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IDEC

Operator Interface

Automation Organizer

WindO/I-NV2

Instruction Manual

Publication history

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Caution

Trademarks

Preface

This instruction manual explains the operation and handling of the MICRO/I HG2G/3G, HG1F/2F/2S/3F/4F. Please read it carefully and ensure that you fully understand the functions and performance of the MICRO/I HG2G/3G, HG1F/2F/2S/3F/4F and the WindO/I-NV2 configuration software.

In this manual the MICRO/I HG2G/3G, HG1F/HG2F/HG2S/HG3F/HG4F are simply referred to as HG2G/3G, HG1F/HG2F/HG2S/HG3F/HG4F respectively. The flame-proof construction type EX4R MICRO/I box is referred to as EX4R. The basic specifications of the EX4R are the same as those of the HG4F. See also the instruction sheets that accompany each screen for additional information including the flame-proof construction of the EX4R. The dedicated screen configuration software for the HG2G/3G, HG1F/2F/2S/3F/4F is referred to as WindO/I-NV2.

Manual Overview

In the table below, the Manuals and Help are available as references for the operation of the HG2G/3G, HG1F/2F/2S/3F/4F and WindO/I-NV2.

References	Content
Instruction Manual (This document)	Describes the hardware specifications of the HG2G/3G, HG1F/2F/2S/3F/4F.
Hardware Manual (PDF)	Information that requires special attention. Failure to operate the product in accordance with the information provided can lead to serious injury or damage.
Communication Manual (PDF)	Describes the connection procedures and available devices for various communication including the PLC-Link communication, O/I Link communication, and DM Link communication.
Downloader Manual (PDF)	The manual is described about Downloader software. Downloader is a software tool which operates independently from WindO/I-NV2. It allows you to upload/download the recipe, Data Log, and project data (without viewing the content of the project).
Character Table (PDF)	A list of fonts can be used with the HG2G/3G, HG1F/2F/2S/3F/4F and WindO/I-NV2. For restrictions on using the HG2G/3G, HG1F/2F/2S/3F/4F, refer to Chapter 37 “3 Character Code Table” on page 575.
Help	Describes the operating procedures. The user is allowed to view all manuals via Help.

Symbols Used in this Document

This document uses the following symbols to facilitate explanation.

Symbols

Useful information relating to a function

Information that requires special attention. Failure to operate the product in accordance with the information provided can lead to serious injury or damage.

OK

Screen buttons are indicated by enclosing text inside a rectangle or by using the actual graphic icon.

[A5]

Keyboard keys are indicated by the keyboard inscription enclosed in square brackets.

[****]

Controls are indicated by enclosing text inside a rectangle .

Confirm that the delivered product is what you have ordered. Read this instruction sheet to make sure of correct operation. Make sure that the instruction sheet is kept by the end user.

SAFETY PRECAUTIONS

- **Be certain to read this manual carefully before performing installation, wiring, or maintenance work, or operating the HG2G/3G, HG1F/2F/2S/3F/4F.**

- **The HG2G/3G, HG1F/2F/2S/3F/4F has been manufactured with careful regard to quality. However, if you intend to use this product in applications where failure of this equipment may result in damage to property or injury, ensure that it used in conjunction with appropriate fail-safe backup equipment.**

- **In this manual, safety precautions are categorized in order of importance to Warning and Caution:**

  ⚠ WARNING

  Warning notices are used to emphasize that improper operation may cause severe personal injury or death.

  ⚠ CAUTION

  Caution notices are used where inattention might cause personal injury or damage to equipment.

⚠ WARNING

- **The HG2G/3G, HG1F/2F/2S/3F/4F is not intended to be used for applications which require high reliability and safety, such as medical equipment, nuclear equipment, railways, aircraft, and vehicles. The HG2G/3G, HG1F/2F/2S/3F/4F cannot be used for these applications.**

- **For other applications which require high reliability in function and precision, provide a failsafe design and redundant design for the entire system including the HG2G/3G, HG1F/2F/2S/3F/4F.**

- **Turn off the power to the HG2G/3G, HG1F/2F/2S/3F/4F before installation, removal, wiring, maintenance, and inspection of the HG2G/3G, HG1F/2F/2S/3F/4F. Failure to turn power off may cause electrical shock or fire hazard.**

- **Special expertise is required to install, wire, configure, and operate the HG2G/3G, HG1F/2F/2S/3F/4F. People without such expertise must not use the HG2G/3G, HG1F/2F/2S/3F/4F.**

- **The HG2G/3G, HG1F/2F/2S/3F/4F uses an LCD (liquid crystal display) as a display device. The liquid inside the LCD is harmful to the skin. If the LCD is broken and the liquid attaches to your skin or clothes, wash the liquid off using soap, and consult a doctor immediately.**

- **Emergency and interlocking circuits must be configured outside of the HG2G/3G, HG1F/2F/3F/4F.**
  Do not use the HG2G/3G, HG1F/2F/3F/4F's internal touch switches for an emergency circuit. If the HG2G/3G, HG1F/2F/2S/3F/4F failed, the external equipment connected to the HG2G/3G, HG1F/2F/2S/3F/4F will no longer be protected, and serious injury to operators and equipment damage may be caused.
  Also, connect the emergency stop switch (Direct opening action, Red switch) or the stop switch (Direct opening action, Gray switch) on the HG2S to the emergency stop circuit fixed to the machine in accordance with ISO13850/EN418.

- **If an emergency stop switch is used for the HG2S, it should be secured and connected to the machine for fear of disconnecting easily.**

- **Connect the emergency stop switch or the stop switch and the enabling switch on the HG2S to function as either a category 0 or category 1 stop in accordance with IEC/EN60204-1 which applies to the HG2S.**

- **When the HG2S cable can be easily disconnected from the machine, use the HG2S with a stop switch so that the operator can easily notice that the HG2S is NOT an emergency stop device which always functions.**

⚠ CAUTION

- **Prevent the HG2G/3G, HG1F/2F/2S/3F/4F from falling while moving or transporting, otherwise damage or malfunction of the HG2G/3G, HG1F/2F/2S/3F/4F will result.**
- **Use the product within the environmental limits given in the catalog and manual. Use of the product in high-temperature or high-humidity environments, or in locations where it is exposed to condensation, corrosive gas or large shock loads can create the risk of electrocution and fire.**
- **The HG2G/3G, HG1F/2F/2S/3F/4F is designed for use in pollution degree 2. Use the HG2G/3G, HG1F/2F/2S/3F/4F in environments of pollution degree 2. (based on the IEC60664-1 rating)**
- **Install the HG2G/3G, HG1F/2F/2S/3F/4F according to the instructions. Improper installation will result in falling, failure, electrical shock, fire hazard, or malfunction of the HG2G/3G, HG1F/2F/2S/3F/4F.**
- **Prevent metal fragments or wire chips from dropping inside the HG2G/3G, HG1F/2F/2S/3F/4F housing. Ingress of such fragments and chips may cause fire hazard, damage, and malfunction.**
- **Use a power supply of the rated value. Using a wrong power supply may cause fire hazard.**
- **The HG2G/3G, HG1F/2F/3F/4F uses "PS2 of EN61131" as DC power supply. (based on the IEC/EN61131 rating)**
- **Use wire of a proper size to meet the voltage and current requirements.**
- **When exporting the HG2G/3G, HG1F/2F/3F/4F to Europe, use an EN60127 (IEC60127) approved fuse on the power line outside the HG2G/3G, HG1F/2F/3F/4F.**
- **The D-sub connector on the end of the cable of the HG2S is not water- and dust-proof. If protection against water and dust is required, the user must implement a water-proof provision on the connector or replace the D-sub connector with a water-proof connector.**
- **When exporting the HG2G/3G, HG1F/2F/3F/4F to Europe, use an EU-approved circuit protector.**
- **Make sure of safety before starting and stopping the HG2G/3G, HG1F/2F/2S/3F/4F. Incorrect operation of the HG2G/3G, HG1F/2F/2S/3F/4F may cause mechanical damage or accidents.**
- **Use the HG2G/3G, HG3F/4F in a local area network if you download, upload or monitor the project data via the Ethernet port.**
- **The touch panel of the HG2G/3G, HG1F/2F/2S/3F/4F is made of glass, and will break if exposed to excessive shock. Take due care when handling it.**
- **When more than one button is pressed at the same time, due to the detection characteristics of an analog type touch panel, only the gravity center of the pressed area is sensed and the unit assumes that only one button is pressed. Thus, when more than one button is pressed simultaneously, the resulting operation is not guaranteed.**
- **The screen becomes blank when the backlight is burnt out; however, the touch panel remains enabled. Incorrect touch panel operation will occur when operating the touch panel when the backlight appears to be turned off but is actually burnt out. Note that this erroneous operation may result in damage.**

- **Do not push hard or scratch the touch panel and protection sheet with a hard object such as a tool, because they are damaged easily.**
- **At temperatures over the rated operating temperature, the clock accuracy is affected. Adjust the clock before use.**
- **For applications which require clock accuracy, adjust the clock periodically.**
- **Do not install the HG2G/3G, HG1F/2F/2S/3F/4F in areas subjected to strong ultraviolet rays, since ultraviolet rays may impair the quality of the LCD.**
- **Do not attempt to disassemble, repair or modify the HG2G/3G, HG1F/2F/2S/3F/4F. This can create the risk of fire or electrocution.**
- **When disposing of the HG2G/3G, HG1F/2F/2S/3F/4F, do so as an industrial waste.**
- **Do not switch off the power or pull out the Memory Card while it is being accessed, as this may result in destruction of the stored data. If the data on the Memory Card is corrupted, format the Memory Card.**
- **Be sure to confirm that the Memory Card Access lamp is not lit prior to turning the power off to the HG3G, HG2F/3F/4F or pulling out the Memory card. Refer to the Instruction Manual for details.**
- **Do not switch off the power or pull out the USB Flash Drive while it is being accessed, as this may result in destruction of the stored data. If the data on the USB Flash Drive is corrupted, format the USB Flash Drive.**

Introduction

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Chapter 2 Creating Projects

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Introduction

1 Overview

This manual describes the MICRO/I operator interface (HG2G/3G and HG1F/2F/2S/3F/4F) and WindO/I-NV2 general configuration software. The information includes drawing tools, setup procedures, limitations and how to configure all objects and parts.

Be sure to read this manual before using MICRO/I or WindO/I-NV2, to gain an adequate understanding of their abilities and functionalities.

The complete set of manuals for MICRO/I and WindO/I-NV2 consists of five manuals (including this manual) and help files. Read these materials as necessary for your particular application. For details, refer to “ Manual Overview” (Pii).

2 Abbreviations, Generic Terms, and Terminology Used in this Manual

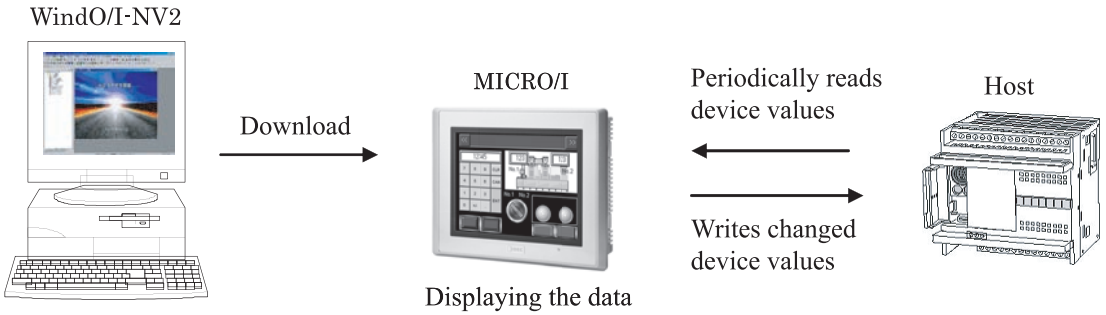
Item	Description
MICRO/I	Generic term used to refer to the HG2G/3G, HG1F/2F/2S/3F/4F.
Host	Generic term used to refer to a PLC or micro computer that is constantly connected to and communicates with the MICRO/I.
Device Address	Memory that is capable of storing values in unit of bits or words loaded on the MICRO/I and host device.
System Area	Device area that is pre-allocated for exchanging screen management, error information, and clock data between the MICRO/I and host device.
PLC Link Communication	A communication method that performs communication with host device according to the setting of the screen and without a program.
DM Link Communication	A communication method that reads to or writes from the MICRO/I device from a PC or microcomputer board.
No Host	A method that is capable of operating the MICRO/I independently without connecting to host device.
User Communication	A communication method which performs communication with external devices such as barcode readers and inverters.
Host Communication	Generic term used to refer to PLC Link Communication and DM Link Communication.
Sub Host Communication	A communication method that performs communication with host device according to the set device list and without a program.
O/I Link	A connection format that enables connections of up to 16 units of MICRO/I with high-speed communications of 115200bps.
O/I Link Master	The MICRO/I unit that is directly connected to host device on the O/I Link network.
O/I Link Slave	The MICRO/I units that are not directly connected to host device on the O/I Link network.
WindO/I-NV2	Integrated configuration software application for creating projects of the MICRO/I.
Project	Data including image data required for operating the MICRO/I, which is created with WindO/I-NV2.
Manager	WindO/I-NV2 provides tools to manage pictures, text and script etc. With the Managers, you can create and manage them in your project.
Setup	Generic term used to refer to the common settings in the project.
Project Settings	Basic settings of operation in the Setup settings.
Alarm Log	A function is that MICRO/I collects the log data of alarms.
Data Log	A function is that MICRO/I collects the data of device addresses.
Script	WindO/I-NV2 provides the function to make a script. A script is an executable list of commands created by a simple programming language.
Text Group	A group of 16 texts at maximum that is in order to dynamically switch the character displayed on the MICRO/I according to the value of the device.
Part	The unit of operation setting to be allocated in the screen.
Windows Font	Text fonts that can be displayed on the Windows OS on which the WindO/I-NV2 is running.
Stroke Font	A glyph's outline is defined by the vertices of individual strokes and stroke's profile. Scalable fonts scale easily without jagged edges. Under font settings, "European Stroke" is a stroke-based font.
Maintenance Communication	Communications between the WindO/I-NV2 and MICRO/I using a dedicated protocol.
Device Monitor	A special popup screen on the MICRO/I on which value of the device can be displayed or changed.

Item	Description
Pass-Through	A function that enables the maintenance of the host device via the MICRO/I.
System Menu	Pre-allocated screen dedicated for performing initial setting of the MICRO/I, self-diagnosis, and clearing the log data etc.
Memory Card	A term referring to CF and SD Memory Card.
Downloader	A software tool which operates independently from WindO/I-NV2.
NV2 Metafile	A graphic data file that integrates drawings created on the WindO/I-NV2 edit screen.

Chapter 1 System Composition

1 System Composition

There are two types of system compositions used in operating the MICRO/I: One that is configured for the operation, and the other that is used for creating projects required for performing operations. In creating projects, use the WindO/I-NV2, the dedicated configuration software application for the MICRO/I.



2 Operating Modes

The internal performance of the MICRO/I includes the Run mode used for normal operations and other modes used for monitoring and transferring a project. Switch to the mode according to the condition of the operation. The MICRO/I has the following five modes of operation.

- Run Mode
- System Mode
- Monitor Mode
- Simulation Mode
- Data Transfer

The following describes the functions of each mode and the conditions required for switching to the mode.

Mode	Functions	Conditions required for switching to the mode
Run Mode	The operator interface is in run mode when it is connected to a host for actual operation. In Run Mode, the operator interface touch switch operations are communicated to the host unit, and based on information from the host unit, the operator interface switches screens and executes its program. This is the normal operating mode of the operator interface.	· The power is switched on. · [Run] is selected in the System Menu. · The project has been downloaded to the operator interface.
System Mode	System Mode is used to perform the initial settings for the MICRO/I and to set the clock and perform self-diagnosis.	· When display the Maintenance Screen, and System Mode is selected. · When all data is cleared using WindO/I-NV2. · When System Menu is specified using either the Goto Screen Button or the Goto Screen Command. · When FFFFh is written to the display screen No. of System Area 1.
Monitor Mode	Monitor Mode is used for debugging using the WindO/I-NV2. When operating in Monitor Mode, the message “Monitor Mode” blinks on the MICRO/I screen. On the HG1F/2F/2S/3F/4F, “Debug Mode” blinks.	· When the [Online] - [Start Monitor] menu is selected on the WindO/I-NV2.
Simulation Mode	Simulation Mode is used for debugging using the MICRO/I only. By setting virtual PLC devices in the MICRO/I and using the Device Monitor function, it is possible to efficiently debug your programs. It is also possible to debug your program using the WindO/I-NV2. When operating in Simulation Mode, the message “Simulation Mode” blinks on the MICRO/I screen.	· To transfer to Simulation Mode, select Simulation in the [Debug] - [System Menu screen]. · When [Simulation] is selected while debugging your program using the WindO/I-NV2.
Data Transfer	In maintenance mode, WindO/I-NV2 is used to transfer data between the MICRO/I and a personal computer. The unit enters Data Transfer in the following situations:	· When a project is being downloaded or uploaded using WindO/I-NV2 software (in the PC).

- Operation stops after transfer to System Mode.
- If [Project Settings] - [Enable maintenance] has not been selected using WindO/I-NV2, the unit will not transfer to System Mode even if the specified location is pressed.

Refer to Chapter 35 “MICRO/I Setup” on page 543 for details about Maintenance Mode.

3 MICRO/I

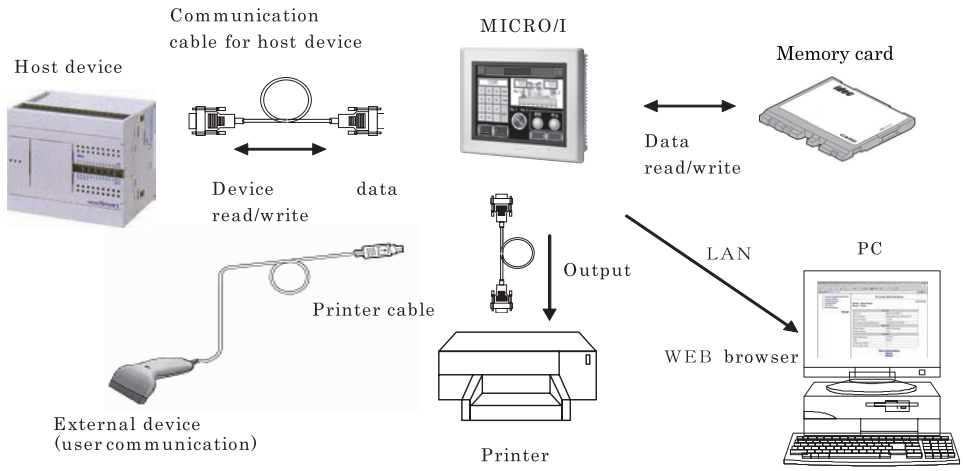
The MICRO/I is equipped with a high-brightness, color LCD with fast screen drawing speed, quick-response touch switches, and high-speed communications to provide a comfortable man-machine interface. It is designed to allow easy data read/write from/to PLC's, and does not burden the operator with issues relating to communications software.

4 WindO/I-NV2

WindO/I-NV2 is a dedicated configuration software application for the MICRO/I programmable display that allows you to perform the various settings required for screen operation. The first step is to create a project and make the various settings for the equipment that you will be using and the operating environment. You then proceed to arrange the switches and display parts to create the screens that will be displayed on the MICRO/I. When the project is complete, you download the project to the MICRO/I.

5 System Composition for the RUN operation

The MICRO/I can be operated in the following system configuration. Devices that can be connected vary depending on your MICRO/I model. Refer to the specifications of the model for the details.



5.1 HG3G (Large size displays)

8.4” and 10.4” TFT LCD display with 65,535-color and 800x600 pixel resolution.

Type No.	HG3G-8JT22TF-*	HG3G-AJT22TF-*
Display Type	8.4 inch Color	10.4 inch Color
Display Resolution	800x600 pixels	800x600 pixels
Serial Interface 1 (COM1) (RS-232C/485 (422))	X	X
Serial Interface 2 (COM2) (RS-232C/485 (422))	X	X
USB Interface (USB1) Mini-B	X	X
USB Interfacet (USB2) Type A	X	X
Ethernet Interface	X	X
O/I Link Interface	---	---
Memory Card Interface(SD)	X	X
Expansion Unit Interface (EXT)	X	X
Audio In	X	X
Audio Out	X	X
Video In	---	---

5.2 HG2G (Medium size displays)

5.7” STN LCD display with 256-color/16-level monochrome and 320x240 pixel resolution.

Type No.	HG2G-SS2*TF	HG2G-SS2*YF	HG2G-SB2*TF	HG2G-SB2*VF
Display Type	5.7 inch Color	5.7 inch Color	5.7inch Monochrome	5.7inch Monochrome
Resolution	320x240 pixels	320x240 pixels	320x240 pixels	320x240 pixels
Serial Interface 1 (COM1) (RS-232C/485 (422))	X	X	X	X
Serial Interface 2(RS-232C)	X	X	X	X
Ethernet Interface	X	---	X	---
O/I Link Interface	X	X	X	X

5.3 HG1F (Compact size displays)

4.6” STN LCD display with 16-level monochrome shades and 300x100 pixel resolutionCompact-sized, stationary type, 16-level display with 300x100 pixel STN monochrome LCD

Type No.	HG1F-SB22BF-*	HG1F-SB22YF-*
Display Type	4.6inch Monochrome	4.6inch Monochrome
Resolution	300x100 pixels	300x100 pixels
Serial Interface 1(RS-232C/485 (422))	X (RS-232C)	X (RS-485/RS-422)
Serial Interface 2(RS-232C)	X	X
O/I Link Interface	X	X

Although the HG1F-SB22YF-* is equipped with a terminal block for RS-485 and a D-sub connector for RS-422, they cannot be used simultaneously.

5.4 HG2F (Medium size displays)

5.7" STN LCD display with 256-color/16-level monochrome and 320x240 pixel resolution.

Type No.	HG2F-SS22VF HG2F-SS52VF	HG2F-SS22VCF HG2F-SS52VCF	HG2F-SS22VDF HG2F-SS52VDF	HG2F-SB22VF HG2F-SB52VF	HG2F-SB22VCF HG2F-SB52VCF	HG2F-SB22VDF HG2F-SB52VDF
Display Type	5.7inch Color	5.7inch Color	5.7inch Color	5.7inch Monochrome	5.7inch Monochrome	5.7inch Monochrome
Resolution	320x240 pixels	320x240 pixels	320x240 pixels	320x240 pixels	320x240 pixels	320x240 pixels
Serial Interface 2 (RS-232C)	X	X	---	X	X	---
Serial Interface 2 (USB)	---	---	X	---	---	X
Expansion Unit Interface	X	X	X	X	X	X
Serial Interface 1 (RS-232C/485 (422))	X	X	X	X	X	X
O/I Link Interface	X	X	X	X	X	X
Compact Flash (CF) Interface	---	X	X	---	X	X

5.5 HG2S (Medium size displays)

5.7" STN LCD display with 256-color/16-level monochrome and 320x240 pixel resolution.

Type No.	HG2S-SS32BH-A□△ HG2S-SS32BH-S□-▲*** HG2S-SS62BH-A□△ HG2S-SS62BH-S□-▲***	HG2S-SS32YH-A□△ HG2S-SS32YH-S□-▲*** HG2S-SS62YH-A□△ HG2S-SS62YH-S□-▲***	HG2S-SB32BH-A□△ HG2S-SB32BH-S□-▲*** HG2S-SB62BH-A□△ HG2S-SB62BH-S□-▲***	HG2S-SB32YH-A□△ HG2S-SB32YH-S□-▲*** HG2S-SB62YH-A□△ HG2S-SB62YH-S□-▲***
Display Type	5.7inchColor	5.7inchColor	5.7inchMonochrome	5.7inchMonochrome
Resolution	320x240 pixels	320x240 pixels	320x240 pixels	320x240 pixels
Serial Interface 2 (RS-232C)	X	X	X	X
Serial Interface 1 (RS-232C/485 (422))	X (RS-232C)	X (RS-485/ RS-422)	X (RS-232C)	X (RS-485/ RS-422)

Note: If △ is "blank", the HG2S is equipped with an emergency stop switch (red). If △ is "N," it is equipped with a stop switch (gray).

Note: If ▲ is "R," the HG2S is equipped with an emergency stop switch (red). If ▲ is "N," it is equipped with a stop switch (gray).
Note: A serial number comes in place of ***, which represents the types and layout of the installed mechanical switches.

5.6 HG3F/4F/EX4R (Large size displays)

8.4" and 10.4" STN LCD display with 256-color and 640x480/800x600 pixel resolution.

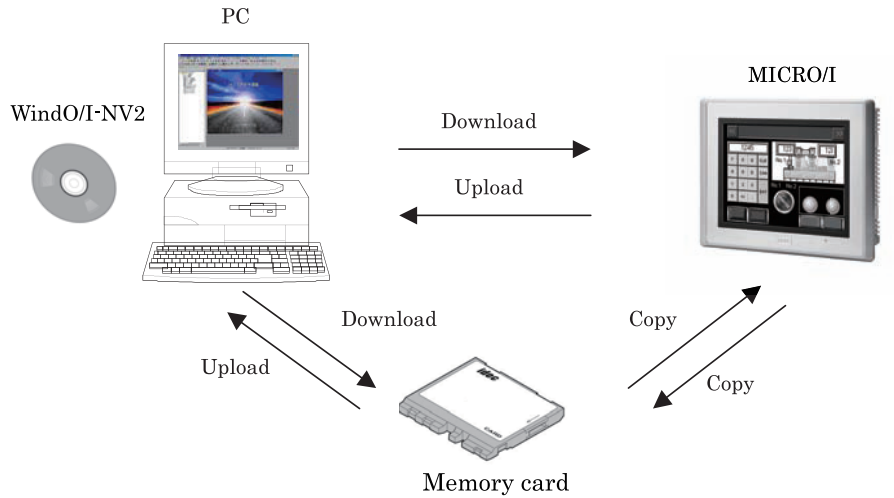
Type No.	HG3F-FT22TF-*	HG3F-FT22VF-*	HG4F-JT22TF-*	HG4F-JT22VF-*	EX4R-D44F-*
Display Type	10 inch Color		12 inch Color		
Resolution	640x480 pixels		800x600 pixels		
Serial Interface 2 (RS-232C)	X	X	X	X	X
Expansion Unit Interface	X	X	X	X	X
Serial Interface 1 (RS-232C/485 (422))	X	X	X	X	X
O/I Link Interface	X	X	X	X	X
Ethernet (LAN) Interface	X	---	X	---	X
Compact Flash (CF) Interface	X	---	X	---	X
Parallel Interface	X	X	X	X	---

The EX4R refers to the Flameproof & Intrinsic safety explosion-proof Display Box.
Note that pressing the touch panel of EX4R will not work while the maintenance cable is inserted into Serial Interface 2.

Chapter 2 Creating Projects

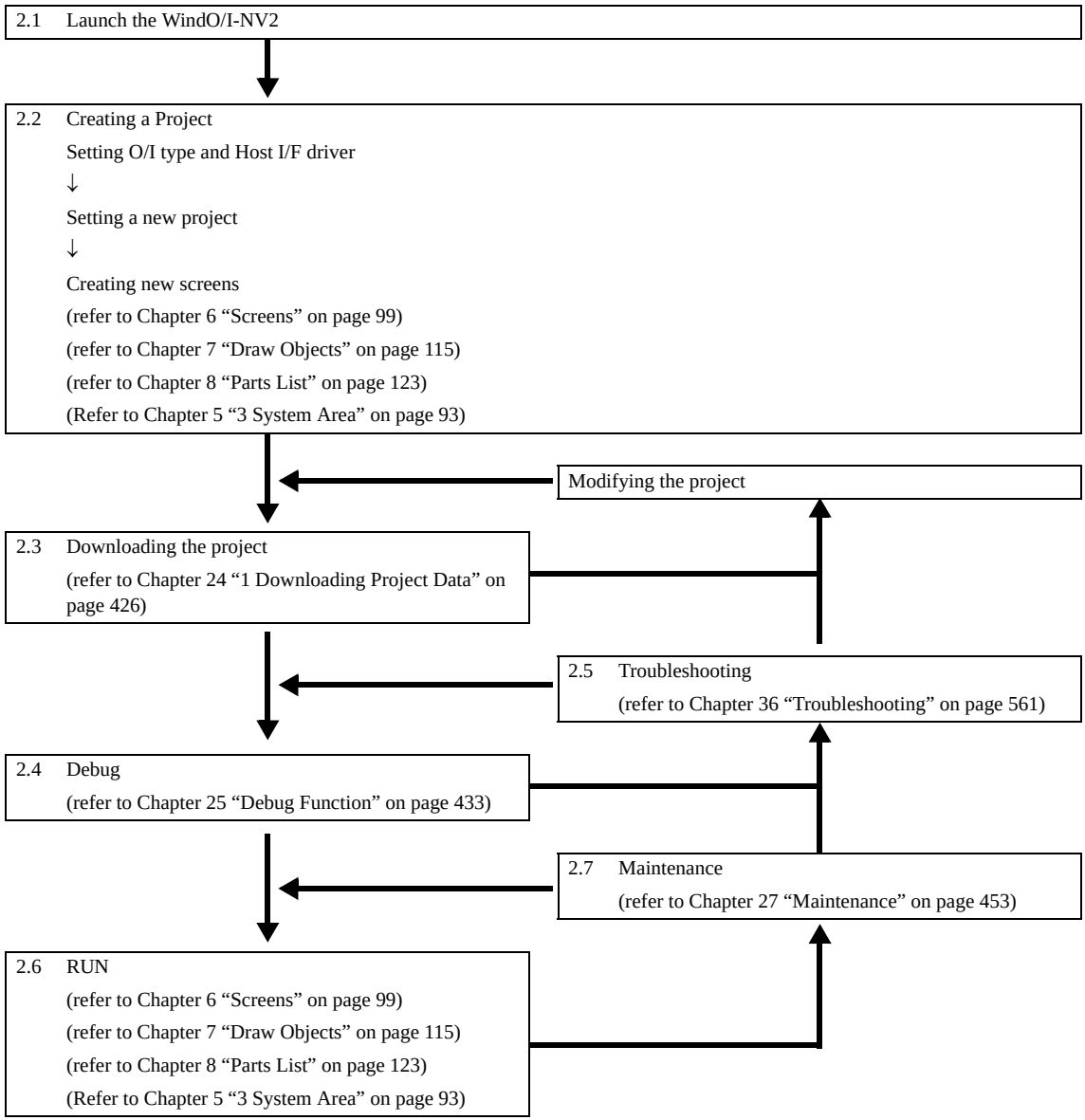
1 System Composition for Creating Screens

It is necessary to create and download a project to the MICRO/I for operating it. Use the WindO/I-NV2 to create a project. The project you have created can be downloaded to the MICRO/I by directly connecting the PC and the MICRO/I, or onto a Memory Card first, and then copied to the HG3G, HG2F/3F/4F.



2 Basic Flow from Project Creation to Run Operation

The following flowchart describes the sequence of step from the project creation for the MICRO/I to the Run operation when using the basic communication, PLC-Link communication.



2.1 Launch WindO/I-NV2

2.2 Creating a Project

Use the WindO/I-NV2 to create a project and new screens to be displayed, and configure the interactions between the performance of the screen and the touch switches, external data and other conditions.

2.3 Downloading the project

Download the project created with the WindO/I-NV2 onto the user memory of the MICRO/I via the Maintenance cable or LAN cable.

2.4 Debug

The user can check the actual performance of the project while editing the data of the created project.

2.5 Troubleshooting

In the event of troubles on the product, communication errors, or irregularities in the users screen creation data, the MICRO/I displays various types of messages that will help the user promptly analyze the cause of the trouble and restore the normal status.

2.6 RUN

After being switched to the RUN mode, the MICRO/I periodically reads data from the host devices related to the parts of the displayed screen via the Host Communications cable. Conversely, the MICRO/I writes the data to the host device when an operation is performed on the MICRTO/I that changes the certain data status.

As described above, the MICRO/I and host device directly read and write data to each other's devices via the communication interface while advancing through a linked series of display steps.

2.7 Maintenance

The Web Server function[*1] allows the user to remotely monitor or operate the state of the O/Is from the web browser. In addition, the saved data in the MICRO/I and files in a Memory Card can be uploaded to the PC.

*1. Only HG3F/ 4F support.

Chapter 3 Overview of WindO/I-NV2

This chapter provides information on minimum system requirements when installing and running WindO/I-NV2 and communication between the PC (using WindO/I-NV2) and the MICRO/I.

1 Minimum System Requirements

Item	Specification
Operating system	Windows 7 , Windows Vista (32-bit), Microsoft Windows XP with Service Pack 3 (32-bit), and Microsoft Windows 2000 Service Pack 4
Computer	PC-AT or compatible
CPU	1.0 GHz processor or faster
Memory	512 MB of installed RAM (1 GB recommended)
Hard disk	800 MB of available hard disk space
Graphics	XGA (1024 x 768) or higher screen resolution
Users	Administrator privilege required
Other	Microsoft .NET Frameworks 2.0 installed, CD-ROM drive, Mouse

- To use USB port of HG2F, the OS should be Windows 2000/XP/Vista/7, and USB1.1 should be available. 64-bit Windows is not supported.
- You must install WindO/I-NV2 or Downloader prior to connecting HG2F using USB the first time. If you connect without the installation, OS invokes the dialog to install appropriate software driver. At that time, select cancel, and then install one of above prior to connecting. If one of above is installed properly, the software driver will be loaded automatically.

2 Connecting to the MICRO/I

The following functions are available when in maintenance communication:

Item	Description
Download	Downloads the project to the MICRO/I or the Memory card. Refer to Chapter 24 “1 Downloading Project Data” on page 426.
Upload	Uploads projects from MICRO/I or Memory card. Refer to Chapter 24 “2 Uploading Project Data” on page 428.
Clear	Clears MICRO/I or the Memory card data. Refer to Chapter 24 “3 Clear” on page 429.
Target Information	Displays the information about the runtime system software of the MICRO/I and downloaded project data. Refer to Chapter 24 “4 Target Information” on page 430.
Downloader	A separate software tool (WindO/I-NV2 utility) which allows a customer to download the project without viewing the project data This protects the project from being viewed or edited. Refer to Chapter 27 “2 Downloader” on page 477.
Debug function	Refer to Chapter 25 “Debug Function” on page 433.

2.1 Maintenance Communication Settings

Set the target, the interface the conditions for communication between the WindO/I-NV2 software and the MICRO/I operator interface.

Select [Home] - [Project] - [Communication Setup] and configure the Communication Settings dialog box.

Item	Description	
Communicate with	Select the target of the communication from the following options.	
	HG1F/2F/2G/2S/3F/3G/4F:	Select to communicate with MICRO/I.
	O/I Link Slaves:	Select to communicate with MICRO/I that is O/I link salve
	Memory card:	Select to destination as Memory card for uploading or downloading. (refer to Chapter 30 “1.5 Reading/Writing Data from/to Memory Card” on page 504)
Port	Select the port used in the communication from the following options.	
	Serial:	Select this option to connect with the Serial Interface 2 of the MICRO/I. (COM1 to COM256)
	USB:	Select to connect with the USB interface of the MICRO/I.
	Ethernet:	Select when using the Ethernet interface of HG2G/3G, HG3F/4F. (TCP Port No.: 2537) Via Web Server Unit: Select this option to connect with the MICRO/I serial interface 2 via the Web Server Unit (Type No.: FC4A-SX5ES1).
Baud Rate	Select baud rate using serial interface.	
Time Out	Set the wait time for a response from the MICRO/I.	

- Connections using Ethernet and O/I link are functions realized in the runtime system software Ver.1.50 (included in WindO/I-NV2 Ver. 2.50) or later versions. If you use the MICRO/I that the runtime system software is older than Ver.1.50 (included in WindO/I-NV2 Ver.2.50) or a brand-new one, you must select the MICRO/I and the port except the “Ethernet” on the Communication Settings. After the runtime system software is upgraded to the version that included in the WindO/I-NV2 Ver.2.50 or later, the functions via O/I Link port and Ethernet port will be available.
- When you select the “O/I Link Slaves” in the Communication Settings, directly connect the PC running WindO/I-NV2 to the MICRO/I (O/I Link Master). It is not possible to the target MICRO/I via the MICRO/I (O/I Link Slave).
- If HG1F/2F/2S/3F/4F series is used as “O/I Link Slaves”, then the “O/I Link Master” should be HG1F/2F/2S/3F/4F series. Similarly, if HG2G/3G series is used as “O/I Link Slaves”, then the “O/I Link Master” should be HG2G/3G series.
- When using EX4R, pressing the touch panel will not work while the maintenance cable is inserted into serial interface 2.
- The HG3G Series maintenance communication port is either the USB (USB1) or Ethernet interface.

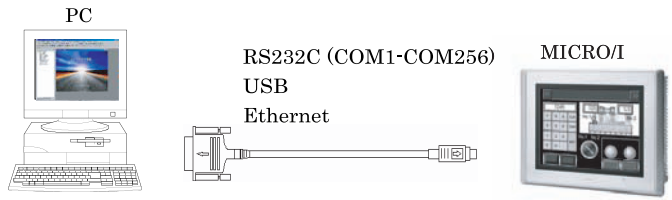
2.2 Connection Example for Maintenance Communication

2.2.1 Maintenance Communication with the MICRO/I

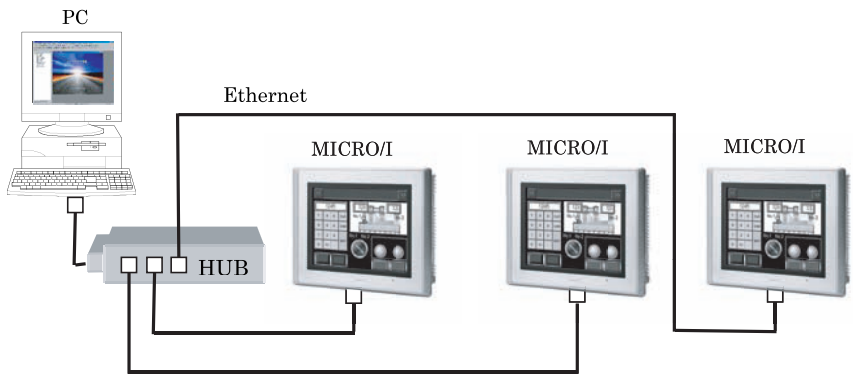
Performs 1:1 communication with the MICRO/I. Using Ethernet enables download on a 1:N basis as well.

Communicate with	MICRO/I
Port	RS232C (COM1-COM256)
	USB
	Ethernet

(Example 1) When connecting with one MICRO/I unit.



(Example 2) When connecting with multiple MICRO/I units via the Ethernet:



A project can be downloaded sequentially to two or more MICRO/I units as a lump operation. However, note that the O/I type should be the same as the setting of the project to be downloaded.

Settings for downloading a project

Setting Item	Description
Download to	Specify the IP Address of the MICRO/I to which you are downloading a project.
IP Address	Specify the IP Address of the MICRO/I that will be set after the download.
Subnet Mask	Set up the Subnet Mask for the network.
Default Gateway	Set up the Default Gateway for the network.

Other settings

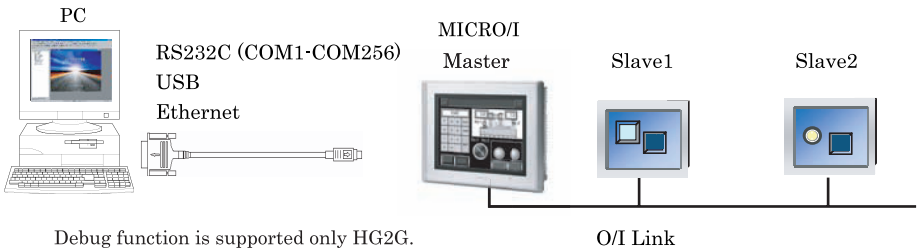
Setting Item	Description
Target IP Address	Specify the IP address of the target MICRO/I.

Set the TCP/IP settings of the MICRO/I when performing maintenance communication via Ethernet. Refer to Chapter 33 “1.1 TCP/IP Settings” on page 530 for the TCP/IP setting. Refer to Chapter 35 “2.1.5 Communication I/F” on page 555 for the setting procedure.

2.2.2 NV2 Maintenance Communication with the O/I Link Slave

Performs communication with Slave units via an O/I Link Master.

Communicate with	O/I Link Slave
Port	RS232C (COM1-COM256)
	USB
	Ethernet



Only the Download/Upload functions can be used.

A project can be downloaded sequentially to two or more MICRO/I units as a lump operation. However, note that the MICRO/I type should be the same as the setting of the project to be downloaded. When downloading a project to the slave HG2G/3G, HG1F/2F/3F/4F, the master MICRO/I stops operation (it will display Data Transfer Mode). However, in Debug mode, the HG2G/3G master does not stop operations while other models (HG1F/2F/3F/4F) do stop.

Settings for downloading a project

Setting Item	Description
Download to	Check the slave number of the download target MICRO/I. (Slave1 to Slave15)
Set slave No.	Set the slave number for after download. Slave 1 Specify the slave number to be set after the download to Slave 1. Slave 2 Specify the slave number to be set after the download to Slave 2. ⋮ ⋮ Slave 15 Specify the slave number to be set after the download to Slave 15.
Master IP Address	his setting appears when you select the “Ethernet” on the Communication Settings.

WARNING

When you set the slave numbers, ensure that they do not conflict with existing slave number settings. Downloading is performed in order from slave number 1. When changing slave numbers, the number is changed at download to each individual slave. Therefore, if you change to an existing slave number, there will be an existing slave with that number, and communication will not be possible.

Other settings

Setting Item	Description
Target IP Address	Selects the target slave.
Master IP Address	When the WindO/I-NV2 is connected with the Master via the Ethernet: This setting appears when you select the “Ethernet” on the Communication Settings.

The factory setting of the O/I link is set to “Disabled”. Select [Initial Setting] - [O/I Link] from the System Menu of the MICRO/I, set the O/I Link to “Enable”, set up each O/I Link port, and then perform the maintenance communication.

WARNING

- Maintenance communication cannot be performed via the O/I Link Master with an O/I Link Slave that is operating in the Simulation Mode. Cancel the simulation or download the projects directly.
- When the HG1F is used as a master for the O/I link communication, the displays and PCs specified as O/I link slaves cannot communicate via the master.

Chapter 4 Communication

This chapter describes the different types of communication between the MICRO/I and the host device.

1 PLC Link Communication

1.1 Overview

With the PLC-Link communication method, the MICRO/I reads from and writes to PLC devices such as relays and registers via the PLC's PLC Link Unit or the CPU Unit Programming Port (the terminology used depends on the PLC manufacturer). No special communication program is required on the PLC when PLC-Link communication is used.

1.2 Operation

The MICRO/I can use PLC-Link communication to read from and write to PLC devices.

- Reading from the PLC

  The MICRO/I continuously reads data from PLC devices set in the currently displayed screen, and display parts (such as numerical displays and pilot lamps) in the MICRO/I screen are updated with the latest data at all times.

- Writing to the PLC

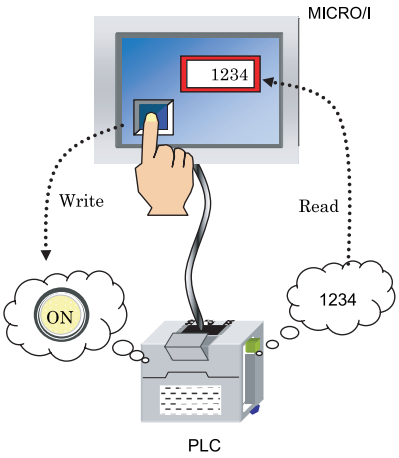
  When data input parts in the MICRO/I screen (such as bit switch and word switch parts) are operated, reading from the PLC is interrupted, and data is written to the PLC.

1.3 1:N Communication

When the Host I/F driver supporting 1:N Communication is selected, two or more PLC units can be connected to a single MICRO/I unit.

WARNING For details regarding the PLC communication method, refer to Chapter1 (PLC Link Communication) of the MICRO/I HG2G, HG1F/2F/2S/3F/4F Communication Manual (PDF) and Chapter2 the Connection to a PLC.

Reading from and writing to PLC devices



1.4 PLC List

In order to connect the MICRO/I to a PLC using PLC-Link Communication, you must select a communication program that is compatible with the PLC's PLC Link Unit (or the PLC model) using the WindO/I-NV2 application. Please refer to MICRO/I HG2G, HG1F/2F/2S/3F/4F Communication Manual (PDF format) for PLC compatibility list.

2 O/I Link Communication

2.1 Overview

O/I Link Communication is used for performing 1:N communication (where one PLC is connected to multiple MICRO/I units). Construct a Master/Slave network (hereafter called an O/I Link) using the MICRO/I units, and perform PLC-Link Communication with the PLC using the Master HG1F/2F/3F/4F (hereafter called Master). The Slave MICRO/I units (hereafter called Slaves) can read from and write to the PLC devices via the Master. Up to 1 Master and 15 Slaves can be connected, and, as is the case with PLC-Link Communication, no special communication program is required in the PLC.

With just a simple setting change, screen data being used with PLC-Link Communication can be used as is with a MICRO/I setup as a Master or Slave.

WARNING The HG2G/3G uses a different type of O/I link communication protocol than HG1F/2F/3F/4F therefore refer to the O/I Link section of the Communication Manual (PDF).

2.2 Operation

With O/I Link Communication a MICRO/I can read data from and write data to host devices.

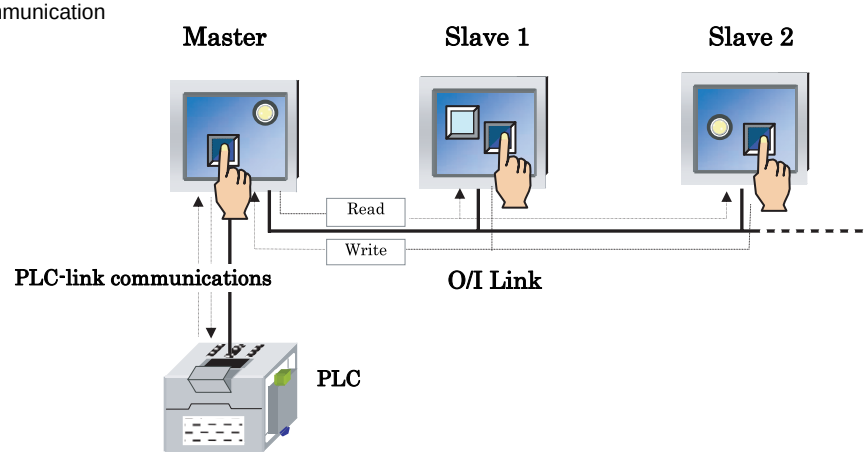
- **Reading from the PLC**

  The Master reads data directly from the PLC devices set in the currently displayed screen, and Slaves read data from the PLC devices set in the currently displayed screen via the Master. Display parts (such as numerical displays and pilot lamps) in the MICRO/I screens are updated with the latest data at all times.

- **Writing to the PLC**

  When data input parts (such as bit switch and word switch parts) in the Master screen are operated, they directly write to the PLC, and if they are in a Slave screen they write to the PLC via the Master.

O/I Link Communication



WARNING
- The HG2S can only be operated as a slave.
- For details regarding the O/I link communication method, refer to chapter 3 (O/I Link Communication) of the MICRO/I HG2G/3G, HG1F/2F/2S/3F/4F Communication Manual (PDF).

3 DM Link Communication

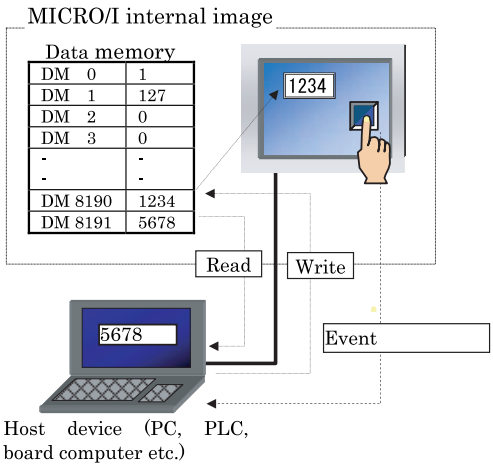
3.1 Overview

DM Link Communication reads data from and writes data to the host devices (PLC, PC or board computer etc.) using the MICRO/I 's dedicated DM Link memory. This is called DM Link 1:1 in the case that one MICRO/I is connected to one host, and DM 1:N if there is more than one MICRO/I connected to a host. Both methods use a dedicated IDEC protocol, so a communication program is required in the host unit.

WARNING

For details regarding the DM Link Communication method, refer to Chapter4 (DM Link Communication) of the MICRO/I HG2G, HG1F/2F/2S/3F/4F Communication Manual (PDF).

DM Link 1:1 Communication



3.2 Operation

The host unit can read from and write to the MICRO/I data memory using DM Link Communication, and the MICRO/I can display the data memory contents on the screen and change the data memory contents.

- Reading from and writing to the data memory using a host

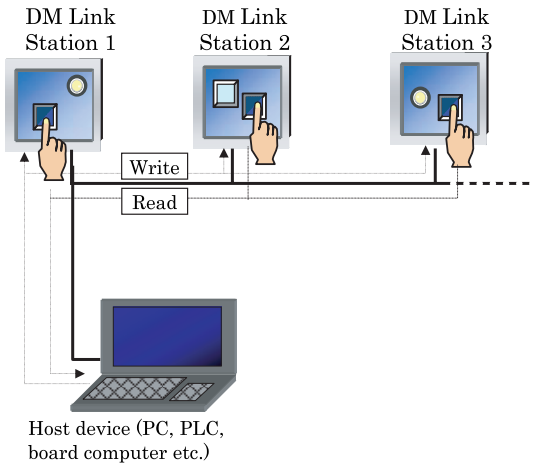
  The host unit can read from and write to the MICRO/I data memory at any time.

- Event transmission from the MICRO/I

  When the MICRO/I writes values to the data memory, the data is transferred from the MICRO/I. This function is referred to as the Event Transmission function.

  The Event Transmission function cannot be used with the DM Link 1:N communication method.

DM Link 1:N Communication

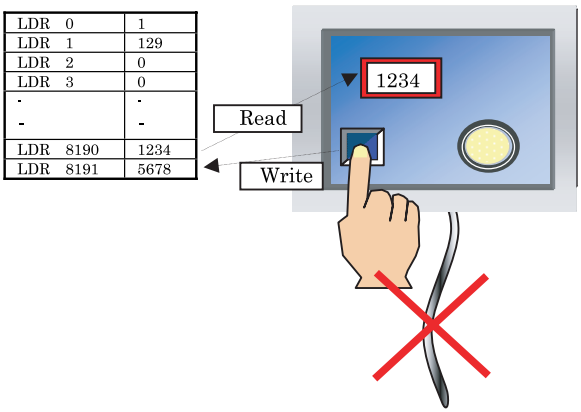


4 No Host

4.1 Overview

In this case, there is no communication connection to a host device, and the MICRO/I operates as a standalone unit. It is possible to read from and write to internal MICRO/I devices (such as relays and registers).

Reading from and writing to MICEO/I Internal devices



No communication connection to a host

4.2 Settings and Devices

When using the MICRO/I without a host, set the Host I/F (refer to Chapter 5 “1.3 Host I/F Driver” on page 88) as follows.

- Manufacturer: IDEC HG System
- PLC Type: No Host

Only the internal O/I devices can be used with the No Host communication method.

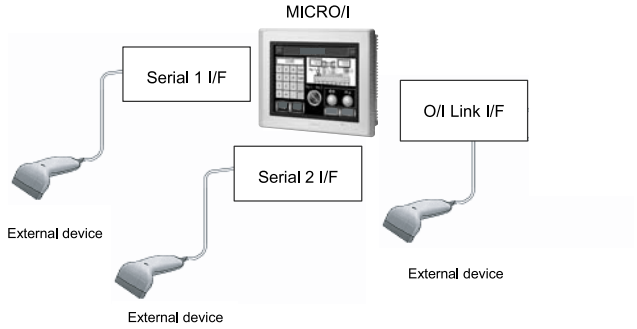
5 User Communication

5.1 Overview

The User Communication function allows you to make a communication protocol for external devices. This function allows communication with two external devices simultaneously while communicating with the host device. The User Communication is available when using the Serial, O/I Link or USB interface.

5.2 Specifications of the User Communication

The MICRO/I supports communication with external devices that comply with the User Communication specifications via the serial interface, the O/I link interface and the USB interface.



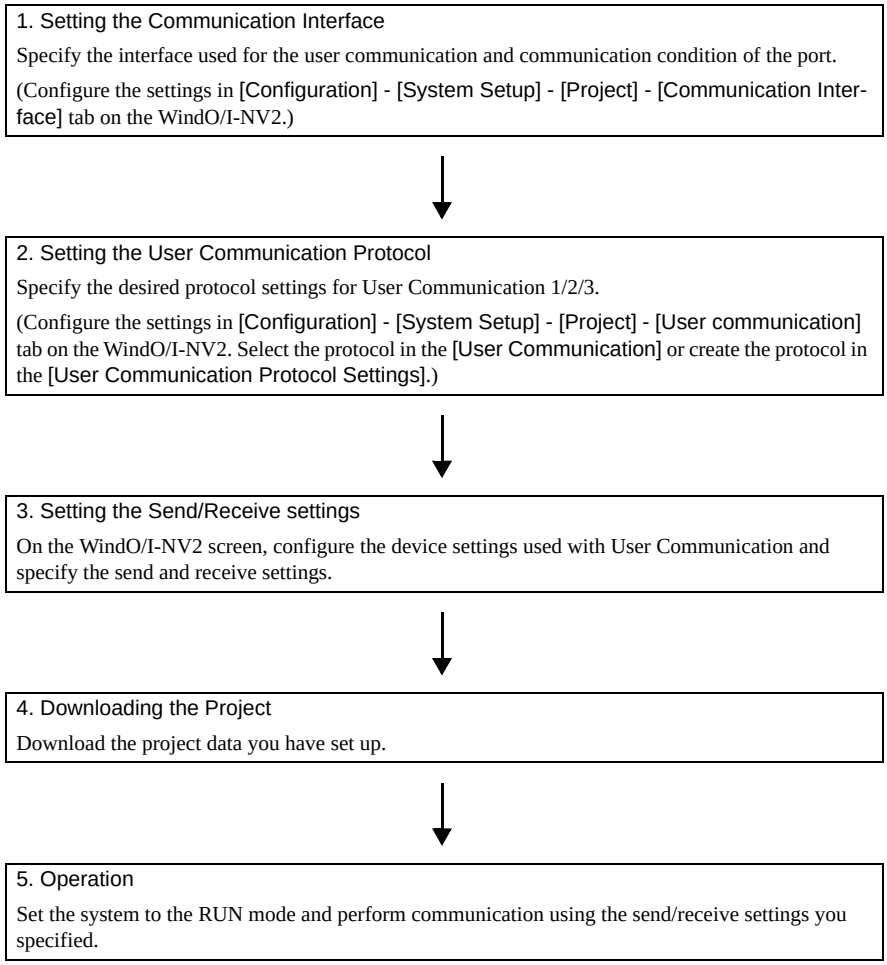
- Refer to Chapter 5 “1.2 Communication Interface” on page 86 for further details on User Communication.
- Up to 31 units can be connected via RS-485; however, it is necessary to thoroughly check the command settings, error handling and other detailed User Communication command specifications when considering the capability of communicating with two or more external devices.
- With the HG2F/2S/3F/4F/EX4R, the Data Bits, Stop Bits, and Parity settings for the O/I Link I/F are fixed to “8 bits”, “1 bit”, and “None” respectively.
- For HG1F, the Serial I/F 2 and the O/I Link I/F can not be used at the same time.
- For HG1F, O/I Link communication stops while the maintenance cable is connected to the Serial I/F 2.
- For HG1F, the O/I Link I/F cannot be used for a communication when [Enable Pass-Through] is selected.

- Correspondence model of USB Barcode Scanner

Manufacturer	Type Number
IDEC DATA LOGIC	QD2130

5.2.1 Basic Flow from Setting the WindO/I-NV2 to User Communication Operation

The following flowchart describes the series of operational procedures from setting the WindO/I-NV2 to User Communication operation.



- Refer to the Help of the WindO/I-NV2 for details about the setting procedures.
- If the setting is other than “No Host” at the time of setting up the User Communication to Serial 1, the O/I Link should be set to “O/I Link Slave”.

5.3 User Communication Protocol

The following table shows the specifications for the parameters of the Communication Protocol to be set according to the external device.

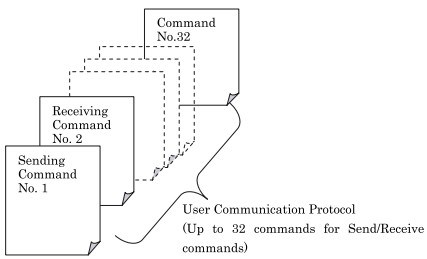
User Communication Protocol Settings

Item	Specifications
Protocol Name	The name of the protocol to be created.
Receiving Character Time Out (for RXD only)	When the interval between data reception (duration from one data reception to the next data reception) exceeds the preset time while receiving frame*1 data, receiving character time out occurs (0: No time out). Refer to “5.5.7 Receiving Character Time Out” (P.64) in this chapter.

*1. A frame refers to a data string from the beginning to the end of a communication command.

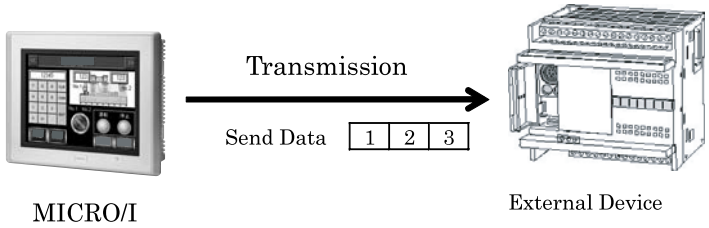
Command Settings (Up to 32 commands can be set up for Send and Receive commands)

Item	Specifications
Comment	The comment for the command to be set up.
Command Type	Set the communication command for TXD (transmission) or RXD (reception).
Completed Device	Allows you to check whether the transmission or the reception is completed successfully. The set bit turns ON after the transmission or the reception processing is completed. Refer to “5.4.3 Completed Device and Transmission Wait” (P.45) in this chapter and refer to “5.5.4 Completed Device” (P.60) in this chapter.
Not Clear Completed Device automatically (for RXD only)	Check this checkbox to enable you not to reset the device to <0> automatically after <1> is written to the Completed bit device.
Status Device	The specified bit in the set device turns ON when an error or time out occurs. Refer to “5.4.4 Status Device” (P.45) in this chapter and refer to “5.5.5 Status Device” (P.61) in this chapter.
Transmission Wait (For TXD only)	Duration of time after the Trigger Condition becomes satisfied until the start of the command transmission. Refer to “5.4.3 Completed Device and Transmission Wait” (P.45) in this chapter.
Receiving Time Out (for RXD only)	Receiving time out occurs if reception of data of 1 frame * is not completed within the specified time. The specified bit of Status Bit turns ON. (0: No time out) Refer to “5.5.6 Receiving Time Out” (P.63) in this chapter.
Trigger Condition	Condition for starting and terminating a transmission or a reception. Refer to “5.4.1 Trigger Condition” (P.37) in this chapter and refer to “5.5.1 Trigger Condition” (P.48) in this chapter.
Command	Constant, Device, Registering Constant, BCC, and Skip (for RXD only) settings can be combined to create a Send/Receive command. Refer to “5.4.2 Transmission Command Settings” (P.37) in this chapter and refer to “5.5.2 Receive Command Settings” (P.48) in this chapter.



5.4 Transmission (TXD) Command

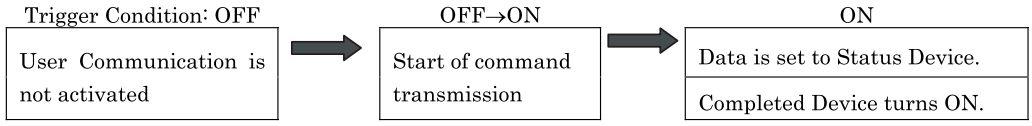
Data can be sent from the MICRO/I by setting a Transmission (TXD) command.



Configure the following setting items when creating a transmission command.

Item	Description of settings
Comment	Specify the comment for this TXD command.
Command Type	Set the communication command to TXD.
Trigger Condition	Specify the condition for starting and terminating a transmission. Refer to “5.4.1 Trigger Condition” (P.37) in this chapter.
Completed Device	Specify the device used for checking that the transmission is completed successfully. Refer to “5.4.3 Completed Device and Transmission Wait” (P.45) in this chapter.
Status Device	Specify the device to which error information and transmission size will be stored (2 words will be occupied.). Refer to “5.4.4 Status Device” (P.45) in this chapter.
Transmission Wait	Specify the duration of time after the Trigger Condition becomes satisfied until the transmission is started (0 to 255 x 100 msec.). Refer to “5.4.3 Completed Device and Transmission Wait” (P.45) in this chapter.
Command	Combine the Constant, Device, Registering Constant, BCC, and Skip (for RXD only) settings to create a communication command. Refer to “5.4.2 Transmission Command Settings” (P.37) in this chapter.

Procedure for transmission process



5.4.1 Trigger Condition

The condition for starting a transmission.

Item	Specifications
Rising-edge	Transmission is started when the device set for “Device” changes from OFF to ON.
Falling-edge	Transmission is started when the device set for “Device” changes from ON to OFF.
Satisfy the condition	Transmission is started when the expression set for “Conditional Expression” and “Data Type” is satisfied. Data Type: BIN16 (+), BIN16 (+/-), BIN32 (+), BIN32 (+/-), BCD4, BCD8, or float32
Fixed Period	Transmission is started each time the duration set for “Period (sec.)” has elapsed.

5.4.2 Transmission Command Settings

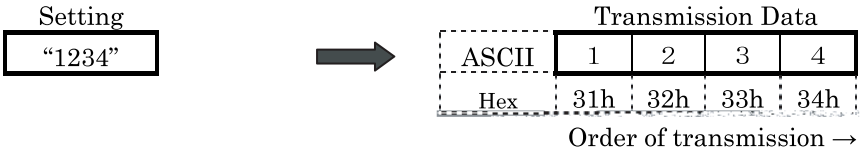
“Constant”, “Device”, “Registering Constant”, and “BCC” can be configured. Combine these settings to create a transmission command.

- Constant

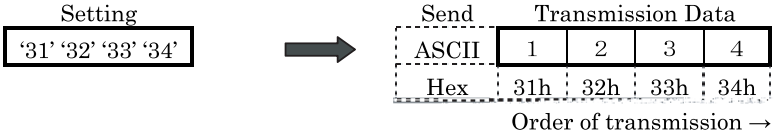
Item	Specifications
Constant (Character)	The specified character data is sent without being converted. The size of a single-byte character is 1 byte and that of a double-byte character is 2 bytes. (1 to 80 bytes)
Constant (Hexadecimal)	The specified hexadecimal data is sent without being converted. Use this setting to send a control code of ASCII data (00h to 1Fh). (1 to 80 bytes)

<Example of settings>

Constant (Character)



Constant (Hexadecimal)



- Device

  Converts the device data using the specified conversion type and transmits the data for the specified number of digits.

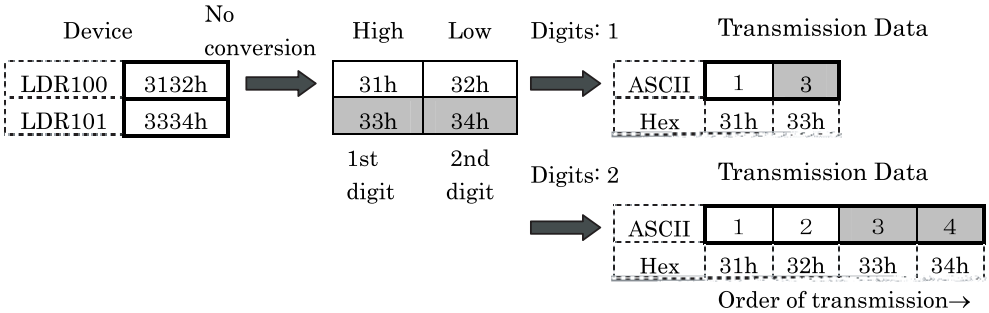
Item		Specifications
Conversion Type*1	Binary (HEX) to ASCII	Considers the device data as binary-coded hexadecimal number and converts it to ASCII data, and then transmits the converted data.
	Binary (DEC) to ASCII	Considers the device data as binary-coded decimal number and converts it to ASCII data, and then transmits the converted data.
	No conversion	Transmits the device data without converting the data.
Digits		Specify the number of bytes to be used as Transmission data after the data is converted with the Conversion Type. Binary (HEX) to ASCII: 1 to 4 Binary (DEC) to ASCII: 1 to 5 No conversion: 1 to 2
Variable*2	With Variable (Checkbox is selected.)	NULL: Send data from the first data to data 00 (hexadecimal) of device data. (Data 00 will not be sent.) This setting is effective for sending only the character data section of character data having 00 (hexadecimal) as the last data. Device: Consider the value of the specified device to be the transmission data size (number of bytes), and send the data of that size (number of bytes) starting from the beginning of the device data. Values exceeding "number of digits x number of words" and negative values are not sent by turning on the specified bit of the status device.
	Without Variable (Checkbox is not selected.)	Send the preset size of the device data ("number of digits x number of words" (bytes)).
Words		Specify the number of word devices to be read. (1 to 99)
Device		Specify the destination device for data reading.
Use Reference Device		Specify this parameter to set the read destination device dynamically. The data is read from the address that is obtained by adding the data stored in the reference device specified here to the specified device address.
Storage Method for data (for No conversion only)		from Upper byte: Obtains and transmits the data from the upper byte of the device. from Lower byte: Obtains and transmits the data from the lower byte of the device.

*1. Converts the data according to the conversion type.

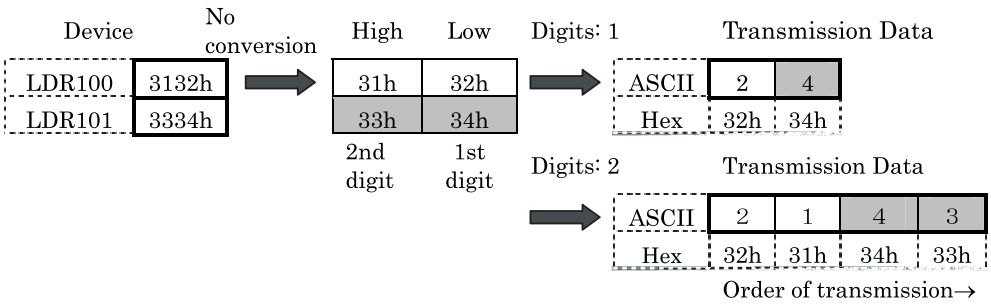
*2. Specify whether the number of device data to be sent is variable or not. (This setting is effective only when No conversion is selected for Conversion Type.

<Example of settings>
When the transmission command consists of “Device” only:

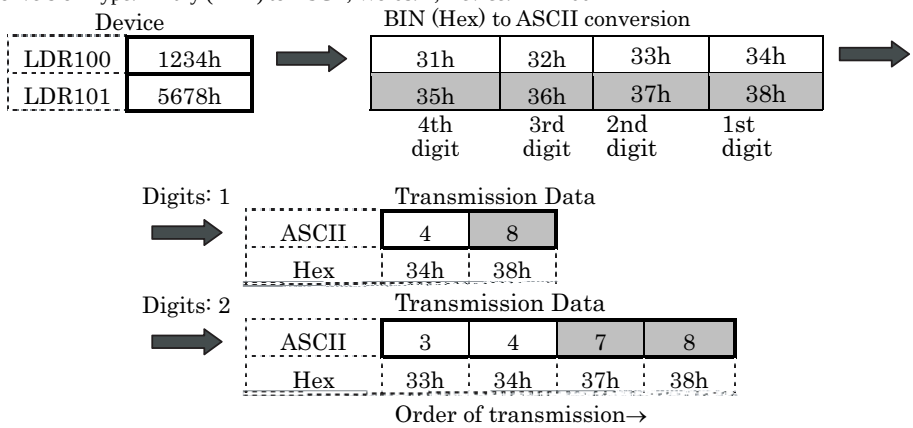
When the Conversion Type: No conversion, Storage Method for data: from Upper byte, Words: 2, Device: LDR100, Variable: Not selected



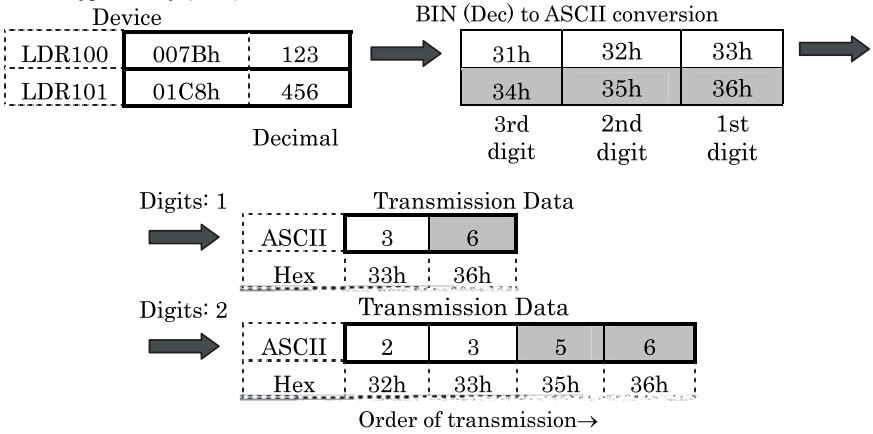
When Conversion Type: No conversion, Storage Method for data: from Lower byte, Words: 2, Device: LDR100, Variable: Not selected



When Conversion Type: Binary (HEX) to ASCII, Words: 2, Device: LDR100

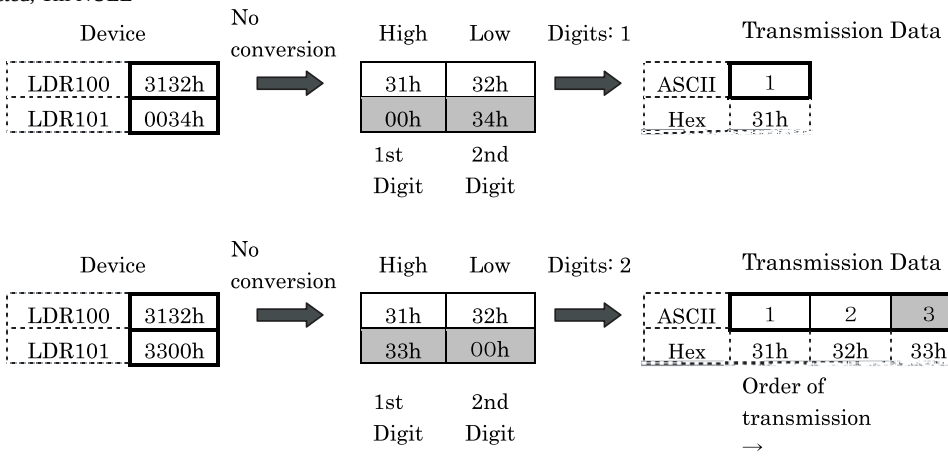


When Conversion Type: Binary (DEC) to ASCII, Words: 2, Device: LDR100

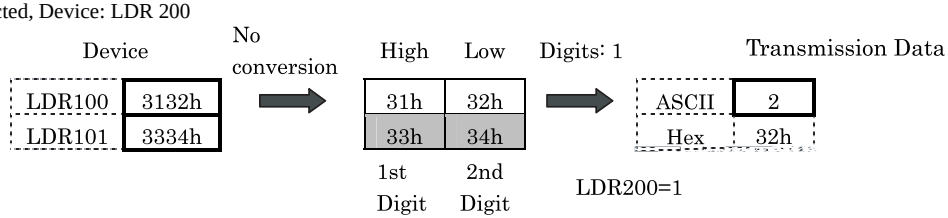


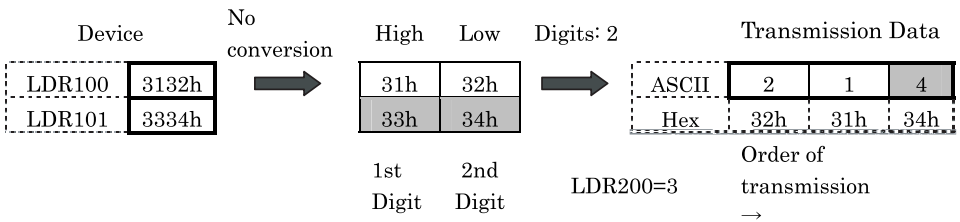
< Example of settings when Variable is selected > (When the transmission command consists of “Device” only)

When Conversion Type: No conversion, Storage Method for data: from Upper byte, Words: 2, Device: LDR100, Variable: Selected, Till NULL



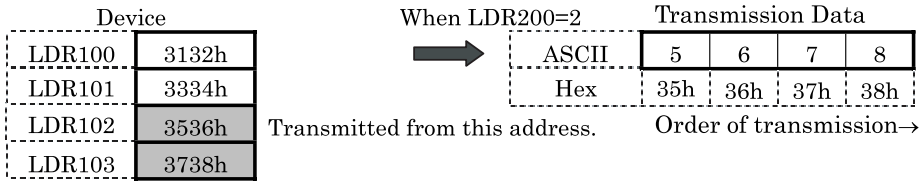
When Conversion Type: No conversion, Storage Method for data: from Lower byte, Words: 2, Device: LDR100, Variable: Selected, Device: LDR 200





<Example of Reference Device settings> (The TXD command consists of "Device" only.)

When Conversion Type: No conversion, Storage Method for data: from Upper byte. Digits: 2, Words: 2, Device: LDR100;Reference Device: LDR200, Variable: Deselected

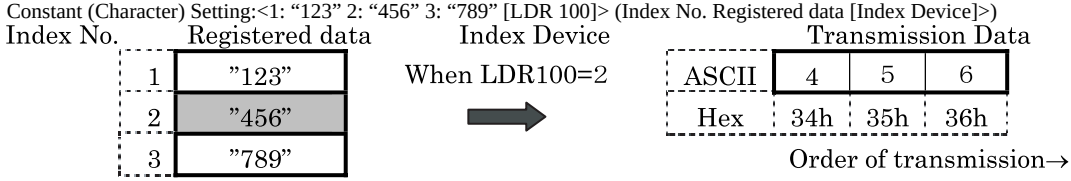


- **Registering Constant**

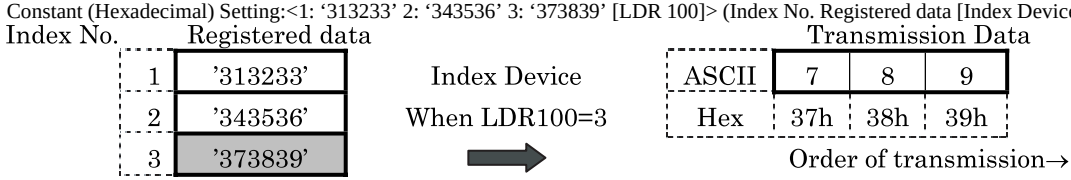
Item	Specifications
Registering Constant (Character)	You can register the character data and corresponding index value in advance. The character data corresponding to the Index Device is transmitted. Number of Registering Constants: The number of character data to be registered. Index: The index value of the character data to be registered. Data: The character data to be registered. Index Device: The device to be read as the index value.
Registering Constant (Hexadecimal)	You can register the hexadecimal data and corresponding index value in advance. The hexadecimal data corresponding to the Index Device is transmitted. Number of Registering Constants: The number of hexadecimal data to be registered. Index: The index value of the data (hexadecimal) to be registered. Data: The data (hexadecimal) to be registered. Index Device: The device to be read as the index value.

<Example of settings>

Constant (Character) Setting:<1: “123” 2: “456” 3: “789” [LDR 100]> (Index No. Registered data [Index Device]>)



Constant (Hexadecimal) Setting:<1: ‘313233’ 2: ‘343536’ 3: ‘373839’ [LDR 100]> (Index No. Registered data [Index Device]>)



- BCC (Block Check Code)

  Calculates the data from the Calculation Start Position to the Calculation End Position using the specified Calculation Type, converts the data with the specified Conversion Type, and transmits the data as BCC data with the number of digits specified with Digits.

Item		Specifications
Calculation Start Position		Specify the position of transmit data at which BCC calculation starts. (1 to 15)
Calculation End Position		Specify the position of transmit data at which BCC calculation ends. The data is counted forward with the data position before the BCC as "0". (0 to 15)
Calculation Type*1	XOR	Calculates the data with exclusive logical add.
	ADD	Calculates the data using addition.
	ADD (2 Complement)	Calculates the data using addition, inverts the bit and then adds 1.
	Modbus ASCII (LCR)	Calculates Modbus ASCII (LCR) using the following procedure: (When Conversion Type: Binary (HEX) to ASCII (fixed), Digits: 2 (fixed)) 1. Convert the ASCII characters between Calculation Start Position and Calculation End Position into 1-byte hexadecimal data for each set of 2 characters. (Example: 37h, 35h → 75h) 2. Calculate the sum of the data obtained in step 1. 3. Invert the bit of the result of step 2 and then add 1. (Two's complement) 4. Convert the lower one byte data of the result of step 3 into ASCII characters. (Example: 75h → 37h, 35h)
	Modbus RTU (CRC)	Calculates Modbus RTU (CRC) using the following procedure: (When Conversion Type: No conversion (fixed), Digits: 2 (fixed)) 1. Obtain an exclusive OR (XOR) of one byte data at Calculation Start Position and FFFFh. 2. If the least significant bit of the result of step 1 is 0, shift to the right by one bit. If the bit is 1, shift to the right by one bit and then obtain XOR of the result and the fixed value (A001h). 3. Repeat step 2 to shift 8 times. 4. Obtain XOR of the next one byte of data and the result of step 3 5. Repeat steps 2 to 4 until the data at Calculation End Position is processed. 6. Consider the result of step 5 as CRC-16, and send it in the order of the lower byte and higher byte. (Example: 1234h → 34h, 12h)
Conversion Type*2	No conversion	Use the data without converting it.
	Binary (HEX) to ASCII	Considers the data as binary-coded hexadecimal number and converts it to ASCII data.
Digits		1 to 2

*1. Calculates the data from the Start Position to the End Position.
*2. Calculates the data using the specified calculation type and converts the data.

<Example of settings>

<Example of settings>

Calculation Start Position	1	2	3	4	5	6		
Calculation End Position	5	4	3	2	1	0		
ASCII	STX	1	2	3	4	5	BCC	CR
Hexadecimal	02h	31h	32h	33h	34h	35h		0Dh

Order of transmission→

Calculation Start Position and Calculation End Position

When Calculation Start Position is 1 and Calculation End Position is 0: Calculates the range “STX 1 2 3 4 5”.

When Calculation Start Position is 2 and Calculation End Position is 1: Calculates the range “1 2 3 4”.

The following explains the operation when the Calculation Start Position is 1 and Calculation End Position is 0:

Calculation Type

XOR: 02h^31h^32h^33h^34h^35h=33h

ADD: 02h+31h+32h+33h+34h+35h=101h?01h

ADD (2 Complement): Inverts the bit of 01h+1=FFh

Conversion Type

Data: 0033h

Bin (Hex) to ASCII conversion →

Converted data

ASCII	3	3
Hex	33h	33h

Order of transmission→

No conversion →

Converted data

ASCII	NUL	3
Hex	00h	33h

Order of transmission→

Conversion Type

Data: 0033h

2 digits →

Transmission data

ASCII	NUL	3
Hex	00h	33h

Order of transmission→

1 digit →

Transmission data

ASCII		3
Hex		33h

Order of transmission→

BCC Data Transmission

Transmits the data for the number of digits obtained from the BCC calculation result.
(When Calculation Type is Modbus ASCII (LCR))

Calculates from Calculation Start Position 2 to Calculation End Position 1 of the example of settings (“1 2 3 4”).

ASCII	B	A
Hex	42h	41h

(When Calculation Type is Modbus RTU (CRC)) Calculates from Calculation Start Position 2 to Calculation End Position 1 of the example of settings (“1 2 3 4”).

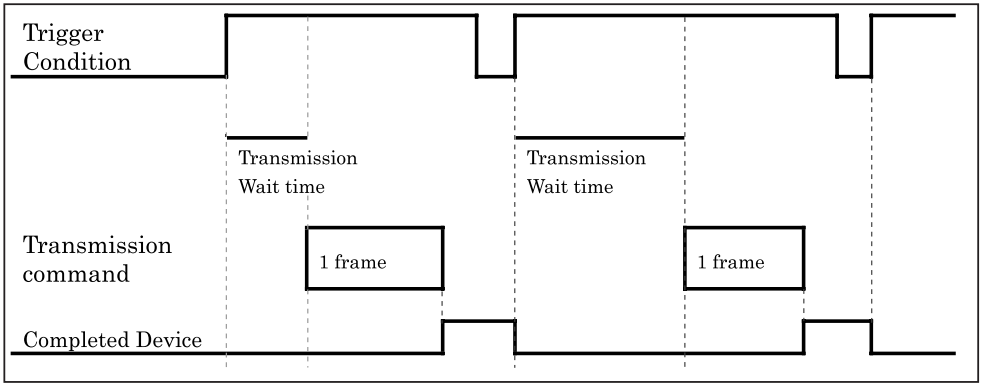
Hex	BAh	30h

5.4.3 Completed Device and Transmission Wait

Transmission is started when the specified Transmission Wait duration has elapsed after the Trigger Condition becomes satisfied.

The Completed Device turns OFF when the Trigger Condition becomes satisfied and turns ON when the transmission is completed successfully.

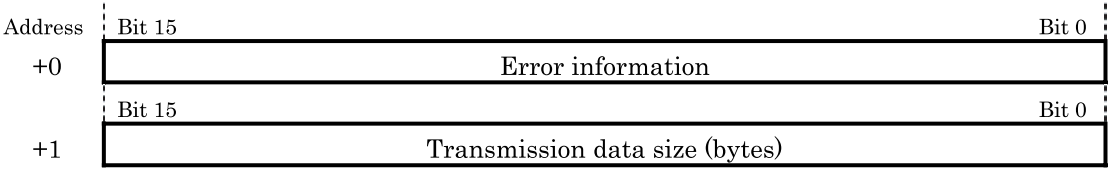
<Example of operation>



5.4.4 Status Device

The Status Device is composed of 2 words, for which transmitted data size and error information (in event of an error) are set.

Status Device configuration (2 words)



Details of the Status Device (+0th word)

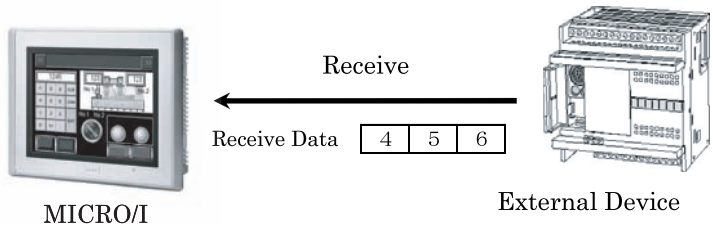
Bit position	Condition for turning the device ON	
0	BCC Error	- The Calculation Start Position and Calculation End Position are not stored in one frame. - The Calculation End Position is set before Calculation Start Position. When the above error occurs, change the Calculation Start Position and Calculation End Position settings. - When Calculation Type is Modbus ASCII (LCR): The data size from Calculation Start Position to Calculation End Position is odd bytes. Or, the data contains data other than ASCII (30h to 39h, 41h to 46h) data. When the above error occurs, change the Calculation Start Position and Calculation End Position settings and the transmission data.
1		Reserved
2		
3	Registering Constant Data Error	The value of the Index Device does not match the Index No. of the registered Registering Constant. When this error occurs, change the data to be set for the Index Device.
4		Reserved
5	Use Reference Device Data Error	When setting the Use Reference Device setting, the device address in which the Reference Device value is stored as offset has exceeded the valid range. When this error occurs, change the data to be set for the Reference Device.
6	Device Data Variable Specification Error	When Variable for the device data is selected and the variable type is Device, the value of the device is negative or exceeds the setting (“number of digits x number of words”). When the above error occurs, change the device value to a positive value or to a value which does not exceed the value of “number of digits x number of words”.
7	Transmission Command Abandon Error	When transmitting data after the Trigger Condition is satisfied, the command with the same Command No. was transmitting data or transmission (transmission is not completed). When this error occurs, set a longer transmission interval.
8		Reserved
9		
10		
11		
12		
13		
14		
15		

WARNING

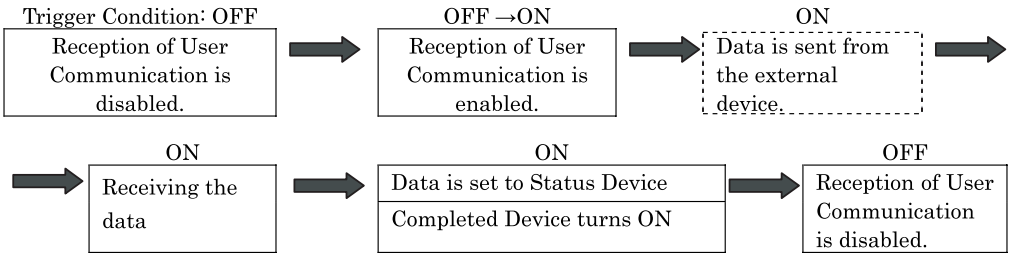
- Once the Status Device is set, the status is retained unless cleared by the user. (Since data is written to an individual bit, the bits other than the one to which data is written will not be changed.)
- The Status Device is cleared (set to “0”) when the Trigger Condition becomes satisfied.
- When an error bit is set to the Status Device, the Completed Device is not turned ON or transmitted.

5.5 Receive (RXD) Command

Setting up a Receive (RXD) command enables the MICRO/I to receive transmission data from an external device.



Procedure for receiving process



Configure the following setting items when creating a Receive command.

Item	Description of settings	
Comment	Specify the comment for this Receive command.	
Command Type	Set the communication command to RXD.	
Completed Device	Specify the device used for checking that the reception is completed successfully. Refer to “5.5.4 Completed Device” (P.60) in this chapter.	
Not Clear Completed Device automatically	Checkbox is selected	When the complete device is automatically off (cleared), this setting is enabled after the device is on.
	Checkbox is not selected	When the complete device is not automatically off (not cleared), this setting is enabled after the device is on.
	Refer to “5.5.4 Completed Device” (P.60) in this chapter.	
Status Device	Specify the device to which error information and receive size will be stored. (2 words will be occupied.) Refer to “5.5.5 Status Device” (P.61) in this chapter.	
Receiving Time Out	Set this parameter when the receiving time out setting is required. (0 to 255 (x 100 msec.)) Refer to “5.5.6 Receiving Time Out” (P.63) in this chapter.	
Trigger Condition	Specify the condition for enabling data reception. Refer to “5.5.1 Trigger Condition” (P.48) in this chapter.	
Command	Combine the Constant, Device, Registering Constant, BCC, and Skip settings to create a communication command. Refer to “5.5.2 Receive Command Settings” (P.48) in this chapter.	
Receiving Character Time Out	Set this parameter when the receiving character time out setting is required. (0 to 255 (x 100 msec.)) Refer to “5.5.7 Receiving Character Time Out” (P.64) in this chapter.	

5.5.1 Trigger Condition

Specify the condition for starting and ending data receiving process.

Item	Specifications
Always ON	Data is received continuously.
While ON	Data is received while the device set for “Device” is ON. Reception is disabled while the device is OFF.
While OFF	Data is received while the device set for “Device” is OFF. Reception is disabled while the device is ON.
While satisfying the condition	Data is received while the conditional expression set for “Conditional Expression” and “Data Type” is satisfied. Reception is disabled while the condition is not satisfied. Data Type: BIN16 (+), BIN16 (+/-), BIN32 (+), BIN32 (+/-), BCD4, BCD8, Float32

5.5.2 Receive Command Settings

“Constant”, “Device”, “Registering Constant”, “BCC”, and “Skip” settings can be configured. Combine these settings to create a Receive command.

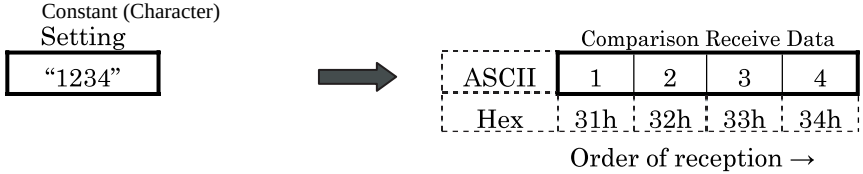
- **Constant**

Item	Specifications
Constant (Character)	The receive data is considered as character data and compared with the receive data without being converted. The size of a single-byte character is 1 byte and that of a double-byte character is 2 bytes. (1 to 80 bytes)
Constant (Hexadecimal)	The receive data is considered as hexadecimal data and compared with the receive data without being converted. Use this setting to receive a control code of ASCII data (00h to 1Fh). (1 to 80 bytes)

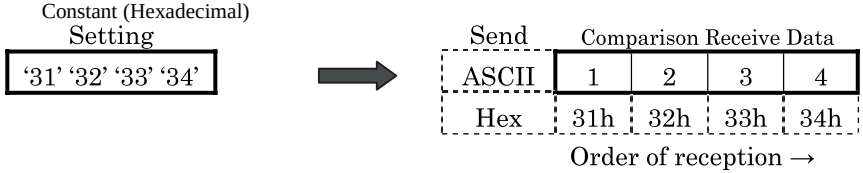
- When a Constant (Character) or Constant (Hexadecimal) is set at the beginning of a command, the first 1 byte is recognized as the start code.
- When a Constant (Character) or Constant (Hexadecimal) is set at the end of a command, the last 1 byte is recognized as the terminator code.

<Example of settings>

Constant (Character)



Constant (Hexadecimal)



- Device

  Converts the specified number of digits of the receive data, and stores the data to the device.

Item		Specifications	
Conversion Type*1	ASCII (HEX) to Binary	Considers the receive data as a hexadecimal number and converts it to binary data, and then stores the data to the device.	
	ASCII (DEC) to Binary	Considers the receive data as a decimal number, converts it to binary data, and then stores the data to the device.	
	No conversion	Stores the receive data without converting the data.	
Digits		The size (number of bytes) of the receive data to be stored in 1 word of the destination device. ASCII (HEX) to Binary 1 to 4 ASCII (DEC) to Binary 1 to 5 No conversion 1 to 2	
Variable		With Variable (Checkbox is selected.)	Converts the receive data received until "Constant" data is received according to the Conversion Type, and then stores the data to the device. Stores "0" to all devices for the remaining number of words.
		Without Variable (Checkbox is not selected.)	Without Variable (Checkbox is not selected.) Converts the receive data of the specified size (Digits x Words) before storing the data to the device.
Words		The number of word devices to be stored. (1 to 250)	
Destination Device		The destination device to which the data is stored.	
Use Reference Device		Specify this parameter to set the storage destination device dynamically. The data is stored from the address that is obtained by adding the data of the reference device specified here to the specified device address.	
Storage Method for data (for No conversion only)		from Upper byte	Data is stored from the upper byte of the device.
		from Lower byte	Data is stored from the lower byte of the device.

*1. Converts the receive data according to the conversion type.

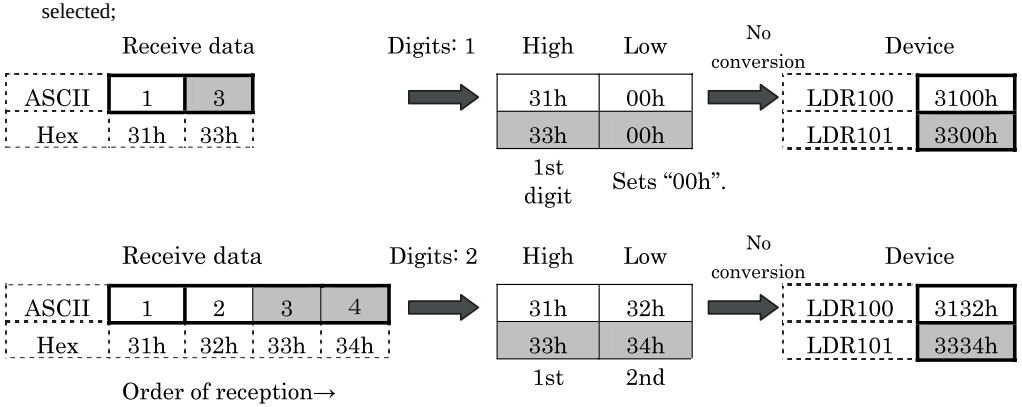
WARNING

- When you want the data stored to the device to be displayed with characters on the Message Display or Character Input, set the [Storage Method of string data] setting in accordance with the [Configuration] - [System Setup] - [Project] - [System] tab. In addition, if you want all the character data of words setting, set "0" in the following device ("Words" setting value +1) as the character terminator code. (Example) When Device: LDR 0 and Words 2; Set LDR 2 to "0". When displaying data less than the number specified with "Words", "0" is set automatically for the remaining number of words. Therefore, it is not required to set "0" manually.
- When setting Variable (except for the end of a command), make sure to set "Constant" next to the device.
- When setting Variable while there is no data to be stored to the device, "0" will be set for all devices of the number specified in the "Words" setting.
- When Variable is selected, data exceeding the maximum size will not be stored (Digits x Words).

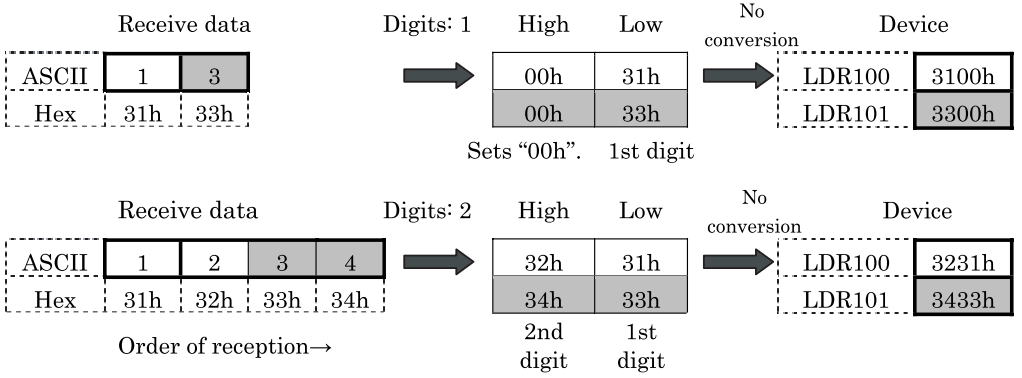
<Example of settings>

When “Variable” checkbox is not selected: (Receive command consists of Device only.)

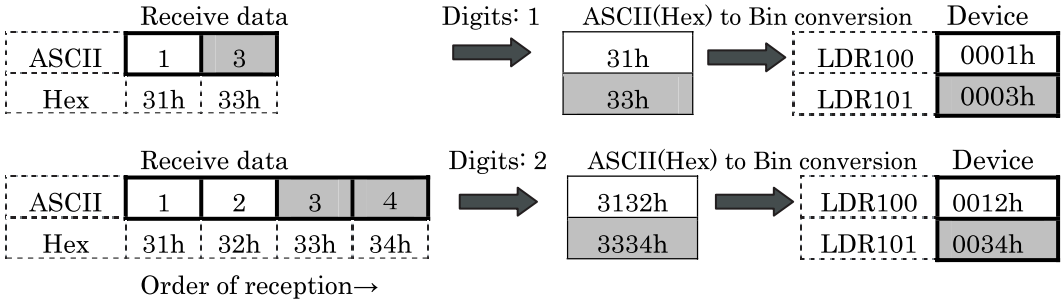
When Conversion Type: No conversion, Storage Method for data: from Upper byte, Words: 2, Device: LDR100, Variable: Not selected;



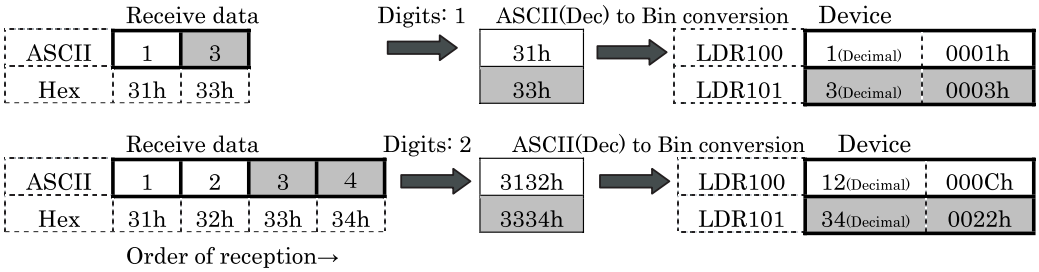
When Conversion Type: No conversion, Storage Method for data: from Upper byte, Words: 2, Device: LDR100, Variable: Not selected;



When Conversion Type: ASCII (HEX) to Binary, Words: 2, Device: LDR100, Variable: Not selected;



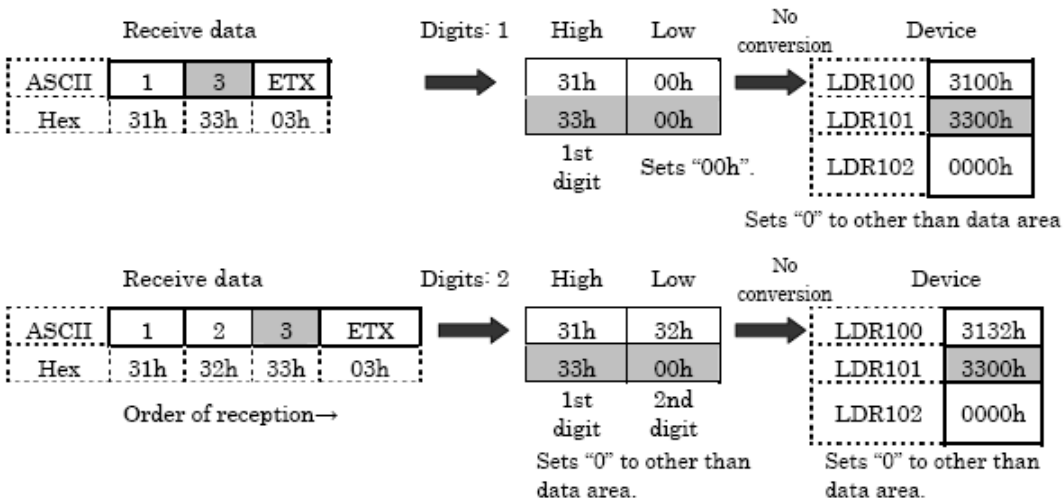
When Conversion Type: ASCII (DEC) to Binary, Words: 2, Device: LDR100, Variable: Not selected;



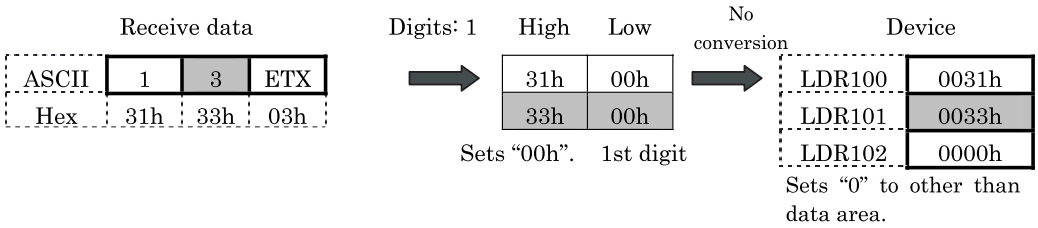
<Example of settings>

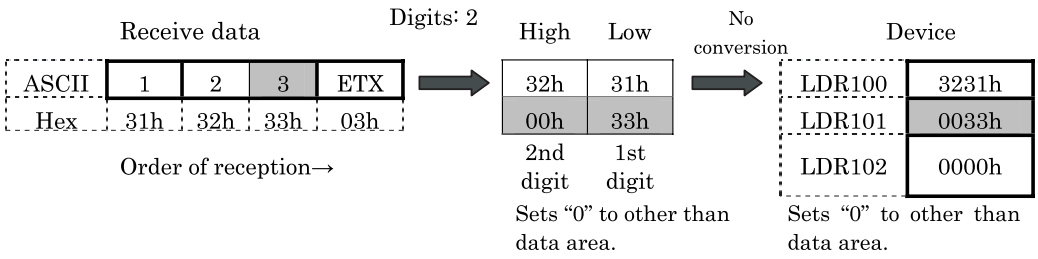
When Variable checkbox is selected: (The Receive command consists of Device+ Constant (03h)) (The data immediately before Constant (03h) is stored to the device.)

When Conversion Type: No conversion, Storage Method for data: from Upper byte, Words: 3, Device: LDR100, Variable: Selected;

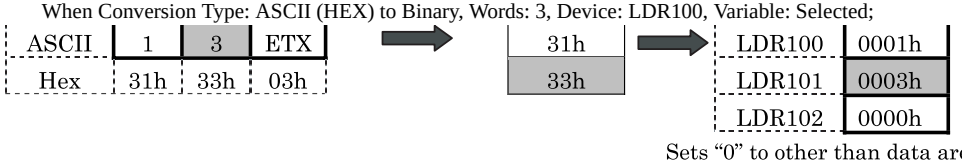


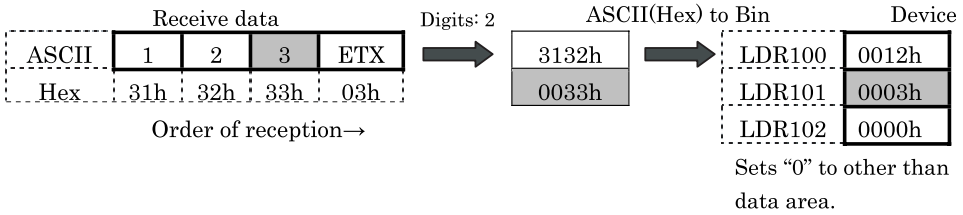
When Conversion Type: No conversion, Storage Method for data: from Lower byte, Words: 3, Device: LDR100, Variable: Selected;



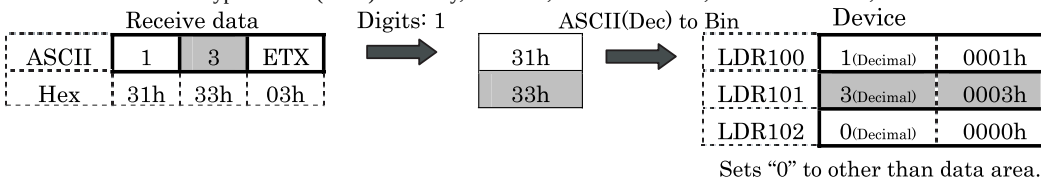


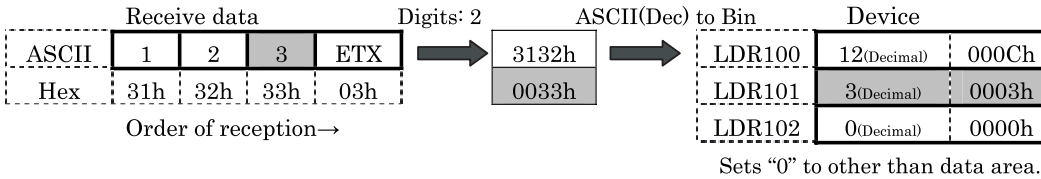
When Conversion Type: ASCII (HEX) to Binary, Words: 3, Device: LDR100, Variable: Selected;





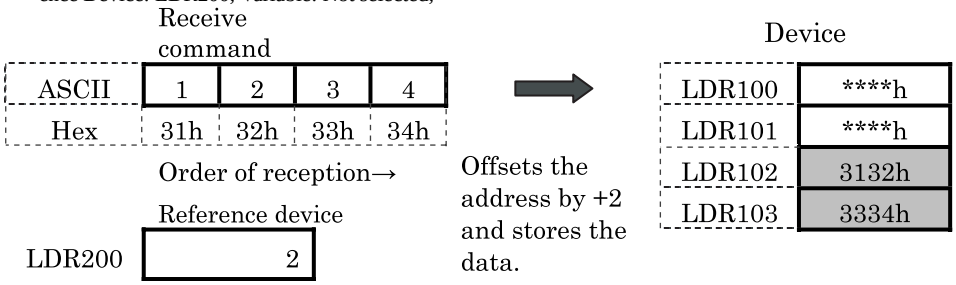
When Conversion Type: ASCII (DEC) to Binary, Words: 3, Device: LDR100, Variable: Selected;





<Example of Reference Device settings> (Receive command consists of “Device” only.)

When Conversion Type: No conversion, Storage Method for data: from Upper byte, Words: 2, Digits: 2, Device: LDR100, Reference Device: LDR200, Variable: Not selected;

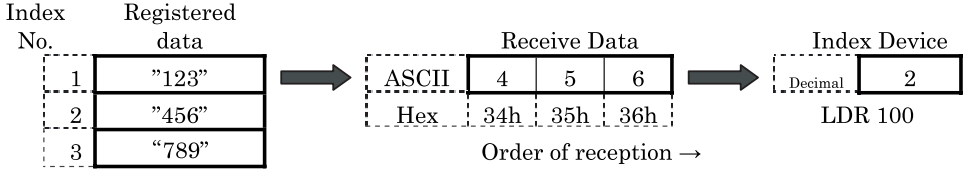


- **Registering Constant**

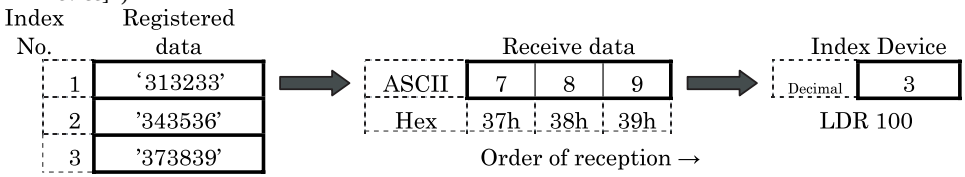
Item	Specifications
Registering Constant (Character)	You can register the character data and corresponding index value in advance. The receive data is compared with registered character data and the matched index value is stored to the Index Device. Number of Registering Constants: The number of character data to be registered. Index: The index value of the character data to be registered. Data: The character data to be registered. Index Device: The destination device to which the index value of registered data that matches the receive data will be written.
Registering Constant (Hexadecimal)	You can register the hexadecimal data and corresponding index value in advance. The receive data is compared with registered hexadecimal data, and the matched index value is stored to the Index Device. Number of Registering Constants: The number of hexadecimal data to be registered. Index: The index value of the hexadecimal data to be registered. Data: The hexadecimal data to be registered. Index Device: The destination device to which the index value of registered data that matches the receive data will be written.

<Example of settings>

Registering Constant (Character) <1: “123” 2: “456” 3: “789” [LDR 100]> (<Index No: Registered data [Index Device]>)



Registering Character (Hexadecimal) <1: '313233' 2: '343536' 3: '373839' [LDR 100]> (<Index No: Registered data [Index Device]>)



<Example of convenient usage of Registering Constant>

The value of registered data can be used to change the storage destination of the device by combining the Registering Constant with the Reference Device setting of the Device Command.

·Set command '02'<1: "AA" 2: "BB" [LDR 100]><OFFSET ([LDR 200], [LDR 100]> '0D'

·Receive command

STX	B	B	31	32	0D

Since the Registering Constant is "BB", "2" is set to the Index Device LDR100.

At the same time, data is set to LDR202 since the offset value of the Reference Device becomes 2.

LDR200	****h
LDR201	****h
LDR202	3132h

- **BCC (Block Check Code)**

  Calculates from the Calculation Start Position to the Calculation End Position of receive data using the specified Calculation Type, converts the data with the specified Conversion Type, and then compares it with the BCC part of the receive data.

Item		Specifications
Calculation Start Position		Specify the position of receive data at which BCC calculation starts. (1 to 15)
Calculation End Position		Specify the position of receive data at which BCC calculation ends. The data is counted forward with the data position before the BCC as "0". (0 to 15)
Calculation Type	Calculates the data from the Start Position to the End Position according to the specified Calculation Type.	
	XOR	Calculates the data with exclusive logical add.
	ADD	Calculates the data using addition.
	ADD (2's Complement)	Calculates the data using addition, inverts the bit and then adds 1.
	Modbus ASCII (LCR)	Calculates Modbus ASCII (LCR) using the following procedure: (When Conversion Type: Binary (HEX) to ASCII (fixed), Digits: 2 (fixed)) 1. Convert the ASCII characters between Calculation Start Position and Calculation End Position into 1-byte hexadecimal data for each set of 2 characters. (Example: 37h, 35h→75h) 2. Calculate the sum of the data obtained in step 1. 3. Invert the bit of the result of step 2 and then add 1. (Two's complement) 4. Convert the lower one byte data of the result of step 3 into ASCII characters. (Example: 75h→37h, 35h)
	Modbus RTU (CRC)	Calculates Modbus RTU (CRC) using the following procedure: (When Conversion Type: No conversion (fixed), Digits: 2 (fixed) 1. Obtain an exclusive OR (XOR) of one byte data at Calculation Start Position and FFFFh. 2. If the least significant bit of the result of step 1 is 0, shift to the right by one bit. If the bit is 1, shift to the right by one bit and then obtain XOR of the result and the fixed value (A001h). 3. Repeat step 2 to shift 8 times. 4. Obtain XOR of the next one byte of data and the result of step 3. 5. Repeat steps 2 to 4 until the data at Calculation End Position is processed. 6. Consider the result of step 5 as CRC-16, and compare it in the order of the lower byte and higher byte. (Example: 1234h→34h, 12h)
Conversion Type	Calculates the data using the specified calculation type and converts the data with the specified conversion type.	
	No conversion	Use the data without converting it.
	Binary (HEX) to ASCII	Considers the data as binary-coded hexadecimal number and converts it to ASCII data.
Digits		1 to 2

<Example of settings>

Calculation Start Position	1	2	3	4	5	6		
Calculation End Position	5	4	3	2	1	0		
ASCII	STX	1	2	3	4	5	BCC	CR
Hexadecimal	02h	31h	32h	33h	34h	35h		0Dh

Order of reception →

Calculation Start Position and Calculation End Position

When Calculation Start Position is 1 and Calculation End Position is 0: Calculates the range “STX 1 2 3 4 5”.

When Calculation Start Position is 2 and Calculation End Position is 1: Calculates the range “1 2 3 4”.

The following explains the operation when the Calculation Start Position is 1 and Calculation End Position is 0:

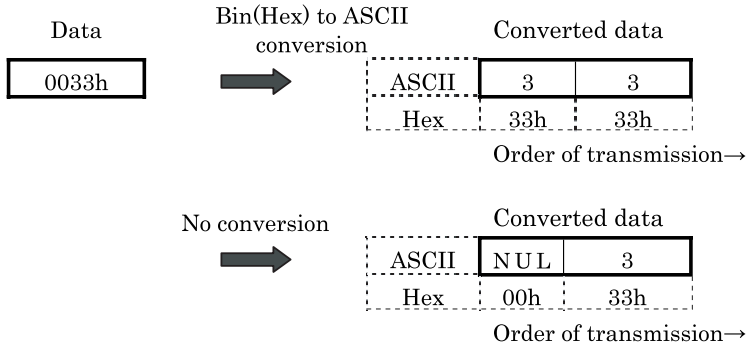
Calculation Type

XOR: 02h^31h^32h^33h^34h^35h=33h

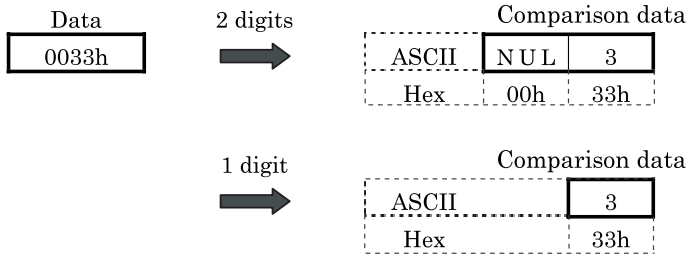
ADD: 02h+31h+32h+33h+34h+35h=101h→01h

ADD (2 Complement): Inverts the bit of 01h+1=FFh

・Conversion Type



・Digits



BCC Data Comparison

The received BCC data is compared with the BCC calculation result.

When the BCC calculation result is 1-digit 33h while receive data is as follows, the data of the BCC part is 33h and matches the calculation result. If the data does not match, the BCC error bit of the Status Device turns ON.

ASCII	STX	1	2	3	4	5	BCC	CR
Hex	02h	31h	32h	33h	34h	35h	33h	0Dh

(When Calculation Type is Modbus ASCII (LCR))

Calculates from Calculation Start Position 2 to Calculation End Position 1 of the example of settings (“1 2 3 4”).

Comparison data

ASCII	B	A
Hex	42h	41h

(When Calculation Type is Modbus RTU (CRC))

Calculates from Calculation Start Position 2 to Calculation End Position 1 of the example of settings (“1 2 3 4”).

Comparison data

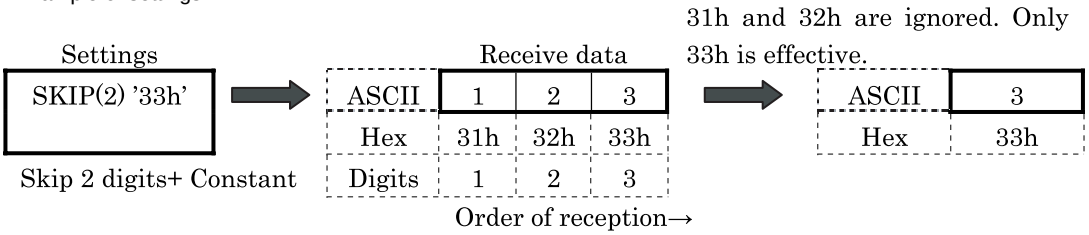
Hex	BAh	30h

- **Skip**

  The data with the specified number of digits in the receive data will be ignored.

Item	Specifications
Digits	1 to 249

<Example of settings>



5.5.3 Start Code and Terminal Code

A start code starts data reception and only one byte can be set up for the code. A terminal code judges the terminal of data reception and only one byte can be set up for the code. Configure the start code and terminal code using the “Constant” command. The first one byte of the constant is recognized as the start code and the last one byte as the terminal code. Code 00h to 7Fh can be set when the data length of the communication condition is 7 bits, and 00h to FFh when the data length is 8 bits.

- Judgment of Terminal of Data Reception

  The judgment procedure for terminal of data reception varies depending on whether the Variable settings for the start code, terminal code, and device commands are set within the command.

Start Code setting	Terminal Code setting	Device with Variable setting	Description of the procedure for judging terminal of data reception
Set	Set	Set/Not set	Reception is started with the start code and terminated with the terminal code. When the terminal code is followed by BCC, the data including the number of digits of BCC is received.
Set	Not set	Set	Reception is started with the start code and the data is received according to the length of the command.
		Not set	Reception is started with the start code and terminated when the maximum command length is received or receiving character time out occurs.
Not set	Set	Set/Not set	The reception is terminated with the terminal code.
Not set	Not set	Set	Reception is terminated when the data of command length is received.
		Not set	Reception is terminated when the maximum command length is received or receiving character time out occurs.

- The “Device with Variable setting” column in the table above indicates “Set” when the “Variable” setting is enabled for at least one “Device” in the receive command, and “Not set” when the “Variable” setting is not enabled for any device.
- When trigger conditions are satisfied for two or more receive commands for which both start code and terminal code are set, all commands are analyzed and processed for receive processing. Since commands with and without errors may be mixed depending on the results of data reception analysis of each command, take extra caution regarding error handling.
- While the condition is satisfied for a command for which either a start code or terminal code is not set, only this command is processed for data reception even when the condition of another command is being satisfied. When two or more commands exist for which either start code or terminal code is not set, the command with the biggest Command No. is processed.
- When a receive command for which a start code is set fails to receive the start code, all of the receive data is ignored and abandoned. (No error occurs.)
- When start code is received with a receive command for which start code and terminal code are set, the data reception is completed after 500 bytes are received if the data received following the first byte does not completely match the designated terminal data.

<Example of settings>

When command is set with start code and terminal code:

Command Settings

Constant (Hexadecimal)	Device	Constant (Hexadecimal)
'02313233'		'34350d'

Start code=02h Terminal code= 0dh

Reception is started with 02h and terminated with 0dh.

Command Settings

Constant (Hexadecimal)	Device	Constant (Hexadecimal)	BCC
'02313233'		'34350d'	

Start code= 02h Terminal code= 0dh

Reception is started with 02h and terminated when the numbers of digits of BCC are received.

When command is set with start code and without terminal code:

Command Settings

Constant (Hexadecimal)	Device (No Variable)	Registering Constant
'02313233'		

Start code= 02h No terminal code

Reception is started with 02h and terminated when data of command length is received.

Command Settings

Constant (Hexadecimal)	Device (With Variable)	Constant (Hexadecimal)	Registering Constant
'02313233'		'03'	

Start code= 02h No terminal code

Reception is started with 02h, and terminated when data of maximum command length is received or receiving character timeout occurs.

When command is set without start code and with terminal code:

Command Settings

Registering Constant	Device	Constant (Hexadecimal)
		'34350d'

No start code Terminal code= 0dh

Reception is started from the beginning and terminated with 0dh.

When command is set without start code and terminal code:

Command Setting

Device (No Variable)	Registering Constant	BCC

No start code No terminal code

Reception is started from the beginning and terminated when data of command length is received.

Command Setting

Skip	Constant (Character)	Device (With Variable)
	"123"	

No start code No terminal code

Reception is started from the beginning and terminated when data of maximum command length is received or receiving character timeout occurs.

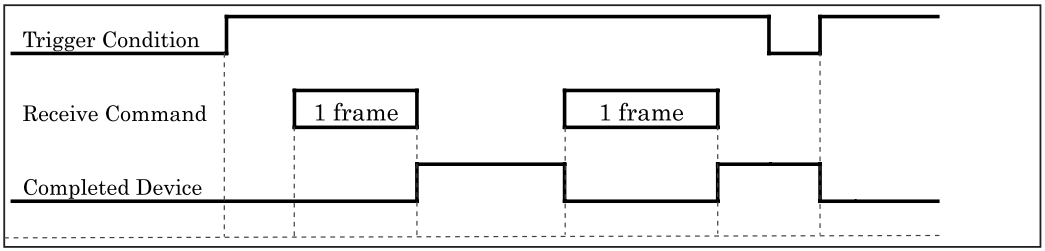
5.5.4 Completed Device

The Completed Device turns on when data reception is completed successfully. The device will not be turned ON when an error has occurred. The operation differs depending on whether the “Not Clear Completed Device automatically” checkbox is selected or not.

- When the “Not Clear Completed Device automatically” checkbox is not selected:

  The Completed Device turns ON when data reception is completed successfully. The Completed Device turns OFF when the first data for the next frame is received.

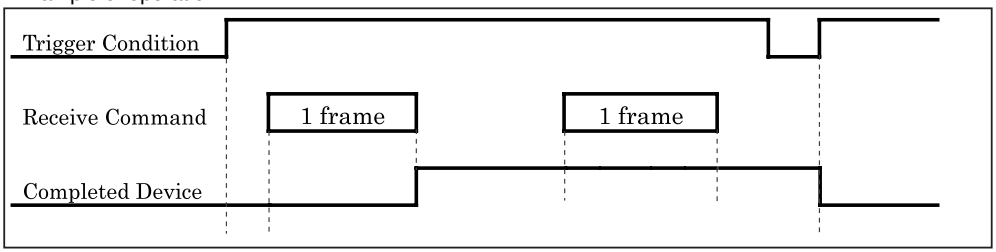
<Example of operation>



- When the “Not Clear Completed Device automatically” checkbox is selected.:

  The Completed Device turns ON when reception of the first data is completed successfully. The Completed Device remains ON until the trigger condition changes from “unsatisfied” to “satisfied” again. Turn the device OFF as necessary.

<Example of operation>



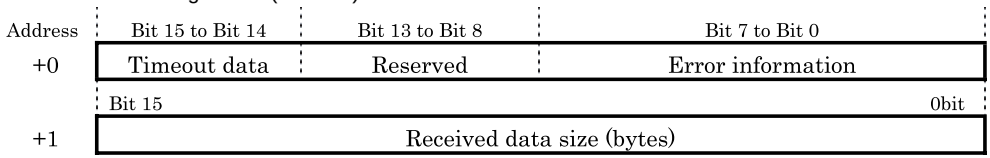
WARNING

- When receiving frame data unilaterally without executing handshaking for transmissions, the Completed Device may not be turned ON when switching screens. In such a case, execute processing using the Completed Device within a Global Script in which the Trigger Condition is set to “Always ON”.
- When receiving consecutive frame data unilaterally without executing handshaking for transmissions, the Completed Device may not be turned ON every time 1 frame is received. Please note that frames cannot be counted properly when counting the number of frames in receive data using the ON/OFF of the Completed Device. In such a case, allow sufficient intervals when transmitting frame data from external devices or take other necessary measures.

5.5.5 Status Device

The Status Device is composed of 2 words: Error information and time out information are set to Address+ 0 and the received data size is set to Address+ 1.

Status Device configuration (2 words)



Details of the Status Device (+0th word)

Bit position	Condition for turning the device ON		
0	BCC Error	- The BCC that calculated the receive data did not match the BCC that is appended to the receive data. When this error occurs, select the transmission data from the external device. - The Calculation Start Position and Calculation End Position are not stored in one frame. - The Calculation End Position is set before Calculation Start Position. When the above error occurs, change the Calculation Start Position and Calculation End Position settings. - When Calculation Type is Modbus ASCII (LCR): The data size from Calculation Start Position to Calculation End Position is odd bytes. Or, the data contains data other than ASCII (30h to 39h, 41h to 46h) data. When the above error occurs, change the Calculation Start Position and Calculation End Position settings and the transmission data from the external device.	
1	Received Data Size Error	Variable is enabled for a device in Receive command.	Data from 1 frame has been processed before one of “Constant”, “Registering Constant”, “Skip”, and “BCC” is processed.
		Variable is not enabled for a device in Receive command.	The receive data size of the receive data did not match that of the specified receive command.
		When this error occurs, select the transmission data from the external device.	
2	Registering Constant Data Error	The Constant (Character) or Constant (Hexadecimal) set up with the receive command did not match the received data. When this error occurs, select the transmission data from the external device.	
3	Registering Constant Error	No data matched the registered setting of the Registering Constant data. When this error occurs, select the transmission data from the external device.	
4	Device Data Conversion Error	- In “ASCII (HEX) to Binary” conversion, a code other than “0” to “9” or “A” to “F” has been received as data. - In “ASCII (DEC) to Binary” conversion, a code other than “0” to “9” has been received as data. - In “ASCII (DEC) to Binary” conversion, the converted data exceeded 65535. When the above error occurs, select the transmission data from the external device.	
5	Device Data Reference Device Error	When setting the Use Reference Device setting, the device address in which the Reference value Device is stored as offset has exceeded the valid range. - The “Words” setting of the device is beyond the range of device address for which data is stored. When this error occurs, change the value of the Reference Device or “Words” setting.	
6	Terminal Code of Receive Data Mis-compare Error	In the receive command whose trigger condition is being satisfied, the start code matched while the terminal code did not match. When this error occurs, select the transmission data from the external device.	

Details of the Status Device (+0th word)

Bit position	Condition for turning the device ON	
7	Device Storing Error	In the multiple Receive (RXD) Commands processing, the number of the same-time stored devices which is sum of the number of the stored device of “Device” and the number of the index device of “Registering Constant”, is over 255 words. If this error occurred, change the setting not to store more than 255 words that is sum of the number of the stored device of “Device” and the number of the index device of “Registering Constant” at the same time. Or set not to satisfy the trigger condition of several command executions and reduce the number of Receive (RXD) Commands that are received and processed.
8		Reserved
9		
10		
11		
12		
13		
14	Receiving Time Out	Data from 1 frame is not received even when the preset time has passed after the trigger condition became satisfied. (When Time Out duration is set to “0”, the time out is not monitored.)
15	Receiving Character Time Out	Receiving Character Time Out After receiving 1 or more byte, the next data did not arrive after the Receiving Time Out duration had elapsed. (When Receiving Character Time Out is set to “0”, the time out is not monitored.)

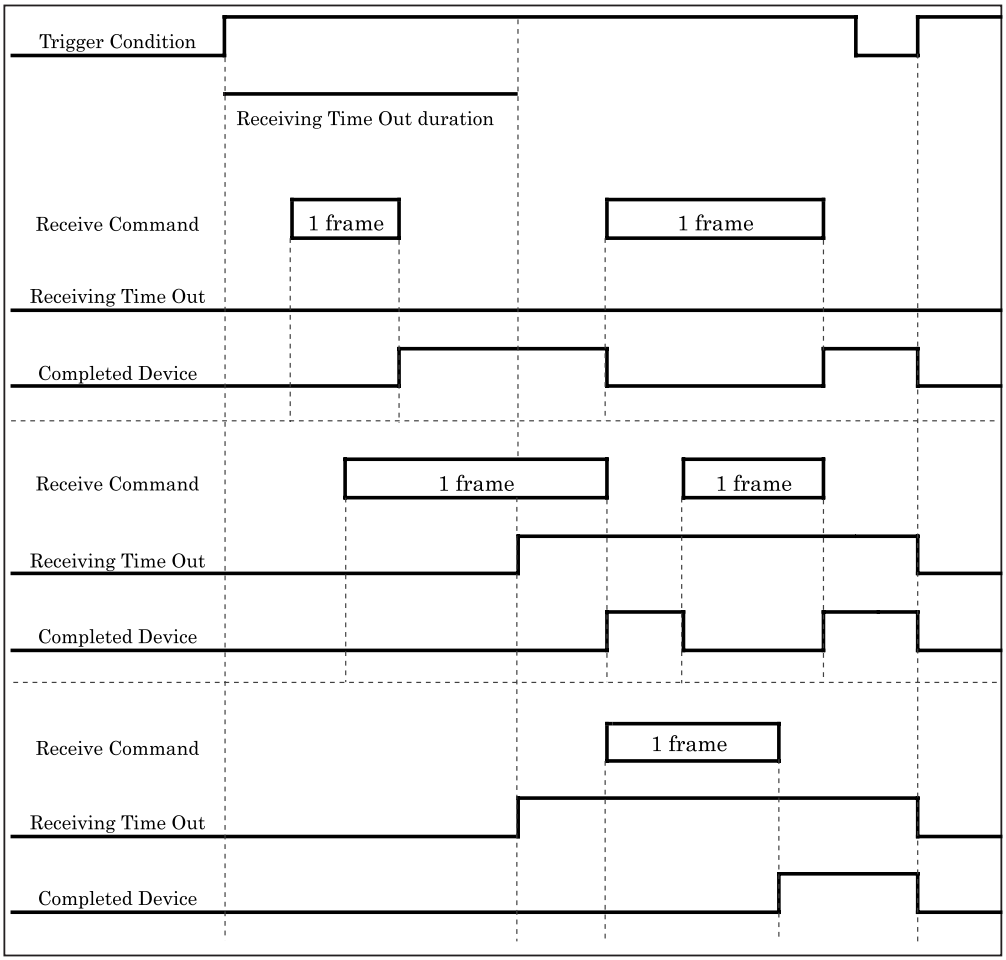
WARNING

- Once the Status Device is set, the status is retained unless cleared by the user. (Since data is written to an individual bit, the bits other than the one in which data is written will not be changed.)
- The Status Device is cleared (set to “0”) when the Trigger Condition becomes satisfied. (When the Trigger Condition of the receive command is set to “Always ON”, the device is retained until Clear processing is executed.)
- After Receiving Character Time Out occurs, analysis of receive data is performed. The specified bit of the Status Device turns ON when the data has an error, and Completed Device of data reception turns ON when no error is found.

5.5.6 Receiving Time Out

The Receiving Time Out bit of the Status Device turns ON if data from 1 frame is not received when the Receiving Time Out duration has elapsed after the Trigger Condition is satisfied. When Receiving Time Out occurs, analysis processing of reception is not executed; as a result, the Completed Device is not turned ON.

<Example of operation> (When “Not Clear Completed Device automatically” checkbox is not selected)



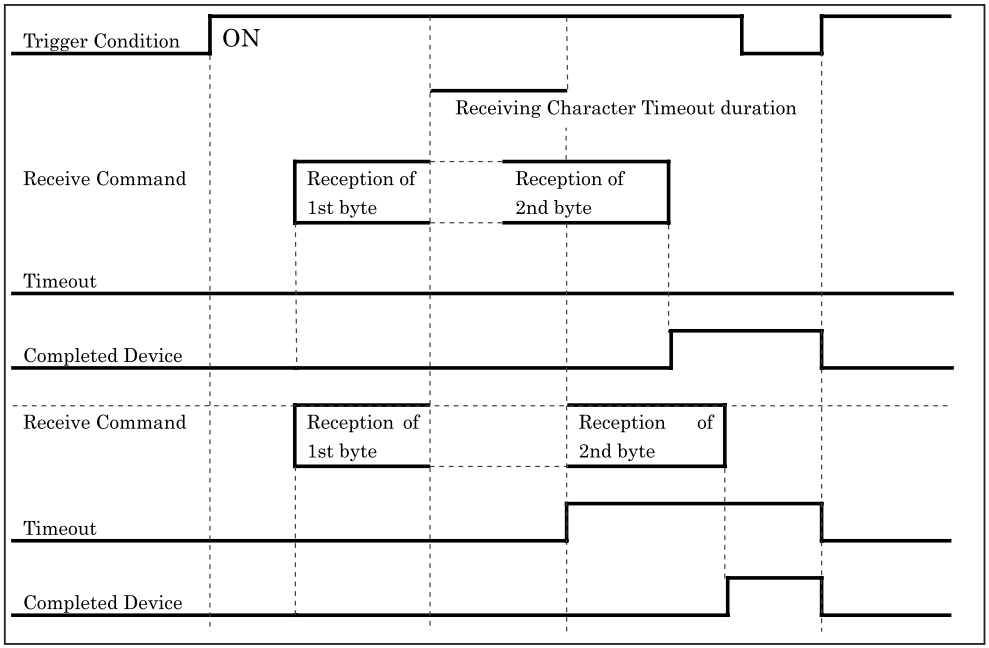
WARNING

When reception of 1 frame is completed or receiving time out occurs during the Receiving Time Out duration, receiving time out will not occur again until the trigger condition is changed from “unsatisfied” to “satisfied” again.

5.5.7 Receiving Character Time Out

While receiving frame data, if the interval of data reception (duration between one data reception and the next data reception) exceeds the Receiving Character Time Out duration, the Receiving Character Time Out bit of the Status Device is turned ON. Since the analysis processing of reception is executed after a Receiving Character Time Out, the Completed Device turns ON if no error is found.

<Example of operation>



5.6 Example of User Communication Settings

5.6.1 Example of User Communication Settings 1

Settings for User Communication Protocol:

Item	Description of settings
Protocol Name	Sample1
Receiving Character Time Out	30 (x 100 msec.)

- Settings for Transmission command

Item	Description of settings	
Comment	TXD command	
Command Type	TXD (Transmission)	
Completed Device	LM101	
Status Device	LDR 110	
Transmission Wait (for TXD only)	50 (x100 msec.)	
Trigger Condition	While ON: LM 100	
Command	Constant (Hexadecimal)	'05'
	Constant (Character)	"D"
	Device	Conversion Type: Binary (DEC) to ASCII, Digits: 4, Words: 1, Device: LDR100
	Constant (Hexadecimal)	'0D'

<Operational procedure>

- Setting the Trigger Condition

  Set 100 (Decimal) to LDR 100.

- Setting the Trigger Condition

  Turn LM100 from OFF to ON to start command transmission. The transmission data is sent after the duration of Transmission Wait (5 sec.) has elapsed. The following table shows the details of the transmission data

Command	Constant (Hexadecimal)	Constant (Character)	Device				Constant (Hexadecimal)
ASCII	ENQ	D	0	1	0	0	CR
Hex	05h	44h	31h	32h	33h	34h	0Dh

- Processing the Completed Device

  LM 101 is turned ON when the transmission is completed successfully.

- Processing the Status Device

  When the data in LDR 110 is "0", the transmission has been completed without an error.

- Settings for Receive command

Item	Description of settings	
Comment	RXD command	
Command Type	Receive (RXD)	
Trigger Condition	While ON: LM 101	
RXD Command Settings	Constant (Hexadecimal)	‘02’
	Constant (Character)	l “D”
	Device	Conversion Type: ASCII (HEX) to Binary, Digits: 4, Words: 1, Device: LDR120, Reference Device: LDR 130
	Constant (Hexadecimal)	‘0D’
Completed Device	LM 102	
Status Device	LDR 140	
Not Clear Completed Device automatically	Not Enabled (The checkbox is not selected.)	
Receiving Time Out	0 (No Receiving Time Out setting)	

<Operational procedure>

- Setting the Trigger Condition

  LM 101 is turned ON when transmission of the TXD command is completed and stands-by for data reception.

- Receiving the data sent from the external device

  The reception of data sent from the external device is processed. The following table shows the details of the receive data.

ASCII	STX	D	1	2	3	4	CR
Hex	02h	44h	31h	32h	33h	34h	0Dh
Setting	Constant (Hexadecimal)	Constant (Character)	Device				Constant (Hexadecimal)

  Since LDR has been set to “100” in data transmission, the data is set to Device LDR 220 (offset with +100 from LDR 120).

LDR 120	****h
···	···
LDR 220	1234h

Offset with +100

- Processing the Completed Device

  LM 102 is turned ON when the reception is completed successfully.

- Processing the Status Device

  When the data in LDR 130 is “0”, the reception has been completed without an error.

5.6.2 Example of User Communication Settings 2

Settings for User Communication Protocol:

Item	Description of settings
Protocol Name	Sample2
Receiving Character Time Out	30 (x 100 msec.)

- Settings for Transmission command

Item	Description of settings	
Comment	TXD command	
Command Type	TXD (Transmission)	
Completed Device	LM201	
Status Device	LDR 220	
Transmission Wait (for TXD only)	0 (x 100 msec.)	
Trigger Condition	While ON: LM 200	
Command	Constant (Hexadecimal)	'05'
	Registering Constant (Character)	10: "AB", 20: "CD", Index Device: LDR 200
	Device	No conversion, from Upper byte, Digits: 2, Words: 2, Device: LDR 210
	BCC	Calculation Start Position: 1, Calculation End Position: 0, XOR, Binary (HEX) to ASCII, Digits: 2
	Constant (Hexadecimal)	'0D0A'

<Operational procedure>

- Setting the Index Device for Registering Constant

  Set 10 (Decimal) for LDR 200 (the Index Device of the Registering Constant) and select "AB".

- Setting the Device data

  Set data "3132h" for LDR 210 and data "3334h" for LDR 211 using in Device command.

- Setting the Trigger Condition

  Turn LM 200 from OFF to ON to start command transmission. The following table shows the details of the transmission data.

Command	Constant (Hexadecimal)	Registering Constant		Device				BCC		Constant (Hexadecimal)	
ASCII	ENQ	A	B	1	2	3	4	0	2	CR	LF
Hex	05h	41h	42h	31h	32h	33h	34h	30h	32h	0Dh	0Ah

- Processing the Completed Device

  LM 201 is turned ON when the transmission is completed successfully.

- Processing the Status Device

  When the data in LDR 220 is "0", the transmission has been completed without an error.

- Settings for Receive command

Item	Description of settings	
Comment	RXD command	
Command Type	Receive (RXD)	
Completed Device	LM 203	
Not Clear Completed Device automatically	Not enabled (The checkbox is not selected.)	
Status Device	LDR 260	
Receiving Time Out	0 (No Receiving Time Out setting)	
Trigger Condition	While ON: LM 202	
Command	Constant (Hexadecimal)	'02'
	Registering Constant (Character)	10: "AB", 20: "CD", Index Device: LDR 230
	Skip	2
	Device	Conversion Type: No conversion, from Upper byte, Digits: 2, Words: 2, Device: LDR 240, Reference Device: LDR 230
	BCC	Calculation Start Position: 1, Calculation End Position: 0, XOR, Binary (HEX) to ASCII, Digits: 2
	Constant (Hexadecimal)	'0D' '0A'

<Operational procedure>

- Processing the Status Device

  Turn ON LM 202 to enable data reception.

- Receiving the data sent from the external device

  The reception of data sent from the external device is processed. The following table shows the details of the receive data.

ASCII	STX	A	B	C	D	1	2	3	4	0	2	CR	LF
Hex	02h	41h	42h	43h	44h	31h	32h	33h	34h	30h	32h	0Dh	0Ah
Setting	Constant (Hexadecimal)	Registering Constant		Skip		Device				BCC		Constant (Hexadecimal)	

  - Set 10 (Decimal) for LDR 230 (the Index Device of the Registering Constant).

  - The 2 digits (specified with Skip setting) of the following data 43h and 44h are ignored.

  - Since the Reference Device LDR 230 of the Device command is "10" (Decimal), the address is offset with +10; as a result, the data is set to the storage device LDR 250 and LDR 251.

LDR 240	****h
…	…
LDR 250	3132h
LDR 251	3334h

Offset with +10

  "[STX] ABCD1234" is calculated with BCC and compared with "3032h".

- Setting the Trigger Condition

Turn LM 200 from OFF to ON to start command transmission. The following table shows the details of the transmission data.

Command	Constant (Hexadecimal)	Registering Constant		Device				BCC		Constant (Hexadecimal)	
ASCII	ENQ	A	B	1	2	3	4	0	2	CR	LF
Hex	05h	41h	42h	31h	32h	33h	34h	30h	32h	0Dh	0Ah

- Processing the Completed Device

LM 203 is turned ON when the reception is completed successfully.

- Processing the Status Device

When the data in LDR 250 is “0”, the reception has been completed without an error.

For examples of User Communication settings, refer to the barcode reader protocol settings for Barcode-Reader1 and Barcode-Reader2 available with the WindO/I-NV2.

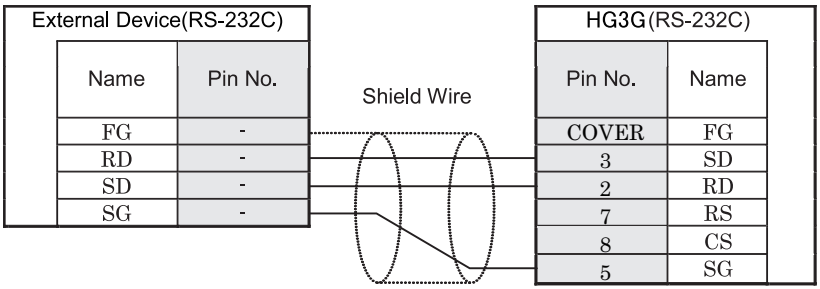
5.7 Connection Diagrams for User Communication

When connecting the MICRO/I with external devices via User Communication, refer to the following connection diagrams.

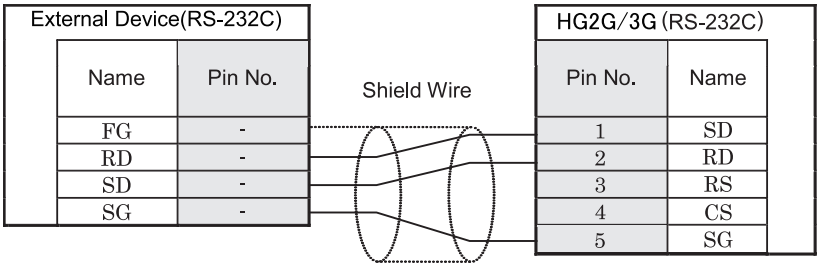
Note that the connector type listed in each connection diagram is for the main unit (not for the cable).

5.7.1 Serial Interface 1 (RS-232C)

HG3G形 (Connector)

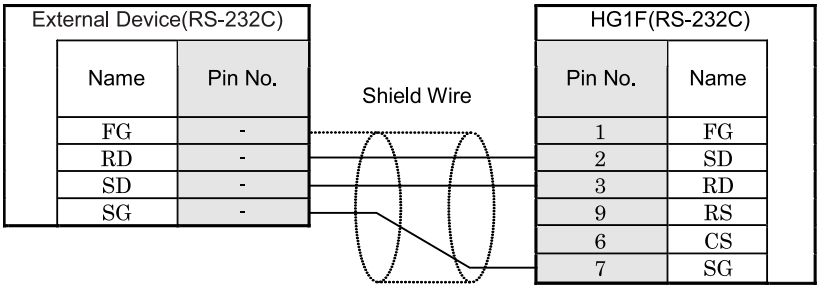


HG2G/3G



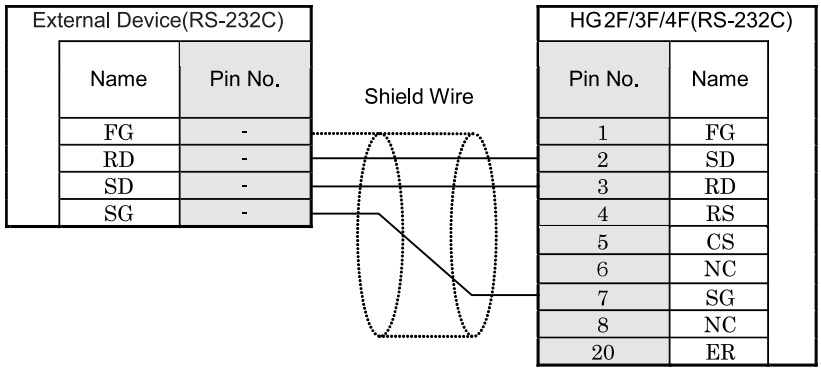
Terminal

HG1F (Connector)



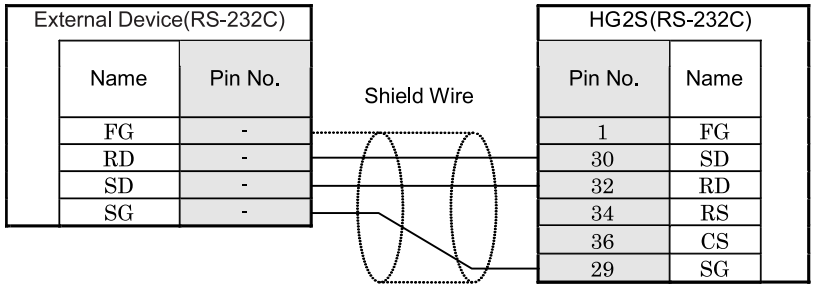
D-sub, 9P connector socket type

HG2F/3F/4F



D-sub, 25P connector socket type

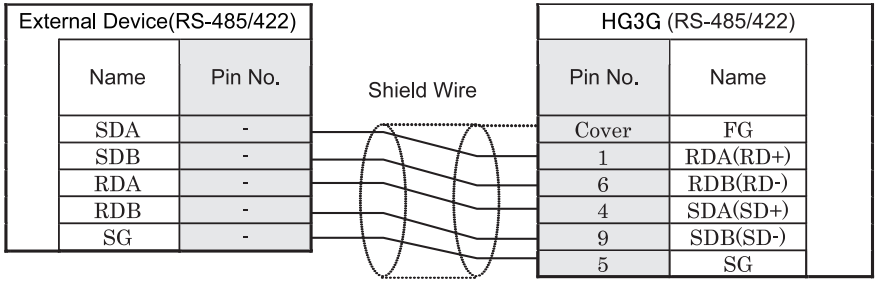
HG2S



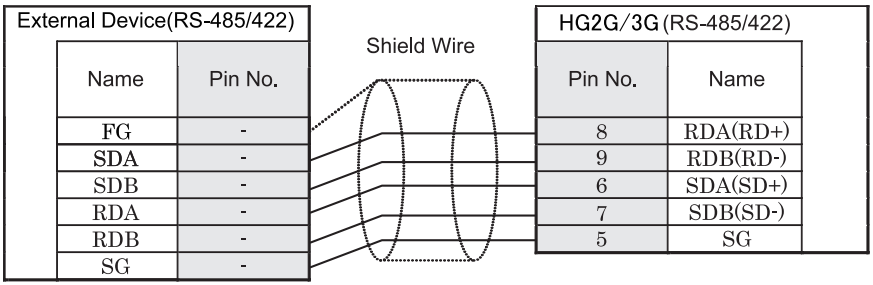
D-sub, 37P connector socket type

5.7.2 Serial Interface 1 (RS-485/422)

HG3G形 (Connector)



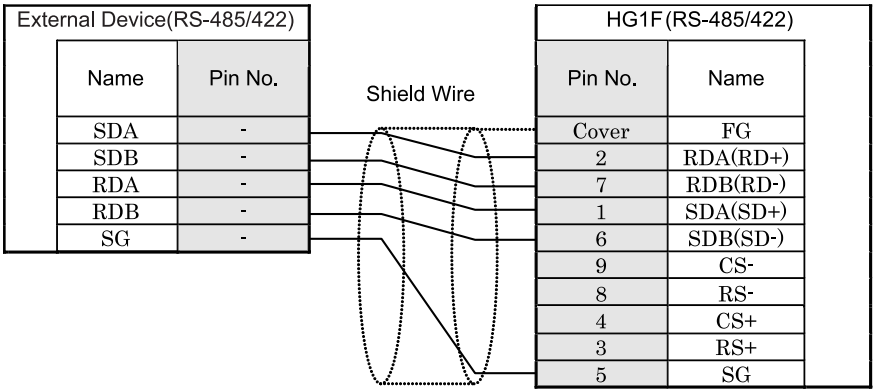
HG2G/3G



Terminal

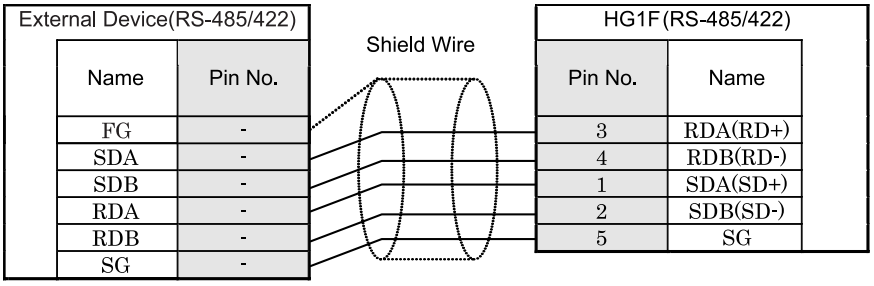
There is no pin No. corresponding to TERM on the HG2G/3G. When inserting a termination resistor, use a communication switch. For the setting of the switch, refer to chapter 1 (Important Points Regarding Wiring) of the MICRO/I HG2G/3G, HG1F/2F/2S/3F/4F Communication Manual (PDF).

HG1F (Connector)



D-sub, 9P connector socket type

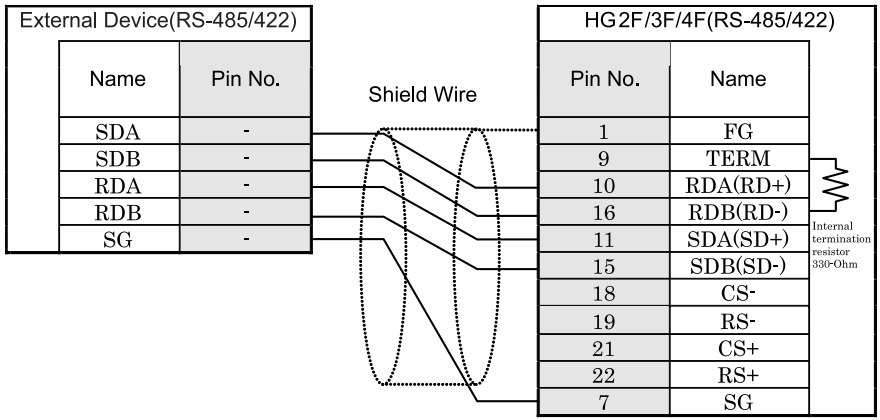
HG1F (Terminal)



Terminal

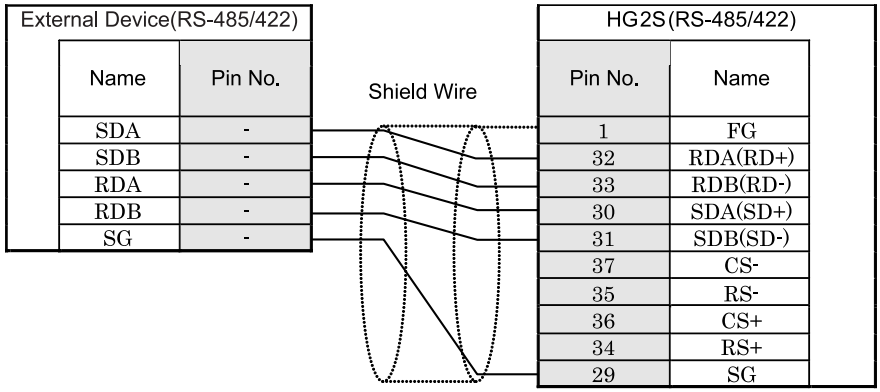
There is no pin No. corresponding to TERM on the HG1F. When inserting a termination resistor, use a communication switch. For the setting of the switch, refer to chapter 1 (Important Points Regarding Wiring) of the MICRO/I HG2G/3G, HG1F/2F/2S/3F/4F Communication Manual (PDF).

HG2F/3F/4F



D-sub, 25P connector socket type

HG2S



D-sub, 37P connector socket type

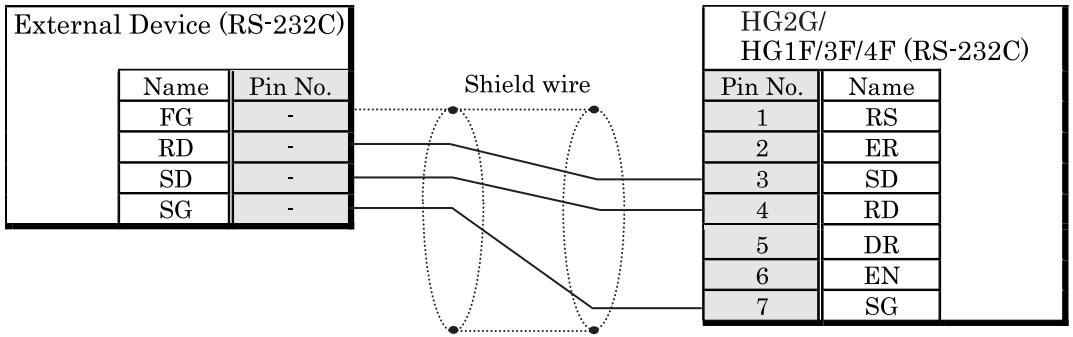
There is no pin No. corresponding to TERM on the HG2S. When inserting a termination resistor, use a communication switch. For the setting of the switch, refer to chapter 1 (Important Points Regarding Wiring) of the MICRO/I HG2G, HG1F/2F/2S/3F/4F Communication Manual (PDF).

5.7.3 Serial Interface 2

HG3G

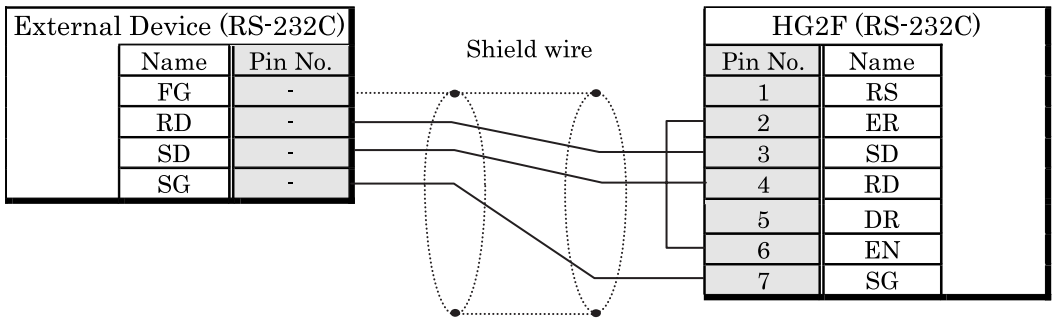
Refer to “5.7.1 Serial Interface 1 (RS-232C)” (P.70) in this chapter HG3G(Connector)” and refer to “5.7.2 Serial Interface 1 (RS-485/422)” (P.71) in this chapter) HG3G(Connector)” about the connection diagram of the Serial Interface 2 on the HG3G.

HG2G/HG1F/3F/4F



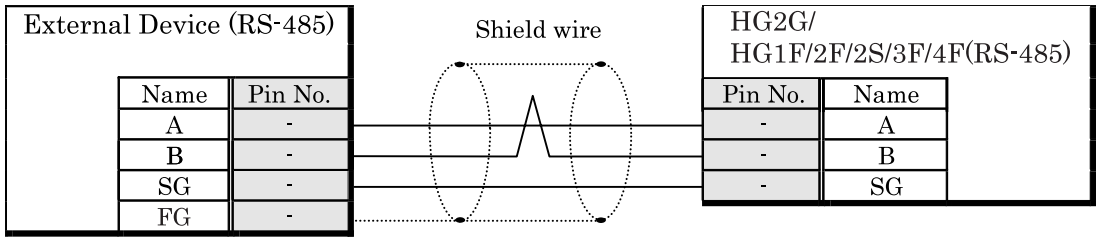
D-sub, 9P connector socket type

HG2F



D-sub, 9P connector socket type

5.7.4 O/I Link Interface



Terminal

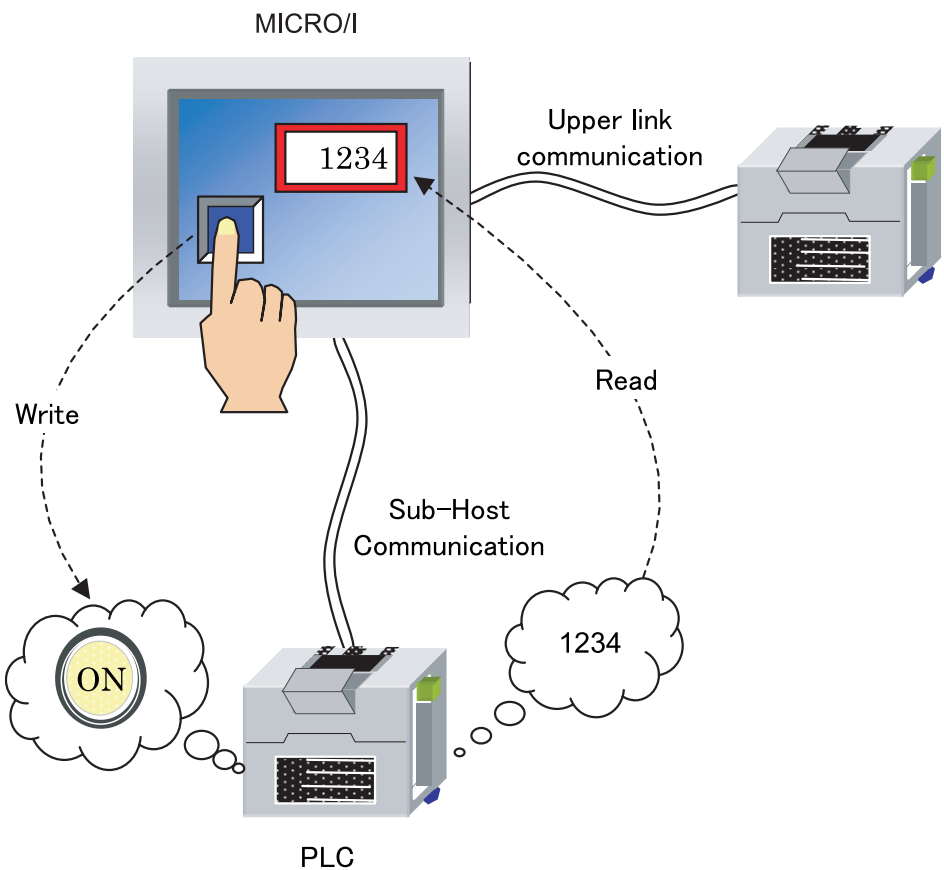
6 Sub Host Communication Method

6.1 Overview

Like PLC link communication, Sub Host Communication is a communication method for reading and writing data from and to devices such as relays (e.g., PLCs) and registers. The basic functions of Sub Host Communication are the same as with PLC link communication. Sub Host Communication performs communication via programming ports on PLC link units (the unit name depends on PLC model) and CPU units or other serial ports. Using Sub Host Communication with PLC Link Communication makes it possible to communicate with two PLCs without making a communication program in the PLC.

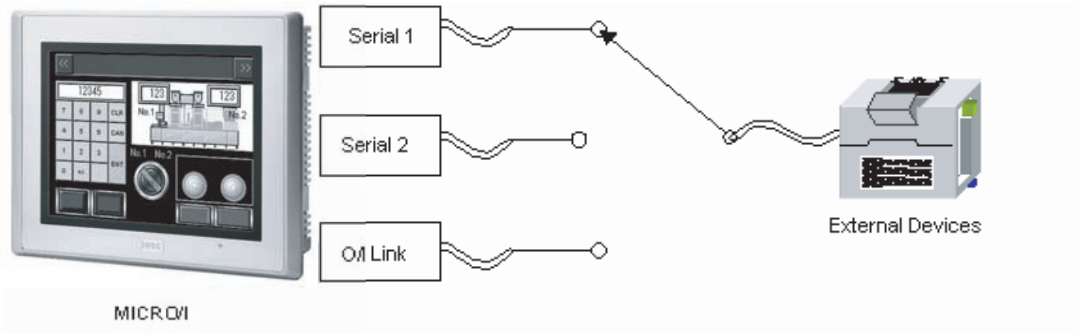
6.2 Operation

The MICRO/I can use the sub-host communication method to read and write host device data. To read and write host device data, assign host device addresses to the HG link register (LLR), which is a HG internal decide. The MICRO/I can read and write data from and to the assigned host device via the LLR.



6.3 Specifications of the Sub Host Communication

The MICRO/I supports communication with external devices that comply with the Sub Host communication specifications via the serial interface or the O/I link interface.

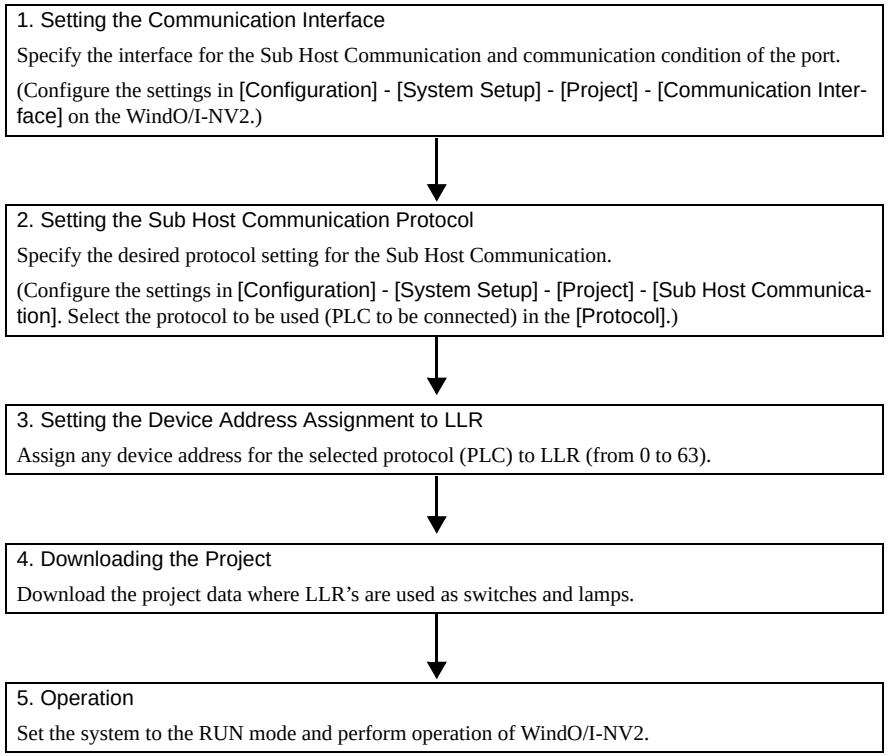


WARNING

- Serial I/F1, serial I/F2, or O/I link can be used for Sub Host Communication. Two or more interfaces cannot be used at the same time.
- With the HG2F/2S/3F/4F/EX4R, the Data Bits, Stop Bits, and Parity settings for the O/I Link I/F are fixed to “8 bits”, “1 bit”, and “None” respectively.
- For HG1F, the Serial I/F 2 and the O/I Link I/F can not be used at the same time.
- For HG1F, O/I Link communication stops while the maintenance cable is connected to the Serial I/F 2.
- For HG1F, the O/I Link I/F cannot be used for a communication when “Enable Pass-Through” is selected.

6.4 Basic Flow from Setting the WindO/I-NV2 to Sub Host Communication

The following flowchart describes the series of operational procedures from setting the WindO/I-NV2 to Sub Host Communication operation.



- Refer to the Help of the WindO/I-NV2 for details about the setting procedures.
- If the setting is other than "No Host" at the time of setting up the Sub Host Communication to Serial 1, the O/I Link should be set to "O/I Link Slave".

6.5 Selecting the Protocol

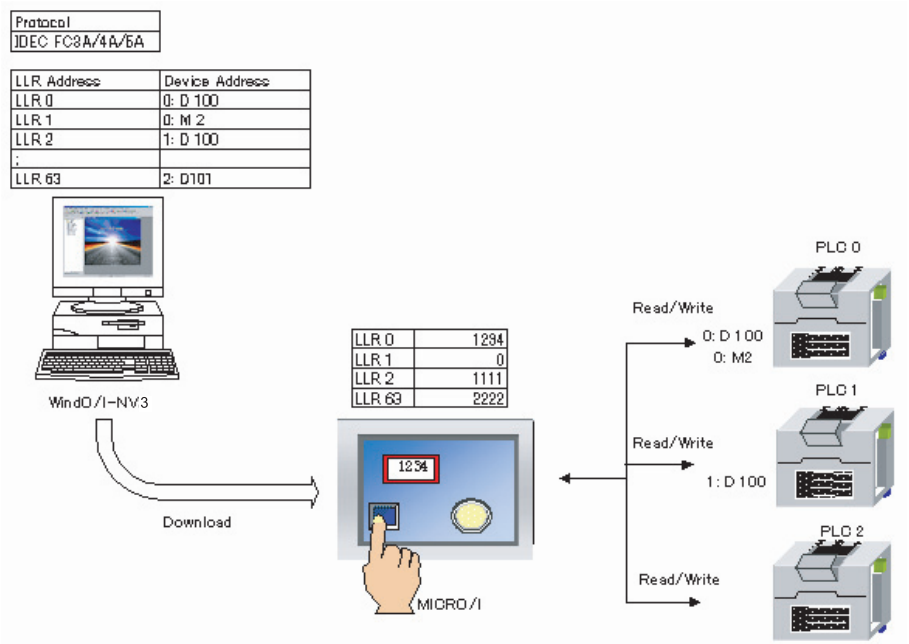
The table below lists the protocols that can be selected in sub-host communication.

Protocol name	Corresponding host I/F driver
IDEC MicroSmart	Manufacturer: IDEC Corporation Host I/F driver name: OpenNet (FC3A), MicroSmart (FC4A/FC5A)
Modbus RTU	Manufacturer: Modicon Host I/F driver name: Modbus RTU

For the devices that can be used by each protocol, communication cable connection, and usable devices, refer to chapter 2 and chapter7 of "MICRO/I HG2G, HG1F/2F/2S/3F/4F Communication Manual" (PDF).

6.6 Setting Internal Device LLR Assignment

To control external devices in sub-host communication, use an LLR (HG link register), which is a MICRO/I internal register. Assign external device addresses to LLR addresses 0 to 63. When a read or write request is issued to the LLR, MICRO/I reads or writes data from or to the assigned external device addresses and reflects the execution result in the LLR.



- Don't use the frequent write operation for LLR which is caused by a script and a word command.
- It may make the reading data operation too much slow.

Refer to the Help of the WindO/I-NV2 for details about setting procedures

6.7 Error information

This setting is for monitoring all error information and for controlling Sub-Host Communication.

6.7.1 Monitor the error information of all Station No.s

This is the error information of all station numbers. Select the destination device with Device Manager.

Bit	15–8	7	6	5	4	3	2	1	0
Function	Reserved	Error Log for Writing	Error Log for Reading	Reserved	Current Error	Reserved	Finish 1st reading	Initialize	Reserved
Read/ Write		R	R		R		R	R/W	

- Bit 1: Clear

  Clear all error information about Sub-Host Communication when the value is change to 1. This bit is changed to 0 after clear. Error information for each station number is also cleared.

- Bit 2: Finish 1st reading

  This bit is changed to 1 when all devices in Sub-Host communication are read.

- Bit 4: Current error

  This bit is changed to 1 while the communication error is occurred in any devices.

  This bit is changed to 0 after the communication error is recovered.

- Bit 6: Error Log for reading

  This bit is changed to 1 when the reading error has occurred in any devices.

  This bit keeps 1 even if the communication error is recovered. This is changed 0 when clear bit is turn on.

- Bit 7: Error Log for writing

  This bit is changed to 1 when the writing error has occurred in some devices.

  This bit keeps 1 even if the communication error is recovered. This is changed 0 when clear bit is turn on.

6.7.2 Monitor the error information of each Station No.

These settings are for monitoring error information and control of each station number. To select a Device Address for error information, go to the Device Manager. 256 word devices from top device set in Device Manager are used. Each device is assigned to each station number of PLC.

Bit	15–8	7	6	5	4	3	2	1	0
Function	Reserved	Error Log for Writing	Error Log for Reading	Reserved	Current Error	Reserved	Finish 1st reading	Reserved	Connection
Read/ Write		R	R		R		R		R/W

- Bit 0: Connection

  When this bit is 1, MICRO/I connect with each station. When this is 0, MICRO/I does not connect the station number. Default value is 1 when the station number is used.

- Bit 2: Finish 1st read

  The value is changed to 1 when all devices assigned to the station number is read.

- Bit 4: Current error

  This bit is changed to 1 while the communication error is occurred in any devices.

  This bit is changed to 0 after the communication error is recovered.

- Bit 6: Error Log for reading

  This bit is changed to 1 when the reading error has occurred in any devices.

  This bit keeps 1 even if the communication error is recovered. This is changed 0 when clear bit is turn on.

- Bit 7: Error Log for writing

  This bit is changed to 1 when the writing error has occurred in some devices.

  This bit keeps 1 even if the communication error is recovered. This is changed 0 when clear bit is turn on.

6.7.3 Keep running with skipping the Station No. of communication error

When this setting is enabled, skip the station number error has occurred and connect with next station number. MICRO/I retry communication with the error station number after other station number.

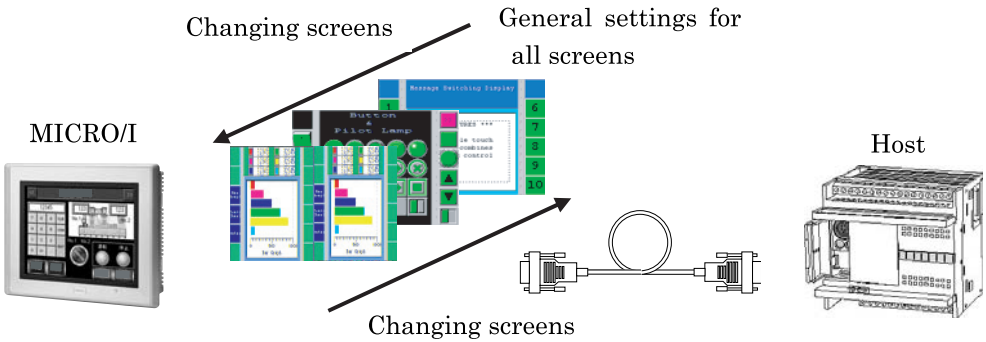
When this setting is disabled, retry communication with same station number until recover from the error.

Chapter 5 Project Settings

The settings and screen data required to run the MICRO/I are contained in a data structure called a Project. You must create a project using WindO/I-NV2 before creating the screens and configuring the settings for the MICRO/I. This chapter describes the various settings required to create a project.

1 Configure the Project

Use the Project Settings menu to configure the general settings for all screens in the project. When the [Configuration] - [System Setup] - [Project] menu is selected on the WindO/I-NV2



Setting Item	Outline
System	This settings is used to configure the general settings in the project for the operation of the MICRO/I. Refer to “1.1 System” (P.83) in this chapter.
Communication Interface	Used to set the function and communication conditions of each communication interface. Refer to “1.2 Communication Interface” (P.86) in this chapter.
Host I/F Driver	This setting is used to display the type number of the MICRO/I, the host device, and set the detailed settings of the PLC-Link communications. Refer to “1.3 Host I/F Driver” (P.88) in this chapter.
Host I/F Network	When Ethernet is used for communication with the host device, use this dialog box to set the IP address and port No. of the host.
Host I/F Extension	This dialog box is used to perform the Host I/F extension settings. The setting items will vary depending on the selected host. This dialog box is only displayed when you have to set them, and is not displayed otherwise.
O/I Link	This setting is used to perform O/I Link communication. The settings are enabled when using the O/I Link. Refer to “1.4 O/I Link” (P.88) in this chapter.
User Communication	Used to select the device to be connected via the User Communication from the list of barcode readers and inverters. This is selected when using the serial devices. Refer to “1.6 User Communication” (P.89) in this chapter.
Sub Host Communication	This setting is used to set the Sub Host Communication. Refer to “6 Sub Host Communication Method” (P.75) in this chapter
Printer	This settings is used to set a printer that is connected to the MICRO/I. Refer to “1.5 Printer” (P.89) in this chapter.
Memory Card	This setting is used to set the folder name for writing the data to the CF Card or the SD Memory Card. The setting is enabled only when using models that are equipped with the memory card interface. Refer to “1.7 Memory Card” (P.89) in this chapter
USB Flash Drive	This setting is used to setup the USB flash drive. The setting is enabled only when using models that are equipped with the USB interface. Refer to “1.8 USB Flash Drive” (P.89) in this chapter

Setting Item	Outline
Project Details	Displays the name, size, Language and the date of the currently open project. You can change the project name by entering a new name here. And also you can input a name for the creator in 40 characters or less. Just after uploading a project data from the MICRO/I, the Modified is the same data as the project data kept in the MICRO/I.
Contents	Use this to input a detailed description of the project in 511 characters or less. A carriage return is equivalent to two characters. After uploading the project, this data will be cleared.

1.1 System

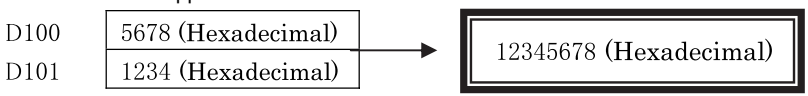
Item		Description
Screen No. Format		Specify either BCD or Binary for the data format for the System Area 1 display screen numbers.
Default Screen		Specify the Initial Screen No. to be displayed when the power is applied. When the default screen number is set at 0, the unit waits for a screen. Either write the screen number to the System Area display screen number region, or set the initial screen number to a number other than 0.
Start Time		Set the time in seconds until communication with the Host I/F starts after power to the MICRO/I is applied (in 1s Steps).
Backlight	Auto OFF	Specifies the period of inactivity that you want to elapse before the MICRO/I turns off backlight. Touching the screen, or setting Bit 5 or Bit 7 of System Area 1 to 1, will restore the backlight.
	Halve the Brightness	Specifies the period of inactivity that you want to elapse before the MICRO/I reduces backlight brightness. Touching the screen, or setting Bit 0 or Bit 7 of System Area 1 to 1, will restore the backlight."
	Light ON with Screen Changing	Automatically reduces the brightness of the backlight after the set time elapses since the MICRO/I was last operated. Touching the screen, or setting Bit 0 or Bit 7 of System Area 1 to 1, will restore the backlight.
Enable Touch Sound		Set the touch screen sound or off. When “Control by Device” is selected, whether the sound function is enabled or not depends on the value of the specified device as follows: 0: Disable, 1: Enable (Long), 2: Enable (short)
Beep Sound		Uses a beep (digital sound) as the touch screen sound.
Sound file		Plays the specified sound file as the touch screen sound. Select from sound IDs registered in Sound Setting.
Touch sound for mechanical switch of HG2S		Set mechanical switch audible feed back on or off. This option is selectable when “Touch sound” is selected.
Enable maintenance		Specify whether or not to display the Maintenance screen during operation. To display Maintenance screen, follow the procedure below. HG2G/3G and HG1F/EX4R series: Press and hold the top-left corner of the screen for 3 seconds. HG2F/2S/3F/4F series: Press the top corners of the screen simultaneously.
Use large font		When magnifying fonts, it is possible to have them automatically replaced with large fonts (refer to Chapter 37 “2 High-quality Fonts” on page 572). However, this requires that one of the large Japanese fonts (first or second standard) or the large European font is downloaded into the MICRO/I.
Enable two-point push		Select whether or not to allow pressing two touch switches together on the MICRO/I. When this is allowed, both of the two overlapping switches work when pressed. With the HG2F/2S/3F/4F, two switches can be turned ON simultaneously.

Item	Description
Enable Low Battery Warning	Select the checkbox off if you do not want to display the battery warning. When using HG1F, warning message is shown when battery level is low level.
System Language	Select the display language for the system screens.
Start from 0 in Always Entry Mode of Numerical Input*1	When the “Always Entry Mode” is selected for a Numerical Input, “0” will be displayed just after the Numerical Input appears on the screen. If you display the current value, deselect this option. This setting is effective for all Numeric Inputs in the current project.
Use System Area	Select the checkbox if you want to use the system area.
Use System Area 3, 4	Set whether or not to use system areas 3 and 4.
Clear Keypad bit in system area automatically*1	When this option is set, touching Keypad makes clear Keypad bit, the bit 0 and bit 1 of the System Area +3, automatically in Numerical Input. When this option is set, touching Keypad makes clear Keypad bit, the bit 5 and bit 6 of System Area +3, automatically in Character Input.
Blinking cycle	Select either 1 second or 0.5 seconds for the blinking speed of parts with a blinking attribute and fixed images.
Watch Dog*1	Use this to monitor communication between the O/I and the host on the host side. This periodically writes data to the host. The value 00FFh is periodically written to the device at the interval set for the monitoring time. Set the device that the data is to be written to and the monitoring time in seconds.
Disable Switch*1	Sets the switch enable/disable condition. Touch switch is active only when the refer device is ON). If this setting is not used, the touch switch is always active.
Use Device Cache*1	- This setting makes the parts operate after reading the values of all host devices that have been set in the current screen when switching the Base Screens or opening the Popup Screens. - With the HG1F/2F/2S/3F/4F, when writing data from a part to the host device, the value written will already be reflected in the next part as parts in the data list operate from top to bottom. This allows the host device to be used as an internal device. Note, this option may slow down the operation of the MICRO/I parts, or cause a delay in the O/I link communication. (On the HG2G, written values are still reflected regardless of this setting.)
Start part with synchronous*1	When this option is set, all command parts in a screen start to work at same time after reading all host devices set in the screen. Also HG internal relay, LSM1, LSM2, LSM3, and LSM5 start to work same way. When this option is not set, command parts, which are not set to read host devices, start to work right after changing the screen. Each command part, which is set to read host devices, starts to work after reading host devices.
Storage Method of string data*1	Select either “from Upper byte” or “from Lower byte” of the device value, when the character string handled with the Message Display or Character Input is read/written to the device.
Storage Method of 32 bit Numerical data*1	This option can be selected only when DM Link Communication, Modicon PLC or FC3A/4A are selected as Host I/F Driver. Select either “from Upper word” or “from Lower word” for reading/writing the device value when BIN32 (+), BIN32 (+/-), BCD8, or float32 is selected for the Data Type.

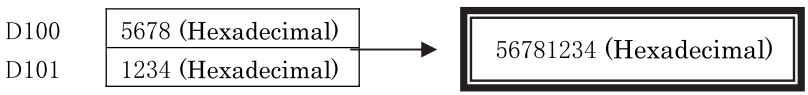
*1. Only available in the Advanced mode.

1.1.1 Example of Storage Method for 32bit Numerical data setting

- When “from Upper word” is selected:



- When “from Lower word” is selected:



- When “for FC3A/4A” is selected:

The storage method for 32-bit numerical data varies depending on the type of host device. Refer to the following table.

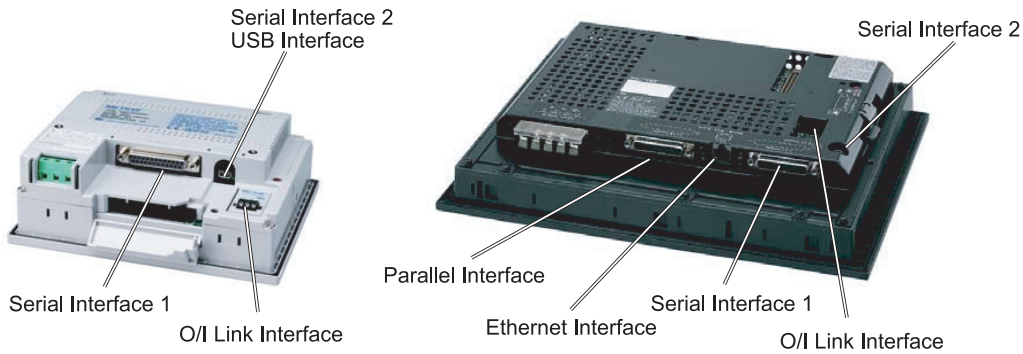
Storage Method for 32bit Numerical data	Device name
From upper word	Input (Word), Output (Word), Internal Relay (Word), Link Register, Spec. Int. Relay (Word)
From lower word	Data Register, Timer (Current), Counter (Current), Timer (Preset), Counter (Preset), Shift Register (Word), Error Register, Spec. Data Register HG internal device

WARNING

- With the MICRO/I, two-point push is not possible when a CC SWITCHTM is in the pressed state.
- The HG2G/3G, HG1F and EX4R are analog-type touch panels. Due to the detection properties of analog-type touch panels, when several switches are pressed simultaneously, the touch panel recognizes the pressed switch as the barycenter of the pressed points (one point). Consequently, operation when pressing several switches together is not guaranteed.
- “System Screen” refers to Maintenance Screen, Device Monitor, Contrast Adjustment, and System Menu.
- For details about the System Area, refer to Chapter 5 “1.1 System” on page 83.
- If the HG2S enable switch connection is set as the reference device, the touch switch is only active when the enable switch is ON.

1.2 Communication Interface

In the Communication Interface setting, one required function can be assigned to each communication interfaceF.



The following table shows the available allocations.

HG3G

Communication Interface	Host Communication	O/I Link Master	O/I Link Slave	User Communication 1/2/3	Printer
Serial Interface (COM1)	X	X	X	X	---
Serial Interface (COM2)	X	X	X	X	---
USB Interface (USB1)Mini-B	---	---	---	---	---
USB Interface (USB2)Type A	---	---	---	X	---
Ethernet Interface (Ethernet)	X	---	---	---	---

- The following interfaces support Maintenance Communication.
  - USB Interface Mini-B
  - Ethernet Interface

HG2G and HG1F/2F/2S/3F/4F series

Communication Interface	Host Interface Communication	O/I Link Master	O/I Link Slave	User Communication 1/2/3	Printer
Serial Interface 1	X	---	X	X	---
Serial Interface 2	---	---	---	X	X*1
USB Interface	---	---	---	---	X*2
O/I Link Interface	---	X	X	X	---
Ethernet Interface	X	---	---	---	---
Parallel Interface	---	---	---	---	X

*1. Support with HG1F/2F/2S/3F/4F series only
*2. Support with HG2F series only

- The following interfaces support Maintenance Communication.
  - Serial Interface 2
  - USB Interface
  - Ethernet Interface

Item		Description
Serial 1	Protocol	Select the protocol that will be assigned to the Serial interface 1. Refer to the above correspondence tables for available protocols. HG3G series: When Serial Interface 2 is set to “O/I Link Master”, Serial Interface 1 or Ethernet Interface is fixed to “Host Communication”. HG2G, HG1F/2F/2S/3F/4F series: “User Communication 1/2/3” can be selected for Serial Interface 1, only if Host I/F Driver is set to “NOHOST”, or O/I Link I/F is set to “O/I Link Slave”. When O/I Link Interface is set to “O/I Link Master”, Serial Interface 2 is fixed to “Host Communication”.
	Baud Rate	Set the communication speed. Use the same setting as for the host device.
	Data Bits	Set the data bits (7 bits or 8 bits).
	Stop Bits	Set the number of stop bits (1 or2).
	Parity	Set the parity check method (even, Odd, or None).
	Flow Control	Select the flow control method from the drop-down list.
	Serial Interface	Select the serial interface from the drop-down list.
Serial 2	Protocol	Select the protocol that will be assigned to the Serial Interface 2. Refer to the above correspondence tables for available protocols. HG3G series: When Serial Interface 1 is set to “O/I Link Master”, Serial Interface 2 or Ethernet Interface is fixed to “Host Communication”.
	Baud Rate	Sets the communication speed of Serial I/F 2. Set this to match the printer that you use.
	Data Bits	Select either 7 or 8 bits for the data bits.
	Stop Bits	Select either 1 or 2 bits for the number of stop bits.
	Parity	Select Even, Odd, or None for the parity check method.
USB	Protocol	Select the protocol that will be assigned to the USB Interface. Select Printer or N/A. Refer to the above correspondence tables for available protocols.

Item		Description
O/I Link	Protocol	Select the protocol that will be assigned to the O/I Link I/F. Select from O/I Link Master, O/I Link Slave, User Communication1 to 3, and N/A. Refer to the above correspondence tables for available protocols.
	Baud Rate	Set the communication speed of the O/I Link I/F.
Ethernet	Protocol	Select the protocol that will be assigned to the Ethernet I/F. Select either Host Communication or N/A. Refer to the above correspondence tables for available protocols.
	IP Address	Sets the IP address for the operator interface.
	Subnet Mask	Sets the subnet mask.
	Default Gateway	Sets the default gateway.
	Forbid Maintenance Communication	Sets whether or not the maintenance communication (this is used between the WindO/I-NV2 software and the MICRO/I) via TCP/IP is allowed.
	Forbid Web Server Function	Sets whether or not the Web Server Function is allowed.
Parallel	Protocol	Select the protocol that will be assigned to the Parallel I/F. Select either Printer or N/A. Refer to the above correspondence tables for available protocols.

WARNING

- Other functions are not available in SERIAL Interface 2 when “Enable Pass-Through” is selected.
- The Function setting of Serial Interface 2 on the EX4R is fixed to “N/A”.
- For HG1F, the Serial Interface 2 and the O/I Link Interface cannot be used at the same time.
- For HG1F, O/I Link communication stops while the maintenance cable is connected to the Serial Interface 2.
- For HG1F, the O/I Link Interface cannot be used for a communication when “Enable Pass-Through” is selected.

1.3 Host I/F Driver

Item	Description
O/I Type	Name of the operator interface selected for the project.
Manufacturer	Name of the selected host manufacturer.
Protocol	Displays the selected Host I/F Driver.
PLC (Host)	Make the specific settings for the Host I/F driver that you will use. For the details of the settings, refer to the Communication Manual (PDF).
Transmission Wait	Set the transmission gap between communication commands (in 10ms Steps).
Time Out	Set the wait time for a response from the PLC (in 100mse. Steps).
Retry Cycles	Set the number of retries until a communication error occurs.
Enable Pass-Through	Specify whether to Enable of Disable the Pass-Through function.

1.4 O/I Link

Item	Description
O/I Link Type	Set the O/I Link Type, Master or Slave Station Number.
Slave Setting	Set slave stations when O/I Link Type.

1.5 Printer

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
		X	X	X	X	X

Only HG1F/2F/2S/3F/4F support this function

Item	Description
Printer Code/ Manufacturer	Select the Printer Code appropriate for the printer that you use. Refer to Chapter 31 “Printer” on page 519 for the details of printer code and available printers.
Details	Displays the main printer types that correspond to the selected printer code.
Form	Select the paper size.
Print Color	Select the color for the output. Click the Reverse Mode if you print a negative of the image by reversing the black and white values.

WARNING
- SII settings are applicable to DPU-414 only.
- Color printing is not supported for PCL.
- When you select the “SII” in the Print language, the outputs are always printed in monochrome.

1.6 User Communication

Item	Description
User Communication	Configure the detailed settings for communicating with a barcode reader or other external devices. Refer to Chapter 4 “5 User Communication” on page 32 for how to use the User Communication functions.

1.7 Memory Card

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X		X		X	X

Only HG3G, HG2F/3F/4F support this function

Item	Description
Memory Card Access Folder	Set the Memory Card write access folder. All data such as alarm log datSet the Memory Card write access folder. The name can be up to eight alphanumeric characters in length (i.e. A to Z, a to z, and 0 to 9). refer to Chapter 30 “1 Memory Card” on page 500.
Remove Files stored in Memory Card	Deletes the files in the Memory Card when the status of the specified device is turned from OFF to ON. All Alarm Log , Data Log, Operation Log, and Screenshot data files can be deleted.

WARNING This feature is only supported by models with a memory card interface.

1.8 USB Flash Drive

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X				X	X

Only HG2G/3G, HG3F/4F support this function

Item	Description
Enable USB AutoRun	Automatically executes the predefined actions when a USB flash drive is inserted into the MICRO/I. To enable this function, select the check box.
Open Popup Screen when USB Flash Drive is inserted	Automatically shows a popup screen when a USB flash drive is inserted into the MICRO/I. To enable this function, select the check box and specify the screen number and the display position of the popup screen."

WARNING This feature is only supported by models with a USB interface.

1.9 Compatibility

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
		X	X	X	X	X

Only HG1F/2F/2S/3F/4F support this function

This function is available when HG1F is selected in WindO/I-NV2 and conversion from HG1B has occurred. Once the project is converted to HG1F and you would like to convert the project to HG2F/3F/4F, the Compatibility function will be carried over. To view the Compatibility properties in WindO/I-NV2, select [Application Button] - [WindO/I-NV2 Options].

Item			Description
Compatible with previous version	Script Trigger Condition	Calculate 16-bit data in 16-bit	Performs an arithmetic operation (+, -, x, /, and residue number operations) using 16-bit data when BIN16 (+), BIN16 (-), or BCD4 is selected for the Data Type. The data overflow that exceeds 16 bits will be lost. Deselect this checkbox in order to perform an operation in 32 bit to eliminate data overflow.
Compatible with HG1B	Word Button, Word Write Command:	Write the data as 2 words	Writes the result of an arithmetic operation (+, -, x, /, residue number operations) as 2 words when BIN16 (+) or BIN16 (+/-) is selected for the Data Type. The result of +, -, x, and / operations is written with 2 words as a 32-bit numerical value. In residue number operation, the quotient data is written to the first word, and the remainder data is written to the second word. Deselect this checkbox in order to write the result of the arithmetic operation with 1 word.
	Numerical Input, Numerical Display	Divide Floating data and Integer data	Reads and displays the data of the floating part and integer part from separate device addresses when BCD4 or BCD8 is selected for the Data Type.
	Message Display	Ignore LF code in the variable strings	Ignores a line feed code LF (0Ah) if it is included in the data read out from the specified device when using variable strings. Deselect this checkbox in order to start a new line with an LF in the message to be displayed.
		Convert NULL code to Space code in the variable strings	Converts an exit code NULL (00h) if it is included in the data read out from the specified device and displays it as a space (20h) when using variable strings. Deselect this checkbox in order to end the message to be displayed with a NULL.
		Always update	Always refreshes the message display even when the Message Display remains unchanged.
	Timer	Keep Timer status after changing the screen	Does not reset the timer clock even if Base Screen is switched or Popup Screen is opened.

2 Project Limitations

2.1 Downloading Restrictions

It is not possible to download data to the MICRO/I if the data size exceeds the available memory capacity.

O/I Type	Project size
HG1F	Approx. 1MB max. (including optional fonts)
HG2G, HG2F/2S	Approx. 2MB max. (including optional fonts)
HG3F/4F	Approx. 6MB max. (including optional fonts)
HG3G	Approx. 12MB max. (including optional fonts)

The size of a project data is depended on the fonts downloaded into the MICRO/I. You can confirm the actual size by using the [Home] - [Project] - [Download] - [Project Data]. (refer to Chapter 37 “1.4 Font Size” on page 570)

The following limitations apply to parts.

The total of Bit Button, Word Button, Goto Screen Button, Key Button and all buttons of Keypad	32,000 max.
Selector switches	200 max.

2.2 Maximum Host Device

- Project

  This is the maximum number of parts that can be set on a single screen displayed with the MICRO/I model.

  A single screen of the MICRO/I model includes the Base Screens being overlaid and the Popup Screens being opened.

Trigger conditions for Global Script Trigger conditions for User Communication Global Script	100 max.

  When the same device address is set multiple times, it is counted as the same device.

- Data Log Settings

Data Log Settings	128 max.

  When the same device address is set multiple times, it is counted as different devices.

- Host Devices Settings per Script

Read Device (Host)	64
Write Device (Host)	64

2.3 Media File Formats

2.3.1 Picture files

The picture file formats that can be displayed on the MICRO/I are indicated below.

O/I type	File format	Description
HG3G	Bitmap	Supports Monochrome Bitmap, 16 Color Bitmap, 256 Color Bitmap and 24-bit bitmap. Those bitmap data must be stored from the bottom side to upper side. Only supports Run-Length Encoring for 256 Color Bitmap images.
	JPEG	Supports baseline DCT-based JPEG files (ISO/IEC 10918-1, ITU-T Recommendation T.81). Does not support JFIF extended format.
HG2G HG1F/2F/2S/3F/4F	HG special format	All supported image files are converted into a dedicated file format for the HG2G and HG1F/2F/2S/3F/4F.

- The MICRO/I can support a picture file no larger than its screen size. When the picture is larger than its screen size, it is not displayed .
- The use of bitmap images is recommended in applications where display speed is a priority. To display JPEG images takes longer than the bitmap images.

2.3.2 Sound files

The sound file formats that can be played on the MICRO/I are indicated below.

File format	WAVE files
Data format	PCM
Sampling rate	8 kHz to 44.1 kHz
Bit rate	16-bit
Audio type	Mono or Stereo
File Size	Max. 512 Kbyte

3 System Area

3.1 Overview

The system areas are used to store the screen control and error data for the MICRO/I. The MICRO/I system area is divided into four regions: The Write and Read shown in this table refer to the action performed by the MICRO/I.

Area	Word Address	Action of MICRO/I
System Area 1	2	Read/Write
System Area 2	2	Write
System Area 3	4	Read
System Area 4	4	Write

The start device address of each system area can be set in the System tab by selecting [Configuration] - [System Setup]- [Project]. Each area is automatically assigned to contiguous address as the “System Area”.

3.2 System Area 1

Data can be read from System Area 1 at any time, but MICRO/I data is only written to System area 1 when the data has changed.

When the power is switched on, the initial screen number is set to the value in Address 0, and the all bits except for Bit 0 (Address + 1) and Bit 7 (Address + 1) are initialized to 0.

If the initial screen number is 0, the error message “Waiting for default screen No.” is displayed.

- Display Screen No.

  Displays the number of the current screen. The screen switches when a new number is written here.

- Backlight On

  This can be used to check whether or not the backlight is on. The backlight is off when this bit is 0, and on when it is 1.

- Blink Display (1 sec. cycle)

  The screen blinks on a 1-second cycle when this bit is set to 1. The screen stops blinking when this bit is set to 0. When both Bit 1 (Address +1) and Bit 2 turn on simultaneously, the action of Bit 1 is given the priority.

- Blink Display (0.5 sec. cycle)

  The screen blinks on a 0.5-second cycle when this bit is set to 1. The screen stops blinking when this bit is set to 0. When both Bit 1 (Address +1) and Bit 2 turn on simultaneously, the action of Bit 1 is given the priority.

- Auto Backlight OFF Release

  The Auto Backlight Off function automatically switches the backlight off if the screen is not touched or if screen switching is not performed for a certain period of time. This function can be set using the WindO/I-NV2. If the backlight is off, you can switch it on by setting this bit to 1.

- Beep

  The beep will sound continuously when this bit is set to 1.

- Screen Display

  This can be used to check the screen display state. When this bit is 0, the screen display is off, and when it is 1, the screen display is on.

- Error Clear

  The error information (System Area 2 address + 2) can be cleared. Switch this bit from 0 to 1 to clear. After the error information is cleared, the MICRO/I resets this bit to 0.

- Numerical Input Setting Clear

  Switch this bit from 0 to 1 to clear the Numerical Input Setting Data (System Area 2 address + 3 bit 0, 1). After the error information is cleared, the MICRO/I resets this bit to 0.

- Character Input Setting

  Switch this bit from 0 to 1 to clear the Character Input Setting Data (System Area 2 address + 3 bit 5, 6). After the error information is cleared, the MICRO/I resets this bit to 0.

Action of MICRO/I	Address	Bit	Function	Data	
				0	1
Read/ Write MICRO/I	+0	0 to 15	Display screen No.	No. of the displayed screen	
↓ ↑	+1	0	Backlight	OFF	ON
System Area		1	Blink Display (1 sec. cycle)	OFF	ON
		2	Blink Display (0.5 sec. cycle)	OFF	ON
		3 to 4	Reserved		
		5	Auto Backlight Off Release	NO	YES
		6	Beep	OFF	ON
		7	Screen Display	OFF	ON
		8	Reserved		
		9	Error Clear	OFF	ON
		10	Numerical Input Setting Clear	OFF	ON
		11	Character Input Setting Clear	OFF	ON
		12 to 15	Reserved		

3.3 System Area 2

Data is written to System Area 2 only when data has been changed in the MICRO/I
When the power is switched on, System Area 2 is cleared (cleared to 0).

- Host Communication Error

  While communicating with a host device via SIO1 (Serial interface 1), the Bit 3 of Address 2 is set.

- Arithmetic Error

  When an illegal arithmetic operation is attempted, the Bit 5 of Address 2 is set.
  Conditions for an arithmetic error are as follows:
  - A value other that 0 to 9 is used when the data type is BCD data type.

  - Divide by 0 attempted.

  - Inconsistency in the maximum, minimum or origin values for a trend graph, or a full range of 0.

- Device range error

  The data is written to the device with the address out of the range, or the number of devices exceeds the limitation.

- Clock IC Error

  When the MICRO/I internal clock stops for some reason, the Bit 7 of Address 2 is set.

- Memory card Access Error

  When an error occurs while accessing to the memory card inserted in the HG3G, HG2F/3F/4F, the Bit 8 of Address 2 is set to 1.

- Printer time out error

  When an error occurs while printing with the connected printer to the MICRO/I, the Bit 9 of Address 2 is set.

- Script Error

  A “1” is written to this location when an error occurs for a process in execution of the script. For details, refer to the values stored in LSD52 and LSD53.

- Replace Battery Error

  When the remaining battery level is low, the Bit 12 of Address 2 is set.

- Replace Battery Error (Low level)

  When the remaining battery level is lowest, the Bit 13 of Address 2 is set.

- Backup Date Error

  A “1” is written here if the MICRO/I internal battery goes flat and the log data or internal keep register or relay contents are lost.

- Numerical input /Character input Setting Complete

  When input is complete it is set to “1” (ON). To reset this bit, use the Bit 10 or Bit 11 of Address + 1.

- Numerical Input / Character input Setting Cancel

  When the Cancel button is pressed to cancel the input, it is set to 1. To reset this bit, use Bit 10 or Bit11 of Address + 1.

- Auto Backlight OFF Being Executed

  When the Auto Backlight Off function is available, the Bit 2 of Address + 3 is 1 while backlight is off.

- Printing

  While printing, the Bit 3 of Address + 3 is 1.

- Transferring recipe data

  While the recipe data is transferring, the Bit 4 of Address + 3 is 1.

Action of MICRO/I	Address	Bit	Function	Data	
				0	1
Write MICRO/I ↓ System Area	+2	0 to 2	Reserved		
		3	Host Communication Error	Normal	Error
		4	Reserved		
		5	Arithmetic Error	Normal	Error
		6	Device range error	Normal	Error
		7	Clock IC Error	Normal	Error
		8	Memory card Access Error	Normal	Error
		9	Printer time out error	Normal	Error
		10	Script error	Normal	Error
		11	Reserved		
		12	Replace Battery Error	Normal	Error
		13	Replace Battery Error	Normal	Error
		14	Backup Data Error	Normal	Error
		15	Reserved		
	+3	0	Numerical input setting complete	-	Complete
		1	Numerical input setting cancel	-	Cancel
		2	Auto Backlight Off Being Executed	Always	Execute
		3	1: Printing	Normal	Printing
		4	1: Recipe data is being transferred.	Normal	Being transferred
		5	Character input setting complete	-	Complete
		6	Character input setting cancel	-	Cancel
		7 to 2	Reserved		

The Bit 0, Bit 1, Bit 5, and Bit 6 of Address +3 cannot be reset directly. Clear these bits by using the Bit 10 and Bit11 of Address +1.

3.4 System Area 3

The System Area 3 data can always be read by System Area 3.

- Calendar Data

  The host calendar data is written to the MICRO/I

- Update

  When set to “1” the calendar data is written to the MICRO/I.

Action of MICRO/I	Address	Bit	Function	Data
Read MICRO/I ↑ System Area	+4	0 to 7	Calendar data “Month” (2 BCD digits)	01 to 12
		8 to 15	Calendar data “Year” (2 BCD digits)	00 to 99
	+5	0 to 7	Calendar data “Hour” (2 BCD digits)	00 to 23
		8 to 15	Calendar data “Day” (2 BCD digits)	01 to 31
	+6	0 to 7	Calendar data “Second” (2 BCD digits)	00 to 59
		8 to 15	Calendar data “Minute” (2 BCD digits)	00 to 59
	+7	0 to 14	Reserved (write “0”)	0
		15	0: Don't update 1: Update	0 or 1

If “Address7-Bit 15” is set to “1”, then all data (Addresses 4, 5, 6) is updated.

3.5 System Area 4

Data is written from the MICRO/I to System Area 4 once per minute.

- Calendar Data

  The MICRO/I calendar data is written to System Area 4

Action of MICRO/I	Address	Bit	Function	Data
Write MICRO/I ↓ System Area	+8	0 to 7	Calendar data “Month” (2 BCD digits)	01 to 12
		8 to 15	Calendar data “Year” (2 BCD digits)	00 to 99
	+9	0 to 7	Calendar data “Hour” (2 BCD digits)	00 to 23
		8 to 15	Calendar data “Day” (2 BCD digits)	01 to 31
	+10	0 to 7	Reserved	0
		8 to 15	Calendar data “Minute” (2 BCD digits)	00 to 59
	+11	0 to 3	Calendar data “Day-of-week” (2 BCD digits)	0 (Sun) to 6 (Sat)
		4 to 15	Reserved	

Chapter 6 Screens

1 Overview

The MICRO/I consists of three types of screens: the Base Screen that is the basic operation screen, the Popup Screens that can be displayed with any position and any size on the Base Screen, and the System Screen, that is available is with the MICRO/I as default.

The following shows the screen numbers of the Base Screen and Popup Screens that can be edited by the user.

Type	Number
Base	1 to 3000
Popup	1 to 3015

2 Screen Types and Operations

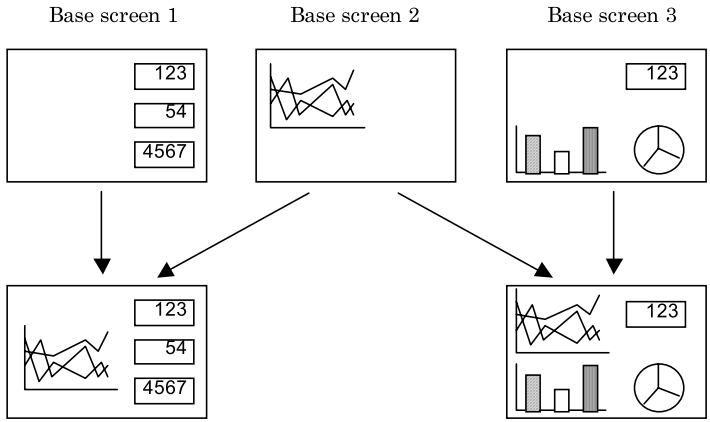
2.1 Base Screen

Base screens the same size as the MICRO/I operator interface and are the basic operation screens. Popup Screens (described below) are displayed on top of base screens. It is possible to directly input text, draw graphics and place parts (such as buttons and lamps) in base screens. The screen size is as follows.

O/I Type	Size (W x H)
HG1F	300 x 100 pixels
HG2G, HG2F/2S	320 x 240 pixels
HG3F	640 x 480 pixels
HG3G, HG4F	800 x 600 pixels

In the MICRO/I operator interface, base screens link to a series of operations, and when base screens are switched, the operation is also switched. One base screen can be used as a virtual pasteboard for up to five other overlay base screens. Overlaying base screens is useful when creating multiple screens that follow a specific format.

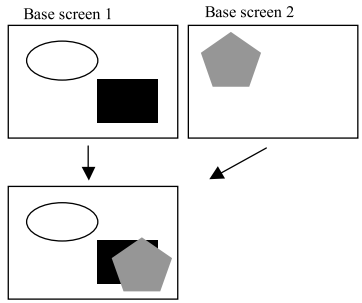
Ex: Overlaying base screens (Overlaying base screen 2 on base screen 1 and base screen 3)



Take note of the following points with regard to overlapping base screens.

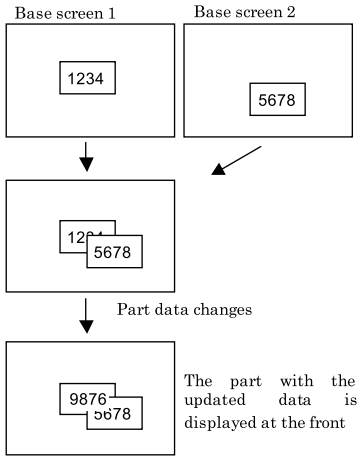
- Graphics

  The graphics in the topmost screen are displayed.



- Parts

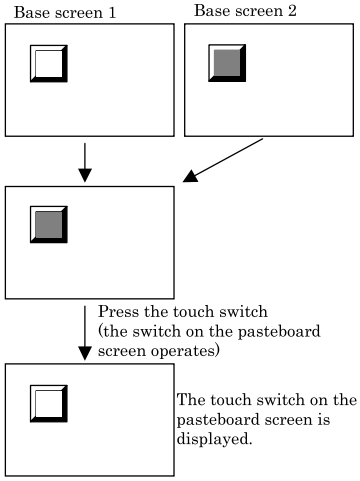
  Parts with updated data or display are displayed at the front.



The display behavior of the overlapping parts differs according to the O/I type. Check the behavior with the MICRO/I.

- Touch switches

  When you press a touch switch, the switch on the base screen under it operates and is displayed at the front.



When two-point pushing for a touch switch is allowed, operation and display updates are performed in order from the lowest layer switch.

- Limits

  The same limits that apply to one screen can also be applied to overlapped screens. Take care that the overlapped screen does not to exceed these limitations (refer to Chapter 6 “3.1 Limitations on number of registered screens” on page 113).

2.1.1 Setting Base Screens

Item	Description
Background Color	Set the background color for the screen.
Overlay with Base Screen/Display Order of Overlapping Screen	Set this when you want to overlap screens. Specify the screen numbers and display positions. You can select up to a maximum of five base screens. This setting only applies to base screens. Use this when you are using multiple base screens with the same display format. With the “Display Order of Overlapping Screen” setting, you can change the position in the display sequence of the screen that you are currently making settings for.
Focus Order	Specify the direction to shift the focus to. Use this to set the direction for shifting the window focus when you are displaying multiple data input devices on the screen (for numerical input etc.) and you wish to perform continuous data input. The sequence of the Focus Movement can be set to Vertical direction, Horizontal direction or Optional direction. For how to set the desired sequence, refer to the description in Help.
Security Group	Specify a Security Group. Using this function, the screens displayed during operation can be restricted according to the user. (refer to Chapter 23 “Security Function” on page 407.)
Blink	Set the screen display mode. Blink (1 sec. cycle): The screen blinks on a 1-second cycle. Blink (0.5 sec. cycle): The screen blinks on a 0.5-second cycle. Backlight OFF: The backlight is turned off until you touch the screen or set the bit 0 or 7 of System Area 1 address + 1 to 1. None: The screen is always displayed without blinking.

WARNING
- An overlay base screen cannot be set to overlap on other base screens.
- The screen background color is the background color set for the bottommost screen.
- If parts of drawings are placed outside the display region, they may not display or work correctly.

- Overlaying base screens are processed to display as follows.

  Ex. 1) When the display order of overlapping screen is set to “Display this screen as base”, the screens are displayed as follows.

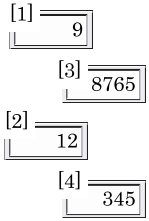
  Base screen being set → Base screen [1] specified for overlay → Base screen [2] specified for overlay ...→ Base screen [5] specified for overlay

  Ex. 2) When the display order of overlapping screen is set to “Display this screen over Overlay 2”, the screens are displayed as follows.

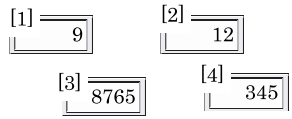
  Base screen [1] specified for overlay → Base screen [2] specified for overlay → Base screen being set → Base screen [3] specified for overlay...→ Base screen [5] specified for overlay

- The Focus Movement is processed in ascending order starting from the smaller X-coordinate in the vertical direction and Y-coordinate in the horizontal direction using the top-left corner of the part as the reference point. Therefore, the focus moves in the following sequence when the parts are not aligned along the X-axis and Y-axis.

Vertical)



Horizontal)

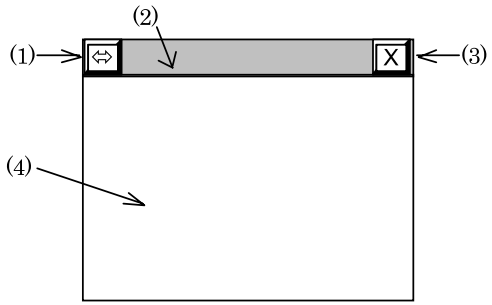


2.2 Popup Screen

Popup screens are displayed on top of base screens. The maximum screen size is as same as a base screen.

The operation of a Popup screen is similar to the operation of a Base screen. Popup screens can be moved, opened or closed on a specific Base screen.

Ex: Overlaying base screens (Overlaying base screen 2 on base screen 1 and base screen 3)



(1) Move Button

When you press the move button, the title bar is displayed in reverse video, and the window switches to Screen Move mode.

The screen will move to the next location that you press on the screen.

(2) Title Bar

The title bar displays the title of the Popup screen. When there are multiple overlapping Popup screens, press the title bar of a window at the back to bring it to the front. You may select a font for the title and switch the title by using the registered text to the Text Manager.

(3) Close Button

Press the close button to close the Popup screen.

(4) Screen Displaying Region

Text and graphics are displayed.

Once you have created a screen you can modify all properties except for the screen type. To do this, double-click anywhere on the screen except for a part or graphic.

2.2.1 Popup Screens for Standard Keypad

The screens from 3001 to 3015 are Popup Screens on which Standard keypad used with Numerical Input and Character Input is set up. These screens are automatically created when a new project is created.

(Example)

DEC. Numerical Keypad

Alphabet Keypad

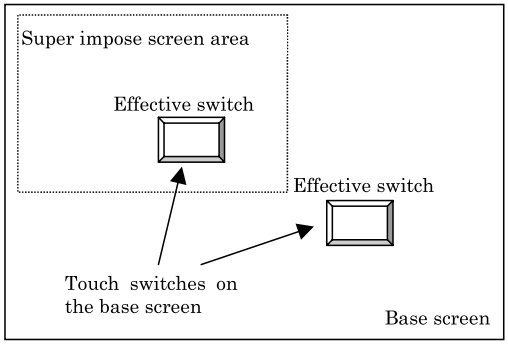
- These Popup Screens are similar to ordinary Popup Screens and any part and any graphics can be set up.
- To reset the screens to the default status when the project is created, delete the screen, and then create a new screen. The screen is created with the Standard keypad being set up.

2.2.2 Setting Popup Screens

Item	Description
Background Color	Set the background color for the screen.
Title Bar	Select this when you want to display a title bar on the screen to display the screen name that you set. You can not enable Show Title Bar if Super Impose is selected.
Screen Effects*1	Sets a background option of the popup screen. None: Fills the background with the specified color as "Background Color". Transparency: Specify the degree of transparency of the screen background. The degree of transparency can be adjusted in 10% increments from 10 to 90%. Superimpose: When this is selected, the popup screen is made transparent so that it is possible to see the original screen from which the popup screen was called. This cannot be set if Show Title Bar is selected. When you open one of these screens, only the placed parts and drawings are displayed, and are superimposed on the existing screen.
Move Button	When this is selected, this displays a move button on the title bar to allow you to move the popup screen. You can select this when Show Title Bar is selected.
Close Button	Select this when you want to display a close button in the title bar on the screen. You can select this when Show Title Bar is selected.
Close while changing Base Screen	This sets whether a displayed popup screen will be closed or not when base screens are switched. This setting only applies to popup screens.
Open the screen with Fade-in*1	When the popup screen opens, it changes the degree of transparency from 100% to the specified degree of transparency "Translucent" when a popup screen is opened. When "Transparency" is set to "None", the degree of transparency changes from 100% to 0%. This setting is not available when "Transparent" is selected as "Transparency".
Focus Order	Specify the direction to shift the focus to. Use this to set the direction for shifting the window focus when you are displaying multiple data input devices on the screen (for numerical input etc.) and you wish to perform continuous data input. The sequence of the Focus Movement can be set to Vertical direction, Horizontal direction or Optional direction. For how to set the desired sequence, refer to the description in Help.
Security Group	Specify a Security Group. By using this function, the screens displayed during operation can be restricted according to the user. (refer to Chapter 23 “Security Function” on page 407.)

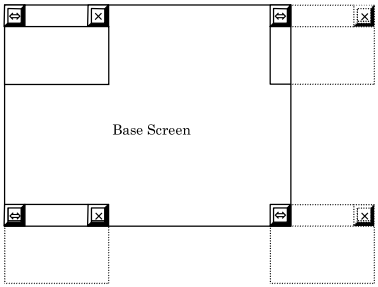
*1. Only HG3G supports.

- If the title bar is present, switches within 20 pixels of the circumference of the active Popup screen are ineffective.
- Even if a Popup screen where superimpose is set on a switch is displayed, the switch is effective. If a Popup screen where superimpose is not set is displayed, the switch is ineffective.
- The title (located at the top of the Popup Screen) is displayed with white text even if a color was selected in the Text Manager.
- When using Popup Screens with the HG2S with CC SWITCHTM type, make sure to place a button within the touch-switch area on the Popup Screen; otherwise, the button may not function properly depending on the display position of the Popup Screen. To place a button within the CC switch area, make the size of the Popup Screen the same size as the Base Screen, and deselect the Show Title Bar option. In addition, make sure to set the display position of the Goto Screen Button or Goto Screen Command, used to display the Popup Screen, to X=0 and Y=0.



- If “Superimpose” is selected as a “Screen Effects”, then the color magenta (R:255, G:4, B:255) is used as the transparent color on the popup screen. Moreover, if this magenta is used in pictures on a Popup screen, the magenta-colored areas will appear transparent.

You can move a Popup screen to any location as long as the move button remains visible on the screen. With the HG2F/2S/3F/4F and EX4R, the Popup Screens can be moved in steps of 20 pixels.
With the HG2G/3G, HG1F, they can be moved in steps of 1 pixel.



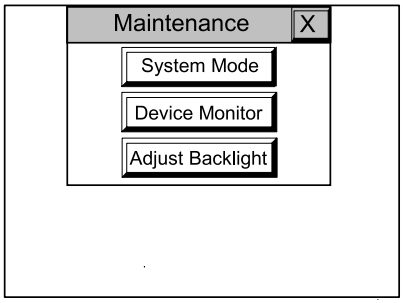
2.3 System Screen

The System Screen allows you to change the settings and operation modes.

WARNING Even when the HG1F is installed vertically, the System Screen is displayed in the same orientation as the horizontal installation.

2.3.1 Maintenance Screen

To display the Maintenance Screen, press the top two corners of the screen at the same time in Run Mode. (On HG2G/3G and HG1F/EX4R, press and hold the top-left corner of the screen in Run Mode for at least 3 seconds.) Press the close button to return to Run Mode.



WARNING
- If a password has been set, press the “System Mode” or “Device Monitor” button to display a screen to enter the password.
- Select “Enable maintenance” on WindO/I-NV2 project settings to display the maintenance screen.

When in Maintenance Mode, the following information will be displayed:

- System Mode

  Displays the MICRO/I initial settings, self-diagnostics and log data clearing. Refer to Chapter 35 “System Mode Overview” on page 544.

- Device Monitor

  Displays the contents of the device and allows the alteration of its data. Refer to Chapter 25 “Device Monitor” on page 442.

- Contrast/ Backlight adjustment/ Adjust Brightness

  The Contrast or backlight of the display can be adjusted to make the screen easier to view.

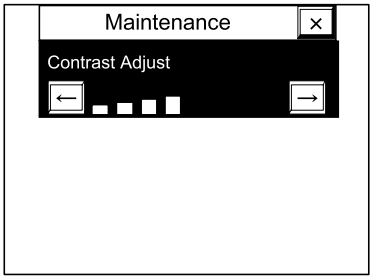
  Procedure

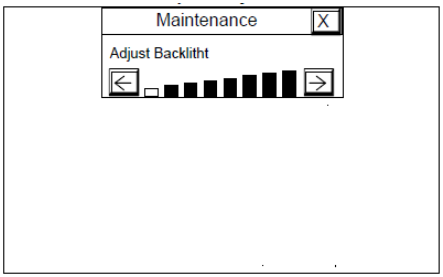
  1. Press the [Contrast Adjust] Contrast Adjust button on Maintenance Screen (for HG2G, HG1F/2F/2S).

     Press the [Adjust Backlight] button on Maintenance Screen (for HG3G, HG3F/4F) or press the Adjust Brightness (for HG3G)

Procedure

2. Press the arrow keys to adjust the contrast or the backlight to a comfortable viewing level.





WARNING

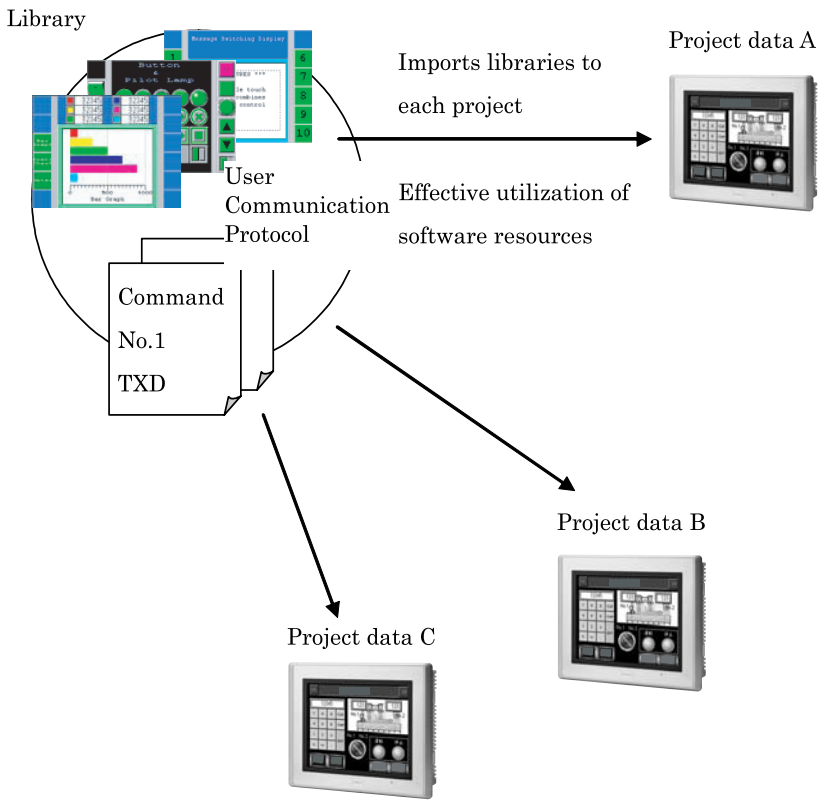
The HG1F/2F/2S are equipped with a function that automatically adjusts the screen contrast depending on the ambient temperature, so during operation the screen brightness may change. Adjust the contrast to the best condition as required.
To ensure the best contrast, adjust the contrast approximately 10 minutes after turning on the power.

- Contrast/Backlight/Brightness adjustment can also be accessed from System Mode as follows:
  - HG2G/3G: Adjust at the Top page.
  - HG2F/ 3F/ 4F: Pressing the top two corners of the screen.
  - HG1F/ EX4R: Pressing the upper left corner for three seconds will display the screen.
- The contrast/backlight/adjust brightness value is stored in LSD51. These values can also be adjusted by changing the value of LSD51.

2.4 Library

With the Library functions you can combine frequently used graphic and operation combinations and register them as one part to facilitate data creation. The main feature of this function is that it is not project dependent, and therefore, libraries can be used by other projects to the one that they were created in.

It is possible to use an existing library in the library currently being existed.



MENU	DESCRIPTION
[Home] - [Screens] - [New] - [Library Screen]	Creates a new library.
[Home] - [Screens] - [Open] - [Library Screen]	Opens an existing library.
[View] - [Workspace] - [Protocol Manager]	Creates and edits the User Communication Protocols.

3 Limitations

3.1 Limitations on number of registered screens

- Base Screens

Total	3,000 max.
Overlay display	5 max.

- Popup Screens

Total	3,015 max.
Overlay display	3 max.

3.2 Maximum Host Device

The number of host devices depends on the project.

- Base Screen (including overlaid base screens)

Write Device (Host)	512 max.
Read Device (Host)	256 max.

- Popup Screen

Write Device (Host)	128 max.
Read Device (Host)	64 max.

However, if more than one device uses the same device address, they are counted as one device.

- The following devices are counted as the Read Device of the host device not only the Write Device.
  1) Device of Potentiometer
  2) Device of Numerical Input
  3) Device of Character Input

3.3 Limitations of Vertical Installation

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
		X				

Only HG1F support this function

The HGIF can be used with a vertical installation.

Even if the vertical installation is selected, the following screens are displayed horizontally.

- System Menu
- Maintenance Menu
- Adjust Contrast Screen
- Password Screen

When the vertical installation is selected, the Bar Chart and Device Monitor cannot be used.

Chapter 7 Draw Objects

This chapter describes how to set graphics used in creating screens, and how they work on the MICRO/I.

1 Operation Overview

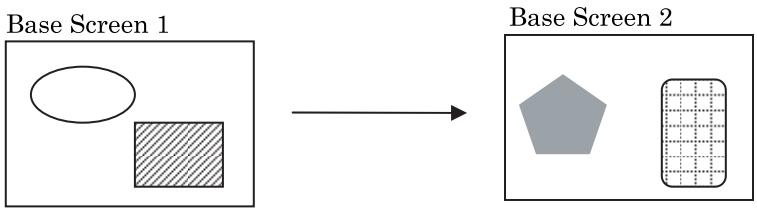
The WindO/I-NV2 allows you to configure the operation of the MICRO/I by setting Draw and Parts objects on the Base screen and Popup screen.

To create objects on the screen you can use the three methods listed below (Drawing, Image, or Text).

Type	Description
Drawing	Line, polygon, circle, pie, object fill
Image	Available images from the Picture Manager
Text	Text

2 Drawing objects

Example) Switching the Base Screen from 1 to 2



When switching screens, the graphic objects and the target Base Screen are displayed at the same time. The display will not change until the screen is switched again.

Item	Description
Line Width	1/2/3/5 Dots
Line Type	Solid line / Dotted line / Broken line / Broken line (Long type) / Alternate long and short dashed line / Chain double-dashed line
Fg. Color	Select the foreground color. (Select from 256 colors for color display or 16 colors for monochrome display.)
Bg. Color	Select the background color. (Select from 256 colors for color display or 16 colors for monochrome display.)
Pattern	Select from 11 patterns.
Blink	Enable or disable the Blink setting. The blink period can be set in the Project Settings. (refer to Chapter 5 “Project Settings” on page 81.)

2.1 Drawing

Drawing menu	Function
Line	Draws a line.
Polyline	Draws contiguous, multiple lines (polygonal line).
Polygon	Fills the closed loop of the polyline with the specified color.
Rectangle	Draws a rectangle.
Circle/Ellipse	Draws a circle or ellipse.
Arc	Draws an elliptical arc.
Pie	Draws a pie.
Equilateral Polygon	Draws an equilateral polygon (triangle, diamond, pentagon, hexagon, or octagon).
Paint	Fills a closed region with the specified color and pattern.

WARNING

When Paint is used on a screen, it will fill the area where indicated. However, if the fill is not as expected, then check the order and borders of other objects, located on the Object tab of the workspace window, and make necessary adjustments.

2.2 Picture

This object displays a picture registered to Picture Manager on the Screen Window. You can use a picture as the screen background. For picture file restrictions, refer to Chapter 5 “2.3 Media File Formats” on page 91.

2.3 Text

Set text by selecting the [Home] - [Drawing] - [Text] command from the WindO/I-NV2 menu.

Item		Description
Font		Select the display font for the text. (Refer to Chapter 37 “3 Character Code Table” on page 575.) (Japanese, European, Chinese, Taiwanese, Korean, Central European, Baltic, Cyrillic, Windows, European Stroke)
Style		Select the style for the text. (Regular, Bold or Shadow) This setting is available when “Japanese”, “European”, “Central European”, “Baltic” or “Cyrillic” is selected under “Font”.
Align Text	Horizontal	Select the horizontal alignment. (Left, Center-left, Center or Right)
	Vertical	Select the vertical alignment. Fixed to “Top” when the Vertical Writing option is selected. (Top, Center, Center-top or Bottom)
Vertical Writing		Select the checkbox to display the characters in the vertical direction.
Use Text Manager		Select whether or not to use the registered text with the Text Manager.
Text ID		When the [Use Text Manager] is selected, specify the ID number of the text registered with the Text Manager. (1 to 32000)
Text		Enter the characters to be displayed. (3750 characters) (Refer to Help for details.)
Text Color		Select the display color for the text. (Select from 256 colors for color display, 16 colors for monochrome display, or TMC (character color on Text Manager).)
Background Color		Select the background color for the text. (Select from 256 colors for color display or 16 colors for monochrome display.)
Shadow Color		Select the shading color for the text. (Select from 256 colors for color display or 16 colors for monochrome display.)
Use Text Area		When this option is set, you can specify the display area. Text alignment follows this area. If you use the Text Auto Resizing function, set this option.
Magnification		Select the vertical and horizontal magnification for the text. (0.5, 1, 2, 3, 4, or 8) This setting is available when “Japanese”, “European”, “Central European”, “Baltic” or “Cyrillic” is selected under “Font”.
Size		Specifies the size of the text. (8-128) This setting is available when “European Stroke” is selected under the “Font”.
Animation		Select whether the display text blinks or not.
Coordinates		Set the display position for the text.

WARNING

- When a Text ID with a Windows font is selected, the style and the magnification specified in the dialog box becomes disabled.
- "Vertical Writing" is not available when "European stroke" is selected as "Font".

- When a line feed is inserted in the text box, the text is displayed on the MICRO/I with the line feed inserted. A line feed is the equivalent of 2 characters.
- When the Display Text Group is switched, the display position of the text (graphic image) will not be updated. The display position is updated under the following conditions.
  1. When the “text” is moved.
  2. When the Properties setting dialog box is opened and then closed by clicking [OK].

3 Limitations on numbers of images

Limitations on numbers of images

- Inflections per polyline

Maximum	300 points

4 Available Pictures

HG3G	Picture Manager	65536 colors
	Properties sheet	256 colors
HG2G, HG2F/2S/3F/4F	Picture Manager	256 colors
	Properties sheet	256 colors
HG2G(Monochrome), HG1F/2F(Monochrome) HG2S(Monochrome)	Picture Manager	16 colors
	Properties sheet	16 colors

Chapter 8 Parts List

This chapter describes the operation of each part when creating projects.

1 Overview

The WindO/I-NV2 allows you to configure the operation of the MICRO/I by setting Part objects on the Base screen and Popup screens.

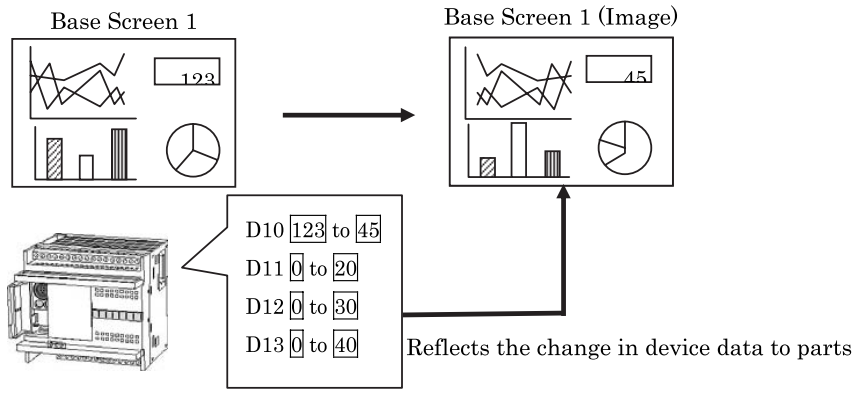
Part Functions:

Type	Description
Button	This object can set a bit, move data, switch screens or print the screen image etc. by pressing touch switches.
Lamp	Switches the display object to match the device condition.
Data Display	This object can display the data with text, graphics and graph etc.
Chart	Displays device values on chat or meter.
Command	This object can set a bit, move data, switch screens, print the screen image or calculate data etc. according to the Trigger Condition. And this object is not displayed on the MICRO/I.

2 Part objects

There are five main groups of parts used in MICRO/I: buttons, lamps, data displays, charts and commands.

Example) When the following parts are set up on Base Screen 1 (Line Chart, Numerical Input, Bar Chart, and Meter)



A change in the value of the device set up with the corresponding part will change the display of the part, or execute the operations between devices or write data to the device.

Parts	Item	Description
Button	Bit Button	A button placed on a touch or CC SWITCH on the screen that writes a “1” or “0” to a specified bit device.
	Word Button	A button placed on a touch or CC SWITCH on the screen that can be used to transfer, write, or perform arithmetic or logic operations on data.
	Goto Screen Button	A button placed on a touch or CC SWITCH on the screen that switches to another screen.
	Print Button	A button placed on a touch or CC SWITCH on the screen that outputs the screen displayed on the operator interface to the printer or the Memory Card.
	Key Button	A button made up of combinations of other parts such as Numerical Input, Character Input, Alarm Log Displays, and Alarm List Displays
	Multi-Button	The Multi button parts can execute several functions at once.
	Keypad	A button used when inputting data using a Numerical Input or Character Input.
	Selector Switch	A switch that turns one of a group of outputs on.
	Potentiometer	A part that uses a slider to input data to a device.
Lamp	Pilot Lamp	A part that switches display images according to the state of a specified bit device.
	Multi-State Lamp	A part that switches display images according to the state of a specified device.

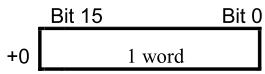
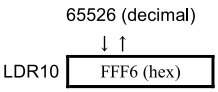
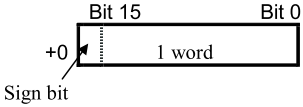
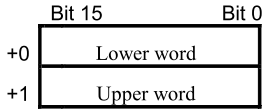
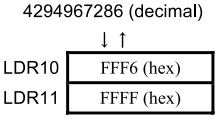
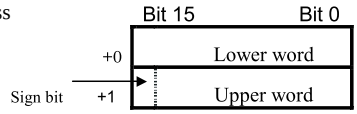
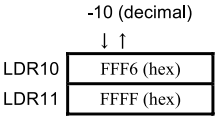
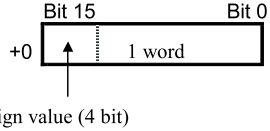
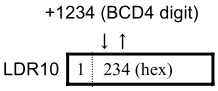
Parts	Item	Description
Data Display	Numerical Input	A part that uses either a Keypad or Key Button for numerical data input.
	Character Input	A part that uses either a Keypad or Key Button for character data input.
	Picture Display	A part that switches registered images depending on the value in a device.
	Message Display	A part that displays fixed text strings or converts device data to character code for display.
	Message Switching Display	A part that switches registered messages depending on the value in a device.
	Alarm List Display	A part that displays multiple messages depending on the state of a trigger device.
	Alarm Log Display	A part that displays the alarm log data stored in the MICRO/I.
	Numerical Display	A part that displays device data numerically.
	Calendar	A part that displays the date/time using the MICRO/I system clock.
Chart	Bar Chart	A part that displays device data in a bar graph.
	Line Chart	A part that displays log data in a line chart.
	Pie Chart	A part that displays device data in a pie chart.
	Meter	A part that displays device data on a meter.
Command	Bit Write Command	A command that writes a “1” or “0” to a specified bit device when certain trigger conditions either toggle to the established state or are satisfied.
	Word Write Command	A command that writes data to a specified word device, transfers data or performs an arithmetic or logic operation on data when certain trigger conditions either toggle to the established state or are satisfied.
	Goto Screen Command	A command that switches to the specified screen when certain trigger conditions either toggle to the established state or are satisfied.
	Print Command	A command that outputs the screen displayed on the operator interface to the printer or the Memory Card when certain trigger conditions either toggle to the established state or are satisfied.
	Script Command	A command that executes the registered script according to the trigger condition.
	Multi-Command	The Multi Command parts can execute several functions at once.
	Timer	A timer works while the specified trigger conditions are satisfied. It turns the timer contact (one of the internal devices) ON when the value set for the timer is reached.

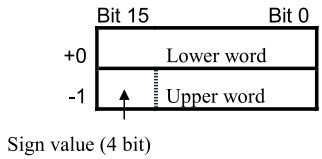
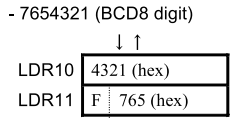
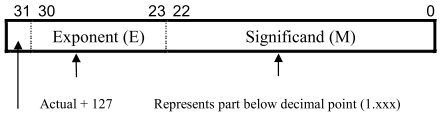
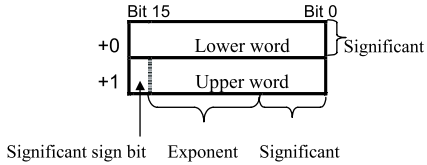
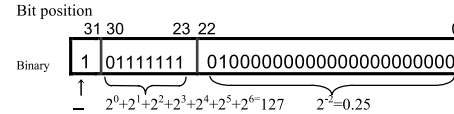
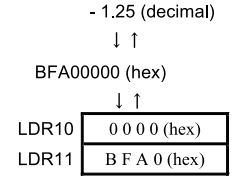
3 General Settings for Parts

3.1 Data Type

Numerical data is converted into the following binary data for storage in memory.

Data Type	Words	Setting Range
BIN16 (+)	1	0 to 65535
BIN16 (+/-)	1	-32768 to 32767
BIN32 (+)	2	0 to 4294967295
BIN32 (+/-)	2	-2147483648 to 2147483647
BCD4	1	-999 to 9999
BCD8	2	-9999999 to 99999999
float32	2	-3.4000E+38 to -1.1800E-38,0,1.1800E-38 to 3.4000E+38

Data Type	Explanation	Example
BIN16 (+)	Start address 	Ex: Start address is LDR10 
BIN16 (+/-)	Start address 	Ex: Start address is LDR10 
BIN32 (+)	Start address 	Ex: Start address is LDR10 
BIN32 (+/-)	Start address 	Ex: Start address is LDR10 
BCD4	Start address 	Ex: Start address is LDR10 

Data Type	Explanation	Example
BCD8	Start address 	Ex: Start address is LDR10 
float32	float32 is floating point data (that complies with IEEE754). A valid digit is 6. The data is expressed as follows Floating-point data: $\text{Significand} \times 2^{\text{Exponent}}$  Sign bit (S) (0: positive, 1: negative) This can be expressed by the following formula. $\begin{cases} (-1)^S \times (1+M) \times 2^{E-127} & (0 < E < 255) \\ 0 & (E=M=\text{Significand sign}=0) \end{cases}$ Allocation to a device is as follows. 	Ex: Bit position  Floating point decimal data = $-1.25 \times 2^{127-127} = -1.25$ Ex: 

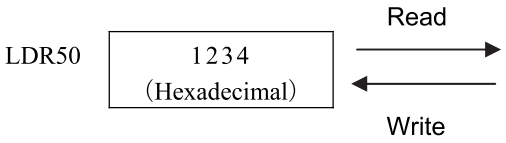
WARNING When using the BIN32, BCD8, or float32 data types, the device address data communicates with the host in 16-bits. It is therefore possible that the data update for the upper and lower words may be different.

3.2 Indirect Read and Indirect Write of Devices

- **Direct read and Direct write**

  Directly reads/writes data from/to the specified device.

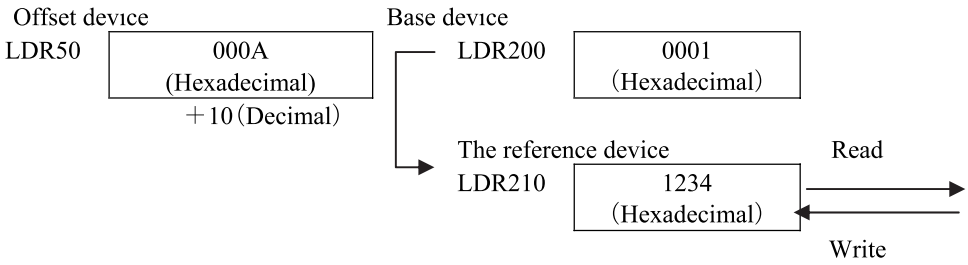
  (Example) When directly reading/writing 1234 (Hexadecimal) from/to device LDR50



- **Indirect read and Indirect write**

  Reads/writes data from/to the address obtained by adding the Offset device value to the specified Base device address.

  (Example) When the Base device is LDR200, and Offset device is LDR50



- **Parts that support Indirect read and Indirect write**

	Indirect read	Indirect write
Word Button	Supported	Supported
Numerical Input	Supported	Supported
Character Input	Supported	Supported
Numerical Display	Supported	Not supported
Word Write Command	Supported	Supported
Script Command	Supported	Supported

WARNING

- The maximum offset value is 32767.
- When using the Script Command, make sure that the value stored in the Offset device corresponds to the data type. When using other parts shown above, store a value in the Offset device with the BIN16+ data type.

  Example) When setting an indirect value of “10” with BCD4 data type
  Parts other than Script Command: “10” in the BIN16 value
  Script Command: “10” in the BCD value (Equivalent of “16” in BIN)

- **Indirect read operation flow of the host device**

  The indirect read of the host device begins with decision of the destination device after having changed the offset value or after switching screens. For this reason, it takes a time to finish reading indirectly.

  The following flowchart describes the operation, when the offset values of the Base screen changes.

Operation	Status of LSM14
Screen is switched or Offset value is changed.	OFF
↓	OFF
Part objects with the setting of indirect reading detect the change of offset values. HG Special Relay LSM14 turns ON automatically. Starts the reading from the host device specified for indirect reading.	ON
↓ ↓ ↓	ON
Completes the reading from the host device specified for indirect reading. HG Special Relay LSM14 turns OFF automatically.	OFF

If you execute the transfer and the arithmetic operation before completion of the reading, the error occurs.

  The LSM14 and the LSM15 turns on while indirect reading.
  LSM14 is assigned for the Base Screen, and LSM15 is assigned for the Popup Screens.
  The LSM14 and the LSM15 turn on after 1 scan when Offset value is changed.

- **Cautions in drawing the indirect read of the host device**

  If you use the Word Write Command or the Script Command, use the following method for the indirect reading.
  1, Turn on LSM14 after the offset value is changed or after screen is changed.
  2, Execute the indirect reading after the LSM14 turns off automatically.
  (Please see the chart below.)

Example setting for base screen

Operation	Status of LSM14
Screen is switched or Offset value is changed.	OFF
Turn on LSM14 with a word write command or a screen script command.	ON
↓	ON
Part objects with the setting of indirect reading detect the change of offset values. HG Special Relay LSM14 turns ON automatically. Starts the reading from the host device specified for indirect reading.	ON
↓ ↓ ↓	ON
Completes the reading from the host device specified for indirect reading. HG Special Relay LSM14 turns OFF automatically.	OFF
Execution of the transfer and the arithmetic operation.	OFF

3.3 Trigger Condition

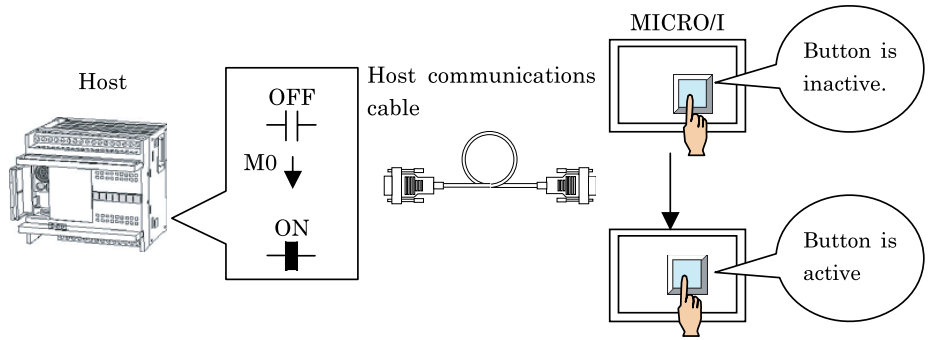
3.3.1 Trigger Condition of Button

This is the general setting for the buttons and input parts. When the trigger condition is satisfied, the button becomes active; however, pressing the button will not trigger an operation when the trigger condition is not satisfied.

The setting is configured in the Advanced mode only, and can be set up on the Trigger Condition of Button tab of the Properties sheet.

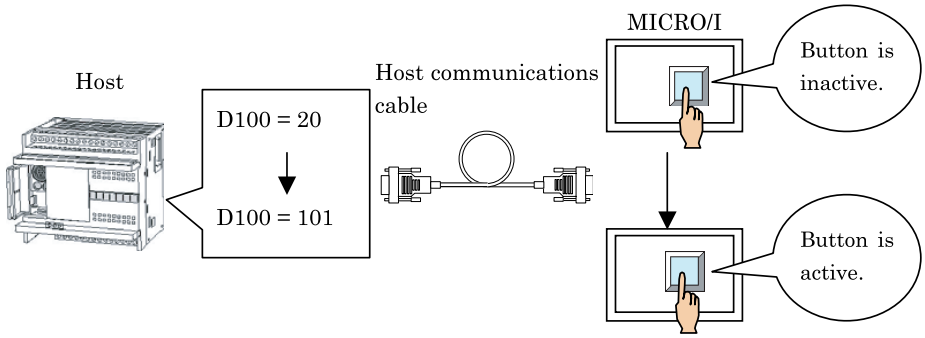
Setting	Trigger Type	While ON
	Device	M0

The button is active only while M0 is ON. Pressing the button will not activate it while M0 is OFF.



Setting	Trigger Type	While satisfying the condition
	Condition	[D 100] > 100

The button is active only while the value of D100 is greater than 100. Pressing the button will not activate it while the value of D100 is equal to or less than 100.



Item	Description
Trigger Type	Set the condition that will make the touch switch active. The default setting is “Always ON”. Always ON: This part always active. While ON: While the selected device is ON, this part is active. While OFF: While the selected device is OFF, this part is active. While satisfying the condition: While the condition is satisfied, this part is active.
Data Type	Select the data type for when “While satisfying the condition” is selected as the Trigger Condition. This cannot be set otherwise. (BIN16 (+) BIN16 (+/-) BIN32 (+) BIN32 (+/-) BCD4 BCD8 float32)
Device	Set a Bit Device. (Specify the bit in the Bit or Word device) when either ON or OFF is selected.
Condition	Set the condition formula (when “While satisfying the condition” is selected) (refer to “3.3.4 Condition Settings” (P.135) in this chapter for details.)
Comment	Enter a comment for the Trigger Condition. Up to 80 characters can be entered.

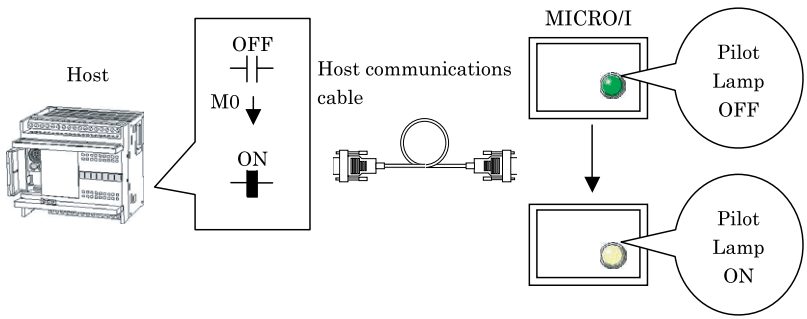
3.3.2 Trigger Conditions (Pilot Lamp, Timer, Numerical Display, Message Display, Picture Display, Line Chart, Bar Chart, Calendar)

These are the general settings for the Pilot Lamp, Timer, Numerical Display, Message Display, Picture Display, Line Chart, and Bar Chart. While the trigger conditions are satisfied, the Pilot Lamp turns on, or the Timer performs timekeeping. The setting can be configured from the Trigger Condition tab of the Properties sheet.

Parts	While satisfying trigger conditions	While not satisfying trigger conditions
Pilot Lamp	Pilot lamp turns on.	Pilot lamp is turned off.
Timer	Timekeeping	Timekeeping is reset.
Numerical Display	Display is updated.	Numerical value is not displayed/not updated.
Message Display	Display is updated.	Display is cleared.
Picture Display	Display is updated.	Picture is not displayed/not updated..
Line Chart	Display is updated.	Display is cleared.
Bar Chart	Display is updated.	Graph is not displayed/not updated.
Calendar	Display is updated.	Display is cleared.

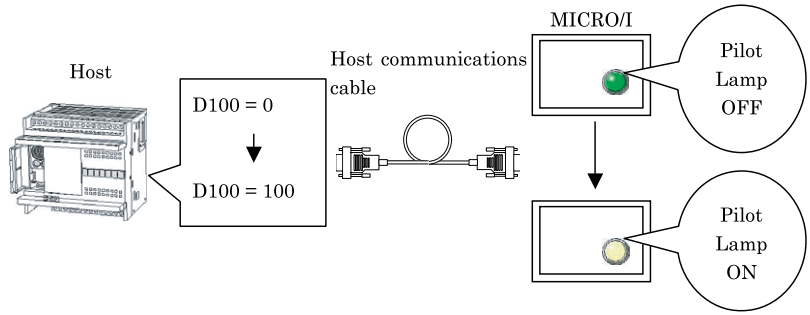
Setting	Trigger Type	While ON
	Device	M0

The Pilot Lamp turns on only while M0 is turned ON. The Pilot Lamp is turned off when M0 is turned OFF.



Setting	Trigger Type	While satisfying the condition
	Condition	[D 100] == 100

The Pilot Lamp turns on only while the value of D100 is equal to 100. The Pilot Lamp is turned off while the value of D100 is not equal to 100.



Item	Description
Trigger Type	Set the condition to trigger the lamp and the timer. Always ON: Continuously updates the display of the Numerical Display and Line Chart. While ON: While the selected device is ON, this part works. While OFF: While the selected device is OFF, this part works. While satisfying the condition: While the condition is satisfied, this part works.
Data Type	When the “While satisfying the condition” is selected in the Trigger Type, select the data type. (BIN16 (+) BIN16 (+/-) BIN32 (+) BIN32 (+/-) BCD4 BCD8 float32)
Device	Set a bit device. when “While ON” or “While OFF” is selected.
Condition	Set the condition formula. When “While satisfying the condition” is selected. (refer to “3.3.4 Condition Settings” (P.135) in this chapter)
While not satisfying the condition	Can be set for Picture Display*1, Numerical Display or Bar Chart. Select the behavior of the part when the trigger condition is not satisfied. Picture Display:*1 “Not display Picture” or “Not update Picture” Numerical Display: “Not display Numerical data” or “Not update Numerical data” Bar Chart: “Not display Graph data” or “Not update Graph data”
Comment	Enter a comment for the Trigger Condition. Up to 80 characters can be entered.

*1. Supports HG3G series only.

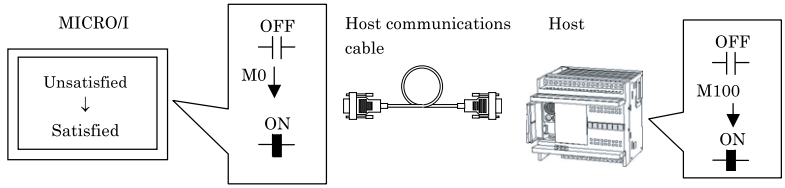
3.3.3 Trigger Condition (Command)

This is the general setting for Command parts. The Command part is executed when the trigger condition is satisfied or being satisfied.

The setting can be configured from the Trigger Condition tab of the Properties sheet.

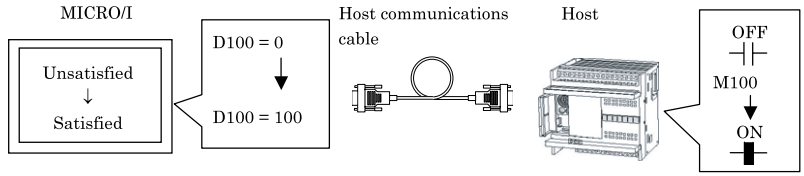
Setting	Part	Bit Write Command
	Trigger Type	Rising-edge
	Device	M0

The Bit write command is executed when M0 is changed from OFF to ON.



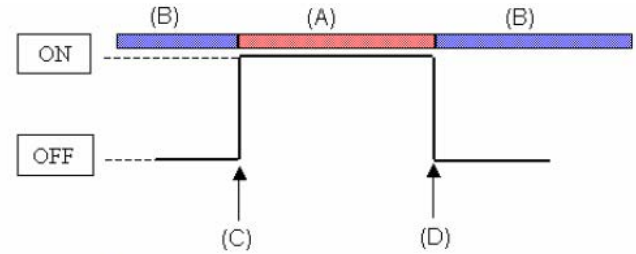
Setting	Part	Bit Write Command
	Trigger Type	Satisfy the condition
	Device	[D 100] == 100

The Bit write command is executed when the value of D100 becomes “100”.

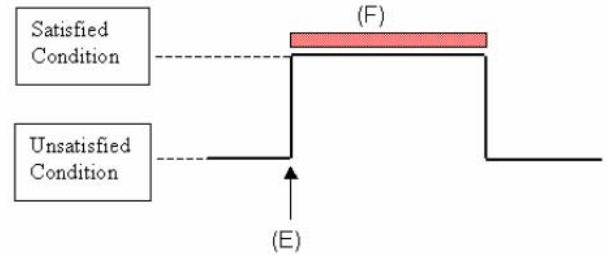


Item	Description
Trigger Type	Set the condition to execute. Rising-edge: The part executes when the trigger device goes from 0 to 1. Falling-edge: The part executes when the trigger device goes from 1 to 0. Satisfying the condition: The part only executes when the specified condition toggles to the established state. While satisfying the condition: The part executes while the specified condition is satisfied. Fixed Period: The part executes each time the set period elapses. This option is available with Scripts only.
Data Type	Select the data type for the case that either “Satisfying the condition” or “While satisfying the condition” is selected. This cannot be specified for the other trigger conditions. (BIN16 (+) BIN16 (+/-) BIN32 (+) BIN32 (+/-) BCD4 BCD8 float32)
Device	Set the bit device. When “Rising-edge” or “Falling-edge” is selected.
Condition	Set the condition formula. It is used whether “Satisfying the condition” or “While satisfying the condition” is selected.
Period	Set the period in one second units. (1 to 3600) This option is available with Scripts only. When “Fix Period” is selected.
Comment	Enter a comment for the Trigger Condition. Up to 80 characters can be entered.

Satisfy Condition



(A) While ON
(B) While OFF
(C) Rising Edge
(D) Falling Edge



(E) Satisfy the Condition
(F) While Satisfying the Condition

3.3.4 Condition Settings

You can combine multiple items of data and math operators to specify the formula as a trigger condition. The format for the condition formula is as follows:

Data 1 (Comparison operator) Data 2 (Arithmetic operator) Data 3

· Arithmetic operator, Comparison operator or Bit operations is placed any position.
· There is no limitation on the number of data and operators; however, it is limited to the maximum 120 characters per line.
· It is possible to append an invert data symbol (~) before the data items.
· It is possible to use parenthetic descriptions.
· The priority of operators is as same as in the script.

Example:

```
[M 0] == [M 1]
```

If M0 and M1 are equal, then the condition is satisfied.

```
[M 0] == [M 1] & [M 2]
```

If the result of M1 AND M2 is equal to M0, then the condition is satisfied.

```
[M 0] == ~[M 1]
```

If the result a bit invert of M1 is equal to M0, then the condition is satisfied.

```
1 == ([M 0] & [M 1]) | [M 2]
```

If the result of M0 AND M1 OR with M2 is equal to 1, then the condition is satisfied

```
1234 == [D 0]
```

If the value of D0 is equal to 1234, then the condition is satisfied.

```
100 <= [D 0] + [D 1] + [D 2] + [D 3] + [D 4]
```

If the sum of the values of D0 to D4 is equal to or greater than 100, then the condition is satisfied.

```
0 != [D 0] % 10
```

If D100 is greater than 2 and less than 10, then the condition is satisfied.

Other description examples:

[M 0] == ~[M 1] & ~[M 2] & [M 3] & [M 4]

[LM 10] & [LM 11] == ([LM 12] & [LM 13]) | ([LM 14] & [LM 15])

[D 10] + [D 11] == [D 12] + [D 13]

[D 10] == [D 11] + [D 12] + [D 13] * 2 + [D 14]

Item	Description	
Data	Specify the type and value of each data.	
	Value:	Use a constant as the data. The value depends on the selected data type.
	Device:	Use the content of the selected device as the data. Make sure to put the device address in brackets.
Comparison operator	Select comparison operator	
	==	Equal to
	!=	Not equal to
	>=	Greater than or equal to
	<=	Less than or equal to
	>	Greater than
	<	Less than
Arithmetic operator	Select arithmetic operator	
	+	Plus
	-	Minus
	*	Multiply
	/	Divide
	%	Remainder
Bit operator	Select bit operator.	
	&	Logical AND
	|	Logical OR
	^	Exclusive OR
	~	If you add the invert bit symbol (~) before a device, the bits in the number are inverted. In the case of a bit device, “0” becomes “1” and “1” becomes “0”. In the case of a word device and value, “0” becomes “65535” and “65535” becomes “0”.
	<<	Shift left
	>>	Shift right

- Do not use Bit and Word devices together for the data.
- Specify the arithmetic operator from among “&” (logical AND), “|” (logical OR) and “^” (exclusive OR) while selecting bit devices from among the data.

3.4 View

These are the general settings for Button and Pilot Lamp. The settings can be configured from the View tab of the Properties sheet. The View settings are disabled when “No Image” is selected for the “View Switching Method” of the Button.

Item		Description
Image Type		Select a type for the image. Standard: Use one of the standard images provided with WindO/I-NV2. Picture: Select an image that has been registered using the Picture Manager. For picture file restrictions,refer to Chapter 5 “2.3 Media File Formats” on page 91.
OFF	Fg. Color/ Bg. Color	Opens the Color Palette for setting the OFF-state foreground color/ background color. (Select a color from 256 colors for color display or 16 colors for monochrome display.) “Enabled only when “Standard” is selected for the “Image Type” option.
	Pattern	Opens the Pattern Palette for setting the OFF-state image pattern. (10 patterns) Enabled only when “Standard” is selected for the “Image Type” option.
ON	Fg. Color/ Bg. Color	Opens the Color Palette for setting the ON-state foreground color/ background color. (Select a color from 256 colors for color display or 16 colors for monochrome display.) Enabled only when “Standard” is selected for the “Image Type” option.
	Pattern	Opens the Pattern Palette for setting the ON-state image pattern. (10 patterns) Enabled only when “Standard” is selected for the “Image Type” option.
	Blink	When Blink is selected, the OFF and ON images is displayed alternatively. Can be set for Button only.
Coordinates		Enter the coordinates of the display position. X: The X coordinate of the left upper point is displayed. Y: The Y coordinate of the left upper point is displayed.
Size		Enter the number of the size. W: The width of this part is displayed. H: The height of this part is displayed.

3.5 Registration Text

These are the general settings for Button and Pilot Lamp. The settings can be configured from the Registration Text tab of the Properties sheet. The Registration Text settings are disabled when “No Image” is selected for the “View Switching Method” of the Button.

Item		Description
Font		Select the display font for the text. (refer to Chapter 37 “3 Character Code Table” on page 575.) (Japanese, European, Chinese, Taiwanese, Korean, Central European, Baltic, Cyrillic, Windows, European Stroke)
Style		Select the style for the registration text display font. (Regular or Bold) Cannot be selected when using the Windows font. This setting is available when “Japanese”, “European”, “Central European”, “Baltic” or “Cyrillic” is selected under “Font”.
Magnification		Select the vertical and horizontal magnification for the text. (0.5, 1, 2, 3, 4, or 8) Cannot be selected when using the Windows font. This setting is available when “Japanese”, “European”, “Central European”, “Baltic” or “Cyrillic” is selected under “Font”.
Size		Specifies the size of the text. (8 to 128) This setting is available when “European Stroke” is selected under the “Font”.
Align Text	Horizontal	Select the horizontal alignment. (Left, Center-left, Center or Right)
	Vertical	Select the vertical alignment. (Top, Center, Center-top or Bottom)
Set by State		Select this checkbox if you want to switch the text when the part is toggled between ON/OFF.
Use Text Manager		Select whether or not to use the registered text with the Text Manager. Use this setting when switching the Text Group.
OFF	Text	Input the text to be displayed on the button. (3750 characters) Refer to Help for details
	Color	Sets the text display color for the OFF state. (Select from 256 colors for color display, 16 colors for monochrome display, or TMC (character color on Text Manager).)
	Text ID	When the [Use Text Manager] is selected, specify the ID number of the text registered with the Text Manager. (1 to 32000)
ON	Text	Input the text to be displayed on the button. (3750 characters) Refer to Help for details
	Color	Sets the text display color for the ON state. (Select from 256 colors for color display, 16 colors for monochrome display, or TMC (character color on Text Manager).)
	Text ID	When the [Use Text Manager] is selected, specify the ID number of the text registered with the Text Manager. (1 to 32000)

3.5.1 Text Alignment (Horizontal Writing)

Use text alignment to change the display position of the text.

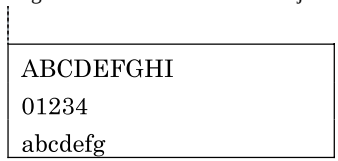
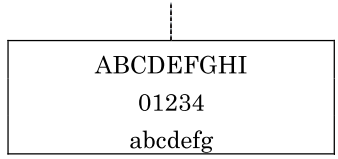
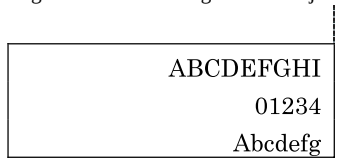
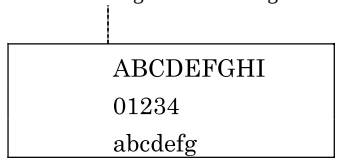
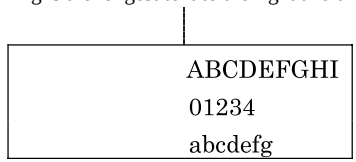
Text alignment display images

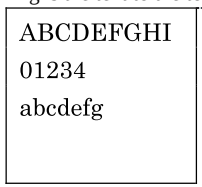
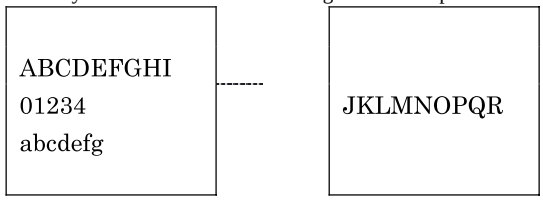
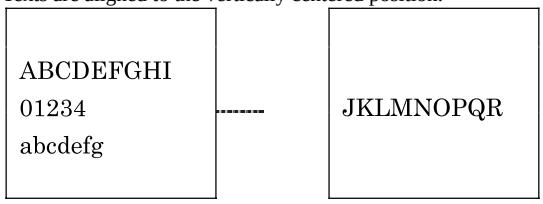
	Left	Center	Right
Top	ABCDEFGHI 01234 abcdefg	ABCDEFGHI 01234 abcdefg	ABCDEFGHI 01234 abcdefg
Center	ABCDEFGHI 01234 abcdefg	ABCDEFGHI 01234 abcdefg	ABCDEFGHI 01234 abcdefg
Bottom	ABCDEFGHI 01234 abcdefg	ABCDEFGHI 01234 abcdefg	ABCDEFGHI 01234 abcdefg

Text alignment display images (for version 2.40 and below)

	Left	Center-left	Right-left
Top	ABCDEFGHI 01234 abcdefg		
Center -top	ABCDEFGHI 01234 abcdefg	ABCDEFGHI 01234 abcdefg	ABCDEFGHI 01234 abcdefg

When the Windows Font is selected on the Text Manager, all text displays are aligned to Center-left/Right-left even when selecting Center/Right.

Item	Sub-item	Description
Horizontal	Left	Aligns the text to the left of the object. 
	Center	Aligns the text to the center of the object. 
	Right	Aligns the text to the right of the object. 
	Center-left	Centers the longest text and aligns other text to the left of it. 
	Right-left	Aligns the longest text to the right and aligns other text to the right of it. 

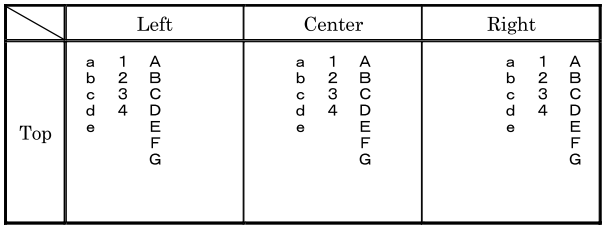
Item	Sub-item	Description
Vertical	Top	Aligns the text to the top of the object. 
	Center-top	Button, Pilot Lamp: The text is vertically centered at OFF condition. At ON condition, the text is aligned to the top line of the vertically centered text (OFF). **OFF** **ON**  Message Display: Text is vertically centered.·Message Switching Display: Of several texts on switching pages, the text with maximum number of lines are vertically centered. Other texts are aligned to the top line of the vertically centered text. 
	Center	Texts are aligned to the vertically centered position. 
	Bottom	Aligns the text to the bottom of the object. 

WARNING When selecting the “Use Text Manager” option, you cannot select the Center-left/Right-left and Center/Right.

3.5.2 Text Alignment (Vertical Writing)

Change the Text Alignment setting to change the display position of characters.

Text alignment display image



Item	Sub-item	Description
Horizontal	Left	Aligns the text string (entire line) to the left edge of the object. Aligns the text to the left. Aligns the text to the left. A0 a B1 b C2 c D d e
	Center	Aligns the text string (entire line) to the center of the object. Aligns the text to the | Center line A0 a B1 b C2 c D d e
	Right	Aligns the text string (entire line) to the right edge of the object. Aligns the text to the right. Aligns the text to the right. A0 a B1 b C2 c D d e
Vertical	Top	Aligns the text string to the upper edge of the object. A0 a B1 b C2 c D d e Aligns the text to top.

- When using Windows font while selecting the “Use Text Manager” option, the Vertical/Horizontal Writing setting for text is automatically set to the Windows font setting registered in the Text Manager.
- "Vertical Writing" is not available when "European stroke" is selected as "Font".
- When Vertical Writing is selected the Vertical Text Alignment is fixed to “Top”.
- When selecting Japanese/ Chinese/ Taiwanese/ Korean font while the Vertical Writing option is selected, the text with single-byte characters is aligned to the left edge of the line.
  (Example)

- When Vertical Writing is selected, a dash is displayed in Horizontal writing. A single-byte voiced sound/semi voiced sound symbol is displayed as the next character.
  (Example)

3.5.3 Windows Font

The Windows font can be used by the following two procedures.

Procedure	Applicable parts
Use the registered text that is used the Windows font in the Text Manager.	Bit Button, Word Button, Goto Screen Button, Print Button, Key Button, Keypad, Selector Switch, Pilot Lamp, Multi-State Lamp, Message Display, Message Switching Display, Alarm List Display, Alarm Log Display, Bar Chart, Line Chart
Select the Windows font in the Font setting on the Properties sheet.	Bit Button, Word Button, Goto Screen Button, Print Button, Key Button, Keypad, Pilot Lamp, Multi-State Lamp

To use the registered text that is used the Windows font in the Text Manager, select the Use Text Manager on the Graphics/Parts Objects, and then specify the Text ID of the target text.

There is the following information about the Windows font display function that you should know about.

Item		Limitations on Windows font registered to the Text Manager
Parts Property	Style	Style setting is ineffective.
	Magnification	Magnification setting is ineffective (only 1 x 1 display is available). However, if the Alarm List Display, Message Display, or Message Switching Display provides scroll display, the display area depends on the magnification settings of the part properties even if a Windows font is used.
	Align Text	Multiple lines with center/right alignment are displayed with center-left/right-left alignment.
	Vertical Writing	The Vertical Writing setting is disabled. Even when the Vertical Writing option is selected, the text is displayed according to the image of Horizontal Writing registered in the Text Manager.
Message Display131		When the Use Text Manager is selected and you select the registered text that is used the Windows font in the Text Manager, the read device data code; “\@” cannot be handled. The character string “\@” is displayed as it is.

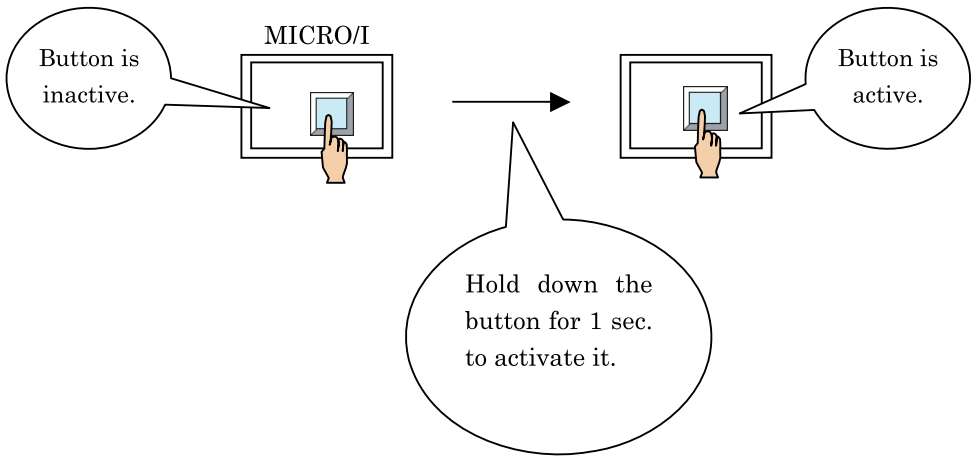
Item	Limitations on Windows font registered to the Text Manager
Alarm Log Display	- Multiple line titles and messages become multiple line text displays. - The line feed width does not change automatically in accordance with the text size. Please adjust the line height.
Alarm List Display	- Multiple line messages become multiple line text displays. - The line feed width does not change automatically in accordance with the text size. Please adjust the line height.
Bar Graph Line Chart	Multiple line label text becomes multiple line text displays.
Alarm Log Printing	Even if the message is in Windows font, it is printed as a normal text image (not as a Windows font image).
Numerical Display Numerical Input	When selecting a Windows font that is larger than the number of digits in the Unit, the data display will exceed the range of a part.

3.6 Option

3.6.1 ON delay

This is the general setting for Button. When “ON delay” is selected on the Options tab of the Properties sheet, the button is activated after the touch switch is held down for a predetermined time. It is useful for preventing false operations. This function can be set up only when the Advanced mode is selected, and configured on the Options tab of Properties sheet.

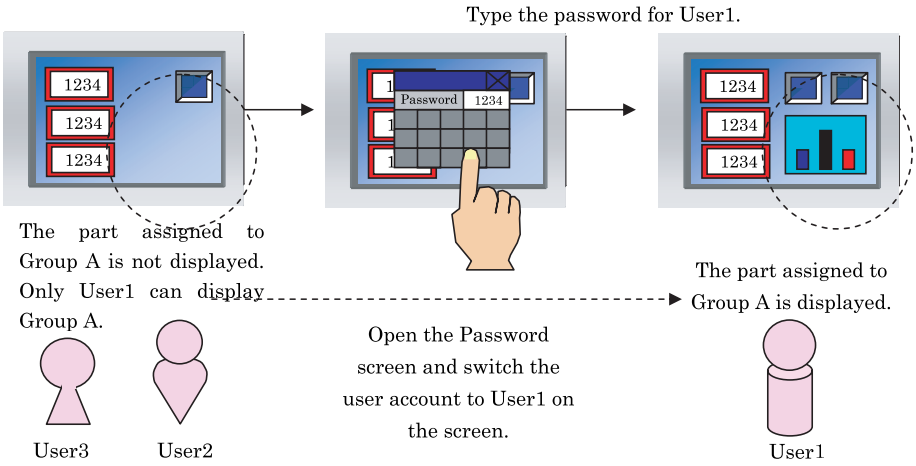
Setting	ON delay	Selected
	Time	1 second



Item	Description
ON delay	Select the box when using the ON delay function.
Time (100 msec.)	Specify the duration for which the button should be held pressed down before it becomes active. Enter the value in 10 msec. units.

3.6.2 Security Group

Specify a Security Group for each part. You can restrict users from displaying or operating parts by specifying Security Groups that can be used by specific users. For Display parts, specify one display Security Group. For a switch and data input part, set up a Security Group each for displaying and inputting data. The operation can be controlled by the Security Group for data input, realizing a function similar to the Trigger Condition of Button.



Procedure	Applicable parts
Security Group	Specify a Security Group for parts for which display or operation must be restricted. The default setting is “None”. None — The security function is not used. Administrator, Operator, Reader — These Security Groups are available by default. Other than above, users can create their own Security Groups. For details of the Security Group, refer to Chapter 23 “7 Security Groups” on page 420.

For details of the Security Group, refer to Chapter 23 “Security Function” on page 407.

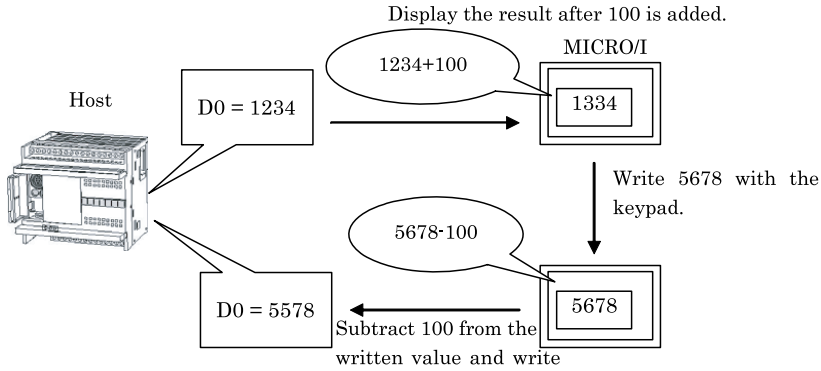
3.6.3 No Touch Sound

This setting is common to Button, Selector Switch, Potentiometer, Numerical Input, and Character Input. You can disable the touch sound of the selected switch even when [Touch sound] in [Project Settings] - [System] is enabled. This setting is configured in Advanced mode only, and can be set up on the Options tab of the Properties sheet.

3.6.4 Arithmetic Operation

This setting is common to Numerical Display and Numerical Input. When displaying a numerical value, you can calculate the value of the selected device and display the result. With Numerical Input, you can calculate the value entered with the keypad and write the result into the selected device. This setting is configured in Advanced mode only, and can be set up on the “Option” tab of the Properties sheet.

Setting	Parts	Numerical Input
	Destination Device	D0
	Display with Arithmetic operation	@ + 100
	Input with Arithmetic operation	@ - 100



Procedure	Applicable parts
Display with Arithmetic operation	Set the condition formula. The device value is calculated with the written condition formula and the result is displayed. (refer to “3.3.4 Condition Settings” (P.135) in this chapter.)
Input with Arithmetic operation	Set the condition formula. The value entered with the keypad is calculated and the result is written to the device. (refer to “3.3.4 Condition Settings” (P.135) in this chapter.)

3.6.5 Condition settings

The condition formula can be set on the “Operation” tab of Numerical Display or Numerical Input. You can combine multiple items of data and operators to specify the formula as a trigger condition. The format for the condition formula is as follows:

@ (Arithmetic operator) Data 1 (Arithmetic operator) Data 2

· Only arithmetic operators can be used, and they can be placed in any position.
· There is no limitation on the number of data and operators; however, it is limited to the maximum 120 characters per line.
· It is possible to use parenthetic descriptions.
· The priority of operators is the same as in the script. (refer to Chapter 21 “Scripts” on page 359.)
· “@” represents the device specified on the General tab to be used for calculation.
· Only one @ must be included in the condition formula. It can be placed in any position.

Example:

@ + 1

Display with Arithmetic operation: Adds 1 to the device value and displays the result.
Input with Arithmetic operation: Adds 1 to the value entered with the keypad and writes the result to the device.

[LDR 0] + @ + 100

Display with Arithmetic operation: Displays the sum of the value of LDR0, device value, and 100.
Input with Arithmetic operation: Writes the sum of the value of LDR0, device value, and 100 into the device.

@ & 3

Display with Arithmetic operation: Displays the AND result of the device value and 3.
Input with Arithmetic operation: Writes the AND result of the value entered with the keypad and 3 into the device.

Procedure	Applicable parts
@	When “Display with Arithmetic operation” is selected, the read value of the device. When “Input with Arithmetic operation” is selected, the value entered with the keypad. Only one @ must be included in the condition formula. It can be placed in any position.
Data	Specify the type and value of each data. Value — Use a constant as the data. The value depends on the selected data type. Device — Use the content of the selected device as the data. Only word devices can be used. Make sure to put the device address in brackets.
Arithmetic operator	Select an arithmetic operator. + Plus - Minus * Multiply / Divide % Reminder
Bit operator	Select an bit operator. & Logical AND | Logical OR ^ Exclusive OR << Shift left >> Shift right

4 Limitations on numbers of parts

Limitations on numbers of parts

- Parts and commands per screen

Base screen	960 max.
Popup screen	480 max.

- Number of parts that can be set per screen with the HG1F/2F/2S/3F/3F

  This is the maximum number of parts that can be set on a single screen displayed with the MICRO/I model.

  A single screen of the MICRO/I model includes the Base Screens being overlaid and the Popup Screens being opened.

Alarm List or Alarm Log Display parts	1
Either a Numerical Input (Always Entry Mode) or a Character Input (Always Entry Mode).	1
Potentiometer	32 max.
Numerical Input	255 max.
Character Input	255 max.

When you set Numerical Input or Character Input parts to Always Entry mode, you should not set other Numerical Input or Character Input parts to Always Entry mode per screen.

- Host Devices Settings per Script

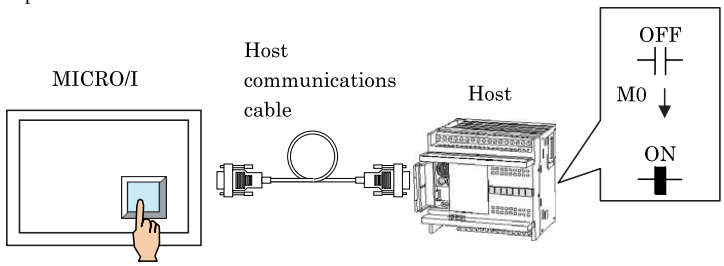
Read Device (Host)	64
Write Device (Host)	64

Chapter 9 Buttons

1 Bit Button

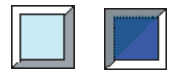
The Bit button part writes to a specified bit device.

The Action Mode can be selected from Set/ Reset/ Momentary/ Alternate/ Toggle/ Move to specify the actions. In addition, the displayed image can be switched according to the state of the specified bit independently from the touch operation, which realizes the behavior of illuminated push button.



1.1 Operation Example

Setting	Action Mode	Set/ Reset/ Momentary/ Alternate/ Toggle
	View Switching Method	Button
	Trigger Type	Always ON



Operation		Initial image	Press	Release	Press	Release
View	Set Reset Momentary Toggle					
	Alternate					
Destination Device	Set	-	ON	-	ON	-
	Reset	-	OFF	-	OFF	-
	Momentary	-	ON	OFF	ON	OFF
	Alternate	-	ON	-	OFF	-
	Toggle	-	Toggle	-	Toggle	-

- In the case of Momentary operation, if the screen switches when the button is being pressed, a “0” is written to the destination device.
- The destination device is only written to when the state of the button changes.

When Toggle is selected, setting the same device as the Destination Device to the “Device” of the View Switching Method allows you to toggle the state while monitoring the status of the device.

1.2 Bit Button Settings

1.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Buttons] - [Bit Button] from the WindO/I-NV2 menu.

Item		Description
Part Name		Set the part name. (20 characters)
Action Mode		Select an operation mode from among the following choices. Set: Writes a “1” to the destination device when pressed. Reset: Writes a “0” to the destination device when pressed. Momentary: Writes a “1” to the destination device when pressed, and writes a “0” when released. Alternate: Alternately writes a “1” or “0” to the destination device each time it is pressed. Toggle: Invert the value of the destination device each time it is pressed. Move: Copy the value of the source device to the destination device when it is pressed.
Destination Device		Select the bit device to write to.
Write*1		Specify the number of times to repeat writing (1 to 64). This setting is available only when the Action Mode is Set or Reset. The same value is written into continuous bit devices (Example: M0, M1, M2, and so on). When the bit position of a word device is specified, the same value is written into continuous word devices (Example: D0-15, D1-15, D2-15, and so on).
Source device	Device	Can be set only when “Move” is selected for the Action Mode. Specify the source bit device.
	Transfer	Can be set only when “Move” is selected for the Action Mode. Specify the number of bits to be transferred (1 to 64).
View Switching Method*1		Select the method to use for switching the view. Button: Switches between the ON and OFF image displays when the button is pressed. Device: The OFF image is displayed when the content of the reference device is “0”, and the ON image is displayed when it is “1”. No Image: No image is displayed.

*1. Only available in the Advanced mode.

1.2.2 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Buttons] - [Bit Button] from the WindO/I-NV2 menu. It is not possible to select the View tab if you have selected No Image as the View Switching Method. Refer to Chapter 8 “3.4 View” on page 137 for the setting parameters.

1.2.3 Registration Text

These settings associate with the registration text which can be set on the Registration Text tab by selecting [Home] - [Parts] - [Buttons] - [Bit Button] from the WindO/I-NV2 menu. If you select No Image as the view switching method in the General tab sheet, it is not possible to set text. Refer to Chapter 8 “3.5 Registration Text” on page 138 for the setting parameters.

1.2.4 Trigger Condition of Button

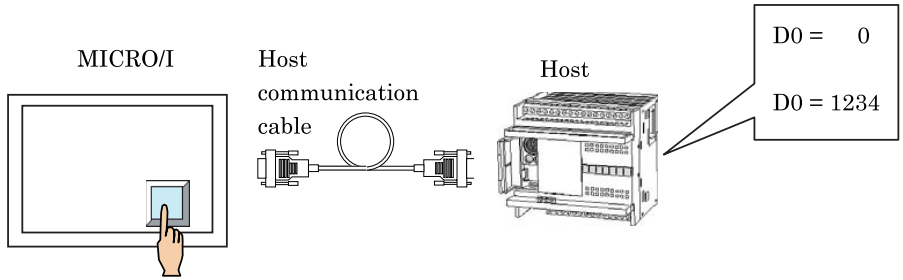
These settings associate with the trigger conditions which can be set on the Trigger Condition of Button tab by selecting [Home] - [Parts] - [Buttons] - [Bit Button] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.3.1 Trigger Condition of Button” on page 131 for the setting parameters.

1.2.5 Option

These settings associate with the ON delay of Buttons, disabling the touch sound, and the Security Group, which can be set on the Options tab by selecting [Home] - [Parts] - [Buttons] - [Bit Button] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.6 Option” on page 144for the setting parameters.

2 Word Button

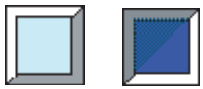
The Word Button performs arithmetic, logical operations and writes it to a destination device. For example, by selecting the Move in the Action Mode, this will allow to you copy the data stored in the specified device to another device in units of words.



2.1 Operation Example

An operation example is given below.

Setting	Action Mode	+
	Source 1	D100
	Data	D200
	Destination Device	D300
	Trigger Type	Always ON



Operation		Initial image		Press		Release
View (Button)			→		→	
Action		-		Execute D100+D200		-
Device Data	D100	10		10		10
	D200	20		20		20
	D300	0		30		30

- In the case of Momentary operation, if the screen switches when the button is being pressed, the “OFF Data” value is written to the destination device.
- When BCD is selected in Data Type, data other than 0 to 9 contained in the arithmetic data will write “1” to the arithmetic error in System Area 2, which will display an error message. (Refer to Chapter 5 “3.3 System Area 2” on page 94, section of the “Arithmetic Error”.)

2.2 Word Button Settings

2.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Buttons] - [Word Button] from the WindO/I-NV2 menu.

Item	Description
Part Name	Set the part name. (20 characters)
Action Mode	Select an operation mode from among the following choices. These operation modes are only executed when the button is pressed. Set — Writes the data (Value) to the device. Move — Writes the data (device contents) to the destination device. Momentary — Writes the ON data to the destination device when you press the button, and writes the OFF data to the destination device when you release the button. Alternate — Writes the ON and OFF data alternately to the destination device whenever you press the button. Add — Adds the data to the contents of the source 1 and writes the result to the destination device. Sub — Subtracts the data from the contents of the source 1 and writes the result to the destination device. Multi — Multiplies the data with the contents of the source 1 and writes the result to the destination device. Div — Divides the content of the source 1 by the data and writes the result (quotient) to the destination device. Mod — Divides the content of the source 1 by the data and writes the remainder to the destination device. OR — Performs a logical OR between the data and the contents of the source 1 and writes the result to the destination device. AND — Performs a logical AND between the data and the contents of the source 1 and writes the result to the destination device. XOR — Performs a logical XOR between the data and the contents of the source 1 and writes the result to the destination device.
Data Type	Select the data type for the operation mode. The available selections depend on the action mode. BIN16 (+) — All Action mode BIN16 (+/-) — Set, Momentary, Alternate, Add, Sub, Multi, Div, Mod BIN32 (+) — All Action mode BIN32 (+/-) — Set, Momentary, Alternate, Add, Sub, Multi, Div, Mod BCD4 — Set, Momentary, Alternate, Add, Sub, Multi, Div, Mod BCD8 — Set, Momentary, Alternate, Add, Sub, Multi, Div, Mod float32 — Set, Momentary, Alternate, Add, Sub, Multi, Div, Mod
Source1	Specify the read device to be targeted by the trigger. (Word device)

Item		Description
Source Data	(Value / Device)	Select the data type for the source data. Value: Use a constant as the source data. Device: Use the content of the selected device as the source data. Also specify the OFF data when "Momentary" or "Alternate" is selected in the Action Mode. When you select the "Set", "Momentary", "Alternate", "Move" in the Action Mode, you do not select "Device". When you select the "Move" in the Action Mode, you do not select "Value".
	Hexadecimal	Select this checkbox if you input the value with the hexadecimal notation. You do not need to select if you input the value with the decimal notation.
	Use Reference Device*1	When you select the "Move" in the Action Mode, this setting is available. Select this checkbox if you change the address of the Source Data according to the value in the reference device. (refer to Chapter 8 "3.2 Indirect Read and Indirect Write of Devices" on page 129.)
	Transfer*1	When you select the "Move" in the Action Mode, this setting is available. Enter the number of words to be copied. (1 to 64)
Destination Device		Set the device for storing the result of the operation with the Action Mode.
Use Reference Device*1		When you select the "Move" in the Action Mode, this setting is available. Select this checkbox if you change the address of the Source Data according to the value in the reference device. Set the reference device. (refer to Chapter 8 "3.2 Indirect Read and Indirect Write of Devices" on page 129.
Write*1		When you select the "Set", "Momentary", "Alternate" in the Action Mode, this setting is available. Enter how may times the source data is copied. (1 to 64) For example, when the Data Type is "BIN16+" and this setting is "50", the same data will be copied to 50 continuous addresses from the selected device. The Destination Device will be the start address. When the Data Type is "BIN32+" and this setting is "50", the same data will be copied to 100 continuous addresses from the selected device. The Destination Device will be the start address. (When you select "BIN32+" with the Data Type, you use 2 words. And if this setting is "50", you will use 100 words.)
View Switching Method*1		Select the method to use for switching the view. The display images for the ON and OFF states follow the settings given below. Button: Switches between the ON and OFF image displays when the button is pressed. Device: The OFF image is displayed when the content of the reference device is "0", and the ON image is displayed when it is "1". No Image: No image is displayed.

*1. Only available in the Advanced mode.

2.2.2 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Buttons] - [Word Button] from the WindO/I-NV2 menu. It is not possible to select the View tab if you have selected No Image as the View Switching Method. Refer to Chapter 8 "3.4 View" on page 137.

2.2.3 Registration Text

These settings associate with the registration text which can be set on the Registration Text tab by selecting [Home] - [Parts] - [Buttons] - [Word Button] from the WindO/I-NV2 menu. If you select No Image as the view switching method in the General tab sheet, it is not possible to set text. Refer to Chapter 8 "3.5 Registration Text" on page 138 for the setting parameters.

2.2.4 Trigger Condition of Button

These settings associate with the trigger conditions which can be set on the Trigger Condition of Button tab by selecting [Home] - [Parts] - [Buttons] - [Word Button] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.3.1 Trigger Condition of Button” on page 131 for the setting parameters.

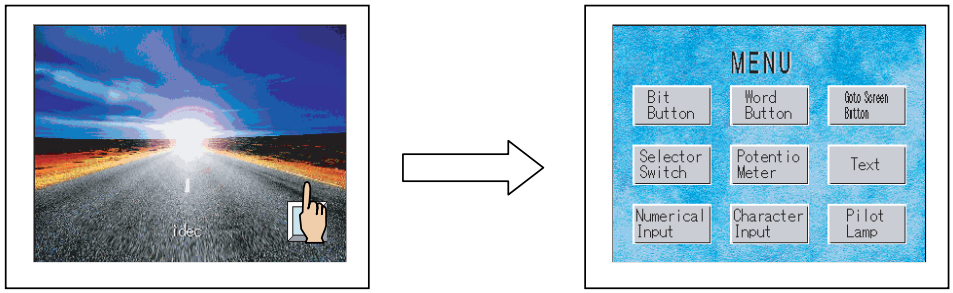
2.2.5 Option

These settings associate with the ON delay of Buttons, disabling the touch sound, and the Security Group, which can be set on the Options tab by selecting [Home] - [Parts] - [Buttons] - [Word Button] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.6 Option” on page 144 for the setting parameters.

3 Goto Screen Button

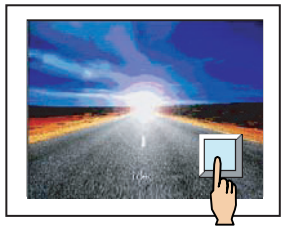
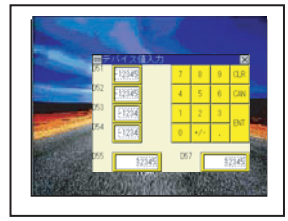
The Goto Screen Button part can be used to switch display screens and to open and close popup screens.

In addition to switching between Base Screens, it opens and closes a Popup Screen, Device Monitor Screen, Adjust contrast Screen or Password Screen. When switching Base screens, it is possible to directly specify the Screen No. or to go back to the previous screen up to 16 times. In addition, it can be configured for switching to the System Menu, which allows you to move to the System Menu easily and perform maintenance.



3.1 Operation Example

Setting	Action Mode	Open Popup Screen

Opera-tion			
Action	Press		Opens the specified Popup Screen

WARNING

- When switching the Base Screens or opening/closing a Popup Screen or Device Monitor Screen using your hand to touch the display screen, the buttons will not be activated until you take your hand off the screen even if Two-point push is enabled in the Project Settings.
- A screen switch is not executed when the popup screen is already open.

3.2 Goto Screen Button Settings

3.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Buttons] - [Goto Screen Button] from the WindO/I-NV2 menu.

Item		Description	
Part Name		Set the part name. (20 characters)	
Action Mode		Select the operation mode from among the following choices.	
		Back to previous Screen:	Switches to the previous screen when the button is pressed. (Max. 16 screens)
		Switch to Base Screen:	Switches to the specified Base Screen number when the button is pressed.
		Open Popup Screen:	Opens the specified Popup Screen when the button is pressed.
		Close Popup Screen:	Closes the specified Popup Screen when the button is pressed.
		Open Device Monitor Screen:	Opens the Device Monitor when the button is pressed.
		Close Device Monitor Screen:	Closes the Device Monitor when the button is pressed.
		Open Password Screen:	Opens the Password Screen when the button is pressed.
		Close Password Screen:	Closes the Password Screen when the button is pressed.
		Open Adjust contrast Screen:	Opens the Adjust contrast Screen when the button is pressed.
		Close Adjust contrast Screen:	Closes the Adjust contrast Screen when the button is pressed.
		Reset current screen:	Reset the current Base Screen when the button is pressed.
		Switch to System Menu Screen:	Switches to the System Menu when the button is pressed.
Goto Screen	Screen No.	Input the screen number. When Switch to Base Screen is selected for the Screen Type, input the base screen number to go to. When Open Popup Screen or Close Popup Screen is selected for the screen type, specify the popup screen number. (Base Screen: 1 to 3000, Popup Screen: 1 to 3015)	
	Use Reference Device*1	When “Open Popup Screen” or “Close Popup Screen” is selected for the Action Mode, the Screen No. and coordinates used for opening or closing the Popup Screen will be the data in the specified device at the moment the button is pressed.	
	Coordinate	X:	When Open Popup Screen or Open Device Monitor Screen is selected for the Screen Type, input the X-coordinate position (left side) for displaying the screen.
		Y:	When Open Popup Screen or Open Device Monitor Screen is selected for the Screen Type, input the Y-coordinate position (top side) for displaying the screen.
	Use Reference Device*1	Open a Popup screen with the data for the specified device as the display coordinates	

Item	Description
View Switching Method*1	Select the method to use for switching the view Button: Switches between the ON and OFF image displays when the button is pressed. Device: The OFF image is displayed when the content of the reference device is "0", and the ON image is displayed when it is "1". No Image: No image is displayed.

*1. Only available in the Advanced mode.

- With the HG2G, HG2F/2S/3F/4F and EX4R, the position coordinates X and Y for displaying the Popup Screen can be specified only in steps of 20 dots.
- When "Use Reference Device" is selected with the HG2G, HG2F/2S/3F/4F and EX4R, the coordinates are automatically adjusted to a position at a multiple of 20 dots.
- If the displayed Base Screen is reset when "Reset current screen" is set, Popup Screens and internal devices start their operation in the status in which the Base Screen is switched.

3.2.2 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Buttons] - [Goto Screen Button] from the WindO/I-NV2 menu. It is not possible to select the View tab if you have selected No Image as the View Switching Method. Refer to Chapter 8 "3.4 View" on page 137 for the setting parameters.

3.2.3 Registration Text

These settings associate with the registration text which can be set on the Registration Text tab by selecting [Home] - [Parts] - [Buttons] - [Goto Screen Button] from the WindO/I-NV2 menu. If you select No Image as the view switching method in the General tab sheet, it is not possible to set text. Refer to Chapter 8 "3.5 Registration Text" on page 138 for the setting parameters.

3.2.4 Trigger Condition of Button

These settings associate with the trigger conditions which can be set on the Trigger Condition of Button tab by selecting [Home] - [Parts] - [Buttons] - [Goto Screen Button] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 "3.3.1 Trigger Condition of Button" on page 131 for the setting parameters.

3.2.5 Option

These settings associate with the ON delay of Buttons, disabling the touch sound, and the Security Group, which can be set on the Options tab by selecting [Home] - [Parts] - [Buttons] - [Goto Screen Button] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 "3.6 Option" on page 144 for the setting parameters.

4 Print Button

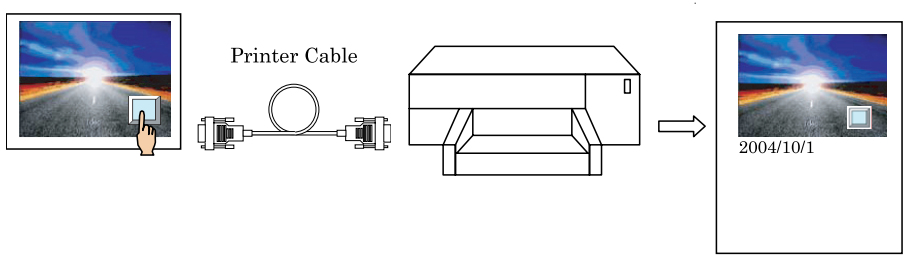
HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X	X	X	X	X	X

Only HG3G, HG1F/2F/2S/3F/4F support this function

The Print Button outputs the screen displayed on the MICRO/I to the printer or the Memory Card as a screenshot of the screen in the bitmap or the jpeg format. You can prepare a written report easily by using the screenshot data.

4.1 Operation Example

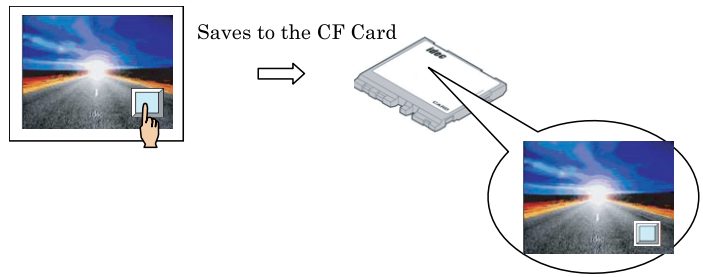
Setting	Output to	Printer
	Print time stamp	Selected



HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
			X		X	X

Only HG2F/3F/4F support this function

Setting	Output to	Memory Card



WARNING

- File names which have been saved to the Memory Card displays the following information:
  HG3G: CAP***.JPG (***: Date and time of the file are automatically assigned)
  (Example) A file created at 18:50:25 on June 30, 2010 will be named "CAP100630_185025.JPG".
  HG2F/3F/4F: CAP***.BMP (***: Serial number from 001 to 999 are automatically assigned)
- Set the maximum number of Screenshots stored in the Memory Card to LSD 65. The range is from 1 to 999, and the default value is 99.
- While a screenshot is being captured, the next screenshot cannot be captured. It may take some time to capture screenshots when using the USB AutoRun function or the File Copy function with the Key button or others.
- When you print out the screen on HG3/4F using SII DPU-414 printer, the horizontal print sizes are the only 320 pixels from the left edge of HG3/4F screen.

4.2 Print Button Settings

4.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Buttons] - [Print Button] from the WindO/I-NV2 menu.

Item	Description
Part Name	Sets the part name. (20 characters)
Print Device	Select the output device. Printer: Output to the printer connected to the operator interface. Memory Card: Output as a file to the Memory Card inserted into the MICRO/I. File formats are as follows: HG3G: JPEG file format HG2F/3F/4F: BMP file format
Action Mode	Select the operation of the Printout Button. Print Screen: Output to the printer or Memory Card. Cancel Printout: Cancel printout
Print Time stamp	Print the data and time of printing. The date and time format depends on the language selected in the System Menu.
View Switching Method*1	Select the method to use for switching the view. Button: Switches between the ON and OFF image displays when the button is pressed. Device: The OFF image is displayed when the content of the reference device is "0", and the ON image is displayed when it is "1". No Image: No image is displayed.

*1. Only available in the Advanced mode.

4.2.2 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Buttons] - [Print Button] from the WindO/I-NV2 menu. It is not possible to select the View tab if you have selected No Image as the View Switching Method. Refer to Chapter 8 "3.4 View" on page 137 for the setting parameters.

4.2.3 Registration Text

These settings associate with the registration text which can be set on the Registration Text tab by selecting [Home] - [Parts] - [Buttons] - [Print Button] from the WindO/I-NV2 menu. If you select No Image as the view switching method in the General tab sheet, it is not possible to set text. Refer to Chapter 8 "3.5 Registration Text" on page 138 for the setting parameters.

4.2.4 Trigger Condition of Button

These settings associate with the trigger conditions which can be set on the Trigger Condition of Button tab by selecting [Home] - [Parts] - [Buttons] - [Print Button] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 "3.3.1 Trigger Condition of Button" on page 131 for the setting parameters.

4.2.5 Option

These settings associate with the ON delay of Buttons, disabling the touch sound, and the Security Group, which can be set on the Options tab by selecting [Home] - [Parts] - [Buttons] - [Print Button] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 "3.6 Option" on page 144 for the setting parameters.

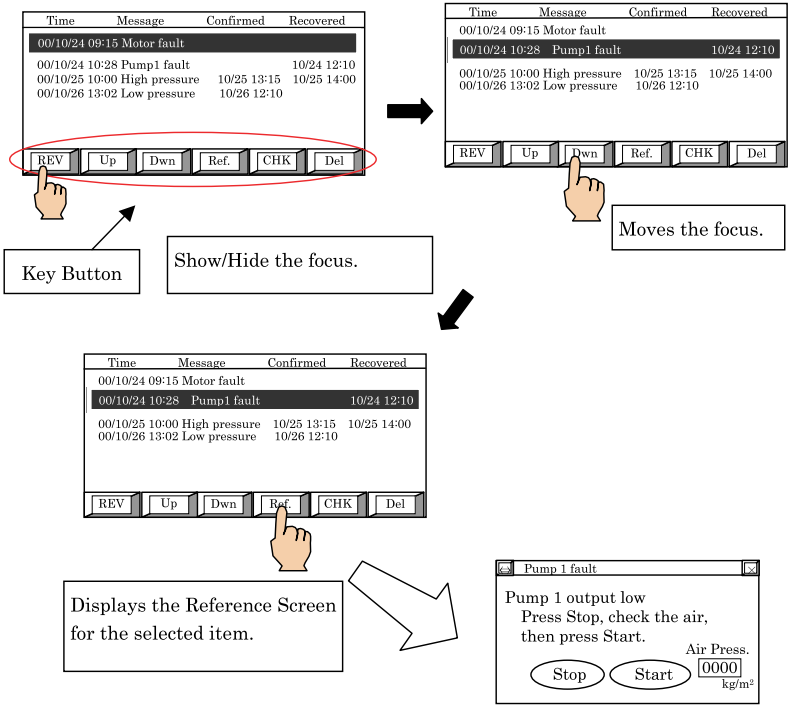
5 Key Button

Some key buttons are used in combination with other parts and some are used to transfer data.

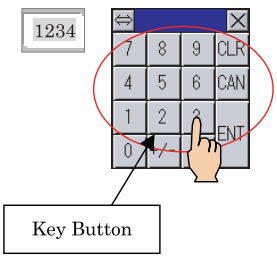
5.1 peration Example

Setting	Key Type	REVERSE, Fcs. Up, Fcs. Dwn, Ref., CHECK, Del
	Applicable part	Alarm Log Display

The following example shows Key buttons used in combination with Alarm Log Display.



Setting	Key Type	1 to 9, ENT, CAN, CLR
	Applicable part	Numerical Input



Key buttons are executed on the next scan after the button is pressed.

5.2 Key Button Settings

5.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Buttons] - [Key Button] from the WindO/I-NV2 menu.

Item	Description
Part Name	Sets the part name. (20 characters)
Key Type	Select the type of key to place on the screen. Key Language: Select the language for the Key button. (Japanese, European, Central European, Baltic, Cyrillic) Browser: Opens the Key Browser for selecting a Key button. Select the Key button with the “Key Browser”. (Key Type): Displays the name of the key selected using the Key Browser. The following settings can be set by the key selected from Key Browser. Popup Screen No.: This setting is available when the “Alt” key is selected under "Key Type". Specifies the Popup Screen number. "Alt" key can switch the Popup Screen called from the Numerical Input or the Character Input to the specified popup screen. Scroll Size: This setting is available when the “Pg. Up”, “Pg. Dwn”, “Fcs. Up” or “Fcs. Dwn” key is selected under "Key Type". Specifies the line number to scroll or move the display lines. (1 to 1023) “Pg. Up” and “Pg. Dwn” keys can scroll up or downthe displayed lines on the page. “Fcs. Up” and “Fcs. Dwn” keys can moves up or down the focus on the displayed list for the specified number of lines.

Item	Description
	Transfer Settings: This setting is available when the “Download Project” key is selected under "Key Type". Souse: Specify the full path for the ZNV file. Set the storage type and the file path. Destination Automatically set the item according to the selected item under the "Key Type". This setting is available when the “Upload Project” key is selected under "Key Type". Souse: Automatically set the item according to the selected item under the "Key Type". Destination Specify the folder path for the uploaded file. The uploaded file will be saved in the folder. Set the storage type and the folder path. This setting is available when the “Download PLC Program” key is selected under "Key Type". Souse: Specify the full path for the ZNV file. Set the storage type and the file path. Destination Specify the network number of the PLC you want to download the PLC program. This setting is available when the “Upload PLC Program” key is selected under "Key Type". Souse: Specify the network number of the PLC stored the PLC program you want to upload. Destination Specify the folder path for the uploaded file. The uploaded file will be saved in the folder. Set the storage type and the folder path. This setting is available when the “File Copy” key is selected under "Key Type". Souse: Specify the source file or source folder path for coping files. Set the storage type and the file or folder path. Destination Specify the destination folder path for coping files. Set the storage type and the folder path. More than 247 characters can not be used as a file path or folder path.
View Switching Method*1	Select the method to use for switching the view. Button: Switches between the ON and OFF image displays when the button is pressed. Device: The OFF image is displayed when the content of the reference device is “0”, and the ON image is displayed when it is “1”. No Image: No image is displayed.

*1. Only available in the Advanced mode.

- **Parts Available for Key Button**

The available buttons vary depending on the part type as bellow.

Part Name	Key	Operation
Numerical Input Keypad	0 to 9	Inputs the number from 0 to 9
	A to F	Inputs the hexadecimal number from A to F
	.	Inputs the floating point
	+/-	Toggles the sign
	CAN	Clears the numerical input and closes the popup screen
	ENT	Writes the numerical data to the destination device and shifts the focus there
	Fcs. >	Shifts the focus to the next item in accordance with the screen properties
	< Fcs.	Shifts the focus to the previous item in accordance with the screen properties
	CLR	Clears the numerical input
	Alt	Automatically closes the Popup screen that is opened from the Numerical Input, and then opens the Popup screen with the specified screen number.
Character Input	0 to 9	Inputs the numeral from 0 to 9
	A to Z	Inputs the alphabet from A to Z
	a to z	Inputs the alphabet from a to z
	!	Inputs the !
	"	Inputs the "
	#	Inputs the #
	$	Inputs the $
	%	Inputs the %
	&	Inputs the &
	‘	Inputs the ‘
	(	Inputs the (
	)	Inputs the)
	*	Inputs the *
	+	Inputs the +
	,	Inputs the ,
	-	Inputs the -
	.	Inputs the .
	/	Inputs the /
	:	Inputs the :
	;	Inputs the ;
	<	Inputs the <
	=	Inputs the =
	>	Inputs the >
	?	Inputs the ?
	@	Inputs the @
	[	Inputs the [

Part Name	Key	Operation
Character Input	\	Inputs the \
	]	Inputs the]
	^	Inputs the ^
	_	Inputs the _
	`	Inputs the `
	{	Inputs the {
	|	Inputs the |
	}	Inputs the }
	~	Inputs the ~
	CAN	Clears all input characters and closes the popup screen
	CLR	Clears all input characters
	DEL	Deletes the character at the cursor position
	BS	Deletes the character to the left of the cursor.
	ENT	Writes the ASCII code to the write destination device and shifts the focus there
	SP	Inputs the space character
	ア to ン	Inputs the Japanese Kana character from ア to ン
	ア to オ	Inputs the Japanese Kana character from ア to オ
	ャ, ュ, ョ, ッ	Inputs the Japanese Kana character of ャ, ュ, ョ and ッ
	゛	Inputs the Japanese character of ゛
	゜	Inputs the Japanese character of ゜
	ー	Inputs the Japanese character of ー
	.	Inputs the Japanese character of .
	「	Inputs the Japanese character of 「
	」	Inputs the Japanese character of 」
	、	Inputs the Japanese character of 、
	。	Inputs the Japanese character of 。
	Cur. >	Moves the cursor right
	< Cur.	Moves the cursor left
	Fcs. >	Shifts the focus to the next item in accordance with the screen properties
	< Fcs.	Shifts the focus to the previous item in accordance with the screen properties
	Alt	Automatically closes the Popup screen that is opened from the Character Input, and then opens the Popup screen with the specified screen number.
Alarm List Display	Pg. Up	Scrolls up by the number of lines specified with the Scroll Size setting. (1 to 1023)
	Pg. Dwn	Scrolls down by the number of lines specified with the Scroll Size setting. (1 to 1023)
	Fcs. Up	Shifts the focus up by the number of lines specified with the Scroll Size setting. (1 to 1023)
	Fcs. Dwn	Shifts the focus down by the number of lines specified with the Scroll Size setting. (1 to 1023)
	REVERSE	Toggle the focus between hide and show
	Ref.	Display the details screen

Part Name	Key	Operation
Alarm Log Display	Fcs. Up	Shifts the focus up by the number of lines specified with the Scroll Size setting. (1 to 1023)
	Fcs. Dwn	Shifts the focus down by the number of lines specified with the Scroll Size setting. (1 to 1023)
	REVERSE	Toggle the focus between hide and show
	CHECK	Displays the time and date that the selected data was confirmed
	All Chk.	Display the time and date that all data was confirmed
	Del.	Delete the display of the selection
	Del. All	Delete the display for all of the selected data
	Ref.	Display the details screen for the selection
	Stop Beep	Stops the beeping sound that is activated when an alarm occurs

- The characters that can be entered using the Character Input vary depending on the selected Font in the Format of the Character Input. Refer to Chapter 37 “3 Character Code Table” on page 575 for the characters that can be entered.
- Pressing the [< Cur.] and [Cur. >] buttons in the Character Input and the [Pg. Up], [Pg. Dwn], [Fcs. Up], and [Fcs. Dwn] buttons in the Alarm List Display/Alarm Log Display for one second or longer will automatically move the cursor or the focus position.

- Data Transfer function

The action of Key Buttons which have the Data Transfer function is as below.

Key	Operation
Download Project	Downloads the Project (ZNV file) to the MICRO/I from the SD Memory Card or USB flash drive inserted into the MICRO/I.
Upload Project	Uploads the Project (ZNV file) from the MICRO/I to the SD Memory Card or USB flash drive inserted into the MICRO/I.
Download PLC Program	Downloads the PLC Program (ZLD file) to the PLC from the SD Memory Card or USB flash drive inserted into the MICRO/I.
Upload PLC Program	Uploads the PLC Program (ZLD file) from the PLC to the SD Memory Card or USB flash drive inserted into the MICRO/I.
File Copy	Copies files between the SD Memory Card and USB flash drive.

Only HG3G support.

5.2.2 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Buttons] - [Key Button] from the WindO/I-NV2 menu. It is not possible to select the View tab if you have selected No Image as the View Switching Method. Refer to Chapter 8 “3.4 View” on page 137 for the setting parameters.

5.2.3 Registration Text

These settings associate with the registration text which can be set on the Registration Text tab by selecting [Home] - [Parts] - [Buttons] - [Key Button] from the WindO/I-NV2 menu. If you select No Image as the view switching method in the General tab sheet, it is not possible to set text. Refer to Chapter 8 “3.5 Registration Text” on page 138 for the setting parameters.

5.2.4 Trigger Condition of Button

These settings associate with the trigger conditions which can be set on the Trigger Condition of Button tab by selecting [Home] - [Parts] - [Buttons] - [Key Button] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.3.1 Trigger Condition of Button” on page 131 for the setting parameters.

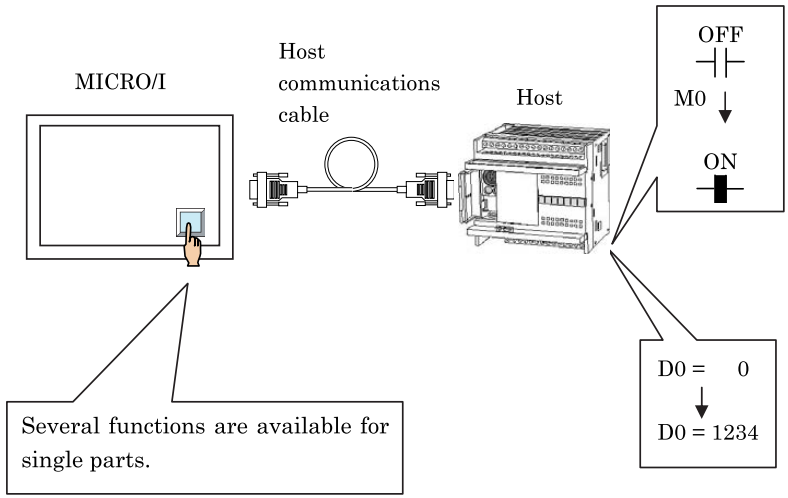
5.2.5 Option

These settings associate with the ON delay of Buttons, disabling the touch sound, and the Security Group, which can be set on the Options tab by selecting [Home] - [Parts] - [Buttons] - [Key Button] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.6 Option” on page 144 for the setting parameters.

6 Multi-Button

The Multi button parts can execute several functions at once.

Bit Write, Word Write, Goto Screen, Print, Key and Script Command are available.



- When multiple Goto Screen commands for the Switch to Base Screen are set, executes only the command at the end of the Function List . The Goto Screen command for the Switch to Base Screen is not executed in the order of the Function List; it is executed at the end of a scan for which the Multi-Button was pressed.
- If multiple Key commands are set, the 2 closest to the top of the Function List are executed and commands from the 3rd one on are not executed. If multiple Key commands which are used as Data Transfer are set, only the command closest the top of the list is executed.
- Key commands are executed on the next scan after the button is pressed.

6.1 Multi-Button Settings

6.1.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Buttons] - [Multi-Button] from the WindO/I-NV2 menu.

Item	Description
Part Name	Sets the part name. (20 characters)
Action Mode	Select an operation mode of button. Momentary: Turns ON when pressed, and turns OFF when released. Alternate: Alternately ON or OFF each time it is pressed.

Item		Description
Multi-Function	Function List	Function list is shown.
	Add	Add new function. Max 32 point can be set. Bit Write: It is same as Bit Write Button. Word Write: It is same as Word Write Button. Goto Screen: It is same as Goto Screen Button. Print: It is same as Print Button. Key: It is same as Key Button. Script: It is same as Script.
	Edit	Edit selected item.
	Delete	Delete selected item.
	Copy	Copy selected item.
	Up	Move up selected item.
	Down	Move down selected item.
View Switching Method*1		Select the method to use for switching the view. Button: Switches between the ON and OFF image displays when the button is pressed. Device: The OFF image is displayed when the content of the reference device is “0”, and the ON image is displayed when it is “1”. No Image: No image is displayed.

*1. Only available in the Advanced mode.

6.1.2 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Buttons] - [Multi-Button] from the WindO/I-NV2 menu. It is not possible to select the View tab if you have selected No Image as the View Switching Method. Refer to Chapter 8 “3.4 View” on page 137 for the setting parameters.

6.1.3 Registration Text

These settings associate with the registration text which can be set on the Registration Text tab by selecting [Home] - [Parts] - [Buttons] - [Multi-Button] from the WindO/I-NV2 menu. If you select No Image as the view switching method in the General tab sheet, it is not possible to set text. Refer to Chapter 8 “3.5 Registration Text” on page 138 for the setting parameters.

6.1.4 Trigger Condition of Button

These settings associate with the trigger conditions which can be set on the Trigger Condition of Button tab by selecting [Home] - [Parts] - [Buttons] - [Multi-Button] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.3.1 Trigger Condition of Button” on page 131 for the setting parameters.

6.1.5 Option

These settings associate with the ON delay of Buttons, disabling the touch sound, and the Security Group, which can be set on the Options tab by selecting [Home] - [Parts] - [Buttons] - [Multi-Button] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.6 Option” on page 144 for the setting parameters.

7 Keypad

The Keypad part is used for data input with the Numerical Input part and the Character Input part.

A Keypad part is constructed from a number of Key Buttons. After placement on the screen, the Keypad part is treated as a group of Key Buttons. However, even if you group a number of Key Buttons together, they are not treated as a Keypad part.

7.1 Keypad Settings

7.1.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Buttons] - [Keypad] from the WindO/I-NV2 menu.

Item		Description
Browser		Click to display the View Browser for selecting the type of keypad.
Button	Fg. Color	Opens the Color Palette for setting the foreground color for the keypad buttons. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Bg. Color	Opens the Color Palette for setting the background color for the keypad buttons. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Pattern	Opens the pattern Palette for setting the pattern for the keypad. (10 patterns)
Registration Text	Font	Select the display font for the text. (refer to Chapter 37 “3 Character Code Table” on page 575 for details.) (Japanese, European, Chinese, Taiwanese, Korean, Central European, Baltic, Cyrillic, Windows, European Stroke)
	Style	Select the style for the registration text display font. (Regular or Bold) Cannot be selected when using the Windows font. This setting is available when “Japanese”, “European”, “Central European”, “Baltic” or “Cyrillic” is selected under “Font”..
	Magnification	Select the vertical and horizontal magnification for the text. (0.5, 1, 2, 3, 4, or 8) Cannot be selected when using the Windows font. This setting is available when “Japanese”, “European”, “Central European”, “Baltic” or “Cyrillic” is selected under “Font”.
	Size	Specifies the size of the text. (8 to 128) This setting is available when “European Stroke” is selected under the “Font”.
	Text Color	Opens the Color Palette for setting the color for the text for the keypad buttons.
Coordinates		Enter the coordinates of the display position. X: The X coordinate of the left upper point is displayed. Y: The Y coordinate of the left upper point is displayed.

Item	Description
Size	Enter the number of the size. W: The width of this part is displayed. H: The height of this part is displayed.

- Properties of grouped switches

It is only possible to modify the common setting items for Key Buttons when they are grouped.

View

Item		Description
Image Type		Select a type for the image. Standard: Use one of the standard images provided with WindO/I-NV2 Picture: Select an image that has been registered using the Picture Manager.
Browser		Click to display the View Browser for selecting the type of keypad.
OFF	Fg. Color	Opens the Color Palette for setting the foreground color for the grouped key buttons. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Bg. Color	Opens the Color Palette for setting the background color for the grouped key buttons. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Pattern	Opens the Pattern Palette for setting the pattern for the grouped key buttons. (10 patterns)
ON	Fg. Color	Opens the Color Palette for setting the foreground color for the grouped key buttons. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Bg. Color	Opens the Color Palette for setting the background color for the grouped key buttons. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Pattern	Opens the Pattern Palette for setting the pattern for the grouped key buttons. (10 patterns)
	Blink	When Blink is selected, the OFF and ON images is displayed alternatively. Can be set for Button only.
Coordinates		Enter the coordinates of the display position. X: The X coordinate of the left upper point is displayed. Y: The Y coordinate of the left upper point is displayed.
Size		Enter the number of the size. W: The width of this part is displayed. H: The height of this part is displayed.

Registration Text

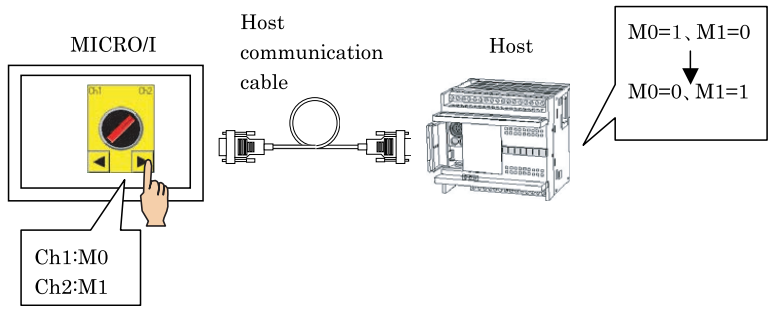
Refer to Chapter 8 “3.5 Registration Text” on page 138 for the setting parameters.

Option

Refer to Chapter 8 “3.6 Option” on page 144 for the setting parameters.

8 Selector Switch

The Selector Switch part is used to switch on one device from among a number of devices and switch the others off. The Selector Switch is capable of exclusively controlling devices with up to 3 channels.



8.1 Operation Example

Setting	Switch Type	2-Notch No-return operation.
	Default notch position	Ch1

Operation	-	Press	Release	Press	Release
Ch1 operation	-	0	-	1	-
Ch2 operation	-	1	-	0	-

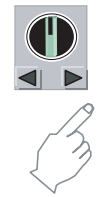
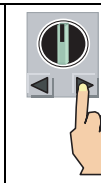
Setting	Switch Type	2-Notch right-return operation.
	Default notch position	Ch1

Operation	-	Press	Release
Ch1 operation	-	0	1
Ch2 operation	-	1	0

Setting	Switch Type	3-Notch No-return operation.
	Default notch position	Ch2

							
Operation	-	Press	Release	Press	Release	Press	Release
Ch1 operation	-	-	-	-	-	1	-
Ch2 operation	-	0	-	1	-	0	-
Ch3 operation	-	1	-	0	-	-	-

Setting	Switch Type	3-Notch right-return operation
	Default notch position	Ch2

							
Operation	-	Press	Release	Press	Release	Press	Release
Ch1 operation	-	-	-	1	-	0	-
Ch2 operation	-	0	1	0	-	1	-
Ch3 operation	-	1	0	-	-	-	-

WARNING

- When the “Ch1”, “Ch2”, “Ch3” is selected in the Default Position, Changes in the Channel value from something other than operation of a Selector Switch touch key are not reflected in the display.
- The initial positions for the right-return switches are to the left and the initial position for the left-return switches is to the right. The initial position for the 3-Notch both-return switch is the center.
- When a selector switch is first displayed (after power on etc.), the initial switch position is that of the ON channel set by the Default State setting (except for the three return-type switches whose initial position is fixed), and the ON/OFF state of each channel is written to the device at this time.
- When the “Read from Destination Device” is selected in the Default Position, changes in the Channel value are reflected in the display. The value of the Destination Device becomes the initial notch position immediately after power-on or screen switching. When the value of the Destination Device is invalid, the initial positions for the 2-Notch No-return and right-return switches are to the left and the initial position for the left-return switches is to the right. The initial position for the 3-Notch switch is the center.

8.2 Selector Switch Settings

8.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Buttons] - [Selector Switch] from the WindO/I-NV2 menu.

Item	Description
Part Name	Sets the part name. (20 characters)
Switch Type	Select the operation of the selector switch for among the following seven modes. - The 2-Notch selector switch knob has two positions (right and left). - The 3-Notch selector switch knob has three positions (right, left and center). 2-Notch No-return: The left or right touch switches move the selector switch to the left or right respectively, and it stays in the same position when the touch switch is released. 2-Notch R-return: The initial position for the switch knob is at the left, and when the right touch switch is pressed, selector switch moves to the right. It returns to the left position after the touch switch is released. 2-Notch L-return: The initial position for the switch knob is at the right, and when the left touch switch is pressed, selector switch moves to the left. It returns to the right position after the touch switch is released. 3-Notch No-return: The touch switches move the switch knob to the left or right, and it stays in the position that it was switched to (either left, right or center) when the touch switch is released. 3-Notch R-return: The touch switches move the switch knob to the left or right, and if it is switched to the right, it returns to the center position when the touch switch was released. Otherwise, it stays in the position that it was switched to. 3-Notch L-return: The touch switches move the switch knob to the left or right, and if it was switched to the left, it returns to the center position when the touch switch is released. Otherwise, it stays in the position that it was switched to. 3-Notch Both-return: The initial position for the selector knob is in the center, and the touch switches move the switch knob to the left or right. It returns to the center position when the touch switch is released.

Item		Description
Notch	Use Text Manager	Select whether or not to use the registered text with the Text Manager.
	Default Position	Select the initial notch position of the Selector Switch immediately after the screen is switched. Ch1: The default notch position is set to Ch1. Ch2: The default notch position is set to Ch2. Ch3: The default notch position is set to Ch3. Read from Destination Device: The default notch position is specified with the value of the Destination Device.
	List	Displays the No., Device, State, Text, and Text Color set for each channel. Clicking the [Set], [Insert], or [Delete] button will reflect the settings on the list. No.: Displays the output channel. The number of channels depends on the type of switch. Device: Displays the devices set as Destination Devices for each channel. “Unregistered” is displayed if the channel settings have not been made. Text: Displays the registration text for each channel. This is blank if the channel settings have not been made. Color: Displays the registration text color for each channel. The default color is displayed if the channel has not been configured. (Select from 256 colors for color display, 16 colors for monochrome display, or Text Manager Color palette).

8.2.2 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Buttons] - [Selector Switch] from the WindO/I-NV2 menu.

Item		Description
Browser		Click to display the View Browser and select display images for the part.
Knob Color		Opens the Color Palette for setting the color of the selector switch knob. (Select from 256 colors for color display or 16 colors for monochrome display.)
Flange	Fg. Color	Opens the Color Palette for setting the foreground color of the flange. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Bg. Color	Opens the Color Palette for setting the background color of the flange. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Pattern	Opens the Pattern Palette for setting the pattern of the flange. (10 patterns)
Switch	Fg. Color	Opens the Color Palette for setting the foreground color of the switch. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Bg. Color	Opens the Color Palette for setting the background color of the switch. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Pattern	Opens the Pattern Palette for setting the pattern of the switch. (10 patterns)
Coordinates		Enter the coordinates of the display position. X: The X coordinate of the left upper point is displayed. Y: The Y coordinate of the left upper point is displayed.
Size		Enter the number of the size. W: The width of this part is displayed. H: The height of this part is displayed.

8.2.3 Format

These settings associate with the format of the registration text which can be set on the Format tab by selecting [Home] - [Parts] - [Buttons] - [Selector Switch] from the WindO/I-NV2 menu.

Item	Description
Font	Select the display font for the text. (refer to Chapter 37 “3 Character Code Table” on page 575 for details.) (Japanese, European, Chinese, Taiwanese, Korean, Central European, Baltic, Cyrillic, European Stroke)
Style	Select the style for the registration text display font. (Regular or Bold) Cannot be selected when using the Windows font. This setting is available when “Japanese”, “European”, “Central European”, “Baltic” or “Cyrillic” is selected under “Font”.
Magnification	Select the vertical and horizontal magnification for the text. (0.5, 1, 2, 3, 4, or 8) Cannot be selected when using the Windows font. This setting is available when “Japanese”, “European”, “Central European”, “Baltic” or “Cyrillic” is selected under “Font”.
Size	Specifies the size of the text. (8 to 128) This setting is available when “European Stroke” is selected under the “Font”.

8.2.4 Trigger Condition of Button

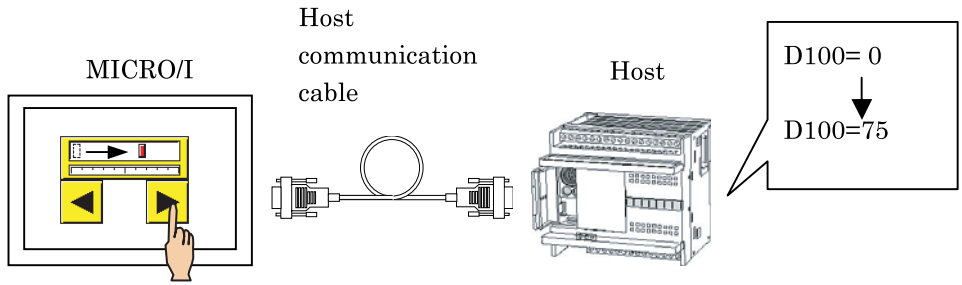
These settings associate with the trigger conditions which can be set on the Trigger Condition of Button tab by selecting [Home] - [Parts] - [Buttons] - [Selector Switch] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.3.1 Trigger Condition of Button” on page 131 for the setting parameters.

8.2.5 Option

These settings associate with the ON delay of Buttons, disabling the touch sound, and the Security Group, which can be set on the Options tab by selecting [Home] - [Parts] - [Buttons] - [Selector Switch] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.6 Option” on page 144 for the setting parameters.

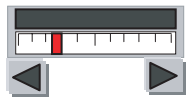
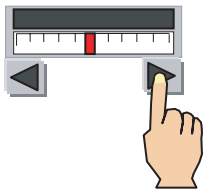
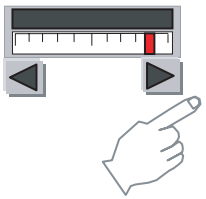
9 Potentiometer

The Potentiometer inputs data to a specified device. The input value is increased or decreased by pressing the switch, and displayed with the slider bar in real time. The data is written to the device when the switch is released.



9.1 Operation Example

Setting	Destination Device	D100

			
	Current value of output device	Potentiometer value increases while the switch is pressed	Current value of output device
Operation	-	Press	Release
Operation	-	-	Potentiometer value is output to the destination device

- The target device value is read immediately after a screen is switched, and the position of the potentiometer level indicator is displayed accordingly.
- If a potentiometer value is changed by operating the touch keys, the changes are reflected in the potentiometer needle display when the screen is switched. However, if the value of the device is directly changed by a means other than the touch keys, the changes are not reflected in the potentiometer needle display when the screen is switched.

9.2 Potentiometer Settings

9.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Buttons] - [Potentiometer] from the WindO/I-NV2 menu.

Item	Description
Part Name	Sets the part name. (20 characters)
Data Type	Select the Data Type. (refer to Chapter 8 “3.1 Data Type” on page 127 for details.) (BIN16 (+) BIN16 (+/-) BIN32 (+) BIN32 (+/-) BCD4 BCD8)
Minimum	Set the minimum value for the input data range. (refer to Chapter 8 “3.1 Data Type” on page 127 for details.) (Depends on the data type)
Maximum	Set the maximum value for the input data range. (refer to Chapter 8 “3.1 Data Type” on page 127 for details.) (Depends on the data type)
Destination Device	Specify the output destination device for the input value. (R/W Word devices)

9.2.2 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Buttons] - [Potentiometer] from the WindO/I-NV2 menu.

Item		Description
Browser		Opens the View Browser for selecting a display image.
Slider Color		Open the Color Palette for selecting the slider color. (Select from 256 colors for color display or 16 colors for monochrome display.)
Plate Color		Open the Color Palette for selecting the plate color. (Select from 256 colors for color display or 16 colors for monochrome display.)
Flange	Fg. Color	Open the Color Palette for selecting the foreground color of the Flange. This item is not available if No Flange is set for the image. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Bg. Color	Open the Color Palette for selecting the background color of the Flange. This item is not available if No Flange is set for the image. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Pattern	Open the Pattern Palette for selecting the pattern of the Flange. This item is not available if No Flange is set for the image. (10 patterns)
Switch	Fg. Color	Open the Color Palette for selecting the foreground color of the Switch. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Bg. Color	Open the Color Palette for selecting the background color of the Switch. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Pattern	Open the Pattern Palette for selecting the pattern of the Switch. (10 patterns)
Coordinates		Enter the coordinates of the display position. X: The X coordinate of the left upper point is displayed. Y: The Y coordinate of the left upper point is displayed.
Size		Enter the number of the size. W: The width of this part is displayed. H: The height of this part is displayed.

9.2.3 Trigger Condition of Button

These settings associate with the trigger conditions which can be set on the Trigger Condition of Button tab by selecting [Home] - [Parts] - [Buttons] - [Potentiometer] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.3.1 Trigger Condition of Button” on page 131 for the setting parameters.

9.2.4 Option

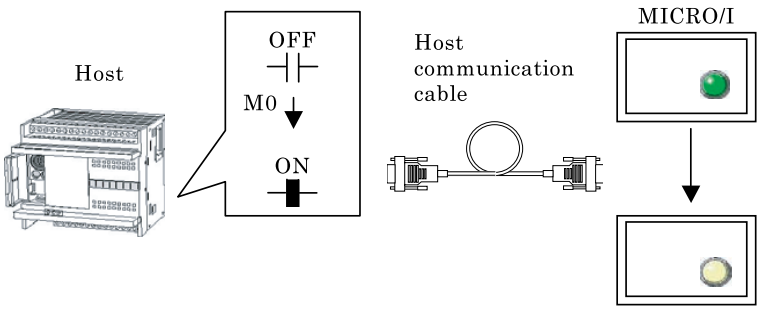
These settings associate with the Security Group and disabling the touch sound, which can be set on the Options tab by selecting [Home] - [Parts] - [Buttons] - [Potentiometer] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.6 Option” on page 144 for the setting parameters.

Chapter 10 Lamps

1 Pilot Lamp

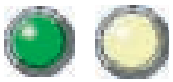
The Pilot Lamp part switches or brinks its display image to reflect the ON/OFF state of a specified bit device.

The Pilot Lamp is capable of displaying three states: OFF, ON, and Blink. In addition, it is possible to hide the image at the OFF state.



1.1 Operation Example

Setting	Operation Mode	Blink
	Blink Trigger Device	LM1
	Trigger Condition	LM0



(Specify the direction in the Focus Movement on the Properties of Base Screen: Vertical)

Trigger Condition (While ON) Device Value (LM0)	0	→	1	→	1	→	0	
Blink Trigger Device Value (LM1)	0		0		1		1	

- The behavior of the image is according to the values of the Trigger Condition and the Blink trigger device.
- Even if “Recover Background” option is enabled, the OFF image is always displayed and the ON image blinks on a Superimpose screen.

1.2 Pilot Lamp Settings

1.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Lamps] - [Pilot Lamp] from the WindO/I-NV2 menu.

Item	Description
Part Name	Sets the part name. (20 characters)
Action Mode	Select the operation mode for the part from among the following choices. No Blink: The ON image is displayed while the trigger condition is established. Blink: The display switches between the ON and OFF images at a fixed period while the trigger condition is established and the data of the reference device is "1". Brink Trigger Device: Set the device to perform the blink operation. * Set the period in the Blinking cycle on the [Configuration] - [System Setup] - [Project] - [System] tab of the Project Settings.

1.2.2 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Lamps] - [Pilot Lamp] from the WindO/I-NV2 menu. Refer to Chapter 8 "3.4 View" on page 137 for the setting parameters. The following settings can also be configured in the Advanced mode.

Item	Description
Not display Image	Select this option to hide the image in the OFF state.
Recover Background	Specify whether or not to recover the background to the original state. When this option is enabled, the background is recovered. When this option is disabled, the previously displayed image remains. This setting can be set only when registered Picture is selected. When the O/I type is HG3G, this setting is always enabled.

WARNING
- When "Recover Background" is selected, the number of parts that can be placed per screen decreases. When the MICRO/I displays an error message, deselect "Recover Background" or reduce the number of parts.
- When "Not Display Image" is selected, the "Recover Background" option is always enabled.
- When "Not Display Image" is selected, the registration text is always displayed.

1.2.3 Registration Text

These settings associate with the registration text which can be set on the Registration Text tab by selecting [Home] - [Parts] - [Lamps] - [Pilot Lamp] from the WindO/I-NV2 menu. Refer to Chapter 8 "3.5 Registration Text" on page 138 for the setting parameters.

1.2.4 Trigger Condition

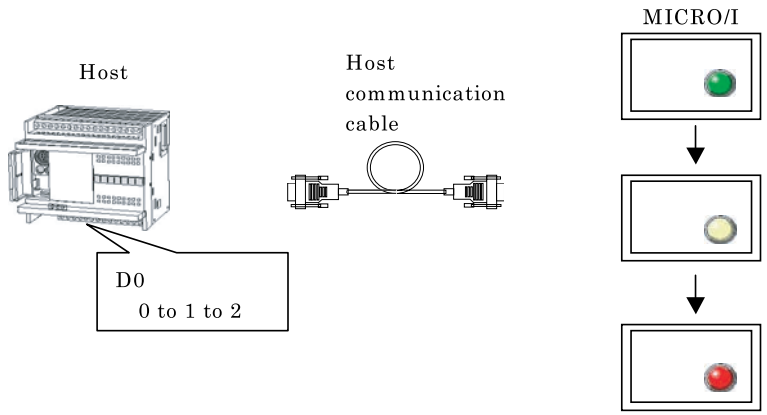
These settings associate with the trigger conditions which can be set on the Trigger Condition tab by selecting [Home] - [Parts] - [Lamps] - [Pilot Lamp] from the WindO/I-NV2 menu. Refer to Chapter 8 "3.3.2 Trigger Conditions (Pilot Lamp, Timer, Numerical Display, Message Display, Picture Display, Line Chart, Bar Chart, Calendar)" on page 132 for the setting parameters.

1.2.5 Option

These settings associate with the Security Group which can be set on the Options tab by selecting [Home] - [Parts] - [Lamps] - [Pilot Lamp] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 "3.6 Option" on page 144 for the setting parameters.

2 Multi-State Lamp

The Multi-State Lamp switches display images according to the value of the specified device. The status can be specified by Bit or Value. The Blink function is available for each image.



2.1 Operation Example

Setting	Trigger Device	D100
	picture	Pic0-Pic2

			→		→		→	
		No display		Displaying Pic1		Displaying Pic0		Displaying Pic2
Trig-ger Device Data	Switching Method: Bit (bottom 4 bits)	0000		0010		0011		0100
	Switching Method: Value	Outside of the range (The value is over the State num-ber)		1		0		2

- If more than one bit in the trigger device is “1” when you select “Bit” with the Switching Method, the picture allocated to the lowest order bit is displayed.
- If no picture is allocated to the bit that is “1” when you select “Bit” with the Switching Method, nothing is displayed.
- If the trigger device value is “0” when you select “Bit” with the Switching Method, the display is not updated.
- If pictures of different size are to be switched, they are all automatically adjusted to the size of Pic0.

2.2 Multi-State Lamp Settings

2.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Lamps] - [Multi-State Lamp] from the WindO/I-NV2 menu.

Item	Description
Part Name	Sets the part name. (20 characters)
Switching Method	Select the switching method. Bit: This method allocates a picture to the device bit position, and displays the picture when the bit of the Trigger Device turns OFF to ON. The bit position is the Pic number. Value: This method switches graphics by setting the graphic number in a device. The device value is the Pic number.
Trigger Device	Specify the trigger device for displaying the image. The registered image that corresponds to the bit in the device specified here is displayed.

2.2.2 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Lamps] - [Multi-State Lamp] from the WindO/I-NV2 menu.

Item	Description
Image Type	Select a type for the image. Standard: Use one of the standard images provided with WindO/I-NV2. Picture: Select an image that has been registered using the Picture Manager.
Recover Background*1	Specify whether or not to recover the background to the original state. When this option is enabled and the display image is not allocated, the background of the area on which the picture was displayed will be recovered. When the option is disabled, the area will be filled with the background color.When the O/I type is HG3G, this setting is always enabled.
Coordinates	Enter the coordinates of the display position. Enabled when “Dynamic Position” is not selected on the General tab. X: The X coordinate of the left upper point is displayed. Y: The Y coordinate of the left upper point is displayed.
Size	Enter the number of the size. Enabled when “Dynamic Position” is not selected on the General tab. W: The width of this part is displayed. H: The height of this part is displayed.

*1. Only available in the Advanced mode.

2.2.3 Registration Text

These settings associate with the registration text which can be set on the Registration Text tab by selecting [Home] - [Parts] - [Lamps] - [Multi-State Lamp] from the WindO/I-NV2 menu.

Item		Description
Font		Select the display font for the text. (refer to Chapter 37 “3 Character Code Table” on page 575 for details.) (Japanese, European, Chinese, Taiwanese, Korean, Central European, Baltic, Cyrillic, Windows, European Stroke)
Style		Select the style for the registration text display font. (Regular or Bold) Cannot be selected when using the Windows font. This setting is available when “Japanese”, “European”, “Central European”, “Baltic” or “Cyrillic” is selected under “Font”.
Magnification		Select the vertical and horizontal magnification for the text. (0.5, 1, 2, 3, 4, or 8) Cannot be selected when using the Windows font. This setting is available when “Japanese”, “European”, “Central European”, “Baltic” or “Cyrillic” is selected under “Font”.
Size		Specifies the size of the text. (8 to 128) This setting is available when “European Stroke” is selected under the “Font”.
Align Text	Horizontal:	Select the horizontal alignment. (Left, Center-left, Center or Right)
	Vertical:	Select the vertical alignment. (Top, Center, Center-top or Bottom)
Use Text Manager		Select whether or not to use the registered text with the Text Manager. Use this setting when switching Text Groups.

2.2.4 State

These settings associate with each state can which be set on the State tab by selecting [Home] - [Parts] - [Lamps] - [Multi-State Lamp] from the WindO/I-NV2 menu.

Item	Description
Number of States	Specify the number of states.
Settings	The information of the display image, Registration Text, Fg. Color, Bg. Color, Pattern, Text Color, and Blink for each state is displayed in a list. Double-clicking the State number or clicking the [Set] or [Insert] button will open the State Settings, allowing you to configure each parameter. Clicking the [Remove] button will clear the settings for the selected state. State: Displays the state number of the lamp. All of the numbers specified with the No. of State will be displayed. Image: Displays the name of the display image that has been set up. When "Standard" is selected for the Image Type, the library name is displayed. When "Picture" is selected, the filename is displayed. When the image is not registered, "Unregistered" is displayed. Text: Displays the registration text to be displayed on the lamp. Fg. Color: Displays the foreground color for the image. (Color: 256 colors Monochrome: 16 colors) Enabled only when Standard is selected for the Image Type. Bg. Color: Displays the background color for the image. (Color: 256 colors Monochrome: 16 colors) Enabled only when Standard is selected for the Image Type. Pattern: Displays the pattern for the image. (10 patterns) Enabled only when Standard is selected for the Image Type. Text Color: Displays the color for the registration text. (Color: 256 colors Monochrome: 16 colors) Blink: Displays whether or not to blink the image. When the "Blink" checkbox is selected, "Y" (Yes) is displayed. When the checkbox is not selected, "N" (No) is displayed. Windows Font: Displays the Windows font setting. Enabled only when "Windows" is selected for the Font.

WARNING
- It is not possible to set multiple images at one time.
- Settings should be configured for all of the states you have set up with the No. of State.
- When "Recover Background" is selected, the number of images that can be placed per screen decreases. When the MICRO/I displays an error message, deselect "Recover Background" or reduce the number of parts.

2.2.5 Option

These settings associate with the Security Group which can be set on the Options tab by selecting [Home] - [Parts] - [Lamps] - [Multi-State Lamp] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 "3.6 Option" on page 144 for the setting parameters.

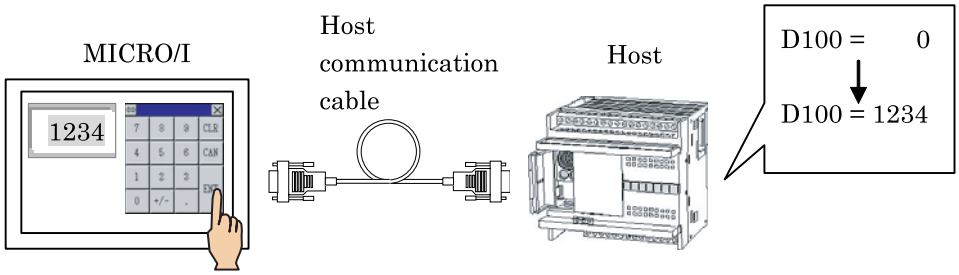
Chapter 11 Data Display

This chapter describes the operation of the Display parts: Numerical and Character Input, Picture, Message and Message Switching Displays, Alarm List and Log, Numerical and Calendar Displays.

1 Numerical Input

The Numerical Input uses the Keypad or Key buttons for numerical input.

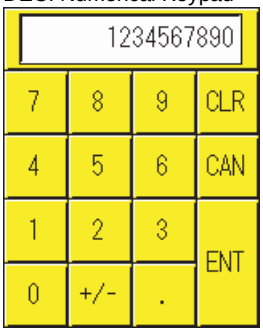
The Numerical Input sets the numerical value entered with the Keypad or Key Button to the specified device. There are the following three types of Numerical Input: The Popup that allows you to open the Popup Screen and enter data with the Keypad placed on it, the Current Screen that allows you to enter data from the Keypad placed on the same screen, and the Use as Display for Keypad that displays the input value not the current value.



On each of Popup screens No. 3001 to 3015, the standard Keypad used for the Numerical Input or Character Input is placed in advance. These Popup screens are automatically created when a new project is created.

When you select “Standard” in Type of Keypad, the screen that placed the most suitable Keypad is automatically selected from Popup screens No.3001 to 3015 according to the other settings.

DEC. Numerical Keypad

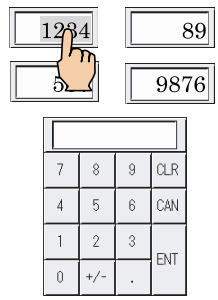
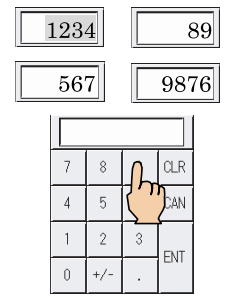
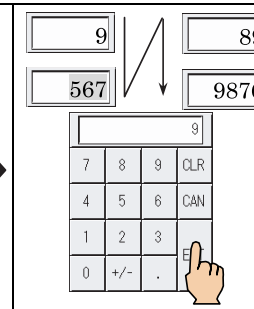


1.1 Operation Example

Calling up a keypad for continuous input

Setting	Keypad Type	Standard
	Display Type	Decimal
	Destination Device	D100
	Focus is moved by ENT button	Selected

(Specify the direction in the Focus Movement on the Properties of Base Screen: Vertical)

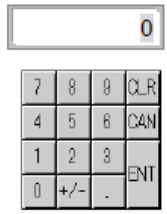
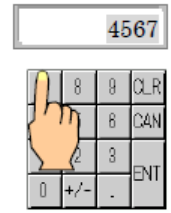
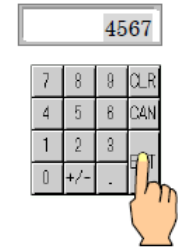
Display and operation			
	Popup screen with the standard keypad is displayed.	The input numerical value is displayed on the Numerical Input.	The input value is stored in the device, and the focus moves to the next numerical input.
Operation	Select numerical input	Input value	Press ENT

- When the CAN key is pressed, the selection of the Numerical Input is cancelled, and it returns to the current display.
- When the setting is such that the focus is not shifted to the next Numerical Input when the ENT key is pressed, pressing the ENT key stores the entered value in the device and cancels selection of the Numerical Input. To continue input, select the Numerical Input again.
- When you place a keypad in a screen where there is a Numerical Input it is displayed at all times, but only becomes active when the Numerical Input is selected.

When Always Entry Mode is selected

Setting	Keypad Type	Current Screen
	Display Type	Decimal
	Destination Device	D100
	Always Entry Mode	Selected

(Only one Character Input can be set for each screen.)

Display and operation					
	Waiting for input		The input value is displayed		The input value is stored in the device and it waits for the next input.
Operation	-		Input value		Press ENT

WARNING

- If you input out-of-range data and press ENT, a question mark is displayed in the numerical display, and nothing is written to the device.
- When the data type is binary or BCD, and Display Floating Point is set, floating-point input is possible, but the value is written to the device as an integer.

  Ex 1: BIN16 (+), Display Floating Point, Digits: 5, Floating Digits: 3, and Storage device: LDR100

Keypad input		Value written
12.345	→	LDR100 12345 (decimal) (3039 (HEX))

  Ex 2: BCD4 (Display Floating Point), Digits: 4, Floating Digits: 2, and Storage device: LDR200

Keypad input		Value written
12.3	→	LDR200 1230 (hex)

- When the ENT key is pressed to complete the numerical input, a “1” is written to bit 0 in System Area +3.
- When the CAN key is pressed, a “1” is written to bit 1 in System Area +3.
  Before you fix the data with the ENT key, you can cancel to set the data if you close the keypad on the popup screen with the Close button of the title bar or you make the Numerical Input be active while another one is active. In this case, this bit is not set to “1”.
- Both of the bits for the ENT and CAN key are cleared when the bit 10 status of “System Area +1” is changed from 0 to1. These bits are automatically cleared by key input operation when the “Clear Keypad bit in System Area automatically” is selected in the Project Settings.
- When “Display numerical value with *” is selected, the numerical display area will be blank if the stored data is “0”.
- When “Display numerical value with *” is selected, the numerical display area will become blank at the moment the Numerical Input is activated.
- When “Display numerical value with *” is selected, pressing the ENT key to confirm the numeral while the display area is blank will write “0” to the destination device.

1.2 Storing Data to Devices

1.2.1 Allowed Digit Settings

Display Format	Data Type	Digits	Floating Digits
Decimal display	BIN16 (+), BIN16 (+/-)	1 to 5	1 to the number of Digits*1
	BIN32 (+), BIN32 (+/-)	1 to 10	1 to the number of Digits*1
	BCD4	1 to 4	1 to the number of Digits*1
	BCD8	1 to 8	1 to the number of Digits*1
	float32	1 to 10	1 to 8
Hexadecimal display	BIN16 (+)	1 to 4	-
	BIN32 (+)	1 to 8	-

*1. The number of Floating Digits must be smaller than the number of Digits.

1.2.2 Input Floating Digits

The value is displayed as floating digits, but stored in the device as integral number.

Ex: Data: BIN16 (+), Digits: 5, Display Floating Point: selected, Floating Digits: 3, Destination Device: LDR100, Input “1.23” with Keypad.

1.3 Numerical Input Settings

1.3.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Data Displays] - [Numerical Input] from the WindO/I-NV2 menu.

Item		Description
Part Name		Sets the part name. (20 characters)
Use as Display for Keypad*1		Select to use as displaying input data. You can use combining the ordinary Numerical Input and the Numerical Input with this option.
Keypad	Keypad	Select the screen type which has Keypad. If you select Standard type, a preset screen is chosen. The preset screens are made while making a project.
	Screen No.	Specify the Popup screen number that has Keypad if you select Popup Screen in Type.3001 to 3015 of Popup screens are Standard Keypad ready screens. They are prepared automatically while making a new project.
	Adjust location automatically	This function is available when you select Popup Screen or Standard in Type. Selecting this checkbox, the Popup screen which has Keypad is opened automatically without overlapping the invoker (Numerical Input) If you specify Keypad screen position, deselect and input the coordinate directly. The coordinate is the top left corner of this popup screen showing.
	Coordinates	If you selected Popup for the Location, input the screen display coordinates for the popup screen. The value must be a multiple of 20 dots. X: 0 to (Width of the Base Screen - 20) Y: 0 to (Height of the Base Screen - 20)
Display Type		Select the display type for the keypad input. (Decimal Hexadecimal)

Item		Description
Data Format	Data Type	Select the data type for the numerical input. (refer to Chapter 8 “3.1 Data Type” on page 127 for details.) (BIN16 (+) BIN (16+/-) BIN32 (+) BIN32 (+/-) BCD4 BCD8 float32)
	Digits	Set the number of display digits. The setting range depends on the settings for Display Type and Data Type. (refer to Chapter 11 “1.2.1 Allowed Digit Settings” on page 193.)
	Display Floating Point	Select this checkbox to display a floating point.
	Floating Digits	Set the number of floating digits for display. The setting range depends on the settings for Display Type and Data Type. You cannot set the number of Floating Digits unless the Display Floating Point checkbox is selected. (refer to Chapter 11 “1.2.1 Allowed Digit Settings” on page 193.)
	Floating Symbol	Select a floating symbol. (.,;: /) Even if the symbol is changed, standard key pads will not be changed. Please modify the symbol on the key pads as well.
	Suppress Zeros	Select this checkbox to suppress display of leading zeros in the integer portion of the display. When this checkbox is selected, the high-order zero of the integer part is not displayed.
	Not Display sign	You can hide a minus sign even if the value is negative when the Data Type is selected as BCD4, BCD8, or float32.
Input Method*1		Set the numerical input method. Destination Device: Set the device for storing the input value. Use Reference Device: When Use Reference Device is selected, the reference device is available. (refer to Chapter 8 “3.2 Indirect Read and Indirect Write of Devices” on page 129.
Always Entry Mode*1		Select this checkbox to stay in entry mode at all times. When the Always Entry Mode checkbox is selected, the keypad type is Current Screen, and only one Numerical Input can be set for each screen.
Focus is moved by ENT button*1		Select this checkbox when you have set multiple numerical input parts, and you wish to switch to the next part after pressing the ENT key. Specify the direction in the Focus Movement on the “Screen Properties” - Options tab.
Update the display by ENT button*1		Select this checkbox to update the showing data by pushing ENT button in input status. Until pushing ENT button, the previous data is kept to show.

*1. Only available in the Advanced mode.

If you specify use of a floating point with the binary or BCD data types, the numerical value input is input as an integer with the last specified decimal digit at the 10^{o} position (decimal display format).

1.3.2 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Data Displays] - [Numerical Input] from the WindO/I-NV2 menu.

Item		Description
Browser		Opens the View Browser for selecting a display image.
Plate Color		Open the Color Palette for selecting the plate color. (Select from 256 colors for color display or 16 colors for monochrome display.) This setting is available when “Standard” is selected under “Image Type”.
Flange	Fg. Color	Opens the Color Palette for selecting the foreground color. This item is not available if No Flange is set for the image. (Select from 256 colors for color display or 16 colors for monochrome display.) This setting is available when “Standard” is selected under “Image Type” and the plate with the flange is selected.
	Bg. Color	Opens the Color Palette for selecting the background color. This item is not available if No Flange is set for the image. (Select from 256 colors for color display or 16 colors for monochrome display.) This setting is available when “Standard” is selected under “Image Type” and the plate with the flange is selected.
	Pattern	Opens the Pattern Palette for selecting Sets the pattern. This item is not available if No Flange is set for the image. (10 patterns) This setting is available when “Standard” is selected under “Image Type” and the plate with the flange is selected.
Coordinates		Enter the coordinates of the display position. X: The X coordinate of the left upper point is displayed. Y: The Y coordinate of the left upper point is displayed.
Size		Enter the number of the size. W: The width of this part is displayed. H: The height of this part is displayed.

1.3.3 Format

These settings associate with the display format which can be set on the Format tab by selecting [Home] - [Parts] - [Data Displays] - [Numerical Input] from the WindO/I-NV2 menu.

Item		Description
Font		Select the type of font to be displayed. (Standard, European Stroke, 7-seg)
Size		Specifies the display text size. When “Standard” is selected under “Font”: (8 x 16 16 x 16) When “European Stroke” or “7-seg” is selected under “Font”: (8-128)
Style		Set the style for the number display. (Regular Bold) This setting is available when “Standard” is selected under “Font”.
Magnification		Select the vertical and horizontal magnification for the numbers. (1, 2, 3, 4, or 8) This setting is available when “Standard” is selected under “Font”.
Align Text		Select the horizontal alignment. (Left Center Right)
Text Color	Display Mode	Sets the display color for the numerical data. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Entry Mode	Sets the display color for the numerical data when inputting.
	Reverse	Select this checkbox to reverse the display color when inputting. This setting is available when “Standard” is selected under “Image Type” on the View tab.

Item	Description
Display Numerical Value with '*'*1	Select the checkbox to display the data with "*" (asterisk).
With Unit*1	Select the text string appended to the end of the numerical value from the ID numbers of the Text Manager. The text can be displayed up to 4 characters as a unit. The text is displayed in the color specified on the Format tab.

*1. Only available in the Advanced mode.

When the specified Text ID in the With Unit is used the Windows font, all characters are displayed.

1.3.4 Data Over

These settings associate with the data range which can be set on the Data Over tab by selecting [Home] - [Parts] - [Data Displays] - [Numerical Input] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected.

Item		Description
Range	Data Type	Specify the type and value of each data. Value: Use a constant as the data. The setting range for the value depends on the selected data type. (refer to Chapter 8 "3.1 Data Type" on page 127 for details.) Device: Use the content of the selected device as the data.
	Minimum/ Maximum	Select to set Upper and Lower limits for the input value. (Value: depends on the data type Device: Word device)
When Data Over		When the entered numerical value is out of the range specified with the Upper and Lower limits, 1 is written into the specified bit device.

If you select an item except the "float32" in the Data Type and the "Display Floating Point" is selected on in the [General] tab, enter the value without a decimal point to the Minimum or Maximum in the Data Over tab. For example, if you set the "1.234" to the Maximum, enter the "1234".

1.3.5 Trigger Condition

These settings associate with the trigger conditions which can be set on the Trigger Condition of Button tab by selecting [Home] - [Parts] - [Data Displays] - [Numerical Input] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 "3.3.1 Trigger Condition of Button" on page 131 for the setting parameters.

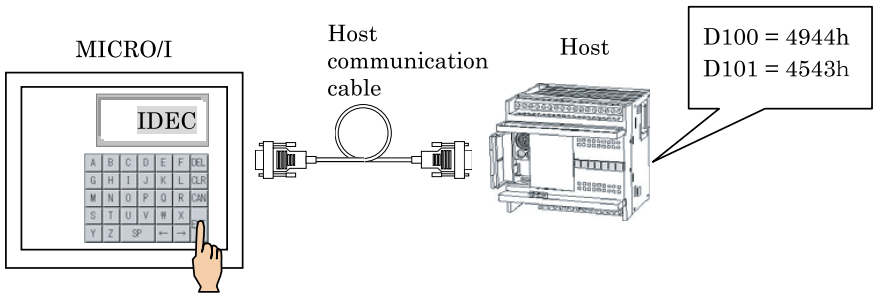
1.3.6 Option

These settings associate with disabling the touch sound, Security Group, and Arithmetic operation, which can be set on the Options tab by selecting [Home] - [Parts] - [Data Displays] - [Numerical Input] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 "3.6 Option" on page 144 for the setting parameters.

2 Character Input

The Character Input uses the Keypad or Special Switches for text data input.

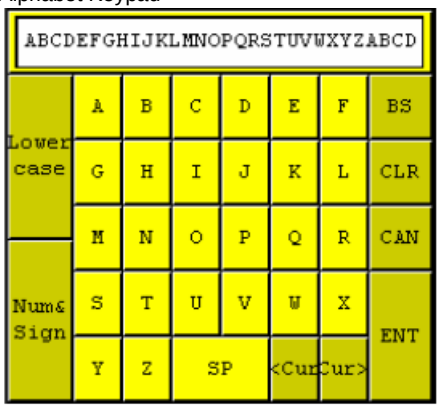
The Character Input sets the characters entered with the Keypad or Key Button to specified device. There are the following three types of Character Input: The Popup that allows you to open the Popup Screen and enter data with the Keypad placed on it, the Current Screen that allows you to enter data from the Keypad placed on the same screen, and the Use as Display for Keypad that displays the input data not the current data.



On each of Popup screens No. 3001 to 3015, the standard Keypad used for the Numerical Input or Character Input is placed in advance. These Popup screens are automatically created when a new project is created.

When you select “Standard” in Type of Keypad, the screen that placed the most suitable Keypad is automatically selected from Popup screens No.3001 to 3015 according to the other settings.

Alphabet Keypad

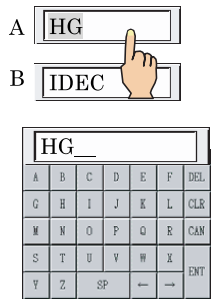
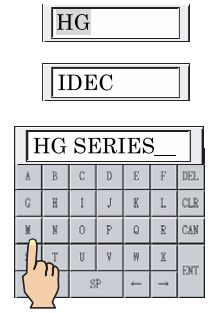
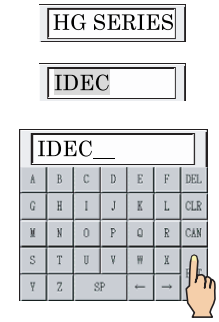


2.1 Operation Example

2.1.1 Calling up a keypad for continuous input

Setting		Character Input A	Character Input B
	Keypad Type	Standard	
	Display Type	9	4
	Destination Device	10	5
	Focus is moved by ENT button	Selected	Deselected
	Destination Device	D100	D200

(Specify the direction in the Focus Movement on the Properties of Base Screen: Vertical)

Display and operation			
	Popup screen with the standard keypad is displayed.	The input value is displayed	The input value is stored in the device, and the focus moves to the next character input.
Operation	Select character input	Input value	Press ENT
D100	4847h	4847h	4847h
D101	0000h	2053h	2053h
D102	0000h	4552h	4552h
D103	0000h	4945h	4945h
D104	0000h	5300h	5300h
D200	4944h	4944h	4944h
D201	4543h	4543h	4543h
D202	0000h	0000h	0000h

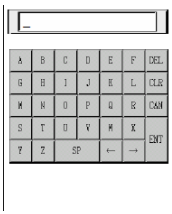
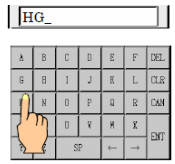
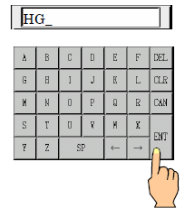
WARNING

- When the CAN key is pressed, the selection of the Character Input is cancelled, and it returns to the current display.
- When the setting is such that the focus is not shifted to the next Character Input when the ENT key is pressed, pressing the ENT key stores the entered value in the device and cancels selection of the Character Input. To continue input, select the Character Input again.
- When you place a keypad in a screen where there is a Character Input it is displayed at all times, but only becomes active when the Character Input is selected.

2.1.2 When Always Entry Mode is selected

Setting	Keypad Type	Current Screen
	Input Digits	20
	Display Digits	10
	Destination Device	D100
	Always Entry Mode	Selected

(Only one Character Input can be set for each screen.)

Display and operation			
	Waiting for input	Input value is displayed	The input value is stored in the device and it waits for the next input.
Operation	-	Input value	Press ENT

WARNING

- When the ENT key is pressed to complete the character input, a “1” is written to bit 5 in System Area +3.
- When the CAN key is pressed, a “1” is written to bit 6 in System Area +3.

  Before you fix the data with the ENT key, you can cancel to set the data if you close the keypad on the popup screen with the Close button of the title bar or you make the Character Input be active while another one is active. In this case, this bit is not set to “1”.
- Both of the bits for the ENT and CAN key are cleared when the bit 11 status of “System Area +1” is changed from 0 to1. These bits are automatically cleared by key input operation when the “Clear Keypad bit in System Area automatically” is selected on the Project Settings.
- The entered characters are stored sequentially starting from the byte specified in the “Storage Method of string data” setting in the Project Settings.
  Example: When “from Upper word” is selected for “Storage Method of string data” in the Project Settings:

	When “ABCDE“ is input	When “ABCD“ is input
Write device	“AB“ (character code 4142(hex))	“AB“ (character code 4142(hex))
Write device+1	“CD“ (character code 4344(hex))	“CD“ (character code 4344(hex))
Write device+2	“E“ (character code 4500(hex))	Terminator 0

  Example; When “from Lower word” is selected for “Storage Method of string data” in the Project Settings:

	When “ABCDE“ is input	When “ABCD“ is input
Write device	“BA“ (character code 4241(hex))	“BA“ (character code 4241(hex))
Write device+1	“DC“ (character code 4443(hex))	“DC“ (character code 4443(hex))
Write device+2	“E“ (character code 0045(hex))	Terminator 0

- When the “Display character with *” setting is enabled, the character display area will become blank at the moment the Character Input is activated.
- When the “Display character with *” setting is enabled, pressing the ENT key to confirm the character while the character display area is blank will write the terminator “0” to the destination device.

2.2 Character Input Settings

2.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Data Displays] - [Character Input] from the WindO/I-NV2 menu.

Item		Description
Part Name		Sets the part name. (20 characters)
Keypad	Use as Display for Keypad*1	Select to use as displaying input data. You can use combining the ordinary Numerical Input and the Numerical Input with this option.
	Keypad	If you select Standard type, a preset screen is chosen. The preset screens are made while making a project.
	Screen No.	Specify the Popup screen number that has Keypad if you select Popup Screen in Type.3001 to 3015 of Popup screens are Standard Keypad ready screens. They are prepared automatically while making a new project.
	Adjust location automatically	his function is available when you select Popup Screen or Standard in Type. Selecting this checkbox, the Popup screen which has Keypad is opened automatically without overlapping the invoker (Character Input) If you specify Keypad screen position, deselect and input the coordinate directly. The coordinate is the top left corner of this popup screen showing.
	Coordinates	If you selected Popup for the Location, input the screen display coordinates for the popup screen. The value must be a multiple of 20 dots. X: 0 to (Width of the Base Screen - 20) Y: 0 to (Height of the Base Screen - 20)
Data Format		Set the number of display characters. Input Digits: Set the number of characters that can be input using the Character Input Display Digits: Set the number of characters that can be displayed on the Character Input
Input Method*1		Set the character input method. Destination Device: Set the device for storing the input value. Use Reference Device: When Use Reference Device is selected, the reference device is available.
Always Entry Mode *1		Select this checkbox to stay in entry mode at all times. Select the screen that is being edited from the “Keypad settings”. When the Always Entry Mode checkbox is selected, the keypad type is Current Screen, and only one Character Input can be set for each screen.
Focus is moved by ENT button*1		Select this checkbox when you have set multiple character input parts, and you wish to switch to the next part after pressing the ENT key. Specify the direction in the Focus Movement on the “Screen Properties” - Options tab.
Update the display by ENT button*1		Select this checkbox to update the showing data by pushing ENT button in input status. Until pushing ENT button, the previous data is kept to show.

*1. Only available in the Advanced mode

2.2.2 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Data Displays] - [Character Input] from the WindO/I-NV2 menu.

2.2.3 Format

These settings associate with the display format which can be set on the Format tab by selecting [Home] - [Parts] - [Data Displays] - [Character Input] from the WindO/I-NV2 menu.

Item		Description
Font		Select the font for the display text. (Japanese, European, Central European, Baltic, Cyrillic, European Stroke)
Size		Specifies the display text size. When “Standard” is selected under “Font”: (8 x 16 16 x 16) When “European Stroke” or “7-seg” is selected under “Font”: (8-128)
Style		Set the style for the number display. (Regular Bold) This setting is available when “Japanese”, “European”, “Central European”, “Baltic” or “Cyrillic” is selected under “Font”.
Magnification		Select the vertical and horizontal magnification for the text. (0.5, 1, 2, 3, 4, or 8) This setting is available when “Japanese”, “European”, “Central European”, “Baltic” or “Cyrillic” is selected under “Font”.
Align Text		Select the horizontal alignment for the text. (Left Center Right)
Text Color	Display Mode	Displays the Color Palette for setting the display color for the character data. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Entry Mode	Displays the Color Palette for selecting the display color for the character data when inputting.
	Reverse	Select this checkbox to reverse the display color when inputting.
Display Character with ‘*’*1		Select the checkbox to display the data with “*” (asterisk).
Change Font with Device*1		Select this option when switching fonts according to the value of the device. When “Standard” or “Popup” is selected for the Keypad Type, it is possible to switch Popup Screen numbers. This function uses 2 words starting from the specified device. 1st word: Font No. (1: Japanese 2: European 6: Central European 7: Baltic 8: Cyrillic) 2nd word: Popup Screen No. (1 to 3015)

*1. Only available in the Advanced mode.

2.2.4 Trigger Condition of Button

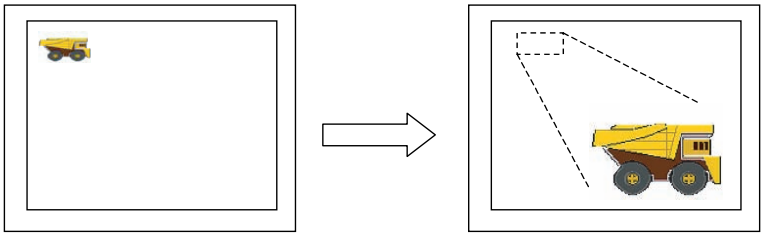
These settings associate with the trigger conditions which can be set on the Trigger Condition of Button tab by selecting [Home] - [Parts] - [Data Displays] - [Character Input] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.3.1 Trigger Condition of Button” on page 131 for the setting parameters.

2.2.5 Option

These settings associate with the Security Group and disabling the touch sound, which can be set on the Options tab by selecting [Home] - [Parts] - [Data Displays] - [Character Input] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.6 Option” on page 144 for the setting parameters.

3 Picture Display

The Picture Display switches the display images depending on the device value or at a constant period.
The size and position of the display image can be changed depending on the value of the specified device. In addition, it is possible to blink the display image. These functions allow you to easily create an animation on the screen.



3.1 Operation Example

Setting	Trigger Device	D100
	Switching Method	Bit
	Device	Pic0-Pic2

	 Pic0 Display		 Pic1 Display		 Pic0 Display		 Pic2 Display
Trigger Device Data (Bit) bottom 4 bits	0001		0010		0011		0100

Setting	Trigger Device	D100
	Switching Method	Value
	Device	Pic0-Pic2

	 Pic0 Display		 Pic1 Display		 Pic0 Display		 Pic2 Display
Trigger Device Data (Value)	0		1		0		2

- If more than one bit in the trigger device is “1” when you select “Bit” with the Switching Method, the picture allocated to the lowest order bit is displayed.
- If no picture is allocated to the bit that is “1” when you select “Bit” with the Switching Method, nothing is displayed.
- If the trigger device value is “0” when you select “Bit” with the Switching Method.
- If there are registered different sizes of image and the Dynamic Size is not selected, they are all automatically adjusted to the size of Pic0.
- Do not move or resize the picture outside of the screen.

You can create the animation easily by using the Dynamic Position or the Dynamic Size.

3.2 Picture Display Settings

3.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Data Displays] - [Picture Display] from the WindO/I-NV2 menu.

Item	Description
Part Name	Sets the part name. (20 characters)
Switching Method	Select the switching method Bit: This method allocates a picture to the device bit position, and switches the display picture when the bit of the Trigger Device turns OFF to ON. The bit position is the Pic number. Value: This method switches the display pictures according to the device value. The device value is the Pic number. Fixed Period: This method switches the display picture after the specified time has elapsed. Pictures are displayed starting from the top of the list (Pic0) .(HG3G only)
Trigger Device	Specify the trigger device for displaying the image. This setting is available when “Bit” or “Value” is selected under “Switching Method”.
Period	Define the frequency on how fast should the images switch from one to the next. (200-60000 [ms])
Blink	Select this checkbox to make the image displayed on the screen blink.
Trigger Device	Specify the trigger device for displaying the image. The registered image that corresponds to the bit in the device specified here is displayed.
Repeat	Select this check box to continuously display pictures again from starting from the top of the picture list. This setting is available when “Fixed Period” is selected under “Switching Method”.
Dynamic Position*1	Select this checkbox if you change the display position of the picture. X: The picture is displayed with the value of the specified device as the X coordinate of the upper left point. Y: The picture is displayed with the value of the specified device as the Y coordinate of the upper left point.
Dynamic Size*1	Select this checkbox if you change the display size of the picture. W: The picture is displayed with the value of the specified device as the width. H: The picture is displayed with the value of the specified device as the height.

*1. Only available in the Advanced mode.

Make sure that the time set for the “Period” is longer than the screen’s scan time. Otherwise, the image may not be displayed. The scan time is stored in HG special register LSD4, refer to Chapter 34 “HG Special Registers (LSD)” on page 538.

3.2.2 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Data Displays] - [Picture Display] from the WindO/I-NV2 menu.

Item	Description
Picture List	Displays a list of the registered picture image file names. Clicking the [Set], [Insert], or [Remove] button will reflect the on the list.
Recover Background*1	Specify whether or not to recover the background to the original state. When this option is enabled and the display image is not allocated, the background of the area on which the picture was displayed will be recovered. When the option is disabled, the area will be filled with the background color. When this option is enabled and “Blink” in the General tab is selected, it will alternate between the picture and background. This setting is always enabled on HG3G.
Image	Displays the part image of cursor position in the “Picture List”.
Coordinates	Enter the coordinates of the display position. Enabled when “Dynamic Position” is not selected on the General tab. X: The X coordinate of the left upper point is displayed. Y: The Y coordinate of the left upper point is displayed.
Size	Enter the number of the size. Enabled when “Dynamic Size” is not selected on the General tab. W: The width of this part is displayed. H: The height of this part is displayed.

*1. Only available in the Advanced mode.

WARNING
- It is not possible to set multiple images at one time.
- The images must be registered in order from Pic0.
- When “Recover Background” is selected, the number of parts that can be placed per screen decreases. When the MICRO/I displays an error message, deselect “Recover Background” or reduce the number of parts.
- When the “Recover Background” is selected, the “Dynamic Size” function cannot be used. Likewise, when the “Dynamic Size” function is selected, the “Recover Background” option is disabled.

To replace a picture selected using the Picture Manager with another, select the registered picture and press the Set button.

3.2.3 Trigger Condition

These settings associate with the trigger conditions which can be set on the Trigger Condition tab by selecting [Home] - [Parts] - [Data Displays] - [Picture Display] from the WindO/I-NV2 menu. Refer to Chapter 8 “3.3.2 Trigger Conditions (Pilot Lamp, Timer, Numerical Display, Message Display, Picture Display, Line Chart, Bar Chart, Calendar)” on page 132 for the setting parameters.

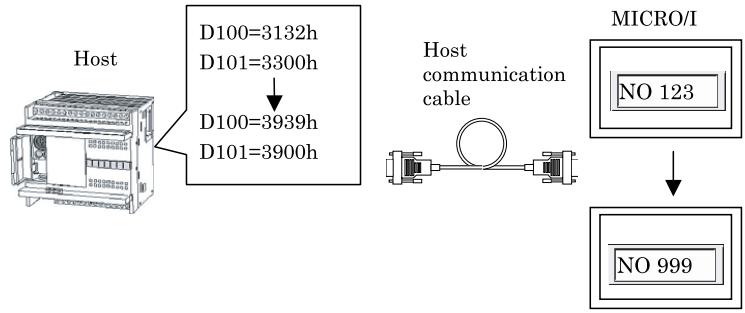
3.2.4 Option

These settings associate with the Security Group which can be set on the Options tab by selecting [Home] - [Parts] - [Data Displays] - [Picture Display] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.6 Option” on page 144 for the setting parameters.

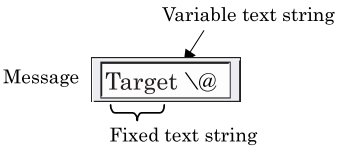
4 Message Display

The Message Display is used to read either device data as character code or a fixed text message, and display it on the screen.

To display text, enter characters to the Message or specify the registered text with Text Manager. To display the device data as text, enter the Read Device code and specify the start device address and number of words to be read. Therefore, it is easy to display the variable message, value or other data with the title.



4.1 Operation Example



- When 3 words from LDR100 are set for Channel 1.

Setting	Message	Fixed text string + Variable text string
	Variable	Ch1, Reference Device-LDR100, Words-3
	Font	Japanese
	Use Text Manager	Not Selected

Display	Target	Target 1234	Target 5678
	Display of fixed text string only. Nothing is displayed when the upper byte of the reference device start address is “0”.	Variable text string	Variable text string
LDR100 value	0031 (HEX)	3132 (HEX)	3536 (HEX)
LDR101 value	3233 (HEX)	3334 (HEX)	3738 (HEX)
LDR102 value	9E07 (HEX)	9E07 (HEX)	969C (HEX)

- When message scrolling is set

Setting	Message	Target A 1234 Target B 5678
	Vertical/horizontal writing	Horizontal writing
	Scroll	Slow

Display	Target A	Target A 1234	Target B 56	Target B 5678
	Trigger Device Data (Bit) bottom 4 bits	The message is scrolled to the left.	The message on the second line follows.	The message is scrolled to the left.

WARNING

- The text string terminator is 0 (one byte). Therefore, nothing is displayed when the 1st byte of the start address is “0”.
- If you only want to display one character, set the 2nd byte to “0”. For example, to display “7” (character code 37 (HEX)), set the data as 3700 (HEX).
- You can specify whether to obtain the string data from the upper byte or lower byte in [Configuration] - [System Setup] - [Project].

Order of byte in string data	Device value	Displayed string
From Upper byte	3132 (Hexadecimal)	12
	3200 (Hexadecimal)	2
From Lower byte	3132 (Hexadecimal)	21
	0031 (Hexadecimal)	1

- When the Read Device code is used, use the character code for the data in the specified device according to the Font in Format tab. Refer to Chapter 37 “3 Character Code Table” on page 575 for the character codes supported by each language.
- Text string is displayed with the font type specified in “Format” settings.
- When “Use Text Manager” is selected on and the Font of the selected Text ID is the “Windows”, the “\@” characters are displayed as is and the device data of the Channel cannot be displayed.
- When “Use Text Manager” is selected on and there are more “\@” codes in the Message than the number of channels set, only the device data for the number of channels is displayed. The remaining “\@” characters are displayed as is.

The fixed text string is always displayed, and the variable text string is displayed in order from the start data of the specified device.

4.2 Message Display Settings

4.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Data Displays] - [Message Display] from the WindO/I-NV2 menu.

Item		Description
Part Name		Sets the part name. (20 characters)
Use Text Manager		Select whether or not to use the registered text with the Text Manager.
Text ID		When the [Use Text Manager] is selected, specify the ID number of the text registered with the Text Manager. (1 to 32000)
Message		Input the message for display on the screen. The message can be up to 610 characters in length. Use carriage returns to display messages with multiple lines. To input a special character or symbol, click the [>>] button to display Unicode Input. If you want to display device data, input "\@" (the read device data code) at the position that you want it to be displayed. These positions will be linked to the read data channels. To display the "\" character, input "\\", and to display "\\", input "\\\\" (twice the number of "\" characters). (610 characters \@: 0 to 8) Available characters are determined by the selected font on the Format tab.
Data	(List)	Displays a list with the set channel No., device, and number of words in the case that you are using the "\@" symbol to display the contents of a device. Clicking the [Set], [Insert], or [Remove] button will reflect the settings on the list. No.: Displays the channel number (Ch1 to Ch8). Device: Displays the reference device set for each channel. Channels that have not been set are displayed as Unregistered. Words: Displays the number of words. The default value for inset channels is 1.
	Reference Device	If an "Unregistered" channel is selected, nothing is displayed in the Reference Device text box. If a set channel is selected, the settings for that channel are displayed.
	Words	Set the number of words from the address set for the Reference device to use. (1 to 64)

4.2.2 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Data Displays] - [Message Display] from the WindO/I-NV2 menu. Refer to Chapter 8 "3.4 View" on page 137 for the setting parameters.

4.2.3 Format

These settings associate with the display format which can be set on the Format tab by selecting [Home] - [Parts] - [Data Displays] - [Message Display] from the WindO/I-NV2 menu.

Item		Description
Font		Select the display font for the text. (Japanese, European, Chinese, Taiwanese, Korean, Central European, Baltic, Cyrillic, European Stroke)
Style		Specify the text style. (Regular Bold) This setting is available when “Japanese”, “European”, “Central European”, “Baltic” or “Cyrillic” is selected under “Font”.
Magnification		Select the vertical and horizontal magnification for the text. (0.5, 1, 2, 3, 4, or 8) This setting is available when “Japanese”, “European”, “Central European”, “Baltic” or “Cyrillic” is selected under “Font”.
Size		Specifies the size of the text. (8 to 128) This setting is available when “European Stroke” is selected under “Font”.
Align Text	Horizontal:	Select the horizontal alignment. (Left, Center-left, Center or Right)
	Vertical:	Select the vertical alignment. (Top, Center or Bottom)
Vertical Writing		Select the checkbox to display the text string in the vertical direction.
Align Text with depending on the length of Variable message		Select when Align Text with depending on the length of Variable message. Deselect when Align Text with depending on the settings of Words.
Text Color		Opens the color palette for selecting the message color. (Color: 256 Monochrome: 16 TMC: Text color on the Text Manager)* When the “Enable” checkbox in the Blink is selected, the color specified in this setting is used as the display color in the ON state.
Scroll*1		Select the checkbox to scroll the message. (1 (Fast) - 10 (Slow))

*1. Only available in the Advanced mode.

WARNING

- "Vertical Writing" is not available when "European stroke" is selected as "Font".
- Refer to Chapter 8 “3.5.2 Text Alignment (Vertical Writing)” on page 142 for precautions when selecting the Vertical Writing setting.
- The display area of variable text string with the Vertical Writing setting will vary depending on the size of the character code (single-byte or double-byte) stored in the specified device.
- When Scroll is selected, the operation changes as follows:
  - A message on several lines is displayed as a continuous line without using carriage returns.
  - The direction of the scroll depends on the drawing direction of the text string.
  - The Blink function is disabled.
  - When there is a change in the variable text string or display color, the message is displayed from the beginning.
  - The number of parts which can be placed on a single screen decreases. If the MICRO/I displays an error message, disable the scroll display or reduce the number of parts on the screen.
  - When the Scan time is extremely slow, the Scroll Speed may become slow.

4.2.4 Trigger Condition

These settings associate with the trigger conditions which can be set on the Trigger Condition tab by selecting [Home] - [Parts] - [Data Displays] - [Message Display] from the WindO/I-NV2 menu. Refer to Chapter 8 “3.3.2 Trigger Conditions (Pilot Lamp, Timer, Numerical Display, Message Display, Picture Display, Line Chart, Bar Chart, Calendar)” on page 132 for the setting parameters.

4.2.5 Option

These settings associate with the display format can be set on the Options tab by selecting [Home] - [Parts] - [Data Displays] - [Message Display] from the WindO/I-NV2 menu. This option is configured only when the Advanced mode is selected.

<table>
<tr><th colspan="2">Item</th><th>Description</th></tr>
<tr><td>Change Color by Device</td><td>Enable</td><td>Select to change the color based on the device value.</td></tr>
<tr><td></td><td>Device</td><td>Select the device to whose data is to be used to change the text color and plate color. Set the display color using a device as shown by specifying one byte to specify the color. When the “Enable” checkbox in the “Blink” is selected, the Text Color and Plate Color of the 2nd word are used in the ON state.
Text color when ON: 1st word, lower byte
Plate color when ON: 1st word, upper byte
Text color when blinking: 2nd word, lower byte
Plate color when blinking: 2nd word, upper byte
Bit position 15 8 7 0
1st word | Plate color when on | Text color when on
2nd word | Plate color when blinking | Text color when blinking</td></tr>
<tr><td>Blink</td><td>Enable</td><td>Select to blink the message text.</td></tr>
<tr><td></td><td>Device</td><td>Specify the device used as the trigger condition for the blink operation.
ON: Displays using the ON display color when the specifying device data is 0.
Blink: Switches between the ON and blink display colors for blinking when the specifying device data is 1.</td></tr>
<tr><td></td><td>Text Color</td><td>Displays the Color Palette for setting the color for the blinking text. (Select from 256 colors for color display or 16 colors for monochrome display.) When the “Enable” checkbox of the “Change Text Color by Device” is selected, this option is disabled.</td></tr>
<tr><td></td><td>Plate Color</td><td>Displays the Color Palette for setting the color for the blinking plate. (Select from 256 colors for color display or 16 colors for monochrome display.) When the “Enable” checkbox of the “Change Text Color by Device” is selected, this option is disabled.</td></tr>
<tr><td colspan="2">Security Group</td><td>Specify a Security Group for the part. By doing this, the parts displayed during operation can be restricted according to the user. (refer to Chapter 23 “Security Function” on page 407.)</td></tr>
</table>

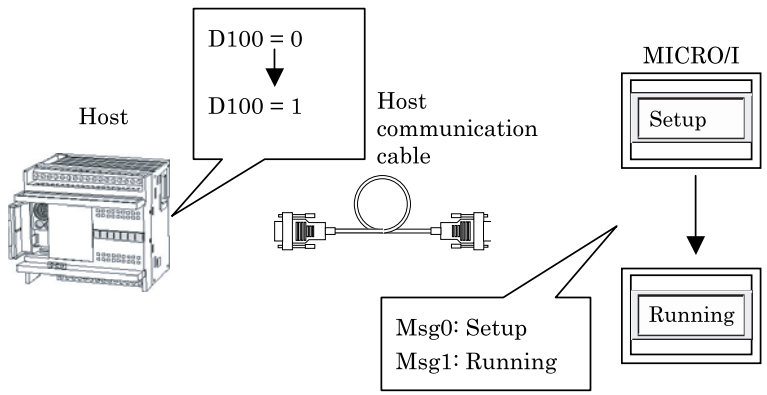
If the Change Color checkbox and the Blink checkbox are selected, the blinking text color and the blinking plate color are the color stored in Change Color by Device data. I.e. They are not the Text Color and Plate Color in the Options tab.

When using the Blink function, the colors specified on the “View” and “Format” tabs and color specified in the Blink are displayed alternately.

5 Message Switching Display

The Message Switching display part switches between registered messages depending on the value in a device. It is not possible to display more than one message at a time.

It is easy to check the current condition by allocating a message to each condition.



5.1 Operation Example

Setting	Trigger Device	D100
	Msg0	Drying
	Msg1	Heating
	Msg2	Cooling

	Drying		Heating		Drying		Cooling
	Msg0 Display		Msg1 Display		Msg0 Display		Msg2 Display
Trigger device data (Bit) bottom 4 bits	0001	→	0010	→	0011	→	0100
Trigger device data (Value)	0		1		0		2

WARNING

- If more than one bit in the trigger device is “1”, the message allocated to the lowest order bit is displayed. If there is no message corresponding to the bit, nothing is displayed.
- If the trigger device data is “0” (Switching Method: Bit) or a value for which no message is set, the message display is cleared.

5.2 Message Switching Display Settings

5.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Data Displays] - [Message Switching Display] from the WindO/I-NV2 menu.

Item	Description
Part Name	Sets the part name. (20 characters)
Switching Method	Select the switching method. Bit: Message numbers are allocated to the device bit positions, and the display is switched by switching the bits on and off. Value: Messages are switched by setting a Message No. in a device, and the device value becomes the Message No.
Trigger Device	Specify the trigger device for displaying the message.

5.2.2 Message

These settings associate with the message to be displayed which can be set on the Message tab by selecting [Home] - [Parts] - [Data Displays] - [Message Switching Display] from the WindO/I-NV2 menu.

Item	Description
Use Text Manager	Select whether or not to use the registered text with the Text Manager.
Settings	Displays the settings for each Message No. Clicking the [Set], [Insert], or [Remove] button will reflect the settings on the list. (Bit: Msg0 to Msg15 Value: Msg0 to Msg999) No.: The message number. The setting range depends on the selection for the Switching Method. Message: Displays the text set in the Message text box, or "Unregistered" if the message has not been set Change: Indicates whether or not the display color is set to change (N (No) or Y (Yes)). "Y (Yes)" is displayed when the "Change Color" checkbox is selected, and "N (No)" when the checkbox is not selected. Text: Displays the text color. If the Change Color checkbox is selected, the color set in this tab sheet is displayed. Plate: Displays the plate color. If the Change Color checkbox is selected, the color set in this tab sheet is displayed, and if the Change Color checkbox is not selected, the color set in Format tab sheet is displayed
Text ID	When the [Use Text Manager] is selected, specify the ID number of the text registered with the Text Manager. (1 to 32000)
Message	Input the message for display on the screen. The message can be up to 3750 characters in length. Use carriage returns to display messages with multiple lines. (3750 characters)
Change Color	Select this checkbox if you want to change the text and plate colors for each message.
Text Color	Displays the Color Palette for selecting the text color for the message when the color is changed for the message. (Select from 256 colors for color display or 16 colors for monochrome display.) When the "Change Color" checkbox is not selected, the Text Color cannot be specified.
Plate Color	Displays the Color Palette for selecting the plate color for the message when the color is changed for the message. (Select from 256 colors for color display or 16 colors for monochrome display.) When the "Change Color" checkbox is not selected, the Plate Color cannot be specified.

- Message registration must be performed in order from Msg0.
- It is not possible to select more than one message from the list at a time.
- The text and plate color settings must be performed in order from Msg0.
- The Set button is not enabled until you input text into the Message text box.
- The Insert button is disabled if all message numbers are set or if an unregistered message number is selected.

5.2.3 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Data Displays] - [Message Switching Display] from the WindO/I-NV2 menu. Refer to Chapter 8 “3.4 View” on page 137 for the setting parameters.

5.2.4 Format

These settings associate with the display format which can be set on the Format tab by selecting [Home] - [Parts] - [Data Displays] - [Message Switching Display] from the WindO/I-NV2 menu.

Item		Description
Font		Select the display font for the text. (refer to Chapter 37 “3 Character Code Table” on page 575 for details.) (Japanese, European, Chinese, Taiwanese, Korean, Central European, Baltic, Cyrillic, European Stroke)
Style		Specify the text style. (Regular Bold) This setting is available when “Japanese”, “European”, “Central European”, “Baltic” or “Cyrillic” is selected under “Font”.
Magnification		Select the vertical and horizontal magnification for the text. (0.5, 1, 2, 3, 4, or 8) This setting is available when “Japanese”, “European”, “Central European”, “Baltic” or “Cyrillic” is selected under “Font”.
Size		Specifies the size of the text. (8 to 128) This setting is available when “European Stroke” is selected under “Font”.
Align Text	Horizontal	Select the horizontal alignment. (Left, Center-left, Center or Right)
	Vertical	Select the vertical alignment. (Top, Center or Bottom)
Vertical Writing		Select the checkbox to display the characters in the vertical direction.
Text Color		Opens the color palette for selecting the message color. (Color: 256 Monochrome: 16 TMC: Text color on the Text Manager)
Scroll*1		Select the checkbox to scroll the message. (1 (Fast) - 10 (Slow))

*1. Only available in the Advanced mode.

- "Vertical Writing" is not available when "European stroke" is selected as "Font".
- Refer to Chapter 8 “3.5.2 Text Alignment (Vertical Writing)” on page 142 for precautions when selecting the Vertical Writing setting.
- When Scroll is selected, the operation changes as follows:
- A message on several lines is displayed as a contiguous line without using carriage returns.
- The direction of the scroll depends on the drawing direction of the text string.
- When there is a change in the text string, the message is displayed from the beginning.
- The number of parts which can be placed on a single screen decreases. If the MICRO/I displays an error message, disable the scroll display or reduce the number of parts on the screen.
- When the Scan time is extremely slow, the Scroll Speed may become slow.

5.2.5 Option

These settings associate with the Security Group which can be set on the Options tab by selecting [Home] - [Parts] - [Data Displays] - [Message Switching Display] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.6 Option” on page 144 for the setting parameters.

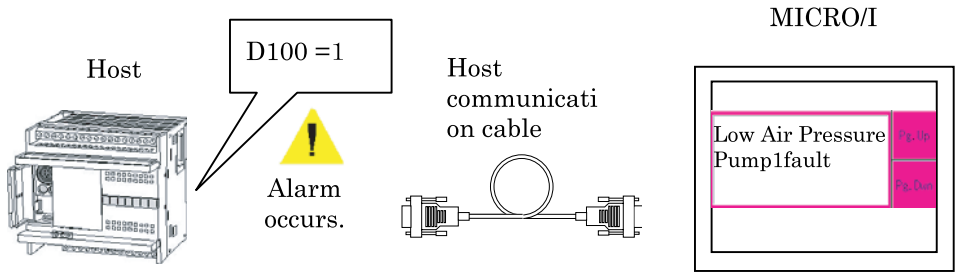
6 Alarm List Display

The Alarm List Display part is used to simultaneously display a number of messages in accordance with the state of the trigger device. The Alarm List Display can be used in the following two ways.

- Use Alarm Log Settings

  The current alarm conditions can be displayed in a list.

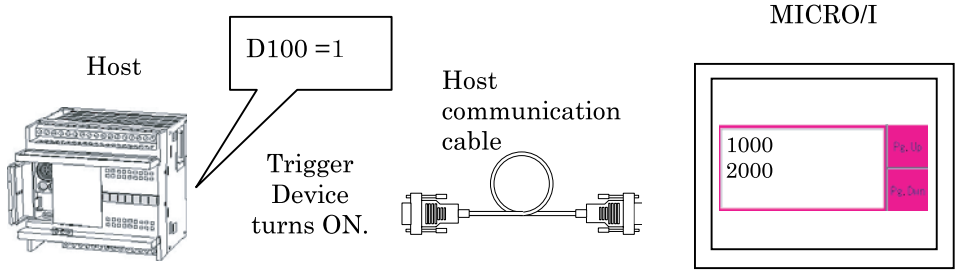
  A message corresponding to each alarm is displayed in Text Manager according to the Alarm Log Settings.



- New Message List

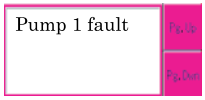
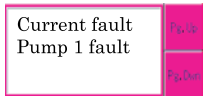
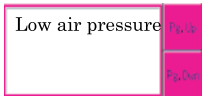
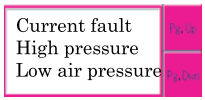
  Two or more messages can be displayed in a list.

  A message corresponding to each bit is displayed in Text Manager according to the Trigger device specified for the Alarm List Display.



6.1 Operation Example

Setting	Alarm List Display	
	Message Settings	Use Alarm Log Settings
	View Type	List, Ascending
	Alarm Log Settings ([Configuration] - [System Setup] - [Alarm Log])	
	General	No. of Blocks: 1
	Channel	Reference Screen Type: Popup Screen, Source Device: D100, Text ID: 1
	Text Manager ([View] - [Workspace] - [Text Manager])	
	ID 1	Current fault
	ID 2	Pump 1 fault
	ID 3	High pressure
	ID 4	Low air pressure

Display				
Source device bottom 4 bits	0010	0011	1000	1101

WARNING When “1” is selected, if more than one device goes ON at the same time, the display priority is the order of registration in the Text Manager.

- Refer to Chapter 9 “Key Button” on page 162 for details regarding key buttons.
  It is possible to make a key button execute two or more operations at one time by overlapping two key buttons. For example, when the Fcs. Dwn button and the Ref. button are overlapped, the Reference screen can be displayed in accordance with the focus movement.
- Only one Alarm List Display or Alarm Log Display can be displayed in a screen.
- The number of lines to be scrolled with the [Pg. Up], [Pg. Dwn], [Fcs. Up], and [Fcs. Dwn] buttons can be specified. Refer to Chapter 9 “Key Button” on page 162 for details.
- When you select “Use Alarm Log Settings”, the recovered alarms are removed from the list automatically regardless of the selected item in Lock/Unlock of Alarm Log Settings.

6.2 Alarm List Display Settings

6.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Data Displays] - [Alarm List Display] from the WindO/I-NV2 menu.

Item	Description
Part Name	Sets the part name. (20 characters)
Message Settings	Set the display messages. Use Alarm Log Settings: Select this option when using a message registered on [Configuration] - [System Setup] - [Alarm Log]. Clicking the Alarm Log Settings button allows you to configure the settings in Alarm Log Settings. New Message List: Select this item to set a new message.
Display Type	Select the number of messages to be displayed at the one time. List: Displays multi lines Sort: Set the display order for list display (Sort: Ascending Descending Old New) One Line: Displays only one line message
Register Occurred No.	Select this checkbox to store the number of bits currently on in the trigger device when New Message List is selected.

6.2.2 List

These settings associate with the message to be displayed which can be set on the List tab by selecting [Home] - [Parts] - [Data Displays] - [Alarm List Display] from the WindO/I-NV2 menu. The settings are configured only when “New Message List” is selected in the Message Settings.

Item	Description
Number of Blocks	Input the number of blocks to use (where one block is comprised of 16 channels). (0 to 64)
Start Text ID	Input the Text ID corresponding to the start bit of the trigger device. Messages are automatically allocated in order of ID starting from the message specified here. (1 to 32000)
Device Setting Method	Select the device setting method. Serial: The trigger device is automatically and continuously set for the block being edited and subsequent blocks starting from the selected address. Random: Allows a trigger device to be set for each block.
Block Settings	Displays the Trigger Device, and number of registered messages set for each block. Clicking the [Edit] or [Insert] button, it opens the Channel Individual Settings and can be set. To clear the settings, click the [Delete] button. Block No.: Displays the Block No. The number is determined by the number specified for “No. of Blocks”. Trigger Device: Displays the device with the trigger conditions for displaying the display message. No. of Reg. Text: Displays the number of registered messages.

- The corresponding messages are continuously set in order of the Text IDs. They cannot be set individually.
- When Serial is selected in Device Settings, it is not possible to make individual trigger device settings. The continuous addresses are set automatically.

6.2.3 Individual Block Settings

These general settings can be set up by using the [Edit] or [Insert] button on the List tab that is accessed by selecting [Home] - [Parts] - [Data Displays] - [Alarm List Display] from the WindO/I-NV2 menu. The settings are configured only when "New Message List" is selected in the Message Settings.

Item		Description
Trigger Device		Set the trigger condition device for displaying the message.
(List)	Msg. No.	Displays the Message No. for each block.
	Enable/Disable	Enable: Read the device bit set in Trigger Device. Disable: Do not read the device bit set in Trigger Device.
	NO/NC	Specify whether the message is to be displayed when the corresponding bit in the trigger device goes on or when it goes off. (NO NC)
	Text ID	Displays the text ID of the display message for the corresponding bit in the trigger device.
	Text	The text corresponding to the "Text ID" is displayed. Only the first line is displayed even if there are multiple lines in the registered text.

WARNING When Serial is selected in the Device Setting, if you change the trigger device, all devices after the set block number are automatically updated.

- The Message No. corresponds to the device bit set in Trigger Device.
- The Text ID is set using Start Text ID in the List tab sheet. It cannot be edited here.
- The text can be edited using the Text Manager dialog box.

6.2.4 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Data Displays] - [Alarm List Display] from the WindO/I-NV2 menu.

Item		Description
Browser		Opens the View Browser for selecting a display image.
Display	Plate Color	Opens the Color Palette for selecting the plate color. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Line Color	Select this checkbox to display lines, and click the button to set a display color. (Select from 256 colors for color display or 16 colors for monochrome display.)
Flange	Fg. Color	Opens the Color Palette for selecting the flange foreground color. This item is not available if No Flange is set for the image. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Bg. Color	Opens the Color Palette for selecting the flange background color. This item is not available if No Flange is set for the image. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Pattern	Opens the Pattern Palette for selecting the flange pattern. This item is not available if No Flange is set for the image. (10 patterns)

Item		Description
Button	Fg. Color	Opens the Color Palette for selecting the button foreground color. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Bg. Color	Opens the Color Palette for selecting the button background color. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Pattern	Opens the Pattern Palette for selecting the button pattern. (10 patterns)
Coordinates		Enter the coordinates of the display position. X: The X coordinate of the left upper point is displayed. Y: The Y coordinate of the left upper point is displayed.
Size		Enter the number of the size. W: The width of this part is displayed. H: The height of this part is displayed.

6.2.5 Format

These settings associate with the display format which can be set on the Format tab by selecting [Home] - [Parts] - [Data Displays] - [Alarm List Display] from the WindO/I-NV2 menu.

Item		Description
Font	Style	Set the font style for the display message. (Regular Bold)
	Magnification	Select the vertical and horizontal magnification for the text. (0.5, 1, 2, 3, 4 or 8)
Display with Same Text Color*1		Select this to unify the text color display. Click the button to display the Color Palette and select a color for the text. If Display with Same Text Color is not selected, the color for each text message will be that set in the Text Manager. (Select from 256 colors for color display or 16 colors for monochrome display.)
Line Spacing*1	Setting Method	Select the method for specifying the amount of vertical space between lines of text. Number of Lines: Specify the number of lines. The line height is adjusted automatically according to the display area on the image. Dots: Specify the line height directly. The relation between “No. of Lines” and “Height [dots]”: Height [dots] =No. of Lines x Magnification (Vertical) x 16
	Height [dots]	Enter the height in dots. (8 and above)
	No. of lines	Enter the number of lines. (1 and above)
Scroll*1		Select the checkbox to scroll the message. This setting is available when “One Line” is selected for View Type on the General tab. (1 (Fast) - 10 (Slow))

*1. Only available in the Advanced mode

WARNING

When Scroll is selected, the operation changes as follows:

- A message on several lines is displayed as a contiguous line without using carriage returns.
- The direction of the scroll depends on the drawing direction of the text string.
- When there is a change in the alarm status, the message is displayed from the beginning.
- The number of parts which can be placed on a single screen decreases. If the MICRO/I displays an error message, disable the scroll display or reduce the number of parts on the screen.
- When the Scan time is extremely slow, the Scroll Speed may become slow.

6.2.6 Options

These settings associate with the display format which can be set on the Options tab by selecting [Home] - [Parts] - [Data Displays] - [Alarm List Display] from the WindO/I-NV2 menu. These settings are configured only when the Advanced mode is selected.

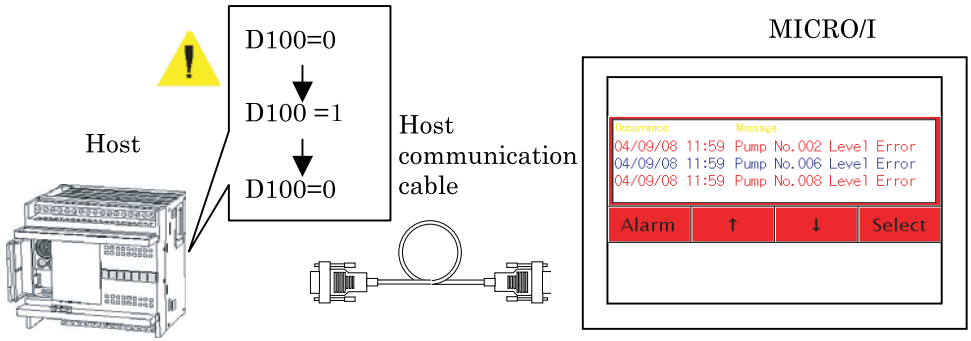
Item	Description
Reference Screen	When using a reference screen for a message, select the type of screen. Enabled when “New Message List” is selected on the General tab. If “Use Alarm Log Settings” is selected on the General tab, the screen type that is selected on the Channel tab of the Alarm Log Settings is displayed on this setting. (Not Use Popup Screen Base Screen)
Coordinates	Set the screen display coordinates for when Popup is selected for the Reference Screen. The value must be a multiple of 20 dots. X: 0 to (Width of the Base Screen - 20) Y: 0 to (Height of the Base Screen - 20)
Screen No. Setting Method	hen Serial is selected, screen numbers after the Message No. being edited are automatically set starting from the Reference Screen No. setting. When Random is selected, you can set a Reference Screen No. for each Message No. (Serial Random)
Reference Screen List	Displays the screen title for the reference screens set for each message. Message No.: Displays the message numbers that are set to Use. Screen No. Displays the corresponding reference screen numbers. Title: Displays the screen title set for the corresponding reference screen.
Security Group	Specify a Security Group for the part. By doing this, the parts displayed during operation can be restricted according to the user. (refer to Chapter 23 “Security Function” on page 407.)

7 Alarm Log Display

The Alarm Log Display displays the alarm log data stored in the MICRO/I.

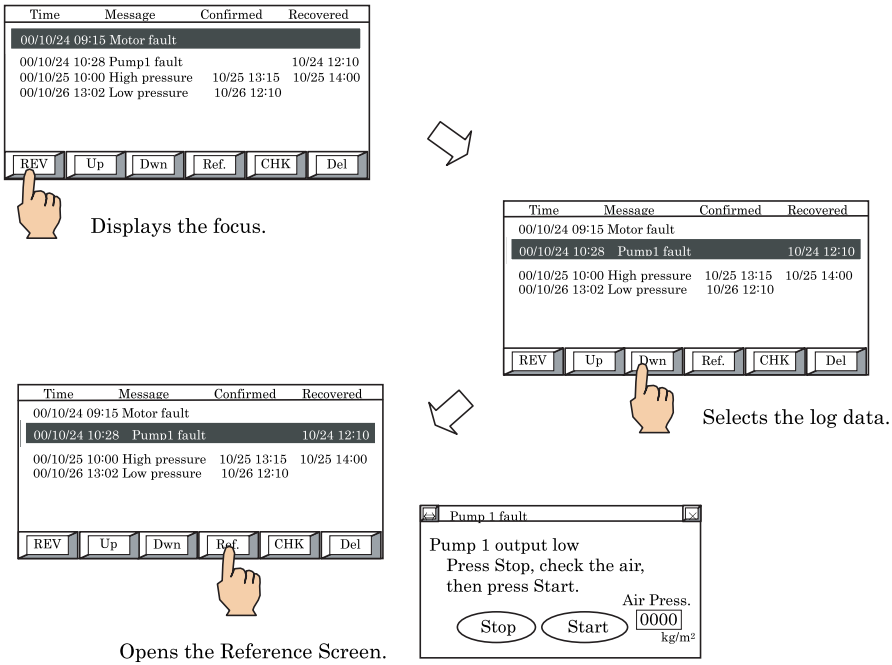
The message, occurrence time, recovery time, and confirmation time corresponding to each alarm can be displayed in a list.

In addition, pressing the Ref. button with the focus placed on the displayed alarm will display the Reference screen corresponding to each alarm.



7.1 Operation Example

Setting	Alarm Log Display	
	Start Line No.	1
	Sort	Old
	Alarm Log ([Configuration] - [System Setup] - [Alarm Log])	
	General	No. of Blocks: 1
	Channel	Reference Screen Type: Popup Screen, Source Device: D100, Text ID: 1
	Text Manager ([View] - [Workspace] - [Text Manager])	
	ID 1	Current fault
	ID 2	Pump 1 fault
	ID 3	High pressure
	ID 4	Low air pressure



- Refer to Chapter 9 “Key Button” on page 162 for details regarding key buttons. It is possible to make a key button execute two or more operations at one time by overlapping two key buttons. For example, when the FRS. Down button and the Ref. button are overlapped, the Reference screen can be displayed in accordance with the focus movement.
- Only one Alarm List Display or Alarm Log Display can be displayed in a screen.
- The number of lines for shifting the focus with the [Fcs. Up] and [Fcs. Dwn] buttons can be specified. Refer to Chapter 9 “Key Button” on page 162 for details.

7.2 Alarm Log Display Settings

7.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Data Displays] - [Alarm Log Display] from the WindO/I-NV2 menu.

Item		Description
Part Name		Sets the part name. (20 characters)
Default Settings	Start Line No.	Input which number of message in the alarm occurrence order to start displaying from in the case that more than one of the specified devices is on at one time. (1 to 1024)
	Sort	Select the message display order. (Old New)
	Display Focus on List after changing Screens or occurring Alarms*1	Displays the focus on the 1st line when a new alarm occurs.
	Display Reference Screen*1	Select the checkbox to display the Reference Screen at the following times. · When the focus has been changed from Hide to Show. · When the focus has been shifted. · When a new alarm has occurred.
Displaying Alarms*1	Not Recovered and Unconfirmed Alarm	Select this checkbox to display the alarms that are neither recovered nor confirmed. They are not displayed when the checkbox is deselected.
	Not Recovered and Confirmed Alarm	Select this checkbox to display the alarms that are confirmed but not recovered. They are not displayed when the checkbox is deselected.
	Recovered and Unconfirmed Alarm	Select this checkbox to display the alarms that are recovered but not confirmed. They are not displayed when the checkbox is deselected.
	Recovered and Confirmed Alarm	Select this checkbox to display the alarms that are recovered and confirmed. They are not displayed when the checkbox is deselected.
First Alarm*1	Change the color of Firs t Alarm	Changes the display color of the first Alarm.
	Display First Alarm to 1st line on List	Always display the First Alarm to the top of list.
Operate the Alarm on the List directly*1		An alarm on the list can be operated directly by pressing the Alarm Log Display.

*1. Only available in the Advanced mode.

7.2.2 Log

These settings associate with the item to be displayed which can be set on the Log tab by selecting [Home] - [Parts] - [Data Displays] - [Alarm Log Display] from the WindO/I-NV2 menu.

Item		Description
Show Items		Select the items to display in the Alarm Log Display. (Title, Occurrence Time, Recovery Time Confirmation Time)
Items	Title	Set titles for the various display items. (40 characters)
	Width	Set the number of display characters. (1 to 40)
	Date	Specify the format for the date. YY/MM/DD MM/DD/YY DD/MM/YY MM/DD DD/MM non-display
	Time	Select the format for the time. (HH: MM HH: MM: SS non-display)
Title	Use Text Manager	Select whether or not to use the registered text with the Text Manager.
	Occurrence Time: Text ID	When the [Use Text Manager] is selected, specify the ID number of the text registered with the Text Manager. (1 to 32000)
	Message: Text ID	When the [Use Text Manager] is selected, specify the ID number of the text registered with the Text Manager. (1 to 32000)
	Recovery Time: Text ID	When the [Use Text Manager] is selected, specify the ID number of the text registered with the Text Manager. (1 to 32000)
	Confirmation Time: Text ID	When the [Use Text Manager] is selected, specify the ID number of the text registered with the Text Manager. (1 to 32000)

- If you change the date or time, the number of characters that can be displayed for the Occurrence Time, Recovery Time and Confirmation Time are automatically adjusted based on the settings.
- If you use the Text ID to the Title, only the first line is displayed even if there are multiple lines in the registered text to the selected ID. (Except Windows font texts)
- The message is displayed in the color set in the Format tab.
- When the Title of “Occurrence Time”, “Message”, “Recovery Time”, or “Confirmation Time” is used a language that is not supported as standard by the OS, the display dialog may become garbled. It will be displayed on the MICRO/I properly after downloading.

7.2.3 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Data Displays] - [Alarm Log Display] from the WindO/I-NV2 menu.

Item		Description
Browser		Opens the View Browser for selecting a display image.
Display	Plate Color	Opens the Color Palette for selecting the plate color. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Line Color	Select this checkbox to display lines, and click the button to display the Color Palette for selecting a display color. (Select from 256 colors for color display or 16 colors for monochrome display.)
Flange	Fg. Color	Opens the Color Palette for selecting the flange foreground color. This item is not available if No Flange is set for the image. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Bg. Color	Opens the Color Palette for selecting the flange background color. This item is not available if No Flange is set for the image. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Pattern	Opens the Pattern Palette for selecting the flange pattern. This item is not available if No Flange is set for the image. (10 patterns)
Button	Fg. Color	Opens the Color Palette for selecting the button foreground color. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Bg. Color	Opens the Color Palette for selecting the button background color. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Pattern	Opens the Pattern Palette for selecting the button pattern. (10 patterns)
Coordinates		Enter the coordinates of the display position. X: The X coordinate of the left upper point is displayed. Y: The Y coordinate of the left upper point is displayed.
Size		Enter the number of the size. W: The width of this part is displayed. H: The height of this part is displayed.

7.2.4 Format

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Data Displays] - [Alarm Log Display] from the WindO/I-NV2 menu.

Item		Description
Style		Set the style for the display message. (Regular Bold) This setting is available when “Japanese”, “European”, “Central European”, “Baltic” or “Cyrillic” is selected under “Font”.
Magnification		Select a magnification for the display message. (1, 2, 3, 4, or 8) This setting is available when “Japanese”, “European”, “Central European”, “Baltic” or “Cyrillic” is selected under “Font”.
Size		Specifies the display text size. (8-128) When “European Stroke” is selected under “Font”:
Title Font		Select the font for the title. (refer to Chapter 37 “3 Character Code Table” on page 575) (European, Japanese, Chinese, Taiwanese, Korean, Central European, Baltic, Cyrillic)
Title Color		Opens the Color Palette for title text color. (Color: 256 Monochrome: 16 TMC: Text color on the Text Manager)
Occurred Color		Opens the Color Palette for setting the display color for alarms when they occur. Select from Color: 256 colors, Monochrome: 16 colors, and TMC (Text color on the Text Manager). The Blink and Reverse[*1] settings can also be set.
Recovered Color		Opens the Color Palette for setting the display color for alarms when they are recovered. Select from Color: 256 colors, Monochrome: 16 colors, and TMC (Text color on the Text Manager). The Blink and Reverse[*1] settings can also be set.
Confirmed Color		Opens the Color Palette for setting the display color for alarms when they are confirmed. Select from Color: 256 colors, Monochrome: 16 colors, and TMC (Text color on the Text Manager). The Blink and Reverse[*1] settings can also be set.
First Alarm Color[*1]		Select the color for displaying the first alarm. Select Color: 256 colors or Monochrome: 16 colors. The Blink and Reverse settings can also be set.
Line Setting[*1]	Setting Method	Select the method of specifying the amount of vertical space between lines of text. No. of Lines: Specify the number of lines. The line height is adjusted automatically according to the display area on the image. Dots: Specify the line height directly. The relationship between “No. of Lines” and “Height [dots]”: Height [dots] =No. of Lines x Magnification (Vertical) x 16
	Height [dots]	Enter the height in dots. (8 and above)
	No. of lines	Enter the number of lines. (1 and above)

*1. Only available in the Advanced mode.

- Also, when both confirmation and recovery have been performed, the color selected for confirmation has priority.
- The “Line Height” setting is not reflected in the title. The number of lines for the title display is fixed to 1, and “title width=1 (number of lines of the title) x Magnification (H) x 16”.

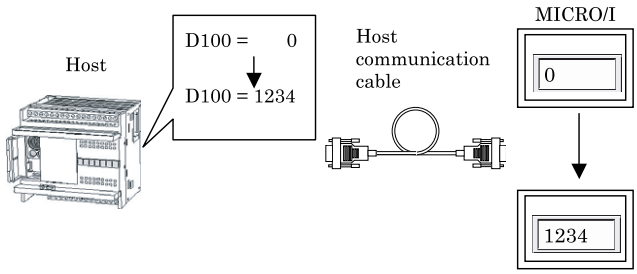
7.2.5 Options

These settings associate with the display format which can be set on the Options tab by selecting [Home] - [Parts] - [Data Displays] - [Alarm Log Display] from the WindO/I-NV2 menu. These settings are configured only when the Advanced mode is selected.

Item	Description
Reference Screen	Displays the reference screen set using the Alarm Log Settings. [...] button: Opens the Alarm Log Settings for reviewing the settings of the Reference Screen on the Channel tab.
Coordinates	Set the display coordinates for the reference screen for each message. The value must be a multiple of 20 dots. X: 0 to (Width of the Base Screen - 20) Y: 0 to (Height of the Base Screen - 20)
Display Block No.	Specify the block number to display from among the collected alarm log data. All: Display all alarm log data. Block No.: Display only the alarm log data in the specified block number.
Security group	Specify a Security Group for the part. By doing this, the parts displayed during operation can be restricted according to the user. (refer to Chapter 23 “Security Function” on page 407.)

8 Numerical Display

The Numerical Display displays a numerical value of the specified device according to the display format specified. It is possible to indirectly specify the device from which data is read. In addition, it is possible to specify the Data Over function for reporting to the specified device.



8.1 Operation Example

8.1.1 Operation Example

Setting	Display Type	Decimal
	Data Format	Data Type-BCD4, Digits-4
	Suppress Zeros	Selected
	Display Device	D100

	1234		????		9999
Data Type	BCD4	➡	BCD4	➡	BCD4
Display Device Value (D100)	1234 (HEX)		A56 (HEX)		9999 (HEX)

8.1.2 Display of Decimal Value

Setting	Display Type	Decimal
	Display Floating Point	Selected

Data Type Digits-4	BIN16 (+)	BCD8	float32
Digits	4	7	2
Display Device Value (LDR200)	1234 (decimal)	4567 (HEX)	70A4 (HEX)
(LDR201)	-	123 (HEX)	3F9D (HEX)
Display	12.34	1234.567	1.23

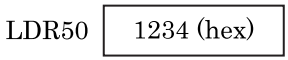
WARNING
- Question marks are displayed when the value in the Display Device is outside the allowed range or not numerical.
- If you set the data type to float32, the data itself expresses the floating point.
- When you will display a floating point, if you set the data type to one of BIN16 (+), BIN16 (+/-), BIN32 (+), BIN32 (+/-), BCD4 or BCD8, the data itself is an integer value, but a floating point is added to display the specified number of decimal digits.

8.1.3 Direct and Indirect read

- Direct read

  Reads directly from the specified display device.

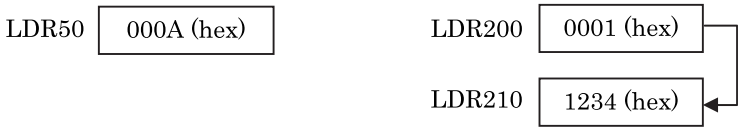
  Ex: Read 1234 (HEX) from LDR50 directly



- Indirect read

  The read address is the value stored in the reference device plus the specified display device address.

  Ex: Display Device: LDR200, Reference Device: LDR50



WARNING ·It can set to the reference device to Max. 32767.

8.2 Numerical Display Settings

8.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Data Displays] - [Numerical Display] from the WindO/I-NV2 menu.

Item		Description
Part Name		Sets the part name. (20 characters)
Display Type		Select the display format for the numerical values. (Decimal Hexadecimal)
Data Format	Data Type	Select the data type for the source data to be displayed. (refer to Chapter 11 “1.2.1 Allowed Digit Settings” on page 193 for details.) (BIN16 (+) BIN16 (+/-) BIN32 (+) BIN32 (+/-) BCD4 BCD8 float32)
	Digits	Set the number of display digits. The setting range depends on the settings for Display Type and Data Type. (refer to Chapter 11 “1.2.1 Allowed Digit Settings” on page 193.)
	Display Floating Point	Select this checkbox to display a floating point.
	Floating Digits	Set the number of floating digits for display. The setting range depends on the settings for Display Type and Data Type. The number of floating digits cannot be specified if the “Display Floating Point” checkbox is not selected. (refer to Chapter 11 “1.2.1 Allowed Digit Settings” on page 193.)
	Floating Symbol	Select a floating symbol. (.,;: /)
	Suppress Zeros	Select this checkbox to suppress display of leading zeros in the integer portion of the display. When this checkbox is selected, the high-order zero of the integer part is not displayed.
	Not Display sign	You can hide a minus sign even if the value is negative, when the data type is BCD4, BCD8, or float32.
Display Method		Set the numerical display method. (refer to Chapter 8 “3.2 Indirect Read and Indirect Write of Devices” on page 129.) Display Device: Set the device that contains the display value. Use Reference Device: When Use Reference Device is selected, the reference device is available.

8.2.2 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Data Displays] - [Numerical Display] from the WindO/I-NV2 menu. Refer to Chapter 8 “3.4 View” on page 137 for the setting parameters.

8.2.3 Format

These settings associate with the display format which can be set on the Format tab by selecting [Home] - [Parts] - [Data Displays] - [Numerical Display] from the WindO/I-NV2 menu.

Item	Description
Font	Select the type of font to be displayed. (Standard, European Stroke, 7-seg)
Size	Specifies the display text size. When “Standard” is selected under “Font”: (8 x 16 16 x 16) When “European Stroke” or “7-seg” is selected under “Font”: (8-128)
Style	Select the display font style. (Regular or Bold) This setting is available when “Standard” is selected under “Font”.
Magnification	Select the magnification for the display numbers. (0.5, 1, 2, 3, 4 or 8) This setting is available when “Standard” is selected under “Font”.
Align Text	Select the horizontal alignment. (Left Center Right)
Text Color	Select the color of the display text. (Select from 256 colors for color display or 16 colors for monochrome display.)
With Unit*1	Select the text string appended to the end of the numerical value from the ID numbers of the Text Manager. The text can be displayed up to 4 characters as a unit. The text is displayed in the color specified on the Format tab.

*1. Only available in the Advanced mode.

When the specified Text ID in the With Unit is used the Windows font, all characters are displayed.

8.2.4 Data Over

These settings associate with the data range which can be set on the Data Over tab by selecting [Home] - [Parts] - [Data Displays] - [Numerical Display] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected.

Item		Description
Range	(Data Type)	Specify the type and value of each data. Value: Use a constant as the data. The setting range for the value depends on the selected data type. (refer to Chapter 11 “1.2.1 Allowed Digit Settings” on page 193 for details.) Device: Use the content of the selected device as the data.
	Minimum/Maximum	Select to set Upper and Lower limits for the input value. Value: Depends on the data type Device: Word device
When Data Over	Blink	Select this to make the display blink when the displayed value is outside the range specified by the maximum and minimum value settings.
	Report	Select this to report when the displayed value is outside the range specified by the maximum and minimum value settings.
	Report Device	Set the report device for when the data is outside of the range specified by the maximum and minimum values.

If you select an item except the “float32” in the Data Type and the “Display Floating Point” is selected on in the [General] tab, enter the value without a decimal point to the Minimum or Maximum in the Data Over tab. For example, if you set the “1.234” to the Maximum, enter the “1234”.

8.2.5 Trigger Condition

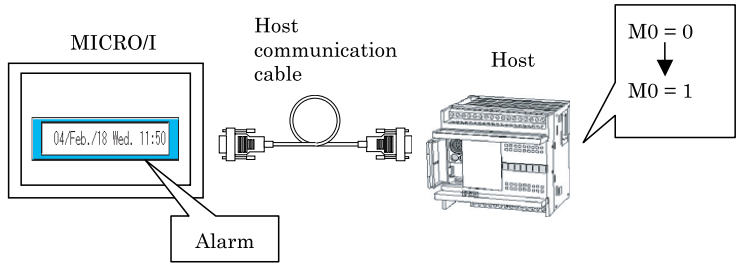
These settings associate with the trigger conditions which can be set on the Trigger Condition tab by selecting [Home] - [Parts] - [Data Displays] - [Numerical Display] from the WindO/I-NV2 menu. Refer to Chapter 8 “3.3.2 Trigger Conditions (Pilot Lamp, Timer, Numerical Display, Message Display, Picture Display, Line Chart, Bar Chart, Calendar)” on page 132 for the setting parameters.

8.2.6 Option

These settings associate with disabling the touch sound, Security Group, and Arithmetic operation, which can be set on the Options tab by selecting [Home] - [Parts] - [Data Displays] - [Numerical Display] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.6 Option” on page 144 for the setting parameters.

9 Calendar

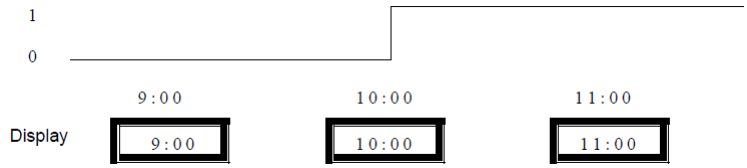
The Calendar displays the date or time using the internal system clock of the MICRO/I. It is possible to set up the Alarm function that turns ON the bit in the specified device at the specified time. It is also possible to set up the Alarm function only without displaying the clock.



9.1 Operation Example

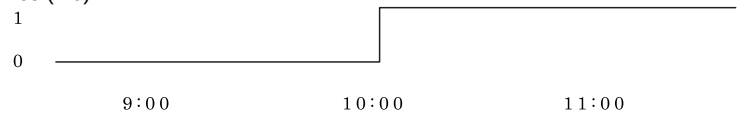
Setting	Calendar Type	Clock & Alarm
	Value/device	Value
	Alarm setting ON time	10:00 a.m.
	Alarm setting OFF time	None
	Alarm Output Device	M0

Alarm destination device (M0)



Setting	Calendar Type	Alarm
	Value/device	Value
	Alarm setting ON time	10:00 a.m.
	Alarm setting OFF time	None
	Alarm Output Device	M0

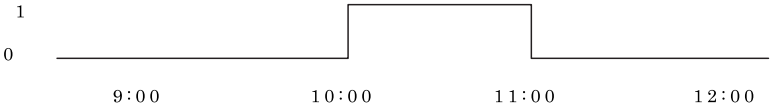
Alarm destination device (M0)



(These values do not appear on the screen)

Setting	Calendar Type	Alarm
	Value/device	Value
	Alarm setting ON time	10:00 a.m.
	Alarm setting OFF time	11:00 a.m.
	Alarm Output Device	M0

Alarm destination device (M0)



(These values do not appear on the screen)

WARNING

- Nothing is displayed when Alarm is selected for the calendar type.
- When an alarm has been set, the output bit device goes on when the alarm time is reached, and continues to stay on. If the OFF time is set, the output bit device switches to OFF at the specified time.
- If the current time is between the ON time and OFF time when the power supply is turned on or a screen is opened, the output bit device switches to ON although the ON time has passed. If the OFF time is not set, the output bit device does not switch to OFF although the ON time has passed.
- If the output bit device is changed, the value is keep till next alarm time.

9.2 Calendar Settings

9.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Data Displays] - [Calendar] from the WindO/I-NV2 menu.

Item		Description
Part Name		Sets the part name. (20 characters)
Calendar Type		Select the calendar operation mode. (Clock, Alarm, Clock & Alarm)
Clock	Clock Type	Select the display items. (Time, Day of the Week & Time, Date & Time, Date & Day of the Week & Time)
	Date Type	Specify the format for the date. (YY/MM/DD, MM/DD/YY, DD/MM/YY, MM/DD, DD/MM)
	Year	Specify the number of digits to be used for the year. (Double Figures, Four Figures)
	Month	Select the format for the month display. (1/2/3..., Jan/Feb/Mar/...)
	Time	Select the format for the time display. (HH: MM HH: MM: SS)

The Year, Month and Date settings are restricted according to the Clock Type.

9.2.2 Alarm

These settings associate with the report function of the alarm which can be set on the Alarm tab by selecting [Home] - [Parts] - [Data Displays] - [Calendar] from the WindO/I-NV2 menu. These settings are configured only when “Alarm” or “Clock & Alarm” is selected for the Calendar Type.

Item			Description
Alarm Time	Value/ Device	Value:	Specify date and time directly.
		Device:	Specify the BCD values stored in the specified device as date and time.
	ON Time	Year	Input the year. (0 to 99)
		Month	Input the month. (1 to 12)
		Day	Input the day. (1 to 31)
		Day of the Week	Input the day of the week.
		Hour	Input the hour. (0 to 23)
		Minute	Input the minute. (0 to 59)
		Second	Input the second. (0 to 59)
	OFF Time	Year	Input the year. (0 to 99)
		Month	Input the month. (1 to 12)
		Day	Input the day. (1 to 31)
		Day of the Week	Input the day of the week.
		Hour	Input the hour. (0 to 23)
		Minute	Input the minute. (0 to 59)
		Second	Input the second. (0 to 59)
Alarm Output Device			Set the output destination device to be output to at the notification time. When the alarm time setting is reached, the output destination bit device goes on.

9.2.3 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Data Displays] - [Calendar] from the WindO/I-NV2 menu. Refer to Chapter 11 “9.2.3 View” on page 236 for the setting parameters.

9.2.4 Trigger Condition

These settings associate with the trigger conditions which can be set on the Trigger Condition tab by selecting [Home] - [Parts] - [Data Displays] - [Calendar] from the WindO/I-NV2 menu. Refer to Chapter 8 “3.3.2 Trigger Conditions (Pilot Lamp, Timer, Numerical Display, Message Display, Picture Display, Line Chart, Bar Chart, Calendar)” on page 132 for the setting parameters.

9.2.5 Format

These settings associate with the display format which can be set on the Format tab by selecting [Home] - [Parts] - [Data Displays] - [Calendar] from the WindO/I-NV2 menu.

Item	Description
Font	Select the type of font to be displayed. (Standard, European Stroke, 7-seg)
Size	Specifies the display text size. When “Standard” is selected under “Font”: (8 x 16 16 x 16) When “European Stroke” or “7-seg” is selected under “Font”: (8-128)
Style	Select the font style for the display numbers. (Regular Bold) This setting is available when “Standard” is selected under “Font”.

Item	Description
Magnification	Select the magnification for the display numbers. (0.5, 1, 2, 3, 4 or 8) This setting is available when “Standard” is selected under “Font”.
Align Text	Select the horizontal alignment. (Left Center Right)
Text Color	Select the color of the display text. (Select from 256 colors for color display or 16 colors for monochrome display.

9.2.6 Option

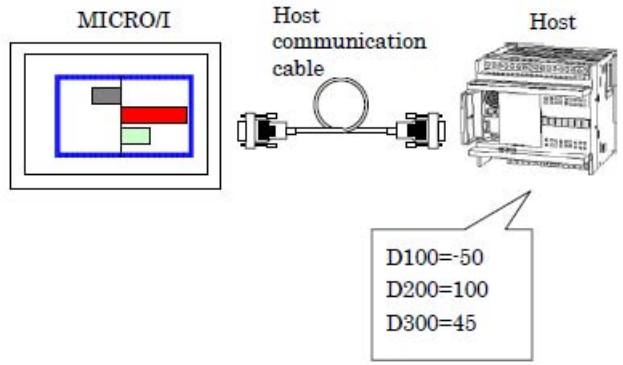
These settings associate with the Security Group which can be set on the Options tab by selecting [Home] - [Parts] - [Data Displays] - [Calendar] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.6 Option” on page 144 for the setting parameters.

Chapter 12 Graph and Meter Parts

1 Bar Chart

The Bar Chart part is used to display data from multiple devices.

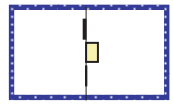
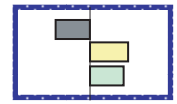
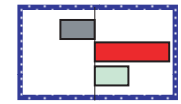
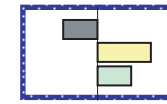
Up to 10 data can be displayed side-by-side in relative values with the origin being the axis. The Bar Chart can display the transition of the value in the specified device in real time. This part can be used only when the display is installed horizontally.



1.1 Operation Example

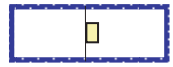
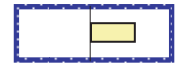
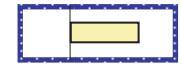
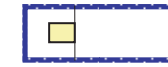
1.1.1 When the data of Origin and Minimum/Maximum is fixed

Setting	Origin	50
	Minimum	0
	Maximum	100
	Ch1 to Ch3	D100 to D300
	Upper limit	90
	Lower limit	10

Display				
	Current value	Current value	Error	Current value
Ch1 input value	45	30	30	30
Ch2 input value	60	75	95 (Data Over)	80 (Value in range)
Ch3 input value	50	70	70	70

1.1.2 When the data of Origin and Minimum/Maximum is variable

Setting	Origin	D0
	Minimum	D1
	Maximum	D2
	Ch1	D100

Display				
Updated value	-	minimum/ maximum	Origin	Ch1
Origin value	50	50	40	40
Minimum value	0	30	30	30
Maximum value	100	70	70	70
Ch1 input value	60	60	60	35

- The graph is not updated in the case that the maximum value equals the minimum value, and if the maximum value equals the minimum value immediately after the Bar Chart part is triggered, the bar graph is not displayed. In such cases, a calculation error is set in System Area 2.
- If the data type is set as BCD and the data contains a character from A to F, a calculation error is set in System Area 2.
- When Variable is selected for Data Format and the device value is (Maximum value) =< (Minimum value), a calculation error is set in System Area 2.

Only the peak points of bars are displayed on the Peak graphs.

1.2 Bar Chart Settings

1.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Charts] - [Bar Chart] from the WindO/I-NV2 menu.

Item		Description
Part Name		Sets the part name. (20 characters)
Graph Type		Select the type of graph. (Horizontal Bar Vertical Bar Horizontal Peak Vertical Peak)
Data Format	Data Type	Select the data type for the source data. (refer to Chapter 8 “3.1 Data Type” on page 127 for details.) (BIN16 (+) BIN16 (+/-) BIN32 (+) BIN32 (+/-) BCD4 BCD8)
	(Data)	Specify the type and value of the origin and minimum/maximum values. Value: Use a constant as the origin and minimum/maximum values. The allowable range of the value depends on the selected data type. (refer to Chapter 8 “3.1 Data Type” on page 127.) Device: Use the content of the selected device as the origin and minimum/maximum values.
	Origin	Set the origin for the graph. The setting range depends on the data type. (refer to Chapter 8 “3.1 Data Type” on page 127 for details.)
	Minimum	Set the minimum value for the graph. The setting range depends on the data type. (refer to Chapter 8 “3.1 Data Type” on page 127 for details.)
	Maximum	Set the maximum value for the graph. The setting range depends on the data type. (refer to Chapter 8 “3.1 Data Type” on page 127 for details.)

1.2.2 Data

These settings associate with the data to be displayed which can be set up on the Graph tab by selecting [Home] - [Parts] - [Charts] - [Bar Chart] from the WindO/I-NV2 menu.

Item		Description
Settings		The settings for Device, Fg. Color (Normal), Fg. Color (Data Over), Bg. Color (Normal), Bg. Color (Data Over), and Pattern are displayed in the List scroll box. Clicking the [Set], [Insert], or [Remove] button will reflect the settings on the list. No.: The graph channel number. Device: The setting of the Reference Device item. “Unregistered” is displayed if the channel has not been set. Fg. Normal: Displays the color set for Fg. Color (Normal). Fg. Over: Displays the color set for Fg. Color (Data Over). Bg. Normal: Displays the color set for Bg. Color (Normal). Bg. Over: Displays the color set for Bg. Color (Data Over). Pattern: Displays the pattern setting.
Reference Device		Select the device where the data for display in the graph is stored.
Fg. Color	Normal	Displays the Color Palette for selecting the normal foreground color. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Data over	Displays the Color Palette for selecting the data over foreground color. (Select from 256 colors for color display or 16 colors for monochrome display.)

Item		Description
Bg. Color	Normal	Displays the Color Palette for selecting the normal background color. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Data over	Displays the Color Palette for selecting the data over background ground color. (Select from 256 colors for color display or 16 colors for monochrome display.)
Pattern		Displays the Pattern Palette for selecting the pattern. (10 patterns)

- It is not possible to set more than one channel at a time.
- Channel settings must be performed in order from Ch1.

- The Insert button is disabled if all channels have been set or an unregistered channel is selected.
- When you select an unregistered channel, the default color and pattern settings are displayed.

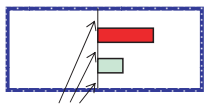
1.2.3 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Charts] - [Bar Chart] from the WindO/I-NV2 menu.

Item		Description
Browser		Opens the View Browser for selecting a display image.
Plate Color		Opens the Color Palette for selecting the plate color. (Select from 256 colors for color display or 16 colors for monochrome display.)
Flange	Fg. Color	Opens the Color Palette for selecting the foreground color. This item is not available if No Flange is set for the image. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Bg. Color	Opens the Color Palette for selecting the background color. This item is not available if No Flange is set for the image. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Pattern	Opens the Pattern Palette for selecting Sets the pattern. This item is not available if No Flange is set for the image. (10 patterns)
Space between Bars*1		Specifies the space between bars on a bar graph.
Coordinates		Enter the coordinates of the display position. X: The X coordinate of the left upper point is displayed. Y: The Y coordinate of the left upper point is displayed.
Size		Enter the number of the size. W: The width of this part is displayed. H: The height of this part is displayed.

*1. Only available in the Advanced mode.

The space specified with the “Space between Bars” option is also applied to both margins of the graph.



Space between Bars

1.2.4 Data Over

These settings associate with the data range which can be set on the Data Over tab by selecting [Home] - [Parts] - [Charts] - [Bar Chart] from the WindO/I-NV2 menu. The settings are configured only when the Advanced mode is selected.

Item		Description
Range	Data Type	Specify the type and value of each data. Value: Use a constant as the data. The setting range for the value depends on the selected data type. (refer to Chapter 8 “3.1 Data Type” on page 127 for details.) Device: Use the content of the selected device as the data.
	Minimum/ Maximum	Select to set Upper and Lower limits for the input value. (Value: depends on the Data Type Device: Word device)
When Data Over	Blink	Select this to make the display blink when the displayed value is outside the range specified by the maximum and minimum value settings.
	Report	Select this to report when the displayed value is outside the range specified by the maximum and minimum value settings.
	Report Device	Set the report device for when the data is outside of the range specified by the maximum and minimum values.

When the “Minimum” or “Maximum” checkbox is not selected, the lower limit or upper limit cannot be specified.

1.2.5 Scale

These settings associate with the display of ticks and labels which can be set on the Scale tab by selecting [Home] - [Parts] - [Charts] - [Bar Chart] from the WindO/I-NV2 menu. The settings are configured only when the Advanced mode is selected.

Item (X-Axis/ Y-Axis)		Description
Show Ticks	(Show Ticks)	Select this checkbox to display a scale on the graph.
	Major Divisions	Enter the number of the major divisions on the X or Y-axis. (1 to 20)
	Minor Divisions	Enter the number of the minor divisions on the X or Y-axis. (1 to 20)
	Color	Select the color of the scale. (Color: 256 colors Monochrome: 16 colors)
	Show Tick Numbers	Select this checkbox to display numbers at the scale divisions.
Show Grid	(Show Grid)	Select this checkbox to display a gridline on the graph.
	Gridline Type	Select the type of gridline display. (Scale Data over)
	Line Type	Select the line type for the gridline. (Solid, Dot, Dash, Long Dash, Long Dash Dot, Long Dash Dot Dot)
	Color	Select the color of the gridline. (Color: 256 colors Monochrome: 16 colors)
Show Label	(Show Label)	Select this checkbox to display a label.
	Font	Select the font for the label. (refer to Chapter 37 “3 Character Code Table” on page 575 for details.) (Japanese, European, Chinese, Taiwanese, Korean, Central European, Baltic, Cyrillic)
	Text	Enter the text you want for the label. (40 characters)
	Text ID	When the [Use Text Manager] is selected, specify the ID number of the text registered with the Text Manager. (1 to 32000) Even if the text for the specified Text ID consists of multiple lines, only one line is displayed.)
	Color	Select the label color. (Color: 256 colors Monochrome: 16 colors TMC: Text color on the Text Manager)
Use Text Manager		Select whether or not to use the registered text with the Text Manager.

- When there is not a sufficient area on the image for displaying scales, the scales are not displayed properly.
- If you select the “Device” in the Minimum & Maximum of the Data Over, you can display the gridline with the “Scale” type only.
- When Device is selected for Data Type, only Scale can be selected for Gridline Type.
- When Device is selected for Data Type, Show Tick Numbers cannot be selected.

- If you select the “Horizontal Bar/Peak” in the Graph Type of the General tab, the scale is on the X-axis. And if the “Vertical Bar/Peak” is selected, it is on the Y-axis.
- If you select the “Data Over” in the Grid Type of the Scale tab, the gridlines are displayed at the positions of the Minimum and the Maximum in the Data Over tab. And the solid line with the same color as the scale is always displayed at the position of the Origin in the General tab.
- If you use the Text ID to the label for a scale, only the first line is displayed even if there are multiple lines in the registered text to the selected ID.
- The gridline is displayed over the graph.

1.2.6 Trigger Condition

These settings associate with disabling the touch sound, Security Group, and Arithmetic operation, which can be set on the Options tab by selecting [Home] - [Parts] - [Charts] - [Bar Chart] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.3.2 Trigger Conditions (Pilot Lamp, Timer, Numerical Display, Message Display, Picture Display, Line Chart, Bar Chart, Calendar)” on page 132 for the setting parameters.

1.2.7 Option

These settings associate with the Security Group which can be set on the Options tab by selecting [Home] - [Parts] - [Charts] - [Bar Chart] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.6 Option” on page 144 for the setting parameters.

2 Line Chart

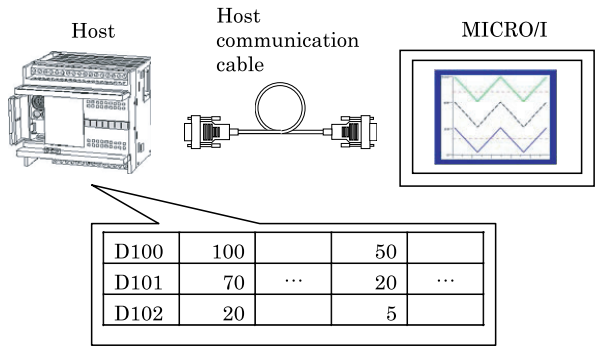
The Line Chart part displays log data from multiple devices in a line chart. The data in the specified device is sampled at stated or any cycle and stored as log data by using Data Log Settings. The Line Chart displays a graph of the log data or the data of the contiguous device address as one line graph.

The type of graph can be selected from Log Trend (Normal or Pen Recorder) and Device Display.

When the Log Trend is selected in the Trend Type, the Line Chart displays up to 20 line graphs on the display area.

The Data Log Setting for the device to be displayed with the Line Chart part should be set up for the entire project. The maximum number of the channel is 20.

The Line Chart (Device Display) displays the data stored in two or more contiguous word devices on a single trend graph. When Device Display is selected, only one line graph is displayed on the display area, which will not involve the restrictions of the Trend channel setting for the entire system.

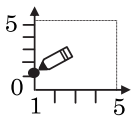
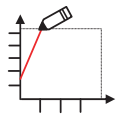
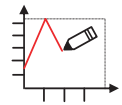
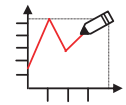
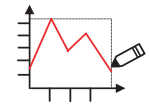
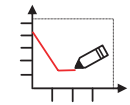


2.1 Operation Example

2.1.1 Normal Display

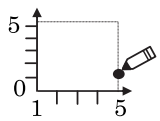
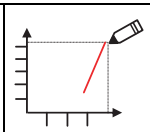
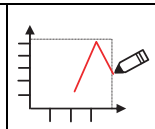
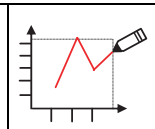
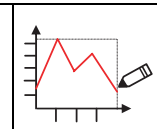
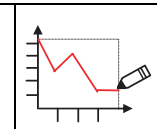
When the value in the device specified for the Graph No. (Channel No.) changes, it is displayed on the graph in series. The latest data is displayed for each sample, and when all points are displayed, the data scrolls to the left according to the setting for Scroll Points to update the display.

Left and right scrolling can be done manually in 1-point steps.

Example Display points: 5 Scroll Points: 3						
	1st point	2nd point	3rd point	4th point	5th point	Scroll and 6th point
Channel value	10	50	30	40	10	10

2.1.2 Pen Recorder Display

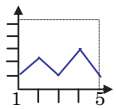
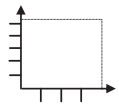
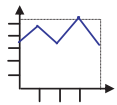
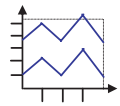
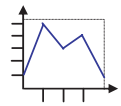
When the value in the device specified for the Graph No. (Channel No.) changes it is displayed on the chart in series. The chart display is scrolled to the left at each sample, and the latest data is always displayed at the right edge of the chart.

Example Display points: 5						
	1st point	2nd point	3rd point	4th point	5th point	Scroll and 6th point
Channel value	10	50	30	40	10	10

2.1.3 Device Display

Displays the data from a multiple sequence of devices on one line chart. This allows you to watch the variation of the data in multiple devices at one time. The Control Status can be use to control chart display (on or off). The number of data to be displayed is determined by the value stored in the second device (the address of the Reference Device +1). The display is controlled by the value of the first device (Control status).

Setting	Chart Type	Line Chart (Device Display)
	Reference Device	D100

Start address	Example Display points: 5					
+0 (D100)	Control status value	1	2	1	1	3
	Display	Update display	Clear display	Update display	Update display	Clear and update display
+1 (D101)	Display Data No.	5	5	5	5	5
+2 (D102)	Display Data 1 Value	10	10	30	10	10
+3 (D103)	Display Data 2 Value	20	20	40	20	50
+4 (D104)	Display Data 3 Value	10	10	20	10	10
+5 (D105)	Display Data 4 Value	30	30	60	30	40
+6 (D106)	Display Data 5 Value	10	10	20	10	10

Note 1: After a value is written to Control Status and processed, it is then cleared to 0.
Note 2: Display control is done using the bottom two bits of Control Status.
00: No display update
01: Update display
10: Clear display
11: Clear and update display

- Data is always updated in the case of Normal and Pen Recorder Display.
- If there is a lot of displayed data, then it may take some time to update Device Display.the line chart. (Only if “Trend Type” is “Device Display”)
- If data type “BCD” is selected and the data contains a value other than 0 through 9, an error message will be displayed in the MICRO/I. In addition, an error value of 1 will be set to System Area 2. Refer to Chapter 5 “Arithmetic Error” on page 94.
- You cannot display multiple data generated from different sampling conditions in a single line chart. To display multiple data, make the sampling conditions the same.

2.2 Settings

2.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Charts] - [Line Chart] from the WindO/I-NV2 menu.

Item		Description
Part Name		Sets the part name. (20 characters)
Trend Type		Select the type of trend graph. (Normal, Pen Recorder or Device Display)
Data Format	Data Type	Select the data type for the graph display data. (refer to Chapter 8 “3.1 Data Type” on page 127 for details.) (BIN16 (+) BIN16 (+/-) BCD4)
	Minimum	Set the maximum value for the graph display data. (Depends on the data type) (refer to Chapter 8 “3.1 Data Type” on page 127 for details.)
	Maximum	Set the minimum value for the graph display data. (Depends on the data type) (refer to Chapter 8 “3.1 Data Type” on page 127for details.)
Display Points		Set the maximum number of display points. Configure this parameter when Log Trend (Normal or Pen Recorder) is selected. (2 to the width of the editing screen)
Scroll Size		Set the scroll step size for automatic scrolling. Configure this parameter when Log Trend (Normal or Pen Recorder) is selected. (1 to the width of the editing screen)
Restart Chart		Set the drawing method while changing screens for Log Line Chart (Normal / Pen Recorder). Selected, the chart is drawing from scratch right after changing the screen.
Scroll*1	Enable Scroll	Select this checkbox when you want to switch between automatic and manual scrolling. The chart scrolling can be controlled by the device that you specify. Configure this parameter when Log Trend (Normal or Pen Recorder) is selected. (When Log Trend (Normal) or Log Trend (Pen Recorder) is selected) (Specify the bit for the Bit device or Word device)
	Right Scroll Device/ Left Scroll Device	Select the device to scroll to the right/left when the graph display is switched to manual. The graph is scrolled one point to the left each time the specified device goes on. Configure this parameter when Log Trend (Normal or Pen Recorder) is selected. (When Log Trend (Normal) or Log Trend (Pen Recorder) is selected) Specify the bit for the Bit device or Word device.

*1. Only available in the Advanced mode

2.2.2 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Charts] - [Line Chart] from the WindO/I-NV2 menu. Refer to Chapter 8 “3.4 View” on page 137 for the setting parameters.

2.2.3 Pen (Log) for Normal/Pen Recorder Display

These settings associate with the data to be displayed which can be set on the Pen (Log) tab by selecting [Home] - [Parts] - [Charts] - [Line Chart] from the WindO/I-NV2 menu. Configure these settings when Log Trend (Normal or Pen Recorder) is selected for the Trend Type on the General tab.

Item	Description
Settings:	The Log No., Line Type, Line Size, and Line Color set for each channel are displayed. Clicking the [Set], [Insert], or [Remove] button reflects the setting on the list. (The channel settings must be done in order from Ch1) No.: Displays the graph channel number. Channel No. Displays the settings in the Log No. "Unregistered" is displayed for channels that have not been set. Data No.: Displays the data number that will be used to draw a graph. Line Type Displays the setting for Line Type. Line Size Displays the setting for Line Size. Line Color Displays the setting for Line Color.
Channel No.	Select the number of the Channel No. to be referenced from the list in the Data Log Settings. (1 to 20) [Data Log Settings…]: Display the Data Log Settings dialog box and select the Device Log No. to be displayed in the chart. (refer to Chapter 16 "Operation Log Function" on page 315.)
Data No.:	Select a number you want to display in the line chart from Data No. that is registered in the selected Channel No. of Data Log Settings.
Line Type:	Select the type of line to be displayed in the chart. (Solid line, Dotted line, Broken line, Broken line (Long type), Alternate long and short dashed line, Chain double-dashed line)
Line Size:	Select the size of the line to be displayed in the chart. (1, 2, 3 or 5 dots)
Line Color:	Displays the Color Palette for selecting the color of the lines in the chart. (Colors: 256 Monochrome: 16)

WARNING Only HG2G supports the "Data No." setting. In case of HG1F/2F/2S/3F/4F, value of the "Source" device address set in the selected Channel No. is displayed to a graph.

2.2.4 Pen (Device) for Device Display

These settings associate with the data to be displayed which can be set up on the Pen (Device) tab by selecting [Home] - [Parts] - [Charts] - [Line Chart] from the WindO/I-NV2 menu. Configure these settings when Line Chart (Device Display) is selected for the Trend Type on the General tab.

Item	Description
Reference Device	Specify the first address of the device used in the line chart (device display). The number of data items displayed in the line chart (device display) is specified by device value [first address of reference device + 2]. Refer to "2.1.3 Device Display" (P248).
Line Type	Select the type of line to be displayed in the graph. (Solid line, Dotted line, Broken line, Broken line (Long type), Alternate long and short dashed line, Chain double-dashed line)
Line Size	Select the size of the line to be displayed in the graph. (1, 2, 3 or 5 dots)
Line Color	Displays the Color Palette for selecting the color of the lines in the graph. (Colors: 256 Monochrome: 16)

2.2.5 Data Over

These settings associate with the data range which can be set on the Data Over tab by selecting [Home] - [Parts] - [Charts] - [Line Chart] from the WindO/I-NV2 menu. This option can be set only when the Advanced mode is selected, and is available when the Data Over is selected in Grid Type on the Scale tab.

Item		Description
Range	(Data Type)	Specify the type and value of each data. Value: Use a constant as the data. The setting range for the value depends on the selected data type. (refer to Chapter 8 “3.1 Data Type” on page 127)
	Minimum/ Maximum	Select to set Upper and Lower limits for the input value. When the “Minimum” or “Maximum” checkbox is not selected, the lower limit or upper limit cannot be specified. (Depends on the selected item in the (Data Type))

2.2.6 Scale

These settings associate with the display of ticks and labels which can be set on the Scale tab by selecting [Home] - [Parts] - [Charts] - [Line Chart] from the WindO/I-NV2 menu. The settings are configured only when the Advanced mode is selected.

Item (X-Axis/Y-Axis)			Description
X-Axis	Show Ticks	(Show Ticks)	Select this checkbox to display a scale on the graph.
		Major Divisions	Enter the number of the major divisions on the X-axis (1 to 20)
		Minor Divisions	Enter the number of the minor divisions on the X-axis. (1 to 20)
		Color	Select the color of the scale. (Color: 256 colors Monochrome: 16 colors)
	Show Grid	(Show Grid)	Select this checkbox to display a gridline on the graph. Enabled only when “Device Display” is selected for the Trend Type. When you select the “Device display” in Line Chart
		Grid Type	Select the type of gridline display. (Scale Data over)
		Line Type	Select the line type for the gridline. (Solid line, Dotted line, Broken line, Broken line (Long type), Alternate long and short dashed line, Chain double-dashed line)
		Color	Select the color of the gridline. (Color: 256 colors Monochrome: 16 colors)
	Show Label	(Show Label)	Select this checkbox to display a label.
		Use Text Manager	Select whether or not to use the registered text with the Text Manager.
		Font	Select the font for the label. (refer to Chapter 37 “3 Character Code Table” on page 575) (Japanese, European, Chinese, Taiwanese, Korean, Central European, Baltic, Cyrillic)
		Text	Enter the text you want for the label. (40 characters)
		Text ID	When the [Use Text Manager] is selected, specify the ID number of the text registered with the Text Manager. (1 to 32000) Even when the text for the specified Text ID consists of multiple lines, only one line is displayed.
		Color	Select the label color. (Color: 256 colors Monochrome: 16 colors TMC: Text Color on the Text Manager)

Item (X-Axis/Y-Axis)			Description
Y-Axis	Show Ticks	(Show Ticks)	Select this checkbox to display a scale on the graph.
		Major Divisions	Enter the number of the major divisions on the X-axis (1 to 20)
		Minor Divisions	Enter the number of the minor divisions on the X-axis. (1 to 20)
		Color	Select the color of the scale. (Color: 256 colors Monochrome: 16 colors)
		Show Tick Numbers	Select this checkbox to display numbers at the scale divisions.
	Show Grid	(Show Grid)	Select this checkbox to display a gridline on the graph.
		Grid Type	Select the type of gridline display. (Scale Data over)
		Line Type	Select the line type for the gridline. (Solid line, Dotted line, Broken line, Broken line (Long type), Alternate long and short dashed line, Chain double-dashed line)
		Color	Select the color of the gridline. (Color: 256 colors Monochrome: 16 colors)
	Show Label	(Show Label)	Select this checkbox to display a label.
		Use Text Manager	Select whether or not to use the registered text with the Text Manager.
		Font	Select the font for the label. (refer to Chapter 37 “3 Character Code Table” on page 575) (Japanese, European, Chinese, Taiwanese, Korean, Central European, Baltic, Cyrillic)
		Text	Enter the text you want for the label. (40 characters)
		Text ID	When the [Use Text Manager] is selected, specify the ID number of the text registered with the Text Manager. (1 to 32000) Even when the text for the specified Text ID consists of multiple lines, only one line is displayed.
		Color	Select the label color. (Color: 256 colors Monochrome: 16 colors TMC: Text Color on the Text Manager)

WARNING When there is not a sufficient area on the image for displaying scales, the scales are not displayed properly.

- If you select the “Data Over” in the Grid Type of the Scale tab, the gridlines are displayed at the positions of the Minimum and the Maximum in the Data Over tab. And the solid line with the same color as the scale is always displayed at the position of the Origin in the General tab.
- The grid is displayed over the graph.

2.2.7 Trigger Condition

These settings associate with the trigger conditions which can be set on the Trigger Condition tab by selecting [Home] - [Parts] - [Charts] - [Line Chart] from the WindO/I-NV2 menu. Refer to Chapter 8 “3.3.2 Trigger Conditions (Pilot Lamp, Timer, Numerical Display, Message Display, Picture Display, Line Chart, Bar Chart, Calendar)” on page 132 for the setting parameters.

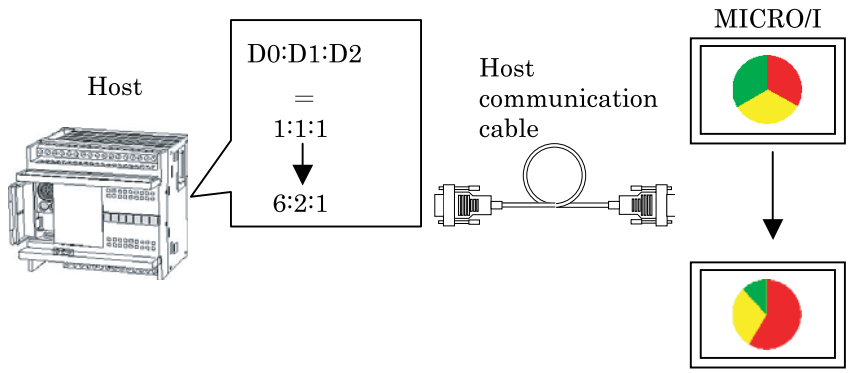
2.2.8 Option

These settings associate with the Security Group which can be set on the Options tab by selecting [Home] - [Parts] - [Charts] - [Line Chart] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 8 “3.6 Option” on page 144 for the setting parameters.

3 Pie Chart

The Pie Chart part graphs data in multiple word units and displays it on the screen. Up to 10 data can be displayed on one graph to illustrate the ratio of each data using a pie chart, or horizontal or vertical bar graph.

The Pie Chart can relatively display the transition of the value in the specified device in real time.



3.1 Operation Example

Setting	Chart Type	Horizontal Bar
	Data	Ch1: D100, Ch2: D200, Ch3:300

Display					
	Latest state		Latest state		Latest state
Ch1	4		4		0
Ch2	4		5		0
Ch3	2		1		0

WARNING

- When BCD is set and there is something other than 0 to 9 in the read data, a “1” is written to Calculation Error in System Area 2, and an error message is displayed. (Refer to Chapter 5 “Arithmetic Error” on page 94)
- If all of the source data is “0” all data is displayed as the same percentage on the graph. An error message is not displayed in this case.
- The latest data is displayed at all times.

3.2 Pie Chart Settings

3.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Charts] - [Pie Chart] from the WindO/I-NV2 menu.

Item		Description
Part Name		Sets the part name. (20 characters)
Chart Type		Select the chart type. (Horizontal Bar Vertical Bar Pie)
Data Type		Select the type of the source data for display in the chart. (refer to Chapter 8 “3.1 Data Type” on page 127 for details.) (BIN16 (+) BIN32 (+) BCD4 BCD8)
Data	Settings	Set the data to be loaded and displayed on the chart. The Device, Fg. Color, Bg. Color and Pattern for the selected channel are displayed in the list. Clicking the [Set], [Insert], or [Remove] button will reflect the settings on the list. No.: The channel number of the chart. Device: Displays the Reference Device item settings. “Unregistered” is displayed when a channel has not been registered. Fg.: The color set using Fg. Color. Bg.: The color set using Bg. Color. Pattern: The pattern set using Pattern.
	Reference Device	Select the device that holds the data to be displayed on the graph.
	Fg. Color	Opens the Color Palette for setting the foreground color. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Bg. Color	Opens the Color Palette for setting the background color. (Select from 256 colors for color display or 16 colors for monochrome display.)
	Pattern	Opens the Pattern Palette for setting the pattern. (10 patterns)

- It is not possible to set more than one channel at a time.
- Channel settings must be performed in order from Ch1.
- The Set button is disabled until a reference device is set.
- The Insert button is disabled if all channels have been set or an unregistered channel is selected.

When you select an unregistered channel, the default color and pattern settings are displayed.

3.2.2 View

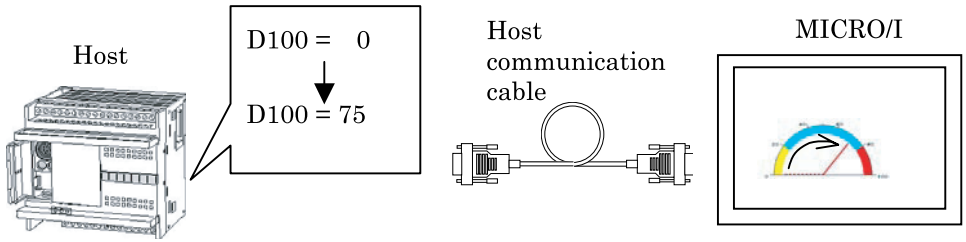
These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Charts] - [Pie Chart] from the WindO/I-NV2 menu. Refer to Chapter 12 “3.2.2 View” on page 254 for the setting parameters.

3.2.3 Option

These settings associate with the Security Group which can be set on the Options tab by selecting [Home] - [Parts] - [Charts] - [Pie Chart] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 12 “3.2.3 Option” on page 254 for the setting parameters.

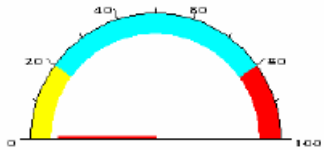
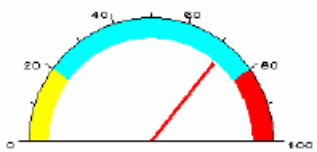
4 Meter

The Meter displays the numerical data in the specified device with a needle. There is 90/180/270Degree Meter, and the range and ticks of the meter can be configured.



4.1 Operation Example

Setting	Meter Type	180 Degree Meter
	Minimum/Maximum	0/100
	Reference Device	LDR100
	Show Range	No. of Ranges: 3
	Show Ticks	Major divisions: 5, Minor divisions: 2

Display	Display 1 	Display 2 
	Latest state	Latest state
device data	0	75

WARNING

- When BCD is set and there is something other than 0 to 9 in the read data, a “1” is written to Calculation Error in System Area 2, and an error message is displayed.
- The latest data is displayed at all times.

4.2 Meter Settings

4.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Charts] - [Meter] from the WindO/I-NV2 menu.

Item		Description
Part Name		Sets the part name. (20 characters)
Meter Type		Select the type for the meter. (90 Degree Meter, 180 Degree Meter, 270 Degree Meter)
Data Format	Data Type	Select the data type for the source data. (refer to Chapter 8 “3.1 Data Type” on page 127 for details.) (BIN16 (+) BIN16 (+/-) BIN32 (+) BIN32 (+/-) BCD4 BCD8)
	Minimum	Input the minimum value for the meter. The allowed setting range depends on the data type. (refer to Chapter 8 “3.1 Data Type” on page 127 for details.)
	Maximum	Input the maximum value for the meter. The allowed setting range depends on the data type. (refer to Chapter 8 “3.1 Data Type” on page 127 for details.)
	Reference Device	Select the device that holds the data to be displayed on the meter.

4.2.2 View

These settings associate with the image which can be set on the View tab by selecting [Home] - [Parts] - [Charts] - [Meter] from the WindO/I-NV2 menu. Refer to Chapter 8 “3.4 View” on page 137 for the setting parameters.

4.2.3 Range

These settings associate with the range be displayed which can be set on the Range tab by selecting [Home] - [Parts] - [Charts] - [Meter] from the WindO/I-NV2 menu. The settings are configured only when the Advanced mode is selected.

Item	Description
Show Range	Select this checkbox to display a range on the Meter.
No. of Ranges	Input the number of ranges to display. (1 to 5)
Range Color	Set the range color. Clicking this button opens the Color Palette, and the selected color is displayed in a button. The image is displayed in the selected color. (Select from 256 colors for color display or 16 colors for monochrome display.)
Limits	Set the limits of the range. Set the limits in order from the smallest value. (refer to Chapter 8 “3.1 Data Type” on page 127.)

4.2.4 Scale

These settings associate with the display of ticks and labels which can be set on the Scale tab by selecting [Home] - [Parts] - [Charts] - [Meter] from the WindO/I-NV2 menu. The settings are configured only when the Advanced mode is selected.

Item		Description
Show Ticks	(Show Ticks)	Select this checkbox to display a scale on the Meter.
	Major Divisions	Enter the number of the major divisions on the plate. (1 to 20)
	Minor Divisions	Input the number for minor divisions on the plate. (1 to 20)
	Show Tick Numbers	Select this checkbox to display numbers at the scale divisions.
	Color	Select the color of the scale. (Color: 256 colors Monochrome: 16 colors)

WARNING When there is not a sufficient area on the image for displaying scales, the scales are not displayed properly.

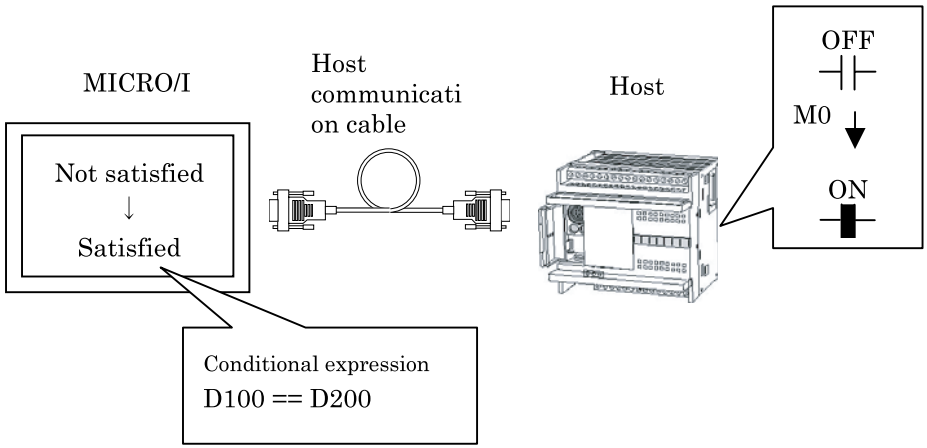
4.2.5 Option

These settings associate with the Security Group which can be set on the Options tab by selecting [Home] - [Parts] - [Charts] - [Meter] from the WindO/I-NV2 menu. This option can be set up only when the Advanced mode is selected. Refer to Chapter 12 “4.2.5 Option” on page 257 for the setting parameters.

Chapter 13 Commands

1 Bit Write Command

The Bit Write Command writes to the specified bit device when specified trigger conditions are established. The Action Mode can be selected from Set/ Reset/ Momentary/ Alternate/ Toggle/ Move to specify the actions.



1.1 Operation Example

Setting	Action Mode	Set/ Reset/ Momentary/ Alternate/ Toggle
	Trigger Type	Rising-edge LM0

Data in trigger condition device (LM0)		1		0		1		0
Destination Device	Set	ON	➡	-	➡	ON	➡	-
	Reset	OFF		-		OFF		-
	Momentary	ON		OFF		ON		OFF
	Toggle	Toggle		-		Toggle		-

When you select the “While satisfying the Condition” in the Trigger Type, writing is executed at the following cases.

- When the specified condition becomes established.
- When the condition is already established immediately after switching screens or supplying power.

1.2 Bit Write Command Settings

1.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Commands] - [Bit Write Command] from the WindO/I-NV2 menu.

Item		Description
Part Name		Sets the part name. (20 characters)
Action Mode		Select the bit write operation from one of the following modes. Set: Writes a “1” to the destination device when the trigger condition goes from false to true. Reset: Writes a “0” to the destination device when the trigger condition goes from false to true. Momentary: Writes a “1” to the destination device when the trigger condition goes from false to true, and writes a “0” to the destination device when the trigger condition goes from true to false. Toggle: Invert the value of the destination device each time it is pressed. Move: Copy the value of the source device to the destination device when it is pressed.
Destination Device		Select the bit device to write to.
Write*1		Specify the number of times to repeat writing (1 to 64). This setting is available only when the Action Mode is Set or Reset. The same value is written into bit devices in series (Example: M0, M1, M2, and so on). When the bit position of a word device is specified, the same value is written into word devices in series (Example: D0-15, D1-15, D2-15, and so on).
Source device	Device	Can be set only when “Move” is selected for the Action Mode. Specify the source bit device.
	Transfer	Can be set only when “Move” is selected for the Action Mode. Specify the number of bits to be transferred (1 to 50).

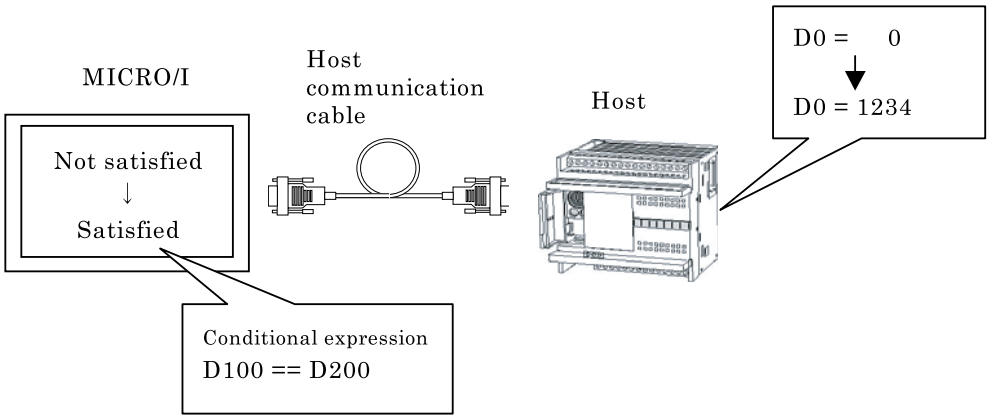
*1. Only available in the Advanced mode

1.2.2 Trigger Condition

These settings associate with the trigger conditions which can be set on the Trigger Condition tab selecting [Home] - [Parts] - [Commands] - [Bit Write Command] from the WindO/I-NV2 menu. Refer to Chapter 8 “3.3.3 Trigger Condition (Command)” on page 133 for the setting parameters.

2 Word Write Command

The Word Write Command part writes data to a specified word device or transfers data when the trigger conditions set for it are established. When writing data, it can also perform a variety of arithmetic and logical operations on it.



2.1 Operation Example

Setting	Action Mode	+
	Source 1	D100
	Data	D200
	Destination Device	D100
	Trigger Type	Rising-edge LM0

Data in trigger condition device (LM0)		1		0		1		0
Action		Execute D100+50	➡	-	➡	Execute D100+50	➡	-
Device data	D100	10		80		80		80
	D200	70		70		130		130

WARNING

When BCD is selected in Data Type, data other than 0 to 9 contained in the arithmetic data will write “1” to the arithmetic error in System Area 2, which will display an error message. (refer to Chapter 5 “3.3 System Area 2” on page 94, section of the “Arithmetic Error”.)

When you select the “While satisfying the Condition” in the Trigger Type, writing is executed at the following cases.

- When the specified condition becomes established.
- When the condition is already established immediately after switching screens or supplying power.
- When the output data is changed while the condition is established.

2.2 Word Write Command Settings

2.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Commands] - [Word Write Command] from the WindO/I-NV2 menu.

Item	Description
Part Name	Sets the part name. (20 characters)
Action Mode	Select an operation mode from among the following choices. Set: Writes the data (Value) to the device. Move: Writes the data (device contents) to the destination device. Momentary: Writes the ON data to the destination device when the Trigger Condition changes from unsatisfied to satisfied, and writes the OFF data when the Trigger Condition changes from satisfied to unsatisfied. Add: Adds the data to the contents of the source 1 and writes the result to the destination device. Sub: Subtracts the data from the contents of the source 1 and writes the result to the destination device. Multi: Multiplies the data with the contents of the source 1 and writes the result to the destination device. Div: Divides the content of the source 1 by the data and writes the result (quotient) to the destination device. Mod: Divides the content of the source 1 by the data and writes the remainder to the destination device. OR: Performs a logical OR between the data and the contents of the source 1 and writes the result to the destination device. AND: Performs a logical AND between the data and the contents of the source 1 and writes the result to the destination device. XOR: Performs a logical XOR between the data and the contents of the source 1 and writes the result to the destination device.
Data Type	Select the data type for the operation mode. The available selections depend on the action mode. BIN16 (+): All Action mode BIN16 (+/-): Set, Momentary, Add, Sub, Multi, Div, Mod BIN32 (+): All Action mode BIN32 (+/-): Set, Momentary, Add, Sub, Multi, Div, Mod BCD4: Set, Momentary, Add, Sub, Multi, Div, Mod BCD8: Set, Momentary, Add, Sub, Multi, Div, Mod float32: Set, Momentary, Add, Sub, Multi, Div, Mod
Source1	Set the source device for the action.

Item		Description
Source Data	(Value / Device)	Select the data type for the source data. Value: Use a constant as the source data. Device: Use the content of the selected device as the source data. Also specify the OFF data when “Momentary” is selected in the Action Mode. When you select the “Set”, “Momentary” in the Action Mode, you do not select “Device”. When you select the “Move” in the Action Mode, you do not select “Value”.
	Hexadecimal	Select this checkbox if you input the value with the hexadecimal notation. Deselect if you input the value with the decimal notation.
	Use Reference Device*1	When you select the “Move” in the Action Mode, this setting is available. Select this checkbox if you change the address of the Source Data according to the value in the reference device. Set the reference device. (refer to Chapter 8 “3.2 Indirect Read and Indirect Write of Devices” on page 129.)
	Transfer*1	When you select the “Move” in the Action Mode, this setting is available. Enter the number of words to be copied. (1 to 64)
Destination Device		Set the device for storing the result of the operation with the Action Mode.
Use Reference Device*1		When you select the “Move” in the Action Mode, this setting is available. Select this checkbox if you change the address of the Source Data according to the value in the reference device. Set the reference device. (refer to Chapter 8 “3.2 Indirect Read and Indirect Write of Devices” on page 129.)
Write*1		When you select the “Set”, “Momentary” in the Action Mode, this setting is available. Enter how may times the source data is copied. For example, when the Data Type is “BIN16+” and this setting is “50”, the same data will be copied to 50 continuous addresses from the selected device. The Destination Device will be the start address. When the Data Type is “BIN32+” and this setting is “50”, the same data will be copied to 100 continuous addresses from the selected device. (1 to 64)

*1. Only available in the Advanced mode

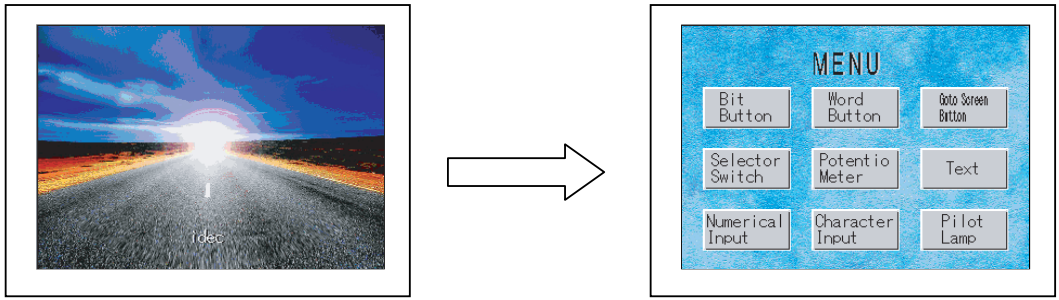
2.2.2 Trigger Condition

These settings associate with the trigger conditions which can be set on the Trigger Condition tab by selecting [Home] - [Parts] - [Commands] - [Word Write Command] from the WindO/I-NV2 menu. Refer to Chapter 8 “3.3.3 Trigger Condition (Command)” on page 133 for the setting parameters.

3 Goto Screen Command

The Goto Screen Command switches to a specified screen when the trigger conditions set for it are established.

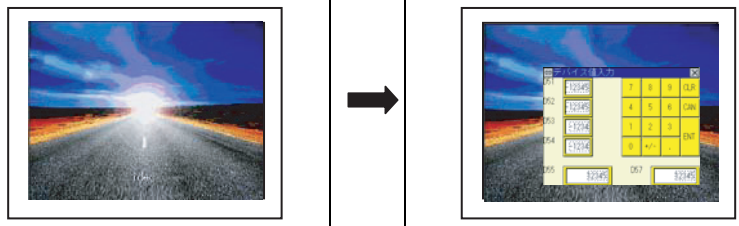
In addition to switching between Base Screens, it opens and closes a Popup Screen, Device Monitor Screen, Adjust contrast Screen or Password Screen. When switching Base screens, it is possible to directly specify the Screen No. or to go back to the previous screen up to 16 times. In addition, it can be configured to switch to the System Menu, which allows you to move to the System Menu easily and perform maintenance.



3.1 Operation Example

Setting	Action Mode	Open Popup Screen

1Display			0
	When satisfying the condition		-Opens Popup Screen



WARNING

- When switching the Base Screens or opening/closing a Popup Screen or Device Monitor Screen using your hand to touch the display screen, the buttons will not be activated until you take your hand off the screen even if Two-point push is enabled in the Project Settings.
- A screen switch is not executed when the popup screen is already open. The popup screen is moved when you select the “While satisfying the Condition” and “Use Reference device X, Y”.

When you select the “While satisfying the Condition” in the Trigger Type, a screen switch is executed at the following cases.

- When the specified condition becomes established.
- When the condition is already established immediately after switching screens or supplying power.

3.2 Goto Screen Command Settings

3.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Commands] - [Goto Screen Command] from the WindO/I-NV2 menu.

Item		Description
Part Name		Sets the part name. (20 characters)
Action Mode		Select the operation mode from among the following choices. Back to previous Screen: Switches to the previous screen when the button is pressed. (Max. 16 screens) Switch to Base Screen: Switches to the specified Base Screen number when the button is pressed. Open Popup Screen: Opens the specified Popup Screen when the button is pressed. Close Popup Screen: Closes the specified Popup Screen when the button is pressed. Open Device Monitor Screen: Opens the Device Monitor when the button is pressed. Close Device Monitor Screen: Closes the Device Monitor when the button is pressed. Open Password Screen: Opens the Password Screen when an unsatisfied trigger condition is satisfied. Close Password Screen: Closes the Password Screen when an unsatisfied trigger condition is satisfied. Open Adjust contrast Screen: Opens the Adjust contrast Screen when an unsatisfied trigger condition is satisfied. Close Adjust contrast Screen: Closes the Adjust contrast Screen when an unsatisfied trigger condition is satisfied. Switch to System Menu Screen: Switches to the System Menu when the button is pressed. Reset current screen: Reset the current Base Screen when an unsatisfied trigger condition is satisfied.
Goto Screen	Screen No.	Input the screen number. When Switch to Base Screen is selected for the Screen Type, input the base screen number to go to. When Open Popup Screen or Close Popup Screen is selected for the screen type, specify the popup screen number. (Base Screen: 1 to 3000, Popup Screen: 1 to 3015)
	Use Reference Device*1	When “Open Popup Screen” or “Close Popup Screen” is selected for the Action Mode, the Screen No. and coordinates used for opening or closing the Popup Screen will be the data in the specified device at the moment the button is pressed. As long as the Trigger Type is satisfying the condition, the device value will be referred even after the Popup Screen is opened.
	Coordinate	X When Open Popup Screen or Open Device Monitor Screen is selected for the Screen Type, input the X-coordinate position (left side) for displaying the screen. Y When Open Popup Screen or Open Device Monitor Screen is selected for the Screen Type, input the Y-coordinate position (top side) for displaying the screen.
	Use Reference Device*1	Open a Popup screen with the data for the specified device as the display coordinates.

*1. Only available in the Advanced mode.

- With the HG2G, HG2F/2S/3F/4F and EX4R, the position coordinates X and Y for displaying the Popup screen can be specified only in steps of 20 dots.
- When “Use Reference Device” is selected with the HG2G, HG2F/2S/3F/4F and EX4R, the coordinates are automatically adjusted to the position at a multiple of 20 dots.
- If the displayed Base Screen is reset when “Reset current screen” is set, Popup Screens and internal devices start their operation in the status in which the Base Screen is switched.

3.2.2 Trigger Condition

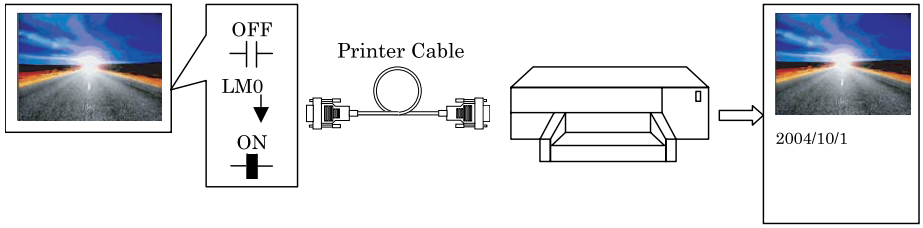
These settings associate with the trigger conditions which can be set on the Trigger Condition tab by selecting[Home] - [Parts] - [Commands] - [Goto Screen Command] from the WindO/I-NV2 menu. Refer to Chapter 8 “3.3.3 Trigger Condition (Command)” on page 133 for the setting parameters.

4 Print Command

This part outputs the screen displayed on the operator interface to the printer or the Memory Card when the stipulated trigger conditions are established. You can make the hardcopy of the displayed screen on the MICRO/I, and it allows you to reproduce the condition in preparing reports or other documents.

4.1 Operation Example

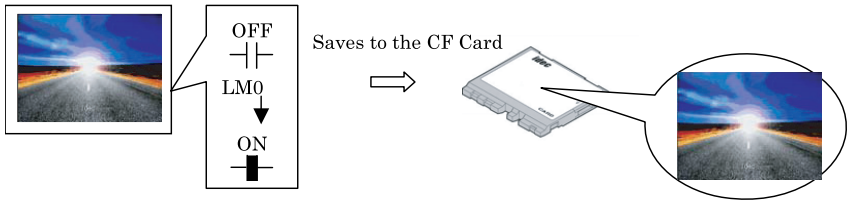
Setting	Print Device	Printer
	Print time stamp	Selected
	Trigger Type	Rising-edge LM0



HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
			X		X	X

Only HG2F/3F/4F support this function

Setting	Print Device	Memory Card



- The name of the file output to the CF Card is CAP***.BMP. *** is a number from 001 to 099, and is allocated automatically and in sequence when the file is created.
  The file size is 308,278 bytes per screen for the HG3F and 481,078 bytes for the HG4F.
- When canceling a print out, the HP printer stops in the middle of the paper. The next print job starts from the position that it stopped in. You should clear the paper before the next print job.
  You can clear the files in the Memory Card by using the Use Erase function in the Memory Card from the CF Card tab on the Project Settings.
- When you print out the screen on HG3/4F using SII DPU-414 printer, the horizontal print sizes are the only 320 pixels from the left edge of HG3/4F screen.
- While the screen image is printing, you cannot print any screens.

When you select the “While satisfying the Condition” in the Trigger Type, printing is executed at the following cases.

- When the specified condition becomes established.
- When the condition is already established immediately after switching screens or supplying power.

4.2 Print Command Settings

4.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Commands] - [Print Command] from the WindO/I-NV2 menu.

Item	Description
Part Name	Sets the part name. (20 characters)
Print Device	Select the output device. Printer: Output to the printer connected to the operator interface. Memory Card: Output as a bitmap file to the Memory Card inserted into the operator interface.
Action Mode	Select the operation of the Printout Button. Print out Screen: Output to the printer or Memory Card. Cancel Print out: Cancel Output to the printer.
Print Time stamp	Print the data and time of printing. The date and time format depends on the language selected in the System Menu.

4.2.2 Trigger Condition

These settings associate with the trigger conditions which can be set on the Trigger Condition tab by selecting [Home] - [Parts] - [Commands] - [Print Command] from the WindO/I-NV2 menu. Refer to Chapter 8 “3.3.3 Trigger Condition (Command)” on page 133 for the setting parameters.

5 Script Command

This part executes the script that corresponds to the specified script ID when the trigger conditions that have been set are established. Conditional statements, arithmetic expressions, and functions can be combined in the description, which realizes complicated processing.

5.1 Operation Example

Setting	Action Mode	Fixed Period: 10 sec.

	Script	[D 100] = [D 100] + 1;
		if ([D 100] >= 50)
		{
		[D 100] = 0;
		}

D100 is increment every 10 seconds, and when D100 reaches or exceeds 50, it is reset to 0.

When “While satisfying the condition” is selected, the script executes in the following cases.

- When the set conditions go from “being unestablished” to “established”.
- When the condition is already established after a screen is switched or after the power is switched on.

5.2 Settings

5.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Commands] - [Script Command] from the WindO/I-NV2 menu.

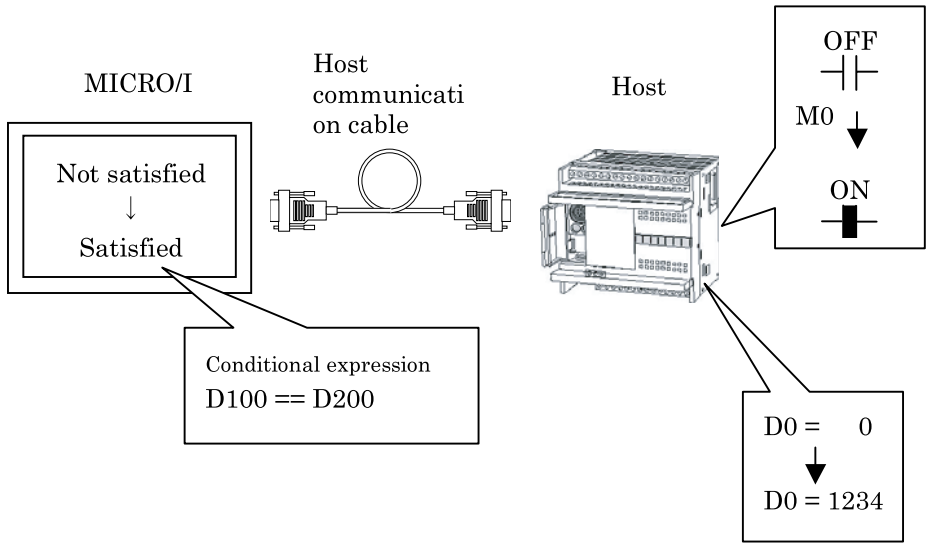
Item	Description
Part Name	Sets the part name. (20 characters)
Script ID	Sets the ID number of the script registered with the Script Manager. Open the Script Manager, and edit the script. (1 to 32000)
Script Name	Displays the name of the selected Script ID.
(Script)	Displays the script text for the selected Script ID. You can edit the script with the Script Manager by double-clicking the script displayed.

5.2.2 Trigger Condition

These settings associate with the trigger conditions which can be set on the Trigger Condition tab by selecting [Home] - [Parts] - [Commands] - [Script Command] from the WindO/I-NV2 menu. Refer to Chapter 8 “3.3.3 Trigger Condition (Command)” on page 133 for the setting parameters.

6 Multi-Command

The Multi-Command parts can execute several functions at once. Bit Write, Word Write, Goto Screen, Print, Key and Script Command are available.



- When multiple Goto Screen commands for the Switch to Base Screen are set, executes only the command at the end of the Function List . The Goto Screen command for the Switch to Base Screen is not executed in the order of the Function List; it is executed at the end of a scan for which the Multi-Command was executed.
- If multiple Key commands are set, the 2 closest to the top of the Function List are executed and commands from the 3rd one on are not executed. If multiple Key commands which are used as Data Transfer are set, only the command closest the top of the list is executed.
- Key commands are executed on the next scan after the button is pressed.

6.1 Multi-Command Settings

6.1.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Commands] - [Multi-Command] from the WindO/I-NV2 menu.

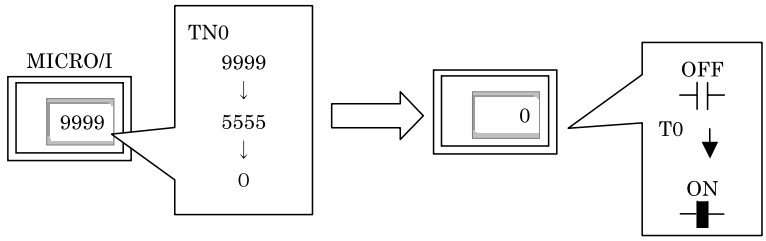
Item		Description
Part Name		Sets the part name. (20 characters)
Function List		Function list is shown.
	Add	Add new function. Max 32 point can be set. Bit Write: It is same as Bit Write Button. Word Write: It is same as Word Write Button. Goto Screen: It is same as Goto Screen Button. Print: It is same as Print Button. Key: It is same as Key Script: It is same as Script.
	Edit	Edit selected item.
	Delete	Delete selected item.
	Copy	Copy selected item.
	Up	Move up selected item.
	Down	Move down selected item.

6.1.2 Trigger Condition

These settings associate with the trigger conditions which can be set on the Trigger Condition tab by selecting [Home] - [Parts] - [Commands] - [Multi-Command] from the WindO/I-NV2 menu. Refer to Chapter 8 “3.3.3 Trigger Condition (Command)” on page 133 for the setting parameters.

7 Timer

The Timer subtracts the preset value while the trigger condition is being satisfied, and turns ON the timer contact (HG Timer (Relay): HG Internal Relay) when the preset value reaches "0". The Timer starts the timekeeping operation when the trigger condition is satisfied. When the time is up, "1" is written to the timer contact. When the trigger condition is not satisfied, the timer contact is set to "0", and the preset time is written to the timer value (HG Timer (Current): HG Internal Register)



7.1 Operation Example

Setting	Timer Address	0
	Preset Value	100
	Trigger Type	While ON LM0

The current value in the Timer register displayed on a numerical display	100	→	100	80 Subtraction →		→	100
Trigger condition (LM0)	0		1		1		0
Timer contact value	-		-		"1" written		"0" written

7.2 Timer Settings

7.2.1 General

These general settings can be set on the General tab by selecting [Home] - [Parts] - [Commands] - [Timer] from the WindO/I-NV2 menu.

Item	Description
Part Name	Sets the part name. (20 characters)
Timer Address	Set the address for the Timer Register/Timer Contact. (0 to 31)
Unit	Select second or millisecond for measuring units.
Preset Value	Select fixed value or reference device for preset value.

7.2.2 Trigger Condition

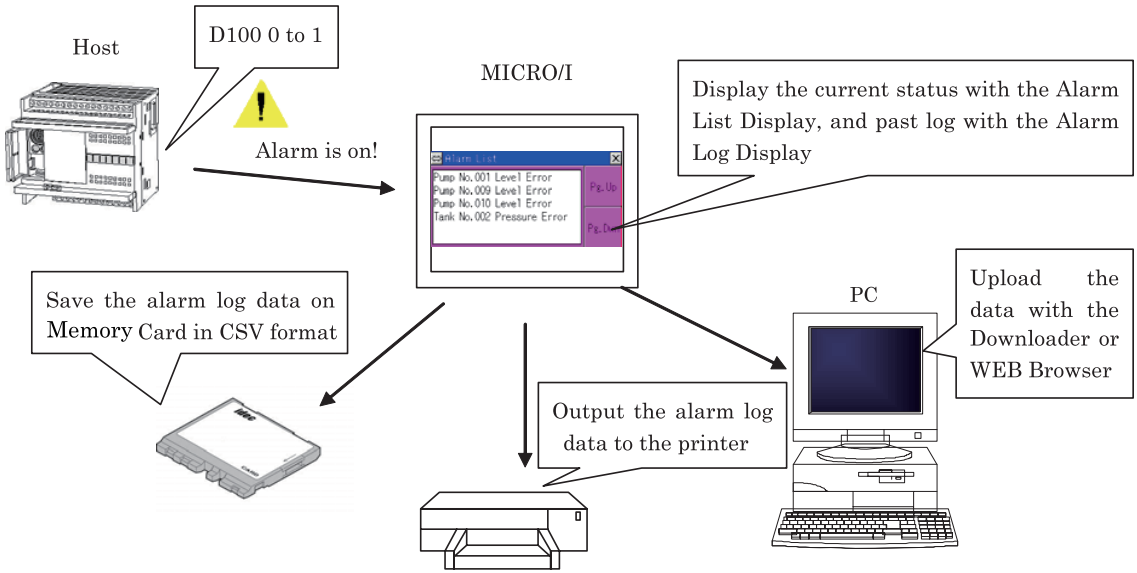
These settings associate with the trigger conditions which can be set on the Trigger Condition tab by selecting [Home] - [Parts] - [Commands] - [Timer] from the WindO/I-NV2 menu. Refer to Chapter 8 "3.3.2 Trigger Conditions (Pilot Lamp, Timer, Numerical Display, Message Display, Picture Display, Line Chart, Bar Chart, Calendar)" on page 132 for the setting parameters.

Chapter 14 Alarm Log Function

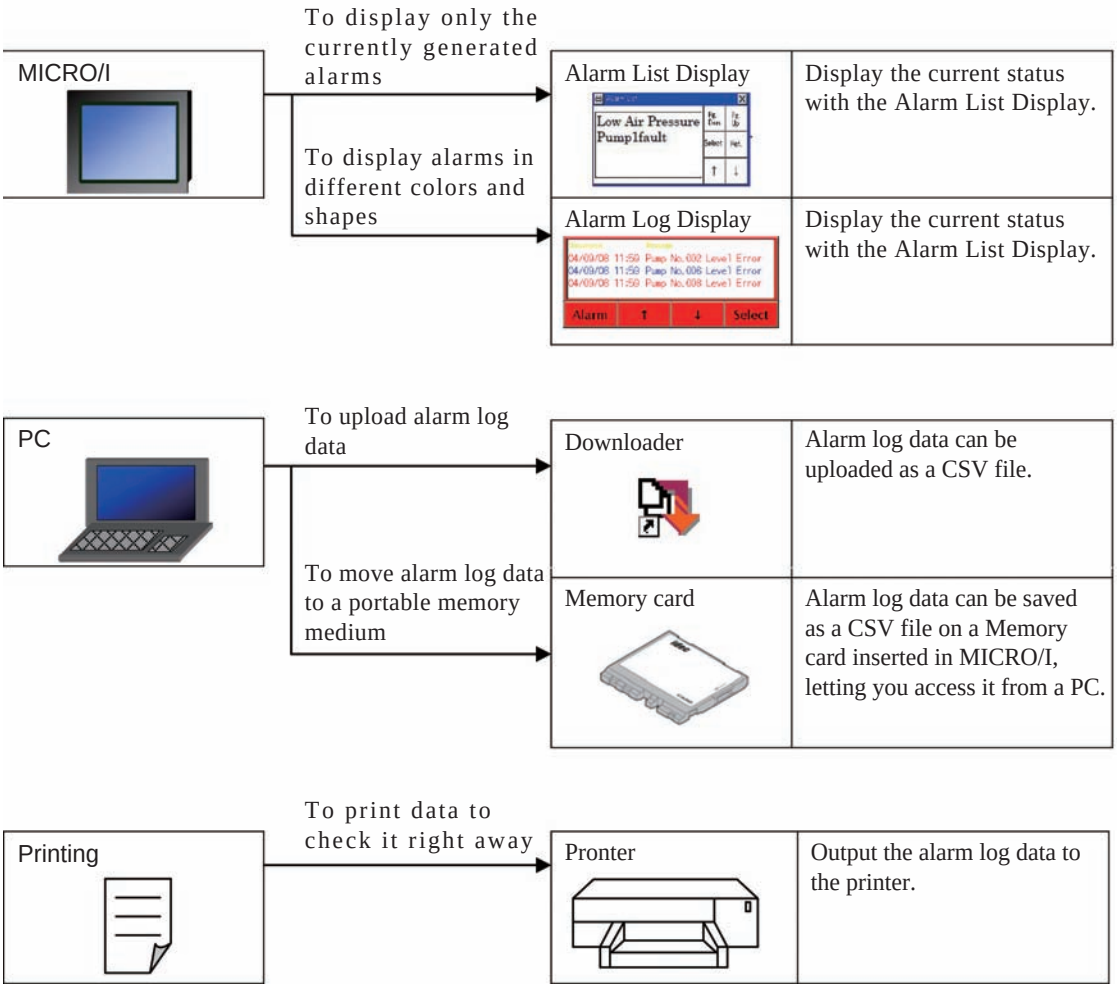
1 Overview

The Alarm Log function stores historical events with a date and time stamp. This stored data is retained even after the power has been turned OFF on the MICRO/I. Also the log data can be stored on the Memory Card or printed. When the host device is selected, the data is read out from the host device at every Monitoring Period (x100 msec.).

The status of the alarm can be displayed with the Alarm List Display or Alarm Log Display. The Alarm List Display is capable for displaying the list of the status of currently active alarms, and the Alarm Log Display is capable of displaying the log data of each alarm condition.

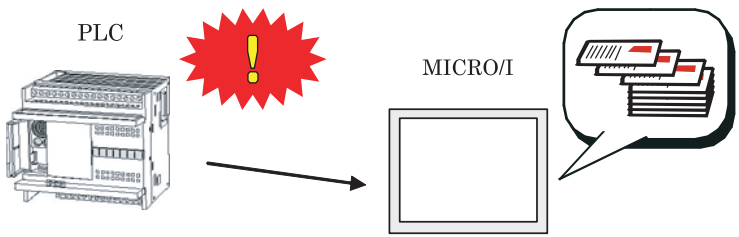


There are several ways to check alarm log data.



1.1 Examples

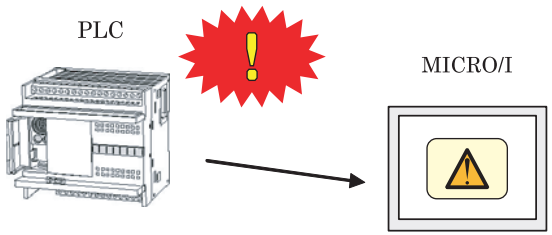
1.1.1 Save Alarm Log Data



You can store data such as the date and time of an alarm occurrence and recovery.

Set the “Number of Blocks” field in the Channel tab of [Alarm Log Settings], and set the “Set Alarms” field. Refer to Chapter 14 “2.2 Channel” on page 280.

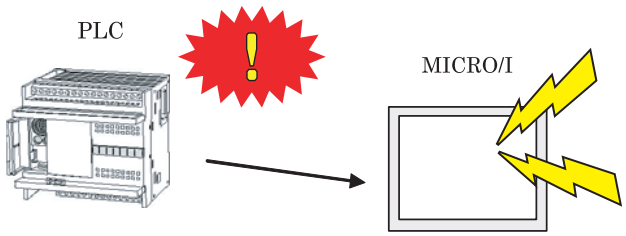
1.1.2 Displaying a Screen When Alarms Are Generated



You can display alarms using the preset popup screen when an alarm occurs.

Configure the “Set Alarm Screen” field in the General tab of [Alarm Log Settings]. Refer to Chapter 14 “2.1 General” on page 279.

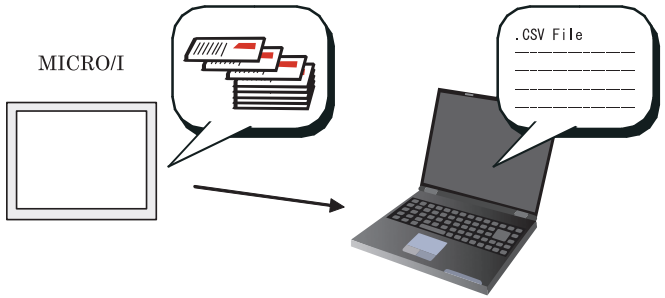
1.1.3 Sounding a Beep When Alarms Are Generated



You can have a beep sound when alarms caused by data errors or other problems are generated.

Select the “Sound Beep When Alarm is Generated” checkbox in the Beep tab of [Alarm Log Settings]. Refer to Chapter 14 “2.5 Beep” on page 284.

1.1.4 Outputting Alarm Log Data as a CSV File



Use the Downloader tool to upload the alarm log data saved in the MICRO/I to a PC.

Set the items in the General tab of [Alarm Log Settings]. Refer to Chapter 14 “2.1 General” on page 279.

2 Settings

2.1 General

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X	X	X	X	X	X

All models support this function.

You can set when you select [Setup] the General tab of [Alarm Log Settings] menu on the WindO/I-NV2. You can also set when you select the General tab of [Configuration] - [System Setup] - [Alarm Log] or, the […] Button Option tab of [Alarm Log Display]

Item		Description
Storage Method		Select the processing method for the case that the alarm log data storage area becomes full: Fixed: No new log data is stored until the Alarm Log is cleared. Rotate: Log data is cleared in order from the oldest entry when new log data is stored.
Monitoring Period		Input the monitoring cycle period in steps of 100 msec.. (6 to 500 (x 100 msec.))
Monitor Number of Active Alarms		Specify a device address that will store the number of alarms generated.
Monitor Number of Accumulated Alarms		Set the start device to write the number of accumulated alarms for each channel. Contiguous devices (No. of blocks x No. of channels) from the specified start address are set up as the devices to which the number of accumulated alarms will be written.
Clear Log Data for Recovered Alarms		Specify the Device Address to be used for clearing the log data. When the Device Address is set to ON, the log data will be cleared.
Store the status of Alarm		Set the start device for storing the alarm status when writing the data for each channel. The continuous numbers for the device (No. of blocks x No. of channels) from the specified start device are assigned as the destination device for writing alarm status. The status of each alarm is written with the following data. Bit 0: 0: Not occurred (After Recover), 1: Occurred Bit 1: 0: Alarm that occurred second and later, 1: Alarm occurred first Bit 2: 0: After confirmation, 1: Before confirmation Bits 3 to 15: Reserved
Call Popup Screen	Call Popup Screen	Select if you want to open Popup Screen as alarm screen when an alarm occurs.
	Popup Screen No.	Input the number of the Popup Screen to be used as the alarm screen. (1 to 3000)
	Coordinates	Input the display coordinates for displaying the alarm screen. The value must be a multiple of 20 dots. X: 0 to (Width of the Base Screen - 20) Y: 0 to (Height of the Base Screen - 20)
Number of Stored Data		Enter the maximum number of alarm log data that is stored. The Alarm log data is stored in the Data Storage Area of the operator interface. (1 to 1024)

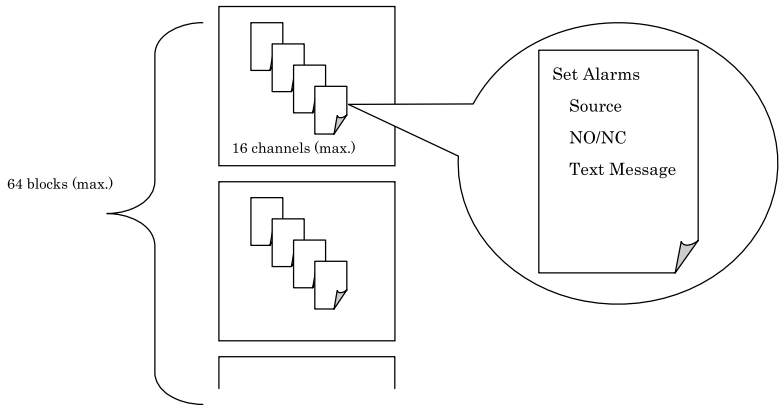
WARNING
- When “Monitor Number of Accumulated Alarms” is selected, the “Device Range Error” occurs if there are not contiguous devices (No. of blocks x No. of channels) from the specified start device.
- When the value of the device of “Monitor Number of Accumulated Alarms” is changed by other action, the number of accumulated alarms is not counted normally.

2.2 Channel

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X	X	X	X	X	X

All models support this function.

Select Channel tab of [Configuration] - [System Setup] - [Alarm Log] on the WindO/I-NV2. Up to 16 messages can be assigned to each block. Total of 1024 data points can be set up for up to 64 blocks when using the Word device type, and total of 112 data points can be set up for up to 7 blocks when using the Bit device type.



Item		Description
Source Device Type		Select the type (Word device or Bit device) for specifying the device to be monitored. (Word/Bit)
Number of Blocks		The Alarm Log data is managed in the unit of blocks. Enter the number of blocks to be used with considering 16 channels as 1 block. (Source Device Type - Word: 0 to 64, Bit: 0 to 7)
Reference Screen Type		Select the type of the reference screen corresponding to the alarm message. (Not Use, Base Screen, Popup Screen)
Settings	No.	Displays Channel No. The displayed Channel No. depends on the setting of “No. of Blocks”.
	Source	Set the source device. The settings are performed in block units.
	Store/No Store	Select either [Store] or [No Store] to determine whether or not to store the log data in the Data Storage Area of the MICRO/I. The data is stored in block units. When [No Store] is selected for a channel, the log data of the channel can be displayed only with the Alarm List Display. The data is retained only when the power is on, and will be lost when the power is turned off.
	Enable/Disable	Select whether or not to use the alarm function. When [Disable] is selected, the data is stored as log data, and will not be retained in the Data Storage Area.
	NO/NC	Display whether the alarm occurs when the monitored bit is changed from OFF to ON, or when it is changed from ON to OFF. (ON/OFF)
	Lock/Unlock	Lock: Even when the corresponding bit in the monitor device is recovered, the status will not be changed to Recovered until the Confirm button is pressed. Unlock: When the corresponding bit in the monitor device is recovered, the status will be changed to Recovered regardless of whether the Confirmation button is pressed or not.
	Text ID	Displays the text ID of the display message for the corresponding bit in the monitor device.
	Text Message	Displays the message set in Text ID.
	Reference Screen No.	Specify the numbers to be used for the Reference Screens that corresponds to each message.

Item	Description
Auto button	Displays the Automatic Settings dialog box. The settings in this dialog box are set at the start for all channels.
Edit button	Displays the Alarm Log Channel Settings dialog box. The settings made in this dialog box are displayed in the selected channel.

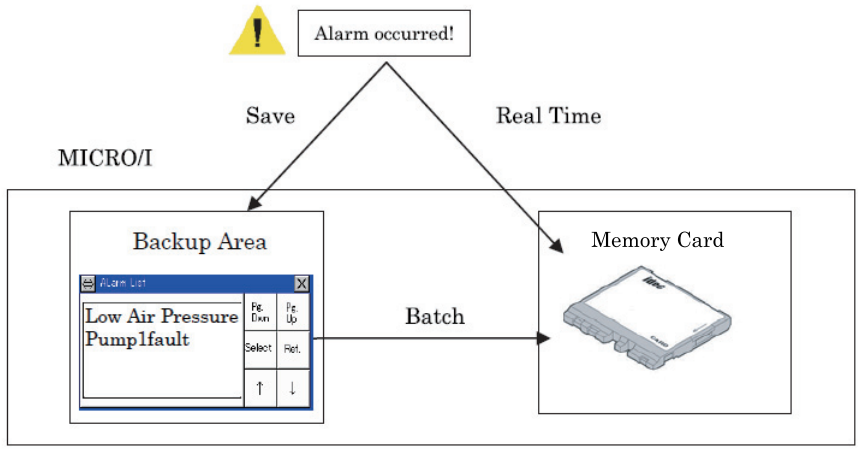
- The text can be edited using the Text Manager dialog box.
- In case of Alarm List Display, when an alarm is recovered, it is always deleted from listed items, in spite of setting of Lock/ Unlock. Use Alarm Log Display if you want to display alarms until finishing confirmation.

2.3 Memory Card Output

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X		X		X	X

Only HG3G, HG2F/3F/4F support this function

Select Memory Card Output tab of [Configuration] - [System Setup] - [Alarm Log] on the WindO/I-NV2.



Item	Description
Batch	All alarm log data stored in the internal memory of the MICRO/I outputs to the Memory Card when the Trigger Device turns to ON. The output data is stored in the folder as below. HG3G: \"Memory Access Folder"\ALARMLOG HG2F/3F/4F: \"Memory Access Folder"\ALARM

Item		Description
	Trigger Device	Assign a Trigger Device and when it changes state from 0 to 1 will activate the process to output a batch of data.
	File name	Assign a filename to save the data outputted. Note, the File name format depends on the O/I type. HG3G: Enter a name of up to 120 alphanumeric characters including file extensions. The default file name is 'ALMHTO.CSV'. HG2F/3F/4F: 'ALMHTO.CSV'. This type of format cannot be changed.
	Add Device data to File Name*1	To modify the file name as required, select the checkbox. The last three digits of the File Name Device value at the moment of the output are appended to the end of the file name. (Example) If the last three digits of the "File Name Device" value is "123", the file name is "ALMHTO123.CSV". File Name Device: Specifies the device address where the values added to the file name are stored.
Real Time		The content of the alarm that has occurred is stored in real time on the Memory Card when the specified conditions occur. The output data is stored in the folder as below. HG3G: \"Memory Access Folder"\ALARMLOG HG2F/3F/4F: \"Memory Access Folder"\ALARM
	Trigger Condition	Select the trigger condition for the real time output. The conditions are Occurrence, Recovery and Confirmation, and multiple selections are possible. (Occurrence Recovery Confirmation)
	File name	Assigns a name to the output data and saves it in a file. File names that can be set depend on the O/I type. HG3G: Enter a name of up to 120 alphanumeric characters including file extensions. The default file name is 'ALMHTO.CSV'. HG2F/3F/4F: 'ALMHTO.CSV'. This cannot be changed.
	Add Device data to File Name*1	Select the checkbox to append the last three digits of the device value at the moment of the output to the end of the file name. (Example) If the last three digits of the "File Name Device" value is "123", the file name is "ALMHTA123.CSV". File Name Device: Specifies the device address where the values added to the file name are stored.

*1. Only available in the Advanced mode.

- These settings are applicable to models equipped with a memory card interface.
- The functions that output the log data to a memory card operates independently from the function that stores the alarm log data in the internal memory.
- Batch: The file is overwritten right after trigger is occurred and the previous file is cleared. Alarm logs which occur after starting to output to Memory card is not written in the file.
- Real time: Writing file is not started right after the condition is satisfied. Alarm logs are stored in the file output buffer once. Actual writing file is processed every 3 minutes or the timing of HG special internal register LSM20 is set from 0 to 1. Alarm logs are added after previous logs file. Therefore, when writing condition occurrence time is shorter than writing speed, the requests are stored within (Register Occurred No.-1) in the file output buffer. If requests occur more than that, the older request is lost and the newer request is replaced one by one.

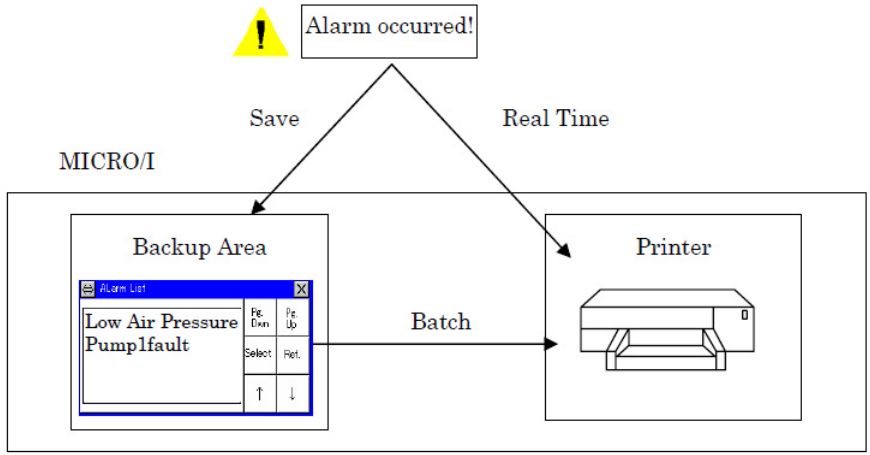
- The option "Real Time Output" stops storing data when the file size exceeds 256MB or it runs out of free space on the memory card .
- It is possible to delete alarm log data files saved on a memory card by using "Remove Files stored in Memory Card" on the Memory Card tab of the Project Settings dialog box.

2.4 Printing

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
		X	X	X	X	X

Only HG1F/2F/2S/3F/4F support this function

Select Printing tab of [Configuration] - [System Setup] - [Alarm Log] on the WindO/I-NV2.



Item	Description
Batch	Prints all alarm log data stored in the Data Storage Area to the connected printer. Printing occurs when the device value goes from 0 to 1.
Real Time	The content of the alarm that has occurred is printed on the printer connected to the MICRO/I in real time when the specified conditions occur. The conditions are Occurrence, Recovery and Confirmation, and multiple selections are possible. (Occurrence Recovery Confirmation)
With second	Select this checkbox to print time in units of seconds.

WARNING

- HG1F/2F/2S/3F/4F can print the alarm log data. HG2G/3G does not support the print function.
- The functions that outputs log data to a printer operate independently from the function that stores alarm log data.
- Batch: After starting to print, alarm log, which occurs after that, is not printed.
- Real time: If printing condition occurrence timing is shorter than printing speed, printing requests are stored within 100 in buffer and processed consecutively. Newer requests will be lost more than that.
- Real time: Printing is processed line by line. Some printer prints out after buffering internally. You can print out forcibly by resume button or cancel button. Some printer will lose print jobs in their buffer cue over a certain buffering time. Please follow your printer manual.

The hard copy image of Batch Output

No.	Occurrence Time	Recovery Time	Confirmation Time	Message
01-00	12/31/03 12:00:00	12/31 12:20:20	12/31 12:30:45	Pressure sensor fault
01-01	12/31/03 12:10:15	12/31 14:00:40	12/31 14:30:50	Hydraulic pressure low
01-00	12/31/03 13:00:30	-	-	Pressure sensor fault
		…		
		…		
		…		

The hard copy image of Real Time Output

12/31/03 12:00:00	Occurrence	01-00	Pressure sensor fault
12/31/03 12:10:15	Occurrence	01-01	Hydraulic pressure low
12/31 12:20:20	Recovery	01-00	Pressure sensor fault
12/31 12:30:45	Confirmation	01-00	Pressure sensor fault
12/31/03 13:00:30	Occurrence	01-00	Pressure sensor fault
	…		
	…		
	…		

2.5 Beep

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X	X	X	X	X	X

All models support this function.

To configure the Beep settings, select [Configuration] - [System Setup] - [Alarm Log] from the WindO/I-NV2 menu, and select the Sound tab.

Item		Description
Beep when Alarm occurs		MICRO/I beeps when alarm occurs.
Beep only First Alarm*1		Selected: Only when the First Alarm occurs, the beep sounds. When a new alarm occurs when other alarms have already occurred, a beeping sound will not be generated. Deselected: Every time alarm occurs, the beep sounds.
Stop Beep*1	Stop when press everywhere on the screen	The beep stops when you touch the screen at any point.
	Stop when touch CHECK or All Chk. button	The beep stops when you press the CHECK or All Chk. Key Button with the Alarm Log Display.
	Stop when all Alarms are recovered	Stop when all Alarms are recovered the beep stops when all alarms in the Occurred status have been recovered.

*1. Only available in the Advanced mode.

- Bit position 6 of the address [System area 1 address + 1] is set to 1 while the beep sounds.
- To stop the beep sound,
  - Press the [Stop Beep] Key Button.
  - Satisfy the condition of the [Stop Beep] settings.
  - Set bit position 6 of the address [System area 1 address + 1] to 0.

  Note that if 1 was written in bit position 6 of the address [System area 1 address + 1], the beep cannot be stopped until the value of this bit position is set to 0.

3 Operation

3.1 Description

3.1.1 Log Data

The table below shows the type of data that will be stored in the Backup Area when an alarm occurs. This alarm data will be updated as the event changes. In addition, they will be stored until it they are cleared or overwritten by new alarm data.

Item	Description
Channel No.	Saves the Channel number of an alarm that has occurred.
Alarm Status	Saves the alarm status (generated, restored or checked). Refer to "3.1.2 Alarm Status" (P.287) in this chapter.
Date of Occurrence	Saves the date/time the alarm was generated.
Date of Recovery	Saves the date/time a restored alarm was restored.
Date of Confirmation	Saves the date/time a checked alarm was checked.

- (Example) Contents of Log Data

1) When an alarm with No. 1-1 occurred:

Chronological Order	Channel	Alarm Status	Date of Occurrence	Date of Recovery	Date of Confirmation
1	1-1	Occurred	2005/12/01 12:50:00		

2) When an alarm with No. 1-2 occurred:

Chronological Order	Channel	Alarm Status	Date of Occurrence	Date of Recovery	Date of Confirmation
1	1-1	Occurred	2005/12/01 12:50:00		
2	1-2	Occurred	2005/12/01 12:50:10		

3) When an alarm with No. 1-1 is recovered:

Chronological Order	Channel	Alarm Status	Date of Occurrence	Date of Recovery	Date of Confirmation
1	1-1	Recovered	2005/12/01 12:50:00	12/01 12:50:20	
2	1-2	Occurred	2005/12/01 12:50:10		

4) When the first alarm is confirmed:

Chronological Order	Channel	Alarm Status	Date of Occurrence	Date of Recovery	Date of Confirmation
1	1-1	Recovered, Confirmed	2005/12/01 12:50:00	12/01 12:50:20	12/01 12:50:30
2	1-2	Occurred	2005/12/01 12:50:10		

5) When the first alarm occurred again:

Chronological Order	Channel	Alarm Status	Date of Occurrence	Date of Recovery	Date of Confirmation
1	1-1	Recovered, Confirmed	005/12/01 12:50:00	12/01 12:50:20	12/01 12:50:30
2	1-2	Occurred	2005/12/01 12:50:10		
3	1-1	Occurred	2005/12/01 12:51:00		

6)When the second alarm is recovered and confirmed:

Chronological Order	Channel	Alarm Status	Date of Occurrence	Date of Recovery	Date of Confirmation
1	1-1	Recovered, Confirmed	005/12/01 12:50:00	12/01 12:50:20	12/01 12:50:30
2	1-2	Recovered, Confirmed	2005/12/01 12:50:10	12/01 12:52:00	12/01 12:52:10
3	1-1	Occurred	2005/12/01 12:51:00		

7) When the third alarm is recovered and confirmed:

Chronological Order	Channel	Alarm Status	Date of Occurrence	Date of Recovery	Date of Confirmation
1	1-1	Recovered, Confirmed	005/12/01 12:50:00	12/01 12:50:20	12/01 12:50:30
2	1-2	Recovered, Confirmed	2005/12/01 12:50:10	12/01 12:52:00	12/01 12:52:10
3	1-1	Recovered, Confirmed	2005/12/01 12:51:00	12/01 12:53:00	12/01 12:54:10

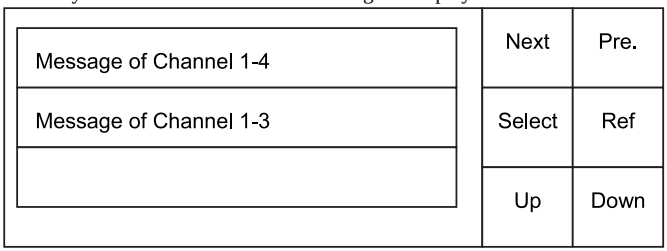
8) When alarms with No. 1-3 and 1-4 occurred:

Chronological Order	Channel	Alarm Status	Date of Occurrence	Date of Recovery	Date of Confirmation
1	1-1	Recovered, Confirmed	005/12/01 12:50:00	12/01 12:50:20	12/01 12:50:30
2	1-2	Recovered, Confirmed	2005/12/01 12:50:10	12/01 12:52:00	12/01 12:52:10
3	1-1	Recovered, Confirmed	2005/12/01 12:51:00	12/01 12:53:00	12/01 12:54:10
4	1-3	Occurred	2005/12/01 13:00:00		
5	1-4	Occurred	2005/12/01 13:10:00		

When 8) of above, if you use Alarm List Display or Alarm Log Display, the following will be displayed on MICRO/I:

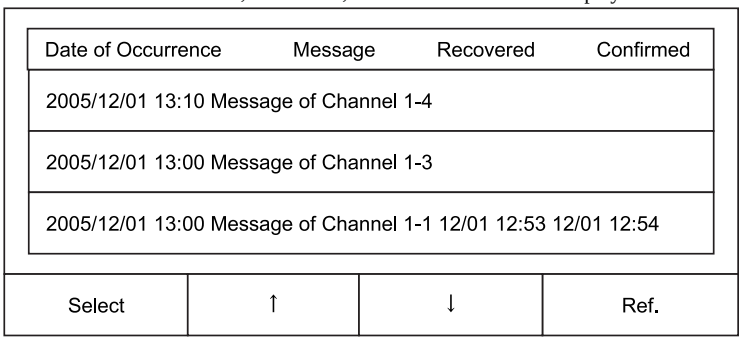
- Alarm List Display

  Only the alarms that are now occurring are displayed in a list.



- Alarm Log Display

  Alarms in the Occurred, Recovered, or Confirmed status are displayed in a list.



3.1.2 Alarm Status

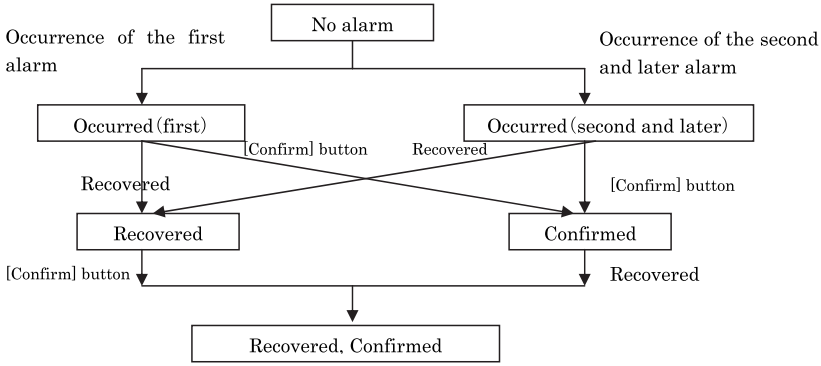
There are four Alarm Status types.

The table below lists the conditions for each type.

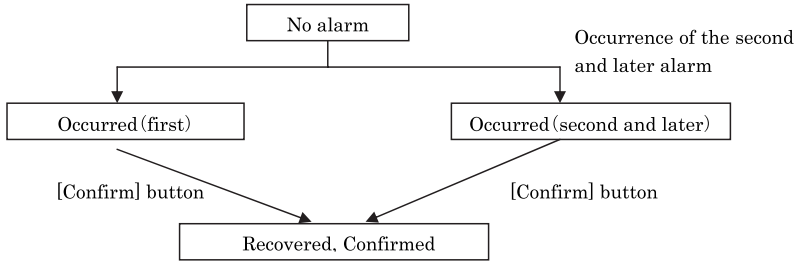
Item		Description
Occurred	First Alarm	The first alarm that occurred when no alarm with the Occurred status existed.
Occurred	Second and later	An alarm that occurred when alarm (s) with the Occurred status already existed.
Recovered		An alarm that has been recovered. However, an alarm will not be recovered until confirmed when a Lock is set for the channel.
Confirmed		An alarm that has been confirmed by pressing the [Confirm] or [Confirm All] Key Button.

The following diagram shows the flow of Alarm Status.

- When Lock-in is not set up for the channel



- When Lock-in is set up for the channel



3.1.3 CSV File Output

When using Downloader to upload alarm log data to a PC or output to a Memory card, the data is saved as a CSV file.

- HG2G/3G

Example of uploaded data or batch output to SD Memory Card

```
" Project Name","Project Name",”V1.80”, "English"
" File Type"," Alarm Log Data"

" Number"," Message"," Occurrence Time"," Recovery Time"," Confirmation Time"," Font Name"
" 1-0","Pressure sensor fault"," 12/31/2003 12:00:10"," 12/31 12:20:10"," 12/31 12:30:10","English"
" 1-1","Hydraulic pressure low"," 12/31/2003 12:10:10"," 12/31 14:00:10"," 12/31 14:30:10","English"
" 1-0","Pressure sensor fault"," 12/31/2003 13:00:10","","","English"
                                        …
                                        …
                                        …
```

Example of real timh output to SD Memory Card

```
" Project Name","Project Name",”V1.80”, "English"
" File Type"," Alarm Log Data"

" Time"," Status","Number "," Message"," Fond"
" 12/31/2003 12:00:10","Occurance"," 1-0","Pressure sensor fault","English"
" 12/31/2003 12:10:10","Occurance"," 1-1","Hydraulic pressure low","English"
" 12/31/2003 12:20:10","Recovery"," 1-0","Pressure sensor fault","English"
" 12/31/2003 12:30:10","Confirmation"," 1-0","Pressure sensor fault","English"
" 12/31/2003 13:00:10","Occurance"," 1-0","Pressure sensor fault","English"
                                        …
                                        …
                                        …
```

The date and time display format is determined by the language set in the Project Information tab of the project settings.
Japanese: YYYY/MM/DD HH: MM: SS
Other languages: MM/DD/YYYY HH: MM: SS

- HG1F/2F/2S/3F/4F

  Example of uploaded data or batch output to CF card

```
" Project Name","Project Name",”V1.80”, "English"
" File Type"," Alarm Log Data"

" Number"," Message"," Occurrence Time"," Recovery Time"," Confirmation Time"," Font Name"
" 1-0","Pressure sensor fault"," 12/31/2003 12:00:10"," 12/31 12:20:10"," 12/31 12:30:10","English"
" 1-1","Hydraulic pressure low"," 12/31/2003 12:10:10"," 12/31 14:00:10"," 12/31 14:30:10","English"
" 1-0","Pressure sensor fault"," 12/31/2003 13:00:10","","","English"
                                        …
                                        …
                                        …
```

  Example of real time output to CF card

```
" Project Name","Project Name",”V1.80”, "English"
" File Type"," Alarm Log Data"

" Time"," Status","Number "," Message"," Fond"
" 12/31/2003 12:00:10","Occurance"," 1-0","Pressure sensor fault","English"
" 12/31/2003 12:10:10","Occurance"," 1-1","Hydraulic pressure low","English"
" 12/31/2003 12:20:10","Recovery"," 1-0","Pressure sensor fault","English"
" 12/31/2003 12:30:10","Confirmation"," 1-0","Pressure sensor fault","English"
" 12/31/2003 13:00:10","Occurance"," 1-0","Pressure sensor fault","English"
                                        …
                                        …
                                        …
```

In case of real time output, byte count per item is calculated from the following expression: [40 + 1 x number of single-byte characters] bytes. For example, each item uses 40 + 21 bytes for the message “Pressure sensor error”. You can store up to 2.20 million alarm logs when using HG9Z-MF128 (128 MB CF card).

3.2 Operation Example

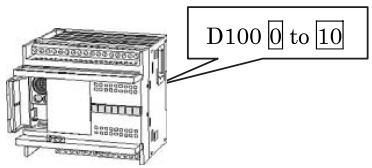
3.2.1 Alarm Log Operation Example

General	Storage Method			Rotate				
	Monitoring Period (x 100 msec.)			200				
	Call popup screen			Call Popup Screen				
				Popup Screen No.		100 (Place the Alarm List Display on this screen)		
				Coordinates X		40		
				Coordinates Y		40		
	Number of Stored Data			1024				
	Beep when Alarm occurs.							
Channel	No. of Blocks			1				
	Source Device			Word				
	Reference Screen Type			Popup Screen				
	No.	Source	Store/ No Store	Enable /Disable	NO/NC	Text ID	Text	Reference Screen No.
	1-0	D100	Store	Enable	ON	ID 1	Current fault	200
	1-1			Enable	ON	ID 2	Pump 1 fault	201
	1-2			Enable	OFF	ID 3	High pressure	202
	1-3			Enable	ON	ID 4	Low air pressure	203
	1-4			Enable	ON	ID 5	Guide elevation	204
	1-5			Disable	ON	...	...	...
	1-6			Disable	ON	...	...	...
	1-7			Disable	ON	...	...	...
	1-8			Disable	ON	...	...	...
	1-9			Disable	ON	...	...	...
	1-10			Disable	ON	...	...	...
	1-11			Disable	ON	...	...	...
	1-12			Disable	ON	...	...	...
	1-13			Disable	ON	...	...	...
	1-14			Disable	ON	...	...	...
	1-15			Disable	ON	...	...	...

It is necessary to preprogram the performance for displaying the detailed description of each alarm and taking countermeasures for the alarm on the Popup screens No. 200 to 204.

3.2.2 Operation Example

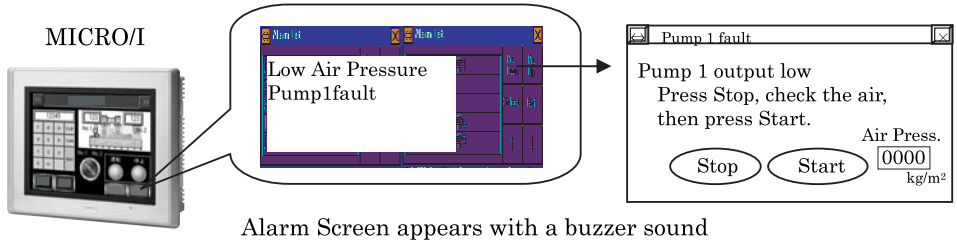
1 The bit 1 and bit 3 of D100 (corresponding to the No. 1-1 and 1-3 in the Alarm Log Settings) are turned from OFF to ON at the same time



"10" is expressed as "0000000000001010" with binary notation, indicating that alarms No. 1-1 and 1-3 are active. The number indicates the block No- bit position of the device.

2 The Popup screen No. 100 designated as the Alarm Screen is displayed on the specified coordinate (40, 40).

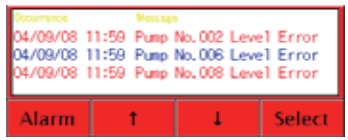
- On the Alarm List Display placed on the Alarm Screen, the messages "Pump 1 failure" and "Low air pressure" are displayed. At the same time, the internal buzzer starts sounding. (The illustration below is conceptual image.)
- Touching on anywhere on the screen will stop the buzzer.
- Use the [REVERSE] [Fcs. Up] and [Fcs. Dwn] Key Buttons to select one of the displayed messages, and press the [Ref.] Key Button to display the Popup screen No. 201 or 203 that contains the detailed description of the alarm and the operation settings for taking measures for the alarm.



Alarm Screen appears with a buzzer sound
detailed description and measures

3 After checking the description of the active alarm and taking necessary measures, close the Alarm Screen. The normal mode is recovered.

4 To view the Alarm Log data of the past, switch to the screen on which Alarm Log Display is set up. The Alarm Log Display is capable of display the Occurrence Time, Recovery Time, and Confirmation Time of the alarms occurred in the past in the chronological order. It is also possible to open the Popup Screen containing the details of each alarm. Use the functions of copying the Alarm Log data with the CSV format to the Memory Card, printout, or the web browsing



Alarm Log Display

Memory Card

Print

WEB Browser
Downloader

4 Restrictions

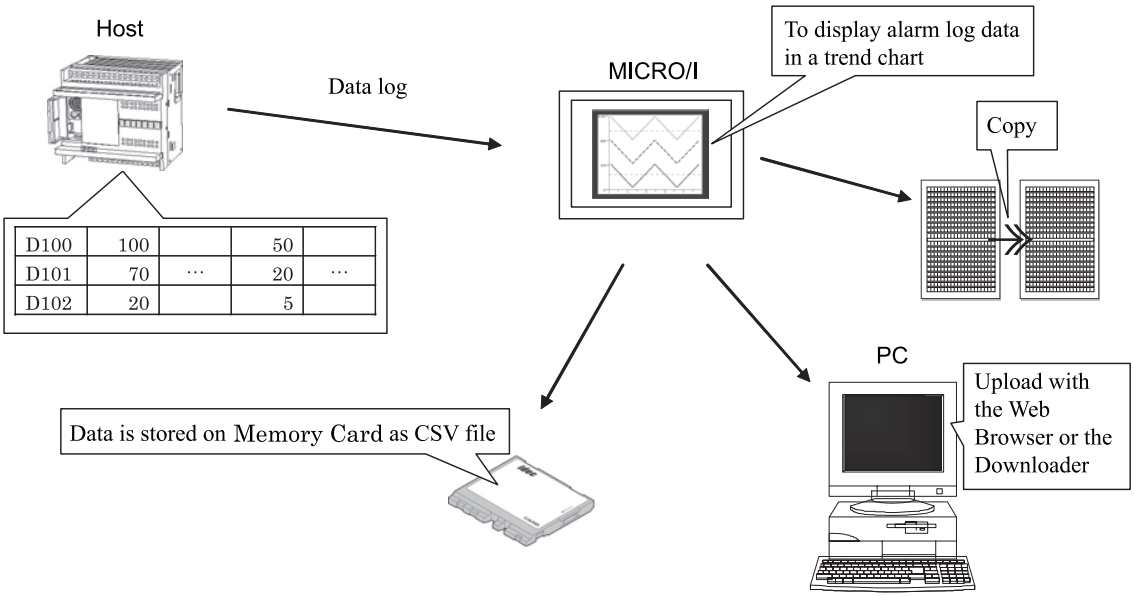
4.1 Maximum Alarm Log Data Storage

The maximum alarm log data that can be stored is 1024 points.

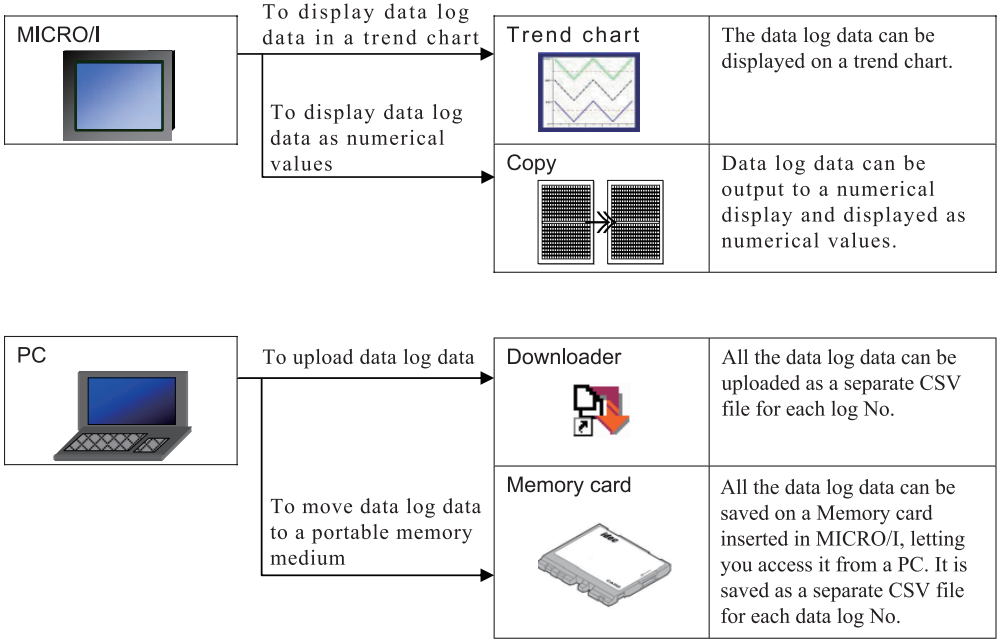
Chapter 15 Data Log Function

1 Overview

The Data Log function records the values from the set Device Address in the internal memory of the MICRO/I. When the stored data exceeds the storage capacity, the old data will be overwritten with the new data. Data Log can be saved in the Data Storage Area to retain the data during power OFF of MICRO/I. In addition, the data can be displayed as a Line Chart or exported to a Device Address.



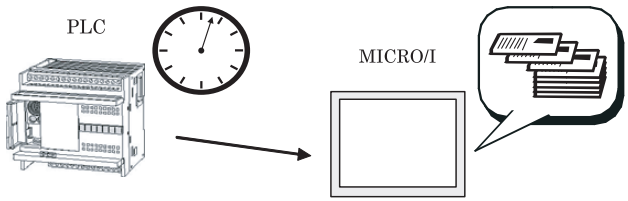
There are several ways to check the data of Data Log.



You can save the uploaded data for each Channel No. from Data Log as a CSV file. Note, you can not upload partial data. You must upload all the data from the set Channel No.

1.1 Examples

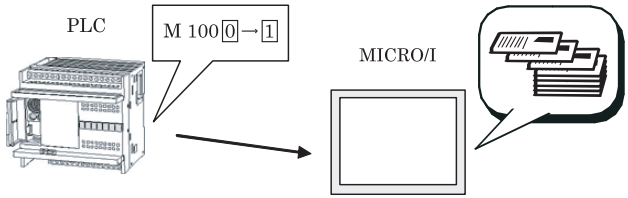
1.1.1 Gather Data from Log Data with a Fixed Cycle.



You can save and store data at set intervals, such as every 10 minutes or every hour.

Select “Fixed Cycle” for “Sampling Condition” in the General tab of [Data Log Settings]. Refer to “2.2.1 General tab” (P.300) in this chapter

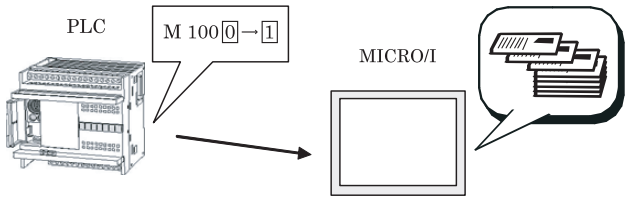
1.1.2 Gather Data from Log Data when there is a Change of Value from a Device Address.



You can store the data when there is a change in the Device Address state (ON/OFF).

Select “Specify Word” for “Sampling Condition” in the General tab of [Data Log Settings]. Refer to “2.2.1 General tab” (P.300) in this chapter

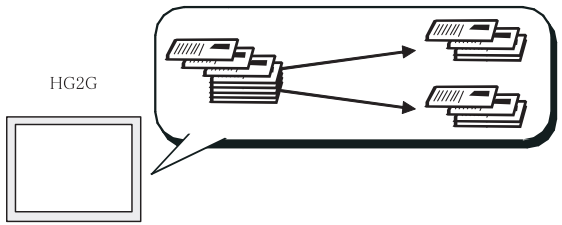
1.1.3 Gather Data from Multiple Device Addresses.



You can save and store the values of multiple connected devices simultaneously.

Set the “Number of Devices” item in the Options tab of [Data Log Settings]. Refer to “2.2.3 Data” (P.303) in this chapter

1.1.4 Output Data from Data Log to a Device Address (applicable to HG2G/3G only).



You can copy the data from Data Log, saved in the Data Storage Area, to a Device Address.

Enter the settings in the Copy tab of Data Log. Refer to “2.2.4 Option tab” (P.304) in this chapter

2 Settings

You can set properties for Data Log function when you select [Data Log Settings] on the General tab of [Line Chart] or [Configuration] - [System Setup] - [Data Log] menu on the WindO/I-NV2.

2.1 Data Log

The settings are listed below.

Item	Description
Log to Data Storage Area	Select this option when you want the data to be retained after MICRO/I power has been turned off.
Number of Stored Data for Data per Device	Specify the number of data to be stored in the Data Storage Area. [...] button Click the button to display “Data Storage Area Management” dialog box. This allows you to change the Number of Stored Log Data per Device. HG1F/2F/2S/3F/4F can store up to 1,024 items when “Log to Data Storage Area” is not selected. Refer to Chapter 17 “Data Storage Area” on page 331.
Clear Log Data	Specify a Device Address to be used for clearing the data stored in Data Log. The data will be cleared when the Device Address changes state from OFF to ON.

- Only HG2G/3G supports the [...] button to “Number of Data Log Data Items to Store Per Device”.
- Only HG1F/2F/2S/3F/4F support the “Log Data in Data Storage Area” setting.

HG2G/3G saves data log data in a Data Storage Area that will preserve the data after power OFF.

2.2 Individual Settings

You can set when you select the [Edit…] Button of [Data Log Settings]

2.2.1 General tab

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X	X	X	X	X	X

Supported by all models (except for some functions).

Item	Description
Channel No.	Displays the Channel No. to be displayed on the line chart.
Log function	Select “Enable” or “Disable” for the Channel No. (Enable/ Disable) Data Log is only performed for the Channel No. with the “Enable” setting.
Source	Displays the device selected in the Source.
Sampling Method	Displays the setting selected in the Sampling Method. Fixed Period: Date is sampled with a fixed period. (in seconds) Time: Displays the setting selected for the sampling range. (1 to 9999 sec.) Event Bit: Date is sampled when the device value changes form 0 to1. Device: Specify the bit in the Bit or Word device Event Word: Date is sampled when the value in the device changes. Device: Word device
Monitor Number of Stored Data	Allows you to monitor the accumulated number of Data Log data stored in a specified address.
Report when Number of Stored Data has reached or exceeded Threshold*1	Allows you to set the Threshold and assign a trigger device (Report Device).
Threshold	Set the threshold value for Number of Stored Data to use for triggering to Report Device. (1-13808)
Report Device	Specify the device address to write to.
Monitor % Space Used in Data Storage Area	This will allow you to monitor the percentage (usage rate) of space used for storing data in the device address. The calculation is as follows: Usage Rate = Number of the current stored data / Maximum number of the stored data per device. Note: a fractional value will be truncated.
Report when % Space Used has reached or exceeded Threshold*1	Allows you to set the Threshold and assign a trigger device (Report Device).
Threshold	Set the threshold value for % Space Used to use for triggering to Report Device. (1-100)
Report Device	Set a Device Address which will be triggered once the limit value from the Threshold is met or exceeded.

*1. Only available in the Advanced mode.

WARNING Only HG2G/3G supports the “Report when Number of Stored Data has reached of exceeded Threshold” and “Report when % Space Used has reached or exceeded Threshold” settings.

2.2.2 Memory Card Output

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X		X		X	X

Only HG3G, HG2F/3F/4F support this function

Set for the outputting Data Log data. Data Log data can be output to the Memory Card with respect to each Channel No.

You can set when you select the [Edit…] Button of [Data Log Settings]

Item	Description
Batch	Outputs all Data Log data stored in the Data Storage Area to the Memory Card. The data is output when the device value goes from 0 to 1.The output data is stored in the folder as below. HG3G: \"Memory Access Folder"\DATALOG HG2F/3F/4F: \"Memory Access Folder"\LOG
Trigger Device	Outputs all data when the Trigger Device value goes from 0 to 1.
File Name	Assigns a name to the output data and saves it in a file. File names that can be set depend on the O/I type. The "*n*" indicates the Channel No. of the Data Log Setting. HG3G: Enter a name of up to 120 alphanumeric characters including file extensions. The default file name is 'LOGO*n*.CSV'. HG2F/3F/4F: 'LOGO*n*.CSV'. This cannot be changed.
Add Device data to File Name*1	Select the checkbox to append the last three digits of the device value at the moment of the output to the end of the file name. (Example) If the Channel No. is "1" and the last three digits of the "File Name Device" value is "123", the file name is "LOGO01123.CSV". File Name Device: Specifies the device address where the values added to the file name are stored.
Real time	Outputs sampled data to the Memory Card in real time when periodic sampling is selected. The output data is stored in the folder as below. HG3G: \"Memory Access Folder"\LOG HG2F/3F/4F: \"Memory Access Folder"\DATALOG
File Name	Assigns a name to the output data and saves it in a file. File names that can be set depend on the O/I type. The "*n*" in the following file names is the data log channel number. HG3G: Enter a name of up to 120 alphanumeric characters including file extensions. The default file name is 'LOGA*n*.CSV'. HG2F/3F/4F: 'LOGA*n*.CSV'. This cannot be changed.
Add Device data to File Name*1	Select the checkbox to append the last three digits of the device value at the moment of the output to the end of the file name. (Example) If the Channel No. is "20" and the last three digits of the "File Name Device" value is "123", the file name is "LOGA20123.CSV". File Name Device: Specifies the device address where the values added to the file name are stored.

*1. Only available in the Advanced mode.

- These settings are supported by models with a memory card interface. They operate independently from the Data Log function.
- The functions that outputs log data to a memory card operate independently from the function that stores alarm log data.
- Batch: The file is overwritten right after the trigger is occurred and the previous file is cleared. Data Log data which is sampled after starting to output to Memory card is not written in the file.
- Real time: Writing file is not started right after the condition is satisfied. Data Log data is stored in the file output buffer once. Actual writing file is processed every 3 minutes or the timing of HG special internal relay LSM 20 is set from 0 to 1. Data Log data is added after previous Data Log data file. Therefore, when writing condition occurrence timing is shorter than writing speed, the requests are stored within (The stored log amount for each data - 1) in the file output buffer. If requests occur more than that, the older request is lost and the newer request is replaced one by one.

- The Real Time Output stops the output when the file size exceeds 256MB or it runs out of free space on the Memory Card. You can clear the output data by using the setting on the [Project Settings] - [System] - [Memory Card] tab.
- It is possible to delete data log data files saved on a memory card using “Remove Files stored in Memory Card” on the Memory Card tab of the Project Settings dialog box.
- The text font set for the start device is output as the Title Font.

2.2.3 Data

HG2G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X	X	X	X	X

Supported by all models (except for some functions).

Specify the number of devices to be used in one Channel No. Data for the specified number of devices will be logged starting from the destination device. When using the Line Chart or Web Server function, only the start device for the specified Channel No. is displayed. When selecting the Memory Card Output or WindO/I-NV2 Utility Software Downloader, data for all devices will be output.

Item		Description
Channel No.		Displays the currently selected Channel No.
Number of Data:		Specify the number of devices to be used.
Use Text Manager		Select whether to use the text strings registered in Text Manager. When this option is selected, the text strings for the title on both sampling time and device address in the CSV file are coming from the Text Manager. On the HG1F/2F/2S/3F/4F, the sampling time titles cannot be changed. If this option is not selected, automatically generated titles such as “data 001” are used as for the data labels.
Sampling Time	Title	Specify the title to be used when using the Downloader to output the data as a CSV file. You can enter up to 40 single byte characters for the title.
Settings	Data No.	Displays the No. of the device.
	Device	Displays the destination device.
	Display Type	Displays the display type for outputting the data to the Memory Card or Web Server.
	Data Type	Specify the data type for outputting the data to the Memory Card or Web Server. When using the Line Chart function, the data type specified with the Line Chart Properties will be enabled. (BIN16 (+) BIN16 (+/-) BCD4)
	Text	Specify the title to be used when using the Downloader to output the data as a CSV file. You can enter up to 40 single byte characters for the title.
	Text ID:	Specify the Text Manager ID No. to set when the “Use Text Manager” checkbox is selected. (1-32000)

WARNING
- Only HG2G/3G supports the “Title” and “Text” settings.
- Models with a memory card interface can output data to a Memory card.
- Models with an Ethernet port can use the Web Server function.

2.2.4 Option tab

HG2G	HG1F	HG2F	HG2S	HG3F	HG4F
X					

Only HG2G supports this function.

You can copy data log data stored in the Data Storage Area to the set device. The copied data can be used as a numeric value. By selecting the data to copy, you can output only the required data to the device.

Item		Description
Copy Data Log Data		Select this to you make settings for copying data log data to a device.
Destination Device		Specify the device address to write to. Only internal MICRO/I devices are supported.
Starting Point	Newest Data	Copy the data log data beginning with the newest data.
	Oldest Data	Copy the data log data beginning with the oldest data.
	Specify by Value of Device	Set a number in a device address to indicate where in the data logged to begin copying. Make sure to use Internal Device Addresses of the MICRO/I.
Number of Data	Value	Specify the number of items to copy, as a fixed value (between 1 and 64).
	Device	Specify a device address and set a value to indicate where in the data log to begin copying from. Only internal device address of the MICRO/I can be used.
Stored order of Data	From Newest to Oldest	Copies the specified number of data items to the device, starting from the newest data item.
	From Oldest to Newest	Copies the specified number of data items to the device, starting from the oldest data item.
Target Data	Sampling Time	Copies the sampling time of the data log data.
	Value of Device	When this option is enabled, it will allow you to set a value or specify a device address.
	Value	Set a number to indicate how many data from a channel you want to copy to the destination device address.
	Device	Set a device address that contains a value to indicate how many data from a channel you want to copy to the destination device address.
	Start No.*1	Specify a number that references to a specific data as the starting point for copying.
	End No.	Specify a number that references to a specific data as the end point for copying.
Trigger Condition	Always	The Copy function will execute whenever data is updated from Data Log.
	Device	The Copy function executes when the value of 1 is written to a specified Device Address.

*1. If you select Sampling Time checkbox, this value is fixed to 1.

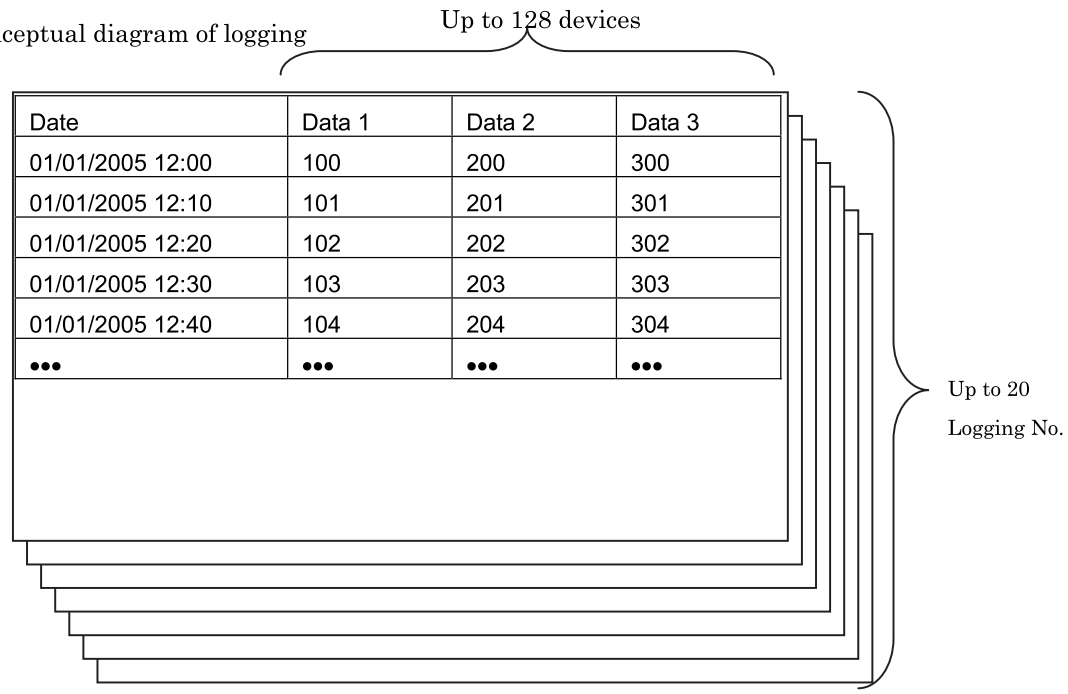
3 Operations

3.1 Description

3.1.1 Data Log

For each Channel No. set up to 128 device addresses. When all the space has been filled, the new data will overwrite the oldest data.

Conceptual diagram of logging



3.1.2 Copy

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
		X	X	X	X	X

Only HG1F/2F/2S/3F/4F support this function

Data logged that matches the specified criteria can be copied to the destination device.*1

- "Starting Point" and sequence for storing data in device

  Data is copied and stored in the destination device in the sequence below. The sequence is determined by the "Copy Start Position" and "Copy Sequence" settings in the Copy tab.

Setting example 1

Destination Device	LDR 10
Starting Point	Newest Data
Number of Data	3
Stored order of Data	From Newest to Oldest

Data log data

Date	Data
12/18/2007 17:44:10	20
⋮	⋮
12/19/2007 19:24:43	22
12/19/2007 20:01:54	24
12/19/2007 21:39:21	26
12/20/2007 05:57:06	28

Destination device

LDR 10	28
LDR 11	26
LDR 12	24

The last three items of data log data are stored sequentially in the destination device, starting with the newest data item.

Setting example 2

Destination Device	LDR 10
Starting Point	Newest Data
Number of Data	3
Stored order of Data	From Oldest to Newest

Data log data

Date	Data
12/18/2007 17:44:10	20
⋮	⋮
12/19/2007 19:24:43	22
12/19/2007 20:01:54	24
12/19/2007 21:39:21	26
12/20/2007 05:57:06	28

Destination device

LDR 10	24
LDR 11	26
LDR 12	28

The last three items of data log data are stored sequentially in the destination device, starting with the oldest data item.

Setting example 3

Destination Device	LDR 10
Starting Point	Specify by Value of Device (value: 4)
Number of Data	3
Stored order of Data	From Newest to Oldest

Data log data

Date	Data
12/18/2007 17:44:10	20
12/19/2007 07:24:09	21
12/19/2007 19:24:43	22
12/19/2007 20:01:54	24
12/19/2007 21:39:21	26
12/20/2007 05:57:06	28
12/20/2007 15:26:17	29
12/21/2007 06:46:57	31

Destination device

LDR 10	28
LDR 11	26
LDR 12	24

The three items of data log data starting with the fourth item after the oldest data log data item are stored sequentially in the destination device, starting with the newest data item.

*1. Any previous data in those device addresses will be overwritten.

- Storing the sampling time

  When copied, the sampling time is stored in the following order: Year, month, day, hour, minute, second. When copied, the sampling time is stored in the following order: year, month, day, hour, minute, second. Even if the configuration in Copy tab is modified, the order stays the same.

  <Operation example> Copying 10/01/2008 12:01:30 when LDR 10 is set as the destination device

LDR 10	LDR 11	LDR 12	LDR 13	LDR 14	LDR 15
2008	10	1	12	1	30

- Storing multiple data items

  When multiple data are copied to the Device Addresses, the storage order will be as follows: 1st sampling time, 2nd sampling time,..., 1st device value, 2nd device value... If the number of data from Data Log is less than the number of data to be copied, zeros will be copied to the remaining destination devices.

  <Operation example 1>
  For instance, 2 rows of data from the Data Log table will be copied to the Destination Device address LDR 10 (as shown on the Destination Device table).

  Data Log Data

Sampling time	Data 1	Data 2	Data 3
10/01/2008 12:34:56	100	60	240
10/01/2008 03:45:12	200	80	450

  Destination device

LDR 10	LDR 11	LDR 12	LDR 13	LDR 14	LDR 15	
2008	10	1	12	34	56	← 1st sampling time
LDR 16	LDR 17	LDR 18	LDR 19	LDR 20	LDR 21	
2008	10	2	3	45	12	← 2nd sampling time
LDR 22	LDR 23					
100	200	← Data 1				
LDR 24	LDR 25					
60	80	← Data 2				
LDR 26	LDR 27					
240	450	← Data 3				

<Operation example 2>
For instance, 4 rows of data from the Data Log table will be copied to the destination device address LDR10. Since the last 2 rows from the Data Log table have no values, then the destination device addresses will display zeroes.

Data Log Data

Sampling time	Data 1	Data 2	Data 3
10/01/2008 12:34:56	100	60	240
10/01/2008 03:45:12	200	80	450

Destination device

LDR 10	LDR 11	LDR 12	LDR 13	LDR 14	LDR 15	
2008	10	1	12	34	56	← 1st sampling time
LDR 16	LDR 17	LDR 18	LDR 19	LDR 20	LDR 21	
2008	10	2	3	45	12	← 2nd sampling time
LDR 22	LDR 23	LDR 24	LDR 25	LDR 26	LDR 27	
0	0	0	0	0	0	← 3rd sampling time
LDR 28	LDR 29	LDR 30	LDR 31	LDR 32	LDR 33	
0	0	0	0	0	0	← 4th sampling time
LDR 34	LDR 35	LDR 36	LDR 37			
100	200	0	0	← Data 1		
LDR 38	LDR 39	LDR 40	LDR 41			
60	80	0	0	← Data 2		
LDR 42	LDR 43	LDR 44	LDR 45			
240	450	0	0	← Data 3		

"Device range error" is displayed when copying is executed in the following examples:

- When the copy start position is set to 0 or to a value greater than the number of stored data
- When the start position value is 0 or a value greater than the number of set devices
- When the end position value is 0 or a value greater than the number of set devices
- When the start position value is greater than the end position value

3.1.3 CSV File Output

When using Downloader to upload alarm log data to a PC or output to a Memory card, the data is saved as a CSV file.

- HG2G/3G

  Example of uploaded data or batch output to SD Memory Card

```
“Project Name”, “Sample Project”, “V1.80”
“File Type”, “Data Log Data”

“Channel No.”, “1”
“Source”, “LDR 0”
“Sampling Method”, “Event Word”
“Device”, “LDR 100”

“Sampling Time”, “Data 001”, “Data 002”, “Data 003”, “Data 004”
" 2003/12/31 12:00:00", 100, 200, 301, 401
" 2003/12/31 12:00:01", 101, 201, 302, 402
" 2003/12/31 12:00:02", 102, 202, 303, 403
" 2003/12/31 12:00:03", 103, 203, 304, 404
                .
                .
                .
```

The date and time display format is determined by the language set in the Project Information tab of the project settings.
Japanese: YYYY/MM/DD HH: MM: SS
Other languages: MM/DD/YYYY HH: MM: SS

- HG1F/2F/2S/3F/4F

  Example of uploaded data or batch output to CF card

```
"Project Name","Sample Project","V1.80"
"File Type","Data Log Data"

"Channel No.","1"
"Source","LDR 00000000"
"Sampling Conditions ","Word Specification"
"Device","LDR 00000100"
"Title Font","Japanese"

"Sampling Time","Data 001","Data 002","Data 003","Data 004"
"12/31/2003 12:00:00", 100, 200, 301, 401
"12/31/2003 12:00:01", 101, 201, 302, 402
"12/31/2003 12:00:02", 102, 202, 303, 403
"12/31/2003 12:00:03", 103, 203, 304, 404
                …
                …
                …
```

Example of real time output to CF card

```
"Project Name","Sample Project","V1.80"
"File Type","Data Log Data"

"Channel No.","1"
"Source","LDR 00000000"
"Sampling Conditions ","Word Specification"
"Device","LDR 00000100"
"Title Font","Japanese"

"Sampling Time","Data 001","Data 002","Data 003","Data 004"
"12/31/2003 12:00:00", 100, 200, 301, 401
"12/31/2003 12:00:01", 101, 201, 302, 402
"12/31/2003 12:00:02", 102, 202, 303, 403
"12/31/2003 12:00:03", 103, 203, 304, 404
                …
                …
                …
```

- The number of bytes used per item during real time output is 30 to 670 bytes and about 130 bytes for the header (except text strings of the title).
- You can store up to about 4.44 million items when using HG9Z-MF128 (128 MB CF card).

3.2 Operation Example

3.2.1 Data Log

In the example below, the value of device D 100 is sampled every 5 seconds.

- Setup

General tab	Channel No.	1
	Log function	Enable
	Source	D 100
	Sampling Method	Fixed Period:
	Time [sec.]	5
Data tab	No. of Data:	3

- Operation

Date	Value of Device		
	D 100	D 101	D 102
10/01/2008 12:00:01	10	70	3
10/01/2008 12:00:02	20	80	2
10/01/2008 12:00:03	30	90	1
10/01/2008 12:00:04	10	70	3
10/01/2008 12:00:05	20	80	2
10/01/2008 12:00:06	30	90	1
10/01/2008 12:00:07	10	70	3
10/01/2008 12:00:08	20	80	2
10/01/2008 12:00:09	30	90	1
10/01/2008 12:00:10	10	70	3
10/01/2008 12:00:11	20	80	2
10/01/2008 12:00:12	30	90	1
10/01/2008 12:00:13	10	70	3
10/01/2008 12:00:14	20	80	2
10/01/2008 12:00:15	30	90	1
10/01/2008 12:00:16	10	70	3

Sampling time	Value of Device		
	Data 1	Data 2	Data 3
10/01/2008 12:00:05	20	80	2
10/01/2008 12:00:10	10	70	3
10/01/2008 12:00:15	30	90	1

3.2.2 Copy

To set the copy operation, follow the procedure described in “Data Log” on page 311. Each time the data from the Data Log is updated, the data is copied to the Device Address starting with LDR 10.

- Setup

Option tab	Copy Data Log Data	Select the checkbox
	Destination Device	LDR 10
	Starting Point	Newest Data
	Number of Data	Value: 1
	Stored order of Data	From Newest to Oldest
	Target Data	Sampling Time Value of Device: Value: Start No.1, End No.3
	Trigger Condition	Always

- Operation

Each time the data log data is updated, the Newest Data (sampling time and value) is copied to the devices starting with LDR 10.

	Sampling Time						Value of Data 1	Value of Data 2	Value of Data 3
	LDR 10	LDR 11	LDR 12	LDR 13	LDR 14	LDR 15	LDR 16	LDR 17	LDR 18
	2008	10	1	12	0	5	20	80	2
	2008	10	1	12	0	10	10	70	3
Newest Data →	2008	10	1	12	0	15	30	90	1

4 Restrictions

4.1 Maximum Number of data Stored

The maximum number of items that can be stored in the data log is given below.

HG3G

	Maximum data from Data Log
Stored in the Data Storage Area	29165 points

HG2G

	Maximum data from Data Log
Stored in the Data Storage Area	13808 points

HG1F/2F/2S/3F/4F

	Maximum data from Data Log	Maximum data per device
Stored in the backup data	2048 points	2048 points
Not stored in the backup data	40960 points	1024 points

Refer to Chapter 17 “Data Storage Area” on page 331 for detail the Data Storage Area.

4.2 Maximum Number of Device Addresses

The total maximum number of devices that can be set for the data log is 128. When the same device address is set multiple times, it is counted as different devices.

4.3 Maximum Number of Copies

The maximum number of data from Data Log that can be copied to devices is 64.

Chapter 16 Operation Log Function

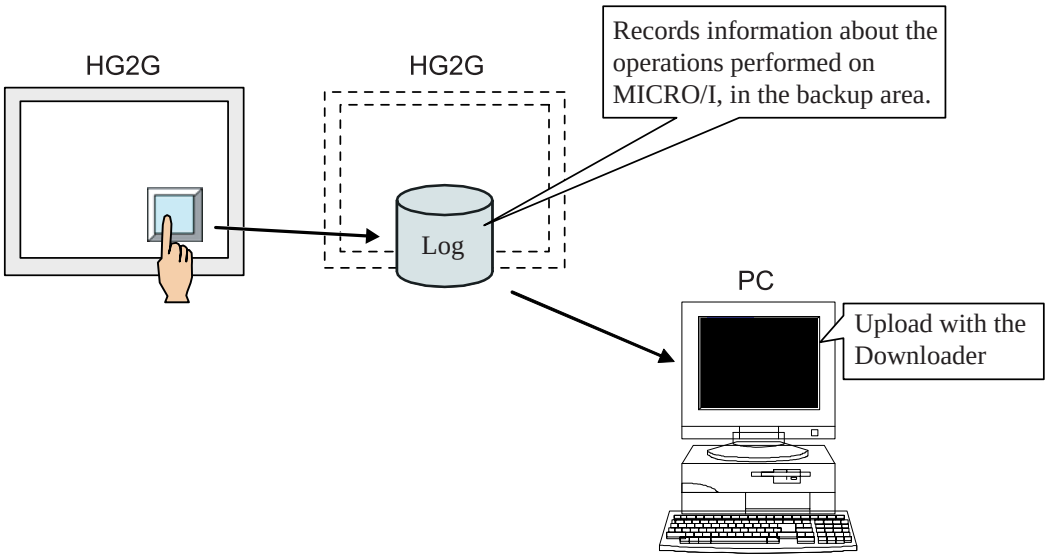
This chapter describes how to set the operation log and how operation log operate in MICRO/I.

1 Overview

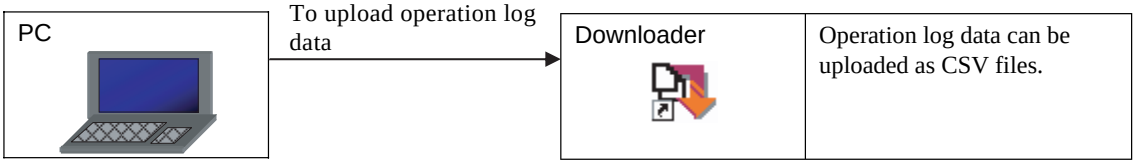
HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

The Operation Log records information for every operation performed in the MICRO/I.
This function enables you to check who performed each operation, when it was performed, what was performed, and where it was performed. In addition, this function can help you analyze the causes of system errors or other types of problems.

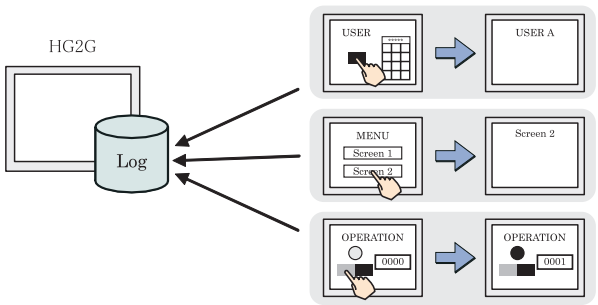


Use the following method to check operation log data:



1.1 Examples

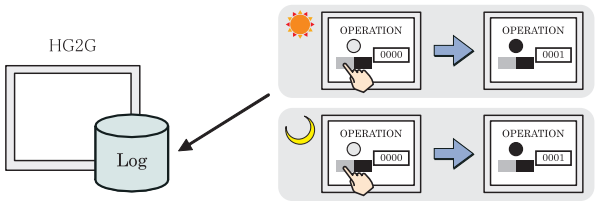
1.1.1 Constantly Record All Operation Information



All the operations below are recorded.
- Power ON
- Switch to Base Screens
- Change Users
- Change Operation Modes
- Press buttons
- Write Data to any Devices

Select the option “Constantly” from the “Operation Condition” in the General tab of [Operation Log Settings] for continuous recording of all events. Refer to “2.1 Operation Log Settings” (P.319) in this chapter.

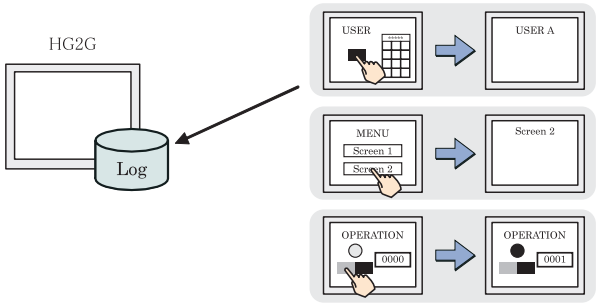
1.1.2 Record Operations when Device Address is Triggered



Events are recorded only if the Device Address is set to ON.

Select “Device” from “Operation Condition” in the General tab of [Operation Log Settings]. Refer to “2.1 Operation Log Settings” (P.319) in this chapter.

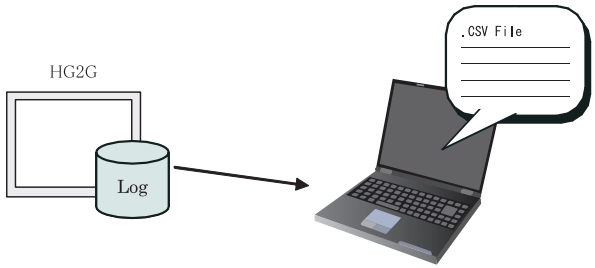
1.1.3 Record Specific Operations Only



You have the option to record specific events by triggering the device address. This will help save memory space in the MICRO/I.

Select the checkbox under “Target Events to Record” in the General tab of [Operation Log Settings] to record specific events. Refer to “2.1 Operation Log Settings” (P.319) in this chapter.

1.1.4 Output Operation Log Data as a CSV File



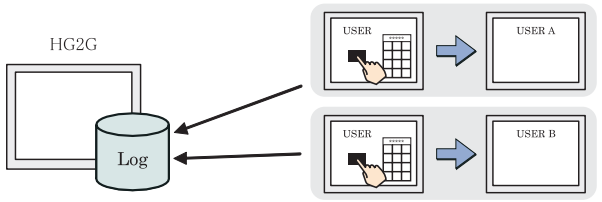
Use the Downloader tool to upload the operation log data saved in MICRO/I to a PC.

Set the text strings for CSV output in “CSV File Output” in the General tab of [Operation Log Settings]. Refer to “Data Level” (P320) in this chapter.

1.2 Application Examples

The examples below illustrates how to use the Operation Log with other applications.

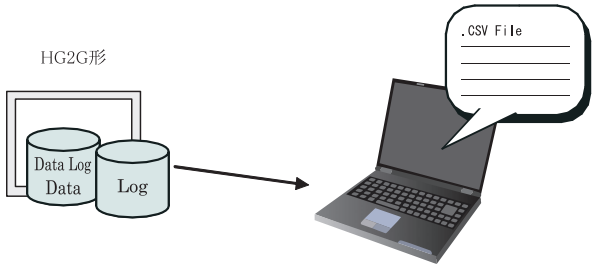
1.2.1 Record Users and Operations



By enabling the Operation Log with the Security Function, the MICRO/I can record who the users are and the type of operation each has performed.

Select the “Change Users” checkbox under “Target Events to Record” in the General tab of [Operation Log Settings]. Refer to “2.1 Operation Log Settings” (P.319) in this chapter. Refer to Chapter 23 “Security Function” on page 407.

1.2.2 Analyze Errors



By using the Operation Log function with the Data Log function, you can analyze data errors from the data log and the information about the operations performed.

Select the “Press buttons” and “Write Data to any Devices” checkboxes under “Target Events to Record” in the General tab of [Operation Log Settings]. Refer to “2.1 Operation Log Settings” (P.319) in this chapter. Refer to Chapter 15 “Data Log Function” on page 295.

2 Settings

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

You can set up the properties of Operation log from [Configuration] - [System Setup] - [Operation Log] in WindO/I-NV2 main menu.

2.1 Operation Log Settings

Item	Description
Enable Operation Log Settings	Specify whether to use the Operation Log function.
Target Events to record	Specify the events to record. You can set any of the events below. - Power ON - Switch to Base Screens - Change Users - Change Operation Modes - Press buttons - Write Data to any Devices
Edit Data Labels	Set this option when uploading operation log data as a CSV file using Downloader. Refer to “Data Level” (P320) in this chapter for information on the settings.
Monitor Number of Stored Data	Writes the number of recorded data to the set device address.
Report when Number of Stored Data has reached or exceeded Threshold*1	Turns the specified device address to ON when the number of recorded data has reached or exceeded the threshold value.
Threshold	Set the threshold value for Number of Stored Data to use for triggering to Report Device. (1-3945)
Report Device	Specify the device to write to.
Monitor % Space Used in Data Storage Area	This will allow you to monitor the percentage (usage rate) of space used for storing data. The calculation is as follows: Usage Rate = Number of the current stored data / Maximum number of the stored data. Note: a fractional value will be truncated.
Report when % Space Used has reached or exceeded Threshold*1	Turns the specified device address to ON when the utilization rate has reached or exceeded the threshold value.
Threshold	Set the threshold value for % Space Used to use for triggering to Report Device. (1-100)
Report Device	Specify the device address to write to.
Clear Log Data	Clears the operation log data saved in the Data Storage Area.
Number of Stored Data	Specify the number of operation log data save in the Data Storage Area.
Trigger Condition	Select the type of operation settings.
Always	Records all operations immediately after the MICRO/I powers ON.
Device	Set a Device Address which will be triggered once the limit value from the Threshold is met or exceeded.

*1. Only available in the Advanced mode.

You can use Downloader to upload recorded operation log data.

- Data Level

Item	Description
Title of Recorded Data	Specify the titles of each recorded data when uploading data (as a CSV file) using Downloader. - Sampling Time - User Name - Screen No. - Event Name - Part Name - Device - Changed to
Use Text Manager	Select whether to use the text strings registered in Text Manager.
Text ID	Specify the Text ID No. (1-32000) from the Text Manager if “Use Text Managers” checkbox is selected.
Text	If “Use Text Manager” is not selected, then enter the text directly. You can enter up to 40 single byte characters.
Event Name	Specify the names of each recorded data when uploading data (as a CSV file) using Downloader. - Power ON - Switch to Base Screens - Change Users - Change Operation Modes - Press buttons - Write Data to any Devices
Use Text Manager for Event Names	Select whether to use the text strings registered in Text Manager.
Text ID	Specify the Text ID No. (1-32000) from the Text Manager if “Use Text Managers” checkbox is selected.
Text	If “Use Text Manager” is not selected, then enter the text directly. You can enter up to 40 single byte characters.

2.2 Memory Card Output

Item	Description
Batch	All alarm log data stored in the internal memory of the MICRO/I outputs to the Memory Card when the Trigger Device turns to ON. The output data is stored in the folder as below. HG3G: \"Memory Access Folder"\OPERATIONLOG HG2F/3F/4F: \"Memory Access Folder"\OPERATION
Trigger Device	Assign a Trigger Device and when it changes state from 0 to 1 will activate the process to output a batch of data.
File name	Enter a name of up to 120 alphanumeric characters including file extensions. The default file name is 'OPLOGO.CSV'. HG3G: Enter a name of up to 120 alphanumeric characters including file extensions. The default file name is 'OPLOGO.CSV'. HG2F/3F/4F: 'OPLOGO.CSV'. This type of format cannot be changed.
Add Device data to File Name*1	To modify the file name as required, select the checkbox. The last three digits of the File Name Device value at the moment of the output are appended to the end of the file name. (Example) If the last three digits of the "File Name Device" value is "123", the file name is "OPLOGO123.CSV". File Name Device: Specifies the device address where the values added to the file name are stored.
Real Time	The content of the alarm that has occurred is stored in real time on the Memory Card when the specified conditions occur. The output data is stored in the folder as below. HG3G: \"Memory Access Folder"\OPERATIONLOG HG2F/3F/4F: \"Memory Access Folder"\OPERATION
File name	Select the trigger condition for the real time output. The conditions are Occurrence, Recovery and Confirmation, and multiple selections are possible. (Occurrence Recovery Confirmation) HG3G: Enter a name of up to 120 alphanumeric characters including file extensions. The default file name is 'OPLOGA.CSV'. HG2F/3F/4F: 'OPLOGA.CSV'. This cannot be changed.
Add Device data to File Name*1	Select the checkbox to append the last three digits of the device value at the moment of the output to the end of the file name. (Example) If the last three digits of the "File Name Device" value is "123", the file name is "OPLOGA123.CSV". File Name Device: Specifies the device address where the values added to the file name are stored.

*1. Only available in the Advanced mode.

WARNING

- These settings are applicable to models equipped with a memory card interface.
- The functions that output the log data to a memory card operates independently from the function that stores the alarm log data in the internal memory.
- Batch: The file is overwritten right after trigger is occurred and the previous file is cleared. Alarm logs which occur after starting to output to Memory card is not written in the file.
- Real time: Writing file is not started right after the condition is satisfied. Alarm logs are stored in the file output buffer once. Actual writing file is processed every 3 minutes or the timing of HG special internal register LSM20 is set from 0 to 1. Alarm logs are added after previous logs file. Therefore, when writing condition occurrence time is shorter than writing speed, the requests are stored within (Register Occurred No.-1) in the file output buffer. If requests occur more than that, the older request is lost and the newer request is replaced one by one.

- The option “Real Time Output” stops storing data when the file size exceeds 256MB or it runs out of free space on the memory card .
- It is possible to delete alarm log data files saved on a memory card by using “Remove Files stored in Memory Card” on the Memory Card tab of the Project Settings dialog box.

3 Operations

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

When Operation Log is enabled, the data is automatically saved immediately and retained at power OFF. When the recorded data exceeds the maximum storage limit the new data will overwrite the oldest data. The number of data that can be stored in the operation log is described in Chapter 17, Section 2.1, “Operation Log Settings” on page 331. You can use Downloader to upload recorded operation log data as a CSV file.

The Operation Log function records the following operations:

Target Events for Record	Recorded information						
	Sampling Time	User	Screen No.	Event Name	Part Name	Device	Changed to
Power ON	X	---	X	X	---	---	---
Switch to Base Screens	X	X	X	X	---	---	X
Change Users	X	X	X	X	---	---	X
Change Operation Modes	X	X	X	X	---	---	X
Press Buttons	X	X	X	X	X	---	---
Write Data to any Devices	X	X	X	X	---	X	X

WARNING The “User” item in the table above is only recorded when using the Security Function.

3.1 Operation Description

The following shows different types of operations and events that can be logged.

3.1.1 Power ON

The table below shows the items that are recorded when MICRO/I is turned ON.

Title of Recorded Data	Recorded information
Sampling Time	The date/time the event occurred.
User Name	---
Screen No.	The initial screen No.
Event Name	Power ON
Part Name	---
Device	---
Changed to	---

3.1.2 Switch to Base Screens

Specifying this event records when a base screen changes.

Applicable parts and functions

- Goto Screen Button (Action Mode: Back to previous Screen, Switch to Base Screen, Reset current screen)
- Goto Screen Command (Action Mode: Back to previous Screen, Switch to Base Screen, Reset current screen)
- Multi-Button (If “Back to previous Screen” or “Switch to Base Screen” or “Reset current screen” is set in the “Goto Screen” command.)
- Multi-Command (If “Back to previous Screen” or “Switch to Base Screen” or “Reset current screen” is set in the “Goto Screen” command.)
- Alarm List Display (If “base screen” is set in “Reference Screen Type” in “Alarm Log Settings”.)
- Alarm Log Display (Key type: Ref.)
- Display screen No. of the System area 1 (System area 1 address + 0 (display screen No.))

Title of Recorded Data	Recorded information
Sampling Time	The date/time the event occurred.
User Name	The user name when the event occurred.
Screen No.	Base screen No. before change
Event Name	Switch to Base Screens
Part Name	---
Device	---
Changed to	Base screen No. after change

3.1.3 Change Users

Specifying this event records when the user changes. The event is only recorded when using the Security Function. Refer to Chapter 23 “Security Function” on page 407 for details of the Security Function.

Applicable parts and functions

- Goto Screen Button (Action Mode: Open Password Screen)
- Goto Screen Command (Action Mode: Open Password Screen)
- Multi-Button (If “Open Password Screen” is set in the “Goto Screen” command.)
- Multi-Command (If “Open Password Screen” is set in the “Goto Screen” command.)
- Security Function (Change User by Device, Back to Default User)

Title of Recorded Data	Recorded information
Sampling Time	The date/time the event occurred.
User Name	User name before change
Screen No.	The base screen No. when the event occurred.
Event Name	Change Users
Part Name	---
Device	---
Changed to	User name after change

- When the user is set to “Default User” in the user account settings, the “Change Users” event is generated when the power is turned ON or directly after the operation mode is switched.
- When the “Change Users” event is generated, the “Switch to Base Screens” event is automatically generated.

3.1.4 Change Operation Modes

Specifying this event records when operation modes change.

Applicable parts and functions

- Goto Screen Button (Action Mode: Switch to System Menu Screen)
- Goto Screen Command (Action Mode: Switch to System Menu Screen)
- Multi-Button (If “Switch to System Menu Screen” is set in the “Goto Screen” command.)
- Multi-Command (If “Switch to System Menu Screen” is set in the “Goto Screen” command.)

Title of Recorded Data	Recorded information
Sampling Time	The date/time the event occurred.
User Name	The user name when the event occurred.
Screen No.	The base screen No. when the event occurred.
Event Name	Change Operation Modes
Part Name	---
Device	---
Changed to	The mode after the change (Run Mode, System Mode, Monitor mode, Simulation Mode).

3.1.5 Press buttons

Specifying this event records when a button presses.

Applicable parts and functions

- Bit Button
- Word Button
- Multi-Button
- Goto Screen Button
- Selector Switch
- Potentiometer
- Numerical Input
- Character Input
- Key Button (Key type: ENT, All Chk, Del. All, Ref., Stop Beep, Download Project, Upload Project, Download PLC Program, Upload PLC Program, File Copy)
- Keypad (Key type: ENT)
- Alarm List Display (Key type: Ref.)
- Alarm Log Display (Key type: All Chk, Del. All, Ref., Stop Beep)

Title of Recorded Data	Recorded information
Sampling Time	The date/time the event occurred.
User Name	The user name when the event occurred.
Screen No.	The base screen No. when the event occurred.
Event Name	Press buttons
Part Name	The part name of the pressed button.
Device	---
Changed to	---

WARNING The operation log function only works with a user program. Therefore the following screens and message are not recorded by this function.

- System Screen
- Password Screen
- System Error Message
- Title Bar of Popup Screen

3.1.6 Write Data to any Devices

When a button that writes data to a device is pushed, the operation is recorded. If the button writes more than 2 words, the operation log will record the words individually.

Applicable parts and functions

- Bit Button
- Word Button
- Selector Switch
- Potentiometer
- Numerical Input
- Character Input
- Multi-Button (Commands: Bit Write, Word Write, Script Command)

Title of Recorded Data	Recorded information
Sampling Time	The date/time the event occurred.
User Name	The user name when the event occurred.
Screen No.	The base screen No. when the event occurred.
Event Name	Write Data to any Devices
Part Name	---
Device	The device address written to
Changed to	The value written

Example) Writing 32-bit data

Pressing a Word Button that sets the value 12345678 (0xBC614E) in D0

Event Name	Part Name	Device	Changed to	
Press buttons	Word Button	---	---	
Write Data to any Devices	---	D 0	24910	(0x614E)
Write Data to any Devices	---	D 1	188	(0xBC)

- The sequence used for storing the value in the device varies according to the setting of “32-Bit Value Data Storage Method”. Refer to Chapter 5 “Project Settings” on page 81 for details.
- When a button is pressed that has an indirect write operation set, the device with the indirect value added is recorded for the “Write Data to any Devices” event generated by pressing the button.
- When a negative value is written, the setting after the change is recorded in BIN16 (+).

3.2 Operation Example

3.2.1 CSV File Output

Operation log data uploaded to a PC using Downloader is saved as a CSV file. The text strings set in “CSV File Output” are output as the titles of recorded items and event names.

- Output Description

Title of Recorded Data	Output Description
Sampling Time	Outputs the date and time. The date and time format is determined by the language set in the Project Information tab in the project settings. Japanese YYYY/MM/DD HH: MM: SS Other Languages MM/DD/YYYY HH: MM: SS
User Name	Outputs the user name.
Screen No.	Outputs the screen type and screen number. Base screen Base [Screen No.] (Ex. Base 100) Sub screen Popup [Screen No.] (Ex. Popup 3000)
Event Name	Outputs the event name set in “CSV File Output”.
Part Name	Outputs the part name of the button.
Device	Outputs the symbol and address of the destination device (Ex. LDR 1, LDR 7-01).

Changed to	The output information varies according to the event type.
	- Switch to Base Screens: Outputs the screen type and screen number.
	- Change Users: Outputs the user name.
	- Change Operation Modes:
	  - Run Mode
	  - System Mode
	  - Monitor mode
	  - Simulation Mode
	- Write Data to any Devices: Outputs written values as decimal values.

- Example of upload

```
"Project Name", "Sample Project", "V4.0"
"File Type", "Operation Log Data"

"Sampling Time", "User", "Screen No.", "Event Name", "Part Name", "Device", "Changed to"
" 2008/11/02 12:34:56", "-", "Base 1", "Power ON", "-", "-", "-"
" 2008/11/12 12:34:56", "-", "Base 1", "Change Operating mode", "-", "-", "Run Mode"
" 2008/11/23 12:34:56", "-", "Base 1", "Change Users", "-", "-", "User1"
" 2008/11/24 12:34:56", "User1", "Base 1", "Switch Base Screens", "-", "-", "Base 1"
" 2008/11/30 12:34:56", "User1", "Base 1", "Press buttons", "Numerical Input", "-", "-"
" 2008/12/02 12:34:56", "User1", "Popup 3001", "Press buttons", "ENT", "-", "-"
" 2008/12/12 12:34:56", "User1", "Base 1", "Write to any devices", "-", "LDR 0", "55"
" 2008/12/13 12:34:56", "User1", "Base 1", "Press buttons", "Change Users", "-", "-"
" 2008/12/21 12:34:56", "User1", "Base 1", "Change Users", "-", "-", "User2"
" 2008/12/22 12:34:56", "User2", "Base 1", "Switch Base Screens", "-", "-", "Base 1"
" 2009/01/02 12:34:56", "User2", "Base 1", "Press buttons", "Potentiometer", "-", "33"
" 2009/01/12 12:34:56", "User2", "Base 1", "Write to any devices", "-", "LDR 0", "-"
" 2009/01/23 12:34:56", "User2", "Base 1", "Press buttons", "Switch Base Screens", "-", "-"
" 2009/01/24 12:34:56", "User2", "Base 1", "Switch Base Screens", "-", "-", "Base 500"
" 2009/01/31 12:34:56", "User2", "Base 1", "Change Operating mode", "-", "-", "System Mode"
```

The CSV file size varies according to the recorded operation log data.

4 Restrictions

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

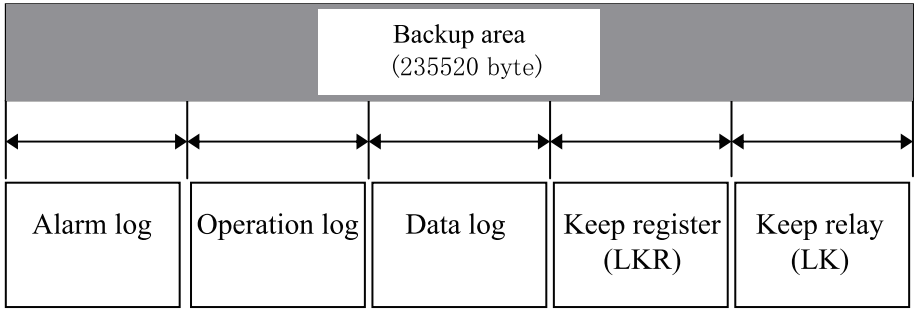
Up to 150 operation log data items can be recorded per operation/event. For example, if writing multiple device addresses using Multi-Button, the operation log function only records up to 150 write operations. Other write operations will not be recorded. When generated data exceeds the maximum number of items, the HG special relay LSM22 turns ON. (refer to Chapter 34 “• HG Special Relay (LSM)” on page 536 for information on LSM relays.)

Chapter 17 Data Storage Area

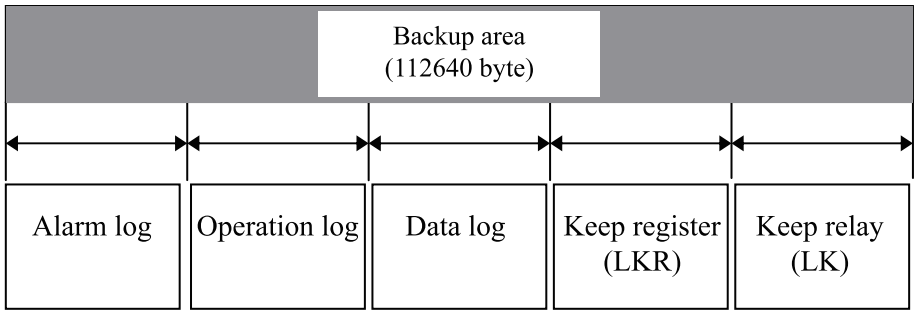
1 Overview

The Backup Area is a data memory area in the MICRO/I. This data memory area can store data such as Alarm Log, Operation Log, Data Log, value of Keep Register (LKR) and Keep Relay (LK). The stored data will be retained after power of MICRO/I has been turned off. You can allocate size of area for each function using Data Storage Area Management dialog box.

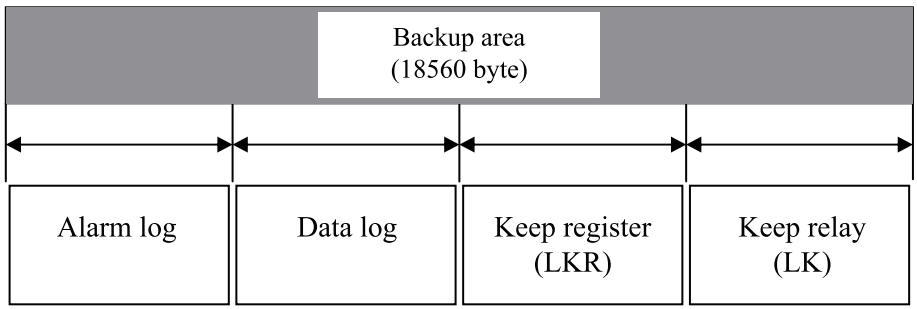
● HG3G



● HG2G



● HG1F/2F/2S/3F/4F



2 Settings

The memory size can be assigned in WindO/I-NV2 when using Alarm Log, Operation Log, or Data Log settings.

2.1 Assigning Data to the Data Storage Area

Function	Description
Number of Stored Data for Alarm Log	Specify the number of alarm logs to be stored.
Number of Stored Data for Operation Log	Specify the number of operation data items to be stored. All the operation log data is stored in the Data Storage Area.
Number of Stored Data for Data Log per Device	Specify the “Number of Stored Data for Data Log per Device” items to be stored. All the operation log data is stored in the Data Storage Area. The data size of the data log will vary according to the number of devices in use.
Number of HG Keep Register (LKR)	Specify the number of addresses to be used as HG Keep Register. All HG Keep Register data is stored in the Data Storage Area.
Number of HG Keep Relay (LK)	Specify the number of addresses to be used as HG Keep Relay. All HG Keep Relay data is stored in the Data Storage Area.
Free Space	Displays the amount of memory available in Data Storage Area.

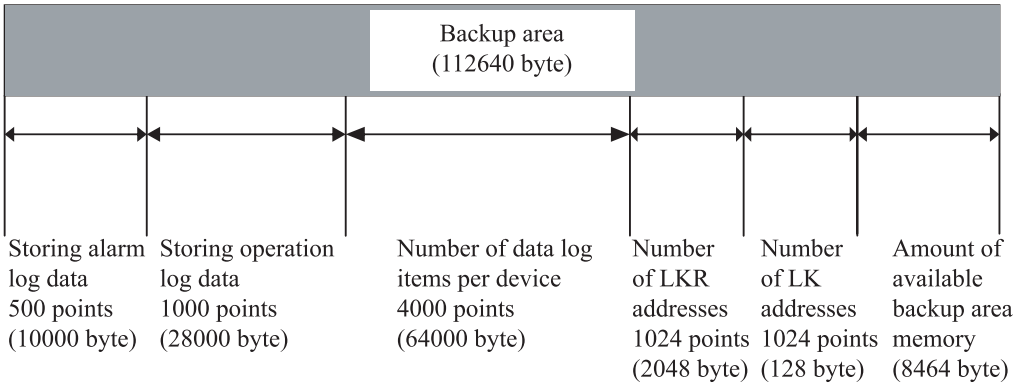
- If “Store” is selected in “Log Data” settings of the alarm log settings then the data will be stored in the Data Storage Area.
- HG1F/2F/2S/3F/4F store all the data log data in the Data Storage Area only when “Store in Data Storage Area” has been selected in the data log settings.

3 Setting Examples

3.1 HG2G

3.1.1 Example 1

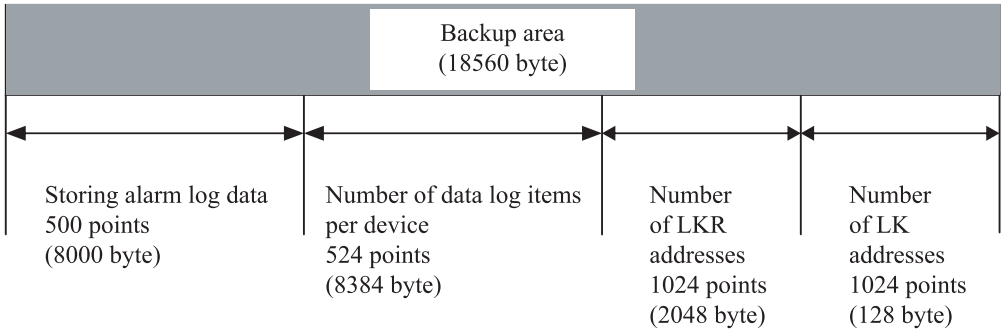
Number of Stored Data for Alarm Log:	500
Number of Stored Data for Operation Log:	1000
Number of Stored Data for Data Log per Device:	4000 (Two Channel Nos., two devices)
Number of HG Keep Register (LKR):	1024
Number of HG Keep Relay (LK):	1024



3.2 HG1F/2F/2S/3F/4F

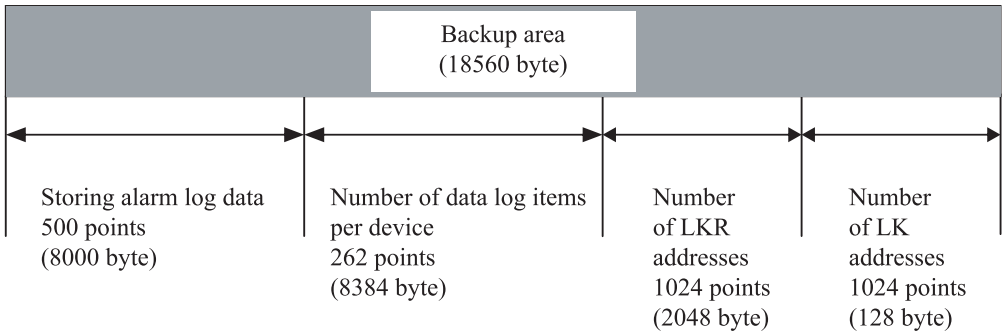
3.2.1 Example 1

Number of Stored Data for Alarm Log:	500
Number of Stored Data for Data Log per Device:	Two Channel Nos., two devices
Number of HG Keep Register (LKR):	1024
Number of HG Keep Relay (LK):	1024



3.2.2 Example 2

Number of Stored Data for Alarm Log:	500
Number of Stored Data for Data Log per Device:	Two Channel Nos., ten devices
Number of HG Keep Register (LKR):	1024
Number of HG Keep Relay (LK):	1024



4 Restrictions

4.1 Storage Limitations

Different MICRO/I models have different storage limitations

HG3G

Function	Minimum number	Maximum number
Number of Stored Data for Alarm Log	0	1024 points
Number of Stored Data for Operation Log	0	8330 points
Number of Stored Data for Data Log per Device	0	29165 points
Number of HG Keep Register (LKR)	1024 points	8192 points
Number of HG Keep Relay (LK)	1024 points	8192 points

HG2G

Function	Minimum number	Maximum number
Number of Stored Data for Alarm Log	0	1024 points
Number of Stored Data for Operation Log	0	3945 points
Number of Stored Data for Data Log per Device	0	13808 points
Number of HG Keep Register (LKR)	1024 points	8192 points
Number of HG Keep Relay (LK)	1024 points	8192 points

HG1F/2F/2S/3F/4F

Function	Minimum number	Maximum number
Number of Stored Data for Alarm Log	0	1024 points
Number of Stored Data for Data Log per Device	0	2048 points
Number of HG Keep Register (LKR)	1024 points	8192 points
Number of HG Keep Relay (LK)	1024 points	8192 points

- When using HG1F/2F/2S/3F/4F, any remaining memory space in the Data Storage Area will be assigned to Data Log automatically. The amount of the remaining space depends on how much memory Alarm Log, LKR and LK device use.

  The amount of Data Log data each device can hold = (Memory size for Data Log) / (6 x Total number of Data Log channels used + 2 x Total number of devices used)

- The data stored in the Data Storage Area will be kept even when turning off the power of the MICRO/I. However, if the battery in the MICRO/I runs out or project data is downloaded into the MICRO/I, the data in the Data Storage Area will be cleared.

- When using HG2G/3G, an option is available where the LKR and LK devices will not be cleared even if a new project data is downloaded into the MICRO/I.

Chapter 18 Preventive Maintenance

1 Overview

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

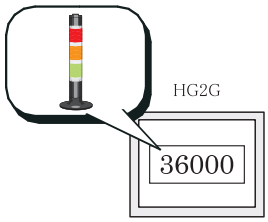
Only HG2G/3G support this function

The Preventive Maintenance function monitors the length of time the specified device address remained ON or counts the number of times the device address switched from OFF to ON state. Once a condition has been met in either case, another specified device address is triggered which is then used to send a maintenance notification to a user. This function can help avoid equipment failure by providing advance notice of a problem from the MICRO/I.

1.1 Example

This section shows examples where Preventive Maintenance is used:

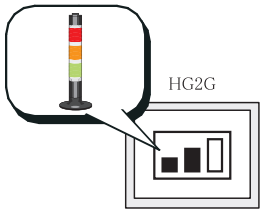
1.1.1 Monitors the Operation Time of an External Device



You can monitor the amount of time the lamp remained ON.

Select the “Monitor Operation Time” checkbox in the Operation Time tab of [Individual Settings]. Refer to “2.2.1 Operation Time tab” (P.340) in this chapter.

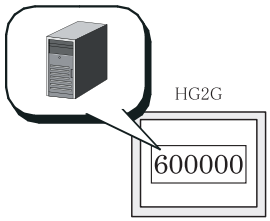
1.1.2 Maintenance Notification Triggered by Cumulative Operation Time



You can set up to 3 threshold values and use their triggers to send maintenance notifications indicating when to replace the lamps or other parts that have a service life relative to their cumulative operation time.

Select the “Notify When Value of Device Storing Operation Time Data Has Reached Threshold Value” checkbox in the Operation Time tab of [Individual Settings]. Refer to “2.2.1 Operation Time tab” (P.340) in this chapter.

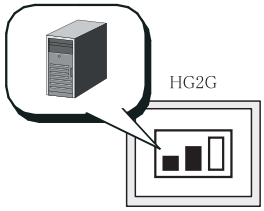
1.1.3 Counting the Number of Times an External Device is Turned ON



You can count the number of times a relay is turned ON.

Select the “Count Operations” checkbox in the Operation Count tab of [Individual Settings]. Refer to “2.2.2 Operation Count tab” (P.341) in this chapter.

1.1.4 Maintenance Notification Triggered by Cumulative Operation Count



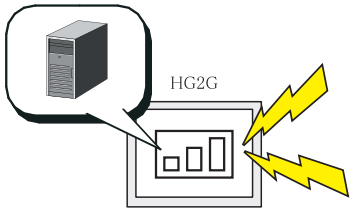
You can set up to 3 threshold values and use their triggers to send maintenance notifications indicating when to replace the lamps or other parts that have a service life relative to their cumulative operation count.

Select the “Notify When Value of Device Storing Operation Count Data Has Reached Threshold Value” checkbox in the Operation Count tab of [Individual Settings]. Refer to “2.2.2 Operation Count tab” (P.341) in this chapter.

1.2 Application Examples

The sections below show some examples using Preventive Maintenance with other functions.

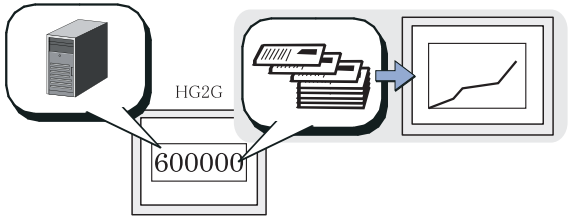
1.2.1 Use Alarm Log for Maintenance Notification



You can use the Preventive Maintenance function with the Alarm Log function to generate an alarm when a preventive maintenance threshold value has been exceeded.

Select the “Notify When Value of Device Storing Operation Time Data Has Reached Threshold Value” checkbox in the Operation Time tab or select the of “Notify when Value of Device Storing Operation Count Data Has Reached Threshold Value” checkbox in the Operation Count tab. Refer to “2.2.1 Operation Time tab” (P.340) in this chapter or refer to “2.2.2 Operation Count tab” (P.341) in this chapter. Refer to Chapter 14 “Alarm Log Function” on page 275 for details of Alarm log function.

1.2.2 Use Data Log to Record Operation Time



You can use the Preventive Maintenance function with the Data Log function to record operation time.

Select the “Measure Operation Time” checkbox in the Operation Time tab. Refer to “2.2.1 Operation Time tab” (P.340) in this chapter. Refer to Chapter 15 “Data Log Function” on page 295 for details of Data log function.

2 Settings

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

Select [Configuration] - [System Setup] - [Preventive Maintenance] on the WindO/I-NV2.

2.1 Preventive Maintenance Settings

The settings are listed below.

Item		Description
Number of Items		Set the number of devices to be monitored.
Display Options	Operation Time	Displays the set operation time.
	Operation Count	Displays the set operation count.
	Operation Time + Operation Count	Displays the set operation time and operation count.

2.2 Individual Preventive Maintenance Settings

This dialog box is displayed when you press [Edit] button on Preventive Maintenance Settings dialog box. You can set the device address to be monitored and items to be measured.

Item	Description
Number	Displays the preventive maintenance setting Number.
Monitor Device	Specify the device to be monitored. You can specify the bit setting of a word device, or a bit device.

2.2.1 Operation Time tab

Item	Description
Measure Operation Time	Measures the length of time the monitored device is ON. Specify the destination device address for the operation time data. Only LKR internal MICRO/I devices are supported. Refer to Chapter 34 “HG Keep Register (LKR)” on page 538 for details of LKR internal device.
Data Type	Select data type for the operation time data. You can select either the BIN16 (+) or BIN32 (+) data type.
Report when Operation Time has reached or exceeded Threshold level	Turns the set device ON when the operation time data has reached or exceeded the threshold value. You can set up to 3 threshold values and Report Devices by selecting checkboxes for each threshold level.
Value	Specify the threshold value with a constant. The allowable setting range depends on the data type.
Device	Specify the threshold value by value of specified device address.
Threshold	Specify the reference value to report. For devices, only internal devices can be used.
Report Device	Specify the device address that will turn ON when the operation time data reaches the threshold value. Only internal devices can be used.

2.2.2 Operation Count tab

Item	Description
Measure Operation Count	Measures the length of time the monitored device is ON. Specify the destination device address for the operation count data. Only LKR internal MICRO/I devices are supported. Refer to Chapter 34 “HG Keep Register (LKR)” on page 538 for details of LKR internal device.
Data Type	Select data type for the operation count data. You can select either the BIN16 (+) or BIN32 (+) data type.
Report when Operation Count has reached or exceeded Threshold level	Turn the set device ON when the operation count data has reached or exceeded the threshold value. You can set up to 3 threshold values and Report Devices by selecting checkboxes for each threshold level. Specify the threshold value by value of specified device address.
Value	Specify the threshold value with a constant. The allowable setting range depends on the data type.
Device	Specify the threshold value by value of specified device address.
Threshold	Specify the reference value to report. For devices, only internal devices can be used.
Report Device	Specify the device address that will turn ON when the operation count data reaches the threshold value. Only internal devices can be used.

3 Operation

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

3.1 Measured/ Counted Values

Data measured or counted by the Preventive Maintenance function is saved in HG Keep Register (LKR). For details, refer to Chapter 34 "• HG Keep Register (LKR)" on page 538.

The range of measured or counted values depends on the data type of the storage device. When a measured or counted value reaches the maximum value of the set data type, the maximum value is retained until the value is reset. To reset the counted value, enter a value of 0 in the specified HG Keep Register (LKR). For details, refer to Chapter 17 "2 Settings" on page 333.

3.2 Measuring Operation Time

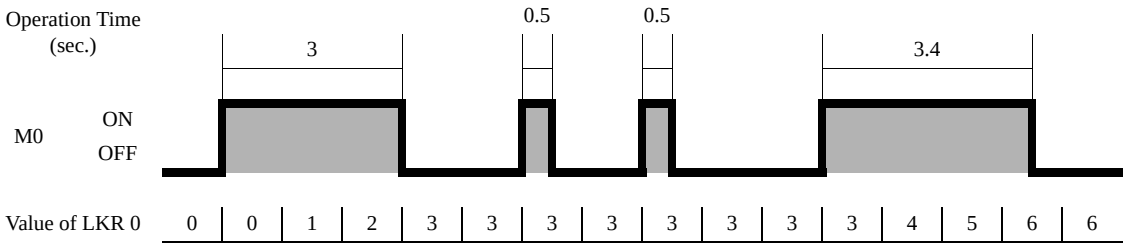
For every second the monitoring device is ON the destination device will count up 1.

3.2.1 Setting Examples

Monitoring Device	M 0
Time Data Storing Device	LKR 0

3.2.2 Operation Example

For every second, the Preventive Maintenance function adds 1 to the value of LKR 0 while monitored device M0 is ON. Nothing is added when the monitored device is ON for less than a second.



3.3 Incrementing the Operation Count

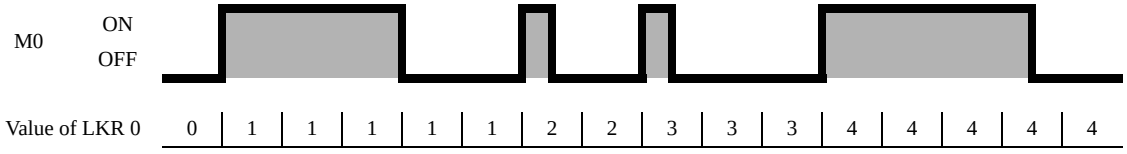
Each time the monitored device is turned ON, the Preventive Maintenance function adds 1 to the value of the device storing the operation count data.

3.3.1 Setting Examples

Monitoring Device	M 0
Count Data Storing Device	LKR 0

3.3.2 Operation Example

The Preventive Maintenance function adds 1 to the value of LKR 0 each time monitored device M0 is turned ON.



3.4 Comparing Data Values With Threshold Values and Reporting to Report Device

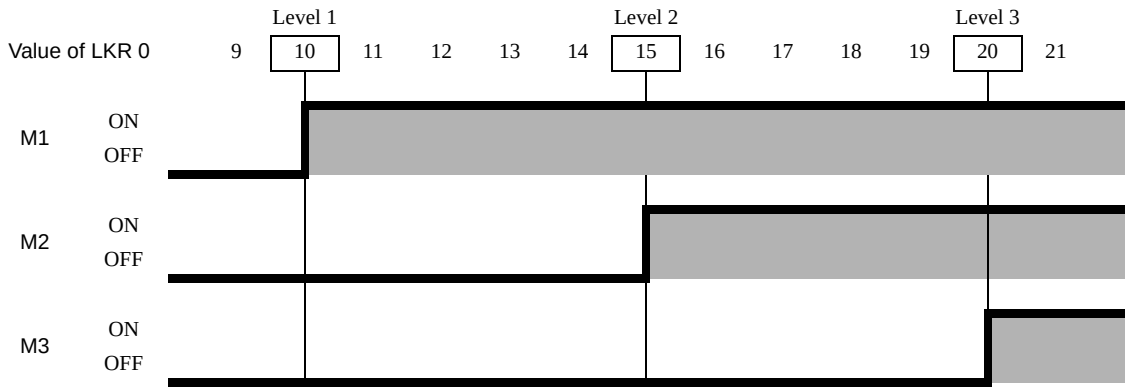
The Report device is turned ON when the measured/counted value reaches the threshold value.

3.4.1 Setting Examples

Measure Operation Count		LKR 0
Threshold	Level 1	10
	Level 2	15
	Level 3	20
Report Device	Level 1	M 1
	Level 2	M 2
	Level 3	M 3

3.4.2 Operation Example

When the value of LKR 0 (in the device storing the operation time data) reaches or exceeds any of the threshold values, Report device corresponded to each threshold level turns ON.



4 Restrictions

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

4.1 Maximum Number of Monitor Devices

You can set up to 256 monitor devices for the Preventive Maintenance function. (Only if all Monitor Devices are word devices with bit.)

When the same device address is set multiple times, it is counted as different devices. Note that you can only set up to 16 monitored device types.

Entering the monitored device settings below results in three monitored device types.

- M 0 — Counted as one type.
- D 100-0
- D 100-1
- D 100-2

  These three devices are counted as one type (D 100).
- D 200-1 — Counted as one type.

4.2 Timing for Measuring Operation Time/ Count

The count up time depends on the scan cycle and the communication cycle between the PLC and MICRO/I, so the operation count may not increment accurately if equipment is turned ON and OFF in short cycles. The scan time is stored in HG special register LSD4, and the scan time for external communication is stored in HG special register LSD6. For details of LSD registers, refer to Chapter 34 “• HG Special Registers (LSD)” on page 538.

4.3 Repeat Use of The Same Storage Devices

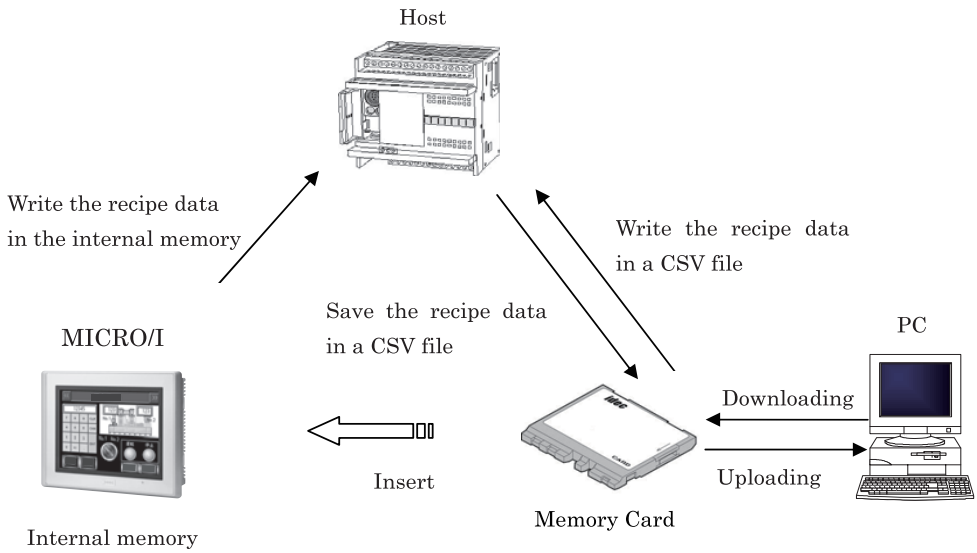
When you set the same device address to “Measure Operation Time” and “Measure Operation Count”, value of the device address will be sum total of measuring result of each setting.

Chapter 19 Recipe Function

1 Overview

The recipe function reads and writes data that has been prepared for use with the host device to and from the host device, and can save this data in a CSV file. This data is called “recipe data” and can be used for initial system settings and by external memory devices connected to the host.

A maximum of 8192 items of recipe data can be managed for each channel, a maximum of 1024 channels can be used with WindO/I-NV2. Also, it is possible to upload the Recipe data saved in the Memory Card via the Web Browser.



Move source	Move destination	Recipe data settings	Application
Internal memory	Host	Set the recipe data using WindO/I-NV2 (recipe data uses the project data area).	In cases such as when you wish to write initial data to the host at the start of operation (this can even with units that are not equipped with a Memory Card).
Memory Card	Host	Store as a CSV file on the Memory Card in advance.	In addition to the above application, when you wish to conserve project data space, and replace the recipe data with the Memory Card data.
Host	Memory Card	When data is read from the host, a recipe data file is automatically created on the Memory Card.	When you want to use a PC to edit and manage recipe data that has been edited on a host.

In addition to creating recipe data, operation settings for the recipe function are also necessary. Select [Setup] - [System Setup] - [Recipe] in WindO/I-NV2 to perform these settings.
Data cannot be written from the host device to the internal memory.

2 Reading and Writing Recipe Files

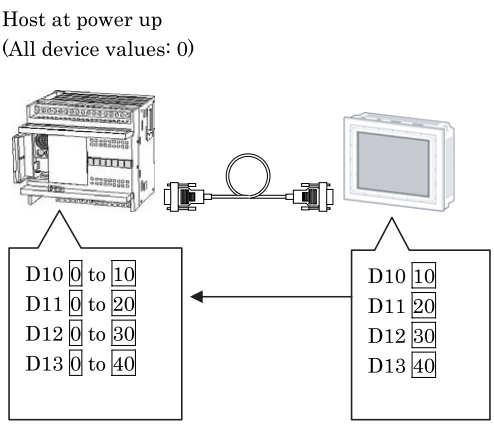
2.1 Writing to a device (from Internal memory/ Memory Card to Host device)

When the device that has been set as the write trigger device goes ON, the recipe file is written batch written to the device. Use this in situations such as when you want to write host device initial values from the operator interface.

Example

(1) When the write trigger device X1 goes from OFF to ON.

(2) Write a device value to a specified host device.



2.2 Reading from a device (from Host device to Memory Card)

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
			X		X	X

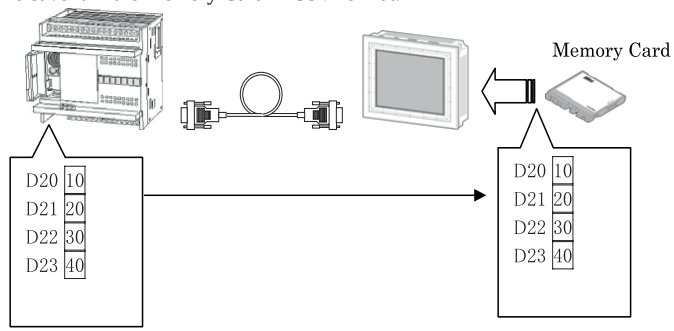
Only HG2F/3F/4F support this function

When the device that has been set as the read trigger device goes ON, the device value read from the device is saved in the Memory Card as a recipe file. Use this function when you want to retain the values from the device address which are stored in the internal memory prior to power OFF of the MICRO/I.

Example

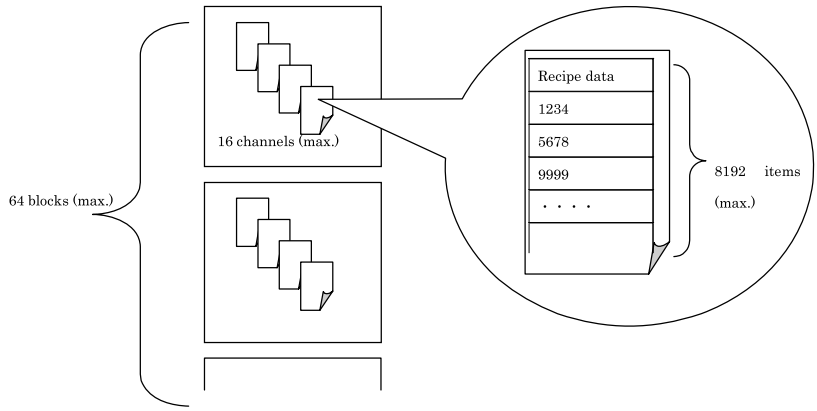
(1) When the read trigger device X2 goes from OFF to ON.

(2) Read the device value and save it in the Memory Card in CSV format.



3 Executing Recipe Functions

The recipe data is managed by channel, and a maximum of 8192 items of recipe data can be managed for each channel. A maximum of 1024 channels (16 channels x 64 blocks) can be used with WindO/I-NV2.



Reading and writing of recipe data is done using the Read/Write launch device set in advance using WindO/I-NV2.
The recipe function is executed when you switch the bit corresponding to each channel of the launch device from OFF to ON.
The launch device is set for each block. The correspond dance between the bits and each channel is given below.

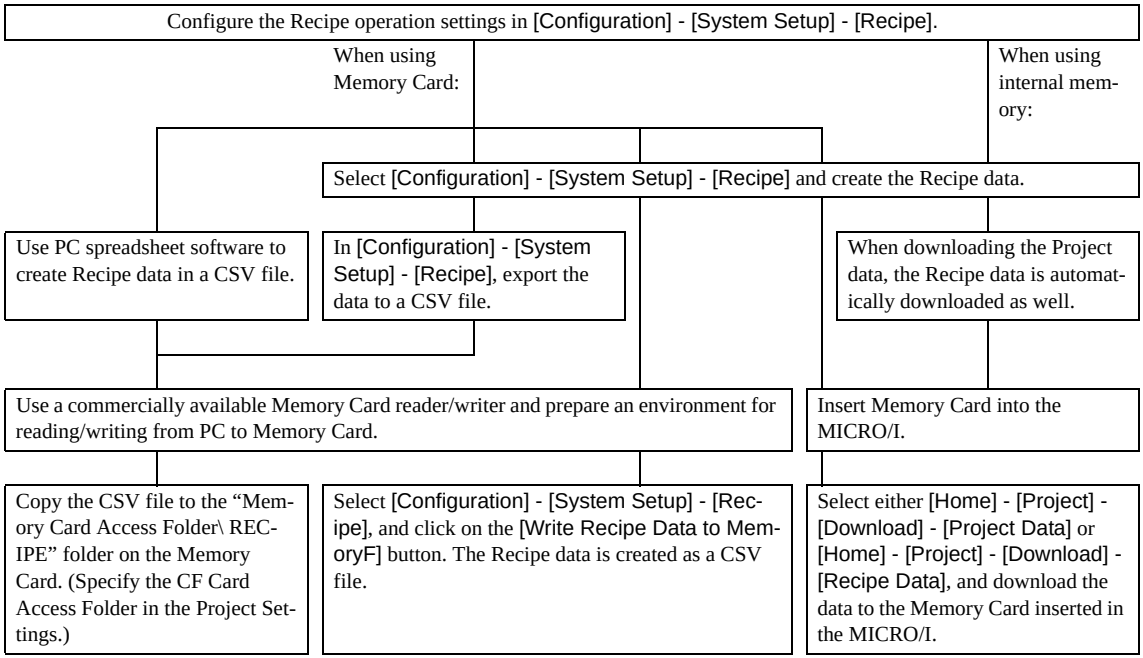
Block 1 write trigger device (word device)

Bit15	Bit14	Bit13	Bit12	Bit11	Bit10	Bit9	Bit8	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Ch15	Ch14	Ch13	Ch12	Ch11	Ch10	Ch9	Ch8	Ch7	Ch6	Ch5	Ch4	Ch3	Ch2	Ch1	Ch0

The recipe for “Block 1 - Channel 0” is written to the host when Bit0 of the write trigger device turns to ON.

4 Creating the Recipe Data

It is necessary to make the recipe data before you set it to the host. The procedure for storing recipe data is as follows.



[CSV File Format]

When you transfer 10-word data, the format is as follows.

```
1234,
2222,
3333,
4444,
5555,
6666,
7777,
8888,
9999,
```

WARNING

- Regardless of whether or not the software is set to use a CSV file, if no CSV file has been created, all zeros are written.
- If a larger number of words are set for the recipe function operation than are in the CSV file, the difference is written as zeros.
- Writing is not executed when Memory card is not inserted.

5 Warning for the Recipe Function

When writing/reading the recipe data with a large number of words, it may take time to execute the operation.

Please monitor the bit in the system area that indicates that recipe transfer in progress when the recipe function is executing.

6 Settings

6.1 Recipe Settings

You can set or modify recipe settings. Select [Configuration] - [System Setup] - [Recipe] from the menu. For the recipe data, 16 channels can be allocated for 1 word device, and up to 64 blocks (total of 1024 channels) can be set.

Item	Description
Number of Blocks	Recipe file is managed by block units. One block has 16 channels. Set block numbers to be used. One recipe file relates to one channel. (0 to 64)
Edit Button	When you click this button, “Recipe Control Settings” for selected channel appears. You can edit selected channel settings with “Recipe Control Settings”.
Write Recipe data to CF Card Button	When you click this button, recipe file data which is set as accessing Memory Card is written to Memory Card as a CSV file. Please make sure Memory card is set on PC appropriately and available.

- Monitoring period of Write Trigger and Read Trigger is synchronized with Monitoring period of Alarm Log Settings (refer to Chapter 14 “Alarm Log Function” on page 275).
- While recipe data transferring, the bit 4 of address +3 of System Area 2 is set as 1 (refer to Chapter 5 “System Area” on page 93).

6.2 Individual Settings

6.2.1 Block

Item	Description
Access to	Specify the recipe file storage location. The setting units are blocks. Memory Card: Use recipe files stored in the Memory Card. MEM: Use recipe files stored in the internal memory of the operator interface. Recipe files are handled as part of the project data. Therefore, make sure not to exceed the available memory capacity
File Name	Sets the name of the recipe file when “Memory Card” is selected for “Access to”. File names that can be set depend on the O/I type. The “*n*” in the above file names is automatically replaced by a four-digit consecutive number. For example, RCP0001.CSV. HG3G: Enter a name of up to 120 alphanumeric characters including file extensions. The default file name is ‘RCP*n*.CSV’. HG2F/3F/4F: This type of format cannot be changed.
Trigger Setting	SettingSets the trigger of the recipe file. R/W: Read/Write trigger R: Read trigger W: Write trigger Set a bit device address for the read trigger device. If this bit changes state from 0 to 1, the data is stored in the recipe file on the Memory Card. The setting is by block units. (Word device)
Read Trigger	Set the read trigger device. If this bit changes state from 0 to 1, the data is stored in the recipe file on the Memory Card. The setting is by block units. (Word device)

Item	Description
Write Trigger	Sets the write trigger device. When this bit goes from 0 to 1, the recipe file is written to the device. The setting is by block units. (Word device)
Monitoring Period	Monitoring period of Write Trigger and Read Trigger is synchronized with Monitoring period of Alarm Log Settings (refer to Chapter 14 “Alarm Log Function” on page 275).

WARNING The “Memory Card” setting is only supported by models with a memory card interface.

6.2.2 Channel

Item	Description
No.	“Channel Number” is shown. Displaying channel number is depended on “Block Numbers.”
Enable/ Disable	Enable: Use this channel’s recipe file. Disable: Do not use this channel’s recipe file. The setting is by channel units.
Recipe Name	Name of the recipe file. Set as you wish. The setting is by channel units. (40 characters max)
Top Device	Set the start address of the read or write storage device. The setting is by channel units.
Number of Data	Set the quantity of recipe data to be used by one channel (recipe file). The setting is by channel units. This can be set up to 8192 points when the data type setting is BIN16 (+), BIN16 (+/-) or BCD4, or up to 4096 points otherwise. (1 to 8192)
Data Type	Select the data type to be used for the recipe data. The setting is by channel units. (BIN16 (+) BIN16 (+/-) BIN32 (+) BIN32 (+/-) BCD4 BCD8)
Display Type	Specify whether the recipe data is to be set in decimal or hexadecimal. The setting is by channel units. Recipe data to be output to the CSV file is fixed to the decimal setting.

6.2.3 Recipe Data

Item	Description
List	Sets just the number of data points for the recipe data of the channel number of the displayed block. Set the value according to the Data Type and Display Type. The range depends on the Data Type selected in the Channel tab.

- When the recipe access is set to Internal Memory, the recipe file is downloaded to the operator interface as part of the project data.
- When the “Access to” column is set to “Memory Card”, you need to save the recipe data in the Memory Card. Refer to Chapter 19 “4 Creating the Recipe Data” on page 349.
- When the recipe access is set to Internal Memory, take care with regard to the capacity used by the recipe files. When the data type is 16 bit, each recipe data item requires two bytes, and when it is 32 bit, each recipe data item requires four bytes.
  Example 1: When one file uses 8192 items of recipe data, 16Kbytes are needed (8192 x 2 x 1).
  Example 2: When 1024 files use 8192 items of recipe data, 16Mbytes are needed (8192 x 2 x 1024).

6.3 Write Recipe Data to Memory Card

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X		X		X	X

Only HG3G, HG2F/3F/4F support this function

It is possible to transfer recipe data from a memory card reader/writer to a PC as CSV files.It is possible to transfer recipe data from the project file to a memory card reader in PC as CSV files.

Click “Write Recipe Data to Memory Card” button to write recipe files the Memory Card. Only the recipe data which are set to "Memory Card" as "Access.

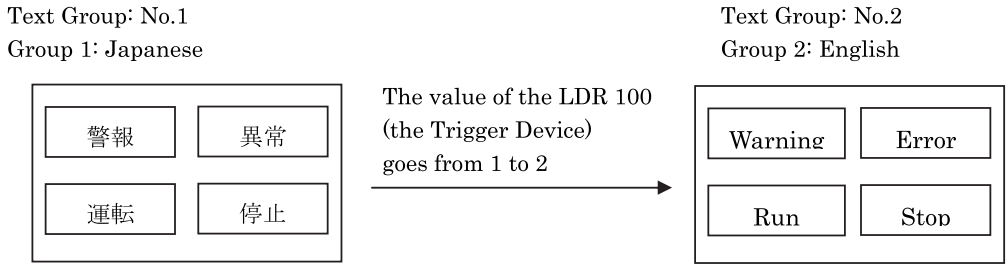
Item	Description
Drive	Select the drive to be allocated to the Memory Card.
Network	Crick the Net work button to display the Map Network. Drive if you use the network drive.
Memory Access Folder	The folder name that you set on the Memory Card tab in Project Settings appeared.

Chapter 20 Text Group Settings

1 Overview

Texts used for the Text in Drawing and the Registration Text of parts etc. can be registered to the Text Manager in advance, which allows the user to easily reuse the text by specifying the Text ID in the Text or the Registration Text etc. When two or more text libraries (referred to as Text Group) are set up, the text on the current screen can be switched dynamically while the MICRO/I is in running. In addition, fonts of two or more languages are downloaded to the MICRO/I in advance, display can be switched among multiple languages. It is also possible to specify fonts of multiple languages within a single Text Group.

Operation Example



Setting Example

Text Browser: Group 1

ID	Font	Color	Text
1	Japanese	000	警報
2	Japanese	000	異常
3	Japanese	000	運転

Text Browser: Group 2

ID	Font	Color	Text
1	English	000	Warning
2	English	000	Error
3	English	000	Run

2 Text Group Settings

You can switch all displayed text by switching the Text Group according to the value of the trigger device. Select [Configuration] - [System Setup] - [Text Group] menu.

Item	Description
No. of Text Groups	Enter a number of groups that you use. (1 to 16)
Text Group Name	Enter the group name. (Up to 20 characters)
Default Group	Select the Group number for display when the operator interface turns on or the value of the trigger device is 0.
Use Dynamic Text	Select the checkbox to switch all displayed text. Selected: Text Group Settings is enabled. Deselected: Text Group Settings is disabled.
Trigger Device	Specify the trigger device for switching the Text Group. The Text Group is switched by a device value and the device value becomes the group number. (Word device)

- When the value of the Trigger Device is set to “0”, the Text Group is switched to the Default Group.
- When an invalid value other than “0” is set to the Trigger Device, the display is not switched.

3 The Functions Available for the Text Group Settings

The following lists the Parts/Objects/Screens available for the Text Group Settings.

Parts/Objects/Screens	Items available for Text Group Settings
Text	Text
Bit Button	Registration Text ON/OFF
Word Button	Registration Text ON/OFF
Goto Screen Button	Registration Text ON/OFF
Print Button	Registration Text ON/OFF
Key Button	Registration Text ON/OFF
Selector Switch	Registration Text ON/OFF
Numerical Input	Unit
Pilot Lamp	Registration Text ON/OFF
Multi-State Lamp	Registration Text
Message Display	Message
Message Switching Display	Message
Alarm List Display	When “Use Alarm Log Settings” is selected: Registered messages in the Alarm Log Settings When “New Message List” is selected: Message
Alarm Log Display	Title and Message
Numerical Display	Unit
Bar Chart	Label of X-axis or Y-axis scale
Line Chart	Label of X-axis or Y-axis scale
Popup Screen	Title
Data Log Settings	Device title

- Only the message of Memory Card output or print of Alarm Log Settings supports the Text Group Settings function.
- Switching a text group resets the displayed Base Screen. Popup Screens and internal devices start their operation in the status in which the Base Screen is switched.
- Since fonts can be set up for each ID on the Text Manager, it is possible to switch displays in the Text Group of mixed fonts such as Japanese, European, and Chinese.

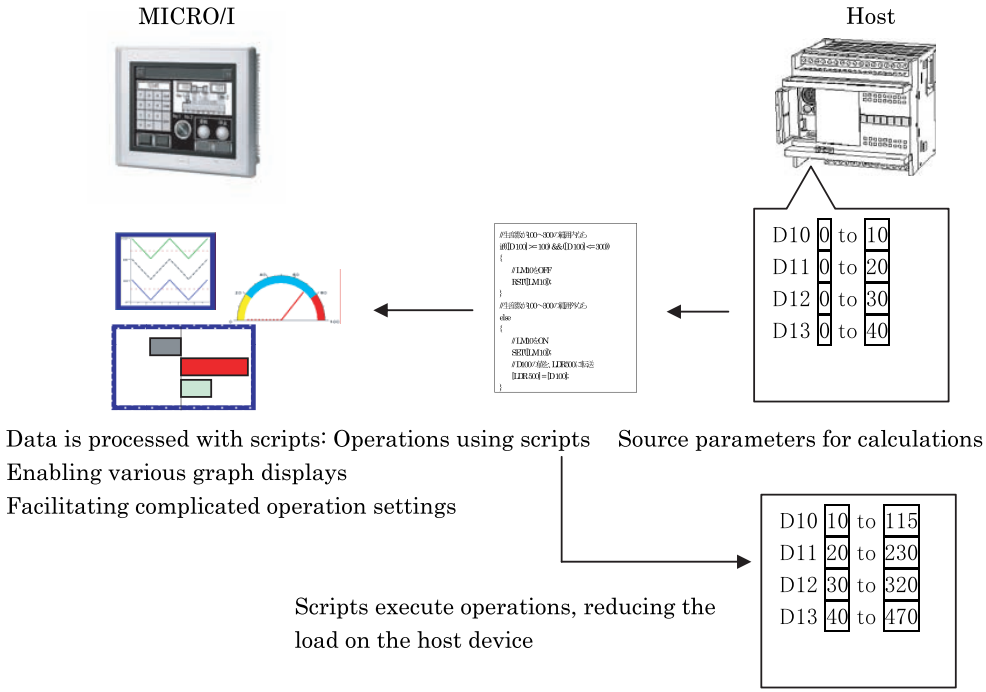
Chapter 21 Scripts

1 Overview

The Script function is a proprietary description programming language, which allows you to execute complicated operations easily.

You can use WindO/I-NV2 to combine conditional statements, mathematical operators and functions etc. to create a variety of complex processes. The conditional statements and functions can be selected and entered from the Function List; in addition, the syntax check function is featured for facilitating program editing and revision, allowing even beginners with no programming experiences to enter functions easily. There are the following two types of scripts, which can be used according to the purpose.

Item	Description
Global Script	Scripts that continually operate in Run Mode Only one script can be set up for a project.
Script Command	Operate in the screen in which they are placed in the same way as other parts. Two or more scripts as part objects can be set up for each screen. (refer to Chapter 13 “5 Script Command” on page 270)



2 Examples

Since scripts can be entered in text format, they can be copied and pasted easily. In addition, scripts can be externally exported or imported as text files, allowing you to create programs efficiently using your favorite, commercially available editor.

- Example 1) Substitution

  The yield volume stored in LDR100 is increment by 1.

```
// Add 1 to LDR100 and store the value to LDR 100
[LDR 100] = [LDR 100] + 1;
```

- Example 2) Arithmetic operation

  The yield volume stored in D100 is multiplied by 10 and stored in LDR200.

```
// Multiply LDR100 by 10 and store the value to LDR200
[LDR 200] = [LDR 100] * 10;
```

- Example 3) Conditional branch

  LM10 is turned OFF if the yield volume stored in D100 is between 100 and 300; otherwise, the LM10 is turned ON and then the value of D100 is transferred to LDR500.

```
//If the yield volume is between 100 and 300
if(([D 100] >= 100) && ([D 100] <= 300))
{
    // Turn OFF LM10
    RST([LM 10]);
}
//If yield volume is outside the range of 100 to 300
else
{
    // Turn ON LM10
    SET([LM 10]);
    // Transfer the value of D100 to LDR500
    [LDR 500] = [D 100];
}
```

* More samples of descriptions using scripts are provided in Appendix.

3 Trigger Condition of Script

The following trigger conditions can be set up for a script. Condition can be selected from various types including Rising-edge, Falling-edge, satisfying the condition, while satisfying the condition, and Fixed Period.

Item	Rising-edge	Falling-edge	Satisfying the condition	While satisfying the condition	Fixed Period	Always ON
Global Script	X	X	---	---	X	X
Script Command	X	X	X	X	X	---

* For details of each trigger condition, refer to Chapter 21 “4.2 Trigger Condition” on page 363 and refer to Chapter 8 “3.3 Trigger Condition” on page 131. The Fixed Period can be set up in unit of one second.

4 Global Script

The Global Script is a script that always operates in independence of the displayed screen. Only one script per project data is available. Select [Configuration] - [System Setup] - [Global Script]. You may set a script for the project data.

4.1 General

Select [Configuration] - [System Setup] - [Global Script] on the WindO/I-NV2.

Item	Description
Use Global Script	Select the Global Script checkbox.
Script ID	Enter the Script ID to be run. (1 to 3200)
Script Name	Displays the Script Name of the selected Script ID.
Script	Displays the script of the selected Script ID.

4.2 Trigger Condition

Select [Configuration] - [System Setup] - [Global Script] on the WindO/I-NV2.

Item	Description
Trigger Type	Sets the conditions for executing the script. Rising-edge: The script executes when the trigger device goes from 0 to 1. Falling-edge: The script executes when the trigger device goes from 1 to 0. Fixed Period: The script executes each time the set cycle time elapses. Always ON: The script executes continuously.
Device	Sets a bit device. When “Rising-edge” or “Falling-edge” is selected.
Period	Sets the cycle period in second units. When “Timer” is selected. (1 to 3600)

- Control that has been realized using multiple parts can be unified and described in one place using scripts. All of the created scripts are managed in block with the Script Manager, greatly improving the maintainability.
- With the cache function that stores the device data, the calculation result is reflected correctly in the next line. It is unnecessary for the consideration of the writing delay in communication with the host device, and facilitates more intuitive program creations. (It is required to change the Project Settings.)

5 Command List

Item	Symbol	Example	Description
Condition-als	if	if (Condition) {Execute;}	Execute if the condition is established.
	if - else	if (Condition) {Execute1;} else {Execute2;}	Execute 1 if the condition is established, or execute 2 if the condition is not established.

	if -
	else if
	-else
		if (Condition1)
		{Execute1;}
		else if (Condition2)
		{Execute2;}
		else
		{Execute3;}
			Execute 1 if condition 1 is established. If condition 1 is not established, evaluate condition 2. If condition 2 is established, execute 2. If condition 2 is not established, execute 3.

	while	while (Condition)
		{
		Execute;
		}
			Continuously execute while the condition is established. If the condition is continuously established, there will be an infinite loop, so do not set constants or devices that do not change. Do not perform host writes within “while” statements.

	switch	switch (Condition value)
		{
		case Constant1:
		Execute1;
		break;
		case Constant2:
		Execute2;
		break;
		default:
		Execute3;
		break;
		}
			It constant 1 and the condition value match, execute 1. If constant 2 and the condition value match, execute 2. If the condition value does not match either constant 1 or constant 2, execute 3.

	return	return;	Finishes the script.

	break	while (Condition)
		{
		switch (Condition value)
		{
		case Constant1:
		Execute1;
		break;
		}
		Execute2;
		}
			Break from loop. With the switch/while statement, the program exits from the statement currently being executed to one external statement. In the example on the left, processing transfers from break to Execute2.

Item	Symbol	Example	Description
Comparison Operators	= =	if ([D 10] == 123) {Execute;}	Equal
	!=	if ([D 10]!= 123) {Execute;}	Not equal
	<	if ([D 10] < 123) {Execute;}	Less than
	<=	if ([D 10] <= 123) {Execute;}	Less than or equal
	>	if ([D 10] > 123) {Execute;}	Greater than
	>=	if ([D 10] >= 123) {Execute;}	Greater than or equal
Logical Operators	&&	if (([D 10] == 123) && ([D 20] == 34)) {Execute;}	Logical And
	||	if (([D 10] == 123) || ([D 20] == 34)) {Execute;}	Logical OR
	!	if ! ([D 10] == 123) {Execute;}	NOT
Arithmetic Operations	+	[D 10] = [D 20] + 123;	Add
	-	[D 10] = [D 20] - 123;	Subtraction
	*	[D 10] = [D 20] * 123;	Multiplication
	/	[D 10] = [D 20] / 123;	Division
	%	[D 10] = [D 20] % 123;	Remainder
Bit Operations	&	[D 10] = [D 20] & 0xFF;	Bit AND
	|	[D 10] = [D 20] | 0xFF;	Bit OR
	^	[D 10] = [D 20] ^ 0xFF;	Bit XOR
	~	[D 10] = ~[D 20];	Invert Bit In the case of word devices or fixed values, 0 goes to 65535, and 65535 goes to 0. In the case of a bit device, 0 goes to 1 and 1 goes to 0.
	<<	[D 10] = [D 20] << 8;	Left shift
	>>	[D 10] = [D 20] >> 8;	Right shift
Bit Functions	SET ( )	SET ([M 100]);	Set Bit. Same as [M 100] = 1;
	RST ( )	RST ([M 100]);	Reset Bit. Same as [M 100] = 0;
	REV ( )	REV ([M 100]);	Invert Bit. Same as [M 100] = ~[M 100];
Word Functions	MAX ( )	[D 10]=MAX ([D 20], [D 30], [D 40]);	Return the maximum value among 15 arguments All Data Type is available.
	MIN ( )	[D 10]=MIN ([D 20], [D 30], [D 40]);	Return the minimum value among 15 arguments. All Data Type is available.
	EXP	[D 10]=EXP ([D 20]);	Calculates the Exponential function. Available only with the float32 Data Type.

Item	Symbol	Example	Description
Word Functions	LOGE	[D 10]=LOGE ([D 20]);	Calculates the Natural Logarithmic function. Specify a value greater than 0 for the argument. Available only with the float32 Data Type.
	LOG10	[D 10]=LOG10 ([D 20]);	Calculates a Base-10 Logarithm. Specify a value greater than 0 for the argument. Available only with the float32 Data Type.
	POW	[D 10]=POW ([D 20],[D 30]);	Calculates the Exponential function. Available only with the float32 Data Type.e.g.) C=POW (A, B); //Substitutes B-power of A into C.
	ROOT	[D 10]=ROOT ([D 20]);	Calculates the positive square root. Available only with the float32 Data Type.
	SIN	[D 10]=SIN ([D 20]);	Calculates the Sine (-1 to +1) in radians (-p/2 to +p/2). Available only with the float32 Data Type.
	COS	[D 10]=COS ([D 20]);	Calculates the Cosine (-1 to +1) in radians (0 to p). Available only with the float32 Data Type.
	TAN	[D 10]=TAN ([D 20]);	Calculates the Tangent (-1 to +1) in radians (-p/2 to +p/2). Available only with the float32 Data Type.
	ASIN	[D 10]=ASIN ([D 20]);	Calculates the Arcsin (-1 to +1) and returns the result in radians (-p/2 to +p/2). Available only with the float32 Data Type.
	ACOS	[D 10]=ACOS ([D 20]);	Calculates the Arccosin (-1 to +1) and returns the result in radians (0 to p). Available only with the float32 Data Type.
	ATAN	[D 10]=ATAN ([D 20]);	Calculates the Arctangent (-1 to +1) and returns the result in radians (-p/2 to +p/2). Available only with the float32 Data Type.
	RAD	[D 10]=RAD ([D 20]);	Converts the Angle into Radians. Available only with the float32 Data Type.
	DEG	[D 10]=DEG ([D 20]);	Converts the Radians into Angle. Available only with the float32 Data Type.
	BCD2BIN ( )	[D 10]=BCD2BIN ([D 20]);	The selected data is converted from BCD to BIN. BIN16 (+), BIN16 (+/-), BIN32 (+) and BIN32 (+/-) are available as the Data Type.
	BIN2BCD ( )	[D 10]=BIN2BCD ([D 20]);	The selected data is converted from BIN to BCD. BIN16 (+), BIN16 (+/-), BIN32 (+) and BIN32 (+/-) are available as the Data Type.
	FLOAT2BIN	[D 10]=FLOAT2BIN ([D 20]);	The selected data is converted from float32 to BIN. BIN32 (+) and BIN32 (+/-) are available as the Data Type. The decimal places are truncated.
	BIN2FLOAT	[D 10]=BIN2FLOAT ([D 20]);	The selected data is converted from BIN to float32. BIN32 (+) and BIN32 (+/-) are available as the Data Type.
	MEMCMP	[D 10] = MEMCMP ([D 20], [D 30], 10)	Compares the specified number of points in units of word and returns the result. If “1” is returned, the data matches. If “0” is returned, the data does not match. It is possible to compare up to 64 words.
	MEMCPY	MEMCPY ([D 20], [D 30], 10)	Copies the specified number of points in units of word. It is possible to compare up to 64 words.
	OFFSET	OFFSET ([D 1],[D 10])	Indirect write/read of device
	LINE	LINE (0,0,100,200)	Draw a Line.

Item	Symbol	Example	Description
Word Functions	RECTAN-GLE	RECTANGLE (0, 0, 100, 200)	Draw a Rectangle.
	CIRCLE	CIRCLE (100, 100, 10, 20)	Draw a Circle/ Ellipse.
	DEC2ASCII	DEC2ASCII ([LDR 10], [LDR 20])	Converts data from the decimal notation to ASCII format. BIN16 (+), BIN16 (+/-), BIN32 (+), BIN32 (+/-), BCD4, and BCD8 are available as the Data Type.
	ASCII2DEC	[LDR 20] =ASCII2DEC ([LDR 30])	Converts data from ASCII format to the decimal notation. BIN16 (+), BIN16 (+/-), BIN32 (+), BIN32 (+/-), BCD4, and BCD8 are available as the Data Type.
	STRCUT	STRCUT ([LDR 10], [LDR 20], 0, 5)	Cuts a character string of the specified length from the specified position.
	STRLEN	[LDR 10] = STRLEN ([LDR 20])	Returns the length of the specified character string. The number of characters does not include NULL.
	STRCAT	STRCAT ([LDR 100], [LDR 200])	Concatenates the specified character string.
	STRSTR	[LDR 0] = STRSTR ([LDR 100], [LDR 200]);	Searches the specified character strings for the specified character string. If a search result is found, it returns the position.
Others	//	// Comment	Comment
	1234	[D 10] = 1234;	Decimal constant
	0xFFFFFFFFh	[D 10] = 0xFFFF;	Hexadecimal constant
	125.99	[D 10] = 125.99;ii	float32 constant
	[D 100]	[D 100][M 100][D 100-0]	Device
	@1 - @16	@16	Temporary device A device that can only be used in a script. Becomes 0 when the script starts.
	;	;	Semicolon must be appended at the end of each execution sentence.
	{ }	if (Condition) {Execute;}	Internal bracket Multiple statement (execution unit)
	( )	if (Condition) {Execute;}	Small bracket Control statement, function reference

For details about the functions, refer to Chapter 21 “8 Writing Scripts” on page 370.

6 Operator Priority

Basically, operator priority is in order from left to right.
When multiple operators are used in combination, calculation is performed based on the priority order given below.

Priority	Operators
High	( ) { }
↑	! - ~
↑	* / %
↑	+ -
↑	<< >>
↑	&
↑	^
↑	|
↑	< <= > >=
↑	== !=
↑	&&
↑	||
Low	=

7 Script Error

7.1 Error Occurrences

Processing of scripts will be interrupted in the event of the following errors.

- Divide by zero error (calculation error).
- Value outside range is stored in the case of data types BCD or float32 (calculation error).
- Execution time for a script exceeded 500ms (script monitor time error).
- Number of writes to host devices exceeded 64 in one script (write quantity error).
- Indirect read from host device while LSM14 or LSM15 is ON. (Indirect device error).
- Indirect read from host device and indirect write to Host device with a Global Script. (Indirect device error).
- When using LINE function, RECTANGLE function or CIRCLE function, the parameter is out of range. (Parameter error).

7.2 Error Storage Location

Script errors are stored in the following location. The error window appears on the MICRO/I screen if an error occurred.

Item	Description	Details
System Area+2-10	Script Error	0: No error 1: Error occurs
LSD 52	Script ID	1 to 32000Display the Script ID number for which the error occurred.
LSD 53	Script Error status	1: Calculation error (float32/BCD/device by zero) 2: Script monitor time error 3: Write quantity error 4: Indirect device error 5: Parameter error

8 Writing Scripts

The following example shows the operation when the data type is set to BIN16 (+).

8.1 General

- Make sure to add a semicolon ";" at the end of an execution expression. A semicolon indicates the end of an execution expression.

```
[LDR 100] = 1234;
```

- Spaces, tabs, and line feeds can be inserted in anywhere. To insert a tab on the Script Editor, press the Ctrl key and TAB key simultaneously.

```
if  ( Space [LDR 100] == 1234 Space ) LF
TAB  { LF
TAB  [LDR 200] = 0;  LF
TAB  }  LF
```

- Use the following format to describe devices and constants.

Item	Example Format	Description
Device	[D 100]	Put a device address in brackets "[" and "]". Insert a single-byte space between the device symbol and device address.
Decimal constant	1234	Directly enter the numerical value.
Hexadecimal constant	0x12AB12ABh	A hexadecimal number can be expressed in two ways below. - Add "0" (zero) and "x" to the head of the value, - Add "h" to the end of the value.

- Enter "//" at the beginning of a comment.
  The sentence following "//" will not be executed.

```
// This line is a comment line. Will not be executed.
[LDR 100] = 1234;
```

- Put a conditional expression ("if", "switch" or "while" function) in parentheses.
  Put an execution expression in curly brackets. In this case, a semicolon is not required at the end of parentheses or curly brackets.

```
if  ( [LDR 100] == 1234 )
{
        [LDR 200] = 0;
}
```

8.2 Arithmetic Operations

- Example 1.1

  Script

```
[LDR 200] = [LDR 100] + 1234;
```

  Description of operation
  Stores a value obtained by adding 1234 to LDR100.

8.3 Bit Operations

- Example 2.1

  Script

```
[LDR 300] = [LDR 100] << [LDR 200] ;
```

  Description of operation
  Shifts the value stored in LDR100 to the left by the value stored in LDR200, and stores the result in LDR300.
  For example, when the value of LDR100 is 1 and LDR200 is 3, “1” is shifted to the left by “3” bits, and “8” is stored in LDR300.

- Example 2.2

  Script

```
[LDR 200] = ~[LDR 100];
```

  Description of operation
  Stores the value obtained by bit-inverting the value of LDR100 to LDR200.
  For example, when the value of LDR100 is 0, “65535” is stored in LDR200.

8.4 Bit Functions

- Example 3.1

  Script

```
SET ( [LM 100] ) ;
```

  Description of operation
  LM100 is switched to ON if “SET ([LM 100]);” is set, the processing will be the same as “[LM 100] = 1;”

8.5 Word Functions

- Example 4.1

  Script

```
[LDR 200] = MAX([LDR 100] , [LDR 110] , [LDR 120] , [LDR 130] , [LDR 140]) ;
```

  Description of operation
  Stores the largest value of LDR100, LDR110, LDR120, LDR130, and LDR140 to LDR200.

- Example 4.2

  Script

```
[LDR 200] = BCD2BIN( [LDR 100] ) ;
```

  Description of operation

  Converts the BCD value stored in LDR100 into a binary data, and stores the result in LDR200.
  For example, if a BCD value of 10 is stored in LDR100, the conversion of this value from BCD to binary is 10 stored in LDR200.

- Example 4.3

  Script

```
[LDR 200] = BIN2BCD( [LDR 100] ) ;
```

  Description of operation

  Converts the binary data stored in LDR100 into a BCD value, and stores the result in LDR200.
  For example, if a binary data of 10 is stored in LDR100, the conversion of this value from binary to BCD is 10 stored in LDR200.

- Example 4.4

  Script

```
[LDR 200] = FLOAT2BIN( [LDR 100] ) ;
```

  Description of operation

  Converts the FLOAT value stored in LDR100 into a binary data, and stores the result in LDR200.
  For example, if a FLOAT value of 1234 is stored in LDR100, the conversion of this value from FLOAT to binary is 1234 stored in LDR200. If a FLOAT value of 1234.56 is stored in LDR100, the decimal place is truncated and 1234 stored in LDR200.

8.6 Comparison Operators

- Example 5.1

  Script

```
if( [LDR 100] < [LDR 200] )
{
        [LDR 300] = 0x100 ;
}
```

  Description of operation

  If the value of LDR100 is smaller than the value of LDR200, “0x100” (HEX) is stored in LDR300.

- Example 5.2

  Script

```
if( [LDR 100] <= [LDR 200] )
{
        [LDR 300] = 0x100    ;
}
```

  Description of operation

  If the value of LDR100 is equal to or less than the value of LDR200, “0x100” (HEX) is stored in LDR300.

- Example 5.3

Script

```
if( [LDR 100] != [LDR 200] )
{
        [LDR 300] = 0x100 ;
}
```

Description of operation
If the value of LDR100 is not equal to the value of LDR200, “0x100” (HEX) is stored in LDR300.

- Example 5.4

Script

```
if( [LDR 100] == [LDR 200] )
{
        [LDR 300] = 0x100 ;
        [LDR 400] = 0x200 ;
        [LDR 500] = 0x300 ;
}
```

Description of operation
If the value of LDR100 is equal to the value of LDR200, “0x100” (HEX) is stored in LDR300, “0x200” (HEX) in LDR400 and “0x300” (HEX) in LDR500.

8.7 Logical Operators

- Example 6.1

Script

```
if ( (0 != [LDR 100]) && ( 0 != [LDR 200]) )
{
        [LDR 300] = 0x100 ;
}
```

Description of operation
If LDR100 and LDR200 both are not equal to “0”, “0x100” (HEX) is stored in LDR300.
If either one of the values equals “0”, no operation is executed.

- Example 6.2

Script

```
if ( ( [LDR 100]==[LDR 200] ) && ( [LDR 300] == [LDR 400] + [LDR 500] ))
{
        [LDR 600] = 100 ;
}
```

Description of operation
If the values of LDR100 and LDR200 are equal, and the sum of LDR400 and LDR500 is equal to LDR300, “100” (decimal) is stored in LDR600. The processing in the curly brackets will not be executed neither expression is satisfied.

- Example 6.3

  Script

```
if( (0 != [LDR 100]) || (0 != [LDR 200]) )
{
        [LDR 300] =100 ;
}
```

  Description of operation

  If LDR100 is not equal to “0”, or LDR200 is not equal to “0”, “100” (decimal) is stored in LDR300. The processing in the curly brackets will be executed if either expression is satisfied.

- Example 6.4

  Script

```
if ( ! (0 != [LDR 100]) )
{
        [LDR 300] = 100 ;
}
```

  Description of operation

  “100” (decimal) is stored in LDR300 if LDR100 is equal to “0”.
  The processing will be the same if the script is described as (0 == [LDR 100])).

- Example 6.5

  Script

```
if ( ! ([LDR 100] == 0x1234) )
{
        [LDR 300] = 100 ;
}
```

  Description of operation

  “100” (decimal) is stored in LDR300 if LDR100 is not equal to 0x1234 (HEX).

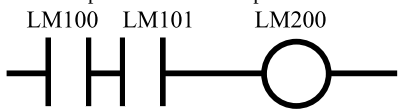
- Example 6.6

Script

```
if ( [LM 100] & [LM 101] )
{
        SET( [LM 200] ) ;
}
else{
        RST( [LM 200] ) ;
}
```

Description of operation

LM200 is switched to ON if the logical multiplication of LM100 and LM101 is not “0”.
The operation of this script is similar to a PLC ladder function as shown below.



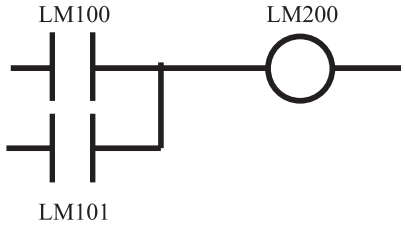
- Example 6.7

Script

```
if ( [LM 100] | [LM 101] )
{
        SET( [LM 200] ) ;
}
else{
        RST( [LM 200] ) ;
}
```

Description of operation

LM200 is switched to ON if the logical sum of LM100 and LM101 is not “0”.
The operation of this script is similar to a PLC ladder function as shown below.



- Example 6.8

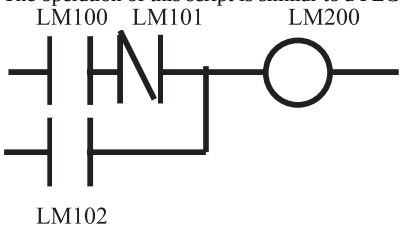
Script

```
if ( ( [LM 100] & ~[LM 101] )| [LM 102] )
{
        SET( [LM 200] ) ;
}
else{
        RST( [LM 200] ) ;
}
```

Description of operation

LM200 is switched to ON if the logical sum of the result of the logical multiplication of LM100 and inverted LM101, and LM102 is not “0”.

The operation of this script is similar to a PLC ladder function as shown below.



8.8 Conditionals

- Example 7.1

Script

```
if ( 0 != [LDR 100] )
{
        if ( 0 != [LDR 200] )
        {
                [LDR 300] = 0x1234;
        }
}
```

Description of operation

“0x1234” (HEX) is stored in LDR300 if LDR100 is not equal to “0” and LDR200 is not equal to “0”.

No operation is executed if LDR100 is not equal to “0” and LDR200 is “0”.

No operation is executed if LDR100 is “0”, regardless of the value of LDR200.

The processing of this script is similar to Example 6.1.

- Example 7.2

Script

```
if ( (0 != [LDR 100]) || (0 != [LDR 200]) )
{
        [LDR 300] = 100 ;
}
else
{
        [LDR 400] = [LDR 500] + 100 ;
}
```

Description of operation

"100" (decimal) is stored in LDR300 if either LDR100 or LDR200 is not equal to "0".
The sum of LDR500 and "100" (decimal) is stored in LDR400, if both LDR100 and LDR200 are "0".

- Example 7.3

Script

```
if ( [LDR 100] == 0)
{
        [LDR 200] = 0x1234 ;
}
else if( [LDR 100] == 1)
{
        [LDR 200] = 0x5678 ;
}
else
{
        [LDR 200] = 0x9999 ;
}
```

Description of operation

"0x1234" (HEX) is stored in LDR200 if LDR100 is equal to "0".
"0x5678" (HEX) is stored in LDR200 if LDR100 is equal to "1".
"0x9999" (HEX) is stored in LDR200 if a value other than above is stored in LDR100.

- Example 7.4

Script

```
if ( [LDR 100])
{
        [LDR 200] = 100 ;
}
```

Description of operation

"100" (decimal) is stored in LDR200 if LDR100 is not "0".

- Example 7.5

  Script

```
if ( [LM 100] )
{
        [LDR 300] = [LDR 400]+[LDR 500] +[LDR 600] +[LDR 700] +[LDR 800] ;
}
```

  Description of operation

  The sum of LDR400, LDR500, LDR600, LDR700, and LDR800 is stored in LDR300 if LM100 is not “0”.

- Example 7.6

  Script

```
if ( [LDR 100] )
{
        if ( [LDR 200] )
        {
                if ( [LDR 300] )
                {
                        [LDR 400] = 100 ;
                }
                else
                {
                        [LDR 400] = 200 ;
                }
        }
}
```

  Description of operation

  “100” (decimal) is stored in LDR400 if all of LDR100, LDR200, and LDR300 are not “0”.
  “200” (decimal) is stored in LDR400 if LDR100 and LDR200 are not “0”, and LDR300 is “0”.
  No operation is executed regardless of the value of LDR300, if either LDR100 or LDR200 is “0”.
  The processing of this script is similar to Example 7.3.

- Example 7.7

Script

```
switch ( [LDR 100] )
{
        case 0 :
                [LDR 200] = 0x1234 ;
                break ;
        case 1 :
                [LDR 200] = 0x5678 ;
                break ;
        default :
                [LDR 200] = 0x9999 ;
                break ;
}
```

Description of operation

"0x1234" (HEX) is stored in LDR200 if LDR100 is equal to "0".
"0x5678" (HEX) is stored in LDR200 if LDR100 is equal to "1".
"0x9999" (HEX) is stored in LDR200 if a value other than above is stored in LDR100.

- Example 7.8

Script

```
switch ( [LDR 100] )
{
        case 10 :
                [LDR 200] = 0x1234 ;
                break ;
        case 999 :
                [LDR 200] = 0x5678 ;
                SET([LM 10]);
                break ;
}
```

Description of operation

"0x1234" (HEX) is stored in LDR200 if LDR100 is equal to "10".
"0x5678" (HEX) is stored in LDR200 and LM10 is switched to ON if LDR100 is equal to 999.
No operation is executed if a value other than above is stored in LDR100.

- Example 7.9

  Script

```
[LDR 100] = 10;
[LDR 200] = 10;

while ( 0 < [LDR 100] )
{
        [LDR 200] = [LDR 200] + 1;
        [LDR 100] = [LDR 100] – 1;
}
```

  Description of operation

  While LDR100 is greater than 0, “1” is repeatedly added to LDR200, and “1” is repeatedly subtracted from LDR100.
  In the above example, LDR100 becomes “0” after the while loop executes the statement enclosed within curly brackets 10 times, therefore this while loop terminates.
  After the above example executes, LDR100 becomes “0”, and LDR200 becomes “20”.

- Example 7.10

  Script

```
[LDR 100] = 0;
[LDR 200] = 10;
[LDR 300] = 3;

while ( [LDR 100] == [LDR 200])
{
        [LDR 100] = [LDR 100] + 1;

        if([LDR 100] == [LDR 300])
        {
SET([LM 0]);
break;
        }
}
```

  Description of operation

  The while loop executes the statement enclosed within curly brackets repeatedly until LDR100 is equal to LDR200.
  If LDR100 is equal to LDR300 within the statement, LM0 is set “0” and the while loop terminates.
  The break statement terminates the execution of the nearest the while loop statement or the conditional switch statement in which it appears.
  In the above example, when the while loop executes the statement enclosed within curly brackets 3 times, LDR100 is equal to LDR300, LM0 is switched to ON, and then the while loop terminates. After the above example is executed, LDR100 becomes “3”, LDR200 becomes “10”, LDR300 becomes “3”, and LM0 becomes “1”.

- Example 7.11

Script

```
if( 0x1234 == [LDR 100])
{
        [LDR 200] = 0x5678;
        return;
}

[LDR 300] = 0;
```

Description of operation

If LDR100 is equal to “0x1234” (HEX), “0x5678” (HEX) is stored in LDR200 and the script terminates.
The return statement terminates the execution of a script.

- Example 7.12

  Script

```
// Processing of converting a decimal value into an octadecimal value.
// Convert 10 (decimal) into 12 (octadecimal), and 16 (decimal) into 20 (octadecimal).
// Converts to an octadecimal value of up to 4 digits.

@1 = 0;                    // Counter of the while statement
@2 = [LDR 100];            // Acquisition of source data
@3 = 1;                    // A decimal radix
@4 = 0;                    // Calculation result

// Repeat 4 times.
while( @1 < 4 )
{
        // Extracts the 1st digit of an octadecimal number from the source data. Store the
        intermediate result of the operation to @10.
        @10 = @2 % 8;
        // Convert the extracted result into a decimal number and add it to the result.
        @4 = @4 + (@10 * @3);

        // Increase the decimal radix by 1 digit.
        @3 = @3 * 10;
        // Decrease the source data by 1 digit.
        @2 = @2 / 8;
        // Terminates the while loop statement if @2 is equal to "0".
        if( 0 == @2 )
        {
                break;
        }

        // Increment the while counter by 1.
        @1 = @1 + 1;
}

// Store the calculation result in LDR200.
[LDR 200] = @4;
```

Description of operation

This example shows a conversion of a decimal number into an octadecimal number by using the while statement. Conversion of up to 4 digits is realized by using while statements to repeat the processing, which divides the decimal source data by 8 to convert it into an octadecimal number on a digit by digit basis. The decimal number of the source data is stored in LDR100, and the converted octadecimal number is stored in LDR200 after the execution of the above example.

8.9 Functions

- Example 8.1

Script

```
[LDR 0] = MEMCMP( [LDR 100] , [LDR 200] , 10 );
```

Description of operation

The values of devices LDR100 through LDR109 are compared with the values of the devices LDR200 through LDR209 respectively.

If all of the corresponding values match, “1” is stored in LDR0. If even one of the values does not match, “0” is stored.

Values are compared respectively

LDR100	⇔	LDR200
LDR101	⇔	LDR201
LDR102	⇔	LDR202
• • •	⇔	• • •
LDR108	⇔	LDR208
LDR109	⇔	LDR209

The values of devices LDR100 through LDR109 are compared with the values of the devices LDR200 through LDR209 respectively.

If all of the corresponding values match, “1” is stored in LDR0. If even one of the values does not match, “0” is stored.

Even if the Data Type is set to BIN32+, BIN32+/-, BCD8, or flosat32, the comparisons are executed in units of word from the start device. Indirect read of the argument is also possible.

- Example 8.2

Script

```
[LDR 0] = MEMCMP( [LDR 100-3] , [LM 0] , 10 );
```

Description of operation

The 3rd bit of LDR100 through the 3rd bit of LDR109 are compared with the bit status of the devices LM0 through LM9.

If all of the corresponding values match, “1” is stored in LDR0. If even one of the values does not match, “0” is stored.

Values are compared respectively

3rd bit of LDR100	⇔	LM0
3rd bit of LDR101	⇔	LM1
3rd bit of LDR102	⇔	LM2
• • •	⇔	• • •
3rd bit of LDR108	⇔	LM8
3rd bit of LDR109	⇔	LM9

The 3rd bit of LDR100 through the 3rd bit of LDR109 are compared with the bit status of the devices LM0 through LM9.

If all of the corresponding values match, “1” is stored in LDR0. If even one of the values does not match, “0” is stored.

Even if the Data Type is set to BIN32+, BIN32+/-, BCD8, or flosat32, the comparisons are executed in units of bit from the start device.

- Example 8.3

Script

```
MEMCPY( [LDR 100] , [LDR 200] , 10 );
```

Description of operation

Copies the values of the devices LDR200 through LDR209 to the devices LDR100 through LDR109.

Copies the values respectively

LDR100	←	LDR200
LDR101	←	LDR201
LDR102	←	LDR202
• • •	←	• • •
LDR108	←	LDR208
LDR109	←	LDR209

Even if the Data Type is set to BIN32+, BIN32+/-, BCD8, or flosat32, the values are copied in units of word from the start device. Copy of bit device can also be specified.

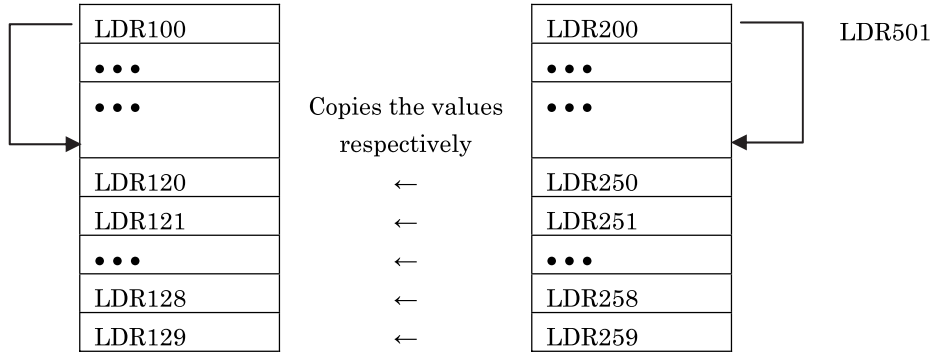
- Example 8.4

Script

```
MEMCPY( OFFSET( [LDR 100] , [LDR 500] ) , OFFSET( [LDR 200] , [LDR 501] ) , 10 );
```

Description of operation

Indirectly reads out the values of devices LDR200 through LDR209 and indirectly writes the values to the devices LDR100 through LDR109.



The MEMCMP function can also use Reference Device as the arguments.

- Example 8.5

  Script

```
LINE( 20 , 20 , 60 , 60 );
```

  Description of operation
  LINE (Start Point X, Start Point Y, End Point X, End Point Y, Line Width, Line Type, Line Color)
  Draw a line in a screen the script running. Last 3 arguments can be omitted.
  Device is available as an argument. Line is not cleared when device value is changed. Overwrite the image with the screen color in order to clear it.
  When wrong data is set to arguments, 5 is written to LSD53 and script is canceled.

Arguments	Description
Start Point X, Start Point Y, End Point X, End Point Y	Set Start Point and End Point of Line. Set the coordinates in the script command is running. These arguments can not be omitted.
Line Width	Set line width. 1:1dot, 2:2dots, 3:3dots, 5:5dots This argument can be omitted. This argument can be omitted. It is “Solid” when this is omitted or when Line width is “1 dot”.
Line type	Set line type. 1: Solid, 2: Dot, 3: Dash, 4: Long dash, 5: Long dash dot, 6: Long dash dot dot This argument can be omitted. It is “Solid” when this is omitted.
Line Color	Set color of line. Refer to Chapter 38 “1 Color Number Correspondence Table” on page 584 about color data. This argument can be omitted. It is “White” (0xF7) when this is omitted.

- Example 8.6

  Script

```
RECTANGLE( 20 , 20 , 60 , 60 );
```

  Description of operation
  RECTANGLE (Start Point X, Start Point Y, End Point X, End Point Y, Line Width, Line Type, Fg. Color, Bg. Color, Pattern, Round Type, Round Radius) Draw a rectangle in a screen the script running. Last 7 arguments can be omitted.
  Device is available as an argument. Rectangle is not cleared when device value is changed. Overwrite the image with the screen color in order to clear it.
  When wrong data is set to arguments, 5 is written to LSD53 and script is canceled.

Arguments	Description
Start Point X, Start Point Y, End Point X, End Point Y	Set Start Point and End Point of Rectangle. Set the coordinates in the script command is running. These arguments can not be omitted.
Line Width	Set line width. 1:1dot, 2:2dots, 3:3dots, 4: Reserved, 5:5dots This argument can be omitted. It is “1dot” when this is omitted.
Line type	Set line type. 1: Solid, 2: Dot, 3: Dash, 4: Long dash, 5: Long dash dot, 6: Long dash dot dot This argument can be omitted. This argument can be omitted. It is “Solid” when this is omitted or when Line width is “1 dot”.

Arguments	Description
Fg. Color, Bg. Color	Set color of rectangle. Refer to Chapter 38 “1 Color Number Correspondence Table” on page 584 about color data. This argument can be omitted. It is “White” (0xF7) when this is omitted.
Pattern	Set pattern. 0:None, 2: Fore100%, 3: Fore25%, 4: Fore50%, 7: Back100%, 8: Horizontal Lines 9: Vertical Lines, 10: Slant up, 11: Slant down, 12: Crosshatch, 13: Tint. 1,5 and 6 is reserved value. This argument can be omitted. It is “None” when this is omitted.
Round Type	Set Round type. 0:None, 1: Straight, 2: Curve. This argument can be omitted. It is “None” when this is omitted.
Round Radius	Set round radius size. This argument can be omitted. It is “0” when this is omitted.

- Example 8.7

  Script

```
CIRCLE( 20 , 20 , 60 , 60 );
```

  Description of operation

  CIRCLE (Center Point X, Center Point Y, Radius X, Radius Y, Line Width, Line Type, Fg.Color, Bg.Color, Pattern)
  Draw a circle/ellipse in a screen the script running. Last 5 arguments can be omitted.
  Device is available as an argument. Circle/ellipse is not cleared when device value is changed. Overwrite the image with the screen color in order to clear it.
  When wrong data is set to arguments, 5 is written to LSD53 and script is canceled.

Arguments	Description
Center Point X, Center Point Y	Set Center Point of Circle. Set the coordinates in the script command is running. These arguments can not be omitted.
Radius X, Radius Y	Set Radius X and Radius Y of Circle. These arguments can not be omitted.
Line Width	Set line width. 1:1dot, 2:2dots, 3:3dots, 4: Reserved, 5:5dots This argument can be omitted. It is “1dot” when this is omitted.
Line type	Set line type. 1: Solid, 2: Dot, 3: Dash, 4: Long dash, 5: Long dash dot, 6: Long dash dot dot This argument can be omitted. It is “Solid” when this is omitted or when Line width is “1 dot”.
Fg. Color, Bg. Color	Set color of Circle. Refer to Chapter 38 “1 Color Number Correspondence Table” on page 584 about color data. This argument can be omitted. It is “White” (0xF7) when this is omitted.
Pattern	Set pattern. 0:None, 2: Fore100%, 3: Fore25%, 4: Fore50%, 7: Back100%, 8: Horizontal Lines, 9: Vertical Lines, 10: Slant up, 11: Slant down, 12: Crosshatch, 13: Tint. 1,5 and 6 is reserved value. This argument can be omitted. It is “None” when this is omitted.

- Example 8.8

Script

```
ASCII2DEC([LDR100], LDR[200]);
```

Description of operation

DEC2ASCII (storage of post-conversion character string, decimal number to be converted)

The numeric value stored in LDR200 is converted to a decimal character string and stored in LDR100. NULL is stored at the end of converted decimal character string.

BIN16 (+), BIN16 (+/-), BIN32 (+), BIN32 (+/-), BCD4, and BCD8 can be used for the data type and only the devices in the operator interface can be used for the device. The character string storage method depends on “Storage Method of string data” in project settings.

1234 conversion (when the data type is BIN16+)

Device	Stored value
LDR 200	1234

→

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'1' = 0x31	'2' = 0x32
LDR 101	'3' = 0x33	'4' = 0x34
LDR 102	0x00	0x00
LDR 103	0x00	0x00

-12345 conversion (when the data type is BIN16+/-)

Device	Stored value
LDR 200	-12345

→

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'-' = 0x2D	'1' = 0x31
LDR 101	'2' = 0x32	'3' = 0x33
LDR 102	'4' = 0x34	'5' = 0x35
LDR 103	0x00	0x00

1234567890 conversion (when the data type is BIN32+)

Device	Stored value
LDR 200 - 201	1234567890

→

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'1' = 0x31	'2' = 0x32
LDR 101	'3' = 0x33	'4' = 0x34
LDR 102	'5' = 0x35	'6' = 0x36
LDR 103	'7' = 0x37	'8' = 0x38
LDR 104	'9' = 0x39	'0' = 0x30
LDR 105	0x00	0x00

-1234567890 conversion (when the data type is BIN32+/-)

Device	Stored value
LDR 200 - 201	-1234567890

→

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'-' = 0x2D	'2' = 0x32
LDR 101	'2' = 0x32	'3' = 0x33
LDR 102	'4' = 0x34	'5' = 0x35
LDR 103	'6' = 0x36	'7' = 0x37
LDR 104	'8' = 0x38	'9' = 0x39
LDR 105	'0' = 0x30	0x00

- Example 8.9

Script

```
ASCII2DEC([LDR100], LDR[200]);
```

Description of operation

Post-conversion decimal number = ASCII2DEC (pre-conversion character string)

The character string stored at the head of LDR200 is converted to a decimal number and stored in LDR100. The number of digits that can be converted become a number in which the sign is added to the number of maximum digits of each data type. If a character that cannot be converted to a numeric value or NULL is found or if the number of searched words exceeds 128 characters (64 words), conversion terminates.

BIN16 (+), BIN16 (+/-), BIN32 (+), BIN32 (+/), BCD4, and BCD8 can be used for the data type and only the devices in the operator interface can be used for the device. The character string storage method depends on “Storage Method of string data” in project settings.

Specification of character string “1234” (when the data type is BIN16+)

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'1' = 0x31	'2' = 0x32
LDR 201	'3' = 0x33	'4' = 0x34
LDR 202	0x00	0x00
LDR 203	0x00	0x00

→

Device	Stored value
LDR 100	1234

Specification of character string “0123456” (when the data type is BIN16+)

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'0' = 0x30	'1' = 0x31
LDR 201	'2' = 0x32	'3' = 0x33
LDR 202	'4' = 0x34	'5' = 0x35
LDR 203	'6' = 0x36	0x00

→

Device	Stored value
LDR 100	12345

Specification of character string “-1234” (when the data type is BIN16+/-)

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'-' = 0x2D	'1' = 0x31
LDR 201	'2' = 0x32	'3' = 0x33
LDR 202	'4' = 0x34	'5' = 0x35
LDR 203	0x00	0x00

→

Device	Stored value
LDR 100	-12345

Specification of character string that exceeds 128 characters (when the data type is BIN16+)

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'0' = 0x30	'0' = 0x30
LDR 201	'0' = 0x30	'0' = 0x30
:	:	:
LDR 261	'0' = 0x30	'0' = 0x30
LDR 262	'1' = 0x31	'2' = 0x32
LDR 263	'3' = 0x33	'4' = 0x34
LDR 264	'5' = 0x35	'6' = 0x36
LDR 265	0x00	0x00

→

Device	Stored value
LDR 100	1234

Character string “1234567890” (when the data type is BIN32+)

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'1' = 0x31	'2' = 0x32
LDR 201	'3' = 0x33	'4' = 0x34
LDR 202	'5' = 0x35	'6' = 0x36
LDR 203	'7' = 0x37	'8' = 0x38
LDR 204	'9' = 0x39	'0' = 0x30
LDR 205	0x00	0x00

→

Device	Stored value
LDR 100 - 101	1234567890

- Example 8.10

Script

```
STRCUT( [LDR 100] , [LDR 200] , 2 , 3 );
```

Description of operation

STRCUT (cut character string, cut source character string, cut start position, number of cut characters)
A character string is cut from the cut source character string, stored in the devices starting from LDR200 according to the cut start position and the number of cut characters and is then stored in the devices starting from LDR100.
You can specify the third argument with a value from 0 to 127 and the fourth argument with a value from 1 to 128. You can specify only the devices in the operator interface in all arguments. The character string storage method depends on “Storage Method of string data” in project settings.

Cutting of character string from cut source character string “ABCDEFG” according to cut start position 2 and number of cut characters 3

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'A' = 0x41	'B' = 0x42
LDR 201	'C' = 0x43	'D' = 0x44
LDR 202	'E' = 0x45	'F' = 0x46
LDR 203	'G' = 0x47	0x00

→

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'C' = 0x43	'D' = 0x44
LDR 101	'E' = 0x45	0x00

Script

```
STRCUT( [LDR 100] , [LDR 200] , 1 , 4 );
```

Cutting of character string from cut source character string “ABCDEFG” according to cut start position 1 and number of cut characters 4

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'A' = 0x41	'B' = 0x42
LDR 201	'C' = 0x43	'D' = 0x44
LDR 202	'E' = 0x45	'F' = 0x46
LDR 203	'G' = 0x47	0x00

→

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'B' = 0x42	'C' = 0x43
LDR 101	'D' = 0x44	'E' = 0x45
LDR 102	0x00	0x00

- Example 8.11

  Script

```
[LDR 100] = STRLEN( [LDR 200] );
```

Description of operation

Length of specified character string = STRLEN (character string whose length is to be checked)

The length of the character string stored in the devices starting from LDR200 is checked and the check result is stored in LDR100. The length of the character string is the number of characters except for NULL.

You can specify only the devices in the operator interface in all arguments. The character string storage method depends on "Storage Method of string data" in project settings.

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'A' = 0x41	'B' = 0x42
LDR 201	'C' = 0x43	'D' = 0x44
LDR 202	'E' = 0x45	'F' = 0x46
LDR 203	'G' = 0x47	0x00

→

Device	Stored value
LDR 100	7

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'A' = 0x41	'B' = 0x42
LDR 201	'C' = 0x43	0x00
LDR 202	'E' = 0x45	'F' = 0x46
LDR 203	'G' = 0x47	0x00

→

Device	Stored value
LDR 100	3

- Example 8.12

Script

```
STRCAT( [LDR 100], [LDR 200] );
```

Description of operation

STRCAT (link destination character string, character string to be linked)

The character string stored in the devices starting from LDR200 is linked to the end of the link destination character string stored in the devices starting from LDR100.

You can specify only the devices in the operator interface in all arguments. The character string storage method depends on "Storage Method of string data" in project settings.

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'A' = 0x41	'B' = 0x42
LDR 101	'C' = 0x43	0x00

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'D' = 0x44	'E' = 0x45
LDR 201	'F' = 0x46	'G' = 0x47
LDR 202	0x00	0x00

→

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'A' = 0x41	'B' = 0x42
LDR 101	'C' = 0x43	'D' = 0x44
LDR 102	'E' = 0x45	'F' = 0x46
LDR 103	'G' = 0x47	0x00

- Example 8.13

Script

```
[LDR 0] = STRSTR( [LDR 100], [LDR 200] );
```

Description of operation

Search key appearance position = STRSTR (character string to be searched, search key)

The character string stored in the devices starting from LDR100 is searched for a search key. If the search key is found, the search key appearance position is returned to LDR0. If the search key is not found, -1 is returned to LDR0. You can specify "?" as the wild card in the search key. Use this wild card together with control code "~".

You can specify only the devices in the indicator in all arguments. Specify search key in up to 128 characters. The character string storage method depends on "Storage Method of string data" in project settings.

Character string found as a result of search for “DEFG”

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'A' = 0x41	'B' = 0x42
LDR 101	'C' = 0x43	'D' = 0x44
LDR 102	'E' = 0x45	'F' = 0x46
LDR 103	'G' = 0x47	'H' = 0x48
LDR 104	'I' = 0x49	'J' = 0x4A
LDR 105	'K' = 0x4B	'L' = 0x4C
LDR 106	'M' = 0x4D	'N' =0x4E
LDR 107	'O' = 0x4F	0x00

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'D' = 0x44	'E' = 0x45
LDR 201	'F' = 0x46	'G' = 0x47
LDR 202	0x00	0x00

→

Device	Stored value
LDR 0	3

No character string found as a result of search for “WXYZ”

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'A' = 0x41	'B' = 0x42
LDR 101	'C' = 0x43	'D' = 0x44
LDR 102	'E' = 0x45	'F' = 0x46
LDR 103	'G' = 0x47	'H' = 0x48
LDR 104	'I' = 0x49	'J' = 0x4A
LDR 105	'K' = 0x4B	'L' = 0x4C
LDR 106	'M' = 0x4D	'N' =0x4E
LDR 107	'O' = 0x4F	0x00

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'W' = 0x57	'X' = 0x58
LDR 201	'Y' = 0x59	'Z' = 0x5A
LDR 202	0x00	0x00

→

Device	Stored value
LDR 0	-1

Search using wild card “?”

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'A' = 0x41	'B' = 0x42
LDR 101	'C' = 0x43	'D' = 0x44
LDR 102	'E' = 0x45	'F' = 0x46
LDR 103	'G' = 0x47	'H' = 0x48
LDR 104	'I' = 0x49	'J' = 0x4A
LDR 105	'K' = 0x4B	'L' = 0x4C
LDR 106	'M' = 0x4D	'N' =0x4E
LDR 107	'O' = 0x4F	0x00

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'E' = 0x45	'?' = 0x3F
LDR 201	'G' = 0x47	'H' = 0x48
LDR 202	0x00	0x00

→

Device	Stored value
LDR 0	4

Search of “?” as a character

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'A' = 0x41	'B' = 0x42
LDR 101	'C' = 0x43	'D' = 0x44
LDR 102	'E' = 0x45	'?' = 0x3F
LDR 103	'G' = 0x47	'H' = 0x48
LDR 104	'I' = 0x49	'J' = 0x4A
LDR 105	'K' = 0x4B	'L' = 0x4C
LDR 106	'M' = 0x4D	'N' =0x4E
LDR 107	'O' = 0x4F	0x00

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'E' = 0x45	'~' = 0x7E
LDR 201	'?' = 0x3F	'G' = 0x47
LDR 202	'H' = 0x48	0x00

→

Device	Stored value
LDR 0	4

Search of "~" as a character

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'A' = 0x41	'B' = 0x42
LDR 101	'C' = 0x43	'D' = 0x44
LDR 102	'E' = 0x45	'~' = 0x7E
LDR 103	'G' = 0x47	'H' = 0x48
LDR 104	'I' = 0x49	'J' = 0x4A
LDR 105	'K' = 0x4B	'L' = 0x4C
LDR 106	'M' = 0x4D	'N' = 0x4E
LDR 107	'O' = 0x4F	0x00

→

Device	Stored value
LDR 0	4

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'E' = 0x45	'~' = 0x7E
LDR 201	'~' = 0x7E	'G' = 0x47
LDR 202	'H' = 0x48	0x00

8.10 Temporary Device

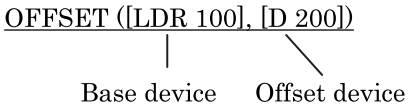
A temporary device can be used only in a script.
Up to 16 temporary devices can be used, which are automatically set "0" at the start of the script.
A temporary device is useful for storing an intermediate result of a calculation.
Can be used as a 16-bit or 32-bit device according to the data type setting.

Script

```
@1 = [D 100];
@2 = @1+1;
@3 = @2*2;
[D 200]=@2;
[D 300]=@3;
```

8.11 Indirect Read and Indirect Write of Devices

Indirect read and indirect write of a device can be executed with a script.



Example of indirect read of a device

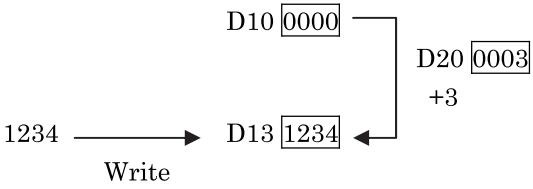
```
// Set “8” for the offset value.
[D 20] = 8;

// Write the value of LDR18 to LDR200.
[LDR 200] = OFFSET( [LDR 10] , [D 20] );
```

Example of indirect write of a device

```
// Set “3” for the offset value.
[D 20] = 3;

// Write 1234 to D13.
OFFSET( [D 10] , [D 20] ) = 1234;
```



Example of indirect read of a host device

```
// When the offset value has changed
// D20 is the new offset value, and LDR1000 is the offset value before the change.
if([D 20] != [LDR 1000])
{
        // Set a value for the offset value.
        [D 20] = [LDR 1000];
        // Directly switch the indirect reading flag to ON.
        [LSM 14] = 1;
}

// If indirect transfer is not active, activate it.
if( 0 == [LSM 14] )
{
   // Write the indirect reading value into LDR200.
   [LDR 200] = OFFSET( [D 10] , [D 20] );
}
```

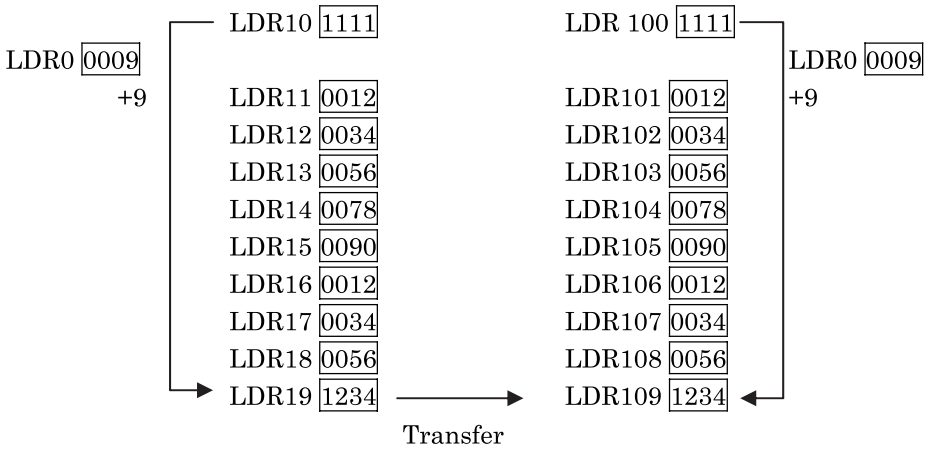
When the offset value changes during an indirect read of the host device, the HG special relay LSM14 or LSM15 switches to ON, which will trigger reading of a destination device with the indirect designation. When the reading is complete, the relay switches to OFF. LSM14 is for the Base screen and LSM15 is for a Popup screen. (refer to Chapter 8 “3.2 Indirect Read and Indirect Write of Devices” on page 129.)

Example of indirect write/read using the while statement

```
// Transfer the values of LDR10 through LDR19 to LDR100 through LDR109.

// Initialize the offset value.
[LDR 0] = 0;

// 10-time loop
while([LDR 0] < 10 )
{
    // Transfers 1 word with indirect read/write function.
    OFFSET( [LDR 100] , [LDR 0] ) = OFFSET( [LDR 10] , [LDR 0] ) ;
    // Increment the offset value.
    [LDR 0] = [LDR 0] + 1;
}
```



- Indirect read from host device and indirect write to Host device cannot be executed with a Global Script. (Although they can be set up using the WindO/I-NV2, they will not work on the MICRO/I.)
- The offset values are available up to 32767.
- Store a value corresponding to the data type to the offset device. For example, when the data type of the script is set to BCD4, store a BCD4 value in the offset device.
- In the “while” sentence, do not specify the indirect read from host device.

9 Important Notes

9.1 Cautions regarding “while” statements

It is possible to loop execution the duration that a “while” statement condition is established. However, in cases such as the following example, the process cannot break out of the infinite loop when the condition is always established.

```
[LDR 100] = 10;

while( 0 != [LDR 100] )
{
[LDR 200] = [LDR 200] + 1;
}
```

Although the while statement will not terminate unless LDR100 becomes “0”, LDR100 remains at “10”, which creates an infinite loop.

Be certain to break out of the loop for the while statement as shown below. Since LDR100 is counting down, when you repeat the while statement at ten times, LDR100 becomes “0” and then you can break out of the loop for the while statement.

```
[LDR 100] = 10;

while( 0 != [LDR 100] )
{
[LDR 200] = [LDR 200] + 1;
[LDR 100] = [LDR 100] –1;
}
```

If the processing time for one script exceeds 500ms (due to a while statement etc.), the script will terminate with an error.

In addition, do not write to host devices in the loop of a while statement.

9.2 Number of Usable Devices

With WindO/I-NV2 the number of host devices that can be set within one script is 64 read devices and 64 write devices.

Also, while a script is being executed in and operator interface, the total write number to the host devices exceeds 64, and the script is terminated as an error.

9.3 Write Delay

If you write a data to the host devices, the write delay is generated and the data is not updated immediately. If you write to the internal devices in the operator interface, the write delay is not occurred.

To avoid generating the write delay to the host devices, select [Configuration] - [System Setup] - [Project]. The setting of "Use Device Cache" is applied not only for the script but also for the whole project.

(Example)

- Device Cache not used

  The D100 initial value is 0.

```
[D 100] = 1000;

[D 100] = [D100] + 5000;
```

  The 1000 in the first line is a write delay, so it is not yet written to the PLC, and therefore when the second line is executed, D100 is still 0.

  Accordingly, in the second line, 5000 is added to 0, and this value is written to D100. After the script is executed, and writing to the OLC is completed, 5000 will be stored in D100.

  In cases such as this, temporarily store the calculation data in an operator interface register.

```
[LDR 0] = 1000;

[LDR 0] = [LDR0] + 5000;

[D 100] = [LDR 0];
```

- Device Cache used

  The D100 initial value is 0.

```
[D 100] = 1000;

[D 100] = [D100] + 5000;
```

  The 1000 in the first line is stored in the cache, and the second line uses the cache value. 6000 Is stored in D100 after the script executes.

Chapter 22 Sound Function

This chapter describes the settings and functionality of the sound interface on the MICRO/I.

1 Overview

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

MICRO/Is with sound interface (AUDIO OUT) can be connected to external speakers with built-in amplifiers to play the sound files. The sound file can be used according to the following:

- An arbitrary bit device is turned on.
- A touch sound instead of a beep.

2 Settings

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

2.1 Sound Settings

You can set or modify sound settings. For Sound Settings, do one of the following:

- On the Configuration tab, in the System Setup group, click Sound.
- On the Project Window, under the project folder, double-click Sound Settings.

Item	
ID	Each sound file has an assigned registration number.
File Name	Specify the name of the sound file to be played. For details on supported sound file format, refer to "Supported Sound Files" below.
Size	Display the size of the sound file selected under “File Name”.
Save to	Specify whether to store the sound file in the internal memory of the MICRO/I or in a memory card.
Trigger Condition	Specify the type of condition for the sound file to be played. It is possible to select “Device Address” or "None" To play sound files triggered by device values, select “Device Address”. Multiple conditions are satisfied at the same time, the sound file.
Device Address	When “Device Address” under “Trigger Condition” is selected, specify the device address that will be used as a condition to play the sound file. All device addresses can be set. However, when using the device address of the host device, more than 128 host.
Repeat	Specify the repetition of the sound file. Enable: Plays the sound repeatedly. Disable: Plays the sound only once.
Error log	If sound settings are invalid, all errors are displayed. Refer to the next chapter for information on restrictions.
Adjust volume	Adjust the sound volume on the MICRO/I by assigning a value on the device address. The setting range is from 0 to 31. If the device address value is set to 0, the sound is muted; if it is set to 31, the sound is played at the maximum volume. If the device address value is outside the settable range, the sound file is played at maximum volume.
Mute	If the set device address turns to ON, the sound is muted. If the sound is muted while a sound file is being played, the sound file continues to play.

- Supported Sound Files

  The sound file format and its limitations:

File format	WAVEfile
Data format	PCM
Sampling rate	8kHz to 44.1kHz
Bit rate	16-bit
Audio type	Mono or stereo
File size	Max. 512 Kbyte

- When a sound file is used as a touch sound, select the sound file on the System tab in the Project Settings, rrefer to Chapter 5 “1.1 System” on page 83.
- For details of HG Special Relays and HG Special Registers for Sound functions, refer to Chapter 34 “Internal Devices” on page 533.

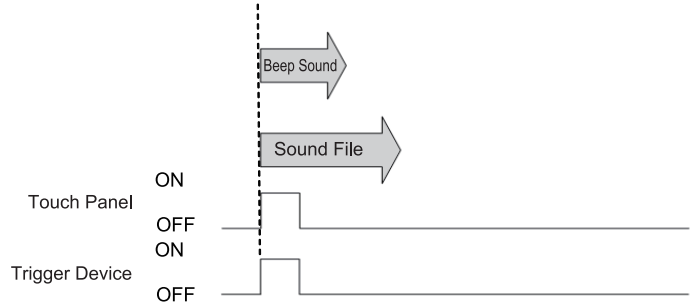
3 Operations

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

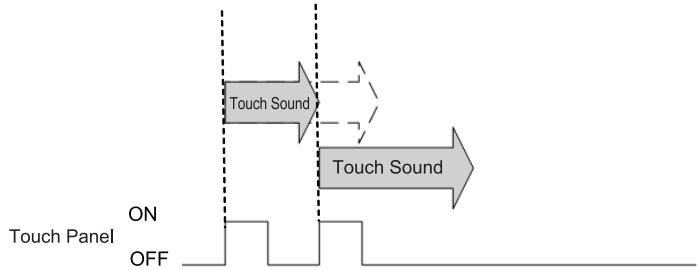
Only HG3G support this function

The MICRO/I cannot play multiple sound files at the same time. Sound file playback is described below.

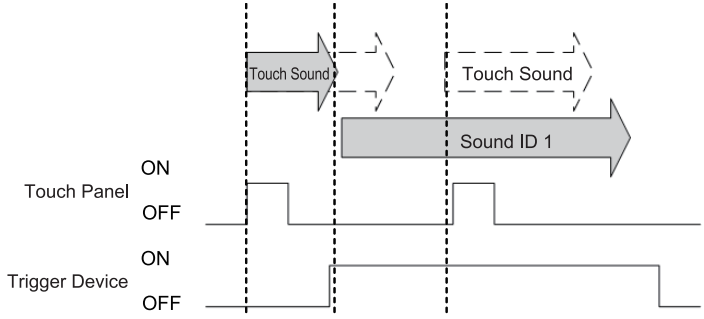
- It is possible to play sound files and beeps at the same time.



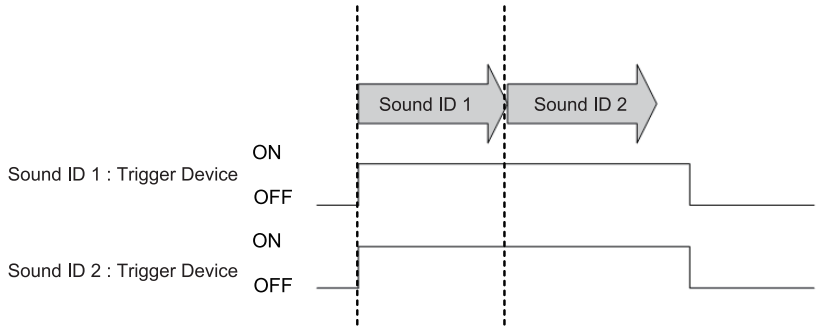
- If the touch panel is pressed while a touch sound is playing, the sound will stop and the new touch sound will be started.



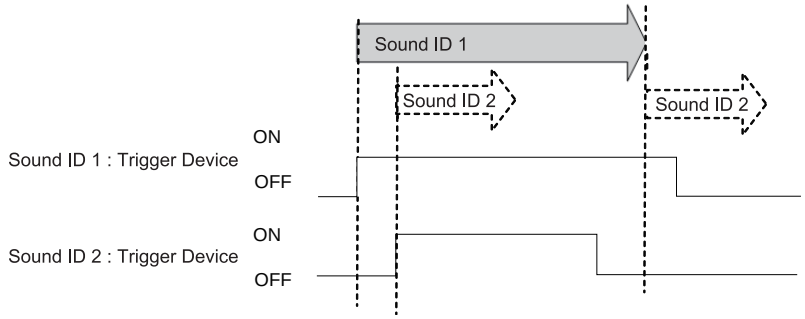
- If a trigger condition for a sound file is satisfied while a sound file is playing as a touch sound, the touch sound that was playing is cancelled, and the touch sound for which the trigger condition was satisfied is played. While a sound file for which a trigger condition has been satisfied is playing, sound files cannot be played as touch sounds.



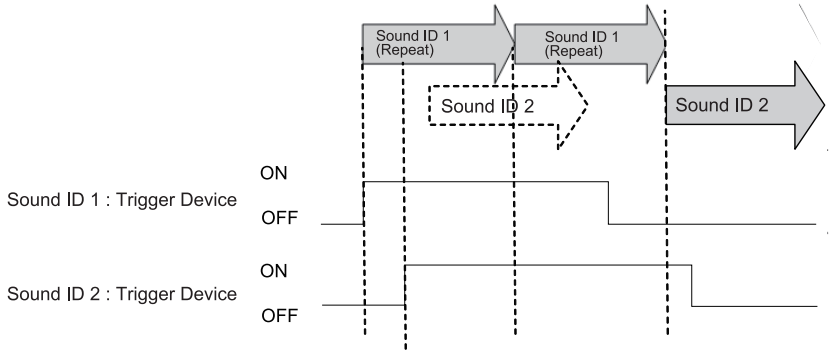
- If two or more trigger conditions are satisfied at the same time, the sound files are played starting with the lowest sound ID number



- When a trigger device for a sound file is ON while another sound file is being played, the sound file will not be played until the current playing sound file finishes playing. If the trigger condition of the sound file is not satisfied when the playing so



- While the sound file is playing and then set to do a “repeat”, other sound files will not be played until the “repeat” method is disabled. In the following example, the "repeat" is enabled in the setting of sound ID1, so the sound file will be played until the trigger device is OFF. In addition, when the trigger device of the sound ID1 is OFF, the sound file of sound ID2 will be played because the trigger device of the sound ID2 is ON.



4 Restrictions

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

Sound function has the following limitations.

- Maximum Number of Sound files:

  A maximum of 1024 sound files can be registered.

- Restrictions related to Trigger Conditions:

  When using the device address of the host device as a trigger condition, the total number of the trigger device for the sound function must be no greater than 128

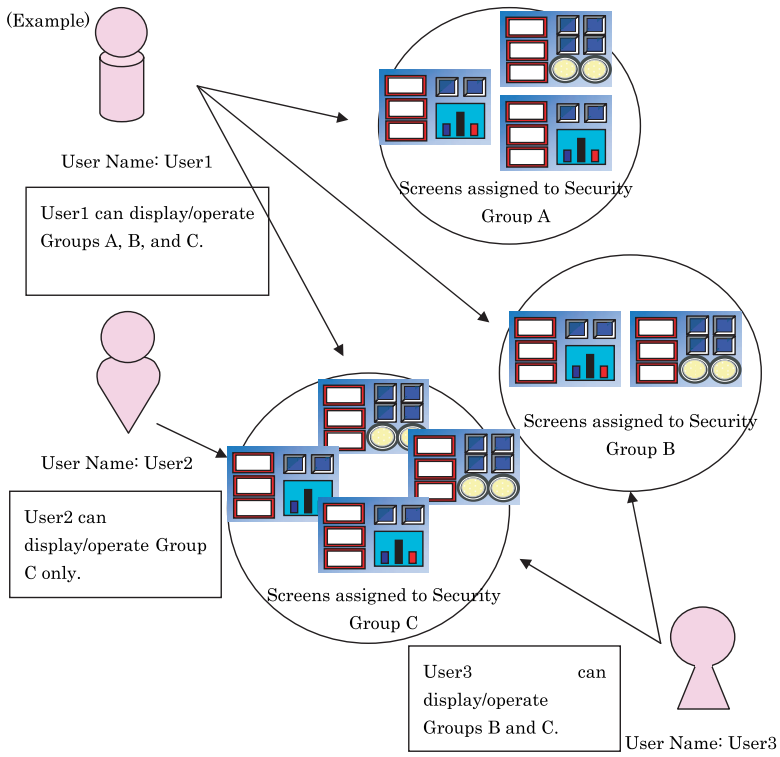
Chapter 23 Security Function

1 Overview

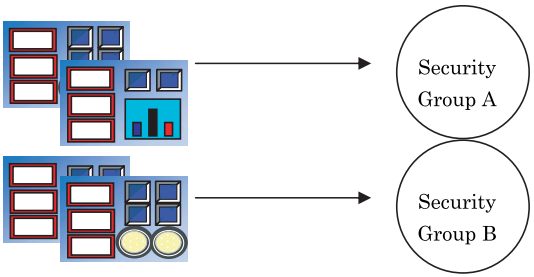
The security function is a function which uses user names and passwords to restrict user activities such as editing projects and displaying/operating data while the system is running.

With the WindO/I-NV2, add a user account with a specific user name and password. Then, specify the Security Group for the user account so that it can be displayed or operated by that user account.

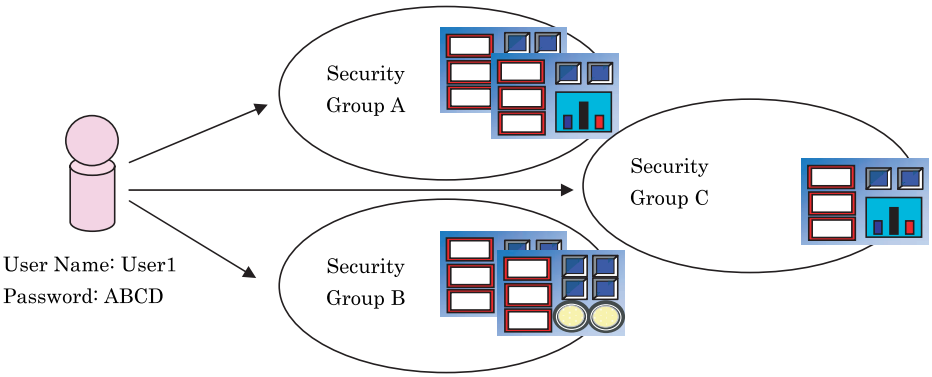
On the MICRO/I, users can select user accounts and change the restriction on the screens and parts they can use by entering the password.



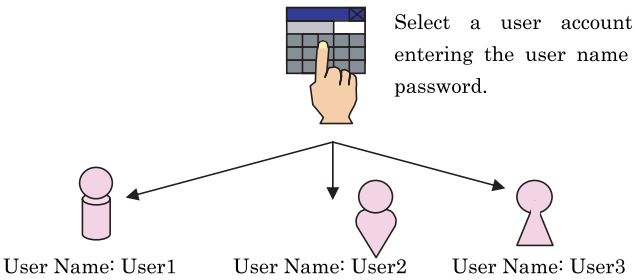
Assign screens and parts to be restricted to a group called a Security Group.
In addition to using the predefined Security Groups, you can also add a new Security Group.



Add a user account with a user name and password to the project.
One or more Security Groups can be specified for each user account.



The MICRO/I recognizes the user account by the user name and password being entered, and restricts the display or operation of the screens.

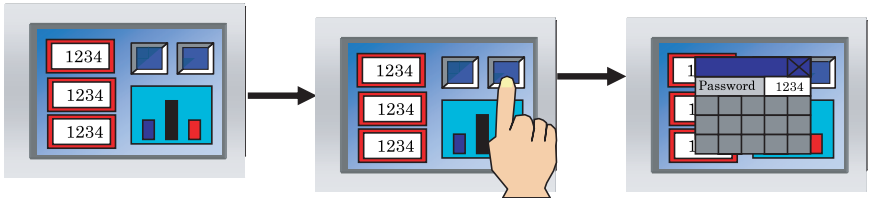


2 Example of the Screen Display Restriction

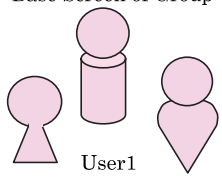
Example of settings

User Name	Allowed Security Group
User1	Group A, Group B, Group C
User2	Group C
User3	Group B, Group C

To switch to Base Screens:

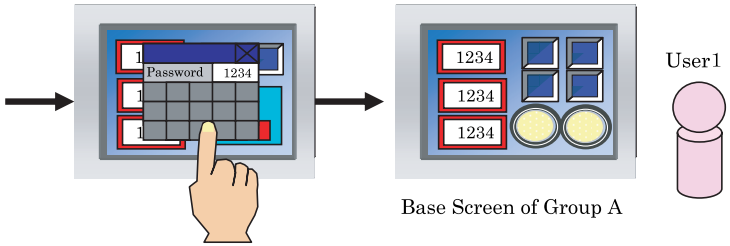


Base Screen of Group C



Press the Goto Screen Button for which the function to switch Base Screens is assigned.

When switching to a screen of Group A, users except User 1 are requested to enter the password because they are not authorized to view the screen. User1 will not be prompted to enter the password.

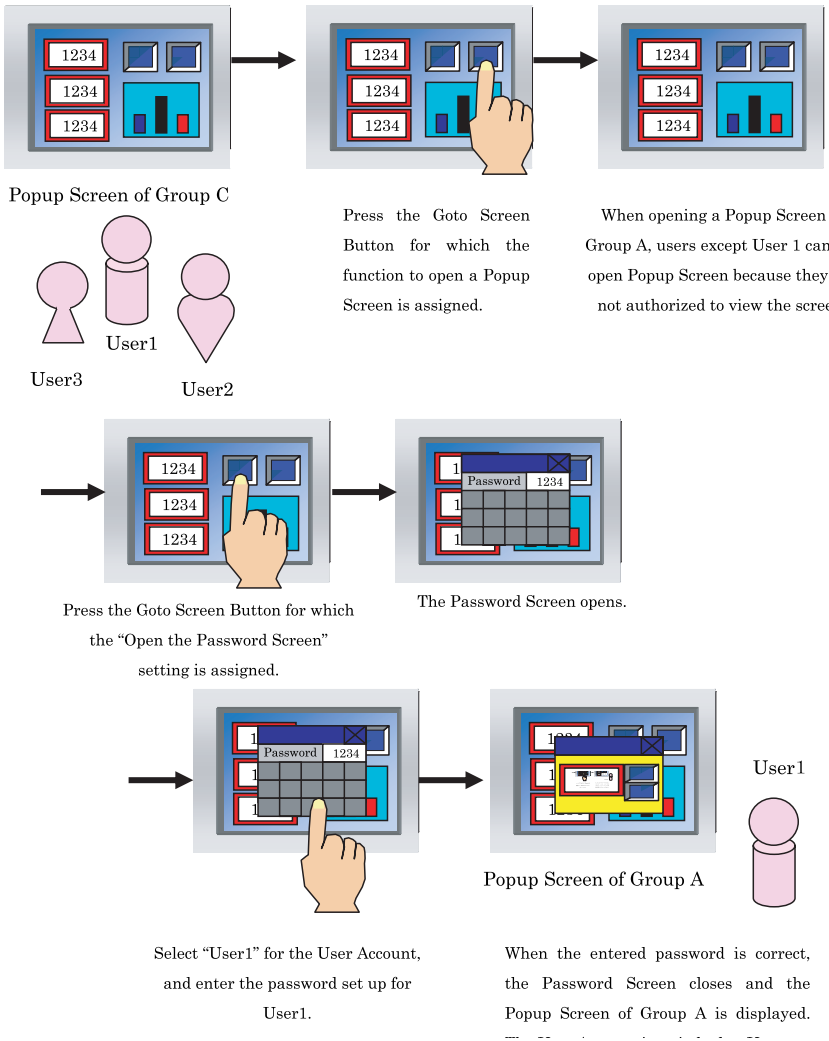


Select “User1” for the User Account, and enter the password set up for User1.

Base Screen of Group A

When the entered password is correct, the Password Screen closes and the Base Screen of Group A is displayed. The User Account is switched to User 1.

To open a Popup Screen:



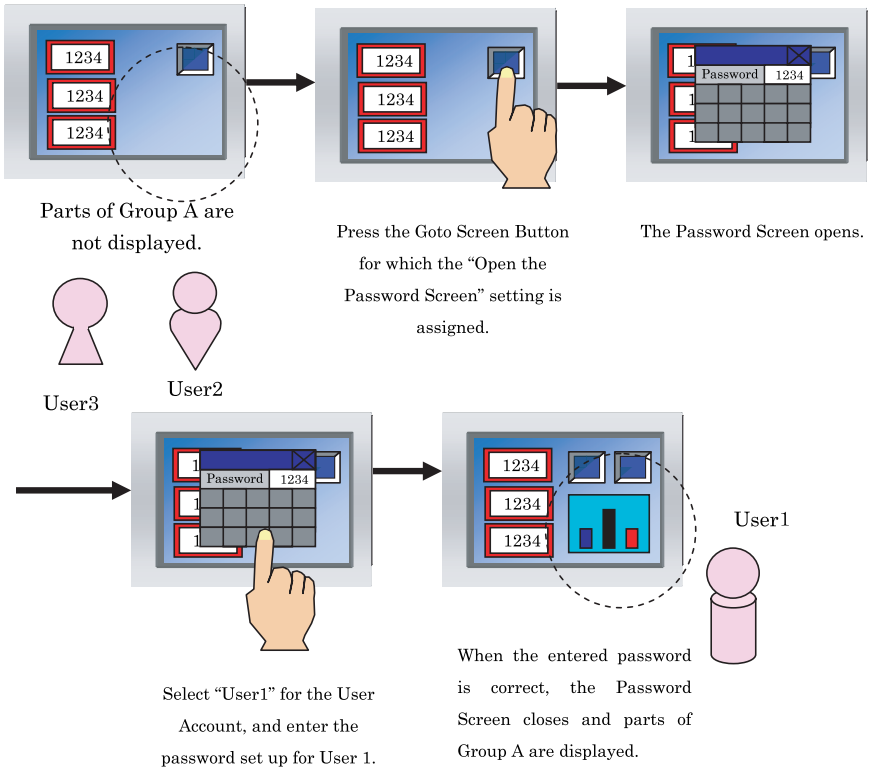
- Verification of User Account is performed only when switching the Base Screens or Opening a Popup Screen by using the Goto Screen Button or Goto Screen Command. The user account is not verified in the following cases:
  - When the Base Screen is switched by using the System Area
  - When the Alarm Screen for the Alarm Log function is displayed
  - Keypad is opened with the Numerical Input or Character Input is used
  - Reference Screen is opened with Alarm Log Display or Alarm List Display is used
  - When opening the Password Screen and switching to another User Account by using the Goto Screen Button or Goto Screen Command, verification is not performed for a screen that is already opened.
- Switching a text group resets the displayed Base Screen. Popup Screens and internal devices start their operation in the status in which the Base Screen is switched.
- Refer to Chapter 23 "5 Password Screen" on page 415 for details about the password entry screen.
- Even when using the HG1F with Vertical screen setting, the Password Screen is displayed in the horizontal display mode.

3 Example of Part Restriction

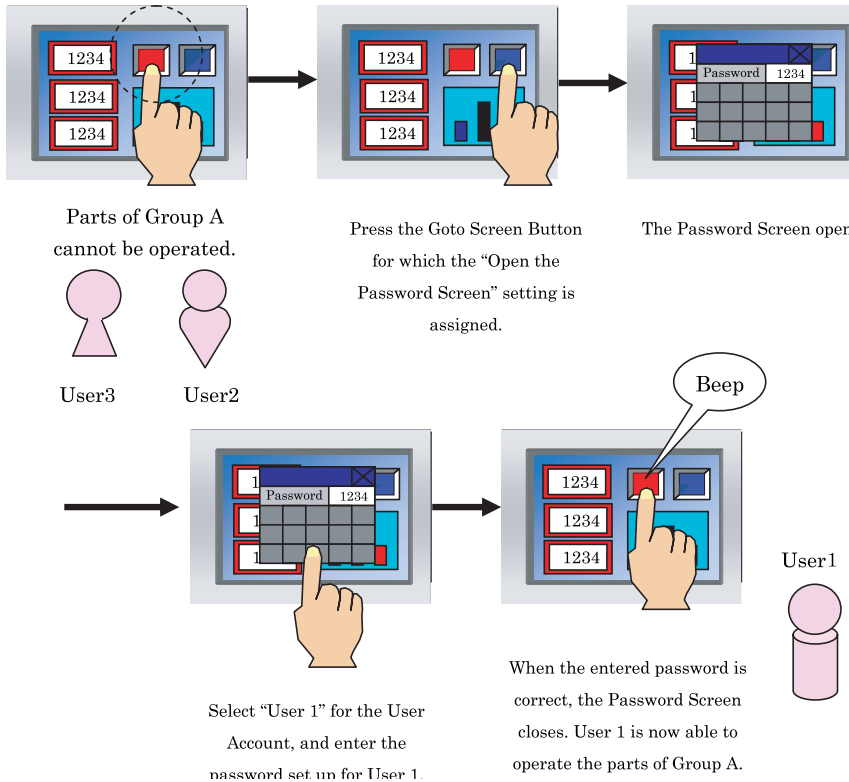
Example of settings

User Name	Allowed Security Group
User1	Group A, Group B, Group C
User2	Group C
User3	Group B, Group C

To display a part:



To input data for a part:



- Since operation can be restricted with the Security Group of data input, a function similar to the Trigger Condition of Button can be realized.
- Parts that are not displayed on the screen cannot be operated regardless of the Security Group of data input.

4 Operation Flow from Setting the WindO/I-NV2 to Using the Security Function

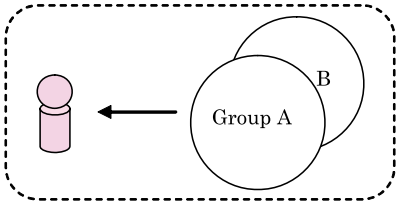
This section shows the operation flow for the security function from setting the WindO/I-NV2 to actual use.

1. Add a new user account.

Enable the Use Security functions option, add a new user account, and then set up the user name and password. To make the settings, select [Setup] - [User Accounts] on the WindO/I-NV2. Up to 15 user accounts can be set up. (refer to “6 User Accounts” (P.417) in this chapter.)

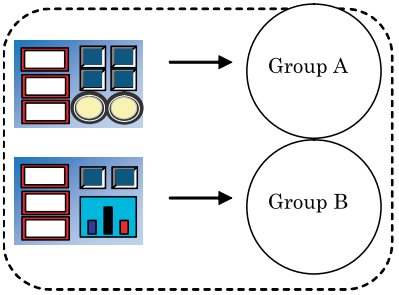
2. Assign a Security Group.

Add user accounts and specify the user names and passwords. (Set them by selecting “Users and Password Settings” with the WindO/I-NV2. Up to 16 users can be used. Refer to “7 Security Groups” (P.420) in this chapter.)



3. Categorize the security level.

Specify Security Groups to appropriate user accounts so that a specific group can be used by a specific user.



4. Set options.

Set the advanced options such as “Back to Default User”. (refer to “6 User Accounts” (P.417) in this chapter.)

5. Download/operation

After the project data is downloaded, the screens are displayed according to the privilege of the user account.

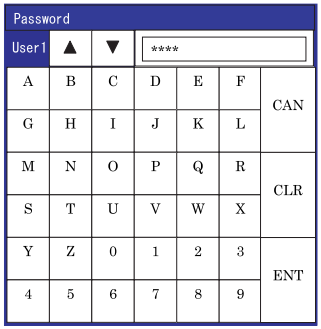
For the advanced setting procedures, refer to the WindO/I-NV2 Help.

5 Password Screen

A user enters a user name and password on the Password Screen to switch the user accounts.

If a password protection has been setup, the MICROI prompts the user to enter the password according to the following case.

- The Password Screen is displayed using the Goto Screen Button, Multi-Button, Goto Screen Command or Multi-Command
- The user makes an unauthorized attempt to switch to a Base Screen using the Goto Screen Button, Multi-Button, Goto Screen Command or Multi-Command. (Only when the “Require password automatically” option is enabled)
- The user attempts to display the System Menu or Device Monitor using the Maintenance menu, Goto Screen Button, Multi-Button, Goto Screen Command or Multi-Command
- The user attempts to execute the Data Transfer functions using the Key Button, Multi-Button, or Multi-Command.
- The user attempts to execute the USB AutoRun functions



Item	Description
User name	Displays the user name. The user name can be switched by using the USR Button.
Password	Displays the password that is being entered with asterisks (*).
Up Button Down Button	Switches the user accounts. These buttons are displayed only when the Use Security functions option is enabled. The following user accounts are available and displayed in the User name box. When switching Base Screens: The user accounts for which the Security Group set up for the destination screen is assigned can be selected. When downloading or uploading a project: Only the user accounts for which "Administrator" is assigned can be selected. When downloading or uploading the PLC Program:*1 Only the user accounts for which "Administrator" is assigned can be selected. When copying the files from USB Flash Drive to Memory Card:*1 Only the user accounts for which "Administrator" or "Operator" is assigned can be selected. When copying the files from Memory Card to USB Flash Drive*1: Only the user accounts for which "Administrator", "Operator" or "Reader" is assigned can be selected. When shifting to the System Menu: Only the user accounts for which "Administrator" is assigned can be selected. When displaying the Device Monitor: The user accounts for which "Administrator" or "Operator" is assigned can be selected. When opening the Password Screen using the Goto Screen Button, Multi-Button, Goto Screen Command or Multi-Command: All user accounts can be selected.
CAN Button	Cancel the Password entry and Close password screen.
CLR Button	Clears the password that is being entered.
ENT Button	Confirms the password that has been entered. When the entered password is correct, the Password Screen is closed. When the entered password is not correct, the entered characters are cleared and the Password Screen switches to the standby mode for password entry.

*1. Only HG3G supports.

- The Password Screen cannot be moved on the screen.
- Refer to Chapter 23 "7 Security Groups" on page 420 about "Administrator" and "Operator".

6 User Accounts

The security parameters can be changed. Select [Configuration] - [Protect] - [User Accounts].

6.1 General

Item	Description
Use Security functions	Select Enable or Disable. When “Disable” is selected, the security functions set up for the screens or parts will not become effective. Only 1 password is available.
No.	Indicates the user account No. Use this No. to switch user accounts with the device.
User Name, Password	Specify a user name and password. A user name can be specified with up to 8 letters (upper/lower-case), numbers, and symbols. A password can be specified with up to 15 letters (upper case only) and numbers.
Security Group	All the Security Groups specified for the user account are displayed. For details, refer to Chapter 23 “7 Security Groups” on page 420.
Default User	Specify the user account displayed when the power is turned on. When “None” is selected, no user accounts will be selected when the power is turned on. Screens and parts for which a Security Group is assigned cannot be displayed.

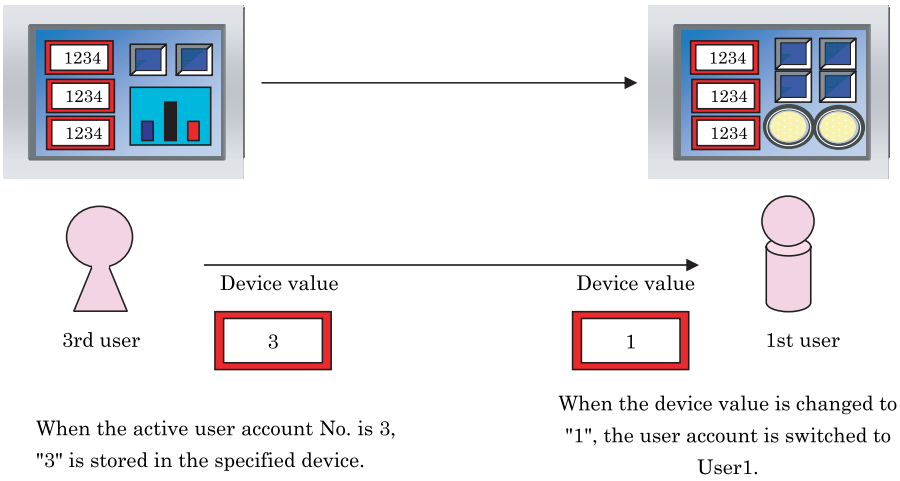
- Keep the password secure and be careful not to lose it.
- If you forget your password, contact our sales representative.

6.2 Option

Item	Description
Change User by Device	Switches the user account by considering the specified device value to be the user account No. (1 to 15). When the data is 0, the user account is switched to the default user. When an invalid value or an unregistered number is specified, the user account is not switched.
Back to Default User	When no operation is detected on the screen for a specified period, the user account is automatically switched back to the default user. When this option is set to “0” minutes, the screen will return to the previous screen immediately after switching the user accounts.
Status of Password Entry	The result of the operation on the Password Screen is stored in the device. When the ENT or CAN switch is pressed on the Password Screen, one of the following bits turns ON. A value of 0 is written in the device when the password input screen is opened, or any button in the password input screen is pressed. 0th bit: When the entered password is correct 1st bit: When the entered password is incorrect 2nd bit: When the password entry is canceled with the CAN switch.
Require a password automatically	Specify whether to automatically display the Password Screen when the user makes an attempt to open a Base Screen that cannot be operated with the current user account by using the Goto Screen Button or Goto Screen Command.

1. Change User by Device

The currently active user account No. is written to the specified device.
When this option is enabled, the currently active user account can be checked by referring to the device.
Moreover, since a different user account can be enabled by changing the device value, the user account can be easily switched from the host or other devices.



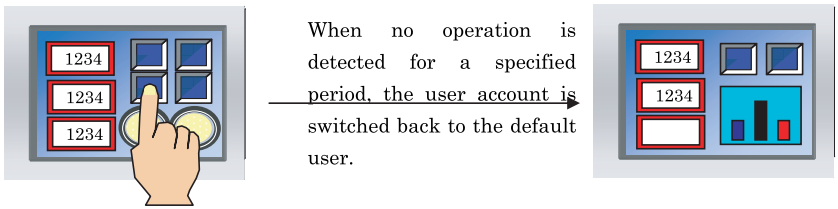
When the active user account No. is 3, "3" is stored in the specified device.

When the device value is changed to "1", the user account is switched to User1.

- When device value “0” is specified, the user account is switched to the default user.
- When any other invalid value for the user account No. is specified, the user account is not switched.

2. Back to Default User

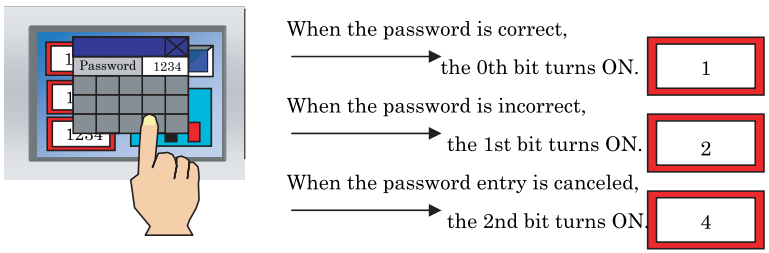
When a user account other than the default user is active and no operation is detected on the screen for a specified period, the user account is automatically switched back to the default user.



3. Monitor Status of password entry

When a password is entered on the Password Screen, the result such as verification passed/failed is stored in the device.

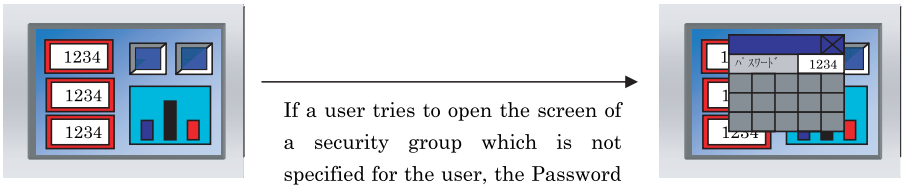
The device value is cleared to 0 when the Password Screen is opened or when any of the buttons on the Password Screen is pressed.



When the entered password is invalid, the characters that are being entered will be cleared and the screen enters the standby mode for password entry.

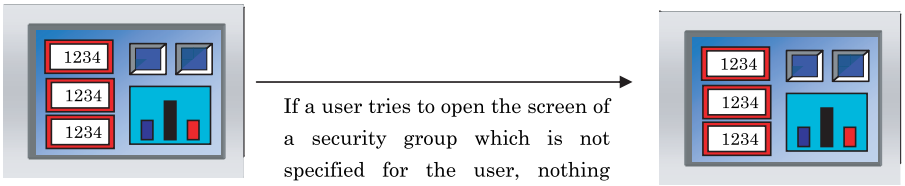
4. Require a password automatically

When “Require a password automatically” is selected



If a user tries to open the screen of a security group which is not specified for the user, the Password Screen opens automatically.

When “Require a password automatically” is not selected

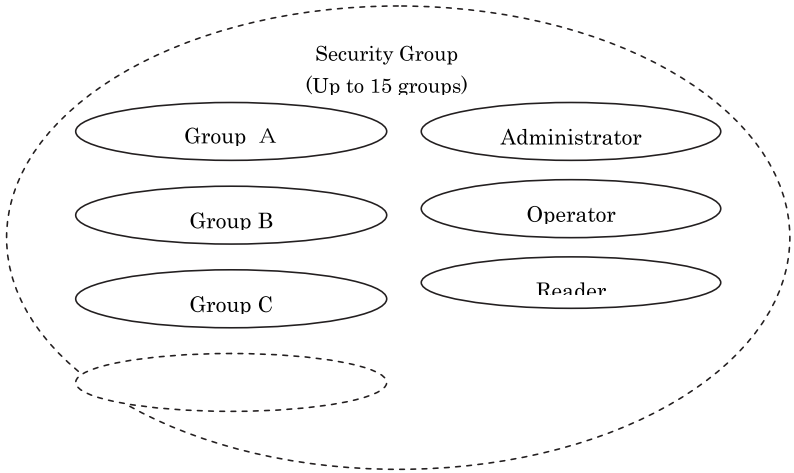


If a user tries to open the screen of a security group which is not specified for the user, nothing happens.

7 Security Groups

Up to 15 Security Groups can be used.

Up to 15 single-byte characters can be used for the name of a Security Group.



Security Group	Description
Administrator Operator Reader	Default Security Groups. Special operations such as creating and downloading projects can be performed by these Security Groups. These Security Groups cannot be assigned to two or more users. These Security Groups can be set up for parts and screens as is the case with a User-defined new group. These Security Groups cannot be cleared or renamed.
User-defined new group	New Security Groups created by the user.

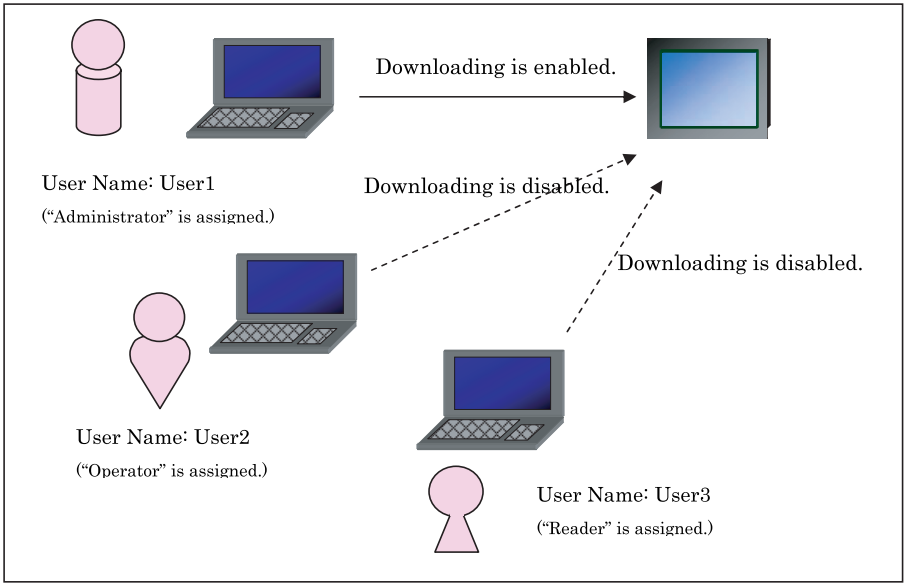
Default Security Groups

“Administrator”, “Operator”, and “Reader” are factory-installed Security Groups.

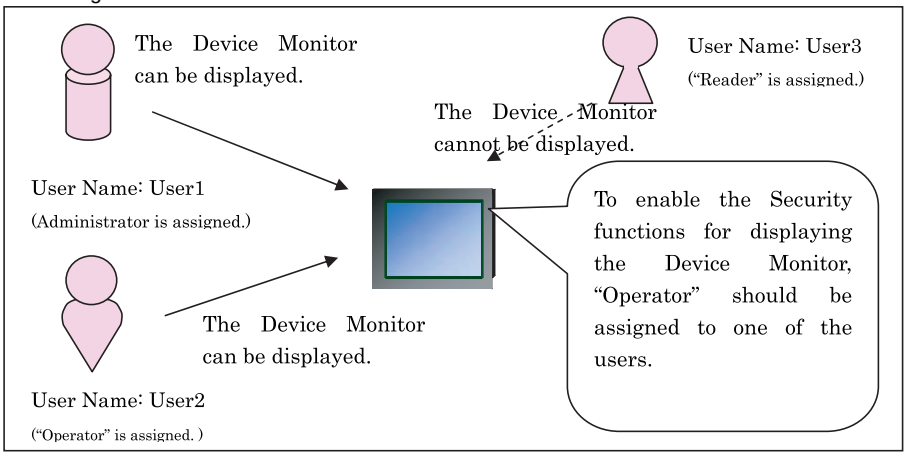
User accounts to which one of these Security Groups is assigned is allowed to perform the following special operations. Operations by users can be restricted by assigning each Security Group appropriately.

Security Group	Description
Administrator	“Administrator” is allowed to perform operations, such as creating or downloading projects, which stop the operation of the MICRO/I. Make sure to assign this group to one of the user accounts.
Operator	“Operator” is allowed to perform operations, such as changing or monitoring the device value, which affect the operation of the MICRO/I.
Reader	“Reader” is only allowed to read out data.

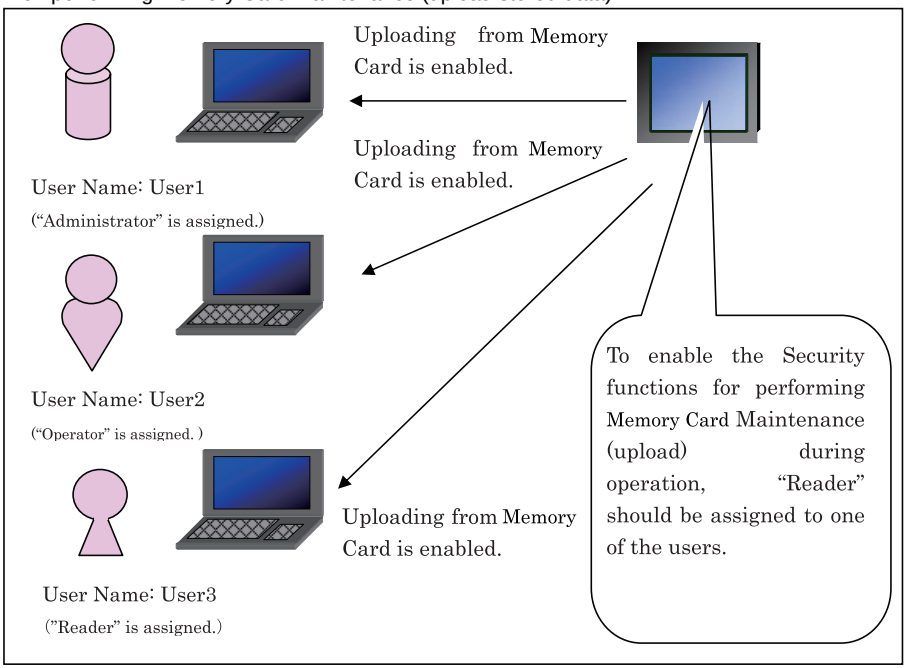
(Example) When downloading a Project:



(Example) When using the Device Monitor on the MICRO/I:



(Example) When performing Memory Card Maintenance (upload stored data):



The following table describes the Security Group required for enabling the Security functions for each operation, and the Security Groups authorized for the operation by providing the password.

(Example)

To enable the Security functions for displaying the Device Monitor, “Operator” should be assigned to one of the users. When you open the Device Monitor on MICRO/I, the password of “Administrator” or “Operator” is available in the password screen.

The password confirmation is never required even if “Administrator” or “Reader” is used in the project when “Operator” is not assigned to any users.

Software	Operation	Required Security Group settings	Authorized Security Group
WindO/I-NV2, Downloader	Opening, downloading, uploading, and clearing a project	Administrator	Administrator
	Memory Card Maintenance (Download Recipe Data, Clear, Format)	Administrator	Administrator
	Memory Card Maintenance (Download Recipe Data while running, Download Project Data)	Operator	Administrator, Operator
	Memory Card Maintenance (Upload the stored data)	Reader	Administrator, Operator, Reader
Downloader	Uploading a log data	Reader	Administrator, Operator, Reader
Runtime System	Change from the RUN Mode to the System Mode.	Administrator	Administrator
	Displaying the Device Monitor screen	Operator	Administrator, Operator
	Downloading and uploading a project.	Administrator	Administrator
	Downloading and uploading a PLC Program.*1	Administrator	Administrator
	Copying files from a USB flash drive to a memory card.*1	Operator	Administrator, Operator
	Copying files from a memory card to a USB flash drive.*1	Reader	Administrator, Operator, Reader
Web Server function	Reading a device using the Device Monitor page	Reader	Administrator, Operator, Reader
	Writing data to the HG internal device using the Device Monitor page	Operator	Administrator, Operator
Software which does not support the security function	WindO/I-NV2 (Ver.2.80 or earlier) Downloader (V1.00)	Administrator	Administrator

*1. Only HG3G supports.

Use the password of “Administrator” when accessing from Old version of WindO/I-NV2 or Downloader.

Chapter 24 Online Function

This chapter describes in detail on how to download and upload project data.

1 Downloading Project Data

This function transfers the data created on the WindO/I-NV2 to the MICRO/I.
Selecting the “Modified Data Only” or “Selected Files” option will transfer only a part of the screen data, which will save time. Note that the Project in the MICRO/I is overwritten when a project is downloaded.

Select [Home] - [Project] - [Download] - [Download] - [Project Data]command.

Setting Item		Description		
Connection Settings		The Connection Settings is applicable when downloading the project data to the MICRO/I.		
Download Data	All	Transfers all screen data.		
	Modified Data Only	Downloads files modified since the previous download. After failing the downloading, download the entire project with All again.		
	Selected Files	Downloads the selected files.		
	Options	Download Runtime system	Forcibly downloads the runtime software regardless of the version of it in the operator interface.	
		Download additional fonts	Download the selected fonts to the MICRO/I. · Japanese large font (First standard) · Japanese large font (Second standard) · Chinese · Taiwanese · Korean · European large font · Central European · Baltic · Cyrillic	
			Target font size (bite)	Displays the total number of bytes of the selected font.
			Downloadable project size (bite)	Displays the free space required in the MICRO/I.
		Target Font Information	Displays the installation status of additional fonts.	
Clear HG Keep Register (LKR) and HG Keep Relay (LK)		Used to select whether or not to clear the values of LK internal MICRO/I devices and LKR addresses when downloading project data. The values are cleared when the checkbox is selected. Note, the values are always cleared regardless of this setting if the Data Storage Area assignments are changed.		
Download Recipe Data to Memory Card		Downloads the Recipe data to the Memory Card inserted into the MICRO/I. Only the Recipe data for which the Recipe access destination is set to “Memory Card” in the Recipe Settings will be downloaded as a CSV file.		

WARNING

- If you change the selected font before downloading it, only the selected font is downloaded. The previous downloaded optional fonts will be cleared from the operator interface.
- If you download without selecting all fonts, the previous downloaded optional fonts will be cleared from the operator. Refer to Chapter 37 “1.2 Installed Fonts in the MICRO/I” on page 569 for the available basic fonts and extended fonts.
- If the download fails and communication is not possible, switch the MICRO/I off and on again, and try to download again.
- Do not select the “Download Runtime system forcibly?” checkbox unless required.
- Do not turn off the power of the MICRO/I during downloading. If the power is cut during downloading, there is some possibility that you cannot access to them via Ethernet or O/I link.
- Only HG2G/3G supports the “Clear HG Keep Register (LKR) and HG Keep Relay (LK)” setting. The values are always cleared when the project data is downloaded to an HG1F/2F/2S/3F/4F.
- Models with a memory card support the “Download Recipe Data to Memory Card” setting.

2 Uploading Project Data

Use the following procedure to upload a project data from the MICRO/I or Memory card to the personal computer.
Specify a drive and folder to save the uploaded project in.

Select [Home] - [Project] - [Upload] - [Upload] - [Project Data] command.

Setting Item		Description
Project Name		Displays the name of the project to be uploaded.
Comment		Displays the comment for the project to be uploaded.
O/I Type		Displays the type of the connected MICRO/I.
Modified		Displays the date and time at which the project to be uploaded was last edited using the WindO/I-NV2.
Path		Specify the location for storing the uploaded project.
Upload with data in Memory Card	Recipe data	Uploads the Project data with the Recipe data saved in the Memory Card. The uploaded recipe data will overwrite the recipe data in the uploaded Project data.
	Picture data	Uploads the Project data with the picture data saved in the Memory Card.
	Sound data*1	Uploads the Project data with the sound data saved in the Memory Card.

*1. Only HG3G supports.

WARNING

- Models with a memory card support the “Download Recipe Data to Memory Card” setting and “Upload data in Memory Card” setting.
- The “Upload with Picture data in Memory Card“ setting can only be used with system software version 2.20 or later.

3 Clear

Use the following procedure to clear the data in the MICRO/I.

Select [Online] - [Touch Screen] command.
Select a function in the following table

Setting Item		Description
Clear	All	Clear the project data, the stored data of Alarm Log, Data Log and Operation Log, HG Keep Register and HG Keep Relay.
	Alarm Log Data	Clear the stored data of Alarm Log.
	Data Log Data	Clear the stored data of Data Log.
	Operation Log Data	Clear the stored data of Operation Log.
	HG Keep Register (LKR) and HG Keep Relay (LK)*1	Clear the data of HG Keep Register (LKR) and HG Keep Relay (LK).
	Stored Data in Memory Card	After MICRO/I stops operation, clears all the data stored in the ”access folder” in the Memory Card (inserted in the MICRO/I). The following data will be cleared. (Alarm Log Data, Data Log Data, Operation Log Data, Recipe data, Screenshot data, Project data, PLC Program)
Format		After stopping the RUN operation of MICRO/I, formats the Memory Card.

*1. Only HG2G/3G support.

- Models with a memory card support the “Stored Data in Memory Card.

4 Target Information

Display the runtime version and the downloaded project data.

Click Target Font Information to check the optional fonts installed in the operator interface. Click [Memory Card Information] to check the status of the Memory Card inserted in the MICRO/I.

Select [Home] - [Project] - [Target Info.] command.

Item	Description	
Target Runtime Information	O/I Type	Displays the type number of the connected MICRO/I.
	Runtime Version	Displays the version of the runtime system software in the connected MICRO/I.
	Memory Space (byte)	Displays the maximum number of bytes of the downloadable project.
Target Project Information	Project Name	Displays the name of the project in the connected MICRO/I.
	Modified Date	Displays the last update date and time of the project in the connected MICRO/I.
	Project Version	Displays the version of WindO/I-NV2 with which the project in the connected MICRO/I was created.
	PLC Manufacturer	Displays the manufacturer of the PLC that is set up for the project in the connected MICRO/I.
	Protocol	Displays the host I/F driver that is set up for the project in the connected MICRO/I.
	Driver Version	Displays the version of the host I/F driver in the connected MICRO/I.
Opened Project Information	Project Name	Displays the name of the project currently opened on the WindO/I-NV2.
	Modified Date	Displays the last update date and time of the project.
	Version No.	Displays the version of WindO/I-NV2 with which the project was created.

You can view the content of the current project and project data downloaded to the MICRO/I at the same time.

Target Font Information

Item	Description
Japanese large font (First standard)	Displays whether or not the font is installed on the MICRO/I.
Japanese large font (Second standard)	Displays whether or not the font is installed on the MICRO/I.
Chinese	Displays whether or not the font is installed on the MICRO/I.
Taiwanese	Displays whether or not the font is installed on the MICRO/I.
Korean	Displays whether or not the font is installed on the MICRO/I.
European large font	Displays whether or not the font is installed on the MICRO/I.
Central European	Displays whether or not the font is installed on the MICRO/I.
Baltic	Displays whether or not the font is installed on the MICRO/I.
Cyrillic	Displays whether or not the font is installed on the MICRO/I.

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X		X		X	X

Only HG3G, HG2F/3F/4F support this function

Target Memory Card Information

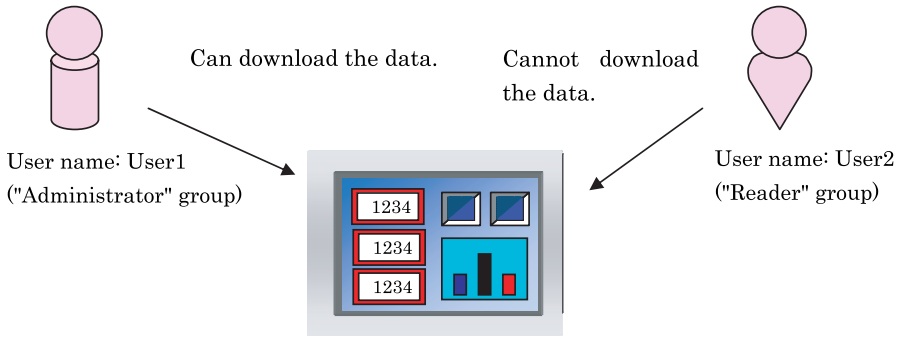
Item	Description
Status	Displays the status of the Memory Card inserted in the MICRO/I.
Memory Capacity (Byte)	Displays the total capacity of the Memory Card.
Free Space (Byte)	Displays the available free space on the Memory Card.
Used Space (Byte)	Displays the used capacity of the Memory Card.

5 Security Function

The security function of the WindO/I-NV2 allows you to restrict users from performing certain maintenance work.

Special Security Groups that are available by default can be assigned to respective users in order to allow only specified users to download data or perform maintenance of the Memory Card.

The security function can be set from the [Configuration] - [Protect] - [User Accounts] in the WindO/I-NV2 menu.



For details of the security function, refer to Chapter 23 “Security Function” on page 407.

Chapter 25 Debug Function

This chapter explains various debug features available for testing the operation of created projects.

1 Overview

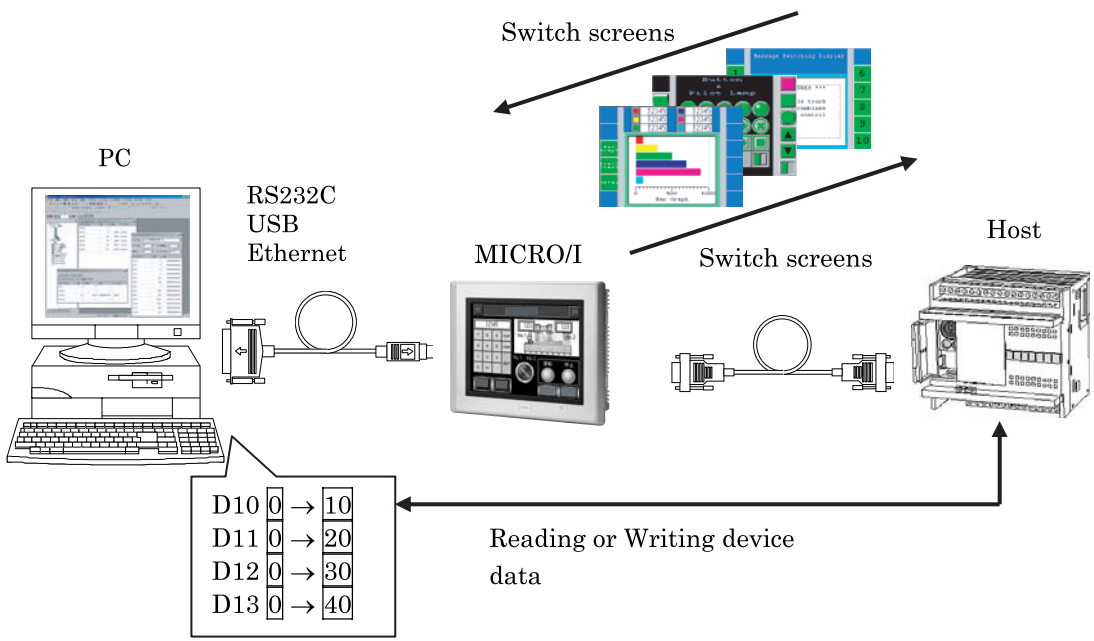
The debug feature on the MICRO/I allows you to monitor and change values in the internal devices and the host device. You can use either WindO/I-NV2 or the device monitor to debug the project on the MICRO/I. Using WindO/I-NV2 allows you to view the device values in various formats, change screens, and edit as you debug. Note, debugging of the O/I link slave can only be done on the HG2G. Using the device monitor allows you to check any device value on the MICRO/I without connecting to a PC for debugging without stopping operation.

2 Debugging using the WindO/I-NV2

It is possible to download your created project to the MICRO/I and edit the data while checking the actual operation of your program. The monitor has four modes: 1) a screen monitor that automatically shows the devices used in the screen displayed on MICRO/I; 2) a custom monitor for registering and displaying arbitrary devices; 3) a batch monitor for monitoring a user-specified group of devices beginning at a user-specified address; and 4) a connected device monitor that displays the communication status with the host device. During monitor mode, moving the mouse closer to a device or operating condition on the [View] - [Workspace] - [Object List] tab or, over a device in a script opened in Script Editor displays the current value in a popup window, and the color of objects on the [View] - [Workspace] - [Object List] changes when their trigger conditions are met. WindO/I-NV2 can also be used to change MICRO/I screens to continue checking other screens.

When you start debug, the operator interface switches to Monitor mode, “Monitor mode” is displayed on the lower left of the screen, and the monitor toolbar appears on the WindO/I-NV2 software.

To implement changes made during debugging, you must execute a download.



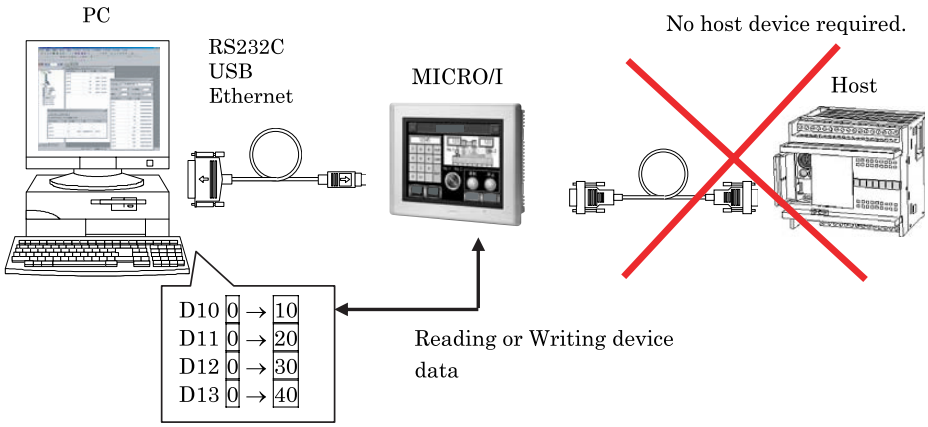
The following menus are available for performing debug operations. These are in [Online] - [Monitors] - [Start Monitor/ Stop Monitor] menu on the WindO/I-NV2.

Setting Item		Outline
Start Monitor		Starts monitoring.
Stop Monitor		Stop monitoring.
Start/Stop Simulation		Switches the mode of the operator interface being debugged from Monitor mode to Simulation Mode. In Simulation Mode, it is possible to debug without being connected to a host unit. Refer to “2.1 Simulation” (P.437) in this chapter.
Go to Screen	(First Screen, Previous Screen, Specified Screen, Next Screen, Last Screen)	It is possible to switch the screen displayed on the operator interface with the WindO/I-NV2 software. Refer to “2.2 Switching screens” (P.437) in this chapter.
Monitor Object list		On the Object list, display the device value in a popup window and change the display color when the Trigger Condition of the object is satisfied.
Back		Returns to the Base Screen that was displayed immediately before the screen was switched.
Forward		Advances to the Base Screen that was displayed immediately before the Back menu was used to switch screens.
These windows are used to make changes and confirm values during debugging.		
Screen Monitor		Displays or hides the Screen Monitor window. This window automatically displays the devices used in the screens displayed on the operator interface. Refer to “2.5 Screen Monitor” (P.439) in this chapter.
Custom Monitor		Displays or hides the Custom Monitor window. Use this window to register the devices that you want to monitor. Refer to “2.6 Custom Monitor” (P.440) in this chapter.
Batch Monitor		Displays or hides the Batch Monitor window. This window is used to lump register the start addresses and number of addresses to monitor. Refer to “2.7 Batch Monitor” (P.441) in this chapter.
Host Monitor		Displays or hides the Batch Monitor window. This window displays the communication status with the host devices connected to the operator interface. Refer to “2.8 Host Monitor” (P.441) in this chapter.
Open Monitoring Screens		Open the screens displayed on the MICRO/I.

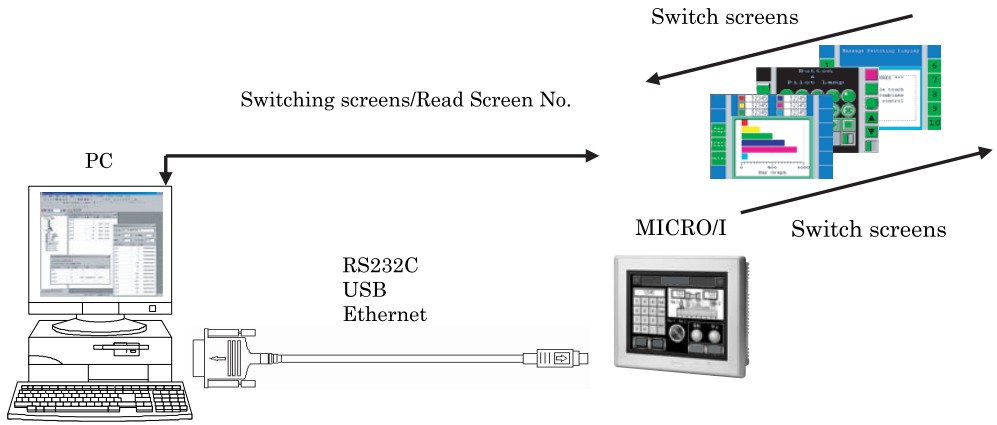
When the data type is BIN32, BCD8, or float32, two words address are used. If the word address selected is the last of the address range, then you will see a repeat value in the last address. The repeat value is coming from the other word address.

2.1 Simulation

When [Start Simulation/Stop Simulation] is selected from the setting parameters, the mode of the O/I is switched from the Monitor mode to Simulation Mode. The Simulation Mode enables debugging while the host device is not connected.



2.2 Switching screens

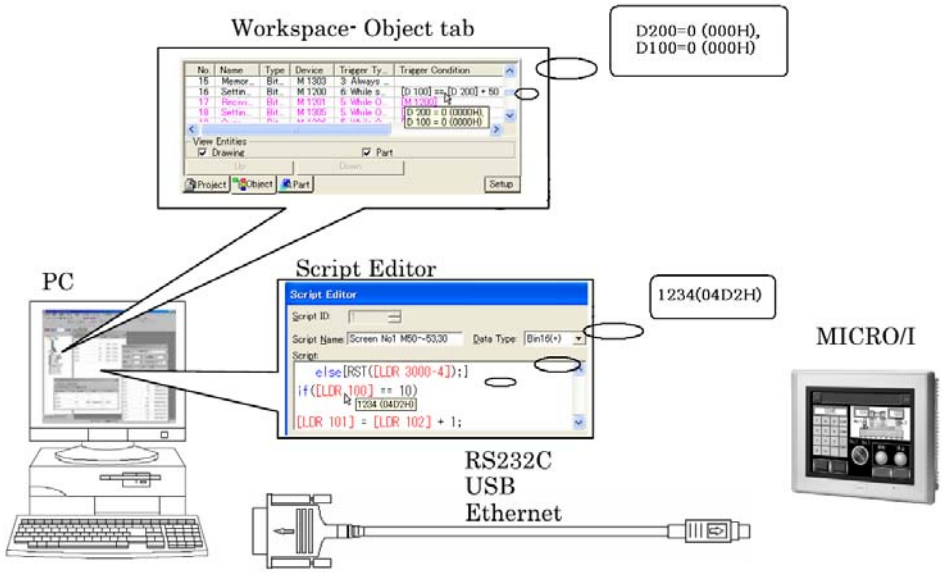


Select [Online] - [Monitors] - [Start Monitor/Stop Monitor] commands, and then selects an item from the submenu.

Item		Outline
Go to Screen	First Screen	Switches to the Base Screen with the smallest number created in the project.
	Previous Screen	Switches to the screen with the number that is one lower than the currently displayed Base Screen. If the screen numbers are not contiguous, it switches to the closest number.
	Specified Screen	Switches to the Base Screen with the specified number.
	Next Screen	Switches to the screen with the number that is one higher than the currently displayed Base Screen. If the screen numbers are not contiguous, it switches to the closest number.
	Last Screen	Switches to the Base Screen with the largest number created in the project.
Back		Returns to the Base Screen that was displayed immediately before the screen was switched.
Forward		Advances to the Base Screen that was displayed immediately before the [Back] command was used to switch screens.

2.3 Display the device value in a popup window

Moving the mouse pointer closer to a device on the [View] - [Workspace] - [Object List] tab or Script Editor will display the device value in decimal and hexadecimal notations in a popup window.

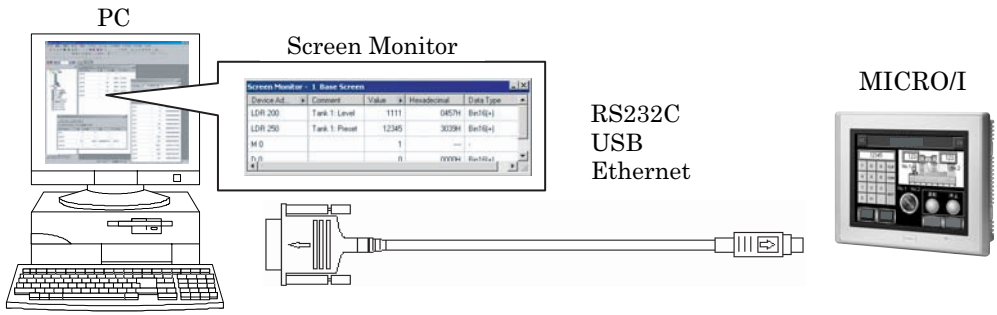


2.4 Highlight objects while satisfying the condition

When the Trigger Condition is satisfied, the display color of the object on the [View] - [Workspace] - [Object List] tab is changed.

2.5 Screen Monitor

Screen Monitor is used to make changes and confirm values during debugging. This window automatically displays the devices used in the screens displayed on the operator interface.



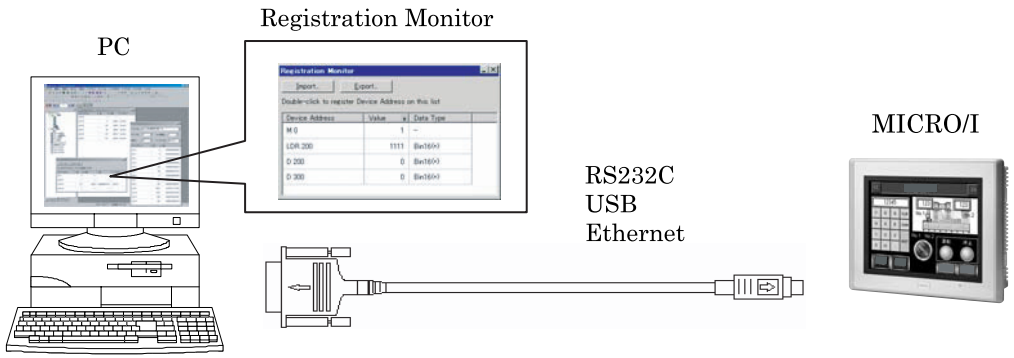
Select [Online] - [Monitors] - [Screen] command.

Item	Outline
Device Address	Displays the device addresses of the devices used in the screen displayed on the operator interface. Comment: Toggles the display of the comment registered in the Device Manager on and off.
Value	Displays the current value of the device displayed in the Device Address. To change the value, click the value cell to select it, and click again to display a cursor and spinbox. Use the spinbox setting or direct input to change the value. The value can be displayed with the decimal, hexiadecimal and binary system. (The value range depends on the Data Type)
Data Type	Select the data type of the display value. (BIN16 (+) BIN16 (+/-) BIN32 (+) BIN32 (+/-) BCD4 BCD8 float32)

When the data type is BIN32, BCD8, or float32, two word addresses are used. If the word address selected is the last of the address range, then you will see a repeat value in the last address. The repeat value is coming from the other word address.

2.6 Custom Monitor

Custom Monitor is used to make changes and confirm values during debugging. Use this window to register the devices that you want to monitor.



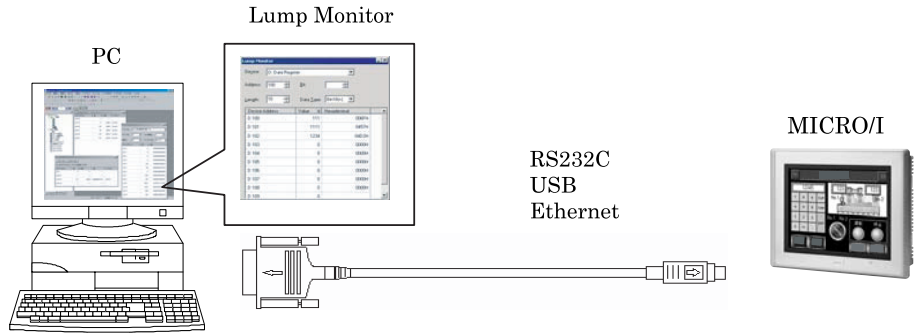
Select [Online] - [Monitors] - [Custom] command.

Item	Outline
Device Address	Registers the devices to monitor. (Depends on the Host I/F Driver)
Value	Displays the current value of the device displayed in the Device Address. To change the value, click the value cell to select it, and click again to display a cursor and spinbox. Use the spinbox setting or direct input to change the value. The value can be displayed with the decimal, hexiadecimal and binary system. (The value range depends on the Data Type)
Data Type	Select the data type of the display value. Click the data type cell to select, and click again to display a dropdown list. Select and change the target data type from the list. (BIN16 (+) BIN16 (+/-) BIN32 (+) BIN32 (+/-) BCD4 BCD8 float32)

When the data type is BIN32, BCD8, or float32, two word addresses are used. If the word address selected is the last of the address range, then you will see a repeat value in the last address. The repeat value is coming from the other word address.

2.7 Batch Monitor

Batch Monitor is used to make changes and confirm values during debugging. This window is used to lump register the start addresses and number of addresses to monitor.



Select [Online] - [Monitors] - [Batch] command.

Item	Outline
Device Type	Select the devices to monitor. (Depends on the Host I/F)
Address	Input the start address of the devices to monitor. (Depends on the selected device)
Bit	Input the bit position if you select a word device. Leave this blank in the case of other devices. (0 to 15)
Length	Input the number of devices to display in the list. (Bit device and word device bit specification: 1 to 16Other than above: 1 to 1000)
Data Type	Select the data type of the display value. (BIN16 (+) BIN16 (+/-) BIN32 (+) BIN32 (+/-) BCD4 BCD8 float32)
Device Address	The address of the devices specified in [Device] is displayed with the start address specified in [Address] and [Bit] and the number of address specified in [Length]. (Depends on [Device], [Address], [Bit position] and [Length]
Value	Displays the current value of the device displayed in the Device Address. To change the value, click the value cell to select it, and click again to display a cursor and spinbox. Use the spinbox setting or direct input to change the value. The value can be displayed with the decimal, hexiadecimal and binary system. (The value range depends on the Data Type)

When the data type is BIN32, BCD8, or float32, two word addresses are used. If the word address selected is the last of the address range, then you will see a repeat value in the last address. The repeat value is coming from the other word address.

2.8 Host Monitor

Host Monitor is used to change the connection status of the host device to be connected for performing 1:N communication. The host device of the disabled port number operates similarly to the Simulation.

Select [Online] - [Monitors] - [Hosts] command.

Item	Outline
(Connection Status)	Toggles between “Connect” and “Disconnect”. MICRO/I does not communicate with the devices set to “Disconnect”.
Station No.	Displays all port numbers of the host devices used with the project.

3 Device Monitor

By registering devices in either Run Mode or Simulation Mode, both data monitoring and data entry can be conducted. Registered devices will remain sorted and displayed on the monitor until the monitor screen is closed and its power turned off or switched to a different mode.

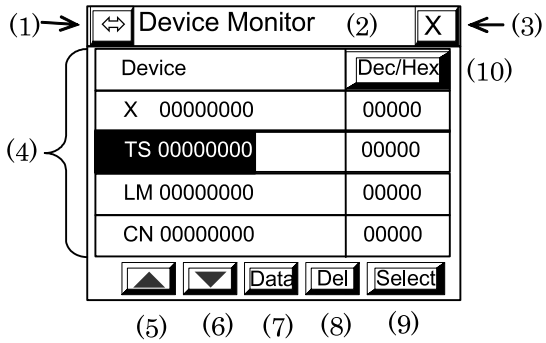
The Device Monitor screens shown in later sections are sample screens using the HG2G/3G, HG1F/2F/2S/3F/4F. The layout is different with the HG1F.

- Available PLC device range depends on PLC types and settings. Selecting unavailable device, “Host Communication error” happens and it can not be back in without reboot. Please be aware of device range.
- Display is conducted using a Popup Screen, so when there are three displays (two displays when a Popup Screen is selected for the alarm Log function) on the Popup Screen, this function cannot be used.
- Even when the display is installed vertically, the Device Monitor screen is displayed in the same way as with the horizontal installation.

- Refer to Chapter 1 “2 Operating Modes” on page 7 for details regarding Simulation Mode.
- The number of devices that can be registered is limited to 64 units.

3.1 Device Value Display

Selecting 'Device Monitor' from the maintenance screen will display the following screen.



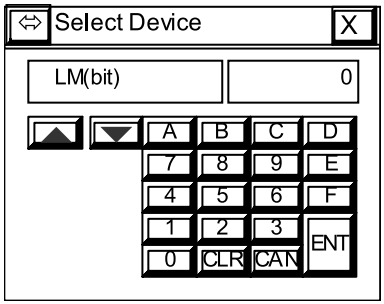
Using this screen, changes in the values of registered devices can be monitored as they occur.

(1)	Pressing the movement button (top left) to move the Device Monitor
(2)	Displays the title.
(3)	Press the close button to close the currently displayed device monitor.
(4)	Displays currently registered devices and their data. When PLC I/F driver supporting 1:N Communication is selected, the PLC No will be displayed in front of device's addresses. (Ex. D 01:00001234)
(5)	Use the cursor buttons to select a device. If there are more than five devices, you can
(6)	Also use the cursor buttons to scroll.
(7)	Pressing the Data button allows the alteration of the currently selected device's data. Data
(8)	Pressing the Remove button will clear the currently selected device.
(9)	Pressing the Select button will allow a device to be registered to the monitor screen.
(10)	Pressing the Dec/Hex button will switch between the decimal form and the hexadecimal form.

3.2 Device Registration

Devices can be registered using the following operation.

1. Press the Select button to display the select device screen.



2. Use the up/down cursor buttons to select the device to be registered.

3. Use the keypad displayed on the screen to input the desired device's address then press the ENT button. The device will be set and return to the device monitor screen.

Press the CLR button to reset the address to 0.

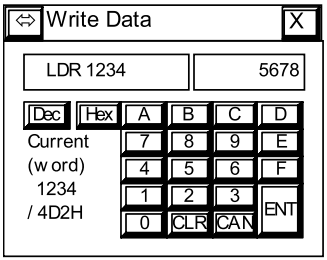
Press the CAN button to cancel device setting and return to the device monitor screen.

- If you enter an invalid device address, pressing ENT will not return you to the monitor screen.
- The next address of the device you previously entered is automatically displayed in the select device screen. Just press the ENT If you want to register the next address.
- When PLC I/F driver supporting 1:N Communication is selected, the : button will be displayed. After you enter PLC No. with 2 digits, press the : button to register the PLC No. and then input device's address.

3.3 Entering the Device Value

Use the following procedure to change the value in a device.

1. **Press the** Data button to display the Write Data screen.



2. **Use the keypad displayed to enter a value and then press the** ENT button to change the value.

   Press the CLR button to reset the input value to 0. Press the CAN button to cancel the operation and return to the device monitor screen. Press the Dec button to switch to decimal input mode. Press the Hex button to switch to hexadecimal input mode.

In decimal input mode, the A through F buttons on the keypad are disabled.

Chapter 26 Pass-Through Function

1 OverviewPass-Through

The Pass-Through function enables the MICRO/I to relay communications between the programming software on the PC and the PLC. Therefore, connecting to the PC can perform communication with both of the MICRO/I and PLC.

1.1 Features of the Pass-Through Function

- Communication with both of the MICRO/I and PLC can be performed by simply connecting the PC to the MICRO/I using a maintenance cable. It is not required to replace the cable connected to the PLC.
- Communication between the programming software on the PC and PLC can be performed without interrupting the operations of the MICRO/I.

1.2 Operating Conditions for the Pass-Through Function

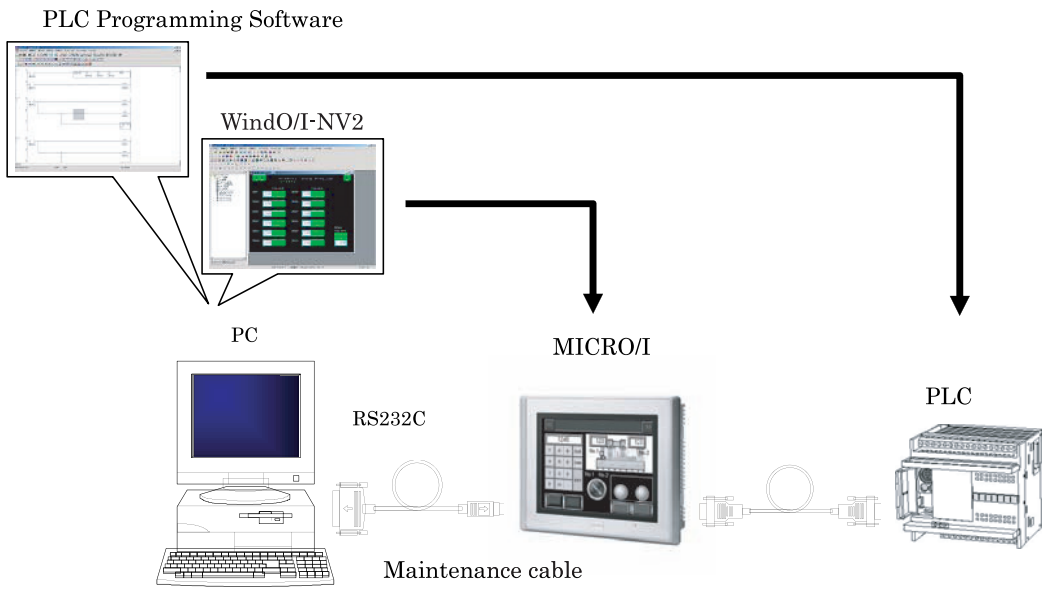
The Pass-Through function operates under the following conditions:

- The MICRO/I is in the Run Mode or Monitor mode.
- A host I/F driver that supports the Pass-Through operation.
- [Project Settings] - [Host I/F Driver] - [Enable Pass-Through] is selected.

WARNING

- Use the Pass-Through Tool with the HG2G/3G series if you have the following:
  - A compertitor's PLC.

  Or
  - Currently using WindLDR Ver. 5.0* - 6.0*.



2 Correspondence modelPass-Through

2.1 MICRO/I

The Pass-Through function can only be used with the following communication interfaces.

MiCRO/I Type	Serial Interface	Ethernet Interface	USB Interface
HG2G	Supported	Supported	Not supported
HG3G	Not supported	Supported	Supported
HG1F	Supported	Not supported	Not supported
HG2F (Serial Interface 2: RS-232C Type)	Supported	Not Supported	Not supported
HG2F (Serial Interface 2: USB Type)	Not supported	Not supported	Not supported
HG2S	Supported	Not supported	Not supported
HG3F	Supported	Supported	Not supported
HG4F	Supported	Supported	Not supported

2.2 PLC

The Pass-Through function is available for the following PLC models.

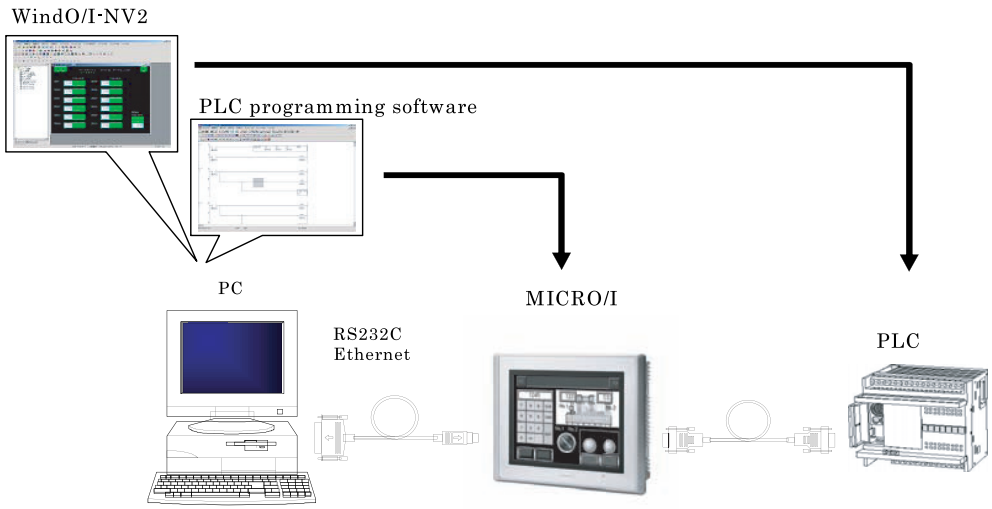
Manufacturer	Series Name	System (CPU unit)	Host I/F Driver
IDEC	MICRO3	Micro3	MICRO3 / MICRO3C
	MICRO3C	Micro3C	
	OpenNet Controller	FC3A	OpenNet (FC3A), MicroSmart (FC4A/FC5A)*1
	MicroSmart	FC4A	
	MicroSmart Pentra	FC5A*2	
Mitsubishi*3	FX Series	FX0, FX0N, FX1, FX2, FX2C, FX1S	MELSEC-FX (CPU)
		FX2N, FX2NC, FX1N, FX1NC	MELSEC-FX2N (CPU)
		FX3U, FX3UC	MELSEC-FX3UC (CPU)
	QCPU	Q02CPU, Q02HCPU	MELSEC-Q (CPU)

*1. Use WindLDR Ver.5.00 or higher when you use the Ethernet Pass-Through functon.
*2. User programs cannot be downloaded and uploaded through FC5A-SIF2 with Pass-Through Function.
*3. We tested by GX Developer Version 8

WindO/I-NV2 updates are available from the IDEC web site. Visit www.idec.com for the latest information and updates.

3 Enable Pass-Through

To use the Pass-Through function, use a Host I/F Driver that supports the Pass-Through function, and select the “Enable Pass-Through” checkbox on [Configuration] - [System Setup] - [Project] - [Host I/F Driver on the WindO/I-NV2.



3.1 Settings Pass-Through

The settings for the Pass-Through function can be changed from the WindO/I-NV2 or System Menu of the MICRO/I.
Use a host I/F driver that supports the Pass-Through operation and follow the procedure below.

- Enabling the Pass-Through Function from the WindO/I-NV2

  Select [Configuration] - [System Setup] - [Project] - [Host I/F Driver, and select the “Use the Pass-Through function” checkbox to enable the Pass-Through function.

- Enabling the Pass-Through Function from the MICRO/I System Menu

  Select [Initial Setting] - [Host I/F Driver] - [Pass-Through Setting], and select “Enable” for the “Pass-Through Setting” setting to enable the Pass-Through function.

3.2 The Pass-Through Preference Function

When transferring data from a PC to PLC using the Pass-Through function, the data transmission speed of the PC and PLC is lower, because the transmission is performed simultaneously with the PLC-link communication of the MICRO/I.

In such a case, setting as follows will improve the data transmission speed from the PC, In that case, MICRO/I prioritizes the sent and received data from the PC, an error message “Host Communication Error” may appear on the MICRO/I because the MICRO/I is out of PLC-link communication with PLC for the meantime.

HG2G/3G:	Host Communication is stopped by Pass-Through Tool.
HG1F/2F/2S/3F/4F:	The HG Special Relay LSM50 to ON position.

3.3 Restrictions and Precautions

3.3.1 When using all models

- Using the Pass-Through function will lower the baud rate of the PLC-link communication with the PLC.
- The Pass-Through function operates only in the “Run Mode” or “Monitor mode”. The function will not operate in the “System Mode” or “Simulation Mode”.
- When using Ver2.60 or earlier of WindO/I-NV2, change the mode to “System Mode” before using the Pass-Through function.
- Can not communicate with MICRO/I via Ethernet when use Pass-Through via serial port.
- Do not use communication with WindO/I-NV2 and Programming software at the same time.
- The Pass-Through function confirms the operation for Download/Upload User Program and Monitor on PLC Programming software. Other functions are not confirmed.

3.3.2 When using HG2G/3G

- If you need to use the Pass-Through function and currently using WindLDR Ver.5.0* - Ver.6.0* or competitor’s PLC programming software, then you must use the Pass-Through Tool. For more information,see the Pass-Through Tool mamual.
- If the communication via Pass-Through fails, change the settings such as Baud Rate, Timeout, Transfer Mode etc on PLC Programming software.

  In case of WindLDR, set as follows.

Transfer Mode:	ASCII
Baud Rate:	9600
Timeout:	5000

- When Host Communication was stopped by Pass-Through Tool, the Host Communication Error on HG2G/3G is not recovered unless starting by Pass-Through Tool or resetting HG2G/3G.

3.3.3 When using HG1F/2F/2S/3F/4F

- If the checkbox is selected for Enable Pass-Through Function, then other functions on Serial Interface 2 are disabled.
- When connect FX series with Pass-Through function, set up the baud rate as 9600bps in programming software.
- When connect MELSEC-QCPU with Pass-Through function, set up the baud rate of programming software to same baud rate as the communication between MICRO/I and PLC.
- Pass-Through via Ethernet is available to only FC3A/4A/5A. But Pass-Through function is not available if using Web Server Module (FC4A-SX5ES1).
- Set the following settings in “Communication Setting” dialog box when you communicate between WindLDR and PLC via Ethernet.
  - Port Number: 2101
  - The Maximum data size: 1
  - Time delay between packets: 100 and over

  (Increase “Time delay between packets” setting value if the communication speed between MICRO/I and PLC is lower than 9600 bps.)

Chapter 27 Maintenance

This chapter describes the Web Server functions that are available during maintenance procedures.

1 Web Server Function

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
					X	X

Only HG3F/4F support this function

1.1 Overview

The Web Server function allows you to remotely perform maintenance of the HG3F/4F using a PC or PDA with the Web Browser (Internet Explorer, Netscape, etc.). To use this function, System setup requires the TCP/IP setting only.

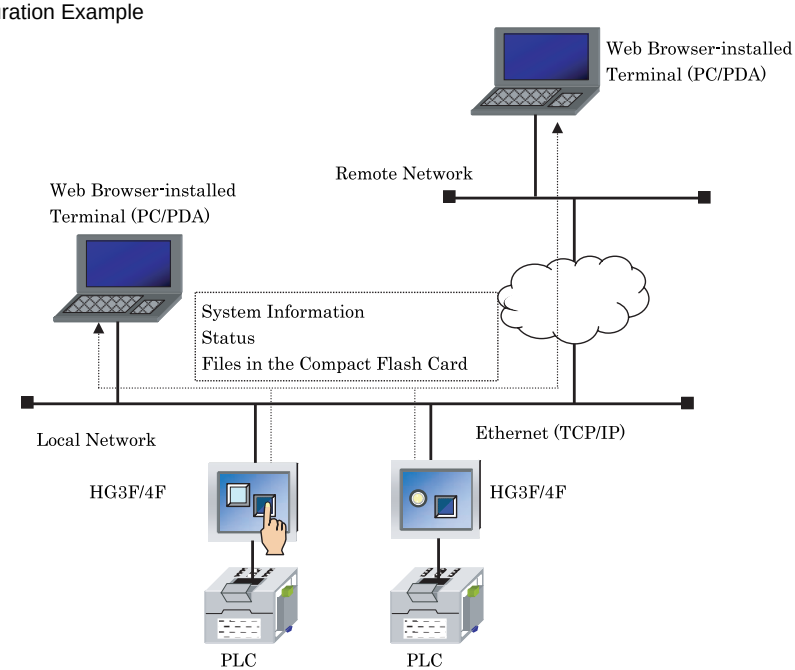
- Monitoring the status of MICRO/I
- Displaying the Alarm Log Data
- Displaying the Data Log Data
- Access to the CF Card
- Device Monitor

1.2 System Configuration

A system configuration example using the web server function is shown below.

The web server function can be operated by setting the TCP/IP on the HG3F/4F operator interface and connecting the operator interface to the TCP/IP network. The interface can be monitored, and the compact flash card can be accessed by using the web Browser terminal.

System Configuration Example



If the local network is connected to the external network, the HG3F/4F operator interface can be accessed from a remote location by properly setting the gateway and router of the local network. Contact the network administrator for the settings.

1.3 Operating Environment

For the best performance of the web server function, use of a web Browser with the following functions is recommended. A web Browser without these functions can be used; however, automatic update and image display may not function properly.

- Style sheet
- Java Script
- Frame
- Table
- Refresh tag
- BMP image

Recommended browsers:

- Internet Explorer 4.0 or higher
- Netscape Navigator 6.1 or higher
- Pocket Internet Explorer 4 or higher

1.4 Default Settings

1.4.1 Installation

Connect the Ethernet connector of the HG3F/4F operator interface to the TCP/IP network.

1.4.2 Settings

The following settings are required to use the web server function.

- TCP/IP of HG3F/4F operator interface
- User Accounts for HG3F/4F

For TCP/IP setting, refer to Chapter 33 “1.1 TCP/IP Settings” on page 530.

1.4.3 Connection

Access the following URL using the web Browser terminal.

URL: http://(IP address of HG3F/4F)/

When the connection starts, you are requested to enter the user name and password. Type the user ID and password which have been set for [Configuration] - [Protect] - [Security] in the WindO/I-NV2 menu. Enter the data for a user for which one of the “Administrator”, “Operator”, and “Reader” Security Groups has been specified.

User ID:	The user name specified with the WindO/I-NV2. The default is “User”.
Password:	The password specified with the WindO/I-NV2 with a length between 4 and 15 alphanumeric characters. When the password has not been specified, leave this field empty. The default is empty.

User ID and password are required when starting the connection to the HG3F/4F operator interface, and when the operator interface has not been accessed for five minutes.

Some web Browser remember the user ID and password entered at the beginning of session, and processes the ID/password requirement automatically.

One or more web Browser terminals can access an HG3F/4F operator interface at the same time. One HG3F/4F operator interface can accommodate up to 10 connections with the web Browser (s).

1.5 Web Page Configuration

The site map of the HG3F/4F operator interface web page is shown on the right. The top page http://(IP address of HG3F/4F)/ links to multiple pages as shown.

Chapter27 1.6,“Monitoring” (on page 458) explains “Top Page”, “System Detailed Information” and “Screen Capture”.

Chapter27 1.7,“Data Display” (on page 463) explains “Alarm Log Data” and “Logging Data.”

Chapter27 1.8.3,“CF (Compact Flash) Card Error Page” (on page 470) explains “CF Card.”

Chapter27 1.9,“Device Monitor” (on page 471) explains “Device Monitor.”

Each page is displayed in English or Japanese. The language displayed is depended on the setting of the Web Browser.

When Japanese is selected as the first preference with the encoding setting of the Web Browser, the page is displayed in Japanese. Otherwise, the page is displayed in English.

When using a frame version browser, all pages are displayed in two frames on the right and left. Click on the menus in the left frame to access the required page, which will be shown in the right frame.

All pages shown in the right frame have “Maximize,” “Menu,” and “Home” links. Click “Maximize” to invalidate the frame function to see the required page on the whole screen. This is useful when the user uses a web browser terminal with a small screen.

Click “Menu” to display the menu page on the non-frame screen.

Click “Home” to return to Top Page. Clicking the link also revalidates the frames on the screen.

Sitemap

- Top Page
  http://(IP address of HG3F/4F)/
  - System Detailed Information
    detail.html
  - System Detailed Information
    - SVGA
      status_svga.html
    - VGA
      status_vga.html
    - QVGA
      status_qvga.html
  - Alarm Log Data Request Form
    alarm.html
    - Alarm Log Data
      history_alarm.html
  - Logging Data Request Form
    logging.html
    - Logging Data
      history_log.html
  - CF Card
    cf.html
    - File List
      CF/[CF Card Access Folder Name]
      /FILELIST.HTM
      - Files in CF Card
  - Device Request Form
    device.html
    - Device Monitor
      device.cgi
      - Internal Device Write Page
        wr_dev.cgi

1.6 Monitoring

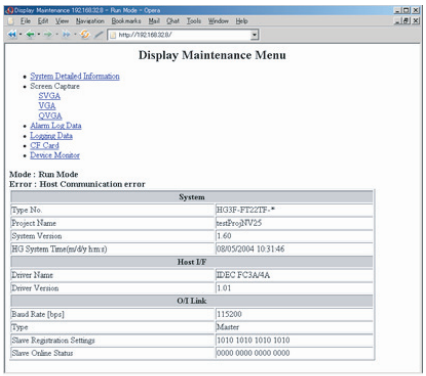
Using the web server function, the status of HG3F/4F operator interface can be monitored remotely from a web Browser terminal. The following information can be monitored.

- Mode
- Error
- Project
- Host Interface Settings
- O/I Link Settings

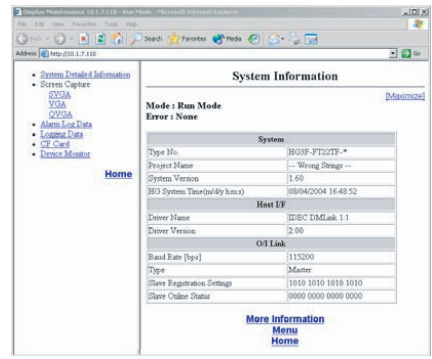
1.6.1 Top Page

An example of top page is shown below.
When using a non-frame version browser, the page will look as follows. It shows the same information as a frame version browser.
When using a frame version browser, the top page shows the page links in the left frame and system information in the right frame

Top Page (Non Frame Version Browser)



Top Page (Frame Version Browser)



The following information of HG3F/4F operator interface is shown on the top page.

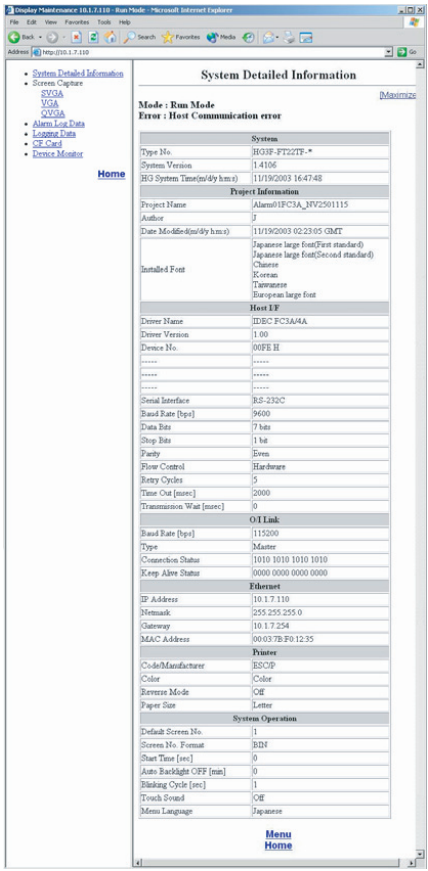
Item	Description
Mode	Shows the current mode of HG3F/4F operator interface.
Error	Same as top page. - Host Communication Error - No Screen Data - Waiting for Default Screen No. - Processing Error - Backup Data Lost - Network Off Line - Device Range Error
System	
Type No.	HG3F/4F
Project Name	Shows project name.
System Version	Shows the version of system program.
HG System Time	Shows the time setting of the system (the access time to the page).
Host I/F	
Driver Name	Shows host / IF driver name.
Driver Version	Shows the version of host I/F driver.
O/I Link	
Baud Rate	Shows the communication speed of O/I Link.
Type	Shows the O/I link station.
Slave Registration Settings	Shows slave registration setting register (LSD102 in the master) in binary.
Slave Online Status	Shows the value of slave online information register (LSD104 of host) in binary.

- For information about the error messages, see Chapter 8, “1.1 Error Messages” in the HF Series Hardware and Software Manual.
- For detailed information of O/I Link, see MICRO/I HG2G, HG1F/2F/2S/3F/4F, Communication Manual (PDF), Chapter 3, O/I Link Communication Interface.

1.6.2 System Detailed Information Page

To access this page, click “System Detailed Information” in the left frame or “More Information” in the right frame on the top page.

System Detailed Information Page



The following information of the HG3F/4F operator interface is shown on the system detailed information page.

Item	Description
Mode	Same as top page.
Error	Same as top page.
System	
Type No.	Same as top page.
System Version	Same as top page.
HG System Time	Same as top page.
Project Information	
Project Name	Same as top page.
Author	Shows the author of project.
Date Modified	Shows the last modification date and time of the project in GMT.
Installed Font	Shows the extension fonts installed in the HG3F/4F.

Item	Description
Host I/F	
Driver Name	Same as top page.
Driver Version	Same as top page.
Parameter unique to driver - 1	The four items below “Driver Version” show the settings which are unique to each driver. Shows the project settings of WindO/I-NV2 / Host I/F driver PLC values. The item names and values depend on the type of driver.
Parameter unique to driver - 2	
Parameter unique to driver - 3	
Parameter unique to driver - 4	
Serial Interface	Shows the serial interface used for the host I/F.
Baud Rate	Shows the communication speed of host I/F.
Data Bits	Shows the data length of host I/F.
Stop Bits	Shows the stop bit of host I/F.
Parity	Shows the parity of host I/F.
Flow Control	Shows the flow control method of host I/F.
Retry Cycles	Shows the numbers of retry cycles before the communication error of host I/F is displayed.
Time Out	Shows the response waiting time from the host.
Transmission Wait	Shows the transmission interval of communication command from host I/F.
O/I Link	
Baud Rate	Same as top page.
Type	Same as top page.
Slave Registration Settings	Same as top page.
Slave Online Status	Same as top page.
Ethernet	
IP Address	Shows IP address.
Netmask	Shows netmask.
Gateway	Shows gateway address.
MAC Address	Shows Ethernet MAC address.
Printer	
Code/Manufacturer	Shows printer control command.
Color	Shows printing color.
Reverse Mode	Shows on/off of black/white reverse mode.
Paper Size	Shows paper size.
System Operation	
Default Screen No.	Shows default screen number.
Screen No. Format	Shows screen number format.
Start Time	Shows the time required to start communication with the host.
Auto Backlight OFF	Shows the time before the backlight goes off automatically.
Blinking Cycle	Shows the blinking cycle of blinking parts and images.
Touch Sound	Shows On/Off of touch panel sound.
Menu Language	Shows the language of system screen.

For the details of host I/F items, see MICRO/I HG2G, HG1F/2F/2S/3F/4F, Communication Manual (PDF).

1.6.3 Screen Capture Page

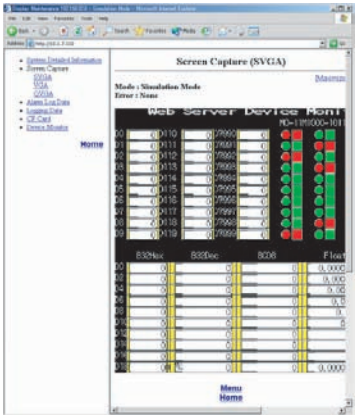
To access this page, click SVGA, VGA, or QVGA under the Screen Capture category on the top page. When selecting the size different from the screen size of the HG3F/4F, the image is displayed with the enlarged or reduced size. This page automatically refreshes in the intervals shown in the following table. The examples of SVGA, VGA, and QVGA pages are shown below.

	Size	Refresh cycle (sec.)
SVGA	800 x 600	60
VGA	640 x 480	60
QVGA	320 x 240	10

WARNING

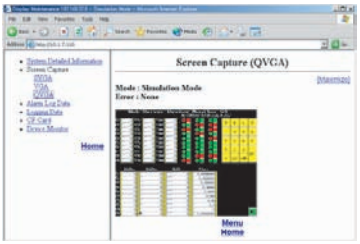
Browser which do not support the refresh tag function do not update the status automatically. Use the browser's updating function and update the page manually.

Screen Capture Page (SVGA)



Screen Capture Page (VGA)

Screen Capture Page (QVGA)



A capture image of the screen on the HG3F/4F operator interface is displayed. The image files are saved as bitmaps.

WARNING

- Browser which do not support bitmap images do not display captured images.
- Captured images may not be updated automatically depending on the browser's cache setting.

1.7 Data Display

The Data Display shows the alarm data and Data Log data stored of the HG3F/4F.

To show the alarm log data and Data Log data stored in the CF (compact flash) cards, go to the CF card page. (refer to Chapter 27 “1.8 CF Card” on page 469 for details.)

1.7.1 Alarm Log Data

Click “Alarm Log Data” on the top page to go to the page. The alarm log data setting in the project is necessary to display it. Select the range of display to show the alarm log data of the HG3F/4F.

Refer to Chapter 14 “Alarm Log Function” on page 275 for the details of alarm log data.

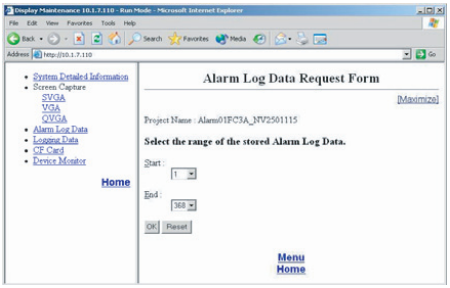
WARNING

When using a browser terminal with slow transaction speed, such as PDA, it may take a few minutes if you request to display the large range.

1. Alarm Log Data Request Form

On this page, select the displaying range of alarm log data.
An example of the Alarm Log Data Request Page is shown below.

Alarm Log Data Request Form



The following information is shown on the Alarm Log Data Request Form.

Item	Description
Project Name	Project name is shown. (When a 2-bytes character is used to the project name, “Wrong Strings” is shown.)
Forms	
Start	Use the drop-down list to select the start line number of the display range (1 to 1024). Recent data are shown in larger numbers. When choosing a smaller number for “Start” than for “End,” the result is shown in ascending order. When choosing a larger number for “Start” than for “End”, the result is shown in descending order. When there is no data, the drop-down list will be blank.
End	Select the end line number of display range from the drop-down list. Refer to the description of “Start” for details.
OK	Press OK to send the display range command to the HG3F/4F.
Reset	Press “Reset” to return the “Start” and “End” values to the defaults.

2. Alarm Log Data

This page shows the alarm log data for the range selected in the Alarm Log Data Request Form.
An example of Alarm Log Data page is shown below.

Alarm Log Data Page

The Alarm Log Data page shows the following information.

Item	Description
Project Name	Project name is shown. (When a 2-bytes character is used to the project name, “Wrong Strings” is shown.)
Forms	
Start	The value shows the number selected in the Alarm Log Request Data Form. Use the drop-down list to select the start line number of display range (1 to 1024). Recent data are shown in larger numbers. When choosing a smaller number for “Start” than for “End,” the result is shown in ascending order. When choosing a larger number for “Start” than for “End”, the result is shown in descending order.
End	The value shows the number selected in the Alarm Log Request Data Form. Refer to the description of “Start” for details.
OK	Press OK to send the display range command to the HG3F/4F.
Reset	Press “Reset” to return the “Start” and “End” values to the defaults.
Table	
Ch. No.	Channel number
Message	The alarm message is shown. (When 2-byte characters are used for the message on English pages, “Wrong Strings” is shown. On Japanese pages, Japanese 2-byte characters show the message. However, 2-byte characters of other languages are not shown.
Occurrence Time	Alarm occurrence time
Recovery Time	Alarm recovery time
Confirmation Time	Alarm confirmation time

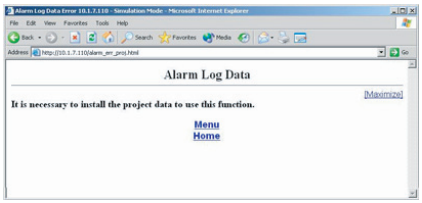
WARNING When an alarm occurs during the request transaction in descending order, the oldest data is overwritten by the alarm, causing possible display of fewer data than requested.

3. Alarm Log Data Error Page

When an error occurs during the transaction of alarm log data, the following page appears.

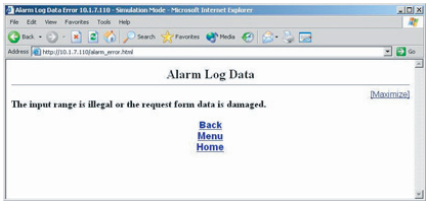
- When no project has been downloaded to the operator interface, the following page appears.

No Project Error Page



- When the HG3F/4F has received an error-laden form data, the following page appears.

Input Form Error Page



1.7.2 Data Log Data

Click “Logging Data” on the top page to go to the page. The Data Log setting in the project is necessary to display it. Data Log data can be obtained by following the instructions below.

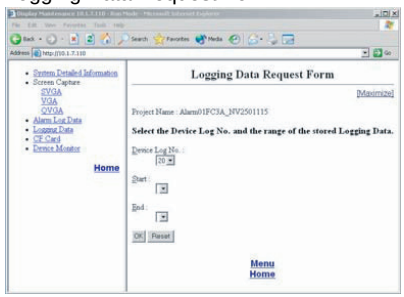
1. Click “Logging Data” on the top menu.
2. Select “Device Log No.,” and click OK.
3. Select the display range, and click OK.
4. The Data Log data is displayed.

Refer to Chapter 15 “Data Log Function” on page 295 for the details of Data Log setting.

1. Logging Data Request Form

Select the “Device Log No.” from the drop-down list.
An example of Data Log Data Request Form page is shown below.

Logging Data Request Form



The following information is shown on the Data Log Data Request Form page.

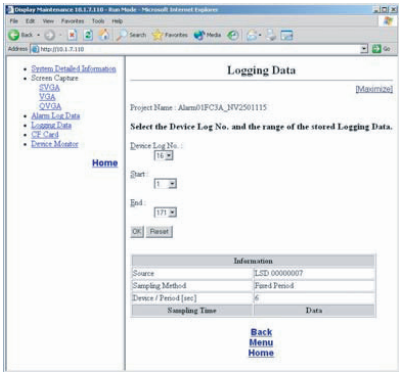
Item	Description
Project Name	Project name is shown. (When a 2-bytes character is used to the project name, “Wrong Strings” is shown.)
Forms	
Device Log No.	Use the drop-down list to select the device log no. Only the Channel No. with “Enable” setting can be selected.
Start	Use the drop-down list to select the start point of display range. At this time, the drop-down list is blank.
End	Use the drop-down list to select the end point of display range. At this time, the drop-down list is blank.
OK	Press OK to send the device log no. command to the HG3F/4F.
Reset	Press “Reset” to return the “Device Log No.”, “Start” and “End” values to the defaults.

2. Logging Data Page

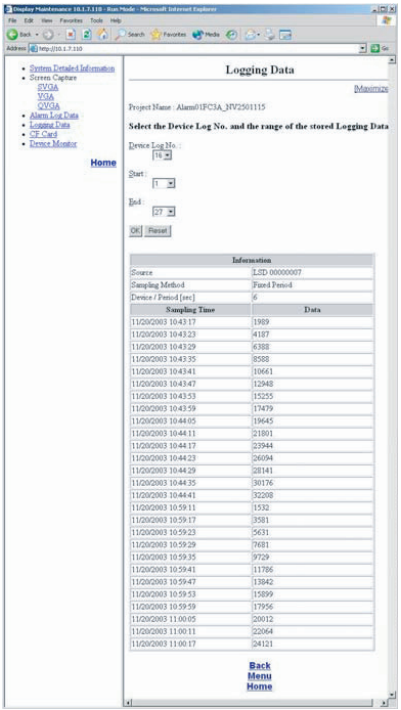
This page shows the Data Log data of the Device Log No. selected in the Data Log data request Form.

When the Device Log No. is selected on the Logging Data Request Form, the drop-down list of display range (Start and End) and the Data Log setting information are shown. Select the display range, and click OK to show the Data Log data. An example of Data Log Data page is shown below.

Logging Data Page (before selecting display range)



Logging Data Page (after selecting display range)



Item	Description
Project Name	Project name is shown. (When a 2-bytes character is used to the project name, “Wrong Strings” is shown.)
Forms	
Device Log No.	Shows the Channel No. currently selected. Device Log No. cannot be changed on this page. To change, return to Data Log Data Request Form page by clicking “Back,” or “Logging Data” link on the menu frame in the left frame.
Start	Use the drop-down list to select the start point of the display range (1 to 1024). Recent data are shown in larger numbers. When choosing a smaller number for “Start” than for “End,” the result is shown in ascending order. When choosing a larger number for “Start” than for “End”, the result is shown in descending order. When there is no data, the drop-down list will be blank.
End	Select the end point of display range from the drop-down list. Refer to the description of “Start” for details.
OK	Press OK to send the display range command to the HG3F/4F.
Reset	Press “Reset” to return the “Device Log No.”, “Start” and “End” values to the defaults.
Table	
Source	Shows the device for Data Log.

Item	Description
Sampling Method	Shows sampling method.
Device/Period [sec.]	When Sampling Method is “Fixed Period”: sampling cycle (sec.). When Sampling Method is “Event Bit” or “Event Word”: sampling event device.
Sampling Time	Shows the sampling dates and times.
Data	Shows sampling data.

WARNING

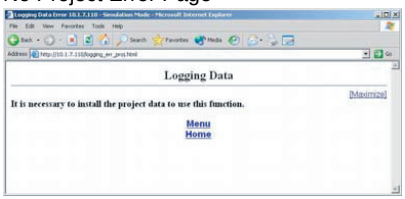
When broad displaying range is selected, creating a table may take a few minutes when using a browser terminal with slow transaction speed, such as PDA.

3. Data Log Data Error Page

When an error occurs during the transaction of alarm log data, the following page appears.

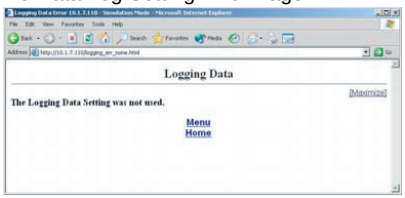
- When no project has been downloaded to the operator interface, the following page appears.

No Project Error Page



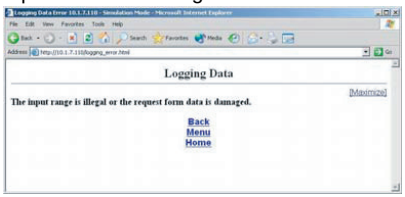
- When Data Log setting has not been completed, the following page appears.

No Data Log Setting Error Page



- When the HG3F/4F has received an error-laden form data, the following page appears.

Input Form Error Page



1.8 CF Card

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
					X	X

Only HG3F/4F support this function

On the CF card page, the following files inside the CF card on the HG3F/4F operator interface can be obtained.

- CSV files under \ALARM
- CSV files under \LOG
- CSV files under \RECIPE
- Bitmap files under \CAPTURE

For the detailed information about the file structure inside CF access folder, refer to Chapter 28 “2 PLC Program Transfer” on page 487.

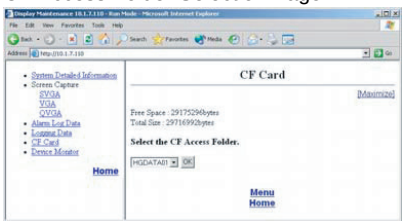
1.8.1 Access Folder Selection Page

This page can be accessed by clicking on the “CF Card” link on the top page, provided the following conditions are satisfied.

- CF card is inserted into the HG3F/4F operator interface.
- CF card is inserted into the HG3F/4F operator interface.
- Folders exist in the root directory of the CF card.

An image of CF access folder selection page is shown below.

CF Access Folder Selection Page



Item	Description
Free Space	Shows the unused space on the CF card.
Total Size	Shows the total capacity of the CF card.
Forms	
Select the Memory Card Access Folder	Use the drop-down list to select the Memory Card access folder.
OK	Press OK to send the CF access folder to the HG3F/4F.

1.8.2 File List Page

The file list of the selected access folder is displayed on this page. Click the file name to display or download the file. An image of the file list page is shown below.

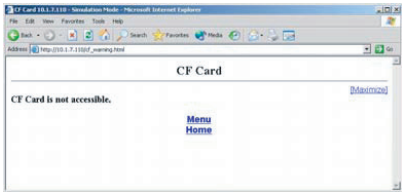
File List Page

1.8.3 CF (Compact Flash) Card Error Page

When the conditions described in 2.1 of this chapter are not satisfied, the following pages will appear when clicking on the “CF Card” link on the top page.

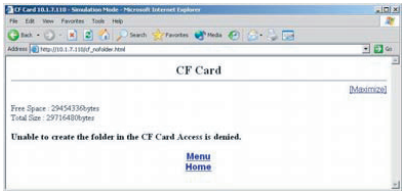
- When the CF card is not inserted into the HG3F/4F, the following page appears.

No CF Card



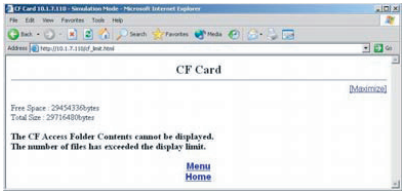
- When the folder dose not exists in the root directory of the CF card, the following page appears.

No Folder



- When the folder of 255 or more exists in the root directory of the CF card, the following page appears.

Excessive Folders



1.9 Device Monitor

The Device Monitor page shows the device values of the requested HG3F/4F. To monitor the device, send a request command to the HG3F/4F as follows.

- Click the “Device Monitor” link on the menu.
- Create the device codes and add to Transmission Request Form.
- Select the refresh time of monitor page.
- Click OK to send the Transmission Request Form data to the HG3F/4F.
- The monitor page of requested device is shown.

When the operator interface is RUN mode, you can monitor the device values on the Web Server.

1.9.1 Device Request Form Page

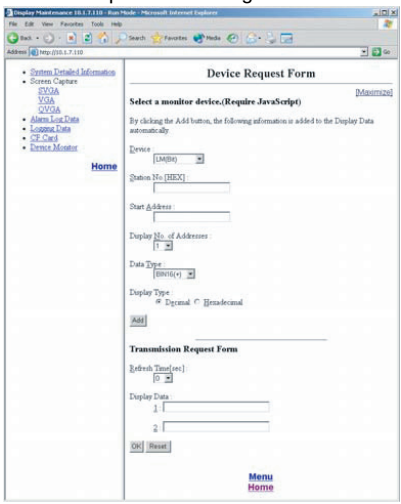
The device codes are created on this page and sent to the HG3F/4F.

The form in the upper half (above “Add” button) uses Java Script and creates the request device codes. The device codes are added to the Display Data 1 and 2 boxes in the lower half. The device codes are then sent to the HG3F/4F.

- The device codes can be created manually. Refer to “request device codes format”. Manual creation of device codes is necessary when using the browser which does not support Java Script.
- Enter the address in “WindO/I-NV2” format if you select “Allen-Bradley” as Host I/F driver.

An example of Device Request Form page is shown below.

Device Request Form Page



The Java Script forms to create the request device codes are shown in the following table.

Item	Description
Device	Select the device from the drop-down list.
Station No.[HEX]	Enter the host station number to monitor, in hexadecimal. When the host station has a decimal station number, enter a hexadecimal equivalent. Valid range is 0 to FF. This form is enabled when the host I/F driver is compatible with the 1:N communication. When nothing is entered, station number 0 is specified.
Start Address	Enter the start address. For bit addressing of word device, enter “-” between the address and bit. Enter the bit in decimal number. Example 1: Address 123, bit 0: 123-0 Example 2: Address 12F, bit 15: 12F-15
Display No. of Addresses	Select the number of devices to monitor from the drop-down list (1 to 10). When selecting 10, 10 addresses are displayed, starting with the address selected for “Start Address” above.
Data Type	Select the format from the drop-down list menu.
Display Type	Select the display type.
Add	Click “Add” to convert the required device information into a device code. The device code is entered in “Display Data 1” or “Display Data 2” boxes. Up to two device codes can be entered. When trying to enter a code while two boxes are occupied, an error dialog message appears.

The details of Transmission Request Form are shown below.

Item	Description
Refresh Time [sec.]	Select the refresh time (sec.) of the Device Monitor page. Select “0” for no refresh.
Display Data 1/Display Data 2	The request device codes are entered. To enter the codes manually, see “Request Device Code Format” on page 5-3. Up to two devices can be monitored on a Device Monitor page. When monitoring one device only, leave the other box blank.
OK	Click “OK” to send the request information to the HG3F/4F.
Reset	Click “Reset” to return the request information to the defaults.

Request Device Code Format

The request device codes entered into “Display Data” boxes are created in the following format.
[Device Symbol]_ [Station No.]_Start Address] _ [No. of Devices] _ [Data Type] _ [Display Type]

Item	Description	
Device Symbol	Enter device symbol. Example: X, D, LDR, LM.	
Station No.[HEX]	When requesting a host device using a host I/F driver compatible with the 1:N communication, enter the host station number in hexadecimal. For other operations, this value is ignored. When the host station has a decimal station number, enter a hexadecimal equivalent. When nothing is entered, station number 0 is specified.	
Start Address	Enter the start address of the device to monitor. For bit addressing of word device, enter “-” between the address and bit. Enter bit in decimal number. Example 1Address 123, bit 0: 123-0Example 2Address 12F, bit 15: 12F-15	
No. of Devices	Enter the number of devices to display (1 to 10).	
Data Type	Enter the data type.	
	Data Type	Code
	BIN16 (+)	B16p
	BIN16 (+/-)	B16
	BIN32 (+)	B32p
	BIN32 (+/-)	B32
	BCD4-digit	BCD4
	BCD8-digit	BCD8
	Float	FLT
Display Type	Enter the display type.	
	Display Type	Code
	Decimal	DEC
	Hexadecimal	HEX

Example 1.Station No. 15 (decimal), D0000-D0007, BIN16 (+), decimal:
D_F_0000_8_B16p_Dec

Example 2.LDR0123 bit 15 - LDR0124 bit 3
LDR__123-15_5_B16p_Dec
Data type and display type are irrelevant to bit devices. However, for convenience of system procedure, enter any parameters to allow the creation of Device Monitor page.

1.9.2 Device Monitor Page

The Device Monitor page shows the current values of the device which was specified on the Device Request Form page. When a request for an internal device is entered, the write request can be sent from this page.

This page can be bookmarked on the browser so that the user can access the Device Monitor page without selecting the device using the device request form page.

WARNING When bookmarking the Device Monitor page on a frame-version browser, make sure to bookmark the frame showing the device monitor. Otherwise, the top page may be bookmarked on some browsers.

An example of Device Monitor page is shown below.

Device Monitor Page

The Device Monitor page shows the following information.

Item	Description
Device	Shows the selected device.
Station No.[HEX]	Shows the host station number of the requested device. This value is shown only when all of the following conditions are met: ·Host I/F driver compatible with the 1:N communication ·Host device
Number	Shows the selected number of devices.
Data Type	Shows the data type of the device.
Display Type	Shows the display type of the device.
Data	Shows the current value of the device. When a host communication error occurs, “Host Communication error” is displayed. When the data type is BCD or Float, “illegal format” is displayed should the value does not match the data type format.

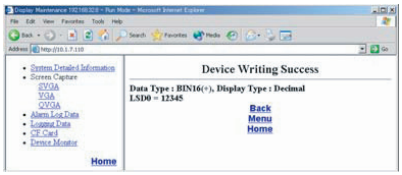
1.9.3 Internal Device Write

When the internal device is requested from the Device Monitor page, the write operation can be performed. The write operation, however, requires a connection using either the “Administrator” or “Operator” Security Group. Writing is disabled when the connection uses the “Reader” Security Group. The Security Group can be specified by selecting “User and Password Settings” on the WindO/I-NV2. When the internal devices are displayed, the Entry Form and OK button are shown in the cell of Data column. Enter the value in the Entry Form and press the OK button to send a write request.

Item	Description
Entry Form	Enter the value to be written to this form. The value is entered with the current Data Type and Display Type.
OK	Press “OK” to send the value in the entry form to the MICRO/I.

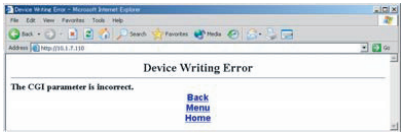
When the write operation succeeds, the following page appears.

Write Completed Page



If the write operation fails, the following page appears.

Write Error Page

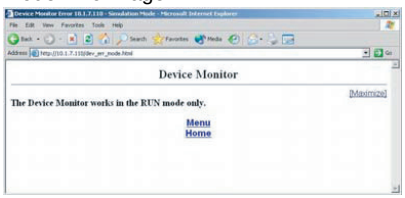


On both pages, clicking the “Back” link returns to the Device Monitor Page.

1.9.4 Device Monitor Error Page

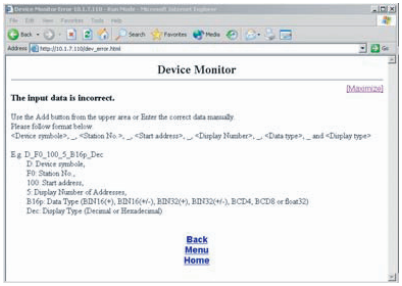
- When the operator interface is not in RUN mode, the following page appears.

Mode Error Page



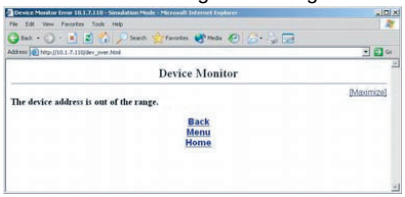
- When the input data is incorrect on Device Request Form, the following page appears.

Input Form Error Page



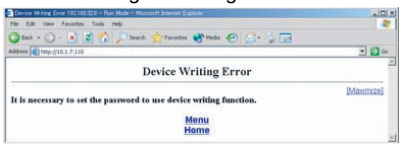
- When the specified device address is out of the range, the following page appears.

Device Address Range Error Page



- When attempting to write to the internal device in the project that is not password-protected, the following page appears.

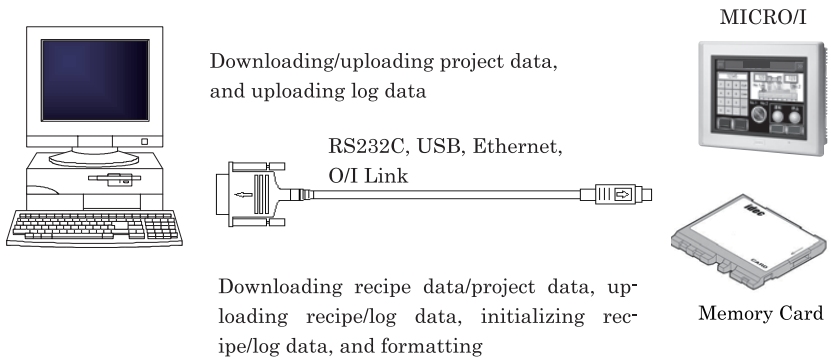
Device Writing Error Page



2 Downloader

Downloader, which can be operated independently from the WindO/I-NV2, has the following features.

- Downloading the Downloader project data created with the WindO/I-NV2 to the MICRO/I.
- Uploading project data and log data from the MICRO/I.
- Downloading project data and recipe data to the Memory Card inserted in the HG3G, HG2F/3F/4F.
- Uploading recipe data and log data from the Memory Card inserted in the HG3G, HG2F/3F/4F.
- Clearing the log data stored in the MICRO/I or the recipe and log data stored in the Memory Card inserted in the MICRO/I.
- Editing registered pictures and the text registered in the Text Manager
- Reading and writing data from and to the specified device (LDR, LKR)
- Allowing the operations above to be executed from other application software by using a command line.



Refer to the “WindO/I Utility Downloader Instruction Manual” for details about the Downloader.

Chapter 28 Data Transfer Function

This chapter describes the Project Transfer function, PLC Program Transfer function and File Copy function.

1 Project Transfer Function

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X		X		X	X

Only HG3G, HG2F/3F/4F support this function

1.1 verview

The project transfer function is used to download or upload projects from the MICRO/I to a memory card or USB flash drive inserted into the MICRO/I.

This function can be executed in the following ways:

- Using the USB AutoRun function
- Using Key Buttons, Multi-Buttons, or Multi-Commands
- Using the System Menu on MICRO/I

- This function is available for use on the HG3G or HG2F/3F/4F that is equipped with a Memory Card interface or USB interface.
- Transferring projects using the USB AutoRun function, Key Buttons, Multi-Buttons, and Multi-Commands is only supported by the HG3G.

1.2 Settings and Operating Procedures

1.2.1 Create a ZNV file

To download a project to the MICRO/I using the Project Transfer function, the project must be converted into a special format (ZNV format) and saved in a memory card or USB flash drive using WindO/I-NV2.

Projects for the Project Transfer function are made using the following procedure:

1. **In WindO/I-NV2, open the project that you want to use with the Project Transfer function.**
2. **On the Home tab, in the Project group, click Download.**
3. **In the Download dialog box, click Change.**
4. **In the Communication Settings dialog box, select “Memory Card” for Communication with.**
5. **In the Download dialog box, click Download.**
6. **In the Select Memory Card Drive dialog box, specify a destination folder.**

- For instructions on how to save a project file in an external memory, refer to Chapter 30 “1.5 Reading/Writing Data from/to Memory Card” on page 504.

1.2.2 Using USB AutoRun function

Download

1. **Create the project file to use with the Project Transfer function.**
2. **Create a USB AutoRun definition file (hgauto.ini) with Project download settings.**
3. **Save the project file created in step 1 and the USB AutoRun definition file created in step 2 in the same USB flash drive.**
4. **Insert the USB flash drive from step 3 into the MICRO/I.**

   The confirmation message is shown on MICRO/I.
5. **Press "Yes" to download the project.**

Upload

1. **Create a USB AutoRun definition file (hgauto.ini) with project upload settings.**
2. **Save the USB AutoRun definition file (hgauto.ini) created in step 1 in a USB flash drive.**
3. **Insert the USB flash drive from step 2 into the MICRO/I.**

   The confirmation message is shown on MICRO/I.
4. **Press "Yes" to upload the project.**

For instructions on how to create a USB AutoRun definition file (hgauto.ini) with Project Transfer function settings, refer to Chapter 30 "2.3.1 USB AutoRun function" on page 510.

1.2.3 Using Key Button, Multi-Button or Multi-Command

Download

1. **Create the project file to use with the project transfer function.**
2. **Save the project file created in step 1 in the external memory.**
3. **Insert the external memory from step 2 into the MICRO/I.**
4. **Press the Key Button or Multi-Button set with Project Transfer settings, or execute a Multi-Command.**

Upload

1. **Insert the external memory into the MICRO/I.**
2. **Press the Key Button or Multi-Button set with project transfer settings, or execute a Multi-Command.**
3. **Press "Yes" to upload the project.**

For instructions on how to set parts that have been set with Project Transfer function settings, refer to Chapter 9 "5.2 Key Button Settings" on page 163.

1.2.4 Using the System Menu on MICRO/I

If using the System Menu, the screen layout and message may be different depending on O/I type

Download

[HG3G]

1. **Create the project file to use with the project transfer function.**
2. **Save the project file created in step 1 in the external memory.**
3. **Insert the external memory from step 2 into the MICRO/I.**
4. **Switch the MICRO/I to the System mode.**
5. **On the System Menu screen, press “File Manager”.**
6. **Specify the external memory from step 3 for source device Drive, and select the project file you want to download.**
7. **Select “MICRO/I” for destination device Drive.**
8. **Press “COPY”, a confirmation message is shown.**
9. **Press “Yes” to download the project.**

[HG2F/3F/4F]

1. **Create the project file to use with the project transfer function.**
2. **Save the project file you created in the Access Folder on the external memory.**
3. **Insert the external memory from step 2 into the MICRO/I.**
4. **Switch the MICRO/I to the System mode.**
5. **On the System Menu screen, press “Initial Setting”, “CF card” and then “CF card to HG”.**
6. **Select the Access Folder in step 3.**
7. **Press “Yes”, the confirmation message is shown.**
8. **Press “Yes” to download the project.**

Upload

[HG3G]

1. **Insert the external memory into the MICRO/I.**
2. **Switch the MICRO/I to the System mode.**
3. **On the System Menu screen, press “File Manager”.**
4. **Specify “MICRO/I” for source device Drive.**
5. **Specify the external memory from step 1 for source device Drive, and select a destination folder to save the file.**
6. **Press “COPY”, a confirmation message is shown.**
7. **Press “Yes” to upload the project to the specified location.**

[HG2F/3F/4F]

1. **Insert the external memory into the MICRO/I.**
2. **Switch the MICRO/I to the System mode.**
3. **On the System Menu screen, press “Initial Setting”, “CF card” and then “HG to CF card”, a confirmation message is shown.**
4. **Press “Yes” to upload the project under the USRDAT folder in the Access Folder.**

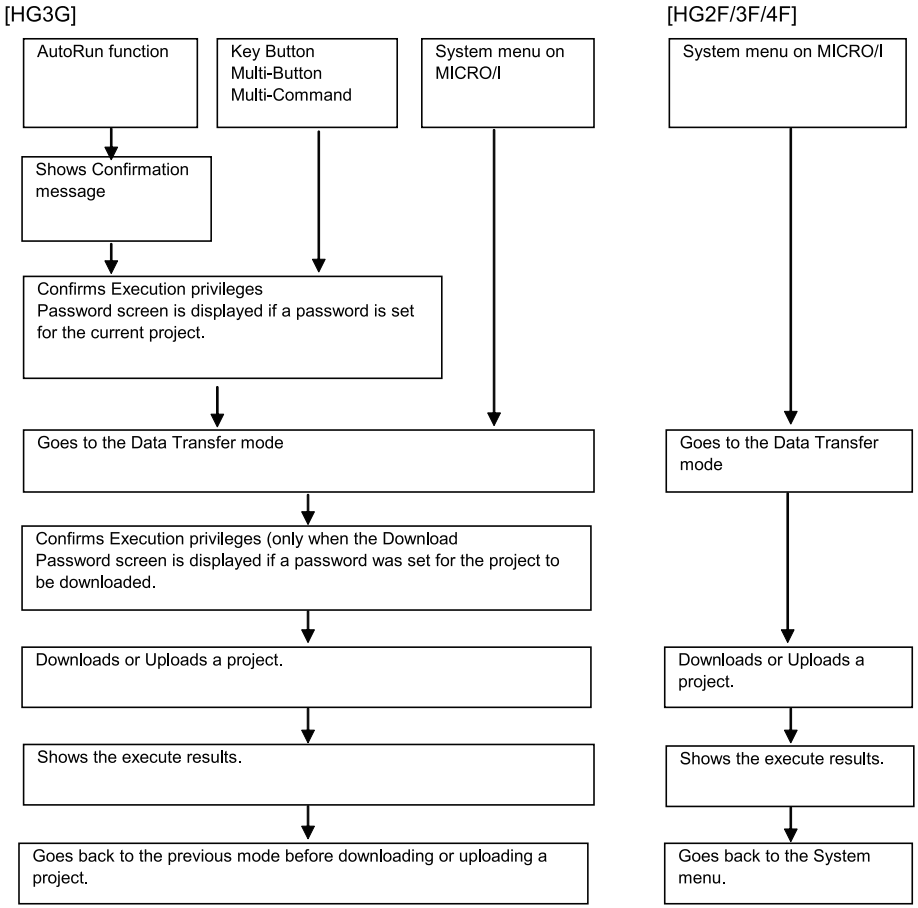
If fails to download or upload a project to MICRO/I, an error message will be shown. (Refer to Chapter 36 “1.1 Error Messages” on page 562.)

1.3 Operation

1.3.1 Description

The diagram below shows the procedure when a Project Transfer is executed.

For instructions on setting passwords, refer to Chapter 23 “Security Function” on page 407.



1.4 Important Notes

- MICRO/I operation stops while the Project Transfer function is running.
- If a project data is downloaded by using Project Transfer function HG Keep Register and HG Keep Relay will be cleared.
- If there is a project file with the same name in the destination folder, it will be overwritten with the uploaded file. In such cases, no confirmation message is displayed.
- If the project data uses picture data, sound data and recipe data in the Memory Card, those data will not be uploaded or downloaded automatically when project transfer function is executed.
- If a project is uploaded with the Project Transfer function on the HG3G, the project file name will be the Project name and the file extension (ZNV). If any characters other than single-byte alphanumeric characters are used in the Project name, the file name may be garbled.
- If a next Data Transfer starts running while the Data Transfer (transferring Project/PLC Program or copying files) function is running, only the current transfer is executed. If two or more Data Transfer functions are set for a Multi-Button or Multi-Command, only the function nearest the top of the list is executed.
- To use the Project Transfer function, the external memory device must have free space approximately equivalent to the size of the ZNV files. Check that the external memory device by using the Project Transfer function has sufficient free space. If it does not have sufficient free space, the project download or upload may fail.
- If it fails to download a project, try downloading the project again.

2 PLC Program Transfer

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

2.1 Overview

The PLC Program Transfer function is used to download or upload PLC Programs from a PLC connected to the MICRO/I to an SD Memory Card or USB memory device inserted into the MICRO/I.

This function can be executed in the following ways:

- Using the USB AutoRun function
- Using Key Buttons, Multi-Buttons, or Multi-Commands
- Using the System Menu on MICRO/I

Compatible PLCs

PLCs that support the PLC Program transfer function are as follows:

Manufacturer	Series Name	System (CPU unit)	PLC Model set using WindO/INV2
IDEC	OpenNet Controller	FC3A	OpenNet(FC3A)), MICROSmart (FC4A/FC5A)
	MicroSmart	FC4A	
	MICROSmart Pentra	FC5A	

2.2 Settings and Operating Procedures

2.2.1 Create a ZLD file

To download a PLC Program to the PLC using the PLC Program Transfer function, the user programs must be converted into a special format (ZLD format).

1. **In WindLDR, open the user program that you want to use with the PLC Program Transfer function.**
2. **Click Application Menu, select Save As and click Other Format.**
3. **Select "ZLD File Format (.ZLD)" from File Type.**

For instructions on how to save a PLC Program file in an external memory, refer to Chapter 30 "1.5 Reading/Writing Data from/to Memory Card" on page 504.

2.2.2 Using USB AutoRun function

Download

1. **Create a user program file for the PLC Program Transfer function.**
2. **Create a USB AutoRun definition file (hgauto.ini) with PLC Program download settings.**
3. **Save the user program file created in step 1 and the USB AutoRun definition file created in step 2 in the same USB flash drive.**
4. **Insert the USB flash drive from step 2 into the MICRO/I. The confirmation message is shown on MICRO/I.**
5. **Press "Yes" to download the user program to the PLC.**

Upload

1. **Create a USB AutoRun definition file (hgauto.ini) with PLC Program upload settings.**
2. **Save the USB AutoRun definition file (hgauto.ini) created in step 1 in a USB flash drive.**
3. **Insert the USB flash drive from step 2 into the MICRO/I.**

   The confirmation message is shown on MICRO/I.
4. **Press "Yes" to upload the user program from the PLC.**

For instructions on how to create a USB AutoRun definition file (hgauto.ini) with PLC Program Transfer function settings, refer to Chapter 30 "2.3.1 USB AutoRun function" on page 510.

2.2.3 Using Key Button, Multi-Button or Multi-Command

Download

1. **Create a user program file for the PLC Program Transfer function.**
2. **Save the user program file created in step 1 in the external memory.**
3. **Insert the external memory from step 2 into the MICRO/I.**
4. **Press the Key Button or Multi-Button set with PLC Program Transfer settings, or execute a Multi-Command.**

Upload

1. **Insert the external memory into the MICRO/I.**
2. **Press the Key Button or Multi-Button set with project transfer settings, or execute a Multi-Command.**

For instructions on how to set parts that have been set with PLC Program Transfer function settings, refer to Chapter 9 "5.2 Key Button Settings" on page 163.

2.2.4 Using the System Menu on MICRO/I

Download

1. **Create the user program file to use with the PLC Program Transfer function by using WindLDR.**
2. **Save the user program file created in step 1 in the external memory.**
3. **Insert the external memory from step 2 into the MICRO/I.**
4. **Switch the MICRO/I to the System mode.**
5. **On the System Menu screen, press “File Manager”.**
6. **Specify the external memory from step 3 for source device Drive, and select the user program file you want to download.**
7. **Select “PLC” for destination device Drive.**
8. **Press “COPY”, a confirmation message is shown.**
9. **Press “Yes” to download the user program to the PLC.**

Upload

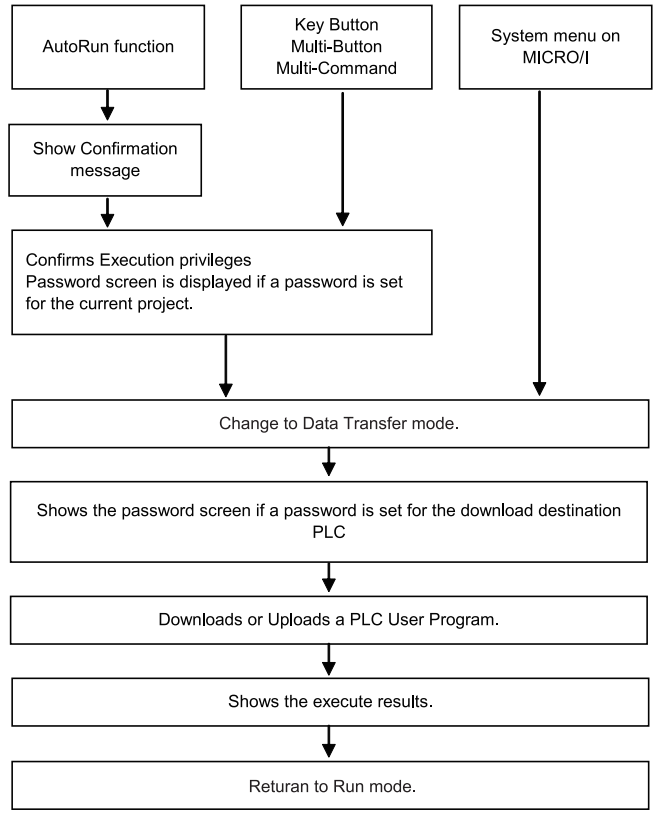
1. **Insert the external memory into the MICRO/I.**
2. **Switch the MICRO/I to the System mode.**
3. **On the System Menu screen, press “File Manager”.**
4. **Specify “PLC” for source device Drive.**
5. **Specify the external memory from step 1 for source device Drive, and select a destination folder to save the file.**
6. **Press “COPY”, a confirmation message is shown.**
7. **Press “Yes” to upload the user program to the specified location.**

If fails to download or upload the user program to the PLC, an error message will be shown. (refer to Chapter 36 “1.1 Error Messages” on page 562.)

2.3 Operation

2.3.1 Description

The diagram below shows the procedure when the PLC Program Transfer is executed.



2.4 Important Notes

- WindLDR Ver.6.30 or later is required to create PLC Program files.
- Both of MICRO/I and PLC stop while the PLC Program Transfer function is running. The PLC will run automatically after downloading or uploading the PLC Program. MICRO/I return to Run mode.
- You can enter capital alphanumeric characters on the MICRO/I. If a password containing non-alphanumeric characters is set on the PLC, you will not be able to enter the correct password.
- PLC Programs cannot be transferred if the MICRO/I is in the Simulation Mode. Switch to the Run Mode, the Monitor Mode or the System Mode, and then execute the PLC Program Transfer function.
- If there is an user program file with the same name in the destination folder, it will be overwritten with the uploaded file. In such cases, no confirmation message is displayed.
- When a user program is uploaded with the PLC Program Transfer function from the PLC, the file name will be set the "name of model_port number_station number_year month day hours minutes seconds and the file extension (ZLD)".
- When a user program is uploaded with the PLC Program Transfer function from the PLC, the file name will be set the "name of model_port number_station number_year month day hours minutes seconds and the file extension (ZLD)".

3 File Copy Function

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

3.1 Overview

The File Copy function is used to copy files between Memory card and USB flash drive inserted into the MICRO/I, or to copy files within an SD Memory Card or USB flash drive.

This function can be executed in the following ways:

- Using the USB AutoRun function
- Using Key Buttons, Multi-Buttons, or Multi-Commands

You can operate the files on the MICRO/I System Menu in addition to the File Copy function. Refer to Chapter 35 “2 Settings” on page 550.

3.2 Settings and Operating Procedures

3.2.1 Using USB AutoRun function

1. **Create a USB AutoRun definition file (hgauto.ini) with File Copy settings.**
2. **Save the USB AutoRun definition file created in step 1 in the USB flash drive.**
3. **Insert the USB flash drive from step 2 into the MICRO/I. The confirmation message is shown on MICRO/I.**
4. **Press “Yes” to copy the files.**

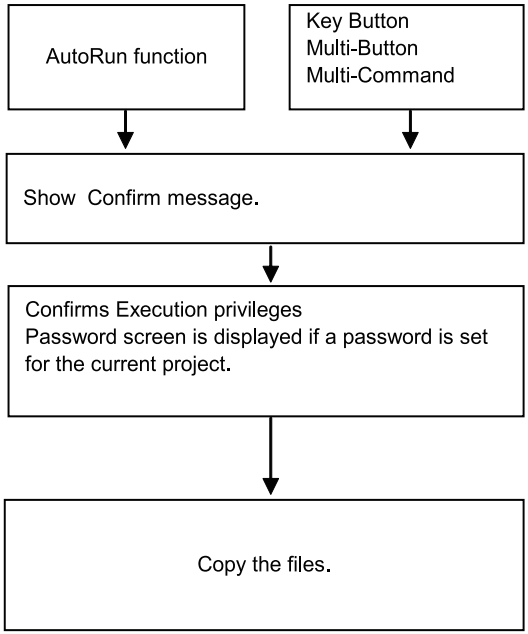
3.2.2 Using Key Button, Multi-Button or Multi-Command

1. **Insert the external memory into the MICRO/I.**
2. **Press the Key Button or Multi-Button set with the File Copy settings, or execute a Multi-Command.**

3.3 Operation

3.3.1 Description

The diagram below shows the procedure when a File Copy is executed.



While the File Copy is executing, LSM23 is ON.

3.4 Important Notes

- If a next Data Transfer starts running while the Data Transfer (transferring Project/PLC Program or copying files) function is running, only the current transfer is executed. If two or more Data Transfer functions are set for a Multi-Button or Multi-Command, only the function nearest the top of the list is executed.
- The file that is being copied cannot be accessed while the File Copy function is running. If the file to be copied is a log data file or similar data, it might lack the log data while copying the file. When copying files used by the current project, switch to the System mode and then use the File Manager.
- The maximum size of files that can be read and written is 256MB.

Chapter 29 Expantion Unit

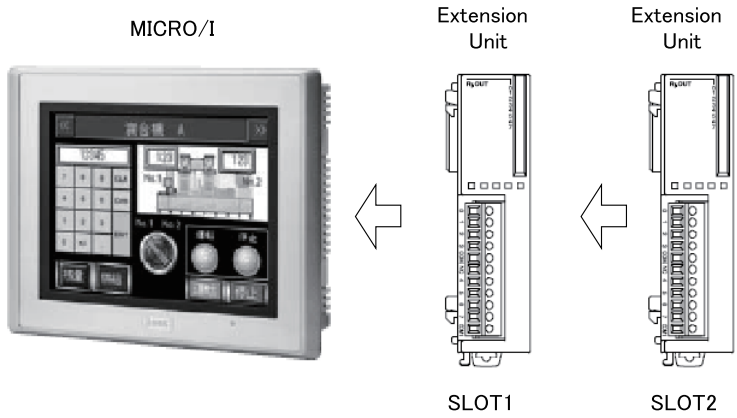
This chapter describes how to set the expansion units and how it operates in MICRO/I.

1 Overview

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

MICRO/Is models with the expansion interface can connect up to two IDEC MicroSmart PLC expansion modules.. Adding Expansion modules provide more functionalities & flexibilities on the MICRO/I.



Attached expansion units are called Slot 1 and Slot 2 in order from the closest unit to MICRO/I.

2 Operation

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

2.1 Digital I/O unit operation

The input and output ports of the Digital I/O unit can each be assigned to “Digital Input (LEX)” and “Digital Output (LEY)” of internal devices. These internal devices are used to control and monitor the state of input/output ports.

The address of them is in octal notation. Addresses are assigned in ascending order from Slot 1. However, if a unit has four input/output ports, addresses 0 to 3 are assigned to each, and addresses 4 to 7 are invalid.

WARNING

Input/output ports of Digital I/O units can also be controlled and monitored using the word devices WLEX and WLEY. WLEX and WLEY make the handling for batch control of input/output ports easy. For details on assigning addresses, refer to Chapter 34 “Internal Devices” on page 533.

3 Restrictions

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

3.1 IDEC PLC Expansion Modules:

- A maximum of two IDEC Microsmart PLC expansion modules can be attached to the expansion interface of the MICRO/I.
- Refer to the table below for the internal current consumption of IDEC's expansion modules .

Digital Expansion Module	Part Number
8-pt DC Input Module	FC4A-N08B01
Digital input module	FC4A-N16B1
Digital input module	FC4A-N16B3
Digital input module	FC4A-N32B3
8-pt Relay Output module	FC4A-R081
Digital output module	FC4A-T08K1
Digital output module	FC4A-T08S1
Digital output module	FC4A-T16K3
Digital output module	FC4A-R161
Digital output module	FC4A-T16S3
Digital output module	FC4A-T32K3
Digital output module	FC4A-T32S3
Digital input/output module	FC4A-M08BR1
Combination 16-pt DC Input/8-pt Relay Output module	FC4A-M24BR2

WARNING

- Do not use the expansion modules which are not included on the table,above .
- More than two FC4A-M24BR2 can not be used at the same time.
- Always turn the MICRO/I and the expansion unit off before attaching or detaching an expansion unit.
- Secure expansion units using the optional mounting bracket.

Chapter 30 External Memory

This chapter describes the folder structure used for external memory as well as precautions when using external memory.

1 Memory Card

1.1 Specification

1.1.1 CF Card

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
			X		X	X

Only HG2F/3F/4F support this function

A CF Card with the following specifications can be used with the MICRO/I.

- A CF Card with a memory size of 16 MB /32 MB /64 MB /128 MB /256 MB /512 MB can be used.
- A CF Card using the FAT-12/16/32 file system can be used. Data can be exchanged using an OS of Windows 2000 or later.
- Shifted JIS code is supported.

  Single-byte kana characters cannot be used for the name of the file or folder. Make sure to use double-byte kana characters.

1.1.2 SD Memory Card

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

A SD Memory Card with the following specifications can be used with the MICRO/I.

- A SD Memory Card with a memory size of 2GB and a SDHC Card with a memory size of 2GB to 32GB can be used.
- A SD Memory Card using the FAT-12/16/32 file system can be used. Data can be exchanged using an OS of Windows 2000 or later.

  However, SD Memory Cards of 2 GB or less are not recognized if formatted as FAT32. Such cards should therefore be formatted as FAT16.
- Roman alphabetical character and number can be used.
- File names may be up to 120 characters long. (Includes file name extensions.)
- File paths may be up to 250 characters long. (Includes file name extensions and drive characters.)
- The maximum size of files that can be read and written is 256MB.
- Volume labels cannot contain the following characters:

  " & ( ) * + , . / : ; < > [ ] \ = | ^
- File and directory names cannot contain the following characters:

  \ / : * ? " < > |

1.2 Compatibility

1.2.1 CF Card

Use of a CF Card manufactured by IDEC, HG9Z-MF128 (128 MB) is recommended.

1.2.2 SD Memory Card

A Use of a SD Memory Card manufactured by IDEC, HG9Z-XMS2(2GB) is recommended. When using a SD Memory Card that is provided by a third party, please consult our representatives.

1.3 Functions

1.3.1 CF Card

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
			X		X	X

Only HG2F/3F/4F support this function

- Copy Project (refer to Chapter 28 “1 Project Transfer Function” on page 480)
- Alarm Log Data Output (refer to Chapter 14 “2.3 Memory Card Output” on page 281)
- Data Log Data Output (refer to Chapter 15 “2.2.2 Memory Card Output” on page 301)
- Screenshot (refer to Chapter 9 “4 Print Button” on page 160 and refer to Chapter 13 “4.2 Print Command Settings” on page 269)
- Reading or writing Recipe Data (refer to Chapter 19 “Recipe Function” on page 345)
- Reading and showing Picture Data (refer to the WindO/I-NV2 Help for details about the Picture Manager)

1.3.2 SD Memory Card

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

- Transferring Project or PLC Program, and operating files. (refer to Chapter 28 “Data Transfer Function” on page 479)
- Alarm Log Data Output (refer to Chapter 14 “2.3 Memory Card Output” on page 281)
- Data Log Data Output (refer to Chapter 15 “2.2.2 Memory Card Output” on page 301)
- Screenshot (refer to Chapter 9 “4 Print Button” on page 160 and refer to Chapter 13 “4.2 Print Command Settings” on page 269)
- Reading or writing Recipe Data (refer to Chapter 19 “Recipe Function” on page 345)
- Reading and showing Picture Data (refer to the WindO/I-NV2 Help for details about the Picture Manager)
- Reading and playing Sound Data (refer to Chapter 22 “Sound Function” on page 401)

1.4 File Structure

1.4.1 CF Card

The CF Card file structure is as follows. All data written to the CF Card is stored in the Memory Card Access Folder. The files and folders are created automatically when the data is written.

CF Card

\HGDATA01 (CF access folder name)

Folder Name	File Name	Description
\ALARM	ALMHTO CSV	Alarm log data (batch)
	ALMHTA.CSV	Alarm log data (real time)
\LOG	LOGO01.CSV- LOGO20.CSV	Logging data (batch) (the sequential number assigned corresponds to the data number)
	LOGA01.CSV- LOGA20.CSV	Logging data (real time) (the sequential number assigned corresponds to the data number)
\RECIPE	RCP0001.CSV- RCP1024.CSV	Recipe data (the sequential number assigned corresponds to the data number)
\CAPTURE	CAP001.BMP- CAP999.BMP	Screen hardcopy data (file name is attached automatically)
\PICTURE	PROJECT.J2F, PROJECT.K2F	Picture data for Picture Browser
\USRDAT	----	Project data

\ HGDATA02 (CF access folder name)
\ALARM
\LOG
\RECIPE
\CAPTURE
\PICTURE
\USRDAT

\ HGDATA03 (CF access folder name)

- You can create a Memory Card Access Folder of your choice using the WindO/I-NV2 project settings. The name can be up to eight alphanumeric characters in length (A-Z and 0-9)... Other folder and file names are fixed.
- The Memory Card Access Folder name will be “HGDATA01” when no project is downloaded to the MICRO/I.
- For details of HG Special Relays and HG Special Registers for Sound functions, rrefer to Chapter 30 “1.1.2 SD Memory Card” on page 500efer to Chapter 32 “Internal Registers” on page ***.
- It is possible to store data for multiple projects on one CF Card.
- The following files can be cleared using the Use Erase function that is on the Memory Card tab in the Project Settings dialog box.

  All Alarm Log file (Real Time): The ALMHTA.CSV file in the ALARM folder is cleared.

  All Data Log files (Real Time): All LOGA**.CSV files in the LOG folder are cleared.

  All Screenshot files: All files in the CAPTURE folder are cleared.
- Set the maximum number of Screenshot in LSD 65 stored in the CF Card.

1.4.2 SD Memory Card

The SD Memory Card file structure is as follows. The files and folders are created automatically when the data is written.

SD memory card

¥HGDATA01 (Memory Card Access Folder Name)

Folder Name	File Name	Description
ALARMLOG	****.CSV Default file names are as below: Batch: ALMHTO.CSV Real Time: ALMHTA.CSV	Alarm Log data
DATALOG	****.CSV Default file names are as below: Batch: LOGO##.CSV Real Time: LOGA**.CSV	Data Log data ##: Data No.
OPERATIONLOG	****.CSV Default file names are as below: Batch: OPLOGO.CSV Real Time: OPLOGA.CSV	Operation Log data
CAPTURE	CAP####.JPG	Screenshot data File name is set automatically. ####: Date. The format is “YYMMDD_HHMMSS”
RECIPE	****.CSV Default file name is RCP####.CSV	Recipe data ####: The recipe number.
PICTURE	****.bmp/jpg	Picture data for Picture Manager
SOUND	****.wav	Sound data for Sound Settings
NVDATA	“Project Name”.ZNV	Project data
LDRDATA	Name of model_Port number_Station number_Date and the file extension (.ZLD)	PLC Program data to download to the PLC

****: An arbitrary name

¥HGDATA02 (Memory Card Access Folder Name)

- ¥ALARMLOG
- ¥DATALOG
- ¥OPERATIONLOG
- ¥CAPTURE
- ¥RECIPE
- ¥PICTURE
- ¥SOUND
- ¥NVDATA
- ¥LDRDATA

¥HGDATA03 (Memory Card Access Folder Name)

- You can create a Memory Card Access Folder of your choice using the WindO/I-NV2 project settings.
  The name can be up to eight alphanumeric characters in length (A-Z and 0-9). Other folder and file names are fixed.
- The Memory Card Access Folder name will be “HGDATA01” when no project is downloaded to the MICRO/I.
- It is possible to store data for multiple projects on one SD Memory Card.
- The following files can be cleared using the Use Erase function that is on the Memory Card tab in the Project Settings dialog box.

  All Alarm Log file : All files in the ALARMLOG folder is cleared.

  All Data Log files “ All files in the DATALOG folder are cleared.

  All Operation Log files: All files in the OPERATIONLOG folder are cleared.

  All Screenshot files: All files in the CAPTURE folder are cleared.
- Set the maximum number of Screenshot files can be set using LSD 65.

1.5 Reading/Writing Data from/to Memory Card

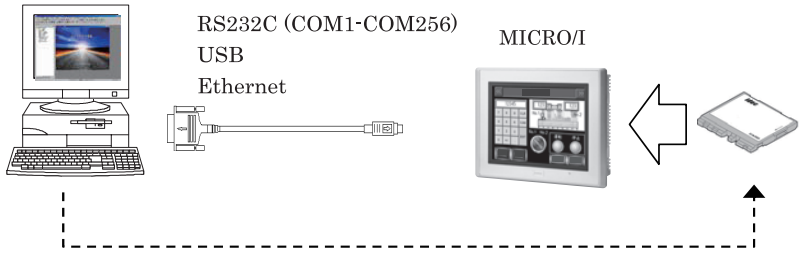
HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X		X		X	X

Only HG3G, HG2F/3F/4F support this function

1.5.1 Reading and Writing to a Memory Card inserted into the MICRO/I

- Using WindO/I-NV2

The target of the maintenance is the data in the Memory Card Access Folder specified with the project currently being run on the MICRO/I.



The maintenance option can be selected from the [Home] - [Project] commands from the WindO/I menu.

Item		Description
Download	Files to Memory Card	After stopping the RUN operation of MICRO/I, downloads the Recipe file to the RECIPE folder in the Memory Card inserted in the MICRO/I. In case of HG3G, you can also download the picture and the sound files.
	Files to Memory Card while running	Without stopping the Run operation of MICRO/I, downloads the Recipe file to the RECIPE folder in the Memory Card inserted in the MICRO/I. In case of HG3G, you can also download the picture and the sound files.
Upload	Stored files in Memory Card	Without stopping the RUN operation of MICRO/I, uploads the Alarm Log Data, Data Log Data, Recipe Data, and Screenshot files stored in the Memory Card inserted in the MICRO/I. In case of HG3G, you can also upload the picture and the sound files.

- Using Downloader

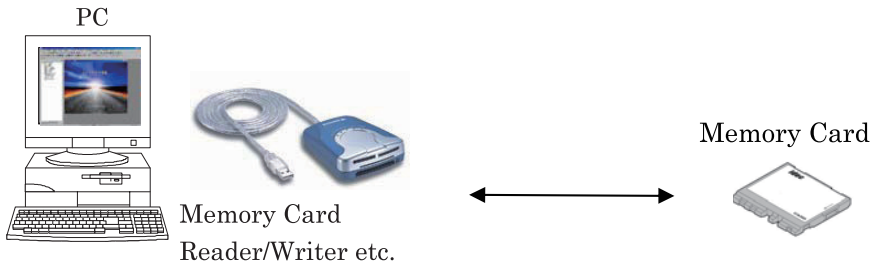
  In Downloader, under "Memory Card Maintenance", click "Download Files to Memory Card" or "Download Files to Memory Card while running". Downloader saves the files to the Access Folder of the SD Memory Card inserted into the MICRO/I.

1.5.2 Reading and writing to a Memory Card inserted into the PC

- Using WindO/I-NV2

  Access the data in the Memory Card using any Memory Card reader/writer.

Communication with	Memory Card



Setting Item	Description
Drive	Select the drive to be allocated to the Memory Card.
Network	Click the Network button to display the Map Network Drive if you use the network drive.
Memory Card Access Folder	Select the folder which the project data will be downloaded from or uploaded to.

WARNING

To open a ZNV format project file using WindO/I-NV2, the project file must be saved under the Memory Card Access folder.(see the following example)
\"Memory Card Access folder"\Project file(ZNV file format)
After saving the project file to the folder, select "Memory Card" in "Communication Settings" dialog box in "Home" tab in WindO/I-NV2, click "Upload" in "Home" tab, and then select the access folder in "Select Memory Card Access Folder" dialog box.

- Using File Manager installed in your PC

  Copy files to a memory card inserted into a PC using Windows Explorer etc.
  To replace picture, sound, and recipe files used with MICRO/I, save the files with the same names in the folders under the Access Folder. Refer to Chapter 5 “2.3 Media File Formats” on page 91 for the details on picture and sound files that can be used with MICRO/I.

1.5.3 Memory Card Writing Timing

When the Alarm Log data and Data Log data with Real Time are written to the Memory Card, they are stored the output buffer once.

The Memory Card writing timing from the output buffer to the Memory Card is as follows.

- Within 3 minutes of the Memory Card output event occurring.
- When the HG Special Relay LSM 20 turns from 0 to 1.
- When you attempt to switch to the System menu.
- When you attempt to download or upload the project data.
- When you push the access pause button.

WARNING

When the operation mode changing (changing to the system menu, downloading or uploading the project) is being attempted while the output file buffer is not empty or CF card is being accessed, the operation mode is changed after writing the buffering data to the CF card automatically and stopping accessing files. The communication error might be occurred for this reason while downloading or uploading the project. In this case, please try to download or upload again, it will work fine.

1.5.4 Access Lamp

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X		X		X	X

Only HG3G, HG2F/3F/4F support this function

Operator interfaces equipped with a Memory Card interface have an access lamp (LED) to indicate the access status of the Memory card. It is also possible to determine the access status of the Memory card by monitoring LSM21. The access lamp states and status descriptions are as follows.

Access lamp state	LSM21 state	Status	Status generation conditions	Operation
Off	OFF	Memory card access stopped	No memory card is inserted. Unsupported Memory card is inserted. Unformatted Memory card is inserted. Memory card access is not possible because the access stop button[*1] has been pressed.	The Memory card can be removed.
Slow blink (ON/OFF every 0.5 seconds)	OFF	Recognizing memory card.	When a Memory card is inserted. When the power is switched on with a Memory card inserted. A short time after slow blinking the lamp will stay on.	
	ON	Waiting for access stop	When the access stop button[*1] is pressed. When LSM20 goes from OFF to ON. A short time after slow blinking the lamp will stay off.	Do not remove the Memory card.
Rapid blink (ON/OFF every 0.2 seconds)	ON	Reading/writing data	When data is being written to or read from the Memory card. However, the lamp stays lit when a project copy operation is being executed, or when data is being written to or read from the Memory card while waiting for the operating mode to switch.	
Lit	ON	Memory card standby state	A usable Memory card is inserted, and access is possible.	

*1. Only HG3F/4F support

Main operation examples

Operation	State of the Access Lamp
At power up When a Memory card is inserted	Off -> Slow blink -> On
When the access stop switch is pressedLSM20 goes from OFF to ON	On -> Slow blink -> Off
Read/write from/to the Memory card (e.g. during screenshot is executing)	On -> Rapid blink -> Off (Reading/writing finished)

1.6 Cautionary Notes

1.6.1 CF Card

- To format a CF Card, use [Initial Setting] - [CF Card] - [Initialize] in the operator interface system menu.
- There is a limit to the number of times that a CF Card can be written to.
  Backup your CF Card data on a periodic basis.
- Never switch off the power or pull out a CF Card while it is being accessed, as this may result in destruction of the stored data. If the data on a CF Card is corrupted, reformat the CF Card.
- Use one of the following procedures to switch off the power and remove a CF Card. “Saving CF card data” message is shown until finish accessing the CF Card. To restore CF Card access, insert the CF Card again.
  1. When you press the CF Card access stop switch, the access lamp will flash. When the operator interface finishes accessing the CF Card this lamp will go off. You can remove the CF Card at this time.
  2. Set the special operator interface special internal register LSD20 to 1, and then confirm that the operator interface special internal register LSD21 is 0. You can then remove the CF Card.
- If the application accesses to the CF Card during running, insert the CF Card into the slot before turning on the MICRO/I. If access to the CF Card fails, the CF Card access error bit in the system area will go ON.
- If you want to use a CF Card on a computer that is not equipped with a PCMCIA slot or CF Card slot, procure a third-party CF Card reader/writer.
- “This CF card not available” message is shown when incompatible card is inserted.
- Never move, clear, or edit files in the PICTURE folder and USRDAT folders because they are saved in the original format.

1.6.2 SD Memory Card

- To format a SD Memory Card, use [Initial Setting] - [SD Memory Card] - [Initialize] in the operator interface system menu.
- There is a limit to the number of times that a SD Memory Card can be written to. Backup your SD Memory Card data on a periodic basis.
- Never switch off the power or pull out a SD Memory Card while it is being accessed, as this may result in destruction of the stored data. If the data on a SD Memory Card is corrupted, reformat the SD Memory Card.
- Before turning off the power or removing an SD Memory Card, set HG Special Relay LSM20 to "1" and check that HG Special Relay LSM21 is "0". “Saving SD Memory Card data” message is shown until finish accessing the SD Memory Card. To restore SD Memory Card access, insert the SD Memory Card again.
- If the application accesses to the SD Memory Card during running, insert the SD Memory Card into the slot before turning on the MICRO/I. If access to the SD Memory Card fails, the SD Memory Card Access Error bit in the system area will go ON.
- If you want to use a SD Memory Card on a computer that is not equipped with a SD Memory Card slot, procure a third-party SD Memory Card reader/writer.
- “This SD Memory Card not available” message is shown when incompatible card is inserted.
- Do not alter Project (ZNV format) or PLC Program files (ZLD format). Altered files cannot be used with MICRO/I or PLCs.

2 USB flash drive

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

2.1 Specification

An USB flash drive with the following specifications can be used with the MICRO/I.

- Maximum capacity of 32 GB.
- An USB flash drive using the FAT-12/16/32 file system can be used. Data can be exchanged using an OS of Windows 95 or later.
- Roman alphabetical character and number can be used.
- File names may be up to 120 characters long. (Includes file name extensions.)
- File paths may be up to 250 characters long. (Includes file name extensions and drive characters.)
- The maximum size of files that can be read and written is 256MB.
- Volume labels cannot contain the following characters:

  " & ( ) * + , . / : ; < > [ ] \ = | ^
- File and directory names cannot contain the following characters:

  \ / : * ? " < > |

2.2 Compatibility

The use of SanDisk USB memory devices is recommended. When using an USB flash drive that is provided by a third party, please consult our representatives.

2.3 Functions

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

- USB AutoRun (refer to “2.3.1 USB AutoRun function” (P.510) in this chapter)
- USB Auto Popup Screen Display (refer to “2.3.2 USB Auto Popup Screen” (P.515) in this chapter)
- Project Transfer, PLC Program Transfer and File Operations (refer to Chapter 28 “28 Data Transfer Function” on page 479)

2.3.1 USB AutoRun function

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

The USB AutoRun function automatically executes predefined processes when a USB flash drive is inserted into the MICRO/I. The following processes can be automatically executed:

- Downloading or Uploading a project data
- Downloading or Uploading PLC Program for IDEC PLCs
- Copying files between SD Memory Cards and USB flash drives

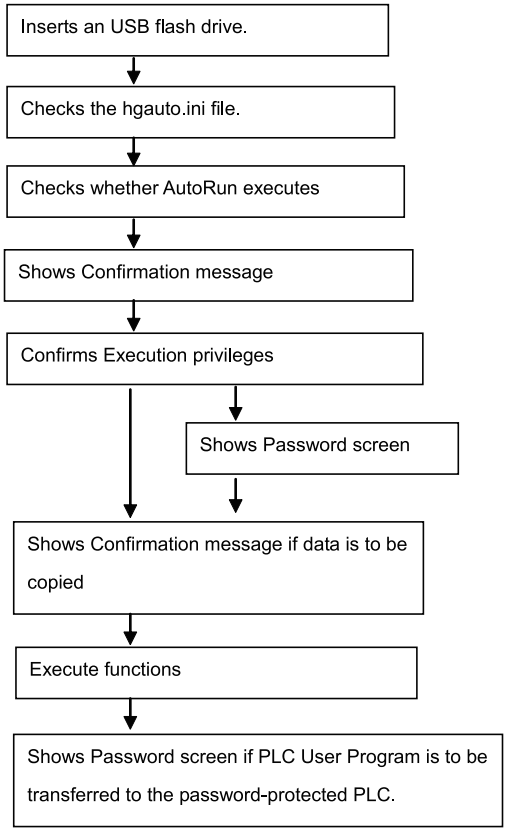
To use the USB AutoRun function, the root folder of the USB flash drive must contain a USB AutoRun definition file (a text file called "hgauto.ini"). The USB AutoRun function executes the processes defined in this file. Refer to “Format of USB AutoRun definition files” (P512) in this chapter for instructions on how to create USB AutoRun definition files.

- Flow of processing

  When a USB flash drive is inserted, the MICRO/I checks whether a USB AutoRun definition file exists in the root folder. If the file does not exist or if the file is corrupted, the USB AutoRun function does nothing. The USB AutoRun function also does nothing if it is disabled under MICRO/I settings. (Refer to “MICRO/I Settings” (P515) in this chapter for more information on disabling the USB AutoRun function.)

  If the root folder of the USB flash drive contains a valid USB AutoRun definition file, the system asks the operator whether or not they want to execute the processes in the USB AutoRun definition file. If the operator chooses to execute the processes, they may be asked to enter a password, depending on the nature of the processes defined in the file. If the correct password is entered, all the processes defined in the USB AutoRun definition file are executed.

The operator is only asked to choose whether or not to execute the process and to enter a password once, even if multiple processes are defined in the USB AutoRun definition file. (The operator may be required to enter a separate password if transferring the PLC Program to a password-protected PLC.)



- Security

  Shows a password entry screen when USB AutoRun is executed in conjunction with the security functions set for the project. In this event, the required password is the password required to execute all commands defined in the USB AutoRun definition file (hgauto.ini). (Refer to examples below.)

  If the correct password is entered on the password screen, a confirmation message is displayed. If an incorrect password is entered or if password entry is cancelled, no commands are executed. To re-execute the USB AutoRun function, insert the USB flash drive again.

  Execution Privileges:

Functions	Administrator	Operator	Reader
Download Project	X	---	---
Upload Project	X	---	---
Download PLC Program	X	---	---
Upload PLC Program	X	---	---
Copy files (from USB flash drive to SD Memory Card)	X	X	---
Copy files(from SD Memory Card to USB flash drive)	X	X	X

Security function example:
If the USB AutoRun definition file contains the Project Data Transfer, PLC Programs Transfer or File Copy from memory cards to USB flash drives, the password associated with the highest user privileges required in order to execute Project Data Transfer is requested.

- Format of USB AutoRun definition files

Items defined in USB AutoRun definition files are indicated below:

[AUTORUN] section:
Specifies the number of commands executed by the USB AutoRun function.

Key	Description
item	Specifies the number of commands to be executed. (1 to 5) Using other numbers here results in an error, and no commands are issued.

[COMMNAD] section
Specify the commands executed by the USB AutoRun function. Up to 5 commands from “COMMAND_1” to “COMMAND_5” can be used in the COMMAND section. Commands are executed in order from 1 to 5.

Key	Description
“ command”	Specify any of the following commands: PRO_DOWNLOAD: Download Project Data PRO_UPLOAD: Upload Project Data LDR_DOWNLOAD: Download PLC Program LDR_UPLOAD: Upload PLC Program FILE_COPY: File Copy For descriptions of commands and corresponding formats. Refer to “Command Names and Parameters” (P512) in this chapter.

- Command Names and Parameters

[Download Project Data]:
Downloads a project file saved on an SD Memory Card or USB flash drive to the MICRO/I. Only project files with the ZNV format can be used with this command.
After a project file is downloaded, the MICRO/I resets itself and then starts running.

Required settings	Description
command	PRO_DOWNLOAD
src_path	Specify the path to the project file you want to download.

[Upload Project Data]
Uploads the project file running on the MICRO/I, and saves it to an SD Memory Card or USB flash drive. Files are saved in ZNV format.
After a project file is uploaded, the MICRO/I resets itself and then starts running.

Required settings	Description
command	PRO_UPLOAD
dst_path	pecify the path to the folder where the uploaded project file will be saved.

[Download PLC Program]
Downloads a ZLD file saved on an SD Memory Card or USB flash drive to a PLC connected to the MICRO/I. Only PLC Programs with the ZLD format can be used with this command. For supported PLCs, precautions, and restrictions, refer to Chapter 28 “2 PLC Program Transfer” on page 487.

Required settings	Description
command	LDR_DOWNLOAD
src_path	Specify the path to the PLC Program you want to download.
dst_port	Specify the port of the MICRO/I to which the destination PLC is connected.
dst_net_no	Specify the Network number of the destination PLC.

[Upload PLC Program]
Uploads an user program executed on a PLC and saves it on an SD Memory Card or USB flash drive. Files are saved in ZLD format. For supported PLCs, precautions, and restrictions, refer to Chapter 28 “2 PLC Program Transfer” on page 487.

Required settings	Description
command	LDR_UPLOAD
dst_path	Specify the path to the folder where the uploaded PLC Program file will be saved.
src_port	Specify the port of the MICRO/I to which the source PLC is connected.
src_net_no	Specify the Network number of the source PLC.

[File Copy]
Copies files between an SD Memory Card and a USB flash drive. If a file name is set as the source path name, the specified file is copied. If a folder name is specified, all files contained in the folder are copied. However, sub folders and files included in sub folders are not copied.

Required settings	Description
command	FILE_COPY
src_path	Specify the path of a source file or folder to copy.
dst_path	Specify a destination folder.

- Source and destination paths

Drive names for external memory devices are as follows:

SD Memory Card	A:\
USB flash drive	B:\

The Port and the Network number when PLC Program is transfered:
The source or destination PLC must be specified when downloading or uploading PLC Program. PLC is specified by the MICRO/I communication port and the PLC Network number.

Port:
MICRO/I communication ports that can be specified for src_path and dst_path are as follows:

Port	Description
COM1	Serial Interface (COM1) D-sub 9pin
COM2	Serial Interface (COM2) Terminal

Network number:
For the network number specified for src_net_no or dst_net_no, specify the same network number (device number) as that set for the PLC.

- Comments

Use semicolons for comments in the USB AutoRun definition file. All text between a semicolon and the next return is treated as a comment.

- Restrictions

The maximum characters in a line are 512 characters. If there are more than 512 characters, the line is ignored.
If the ""hgauto.ini"" file size is more than 512Kbyte, the file can not be used.
If there are Japanese characters, they must be Shift-JIS as character code.
The line feed code must be ""CR"" + ""LF"" which is usually used in Windows. If the other line feed code are used in ""hgauto.ini"", they may not work.

- Examples

The following is an example of a USB AutoRun definition file (hgauto.ini):

```
------------------------------------------------------------------------------------------------------------------------
; hgauto.ini Example
[AUTRUN]
item = 3                                        ;Number of commands
[COMMAND_1]
command = PRO_DOWNLOAD                          ;Command Type Project Download      } 1
src_path = "B:\NV2DATA\HG_PROJECT.ZNV"          ;Source Path

[COMMAND_2]                                     ;Command Type File Copy
command = FILE_COPY                             ;Source Path
src_path = "B:\Error.wav"                       ;Destination Path                   } 2
dst_path = "A:\HGDATA01\SOUND"

[COMMAND_3]                                     ;Command Type PLC Program Download
command = LDR_DOWNLOAD                          ;Source Path
src_path = "B:\LDRDATA\LDR_PROGRAM.ZLD"         ;Destination Port No.               } 3
dst_port = COM1                                 ;Destination Network No.
dst_net_no = 0
------------------------------------------------------------------------------------------------------------------------
```

Explanation
1 Downloading a project file from a USB flash drive.

[COMMAND_1]	Specify the first command to be executed.
command = PRO_DOWNLOAD	Execute “Download Project Data”.
src_path = "B:\NV2DATA\HG_PROJECT.ZNV"	Download the project file stored in the temporary folder (\NV2DATA) of the USB flash drive (B:).

2 Copying a sound file from a USB flash drive to an SD Memory Card.

[COMMAND_2]	Specify the second command to be executed.
command = FILE_COPY	Execute “File Copy”.
src_path = "B:\Error.wav"	
dst_path = "A:\HGDATA01\SOUND"	Copy the specified sound file stored in the temporary folder of the USB flash drive (B:) to the sound data folder (/HGDATA01/SOUND) on the SD Memory Card (A).

3 Downloading a PLC Program.

[COMMAND_3]	Specify the third command to be executed.
command = LDR_DOWNLOAD	Execute “Download PLC Program”.
src_path = "B:\LDRDATA\LDR_PROGRAM.ZLD"	Download a PLC Program stored in the ladder data folder (/LDRDATA) of the USB flash drive (B:) to the PLC (Network number is “0”) connected to the MICRO/I's COM1 port. dst_port = COM1
dst_port = COM1	
dst_net_no = 0	

- MICRO/I Settings

  Sets whether or not to execute the USB AutoRun function when a USB flash drive is inserted in MICRO/I. This setting can be changed in the Project Settings on WindO/I-NV2 or from the System menu on MICRO/I. Refer below for details.

  - Sets whether or not to execute the USB AutoRun function by using WindO/I-NV2. (refer to Chapter 5 “1.8 USB Flash Drive” on page 89)
  - Set whether to enable or disable the USB AutoRun function from the System menu. (Refer to Chapter 35 “2 Settings” on page 550)

Do not remove or insert an SD Memory Card or USB flash drive while the USB AutoRun function is executing.

2.3.2 USB Auto Popup Screen

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

The USB Auto Popup Screen function opens a specified Popup Screen when a USB flash drive is inserted into the MICRO/I. Popup Screens can be used to easily backup data and replace Project Data and PLC Programs.

- Flow of processing

  When a USB flash drive is inserted into a MICRO/I that has the USB Auto Popup Screen function enabled, the specified Popup Screen opens automatically.

- Security

  If a password has been set for the Popup Screen displayed by the USB Auto Popup Screen function, the password will be required. However, password entry is not required if you have logged in as a user with sufficient privileges to display the screen in question.

- MICRO/I Settings

  Set the screen number and display position of the Popup Screen that you want the USB Auto Popup Screen function to open. These settings can be changed in the Project Settings on the WindO/I-NV2. Refer below for details.

  Sets whether or not to execute the USB Auto Popup Screen function by using WindO/I-NV2. (refer to Chapter 5 “1.8 USB Flash Drive” on page 89)

WARNING When the USB Auto Popup Screen function is enabled, if the USB flash drive contains a definition file (hgauto.ini) for use with the USB AutoRun function, both functions will run.

2.4 Reading/Writing Data from/to USB flash drive

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

2.4.1 Reading and Writing to an USB flash drive inserted into the MICRO/I

- Using WindO/I-NV2

2.4.2 Reading and writing to an USB flash drive inserted into the PC Using WindO/I-NV2

2.4.3 USB flash drive Access Status

For HG3G units with a USB interface, USB flash drive access status can be monitored with HG Special Relay LSM 19. The status descriptions are as follows.

Status	LSM21 state	Status generation conditions	Operation
USB flash drive access stopped	OFF	No USB flash drive is inserted. Unsupported USB flash drive is inserted. Unformatted USB flash drive is inserted.	The USB flash drive can be removed.
Recognizing USB flash drive.	OFF	When a USB flash drive is inserted. When the power is switched on with a USB flash drive inserted.	
Waiting for access stop	ON	When LSM18 goes from OFF to ON.	Do not remove the USB flash drive.
Reading/writing data	ON	When data is being written to or read from the USB flash drive.	
USB flash drive standby state	ON	A usable USB flash drive is inserted, and access is possible.	

2.5 Cautionary Notes

- To format a USB flash drive, use [Initial Setting] - [USB flash drive] - [Initialize] in the operator interface system menu.
- There is a limit to the number of times that a USB flash drive can be written to. Backup your USB flash drive data on a periodic basis.
- Never switch off the power or pull out a USB flash drive while it is being accessed, as this may result in destruction of the stored data. If the data on a USB flash drive is corrupted, reformat the USB flash drive.
- Multiple USB memory devices cannot be used at the same time.
- Before turning off the power or removing an USB flash drive, set HG Special Relay LSM18 to "1" and check that HG Special Relay LSM19 is "0". “Saving USB flash drive” message is shown until finish accessing the USB flash drive. To restore USB flash drive access, insert the USB flash drive again.
- “This USB flash drive not available” message is shown when incompatible USB flash drive is inserted.
- Do not alter Project (ZNV format) or PLC Program files (ZLD format). Altered files cannot be used with MICRO/I or PLCs.
- USB hub can not be used.

Chapter 31 Printer

1 Printer Functions

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
		X	X	X	X	X

Only HG1F/2F/2S/3F/4F support this function

The following functions can be used with the MICRO/I equipped with a parallel interface or RS-232C serial interface 2 (SIO2)

- Alarm Log Output

  (refer to Chapter 14 “1 Overview” on page 276)

- Screen hardcopy

  (refer to Chapter 9 “4 Print Button” on page 160 and refer to Chapter 13 “4 Print Command” on page 268)

2 Enable Printers

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
		X	X	X	X	X

Only HG1F/2F/2S/3F/4F support this function

Printer Code/ Manufacturer	Usable Printers (Updated on September, 2006)	MICRO/I Type			
		HG3F/4F		HG1F/2F/2S (SIO2)	
		Parallel Interface	Serial Interface	Serial Interface	USB
ESC/P	Printers that support control code ESC/P Printers with proven operation - SEIKO EPSON CORPORATION MJ-6000C, LP-2500, VP-700 - CANON INC BJ M70	X	X (VP-700)	X (VP-700)	---
PC-PR	Printers that support control code PC-PR Printers with proven operation - SEIKO EPSON CORPORATION MJ-6000C, VP-700	X	X (VP-700)	X (VP-700)	---
PCL	Printers that support control code PCL Printers with proven operation Hewlett-Packard Company Desk jet 3820	X	---	---	---
SII	SII DPU-414	X	X	X	---
ESC/P Raster	EPSON Stylus C83, C84, C87, C88, D88 (SEIKO EPSON CORPORATION PX-V600, PX-V630) Printers with proven operation StylusC84, PX-V600, PX-V630	X	---	---	X

3 Limitation

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
		X	X	X	X	X

Only HG1F/2F/2S/3F/4F support this function

- Color printing is not supported for PCL. When you select the “SII” in the Print language, the outputs are always printed in monochrome.
- 24-pin impact printer is supported, but 9-pin impact printer is NOT supported for ESC/P. And, the printer command that is not ECP like ESC/P2 and ESC/Page is not supported.
- When “PCL” is selected from the Printer Code, and a print job is cancelled by using the Print Button/Command, the paper will not be ejected if HP printer is used. Operate the printer to eject the paper from the printer manually before performing the next print job. When the next print job is executed without ejecting the paper, the next data will be printed where the previous printing was aborted. (refer to Chapter 5 “1.5 Printer” on page 89)
- When connecting the HG2F with a printer using a USB cable, make sure not to use a hub.
- If your printer is not described in the above list, please make sure that it works before using.

Chapter 32 USB

1 USB Functions

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X		X			

Only HG3G, HG2F support this function

The following functions can be used with the MICRO/I equipped with USB interface.

- Online

  Refer to Chapter 24 “Online Function” on page 425.

- Debug

  Refer to Chapter 25 “2 Debugging using the WindO/I-NV2” on page 435.

- Barcode reader

  Refer to Chapter 4 “5 User Communication” on page 32.

- Printing Alarm Log Data

  Refer to Chapter 14 “Alarm Log Function” on page 275.

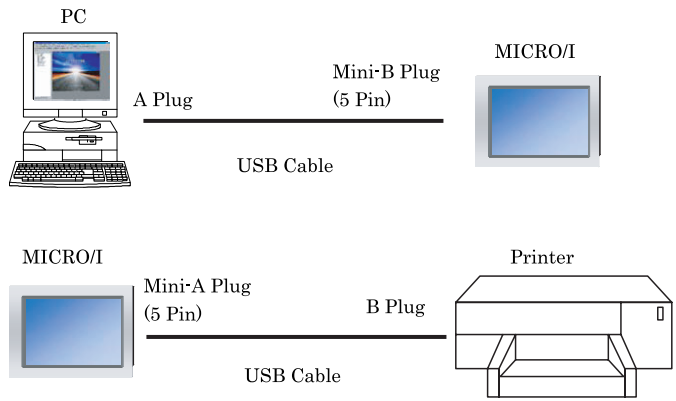
- Printing Screenshots

  Refer to Chapter 9 “4 Print Button” on page 160, refer to Chapter 13 “4 Print Command” on page 268.

	HG3G	HG2F
Online	Supported	Supported
Debug	Supported	Supported
Barcode reader (User Communication)	Supported	Not supported
Printing Alarm Log Data (Printer)	Not supported	Supported
Printing Screenshots (Printer)	Not supported	Supported

WARNING

- To use USB port of HG2F, the OS should be Windows 2000/XP/Vista/7, and USB1.1 should be available. 64-bit Windows is not supported.
- You must install WindO/I-NV2 or Downloader prior to connecting HG2F using USB the first time. If you connect without the installation, OS invokes the dialog to install appropriate software driver. At that time, select cancel, and then install one of above prior to connecting. If one of above is installed properly, the software driver will be loaded automatically.



2 Installation procedure for USB Driver

HG2G	HG1F	HG2F	HG2S	HG3F	HG4F
		X			

Only HG2F supports this function.

You need to install USB driver to use HG2F. Follow the steps below to install driver of the HG2F.

2.1 Note

Static electricity sometimes affects USB communication depending on using USB hub or environment. If you find unstable behavior with USB equipment, the problem can be fixed disconnecting USB equipment and power waiting a few seconds and then reconnecting, or connecting HG2F to the PC directly without using HUB.

2.2 Install

- You have to install WindO/I-NV2 or Downloader to copy essential files to appropriate places prior to the first time connection
- The installation is preceded while connecting HG2F to the PC at the first time.
- To use USB port of HG2F, the OS should be Windows 2000/XP/Vista/7, and USB1.1 should be available. 64-bit Windows is not supported.

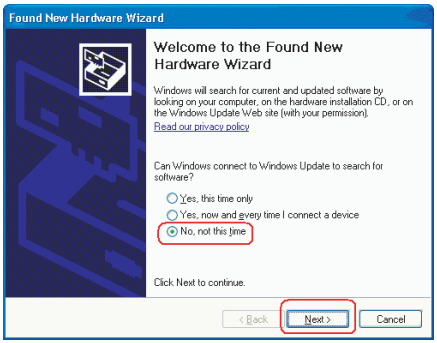
2.2.1 Windows XP

Follow the steps below to install driver for Windows XP.

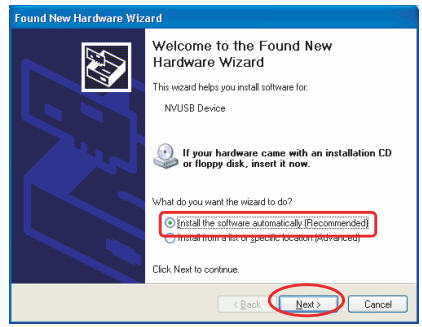
You have to install WindO/I-NV2 or Downloader in advance.

Procedure

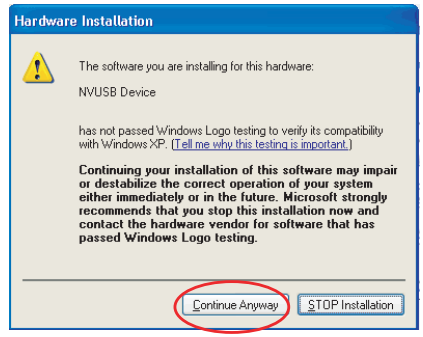
1. Power on the HG2F and the computer where you will connect. Then connect via USB Connection Cable.
2. Windows XP will display the notification “Found New Hardware” and the Found New Hardware Wizard will open.
   If Windows XP Service Pack 2 has been installed, the following dialog appears. If not, go to the next step.
   Select “No, not this time” and click “NEXT”.



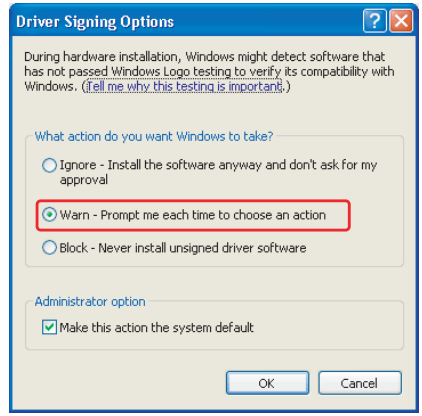
3. Make sure to select the “Install the software automatically (Recommended)” radio button. Click “NEXT”.



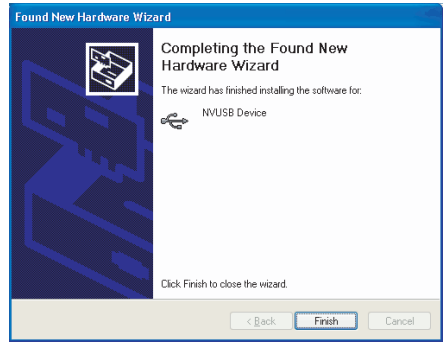
4. Confirm “NVUSB Device” is displayed, and click “Continue Anyway”. When the installation is canceled without appearing this dialog box, please check the next section then install again.



5. As default status, the dialog in the previous section will appear. If not, please check Driver Signing Option. Right-click “My Computer” on the desktop and select “Properties”. Select the tab, “Hardware” and then use in the section “Device Signing” - “Driver Signing Option”. Select “Warn”. Reboot the system and install again.



6. “Completing the Found New Hardware Wizard” will be displayed. The wizard will notify you when the installation is complete.
Click FINISH to close the wizard.



2.2.2 Windows 2000

Follow the steps below to install driver for Windows 2000.
You have to install WindO/I-NV2 or Downloader in advance.

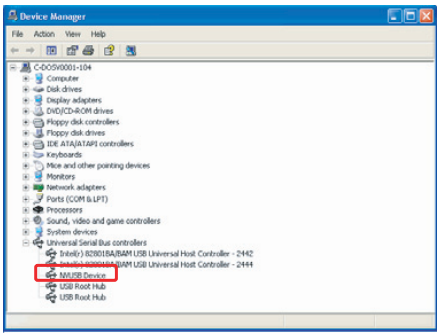
Procedure

1. **Power on the MICRO/I and the computer where you will connect. Then connect via USB Connection Cable.**

2. **Windows 2000 will display the notification “Found New Hardware” and the Found New Hardware Wizard will open. The driver will be installed automatically.**

2.3 Check for a correct driver installation

A successful installation shows an NVUSB Device in the system Device manager in the USB controller group (This is an example image of Windows XP).



This item will disappear disconnecting USB connection or power of MICRO/I. If it shows “Unknown device” or question mark even if it is connected, reconnect and check again. If it is not still recognized, remove the driver from the device manager then reconnect and install again.

3 Limitation

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X		X			

Only HG3G, HG2F support this function

WARNING

- To use USB port of MICRO/I, the OS should be Windows 2000/XP/Vista/7, and USB1.1 should be available. 64-bit Windows is not supported.
- Two or more HG2F/3G units cannot be connected to a PC at one time by using the USB port.
- Please use same port to connect. If using different port, it takes some time to recognize the device first time.
- USB hub can not be used.
- When connecting with a printer, make sure not to use a hub.

Chapter 33 Ethernet

1 Ethernet Functions

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X				X	X

Only HG2G/3G, HG3F/4F support this function

When using a HG2G/3G, HG3F/4F with the Ethernet port, the following functions can be used by configuring TCP/IP settings.

- Online

  Refer to Chapter 3 “Connecting to the MICRO/I” on page 21.

- Debug

  Refer to Chapter 25 “Debugging using the WindO/I-NV2” on page 435.

- Web Server

  Refer to Chapter 27 “Web Server Function” on page 454.

1.1 TCP/IP Settings

Ethernet communication requires that you perform TCP/IP settings (IP address, subnet mask, and default gateway). If the default gateway setting is not required, you may leave it blank. The format is “xxx.xxx.xxx.xxx”, where “xxx” is a number between 0 and 255.

Setting Item	Description	Default Value
IP address	Set the IP address	“192.168.0.1”
Subnet mask	Set the subnet mask	“255.255.255.0”
Default Gateway	Set the default gateway (leave blank if no setting is required)	“”

If there are multiple units on the same network, ensure that their IP addresses are unique, and set the same setting for the subnet mask to all units.

2 Warning for the Ethernet

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X				X	X

Only HG2G/3G, HG3F/4F support this function

Link LED/Tx LED

- The Link LED illuminates when the HG2G/3G, HG3F/4F is connected to the network properly.
- The Tx LED illuminates while the HG2G/3G, HG3F/4F is transmitting data. (The LED appears to be flashing.)

Chapter 34 Internal Devices

1 Overview

The display operation of the MICRO/I is generally set to be controlled by the state of the host devices, and the MICRO/I devices are not normally used.

However, since the data resulting from commands and parts are stored temporarily in internal relays and registers, the MICRO/I does required internal devices of its own.

2 Internal MICRO/I Devices

The MICRO/I contains the following internal devices.

Internal Device Name	Symbol	B/W	R/W	Address Range	Base
HG Internal Relay	LM	B	R/W	0 to 2047	10
HG Keep Relay	LK	B	R/W	Variable	10
HG Temporary Relay	LBM	B	R/W	0 to 127	10
HG Special Relay	LSM	B	R/W	0 to 63	10
HG Timer Relay	LTC	B	R	0 to 31	10
HG Expansion Input (Bit)	LPX	B	R	0 to F	16
HG Expansion Output (Bit)	LPY	B	R/W	0 to F	16
HG Input (Bit)*1	LX	B	R	0 to 3	16
HG Output (Bit)*1	LY	B	R/W	0 to 1	16
HG Digital Input (Bit)*2	LEX	B	R	0 to 77	8
HG Digital Output (Bit)*2	LEY	B	R/W	0 to 77	8
HG Data Register	LDR	W	R/W	0 to 8191	10
HG Keep Register	LKR	W	R/W	Variable	10
HG Temporary Register	LBR	W	R/W	0 to 127	10
HG Timer (Current)	LTD	W	R	0 to 31	10
HG Special Internal Register	LSD	W	R/W	0 to 127	10
HG Link Register	LLR	W	R/W	0 to 63	10
HG Expansion Input (Word)	WLPX	W	R	0	16
HG Expansion Output (Word)	WLPY	W	R/W	0	16
HG Input (Word)*1	WLPX	W	R	0	16
HG Output (Word)*1	WLPY	W	R/W	0	16
HG Digital Input (Word)*2	WLEX	W	R	0,20,40,60	10
HG Digital Output (Word)*2	WLEY	W	R/W	0,20,40,60	10

*1. Only HG2S supports.
*2. Only HG3G supports.

- B/W is an abbreviation of Bit/Word.
  R/W is an abbreviation of Read/Write.
  R/W indicate that both reading and writing are possible, while R indicates that only reading is possible.
- In the HG2S expansion input bits 0 to 7 and expansion output bits 0 to 7 are usable.

- HG Internal Relay (LM)

  The HG internal relay is an internal relay contained within the MICRO/I. There are 2048 points relay.

- HG Keep Relay (LK)

  The HG Keep Relays are internal MICRO/I relays. The state of these relays is retained during power OFF. The maximum number of HG keep relays depends upon the number set in WindO/I-NV2

- HG Temporary Relay (LBM)

  The HG temporary relay is a temporary relay contained within the MICRO/I. A value of 0 is written in the HG temporary relays when the screen, text group or user account is changed, and when the display screen is reset. There are 128 temporary relay points.

- HG Special Relay (LSM)

  The 64 points of the HG special relay are used to perform the following special operations.

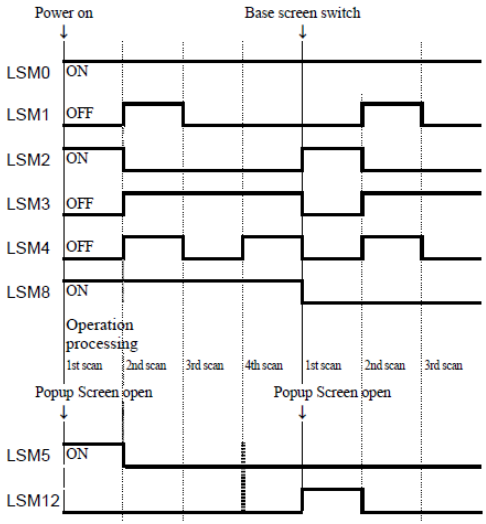
HG Special Relay	Function/Part
LSM0	Always on
LSM1	ON only when a Base screen is switched with a second scan
LSM2	ON only when a Base screen is switched with a first scan
LSM3	OFF only when a Base screen is switched with a first scan
LSM4	Switches between ON/OFF every scan
LSM5	ON only when a Popup screen is opened with a first scan
LSM6	ON while the touch panel is being pressed
LSM7	Switches between ON/OFF each time data is read from every host device (Read Scan)
LSM8	When the power is first switched on, this contact stays ON until the first screen that is displayed is switched
LSM9	When switched from OFF to ON flash memory data is written to Keep Relay and Keep Register.
LSM10	When switched from OFF to ON, the Keep Relay 0-1023 and Keep Register 0-1023 data, and current backlight settings are transferred to the flash memory
LSM11	When switching the base screen, this goes from OFF to ON when all host devices being used have been read, and stays ON until the screen switches.
LSM12	ON only when a Popup screen is closed with a first scan
LSM13	It is set to OFF right after opening the Popup screen. Then it is set to ON after reading all using host devices in this screen.
LSM14	Switched to ON when the value of the reference device used in the current Base Screen changes, which triggers reading of the reference device. Switched to OFF when the reading is complete.
LSM15	Switched to ON when the value of the reference device used in the current Popup screen changes, which triggers reading of the reference device. Switched to OFF when the reading is complete.
LSM16 to 17	Reserved
LSM18	Accessing data from the Memory Card stops when this bit is switched from OFF to ON.
LSM19	This Bit is ON during Memory Card access.
LSM20	Access to the Memory Card stops when this bit is switched from OFF to ON.
LSM21	Bit is ON during Memory Card access.
LSM22	If the number of operation logs generated by one operation is over the limitation, LSM22 turns ON.
LSM23	This bit is ON while copied.
LSM24 to 26	Reserved
LSM27	Stops playing the sound file when this bit is turned from OFF to ON.
LSM28 to 47	Reserved
LSM48	Switches between ON/OFF every 100ms (200ms clock)
LSM49	Switches between ON/OFF every 500ms (1 second clock)

HG Special Relay	Function/Part
LSM50	When switched to ON, limits the host communications and gives priority to the communications between the PC and PLC. (Enabled only when using the Pass-Through function.)
LSM51to 63	Reserved

- Since the Special Internal Relay can be written to, even if a write is attempted, the contents will not change.
- Transfer of the LSM10 Keep Relay and Keep Register to the flash memory can take an excess of one second.Writing to the Flash Memory can be repeated a maximum of 100,000 times. Keep writing to the Flash Memory to a minimum.
- LSM 1/2/3/11 also operates when switches the Text Group.
- Once LSM22 turns ON, it will remain ON until MICRO/I recycles power or 0 is manually written to LSM22.

A scan refers to a period during which all parts placed on a screen are processed. It is not related to the period of reading host devices.

This operation of this relay is illustrated in the timing chart below.



- HG Timer Relay (LTC)

  The HG Timer (single-bit I/O point) is a relay switched on by a part timer.

  The Display Timer can use 32 points.

- HG Expansion Input (LPX), HG Expansion Output (LPY)

  With the HG2G/3G, HG1F/2F/3F/4F these are expansion unit input and output relays installed at the back. You can use 16-point (bit device) or 1-point (word device) expansion input and expansion output.

  With the HG2S these are input and output relays that are used with models that have L6 series square-type switches on the upper switch block. You can use 8-point (bit device) or 1-point (word device) expansion input and expansion output.

Refer to MICRO/I Hardware Manual for the correspondence between the push-button switches and the expansion I/O.

- HG Input (LX), HG Output (LY)

  These are the HG2S input and output relays.

  With a bit device 4 external input points and 3 external output points can be used, and with a word device 1 point of external input and output can be used.

- HG Digital Input (LEX), HG Digital Output (LEY)

  Digital input/output relay for expansion unit connected to HG3G.

- HG Data Register (LDR)

  The HG Data Register is an internal MICRO/I register. 8192 points are available.

- HG Keep Register (LKR)

  The HG Keep Registers are internal MICRO/I registers. The value in these registers is retained during power OFF. The maximum number of HG Keep Register depends upon the number set in WindO/I-NV2. For details, refer to Chapter 17 “4.1 Storage Limitations” on page 336.

- HG Temporary Register (LBR)

  HG temporary register can be used to store value as temporary. This register value will be cleared to 0 when a text group or user account is changed, when a screen is reset or the screen is changed. 128 points are available.

- HG Timer (Current) (LTD)

  Timer registers store the current value of a Timer. 32 points are available.

- HG Link Register (LLR)

  An area that stores device address data for the registered PLC during Sub Host Communication. 64 points are available.
  This register can also be used as an internal register like LDR when Sub Host Communication is not used.

- HG Special Registers (LSD)

  The Special Registers (128 points) perform the following special operations.

HG Special Register	Function/Part
LSD0 to 3	Reserved
LSD4	Scan time (msec.)
LSD5	Screen switch response time (msec.)
LSD6	Read scan communication time (msec.)
LSD7	Scan counter (incremented at each scan)
LSD8	1 second counter (incremented each second)
LSD9	10 msec. counter (increments every 10 msec.)
LSD10	100 msec. counter (incremented every 100 msec.)
LSD11	200 msec. counter (incremented every 200 msec.)
LSD12	500 msec. counter (incremented every 500 msec.)
LSD13	Stores the current Year data from the MICRO/I. “Year” (4 BCD digits)

HG Special Register	Function/Part
LSD14	Stores current time data from MICRO/I. “Month” (2 BCD digits)
LSD15	Stores current time data from MICRO/I. “Day” (2 BCD digits)
LSD16	Stores current time data from MICRO/I. “Hour” (2 BCD digits)
LSD17	Stores current time data from MICRO/I. “Minute” (2 BCD digits)
LSD18	Stores current time data from MICRO/I. “Second” (2 BCD digits)
LSD19	Stores current time data from MICRO/I. “Day-of-week” (1 BCD digit)
LSD20	When a value of “1” is written into this special register, the Internal clock in MICRO/I is updated according to the data stored in LSD21-26.. It automatically resets to “0” after the update.
LSD21	Write a "Year" value to store in the MICRO/I internal clock. (2 BCD digits)
LSD22	Stores set value for "Month" in MICRO/I internal clock. (2 BCD digits)
LSD23	Stores set value for "Day" in MICRO/I internal clock. (2 BCD digits)
LSD24	Stores set value for "Hour" in MICRO/I internal clock. (2 BCD digits)
LSD25	Stores set value for "Minute" in MICRO/I internal clock. (2 BCD digits)
LSD26	Stores set value for "Second" in MICRO/I internal clock. (2 BCD digits)
LSD27 to 30	Reserved
LSD31	Stores the currently displayed screen number. (HG2G/3G only.)
LSD32	Set a value (in reference to a base screen number you want to switch to) and it will automatically switch to a specified base screen number. (HG2G/3G only.) Note, after switching to a base screen, the value stored automatically resets to 0.
LSD33 to 41	Reserved
LSD42	Memory Card error status
LSD43	Memory Card free memory capacity Lower word (CF Card: bytes, SD Memory Card: Kbytes)
LSD44	Memory Card free memory capacity Upper word (CF Card: bytes, SD Memory Card: Kbytes)
LSD45	Memory Card total memory capacity Lower word (CF Card: bytes, SD Memory Card: Kbytes)
LSD46	Memory Card total memory capacity Upper word (CF Card: bytes, SD Memory Card: Kbytes)
LSD47	Reserved (for Host I/F driver)
LSD48	Reserved
LSD49	O/I Link slave station number
LSD50	The sequence value of the message number (or channel number if the alarm function is being used) selected by the cursor in the Alarm List Display is stored. A value of between 1 and 1024 (allocated using ((project No. - 1) x 16 + bit position + 1)) is stored for the number.
LSD51	Contrast level: 0 to 31 (HG2G, HG1F/2F/HG2S) Backlight level: 0 or 31 (HG3F/HG4F) Ajust Brightness Level(0 to 31)(HG3G) Appropriate level of contrast changes by individual difference of MICRO/I.
LSD52	The ID number of the script for which the error occurred.
LSD53	Script error status
LSD54	Reserved (for Script)
LSD55	Color brightness adjustment MICRO/I color brightness is adjusted in four increments. 0 - 7: Dark, 8 - 15: Slightly dark, 16 - 23: Slightly bright, 24 - 31: Bright
LSD56	The number of lines of data from the start line to the line currently selected with the cursor displayed in the Alarm List Display/Alarm Log Display is stored.

HG Special Register	Function/Part
LSD57	The number of log data pieces stored in the Data Storage Area by the alarm log function is stored. (0 to 1024)
LSD58	Reserved
LSD59	Memory Card download status
LSD60	Reserved (for Line Chart)
LSD61	Reserved (for Trigger Condition)
LSD62	Reserved (for TCP/IP)
LSD63 to 64	Reserved
LSD65	The maximum number of Screen Captures in the Memory Card.
LSD66 to 71	Reserved
LSD72	Stores the currently played sound file number.
LSD73	Stores the sound ID which could not be played by any errors.
LSD74 to 78	Reserved
LSD79	Quantity of Expansion I/O Modules
LSD80 to 99	Reserved
LSD100	Reserved (for O/I Link Communication)
LSD101	Polling period register for the O/I Link Slave
LSD102	Slave registration setting register for O/I Link Master
LSD103	Reserved (for O/I Link communication)
LSD104	Slave online information register for O/I Link Master
LSD105	Reserved (for O/I Link communication)
LSD106	Slave error information register for O/I Link Master
LSD107	Reserved (for O/I Link communication)
LSD108 to109	Reserved
LSD110	Reserved (for Host I/F driver)
LSD111	Reserved (for Host I/F driver)
LSD112 to 127	Register for Host I/F driver Refer to Communication Manual (PDF) for details

- LSD4 and 6 store the maximum value, and when the base screen is switched, they are reset.
- The values of LSD4 to 6 are included errors of +/- 10 msec.
- When registers LSD7, 8, 9, 10, 11 or 12 contain FFFF (H) and are incremented, the value becomes 0.
- When you reckon time by using LSD9, the time difference (in 10ms units) from the previous value can be calculated.
- The range for the “Year” in LSD13 is 2000 to 2099, and reverts to 2000 after 2099.
- When “1” is written to LSD20, internal clock is updated by the contents of LSD21-26. After setting the year, month, day, hour, minute, and second data in LSD21 to 26, writes a “1” to LSD20.
- The display format for LSD31 is set under “Screen No. Format” in Project Settings. (BCD, BI)
- This data format for LSD32 is the same as “Screen No. Format” in Project Settings. (BCD, BIN)
  If the screen number is not exist in the project, "No Screen Data" message will appear.
  If 0xFFFF(Hex) is written to LSD32, MICRO/I will display System Menu Screen.
  In case that the current screen is changed by System Area1 and LSD32 at the same instant, the screen number of the System Area1 will be displayed.
- LSD42 stores Memory card error status. Error descriptions are as follows.

  0: Normal
  1: Card not inserted/Incompatible card
  2: Format error
  3: Access error/Insufficient memory in Memory card/Reading or writing failure.
  4: Unsuccessful read of picture data
- For HG3G, the data stored in LSD43 to 46 are stored in kilobytes. 1 K byte is 1024 bytes. Values of less than 1 K byte are rounded up.
- By using the LSD50 value in the Message Switch Display you can display the message that corresponds to the cursor in the Alarm List Display.
- refer to Chapter 21 “7 Script Error” on page 369 for details regarding LSD52 and LSD53.
- LSD 55 is not supported by the HG3G
- The following bit switched to ON while downloading to Memory card by WindO/I-NV2 or Downloader. The bit switched to OFF after downloading.

  Bit2: Recipe data
  Bit4: Project data
  Bit5: Picture data
  Bit 8: Sound data
  Bit 9: PLC Program
- LSM7 and LSD6, 102 to 107 are not available for Slave units when using O/I link communication.
- The maximum number of the Screen Captures stored in the Memory Card is set in LSD65. The value in LSD 65 can be anywhere from 1 to 999. (The default value is 99.)

Chapter 35 MICRO/I Setup

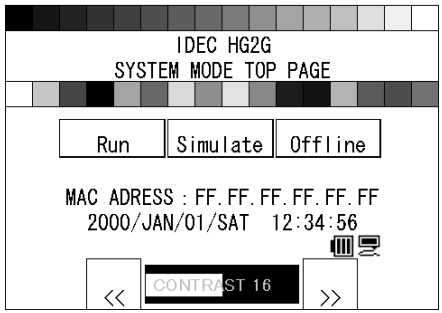
1 System Mode Overview

The System Mode allows you to access the internal MICRO/I initial settings, self diagnosis, and clearing logged data. In this mode, the project in the MICRO/I will not be running.

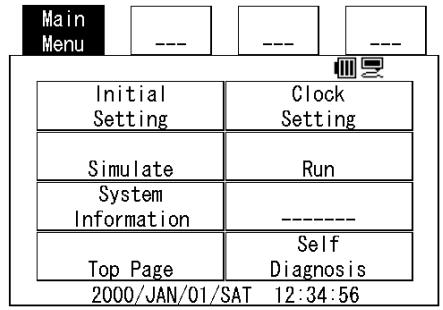
1.1 System Mode Screens

In the System mode, the System Menu screen appears (as shown below).

HG2G /3GTop Page

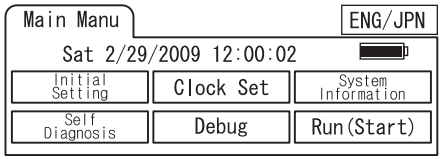


HG2G/3G System Menu screen

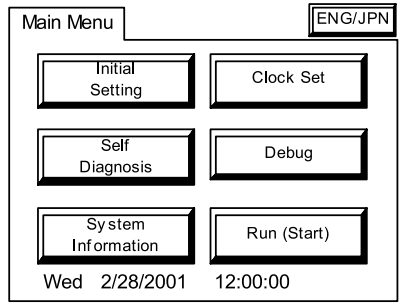


Press the “Offline” button to display the System Menu shown in the left figure.

HG1F System Menu screen



HG2F/2S/3F/4F System Menu screen



For information on accessing the MICRO/I System Mode refer to Chapter 6 “2.3 System Screen” on page 109. Design may change slightly depending on model.

The Top Page and System Menu displays two symbols: Maintenance Cable Status (HG2G only), and Battery Level Status (HG2G/3G and HG1F only).

Maintenance Cable Status

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X						

Only HG2G support this function

	Connected
	Disconnected

Battery Level Status

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X	X				

Only HG2G/3G, HG1F support this function

Full ↓ Empty		Battery level is full.
		Battery level is running low. (The “Battery Level Low” message appears at the top of the screen.)
		Battery level is almost empty, or not inserted. (The “Replace Battery. Battery Level Low” message appears at the top of the screen.)

The Symbols depend on MICRO/I model.

The Top Page (HG2G/3G) and System Menu have the items shown below. Pressing each button switches to the corresponding setting or operation screen.

Top page

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

Item	Descriptions	See page:
Run	Switches to Run Mode.	page 557
Simulate	Switches to Simulation Mode	page 557
Offline	Displays the System Menu screen.	page 545

System Menu screen

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X	X	X	X	X	X

All models support this function.

Item		Descriptions	See page:
HG2G/3G	HG1F/2F/2S/3F/4F		
Initial Setting		Allows adjustment of settings relating to operation, communication parameters, and log data of the MICRO/I.	page 550
Clock Setting	Clock Set	Allows setting of the internal clock of the MICRO/I.	page 557
Simulate	Debug	Switches to simulation mode.	page 557
Run	Run (Start)	Switches to run mode.	page 557

Item		Descriptions	See page:
HG2G/3G	HG1F/2F/2S/3F/4F		
System Information		Displays information relating to the type No., projects, as well as system software of the current MICRO/I.	page 557
File Manager*1	---	Manage the files saved in SD Memory Cards, USB flash drives, and the internal memory of the MICRO/I.	page 558
Top Page	---	Moves to Top Page.	page 559
Self Diagnosis		Executes self diagnosis of memory, the clock, the touch panel, display, communication, expansion interface and others.	page 559

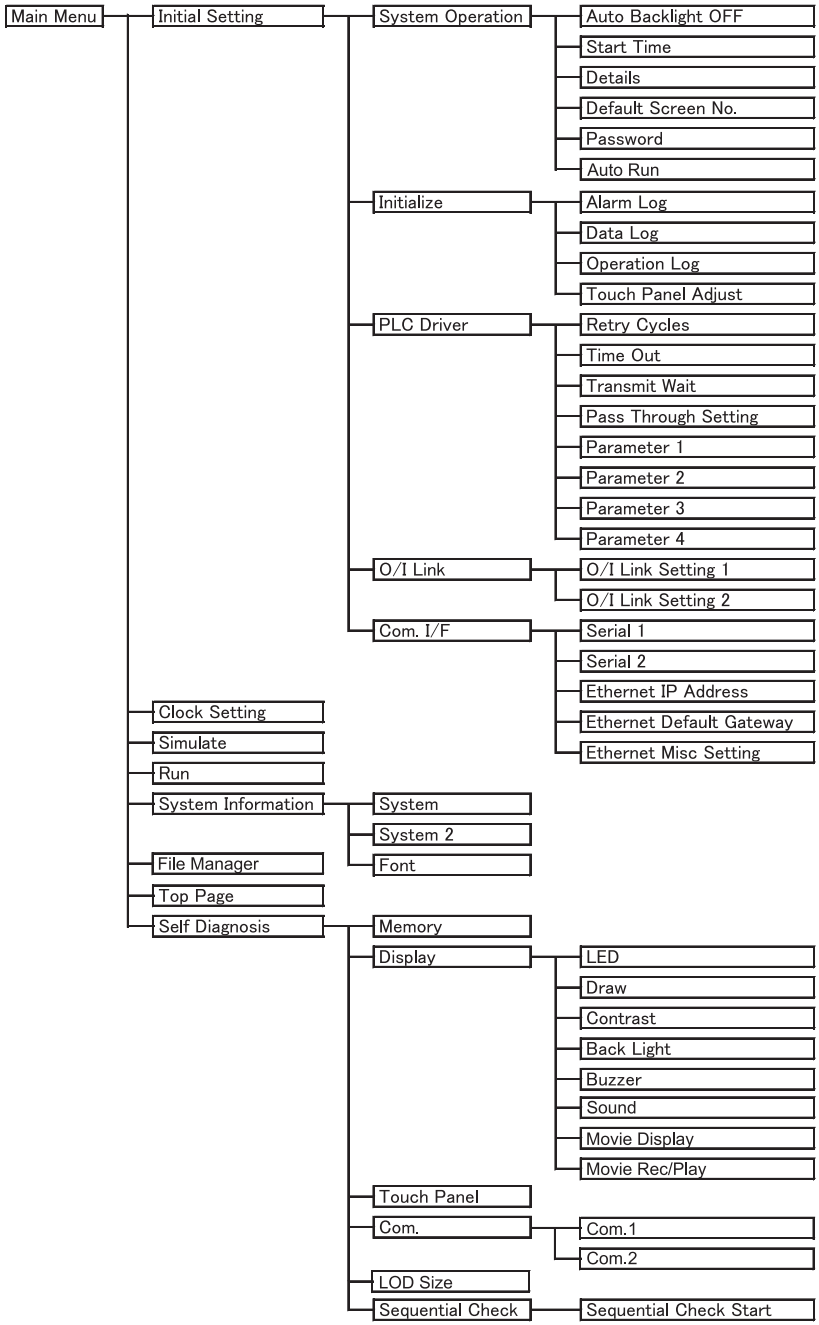
*1. Only HG3G supports.

HG2G can only display the System Menu screen in English. The following O/I types can switch the display language.

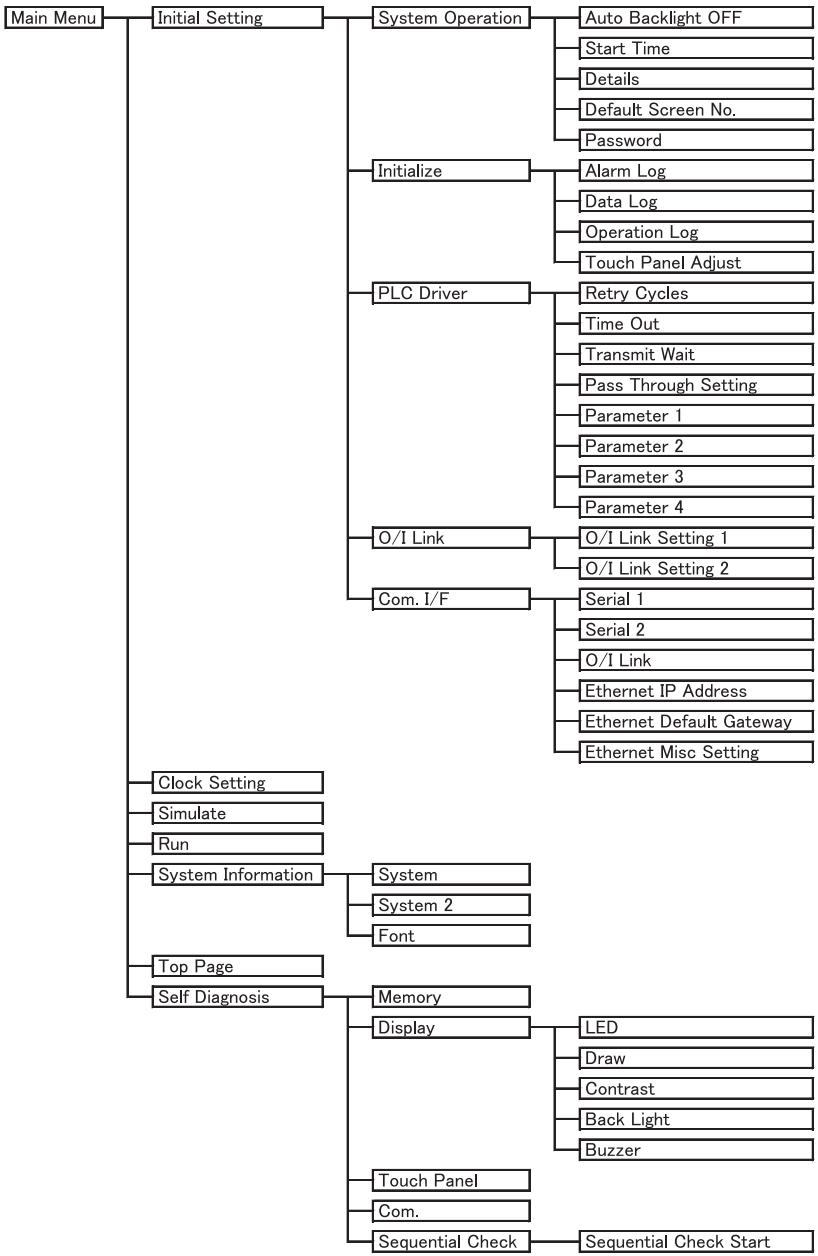
- HG3G: ENG/JPN button
- HG1F/2F/2S/3F/4F: JPN/ENG button
- File Manager only supports HG3G

1.2 s and Layout of Setup Menus

HG3G

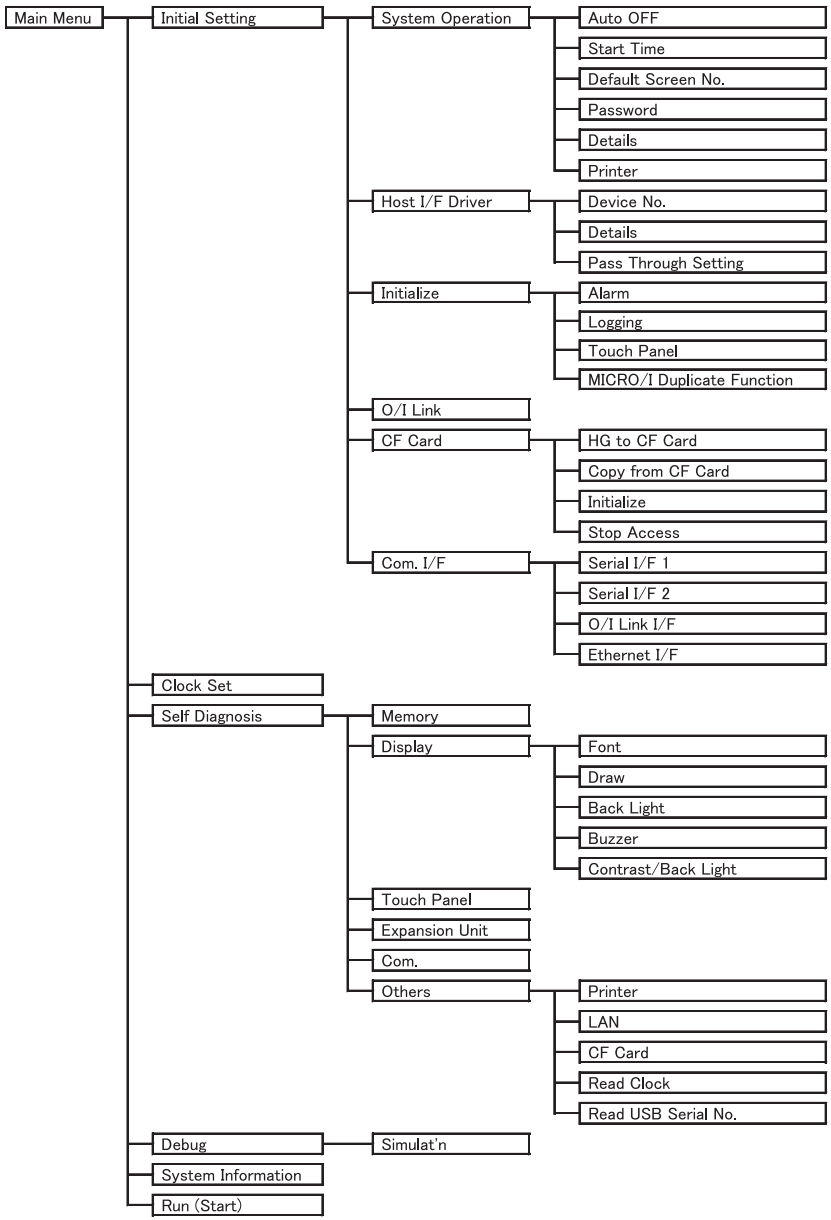


HG2G



WARNING Only models with an Ethernet port support “Ethernet IP Address”, “Ethernet Default Gateway”, and “Ethernet Misc Setting”.

HG1F/2F/2S/3F/4F



WARNING

- Only models with a compact flash interface support the “CF Card”.
- Only models with an Ethernet port support “Ethernet I/F”.
- Only HG2F with a USB port support “Read USB Serial No.”.
- Only models with an analog touch panel support “Initial Settings”-“Initialize”-“Touch Panel Adjust”.
- Only HG1F supports “MICRO/I Duplicate Function”.

2 Settings

The followings are displayed in the HG2G/3G. Description between the parentheses are displayed in the HG1F/2F/3F/4F.

2.1 Initial Setting

Pressing the “Initial Setting” button in the System Menu screen displays the setup screen. You can use this screen to input the settings for MICRO/I operation and communication parameters, and to clear the logs. To return to the System Menu screen, press the “Main Menu” button at the top of the screen.

2.1.1 System Operation

Pressing the “System Operation” button displays the system operation menu screen. You can use this screen to set the items below. Press the button for each item to set it.

- To return to the initial settings screen, press the “Init Set” button at the top of the screen.
- To return to the system operation menu screen from any of the settings screens below, press the “System Opn” button at the top of the screen.

- Backlight Control

  Set the period of inactivity that you want to elapse before the MICRO/I reduces backlight brightness.
  To set a value, Enter the value using the keypad, and then press “ENTER” button.
  To cancel the entered value and display the value currently set, press “CANCEL” button.

- The setting is not updated if you display another screen before pressing “ENTER” button.
- Setting a time of 0 disables the backlight auto OFF function.

- Auto Backlight OFF / Auto OFF

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

  his item sets the amount of time (in minutes) until the backlight turns off automatically when the screen is not touched or switched for a preset amount of time. Set the time using the keypad. Then press “ENTER”. Press the “CANCEL” button to cancel the entered value and display the currently set value.

- The setting is not updated if you display another screen before pressing the “ENTER” button.
- Setting a time of 0 disables the backlight auto OFF function.

- Start Time

  This item sets the amount of time (in minutes) until communication with the host device starts after MICRO/I power ON. This can be used to synchronize boot times with the host machine. Press the “ENTER” button to apply the entered value. Press the “CANCEL” button to cancel the entered value and display the currently set value.

The setting is not updated if you display another screen before applying the setting.

- Details

  The following items can be set.

  - Whether or not to have a sound made when a touch switch is pressed.
  - Select the screen number to be displayed as a binary number or BCD (binary coded decimal).

- To set blink cycle.
- Display the error message in Japanese or English.

Select the item to change using the POSN UP ([s]) or POSN DOWN ([t]) buttons. The selected item is highlighted. Each press of the [CHNG UP] or [CHNG DOWN] button changes the property of the selected item. Repeat this procedure until the desired properties are displayed. Press the “ENTER” button to apply the entered value.

WARNING The setting is not updated if you display another screen before applying the setting.

- Default Screen No.

This item sets the No. (as a decimal value) of the screen to display after power ON. Use the keypad to enter the value. Press the “ENTER” button to apply the entered value. Press the “CANCEL” button to cancel the entered value and display the currently set value.

WARNING
- The setting is not updated if you display another screen before applying the setting.
- If the Default Screen No. is set to 0, MICRO/I will display the screen set in the host device instead of the internal initial screen. For details, refer to Chapter 5 “3.2 System Area 1” on page 93.

- Password

Specifies a password to use to move to System Mode. This changes the password for the “Administrator” Security Group of the WindO/I-NV2.
Press the “Change Password” button to display the password input screen. Use the password input keys to enter a password from 4 to 15 characters. Pressing the “ENTER (ENT)” button applies the entered password and closes the password input screen. Pressing the “CLR” button clears the password input field.

WARNING
- If you press “CAN” on the Password Screen, the setting is not updated and you return to the Password Screen.
- Pressing the “ENTER (ENT)” button without entering a password disables the password function.

- When you do not assign a password to a project data, the Password is blank.
- If you forget your password, contact for sales representative.

- AutoRun

When AutoRun is enabled, AutoRun function will be executed when a USB flash drive is inserted to MICRO/I. You have the option to enable or disable the USB AutoRun function.

WARNING The setting is not updated if you display another screen before applying the setting.

- Printer

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X	X	X	X	X	X

Only HG3G, HG1F/2F/2S/3F/4F support this function

The following items can be set.

- Specify the printer code
- Color or greyscale
- Black and white reversed
- Paper size

Select the item to change using the [s] or [t] buttons. The selected item is highlighted. The condition changes each time you press the “Change” button. Press the “Change” button several times until the condition you want appears. When you press the Save button, the settings are stored and the completion message appears.

WARNING The setting is not updated if you display another screen before applying the setting.

2.1.2 Initialize

Pressing the “Initialize” button displays the initialization menu screen. You can use this screen to set the following items. Press the button for each item to set it.

- To return to the initial settings screen, press the “Init Set” button at the top of the screen.
- To return to the initialization menu screen from any of the settings screens below, press the “Init” button at the top of the screen.

- Alarm Log / Alarm

  Clears all the alarm log data. Set as directed by the confirmation message that appears. Pressing the “NO” button will return you to the initialization menu screen without clearing the alarm log data .

- Data Log / Logging

  Clears all the data logged from Data Log. Set as directed by the confirmation message that appears. Pressing the “NO” button will return you to the initialization menu screen without clearing the data log data

- Operation Log

  Clears all the operation log data. Pressing the “Yes.” button begins the initialization.

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

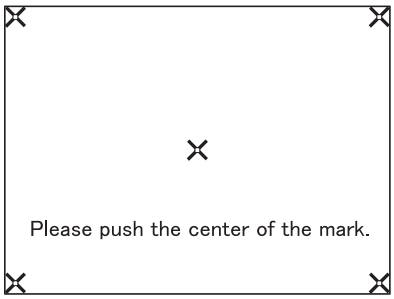
- Touch Panel Adjust / Touch Panel

  Adjusts the analog touch panel. It is supported by HG2G/3G, HG1F and EX4R. Press the “Yes” button.

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X	X				

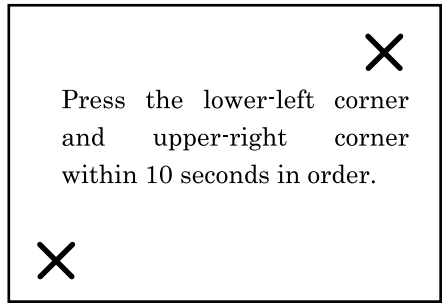
Only HG2G/3G, HG1F support this function

HG2G/3G



Press the center of each × symbol displayed on the screen, in the following order: Top-left, top-right, bottom-right, bottom-left, center. The position of the analog touch panel is properly adjusted and set.

HG1F/EX4R



Press the lower-left corner and then the upper right corner (within 10 seconds).

- MICRO/I Duplicate function

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

Use this function to copy project data between two HG1F displays connected by a cable.

Execute the process as directed by the displayed messages. The project data, font data, system software and Data Storage Area data are read from the source HG1F display and copied to the connected HG1F display.

Cable

MICRO/I		Shielded wire	MICRO/I	
Name	Pin No.		Pin No.	Name
Shield	Cover		Cover	Shield
SD	3		3	SD
RD	4		4	RD
RS	1		1	RS
NC	8		8	NC
DR	5		5	DR
ER	2		2	ER
SG	7		7	SG
EN	6		6	EN
Mini-DIN connector (TCP7100 Series; Hoshiden)			Mini-DIN connector (TCP7100 Series; Hoshiden)	

- Do not remove the cable or do not turn off MICRO/I while data is being transferred. If transfer fails, download the project from WindO/I-NV2 to recover the data.
- Data transfer takes about 5 minutes.
- When transference fails, the following Error information is shown.
  ERR NO.1 = Time out
  ERR NO.2 = Received data is invalid
  ERR NO.3 = Unavailable version
  ERR NO.4 = Unavailable model
  ERR NO.5 = Save data is invalid
  ERR NO.6 = Password is invalid

WARNING

If a password has been set to the connected MICRO/I, set the same password to the MICRO/I executing data transfer. Copying will not start unless the password matches.

2.1.3 PLC Driver / Host I/F Driver

Pressing the “PLC Driver” button (In case of HG1F/2F/2S/3F/4F, press the “Host I/F Driver” button) displays the host interface driver menu screen. Allows setting of communication parameters for the Host I/F Driver. When no project exists, or “No Host” is selected for the Communication Method, the Host I/F Driver setting screen cannot be entered.

- To return to the initial settings screen, press the “Init Set” button at the top of the screen.
- Available host I/F settings will differ based on the currently connected host device. For detailed on individual settings, refer to the Communication Manual (PDF).

- Retry Cycles

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

- Time Out

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

- Transmit Wait

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

- Pass-Through Setting

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

- Parameter 1

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

- Parameter 2

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

- Parameter 3

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

- Parameter 4

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

- Device No.

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

- Details

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

2.1.4 O/I Link

Pressing the “O/I Link” button displays the O/I link menu screen. This screen presents information on the O/I Link. (On the HG2G/3G, various settings can be made by pressing the “O/I Link Setting 1” and “O/I Link Setting 2” buttons.)

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X					

Only HG3G support this function

- To return to the initial settings screen, press the “Init Set” button at the top of the screen.
- Refer to the Communication Manual (PDF) for details.

- O/I Link Setting 1

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

- O/I Link Setting 2

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

2.1.5 Communication I/F

Pressing the “Communication I/F” button displays the communication interface settings menu screen. You can use this screen to set the items below. Press the button for each item to set.

- To return to the initial settings screen, press the “Init Set” button at the top of the screen.
- Press the “Comm. I/F” button at the top of the screen to return to the communication interface settings menu.

- Serial 1 / Serial I/F 1

  Allows the setting of communication parameters for the Serial Interface 1.

- Serial 2 / Serial I/F 2

  Allows the setting of communication parameters for the Serial Interface 2.

- O/I Link / O/I Link I/F

  Allows the setting of communication parameters for the O/I Link Interface.

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X		X	X	X	X	X

Only HG2G, HG1F/2F/2S/3F/4F support this function

- Ethernet IP Address / Ethernet I/F - IP address and subnet mask

  Use the following procedure to set the IP address/ Subnet mask settings.

  Press the left/right buttons to select an item, then use the keypad to enter the IP address and subnet mask values. Press the “ENTER” button to apply the entered values.

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X				X	X

Only HG2G/3G, HG3F/4F support this function

WARNING The setting is not updated if you display another screen before applying the setting.

- Ethernet Default Gateway / Ethernet I/F - Default Gateway

  Specify the default gateway.

  Press the left/right buttons to select an item, then use the keypad to enter the default gateway value. Press the “ENTER” button to apply the entered value.

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X				X	X

Only HG2G/3G, HG3F/4F support this function

WARNING The setting is not updated if you display another screen before applying the setting.

- Ethernet Misc Setting

  Specify whether to allow or prohibit Maintenance Communication via TCP/IP (refer to Chapter 3 “2.2 Connection Example for Maintenance Communication” on page 22).

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X				X	X

Only HG2G/3G, HG3F/4F support this function

Select the item to set using the POSN UP ([s]) or POSN DOWN ([t]) buttons. The selected item is highlighted. Each press of the [CHNG UP] or [CHNG DOWN] button changes the property of the selected item. Repeat this procedure until the desired properties are displayed. Press the “ENTER” button to apply the entered value.

WARNING The setting is not updated if you display another screen before applying the setting.

2.1.6 CF Card

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
			X		X	X

Only HG2F/3F/4F support this function

Press the “CF Card” button to display the CF card menu screen. You can set the items below from this screen. Press the button for each item to set it. This feature is only supported by models with a compact flash interface.

- To return to the initial settings screen, press the “Init Set” button at the top of the screen.
- To return to the CF card menu screen, press the “CF Card” button at the top of the screen.

- HG to CF Card

  Copies project data, font data, and runtime system software from the operator interface to the CF Card.

  Set as directed by the confirmation message that appears. Pressing the “NO” button will return you to the CF card menu screen without executing the copy operation.

The CF access folder is set using the WindO/I-NV2 project settings.

- Copy from CF Card

  Copies the project data, font data and system software from the CF card to MICRO/I’s internal memory. Press the [▲] or [▼] button to select the CF card access folder containing the project data.

  Set as directed by the confirmation message that appears. Pressing the “NO” button will return you to the CF card menu screen without executing the copy operation.

WARNING The project data can not be read if the data was copied from PC to CF card using Windows Explorer. In order to download a project to a CF card, use [Home] - [Project] - [Upload] - [Stored Data in Memory Card].

- Initialize

  Formats the CF card.

  Set as directed by the confirmation message that appears. Pressing the “NO” button will return you to the CF card menu screen without executing the copy operation.

- Stop Access

  Press [Stop Access] to display the following screen.

  The CF access lamp will flash and then go off, and access to the CF card will be stopped.
  The [Access Stop] button (red button) at the rear of the operator has the same function.

2.2 Clock Setting / Clock Set

Press the “Clock Setting” button (in case of HG1F/2F/2S/3F/4F, press the “Clock Set” button) in the System Menu screen to display the clock settings screen. Use this screen to set MICRO/I’s internal clock. To return to the System Menu screen, press the “Main Menu” button at the top of the screen.

- Procedure

1. Press the left/right buttons to select an item, then use the keypad to enter the date or time.
2. Press the “ENT” or “Enter” button to apply the new setting.
3. Press the “SAVE” button to save the date/time setting. (HG2G/3G)

WARNING The setting is not updated if you display another screen before applying the setting.

2.3 Simulate / Debug

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

Simulation Mode is used for debugging, and can only be executed on the MICRO/I machine. To return to the System Menu screen, press the “Main Menu” button at the top of the screen.

Press the “Simulation” button to run the simulation.

2.3.1 Simulation

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X	X	X	X	X	X

Only HG3G, HG1F/2F/2S/3F/4F support this function

You can use this screen to run the Monitor mode with simulation function. Press the “Simulation” button to begin.

To return to the debugging settings screen, press the “Debug” button at the top of the screen.

Press the Start button to run the simulation.

Using the Device Monitor Function in conjunction with the Monitor function is a more efficient means of debugging. (refer to Chapter 25 “3 Device Monitor” on page 442 for details.)

WARNING When the communication setting on the HG1F/2F/2S/3F/4F is set to 1:1, the host device values are retained even after the screen is changed. However, if set to 1:N, or when using the HG2G/3G, the host device values are not retained.

2.4 Run/ Run (Start)

Switches to run mode.

2.5 System Information

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X		X	X	X	X	X

Only HG2G, HG1F/2F/2S/3F/4F support this function

Pressing the “System Information” button in the System Menu screen displays the system information screen. This screen displays information such as the MICRO/I type

No., stored system software type and version No. (HG2G/3G displays this information when the “System” or “System 2” button described below is pressed.) To return to the System Menu screen, press the “Main Menu” button at the top of the screen.

Only the first 15 characters of the project name are displayed.

HG3F/4F displays the MAC address (Media Access Control address) set at time of factory shipment at the bottom of the screen.

2.5.1 System

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

Displays the MICRO/I type No., MAC address (Media Access Control address), stored system software version No. To return to the system information screen, press the “System Info.” button at the top of the screen.

2.5.2 System 2

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

Displays the file name of the project and the manufacturer, protocol, and version no. of PLC. To return to the system information screen, press the “System Info.” button at the top of the screen.

2.5.3 Font

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

Displays the font type stored in MICRO/I. To return to the system information screen, press the “System Info.” button at the top of the screen.

2.6 File Manager

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
	X	X	X	X	X	X

Only HG3G, HG1F/2F/2S/3F/4F support this function

File Manager manages files stored on USB flash drives, SD Memory Cards, and MICRO/I internal memory. It can format external memory devices, copy and delete files, and run associated applications. To return to the System Menu screen, press the “Main Menu” button at the top of the screen.

- Format

  Select the drive you want to format, and then press the “FORMAT” button.

- Copy

  Select the file you want to copy, and then press the “COPY” button.

  If USB Flash Drive or SD Memory Card is selected as the source and the destination device, the selected file will be copied to the device. If the source or the destination device is MICRO/I, “Project Data Transfer” function will be executed and MICRO/I project will be downloaded or uploaded. If the source or the destination device is PLC, “PLC Program Data Transfer” function will be executed and PLC Program will be downloaded or uploaded.(refer to Chapter 28 “1 Project Transfer Function” on page 480.)

- Delete

  Select the files you want to delete, and then press the “DELETE” button.

If the external memory device is not recognized correctly, press the "RELOAD" button to reload it.

2.6.1 System

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

Displays the MICRO/I type No., MAC address (Media Access Control address), stored system software version No. To return to the system information screen, press the “System Info.” button at the top of the screen.

2.6.2 System 2

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

Displays the file name of the project and the manufacturer, protocol, and version no. of PLC. To return to the system information screen, press the “System Info.” button at the top of the screen.

2.6.3 Font

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

Displays the font type stored in MICRO/I. To return to the system information screen, press the “System Info.” button at the top of the screen.

2.7 Top Page

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

Moves to Top Page.

2.8 Self Diagnosis

Pressing the “Self Diagnosis” button in the System Menu screen displays the self-diagnosis screen. Use this screen to run MICRO/I internal self-diagnosis. To execute an operation, press the corresponding button. To return to the System Menu screen, press the “Main Menu” button at the top of the screen.

- You need inspection jigs to run self-diagnosis.
- Self Diagnosis is a special screen for factory inspections. Do not use without due reason.

Chapter 36 Troubleshooting

1 Troubleshooting

The MICRO/I displays a variety of error messages in order to assist you in quickly analyze and resolve problems with the hardware, communications system, and user screen data.

1.1 Error Messages

The following error messages are displayed in the event of communication system problems and problems with user screen data. When an error occurs, take the appropriate indicated action.

If an error persists despite your attempts to correct it, contact your nearest sales representative.

Error Message	Cause	Solution
Waiting for default screen No.	The default screen number is set at 0.	Either write the screen number to the System Area display screen number region, or set the initial screen number to a number other than 0.
No screen data	The specified Base Screen does not exist.	Set the Base Screen and download it to the MICRO/I.
Processing error	- This message is displayed when a value is divided by 0. - There is data which cannot be handled with the BCD4, BCD8, or float32 data types. - There is invalid clock data which is used in Calendar parts.	Check the calculation or settings.
Host Communication error	An error occurred during communication with the host.	Check the communication lines and the communication settings. During 1:N communications, the port number of the host device on which the Host Communication error has occurred.
Device range error	- The data is written to the device with the address out of the range. - The number of devices exceeds the limitation.	Check the device settings.
Access was denied.	There is no CF card in the MICRO/I, therefore, access of the CF card was denied.	Insert a CF card.
No SD Memory Card exists	No SD Memory Card inserted when the unit attempted to access the SD Memory Card.	Insert a SD Memory Card.
No USB flash drive exists	No USB flash drive inserted when the unit attempted to access the USB flash drive.	Insert a USB flash drive.
This CF card not available	- The type of inserted CF card is not recognized with MICRO/I. - The CF card is broken.	Please use a new recommended CF card.
This SD Memory Card not available	- The type of inserted SD Memory Card is not recognized with MICRO/I. - The SD Memory Card is broken.	Please use a new recommended SD Memory Card.
This USB flash is not available	- The type of USB flash drive is not recognized by the MICRO/I. - The USB flash drive is broken.	Please use a new recommended USB flash drive.

Error Message	Cause	Solution
SD Memory Card Access Error	When the unit attempted to access the SD Memory Card: - The SD Memory Card did not have enough free space. - The SD Memory Card was removed partway through. - The SD Memory Card was broken.	Create some free space on the SD Memory Card or get a new one.
USB flash Drive Access Error	When the unit attempted to access the USB flash drive: - The USB flash drive did not have enough free space. - The USB flash drive was removed partway through. - The USB flash drive was broken.	Create some free space on the USB flash drive or get a new one.
ZNV file is not found	The project file (ZNV format) was not in the specified location on the external memory device when a download was made using the Project Data Transfer function.	Check whether or not the file is in the specified location on the external memory device.
ZLD file is not found	The PLC Program file (ZNV format) was not in the specified location on the external memory device when a download was made using the PLC Program Transfer function.	Check whether or not the file is in the specified location on the external memory device.
ZNV file format Error	When a download was made using the Project Data Transfer function: - The project file is not in ZNV format. - The file is corrupt.	Remake the project file (ZNV format).
ZLD file format Error	When a download was made using the PLC Program Transfer function: - The PLC Program file is not in ZLD format. - The file is corrupt.	Remake the PLC Program file (ZLD format).
O/I type is not correct	When a download was made using the Project Data Transfer function, the model of the downloaded project and the model of the destination MICRO/I were different	Check that the model name that is set in the file you want to download is the same as the model name of the destination MICRO/I.
PLC Type is not correct	When a download or upload was made using the PLC Program Transfer function: - The model of the downloaded PLC Program and the model of the destination PLC were different. - The runtime program version using the downloaded PLC Program and the one of the destination PLC were different.	Check PLC models and runtime program versions.
PLC Password is not valid	When a download or upload was made using the PLC Program Transfer function, the password you entered was incorrect.	Enter the correct password.
PLC communication Error	When a download or upload was made using the PLC Program Transfer function, a communication problem with the PLC occurred.	It is possible that there is a problem with the connection with the PLC. Check the connection between MICRO/I and the PLC.

Error Message	Cause	Solution
The specified files are not found	The specified files were not in the specified location on the external memory device when the File Copy function was executed.	Check whether or not the file is in the specified location on the external memory device.
File Size Error	The size of the source file exceeded the limit when the File Copy function was executed.	Check the source file size. For the maximum file size that can be copied, refer to Chapter 30 “1.1.2 SD Memory Card” on page 500 and refer to Chapter 30 “2.1 Specification” on page 509.
Script error	An error occurred for a process in execution of the script.	Check the value of LSD52 and LSD53, and correct the script. For details, refer to Chapter 21 “Scripts” on page 359.
Device write error	The script generated a lot of write data, and the write operation failed.	Reduce the number of write operations to be performed at the same time.
Insufficient memory error	The resource memory of the HG is insufficient because of the use of a large number of the following parts. - Pilot Lamps, Multi-State Lamps, and Picture Displays with the “Recover Background” checkbox is selected. - Message Display, Message Switching Display, and Alarm List Display with the “Scroll” checkbox is selected. - Parts over the number limit of parts that can be set per screen by overlapping Base screen.	Deselect the “Recover Background” or “Scroll” checkbox, or clear parts to reduce memory resource utilization.
Indirect device error	Indirect read and indirect write failed when using the Word Button or Word Write Command.	Do not execute indirect read and indirect write to host device while LSM14 or LSM15 is ON.
Check Interface settings	MICRO/I cannot change into the Run mode because the Interface settings are not correct.	Download the project data after modifying the Interface settings in by selecting [Configuration] - [System Setup] - [Project] - [Communication Interface]tab from the WindO/I-NV2 menu.
Network off-line	This error message is only displayed when O/I Link is being used.	Refer to Communication Manual (PDF) for details.

1.2 Low Battery Voltage

An internal battery maintains clock settings and log data in the MICRO/I. When the battery runs out, keep register data, log data and other backup data will be cleared, and the contrast is reset to the default value. If this happens, the following message is displayed when the MICRO/I is powered up, so take the indicated action.

This message does not show when [Battery warning message] is not set in [Configuration] - [System Setup] - [Project] - [Communication Interface].

In this case, Bit 14 (backup data error) of Address + 2 in System Area 2 is set, and it is reset when MICRO/I is powered on.

Message	Description
Backup data lost	The Log Data and Calendar Data are lost. Set the clock again. Keep the power ON for about two days to charge the battery (HG2F/2S/3F/4F), or replace the battery (HG2G/3G, HG1F).

In case of storing Keep Memory or Keep Relay to the flash memory using HG Special Relay (LSM 10), stored data is transferred to the memory automatically when Backup data is lost.

When using HG2G/3G, 1F type, the following warning messages will be displayed before the battery is dead.

In this case, the Bit 12 (Replace battery error) or Bit 13 (Replace battery error) of Address + 2 in the System Area 2 is set, and it is set whenever the MICRO/I is powered on.

Message	Description
Replace battery	The remaining battery revel is low. Replace the battery in a short time.
Replace battery (Battery level LOW)	The remaining battery revel is lowest. Replace the battery immediately, otherwise backup data will be lost.

1.3 Touch Panel

If the touch panel needs to be readjusted, use the MICRO/I System Menu to readjust the touch panel. For details, refer to Chapter 35 “2.1 Initial Setting” on page 550.

1.4 LED

HG2G	HG3G	HG1F	HG2F	HG2S	HG3F	HG4F
X	X					

Only HG2G/3G support this function

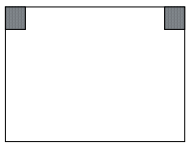
The HG2G/3G has an LED that indicates if power is supplied. If the LED does not light up when power is turned ON, it may indicate a problem exists in the main unit. Contact your vendor or nearest IDEC Corporation.

1.5 When You Cannot Download Project Data

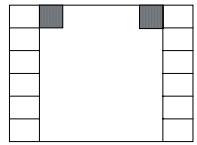
If you are unable to download project data from the WindO/I-NV2, press the two points on the touch panel of the HG2F/2S/3F/4F while at the same time turning the power off and back on again. When using the HG2G/3G, HG1F/EX4R,

press the top left corner of the panel for three seconds or longer while at the same time turning the power off and back on again.

press the top left corner of the panel for three seconds or longer. (See the illustrations below.)



HG2F/2S/3F/4F



HG2S
(CC SWITCH™ type)

HG2G
HG1F/EX4R

When power is turned on again, the screen in the system mode is displayed, and then MICRO/I becomes downloadable status. If you download using Ethernet and O/I Link, check again each setting of TCP/IP and O/I Link before executing the download. Also, when MICRO/I does not show the system mode screen and continues a blackout having a bleep each second, be sure to download using 2-port serial interface or port for USB.

1.6 If the backlight is OFF and the buzzer sounds

If you fail to download the runtime program to MICRO/I, the backlight may turn to OFF and a beep may sound continuously every second, even after the power has been turned off and on again. If this happens, rectify the situation by doing the following:

- HG3G:

  Download the project and the standard fonts by using WindO/I-NV2 via USB cable. When the MICRO/I is in this state, projects cannot be downloaded via Ethernet or using a memory card. To download the standard fonts, select "Download fonts" under “Options” on “Download” in WindO/I-NV2.

- HG2G, HG1F/2F/2S/3F/4F:

  Download the project by using WindO/I-NV2 via the option cable (HG9Z-XCM22). Use a USB cable if using an HG2F with a USB interface. When the MICRO/I is in this state, projects cannot be downloaded via Ethernet or using a memory card.

Chapter 37 Fonts

1 Font

1.1 Supported Languages

The MICRO/I can display multiple fonts by installing them. In addition to the fonts installed on the MICRO/I, all Windows fonts displayed on your PC can be used on the display.

Font	Description
Fonts installed in the MICRO/I	Fonts to be pre-loaded on the MICRO/I. Japanese, European, Chinese, Korean, Taiwanese, Central European, Baltic and Cyrillic fonts can be installed on the MICRO/I. The installed fonts installed can be changed as needed using WindO/I-NV2, which helps save and efficiently operate the user capacity.
Windows Font	All fonts used on the PC can be displayed on the MICRO/I. The Windows fonts allow you to display expressive characters on the MICRO/I screen as needed. Windows fonts are downloaded as part of the project data.

In addition, the MICRO/I has a function that switches between two or more text groups dynamically. With this function, the registration text of buttons can be switched to different languages according to the conditions. For details, refer to Chapter 20 “Text Group Settings” on page 355.

1.2 Installed Fonts in the MICRO/I

Font Name	Code System	Language	
Standard Fonts	Japanese	JIS 8-bit code JIS level-1 and level-2 kanji sets	Japanese
	English	ISO 8859-1 (Latin1)	Icelandic, Irish, Italian, English, Dutch, Swedish, Spanish, Danish, German, Norwegian, Portuguese, Finnish, Faeroese, French
	European Stroke	ISO8859-1(Latin1)	Icelandic, Irish, Italian, English, Dutch, Swedish, Spanish, Danish, German, Norwegian, Portuguese, Finnish, Faeroese, French
	7-seg	ISO8859-1(Latin1)	Displays number 0 to 9, alphabet character A to F, and symbols such as asterisk, plus, minus, and period only
Optional Fonts	Japanese large font (first standard)	JIS level-1 kanji set	* Install this font to achieve a sharper display of enlarged JIS level-1 kanji set “4.2 High-quality Fonts” for the details.
	Japanese large font (second standard)	JIS level-2 kanji set	* Install this font to achieve a sharper display of enlarged JIS level-2 kanji set. Refer to Chapter 37 “2 High-quality Fonts” on page 572 for the details.
	Chinese	GB2312	Chinese
	Korean	KSC5601	Korean
	Taiwanese	BIG5	Taiwanese
	European large font	ISO 8859-1 (Latin1)	* Install this font to achieve a sharper display of enlarged European fonts. Refer to Chapter 37 “2 High-quality Fonts” on page 572 for the details.
	Central European	ANSI1250	Czech, Hungarian, Polish, Slovak, Slovene
	Baltic	ANSI1257	Estonian, Latvian, Lithuanian, Greenlandic, Lappish
	Cyrillic	ANSI1251	Bulgarian, Belarusian, Ukrainian, Serbian 2, Macedonian, Russian

WARNING

- Japanese, European, Japanese large font (first standard), Chinese, and European large font are factory-installed in the HG2F/2S/3F/4F and EX4R. Japanese, European, and European large font are factory-installed in the HG2G and HG1F. The standard fonts cannot be replaced; however, the optional fonts can be downloaded from the WindO/I-NV2.
- Only HG3G Series supports European Stroke, 7-seg under “Font”.
- The MICRO/I displays the single-byte parts of Chinese, Taiwanese, and Korean with ISO 8859-1, and supports Hangul characters only in the double-byte part of Korean.

1.3 Available Fonts for Parts

Parts	Description	MICRO/I-installed Font*1	Windows Font
Button	Bit Button	X	X
	Word Button	X	X
	Goto Screen Button	X	X
	Print Button	X	X
	Key Button	X	X
	Keypad	X	X
	Selector Switch	X	X*3
Data Input	Numerical Input	X	---
	Character Input	X	---
Display	Pilot Lamp	X	X
	Multi-State Lamp	X	X
	Message Display	X	X*2 *3
	Message Switching Display	X	X*3
	Alarm List Display	X	X*3
	Alarm Log Display	X	X*3
	Numerical Display	X	---
Graph	Bar Chart	X	X*3
	Line Chart	X	X*3
	Calendar	X	---

*1. To use a MICRO/I-installed font, the font should be downloaded from the WindO/I-NV2 in advance. Depending on parts and part setting, to the use of European Stroke, European Outline, or 7-seg under "Font" may not be possible. For details, refer to the section on Parts.

*2. Windows font can be used for fixed text only. Only the MICRO/I-installed font can be used for the read device data code for the Message Display.

*3. Windows font can be used only when the "Use Text Manager" is selected.

1.4 Font Size

Font Name		Code System	Size
Optional Fonts	Japanese large font (first standard)	JIS level-1 kanji set	477KB
	Japanese large font (second standard)	JIS level-2 kanji set	424KB
	Chinese	GB2312	238KB
	Korean	KSC5601	109KB
	Taiwanese	BIG5	422KB
	European large font	ISO 8859-1 (Latin1)	102KB
	Central European	ANSI1250	6KB
	Baltic	ANSI1257	6KB
	Cyrillic	ANSI1251	6KB

- The download size of font data is adjusted in multiples of 128KB.
- The download size of font data is 128KB when the font size is 0KB or 128KB and smaller.

(Example) When downloading Japanese large font (level-1 kanji set), Chinese, and European large fonts:
(Factory-set status of the HG2F/2S/3F/4F and EX4R.)

Font	Size
Japanese large font (first standard)	477KB
Chinese	238KB
European large font	102KB
Total size of the font data	817KB

(Example) When downloading Chinese and Korean fonts:

Font	Size
Chinese	238KB
Korean	109KB
Total size of the font data	347KB

Download size of font data	384KB (347KB is adjusted in multiples of 128KB.)

(Example) When downloading all fonts:

Font	Size
Japanese large font (first standard)	477KB
Japanese large font (second standard)	424KB
Chinese	238KB
Korean	109KB
Taiwanese	422KB
European large font	102KB
Central European	6KB
Baltic	6KB
Cyrillic	6KB
Total size of the font data	1790KB

Download size of font data	1792KB (1790KB is adjusted in multiples of 128KB.)

Since the capacity of the HG1F is limited, it is impossible to download all the fonts at the same time.

(Example) When not selecting any fonts:

Font	Size
None	0KB
Total size of the font data	0KB

Download size of font data	128KB (0KB is adjusted in multiples of 128KB.)

2 High-quality Fonts

The high-quality fonts are the Japanese large fonts (first standard/second standard), and European fonts. If you download high-quality fonts and set “Use large font”, the MICRO/I can replace some of the optional fonts with the high-quality fonts (for details about “Use large font”,

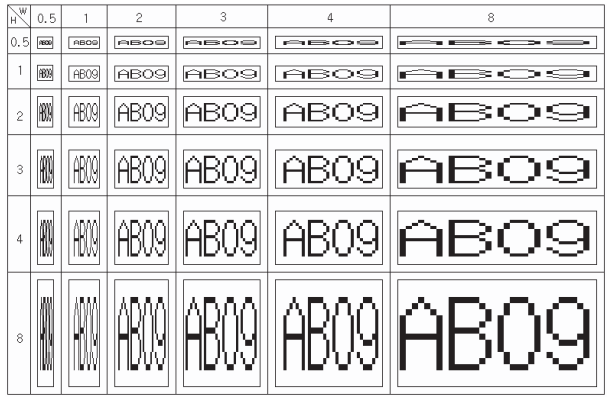
2.1 High-quality European Font Display (Size 8x16)

- Drawing/Part

  Text, Bit Button, Word Button, Goto Screen Button, Print Button, Key Button, Keypad, Selector Switch, Pilot Lamp, Message Display, Message Switching Display, Alarm List Display (Text Manager), Alarm Log Display (Text Manager), Numerical Display, Numerical Input, Calendar

- Font/Size: European, or [8x16]

When “Use large font” is not selected:



When “Use large font” is selected (default)

* The characters with the background color are replaced with the high-quality fonts. (The following characters of Magnification are replaced with the 8x8 size standard fonts. Magnification WxH: 2x0.5, 3x0.5, 4x0.5)

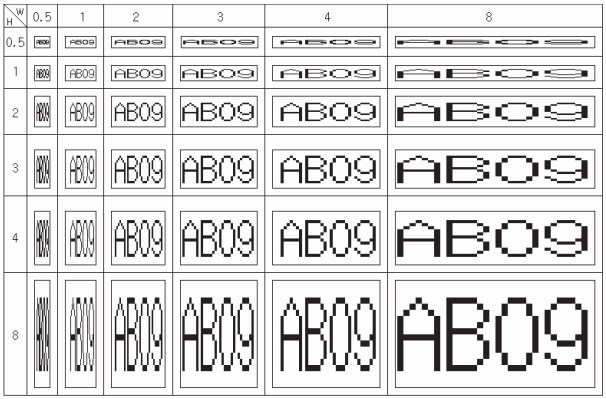
2.2 High-quality Japanese Font Display (Size 8x16)

- Drawing/Part

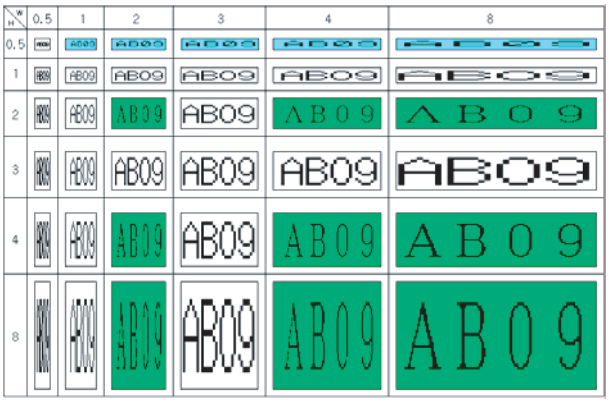
  Text, Bit Button, Word Button, Goto Screen Button, Print Button, Key Button, Keypad, Selector Switch, Pilot Lamp, Message Display, Message Switching Display, Alarm List Display (Text Manager), Alarm Log Display (Text Manager)

- Font:Japanese

When “Use large font” is not selected:



When “Use large font” is selected (default):



* The characters with the background color are replaced with the high-quality fonts. (The following characters of Magnification are replaced with the 8x8 size standard fonts. Magnification WxH: 2x0.5, 3x0.5, 4x0.5)

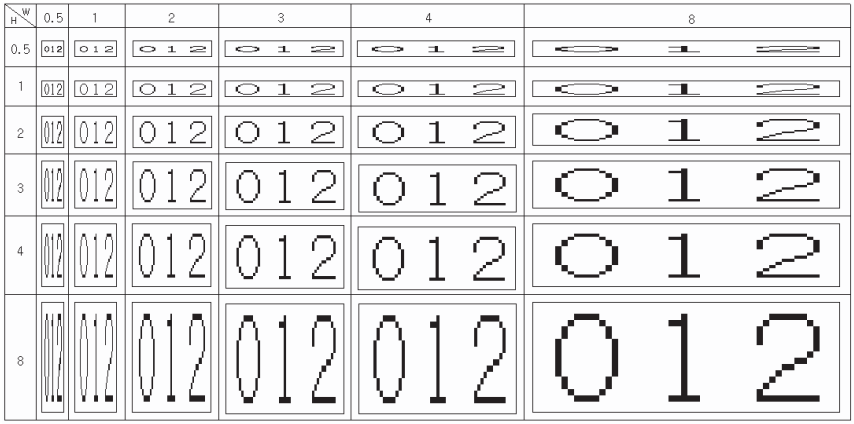
2.3 High-quality Japanese Font Display (Size 16x16)

- Drawing/Part

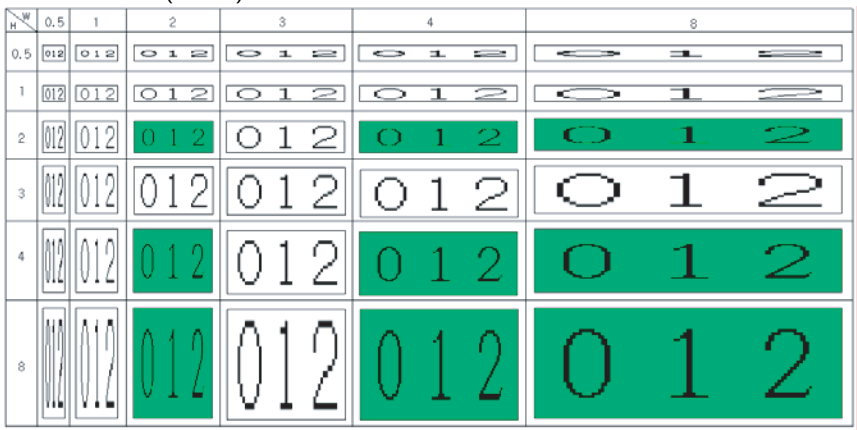
  Numerical Display, Numerical Input, Character Input, Calendar

- Size: [16x16]

When “Use large font” is not selected:



When “Use large font” is selected (default):



* The characters with the background color are replaced with the high-quality fonts.

WARNING

- When the high-quality fonts have not been downloaded into the operator interface, the standard fonts are used even if “Use large font” is selected.
- When the character input part display font size is 8x16, high-quality fonts are not displayed even if “Use large font” is selected.

3 Character Code Table

3.1 European Font (ISO 8859-1)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				°	À	Ð	à	ð
1			!	1	A	Q	a	q			¡	±	Á	Ñ	á	ñ
2			”	2	B	R	b	r			¢	²	Â	Ò	â	ò
3			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó
4			$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u			¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v			¦	¶	Æ	Ö	æ	ö
7			’	7	G	W	g	w			§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	È	Ø	è	ø
9			)	9	I	Y	i	y			©	¹	É	Ù	é	ù
A			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú
B			+	;	K	[	k	{			«	»	Ë	Û	ë	û
C			,	<	L	\	l	|			¬	¼	Ì	Ü	ì	ü
D			-	=	M	]	m	}				½	Í	Ý	í	ý
E			.	>	N	^	n	~			®	¾	Î	Þ	î	þ
F			/	?	O	_	o				¯	¿	Ï	ß	ï	ÿ

3.2 Central European Font (ANSI 1250)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	€			°	Ŕ	Đ	ŕ	đ
1			!	1	A	Q	a	q		‘	ˇ	±	Á	Ń	á	ń
2			”	2	B	R	b	r	‚	’	˘	˛	Â	Ň	â	ň
3			#	3	C	S	c	s		“	Ł	ł	Ă	Ó	ă	ó
4			$	4	D	T	d	t	„	”	¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u	…	•	Ą	µ	Ĺ	Ő	Í	ő
6			&	6	F	V	f	v	†	–	¦	¶	Ć	Ö	ć	ö
7			’	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	Č	Ř	č	ř
9			)	9	I	Y	i	y	‰	™	©	ą	É	Ů	é	ů
A			*	:	J	Z	j	z	Š	š	Ş	ş	Ę	Ú	ę	ú
B			+	;	K	[	k	{	‹	›	«	»	Ë	Ű	ë	ű
C			,	<	L	\	l	|	Ś	ś	¬	Ľ	Ě	Ü	ě	ü
D			-	=	M	]	m	}	Ť	ť	-	˝	Í	Ý	í	ý
E			.	>	N	^	n	~	Ž	ž	®	ľ	Î	Ţ	î	ţ
F			/	?	O	_	o		Ź	ź	Ż	ż	Ď	ß	ď	˙

3.3 Baltic Font (ANSI 1257)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	€			°	Ą	Š	ą	š
1			!	1	A	Q	a	q		‘		±	Į	Ń	į	ń
2			”	2	B	R	b	r	‚	’	¢	²	Ā	Ņ	ā	ņ
3			#	3	C	S	c	s		“	£	³	Ć	Ó	ć	ó
4			$	4	D	T	d	t	„	”	¤	´	Ä	Ō	ä	ō
5			%	5	E	U	e	u	…	•		µ	Å	Õ	å	õ
6			&	6	F	V	f	v	†	-	¦	¶	Ę	Ö	ę	ö
7			’	7	G	W	g	w	‡	–	§	·	Ē	×	ē	÷
8			(	8	H	X	h	x			Ø	ø	Č	Ų	č	ų
9			)	9	I	Y	i	y	‰	™	©	¹	É	Ł	é	ł
A			*	:	J	Z	j	z			Ŗ	ŗ	Ź	Ś	ź	ś
B			+	;	K	[	k	{	‹	›	«	»	Ė	Ū	ė	ū
C			,	<	L	\	l	|		¬	¼	Ģ	Ü	ģ	ü
D			-	=	M	]	m	}	¨	¯	-	½	Ķ	Ż	ķ	ż
E			.	>	N	^	n	~	ˇ	˛	®	¾	Ī	Ž	ī	ž
F			/	?	O	_	o		˙		Æ	æ	Ļ	ß	ļ	˙

3.4 Cyrillic Font (ANSI 1251)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ђ	ђ		°	А	Р	а	р
1			!	1	A	Q	a	q	Ѓ	`	ў	±	Б	С	б	с
2			”	2	B	R	b	r	‚	’	Ў	І	В	Т	в	т
3			#	3	C	S	c	s	ѓ	“	Ј	і	Г	У	г	у
4			$	4	D	T	d	t	„	”	¤	ґ	Д	Ф	д	ф
5			%	5	E	U	e	u	…	•	Ґ	µ	Е	Х	е	х
6			&	6	F	V	f	v	†	-	¦	¶	Ж	Ц	ж	ц
7			’	7	G	W	g	w	‡	–	§	·	З	Ч	з	ч
8			(	8	H	X	h	x	€		Ё	ё	И	Ш	и	ш
9			)	9	I	Y	i	y	‰	™	©	№	Й	Щ	й	щ
A			*	:	J	Z	j	z	Љ	љ	Є	є	К	Ъ	к	ъ
B			+	;	K	[	k	{	‹	›	«	»	Л	Ы	л	ы
C			,	<	L	\	l	|	Њ	њ	¬	j	М	Ь	м	ь
D			-	=	M	]	m	}	Ќ	ќ	-	S	Н	Э	н	э
E			.	>	N	^	n	~	Ћ	ћ	®	s	О	Ю	о	ю
F			/	?	O	_	o		Џ	џ	Ї	ї	П	Я	п	я

3.5 Japanese Font (JIS X0201)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				-	タ	ミ		
1			!	1	A	Q	a	q			。	ア	チ	ム		
2			"	2	B	R	b	r			「	イ	ツ	メ		
3			#	3	C	S	c	s			」	ウ	テ	モ		
4			$	4	D	T	d	t			、	エ	ト	ヤ		
5			%	5	E	U	e	u			・	オ	ナ	ユ		
6			&	6	F	V	f	v			ヲ	カ	ニ	ヨ		
7			'	7	G	W	g	w			ァ	キ	ヌ	ラ		
8			(	8	H	X	h	x			ィ	ク	ネ	リ		
9			)	9	I	Y	i	y			ゥ	ケ	ノ	ル		
A			*	:	J	Z	j	z			ェ	コ	ハ	レ		
B			+	;	K	[	k	{			ォ	サ	ヒ	ロ		
C			,	<	L	¥	l	|			ャ	シ	フ	ワ		
D			-	=	M	]	m	}			ュ	ス	ヘ	ン		
E			.	>	N	^	n	~			ョ	セ	ホ	゛		
F			/	?	O	_	o				ッ	ソ	マ	°		

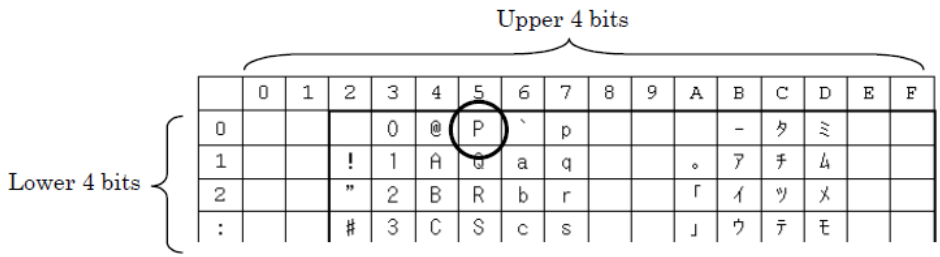
3.6 Control Codes

Refer to the following table when using control codes in User Communications.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DEL														
1	SOH	DCI														
2	STX	DC2														
3	ETX	DC3														
4	EOT	DC4														
5	ENQ	NAK														
6	ACK	SYN														
7	BEL	ETB														
8	BS	CAN														
9	HT	EM														
A	LF	SUB														
B	VT	ESC														
C	FF	FS														
D	CR	GS														
E	SO	RS														
F	SI	US														

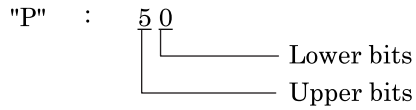
3.7 Using the Character Code Table

Ex: Finding the character code for the character “P” in the table.



	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				-	タ	ミ		
1			!	1	A	Q	a	q			。	ア	チ	ム		
2			"	2	B	R	b	r			「	イ	ツ	メ		
:			#	3	C	S	c	s			」	ウ	テ	モ		

The hexadecimal codes for the upper and lower four bits are “5” and “0” respectively. Therefore the code is expressed as follows:



For other fonts and two-byte characters, refer to the table of the relevant code system.
(Japanese (two-byte characters): JIS first standard/second standard, Chinese: GB2312, Taiwanese: BIG5, Korean (Hangul character): KSC5601)

Chapter 38 Color Number Correspondence Table

1 Color Number Correspondence Table

Refer to the following table if you want to set the display color of a Message Display using the value stored in a device.

Color No.	Data	Color No.	Data	Color No.	Data	Color No.	Data	Color No.	Data	Color No.	Data
		041	0x29	083	0x53	125	0x7D	167	0xA7	209	0xD1
000	0x00	042	0x2A	084	0x54	126	0x7E	168	0xA8	210	0xD2
001	0x01	043	0x2B	085	0x55	127	0x7F	169	0xA9	211	0xD3
002	0x02	044	0x2C	086	0x56	128	0x80	170	0xAA	212	0xD4
003	0x03	045	0x2D	087	0x57	129	0x81	171	0xAB	213	0xD5
004	0x04	046	0x2E	088	0x58	130	0x82	172	0xAC	214	0xD6
005	0x05	047	0x2F	089	0x59	131	0x83	173	0xAD	215	0xD7
006	0x06	048	0x30	090	0x5A	132	0x84	174	0xAE	216	0xD8
007	0x07	049	0x31	091	0x5B	133	0x85	175	0xAF	217	0xD9
008	0x08	050	0x32	092	0x5C	134	0x86	176	0xB0	218	0xDA
009	0x09	051	0x33	093	0x5D	135	0x87	177	0xB1	219	0xDB
010	0x0A	052	0x34	094	0x5E	136	0x88	178	0xB2	220	0xDC
011	0x0B	053	0x35	095	0x5F	137	0x89	179	0xB3	221	0xDD
012	0x0C	054	0x36	096	0x60	138	0x8A	180	0xB4	222	0xDE
013	0x0D	055	0x37	097	0x61	139	0x8B	181	0xB5	223	0xDF
014	0x0E	056	0x38	098	0x62	140	0x8C	182	0xB6	224	0xE0
015	0x0F	057	0x39	099	0x63	141	0x8D	183	0xB7	225	0xE1
016	0x10	058	0x3A	100	0x64	142	0x8E	184	0xB8	226	0xE2
017	0x11	059	0x3B	101	0x65	143	0x8F	185	0xB9	227	0xE3
018	0x12	060	0x3C	102	0x66	144	0x90	186	0xBA	228	0xE4
019	0x13	061	0x3D	103	0x67	145	0x91	187	0xBB	229	0xE5
020	0x14	062	0x3E	104	0x68	146	0x92	188	0xBC	230	0xE6
021	0x15	063	0x3F	105	0x69	147	0x93	189	0xBD	231	0xE7
022	0x16	064	0x40	106	0x6A	148	0x94	190	0xBE	232	0xE8
023	0x17	065	0x41	107	0x6B	149	0x95	191	0xBF	233	0xE9
024	0x18	066	0x42	108	0x6C	150	0x96	192	0xC0	234	0xEA
025	0x19	067	0x43	109	0x6D	151	0x97	193	0xC1	235	0xEB
026	0x1A	068	0x44	110	0x6E	152	0x98	194	0xC2	236	0xEC
027	0x1B	069	0x45	111	0x6F	153	0x99	195	0xC3	237	0xED
028	0x1C	070	0x46	112	0x70	154	0x9A	196	0xC4	238	0xEE
029	0x1D	071	0x47	113	0x71	155	0x9B	197	0xC5	239	0xEF
030	0x1E	072	0x48	114	0x72	156	0x9C	198	0xC6	240	0xF0
031	0x1F	073	0x49	115	0x73	157	0x9D	199	0xC7	241	0xF1
032	0x20	074	0x4A	116	0x74	158	0x9E	200	0xC8	242	0xF2
033	0x21	075	0x4B	117	0x75	159	0x9F	201	0xC9	243	0xF3
034	0x22	076	0x4C	118	0x76	160	0xA0	202	0xCA	244	0xF4
035	0x23	077	0x4D	119	0x77	161	0xA1	203	0xCB	245	0xF5
036	0x24	078	0x4E	120	0x78	162	0xA2	204	0xCC	246	0xF6
037	0x25	079	0x4F	121	0x79	163	0xA3	205	0xCD	255	0xF7
038	0x26	080	0x50	122	0x7A	164	0xA4	206	0xCE		
039	0x27	081	0x51	123	0x7B	165	0xA5	207	0xCF		
040	0x28	082	0x52	124	0x7C	166	0xA6	208	0xD0		

Numerics

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