How to configure DIGI CONNECTWAN cellular modems with IDEC PLC for remote cellular connections

Overview



Basic system setup

DIGI Connect WAN products provide reliable wireless communications via GSM (GPRS/EDGE/HSDPA) or CDMA networks for connectivity to remote locations. They offer an easy and cost effective means of connecting virtually any remote location into the corporate IP network. They are ideal for use where wired networks are not feasible or where alternative network connections are required.

In this application notes, we'll show users how to configure the DIGI CONNECTWAN cellular modem with IDEC MicroSmart Pentra FC5A-D12% with embedded Ethernet port PLC and use WindLDR to remotely connect to the modem through cellular network.



Benefits

- Remote monitor, upload and download PLC programs
- Remote 24/7 monitoring of PLC data
- o Alarms conditions in the PLC can be sent to Email or cell phone through cellular network
- Use WindSRV or write your own application program to centrally monitor PLC status

Parts Used

- 1 FC5A-D12K1E or FC5A-D12S1E MicroSmart Pentra CPU
- 1 DIGI CONNECTWAN GPRS cellular modem (in this application notes, we're using GPRS cellular modem part number DC-WAN-A101-A)
- 1 CAT 5 Ethernet cable

Step 1: Provisioning the DIGI modem

NOTE: The DIGI cellular modem does NOT come provisioned and will require a cellular data plan from a cellular carrier such as AT&T, Verizon, Sprint, etc. Please make sure a data plan is already established with the service provider before proceed with the instructions below.

In this application notes, we are using the GSM GPRS modem and the SIM card with a static Mobile IP address is provided by AT&T.

1. Insert SIM card to the modem SIM slot



2. Connect antenna, power supply and Ethernet cable to your PC/laptop



3. Open your web browser and enter the IP address 192.168.1.1 in the URL address bar



NOTE: The DIGI ConnectWAN has DHCP server enabled by default. In order to discover the DIGI device, make sure your host computer is set up to obtain IP addresses automatically. Also ensure all firewall software is temporarily disabled

4. From the web interface, under Configuration, click (a) "Mobile" (b) enter your service provider name and connection parameters and (c) click "Apply"

NOTE: Please do NOT use the settings in the illustration below but your own settings provided by your service provider



Connect WAN VPN Configuration and Management

Home	Mobile Configuration			
Configuration	▼ Mobile Settings			
Mobile	Select the service provider, service plan, and connection settings used in connecting to the mobile network.			
Serial Ports Alarms	These settings are provided by and can be retrieved from the service provider.			
System Remote Management	Mobile Service Provider Settings			
Security Position	Service Provider: AT&T/Cingular Wireless (Blue Network)			
Applications Python RealPort	Custom Plan Name: i2gold			
Management	Mobile Connection Settings			
Serial Ports Connections Event Logging Network Services	 Re-establish connection when no data is received for a period of time. Inactivity timeout: 3600 seconds 			
Administration File Management	Apply Set to Defaults			



5. From the web interface, under Configuration click Network \rightarrow Network Service Settings. Under Enable Web Server (HTTP) make sure TCP Port 8080 is used. Click Apply.

Home	Network Configuration				
Configuration	▶ Ethernet IP Settings				
Mobile	DHCP Server Settings				
Serial Ports Alarms	 Network Services Settings 				
System Remote Management	Enable Device Discovery (ADDP)				
Security	🔽 Enable Encrypted RealPort	TCP Port:	1027	🔲 Enable TCP Keep-Alive	
Position	📃 Enable Line Printer Daemon (LPD)	TCP Port:	515	Enable TCP Keep-Alive	
Applications Python	🗹 Enable RealPort	TCP Port:	771	Enable TCP Keep-Alive	
RealPort	📃 Enable Remote Login (rlogin)	TCP Port:	513	Enable TCP Keep-Alive	
Management Serial Ports	Enable Remote Shell (rsh)	TCP Port:	514	Enable TCP Keep-Alive	
Connections	🔽 Enable Network Management Protocol (SNMP)	UDP Port:	161		
Event Logging Network Services	🗹 Enable Secure Shell Server (SSH)	TCP Port:	22	🔲 Enable TCP Keep-Alive	
Administration	Enable Telnet Server	TCP Port:	23	🔲 Enable TCP Keep-Alive	
File Management	Enable Web Server (HTTP)	TCP Port:	8080		
Management Backup/Restore	Enable Secure Web Server (HTTPS)	TCP Port:	443		
Update Firmware Factory Default Settings	Apply				
System Information	Dynamic DNS Update Settings				
KEDOOT	IP Filtering Settings				
Logout					

- 6. Under Network Configuration, click IP Forwarding Settings.
- 7. Assuming the FC5A-D12% CPU is configured with IP address 192.168.1.22, we'll configure the modem for communications using the following Ports.
 - Port 2101 WindLDR Maintenance Communications •
 - Port 502 Modbus Communications •
 - Port 80 Web Server .

Forward TCP/UDP/FTP connections from external networks to the following internal devices (you may configure up to 64 forwarding rules):

Enable	Protocol	External Port	Forward To Internal IP Address	Forward To Internal Port	Range Port Count	
	тср	502	192.168.1.22	502	1	Remove
	тср	80	192.168.1.22	80	1	Remove
	тср	2101	192.168.1.22	2101	1	Remove
	FTP 💌	0	0.0.0.0	0	1	Add

8. Click Apply.



Step 2: WindLDR software

- 1. Remove Ethernet cable from PC/laptop and connect it to the FC5A-D12% CPU.
- 2. Launch WindLDR software
- 3. In WindLDR, under Configuration, click Setup icon. Under Communication Settings, select Ethernet and change the "Time delay between packets" to 250 ms.

Communica	tion Setting	gs	? 🗙		
Serial	Ethernet Port Settings				
Ethernet	IP Address:	166 . 130 . 112 . 141	Browse		
USB	Port:	2101			
	Timeout:	3000 📮 ms			
	Retry:	1			
	PLC Network Setting 1:1 				
	© 1:N Network Number: 0 Ethernet Advanced Settings				
	The maximum d	ata size: 1	🔹 x 64 bytes		
	Time delay betv	veen packets: 250	🖶 ms		
	Communication Options				
	Use HGxG Pas	s-Through			

4. Under Configuration, click Connection Settings.

MicroSmart Funct	ion Area	Settings			
Run/Stop Control Memory Backup	2	Configure parameters for client and server co	nnections.		
Input Configuration	Mainte	Maintenance Communication Server			
Communication Ports	🗷 Ena	Enable Maintenance Communication Server			
Cartridana & Madulan	Server	Server Connections			
Davias Cattings	No.	Communication Mode			
Jevice Settings	1	Modbus TCP Server (Slave)	TCP	Configure	
Program Protection	2	Modbus TCP Server (Slave)	TCP	Configure	
elf Diagnostic	3	Unused	TCP		
letwork Settings	4	Unused	TCP		
-mail Settings	5	Unused	TCP		
Vetwork Management	6	Unused	TCP		
Connection Settings	7	Unused	TCP		
Veb Server	8	Unused	TCP		
	Client	Connections			
	No.	Communication Mode			
	1	Unused	TCP		
	2	Unused	TCP		
	3	Unused	TCP		

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5. Under Maintenace Communication Server, click the **Configure** button. Change "Receive Timeout (ms):" to 2000.

Maintenance Communic	ation Server 🔀
Local Host Port No.: Number of Connections:	2101 • 3 •
Receive Timeout (ms):	2000 🔹
Restrict Access by IP Address:	
Allowed IP Address 1:	0.0.0.0
Allowed IP Address 2:	0.0.0.0
Allowed IP Address 3:	0 : 0 : 0 : 0
OK Cancel	Default

6. Construct a simple MOV instruction where a value of 500 is MOVE to destination device D8460.



