

D77D-PNA PROFIBUS Adapter to QCPort Installation Leaflet**D77D-PNA Installation**

The D77D-PNA is designed to be used in industrial applications and installed in accordance with this document. The intended use of the D77D-PNA is for use in clean, dry environments

Mount the D77D-PNA to a DIN Rail

To mount the D77D-PNA to a DIN rail the following procedure must be performed.

- Using a screwdriver or fingernail, gently pull out the locking tab located in the center of the D77D-PNA module.
- Insert the D77D-PNA module on to the DIN rail.
- Depress the locking tab to secure the D77D-PNA to the DIN rail.

Connect the D77D-PNA to PROFIBUS

Connect PROFIBUS to the PROFIBUS DB9 connector located at the middle right of the D77D-PNA, the connector is labeled PROFIBUS.

Configuring PROFIBUS

The PROFIBUS address is set using the 8 position DIP switches located on the front of the D77D-PNA. Valid address ranges are from 1 – 125. Moving the DIP switch to the right is ON and will increment the address by the value to the right of the switch. The address is set using binary notation.

The PROFIBUS baud rate is set automatically using an auto baud technology; there is not need to set the baud rate.

The GSD file is located on the Eaton Electrical web site, go to www.eatonelectrical.com.

The input and output telegram sizes can be read from the D77D-PNA from Modbus if CH Studio is not available, the holding registers are 2737 for the input data and 2738 for the output data size.

Connecting the D77D-PNA to QCPort

The D77D-PNA connects to QCPort using one or both of the two QCPort channels A or B. The connections for the channels are located on the base of the D77D-PNA and use the RJ12 style connectors. From the back of the D77D-PNA, the first port is Channel A and the next two ports are Channel B. Each channel is isolated from one another, though Channel A is used to power the D77D-PNA.

For most applications, a D77E-QPLR is used as the biasing resistor and also as the power tap for QCPort. Then using a backplane (D77E-BPx) the D77E-QPLR, D77D-PNA and other modules can be connected to a DIN rail and the QCPort at the same time. Using this type of a configuration, power is automatically routed from the D77E-QPLR to the D77D-PNA using the D77E-BPx backplane.

Performing a Soft Auto Configuration on the D77D-PNA

The Auto Configure button is labeled AC and is located on the left side of the RS485 connector above the A and B LED's. The Soft Auto Configure will erase the existing I/O data map to PROFIBUS and replace it with a new map that represents the devices on both QCPorts. To perform a Soft Auto Configuration, ensure that the QCPort system has been properly installed, the Group ID's have been set and that there is power applied to the QCPort system for both Channel A and Channel B (if used). All devices must be powered and operating without communication faults. Press and hold the AC button for five seconds. When the button is first pressed, the ST, MS and NS LED's will all go ON. When the LED's go OFF, it is safe to release the button indicating that the Auto Configuration is being performed. If the Soft Auto Configuration is not successful, the MS LED will be solid RED. This is an indication to check the QCPort devices for errors, correct the errors and attempt the Auto Configuration again.

After performing a successful Soft Auto Configuration, the I/O data of the QCPort devices will be placed in the produced telegrams (to the system controller) and consumed telegrams, (to the D77D-PNA). The I/O data of the QCPort devices will be placed in order of the Group ID settings on the QCPort devices from lowest to highest for the IO telegrams to PROFIBUS.

Performing a Hard Auto Configuration on the D77D-PNA

A Hard Auto Configuration is similar to the Soft Auto Configuration except the AC button is held prior and during (for five seconds) power being applied to the QCPort system. **A Hard Configuration will reset all QCPort devices to Out of Box defaults. This resets all parameters previously set by a tool to Out of Box factory defaults.** A Hard Auto Configuration will then remap all the I/O data as described in the Soft Auto Configuration section above.

Modbus TCP Setup and Configuration of the D77D-PNA

The D77D-PNA requires no other setup or configuration for normal operation. For more information refer to the user manual **MN5008001E** PROFIBUS Adapter Users Manual.

Module Current Draw for the D77D-PNA

Modbus TCP	N/A
Channel A QCPort	170 mA
Channel B QCPort	15 mA
PROFIBUS	N/A
Modbus Serial	0 mA

Approvals/Certifications of the D77D-PNA

Agency Certifications	UL-CUL UL 508 CSA C22.2 No. 14 CE (Low Voltage Directive) PTO Certified
Radiated and Conducted Emissions	EN5011 Class A
Electrical/EMC	
• ESD Immunity (IEC61000-4-2)	+/- 8kV air, +/- 4kV contact
• Radiated Immunity (IEC61000-4-3)	10V/m 80-1000 MHz, 80% amplitude modulation @ 1kHz
• Fast Transient (IEC61000-4-4)	+/- 2kV supply and control +/- 1kV communications
• Surge (IEC61000-4-5)	+/- 1kV line-to-line +/- 2kV line-to-ground
• RF Conducted (IEC61000-4-6)	10V, 0.15 – 80MHz
• Magnetic Field (IEC61000-4-8)	30 A/m, 50Hz
Protection Degree (IEC60947-1)	IP20

Environmental Ratings of the D77D-PNA

Transportation and Storage	Temperature	-50°C to 80°C (-58°F to 176°F)
	Humidity	5-95% non-condensing
Operating	Temperature	-25°C to 65°C [-13°F to 131°F]
	Humidity	5-95% non-condensing
	Altitude	Above 2000 meters (6600 feet) consult factory
	Shock IEC 68-2-27	15G any direction for 11 milliseconds
	Vibration IEC 68-2-6	5 – 150 Hz, 5G, 0.7 mm maximum peak-to-peak

Communication Specifications for the D77D-PNA

PROFIBUS Input Telegram Size	244 bytes Max
PROFIBUS Output Telegram Size	176 bytes max
PROFIBUS Diagnostic Telegram Size	36 bytes Max
PROFIBUS Baud Rates	Up to 12 Mb/s
IO Modbus TCP Size Max	1023 16bit registers input 1023 16bit registers output
Modbus TCP Baud Rates	10 Mb/s
Modbus Serial Baud Rate	1200 – 115.2Kbaud (19.2K Default)
Modbus Serial Mode	RTU (default) or ASCII
QCPort Channels	Channel A and Channel B (independent from each other)
Max QCPort Devices	63 CH A 63 CH B

Configuring Modbus

To configure the QCPort devices the software tool CH Studio is required. CH Studio uses the Modbus TCP port to connect to the D77D-PNA for configuration of the QCPort devices. The Modbus TCP port is 10 Mb/s and uses the RJ45 connection. By default, the IP address is set using BootP, CH Studio has a BootP server integrated to automatically set an IP address. Once CH Studio has connected to the D77D-PNA, the IP address can be set static to any address.

There is also a serial connection to D77D-PNA which is also Modbus and is physically connected using RS485. The address for the Modbus serial port will be the same as the PROFIBUS address. The mode and baud of the Modbus Serial port can be configured using the DIP switches labeled Mode and B0 – B2.

The baud rate is set using the configuration switches B0, B1 and B2

B0	B1	B2	Baud
OFF	OFF	OFF	1200
ON	OFF	OFF	2400
OFF	ON	OFF	4800
ON	ON	OFF	9600
OFF	OFF	ON	19.2K
ON	OFF	ON	38.4K
OFF	ON	ON	57.6K
ON	ON	ON	115.2K

State	Description
CPU Status (ST)	
On Solid	CPU Fault
Blinking	CPU OK
Off	No Power
Module Status (MS)	
Blinking Green	Unconfigured
Steady Green	OK, Configured
Flashing Red	Faulted or Missing QCPort Device
Steady Red	Major Fault
Off	No Power

PROFIBUS Status (SF/BF)

SF	BF	
OFF	On	No Connection, Unconfigured
ON	OFF	Parameter Error, PCB Communication Error
OFF	OFF	Data Exchange Mode

Channel Status (A or B)

Blinking	One or more devices on QCPort are faulted QCPort not scanning
Steady	QCPort Scanning
Off	No Power No Communication on that Channel