# PEN

## POWERLOGIC® Ethernet NIM

### Description

The PEN is an Ethernet network interface module originally intended for use with Square D® POWERLOGIC Circuit Monitors. It is designed to be mounted directly on the back of a CM 2000 series Circuit Monitor in the same fashion as analog I/O (IOM) is attached. Power for the PEN is supplied by the Circuit Monitor through the PEN's attached ribbon cable. One PEN can support a network of up to 32 Circuit Monitors.

The PEN-T-SA model is a stand-alone version of the PEN module. Intended for panel mounting, these modules are powered by a direct AC screw terminal connector, and are ideal for use with POWERLOGIC power meters or POWERLINK® panels. The PEN can also be used to communicate with Modbus® RTU devices over Ethernet.

### Ports

The PEN is equipped with an RS-422/RS-485 port and an Ethernet port. The serial connection from a standard PEN is a four-conductor pigtail. This pigtail is furnished with spade connectors for easy wiring to the RS-485 communication port on the Circuit Monitor. The Serial port on the PEN-T-SA is a removable 5 position screw terminal. All versions of the PEN can speak either PNIM or Modbus RTU protocol over this serial connection. When connected to a POWERLOGIC network, the serial port self-determines baud rate and parity, then stores this configuration in the PEN's internal registers.

### Ethernet

The PEN-T units feature a standard 10BaseT RJ45 twisted pair Ethernet port for standard CAT-5 wiring. All versions support both of these Ethernet protocols: SY/MAX® 802.3 and MODBUS/TCP.

The PENs may use MODBUS/TCP Ethernet protocol. MODBUS/TCP is the protocol used in the Modicon Quantum™ Series NOE. Because it is truly open, it has become a popular Ethernet protocol among many hardware and software manufacturers.

The PENs may also use SY/MAX 802.3 Ethernet protocol, the protocol common to SY/MAX 450 and 650 processors. SY/MAX 802.3 can be used at the same time as Modbus/TCP.

In TCP/IP modes the PEN responds to its IP address and uses the Destination Index in the Modbus/TCP packet to determine the target slave device.

### Configuration

When connected to a POWERLOGIC network, The only configuration required in the PEN is the IP address (TCP/IP versions) or the SY/MAX drop number (SY/MAX 802.3 versions). This configuration is stored in reserved registers inside Circuit Monitor number 1, which must be connected to the PEN's POWERLOGIC network. The other Circuit Monitors on the network will have device numbers between 2 and 32.

When connected to a network of Modbus RTU devices, the PEN's serial communications must be configured by the user. The serial protocol, along with baud rate and parity, are set using the PENSW
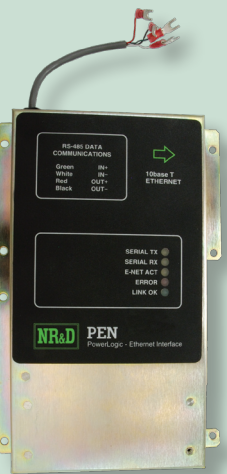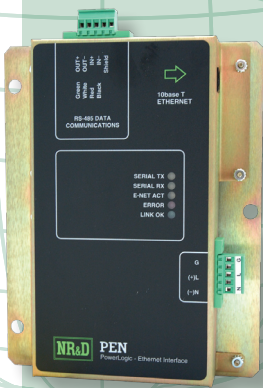
configuration software supplied with each unit.

I/O cannot be used on a Circuit Monitor that has a PEN attached. If I/O is needed at a given Circuit Monitor's location, use a PEN-T-SA or an EPE5 and NRK2 instead of the PEN.

## Ordering Information

**The PEN is available as:**
- **PEN-T**    with Pigtail RS-422/RS-485 port, 10BaseT Ethernet port (SY/MAX 802.3 and TCP/IP Protocols); for mounting to circuit monitor
- **PEN-T-SA**  with Screw Terminal RS-422/RS-485 port, 10BaseT Ethernet port (SY/MAX 802.3 and TCP/IP Protocols); with mounting plate and wall transformer for stand-alone operation

## Related Equipment

**The PEN has the following  equipment available:**
- **NC5**     PEN-T-SA replacement Network Connector
- **PC3**     PEN-T-SA replacement Power Connector
- **TPH**     PEN-T or PEN-T-SA Ethernet cable
- **TPX**     PEN-T or PEN-T-SA Crossed Ethernet cable

## Specifications

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| Warranty / Manual | The PEN is furnished with a user manual on cd and carries a one year warranty from the date of shipment. During the warranty period, free firmware upgrades are available. See Niobrara's Standard Terms and Conditions of Sale for additional warranty information. |
| Dimensions | 6.2" wide by 9.2" high by 1.6" deep (158 x 234 x 41 mm); 2 pounds (900g) net weight. Heavy duty steel case with brushed chromate finish. |
| Power Requirements | From Circuit Monitor. 5 VDC, 1A. SA model: 90-276 VAC (47-63 Hz) or 125-350 VDC; 6 watts. |
| PEN-T Power Connector | Ribbon cable to back of Circuit Monitor 2000. |
| PEN-T-SA Power Connector | 5-position screw terminal. |
| Serial Port Modes | PNIM. Master or Modbus Gate mode. Optically isolated. 2-wire RS-485 compatible. |
| PEN-T Serial Port | RS-422/RS-485 4-wire pigtail with spade connectors on conductors. PowerLogic color code. |
| PEN-T-SA Serial Port | 5-position removable screw terminal. |
| Ethernet Port | AUI - 15-pin D-subminiature female AUI for use with Ethernet transceivers. One-piece slide lock. 10BaseT - Standard RJ45 port. SY/MAX 802.3 and MODBUS/TCP compatible. |
| Indicators | LED indicators for Serial Port Transmit, Serial Port Receive, Busy, Error, Link, and Ethernet activity.  Six total indicators. |