phoenix digital

10/100 Ethernet (OCR-ETF)

Installation & Quick Start Manual

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1 Configuration and Installation

This section provides preparation for use and installation instructions (including unpacking and inspection instructions), and a functional description of indicators, diagnostics and configuration instructions.

1.1 Unpacking Instructions

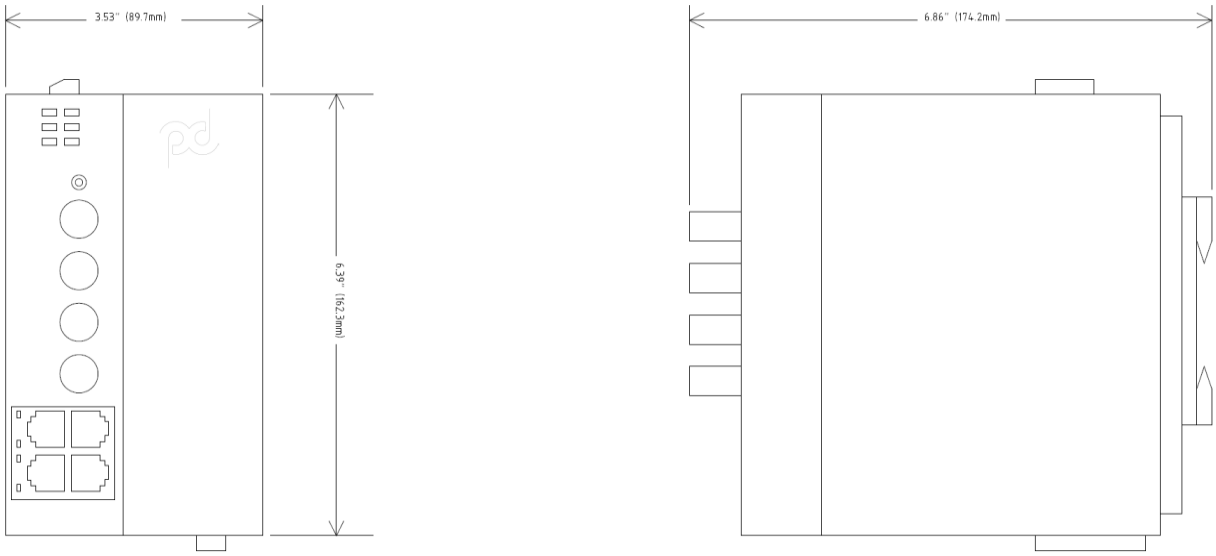
All Phoenix Digital fiber optic modules are shipped from the factory in shock absorbing materials. Remove the fiber modules from the packing material and refer to the packing list to verify that all items are present. All equipment should be visually inspected for damage upon removal from the shipping container. Save the packing materials for future storage or reshipment.

NOTE: If the shipping carton is damaged upon receipt, request that the carrier's agent be present while the unit is being unpacked and inspected.

1.2 Installation and Mounting Procedure

Standalone, DIN-Rail/Panelmount OCR-ETF modules should be DIN-Rail mounted or panel mounted per the mounting specifications provided in Figure 1. All Phoenix Digital fiber optic modules are convection cooled, requiring no fan or forced air cooling. An unobstructed air space must be maintained above and below the fiber modules (6 inches minimum) to insure adequate convection airflow. The air at the bottom of the fiber optic module may not exceed 60 degrees Celsius (140 degrees F).

Figure 1 – Mounting Specifications



1.3 Configuration Instructions and Interactive Diagnostics

Phoenix Digital's fiber optic modules provide advanced, interactive, system-level diagnostics. These diagnostics may be accessed thru the PC based diagnostic software or via Discrete Contact Outputs to validate network integrity and assist in troubleshooting network problems...

1. Detect and Locate Fault Conditions Throughout the Network
2. Verify Fault Management and Overall Network Integrity
3. Simulate Network Fault Conditions
4. Trap-and-Hold Intermittent Failure Conditions

These advanced interactive diagnostics provide the user with a powerful set of tools, greatly simplifying network start-up and on-line maintenance of Ethernet communication networks.

Note: Activation and control of Standalone OCR-ETF Diagnostics is provided through Diagnostic/Configuration Select Switch Settings. Diagnostic/Configuration Select Switch Settings are provided in Table 1. Monitoring of Standalone, DIN-Rail/Panelmount OCR-ETF diagnostics is provided using reed relay contact outputs. These outputs are accessible on the J7 connector. Specifications and detailed pin-out for the J7 connector pin-out are provided in Table 2.

Each fiber optic module must be configured (switch selectable) prior to installation.

Configuration Switch locations are identified on the overview of the fiber optic modules depicted in Figure 2. Specifications detailing fiber optic module Network Configuration Switch designations are provided in Table 1.

Figure 2 – Diagnostic and Configuration Switch Locations

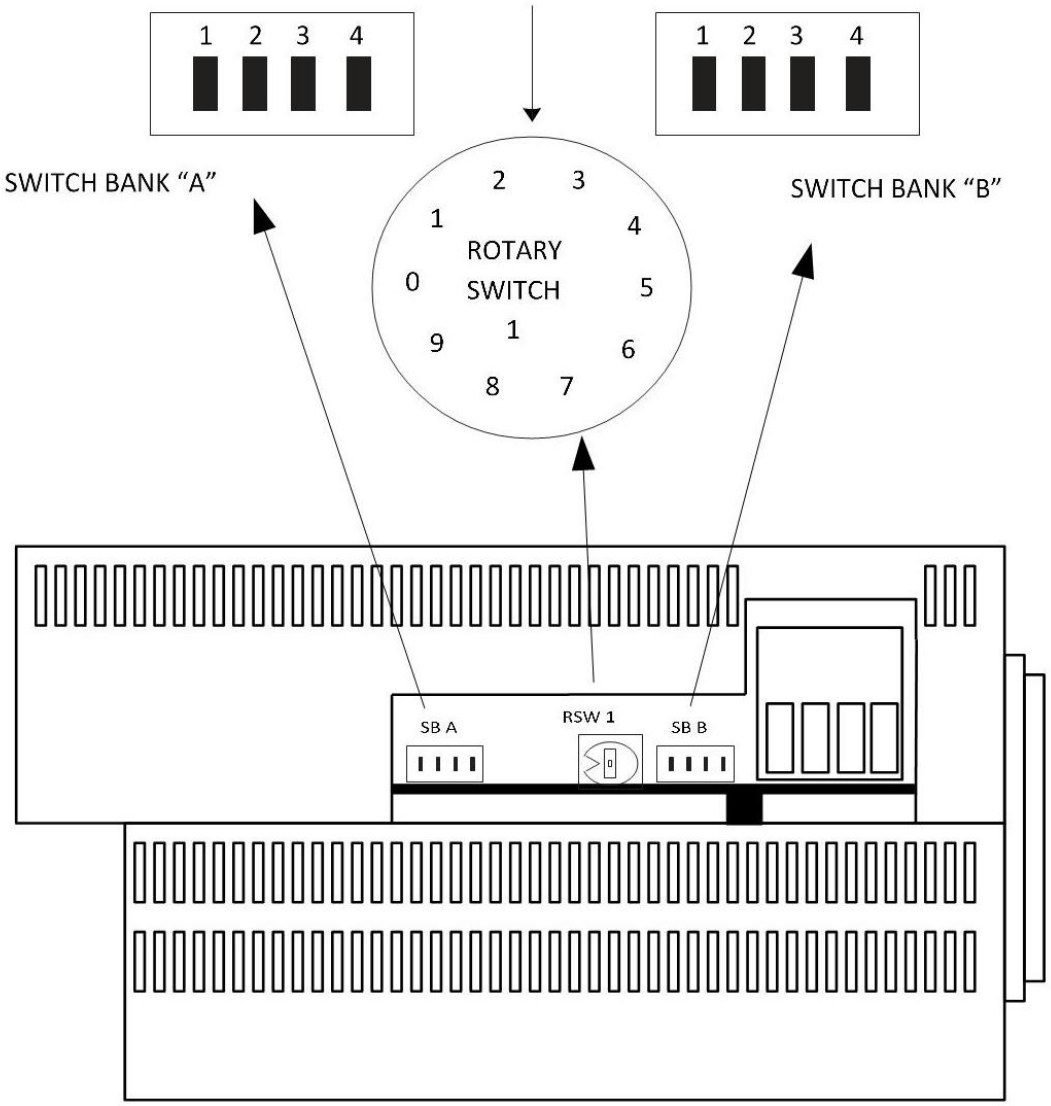

1 2 3 4
1 2 3 4
SWITCH BANK "A"
SWITCH BANK "B"
ROTARY
SWITCH
0
1
2
3
4
5
6
7
8
9
SB A
RSW 1
SB B

Table 1 – Diagnostic and Configuration Switch Designations

Switch	Position	Function	Factory Default Position
Switch Bank "A"	1	Unused	OFF
	2	Processor Backplane Communications Enable (1746 OLC Plug-In Modules Only)	ON
	3	Unused	OFF
	4	Unused	OFF
Switch Bank "B"	1	Network Master Fiber Module	OFF
	2	Trap Mode Select	OFF
	3	Force Optical Channel A Error	OFF
	4	Force Optical Channel B Error	OFF
Rotary Switch 1	0	Level 1, Standard Priority, All Ports	OFF
	1	Level 2, Elevated Priority, All Ports	OFF
	2	Level 3, High Priority, All Ports	OFF
	3	Ports J1, J3, J5 Level 2 Priority Ports J2, J4, J6 Level 1 Priority	OFF
	4	Ports J1, J3, J5 Level 3 Priority Ports J2, J4, J6 Level 1 Priority	OFF
	5	Ports J1, J3, J5 Level 3 Priority Ports J2, J4, J6 Level 2 Priority	OFF
	6	Ports J1, J3, J5 Level 4 Priority Ports J2, J4, J6 Level 1 Priority	OFF
	7	Ports J1, J3, J5 Level 4 Priority Ports J2, J4, J6 Level 3 Priority	OFF
	8	Local Interface Disable	OFF
	9	Unused	OFF

Table 2 – Standalone, DIN-RAIL/Panelmount OCR-ETF Diagnostic Outputs

J7 Connector	Function
1, 2	Channel A Error (ERR)
3, 4	Channel B ERR

Table 3 – Diagnostic Relay Contact Electrical Specifications

Arrangement..... 1 FORM A
Initial isolation resistance, max..... 1,000 Meg Ohm

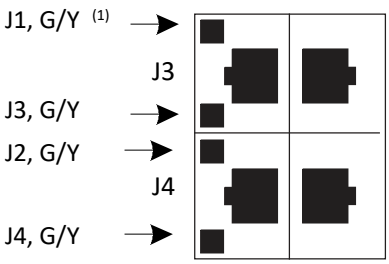
Rating (resistive)

Max. switching voltage ..... 350 VAC, 350 VDC
Max. continuous load current..... 0.1 A
Max power dissipation..... 800 mW
Max. On resistance ..... 35 ohms
Max. Off state leakage ..... 1 microamp
Isolation voltage..... 1,500 VAC

1.4 Diagnostic Status Indicator Definition

Table 4 - OCX Status Lights

Ch A, B ACT/ERR for OCX-ETF and OCR-ETF (Ch A, B Active/Error)	• Illuminates solid green when the corresponding optical network receive input is receiving valid communications. • Illuminates solid red when the corresponding optical network receive input fails to detect valid communications. • Illuminates flashing green/red when the network is in Trap Mode, the module at this location had previously trapped a failure, the cause of the failure has been repaired, and the network has not yet been reset from the trapped condition.
Ch A, B Tx/Rx	• Illuminates solid green when the corresponding optical network channel is active, and no data is passing through the channel in either direction. • Illuminates flashing green when the module is transmitting data on the corresponding fiber optic network transmit data output. • Illuminates flashing yellow when the module is receiving data on the corresponding fiber optic network receive data input. • Indicator is OFF when the corresponding optical network channel is inactive.
Global ERR	• Illuminates solid green when all network fiber connections are good. (Requires a redundant network configuration with a Network Master module.) • Illuminates flashing green when there is a break somewhere in the network and the modules are not in Trap Mode. (Requires a redundant network configuration with a Network Master module.) • Illuminates flashing red when the network is in Trap Mode and there is a failure condition trapped somewhere on the network. • Illuminates flashing green/red when the network is in Trap Mode, a failure had been previously trapped somewhere on the network, the cause of the failure has been repaired, and the network has not yet been reset from the trapped condition. • Indicator is OFF when no Master Module is detected on the network.
OK	• Illuminates solid red during reset condition. • Illuminates solid green during normal operation.
Link Status Indicators	• Solid Green = Link Established • Flashing Green = Transmit Data • Flashing Yellow = Receive Data • OFF = No Link Detected

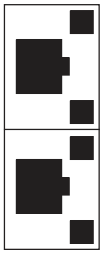


Solid Green (Link Established)

Flashes Green (Transmit Data)

Flashes Yellow (Receive Data)

OFF (No Link).



J5 Single Color Link Status Indicator
- Solid Yellow (Receive Data)
- OFF (All other states and conditions)

J6 Single Color Link Status Indicator
- Solid Green (Link Established)
- Flashes Green (Transmit or Receive Data)
- OFF (No Link).

1.5 POWER SUPPLY SPECIFICATIONS

1.5.1 24V DC INPUT BARRIER STRIP PIN DEFINITIONS

P1 BARRIER DESIGNATION	SIGNAL NAME
+24V	24 VDC
-24V	+24 VDC Return
C-GND	Chassis Ground

1.5.2 24 VDC Power Supply Requirements

(Specified at the +24 VDC, +24 VDC Return Input Power Connections on the OCR-ETF connector):

Input Voltage Range	+18 VDC to +30 VDC
OCX Input Current	0.60 Amps
Regulation (Load and Line)	0.6% (min)
Fuse	2 AMP, 250 VAC SLO BLO

The fuse is mounted on the internal printed circuit board of the Auxiliary Power Supply. For fuse access the user must remove the Auxiliary Power Supply from the side of the Standalone, DIN-Rail/Panelmount OCR-ETF enclosure.

1.5.3 120/220 VAC INPUT BARRIER STRIP PIN DEFINITIONS

Fuse ..... 2 AMP, 250 VAC SLO BLO

L1 ..... AC Power In (High Line)

L2 ..... AC Power In (Neutral)

⏚ ..... Chassis Ground

1.5.4 120/220 VAC Power Supply Requirements

(Specified at the L1, L2 Input Power Connections on the Standalone, DIN-Rail/Panelmount OCR-ETF Connector):

Fuse ..... 2 AMP, 250 VAC SLO BLO

Input Voltage Range ..... 85 VAC to 264 VAC

Input Frequency Range ..... 47 to 440 Hz

Conducted RFI ..... FCC limit B and VDE Limit A

Hold Up Time ..... 12 milliseconds

Power Consumption ..... 15 watts per Unit

Fuse ..... 2 Amp, 250 VAC, SLO BLO

The fuse is mounted on the internal printed circuit board of the Auxiliary Power Supply. For fuse access the user must remove the Auxiliary Power Supply from the side of the Standalone, DIN-Rail/Panelmount OCR-ETF enclosure.

1.5.5 125 VDC INPUT BARRIER STRIP PIN DEFINITIONS

+125V ..... +125 VDC In

-125V ..... -125 VDC Return

C-GND ..... Chassis Ground

1.5.6 125 VDC Power Supply Requirements

(Specified at the +125V, +125V Return Input Power Connections on the Standalone, DIN-Rail/Panelmount OCR-ETF Connector):

Fuse ..... 2 AMP, 250 VAC SLO BLO

Input Voltage Range ..... 120 to 370 VDC

Power Consumption ..... 15 Watts per unit

Fuse ..... 2 Amp, 250 VAC, SLO BLO

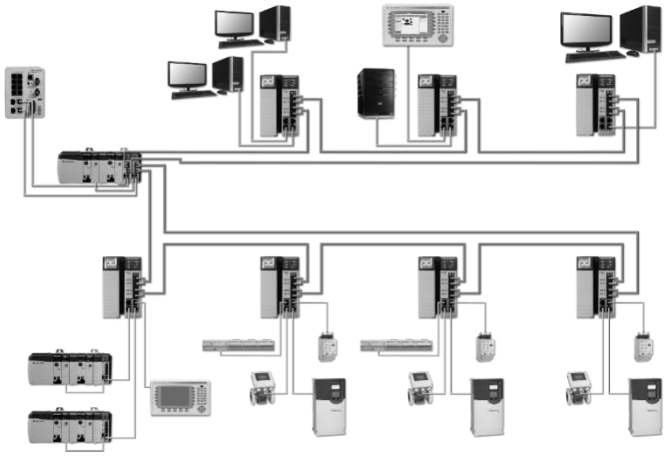
The fuse is mounted on the internal printed circuit board of the Auxiliary Power Supply. For fuse access the user must remove the Auxiliary Power Supply from the side of the Standalone, DIN-Rail/Panelmount OCR-ETF enclosure.

2 Technical Information

2.1 Fault Tolerant, Self-Healing Communication

Phoenix Digital's Fault Tolerant, Self-Healing Communication technology provides diagnostic monitoring of the communication signal waveforms at each node on the network, and ultra-high-speed detection, isolation, and correction of points of communication failure anywhere on the network. Phoenix Digital's fiber optic modules will self-heal communication failures in ring or point-to-point network to maintain communication continuity throughout the network in the event of a network failure in a fault tolerant network configuration.

Figure 3 - Example of Typical Fault Tolerant, Fiber Optic Module Network Configurations using Phoenix Digital's Ethernet fiber optic communication modules



In a Phoenix Digital fault tolerant ring network, one fiber optic communication module on the fiber optic Ethernet ring must be switch configured to be a Network Master module by enabling a single DIP switch (Refer to Table 1), and all other modules must be switch configured to be Slave modules. The fiber optic

Network Master module may be located anywhere on the fiber optic network. In the event of a failure of any module or failure of the network Master module itself, the remaining fiber optic modules will continue to communicate with each other through the redundant communication path to maintain network communication.

The fiber optic modules may either be interconnected Channel A Tx/Rx to Channel A Rx/Tx, then Ch B Tx/Rx to Ch B Rx/Tx, etc., around the ring; or Ch A Tx/Rx to Ch B Rx/Tx, then Ch A Tx/Rx to Ch B Rx/Tx, etc., around the ring. There is no special restriction limiting how the fiber channels must be connected, if the transmit/receive connections from one channel are connected to a complementary set of connections on another channel. Diagnostic monitoring circuitry at each module (master and slave) will continuously monitor the integrity of the communication carriers present at the receive data inputs of each communication module. This high speed combinational diagnostic monitoring circuitry will monitor and detect communication failures in carrier symmetry, jitter, amplitude, and babble. In the event a fault condition is diagnosed on the network the fiber modules detecting the failure will immediately enunciate the failure to enable maintenance personnel to locate fault conditions (remote status monitoring), add/delete nodes, and splice/terminate/replace media on-line, without disrupting network communications.

Figure 4 – Redundant Network Typical Fiber Routing

In a “non-redundant” network, all the fiber optic modules should be configured as Slaves. The fiber optic modules may be interconnected Channel A Tx/Rx to Channel A Rx/Tx, then Ch B Tx/Rx to Ch B Rx/Tx, etc., throughout the bus; or Ch A Tx/Rx to Ch B Rx/Tx, then Ch A Tx/Rx to Ch B Rx/Tx, etc., throughout the bus. The

outside ports on the two end fiber modules should remain unconnected to any other devices. Since the red ERR or ER error indicator on the front of the fiber optic module will remain on whenever there is no connection and/or valid carrier signal at the corresponding fiber optic receive input, the error indicators corresponding to the receive data inputs on the outside ports of the two end fiber modules on the bus will remain continuously on. However, this is not an indication of a network error, because in this configuration these network inputs will remain open and unconnected.

Figure 5 – Non-Redundant Network Typical Fiber Routing

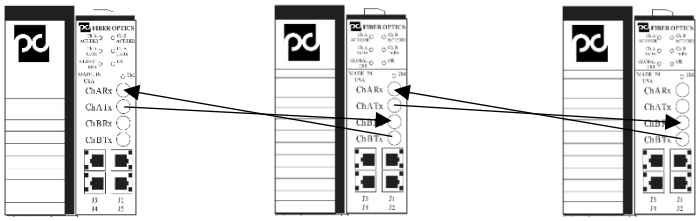
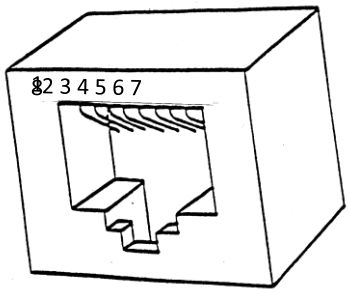


Table 5 – Truth Table for RJ45s

10/100 Base-T Pin Number (1)	Ethernet Connector Signal Name (10/100 Base-T RJ45 Interface... Orientation)
1	RD+ (Output)
2	RD- (Output)
3	TD+ (Input)
4	NC (2)
5	NC (2)
6	TD- (Input)
7	NC (2)
8	NC (2)

The 10/100 Base-T connectors are 8 pin RJ45 Receptacles. RJ45 Receptacle pin orientation (front view) is given in the figure below...



"NC" = No Connection. All undesignated pin numbers should remain unconnected to any electrical signals.