Redundant Fiber Optic Networking Modules for PLC Networks

Built-for-purpose Ethernet networking modules
For connecting PLC to PLC and for connecting PLC to remote I/O

fiber optic redundant Ethernet networking
This is not an IT switch. This is a networking module that control engineers can support, built for PLC networks, built for connecting Ethernet remote I/O, with fiber and redundancy by design.

- Connect OCR networking modules together in a ring via redundant fiber backbone over long distances
- Connect your Ethernet PLCs, Ethernet remote I/O to the copper ports on each OCR networking module
- Unique ring architecture reduces cabling to end devices
- Redundant ring architecture adds an additional network path to increase reliability
- Relay out for fault indication (ETF module)
- Network status and diagnostics software
- Scalable platform
- DIN rail mountable

**Reduce Installation Costs, Increase Reliability, Built-for-purpose**

Ethernet IT switches connect office computers and servers, and they direct data to destinations. IT switches offer flexibility for the office environment like configuration, firmware patches, quality of service for voice, and VLANs to segregate finance, sales, marketing, and the engineering department, for example. And, IT switches have the luxury of being supported by IT staff.

The Phoenix Digital OCR is not a complex IT managed switch. It’s not for your servers and PC’s. It’s for your PLC network, only. And it’s built for this industrial purpose. It’s plug and play, high performance, redundant fiber, self-healing networking module for your PLC networks and remote I/O networks.

**Redundant Fiber Self-healing Backbone**

OCR modules are connected together in a redundant fiber ring architecture. It’s redundant to increase reliability. It’s a closed ring so one module can fail, and there’s still a network path to the other modules. It’s fiber, so you can cover long distances with EMI immunity. The network is self-healing, so if you lose a fiber cable, or a module, there’s zero network convergence time.

**Unique, High Performance**

The OCR supports up to 1Gbit/sec network speeds, and uniquely, can support those speeds up to 100% bandwidth utilization. This is only possible because of the patented technique of packetization between modules that always runs at 100% carrying network data.

**Plug and Play**

Full disclosure... it’s almost plug and play. Truth is, you have to set one DIP switch on one OCR module on your network to designate a network master on the ring architecture. So, if any module fails, it’s plug and play, unless you have to throw that one DIP switch -- but hey -- no command line interface programming, so that’s pretty much plug and play for a network switch!

**Cost Saving Architecture**

IT switches are hub and spoke -- switch at the hub, components at the spokes. The OCR network is a ring, and hub, and spoke architecture. OCR switches are arranged in a ring and your devices connected to each OCR (a hub) which reduces network components, cabling, and connections by as much as 40%.

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OCR ETG Connections

OCR ETF Connections

- Redundant fiber backbone between OCR modules
- RJ45 ports for field devices
- Returned signal strength voltage test points
OCR Benefits

- 30 sec MTTR mean time to repair
- 10 sec power up
- 0 sec network convergence time on channel failure
- Hot swappable modules
- No command line interface configuration
- No software updates, security patches, driver updates, or memory flash configurations
- Integrated returned signal strength (RSS) (ETG module)
- Transports Modbus TCP, PROFINET, Ethernet/IP, and Ethernet all at the same time
- Field replaceable SFPs
- Commonality of spares
- Embedded diagnostics
- No IP addressing

Scalable Platform

The ring architecture can be extended at anytime, and while running, with no interruption to the network.

End devices can be connected, while running, to the copper ports, and OCR modules can be inserted into the fiber ring with no interruption to the existing network.

Other networking modules from Softing, that can be added to the network, include ControlLogix in-chassis networking module (OCX), and PLC-5 in-chassis module (OCM).

OCR Diagnostics

Diagnostic software is included with the network switch.

In the example below, the red line is an indication that one of the fiber cables between modules is down.

In this example, there is no outage because the network automatically adjusts and all modules remain connected via the ring.

The blue dot represents the master module on the network. This module was designated the master by setting a DIP switch in the module to Master.
## Specifications

| Ethernet speed | 10/100 MB for model OCR-ETF  
10/100/1000 MB for model OCR-ETG |
|----------------|---------------------------------|
| Fiber          | Single mode or multimode  
ST, SC, or LC connectors for model OCR-ETF  
LC connector for model OCR-ETG  
-15 dBm transmit power typical multimode  
-18 dBm transmit power typical single mode  
-32 dBm receive sensitivity |
| Power supply   | 0 to 60 degrees C (32 to 140 F) operating temperature  
120/220 VAC input voltage or...  
24 VDC dual feed  
8 - 10 watts power consumption |
| Environmental  | 0 to 60 degrees C (32 to 140 F) operating temperature  
-40 to 85 degrees C (-40 to 185 F) storage temperature  
0 - 95% relative humidity, non-condensing |
| Dimensions     | 162.3 mm H x 89.7 mm W x 174.2 mm D  
6.39” H x 3.53” W x 6.86” D |
| Approvals      | UL and CUL Class I Div 2 all groups  
CE |
| Diagnostics    | ETG has RSS voltage out. ETF has relay out for fault indication. |

## Ordering Options

### Part Numbers

OCR-ETF-(1)-(2)-(3)-(4)-(5) FAST Ethernet Communications 10/100BaseT  
OCR-ETG-(1)-(2)-(3)-(4)-(5) Gigabit Ethernet Communications 1000BaseT

### Explanation

1. "85" = 850 nanometer wavelength selection (Multimode only)  
"13" = 1300 nanometer wavelength selection (Multimode or Single Mode)  
"15" = 1550 nanometer wavelength selection (Single mode only)  

2. "D" = Interactive Diagnostics

3. "ST" = ST Fiber Optic Connector Style  
"LC" = LC Fiber Optic Connector Style (Not available for the 850 nm wavelength.)

4. "24V" = 24 VDC Operation  
"ACV" = 120/220 VAC, 50/60 Hz Operation  
"125V" = 125 VDC Operation

5. "SM" = Single Mode Fiber Compatibility (Available with the 1300 nm or 1550 nm wavelengths only.)  
blank = Multimode Fiber Compatibility