



Phoenix  
Digital

# OPTICAL COMMUNICATION For SIEMENS/TI TIWAY, PEERLINK, and Remote I/O Networks

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Phoenix Digital now provides Fiber Optic TIWAY™, PEERLINK™, and Remote I/O Communications. Optical Communication Modules (OCMs) are available for SIEMENS SIMATIC TI 505 Chassis Installation, or in modular Standalone Enclosures for Panelmount Installation... with integral 120/220 VAC, 24 VDC, or 125 VDC power supplies.

## FEATURES

- Fiber Optic Communications. . .
  - Noise Immunity
  - Intrinsically Safe
- Dependable Data Communications. . .
  - On-Line Error Checking
  - Fault Prediction
  - Fault Location
  - Fault Tolerant
  - Redundant Fiber Media
- Plugs Directly Into SIEMENS/TI System Chassis. . .
  - SIMATIC TI 505 Plug-In Module
- Network-Wide Diagnostics. . .
  - Locates Fault and Impending Fault Conditions
- Short or Long Distance. . .
  - 6 Feet (2 Meters) to 6 Miles (10 Kilometers) Apart - Multimode Operation
  - Over 16 Miles (25 Kilometers) Apart - Singlemode Operation
- Selectable Wavelengths. . .
  - 850 nanometers, 1300 nanometers
- Compatible with Both Singlemode and Multimode Fiber, and with Industrial Fiber
- Ruggedized Industrial Fiber Optic Cable. . .
  - Available only from Phoenix Digital



## DESCRIPTION

Phoenix Digital's family of Optical Communication Modules for use with SIEMENS/TI TIWAY, PEERLINK, and Remote I/O networks provide the most advanced, comprehensive, fiber optic communication capabilities on the market today. Phoenix Digital's OCMs provide optical communication media, transparent to the communication protocol and configurable for distribution by the user in ring, bus, star, tree, or point-to-point network installations. Fiber optic cable is now the media of preference for harsh industrial network environments due to the inherent benefits of high reliability, electrical noise immunity, and intrinsic safety.

Phoenix Digital's OCMs provide continuous on-line error checking for jitter, pulsewidth distortion, carrier symmetry, and optical signal strength. All of this, together with comprehensive self-test diagnostics, optimizes the overall integrity of SIEMENS/TI TIWAY, PEERLINK, and Remote I/O communication networks at-large, providing Dependable Data Communications.

Optical communication network options include features not found in even the most expensive communication network installations:

- On-line Diagnostic Monitoring
- Self Healing Communication Recovery
- In-line Signal Monitoring
- Locates Fault and Impending Fault Conditions
- Fully Compatible with SIEMENS/TI TIWAY, PEERLINK, and Remote I/O Networks
- Annunciation of Low Signal Level
- Wavelength Selection
- Extended Communication Distances

Phoenix Digital's OCMs may be used together in the same physical network to connect SIEMENS/TI Controllers, I/O Chassis, Host Adapters, Operator Interface Stations, Network Interface Modules, etc. Phoenix Digital makes all of this possible, in the price range of a conventional communication modem, through application of its patented self healing communication switch and advanced optical technologies.

## OPERATION

**FAULT PREDICTIVE...** Phoenix Digital's OCMs provide fault prediction thru diagnostic monitoring and detection of impending communication failures resulting from gradual degradation of the communication link itself. The OCM monitors for impending fault conditions by continuously measuring the actual in-line signal strength (optical power) of the data communications



**STANDALONE OCM  
FOR TIWAY, PEER-  
LINK, AND REMOTE  
I/O NETWORKS**

at the receive data inputs on the module. The OCM continuously compares these actual in-line measurements to preset optical power reference thresholds. If the actual in-line data communication signal strength degrades below these power thresholds the OCM will detect and annunciate the impending failure condition via indicators on the front of the module. The OCM also provides hardwired diagnostic outputs (discrete and analog) for detecting and locating impending fault conditions, and for on-line optical power measurement. Thus, communication network status is continuously monitored, and impending failure conditions are located and annunciated before the communication failure actually occurs. OCM diagnostics insure on-line network integrity, and enable maintenance personnel to perform Predictive Maintenance on fiber optic TIWAY, PEERLINK and Remote I/O communication networks at-large!

**FAULT MANAGEMENT...** Phoenix Digital's OCMs provide fault tolerant, self healing communications through diagnostic monitoring of the communication signal waveforms at each

node on the network, and ultra-high speed detection and isolation of points of communication failure anywhere on the network. OCM modules self heal around communication failures in ring, bus, star, tree, or point-to-point network configurations. OCMs automatically redirect network traffic around points of failure until the failure conditions are corrected, and then automatically restore the communication network to its original traffic patterns. Thus, communication continuity is unconditionally maintained by the OCM module in the event of either node or media failure, enabling maintenance personnel to splice/terminate/replace fiber media, add/delete nodes, etc. on-line, without disrupting network communications! In addition, the OCM provides diagnostic outputs to locate network fault conditions, providing on-line diagnostic monitoring of the communication network at-large. All of this is transparent to the operation TIWAY, PEERLINK, and Remote I/O communication networks.

**INTERACTIVE DIAGNOSTICS...** Phoenix Digital's OCMs provide advanced, system-level interactive diagnostics. These diagnostics may be used to assist in troubleshooting a wide variety of different types of network problems:

- Detect and Locate Fault Conditions Throughout the Network
- Trap-and-Hold, and Locate Intermittent Communication Failures
- Detect and Locate Impending Fault Conditions Throughout the Network

These advanced diagnostics provide the user with a powerful set of tools, greatly simplifying network start-up and on-line maintenance of TIWAY, PEERLINK, and Remote I/O communication networks.

**EXTENDED DISTANCES...** Phoenix Digital's OCMs provide optional wavelength selection for extended distance applications. The economical 850 nanometer wavelength may be selected for data communication

networks with less than 12,000 feet (3,650 meters) between nodes. The higher performance 1300 nanometer multimode wavelength may be selected for longer distance applications, extending communication distances between nodes to over 6 miles (10 kilometers). The 1300 nanometer singlemode wavelength may be selected for extended distance applications, extending communication distances between TIWAY and Remote I/O nodes to over 16 miles (25 kilometers)! (Consult factory for PEERLINK distance capabilities.)

## INSTALLATION

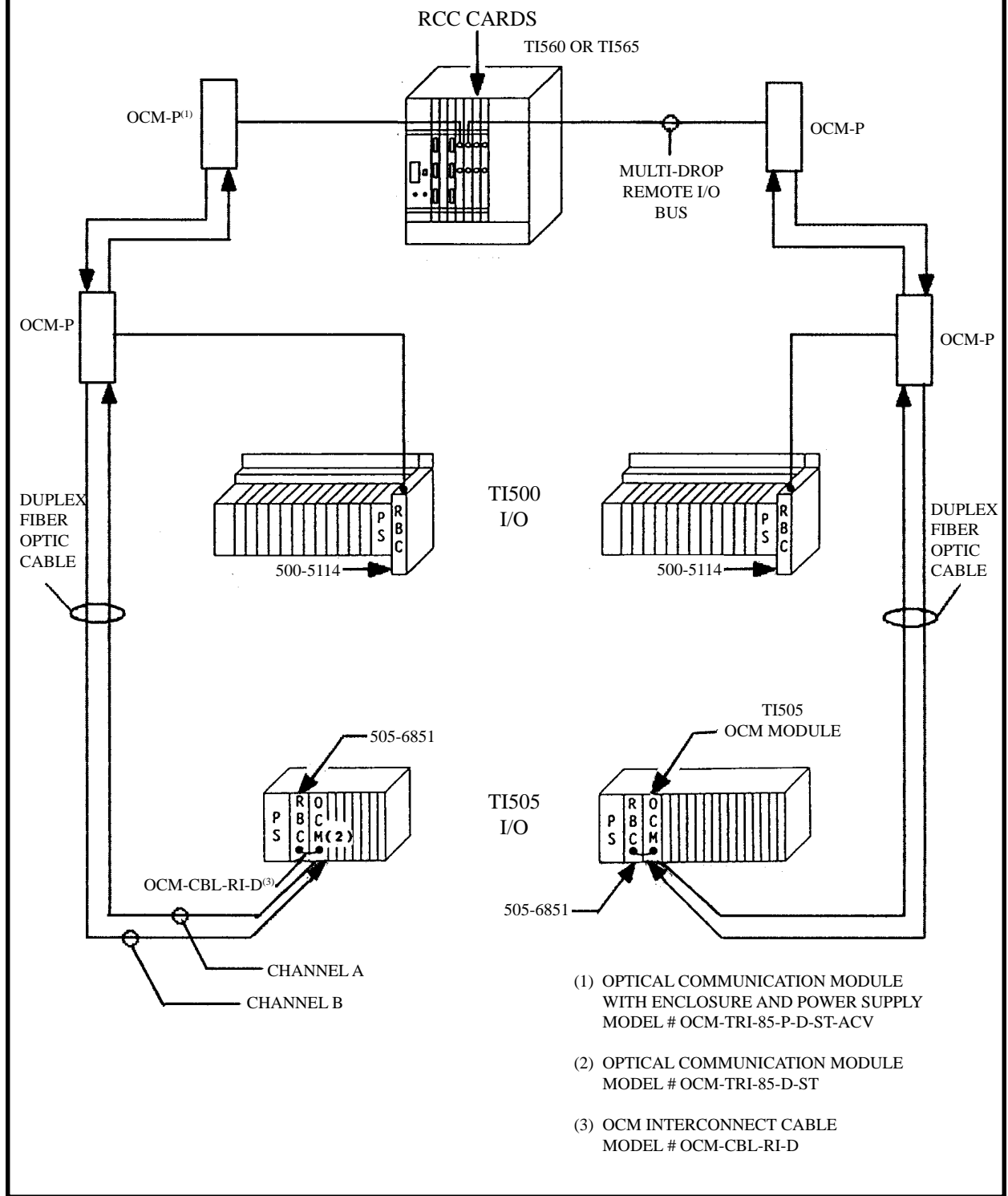
Phoenix Digital's Optical Communication Modules are available in both plug-in and standalone configurations, for TIWAY, PEERLINK, and Remote I/O network applications. Plug-in OCMs install directly into SIEMENS/TI SIMATIC 505 Chassis. Standalone OCMs may be Panelmounted. SIEMENS/TI UHA/NIM (TIWAY/PEERLINK) or CPU/RBC (Remote I/O) modules may be cabled directly to OCMs using Phoenix Digital's OCM Interconnect Cables (see Ordering Information). OCMs may be interconnected on the fiber optic network in an active bus configuration, using either multimode or singlemode fiber optic cable (See Figure on Page 7). Channel A Receive Data inputs and Transmit Data outputs should be interconnected sequentially from OCM to OCM in one direction, and Channel B Receive and Transmit Data inputs and outputs interconnected sequentially in the opposite direction. This configuration may be made fault tolerant by cross-connecting end-to-end Channel A (Ch A Transmit to Ch A Receive) and Channel B (Ch B Transmit to Ch B Receive) on the OCMs on either end of the active bus (See Figure on Page 8). This effectively transforms it into a counter-rotating ring TIWAY, PEERLINK, or Remote I/O network configuration without requiring any further action by the user.







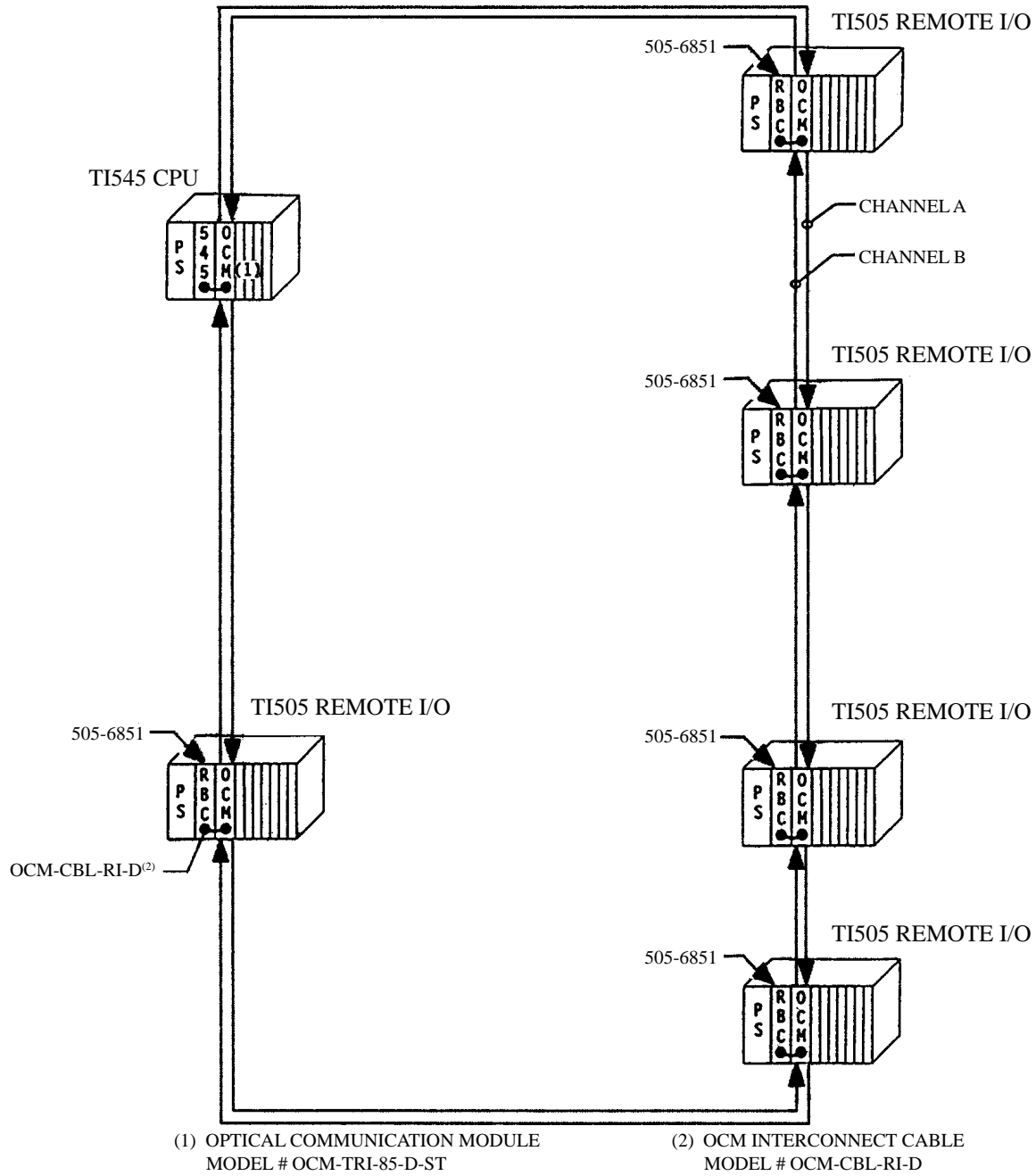
### REMOTE I/O: ACTIVE BUS CONFIGURATIONS



- (1) OPTICAL COMMUNICATION MODULE WITH ENCLOSURE AND POWER SUPPLY  
MODEL # OCM-TRI-85-P-D-ST-ACV
- (2) OPTICAL COMMUNICATION MODULE  
MODEL # OCM-TRI-85-D-ST
- (3) OCM INTERCONNECT CABLE  
MODEL # OCM-CBL-RI-D

### TYPICAL REMOTE I/O OCM INSTALLATION CONFIGURATIONS

**REMOTE I/O:  
DUAL MEDIA RING CONFIGURATION  
(FAULT TOLERANT)**



**TYPICAL REMOTE I/O OCM INSTALLATION CONFIGURATION**



7650 East Evans Rd., Bldg A  
Scottsdale, AZ 85260  
(480) 483-7393 Phone  
(480) 483-7391 Fax

email: phxdigital@aol.com

internet: <http://www.phoenixdigitalcorp.com>