



Fiber Type	2W Digital CO (PBX) Card	2W Digital Sub (Tel Set) Card
Multimode ST	8806-1334-02	8806-1344-02
Multimode SC	8805-1334-02	8805-1344-02
Single-mode ST	8806-1361-02	8806-1371-02
Single-mode SC	8805-1361-02	8805-1371-02

### Description

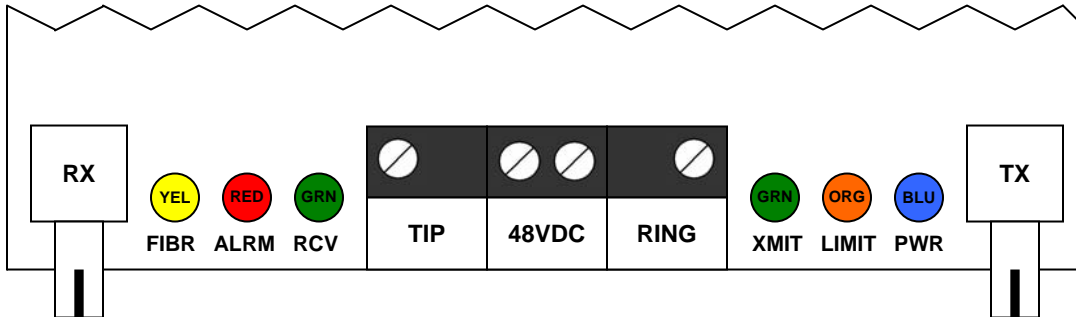
The 2-Wire Digital Phone Fiber Optic Link system interfaces a single line from a digital PBX to a digital telephone that would normally connect through a copper pair. Electrical signals received from the copper pair are converted into optical signals and transmitted through fiber optic cable to the opposite end card. The optical signals are converted back to electrical signals and transmitted to the copper pair.

**2-Wire Digital Phone CO Side Card.** The 2-Wire Digital Phone CO Card provides the electrical-optical interface between a digital PBX 2-wire line and two fiber strands.

**2-Wire Digital Phone Sub Side Card.** The 2-Wire Digital Phone Sub Card provides the optical-electrical interface between the two fiber strands and a 2-wire line to the digital telephone handset. The Sub Card supplies power over the copper pair to the digital telephone set.

**Powering.** The CO 2-Wire Digital Phone Card requires a 24-56VDC power source connected to the card “48VDC” terminal. The Sub 2-Wire Digital Phone Card requires a 44-56VDC power source connected to the card “48VDC” terminal.

**Surge Protection.** The copper pair is protected by thermistors and a gas discharge tube connected between tip and ring. Transients appearing on the power input are limited by thermistors and a metal oxide varistor.



**T1 Card connection terminals and LED's**

LED	COLOR	ON*	OFF
FIBER (FIBR)	YELLOW	FIBER IS CONNECTED BETWEEN CO & SUB CARDS	NO FIBER CONTINUITY. SWITCH SW2 IS OFF ON FAR END.
ALARM (ALRM)	RED	LOSS OF SIGNAL	NORMAL OPERATION
RECEIVE (RCV)	GREEN	SIGNAL IS RECEIVED FROM FIBER	LOW LEVEL OR NO SIGNAL IS RECEIVED FROM FIBER
TRANSMIT (XMIT)	GREEN	SIGNAL RECEIVED AT COPPER INPUT	LOW LEVEL OR NO SIGNAL RECEIVED AT COPPER INPUT
LIMIT	ORANGE	COPPER INPUT SIGNAL OVERLOAD	COPPER INPUT SIGNAL LEVEL NOT IN OVERLOAD
POWER (PWR)	BLUE	DC POWER CONNECTED	NO DC POWER CONNECTED

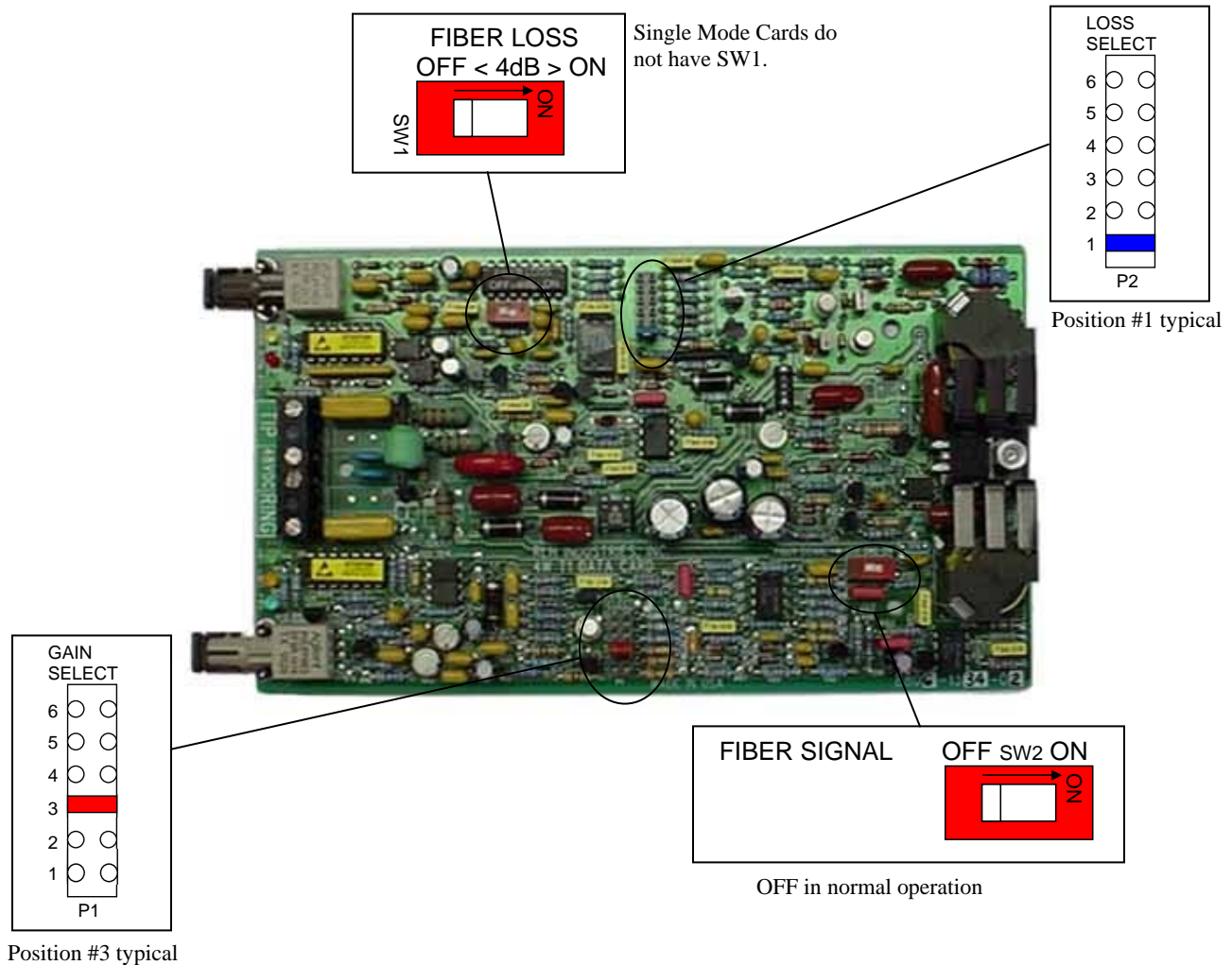
\* ALL L.E.D.'S WILL BE ON FOR APPROXIMATELY 5 SECONDS FOLLOWING POWER UP.

### Installation

**Connect fiber optic cable.** Fiber Optic Link Cards are equipped with two optical connectors. Connect fiber to the transmit and receive terminals marked "TX" and "RX". For example, if fiber #1 is connected to "TX" on the CO Card, fiber #1 must be connected to "RX" on the Sub Card. Fiber cable should always be routed loosely avoiding tight bends.

**Connect copper pair.** The copper pair from the PBX connects to the black "Tip" and "Ring" screw-down terminals on the CO Card. The copper pair from the telephone connects to the black "Tip" and "Ring" screw-down terminals on the Sub Card.

**Connect Power.** Connect a 24-56VDC (70mA minimum) power source to the 48VDC terminal on the CO Card. Connect a 44-56VDC (90mA minimum) power source to the "48VDC" terminal on the Sub Card. The power input is not polarity sensitive.



**Adjustment settings location on PCB (CO PBX Card shown)**

**Set system Level** CO and Sub optic transmit levels are set by the GAIN SELECT jumper on the Cards by observing the “XMIT” and “LIMIT” L.E.D.s to indicate the optimum setting. Gain is set in 6dB increments by selecting the highest numbered position that will not turn on the orange LIMIT L.E.D., but will turn on the green XMIT L.E.D. Note: If the LIMIT L.E.D. is on, the XMIT L.E.D. will also be on. The LIMIT L.E.D. indicates signal overload. If the XMIT L.E.D. is not on, jump to a higher number position until the LIMIT L.E.D. is on, then set the jumper to the next lower numbered position. The LOSS SELECT jumper should remain at position 1. Repeat in opposite direction.

**Switch SW1**, a single position dip switch used for Multimode fiber Cards to increase margin. The switch SW1 is typically set in the “OFF” position. A minimum of 4dB loss or 4,000 foot distance on multimode is needed for proper operation in the “ON” position. Single mode fiber Cards do not have SW1.

**Switch SW2**, a single position dip switch used to turn on and off a fiber test signal that will light the yellow fiber (FIBR) L.E.D. on the far end card when fiber is connected between both cards. Set SW2 to the “OFF” position for normal operation.

**Troubleshooting**

If trouble is encountered, verify all installer connections and switch settings. If trouble persists, replace the unit and retest. If technical assistance is required, contact RLH Industries, Inc. Technical support department: (714) 532-1672 (6 am to 6 pm- PST), or for after hours, weekends and holidays call (714) 366-2503 or (714) 457-5740.

**Warranty Repair**

RLH Industries, Inc. Fiber Optic Link products have an unconditional lifetime warranty. If a unit needs repair, call the RLH Customer Service department for a Return Material Authorization (RMA) number and return the defective unit with the RMA number, freight prepaid, along with a brief description of the problem. As specified in our warranty RLH will repair and return the unit at no charge to the customer. If an out-of-service condition exists, a replacement unit can be obtained; however, a purchase order number will be required to ensure return of the replacement unit.

**Specifications**

Transmission method:	Amplitude modulated light via two optical fibers Short Haul: 650nm Multimode: 850nm Single-mode: 1310nm
Maximum System length (Fiber + Copper):	Multimode: 1 mile (1.6km) Single-mode: 1 mile (1.6km) Note: Length of system limited by digital PBX maximum allowable delay
Fiber Type:	Multimode: 62.5/125µm, 50/125µm Single-mode: 9/125µm
Temperature Limits:	-40°F to +158°F (-40°C to +60°C + maximum solar load)
Humidity:	95% non-condensing
Bandwidth:	100 kHz to 10 MHz
Signal to Noise:	>45 dB for line attenuation up to 30 dB at 772 kHz
Digital Data Type:	Bipolar digital data stream with no dc reference
Maximum Data Rate:	3.152 Mbps
BER:	<10 <sup>-9</sup>
Transmit Level (with Loss Select at position 1):	2.5V P-P Nominal at 20°C (68°F) 2.0V P-P to 3.1V P-P from -40°C to 70°C (-40°F to +158°F)
Surge Protection:	PTC thermistors, gas tube and varistors
Power Requirements:	CO Card: 24-56VDC, 70mA Sub Card: 44-56VDC 90mA
Powering Method:	DC power source connected to "48VDC" input.

**RLH Industries, Inc.**  
936 N. Main Street  
Orange, CA 92867 USA

Sales and Customer Service: (866) DO-FIBER, (866) 363-4237  
E-Mail: info@fiberopticlink.com  
Website: www.FiberOpticLink.com