

## 4-Channel Contact Closure Fiber Optic Link Interface System

4RU Plug-In Card Installation Information

### Description

The RLH 4 Channel Contact Closure Fiber Optic Link system provides a transmission of up to four independent contact closure signals over one optical fiber. The system comprises 2 cards, a transmitter card and a receiver card.

This hardened, rugged system is designed to be installed into any of the RLH card shelf housings and is covered by our **Exclusive Unconditional Lifetime Warranty**.

#### Contact Closure Transmitter Card

The Contact Closure Transmitter Card provides the electrical/optical interface between the dry contact closure relay input and a fiber strand. The card is locally powered from a 24-56VDC source.

**Note:** In order to maintain high voltage isolation, Fiber Optic Link TX and RX cards must be powered from separate power sources.

#### Contact Closure Receiver Card

The Contact Closure Receiver Card provides the optical/electrical interface between a fiber strand and a normally-open relay contact output. The receiver card is locally powered by a 24-56VDC source. The receiver card provides LED indicators to display relay conditions, power, and fiber carrier receive.



RLH 4 Channel Contact Closure RX Card

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#### Standard Features

##### Exclusive Unconditional Lifetime Warranty

Convenient LED status indicators

Single and Multimode fiber models available

RX side includes alarm contact for status monitoring

DC power is not polarity sensitive

Single slot RLH 4RU plug-in form factor allows up to 12 cards in a RLH 12 card housing, or multiple housings for larger installations

Environmentally rugged with wide operating range:  
-40°F to +158°F (-40°C to +70°C)

Specifications subject to change without notice.

## General Safety Practices

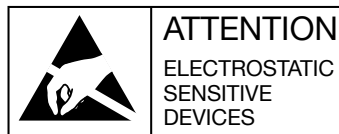
The equipment discussed in this document may require tools designed for the purpose being described. RLH recommends that service personnel be familiar with the correct handling and use of any installation equipment used, and follow all safety precautions including the use of protective personal equipment as required.

### Caution - Severe Shock Hazard

- Never install during a lightning storm or where unsafe high voltages are present.
- Use caution when handling copper wiring and follow appropriate safety regulations.

## Special handling requirements

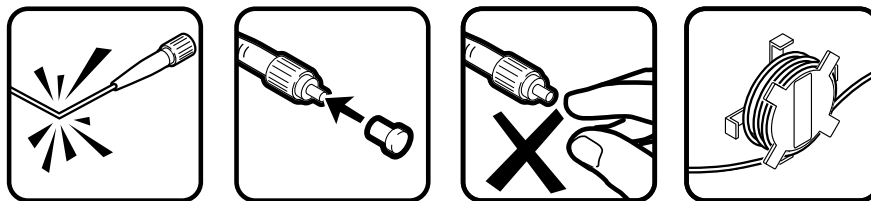
### Be careful when handling electronic components



- This product contains static sensitive components.
- Handle Fiber Optic Link cards at their edges only.
- Follow proper electrostatic discharge procedures.

This card utilizes circuitry that can be damaged by static electricity. When transporting the card, carry it in an ESD safe container such as the antistatic bag provided with the card. Before handling cards, discharge yourself of static electricity by physical bodily contact with earth ground. When handling cards, hold by outer edges and avoid touching circuitry. Failure to follow ESD precautions may cause serious damage to the card and prevent proper operation.

### Guidelines for handling terminated fiber cable



- Do not bend fiber cable sharply. Use gradual and smooth bends to avoid damaging glass fiber.
- Keep dust caps on fiber optic connectors at all times when disconnected.
- Do not remove dust caps from unused fiber.
- Keep fiber ends and fiber connectors clean and free from dust, dirt and debris. Contamination will cause signal loss.
- Do not touch fiber ends.
- Store excess fiber on housing spools or fiber spools at site

# Acronyms

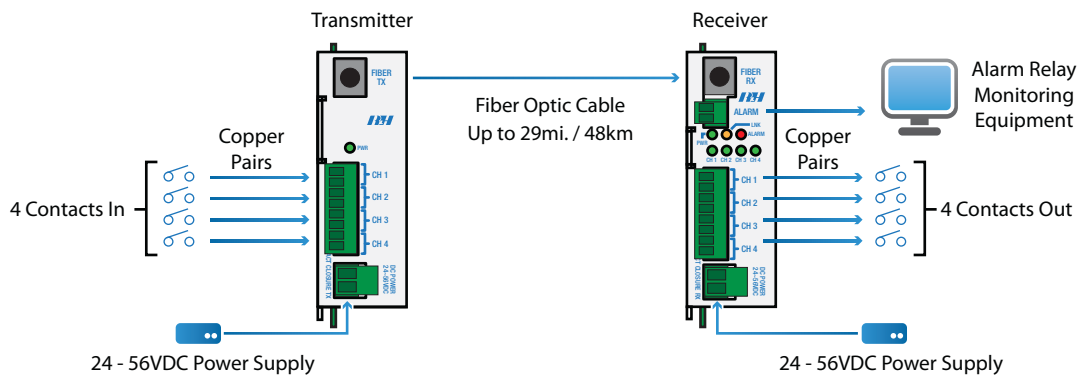
Commonly used acronyms and abbreviations

Acronym/Abbreviation	Description
RU	Rack Unit (EIA)
TX	Transmit
RX	Receive
PWR	Power
CH	Dry Contact Channel
NO	Normally Open
NC	Normally Closed

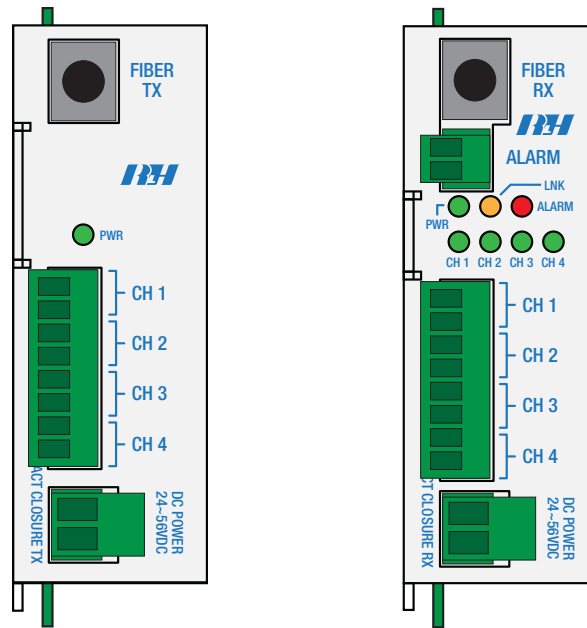
# Applications

Network equipment in high voltage areas can be at risk due to Ground Potential Rise (GPR). A copper network cable referenced to a remote ground can become a path for high voltages during a ground fault. Placement of all-dielectric fiber optic cable (instead of copper) completely eliminates the presence of a remote ground, which dramatically increases safety of personnel and reliability of equipment.

By utilizing fiber optic cable, the Contact Closure Fiber Optic Link System provides absolute electrical isolation between both ends of the network. It is immune to EMI/RF interference, ground loops, and high voltage surges from lightning or ground faults, and is ideal in electrically noisy environments such as near large power sources, electrical motors, and radio communications equipment.



**Contact Closure System Diagram**



**4 Channel Contact Closure TX and RX Front Panels**

## Installation

Prior to installation:

- Check for shipping damage
- Check the contents to ensure correct model and fiber type
- Have a clean, dry installation environment ready
- Ensure that the fiber type at the site matches the system type

Required for installation:

- 24-56VDC (15mA@24VDC minimum) power source at the TX side
- 24-56VDC (65mA@24VDC minimum) power source at the RX side
- RLH card housing
- Multimeter

Measure the DC voltage of the source power to ensure that it is 24-56VDC. All electrical and fiber optic connection are made directly onto the card. The Ethernet over fiber card is designed to be installed into any RLH card housing.

### Connect fiber optic cable

Connect fiber to the transmit and receive optical connectors marked FIBER TX and FIBER RX on the faceplate. Fiber cable should always be routed loosely avoiding tight bends.

### Connect copper wire pairs

Connect the wire pair from each dry relay contact to the green screw-down terminal on the faceplate. The channels are listed as CH1 ~ CH4. Note which contact channel is being used.

**Note:** This system is dry contact only. Do not apply voltage to the contact terminals on the TX unit or the system may be damaged.

Connect alarm relay monitoring equipment wire pair to the alarm contact marked ALARM. To make wiring easier, the connector blocks may be removed from the card by pulling straight out. Seat the connectors fully into their sockets before operating the system.

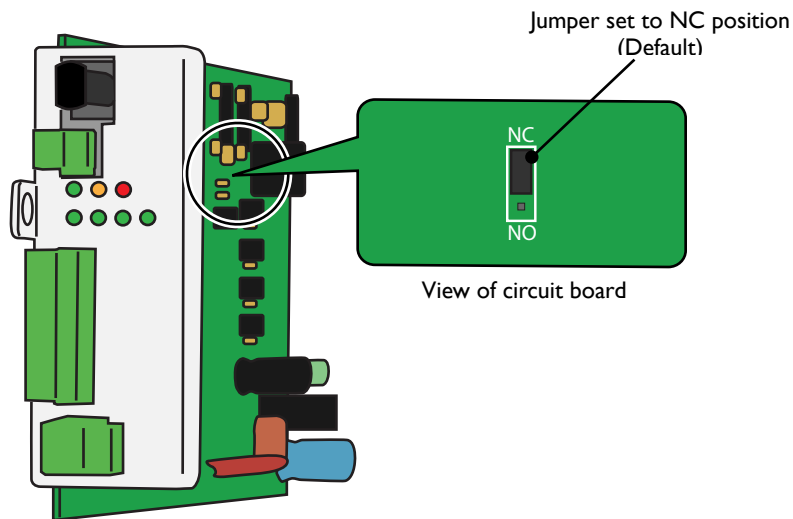
### Connect Power

Connect a 24-56VDC power source wiring to the screw-down terminals indicated as DC POWER. The power input is not polarity sensitive. To make wiring easier, the terminal unplugs from the card by pulling straight out.

### Set Alarm Jumper

The RX card includes an alarm contact for connecting to monitoring equipment. It monitors the fiber signal from the TX side, so when the alarm is on there either a problem with the fiber cable and connections, or the TX side is powered down.

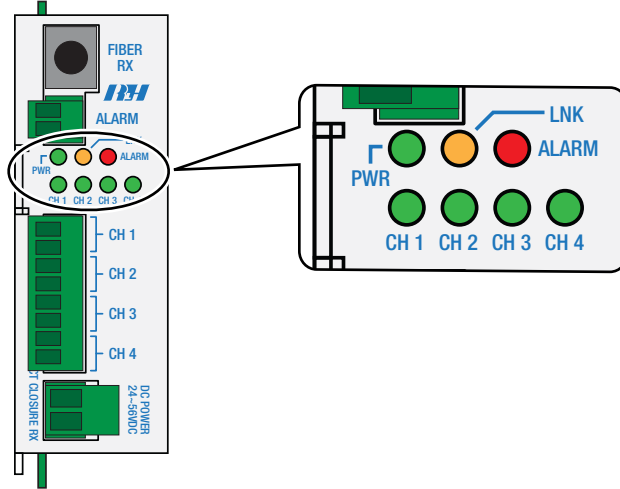
The alarm contact is set at the factory to Normally Closed (NC) by default. To change the alarm contact to Normally Open (NO) move the jumper on the card to the NO position.



**Alarm Configuration Jumper**

# Troubleshooting

If trouble is encountered, verify all copper and fiber connections, signal and voltage levels. If the alarm is on, double check the alarm jumper, fiber cable and connections, or TX side power source and connections.



**RX Card LED indicators**

Card	Indicator	LED	Description
TX	PWR	ON	DC power is present at the power connector
		OFF	Power is disconnected
RX	PWR	ON	DC power is present at the power connector
		OFF	Power is disconnected
	LINK	ON	Fiber optic signal is detected
		OFF	Fiber optic signal is not present
	ALARM	ON	Fiber optic signal is not present
		OFF	Fiber optic signal is detected
CHI ~ CH4		ON	Channel relay is CLOSED
		OFF	Channel relay is OPEN

If trouble persists, replace the unit and retest. If technical assistance is required, contact RLH Industries, Inc. technical support department.

## Ordering Information

4C4 - XXXXX - 2  
 Configuration Code

Code	Multimode	Single Mode	SC Connector	ST Connector	1km / 0.6 mi.	15km / 9 mi.	48km / 29 mi.	TX Card	RX Card
M2SCT *	●		●		●			●	
M2SCR *	●		●		●				●
M2STT *	●			●	●			●	
M2STR *	●			●	●				●
S3SCT		●	●			●		●	
S4SCT		●	●				●	●	
S3SCR		●	●			●	●		●
S3STT		●		●		●		●	
S4STT		●		●			●	●	
S3STR		●		●		●	●		●

- ▶ \* 62.5µm multimode fiber compatibility is standard, add **-50** to part number for 50µm fiber compatibility
- ▶ A complete system requires 1 TX unit and 1 RX unit
- ▶ Please contact your RLH sales representative for pricing and delivery information

## General Specifications

<b>Transmission method</b>	Amplitude modulated light via two optical fibers	
	Multimode:	850nm
	Single-mode:	1310nm
	Single-mode Long Haul:	1310nm
<b>Maximum Fiber Attenuation / Distance</b>	Multimode:	6dB / 1.2 miles (2km)
	Single-mode:	8dB / 9 miles (15km)
	Single-mode Long Haul:	24dB* / 29 mi. (48 km), min. required loss *-8dB
	*Note: Distances equated using industry standard fiber and connector attenuation of 3dB/Km. Fiber condition, splices and connectors may affect actual range.	
<b>Fiber Type</b>	ST or SC connectors	
	Multimode:	62.5/125µm, 50/125µm
	Single-mode:	8-9/125µm
<b>Wire Connector</b>	Screw clamp terminal block, 16 ~ 26 AWG	
<b>Input 1-4 (TX Card)</b>	Dry contact closure relay	
<b>Output 1-4 (RX Card)</b>	Normally Open Relay	
<b>Alarm Output (RX Card)</b>	Normally Open/Closed Relay	
<b>Relay Maximum Rating</b>	115VAC 0.6A, 110VDC 0.6A, 30VDC 2A	
<b>Response Time</b>	10ms	
<b>Surge Protection</b>	PTC thermistors, zener diodes and varistors	
<b>Power Requirements</b>	TX Card:	24-56VDC, 15mA minimum
	RX Card:	24-56VDC, 60mA minimum
<b>Powering Method</b>	Local DC power source	
<b>Operating Temperature</b>	-40° to +158° F (-40° to +70° C), 95% non-condensing	
<b>Dimensions</b>	RLH 4RU Plug-in Card, L7" x W4"x H1.24"	

Specifications subject to change without notice.

## Warranty

RLH is recognized throughout the world and offers the only **UNCONDITIONAL LIFETIME WARRANTY** in the industry. We are very proud of our warranty which simply states that the product is warranted to be free of defects in material and workmanship for the **LIFE OF THE PRODUCT**.

- We believe our customers shouldn't have to incur additional costs due to failure or damage
- We engineer our products with total confidence in our quality
- We understand how safety and reliability impact the total cost of ownership
- We know that customer support extends beyond the initial sale, so **we stand behind our products**

RLH will replace any product, or part thereof, that fails **FOR ANY REASON**, provided the defective part is returned to RLH Freight prepaid. This warranty is **UNCONDITIONAL** and valid even when RLH products have been abused or mishandled, or the product has been damaged as a result of a natural disaster. This warranty will reduce your costs and simplify your maintenance activities. Not all RLH products are covered by this warranty.

**To make a warranty claim, or schedule repair or replacement of your RLH product, please contact us for an RMA number.** You will be promptly assisted by one of our warranty specialists. All returns must have an RMA number before we can receive any items.

## Technical Support

<b>Normal technical support:</b> (Mon - Fri 6am - 6pm PST)	Local (714) 532-1672 Toll Free (800) 877-1672 Toll Free (866) DO-FIBER
<b>24/7 Technical support:</b>	(714) 396-8982 (714) 457-5740

## Contact Information

<b>Corporate Headquarters:</b>	RLH Industries, Inc. 936 N. Main Street Orange, CA 92867 USA
<b>Phone:</b>	Local (714) 532-1672 Toll Free (800) 877-1672 Toll Free (866) DO-FIBER
<b>Fax:</b>	(714) 532-1885
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<b>Web site:</b>	www.fiberopticlink.com

# RLH FIBER OPTIC LINK

RLH Industries, Inc., The Leader in Fiber Optic Telecom Isolation Technology

LIFETIME

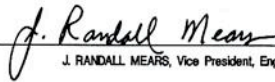
## UNCONDITIONAL WARRANTY

RLH INDUSTRIES, INC. FIBER OPTIC LINK assemblies are warranted to be free of defects in materials and workmanship for the life of the product. This lifetime warranty is effective for RLH products sold from February 2, 1988, to the present, with the exception of fiber optic cable assemblies which are warranted only to be free of defects in manufacturing and batteries, which carry a 5-year unconditional replacement warranty.

RLH Industries, Inc. will repair or replace any product, or part thereof, that fails for any reason, provided the defective part is returned to RLH, freight prepaid.

This warranty is UNCONDITIONAL and is valid even when RLH Fiber Optic Link assemblies have been abused or mishandled, where unauthorized repairs have been attempted or performed, or product has been damaged as a result of a natural disaster.

Authorized by:



J. RANDALL MEARS, Vice President, Engineering



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Please contact your RLH sales representative for pricing and delivery information.

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