RLH Industries, Inc.

USER GUIDE

The leader in rugged fiber optic technology.

U-020 2023-10-23

4-Channel Contact Closure Fiber Link Card System

SYSTEM INSTALLATION INFORMATION

4 Channel Contact Closure System

Description

The 4 Channel Contact Closure Fiber Link system provides a transmission of up to four independent contact closure signals over one optical fiber. The systems 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 **Limited 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 monitoring system or equipment. The card is locally powered from a 24-56VDC source.

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

Contact Closure Receiver Card

The Contact Closure Receiver Card provides the optical/electrical interface between a monitoring system or equipment 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, fiber carrier receive and fiber link status.

Contents

Standard Features

- Environmentally rugged with wide operating range: -40˚F to +158˚F (-40˚C to +70˚C)
- Convenient LED status indicators
- Single and Multimode fiber models available
- RX side includes alarm contact for status monitoring
- DC power is not polarity sensitive
- Standard RLH Fiber Link Card form factor.
- Single card up to 12 card housing options
- **Limited Lifetime Warranty**

General Safety Practices

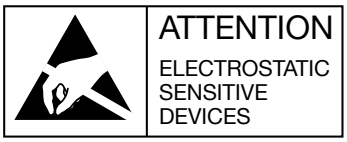
The equipment discussed in this document may require tools designed for the purpose being described. RLH recommends that service personnel be familiar with the correct handling and use of any installation equipment used, and follow all safety precautions including the use of protective personal equipment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

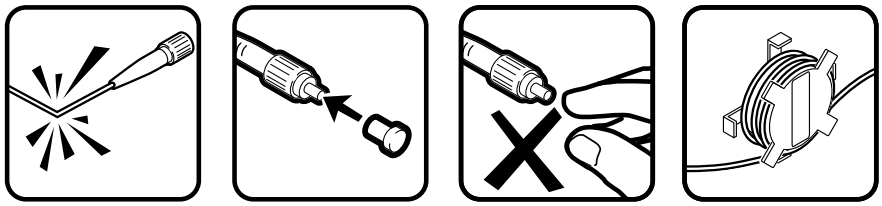
Be careful when handling electronic components



- This product contains static sensitive components.
- Handle the 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

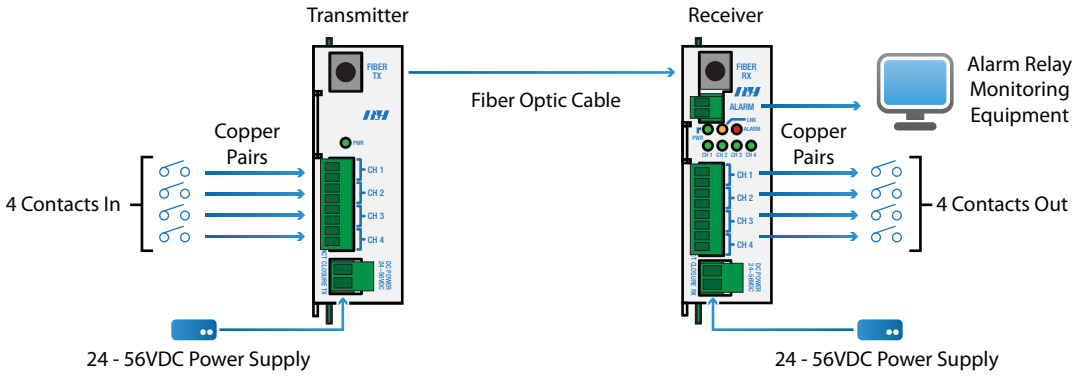
Commonly used acronyms and abbreviations.

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

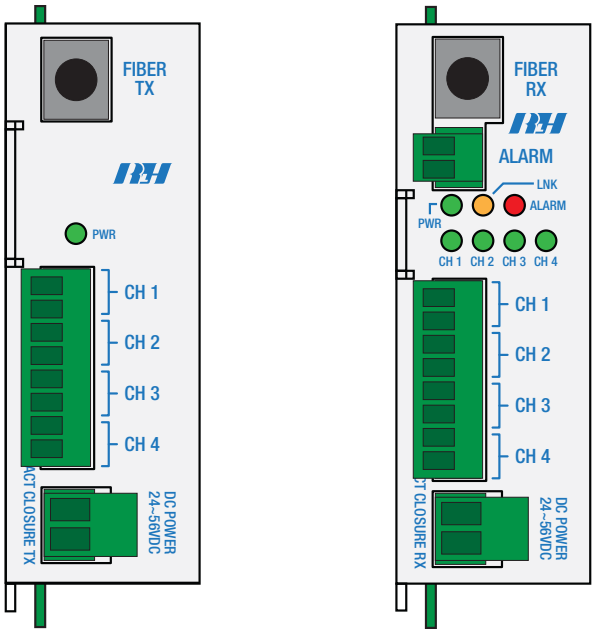
Applications

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 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

Before Installing:

- 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 Fiber Link Card system 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.

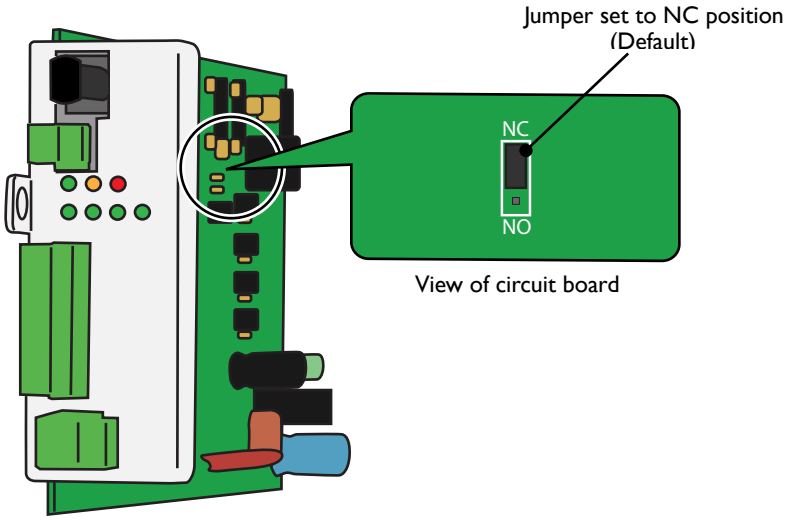
Connect Power

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.

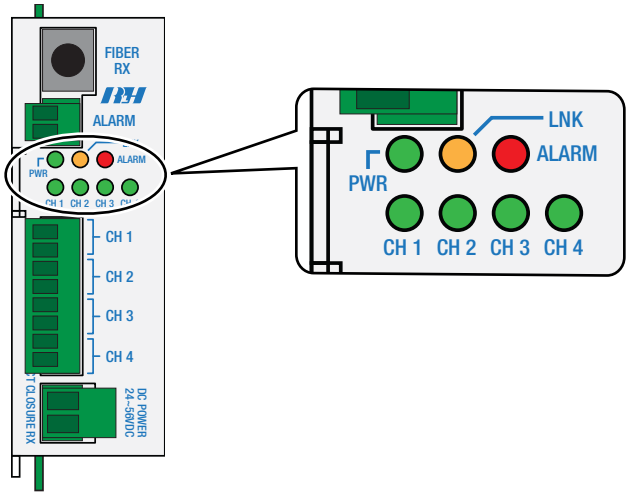
The alarm contact is set at the factory to Normally Closed (**NC**) by default. To change the alarm contact to Normally Open (**NO**) move the jumper on the card to the **NO** position.



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
	CH1 ~ 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

Each 4 Channel Contact Closure Card is identified with a part number on the card.

Optics	Fiber	Distance	Description	Part Number
Multimode ST	62.5µm	2km / 1.2 mi.	TX Card	**4C4-M2STT-02**
			RX Card	**4C4-M2STR-02**
Single-mode ST	8~9 µm	15km / 9mi.	TX Card	**4C4-S3STT-02**
			RX Card	**4C4-S3STR-02**

- A complete system requires 1 TX unit and 1 RX unit
- Please contact your RLH sales representative for pricing and delivery information

General Specifications

Transmission method	Amplitude modulated light via two optical fibers	
	Multimode:	850nm
	Single-mode:	1310nm
Maximum Fiber Attenuation /Distance *	Multimode:	6dB / 1.2 miles (2km)
	Single-mode:	8dB / 9 miles (15km)
	*Note: Distances equated using industry standard fiber and connector attenuation of 3dB/Km. Fiber condition, splices and connectors may affect actual range.	
Fiber Type	ST connectors	
	Multimode:	62.5/125µm
	Single-mode:	8-9/125µm
Wire Connector	Screw clamp terminal block, 16 ~ 26 AWG	
Input 1-4 (TX Card)	Dry contact closure relay	
Output 1-4 (RX Card)	Normally Open Relay	
Alarm Output (RX Card)	Normally Open/Closed Relay	
Relay Maximum Rating	115VAC 0.6A, 110VDC 0.6A, 30VDC 2A	
Response Time	10ms	
Surge Protection	PTC thermistors, zener diodes and varistors	
Power Requirements	TX Card:	24-56VDC, 15mA minimum
	RX Card:	24-56VDC, 65mA minimum
Powering Method	Local DC power source	
Operating Temperature	-40° to +158° F (-40° to +70° C), 95% non-condensing	
Dimensions	Standard RLH Fiber Link Card, L7" x W4"x H1.24"	
Warranty	Limited Lifetime	*Visit* www.fiberopticlink.com *for warranty details*

Technical Support

Normal technical support: (Mon - Fri 6am - 6pm PST)	(714) 532-1672 Toll Free 1-800-877-1672 Toll Free 1-866-DO-FIBER
Email:	support@fiberopticlink.com
24/7 technical support: (Outside normal business hours)	Toll Free 1-855-RLH-24X7 Toll Free 1-855-754-2497

Contact Information

Corporate Headquarters:	RLH Industries, Inc. 936 N. Main Street Orange, CA 92867 USA
Phone:	(714) 532-1672 Toll Free 1-800-877-1672 Toll Free 1-866-DO-FIBER
Fax:	(714) 532-1885
Email:	info@fiberopticlink.com
Web site:	www.fiberopticlink.com