

## 4 Channel Contact Closure

### Transmit 4 Contact Closures Over a Single Fiber

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 a transmitter module and a receiver module, each in a compact DIN mount housing.

The system requires a 24~56VDC local power source at each end to provide power. The RX module includes a NC/NO alarm contact for system monitoring. Fiber optic cable is immune to RF noise, high voltages, and provides a transmission range of up to 15km/ 9 miles.

The DIN mount is designed to be installed onto a standard T35 (35mm) DIN rail.

### Transmitter Module

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

Note: In order to maintain high voltage isolation, Fiber Link transmitter and receiver modules must be powered from separate power sources.

### Receiver Module

The receiver module is locally powered by a 24~56VDC source and provides LED indicators to display relay conditions, power, and fiber link.

## Ordering Information

| Transmitter/Receiver | Mode       | Connector | Distance      | Fibers       | Part Number |
|----------------------|------------|-----------|---------------|--------------|-------------|
| Transmitter          | Multimode  | ST        | 2km/1.2 miles | Single Fiber | 4CD-03-2    |
| Receiver             | Multimode  | ST        | 2km/1.2 miles | Single Fiber | 4CD-04-2    |
| Transmitter          | Singlemode | ST        | 15km/9 miles  | Single Fiber | 4CD-20-2    |
| Receiver             | Singlemode | ST        | 15km/9 miles  | Single Fiber | 4CD-22-2    |

- A complete system requires one Transmitter and one Receiver
- When a fiber splitter is used, multiple receivers can be paired with one transmitter



4 Channel Contact Closure (receiver shown)

## Key Features

- Hardened to operate in -40°C to +70°C (-40°F to +158°F)
- Can be powered by 24~56VDC
- Convenient LED status indicators
- Receiver includes alarm contacts for status monitoring
- Input power is not polarity sensitive
- Convenient DIN Rail or Wall Mount
- Limited Lifetime Warranty
- Made in the USA

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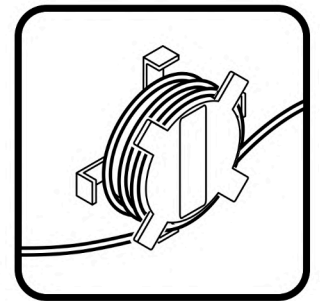
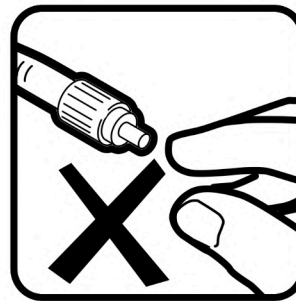
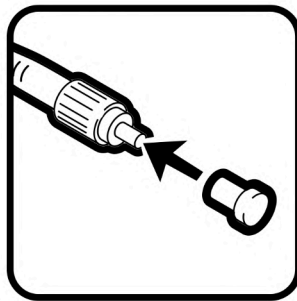
### General Safety Practices

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 HAZZARD

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

### 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

### Commonly Used Acronyms & Abbreviations

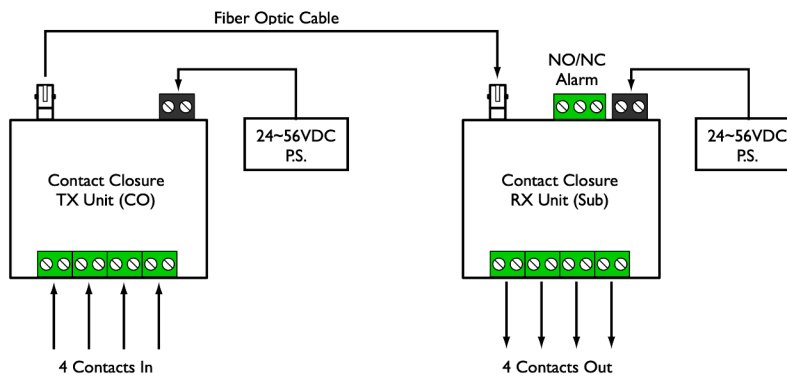
| Name | Description         |
|------|---------------------|
| TX   | Transmit            |
| RX   | Receive             |
| PWR  | Power               |
| CH   | Dry Contact Channel |
| NC   | Normally Closed     |
| NO   | Normally Open       |
| BLU  | Blue                |
| ORG  | Orange              |
| GRN  | Green               |

## Applications

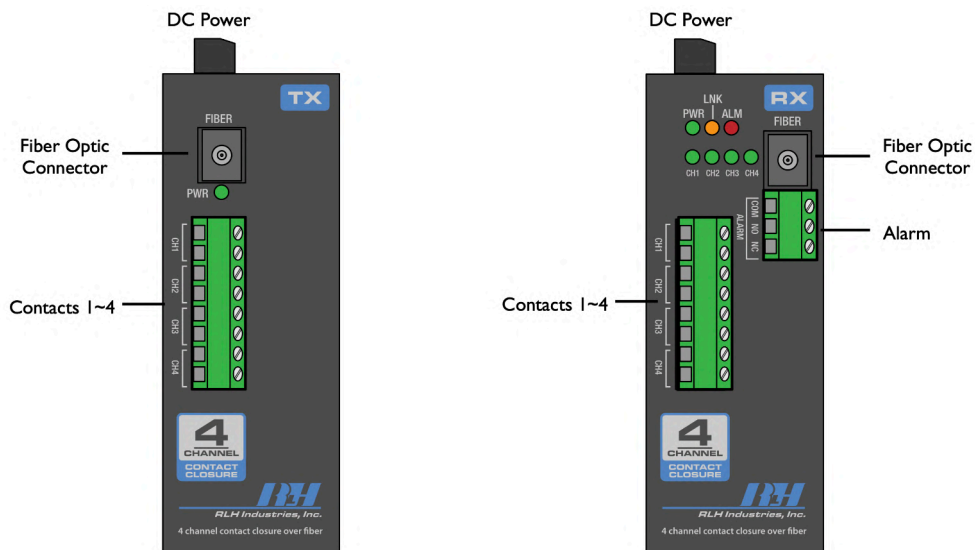
Network equipment in high voltage areas can be at risk due to Ground Potential Rise (GPR). A copper network cable referenced to a remote ground can become a path for high voltages during a ground fault. Placement of all-dielectric fiber optic cable (instead of copper) completely eliminates the presence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

## System Diagram



4 Channel Contact Closure System Diagram



4 Channel Contact Closure Connectors

## Installation

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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
- DIN rail for mounting
- 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 unit.

### Connect Fiber Optic Cable

Connect fiber to the transmit and receive optical connectors on the top of the units. Fiber cable should always be routed loosely avoiding tight bends.

### Connect Contact Wire Pairs

Connect the wire pair from each dry relay contact to the green screw-down terminals on the front of the units. The terminal blocks may be removed on the 4 channel system for ease of wiring by pulling the connector straight out. Be sure to fully seat the terminal block back into the connector when finished.

Refer to the connector diagram on the front of the unit for channel assignment. The channels are also identified on the connector blocks. 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 on the RX module. Use the NO or NC contact as required. To make wiring easier, the connector block may be removed by pulling straight up. Seat the connector fully into their sockets before operating the system.

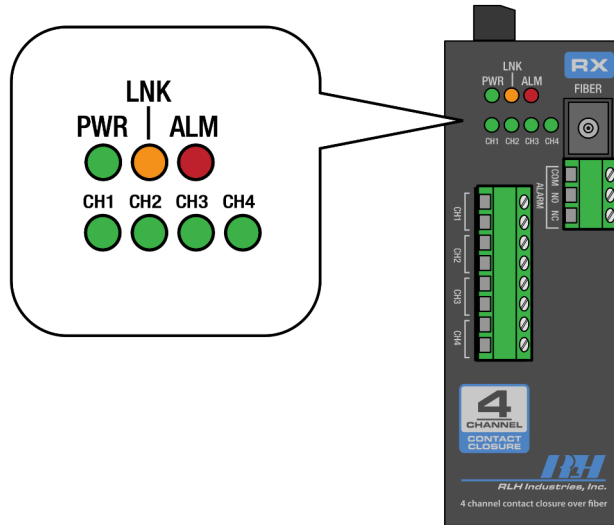
### Connect Power

Connect a 24-56VDC power source wiring to the screw-down terminals indicated as DC POWER. The power input is not polarity sensitive. The terminal unplugs from the module to make wiring easier.

**Note:** Connect a chassis ground wire to the screw on the top or bottom of the module housing to reduce the chance of damage from lightning or other high voltage events.

## Installation (cont'd)

### LED Identification



**RX Card LED indicators**

| Module | Indicator | Color | Status    | Description   |
|--------|-----------|-------|-----------|---|
| TX     | Power     | BLU   | ON<br>OFF | DC power is present at the power connector<br>Power is disconnected |
| RX     | Power     | BLU   | ON<br>OFF | DC power is present at the power connector<br>Power is disconnected |
|        | LNK       | ORG   | ON<br>OFF | Fiber optic signal is detected<br>Fiber optic signal is not present |
|        | Alarm     | RED   | ON<br>OFF | Fiber optic signal is not present<br>Fiber optic signal is detected |
|        | CH1 ~ CH4 | GRN   | ON<br>OFF | Channel relay is CLOSED<br>Channel relay is OPEN                    |

## Troubleshooting

If trouble is encountered, verify all copper and fiber connections, signal and voltage levels. If the alarm is on, check the fiber cable and connections, or the other units power source and connections. If trouble persists, contact RLH Industries, Inc. technical support department\*.

\*Tech support contact info is at the end of this document

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### Key Specifications

|  |   |                      |          |
|--|---|----------------------|----------|
| <b>Transmission Method:</b>                  | Amplitude modulated light via one optical fiber   |                      |          |
|  | <b>Multimode:</b>   | 850nm                |          |
|  | <b>Singlemode:</b>  | 1310nm               |          |
|  | <b>Singlemode Long Haul:</b>  | 1310nm               |          |
| <b>Maximum Fiber Attenuation /Distance:</b>  | <b>Multimode:</b>   | 6dB / 2km/1.2 miles  |          |
|  | <b>Singlemode:</b>  | 8dB / 15km/9 miles   |          |
|  | 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 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 Module):</b>                | Dry contact closure relay   |                      |          |
| <b>Output 1~4 (RX Module):</b>               | Normally Open Relay   |                      |          |
| <b>Alarm Output (RX Module):</b>             | Normally Open/Closed Relay  |                      |          |
| <b>Output Relay Contacts Maximum Rating:</b> | 115VAC  | 1.087A               | 125VA    |
|  | 12VDC   | 3.000A               | 36 Watts |
|  | 24VDC   | 2.500A               | 60 Watts |
|  | 48VDC   | 1.250A               | 60 Watts |
|  | 130VDC  | 0.462A               | 60 Watts |
|  | 250VDC  | 0.240A               | 60 Watts |
| <b>Response Time:</b>                        | 10ms  |                      |          |
| <b>Surge Protection:</b>                     | PTC thermistors, zener diodes and varistors   |                      |          |
| <b>Mean Time Between Failures (MTBF):</b>    | 175,200 Hours (20 Years)  |                      |          |
| <b>Power Requirements:</b>                   | TX Module: 24~56VDC, 15mA minimum   |                      |          |
|  | RX Module: 24~56VDC, 60mA minimum   |                      |          |
| <b>Powering Method:</b>                      | Local DC power source   |                      |          |
| <b>Operating Temperature:</b>                | -40°C to +70°C (-40°F to +158°F), 95% non-condensing  |                      |          |
| <b>Mounting:</b>                             | T35 DIN Rail Mount (included)   |                      |          |
| <b>Dimensions:</b>                           | 1.9" (W) x 3.5" (D) x 5" (H), (49mm x 89mm x 127mm)   |                      |          |
|  | *Not including connectors   |                      |          |
| <b>Warranty:</b>                             | Limited Lifetime  |                      |          |

**USER GUIDE**[www.fiberopticlink.com](http://www.fiberopticlink.com)**Contact**

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|----------|---|
| By Mail: | Att: Sales<br>RLH Industries, Inc.<br>936 N. Main St.<br>Orange, CA 92867 |
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|---|-----------|------------------------------|
| By Phone:<br>Sales / Service<br>Mon - Fri, 6am - 6pm, PST | Local     | 714-532-1672                 |
|   | Toll Free | 800-877-1672<br>866-DO-FIBER |

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**Tech Support**

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