

USER GUIDE

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Bi-Directional Contact Closure

Two-Way Signaling of a Contact Closure Over Fiber

The Bi-Directional Contact Closure Fiber Link system provides two-way transport of a contact closure signal over optical fiber. Applications include alarm event triggering, building automation, environmental control systems, fire & alarm systems, gate control, traffic signal control equipment, and more.

Fiber optic cable is immune to RF noise, high voltages, and extends the signal transmission range up to 48km. These devices come in a compact DIN and wall mountable housing. This flexible mounting design is meant for standard T35 DIN rail when din mounted or can be wall mounted using the included wall mount ears.

This contact closure system is designed to operate over an extreme temperature range, providing reliability in harsh environments. It is made in the U.S.A and covered by our Limited Lifetime Warranty.



Bi-Directional Contact Closure

Contact Input - Transmitter Device

The input has the ability to sense a dry contact closure. The input unit uses an internal isolated power supply to provide a sensing current used to indicate whether the contact terminals being monitored are connected or open.

Contact Output - Receiver Device

The output relay comes with 3 positions, which include normally open, common, and normally closed.

Key Features

- Convenient LED status indicators
- Available with ST connectors
- Singlemode and multimode options available
- Input will sense a dry contact closure
- Output relay is rated to support to 60 Watts
- Can be powered by 12~48VDC
- Pluggable terminal blocks
- Alarm contact for status monitoring
- Wide operating temp -40°F to +158°F (-40°C to +70°C)
- Standard T35 DIN rail or wall mountable

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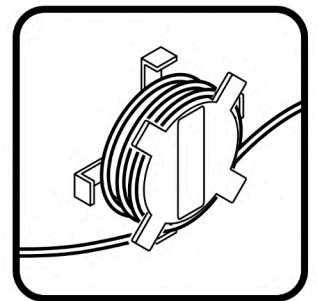
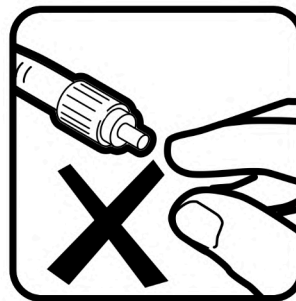
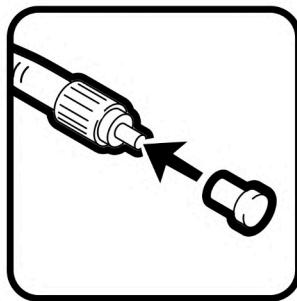
General Safety Practices

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 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

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

TX = Transmit	DRY = Input does not require voltage to sense a dry contact
RX = Receive	NC = Normally Closed
PWR = Power	COM = Common

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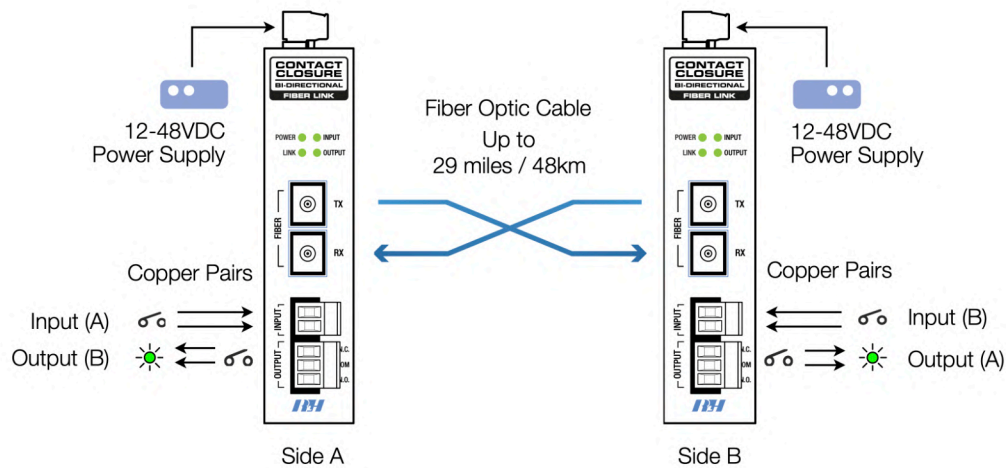
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Applications

By utilizing fiber optic cable, the Bi-Directional Contact Closure DIN 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.

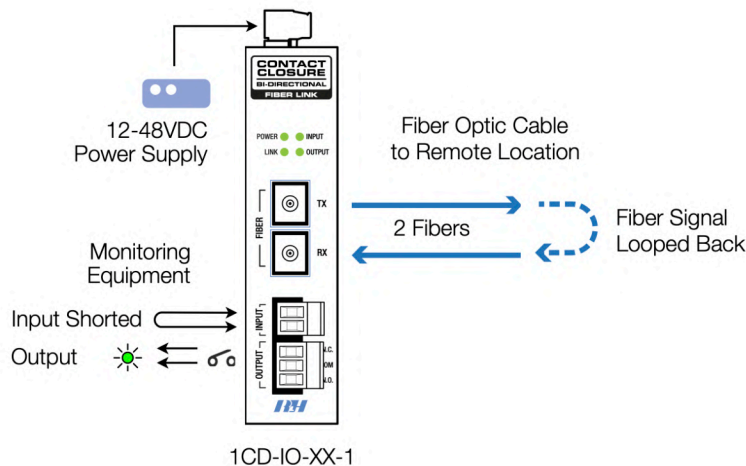
Additionally, the contact closure system allows the use of fiber cable infrastructure to transport relay alarms to and from locations being able to achieve distances of up to 48km. Using a fiber optic contact closure system can simplify messaging and eliminate the need for a PLC or IED to transport the status of remote alarms and IO.

Bi-Directional Contact Closure System



Fiber Cable Continuity Monitor

Use a single device as a fiber optic cable monitor to detect breaks in a fiber cable. The fiber cable signal is looped back through two strands of fiber and will provide a relay alarm if an interruption in the fiber path occurs.



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Installation

Prior to installation:

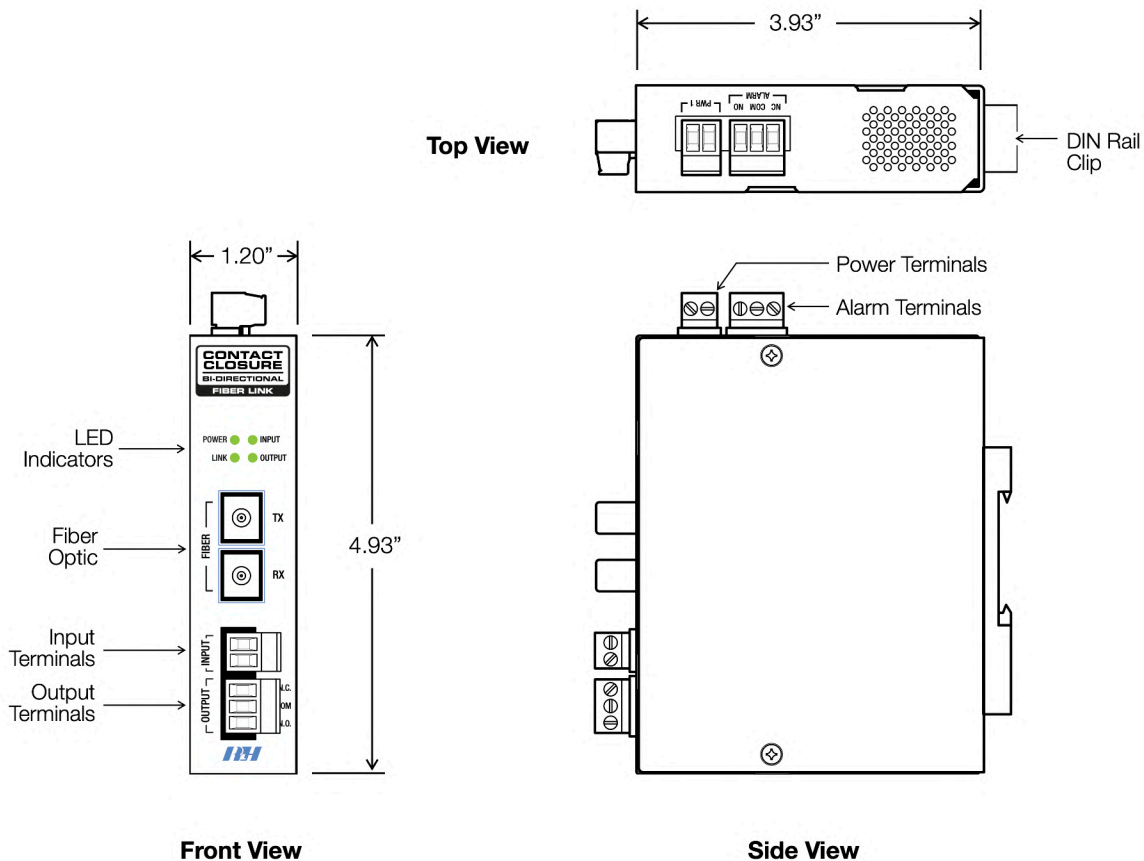
- Check for shipping damage
- Check the contents to ensure correct model and fiber type
- Have a clean, dry installation environment ready
- Ensure that the fiber type at the site matches the system type

Required for installation:

- 12~48VDC power source at both installation sites
- DIN rail for mounting
- Multimeter
- Measure the DC voltage of the source power to ensure that it is 12-48VDC. All electrical and fiber optic connection are made directly onto the unit

Front Panel

The front panel contains the input or output contact terminals, LED's, and the TX or RX fiber port.



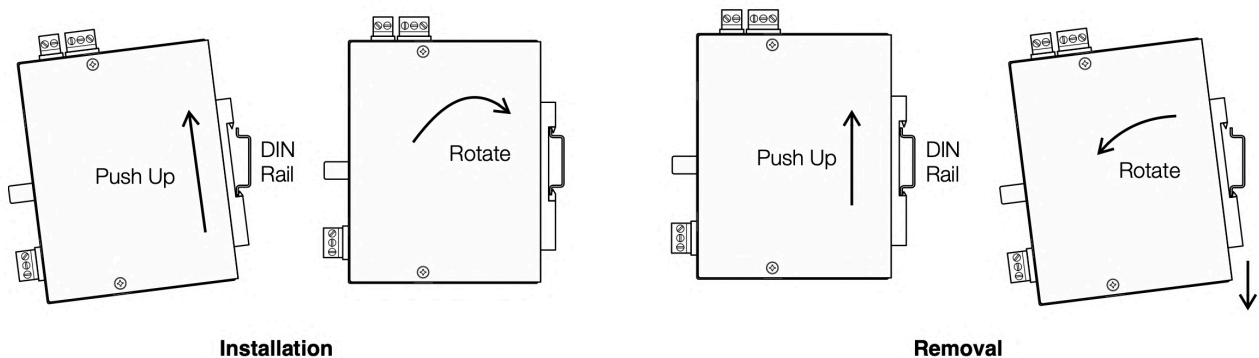
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Installation (cont'd)

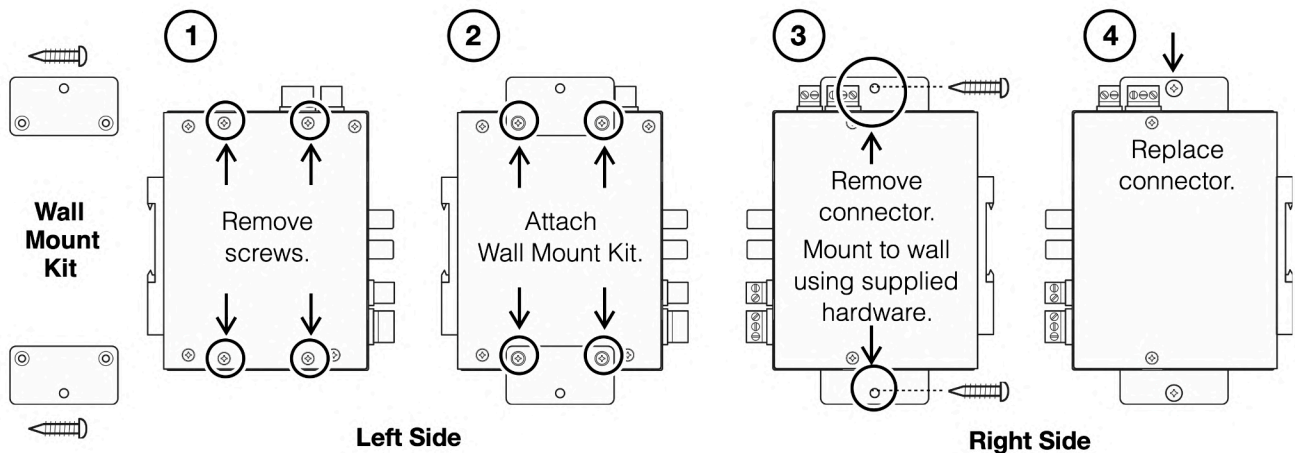
DIN Rail Mounting

The DIN clip for mounting the system is mounted onto the rear panel. Hook the DIN clip on the top flange of the DIN rail and rotate to the locked position to install. To remove, push up to depress the spring latch and rotate off of the DIN rail.



Wall Mounting

The system can be easily wall mounted by attaching the provided wall mount ears and hardware. Attach the wall mount ears by following the instructions below.



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Installation (cont'd)

Connect Fiber Optic Cable

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

- Once the system is properly connected the Link LED, on the receiver unit, should turn ON

Connect Contact Wire Pairs

Connect the customer equipment to the green screw-down terminals on the front.

- The contact terminals may be removed and accept wire sizes 16~26 AWG
- Fully seat the terminal block back into the connector before operating the system

Dry Input:

- The Input will sense a contact closure to trigger the Input
- Fully seat the terminal block back into the connector before operating the system
- Check to ensure the copper pairs being used do not exceed 1000 Ohms
- Do not apply voltage to Input terminals as the system may be damaged

Relay Output:

- Remove power to the unit during installing or maintenance
- Ensure the output relays maximum load and voltage is not exceeded
- Use the Normally Open, Normally Closed, and Common terminals as needed per your installation

Receiver Alarm Contact Wiring

The contact will alarm when the fiber link is down or a power failure.

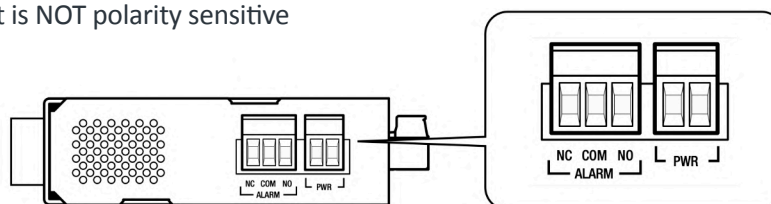
- Use the NO or NC contact positions as required
- The alarm terminal block may be removed and accept wire sizes 16~26 AWG
- Fully seat the terminal block back into the connector before operating the system

Connect Power

Ensure power supply is OFF prior to wiring the system. Connect a 12-48VDC power supply to the screw-down terminals located on the top of the unit.

- Requires one (1) 12-48VDC power supply on each side of the system
- Fully seat the terminal block back into the connector before operating the system.

Note: Power input is NOT polarity sensitive



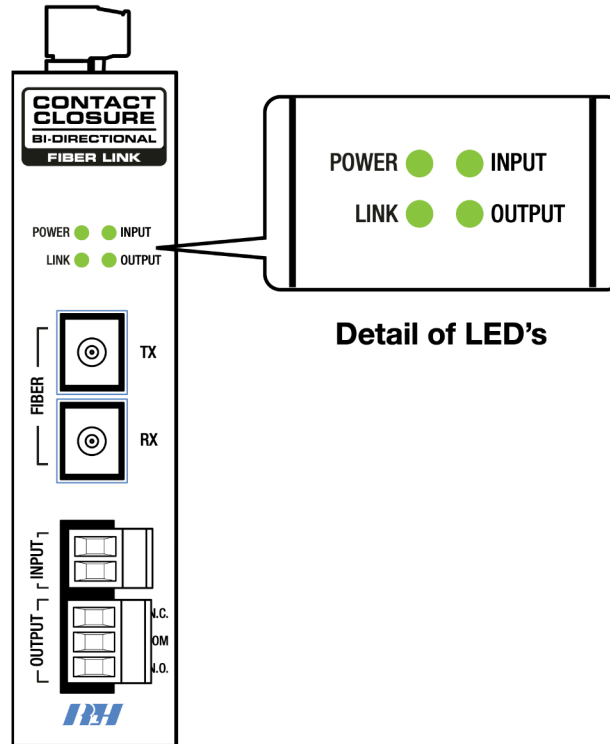
Top View of Power & RX Alarm Terminals

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Installation (cont'd)

LED Identification



**Bi-Directional
Contact Closure**

LED	Name	Status	Condition
Power	Power Failure	ON Off	DC input power OK DC input power failed
Link	System Link	ON Off	Paired via fiber connection
Input	Input Sensor	ON Off	Not paired Input ON (Active) Input OFF
Output	Output Relay	ON Off	Output is ON Output is OFF

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Key Specifications

Optical Wavelength:	Multimode	850nm
	Singlemode	1310nm
	Single-mode Long Haul	1310nm
Maximum Fiber Attenuation/Distance*:	Multimode	8dB / 1.2 miles (2km)
	Singlemode	8dB / 9 miles (15km)
	Single-mode Long Haul	24dB* / 29 miles (48 km), min. required loss *-8dB
* Note: Distances equated using industry standard fiber and connector attenuation. Fiber condition, splices and connectors may affect actual range.		
Fiber Type:	ST - Multimode	62.5/125µm, 50/125µm
	ST - Singlemode	8-9/125µm
Wire Connectors:	Pluggable screw clamp terminal block, 16~26 AWG	
Input:	Dry Contact Sensing	
	*Input terminals will provide the sensing current necessary to detect a dry contact closure.	
Input Line Resistance:	1000 Ohms maximum	
Output Relay:	Common / Normally Open / Normally Closed Relay (SPDT)	
Output Relay Maximum Ratings:	125 VAC 1.0A, 100VDC 0.6A, 30VDC 2A	
Output Relay Max. Switching Voltage:	200VDC, 150VAC	
Alarm Relay Output:	Common / Normally Open / Normally Closed Solid State Relay (SPDT)	
Alarm Relay Maximum Ratings:		
	Normally Open	Normally Closed
Internal Impedance	25 Ohms	35 Ohms
Source Voltage	170V Peak	170V Peak
Max Load	95mA	80mA
Response Time:	6.4ms	
Surge Protection:	PTC thermistors, thyristors, zener diodes and varistors	
Power Requirements:	12-48VDC (11.0~56VDC)	
Power Consumption:	TX Unit: 30mA Maximum	RX Unit: 70mA Maximum
Operating Temperature:	-40°F to +158°F (-40°C to +70°C), 95% non-condensing	
Mounting:	T35 DIN rail mount or wall mount with the included kit	
Weight:	1 lb. / 454g	
Dimensions:	1.2" (W) x 3.5" (D) x 4.93" (H), (31mm x 89mm x 100mm)	
	*Not including connectors	
Safety:	FCC Class B, CE, RoHS, UL Listed, CB Scheme	

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Ordering Information

Mode	Distance	Connector	Fibers	Part Number
Multimode	2km/1.2 miles	ST	Dual Fiber	1CD-IO-03-1
Singlemode	15km/9 miles	ST	Dual Fiber	1CD-IO-20-1
Singlemode	48km/29 miles	ST	Dual Fiber	1CD-IO-21-1

- A complete system requires a Transmitter and a Receiver

Contact

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