



RLH Industries, Inc.

USER GUIDE

The leader in rugged fiber optic technology.

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4 Channel 4~20mA / 0~10VDC Analog DIN Fiber Link System SYSTEM INSTALLATION INFORMATION

Description

The DIN mount, 4 channel 4-20mA / 0-10VDC analog Fiber Link system provides a transmission of up to four independent analog signals over one optical fiber.

These rugged modules are designed to be mounted on any standard T-35 DIN rail or wall surface. They are temperature hardened, however if used outdoors they must be installed in a weatherproof housing. The system is covered by our **Limited Lifetime Warranty**

Analog Transmitter Module

The transmitter module provides the electrical-to-optical interface between four independent analog 4~20mA or 0~10VDC inputs and a fiber strand. Each channel can be selected for 4~20mA or 0~10V signal protocols. The transmitter card is locally powered from a 24-56VDC source, and provides a LED power indicator.

Analog Receiver Module

The receiver module provides the optical-to-electrical interface between a fiber strand and four independent analog 4~20mA or 0~10VDC outputs. Each channel can be individually selected for 4~20mA or 0~10V signal protocols. The receiver card is locally powered by a 24-56VDC source, and provides LED indicators to display power, alarm, and fiber link status.



4 Channel 4~20mA / 0~10VDC Analog RX Unit

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Standard Features

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

Convenient LED status indicators

4 Channels over a single fiber

DC power is not polarity sensitive

Compact DIN rail/wall mount housing

Input and output may be individually configured

Limited Lifetime Warranty

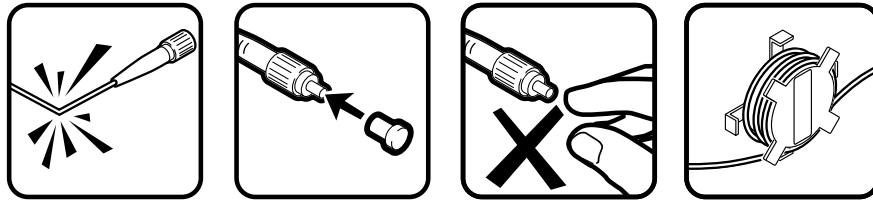
General Safety Practices

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.

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

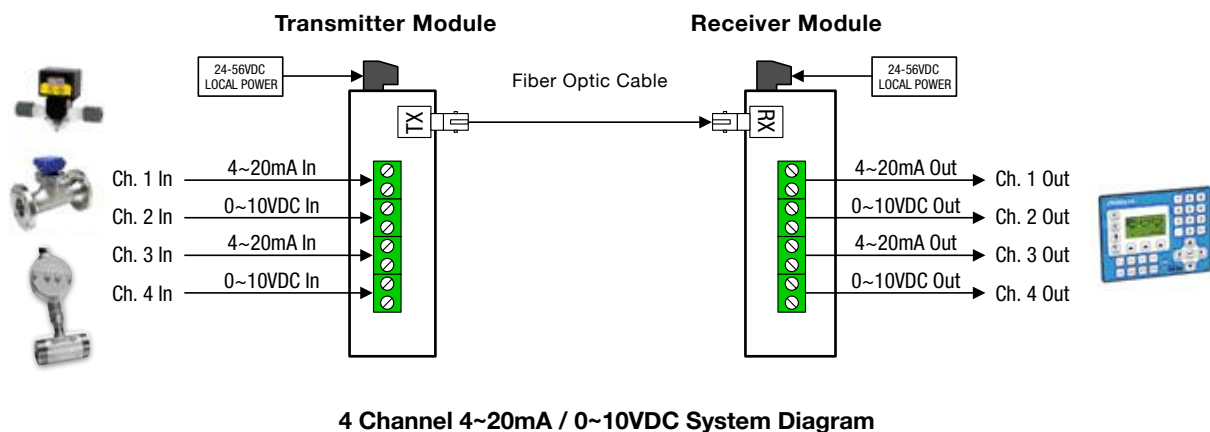
Commonly used acronyms and abbreviations

Acronym/Abbreviation	Description
TX	Transmit
RX	Receive
PWR	Power
LNK	Fiber Link
ALM	Alarm
CH	Channel

Application

Network and control 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 4~20mA system provides absolute electrical isolation between both ends of the communications 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.



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

If damage is discovered file a claim immediately with the carrier, then contact RLH customer service.

Required for installation:

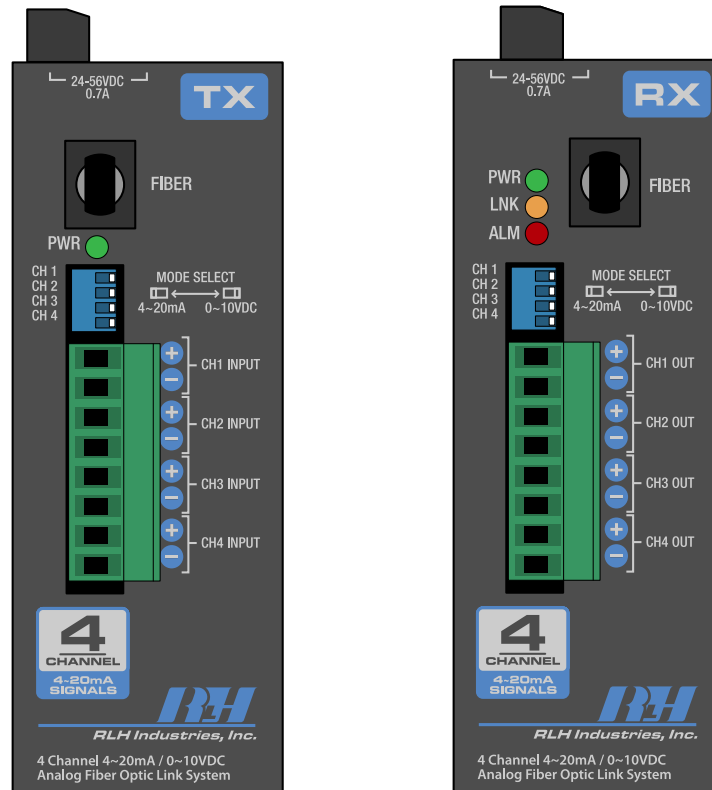
- 24-56VDC (15mA@24VDC minimum) power source at the TX side
- 24-56VDC (65mA@24VDC minimum) power source at the RX side
- Suitable wall or DIN rail space
- Multimeter

To install a module onto a DIN rail, hook the mounting clip over the bottom part of the rail flange first, then rotate and snap the clip onto the top rail flange. To remove, lift up on the module and disengage the top of the DIN rail clip first.

Measure the DC voltage of the source power to ensure that it is 24-56VDC prior to connecting power to the device.

Connect fiber optic cable

Each module is equipped with an optical connector. Connect fiber between the transmitter module marked "TX" and the receiver module marked "RX". Fiber cable should always be routed loosely avoiding tight bends.



Transmitter and Receiver Modules

Connect Power

Connect a 24-56VDC (see power requirements in the Specifications section) power source to the black screw-down terminal on the top of the module. The power input is not polarity sensitive.

The connector may be removed for ease of wiring by pulling it straight out. Be sure to seat the connector fully when reinstalling.

Connect copper pairs

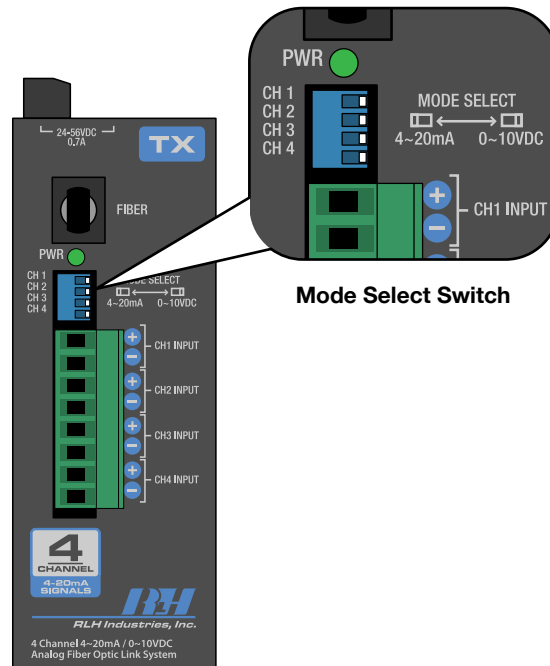
The wire pairs from the sensor or controller equipment connect to the green screw-down terminals on the transmitter and receiver modules labelled Ch.1 through Ch. 4. Set the Mode prior to connection (refer to the Mode Select Switch section).

Note: Observe polarity on the input and output connectors.

The connector may be removed for ease of wiring by pulling it straight out. Be sure to seat the connector fully when reinstalling.

Mode Select Switch

The transmitter can accept 0~10VDC or 4~20mA inputs, and the receiver can output 0~10VDC or 4-20mA signals. Each channel can be set individually.



Transmitter settings - TX

The transmitter must be set to the type of analog signal connected to the input connector. For example, a 4~20mA current input must use the 4~20mA setting on the Mode Select switch. Each switch channel corresponds to the matching input channel.

- Set the Mode Select switch for Ch. 1, 2, 3 or 4 to the **left** (ON) for 4~20mA current signal input
- Set the Mode Select switch for Ch. 1, 2, 3 or 4 to the **right** (OFF) for 0~10VDC voltage signal input

Receiver settings - RX

The receiver may be set to whichever signal output type is desired. Set the Mode Select switch on the receiver to match the equipment you wish to connect.

- Set the Mode Select switch for Ch. 1, 2, 3 or 4 to the **left** (ON) for 4~20mA current signal output
- Set the Mode Select switch for Ch. 1, 2, 3 or 4 to the **right** (OFF) for 0~10VDC voltage signal output

Mixed Settings

0~10VDC in and 4~20mA out

- Set the transmitter Mode Select switch for Ch. 1, 2, 3 or 4 to the **right** (OFF) for 0~10VDC voltage signal input
- Set the receiver Mode Select switch for Ch. 1, 2, 3 or 4 to the **left** (ON) for 4~20mA current signal output

4~20mA in and 0~10VDC out

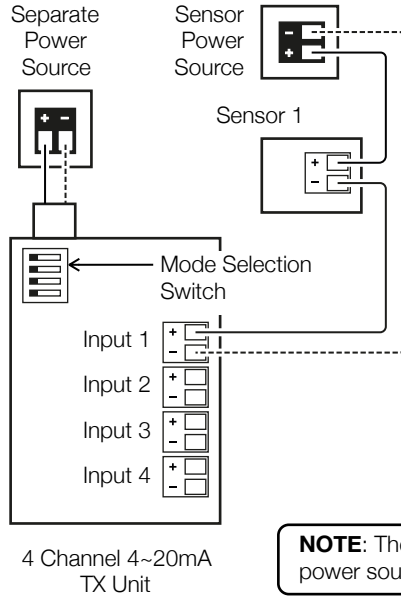
- Set the transmitter Mode Select switch for Ch. 1, 2, 3 or 4 to the **left** (ON) for 4~20mA current signal input
- Set the receiver Mode Select switch for Ch. 1, 2, 3 or 4 to the **right** (OFF) for 0~10VDC voltage signal output

24VDC Loop Power - Connection Diagrams

Follow the connection diagrams below for loop power applications.

Single Device Connection Diagram

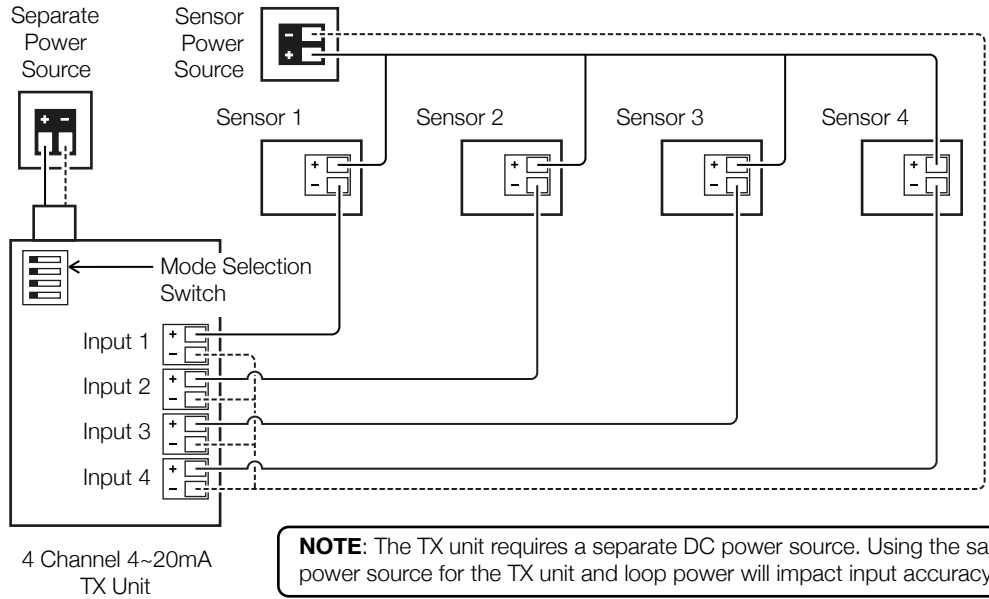
CAUTION! Mode selection switch must be set to 4~20mA before wiring to prevent damage to the device.



NOTE: The TX unit requires a separate DC power source. Using the same power source for the TX unit and loop power will impact input accuracy.

Multi-Device Connection Diagram

CAUTION! Mode selection switch must be set to 4~20mA before wiring to prevent damage to the device.



NOTE: The TX unit requires a separate DC power source. Using the same power source for the TX unit and loop power will impact input accuracy.

Troubleshooting

If trouble is encountered, verify all installer connections, fiber continuity, signal and voltage levels. If trouble persists, replace the unit and retest. If technical assistance is required, contact RLH Industries, Inc. Technical support department:

800-877-1672 (6 am to 6 pm- PST),
or call our 24/7 Technical/Customer Service: (714) 366-2503 or (714) 457-5740

General Specifications

Transmission method	Frequency modulated light via a single optical fiber	
	Multimode:	850nm
	Single-mode:	1310nm
	Single-mode Long Haul:	1310nm
Maximum Fiber Attenuation / Distance	Multimode:	6dB / 1.2 miles (2km)*
	Single-mode:	8dB / 9 miles (15km)*
		24dB* / 29 mi. (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 or SC connectors	
	Multimode:	62.5/125µm, 50/125µm
	Single-mode:	8-9/125µm
Wire Connector	Screw clamp terminal blocks, 16 ~ 26 AWG	
Input 1-4 (TX Module)	4~20mA current loop or 0~10VDC	
Output 1-4 (RX Module)	+/- 2% accuracy 500 Ohm maximum loop resistance	
RX Module LED Indicators	Green LED	Power is present
	Yellow LED	Fiber connection is good
	Red LED	DC power is down at TX side or fiber connection has failed
Response Time	10ms	
Surge Protection	PTC thermistors, zener diodes and varistors	
Power Requirements	TX Module	24-56VDC, 2.5W max.
	RX Module	24-56VDC, 60mA minimum
Powering Method	Local DC power source	
Operating Temperature	-40° to +158° F (-40° to +70° C), 95% non-condensing	
Dimensions	H5" x W1.9" x D3.9" (127mm x 48mm x 100mm) - Not including connectors	
Warranty	Limited Lifetime	Visit www.fiberopticklink.com for warranty details

Ordering Information

Each 4 Channel 4~20mA/0~10VDC Analog DIN Fiber Link system is identified with the part number. A complete system requires a TX module and a RX module.

Optics	Description	Distance	μm	Part Number
Multimode SC	TX Card	2km / 1.2 mi	62.5/50 μm	420-01-1
	RX Card	2km / 1.2 mi	62.5/50 μm	420-02-1
Multimode ST	TX Card	2km / 1.2 mi	62.5/50 μm	420-03-1
	RX Card	2km / 1.2 mi	62.5/50 μm	420-04-1
Single-mode SC	TX Card	15km / 9 mi.	8~9 μm	420-10-1
	TX Card	48km / 29 mi.	8~9 μm	420-11-1
	RX Card	15km / 9 mi. & 48km / 29 mi.	8~9 μm	420-12-1
Single-mode ST	TX Card	15km / 9 mi.	8~9 μm	420-20-1
	TX Card	48km / 29 mi.	8~9 μm	420-21-1
	RX Card	15km / 9 mi. & 48km / 29 mi.	8~9 μm	420-22-1

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

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



RLH Industries, Inc.
 936 N. Main Street, Orange, CA 92867 USA
 T: (714) 532-1672
 F: (714) 532-1885

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

Specifications subject to change without notice.