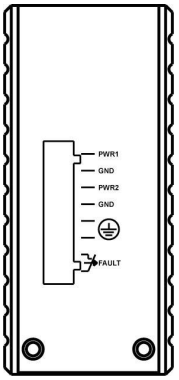
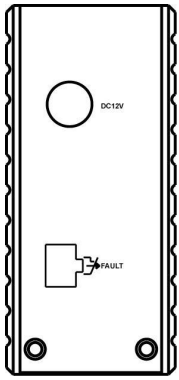
Quick Start Guide

This quick start guide describes how to install and use the hardened media converter. This is the media converter of choice for harsh environments constrained by space.

Physical Description

The Terminal Block and Power inputs





Terminal Assignments	
PWR1	Power Input 0.19A@48VDC(10~48VDC)
GND	Power Ground
PWR2	Power Input 0.19A@48VDC(10~48VDC)
GND	Power Ground
	Earth Ground
FAULT	1. The relay opens if PWR1 or PWR2 fails 2. The relay opens if Per Port Link is Broken (When Link Down Detection is Enabled)

DIP					
1 2 3 4	1	LFP Enable	FIBER F. Mode	COPPER LNK_DOWN_Det. ON	FIBER LNK_DOWN_Det. ON
	0	LFP Disable	FIBER Auto Mode	COPPER LNK_DOWN_Det. OFF	FIBER LNK_DOWN_Det. OFF

Power Input	
PWR	Power Input 0.76A@12VDC
FAULT	1. The relay opens if PWR1 or PWR2 fails 2. The relay opens if Per Port Link is Broken (When Link Down Detection is Enabled)

DIP					
1 2 3 4	1	LFP Enable	FIBER F. Mode	COPPER LNK_DOWN_Det. ON	FIBER LNK_DOWN_Det. ON
	0	LFP Disable	FIBER Auto Mode	COPPER LNK_DOWN_Det. OFF	FIBER LNK_DOWN_Det. OFF

Note: *One side of the fiber ports should be* ***forced*** *to duplex mode and flow control, and the other side of fiber ports should be set to* ***auto*** *detect duplex mode when two of EL9000 media converters are connected to each other via fiber connection.*

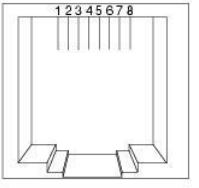
- DC Terminal Block Power Inputs: There are two pairs of power inputs can be used to power up this media converter. Redundant power supplies function is supported. You need to have two power inputs connected to run the media converter, but the FAULT LED indicator will light up to remind that the power redundant system functions abnormal in case either PWR1 or PWR2 is dead. Media Converter, however, continues working normally even fault LED indicator lights up.

- DC JACK Power input: 12VDC.

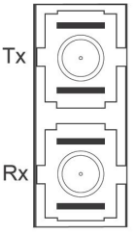
The 1000Base-T and 1000Base-SX/LX Connectors

The 1000Base-T Connections
The following lists the pinouts of 1000Base-T port.

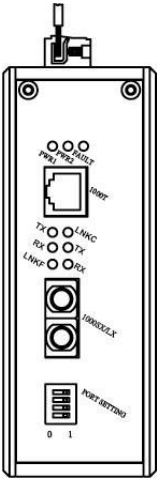
Pin	Label
1	TP0+
2	TP0-
3	TP1+
4	TP2+
5	TP2-
6	TP1-
7	TP3+
8	TP3-



The 1000BaseSX/LX Connections
The fiber port pinouts: The Tx (transmit) port of device I is connected to the Rx (receive) port of device II, and the Rx (receive) port of device I to the Tx (transmit) port of device II.



The Port Status LEDs



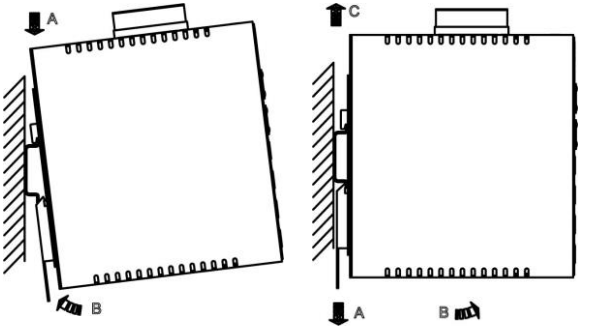
LEDs	State	Indication
FAULT	Steady	Power redundant system or ports function abnormally
	Off	Power redundant system and ports function normally
PWR1 PWR2	Steady	Power on PWR stands for POWER
	Off	Power off
LNKC	Steady	A valid network connection established for copper port LNK stands for LINK
	Off	No valid network connection established for copper port
LNKF	Steady	A valid network connection established for fiber port LNK stands for LINK
	Off	No valid network connection established for fiber port
TX	Flashing	Transmitting data TX stands for TRANSMIT
	Off	No transmitting data
RX	Flashing	Receiving data RX stands for RECEIVE
	Off	No data being received

Functional Description

- Meets NEMA TS1/TS2 Environmental requirements: temperature, shock, and vibration for traffic control equipment.
- Meets IEC61000-6-2 EMC Generic Standard Immunity for industrial environment.
- Support 802.3ab/802.3z/802.3x. Auto-negotiation and Auto MDI/MDIX.
- 1000Base-SX/LX: Multi mode, Single mode, or WDM Single mode SC type.
- One DIP switch for configuring link-fault-pass-through, fiber auto negotiation, and port link down alarm.
- Alarms for power and port link failure by relay output. Relay contact rating with current 1.5A @ 24VDC, 0.5A @ 120VAC.
- Operating voltage and Max. current consumption: 0.76A @ 12VDC, 0.38A @ 24VDC, 0.19A @ 48VDC. Power consumption: 9.12W Max.
- Power Supply: Redundant DC Terminal Block power inputs or 12VDC DC JACK with 100-240VAC external power supply.
- Field Wiring Terminal: Use Copper Conductors Only, 60/75℃, 12-24 AWG torque value 7 lb-in.
- -40℃ to 75℃ (-40℉ to 167℉) operating temperature range. Tested for functional operation @ -40℃ to 85℃ (-40℉ to 185℉). UL1604 Industrial Control Equipment certified Maximum Surrounding Air Temperature @ 74℃ (165℉).
- Supports DIN-Rail, Panel, or Rack Mounting installation.
- UL1604 Class I, Division 2 Classified for use in hazardous locations (applicable to versions with terminal block power option).
- This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D OR non-hazardous locations only.
- WARNING – EXPLOSION HAZARD – Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous.
- WARNING – EXPLOSION HAZARD – Substitution of components may impair suitability for Class I, Division 2.

Assembly, Startup, and Dismantling

- Assembly: Place the media converter on the DIN rail from above using the slot. Push the front of the media converter toward the mounting surface until it audibly snaps into place.
- Startup: Connect the supply voltage to start up the media converter via the terminal block (or DC JACK).
- Dismantling: Pull out the lower edge and then remove the media converter from the DIN rail.


A
B
C
A
B

Preface

Our hardened media converter provides an affordable solution for rugged environments, transportation road-side cabinets, industrial shop floors, multi tenant dwellings or Fiber To The Home (FTTH) applications. Capable of operating at temperature extremes of -40°C to +75°C, this is by far the media converter of choice for harsh environments in which space constraints exist.

Plug-and-Play Solution:
The hardened media converter is a plug-and-play compact media converter which doesn't have any complicated software to set up.

This manual describes the installation and use of the hardened media converter with the link-fault-pass-through function. The converter also provides one channel media conversion between 1000Base-T and 1000Base-SX/LX.

The converter is in full compliance with IEEE802.3ab 1000Base-T and IEEE802.3z 1000Base-SX/LX standards.

In this manual, you will find:

- Product overview
- Features of the media converter
- Illustrative LED functions
- Installation instructions
- Specifications

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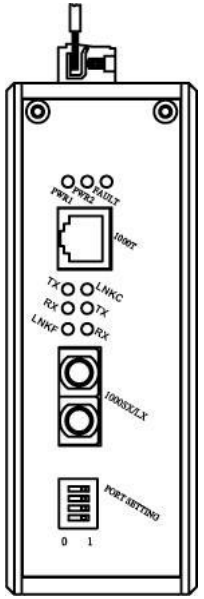
Introduction

The media converter provides one channel for media conversion between 1000Base-T and 1000Base-SX/LX with the link-fault-pass-through function. This hardened fiber optic solution is perfectly suitable for industrial applications or rugged environmental conditions.

Product Overview



Product Features

- Meets NEMA TS1/TS2 Environmental requirements: temperature, shock, and vibration for traffic control equipment.
- Meets IEC61000-6-2 EMC Generic Standard Immunity for industrial environment.
- Support 802.3ab/802.3z/802.3x. Auto-negotiation and Auto MDI/MDIX.
- 1000Base-SX/LX: Multi mode, Single mode, or WDM Single mode SC type.
- One DIP switch for configuring link-fault-pass-through, fiber auto negotiation, and port link down alarm.
- Alarms for power and port link failure by relay output. Relay contact rating with current 1.5A @ 24VDC, 0.5A @ 120VAC.
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- Power Supply: Redundant DC Terminal Block power inputs or 12VDC DC JACK with 100-240VAC external power supply.

- Field Wiring Terminal: Use Copper Conductors Only, 60/75℃, 12-24 AWG torque value 7 lb-in.
- -40℃to 75℃(-40℉ to 167℉) operating temperature range. Tested for functional operation @ -40℃ to 85℃ (-40℉ to 185℉). UL1604 Industrial Control Equipment certified Maximum Surrounding Air Temperature @ 74℃ (165℉).
- Supports DIN-Rail, Panel, or Rack Mounting installation.
- UL1604 Class I, Division 2 Classified for use in hazardous locations (applicable to versions with terminal block power option).
- This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D OR non-hazardous locations only.
- WARNING – EXPLOSION HAZARD – Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous.
- WARNING – EXPLOSION HAZARD – Substitution of components may impair suitability for Class I, Division 2.

<Note>
One of the fiber ports should be forced to full duplex mode when two 1000Base-T and 1000Base-SX/LX one-channel media converters are connected to each other via fiber port.

Packing List

When you open this product package, you will find the items listed below. Please inspect the contents, and report any apparent damage or missing items immediately to our authorized reseller.

- The Media Converter
- User's Manual
- AC to DC Power Adaptor and Power Cable (optional)

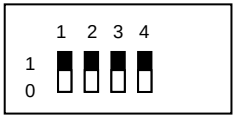
One-Channel Media Converter

Ports

The Converter provides one copper port and one fiber port. The fiber port provides options of Multi-mode, Single-mode, or WDM Single-mode fiber using an SC connector.
The copper port uses RJ-45 connector, auto-MDIX, and auto negotiates.

Port Settings

Port settings are made very simple by means of a DIP (Dual Inline Package) switch on the front panel of the hardened media converter.
Default DIP switch settings:



DIP Switch

There are four pins on the DIP switch for port settings. Refer to the table below for more details.

DIP switch No.	0	1	
1	Disable LFPT	Enable LFPT	LFPT: link-fault-pass-through
2	Enable auto negotiation for fiber port	Enable forced mode for fiber port	
3	Disable link down alarm for copper port	Enable link down alarm for copper port	
4	Disable link down alarm for fiber port	Enable link down alarm for fiber port	

Note: *One side of the fiber ports should be* ***forced*** *to duplex mode and flow control, and the other side of fiber ports should be set to* ***auto*** *detect duplex mode when two of EL9000 media converters are connected to each other via fiber connection.*

Front Panel & LEDs

LED Indicators
The LED indicators give you instant feedback on converter status:

LED's	State	Indication
FAULT	Steady	Power redundant system or ports function abnormally
	Off	Power redundant system and ports function normally
PWR1 PWR2	Steady	Power on PWR stands for POWER
	Off	Power off
LNKC	Steady	A valid network connection established for copper port LNK stands for LINK
	Off	No valid network connection established for copper port
LNKF	Steady	A valid network connection established for fiber port LNK stands for LINK
	Off	No valid network connection established for fiber port
TX	Flashing	Transmitting data TX stands for TRANSMIT
	Off	No transmitting data
RX	Flashing	Receiving data RX stands for RECEIVE
	Off	No data being received

Installation

This chapter gives step-by-step installation instructions for the Converter.

Selecting a Site for the Equipment

As with any electric device, you should place the equipment where it will not be subjected to extreme temperatures, humidity, or electromagnetic interference. Specifically, the site you select should meet the following requirements:

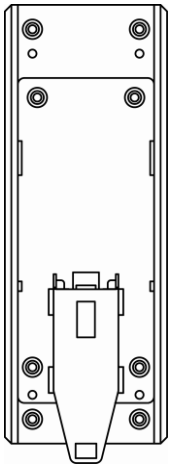
- The ambient temperature should be between -40 to 75 degrees Celsius.
- The relative humidity should be less than 95 percent, non-condensing.
- Surrounding electrical devices should not exceed the electromagnetic field (RFC) standards.
- Make sure that the equipment receives adequate ventilation. Do not block the ventilation holes of the equipment.
- The power outlet should be within 1.8 meters of the product.

DIN Rail Mounting

Fix the DIN rail attachment plate to the back panel of the media converter.

Installation: Place the media converter on the DIN rail from above using the slot. Push the front of the media converter toward the mounting surface until it audibly snaps into place.

Removal: Pull out the lower edge and then remove the media converter from the DIN rail.



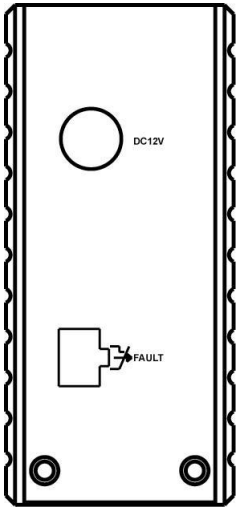
Connecting to Power

Redundant DC Terminal Block Power Inputs or 12VDC DC Jack:

12VDC DC Jack

Step 1: Connect the supplied AC to DC power adapter to the receptacle on the topside of the media converter.

Step 2: Connect the power cord to the AC to DC power adapter and attach the plug into a standard AC outlet with the appropriate AC voltage.

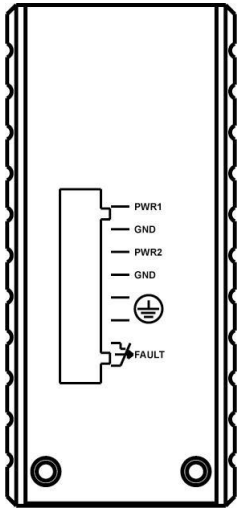


Redundant DC Terminal Block Power Inputs

There are two pairs of power inputs can be used to power up this device. You need to have two power inputs connected to run the media converter, but the FAULT LED indicator will light up to remind that the power redundant system functions abnormal in case either PWR1 or PWR2 is dead. Media Converter, however, continues working normally even fault LED indicator lights up.

Step 1: Connect the DC power cord to the plug-able terminal block on the media converter, and then plug it into a standard DC outlet.

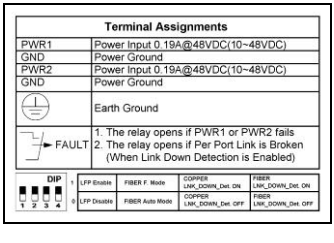
Step 2: Disconnect the power cord if you want to shut down the media converter.

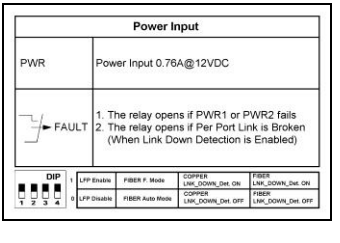


Field Wiring Terminal: Use Copper Conductors Only, 60/75℃, 12-24 AWG torque value 7 lb-in.

Alarms for Power and Port Failure

Step 1: There are two pins on the terminal block that are used for power failure detection. It provides a normal closed output when the power source is active. Use this as a dry contact application to send a signal for power failure detection.





Special note:
The relay output is normal in an open position when there is no power to the media converter. Please do not connect any power source to this terminal to prevent a shortage to your power supply.

Specifications

Applicable Standards	IEEE 802.3ab 1000Base-T IEEE 802.3z 1000Base-SX/LX
Fixed Ports	1 copper port, 1 fiber port
Speed 1000Base-T	2000Mbps for full-duplex
1000Base-SX/LX	2000Mbps for full-duplex
Forwarding rate	1,488,000pps for 1000Mbps
Cable 1000Base-T	4-pair UTP/STP Cat. 5 up to 100m
1000Base-SX/LX	MMF (50 or 62.5μm), SMF (9 or 10μm)
LED Indicators	Per Unit- (3 LEDs): PWR1, PWR2, FAULT
	Per Port- Copper (3 LEDs): LNKC, TX, RX Fiber (3 LEDs): LNKF, TX, RX
Dimensions	50mm (W) × 110mm (D) x 135mm (H) (1.97" (W) x 4.33" (D) x 5.31" (H))
Weight	0.8Kg (1.76lbs.)
Power	DC Jack: 12VDC, External AC/DC required Terminal Block: 10-48VDC
Operating Voltage & Max. Current Consumption	0.76A @ 12VDC, 0.38A @ 24VDC, 0.19A @ 48VDC
Power Consumption	9.12W Max.
Operating Temperature	-40°C ~ 75°C (-40℉ ~ 167℉) Tested for functional operation @ -40°C ~ 85°C (-40℉ ~ 185℉) UL1604 Industrial Control Equipment certified Maximum Surrounding Air Temperature @ 74℃ (165℉)
Storage Temperature	-40°C ~ 85°C (-40℉ ~ 185℉)
Humidity	5 ~ 95%, non-condensing
Safety	Hazardous locations: Class I, Division 2 group A, B, C & D UL60950-1, EN60950-1, IEC60950-1
EMI	FCC Part 15, Class A EN61000-6-3: EN55022, EN61000-3-2, EN61000-3-3
EMS	EN61000-6-2: EN61000-4-2 (ESD Standard) EN61000-4-3 (Radiated RFI Standards) EN61000-4-4 (Burst Standards) EN61000-4-5 (Surge Standards) EN61000-4-6 (Induced RFI Standards) EN61000-4-8 (Magnetic Field Standards) EN61000-4-11 (Voltage Dips Standards)
Environmental Test Compliance	IEC60068-2-6 Fc (Vibration Resistance) IEC60068-2-27 Ea (Shock) IEC60068-2-32 Ed (Free Fall)

NEMA TS1/2 Environmental requirements for traffic control equipment