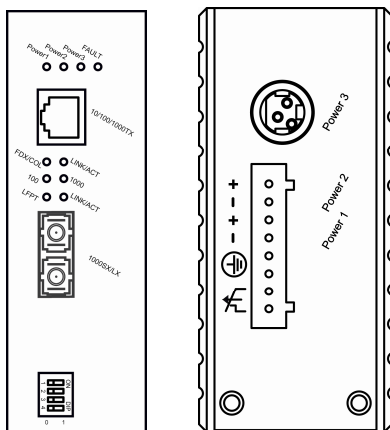




## Quick Start Guide

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

### Physical Description


#### The Terminal Block and Power inputs



Power Input Assignment		
Power3		12VDC
Power2	+	12-48VDC
	-	Power Ground
Power1	+	12-48VDC
	-	Power Ground
		Earth Ground
Relay Alarm Assignment		
 FAULT	*Relay warning signal disable for following: The relay contact closes if Power1 and Power2 are both failed but Power3 on. The relay contact closes if Power3 is failed but Power1 and Power2 are both on.	

- DC Terminal Block Power Inputs: There are two pairs of power inputs can be used to power up this media converter.
- DC JACK Power input: 12VDC.

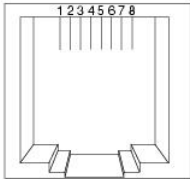
## DIP Switch

	DIP switch No.	0 (OFF)	1 (ON)
	1	Disable LFPT	Enable LFPT
	2	Disable link down alarm for copper port	Enable link down alarm for copper port
	3	Disable link down alarm for fiber port	Enable link down alarm for fiber port
	4	Enable force mode for fiber port	Enable auto-negotiation for fiber port

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

The 1000Base-T Connections

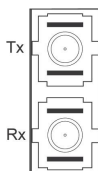
The following lists the pinouts of 1000Base-T port.

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

The 1000Base-SX/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.



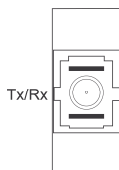
# Gigabit Hardened Media Converter

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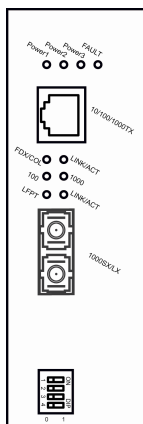
## The WDM 1000Base-BX Connections

The fiber port pinouts

Only one single-mode optical fiber is required to transmit and receive data.



## The Port Status LEDs



## Gigabit Hardened Media Converter

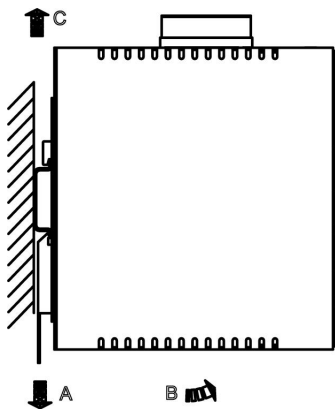
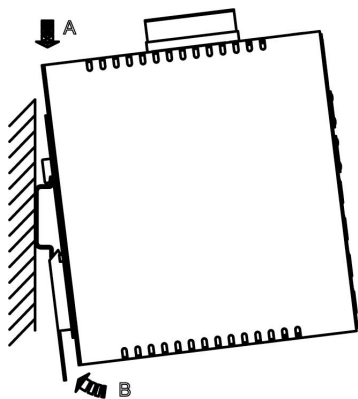
LEDs	State	Indication
FAULT	Steady	Power redundant system or ports function abnormally
	Off	Power redundant system and ports function normally
Power1 Power2 Power3	Steady	Power on
	Off	Power off
LFPT	Steady	LFPT function enabled
	Off	LFPT function disabled
1000Base-SX/LX/BX		
LINK/ACT	Steady	A valid network connection established for fiber port
	Flashing	Transmitting or receiving data ACT stands for Activity
	Off	No valid network connection established for fiber port
10/100/1000Base-TX		
LINK/ACT	Steady	A valid network connection established for copper port
	Flashing	Transmitting or receiving data ACT stands for Activity
	Off	No valid network connection established for copper port
FDX/COL	Steady	Connected in full duplex mode
	Flashing	Collision occurred COL stands for Collision
	Off	Connected in half duplex mode
1000	Steady	Connected at 1000Mbps
	Off	Not connected at 1000Mbps
100	Steady	Connected at 100Mbps
	Off	Connected at 10Mbps

### Functional Description

- Meets NEMA TS1/TS2 Environmental requirements: temperature, shock, and vibration for traffic control equipment.
- Meets EN61000-6-2 & EN61000-6-4 EMC Generic Standard Immunity for industrial environment.
- DIP switch configuration for link-fault-pass-through, fiber auto/force mode, and port link down alarm.
- 4096 MAC addresses, 2.75M bits buffer memory.
- Supports 802.3/802.3u/802.3ab/802.3z/802.3x. Auto-negotiation and Auto MDI/MDIX.
- Full wire-speed forwarding rate.
- Alarms for power and port link failure by relay output. Relay contact rating with current 1A @ 30VDC, 0.5A @ 120VAC.
- Operating voltage and Max. current consumption: 1A @ 12VDC, 0.5A @ 24VDC, 0.25A @ 48VDC. Power consumption: 12W Max.
- Power Supply: Redundant DC Terminal Block power inputs or 12VDC DC JACK with 100-240VAC external power supply.
- Field Wiring Terminal Markings: Use Copper Conductors Only, 60/75°C, wire range 12-24 AWG, torque value 7 lb-in.
- -40°C to 75°C (-40°F to 167°F) operating temperature range. Tested for functional operation @ -40°C to 85°C (-40°F to 185°F). UL508 Industrial Control Equipment certified Maximum Surrounding Air Temperature @ 75°C (167°F).
- For use in Pollution Degree 2 Environment.
- Supports DIN-Rail, Panel, or Rack Mounting installation.

### 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.



## 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 10/100/1000Base-TX and Gigabit fiber port.

The converter is in full compliance with IEEE802.3 10Base-T, IEEE802.3u 100Base-TX, IEEE802.3ab 1000Base-T and IEEE802.3z 1000Base-SX/LX/BX standards.

In this manual, you will find:

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

## Table of Contents

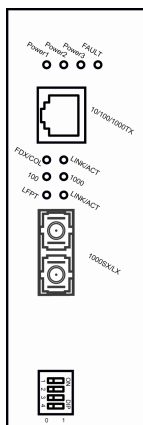
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## Introduction

The media converter provides one channel for media conversion between 10/100/1000Base-TX and Gigabit fiber port 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 such as temperature, shock, and vibration for traffic control equipment.
- Meets EN61000-6-2 & EN61000-6-4 EMC Generic Standard Immunity for industrial environment.
- DIP switch configuration for link-fault-pass-through, fiber auto/force mode, and port link down alarm.
- 4096 MAC addresses, 2.75M bits buffer memory.
- Supports 802.3/802.3u/802.3ab/802.3z/802.3x. Auto-negotiation and Auto MDI/MDIX.
- The Gigabit fiber ports should be set to (forced full duplex mode, forced full duplex mode) or (auto mode, auto mode) when two 10/100/1000Base-TX and Gigabit fiber one-channel media converters are connected to each other via Gigabit fiber ports.
- Full wire-speed forwarding rate.
- Back-pressure & IEEE802.3x compliant flow control.
- Alarms for power and port link failure by relay output.
- Relay contact rating with current 1A @ 30VDC, 0.5A @ 120VAC.

- Operating voltage and Max. current consumption: 1A @ 12VDC, 0.5A @ 24VDC, 0.25A @ 48VDC. Power consumption: 12W Max.
- Power Supply: Redundant DC Terminal Block power inputs or 12VDC DC JACK with 100-240VAC external power supply.
- Field Wiring Terminal Markings: Use Copper Conductors Only, 60/75°C, wire range 12-24 AWG, torque value 7 lb-in.
- -40°C to 75°C (-40°F to 167°F) operating temperature range. Tested for functional operation @ -40°C to 85°C (-40°F to 185°F). UL508 Industrial Control Equipment certified Maximum Surrounding Air Temperature @ 75°C (167°F).
- For use in Pollution Degree 2 Environment.
- Supports DIN-Rail, Panel, or Rack Mounting installation.
- Front panel status LEDs.

### <Note>

Both of the Gigabit fiber ports should be forced to full duplex mode (or auto mode) when two 10/100/1000Base-TX and Gigabit fiber one-channel media converters are connected to each other via Gigabit fiber ports.

## 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 is available for options of Multi-mode, Single-mode, or WDM Single-mode. The copper port uses RJ-45 connector, auto-MDIX, and auto negotiation.

## 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 (OFF)	1 (ON)
1	Disable LFPT	Enable LFPT
2	Disable link down alarm for copper port	Enable link down alarm for copper port
3	Disable link down alarm for fiber port	Enable link down alarm for fiber port
4	Enable force mode for fiber port	Enable auto-negotiation for fiber port

## Front Panel & LEDs

### LED Indicators

The LED indicators give you instant feedback on converter status:

LEDs	State	Indication
FAULT	Steady	Power redundant system or ports function abnormally
	Off	Power redundant system and ports function normally
Power1 Power2 Power3	Steady	Power on
	Off	Power off
LFPT	Steady	LFPT function enabled
	Off	LFPT function disabled
1000Base-SX/LX/BX		
LINK/ACT	Steady	A valid network connection established for fiber port
	Flashing	Transmitting or receiving data ACT stands for Activity
	Off	No valid network connection established for fiber port
10/100/1000Base-TX		
LINK/ACT	Steady	A valid network connection established for copper port
	Flashing	Transmitting or receiving data ACT stands for Activity
	Off	No valid network connection established for copper port
FDX/COL	Steady	Connected in full duplex mode
	Flashing	Collision occurred COL stands for Collision
	Off	Connected in half duplex mode
1000	Steady	Connected at 1000Mbps
	Off	Not connected at 1000Mbps
100	Steady	Connected at 100Mbps
	Off	Connected at 10Mbps

## Installation

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

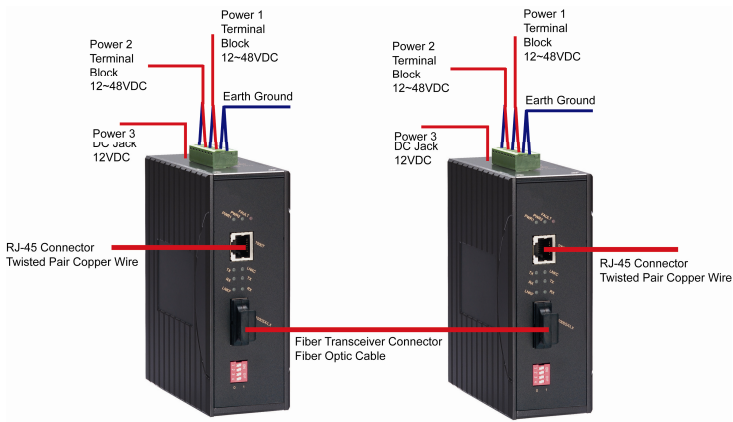
### Selecting a Site for the Equipment

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 (RF) 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.

### Wiring Diagram

Field Wiring Terminal Markings: Use Copper Conductors Only, 60/75°C, wire range 12-24 AWG, torque value 7 lb-in.



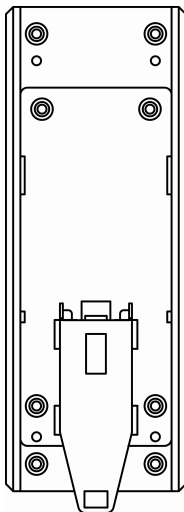
### DIN Rail Mounting

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

## Gigabit Hardened Media Converter

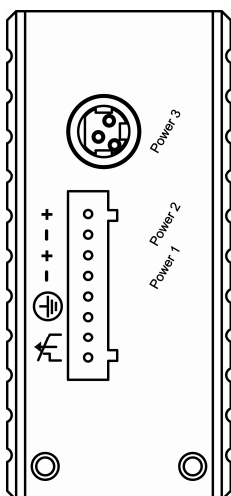
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- Installation: Place the media converter on the DIN rail from above using the slot. Push the front of the media converter toward the mounting surface until it audibly snaps into place.
- Removal: Pull out the lower edge and then remove the media converter from the DIN rail.



### Connecting to Power

Redundant DC Terminal Block Power Inputs and 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.

**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.



## 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.

Power Input Assignment			
Power3		12VDC	DC Jack
Power2	+	12-48VDC	Terminal Block
	-	Power Ground	

## Gigabit Hardened Media Converter

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Power1	+	12-48VDC	
	-	Power Ground	
		Earth Ground	
Relay Alarm Assignment			
 FAULT	*Relay warning signal disable for following: The relay contact closes if Power1 and Power2 are both failed but Power3 on. The relay contact closes if Power3 is failed but Power1 and Power2 are both on.		

<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 802.3 10Base-T IEEE 802.3u 100Base-TX IEEE 802.3ab 1000Base-T IEEE 802.3z 1000Base-SX/LX/BX
Fixed Ports	1 copper port, 1 fiber port
Speed 10Base-T 100Base-TX 1000Base-T 1000Base-SX/LX/BX	10/20Mbps for half/full-duplex 100/200Mbps for half/full-duplex 2000Mbps for full-duplex 2000Mbps for full-duplex
Forwarding rate	14,880pps for 10Mbps 148,810pps for 100Mbps 1,488,100pps for 1000Mbps
Cable 1000Base-T 1000Base-SX/LX/BX	4-pair UTP/STP Cat. 5 up to 100m MMF (50 or 62.5µm), SMF (9 or 10µm)
LED Indicators	Per Unit: FAULT, Power1, Power2, Power3, LFPT  Per Port: Fiber: LINK/ACT Copper: LINK/ACT, FDX/COL, 1000, 100
Dimensions	50mm (W) × 110mm (D) × 135mm (H) (1.97" (W) × 4.33" (D) × 5.31" (H))
Weight	0.8Kg (1.76lbs.)
Power	DC Jack: 12VDC, External AC/DC required Terminal Block: 12-48VDC
Operating Voltage & Max. Current Consumption	1A @ 12VDC, 0.5A @ 24VDC, 0.25A @ 48VDC
Power Consumption	12W Max.
Operating Temperature	-40°C ~ 75°C (-40°F ~ 167°F) Tested for functional operation @ -40°C ~ 85°C (-40°F ~ 185°F) UL508 Industrial Control Equipment certified Maximum Surrounding Air Temperature @ 75°C (167°F)
Storage Temperature	-40°C ~ 85°C (-40°F ~ 185°F)
Humidity	5 ~ 95%, non-condensing
Safety	UL508

## Gigabit Hardened Media Converter

EMI	FCC Part 15, Class A VCCI, Class A EN61000-6-4: 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)
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	