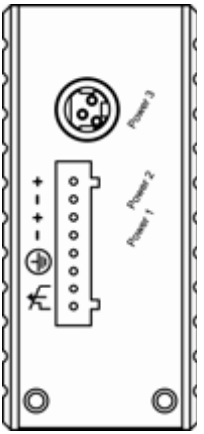
# Quick Start Guide

This quick start guide describes how to install and use the Gigabit SFP 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 | DC Jack |
| Power2 | + | 12-48VDC | Terminal Block |
| | − | Power Ground | |
| Power1 | + | 12-48VDC | |
| | − | Power Ground | |
| ⏚ | | Earth Ground | |
| Relay Alarm Assignment | | | |
| FAULT | | *Relay warning signal disable for following:<br>The relay contact closes if Power1 and Power2 are both failed but Power3 on.<br>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.

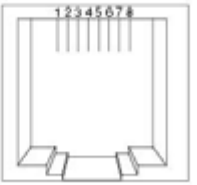
**DIP Switch**


| 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 SFP socket port | Enable link down alarm for SFP socket port |
| 4 | Enable force mode for SFP socket port | Enable auto-negotiation for SFP socket port |

**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 1000Base-SX/LX Connections
The SFP socket for Gigabit fiber optic expansion.

**The Port Status LEDs**

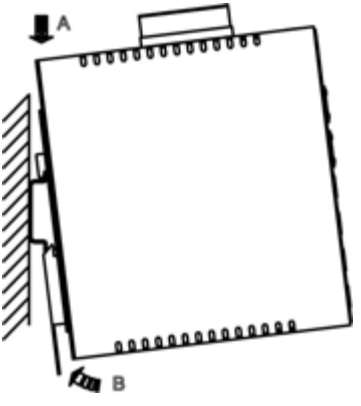
| LEDs | State | Indication |
|---|---|---|
| FAULT | Steady | Power redundant system or ports function abnormally |
| | Off | Power redundant system and ports function normally |
| Power1<br>Power2<br>Power3 | Steady | Power on |
| | Off | Power off |
| LFPT | Steady | LFPT function enabled |
| | Off | LFPT function disabled |
| 1000Base-SX/LX | | |
| LINK/ACT | Steady | A valid network connection established for SFP port |
| | Flashing | Transmitting or receiving data<br>ACT stands for Activity |
| | Off | No valid network connection established for SFP port |
| 10/100/1000Base-TX | | |
| LINK/ACT | Steady | A valid network connection established for copper port |
| | Flashing | Transmitting or receiving data<br>ACT stands for Activity |
| | Off | No valid network connection established for copper port |
| FDX/COL | Steady | Connected in full duplex mode |
| | Flashing | Collision occurred<br>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 & EN61000-6-3 EMC Generic Standard Immunity for industrial environment.
- UL1604 Class 1, Division 2 Classified for use in hazardous locations (applicable to versions with terminal block power option).
- 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.
- SFP socket for Gigabit fiber optic expansion.
- 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: 0.88A @ 12VDC, 0.44A @ 24VDC, 0.22A @ 48VDC. Power consumption: 10.5W Max.
- Power Supply: Redundant DC Terminal Block power inputs or 12VDC DC JACK with 100-240VAC external power supply.
- -40℃ to 75℃ (-40℉ to 167℉) operating temperature range.
  Tested for functional operation @ -40℃ to 85℃ (-40℉ to 185℉).
- 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.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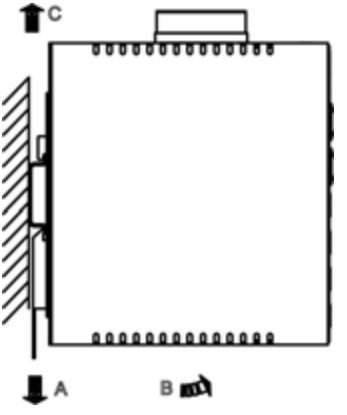
B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# Preface

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 SFP socket 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 standards.

In this manual, you will find:

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

# Table of Contents

# Introduction

The media converter provides one channel for media conversion between 10/100/1000Base-TX and Gigabit SFP socket 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 & EN61000-6-3 EMC Generic Standard Immunity for industrial environment
- UL1604 Class 1, Division 2 Classified for use in hazardous locations (applicable to versions with terminal block power option)
- 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
- SFP socket for Gigabit fiber optic expansion
- The Gigabit SFP socket with SFP fiber transceiver 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 SFP socket one-channel media converters are connected to each other via Gigabit SFP socket with SFP fiber transceiver

- 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: 0.88A @ 12VDC, 0.44A @ 24VDC, 0.22A @ 48VDC. Power consumption: 10.5W Max.
- Power Supply: Redundant DC Terminal Block power inputs or 12VDC DC JACK with 100-240VAC external power supply
- -40℃ to 75℃ (-40℉ to 167℉) operating temperature range
  Tested for functional operation @ -40℃ to 85℃ (-40℉ to 185℉)
- Supports DIN-Rail, Panel, or Rack Mounting installation
- Front panel status LEDs

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

## 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)

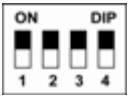
# One-Channel Media Converter

## Ports

The Converter provides one copper port and one Gigabit SFP socket port. The Gigabit SFP socket port is available for options of Multi-mode, Single-mode, or WDM Single-mode SFP fiber transceiver using LC 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 (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 SFP socket port | Enable link down alarm for SFP socket port |
| 4 | Enable force mode for SFP socket port | Enable auto-negotiation for SFP socket 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<br>Power2<br>Power3 | Steady | Power on |
| | Off | Power off |
| LFPT | Steady | LFPT function enabled |
| | Off | LFPT function disabled |
| 1000Base-SX/LX | | |
| LINK/ACT | Steady | A valid network connection established for SFP port |
| | Flashing | Transmitting or receiving data<br>ACT stands for Activity |
| | Off | No valid network connection established for SFP port |
| 10/100/1000Base-TX | | |
| LINK/ACT | Steady | A valid network connection established for copper port |
| | Flashing | Transmitting or receiving data<br>ACT stands for Activity |
| | Off | No valid network connection established for copper port |
| FDX/COL | Steady | Connected in full duplex mode |
| | Flashing | Collision occurred<br>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.

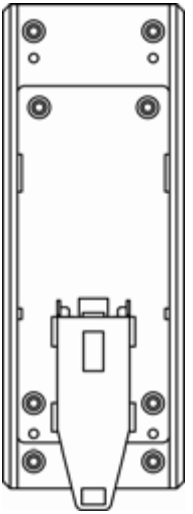
## Selecting a Site for the Equipment

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 (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.

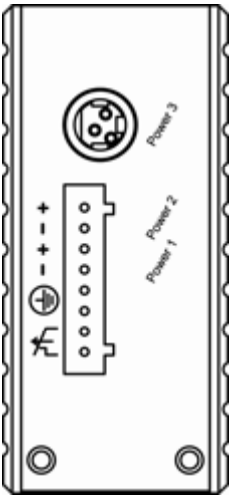
## DIN Rail Mounting

- 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 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.

<table>
<tr><td colspan="4">Power Input Assignment</td></tr>
<tr><td colspan="2">Power3</td><td>12VDC</td><td>DC Jack</td></tr>
<tr><td rowspan="2">Power2</td><td>+</td><td>12-48VDC</td><td rowspan="5">Terminal Block</td></tr>
<tr><td>−</td><td>Power Ground</td></tr>
<tr><td rowspan="2">Power1</td><td>+</td><td>12-48VDC</td></tr>
<tr><td>−</td><td>Power Ground</td></tr>
<tr><td colspan="2">  </td><td>Earth Ground</td></tr>
<tr><td colspan="4">Relay Alarm Assignment</td></tr>
<tr><td>  <br>FAULT</td><td colspan="3">*Relay warning signal disable for following:<br>The relay contact closes if Power1 and Power2 are both failed but Power3 on.<br>The relay contact closes if Power3 is failed but Power1 and Power2 are both on.</td></tr>
</table>

<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<br>IEEE 802.3u 100Base-TX<br>IEEE 802.3ab 1000Base-T<br>IEEE 802.3z 1000Base-SX/LX |
| Fixed Ports | 1 copper port, 1 Gigabit SFP socket port |
| Speed<br>10Base-T<br>100Base-TX<br>1000Base-T<br>1000Base-SX/LX | <br>10/20Mbps for half/full-duplex<br>100/200Mbps for half/full-duplex<br>2000Mbps for full-duplex<br>2000Mbps for full-duplex |
| Forwarding rate | 14,880pps for 10Mbps<br>148,810pps for 100Mbps<br>1,488,100pps 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:<br>FAULT, Power1, Power2, Power3, LFPT |
| | Per Port:<br>SFP socket: LINK/ACT<br>Copper: LINK/ACT, FDX/COL, 1000, 100 |
| Dimensions | 50mm (W) × 110mm (D) x 135mm (H)<br>(1.97” (W) x 4.33” (D) x 5.31” (H)) |
| Weight | 0.8Kg (1.76lbs.) |
| Power | DC Jack: 12VDC, External AC/DC required<br>Terminal Block: 12-48VDC |
| Operating Voltage & Max. Current Consumption | 0.88A @ 12VDC, 0.44A @ 24VDC, 0.22A @ 48VDC |
| Power Consumption | 10.5W Max. |
| Operating Temperature | -40°C ~ 75°C (-40°F ~ 167°F)<br>Tested for functional operation @<br>-40°C ~ 85°C (-40°F ~ 185°F) |
| Storage Temperature | -40°C ~ 85°C (-40°F ~ 185°F) |
| Humidity | 5 ~ 95%, non-condensing |
| Safety | Hazardous locations: Class 1, Division 2 group A, B, C & D<br>UL60950-1, EN60950-1, IEC60950-1 |

| | |
|---|---|
| EMI | FCC Part 15, Class A<br>EN61000-6-3: EN55022, EN61000-3-2, EN61000-3-3 |
| EMS | EN61000-6-2:<br>EN61000-4-2 (ESD Standard)<br>EN61000-4-3 (Radiated RFI Standards)<br>EN61000-4-4 (Burst Standards)<br>EN61000-4-5 (Surge Standards)<br>EN61000-4-6 (Induced RFI Standards)<br>EN61000-4-8 (Magnetic Field Standards)<br>EN61000-4-11 (Voltage Dips Standards) |
| Environmental Test Compliance | IEC60068-2-6 Fc (Vibration Resistance)<br>IEC60068-2-27 Ea (Shock)<br>IEC60068-2-32 Ed (Free Fall) |
| NEMA TS1/2 Environmental requirements for traffic control equipment | |