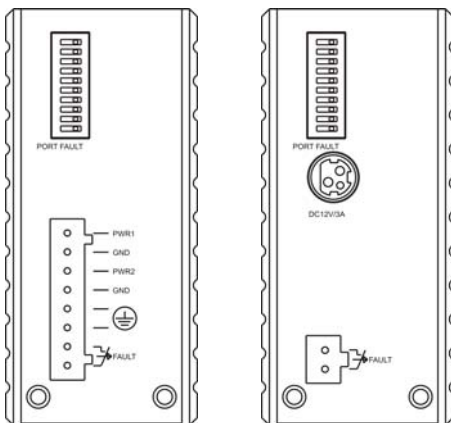


## Quick Start Guide

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

## Physical Description

### The Terminal Block and Power inputs



Terminal Assignment	
PWR1	Power Input 1 (10 ~ 48VDC)
GND	Power Ground
PWR2	Power Input 2 (10 ~ 48VDC)
GND	Power Ground
	Earth Ground
	1. The relay opens if PWR1 or PWR2 fails 2. The relay opens if the Port Link is broken (When Link Down Detection is Enabled)
 ON: Enable Port Fault Alarm OFF: Disable Port Fault Alarm PIN: 6~10 N/A	

Power Input Assignment	
PWR1	12 VDC Jack
Relay Alarm Assignment	
	*Relay Warning signal disable for following: 1. The rela contactclose if power fails.
 ON: Enable Port Fault Alarm OFF: Disable Port Fault Alarm PIN 6~10: N/A	

- DC Terminal Block Power Inputs: There are two pairs of power inputs can be used to power up this device.

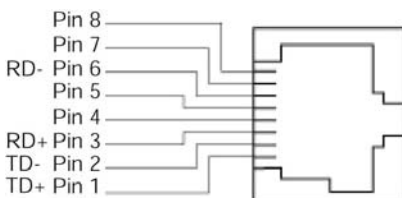
Redundant power supplies function is supported. You need to have two power inputs connected to run the device, but the FAULT LED indicator will light up to remind that the power redundant system functions abnormal in case either PWR1 or PWR2 is dead. This device, however, continues working normally even fault LED indicator lights up.

- DC Jack Power input: 12VDC.

## **The 10/100Base-TX and 100Base-FX Connectors**

### **1. The 10/100Base-TX Connections**

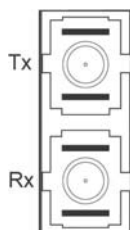
The following lists the pinouts of 10/100Base-TX ports.



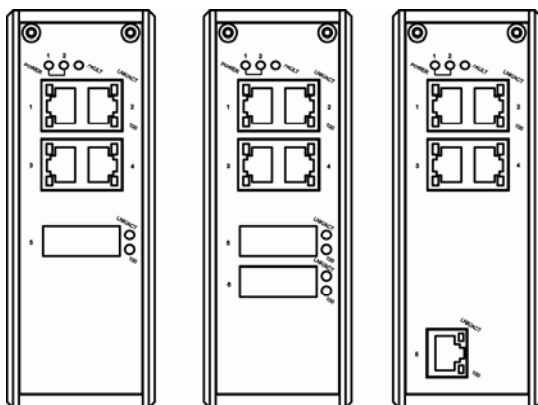
<b>Pin</b>	<b>Regular Ports</b>	<b>Uplink port</b>
1	Output Transmit Data +	Input Receive Data +
2	Output Transmit Data -	Input Receive Data -
3	Input Receive Data +	Output Transmit Data +
4	NC	NC
5	NC	NC
6	Input Receive Data -	Output Transmit Data -
7	NC	NC
8	NC	NC

### **2. The 100Base-FX 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



## **Functional Description**

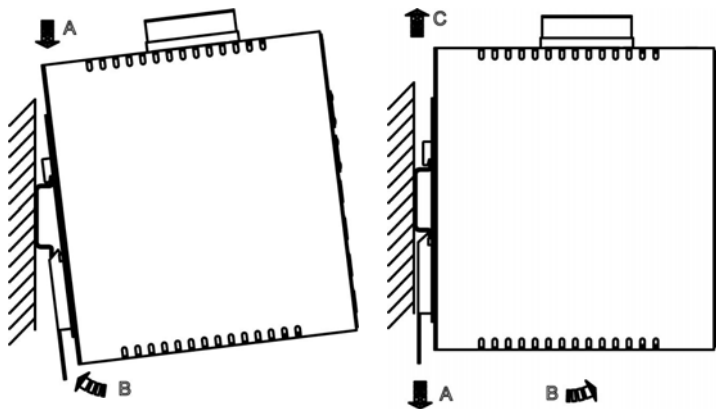
- Meets NEMA TS1/TS2 Environmental requirements such as temperature, shock, and vibration for traffic control equipment.
- Meets EN61000-6-2 & EN61000-6-3 EMC Generic Standard Immunity for industrial environment.
- Support 802.3/802.3u/802.3x. Auto-negotiation: 10/100Mbps, full/half-duplex; Auto MDI/MDIX.
- 100Base-FX: Multi mode SC or ST type; Single mode SC or ST type; WDM Single mode SC type.
- Support 2048 MAC addresses. Provides 768K bits memory buffer.
- Alarms for power and port link failure by relay output 1.5A @ 24VDC.
- 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.
- -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).
- Supports DIN-Rail or Panel Mounting installation.

## Hardened Ethernet Switch

LED	State	Indication
<b>POWER</b>		
<b>PWR1</b> <b>PWR2</b> (Green)	Steady	Switch is properly connected to power and turned on.
	Off	Switch is not connected to power and is turned off.
<b>FAULT</b>		
<b>FAULT</b> (Red)	Steady	<ul style="list-style-type: none"><li>• Power redundant system failure occurred.</li><li>• Port failure occurred (when port fault alarm dip switch is enabled).</li></ul>
	Off	<ul style="list-style-type: none"><li>• Power redundant system failure is not occurred.</li><li>• Port failure is not occurred (when port fault alarm dip switch is enabled).</li><li>• Port fault alarm dip switch is disabled.</li></ul>
<b>10/100TX or 100FX</b>		
<b>LNK/ACT</b> (Green)	Steady	A valid network connection established. LNK stands for LINK.
	Flashing	Transmitting or receiving data. ACT stands for ACTIVITY.
<b>100</b> (Yellow)	Steady	Light solid yellow for a port transferring at 100Mbps.
	Off	The port is transferring at 10Mbps If this LED is dark.

## Assembly, Startup, and Dismantling

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



## **Preface**

A member of the growing family of rugged switches, this switch addresses a need for a smaller switch. This switch provides an affordable solution for rugged and outdoor environment, transportation road-side cabinet, industrial floor shop, multitenant dwellings or Fiber To The Home (FTTH) applications. Capable of operating at temperature extremes of  $-40^{\circ}\text{C}$  to  $+75^{\circ}\text{C}$ , this is the switch of choice for harsh environments constrained by space.

### **Plug-and-Play Solution:**

The switch is a plug-and-play Fast Ethernet Switch in compact size. It doesn't have any complicated software to set up.

This manual describes how to install and use the hardened Ethernet Switch. This switch integrates full wire speed switching technology. This switch brings the answer to complicated hardened networking environments.

To get the most out of this manual, you should have an understanding of Ethernet networking concepts.

In this manual, you will find:

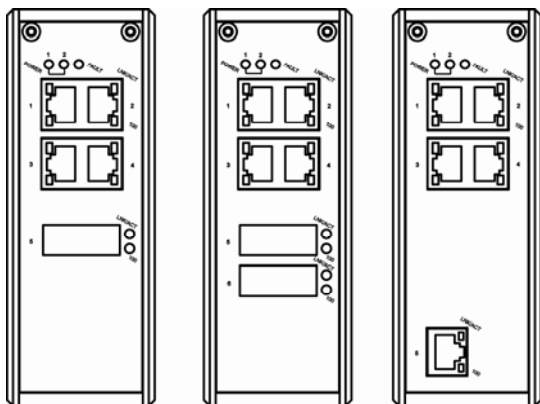
- Features on the switch
- Illustrative LED functions
- Installation instructions
- Specifications

# Table of Contents

<b>QUICK START GUIDE</b>	<b>1</b>
PHYSICAL DESCRIPTION	1
<i>The Terminal Block and Power inputs</i>	1
<i>The 10/100Base-TX and 100Base-FX Connectors</i>	2
<i>The Port Status LEDs</i>	3
FUNCTIONAL DESCRIPTION	4
ASSEMBLY, STARTUP, AND DISMANTLING	5
<b>PREFACE</b>	<b>7</b>
<b>TABLE OF CONTENTS</b>	<b>8</b>
<b>PRODUCT OVERVIEW</b>	<b>9</b>
HARDENED ETHERNET SWITCH	9
PACKAGE CONTENTS	9
PRODUCT HIGHLIGHTS	10
<i>Basic Features</i>	10
FRONT PANEL DISPLAY	11
PHYSICAL PORTS	12
<b>INSTALLATION</b>	<b>13</b>
SELECTING A SITE FOR THE SWITCH	13
DIN RAIL MOUNTING	14
CONNECTING TO POWER	15
<i>Redundant DC Terminal Block Power Inputs</i>	15
<i>12VDC DC Jack</i>	16
<i>Alarms for Power and Port Failure</i>	18
CONNECTING TO YOUR NETWORK	19
<i>Cable Type &amp; Length</i>	19
<i>Cabling</i>	20
<b>SPECIFICATIONS</b>	<b>21</b>
<b>APPENDIX A – CONNECTOR PINOUTS</b>	<b>23</b>

## Product Overview

### Hardened Ethernet Switch



### Package Contents

When you unpack the product package, you shall find the items listed below. Please inspect the contents, and report any apparent damage or missing items immediately to your authorized reseller.

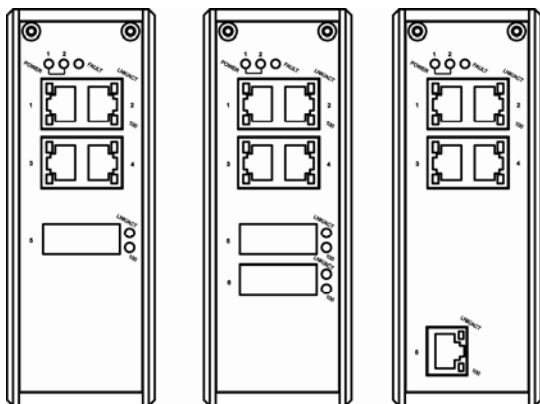
- ✓ ***This Switch***
- ✓ ***User's Manual***
- ✓ ***External power adapter & Power Cord (Optional)***

## **Product Highlights**

### **Basic 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.
- Support 802.3/802.3u/802.3X.
- Auto-negotiation: 10/100Mbps, Full/half-duplex; Auto MDI/MDIX.
- Support 2048 MAC addresses.
- Provides 768K bits memory buffer.
- Alarms for power and port link failure by relay output 1.5A @ 24VDC.
- 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.
- -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).
- Supports DIN-Rail or Panel Mounting installation.

## Front Panel Display



## Status LEDs

## Hardened Ethernet Switch

LED	State	Indication
<b>POWER</b>		
<b>PWR1</b> <b>PWR2</b> (Green)	Steady	Switch is properly connected to power and turned on.
	Off	Switch is not connected to power and is turned off.
<b>FAULT</b>		
<b>FAULT</b> (Red)	Steady	<ul style="list-style-type: none"><li>• Power redundant system failure occurred.</li><li>• Port failure occurred (when port fault alarm dip switch is enabled).</li></ul>
	Off	<ul style="list-style-type: none"><li>• Power redundant system failure is not occurred.</li><li>• Port failure is not occurred (when port fault alarm dip switch is enabled).</li><li>• Port fault alarm dip switch is disabled.</li></ul>
<b>10/100TX or 100FX</b>		
<b>LNK/ACT</b> (Green)	Steady	A valid network connection established. LNK stands for LINK.
	Flashing	Transmitting or receiving data. ACT stands for ACTIVITY.
<b>100</b> (Yellow)	Steady	Light solid yellow for a port transferring at 100Mbps.
	Off	The port is transferring at 10Mbps If this LED is dark.

## Physical Ports

This switch provides:

- Five 10/100Base-TX ports
- Four 10/100Base-TX ports + one 100Base-FX port
- Four 10/100Base-TX ports + two 100Base-FX ports

### CONNECTIVITY

- RJ-45 connectors
- SC or ST connector on 100Base-FX fiber port

## Installation

This chapter gives step-by-step instructions about how to install the switch:

### Selecting a Site for the Switch

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

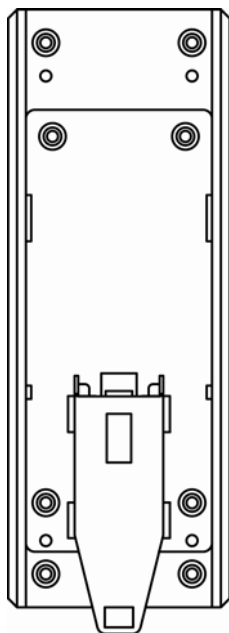
- The ambient temperature should be between -40 to 75 degrees Celsius.
- The relative humidity should be less than 95 percent, non-condensing.
- Surrounding electrical devices should not exceed the electromagnetic field (RFC) standards.
- Make sure that the switch receives adequate ventilation. Do not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

## **DIN Rail Mounting**

Fix the DIN rail attachment plate to the back panel of the switch.

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

**Removal:** Pull out the lower edge and then remove the switch from the DIN rail.



## Connecting to Power

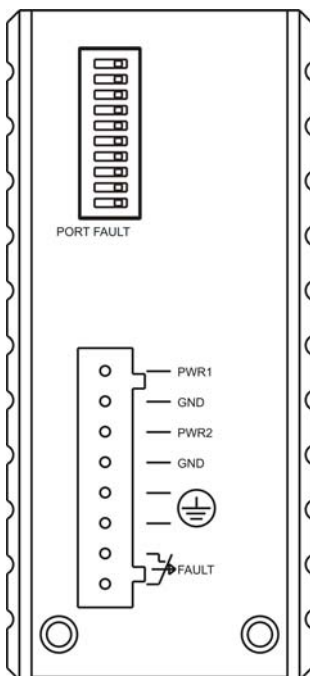
Redundant DC Terminal Block Power Inputs or 12VDC DC Jack:

### 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 device, 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. This device, 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 switch, and then plug it into a standard DC outlet.

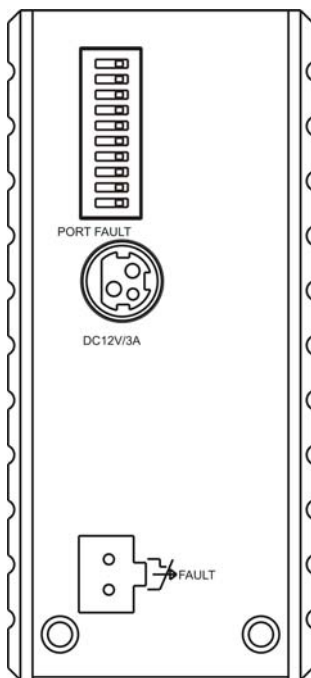
**Step 2:** Disconnect the power cord if you want to shut down the switch.



## **12VDC DC Jack**




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



**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.



## Alarms for Power and Port Failure

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

Terminal Assignment	
PWR1	Power Input 1 (10 ~ 48VDC)
GND	Power Ground
PWR2	Power Input 2 (10 ~ 48VDC)
GND	Power Ground
	Earth Ground
 FAULT	1. The relay opens if PWR1 or PWR2 fails 2. The relay opens if the Port Link is broken (When Link Down Detection is Enabled)
	ON: Enable Port Fault Alarm OFF: Disable Port Fault Alarm PIN: 6~10 N/A

Power Input Assignment	
PWR1	12 VDC Jack
Relay Alarm Assignment	
 FAULT	*Relay Warning signal disable for following: 1. The relay contact close if power fails.
	ON: Enable Port Fault Alarm OFF: Disable Port Fault Alarm PIN 6~10: N/A

**Special note:**

**The relay output is normal open position when there is no power to the switch. Please do not connect any power source to this terminal to prevent the shortage to your power supply.**

## Connecting to Your Network

### Cable Type & Length

It is necessary to follow the cable specifications below when connecting the switch to your network. Use appropriate cables that meet your speed and cabling requirements.

#### Cable Specifications

Speed	Connector	Port Speed Half/Full Duplex	Cable	Max. Distance
10Base-T	RJ-45	10/20 Mbps	2-pair UTP/STP Cat. 3, 4, 5	100 m
100Base-TX	RJ-45	100/200 Mbps	2-pair UTP/STP Cat. 5	100 m
100Base-FX	SC, ST	100/200 Mbps	MMF (50 or 62.5 $\mu$ m)	2 km
100Base-FX	SC, ST	100/200 Mbps	SMF (9 or 10 $\mu$ m)	15, 40, or 75 km

## **Cabling**

**Step 1:** First, ensure the power of the switch and end devices are turned off.

**<Note>** Always ensure that the power is off before any installation.

**Step 2:** Prepare cable with corresponding connectors for each type of port in use.

**Step 3:** Consult the previous section for cabling requirements based on connectors and speed.

**Step 4:** Connect one end of the cable to the switch and the other end to a desired device.

**Step 5:** Once the connections between two end devices are made successfully, turn on the power and the switch is operational.

## Specifications

<b>Hardened Ethernet Switch</b>	10/100Base-TX auto-negotiating ports with RJ-45 connectors, 100Base-FX fiber ports
<b>Applicable Standards</b>	IEEE 802.3 10Base-T IEEE 802.3u 100Base-TX/FX
<b>Switching Method</b>	Store-and-Forward
<b>Forwarding Rate</b>	
10Base-T:	10 / 20Mbps half / full-duplex
100Base-TX/FX:	100 / 200Mbps half / full-duplex
<b>Performance</b>	14,880pps for 10Mbps 148,810pps for 100Mbps
<b>Cable</b>	
10Base-T:	2-pair UTP/STP Cat. 3, 4, 5
100Base-TX:	2-pair UTP/STP Cat. 5 Up to 100m (328ft)
100Base-FX:	MMF (50 or 62.5µm), SMF (9 or 10µm)
<b>LED Indicators</b>	Per unit – Power status (Power 1, Power 2) FAULT Per port – 10/100TX or 100FX - LNK/ACT (Green), 100 (Yellow)
<b>Dimensions</b>	50mm (W) x 110mm (D) x 135mm (H) (1.97" (W) x 4.33" (D) x 5.31" (H))
<b>Net Weight</b>	0.8Kg (1.76lbs.)
<b>Power</b>	Terminal Block: 10-48VDC DC Jack: 12VDC, External AC/DC required
<b>Operating Voltage &amp; Max. Current Consumption</b>	0.76A @ 12VDC, 0.38A @ 24VDC, 0.19A @ 48VDC
<b>Power Consumption</b>	9.12W Max.
<b>Operating Temperature</b>	-40°C to 75°C (-40°F to 167°F) Tested for functional operation @ -40°C to 85°C (-40°F to 185°F)
<b>Storage Temperature</b>	-45°C to 85°C (-40°F to 185°F)
<b>Humidity</b>	5%-95% non-condensing
<b>Safety</b>	UL60950-1, EN60950-1, IEC60950-1
<b>EMI</b>	FCC Part 15, Class A EN61000-6-3: EN55022, EN61000-3-2, EN61000-3-3

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### EMS

EN61000-6-2:

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## *Hardened Ethernet Switch*

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EN61000-4-2 (ESD Standards)

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 Dip Standards)

**Environmental Test Compliance**

IEC60068-2-6 Fc (Vibration Resistance)

IEC60068-2-27 Ea (Shock)

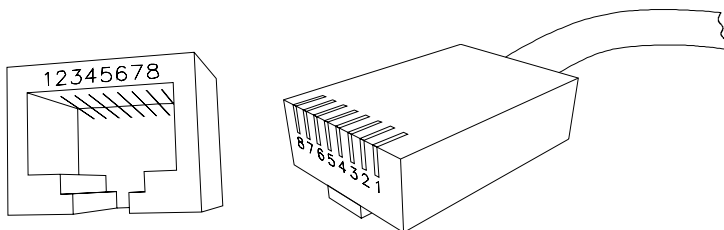
IEC60068-2-32 Ed (Free Fall)

**NEMA TS1/2 Environmental requirements for traffic control equipment**

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## Appendix A – Connector Pinouts

Pin arrangement of RJ-45 connectors:



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### RJ-45 Connector and Cable Pins

The following table lists the pinout of 10/100Base-TX ports.

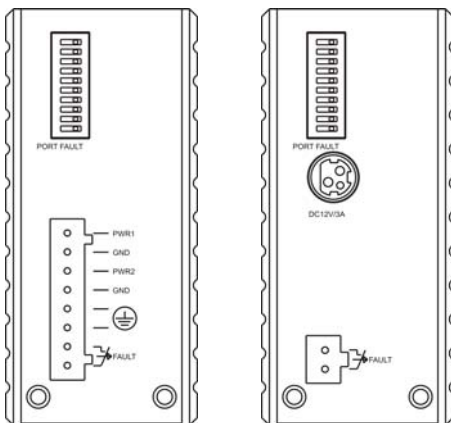
Pin	Regular Ports	Uplink port
1	Output Transmit Data +	Input Receive Data +
2	Output Transmit Data -	Input Receive Data -
3	Input Receive Data +	Output Transmit Data +
4	NC	NC
5	NC	NC
6	Input Receive Data -	Output Transmit Data -
7	NC	NC
8	NC	NC

## Quick Start Guide

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

## Physical Description

### The Terminal Block and Power inputs



Terminal Assignment													
PWR1	Power Input 1 (10 ~ 48VDC)												
GND	Power Ground												
PWR2	Power Input 2 (10 ~ 48VDC)												
GND	Power Ground												
	Earth Ground												
	1. The relay opens if PWR1 or PWR2 fails 2. The relay opens if the Port Link is broken (When Link Down Detection is Enabled)												
<table border="1"> <tr> <td>ON</td> <td>DIP</td> </tr> <tr> <td>1</td> <td>2</td> </tr> <tr> <td>3</td> <td>4</td> </tr> <tr> <td>5</td> <td>6</td> </tr> <tr> <td>7</td> <td>8</td> </tr> <tr> <td>9</td> <td>10</td> </tr> </table>	ON	DIP	1	2	3	4	5	6	7	8	9	10	ON: Enable Port Fault Alarm OFF: Disable Port Fault Alarm PIN 10: N/A
ON	DIP												
1	2												
3	4												
5	6												
7	8												
9	10												

Power Input Assignment													
PWR1	12 VDC Jack												
Relay Alarm Assignment													
	*Relay Warning signal disable for following: 1. The relay contact close if power fails.												
<table border="1"> <tr> <td>ON</td> <td>DIP</td> </tr> <tr> <td>1</td> <td>2</td> </tr> <tr> <td>3</td> <td>4</td> </tr> <tr> <td>5</td> <td>6</td> </tr> <tr> <td>7</td> <td>8</td> </tr> <tr> <td>9</td> <td>10</td> </tr> </table>	ON	DIP	1	2	3	4	5	6	7	8	9	10	ON: Enable Port Fault Alarm OFF: Disable Port Fault Alarm PIN 10: N/A
ON	DIP												
1	2												
3	4												
5	6												
7	8												
9	10												

- DC Terminal Block Power Inputs: There are two pairs of power inputs can be used to power up this device. Redundant power supplies function is supported. You

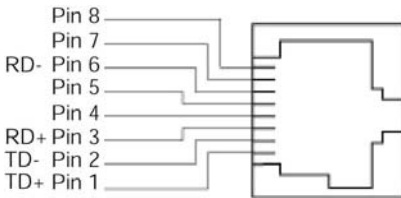
need to have two power inputs connected to run the device, but the FAULT LED indicator will light up to remind that the power redundant system functions abnormal in case either PWR1 or PWR2 is dead. This device, however, continues working normally even fault LED indicator lights up.

- DC Jack Power input: 12VDC.

## **The 10/100Base-TX and 100Base-FX Connectors**

### **1. The 10/100Base-TX Connections**

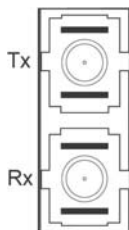
The following lists the pinouts of 10/100Base-TX ports.



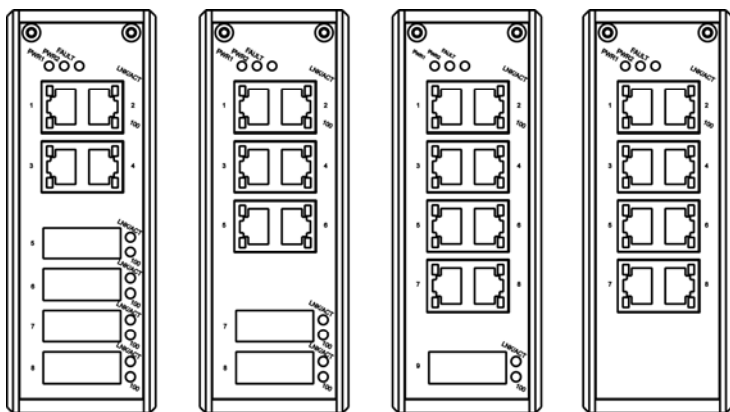
<b>Pin</b>	<b>Regular Ports</b>	<b>Uplink port</b>
1	Output Transmit Data +	Input Receive Data +
2	Output Transmit Data -	Input Receive Data -
3	Input Receive Data +	Output Transmit Data +
4	NC	NC
5	NC	NC
6	Input Receive Data -	Output Transmit Data -
7	NC	NC
8	NC	NC

### **2. The 100Base-FX 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



## Functional Description

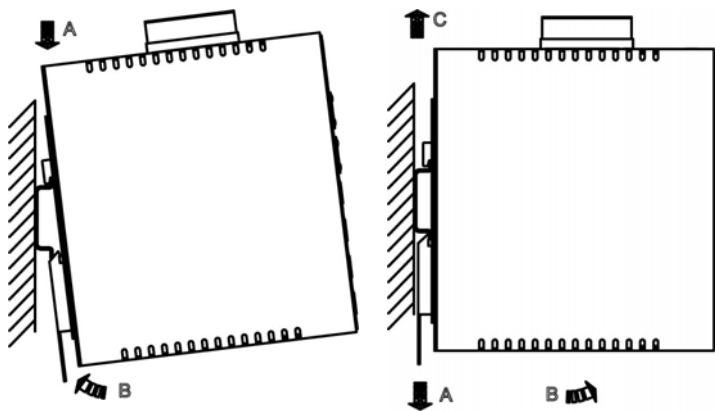
- Meets NEMA TS1/TS2 Environmental requirements such as temperature, shock, and vibration for traffic control equipment.
- Meets EN61000-6-2 & EN61000-6-3 EMC Generic Standard Immunity for industrial environment.
- Support 802.3/802.3u/802.3x. Auto-negotiation: 10/100Mbps, full/half-duplex; Auto MDI/MDIX.
- 100Base-FX: Multi mode SC or ST type; Single mode SC or ST type; WDM Single mode SC type.
- Support 2048 MAC addresses. Provides 768K bits memory buffer.
- Alarms for power and port link failure by relay output 1.5A @ 24VDC.
- 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°C, 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). UL1604 Industrial Control Equipment certified Maximum Surrounding Air Temperature @ 74°C (165°F).
- Supports DIN-Rail or Panel 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.

LED	State	Indication
<b>POWER</b>		
<b>PWR1</b> <b>PWR2</b> (Green)	Steady	Switch is properly connected to power and turned on.
	Off	Switch is not connected to power and is turned off.
<b>FAULT</b>		
<b>FAULT</b> (Red)	Steady	<ul style="list-style-type: none"> <li>Power redundant system failure occurred.</li> <li>Port failure occurred (when port fault alarm dip switch is enabled).</li> </ul>
	Off	<ul style="list-style-type: none"> <li>Power redundant system failure is not occurred.</li> <li>Port failure is not occurred (when port fault alarm dip switch is enabled).</li> <li>Port fault alarm dip switch is disabled.</li> </ul>
<b>10/100TX or 100FX</b>		
<b>LNK/ACT</b> (Green)	Steady	A valid network connection established. LNK stands for LINK.
	Flashing	Transmitting or receiving data. ACT stands for ACTIVITY.
<b>100</b> (Yellow)	Steady	Light solid yellow for a port transferring at 100Mbps.
	Off	The port is transferring at 10Mbps If this LED is dark.

## Assembly, Startup, and Dismantling

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



## **Preface**

A member of the growing family of rugged switches, this switch addresses a need for a smaller switch. This switch provides an affordable solution for rugged and outdoor environment, transportation road-side cabinet, industrial floor shop, multitenant dwellings or Fiber To The Home (FTTH) applications. Capable of operating at temperature extremes of  $-40^{\circ}\text{C}$  to  $+75^{\circ}\text{C}$ , this is the switch of choice for harsh environments constrained by space.

### **Plug-and-Play Solution:**

The switch is a plug-and-play Fast Ethernet Switch in compact size. It doesn't have any complicated software to set up.

This manual describes how to install and use the hardened Ethernet Switch. This switch integrates full wire speed switching technology. This switch brings the answer to complicated hardened networking environments.

To get the most out of this manual, you should have an understanding of Ethernet networking concepts.

In this manual, you will find:

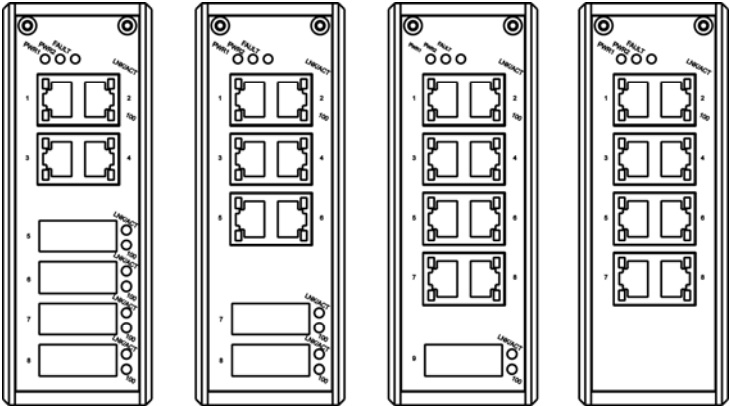
- Features on the switch
- Illustrative LED functions
- Installation instructions
- Specifications

# Table of Contents

<b>QUICK START GUIDE</b>	<b>1</b>
PHYSICAL DESCRIPTION	1
<i>The Terminal Block and Power inputs</i>	1
<i>The 10/100Base-TX and 100Base-FX Connectors</i>	2
<i>The Port Status LEDs</i>	3
FUNCTIONAL DESCRIPTION	4
ASSEMBLY, STARTUP, AND DISMANTLING	6
<b>PREFACE</b>	<b>7</b>
<b>TABLE OF CONTENTS</b>	<b>8</b>
<b>PRODUCT OVERVIEW</b>	<b>9</b>
HARDENED ETHERNET SWITCH	9
PACKAGE CONTENTS	9
PRODUCT HIGHLIGHTS	10
<i>Basic Features</i>	10
FRONT PANEL DISPLAY	11
PHYSICAL PORTS	12
<b>INSTALLATION</b>	<b>13</b>
SELECTING A SITE FOR THE SWITCH	13
DIN RAIL MOUNTING	14
CONNECTING TO POWER	15
<i>Redundant DC Terminal Block Power Inputs</i>	15
<i>12VDC DC Jack</i>	16
<i>Alarms for Power and Port Failure</i>	18
CONNECTING TO YOUR NETWORK	19
<i>Cable Type &amp; Length</i>	19
<i>Cabling</i>	20
<b>SPECIFICATIONS</b>	<b>21</b>
<b>APPENDIX A – CONNECTOR PINOUTS</b>	<b>23</b>

## Product Overview

### Hardened Ethernet Switch



### Package Contents

When you unpack the product package, you shall find the items listed below. Please inspect the contents, and report any apparent damage or missing items immediately to your authorized reseller.

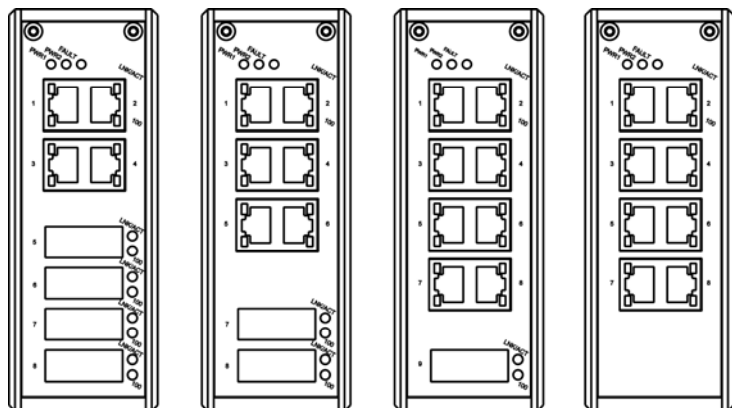
- ✓ ***This Switch***
- ✓ ***User's Manual***
- ✓ ***External power adapter & Power Cord (Optional)***

## **Product Highlights**

### **Basic 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 I, Division 2 Classified for use in hazardous locations (applicable to versions with terminal block power option).
- Support 802.3/802.3u/802.3X.
- Auto-negotiation: 10/100Mbps, Full/half-duplex; Auto MDI/MDIX.
- Support 2048 MAC addresses.
- Provides 768K bits memory buffer.
- Alarms for power and port link failure by relay output 1.5A @ 24VDC.
- 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°C, 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). UL1604 Industrial Control Equipment certified Maximum Surrounding Air Temperature @ 74°C (165°F).
- Supports DIN-Rail or Panel Mounting installation.

## Front Panel Display



## Status LEDs

## Hardened Ethernet Switch

LED	State	Indication
<b>POWER</b>		
<b>PWR1</b> <b>PWR2</b> (Green)	Steady	Switch is properly connected to power and turned on.
	Off	Switch is not connected to power and is turned off.
<b>FAULT</b>		
<b>FAULT</b> (Red)	Steady	<ul style="list-style-type: none"><li>• Power redundant system failure occurred.</li><li>• Port failure occurred (when port fault alarm dip switch is enabled).</li></ul>
	Off	<ul style="list-style-type: none"><li>• Power redundant system failure is not occurred.</li><li>• Port failure is not occurred (when port fault alarm dip switch is enabled).</li><li>• Port fault alarm dip switch is disabled.</li></ul>
<b>10/100TX or 100FX</b>		
<b>LNK/ACT</b> (Green)	Steady	A valid network connection established. LNK stands for LINK.
	Flashing	Transmitting or receiving data. ACT stands for ACTIVITY.
<b>100</b> (Yellow)	Steady	Light solid yellow for a port transferring at 100Mbps.
	Off	The port is transferring at 10Mbps If this LED is dark.

## Physical Ports

This switch provides:

- Eight 10/100Base-TX ports
- Eight 10/100Base-TX ports + one 100Base-FX port
- Six 10/100Base-TX ports + two 100Base-FX ports
- Four 10/100Base-TX ports + four 100Base-FX ports

### CONNECTIVITY

- RJ-45 connectors
- SC or ST connector on 100Base-FX fiber port

## Installation

This chapter gives step-by-step instructions about how to install the switch:

### Selecting a Site for the Switch

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

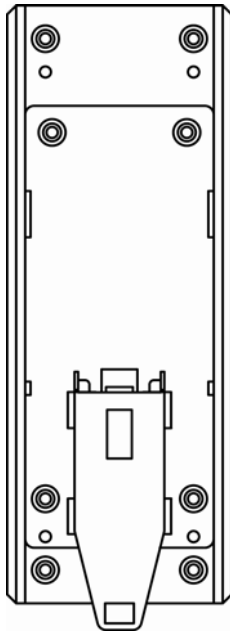
- The ambient temperature should be between -40 to 75 degrees Celsius.
- The relative humidity should be less than 95 percent, non-condensing.
- Surrounding electrical devices should not exceed the electromagnetic field (RFC) standards.
- Make sure that the switch receives adequate ventilation. Do not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

## **DIN Rail Mounting**

Fix the DIN rail attachment plate to the back panel of the switch.

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

**Removal:** Pull out the lower edge and then remove the switch from the DIN rail.



## Connecting to Power

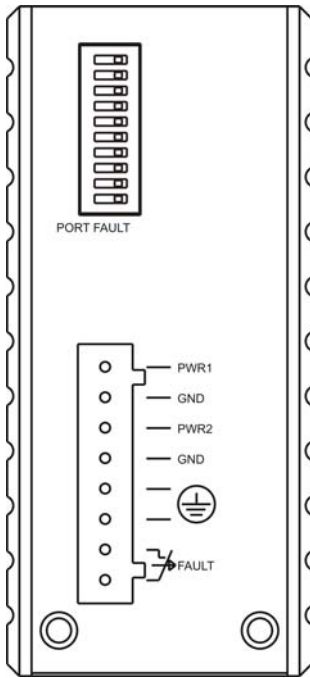
Redundant DC Terminal Block Power Inputs or 12VDC DC Jack:

### 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 device, 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. This device, 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 switch, and then plug it into a standard DC outlet.

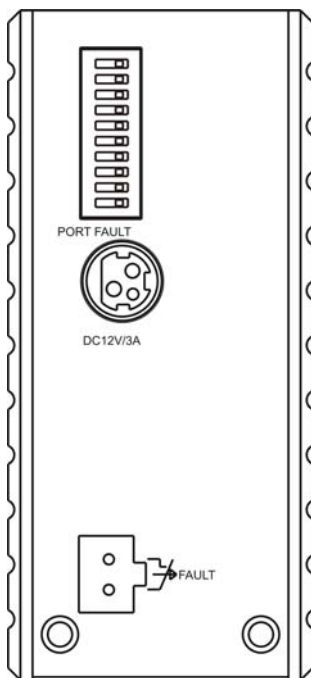
**Step 2:** Disconnect the power cord if you want to shut down the switch.



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

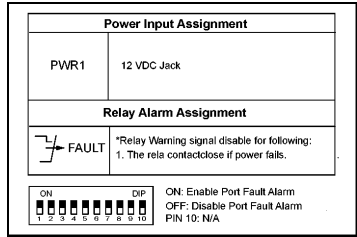
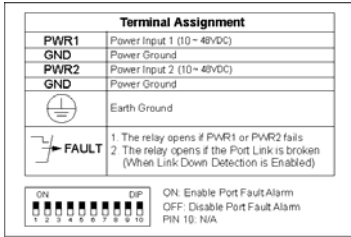
## **12VDC DC Jack**

- Step 1:** Connect the supplied AC to DC power adapter to the receptacle on the topside of the switch.
- 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.



## Alarms for Power and Port Failure

**Step 1:** There are two pins on the terminal block are used for power failure detection. It provides the normally 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 open position when there is no power to the switch. Please do not connect any power source to this terminal to prevent the shortage to your power supply.

## Connecting to Your Network

### Cable Type & Length

It is necessary to follow the cable specifications below when connecting the switch to your network. Use appropriate cables that meet your speed and cabling requirements.

#### Cable Specifications

<b>Speed</b>	<b>Connector</b>	<b>Port Speed Half/Full Duplex</b>	<b>Cable</b>	<b>Max. Distance</b>
10Base-T	RJ-45	10/20 Mbps	2-pair UTP/STP Cat. 3, 4, 5	100 m
100Base-TX	RJ-45	100/200 Mbps	2-pair UTP/STP Cat. 5	100 m
100Base-FX	SC, ST	100/200 Mbps	MMF (50 or 62.5 $\mu$ m)	2 km
100Base-FX	SC, ST	100/200 Mbps	SMF (9 or 10 $\mu$ m)	15, 40, or 75 km

## **Cabling**

**Step 1:** First, ensure the power of the switch and end devices are turned off.

**<Note>** Always ensure that the power is off before any installation.

**Step 2:** Prepare cable with corresponding connectors for each type of port in use.

**Step 3:** Consult the previous section for cabling requirements based on connectors and speed.

**Step 4:** Connect one end of the cable to the switch and the other end to a desired device.

**Step 5:** Once the connections between two end devices are made successfully, turn on the power and the switch is operational.

## Specifications

<b>Hardened Ethernet Switch</b>	10/100Base-TX auto-negotiating ports with RJ-45 connectors, 100Base-FX fiber ports
<b>Applicable Standards</b>	IEEE 802.3 10Base-T IEEE 802.3u 100Base-TX/FX
<b>Switching Method</b>	Store-and-Forward
<b>Forwarding Rate</b>	
10Base-T:	10 / 20Mbps half / full-duplex
100Base-TX/FX:	100 / 200Mbps half / full-duplex
<b>Performance</b>	14,880pps for 10Mbps 148,810pps for 100Mbps
<b>Cable</b>	
10Base-T:	2-pair UTP/STP Cat. 3, 4, 5
100Base-TX:	2-pair UTP/STP Cat. 5 Up to 100m (328ft)
100Base-FX:	MMF (50 or 62.5µm), SMF (9 or 10µm)
<b>LED Indicators</b>	Per unit – Power status (Power 1, Power 2) FAULT Per port –10/100TX or 100FX - LNK/ACT (Green), 100 (Yellow)
<b>Dimensions</b>	50mm (W) x 110mm (D) x 135mm (H) (1.97" (W) x 4.33" (D) x 5.31" (H))
<b>Net Weight</b>	0.8Kg (1.76lbs.)
<b>Power</b>	Terminal Block: 10-48VDC DC Jack: 12VDC, External AC/DC required
<b>Operating Voltage &amp; Max. Current Consumption</b>	0.76A @ 12VDC, 0.38A @ 24VDC, 0.19A @ 48VDC
<b>Power Consumption</b>	9.12W Max.
<b>Operating Temperature</b>	-40°C to 75°C (-40°F to 167°F) Tested for functional operation @ -40°C to 85°C (-40°F to 185°F) UL1604 Industrial Control Equipment certified Maximum Surrounding Air Temperature @ 74°C (165°F)
<b>Storage Temperature</b>	-45°C to 85°C (-40°F to 185°F)
<b>Humidity</b>	5%-95% non-condensing
<b>Safety</b>	Hazardous location: Class I, Division 2 group A, B, C & D UL60950-1, EN60950-1, IEC60950-1
<b>EMI</b>	FCC Part 15, Class A EN61000-6-3: EN55022, EN61000-3-2, EN61000-3-3

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**EMS**

EN61000-6-2:

EN61000-4-2 (ESD Standards)

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 Dip Standards)

**Environmental Test Compliance**

IEC60068-2-6 Fc (Vibration Resistance)

IEC60068-2-27 Ea (Shock)

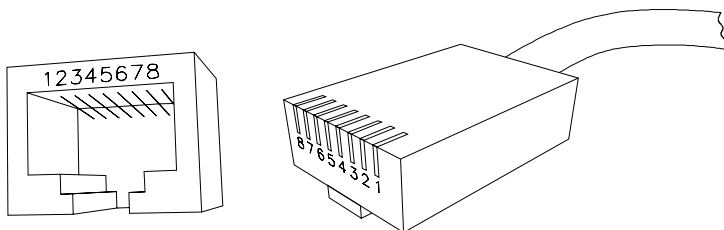
IEC60068-2-32 Ed (Free Fall)

**NEMA TS1/2 Environmental requirements for traffic control equipment**

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## Appendix A – Connector Pinouts

Pin arrangement of RJ-45 connectors:



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### RJ-45 Connector and Cable Pins

The following table lists the pinout of 10/100Base-TX ports.

Pin	Regular Ports	Uplink port
1	Output Transmit Data +	Input Receive Data +
2	Output Transmit Data -	Input Receive Data -
3	Input Receive Data +	Output Transmit Data +
4	NC	NC
5	NC	NC
6	Input Receive Data -	Output Transmit Data -
7	NC	NC
8	NC	NC