CTS

CONNECTION TECHNOLOGY SYSTEMS

IES-3006 SERIES
Industrial Ethernet Switch

IES-3006SFP-DR
**4 Ports 10/100/1000Base-T plus 2 Ports 100/1000Base-X
Industrial Ethernet Switch**

IES-3006SFP-F1-DR
**5 Ports 10/100/1000Base-T plus 1 Port 100/1000Base-X
Industrial Ethernet Switch**

IES-3006TP
6 Ports 10/100/1000Base-T Industrial Ethernet Switch

User's Guide

Version 0.91

Revision History

Version	Date	Description
0.90	20141119	First release
0.91	20151104	Revise series wiring connection illustration Section 2.5

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FCC Warning

This equipment has been tested and found to comply with the limits for a Class-A digital device, pursuant to Part 15 of the FCC Rules. These limitations are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if the equipment is not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

■ Reorient or relocate the receiving antenna.

■ Increase the separation between the equipment and receiver.

■ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

■ Consult your local distributors or an experienced radio/TV technician for help.

■ Shielded interface cables must be used in order to comply with emission limits.

Changes or modifications to the equipment, which are not approved by the party responsible for compliance, could affect the user's authority to operate the equipment.

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Table of Contents

1. OVERVIEW

Thank you for choosing the IES-3006 series Industrial Ethernet Switches. IES-3006 series Industrial Ethernet Switches are designed to meet the massive needs for Gigabit and Fast Ethernet network deployments and aim at industrial applications that demand wide range of operating temperature. They are fully compliant with IEEE802.3, 802.3u, 802.3x, 802.3ab, 802.3z and 802.3x standards. Besides, redundant power supplies are both offered on IES-3006 series Industrial Ethernet Switches for users to create a reliable and stable network in the event of power failure. By employing Store-and-Forward switching mechanism, the switch provides low latency and faster data transmission.

1.1 Specification

Interface
1. **IES-3006SFP-DR**

    ● LAN Ports: 10/100/1000BASE-T x 4

    ● WAN Ports: 100/1000BASE-X x 2

2. **IES-3006SFP-F1-DR**

    ● LAN Ports: 10/100/1000BASE-T x 4

    ● WAN Ports: 100/1000BASE-X x 1 + 10/100/1000BASE-T x 1

3. **IES-3006TP**

    ● LAN Ports: 10/100/1000BASE-T x 4

    ● WAN Ports: 10/100/1000BASE-T x 2

Standards

    ● Comply with IEEE 802.3, 802.3u, 802.3ab, 802.3z and 802.3x standards

Features

    ● Switching:

      ■ Support Auto-Negotiation in TP ports

      ■ Support MDI/MDIX Auto-Crossover in TP ports

      ■ Full/Half Duplex Mode Operation

      ■ MAC Address Table: 2K

      ■ Store-and-Forward Switching Mechanism

Cable Specifications

The following table contains various cable specifications for the Industrial Ethernet Switch. Please make sure that you use the proper cable when connecting the Industrial Ethernet Switches.

Cable Type	Description
10BASE-T	UTP Category 3, 4, 5 (100 meters max.) EIA/TIA- 568 150-ohm STP (100 meters max.)
100BASE-TX	UTP Cat. 5 (100 meters max.) EIA/TIA-568 150-ohm STP (100 meters max.)
1000BASE-T	UTP Cat. 5e (100 meters max.) UTP Cat. 5 (100 meters max.) EIA/TIA-568B 150-ohm STP (100 meters max.)
100BASE-FX	Multi-mode fiber module(2km) / Single-mode fiber module
1000BASE-SX	Multi-mode fiber module (550m)
1000BASE-LX	Single-mode fiber module (10km)
1000BASE-LH	Single-mode fiber module (30km/50km)
1000BASE-ZX	Single-mode fiber module (80km)
Mini-GBIC	SFP Transceiver for 1000BASE-SX Multi-mode fiber module (550m) SFP Transceiver for 1000BASE-LX Single-mode fiber module (10km) SFP Transceiver for 1000BASE-LH Single-mode fiber module (30km/50km) SFP Transceiver for 1000BASE-ZX Single-mode fiber module (80km)

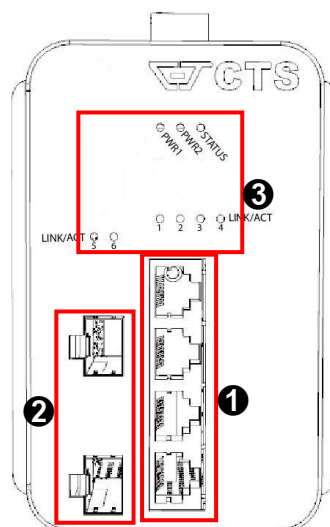# 1.2 Panel Layout

Front Panel

Figure 1. Front Panel for 4 Ports 10/100/1000Base-T + 2 ports 100/1000Base-X
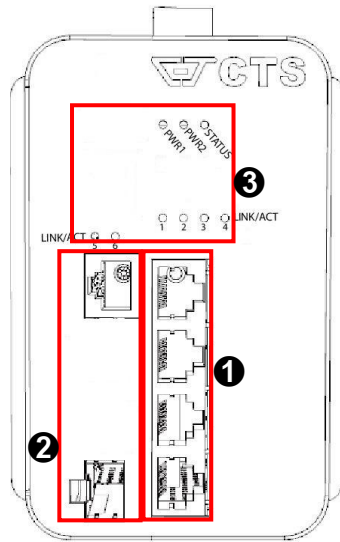
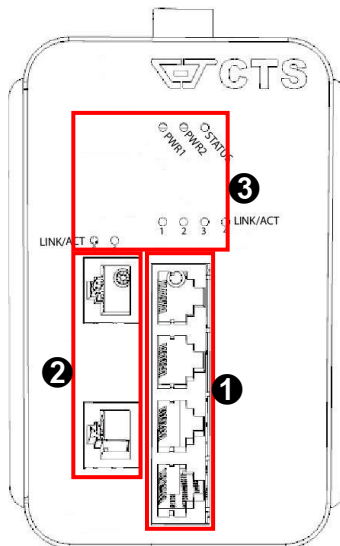**Figure 2.** Front Panel for 5 Ports 10/100/1000Base-T + 1 port 100/1000Base-X

Figure 3. Front Panel for 6 Ports 10/100/1000Base-T

❶**10/100/1000Mbps RJ-45 LAN ports**

❷**10/100/1000Mbps RJ-45 port(s) or 100/1000Mbps SFP port(s)**

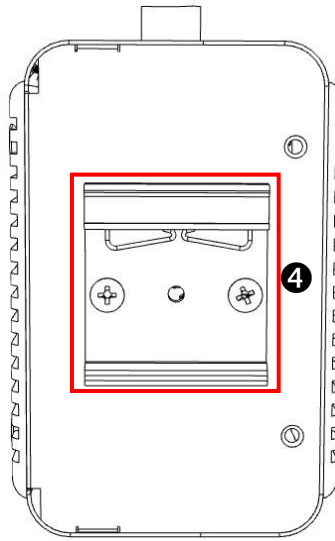❸**LEDs (for more information, please see chapter 3.1)**

Rear Panel

Figure 4. Rear Panel

❹**DIN-Rail metal spring (for more information, please see chapter 2.3)**
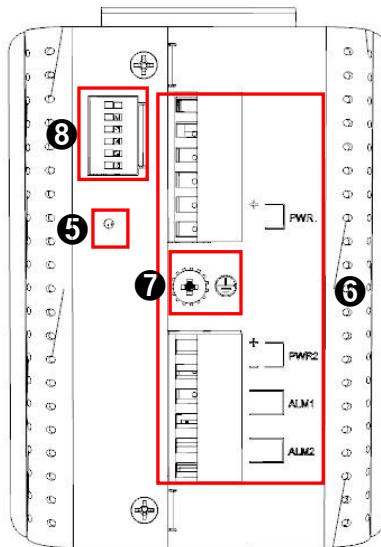
Top Panel

Figure 5. Top Panel

❺**Reset Button:**

- Insert a pin or paper clip to press the Reset Button for 5 seconds to restart the system

- Insert a pin or paper clip to press the Reset Button for 10 seconds to reset the device back to factory defaults.

❻**Terminal blocks (for more information, please see chapter 2.4)**

❼Ground wire screw (for more information, please see chapter 2.3)

❽DIP Switch (for more information, please see chapter 3.2)

2. INSTALLATION

To properly install the Industrial Ethernet Switch, please follow the procedures listed below. Procedures covered in this chapter are described below in separate sections.

- Installation Requirements
- Unpacking the Industrial Ethernet Switch
- Installing the Industrial Ethernet Switch
- Powering on the Industrial Ethernet Switch
- Connecting the Industrial Ethernet Switch to the Network

2.1 Installation Requirements

ATTENTION

Be sure to power off before installing or wiring your Industrial Ethernet Switch.

Be sure to calculate the maximum possible current in each power wire and common wire. If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

Be sure to read and follow below important guidelines :

- Do not run signal or communications wiring and power wiring through the same wire conduit. Wires with different signal characteristics should be routed separately to avoid interference.
- It is recommended that wiring which shares similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separate and label the wiring to all devices in the system if necessary.

2.2 Checking the Package Contents

Unpack the package carefully and check the package contents. The package should contain the following items:

- Items included in standard package:
  - 1 Industrial Ethernet Switch
  - 1 Documentation CD

If any of the above items is found missing or damaged, please contact your local sales representative for support or replacement.

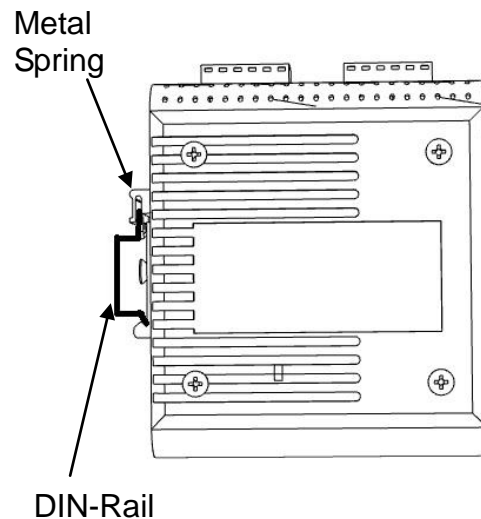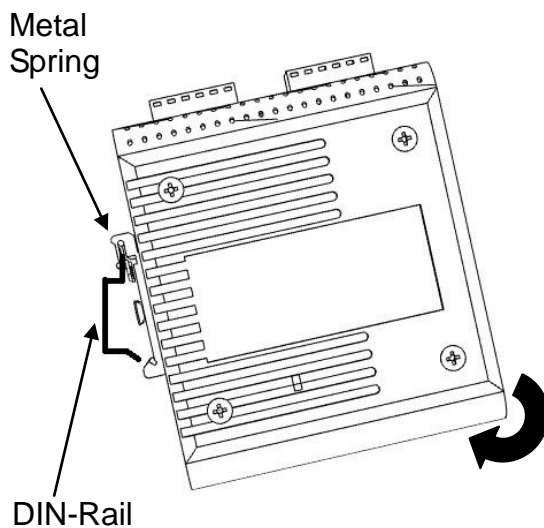# 2.3 Installing the Industrial Ethernet Switch

⚠️ **ATTENTION**
This product is intended to be mounted to a well-grounded mounting surface, such as a metal panel.

DIN-Rail Mounting

STEP 1 : Insert the top of the DIN-Rail into the slot just below the metal spring

STEP 2 : The DIN-Rail attachment unit will be snapped into place as shown

Metal
Spring

Metal
Spring

DIN-Rail

DIN-Rail

Grounding the Industrial Ethernet Switch

Grounding helps to limit the effects of noise due to electromagnetic interference (EMI). Be sure to install the ground connection from the ground screw to the grounding surface before connecting devices.
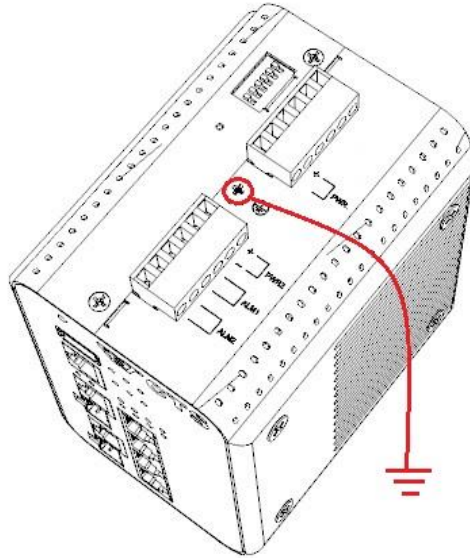

Figure 6. Grounding wire

# 2.4 Wiring the Redundant Power Inputs

The Industrial Ethernet Switch can be used with DC power 48-54 VDC with 2 terminal blocks. The terminal blocks are located on the upper panel of the Industrial Ethernet Switch. Before powering the Industrial Ethernet Switch, please make sure that network cables and power cables are securely connected.

> ⚠️ **ATTENTION**
> **Before connecting the Industrial Ethernet Switch to the DC power inputs, make sure the DC power source voltage is stable.**

PWR1 and PWR2 power supply are two pairs of contacts on the terminal block connectors for power redundancy purpose. The redundant power supply will take over seamlessly when one power source is down to protect your device or network from the loss of power. When you use only one power supply (no redundant power is available), the LED Power/Port Status will flash in orange to alert the user.
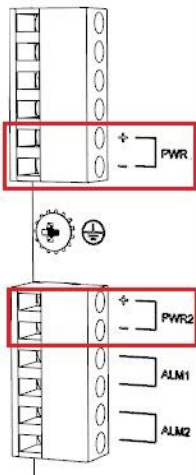
STEP 1 :
Insert the negative/positive DC wires into the V-/V+ terminals.

STEP 2 :
Use a small flat-blade screwdriver to tighten the wire-clamp screws on the front of the terminal block connector.

STEP 3 :
Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on the IES's top panel.

2.5 Wiring the Alarm Contact

The Industrial Ethernet Switch has two sets of Alarm Contacts which are used to detect both power faults and port faults. We will explain the meaning of the two sets of contacts used to connect the Alarm Contact below.
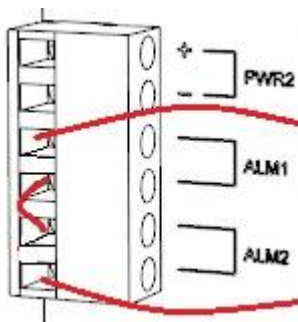
If you have two Alarm Systems:
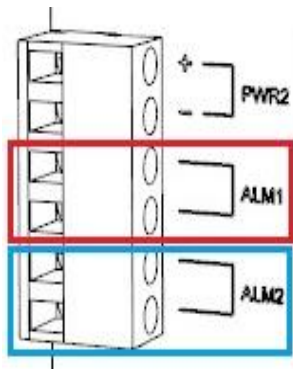
ALM1:
The two wires attached to the Fault contacts form an open circuit when the IES has lost power from one of the DC power inputs.

ALM 2 :
The two wires attached to the Fault contacts form an open circuit when one of the ports for which the corresponding Port Alarm DIP Switch is set to ON be not properly connected.

If you have only one Alarm System:

The two wires attached to the Fault contacts form an open circuit when :

The IES has lost power from one of the DC power inputs.

AND

One of the ports for which the corresponding Port Alarm DIP Switch is set to ON be not properly connected.
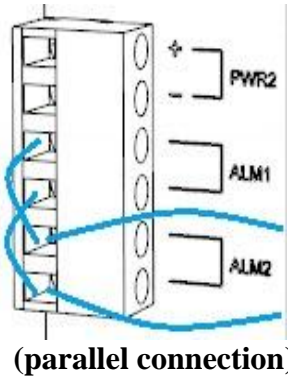
(series connection)

13

The two wires attached to the Fault contacts form an open circuit when :

The IES has lost power from one of the DC power inputs.

OR

One of the ports for which the corresponding Port Alarm DIP Switch is set to ON be not properly connected.

(parallel connection)

2.6 Connecting the switch to Network

Connect to Network

This Industrial Ethernet Switch has 2 uplink ports (RJ-45 or SFP, please refer to ordering information) and 4 downlink 10/100/1000Mbps RJ-45 ports for you to implement it in your industrial environment. All RJ-45 ports can be inserted by 10/100/1000Base-T cables, connecting to the end devices. The fiber port(s) can accept any kind of connector with proper SFP transceiver (mini-GBIC).
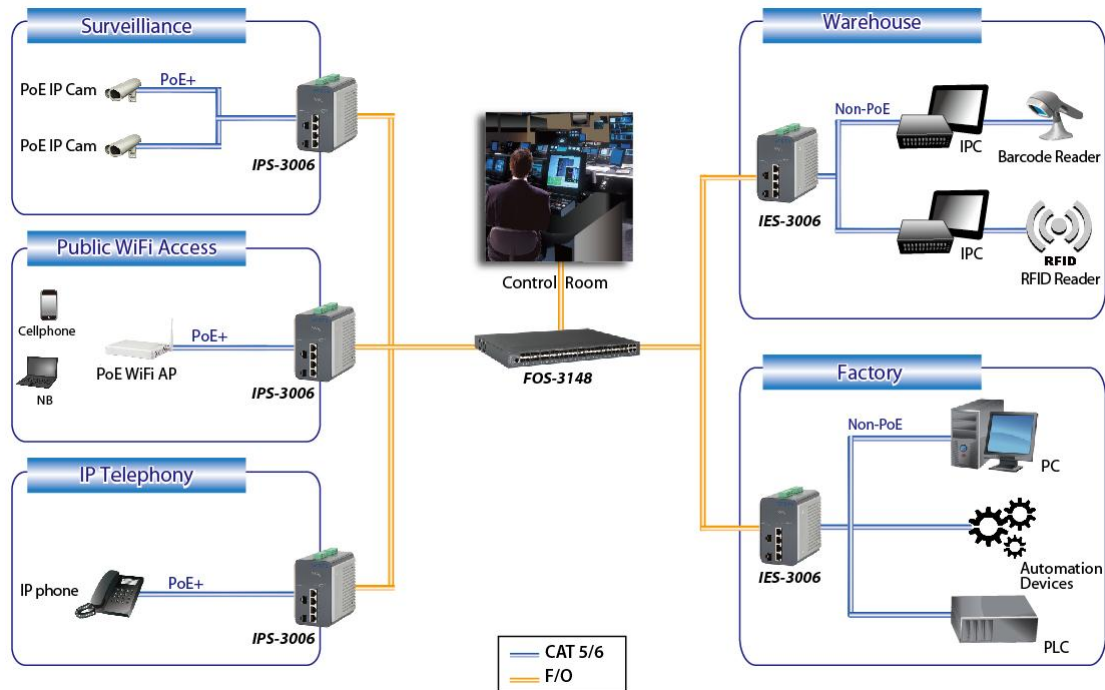

Figure 7.   Industrial Ethernet Switch general application

3. OPERATION

The Industrial Ethernet Switch is Plug & Play compliant. Real-time operational status can be monitored through a set of LED indicators located on the front panel.

3.1 LED Definitions

LED	Definition	Color	Operation
PWR1	Power	Off	Device is powered down.
		Green	Device is powered up.
PWR2	Power	Off	Device is powered down.
		Green	Device is powered up.
STATUS	Ethernet Port Link Down Alarm Status	Orange	Alarm is currently present
		Off	No alarm is currently present
LINK/ACT 1~6	Port Status	Off	Port link is down
		Green	Link is up and works at 10 or 100Mbps.
		Green Blinking	Receiving and transmitting data.
		Orange	Link is up and works at 1000Mbps.
		Orange Blinking	Receiving and transmitting data.

3.2 DIP Switch Definitions

Pin NO.	Function	OFF	ON
1	Port 1 Ethernet Port Link Down Alarm	Disable	Enable
2	Port 2 Ethernet Port Link Down Alarm	Disable	Enable
3	Port 3 Ethernet Port Link Down Alarm	Disable	Enable
4	Port 4 Ethernet Port Link Down Alarm	Disable	Enable
5	Port 5 Ethernet Port Link Down Alarm	Disable	Enable
6	Port 6 Ethernet Port Link Down Alarm	Disable	Enable

4. MAINTENANCE

It is easy to use and maintain this Industrial Ethernet Switch. The procedures are suggested when you want to identify faults or perform hardware replacement.

4.1 Fault Identification

Identifying faults can greatly reduce the time required to find the problem and solution. Users may perform local or remote checks to find the problems.

Local Check

Users can perform local checks by observing LED indicators status.

- When the whole system fails to function,
  - Check Power LED status
  - Check Power connection
  - Reset power

- When certain network link fails to function,
  - Locate the port of the switch
  - Check Port Link Status LED
  - Check cable connection between the port and the connected device
  - Reset power

4.2 Hardware Replacement Procedures

ATTENTION

The Industrial Ethernet Switch contains no user-serviceable parts. DO NOT, UNDER ANY CIRCUMSTANCES, open and attempt to repair it.

Failure to observe this warning could result in personal injury or death from electrical shock.

Failure to observe the above warning will immediately void any Warranty.