

InSwitch Industrial Ethernet Switch

ISE Series User Manual

Version 3.4



Beijing InHand Networking Technology Co., Ltd.

User's Manual for InSwitch ISE Series Products

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InHand reserves hereby the right to amend this manual without further notice to users.

Please log in our website or contact our business agent directly for revision status of the manual.

Safety Instructions

The product has excellent and reliable performance within its designed use, however damage to the ISE switch should be avoided.

Please read the manual carefully and keep it for later reference.

Please pay attention to the follows when using the equipment:

- Do not place the equipment close to water or wet places.
- Do not place anything on power cable, which shall be kept out of reach.
- Do not cover, tie or wrap-up the power cable in order to prevent fire.
- Inspect the power cable and other connections regularly to ensure they are not damaged and well connected.
- Please keep the socket and plug of the optical fiber clean ,and do not looking directly the into cross section of optical fiber during operation of the equipment.
- Keep the equipment clean and wipe with soft cotton cloth when necessary.
- Unless other wise instructed in the manual, please do not try to repair the equipment by yourself.

Please disconnect power source immediately under the following circumstances and then contact InHand Networks.

- Entering of water into the equipment.
- Physical damage to the equipment or cracking of the casing.
- Abnormal equipment behavior or a complete change in performance.
- Gas, smoke or noise generated by the equipment.

Brief Introduction to the ISE Manual

The manual is applicable for ISE2005D, ISE2008D, ISE2016D, ISE3005D, ISE3008D, ISE3009D, ISE3010D, ISE3018D of ISE series products.

The manual contains the following chapters:

- Package contents . List of goods that should be contained in packing box of the equipment.
- Product introduction. Brief introduction of the product and outstanding features thereof.
- Front panel and dimension. Front panel diagram and dimension of each and every product of ISF series are provided.
- Installation. Installation method is given in details to guide users to install the equipment correctly.
- Cable connection. Description of correct methods for connecting power cables and communication cables.
- Introduction of functions. Detailed description of features and uses.
- Specifications and parameters. Description of codes and standards observed by the product, and product specifications and parameters.
- Networking models. Briefly explain the common networking models for the ISE series switch.

Readers are instructed to read the contents carefully when the following icons are present in the manual. Example of the icons are listed in the following table.



Note: Supplementary to main text.



Warning: Function may not be available or damage of equipment may occur if operational instructions are not followed.



Danger: Bodily injury may occur if operation instruction is not followed.

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I. Package Contents

Common accessories are provided for each set of ISE series products (as shown in list of standard accessories). Please check our package carefully after taking delivery and contact InHand sales personnel in a timely manner if any piece is missing or damaged.

In addition, InHand can also provide users with optional accessories as per different field conditions and customer requirements. Please refer to list of optional accessories for details.

Standard Accessories

Accessory	Qty.	Description
Industrial Ethernet switch	1 Device	InSwitch ISE series switch
Product documents	1 Package	Optical disk
DIN-rail	1 Piece	Fixed type switch
Product warranty statement	1 Sheet	Warranty period is 5 years.

Optional accessories

Accessory	Qty.	Description
220VAC-24VDC adapter	1 Set	InSwitch ISF series switch
1m optical jumper wire	1 Piece	For user testing
Installation accessories	1 Set	1 piece wall-mounting accessory and 4 screws

II. Product Introduction

2.1 General

The ISE1005D series switches are designed for applications in electric power, transportation, industrial control and other severe industrial environments. They integrate a wide temperature range, high voltage tolerance, enterprise-class forwarding performance, high-bandwidth, strong cabinet, protected industrial circuits and other industrial features. They are capable of plug and play, and can satisfy reliability requirements in the harsh industrial environment.

2.2 Outstanding Product Features

High-performance Ethernet switch technology:

- IEEE802.3/802.3u/802.3x
- Flow control (full duplex and half duplex flow control)
- Automated speed and duplex negotiation
- Broadcast storm protection
- Store-and-forward switching mode
- 10/100M full duplex/half duplex MDI/MDI-X self adaptive

Reliable and steady operation in severe electrical environments:

- Passed high-standard electromagnetic compatibility tests
- Zero packet loss under intensive electromagnetic interference

Suitable for application under various severe conditions and environment:

- Working temperature: -40~85 °C
- Relative humidity: 5%~95% (free of condensation)
- IP40 protection class, fully enclosed and seamless type metal cabinet, and fanless cooling
- Pollution degree 2

Satisfying industrial installation requirement:

- Standard industrial DIN rail or wall-mount type installation
- Industrial power source terminal or I/O terminal
- PCB protection coating available

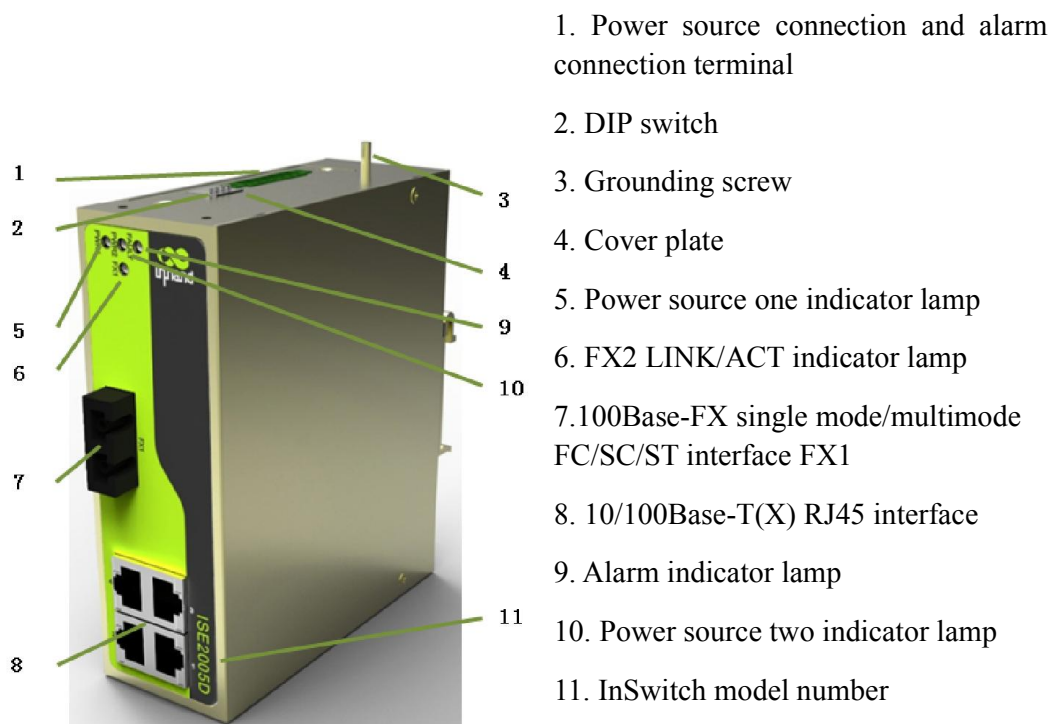
Network reliability enhanced with redundancy and alarms:

- Dual power-supply redundant inputs
- A warning can be produced via relay after power supply failure and interruption of port connections

III. Front Panel Layout and Dimensions

3.1 ISE2005D

Front Panel Layout





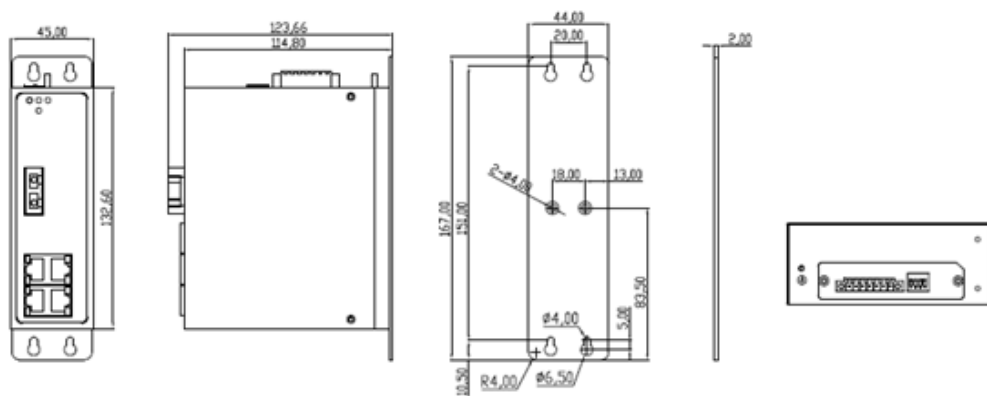
12. DIN-rail bracket upper lip

13. Clamping spring

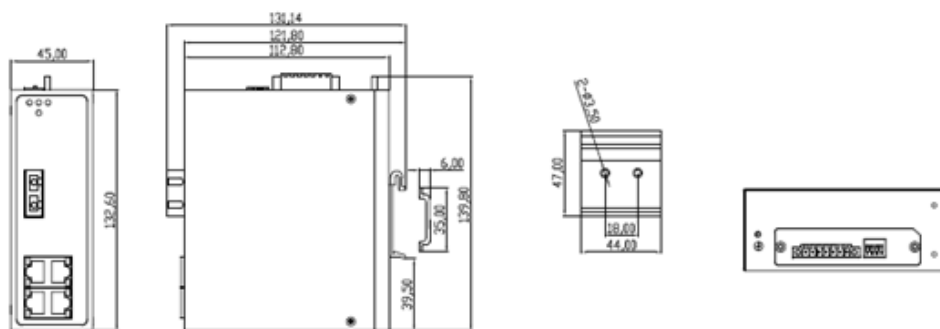
14. DIN-rail bracket attachment screw

Structural Dimensions

(Units: mm)



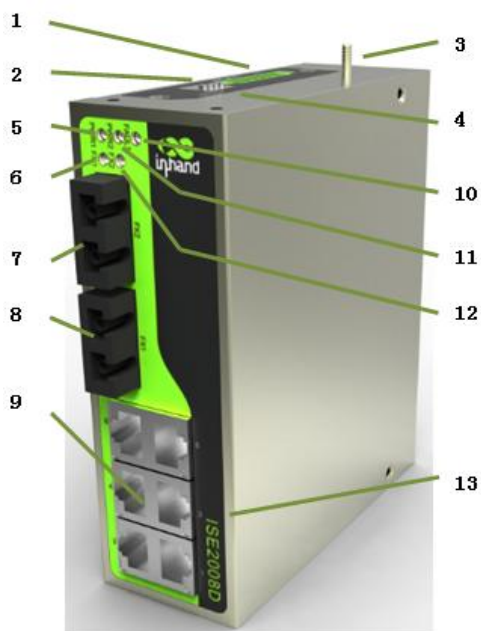
Wall mounting diagram



DIN-rail mounting diagram

3.2 ISE2008D

Front Panel Layout



1. Power source connection and alarm connection terminal

2. Dip switch

3. Protective grounding screw

4. Cover plate

5. Power source one indication lamp

6. Optical port FX1 LINK/ACT indication lamp

7. 100Base-FX single mode/multimode FC/SC/ST interface FX1

8. 100Base-FX single mode/multimode FC/SC/ST interface FX2

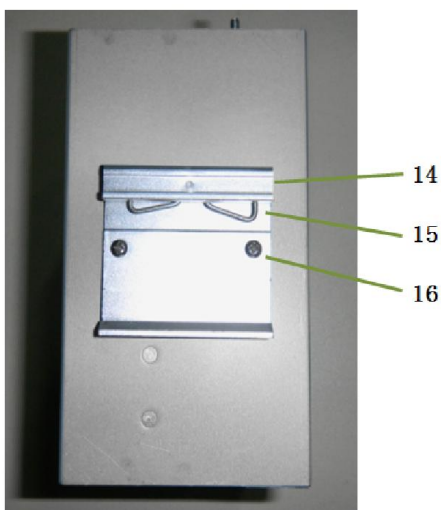
9. 10/100Base-T(X) RJ45

10. Alarm indication lamp

11. Power source two indication lamp

12. Optical port FX2 LINK/ACT indication lamp

13. InSwitch model number



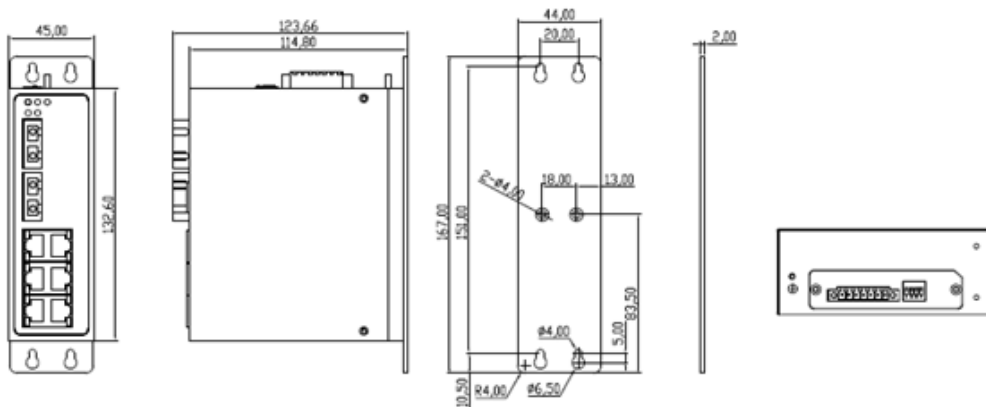
14. DIN-rail bracket upper lip

15. Clamp spring

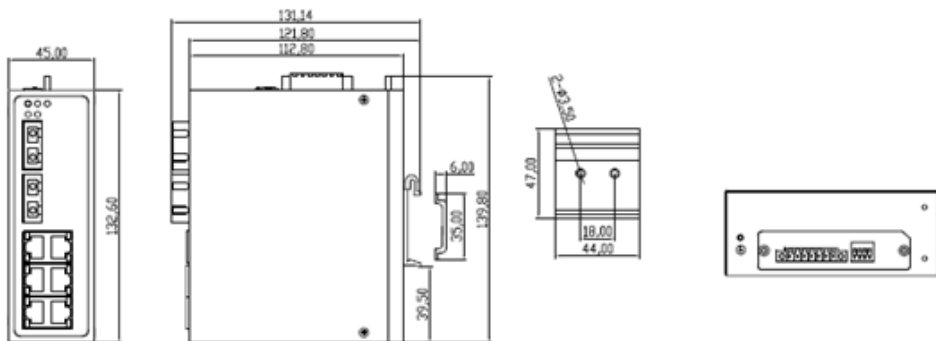
16. DIN-rail bracket attachment screw

Structural Dimensions

(Units: mm)



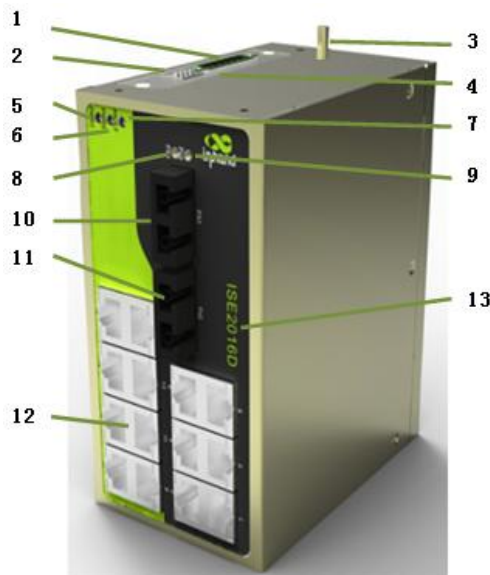
Wall mounting diagram



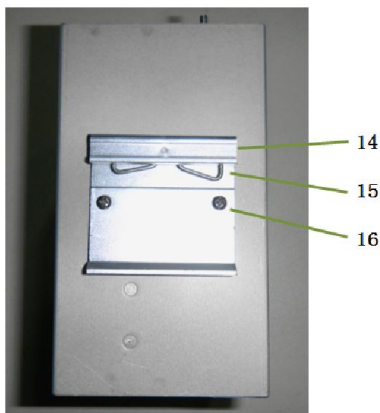
DIN-rail mounting diagram

3.3 ISE2016D

Front Panel Layout



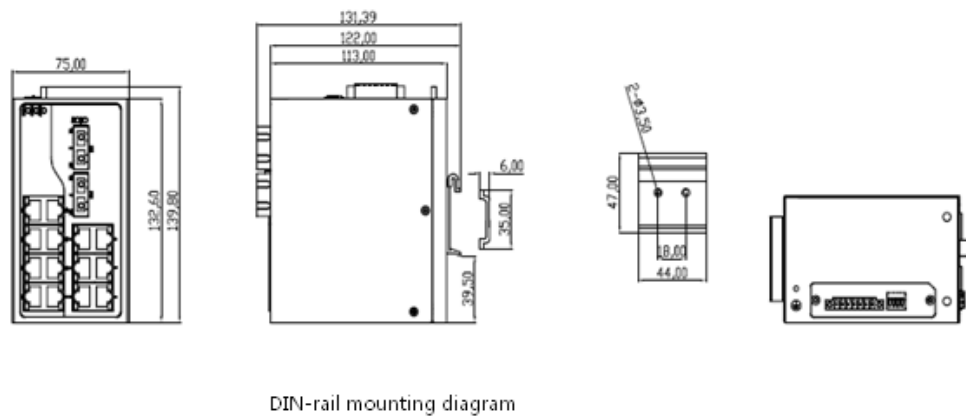
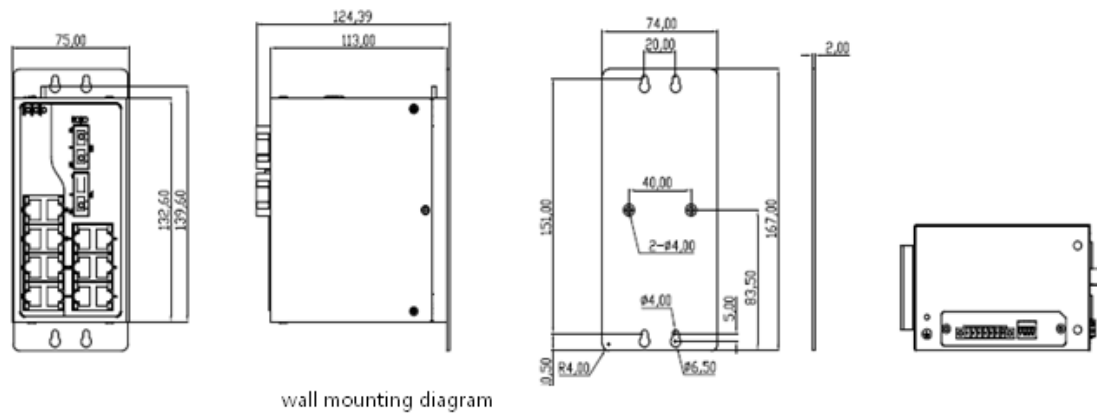
1. Power source connection and alarm connection terminal
2. Dip switch
3. Grounding screw
4. Cover plate
5. Power source one indication lamp
6. Power source two indication lamp
7. Alarm indication lamp
8. Optical port FX1 LINK/ACT indication lamp
9. Optical port FX2 LINK/ACT indication lamp
10. 100Base-FX single mode/multimode FC/SC/ST interface FX1
11. 100Base-FX single mode/multimode FC/SC/ST interface FX2
12. 10/100Base-T(X) RJ45 port
13. InSwitch model number



14. DIN-rail bracket upper lip
15. Clamp spring
16. DIN-rail bracket attachment screw

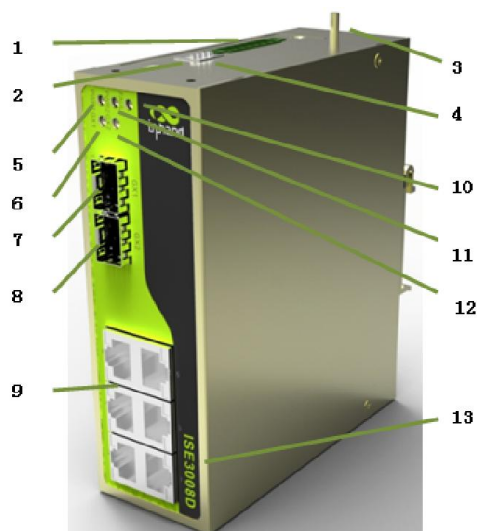
Structural Dimensions

(Units: mm)



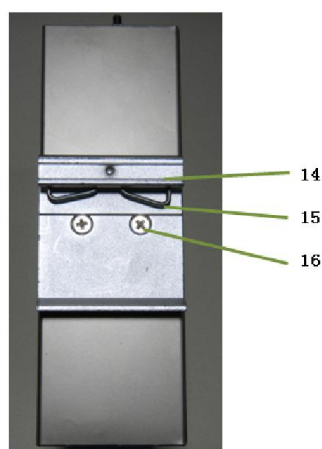
3.4 ISE3008D

Front Panel Layout



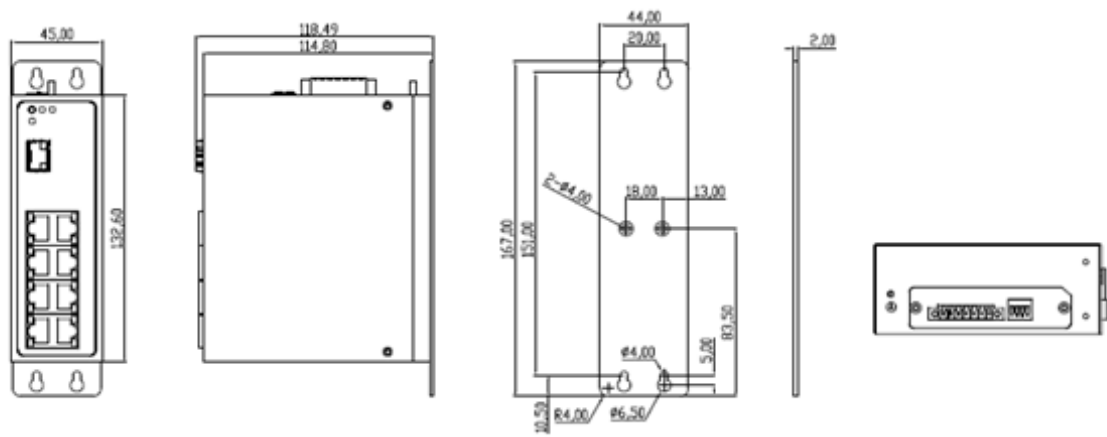
1. Power source connection and alarm connection terminal
2. Dip switch
3. Grounding Screw
4. Cover plate
5. Power source one indication lamp
6. GX1 LINK/ACT indication lamp
7. 1000Base-X, 1000Base-T(X) SFP port GX1
8. 1000Base-X, 1000Base-T(X) SFP port GX2
9. 10/100Base-T(X) RJ45 port
10. Alarm indication lamp
11. Power source two indication lamp
12. GX2 LINK/ACT indication lamp
13. InSwitch model number

14. DIN-rail bracket upper lip
15. Clamp spring
16. DIN-rail bracket attachment screw

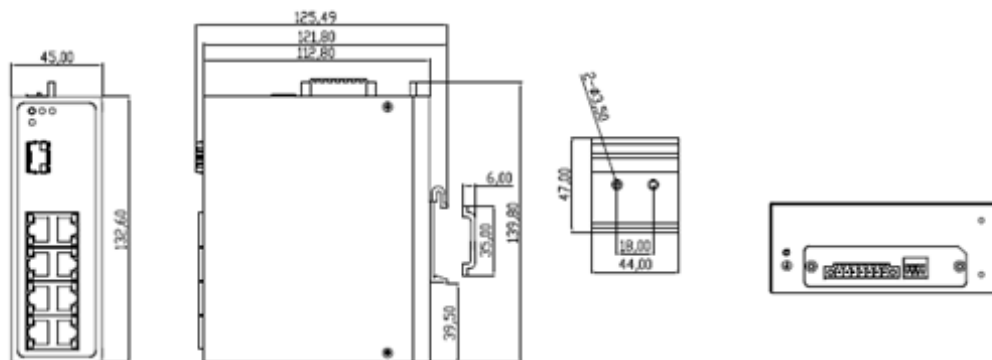


Structural Dimensions

(Units: mm)



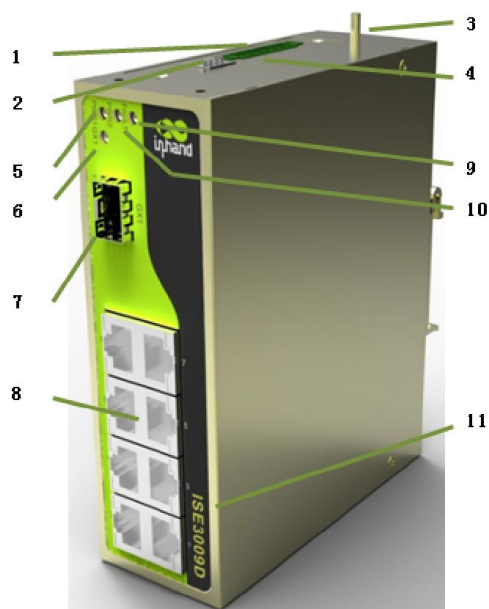
wall mounting diagram



DIN-rail mounting diagram

3.5 ISE3009D

Front Panel Layout



1. Power source connection and alarm connection terminal

2. Dip switch

3. Grounding Screw

4. Cover plate

5. Power source one indication lamp

6. GX1 LINK/ACT indication lamp

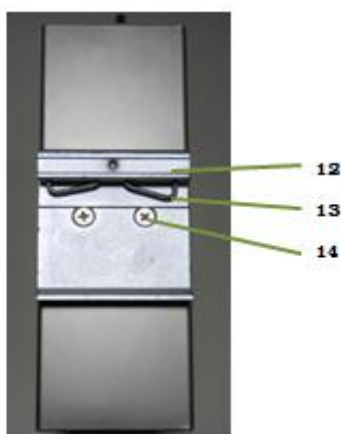
7. 1000Base-X, 1000Base-T(X) SFP port GX1

8. 10/100Base-T(X) RJ45 port

9. Alarm indication lamp

10. Power source two indication lamp

11. InSwitch model number



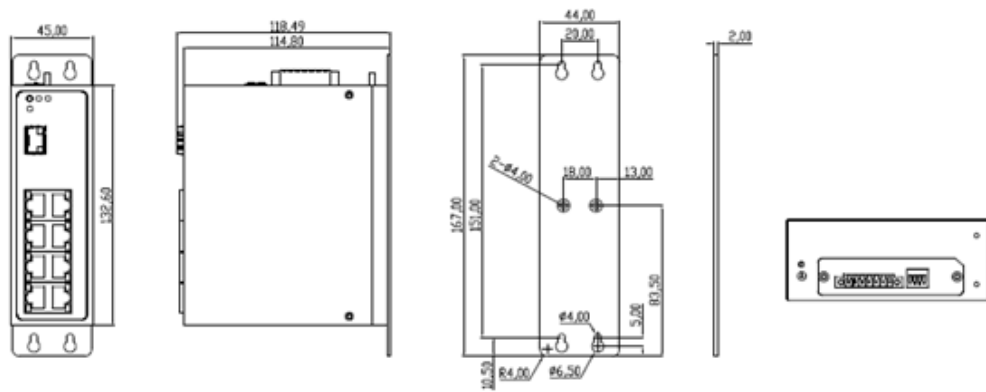
14. DIN-rail bracket upper lip

15. Clamp spring

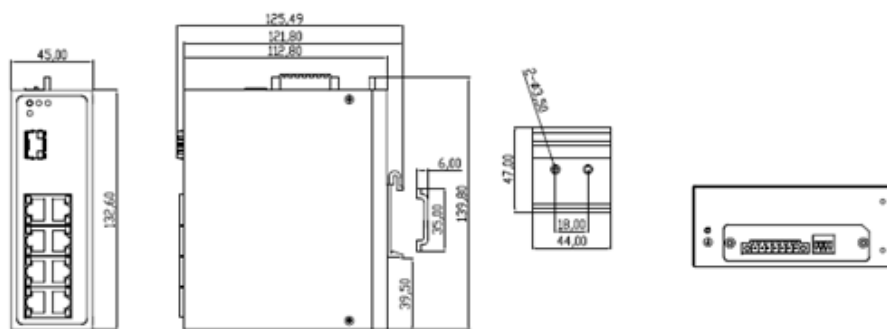
16. DIN-rail bracket attachment screw

Structural Dimensions

(Units: mm)



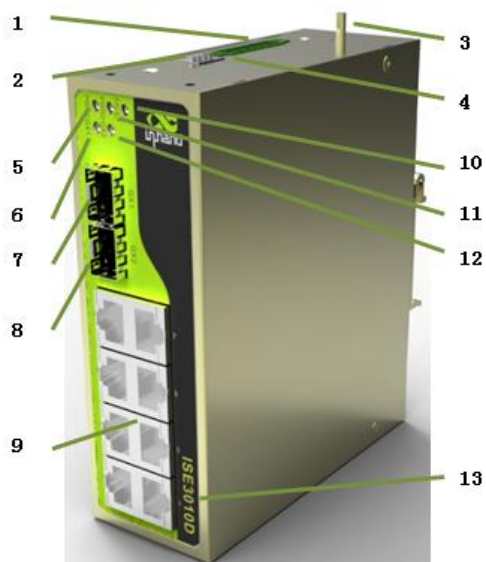
wall mounting diagram



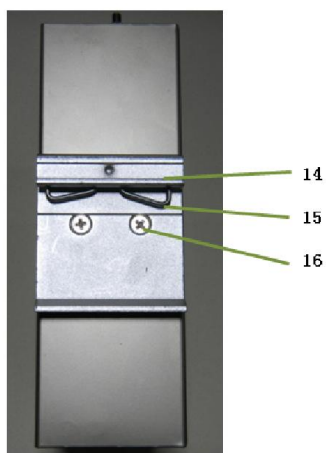
DIN-rail mounting diagram

3.6 ISE3010D

Front Panel Layout



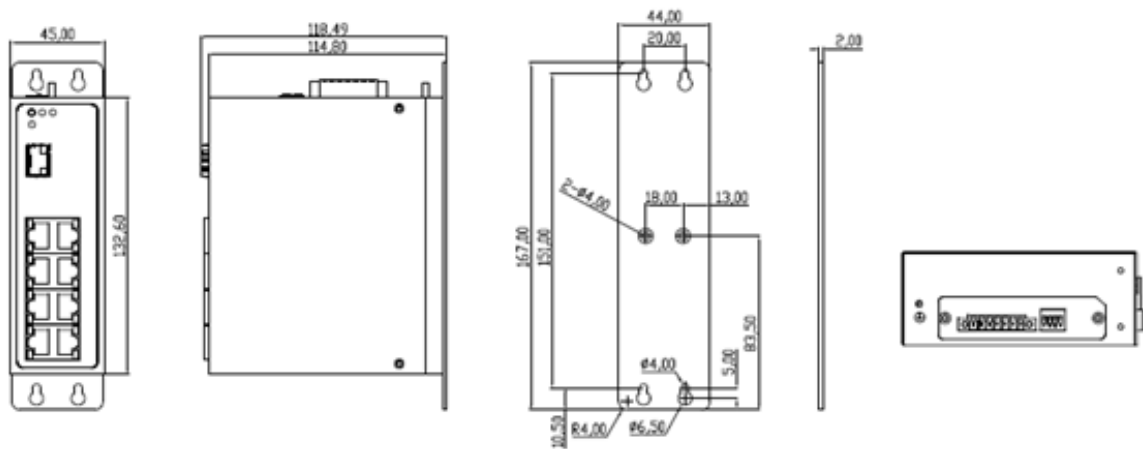
1. Power source connection and alarm connection terminal
2. Dip switch
3. Grounding screw
4. Cover plate
5. Power source one indication lamp
6. GX1 LINK/ACT indication lamp
7. 1000Base-X, 1000Base-T(X) SFP interface GX1
8. 1000Base-X, 1000Base-T(X) SFP interface GX2
9. 10/100Base-T(X) RJ45 port
10. Alarm indication lamp
11. Power source two indication lamp
12. GX2 LINK/ACT indication lamp
13. InSwitch model number



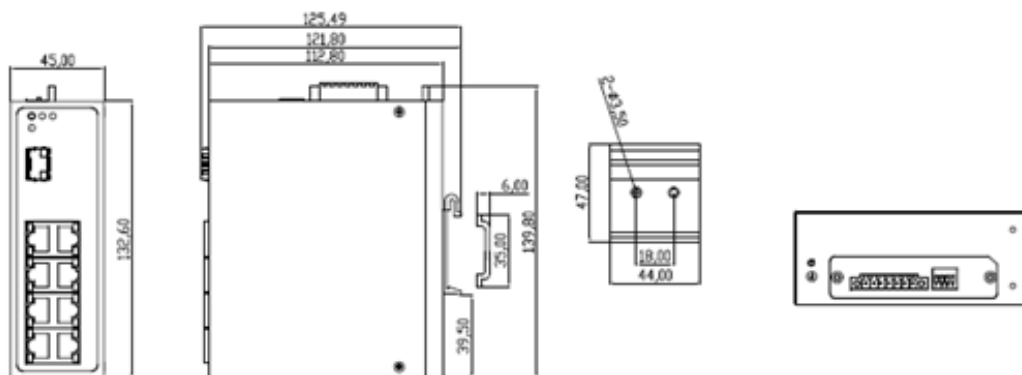
14. DIN-rail bracket upper lip
15. Clamp spring
16. DIN-rail bracket attachment screw

Structural Dimensions

(Units: mm)



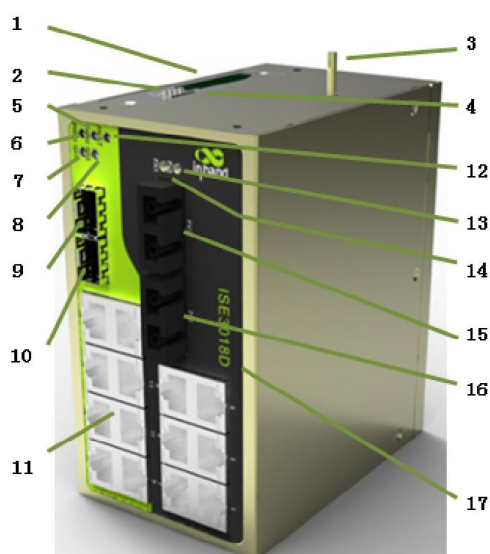
wall mounting diagram



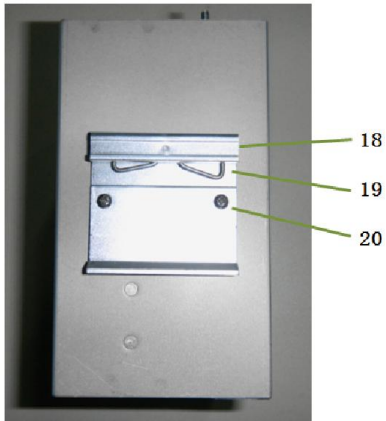
DIN-rail mounting diagram

3.7 ISE3018D

Front Panel Layout



1. Power terminal
2. Dip switch
3. Grounding screw
4. Cover plate
5. Power source two indication lamp
6. Power source one indication lamp
7. GX1 LINK/ACT indication lamp
8. GX2 LINK/ACT indication lamp
9. 1000Base-X, 1000Base-T(X) SFP interface GX1
10. 1000Base-X, 1000Base-T(X) SFP interface GX2
11. 10/100Base-T(X) RJ45 port
12. Alarm indication lamp
13. Optical port FX2 LINK/ACT indication lamp
14. Optical port FX2 LINK/ACT indication lamp
15. 100Base-FX single mode/multimode FC/SC/ST interface FX1
16. 100Base-FX single mode/multimode FC/SC/ST interface FX2
17. InSwitch model number



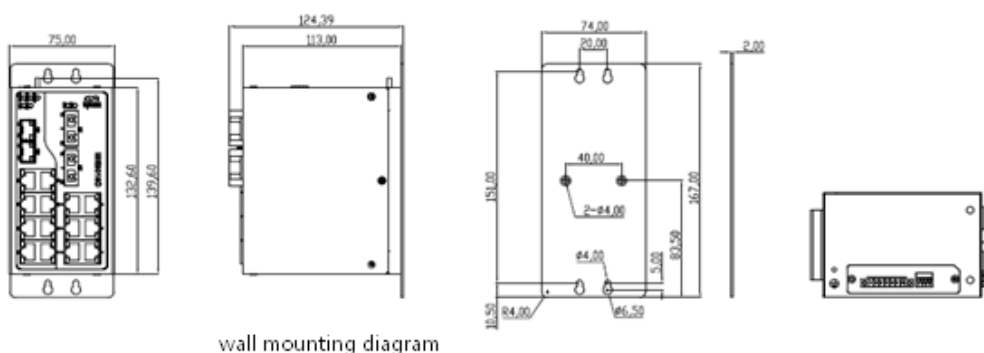
18. DIN-rail bracket upper lip

19. Clamp spring

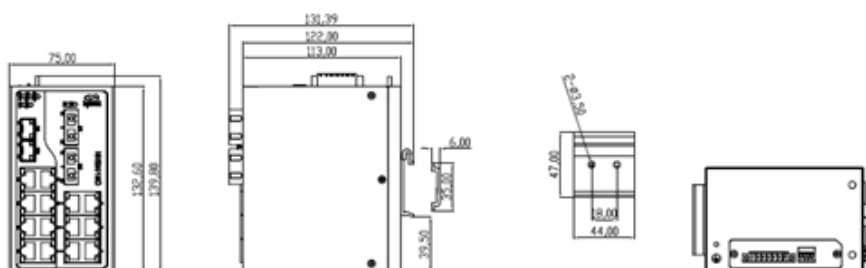
20. DIN-rail bracket attachment screw

Structural Dimensions

(Units: mm)



wall mounting diagram



DIN-rail mounting diagram



Note:

1. Some product models have optional copper and fiber ports. Therefore, one part number is used as an example in the layout sections. The models have optional ports:

ISE1005D: 1 100M fiber/copper port optional, 4 100baseT(x)

ISE2005D: 1 100M fiber/copper port optional, 4 100baseT(x)

ISE2008D: 4 100M fiber/copper port optional, 4 100baseT(x)

ISE3008D: 1 1000M fiber port, 3 100M fiber port, 4 100baseT(x)

ISE3009D: 1 1000M fiber port, 8 100baseT(x)

ISE5005D: 1 100M fiber/copper port optional, 4 100baseT(x)

IV. Installation

Installation Requirement

- Power source requirements: 24 VDC (12~48 VDC). Attention shall be paid to power voltages.
- Operating temperature: -40~85 °C
- Storage temperature: -40~85 °C
- Relative humidity 5%~95% (non-condensing).
- Grounding resistance requirement: less than 1 Ω.
- Avoid direct sunshine and keep away from heat sources or intensive electromagnetic interference.
- Inspect for availability of cable and joints required for installation.

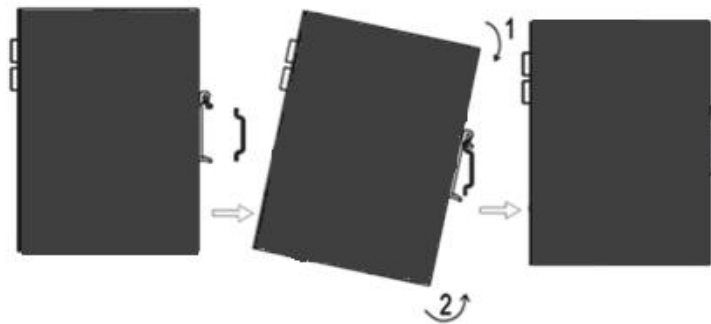
4.1 Instruction for DIN-Rail Installation

4.1.1 DIN-Rail Mounting

Step 1: Select a place to install the device, and make sure there is sufficient space.

Step 2: Hook the upper lip of the bracket onto the DIN-rail.

Step 3: While pushing down to compress the clips, push the bottom part of the switch towards the wall.



4.1.2 DIN-Rail Removal

Step 1: As the arrow 1 shows, pull down on the device to compress the bracket clips.

Step 2: Pull the bottom of the device away from the wall until it is unhooked from the DIN-rail.

Step 3: Unhook the device from the DIN-rail.

4.2 Instruction for Wall mounting

4.2.1 Wall mount

Follow these steps:

Step 1: Install the wall-mounting plate onto the switch.

Step 2: Locate the screws which are packaged with the wall mounting plate. Fix screws in the mounting position as shown by the arrows in Figure 4-3.



Figure 4-3 Mount the Device on the Wall

Step3: After installing the screws, pull the switch into the position as shown in Figure 4-4.

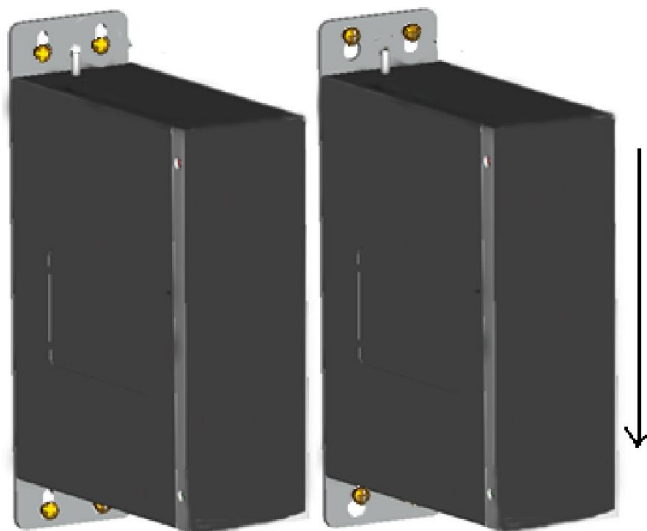


Figure 4-4

4.2.2 DIN-Rail Dismount

Step1: Use a screwdriver to loosen the screws, so that the switch can freely move up and down.

Step2: Lift switch to the position shown in Figure 4-5.

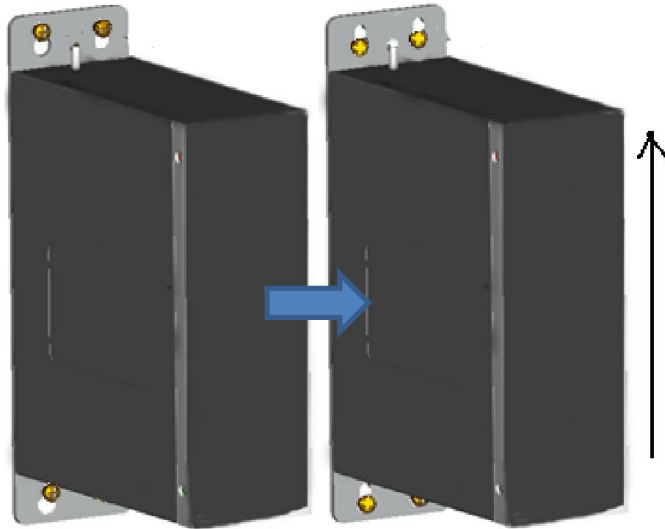


Figure 4-5

Step3: Hold the switch up and remove the four screws.



Figure 4-6

Step 3b: Alternatively, do not remove the screws, and directly remove the switch by lifting while gently pulling it away from the wall, as shown in figure 4-7.



Figure 4-7

V. Ethernet Cables and Wiring

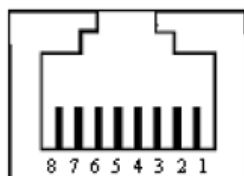
5.1 10/100Base-T(X) port

The RJ45 interface automatically detects 10/100Base-T(X) and MID/MDI-X protocols. The RJ-45 ports may be connected with either a straight-through or crossover cable and can automatically compensate for either type.



Attention: Standard CAT5 or CAT5e types twisted pair cabling shall be used.

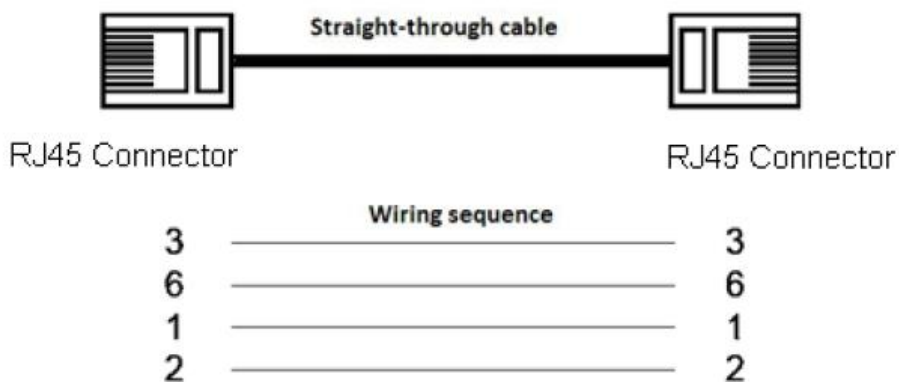
- Image of an RJ45 interface



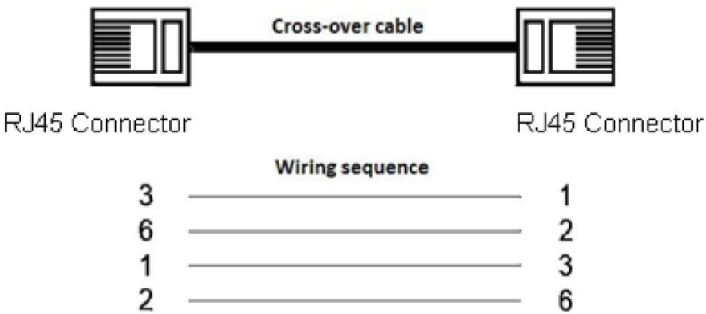
- Description of pins on 10/100Base-T(X) port

Pin	MDI	MDI-X
1	Positive terminal for data transmission (TD+)	Positive terminal for data receiving (RD+)
2	Negative terminal for data transmission (TD-)	Negative terminal for data receiving (RD-)
3	Positive terminal for data receiving (RD+)	Positive terminal for data transmission (TD+)
6	Negative terminal for data receiving (RD-)	Negative terminal for data transmission (TD-)
4,5,7,8	Not used	Not used

- 100Base-TX Straight-through cable



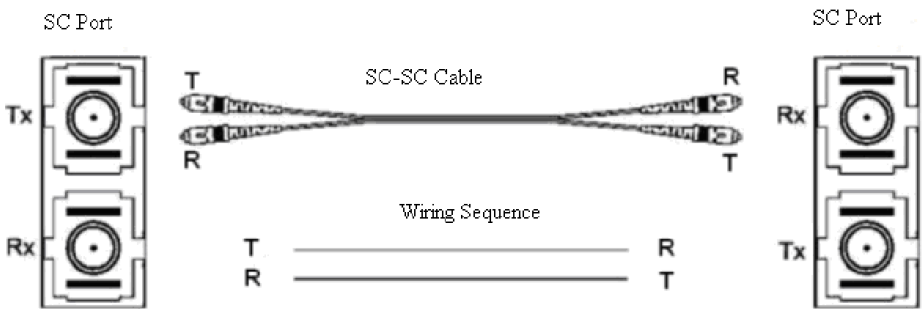
100Base-TX cross-over cable



5.2 100Base-FX port

Carefully plug in the optical cables and polish the connectors if necessary. Rough handling and repeated use can damage the cable and connectors.

Ensure that both ends of the fiberoptic cable are correctly wired. The Tx port of the home terminal shall be connected to Rx port of the opposite terminal, and the Rx of the home terminal shall be connected to Tx port of the opposite terminal. Here, the SC port is used as an example for wiring optical cable connections. The process for connecting ST, FC and LC cables are the same as SC.



Attention:

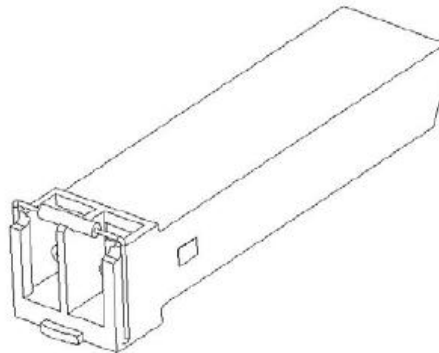
When both ends of the fiberoptic cable are plugged in, but the port LEDs do not blink, check that the wiring is correct. The Rx and Tx cables may be switched.

5.3 1000Base-X, 1000Base-T(X) SFP Port

The SFP port supports either a gigabit SFP optical module (1000Base-X) or gigabit SFP electric module, 1000Base-T(X), depending on network requirements.

Gigabit SFP optical module

A typical gigabit SFP optical module is shown in the following diagram:

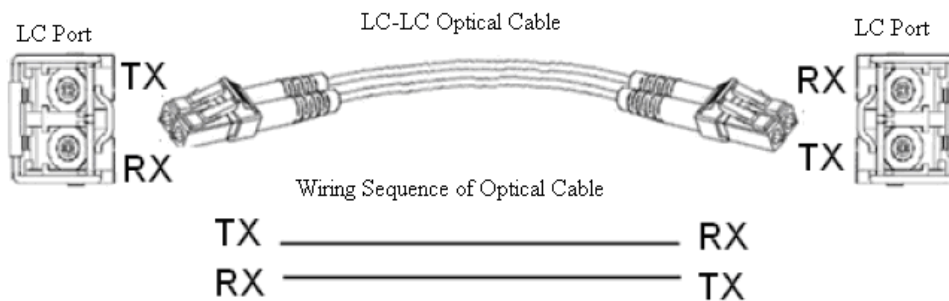


LC interface is adopted for gigabit SFP optical module, including receiving port (Rx) and transmission port (Tx).

Optical cable connection steps:

Step 1: Plug a SFP optical module into the SFP slot.

Step 2: To connect an optical cable, connect the Rx of the home port to the Tx of the opposite port, and connect the Tx of the home port to the Rx of the opposite port, as shown in the following diagram:

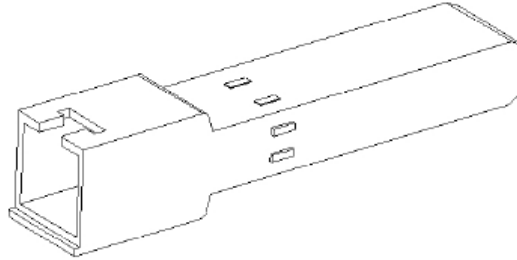


! Attention:

When both ends of the fiberoptic cable are plugged in, but the port LEDs do not blink, check that the wiring is correct. The Rx and Tx cables may be switched.

- Gigabit SFP electric module

Typical gigabit SFP electric module is shown in the following diagram.



The steps for connecting network cables to an SFP electric module are as follows:

Step 1: Plug the SFP electric module into the SFP slot.

Step 2: Connect both ends with an Ethernet cable.



Attention:

CAT5, CAT6 or CAT7 types of twisted pair cable shall be used.

5.4 Power Source

The InSwitch ISE series allow for dual redundant power supplies on its industrial terminal block. Dual power supply connections allow users to provide more redundancy and fallback options for important nodes. The terminal block allows industrial and electric power users to employ the existing power supply in an enclosure. Simply wire the power supply's positive negative and ground into the power terminal to power on the switch.

The wiring schematic for the industrial power terminal is shown below.

