Industrial 8-port Switches

JetNet 2208 Series

Installation Guide

DOCUMENT CHANGE SUMMARY			
V1.0	Initial release		202410

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Contents

I. Safety Instruction

I.I. Symbols

CAUTION 	A Caution symbol indicates a potentially hazardous situation to you.
WARNING 	A Warning symbol indicates situations that can be potentially lethal or extremely hazardous to you.
	An Attention symbol indicates potential damage to programs, devices, or data.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.

II. Safety Warnings

Solid state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid-State Controls describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable. In no event will Beijer Electronics be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment. The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any installation, Beijer Electronics cannot assume responsibility or liability for actual use based on the examples and diagrams. Products should be used in environments with a pollution index of less than 2. Ensure that the installation environment does not exceed 95% humidity.

WARNING

To prevent electric arcs:

- Always turn off the power before working on these products. Doing so while the power is on can cause unexpected and dangerous behaviour in the field devices. Electrical arcing poses an explosion risk in hazardous locations. Ensure the area is safe and the system power is off.
- Check the rated voltage and terminal array before wiring.
- Avoid environments over 75℃ (167F℃) of temperature. Avoid placing it directly in the sunlight.
- Ensure that inputs and outputs are made according to the module specification. Wire the system using standard cables.
- To avoid an electric shock or malfunction, do not touch any terminal blocks or IO modules while the system is running.
- Keep metal objects away from the unit, and only let trained electricians do the wiring. This can help prevent fires, electric shocks, and unit problems.
- Modules should not be placed near inflammable materials. A fire may result if it is not handled properly.

WARNING

Electrostatic discharge: The modules are equipped with electronic components that may be destroyed by electrostatic discharge. When handling the modules, ensure that the environment (persons, workplace and packing) is well grounded. Avoid touching conductive components, M-bus and Hot swap-bus pin.

WARNING

Statement 1008—Class 1 Laser Product:

- This product is a Class 1 laser product. This device is designed for use with a certified optical transceiver module, classified as Laser Class 1.
- When connected to a fiber optic port, never look directly into the laser while it's powered on. Additionally, avoid looking directly into the fiber port or the end of the fiber cable when they are powered.
- For further information, please contact Beijer Electronics Corp.

III. Declaration of Conformity

I.II. CE compliance

This product has been certified to meet CE environmental standards. It was tested under industrial conditions and found to be compliant. To prevent damage from electrostatic discharge and electromagnetic interference, we recommend using CE-certified industrial enclosures.

I.III. FCC Class B

This device has been evaluated and found to meet the FCC's Class B limits for digital equipment. These standards are intended to protect against harmful interference in home environments. This equipment produces radio frequency energy and can cause interference if not used as instructed. However, interference may still occur in some cases. If this equipment interferes with your radio or TV reception, try the following:

- Reposition the antenna.
- Increase the distance between the equipment and receiver.
- Plug the equipment into a different outlet.

FCC Caution: Unapproved changes or modifications to this equipment may nullify the user's authority to operate it. This device conforms to FCC Part 15. The following conditions govern its operation:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Chapter 1. Switch Overview

The JetNet 2208 Series, comprising the JetNet 2208-T8, JetNet 2208T7-SC1-SM, and JetNet 2208-T7-SC1-MM models. The 8-Port Industrial Grade Switch represents a robust networking solution designed to meet the demanding requirements of industrial environments. Combining reliability, durability, and advanced features, this switch serves as a pivotal component in industrial automation, manufacturing, and other critical infrastructure applications.

1.1. Main Features

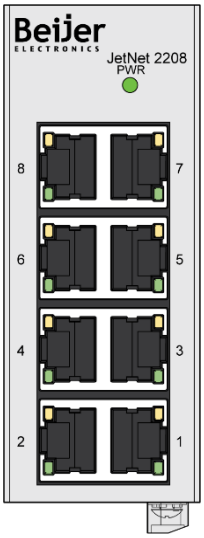
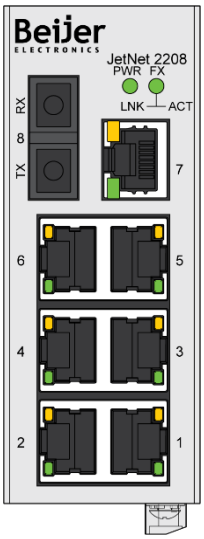
1.1.1. HW Function

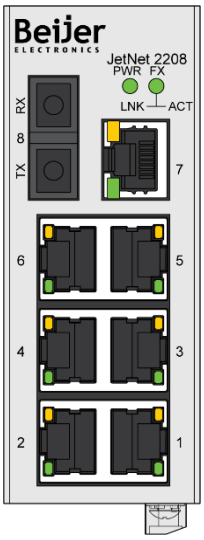
- 8 or 7 ports of 10/100Base T(X) with RJ-45 connector.
  - Support IEEE802.3/802.3u Non-blocking Switching Performance
  - Auto negotiation speed
  - Full/Half duplex mode ftControl
  - Auto MDI/MDI-X connection
- 0 or 1 port of 100Base FX single model or multi-mode SC connector (Fiber model)
  - SC Connectors
  - Support Single mode with transmission distance 30KM
  - Support Multi mode with transmission distance 2KM
- 12/24/48VDC operating voltage
- Industrial slim size
- Support 802.1p QoS (CoS)
- Flow control default enable.

Variants	Remark
JetNet 2208-T8	8 Port Industrial Switch, 8x RJ45 ports
JetNet 2208-T7-SC1-SM	8 Port Industrial Switch, 7x RJ45 Ports, 1x Single-mode fibre with SC Connector
JetNet 2208-T7-SC1-MM	8 Port Industrial Switch, 7x RJ45 Ports, 1x Multi-mode fibre with SC Connector

1.1.2. Switch Models

The JetNet 2208 series is available in the following models.

Switch Model	Description	Picture
JetNet 2208-T8	• 8-port Industrial Switch • 8 x RJ45 Ports	
JetNet 2208T7-SC1-SM	• 8-port Industrial Switch • 7 x RJ45 Ports • 1 x Single-mode Fibre with SC Connector	

JetNet 2208-T7-SC1-MM	• 8-Port Industrial Switch • 7 x RJ45 Ports • 1 x Multi-mode Fibre with SC Connector	

1.2. Performance

Specifications	Description
IEEE standard	• IEEE 802.3 10Base-T • IEEE 802.3u 100Base-TX • IEEE 802.3u 100Base-FX (fiber model) • IEEE 802.3x Flow Control and Back Pressure • IEEE 802.3p CoS
Switch Technology	Store and Forward technology
Network forwarding performance	14,880pps for 10Mbps, 148,800pps for 100Mbps
MAC address	2K
Broadcast storm	Default disable
CoS	• Default Enable • High (7):16 Low (0~6):1
Interface	
RJ-45 Port	• 8-port 10/100BaseT(X) RJ-45 Ethernet port Non-blocking switching performance • 7-port 10/100BaseT(X) RJ-45 Ethernet port non-blocking switching performance • Auto negotiation speed, Full/Half duplex mode and auto MDI/MDI-X connection
Fiber Port	1-SC port (fiber model)
Ethernet Cable	100 Base-TX: 4-pair Cat.5e / Cat.6 UTP/STP cable, 100Meters
Power Requirement	
System Power	Power inputs
Voltage	1* 12/24/48VDC
Enclosure Port	
Weight (with packaging)	434g
Weight (without packaging)	330g
Installation	DIN-Rail mounting
Case	IP30 grade metal case
Dimension (mm)	72 (D) x 39 (W) x 98 (H) (without DIN rail clip)

Specifications	Description
LED	JetNet 2208-T8 / JetNet 2208-T7-SC1-SM / JetNet 2208-T7-SC1-MM • 1 x Power (Green on) Ethernet Port (RJ-45): • Speed 100Mbps Link (Amber on) • Speed 10Mbps link (Amber off) • Ethernet Activity (Green blinking) • Ethernet Link (Green on) JetNet 2208-T7-SC1-SM / JetNet 2208-T7-SC1-MM • 1 x Fiber: Link (Green on) • Activity (Green blinking)

1.3. Declaration of Conformity

1.3.1. Certification

Specifications	Description
UL, cUL	UL/cUL 62328-1
FCC	Part 15B

1.3.2. EMC

Specifications	Description
CE	EN 61000-6-4:2019 EN 61000-6-2:2005 EN55035:2017+A11:2020 EN55032:2015+A11:2020, Class A
FCC	FCC Part 15
KCC	KCC
UK	UKCA

1.4. Environmental Requirements

1.4.1. Storage and transportation

Specifications	Description
Temperature range Storage	-40 ° to +85°C
Relative humidity Storage	0- 95 % RH non-condensing at ambient temperature
Packaging box dimension	154 x 126 x 64.5 mm

1.5. Operations

Specifications	Description
Temperature range Operation	-40 ° to +75 °C
Relative humidity operation	0 - 95 % RH non-condensing at ambient temperature.
Vibration	EN 60068-2-6:2008 Vibration, sinusoidal EN 60068-2-64:2009 Vibration, broadband random
Shock	EN 60068-2-27:2010 Shock, half-sine
DC Input Voltage / Power supply	12/24/48 VDC (1.5 KV isolated)

1.6. Front Panel

Described in this section are the front panel components of the JetNet 2208-T8 series switches.

1.6.1. JetNet 2208-T8

The LEDs and ports for the JetNet 2208-T8 are located on the front panel of the switch as illustrated in the following illustrations.

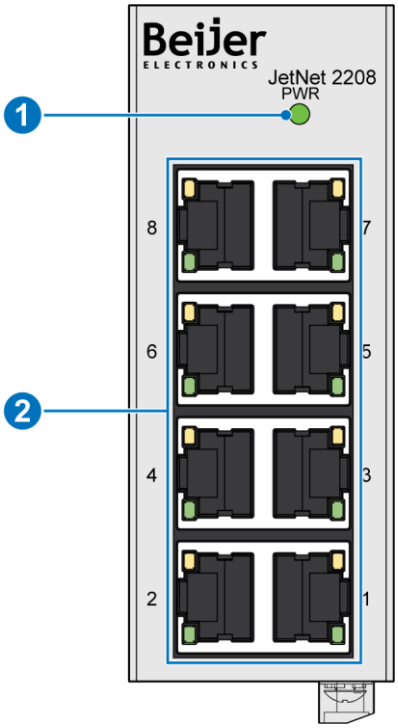


Figure 1: Front Panel of JetNet 2208-T8

No.	Item	Description
1.	System LEDs	See Front Panel LEDs on page 19 for further details
2.	ETH ports	RJ45 Ethernet ports, 10 Mbps and 100 Mbps on Cat 5e cables

1.6.2. JetNet 2208-T7-SC1-SM

The LEDs and ports for the JetNet 2208-T7-SC1-SM are located on the front panel of the switch as illustrated in the following illustrations.

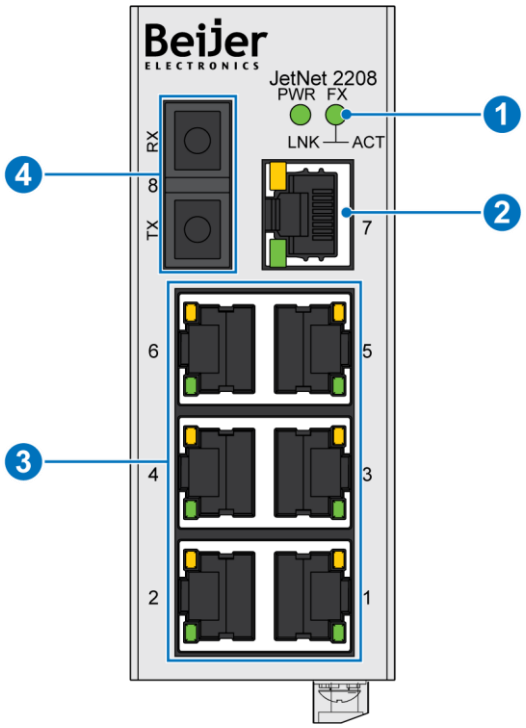


Figure 2: Front Panel of JetNet 2208-T7-SC1-SM

No.	Item	Description
1.	System LEDs	See Front Panel LEDs on page 19 for further details
2.	ETH ports	RJ45 Ethernet ports, 10 Mbps and 100 Mbps on Cat 5e cables
3.		
4.	Fiber port	Single-mode 30 km

1.6.3. JetNet 2208-T7-SC1-MM

The LEDs and ports for the JetNet 2208-T7-SC1-MM are located on the front panel of the switch as illustrated in the following illustrations.

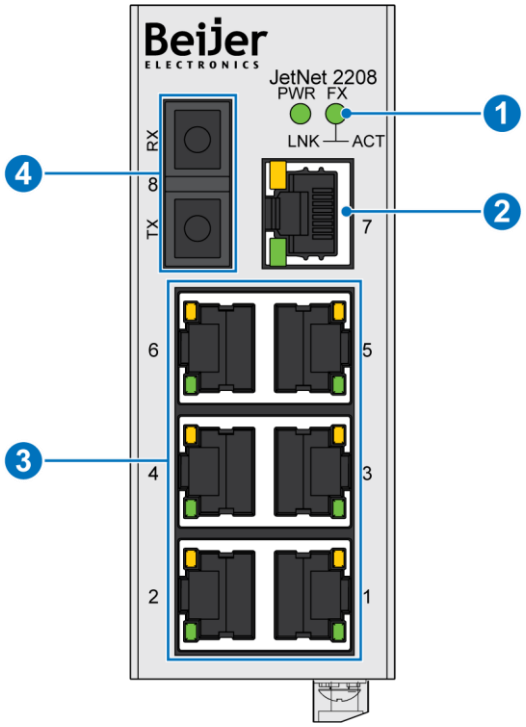


Figure 3: Front Panel of JetNet 2208-T7-SC1-MM

No.	Item	Description
1.	System LEDs	See Front Panel LEDs on page 19 for further details
2.	ETH ports	RJ45 Ethernet ports, 10 Mbps and 100 Mbps on Cat 5e cables
3.		
4.	Fiber port	Multi-mode 2 km

1.6.4. Front Panel LEDs

The system LEDs are used to monitor the switch activity and performance. The following illustration depicts the front panel on a JetNet 2208 Series. A specific LED panel is dependent on a specific JetNet model.

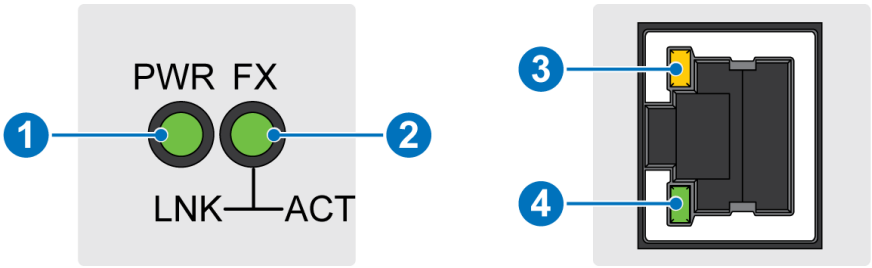


Figure 4: Front Panel LEDs for JetNet 2208 Series

No.	Item	Description
	JetNet 2208-T8 / JetNet 2208-T7-SC1-SM / JetNet 2208-T7-SC1-MM	
1	Power LED	• On: Green • Off
3	Port Speed Indicator (RJ-45) LED	• On: Amber, speed 100Mbps link • Off: Amber, speed 10Mbps link
4	Port Link/Activity (RJ-45) LED	• Blinking: Green, Ethernet activity • On: Green, Ethernet link
	JetNet 2208-T7-SC1-SM / JetNet 2208-T7-SC1-MM	
2	Fiber LED	• On: Green, link • Blinking: Green, activity

1.7. Rear View

The following view illustrates the rear view of a JetNet 2208 Series device. For demonstration purposes a single sample is illustrated. Varying models may differ in shape and form.

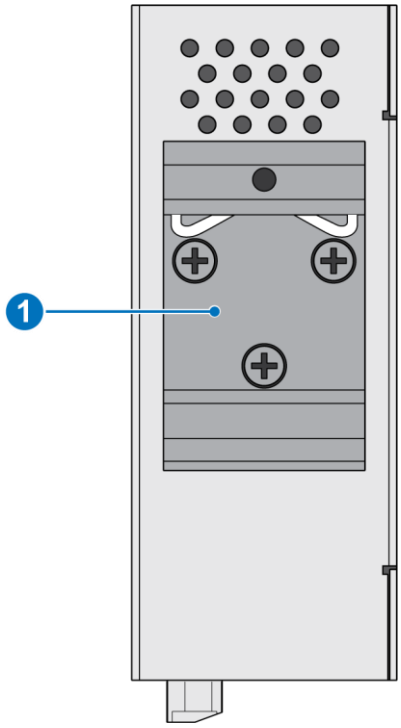


Figure 5: JetNet 2208 Series Rear Panel

No.	Item	Description
1.	DIN rail plate	Connect to DIN rail for mounting

1.8. Bottom View

The following view illustrates the bottom view of a JetNet 2208 Series device. The power input and grounding connector are located on the bottom panel of the switch as illustrated in the following illustrations. For demonstration purposes a single sample is illustrated. Varying models may differ in shape and form.

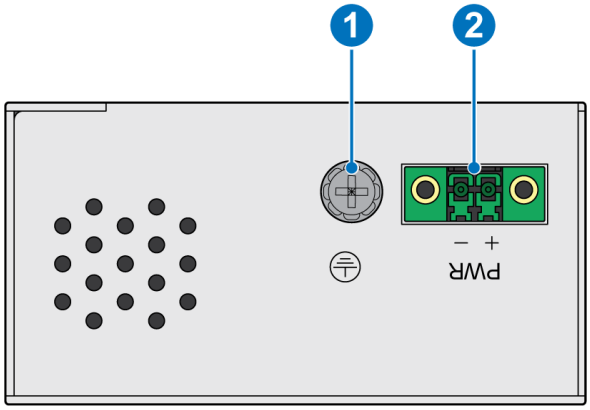


Figure 6: Bottom View of JetNet 2208 Series

No.	Item	Description
1.	Ground terminal	Connect to a ground source to provide local earth potential.
2.	Terminal block receptor	Connect a terminal block for power

1.9. Dimensions

The power inputs and relay connectors are located on the rear panel of the switch as illustrated in the following illustrations.

1.9.1. Vdc

1.9.2. JetNet 2208-T8

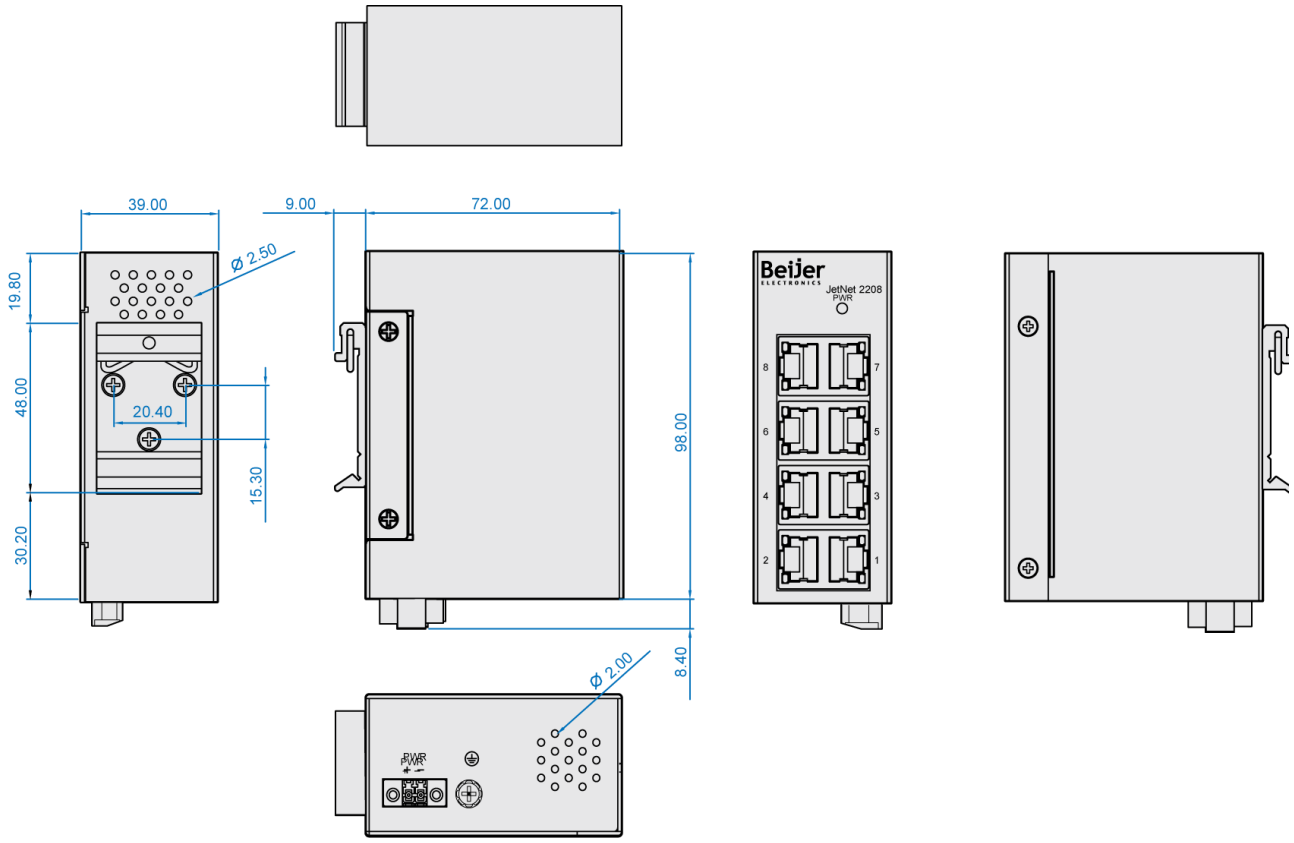


Figure 7: 8-Port JetNet 2208-T8 Dimensions

1.9.3. JetNet 2208-T7-SC1-SM

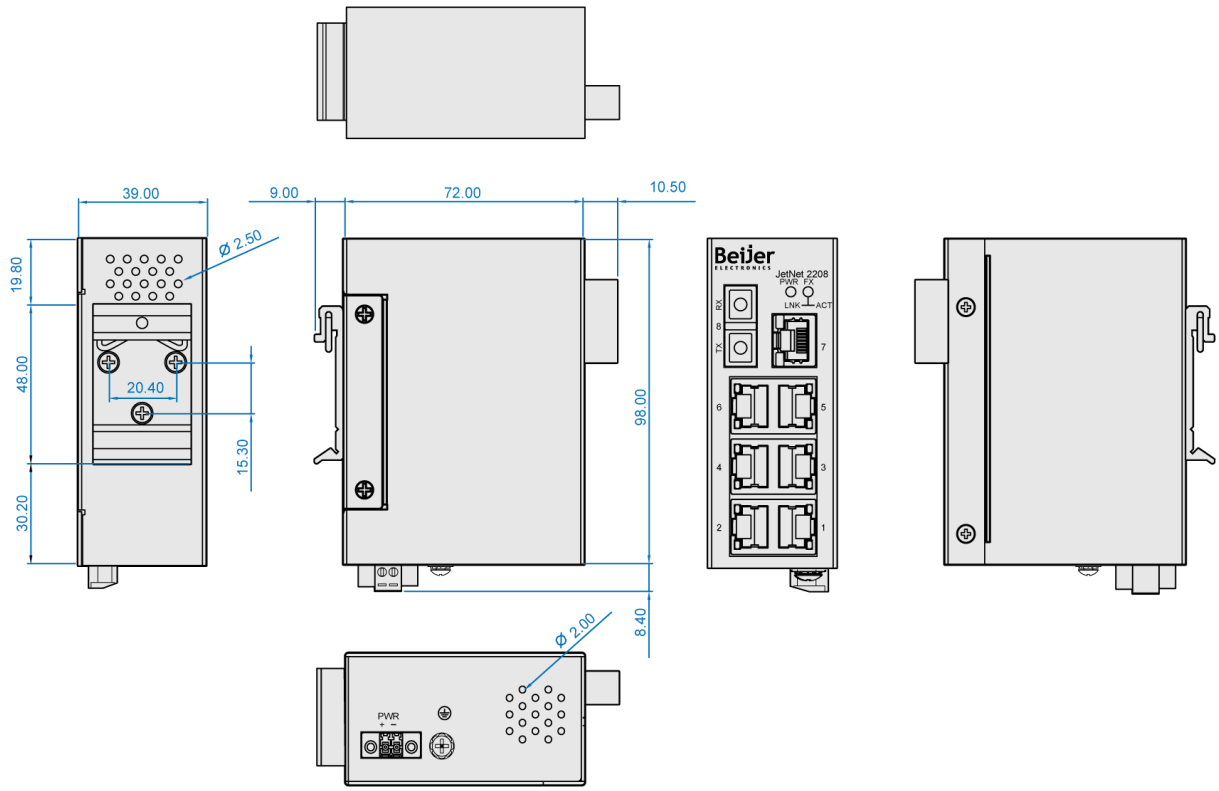


Figure 8: 8-Port JetNet 2208-T7-SC1-SM Dimensions

1.9.4. JetNet 2208-T7-SC1-MM

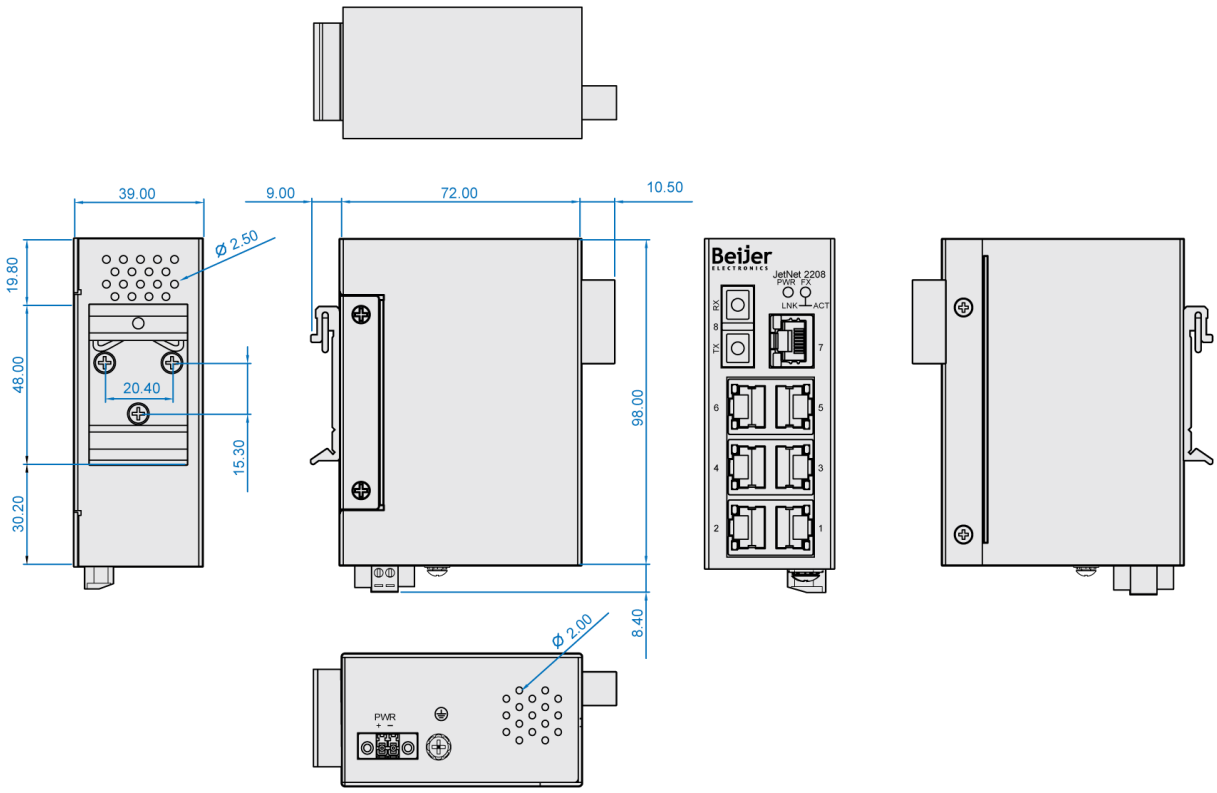


Figure 9: 8-Port JetNet 2208-T7-SC1-MM Dimensions

Chapter 2. Hardware Installation

2.1. Electrical Safety Information

1. Voltage, frequency, and current requirements must be met according to the manufacturer's label. Using a power source other than those specified may cause improper operation, damage to the equipment, or pose a fire hazard.
2. This equipment contains no user-serviceable parts. Service should only be provided by qualified technicians.
3. Power cords for this equipment come with an integral safety ground wire that can be connected to grounded safety outlets.
4. It is not recommended to replace the power cord with one that is not approved by the manufacturer. Connecting an adapter plug to a 2-wire outlet will defeat the continuity of the grounding wire.
5. Modification or misuse of the ground wire can cause serious injury or death; the ground wire is required as part of the safety certification.
6. In case of questions regarding the installation, contact a qualified electrician or the manufacturer.
7. AC adapters with Listed certification provide protective earthing. Short-circuit backup protection shall be provided in the building installation.
8. Local and national wiring regulations and guidelines must be followed when installing protective bonding.

2.2. Package Contents

After unpacking the device, validate the contents to ensure you have received all the included components.

- JetNet 2208 series industrial switch
- Documentation — Installation Guide

2.3. Installing the Switch

2.3.1. Installation Requirements

The fastest way to install the product is by choosing the DIN rail mount option. Moreover, this option efficiently utilizes the available rail space.

To secure the switch, you can use the metal DIN rail kit provided. It can be attached to the back of the device, allowing for mounting on a standard DIN rail:

- Measuring 30 mm (1.18") in width and 48 mm (1.89") in height

You have the flexibility to mount the devices either vertically or horizontally. For more detailed instructions, please consult the following information.

2.3.2. Installation Guidelines

Make sure the following guidelines are met when selecting a location for the switch:

To ensure that the switch front and rear panels are clear, the following conditions must be met:

- The ports are accessible without restriction, allowing unrestricted cabling.
- The front-panel LEDs are easy to read.
- The power cord can reach the switch rear panel connector from the power outlet. The cable length from the switch to the device connected cannot exceed 100 meters (328 feet).
- Electrical noise sources such as radios, power lines, and fluorescent lighting fixtures should be kept away from the cabling. Ensure that the cabling is safe from other devices that might damage it.
- There is no restriction on airflow around the switch and through the vents.
- Do not expose the unit to temperatures above 75°C (167°F). If installed in a closed cabinet, ensure the temperature around the switch is not higher than specified.
- Fan and blowers in cooling mechanisms can draw dust and other particles, resulting in contaminant buildup inside the chassis, resulting in system malfunction. In order to ensure the best performance of this equipment, it must be installed in a dust-free environment
- It is important that the humidity around the switch does not exceed 95%.

2.4. DIN Rail Mounting

1. Place the rear panel of the switch in front of the DIN rail, ensuring that the top part of the DIN rail clip securely hooks over the top of the rail. This arrangement is depicted in the following illustration.
2. Confirm that the DIN rail is positioned behind the spring mechanism. Once the rail is correctly seated within the DIN rail clip, press the front of the switch to rotate it downward and engage the release tab on the DIN rail clip.

If the installation is accurate, the bottom of the DIN rail should be fully inserted into the release tab.

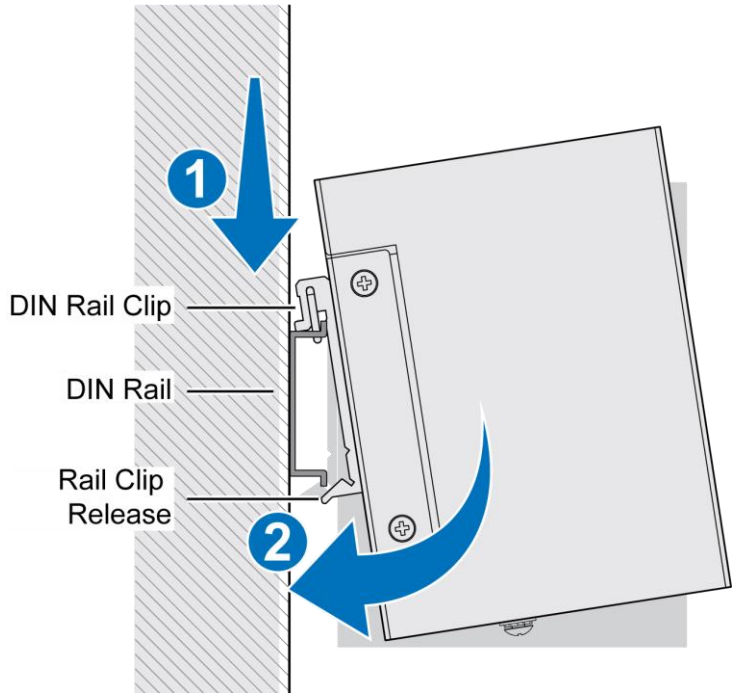


Figure 10: Installing a DIN-Rail Kit

The following is an illustration of a completed DIN installation.

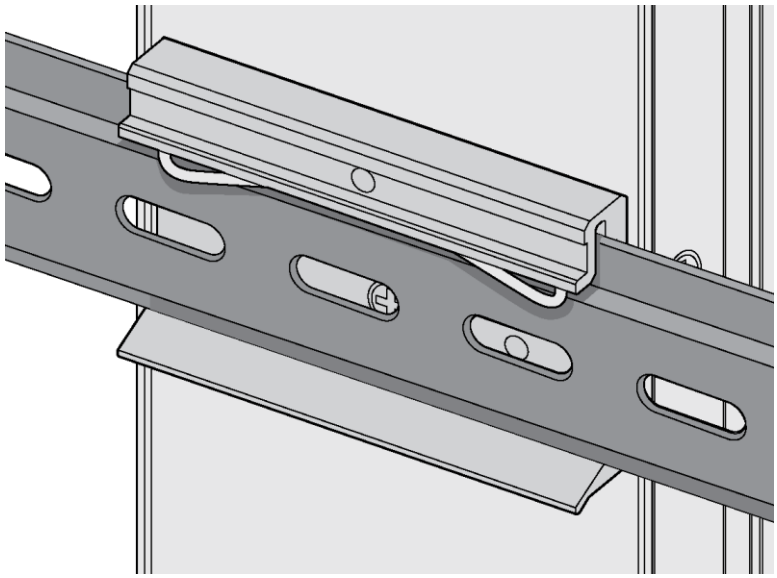


Figure 11: Example of an Installed DIN Rail Kit

3. Hold the bottom of the switch and gently tilt it upward. If you encounter resistance, it indicates that the switch has been properly installed. If you do not experience any resistance, it is advisable to restart the installation process from the beginning.

2.4.1. Removing the DIN-Rail Mounting Kit

1. Depress the switch downwards to release the lower part of the plate from the DIN rail.
2. Rotate the lower section of the device towards yourself and away from the DIN rail.
3. When the bottom portion is no longer in contact with the DIN rail, lift the device directly upwards to detach it from the rail.

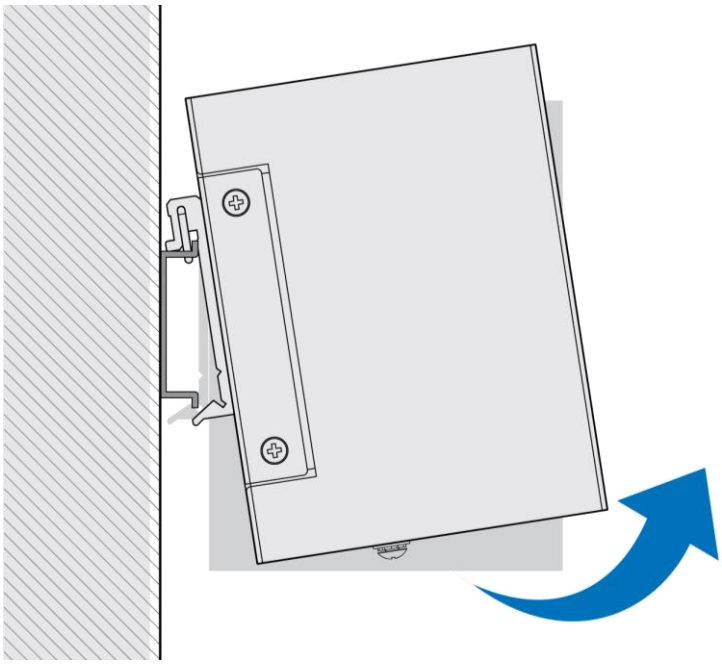


Figure 12: Removing a DIN Rail

2.5. Ethernet Cable Wiring

You should use data-quality twisted-pair cabling (rated CAT5 or higher) for RJ45 connectors. For optimal performance, shielded cabling should be used. Additional protection may be provided by shielded cabling.

Straight Through Cable Wiring			Cross-over Cable Wiring		
Switch	Direction	Switch	Switch	Direction	Switch
Pin 1 RD+	→	Pin 1 TD+	Pin 1 RD+	←	Pin 3 TD+
Pin 2 RD-	→	Pin 2 TD-	Pin 2 RD-	←	Pin 6 TD-
Pin 3 TD+	→	Pin 3 RD+	Pin 3 TD+	→	Pin 1 RD+
Pin 6 TD-	→	Pin 6 RD-	Pin 6 TD-	→	Pin 2 RD-

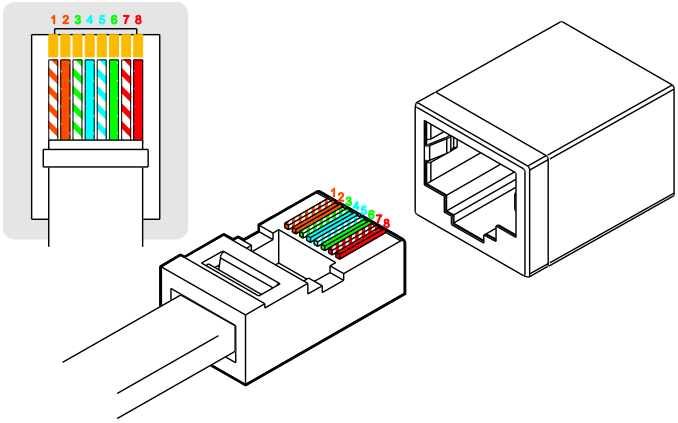


Figure 13: Mounting a Switch in a Rack

Note!! Ethernet cables use pins 1, 2, 3, and 6 of an 8-pin RJ-45 connectors. The signals of these pins are converted by the automatic MDI-X function, as shown in the table below:

Ethernet Cable Pin Definition		
Pin MDI-X	Signals	MDI Signals
1	RD+	TD+
2	RD-	TD-
3	TD+	RD+
6	TD-	RD-

Connect one side of an Ethernet cable into any switch port and connect the other side to your attached device. The LNK LED will light up when the cable is correctly connected.
Refer to the LED Indicators section for descriptions of each LED indicator. Always make sure that the cables between the switches and attached devices (e.g. switch, hub, or workstation) are less than 100 meters (328 feet).
The wiring cable types are listed as follows:

- 10Base-T: 2-pair UTP/STP Cat. 3, 4, 5 cable, EIA/TIA-568 100-ohm (100m)
- 100Base-TX: 2-pair UTP/STP Cat. 5 cable, EIA/TIA-568 100-ohm (100m)
- 1000Base-TX: 4-pair UTP/STP Cat. 5 cable, EIA/TIA-568 100-ohm (100m)

2.6. Connecting Power Inputs

2.6.1. Overview

WARNING 	Before servicing or wiring the switch, power it down and disconnect the power cord.

WARNING 	Ensure that the power has been turned off before disconnecting modules or cabling. Only the voltage specified on the type plate can be used with the device. Ensure that you are only using components that are specifically intended for the switch device when powering it.

To power a switch, it is necessary to apply a DC voltage within the range of 12/24/48 VDC between the V1+ terminal and the V1- terminal (PW1), as shown in the provided illustrations. It is important to note that a Class 2 power supply is required to maintain a UL62368 panel listing. Furthermore, the chassis ground screw terminal should be connected to the panel or chassis ground.

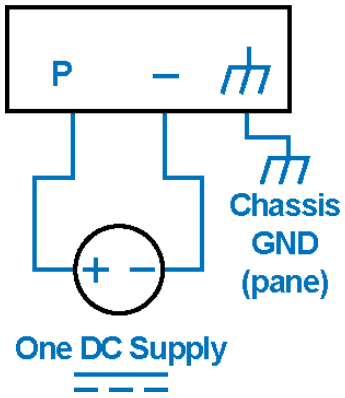


Figure 14: Power Wiring Diagram

2.6.2. Considerations

Before wiring the device, consider the following guidelines:

- For better management and servicing, label all wiring and cabling to the various devices.
- Earthing conductors must have at least a 3.31 mm^2 cross section.
- Terminal Blocks (DC1) are suitable for AWGs from 14 to 28.
- Route power and device wiring separately according to best practices.
- Calculate the maximum current that can flow through each power and common wire. Ensure that the power draw is within the limits set by your local electrical code.
- Electrically similar wiring should not be bundled together.
- Ensure that inputs and outputs are wired separately.

IMPORTANT	It is possible for signal interference to occur when power and communication wiring are routed through the same conduit. Ensure that power and communications wires are routed through separate conduits to avoid interference and degradation of signal quality.

2.7. Grounding the Device

Follow the grounding procedure instructions and observe these warnings to ensure your equipment is adequately connected to earth ground:

WARNING 	Make sure the device is properly grounded before connecting it. An improper grounding setup may pose a safety risk and could be hazardous.

WARNING 	The ground connection must always be made first and disconnected last when installing or replacing the unit.

WARNING 	Equipment or cables should not be serviced during periods of lightning activity.

Follow these steps to install a single-ground lug on the switch.

- Make sure you locate the ground adaptor and lug that come with the switch.

1. If the ground wire is insulated, strip it to 0.5 inch (12.7 mm) ± 0.02 inch (0.5 mm).

Prepare the Grounding Screw and Wire

2. Insert the Earth Ground Screw with the green-yellow wire (wire size: 20 AWG minimum) and tighten it. Connection of the other end to the building protective earth

Install the Grounding Screw

3. Locate the grounding hole on the rear panel of the switch.
4. Insert the grounding screw with the attached wire into the hole.
5. Tighten the screw securely.

Connect the Grounding Wire to the Building Earth

6. Route the other end of the grounding wire to a suitable grounding point within the building, such as a grounding busbar or a dedicated grounding electrode.
7. Connect the wire to the grounding point using a secure method, such as a terminal block or a lug and screw connection. Ensure a reliable electrical connection.

Note: For optimal grounding performance, consult local electrical codes and regulations for specific requirements regarding grounding points, wire sizes, and installation techniques.

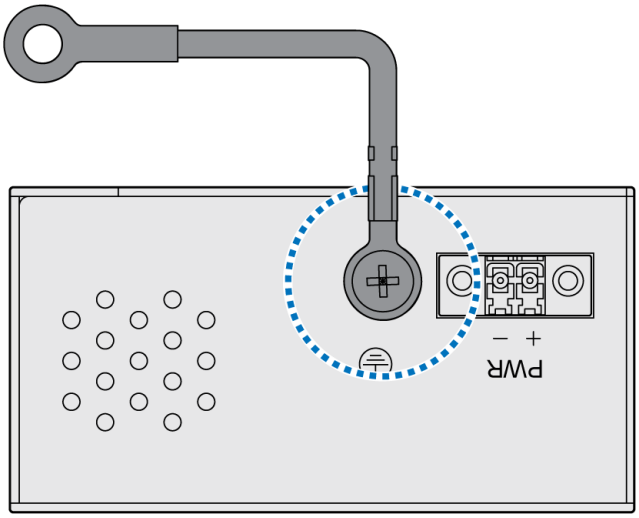


Figure 15: Installing a Ground Lug and Wire

2.8. Wiring a Relay

The two contacts on the side and the front two contacts on the 4-contact terminal block connector are for the DC inputs. As illustrated in the following figure, the side and front view of a terminal block are displayed.

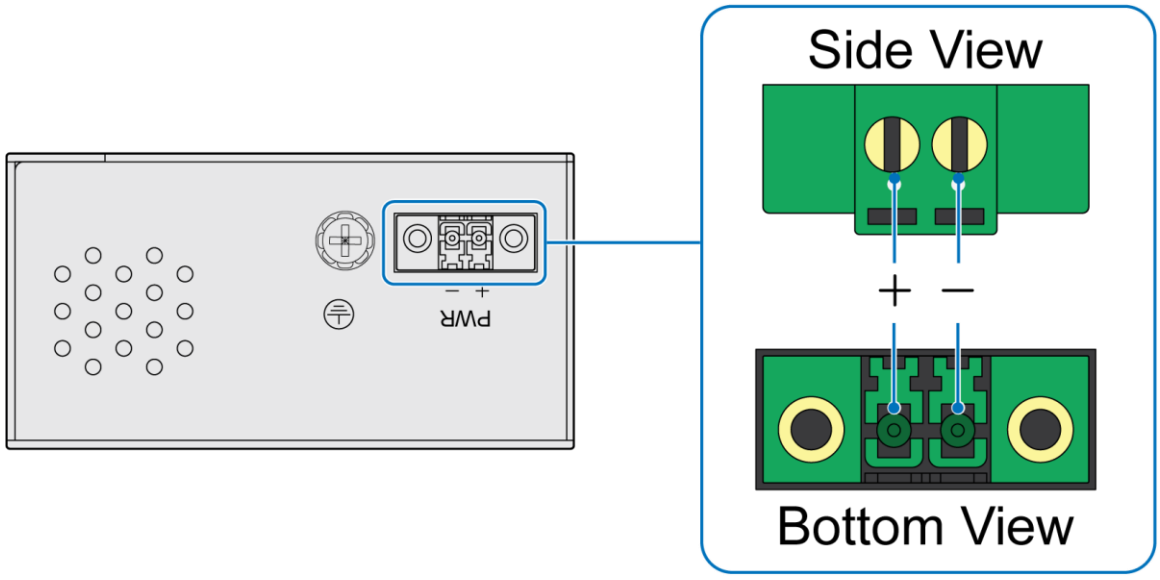


Figure 16: Terminal Block Side and Front Views

2.8.1. Wiring Power Inputs

Power cables for DC power systems include 12-48V power cables and a RTN ground cable. Based on actual sire requirements, ensure that the DC power cables are of a suitable length.

WARNING 	Prior to disconnecting any modules or cables, ensure that the power is switched off. It is important to note that the device only supports the voltage specified on the type plate. Avoid using any power components that are not explicitly designated for the switch device.
CAUTION 	The installation and maintenance of input terminal block connector must be carried out by qualified personnel.

To wire the power inputs:

Ensure that the power is disconnected from both the switch and the power converter before proceeding. Follow these steps:

Loosen the Screws:

1. Locate the input terminal block connector on your equipment.
2. Carefully loosen the screws that hold the connector in place. This will allow you to insert the input wire.

Insert the Input Wire:

3. Prepare your input wire. Ensure it meets the specified requirements: 12/24/48 VDC voltage, 28-14 AWG minimum wire size, and copper wire type.
4. Carefully insert the stripped end of the input wire into the appropriate terminal on the input terminal block connector. Make sure the wire is inserted securely and correctly.

Tighten the Screws:

5. Once the wire is inserted, tighten the screws on the input terminal block connector. Use a torque wrench to ensure you apply the correct torque of 0.19 Nm (1.7 lbin). This is important for a secure and reliable connection.

Install the Connector:

6. Carefully install it back into its designated place on the equipment. Make sure it's properly seated and secured.

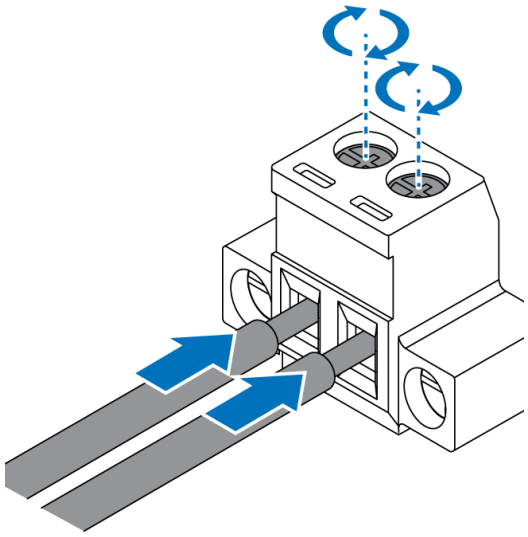


Figure 17: Installing Power Cabling in a Terminal Block

2.9. Power Supply Specifications

DC Power Supply Requirements:

- Voltage: 12/24/48 VDC
- Current: 0.21 A (minimum)
- Operating Temperature: Maximum 75 °C
- Operating Altitude: Maximum 2000 meters

Power Source Requirements:

- Approval: Must be UL Listed.
- Isolation: Double or reinforced insulation is required when using the unit with DC power to separate it from the AC mains.

For further assistance or information, contact Beijer Electronics Corp.

Table 1 Power Supply Specifications - JetNet 2208 Series

Model	Input Range	Power Consumption
JetNet 2208-T8	12/24/48VDC	< 2.4W
JetNet 2208-T7-SC1-SM JetNet 2208-T7-SC1-MM		< 3.36W