F&eIT Series

10/100/1000M AUTO-MDIX
Industrial switchingHUB
For DIN rail, 8 ports

SH-9008H-FIT

User's Manual

CONTEC CO., LTD.

Check Your Package

Thank you for purchasing the CONTEC product.

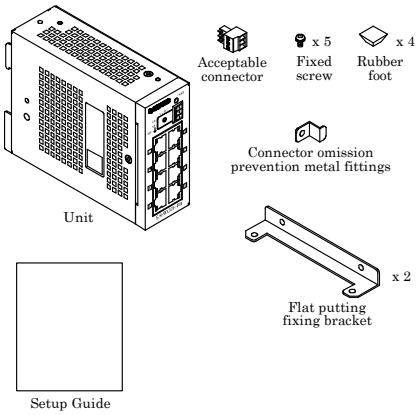
The product consists of the items listed below.

Check, with the following list, that your package is complete. If you discover damaged or missing items, contact your retailer.

Product Configuration List

Name	Pcs.
Unit	1
Setup Guide	1
Acceptable connector	1
Connector omission prevention metal fittings	1
Flat putting fixing bracket	2
Fixed screw M3×6	5
Rubber foot	4

* The manual of this product can be downloaded from CONTEC homepage (http://www.contec.com/) free of charge.



⚠ CAUTION

To operate this product, a power supply (12-24VDC±5%) is required separately.

For power supply, see Chapter 3, Nomenclature of unit Components and Their Settings, “About of Power Supply”.

Copyright

Trademarks

Table of Contents

1. Before Using the Product

This chapter provides information you should know before using the product.

About the Unit

SH-9008H-FIT is a compact-sized [39(W) × 120(D) × 94(H) mm] industrial switching HUB unit that is compliant with the IEEE802.3ab (1000BASE-T)/IEEE802.3u (100BASE-TX)/IEEE802.3 (10BASE-T) standards.
Its features include Jumbo Frame support, AutoMDI/MDI-X, auto-negotiation, and automatic power adjusting function. The automatic power adjusting function can reduce the power consumption by up to 60%. *1
With fan less configuration, SH-9008H-FIT is suitable for places where silence is required. In addition, the adoption of metal casing with great radiation performance enables the unit to be used in ambient temperatures of 0 to 50°C. A DIN rail mounting mechanism and the mounting brackets provided with the unit enable various types of installation.
Please read this manual carefully so that you can build a system by connecting the switching HUB unit to external devices.

Features

- Compact-sized (39 (W) × 120 (D) ×94 (H) mm) unit equipped with 8 ports capable of 1000BASE-T
  The compact-sized unit enclosure (39 (W) ×120 (D) ×94 (H) mm) is equipped with the 8 ports that are compliant with IEEE802.3ab (1000BASE-T)/IEEE802.3u (100BASE-TX)/IEEE802.3 (10BASE-T).
  With fan less configuration, this product is suitable for places where silence is required. In addition, the adoption of metal casing with great radiation performance provides the operating ambient temperature of 0 to 50°C.
- For jumbo frame
  It is compatible with Jumbo Frame that increases transfer rate. Connection with Jumbo Frame compatible devices increases data transfer rate and contributes to increased transfer rate and reduced CPU load.
- Auto MDI/MDI-X feature, auto-negotiation feature
  The Auto MDI/MDI-X feature can automatically recognize the cable type, straight-through cable or crossover cable, to prevent problems using the wrong cable type.

  Also, the auto-negotiation feature can automatically recognize and choose the best communication rate (10/100/1000Mbps) and method (half/full duplex) available.
- Automatic power adjusting function
  This function can automatically adjust the power consumption of unused ports, enabling reduced power consumption by up to 60%. *1
- Flexible installation orientation.
  The unit is equipped with a 35mm DIN rail mounting mechanism as standard. Also, the mounting brackets provided with the unit make installation in any orientation possible (floor, ceiling, etc.).
- Capable of running on a wide range of input voltages (12 to 24VDC)
  The unit will function normally even if input voltage fluctuates within the acceptable range. In addition, the power connector includes an FG terminal.

*1 The comparison result of measured values when all (eight) ports are in operation with those when all (eight) ports are unused.

Customer Support

CONTEC provides the following support services for you to use CONTEC products more efficiently and comfortably.
Download the latest drivers from CONTEC's Web site to use. In addition, as documents such as precautions are also provided on the Web site, have a look on CONTEC's Web site.

Web Site

Japanese http://www.contec.co.jp/
English http://www.contec.com/
Chinese http://www.contec.com.cn/

Latest product information
CONTEC provides up-to-date information on products.

CONTEC also provides product manuals and various technical documents in the PDF.

Free download
You can download updated driver software and differential files as well as sample programs available in several languages.

Note! For product information
Contact your retailer if you have any technical question about a CONTEC product or need its price, delivery time, or estimate information.

Limited One-Year Warranty

CONTEC F&eIT products are warranted by CONTEC CO., LTD. to be free from defects in material and workmanship for up to one year from the date of purchase by the original purchaser.

Repair will be free of charge only when this product is returned freight prepaid with a copy of the original invoice and a Return Merchandise Authorization to the distributor or the CONTEC group office, from which it was purchased.

This warranty is not applicable for scratches or normal wear, but only for the electronic circuitry and original products. The warranty is not applicable if the device has been tampered with or damaged through abuse, mistreatment, neglect, or unreasonable use, or if the original invoice is not included, in which case repairs will be considered beyond the warranty policy.

How to Obtain Service

For replacement or repair, return the device freight prepaid, with a copy of the original invoice. Please obtain a Return Merchandise Authorization Number (RMA) from the CONTEC group office where you purchased before returning any product.

* No product will be accepted by CONTEC group without the RMA number.

Liability

The obligation of the warrantor is solely to repair or replace the product. In no event will the warrantor be liable for any incidental or consequential damages due to such defect or consequences that arise from inexperienced usage, misuse, or malfunction of this device.

Safety Precautions

Understand the following definitions and precautions to use the product safely.

Safety Information

This document provides safety information using the following symbols to prevent accidents resulting in injury or death and the destruction of equipment and resources. Understand the meanings of these labels to operate the equipment safely.

⚠ DANGER	DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

Handling Precautions

⚠ DANGER

Do not use the product where it is exposed to flammable or corrosive gas. Doing so may result in an explosion, fire, electric shock, or failure.

⚠ CAUTION

- The link speed value (e.g., 1000Mbps) of the transmission rate used in the Manual (this document) is the theoretical maximum value of the wired LAN standard and do not indicate the actual data transmission speed.
- The frame loss could occur depending on the connection destination or installed environment.
- When attempt is made to perform communication for devices that are not Jumbo Frame compatible, communication efficiency may drop extremely. There are also cases where communication is disconnected.
- As this product contains precision electronic components, do not use or store magnetic field or radio waves. They may cause the malfunction, heat generation, fault, or damage.
- Do not use or store the equipment in a hot or cold place, or in a place that is subject to severe temperature changes. They may cause the malfunction, heat generation, fault, or damage.
- Do not use or store the equipment in a place subject to direct sunlight or near a heating device, such as a stove. And do not use or store the product near equipment generating a strong magnetic field or radio waves. They may cause the malfunction, heat generation, fault, or damage.
- Do not use or store this product in the presence of chemicals.
- Do not use this product in extremely humid or dusty locations. It is extremely dangerous to use this product with its interior penetrated by water or any other fluid or conductive dust. If this product must be used in such an environment, install it on a dust-proof control panel, for example.

- If you noticing abnormal odor or overheat, please unplug the power cord immediately.
- When you find faults or abnormalities (bad smell or excessive heat), pull the power cord off, then contact the shop you bought the product or our information center.
- The product could be very hot in the operation. Please do not touch by hands or body. It may cause burns.
- To avoid electric shock, please do not touch the system with a wet hand.
- Do not open the unit casing. CONTEC will disclaim any responsibility for equipment whose casing has been opened.
- Do not modify the unit. CONTEC will bear no responsibility for any problems, etc., resulting from modifying this unit.
- To clean this product, gently wipe it with a soft cloth soaked with water or a neutral detergent. Do not use benzene, a thinner, or other volatile solvents as they can cause the coating to discolor or peel off.
- Do not modify the product. CONTEC will bear no responsibility for any problems, etc., resulting from modifying this product.
- If you move or transfer the product, make sure to attach the Setup Guide (this document).
- To use the product in places affected by overcurrent or overvoltage (lightning surge, etc.), select appropriate surge protection device (SPD) for all entry paths (power line, LAN, ground, etc.). For selection/introduction/installation of SPD, please consult a specialist.
- Regardless of the foregoing statements, CONTEC is not liable for any damages whatsoever (including damages for loss of business profits) arising out of the use or inability to use this CONTEC product or the information contained herein.

FCC PART15 class A Notice

NOTE

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 limits are designed to provide reasonable protection against harmful interference when the equipment is operated in commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference at his own expense.

WARNING TO USER

Change or modifications not expressly approved the manufacturer can void the user's authority to operate this equipment.

Environment

Use this product in the following environment. If used in an unauthorized environment, the board may overheat, malfunction, or cause a failure.

Operating temperature

0 - 50°C

Operating humidity

10 - 90%RH (No condensation)

Corrosive gases

None

Floating dust particles

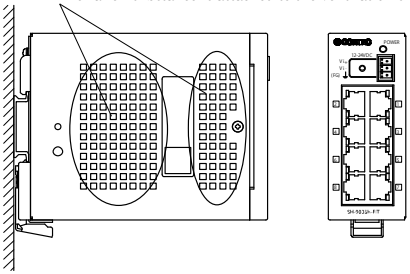
Not to be excessive

Inspection

Inspect the product periodically as follows to use it safely.

* The ventilation slits are not covered, and neither dust nor alien substance is attached to the ventilation slits.

* The ventilation slits are not covered, and neither dust nor alien substance is attached to the ventilation slits.



Storage

When storing this product, keep it in its original packing form.

(1) Put the unit in the storage bag.

(2) Wrap it in the packing material, then put it in the box.

(3) Store the package at room temperature at a place free from direct sunlight, moisture, shock, vibration, magnetism, and static electricity.

Disposal

When disposing of the product, follow the disposal procedures stipulated under the relevant laws and municipal ordinances.

2. Setup of Hardware

Mounting or Removed DIN rail

Mounting on a DIN rail

(1) Hook the clips on the upper DIN rail fixation metal fittings to the groove on the upper DIN rail, then push the lower part of the product to the DIN rail.

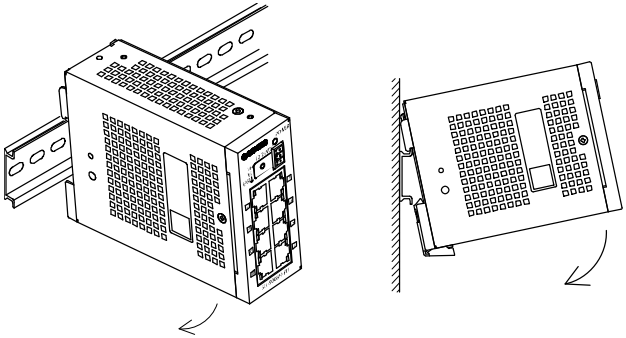


Figure 2.1. Mounting on a DIN rail < *1* / *2* >

(2) The Latch metal fittings is automatically locked, and the unit can be mounted in one-touch.

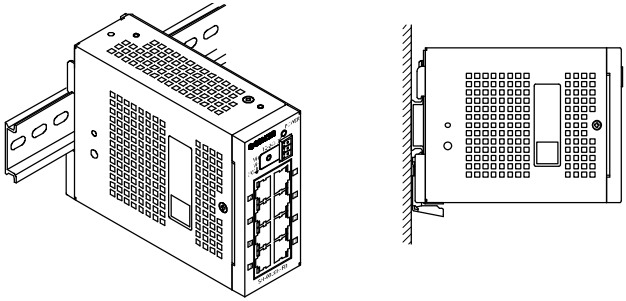


Figure 2.2. Mounting on a DIN rail < *2* / *2* >

Removed DIN rail

A Phillips-head screw driver or a flathead screw driver is required to remove the unit from the DIN rail.

⚠ WARNING

Remove LAN cables and power cables connected to the unit before removal from the DIN rail.

For a Phillips-head screw driver

(1) Push a phillips-head screw driver (diameter: 6-7mm) into the latch metal fitting on the lower part of product. Do not put too much force in doing that. The DIN rail fixation metal fittings or the product may be damaged.

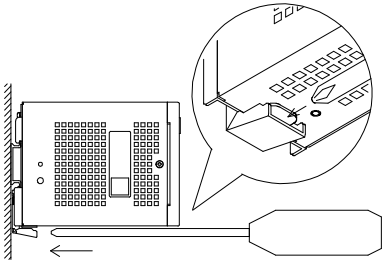


Figure 2.3. Removing the unit from the DIN rail with phillips-head screw driver < *1 / 3* >

(2) The latch metal fitting is pushed down and the product can be removed from the DIN rail.

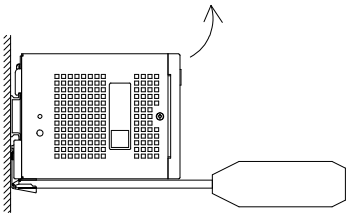


Figure 2.4. Removing the unit from the DIN rail with phillips-head screw driver < *2 / 3* >

(3) By lifting the unit, you can easily remove it from the DIN rail.

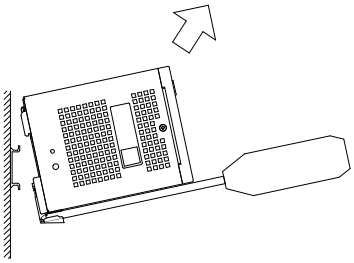


Figure 2.5. Removing the unit from the DIN rail with phillips-head screw driver < *3 / 3* >

For a flathead screw driver

(1) Push the flathead screw driver (tooth width 5.5 - 7mm) into the latch metal fitting at the lower section of the unit, and then push it down vertically.

Do not put too much force in doing that. The DIN rail fixation metal fittings or the product may be damaged.

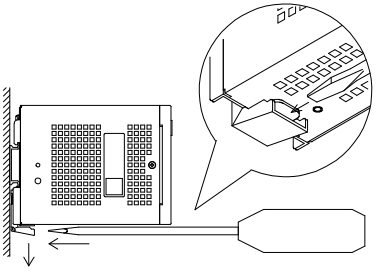


Figure 2.6. Removing the unit from the DIN rail with flathead screw driver < *1 / 3* >

(2) The latch metal fitting is pushed down and the product can be removed from the DIN rail.

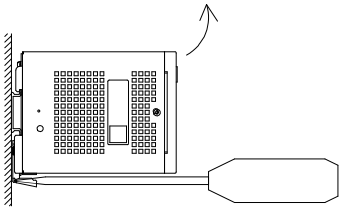


Figure 2.7. Removing the unit from the DIN rail with flathead screw driver < *2 / 3* >

(3) By lifting the unit, you can easily remove it from the DIN rail.

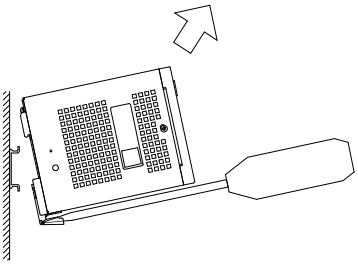


Figure 2.8. Removing the unit from the DIN rail with flathead screw driver < *3 / 3* >

Mounting of Flat putting fixing bracket and rubber foot

Mounting

Remove the four location screws used for fixing the unit and the DIN rail mounting brackets, and then remove the DIN rail mounting brackets from the unit. This operation is performed for both flat putting fixing brackets and rubber feet.

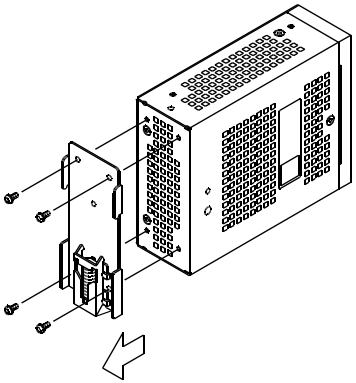


Figure 2.9. Removed of DIN rail fixing bracket

Flat putting fixing bracket

Fixes the unit with screws supplied with this product.

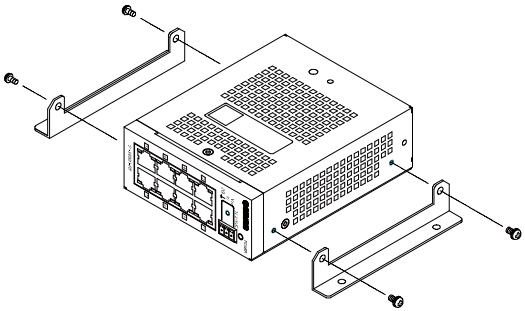


Figure 2.10. Mounting of flat putting fixing bracket

Rubber foot

Align with the four corners on the unit overview level side, and mount the rubber feet supplied with this product.

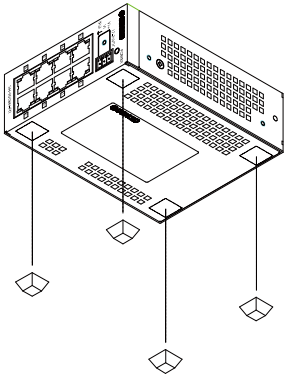


Figure 2.11. Mounting of rubber foot

Mount of connector omission prevention metal fittings

Mounting

(1) Connect an appropriate connector to the power connector, mount the connector detaching prevention metal fitting.

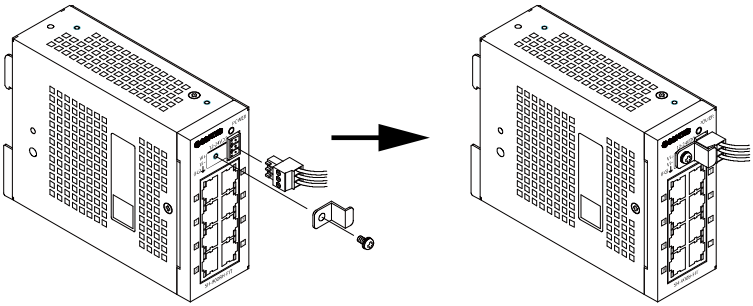


Figure 2.12. Mount of connector omission prevention metal fittings

Installation Conditions

⚠ WARNING

Even within the temperature specification range, make sure the heat in the unit can let off adequately in the case of high temperature environment application.

Installation orientation

When DIN rail mounted

Avoid installation on unsuitable installation directions as insufficient heat dissipation may occur.

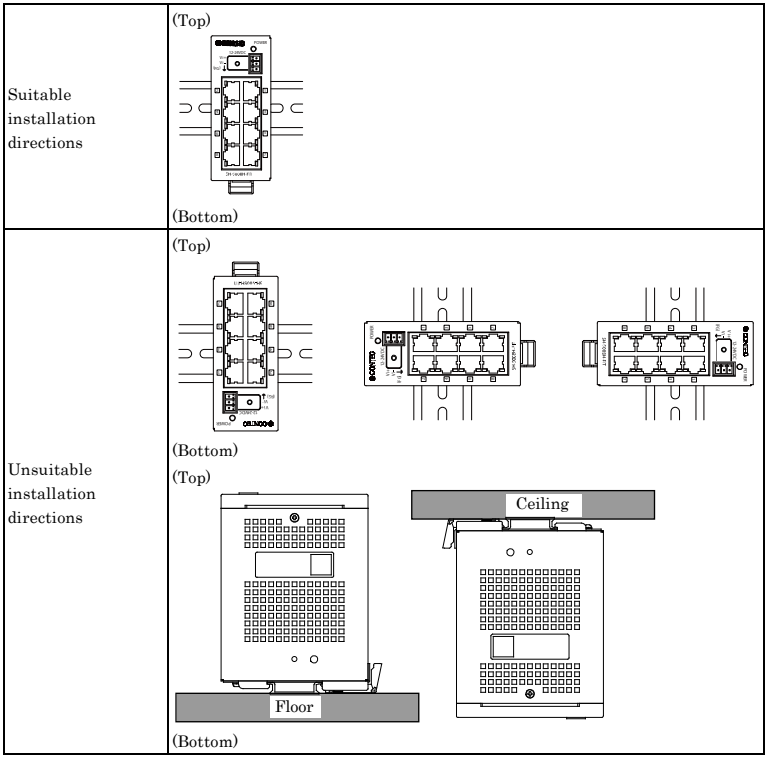


Figure 2.13. Installation direction (when the DIN rail fixing brackets mounted)

Flat putting fixing bracket mounted

Installation in all directions is possible if flat putting fixing brackets are mounted. However, as heat dissipation may be not adequate compared with installation in other directions, keep the distance from surrounding objects as long as possible in case of high temperature environment application.

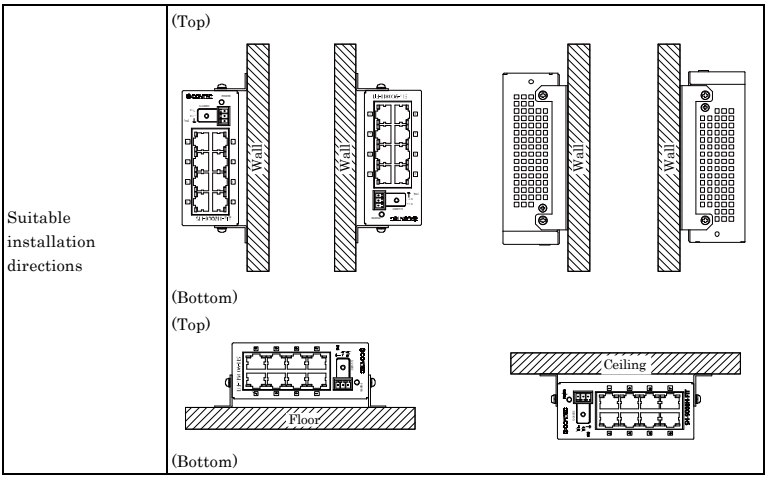


Figure 2.14. Installation direction (when flat putting fixing brackets mounted)

Rubber foot mounted

Mount the rubber feet to install it if fixing brackets are not mounted in the case of horizontal installation. Avoid installation on unsuitable installation directions as this may cause insufficient heat dissipation and overturning.

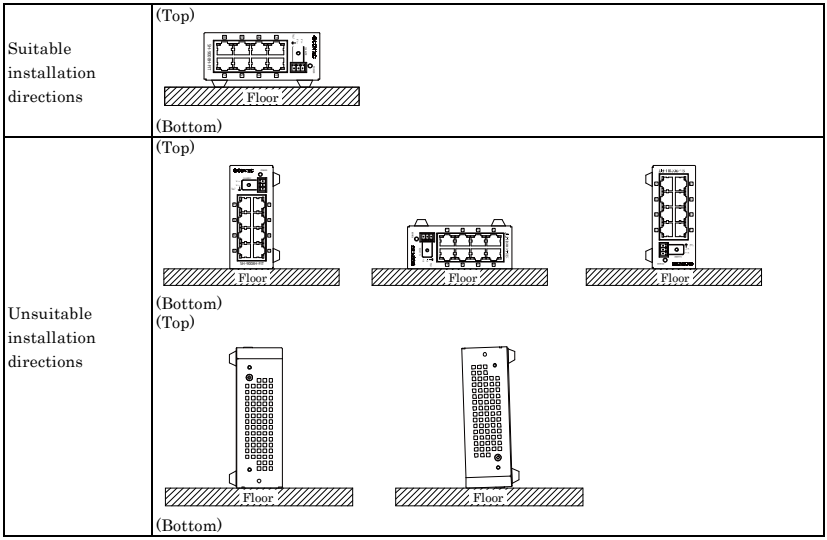


Figure 2.15. Installation direction (in the case of rubber feet)

Spacing between the system unit and any surrounding objects

⚠ WARNING

Do not locate the module in a fully enclosed housing.

DIN rail mounted

Secure a distance of at least 50mm between the top/bottom of the main unit and any surrounding objects and also a distance of at least 50mm between each side of the unit and any surrounding objects (5.8mm for the unit overview level side).

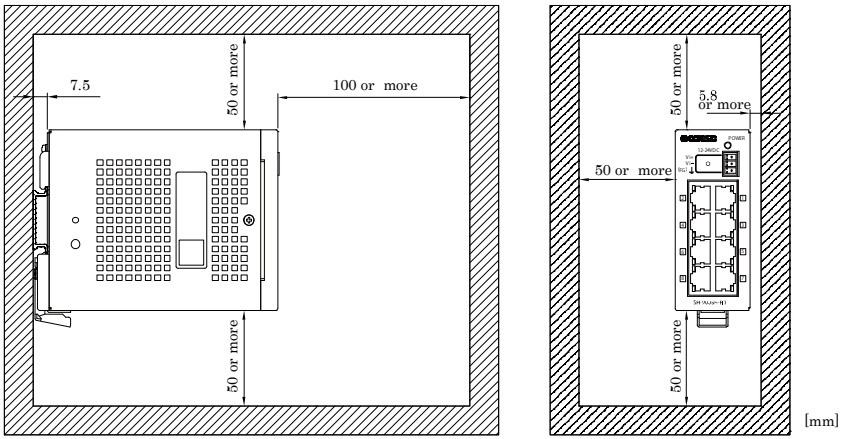


Figure 2.16. Spacing between the system unit and any surrounding objects while the DIN rail mounted

When flat putting fixing brackets and rubber feet mounted

Secure a distance of at least 50/5.8mm between the top/bottom of the main unit and any surrounding objects and also a distance of at least 50mm between each side of the unit and any surrounding objects.

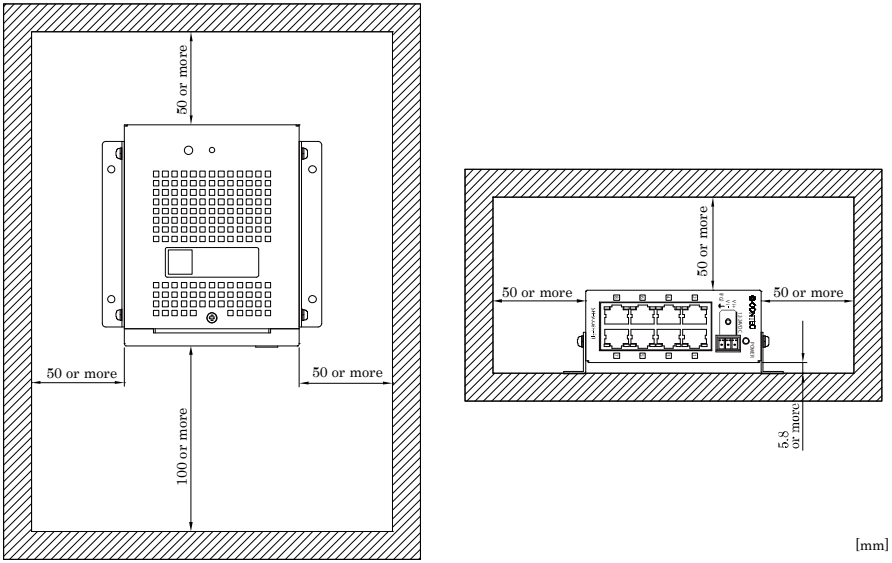


Figure 2.17. Spacing between the system unit and any surrounding objects while flat putting fixing brackets and rubber feet mounted

3. Nomenclature of unit Components and Their Settings

Name of unit Components and Function

Figure 3.1 shows the nomenclature of unit components.

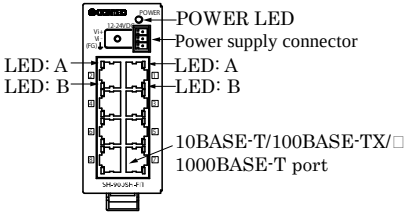


Figure 3.1. Names of unit Components

Table 3.1. LED Indicators

Name	Status	Color	Content of Display
POWER LED	POWER	Green	OFF : Power off ON : Power on
LED:A	10Mbps 100Mbps	Yellow Green	OFF : No LINK ON : LINK
LED:B	1000Mbps	Green	Flashing : ACT(Data send/ receive)

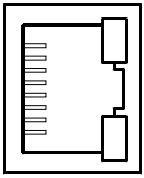
Table 3.2. Connectors

Name	Function
Power supply Connector	Acceptable connector(Appending):MC1,5/3-ST-3,5(PHOENIX CONTACT) The correspondence cable is AWG28-16. (In the length of the cable, it is a condition to fill the power supply specification.) You can prevent connectors from being omitted by connector omission prevention metal fittings. You can connect cables by screw cramps.

Power Supply Connector	MC1,5/3-G-3,5 (PHOENIX CONTACT)	
12 - 24VDC	Vi+ Vi- FG	
Pin Number	Signal	Description
1	Vi+	Power (12-24VDC±5%)
2	Vi-	Power(GND)
3	FG	Frame Ground

Table 3.3. 10BASE-T/100BASE-TX/1000BASE-T port

Name	Function
10BASE-T/ 100BASE-TX/ 1000BASE-T port	Ports 1 - 8 This is the port for connecting the PC (LAN adapter) and other HUB units and bridges. Auto-negotiation of communication rates (10Mbps/100Mbps/1000Mbps), and communication methods(Half/Full duplex). By Auto MDI/MDI-X function, straight cable and the cross cable are recognized automatically.

Use connector	JC0-0182NL(Pulse)	
		
Pin name	Signal	Description
1	TRD+(0)	Data0 is transmitted and received(+)
2	TRD-(0)	Data0 is transmitted and received(-)
3	TRD+(1)	Data1 is transmitted and received(+)
4	TRD+(2)	Data2 is transmitted and received(+)
5	TRD-(2)	Data2 is transmitted and received(-)
6	TRD-(1)	Data1 is transmitted and received(-)
7	TRD+(3)	Data3 is transmitted and received(+)
8	TRD-(3)	Data3 is transmitted and received(-)

About of Power Supply

For power supply, use the power supply that rises within an input voltage range of 11.6VDC or higher within 50msec. The power supply that cannot meet this requirement may cause device failure or accident.

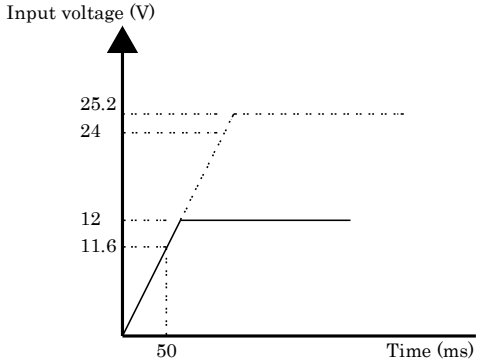


Figure 3.2. Graph of Rise Time of Power Supply

4. Connecting to a Network

Network Cables

Cables meeting the following specifications should be used:

- 10BASE-T : Equal to greater than Category 3 UTP, STP cable 100m or less
- 100BASE-TX : Equal to greater than Category 5 UTP, STP cable 100m or less
- 1000BASE-T : Equal to greater than Category 5e UTP, STP cable 100m or less
- There are straight/cross UTP and STP cables. Auto MDI/MDI-X feature allows connection of your Switching HUB unit to a personal computer (LAN adapter) or another HUB unit and a bridges using either a straight or cross cable.

Connecting a Personal Computer, another HUB unit or bridge

When connecting the Switching HUB unit to a personal computer, an F&eIT series contoroller unit, another HUB unit or a bridge, use any 10BASE-T/100BASE-TX/1000BASE-T port and either a straight or cross cable.

⚠ WARNING

When using Jumbo Frame, it is necessary for other network devices of the communication partner, such as LAN adapters, to be Jumbo Frame compatible.

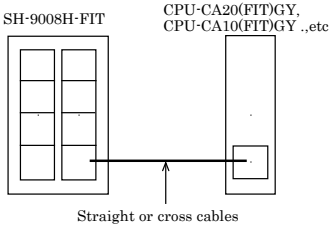


Figure 4.1. An example for connection with PC or other HUBs and control modules

Connection Restrictions with 100BASE-TX Repeater HUBs

Cascade connection with 100BASE-TX repeater HUBs at Class I is possible. Up to two stages of cascade connection between 100BASE-TX Class II repeaters is possible. In addition, the total maximum cable length of cables (1)(2)(3) is 205m or less. For details, see the operation manual of your100BASE-TX repeater HUB.

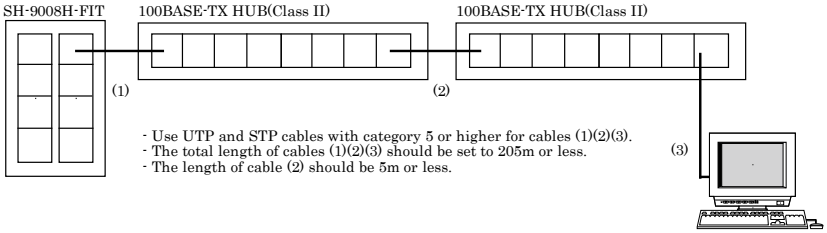


Figure 4.2. Connection restrictions with 100BASE-TX repeater HUB (Class II)

Connection Restrictions with 10BASE-T Repeater HUBs

As many as four stages of 10BASE-T repeater HUBs can be connected using cascade connection. In addition, the maximum length of UTP and STP cables between cascaded HUBs is 100m. For details, see the operation manual of your 10BASE-T repeater HUB.

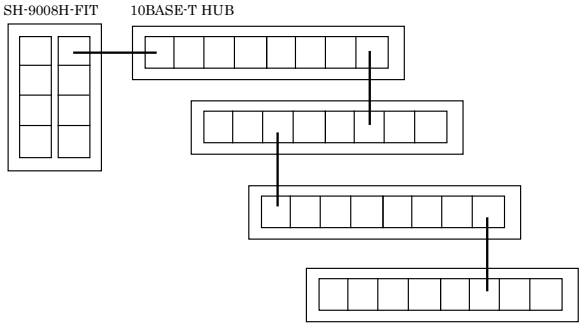


Figure 4.3. Connection restrictions with 10BASE-T repeater HUBs

5. System Reference

Specification

Table 5.1. Specifications

Item	Specification
Ethernet standards	IEEE802.3/IEEE802.3u /IEEE802.3ab –compliant
Data transfer rate	10Mbps/100Mbps/1000Mbps (auto-negotiation)
Access method	CSMA/CD
Communications method	All ports: Full/Half duplex (auto-negotiation)
Topology	Star topology
Flow control	Full Duplex : IEEE802.3x compliant flow control Half Duplex :Back pressure
Number of effective ports	8
Switching method	Store and forward
Address table	8,192 entries
Jumbo frame*1	9.6Kbyte
Buffer capacity	512Kbyte
Aging time	300sec (Max.)
LED indicator	POWER(Green), LINK/ACT 10M(Yellow), LINK/ACT 100M(Green), LINK/ACT 1000M(Green)
Power supply voltage	12V - 24VDC±5%
FG pin	Power supply connector equipped with FG pin
Power consumption (Max.)	When inputting 12V : 0.65A, When inputting 24V : 0.35A
Physical dimensions (mm)	39(W) x 120(D) x 94(H) (exclusive of protrusions)
Weight	360g (410g when the DIN rail fixation metal fittings(standard) or the flat putting fixing bracket is installed)
Module installation method	One-touch attachment of a 35mm DIN rail. (Mounting mechanism is equipped with the main body as standard), Fixation with the mounting phase by using the flat putting fixing bracket and rubber feet.

*1 When using Jumbo Frame, it is necessary for other network devices on the communication route to be Jumbo Frame compatible.

Table 5.2. Installation Environment Requirements

Item		Specification
Operating temperature		0 - 50°C
Storage temperature		-10 - 60°C
Humidity		10 - 90%RH(No condensation)
Floating dust particles		Not to be excessive
Corrosive gases		None
Line-Noise resistance	Line-noise	AC line/2kV, Signal line/1kV (JIS C61000-4-4Level 3, EN61000-4-4Level 3)
	Static electricity resistance	Contact discharge/4kV (JIS C61000-4-2Level 2, EN61000-4-2Level 2) Atmospheric discharge/8kV (JIS C61000-4-2Level 3, EN61000-4-2Level 3)
Vibration resistance	Sweep resistance	10 - 57Hz/semi-amplitude 0.15mm,57 - 150Hz/2.0G 40minutes each in X, Y, and Z directions (JIS C60068-2-6-compliant, IEC60068-2-6-compliant)
Impact resistance		15G, half-sine shock for 11ms in X, Y, and Z directions (JIS C60068-2-27-compliant, IEC60068-2-27-compliant)
Grounding		Class D grounding (previous class 3 grounding)

Physical Dimensions

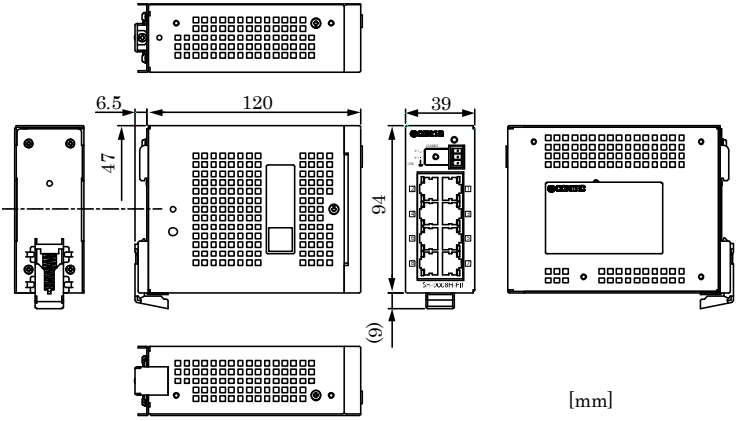


Figure 5.1. Physical dimensions when Din rail fixation metal fittings (standard) are installed

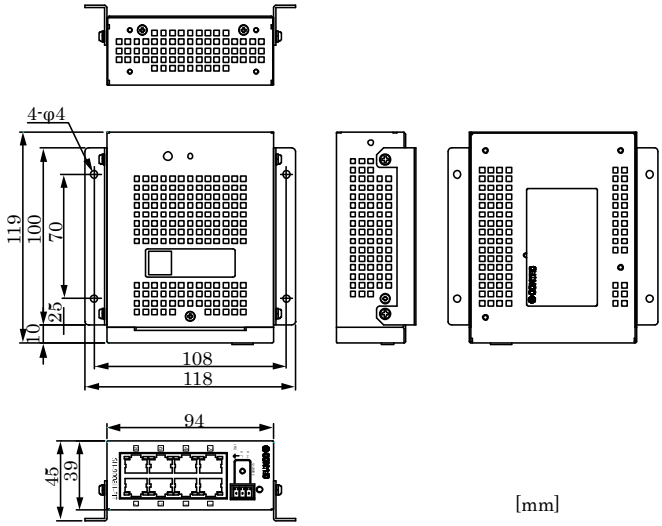


Figure 5.2. Physical dimensions when flat putting fixing brackets is installed

Differences from SH-9008-FIT

SH-9008H-FIT, the higher-grade model of the conventional SH-9008-FIT, has the main differences as follows:

	SH-9008-FIT	SH-9008H-FIT
Capacity of buffer	176Kbyte	512Kbyte
Power consumption (Max.)	For 12V input : 0.6A, For 24V input : 0.4A	For 12V input : 0.65A, For 24V input : 0.35A

SH-9008H-FIT

User's Manual

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