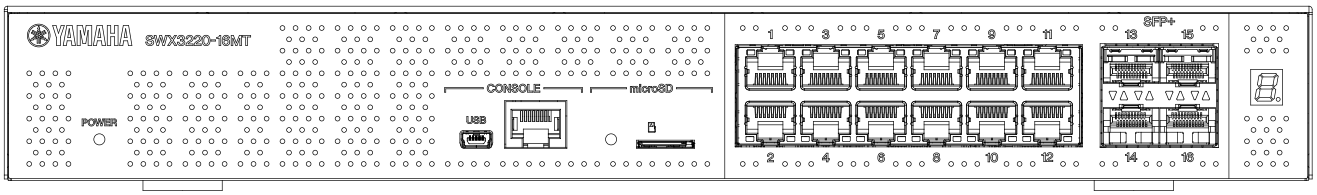
L3 SWITCH
SWX3220-16MT

User Guide



EN

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1. Introduction

1.1. Product Features

The “SWX3220-16MT” standard L3 switch continues on with the features of the SWX3200 Series, while featuring high-speed LAN ports with speeds of more than 1 Gbps. In addition to the models that offer the previous type of LAN ports, this series also includes models with SFP+ ports, allowing you to select the model that meets your capacity distance and quantity requirements. This product can be used as a core switch or as a distribution switch for medium-sized networks.

1.2. Included items

Verify that the following included items are present.

- Read This First (printed documentation)
- Power cord
- Power cord clamp (used only for the included dedicated power cord)
  Use this when plugging in the power cord. For details on installation, refer to “Connecting the power cord”.
- Rubber foot (4)
  These are necessary when Placing the product on a level surface. For details on installation, refer to “Placing the product on a level surface”.
- 19-inch rack mount hardware (2)
  These are required when installing this product in a 19-inch rack (1U size). For details on installation, refer to “Installing in a 19-inch rack”.
- Wall mount hardware (2)
  For details on installation onto a wall or ceiling, refer to “Installing onto a wall or ceiling”.
- Universal screws for hardware mounting (flat-headed, diameter: 3.0 mm, length: 8.0 mm, screw head diameter: 5.5 mm) (8)
  Eight screws are used for the 19-inch rack mount hardware, and six screws are used for the wall mount hardware.
- Dust cover (4)
  These are pre-installed on the SFP+ ports when the product is shipped.
  Leave these dust covers on all ports to which cables will not be connected, to protect the product from dust getting inside.

1.3. Optional accessories

- SFP module:SFP-SWRG-SX/SFP-SWRG-LX
  Standards supported: 1000BASE-SX/1000BASE-LX
  This is necessary when connecting fiber optic cables.
  Attach this to the SFP+ ports. For details on attaching, refer to “Installing an SFP module”.
- SFP module:SFP-SWRT-SR/SFP-SWRT-LR
  Standards supported: 10GBASE-SR/10GBASE-LR
  This is necessary when connecting fiber optic cables.
  Attach this to the SFP+ ports. For details on attaching, refer to “Installing an SFP module”.
- Direct attach cable:DAC-SWRT-3M/DAC-SWRT-1M
  This cable can be used to directly connect SFP+ ports between Yamaha products. This allows you to build an inexpensive 10-gigabit Ethernet system, although with limited distance.
  For switches that support stack functionality, this cable can also be used as a stack cable.
  For details on attaching, refer to “Installing a direct attach cable”.

For details on optional accessories, refer to the websites listed below.
http://www.yamahaproaudio.com/

1.4. Website information

The contents of “Optional accessories,” “Read This First,” “User guide,” “Command reference” and “Technical data” are available on the following websites.
http://www.yamahaproaudio.com/

1.5. Manual information

The following manuals are provided to match various usage scenarios for this product. Refer to the appropriate manual according to your needs.

- Read This First (printed documentation)
  Includes various points of caution regarding the use of this product. Read this document before using the product.
- User Guide (this guide)
  Includes information on installing, connecting and configuring the settings for this product.
- Command reference (website)
  Lists the command formats used when configuring this product, and usage examples for each.
- Technical data (website)
  Provides detailed information on this product’s functions.
- Help contents for the “Web settings screens”
  Lists detailed explanations of each parameter in the settings.

1.6. Conventions used in this guide

- Copying or reproduction of this guide in whole or in part is expressly forbidden without the written consent of the manufacturer.
- The explanations in this guide are based on current product specifications as of the date of publication. The latest version of this document can be downloaded from the Yamaha website.
- All illustrations and screens included in this guide are for the purpose of explanation.
- Company names and product names in this guide are abbreviated as follows.
    - Yamaha L3 switch SWX3220-16MT: this product
    - 100BASE-TX/1000BASE-T/2.5GBASE-T/5GBASE-T/10GBASE-T cable: LAN cable
- Other company names and product names in this document are the registered trademarks or trademarks of their respective corporate owners.
    - Microsoft and Windows are registered trademarks of Microsoft Corporation USA in the USA and other countries.
- The symbols listed in this guide and their contents are as follows.



Warning
Refers to a situation that poses the risk of death or serious injury to the user.



Caution
Refers to a situation that poses the risk of injury to the user.



Caution
Refers to information that the user must comply with to avoid product malfunction, damage, faulty operations or loss of data.



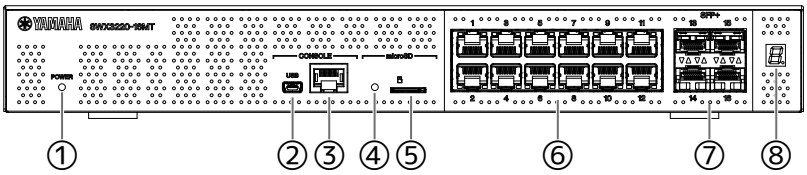
Important
Refers to information that the user must know to properly operate and use this product.



Memo
Refers to information regarding the operation and use of this product. Read this for your reference.

2. Controls and connectors

2.1. Front panel



① POWER indicator

Lights when power is supplied to the product.

POWER indicator	Status
Unlit	Power OFF
Flashing (green)	Power ON, starting up
Lit (green)	Power ON, normal
Lit (orange)	Power ON, error occurred

Caution

When one of the following errors is detected, the POWER indicator lights up orange. Check the detected error and handle as appropriate.
Use the “show environment” command to check the temperature and fan status.
For details on the commands, refer to the “Command reference” (on the Yamaha website).

- Fan stopped
  The fan that blows hot air out of the product has stopped.
  Stop using this product immediately and contact the dealer where you purchased this product to have the product inspected and/or repaired.
- Internal temperature error
  An internal temperature error has occurred inside of this product.
  Review the environment in which this product is installed, and correctly install this product so that the internal temperature is at an appropriate level.
- Corruption of config save area
  The config information cannot be read correctly at startup.
  Contact the dealer where you purchased this product to have the product inspected and/or repaired.

② mini-USB CONSOLE port

This is a mini-USB port used when making settings. Use a USB cable to connect it to the USB port of your computer. Use a USB cable equipped with a USB Type A connector and a USB mini-B (5-pin) connector.

Memo

- Use a cable that supports data transfer. Charge-only cables cannot be used.

③ RJ-45 CONSOLE port

This is an RJ-45 port used when making settings. Use an RJ-45/DB-9 console cable to connect it to the RS-232C connector (COM port) of your computer.

④ microSD indicator

Indicates the connection and usage status of the microSD card.

microSD indicator	Status
Unlit	A microSD card is not inserted in the slot.
Flashing (green)	The microSD card is being accessed.
Lit (green)	A microSD card is inserted.

Caution

- Do not remove the microSD card if this indicator is flashing green. If you do, your data may become corrupt.

⑤ microSD slot

Insert a microSD card into this slot.

⑥ LAN ports

These ports support 100BASE-TX/1000BASE-T/2.5GBASE-T/5GBASE-T/10GBASE-T communications.
The ports are compatible with IEEE802.3az Energy Efficient Ethernet (EEE) for low-power ethernet communications (low power consumption mode).
For details on the low power consumption mode settings, refer to the “Command reference” (Yamaha website).

⑦ SFP+ ports

These ports support 1000BASE-SX/1000BASE-LX/10GBASE-SR/10GBASE-LR communications.

Attach an SFP module or direct attach cable (sold separately) to these ports.

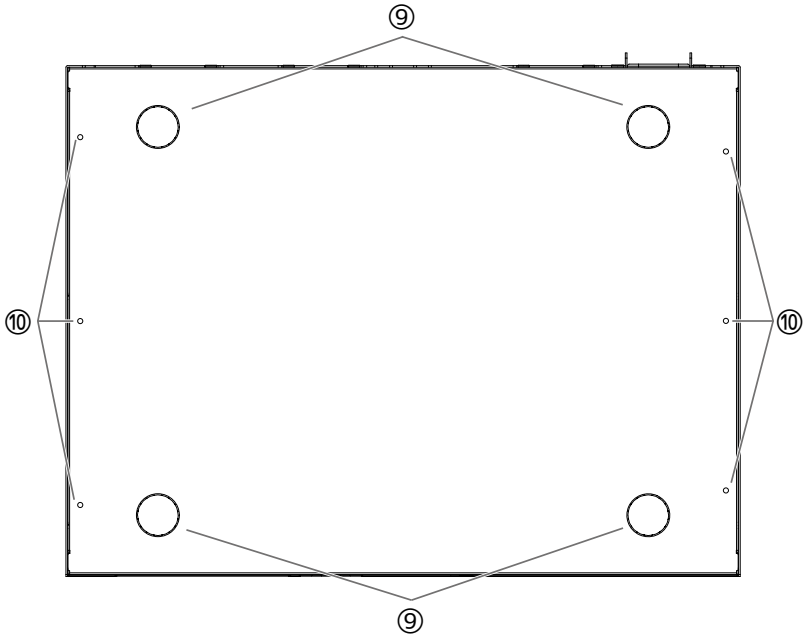
For details on products compatible with the SFP module, refer to “Optional accessories”.
For details on installation, refer to “Installing an SFP module” or “Installing a direct attach cable”.
These ports can also be used for stack connection. For details on stack connections, refer to “Making stack connections”.

⑧ Stack ID display indicator

This indicates the stack ID when stack connection is used.

When not using a stack connection, “1” is shown.
If the stack architecture has failed, “E” is shown.

2.2. Bottom panel



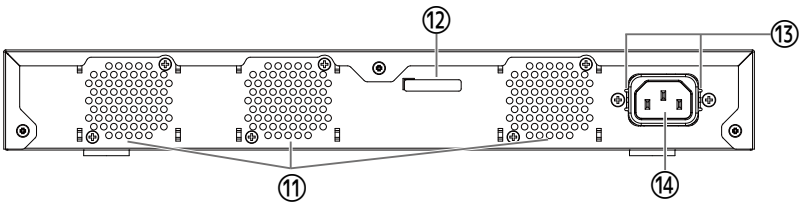
⑨ Rubber foot attachment guides

These are the locations where the rubber feet are to be attached when placing the product on a level surface. For details on installation, refer to “Placing the product on a level surface” in “Installation.”

⑩ Wall mount hardware attachment holes

Use these holes to attach the hardware included with the dedicated wall mount kit. For details on installation, refer to “Installing onto a wall or ceiling” in “Installation.”

2.3. Rear panel



⑪ Cooling vents

These holes are used to force out the hot air generated inside the product, using the fan.

Warning

- Do not block or place objects near the fan outlet.
  Doing so could cause fire or malfunctions.

⑫ Serial number

The same indication is shown on the product nameplate.

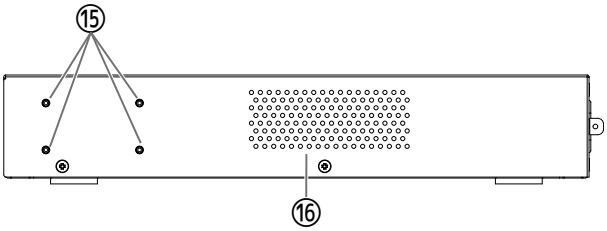
⑬ Power cord clamp attachment holes

The included power cord clamp (C-shaped) can be attached here. For details on installation, refer to “Connecting the power cord” in “Connections.”

⑭ Power supply inlet (three-prong connector, C14 type)

Insert the included power supply cord here.

2.4. Side panel



⑮ 19-inch rack mount hardware attachment holes

These are used when installing this product in a 19-inch rack (1U). For details on installation, refer to “Installing in a 19-inch rack” in “Installation.”

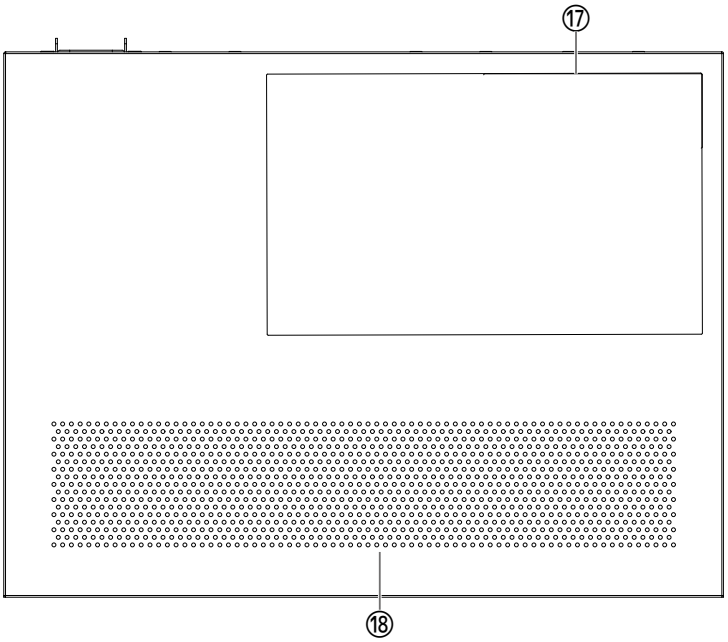
⑯ Cooling vents

These holes are used when drawing in outside air with the fan to cool the product.

Warning

- Do not block the cooling vents or place objects near them.
  Doing so could cause fire or malfunctions.

2.5. Top panel



⑰ Product label

This lists the model name, serial number, MAC address and other information pertaining to this product.

⑱ Cooling vents

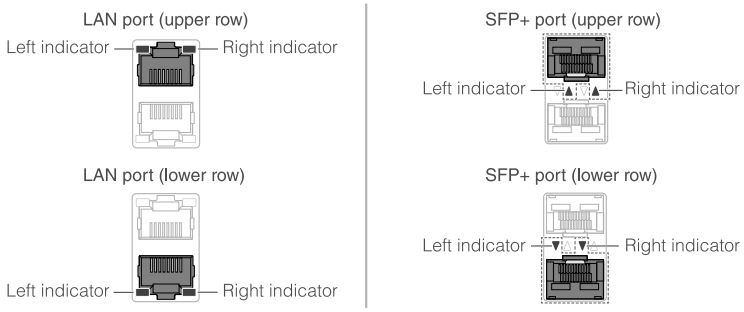
These holes are used when drawing in outside air with the fan to cool the product.

Warning

- Do not block the cooling vents or place objects near them. Doing so could cause fire or malfunctions.

2.6. Port indicators

These are indicators for the LAN ports and SFP+ ports, and indicate the state of each port in each mode.



There are different display modes, including the “LINK/ACT” mode (in which the link status and connection speed are displayed), the “STATUS mode” (in which the error status is displayed) and the “OFF mode” (in which the port indicator is turned off).
Normally, the product operates in LINK/ACT mode or OFF mode.

2.6.1. LINK/ACT mode

The indicators show the link status and connection speed of the LAN ports or SFP+ ports.

LAN ports

Left indicator	Link status
Unlit	The link is lost (unavailable).
Lit (green)	A link has been established (available).
Flashing (green)	Data is flowing.

Right indicator	Connection speed
Unlit	Not connected, or connected by 100BASE-TX.
Lit (orange)	Connected by 1000BASE-T.
Lit (green)	Connected by 2.5G/5G/10GBASE-T.

SFP+ ports

Left indicator	Link status
Unlit	The link is lost (unavailable).
Lit (green)	A link has been established (available).
Flashing (green)	Data is flowing.

Right indicator	Connection speed
Unlit	Not connected
Lit (orange)	Connected by 1000BASE-SX/LX.
Lit (green)	Connected by 10GBASE-SR/LR. When using a direct attach cable, the product is connected at 10Gbps.

2.6.2. STATUS mode

This mode shows the error status of the LAN ports or SFP+ ports.
When one of the following errors is detected, the product switches to STATUS mode (mandatory) and the port's left indicator flashes orange.

- Loop detection
- SFP light reception level error detection

LAN ports

Left indicator	Right indicator	Status
Unlit	Unlit	Normal
Flashing (orange)	Unlit	Loop detected, then the port was blocked or shut down.

SFP+ ports

Left indicator	Status
Unlit	Normal
Flashing (orange)	A loop or SFP light reception level error was detected. Or, SFP light reception level error was detected.

See "Technical data" for this product for details.

Memo

- You can check the cause of the error using the "show error port-led" command.
- When all errors have been resolved, the product automatically switches to the default LED mode.

2.6.3. OFF mode

The indicators on the LAN and SFP+ ports, as well as the stack ID display indicator turns off.

2.7. Switching through port indicator display modes

When an error occurs, the product switches to STATUS mode; and after the product is restored from error status, the product returns to default LED mode automatically. The product switches to STATUS mode automatically. You cannot switch manually to STATUS mode.
See the tables below for how modes are switched.

For default LED mode: LINK/ACT mode

Mode name	Switching conditions	Explanation
LINK/ACT	Normal	Displays the link status using the left indicators on the LAN/SFP+ ports, and the connection speed on the right indicators.
↑ ↓		
STATUS	Error occurred (automatic switching to LINK/ACT mode to restore)	Displays the LAN/SFP+ port error status.

For default LED mode: OFF mode

Mode name	Switching conditions	Explanation
OFF	Normal	The indicators on the LAN/SFP+ ports and the stack ID display indicator goes dark.
↑ ↓		
STATUS	Error occurred (automatic switching to OFF mode to restore)	Displays the LAN/SFP+ port error status.

Memo

- The factory default default LED mode is set to LINK/ACT mode.
- Use the “show led-mode” command to check the default LED mode and the display mode that is currently displayed.

2.7.1. Switching the default LED mode for the port indicators

Use the “led-mode default” command to switch between the settings for the default LED mode (LINK/ACT mode, OFF mode).

Memo

- This explains what happens when switching from LINK/ACT mode to OFF mode. This assumes that you have logged in using the steps in “Logging in from a computer connected to the CONSOLE port” or “Making settings from the command line using Telnet”.

1. Type “enable”, and press the [Enter] key.
   You are now in privileged EXEC mode.

```
SWX3220>enable
SWX3220#
```

2. Type “configure terminal”, and press the [Enter] key.
   The product switches from command input mode to global configuration mode.

```
SWX3220#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
SWX3220(config)#
```

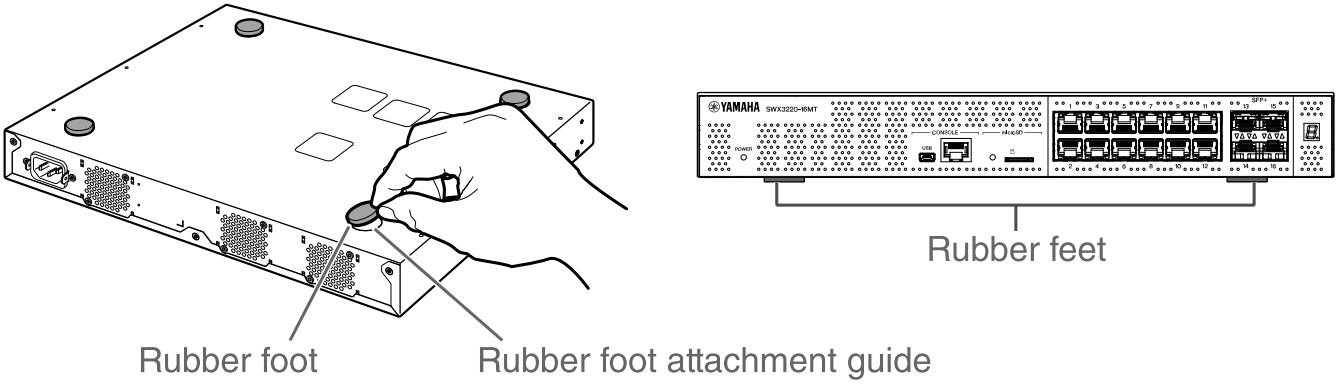
3. Type “led-mode default off”, and press the [Enter] key.
   The product switches to OFF mode.

```
SWX3220(config)#led-mode default off
SWX3220(config)#exit
SWX3220#
```

3. Installation

3.1. Placing the product on a level surface

Attach the included rubber feet on the rubber foot attachment guides as shown in the illustration, and press down on them firmly so that they do not peel off. Afterwards, place the product on a level surface, such as on top of a desk.

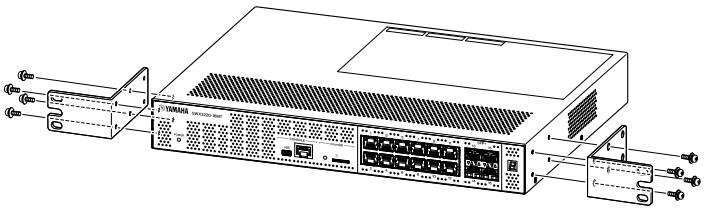


Caution

- Make sure to attach the rubber feet when the product is placed horizontally (flat).
  Failure to do so could cause fire or burns.

3.2. Installing in a 19-inch rack

This product fits in a 19-inch rack mount (1U size). When installing the product in a 19-inch rack, attach the included rack mount hardware (2 pcs.) using the included screws (8 pcs., small flathead, diameter: 3.0 mm, length: 8.0 mm, screw head diameter: 5.5 mm) to secure it in place.
Use a screwdriver to firmly tighten the screws.



Warning

- When attaching or removing this product, you must disconnect the product's power plug from the power outlet.
  Failing to do so could cause electrical shock or malfunctions.
- Make sure to use the included 19-inch rack mount hardware and screws.
  If the product falls, you may be injured or the product may become damaged. This could also cause electric shock or malfunctions.
- Do not block the cooling vents on the top or the sides of this product, or the fan outlet on the back.
  Doing so could cause fire or malfunctions.

Caution

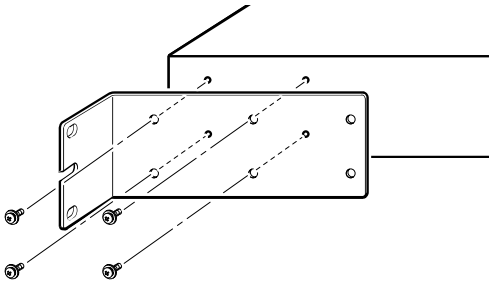
- If the rack cabinet has a door, use sufficient care to ensure that it does not interfere with communication cables or the power cord after this product is installed.

Memo

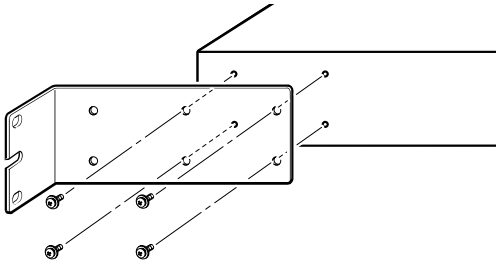
- Screws for fastening this product to the 19-inch rack are not included.

The 19-inch rack mount hardware can be attached to this product using either of the following two methods.

Method A: Attach the 19-inch rack mount hardware so that its rack screw surface is flush with the front panel of this product.
This is the usual mounting method.



Method B: Install the product 4 cm deeper than method A.
If the 19-inch rack has a door, install this product in a recessed position so that LAN cables inserted into the front panel of the product do not touch the door of the rack.



3.3. Installing onto a wall or ceiling

Attach the included wall mount hardware (2 pcs.) using the included screws (6 pcs.).

Items to prepare

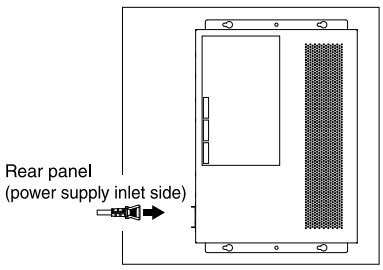
- **Wall or ceiling mounting screws (6)**
  Screws for installing this product onto a wall or ceiling are not included. You will need to purchase commercially available screws.
  The type and length of screws differ depending on where the product is to be installed. Be sure to check the material and thickness of the wall where the product is to be installed, and use screws appropriate for the wall material.

Caution

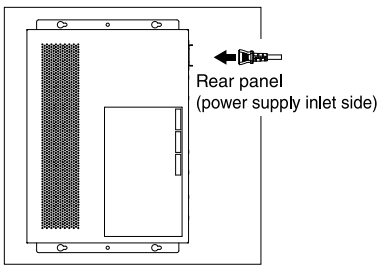
- Use the appropriate screws.
  If the product falls, you may be injured or the product may become damaged.

Mounting template

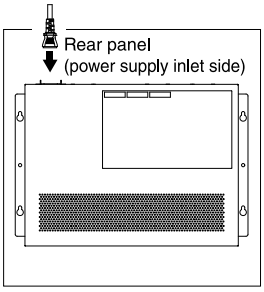
The product can be installed with its rear panel or either side facing up, but not with the front panel facing up or at an angle.



<The front panel is facing right.>



<The front panel is facing left.>



<The front panel is facing down.>

Warning

- When attaching or removing this product, you must disconnect the product's power plug from the power outlet.
  Failing to do so could cause electrical shock or malfunctions.
- Do not install with the front panel facing up.
  Doing so could cause a malfunction or fire.

Caution

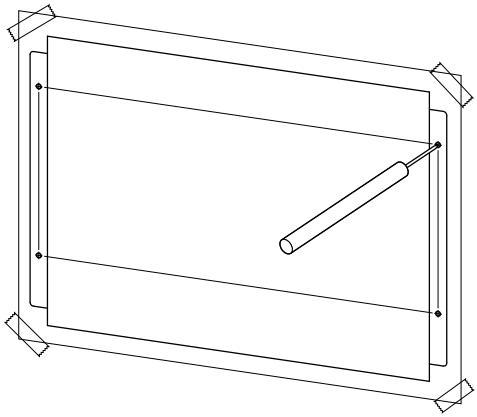
- Do not attach this product in a high place.
  Make sure that the installation height is no greater than 200 cm.
  If the product falls, you may be injured or the product may become damaged.
- Make sure to follow the steps for installation in this manual. Failure to do so could cause electrical shock or malfunctions.

Memo

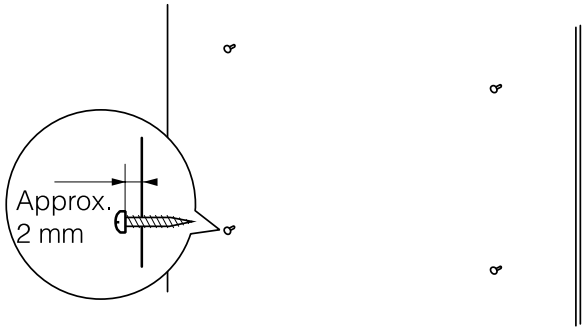
- The wall mount hardware has one surface that must be attached to the product and one surface that must be attached to the wall or ceiling. The product cannot be safely mounted if you attach the hardware to the wrong surface. For details on distinguishing the surfaces, refer to the illustrations for step 6 and step 7.

Installation procedure

1. Make an A3-sized printout of the screw positioning sheet (the illustration showing where the screws are to be installed to the wall or ceiling) from the download site for this product.
2. Use a piece of tape to keep the screw positioning sheet in place.
3. Use a gimlet or similar tool to poke holes in the wall or the ceiling through the “+” marks on the screw positioning sheet.



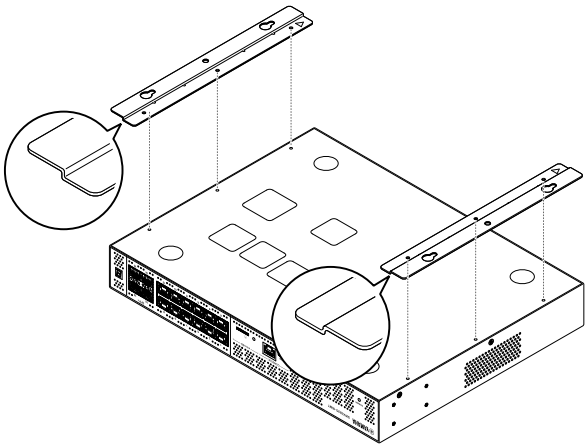
4. Remove the screw positioning sheet from the wall.
5. Provisionally install four commercially available screws at the holes that you marked in step 3. At this time, leave approximately 2 mm between the head of the screw and the surface of the wall, allowing room for the mounting accessory to engage the screws.



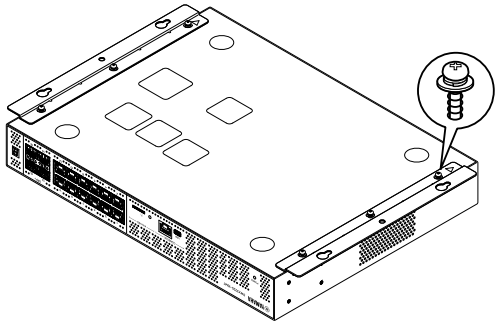
Caution

- Be sure to follow the steps in this manual when installing this product.
  Failure to do so may cause the product to fall, resulting in injuries, malfunction or damage.
- You must use screws that are appropriate for the material and thickness of the wall.
  If the product falls, you may be injured or the product may become damaged.

6. Align the product with the mounting accessory.



7. Use the included screws (flat-headed, M3×8L, diameter: 3.0 mm, length: 8.0 mm, screw head diameter: 5.5 mm) (6) to install the mounting accessory onto this product. Use a Phillips screwdriver to firmly fasten the screws.



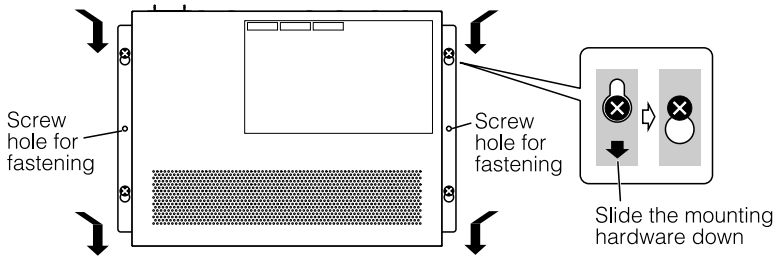
Warning

- Use only the screws that were included.
  If the product falls, you may be injured or the product may become damaged.
  This could also cause electric shock or malfunctions.

Caution

- Take care when letting your hand or finger contact the corners of the mounting accessory.
  Inattention might cause injury.

8. Engage the assembled mounting accessory onto the commercially available screws that you provisionally installed on the wall or ceiling, and slide it to the side.
   The illustration below shows an example of an installation with the back of the product facing up.



Warning

- Do not install with the front panel facing up.
  Failing to do so could cause malfunctions or fire.

Caution

- Do not let the product fall.
  If the product falls, you may be injured or the product may become damaged.

Caution

- When installing the product with its side facing up, engage the mounting accessory with the screws that you provisionally installed, and slide the mounting accessory either to the left or right.

9. Further tighten the screws that you provisionally attached.
10. Install the commercially available screws in the fastening screw holes (two locations) of the mounting accessory to secure the product in place.

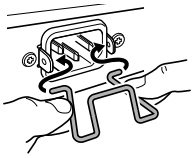
Caution

- You must use screws that are appropriate for the material of the wall or ceiling.
  If the product falls, you may be injured or the product may become damaged.

4. Connections

4.1. Connecting the power cord

1. Attach the included power cord clamp.
   To prevent accidental disconnection of the power cord, insert the included power cord clamp into the power cord clamp holes of the product to secure the power cord.

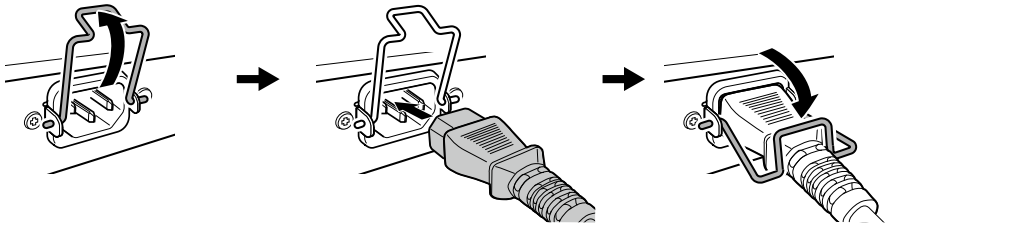


Insert the included clamp into the holes of the unit from the inside.

Caution

- The included power cord clamp is only for the included power supply cord.
- If you use the clamp for other power cords aside from that which was included, the cord might be damaged or might not be properly secured.

2. Connect the included power cord to the power supply inlet, and secure it with the clamp.



① Raise the clamp. ② Connect the power cord. ③ Press down on the clamp to secure the power cord.

3. Connect the power cord to an electrical outlet.
   The POWER indicator lights up green.

Caution

If the POWER indicator is lit orange, one of the following errors has occurred. Check the error situation and deal with it appropriately.

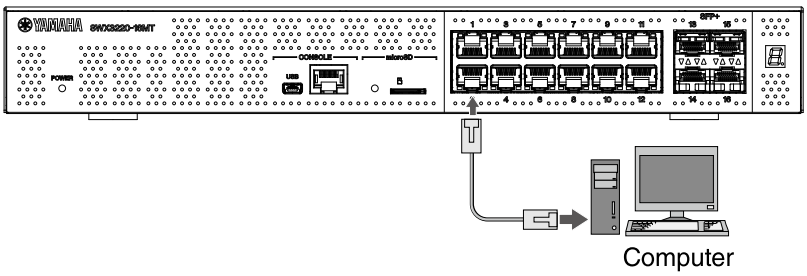
- Fan stopped
  Stop using this product immediately and contact the dealer where you purchased this product to have the product inspected and/or repaired.
- Internal temperature error
  Review the environment in which this product is installed, and correctly install this product so that the internal temperature is at an appropriate level.
- Corruption of config save area
  The config information cannot be read correctly at startup.
  Contact the dealer where you purchased this product to have the product inspected and/or repaired.

Memo

- This product does not have a power switch. The power turns on when you insert the plug of the power cord connected to this product into a power outlet.

4.2. Connecting to a network device or computer

Using LAN cables, connect the LAN port of the network device or computer to the LAN ports of this product.



When using fiber optic cables to make connections, install an appropriate SFP module in the SFP+ port. For the attachment procedure, refer to "Installing an SFP module".

Referring to the following table, use cables that are compatible with the port's link speed.

Link speed	Cables to use	Maximum transmission distance
100BASE-TX/1000BASE-T	Enhanced category 5 or higher	100 m
2.5GBASE-T	Enhanced category 5 or higher	100 m (*)
5GBASE-T	Enhanced category 5 or higher	100 m (*)
10GBASE-T	Category 6	55 m (*)
	Category 6A	100 m

*The maximum transmission distances listed are theoretical. Actual transmission distances may vary depending on the usage environment. Bundling cables or using similar methods may also cause ambient noise, which may reduce the maximum transmission distance.

Caution

- Do not connect this product to a public Wi-Fi and/or Internet service directly. Only connect this product to the Internet through a router with strong password protections. Consult your router manufacturer for information on optimum security practices.
- The LAN ports and the RJ-45 CONSOLE port all use the same 8-pin connector. Improper connections may cause hardware damage or malfunction. Use care when making connections.

Memo

- When the default LED mode is set to “LINK/ACT” mode, you will be able to check the connection status between the network equipment and your computer. For details on switching between modes or on the connection status, refer to “Switching the default LED mode for the port indicators” and “Port indicators”.

4.3. Installing an SFP module

You can install an SFP module to the SFP+ ports of this product.

Caution

- Attach the dust covers onto the SFP+ ports that are not in use. Failing to do so could allow foreign objects to enter, causing malfunctions. When you take the dust covers off, keep them in a safe place to avoid misplacing them.

Memo

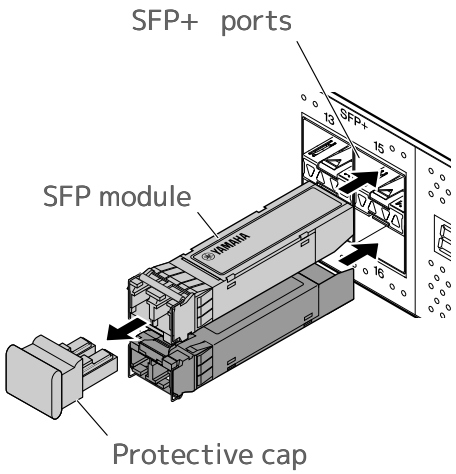
- For details on compatible SFP modules, refer to the corresponding item in Optional accessories.
- Also refer to the owner’s manuals included with each module for details on attaching and removing the modules, as well as for points of caution.

1. Remove the dust cover that is affixed to this product’s SFP+ port, and insert the SFP module.

Memo

- Since this product supports hot-swapping, an SFP module can be installed without turning the power off.

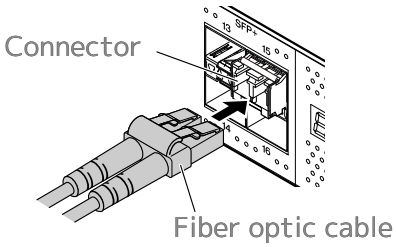
2. Remove the protective cap from the SFP module.



Caution

- Do not look into the optical emitter when installing an SFP module. The SFP modules separately sold by Yamaha are class 1 laser devices. These devices may emit laser beams invisible to the eye. If a laser beam enters your eye, your eyesight might be damaged.

3. Connect a fiber optic cable that is suitable for each module to the connector.



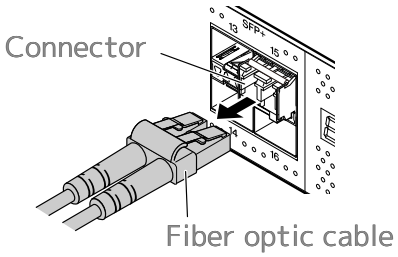
4.4. Removing an SFP module

Secure this product so that it will not move, and while grasping the lever of the SFP module, pull it slowly toward yourself to remove the module from the SFP+ port.

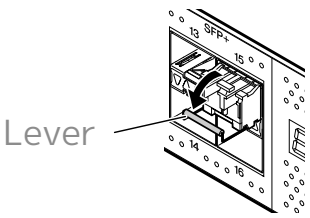
Memo

- Also refer to the owner's manuals included with the SFP module for details on attachment and removal, as well as for points of caution.

1. Detach the fiber optic cable.



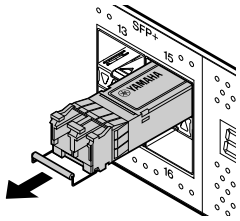
2. If the SFP module is connected to the upper row of ports, lower the SFP module's lever. If it is connected to the lower row of ports, raise the lever.



Caution

- Do not look into the optical emitter when installing an SFP module. The SFP modules separately sold by Yamaha are class 1 laser devices. These devices may emit laser beams invisible to the eye. If a laser beam enters your eye, your eyesight might be damaged.

3. Grasp the lever and pull out the SFP module.



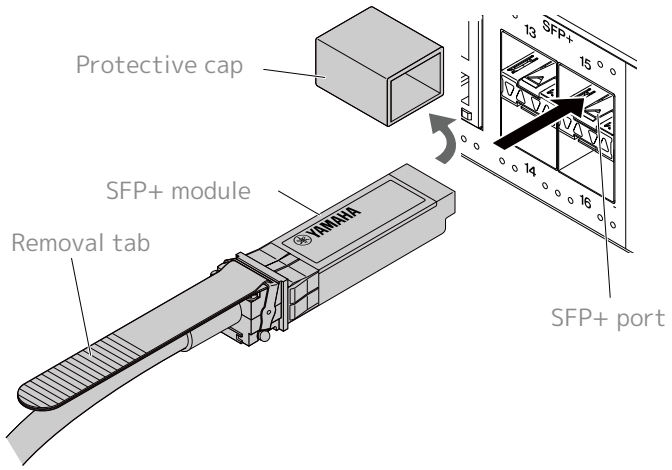
Memo

- Since this product supports hot-swapping, an SFP module can be removed without turning the power off.

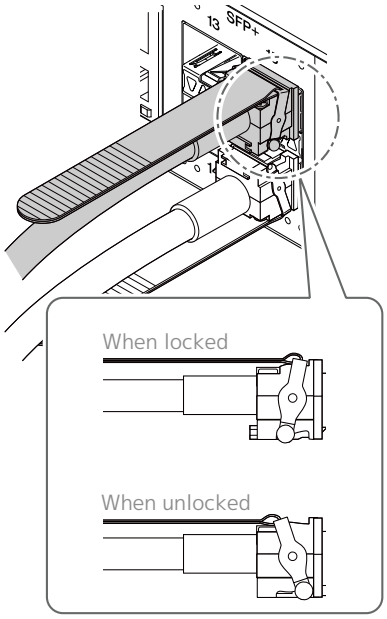
4.5. Installing a direct attach cable

A direct attach cable can be installed onto an SFP+ port of this product.

1. Remove the dust cover attached to the SFP+ port, and remove the protective cap of the direct attach cable.



2. Grasp the body of the direct attach cable and insert it firmly into the SFP+ port of this product.



Caution

- When making a stack connection using a direct attach cable, make sure that the grounding for the connected devices is at the same potential. Connecting two devices with different grounding potentials with a direct attach cable may cause malfunctions or device failure.
- Attach the dust covers onto the SFP+ ports that are not in use. Failing to do so could allow foreign objects to enter, causing malfunctions. When you take the dust covers off, keep them in a safe place to avoid misplacing them.

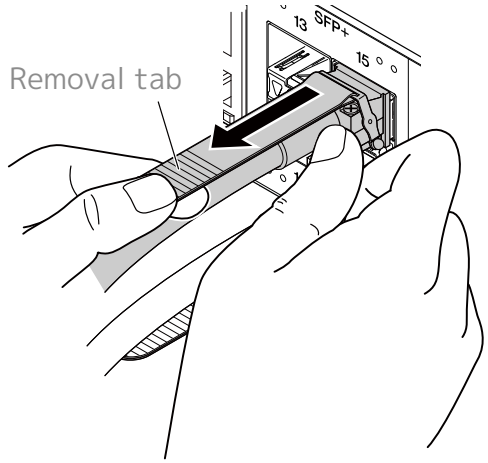
Memo

- Since this product supports hot-swapping, a direct attach cable can be attached without turning the power off.
- Refer to the manual included with each direct attach cable for instructions and precautions regarding installation and removal.

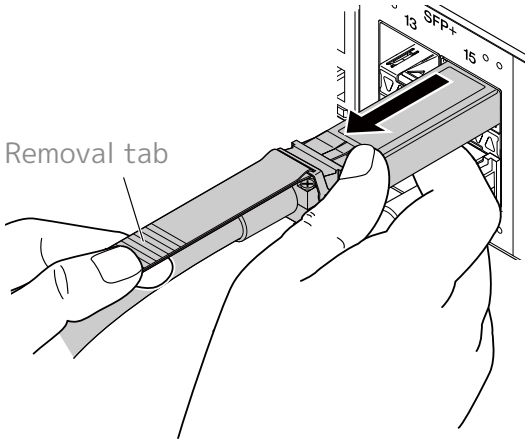
4.6. Removing a direct attach cable

A direct attach cable can be attached to the SFP+ ports on this product.

1. While using one hand to push the SFP+ module section inward, use the other hand to pull the removal tab toward yourself, disengaging the lock.



2. When the lock disengages, continue pulling the removal tab and slowly pull out the SFP+ module section.



Caution

- It may be difficult to pull out the direct attach cable (sold separately). Refer to the User Guide (available from the website) to properly disconnect it. Forcibly pulling out the cable may damage this product or the direct attach cable.

Memo

- Since this product supports hot-swapping, a direct attach cable can be removed without turning the power off.
- Refer to the manual included to each direct attach cable for installation or removal methods and precautions.

4.7. Making stack connections

A direct attach cable or SFP module can be installed onto the SFP+ ports of this product. When using an SFP+ module, you must additionally provide a fiber optic cable that is suitable for the SFP module. For details on installing and removing a direct attach cable, refer to “Installing a direct attach cable” or “Removing a direct attach cable”. For the procedure to attach an SFP module, refer to “Installing an SFP module” or “Removing an SFP module”.

Memo

- Also refer to the owner’s manuals included with the direct attach cable or SFP module for details on attachment and removal, as well as for points of caution. For details on stack connections, refer to “Technical data.”

5. Settings

The settings for this product can be made in the following ways.

- Making settings from the command line using the CONSOLE port
- Making settings from the command line using Telnet
- Making settings from the command line using SSH
- Making settings using the Web GUI
- Restoring this product's settings to their factory-set defaults

You can log in to this product either as a standard user or as an administrative user. This section explains how to log in as an administrative user.
See "Technical data" for details.

For details on the commands used by this product, refer to "Command reference."

5.1. Making settings from the command line using the CONSOLE port

Here we explain the cable, driver, software, and settings that are necessary in order to use the CONSOLE port.

5.1.1. Preparing a console cable

- Connect the computer to the CONSOLE port of this product using a USB cable or an RJ-45/DB-9 console cable.
- For the USB cable connected to the mini-USB CONSOLE port, use a USB cable that is equipped with a USB Type A connector and a mini-USB Type B (5-pin) connector, which supports data communication. Charge-only cables cannot be used.

5.1.2. Installing the USB serial driver

- To use the mini-USB CONSOLE port, the USB serial driver must first be installed.
- For details on installing the USB serial driver, refer to the "Yamaha Network Device USB Serial Driver Installation Guide."
  The Yamaha Network Device USB Serial Driver Installation Guide and the installer can be downloaded from the Yamaha website shown below.
  Utility download: https://yamahaproaudio.com/

5.1.3. Getting the computer ready

You will need terminal software that controls the serial (COM) port of the computer. Set the parameters of the terminal software as follows.

Parameter	Value
Data transmission speed	9600 bit/s
Character bit length	8
Parity check	None
Number of stop bits	1
Flow control	Xon/Xoff

If the computer is connected to both the RJ-45 CONSOLE port and the mini-USB CONSOLE port, only terminal software that uses the mini-USB CONSOLE port can be used to make settings. The messages that are output from this product are output to both CONSOLE ports.

5.1.4. Logging in from a computer connected to the CONSOLE port

1. Using a console cable, connect this product to the computer.
   Connect the computer to the CONSOLE port of this product using a USB cable or an RJ-45/DB-9 console cable.



Caution

- The LAN ports and the RJ-45 CONSOLE port all use the same 8-pin connector.
  Improper connections may cause hardware damage or malfunction.
  Use care when making connections.
- If you use the mini-USB CONSOLE port, do not use a USB hub.
  If multiple Yamaha router or switches are connected to one computer, the COM port numbers assigned to the connection might be swapped inadvertently. Use care to ensure that you do not change the settings of an unintended device.

2. Check the power supply of this product.
   If this product is not powered on, turn on the power as described in "Connecting the power cord". When this product powers-on and the command line is usable, a startup message appears in the console screen of the computer.
   If the power is already on, a startup message does not appear.

   For the SWX3220-16MT

```
SWX3220-16MT Rev.4.02.02 (Mon Dec 14 12:07:35 2020)
Copyright (c) 2020-2021 Yamaha Corporation. All Rights Reserved.
```

3. Press the [Enter] key.
   The system waits for a user name to be entered.
   If a user name has already been specified, enter the user name.
   When the product is shipped from the factory, a user name has not been specified, so it does not need to be entered.

```
Username:
```

4. Press the [Enter] key.
   The system waits for a password to be entered.
   If a password has already been specified, enter the password.
   When the product is shipped from the factory, a password has not been specified, so it does not need to be entered.

```
Password:
```

5. Press the [Enter] key.
   If password authentication is successful, the command prompt appears and you can enter commands.

```
SWX3220>
```

Memo

- For details on the commands, refer to the “Command reference” (on the Yamaha website).

5.2. Making settings from the command line using Telnet

This explains how to log in to this product using a Telnet client from a host on your LAN.

5.2.1. Logging in to this product using a Telnet client

Use a Telnet client such as a computer to log into this product and connect to the built-in Telnet server.
Here we explain how to use the Telnet client in Windows to connect to the built-in Telnet server on this product.

Memo

- Telnet functionality is disabled on Windows by default. To use Telnet, you will need to enable the Telnet client.

1. Connect this product to the computer with a LAN cable.
2. Check the power supply of this product.
   If this product is not powered on, turn on the power as described in “Connecting the power cord”. Once the power is on, go to step 3.
3. Launch the Windows command prompt.

4. Use the telnet command to input the IP address of this product.
   When the settings of this product are still set to their factory defaults, input "192.168.100.240" after the "telnet" command.

   ```
   telnet 192.168.100.240
   ```

5. Press the [Enter] key.
   The system waits for a user name to be entered.
   If a user name has already been specified, enter the user name.
   When the product is shipped from the factory, a user name has not been specified, so it does not need to be entered.

   ```
   Username:
   ```

6. Press the [Enter] key.
   The system waits for a password to be entered.
   If a password has already been specified, enter the password.
   When the product is shipped from the factory, a password has not been specified, so it does not need to be entered.

   ```
   Password:
   ```

7. Press the [Enter] key.
   If password authentication is successful, the command prompt appears and you can enter commands.

   ```
   SWX3220>
   ```

Memo

- For details on the commands, refer to the "Command reference" (on the Yamaha website).

5.3. Making settings from the command line using SSH

This explains what you need to prepare for logging in to this product from an SSH client on your LAN. Refer to the owner's manual of the SSH client you are using for how to log in.

Caution

Please be aware that the following functions are not supported on the SSH server of this product.

- SSH protocol version 1
- User authentication methods aside from passwords
  (host base authentication, public key authentication, challenge-response authentication, GSSAPI authentication)
- Port forwarding (X11/TCP forwarding)
- Gateway ports (port relaying)
- Permitting the use of empty passwords

5.3.1. Settings for using SSH server functionality

The SSH server functionality on this product is disabled when shipped from the factory by default. To log in and use the SSH client on this product, you must first login using a different method and then configure the following settings.

- Register your user name and password on this product
- Enable SSH server functionality on this product

Memo

- This explanation assumes that you have logged in using the steps in "Making settings from the command line using the CONSOLE port".

1. Type "enable" and press the [Enter] key.
   You are now in privileged EXEC mode.

```
SWX3220>enable
SWX3220#
```

2. Use the "ssh-server host key generate" command to generate a host key for the SSH server.

```
SWX3220#ssh-server host key generate
SWX3220#
```

Memo

- The "ssh-server host key generate" command generates a pair of keys, a DSA/RSA public key and a private key. Note that it may take a minute to process the command, depending on the model.

3. Type “configure terminal” and press the [Enter] key.
   The product switches from command input mode to global configuration mode.

```
SWX3220#configure terminal
Enter configuration commands, one per line.End with CNTL/Z.
SWX3220(config)#
```

4. Use the “ssh-server enable” command to enable the SSH server functionality.

```
SWX3220(config)#ssh-server enable
SWX3220(config)#
```

5. Register a user with password using the “username” command.



Important: You must supply a user name and password when logging in via SSH. Make sure to register a user with password ahead of time.

Example: User name: yamaha; password: 1a2b3c4d

```
SWX3220(config)#username yamaha password 1a2b3c4d
SWX3220(config)#
```

6. Type “exit” and press the [Enter] key.
   The product returns to privileged EXEC mode.

```
SWX3220(config)#exit
SWX3220#
```

7. Save the settings as necessary.

```
SWX3220#write
Succeeded to write configuration
SWX3220#
```



Memo

- For details on the commands, refer to the “Command reference” (on the Yamaha website).
- Refer to the owner’s manual of the SSH client you are using for the SSH client settings and operations.

5.4. Making settings using the Web GUI

This explains how to log in to this product using the Web GUI.

For details on compatible Web browsers, refer to the website listed below.
Web browser compatibility with Web GUI on Yamaha network products:
http://www.yamahaproaudio.com/

5.4.1. Logging in to this product using a Web browser

1. Connect this product to the computer with a LAN cable.
2. Check the power supply of this product.
   If this product is not powered on, turn on the power as described in “Connecting the power cord”. Once the power is on, go to step 3.
3. Launch the Web browser and access “http://(IP address of this product)/.”
   When access is successful, a login screen appears where you can enter a user name and password.



Memo

- The IP address of this product is set to “192.168.100.240/24” by default when shipped from the factory.
- If this product is not connected to a network, change the IP address of the computer to use for settings to the “192.168.100.0/24” segment.
  See the help documentation of your computer for how to change the computer’s IP address.

4. Enter the user name and password, and click the "Login" button.
   With the factory settings, the user name and password are not specified, so it is not necessary to enter a user name and password.
   After successful login from the factory default state, a language selection screen is shown.
5. Select the language to use.
   You can change the language after login from the Web GUI.

5.5. Restoring this product’s settings to their factory-set defaults

This explains how to restore this product’s settings to their factory-set defaults.

- Using the “cold start” command to restore the factory settings
- Entering the [I] (uppercase I) key during startup to restore the factory settings
- Restoring this product’s settings to their factory-set defaults from the Web GUI

Caution

When restoring the factory settings, note the following points.

- All communication is halted immediately after execution.
- The IP address of this product will be initialized to the factory default setting (192.168.100.240).
- You cannot restore the current contents of the settings after you have restored them to their factory defaults. If necessary, use external memory to save the settings before you proceed with initialization. For details on how to export settings to external memory, refer to the “Technical data for Yamaha network devices,” available on the Yamaha website.

5.5.1. Using the “cold start” command to restore the factory settings

You can return the product to its factory settings from the command line via the CONSOLE port, Telnet or an SSH client.

Caution

- Communications will be halted when logging in via Telnet or an SSH client.

Memo

- This explanation assumes that you have logged in using the steps in “Logging in from a computer connected to the CONSOLE port” or “Making settings from the command line using Telnet”.

1. Type “enable”, and press the [Enter] key.
   The product switches to privileged EXEC mode.

```
SWX3220>enable
SWX3220#
```

2. Enter the “cold start” command, and press the [Enter] key.
   You will be asked to enter the administrator password.

```
SWX3220#cold start
Password:
```

1. Enter the administrator password and press the [Enter] key.
   The settings saved in this product are returned to their factory-set state, SYSLOG is deleted and then the product reboots.

5.5.2. Entering the [I] (uppercase I) key during startup to restore the factory settings

The product can be restored to its factory settings by entering an uppercase “I” when the product is starting up. Here we explain how to reboot the product using the “reload” command. The procedure is also the same when rebooting by pulling out the power cord and plugging it back in again.

Memo

- This explanation assumes that you have logged in using the steps in “Logging in from a computer connected to the CONSOLE port”.

1. Type “enable”, and press the [Enter] key.
   You are now in privileged EXEC mode.

```
SWX3220>enable
SWX3220#
```

2. Enter the “reload” command, and press the [y] key.
   The product will reboot.

```
SWX3220#reload
reboot system? (y/n): y
```

3. After reboot, enter an uppercase "I" within one second after the “BootROM Ver” (see below) appears on the console screen.

```
SWX3220 BootROM Ver.1.00
```

Memo

- Before the “BootROM Ver” appears on the console screen, you can press the [Caps Lock] key or hold down the [Shift] key so that you will be ready to enter an uppercase "I" immediately.

4. When you see a screen asking whether to execute initialization, press the [y] key to execute.

```
Initialize or not ?(y/n)
```

   Initialization is executed.

```
Ready to Initialize
.....
```

5.5.3. Restoring this product’s settings to their factory-set defaults from the Web GUI

This product can be restored to its factory-set state by making settings from the Web GUI.

Memo

- This explanation assumes that you have logged in using the steps in “Logging in to this product using a Web browser”.

1. Select the “Administration” tab – “Maintenance” – “Restart or Initialize,” in that order.
   The "Restart or Initialize" screen appears.
2. In the "Initialize" section, click the “Proceed” button.
   The "Initialize" screen appears.
3. Enter the administrative password, and click the “Confirm” button.
   The "Confirm execution" screen appears.
4. Verify the contents, and click the "Execute" button.
   The product is returned to its factory-set state. Also, the “Initialization” dialog box appears, and the product reboots.
5. After this product finishes rebooting, access the Web GUI again.

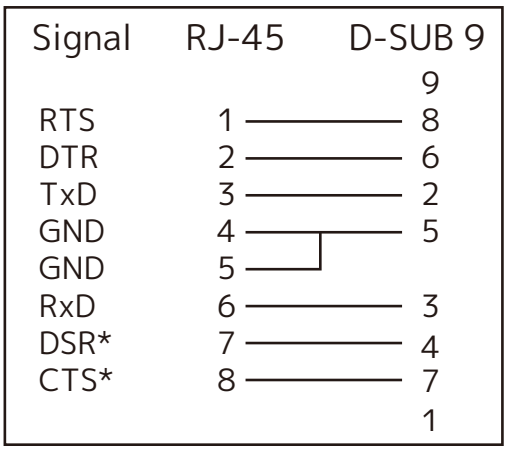
Memo

- During reboot, the computer on which the Web GUI is open will be unable to communicate with the product (the status indication of the computer’s network adapter will be "Network cable is not connected"). Communication will be restored when the reboot is completed. The IP address of this product will be restored to the factory default setting (192.168.100.240) after rebooting. Once Web GUI is redisplayed, access “192.168.100.240”.

6. Appendix

6.1. RJ-45/DB-9 console cable pin configuration

Console (RS-232C)



* These signals are not used by this product.

Manual Development Group
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Published July 2021
YJ-A0