The Aurora 830 switch installation guide

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Chapter 1. Introduction

This guide is to assist the reader with the most basic form of installation and cable connection to our switches. As there is more than one switch in the Aurora series, the actual port placement might slightly differ, however, the installation and connection logic are the same for all Netberg switches.

1.1. Conventions

Several different typographic conventions are used throughout this manual. Refer to the following examples for common usage.

Bold type face denotes menu items, buttons and application names.

Italic type face denotes references to other sections, and the names of the folders, menus, programs, and files.

`<Enter>` type face denotes keyboard keys.

Warning information appears before the text it references and should not be ignored as the content may prevent damage to the device.

CAUTIONS APPEAR BEFORE THE TEXT IT REFERENCES, SIMILAR TO NOTES AND WARNINGS. CAUTIONS, HOWEVER, APPEAR IN CAPITAL LETTERS AND CONTAIN VITAL HEALTH AND SAFETY INFORMATION.

Indicates information that is important to know for the proper completion of a procedure, choice of an option, or completing a task.

Highlights general or useful information and tips.

1.2. Disclaimer

The information in this document is subject to change without notice. The manufacturer makes no representations or warranties with respect to the contents hereof and specifically disclaims any implied warranties of merchantability or fitness for any particular purpose. Furthermore, the manufacturer reserves the right to revise this publication and to make changes from time to time in the content hereof without obligation of the manufacturer to notify any person of such revision or changes.

For the latest information and updates please refer to www.netbergtw.com

All the illustrations in this technical guide are for reference only and are subject to change without prior notice.

Chapter 2. Hardware Installation

2.1. Package content

Package includes:

- One Netberg Aurora Switch
- Two AC power cords (AC version only).
- One RS-232-to-RJ45 console cable.
- One USB 3.0 cable.
- One pair of frontal rack-mount brackets.
- One tool-less mounting rail kit (4-post rack)
- Two sets of mounting screws.
- One grounding kit.

If any of the above mention items was not found inside the package contents of this switch or are damaged in any way, contact your reseller immediately.

2.2. Installation Guidelines

This section will discuss the hardware installation guidelines that administrators must follow in order to properly and safely install this switch into the appropriate environment.

2.3. Rack-mount Safety Precautions

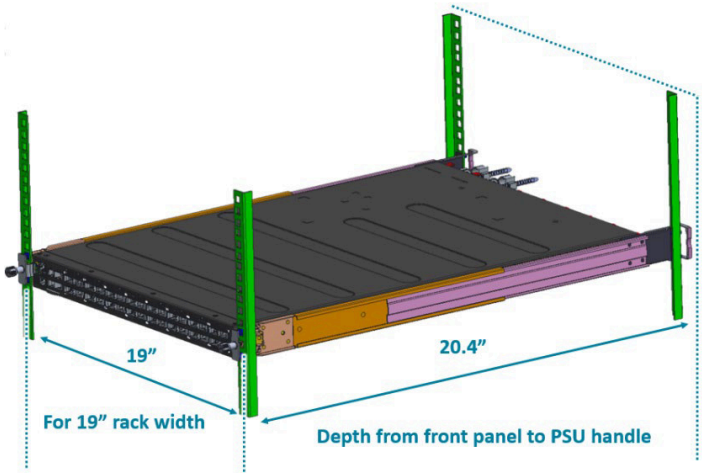
For your protection, observe the following rack-mount safety precautions when setting up your equipment:

- Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
- Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (for example, use of power strips).
- For safety, equipment should always be loaded from the bottom up. That is, install the equipment that will be mounted in the lowest part of the rack first, then the next higher systems, etc.
- To prevent the rack from tipping during equipment installation, the anti-tilt bar on the rack must be deployed.
- The mounting brackets provided must be used to securely mount the device in a rack-mount unit.

2.4. Installation into a Rack

The switch can be mounted in a standard 19"(1U) rack using the provided mounting tool-less rails. The following section will explain how to install the rack-mount brackets onto the switch and then mount the switch into a standard 1U rack-mount unit.

Figure 2.1. Rack dimensions



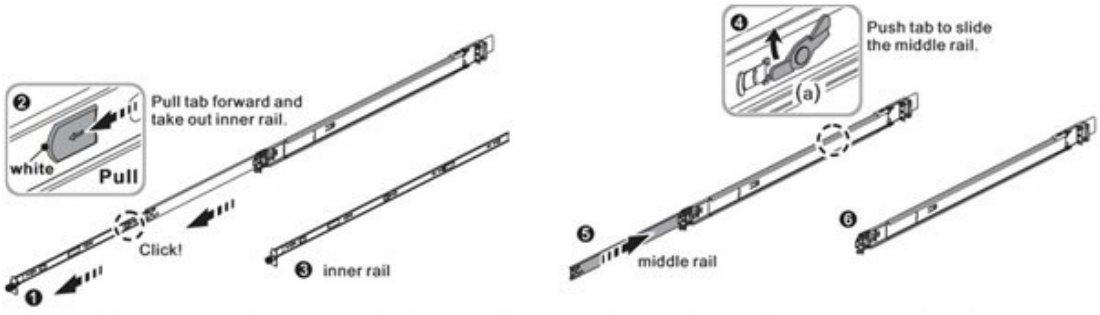
1. Separate the adjustable rail slides.

   a. Pull apart the inner and outer rails until they are locked. An audible click can be heard when the rails are locked in place.

   b. Pull the white tab forward to unlock the rails and completely separate the inner and outer rails. The white tab is located on the inner rail.

   c. Once the inner rail is separated, push the tab on the outer rail to unlock and slide the middle rail back.

   Figure 2.2. Inner rail installation

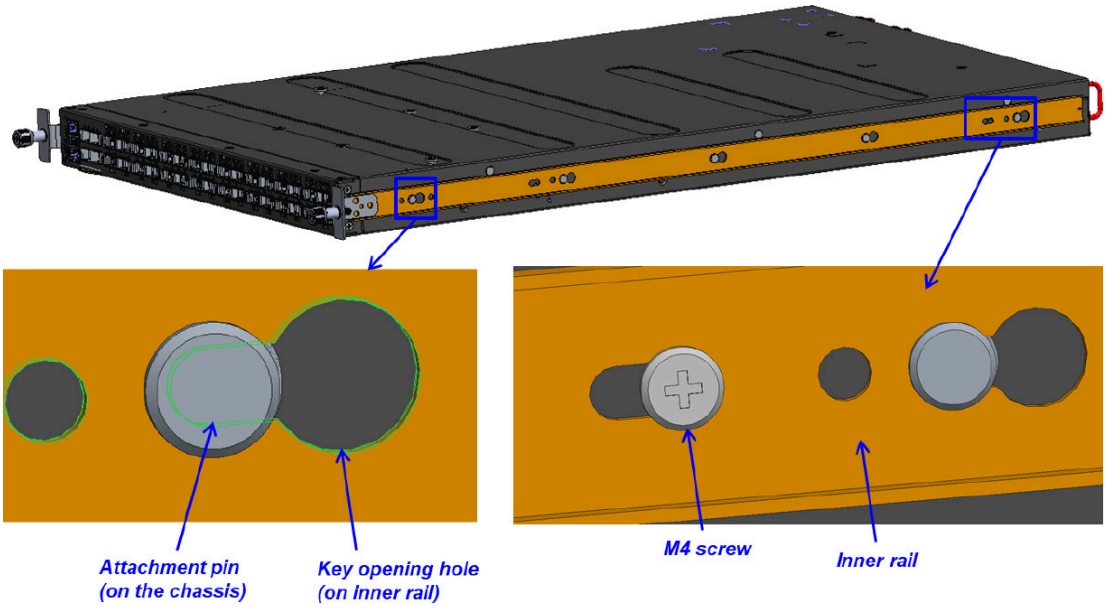


2. Install the inner rails onto the chassis.

   a. The inner rail has key-shaped holes where attachment pins on the chassis can be aligned. The chassis has five attachment pins on each side, for ten pins. Fit the key-shaped holes with the attachment pins and pull back to hold the inner rack in place.

b. After the attachment pins are secured to the inner rail, lock the inner rail to the chassis using two M4 screws (one on each chassis side). See the figure below.

Figure 2.3. Mounting point options



Two individuals are recommended to install the switch. One individual should position the switch in the rack, while the other secures it using the rack screws.

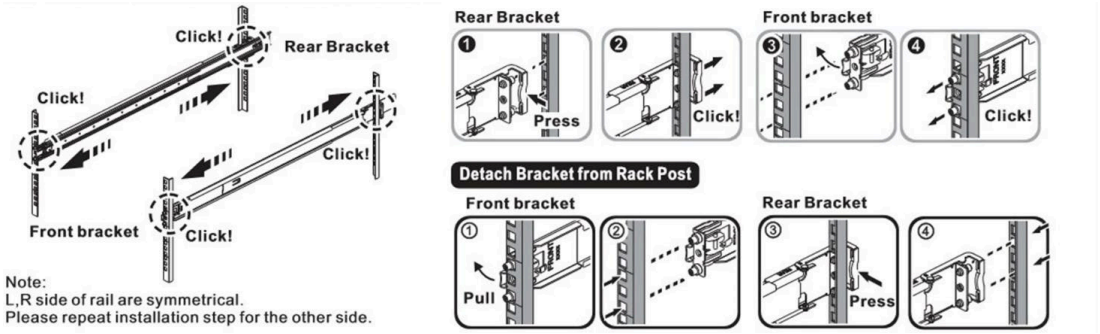
Deux personnes sont nécessaires pour installer un commutateur dans un bâti : La première personne va positionner le commutateur dans le bâti, la seconde va le fixer avec des vis de montage.

3. Fix the outer rails onto the rack.

   a. The outer rails have two brackets on the front and rear. Pull back the clip of the rear bracket to attach it onto the rack. An audible click can be hear when the bracket is secured onto the rack.

   b. Once the rear bracket is secured, pull back the clip of the front bracket attach it to the rack. An audible click can be heard when the bracket is secured onto the rack.

Figure 2.4. Mounting the switch



4. Insert the Chassis to complete the installation.

   a. Pull the middle rail fully extended into the lock position. An audible click can be heard when the middle rail is fully extended and locked into position.

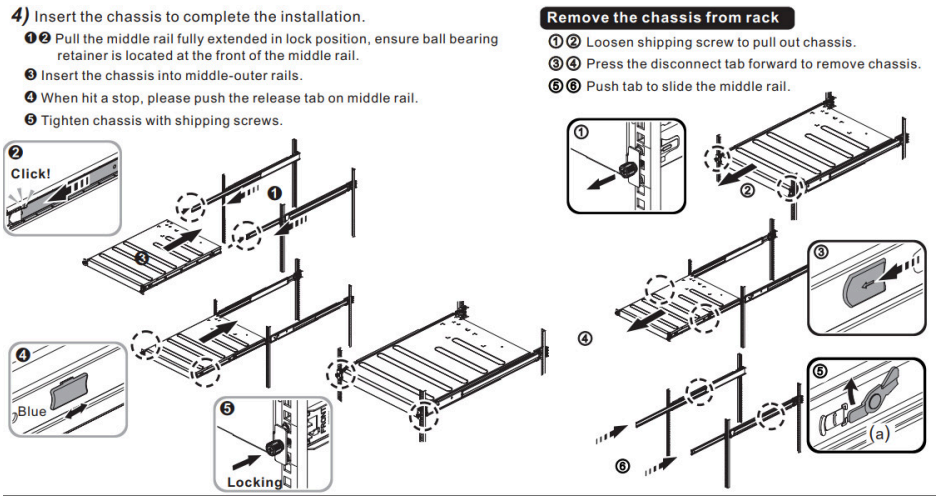
   b. Insert the chassis by lining up the inner rails into the slot of the middle rail.

   c. Slide the chassis into the middle rail until it hits a stop.

   d. Push the blue release tab on each rail to unlock the rails and slide the chassis into the rack.

   e. Lock the chassis into place by using the captive screw on the front of the inner rail.

Figure 2.5. Mounting the switch



Illustrations are for reference purposes only. Actual cabinet posts may differ.

2.5. Power supply

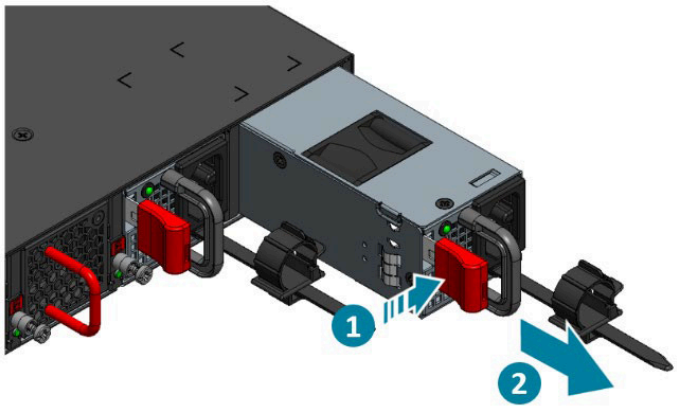
Equipped with two supply modules, the switch can operate with either one or two power supply modules. If the switch uses two power supply modules, you can hot-swap one of the PSU during the operations.

One PSU is enough for a fully loaded chassis.

2.5.1. Replacing a PSU

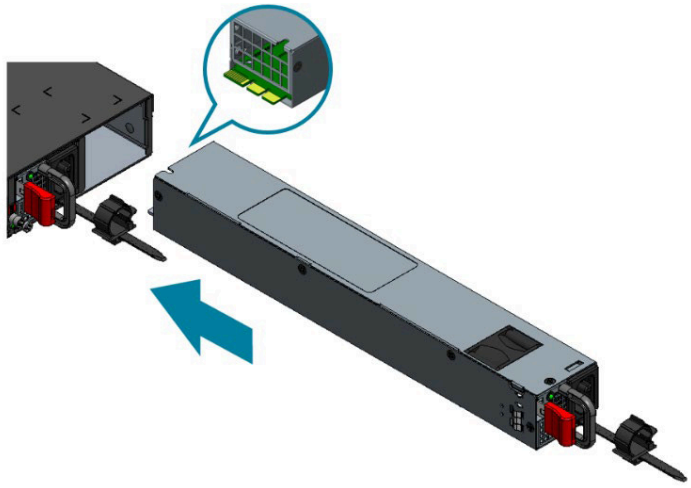
1. Hold the PSU handle and press the release latch to unlock from the switch.
2. Pull the PSU module out of the switch.

Figure 2.6. Removing the PSU module



3. Align the PSU with the switch bay.
4. Slide the PSU into the switch and push until it is flush with the bay.

Figure 2.7. Inserting the PSU module



The AC power connector is a standard three-pronged connector. The switch automatically adjusts its power setting to any supply voltage in the range from 100-240 VAC at 50-60 Hz.

2.6. Grounding the Switch

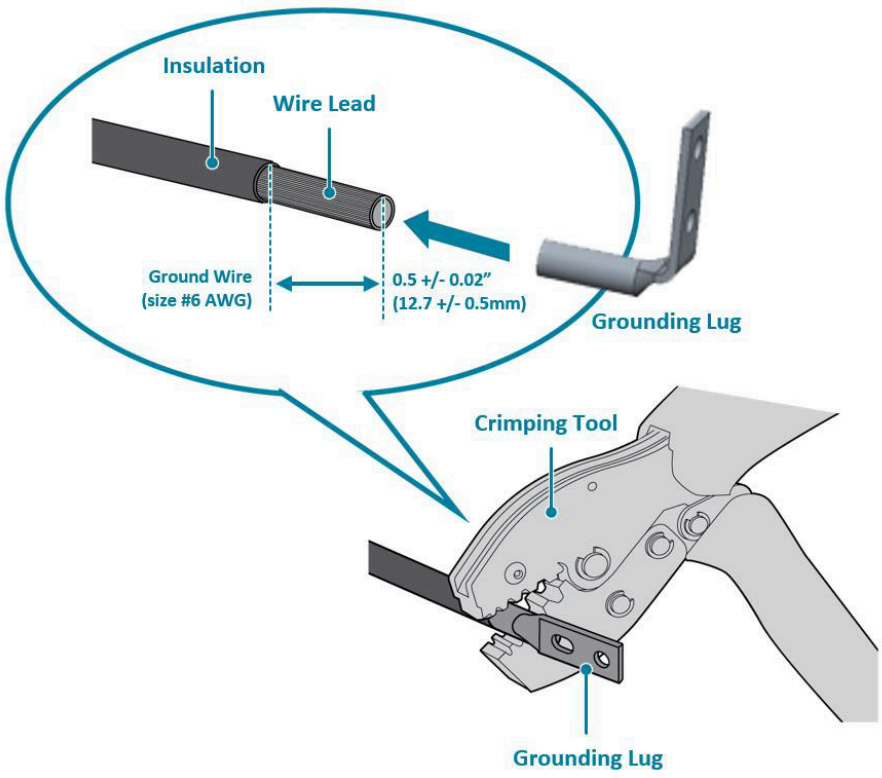
This equipment must be grounded. Do not defeat the ground conductor or operate the equipment without a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

1. Ensure the rack is properly grounded and in compliance with local regulatory guidelines. Ensure that a good electrical connection to the grounding point exists. Remove any paint or material that may prevent good contact.

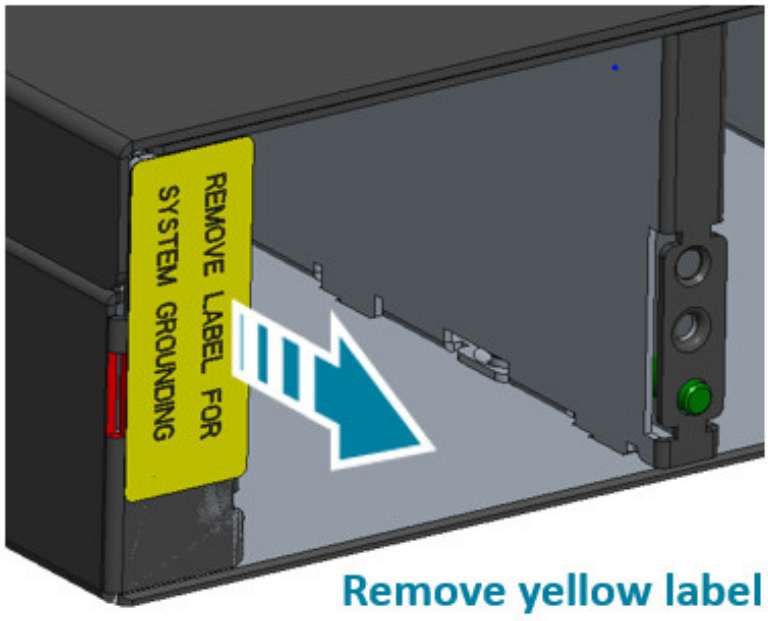
2. Strip the insulation from a size #6 AWG grounding wire (not provided within the switch), leaving 0.5” +/-0.02” (12.7mm +/-0.5mm) of the exposed grounding wire.

3. Insert the exposed grounding wire into the hole of the grounding lug (provided with package contents).

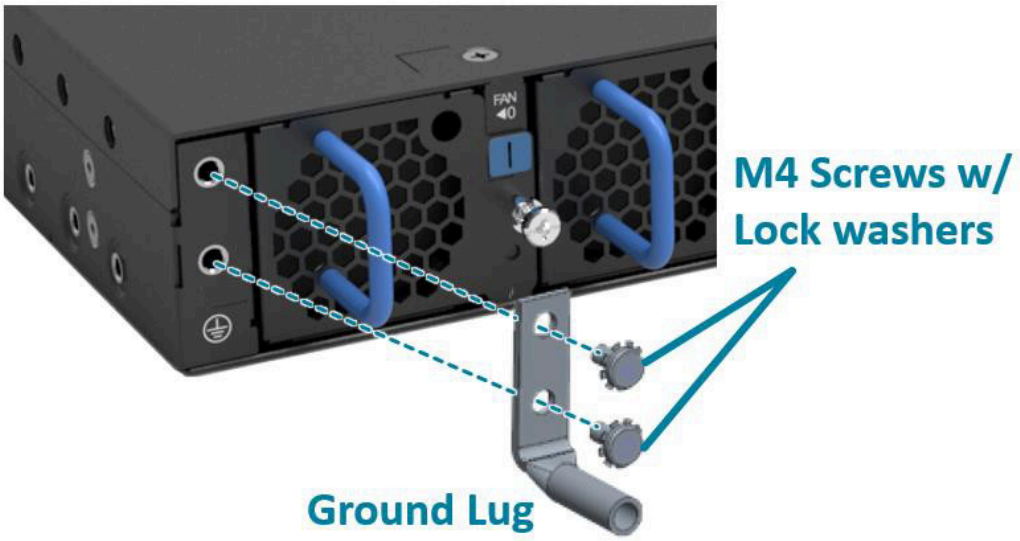
4. Firmly secure the grounding wire to the grounding lug using a crimping tool.



5. Remove the protective label from the designated grounding pad beside the PSU modules.



6. Firmly secure the grounding lug using two provided M4 screws and washers.



The chassis ground connection must not be removed unless all power supply connections have been disconnected.

Le raccordement à la terre ne doit pas être retiré sauf si toutes les connexions d'alimentation ont été débranchées.

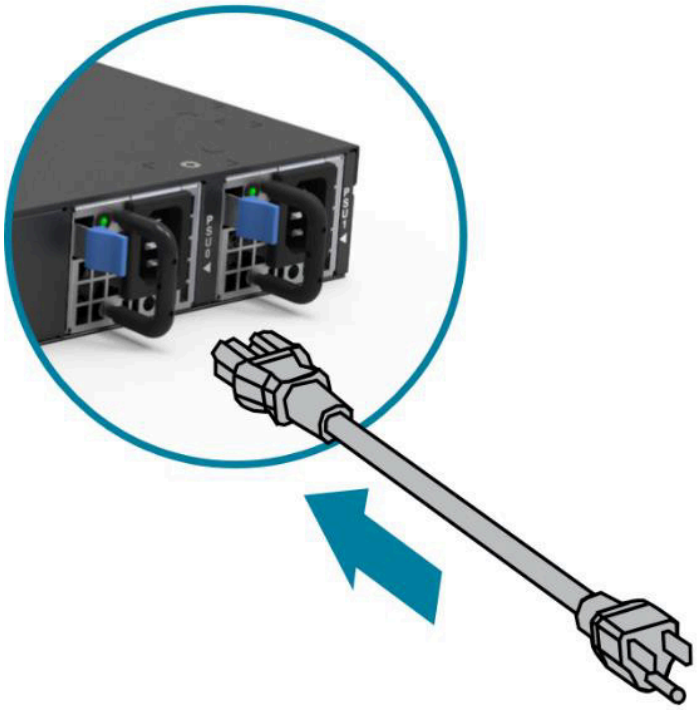
The device must be installed in a restricted access location.

L’appareil doit être installé dans un emplacement à accès restreint. Il doit comporter une borne de terre de protection distincte sur le châssis, qui doit être connectée en permanence à la terre pour assurer une mise à la terre adéquate du châssis et protéger l’opérateur des risques électriques.

2.7. Connect the Power Cable

Connect one end of the AC power cord, included in the package, into the grounded electrical outlet at the site and insert the other end of the AC power cord into the AC power receptacle of the AC power supply module on the back panel of the switch. The switch will automatically adjust the voltage supplied to the voltage needed as this power supply supports any voltage power supply in the range from 100VAC to 240VAC at 50Hz to 60Hz.

The LED indicators on the front panel of the switch should lights green after power-on.



The maximum system power consumption is 1246.6 watts. If only a 110V AC power source is available, the Aurora 830 can still be powered with both PSUs, providing 1000 watts each for a total output of 2000 watts. However, if one PSU stops functioning, the power output would be inefficient in sustaining the switch's operation.

Use the AC power cord supplied with the switch. For International use, you may need to change the AC power cord. You must use power cord sets that have been approved for the socket type in your country.

Utilisez le cordon d'alimentation secteur fourni avec le commutateur. Pour une utilisation internationale, vous devrez peut-être changer le cordon d'alimentation. Vous devez utiliser des jeux de cordons d'alimentation approuvés pour le type de prise de votre pays.

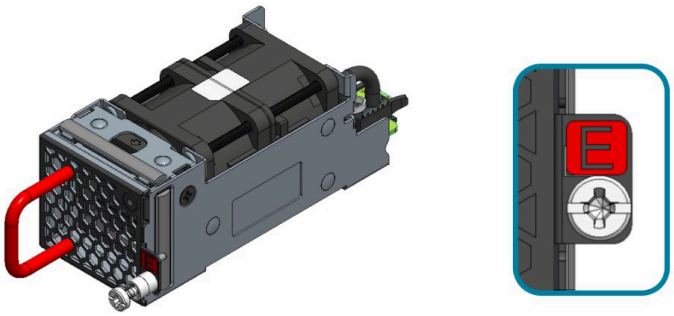
2.8. Fan Modules

The fan module is a field replaceable unit and can be replaced during operations as long as the remaining modules are installed and operating.

Replacing fan modules

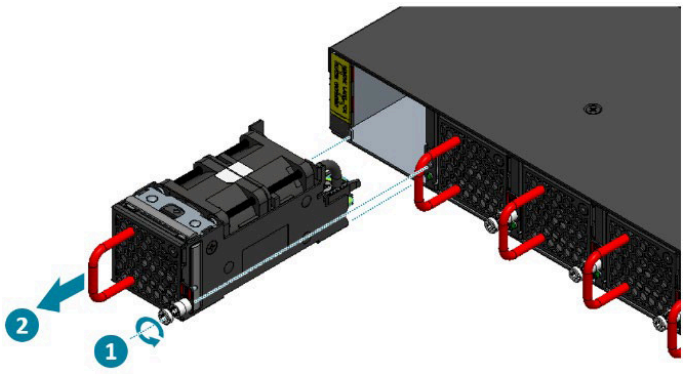
1. Loosen the captive screw securing the fan module.

Figure 2.8. Loosen the fan screw



2. Pull out the fan module.

Figure 2.9. Removing the fan module

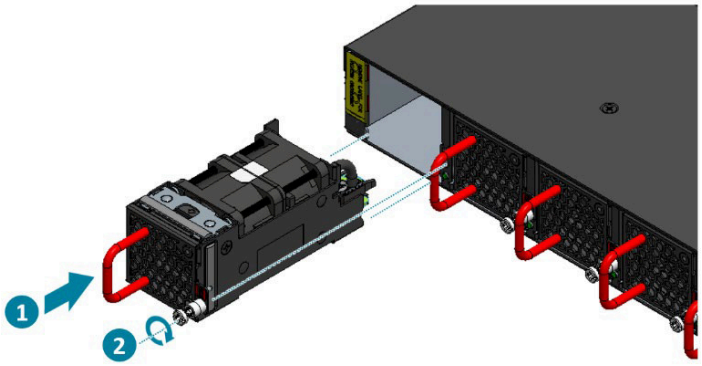


3. Align the fan module with the switch bay.

4. Slide the fan module into the switch and push until it is flush with the bay.

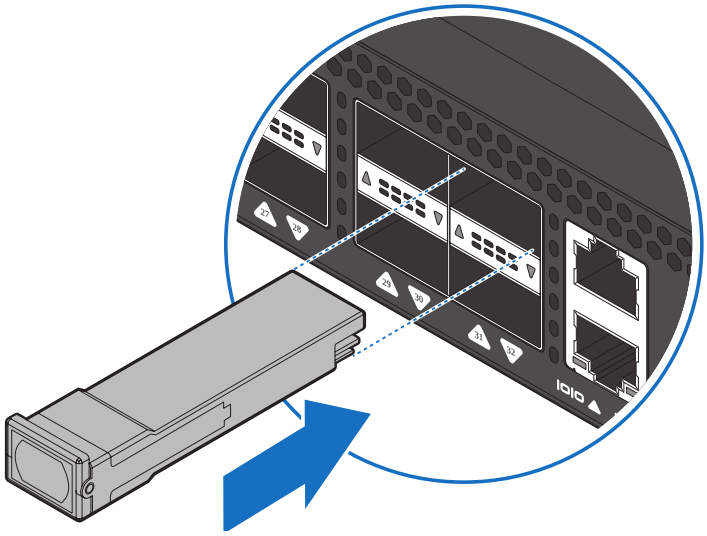
5. Secure the captive screw.

Figure 2.10. Inserting the fan module



2.9. Installing Transceivers and cables into the Switch Ports

Figure 2.11. Transceivers and cables



Do not use tie wraps with optical cables to prevent over-tightening and damage.

Check the following guidelines before connecting the transceiver:

- Before installing the switch, consider rack space requirements for cable management and plan accordingly.
- It is recommended to use hook-and-loop style straps to secure and organize the cables.
- For easier management, label each fiber-optic cable and record its connection.
- Maintain a clear line of sight to the port LEDs by routing the cables away from the LEDs.

Before connecting anything (cables, transceivers, etc.) to the switch, please ensure to discharge any static electricity that may have built up during handling. It is also recommended the cabling be done by a professional who is grounded, such as by wearing an ESD wrist strap.

2.9.1. SFP+/SFP28 Port Connection (LC Type Connector)

The Small Form-Factor Pluggable Plus (SFP+) port is the second generation of the SFP interconnect system designed for 10Gb/s data rate. The SFP+ ports support 10-gigabit IEEE 802.3ae Ethernet for fiber mediums.

The Small Form-Factor Pluggable 28 (SFP28) port is the next generation of the SFP interconnect system designed for 25Gb/s data rate. The SFP28 ports enables error-free transmission of 25 Gb/s over 100 meters of OM4 multimode fiber.

The SFP+/SFP28 ports are numbered and have corresponding SFP port LEDs.

To install an SFP module, do the following:

1. Slide the SFP module into an SFP port.

Ensure the SFP module is positioned correctly before installing it into the port.

2. Push completely until the module locks into place.
3. Repeat the above procedures to install additional SFP+ modules.

The SFP port LED lights green when the network link is established.

2.9.2. QSFP-DD Port Connection

QSFP-DD (Quad SFP Double Density) ports which support 400G/per port or fan out to 4x100G by using the fan out DAC cable.

1. Slide the QSFP module into a QSFP-DD port.

Ensure the QSFP module is positioned correctly before installing it into the port.

2. Push completely until the module locks into place.
3. Repeat the above procedures to install additional QSFP modules.

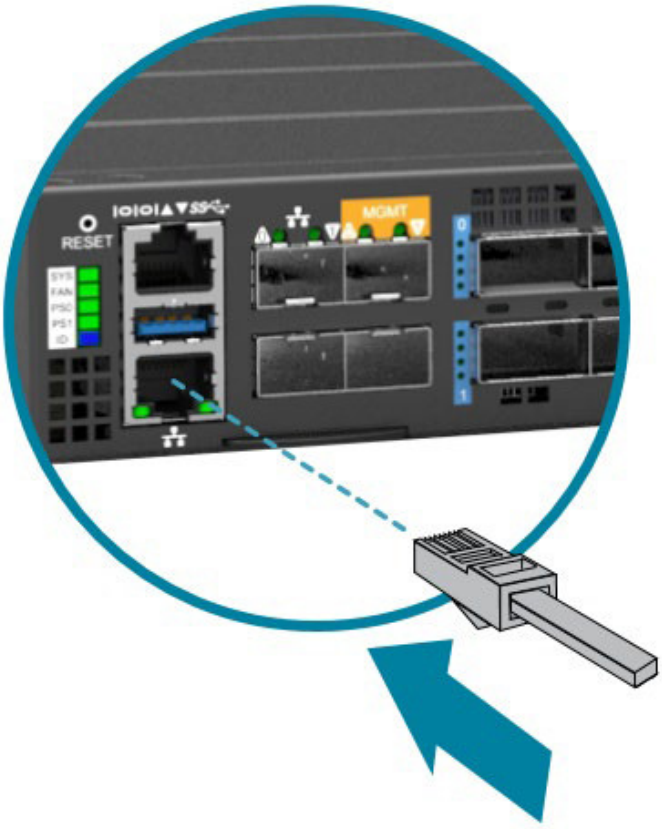
The QSFP-DD port LED lights green when the network link is established.

Aurora 830 supports up to six OpenZR+/ZR transceivers in ports 8, 12, 16, 20, 24, 28.

Figure 2.12. OpenZR/ZR+ optics support

2.10. Console port

The console port is used for setting up and managing the switch via a connection to a console terminal or PC using a terminal emulation program. You can connect the switch to a terminal or PC using the supplied console cable (RJ-45 male to RS-232 female cable) for serial communication.



Below is the console cable wiring specification table:

Table 2.1. Console cable pin definition

RJ-45 Port of Switch	DB9 Female Port of PC	Abbreviation	Description
3	2	RD	Received Data
6	3	TD	Transmit Data
1	8	CTS	Clear To Send
8	7	RTS	Request To Send

Using the console port, you can perform the following:

- Configure, manage and monitor the switch using the CLI commands
- Manage and monitor network activity by Simple Network Management Protocol (SNMP) management

- Upgrade the firmware

To connect to the console, do the following:

1. Connect the RJ-45 connector to the console port (|o|o) of the switch.
2. Connect the RS-232 end to a terminal or PC.
3. Manage the switch using the CLI commands (refer to the CLI User Manual for more information).

The switch uses the following default settings:

- Baud rate: 115200
- Data width: 8 bits
- Parity: None
- Stop bits: 1
- Flow control: None

2.11. OOB Management Ports

Two types of OOB management ports can access the control plane NOS for management purposes.

1. The first port type is the RJ45 OOB port.
2. The second port type is the two 10G SFP+ ports.

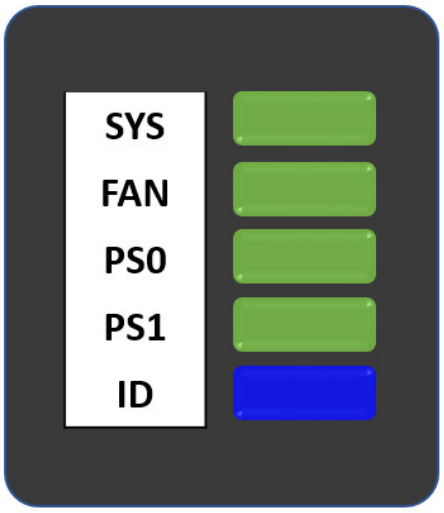
2.12. Management Ports

Two 10G SFP+ ports are available to connect to the TD4 management interfaces. These ports are marked with an orange "MGMT."

2.13. Verifying Switch Operation

Verify basic switch operation by checking the system LEDs.

When a NOS operating normally, the PSU1/PSU2, FAN, and SYS LEDs should all display green.



Chapter 3. Netberg Aurora 830 switch

The switch chassis is equipped with the following ports:

- 2x 10G SFP+ + 32x 400G QSFP-DD ports supporting an optical transceiver, active optical cables, or direct-attached cable to connect the QSFP-DD port to the hosts
- 1 Management ports enables you to manage the switch operation using an RJ-45 Ethernet cable
- 1 Console port to perform the initial configuration by connecting to a PC with the RJ-45 to DB-9 serial adapter cable
- 1 USB port to load the configuration files or OS from a USB storage device to the switch's flash/ SSD memory

Figure 3.1. Aurora 830 front view

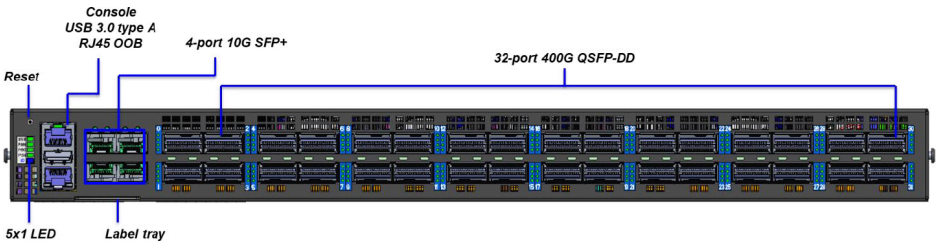


Table 3.1. Front panel features

No	Description
1	32x 400G QSFP-DD Ports
2	2x 10G SFP+ management ports 2x 10G SFP+ OOB management ports
3	RJ-45 OOB Management Port
4	USB 3.0 type-A Port
5	RJ45 Console Port
6	System LED
7	Reset button

Figure 3.2. Aurora 830 rear view

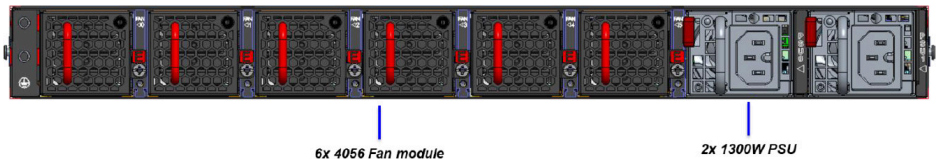


Table 3.2. Rear panel features

No	Description
1	Grounding Pad

No	Description
2	Fan Modules
3	PSU Modules

3.1. Button and System LED Information

This switch is equipped with SFP28 port link/activity LEDs (1 per port), QSFP28 port link/activity LEDs (4 per port), one activity LED and one link LED for the management port, and a health/status LED indicator on the front panel. These LEDs allow constant monitoring of basic system functions while the switch is operating and provide visual indication of system status.

Figure 3.3. Front Panel LED

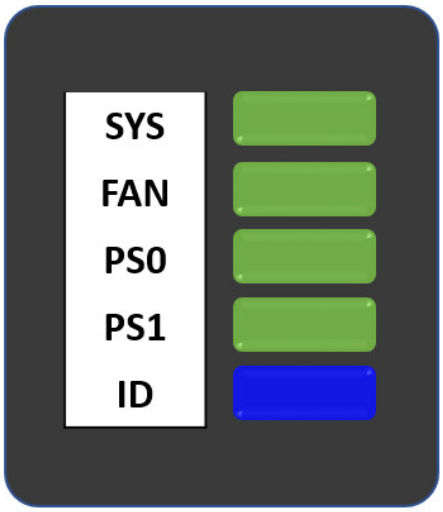


Table 3.3. Front panel features

No	Description
1	System LED
2	Fan status LED
3	PS0 status LED
4	PS1 status LED
5	System ID LED

Table 3.4. System LED Information

LED Condition	Switch Status
SYS	
Off	No power
Solid Green	Host CPU/BMC boot complete
Solid Amber	Power is up but Host CPU boot failed
FAN	
Off	Fans are not initialized
Solid Green	All Fans are work normal
Blinking Amber	Fan fail: one or more Fans need service

LED Condition	Switch Status
PS0	
Off	No power
Solid Green	PSU0 working normal
Blinking Amber	PSU0 fail (PSU0 needs service)
PS1	
Off	No power
Solid Green	PSU1 working normal
Blinking Amber	PSU1 fail (PSU1 needs service)
ID	
Off	No Power
Blinking Blue	Beacon feature is enabled on the switch

The back panel of this switch provides the AC power LEDs and fan module LEDs.

Additional information about PSU status can be obtained by the LEDs located on the PSU itself.

Table 3.5. PSU module LED

LED Condition	Switch Status
Off	No input power to all power supplies.
Green	Output ON and OK
Blinking Green (1/sec)	PSU standby state input power present / Only +5VSB on.
Blinking Green (2/sec)	Power supply firmware updating (Boot-loader mode).
Red	Power supply critical event causing a shutdown, failure, over current, short circuit, over voltage, fan failure, and/or over temperature.
Blinking Red (1/sec)	DC power cord unplugged or DC power lost with a second power supply in parallel still with DC input power. Power supply DC present, 5VSB and 12V off via on/off control from system.
Blinking between Green and Red	Power supply warning events where the power supply continues to operate; high temp, high power, high current, and/or slow fan.

Table 3.6. Fan module LED

LED Condition	Switch Status
Off	No input power
Solid Green	Fan is functioning normal
Blinking Amber	Fan is abnormal, service is required

Table 3.7. Ports Activity LED Information

LED Type	Color	Status	Function
QSFP-DD 400G Mode Link/ Activity LEDs	Green	Solid	Link is up

LED Type	Color	Status	Function
		Blinking	400G activity
		Off	Link is down
QSFP-DD 100G Mode Link/ Activity LEDs	Amber	Solid	Link is up
		Blinking	100G activity
		Off	Link is down

3.2. Specification

System specification

Ports	• 32x 400GbE QSFP-DD ports in 1 RU • Supports breakout to 2x200GbE or 4x100GbE (up to 144 10GbE ports) • 2x 10G SFP+ TD4 management port • 2x 10G SFP+ OOB management port • 1x RJ-45 out-of-band (10/100/1000) management • 1x RJ-45 console (RS232) • 1x USB 3.0
Front IO	• System health/status LED • Fan status LED • PS0/PS1 status LED • ID LED • Reset button
Rear IO	• Fan LEDs • PSU1 status LED • PSU2 status LED
Performance	• Switching silicon: 12.8Tbps Broadcom Trident4-X11 BCM56880 • Intel® Xeon™ Processor D-2145NT • 32GB DDR4 ECC • 128GB SSD
BMC	ASPEED AST2420

Power	• 1+1 1300W redundant, load sharing, hot-swappable PSU modules
	  • AC/HVDC input: 100-240V~, 15-7.5A/190-310VDC, 7.5A (AC Inlet: IEC 60320 C15)
	  • DC input: -36 to -72V, 38A
	Typical power - 310W (without optics)

Cooling	• 6 N+1 redundant fans • Front-to-Back airflow

Dimensions (DxWxH)	650 x 440 x 44 mm
Environment	Operating temperature: 0~45°C
Operating humidity	20-95% maximum relative humidity (non-condensing)
Compatible NOS	• Ubuntu Linux • SONiC

3.3. Supported Cables and Transceivers

The switch supports 8x 50G PAM4 modulation. Please pick the modules accordingly.

400GE QSFP-DD ZR, 400GE QSFP-DD ER4, 400GE QSFP-DD LR4, 400GE QSFP-DD SR8, 400GE QSFP-DD FR4, 400GE QSFP-DD DR4, 400GE QSFP-DD DR4+, 400GE QSFP-DD PLR4, 200GE QSFP56 SR4, 200GE QSFP56 FR4, 100GE QSFP28 ZR4, 100GE QSFP28 ER4, 100GE QSFP28 LR4, 100GE QSFP28 SR4.

Passive copper cables up to 2m.

Active optical cables up to 300m.