Arctica Ethernet Switches Installation Guide

Models: Arctica 1600cs, Arctica 3200cs, Arctica 4808xs

Version 1.0
2018-09-25

About this Manual

This manual describes the installation and basic use of the Penguin Computing Arctica Ethernet Switches.

Intended Audience

This manual is intended for IT managers and system administrators.

Conventions

The following icons are used throughout this document to indicate information that is important to the user.

This icon makes recommendations to the user.

This icon indicates information that is helpful to the user.

This icon indicates a situation that can
potentially cause damage to hardware software.

This icon indicates a situation that can potentially cause personal injury.

This icon indicates a situation that can potentially cause personal injury.

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Introduction to Arctica Ethernet Switch Systems

Overview

Penguin Computing Arctica 1U switch systems are an ideal spine and Top of Rack (ToR) solution, allowing maximum flexibility, with port speeds spanning from 10Gb/s to 100Gb/s per port, and port density that enables full rack connectivity to any server at any speed. The uplink ports allow a variety of blocking ratios that suit any application requirement. Powered by the Spectrum ASIC, the systems carry whopping switching and processing capacities in a compact 1U form factor.

Keeping with the Penguin Computing tradition of setting performance record switch systems, the Spectrum based systems introduce the world's lowest latency for 100GbE switching and routing elements—while having the lowest power consumption in the market. They enable the use of 10, 25, 40, 50 and 100GbE in a large scale without changing power infrastructure facilities.

The Spectrum based switch systems are a part of Penguin Computing's complete end-to-end solution, which provides 10GbE through 100GbE interconnectivity within the data center. These systems introduce hardware capabilities for multiple tunneling protocols that enable increased reachability and scalability for today's data centers. Implementing MPLS, NVGRE and VXLAN tunneling encapsulations in the network layer of the data center allows more flexibility for terminating a tunnel by the network, in addition to termination on the server endpoint.

While Spectrum provides the thrust and acceleration that powers the switch systems, they get yet another angle of capabilities, running with a powerful x86-based processor, which allows them to not only be the highest performing switch fabric elements, but also grants them the ability to incorporate a Linux running server into the same device. This opens up multiple application aspects of utilizing the high CPU processing power and the best switching fabric, to create a powerful machine with unique appliance capabilities that can improve numerous network implementation paradigms.

The Spectrum™ based 1U switch systems support the Open Network Install Environment (ONIE) for zero touch installations of network operating systems. All Ethernet systems can be purchased preloaded with Cumulus Linux.

Figure 1: Arctica 3200cs Front Side View

Figure 2: Arctica 4808xs Front Side View

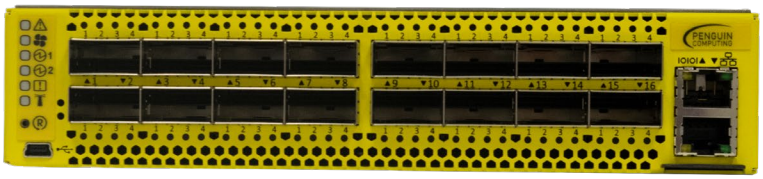


Figure 3: Arctica 1600cs Front Side View

Figure 4: Arctica 3200cs and Arctica 4808xs Rear Side View

Speed and Switching

This table describes maximum throughput and interface speed per system model.

Table 1: Speed and Switching Capabilities

System Model	10/25GbE SFP28 Interfaces*	40/50/100GbE QSFP28 Interfaces*	Max Throughpu
Arctica 3200cs	64 (using QSFP to SFP breakout cables)	32	3.2 Tb/s
Arctica 4808xs	Total 64, 48x SFP+ 16 (using QSFP to SFP breakout cables)	8	2 Tb/s
Arctica 1600cs	64 (using QSFP to SFP breakout cables)	16 (or 32 50GbE inter- faces when using QSFP to 2xQSFP breakout cables).	1.6 Tb/s

Management Interfaces, PSUs and Fans

This table lists the various management interfaces, PSUs and fans per system model.

Table 2: Management Interfaces, PSUs and Fans

System	USB	MGT	Console	PSU	Fan
Arctica 3200cs	Rear	Rear (2 ports)	Rear	2 units	4 units
Arctica 4808xs	Rear	Rear (2 ports)	Rear	2 units	4 units
Arctica 1600cs	Front (mini USB)	Front (1 port)	Front	2 units (non-replaceable)	4 units (non-replaceable)

Installation

Safety Warnings

1. Installation Instructions

Read all installation instructions before connecting the equipment to the power source.

2. Bodily injury due to excessive weight lifting.

Use enough people to safely lift this product.

3. Heavy Equipment

This equipment is heavy and should be moved using a mechanical lift to avoid injuries.

4. Risk of Electric Shock!

With the fan module removed power pins are accessible within the module cavity. Do not insert tools or body parts into the fan module cavity.

5. Excessive temperature

This equipment should not be operated in an area with an ambient temperature exceed-ing the maximum recommended: 45°C (113°F). Moreover, to guarantee proper ventilation, allow at least 8cm (3 inches) of clearance around the ventilation openings.

6. Stacking the Chassis

The chassis should not be stacked on any other equipment. If the chassis falls, it can cause bodily injury and equipment damage.

7. Redundant Power Supply Connection - Electrical Hazard

This product includes a redundant power or a blank in its place. If a blank is present, do not operate the product with the blank cover removed or not securely fastened.

8. Double Pole/Neutral Fusing

This system has double pole/neutral fusing. Remove all power cords before opening the cover of this product or touching any internal parts.

9. Multiple Power Inlets — Risk of electric shock and energy hazard.

The PSUs are all independent. Be sure to disconnect all power supplies to ensure a powered-down state inside of the switch platform.

10. During Lightning - Electrical Hazard

During periods of lightning activity, do not work on the equipment. Do not connect or disconnect any cables.

11. CopperCable Connecting/Disconnecting

Copper cables are heavy and inflexible, as such they should be carefully attached or detached from the connectors. Refer to the cable manufacturer for special warnings/ instructions.

12. Rack Mounting and Servicing

When this product is mounted or serviced in a rack, special precautions must be taken to ensure that the system remains stable. In general you should fill the rack with equip- ment starting from the bottom to the top.

13. Equipment Installation

This equipment should be installed, replaced, and/or serviced only by trained and qualified personnel.

14. Equipment Disposal

Disposal of this equipment should be in accordance with all national laws and regulations.

15. Local and National Electrical Codes

This equipment should be installed in compliance with local and national electrical codes.

16. Installation Codes

This device must be installed according to the latest version of the country national electrical codes. For North America, equipment must be installed in accordance to the applicable requirements in the US National Electrical Code and the Canadian Electri-cal Code.

17. Battery Replacement

Warning: Replace only with UL Recognized battery, certified for maximum abnormal charging current not less than 4mA.

There is a risk of explosion if the battery is replaced with a battery of an incorrect type.

Dispose of used batteries according to the instructions.

18. UL Listed and CSA Certified Power Supply Cord

For a North American power connection, select a power supply cord that is UL Listed and CSA Certified, 3-conductor, [16 AWG], terminated with a molded plug rated at 125 V, [13 A], with a minimum length of 1.5m [six feet] but no longer than 4.5m.

For European connection, select a power supply cord that is internationally harmonized and marked “<HAR>”, 3-conductor, minimum 1.0 mm2 wire, rated at 300 V, with a PVC insulated jacket. The cord must have a molded plug rated at 250 V, 10 A.

19. Installation codes

This device must be installed according to the latest version of the country national electrical codes. For North America, equipment must be installed in accordance to the applicable requirements in the US National Electrical Code and the Canadian Electrical Code.

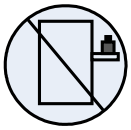
20. Interconnecting the Units

Cables for connecting to the unit RS232 and Ethernet Interfaces must be UL certified type DP-1 or DP-2. (Note- when residing in non LPS circuit)

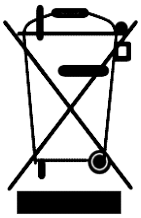
21. Overcurrent Protection

A readily accessible Listed branch circuit overcurrent protective device rated 20 A must be incorporated in the building wiring.

22. Do Not Use the Switch as a Shelf or Work Space



CAUTION: Slide/rail mounted equipment is not to be used as a shelf or a work space. The rails are not intended for sliding the unit away from the rack. It is for permanent instal- lation at final resting place only, not used for service and maintenance



23. WEEE Directive

According to the WEEE Directive 2002/96/EC, all waste electrical and electronic equipment (EEE) should be collected separately and not disposed of with regular household waste.

Dispose of this product and all of its parts in a responsible and environmentally friendly way.

System Installation and Initialization

Installation and initialization of the system require attention to the normal mechanical, power, and thermal precautions for rack-mounted equipment.

The rack mounting holes conform to the EIA-310 standard for 19-inch racks. Take precautions to guarantee proper ventilation in order to maintain good airflow at ambient temperature.

Unless otherwise specified, Penguin Computing products are designed to work in an environmentally controlled data center with low levels of gaseous and dust (particulate) contamination.

The operation environment should meet severity level G1 as per ISA 71.04 for gaseous contamination and ISO 14644-1 class 8 for cleanliness level.

This is the installation procedure for the system:

1. Follow the safety warnings in the previous section.
2. Pay attention to the air flow consideration within the system and rack - refer to the Air Flow section below.
3. Make sure that none of the package contents are missing or damaged - see **Package Contents** below.
4. Mount the system into a rack enclosure - see **Systems Mounting Options**.
5. Power on the system - refer to the **Initial Power On** section below.
6. [Optional]: FRU replacements are described further below in this document.

Air flow

The following information does not apply to Arctica 1600cs. In the 1600cs systems, the fan units are non-replaceable.

Penguin Computing's Arctica Switches are offered with two air flow patterns:

- Power (rear) side inlet to connector side outlet - marked with blue power supplies/fans- FRUs' handles, as shown in Figure 7.
- Connector (front) side inlet to power side outlet - marked with red power supplies/fans FRUs' handles, as shown in Figure 8.

Figure 5: Air Flow Direction Marking - Power Side Inlet to Connector Side Outlet

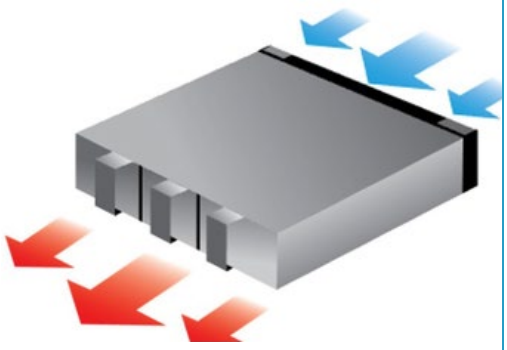
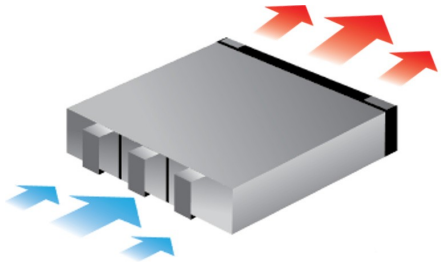
Figure 6: Air Flow Direction Marking - Connector Side Inlet to Power Side Outlet

All servers and systems in the same rack should be planned with the same airflow direction.

All FRU components need to have the same air flow direction. A mismatch in the air flow will affect the heat dissipation.

The table below provides an air flow color legend and respective OPN designation.

Table 3: Air flow color legend

Direction	Description
	Connector side inlet to power side outlet. Red latches are placed on the power inlet side.
	Power side inlet to connector side outlet. Blue latches are placed on the power inlet side.

Package Contents

Before installing your new system, unpack it and check against the parts list below that all the parts have been sent. Check the parts for visible damage that may have occurred during shipping.
The Arctica 3200cs and Arctica 4808xs package content is as follows:

- 1 – System
- 1 – Rail kit

- 1 – Power cable for each power supply unit – Type C13-C14
- 1 – Cable retainer for each power supply unit
- 1 – DB9 to RJ-45 2m harness

The Arctica 1600cs package content is as follows:

- 1 – System
- 1 – Power cable for each power supply unit – Type C13-C14
- 1 – DB9 to RJ-451 2m harness

A designated rail kit for the Arctica 1600cs systems can be purchased separately.

If anything is damaged or missing, contact your sales representative at corp-support@penguincomputing.com.

19” Systems Mounting Options

By default, the Arctica 3200cs systems are sold with the Static Rail Kit for Arctica 3200cs. The Arctica 4808xs systems are sold with the Static Rail Kit for Arctica 4808xs. For the telescopic rail kit installation instructions (can be used with Arctica 3200cs only), see Telescopic Rail Kit for Arctica 3200cs.

The Arctica 1600cs system is sold without a rail kit. A designated rail kit can be purchased separately. For installation instructions, see Side by Side Mounting for Arctica 1600cs Rail Kit.

At least two people are required to safely mount the system in the rack.

Table 4: Static Rail Kit for 3200cs

Penguin PN	Rack Size and Rack Depth Range
10026062	Short (17”-24”) or Standard (24”-34”)

The following parts are included in the static rail kit (see the figure below):

- 2x Rack mount rails (A)
- 2x Rack mount brackets (B)
- 2x Rack mount blades (C)
- 8x M6 Standard cage nuts[1] [2] and 8x M6 Standard pan-head Phillips screws[1] (D)
- 4x Phillips100 DEG F.H TYPE-I ST.ST 6-32 X 1/4 screw with around patch (E)

[1] Other threads are available by special order: M5, 10-32, 12-24
[2] G-type cage-nut is available by special order.

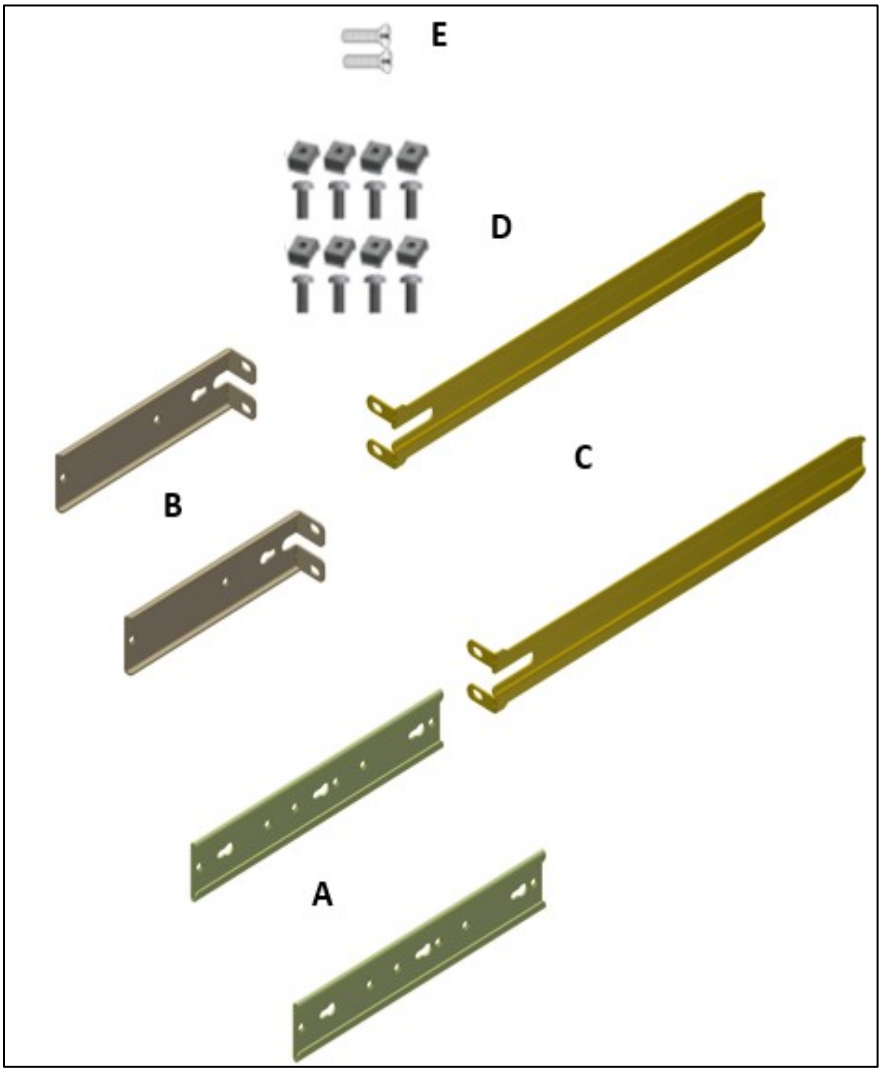


Figure 7: Rack Rail Kit Parts

Mount the system into the rack

Before mounting the system to the rack, select the way you wish to place the system. Pay attention to the airflow within the rack cooling, connector and cabling options.

While planning how to place the system, consider the two installation options shown in the figure below, and review the following points:

- Make sure the system air flow is compatible with your installation selection. It is import- ant to keep the airflow within the rack in the same direction.
- Note that the part of the system to which you choose to attach the rails (the front panel direction, as demonstrated in Option 1 or the FRUs direction, as demonstrated in Option
- 2) will determine the system's adjustable side. The system's part to which the brackets are attached will be adjacent to the cabinet.
- The FRU side is extractable. Mounting the rack brackets inverted to the FRU side (Option 2) will allow you to slide the FRUs, in and out.

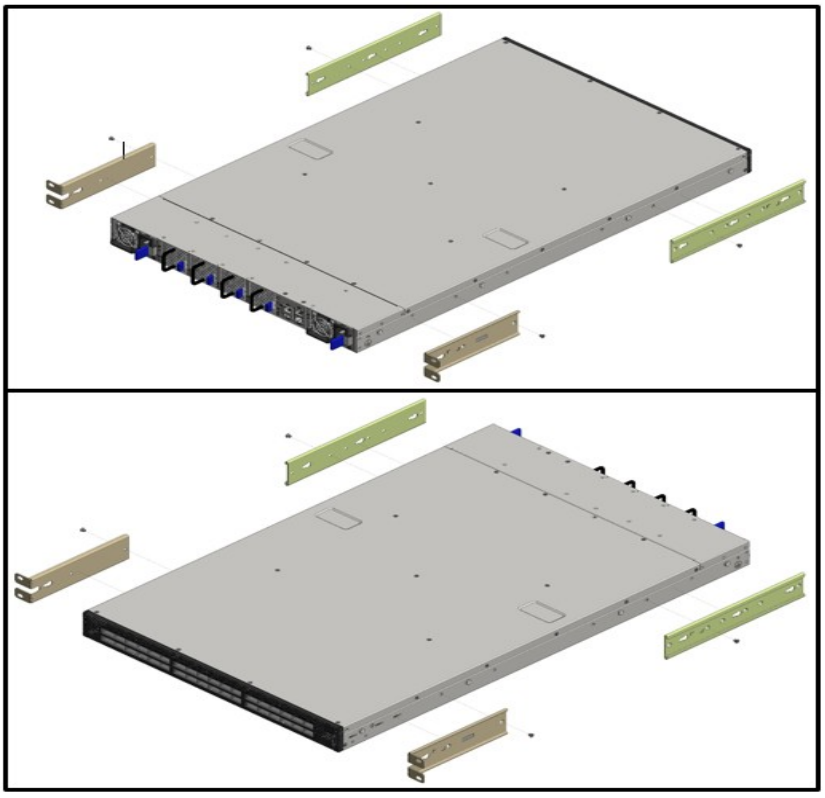


Figure 8: Installation options

Refer to Figure 7: Rack Rail Kit Parts above and follow these steps:

Step 1. Attach the left and right rack mount rails (A) to the switch, by gently pushing the switch chassis' pins through the slider key holes, until locking occurs.

Step 2. Secure the chassis in the rails by screwing 2 flat head Phillips screws (E) in the designated points with a torque of 1.5±0.2 Nm. See the figure below.

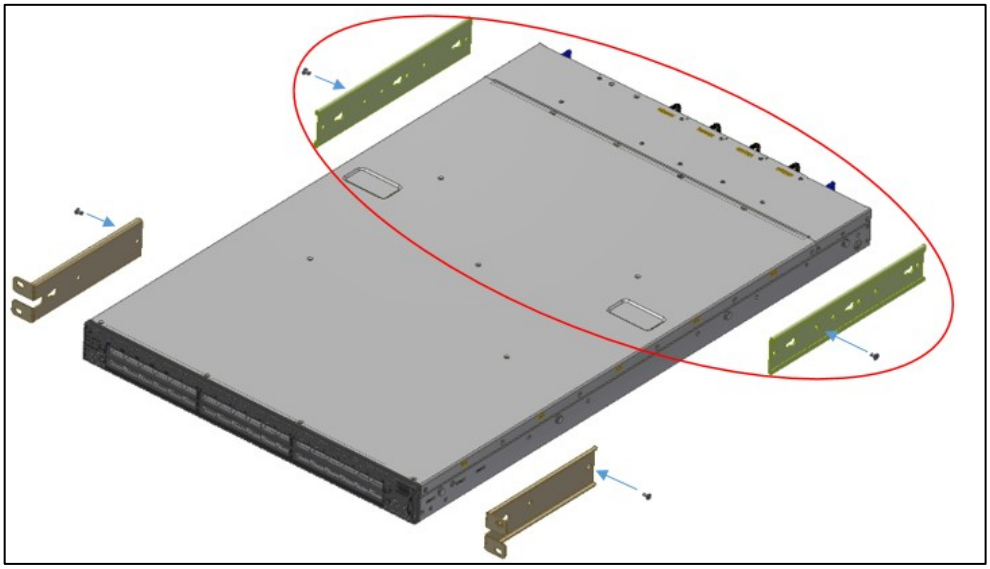


Figure 9: Attaching the Rails to the Chassis

Step 3. Attach the left and right rack mount brackets (B) to the switch, by gently pushing the switch chassis' pins through the slider key holes, until locking occurs. Secure the system in the brackets by screwing the remaining 2 flat head Phillips screws (E) in the designated points with a torque of 1.5±0.2 Nm. See the figure below.

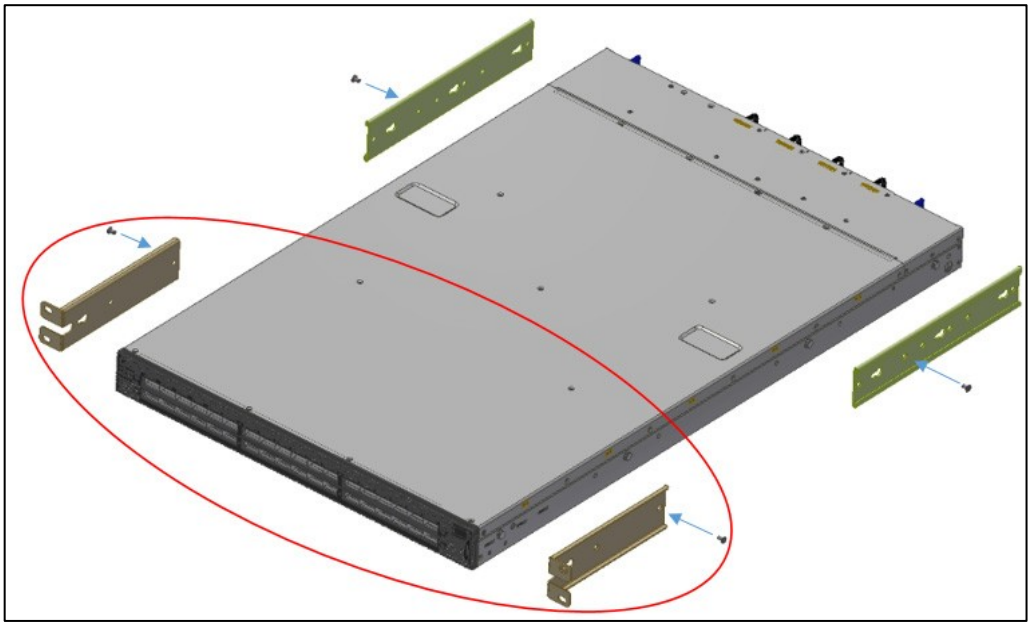


Figure 10: Attaching the Brackets to the Chassis

Step 4. Install 8 cage nuts in the desired 1U slots of the rack: 4 cage nuts in the non-extractable side (in the top and bottom holes only) and 4 cage nuts in the extractable side.

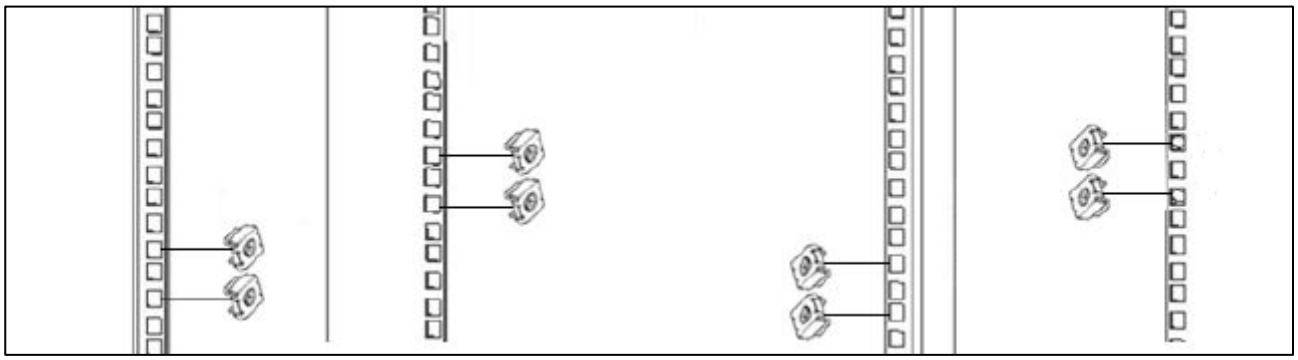


Figure 11: Installing the Cage Nuts

While each rack U (unit) consists of three holes, the cage nut should be installed vertically with its ears engaging the top and bottom holes only.

While your installation partner is supporting the system's weight, perform the following steps:

Step 5. Mount the system into the rack enclosure, and attach the brackets installed on the system to the rack's posts. Secure the brackets to the rack posts by inserting four M6 screws in the designated cage nuts, as described in the figure below. Do not tighten the screws yet.

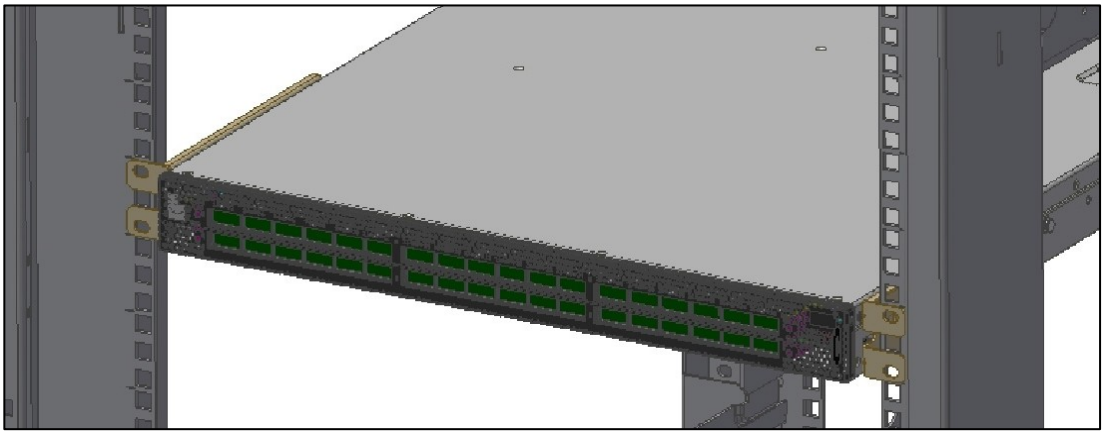


Figure 12: Attaching the Brackets to the Rack

Step 6. Slide the two blades into the left and right rails, and then adjust them to fit the depth of your rack. Use four M6 screws (D) to fix the blades into the rack. Do not tighten the screws yet.

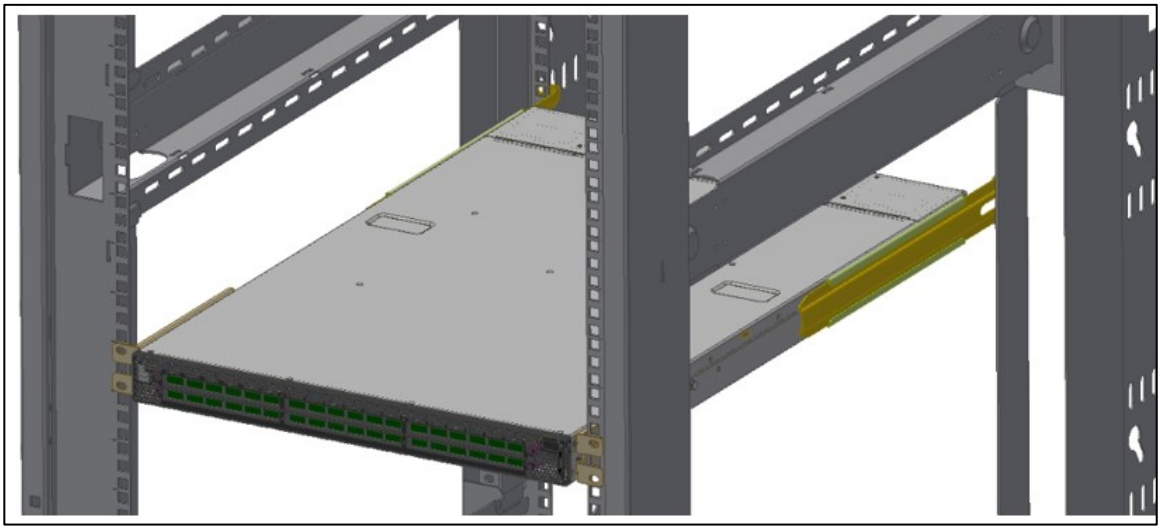


Figure 13: Sliding the Blades in the Rails

Step 7. Secure the system in the rack by tightening the 8 screws inserted in Step 5 and Step 6 with a torque of 4.5±0.5 Nm.

Removing the System from the Rack

To remove a unit from the rack:

Step 1. Turn off the system and disconnect it from peripherals and from the electrical outlet. While your installation partner is supporting the system's weight:

Step 2. Loosen the screws attaching the brackets to the rack. Do not remove them yet.

Step 3. Loosen the screws attaching the blades to the rack, and pull the blades towards you, while your partner is holding the system.

Step 4. Extract the loosened screws from Step 2 and dismount the system from the rack.

Step 5. Remove the rails and brackets from the chassis by unscrewing 8 screws.

Telescopic Rail Kit for Arctica 3200cs

There are two installation kit options:

- Standard depth systems should be mounted using the standard rail kit.
- Short depth systems can be mounted using either of the rail kits.

Table 5: Installation Kit

Penguin PN	Rack Size and Rack Depth Range
10027052	Short (17"-24" \ 43.1 to 61 cm)
10027053	Standard (24"-34" \ 61 to 86.3 cm)

The following parts are included in the rail kit package (see Figure 14: Rack Rail Kit Parts):

- 1x Right inner rail (A)
- 1x Left inner rail (B)
- 2x Outer rails (C)
- 2x Outer rails (D)
- 10x M6 Standard cage nuts[1] [2] and 10x M6 Standard pan-head Phillips screws[1] (E)

- 2x Phillips100 DEG F.H TYPE-I ST.ST 6-32 X 1/4 screw with around patch (F)

[1] Other threads are available by special order: M5, 10-32, 12-24
[2] G-type cage-nut is available by special order.

The rails must be separated prior to the installation procedure. See the figure below.

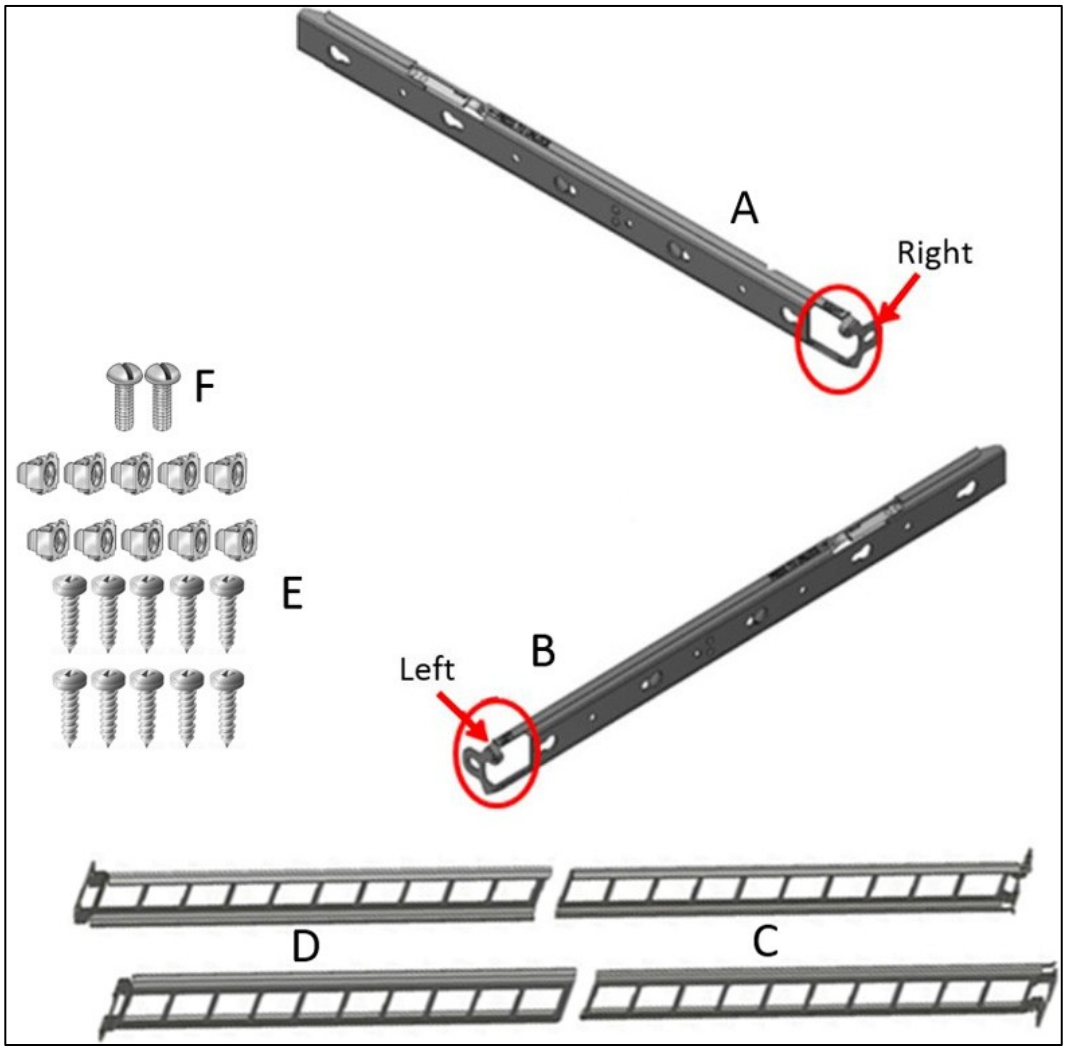


Figure 14: Rack Rail Kit Parts

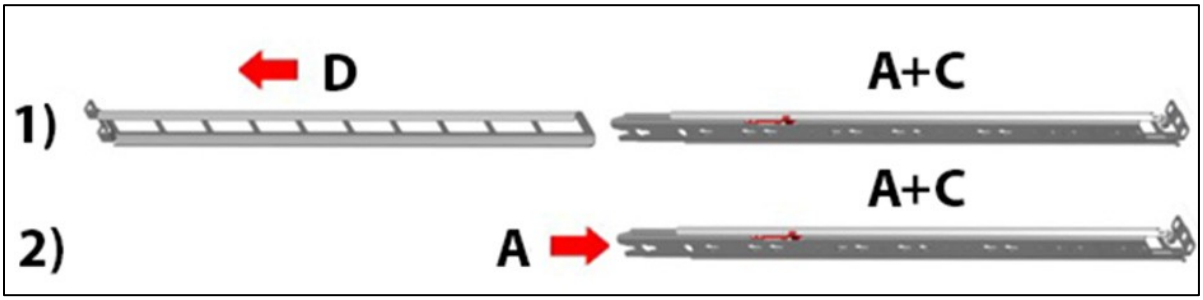


Figure 15: Rails Separation

To separate the rails, follow these steps:

1. Extend the rail assembly by pulling the extension outwards (D).
2. Extract rail A from rail C by pushing it outside from the rear part of the assembly. To allow complete separation of rail A from rail C, press the quick-release latch.

Before mounting the system to the rack, select the way you wish to place the system. Pay attention to the airflow within the rack cooling, connector and cabling options.

While planning how to place the system, review the following points:

- Make sure the system air flow is compatible with your installation selection. It is import- ant to keep the airflow within the rack in the same direction.
- In case there are cables that cannot bend within the rack, or in case more space is needed for cable bending radius, it is possible to recess the connector side or the FRU side by 3” or 4” (7.62 or 10.16cm) by optional placement of the system’s rails.
- The FRU side is extractable. Mounting the sliding rail inverted to the system will allow you to slide the FRU side of the system, in and out.

Follow these steps:

Step 1. Install 10 cage nuts into the desired 1U slots of the rack: 4 cage nuts in the non-extractable side and 6 cage nuts in the extractable side.

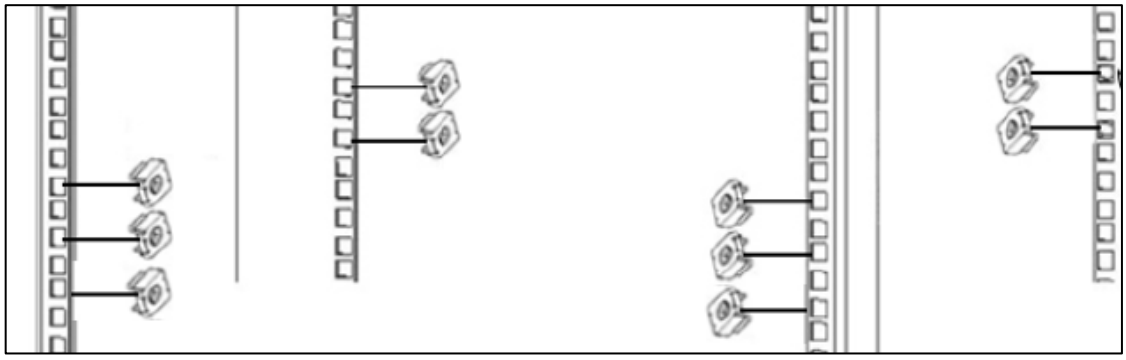


Figure 16: Installing the Cage Nuts

Step 2. Mount both of the outer rails (C+D) into the rack (as shown in the figure below), and then use 8 standard pan-head screws (E) to fix them to the rack. Do not tighten the screws yet.

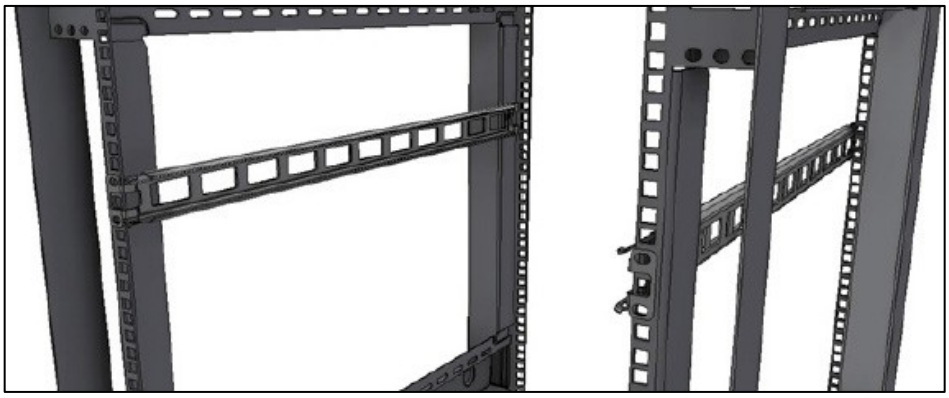


Figure 17: Mounting the Outer Rails into the Rack

Step 3. If cable accommodation is required, route the power cable and/or Eth cable through either of the outer rails.

Step 4. Attach the switch to the left and right inner rails (A+B), by gently pushing the switch chassis pins through the slider key holes, until locking occurs.

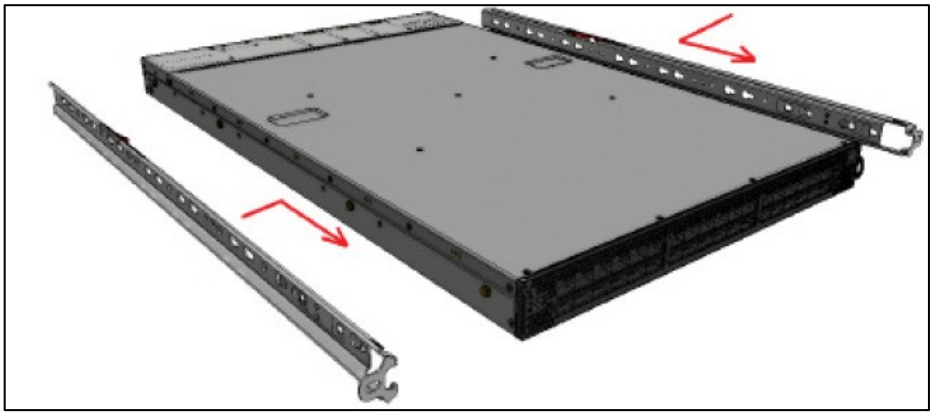


Figure 18: Attaching the Inner Rails to the Chassis

Step 5. Secure the chassis in the inner rails by screwing the 2 flat head Phillips screws (F) in the designated points with a torque of 1.5±0.2 Nm.

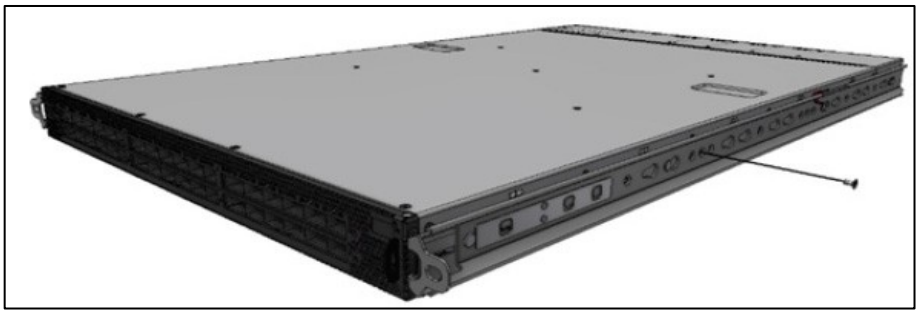


Figure 19: Securing the Chassis in the Inner Rails

Step 6. Slide the switch into the rack by carefully pushing the inner rails into the outer rails installed on the rack.

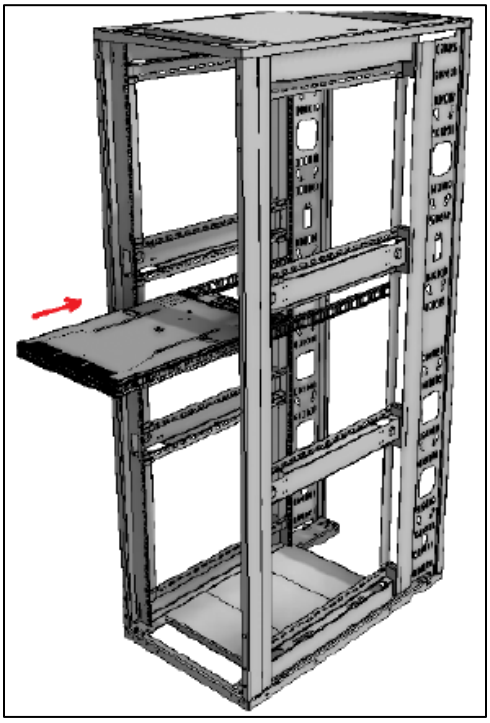


Figure 20: Sliding the Switch into the Rack

Step 7. When fully inserted, fix the switch by closing the remaining 2 screws in the middle and tightening the 8 screws inserted in Step 2 with a torque of 4.5±0.5 Nm.

Removing the System from the Rack

Follow these steps to remove a unit from the rack:

Step 1. Turn off the system and disconnect it from peripherals and from the electrical outlet.

Step 2. Unscrew the two M6 screws securing the front of the inner rails' ears to the outer rails and to the rack.

Step 3. Pull the unit out until braking is felt. For safety purposes, the locking mechanism will not allow a complete removal of the unit at this stage.

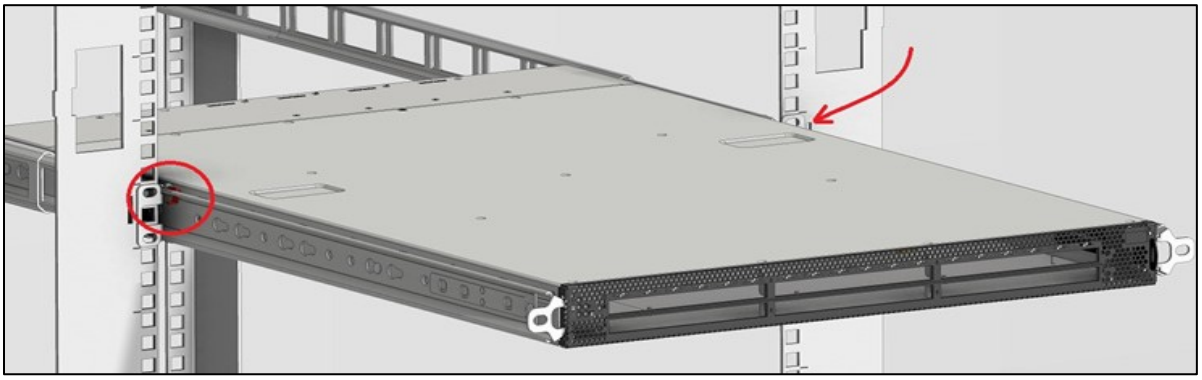


Figure 21: Pulling the Unit Outwards

Step 4. Press on the locking spring (appears in red in Figure 24) on both sides simultaneously, and then continue pulling the unit towards you until it is fully removed.

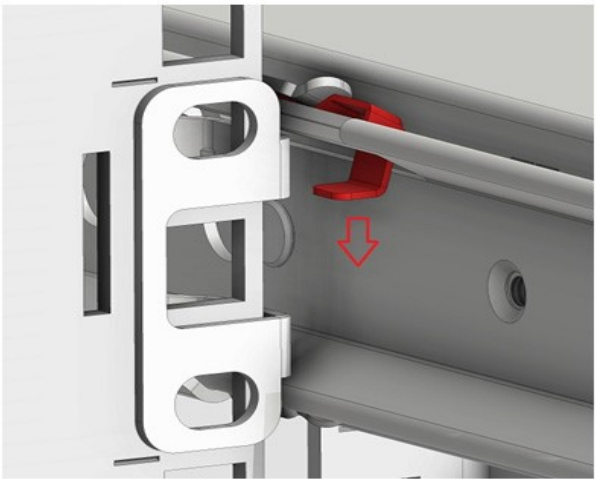


Figure 22: Locking Mechanism

Static Rail Kit for Arctica 4808xs

At least two people are required to safely mount the system in the rack.

By default, the system is sold with the standard-depth rail kit. The short-depth rail kit can be supplied upon request.

Table 6: Installation Kit

Penguin PN	Rack Size and Rack Depth Range
10026063	Short (19.7"-23.6" \ 50 to 60 cm)
10026064	Standard (23.6"-31.5" \ 60 to 80 cm)

The following parts are included in the static rail kit (see Figure 23: Rack Rail Kit Parts):

- 2x Rack mount rails (A)
- 2x Rack mount blades (B)
- 8x M6 Standard cage nuts[1] [2] and 8x M6 Standard pan-head Phillips screws[1] (C)
- 4x Phillips100 DEG F.H TYPE-I ST.ST 6-32 X 1/4 screw with around patch (D).

[1] Other threads are available by special order: M5, 10-32, 12-24
[2] G-type cage-nut is available by special order.

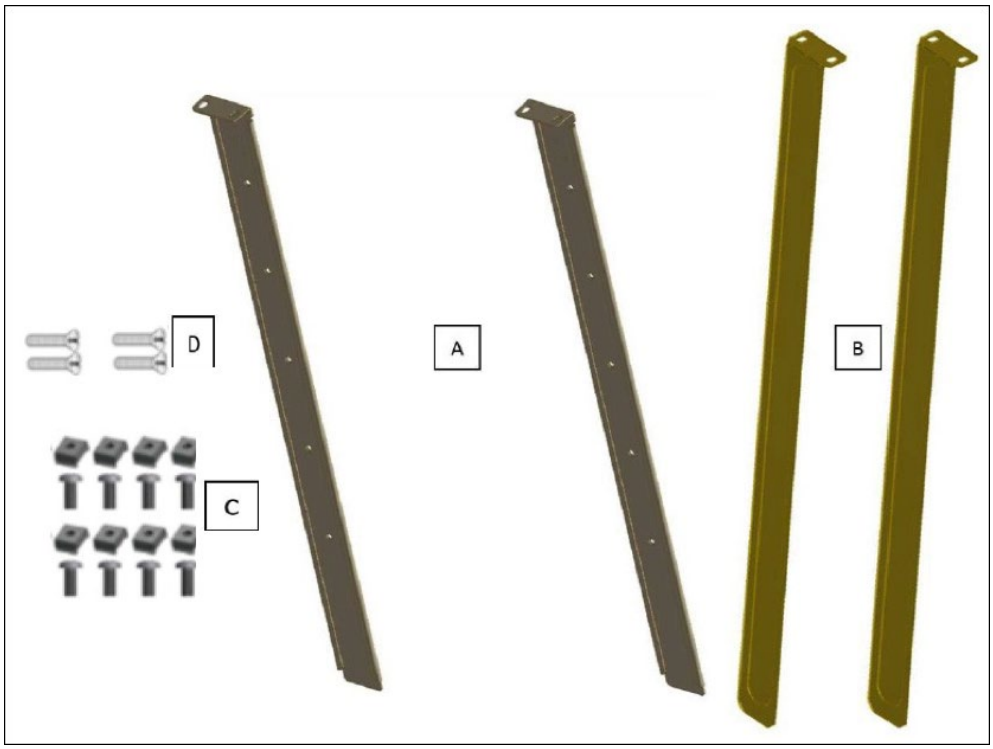


Figure 23: Rack Rail Kit Parts

Before mounting the system to the rack, select the way you wish to place the system. Pay attention to the airflow within the rack cooling, connector and cabling options.

While planning how to place the system, consider the two installation options shown in the figure below, and review the following points:

- Make sure the system air flow is compatible with your installation selection. It is import- ant to keep the airflow within the rack in the same direction.
- Note that the part of the system to which you choose to attach the rails (the front panel direction, as demonstrated in Option 1 or the FRUs direction, as demonstrated in Option 2, will determine the system's adjustable side. The system's part to which the blades are attached, will be adjacent to the cabinet.
- In case there are cables that cannot bend within the rack, or in case more space is needed for cable bending radius, it is possible to recess the connector side or the FRU side by 3.5" (8.9 cm), by optional placement of the system's rails.
- The FRU side is extractable. Mounting the rack blades inverted to the FRU side (Option 2) will allow you to slide the FRUs, in and out.

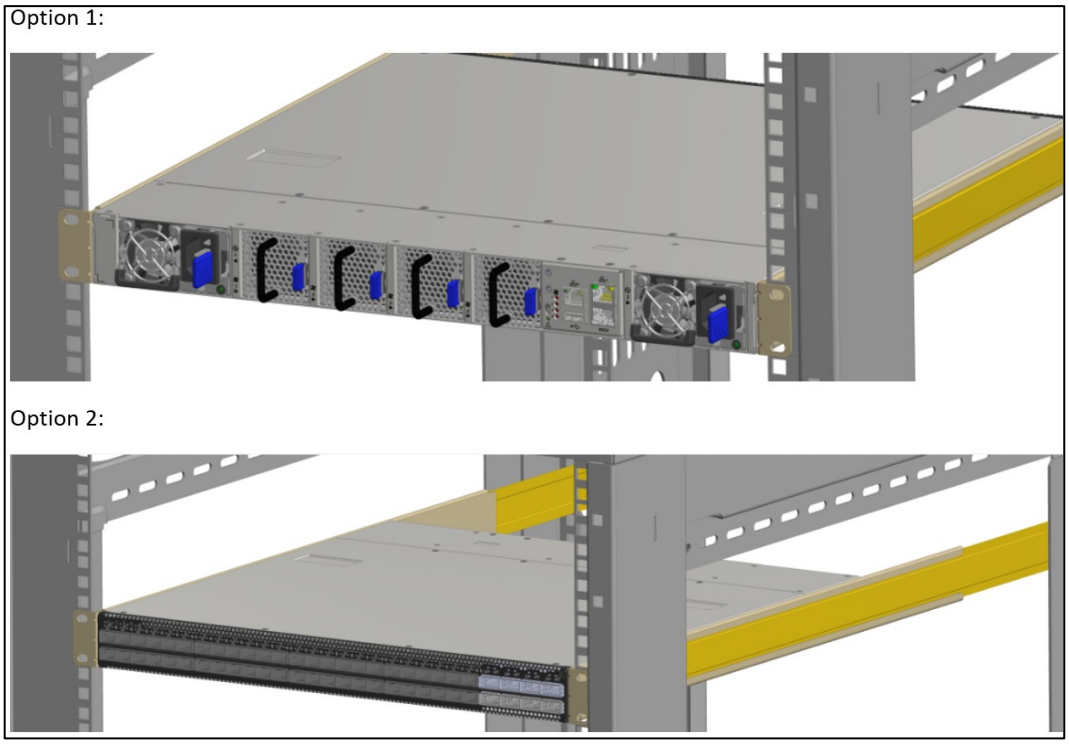


Figure 24: Installation Options

Follow these steps:

Step 1. Attach the left and right rack mount rails (A) to the switch, and then secure the chassis in the rails by screwing 2 flat head Phillips screws (D) in the designated points on each side (a total of 4 screws). See the figure below. To tighten the screws, use a torque of 1.5±0.2 Nm.

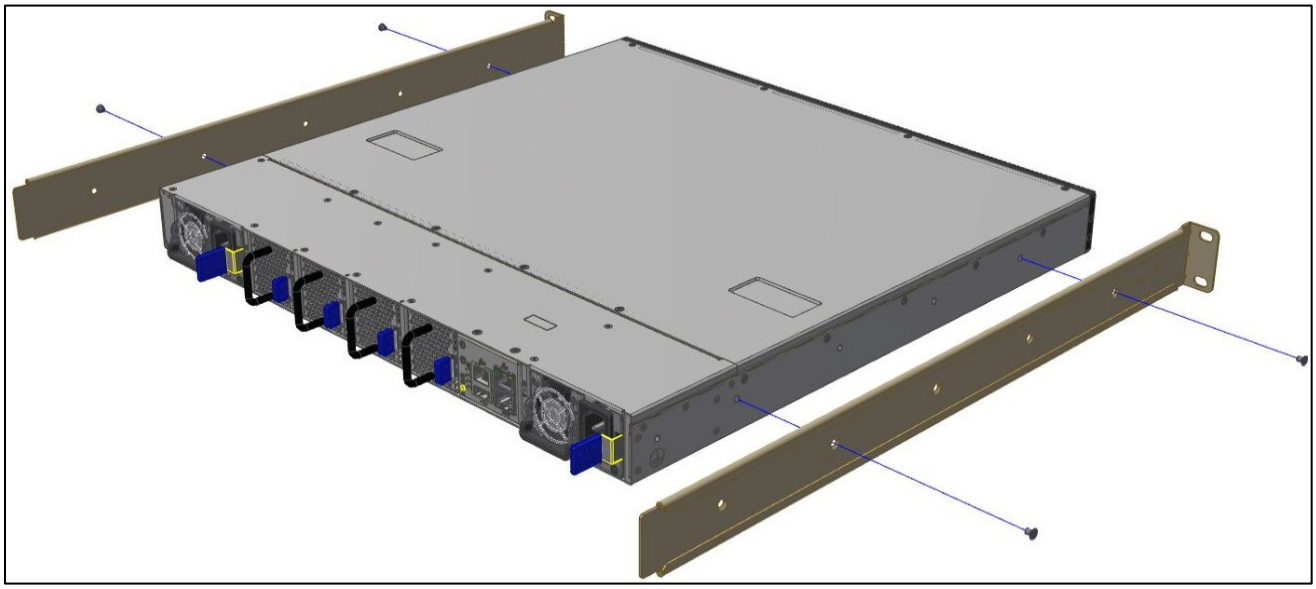


Figure 25: Attaching the Rails to the Chassis

Step 2. Install 8 cage nuts (C) in the desired 1U slots of the rack: 4 cage nuts in the non-extractable side and 4 cage nuts in the extractable side. Note that while each rack U (unit) consists of three holes, the cage nut should be installed vertically with its ears engaging the top and bot- tom holes only. See the figure below.

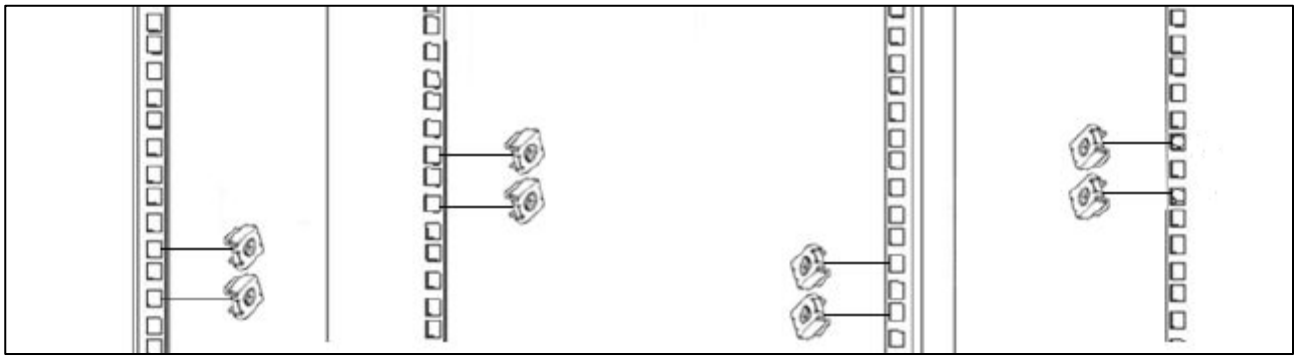


Figure 26: Installing the Cage Nuts

With your installation partner supporting the weight of the system, perform steps 3, 4 and 5:

Step 3. On the rear side of the cabinet, install the two blades (B) in the selected rack unit, using four M6 screws (C). Do not tighten the screws yet. See Figure 29.

Step 4. Slide the two blades into the left and right rails, and adjust them to fit your rack's depth. Use four M6 screws (D) to fix the blades into the rack. Do not tighten the screws yet. See Figure 30.

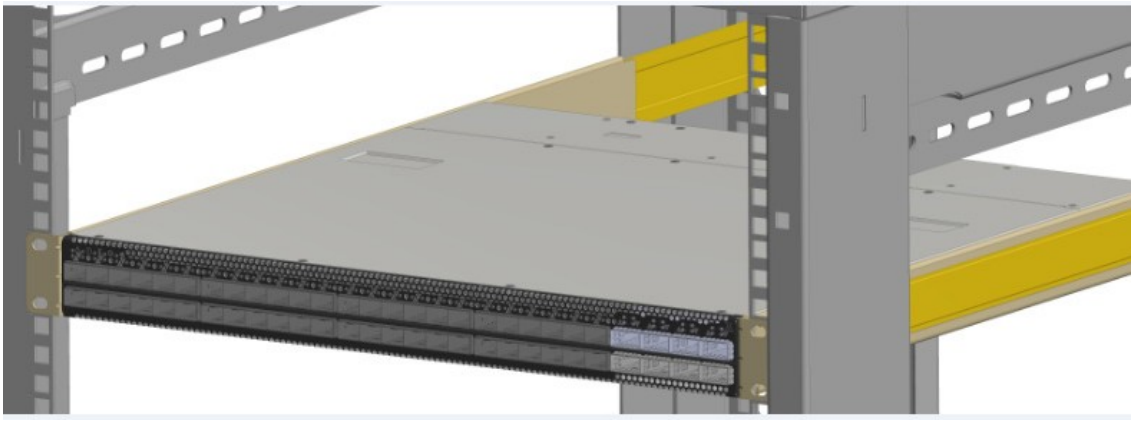


Figure 27: Sliding the Blades in the Rails

Step 5. Secure the system in the rack by tightening the 8 screws inserted in Step 3 and Step 4 with a torque of 4.5±0.5 Nm.

Side by Side Mounting for Arctica 1600cs Rail Kit

A designated rail kit for the Arctica 1600cs systems can be purchased separately.

This section is relevant to short-depth systems that permit this type of installation.

For safety, it is necessary that at least two people mount the system in the rack.

Table 7: Installation Kit

Penguin PN	Rack Size and Rack Depth Range
10026065	Rack installation kit for 1600cs short depth 1U switches permits installation of one or two switches side-by-side into standard depth racks.

The following parts are included in the rail kit (see Figure 28 below):

- 1 metal frame for two systems (A)
- 2 system mounting blades with 8 screw holes - the kit contains enough rails to install 2 systems (B)
- 2 system mounting blades with 7 screw holes - the kit contains enough rails to install 2 systems (C)
- 2 frame rail slides (D)
- 30 flat head 4-40 screws - the kit contains enough screws to install 2 systems (E)
- 2 blank covers (F)
- 10 (+2 spare units) M6 pan head screws (G)
- 10 (+2 spare units) M6 spring washers (H)
- 10 (+2 spare units) M6 spring steel cage nuts (I)
- 6 (+2 spare units) cable-ties (J)

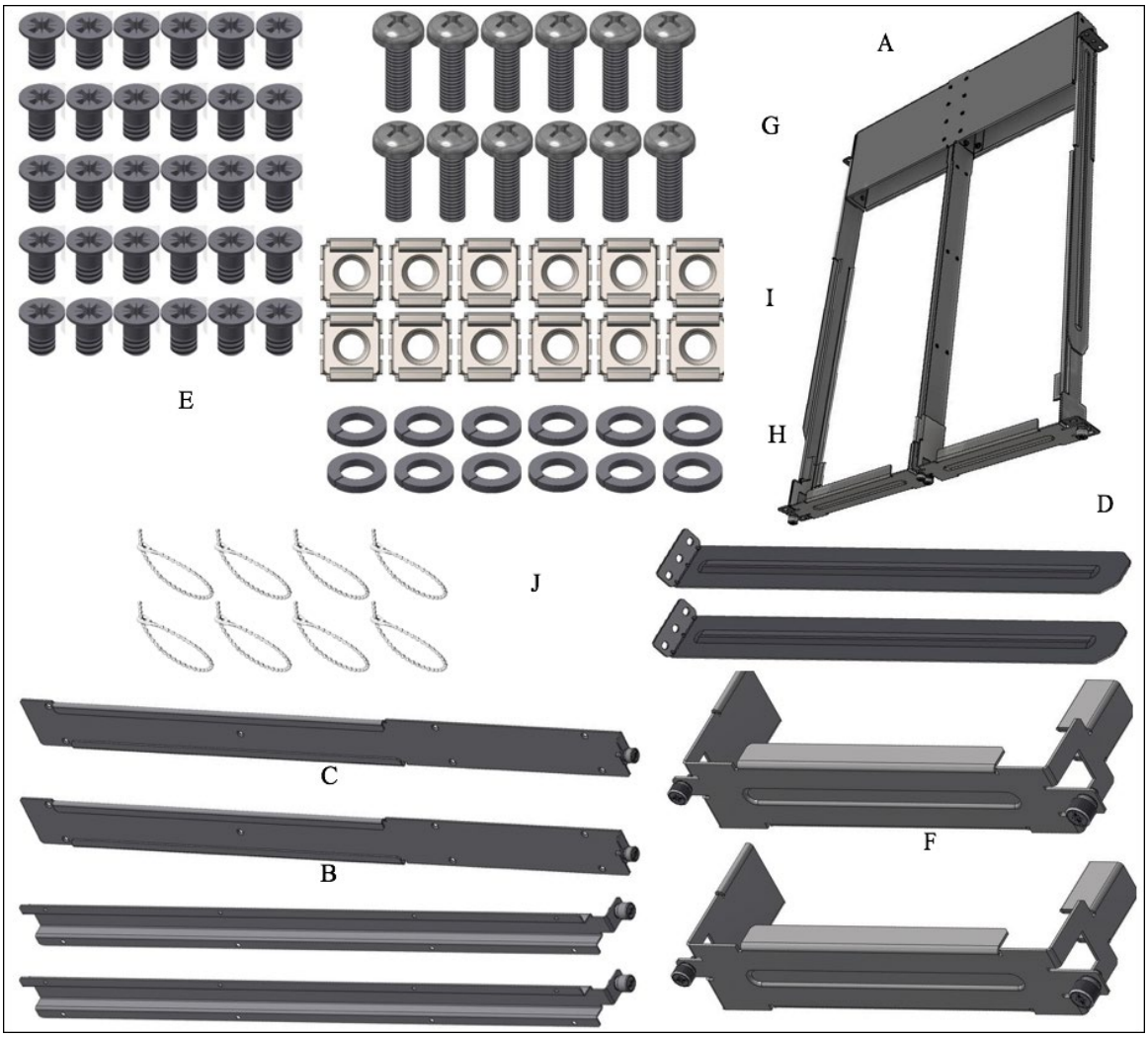


Figure 28: Rack Rail Kit Parts

Before mounting the system to the rack, choose how you want to place the system. Pay attention to the airflow within the rack cooling, connector, and cabling options.

- The installation kits come with enough system mounted rails and flat head screws to install two systems.
- The two system metal frames will fit into racks with from 23.6” (600mm) to 31.5” (800mm) space between the vertical supports.
- You may install your system in either the right or in the left part of the metal frame.
- The following instructions apply to installation in the right part. For installation in the frame’s left part, follow the same instructions, while replacing “right” with “left”, and vice versa.

Follow these steps:

Step 1. Insert the SE (single ended) plugs to the dedicated inlets in the system's rear panel.

Step 2. Carefully position the SE (single ended) cables one on top of the other, then use three cable ties to pair them together, as shown in the figure.

While pairing the cables, make sure the cables are paired in symmetry to the switch, in order to avoid damaging the cables.

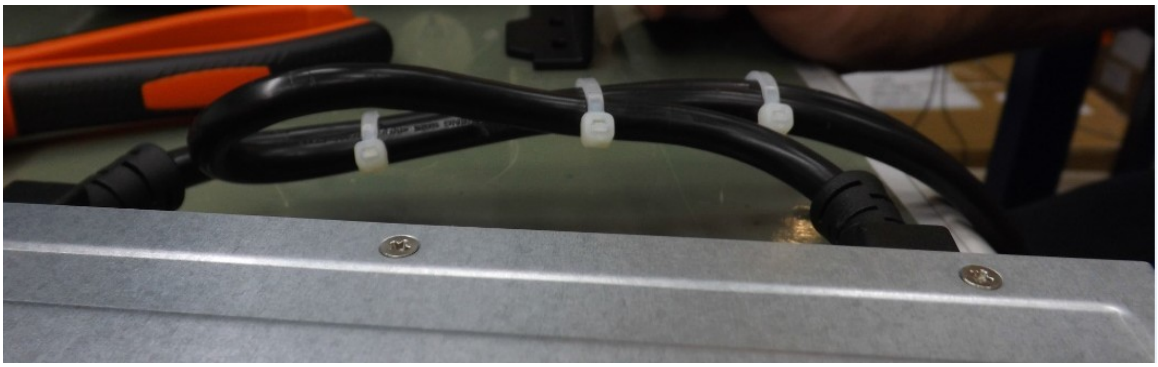


Figure 29: Coupling the Cables with Cable-ties

Figure 30: Coupled Cables - Rear View

Step 3. Place the coupled cables in the designated area within the right flat blade (the blade with 7 screw holes) as shown in the figure below.

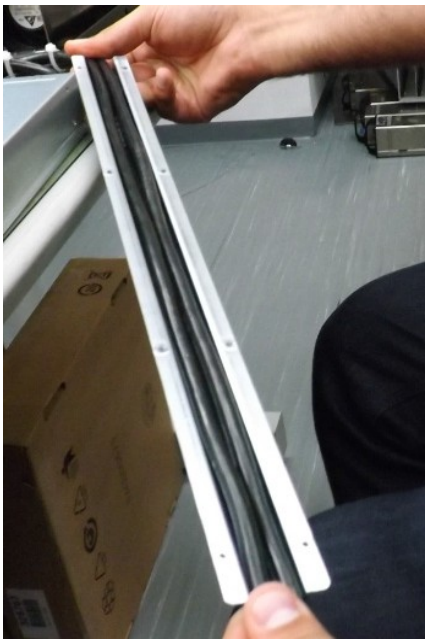


Figure 31: Cables within the Rail

In the next step, you will be attaching the rails to the chassis, before doing that, make sure the cables are laid properly within them. Avoid using excessive pressure, as it can damage the cables.

Step 4. While holding the cables together in the blade rail with one hand, use your other hand to secure the blades to the chassis. Screw in the right blade with eight 4-40 flathead screws, and the left blade with seven 4-40 flathead screws. The recommended torque is 0.49-0.54 Nm.

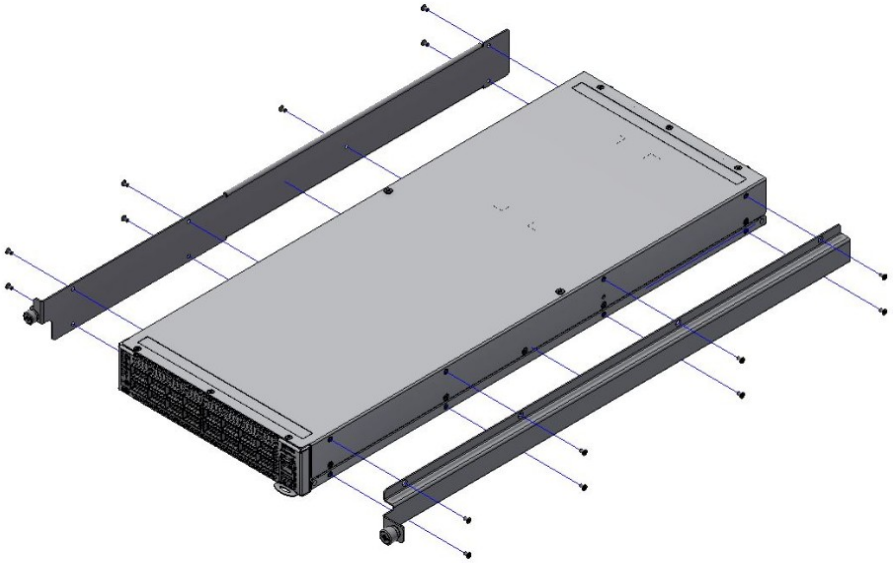


Figure 32: Attach the blades to the system

Figure 33: Attached Rail with Threaded Cables - Top View

Step 5. Slide the two frame slides into the dedicated rails in the metal frame. See the figure below.

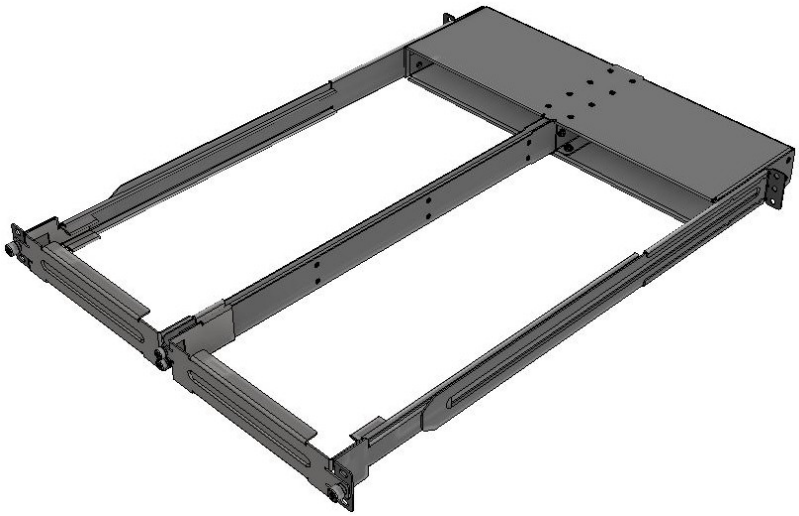


Figure 34: Sliding the Frame Sliders into the Rails

Step 6. Place the frame in the cabinet, then install ten cage nuts in the desired 1U slots of the rack: three cage nuts in the front part of each cabinet post, and two cage nuts in the rear part of each cabinet post.

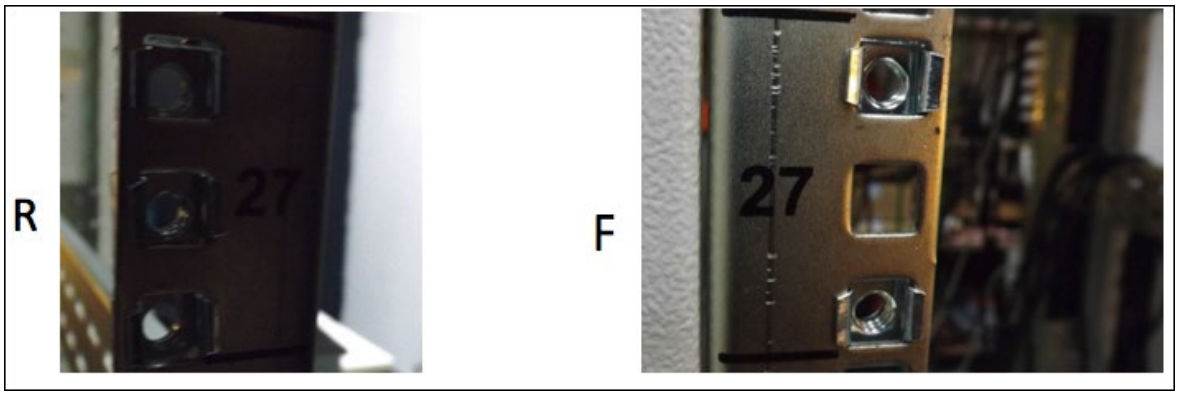


Figure 35: Installing the Cage Nuts

Step 7. Attach the frame to the rack by using ten-spacer cage nut to adapt the square openings in the vertical support, and then screw ten M6 pan head screws—four in the front part of the rack, and six in its rear part. The recommended torque is 6.55-7.35 Nm. See the figure below.

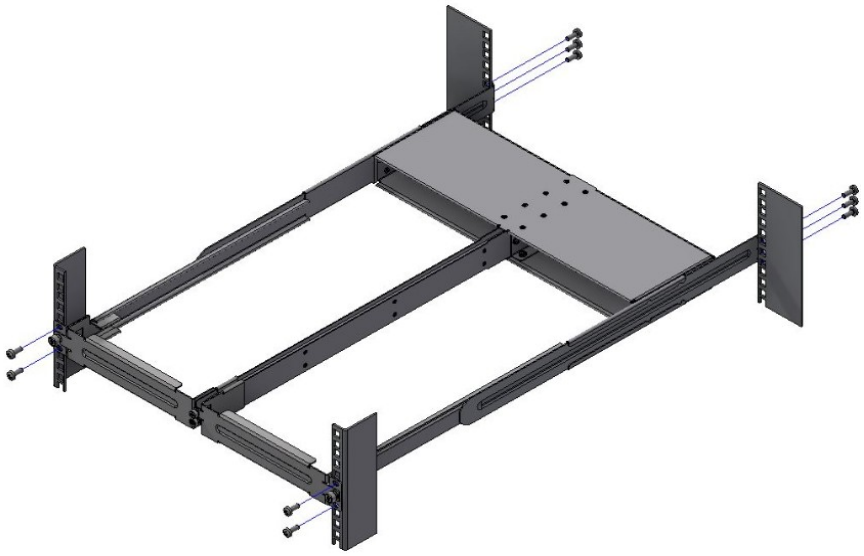


Figure 36: Attaching the Frame to the Rack

Do not remove both of the blank covers at the same time. When no system is installed, at least one of them should be present to support the frame's partition.

Step 8. Remove the blank cover from the selected slot in the frame and mount the system by sliding its mounting blades into the frame. Repeat this step to install an additional system in the other side of the frame, if needed.

Step 9. Tighten the capture nuts to secure the system in the frame. The recommended torque on the right screw is 3.0-3.36 Nm while on the left screw recommended torque is 0.89-0.98 Nm.

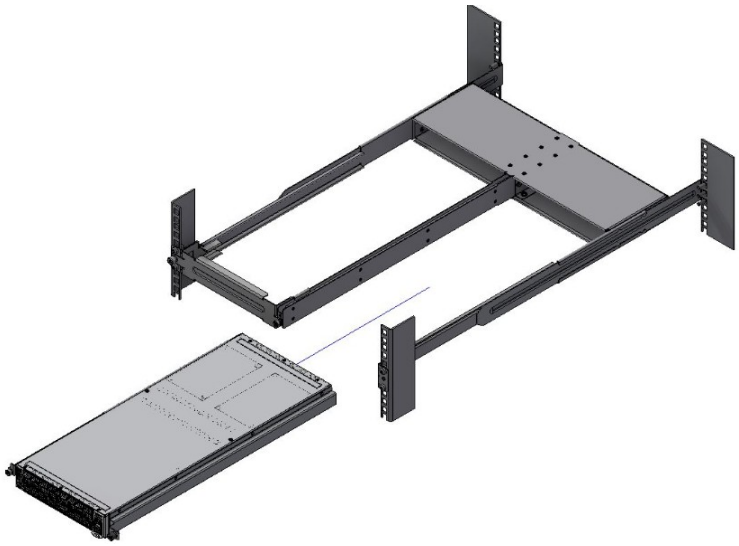


Figure 37: Sliding the System's Blades in the Rails

Cable Installation

All cables can be inserted or removed with the unit powered on.

To insert a cable, press the connector into the port receptacle until the connector is firmly seated. The LED indicator, that corresponds to each data port will light when the physical connection is established. When a logical connection is made, the relevant port LED will turn on.

To remove a cable, disengage the locks and slowly pull the connector away from the port receptacle. The LED indicator for that port will turn off when the cable is unseated.

For more information about port LEDs, refer to Port LEDs.

Do not force the cable into the cage with more than 40 newtons / 9.0 pounds / 4kg force. Greater insertion force may cause damage to the cable or to the cage.

The Arctica 4808xs system includes ports of different types. Figure 43 does not apply to the SFP+ ports. See the figure below.

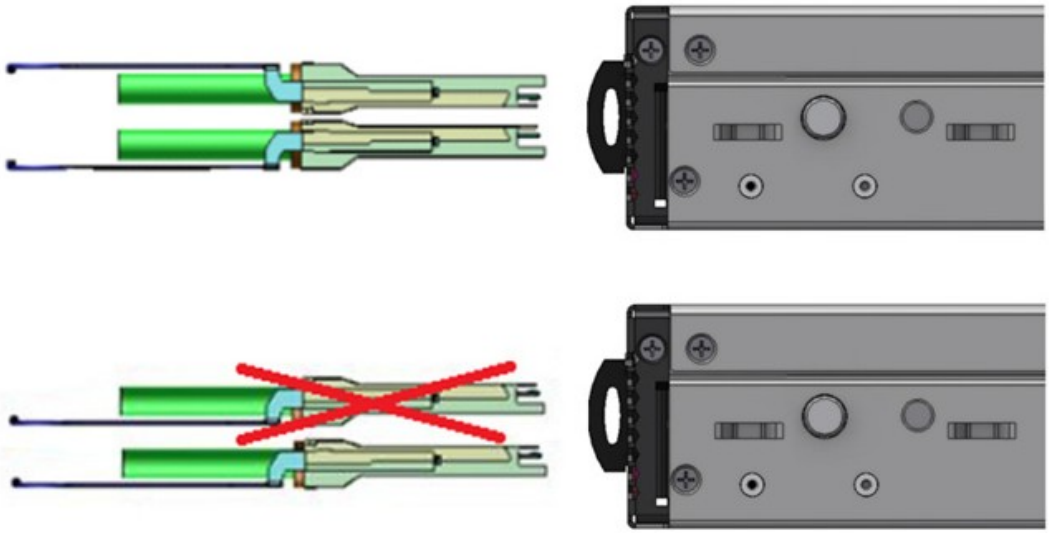


Figure 38: Arctica 3200cs and Arctica 1600cs Cable Orientation

Figure 39: Arctica 4808xs Cable Orientation

Breakout Cables and Adapters

A 100GbE port can be split to two 50GbE ports, or to four (or less) 25GbE ports, using a breakout cable.

Splitting a 100GbE QSFP28 port to 4 separate 25GbE ports (using a breakout cable) disables (unmaps) the 100GbE port below it. See the figures below.

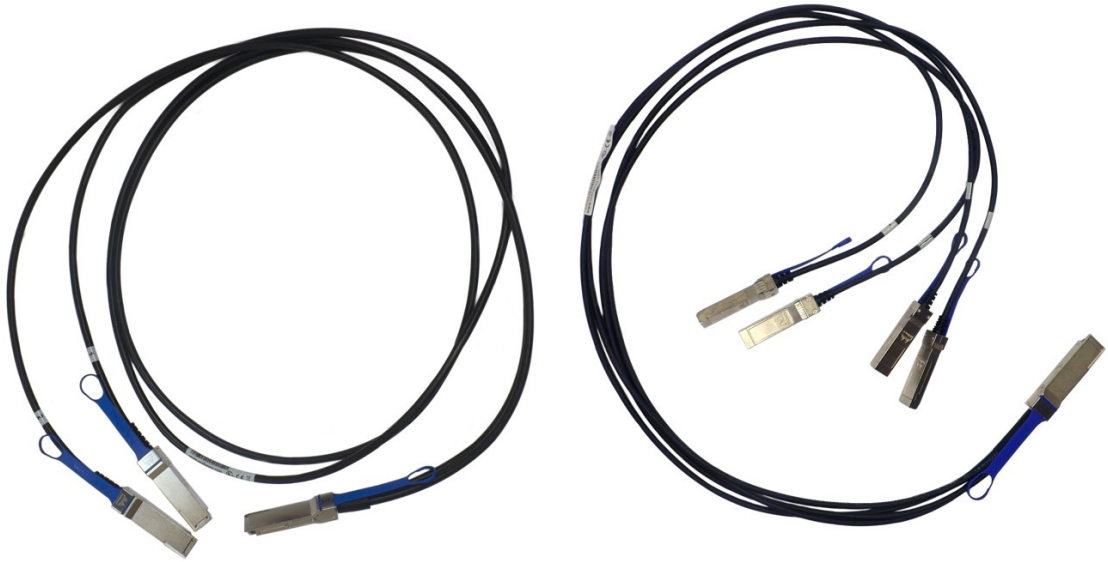


Figure 40: Breakout or Fanout

Arctica 3200cs Splitting Options

Figure 41: Arctica 3200cs Splitting Options

The top QSFP28 ports marked in green can be split into 4 SFP28 ports, each. The bottom QSFP28 ports (gray) are blocked when the upper ports are in split mode. All QSFP28 ports marked in yellow can be split to 2 SFP28 ports.

Arctica 4808xs Splitting Options

The top QSFP28 ports - 49,51,53,55 (green) can be split into 4 SFP28 ports each. All QSFP28 ports can be split into two QSFP28 ports.

The bottom QSFP28 ports - 50,52,54,56 (gray) are blocked when the upper ports are in split mode.

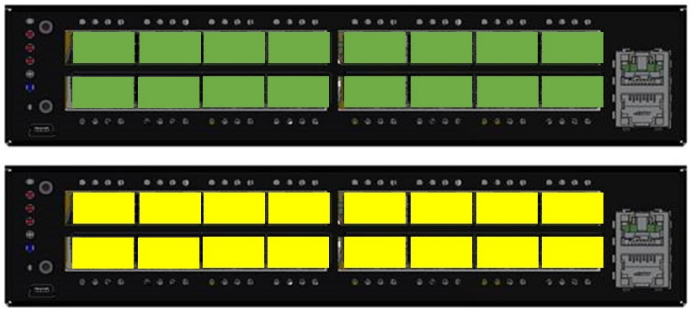


Figure 42: Arctica 1600cs Splitting Options

All QSFP28 ports cam be split. Each port can be split to 4xSFP28 (10/25G) or 2xQSFP28 (50G) ports each. There are no blocking requirements.

Initial Power On

The input voltage of each system is given in the Specifications chapter. The power cords should be standard 3-wire AC power cords including a safety ground and rated for 15A or higher.

The system platform will automatically power on when AC power is applied. There is no power system. Check all boards, power supplies, and fan tray modules for proper insertion before plugging in a power cable.

Step 1. Plug in the first power cable.

Step 2. Plug in the second power cable.

Step 3. Wait for the System Status LED to turn green.

It may take up to five minutes to turn on the system. If the System Status LED shows red after five minutes, unplug the system and call your Penguin Computing representative for assistance.

Step 4. Check the System Status LEDs and confirm that all of the LEDs show status lights consistent with normal operation (initially flashing, and then moving to a steady color) as shown in the figure below. For more information, refer to LEDs.

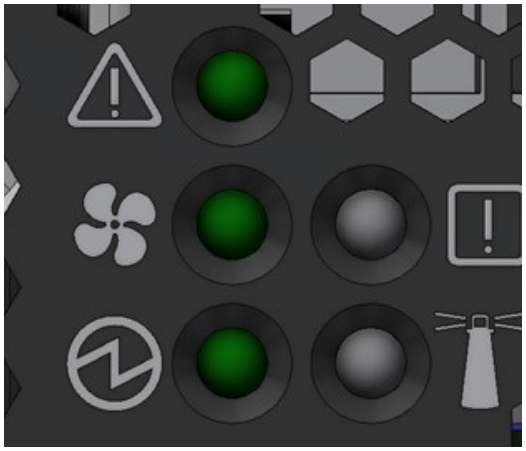


Figure 43: System Status LEDs 5 Minutes After Power On in Arctica 3200cs

Figure 44: System Status LEDs 5 Minutes After Power On

Figure 45: System Status LEDs 5 Minutes After Power On

After inserting a power cable and confirming the green System Status LED light is on, make sure that the Fan Status LED shows green.

If the Fan Status LED is not green, unplug the power connection and check that the fan module is inserted properly and that the mating connector of the fan unit is free of any dirt and/or obstacles. If no obstacles were found and the problem persists, call your Penguin Computing representative for assistance.

Risk of electric shock and energy hazard. The two power supply units are independent.

Disconnect all power supplies to ensure a powered down state inside of the switch platform.

Figure 46: Two Power Inlets - Electric Caution Notifications

FRU Replacements

The following information does not apply to the Arctica 1600cs series. The Arctica 1600cs systems include two non-replaceable power supply units and four non-replaceable fan units.

Power Supply

Arctica systems that are equipped with two replaceable power supply units work in a redundant configuration. Either unit may be extracted without bringing down the system.

Ensure that the power supply unit that you are NOT replacing is showing all green, for both the power supply unit and System Status LEDs.

Power supply units have directional air flows similar to the fan module. The fan module airflow must coincide with the airflow of all of the power supply units. If the power supply unit airflow direction is different from the fan module airflow direction, the system's internal temperature will be affected.

For power supply unit air flow direction, refer to Fans.

The power supply slots of Arctica 4808xs should not be left empty for more than 5 minutes.

Step 1. Remove the power cord from the power supply unit.

Step 2. Grasping the handle with your hand, push the latch release with your thumb while pulling the handle outward. As the power supply unit unseats, the power supply unit status LEDs will turn off.

Step 3. Remove the power supply unit.

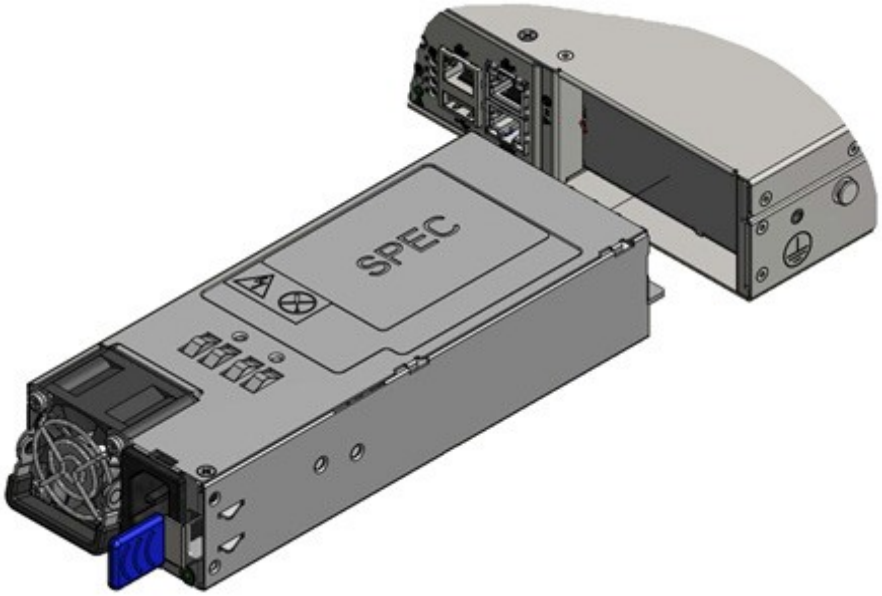


Figure 47: PS Unit Pulled Out

Do not attempt to insert a power supply unit with a power cord connected to it.

To insert a power supply unit:

Step 1. Make sure the mating connector of the new unit is free of any dirt and/or obstacles.

Step 2. Insert the power supply unit by sliding it into the opening, until a slight resistance is felt.
Step 3. Continue pressing the power supply unit until it seats completely. The latch will snap into place, confirming the proper installation.

Step 4. Insert the power cord into the supply connector.

Step 5. Insert the other end of the power cord into an outlet of the correct voltage.

The green power supply unit indicator should light. If it does not, repeat the whole procedure to extract the power supply unit and re-insert it.

Fans

The system can fully operate if one fan FRU is dysfunctional or missing. Failure of more than one fan is not supported.

Ensure that the fans have the air flow that matches the model number. An air flow opposite to the system design will cause the system to operate at a higher (less than optimal) temperature.

For power supply unit air flow direction, refer to Air flow.

To remove a fan unit:

Step 1. Grasping the handle with your right hand, push the latch release with your thumb while pulling the handle outward. As the fan unit unseats, the fan unit status LEDs will turn off.

Step 2. Remove the fan unit.

To insert a fan unit:

Step 1. Make sure the mating connector of the new unit is free of any dirt and/or obstacles.

Step 2. Insert the fan unit by sliding it into the opening until slight resistance is felt. Continue pressing the fan unit until it seats completely.

The green Fan Status LED should light. If not, extract the fan unit and reinsert it. After two unsuccessful attempts to install the fan unit, power off the system before attempting to debug the system.

Figure 48: Fan Module Latches

Interfaces

Supported Interfaces

The systems support the following interfaces:

- Data interfaces - Ethernet
- 10/100/1000 MbE speed rates
- USB port (mini USB in 1600cs)
- RS232 Console port
- RJ45 management interface(s)
- Reset button
- Status and Port LEDs

In order to review the full configuration options matrix, refer to Table 2: Management Interfaces, PSUs and Fans.

Data Interfaces

The data interfaces use QSFP28 connectors. The full list of interfaces per system is provided in Table 1: Speed and Switching Capabilities. Each QSFP28 port can be connected with a QSFP28 cable or connector for 25/40/50/56/100GbE, or 1/10/25GbE when connecting through QSFP28 to SFP28 adapters, hybrid or split cables. The systems offer High Power/LR4 transceivers support (up to 3.5W) in all QSFP28 ports. Some QSFP28 ports support 4.5W transceivers, as detailed in the following table:

Table 8: High Power/LR4 Transceivers Support

Model Family	Ports	Maximum High Power Support
Arctica 3200cs	1, 2, 31, 32	4.5W[a]
Arctica 4808xs	1,2,47,48	2.5W
	49, 50, 55, 56	4.5W[a]
Arctica 1600cs	1, 2, 15, 16	4.5W[a]

[a]4.5W high power modules are supported on MLNX-OS from version 3.6.3004 onwards.

The SFP+ ports in 4808xs support Level II (up to 1.5W) transceivers.

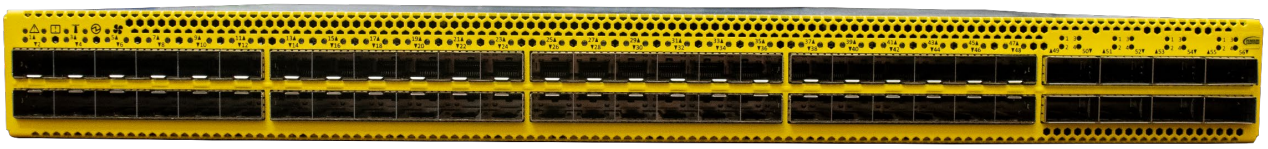


Figure 49: Using 4.5W Modules on Ports 49, 50, 55, 56 in Arctica 4808xs

Speed

Ethernet speed must be set manually. The system's ports can be manually configured to run at speeds ranging from 10GbE to 100GbE (for more details, see Specifications.

RS232 (Console)

The port labeled **Console** IOIOI is an RS232 serial port on the back side of the chassis in Arctica 3200cs and Arctica 4808xs, and on the front side in Arctica 1600cs. It is used for initial configuration and debugging. Upon first installation of the system, you need to connect a PC to this interface and configure network parameters for remote connections. Refer to FRU Replacements to view the full procedure.

Management

The RJ45 Ethernet ports labeled **MGT** provide access for remote management. The management ports are configured with auto-negotiation capabilities by default (100MbE to 1000GbE). The management ports' network attributes (such as IP address) need to be pre-configured via the RS232 serial console port or by DHCP before use. Refer to FRU Replacements to view the full procedure.

In the Arctica 1600cs systems there is only one MGT port.

Ensure you use only FCC compliant Ethernet cables.

USB

The USB interface is USB 2.0 (mini USB in Arctica 1600cs) compliant (USB 1.0 is not supported). The connector comes in a standard USB shape.

To view the full matrix of the USB configuration options, refer to Table 2: Management Interfaces, PSUs and Fans.

Do not use excessive force when inserting or extracting the USB disk to and from the connector.

Reset Button

The reset button is located on the rear side of the system next to the fan status LEDs in Arctica 3200cs and Arctica 4808xs, and on the front side in Arctica 1600cs. This reset button requires a tool to be pressed.

Do not use a sharp pointed object such as a needle or a push pin for pressing the reset button. Use a flat object to push the reset button.

To reset the system and the CPU of its management board, push the reset button and keep it pressed for up to 15 seconds.

To reset the system, the CPU of its management board, and the “admin” password, push the reset button and keep it pressed for at least 15 seconds.

Status and Port LEDs

See “LEDs” in the next section.

LEDs

LED Notifications

The system LEDs are an important tool for hardware event notification and troubleshooting.

Table 9: LEDs Symbols

Symbol	Name	Description	Normal Conditions
	System Status LED	Shows the health of the system.	Green/Flashing green when booting
	Fan Status LED	Shows the health of the fans.	Green
	Power supply units LEDs	Shows the health of the power supply units.	Green
	Bad Port LED	Lights up when a symbol error is detected on one of the ports.	Off
	Unit Identifier LED	Lights up on command through the CLI.	Off or blue when identifying a port

System Status LED

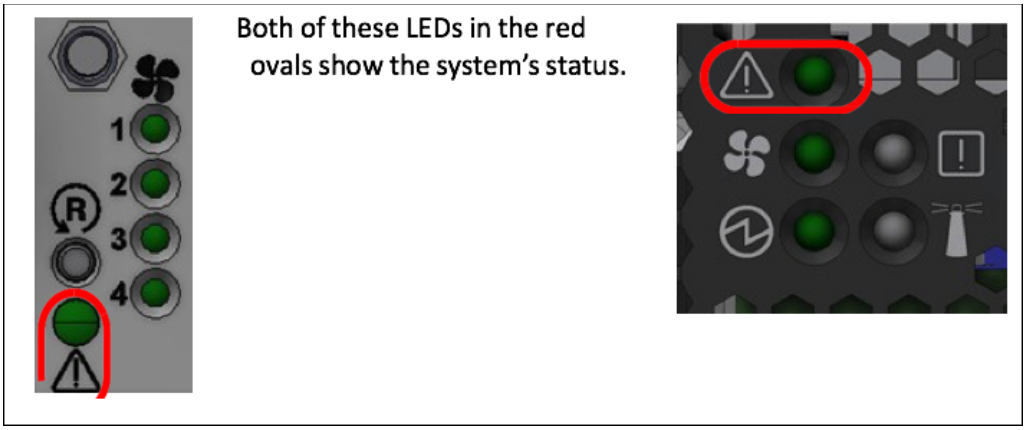


Figure 50: System Status LEDs - Front and Rear Sides in Arctica 3200cs

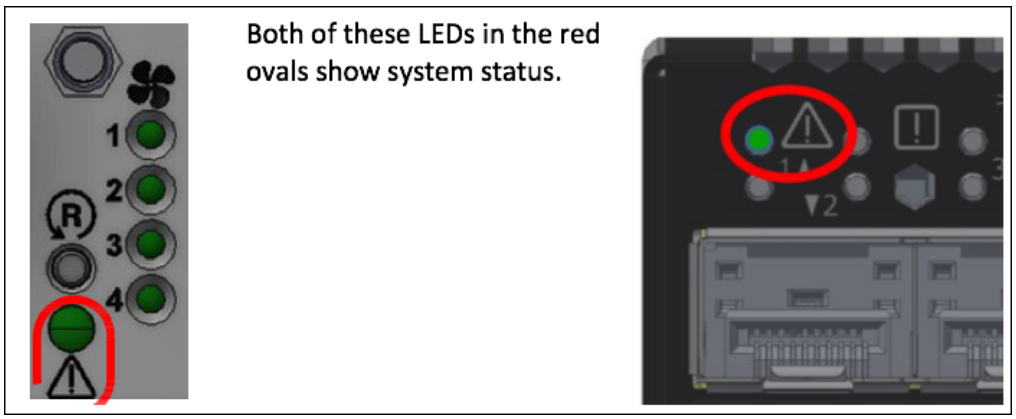


Figure 51: System Status LEDs - Front and Rear Sides in Arctica 4808xs

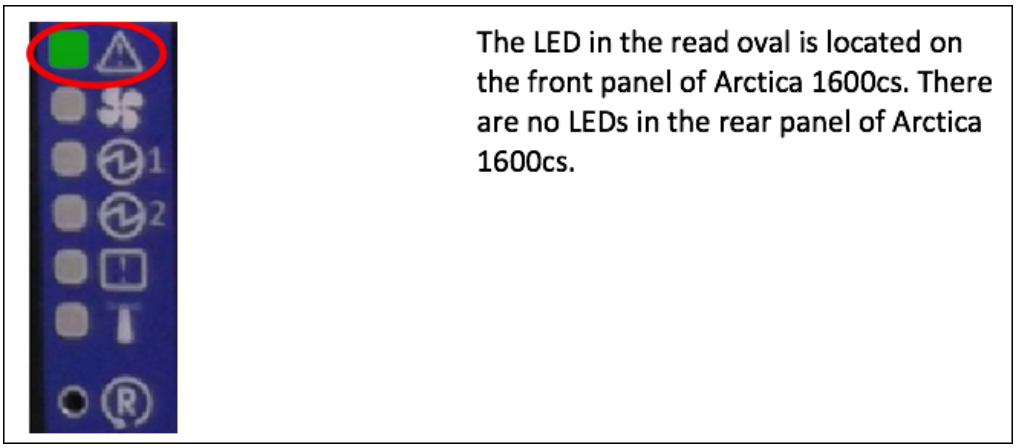


Figure 52: System Status LED in Arctica 1600cs

Both of the System Status LEDs (front and back, if exist) supply identical information.

It may take up to five minutes to turn on the system. If the System Status LED shows red after five minutes, unplug the system and call your Penguin Computing representative for assistance.

Table 10: System Status LED Assignments

LED Behavior	Description	Action Required
Solid Green	The system is up and running nor- mally.	N/A
Flashing Green	The system is booting up.	Wait up to five minutes for the end of the booting process.
Solid Red	Major error has occurred. For example, corrupted firmware, sys- tem is overheated etc.	If the System Status LED shows red five minutes after starting the system, unplug the system and call your Penguin Computing representative for assistance.

Fan Status LED

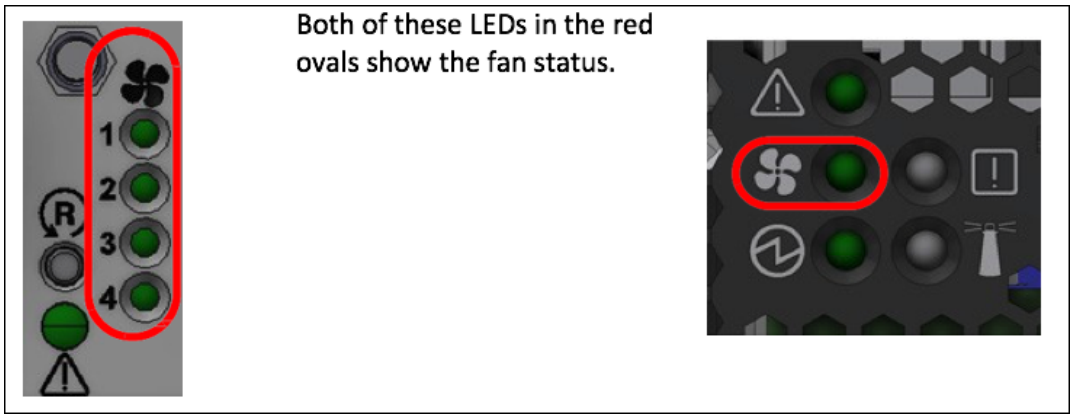


Figure 53: Fan Status LED in Arctica 3200cs - Front and Rear Sides

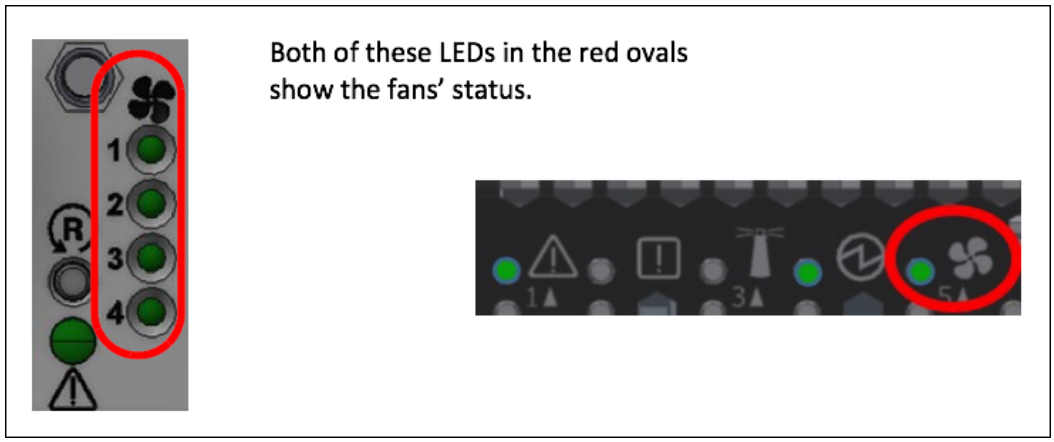


Figure 54: Fan Status LED in Arctica 4808xs - Front and Rear Sides

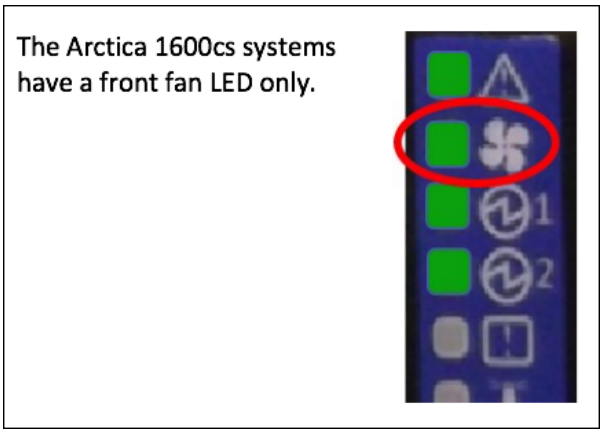


Figure 55: Fan Status LED in Artica 1600cs

LED Behavior	Description	Action Required
Solid Green	All fans are up and running.	N/A
Solid Red	Error, one or more fans are not operating properly.	The faulty FRUs should be replaced.
Off	System boot	N/A

The table below does not apply to the Arctica 1600cs systems.

LED Behavior	Description	Action Required
Solid Green	A specific fan is operating.	N/A
Solid Red	A specific fan unit is missing or not operating properly.	The fan unit should be replaced.
Off	System boot	N/A

Risk of Electric Shock!

With the fan module removed, power pins are accessible within the module cavity. Do not insert tools or body parts into the fan module cavity.

Power Supply Status LEDs

The following information does not apply to the Arctica 1600cs systems. In these systems, the power supply units are non-replaceable, and there is a designated LED for each unit in the system's front panel. See the figures below.

Figure 56: Power Status LED

There are two power supply inlets in the system (for redundancy). The system can operate with only one power supply connected. In case the power supply is an FRU, a second power supply unit can be added to support hot-swap ability. Each power supply unit has a single 2 color LED on the right side of the unit, that indicates the status of the unit.

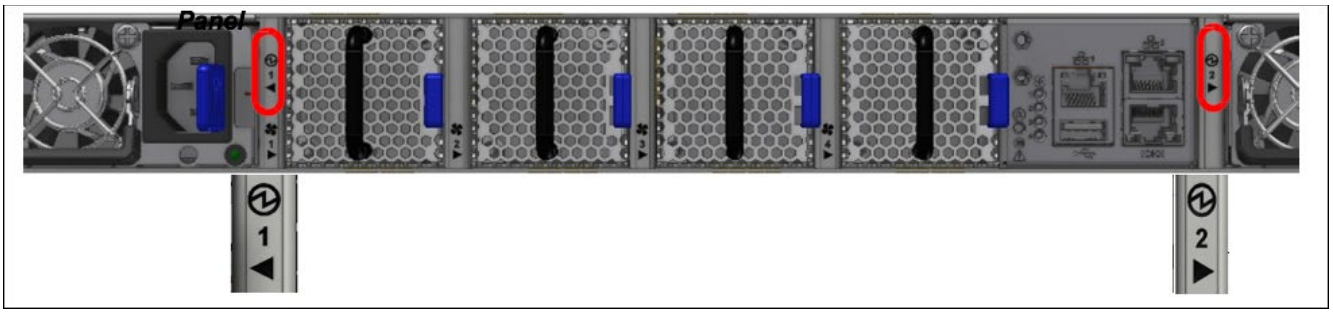


Figure 57: Arctica 3200cs and Arctica 4808xs Rear Side

The primary power supply (PS) unit is located on the left side, and the secondary unit is located on the right side.

Table 11: Power Supply Unit Status Front LED Assignments for Arctica 3200cs and Arctica 4808xs

LED Behavior	Description	Action Required
Solid Green	All plugged (one or two) power supplies are running normally.	N/A
Solid Red	PSU is faulty or disconnected	Make sure the AC cable is plugged in and active. If the problem resumes, the FRUs might be faulty, and should then be replaced.
Off	N/A	N/A

LED Behavior	Description	Action Required
Solid Green	Power supply is running normally.	N/A
Solid Red	PSU is faulty or disconnected	Make sure the AC cable is plugged in and active. If the problem resumes, the PSU might be faulty.
Off	PSU not present	N/A

The power supply status LEDs on the rear side of the system (in Arctica 3200cs and Arctica 4808xs only) are located on the PSUs themselves. Each PSU has one LED of its own

The table below does not apply to the Arctica 1600cs systems.

LED Behavior	Description	Action Required
Solid Green	The PSU is running normally.	N/A
Flashing Green	AC present / Only 12VSB on (PSU off) or PSU in Smart-on state.	Call your Penguin Computing representative for assistance.
Amber	AC cord unplugged or AC power lost while the second power supply still has AC input power.	Plug in the AC cord of the faulty PSU.
	PS failure (including voltage out of range and power cord disconnected).	Check voltage. If OK, call your Penguin Computing representative for assistance.

LED Behavior	Description	Action Required
Flashing Amber	Power supply warning events where the power supply continues to operate; high temp, high power, high current, slow fan.	Call your Penguin Computing representative for assistance.
Off	No AC power to all power supplies.	No AC power to all power supplies.

Bad Port LED

The Bad Port LED indicator is used to indicate symbol errors in one or more system ports. Table 22 shows the bad port status LED assignment.

Table 12: Bad Port LED Assignments: Bad Port LED Assignments

LED Behavior	Description	Action Required
Flashing Amber	Error, one or more ports have received symbol errors. Possible causes are: • Bad cable • Bad connection • Bad connector	Check symbol error counters on the system UI to identify the ports. Replace the cable on these ports.
Off	No symbol errors have been received in last few seconds (normal condition).	N/A

Port LEDs

Figure 58: Arctica 4808xs SFP+ Port LEDs

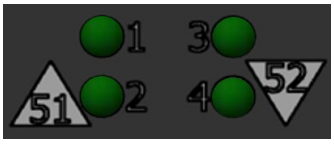


Figure 59: Arctica 4808xs QSFP28 Port LEDs

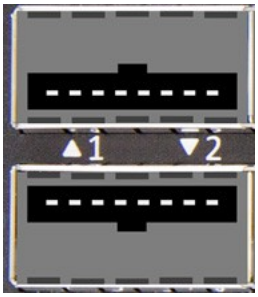


Figure 60: Arctica 1600cs Port LEDs

In the Arctica 4808xs systems, the status of each pair of adjacent QSFP28 ports is indicated by four LEDs, as shown in the picture above:

- While the bottom LEDs signify the port status in regular condition, the upper LEDs operate only when the port is split.
- When one port is split to two, a connection of 100GbE can be utilized in its adjacent port.
- When one port is split to four, it adjacent port is cancelled.
- If the ports run at a 100GbE/40GbE speed each, the two lower LEDs (2 and 4) will light green.
- If the ports run at a 50GbE speed each, the left LEDs (1 and 2) will light green for the upper port, and the right LEDs (3 and 4) will light green for the lower port.
- If the ports run at a 25GbE/10GbE speed each, all LEDs may light green, according to the selected lane.

LED Behavior	Description	Action Required
Solid Green	Link is up with no traffic.	N/A
Flashing Green	Link is up with traffic.	N/A
Flashing Amber	A problem with the link.	Check the cable, then replace it if necessary.
Off	Link is down.	Check the cable.

Inventory Information

System inventory parameters (such as Serial Number, Part Number, GUID and MAC address) can be extracted from the inventory pull-out tab on the lower right side of the front panel. In some systems, there is no pull-out tab, and the information is provided on labels in several locations.

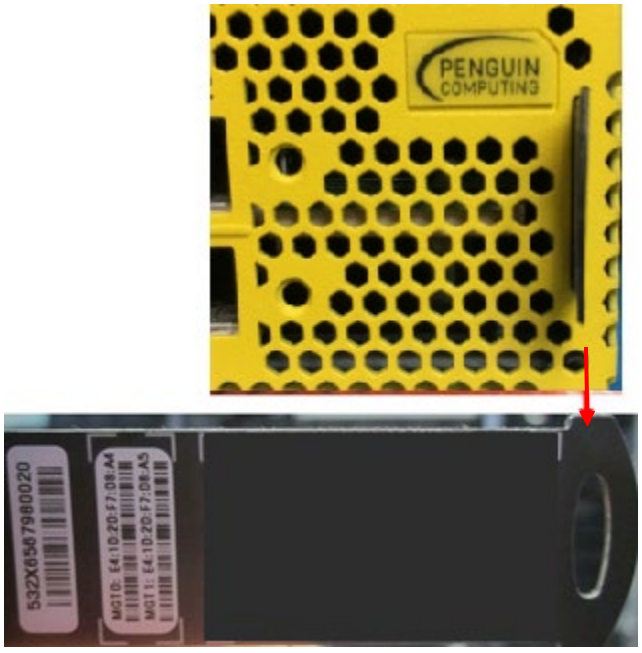


Figure 61: Arctica 3200cs Pull-out Tab

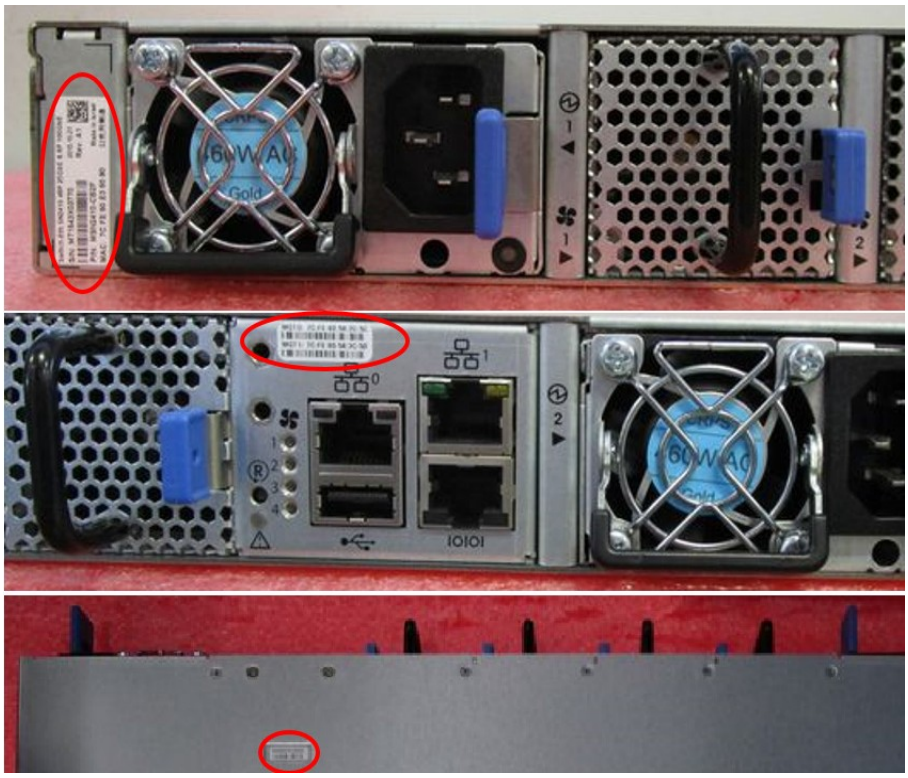


Figure 62: Arctica 4808xs Inventory Information Illustration

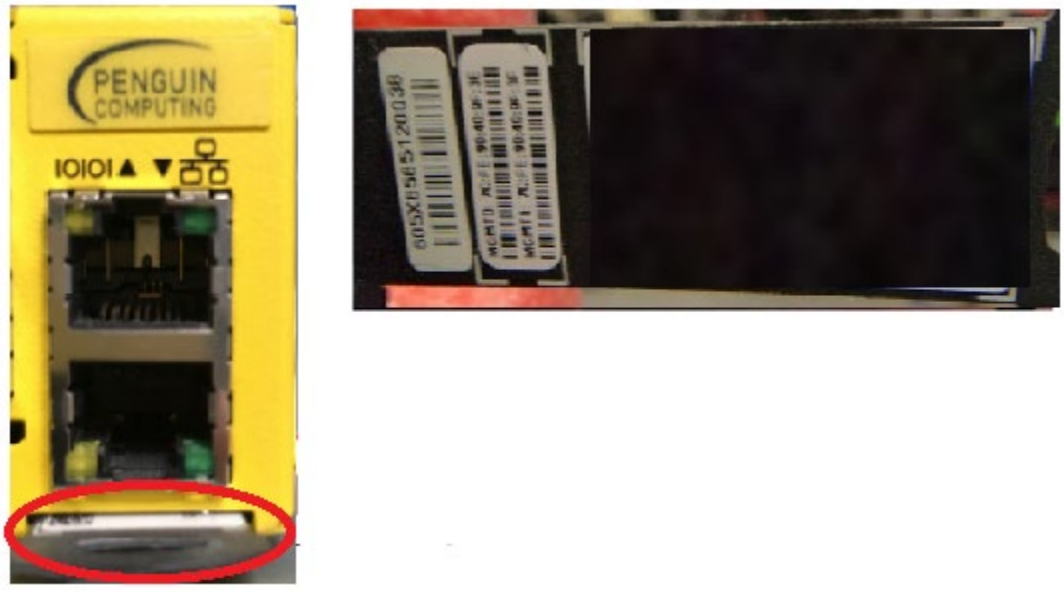


Figure 63: Arctica 1600cs Pull-out Tab

Software Management

There are three thermal threshold definitions for the switch device which impact the overall switch system operation state:

- Warning – 105°C: On managed systems only: When the device crosses the 100°C threshold, a Warning Threshold message will be issued by the management SW, indicating to system administration that the switch has crossed the Warning threshold. Note that this temperature threshold does not require nor lead to any action by hardware (such as switch shutdown).
- Critical – 120°C: When the device crosses this temperature, the firmware will automatically shut down the device.
- Emergency – 130°C: In case the firmware fails to shut down the device upon crossing the Critical threshold, the device will auto-shutdown upon crossing the Emergency (130°C) threshold.

Troubleshooting

Troubleshooting Instructions

Table 13: Troubleshooting

Problem Indicator	Symptoms	Cause and Solution
LEDs	System Status LED is blinking for more than 5 minutes	**Cause:** OS software did not boot properly, and only firmware is running. **Solution:** Connect to the system via the console port, then check the software status. You might need to contact a FAE if the OS software did not load properly.
	System Status LED is red	**Cause:** • Critical system fault (CPU error, bad firmware) • Over Temperature Solution: • Check environmental conditions (room temperature).
	Fan Status LED is red	**Cause:** Possible fan issue. **Solution:** Check that the FAN is fully inserted and nothing blocks the airflow Replace the FAN FRU if needed (possible in Arctica 3200cs and 4808xs only).
	PSU Status LED is red	**Cause:** Possible PSU issue. **Solution:** Check/replace the power cable Replace the PSU if needed (possible in Arctica 3200cs and 4808xs only)

Specifications

Arctica 3200cs Series

Table 14: Arctica 3200cs Specifications

Feature	Value
Mechanical	**Size:** **Standard** - 1.72” (H) x 16.84” (W) x27” (D), 43.8mm (H) x 427.83mm (W) x 686.8mm (D)
	Mounting: 19” Rack mount
	Weight: 1 PSU: 10.23kg, 2 PSUs: 11.1kg
	Speed: 10/25/40/50/100GbE per port
	Connector cage: 32 QSFP28
Environmental	**Temperature:** Operational: 0° to 40°C Non-Operational: -40° to 70°C
	Humidity: Operational: 10% - 85% non-condensing Non-Operational: 10% - 90% non-condensing
	Altitude: 3050m
	Noise level: 71.6 dB(A)
Regulatory	**Safety/ EMC:** CB, TUV, CE, FCC, VCCI

Feature	Value
	RoHS6
Power	**Input Voltage:** 100-127VAC; 50/60Hz 3.5A; 200-240 50/60Hz 2.9A/ 192-288VDC (not certified)
	Global Power Consumption: 40GbE Models - Max power with optical cables (assuming 2W per port): 308.5W **100GbE Models -** Typical power with passive cables (ATIS): 150W Max power with optical cables (assuming 3.5W per port): 398W
Main Devices	**CPU:** Intel x86 1.40GHZ Dual Core **PCIe:** 4x Gen2.0
	Switch: Mellanox Spectrum™
	Memory: 8GB DDR3 RAM, 32GB SSD
Throughput	3.2Tb/s

Arctica 4808xs Series

Table 15: Arctica 4808xs Specifications

Feature	Value
Mechanical	**Size:** 43.9mm (H) x 438mm (W) x 394mm (D) 1.72"(H) x 17.24"(W) x 15.5"(D)
	Mounting: 19” Rack mount
	Weight: 1 PSU: 10.23kg, 2 PSUs: 11.1kg
	Speed: 10/25/40/50/100GbE per QSFP28 port
	Connector cage: 48 SFP+ and 8 QSFP28
Environmental	**Temperature:** Operational: 0° to 40°C Non-Operational: -40° to 70°C
	Humidity: Operational: 10% - 85% non-condensing Non-Operational: 10% - 90% non-condensing
	Altitude: 3050m
	Noise level: 70.9 dB(A)
Regulatory	**Safety/ EMC:** CB, TUV, CE, FCC, VCCI
	RoHS6

Feature	Value
Power	**Input Voltage:** 100-127VAC; 50/60Hz 3.5A; 200-240 50/60Hz 2.9A/ 192-288VDC (not certified)
	Global Power Consumption: 40GbE Models - Max power with optical cables (assuming 2W per each QSFP28 port, and 1W per each SFP28 port): 295.1 **100GbE Models -** Typical power with passive cables (ATIS): 165W Max power with optical cables (assuming 3.5W per each QSFP28 port, and 1.5W per each SFP28 port): 362W
Main Devices	**CPU:** Intel x86 1.40GHZ Dual Core **PCIe:** 4x Gen2.0
	Switch: Mellanox Spectrum™
	Memory: 8GB DDR3 RAM, 32GB SSD
Throughput	2 Tb/s

Arctica 1600cs Series

Table 16: Arctica 1600cs Specifications

Feature	Value
Mechanical	**Size:** 43.8mm (H) x 200mm (W) x 508mm (D) 1.72" (H) x 7.87" (W) x 20" (D)
	Mounting: 19” Rack mount
	Weight: 4.540kg
	Speed: 10/25/40/50/100GbE per port
	Connector cage: 16 QSFP28
Environmental	**Temperature:** Operational: 0° to 40°C Non-Operational: -40° to 70°C
	Humidity: Operational: 10% - 85% non-condensing Non-Operational: 10% - 90% non-condensing
	Altitude: 3050m
	Noise level: 73.7 dB(A)
Regulatory	**Safety/ EMC:** CB, TUV, CE, FCC, VCCI
	RoHS6
Power	**Input Voltage:** 100-127VAC 50/60Hz 4.5A; 200-240 50/60Hz 2.9A

Feature	Value
	Global Power Consumption: 40GbE Models - Max power with optical cables (assuming 2W per each QSFP28 port, and 1W per each SFP28 port): 295.1 **100GbE Models -** Typical power with passive cables (ATIS): 94.3W Max power with optical cables (assuming 3.5W per each QSFP28 port, and 1.5W per each SFP28 port): 248.6W
Main Devices	**CPU:** Intel x86 2.40GHZ Quad Core **PCIe:** 4x Gen2.0
	Switch: Mellanox Spectrum™
	Memory: SDRAM: 8GB DDR3L 1600 MT/s SO-DIMM Storage: 16GB Dual Channel MLC M.2-SATA SSD
Throughput	3.2 Tb/s

Appendix A: Accessory & Replacement Parts

Table 17: OPNs for Replacement Parts

Penguin PN	Part Description
10026062	Rack installation kit for 1U systems to be mounted into short or standard depth racks
MTEF-KIT-S	Rack installation kit for standard depth 1U systems to be mounted into standard depth racks
10026064	Rack installation kit for 1U wide systems to be mounted into short depth racks
10026063	Rack installation kit for 1U wide systems to be mounted into standard depth racks
10026065	Rack installation kit for Arctica 1600cs short depth 1U switches, allows installation of one or two switches side-by-side into standard depth racks
10026066	460W AC Power Supply w/ rear to front air flow
10026067	460W AC Power Supply w/ front to rear air flow
10026523	Harness RS232 2M cable – DB9 to RJ-45
10026524	Power cord Type C13-C14
10026068	Fan module w/rear to front airflow
10026069	Fan module w/front to rear airflow

Appendix B: Disassembly and Disposal

Disassembly Procedure

To disassemble the system from the rack:

1. Unplug and remove all connectors.
2. Unplug all power cords.
3. Remove the ground wire.
4. Unscrew the center bolts from the side of the system with the bracket.

Support the weight of the system when you remove the screws so that the system does not fall.

5. Slide the system from the rack.
6. Remove the rail slides from the rack.
7. Remove the caged nuts.