SwitchX® 64 Port SFP+ Ethernet Switch Hardware User Manual

P/N: MSX1016X-2BFR, MSX1016X-2BRR

Rev 1.2

www.mellanox.com

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Revision History

Table 1 - Revision History Table

Date	Revision	Description
November 2012	Rev 1.2	Removed Updating FW section; not needed for Ethernet switches
October 2012	Rev 1.1	• Added China CCC Warning Statement • Fixes to port to LED assignment
February 2012	Rev 1.0	Initial release

About this Manual

This manual describes the installation and basic use of the Mellanox SX1016 switch, which is based on the SwitchX® switch device.

Intended Audience

This manual is intended for users and system administrators responsible for installing and setting up the switch platforms listed above.

The manual assumes familiarity with Ethernet Networks and Architecture.

Related Documentation

Additional Documentation available from Mellanox:

Table 2 - Reference Documents

Switch Firmware and Firmware Update Tools	See http://www.mellanox.com > Support > Download Firmware Tools

Conventions

Throughout this manual, the name SX1016 and the term switch are used to describe the 64-port SFP+ 10Gb/s switch unless explicitly indicated otherwise.

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

This symbol signals recommendations to the user.

This symbol indicates information that is helpful to the user.

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

BEWARE! This symbol indicates a situation that can potentially cause personal injury or damage to hardware or software.

Mellanox Part Numbering Legend

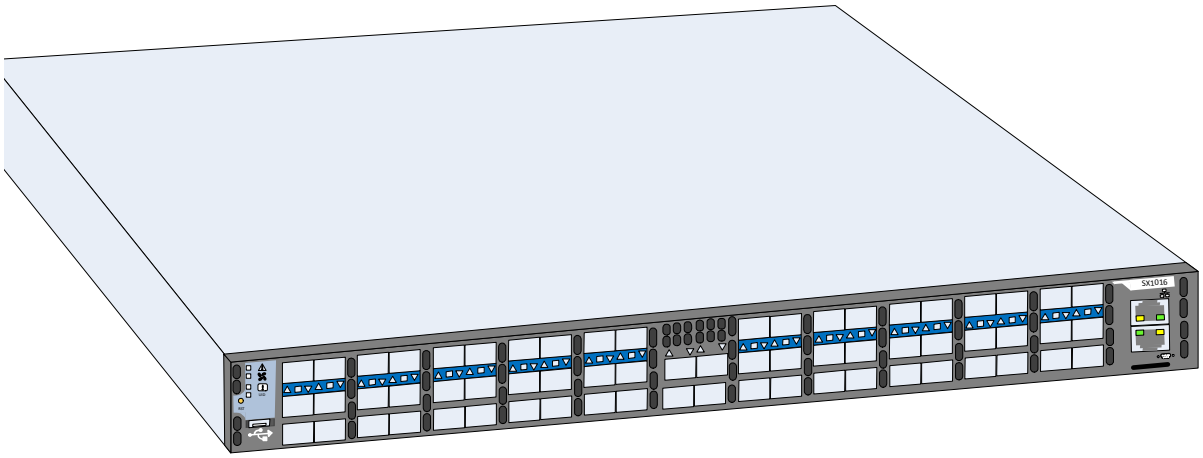
Place	Field	Decoder
M		Mellanox Technologies
SX	System Type	SwitchX® silicon
B	Protocol	(1, 2, 3, 4) = Ethernet
C	Height of Unit	0 = 1U 1 = 1.5U 2 = 2U
FF	# of 40Gb/s Ports equivalent	16
G	Line rate of the fastest port	X = 10GbE
-	Separator	
#	Power supplies number of power supplies shipped with the basic system	2 = 2 power supplies
M	Depth of the Unit	B = short depth
Y	Air Flow direction	R= Connector side to PSU side airflow F= PSU side to connector side airflow
R	Chip Generation	R – SwitchX S – SwitchX-2

1 Overview

The SX1016 is an economical, high-performance 64-port 10GbE switch providing 1.28Tb/s of line rate performance. Based on Mellanox's SwitchX® silicon and innovative hardware design, the switch packs 64 SFP+ interfaces in an ultra-dense 1U form factor. The SX1016 features industry leading latency of 250ns and power of less than 1.0W per port, providing optimal performance and efficiency for enterprise data center, financial services, Web 2.0, High Performance Computing and cloud computing applications.

Basic installation and hardware maintenance is covered in "Hardware Basic Operation and Installation" on page 15.

Figure 1: SX1016 Switch



1.1 Features

The SX1016 supports the following features:

- 64 SFP+ ports of 10 Gb/s
- up to 24 native Fiber Channel ports
- Two management options:
  - Supports Mellanox PPC460 Mezzanine CPU
  - Supports Mellanox X86 Mezzanine CPU
- 2 250W AC/DC fixed Power supplies
- 6 Fixed Fans with 5+1 redundancy
- On board temperature monitoring
- Reset Push button on front panel
- Front Panel indication LEDs:
  - Status LED (Red / Yellow / Green)
  - Fans Status LED (Red / Green)
  - UID LED (Blue)
  - Bad port LED (Yellow / Green)

1.2 Serial Number and Product Version Information

The serial number and MAC for the switch are found on the back panel. The serial number and product version information are found on the label seen in the figure below. Near this label is another label with the management MAC.

Figure 2: Generic Product label

Figure 3: Management MAC Label

2 Installation Safety Warnings

Warnings in French can be found on page 43. Warnings in German can be found on page 46. Warnings in Spanish can be found on page 50.

1. Installation Instructions

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

2. Over-temperature

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

3. 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.

4. 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.**

5. During Lightning - Electrical Hazard

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

6. Copper Cable Connecting/Disconnecting

Copper cables are heavy and not flexible, as such they should be carefully attached to or detached from the connectors. Refer to the cable manufacturer for special warnings/ instructions.

7. 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 equipment starting from the bottom to the top.

8. High Leakage Current

WARNING: High leakage current; Earth connection essential before connecting supply.

9. Connect a Valid Ground to this Device

Before connecting this device to the power line, the protective earth terminal screws of this device must be connected to the protective earth in the building installation.

10. Equipment Installation

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

11. Equipment Disposal

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

12. Local and National Electrical Codes

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

13. 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.

14. Interconnection Of 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)

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

15. Suitable Enclosure

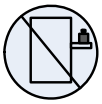
Suitable electrical, mechanical and fire enclosure shall be provided by the end product manufacturer and or the end user.

16. UL Listed and CSA Certified Power Supply Cord

For 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.

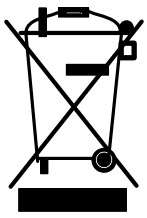
For European connection, select a power supply cord that is internationally harmonized and marked “<HAR>”, 3 - conductor, minimum 1.0 mm 2 wire, rated at 300 V, with a PVC insulated jacket. The cord must have a molded plug rated at 250 V, 10 A.

17. 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 installation at final resting place only, not used for service and maintenance.

18. 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.

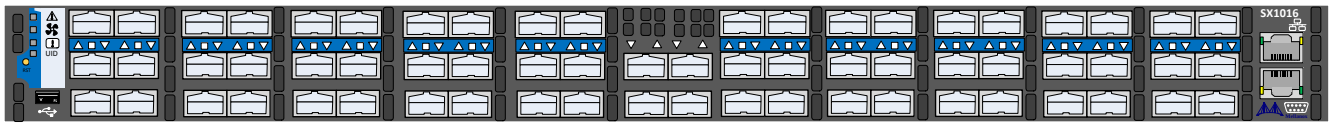
Dispose of this product and all of its parts in a responsible and environmentally friendly way.

3 Hardware Basic Operation and Installation

3.1 Switch Platform Hardware Overview

Figure 4 shows the front view of the switch. The figure shows port configurations for the switch systems, interface connectors, and various status LEDs.

Figure 4: Switch System Front Panel



All connectivity is via the connector side panel. All connectors can support active cables.

3.1.1 LED Assignments

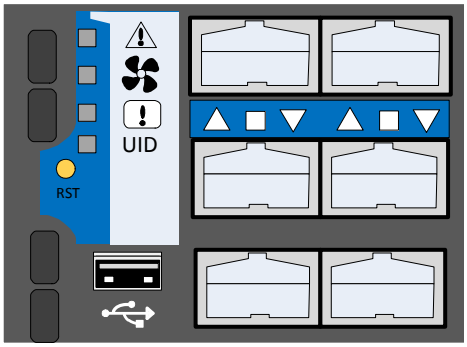
3.1.1.1 System Status Indicators

The System Status Indicators are located on the left side of the front (connector side) panel. The system status indicators should display as follows:

When the switch is plugged in, within four minutes the following LEDs should be evident.

- The Status LED should light up green.
- The Fan LED should light up green.
- The Bad Port LED should be off.
- The Unit ID LED should be off.

Figure 5: Status LEDs



If the status LED shows red after four minutes unplug the switch and call your Mellanox representative for assistance.

If the fan LED shows red unplug the switch and call your Mellanox representative for assistance.

If the switch shuts down due to over-temperature, unplug the switch, wait 5 minutes and replug in the switch. For more information See “Troubleshooting” on page 31.

3.1.1.2 Status LED

The status indicator is located on the left side of the front panel (connector side) of the unit. The following status conditions are possible:

Table 3 - Switch Status LED Configurations

LED Configuration	LED Description
Off	No power to the switch.
Solid Green	OK – the switch is running. All OK.
Blinking Green	Switch is booting up.
Red	Error – there is a problem with power output from the power supply, or there is a thermal shut down.

3.1.1.3 Fan Indicators

The fan indicator is located on the left side of the front panel (connector side) of the unit. The following fan status conditions are possible:

Table 4 - Fan LED Configurations

LED Configuration	FAN LED
Off	There is no power to the fans.
Green	OK – the fans are running.
Red	Error – the fans are not operating properly. Replace the switch.

Fans must be operating while the power supply is plugged in.

If the switch shuts down due to over-temperature, unplug the switch, wait 5 minutes and replug in the switch. For more information See “Troubleshooting” on page 31.

3.1.1.4 Bad Port LED

The bad port indicator is located on the left side of the front panel (connector side) of the unit. The following bad port conditions are possible:

Table 5 - Bad Port LED Configurations

LED Configuration	Description
Off	OK – all ports are up and running.
Flashing Orange	Error – one or possibly more ports has just received a symbol error.

This LED shows symbol errors. Possible causes for this are:

- bad cable
- bad connection
- bad connector

This LED lights up when one or more ports is receiving a symbol error. The LED immediately goes off until the next symbol error is received.

3.1.1.5 UID LED Switch Identifier

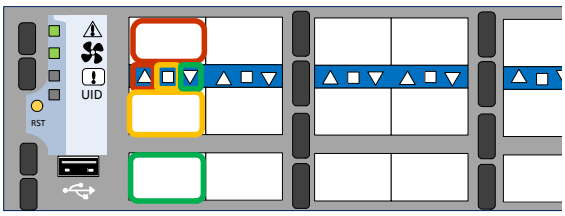
The UID LED is a debug feature that will become available to customers in the near future. For details please contact Mellanox Technologies support.

3.1.1.6 Port Connector LED

The port LEDs are assigned to the ports as in figure:

3.1.2 Port Connector LED Assignment

Figure 6: LED to Port Assignment



Between the top two ports is a row of LEDs. The left LED is for the top port in the column, the middle LED is for the center port in the column and the right LED is for the bottom port in the column. Some versions of this switch have a fourth LED. When there are four LEDs, the second from the left will be disabled.

Table 6 - Port Connector Physical and Logical Link Indications

LED Configuration	LED Description
Off	Physical link down / Default
Solid Green	Physical link up no traffic
Flashing Green	Physical link up with traffic
Flashing Orange	Physical errors

This LED when flashing orange shows port physical errors. Possible causes for this are:

- bad cable
- bad connection
- bad connector
- bad cage

3.2 Air Flow

These switches can come with two air flow patterns. The two patterns are:

- power supply side inlet to connector side outlet
- connector side inlet to power supply side outlet

The air flow is specified in the product model number. See “Mellanox Part Numbering Legend” on page 9.

3.3 SFP+ Cable Power Budget Classification

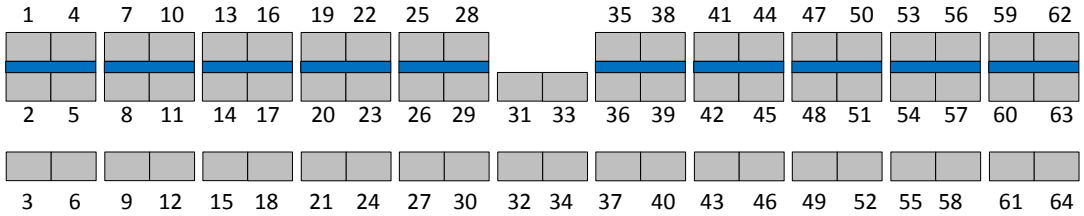
This switch is designed for active cables with a max power per module of 1.0W.

3.4 Interfaces

3.4.1 Port Connector Interfaces

The Connector side of the switch has 64 SFP+ 10

Figure 7: Port Numbering

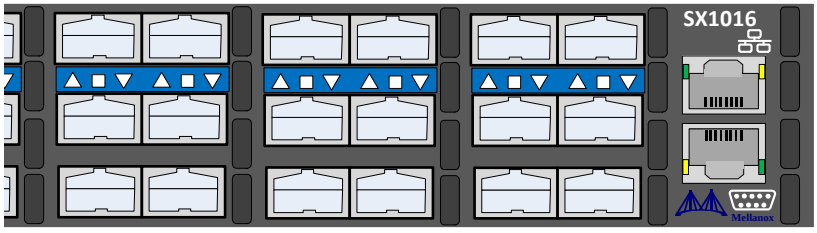


3.5 Management and Firmware Updating Interfaces

There are two interfaces to connect to the SX1016:

- 1 X 100M/1Gb Ethernet connectors labelled
- 1 connector that is labelled Use this RJ-45 connector to connect to the host PC

Figure 8: Management Interfaces



3.5.1 RJ-45 Console Connector

The port labelled is for a local host connection to the management module. This is used the first time the switch is connected. A harness is included in the package to connect to a DB9 connection on a host PC. Before any remote management is available you must connect to a local host PC and follow the instructions in the Installation Guide, “Configuring the Switch for the First Time”. For the Socket pinout see “RJ45 CONSOLE and Ethernet Interfaces” on page 51.

3.5.2 Mini USB

This interface can be used to update SW.

3.5.3 RJ-45 Ethernet Connector

The Ethernet connection labelled provides access for remote management. The switch can be connected to any Ethernet port.

Warning: Any red status LED is cause for concern and must be dealt with immediately. It can take up to 4 minutes to boot up, during which time the status LED may indicate red.

3.5.4 I2C Connector

There is an “I2C”interface on the side panel. This interface is only for FAEs and advanced users.

4 Installation

4.1 Package Contents and Installation

Before you install your new switch, unpack the system and check to make sure that all the parts have been sent, check this against the parts list below. Check the parts for visible damage that may have occurred during shipping.

The switch comes packed with the following items:

- 1 X – switch
- 1 X – installation kit
- 1 X – power cable for each PSU – Type B 6ft US 125V 10A cord
  - See "Replacement Parts Ordering Numbers" on page 42. to order power cords for various countries.
  - A single power cord for each power supply unit can be ordered at no extra charge.
- 1 X – Harness
  - HAR000028 – Harness RS232 2M cable – DB9 to RJ45
- 1 X – Quick Start Guide
- 1 X – China RoHS statement

If anything is damaged or missing, contact your customer representative immediately.
For customer support go to:
www.mellanox.com => Support => Customer Support Portal Login

4.1.1 Installing the Switch in the Rack

Tools and Customer Supplied Parts

- Phillips Screwdrivers #1 and #2
- ESD strap
- ESD mat
- grounding screw
- grounding wire sufficient to reach a valid ground

4.1.1.1 Installation Kits

There are two installation kit options. One long and one short. Both the long and the short installation kit can be used with this switch.

Table 7 - Installation Kit According to Rack Size

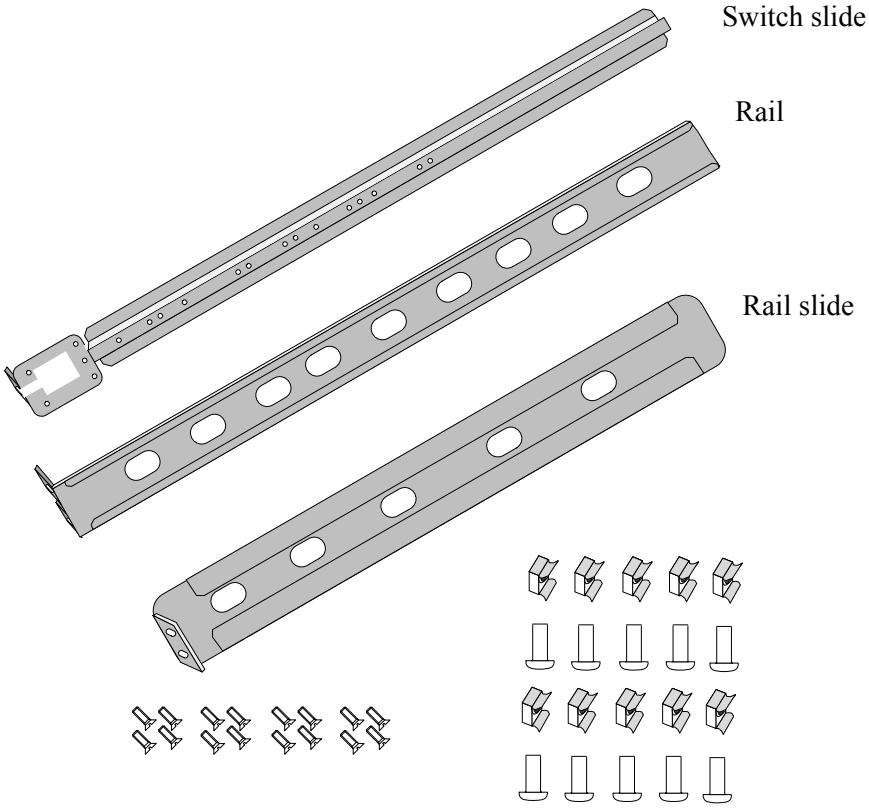
Kit OPN	Rack Size
MSX60-BKIT	40-60 cm
MSX60-SKIT	60-80 cm

For racks from 60cm to 80cm deep either use the standard depth switches with the long rail kit or the short switches with the long rail kit.

Parts included in the rail kit:

- 2 rails
- 2 rail slides
- 2 switch slides
- 16 recessed flat head screws for the standard switch
- 10 caged nuts
- 10 pan head screws M6

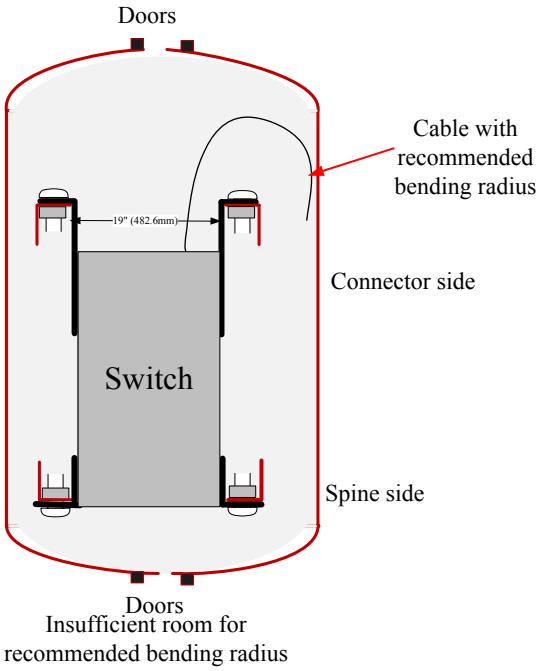
Figure 9: Rack Rail Kit Parts



1. Place the ESD mat on the floor where you will be working and put on the ESD strap. Make sure the ESD strap is touching your skin and that the other end is connected to a verified ground.
2. Choose which side of the switch you want even with the rack vertical support. Either the side with the power supply units or the side with the SFP+ connectors can be even with one of the vertical rack supports.

Things to consider before choosing where to mount the rails and rail slides.

Figure 10: Placement of Switch in Rack



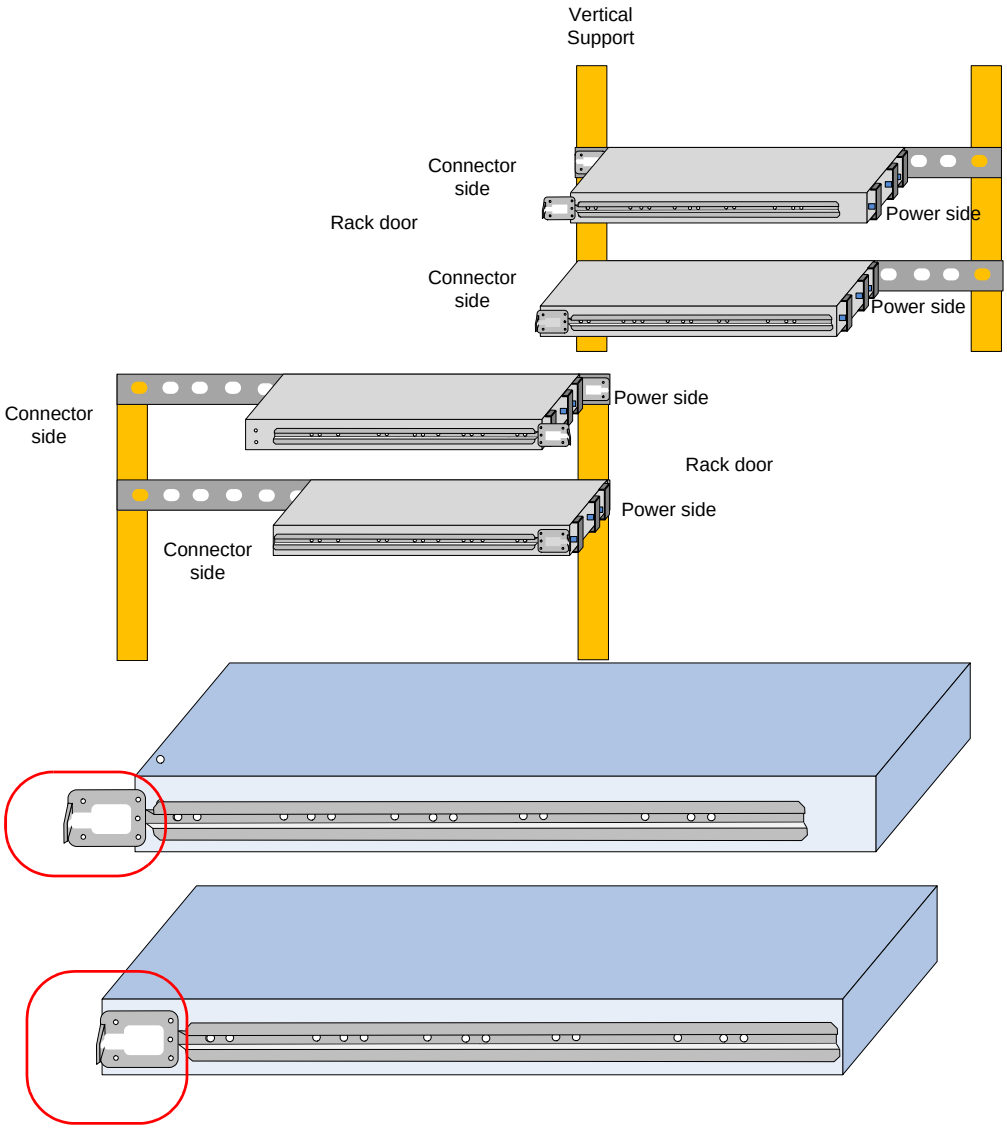
Things to consider before choosing where to mount the rails and rail slides.

The distance between the rack and the door can be as little as 4 cm on one side of the rack and as much as 18 cm on the other side of the rack. Keep in mind that there can be as many as 3618 cables connected to the switch.

The distance between the rack and the door can be as little as 4 cm on one side of the rack and as much as 18 cm on the other side of the rack. Keep in mind that there can be as many as 64 data cables plus 1 management cable plus 1 serial cable connected to the switch.

- Do you want the connector side recessed in the rack to allow for a larger cable bending radius? It is possible to recess the connector side by 5cm by optional placement of the switch rails. See Figure 11,“Mounting Options”.
- Will the connector side be recessed past other equipment in the rack and will this be problematic?
- The installation kit allows for a 2” recess of the switch past the vertical support.

Figure 11: Mounting Options



3. Decide which mounting option you want to use.

To use the rail kit to transfer the power cord from the connector side to the power side **go to Transferring the Power Cord -** Section Appendix C:**.**

4. Screw the switch slides onto the switch. Use 5 flat head screws for short switches and 7 screws for standard depth switches, to connect each switch slide.

Figure 12: Screwing on the Rail

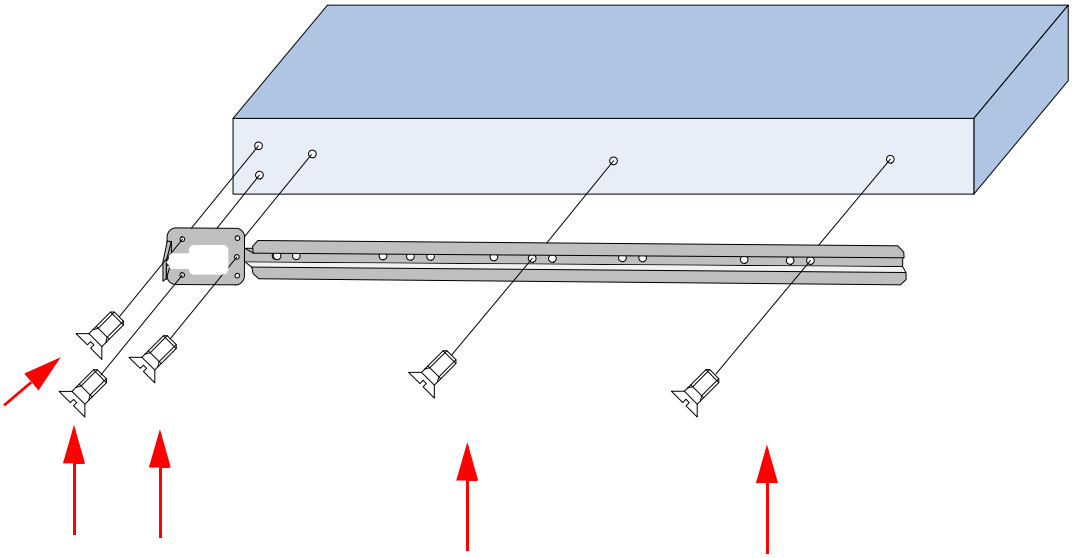
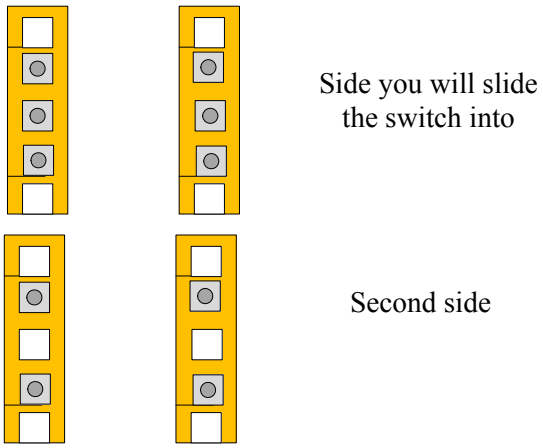
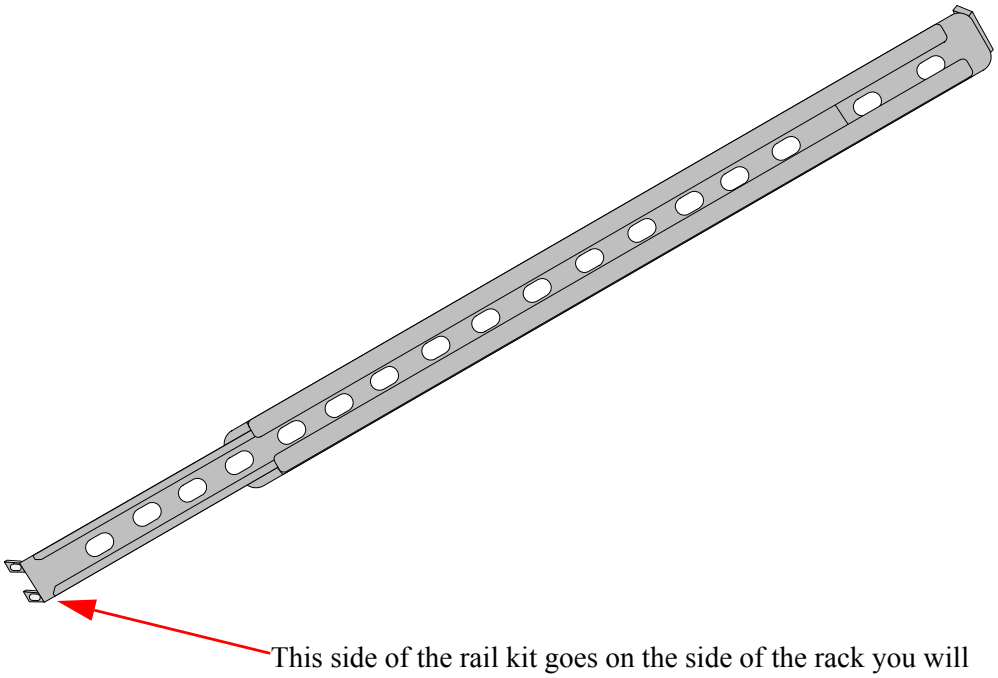


Figure 13: Inserting the Caged Nuts



5. Clip 6 caged nuts into the holes in the rack on the side of the rack you will be sliding the switch into. Check that both sides of the switch, power side and connector side, are at the same level in the rack.
6. Clip 4 more caged nuts into the holes on the opposite side of the rack Check that both sides of the switch, left and right, are the same level in the rack.
7. Slide the rail into the rail slide.
8. Using two of the bolts for each corner install the rails and rail slides in the rack. Do not tighten the bolts yet.

Figure 14: Slide the Rail into the Rail Slide



9. Slide the switch into the rails.
10. Tighten the bolts to 9.2 Nm or 81.5 pound inches.
11. Put the switch into place and screw the bolts into the nuts. Tighten the bolts to 9.2 Nm or 81.5 pound inches.
12. Ground the switch.
13. Plug in the power cables.
14. Check the Status LEDs and confirm that all of the LEDs show status lights consistent with normal operation.

Warning: Any yellow or red status LEDs are cause for concern and must be dealt with immediately.

It can take up to 5 minutes to boot up, during which time the status LED may indicate red.

15. You can start connecting all of the cables to the switch.

4.1.2 Power Connections and Initial Power On

Each PSU has a separate AC receptacle. The input voltage is auto-adjusting for 90 - 264 VAC, 50-60Hz power connections. The power cords should be standard 3-wire AC power cords including a safety ground and rated for 15A or higher.

Caution: The power supplies in this switch are Double Pole / Neutral Fusing.

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

Caution: After inserting a power cable and confirming the green system status LED light is on; make sure that the Fan Status indicator shows green.

If the fan status indicator is not green then 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.

Caution: When turning off the switch, make sure ALL Connector LEDS are off to ensure a powered down status.

4.1.3 Grounding the Switch

Check to determine if your local or national electrical codes require an external ground to all IT components. If so, connect a ground wire to one of the casing screws and connect the other end to a valid ground. If you choose to not use the ground screw, make sure that the rack is properly grounded and that there is a valid ground connection between the chassis of the switch and the rack. Test the ground using an Ohm meter.

Some national and/or local codes may require IT components to be bonded and externally grounded (not including the power cord ground). You must follow all national and local codes when installing this equipment.

4.1.4 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 orange LED indicator corresponding to each port will light when the physical connection is established (that is, when the unit is powered on and a cable is plugged into the port with the other end of the connector plugged into a functioning port). After plugging in a cable, lock the connector using the latching

mechanism particular to the cable vendor. When a logical connection is made the green light will come on. When data is being transferred the light will blink green.

Cables in the middle row should be inserted up side down in relation to the how the cables are inserted in the top row.

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

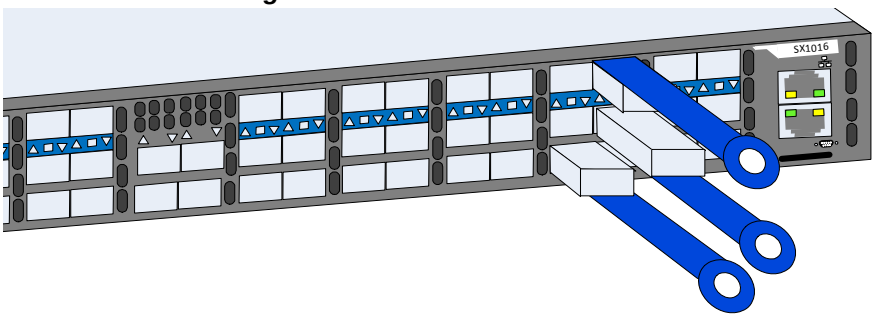
Care should be taken not to impede the air exhaust flow through the ventilation holes next to the data connection ports. Cable lengths should be used which allow for routing horizontally around to the side of the chassis before bending upward or downward in the rack.

When inserting cables into the switch always insert the center row cable before the top and bottom row cables.

4.1.5 Cable Orientation

The cables need to be inserted according to Figure 15.

Figure 15: Cable Orientation for Insertion



4.1.6 Supported Approved Cables

For a list of all approved cables see:

www.mellanox.com/related-docs/user_manuals/Mellanox_approved_cables.pdf

4.2 Disposal

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.

For proper disassembly instructions see the Mellanox website.

5 Management and Tools Overview

The switch to be managed either remotely, or Out-of-Band using MLNX-OS.

5.1 Chassis Management Using the MLNX-OS Software

The SX10XX switches come standard with a management software module for chassis management called Mellanox Operating System (MLNX-OS). MLNX-OS is installed on all SwitchX based managed switch systems. MLNX-OS includes a CLI, WebUI, SNMP and chassis management software.

The Ethernet ports for remote management connect to Ethernet switches. These switches must be configured to 100M/1G auto-negotiation.

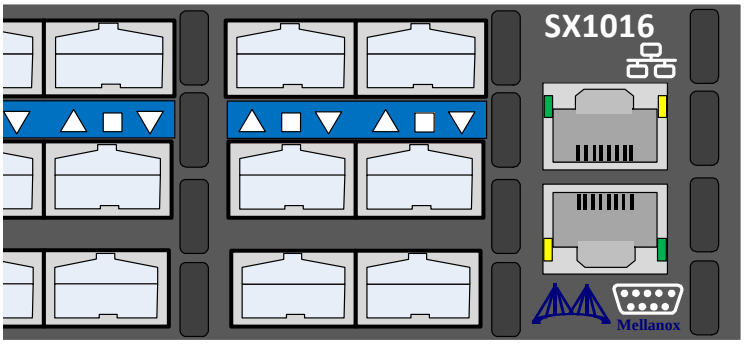
5.2 Configuring the Switch for the First Time

See the Installation Guide of the switches, “Configuring the Switch for the First Time”. The port labelled  must be connected to a local host PC. This must be used the first time the switch is connected. This must be done before any remote management is available.

Hook up the supplied harness cable (HAR00028) from the connector labelled  to the DB9 connector of the local host PC.

Figure 16: Host Connection

Manage-



CONSOLE

5.2.1 Starting a Remote Connection to the Switch

For details on the SNMP commands and MIBs supported refer the MLNX-OS Software Command Reference Guide.

5.2.2 Upgrading Software

The new software and firmware update is available from the Mellanox Support website. Copy the update to a known location on a Remote server within the user's LAN.

Use the CLI or the GUI in order to perform Software upgrade. For further information please refer to the MLNX-OS user manual.

Be sure to read and follow all of the instructions regarding the updating of the software on your switch system.

6 Troubleshooting

As soon as a switch is plugged in, continuously monitor the status light. Make sure that it turns green within 4 minutes of booting up.

Status LED and Fan LED

If the fan LED is red make sure that the ambient temperature is within the range specified in the specification section of the appendix.

If any of the LEDs are red after 4 minutes, unplug the switch and call your Mellanox representative.

Power supply unit:

1. Check that the power cable has a voltage within the range of 100 - 240 volts AC.
2. Remove and reinstall the power cable.

The green power LED for the fans does not come on:

Caution: Do not run the switch if the System Status LED for the Fans is red or off!

The connector LED for the port connector does not come on:

1. Check that both ends of the cable are connected.
2. Check that the locks on the ends are secured.
3. Make sure that the latest firmware version is installed on both the cards and the switch.
4. If media adapters are used, check that the all connections are good, tight, and secure.

The connector LED is flashing orange:

1. Check that the Subnet Manager has been started.
2. Check the cable is connected properly at both ends.
3. Check that the cable is good.
4. Check that the connections are good (no cable weight on the connector, no twists in the cable at the connector, etc.).
5. Check the port connectors at both ends.

The switch is off:

1. Unplug the switch.
2. Wait 5 minutes.
3. Plug in the switch.
4. If the switch does not come on, check the power supply.
5. If the switch comes on, use the management software to determine the cause of the shutdown.
6. Check the temperature of the switch.
7. Check the ambient air temperature to make sure it is not too high.
8. Check the Fan status.

The switch is not working and unresponsive:

1. Unplug the switch.
2. Wait 5 minutes.
3. Plug in the switch.
4. If the switch does not come on, check the power supplies.
5. If the switch comes on, use the management software to determine the cause of the shutdown.
6. Reset the switch.

Appendix A: Specification

Table 8 - SX1016 Specification Data

Physical				
Size	Size: SX1016B (short)	1.716” (1U) H x 16.85” W x 16.2” D 43.6mm X 427.9mm X 410.9mm		
Weight / Center of Gravity	Weight: **Short:**	7.82kg 2 PSUs	Center of Gravity: **Short:**	As measured from the Connector side, left side bottom corner. TBD 21.6mm X 214mm X 218.8mm
Mounting	Mounting:	19” Rack mount		
SerDes Speeds / Connector Types	SerDes Speeds:	10 Gb/s per port	Connector Types:	SFP+
Air Flow/ Heat dissipation	Air Flow:	59.3 CFM	Heat dissipation: Maximum	685.84BTUs/hr
Power and Environmental				
Input Voltage / Management CPU	Input Voltage:	90 - 264 VAC 50-60Hz	Management CPU:	PowerPC 460EX CPU
Power numbers	Power Consumption:	PS unit fan is always at 70%	Typ @ Typ: 10GigE Active Cables: Passive cables:	 174.06W 116.18W
	Max @ Max: 10GigE Active Cables: Passive cables:	 239.53W 156.84W		
Cable power / Temperature	SFP+:	MAX 1.0W TYP: 0.8W	Temperature: Operating Non-operating	 0° to 45° Celsius -40° to 70° Celsius
Shock and Vibration/ Humidity	Shock and Vibration:	ETSI EN 300 019-2-2: 1999-09	Humidity: Operating	 5% - 95% non-condensing

Protocol Support				
Speed protocol / QoS / Management	Ethernet:	Auto-Negotiation of (10Gb/s, 1Gb/s)	Management:	Managed using MLNX-OS
Data Rate	Data Rate:	10GigE		
Regulatory Compliance				
Safety \ EMC (Emissions)	Safety:	US/Canada: cTUVus EU: IEC60950 International: CB	EMC (Emissions):	USA: FCC, Class A Canada: ICES, Class A EU: EN55022, Class A EU: EN55024, Class A EU: EN61000-3-2, Class A EU: EN61000-3-3, Class A Japan: VCCI, Class A
Environmental / Acoustic	Environmental:	EU: IEC 60068-2-64: Random Vibration EU: IEC 60068-2-29: Shocks, Type I / II EU: IEC 60068-2-32: Fall Test	Acoustic:	ISO 7779 ETS 300 753
Scalability and Performance				
Switching Performance / Capacity	Switching Performance:	Simultaneous wire-speed any port to any port	Switching Capacity:	1.28Tb/s

A.1 Approved Cables

For a list of all approved cables see:

www.mellanox.com/related-docs/user_manuals/Mellanox_approved_cables.pdf

A.2 EMC Certifications

The list of approved certifications per switch in different regions of the world is located on the Mellanox website at:

www.mellanox.com/related-docs/user_manuals/Regulatory_and_Compliance_Guide.pdf

EMC statements are also in the Regulatory and Compliance Guide.

A.3 China CCC Warning Statement

China-CCC Warning statements

在维修的时候一定要断开所有电源（English translation“disconnect all power sources before service”）

For non tropical use:

安全说明和标记	汉文	“仅适用于非热带气候条件下安全使用。”
	藏文	《[illegible]》
	蒙古文	“ཚ་བའི་ས་ཁུལ་གྱི་གནམ་གཤིས་མིན་པའི་ས་ཁུལ་ཁོ་ནར་ཉེན་མེད་བེད་སྤྱོད་བྱས་འཐུས།”
	壮文	Dan hab yungh youq gij dienheiq diuzgen mbouj dwg diegndat haenx ancienz sawjyungh.
	维文	غەيرى ئىسسىق بەلباغ ھاۋا كىلىماتى شارائىتىدىلا بىخەتەر ئىشلەتكىلى بولىدۇ

For altitude 2000 meter and below:

安全说明和标记	汉文	仅适用于海拔2000m以下地区安全使用。
	藏文	《2000m [illegible]》
	蒙古文	“རྒྱ་མཚོའི་ངོས་ལས་མཐོ་ཚད་སྨི2000མན་གྱི་ས་ཁུལ་ཁོ་ནར་ཉེན་མེད་བེད་སྤྱོད་བྱས་འཐུས།”
	壮文	Dan hab yungh youq gij digih haijbaz 2000m doxroengz haenx ancienz sawjyungh.
	维文	دېڭىز يۈزىدىن 2000 مېتر تۆۋەن رايونلاردىلا بىخەتەر ئىشلەتكىلى بولىدۇ

Warning for Class A:

声 明

此为 A 级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

English translation of above statement

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

Appendix B: Thermal Threshold Definitions

There are three thermal threshold definitions for the SwitchX® switch device which impact the overall switch system operation state: Warning, Critical and Emergency.

1. Warning – 100C

On managed systems only: When the SwitchX® device crosses the 100C threshold, a Warning Threshold message will be issued by the MLNX-OS 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).

2. Critical – 120C

When the SwitchX® device crosses this temperature, the firmware will automatically shut down the device.

3. Emergency – 130C

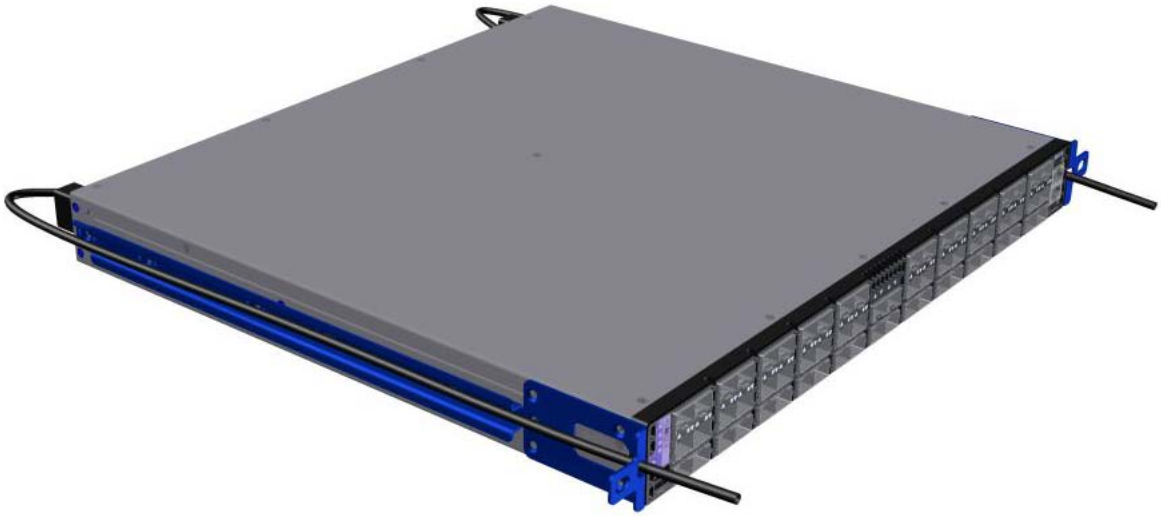
In case the firmware fails to shut down the SwitchX® device upon crossing the Critical threshold, the SwitchX® device will auto-shutdown upon crossing the Emergency (130C) threshold.

Appendix C: Transferring the Power Cord

To use the rail kit to transfer the power cord from the connector side to the power side follow these directions. Do you want to install power cords on both sides of the switch or only one side? For each power cord you want to transfer:

1. Once you have decided which side of the switch will be next to the vertical support?
2. Make sure that you place the cord so that the correct end of the cord will be at the power side of the switch. This will depend on which of the four mounting options you choose.

Figure 17: Transfer Power Cord



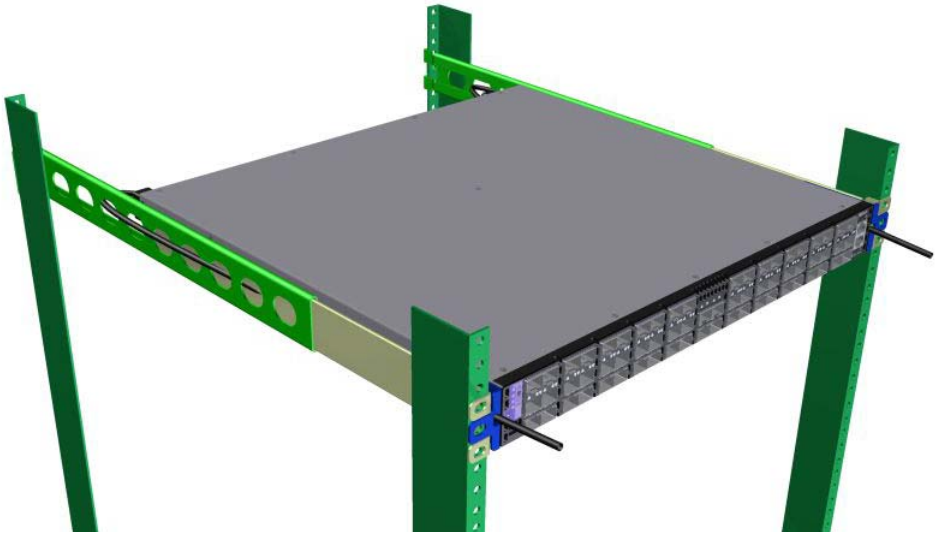
3. Put the power cord in the switch slide channel.
4. Push the cord end through the hole in the switch slide. Leave ~ 7” of cord hanging out from the hole.

Figure 18: Put the Cord Through the Switch Slide Before Screwing it to the Switch

5. Screw the switch slides to the switch.

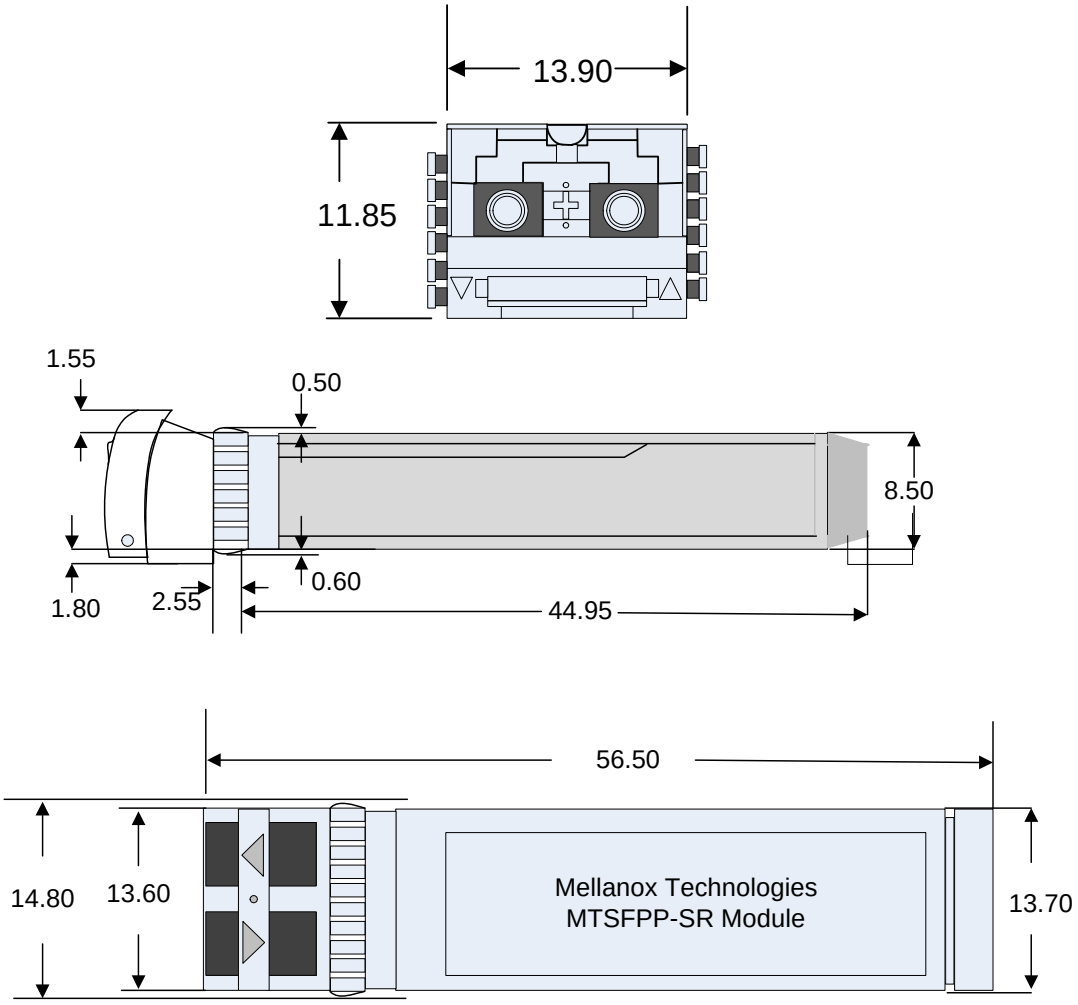
Figure 19: Screw the Switch Slide to the Switch

Figure 20: Transfer Power Cord Finished



6. Return to step 4 on page 24 and continue the installation.

Appendix D: SFP+ Interface



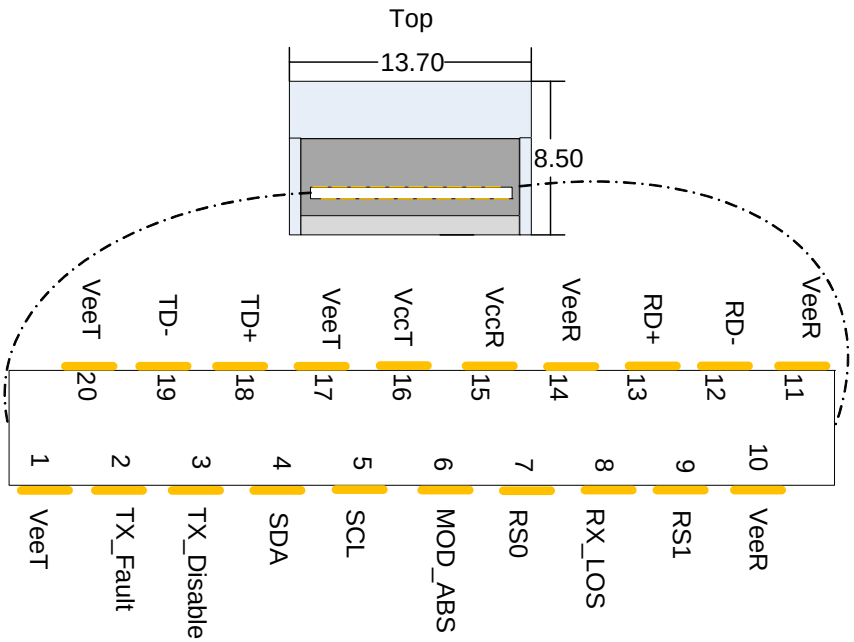


Table 9 - SFP+ Pinout

Pin	Symbol Name	Description
1	VeeT	Transmitter Ground (Common with Receiver Ground) [a]
2	TX_Fault	Transmitter Fault.[b]
3	TX_Disable	Transmitter Disable. Laser output disabled on high or open. [c]
4	SDA	2-wire Serial Interface Data Line [d]
5	SCL	2-wire Serial Interface Clock Line [d]
6	MOD_ABS	Module Absent. Grounded within the module [d]
7	RS0	No connection required
8	RX_LOS	Loss of Signal indication. Logic 0 indicates normal operation. [e]
9	RS1	No connection required
10	VeeR	Receiver Ground (Common with Transmitter Ground) [a]
11	VeeR	Receiver Ground (Common with Transmitter Ground)[a]
12	RD-	Receiver Inverted DATA out. AC Coupled
13	RD+	Receiver Non-inverted DATA out. AC Coupled
14	VeeR	Receiver Ground (Common with Transmitter Ground) [a]

Table 9 - SFP+ Pinout

Pin	Symbol Name	Description
15	VccR	Receiver Power Supply
16	VccT	Transmitter Power Supply
17	VeeT	Transmitter Ground (Common with Receiver Ground) [a]
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.
19	TD-	Transmitter Inverted DATA in. AC Coupled.
20	VeeT	Transmitter Ground (Common with Receiver Ground)[a]

a. Circuit ground is internally isolated from chassis ground.
b. T_{FAULT} is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V. A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
c. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V
d. Should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate module is plugged in.
e. LOS is open collector output. Should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

Appendix E: Replacement Parts Ordering Numbers

Table 10 - Replacement Parts Ordering Numbers

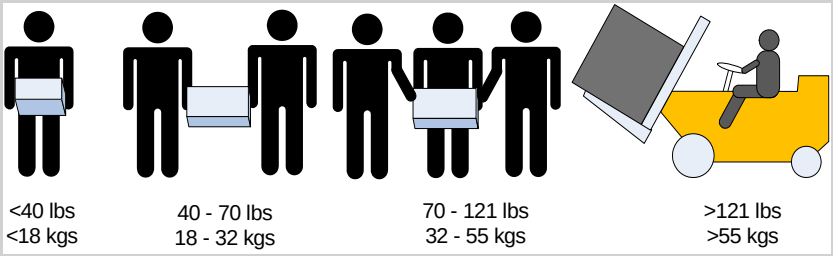
Part Description	OPN
RS232 Cable RJ45 to DB9 Harness	HAR000028
I2C DB9 or RJ45 to USB Adapter	MTUSB-1
Power cord Type C13-C14 250V 10A 1.5M	ACC000251
Power cord Type C13-C14 250V 15A 2M RIGHT ANGLE	ACC000242
Power cord Type B for USA, Canada, Mexico, Taiwan Type B 6ft US 125V 10A cord	ACC000204
Power cord Type B for USA, Canada, Mexico, Taiwan 125V15A 4M USA UL (Type B) RIGHT ANGLE	ACC000241
Power cord Type H for Israel	ACC000205
Power cord Type E/F for Sweden, France, Germany, Netherlands, Russia	ACC000207
Power cord Type G for UK	ACC000208
Power cord Type D for India	ACC000209
Power cord Type I for China	ACC000210
Power cord Type J for Switzerland	ACC000211
Power cord Type B for Japan,	ACC000212
Power cord Type I for Australia	ACC000213

Appendix F: Avertissements de sécurité d'installation (French)

1. Instructions d'installation

Lisez toutes les instructions d'installation avant de brancher le matériel à la source d'alimentation électrique.

2.



3. Température excessive

Ce matériel ne doit pas fonctionner dans une zone avec une température ambiante dépassant le maximum recommandé de 45°C (113°F). Un flux d'air de 200LFM à cette température ambiante maximale est nécessaire. En outre, pour garantir un bon écoulement de l'air, laissez au moins 8 cm (3 pouces) d'espace libre autour des ouvertures de ventilation.

4. Empilage du châssis

Le châssis ne doit pas être empilé sur un autre matériel. Si le châssis tombe, il peut provoquer des blessures corporelles et des dégradations de biens.

5. Système de fusible neutre/à double pôle

Avertissement: Système de fusible neutre/à double pôle. Veuillez debrancher tous les cordons d'alimentation avant d'ouvrir le boitier de ce produit ou de toucher un de ses composants internes.

6. Orages – dangers électriques

Pendant un orage, il ne faut pas utiliser le matériel et il ne faut pas brancher ou débrancher les câbles.

7. Branchement/débranchement des câbles InfiniBand en cuivre

Les câbles InfiniBand en cuivre sont lourds et ne sont pas flexibles, il faut donc faire très attention en les branchant et en les débranchant des connecteurs. Consultez le fabricant des câbles pour connaître les mises en garde et les instructions spéciales.

8. Montage et entretien sur baie

Lorsque ce produit est monté ou entretenu sur baie, il faut prendre des précautions spéciales pour s'assurer que le système reste stable. En général, il faut remplir la baie avec du matériel de bas en haut.

9. Forts Courants de Fuite High Leakage Current

Attention: Forts courants de fuite. Il est essentiel de relier a la terre avant de brancher l'alimentation.

10. Ajouter une information de connexion à la masse Connect a Valid Ground to this Device

Avant de brancher l'appareil à la conduite d'alimentation, les vis de protection à la terre du terminal de l'appareil doivent être appliquées à l'installation de protection à la Terre du bâtiment.

11. Installation du matériel

Ce matériel ne doit être installé, remplacé ou entretenu que par du personnel formé et qualifié.

12. Elimination du matériel

L'élimination de ce matériel doit s'effectuer dans le respect de toutes les législations et réglementations nationales en vigueur.

13. Codes électriques locaux et nationaux

Ce matériel doit être installé dans le respect des codes électriques locaux et nationaux.

14. Codes d'installation

L'appareil doit être installé selon l'ancienne version des codes électriques nationaux du pays. Pour l'Amérique du Nord, l'équipement doit être installé conformément aux spécifications du Code Electrique National Américain et du Code Electrique Canadien.

15. Interconnexion des unites

Les câbles de branchement à l'unité RS232 et les interfaces Ethernet doivent être certifiés UL de type DP-1 ou DP-2. (Note - lorsqu'il existe dans un circuit non LPS)

Protection contre la surintensité : Un appareil de protection répertorié facilement accessible contre la surintensité du circuit de branchement et calibré à 20A doit être incorporé dans le câblage électrique du bâtiment.

16. S'assurer que les enceintes sont appropriées

Des enceintes électriques, mécaniques et incendie adaptées doivent être fournies par le fabricant du produit final ou par l'utilisateur final.

17. Cordons électriques CA homologués UL

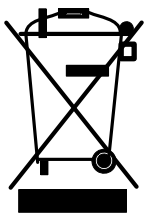
Pour les prises électriques en Amérique du Nord, choisissez un cordon électrique homologué UL et certifié CSA

à 3 conducteurs, [18 AWG], terminé par une fiche moulée, d'une tension nominale de 125 V, [15 A], avec une longueur minimale de 1,5 m [6 pieds] et d'une longueur maximale de 4,5 m [18 pieds]

Pour les prises électriques en Europe, choisissez un cordon électrique harmonisé internationalement et marqué "<HAR>",

à 3 conducteurs, d'un diamètre de fil minimum de 0,75 mm2, d'une tension nominale de 300 V, avec une gaine isolée en PVC. Le cordon doit avoir une fiche moulée d'une tension nominale de 250 V et d'une intensité nominale de 10 A.

18. La Directive WEEE



Conformément à la Directive WEEE 2002/96/EC, les déchets d'équipements électriques et électroniques (EEE) doivent être triés et ne peuvent être éliminés avec les déchets ménagers.

Veuillez disposer de ce produit et de tous ses composants de manière responsable et respectueuse de l'environnement.

Appendix G: Installation - Sicherheitshinweise (German)

1. Installationsanleitungen

Lesen Sie alle Installationsanleitungen, bevor Sie das Gerät an die Stromversorgung anschließen.

2. Übertemperatur

Dieses Gerät sollte nicht in einem Bereich mit einer Umgebungstemperatur über der maximal empfohlenen Temperatur von 45°C (113°F) betrieben werden. Es ist ein Luftstrom von 200 LFM bei maximaler Umgebungstemperatur erforderlich. Außerdem sollten mindestens 8 cm (3 in.) Freiraum um die Belüftungsöffnungen sein, um einen einwandfreien Luftstrom zu gewährleisten.

3. Stapeln des Chassis

Das Chassis sollte nicht auf andere Geräte gestapelt werden. Wenn das Chassis herunterfällt, kann es zu Verletzungen und Beschädigungen an Geräten führen.

4. Redundanter Stromversorgungsanschluss - Elektrische Gefahr

Dieses Produkt verfügt über eine Abdeckung über dem Bereich für die redundante Stromversorgung. Betreiben Sie das Produkt nicht, wenn diese Abdeckung nicht sicher festsitzt oder entfernt wurde.

5. Bei Gewitter - Elektrische Gefahr

Arbeiten Sie während eines Gewitters und Blitzschlag nicht am Gerät, schließen Sie keine Kabel an oder ab.

6. Anschließen/Trennen von InfiniBand-Kupferkabel

InfiniBand-Kupferkabel sind schwer und nicht flexible. Deshalb müssen sie vorsichtig an die Anschlüsse angebracht bzw. davon getrennt werden. Lesen Sie die speziellen Warnungen und Anleitungen des Kabelherstellers.

7. Gafahr des elektrischen Schocks.

Gafahr des elektrischen Schocks. Entferrnen des Netzsteckers elnes Netzteils spannungsfrei. Um alle Einhieten spannungsfrei zu machen sind die Netzstecker aller Netzteile zu entfernen

Risk of electric shock and energy hazard.
The PSUs are all independent.
Disconnect all power supplies to ensure a powered down state inside of the switch platform.

8. Rack-Montage und Wartung

Wenn dieses Produkt in einem Rack montiert oder gewartet wird, sind besondere Vorsichtsmaßnahmen zu ergreifen, um die Stabilität des Systems zu gewährleisten. Im Allgemeinen sollten Sie das Gestell von unten nach oben mit Geräten füllen.

9. Geräteinstallation

Diese Gerät sollte nur von geschultem und qualifiziertem Personal installiert, ausgetauscht oder gewartet werden.

10. Geräteentsorgung

Die Entsorgung dieses Geräts sollte unter Beachtung aller nationalen Gesetze Bestimmungen erfolgen.

11. Regionale und nationale elektrische Bestimmungen

Dieses Gerät sollte unter Beachtung der regionalen und nationalen elektrischen Bestimmungen installiert werden.

12. Richtigen Schutz sicherstellen

Geeigneter elekrischer, mechanischer und Feuerschutz sind vom
Hersteller des Endprodukts oder dem Endbenutzer bereitzustellen.

13. Strahlenkontakt

Achtung – Nutzung von Steuerungen oder Einstellungen oder Ausführung von Prozeduren, die hier nicht spezifiziert sind, kann zu gefährlichem Strahlenkontakt führen..

Klasse 1 Laserprodukt und Referenzen zu den aktuellsten Lasterstandards :
ICE 60 825-1:1993 + A1:1997 + A2:2001 und EN 60825-1:1994+A1:1996+ A2:2001

14. UL-und CSA Certified Netzkabel

Für Nordamerika Stromanschluss, wählen Sie ein Netzkabel, das UL-und CSA Certified
3 - Leiter, [18 AWG], mit einem angespritztem Stecker bewertet bei 125 V, [15], mit einer Mindestlänge von 1,5 m [Six Feet] aber nicht mehr als 4,5 m.
Für die europäischen Zusammenhang, wählen Sie ein Netzkabel, das international harmonisiert und der Aufschrift "<HAR>",
3 - Leiter, mindestens 0,75 mm2 Draht, bewertet mit 300 V, mit einem PVC-Mantel isoliert. Das Kabel muss eine angespritztem Stecker bewertet bei 250 V, 10 A. "

15. Ableitstrom> 3.5mA LEAKAGE >3.5mA

WARNUNG: Hohe Ableitstrom; Earth Verbindung, bevor Sie die Verbindung von wesentlicher Bedeutung werden.

16. Add GND Verbindung Informationen

Bevor Sie dieses Gerät an das Stromnetz, die Schutzerde Terminal Schrauben dieses Gerät muss an den Schutzleiter in der Gebäudeinstallation.

17. Installation Codes

Dieses Gerät muss installiert sein, entsprechend auf die neueste Version des Landes National Electrical Code. Für Nordamerika, müssen in Übereinstimmung mit den geltenden Vorschriften in der US-amerikanischen National Electrical Code und dem Canadian Electrical Code.

18. Zusammenschaltung von EINHEITEN

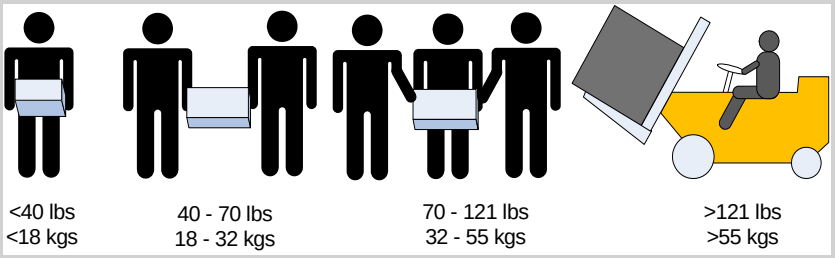
Kabel für den Anschluss an das Gerät RS232-und Ethernet-Schnittstellen müssen UL zertifiziert Typ DP-1 oder DP-2. (Hinweis-, wenn nicht mit Wohnsitz in LPS-Schaltung)

Überstromschutz: Eine leicht zugängliche Auflistung Abzweigleitung Überstrom-Schutzeinrichtung 20 A bewertet werden müssen in dem Gebäude Verkabelung.

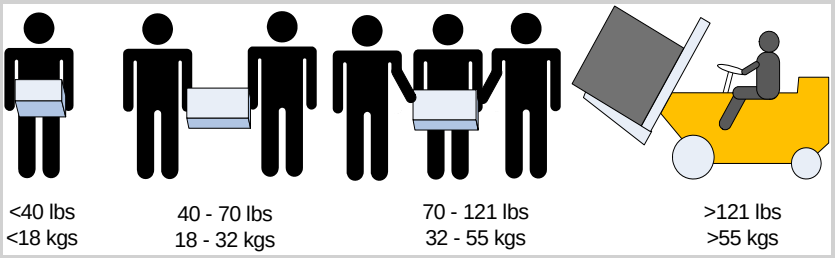
19. Zweipolige bzw. Neutralleiter-Sicherung im Netzteil

Achtung:
Zweipolige bzw. Neutralleiter-Sicherung im Netzteil. Netzstecker ziehen, um sicherzustellen, daß keine Spannung am Gerät anliegt. Entfernen Sie alle Netzkabel vor dem Öffnen der Abdeckung dieses Produkts oder dem Berühren der Innenteile.

20. Bodily Injury Due to Weight



Use enough people to safely lift this product.

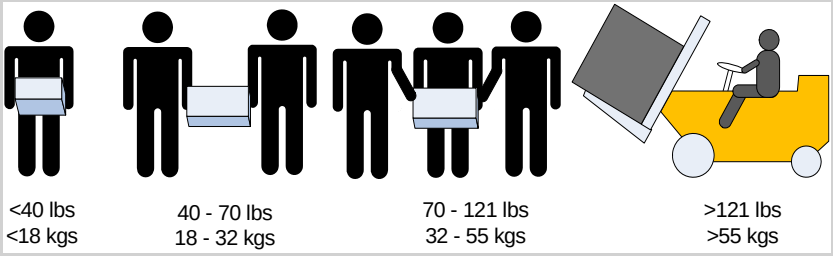


Appendix H: Advertencias de seguridad para la instalación (Spanish)

1. Instrucciones de instalación

Antes de conectar el equipo a la fuente de alimentación, leer todas las instrucciones de instalación.

2. Lesión corporal por peso



3. Lesión corporal por peso

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

4. Sobrecalentamiento

No se debe utilizar el equipo en un área con una temperatura ambiente superior a la máxima recomendada: 45°C. Además, para garantizar una circulación de aire adecuada, se debe dejar como mínimo un espacio de 8 cm (3 pulgadas) alrededor de las aberturas de ventilación.

5. Apilamiento del chasis

Los chasis no se deben apilar sobre otros equipos. La caída del chasis podría causar lesiones corporales, así como daños al equipo.

6. Dos fusibles, uno en el polo y otro en el neutro

Dos fusibles, uno en el polo y otro en el neutro. Quitar los cables de corriente antes de abrir la tapa de este producto o tocar cualquier componente interno.

7. Cuando hay rayos: peligro de descarga eléctrica

No utilizar el equipo ni conectar o desconectar cables durante períodos de actividad de rayos.

8. Conexión y desconexión del cable Copper InfiniBand

Dado que los cables de cobre InfiniBand son pesados y no son flexibles, su conexión a los conectores y su desconexión se deben efectuar con mucho cuidado. Para ver advertencias o instrucciones especiales, consultar al fabricante del cable.

9. Montaje y mantenimiento de bastidores

Al instalar o realizar el mantenimiento de este aparato en un bastidor, es preciso adoptar precauciones especiales para garantizar que el sistema se mantenga estable. En general, en un bastidor, los equipos se deben instalar comenzando desde abajo hacia arriba.

10. Instalación de equipos

La instalación, el reemplazo y el mantenimiento de este equipo estarán a cargo únicamente de personal capacitado y competente.

11. Asegurar confinamientos adecuados

El fabricante del producto final o el usuario final deberán suministrar un confinamiento adecuado para componentes eléctricos y mecánicos y contra incendio.

12. Eliminación de equipos

La eliminación definitiva de este equipo se debe efectuar conforme a todas las leyes y reglamentaciones nacionales.

13. Códigos eléctricos locales y nacionales

Este equipo se debe instalar conforme a los códigos eléctricos locales y nacionales.

14. Cable de alimentación homologado por UL y con certificación CSA

En conexiones de América del Norte, seleccionar un cable de alimentación homologado por UL y con certificación CSA de tres conductores, [16 AWG], terminado en un enchufe moldeado con capuchón de 125 voltios nominal, [13 A], con una longitud mínima de 1,5 metros, pero no más de 4,5 metros.

En conexiones europeas, seleccionar un cable de alimentación armonizado internacionalmente y marcado "<HAR>", de tres conductores, hilo de 1,0 mm2 como mínimo, 300 voltios nominal, con cobertura protectora aislante de PVC. El cable debe tener un enchufe moldeado con capuchón de 250 voltios nominal, 10 A.

15. Añadir conexión a tierra

Antes de conectar el dispositivo a la línea de alimentación, los tornillos del terminal de la puesta a tierra de protección del dispositivo se deben conectar a la puesta a tierra de protección de la instalación del edificio.

(Información de conexión a tierra):

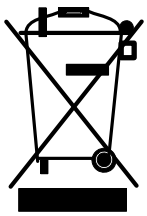
La instalación del edificio deberá prover un medio para la conexión con la puesta a tierra de protección y un técnico de servicio deberá conectar permanentemente el equipo a dicho medio de conexión.

Un TÉCNICO DE SERVICIO comprobará si la toma eléctrica de la que se suministrará corriente al equipo provee una conexión con la puesta a tierra de protección del edificio. De no ser así, el TÉCNICO DE SERVICIO se encargará de instalar un CONDUCTOR DE CONEXIÓN A TIERRA DE PROTECCIÓN, del terminal de puesta a tierra de protección separado al conductor de tierra de protección del edificio. El equipo se instalará en un área donde haya conexión equipotencial, como por ejemplo, un centro de telecomunicaciones o una sala de computadoras dedicada.

16. Códigos de instalación

Este dispositivo se debe instalar conforme a la versión más reciente de los códigos eléctricos nacionales del país en cuestión. En América del Norte, el equipo se debe instalar de acuerdo con las disposiciones vigentes del Código Eléctrico Nacional de los EE.UU. y del Código Eléctrico de Canadá.

17. Directiva sobre RAEE



Conforme a la Directiva 2002/96/CE sobre RAEE, todos los residuos de equipos eléctricos y electrónicos (EEE) se deben recolectar por separado y no se deben eliminar junto con residuos domésticos.

Al deshacerse de este producto y de todas sus partes, hágalo de una manera responsable y respetuosa con el medio ambiente.

7.

Appendix I: Special Regulations Regarding Finland, Sweden, Denmark, and Norway

Denmark- This unit is class I and must be connected with an AC cord compliant with all national electrical codes in Denmark. The AC cord shall have an integral ground wire, and can only be plugged into a fully grounded outlet.

Do not connect this unit to any outlet that is not fully grounded!

- **Finland -**

"Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan"

- **Norway -**

"Apparatet må tilkoples jordet stikkontakt"
Unit is intended for connection to IT power systems for Norway only.

- **Sweden -**

"Apparaten skall anslutas till jordat uttag."