

SpycerNode User Manual



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General

This chapter includes the following section:

- [About this Documentation \(page 8\)](#)

About this Documentation

This documentation informs you about the installation of the SpycerNode hardware, a storage system by Rohde & Schwarz, its operation as well as all connection possibilities. Furthermore, it describes maintenance tasks that you may carry out on your own.

Required Reading

Each person who is responsible for installation, operation, maintenance or setting of the system has to read and understand this manual.

Target Group

To use this manual you should know how to handle computer equipment. Furthermore, to connect the R&S system to a network you should have experience as a network administrator and know how to set up the required network connections on the installation site in hard- as well as software.

When performing maintenance tasks on the hardware of the R&S system, you must be qualified to work on, repair and test electrical equipment.

Additional Documentation

Following documents have to be heeded while working with SpycerNode:

- Data Sheet

The complete documentation can be downloaded from **<https://gloris.rohde-schwarz.com>** after registering/logging in to access restricted information. There you may find updated manuals and further information as well.

Safety

This chapter is divided into the following sections:

- For your Safety (page 10)
- General Notes (page 11)

For your Safety

For your Safety

The product documentation helps you to use SpycerNode safely and efficiently. Keep the product documentation in a safe place and pass it on to the subsequent users. Use SpycerNode only in its designated purpose as described in the product documentation. Observe the performance limits and operating conditions stated in the specification (data sheet).

Safety information is part of the product documentation. It warns you about the potential dangers and gives instructions how to prevent personal injury or damage caused by dangerous situations.

Safety information is provided as follows:

- In the "Basic Safety Instructions", safety issues are grouped according to subjects.
- Throughout the documentation, safety instructions are provided when you must pay attention during setup or operation.

Always read the safety instructions carefully. Make sure to fully comply with them. Do not take risks and do not underestimate the potential danger of small details such as a damaged power cable.

General Notes

Please observe the following general important notes:

- Do not lift the enclosure by the handles on the rear modules or the PCMs. They are not designed to take the weight. Only lift from underneath the main chassis.
- If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- The optional RJ45 socket on the I/O module, it is for Ethernet connection only and must not be connected to a telecommunications network.
- All plug-in modules and blank plates are part of the fire enclosure and must only be removed when a replacement can be immediately added. The system must not be run without all modules or blanks in place.
- Unplug the unit before you move it or if you think it has become damaged in any way.
- The plug on the power supply cord is used as the main disconnect device. Ensure that the socket outlets are located near the equipment and are easily accessible.
- When powered by multiple AC sources, disconnect all supply power for complete isolation.
- In order to comply with applicable safety, emission and thermal requirements no covers should be removed and all bays must be populated with plug-in modules or blanks.
- The power connection should always be disconnected prior to removal of a PCM/PSU from the enclosure.
- A safe electrical earth connection must be provided to the power supply cords. Check the grounding of the enclosure before applying power.
- Provide a suitable power source with electrical overload protection to meet the requirements laid down in the technical specification.
- Do not remove PCMs, Cooling Modules, PSUs or I/O Modules unless you have a replacement model of the correct type ready for insertion.
- Connect the system to an uninterruptible power supply redundantly on two phases.
- It is recommended that you fit and check a suitable anti-static wrist or ankle strap and observe all conventional ESD precautions when handling plug-in modules and components. Avoid contact with backplane components and module connectors, etc.

2U Enclosures

Please observe the following general important notes:

- An enclosure can weigh up to 26 kg (57lb) depending on configuration. Do not try to lift the enclosure by yourself.
- It is advisable to remove all plug-in modules to minimize weight before lifting the enclosure.
- The enclosure must only be operated from a power supply input voltage range of 100-240 VAC.

General Notes

- When bifurcated power cords ('Y' leads) are used, they must only be connected to a supply range of 200-240 V.
- A faulty PCM must be replaced with a fully operational module within 24 hours.

5U Enclosure

Please observe the following general important notes:

- Important: The enclosure must be mounted in a rack.
- An unpopulated enclosure can weigh up to 45kg (100lb). Use appropriate lifting methods.
- A fully populated enclosure weighs 135kg (298lb). Only lift the enclosure when the drawers are empty and latched closed. Do not attempt to lift the enclosure when populated with drives.
- When closing the drawers, do so firmly, ensuring the latches are engaged.
- Do not attempt to disassemble the rear sub-chassis from the enclosure.
- Operating temperatures inside the enclosure drawers can reach up to 60°C. Take care when opening drawers and removing drive carriers.
- If any component of the product fails, consult your storage vendor.
- For North American use, each branch circuit must be rated for 20A.
- The equipment is suitable for connection to an IT power system (Norway), when mounted in a Restricted Access Location where equipotential bonding has been applied by a service person.
- Double pole/neutral fusing in PSUs.
- Risk of explosion if the battery within the RAID controller is replaced with an incorrect type. Dispose of used batteries according to the instructions. There are no user serviceable parts within the RAID controller.
- Due to product acoustics it is recommended that users wear ear protection for any prolonged exposure.
- To prevent over-turning, drawer interlocks stop users from opening both drawers at the same time. Do not attempt to force open a drawer when the other drawer is already open.
- The product ratings are: voltage: 200 to 240 VAC; current: 16A or 13A per inlet; frequency: 50 to 60 Hz. This information can also be found on the back of the PSUs.

Product Description

This chapter is divided into the following sections:

- Function (page 14)
- Models (page 15)
- Certified Clients for SpycerNode (page 17)
- System ID and Serial Number (page 18)
- The Front of the System (page 19)
- The Rear of the System (page 28)

Function

With SpycerNode, Rohde & Schwarz has brought enterprise-class storage features to the media and entertainment market segment. Today's exponential growth of data and transactions is demanding larger and larger amounts of unstructured data storage and management across diverse workloads. As each department or division attempts to satisfy its own storage and performance needs, your organization can find itself with many disparate systems isolated from each other. This can result in expensive resource duplication, complicated management and isolated pools of data. In addition, the resulting islands of information may hold valuable insights that may not be accessible in such a fragmented environment. Traditional RAID is no longer an effective mechanism for data protection for modern disk drives, since it can take several hours or even days to rebuild a failed drive. Advanced erasure coding to spread the data and shorten recovery time is required to avoid the catastrophic results of multi-disk failures with traditional RAID.

The R&S SpycerNode with its ideal physical sizes as a building block is easy to install and deploy. IT managers appreciate features such as two-digit front-panel shelf ID, activity and status indicators for all key components, alarms and lockable carriers. With a "no single point of failure" design and support for both dual ported NL-SAS and dual ported SSD-drives, the R&S SpycerNode is ready to fulfill a wide variety of applications.

Models

SpycerNode is available in the following hardware platforms with different configurations:

- SpycerNode 2U12 main unit (including appliance controllers)
- SpycerNode 2U24 main unit (including appliance controllers)
- SpycerNode 5U84 main unit (including appliance controllers)

Storage Extensions

For all systems the following storage extensions are available:

- SpycerNode 2U12JB unit (including SAS expanders)
- SpycerNode 2U24JB unit (including SAS expanders)
- SpycerNode 5U84JB unit (including SAS expanders)

2U12/ 2U12JB

Available drive bundles:

- HDD bundle 96 TB (12 HCS 8TB drives)
- SSD bundle 11TB (12 SAS SSD 960GB drives)
- SSD bundle 23TB (12 SAS SSD 1920GB drives)
- SSD bundle 43TB (12 SAS SSD 3840GB drives)

2U24/ 2U24JB

Available drive bundles:

- SSD Bundle 23TB (24 SAS SSD 960GB drives)
- SSD Bundle 46TB (24 SAS SSD 1920GB drives)
- SSD Bundle 92TB (24 SAS SSD 3840GB drives)




5U84/ 5U84JB

Available drive bundles:

- HDD Bundle 336TB (42 HCS 8TB drives)
- SSD Bundle 40TB (42 SAS SSD 960GB drives)
- SSD Bundle 80TB (42 SAS SSD 1920GB drives)
- SSD Bundle 160TB (42 SAS SSD 3840GB drives)

Models

Enclosure Overview

	<p>SpycerNode 2U12/2U12JB</p> <ul style="list-style-type: none"> • 2U high, 65 cm length • 12 x 3.5" SAS drives • 2 x 764W power cooling modules • LS controllers: 2 x 1U • SBB 2.0 compliant
	<p>SpycerNode 2U24/2U24JB</p> <ul style="list-style-type: none"> • 2U high, 65 cm length • 24 x 2.5" SAS SSD drives • 2 x 764W power cooling modules • 2 x controllers • SBB 2.0 compliant
	<p>SpycerNode 5U84/5U84JB</p> <ul style="list-style-type: none"> • 5U high, 96cm length • 84 x 3.5" high capacity SAS drives • 2 x 2200W power supply units • 2 controllers • 5 x fan modules

Certified Clients for SpycerNode

There are different ways to connect clients to SpycerNode.

SpycerNode exposes the storage via the NSD (Network Shared Disk) protocol to the ethernet network. A NSD client is any server or workstation that has the native Spectrum Scale protocol installed and is designated to operate as a client. Physically reading or writing user data to the SAN disks is done on behalf of the NSD clients that trigger the disk operations

The following operating systems are supported for native Spectrum Scale 5 clients:

- Windows 10
- RHEL/CentOS 7.1 (or later)
- SLES12 SP1 (or later)
- Ubuntu 16.04 and 18.04.1

Besides the native clients following file sharing protocols are supported:

Protocol	Version	Operating System
Samba	SMBv2, SMBv3	Linux/Windows/OSX
NFS	NFSv4	Linux/OSX
FTP	-	Linux/Windows/OSX

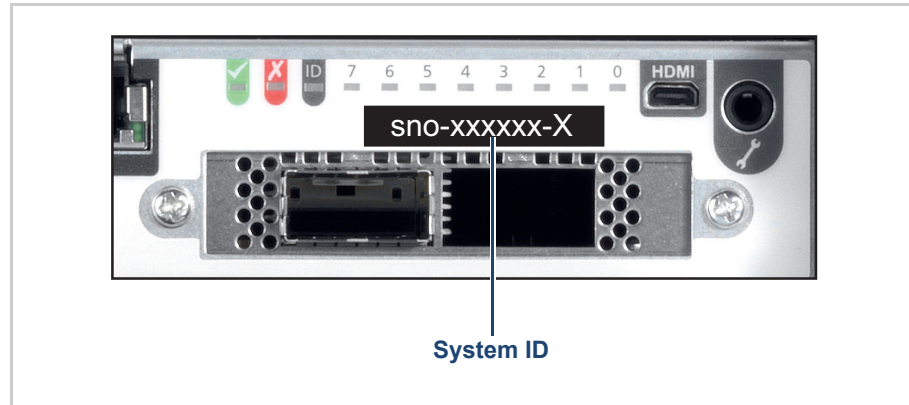


Performance values may differ for individual client configuration.

System ID and Serial Number

The system ID and the serial number are located on the back panel of the system.

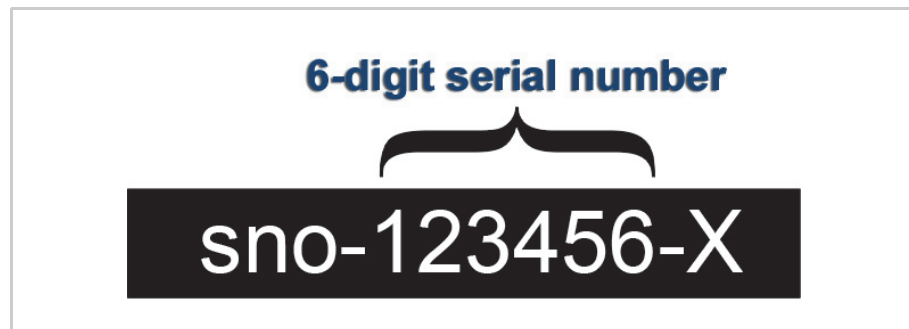
System ID



Location of the system ID

Serial Number

The serial number is part of the system ID and is represented as a 6-digit number:



Serial number as part of the system ID



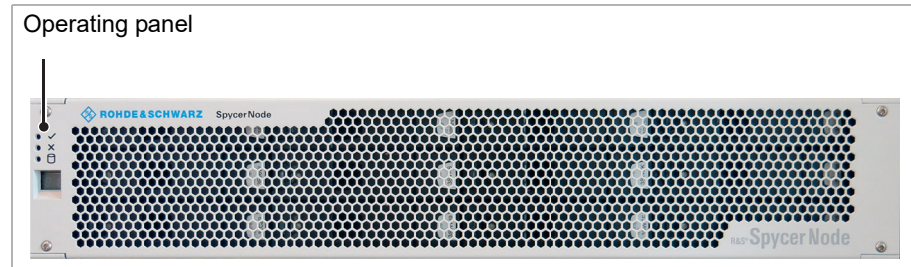
This 6-digit serial number is used as password when logging in to:

- R&S[®]Device Manager web frontend (username: "administrator")
- IPMI login (username: "admin"). For systems built after April 2022 prepend "rs" to the beginning of the serial number (e.g "rs123456").

The Front of the System

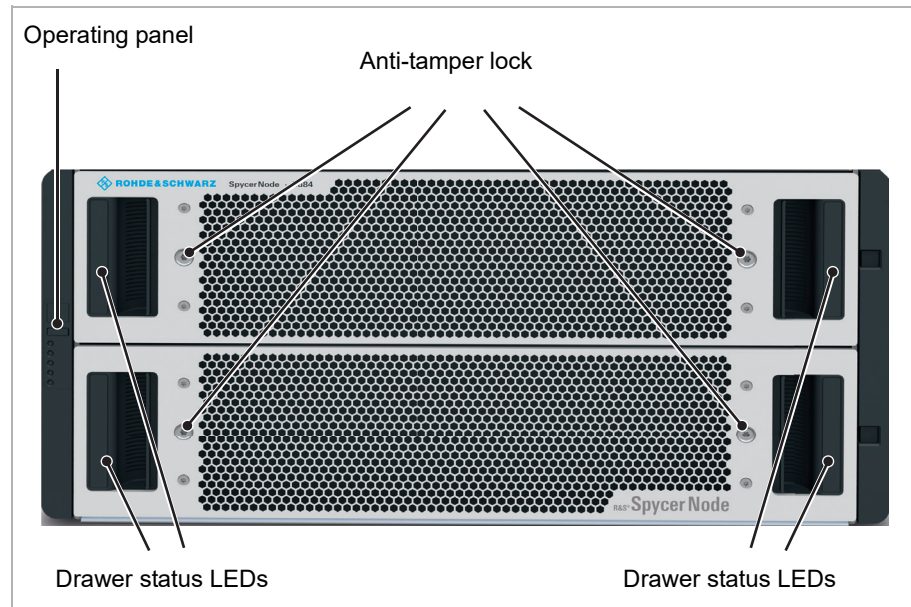
Enclosure Front

The enclosure has a removable front plate. With a 2U12 and 2U24 enclosure it is necessary to remove the front plate to get access to the drive slots. For more information about the drives see chapter “Drives” on page 24.



2u enclosure front

Operating panel	For more information see chapter “Operating Panel (2U Enclosures)” on page 20
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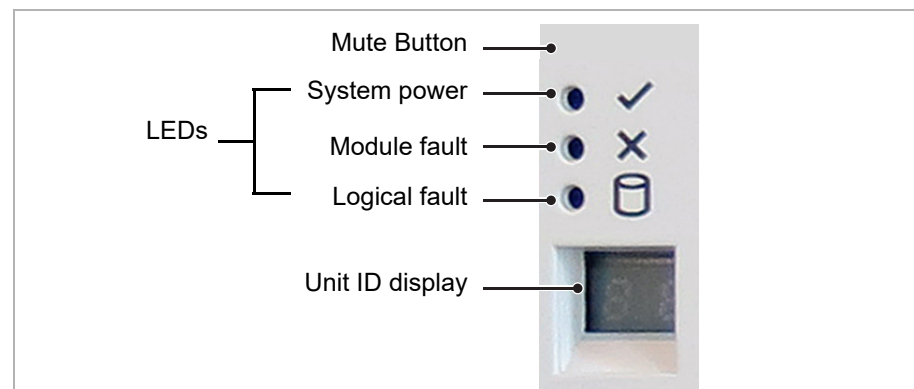
5U84 enclosure front

Operating panel	For more information see chapter “Operating Panel (5U Enclosure)” on page 22
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The Front of the System

Anti-tamper locks	The red arrows on the locks will point inwards if the locks are disengaged. Unlock them if necessary by rotating them counterclockwise using a screwdriver with a torx T20 bit.
Drawer 1/2 status	For more information see chapter “Drawer LEDs” on page 23.

Operating Panel (2U Enclosures)



Operating panel for 2U12 and 2U24

Mute Button	(Reserved)
LEDs	Fore more information see LEDs.
Unit ID display	Displays the enclosure identification number (for use with multiple enclosure systems).

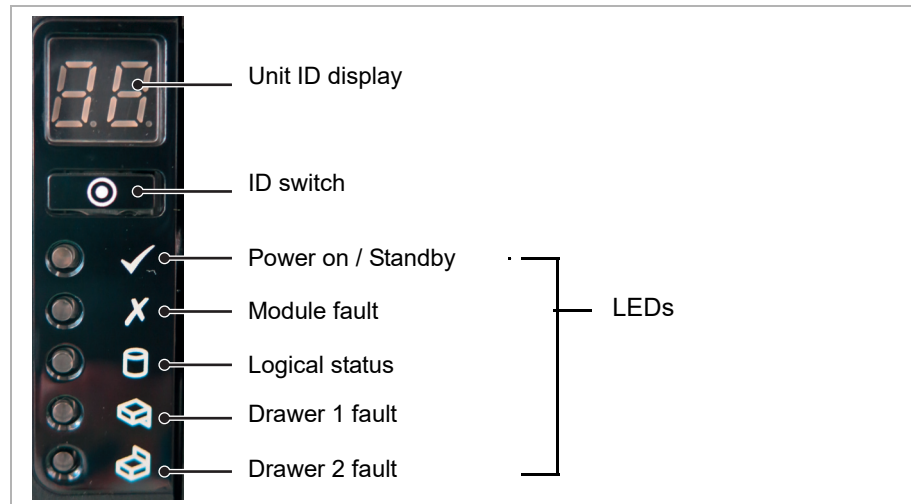
LEDs

System power (green/amber)	Module fault (amber)	Logical fault (amber)	LED display	Associated LEDs/alarms	Status
On	On	On	On		Operating panel power on (5s) test state.
On	Off	Off	X		Power on, all functions good
On	On	X	X	PCM fault LEDs, fan fault LEDs	Any PCM fault, fan fault, over or under temperature
On	On	X	X	SBB module LEDs	Any SBB module fault
On	On	X	X	No module LEDs	Enclosure logical fault
On	Flash	X	X	Module status LED on SBB module	Unknown (invalid or mixed) SBB module type installed, I ² C bus failure (inter SBB comms) JBOD VPD configuration error
On	Flash	X	X	PCM fault LEDs, fan fault LEDs	Unknown (invalid or mixed) PCM type installed, or I ² C bus failure (PCM comms)
On	X	On	X	Array in failed or degraded state	Drive failure has occurred causing loss of availability or redundancy
On	X	Flash	X	Arrays in impacted state	Arrays operating background function
On	Flash	X	X	SES state S1	Enclosure ID setting different from 'start of day' setting
On	X	X	Flash		Enclosure identification or invalid ID selected

X = Disregard

The Front of the System

Operating Panel (5U Enclosure)



Operating panel for 5U Enclosure

Unit ID display	Displays the enclosure identification number (for use with multiple enclosure systems), but can be configured by the ID switch.
ID switch	Used to set the Unit ID display (refer to chapter “Setting the Unit Identification Number” on page 59 for details).
LED	Fore more information see LEDs.

LEDs

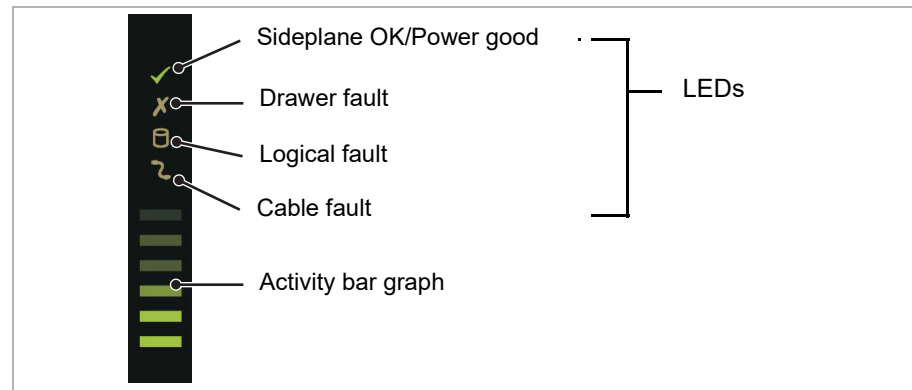
Unit ID display	Power (green/amber)	Module fault (amber)	Logical status (amber)	Drawer 1 fault	Drawer 2 fault	Associated LEDs or Alarms	Status
X	On	Off	Off	Off	Off		Power on, all functions good
X	On	On	X	X	X	Single beep, then double	Operating panel power on (5s) test state.
X	On	On	X	Off	Off	PSU fault LEDs, fan fault LEDs	Any PSU fault, fan fault, over or under temperature
X	On	On	X	Off	Off	SBB module LEDs	Any SBB module fault
X	On	F	X	Off	Off		Enclosure logical fault (eg VPD config. error)
X	On	F	X	Off	Off	Module status LED on SBB module	Unknown (invalid or mixed) SBB module type installed, I2C Bus failure (inter SBB comms) JBOD VPD configuration error

The Front of the System

Unit ID display	Power (green/amber)	Module fault (amber)	Logical status (amber)	Drawer 1 fault	Drawer 2 fault	Associated LEDs or Alarms	Status
X	On	F	X	Off	Off	PSU fault LEDs, fan fault LEDs	Unknown (invalid or mixed) PSU module type installed, or I2C Bus failure (PSU comms)
X	On	X	On	Off	Off	DDIC fault LED, drawer fault LED	Drive failure has occurred causing loss of available or redundancy
X	On	X	X	On	Off	Fault LED on drawer 1	Fault present on drawer 1 (drive, cable or fanout card fault)
X	On	X	X	Off	On	Fault LED on drawer 2	Fault present on drawer 2 (drive, cable or fanout card fault)
F	X	X	X	X	X		SES controlled enclosure identify

X = Disregard; F = Flashing

Drawer LEDs



Drawer LEDs for 5U Enclosure

LEDs	Fore more information see the following table.
Activity bar graph	Shows the amount of data I/O from zero segments lit (no I/O) to all six segments lit (maximum I/O).

The Front of the System

Sideplane OK/Power (green)	Sideplane fault (amber)	Logical fault (amber)	Cable fault (amber)	Activity bar graph (green)	Status
On	Off	Off	Off	X	Sideplane card OK/Ppower good
X	On	X	X	Off	Sideplane card fault
On	X	On	X	X	Drive fault (host indicated)
Off	X	X	On	Off	Cable fault
On	Off	Off	Off	On*	Drive activity

* The Activity bar graph is a 6-segment drive activity meter, showing activity of the SAS interface to the sideplane. For zero activity, no segments are lit, scaling lineary until all segments are lit when the interface is transferring data at full capacity.

X = Disregard

Drives

Drives are provided with dual interfaces and these are connected into separate storage domains. Therefore a fault in one controller does not prevent the other from operating.

All drives are dual ported, so more than one initiator will be communicating with the device at any point in time. All drives therefore support SCSI reservations. This is a method to allow a controller to “own” access to a given device, reserving it for its exclusive use.

All drives provide error detection and correction capabilities. These are reported to the application in line with the SCSI specifications.



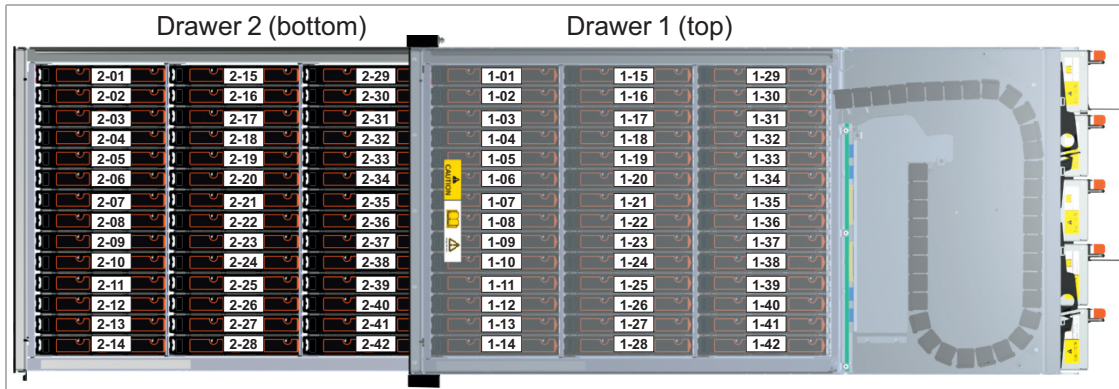
The order of the hard drives in an enclosure is virtualized, and may bear no resemblance to the order shown here.



Drive mapping for 2U12



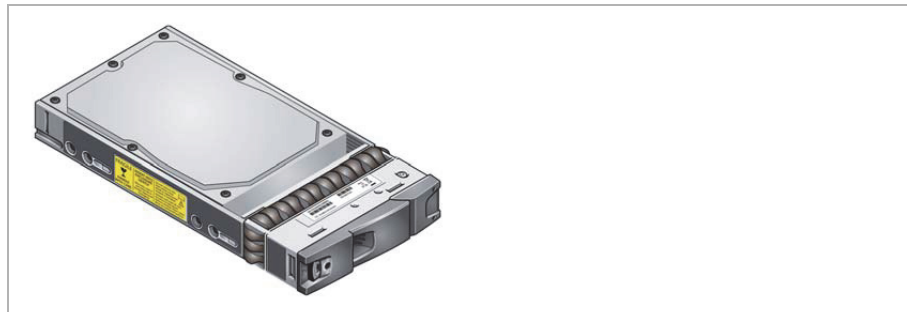
Drive mapping for 2U24



Drive mapping for 5U Enclosure

Carriers (2U Enclosures)

In 2U12 enclosures a HB carrier is used. It houses a single 3.5 SAS drive or, with an adapter, a 2.5 inch SAS SSD.



HB drive carrier (SAS drive)

The Front of the System

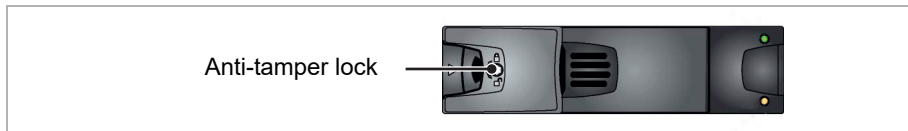
In 2U24 enclosures a EB carrier is used. It houses a single 2.5 inch SAS or SATA drive.



EB drive carrier (SAS Drive)

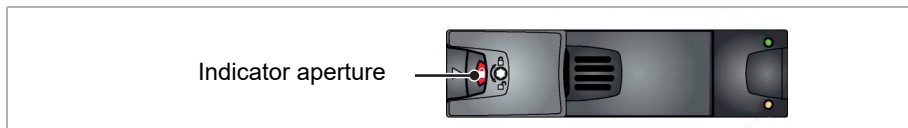
Anti-tamper Locks

The HB and the EB carrier provides anti-tamper locks.



Anti tamper lock unlocked

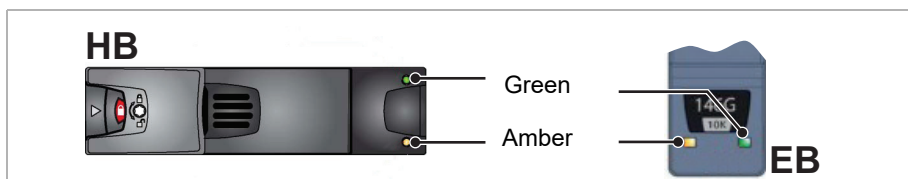
When locked, the carrier cannot be removed from the enclosure. This will be indicated by the indicator aperture.



Anti tamper lock locked / Indicator aperture

LEDs

The HB and EB drive carriers have a green and an amber LED.



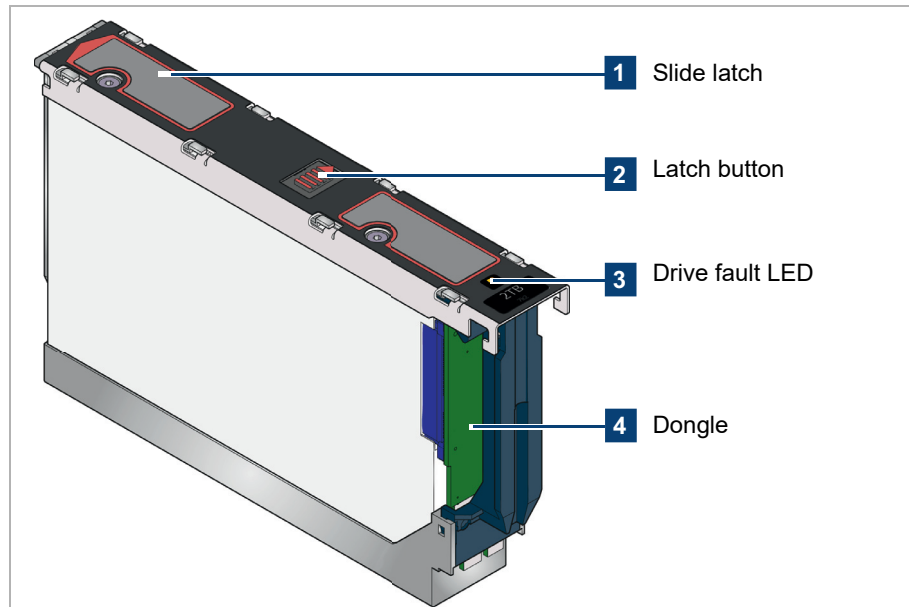
HB and EB drive carrier LEDs

Green	Amber	Associated operation panel	Status
Off	Off	None	No drive installed
On/ Flashing	Off	None	Drive installed and operational

Green	Amber	Associated operation panel	Status
On	Flash 1s on/1s off	None	SES device identify set
On	On	Logical fault (amber)	SES device fault bit set
Off	On	Module fault (amber)	Power control circuit failure
On	Flash 1s on/1s off	Logical fault (amber)	RAID event indication

Carriers (5U Enclosure)

In the 5U enclosures, each drive is housed in a carrier that enables secure insertion of the drive into the drawer.



Disk drive in carrier

The following hard disk drives are supported:

- 3.5" 7200rpm SAS drive

Contact your storage vendor for details of other hard disk drives that are available for use in the SpycerNode 5U storage system.

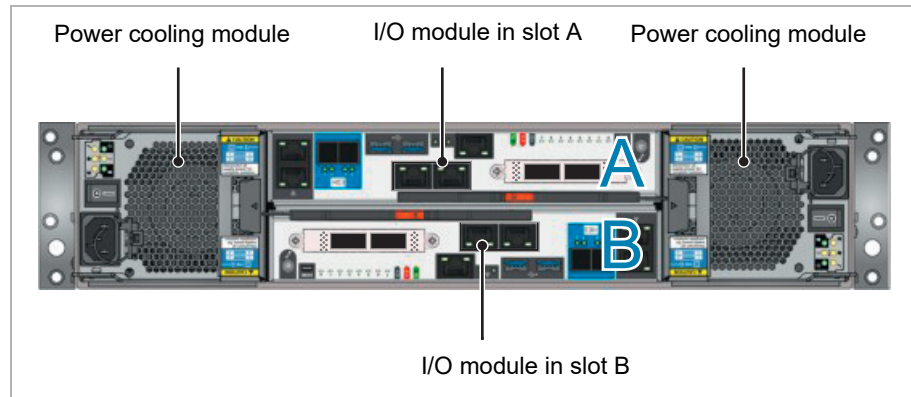
The following solid state drives are supported:

- 2.5" SAS solid state drive with 3.5" adapter

The drive carrier has a single amber LED which is lit when the drive has a fault.

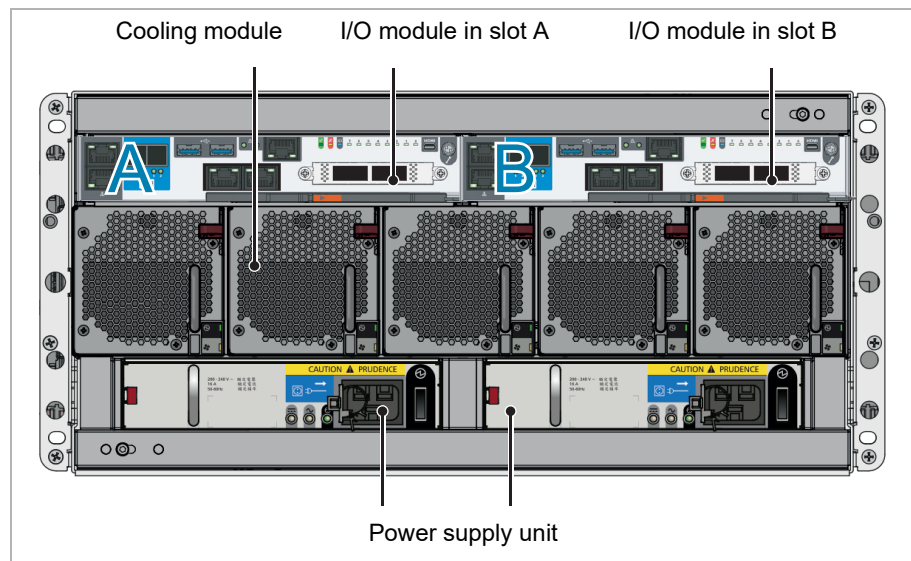
The Rear of the System

The rear of the chassis provides access to the I/O modules and the (power) cooling modules.



Back panel for 2U12 with 2x AP-LS I/O modules

I/O module (2x)	For more information see chapter “I/O Modules” on page 29.
Power cooling module (2x)	For more information see chapter “Power Cooling Module (2U Enclosures)” on page 33.



Back panel for 5U84

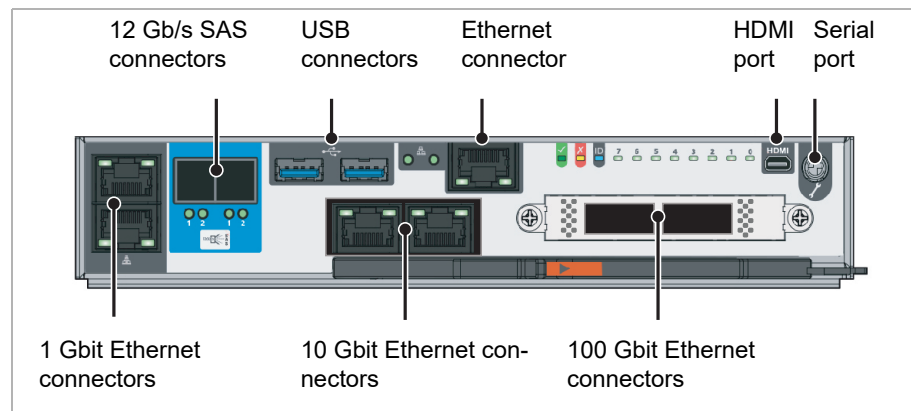
Cooling module (5x)	For more information see chapter “Fan Cooling Modules (5U Enclosure)” on page 34
I/O module (2x)	For more information see chapter “I/O Modules” on page 29.
Power supply unit (2x)	For more information see chapter “Power Supply Unit (5U Enclosure)” on page 36.

I/O Modules

A pair of I/O modules (of identical type) are provided in the enclosure so that the system can operate in HA (high available) mode. Incoming data is processed and eventually stored on the storage devices within the enclosure or on expansion enclosures.

Data Integrity is provided by protection of all data buses with at least parity protection, but more commonly error-correcting memory as provided on the main DRAM.

AP-LS I/O Module



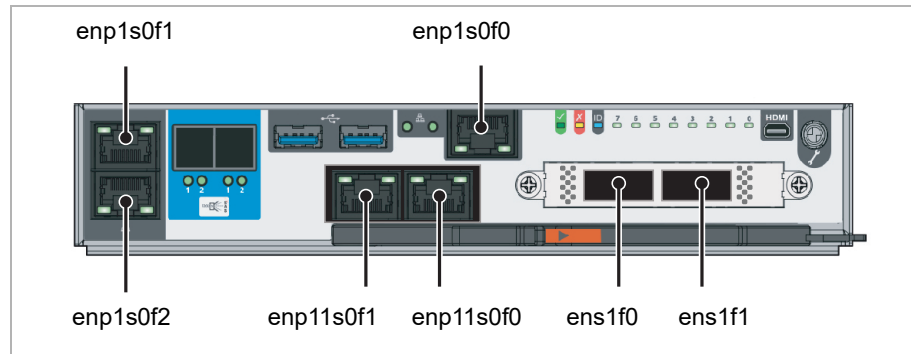
AP-LS1 I/O module (12Gb/s)

12 Gb/s SAS connectors	Connection for storage extension (e.g. JBODs)
USB connectors	For service purpose only.
Ethernet connector	For internal purpose only.
Micro HDMI port	For service purpose only.
Serial port	For service purpose only.
100 Gbit Ethernet connectors	High speed storage network connections. For details see chapter "Network Ports" on page 30.
10 Gbit Ethernet connectors	LAN connection. For details see chapter "Network Ports" on page 30.
1 Gbit Ethernet connectors	LAN connection. For details see chapter "Network Ports" on page 30.

For more information about the configuration see chapter "Initial Setup" on page 60.

The Rear of the System

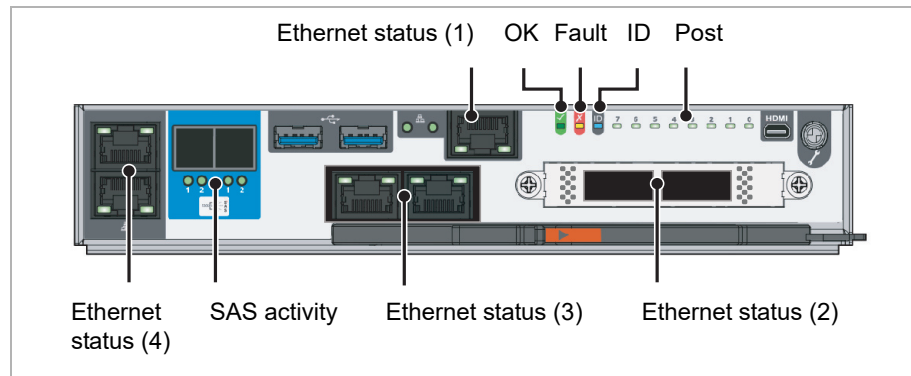
Network Ports



AP-LS1 I/O module (12Gb/s)

enp1s0f1	Recommended management port: IPMI configuration and monitoring Default configuration: DHCP
enp1s0f0	LAN connection (1 Gbit) For internal purpose only.
enp1s0f2	LAN connection (1 Gbit) Default configuration: Static IP (10.0.0.4)
enp11s0f0	LAN connection (10 Gbit)
enp11s0f1	LAN connection (10 Gbit)
ens1f0	High speed storage network connections (100 Gbit)
ens1f1	High speed storage network connections (100 Gbit)

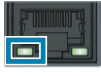
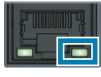
LEDs



LEDs for AP-LS1 I/O module

OK/ Fault / ID	For more information see the following table.
SAS activity	Steady green when there is a connection but no activity. Flashing green when there is a connection and activity.

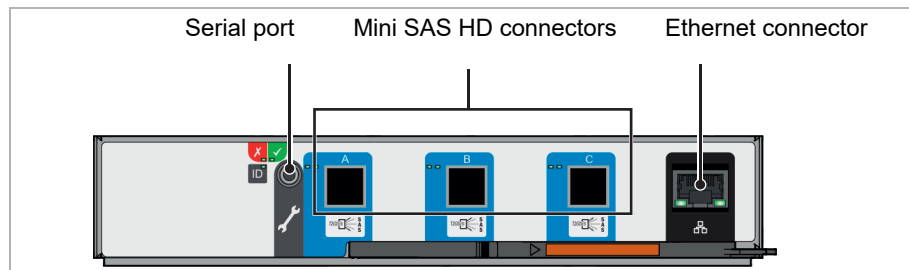
The Rear of the System

Post LEDs	Power On Self Test LEDs are used to show the boot progress of the x86 subsystem. If it fails to boot, the LEDs will show what stage of the process was being performed when the problem occurred.	
Ethernet status		(1), (2), (3) and (4): <ul style="list-style-type: none"> • Off: no connection • Steady green: network link is active • Flashing green: network activity
		Indicates the network speed. <p>(1):</p> <ul style="list-style-type: none"> • Off: no link • Amber: 10/100Mb/s • Green: 1Gb/s <p>(2):</p> <ul style="list-style-type: none"> • Off: no link • Green: 100 Gb/s <p>(3):</p> <ul style="list-style-type: none"> • Off: No link • Amber: 100 Mb/s • Green: 1 Gb/s or 10 Gb/s <p>(4):</p> <ul style="list-style-type: none"> • Off: No link • Amber: 100Mb/s • Green: 1Gb/s or 10Gb/s

I/O module OK (green)	I/O module fault (amber)	Ident (blue)	Status
On	Off	X	I/O module OK
On	On	X	I/O module fault
X	X	On	Application has set Identify LED on
Flashing	X	X	I/O module VPD error

X = Disregard

JBOD I/O Module

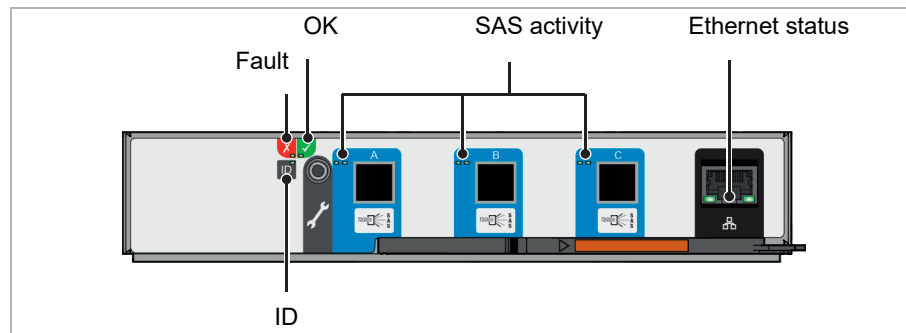


JBOD I/O module

The Rear of the System

Serial port	For internal purpose only.
Mini SAS HD connectors	Connection to main controller (AP-LS I/O Module)
Ethernet connector	For internal purpose only.

LEDs

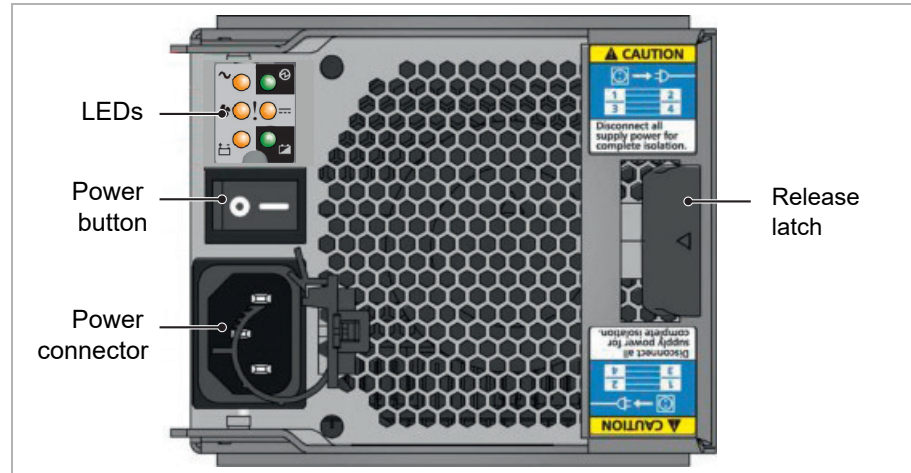


LEDs for JBOD I/O module

Fault	Amber when there is a fault in the controller.
OK	Green when the controller is operating correctly. Flashing green when there is a controller VPD error.
SAS activity	Steady green when there is a connection but no activity. Flashing green when there is a connection and activity.
Ethernet status	<p>(1), (2) and (3):</p> <ul style="list-style-type: none"> ● Off: no connection ● Steady green: network link is active ● Flashing green: network activity
	<p>Indicates the network speed.</p> <ul style="list-style-type: none"> ● Off: no link ● Amber: 10/100Mb/s ● Green: 1Gb/s
ID	Blue when the module is being identified.

Power Cooling Module (2U Enclosures)

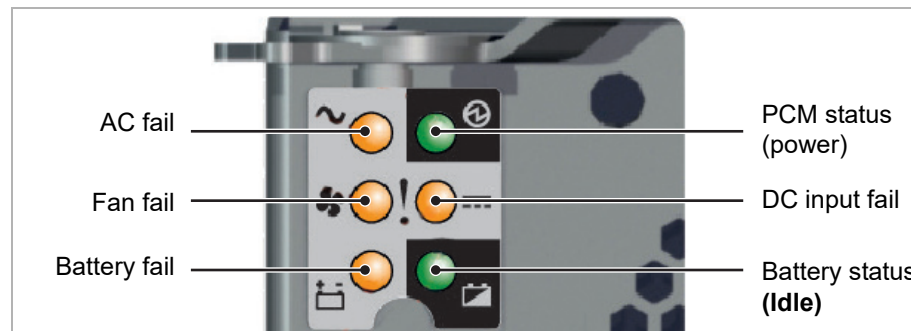
The 2U12 and 2U24 enclosures contain two power supplies which include integrated cooling modules for cooling the disk drives and the controllers.



Power cooling module for 2U12 and 2U24

LEDs	For more information see "LEDs" on page 33.
Release latch	Locks it in the power supply.
Power connector	Power is provided by two 764 W PSU's These require an input of 200 to 240 VAC at 50 to 60 Hz. The IEC C14 AC connector requires a C13 AC jack.
Power button	Turns the system on or off.

LEDs



LEDs power cooling module

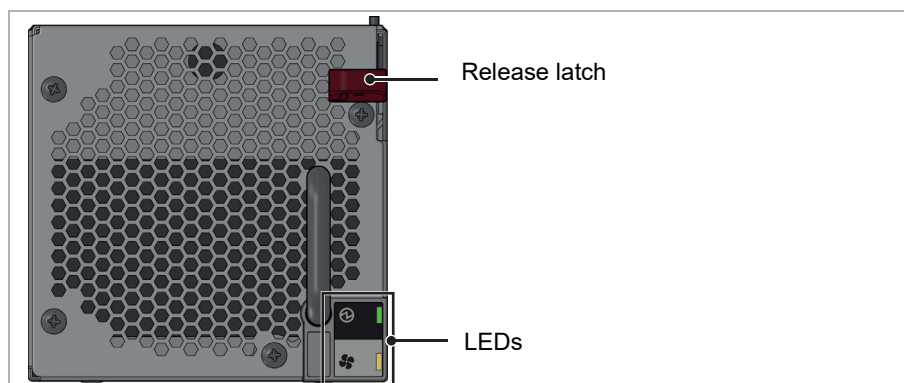
PCM OK (green)	Fan fail (amber)	AC fail (amber)	DC fail (amber)	Status
Off	Off	Off	Off	No AC power on any PCM
Off	Off	On	On	No AC power on this PCM only

The Rear of the System

PCM OK (green)	Fan fail (amber)	AC fail (amber)	DC fail (amber)	Status
On	Off	Off	Off	AC present; PCM OK
On	Off	Off	On	PCM fan speed is outside acceptable limits
Off	On	Off	Off	PCM fan has failed
Off	On	On	On	PCM fault (over temperature, over voltage, or over current)
Flashing	Off	Off	Off	Standby mode
Off	Flashing	Flashing	Flashing	PCM firmware download in progress

Fan Cooling Modules (5U Enclosure)

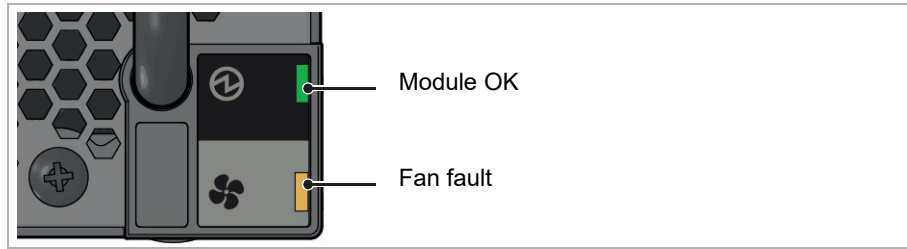
The 5U enclosure contains five fan modules for cooling the disk drives and the controllers.



Fan cooling module for 5U Enclosure

Release latch	Locks the fan cooling module.
LEDs	For more information see "LEDs" on page 35.

LEDs



LEDs fan cooling module

Module OK	Constant green indicates that the fan is working correctly.
Fan fault	Amber indicates that a fan has failed.

Module OK (green)	Fan fault (amber)	Status
On	X	Module good (battery and fan)
X	Off	Fan OK
X	On	Communication lost with fan module controller
X	On	Reported fan speed is out of tolerance

X = Disregard

Fan Behavior

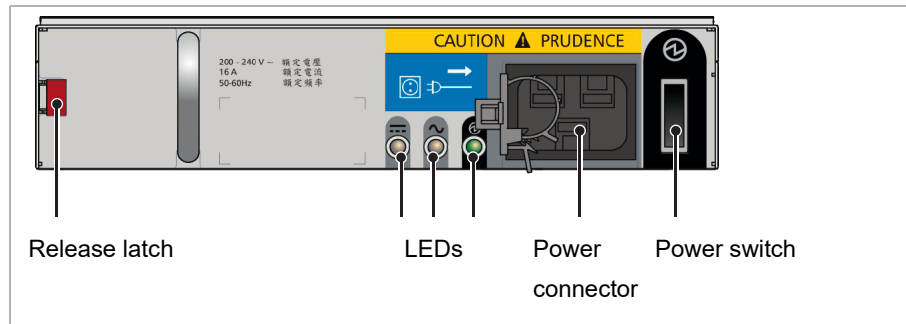
If a power supply unit/power cooling module or controller removed from the enclosure, the fans will increase speed to provide sufficient cooling. However, if the enclosure is powered on with only one power supply unit/power cooling module or controller, it is assumed that a blanking plate is in place for the missing units, and the fans will run at the normal speed.



The enclosure should never be run for more than a few seconds with any slot not occupied either by the appropriate component or a blanking plate. To do so disrupts the airflow and can result in over-heating.

The Rear of the System

Power Supply Unit (5U Enclosure)

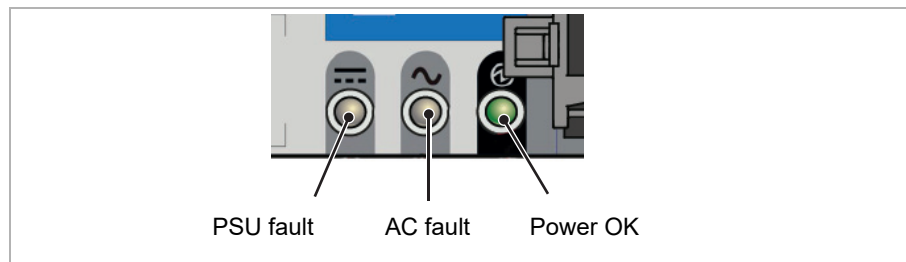


Release latch	Locks the power supply unit.
LEDs	For more information see chapter “LEDs” on page 36
Power connector	Power is provided by two 2200 W PSU's These require an input of 200 to 240 VAC at 50 to 60 Hz. The IEC C20 AC connector requires a C19 AC jack.
Power switch	Turns the unit on or off.

Dual PSUs provide redundant power for the system: if one PSU fails, the other will keep the system running while you replace the faulty module. The PSUs are hot-swappable. Replacement of a PSU can be performed while the enclosure is running, but the procedure must be completed within two minutes of the removal of the defective PSU. Ensure you have a replacement PSU before you remove the defective PSU.

The enclosure chassis is keyed to prevent PSUs from being inserted upside down.

LEDs



PSU fail (amber)	AC fail (amber)	Power OK (green)	Status
Off	Off	Off	No AC power to either PSU.
On	On	Off	PSU present but not supplying power.
Off	Off	On	Mains AC present, switch on. This PSU is providing power output.

The Rear of the System

PSU fail (amber)	AC fail (amber)	Power OK (green)	Status
Off	Off	Flashing	AC power present, PSU in standby mode (i.e. other PSU is providing power output).
Flashing	Flashing	Off	PSU firmware download.
On	On	Off	PSU Alert State (usually due to reaching critical temp).
Off	On	Off	Mains AC to this PSU has failed, PSU is not supplying power, other PSU is providing power.
On	On	On	GEM software lost communication with PSU.
On	X	Off	PSU has failed.

X = Disregard

The Rear of the System

Installation

This chapter is divided into the following sections:

- Unpacking the System (page 40)
- Mounting the System into a Rack (page 41)
- Installing the Drives (page 46)
- Connecting the Power Source (page 49)
- Connecting to Networks (page 52)
- Starting the System (page 53)
- Shutting down the System (page 54)

Unpacking the System

Perform the following steps:

1. Unpack the SpycerNode system and its accessories.

NOTICE**Warranty Claims**

To make warranty claims you have to keep the original packing and use it in case of a return transportation.

2. Check your delivery and compare it with the delivery note. In case of missing items, please contact your local vendor or Rohde & Schwarz immediately.
3. Place the system on a firm, flat surface within reach of a power outlet or mount it in a rack (see Mounting the System into a Rack). For proper air circulation and cooling make sure the ventilation holes on the rear of the system are not covered.

NOTICE**Environmental Conditions**

For error-free working and a long service life **SpycerNode** needs some basic environmental conditions:

- Do not expose the SpycerNode to sources of heat, such as direct sunlight or a radiator.
 - Do not cover or obstruct the ventilation holes of the system. When installing the system in a rack, take care that warmed up air is conducted to the rear of the rack and properly vented away.
 - Avoid areas with high humidity or dust. Best operating conditions are given in an air-conditioned site.
 - Do not expose the SpycerNode to strong electric or magnetic fields.
 - Avoid areas where the SpycerNode will be subject to vibrations or shocks.
-

Mounting the System into a Rack

Rack System Precautions

The following safety requirements must be considered when the unit is mounted in a rack.

- The rack construction must be capable of supporting the total weight of the installed enclosure(s) and the design should incorporate stabilizing features suitable to prevent the rack from tipping or being pushed over during installation or in normal use.
- The system must be operated with low pressure rear exhaust installation [back pressure created by rack doors and obstacles not to exceed 5 pascals (0.5mm water gauge)].
- The rack design should take into consideration the maximum operating ambient temperature for the unit, which is 35°C when fitted with AP-LS controllers, or 40°C when fitted with JBOD controllers.
- The rack should have a safe electrical distribution system. It must provide over-current protection for the unit and must not be overloaded by the total number of units installed in the rack. When addressing these concerns consideration should be given to the electrical power consumption rating shown on the nameplate.
- The electrical distribution system must provide a reliable earth for each unit in the rack.
- The design of the electrical distribution system must take into consideration the total earth leakage current from all the power supplies in all the units. The rack may require labelling with "HIGH LEAKAGE CURRENT. Earth connection essential before connecting supply".
- The rack when configured with the units must meet the safety requirements of UL 60950-1 and IEC 60950-1.

⚠ WARNING**Rack Toppling Over**

Racks may toppling over due to a massive over-weight in the upper part.

Do not slide more than one enclosure out of the rack at a time. When loading a rack with enclosures, fill from the bottom up; empty from the top down. Close all enclosures before loading.

Mounting the System into a Rack

 **CAUTION****Risk of injury.**

An unpopulated enclosure can weigh up to 50 kg and more.

Do not try to lift it by yourself. Never attempt to lift the enclosure when populated with drives. Till removing the device, from the rack beware that the enclosure is not permanently connected with the rack.

 **NOTICE****Electronic discharge**

Computer hardware contains components that are sensitive to electrostatic discharge. If you touch them without precautionary measures, they can be destroyed.

Ensure that you have fitted and checked a suitable anti-static wrist or ankle strap and observe all conventional ESD precautions when handling modules and components. Avoid contact with backplane component and module connectors, etc. ESD damage is not covered by warranty.



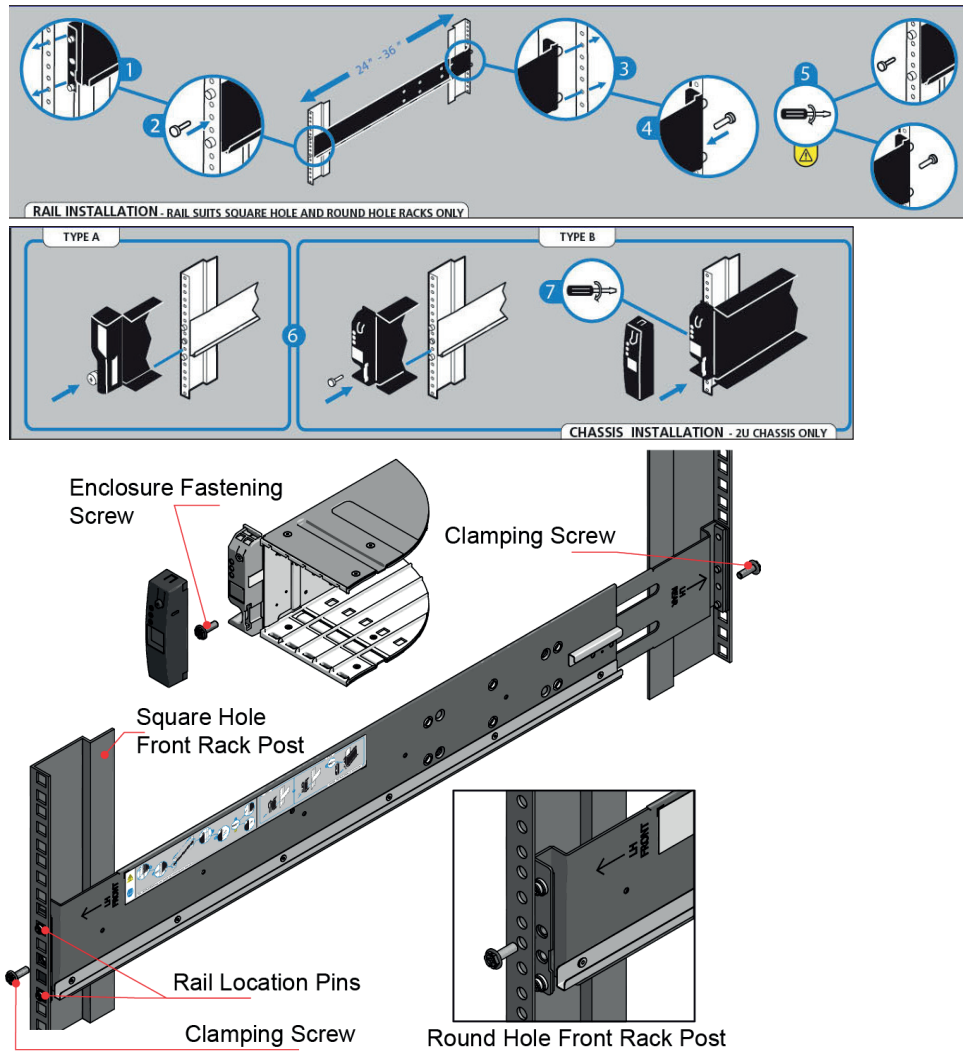
Rail Kit Adjustment Range: Suits a 1 metre deep rack within Rack Specification IEC 60297.

Inside of the front post to inside of the rear post: 713 mm - 884 mm

2U Enclosures

Perform the following steps:

1. Refer to the label on rail (left hand rail only shown for clarity).



2. To facilitate access, remove the door from the rack.
3. Lift the enclosure and position the rear on the rack guide rails.
4. Slide the enclosure fully into the rack, and secure with screws in the mounting flanges.

SpycerNode is fully mounted into the rack.

Mounting the System into a Rack

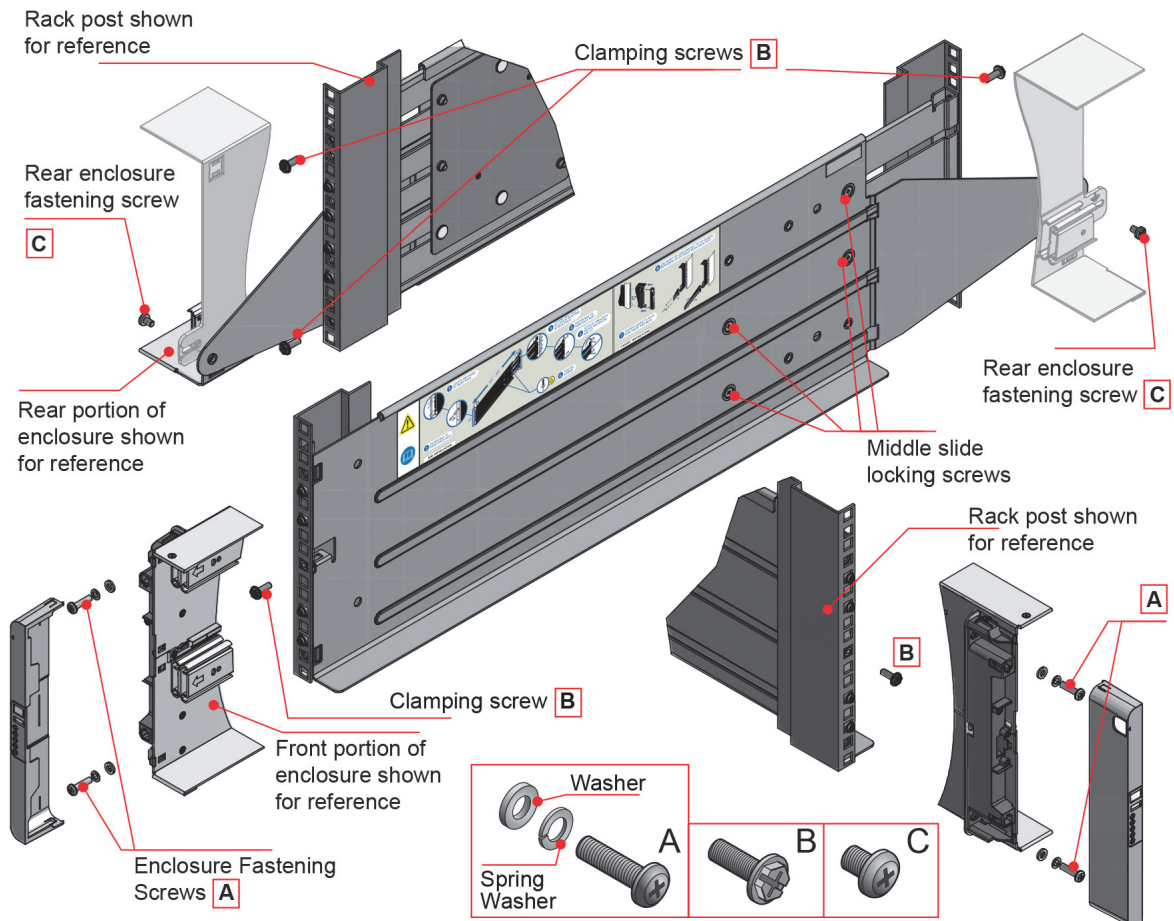
5U Enclosures

Perform the following steps:



A Torx T20 screwdriver is needed to lock and unlock the drawers.

1. To facilitate access, remove the door from the rack.
2. Ensure the pre-assembled rails are at their shortest length.
3. Locate the rail location pins inside the front of the rack and extend the length of the rail assembly to enable the rear location pins to locate. Ensure the pins are fully located in the square or round holes in the rack posts.



4. Fully tighten all clamping screws (left and right) and middle slide locking screws.
5. Ensure the rear spacer clips (x4) are fitted tight to the edge of the rack post.
6. Slide the enclosure fully home on its rails.

Mounting the System into a Rack

7. Fasten the front of the enclosure using the enclosure fastening screws (x4) as shown in the figure above.
8. Fix the rear of the enclosure to the hold down bracket with the rear enclosure fixing screws (x2).

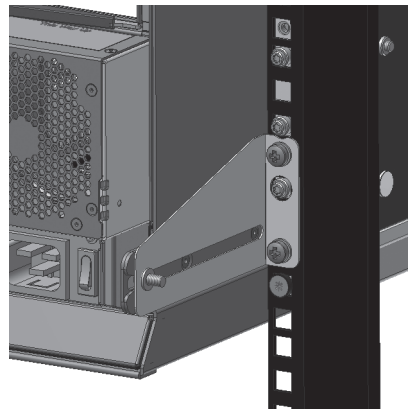


Use the long or short hold down bracket depending on the distance from the rack post to the enclosure hold down slot. Ensure the sliding nut is at the rear of the slot prior to fitting the bracket to the post, then slide the nut along the slot to enable the rear enclosure fastening screw to be fitted.



For rack depths where the rack posts are behind the enclosure hold down slots:

1. Swap the left and right hold down brackets.
2. Insert the long flange between the rack post and chassis side.



3. The sliding nut head must always face away from the enclosure, whichever configuration is used.

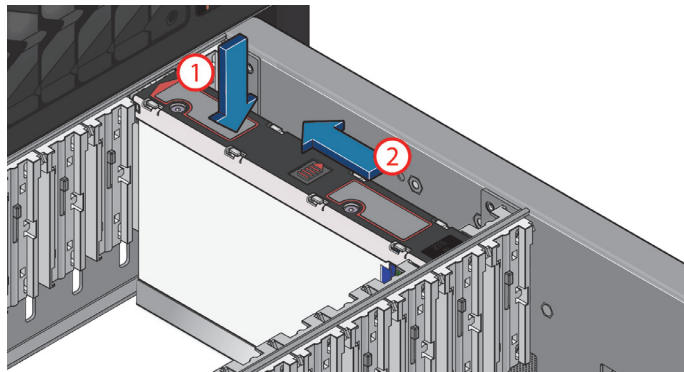
SpycerNode is fully mounted into the rack.

Installing the Drives

5U Enclosure

Perform the following steps:

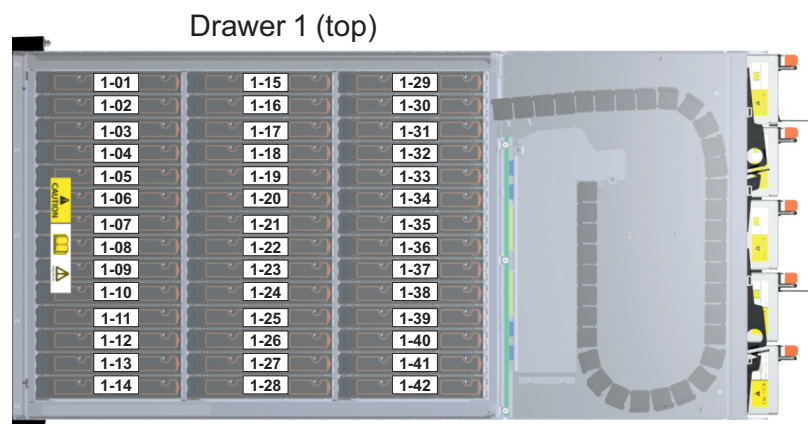
1. Make sure the anti-tamper lock is not engaged (see chapter “Anti-tamper Locks” on page 26).
2. Open the top drawer.
3. Insert the drives with the lock mechanism facing left.
Push the drive downwards and hold it down while sliding the drive carrier plate in the direction shown in the following figure. This locks the drive in place.



Full loaded Configuration

Perform the following steps:

1. Install 42 drives into slot 1-01 through 1-42. Make sure the drives are securely locked into place.



2. Optionally lock the drives with the Torx T20 bit.
3. Close and lock the drawer.

4. Open the bottom drawer.
5. Install the remaining 42 drives into slot 2-01 through 2-42. Make sure the drives are securely locked into place.

Drawer 2 (bottom)



6. Optionally lock the drives with the Torx T20 bit.
7. Close and lock the drawer.

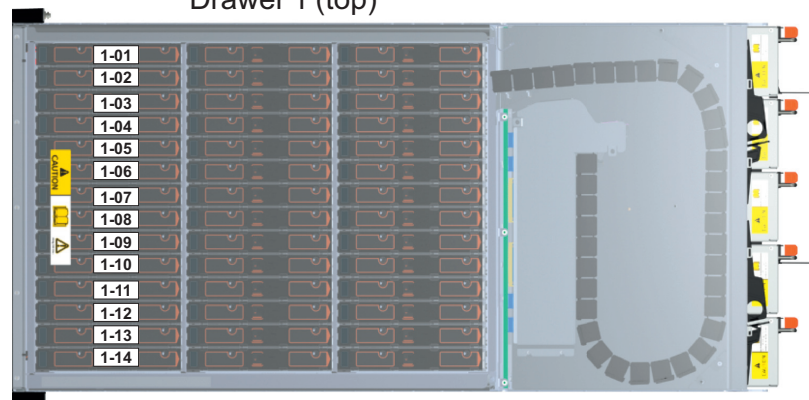
All drives for a full loaded configuration are fully installed in SpycerNode.

Half Loaded Configuration

Perform the following steps:

1. Install 14 drives into slot 1-01 through 1-14. Make sure the drives are securely locked into place.

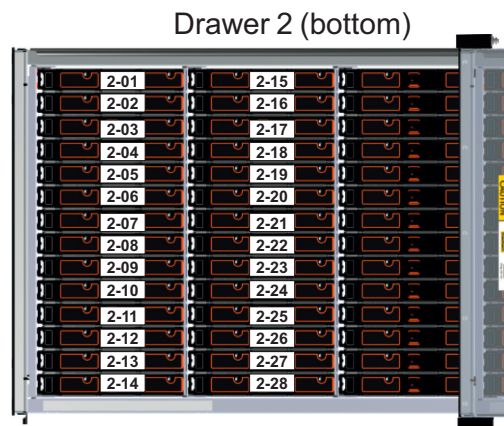
Drawer 1 (top)



2. Optionally lock the drives with the Torx T20 bit.
3. Close and lock the drawer.
4. Open the bottom drawer.

Installing the Drives

5. Install the remaining 28 drives into slot 2-01 through 2-28. Make sure the drives are securely locked into place.



6. Optionally lock the drives with the Torx T20 bit.
7. Close and lock the drawer.

All drives for a half loaded configuration are fully installed in SpycerNode.

2U Enclosures

Perform the following steps:

1. Make sure the anti-tamper lock is not engaged (see chapter “Anti-tamper Locks” on page 26).
2. For a 2U12 enclosure follow the instruction in chapter “Installing a 3.5-inch Drive Carrier” on page 108. For a 2U24 enclosure follow the instructions in chapter “Installing a 2.5-inch Drive Carrier” on page 112.

All drives are fully installed in SpycerNode.

Connecting the Power Source

NOTICE**Loss of Data/Corrupt Data**

In the event of a power failure the device will be abruptly switched off. This can result in corrupt data, loss of data and equipment damage.

Connect the system to an uninterruptible power supply redundantly on two phases.

NOTICE**Electrical Shock**

If any part of the device is damaged and the exterior of the system is still under power.

The enclosure must be grounded before applying power.

2U Enclosures

Perform the following steps:

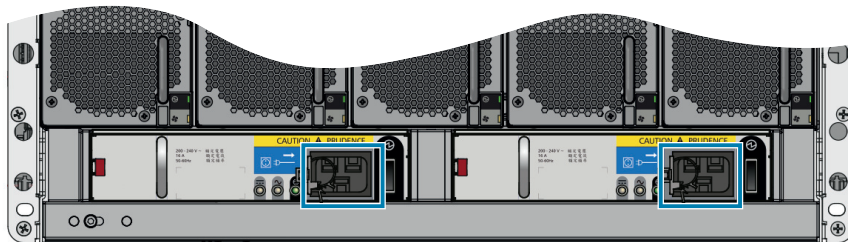
- Connect C13 AC plugs to both C14 AC connectors.



5U Enclosures

Perform the following steps:

- Connect C19 AC to both C20 AC connectors.



SpycerNode is ready for first use. The SpycerNode hardware is now properly installed.

Connecting the I/O Modules

2U Enclosures

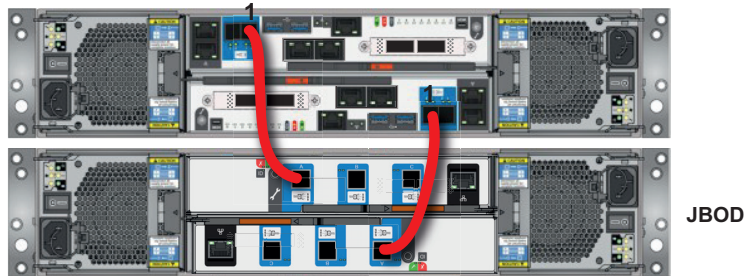
Perform the following steps:

1. Connect both AP-LS I/O modules with the control cable.

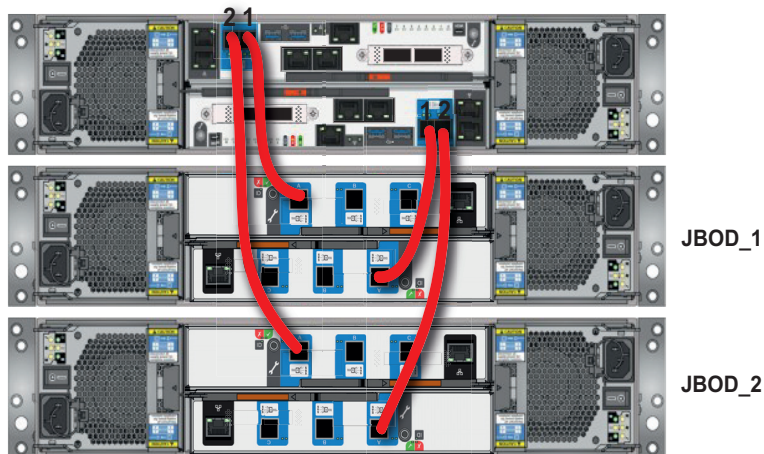


2. If a JBOD I/O module is part of your system structure (see also JBOD I/O Module (page 31)), connect the Mini SAS HD connectors from the AP-LS I/O module to the JBOD I/O modules as described below.

→ For systems with a single JBOD module:



→ For systems with two JBOD modules:

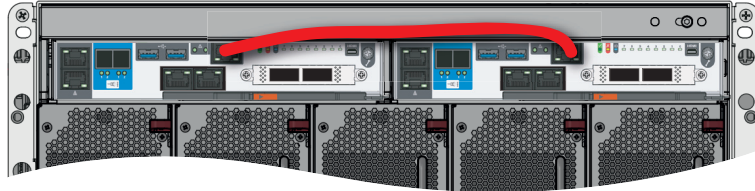


The SpycerNode modules are now properly installed.

5U Enclosures

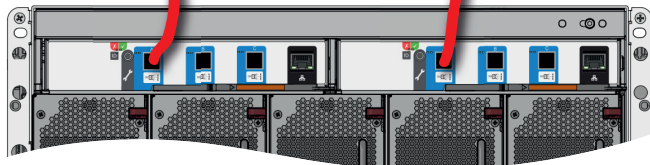
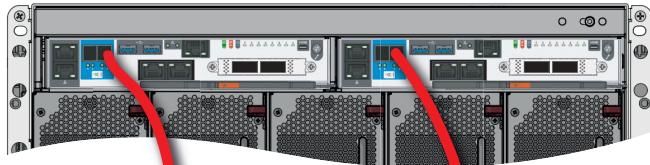
Perform the following steps:

1. Connect both AP-LS I/O modules with the control cable.



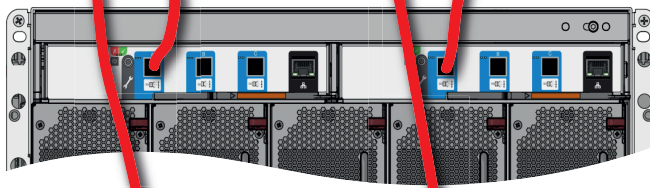
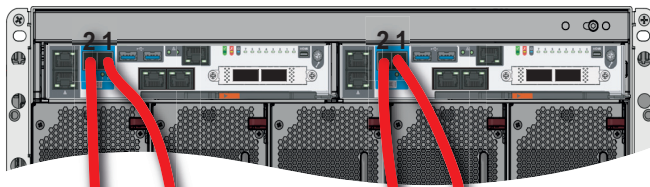
2. If a JBOD I/O module is part of your system structure (see also JBOD I/O Module (page 31)), connect the Mini SAS HD connectors from the AP-LS I/O module to the JBOD I/O modules as described below.

→ For systems with a single JBOD module:

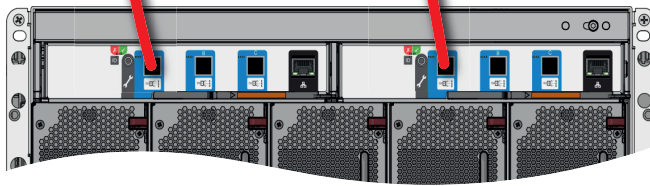


JBOD

→ For systems with two JBOD modules:



JBOD_1



JBOD_2

The SpycerNode modules are now properly installed.

Connecting to Networks

Perform the following steps:

1. Optionally connect your local network to the 1 Gbit and/or 10 Gbit Ethernet connectors (see chapter “AP-LS I/O Module” on page 29).
2. Connect your storage backbone switch to the 100 Gbit Ethernet connector with a 100 GbE QSFP cable.



Make sure that the network topology supports jumbo frames. For more information see chapter “R&S Network Switch Configuration” on page 56.



„Flow Control Mode” should be disabled in the network switch terminal.

SpycerNode is ready for first use. The SpycerNode hardware is now properly installed.

Starting the System

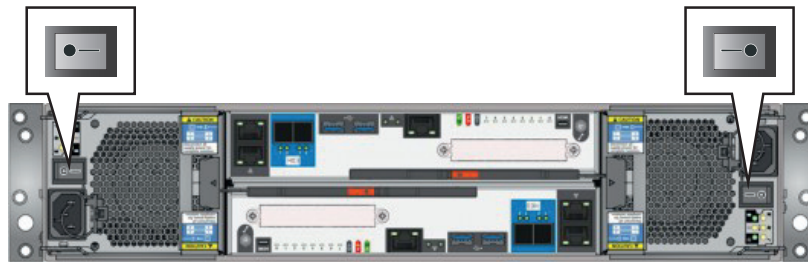
After a proper installation of the system you may start SpycerNode at any time.



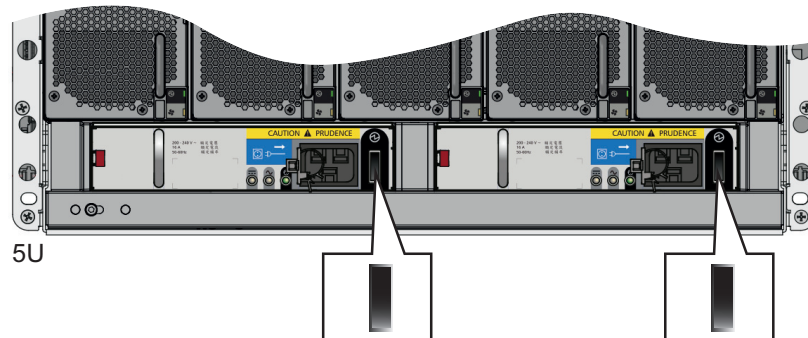
If a storage extension (e.g. 2U12JB) is connected to the system this extension must be turned on first.

Perform the following steps:

- Press the power switches briefly to turn on the system.



2U



5U

- ▶ The system will be started. It takes several minutes until the system is fully operational.

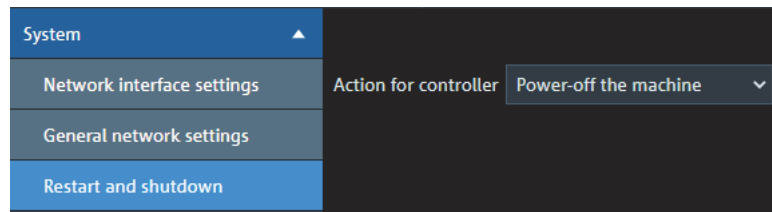
Continue with chapter “Initial Setup” on page 60.

Shutting down the System

Shutting down the System

Perform the following steps:

1. Open the R&S®Device Manager on your local system as described in "Using the R&S®Device Manger" on page 86.
2. Select „Restart and Shutdown“ in the „System“ menu.



3. Select the respective method and apply your setting.
The system is shut down.

Configuration

This chapter is divided into the following sections:

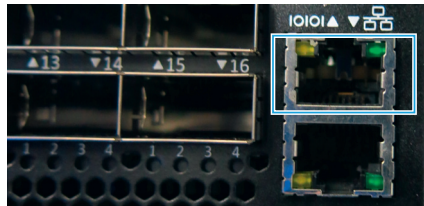
- R&S Network Switch Configuration (page 56)
- Setting the Unit Identification Number (page 59)
- Initial Setup (page 60)
- Installing the Spectrum Scale Client (page 74)

R&S Network Switch Configuration

The R&S network switch needs an initial configuration before it can be accessible for management. For best performance your network topology must support jumbo frames.

Perform the following steps:

1. Connect the power supply.
2. Connect the serial port of the host PC to the console port of the switch with the DB9 to RJ-45 cable. If your host PC does not have a native serial port you can use a USB-to-RS232-Adapter.



3. Open terminal program (recommended: **PUTTY**).
4. Configure a serial terminal program.

Parameter	Settings
Baud rate	115200
Data bits	8
Stop bits	1
Parity	None
Flow control	None

5. Log in:

OS	Username	Password
Onyx OS (MLNX-OS)	admin	admin

Configure a static IP for Management Interface

Perform the following steps:



You will only be required to perform the procedure below if your switch configuration has been initially set to DHCP. Also, if setting up the switch for the first time, a quick start wizard from the original manufacturer will be presented to set a static IP address.

1. Enter **enable**
 - ▶ The terminal changes to admin mode:
switch [master] #
2. Enter **configure terminal**
 - ▶ The terminal changes to config mode:
switch [master] (config) #
3. Use the following commands:
switch [master] (config) # no interface mgmt0 dhcp
switch [master] (config) # interface mgmt0 ip address <IP>
<NETMASK>

Configure MTU

Configure MTU (Jumbo Frames): The Value must be **9216**. These settings have to be done for each port.

Using the network switch terminal follow the instructions below.

Perform the following steps:

1. Enter **enable**
 - ▶ The terminal changes to admin mode:
switch [master] #
2. Enter **configure terminal**
 - ▶ The terminal changes to config mode:
switch [master] (config) #
3. Enter **interface [switch]/[port]-[switch]/[port] shutdown**
4. Enter **interface ethernet [switch]/[port]-[switch]/[port] mtu 9216** (e.g. **1/1-1/16 mtu 9216**)
5. Enter **no interface [switch]/[port]-[switch]/[port] shutdown**
6. Enter **configuration write** to save the configuration.
7. Enter **show interfaces** to check the configuration.

The network switch is now configured.

Optional

Configure port for splitter cable

Configure the port for splitter cable to connect 10Gbit clients to the switch.

Perform the following steps:

- Enter **interface ethernet 1/[port number you want to split] module-type qsfp-split-4**

R&S Network Switch Configuration

Display IP interfaces

Perform the following steps:

- Enter **show IP Interface** to connect via DHCP to display IP interfaces.

Display actual IP address of the management interface

Perform the following steps:

- Use the following commands:

```
switch [master] (config) # show interfaces mgmt0 brief
Interface mgmt0 status:
Comment:
Admin up:          yes
Link up:           yes
DHCP running:     no
IP address:        172.23.73.51
Netmask:           255.255.240.0
Secondary address: 172.23.73.100/20 (alias: 'mgmt0:0')
IPv6 enabled:     yes
Autoconf enabled: no
Autoconf route:   yes
Autoconf privacy: no
DHCPv6 running:  no
IPv6 addresses:   1
IPv6 address:     fe80::e61d:2dff:fe68:fd6e/64
Speed:            1000Mb/s
Duplex:           full
Interface type:   ethernet
Interface source: physical
MTU:              1500
HW address:       E4:1D:2D:68:FD:6E
```

Setting the Unit Identification Number

The unit identification number is not set before the first system power on. The display is set to "00" (flashing). The enclosure continues to power up even if the unit identification number is not set. How to set the unit identification number is described below. With a 5U enclosure use the ID switch and with a 2U enclosure use the mute button.

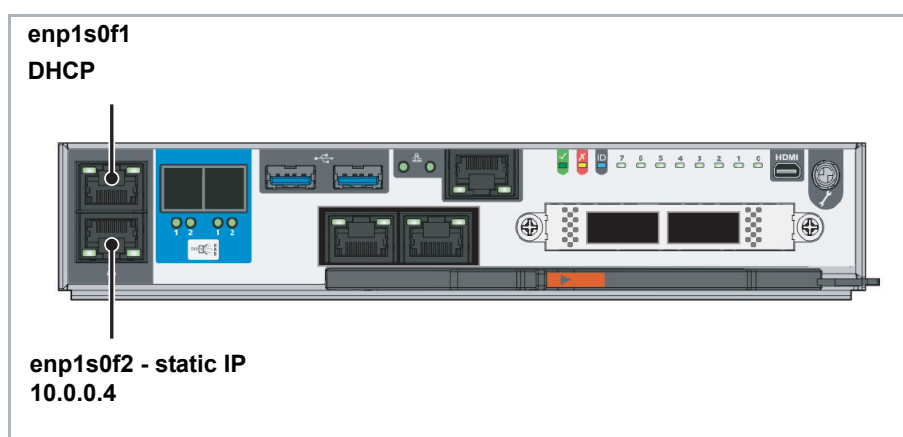
Perform the following steps:

1. Press and hold the ID switch/mute button on the operating panel for a period of five seconds. The left-hand digit flashes.
2. Press and release the ID switch/mute button to increment the number until the required digit is reached.
3. Press and hold the ID switch/mute button for a period of five seconds. The right-hand digit flashes.
4. Press and release the ID switch/mute button to increment the number until the required digit is reached.
5. Press and hold the ID switch/mute button for a period of five seconds to finish setting the number. Values of "01" to "99" are valid.

Initial Setup

For initial setup the device must be integrated into a network to establish access to the R&S® Device Manager. The Device Manager is the tool that allows you to configure and monitor all R&S devices connected within a local network.

The network connection can be done via either of the two 1Gbit network ports at the rear of the system. However, depending on which one you choose, different settings must be applied, since the first one is set to DHCP (Dynamic Host Configuration Protocol) and the second one to static IP (10.0.0.4).



The following topics are covered:

- Using Dynamic Host Configuration Protocol (DHCP) (page 60)
- Using Static IP (page 67)

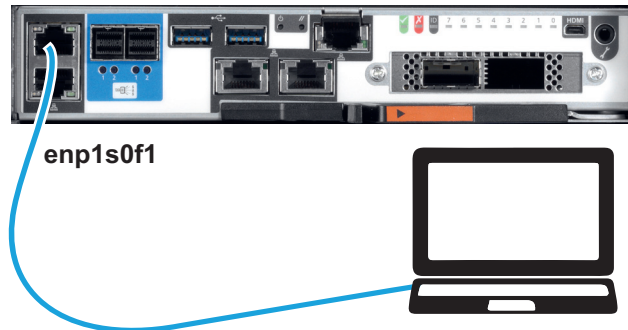
Using Dynamic Host Configuration Protocol (DHCP)



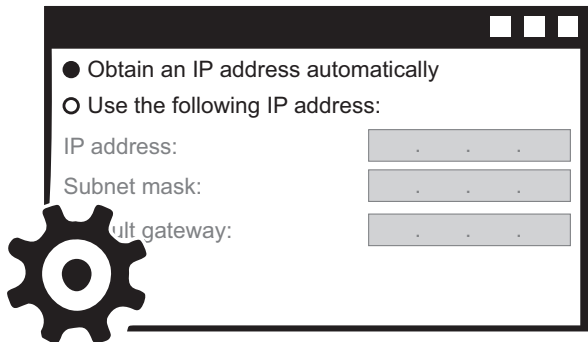
With a zeroconf capable PC/MAC it is possible to automatically detect network services. You can also use a zeroconf browser to view all zeroconf capable devices in your network. If your PC is not zeroconf capable use tools such as Bonjour.exe for the automatic detection of network services or connect your system using a static IP address ("Using Static IP" (page 67)).

Perform the following steps:

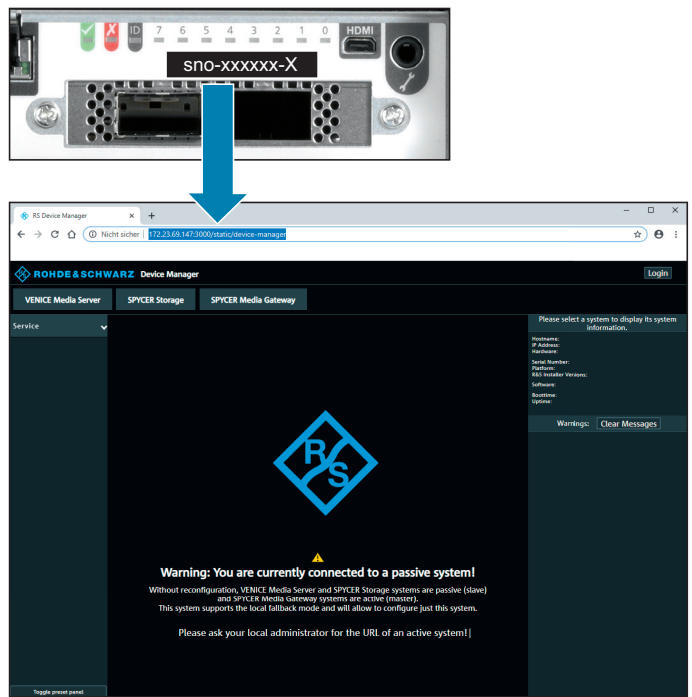
1. Connect port **ENP1S0F1** to a PC/Mac.



2. Select **Obtain an IP address automatically** on the PC/Mac.



3. Enter the host name of the controller (see controller label) in the Chrome web browser to open the R&S[®] Device Manager on your local system. (i.e. <http://sno-100768-a.local>)



Initial Setup

- The first time you log in, enter the following credentials:

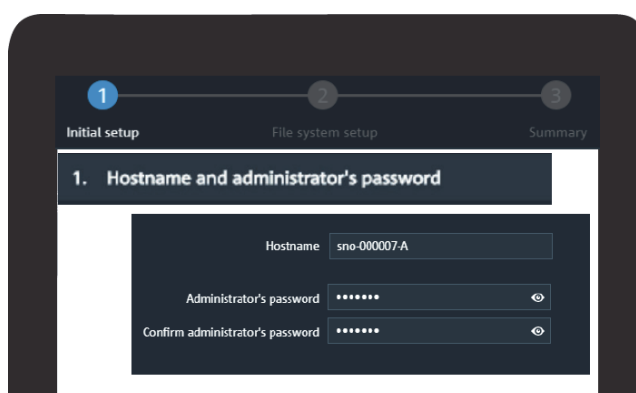
USERNAME: administrator

PASSWORD: [serial number of the device]



- ▶ The Easy Setup Wizard of the Device Manager initiates automatically right after the first login.

- Define hostname and password for the system:



The password must contain at least six characters.

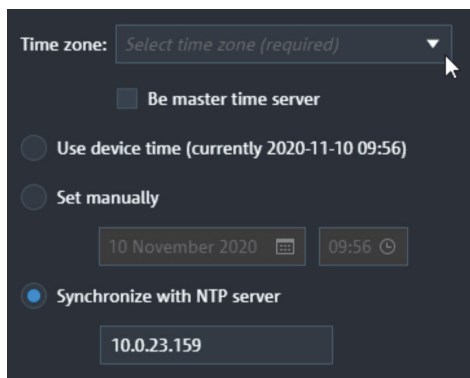


The password credentials defined in this step apply also to the other network services running on the system, such as Samba Share, or Spectrum Scale.



For R&S systems equipped with two controllers, each of the configuration settings have to be performed separately for each one of the controllers. The Wizard will guide you through that process and will label the current controller as active (Controller A/B).

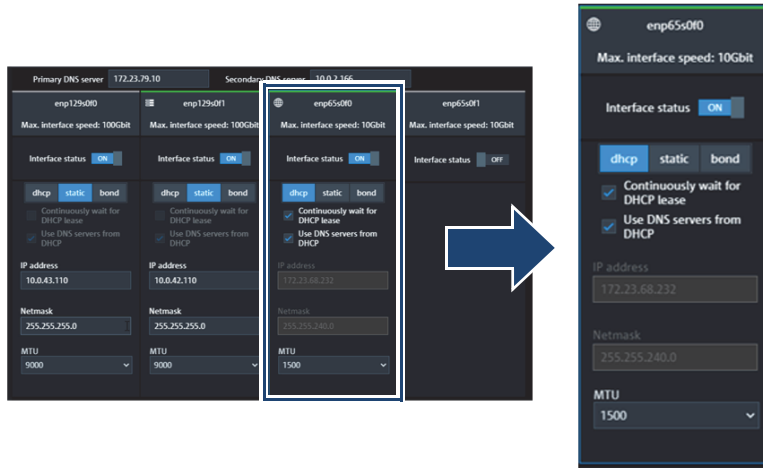
6. Specify date and time settings for the system.



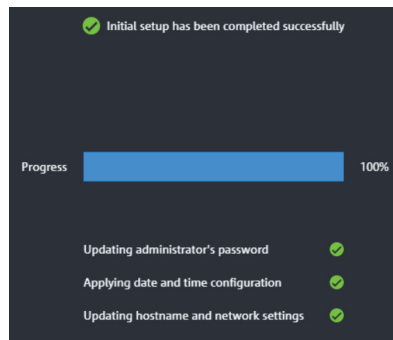
Time zone	Select your time zone from various predefined selection options.
Be master time server	Set the checkbox if you want to designate this particular system as the main NTP server within your local network.
Use device time	Read the current date and time of the device and set it as default.
Set manually	Manual entry of the date and time settings.
Synchronize with NTP server	Synchronize the date and time settings with a central NTP server from your local network.

Initial Setup

7. Select the **ENP1S0F1** network port section and make sure the **INTERFACE STATUS** is set to **ON** and **DHCP** mode is enabled. The **IP ADDRESS** and **NETMASK** are set automatically.

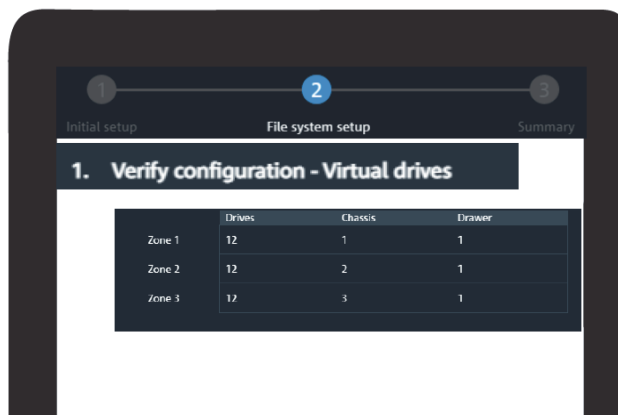


► With this step, the first part of the setup is completed:



Please note that Link Aggregation (bonding) of network ports is not possible in this initial stage. To perform the bonding, the Setup Wizard has to be completed first.

8. In the next installation phase, the file system configuration is carried out. First, the metadata drives and the installed storage capacity are displayed.



Zone 1	Shows the number of metadata drives, the drive type, the capacity, and RAID level.
Zone 2 / Zone 3	Shows the installed storage drives type, their capacity and the level of RAID protection. Each zone represents a single drive set which consists always of 30 drives. A system with half the capacity will have only one zone populated.



In this step you have the option to restart the entire setup procedure by clicking the “Restart wizard” button.

- In the next step you select the interface for you storage network connection.

Network interface (IP) 10.0.42.110 (100Gbit) ▼

File system name sno-vol0

Linux mount point /media/vol0

Windows drive letter S ▼

Network interface (IP)	Select the network interface for your file system. The connection is usually established via the 100Gbit interfaces.
File system name	Provide a name for your file system.
Linux mount point	Define the mount path for this file system at your connected Linux native clients.
Windows drive letter	Define the drive letter designation for this file system at your connected Windows native clients.

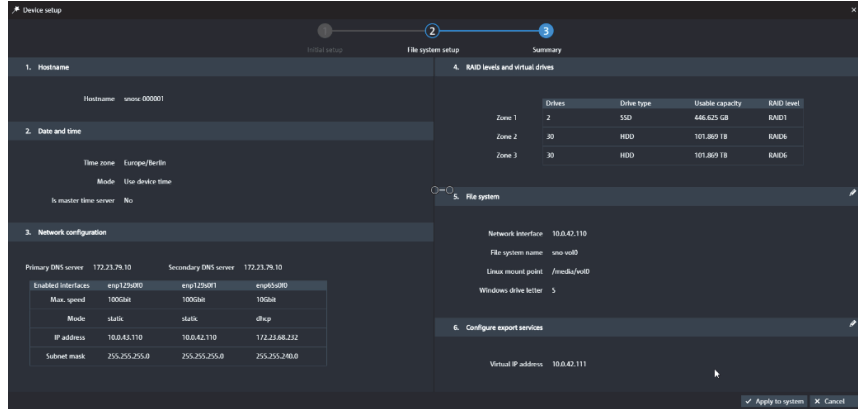
- Define a virtual IP address for the export services (e.g. via Samba). It is already preset to the same subnet domain, thus you have to provide only the last three digits. If required, you can also change the network interface for the export services.

Network interface Same interface as file system ▼

Virtual IP address 10.0.42. 126

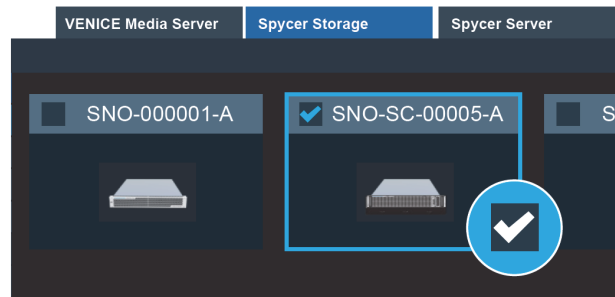
Initial Setup

11. A summary is presented in the last step with the option to make changes to the file system and virtual IP configuration settings. Press **Apply to system** to confirm the settings.

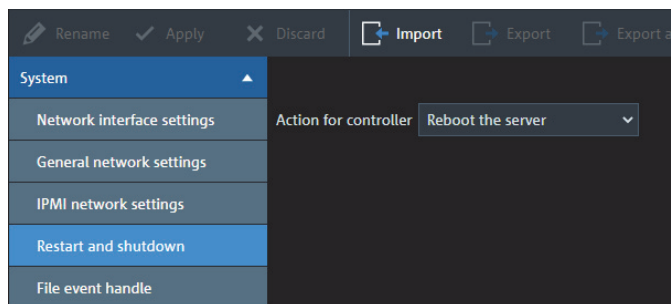


Completing the Easy Setup Wizard will provide the basic settings required to start operating your system. Further settings options are available through the R&S@Device Manager after the initial setup.

12. On the main page of the Device Manager select the corresponding system.



13. Navigate to **System > Restart and shutdown** and opt for the reboot option.

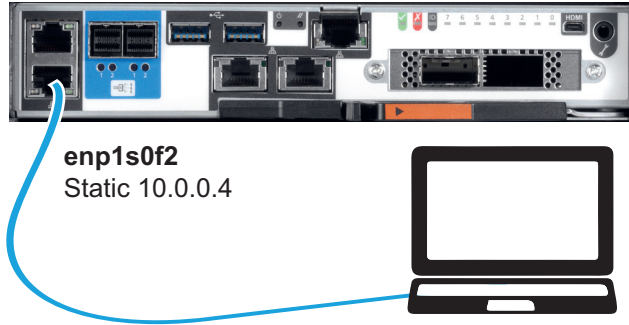


The SpycerNode hardware is now properly installed and ready for first use.

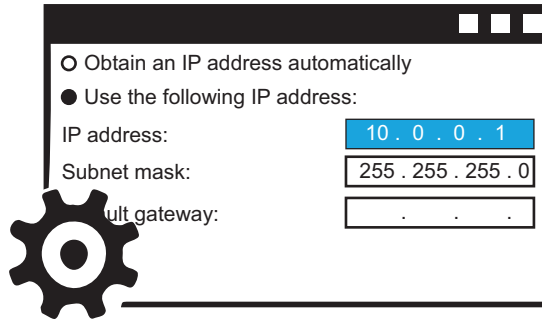
Using Static IP

Perform the following steps:

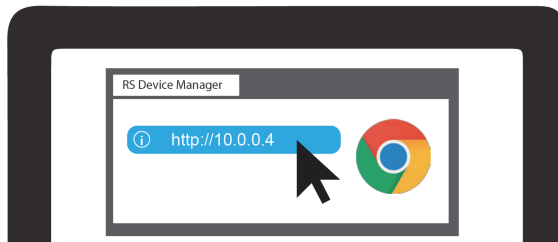
1. Connect port **ENP1S0F2** to a PC/Mac.



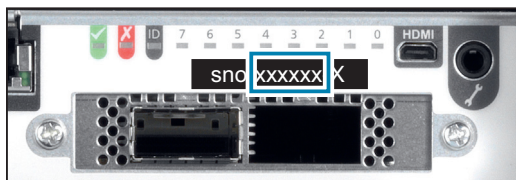
2. Change the IP for the connected network interface in the network settings of your PC/Mac to „10.0.0.1“.



3. Enter the static IP in the Chrome web browser to open the R&S®Device Manager on your local system. (i.e. <http://10.0.0.4>).

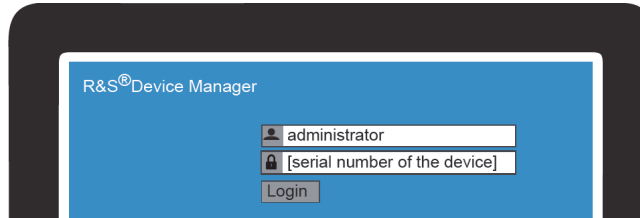


4. Locate the serial number of the device which is to be found at the rear of system.



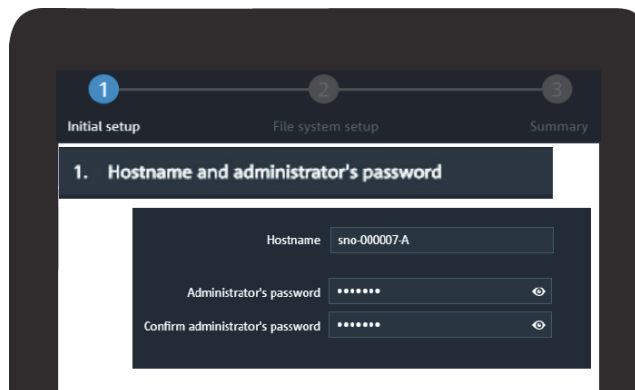
Initial Setup

- The first time you log in, enter the following credentials:
USERNAME: administrator
PASSWORD: [serial number of the device]



- ▶ The Easy Setup Wizard of the Device manager initiates automatically right after the first login.

- Define hostname and password for the system:



The password must contain at least six characters.

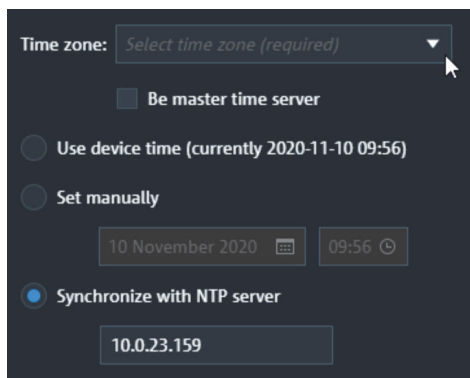


The password credentials defined in this step apply also to the other network services running on the system, such as Samba Share, Spectrum Scale or Broadcom UI.



For R&S systems equipped with two controllers, each of the configuration settings have to be performed separately for each one of the controllers. The Wizard will guide you through that process and will label the current controller as active (Controller A/B).

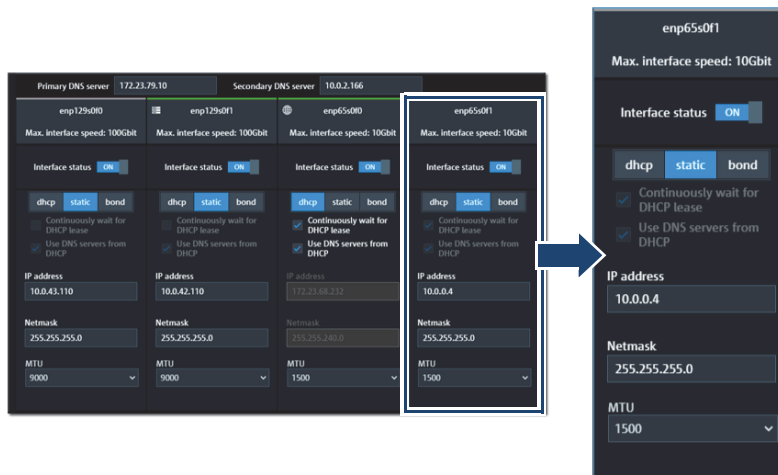
7. Specify date and time settings for the system.



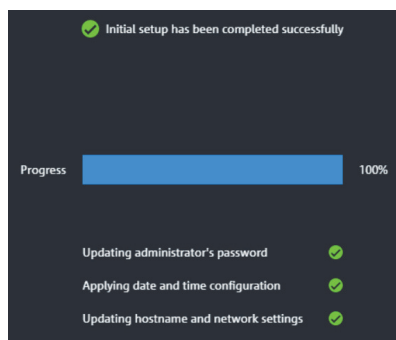
Time zone	Select your time zone from various predefined selection options.
Be master time server	Set the checkbox if you want to designate this particular system as the main NTP server within your local network.
Use device time	Read the current date and time of the device and set it as default.
Set manually	Manual entry of the date and time settings.
Synchronize with NTP server	Synchronize the date and time settings with a central NTP server from you local network.

Initial Setup

- The network settings are displayed in the **ENP1S0F2** network port section. The **IP ADDRESS** is set to **10.0.0.4** and the **NETMASK** to **255.255.255.0**. If you wish to use another static IP address you can enter it here into the IP address field.

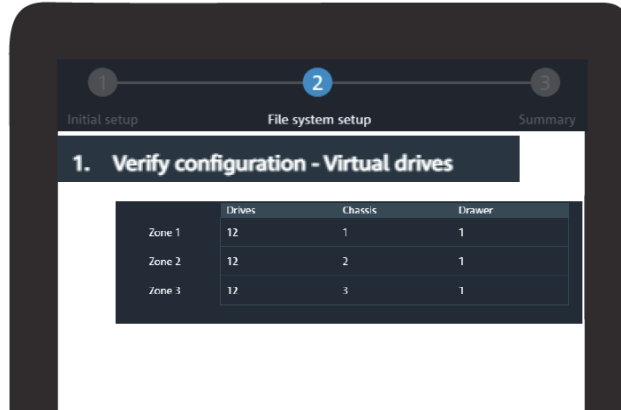


▶ With this step, the first part of the setup is completed:



Please note that Link Aggregation (bonding) of network ports is not possible in this initial stage. To perform the bonding, the Setup Wizard has to be completed first.

- In the next installation phase, the file system configuration is carried out. First, the metadata drives and the installed storage capacity are displayed.

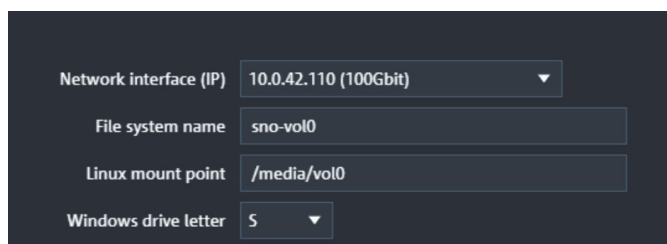


Zone 1	Shows the number of metadata drives, the drive type, the capacity and RAID level.
Zone 2 / Zone 3	Shows the installed storage drives type, their capacity and the level of RAID protection. Each zone represents a single drive set which consists always of 30 drives. A system with half the capacity will have only one zone populated.



In this step you have the option to restart the entire setup procedure by clicking the “Restart wizard” button.

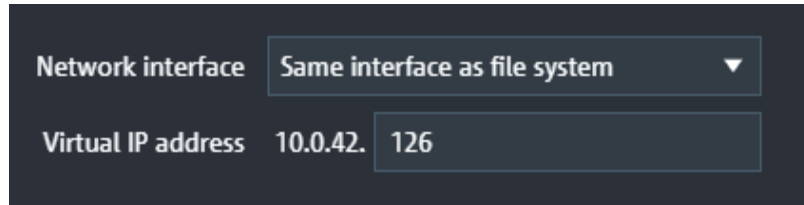
- In the next step you select the interface for your storage network connection.



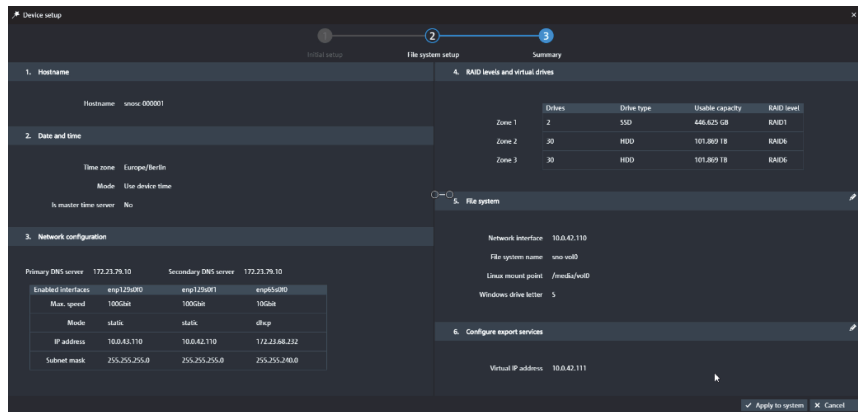
Network interface (IP)	Select the network interface for your file system. The connection is usually established via the 100Gbit (optionally 200Gbit) interfaces.
File system name	Provide a name for your file system.
Linux mount point	Define the mount path for this file system at your connected Linux native clients.
Windows drive letter	Define the drive letter designation for the your file system at your connected Windows native clients.

Initial Setup

- Define a virtual IP address for the export services (e.g. via Samba). It is already preset to the same subnet domain, thus you have to provide only the last three digits. If required, you can also change the network interface for the export services.



- A summary is presented in the last step with the option to make changes to the file system and virtual IP configuration settings. Press **Apply to system** to confirm the settings.

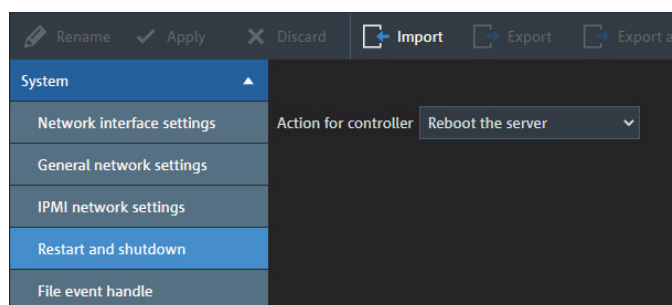


Completing the Easy Setup Wizard will provide the basic settings required to start operating your system. Further settings options are available through the R&S®Device Manager after the initial setup.

- On the main page of the Device Manager select the corresponding system.



14. Navigate to **System > Restart and shutdown** and opt for the reboot option.



The SpycerNode hardware is now properly installed and ready for first use.

Installing the Spectrum Scale Client

Installing the Spectrum Scale Client

This section describes the Spectrum Scale client installation on your system.

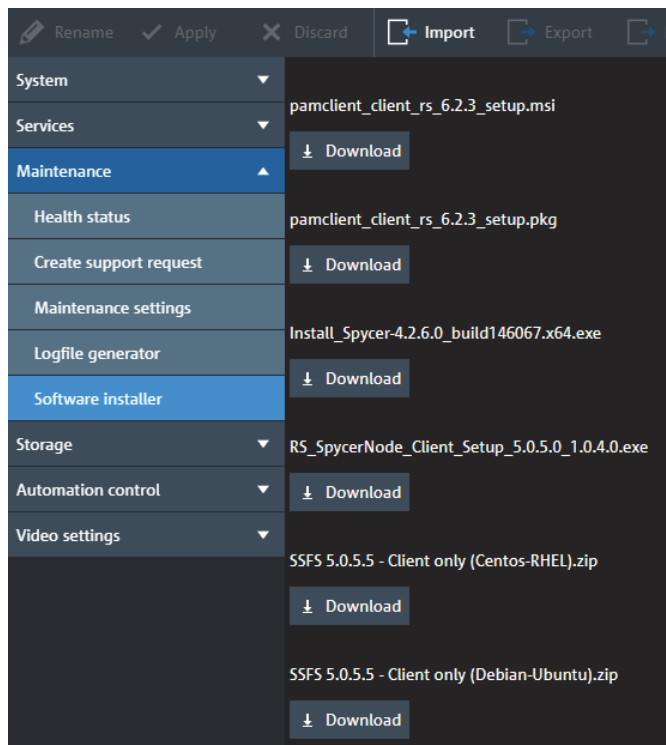
The following topics are covered:

- Installing under Linux (page 74)
- Installing under Windows (page 75)
- Adding a Native Spectrum Scale Client to an Existing Cluster (page 82)
- Removing a Native Spectrum Scale Client (page 83)

Installing under Linux

Perform the following steps:

1. In the R&S® Device Manager navigate to **Maintenance > Software installer**, and download the corresponding SSFS installer package.



2. Unpack the corresponding archives locally.

Installing the Spectrum Scale Client

3. Install the packages:

→ For CentOS-RHEL use the following command:

```
yum -y install gpfs.base*.rpm gpfs.docs*.rpm  
gpfs.gpl*.rpm gpfs.gskit*.rpm gpfs.msg.en_US*.rpm  
gpfs.license.std*.rpm
```

→ For Debian-Ubuntu use the following command:

```
dpkg -y install gpfs.base*.deb gpfs.docs*.deb  
gpfs.gpl*.deb gpfs.gskit*.deb gpfs.msg.en_US*.deb  
gpfs.license.std*.deb
```

4. Next, install the driver module for the current Kernel:

```
/usr/lpp/mmfs/bin/mmbuildgpl
```

Installing under Windows

Preparations

Perform the following steps:

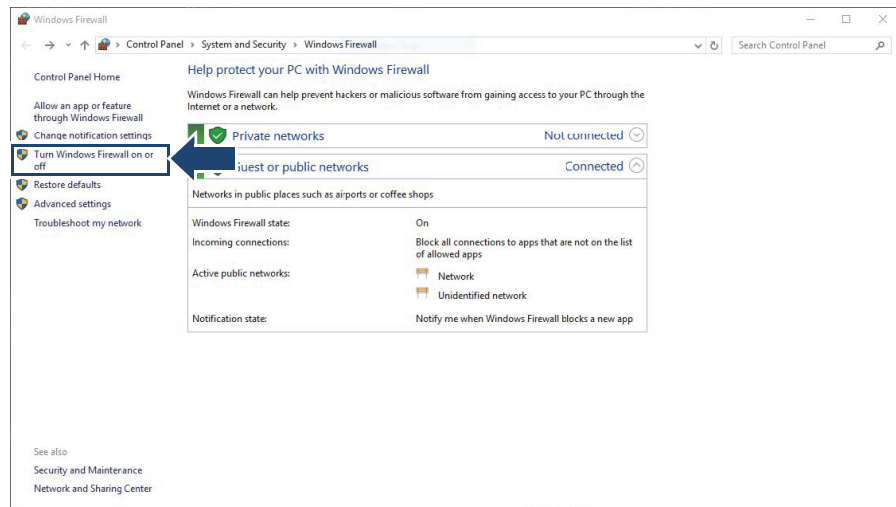


If you are unfamiliar with these settings, contact your system administrator.

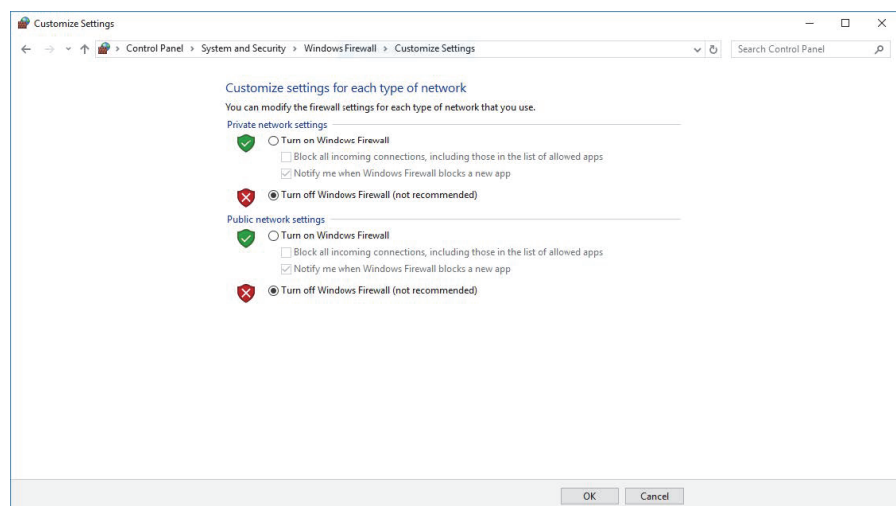
Note that creating a new user requires a current account with administrator rights.

Installing the Spectrum Scale Client

1. Open the Windows Control Panel to disable the Windows firewall.
2. Select "Turn Windows Firewall on or off".



3. Select "Turn off Windows Firewall" in both "Private network settings" and in "Public network settings".



4. Confirm your changes with "OK".
5. Disable SECURE BOOT in the mainboard BIOS.
6. Unzip the file `GPFS_Client.zip` to `C:\`

Installing the Mellanox Network Card

Perform the following steps:

1. Install the network card according to the Mellanox installation manual.
2. Change the directory to:

```
C:\GPFS_Client\Network\Mellanox\MCX556AECAT-DRV
```

3. In administration mode execute:

```
MLNX_WinOF2-2_0_50000_All_x64
```

4. Follow the instructions on screen.
5. Select "Complete Installation".



If a firmware update is necessary it is done automatically through the installation routine.

6. Change the directory to:

```
C:\GPFS_Client\Network\Mellanox\MCX556AECAT_FW_Tools
```

7. In administration mode execute:

```
WinMFT_x64_4_10_0_104
```

8. Follow the onscreen instruction of the installation routine.
9. Open a Windows command shell (cmd) in administrator mode.
10. Change the corresponding directory:

```
cd c:\Program Files\mellanox\winmft
```

Installing the Spectrum Scale Client

11. Change the port type to **Ethernet** by using the following command:
 → For a dual Mellanox network card:

```
mlxconfig -d /dev/mst/mt4119_pciconf0 set
LINK_TYPE_P1=2 LINK_TYPE_P2=2
```

- For a single port Mellanox network card:

```
mlxconfig -d /dev/mst/mt4119_pciconf0 set
LINK_TYPE_P1=2
```

12. Type in **y** to apply the Ethernet mode.

```
Device #1:
-----

Device type:   ConnectX5
PCI device:    /dev/mst/mt4119_pciconf0

Configurations:      Current New
...
                LINK_TYPE_P1  IB(1)  ETH(2)
                LINK_TYPE_P2  IB(1)  ETH(2)
...
Apply new Configuration? ? (y/n) [n] : y
Applying... Done!

-I- Please reboot machine to load new configurations.
```

Now you can proceed with the network settings.

Mellanox Network Card Configuration

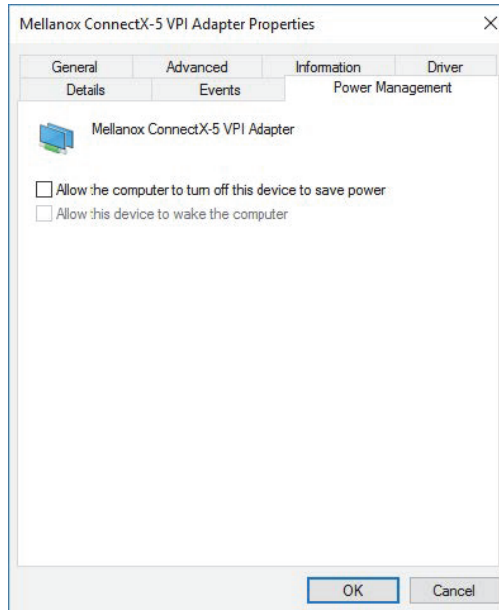


If you are unfamiliar with these settings, contact your system administrator.

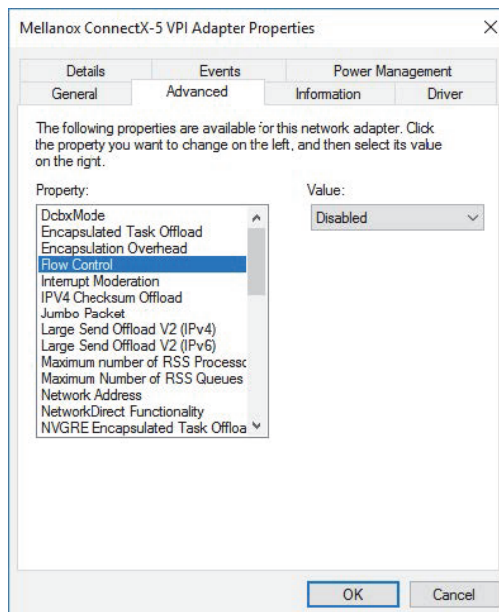
Perform the following steps:

1. Open the "Mellanox ConnectX-5 VPI Adapter Properties".
2. Disable "IPv6" in the Ethernet properties.
3. Set a static IPv4 network address that is in the address area of your GPFS cluster.

4. Disable "Power Management".

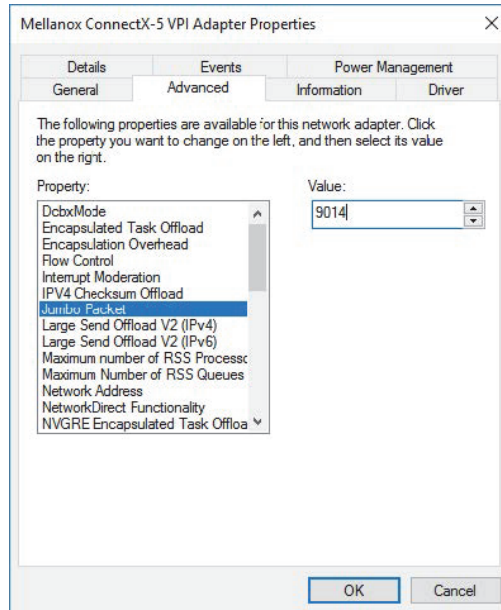


5. Disable "Flow Control".



Installing the Spectrum Scale Client

- Set the "Jumbo Packet" to 9014.

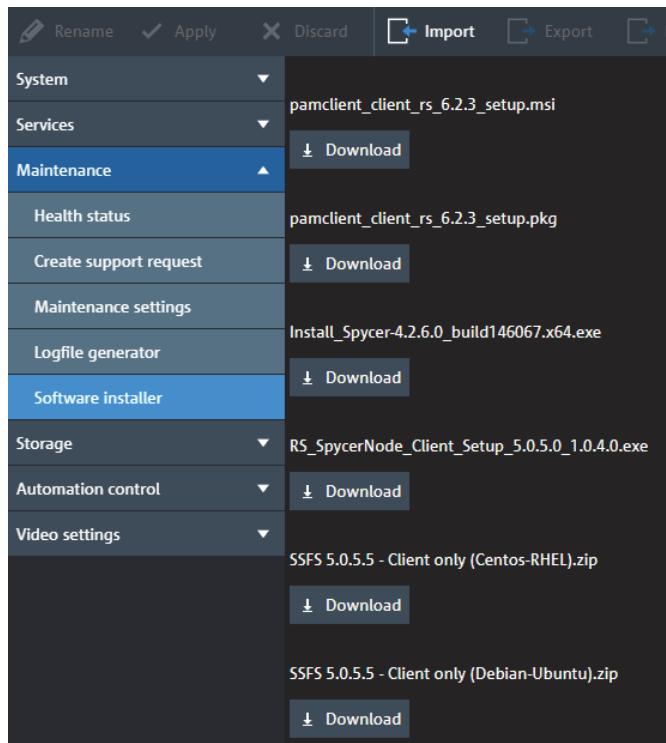


The configuration of the network card is complete.

Installing Spectrum Scale

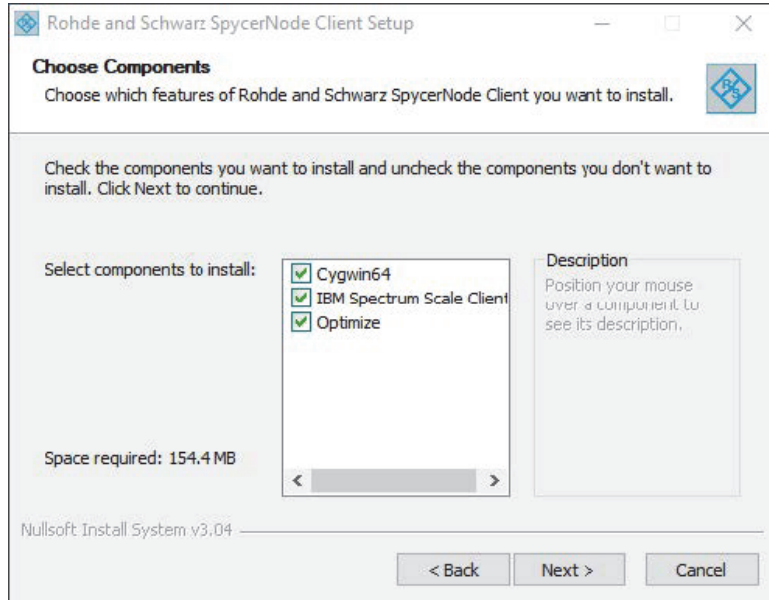
Perform the following steps:

- In the R&S® Device Manager navigate to **Maintenance > Software installer**, and download the corresponding SSFS installer package.

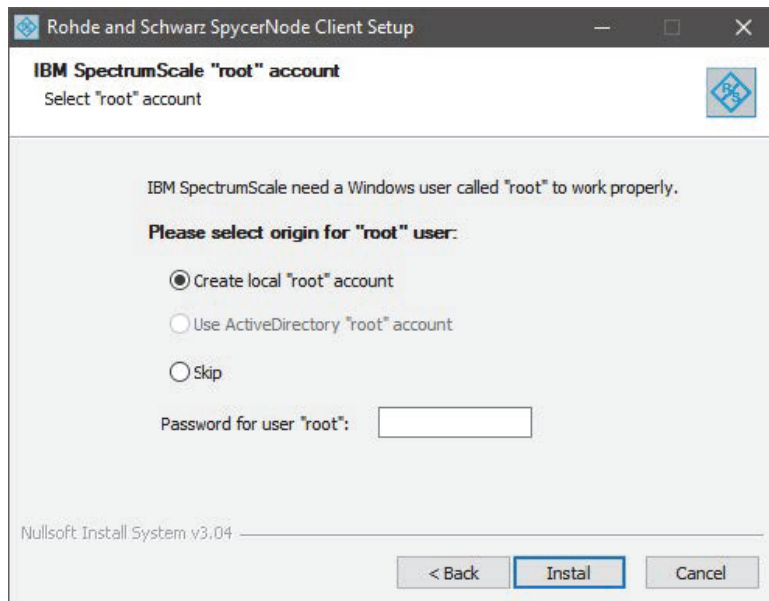


Installing the Spectrum Scale Client

2. Execute the client installer on your client device and accept the license agreement.
3. Select all components to install.



4. Create a local "root" account with password if this hasn't been done.



5. Confirm with "Install".
- The Spectrum Scale Client installation has been successfully completed.

Installing the Spectrum Scale Client

Adding a Native Spectrum Scale Client to an Existing Cluster

Perform the following steps:

1. Start Spectrum Scale on the client.
2. Copy the public SSH keys from all system controllers to the client:

```
#> ssh-copy-id -o StrictHostKeyChecking=no <client hostname>
```

3. Login to a SpycerNode controller that is already part of the existing cluster to add the client system to the cluster.

```
#> mmaddnode -N <client hostname>
#> mmchlicense client --accept -N <client hostname>
```

4. Change client specific Spectrum Scale settings.
5. Set the pagepool size.

```
#> mmchconfig pagepool=16G -N <client hostname> -i
```



The recommended pagepool size for clients is 16 GB. The minimum size for the pagepool is 2 GB.

Done.



If you need to change the drive letter of the file system on Windows clients do the following:

→ Unmount the file system from all nodes first.

```
#> mmumount -a
```

→ Change the drive letter (add ":" to the letter, e.g. "S:").

```
#> mmchfs sno-vol0 -t <drive letter>
```

→ Re-mount the file system on all nodes.

```
#> mmmount -a
```

Removing a Native Spectrum Scale Client

Perform the following steps:

1. Login to a R&S storage system that is part of the cluster.
2. Shutdown Spectrum Scale on the client node.

```
#> mmshutdown -N <client hostname>
```

3. Remove the client from the cluster.

```
#> mmdelnode -N <client hostname>
```

Done.

Installing the Spectrum Scale Client

Operation

This chapter includes the following section:

- Using the R&S@Device Manger (page 86)

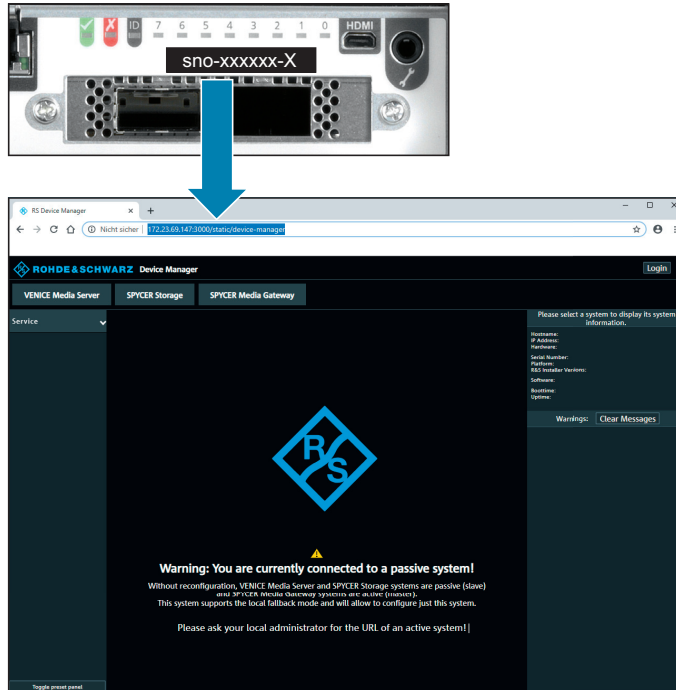
Using the R&S®Device Manger

Using the R&S®Device Manger

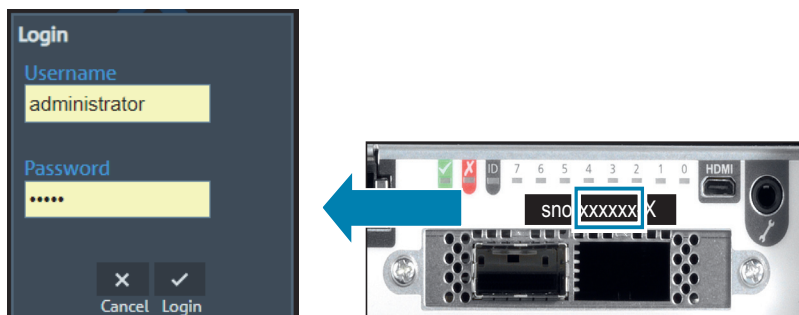
For installation and system monitoring purpose use the R&S®Device Manager, the convenient solution also developed by Rohde & Schwarz.

Perform the following steps:

1. Enter the host name of the controller (see controller label) in the Chrome web browser to open the R&S®Device Manager on your local system. (i.e. `http://sno-100768-a.local`)



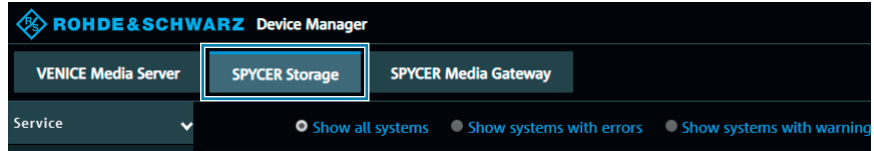
2. Select **Login** to get access to all configuration options.
 - ▶ The **LOGIN** window opens.
3. Enter username and password. The default passwords are provided below:
 - username:** „administrator“,
 - password:** „[serial number of your device]“ (see controller label)



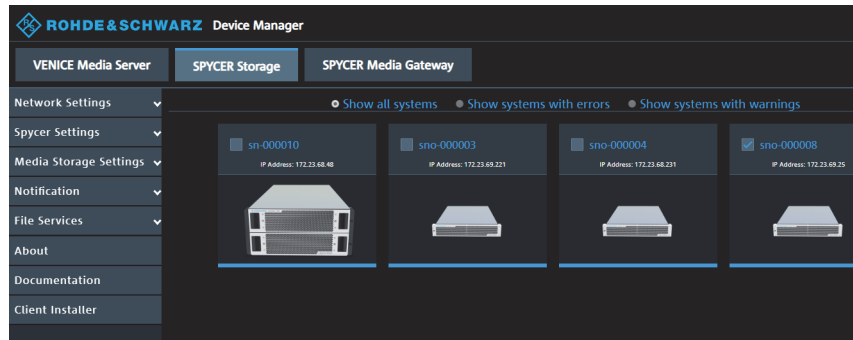


If you log in for the first time, the Easy Setup Wizard will start automatically, see Initial Setup (page 60). You will have the option to change the default password and create a new user.

4. Select the **SPYCER STORAGE** tab.



5. Select the corresponding controller (I/O module name).



After login the complete menu becomes visible.

Using the R&S@Device Manger

Administration

This chapter is divided into the following sections:

- System Update (page 90)
- System Monitoring (page 91)

System Update

Perform the following steps:

1. Download the last version of the installation package (zip-file) from:
<https://gloris.rohde-schwarz.com> on your host PC.



The installation of the packages can only be done on a Windows platform. The respective system has to be in the same network as SpycerNode.

2. Open the file manager (Windows Explorer).
3. Switch to the directory that contains the installation file.
4. Unzip the installation package.
5. Execute the installation file with a double-click of the mouse.
 - ▶ The installation routine starts and will guide you through the installation process.
6. Select the systems you want to update.
Identify the system with the serial number on the controller label or type plate.

R&S Software Distributor

Device List
Please select your target devices ...

Device	Serial No.	Version	Status
<input checked="" type="checkbox"/> SpycerNode 2u12	000016	75.2-4.75.0.13-gpfs5.0.2.1	remote connected
<input type="checkbox"/> SpycerNode 2u24	000013	75.2-4.75.0.12-gpfs5.0.2.1	remote connected
<input type="checkbox"/> SpycerNode 2u24	000001	75.1-4.75.0.20190831-gpfs5.0.2.1	remote connected
<input type="checkbox"/> SpycerNode 2u24	000003	75.2-4.75.0.20190903-gpfs5.0.2.1	remote connected
<input type="checkbox"/> SpycerNode 2u24	000001	75.2-4.75.0.13-gpfs5.0.2.1	remote connected
<input type="checkbox"/> SpycerNode 2u24	000003	75.2-4.75.0.20190903-gpfs5.0.2.1	remote connected
<input type="checkbox"/> SpycerNode 2u24	000001	75.2-4.75.0.12-gpfs5.0.2.1	remote connected
<input type="checkbox"/> SpycerNode 2u24	000013	75.2-4.75.0.12-gpfs5.0.2.1	remote connected
<input type="checkbox"/> SpycerNode 2u24	000001	75.1-4.75.0.20190831-gpfs5.0.2.1	remote connected



Note, that only one controller can be updated on one SpycerNode system. Various controllers can be updated only on different systems.

7. Follow the instructions given on the screen.
 - ▶ During the installation procedure all necessary files and libraries will be installed on the computer system. The installation will be finished as soon as a message reports this.
8. Restart the server.

After the cold start the system update will be complete and it can be started at any time.

System Monitoring

You can monitor single parts of your system using SNMP data points, or you can use the R&S® Device Manager that allows you to query the state of the SpycerNode and single parts of the hardware. You will be able to define critical values and configure an e-mail notification as well. Remote management (IPMI) is also possible via the R&S® Device Manager.



The use of notifications through the hardware manufacturers BMC system (Ami MegaRAC/Dell iDrac) is not recommended nor supported by Rohde & Schwarz.

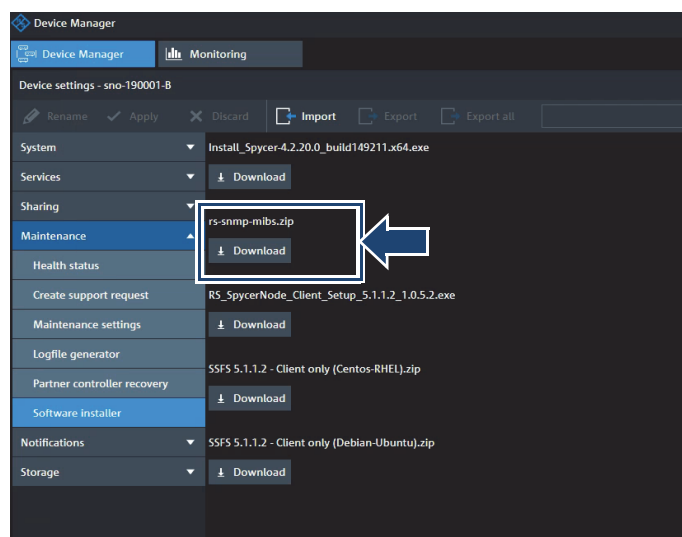
There are various methods to monitor the system:

- Monitoring through SNMP (page 91)
- Monitoring through the Device Manager (page 92)
- Monitoring Disk Arrays (page 94)

Monitoring through SNMP

The Simple Network Management Protocol (SNMP) is a standard Internet protocol for the device management in IP networks. SNMP allows you to e.g. monitor and query the state of several SpycerNode devices in a network or single parts of the hardware.

SpycerNode provides a **RS-SPYCERNODE-V1-MIB** that gives you the opportunity to query the state of the system or parts of it, using SNMP. To access the MIB file via the Device Manager navigate to "Maintenance" > "Software installer" and download the "rs-snmplib.zip" package.



Explanation of the OIDs;

When using a monitoring software, you will have to enter all OIDs once to be able to monitor the hardware's state continuously.

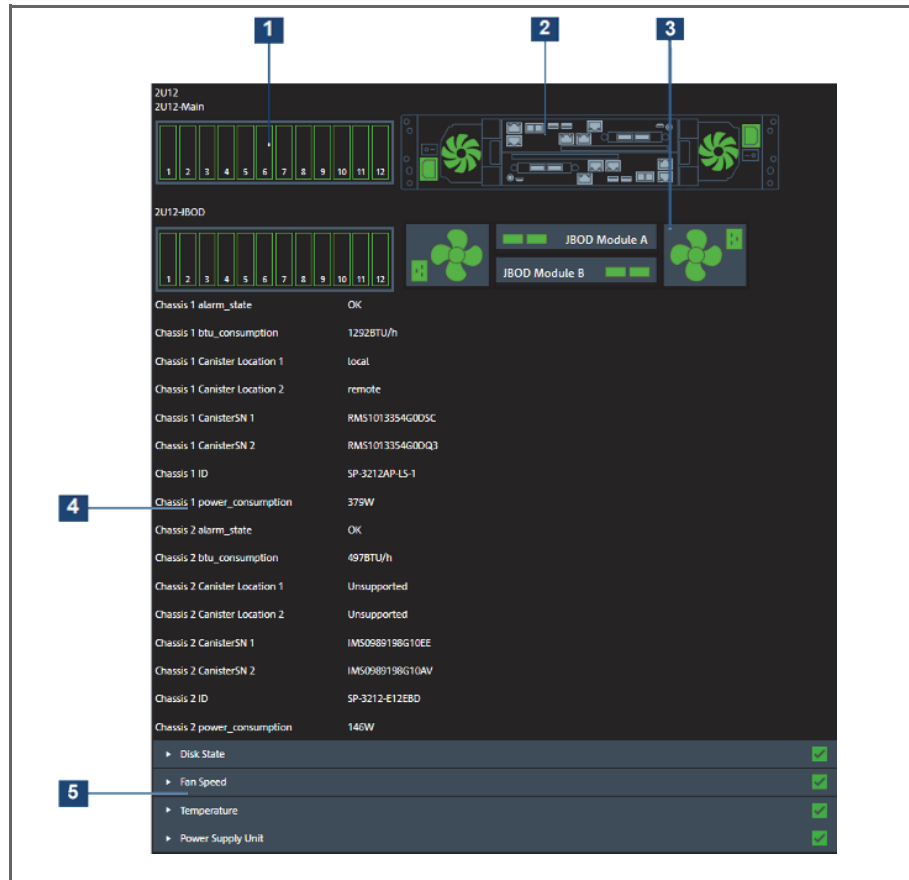
System Monitoring

File	OIDs	Object	Value
RS-SPYCER-NODE-V1-MIB	.1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.12.1.0	Chassis Fan 1	RPM (Rounds per minute)
	.1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.12.2.0	Chassis Fan 2	
	.1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.12.3.0	Chassis Fan 3	
	[...]	[...]	
	.1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.13.1.0	Chassis Temp 1	Temperature in °C
	.1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.13.2.0	Chassis Temp 2	
	.1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.13.3.0	Chassis Temp 3	
	[...]	[...]	
	.1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.14.1.4.0	Status System disk 1	"OK"/"Critical"/"Not installed"
	.1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.14.2.4.0	Status System disk 2	
	.1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.14.3.4.0	Status System disk 3	
	[...]	[...]	
	.1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.10.1.3.0	Status PSU 1	"OK"/"Critical"
	.1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.10.1.3.0	Status PSU 2	

Monitoring through the Device Manager

The Device Manager monitors critical system components in realtime and displays the gathered information.

The Health Panel for the SpycerNode provides both visual and statistics details about the status of the system components. The panel can be accessed by selecting the corresponding system and navigating to "Maintenance > Health status".



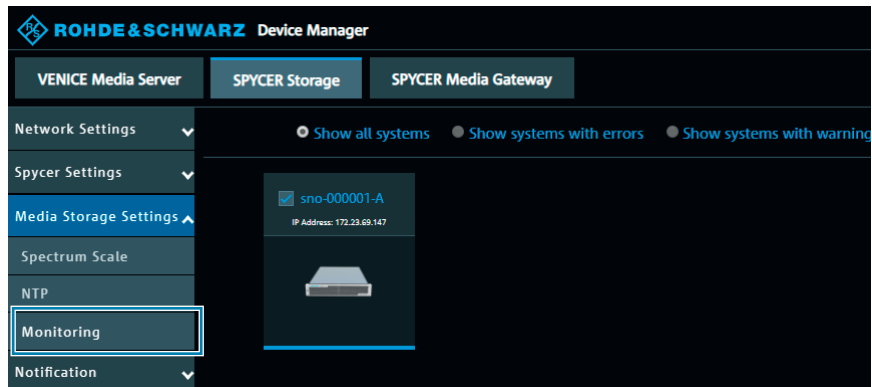
Health status panel

1	Disk Array Status	<p>Displays graphically the state of each disk drive within the array.</p> <p>Green indicates normal operation, red indicates malfunction or total failure.</p>
2	Rear Panel Status	<p>Displays the state of the cooling fans and the power supply units on the rear of the main panel.</p> <p>Green indicates normal operation, red indicates malfunction or total failure.</p>
3	JBOD Status	<p>Displays graphically the state of the JBOD module (cooling fans, and the Ethernet connectors)</p> <p>Green indicates normal operation, red indicates malfunction or total failure.</p>
4	Main Components Status	<p>Displays general information on the main components of the system.</p>
5	Group Components Status	<p>Each component category is separated in a dropdown menu and can be extended to view the details on any single component.</p>

Monitoring Disk Arrays

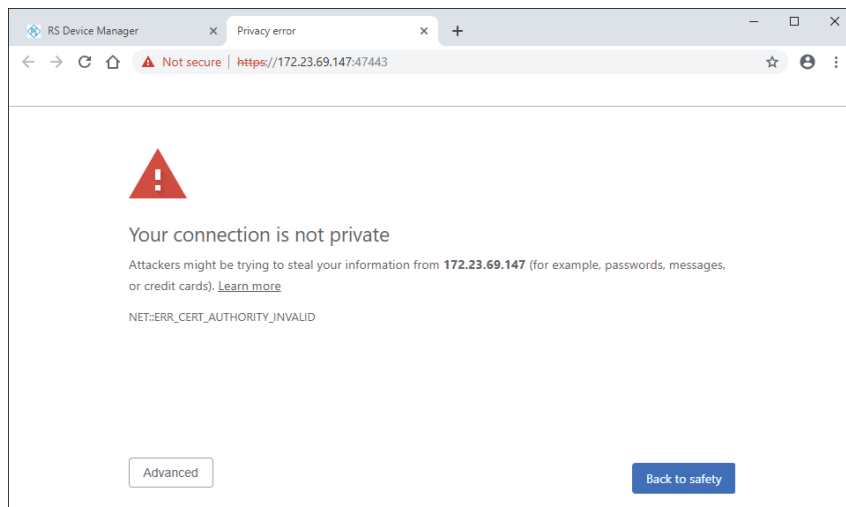
Perform the following steps:

1. Open the R&S® Device Manager on your local system as described in "Using the R&S® Device Manger" on page 86.
2. Select Monitoring in the settings menu.

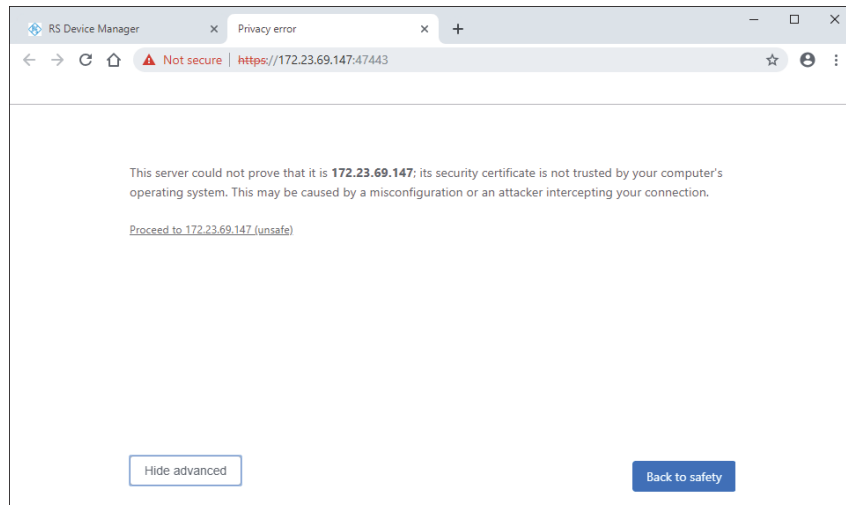


▶ A new tab opens.

3. If you open this tab for the first time you will get a „Not secure“ note. Select „Advanced“ to continue.

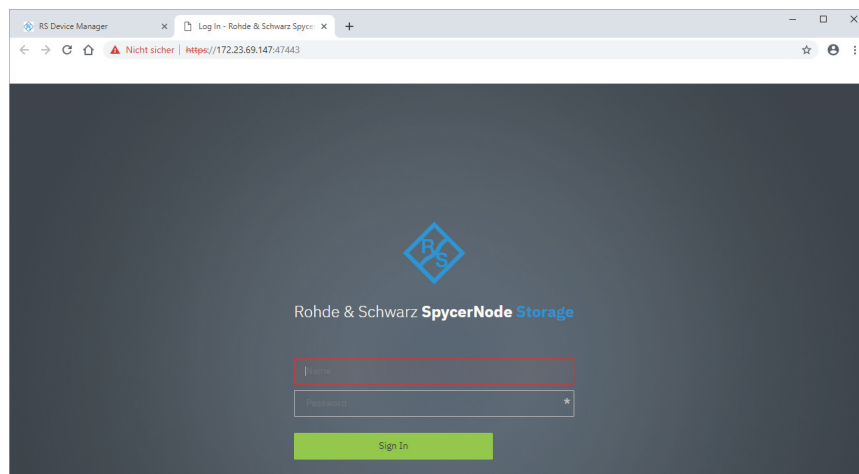


4. Select „Proceed to xxx.xx.xx.xxx (unsafe) to continue.

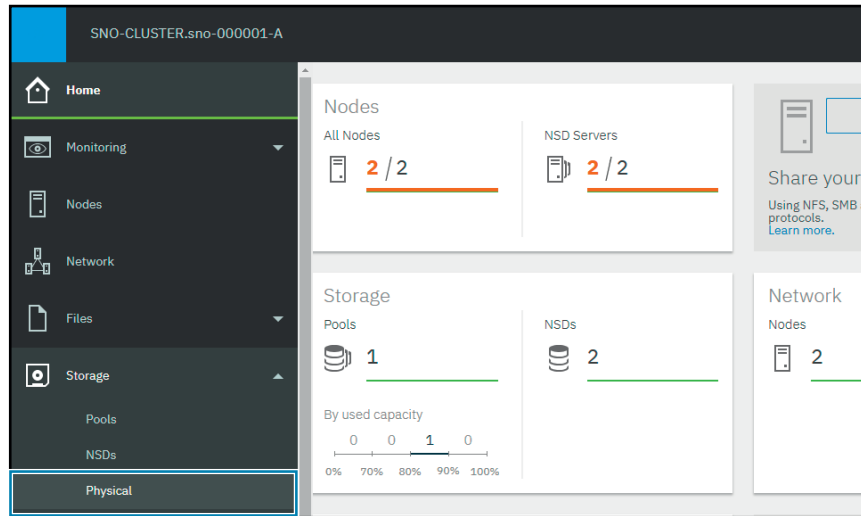


► The monitoring interface opens.

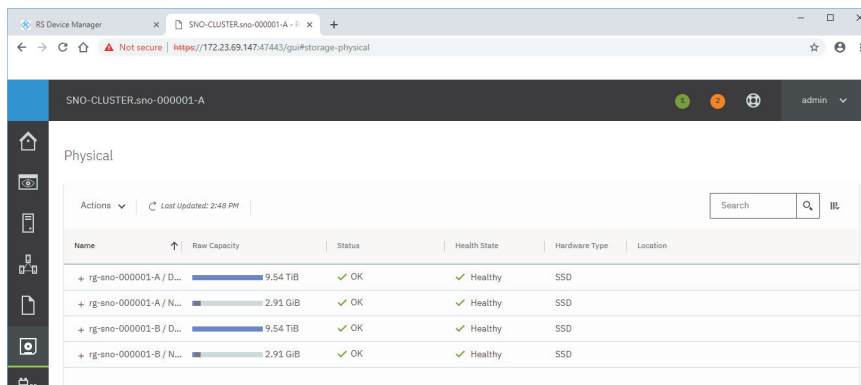
5. Enter username and password. The default credentials are given below:
username: admin - password: admin001



6. Select **Physical** in the **Storage** menu.



7. If necessary select one of the arrays to get more information.



If you have to replace a disk array in a 5U enclosure follow the instructions in chapter "Identifying a Broken Drive Carrier" on page 117 or "Identifying a Broken Disk Carrier" on page 107 for a 2U enclosure.

Maintenance

This chapter is divided into the following sections:

- Safety Instructions (page 98)
- Replacing an I/O Module (page 99)
- 2U Enclosures (page 103)
- 5U Enclosures (page 115)

Safety Instructions

NOTICE**Electronic discharge**

Computer hardware contains components that are sensitive to electrostatic discharge. If you touch them without precautionary measures, they can be destroyed.

It is recommended that you fit and check a suitable anti-static wrist or ankle strap and observe all conventional ESD precautions when handling plug-in modules and components. Avoid contact with midplane components and module connectors.



Always have available a replacement or blank module before removing the old module. When you replace a module, you must never leave an empty bay in the rear of the enclosure.

Replacing an I/O Module

The I/O module is hot-swappable and therefore removal or replacement may be done while the power supply is on.

Removing an I/O Module

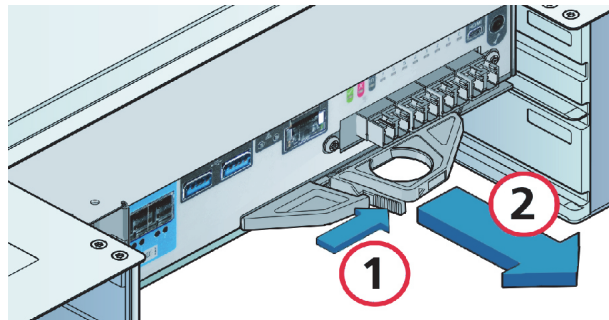
NOTICE**Overheating damage**

An incorrect airflow can damage components.

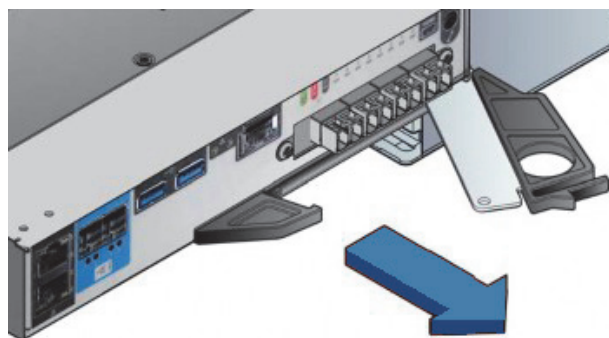
Do not remove this module unless a replacement can be immediately added. The system must not be operated without all modules in place.

Perform the following steps:

1. Grasp the module latch between the thumb and forefinger and squeeze them together to release the latch (1).
2. Pull the latch out to release the module from the enclosure (2).



3. Grip the latch handles and remove the module.



The I/O module is successfully removed.

Replacing an I/O Module

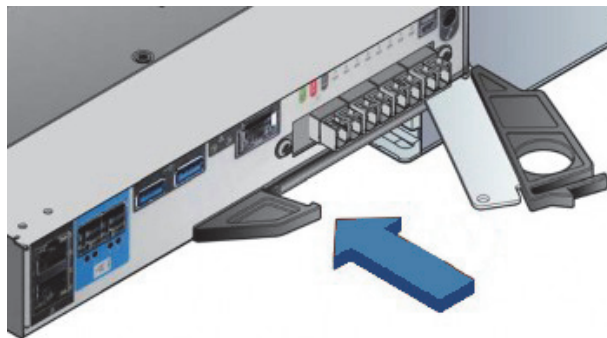
Installing an I/O Module

NOTICE**Electronic Overload**

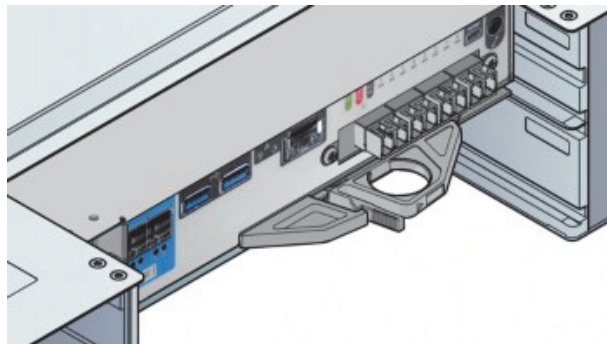
EMC precautions: if passive copper cables are connected, the cable must not have a connection to a common ground/earth point.

Perform the following steps:

1. Examine for damage, closely inspect the interface connector. Do not install it if the pins are bent.
2. With the latches in the open position, slide the module into the enclosure until the latches engage.



3. Set the module in position by manually closing the latches. A click should be heard as the latches engage.



The I/O module may take up to one minute to re-initialize after the cables are inserted.

The I/O module is successfully installed.

System Recovery

This option allows you to re-install a recovery image, e.g. after having exchanged a failed storage controller (I/O module). This backup image is created each day interchangeably, meaning controller "A" stores the image of controller "B" and vice versa.

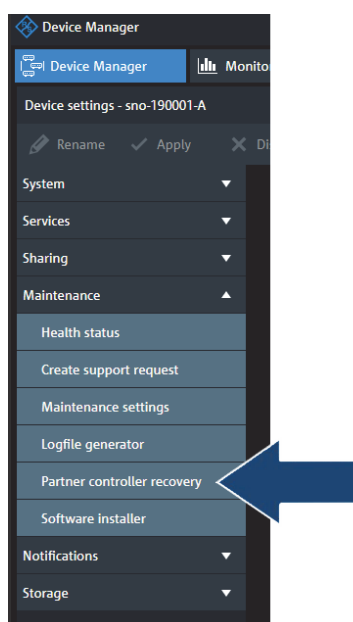
NOTICE

Data Loss

Starting the process will erase the memory of the partner controller. During the recovery the partner controller is occupied and not available. Recovery takes about 50 minutes.

Perform the following steps:

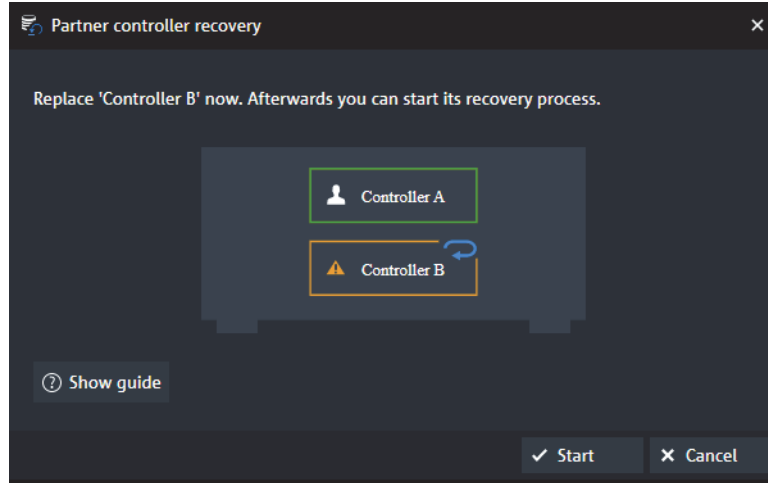
1. After having exchanged a controller module, log in to its partner controller in the Device Manager and open the settings menu.
2. Navigate to "Maintenance" > "Partner controller recovery"



3. Select "Recover"

Replacing an I/O Module

- Click "Start" to initiate the automated recovery process. Thereat, the backup image stored on the active controller will be installed on the replacement unit.

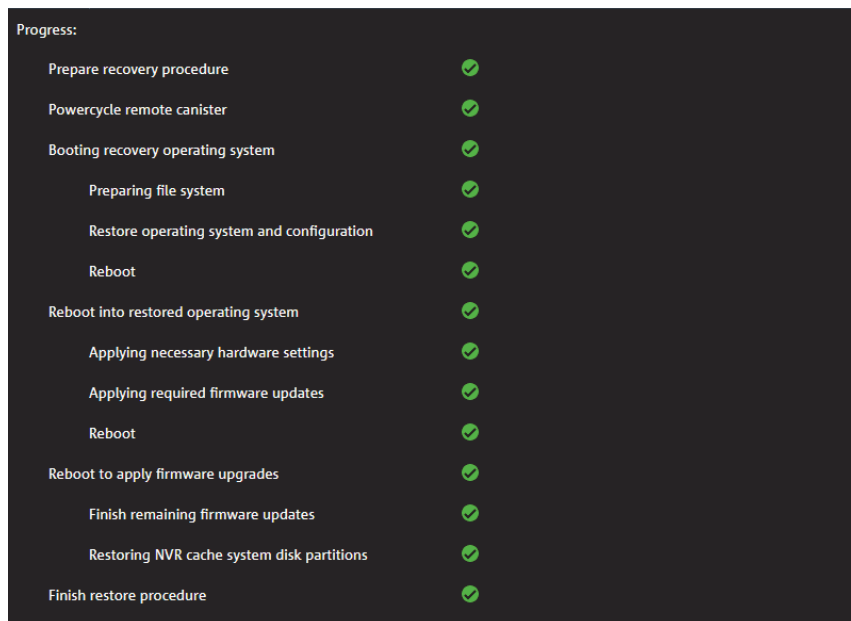


- The recovery procedure is now initiated. The progress of each of the steps is indicated on the screen.



Please note that the process may take up to 50 minutes.

- The recovery image is now installed on the replaced controller. Click "Finish" to exit the dialog.



2U Enclosures

Removing and Mounting the Front Plate

On all 2U enclosures it is necessary to remove the front plate to access the drives.

Removing the Front Plate

Perform the following steps:

- Pull the front plate on both sides simultaneously from the enclosure.



Mounting the Front Plate

Perform the following steps:

- Push the front plate on both sides simultaneously towards the enclosure.



Replacing a Power Cooling Module

The power cooling module is hot-swappable.

⚠ WARNING**Danger of electric shock inside**

In the power supply components be located directly on the mains voltage. Even after disconnection touching can be fatal.

Do not remove covers from the power cooling module. Return the module to your supplier for repair.

Removing a Power Cooling Module

NOTICE**Overheating damage**

Operation of the enclosure with any modules missing will disrupt the airflow and the drives will not receive sufficient cooling.

It is essential that all apertures are filled before operating the enclosure system.

NOTICE**System Damage**

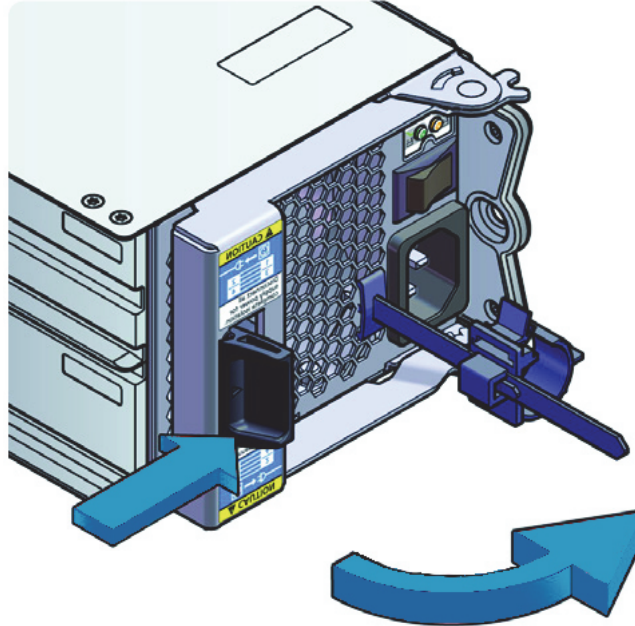
Prior to removing the power cooling module, disconnect the power from the power cooling module, by either the mains switch (where present) or by physically removing the power source in order to ensure that your system has warning of an imminent power shutdown.

A faulty power cooling module must be replaced by a fully operational power cooling module within 24 hours.

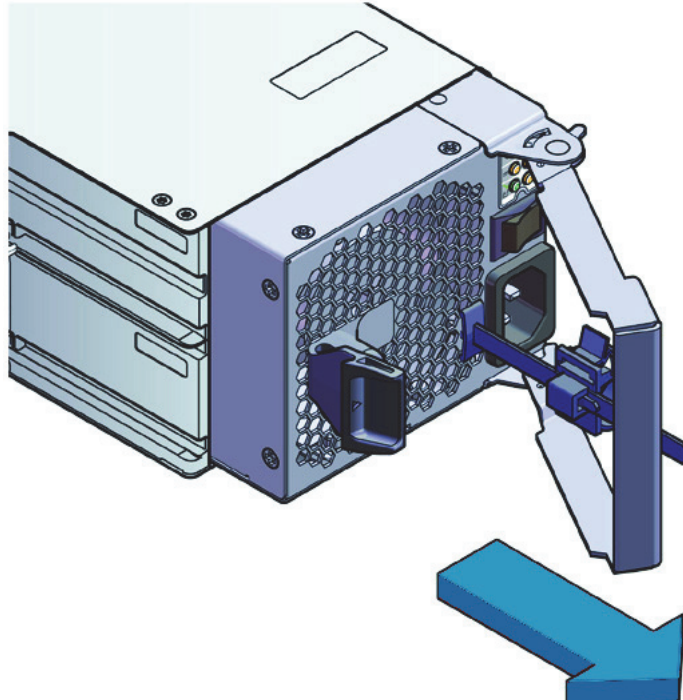
Perform the following steps:

1. Ensure that you identify the faulty power cooling module correctly.
2. Switch off and disconnect the power supply cord.

3. Grasp the latch and the side of the power cooling module handle between thumb and forefinger, squeeze together and open the handle to cam the power cooling module out of the enclosure.



4. Grip the handle and withdraw the power cooling module.



The power cooling module is successfully removed.

Installing a Power Cooling Module

NOTICE**Overheating damage**

Operation of the enclosure with any modules missing will disrupt the airflow and the drives will not receive sufficient cooling.

Handle the power cooling module carefully and avoid damaging the connector pins. Do not install the power cooling module if any pins appear to be bent.

⚠ WARNING**Electric shock**

With no reliable earth connection an electric shock can cause by high leakage current (touch current).

If three or four power cooling modules are fitted, a 5U84 enclosure must be connected to at least two separate and independent power sources.

Perform the following steps:

1. Check for damage, especially to all connectors.
2. With the power cooling module handle in the open position, slide the module into the enclosure.
3. Cam the module home by manually closing the power cooling module handle. A click should be heard as the handle latch engages.
4. Connect the power cables to the power source and to the power cooling module.
5. Secure the strain relief bales.

The power cooling module is successfully installed.

Replacing a Drive Carrier (2u12)

NOTICE**Electric discharge**

Observe all conventional ESD precautions when handling modules and components.

Avoid contact with midplane components and module connectors.

Identifying a Broken Disk Carrier

The procedure is basically the same as for 5U enclosures.

Perform the following steps:

- Follow the instructions in chapter “Identifying a Broken Drive Carrier” on page 117.

Removing a 3.5-inch Drive Carrier

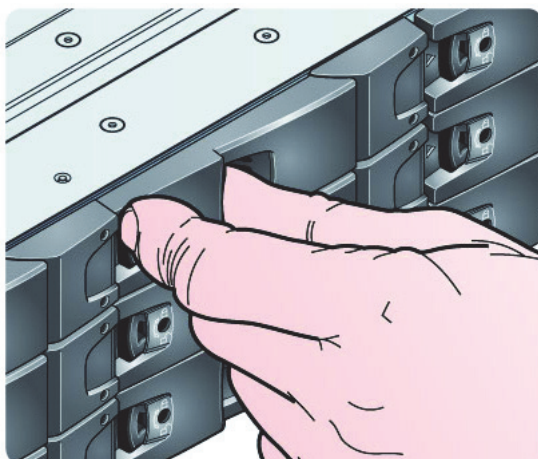
NOTICE**Disk damage**

Damage can occur to a drive if it is removed while it still spins.

We recommend that you perform all steps of the following procedure to make sure that the drive has stopped prior to removal. Avoid vibrations after pulling out.

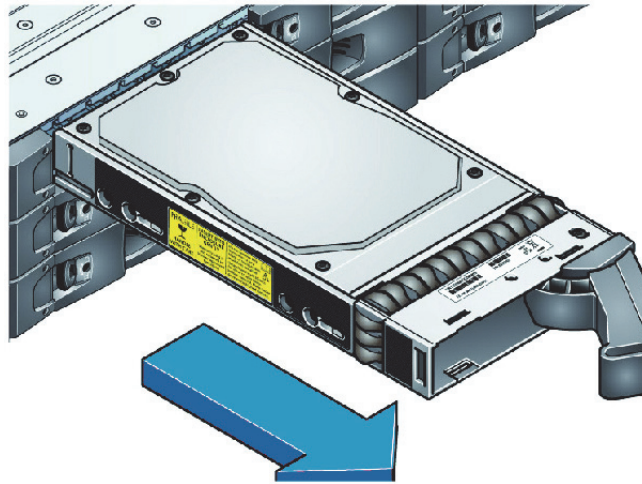
Perform the following steps:

1. If the anti-tamper lock has been activated, de-activate it by locating the key into its socket and rotating it counter-clockwise until the indicator is no longer visible in the aperture beside the key. See chapter “Activating the Anti-tamper Locks” on page 110.
2. Press the latch in the handle towards the handle hinge to release the carrier handle.



2U Enclosures

3. Gently remove the drive carrier approximately 1 inch (25mm), then wait 30 seconds.



4. Remove the module fully from the drive bay.

CAUTION**Overheating damage**

There will be inadequate drive cooling if any of the unused drive bays are left open.

Dummy drive carriers must be fitted to all unused drive bays.

The 3.5-inch carrier is successfully removed.

Installing a 3.5-inch Drive Carrier**NOTICE****Component damage**

A drive carrier cannot be installed if its anti-tamper lock is activated outside the enclosure.

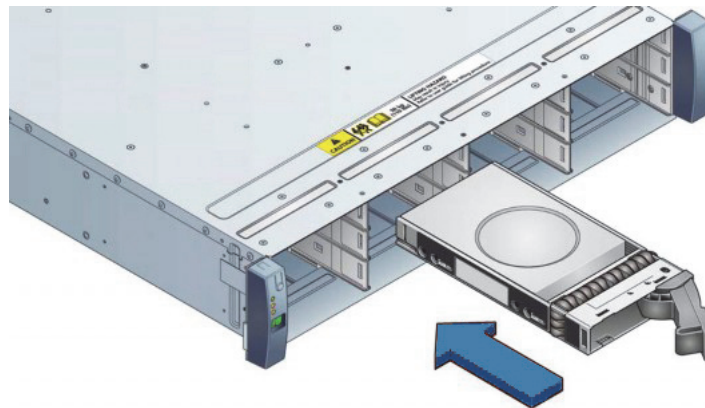
Deactivate the anti-tamper lock. Refer for it to chapter “Removing a 3.5-inch Drive Carrier” on page 107.

Perform the following steps:

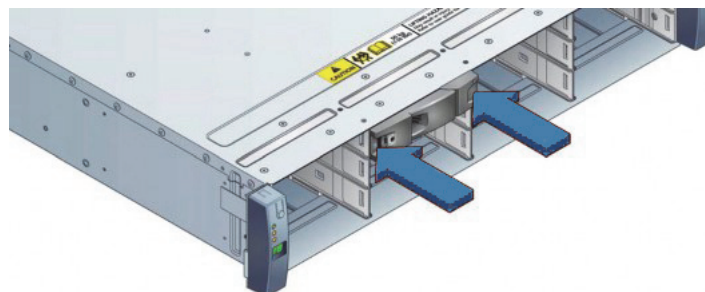
1. Release the drive carrier handle, by depressing the latch in the handle.



2. Put the drive carrier into the enclosure. Make sure that the drive carrier is in a position so that the drive points up and the handle opens from the left.



3. Slide the drive carrier fully into the enclosure.
4. Cam the drive carrier home. The foot on the carrier will engage into a slot in the enclosure. Continue to push firmly until the handle fully engages. A click should be heard as the latch engages and holds the handle closed.

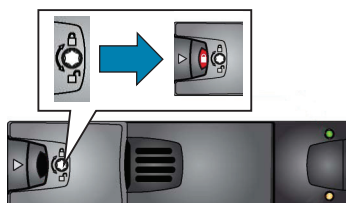


The 3.5-inch carrier is successfully installed.

Activating the Anti-tamper Locks

Perform the following steps:

1. Carefully put the lock key provided into the cutout in the handle.
2. Position the key into its socket.
3. Rotate the key in a clockwise direction until the indicator is visible in the aperture beside the key.



4. Remove the key.

The Anti-tamper lock is successfully activated.

Replacing a Drive Carrier (2u24)

NOTICE**Electric discharge**

Observe all conventional ESD precautions when handling modules and components.

Avoid contact with midplane components and module connectors.

Identifying a Broken Disk Carrier

The procedure is basically the same as for 5U enclosures.

Perform the following steps:

- Follow the instructions in chapter “Identifying a Broken Drive Carrier” on page 117.

Removing a 2.5-inch Drive Carrier

The replacement procedure for 2.5" drive carriers is basically the same as for 3.5" drive carriers, except that the 2.5" drive carriers are mounted vertically.

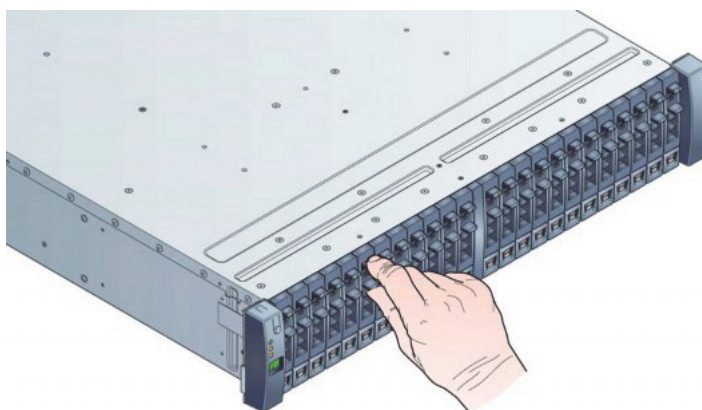
NOTICE**Disk damage**

Damage can occur to a drive if it is removed while it still spins.

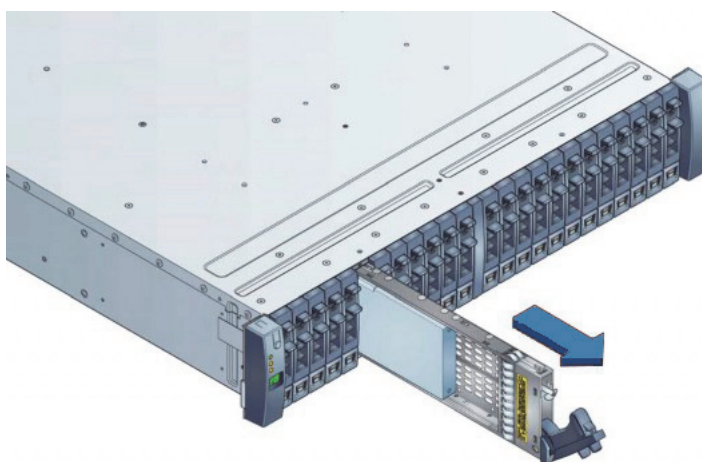
We recommend that you perform all steps of the following procedure to make sure that the drive has stopped prior to removal. Avoid vibrations after pulling out.

Perform the following steps:

1. Press the latch to release the handle.



2. Remove the drive carrier.



The 2.5-inch carrier is successfully removed.

2U Enclosures

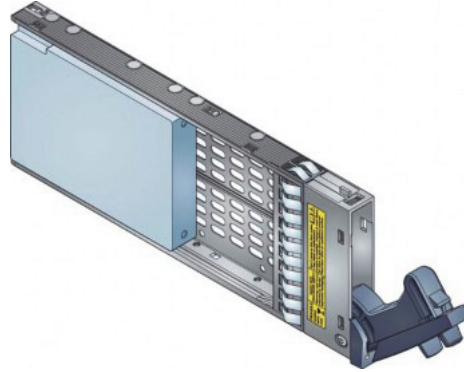
Installing a 2.5-inch Drive Carrier

Perform the following steps:

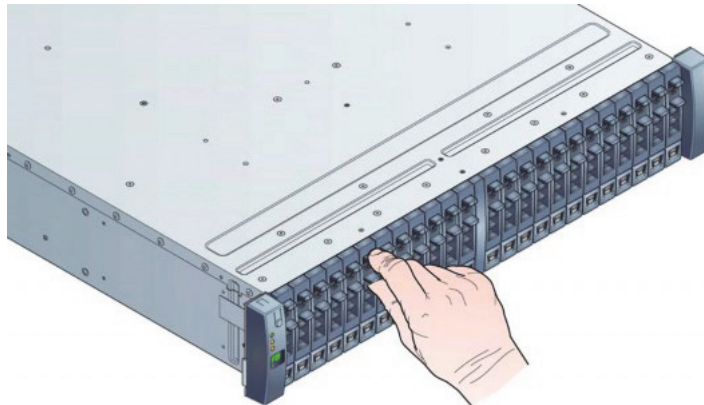
1. Release the carrier handle, by pressing the latch in the handle downwards and insert the carrier into the enclosure in the vertical position.



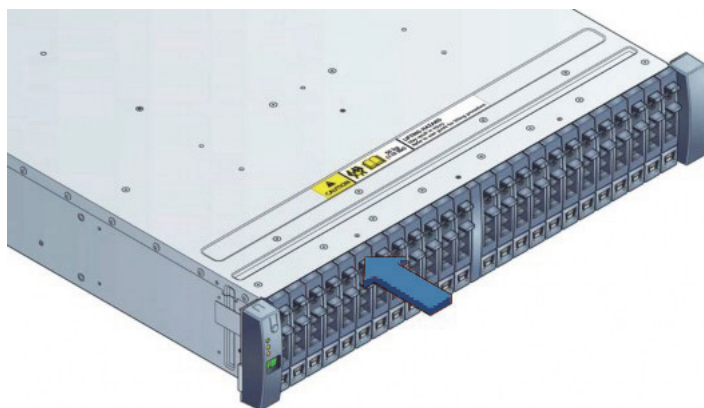
Make sure that the carrier is positioned so that the drive is on the left side and the handle opens from the top.



2. Slide the carrier fully into the enclosure until it is stopped by the clamping lever on the bottom of the carrier.



3. Cam the carrier home. The lever on the carrier will engage into a slot in the enclosure. Continue to push firmly until the handle fully engages. A click should be heard as the latch engages and holds the handle closed.





Make sure that the handle always opens from the top.

The 2.5-inch carrier is successfully installed.

Dummy Carrier Removal/Replacement

Dummy drive carrier modules are removed and replaced in the enclosure simply by pulling the module out of the enclosure or pushing it into place.

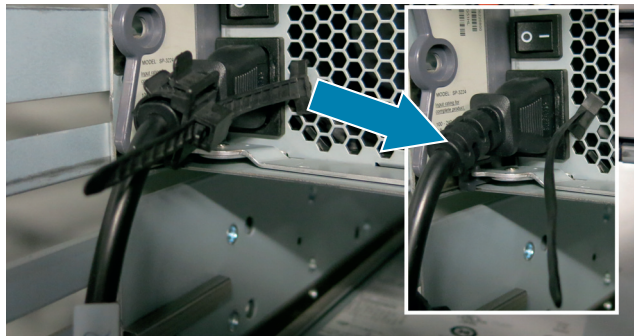
Replacing a Power Supply Unit

Removing a Power Supply Unit

The power supplies in the 2U enclosure include cooling fans as well as supplying power to the system. The power supplies are bi-directional; you can insert a power supply into either the left or right slot.

Perform the following steps:

1. Open the strain relief and unplug the power cord.



2. Press the black release latch towards the center of the module.
3. Open the silver latch, which disengages the power supply module from the engine.



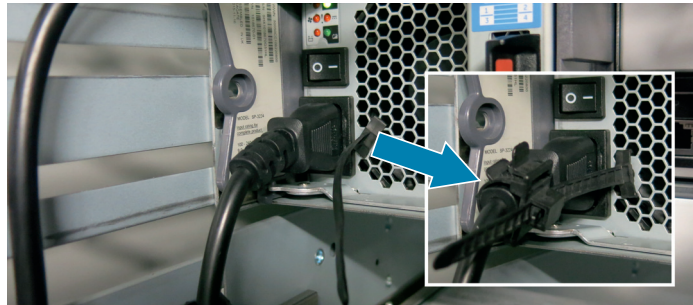
2U Enclosures

The power supply unit is successfully removed.

Installing a Power Supply Unit

Perform the following steps:

1. Position the power supply so that the release latch and handle are closest to the controller.
2. Slide the power supply into its slot and close the handle until the latch clicks in place.
3. Reconnect the power cord and secure the strain relief.



The power supply unit is successfully installed.

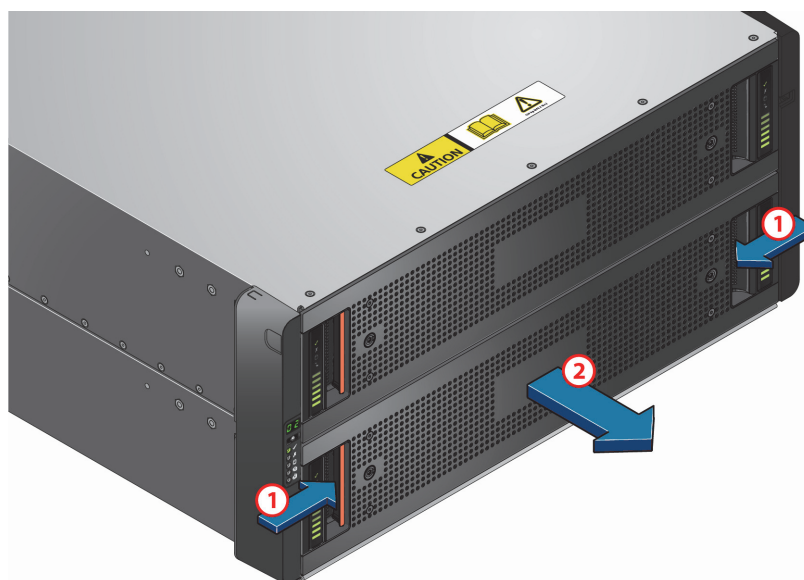
5U Enclosures

General Procedures

Opening a Drawer

Perform the following steps:

1. Make sure the anti-tamper locks are not engaged (see chapter “Enclosure Front” on page 19).
2. Push the drawer latches inward and hold them.
3. Pull the drawer all the way out until it locks open.



NOTICE**Overheating damage**

An incorrect airflow can damage components.

The drawer must not be left open for more than two minutes while the enclosure is powered.

The drawer is fully opened.

5U Enclosures

Closing a Drawer

Perform the following steps:

1. Pull and hold both of the white latches on the sides of the drawer.



2. Push the drawer in slightly.
3. Release the white latches and check they have returned to their original position.
4. Push the drawer all the way back into the enclosure, making sure it clicks home.

The drawer is fully closed.

Replacing a Drive Carrier

Identifying a Broken Drive Carrier

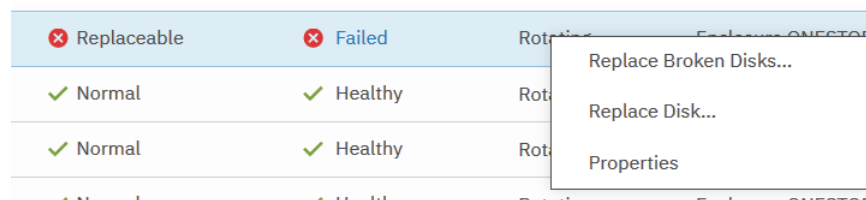
Perform the following steps:

1. Open the R&S Device Manager as described in chapter “Using the R&S®Device Manger” on page 86.
2. Open the monitoring interface as described in "Monitoring Disk Arrays" on page 94.

Name	Raw Capacity	Status	Health State
+ rg-sno-000011-A / D...	296,82 TiB	OK	Healthy
+ rg-sno-000011-A / N...	2,91 GiB	OK	Healthy
+ rg-sno-000011-B / D...	296,82 TiB	Needs service 1 disk problem	Degraded
+ rg-sno-000011-B / N...	2,91 GiB	OK	Healthy

▶ A defect disk array will be indicated.

3. Select **Replace Broken Disks...** in the context menu.



▶ The **Fix Procedure** wizard opens.

4. Follow the instructions of the wizard.

Fix Procedure: Replace disks

Get set up

○ Get set up

○ Replace disk

Before you get started

Do not replace the disk yet! You are about to replace disk named **e1d2s13**, located at **Enclosure ONESTOR-5U84-SHF1016438G002A Drawer 2 Slot 13**. Make sure you have a replacement disk with the FRU **ST8000NM0075** before proceeding.

If you have a replacement disk, click Next to prepare the disk for removal. This suspends the I/O to the disk and turns off its power.

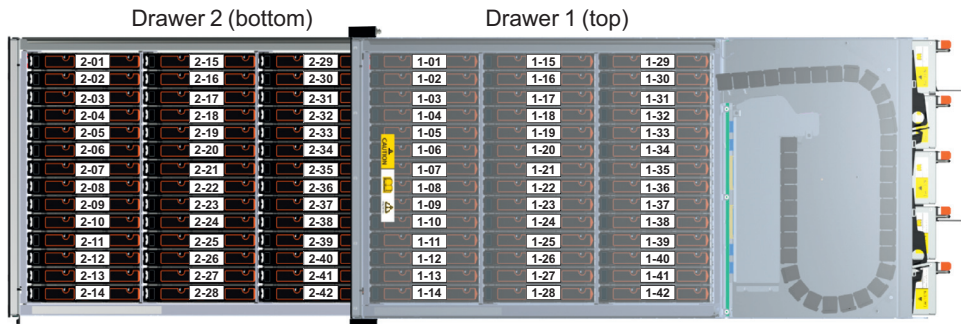
Status: No task running ▾

Abbrechen
◀ Zurück
Weiter ▶

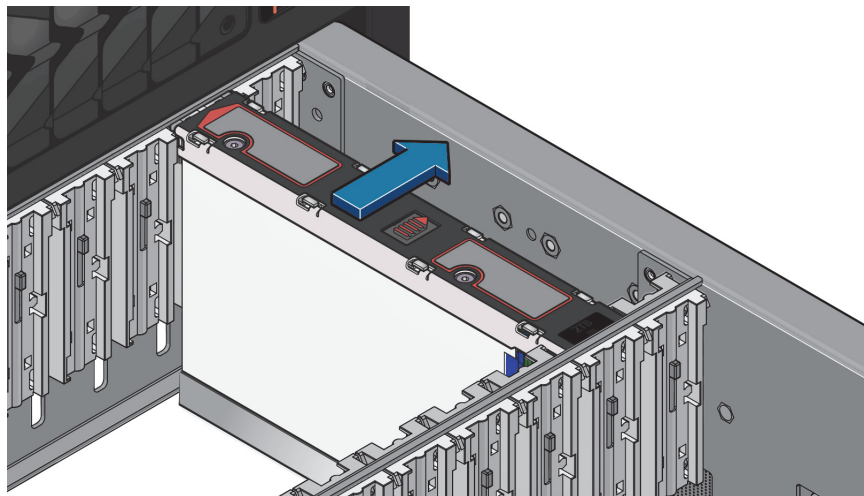
Removing a Drive Carrier

Perform the following steps:

1. Identify which drawer contains the drive to be replaced. If the drive number is known, the plan in the following figure can be used. If the drive has failed, the drive fault LED will be lit amber on the relevant drawer.



2. Open the relevant drawer using the instructions in chapter “Opening a Drawer” on page 115.
3. Locate the drive to be replaced, either by using the drive plan in the figure in step 1 or by looking for the amber LED on the drive that indicates a fault.
4. Push the drive carrier latch in the direction to unlock the drive.



5. Pull the drive upwards and out of the drawer.

NOTICE

Overheating damage

An incorrect airflow can damage components.

If you are not going to replace the drive immediately, close the drawer (see chapter “Closing a Drawer” on page 116) so that correct airflow and cooling are maintained in the enclosure.

The disk drive carrier is successfully removed.

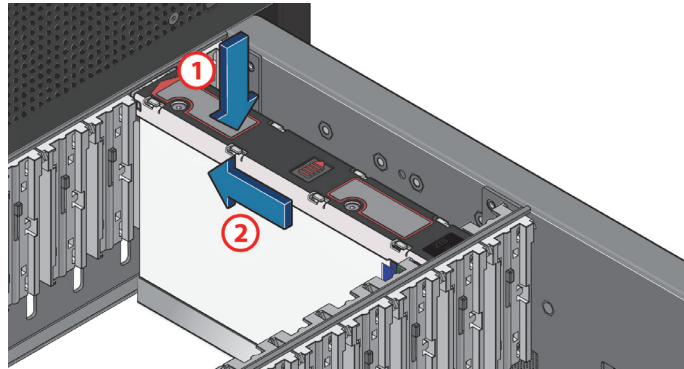
Installing a Drive Carrier



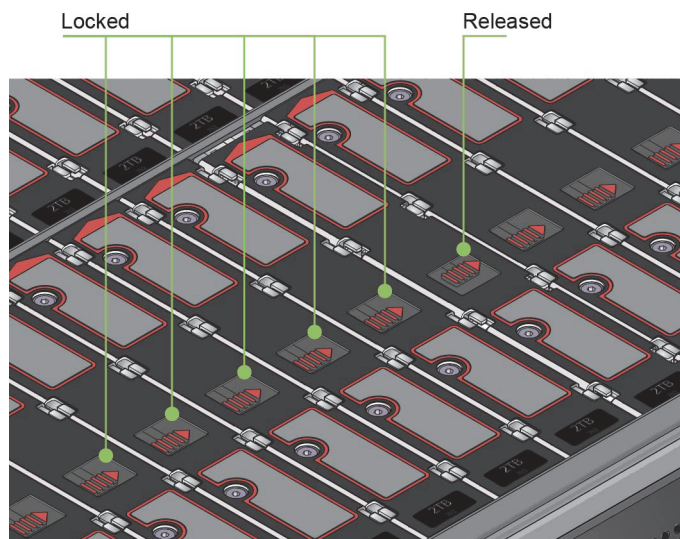
Failed drives must be replaced with approved drives. Contact your storage vendor for details.

Perform the following steps:

1. If the relevant drawer is not already open, open it using the instructions in chapter “Opening a Drawer” on page 115.
2. Lower the drive carrier into the slot, with the drive capacity label facing towards you (1).
3. Push the drive carrier downwards and hold it down while sliding the drive carrier plate in the direction. This locks the drive in place (2).



4. Check that the release latch has returned to its locked position.



5. Close the drawer using the instructions in chapter “Closing a Drawer” on page 116.

NOTICE**Overheating damage**

An incorrect airflow can damage components.

The drawers must be populated with drives in whole rows at a time (there are 3 rows of 14 drives per drawer). The minimum number of drives in an enclosure is 14, the number of rows must not differ by more than 1 between top and bottom drawers and the rows should be populated from the front to the rear of the enclosure.

The drive carrier is successfully installed.

Replacing a Cooling Module

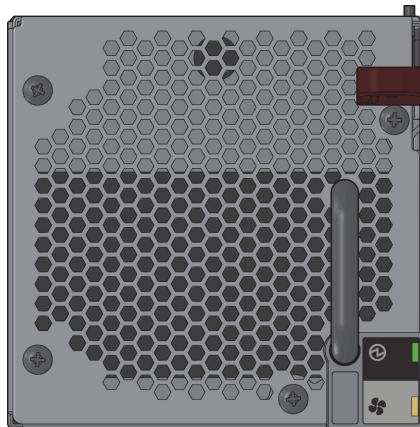


Before removing a module, make sure you have a replacement module to insert.

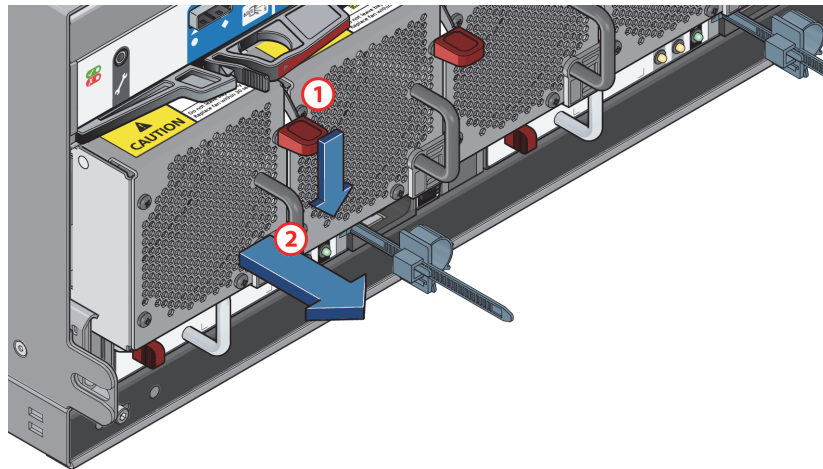
Removing a Cooling Module

Perform the following steps:

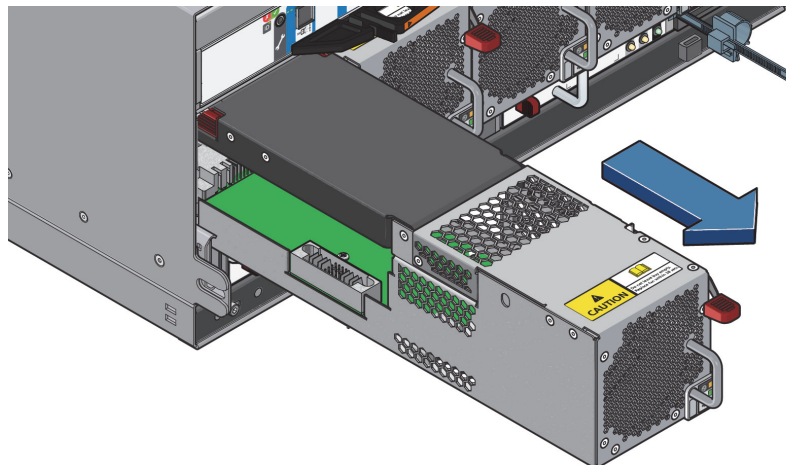
1. Identify the cooling module to be removed. If the module has failed, the fan fault LED will be lit amber.



2. Push down and hold the red release latch (1) and pull the module out by its handle (2).



3. Pull the module out completely.

**NOTICE****Overheating damage**

An incorrect airflow can damage components.

The cooling module bay must not be empty for more than two minutes while the enclosure is powered.

The cooling module is successfully removed.

Installing a Cooling Module

Perform the following steps:

1. Rotate the cooling module so that the red release latch and handle are on the right-hand side.
2. Slide the cooling module into its slot until the latch clicks home. The enclosure will automatically detect and make use of the new unit.

The cooling module is successfully installed.

Replacing a Power Supply Unit

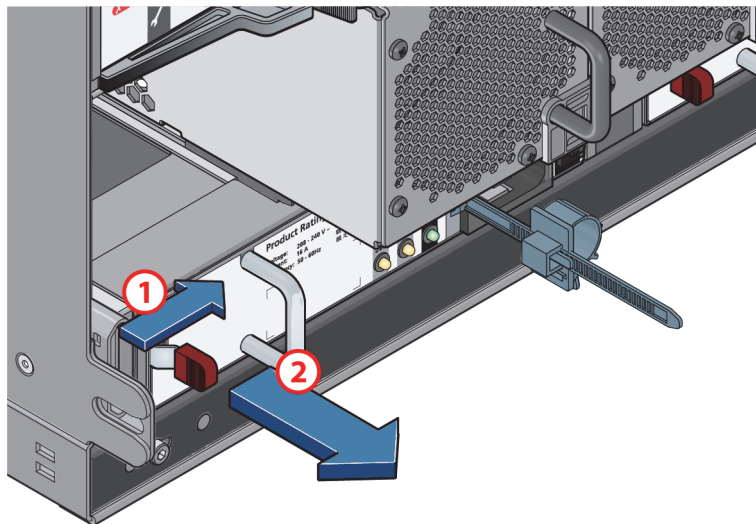
Removing a Power Supply Unit



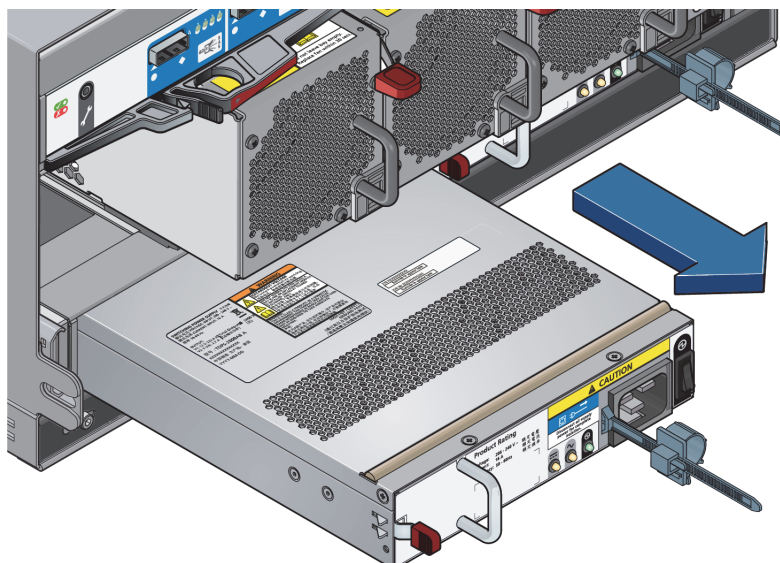
Before removing a module, make sure you have a replacement module to insert.

Perform the following steps:

1. Identify the power supply unit to be removed using appropriate fault reporting software.
2. Push the red release latch to the right and hold it (1), then pull the module out by its handle (2).



3. Pull out the module completely.



NOTICE**Overheating damage**

An incorrect airflow can damage components.

The power supply unit module bay must not be empty for more than two minutes while the enclosure is powered.

Installing a Power Supply Unit

Perform the following steps:

1. Rotate the power supply unit so that the red release latch and handle are on the left-hand side.
2. Slide the power supply unit into its slot until the latch clicks home. The enclosure will automatically detect the new unit.

5U Enclosures

Working with the R&S Installer (RSI)

The Rohde & Schwarz Installer (RSI) is used to install the entire software environment required to operate R&S systems. The RSI is an executable that needs to run on a computer with a Windows operating system in order to update one or more R&S systems over the network.

This chapter is divided into the following sections:

- Types of RSI Packages (page 126)
- Using an RSI (page 127)
- RSI Troubleshooting (page 129)

Types of RSI Packages

There are currently three different types of RSI packages. Please refer to the GLORIS site for your system at <https://gloris.rohde-schwarz.com> and download the linked RSI packages.



When updating a system, the RSI packages have to be installed in the following specific order according to their type:


- 1 **File system RSI.** This contains a new version of the file system, either Spectrum Scale or StorNext.
- 2 **Operating system RSI.** This contains fixes and improvements for the operating system.
- 3 **Software RSI.** This updates the R&S software such as R&S@VENICE and Spycer.



Please be aware that the system will automatically reboot within ten minutes after the installation of a file system or operating system RSI.

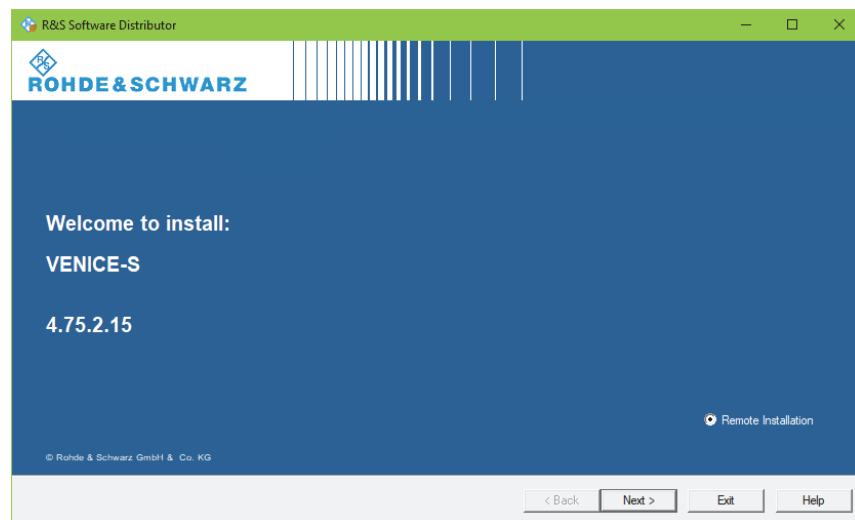
Using an RSI

The RSI package is a Windows executable that can remotely update R&S systems in the network.

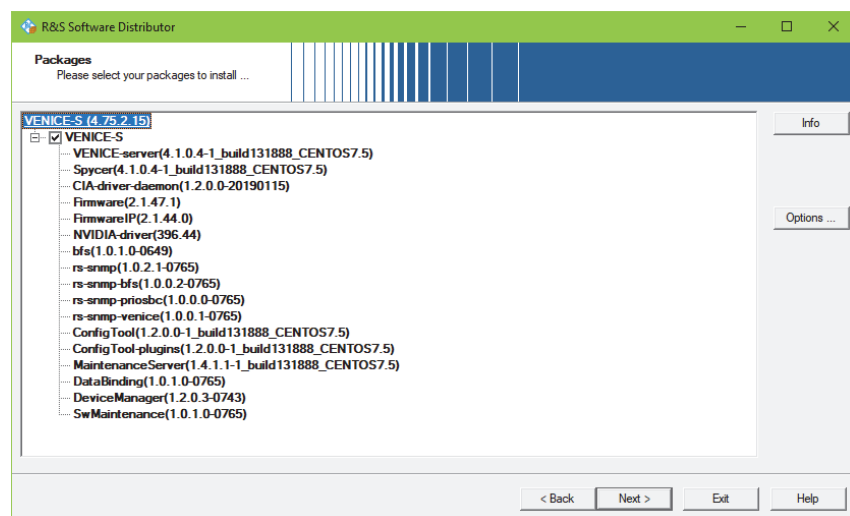
-  Always make sure to install the RSI packages in the correct order according to their type, see "Types of RSI Packages" (page 126).

Perform the following steps:

1. On a Windows system, start the installer with a double click.
 - ▶ First, the version information of the current installer is provided.

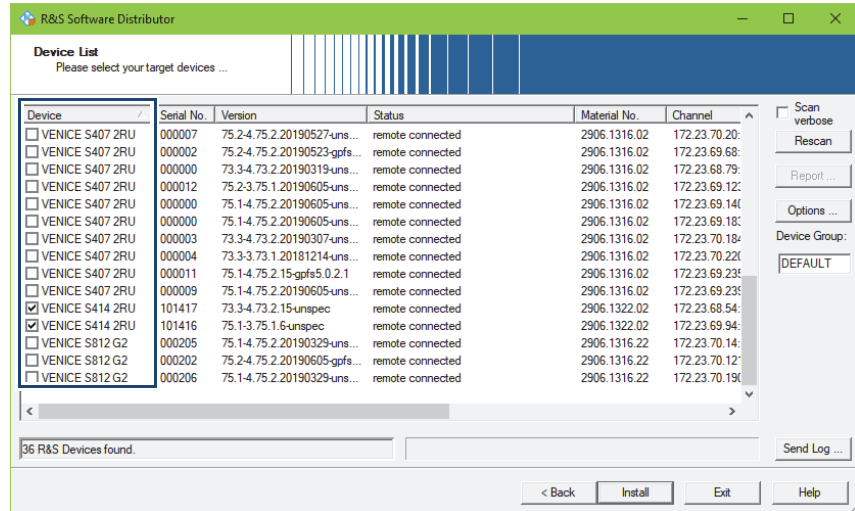


2. Click the **Next** button.
 - ▶ The installer will list all software (operating system, drivers and tools) which will be updated.



Using an RSI

3. Click **Next** to proceed to the next section.
 - ▶ A list is shown with all newer R&S systems detected in the network. In the first column, you can select one or more systems to be updated.



4. Click **Install** to start the installation. The current status will be shown in the Status column.



Please be aware that the system will automatically reboot within ten minutes after the installation of a file system or operating system RSI.

RSI Troubleshooting

This section provides information on what to do in case an RSI installation fails.

Logs

Logs of the installation process are created on the systems involved. The logs are located under `/var/log/rohde-schwarz/swupdate/rsi-installer_<YYYY-MM-DD>__<HH-MM-SS>.txt`.

Error Codes

If errors occur during the installation, the RSI will show error codes displayed on the monitor, without having to open the log files. Some errors can be rectified on site while others require to contact the R&S support department for assistance. If the latter is the case, please provide the code number of the error(s) in question.

Error code	Message	Description & possible solution
5	Installer already running!	-
30	Failed unpacking Windows client installers!	Disk volume is full or installation packages are defective.
31	Failed importing new packages!	Disk volume is full or installation packages are defective.
32	Failed updating!	Disk volume is full or installation packages are defective.
33	Failed installing meta package!	The meta package of the product is defective or required packages are missing.
34	Image version is 'X', must be at least 'Y'!	Operating system image is not compatible with the RSI. Possible cause is the attempt to install a new RSI on an obsolete/outdated image.
35	Machine UUID '/etc/opt/rohde-schwarz/machine-uuid' is missing!	Installation failed on the system. Try executing <code>fbms-setup.sh</code> .
36	System configuration '/etc/opt/rohde-schwarz/swupdate.conf' is missing!	Installation failed on the system. Try executing <code>fbms-setup.sh</code> .

RSI Troubleshooting

Error code	Message	Description & possible solution
37	This RSI is for CentOS 'X', but this system is running 'Y'!	The CentOS version of the system is not compatible with the RSI. Either update the system or use an appropriate RSI.
38	Package 'zvbi' is not installed. Please contact the support!	The 'zvbi' package has to be installed manually. Please contact R&S support department.
39	NVIDIA driver 'X' is missing!	Please contact R&S support department.
40	Failed installing NVIDIA driver!	More details can be found in the log file on the system. Please contact R&S support department.
41	Failed configuring NVIDIA driver!	nvidia-smi -e 0 command has failed. Call up the command in a shell, gather the information details and contact R&S support department.
42	zip_unpack() failed: argument missing (1: X, 2: Y)	Not enough parameters for the internal RSI execution. Please contact R&S support department.
43	Failed unpacking ZIP file!	Unpacking process failed. More details can be found in the log file on the system. Please contact R&S support department.
44	Needed hotfix is missing!	More details can be found in the log file on the system. Please contact R&S support department.
45	The new version is older than the currently installed version!	A downgrade to an older version is not possible.
46	Unpacking tar.gz archives failed!	Unpacking the (rus-configd-plugins rus-extra).tar.gz archive has failed. Please contact R&S support department.
47	CentOS version is 'X', but must be at least 'Y'!	CentOS version is outdated. Upgrade first the operating system.

Error code	Message	Description & possible solution
48	CentOS version is 'X', but must be lower than 'Y'!	The newer CentOS version is not compatible with this outdated RSI. Use a newer RSI version.
49	Please perform a manual downgrade before installing this version!	A downgrade is required. All packages must be uninstalled using '/opt/rohde-schwarz/fbms-uninstall.sh uninstall'

RSI Troubleshooting



Transport

This chapter includes the following sections:

- "Safety Notes" (page 134)
- "Packing the System" (page 135)

Safety Notes

SpycerNode is a very sensitive device. Handle it with great care especially the disks of the system.

	Fragile. Avoid shocks or vibrations. For longer distances use a lifting device.
	Keep dry.



DANGER

Risk of injury while handling component with heavy weight

Improper handling of the SpycerNode can cause substantial damage to personnel and equipment by falling or overturning.

- SpycerNode must be lifted and carried by two people on both sides
- It is preferable to use lifting devices and means of transport.
- Beware of the crushing hazard when working with heavy loads.

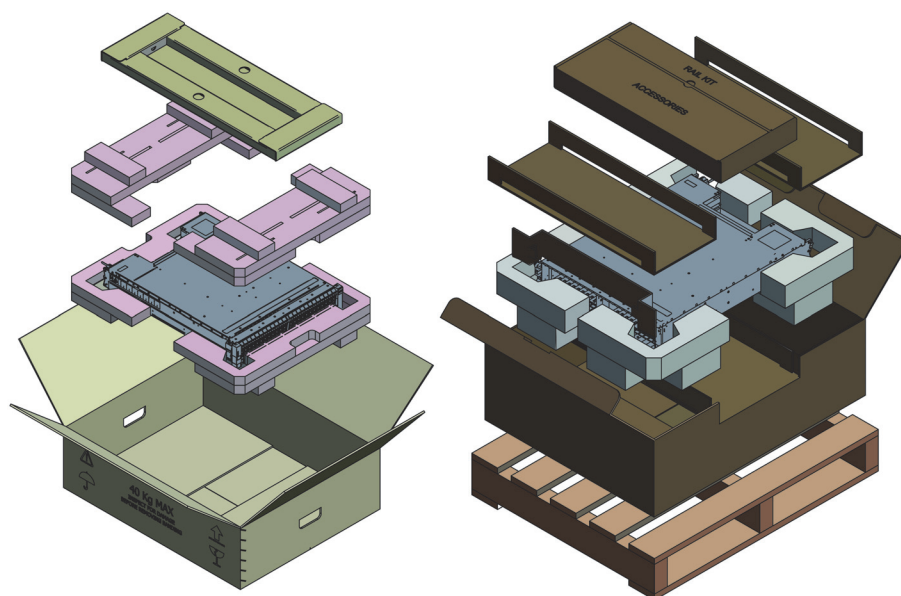
Packing the System

NOTICE**Transportation Damage**

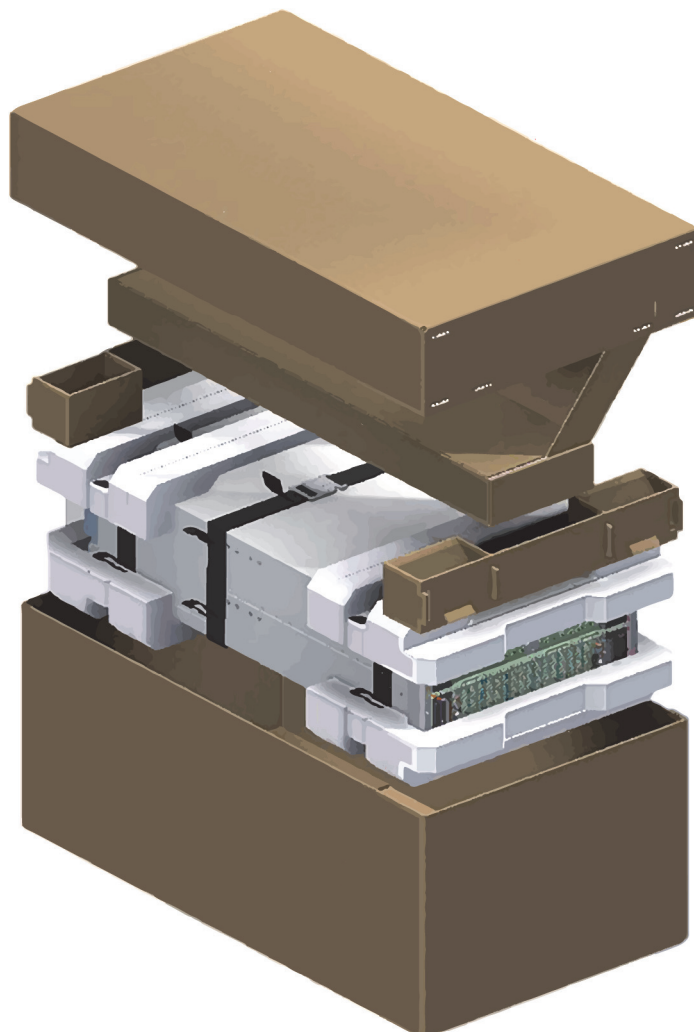
Warranty will be void if not using the original packing for transportation.

Keep the original packing and use it in case of transportation. If you do not have the original packing anymore, use a similar structured packing for transportation. **Rohde & Schwarz** cannot be held liable for transportation damages.

2U Enclosures



5U Enclosures



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