

March Networks

9000 R Series IP Recorder with RAID

Models 9116 R, 9124 R, 9132 R, 9248 R, and 9264 R

Installation Guide



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Chapter 1

Mandatory Regulations

You must be familiar with the following mandatory regulations governing the product's operations. You should also adhere to these instructions to ensure the installation meets regulatory compliance.

Regulatory Compliance Statements

Canada - Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.
CAN ICES-3 (A)/NMB-3(A)

United States - Federal Communications Commission

Supplier's Declaration of Conformity

Product Name: Hybrid NVR

Product Model: 9000 HP, 9000 MP

Company Name: March Networks Inc.
The Pinnacle Building
3455 Peachtree Road North East, Suite 500
Atlanta, Georgia 30326
1 800 563 5564

- 1 This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the installation guide, is liable to cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to correct the interference at their own expense. Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.
- 2 This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Europe

This equipment complies with the following EU directives: 2014/30/EU, 2014/35/EU, 2011/65/EU, and (EU) 2015/863. A Declaration of Conformity is available upon request.

Environmental Directive Compliance

March Networks is committed to doing our part to protect the environment. March Networks is compliant with current RoHS and WEEE directives:

- RoHS 2 (2011/65/EU) with RoHS 3 (EU) 2015/863
- WEEE recast (directive 2012/19/EU) and its amendments

Further details on corporate environmental policies and on RoHS and WEEE compliance are available from March Networks customer support.

Battery Notices

CAUTION: There is risk of explosion if any battery is replaced with another battery of the incorrect type. Ensure that you only use the NiCd battery pack and lithium battery provided by March Networks.

NiCd Battery Pack Notice

The unit contains an internal NiCd battery pack that is used during power shortages. The NiCd battery pack may explode, leak, or get hot, causing personal injury if the following precautions are not followed:

- Do not remove the NiCd battery pack and use it in a device other than the recorder.
- The unit has a built-in battery charger. Do not attempt to charge the NiCd battery pack using a different battery charger.
- Replace only with a March Networks NiCd battery pack.
- Do not disassemble the NiCd battery pack.
- Do not open or try to open the individual NiCd battery pack cells.
- Do not dispose of the NiCd battery pack in fire.
- Do not short circuit the NiCd battery pack terminals.

Dispose of the NiCd battery pack in accordance with all applicable federal, state, provincial, and local regulations. Inquire with your local recycling office for recycling guidelines.

Lithium Battery Notice

The unit contains an internal lithium battery that powers the clock and other system operations. Ensure you consider the lithium battery when disposing of the unit. Dispose of the lithium battery in accordance with all applicable federal, state, provincial, and local regulations. Inquire with your recycling office for recycling guidelines.

Avis pour les batteries

ATTENTION: Il y a un risque d'explosion si une batterie est remplacée par un autre type de batterie. Assurez-vous d'utiliser le bloc de batterie NiCd et la batterie Lithium de March Networks.

Avis sur le bloc de batterie NiCd

L'unité contient un bloc de batterie interne qui est utilisé lors de pannes de courant. Le bloc de batterie NiCd peut exploser, couler ou devenir chaud, pouvant causer des blessures si les précautions suivantes ne sont pas respectées :

- Ne pas enlever le bloc de batterie NiCd et/ou l'utiliser à d'autres fins.
- L'unité a un chargeur de batterie intégré. N'utiliser pas un autre chargeur pour charger le bloc de batterie.

- Remplacer seulement avec les blocs de batterie de marque March Networks.
- Ne pas modifier le bloc de batterie NiCd.
- Ne pas ouvrir ou tenter d'ouvrir la batterie individuelle NiCd
- Ne pas jeter le bloc de batterie dans le feu.
- Ne pas court-circuiter les terminaux du bloc de batterie NiCd.

Disposer du bloc de batterie NiCd en accord avec les lois locales, provinciales ou fédérales. Renseignez-vous à votre bureau de recyclage local pour les règles de recyclage.

Avis sur la batterie Lithium

L'unité contient une batterie Lithium interne qui procure du pouvoir à l'horloge interne de l'unité et au système d'opération.

Assurez-vous de considérer la batterie Lithium lorsque vous disposer de l'unité. Disposez de la batterie Lithium en accord avec les lois locales, provinciales ou fédérales. Renseignez-vous à votre bureau de recyclage local pour les règles de recyclage.

Safety Notice



Caution: risk of electrical shock

Before you access any components located inside the unit, power down the unit using the power On/Off pinhole (for location, see “Turning the Recorder On and Off” on page 31). After the status LEDs turn off, to prevent injury, disconnect the unit from the power source:



For the 9000 R HP series with RAID model, turn off the power switch and remove both power cords from the unit.

For the 9000 R MP series with RAID model, remove both power cords from the unit.

Note: The HP series model has a power switch on the back of the unit, the MP series model does not (see “Turning the Recorder On and Off” on page 31).

Only qualified service personnel should access the inside of the unit.

An AC power cord is provided with a grounded attachment plug. To avoid electrical shock, always use the AC power cord and plug with a properly grounded outlet (connected to earth).

To maintain safety compliance, ensure the AC power cord has the appropriate safety approvals for the country in which the equipment is to be installed. For North America, the AC power cord must be a UL listed SJT NEMA 5-15 equivalent or better.

IP cameras and networks that are directly connected to the recorder must be located indoors only (intra-building). Connect the recorder only to PoE networks without routing to the outside plant.

If you carry or move the recorder unit using the handles on the front panel, always use both handles. Do not attempt to carry or move the unit using only one of the handles.

Do not insert any foreign objects into the fan, vents, ports, or other opening in the unit.

Avis de sécurité



Attention: risque d'électrocution

Avant d'accéder aux composantes internes de l'unité, mettez l'unité hors tension à l'aide du trou d'épingle Marche / Arrêt (pour l'emplacement, voir « Hard Drives » à la page 21). Une fois les voyants d'état éteints, pour éviter les blessures, débranchez l'appareil de la source d'alimentation:



Pour la série 9000 R HP avec RAID, éteignez l'interrupteur d'alimentation et retirez les deux cordons d'alimentation de l'unité.

Pour la série 9000 R MP avec RAID, retirez les deux cordons d'alimentation de l'unité.

Remarque: Le modèle de la série HP est doté d'un interrupteur d'alimentation situé à l'arrière de l'appareil, ce qui n'est pas le cas du modèle de la série MP (voir « Turning the Recorder On and Off » à la page 31).

Seulement le personnel de service qualifié a le droit d'accéder l'intérieur de l'unité.

Le câble de pouvoir AC est fournie avec un câble de mise à terre. Pour éviter tout choc, utilisez toujours le câble de pouvoir AC relié avec la prise de courant adéquate (contenant une mise à terre).

Pour maintenir votre conformité de sécurité, assurez-vous que le câble de pouvoir AC a obtenu les approbations de sécurité applicables pour le pays ou l'installation est faites. Pour l'Amérique du Nord, le câble de pouvoir AC doit avoir une certification UL SJT NEMA 5-15, équivalente ou meilleur.

Les caméras IP et les réseaux connectés directement à l'enregistreur doivent être situés à l'intérieur uniquement (intra-bâtiment). Branchez l'enregistreur uniquement aux réseaux PoE sans acheminement vers l'installation extérieure.

Si vous transportez ou déplacez l'enregistreur à l'aide des poignées du panneau avant, utilisez toujours les deux poignées. N'essayez pas de transporter ou de déplacer l'unité en utilisant seulement une des poignées.

N'insérez pas d'objets étrangers dans le ventilateur, les événements, les ports ou toute autre ouverture dans l'unité.

Rack Mounting Safety Precautions

You must observe the following installation precautions when mounting the recorder in a rack.

- Ambient temperature: When installing the recorder in a closed rack or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than ambient temperature of the room. Airspace or airflow around the recorder unit must provide ambient air of less than 104° Fahrenheit (40° Celsius) when measured above and below the unit.
- Air flow: Installation of the recorder in a rack must allow sufficient air flow for safe operation.
- Mechanical loading: Installation of the recorder in a rack must ensure that a hazardous condition does not occur because of uneven mechanical loading.
- Circuit overloading: When connecting the recorder to the power supply circuit, ensure that you do not overload the circuit. Consider the effects of circuit overload on overcurrent protection and supply wiring. Use equipment nameplate ratings to verify the requirements.
- Reliable earthing: You must maintain reliable earthing of any rack-mounted equipment. Pay particular attention to connections other than direct connections to the branch circuit (for example, the use of power bars).

Précautions de sécurité pour une installation dans un rack

Vous devez respecter les précautions d'installation suivantes lors du montage de l'enregistreur dans un rack.

- **Température ambiante:** Lors de l'installation de l'enregistreur dans un rack fermé ou dans un rack comprenant plusieurs étages, la température ambiante de fonctionnement de l'environnement du rack peut être supérieure à la température ambiante de la pièce. L'espace aérien ou le flux d'air autour de l'enregistreur doit fournir un air ambiant inférieur à 40 ° C (104 ° F) lorsqu'il est mesuré au-dessus et au-dessous de l'unité.
- **Flux d'air:** L'installation de l'enregistreur dans un rack doit permettre un débit d'air suffisant pour un fonctionnement sûr.
- **Chargement mécanique:** L'installation de l'enregistreur doit garantir qu'aucune condition dangereuse ne se produise en raison d'une charge mécanique inégale.
- **Surcharge du circuit:** Lorsque vous connectez l'enregistreur au circuit d'alimentation, veillez à ne pas surcharger le circuit. Tenez compte des effets de la surcharge du circuit sur la protection contre les surintensités et le câblage d'alimentation. Utilisez les spécifications indiquées sur l'enseigne du fabricant de l'équipement pour vérifier les exigences.
- **Mise à la terre fiable:** Vous devez maintenir une mise à la terre fiable de tout équipement monté en rack. Portez une attention particulière aux connexions autres que les connexions directes au circuit d'alimentation (par exemple, l'utilisation de barres d'alimentation).

Anti-Static Precautions

Ensure proper use of an anti-static guard during installation to avoid damage to the unit from electrostatic discharge.

Servicing Notice

The procedures contained in this publication outline how to install or service components located inside the unit, requiring the removal of the cover. Installation and maintenance procedures requiring internal unit access are to be performed by qualified service personnel only.

Shipping Notice

Shipment of the unit and components may expose the unit to temperature extremes. We recommend you allow the unit to return to room temperature prior to operation.

Regulatory Model Definition Information

The certification regulatory model names for the recorder are defined in the following table.

Recorder	Certification Regulatory Model Name
<ul style="list-style-type: none"> • 9264 R IP recorder with RAID • 9248 R IP recorder with RAID 	9000 HP
<ul style="list-style-type: none"> • 9132 R IP recorder with RAID • 9124 R IP recorder with RAID • 9116 R IP recorder with RAID 	9000 MP

Chapter 2

Feature Overview

The 16, 24, 32, 48, or 64 channel 9000 R Series IP Recorder with RAID (Redundant Array of Independent Disks) is a scalable recording platform that supports high-resolution IP cameras. The models included are the 9116 R, 9124 R, 9132 R, the 9248 R, and the 9264 R.

The 9000 R Series IP Recorder with RAID offers outstanding video compression and storage, and can be managed using either the March Networks Command or the Visual Intelligence video management platforms.

Note: You can manage a 9000 R Series IP Recorder with RAID using either of the management platforms offered by March Networks. You should familiarize yourself with the differences between the platforms prior to deploying the recorders. For more information, see the documentation available from the March Networks Partner Portal.

This section of the installation guide contains the following information:

- “Key Features” on page 11
- “Packaging/Shipment Contents” on page 12
- “Specifications” on page 13
- “Video Capture Rates” on page 14
- “Front Panel LEDs” on page 15
- “USB Ports” on page 17
- “Ethernet Ports and HD Video Monitor Output” on page 18
- “Power Connections for Redundant Power Supply” on page 19
- “Hard Drives” on page 21
- “Hard Drive Array - Important Considerations” on page 22
- “Hot Spare Hard Drive” on page 23
- “NiCd Battery Pack and Lithium Battery” on page 24

Key Features

The 9000 R Series IP Recorder with RAID is available in five different models, the 9116 R, 9124 R, 9132 R, 9248 R, and 9264 R. The two larger models are also available with a hot spare drive option. Physically, the 9248 R and 9264 R are bigger models with up to 8 hard drives and a 2U height. The 9116 R, 9124 R, and 9132 R are smaller models with up to 4 hard drives and a 1U height. The following table shows the key differences between the different models.

Feature	9116 R	9124 R	9132 R	9248 R	9264 R
Total IP Inputs	16	24	32	48	64
IP Performance (aggregate)	200 Mbps			300 Mbps	400 Mbps
Hard Drives	4 hard disk drives			4, 6, or 8 hard disk drives	
Mounting	Rack mount: 1U high, 19" 2 post rack ONLY supported with shelf kit 4 post rack (rails included)			Rack mount: 2U high, 19" 2 post rack ONLY supported with shelf kit 4 post rack (rails included)	
Hot Spare Drive	Not available			Available if included on your model Both models with 6 or 8 hard drives are available with or without hot spare	

Some of the key features and benefits of the 9000 R Series IP Recorder with RAID include:

- Video compression for IP cameras: H.264, MPEG4, MPEG, MJPEG
- Integrated RAID controller: either RAID 5 or RAID 6 support.
- High-capacity internal storage: four, six, or eight SATA hard drives (smaller 91xx R models limited to four)
- Hot swappable hard drives: you can remove/replace a hard drive without powering off the recorder.
- Hot spare drive option available on 9248 R and 9264 R with 6 or 8 hard drives
- Redundant power supply: Contains two power supply modules. Each power supply module is capable of powering the entire recorder if one of them fails. This minimizes chance of a complete shutdown.
- High temperature shutdown: the recorder shuts down if it gets too hot, and restarts when the temperature drops to a safe level.
- Internal back-up battery for power brown-out protection
- Advanced networking features for unlimited scalability and dependable remote access
- Advanced health management features for centralized support and maximum up-time
- Analog camera support through an encoder
- Analytics facilitated via analytics-enabled cameras
- Front panel QR code containing recorder information such as model number and serial number



Packaging/Shipment Contents

The following items are included in each system shipment, and should be located/verified before installation begins:

- 9000 R Series IP recorder with RAID
- Dual AC power cord for redundant power supply
- Hard drive caddy keys
- 4-post rack rail kit
- Instructions for downloading software and technical publications from the March Networks Partner Portal website.

Additional Optional Items

- 2-post shelf kit available for purchase from March Networks (part number 34916). Do **not** install the recorder in a 2-post rack unless you are using this shelf kit.

WARNING: The procedures contained in this guide outline how to install or service components located inside the unit, requiring the removal of the cover. Installation and maintenance procedures requiring internal unit access are to be performed by qualified service personnel only.

When working inside the unit, ensure you take anti-static precautions.

Any attempt to service components of the recorder that are not considered field replaceable will invalidate your warranty. The list of field serviceable parts includes:

- Hard drive with caddy
- Back-up battery
- Fans
- Power supply

Do not power up or operate the unit with the cover removed. The cover ensures the safe operation of the unit. Operating the unit without the cover can expose you to live electric current and can cause the hard drives to overheat.

ATTENTION : Les procédures contenues dans ce guide décrivent comment installer ou réparer les composants situés à l'intérieur de l'unité, nécessitant le retrait du capot. Les procédures d'installation et de maintenance nécessitant un accès interne à l'unité doivent être effectuées uniquement par du personnel de maintenance qualifié.

Lorsque vous travaillez à l'intérieur de l'appareil, assurez-vous de prendre des précautions antistatiques.

Toute tentative de réparation de composants de l'enregistreur qui ne sont pas considérés comme remplaçables sur site annulera votre garantie. La liste des pièces réparables sur site comprend:

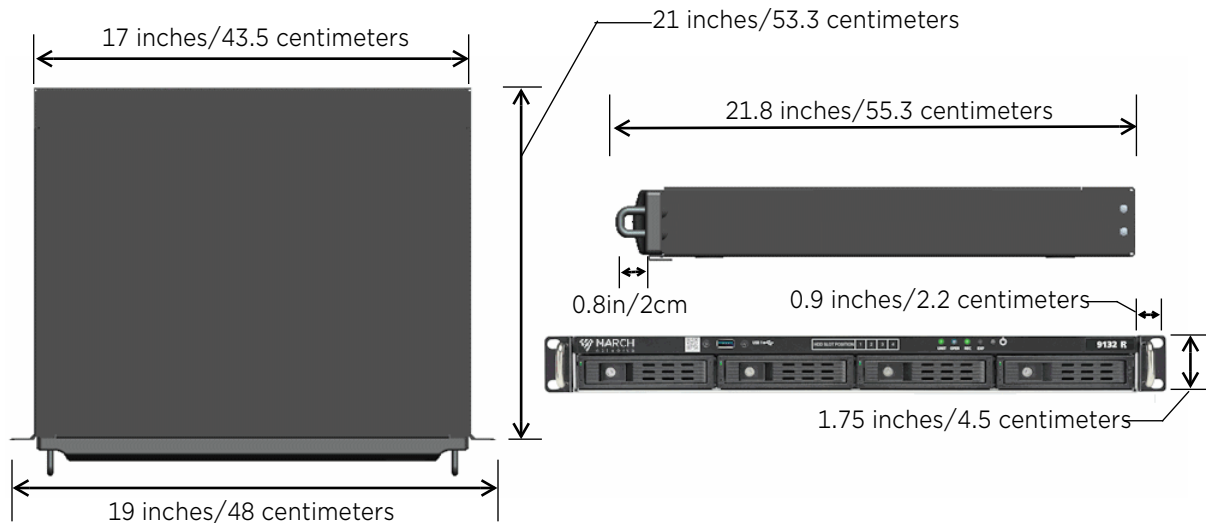
- Disque dur avec caddy
- Batteries de sauvegarde
- Ventilateurs
- Source de courant

N'allumez pas et ne faites pas fonctionner l'appareil avec le couvercle retiré. Le couvercle garantit le fonctionnement sûr de l'unité. Faire fonctionner l'appareil sans le couvercle peut vous exposer à un courant électrique sous tension et entraîner une surchauffe des disques durs.

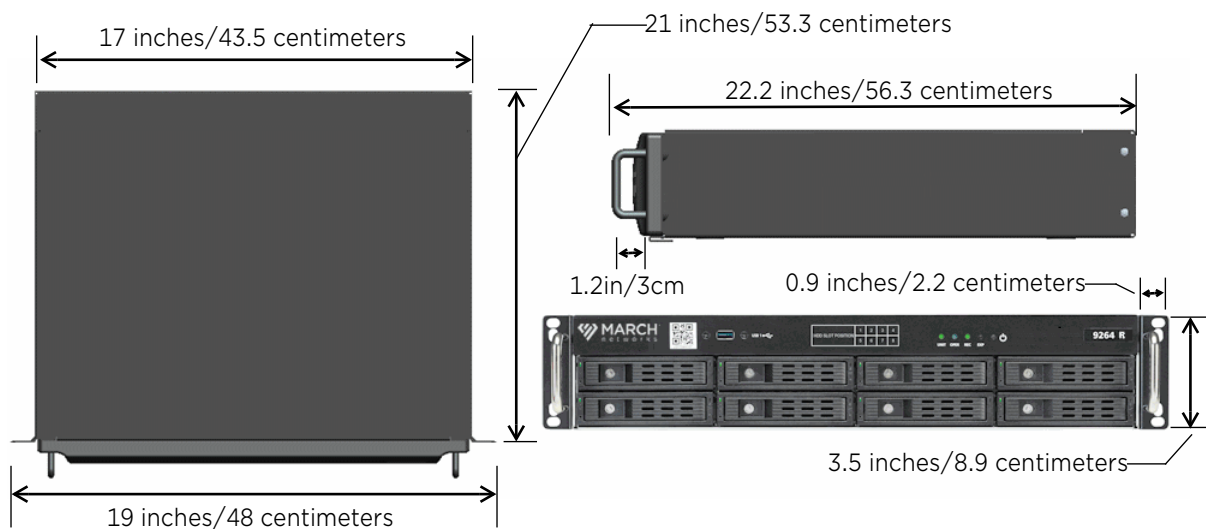
Specifications

This section contains the dimensions, weight, temperature ranges, and power ratings of the unit. Dimensions are different for the 1U models (9116 R, 9124 R, and 9132 R) and the two 2U models (9248 R and 9264 R).

Dimensions of the 1U Model (9116 R, 9124 R, and 9132 R)



Dimensions of the 2U Model (9248 R and 9264 R)



Weight

9116 R, 9124 R, and 9132 R (1U) — 22.31 pounds / 10.12 kilograms (without hard drives)

9248 R and 9264 R (2U) — 28.11 pounds / 12.75 kilograms (without hard drives)

Each hard drive (HDD) — 1.7 pounds / 0.8 kilograms

Operating and Storage Temperature

Operating temperature: 32 to 104° Fahrenheit / 0 to 40° Celsius

Storage temperature: -40 to 158° Fahrenheit / -40 to 70° Celsius

WARNING: The recorder must be mounted in accordance with the mounting guidelines in this publication to ensure the unit remains within the recommended operating temperature range. For more information, see “Mounting the Recorder” on page 26).

ATTENTION : L’enregistreur doit être monté conformément aux directives de montage de cette publication pour garantir que l’unité reste dans la plage de températures de fonctionnement recommandée. Pour plus d’informations, voir « Mounting the Recorder » à la page 26).

High Temperature Shutdown

This feature ensures that the recorder shuts down if it gets too hot, and restarts when the temperature drops to a safe level. If this occurs, a critical software alert is triggered.

Heat Dissipation

Under normal operating conditions:

9116 R, 9124 R, and 9132 R model

- 238 BTU per hour (recorder with 4 HDD drives)

9248 R and 9264 R model

- 238 BTU per hour (recorder with 4 HDD drives)
- 340 BTU per hour (recorder with 8 HDD drives)

Each hard drive (HDD)

- 27 BTU per hour

Power Ratings

Power input: 100-240 volts AC input (auto-sensing)

Current rating: 2.5 A

Frequency range: 50-60 Hz

Power consumption:

- 9116 R, 9124 R, and 9132 R model — 70 W typical, 135 W maximum
- 9248 R and 9264 R models — 100 W typical, 225 W maximum

Video Capture Rates

The IP camera input capture rate is dependent on the resolution and quality of the images captured. The 9000 R series recorders accommodate a total recording rate of up to:

- 400 Mbps for the 9264 R model
- 300 Mbps for the 9248 R model
- 200 Mbps for the 9132 R, 9124 R, and 9116 R models

There is no set limit per camera channel.

Front Panel LEDs

The colored LEDs (Light Emitting Diodes) on the front panel of the unit indicate status. Each tricolor LED is marked to indicate which component the LED displays information about. The color of the LED and whether the light is on solid, flashing, or off, gives you information about the recorder.

2U model Front Panel LEDs



1U model Front Panel LEDs



Unit LED The status of the unit.	Green	Solid: The unit's software and hardware are operating correctly. Flashing: The power On/Off pinhole has been pressed or the AC power has been removed — the system is waiting for software to complete the shutdown of the unit.
	Blue	Solid: The operating system is loaded but the unit's software application is still loading. Flashing: The unit is booting up after the power switch has been turned on or power has been applied, or after a software reboot.
	Red	Solid: The hardware watchdog timer has expired and reset the system. Flashing: The unit's temperature is too hot for startup. The flashing red unit LED indicates that startup is delayed until the fans cool the unit to an acceptable temperature.
Operation LED The status of the unit's operation.	Green	Solid: The software in the unit is operating correctly, and the unit is powered and running. Flashing: The operating system is available but the software is still loading.
	Blue	A system-level problem (non-critical) has been reported.
	Red	A critical error has occurred. Use the Administrator Console or Command Client software application to review the health alert and determine a possible resolution. For more information, see the <i>Administrator Console User Manual</i> or <i>Command Enterprise and Client User Guide</i> , available from the March Networks Partner Portal website.

Recording LED The status of the unit's recording.	Green	Actively recording as configured (the recorder may be configured to record continuously or only configured to record when triggered by an alarm or a schedule).
	Red	A system-level problem has occurred which is affecting current recording or will affect future recording.
	Off	The system is starting up or is not currently configured to record.
Export LED The status of an export to an external media device.	Green	Solid: Media transfer is complete. Flashing: Media transfer is in progress.
	Blue	Solid: External media device detected. Flashing: <ul style="list-style-type: none"> A request to export media clips to an external media device has been initiated but the recorder is still logging the media. Exporting will not start until the recorder finishes logging the media. Media clips are ready to be exported to the external media device but no external device is detected. The external media device is full. Empty the device or insert a new one.
	Red	Failure of media transfer.
	Off	No external media device is connected or the external device is not usable.

Note: Information about operation and recording errors (indicated by the Operation or Recording LED) can be retrieved using the Command Client or the Administrator Console (depending on which software platform you are using, Command or Visual Intelligence). For more information, see the *Command Enterprise User Guide* or the *Administrator Console User Manual*, available from the March Networks Partner Portal.

Hard Drive Caddy LEDs

Each hard drive caddy has a green and a red LED on the front to provide information about the hard drive.



Green LED

Indicates that a hard drive is present in the caddy and has power.

Red LED

Indicates that there is a problem with the hard drive in that caddy. See “Hard Drive Error LED Status” on page 22.

Use the Administrator Console or Command Client software application to review the health alert and determine a possible resolution. For more information, see the *Administrator Console User Manual* or *Command Enterprise User Guide*, available from the March Networks Partner Portal website.

USB Ports

There is one USB 3.0 port on the front of the unit, and two USB 2.0 ports on the back of the unit.

Front USB

There is one USB port on the front of the unit for connection of external peripherals.

The front port provides up to 1 A to power peripherals with a USB cable.

The port supports USB version 3.0 and is USB version 2.0 compatible.

USB 3.0 Port on front of 2U model (USB 1)



USB 3.0 Port on front of 1U model (USB 1)



Back USB

Two more USB ports are available at the rear of the unit.

These ports provide connections for external peripherals, provide up to 0.5 A per port to power peripherals with a USB cable, and support USB version 2.0.



Two USB 2.0 Ports on back of 2U model (USB 2 and USB 3)



Two USB 2.0 Ports on back of 1U model (USB 2 and USB 3)

Ethernet Ports and HD Video Monitor Output

There are two Ethernet ports and one HD video monitor output available on the back of the unit.

2U model



2 Ethernet Ports and LEDs HD Video Monitor Output

1U model



2 Ethernet Ports and LEDs HD Video Monitor Output

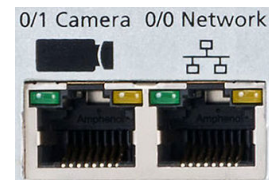
Two Ethernet Ports and LEDs

There are two gigabit Ethernet ports on RJ-45 connectors with LEDs to indicate the status of the connection. They each provide a 10/100/1000 BaseT auto-negotiated Ethernet connection on a standard network pinout.

The right port (0/0 Network) is the primary network port and the left port (0/1 Camera) is for IP camera networks.

Each Ethernet port has colored LEDs that indicate the connection status.

- Amber LED (on solid): A link is established with the point of presence (POP).
- Amber LED (flashing): There is activity on the established link.
- Green LED (on solid): A 1000 BaseT link is negotiated on the port.
- Green LED (off): A 10/100 BaseT link is negotiated on the port.



HD Monitor Output

The HD monitor output port incorporates HDMI® technology and allows you to connect an HDMI monitor.

The **HD Monitor 1** port offers a 16:9 aspect ratio and a resolution of 1920 x 1080p at 60Hz. No audio support.



Display Monitor

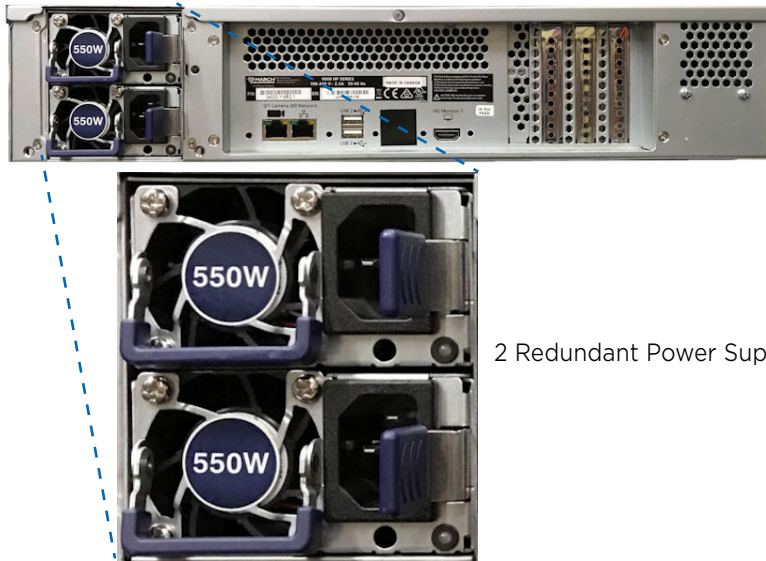
When you connect a monitor to the HD Output you can display the video from one or more cameras. You can change the display time, choose which cameras to display, show the cameras in various size grids, and change the order that the cameras display using the Administrator Console. For more information, see the *Administrator Console User Manual* or online Help.

Power Connections for Redundant Power Supply

The power connections for the redundant power supply are located on the back of the unit.

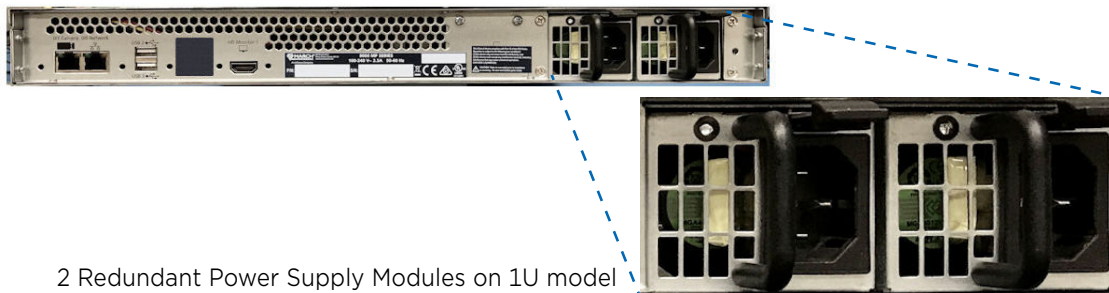
The redundant power supply contains two power supply modules. Each power supply module is capable of powering the entire recorder, if necessary. If one module fails, the other module powers the recorder alone until the failed module is replaced. The switch between the power supply modules is seamless, so that normal use of the recorder is not affected.

2U model



2 Redundant Power Supply Modules on 2U model

1U model



2 Redundant Power Supply Modules on 1U model

You must connect the unit to two power outlets using two connected AC power cords. If one of the power supply modules is not connected, an alarm sounds and an alert is generated.

- An alarm sounds and a software alert is generated if one of the power supply modules fails or is not connected.
- You can silence the alarm by reconnecting the cable or replacing the failed module. See “Replacing a Redundant Power Supply Module” on page 29.
- The LED on the back of the failed 2U power supply module is solid amber, the LED on the back of the failed 1U power supply module is unlit. (The LED on a correctly functioning power supply module is solid green.)

Important: Ensure that you only use the AC power cords supplied with your recorder unit. Failure to use the correct power cords can result in damage to the power supply or unexpected power loss.

Power Supply Module LEDs

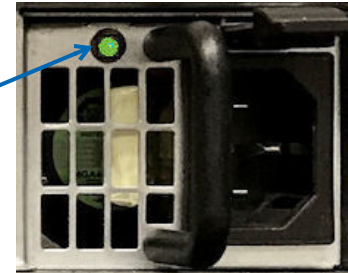
Each power supply module has an LED to indicate status.

Note: The following photos do not show the power cords.

2U power supply module



1U power supply module



Status LED

The following table lists the details of the LEDs for the 2U power supply modules.

2U Recorder — Power Supply Module LED Status

LED State	Power Supply Condition
Off	No AC power available.
Flashing Green	AC power on standby - the system is in the process of shutting down after using the power On/Off pinhole to safely shut down the recorder unit.
Solid Green	AC power available, module is functioning correctly.
Flashing Amber	Power supply warning, but the power supply continues to operate. (Temperature too high, current too high, fan too slow.)
Solid Amber	AC cord unplugged, AC power lost from this module, or module failure. Power supply critical event.

The following table lists the details of the LEDs for the 1U power supply modules.

1U Recorder — Power Supply LED Status

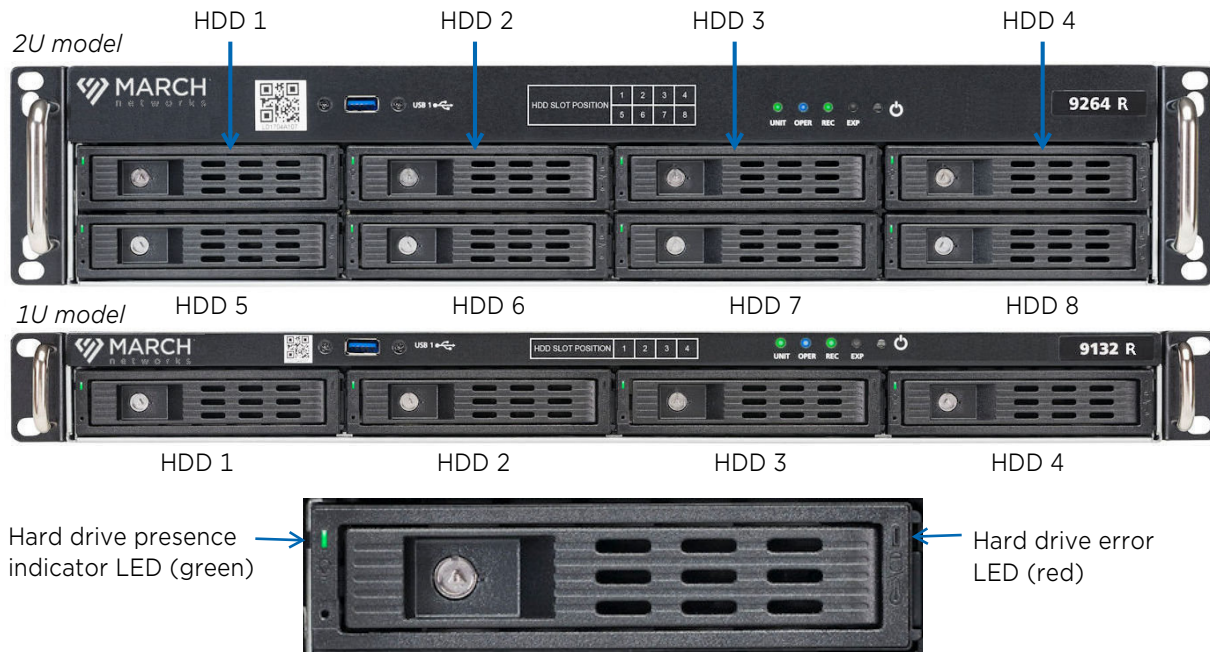
LED State	Power Supply Condition
Off	No AC power available or module failure.
Green	AC power available, module is functioning correctly.

Hard Drives

You can install four, six, or eight hard disk drives (HDD) in the 9248 R or 9264 R 2U models, and four hard drives in the 9116 R, 9124 R, and 9132 R 1U models. The units must conform to these drive options to support RAID.

Hard drives in the 9000 R series are hot swappable: you can remove and replace a hard drive without powering off the recorder.

A table with the HDD slot position numbers is printed on the front of each recorder for easy reference.



The unit uses Serial ATA (SATA) hard drive technology. The integrated RAID controller offers either RAID 5 or RAID 6 support. A hot spare drive is available in the 9248 R or 9264 R models if purchased with this configuration. The hot spare automatically replaces a failing/failed drive in the RAID array.

The 9116 R, 9124 R, and 9132 R 1U models require that all four hard drives are in place to support the RAID array.

The 9248 R or 9264 R 2U models require that either four, six, or eight hard drives are in place to support the RAID array.

Each hard drive is located inside a lockable caddy which opens with a key, so that you can remove or replace the hard drive.



Hard drive caddy open in 2U model

For information about installing hard drives, see “Replacing a Hard Drive” on page 27.

Hard Drive Error LED Status



Hard drive error
LED (red)

When the recorder is operating, the hard drive error LED has the following states:

- **Off**
Drive is functioning normally.
- **On solid (red)**
Problem with the drive.
Use the Administrator Console or Command Client software application to review the health alert and determine a possible resolution. For more information, see the *Administrator Console User Manual* or *Command Enterprise and Client User Guide*, available from the March Networks Partner Portal website.
- **Flashing**
All hard drives flash while RAID is rebuilding, until the rebuild is complete and stable.

Hard Drive Array - Important Considerations

- If you have to replace a hard drive in the array, ensure that the replacement hard drive is either a brand new drive or has been pre-formatted to clear any other data from it. The RAID array will not rebuild if the replacement disk already contains data.
- Do not place a RAID formatted hard drive into a non-RAID recorder or a non-RAID investigation station. You will lose all the data on the RAID hard drive.
- The 9000 R Series IP recorder with RAID is available with various hard drive capacities, but each of the drives in one recorder must be the same capacity to support RAID.
Note: You cannot rebuild the RAID by replacing a hard drive with a smaller size hard drive. For example, in a RAID configuration with four 12 TB hard drives, you cannot replace one of the drives with an 10 TB hard drive.
- If a health alert informs you that a RAID hard drive has failed for any reason, replace or fix the hard drive as soon as possible to avoid losing any data. The RAID configuration requires all four, six, or eight hard drives, and if more than one drive fails, you can lose all data. RAID Health alerts are monitored using the Administrator Console software.
For more information on health alerts, see the Administrator Console User Manual, available from the March Networks Partner Portal website.
- Do not attempt to replace more than one hard drive at a time, unless your recorder has RAID 6 (which supports replacement of 2 failed drives at a time). Without RAID 6, attempting to replace more than one drive at a time can produce unpredicted results and may cause data loss.
- Do not switch drives in the array to different slots, even when replacing a failed drive. This can produce unpredicted results and may cause data loss.
- Do not interrupt the recorder while RAID is in the process of rebuilding. For example, do not attempt to upgrade the recorder or place the recorder in investigation mode while RAID is rebuilding. Wait until the rebuild has successfully completed and RAID is back online.

Hot Spare Hard Drive

If you have a model with the hot spare hard drive option and a drive in the array fails, the system automatically begins to rebuild the failing/failed drive using the hot spare drive.

The hot spare drive is available on the 9248 R and 9264 R models with 6 or 8 hard drives. You must purchase the recorder with the hot spare option.

Health alerts inform you if there is a problem with a hard drive that requires a hot spare rebuild. You can use the Command Client or the Administrator Console software application user interface to monitor health alerts.

- In the Command Client, monitor the Health panel and/or the System Overview tab. See the *Command Enterprise and Client User Guide* for more information.
- In the Administrator Console, monitor the Alert Inbox in the Health Monitoring task type. See the *Administrator Console User Manual* for more information.

Tip: With an SSH client you can access the recorder using the Provisioning Interface and use the SHOWDISK command to check whether your RAID includes a hot spare drive.

Hot Spare Rebuild Process

- 1 If one of the hard drives in the array fails, the Administrator Console and the Command Client software applications display the following health alerts (you can check either application):

- **RAID Disk failed** — there is a problem with a hard drive.
- **RAID Rebuilding** — the system has triggered the hot spare rebuilding process.

- 2 You can replace the failed hard drive while the array rebuilds (see “Replacing a Hard Drive” on page 27).

Note: The rebuild process can take hours to days to complete, depending on your system. If using RAID 6, the system may have to rebuild two disks, and with the hot spare configuration there may be two copy back procedures. You can check the copy back process using the SHOWDISK provisioning command. Do not remove drives after replacing them during the rebuild.

- 3 When the rebuild is complete, the alert status changes to:

- **RAID degraded** — the rebuild is complete, but the process is not complete.

The process is not complete because in the RAID array, all drives must remain in the same assigned slots. To accomplish this, after the system completes the rebuild, it copies the information from the hot spare drive to the new drive that has replaced the failed drive. For the system to start the process of copying, all of the following must be true:

- a The rebuild is complete (the **RAID degraded** alert replaces the **RAID rebuilding** alert).
- b The failed hard drive is successfully replaced (see “Replacing a Hard Drive” on page 27).
- c The **RAID Disk failed** alert is resolved. You can see this in either the Command Client or the Administrator Console user interface:
 - Command Client Health panel, the State column for the alert displays a green check mark.
 - Administrator Console Alert Inbox, the State column for the alert displays **Resolved**.

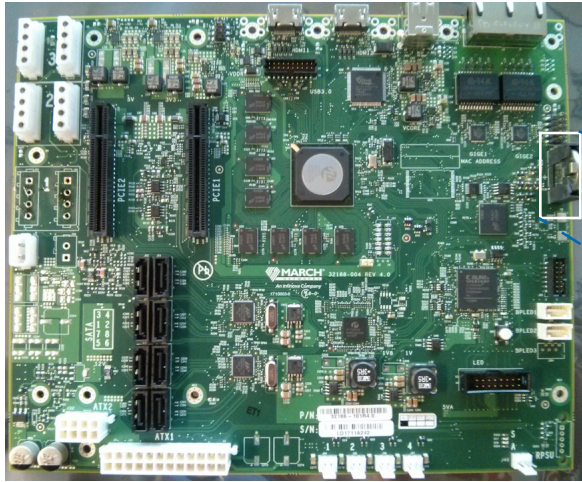
- 4 When the conditions above are all met (a, b, and c), the system starts to copy the information from the hot spare drive to the new drive, in the same slot as the original failed drive.

This ensures that when the process is complete, the drives in the array and the hot spare drive are all in the same slots that they were before the drive failure occurred, and the system is back to normal. The replaced drive is active and the hot spare is standing by to act as a spare again.

When the copy is complete and the system is back to normal, the **RAID degraded** alert changes state to a green check mark in Command Client and **Resolved** in the Administrator console.

NiCd Battery Pack and Lithium Battery

There is a NiCd battery pack and a lithium battery inside the unit.



View of main PCB without RAID card or connections

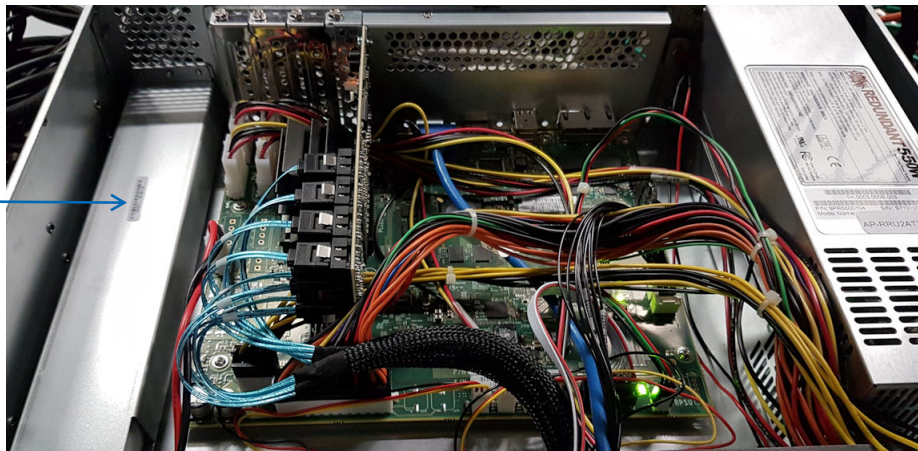


Rear of recorder

Lithium Battery

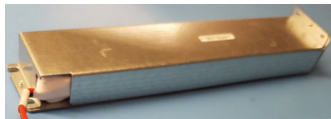
Rear of recorder

NiCd battery unit in the 2U model recorder



View of main PCB with RAID card and connections

NiCd Battery Pack



Used by the unit to allow graceful shut down during power outages. The unit will perform a graceful shut down if power is removed for more than 15 seconds.

Custom NiCd battery pack supplied by March Networks.

Lithium Battery

Provides backup power for the unit's RTC (Real Time Clock).

WARNING: Before you replace the batteries, read the "Battery Notices" on page 6. Only use approved batteries in the unit. Before you replace the batteries, power down the unit. Ensure the LEDs at the front of the unit are all off before you remove the cover.

ATTENTION : Avant de remplacer les piles, lisez les « Avis pour les batteries » à la page 6. Utilisez uniquement des piles approuvées dans l'appareil. Avant de remplacer les piles, éteignez l'unité. Assurez-vous que les voyants LED à l'avant de l'unité s'éteignent avant de retirer le couvercle.

Chapter 3

Unit Setup

This section of the guide provides instructions for setting up the unit. It includes the following tasks:

- “Mounting the Recorder” on page 26
- “Replacing a Hard Drive” on page 27
- “Replacing a Redundant Power Supply Module” on page 29
- “Turning the Recorder On and Off” on page 31

Once the preliminary setup is complete, specify the recorder’s initial configuration using the unit’s provisioning interface. For more information, see the *Provisioning Interface Technical Instructions*.

Then, specify basic device configurations using the March Networks Administrator Console. The Administrator Console application is included in the software installation package. For more information, see the *Administrator Console User Manual*, available for download from the March Networks Partner Portal website.

Mounting the Recorder

Rack-mount the unit in a standard 19-inch 4-post server rack. The mounting rack rails are included with the recorder.

WARNING: Do NOT attempt to mount the recorder in a 2-post server rack unless you are using the March Networks server shelf (part number 34916). If you do not have the server shelf, you must mount the recorder in a 4-post server rack.

ATTENTION : N'essayez PAS de monter l'enregistreur dans un rack de serveur à 2 montants, sauf si vous utilisez l'étagère de serveur March Networks (numéro de pièce 34916). Si vous ne disposez pas de l'étagère du serveur, vous devez monter l'enregistreur dans un rack de serveur à 4 montants.

Important: Ensure that you read the "Rack Mounting Safety Precautions" on page 8 before you mount your recorder in a rack, and conform to all the safety precaution instructions.

Important : Assurez-vous de lire les « Précautions de sécurité pour une installation dans un rack » à la page 9 avant de monter votre enregistreur dans un rack, et conformez-vous à toutes les consignes de sécurité.

To rack-mount the recorder in a 4-post rack

- 1 Position the recorder in the appropriate position.
- 2 Using the included rack rails, attach the recorder to the rack.
For details, consult the documentation accompanying the rack rails.

To rack-mount the recorder in a 2-post rack using the shelf

Instructions for mounting the recorder using the server shelf are available from the March Networks Partner Portal website.

Note: You can optionally desk mount the recorder. To ensure the unit meets the recommended operating temperature, the unit must be desk-mounted in a location that ensures that it is unobstructed on all sides.

Replacing a Hard Drive

This section describes how to replace a hard drive. These units **must** contain either four, six, or eight hard drives for the RAID array (either RAID 5 or RAID 6 support):

- The 9248 R or 9264 R 2U models must contain either four, six, or eight hard drives.
- The 9116 R, 9124 R, and 9132 R 1U models must contain four hard drives.

The hard drives in the 9000 R series are hot swappable: you can remove and replace a hard drive without powering off the recorder.

IMPORTANT:

- You must use a brand new hard drive or pre-format a used hard drive to clear any other data on it. The RAID array will NOT rebuild if the replacement disk already contains data.
- Do not place a RAID formatted hard drive into a non-RAID recorder or a non-RAID investigation station. You will lose all the data on the RAID hard drive.
- You cannot replace a hard drive in the array with a smaller size (less TB) hard drive. For example, in a RAID configuration with six 14 TB hard drives, you cannot replace a 14 TB hard drive with a 12 TB hard drive.
- If a health alert informs you that a RAID hard drive has failed for any reason, replace or fix the hard drive as soon as possible to avoid losing any data.
- Do not insert a hard drive from a recorder other than a 9000 R series with RAID. The 9000 R series with RAID does not support hard drives from any other recorder series, even for investigation purposes. If investigating a hard drive from a 9000 R series with RAID, insert the drive into a 9000 R series with RAID recorder.
- Do not attempt to replace more than one hard drive at a time, unless your recorder has RAID 6 (which supports replacement of 2 failed drives at a time). Without RAID 6, attempting to replace more than one drive at a time can produce unpredicted results and may cause data loss.
- Do not switch drives to different slots, even when replacing a failed drive. This can produce unpredicted results and may cause data loss.
- Do not interrupt the recorder while RAID is in the process of rebuilding. For example, do not attempt to upgrade the recorder or place the recorder in investigation mode while RAID is rebuilding. Wait until the rebuild has successfully completed and RAID is back online.
- See “Hot Spare Rebuild Process” on page 23 for details and important information about rebuilding with a hot spare drive.

Installation Requirements

The following are included in the packaging with the hard drive:

- four (4) screws for each hard drive (used to secure the hard drive to the bracket)

To replace a hard drive

- 1 Identify the caddy that contains the hard drive you want to replace and insert the key into the door lock.

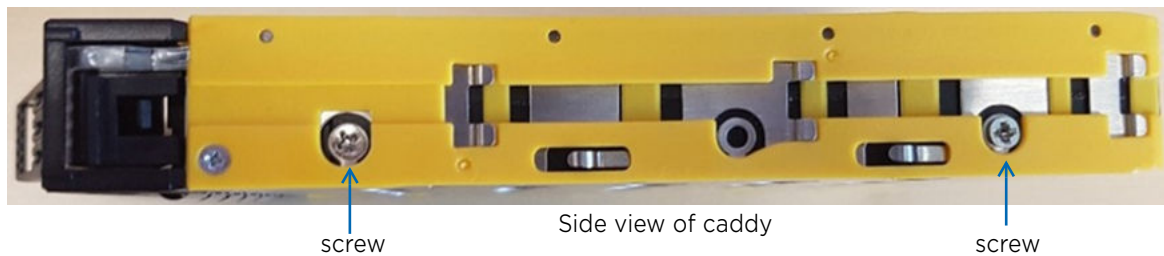
Note: Hard drives in the 9000 R series are hot swappable: you can remove and replace a hard drive without powering off the recorder.

Turn the key and pull the caddy door open. You can now slide the caddy out of the unit.



- 2 Loosen the four screws at the sides of the caddy hard drive bracket (two each side) and remove the hard drive from the caddy.

Note: Set the screws aside - you will use them to re-attach the hard drive.



- 3 Insert the new hard drive into the caddy bracket using the provided screws (four for each hard drive).
The side of the hard drive with the exposed electronics must be facing down (the label facing up). Install and tighten the two screws on one side of a hard drive before installing and tightening the two screws on the other side. When tightening the screws, use 4.3 in-lbs (inch pounds) of torque.
- 4 Slide the caddy back into the recorder unit, close the door, and turn the key to secure the hard drive.

Replacing a Redundant Power Supply Module

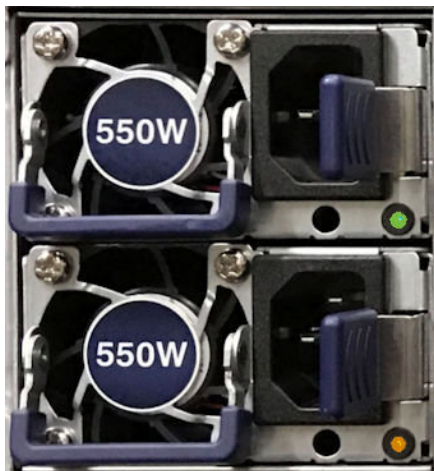
On each 9000 R with RAID unit, the power supply has two modules. Each power supply module is capable of powering the entire recorder, if necessary. If one module fails, the other module powers the recorder alone until the failed module is replaced. You must replace a failed power supply module as soon as possible in order to ensure that the unit does not lose power completely. The procedure for replacing a power module is slightly different depending on the recorder model.

Replacing a Redundant Power Supply Module in a 2U Recorder

The power supply modules for the 2U recorder have a lever at the right side of each module to unlock the module from the recorder unit. The functioning power supply module remains plugged in so that the recorder never loses power during the replacement process.

To replace a redundant power supply module in a 2U recorder

- 1 The LEDs on the back of the power supply modules indicate which module has failed and requires replacing. Only unplug the power cord from the failed module. DO NOT unplug the functioning module.

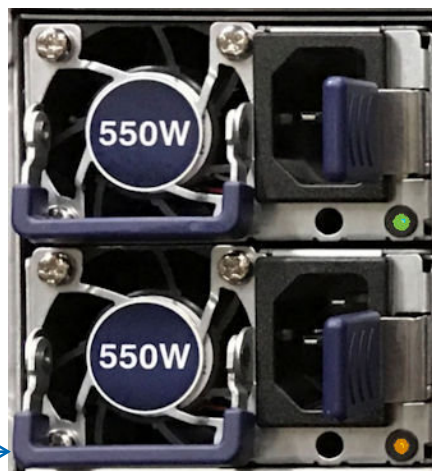


Note: Photo does not show power cords. Do not unplug functioning module.

Green LED indicates this module is functioning correctly

Amber LED indicates failure

- 2 On the module that you want to replace, move the lever at the right of the module to the left to unlock the module from the recorder unit.



Move this lever to the left

Handle of module

- 3 Lift up the handle of the module and use it to pull the module out of the recorder.
 - 4 Insert the new power supply module into the recorder until it clicks into place.
 - 5 Plug the AC power cord into the new power supply module.
- The LED on the new module turns green to indicate that it is functioning correctly.

Replacing a Redundant Power Supply Module in a 1U Recorder

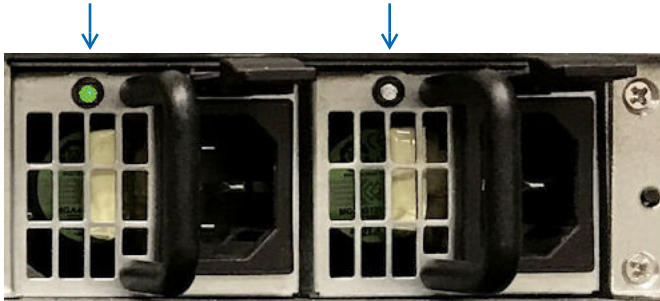
The power supply modules for the 1U recorder have a lever at the top right of each module to unlock the module from the recorder unit. The functioning power supply module remains plugged in so that the recorder never loses power during the replacement process.

To replace a redundant power supply module in a 1U model

- 1 The LEDs on the back of the power supply modules indicate which module has failed and requires replacing. Only unplug the power cord from the failed module. DO NOT unplug the functioning module.

Green LED indicates module
is functioning correctly

Unlit LED indicates
module not functioning



Note: Photo does not show power cords. Do not unplug functioning module.

- 2 On the module that you want to replace, move the lever at the top right of the module down to unlock the module from the recorder unit.

Move lever down



Handle of module

- 3 Pull the handle of the module so that the module slides out of the recorder.
 - 4 Insert the new power supply module into the recorder until it clicks into place.
 - 5 Plug the AC power cord into the new power supply module.
- The LED on the new module turns green to indicate that it is functioning correctly.

Turning the Recorder On and Off

All models have power connectors on the back of the unit to plug in the two AC power cords (for the redundant power supply).

There is a power On/Off pinhole on the front of the recorder.

Power connectors on 2U models



Power connectors on 1U model



To turn the recorder off and on gracefully

- 1 Insert a paper clip into the power On/Off pinhole and press gently to power down the recorder safely. Using the power On/Off pinhole ensures a graceful shutdown.

Note: Wait for the front panel LEDs to turn off completely. This indicates that the recorder is safely powered off.

- 2 To turn the recorder back on, insert a paper clip into the power On/Off pinhole and press gently to power up the recorder safely.

The front panel LEDs allow you to monitor the recorder's status as it starts up.

Glossary

Administrator Console

A configuration and maintenance tool that lets security and IT staff customize and maintain recorders in a central or local manner.

FPS

Frames per second. A measurement of the streaming rate, at which the video is recorded.

LED

Light emitting diode. Indicates the recorder's status.

NiCd battery

Nickel-Cadmium battery. Provides backup power during power shortages.

PCBA

Printed Circuit Board Assembly.

PTZ

Pan tilt zoom. A camera that you can remotely control using either a device controller connected to your computer, or using software controls.

RAID

Redundant Array of Independent Disks. A data storage method that combines multiple physical disk drives into one or more logical units for data redundancy and performance improvement.

Recorder

Devices at your site that capture, store, and stream audio, video, and text data from connected devices.

SATA

Serial ATA (Serial Advanced Technology Attachment). A standard for connecting hard drives to a motherboard. The SATA standard is based on serial signaling technology.

USB

Universal serial bus. An interface between the recorder and add-on devices.

Company Overview

March Networks® helps organizations transform video into business intelligence through the integration of surveillance video, analytics, and data from business systems and IoT devices. Companies worldwide use our software solutions to improve efficiency and compliance, reduce losses and risk, enhance customer service and compete more successfully. With deep roots in video security and networking, March Networks is also recognized as the leader in scalable, enterprise-class video management and hosted services. We are proud to work with many of the world's largest financial institutions, retail brands, cannabis operators and transit authorities, and deliver our software and systems through an extensive distribution and partner network in more than 70 countries. Founded in 2000, March Networks is headquartered in Ottawa, Ontario, Canada. For more information, please visit www.marchnetworks.com.

Customer Support and Assistance

Certified partners can telephone our Technical Support team Monday to Friday during business hours or email at any time.

North America, South America, & Asia Pacific

Telephone – 1 613 591 1441
Toll Free (US & Canada) – 1 800 472 0116
Email – techsupport@marchnetworks.com

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Telephone – +39 0362 17935 extension 3
Email – supporteurope@marchnetworks.com

If you have purchased a March Networks solution through one of our Certified Partners, please contact your representative directly for first level technical support.