March Networks

8516 Hybrid NVR with RAID

Models 8516 SR and 8516 RR

Installation Guide

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Contents

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: HNVR HS, HNVR HR

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 operated 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, and 2011/65/EU. 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 or RoHS recast (directive 2011/65/EU) and its amendments
- 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

Before you access any components located inside the unit, turn the key counter-clockwise, to the OFF position. After the status LEDs turn off, remove the power cord from the unit to prevent injury.

Only qualified service personnel are to access the inside of the unit.

An AC power cord is provided with a grounded attachment plug for the external power supply. 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.

When connected to an outdoor camera, the screen of the camera's coaxial cable must to be properly grounded (connected to earth). Cable distribution systems are subject to the National Electrical Code (NEC) in the United States and the Canadian Electrical Code (CEC) in Canada.

If you carry or move the NVR 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

Avant d'accéder aux composantes internes de l'unité, vous devez enlever le câble de pouvoir et attendre que toutes les lumières d'état ('STATUS LED') de l'unité soient éteintes.

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 le bloc d'alimentation électrique. 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.

Lorsque relié à une caméra installée à l'extérieur, l'enveloppe du câble coaxial de la camera doit être mise à terre de façon adéquate. Les systèmes de distribution câblés sont sujet au code électrique National (NEC) au États-Unis et au code électrique Canadien (CEC) au Canada.

Si vous transportez ou déplacez l'unité NVR 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 évents, les ports ou toute autre ouverture dans l'unité.

Fuse

CAUTION: For continued protection against risk of fire, replace only with same type and rating of fuse.

For more information, see "Power Connector and Fuse Compartment" on page 23.

Fusible

ATTENTION : Pour une protection soutenue contre les risques d'incendie, remplacer seulement avec un fusible de même type et classe.

Pour plus d'informations, consultez « Power Connector and Fuse Compartment » à la page 23.

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.

Model Definition Information

The HNVR HS Series and the HNVR HR Series are regulatory models for the 8516 SR and the 8516 RR 16 Channel Hybrid NVRs. The model information is outlined in the following table.

Certification Regulatory Model	Includes the following NVRs:
HNVR HS	8516 SR
HNVR HR	8516 RR

Chapter 2

Feature Overview

The 8516 Hybrid NVR with RAID (Redundant Array of Independent Disks) is a 16-channel recording platform with integrated RAID 5, able to support both analog and high-resolution IP cameras. The models included are the 8516 RR and the 8516 SR.

The 8516 NVR 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 an 8516 NVR using either of the management platforms offered by March Networks: Command or Visual Intelligence. 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.

The 8516 NVR is available in two distinct types: the **RR model** (8516 RR), which comes with a docking station for mounting in a rack, and the **SR model** (8516 SR), which is intended to be placed on a flat surface.

This section of the installation guide contains the following information:

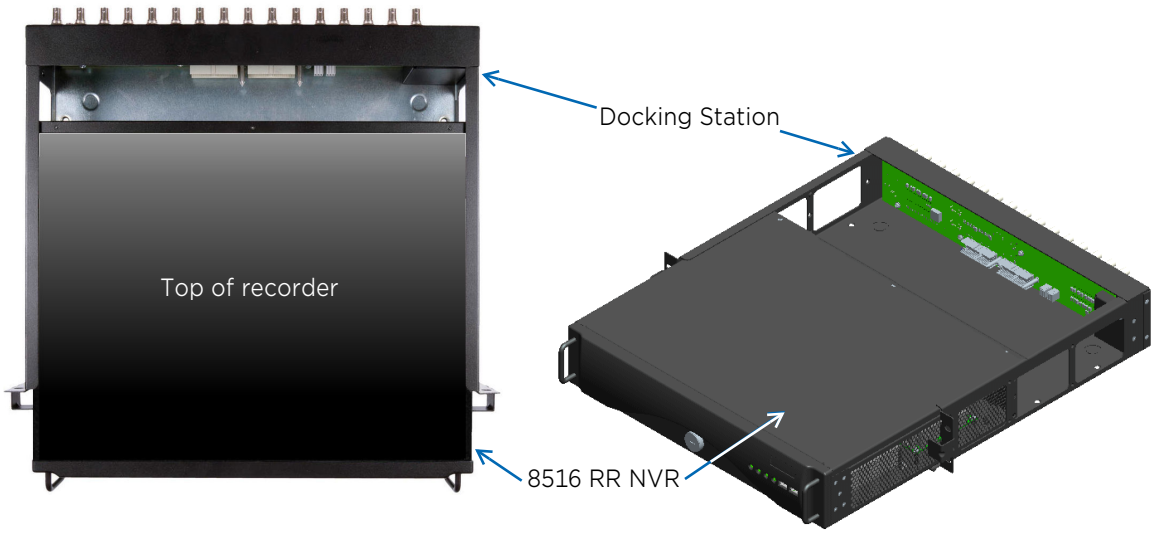
Key Features

The 8516 Hybrid NVR with RAID comes in two distinct types: the **RR model** (8516 RR) and the **SR model** (8516 SR). The RR model comes with a docking station and can be mounted in a rack, the SR model has a backplane and is intended to be placed on a flat surface such as a desktop.

Some of the key features and benefits of the 8516 Hybrid NVR with RAID include:

- **Camera Capacity:** 16 total cameras. The recorder accommodates any combination of analog or IP cameras, as long as the total number of cameras is 16.
- **Concurrent Frame Rate:**15 FPS per channel at 4CIF, 30 FPS at 2CIF / CIF
- **IP Camera Bandwidth:** 16 channels at 3 mbps = 48 mbps total
- **RAID:** Integrated RAID controller - RAID 5 support using 4 hard drives. RAID 5 offers the best overall balance of data protection and performance, and makes the most efficient use of drive capacity.
- **Hard Drives:** Each unit must have four hard drives to support RAID. Various drive capacities are available, but each of the four drives must be the same capacity to support RAID (for example, 4 x 8TB or 4 x 12TB).
- **Video compression:**
  - Analog cameras — H.264 with multi-level encoding
  - IP cameras — H.264, MPEG4, JPEG
- Eight alarm inputs, four switches, plus four mono audio inputs and two mono audio outputs, for enhanced audio/video security coverage.
- High-capacity internal storage: four SATA RAID hard drives
- 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.
- QR code - use March Networks' free GURU Smartphone App to scan the recorder's front panel QR code for instant product information, like serial number and warranty information.

The RR model recorders slide out of the docking station for easy installation and maintenance.



Packaging/Shipment Contents

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

- 8516 Hybrid NVR with RAID
- Docking station (RR model)
- Keys for activating unit power (and locking the unit in the docking station for the RR model)
- AC power cord
- Hard drive mounting screws - Four (4) screws per drive. If hard drives are installed, screws are in use.
- Data and power cables for the hard drives
- Instructions for downloading software and technical publications from the March Networks Partner Portal website.

Note: A wall-mounting kit can be purchased separately if required.

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 drives, caddies, and cables
- Back-up batteries
- Fans

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. Docking the unit without the cover can also cause alignment problems and damage the docking station connectors.

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:

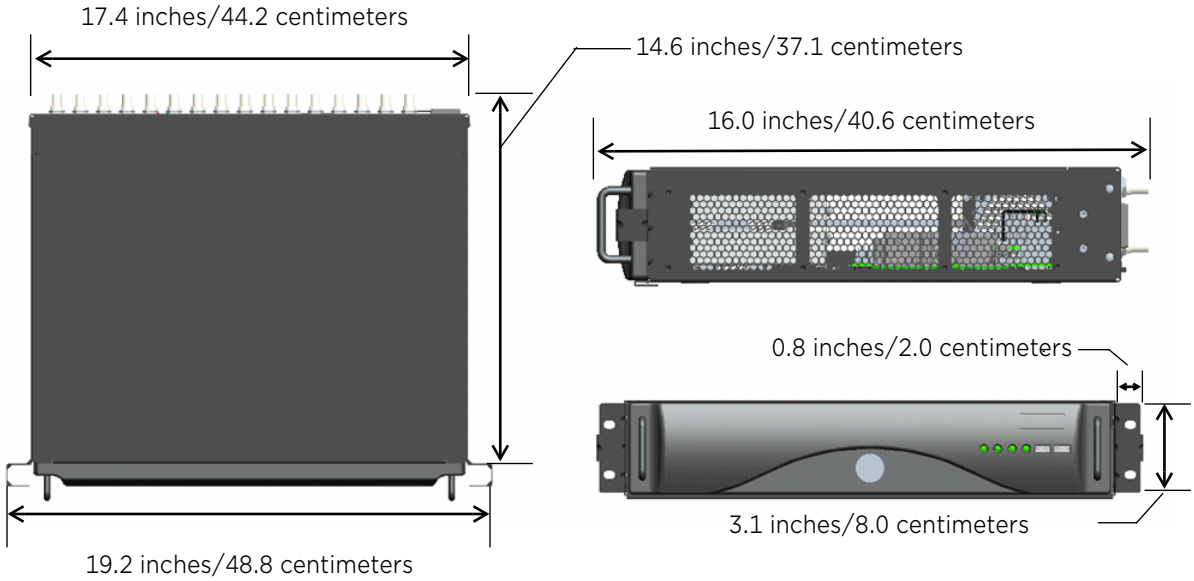
- Disques durs, caddies, et câbles
- Batteries de sauvegarde
- Ventilateurs

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. L'ancrage de l'unité sans le couvercle peut également provoquer des problèmes d'alignement et endommager les connecteurs de la station d'accueil.

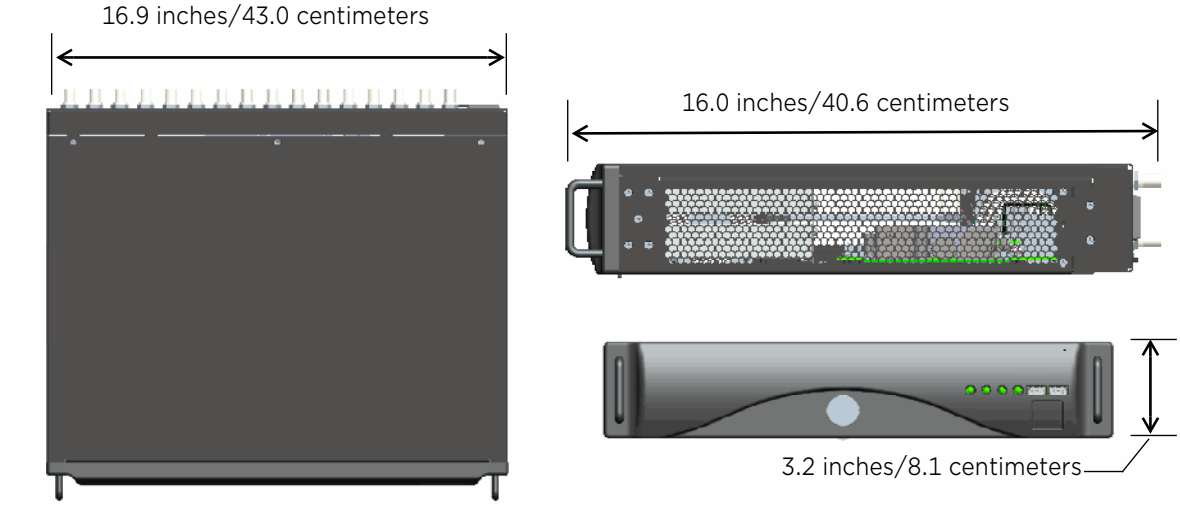
Specifications

This section contains the dimensions, weight, temperature ranges, and power ratings of the unit.

Dimensions of the RR Model (with Docking Station)



Dimensions of SR Model (with Backplane)



Weight

- RR models with docking station (no hard drives): 18.5 pounds / 8.4 kilograms
- SR models with backplane (no hard drives): 13.0 pounds/5.9 kilograms
- Each hard drive: Approximately 6 pounds / 2.8 kilograms

Operating and Storage Temperature

- Operating temperature: 41 to 104° Fahrenheit / 5 to 40° Celsius
- Storage temperature: -40 to 158° Fahrenheit / -40 to 70° Celsius

WARNING: The recorder and docking station (if required) 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 et la station d'accueil (si nécessaire) doivent être montés 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.

Power Ratings

- Power input: 100-240 volts AC input (auto-sensing)
- Current rating: 2.3 A
- Frequency range: 50-60 Hz
- Power consumption: 50 W (typical)

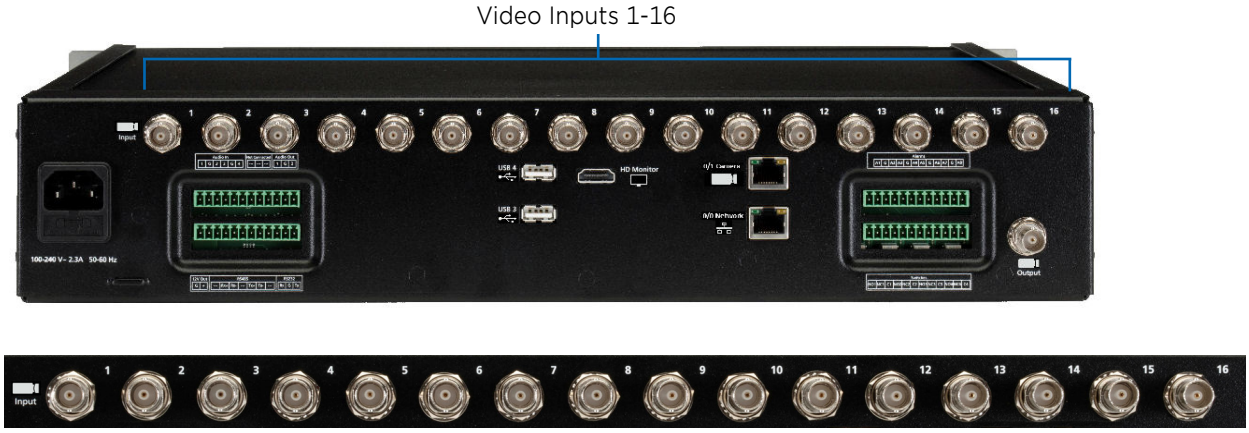
Video Inputs

There are 16 analog video inputs on the back of the unit. The IP cameras can connect to the recorder through a camera network on the camera Ethernet port (see “Ethernet Ports, USB Ports, Video and HD Monitor Output” on page 21). IP cameras are connected using a CAT5e cable or a cable of higher performance, such as CAT6 cable.

The number of IP cameras the unit supports depends on the number of analog cameras you are using.

The unit has 16 hybrid channels which can be used to include any combination of 0-16 analog cameras and 0-16 IP cameras, as long as the total number of cameras is 16. The 8516 does not support any
IP-only camera channels.

For example, if no analog cameras are in use, the 8516 model supports up to 16 IP video cameras. If no IP cameras are in use, it supports up to 16 analog cameras. You can combine IP and analog cameras (for example, 8 IP cameras and 8 analog cameras) as long as they add up to a total of 16 cameras.



Video Inputs on BNC Coaxial Connector

The analog video inputs are BNC coaxial connectors that support NTSC (North American) and PAL inputs.

Video Termination

Video termination for the 8516 is controlled through the Visual Intelligence software. You can use the March Networks Administrator Console application to view and modify the analog video termination.

For more information, see the *Administrator Console User Manual* or online Help.

Video Capture Rates

This section details the video inputs and associated video capture rates.

The 8516 supports the following resolutions for analog cameras:

- 4CIF — 704 x 480 (NTSC) or 704 x 576 (PAL)
- 2CIF — 704 x 240 (NTSC) or 704 x 288 (PAL)
- CIF — 352 x 240 (NTSC) or 352 x 288 (PAL)

The FPS (frames per second) values are across all 16 video inputs.

8516 Models

- **NTSC**: 15 FPS per channel (all 16 channels) = 240 FPS at 4CIF
- **PAL**: 13 FPS per channel (all 16 channels) = 200 FPS at 4CIF

IP Camera Video Inputs

The IP camera input capture rate is dependent on the resolution and quality of the images captured.

The IP cameras have a recommended maximum of 15 FPS per channel at 4CIF for the 8516 model.

The 8516 provides a capture rate of up to 3 mbps and 15 FPS per attached IP camera for 16 cameras (a total of 48 mbps of inbound traffic from 16 IP cameras).

- 16 channels at 3 mbps = 48 mbps

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.

Front Panel LEDs

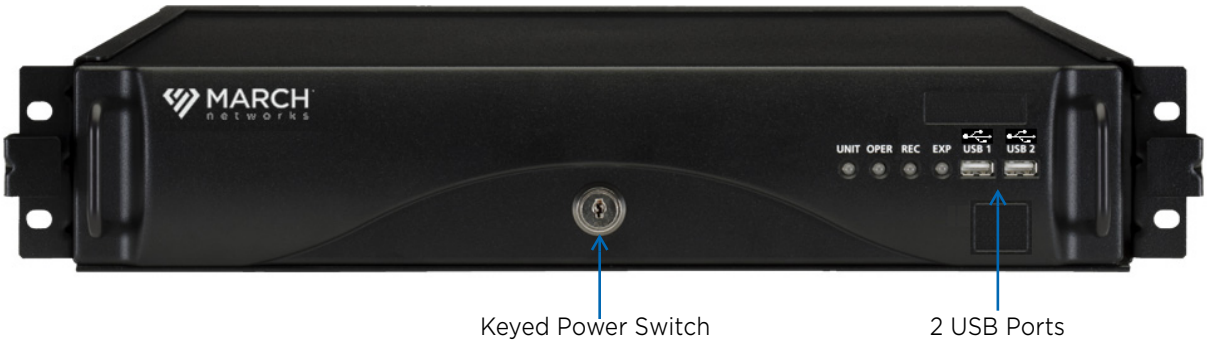
Unit LED The status of the unit.	Green	**Solid:** The unit's software and hardware are operating correctly. **Flashing:** The keyed power switch has been turned off or power has been removed — the system is waiting for software to complete the shutdown of the unit.
	Blue	**Solid:** The operating system is loaded but the unit's software application is still loading. **Flashing:** The unit is booting up after the keyed power switch has been turned on or after a software reboot.
	Red	The hardware watchdog timer has expired and reset the system.
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 *Administrator Console User Manual* or *Command Enterprise User Guide*, 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:** • 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.

Keyed Power Switch and Front USB Ports

There is a keyed power switch and two USB ports on the front of the unit.



Keyed Power Switch

If the unit has a docking station (RR model), when the unit is powered on, the locking mechanism prevents the unit from being undocked. Turning the key to the left initiates shut down. Once the LEDs are off, if the unit has a docking station, the unit can be safely removed from the docking station.

Two Front USB Ports

There are two USB ports on the front of the unit for connection of external peripherals. Each port provides up to 0.5 A to power peripherals with a USB cable.

The ports support USB version 2.0.

Note: Two more USB ports are available at the rear of the unit. For details, see “Ethernet Ports, USB Ports, Video and HD Monitor Output” on page 21.

12-Volt Out, RS-485, and RS-232

There is a 12-Volt Out connection, an RS-485 interface, and an RS-232 interface on the back of the unit.

Pinout

12-Volt Out

This connection is for powering external devices with a battery backed up source. It is intended for use with the March Networks 2316 Encoder.

Maximum 12 Watts.

The **G** indicates the ground connection pin and the **+** indicates the 12-volt positive connection pin.

RS-485 Interface

The RS-485 interface allows you to control a PTZ camera, with the following pins:

Pin	---	Rx+	Rx-	---	Tx+	Tx-	---
Definition	Unused pin	Input: Receive positive	Input: Receive negative	Unused pin	Output: Transmit positive	Output: Transmit negative	Unused pin

You can also use this to provide text capture with an RS-485 to RS-232 converter.

RS-232 Interface

The RS-232 interface allows you to provide text capture, with the following pins:

Pin	Rx	G	Tx
Definition	Input	Ground	Output

You can also use this to control a PTZ camera with an RS-232 to RS-485 converter.

Alarm and Switch Terminals

There are alarm and switch terminals on the back of the unit. Alarm and switch devices can connect to these.

Connecting an Alarm or Switch Device

Using the following procedure, you can connect alarm and switch devices to the terminals at the back of the unit.

Note: The 8516 NVR does not support End-of-Line (EOL) resistors. Only Open and Closed states are monitored.

To connect an alarm or switch device

1 Ensure the unit is powered down and the LEDs at the front of the unit are off.

2 Locate the appropriate alarm or switch terminals (refer to the graphic above).

3 Attach the device to the appropriate terminals:

For alarm devices:

- Use the G (ground) terminal closest to the alarm terminal when connecting the common wire.

  Note: The alarm input is open/short, dry contact only.

For switch devices:

- Connect the switch device common wire to the appropriate common (C) terminal.

  Note: The maximum voltage for a connected switch device is 60 volts DC input at 1 Amp or 60 Watts. Anything above 60 Watts must be handled by a second-stage relay control circuit, approved and validated by certified electrician.

- Depending on the switch's default state, connect the normally-open or normally-closed wire to the corresponding normally-open (NO) or normally-closed (NC) terminal, respectively.

4 After you connect all of the alarm and/or switch devices, you can turn on the unit.

Audio Terminals

Audio in and out terminals are available on the back of the unit. These terminals provide line level audio input and output.

Audio In Audio Out

Pinout		Description
Audio In	1	Signal for audio input channel 1. Connect the return to the “G” between audio input 1 and 2.
	2	Signal for audio input channel 2. Connect the return to the “G” between audio input 1 and 2.
	3	Signal for audio input channel 3. Connect the return to the “G” between audio input 3 and 4.
	4	Signal for audio input channel 4. Connect the return to the “G” between audio input 3 and 4.
	G	Return for the audio inputs. Each “G” is shared with 2 adjacent input channels. The 2 adjacent input channels are the only channels that should use each return.
Audio Out	1	Signal for audio output channel 1. Connect the return to the “G” between audio output 1 and 2.
	2	Signal for audio output channel 2. Connect the return to the “G” between audio output 1 and 2.
	G	Return for the audio outputs. The 2 adjacent output channels are the only channels that should use this return.

Audio Input

Connect an audio cable to the Audio In terminal block.

Use the audio cable to connect an audio input device, such as a microphone, to the unit.

If you are connecting a microphone to the unit, you must use a pre-amplifier to amplify the signal to line level. Place the pre-amplifier close to the microphone for best results.

Input specification: unbalanced, 10 kΩ, 1Vp-p (line level)

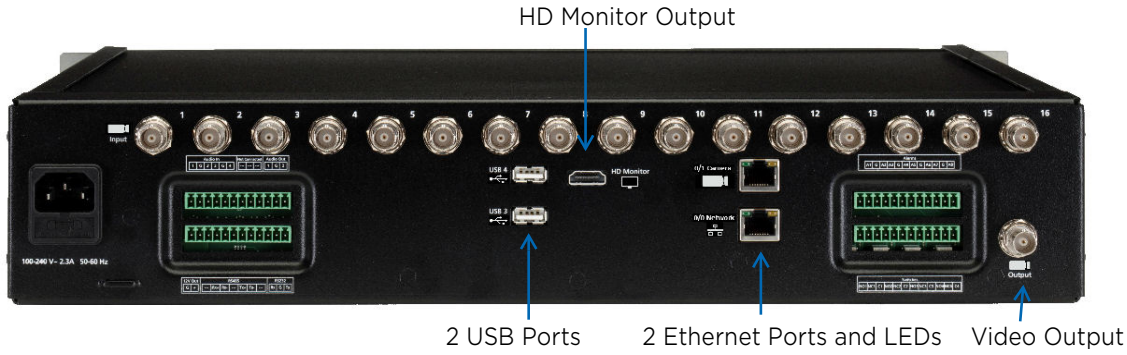
Audio Output

Connect an audio cable to the Audio Out terminal block. Use the audio cable to connect an amplified audio output device, such as an intercom or speaker, to the unit. Ensure that the audio output device (whether intercom or speaker) includes a built-in amplifier.

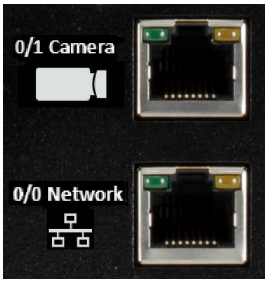
Output specification: unbalanced, 600 Ω, 1Vp-p (line level)

Ethernet Ports, USB Ports, Video and HD Monitor Output

There are two Ethernet ports, two USB ports, and a video output available on the back of the unit.



Two Ethernet Ports and LEDs



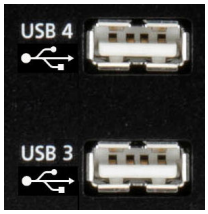
There are two gigabit Ethernet ports on RJ-45 connectors with LEDs to indicate the status of the connection. They each provide a 10/100/1000 BaseT auto-negotiated Ethernet connection on a standard network pinout.

The bottom port (0/0 Network) is the primary network port and the top 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.

Two Rear USB Ports



Two USB 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.

Note: Two USB ports are also available at the front of the unit. For details, see “Keyed Power Switch and Front USB Ports” on page 17.

Video Output

A switched video output on BNC coaxial connector outputs video to an external monitor.

By default, when you connect a monitor to the Video Output, the video from all connected analog cameras is displayed on the monitor for 5 seconds per camera. You can change the display time, choose which cameras to display, add IP cameras, 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.
Supports NTSC/PAL output (matches input format).

HD Monitor Output

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

Offers a 16:9 aspect ratio and 1080p resolution.

Display Monitor

By default, when you connect a monitor to the HD Output, the video from all connected analog cameras is displayed on the monitor for 5 seconds per camera. You can change the display time, choose which cameras to display, add IP cameras, 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.

Local Control

You can also access the NVR through a Local Control interface which you view using the monitor attached to the HD output. By default, local control is disabled. You can enable local control by using the **setlc** command on the recorder's built-in Provisioning Interface. Enabling local control disables the display monitor feature on the HD output, but the display monitor feature is still available on the Video Output.

For more information on the Provisioning Interface, see the *Provisioning Interface Technical Instructions*, available for download from the March Networks Partner Portal.

For more information on using Local Control, see the *8000 Series NVR Local Control Addendum* or the *Local Control for the 8000 Series NVR Quick Start Guide*, available for download from the March Networks Partner Portal.

Power Connector and Fuse Compartment

The power connector and fuse compartment are located on the back of the unit.

Power Connector

Connects the docking station to a power source via a connected power cord.

For the unit's power ratings, see "Specifications" on page 12.

For information on powering the unit, see "Turning the Unit On and Off" on page 40.

Fuse Compartment

Contains one type "T" 5 millimeter x 20 millimeter glass fuse, rated for 2.5 A and 250 volts AC.

Replacing the Fuse

The fuse is located in the fuse compartment at the base of the AC power cord connector.

To replace the fuse, power down the unit, remove the AC power cord from the rear of the docking station, and then remove the fuse compartment.

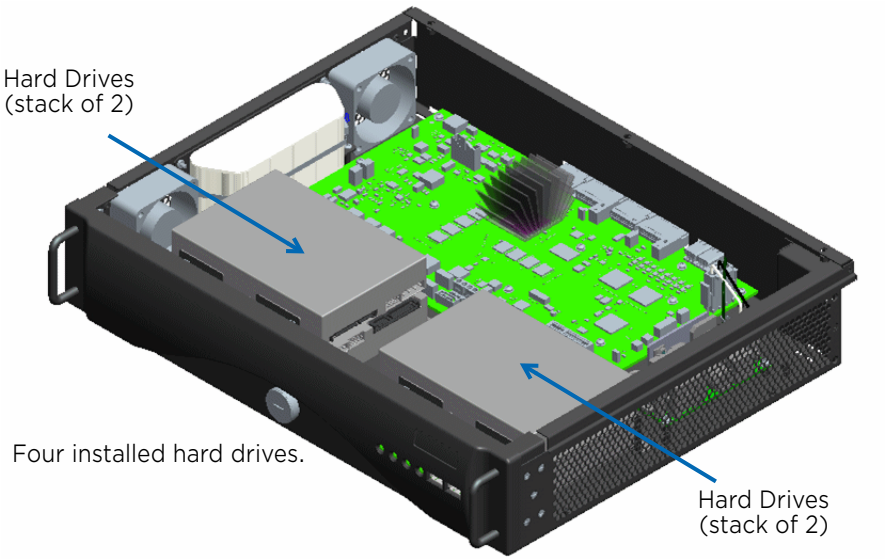
Replace the damaged fuse with a type "T" 5 millimeter x 20 millimeter glass fuse, rated for 2.5 A and 250 volts AC.

WARNING: Do not attempt to replace the fuse while the unit is powered, or while the AC power cord is attached to the docking station, as you may suffer serious personal injury. Consult an electrician or a qualified service technician if you are unfamiliar with fuse replacement. For information about powering down the unit, see "Turning the Unit On and Off" on page 40.

ATTENTION : N'essayez pas de remplacer le fusible lorsque l'appareil est sous tension ou lorsque le cordon d'alimentation secteur est connecté à la station d'accueil, car vous pourriez subir des blessures graves. Consultez un électricien ou un technicien qualifié si vous n'êtes pas familier avec le remplacement des fusibles. Pour plus d'informations sur la mise hors tension de l'unité, voir « Turning the Unit On and Off » à la page 40.

Hard Drives

The unit must contain four hard drives to support RAID.



Hard Drive Details

The unit uses Serial ATA (SATA) hard drive technology.

Each unit has four hard drives. Various drive capacities are available, but each of the four drives must be the same capacity to support RAID (for example, 4 x 8TB or 4 x 12TB).

The integrated RAID controller offers RAID 5 support.

The unit requires that all four hard drives are in place to support the RAID array.

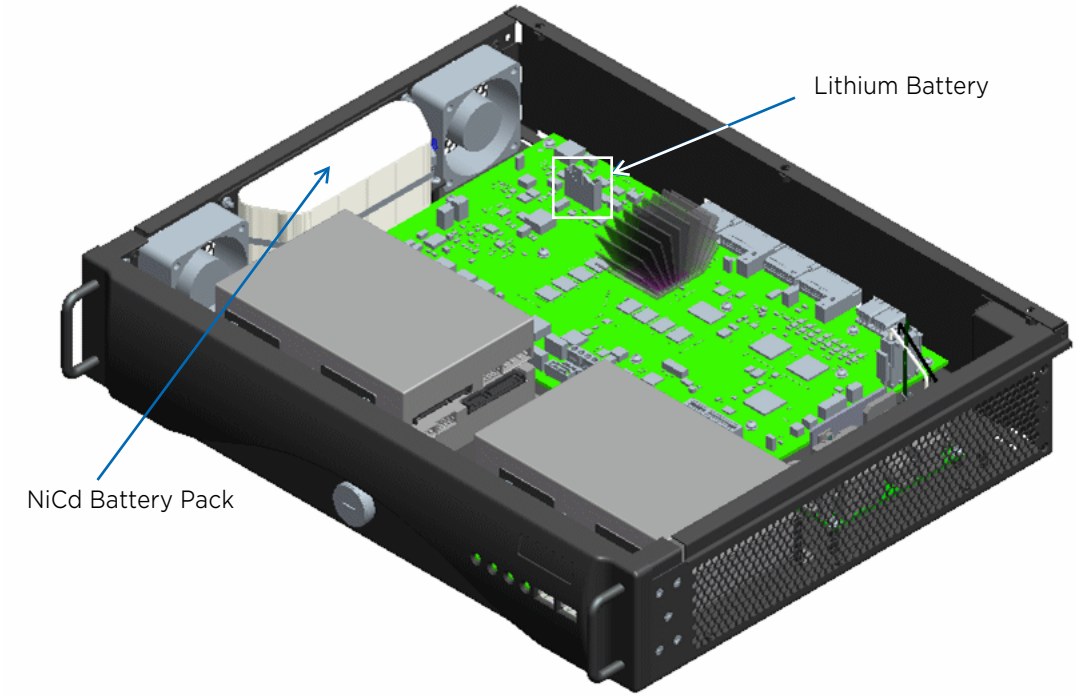
For information about installing hard drives, see “Replacing Hard Drives” on page 34.

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.
- You cannot rebuild the RAID by replacing a hard drive with a smaller size hard drive. For example, in a RAID configuration with four 12TB hard drives, you cannot replace one of the drives with a 10TB 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 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 interrupt the recorder while it is in the process of rebuilding. For example, do not attempt to upgrade the recorder or place the recorder in investigation mode while it is rebuilding. Wait until the rebuild has successfully completed and RAID is back online.

NiCd Battery Pack and Lithium Battery

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



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 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 and (if applicable) undock the unit. Ensure the LEDs at the front of the unit turn 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 et (le cas échéant) déconnectez 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 Hard Drives" on page 34
- "Turning the Unit On and Off" on page 40

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.

Mounting the Recorder

There are three methods for mounting the recorder: rack-mounting (RR model only), wall-mounting, and desk-mounting (SR model only). Choose the mounting method that best suits the location and your model.

Mounting Method	Applicable Models	Advantages
Rack-Mounting	RR Model Only	Supports standard 19″ rack-mounting (2U high). Multiple docking stations can be installed in a rack. The unit is easily accessible.
Wall-Mounting	All models	The unit can be placed in an unobtrusive location.
Desk-Mounting	SR Model Only	The unit can be placed on a desk or flat surface. The unit is easily accessible.

Rack-Mounting

Rack-mount the docking station in a standard 19-inch rack (RR model only).

To rack-mount the docking station

1 Position the docking station in the appropriate position.

2 Attach the docking station to the rack using four screws. For details about recommended screws, consult the documentation accompanying the rack.

WARNING: Airspace or airflow around the unit and docking station must provide ambient air of less than 104° Fahrenheit (40° Celsius) when measured above and below the unit and docking station.

ATTENTION : L'espace aérien ou le flux d'air autour de l'unité et de la station d'accueil doit fournir un air ambiant inférieur à 104 ° Fahrenheit (40 ° Celsius) lorsqu'il est mesuré au-dessus et en dessous de l'unité et de la station d'accueil.

Wall-Mounting

Wall-mount the docking station or the recorder unit using the brackets provided in the wall-mounting kit. The wall-mounting kit is not included with the recorder: it must be purchased separately.

WARNING: The unit must be mounted with the cooling fans and the drip trays at the bottom. Ensure the location where you wall-mount the unit can fully support the unit's weight. For information about the weight, see "Specifications" on page 12. To ensure the unit does not exceed the recommended operating temperature, the unit must be wall-mounted in a location where it is unobstructed on all sides.

ATTENTION : L'unité doit être montée avec les ventilateurs de refroidissement et les bacs d'égouttement en bas. Assurez-vous que l'endroit où vous fixez l'appareil au mur peut supporter pleinement son poids. Pour plus d'informations sur le poids, voir « Specifications » à la page 12. Pour garantir que l'unité ne dépasse pas la température de fonctionnement recommandée, l'unité doit être fixée au mur dans un endroit où elle n'est pas obstruée de tous les côtés.

Items Required to Wall-Mount

The following items are required to wall-mount:

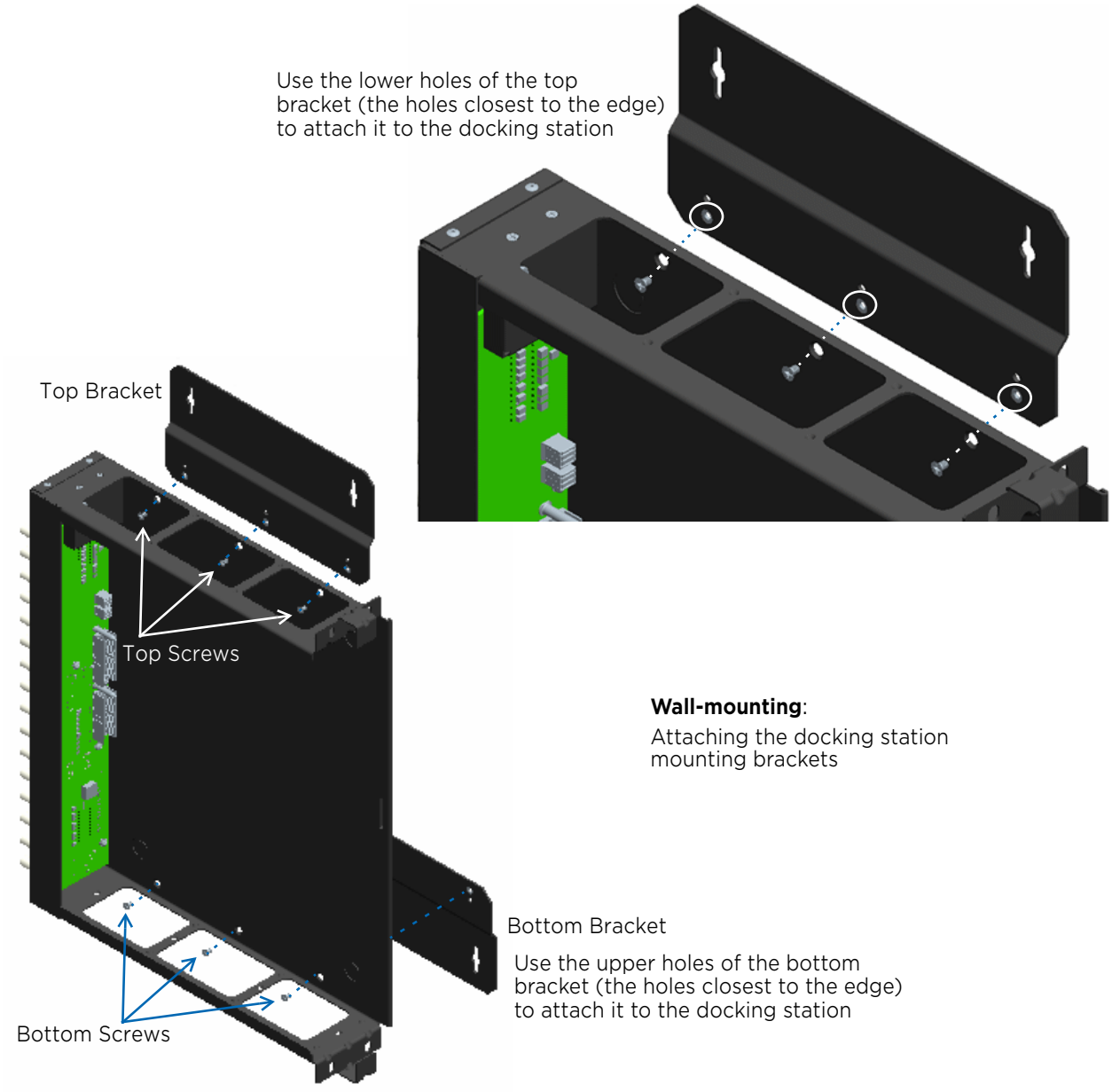
- **Mounting screws** — pan head, sheet metal screw, #14 x 1.5 inch, steel, four (4) screws required
- **Drywall anchors** — four (4) anchors required, to use with #14 mounting screws

Wall-Mounting with a Docking Station

If your NVR unit includes a docking station (RR model only), you attach the brackets and drip trays to the docking station, which holds the NVR unit on the wall.

To attach the docking station mounting brackets

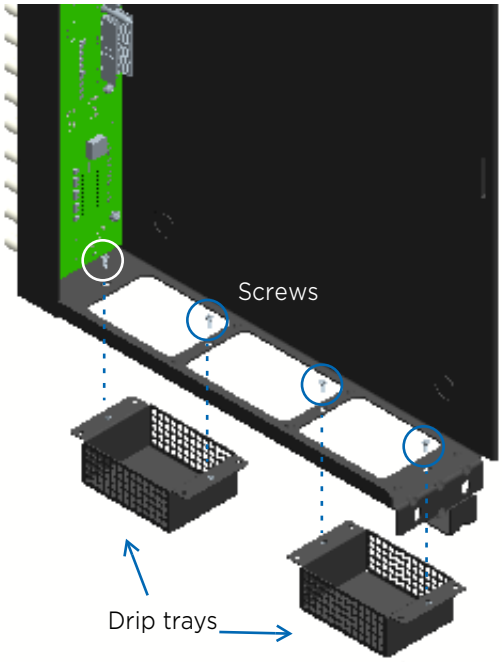
Use the large countersunk screws provided in the wall-mounting kit to attach the brackets to the docking station. The following figure shows how the brackets are attached to the docking station.



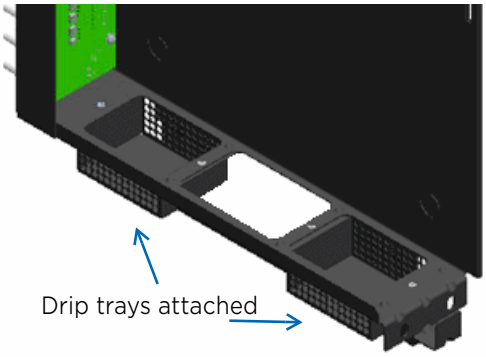
Wall-mounting:
Attaching the docking station mounting brackets

Attaching the Drip Trays to the Docking Station

Because the cooling fans are at the bottom of the recorder when wall-mounted, two drip trays are required. The drip trays and four small countersunk screws required to attach the trays to the docking station are included in the wall-mounting kit. It is recommended that you attach the drip trays to the docking station before you mount it on the wall.



Wall-mounting: Attaching the drip trays

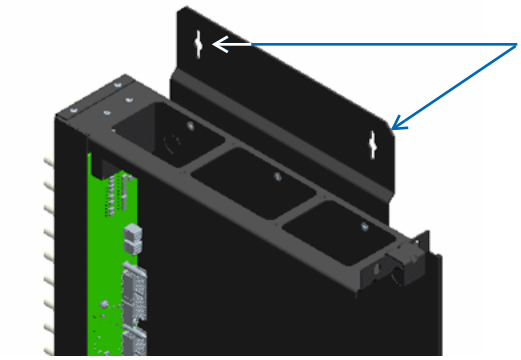


To wall-mount the docking station

1 Locate the left and right wall stud to which the recorder is to be mounted.

If the wall studs are behind drywall, use a stud finder to locate the wall studs, and then mark the wall stud location.

2 Mark the upper mounting screw locations, using the brackets attached to the docking station as a template. The wall mount holes are located 7.9 inches (20 centimeters) apart.



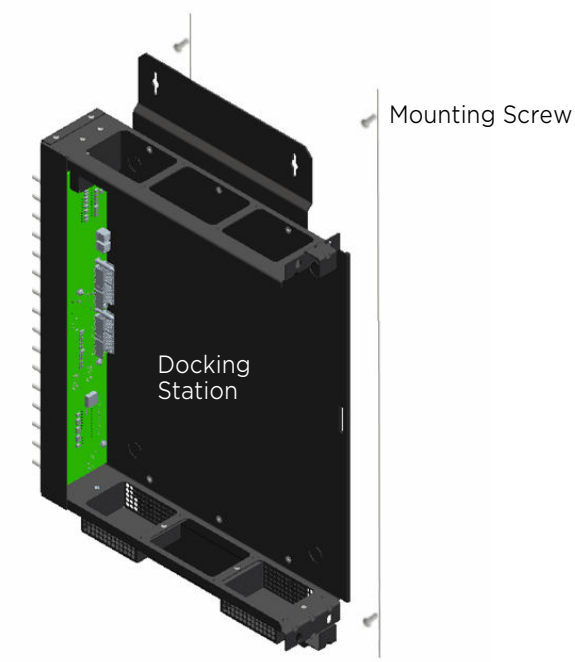
Wall-mounting: Upper mounting screw locations

Use the brackets to mark the upper mounting screw locations.

3 Install the upper mounting screws at the marked locations.
   - If the upper mounting location is in a wall stud, thread the screw directly into the wall stud.
   - If the upper mounting location is in drywall, first install a drywall anchor, and then thread the screw into the drywall anchor.

   Do not thread the mounting screws all the way in. The screw heads should protrude approximately 0.25 inches (0.64 centimeters) from the mounting surface so that you can hang the docking station on them.
4 Lift up the docking station and hang it on the upper mounting screws. Do not tighten the screws at this time.
5 Mark the locations of the two lower mounting holes.
6 Remove the docking station from the mounting screws and put it aside.
7 Install the lower mounting screws at the marked locations.
   - If the lower mounting location is in a wall stud, thread the screw directly into the wall stud.
   - If the lower mounting location is in drywall, first install a drywall anchor, and then thread the screw into the drywall anchor.

   Do not thread the mounting screws all the way in. The screw heads should protrude approximately 0.25 inches (0.64 centimeters) from the mounting surface so the recorder can be hung on them.



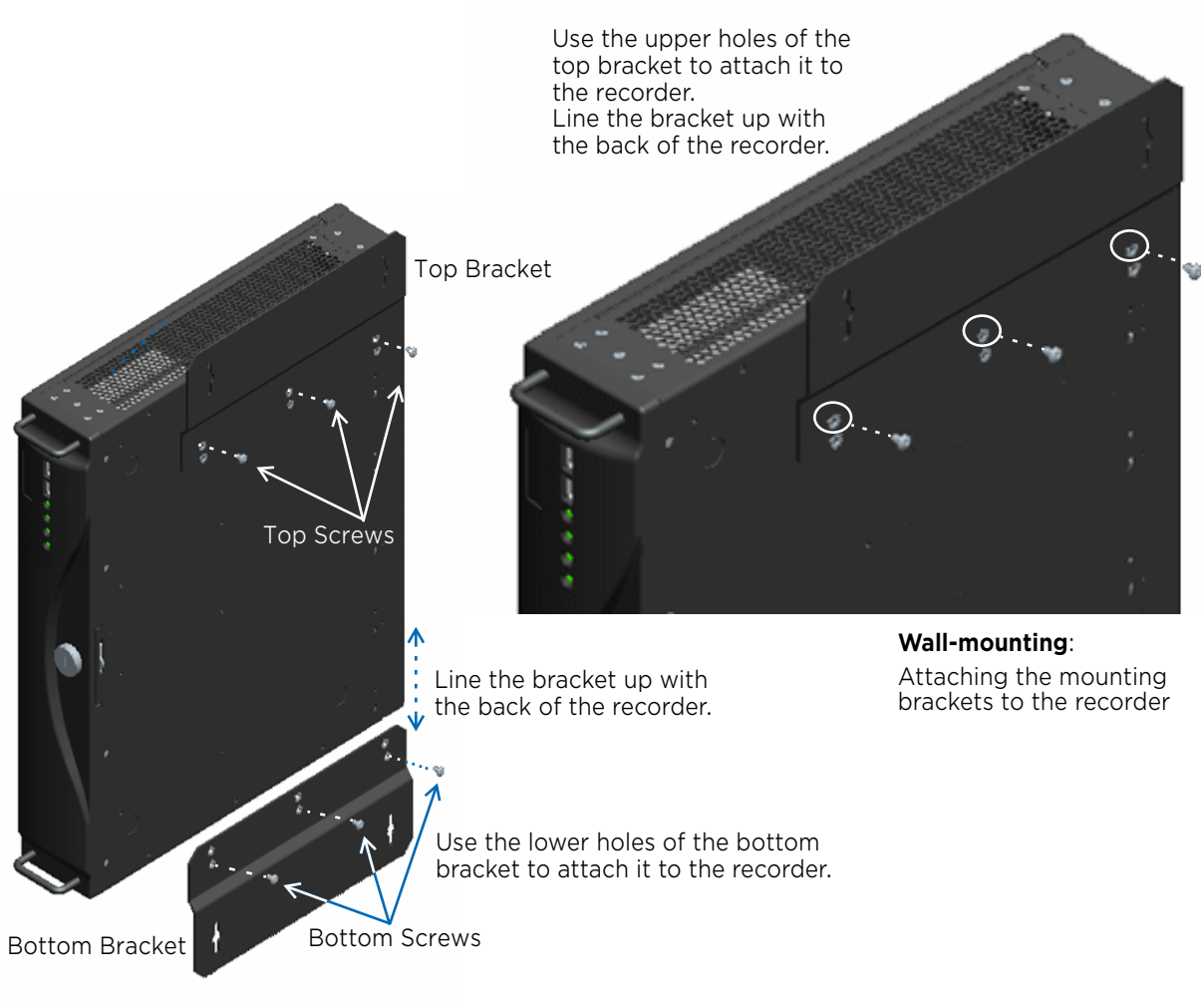
8 Hang the docking station on the mounting screws. The docking station drops approximately 0.5 inches (1.27 centimeters) when hung on the mounting screws. The screws lock into the mounting hole keyways, providing a positive locking mechanism.
9 Tighten the mounting screws.

Wall-Mounting without a Docking Station

If your NVR does not include a docking station (SR model), you attach the brackets and drip trays directly to the recorder unit.

To attach the mounting brackets to the recorder

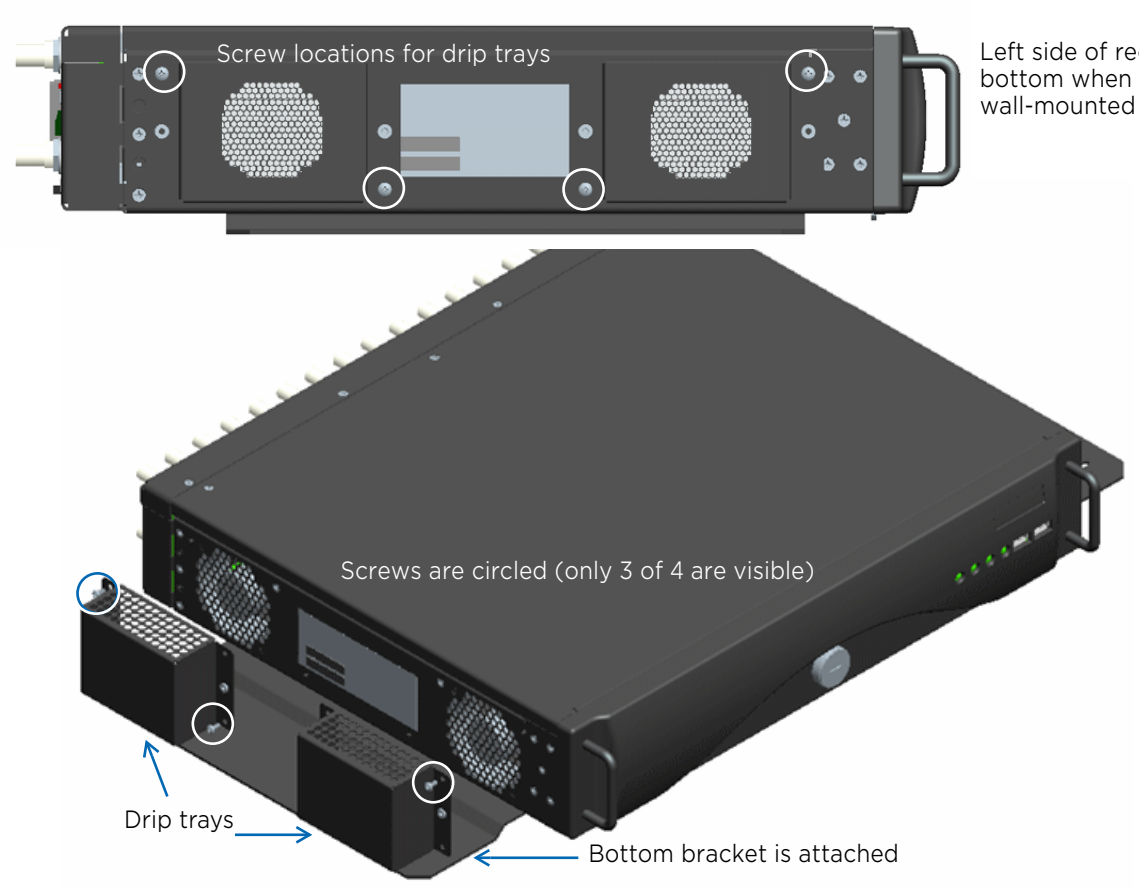
Use the large pan head screws provided in the wall-mounting kit to attach the brackets to the recorder. The following figure shows how the brackets are attached to the recorder.



Wall-mounting:
Attaching the mounting brackets to the recorder

Attaching the Drip Trays to the Recorder

Because the cooling fans are at the bottom of the recorder when wall-mounted, two drip trays are required. The drip trays and four small pan head screws required to attach the trays to the recorder are included in the wall-mounting kit. It is recommended that you attach the drip trays to the recorder before you mount it on the wall.

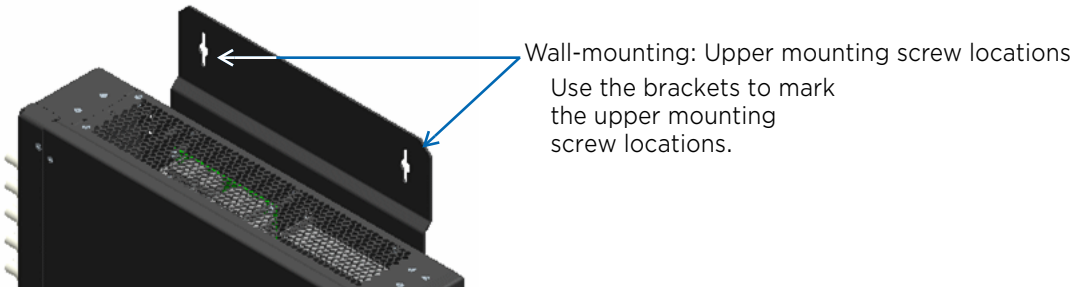


To wall-mount the recorder

1 Locate the left and right wall stud to which the recorder is to be mounted.

If the wall studs are behind drywall, use a stud finder to locate the wall studs, and then mark the wall stud location.

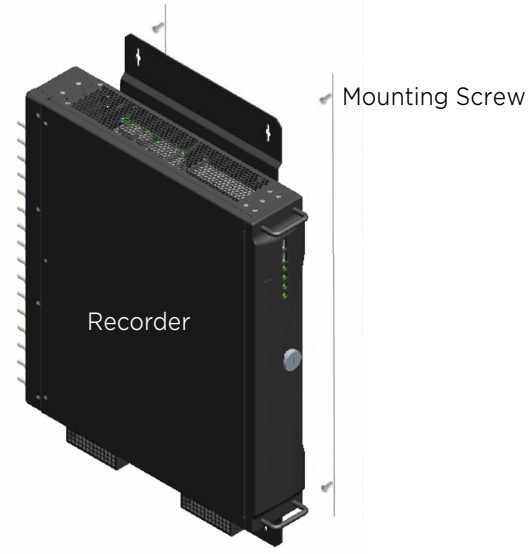
2 Mark the upper mounting screw locations, using the brackets attached to the recorder as a template. The wall mount holes are located 7.9 inches (20 centimeters) apart.



3 Install the upper mounting screws at the marked locations.
   - If the upper mounting location is in a wall stud, thread the screw directly into the wall stud.
   - If the location is in drywall, first install a drywall anchor, then thread the screw into the anchor.

   Do not thread the mounting screws all the way in. The screw heads should protrude approximately 0.25 inches (0.64 centimeters) from the mounting surface so that you can hang the recorder on them.
4 Lift up the recorder and hang it on the upper mounting screws. Do not tighten the screws at this time.
5 Mark the locations of the two lower mounting holes.
6 Remove the recorder from the mounting screws and put it aside.
7 Install the lower mounting screws at the marked locations.
   - If the lower mounting location is in a wall stud, thread the screw directly into the wall stud.
   - If the location is in drywall, first install a drywall anchor, then thread the screw into the anchor.

   Do not thread the mounting screws all the way in. The screw heads should protrude approximately 0.25 inches (0.64 centimeters) from the mounting surface so that you can hang the recorder on them.



8 Hang the recorder on the mounting screws. The recorder drops approximately 0.5 inches (1.27 centimeters) when hung on the mounting screws. The screws lock into the mounting hole keyways, providing a positive locking mechanism.
9 Tighten the mounting screws.

Desk-Mounting

The SR model is shipped with rubber feet attached to the bottom of the unit, so that you can safely mount it on a desk. The RR model is not intended for desk-mounting.

WARNING: 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.

ATTENTION : Pour garantir que l'unité respecte la température de fonctionnement recommandée, l'unité doit être montée sur un bureau dans un endroit qui garantit qu'elle est dégagée de tous les côtés.

Replacing Hard Drives

This section describes how to replace a hard drive (this unit **must** contain four to support RAID).

WARNING: The procedures contained in this section outline how to install components located inside the unit, requiring the removal of the cover. These procedures are to be performed by qualified service personnel only. When working inside the unit, ensure you take anti-static precautions.
Do not operate the unit with the cover off.

ATTENTION : Les procédures contenues dans cette section décrivent comment installer les composants situés à l'intérieur de l'unité, nécessitant le retrait du couvercle. Ces procédures doivent être effectuées uniquement par du personnel de service qualifié. Lorsque vous travaillez à l'intérieur de l'appareil, assurez-vous de prendre des précautions antistatiques. N'utilisez pas l'appareil avec le couvercle retiré.

Replacing a Hard Drive

The following procedure details how to replace a hard drive. This unit must contain four hard drives for the RAID array (RAID 5 support).

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. See “Hard Drive Array - Important Considerations” on page 24 for more information.

Installation Requirements

The following are included in the packaging with the recorder:

- 16 screws, four (4) for each hard drive (used to secure the hard drive to the bracket)
- four (4) data cables, one for each hard drive (attached to RAID card)
- four (4) power cables, one for each hard drive (attached to PCBA)

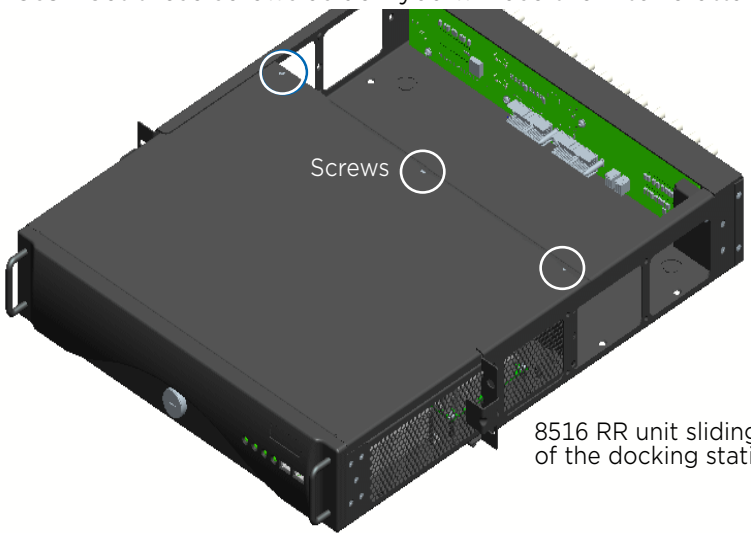
To replace one or more hard drives

1 Turn off the unit using the key and wait for the LEDs to turn off.

2 If the unit has a docking station (RR model), remove the unit from the docking station. If the unit does not have a docking station (SR model), you do not need to remove the unit from the backplane, as the screws on the cover of the unit are already accessible.

3 Remove the three (3) screws from the cover of the recorder.

Note: Set these screws aside - you will use them to re-attach the cover.

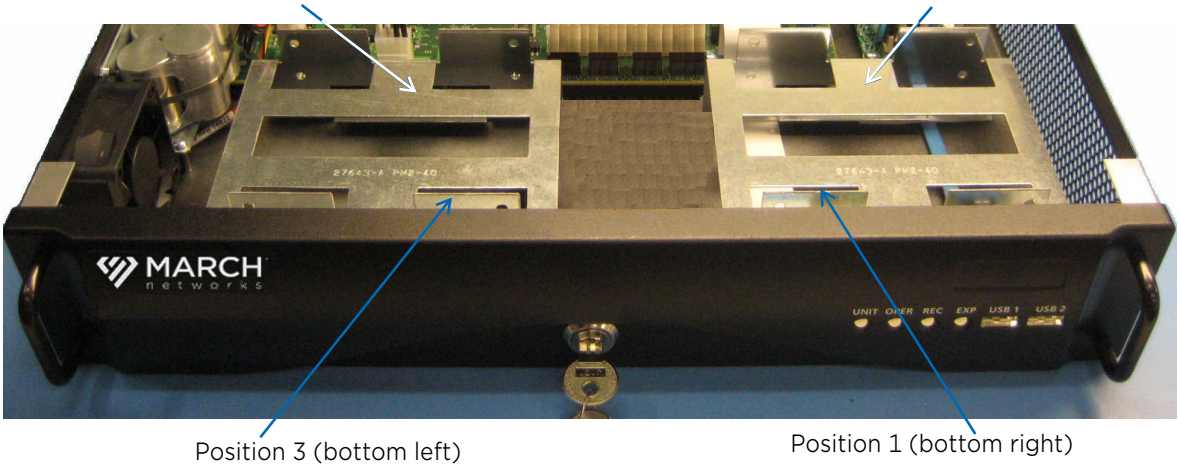


8516 RR unit sliding out of the docking station

4 Remove the cover of the recorder.

There are four hard drive positions in two hard drive trays. Position 1 is at the bottom of the right-hand tray, position 2 is at the top of the right-hand tray, position 3 is at the bottom of the left-hand tray, and position 4 is at the top of the left-hand tray.

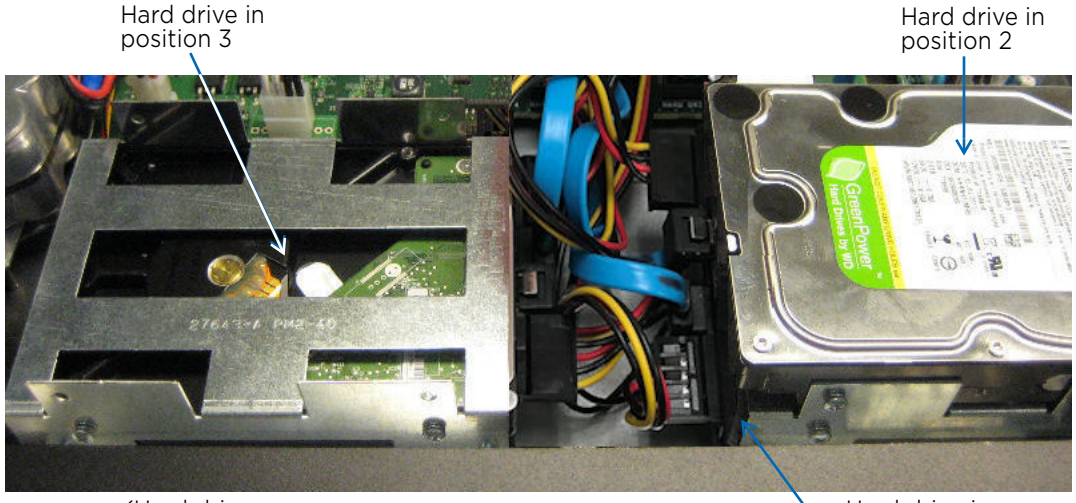
The following photo shows the hard drive positions in the unit without any hard drives installed.



Unit above shown without installed hard drives (Empty brackets shown)

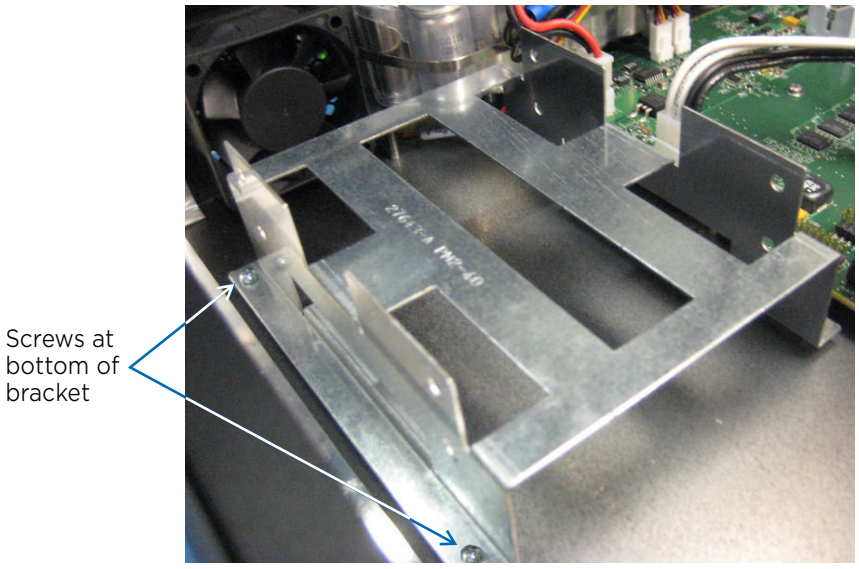
Important: This unit must contain all four hard drives to support RAID.

The following photo shows a close-up of the inside of a unit with three hard drives installed.

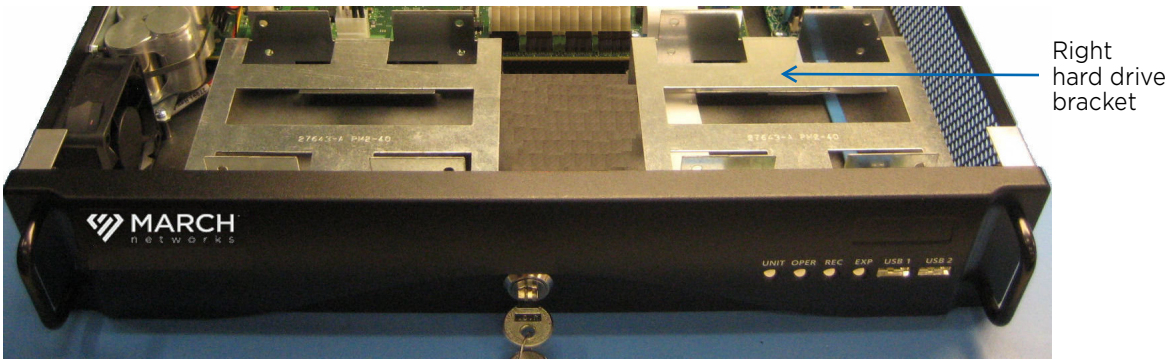


5 Loosen the four screws at the bottom of the hard drive bracket (two each side) and remove it from the recorder.

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



If you are replacing the hard drive in position 1 or 2, you need the right bracket, if you are replacing the hard drive in position 3 or 4 you need the left bracket.



6 Remove the four screws attaching the old hard drive to the bracket and remove the old hard drive.

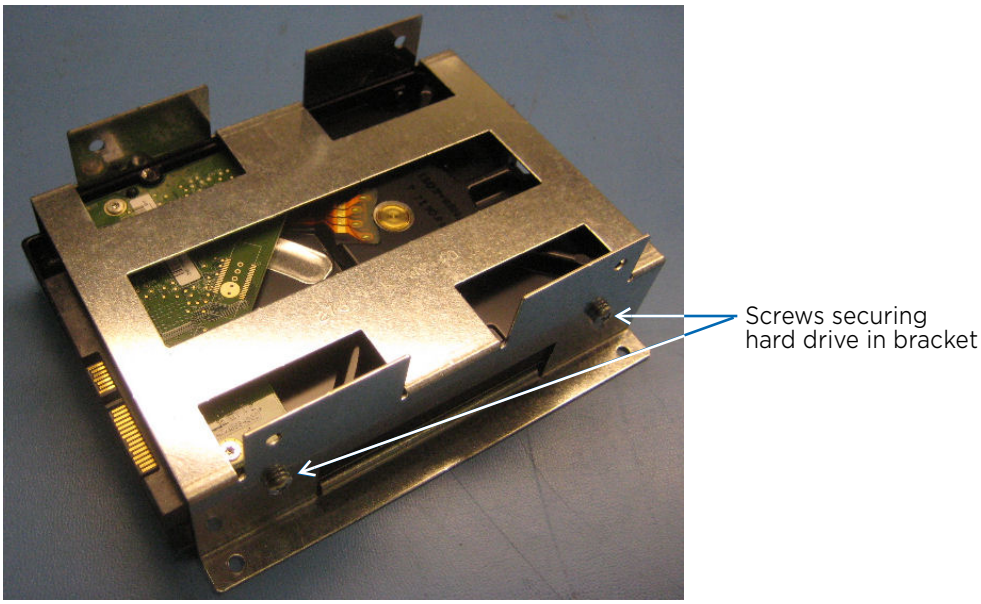
7 Insert the new hard drive into the bracket using the four screws.

For the hard drives at the bottom of each bracket (positions 1 and 3) the side with the exposed electronics must be facing up (the label facing down). For the hard drives at the top of the bracket (positions 2 and 4) the side with the exposed electronics must be facing down (the label facing up).

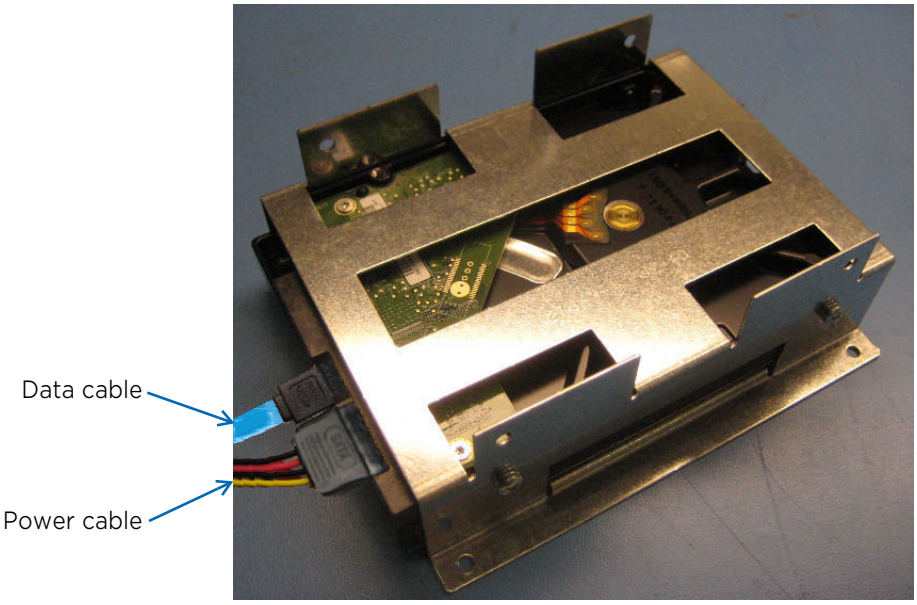
The data cable and power cable connections of the hard drives must face the middle of the recorder when the hard drive bracket is in place.

Install and tighten the two screws on one side of a hard drive before installing and tightening the two screws on the other side.

Note: When tightening the screws, use 5.3 in-lbs (inch pounds) of torque.

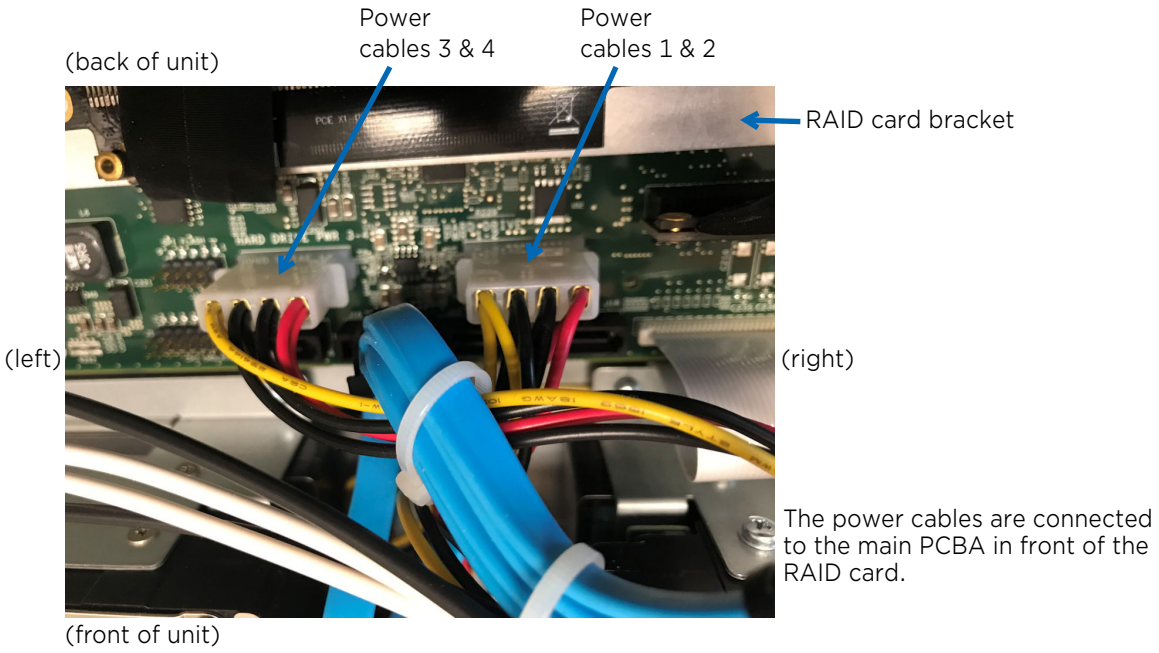


8 For each position where you are replacing a hard drive, locate the data and power cables and connect both cables to the hard drive before you install the bracket back in the unit. The data cables are marked with numbers to indicate which position they go in: attach the data cable marked 1 to the hard drive in position 1.

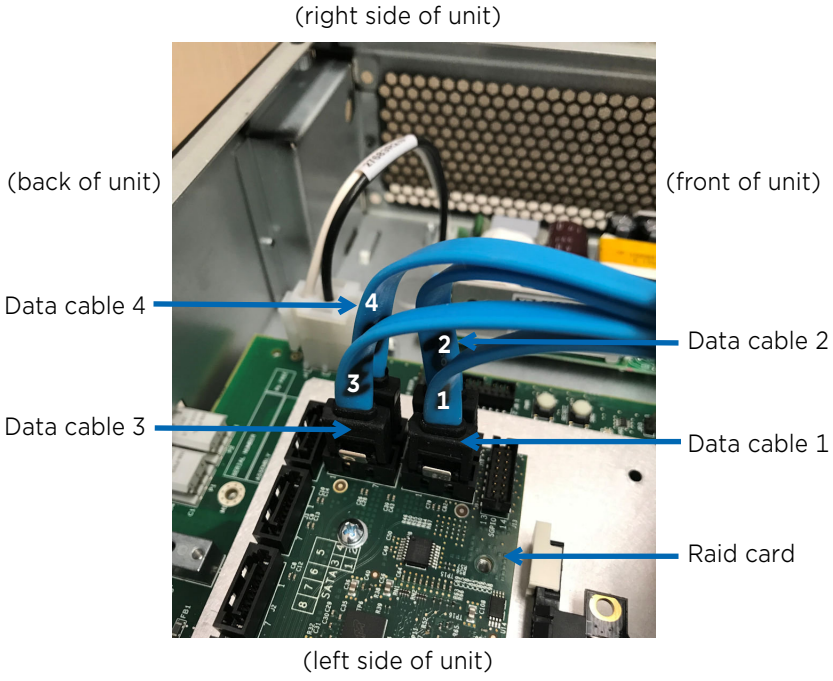


9 Ensure that the power cables are connected to the main PCBA and the data cables are connected to the RAID card.

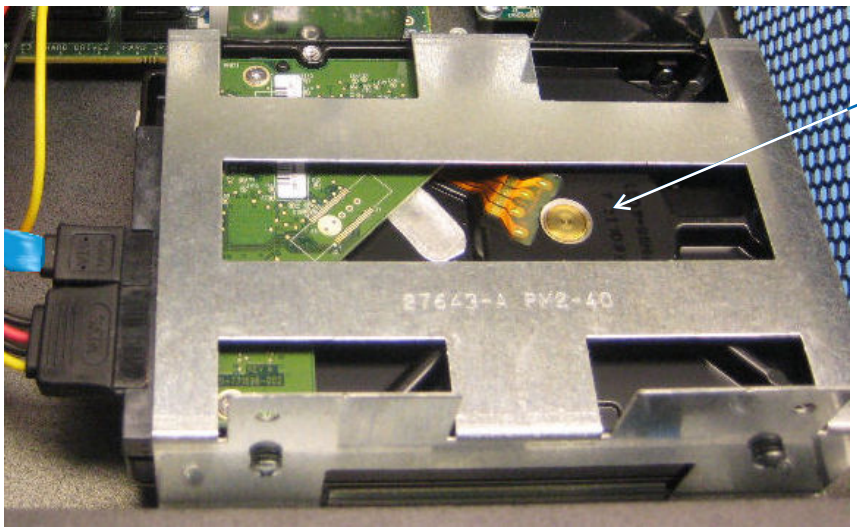
The power cables are connected to the PCBA with the power cable for the hard drives in position one and two on the far right, and the power cable for the hard drives in position three and four on the far left, as shown in the photos below.



10 The data cables are connected to the right side of the RAID card, which is attached on top of the main PCBA.



11 Install the hard drive bracket in the recorder unit and secure the bracket with the four screws at the bottom. The data cable and power cable connections of the hard drives must face the middle of the recorder.



12 Repeat the above steps for the other hard drives you are replacing, if applicable.

When replacing multiple hard drives, ensure that:

- The hard drives at the bottom of each bracket (positions 1 and 3) must have the side with the exposed electronics facing up (the label facing down). The hard drives at the top of the bracket (positions 2 and 4) must have the side with the exposed electronics 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. Use 5.3 in-lbs (inch pounds) of torque.
- Attach the data and power cables to the hard drives and then to the main PCBA before you replace the brackets back in the recorder unit. Data cables are numbered to indicate which hard drive position they are for.

All four hard drives installed

13 When all four hard drives are installed, replace the cover of the recorder unit and secure it with the three (3) screws. Use 3.0 in-lbs (inch pounds) of torque.

14 If the unit has a docking station (8516 RR), replace the unit in the docking station.

Turning the Unit On and Off

Before turning the unit on, first ensure that the AC power cord is plugged into the power connector on the back of the docking station (RR model) or back plane (SR model).

The power connector is shown in section “Power Connector and Fuse Compartment” on page 23.

To turn the unit on and off

1 Insert the key into the lock.

2 Turn the key in one of the following directions:

- **Clockwise** — Turns the unit on. If the unit has a docking station, when the unit is properly docked, the key turns easily in the lock. If the key does not turn easily, check that the unit is docked properly and that the cover is firmly secured. Do not force the key.
- **Counter-clockwise** — Turns the unit off. If the unit has a docking station, ensure the LEDs at the front of the unit turn off before you undock it.

Insert the key into the lock.
To turn the unit on, turn the key clockwise.
To turn the unit off, turn the key counter-clockwise.

Glossary

Administrator Console

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

Docking Station

A metal frame that holds the recorder in place. All main device connections, including the required connection to a camera and power source are made to the docking station — not the recorder — allowing device cables to remain in place when the recorder is serviced, or undocked.

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.

NTSC

National Television Standards Committee. A video standard typically used in North America.

NVR

Network Video Recorder. See also Recorder.

PAL

Phase Alternation Line. The analog television display standard used in Europe and other parts of the world.

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*.

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