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a Motorola Solutions Company

User Guide

Avigilon 4th Generation Network Video Recorder

NVR4X-STD-16TB, NVR4X-STD-24TB, NVR4X-STD-32TB and NVR4X-STD-48TB

Table of Contents

Introduction

The Avigilon Network Video Recorder is preloaded with the Avigilon Control Center software and is configured for maximum performance and reliability. The Network Video Recorder can be easily integrated into any existing Avigilon security system, or act as the base of a new site.

Before You Start

Avigilon recommends the use of an uninterruptible power supply (UPS) system to protect your video surveillance system hardware. A UPS system is used to protect critical equipment from mains supply problems, including spikes, voltage dips, fluctuations and complete power failures using a dedicated battery. It can also be used to power equipment during the time it takes for a standby generator to be started and synchronized.

Any UPS connection must include configuration to shut down the operating system on the appliance when battery power is low or there is 15 minutes of power remaining.

It is recommended that cameras not be connected to the appliance until after the appropriate network configuration has been set up.

Overview

Front View
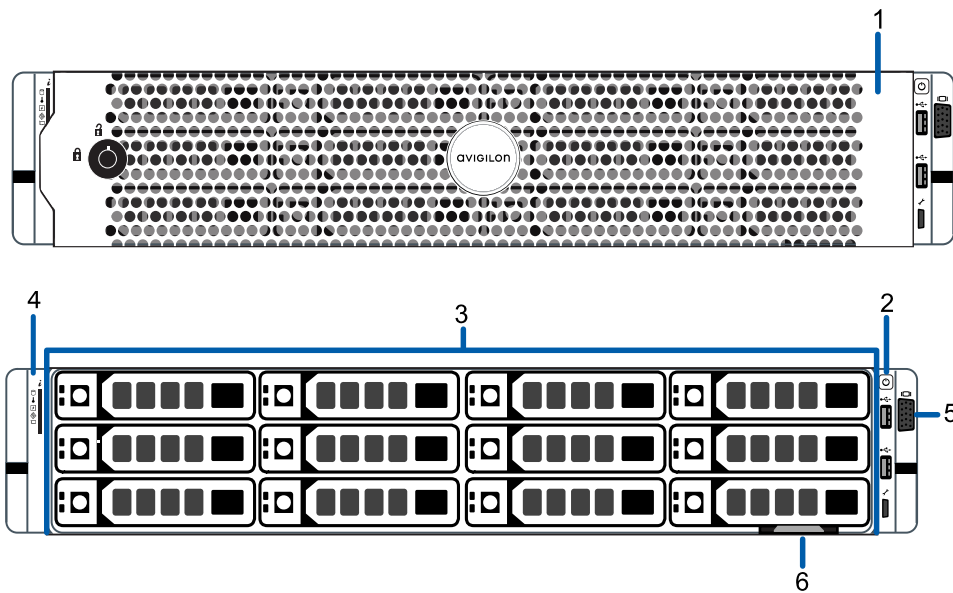
1. **Bezel**

   Protects against unauthorized physical access to the hard drives.

2. **Power button**

   Controls the power supply to the recorder.

3. **Hard drives**

   Provides access to hot-swappable hard drives. There are LED indicators on each hard drive.

   Some drives may contain an empty hard drive tray.

4. **Diagnostic indicators**

   Provides information about system operations.

   For more information, see *LED Indicators* on page 15.

5. **Video connector**

   Accepts a VGA monitor connection.

6. **Information tag**

   Provides the product service details and support information.

Back View
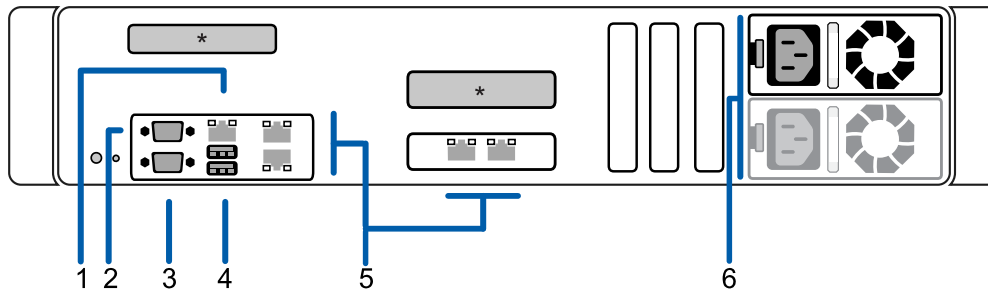
* = Expansion slots in use

1. **Out-of-Band Management (OOBM) connector**

   Accepts an OOBM RJ-45 connection.

2. **Serial connector**

   Accepts connections to serial devices.

3. **Video connector**

   Accepts a VGA monitor connection.

4. **USB connectors**

   Accepts USB connections to external devices.

5. **RJ-45 1 Gbps Ethernet ports (4)**

   Accepts Ethernet connections to multiple networks.

6. **Power supply**

   Power supply unit and slot for the optional, redundant, 2nd power supply.

Installation

Package Contents

Ensure the package contains the following:

- Avigilon Network Video Recorder
- Rack sliding rail assembly kit
- Cable management arm assembly kit
- Bezel and key
- Power cable

Installing the Sliding Rack Rails and Cable Management Arm

If the recorder will be kept in a server rack, install the Sliding Rack Rails and the Cable Management Arm (CMA) provided in the recorder package. Follow the procedures outlined in the *Rack Installation Instructions* and the *CMA Installation Instructions* provided in the assembly kits.

> **Note:** The supplied Sliding Rack Rails are compatible with square and round hole racks.

Connecting Cables

Refer to the diagrams in the Overview section for the location of the different connectors. Make the following connections as required:

1. Connect a KVM switch or separate keyboard, mouse and monitor to the recorder.
   - The keyboard and mouse can be connected to any USB port on the recorder.
   - The monitor can be connected to any video connector at the front or back of the recorder.
2. Connect the recorder to your network by plugging an Ethernet cable into one of the Ethernet ports.
3. Connect a power cable to the power supply at the back of the recorder.
4. Press the power button on the front of the recorder. Check that the recorder LED indicators display the correct status. For more information on the different LED status indicators, see *LED Indicators* on page 15.

Installing the Bezel

The bezel can be installed on the front of the recorder to help protect the hard drives against unauthorized access.
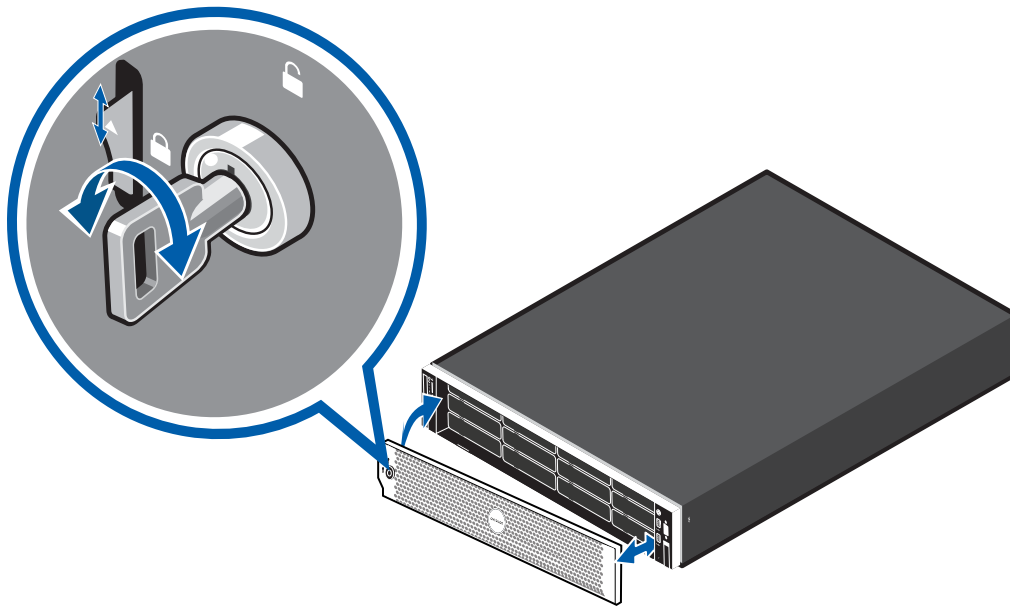
1. Align and insert the right end of the bezel until it clicks into place.

2. Push the left end of the bezel into the front of the unit until it clicks into place.

3. Use the provided key to lock the bezel.

Set Up Your Operating System

The Avigilon Network Video Recorder is preloaded with a Windows 10 or Windows Server 2016 operating system. Determine which operating system you have, and then follow the instructions in the corresponding procedure to set up that operating system.

- Windows 10. For more information, see *Logging into Windows 10 for the First Time* below.
- Windows Server 2016. For more information, see *Logging into Windows Server for the First Time* on the next page.

Logging into Windows 10 for the First Time

After the recorder starts, you will need to configure the Windows operating system for the first time.

1. On the first screen, the MICROSOFT SOFTWARE LICENSE TERMS and AVIGILON CONTROL CENTER™ SOFTWARE END USER LICENSE AGREEMENT are displayed. Review the terms and click **Accept**.

2. Select **Join a local Active Directory domain**.

    Note: This prompt appears only if an Active Directory is present on the network. See the *Windows Help and Support* files for more information.

3. Enter a user name for accessing the Windows software.

4. Enter a password and password hint for the user name and click **Next**.

5. Once logged in, the recorder will go through initial system setup, and ask to select the version of AvigilonControl Center to use:

   - **Use ACC 7.x.x (recommended)**. Select this option to use the latest version of the ACC software.
   - **Downgrade to ACC 6.x.x**. Select this option to downgrade your NVR to version 6.x.x. This older version of the ACC software would not support newer features such as facial recognition and the Focus of Attention interface.

You are logged in to the Windows environment. The Avigilon Control Center Admin Tool and the ACC client automatically start up.

> **Note:** If you are performing operating system recovery, the ACC client does not automatically start up. For more information about running the local ACC installer, see *Operating System Recovery By Avigilon Recovery Partition* on page 8.

Proceed to activate the license for the Avigilon Control Center software on your Network Video Recorder.

Logging into Windows Server for the First Time

After the recorder powers up, you will need to configure the Windows operating system for the first time

1. On the first screen, scroll through the list and select your preferred language.
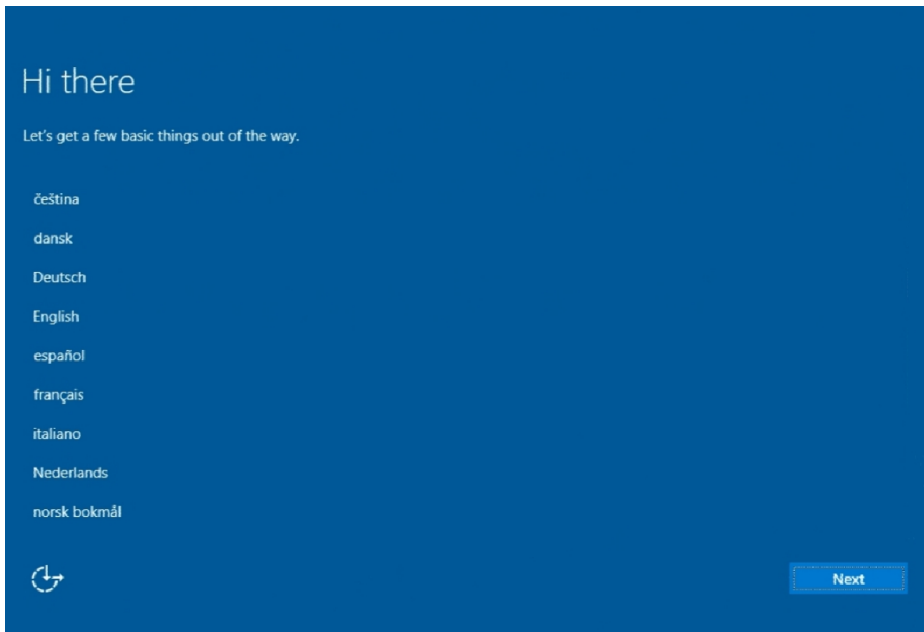

Figure 1: The language selection screen during initial Windows software set up. (Used with permission from Microsoft.)

2. Select the country/region, preferred app language, and keyboard layout, then click **Next**.
   NOTE: If a language other than English is selected, the server will restart. This is a normal Windows behavior, please proceed with step 3 once the server has finished restarting.

3. The End User License agreements are displayed. Review the terms then click **Accept**.

4. On the Customize settings screen, set a password for the local administrator account.
   The password must:

   - Have a minimum length of 7 characters.

   - Meet complexity requirements. See **https://technet.microsoft.com/en-ca/library/cc956977.aspx** for details.

   You cannot reuse your last 24 passwords.

   The password will expire in 42 days.

5. Press Ctrl+Alt+Delete to unlock and input the login password created in the previous step.

6. Once logged in, the recorder will go through initial system setup, and ask to select the version of Avigilon Control Center to use:

   - **Use ACC 7.x.x (recommended)**. Select this option to use the latest version of the ACC software.

   - **Downgrade to ACC 6.x.x**. Select this option to downgrade your NVR to version 6.x.x. This older version of the ACC software would not support newer features such as facial recognition and the Focus of Attention interface.

7. The Setup dialog will start configuring the system storage. This process may take up to 5- 10 minutes depending upon the size of the storage volume.

8. The Avigilon Control Center Software will start running automatically and the NVR Analytics Kit will be configured.

9. Once the setup procedure is complete, the system will restart.

Proceed to activate the license for the Avigilon Control Center software on your Network Video Recorder.

Connecting to ACC Software and ACS

Once you have deployed your NVR, you should activate your ACC software and connect to Avigilon Cloud Services (ACS).

Activating and Configuring ACC Software

- **Initial ACC™ System Setup and Workflow Guide**
- **ACC 7 Help Center**

Printable versions of these guides are available on the Avigilon website: **avigilon.com/support/software/**.

Connecting to Avigilon Cloud Services

After activating your ACC software, you can connect your ACC site to the cloud, free of charge, and take advantage of the capabilities and features that provide centralized access across distributed systems.

To connect your site to Avigilon Cloud Services, see **help.avigilon.com/cloud**.

For information about the cloud services, see **Avigilon Cloud Services Support**.

Troubleshooting

Network Configuration

By default, the Network Video Recorder acquires an IP address on the network through DHCP. If you need to set up the recorder to use a static IP address or any specific network configuration, see the *Windows Help and Support* files for more information.

Checking System Health

You can check on the health of the system components in the Site Health in the ACC Client software. See **Site Health** in the *ACC Client User Guide* for more information.

Operating System Recovery By Avigilon Recovery Partition

If you need to recover the Windows operating system, the NVR includes an onboard Avigilon recovery partition that is separate from the operating system partition. The advantage of using the Avigilon recovery partition is that you do not need an internet connection.

> **Important:** Your operating system drive will be erased and restored to factory settings. Before you proceed with operating system recovery, complete any necessary backups of custom ACC configuration and video recordings. For more information about ACC software backups, see **avigilon.com/recovery**.
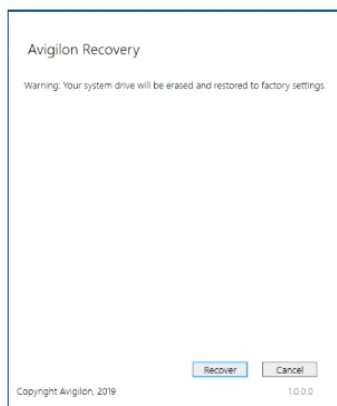
> **Note:** Depending on when your NVR was shipped, it is recommended that you connect to the network when possible to install updates for Windows and ACC Client software after system recovery is completed. For more information about ACC software installations, see **avigilon.com/recovery**.

1. Start operating system recovery in one of the following ways:
   - On your Windows desktop, select [⊞] and then hold down the Shift key and select **Restart**.
   - On your locked Windows screen, select [⏻] and then hold down the Shift key and select **Restart**.
   - During direct boot of the operating system, repeatedly press the down-arrow key and select the partition.
2. On the **Choose an option** screen, select **Use another operating system**.
3. Select the **OS Recovery** partition.
4. On the **Avigilon Recovery** window, select **Recover**.

Avigilon Recovery

Warning: Your system drive will be erased and restored to factory settings.

Recover   Cancel

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Allow up to half an hour for the recovery to complete.

5. After system reboot, complete the Windows setup process.

   For more information about setting up a Windows Server 2016 operating system, see *Logging into Windows Server for the First Time* on page 6.

> **Note:** During the Windows setup steps, you will not be asked to choose a version and install the ACC software. The ACC software installation is covered in the following step.

6. Navigate to `C:\Avigilon\Control Center Installation Files,` and run the ACC installer for the version of ACC software in use at your site.

Operating System Recovery By External USB

If you need to recover the Windows operating system on the Network Video Recorder and you have access to the internet, download the latest Avigilon Recovery Image from **avigilon.com/recovery** and refer to Support and Downloads for the following information:

- Minimum size of the USB recovery device
- Creating an external USB recovery device
- Recovering the operating system from an external USB recovery device

The general steps are:

1. Load the Avigilon Recovery Image onto a USB recovery device.
2. Plug the USB recovery device into the workstation.
3. Repeatedly press the F12 key while booting the workstation.
4. On the UEFI Boot menu, select the USB recovery device.

Advanced Features

Checking System Health

You can check your system health through the ACC Client Site Health or with the Server Administrator software.

ACC Client Site Health

You can check on the health of the system components in the Site Health in the ACC Client software. See **Site Health** in the *ACC Client User Guide* for more information.

Server Administrator Software System Health

The Server Administrator software is pre-installed on the recorder. The software provides information about the recorder's system operation status, and gives you remote access to the recorder for recovery operations.

If one of the LED indicators on the recorder is flashing an error warning, the Server Administrator will display details about the problem. For more information about the LED indicators, see *LED Indicators* on page 15.

1. Open the Server Administrator.

    - To open the Server Administrator locally, double-click the **Server Administrator** shortcut icon on the desktop.
    - To open the Server Administrator remotely, open a web browser and enter this address: `https://<recorder IP Address>:1311/`.

        For example: `https://192.168.1.32:1311/` or `https://localhost:1311/`.

    If you are using an intranet connection, your browser may display an error message. Allow the browser to ignore the certificate warnings.

2. If asked to log in, enter the Windows software administrator username and password that was configured for the recorder.

3. On the Server Administrator home page, the health of the system components are displayed in the workspace on the right.

- To see the health of other system components, expand and select a different component from the System Tree on the left.
- The table displayed in the workspace lists system components and their status:

☑	The system component is running normally.
⚠	The system component has a non-critical warning.
✖	The system component has a critical failure.
◈	The system component status is unknown.

- To see the details of a system component, select the system component from the workspace.

The Server Administrator is also used to customize the Redundant Array of Independent Disks (RAID) settings, assign a hot spare and remotely monitor the system health. For more information about the features in the Server Administrator, see the Help system provided in the software.

Replacing a Hard Drive Blank

The hard drives on the Network Video Recorder are set up in a RAID configuration. This allows information to be recorded across several hard drives.

If one or two hard drives fail, there is enough information on the other hard drives for the recorder to continue recording video.

Depending on the recorder model, there may be hard drive blanks at the front of the recorder. You can replace the blanks with hard drives as required.

1. Remove the bezel.
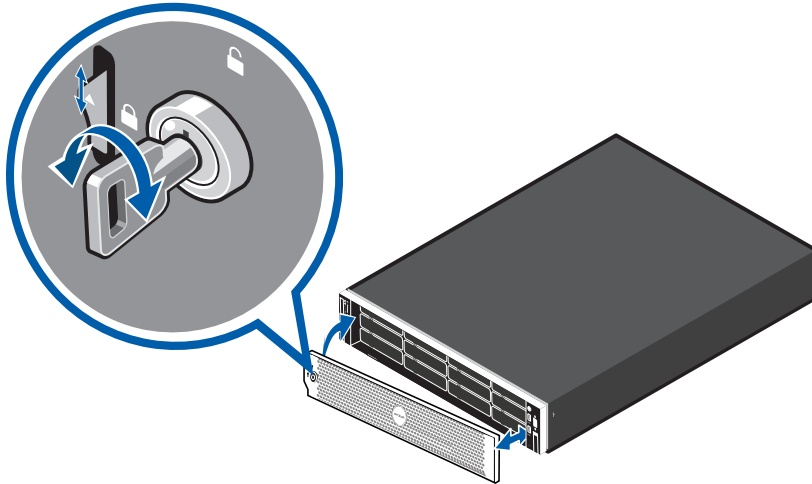
   a. Unlock the bezel.
   b. Push the release button next to the lock.
   c. Pull the left end of the bezel then unhook the right end to remove the bezel.
2. Press the release button and slide the blank out of the hard drive slot.
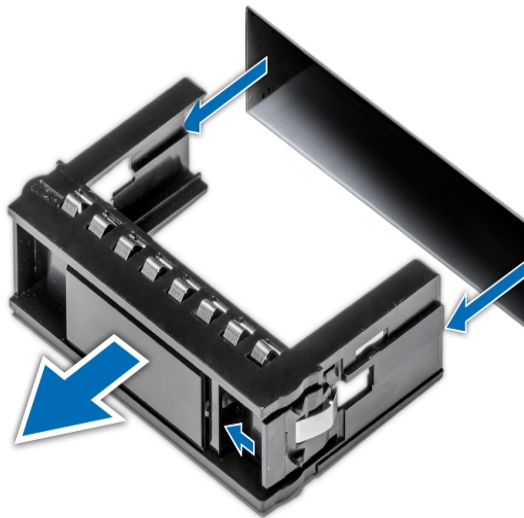
3. Insert the hard drive all the way into the recorder then push the handle against the hard drive to lock it into place.
4. Open the Server Administrator application and expand the System Tree.

   The new hard drive should be automatically added to the Physical Disks list. The list is typically available here: **System** > **Storage** > **PERC H730P** > **Connector 0 (RAID)** > **Enclosure (Backplane)** > **Physical Disks**.

5. Assign a task to the new hard drive or allow it to exist as an extra storage drive.

   It is recommended to use the new hard drive as a hot spare. Hot spares are hard drives that are available on standby in the event of a hard drive failure in the RAID. If that occurs, you can configure the system to automatically redirect recording to the unused hard drive.

   To assign the new hard drive as a hot spare:

   a. In the Task list, select **Assign and Unassign Global Hot Spare**.
   b. Click **Execute**.

If the new hard drive is not displayed in the Server Administrator, try one of the following:

- Refresh the browser.
- Reboot the recorder.

1. Locate the failed hard drive at the front or back of the recorder.
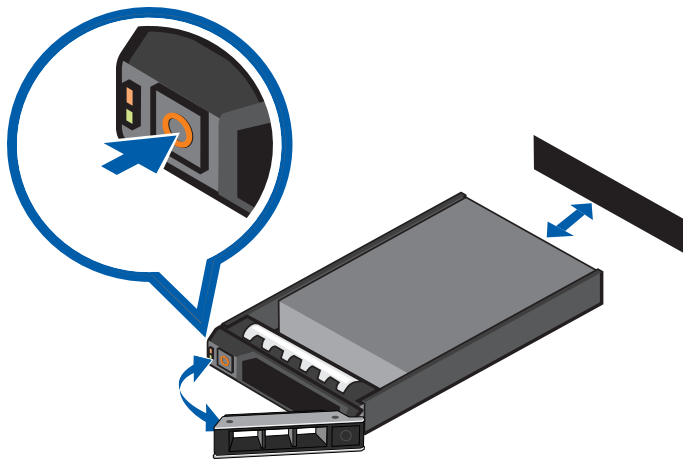
2. Press the release button on the front left of the hard drive.
3. When the handle is released, pull the hard drive out of the recorder.
4. Remove the four screws from the side of the hard drive carrier.
5. Lift the failed hard drive out of the carrier.
6. Insert a new hard drive into the carrier then screw it into place. The hard drive connectors should face the back.
7. When the hard drive is secured in the carrier, insert the hard drive back into the recorder.
8. Once the hard drive is inserted all the way in, push the handle against the hard drive to lock it into place.

The recorder immediately starts rebuilding the hard drive. The progress is displayed in the Server Administrator. This may take several hours.

LED Indicators

The following tables describe what the LEDs on the Network Video Recorder indicate.

Diagnostic Indicators

The diagnostic indicators on the front panel highlight system issues during system startup.

> **Note:** The diagnostic indicators only light-up when the recorder is powered.

LED Indicator	Description
⬛ **Hard drive**	• Blinks orange — the hard drive is experiencing an error.

🌡 **Temperature**	• Blinks orange — there is a thermal error.
	Errors include:
	    • temperature out of range
	    • fan failure
	Check that the fans are functioning correctly and the air vents are not blocked.

⚡ **Electrical**	• Blinks orange — there is an electrical error.
	 Errors include:
	    • voltage out of range
	    • failed power supply
	    • voltage regulator
	Check the power status indicator to confirm if it is an issue with the power supply.

〰 **Memory**	• Blinks orange — there is a memory error.
▭ **PCIe**	• Blinks orange — there is a PCIe card error. Restart then upgrade the device firmware if the error persists.
System health and System ID	• Blue — powered and in good health • Blinking blue — System ID mode active • Orange — fail-safe mode • Blinks orange — there is an error

Power Status Indicators

The power button on the front lights up when power is on.

Additional information about the power supply is provided by the power status indicator on the power supplies at the back. The following table describes what the LEDs indicate:
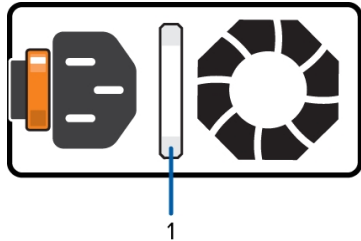

Figure 2: (1) The power status indicator.

LED Indicator	Description
Off	Power is not connected.
Green	Power is supplied.
Flashing green	The firmware update is being applied to the power supply unit.
Flashing green then turns off	The redundant power supply is mismatched. This only occurs if you have a secondary redundant power supply installed.
Flashing orange	There is a problem with the power supply.

Network Link Status Indicators

When the recorder is connected to the network, the recorder's connection status LEDs above the Ethernet port display the recorder's connection status to the network. The following table describes what the LEDs indicate:

Figure 3: (1) Link LED. (2) Connection activity LED.

LED Indicator	Description
Off	The recorder is not connected to a network.
Link LED — green **Connection Activity LED — blinking green**	The recorder is connected to a network at the maximum port speed.
Link LED — orange	The recorder is connected to a network at less than the

LED Indicator	Description
Connection Activity LED — blinking green	maximum port speed.
Link LED — green Connection Activity LED — off	The recorder is connected to a network at the maximum port speed and data is not being sent or received.
Link LED — orange Connection Activity LED — off	The recorder is connected to a network at less than the maximum port speed and data is not being sent or received.

Hard Drive RAID Status Indicators

Each hard drive has its own set of LED indicators to show its activity and status.
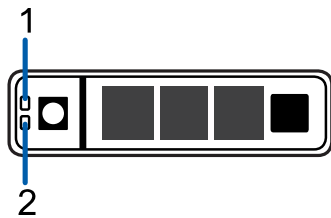

Figure 4: (1) Status LED. (2) Activity LED.

The Activity LED flashes green when the hard drives are working. The following table describes what the Status LEDs indicate:

LED Indicator	Description
Green	The hard drive is online.
Off	The hard drive is disconnected from the recorder.
Two short green flashes every second	The system is identifying a new hard drive, or preparing a hard drive for removal.
Flashes green, orange, then off	The hard drive is predicted to fail.
Four short orange flashes per second	The hard drive has failed.
Flashes green slowly	The hard drive is rebuilding.
Blinks green for three seconds, orange for three seconds, and off for six seconds	The hard drive rebuild has been aborted.

Limited Warranty and Technical Support

Avigilon warranty terms for this product are provided at **avigilon.com/warranty**.

Warranty service and technical support can be obtained by contacting Avigilon Technical Support: **avigilon.com/contact**.

For More Information

For additional product documentation and software and firmware upgrades, visit **avigilon.com/support**.

Technical Support

Contact Avigilon Technical Support at **avigilon.com/contact**.