

PIVOTCam-SE Firmware Upgrade Instructions

This document describes how to upgrade camera firmware for Ross Video PIVOTCam-SE PTZ cameras.

PIVOTCam-SE firmware includes multiple upgradeable components. This document provides instructions for upgrading each of them.

You can check whether a camera already has the latest version of a given firmware component. If the camera is already running the latest version, then that component does not need to be upgraded. For more information, see “**Checking Firmware Versions**” on page 2.

IMPORTANT: Upgrading camera firmware permanently discards all presets stored on the camera. If you want to retain any presets, you must store them externally. For example, you can use a legacy PIVOTCam Control Panel to recall presets and store them.

Before You Begin:

1. Ensure you have the following:
 - Physical access to the camera. While performing the procedures in this document, you may be required to connect and disconnect cables, and unmount the camera to access the DIP switches on its bottom.
 - A computer running Windows.
 - The serial cable that came with the camera (8-pin serial mini-DIN to female DB9).
 - A converter cable (9-pin male DB9 to male USB-A). This cable is not included with the PIVOTCam-SE, but is readily available.
 - The remote control unit that came with the camera.
2. Download the latest firmware upgrade package from <https://www.rossvideo.com/support/software-downloads/pivotcam/>.
3. Refer to the Release Notes for information about the firmware upgrades. The Release Notes are included in the firmware upgrade package.
4. Access the on-screen menu and take note of all IP settings.

Upgrading a given firmware component may cause the camera to change the DHCP mode or reset the IP address. If you find you cannot access/control the camera, use the remote control to access the on-screen menu and reset the IP settings manually.
5. Determine which firmware components require upgrading.

For more information, see “**Checking Firmware Versions**” on page 2.

IMPORTANT: Perform the upgrade procedures in the order in which they appear in this document.

The upgradeable firmware components and upgrade procedures are as follows:

1. ARM (Advanced RISC Machine) firmware
For detailed upgrade instructions, see “**ARM Firmware Upgrade**” on page 3.
2. Motor Driver firmware
For detailed upgrade instructions, see “**Motor Driver Firmware Upgrade**” on page 6.
3. CAM firmware
For detailed upgrade instructions, see “**CAM Firmware Upgrade**” on page 9.

Checking Firmware Versions

You can check what version of each firmware component a camera is running. If the camera already has the latest version, then that component does not need to be upgraded.

After you check the firmware version numbers on the camera, compare them to the firmware version numbers listed in the Release Notes, which are available as a PDF file in the firmware upgrade package. The Release Notes are also available for download at <https://www.rossvideo.com/support/software-downloads/pivotcam/>.

The firmware version numbers are available through the camera's on-screen menu.

To check the firmware version numbers:

1. Ensure that the camera is turned **ON**.
2. Connect or route the camera's video output to a video monitor so you can view the camera's on-screen menu.
3. Point the remote control unit toward the front of the camera and press the **MENU** button.

The on-screen menu should appear.

If the on-screen menu does not appear, press a camera selection button (**CAM1**, **CAM2**, **CAM3**, or **CAM4**), and then press the **MENU** button again. Try different camera selection buttons until the on-screen menu appears.

4. Press the **DOWN** button to scroll through the list until **INFO** is highlighted.
5. Make note of the number beside **ARM VER**.

This is the ARM firmware version. If it is different than the version listed in the Release Notes, the ARM firmware must be upgraded.

6. Make note of the number beside **MD VER**.

This is the Motor Driver firmware version. If it is different than the version listed in the Release Notes, the Motor Driver firmware must be upgraded.

7. Make note of the number beside **CAM VER**.

This is the CAM firmware version. If it is different than the version listed in the Release Notes, the CAM firmware must be upgraded.

8. Press the **MENU** button.

A message appears.

9. Press **OK**.

The on-screen menu closes.

ARM Firmware Upgrade

This procedure requires the following:

- Physical access to the camera. When instructed to do so, you will be required to connect and disconnect cables, and unmount the camera to access the DIP switches on its bottom.
- A computer running Windows.
- The serial cable that came with the camera (8-pin serial mini-DIN to female DB9).
- A converter cable (9-pin male DB9 to male USB-A). This cable is not included with the PIVOTCam-SE, but is readily available.
- Files from the latest firmware upgrade package.

To upgrade the ARM firmware:

1. Power **OFF** the camera.

Note: Power may be provided through the power supply unit/cable included with the PIVOTCam-SE, or through PoE (Power over Ethernet). You must disconnect all power sources to the camera.

2. Use a paper clip or other small tool to set the DIP switches on the underside of the camera as follows: **SW1** to **OFF**; **SW2** to **ON**, as shown in Figure 1.

Tip: You may need to unmount the camera to access the DIP switches.

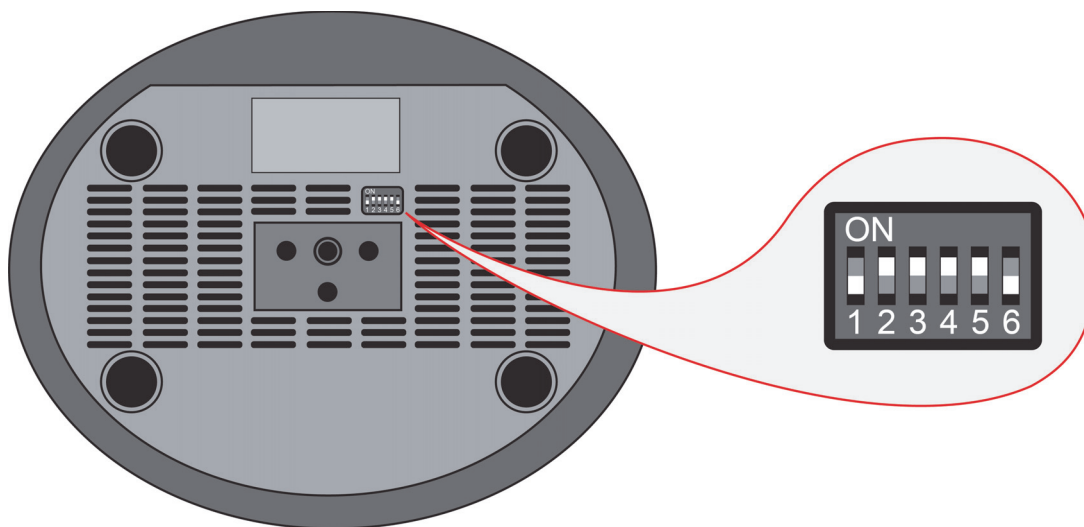


Figure 1 - DIP switches, with Switch 1 turned OFF and Switch 2 turned ON

CAUTION: Handle DIP switches with care. They are very small and delicate.

3. Connect the 8-pin serial mini-DIN cable to the **RS232 IN** connector on the rear of the camera. The other end of the cable has a 9-pin female RS-232 (DB9) connector (Figure 2).



Figure 2 - PIVOTCam-SE (rear view), with red box showing the RS232 IN port

4. Connect a converter cable (9-pin male DB9 to male USB-A) to the cable mentioned in **Step 3**, and then connect the USB-A end of the converter cable to the Windows computer.

Note: This cable is not included with the PIVOTCam-SE, but is readily available.
5. Run the MCU ISP (in-system programmer) tool (**mcuisp.exe**) file, which is one of the files included in the firmware upgrade package.
6. In the MCU ISP tool, on the **Port** tab, set the **COM** port to the **USB** port you are using.

Tip: In this example we are using **COM1**, (outlined in red in Figure 3), but you need to set it according to your computer.

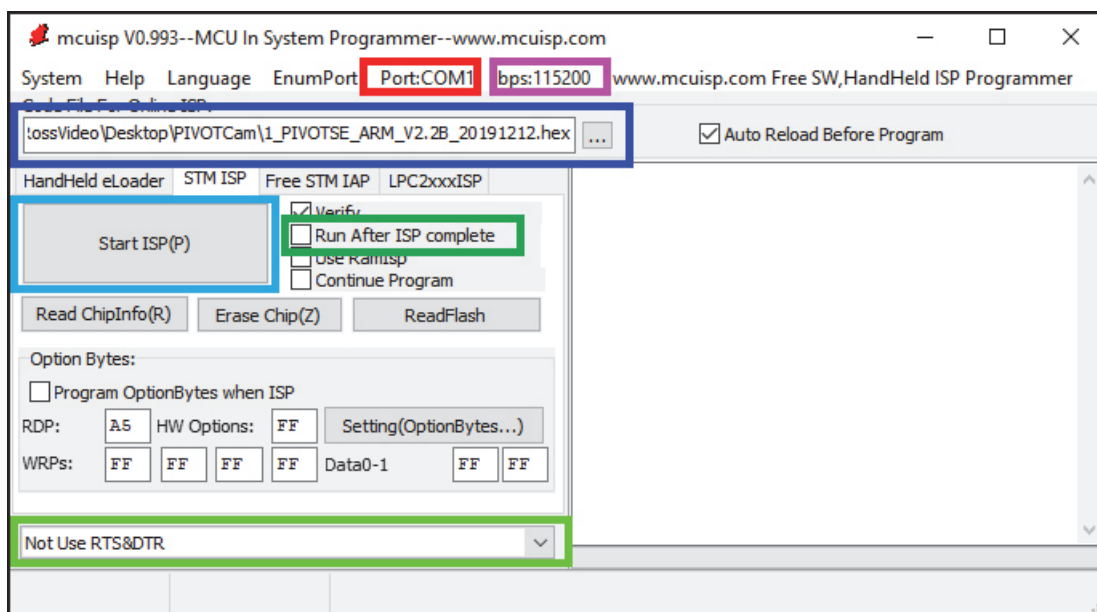


Figure 3 - MCU ISP application, with colored boxes showing controls that are mentioned in the steps of this procedure

7. Set the **Baud rate** to **115200** (outlined in purple in Figure 3).
8. Browse to find and select the **ARM** firmware file (see box outlined in dark blue in Figure 3).
Tip: The filename starts with **1_PIVOTSE_ARM**, and is similar to the following:
1_PIVOTSE_ARM_V2.2B_20191212.hex.
9. Clear the **Run after ISP complete** check box (outlined in dark green in Figure 3).
10. In the list at the bottom of the MCU ISP tool, select **Not Use RTS&DTR**. (outlined in light green in Figure 3).
11. Power **ON** the camera and then in the **MCU ISP** application, click the **Start ISP** button (outlined in light blue in Figure 3).

The firmware upgrade may take several minutes. A progress log appears (see Figure 4).

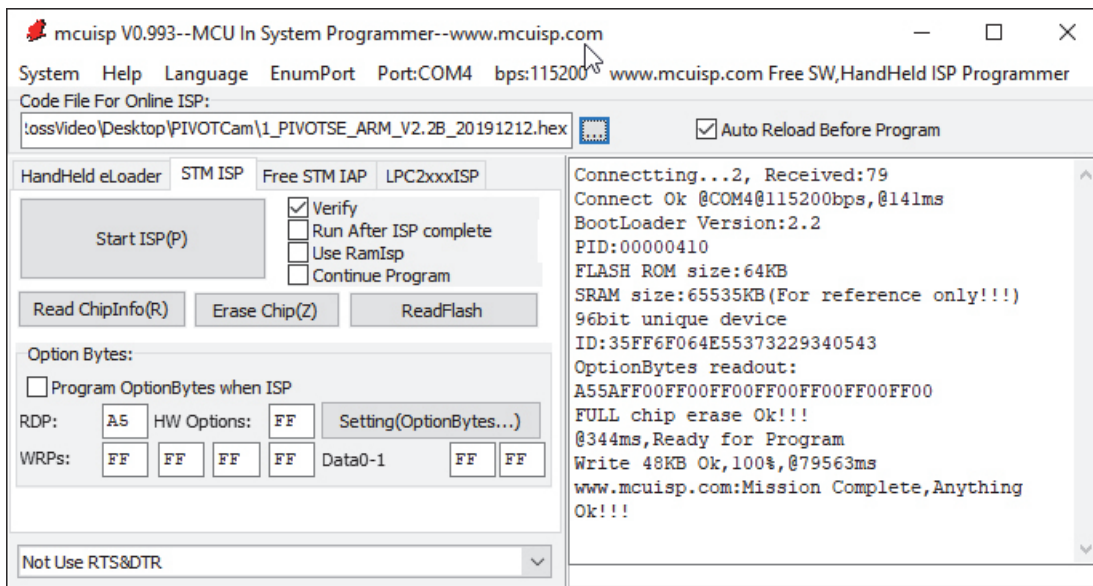


Figure 4 - MSU ISP application, showing the progress log after a successful ARM firmware upgrade

When the upgrade is complete, the progress log displays the following message: *Mission Complete, Anything OK!!!*

12. Power **OFF** the camera, and then set DIP switch **SW1** to the **ON** position, as shown in Figure 5.



Figure 5 - DIP switches, set for normal operation

Tip: The correct operational configuration of the DIP switches is as follows: **SW1 to SW5 are ON**, and **SW6 is OFF**.

13. Power **ON** the camera to run it with the new ARM firmware.

The lens zooms in and out.

WARNING: The lens must be allowed to automatically zoom in and out after the upgrade to avoid upgrade failure. Do **NOT** power off the camera before the lens stops zooming.

Motor Driver Firmware Upgrade

This procedure requires the following:

- Physical access to the camera. When instructed to do so, you will be required to connect and disconnect cables, and unmount the camera to access the DIP switches on its bottom.
- A computer running Windows.
- The serial cable that came with the camera (8-pin serial mini-DIN to female DB9).
- A converter cable (9-pin male DB9 to male USB-A). This cable is not included with the PIVOTCam-SE, but is readily available.
- Files from the latest firmware upgrade package.

To upgrade the Motor Driver firmware:

1. Power **OFF** the camera.

Note: Power may be provided through the power supply unit/cable included with the PIVOTCam-SE, or through PoE (Power over Ethernet). You must disconnect all power sources to the camera.

2. Use a paper clip or other small tool to set the DIP switches on the underside of the camera as follows: **SW1** to **ON**; **SW2** to **OFF**, as shown in Figure 6.

Tip: You may need to unmount the camera to access the DIP switches.

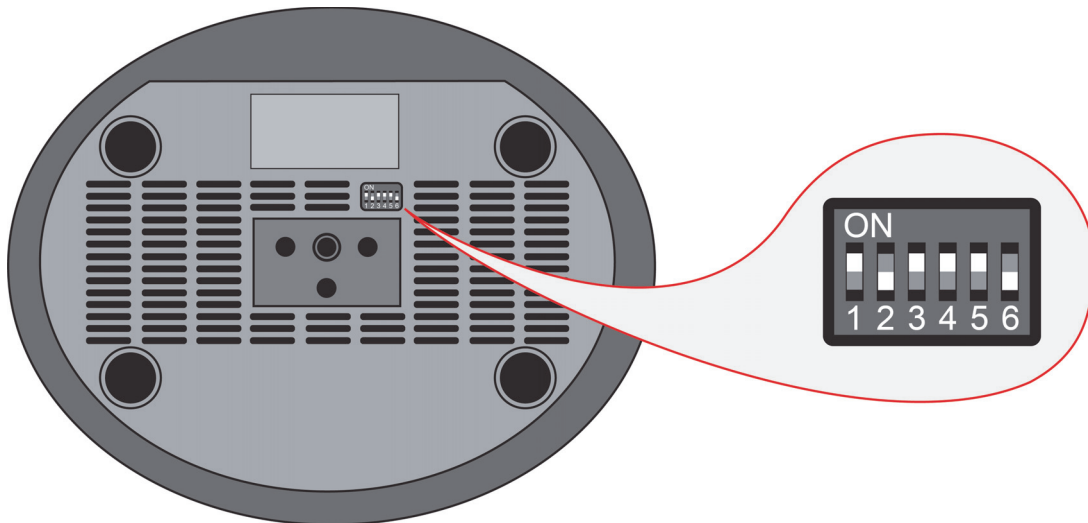


Figure 6 - DIP switches, with Switch 1 turned ON and Switch 2 turned OFF

CAUTION: Handle DIP switches with care. They are very small and delicate.

3. Connect the 8-pin serial mini-DIN cable to the **RS232 IN** connector on the rear of the camera. The other end of the cable has a 9-pin female RS-232 (DB9) connector (Figure 7).



Figure 7 - PIVOTCam-SE (rear view), with red box showing the RS232 IN port

4. Connect a converter cable (9-pin male DB9 to male USB-A) to the cable mentioned in **Step 3**, and then connect the USB-A end of the converter cable to the Windows computer.

Note: This cable is not included with the PIVOTCam-SE, but is readily available.
5. Run the MCU ISP (in-system programmer) tool (**mcuisp.exe**) file, which is one of the files included in the firmware upgrade package.
6. In the MCU ISP tool, on the **Port** tab, set the **COM** port to the **USB** port you are using.

Tip: In this example we are using **COM1**, (outlined in red in Figure 8), but you need to set it according to your computer.

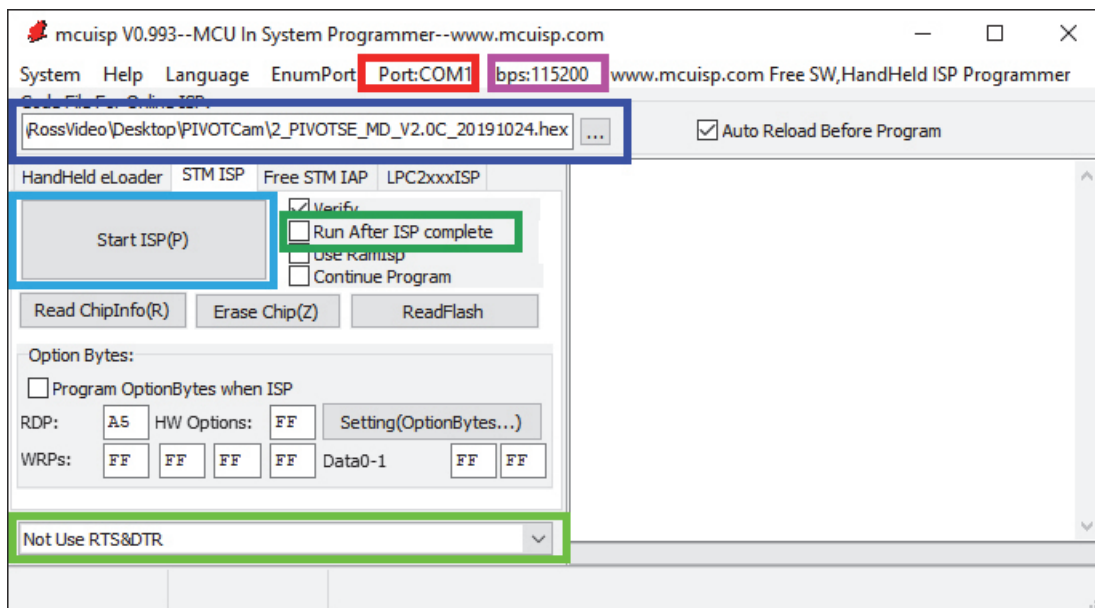


Figure 8 - MCU ISP application, with colored boxes showing controls that are mentioned in the steps of this procedure

7. Set the **Baud rate** to **115200** (outlined in purple in Figure 8).
8. Browse to find and select the **Motor Driver** firmware file (see box outlined in dark blue in Figure 8).
Tip: The filename starts with **2_PIVOTSE_MD**, and is similar to the following:
2_PIVOTSE_MD_V2.0C_20191024.hex.
9. Clear the **Run after ISP complete** check box (outlined in dark green in Figure 8).
10. In the list at the bottom of the MCU ISP tool, select **Not Use RTS&DTR**. (outlined in light green in Figure 8).
11. Power **ON** the camera and then in the **MCU ISP** application, click the **Start ISP** button (outlined in light blue in Figure 8).

The firmware upgrade may take several minutes. A progress log appears (see Figure 9).

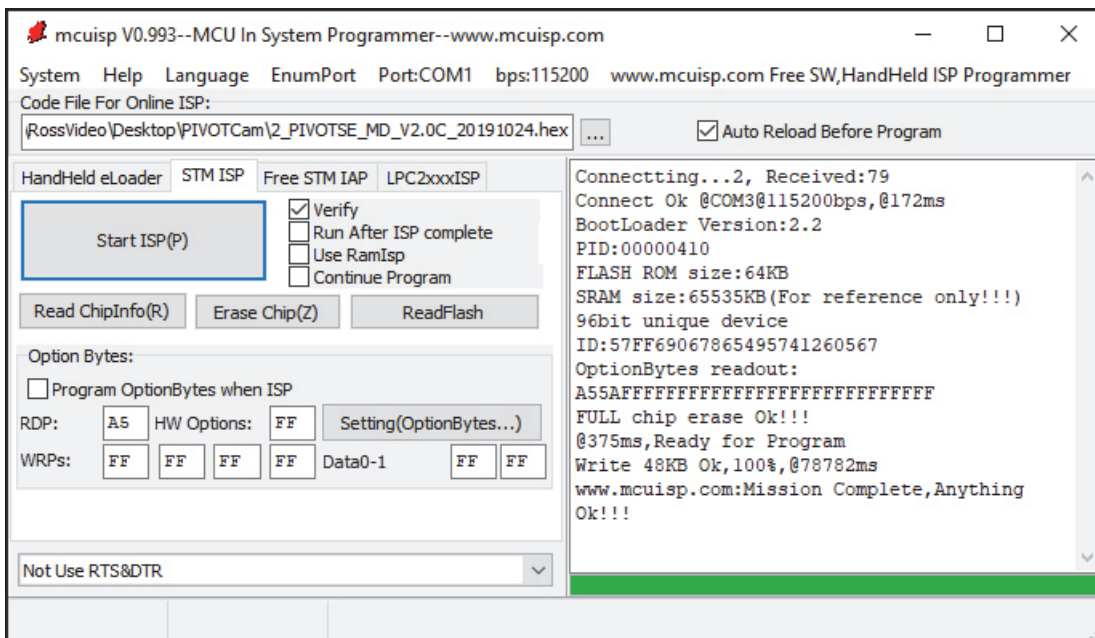


Figure 9 - MSU ISP application, showing the progress log after a successful upgrade

When the upgrade is complete, the progress log displays the following message: *Mission Complete, Anything OK!!!*

12. Power **OFF** the camera, and then set DIP switch **SW2** to the **ON** position, as shown in Figure 10.



Figure 10 - DIP switches, set for normal operation

Tip: The correct operational configuration of the DIP switches is as follows: **SW1 to SW5 are ON**, and **SW6 is OFF**.

13. Power **ON** the camera to run it with the new Motor Driver firmware.

The lens zooms in and out.

WARNING: The lens must be allowed to automatically zoom in and out after the upgrade to avoid upgrade failure. Do **NOT** power off the camera before the lens stops zooming.

CAM Firmware Upgrade

This procedure requires the following:

- Physical access to the camera. When instructed to do so, you will be required to connect and disconnect cables.
- A computer running Windows.
- Files from the latest firmware upgrade package.

To upgrade the CAM firmware:

1. Ensure the camera is turned **ON** and connected to your network via a standard Ethernet cable connected to the **RJ45 LAN** port on the rear of the camera.



Figure 11 - PIVOTCam-SE (rear view), with red box showing the RJ45 LAN port

2. Connect your computer to the same network.
3. Open a browser window and access the camera's WEB UI by navigating to the camera's IP address.
Tip: The default IP address is **192.168.1.188**. Each camera on your network requires a unique IP address.
Tip: Record the IP address of the camera, including subnet mask and gateway. You may need this information later in this procedure if you want the camera to retain its current IP address. Some upgrades cause the camera IP address to be set to the factory default.
4. Type the **Username** and **Password** to access the WEB UI:
 - The default **Username** is **admin**.
 - The default **Password** is **admin**.
5. In the WEB UI, navigate to **Settings > Firmware Upgrade**.
6. Click **Select File**, and then navigate to the CAM firmware file from the firmware upgrade package.
Tip: The filename starts with **3_PIVOTSE_CAM**, and is similar to the following:
3_PIVOTSE_CAM_V305_20191129.bin.
7. Click **Upgrade**.

The upgrade starts. The upgrade status bar indicates upgrade progress (Figure 12).

WARNING: Read and obey all warnings presented during the upgrade, as shown in Figure 12! Failure to do so may cause the upgrade to fail and may make the camera permanently inoperable!

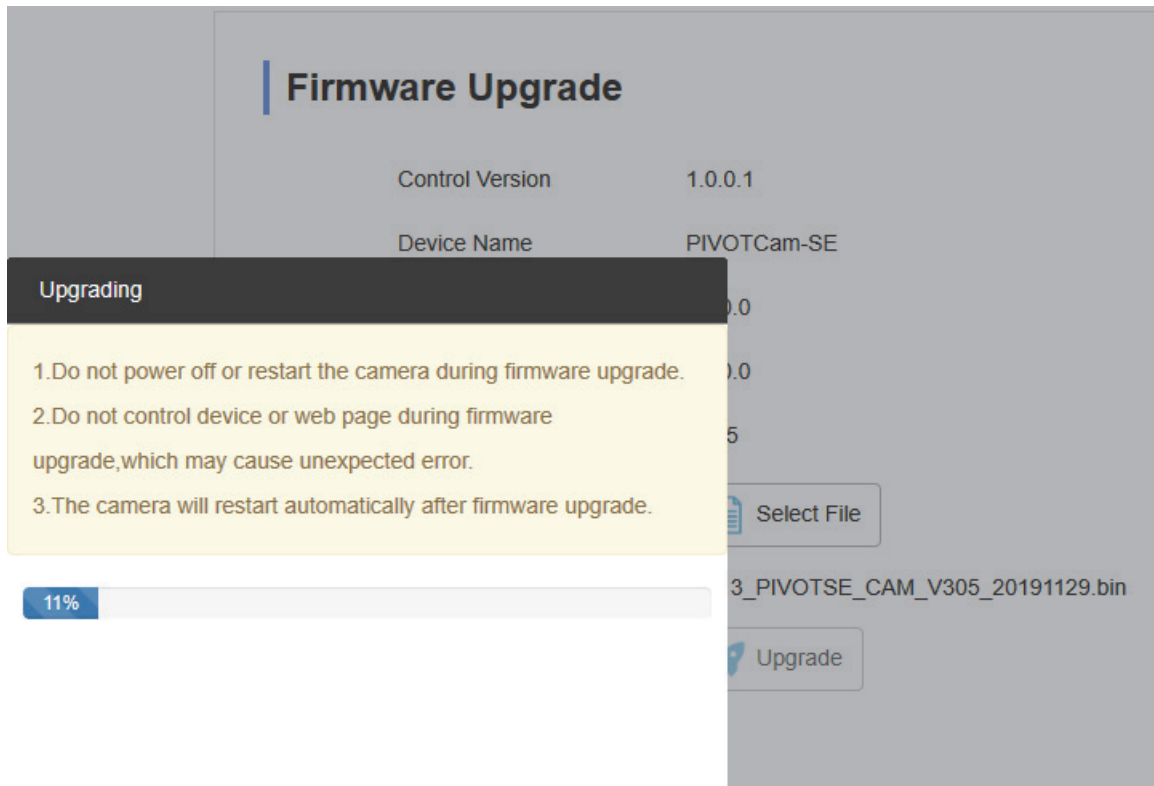


Figure 12 - Upgrading window, showing the upgrade status bar.

When the upgrade is complete the camera reboots.

8. After the camera reboots, if no video image appears, perform a hard reset of the camera by disconnecting power, waiting five seconds, and reconnecting it. The camera reboots.

Note: Power may be provided through the power supply unit/cable included with the PIVOTCam-SE, or through PoE (Power over Ethernet). You must disconnect all power sources to the camera to perform a hard reset.

9. Unplug the power cable, wait five seconds, and then plug it back in. The camera reboots.
10. Access the camera's Web UI and confirm that the firmware version number matches the firmware version to which you are upgrading.

The CAM firmware upgrade is complete.