



# Firmware update guide for Spectrum Black

This manual provides information and instructions for updating the scaler firmware, for the following W-OLED Spectrum Black monitors developed by Dough:

ES07E91, ES07EF5, ES07EFB, ES07EFE

# Before you begin

You can download the latest firmware updates from the Downloads section of our support page at <https://dough.tech>. Special instructions may be included, so keep an eye out for **instructions.pdf**.

Firmware is a specific class of software that provides low-level control for the device's specific hardware. Unlike device drivers which are stored on your computer's system drive, firmware is stored on the chips in the device itself. Though it rarely needs to be updated, firmware updates can improve system security, performance, or stability, and can in some cases even add new functionality.



## IMPORTANT

Because firmware updates are written to non-volatile storage inside the monitor, there is a certain risk involved when installing them. Despite built-in failsafe- and recovery features, (a part of) Spectrum may not function properly if the update process is interrupted. Therefore, you should always make sure your monitor is connected to a reliable power source, and that you dedicate enough time to this process before you begin.

The documentation that comes with each firmware update lists the changes it enacts. We recommend that you only install firmware updates if you are experiencing issues with the affected features or intend to use the new features it adds.

### **Installing firmware updates is always done at your own risk!**

Take careful note of your monitor's model number, and only use firmware files that are specifically developed for your exact model. Using firmware developed for a different model may cause (a part of) Spectrum to not function properly.

Always cross-check the model number of your monitor with the models listed in the firmware update's documentation! You can learn more about locating your monitor's model number in the user manual. If you are uncertain about which firmware file is right for your monitor, please contact our support team at <https://dough.tech>.

# Change log

## Version 1.0.16

- Resolved Brightness setting not working in Uniform brightness mode (models ES07E91, ES07EFE)
- Resolved quick action notifications remaining indefinitely when OSD Timeout is set to 0 (models ES07E91, ES07EFE)
- Resolved incorrect White point gain baseline, changed from DCI-P3 to  $D_{65}$
- Resolved crosshair overlay not automatically switching off after stand-by, power off, or two hours of use
- Resolved frame counter overlay not automatically switching off after stand-by, power off, or two hours of use
- Resolved incorrect indicator light diagnostic behavior when short-circuit is detected
- Resolved some minor display issues of the OSD menu
- Improved granularity for White point gain controls

## Version 1.0.14

- Added setting in HDR mode to favor brightness curve accuracy or maximum brightness
- Resolved Brightness setting not working in Uniform brightness mode (models ES07EF5, ES07EFB)
- Resolved quick action notifications remaining indefinitely when OSD Timeout is set to 0 (models ES07EF5, ES07EFB)
- Resolved indicator light not accurately updating with the monitor's state changes
- Improved HDR and SDR brightness accuracy
- Improved HDR and SDR color accuracy
- Improved monitor start-up performance

## Version 1.0.13

- Added separate values in SDR and HDR mode for most settings in the Picture menu
- Resolved some OSD menu settings not saving properly
- Resolved color balance shifting when adjusting Color space
- Resolved screen saving mode activating too quickly
- Resolved some minor display issues of the OSD menu
- Improved HDR and SDR maximum brightness
- Improved HDR and SDR brightness accuracy
- Improved display of near-black dark tones
- Improved brightness uniformity in Uniform brightness mode
- Improved speed at which the monitor powers on or wakes from standby mode
- Improved speed at which the monitor switches input signals
- Improved speed at which BFI enables/disables

## Version 1.0.6

- Resolved the scheduled maintenance notification for Transistor wear compensation not displaying properly
- Resolved incorrect default quick action for the shortcut button
- Resolved some minor display issues of the OSD menu
- Improved HDR brightness accuracy
- Initial release version (models ES07EF5, ES07EFB)

## Version 1.0.2

- Initial release version (models ES07E91, ES07EFE)

# Prepare the USB drive



## NOTE

The USB drive with the firmware update file can be prepared on any operating system. Advanced users should be able to prepare the update with just the instructions given on this page.

To aid users with less experience, we have included more detailed step-by-step instructions in subsequent chapters for the most common operating systems. Windows users can find more details on these steps on page 6, and macOS users can find more details on page 10.

1. Format a USB storage drive using the FAT32 file system.



## IMPORTANT

Please note that any data on a drive will be erased when you format it. Make sure to back up any important files on the drive before formatting it!

The update process only supports drive volumes of up to 32GB.



## NOTE

If you have a storage drive that already meets the requirements, you do not need to format it and can skip to step 2. In this case, existing files on the drive will not be affected.

2. Copy the firmware update (.bin) file to the root directory of the storage drive.



## IMPORTANT

Take careful note of your monitor's model number and only use firmware files that are intended for your exact model. Using firmware developed for a different model may cause (a part of) Spectrum to not function properly.

If you are uncertain about which firmware file is right for your monitor, please contact our support team at <https://dough.tech>.

3. Rename the firmware update file to 'update.bin'.
4. Disconnect the USB storage drive from your computer.




## IMPORTANT

Failure to eject the drive in the operating system before physically disconnecting the USB drive may cause loss or corruption of data on the drive.

## Detailed instructions for Windows users


1. Format a USB storage drive using the FAT32 file system.



**IMPORTANT**

Please note that any data on a drive will be erased when you format it. Make sure to back up any important files on the drive before formatting it!

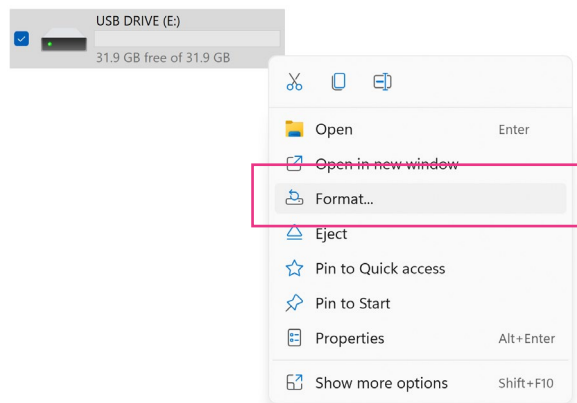
The update process only supports drive volumes of up to 32GB.



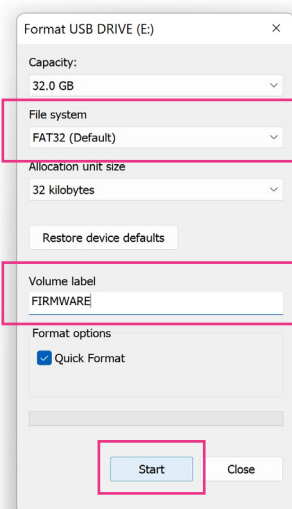
**NOTE**

If you have a storage drive that already meets the requirements, you do not need to format it and can skip to step 2. In this case, existing files on the drive will not be affected.

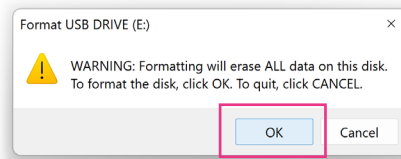
- a. Right-click the drive in Explorer and choose **Format** from the menu that appears. This brings up the **Format** window.



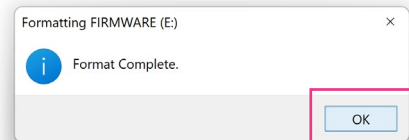
- b. Make sure that **FAT32 (Default)** is selected from the drop-down menu under **File system**. You can name the drive under **Volume label** to more easily recognize it later.




- c. Click **Start** to begin the formatting process. You will need to confirm that all existing data on the USB drive will be erased by clicking **OK**.



- d. Once the formatting process is completed, you will receive a notification. Click **OK**. You can now close the **Format** window by clicking **Close**.



2. Copy the firmware update (.bin) file to the root directory of the storage drive.

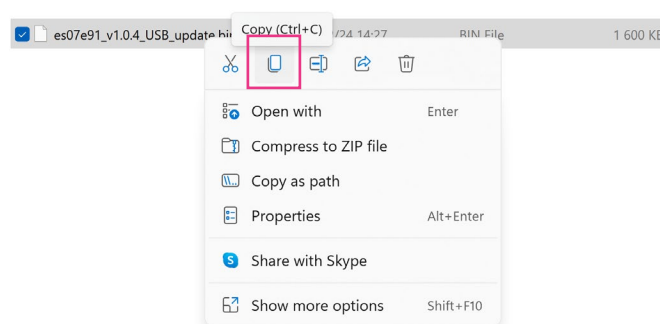


**IMPORTANT**

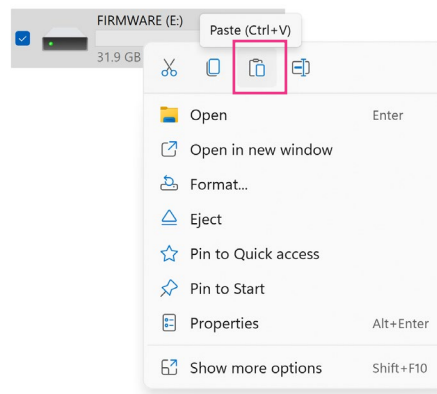
Take careful note of your monitor's model number and only use firmware files that are intended for your exact model. Using firmware developed for a different model may cause (a part of) Spectrum to not function properly.

If you are uncertain about which firmware file is right for your monitor, please contact our support team at <https://dough.tech>.

- a. Right-click the firmware update file and choose **Copy** from the menu that appears, or select the file by left-clicking it and press Control + C.

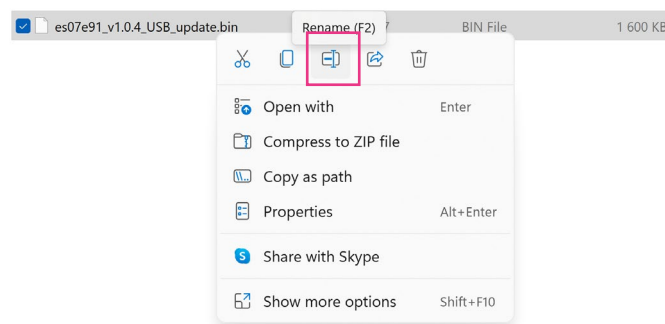


- b. Right-click the USB drive you wish to use for the firmware update and choose **Paste** from the menu that appears, or select the drive by left-clicking it and press Control + V.

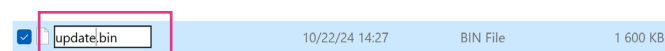


3. Rename the firmware update file to 'update.bin'.

- a. Right-click the firmware update file on the USB drive and choose **Rename** from the menu that appears, or select the file on the USB drive by left-clicking it and press F2.



- b. Type the new name for the file, 'update.bin', and store it by pressing Enter.



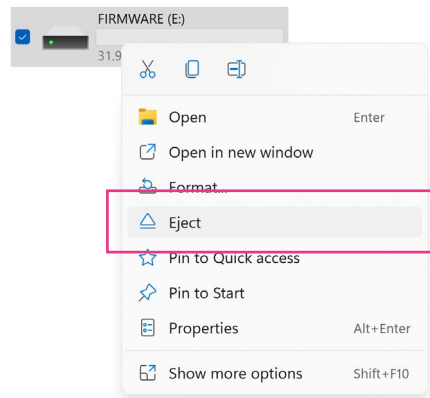


4. Disconnect the USB storage drive from your computer.

**IMPORTANT**

Failure to eject the drive in Windows before physically disconnecting the USB drive may cause loss or corruption of data on the drive.

- a. Right-click the USB storage drive and choose **Eject** from the menu that appears.



- b. You may now remove the drive from your computer.

**IMPORTANT**

If your USB storage drive has an activity indicator light, wait for it to stop blinking before physically disconnecting the USB drive.

## Detailed instructions for macOS users

1. Format a USB storage drive using the FAT32 file system.



### IMPORTANT

Please note that any data on a drive will be erased when you format it. Make sure to back up any important files on the drive before formatting it!

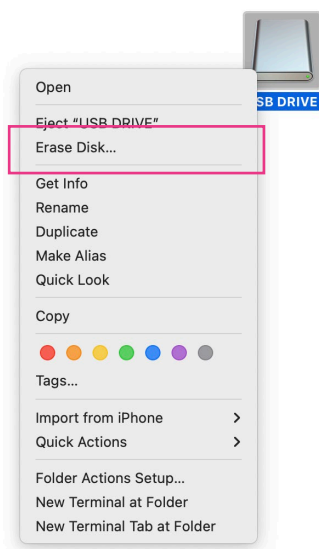
The update process only supports drive volumes of up to 32GB.



### NOTE

If you have a storage drive that already meets the requirements, you do not need to format it and can skip to step 2. In this case, existing files on the drive will not be affected.

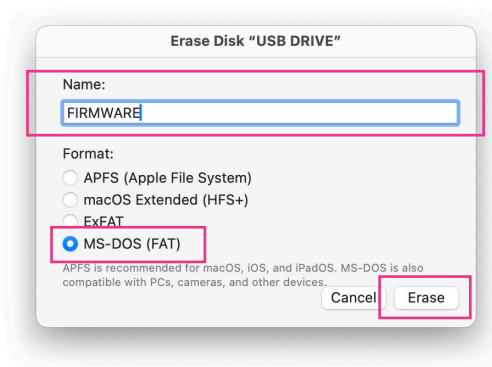
- a. Secondary click the drive on the desktop or in Finder and choose **Erase Disk...** from the menu that appears. This brings up the **Erase Disk** window.



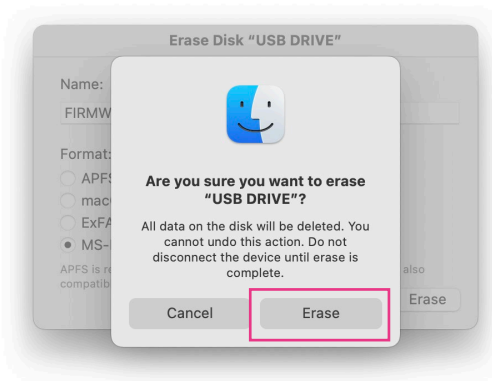
### NOTE

You can secondary click on a Mac either by right-clicking if you are using a mouse with multiple buttons or by holding Control (ctrl) and clicking if you are using a trackpad or mouse with only one button.

- b. Make sure that **MS-DOS (FAT)** is selected from the menu under **Format**. You can name the drive under **Name** to more easily recognize it later.



- c. Click **Erase** to begin the formatting process. You will need to confirm that all existing data on the USB drive will be erased.



- d. Once the formatting process is completed, the drive will re-appear on your desktop and in Finder. If you chose a new name, it will appear with its new name.



2. Copy the firmware update (.bin) file to the root directory of the storage drive.

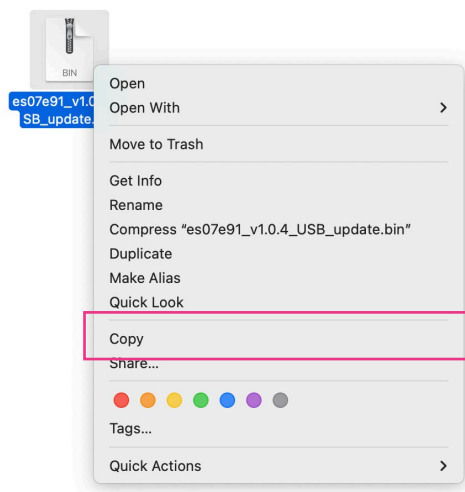


#### IMPORTANT

Take careful note of your monitor's model number and only use firmware files that are intended for your exact model. Using firmware developed for a different model may cause (a part of) Spectrum to not function properly.

If you are uncertain about which firmware file is right for your monitor, please contact our support team at <https://dough.tech>.

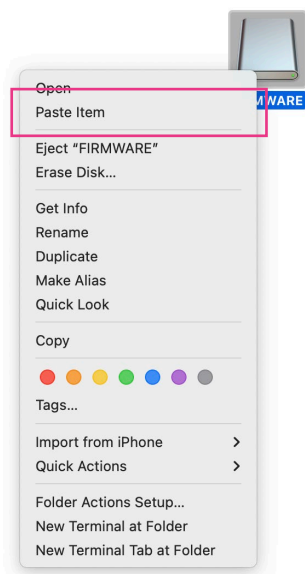
- a. Secondary click the firmware update file and choose **Copy...** from the menu that appears, or select the file by clicking it and press ⌘ + C.



#### NOTE

You can secondary click on a Mac either by right-clicking if you are using a mouse with multiple buttons or by holding Control (ctrl) and clicking if you are using a trackpad or mouse with only one button.

- b. Secondary click the USB drive you wish to use for the firmware update and choose **Paste item** from the menu that appears, or select the drive by clicking it and press **⌘ + V**.

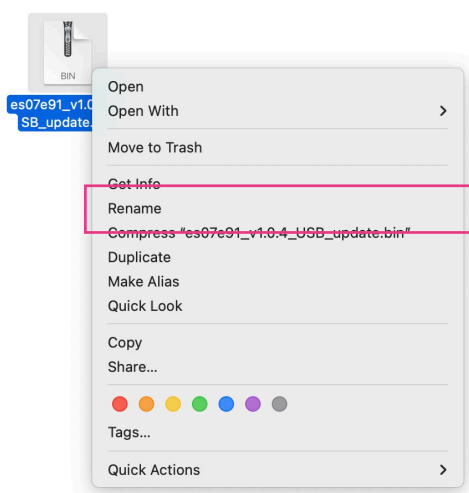


#### NOTE

You can secondary click on a Mac either by right-clicking if you are using a mouse with multiple buttons or by holding Control (ctrl) and clicking if you are using a trackpad or mouse with only one button.

3. Rename the firmware update file to 'update.bin'.

- a. Secondary click the firmware update file on the USB drive and choose **Rename** from the menu that appears.



- b. Type the new name for the file, 'update.bin', and store it by pressing Enter.



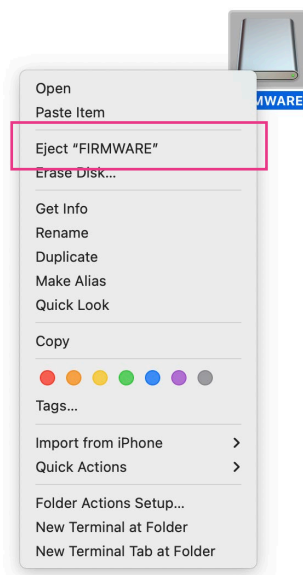
4. Disconnect the USB storage drive from your computer.



#### IMPORTANT

Failure to eject the drive in macOS before physically disconnecting the USB drive may cause loss or corruption of data on the drive.

- a. Secondary click the USB storage drive and choose **Eject** from the menu that appears, or click and drag the drive's icon to the Trash in the Dock. The Trash icon will change into an 'eject' symbol when using the latter method.



#### NOTE

You can secondary click on a Mac either by right-clicking if you are using a mouse with multiple buttons or by holding Control (ctrl) and clicking if you are using a trackpad or mouse with only one button.

- b. You may now remove the drive from your computer.

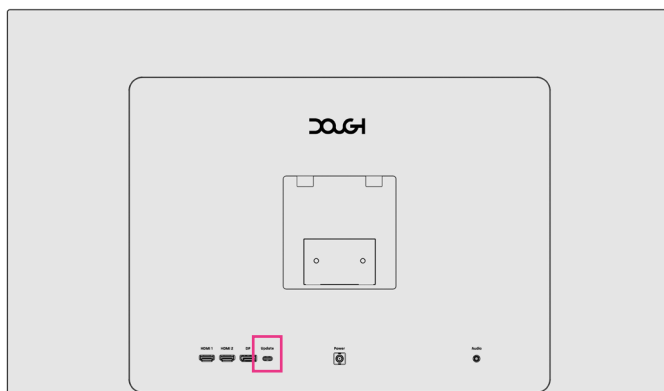


#### IMPORTANT

If your USB storage drive has an activity indicator light, wait for it to stop blinking before physically disconnecting the USB drive.

# Install the update

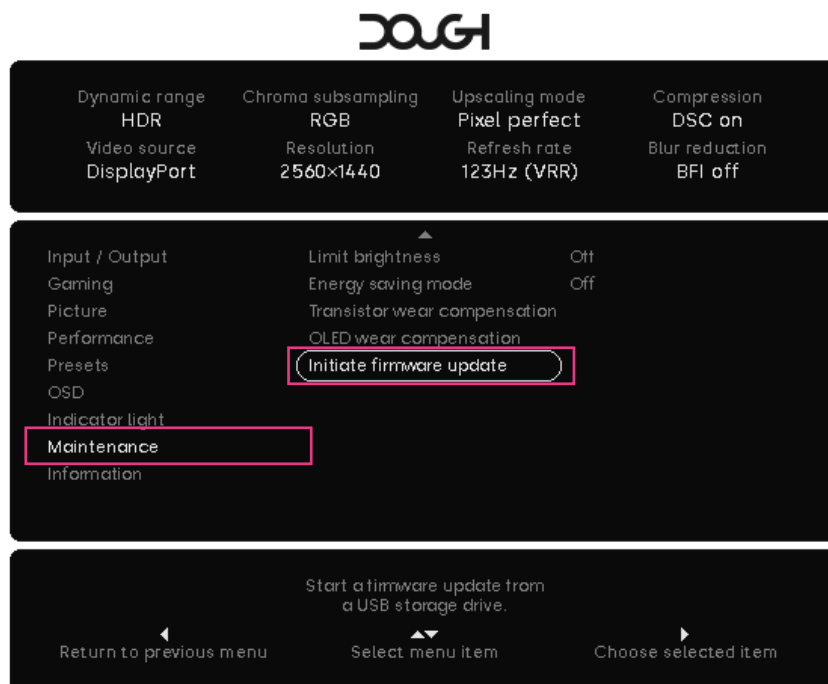
1. Unplug the power adapter from the monitor. Wait 20 seconds, then plug it back in. This is called a 'power cycle'.
2. Connect the USB storage drive containing the update file to the USB Type-C port on the monitor, marked **Update**.



## NOTE

If you are using a USB 2.0 storage drive in combination with a USB Type-A to Type-C adapter, the drive may only work in one orientation due to the way USB 2.0 signals are wired inside USB Type-C connectors. If your drive is not recognized by the update process, try unplugging it, turning it over, and plugging it in again.

- Using the joystick at the bottom of the monitor, navigate to the **Maintenance** menu of the on-screen display (OSD).



- Select **Initiate firmware update**. The monitor will search the attached USB drive. Wait for it to find a valid update file.

Make sure the drive with your update is connected to the monitor's USB port and uses the FAT32 file system.

Searching for update.bin



#### IMPORTANT

While the monitor is performing the update, do not disconnect or power off the monitor, change settings on the monitor, or disconnect the USB drive.



5. A bar will indicate the current progress of the firmware update. Wait for the update to install.

**IMPORTANT**

While the monitor is performing the update, do not disconnect or power off the monitor, change settings on the monitor, or disconnect the USB drive.

6. When the update is installed, the monitor shows 'Update successful'. The monitor will restart automatically after a few seconds, during which the screen may go black. Once the monitor has restarted, the process is complete.



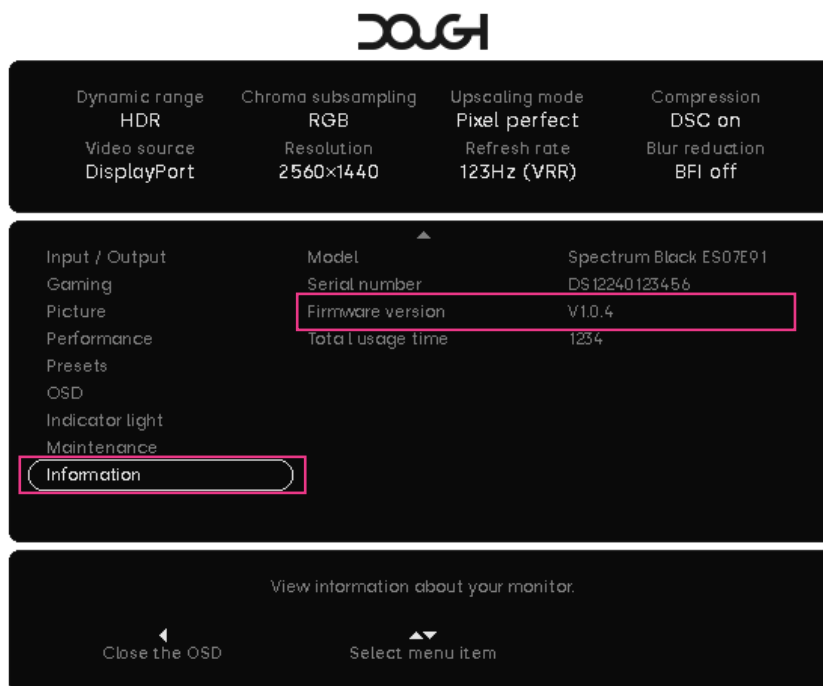
7. You may now remove the USB storage drive from your monitor.

**IMPORTANT**

If your USB storage drive has an activity indicator light, wait for it to stop blinking before physically disconnecting the USB drive.

# Verify the update

1. Using the joystick at the bottom of the monitor, navigate to the **Information** menu of the OSD.



2. Verify that **Firmware version** now displays the new version number. This confirms that the firmware update was installed successfully.