

Chronos Software Version 0.7.0

Release Notes



Purpose

This document outlines the improvements to Chronos 1.4 and 2.1 software as released in Version 0.7.0, instructions on how to install the software itself, and finally how to calibrate the camera after an update.

2021-08-31, Kron Technologies Inc.

New Features and Improvements

- Our update server is up and running again. Cameras can update over the internet again.
- Improvements while saving:
 - Save speed has been increased by up to ~30%.
 - Stability while saving has been greatly improved.
- Trigger/IO screen improvements:
 - Clarified some settings with "toggle" mode on the Trigger/IO screen. Now it specifies that it's only for buttons/switches and settings that should not be changed can't be changed when using this trigger function.
 - Trigger/IO screen now has a link to the trigger delay screen, and it will offer a reminder when using triggers if the trigger delay is changed from default (in case it was set accidentally).
- The 'Disable Ring Buffer' setting is now saved after the camera reboots.
- Webpage improvements:
 - Webpage has "zero-time" black calibration support (accessible from the menu at the top of the page). This feature allows for a fast black calibration to take place without the need to physically cover the image sensor.
 - Option for 'Digital Gain' added to the Main Screen / Homepage.
 - Some Chronos 2.1 color matrix options added to the webpage (for that camera).
- Miscellaneous bug fixes:
 - 'Black Cal All' doesn't crash the camera if certain specific trigger modes are used, nor will it set the trigger delay.
 - H.264 (mp4) files will not overwrite a previous file if a filename is provided (instead, it gives a warning that the filename was already used).

- Chronos 2.1 image quality:
 - A previous software upgrade introduced a horizontal "shadow" when some areas were overexposed. This has been greatly reduced in v0.7.0
 - Pink/magenta shift (especially in bright areas) reduced overall
- DNG metadata updated:
 - All cameras formerly saved DNG images with metadata that indicated they were Chronos 1.4s, but this has been fixed. Chronos 2.1 cameras now say "Chronos 2.1" and Chronos 1.4 cameras still say "Chronos 1.4".
 - Color matrix settings are saved to DNG images now. Before, color matrix parameters in DNG files were always the same and ignored the camera's settings, but now the settings on the camera get saved in DNG files.

Known Issues

- If the camera is being controlled via the web page, no messages will be shown on the back-of-camera display if the video output mode is changed between LIVE/RECORDING and PLAYBACK through the web interface.
- If the camera is powered on while connected to 10/100 (non-gigabit) network equipment, the back-of-camera display will fail to start.
- When using Live Record Mode to simultaneously record 60 FPS mp4 footage to an external storage device, the video display may momentarily blank or freeze while the stream is being written to the storage device. This will not affect the high-speed recording.
- Trying to navigate through a device after physically removing it (without properly removing it via the "Safely Remove" option) using the file browser can cause a crash.
- Using both the "rotate" and "left side" display settings at the same time may not work reliably, and might require selecting these settings twice.
- When saving extremely long videos (a full-buffer of very high frame rates, such as 32,667 FPS and above) as H.264 (mp4) videos, the camera's video encoder core can lock up (crash). For best reliability at very high frame rates, we suggest saving as CinemaDNG images instead, or saving shorter segments of the videos.

In the event of a crash, a frame-by-frame recovery tool is available as long as the camera is left on.

- A blank/black screen will be displayed if certain combinations of higher frame rates and higher analog gain levels are used.

Specific common resolutions where this will occur:

1024 x N at 24dB

800 x N at or above 18dB

640 x N at or above 18dB

Updating Your Camera

There are two methods to update to Version 0.7.0. *Please ensure that you have an AC adapter connected to the camera, and your calibration settings are backed up before proceeding with the update procedure.*

Method 1: Internet Update - for cameras on version 0.4.0+

Cameras using Version 0.4.0 and above may be updated via the internet. Calibration data does not need to be restored using this method.

- 1) Connect your Chronos to the internet via the ethernet port.
- 2) Navigate to Util->Storage, then tap Apply Software Update -> Check for Updates
- 3) The camera will ask if you want to install the found updates; press 'Yes'.

Packages will be upgraded, and then the camera will reboot automatically. This procedure will take approximately 3 minutes.

If your camera was previously running software older than 0.6.*, we recommend viewing version 0.6.0's release notes as well. Also see the section 'Calibrating Your Camera' below.

Method 2: Write microSD Card - for cameras on any software version

If a spare microSD of similar size and quality to the factory microSD card is available, it is highly recommended to save the current card while updating a new card with the latest software.

If you are updating from 0.4.0 or older, the power controller will also be updated, which will cause the power status indicator LED on the top of the camera to blink green and red while the fan runs at 100% momentarily. Do not interrupt or power down the camera while this is taking place.

- 1) Download the software update package here:
<http://debian.krontech.ca/builds/chronos-voyager-20210831.img.xz>
- 2) Use [Balena Etcher](#) to write the software to a microSD card. This is recommended as it verifies the integrity of the data written to the microSD card.
 - a) Remove the microSD card from the bottom of the camera, or supply an extra microSD card if you wish to leave the current software version on a spare backup card. The card uses a push-push mechanism for insertion

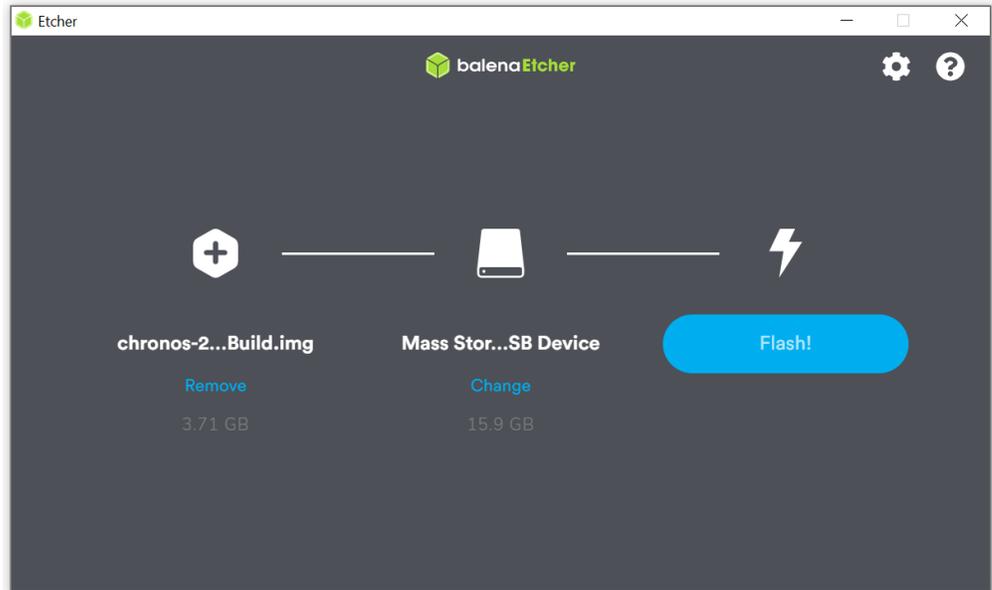
and removal. A ballpoint pen can be used to push down on the card until it ejects.



- b) Insert the microSD card into your computer. You can safely ignore Windows messages and warnings about problems with the device.

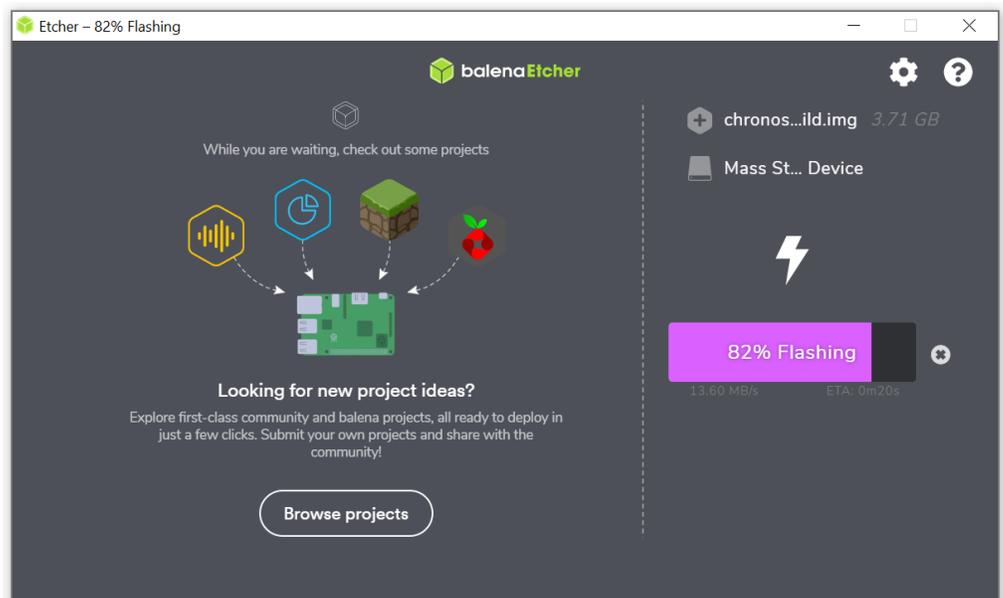


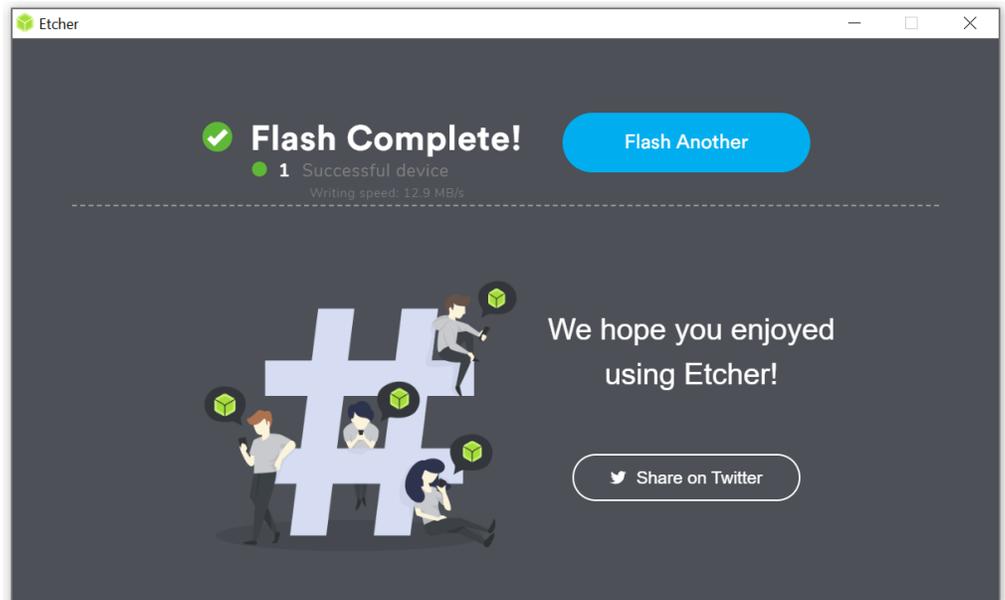
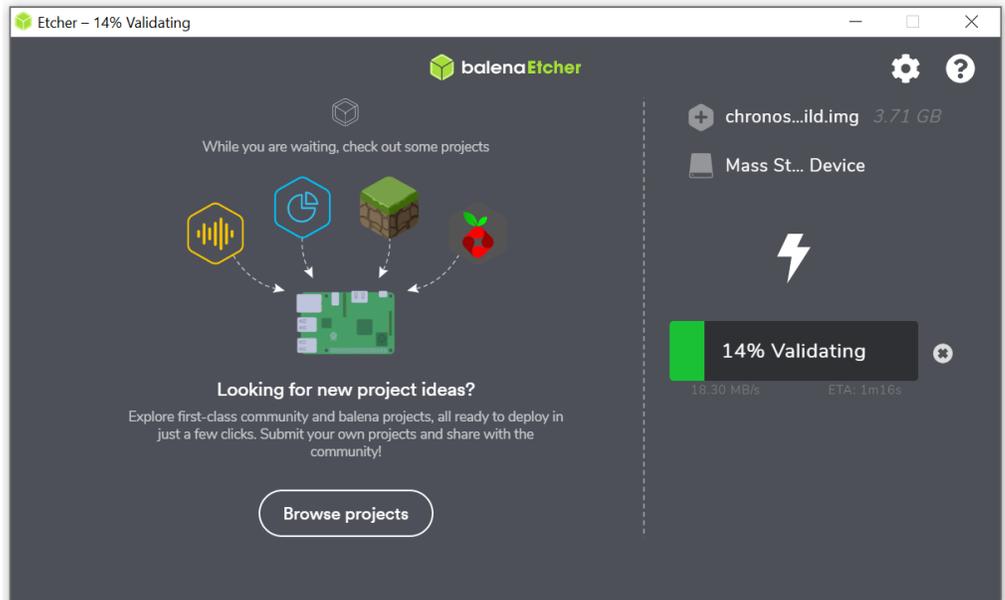
- c) Open Balena Etcher and select the **chronos-voyager-20210831.img.xz** file as downloaded to your computer in Step 1. Balena Etcher should automatically select the microSD card that will be overwritten.



Please note that no specific formatting of the card is required prior to this procedure. Balena Etcher automatically creates the necessary file systems from the image file provided in Step 1.

- d) Click **Flash!** The software will begin being loaded to the microSD card, with the following sequence of screens:





- 3) If Step 2 is successful, remove the microSD card and insert it into the bottom of the camera, ensuring to push the card in with a ballpoint pen until a click is heard.
- 4) Turn the camera on. Once it has booted, the next section may be followed to perform image calibration.

Calibrating Your Camera

Starting with software version 0.6.0, Kron Technologies announced that there are no longer any special factory files that must be generated at our facilities. Both Chronos 1.4 and 2.1 models may be fully calibrated by owners within 10-15 minutes. If you are upgrading from version 0.6.* or later, you may not require recalibration.

- 1) [Chronos 2.1 ONLY - Chronos 1.4 users please skip to Step 2]** On the first bootup with software version 0.6.0 or later, the camera will prompt the user for a Column Gain Calibration, as shown below:

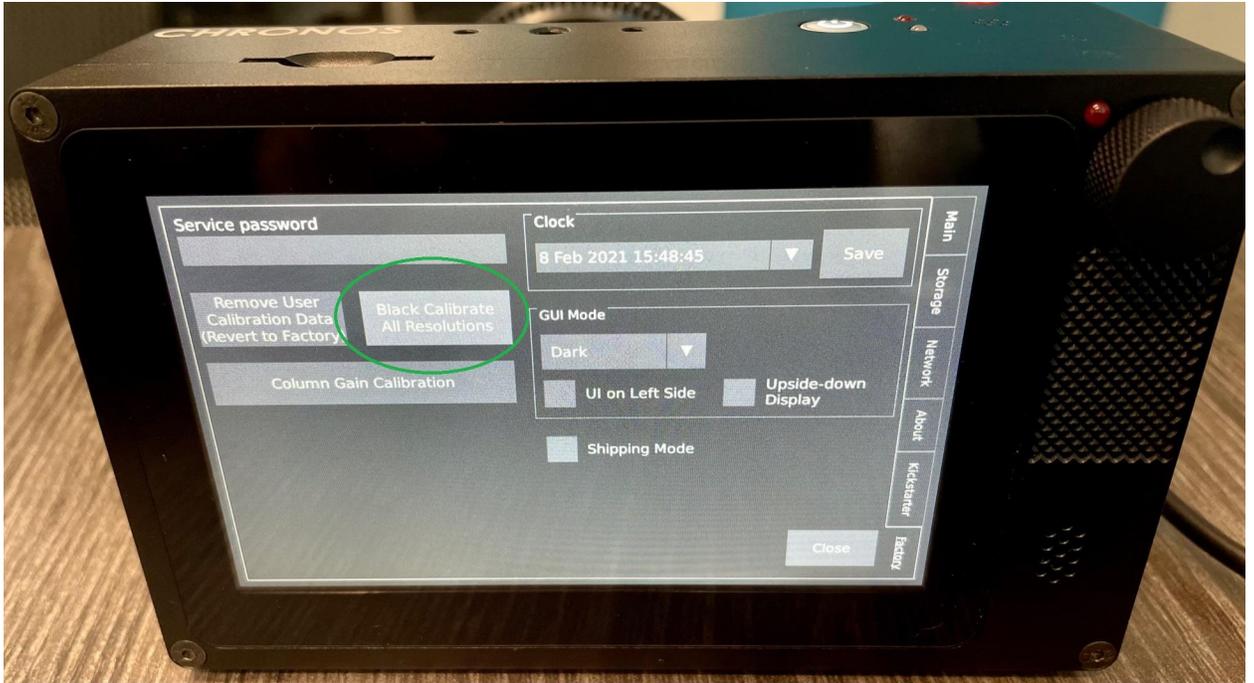


Wait for 15 minutes to let the camera and image sensor reach their operating temperatures, then press **Yes**. This procedure can be redone at any time via the Util -> Factory screen.

A message will be displayed as the viewfinder of the camera flickers. This is normal, as the sensor is being put into various modes automatically.

When the *Computing column gain calibration complete.* message is displayed, press OK and then power the camera down.

- 2) Power on the camera and wait 15 minutes to let it reach operating temperature if Step 1 was skipped.
- 3) Install a lens cap or CS-mount cap as supplied with the camera to block out any light from entering the image sensor path.
- 4) Navigate to **Util -> Factory** and select **Black Calibrate All Resolutions**. This is the final step required for a full calibration of both Chronos 1.4 and 2.1 cameras.



The camera will display a progress bar as it begins to perform a Black Calibration for each standard resolution and analog gain. This process will take approximately 10 minutes and display a completion message once finished.

- 5) Calibration of the camera is complete. It may now be used to capture high-speed footage with optimal image quality.