CaptureGRID Documentation

Release 6.8

Kuvacode

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1 Windows

Minimum Requirements

- Microsoft Windows 10 (64bit) or later

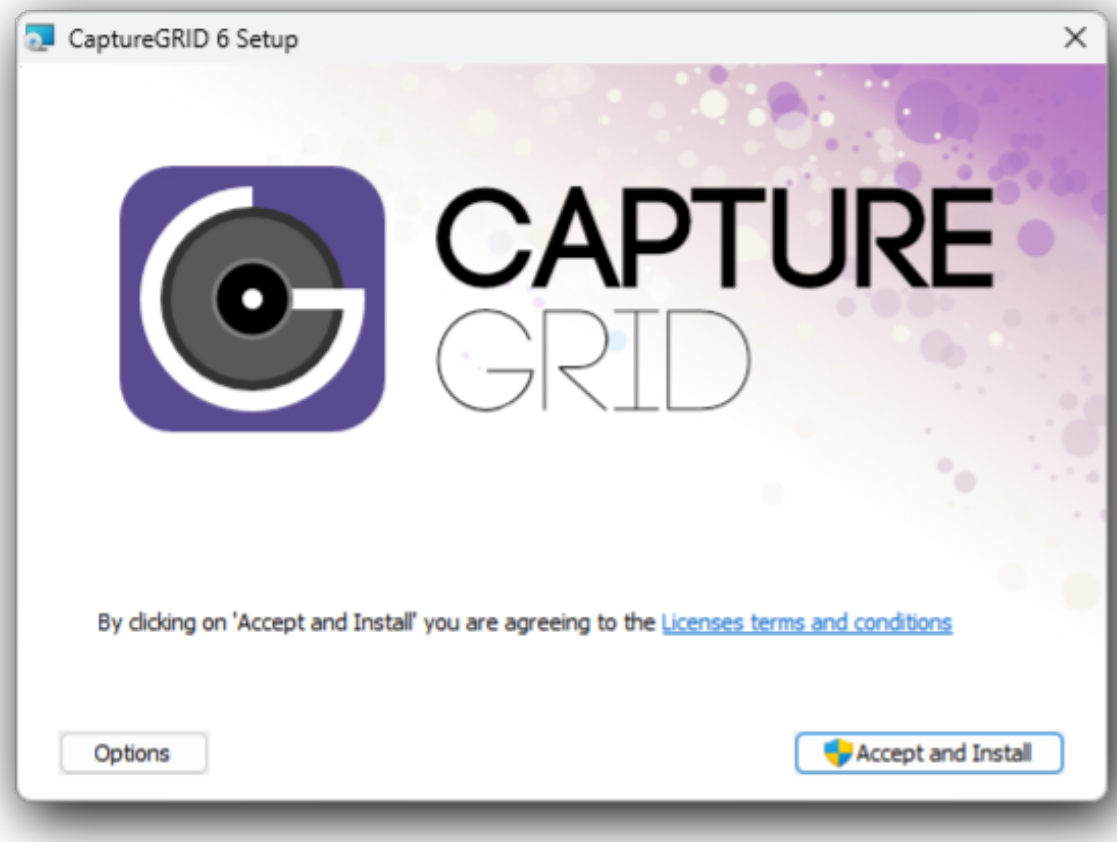
1.1 Installation

CaptureGRID has an install program that configures it for your system. To install, download the file from https://kuvacode.com/capturegrid6, open it, and follow the on-screen instructions.

To uninstall the app, run the *CaptureGRID 6 Uninstall* shortcut that is located alongside the **CaptureGRID 6** program link. Alternatively you can go to the **Add or Remove Programs** located in the Windows Control Panel, and click *Remove* next to the **CaptureGRID 6** item in the list.

1.2 Obtaining Updates

New releases of the app will be made available at https://kuvacode.com/capturegrid6. You can install a new version without uninstalling the previous version, and your personal settings will also be preserved.


CaptureGRID 6 Setup
CAPTURE
GRID
By clicking on 'Accept and Install' you are agreeing to the Licenses terms and conditions
Options
Accept and Install

2 macOS

Minimum Requirements

- macOS 13.5 (Ventura) or later
- Intel or Apple Silicon

2.1 Installation

CaptureGRID is provided as a standalone DMG package file. To install, download the file from https://kuvacode.com/capturegrid6, open it, and drag the **CaptureGRID 6** item to your **Applications** folder.



To uninstall the app, simply delete the **CaptureGRID 6** item located in the **Applications** folder.

2.2 Obtaining Updates

New releases of the app will be made available at https://kuvacode.com/capturegrid6. You can install a new version without uninstalling the previous version, and your personal settings will also be preserved.

3 Linux

Minimum Requirements

- Ubuntu 20.04 or later
- Intel/AMD 64bit, or ARM64

CaptureGRID is provided as a snap package, and is available from the Ubuntu snap store at https://snapcraft.io/capturegrid6.

3.1 Installation

First, ensure that the `core` snap is installed, using the following command:

```
> snap install core
```

CaptureGRID can then be installed with the following command. This downloads the correct version of the package for your system and installs it:

```
> snap install capturegrid6
```

To uninstall the app, run the following command:

```
> snap remove capturegrid6
```

3.2 Running the App

The app is configured to run as a background service. After install, this service will be started automatically. To check the status of the service:

```
> snap services
```

To start/stop the service, or view the logs from the service:

```
> snap start capturegrid6
> snap stop capturegrid6
> snap logs -n all -f capturegrid6
```

Instead of running as a background service, the app can also be run manually from the command line by executing the `capturegrid6` command:

```
> snap stop capturegrid6
> capturegrid6 --help
Usage: CaptureGRID6 [options]
```

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```
Options:
  -c, --cli         Run in CLI mode
  -g, --grid        Enable GRID networking
  -a, --api         Enable External API
  -m, --minimised   Start minimised to System Tray
  -r, --run         Specifies a script file to run immediately
  -v, --version     Print version number and exit
  -h, --help        Show this help message and exit
```

When the app runs as a background service there is no window to manage it from. Use the `capturegrid6.ctl` command to control it from the command line instead, for example to activate the license or change the download folder:

```
> capturegrid6.ctl license activate <code>
> capturegrid6.ctl download-dir /data/photos
```

The External API must be enabled for this to work. See *Command Line Tool* for details.

3.3 Obtaining Updates

New releases of the app will be made available through the Ubuntu snap store, and will be applied automatically. To check the current version you have installed:

```
> snap list capturegrid6
```

Tip

For more information about snaps, see:

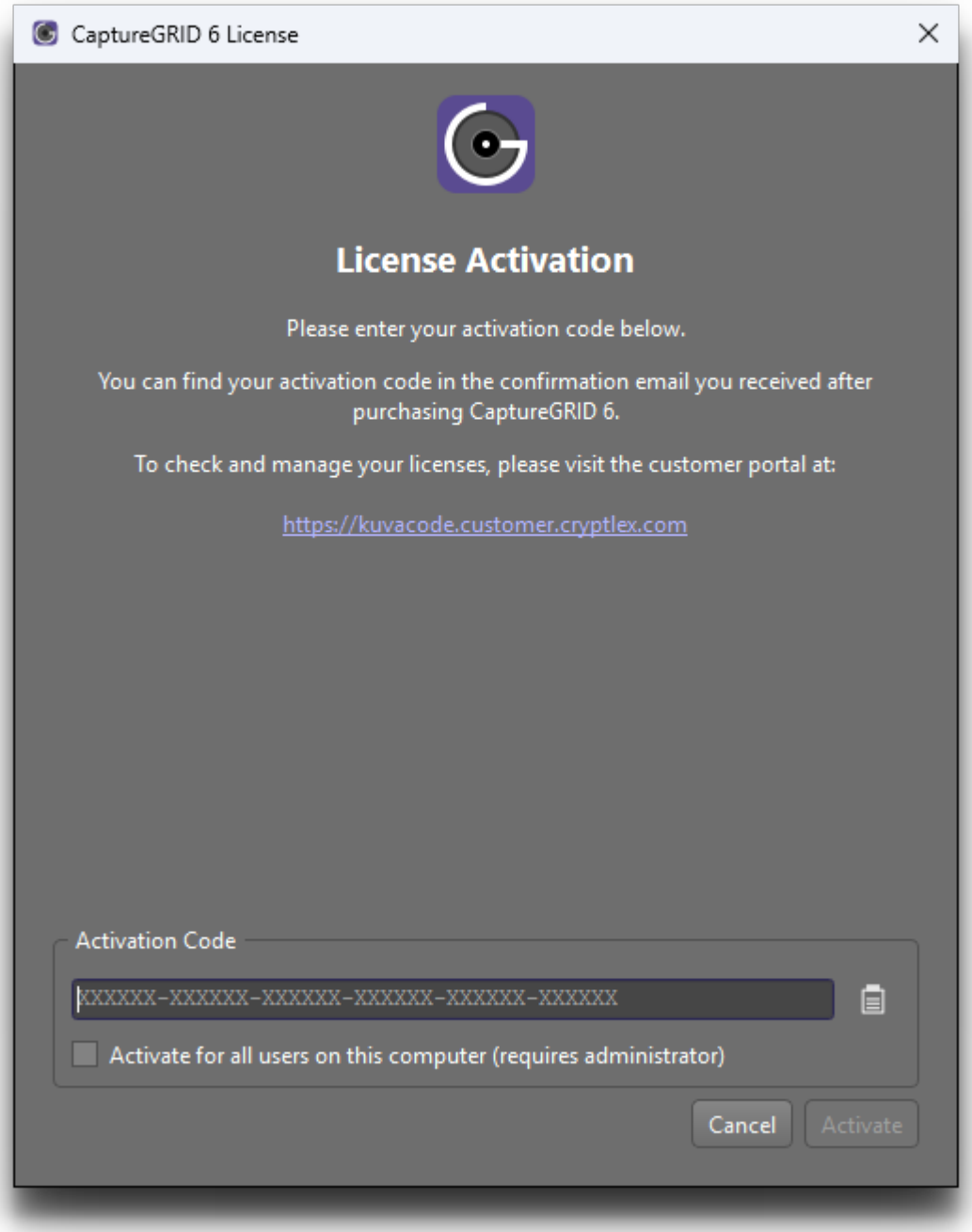
https://docs.snapcraft.io/getting-started

4 License Activation

How to activate your license for CaptureGRID

When CaptureGRID is first installed on a computer, it will operate in a trial mode lasting one month. During the trial period, all functionality is unlocked, so this time can be used to evaluate the app before making a purchase.

After purchasing a license for CaptureGRID, you will receive an email containing the activation code, which can be used to activate and unlock the app from trial mode. This email is sent to the same email address that you specified when making the purchase.


CaptureGRID 6 License
License Activation
Please enter your activation code below.
You can find your activation code in the confirmation email you received after purchasing CaptureGRID 6.
To check and manage your licenses, please visit the customer portal at:
https://kuvacode.customer.cryptlex.com
Activation Code
XXXXXXX-XXXXXXX-XXXXXXX-XXXXXXX-XXXXXXX-XXXXXXX
Activate for all users on this computer (requires administrator)
Cancel
Activate

4.1 Activation Code

In a multi-computer camera rig, the activation code only needs to be used on one of the computers. Once all the computers are connected and communicating over the network, the license information will be synchronised across the computers and unlock them all from trial mode.

Therefore it's expected that you consider one of the computers to be the *master* computer, and only enter the activation code manually on this computer.

So infact there are two different ways in which the app will unlock from trial mode:

- User enters activation code into app's UI
- App automatically receives license information from other networked computer

The activation code itself can be used on up to 2 computers at the same time, so unlocking the app this way can only be done 2 times. The intention is to use this method for the *master* computer, and then also a secondary backup computer as required.

> **Note**
>
> The format of the activation code is 36 hexidecimal digits, for example:
>
> `ABC012-DEF345-FED678-CBA901-ABC234-DEF567`

4.2 Deactivating

If you ever need to deactivate the license, open *Help -> Manage License* and click the *Deactivate* button in the dialog that appears. You may need to do this if you want to install the software on another computer and use the same license there.

> **Note**
>
> You can view the license information and manage the activations/deactivations yourself at the customer portal website:
>
> https://kuvacode.customer.cryptlex.com

4.3 Offline Use

An internet connection is only needed for the initial activation. When the activation code is entered, the app saves the license information on the computer, so after that the computer can be disconnected from the network, or used in a fully air-gapped environment, and the app will remain activated and fully functional.

Each time the app is launched, it will try to contact the licensing server if a network connection is available. If the server can't be reached, the app simply carries on using the saved license information, so there is no loss of functionality when working offline.

This only applies to the internet connection. In a multi-computer camera rig, the computers still need to be connected to each other over the local network, as described in *Networking*.

4.4 Firewall Settings

The app contacts the licensing server over the internet when you enter the activation code, when you deactivate the license, and each time it is launched to check that the license is still valid. If the licensing server can't be reached at launch, the app carries on working as normal, as described in *Offline Use* above. It also contacts the Kuvacode website to check whether a software update is available.

On a corporate or otherwise restricted network these connections can be blocked by a firewall, which will cause the activation to fail. If this happens, ask your network administrator to allow outgoing connections to the servers listed below. All of them are contacted over HTTPS on port 443.

Server	Purpose
`api.cryptlex.com`	Activating and deactivating the license, and checking that it is still valid.
`license.kuvacode.com`	Registering your license details when the activation code is first entered.
`capturegrid6.kuvacode.com`	Checking whether a software update is available.
`kuvacode.com`	Checking whether a software update is available (the check above is redirected to here).
`archive.kuvacode.com`	Downloading the software update itself.

Only outgoing connections to these servers are needed. This is separate from the local network connections used between the computers in a multi-computer camera rig, which are described in *Networking*.

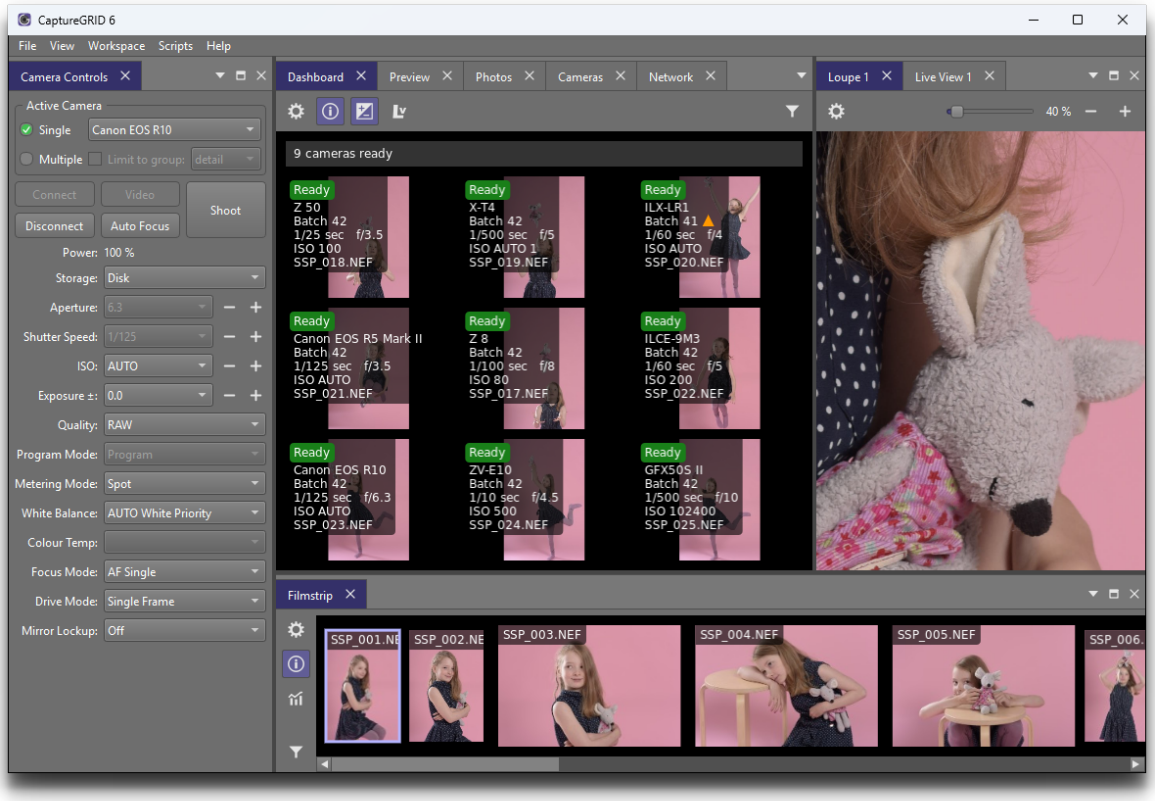
> **Note**
>
> If your firewall is configured with IP addresses rather than server names, the current addresses used by the licensing server are published by Cryptlex, the licensing provider, at:
>
> https://cryptlex.com/docs/sdks-and-apis/proxies-and-firewall

5 Application Interface

How to arrange and save your window layout

The CaptureGRID interface is built around a docking system. The main application window hosts a large number of dockable panes — the **Dashboard**, **Cameras**, **Camera Controls**, **Photos**, **Filmstrip**, **Preview**, **Live View**, **Loupe**, **Network**, **Session**, **Trigger Controls**, **Script Controls**, **Backup**, **Log**, and so on. Each of these can be docked into the main window, floated as its own free-standing window, grouped into tabbed docks, or hidden entirely.

This flexibility is important because the right layout for a multi-camera shoot is rarely the same as the right layout for reviewing photos after the fact. The interface is designed to be arranged for the task at hand, and the result can be saved as a **workspace** so the same layout can be brought back later without re-arranging everything by hand.


CaptureGRID 6
File View Workspace Scripts Help
Camera Controls
Active Camera
Single Canon EOS R10
Multiple Limit to group: detail
Connect Video Shoot
Disconnect Auto Focus
Power: 100 %
Storage: Disk
Aperture: 6.3
Shutter Speed: 1/125
ISO: AUTO
Exposure ±: 0.0
Quality: RAW
Program Mode: Program
Metering Mode: Spot
White Balance: AUTO White Priority
Colour Temp:
Focus Mode: AF Single
Drive Mode: Single Frame
Mirror Lockup: Off
Dashboard Preview Photos Cameras Network
9 cameras ready
Ready
Z 50
Batch 42
1/25 sec f/3.5
ISO 100
SSP_018.NEF
Ready
X-T4
Batch 42
1/500 sec f/5
ISO AUTO 1
SSP_019.NEF
Ready
ILX-LR1
Batch 41
1/60 sec f/4
ISO AUTO
SSP_020.NEF
Ready
Canon EOS R5 Mark II
Batch 42
1/125 sec f/3.5
ISO AUTO
SSP_021.NEF
Ready
Z 8
Batch 42
1/100 sec f/8
ISO 80
SSP_017.NEF
Ready
ILCE-9M3
Batch 42
1/60 sec f/5
ISO 200
SSP_022.NEF
Ready
Canon EOS R10
Batch 42
1/125 sec f/6.3
ISO AUTO
SSP_023.NEF
Ready
ZV-E10
Batch 42
1/10 sec f/4.5
ISO 500
SSP_024.NEF
Ready
GFX50S II
Batch 42
1/500 sec f/10
ISO 102400
SSP_025.NEF
Loupe 1 Live View 1
40 %
Filmstrip
SSP_001.NE
SSP_002.NE
SSP_003.NEF
SSP_004.NEF
SSP_005.NEF
SSP_006.

5.1 Showing and Hiding Panes

Every pane in the app can be opened or closed individually from the *View* menu. The menu shows the full list of available panes — selecting one toggles it open or closed.

If a layout starts to feel cluttered, the simplest fix is to close the panes you are not currently using. They can be reopened any time from the same menu.

5.2 Docking and Floating

Each pane has a title bar at the top. Dragging the title bar lets you move the pane:

- **Dock** — drop the pane onto one of the dock zones at the edge of the main window (top, bottom, left, right) or onto an existing docked pane to share the same area
- **Float** — drop the pane away from any dock zone to leave it as a free-standing window. Floating panes can be moved to a second monitor, which is useful when working with multiple displays
- **Re-dock** — drag a floating pane's title bar back to a dock zone to attach it again

Docked panes can be resized by dragging the splitter bar between adjacent panes.

5.3 Tabbed Docks

When a pane is dropped onto an existing docked pane (rather than onto a dock zone at the edge), the two panes share the same area and appear as tabs at the bottom of the dock. This is a useful way to keep related panes available without using more screen space — for example, the **Photos** table and the **Filmstrip** can occupy the same area, with a tab to switch between them.

5.4 Workspaces

A **workspace** is a saved snapshot of the current window layout — which panes are open, where they are docked, how they are sized, and which tabs are grouped together. Workspaces let you build a layout once and switch between them as the task changes.

All workspace actions are available from the *Workspace* menu.

Save Workspace
: Save the current layout as a named workspace.

Switch Workspace
: Open a submenu showing all saved workspaces; selecting one restores its layout.

Delete Workspace
: Remove a saved workspace.

Reset Workspace
: Restore the layout to the app's default arrangement. Useful when a layout has been changed in a way that is hard to undo.

> **Tip**
>
> A common pattern is to save two or three workspaces aligned with your most common tasks — for example, one **Capture** workspace that prioritises the **Dashboard**, **Live View**, and **Camera Controls**, and one **Review** workspace that prioritises the **Filmstrip**, **Preview**, **Loupe**, and **Photos** table. Switching between them is then a single click.

5.5 Default Focus

When the app starts, the **Dashboard** is given default focus. This ensures that the multi-camera overview is the first thing you see, and that keyboard shortcuts such as `F5` (take photo) or `F6` (auto focus) act on the cameras visible in the Dashboard. For more on the Dashboard, see *Dashboard*.

5.6 Keyboard Shortcuts

Many actions can be done from the keyboard. Camera actions, such as taking a photo or changing a camera setting, act on the active cameras (see *Active Camera*). Photo actions act on the photos selected in the **Photos** table or **Filmstrip**.

The shortcuts work from any window, including a floating one.

Default Shortcuts

Key	Action
F2	Turn full screen on or off
Esc	Leave full screen
F5	Take a photo
F6	Auto focus
F7	Take a photo on all connected cameras
F8	Run the currently loaded script
F9	Go to the *Barcode* field in the **Session** window
Ctrl+O	Open the **Options** window

On macOS, use the Command key in place of Ctrl. Depending on your keyboard settings, you may also need to hold the Fn key to use the function keys.

Changing Shortcuts

All the shortcuts except Esc can be changed in the **Shortcuts** tab of the **Options** window. It lists every action that can be given a key, grouped as follows:

- **Camera** — take a photo, auto focus, take a photo on all connected cameras, run the script, press and release the shutter button, connect, disconnect and identify the camera, and detect cameras.
- **Camera property** — step each camera setting up or down, such as aperture, shutter speed, ISO and white balance. Each setting has one action to step it up and one to step it down.
- **Live view focus** — the six focus steps of the Live View focus buttons (see *Focus Buttons and Mouse Wheel*).
- **Photo** — view, download, hide or unhide the selected photo, reshoot it with the same name, and activate the selected barcode.
- **Application** — full screen, the **Options** window, the *Barcode* field, and showing each window, such as the **Preview** or **Live View 1**.

Only the default shortcuts above have a key to begin with. To give an action a key, click its box in the *Key* column and press the key. To remove a key, click the clear button in its box. Then press *Apply* or *OK* to keep the changes.

- Each key can only be used once. If the key is already in use, it is refused, and the tab shows which action is using it.

- A key pressed on its own, such as a letter or a number, doesn't work while you are typing in a text field such as the *Barcode* field. The tab warns you when you choose one. Function keys, and keys pressed with Ctrl or Alt, work everywhere.
- *Reset Shortcuts* puts back the default keys, and turns the legacy shortcuts back on.

Legacy Single-Key Shortcuts

Earlier versions of the app used single-letter shortcuts. These are still on by default:

Key	Action
T	Take a photo
Z	Take a photo on all connected cameras
F	Auto focus
R	Run the currently loaded script
A	Select the aperture camera setting
S	Select the shutter speed camera setting
I	Select the ISO camera setting
E	Select the exposure compensation camera setting
Q	Select the photo quality camera setting
M	Select the metering mode camera setting
W	Select the white balance camera setting
Up arrow	Change the value of the currently selected camera setting
Down arrow	Change the value of the currently selected camera setting

These keys can't be changed, and they don't work while you are typing in a text field. To turn them off, untick *Also use the legacy single-key shortcuts* in the **Shortcuts** tab. While they are on, their keys can't be given to other actions.

6 Upgrading from CaptureGRID 4

How to migrate your data from CaptureGRID 4

CaptureGRID 6 can be installed alongside CaptureGRID 4. The two versions will not interfere with each other, and you can continue to use CaptureGRID 4 while evaluating CaptureGRID 6.

6.1 Data Migration

When CaptureGRID 6 is launched for the first time, it will detect any existing CaptureGRID 4 installation and offer to migrate your data. This includes:

- Camera names and serial number associations
- Camera presets
- Application options and settings

> **Note**
>
> The migration is a one-time operation. After the migration is complete, changes made in CaptureGRID 4 will not be reflected in CaptureGRID 6, and vice versa.

6.2 License

CaptureGRID 6 requires a separate license from CaptureGRID 4. Your existing CaptureGRID 4 license will not work with CaptureGRID 6. Please visit https://kuvacode.com to purchase a new license.

6.3 What's New

CaptureGRID 6 includes the following major improvements over CaptureGRID 4:

- **Fujifilm camera support** – Fujifilm GFX and X-series cameras are now supported, in addition to Canon, Nikon, and Sony
- **New camera support** – Many recent Canon, Nikon, Sony and Fujifilm models, and the Sigma fp and fp L, are now supported. See *Supported Cameras* for the full list
- **Language support** – The application interface can be displayed in 18 languages in addition to English, chosen when the app is first run and changed at any time afterwards
- **New Dashboard window** – A dedicated window for monitoring and controlling multiple cameras at a glance, with live view display and quick camera actions
- **Photo ratings** – Apply star ratings to photos and filter the photo views by rating
- **Photo import** – Import photos that are already on a camera's memory card, as well as downloading new photos as they are taken
- **Enhanced Filmstrip** – New photo grid layout mode and orientation controls for organising photos
- **Filtering and sorting** – Filter and sort controls in the Filmstrip, Photos, Cameras and Dashboard windows, for finding photos and cameras quickly
- **macOS Apple Silicon** – Native support for Apple Silicon processors
- **Improved macOS camera support** – New native camera backend using Apple's ImageCaptureCore API
- **Database-driven storage** – Camera and photo data is now stored in a persistent database, providing better reliability and faster performance
- **Synchronised camera trigger** – Improved synchronised triggering across multiple cameras

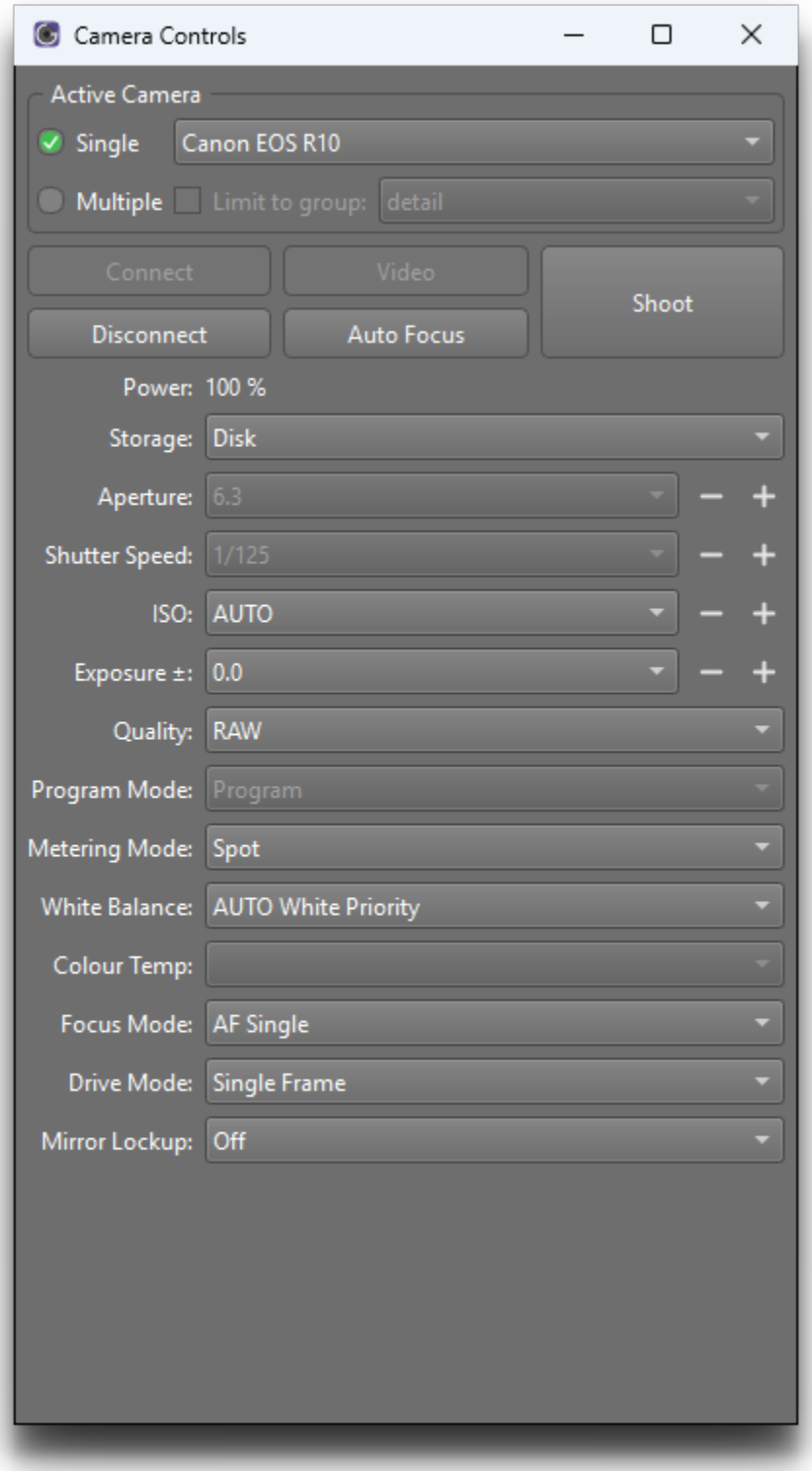
7 Camera Control

How to control your cameras

The app exposes several ways to monitor and control the cameras, and allows actions to be done across multiple cameras at the same time.

The primary way of control is using the **Camera Controls** window, as shown below. This window serves 3 purposes:

- Which cameras are active; either one specific camera, all cameras, or a group of cameras
- Actions to take on the active cameras
- View current status of the active cameras


Camera Controls
Active Camera
Single
Canon EOS R10
Multiple
Limit to group:
detail
Connect
Video
Shoot
Disconnect
Auto Focus
Power: 100 %
Storage:
Disk
Aperture:
6.3
Shutter Speed:
1/125
ISO:
AUTO
Exposure ±:
0.0
Quality:
RAW
Program Mode:
Program
Metering Mode:
Spot
White Balance:
AUTO White Priority
Colour Temp:
Focus Mode:
AF Single
Drive Mode:
Single Frame
Mirror Lockup:
Off

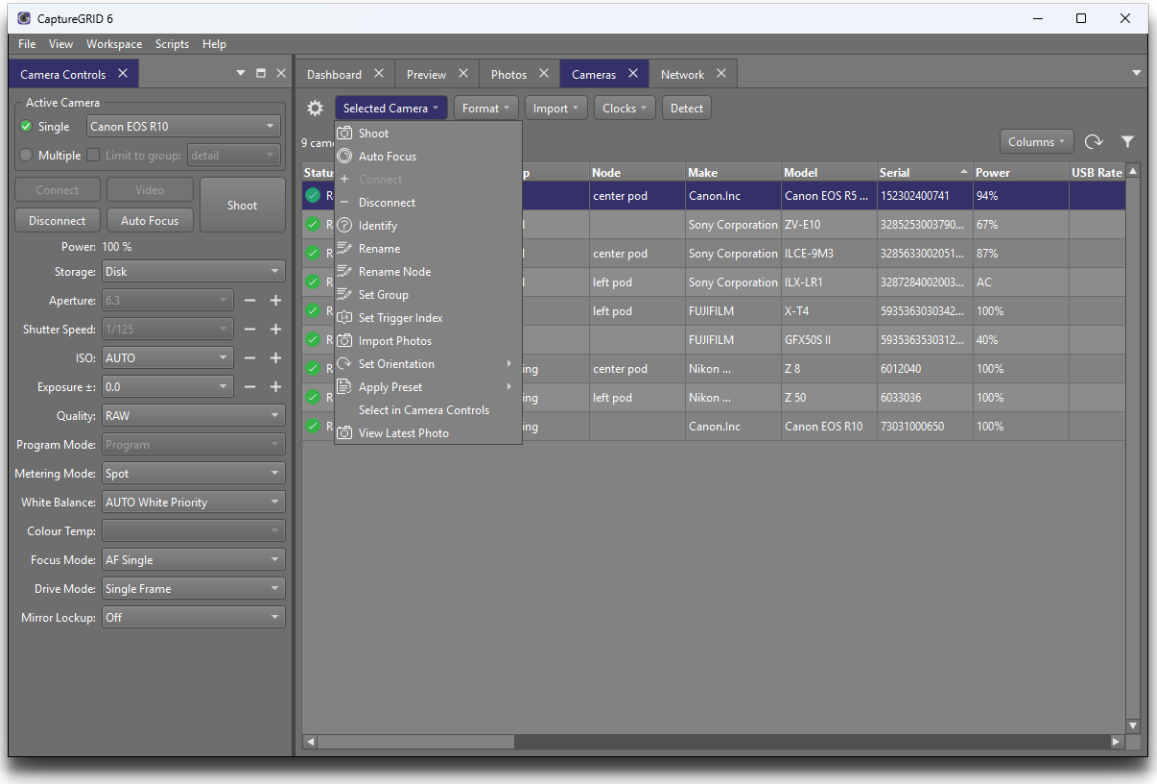
7.1 Active Camera

At the top of this window is the **Active Camera** section, which a dropdown list of all the cameras that are currently connected. By changing the selection in this dropdown list, you can switch to controlling/viewing a different camera.

It also contains radio buttons for *Single* and *Multiple*. When *Single* is selected, then any actions taken will affect only the camera that is currently selected in the dropdown list. When *Multiple* is selected, then any actions will affect all connected cameras.

The *Limit to group* checkbox allows a specific set of cameras to be selected. These camera groups can be created by right-clicking a camera in the camera table.

The screenshot below shows a typical working layout, with the **Camera Controls** window on the left and the **Cameras** table in the centre. A camera is selected in the table, and the **Active Camera** dropdown is open to switch which camera is being controlled.



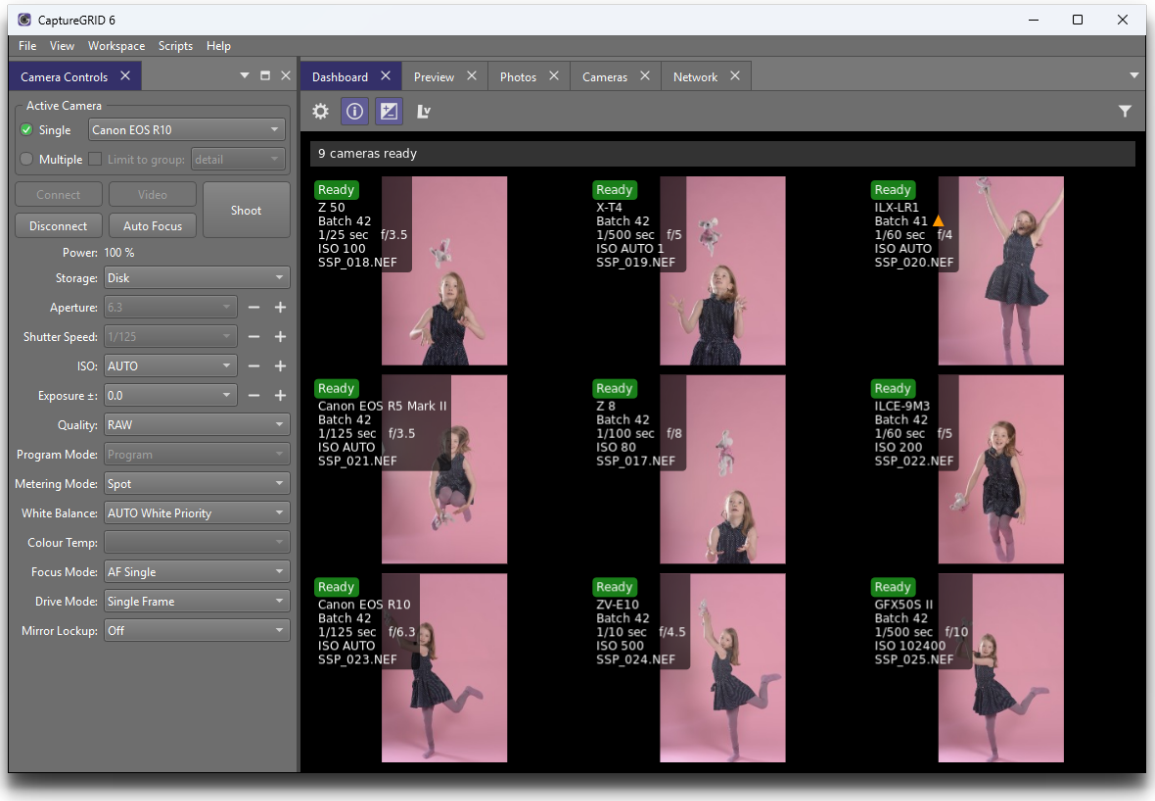
7.2 Keyboard Shortcuts

Taking a photo, auto focus and changing camera settings can also be done from the keyboard, and act on the active cameras. For the full list, and how to change the keys, see *Keyboard Shortcuts*.

8 Dashboard

Monitoring multiple cameras at a glance

The **Dashboard** is the primary window in CaptureGRID. It provides a live overview of every connected camera, with each camera shown as its own tile in a grid layout. For multi-camera rigs — the common case in CaptureGRID — this is the natural starting point, because the status of the whole rig can be seen on screen at the same time.



When the app starts, the Dashboard is given default focus. This ensures that the multi-camera overview is the first thing you see, and that keyboard shortcuts such as `F5` (take photo) or `F6` (auto focus) act on the cameras that are visible in the Dashboard. For the full list of keyboard shortcuts, see *Keyboard Shortcuts*.

8.1 Camera Tiles

Each tile in the Dashboard represents one connected camera, and shows the information you most often need at a glance:

- The camera's name
- The current connection and busy status
- A thumbnail of the most recently taken photo
- Camera-level status indicators

The tiles are arranged in a grid that automatically reflows to fit the available window size. As cameras are added or removed, the layout adjusts accordingly.

8.2 Toolbar

A toolbar at the top of the Dashboard provides quick access to view controls, including the **Highlight Camera Warnings** toggle described below.

> **Tip**
>
> The toolbar's **Highlight Camera Warnings** toggle is one of the most useful elements in the Dashboard for live operation. When enabled, any camera with a problem — a disconnection, a batch number mismatch between cameras, or any other condition that could affect the shoot — is highlighted and flashes in the Dashboard tile layout, drawing your attention to it.
>
> During a session, this means a glance at the Dashboard is enough to spot trouble without inspecting every camera tile individually.

8.3 Filtering

When working with a large rig, the Dashboard's filter controls allow you to narrow the visible set of tiles.

Group
: Limits the view to cameras in a specific group. For more on creating and using camera groups, see *Active Camera*.

Node
: Limits the view to cameras connected to a particular **Node** on the network. This is useful when running across multiple computers; for more on multi-node operation, see *Networking*.

8.4 Relationship to Other Windows

The Dashboard is the always-on overview. For deeper inspection of any individual camera or photo, the app provides dedicated windows:

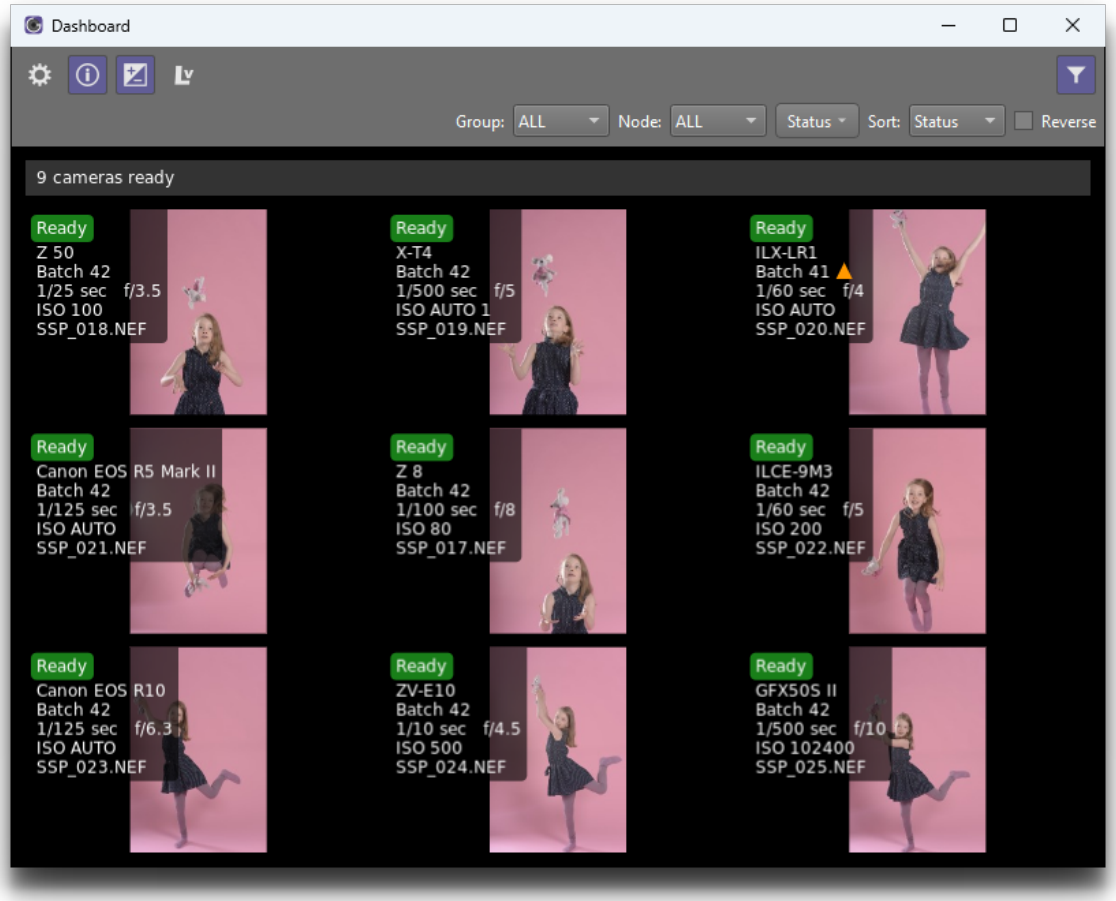
- For per-camera live view, focus and zoom, see the **Live View** windows described in *Live View*.
- For the tabular view of every camera and its settings, see the **Cameras** window described in *Viewing Cameras*.
- For full-size photo preview, zoom and per-photo actions, see *Viewing Photos*.

The Dashboard is typically used alongside one or more of these — for example, with the Dashboard docked on one half of the screen and a **Preview** window on the other, so the rig overview and the most recent photo are both visible at the same time.

9 Viewing Cameras

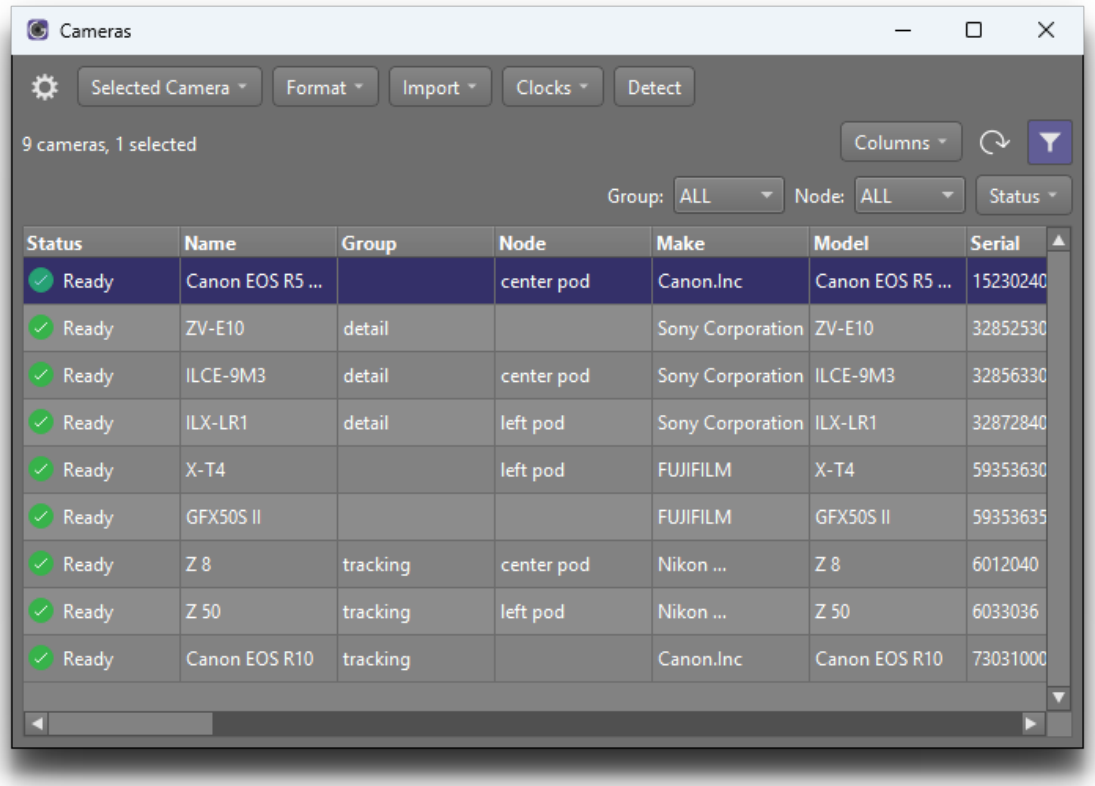
Inspecting and viewing individual cameras

CaptureGRID provides several windows for working with cameras. The **Dashboard** shows a multi-camera overview (see *Dashboard*), and the **Camera Controls** window is for configuring settings and triggering (see *Camera Control*). This page covers the remaining two: the **Cameras** window for the tabular view of every camera the app knows about, and the **Live View** window for the real-time preview of what a single camera is seeing.


Dashboard
Group: ALL
Node: ALL
Status
Sort: Status
Reverse
9 cameras ready
Ready
Z 50
Batch 42
1/25 sec f/3.5
ISO 100
SSP_018.NEF
Ready
X-T4
Batch 42
1/500 sec f/5
ISO AUTO 1
SSP_019.NEF
Ready
ILX-LR1
Batch 41
1/60 sec f/4
ISO AUTO
SSP_020.NEF
Ready
Canon EOS R5 Mark II
Batch 42
1/125 sec f/3.5
ISO AUTO
SSP_021.NEF
Ready
Z 8
Batch 42
1/100 sec f/8
ISO 80
SSP_017.NEF
Ready
ILCE-9M3
Batch 42
1/60 sec f/5
ISO 200
SSP_022.NEF
Ready
Canon EOS R10
Batch 42
1/125 sec f/6.3
ISO AUTO
SSP_023.NEF
Ready
ZV-E10
Batch 42
1/10 sec f/4.5
ISO 500
SSP_024.NEF
Ready
GFX50S II
Batch 42
1/500 sec f/10
ISO 102400
SSP_025.NEF

9.1 Cameras Window

The **Cameras** window shows every camera that the app knows about, in a table format. This includes cameras currently connected as well as cameras that have been seen before. Each row corresponds to one camera and shows its name, group, status, settings and other identifying information.



The window is useful when working with a large rig and you need detailed information about each camera in one place — for example, to check that all cameras have the expected aperture setting, or to identify a camera that has lost connection.

Filtering and Sorting

The Cameras window has a filter row at the top of the table that lets you narrow the visible rows. You can filter by:

- **Group** — only show cameras in a particular group
- **Node** — only show cameras connected to a particular **Node**
- **Status** — only show cameras with a particular connection status

Column headings can also be clicked to sort the table.

Right-click Actions

Right-clicking a row opens a context menu with actions that apply to the selected camera. The most commonly used are:

- *Rename* — set a custom name for the camera (stored against the serial number, so the name persists across reconnects)
- *Set Group* — assign the camera to a named group, for use with the Dashboard's group filter and the Camera Controls window's *Limit to group* checkbox
- *Connect* / *Disconnect* — control the connection to the camera
- *Identify* — flash an indicator on the physical camera to help locate it in a rig

Selecting multiple rows before right-clicking lets the same action be applied to all of the selected cameras at once.

9.2 Live View Window

The **Live View** window shows a real-time preview from a single camera. This is the most common way to compose a shot, check focus, or verify that a scene looks the way you expect before triggering the camera.

Up to four Live View windows can be open at once, each showing a different camera. For everything the Live View windows can do — focusing, zooming, overlays and camera-specific notes — see *Live View*.

10 Live View

Framing and focusing cameras in real time

Live View shows a real-time preview of what a camera is seeing. Use it to compose a shot, check and adjust focus, or confirm that each camera is pointing where it should be before you trigger it.

The main place to work with Live View is the **Live View** window, which shows one camera at a time. Live View can also be shown in the **Preview** window and in the **Dashboard** tiles (see *Live View in the Preview and Dashboard*).

10.1 Live View Windows

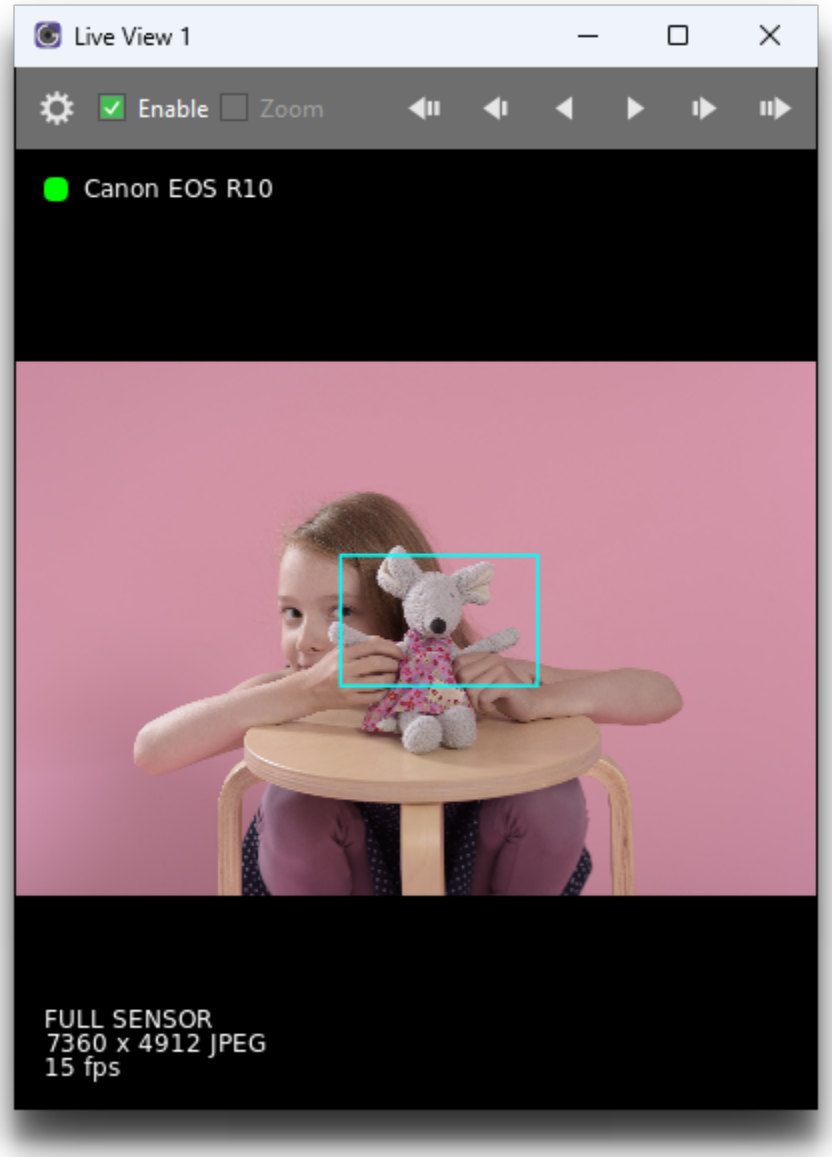
CaptureGRID has four Live View windows, named **Live View 1** to **Live View 4**. Open them from the *View* menu. Like any other pane they can be docked, floated or tabbed, and kept as part of a saved workspace (see *Application Interface*).

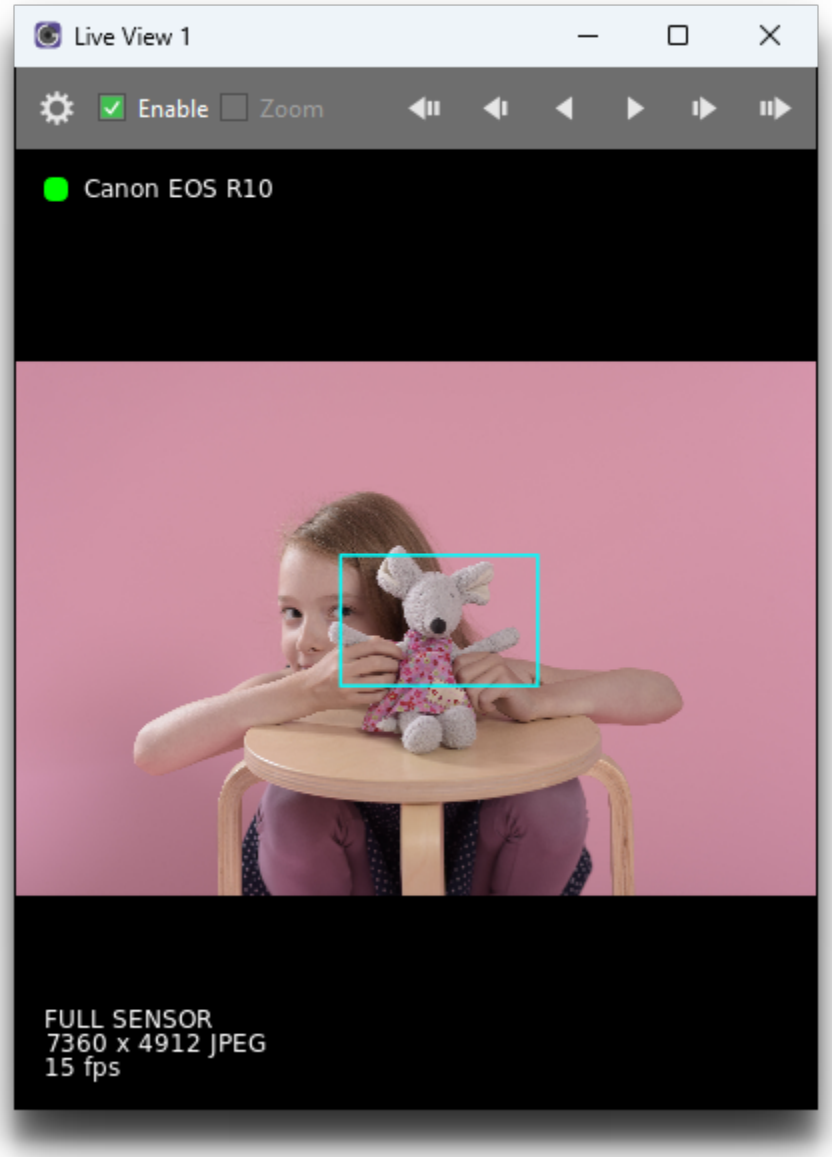
Having more than one open lets you monitor several cameras side by side. Each window has its own camera and its own options, so one window can show a camera at full frame while another is zoomed in to check critical focus.

Choosing the Camera

Click the *Options* button (the cog at the left of the toolbar) to choose which camera the window shows, under *Show Live View From*:

- With *Active Camera* ticked (the default), the window follows the camera selected in the **Camera Controls** window (see *Active Camera*).
- With it unticked, pick a camera from the list and the window stays on that camera, whichever camera is active. The list includes every camera that has been connected before, so a window can stay set to a camera while it is disconnected.


Live View 1
Enable
Zoom
Canon EOS R10
FULL SENSOR
7360 x 4912 JPEG
15 fps


Live View 1
Enable
Zoom
Canon EOS R10
FULL SENSOR
7360 x 4912 JPEG
15 fps

The controls in a Live View window, and the mouse actions described below, only ever affect the camera that window is showing.

10.2 Toolbar

Control	What it does
Options (cog)	Opens the window's options (see *Window Options*)
Enable	Turns Live View on or off on the camera
Zoom	Switches the camera to a zoomed-in Live View (see *Zooming*). Unavailable when Live View is off, or the camera doesn't support zoom
Focus buttons (six arrows)	Move the focus further away (the three buttons on the left) or nearer (the three on the right), in large, medium or small steps. The outermost buttons make the largest steps

The *Enable* and *Zoom* checkboxes show the camera's current state, so they also update if Live View is turned on or off some other way, such as from a script or the External API.

10.3 Focusing

Focus Buttons and Mouse Wheel

The six focus buttons drive the lens's focus motor directly, which is useful for fine-tuning focus by eye, especially with the view zoomed in. With *Focus Live View with mouse wheel* ticked in the window options (the default), you can also turn the mouse wheel over the Live View: scrolling up moves focus further away and scrolling down moves it nearer, by the smallest step.

The focus buttons only work while Live View is on. They are always shown, but they only work on cameras and lenses that support focus control, and some cameras also need a particular focus mode — see *Camera-Specific Notes*.

Cameras don't report where the lens is focused, so each step moves the focus relative to its current position. How far a step moves the focus depends on the camera and lens.

The six focus steps can also be given keyboard shortcuts (see *Changing Shortcuts*). Like the *Auto Focus* button, they act on the active cameras rather than on the camera a Live View window is showing.

Moving the AF Area

The Live View shows the camera's AF (autofocus) area as an outlined box. Hover over it and the outline turns red and is labelled **AF AREA**. Drag the box to move the AF area to a different part of the frame. A movement of less than a few pixels is treated as a click rather than a drag, so the box doesn't move by accident.

When the view is zoomed in, dragging moves the zoomed region instead (see *Zooming*).

Whether the camera then focuses at the AF area depends on its own autofocus settings. It needs an AF mode where you choose the focus point, usually a single-point Live View AF mode. In modes such as face tracking or automatic area selection, the camera may pick its own focus point instead. The right setting varies between cameras.

Double-Click to Focus

Double-click anywhere in the Live View window to move the AF area to that point and focus there. This is quicker than dragging the AF area into place and then pressing **Auto Focus**.

When the view is zoomed in, it only shows the zoomed region, so a double-click recentres the zoomed region on the point you clicked and then focuses.

The AF area is always kept within the camera's sensor, so a double-click near the edge of the frame moves it as far as it can go. If the camera cannot move its AF area, a double-click still focuses at the camera's current AF point.

Auto Focus

Besides double-clicking, you can trigger autofocus with:

- The *Auto Focus* button in the **Camera Controls** window
- The `F6` keyboard shortcut (see *Keyboard Shortcuts*)
- *Auto Focus* in the right-click menu of a camera in the **Cameras** window or a **Dashboard** tile

These act on the active cameras, which may be several cameras at once, whereas a double-click in a Live View window focuses only the camera that window is showing.

While the camera is focusing after a double-click or a turn of the mouse wheel, **FOCUS** is shown briefly at the top-right of the view.

10.4 Zooming

Tick *Zoom* to switch the camera to a magnified Live View of part of the frame, for checking critical focus. The camera decides the resolution of the Live View image, and it is much lower than a photo. When zoomed in, the camera sends a crop of the sensor at finer detail, which makes zoom the best way to focus precisely by eye. The statistics overlay (see *Overlays*) reads **ZOOM REGION** while zoomed and **FULL SENSOR** otherwise.

To look at a different part of the frame while zoomed, either:

- Drag the outlined box. While you drag, the view shows the whole sensor so you can see where the zoomed region will go.
- Double-click a point in the view to recentre the zoomed region on it.

The zoom level varies depending on the camera model, and not every camera supports zoom — see *Camera Support*.

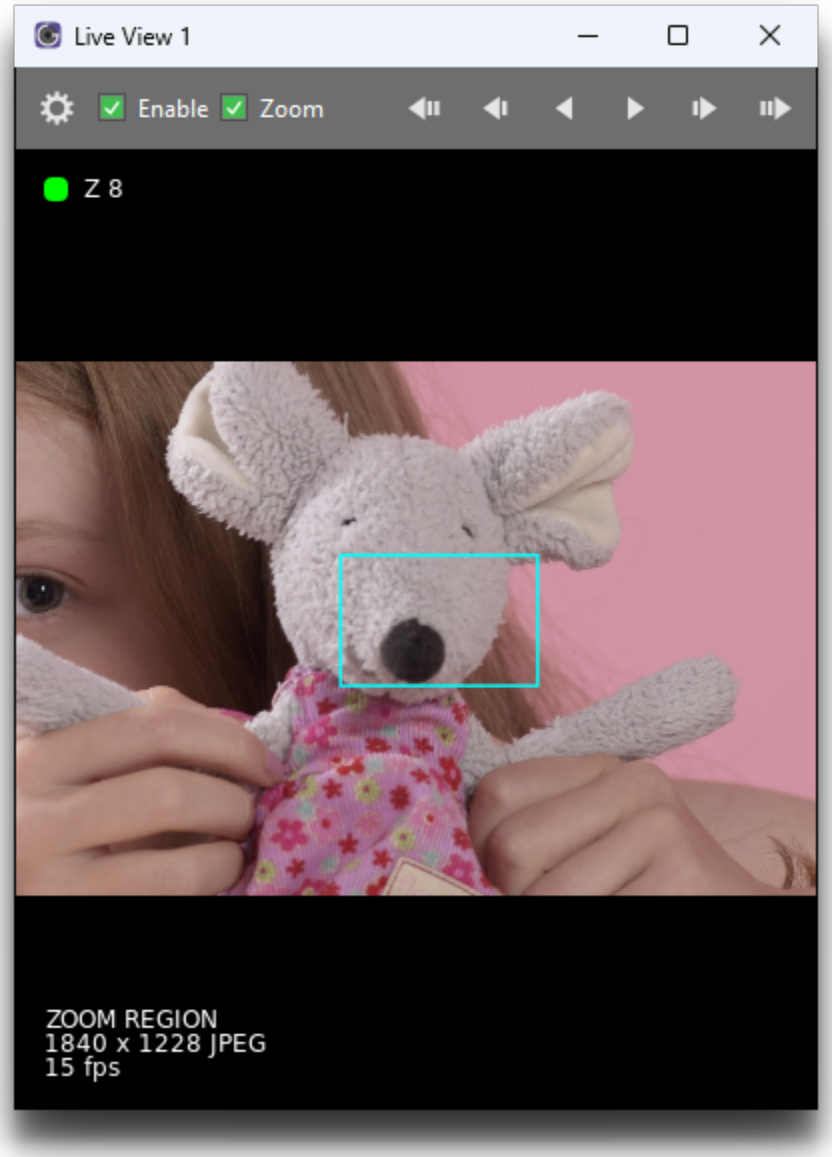
10.5 Overlays

The Live View window can draw these on top of the live image:

Live View indicator (top-left)
: The camera's name, with a status light that pulses **green** while Live View frames are arriving, **yellow** while Live View is on but no frame has arrived yet, and **red** while the camera is recording video. It is **grey** when Live View is off. Toggle it with *Show Live View indicator*.

Statistics (bottom-left)
: Whether the view is the full sensor or a zoomed region, the size of the Live View image, and the frame rate it is arriving at. Toggle it with *Show Live View statistics*.

AF area
: The outlined box described in *Moving the AF Area*. It is always shown when the camera reports an AF area.


Live View 1
Enable
Zoom
Z 8
ZOOM REGION
1840 x 1228 JPEG
15 fps

Grid
: A grid of lines over the live image, to help with composition and lining up cameras. See *Window Options*.

Image overlay
: A semi-transparent image of your choice drawn over the Live View, for example a previous photo to line up a repeat shot. It is not drawn while zoomed in. See *Window Options*.

While the camera is recording video, the elapsed recording time is shown at the top-right.

10.6 Window Options

Click the *Options* button (the cog) to open the window's options. Each of the four Live View windows keeps its own settings.

Show Live View From

- *Active Camera* (on by default) — follow the active camera. Untick it to pick a camera from the list instead. See *Choosing the Camera*.

UI

- *Focus Live View with mouse wheel* (on by default) — focus by turning the mouse wheel over the view. See *Focus Buttons and Mouse Wheel*.
- *Show Live View indicator* (on by default) — show the camera name and status light.
- *Show Live View statistics* — show the zoom state, image size and frame rate.

Orientation

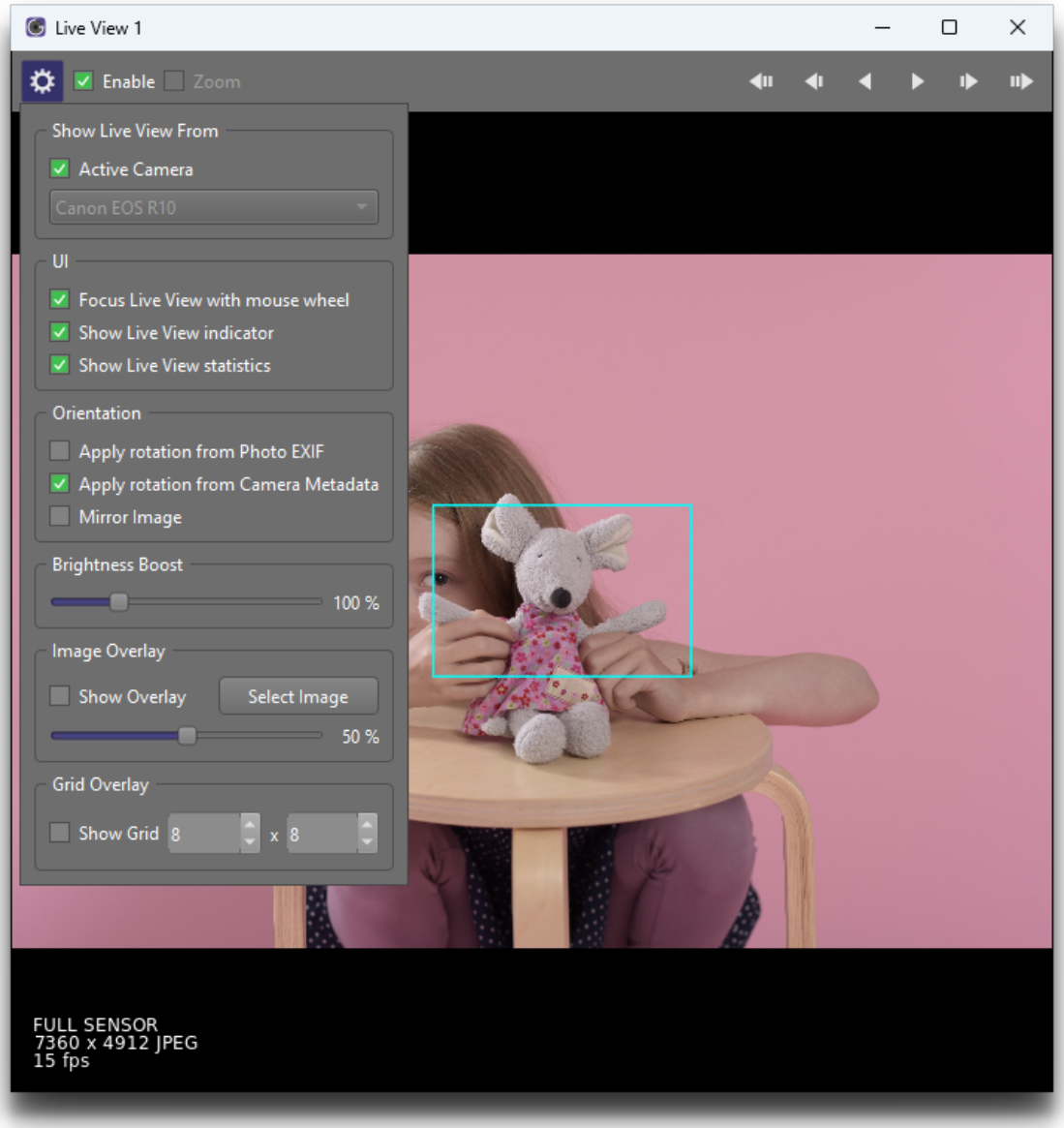
- *Apply rotation from Photo EXIF* — rotate the view to match the orientation the camera records in its photos.
- *Apply rotation from Camera Metadata* (on by default) — rotate the view by the orientation set with *Set Orientation* in the camera's right-click menu.
- *Mirror Image* — flip the view horizontally.

Brightness Boost

Brighten or darken the view, from 10% to 400% (100% by default). This only changes how the image is displayed, not the camera's exposure.

Image Overlay

Tick *Show Overlay* and click *Select Image* to draw an image over the view, for example a previous photo to line up a repeat shot. The slider sets how strongly the image shows, from 0 (invisible) to 100 (fully opaque), and starts at 50. The image isn't drawn while zoomed in.


Live View 1
Enable
Zoom
Show Live View From
Active Camera
Canon EOS R10
UI
Focus Live View with mouse wheel
Show Live View indicator
Show Live View statistics
Orientation
Apply rotation from Photo EXIF
Apply rotation from Camera Metadata
Mirror Image
Brightness Boost
100 %
Image Overlay
Show Overlay
Select Image
50 %
Grid Overlay
Show Grid
8
x
8
FULL SENSOR
7360 x 4912 JPEG
15 fps

Grid Overlay

Tick *Show Grid* to draw a grid over the view, and set the number of rows and columns (8 x 8 by default). The grid uses the same colour as the grid in the **Preview** window.

10.7 Live View in the Preview and Dashboard

The **Preview** window and the **Dashboard** can show Live View as well as photos. Each has a *Live View Overlay Options* button (marked **Lv**) on its toolbar with these settings:

- *Show Live View Overlay* (on by default) — show Live View when it is available.
- *Transparency* (100 by default) — how strongly Live View covers the photo underneath. At 100 it is fully opaque.
- *Brightness Boost* (100% by default) — brighten or darken Live View, from 10% to 400%, as in the Live View window.
- *Photo Review Time* (4 seconds by default) — how long a newly taken photo is shown before Live View takes over again. While a photo is being reviewed, the indicator reads **LIVEVIEW: REVIEW** with a countdown.

Showing Live View there takes two steps: *Show Live View Overlay* must be ticked, and Live View must be turned on for the camera — from a Live View window, for example.

Preview

The Preview shows Live View from the camera that took the photo being displayed, drawn over the photo, with **LIVEVIEW** at the bottom-left.

- **Not zoomed:** the AF area is outlined as in the Live View window. Drag it to move the AF area, or double-click a point to move the AF area there and focus.
- **Zoomed:** the Preview always shows the whole sensor, so the zoomed Live View is drawn inside an outlined box at the position of the zoomed region, labelled **LIVE VIEW** when you hover over it. Drag the box, or double-click elsewhere in the photo, to move the zoomed region. A double-click inside the box focuses without moving it.

When Live View is showing, *Scan Image for Barcode* scans the Live View image (see *Barcode Scanning*).

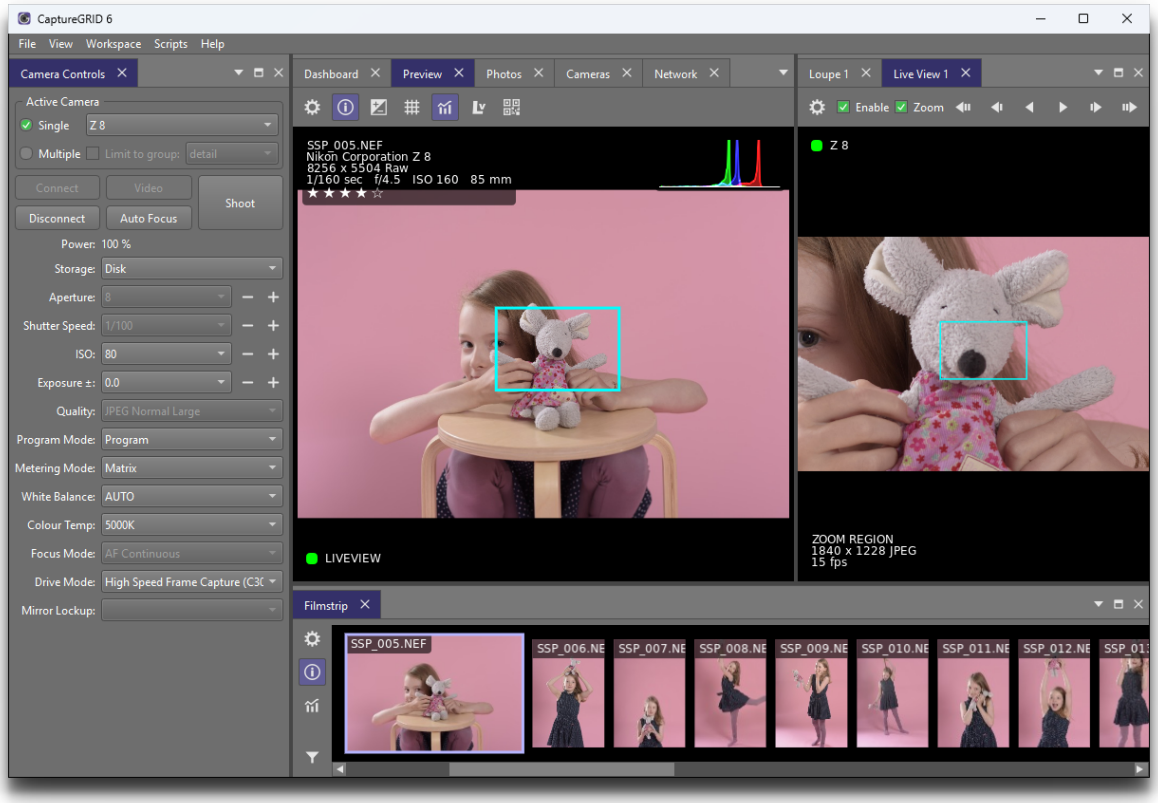
Dashboard

Each Dashboard tile shows Live View from its own camera when Live View is on for that camera. After the camera takes a photo, the tile shows the photo for the *Photo Review Time*, then returns to Live View. The tiles don't respond to dragging or double-clicking; to focus a camera from the Dashboard, right-click its tile and choose *Auto Focus*. See *Dashboard*.

10.8 Camera Support

Which Live View features are available depends on the camera:

Camera	Zoom	Move AF area	Focus buttons	Auto Focus
Canon	Yes	Yes	Yes *	Yes *
Fujifilm	Yes	Yes	Yes *	Yes *
Nikon	Most models	Yes	Most models *	Yes
Sigma	No	No	Yes *	Yes *
Sony	Some models	Zoomed only	Yes *	Yes *


CaptureGRID 6
File View Workspace Scripts Help
Camera Controls
Active Camera
Single Z 8
Multiple Limit to group: detail
Connect Video Shoot
Disconnect Auto Focus
Power: 100 %
Storage: Disk
Aperture: 8
Shutter Speed: 1/100
ISO: 80
Exposure ±: 0.0
Quality: JPEG Normal Large
Program Mode: Program
Metering Mode: Matrix
White Balance: AUTO
Colour Temp: 5000K
Focus Mode: AF Continuous
Drive Mode: High Speed Frame Capture (C3
Mirror Lockup:
Dashboard Preview Photos Cameras Network
SSP_005.NEF
Nikon Corporation Z 8
8256 x 5504 Raw
1/160 sec f/4.5 ISO 160 85 mm
LIVEVIEW
Loupe 1 Live View 1
Enable Zoom
Z 8
ZOOM REGION
1840 x 1228 JPEG
15 fps
Filmstrip
SSP_005.NEF
SSP_006.NE
SSP_007.NE
SSP_008.NE
SSP_009.NE
SSP_010.NE
SSP_011.NE
SSP_012.NE

* With conditions — see *Camera-Specific Notes*.

Live View itself is available on every supported camera except the Nikon D3000 and D3100, the Sony a6000 and the Ricoh Theta S. For the full list of supported cameras, see *Supported Cameras*.

10.9 Camera-Specific Notes

Some cameras need particular settings for Live View features to work, or behave differently from the rest. For differences that aren't about Live View, see *Camera Notes*.

All Cameras

- Some cameras limit their exposure settings while Live View is on. For example, the Nikon D7000 can't use shutter speeds slower than 1/30 s in Live View. Turn Live View on before setting the aperture and shutter speed, so that you see the values the camera will actually use.
- The Live View image can be framed slightly differently from the photo the camera takes. This comes from the camera and lens.
- Whether Live View keeps running while the camera records video depends on the model.

Canon

- Canon cameras use the same position for the AF area and the zoomed region, so moving the AF area also sets which part of the frame is magnified when you turn on *Zoom*.
- The focus buttons need the lens's AF/MF switch set to AF.
- *Auto Focus* doesn't work when the camera's *Focus Mode* is MF, for example because the lens's AF/MF switch is set to MF.

Fujifilm

- The focus buttons and *Auto Focus* only work when the camera's *Control Mode* is *App* (see *Fujifilm*).
- The focus buttons only work when the camera's *Focus Mode* is MF. In any other focus mode they have no effect, even though they are not greyed out. The steps are a share of the lens's focus range, and focus stops at the ends of the range.
- *Auto Focus* doesn't work when the *Focus Mode* is MF. Live View pauses briefly while the camera focuses.
- While Live View is on, the camera ignores its own buttons, so you can't shoot or change settings on the camera body. The settings can't be changed from the app either. Turn Live View off to change them.
- Turning zoom on or off briefly restarts Live View.
- The AF area moves in whole focus points, so very small drags are ignored. The size of the box drawn for the AF area is approximate.
- Taking a photo stops Live View on the camera. It is turned back on automatically afterwards (see *Automatic Behaviour*).

Nikon

- The focus buttons need an autofocus lens, with the lens and camera set to AF rather than MF.
- The D3000 and D3100 don't support Live View. The D3200, D3300, D3400 and D3500 support Live View, but not zoom or the focus buttons.
- On the D800 and D800E, set the camera's Live View selector to Live View photography, not movie Live View. Movie Live View shows the image at a different aspect ratio, and blocks RAW and some shutter speeds.
- When not zoomed, dragging moves the camera's AF point. When zoomed, it moves the zoomed region.
- While Live View is on, the camera's Live View AF-area mode is switched to normal-area AF, so that the AF area can be moved. Your own setting is put back when Live View is turned off.
- On some models, *Storage* is set to Disk and can't be changed while Live View is on (see *Nikon*).

Sigma

- *Auto Focus* only works when the camera's *Control Mode* is *App*. The focus buttons work in both modes (see *Sigma*).
- The focus buttons need a lens that the camera can focus electronically. With other lenses they have no effect. The steps are a share of the lens's focus range, and focus stops at the ends of the range.
- Live View zoom isn't available, and the AF area can't be moved from the app.
- Taking a photo stops Live View on the camera. It is turned back on automatically afterwards (see *Automatic Behaviour*).

Sony

- The Sony a6000 doesn't support Live View.
- The focus buttons only work when the camera's focus mode is MF. If they have no effect, set the camera to manual focus.
- Not all Sony models support Live View zoom. On those that don't, the *Zoom* checkbox is unavailable.
- The AF area can't be moved from the app. Dragging only works while zoomed, where it moves the zoomed region. When not zoomed, a double-click focuses without moving anything.
- *Auto Focus* doesn't work when the camera's *Focus Mode* is MF. On models with a focus mode dial on the body, such as the a9 III, the dial decides the focus mode and the app's *Focus Mode* setting has no effect. If *Auto Focus* does nothing, check the dial isn't set to MF.
- Turn Live View zoom off before using a power zoom lens. While Live View zoom is on, power zoom doesn't move.

10.10 Automatic Behaviour

CaptureGRID looks after Live View in the background:

- Many cameras leave Live View when they take a photo. If you turned Live View on, CaptureGRID turns it back on automatically once the shot has finished, and restores the zoom if it was zoomed in.
- Live View frames are paused while a photo is being taken, so the capture isn't slowed down.
- Live View is turned off when a camera is disconnected.

The **Cameras** window has a **Live View** column showing whether Live View is on for each camera (see *Cameras Window*).

> **Tip**
>
> Live View places noticeable load on the camera and the USB connection. If you are running a large rig, consider only turning Live View on for the cameras you are actively framing, and turning it off on the others.

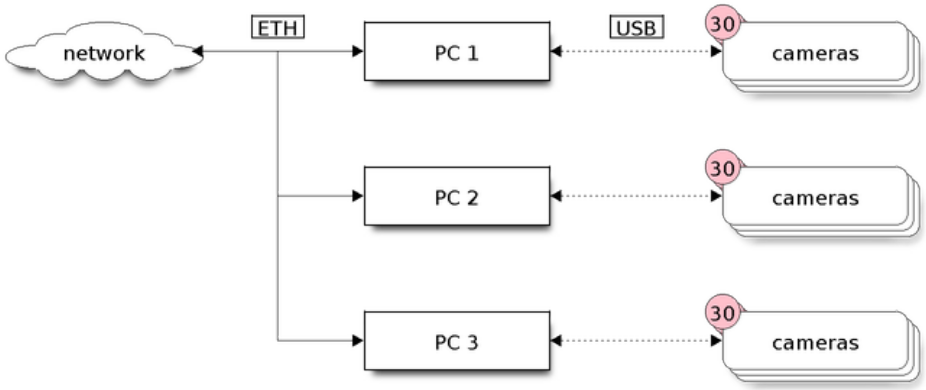
11 Networking

How to manage networking for multi-computer synchronisation

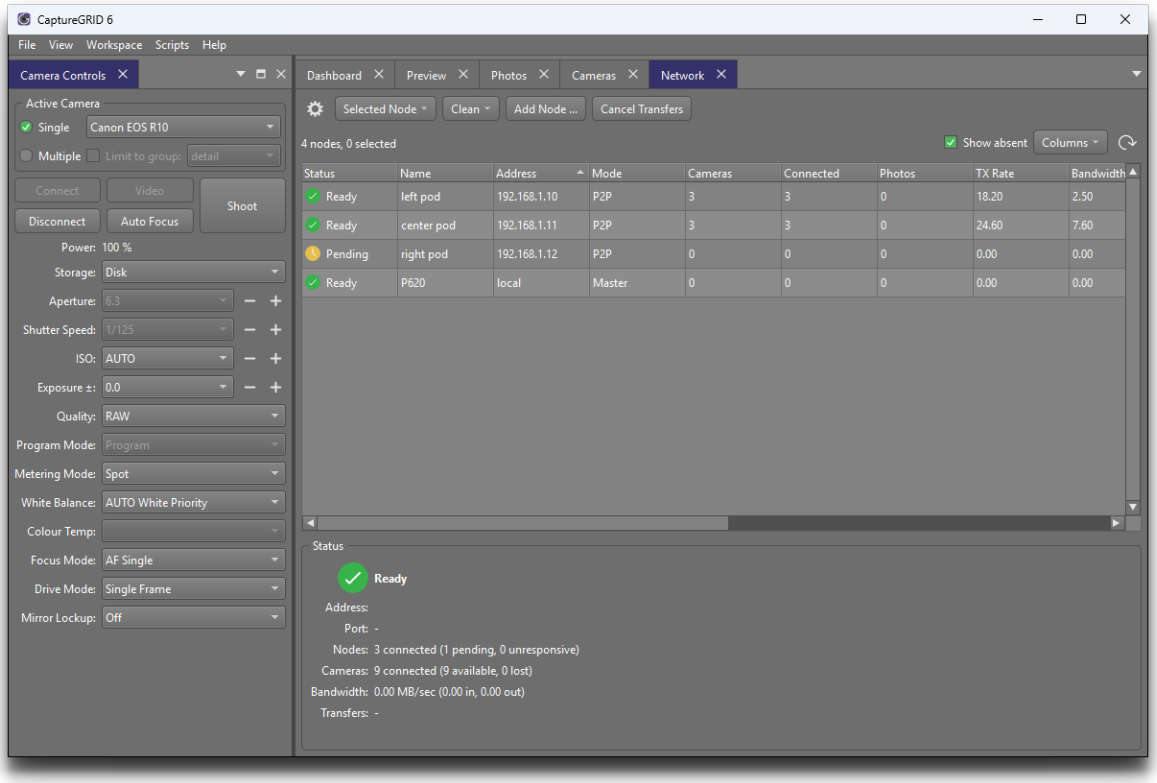
> **Note**
>
> This feature is not available in **CaptureGRID CELL**, which supports up to 8 cameras on a single computer only.

The networking functionality of CaptureGRID allows you to connect and control a large number of cameras, by splitting the USB connections across multiple computers. This means the number of cameras is not limited by the USB hardware capabilities of a single computer, but instead can be scaled up by adding more computers.

The computers you use do not have to be the same type, or even use the same OS, they just need to have the CaptureGRID software installed and running on them, and be connected to the same local network. So for example, if the multi-camera rig needs to support 90 cameras, this could be achieved with 3 PCs, with 30 cameras connected to each:



The screenshot below shows the **Network** tab, which is used to monitor and these control features.



Each computer on the network is referred to as a **Node**, and the table in the centre shows all the known nodes along with their status.

In order to discover and connect to the other nodes on the local network, the app will periodically send out a discovery message. Once another node is detected, the two will begin further network communication and synchronise camera and photo information.

Once all nodes are connected and synchronised, the user can operate the app from just one of the computers, to get a unified view of all cameras and photos on the network, and be able to take actions on all cameras at the same time.

11.1 Network Mode

Each node can be configured to operate with a particular network mode. This controls which other nodes it is allowed to communicate with.

To change this, right-click a node in the node table, and use the *Set Network Mode* menu option. For the local node, it can also be set using the *Network Mode* dropdown menu. The valid modes are:

Network Mode	Description
P2P	P2P (peer to peer) nodes main connection to other P2P nodes and to the Master node.
Master	Master node maintains connection to all other nodes, regardless of their network mode. Master node also distributes options to all other nodes.
Slave	Slave nodes only maintain connection to the Master node.

The default mode is **P2P**, and this is suitable for most situations. A typical configuration is to have one node set to **Master**, and all other nodes set to **P2P**.

For scenarios that have a large number of nodes, it is recommended to set the main computer to **Master**, and all other nodes to **Slave**. This reduces the overall network traffic being sent between nodes.

> **Tip**
>
> Before right-clicking the nodes in the node table, it's possible to select multiple rows in the table. This allows the mode to be changed for multiple nodes at the same time.

11.2 Distributing Options

It's not just camera and photo information that can be synchronised between nodes, the app also allows various options to be set from one node by the user, and automatically sent to the other nodes.

This is enabled for any nodes that have *Network Mode* set to **Master**.

> **Tip**
>
> It's recommended that you consider one of the computers as the *Master* node, and set the *Network Mode* to **Master** for only that node, and make all edits to the Options from that node.

11.3 Photo Transfers

Whenever a new photo is taken, information about that photo is synchronised to all nodes. However by default, the actual photo file will only be saved to the node where the camera is connected, to the **Photo Download Directory** on that computer.

To gather all the photos onto a single computer, the app has a feature for transferring photo files between nodes. To enable this, change the *Sync photos* dropdown menu. The valid options are:

Sync Mode	Description
None	Photo transfers are not enabled.
All	Photo transfers for all photos are enabled.
JPEG	Photo transfers for only JPEG photos are enabled.

> **Note**
>
> An alternative to using the built-in photo transfers, is to instead point each node's **Photo Download Folder** to a common network shared folder. Depending on you network configuration, this may result shorter times to gather the photos to a single location.
>
> However, the app's photo viewer will not be aware of those network transfers, so it will only be possible to view the photo from inside the app, on the node that did the USB download.

11.4 Node Information

The main part of the **Network** tab shows a table containing all the nodes that are known to the local app. It lists various bits of information about each node, as described below:

Column	Description
Status	The status of the node. This will be one of: • Disconnected - *network connection to the node is down* • Pending - *network connection to the node is pending* • Ready - *network connection to the node is up and node is ready* • Busy - *node is connected but currently busy with an operation* • Error - *node has encountered an error condition*
Name	The name of the node. This defaults to node's hostname. Each node can renamed with a custom name, by editing this field.
Address	The IP address of the node.
Mode	The network mode used by the node. This can be either: • P2P (peer to peer) • Master • Slave
Cameras	The number of cameras that where detected by the node.
Connected	The number of cameras on the node that are connected and and ready for operation.
Photos	The number of photos that have been taken by cameras that are connected to this node.
TX Rate	The network transfer rate in MBytes/second, for the most recent photo transfer from this node.
Bandwidth	The current network bandwidth in MBytes/second between this node, as averaged over the last second.
Latency	The round-trip time in milliseconds for a request/reply message between the node.
Disk Space	The available disk space on the node.
Memory Usage	The memory usage on the node.
Version	The version of CaptureGRID software running on the node.
Platform	The type of computer running the node.
Clock	The current time on the node.
Up Time	The total time that the CaptureGRID app has been running on the node.

11.5 Network Configuration

The app will attempt to choose a suitable network configuration, so in most cases the network connection will work automatically. If the network connection is down, the app will periodically check and retry until the connection is up again. Manual changes to network configuration can be made using the controls in the bottom left of the **Network** tab.

Interface
: When the network connection is enabled, the app will retrieve the list of valid network interfaces on the computer. These are listed in the *Interface* dropdown list. The app will attempt to choose the appropriate one for the local network, but you may need to select it here if it cannot determine the correct one to use.

Port
: This controls which port used for network communication. A reason for changing this is if you need to operate two multi-camera rigs, as then the network communication can be segregated for each set of computers.

Discovery mode
: This option allows control over what method is used for networt discovery. This may need to be changed if the computers are unabled to detect each other, due to how network traffic is handled by the local router.

Max transfers
: This controls the maximum number of active photo transfers coming into the node.

Transfer size
: When transferring photos, the data is split across multiple network messages; this controls the maximum size of each message. A larger transfer size means fewer messages need to be sent, but more memory is required.

Node timeout
: If no messages have been received from another node within this timeout period, that node is considered to be unavailable and is disconnected.

12 Photo Download

How to control and automate downloading photos

When a new photo is taken, the actual location of the photo file is determined by the **Storage** camera setting. This provides control over where the photo is initially saved, and whether it is automatically downloaded. This setting has four possible values:

Stor-age	Description
Disk	The photo is not saved to the camera's memory card, but instead is immediately downloaded and saved to the local computer disk.
Card	The photo is saved to the camera's memory card, and not automatically downloaded.
Both	The photo is saved to the camera's memory card, and also immediately downloaded and saved to the local computer disk.
JPEG	The photo is saved to the camera's memory card. If the photo is in JPEG format it is also immediately downloaded and saved to the local computer disk.

Once the photo is downloaded, if the camera is active in the display window, then the photo will be automatically viewed in the display window.

> **Note**
>
> If you are using the networking functionality for synchronising between multiple computers, there is also additional step to consider for transferring photos between those computers. The **Storage** mode described here does not affect that. For more information on network photo transfers, see *Photo Transfers*.

The **Storage** camera setting can be changed in the **Camera Controls** window as shown below.

12.1 Manual Download

For each new photo that is taken, the app will automatically detect this and query the camera for information about this photo. The app will create a new *Photo* entry, which will then be visible in the **Filmstrip** window and the **Photos** table.

For photos that have not been downloaded yet and are currently on the camera's memory card, they are a few ways to begin the download. The screenshot below shows the table of photos. Above the table is the *Download All* button, which will begin download of all such photos.

The screenshot also shows the context menu when a photo is right-clicked. Selecting the *Download* action from this menu will then download the currently selected photo.

The table has a column labelled **Location**. This shows the current location of each photo. If the photo has not yet been downloaded then the location will be `Camera`. Once a photo has been downloaded and saved to the local computer disk, then the location will be `Local Disk`.

12.2 Shooting RAW + JPEG

When shooting in dual RAW + JPEG mode, the camera will save each photo as both a RAW file and a JPEG file.

The RAW photo and JPEG photo will be assigned a unique Sequence number. However, they will both be assigned to the same Batch number. So depending on the how the options are configured for filenaming, this may lead to the RAW and JPEG photos be given different filenames. For more information on how this numbering is used for photo filenames, see *Name Policy*.

12.3 Setting a default

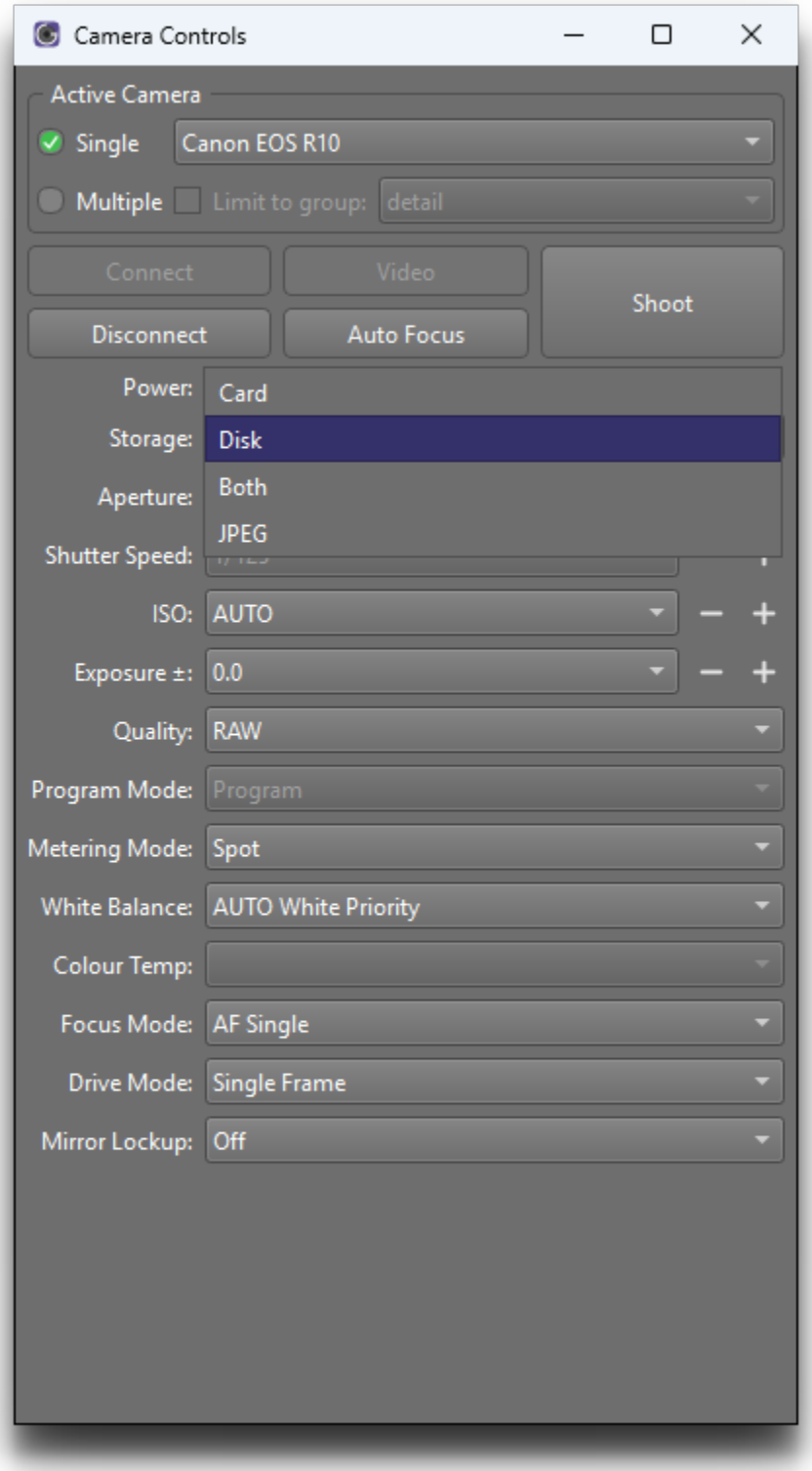
When a camera is first connected to the app, the **Storage** mode will be set to a specific value. This defaults to `Disk`, but there is an option to customise this. In the **Cameras** window, click the options (gear) button to open its menu. Under the **Default Camera Settings** section there is a drop down box labelled *Camera Storage*, which sets the default Storage mode applied to each newly connected camera.

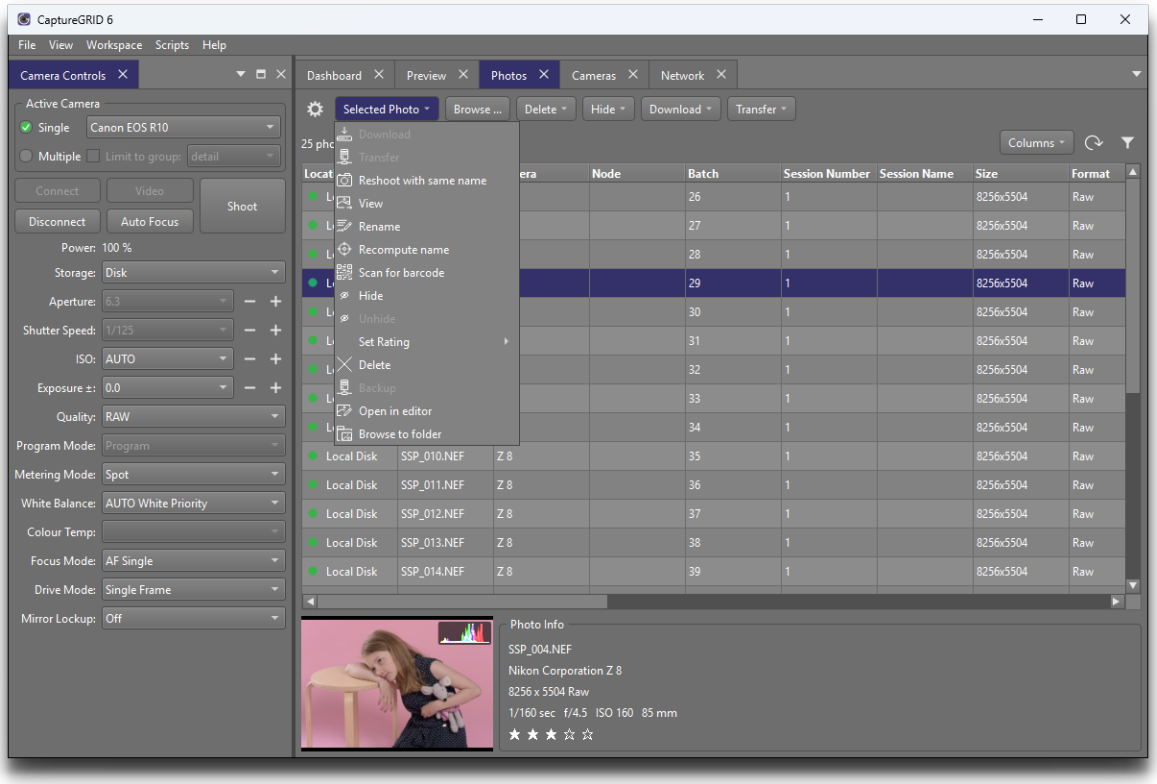
12.4 Adding Metadata to Photos

The app can write extra information into the metadata of each photo as it is downloaded. The information is stored inside the photo file itself, so it stays with the photo even if the file is later renamed or moved, and it can be read by other software that shows EXIF / XMP information.

To turn this on, in the **Photos** window click the options (gear) button and tick *Add Metadata to Photos* in the **Photo Metadata** section. This is turned off by default.

Below the checkbox there is a list of the metadata fields that the app can write. For each field, choose what information to put in it from the drop down box:

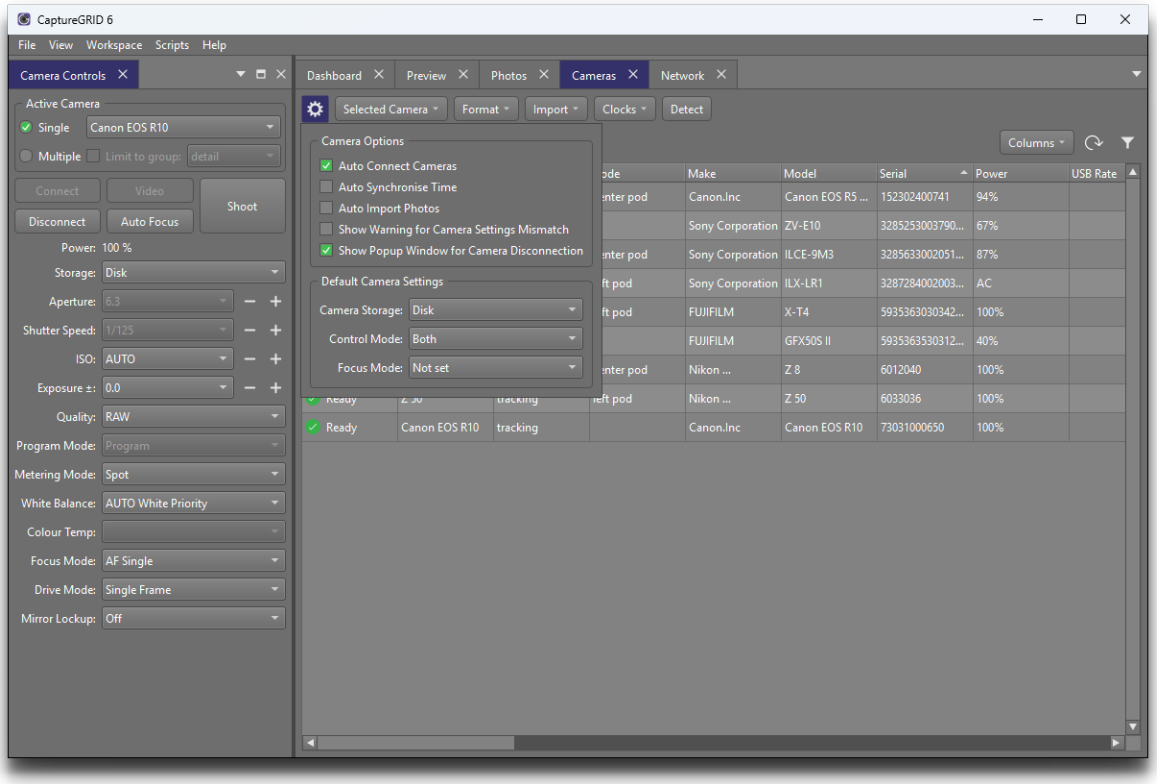

Camera Controls
Active Camera
Single
Canon EOS R10
Multiple
Limit to group:
detail
Connect
Video
Shoot
Disconnect
Auto Focus
Power:
Card
Storage:
Disk
Aperture:
Both
JPEG
Shutter Speed:
ISO:
AUTO
Exposure ±:
0.0
Quality:
RAW
Program Mode:
Program
Metering Mode:
Spot
White Balance:
AUTO White Priority
Colour Temp:
Focus Mode:
AF Single
Drive Mode:
Single Frame
Mirror Lockup:
Off



Value	Description
None	The field is left untouched.
Barcode	The most recently scanned barcode text. For more information, see *Barcode Scanning*.
Session Name	The current Session Name, as set in the **Session** window.
Unique Tag	The current Unique Tag, as set in the **Session** window.
Camera Name	The name of the camera that took the photo.
Camera Group	The name of the group the camera belongs to.

The fields that can be written are *UserComment*, *ImageDescription*, *Copyright* and *Artist*. By default the barcode is written to *UserComment*, and the other fields are set to *None*.

Each value is the one current at the moment the photo is downloaded — the same value that would be used for the matching part of the filename (`[Z]`, `[N]`, `[U]`, `[C]` or `[G]`). For more information, see *Name Policy*.



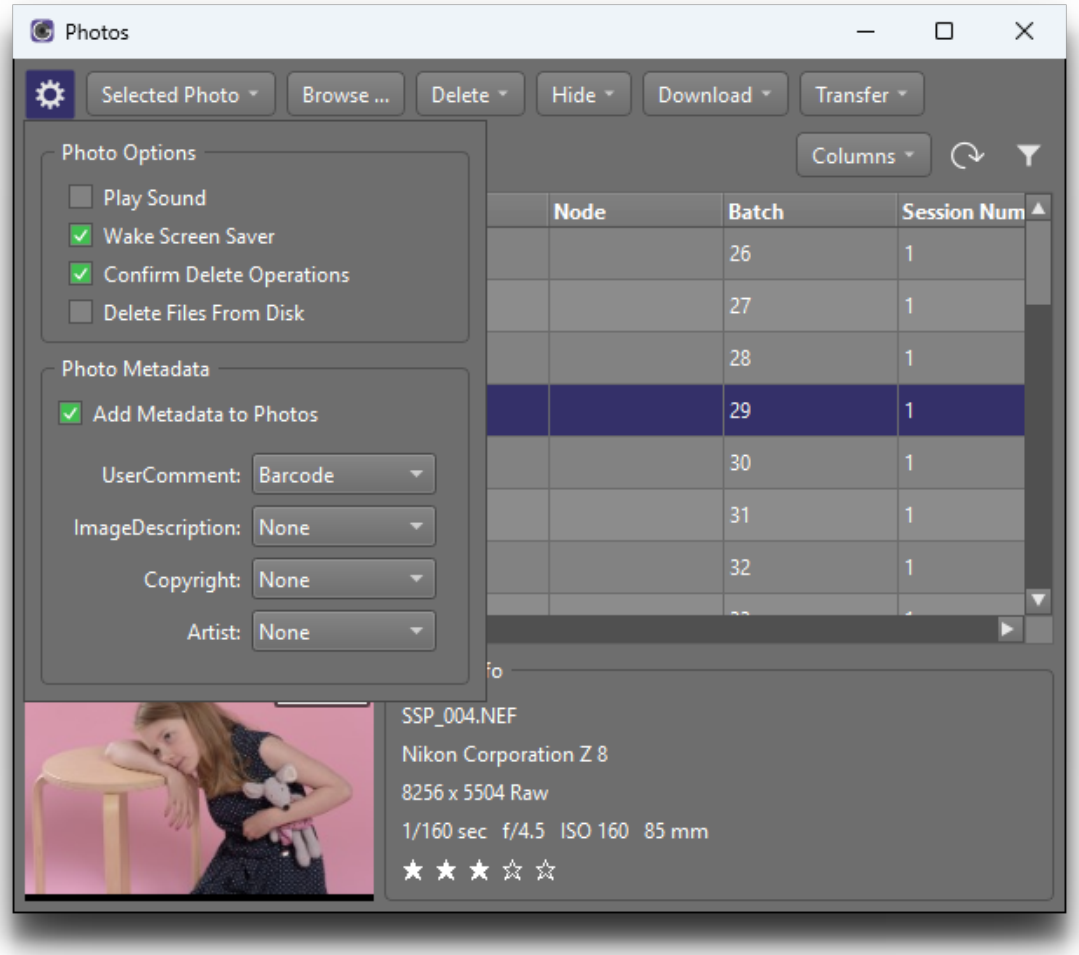
13 Photo Import

Importing existing photos from a camera's memory card

Alongside the regular automatic download of newly-taken photos, CaptureGRID can also import existing photos already on a camera's memory card. This is useful when:

- Photos were taken before the camera was connected to the app, and you want to bring them into the app's photo library
- A camera was previously used in **Card** storage mode (see *Photo Download*), and you now want to pull those photos down to the local computer
- You are setting up the app with a camera that already has photos on it from a prior session

Photo import is distinct from photo download: download happens automatically as new photos are taken, while import is a deliberate action you start to fetch photos that the app did not see being captured.


Photos
Selected Photo
Browse ...
Delete
Hide
Download
Transfer
Columns
Photo Options
Play Sound
Wake Screen Saver
Confirm Delete Operations
Delete Files From Disk
Photo Metadata
Add Metadata to Photos
UserComment:
Barcode
ImageDescription:
None
Copyright:
None
Artist:
None
Node
Batch
Session Num
26
1
27
1
28
1
29
1
30
1
31
1
32
1
SSP_004.NEF
Nikon Corporation Z 8
8256 x 5504 Raw
1/160 sec f/4.5 ISO 160 85 mm

13.1 Starting an Import

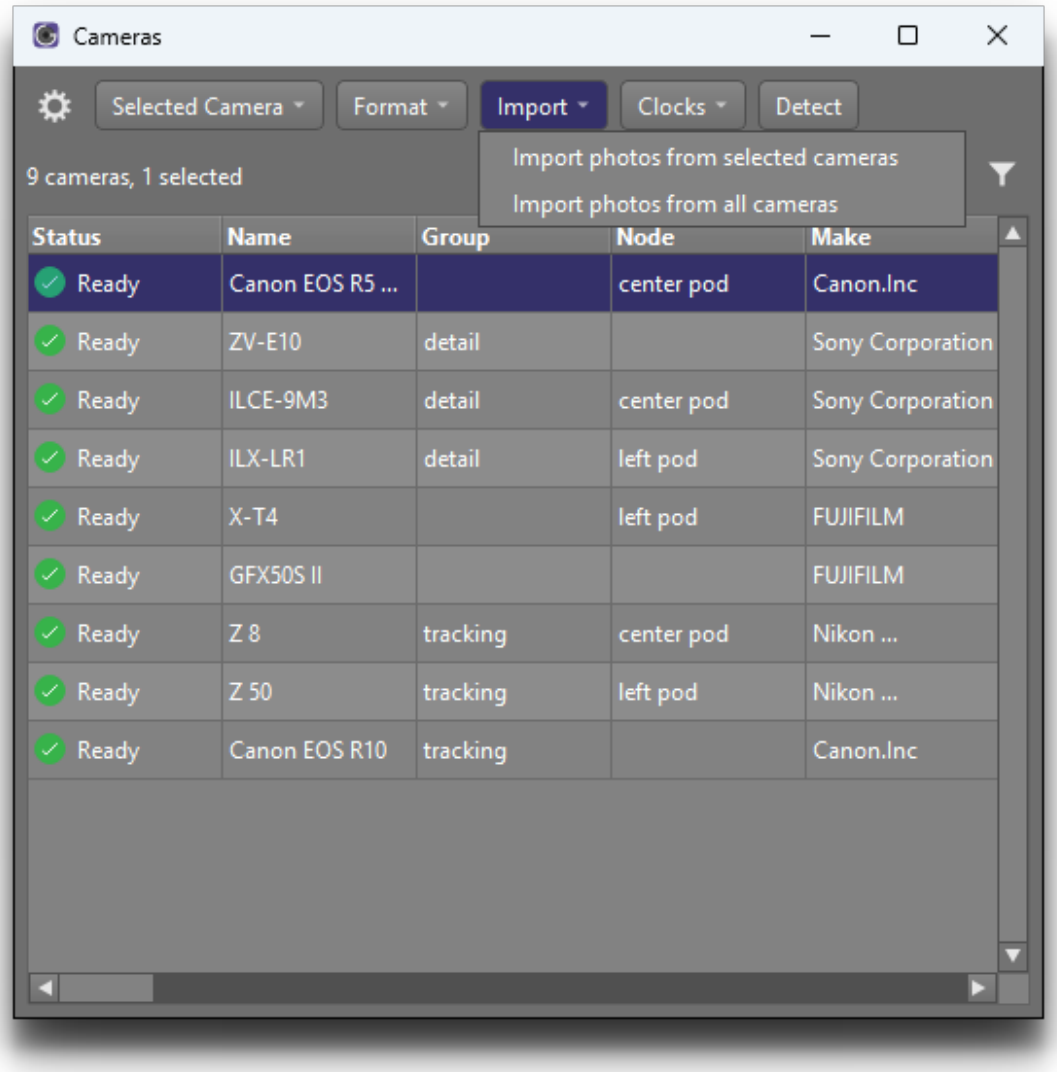
An import can be started in two ways:

- From the **Cameras** window, click the *Import* button in the toolbar. The button has a dropdown with two options:

  Import photos from selected cameras
  : Import from the cameras currently selected in the Cameras table.

  Import photos from all cameras
  : Import from every connected camera.

- From the Cameras table itself, right-click a camera and choose *Import Photos* from the context menu. If several rows are selected before right-clicking, the action applies to all of them.



For multi-camera rigs, this means a single click can pull photos from the whole rig at once.

13.2 Import Process

Starting an import does not download any image files. Instead, the app queries the camera's memory card and adds an entry to its photo library for each photo found there. These entries appear in the **Filmstrip** and the **Photos** table just like automatically-detected photos, with their **Location** shown as `Camera` to indicate that the file is still on the memory card and has not yet been downloaded.

The image files themselves are downloaded later, in the normal way — for example with the *Download All* button or the per-photo *Download* action (see *Manual Download*). Once downloaded, the files are saved to the **Photo Download Folder** and have their filenames computed according to the current name policy (see *Name Policy*).

While the import is running, the affected camera is shown as busy in the **Cameras** window and **Dashboard**, so you can see that it is not available for triggering until the import completes.

13.3 Ratings and Metadata

EXIF metadata is read when a photo is downloaded, not at import time. So any rating that was set on the camera or by another tool is picked up once an imported photo has been downloaded to the computer, in the same way as for photos that were downloaded automatically. For more on ratings, see *Photo Ratings*.

14 Viewing Photos

Working with downloaded photos

CaptureGRID has four windows dedicated to viewing and working with photos: **Filmstrip**, **Preview**, **Loupe**, and the **Photos** table. Each is suited to a different way of looking at photos, and they are designed to work together — selecting a photo in one window updates the others.

For a quick map:

- **Filmstrip** — thumbnails in a row or grid; the natural starting point for browsing recent photos
- **Preview** — large display of a single photo, with histogram, grid, and other overlays
- **Loupe** — closer detail view of a photo, useful for checking critical focus
- **Photos** — the full database of every photo the app knows about, in table form, with filtering and sorting

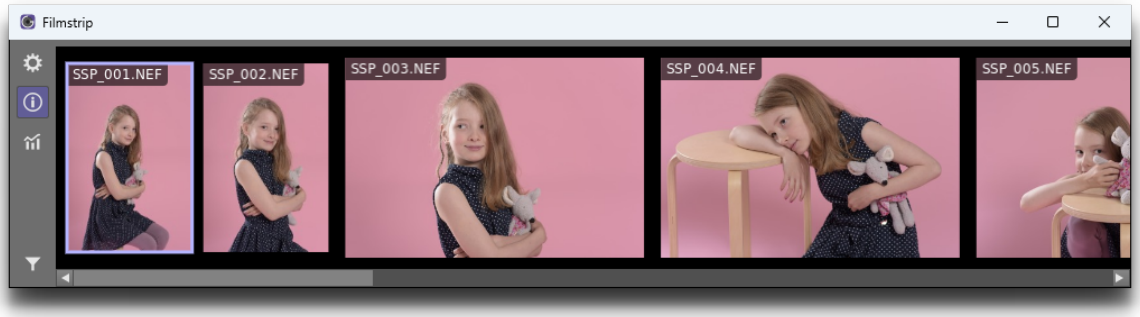
14.1 Filmstrip

The **Filmstrip** window shows photo thumbnails arranged in a strip. This is the most-used view for keeping track of recently downloaded photos and quickly stepping through them.

Orientation and Layout

The Filmstrip can be set to either horizontal or vertical orientation, which lets it dock comfortably on different edges of the screen. In addition to the strip layout, it also supports a photo **grid layout mode** that arranges thumbnails in a two-dimensional grid rather than a single row or column.

A toolbar at the edge of the window provides quick access to layout controls and filter toggles.



Filtering and Sorting

The Filmstrip's filter controls let you narrow the visible thumbnails. You can filter by:

- Camera
- Group
- Session and batch number
- Rating (see *Photo Ratings*)
- Image type (e.g. JPEG, RAW)

Sort order can also be adjusted, for example to put newest photos first.

14.2 Preview

The **Preview** window shows a large, full-frame view of a single photo or live view stream. It is the main place for visually inspecting a photo after capture.

The window can display:

- The most recently taken photo (the default view)
- A specific photo selected from the Filmstrip or Photos table
- Live View from the camera that took the photo

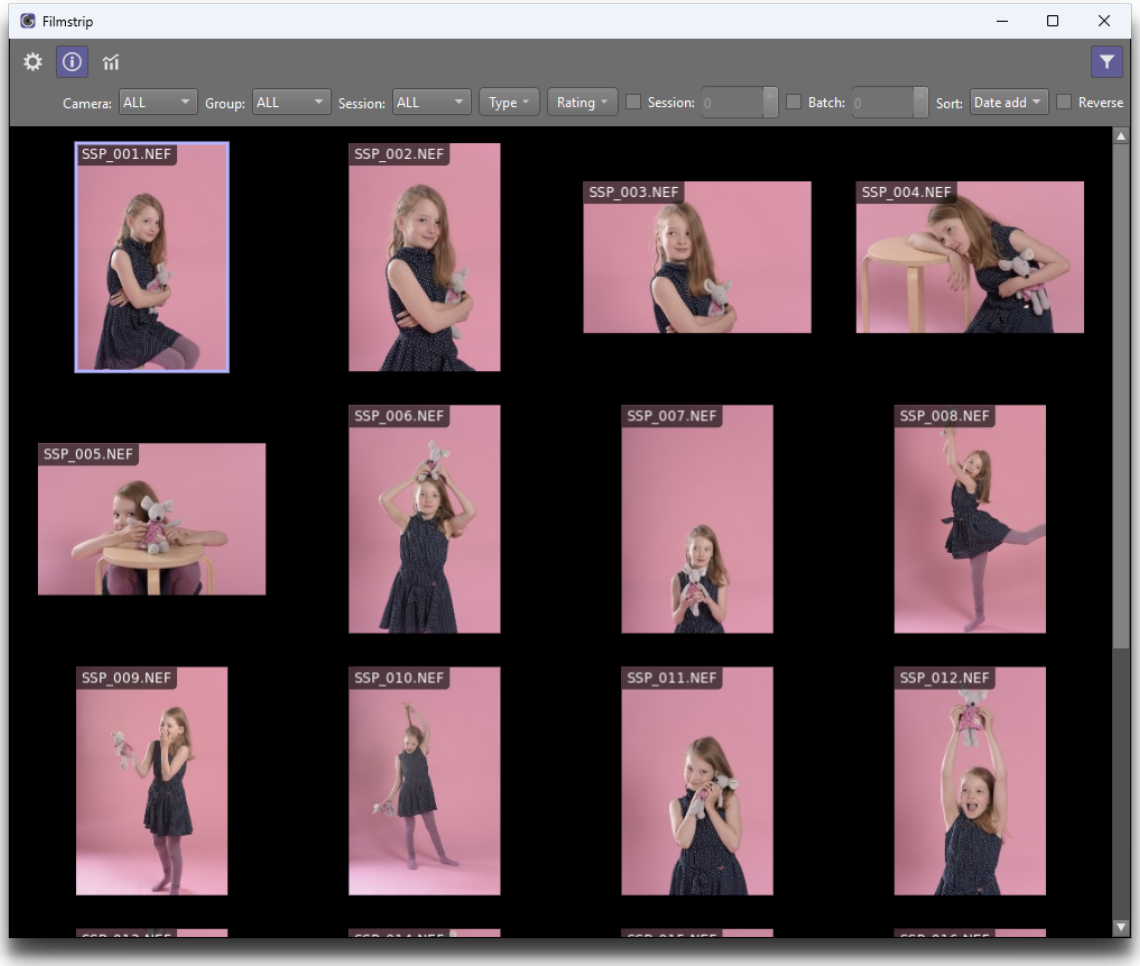
When Live View is showing, you can move the camera's AF area and focus from the Preview. See *Live View in the Preview and Dashboard*.

Overlays

A number of overlays can be enabled to help with image inspection:

- **Info overlay** — shows camera name, capture settings (aperture, shutter, ISO, etc.), and filename
- **Histogram** — RGB channel levels for the current image
- **Grid overlay** — composition guide (e.g. rule of thirds)
- **Highlight indicator** — shows areas of the image where the colour is at the edge of the range

These overlays can be toggled individually from the window's toolbar or from the **Options** window.


Filmstrip
Camera: ALL
Group: ALL
Session: ALL
Type
Rating
Session: 0
Batch: 0
Sort: Date add
Reverse
SSP_001.NEF
SSP_002.NEF
SSP_003.NEF
SSP_004.NEF
SSP_005.NEF
SSP_006.NEF
SSP_007.NEF
SSP_008.NEF
SSP_009.NEF
SSP_010.NEF
SSP_011.NEF
SSP_012.NEF

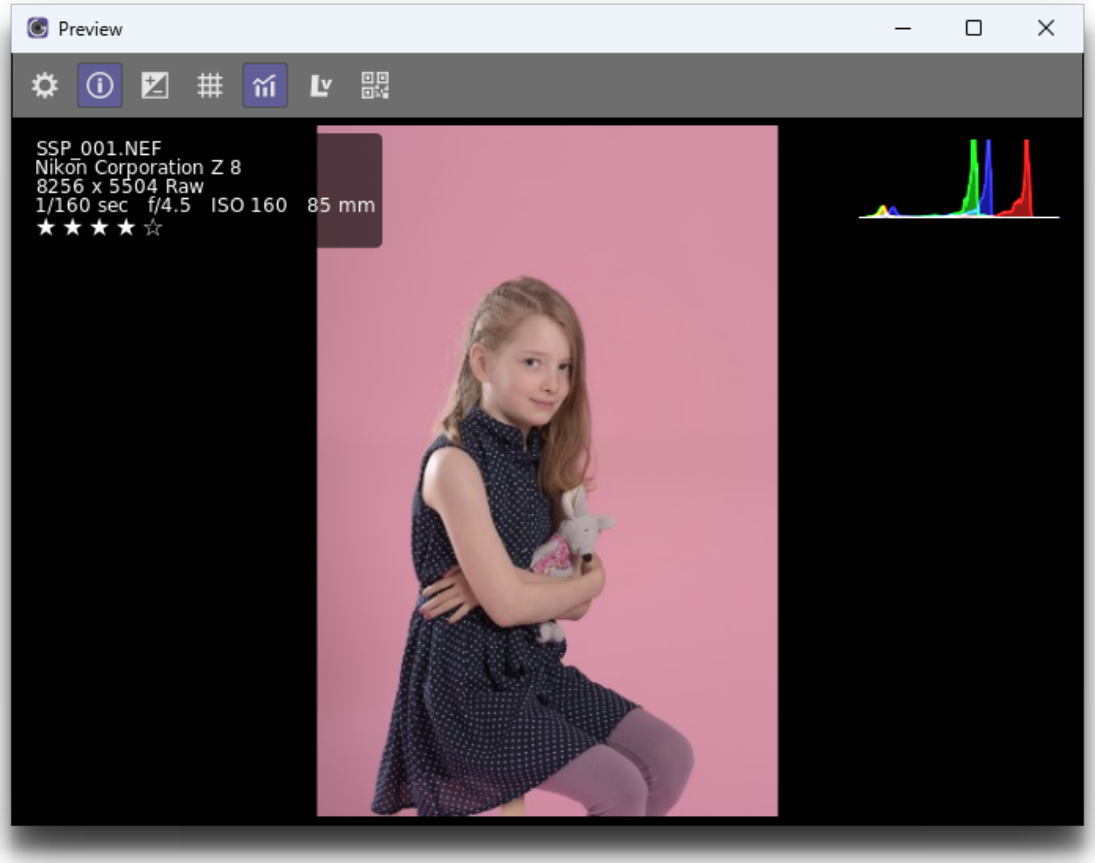
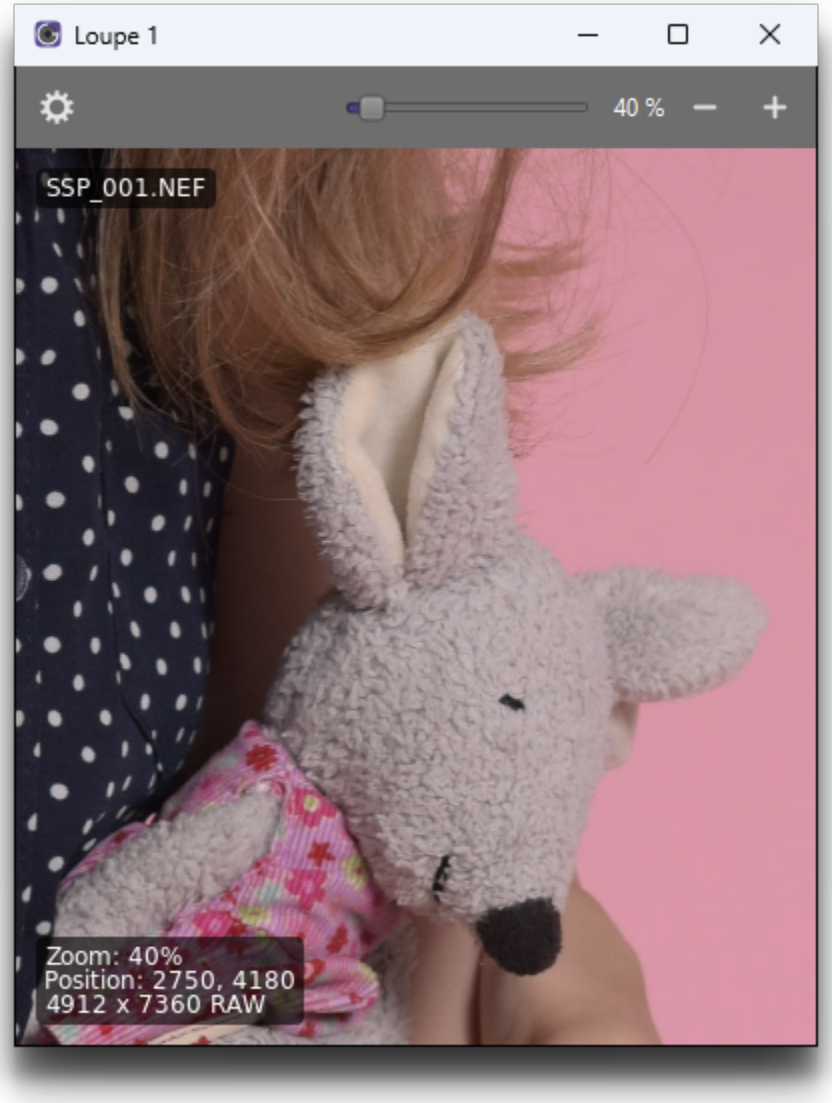

Preview
SSP_001.NEF
Nikon Corporation Z 8
8256 x 5504 Raw
1/160 sec f/4.5 ISO 160 85 mm
★★★★☆

Photo Menu

Right-clicking the photo in the Preview window opens a context menu with actions that apply to the currently displayed photo, such as viewing details, opening in an external editor, or deleting. This is the same set of actions available from the right-click menu in the Filmstrip and Photos windows.

14.3 Loupe

The **Loupe** window provides a closer detail view of a photo, showing a magnified region. It is most useful for checking critical focus and fine detail that cannot easily be seen at the regular display size.



The Loupe is linked to the Preview window — when both are open, the Loupe shows a magnified view of a region

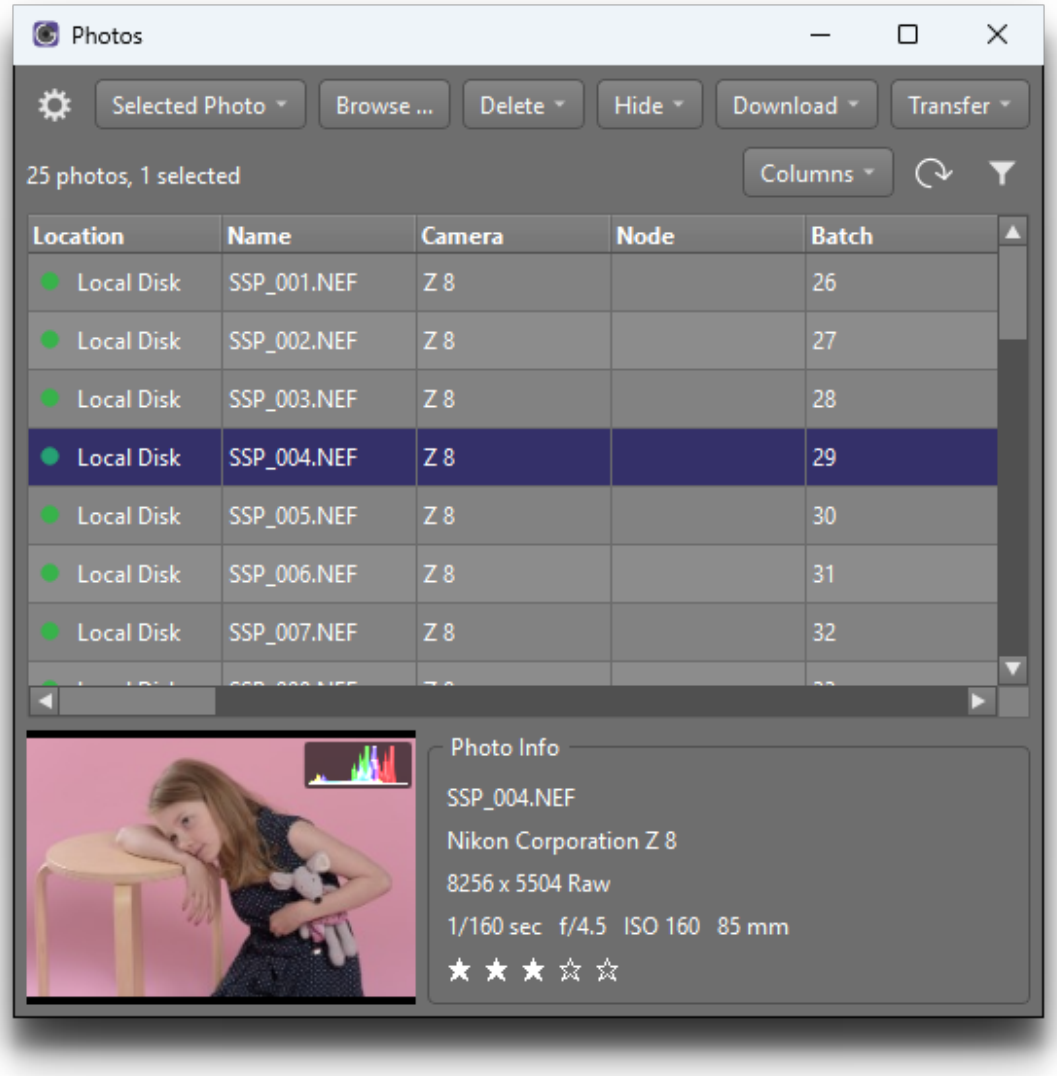
within the Preview, and the Preview shows a rectangle indicating which region the Loupe is focused on. You can drag the rectangle in the Preview to move the Loupe, or use the controls in the Loupe window directly.

Multiple Loupe Instances

The app supports up to two **Loupe** windows open at the same time. This makes it possible to inspect two areas of an image side by side without having to pan back and forth.

14.4 Photos Table

The **Photos** window provides a tabular view of every photo the app knows about. Unlike the Filmstrip — which is geared toward recent photos — the Photos table is for working with the whole photo collection.



Each row in the table represents one photo, with columns for filename, camera, group, session, batch, rating, file size, capture time, and other details. Column visibility and order can be customised.

Filter Row

A filter row at the top of the table allows the visible photos to be narrowed by:

- Camera
- Group
- Session and batch number
- Rating (see *Photo Ratings*)
- Image type
- Location (camera memory card or local disk)

Column headings can be clicked to sort.

Bulk Actions

Multiple rows can be selected in the Photos table, and right-clicking opens a context menu with actions that apply to the selection. This includes downloading, deleting, renaming, and changing rating.

14.5 Selection Across Windows

The four photo windows share a unified selection. When you click a thumbnail in the **Filmstrip**, the **Preview** updates to show that photo and the **Loupe** updates to show a magnified region of it. The same selection is reflected in the highlighted row of the **Photos** table.

This makes it natural to set up the windows together — for example, with the Filmstrip and Photos table on one side of the screen for browsing, and the Preview and Loupe on the other for inspection.

15 Photo Ratings

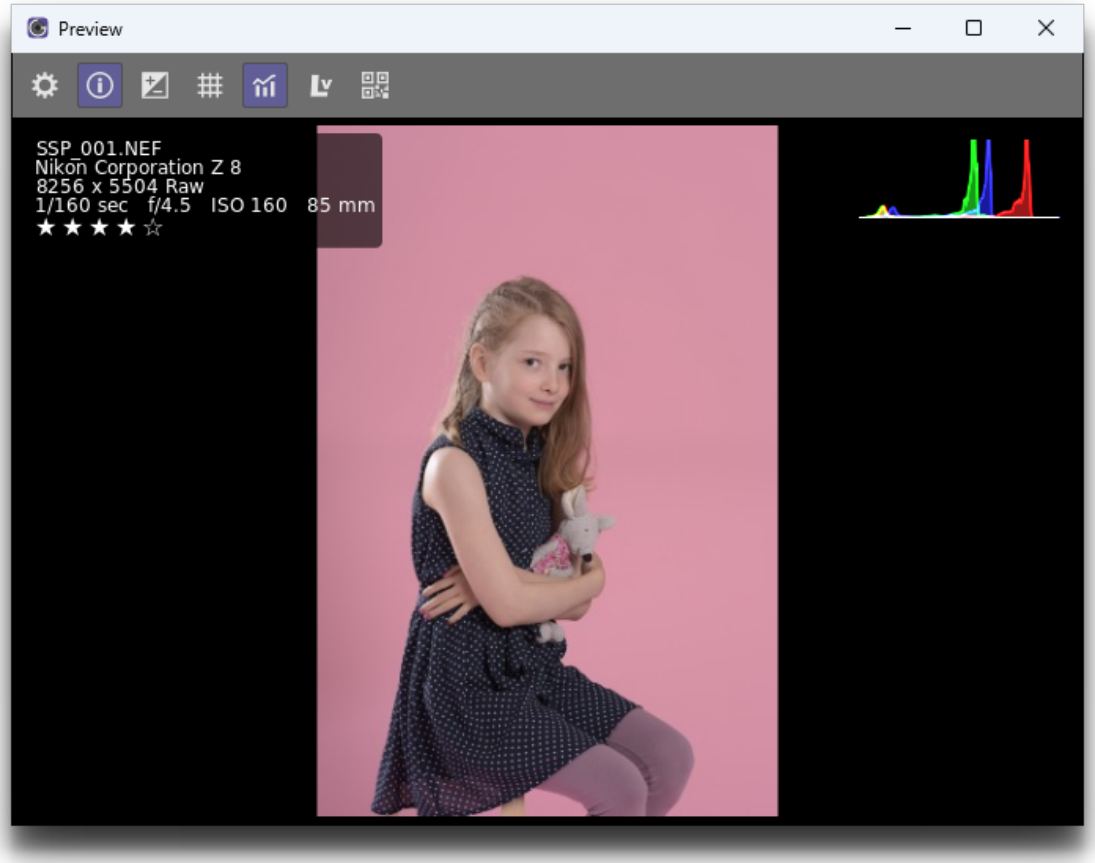
Rating photos to track favourites and reject rejects

CaptureGRID supports a 0 to 5 star rating per photo. Ratings can be set in the app and are read from each photo's EXIF metadata where present. They provide a simple way to flag favourites or rejects during a shoot, and to filter the photo list later when reviewing.

15.1 Setting a Rating

A photo's rating can be set or changed from any of the photo viewing windows:

- **Preview** — rating stars are shown alongside the photo and can be clicked to set the value
- **Filmstrip** — rating stars are shown on each thumbnail and can be edited in place
- **Photos** table — the rating column shows the current value and can be edited directly


Preview
SSP_001.NEF
Nikon Corporation Z 8
8256 x 5504 Raw
1/160 sec f/4.5 ISO 160 85 mm
★★★★☆

For more on these windows, see *Viewing Photos*.

A rating of 0 (no stars) is the default for a new photo. The other values are 1, 2, 3, 4 and 5 stars. There is no half-star value.

15.2 Reading from EXIF

When a photo is downloaded or imported, the app reads any rating that is already present in the photo's EXIF metadata and uses it as the photo's initial rating in CaptureGRID. This means ratings applied by the camera or by another tool — for example, an in-camera rating button — will be preserved.

15.3 Filtering and Sorting by Rating

Once ratings have been applied, they can be used to narrow or order the photo list:

- The **Filmstrip** filter controls include a rating filter, useful for stepping through only your favourites.
- The **Photos** table can be filtered by rating from the filter row, and the rating column can be clicked to sort.
- The rating filter combines with the other filters (camera, group, session, etc.), so for example you can list 4+ star photos taken by a specific camera in a specific session.

For more on filtering in the photo windows, see *Viewing Photos*.

16 Name Policy

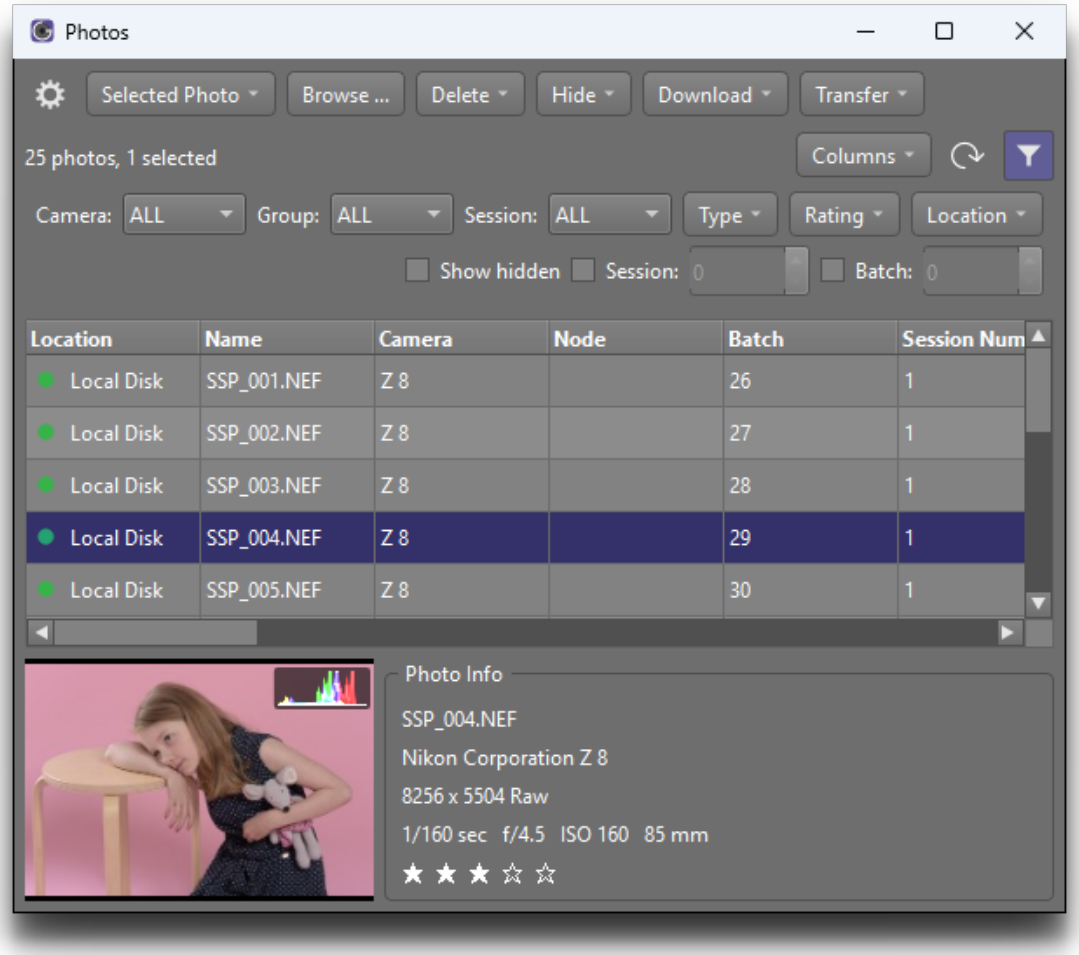
How to customise the filename when saving photos

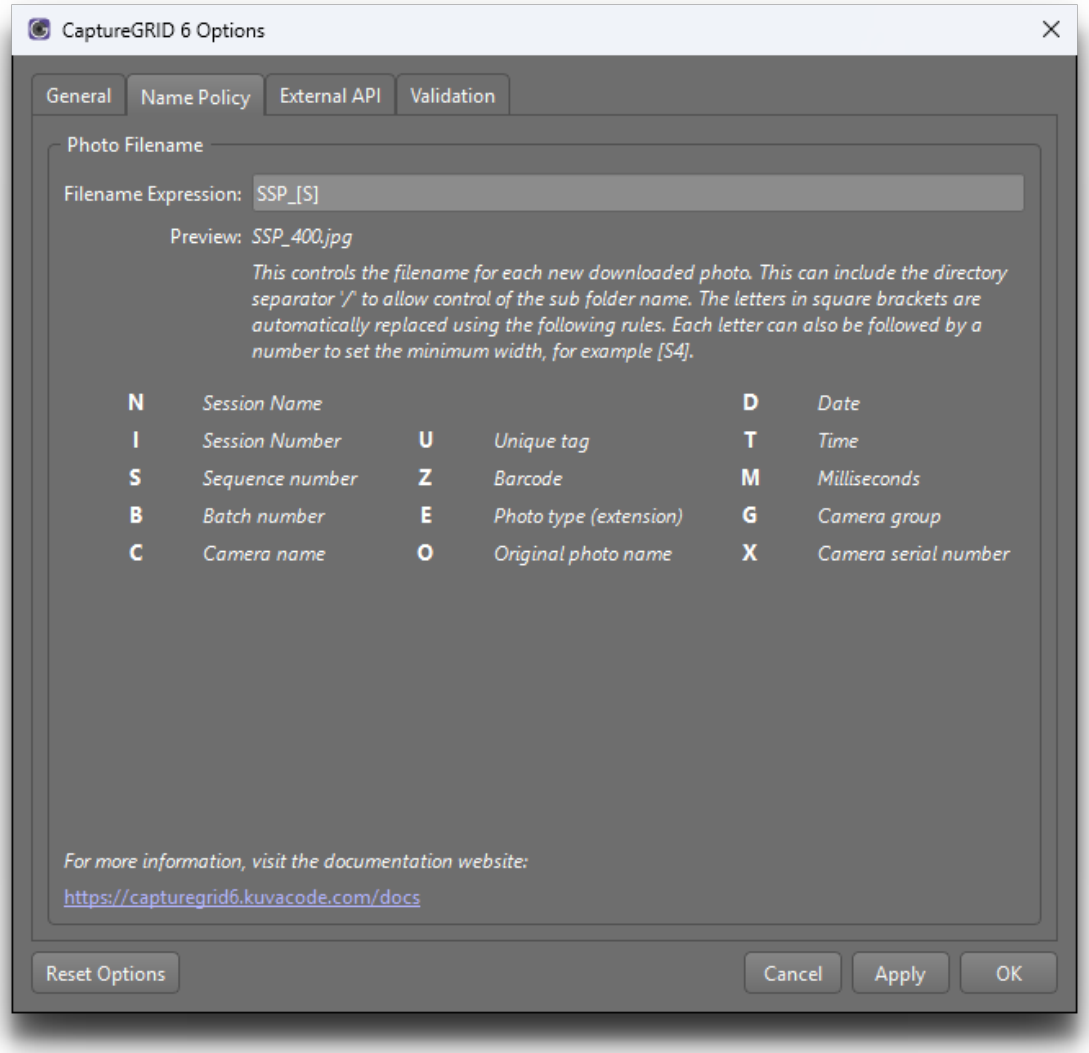
Whenever the app detects that a new photo has been taken, it will assign that photo a unique filename. The actual filename to use is computed dynamically by the app, and is controlled by the current name policy. These options can be customised in the **Options** window under the **Name Policy** tab, as shown in the screenshot below.

16.1 Filename Expression

The filename expression is the text that specifies how each new filename is computed. This text may contain special identifiers, as letters inside a pair of square brackets. These parts are automatically extracted and replaced with dynamic information, by following some rules for each letter.

For example, if the text contains `[D]` then this part of the filename will be replaced with the current date. The full set of rules is shown in the table below.


Photos
Selected Photo
Browse ...
Delete
Hide
Download
Transfer
25 photos, 1 selected
Columns
Camera: ALL
Group: ALL
Session: ALL
Type
Rating
Location
Show hidden
Session: 0
Batch: 0
Location
Name
Camera
Node
Batch
Session Num
Local Disk SSP_001.NEF Z 8 26 1
Local Disk SSP_002.NEF Z 8 27 1
Local Disk SSP_003.NEF Z 8 28 1
Local Disk SSP_004.NEF Z 8 29 1
Local Disk SSP_005.NEF Z 8 30 1
Photo Info
SSP_004.NEF
Nikon Corporation Z 8
8256 x 5504 Raw
1/160 sec f/4.5 ISO 160 85 mm


CaptureGRID 6 Options
General
Name Policy
External API
Validation
Photo Filename
Filename Expression:
SSP_[S]
Preview: SSP_400.jpg
This controls the filename for each new downloaded photo. This can include the directory separator '/' to allow control of the sub folder name. The letters in square brackets are automatically replaced using the following rules. Each letter can also be followed by a number to set the minimum width, for example [S4].
N Session Name
I Session Number
S Sequence number
B Batch number
C Camera name
U Unique tag
Z Barcode
E Photo type (extension)
O Original photo name
D Date
T Time
M Milliseconds
G Camera group
X Camera serial number
For more information, visit the documentation website:
https://capturegrid6.kuvacode.com/docs
Reset Options
Cancel
Apply
OK

Letter	Meaning	Description
N	Session name	A bit of text, that can be changed easily in the app's UI.
I	Session number	A number that can be manually incremented and decremented by clicking a button in the app's UI.
S	Sequence number	A number that is automatically incremented after each new photo is taken. Each GRID node has its own sequence number, so this makes each filename unique on that node, but two nodes can use the same number. When using more than one node, combine it with **A** or **C** to keep filenames unique. When the camera saves RAW + JPEG files for one exposure, both files use the same number.
B	Batch number	A number that is associated with each camera, and automatically incremented whenever that camera takes a new photo. So effectively this is a per-camera sequence number. When the camera is set to save each photo to RAW + JPEG files with a dual format quality setting, this number will increment just once per exposure, so the RAW and JPEG files will use the same number.
C	Camera name	Name of the camera that took the photo.
X	Camera serial number	Serial number of the camera that took the photo.
O	Original photo name	If the camera itself generated a filename, this contains it.
E	Photo file extension	The file extension of the photo, in upper case and without the dot (for example JPG, NEF, CR2 etc). Use **e** for lower case. See *File Extension*.
U	Unique tag	A unique bit of text, that can be changed easily in the app's UI.
Z	Barcode	The text from the last barcode that was scanned by the app. If the barcode is a vCard, see *Barcode vCard Fields*.
A	App name	The GRID node name of the computer that the camera is connected to (by default, its hostname). It can be changed by right-clicking a camera and choosing **Rename Node**, or by editing the Node column in the camera table.
D	Date	The current date in the format YYYYMMDD.
T	Time	The current time in the format HHMMSS.
M	Milliseconds	The millisecond part of the current time as a number between 000 and 999. This is always three digits, and a minimum width number has no effect.
G	Camera Group	The name of the group that the camera belongs to.

Note

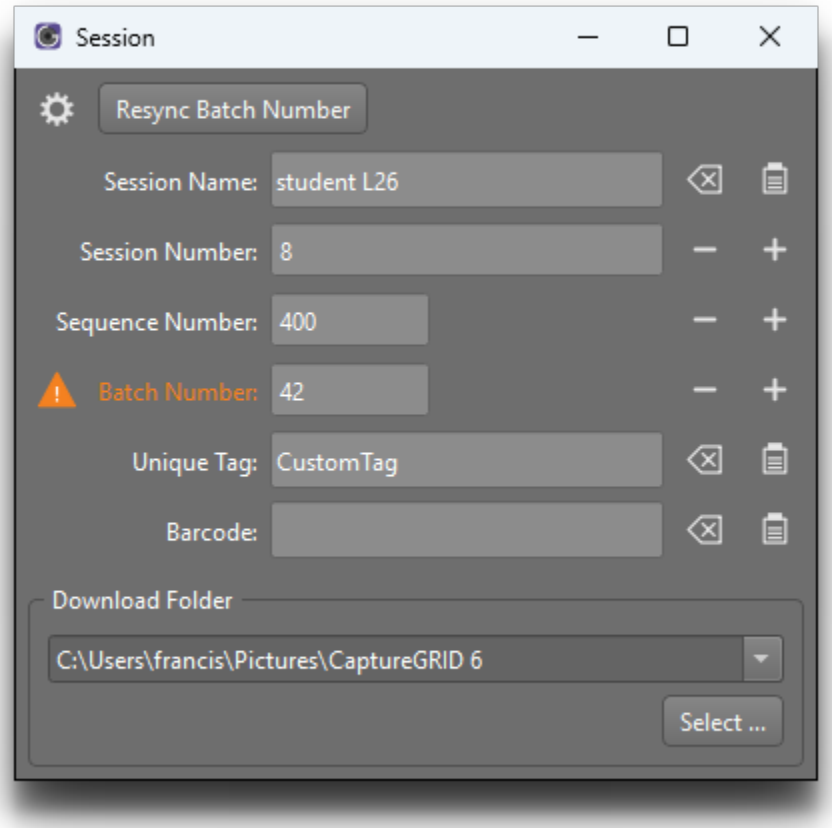
If the filename computed is not unique, it may clash with an existing photo file that has already been saved. If this happens, the app has a safety mechanism to ensure no files are overwritten, see *Overwriting Files*. So if the final filename has an unexpected `_1` or `_2` suffix, this is the reason.

16.2 Quickly Changing Filename Options

The app UI has a dedicated **Session** window where this information can be quickly checked and edited, as shown in the screenshot below.

This allows you to change the `[N]` Session Name text and `[U]` Unique Tag text, and set the `[I]` Session number, `[S]` Sequence number and `[B]` Batch number, either by typing a new value or with the + and - buttons. These changes take effect immediately and will be reflected in the filename for any subsequent photos that are taken.

If the connected cameras have different batch numbers, a warning is shown next to the Batch number. Clicking **Resync Batch Number** brings them back in sync, using the highest batch number of the connected cameras.



This window also shows the current **Barcode** information. The app has the ability to scan photos for barcodes or QR codes, and extract the text from them. Such barcode text can then be used as part of the filename by using `[Z]`. For more information on how the barcode scanning works, see *Barcode Scanning*.

16.3 Session Options

The **Options** button in the **Session** window opens the session options, which control when these values are changed automatically:

- **Reset Sequence Number** resets the `[S]` Sequence number to 1 when the app starts, when the session changes, or both.
- **Reset Batch Number** does the same for the `[B]` Batch number.
- **Clear Text Fields** clears the Session Name, Unique Tag and Barcode when the app starts, or when the session changes.
- **Autofill From Clipboard** copies any new text on the clipboard into the Session Name, the Unique Tag, or both.
- **Allow spaces in filename** keeps space characters in the filename, instead of replacing them with `_`. See *Invalid Characters*.

The session changes whenever the Session Name, Session Number, Unique Tag, Barcode or Download Folder is changed in the **Session** window, including when a new barcode is scanned. **Clear Text Fields** only reacts to some of these: changing the Session Name clears the Unique Tag and Barcode, and changing the Session Number clears the Session Name, Unique Tag and Barcode.

16.4 Using Subdirectories

The filename expression can also include the directory separator `/`. This allows one or more subdirectories to be included in the final filename. The final filename will always be relative to the current **Download Folder**, which can be set in the **Session** window or the **Options** window.

16.5 Using Camera Generated Name

Although the `[O]` Original photo name should contain the filename that was generated by the camera, it only does this when using the `Card` Storage mode. If the Storage mode is set to `Disk` or `Both`, then the camera will not provide information about the filename it generated, and hence the app will end up using text such as `IMG_0000` instead.

16.6 Setting Camera Names

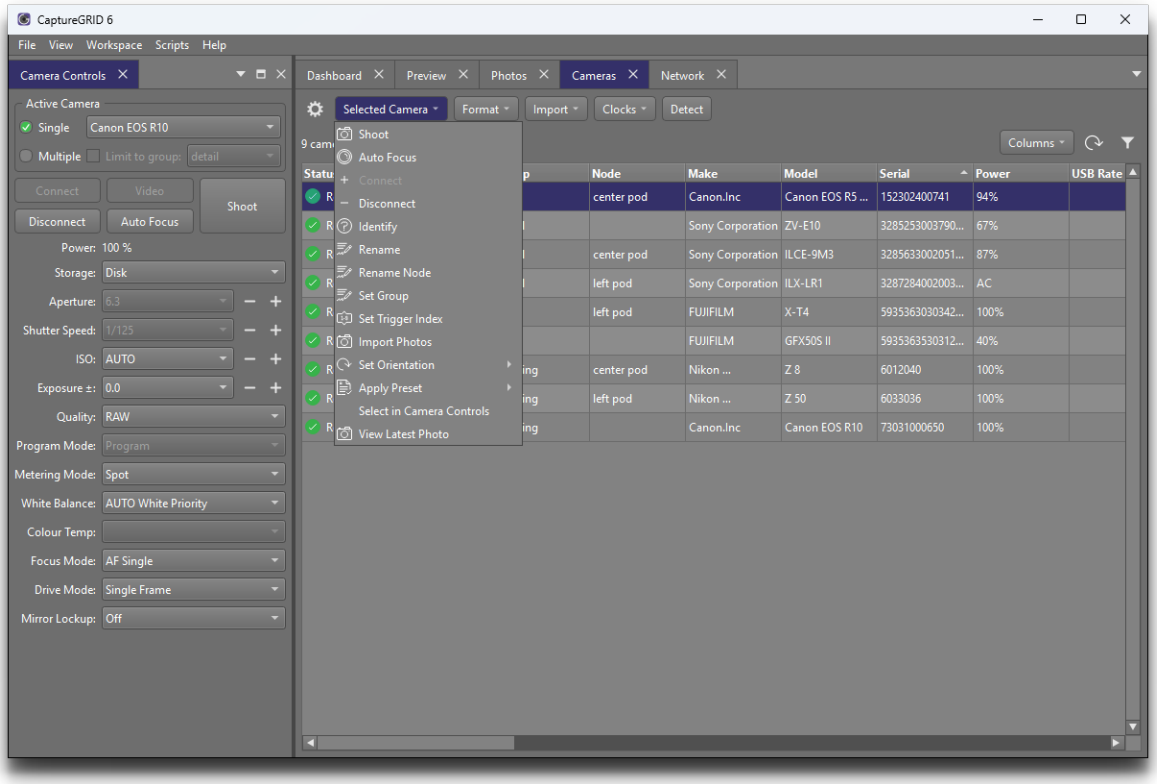
The `[C]` camera name is extremely useful when using multiple cameras, as this allows the filename of each photo to contain the name of the camera that took the photo. For each camera that is connected, the app will store a name for the camera. This name is associated with the camera's serial number. The name can be customised in the camera table UI, by right-clicking the camera as shown below:

16.7 Formatting Options

Each letter in square brackets can be followed by an optional number, which will then control the minimum width of the replacement text. For numbers, the number will be padded with extra leading `0`'s. For text, it will be padded with extra trailing `_`'s (underscore).

For example, if the current sequence number is 23, then `[S]` will be replaced with `23`, whereas `[S4]` will be replaced with `0023`. If the camera is named "left", then `[C6]` will be replaced with `left__`.

The `[D]` and `[T]` (date and time) letters can also take an extra character, which is then used as a separator between the date or time components. For example, if the current date is 20th August 2011, then `[D]` will be replaced by `20110820`, whereas `[D-]` will be replaced by `2011-08-20`.



16.8 Extended formatting for date/time

The `[T]` letter also has an extended option, to allow extra customisation of how the date/time is generated. After the `T` character you can specify an arbitrary string, which is then passed to the standard strftime() function for formatting. For example `[T%A %d %B %Y]` will pass the string `%A %d %B %Y` to strftime(), which will format it as `Saturday 20 August 2017`.

> **Note**
>
> For more information on what can be handled by strftime():
>
> http://www.cplusplus.com/reference/ctime/strftime/

16.9 File Extension

The file extension is added to the end of the computed filename automatically, so the filename expression does not need to include it. By default the app uses the extension of the file sent by the camera, so whether it is upper or lower case depends on the camera (for example `.JPG` or `.jpg`).

To choose the case yourself, end the filename expression with `.[e]` for lower case or `.[E]` for upper case. For example, `[D]_[S4].[e]` gives `20110820_0128.jpg`, even if the camera sent `IMG_0001.JPG`.

`[E]` and `[e]` can also be used elsewhere in the filename expression, for example `[E]/[S4]` saves RAW and JPEG files into separate subdirectories, such as `NEF` and `JPG`. In that case the extension is still added to the end of the filename as usual.

16.10 Barcode vCard Fields

A barcode or QR code can contain a vCard, which is a contact card with fields such as a name, email address and phone number. If the last barcode scanned is a vCard, then `[Z]` on its own is replaced with the text `VCARD`, rather than the whole card.

To use a single field from the vCard, put the name of the field after the `Z`. For example, `[ZFN]` is replaced with the contact's full name, and `[ZEMAIL]` with their email address. So if the full name is "Jane Smith", then `[ZFN]_[S4]` gives `Jane_Smith_0128.jpg`.

- Field names are not case sensitive, so `[Zfn]` is the same as `[ZFN]`.
- If the vCard contains the same field more than once (for example several `TEL` phone numbers), the first one is used.
- If the vCard does not contain the field, or the barcode is not a vCard, the field is replaced with nothing.
- Use `FN` rather than `N` for the name. The `N` field holds the parts of the name separated by `;` characters, and these are kept in the filename.
- A field cannot be combined with a minimum width number.

16.11 Invalid Characters

Any invalid characters in the computed filename will be replaced with an `_` (underscore) character. This includes the `:` (colon) character.

The space character is also replaced, unless **Allow spaces in filename** is turned on in the *Session Options*. When it is turned on, spaces are kept, and text is padded with spaces instead of `_`'s (see *Formatting Options*).

16.12 Examples

The following table shows some examples of the filename expression, and what the resulting computed filename would be. This assumes the photo taken is a JPEG saved with a `.jpg` extension, that the current sequence number is 128, the current batch number is 23, the camera that took the photo is named "centre", the current unique tag is "modelX", and that the current date is 20th August 2011.

Filename Expression	Computed filename
SSP_[S4]	SSP_0128.jpg
[D]/[U]_[S4]	20110820/modelX_0128.jpg
[D]_[U]/[C]_[B]	20110820_modelX/centre_23.jpg

16.13 Overwriting Files

The app has a safety mechanism so that it will never overwrite an existing file. This guards against the accidental loss of photos. Whenever the app is about to save a photo, it first checks whether there is an existing file with the same filename. If it finds an existing file, then it will append a `_1` to the end of the filename and then try again. If that new filename also already exists, then it will append a `_2`, and try again, and continue to try with incrementing number suffixes.

17 Backup

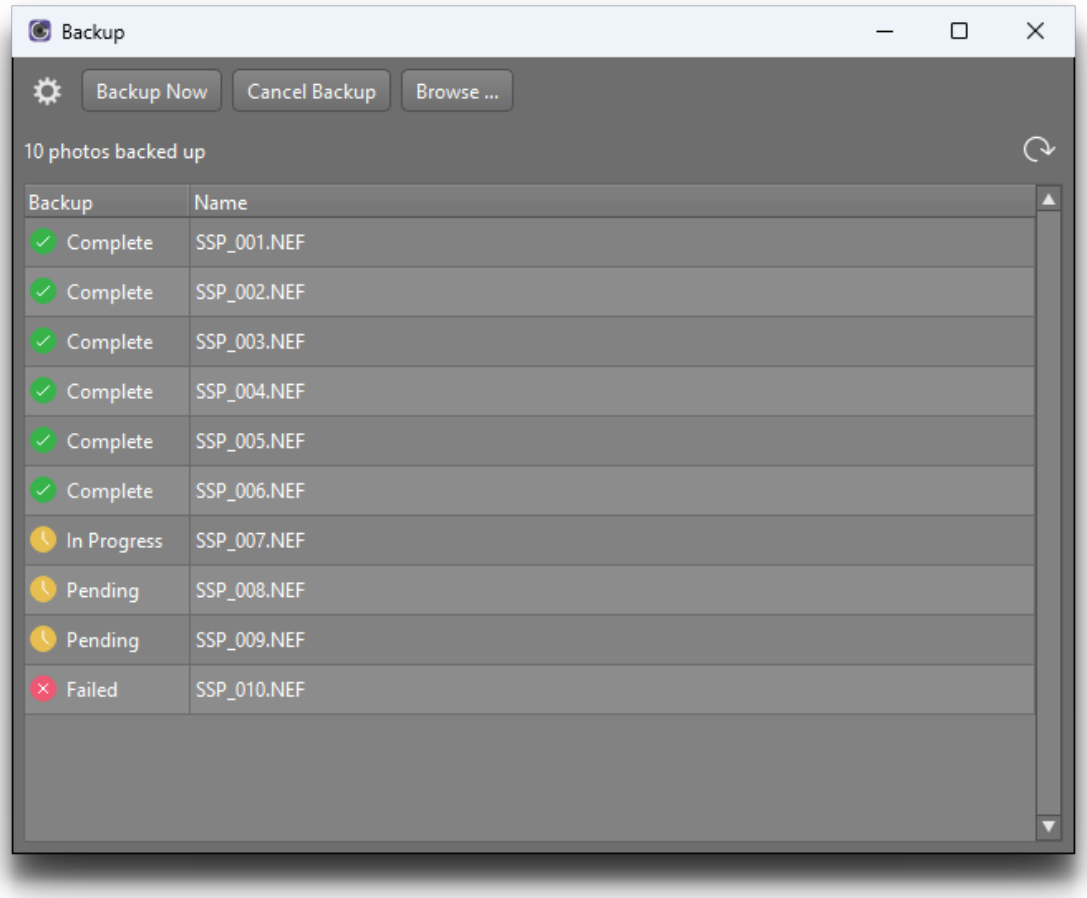
Automatic backup of photos to a secondary location

CaptureGRID can automatically copy each downloaded photo to a secondary backup location. This provides a layer of redundancy that protects against accidental deletion or disk failure at the primary download location.

Backup is configured per-node. Each new photo is copied automatically as it is downloaded, and existing photos can also be backed up retroactively via a manual action in the **Backup** window. Each node maintains its own backup independently of the others, which makes the backup feature orthogonal to the GRID networking feature described in *Networking* — they protect against different kinds of failure and are typically used together.

17.1 Backup Window

The **Backup** window shows the current backup configuration and the status of recent backup activity.



From this window you can monitor:

- The current backup destination
- The most recent backup operations

- Any errors or warnings (for example, if the backup location is full or unreachable)

17.2 Configuration

Backup is configured from inside the **Backup** window itself: click the options (gear) button at the top of the window to open the backup settings popup, where you set the backup destination and toggle whether photos are backed up automatically as they are downloaded.

When the backup is enabled, each photo that is saved to the local **Photo Download Folder** is also copied to the configured backup location. The copy happens automatically and asynchronously, so the download itself is not blocked waiting for the backup to complete.

> **Tip**
>
> A common configuration is to set the backup destination to a different physical disk from the primary download folder. This means a single disk failure cannot lose both copies.
>
> For more critical capture scenarios, the backup destination can be a network shared folder, in which case the photos end up on another machine altogether.

17.3 Relationship to GRID Networking

Backup and GRID networking both provide protection against losing photos, but they work at different levels:

- **Backup** is per-node and copies each photo to a secondary location on the same network. It is concerned with redundancy of the photo file itself.
- **GRID networking** synchronises photo *information* across all nodes on the network, and (when **Sync photos** is enabled) also transfers the photo files to other nodes. See *Photo Transfers* for the details.

The two features are independent — backup runs whether or not GRID is enabled, and GRID's photo transfers run whether or not backup is configured. Many setups use both: GRID to gather all photos onto a central node, and backup on that central node to provide a redundant copy of the aggregated photo set.

18 Barcode Scanning

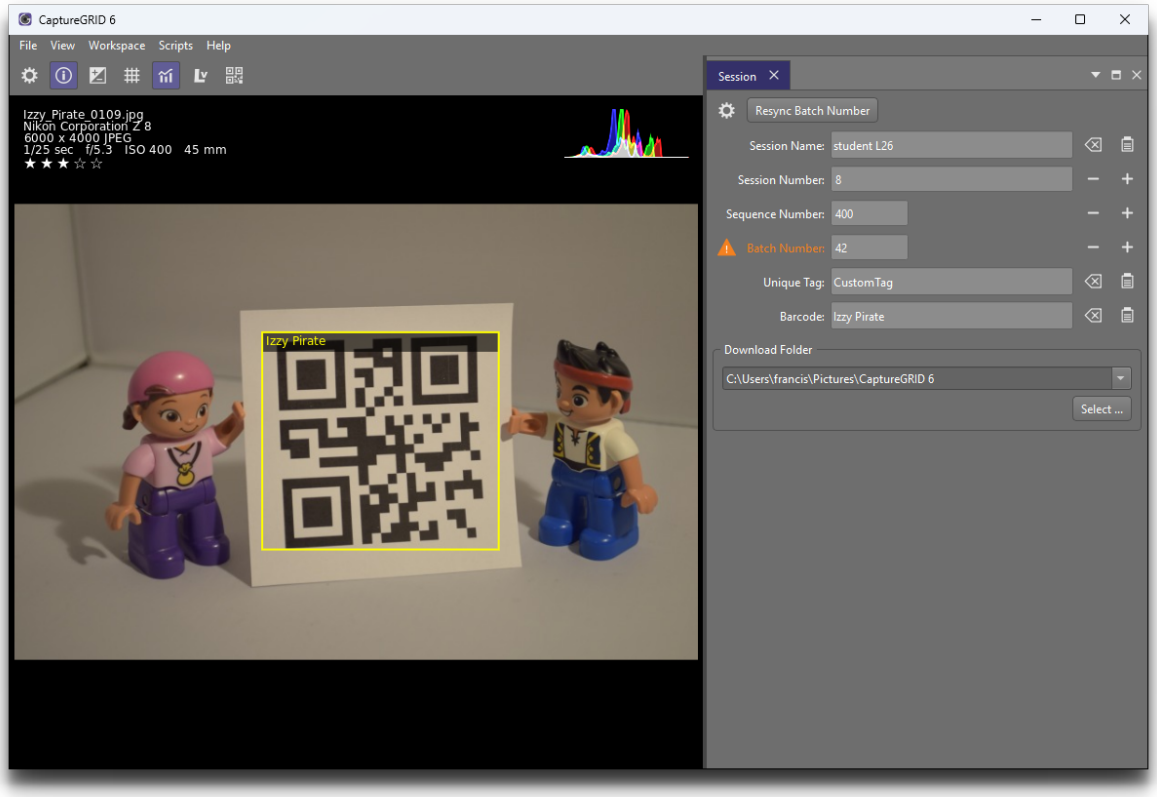
How to scan your photos for barcode information

CaptureGRID has the ability to scan a photo and detect if it contains a barcode or QR code, and extract the text information from it. This text can then be used as part of the filename when saving the photo.

When a barcode is successfully scanned, it is saved and shown in the **Session** window.

The next time the app has to compute a photo filename, it will use this barcode text to replace the `[Z]` parts of the filename expression. For more information on how the filename expression works, see *Name Policy*.

The screenshot above shows a demonstration. The QR code in the photo contains the text `kuvacode`. After the photo was taken, it was automatically downloaded and then scanned for a barcode. The text was extracted and then put in the *Barcode* text box in the **Session** window. The filename used when saving the photo contains the same text.

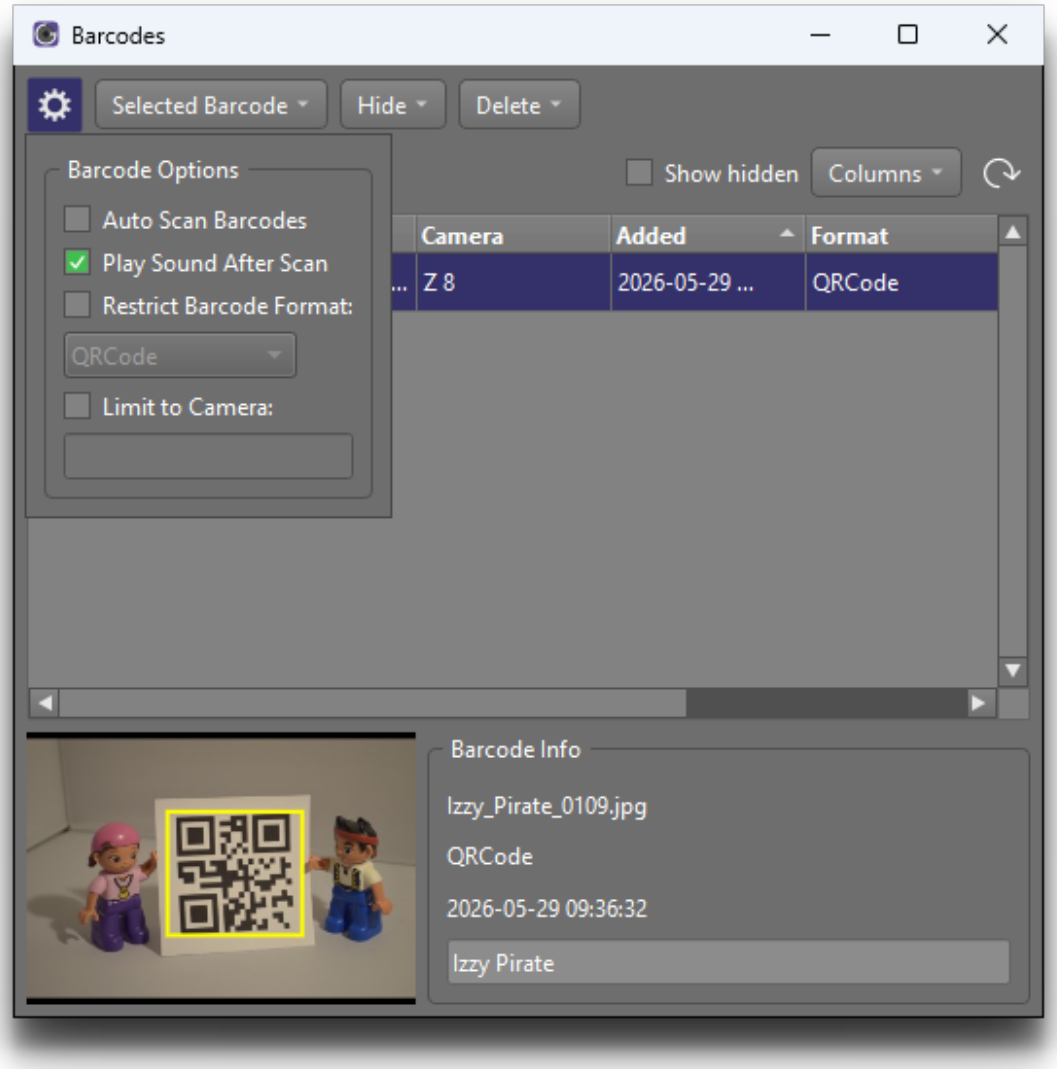

CaptureGRID 6
File View Workspace Scripts Help
Izzy_Pirate_0109.jpg
Nikon Corporation Z 8
6000 x 4000 JPEG
1/25 sec f/5.3 ISO 400 45 mm
Izzy Pirate
Session
Resync Batch Number
Session Name: student L26
Session Number: 8
Sequence Number: 400
Batch Number: 42
Unique Tag: CustomTag
Barcode: Izzy Pirate
Download Folder
C:\Users\francis\Pictures\CaptureGRID 6
Select ...

18.1 Automatic Scanning

You can configure the app to automatically scan any new photos for a barcode. If you are using multiple cameras, this automatic scanning can be restricted to only scan photos taken by certain cameras. The screenshot below shows these in the **Options** window.

Whenever a barcode is automatically scanned, it will affect the filename of that particular photo, and then all subsequent photos until another barcode is scanned.

Automatic scanning is also performed for liveview images, so a barcode can be extracted directly from the liveview stream even before a photo is taken.



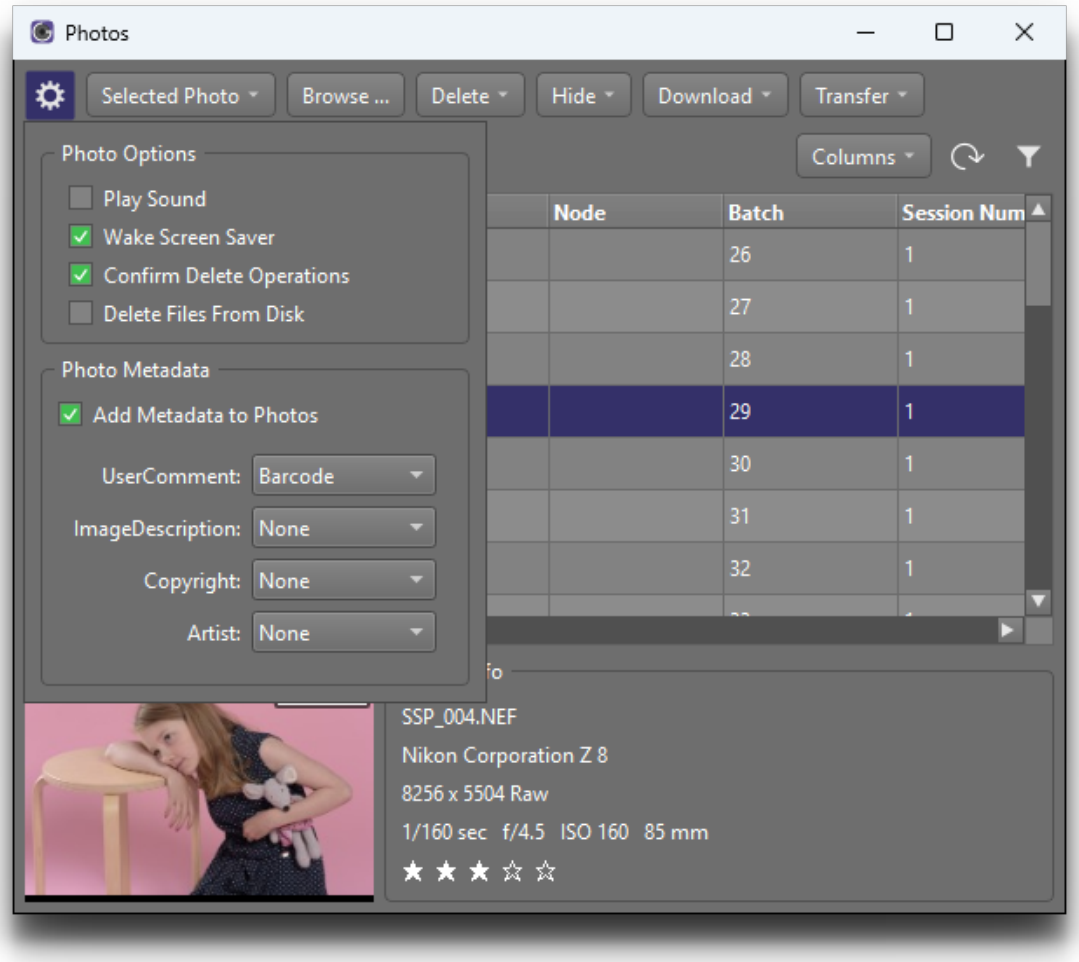
18.2 Manually Scanning

The barcode scanning can be triggered manually at any time by pressing the button at the top of the **Preview** window. The app will try to scan a barcode from whichever image is visible at that time, and this can include a previously taken photo or a liveview image.

18.3 Saving the Barcode in Photo Metadata

As well as using the barcode in the filename, the app can write the barcode text into the metadata of each photo as it is downloaded. This means the barcode stays with the photo even if the file is later renamed, and it can be read by other software that shows EXIF / XMP information.

To turn this on, in the **Photos** window click the options (gear) button and tick *Add Metadata to Photos* in the **Photo Metadata** section. This is turned off by default.



Below the checkbox there is a list of the metadata fields that the app can write, and for each one you can choose what information to put in it:

- *UserComment*
- *ImageDescription*
- *Copyright*
- *Artist*

By default the barcode is written to the *UserComment* field, and the other fields are left untouched. Each field can be set to *Barcode*, *Session Name*, *Unique Tag*, *Camera Name* or *Camera Group*, or to *None* to leave that field alone.

The metadata is added using the barcode that is current at the moment the photo is downloaded — the same value that would be used for `[Z]` in the filename. For more information on the other values that can be added, see *Adding Metadata to Photos*.

18.4 Supported Barcode Types

The following barcode symbologies are supported:

- Aztec
- Codabar
- Code 39
- Code 93
- Code 128
- DataBar
- DataBar Expanded
- Data Matrix
- EAN-8
- EAN-13 / UPC-A
- ITF (Interleaved 2 of 5)
- MaxiCode
- PDF417
- QR Code
- UPC-E

CaptureGRID uses the ZXing open source library for detecting barcodes. Their website is: https://github.com/zxing-cpp/zxing-cpp

18.5 Using an External Barcode Scanner

It's also possible to use an external barcode scanner with the app. As long as this is also connected to the same computer, and can be configured to enter text in a UI text box, you can have it fill in the *Barcode* text box of the **Session** window.

Press `F9` to go to the *Barcode* field before scanning. Many scanners can also send a key after the barcode. If you set this to a key that has a keyboard shortcut, such as `F5` to take a photo, a single scan can fill in the barcode and then trigger the shortcut. Use a function key or a key with Ctrl or Alt for this, as keys pressed on their own don't work while the *Barcode* field has focus (see *Keyboard Shortcuts*).

19 Script Controls

Running Python scripts inside the app to automate cameras

CaptureGRID has a built-in Python interpreter that can run scripts against the connected cameras. This is the natural way to automate repeated capture patterns — time-lapse, focus stacking, bracketing, delayed trigger, and so on — without needing a separate program.

For automation driven from outside the app, see the External API described in *External API*. The two mechanisms are complementary:

- **Script Controls** — run a script *inside* the app, with no external program required. The script has direct access to the in-app camera and photo APIs.
- **External API** — drive the app from *outside* via ZeroMQ, from a program that may be in any language.

Many automation tasks can be done with either approach; scripts are usually quicker to set up because there is no separate process to manage.

19.1 Script Controls Window

The **Script Controls** window is the place to load, configure, and run scripts.

Loading a Script

A script is loaded from the *Scripts* → *Load Custom Script…* menu item. The app will prompt for the script file (a `.py` file) and then read it.

Once loaded, the script appears in the **Script Controls** window along with any parameters it defines.

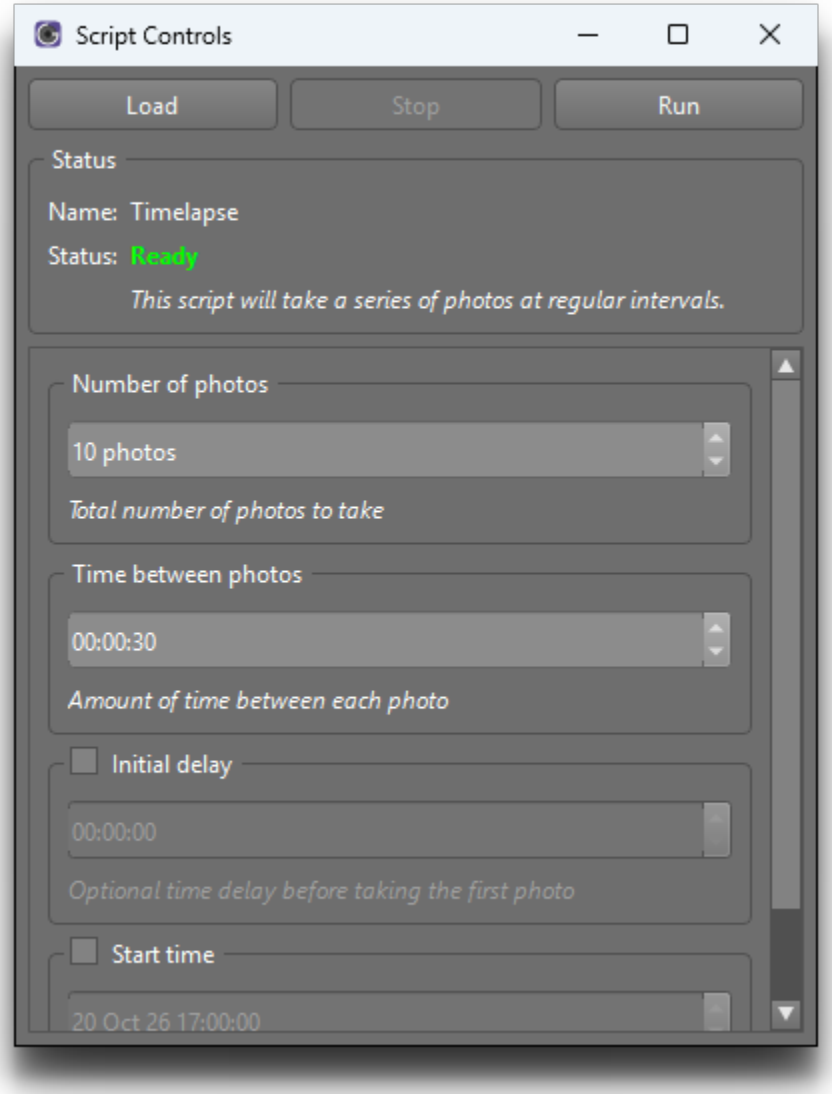
Parameters

Scripts can declare parameters that the user can set from the UI before running. The **Script Controls** window automatically generates the appropriate input widgets for each parameter — for example, number boxes for numeric parameters and text boxes for text parameters. This allows the same script to be reused with different values without editing the source.

Running

The script can be started from the *Run* button in the window, or from the keyboard shortcut `F8` (see *Keyboard Shortcuts*). It runs against the currently active cameras (see *Active Camera*), so scripts can be designed once and then applied across single cameras, all cameras, or a specific group depending on the active selection.

Output and status messages from the script appear in the **Log** window. A running script can be interrupted from the **Script Controls** window.


Script Controls
Load
Stop
Run
Status
Name: Timelapse
Status: Ready
This script will take a series of photos at regular intervals.
Number of photos
10 photos
Total number of photos to take
Time between photos
00:00:30
Amount of time between each photo
Initial delay
00:00:00
Optional time delay before taking the first photo
Start time
20 Oct 26 17:00:00

19.2 Auto-Loading

An option in the **Options** window controls whether the app automatically loads a previously used script on startup. This is useful when the same script is used as part of a regular workflow, so it is ready to run without manually loading each time.

19.3 Script API

Scripts have access to a Python API for interacting with cameras and photos. The API surface includes functions for triggering cameras, changing camera settings, downloading photos, and waiting for events.

> **Tip**
>
> For documentation of the script API, including the available functions and example scripts, see the public git repo:
>
> https://github.com/kuvacode/smartshooter-api/tree/v6

20 Trigger Controls

Configuring multi-camera triggering

The **Trigger Controls** window provides fine-grained control over how and when cameras are triggered. It is particularly important in multi-camera setups where the timing of capture across cameras matters — for example, in capturing a moment from many angles at the same instant.

The window is organised into three sections, each providing a different type of control:

- **Shutter Button** — direct manual control of the shutter button on the active cameras
- **Synchronised Trigger** — triggering multiple cameras together, with optional latch control (CaptureGRID-only)
- **Power Zoom** — adjusting power zoom on cameras that support it

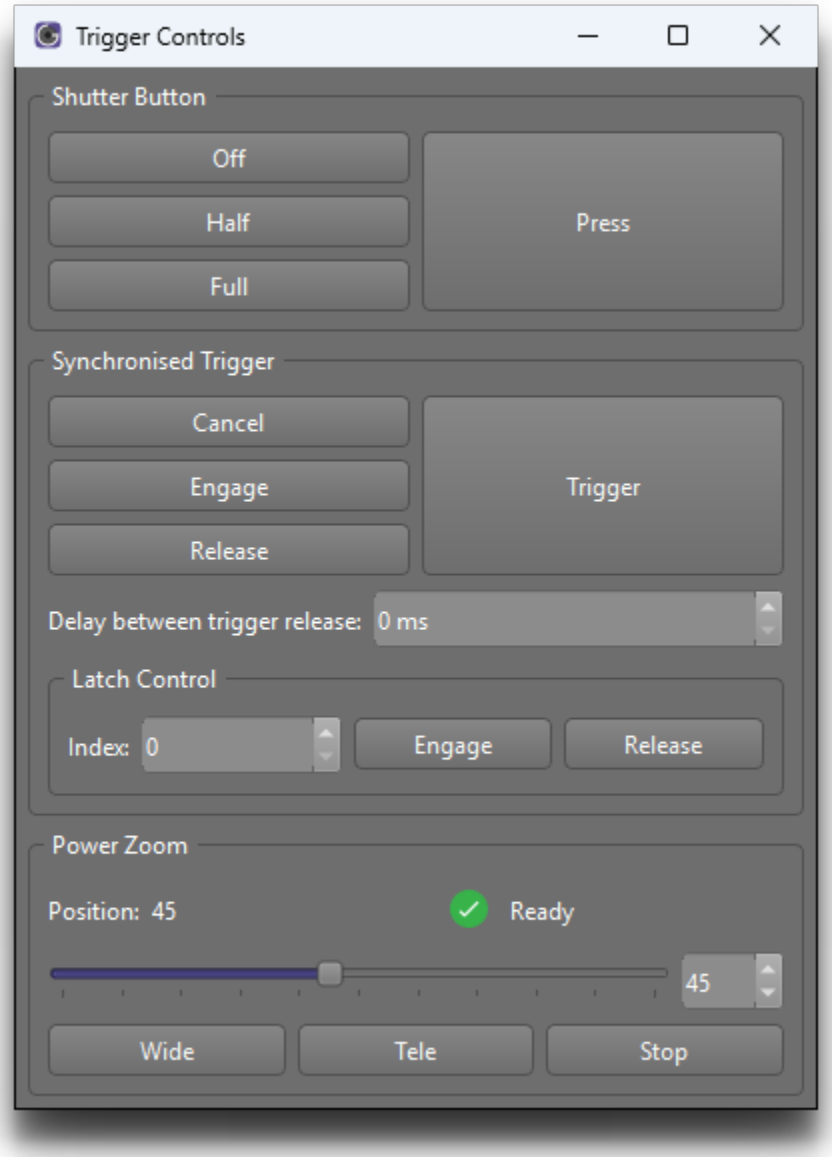
For the basics of taking a photo on the active camera(s), see *Camera Control*. The Trigger Controls window extends that with timing, synchronisation and zoom controls that go beyond the regular trigger action.

20.1 Shutter Button

The first section of the window provides direct manual control of the shutter button on the active cameras. This mirrors the behaviour of physically pressing the shutter button on the camera body — you can hold the button to trigger continuous shooting, half-press to acquire focus, and so on.

This is useful in scenarios where you want the same timing control that a physical shutter press gives you, but applied across multiple cameras at once.

> **Note**
>
> Direct shutter button control is only supported on some cameras. For cameras that do not support it, these buttons are disabled and appear greyed out.


Trigger Controls
Shutter Button
Off
Half
Full
Press
Synchronised Trigger
Cancel
Engage
Release
Trigger
Delay between trigger release:
0 ms
Latch Control
Index:
0
Engage
Release
Power Zoom
Position: 45
Ready
45
Wide
Tele
Stop

20.2 Synchronised Trigger

The second section coordinates triggering across multiple cameras so that all selected cameras fire as close to the same instant as possible. This is the key CaptureGRID feature for capture scenarios where temporal alignment between cameras matters — for example, sports analysis rigs, bullet-time rigs, or any setup where the parallax between cameras must be captured at a single moment.

Synchronised trigger works across both:

- **Multiple cameras connected to one computer** — all selected cameras are triggered as close to the same instant as the local hardware allows
- **Multiple cameras across multiple computers** — when the GRID networking feature is enabled, the synchronised trigger coordinates across all nodes in the network so that cameras on different computers fire together

For more on configuring GRID networking, see *Networking*.

> **Note**
>
> The **Synchronised Trigger** section is only available in CaptureGRID builds. Smart Shooter builds, which do not include the GRID networking feature, do not show this section.

Latch Control

Inside the Synchronised Trigger section, a **Latch Control** sub-group provides a latched-shutter mode that holds the shutter active for the duration of the latch. This is the model required by some cameras and some capture modes.

> **Tip**
>
> For tightest synchronisation across nodes, ensure that the system clocks on all GRID nodes are synchronised. CaptureGRID's GRID network does its own clock synchronisation between nodes, but starting from system clocks that are already close together gives the most reliable result.

20.3 Power Zoom

The third section provides controls for adjusting the **power zoom** on cameras that support it — predominantly Sony Alpha bodies with power-zoom lenses.

The controls apply to the currently selected cameras (see *Active Camera*). Cameras without power-zoom support are unaffected. By restricting the active selection to the power-zoom cameras in the rig, you can adjust them together without affecting other cameras.

Typical controls in this section include zoom wide, zoom telephoto, and setting a specific zoom position. The exact set of controls depends on the camera model.

> **Note**
>
> Power zoom is only supported on some Sony cameras fitted with a power-zoom lens. For cameras and lenses that do not support it, these controls are disabled and appear greyed out.

21 External API

Integrating CaptureGRID with an external system

CaptureGRID can be integrated with an external system by using the **External API** feature. This provides two key channels of communication:

- Publisher of event information
- Server for handling command requests

The External API uses the ZeroMQ library for managing the communication transport layer. See http://zeromq.org for more information on how to use ZeroMQ from your system. This also defines the programming model for using the event publisher and request/reply server, as these are implementated as ZeroMQ socket endpoints.

All messages passed over the External API are encoded in JSON format. See http://json.org for more information on how to handle this type of message format.

> **Tip**
>
> Sample python code for the External API is available at:
>
> https://github.com/kuvacode/smartshooter-api/tree/v6

21.1 Listening to Events

The event publisher will broadcast messages about important events that happen inside the app. This includes:

- When a new photo is taken
- When a photo changes state (downloaded/deleted/renamed etc)
- When a new camera is detected
- When a camera changes state
- When a camera property changes state

Below is an example of a listener application written in Python. This can be run from the command line, and simply prints out each message that is received from the app's publisher endpoint.

```
#!/usr/bin/env python3
#
# Copyright (c) 2015-2019, Kuvacode Oy
# All rights reserved. No warranty, explicit or implicit, provided.
#

import zmq

def main():
    context = zmq.Context()
    sub_address = "tcp://127.0.0.1:54543"
    sub_socket = context.socket(zmq.SUB)
    sub_socket.setsockopt(zmq.SUBSCRIBE, b"")
    sub_socket.connect(sub_address)
    print("Opened listener to: {0}".format(sub_address))
```

(continues on next page)

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```
    while (True):
        raw = sub_socket.recv()
        json_msg = raw.decode("utf-8")
        print("Received: {0}".format(json_msg))

if __name__ == '__main__':
    main()
```

downloads/smartshooter_listen.py

For example, the text below shows the output from this after a new photo has been taken:

```
Opened listener to: tcp://127.0.0.1:54543
Received: {
  "msg_type": "Event",
  "msg_id": "PhotoUpdated",
  "msg_seq_num": 187,
  "msg_user_id": 0,
  "msg_result": true,
  "NetworkAddress": "192.168.1.52",
  "NetworkEndpoint": "tcp://192.168.1.52:54442",
  "PhotoSelection": "Single",
  "PhotoKey": "5752505c-07f1-4cd3-ab47-d70b4f8a5d02",
  "CameraKey": "Nikon Corporation|D5300|4337807",
  "PhotoLocation": "Local Disk",
  "PhotoOriginalName": "DSC_0000.NEF",
  "PhotoComputedName": "SSP_30.nef",
  "PhotoDateCaptured": "20190530 19:53:07.000",
  "PhotoOrigin": "ui",
  "PhotoFormat": "Raw",
  "PhotoOrientation": "None",
  "PhotoAperture": "5",
  "PhotoShutterSpeed": "1/10",
  "PhotoISO": "400",
  "PhotoFocalLength": "52.0",
  "PhotoWidth": 6000,
  "PhotoHeight": 4000,
  "PhotoFilesize": 24755185,
  "PhotoIsImage": true,
  "PhotoSequenceNum": 30,
  "PhotoBatchNum": 141,
  "PhotoHash": "095A4317"
}
```

21.2 Sending Requests

The request/reply server inside the app can handle requests to do various actions such as:

- Connect/Disconnect camera
- Take photo
- Download/rename/delete photo
- Change camera property
- Auto focus camera
- Change sequence/batch number

> **Tip**
>
> For further documentation see the public git repo:
>
> https://github.com/kuvacode/smartshooter-api/tree/v6
>
> And in particular the API documentation stored here:
>
> https://github.com/kuvacode/smartshooter-api/blob/v6/external_api.rst

> **Tip**
>
> To send requests from a terminal or a script without writing any code, use the *Command Line Tool*.

21.3 Configuring the External API

By default the External API is disabled. To enable it, go to the **External API** tab in the **Options** window and enable the checkbox, as shown below. This also allows customisation of the ZeroMQ endpoints that are used for the event publisher and request/reply server, so that it can be opened up for access from other computers on a network.

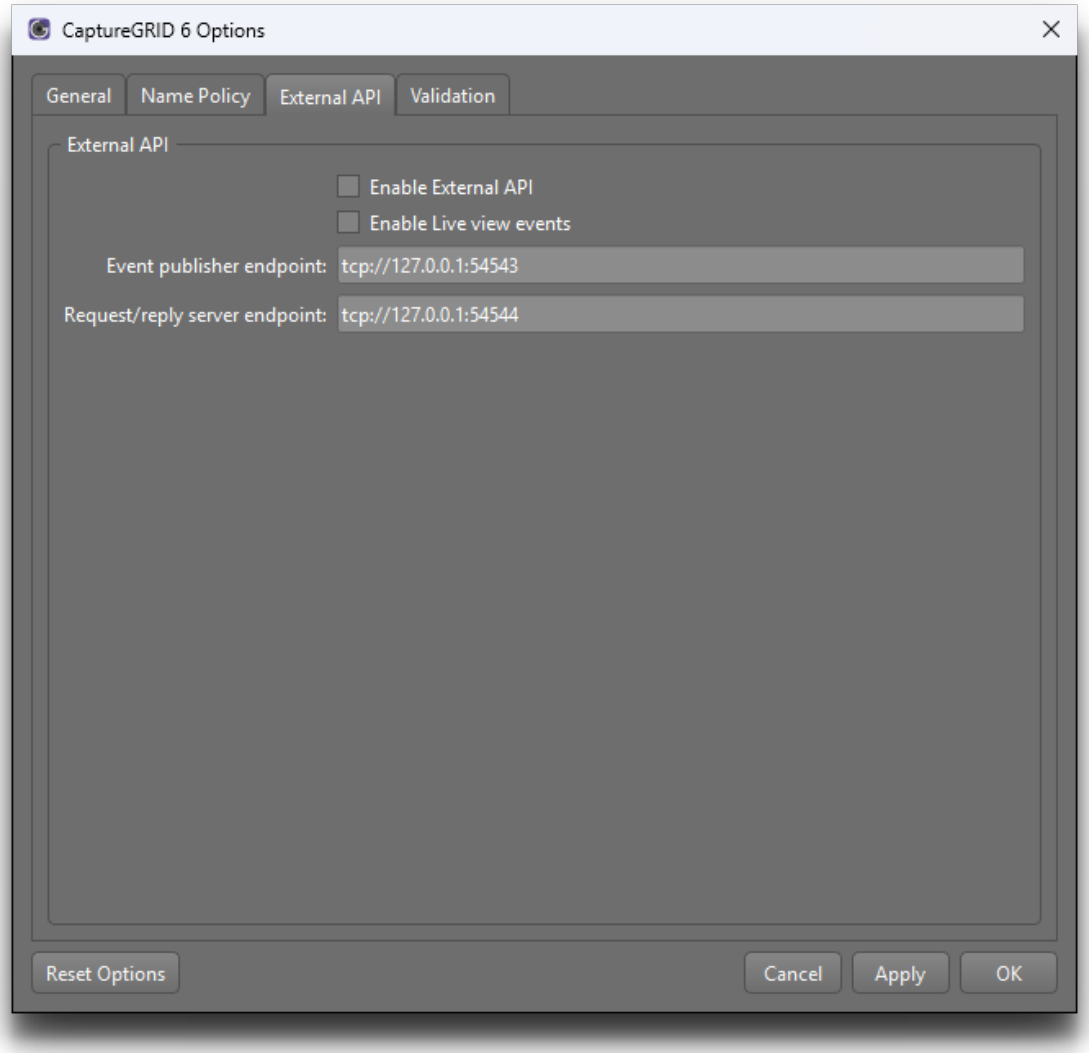
22 Command Line Tool

Controlling CaptureGRID from a terminal or script

CaptureGRID includes `capturegrid6ctl`, a command line tool for controlling a running copy of the app. It is useful when the app has no screen to work with, such as a node running as a background service on Linux, and for automating setup tasks from a script.

With it you can:

- Check the app's version, uptime, free disk space and camera count
- Activate or deactivate the license
- View and change options, such as the photo download folder
- List cameras, and ask the app to look for newly connected ones
- Watch events from the app as they happen
- Send any *External API* request


CaptureGRID 6 Options
General
Name Policy
External API
Validation
External API
Enable External API
Enable Live view events
Event publisher endpoint:
tcp://127.0.0.1:54543
Request/reply server endpoint:
tcp://127.0.0.1:54544
Reset Options
Cancel
Apply
OK

- Quit the app

22.1 Installing and Running

The tool is installed together with the app, so there is nothing extra to install. How you run it depends on your platform:

Platform	Command
Windows	`"C:\Program Files\CaptureGRID 6\capturegrid6ctl.exe"`
macOS	`"/Applications/CaptureGRID 6.app/Contents/MacOS/capturegrid6ctl"`
Linux	`capturegrid6.ctl`

The examples on this page use `capturegrid6ctl`; substitute the command for your platform.

The tool talks to the app over the *External API*, so the External API must be enabled. Turn it on in the **External API** tab of the **Options** window, or start the app with the `--api` command line option (see *Linux*). If the app can't be reached, the tool says so:

```
> capturegrid6ctl status
error: cannot connect to tcp://127.0.0.1:54544
Is CaptureGRID running with the External API enabled? Turn it on in
Options > External API, or start CaptureGRID with --api.
```

22.2 Ways of Using It

The tool can be used in three ways.

Run a single command by giving it on the command line. The tool runs the command, prints the result and exits:

```
> capturegrid6ctl status
Version      6.8.0 (linux)
Computer     node-01
Uptime       2h 14m
Disk free    412.5 GB
Download dir /data/photos
Cameras      4
Photos       0
```

Start an interactive shell by running the tool with no command. The shell keeps a history of the commands you type, and the `Tab` key completes command names, option names and request names. Type `exit` or press `Ctrl-D` to quit:

```
> capturegrid6ctl
capturegrid6ctl 6.8.0 - talking to CaptureGRID at tcp://127.0.0.1:54544. Type 'help' for␣
↪commands.
capturegrid> cameras
KEY                          NAME     MODEL           STATUS
Canon|EOS R6|012345678901    Front    Canon EOS R6    Ready
...
capturegrid> exit
```

Run a script by piping a file of commands into the tool, one command per line. Blank lines and lines starting with `#` are ignored. The script stops at the first command that fails:

```
> capturegrid6ctl < setup.txt
```

For example, a `setup.txt` that prepares a new node:

```
# Prepare a new capture node
license activate ABCD-EFGH-IJKL-MNOP
download-dir /data/photos
options set AutoConnect true
cameras detect
```

22.3 Commands

Command	Description
`status`	Show the app's version, uptime, free disk space, download folder, and the number of cameras and photos.
`license activate <code>`	Activate the license with an activation code. Any license already active on the computer is deactivated first.
`license deactivate`	Deactivate the license on the computer.
`options list`	Show all options and their current values. `options` on its own does the same.
`options get <name>`	Show the value of one option.
`options set <name> <value>`	Change an option.
`download-dir [<path>]`	Show the photo download folder, or change it when a path is given.
`config set <key> <value>`	Change an internal config value. Only use this when advised by Kuvacode support.
`cameras list`	List the cameras, with their key, name, model and status. `cameras` on its own does the same.
`cameras detect`	Ask the app to look for newly connected cameras.
`watch [<event>...]`	Print events from the app as they happen, until `Ctrl-C` is pressed.
`send <msg_id> [<fields>]`	Send any External API request and print the reply.
`shutdown`	Quit the app.
`help [<command>]`	List the commands, or show details of one command.

Changing Options

Option names are not case-sensitive, and the value you give is converted to the option's type. Options that are on or off accept `true`/`false`, as well as `yes`/`no`, `on`/`off` and `1`/`0`. After changing an option, the tool reads it back from the app to check that it was applied:

```
> capturegrid6ctl options set autoconnect on
AutoConnect = true
```

`download-dir` is a shortcut for the `DownloadPath` option. A relative path, or one starting with `~`, is turned into a full path, so this sets the download folder to the `photos` folder inside the current one:

```
> capturegrid6ctl download-dir photos
```

When the app is running on another computer, the path must be given in full.

Watching Events

`watch` prints a line for each event the app publishes, such as a photo being taken or a camera changing state. To see only some events, name them — the start of a name is enough, so `watch camera photo` shows only `CameraUpdated` and `PhotoUpdated` events.

The events are `CameraUpdated`, `LiveviewUpdated`, `NodeUpdated`, `OptionsUpdated`, `PhotoUpdated` and `RelayCustomText`. Live view frames are large and very frequent, so `LiveviewUpdated` is only shown when you ask for it by name.

Sending Any Request

`send` gives access to every request the External API supports, including ones without a command of their own. The fields of the request are given either as one JSON object, or as `KEY=VALUE` pairs:

```
> capturegrid6ctl send SetSequenceNum PhotoSequenceNum=10
> capturegrid6ctl send SetSequenceNum '{"PhotoSequenceNum": 10}'
```

A value is read as JSON when it can be (`true`, `42`, `"text"`), and as text otherwise. The reply from the app is printed as JSON. The full list of requests and their fields is in the External API documentation:

https://github.com/kuvacode/smartshooter-api/blob/v6/external_api.rst

22.4 Options

These options go before the command:

```
capturegrid6ctl [options] [command ...]
```

Option	Description
`-e, --endpoint URL`	The app's request endpoint. The default is `tcp://127.0.0.1:54544`, the app on the same computer.
`--events URL`	The app's event endpoint, used by `watch`. The default is port `54543` on the same host as the request endpoint.
`-t, --timeout SECONDS`	How long to wait for a reply from the app. The default is 5 seconds.
`--json`	Print the app's replies as JSON, for use by other programs.
`-V, --version`	Show the tool's version and exit.
`-h, --help`	Show help and exit.

The endpoints can also be set with the `CAPTUREGRID6CTL_ENDPOINT` and `CAPTUREGRID6CTL_EVENTS` environment variables.

Controlling Another Computer

By default the tool controls the app on the same computer. To control an app on another computer, first open up its External API endpoints to the network in the **External API** tab of its **Options** window (see *External API*), then give its address with `--endpoint`:

```
> capturegrid6ctl --endpoint tcp://192.168.1.52:54544 status
```

22.5 Using It in Scripts

The tool's exit status tells a script whether the command worked:

Status	Meaning
`0`	The command succeeded.
`1`	The app reported that the command failed. The error message gives the reason.
`2`	The command was not used correctly, such as an unknown command or option, or a value of the wrong type.
`3`	The app could not be reached, or did not reply in time.

Errors are printed to standard error, and results to standard output. Use `--json` when another program will read the output.

23 Supported Cameras

For settings needed on the camera, and features that work differently on particular camera makes, see *Camera Notes*.

23.1 Canon

Canon M6 Mark II
Canon M50
Canon M50 Mark II
Canon M100
Canon M200
Canon R
Canon Ra
Canon R1
Canon R3
Canon R5
Canon R5 C
Canon R5 Mark II
Canon R6
Canon R6 Mark II
Canon R6 Mark III
Canon R7
Canon R8
Canon R10
Canon R50

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Table 1 – continued from previous page

Canon R100
Canon RP
Canon 1D C
Canon 1D Mark III
Canon 1D Mark IV
Canon 1D X
Canon 1D X Mark II
Canon 1D X Mark III
Canon 1Ds Mark III
Canon 5D
Canon 5D Mark II
Canon 5D Mark III
Canon 5D Mark IV
Canon 5Ds
Canon 5Ds R
Canon 6D
Canon 6D Mark II
Canon 7D
Canon 7D Mark II
Canon 40D
Canon 50D
Canon 60D
Canon 60Da
Canon 70D
Canon 77D / 9000D
Canon 80D
Canon 90D
Canon 100D / Rebel SL1 / Kiss X7
Canon 200D / Rebel SL2 / Kiss X8
Canon 250D / Rebel SL3 / Kiss X10 / 200D Mark II
Canon 350D
Canon 400D
Canon 450D / Rebel XSi / Kiss X2
Canon 500D / Rebel T1i / Kiss X3
Canon 550D / Rebel T2i / Kiss X4
Canon 600D / Rebel T3i / Kiss X5
Canon 650D / Rebel T4i / Kiss X6i
Canon 700D / Rebel T5i / Kiss X7i
Canon 750D / Rebel T6i / Kiss X8i
Canon 760D / Rebel T6s / 8000D
Canon 800D / Rebel T7i / Kiss X9i
Canon 850D / Rebel T8i / Kiss X10i
Canon 1000D / Rebel XS / Kiss F
Canon 1100D / Rebel T3 / Kiss X50
Canon 1200D / Rebel T5 / Kiss X70
Canon 1300D / Rebel T6 / Kiss X80
Canon 2000D / Rebel T7 / Kiss X90 / 1500D
Canon 4000D / Rebel T100 / 3000D

23.2 Fujifilm

Fujifilm GFX 50r
Fujifilm GFX 50s
Fujifilm GFX 50s II
Fujifilm GFX 100
Fujifilm GFX 100 II
Fujifilm GFX 100s
Fujifilm X-H1
Fujifilm X-H2
Fujifilm X-H2S
Fujifilm X-S10
Fujifilm X-T1
Fujifilm X-T2
Fujifilm X-T3
Fujifilm X-T4
Fujifilm X-T5

23.3 Nikon

Nikon Z5
Nikon Z5 II
Nikon Z6
Nikon Z6 II
Nikon Z6 III
Nikon Z7
Nikon Z7 II
Nikon Z8
Nikon Z9
Nikon Z30
Nikon Z50
Nikon Z50 II
Nikon Zf
Nikon Zfc
Nikon ZR
Nikon D3
Nikon D3s
Nikon D3X
Nikon D4
Nikon D4s
Nikon D5
Nikon D6
Nikon DF
Nikon D200
Nikon D800
Nikon D800E
Nikon D810
Nikon D810A
Nikon D850
Nikon D700

continues on next page

Table 2 – continued from previous page

Nikon D750
Nikon D780
Nikon D600
Nikon D610
Nikon D300
Nikon D300s
Nikon D500
Nikon D7000
Nikon D7100
Nikon D7200
Nikon D7500
Nikon D5000
Nikon D5100
Nikon D5200
Nikon D5300
Nikon D5500
Nikon D5600
Nikon D3000
Nikon D3100
Nikon D3200
Nikon D3300
Nikon D3400
Nikon D3500
Nikon D40
Nikon D60
Nikon D80
Nikon D90
Nikon S2800
Nikon S3600
Nikon S6700
Nikon S9100

23.4 Ricoh

Ricoh Theta S

23.5 Sigma

Sigma fp
Sigma fp L

23.6 Sony

Sony a6000
Sony a6100
Sony a6300
Sony a6400
Sony a6500
Sony a6600
Sony a6700
Sony a1
Sony a1 II
Sony a7
Sony a7 II
Sony a7 III
Sony a7 IV
Sony a7 V
Sony a7C
Sony a7C II
Sony a7CR
Sony a7R
Sony a7R II
Sony a7R III
Sony a7R IV
Sony a7R V
Sony a7S
Sony a7S II
Sony a7S III
Sony a9
Sony a9 II
Sony a9 III
Sony FX3
Sony FX30
Sony ILX-LR1
Sony UMC-R10C
Sony ZV-E1
Sony ZV-E10
Sony ZV-E10 II

24 Camera Notes

Settings and limitations that differ between camera makes

Most cameras work the same way in the app. This page lists what is different for each camera make: settings needed on the camera, settings the app changes or adds, and features that aren't available. For Live View features, see *Camera Support*.

24.1 Canon

- **Storage** – **Storage** offers **Disk**, **Card**, **Both** and **JPEG**. On a camera with two card slots, **Both** saves to the slot selected on the camera. If there is no memory card in the camera, **Storage** stays at **Disk**. While the camera records video, **Storage** is switched to **Card** until recording stops.
- **Self-timer and bulb** – While the shutter speed or mode dial is set to Bulb, a 2 or 10 second self-timer drive mode is switched to single frame. The original drive mode is put back when the camera is no longer set to Bulb.
- **Not supported** – Power zoom. Bulb exposures, video recording, and reading or setting the camera's clock are only available on some models.

24.2 Fujifilm

- **Control Mode** – Fujifilm cameras have a *Control Mode* setting in the **Camera Controls** window, set to *Camera* or *App*. The app sets it to *Camera* when the camera connects, and back to *Camera* when it disconnects. The app can take photos and use Live View in both modes: in *Camera* mode it takes control of the camera just for the shot, or while Live View is on, and then hands it back. The differences are:
  - The camera settings can only be changed from the app in *App* mode, and not while Live View is on.
  - *Auto Focus* and the Live View focus buttons only work in *App* mode (see *Fujifilm*).
- **Exposure settings** – Except in manual exposure mode, only the setting that the exposure mode leaves free can be changed: *Aperture* in A mode, and *Shutter Speed* in S mode.
- **Release priority** – The first time the app takes control of the camera, it sets the camera's AF-S and AF-C RELEASE/FOCUS PRIORITY settings to RELEASE, so that the camera doesn't refuse a shot from the app when it judges the scene out of focus. The original settings are put back when the camera is disconnected in the app, but not if the USB cable is unplugged first.
- **Storage** – Only **Disk** and **Both** are available. If there is no memory card in the camera, **Storage** stays at **Disk**. On some models **Storage** is fixed at **Disk**.
- **Not supported** – Bulb exposures, video recording and power zoom. Reading or setting the camera's clock is only available on some models.

24.3 Nikon

- **Connecting** – When a Nikon camera connects, any photos still waiting in the camera's memory buffer, and not yet saved to the memory card, are discarded.
- **Storage** – **Storage** offers **Disk**, **Card**, **Both** and **JPEG**. If there is no memory card in the camera, **Storage** stays at **Disk**. While the camera records video, **Storage** is switched to **Card** until recording stops.
- **Live View** – On some models, turning Live View on sets **Storage** to **Disk** and stops it being changed until Live View is turned off. **Storage** then stays at **Disk** until you change it.
- **Not supported** – Power zoom. Bulb exposures, video recording, and reading or setting the camera's clock are only available on some models.

24.4 Ricoh

These notes apply to the Ricoh Theta S.

- **Storage** – The camera always saves photos to its own memory, and **Storage** only decides what the app does with them:
  - **Disk** – The photo is downloaded, and then deleted from the camera.
  - **Both** – The photo is downloaded, and kept on the camera.
  - **JPEG** – Only JPEG photos are downloaded, and kept on the camera.
  - **Card** – The photo is not downloaded.
- **Not supported** – Live View, *Auto Focus*, bulb exposures, video recording and power zoom.

24.5 Sigma

These notes apply to the Sigma fp and fp L.

- **Control Mode** – The **Camera Controls** window has a *Control Mode* setting, set to *App* or *Camera*. It starts as *App*, where the app takes photos, focuses and changes the camera settings. In *Camera* mode you take photos with the camera's own shutter button and the app downloads them, but the app can't take photos or focus, and the camera settings can't be changed from the app.
- **Storage** – Only two **Storage** values are available:
  - **Disk** – The photo is downloaded and saved to the local computer disk, and not saved to the camera's memory card.
  - **Buffer** – The photo is held on the camera and not downloaded yet, so that a batch of photos can be shot first. When **Storage** is set back to **Disk**, the photos held on the camera are downloaded, in the order they were taken.

  Card and **Both** aren't offered, because the camera would overwrite photos already on its memory card with the new ones. When a Sigma camera connects, the app sets it to save photos to the computer, and **Storage** starts as **Disk** whatever the *Camera Storage* default is (see *Setting a default*). Photos held with **Buffer** are discarded if the camera is disconnected before **Storage** is set back to **Disk**, and *Identify* and *Reshoot* don't work while **Storage** is **Buffer**.
- **Not supported** – Bulb exposures, video recording, and formatting the memory card or deleting photos from it. The camera's clock can be set from the app, but not read. In Live View, zoom isn't available and the AF area can't be moved (see *Sigma*).

- **Fast bursts** – During fast continuous shooting the camera can occasionally stop taking photos, and the app then shows an error for the camera. Unplug the USB cable and plug it back in to recover. Disconnecting and reconnecting in the app is not enough.

24.6 Sony

The Sony UMC-R10C works differently from the other Sony models, and is covered separately at the end.

- **Connecting** – The camera's USB connection must be set to PC Remote.
- **Storage** – **Storage** offers **Disk**, **Card** and **Both**, but not **JPEG**. On some older models the app can't change where photos are saved, so **Storage** is fixed at **Disk**.
- **Not supported** – Bulb exposures and video recording. On some models the camera's clock can't be read or set from the app.
- **UMC-R10C** – **Storage** offers **Disk** and **Card**. Bulb exposures (with the shutter speed set to Bulb), video recording and power zoom are available. Connecting can take a few seconds longer than for other cameras.

25 Getting Help

25.1 Discussion Forums

This is a place to ask general and technical questions, report bugs, request new features, or just share information with other users. They are monitored by the team and so any open questions will receive a response:

https://discourse.kuvacode.com

25.2 Email

To contact us directly, our email address is:

support@kuvacode.com

You can use this for inquiries, sales, and support issues.

25.3 Log Files

The CaptureGRID application records a log file about what the app is doing, and what errors it encounters. When reporting issues, it's useful to provide the log as this helps diagnose whats going wrong.

There are two log files called:

```
capturegrid6_log.txt
capturegrid6_history.txt
```

To locate where these are stored, click `Help -> Locate Log File` in the app's top menu bar. This will open a file browser window in the correct directory.

On Windows, this will be somewhere like:

```
C:\Users\francis\AppData\Roaming\CaptureGRID 6
```

On macOS, this will be somewhere like:

```
/Users/francis/Library/Application Support/CaptureGRID 6
```

26 Release Notes

26.1 v6.8

17th November 2026

- Add support for the Sigma fp and fp L
- Add capturegrid6ctl, a command line tool for controlling CaptureGRID from a terminal or script
- Fix the Select Image button in the Live View options failing to open the file picker on Windows
- Show the options popup again after choosing an overlay image or a colour from it
- Turn off the Dropbox warning by default, and hide its option on Windows and Linux, where it has no effect
- Improve External API replies to failed requests, which now say why in a new msg_error field
- Reject External API SetOptions requests with an unknown option or a wrongly typed value, instead of reporting success
- Fix an External API license activation reporting success when the current license could not be deactivated first
- Install the Microsoft Visual C++ runtime silently from the Windows installer

26.2 v6.7

31st October 2026

- Add Live View autofocus, focus buttons, and zoom and pan on Fujifilm cameras, in App control mode
- Add customisable keyboard shortcuts, with a new Shortcuts tab in Options
- Support system-wide license activation on macOS
- Improve the photo info layout, showing the same details in the same order in the info panel, overlays and Dashboard, with units on each value
- Fix the license being lost when the app starts without a network connection
- Fix long exposure shutter speeds showing as raw fractions such as 1199/10 in the photo info
- Fix Fujifilm shutter speeds showing as “1/-11” in Program and Aperture Priority modes
- Fix Fujifilm shots in manual focus occasionally failing and leaving the camera unresponsive
- Fix Fujifilm cameras being left in PC priority when connected while busy
- Fix menus and popups not appearing in full screen on Windows
- Fix the first character of a barcode scan being dropped after clearing the Barcode field
- Fix GRID networking choosing a VPN interface, such as Tailscale, on a fresh install
- Improve the log message when Windows has reserved the GRID port

26.3 v6.6

9th October 2026

- Add double-click on Live View to move the AF area to that point and autofocus
- Fix characters occasionally going missing from text drawn over the live view, preview and Dashboard
- Fix English counts reading “25 photo(s)” instead of “25 photos”

26.4 v6.5

22nd September 2026

- Add configurable Photo Metadata options, replacing the Canon-only Copyright write
- Deprecate the AddBarcodeToMetadata External API field in favour of AddMetadataToPhotos
- Let a click on the main window bring the app back to the front
- Fix Default Storage Mode option not being applied on Nikon cameras
- Fix Nikon Live View zoom region not being draggable
- Fix Brazilian Portuguese and Chinese translations not being loaded
- Fix the Linux snap package failing to start in desktop mode
- Let users request another activation when the activation limit is reached
- Improve the license dialog page shown when the activation limit is reached

26.5 v6.4

7th August 2026

- Add support for the new CaptureGRID CELL edition
- Add option to activate a license for all users of a Windows computer
- Improve camera detection to ignore Nikon cameras that are charging or powered off
- Fix a crash that could occur when switching the camera connection backend

26.6 v6.3

2nd July 2026

- Fix trial camera limit so trials support the full number of cameras

26.7 v6.2

28th June 2026

- Add support for 18 languages, with a fully translatable interface:
  - Czech
  - Danish
  - German
  - Spanish
  - French
  - Italian
  - Dutch
  - Norwegian
  - Polish
  - Portuguese
  - Finnish
  - Swedish
  - Turkish
  - Russian
  - Korean
  - Japanese
  - Simplified Chinese
  - Traditional Chinese
- Add new built-in app updater for Windows
- Fix swapped Is Image and Is Saved column header labels

26.8 v6.1

1st June 2026

- First official release of CaptureGRID 6

26.9 v6.0

2026

CaptureGRID 6 is a major new release. The headline new features are:

- Add support for a wide range of Canon, Nikon, Sony, and Fujifilm cameras:
  - Canon 1D X Mark III, M50, M50 Mark II, M100, M200, R1, R5 C, R5 Mark II, R6 Mark II, R6 Mark III, R8, R50, and R100
  - Fujifilm GFX 50r, GFX 50s, GFX 50s II, GFX 100, GFX 100 II, GFX 100s, X-H1, X-H2, X-H2S, X-S10, X-T1, X-T2, X-T3, X-T4, and X-T5

  - Nikon Z5 II, Z6 III, Z8, Z30, Z50 II, Zf, Zfc, and ZR
  - Sony a1 II, a6700, a7 V, a7C II, a7CR, a7R V, a9 II, a9 III, FX3, FX30, ILX-LR1, ZV-E1, and ZV-E10 II
- Add persistent database for camera and photo data storage
- Add new macOS camera backend using the ImageCaptureCore API
- Add synchronised camera trigger for multi-camera capture
- Add new Dashboard window for multi-camera monitoring
- Add support for importing existing photos from camera memory card
- Add support for viewing and editing photo ratings, including reading ratings from photo EXIF data

Additional changes in this release:

- Add action to Camera menu for viewing latest photo
- Add photo grid layout mode to Filmstrip window
- Add toolbar to Filmstrip window
- Add option to force Filmstrip into horizontal or vertical orientation
- Add filtering and sorting controls to Filmstrip, Photos, Dashboard, and Cameras windows
- Add Photo menu popup to Preview window
- Add draggable Loupe rect to Preview window
- Add options popup to Loupe window
- Show barcode rect in Preview and Filmstrip windows
- Add support for deleting barcodes
- Add camera name to the info overlay in the Preview window
- Add dropdown and history for photo download folder
- Add buttons to Session window for clearing the text fields
- Add option to automatically clear session text fields when app starts
- Add option to control the conversion of spaces to underscores in photo filenames
- Add option to enable/disable photo auto view behaviour
- Add button for pasting code into License window
- Add new SetActiveCamera request to External API
- Set default macOS camera transport mode to ImageCaptureCore
- Improve info overlay in Filmstrip window
- Improve algorithm used for RGB histogram calculation
- Improve layout of Session window
- Harmonise naming of Photo Download Folder
- Optimise default layout for small screen sizes
- Optimise handling of large messages in Log window
- Support extended ISO values on Sony cameras
- Persist image thumbnail cache across runs

- Save and restore the currently selected and viewed photo
- Fix identification of Mark II Canon R models
- Fix photo download for Canon R5 Mark II
- Fix Capture operation on Fujifilm X-T5
- Fix Live View operation on Fujifilm X-T5
- Fix issues with Fujifilm capture sequence
- Fix Liveview overlay aspect ratio in Preview window
- Fix issue with camera selection mode from liveview widget
- Fix issue with camera preset deletion removing the wrong preset
- Fix rendering issues with floating windows that contain GL content
- Fix initial state of Storage dropdown menu in Camera Controls window
- Fix Shoot action incorrectly triggering continuous shooting
- Fix file save failures on linux
- Reject incoming GRID network connections from CaptureGRID 4 nodes
- Disable the camera preset setting checkbox if setting is not available
- Decrease preference of virtual machine IPs when selecting network interface
- Remove image from view when its photo is deleted
- Remove secondary confirmation prompt for photo delete operation
- Remove support for Lightroom Plugin feature
- Remove menu item for sending feedback email
- Includes changes from v5.x (internal releases, not publicly released as CaptureGRID):
  - Add support for changing camera settings on Fujifilm cameras
  - Add support for Sony a6700 Live View zoom region
  - Add support for “JPEG” storage mode for Canon and Nikon cameras
  - Add support for “Both” storage mode for Fujifilm cameras
  - Add support for PNG overlay images
  - Add support for showing overlay image in Live View window
  - Add native support for Apple Silicon
  - Switch to new docking system for UI windows
  - Support saving custom UI workspace layouts
  - Support photo backup to secondary location
  - Switch to per-camera licensing model for multi-camera support
  - Add dedicated Barcode window
  - Add dedicated Loupe window
  - Add dedicated Filmstrip window
  - Add dedicated Live View window

- Add Download Folder field to Session window
- Add option for showing grid overlay in Live View window
- Add photo review timer for live view overlay
- Add image thumbnail to Photos table UI
- Add image thumbnail to Barcode table UI
- Add column for Power Zoom position to Camera table
- Add Barcode column to Photos table
- Add visual highlight of photo barcode location
- Add barcode format to scanned barcode information
- Add option to play sound after photo is taken
- Add option to play sound after barcode is scanned
- Add sound effect for camera lost event
- Add option to Photo Delete action to leave files in download directory
- Add option to disable the popup for confirming photo deletion
- Add popup warning about camera connection issues with Dropbox
- Add popup warning about performance impact of automatic barcode scanning
- Add UI to verify installation of Lightroom plugin
- Add reset button to background colour option
- Add button to launch QR Code Generator app
- Add confirmation prompt when deleting camera preset
- Add External API field to control the conversion of spaces to underscores in photo filenames
- Allow saving barcode info to photo EXIF metadata
- Allow barcode scanning to be restricted to specific type
- Allow vertical orientation of Filmstrip window
- Allow scrolling filmstrip with mouse wheel
- Allow per window live view options
- Allow multiple instances of Live View window
- Expose Live View image data to External API
- Show Live View indicator in Preview window
- Improve support for HiDPI displays
- Improve download performance during Nikon continuous shooting mode
- Improve responsiveness of image decoding during high speed shooting
- Improve performance of image cache cleanup
- Improve messaging in Delete Photos confirmation window
- Improve histogram rgb channel levels
- Improve scrollbar behaviour of Filmstrip window

- Improve UI of Delete photo window
- Improve UI of Memory Card Format window
- Improve UI for License window
- Improve UI for Camera Lost Warning window
- Improve UI of Presets UI window
- Improve UI for Sony power zoom
- Improve Windows installer package
- Optimise photo views to avoid unnecessary image decoding
- Reduce battery usage of photo display windows
- Reduce size of UI elements on standard DPI displays
- Increase macOS minimum version to 13.5 (Ventura)
- Rename Capture window to Preview window
- Rename Filename Options window to Session window
- Move camera options to Cameras window
- Move barcode options to Barcode window
- Move session options into popup menu
- Update app style sheet and icons
- Update External API activation requests to ignore duplicate activation code
- Enable keyboard movement in Filmstrip window
- Make Shoot button more prominent in Camera Controls window
- Set tab order for UI controls
- Automatically close camera lost warning when camera is reconnected
- Increase movement during Sony power zoom wide/tele commands
- Support connection to Sony cameras using Sony PTP driver on Windows
- Remove camera power icons from UI
- Remove Photos sub-menu from top menu bar
- Remove live view controls from Camera Controls window
- Remove option to enable/disable photo display
- Remove Recent Photos window
- Remove Card Preview feature
- Fix handling of Aperture setting on Fujifilm cameras
- Fix flickering of photo histogram
- Fix issue with photos being shown with wrong image resolution
- Fix issue with stuck loop during Sony powerzoom movement
- Fix download error during app update process on Windows
- Fix keyboard navigation in Filmstrip window

  - Fix possible instability caused by window drawing order
  - Fix display of Live View zoom region for Sony a6700
  - Fix issue with session options not being saved and restored after restart
  - Fix hang in LR plugin when stopping tethered connection
  - Fix issue with shutdown failure when there are floating windows
  - Fix crash on macOS caused by GUI framework
  - Fix issue with detection of Sony cameras on Windows
  - Fix support for transparent PNG image overlay
  - Fix window state save/restore behaviour after restart on macOS
  - Fix possible crash when saving barcode info to photo EXIF
  - Fix issue with overlay image being unloaded while still visible
  - Fix photo backup when copying from subdirectories of the photo download directory
  - Fix bug with use of barcode camera filter expression
  - Fix error when reading Sony power zoom position
  - Fix issue with Microsoft C++ DLL mismatch with windows installer
  - Correctly detect photo capture when using Card storage with Sony cameras
  - Keep Camera Controls UI in sync when camera setting change fails
  - Ensure that the values for Quality camera setting are alphabetically sorted in UI
  - Ensure mousewheel focus only happens when liveview is enabled
  - Ensure camera lost warning is shown again when another camera is lost
  - Ensure main window is focused when license window closes
  - Ignore Apple devices from USB detection
  - Ignore non-camera USB devices on Windows

v4.28

20th January 2025

- Add support for synchronised camera trigger
- Add option to Photo Delete action to leave files in download directory
- Add option to disable the popup for confirming photo deletion
- Add column for power zoom position to camera table
- Add power zoom movement target to External API camera info
- Add External API request for stopping power zoom movement
- Improve power zoom UI
- Improve accuracy of Sony power zoom positioning
- Improve messaging in Delete Photos confirmation window
- Improve download performance during Nikon continuous shooting mode

- Fix use of barcode camera filter expression
- Fix issue with stuck loop during Sony powerzoom movement
- Update External API activation requests to ignore duplicate activation code

v4.27

6th December 2022

- Add support for Nikon Z6 II
- Add support for Nikon Z7 II
- Add support for Nikon Z9
- Fix support for Nikon image quality * modes
- Fix app hang during synchronisation of photo list

v4.25

6th August 2022

- Add support for Sony a7 IV
- Add support for Sony ZV-E10
- Add support for Canon R7
- Add support for Canon R10
- Add support for Liveview zoom/position on Sony cameras
- Add support for direct shutter button control on Sony cameras
- Fix crash caused by bug with texture loading in UI layout logic
- Fix issue with shutter button control during continuous highspeed shooting
- Fix issue with Sony triggering during MF focus mode
- Fix incorrect loupe size when loading photo thumbnails
- Fix storage of license activation status on linux
- Allow liveview images to be sent to External API
- Remove barcode metadata checkbox from options UI

v4.24

28th March 2022

- Adjust Sony live view focus sensitivity
- Ensure Nikon cameras are disconnected gracefully
- Ensure Recent Photos list auto-scrolls to end when new photo is added
- Fix clickable UI area for camera live view popup menu
- Fix typo in tooltip for focus step buttons
- Fix issue with photo quality setting being ignored on Sony cameras

- Add support for Transfer request from External API
- Add support for live view focus with Sony UMC cameras
- Improve log message for failed license activation request

v4.22

3rd May 2021

- Add support for Sony a1
- Add support for Sony a7C
- Add support for Sony a7S III
- Add support for Nikon D6
- Add support for Nikon D780
- Add support for Nikon Z 5
- Add support for Nikon Z 50
- Add support for Canon Ra
- Add support for Canon RP
- Add support for Canon R5
- Add support for Canon R6
- Add support for Canon M6 Mark II
- Add support for Canon 90D
- Add support for Canon 850D / Rebel T8i / Kiss X10i
- Add support for full control of camera settings on Sony a7R4, a7C, a1
- Add support for live view focus with Sony Alpha cameras
- Add support for controlling power zoom on some Sony Alpha cameras
- Add support for setting custom White Balance colour temperature on Nikon and Sony cameras
- Add support for Pixel Shift mode on recent Sony cameras
- Add full support for Canon CR3 file format
- Add display option to enable/disable filmstrip and tool panels
- Add photo filename validation feature
- Add system tray icon to mac app
- Add command line option to start minimised to system tray
- Adjust Sony live view focus sensitivity
- Allow Colour Temp setting to be part of stored camera preset
- Improve accuracy of barcode scanning
- Fix Storage mode setting for recent Sony cameras
- Fix intermittent failure of live view on Sony cameras
- Fix video download on Canon EOS R

- Fix quick loupe for live view on Sony cameras
- Fix live view on Sony a7C and similar models
- Fix issue with dropped replies for External API requests
- Fix issue with background image being hidden until first photo is taken
- Fix incorrect msg_seq_num on External API replies
- Ensure Lightroom retains focus when plugin is launched from within Lightroom
- Ensure empty files are removed if video download fails
- Ensure invalid External API requests are correctly rejected
- Ensure live view is marked as not-supported on the Sony a6000
- Do not exit app when minimised to system tray and main window is closed
- Update message in trial ended notification window
- Prepare support for macOS Big Sur and Apple Silicon

v4.17

1st July 2020

- Fix issue with flickering liveview on Sony cameras
- Fix use of Windows network shares in Photo Download Directory
- Fix issue with UI focus when trying to change/edit camera from camera table
- Fix deadlock issue after barcode scan triggers photo renaming
- Add support for Raspberry Pi 4 system image
- Add help menu item for submitting feedback email
- Add button to License window for rechecking license
- Add license type and order ID to License window
- Show full product SKU in License window
- Decrease tolerance for over/under exposure warning

v4.15

22nd April 2020

- Improve reliability of Sony capture when AF is enabled
- Improve latency of Sony AF capture
- Improve highlight graphics for filmstrip photos
- Fix Sony auto focus functionality
- Fix camera status when Sony MF capture fails
- Fix issues with Sony photo download during highspeed continuous shooting
- Fix crash when value for script parameter contains empty text
- Detect Sony storage mode setting from camera

- Add option to enable/disable Capture display
- Add system tray icon to windows app
- Add option to start app minimised to system tray
- Add highlight for current camera in Cameras display panel
- Add StorageID, PersistentID, and OriginalPath to External API photo info
- Add GetCamera request message to External API
- Add option to persist photo info after app restart
- Support restore of photo info from previous session
- Allow app to be activated/deactivate via External API
- Allow Camera Controls current camera to be selected from Cameras display panel
- Ensure any outstanding Sony autofocus requests are cancelled before disconnect
- Ensure External API can be enabled even if app is deactivated
- Restore camera selection mode after app restart

v4.14

19th February 2020

- Improve image quality of previews and thumbnails in photo display window
- Add option to disable Live View focus with mouse wheel
- Add support for bugsplat crash reporting on mac
- Add error code descriptions to cryptlex license window UI
- Add mappings for more Sony a7R4 camera settings
- Show trial ID in trial/license window
- Ensure correct texture level is chosen in photo preview window
- Ensure Quick Loupe uses fullsize photo
- Ensure control characters (ie. newline) are stipped from photo filename
- Ensure PhotoFilename field is sent to external API event stream
- Ensure log file is updated on regular interval
- Fix issue with Sony camera properties getting out of sync
- Fix issue with Sony capture requests returning early failure
- Fix issue with histogram when two display windows are used
- Fix issue with photo detection and download on Sony a7R4
- Fix issue with sticky UI controls on mac
- Fix error when running Bulb Timelapse script
- Fix crash when using multiple display windows on mac
- Fix crash when loading background image

v4.12

31st December 2019

- Fix issue with update window getting stuck in background on mac
- Fix issue with Live View FPS controls
- Fix issue with photo names contained absolute files paths
- Fix External API fields for CameraNumDownloadsComplete and CameraNumDownloadsFailed
- Support GRID network transfers for video files
- Separate GRID photo USB download and network transfer operations
- Add option for setting default Live View FPS
- Add rate limiter to photo viewer to avoid backlog of loading/decoding operations
- Stop sendling LiveviewUpdated message to External API
- Do not switch network adapter if chosen IP address temporarily goes down

v4.11

15th November 2019

- Add ability to retrieve log file from remote GRID nodes
- Add ability to clean download data and directory from GRID nodes
- Add information about GRID node memory usage
- Add support for photo quality settings on Sony cameras
- Add new OptionsUpdated External API message
- Add option to hide on-card photos from filmstrip
- Add new Trigger Controls UI window
- Add UI to allow formatting memory cards in specific cameras
- Change ‘Delete All’ button to only delete known photos and not download directory
- Increase default GRID photo transfer size to 50 MB
- Improve UI for hiding/unhiding photos
- Fix GRID node disk space calculation for linux 32bit platforms
- Fix GRID slave node handling requests with ‘multiple’ selection mode
- Fix support for RAW+JPEG mode on Sony cameras
- Ensure large log file does not persist once app is restarted
- Ensure app update checks do not happen while activation window is still visible
- Ensure GRID node name and camera database is saved even when app is not shutdown cleanly
- Ensure OptionsInfo and DownloadPath are added to External API synchronistion reply
- Ignore folders created by camera on memory card
- Ignore duplicate photos when shooting to dual memory card slots
- Avoid possible app hang when handling USB communication errors on Windows

v4.10

28th October 2019

- Support new master/slave GRID networking mode
- Optimise memory usage when GRID photo transfers are done in single chunk
- Allow multiple nodes to be selection from node table UI
- Allow GRID node renaming from camera table UI
- Allow GRID node names be be edited directly from row in nodes table UI
- Add ability to filter absent nodes from node table UI
- Add option to disable automatic rotation using photo EXIF
- Add option to apply rotation from camera metadata
- Add option to auto fill Session Name or Unique Tag when clipboard text changes
- Add checkbox for pausing output text in log window
- Add single 'Manage License' item to help menu
- Use GRID master node mode to decide about distributing options
- Only send GRID discovery messages from unconnected nodes or master node
- Fix USB host controller detection and balancing on Windows
- Fix orientation of live view loupe when display mirroring is enabled
- Fix possible hang when closing application
- Fix issue when renaming local GRID node
- Fix license verification when running in CLI mode
- Fix initial text in node/camera table selection indicator

v4.9

29th September 2019

- Add Sony support for cameras in the a6xxx range, a9, and a7 variants
- Add support for changing Sony camera properties
- Add support for live view on Sony cameras
- Add UI buttons for incrementing/decrementing camera properties
- Add script for direct shutter button control for Canon cameras
- Add rate limiter to fix hang during GRID photo synchronisation
- Fix colouring of UI text for script status
- Fix photo rendering for GPUs that have limited max texture size
- Fix issue with [E] filename token when shooting RAW+JPEG
- Fix issue with Sony camera communication on linux
- Fix possible app hang and memory leak during heavy GRID network traffic
- Replace warning icons with coloured text in Camera Controls window

- Allow parallel downloads from cameras connected through same USB host controller
- Ensure trial dialog is not shown for GRID slaves even after license file has become stale

v4.8

28th August 2019

- Add support for Canon 250D / Rebel SL3 / Kiss X10
- Add new zxing barcode scanner engine
- Add buttons for pasting clipboard into filename options text fields
- Fix issue with support for cardless operation with Canon cameras
- Fix misleading names used in PTP property log messages
- Show platform with GRID node information
- Show Card/Disk status for filmstrip thumbnail placeholder
- Replace Client Presentation Mode option with Card Preview dropdown menu
- Change behaviour of barcode text field to accept external scanner input
- Track Session Name and Session Number information with each photo
- Ensure camera status is updated for lost cameras during GRID network synchronisation
- Improve GUI table perf by disabling automatic column resizing
- Separate photo location and hidden status
- Allow photos to be unhidden

v4.7

24th July 2019

- Fix issue with migrated camera names being overridden with default model name
- Fix issue with incorrect state for photo/camera/node information after network synchronisation
- Fix issue with GRID photo transfers getting stuck under heavy load
- Fix issue with GRID network messages being consuming too slowly, leading to connection timeout
- Fix memory corruption and crash when synchronising GRID network connection
- Fix issue with rejected download requests of camera already has capture request pending
- Improve reliability of GRID network session handling and recovery
- Add network priority mode option to control GUI/network priority
- Add Node column to photo and camera tables
- Add link to documentation website in Help menu
- Add ability to customise GRID node connection timeout
- Ensure Client Presentation Mode only downloads JPEGs when shooting RAW+JPEG
- Ensure session num UI gets updated after options update
- Ensure log file is flushed when handling bugsplat report

- Ensure linux snap package uses common user directory for photo storage
- Show totals for photos/cameras/nodes in UI tables
- Reduce use of GPU when Capture tab is not visible
- Filter out noisy Nikon ExposureIndicateStatus messages from log

v4.6

5th July 2019

- Initial release of CaptureGRID 4 (split from Smart Shooter 4)