Manual for OGMA GP662C, GP678C and GP678M Guide/Planetary cameras

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Discover the ins and outs of the GP662C, GP678C, and GP678M Guide/Planetary cameras with guidance from both our engineering team and the user community.

While this manual covers a broad range of topics related to your camera's setup, operation, and maintenance, it intentionally does not delve into specifics about using your camera with third-party software applications. The use and mastery of such software are best supported by the extensive resources available on the respective software developers' websites. However, we recommend certain software that pairs well with your camera for optimal performance. Still, guidance on these applications should be sought directly from their sources to ensure you have the most accurate and up-to-date information.

This dynamic manual is a collaborative effort, blending valuable insights from users like you with expert advice from our engineering staff. We view our customers as the true experts in astrophotography. As a continuously updated resource, we suggest bookmarking this page to access the latest tips and updates easily.

In our commitment to practicality, sustainability, and affordability, we've chosen not to print this manual. Keeping it digital ensures the content remains current, helps reduce the overall cost of your camera, and avoids unnecessary environmental impact by saving trees.

We welcome your questions, contributions, and feedback at any time!

Introduction

OGMA GP Series of Guide/Planetary Cameras

Welcome to the versatile world of the OGMA GP662C, GP678C, and GP678M astronomy cameras, designed to cater to your planetary and deep sky imaging needs and autoguiding.

With their sleek barrel-shaped bodies, these cameras can be easily inserted into your telescope's focuser or into an off-axis guider (OAG), ensuring a smooth and secure connection for your celestial explorations.

What's in the Box

Safety Information

Avoid exposing the camera to water or moisture. Do not use the camera if it is wet.

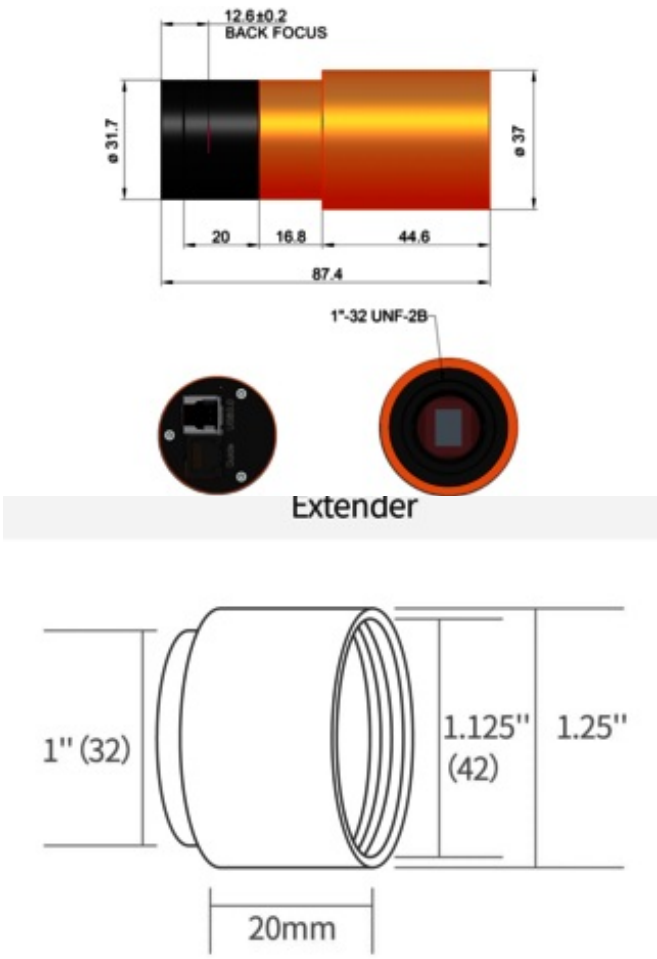
Do not disassemble the camera.

Only power the camera with the USB3 cable provided.

Do not point your telescope directly to the Sun as it can damage your eyes or the camera, if it is connected to the telescope.

Mechanical Drawings

OGMA GP Series Mechanical Drawings



Barrel Shape

The body of the three cameras, GP662C, GP678C, AND GP678M, have the same barrel shape and dimensions.

The only different dimension is the size of the sensor, in the case of the GP662C.

In every case, the sensor is behind a UV/IR glass.

The distance from the flange to the sensor is 12.6mm, with a tolerance of +/-0.2mm.

Connectivity

Ports

Located on the back of the camera

- ST4 auto-guiding interface.
- USB3.0 data and power interface.

USB 3.0 on models GP678C & GP678M

The GP678C and GP678M cameras feature a physical USB 3.0 port for fast and reliable data transfers. Using the USB 3.0 connection is straightforward and plug-and-play. However, occasionally, users report that the camera "***is recognized as a USB 2.0 device instead of USB 3.0 on Windows***" . This issue is typically resolved by unplugging and reconnecting the camera. It's worth noting that this can occur with any USB 3.0 device, not just our cameras.

If you encounter this issue and can't resolve it by reconnecting the USB cable, consult the troubleshooting guide that we wrote for the user manual of the cooled cameras at https://getogma.com/manual/ap26/usb3

Autoguiding

Using the OGMA GP662C, GP678C, and GP678M cameras for autoguiding in your astrophotography setup can significantly enhance the accuracy of your long-exposure images by compensating for tracking errors. Here's how to use these cameras with PHD2, a popular autoguiding software:

Step 1: Install Necessary Drivers and Software

Before starting, ensure that you have the latest OGMA ASCOM driver installed on your computer to facilitate communication between the camera and PHD2. You can download this driver from the OGMA website or the product support page. Also, install PHD2 if you haven't already done so.

Step 2: Connect the Camera to Your Telescope

Attach the OGMA camera (GP662C, GP678C, or GP678M) to the guide scope or OAG attached to your main telescope. Ensure the camera is securely fitted to prevent any movement during imaging.

Step 3: Connect the Camera to Your Computer

Connect your camera to your computer using the USB cable provided. Ensure the connection is secure to avoid any disconnections during the guiding process.

Step 4: Launch PHD2 and Select the OGMA Camera

Open PHD2 on your computer.

Go to the "Camera" menu and select "Connect Camera."

From the camera selection window, choose "ASCOM Camera" and click "OK."

In the ASCOM Camera Selection window, select the "OGMA ASCOM Driver" from the list and click "Properties" or "OK" (depending on your version of PHD2).

Step 5: Configure the OGMA ASCOM Driver

Upon selecting the OGMA ASCOM driver, a configuration window will appear. In this window, you need to select the specific model of your OGMA camera (GP662C, GP678C, or GP678M) from the dropdown menu. This step is crucial as it ensures the software communicates correctly with your specific camera model.

After selecting your camera model, confirm any other necessary settings and click "OK" to close the configuration window.

Step 6: Establish Connection in PHD2

With the camera selected and configured, click "Connect" in PHD2 to establish a connection with your OGMA camera.

Once connected, you should see a live feed from your guide camera in the PHD2 interface.

Step 7: Begin Autoguiding

Use PHD2 to select a guide star in the camera's field of view. Ideally, choose a bright star for more reliable guiding.

Calibrate PHD2 by following the on-screen instructions. Calibration allows PHD2 to understand how the movements of the motors of your mount correspond to changes in the position of the guide star.

Once calibration is complete, start guiding. PHD2 will now monitor the guide star and correct your mount's tracking to compensate for any drift.

Additional Tips

Ensure your guide scope is securely mounted and aligned with your main telescope.

Regularly check for updates for both the OGMA ASCOM driver and PHD2 software to ensure optimal compatibility and performance.

Experiment with PHD2's settings, such as the guiding algorithm and exposure times, to achieve the best results for your specific setup.

By following these steps, you can utilize your OGMA GP662C, GP678C, or GP678M camera for precise autoguiding, enhancing the quality of your astrophotography with minimal tracking errors.

PHD2 Camera Selection

Introduction

Please note: at the end of this document, we discuss a confusing error message you may encounter in PHD2 and how to solve it. We will also address any issues you may encounter when upgrading your PHD2.

What version of PHD2 you should use?

Most software developers recommend that you use the stable release of their software; PHD2 is one of these rare exceptions. When you visit PHD2's download page, at the time of this writing, there is a notice indicating:

> We recommend running the latest development snapshot build to get the latest bug fixes and enhancements. The development builds are updated more frequently than the general releases below.

This notice may be removed at any time. Therefore, you should check before downloading a version of PHD2.

If you have downloaded PHD2 v2.6.13dev6 or newer, you will be able to use the native integration of our SDK, which is faster and more flexible than the ASCOM platform.

How do you connect to PHD2?

There are two methods for connecting the OGMA guide cameras to PHD2:

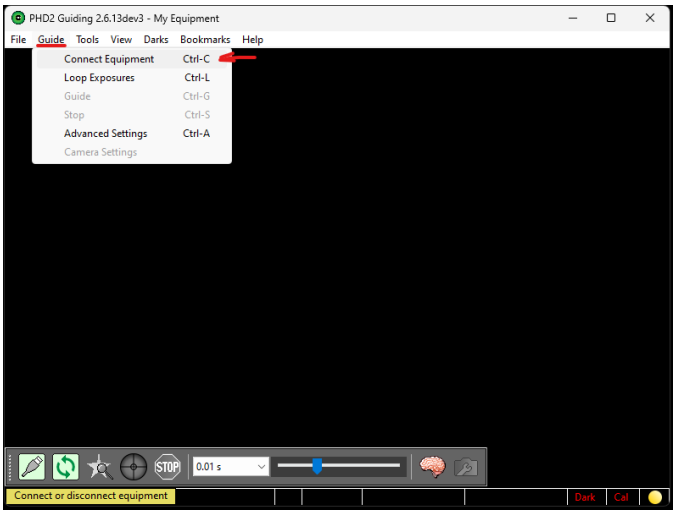
1. Using the native integration (recommended)
2. Using the OGMA ASCOM driver

1- Connect using the native integration (recommended)

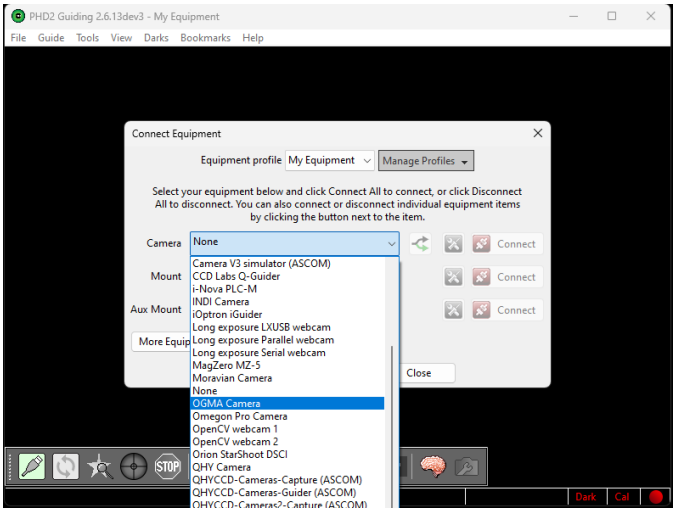
OGMA AP Series has been fully integrated with PHD2 since v2.6.13dev3 from 21 April 2024. This means you don't have to download or install our ASCOM driver to use the camera with PHD2.

Once you have installed v2.6.13dev3 or newer, open PHD2 and select your camera as follows:

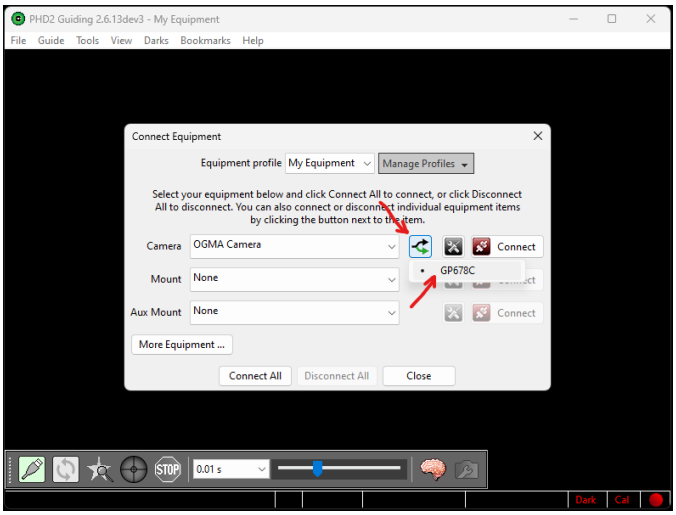
1- Click Guied > Connect Equipment



2 - Click Camera > OGMA Camera (Do not select the **ASCOM OGMAVision Camera** because it is slower).



3 - Click the button with the arrows near OGMA Cameras



4- Finally, click the "Connect" button with the red icon.

At this point, you should have your GP camera connected natively.

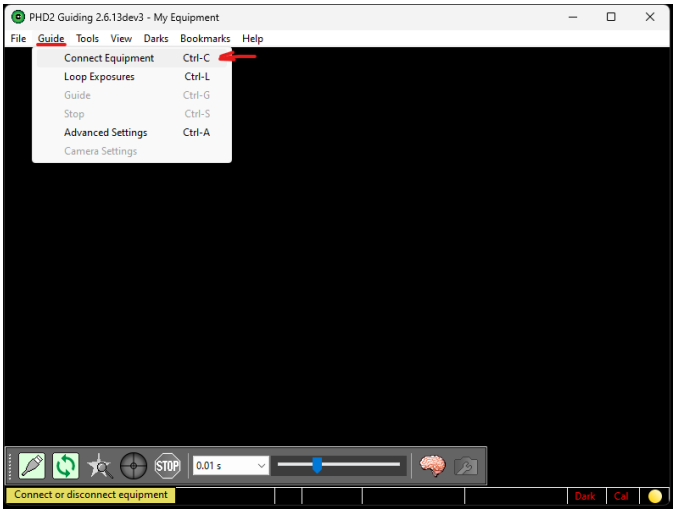
2- Connect using the ASCOM driver

If you can't download a version of PHD2 newer than v2.6.13dev3 from 21 April 2024, or if you're using a new camera model that has just been released and hasn't been integrated natively yet, then you should use the latest OGMA ASCOM driver to establish the connection in PHD2.

To do so, follow these steps:

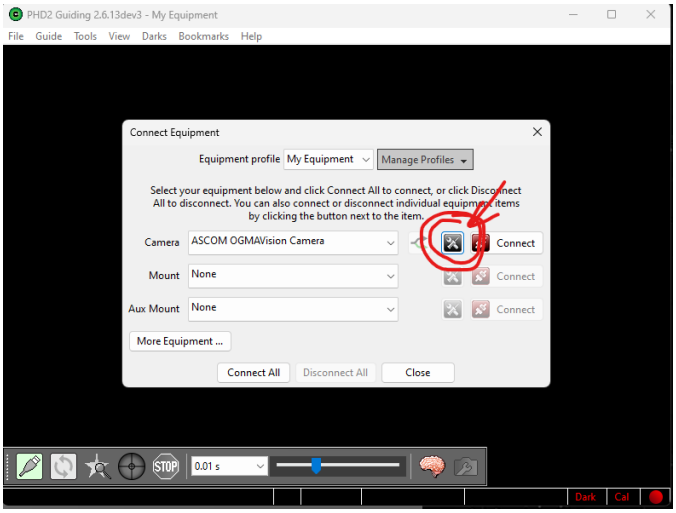
1- Download and install the latest OGMA ASCOM driver.

2- Open PHD2 and click Guide > Connect Equipment.



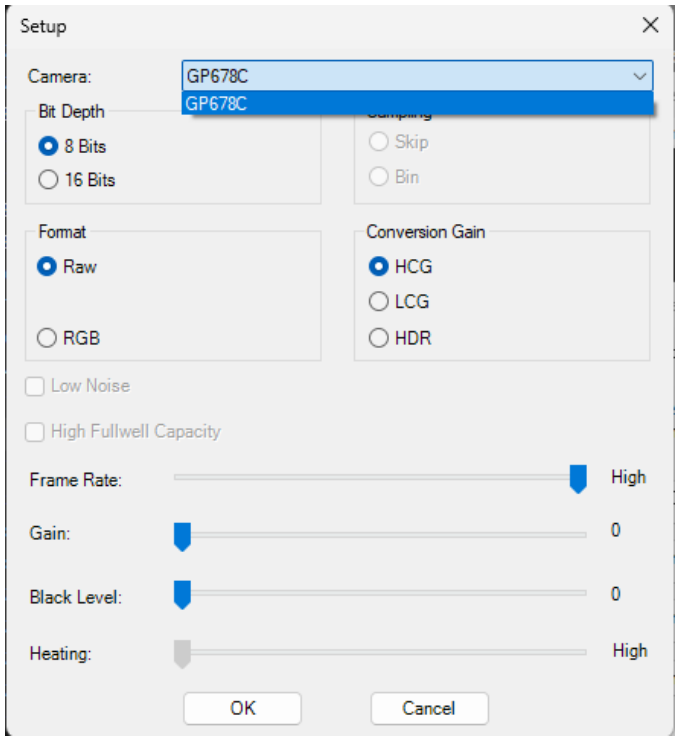
3- Click the Camera drop-down and select ASCOM OGAMVision Camera.

4- Then click the Tools button to the right of the camera drop-down.



5- The ASCOM setup window will open.

6- Use the drop-down to select the right camera. **This is very important!**



7- Click OK, and click the "Connect" button with the red icon.

At this point, you should have your GP camera connected through the ACOM driver.

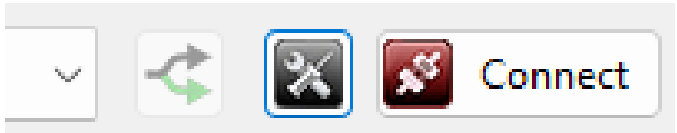
Confusing error message in PHD2

When using PHD2 with multiple cameras from the same brand connected to your computer, the software may automatically select the first camera it detects based on alphabetical order. This can lead to a confusing error message.

For example, after selecting the OGMA native or ASCOM driver, if you have both an AP26MC camera and a GP678C camera from OGMA connected, PHD2 will default to the AP26MC because its model name starts with an "A", which comes first alphabetically. If this AP26MC camera is already being used by another software like NINA, APT, or through an ASCOM connection, PHD2 will display an error message stating, "This camera is already in use."

The confusion arises because the error message doesn't specify which camera is in use. Instead, it refers to "This camera" as the one PHD2 is attempting to connect to by default, not necessarily the one you intended to use.

To resolve this, manually select your desired camera in PHD2. Click the "Tools" button near the camera selection drop-down menu to choose the specific camera you want to connect to, bypassing the automatic internal selection that PHD2 is trying to make.



Possible issue after upgrading PHD2

PHD2's development builds receive updates more frequently than the stable release versions. As such, it's advisable to check for and install the latest builds regularly.

If you switch from a stable build to a development snapshot, there may be a scenario in which the previous version of PHD2 might still be running in the background. If you attempt to open the new

version while the old one is active, the new version won't launch. To resolve this, close or kill the currently running version before installing and opening another.

Planetary imaging

Using the OGMA GP662C, GP678C, and GP678M cameras for planetary imaging involves several steps, designed to help you capture detailed and clear images of planets in our solar system. Here’s a general guide to get you started:

1. Equipment Setup

Attach the Camera: Securely attach your chosen OGMA camera (GP662C, GP678C, or GP678M) to the telescope. Thanks to their barrel-shaped design, these cameras will fit smoothly into a telescope's 1.25-inch focuser.

Connect to Your Computer: Use the provided USB cable to connect the camera to your computer. Ensure you have the necessary drivers installed, usually available on the manufacturer's website.

2. Choose the Right Software

While these cameras are compatible with various astrophotography software, selecting one that suits your needs and skill level is crucial. Software such as SharpCap, FireCapture, or AstroDMx can be excellent choices. Please note that this manual doesn’t cover detailed software operation; for that, consult the specific software’s documentation or online resources.

SharpCap and AstroDMx are being updated more often, and this camera should have a native integration with both.

FireCapture is taking longer between updates. If your camera model is not recognized natively by FireCapture, you can have the camera recognized by replacing the file ogmacam.dll in the FireCapture program folder with the x64 version from the OGMA SDK. To do so:

1. Download the full OGMA SDK from https://github.com/OGMAvision/OGMAcamSDK/archive/refs/heads/main.zip
2. Decompress the zip file
3. Locate the latest ogmacam.dll inside the directory \win\x64\ of the SDK
4. Replace the file ogmacam.dll in the FireCapture program folder

3. Focus

Achieve Sharp Focus: Use a bright star to focus your telescope with the camera attached. Many software applications offer focusing aids like Bahtinov mask tools or focus assist features to help you achieve sharp focus.

4. Planetary Imaging Settings

Resolution and Frame Rate: Set your software to capture at the highest possible resolution that your camera supports. Adjust the frame rate to a suitable value, considering that higher frame rates might necessitate higher gain settings or reduced exposure times.

Exposure and Gain: Adjust the exposure time to ensure the planet is well-exposed but not overexposed. Increase the gain as needed to achieve a bright image without introducing too much noise.

ROI (Region of Interest): Use the ROI feature to select just the area around the planet. This reduces file size and increases the frame rate, allowing more frames to be captured in a shorter time.

5. Capture

Record Video: Planetary imaging often involves recording a video of the planet for several minutes. This lets you capture many frames that can later be stacked to produce a detailed image.

Use Filters: If your setup allows, using color or specialized planetary filters can enhance certain features on the planet’s surface.

6. Processing

Stacking: Use software like AutoStakkert or RegiStax to stack the best frames from your video. Stacking combines the clearest frames to improve the signal-to-noise ratio, bringing out more detail.

Post-Processing: You can further refine your image using photo editing software. Adjustments such as sharpening, contrast, and color balance can significantly improve the final image.

7. Practice and Experiment

Planetary imaging requires practice and experimentation. Each session can be a learning experience, helping you fine-tune your process for capturing stunning planetary images.

By following these steps and utilizing the capabilities of the OGMA GP662C, GP678C, and GP678M cameras, you're well on your way to capturing breathtaking images of planets. Remember, patience and practice are key in astrophotography. Happy imaging!

SharpCap Sensor Analysis (GP Series)

The SharpCap sensor analysis is a popular test used by amateur astrophotographers to evaluate the performance of their cameras.

You can see the actual result of our analysis for each cooled camera on their respective product pages:

- GP662C
- GP678C
- GP678M

Look for the interactive graphs near the bottom of the page.

How we conducted the SharpCap Sensor Analysis

We connected the camera to an MS Windows laptop using a USB 3.0 port on the computer.

In SharpCap, we selected the OGMA ASCOM driver to connect to the camera.

Note that we didn't use the DirectShow driver because the USB transfer speed is slower with DirectShow.

We ran sensor analysis for every type of Conversion Gain available.

Known Issues (GP Camera Series)

FireCapture is Not Detecting a Camera

When using a new camera model with FireCapture, it may be possible that FireCapture does not detect the camera because the camera integration into FireCapture has yet to be released.

You don't have to wait for the next release of FireCapture to fix this. You can replace the DLL file that comes with FireCapture with our most recent version.

Note that FireCapture is distributed as a directory that you place somewhere on your computer.

Replace the DLL as follows:

1. Download one of the following DLL files depending on whether your operative system is x64 or x86:
    1. ogmacam.dll (x64 version)
    2. ogmacam.dll (x86 version)
2. Copy the ogmacam.dll file and paste it into your FireCapture directory.
3. If asked, click Yes to confirm the replacement of the existing file.

Help Us Improve

While we strive to ensure that our products meet the highest standards, occasionally, some issues may arise that we have not yet documented. We highly encourage you to let us know if you encounter any problems that are not listed on our known issues page.

Additionally, if you've discovered a workaround or a solution to an issue you've experienced, we would love to hear about it! Sharing your solutions can greatly assist other users facing similar challenges.

Your insights could lead to direct improvements in our manuals and troubleshooting guides.

We are looking forward to your input!

Firmware Update for GP678C and GP678M

Introduction

All guide/planetary cameras of models GP678C and GP678M with firmware version FPGA 4.3 will require this update.

You can check the FPGA version using the file **updatefw.exe** included in this package.

Note: It is possible that after updating the camera's firmware, you will need to update the Ogma DLL file inside the installation directory of software like N.I.N.A. This won't be necessary after N.I.N.A. releases its Version 3.2 or after your software adopts the latest version of our SDK. If you are using N.I.N.A. Version 3.1, you may follow the instructions to replace the OGMA DLL file.

Files

Upgrade tool and firmware - January 12, 2025:

GP678C-Color-FPGA4.5.zip - For color cameras only.

GP678M-Mono-FPGA4.5.zip - For monochrome cameras only.

Requirements

To apply this update to your camera, you will need:

1. A Microsoft Windows 10 or 11 computer.
2. A camera model, GP678C or GP678M that hasn't received this update.
3. The decompressed content of the ZIP file that you can download from this page.

Steps to Update the Firmware

1. Connect one extreme of the USB cable to the camera and the other extreme to a blue USB 3.0 port on your Windows computer.
2. Double-click the file **updatefw.exe**. You will see a window asking you to select the camera.
3. Select the camera that shows as "**GP678C**" or "**GP678M**". If you only have one camera connected, this should be the only option available, and it will be selected by default. We recommend connecting only one camera to your computer during this process to avoid mistakes.
4. Before installing the new firmware, identify the version that is currently installed.
   To do so, click [Misc...] > [About...]
5. Please note that the FPGA value listed should be older than the one you are applying. Click [OK] to close the version window.
6. Click [Update...], and a window will open to select the appropriate firmware.
7. Select the firmware that you want to apply.
   Remember:
   - The filename should contain your camera model.
   - Apply only a newer update as determined by the FPGA number.
8. A confirmation window will pop up. If everything looks OK, click [OK]
9. Wait until the update is completed. At the end, you will see a confirmation like this.
10. The update has been completed, and the camera is recommended to be powered off.

Using the latest OGMA SDK

Software like NINA, SharpCap, and FireCapture use OGMA's SDK to integrate our cameras natively.

Occasionally, we release updates to the OGMA SDK. However, it may take some time for the developers of NINA, SharpCap, and FireCapture to release updated versions of their software containing our latest SDK.

In most cases, your camera will work without issues using an older version of the SDK. However, if you're using a newer camera and encounter problems, you may be able to resolve them by replacing the existing **ogmacam.dll** file in your software with the latest version.

You can download the latest DLL for your version of Windows here:

- Download for x64 (most common)

- Download for x86

For NINA on x64 systems, you can find the ogmacam.dll file in the following directory:

C:\Program Files\N.I.N.A. - Nighttime Imaging 'N' Astronomy\External\x64\OGMA

and for x86 (older systems), in the following directory:

C:\Program Files\N.I.N.A. - Nighttime Imaging 'N' Astronomy\External\x86\OGMA

Important:

- Always back up the existing DLL file before replacing it. This ensures you can revert to the original version if needed.
- After replacing the DLL file, unplug your camera and restart the software to ensure the changes take effect.