



Phase One iXH Camera System

Developed for Phase One Cultural Heritage, Scientific and
Industrial Imaging Solutions

Installation Guide

This guide describes installation of your Phase One iXH-150MP camera system. As new features are introduced via firmware updates, the downloadable version of this document changes accordingly. Downloads are available [HERE](#)

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1 What's in the Box?

The Standard Components below are included with the camera; the Optional Components can be purchased separately.

- Phase One iXH 150MP camera
- Phase One RS 72mm MkII / f5.6 Lens
- 24 V DC power supply with international outlet adapters, 5m
- USB 3.0 A- C cable, 4.6m
- Flash sync cable, 5m
- Hand release unit with 30cm cable
- Hand release trigger cable, 5m
- iXH Light Control cable, 5m
- iXG/ iXH VHQ L-shaped bracket
- Screwdriver, Allen 4mm
- Microfiber Cloth
- USB drive with documentation
- Installation Guide
- Warranty certificate
- Suitcase for iXG camera

1.1 Optional Accessories

- Schneider Kreuznach RS 120mm / f5.6 APO Macro lens
- Collapsible ø46mm lens shade for 120mm lens
- 21mm Extension Tube
- 42mm Extension Tube

2 Camera Systems Overview

The iXH camera is integrated into a Cultural Heritage digitization system offering high resolution capturing capabilities with the Phase One image capture and processing software, Capture One CH.

This iXH Installation Guide guides you through the required procedures for installing the iXH camera.



2.1 iXH Camera Parts

1. Lens locking lever
2. Top ¼" threaded holes for VHQ L-Bracket
3. Bottom ¼" threaded holes for VHQ L-Bracket
4. USB-c port
5. Data terminal A
6. Data terminal B
7. Power terminal
8. HDMI port cover
9. Sync Terminal
10. 10G Ethernet port/ module



Figure 1 - Camera Parts

3 Mounting/Dismounting a Lens



Figure 2 – Mounting a Lens

NOTE:

Before mounting or dismounting a lens, ensure that the power cable is not attached to the camera

4 Dismounting a Lens from the iXH Camera

Lenses on the iXH series of cameras are easily dismounted.

Note:

Ensure that you only dismount lenses in a clean environment. Place the detached lens on a soft cloth on the table to avoid scratching the lens.

To dismount the lens:

1. Release the lens' locking lever



Figure 3 –Lens Locking Lever

2. Remove the lens by pulling it gently away from the camera



Figure 4 –A Lens

Note:

If no lens is being mounted, ensure that the camera is stored in a way to protect it from dust, moisture and other damage. When the iXH camera is mounted facing down always make sure (double check) that the lens is well secured by having the lens locking levers engaged.

5 Mounting a Lens on the iXH Camera

Lenses of the iXH cameras are easily mounted.

Note:

- *Ensure that you only mount lenses in a clean environment.*
- *Place a soft cloth down on the table to avoid scratching the lens.*
- *Ensure that you remove the rear lens cap (if attached) before mounting the lens.*

To Mount a lens:

1. Place the Lens over the iXH camera body and guide it into position against the camera body using the two large positioning pins.



Figure 5 – Positioning Pins

2. Close the Lens locking levers.



Figure 6 –Lens Locking Lever

Note:

The Lens is asymmetrical and can only be fitted in ONE position.

6 Connecting Peripherals

This section describes the different peripheral devices, which can optionally be connected to the iXH camera.

6.1 Attaching the iXH camera to a copy stand

1. If not already attached, use the supplied 4mm Allen screwdriver to attach the VHQ L Bracket to the iXH camera by its two (hidden) screws.



2. Attach and secure the camera onto the receiver on the Phase One copy stand. If using a 3rd party copy stand you can use the 3/8" threaded hole to mount it.

* (3/8" or 1/4" thread with an adapter)

Note

The VHQ L Bracket allows the camera's position to be set in either "portrait" or "landscape" position without removing the camera and while keeping the lens centered.

7 Camera Remote Triggering

The iXH camera can be triggered by the following options:

- Remote Shutter Trigger
- Foot Pedal
- Through Capture One

7.1 Connecting the Remote Shutter Trigger

The **Remote Shutter Trigger** is used to remotely trigger the iXH camera. Use the 5-meter trigger cable to connect the Hand release trigger with 30cm cable to the iXH camera.

To connect the Remote Shutter Trigger:

1. Connect the LEMO-of the iXH 5-meter trigger cable to one of the data terminals of the iXH camera.



2. Connect the 30cm cable to the Hand Release Trigger.
3. Connect the other end (female Audio connector) of the iXH Hand Release Trigger cable to the 3.5mm male audio jack of the 30cm cable.



7.2 Connecting a Foot Pedal

The Foot pedal is used to remotely trigger the iXH camera. Use the 5-meter trigger cable to connect a Foot pedal unit to the iXH camera.

To Connect a iXG Foot Pedal:

1. Connect the LEMO of the iXH trigger cable to one of the data terminals of the iXH G camera.
2. Connect the other end (female Audio Connector) of the iXH hand release trigger cable to the 3.5mm male audio jack of the foot pedal.



7.3 Connecting Flash Sync Cable

The Flash Sync Cable is used to trigger a Flash device (a generator or a wireless transmitter).

To connect the Flash sync cable:

1. Connect the Lemo connector of the Flash sync cable to the iXH camera's sync terminal on the right hand side of the camera.
2. Connect the cable's other end (Audio connector) to the Flash device.

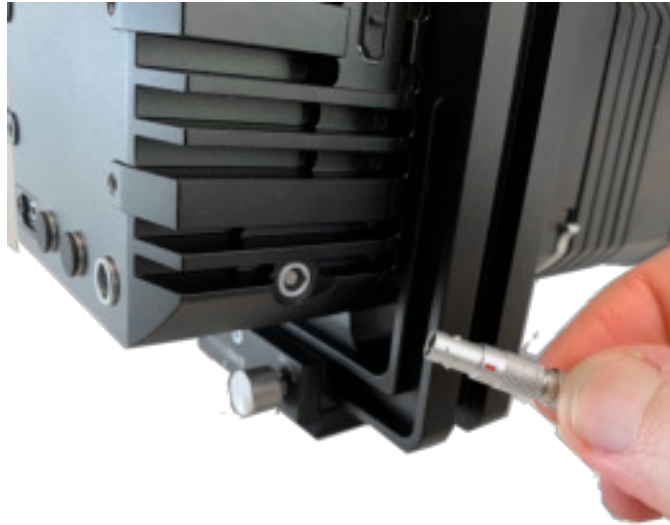


Figure 7 – Flash Connector

8 Connecting the Power Supply

To connect the camera to the iXH power supply:

- Connect the Lemo connector of the iXH power cable to the power terminal of the iXH camera.

Note

When not in use, always disconnect the power from the iXH camera.



Figure 8 - Power Connector

9 Connecting a USB-c Cable to a Computer

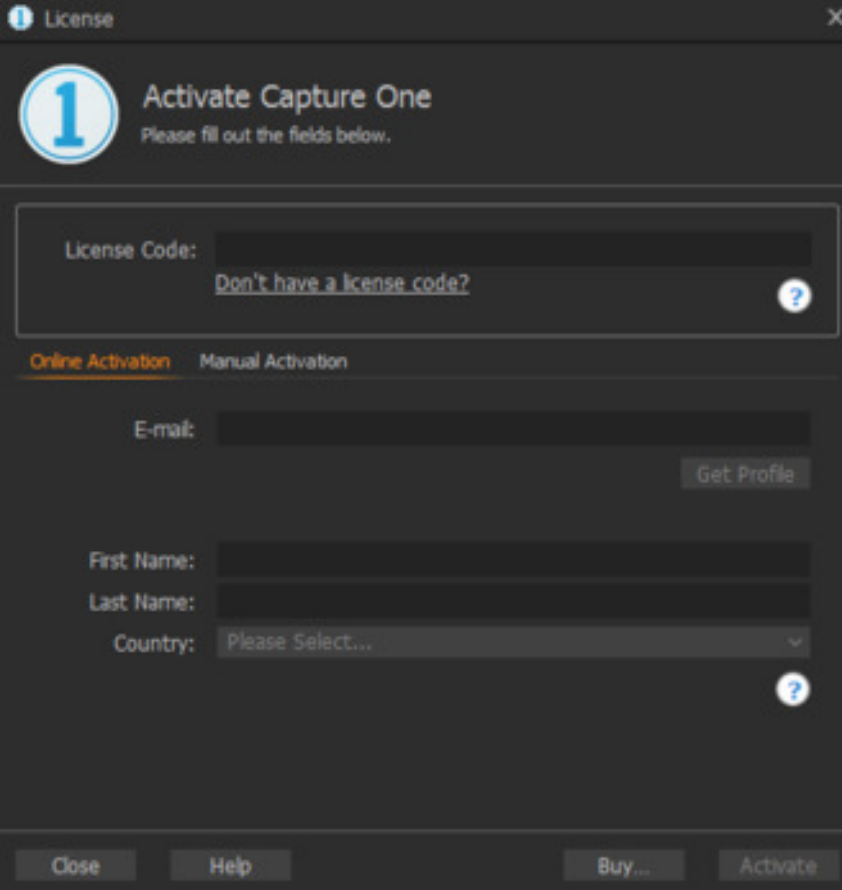
Connecting iXH to a computer using a USB-c cable:



1. Insert the end of the USB-c cable to the USB-c port of the camera.
2. Connect the other end of the USB-c cable to the USB port of your computer.

Note

For computers equipped with USB-c ports only, you will need a suitable cable or an adapter.



The screenshot shows a dark-themed 'License' dialog box with a close button (X) in the top right corner. The main heading is '1 Activate Capture One' with a subtext 'Please fill out the fields below.' Below this is a 'License Code:' text field with a 'Don't have a license code?' link and a help icon (question mark) to its right. A tabbed interface follows, with 'Online Activation' selected and 'Manual Activation' as an alternative. The 'Online Activation' section contains an 'E-mail:' text field with a 'Get Profile' button to its right, and 'First Name:', 'Last Name:', and 'Country:' text fields. The 'Country:' field is a dropdown menu currently showing 'Please Select...'. A help icon (question mark) is located to the right of the 'Country:' field. At the bottom of the dialog are four buttons: 'Close', 'Help', 'Buy...', and 'Activate'.

License

1 Activate Capture One
Please fill out the fields below.

License Code: [Don't have a license code?](#) ?

Online Activation Manual Activation

E-mail:

First Name:

Last Name:

Country: ?

10 Starting a Tethered Session in Capture One

*After installing and activating the software, see Capture One Installation

To start a tethered session:

From the File menu, select New Session

1. Fill in the information to customize your session
2. Click OK to start your session.

11 Setting Date and Time on the iXH camera

1. In Capture One, go to the Camera Settings Tool
2. The first field at the top shows the current date and time set on the camera
3. In the 2nd field you can type in your local Date and Time. This will override the existing setting.
4. It is important to keep the YYYY-MM-DD HH:MM format
5. When done press the Tab key on your keyboard



12 Operating the Phase One iXH camera using 1G/10G

Phase One iXH cameras use both USB3 and 10G interfaces (not simultaneously).

To connect a Phase One iXH camera using 10G networking, use one of the following medias:

- **_Up to 5 meters:** Use SFP + DAC passive cable. Consumes less power on the camera side.
- **_Up to 30 meters:** Use SFP + copper transceivers (use CAT6e cable or better)
- **_30+ meters:** Use SFP + optical transceivers

Some PCs have a 10G interface built-in adapter board. Configure the computer's network port for Jumbo packets using the largest option available on that PC to optimize 10G performances (see section "Configuring Packets").

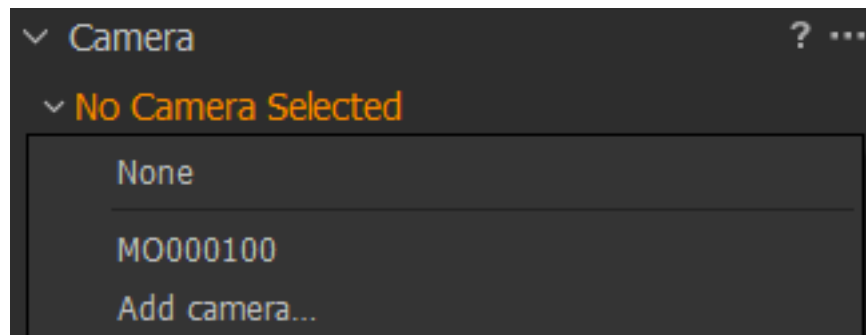
- **_The IP address of each camera is factory set. The default address is: "192.168.1.XXX"**
- **_ "XXX" refers to the last 3 digits of the camera's S/N (located on the bottom of the camera)**
- **_The default mask is 255.255.255.0**

Note: If you are using two cameras with the same last 3 digits on your local network, there will be an IP configuration conflict. In this case, connect one of the cameras using a USB3 connection and manually configure its IP address so that it is different from the address of any other camera connected on the network.

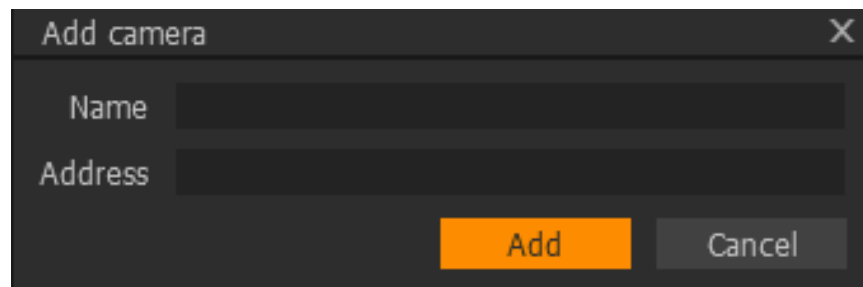
13 Connecting a new camera to Capture One

To Connect a new camera to Capture One perform the following procedures:

1. Connect the camera to the computer running Capture One.
2. Click Camera > Camera Network Manager
3. Select Add Camera.



The Add camera dialog displays.

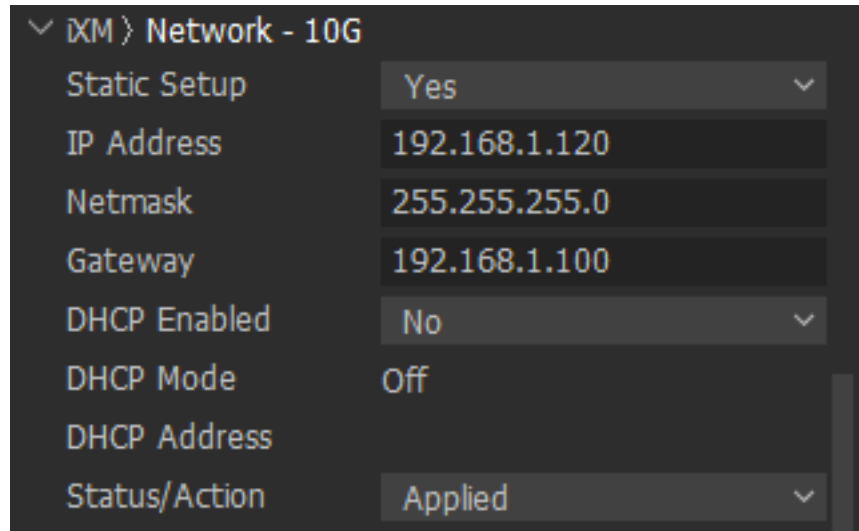


4. Enter a unique name and IP address for the camera.
5. After several seconds, the camera connects to the host computer.
6. If the camera does not connect over 10G, disconnect it from 10G and reconnect it using a USB3 cable.

13.1 Verifying a camera's IP address

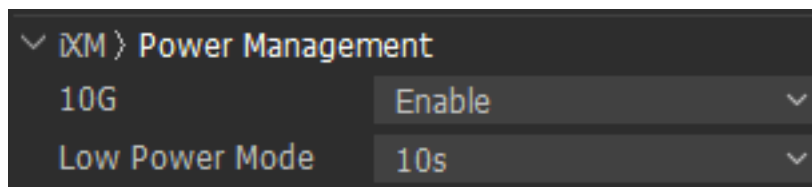
To Verify Camera's ID:

1. Connect the camera to Capture One using a USB3 cable.
2. Go to the tab: Camera_> Camera_settings_>_Network– 10G



iXM > Network - 10G	
Static Setup	Yes
IP Address	192.168.1.120
Netmask	255.255.255.0
Gateway	192.168.1.100
DHCP Enabled	No
DHCP Mode	Off
DHCP Address	
Status/Action	Applied

3. Make sure that the IP configuration settings are valid and that the 10G option is set to Enable in **Camera Settings > Power Management**.



iXM > Power Management	
10G	Enable
Low Power Mode	10s

13.2 Verified hardware for 10G networking

Company: www.SFPcables.com.

13.3 Adapters

Single port: 10Gb/s Ethernet Converged Network Adapter, Compatibility: Intel X520-DA1: X520-10G-1S-X8

Dual port: 10Gb/s Ethernet Converged Network Adapter
Compatibility: Intel X520-DA2: X520-10G-2S-X8

13.4 SFP+ modules

Copper: SFP + copper transceiver 10GBase-T, Cat 6a/7, 30m (ASF-10G-T).
Compatibility: None, Intel, Cisco. Model: ASF-10G-T

Fiber: 10Gb/s SFP+ SR Transceiver 10GBase-SR 850nm, 300M, for Intel.
Model: AXS85-192-M3

13.5 Media

- Copper:** Cat 6e and better are required for 10G communication. Lengths range from 1 meter up to 10 + meters.
- Fiber optic:** LC to LC, Multimode OM3 10Gb 50/125µm, Duplex. Lengths range from 1 meter up to 100+ meters.

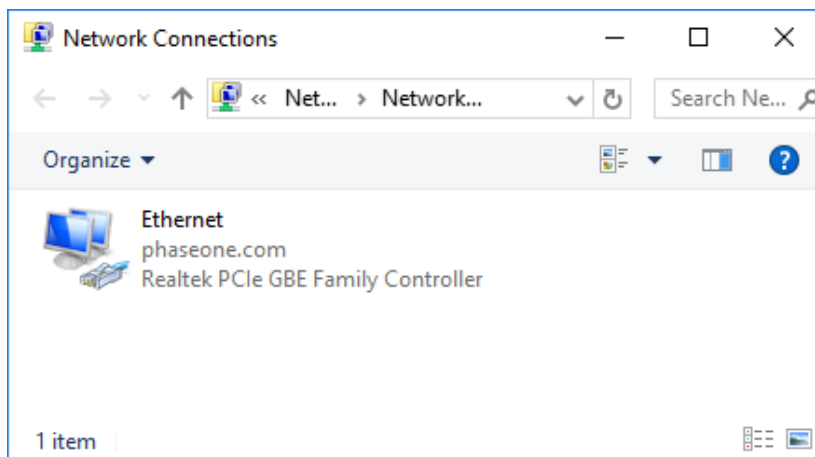
13.6 Connection Types

Connection	75065000
Active - Copper media	75066000
Active - Optical media	75065000

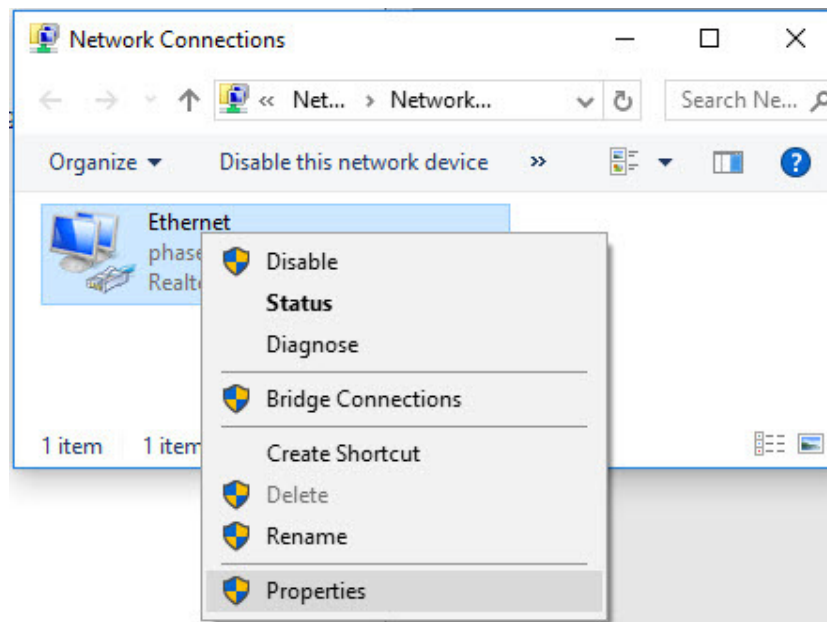
13.7 Configuring Jumbo Packets

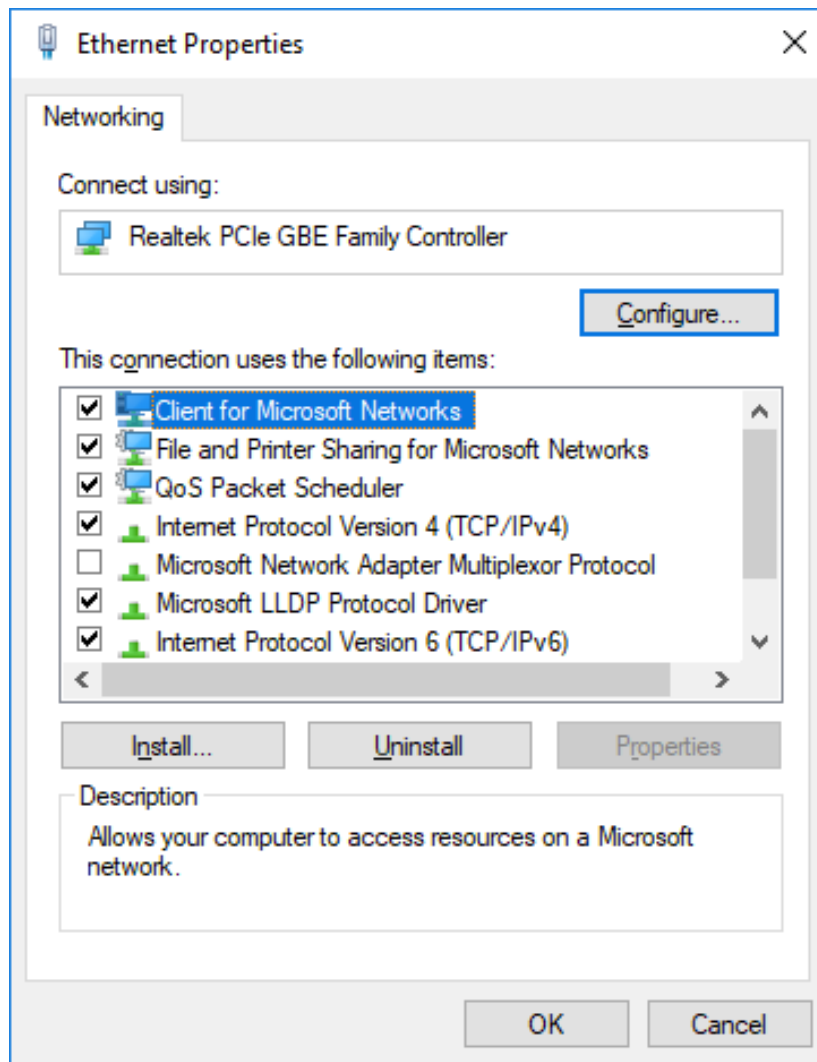
Setting Jumbo Packets is unique to each network card. However, in Windows 10, many cards share the procedure described below:

1. Open the Network and Sharing Center.
2. Click **Change adapter settings**.

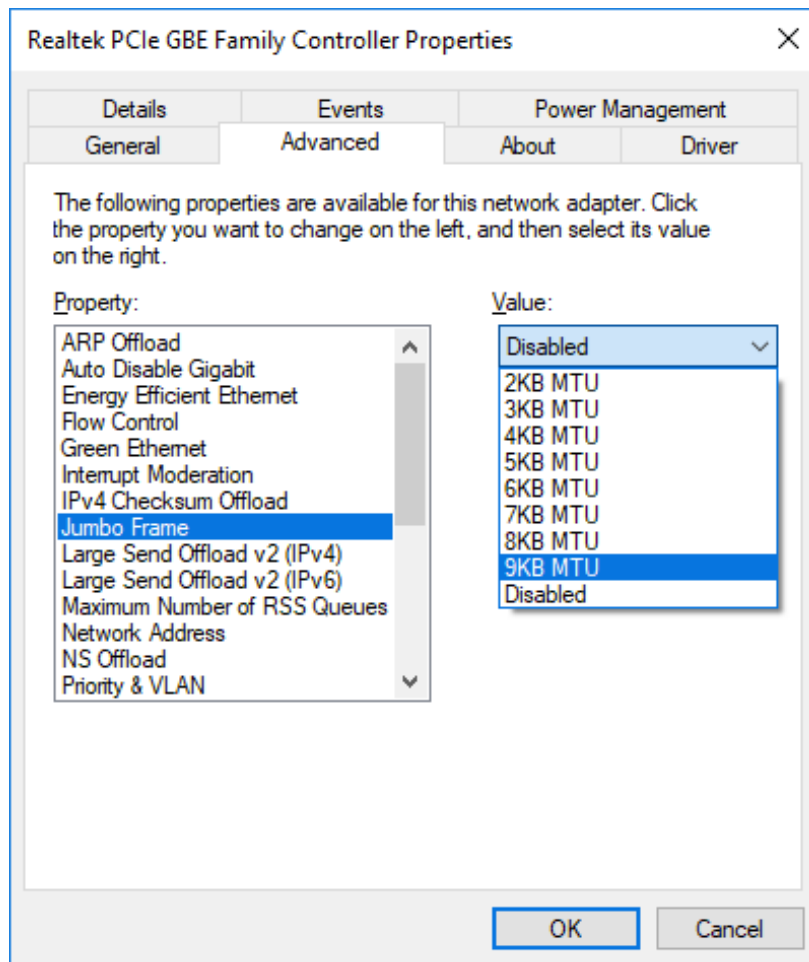


3. Right-click on the NIC you want to enable jumbo frames and select Properties.





4. Click **Configure** for the network adapter and select **Advanced** tab.

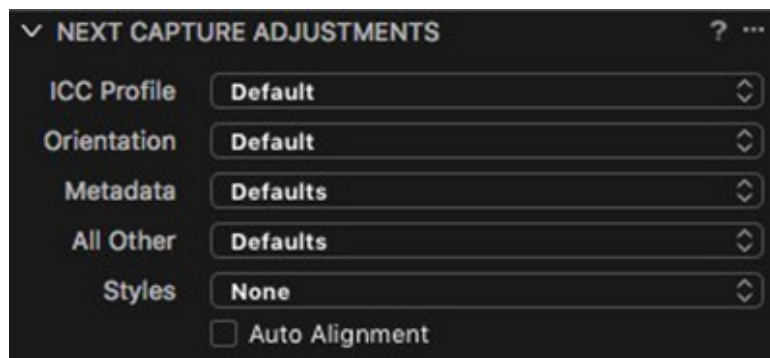


5. Select Jumbo Frame and the required value for your system, (e.g., **9kB MTU** [9,014 Bytes]) depending on the NIC.
6. Click **OK** to all dialogs. • **_NOTE:** When you make this change, the NIC loses network connectivity for a few seconds.
7. Reboot to ensure the change takes effect.
8. Approve all changes.

14 Selecting Next Capture Adjustments

In the Next Capture Adjustments section, configure the following:

- ICC Profile
- Orientation
- Metadata
- All Other
- Styles
- Auto Alignment



15 Selecting Camera Controls and Settings

In the Camera Controls Section, make selections for:

- Shutter speed
- Aperture
- ISO
- White Balance (from the list or manually)
- File Format (IIQ-L 16/14-bit or IIQ-S)



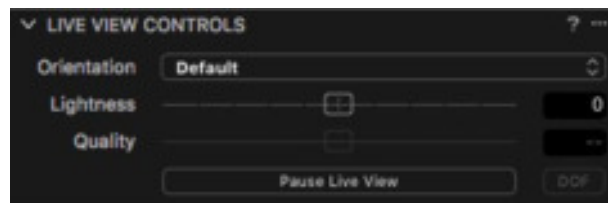
15.1 Working with Live View

To work with Live View:

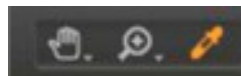
1. Start a Tethered session as described above.
2. Choose Window > Live View or press the Live View icon . The Live View session starts.
3. Press RGB icon to switch between an RGB and a Black and White view.



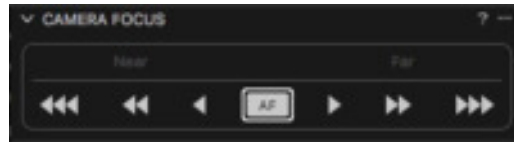
4. Adjust Lightness and Quality as desired.



5. Set White Balance using the White Balance picker (WB is only for Live View).



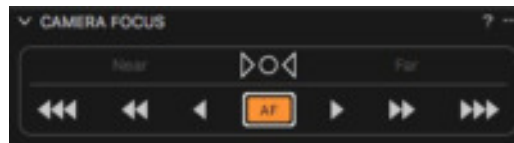
6. Adjust the composition.
7. In the Camera focus tool, click on the focus arrows to focus the camera's lens.



8. Click single arrows for fine focusing and multiple arrows for medium or large focusing.

<<<	Large focus steps	Extends the lens for closer distances
<<	Medium focus steps	
<	Fine focus steps	
>>>	Large focus steps	Contracts the lens for farther distances
>>	Medium focus steps	
>	Fine focus steps	

9. To use Auto Focus, press the AF button.



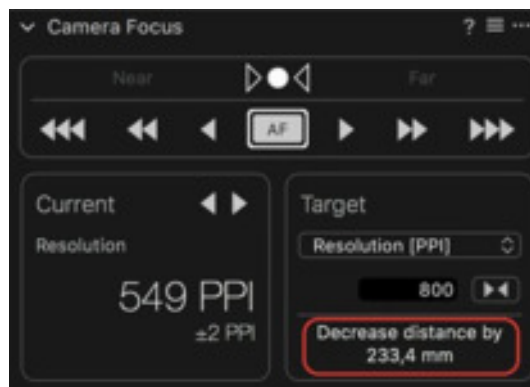
10. Select the desired Target unit from the drop-down menu in the Camera Focus Tool, choosing either Resolution (PPI), Field of View (image dimension), Distance, or Magnification.



11. Enter the Target value in the field and click on the button next to it to apply the value.



The Camera Focus tool will now indicate how far the camera has to move on the copy stand to reach the desired target resolution.

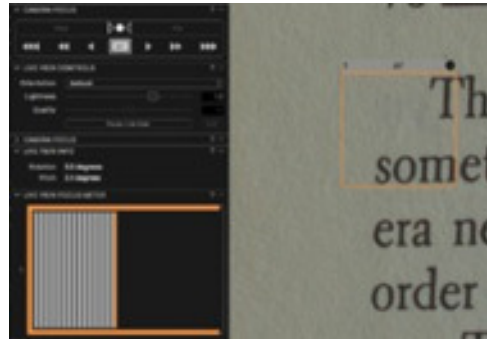


12. Adjust the camera position on the copy stand and press AF again. The Tool will recalculate distance and resolution and advise if further adjustment is required.



13. A Focus Meter frame will appear in the center of the image preview, you can grab and move it to the area in the image that you wish to place focus on. The camera

will automatically move the lens Up/Down until focus is achieved and the frame is shown in Orange.



14. To use Fine Auto Focus, press and hold the Alt Key and then press the AF button. The sign on the button will change and the camera will make small adjustments to focus.



Fine Focus
AF Button

1.

If the camera is already set to a close range from the focus plane, you can hold the Alt key and then press the AF button. The sign on the button changes to μ AF and the camera refocus by smaller focusing steps.

To set Fine Focus as the default mode, click on the “...” sign at the top right corner of the Camera Focus Tool and select AF Mode: Fine. The sign of the AF button changes as shown above.

Note:

For optimal results, reduce the Focus Meter frame's size and zoom in to 100% on the area of interest

15. Close the Live View window.

16 Capturing Images

This section describes the basic steps required for capturing images, optimized in terms of exposure resolution and sharpness. For more advanced instruction, please refer to Capture One's manual.

16.1 Shooting a Test Shot

To shoot a test shot:

1. Choose Camera.
2. Click Capture or press the Capture button in the Camera Tool.



The image appears on your monitor.

Note:

You can also trigger the camera by using the hand release or foot paddle units.

16.2 Evaluating Your Shot

To evaluate your shot:

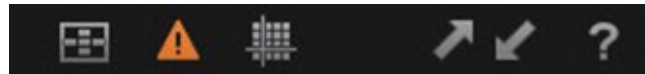
1. Check your exposure with the histogram and picker tool.



2. Check your exposure with the over-exposure and under-exposure warnings and make any necessary corrections. The following figure is an image with a warning of white areas that are over exposed.



The following figure displays the Warning On/Off toggling option at the upper tool bar.



Note:

At this stage it is recommended to use the zoom tool at 100% to check and confirm sharpness of the image.

16.3 Setting White Balance

To set the white balance:

1. Take a first shot of the Tethered session.
2. Click the White Balance icon in the Camera Tool.
3. Use the White Balance picker to set White Balance from a neutral area of an image file.



4. Click Set when the desired White Balance setting is achieved.

For additional help on Capture One CH please see

<https://support.captureone.com/hc/en-us/sections/360000704038-Capture-One-Cultural-Heritage-CH->

17 Light Control Setting

The light control controls the use of respectively flash and continuous light sources.

There are 3 different parameters to observe: Lighting Mode, Light Strobe Mode and Pre-activation Time

When Lighting mode is "Flash" the 2 other parameters are irrelevant.

17.1 Lighting Mode

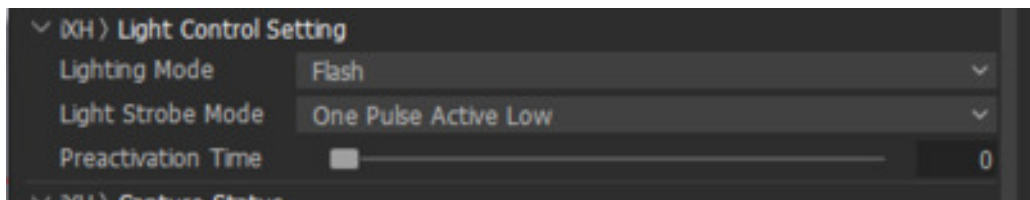
1. Flash
2. Continuous Light

17.1.1 Lighting Mode = Flash:

Use this mode to trigger flash systems. The Flash pulse front edge is at the beginning of the full opening of exposure cycle and goes OFF after 5 ms.

Connect the flash system with audio connector of the iXH flash cable and connect the small LEMO connector to the LEMO 5 socket on the side of iXH.

Flash trigger is basically a switch that connects terminals 2 and/ or 3 to the LEMO 5 connector for 5ms.



17.1.2 Lighting Mode = Continuous Light

The Continuous Light mode is made to control LED lighting equipment.

iXH controls the light with a Light Strobe signal available on both the LEMO 2 and LEMO 3 terminals. The iXH Light Control cable connects to either LEMO 2 or 3 in one end and to a Light controller in the other end with the audio connector.

iXH is then able to control turning the Light ON or turn the Light Level up just before camera exposure starts. When camera exposure has ended iXH Light then turns the Light OFF or decreases the Light Level.

Hence the total amount of continuous light exposure to the cultural heritage artefacts is minimized which is also to the convenience for the photographic operator staff.

Alternatively, the Light strobe could also be used control turn off of environmental white light during the exposure, in situations when special narrowband light is used during exposure and the broadband white environmental light would be disturbing exposure light quality.

The Pre-activation Time explained later can be set from 0s to 1s. Thus ramp up time for exposure light or the post-capture lighting time can be taking into consideration.

No matter what shutter mode i.e. ES or LS is used the Light Strobe signals the end of sequence when all data has been read out of the sensor. Hence the duration of the light pulse is not the same as the exposure time.

There DT Photon Smart Controller is a light system that is directly compatible with iXH.

The Photon Smart Controller supports operation with a basic modelling light level (called DIM level) and raises to higher light level for exposure (called FLASH Level). The DIM Level and the FLASH levels are set independently on the front panel of the Photon Smart Controller.

The Photon Smart Controller requires a pre-activation time of at least 80ms to obtain maximum level of light when exposure starts. It presents a fixed duration of the FLASH level of 700ms on the first version. So recommended exposure time for LS shutter mode will be 0.6s. For longer exposure times you need to disable the Dynamic Light Level function on the Light Controller.

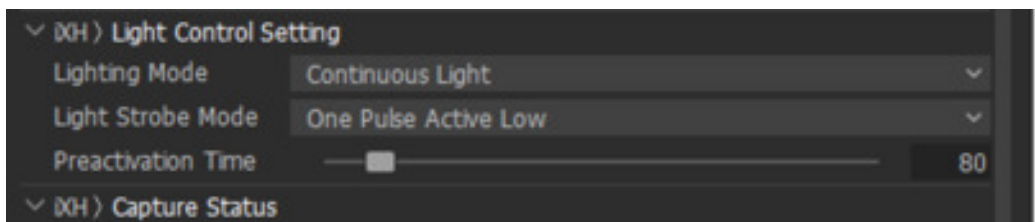
Future versions may use also the End of the Light Strobe Signal so exposure time longer than 700ms may be possible.

17.2 Light Strobe Mode

For Constant Light you can select 4 modes of signaling logic

1. One Pulse Active Low
2. Two Pulses Active Low
3. One Pulse Active High
4. Two Pulses Active High

To support the DT Photo Smart Controller you should select "One Pulse Active Low"



The 3 other Light Strobe modes are intended for future options with other Lighting equipment having a different control signal interface for light ON/ OFF.

17.2.1 Pre-activation Time

The pre-activation time can be set from 0ms to 1000ms, in 1ms steps. Actual tolerance is approx. 10ms.

The Pre-activation Time controls how much earlier the Lighting Equipment receives a start trigger before the exposure starts. This enables lighting equipment to initiate up the light level to reach full operation level before the exposure begins.

DT Photo Smart Controller requires a Pre-activation Time of 80ms to be at full level when exposure begins.

Note: When Lighting Mode is "Flash" the LEMO 2 and 3 does not create the Light Strobe signal.

When Lighting mode is "Continuous Light" there is no creation of Flash trigger pulse on Lemo5

18 Firmware Handling

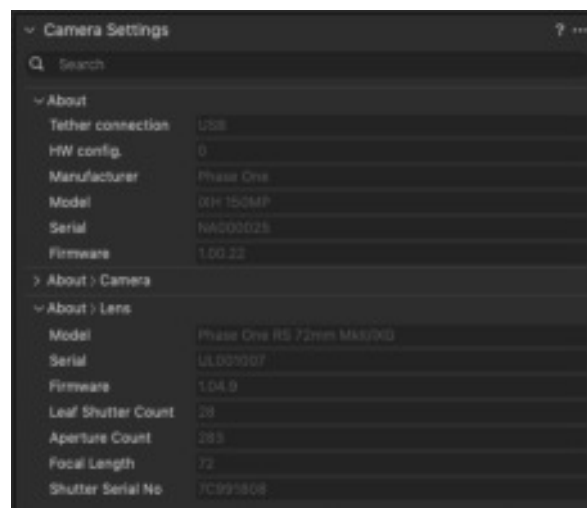
The Camera Settings tool in Capture One can display technical information about the hardware and embedded firmware of both the camera and lenses. body and back. This is especially useful if support is needed or if you want to check if Phase One is offering a newer firmware update.

Please make a note of the firmware menu contents before contacting the local partner or Phase One Support.

18.1 Checking the Camera Firmware Version

To determine if you have the latest camera firmware installed:

1. Go to the Camera Settings tool and scroll down to About (insert new screen grabs).
2. Check to see if the firmware version installed on the camera is the same as the latest version available in the Downloads section of industrial.phaseone.com website.



18.2 About the Phase One Firmware Updater Application

The Phase One Firmware Updater application is used to update your Phase One iXH camera with new firmware. The Firmware Updater for Mac or Windows is available at the Downloads section of the industrial.phaseone.com website.

The Firmware Updater does not in itself contain any firmware— it detects the camera attached, checks online for the latest firmware and retrieves and installs the firmware packages for your device.

18.3 Installing the Firmware Updater Application

Download the Firmware Updater from the Downloads section of the industrial.phaseone.com website and follow the appropriate installation instructions below:

18.3.1 Mac

To install the Firmware Updater on a Mac:

1. Open the zip file and copy the Firmware Updater application to your Applications folder.
2. Double-click the icon to start the Firmware Updater Setup Wizard.

18.3.2 Windows

1. Open the zip file and store the FWUpdater.msi.
2. Double-click FWUpdater.msi to start the Firmware Updater Setup Wizard.
3. When installation completes, click Start > Phase One > Firmware Updater.

18.4 Updating the iXH Camera Firmware

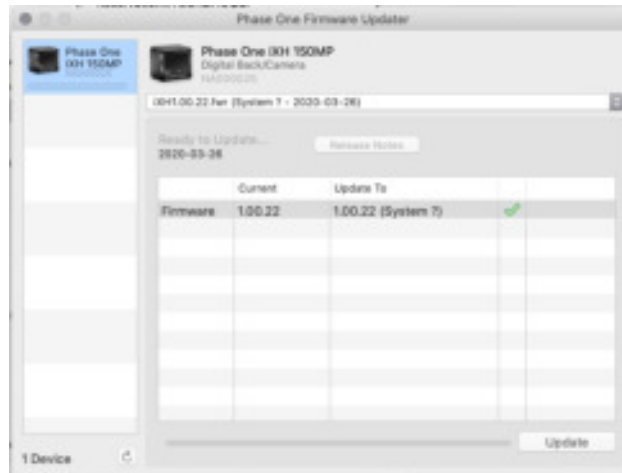
Steps for updating are the same on both Mac and Windows screenshots come from the Mac version:

Before starting, ensure that:

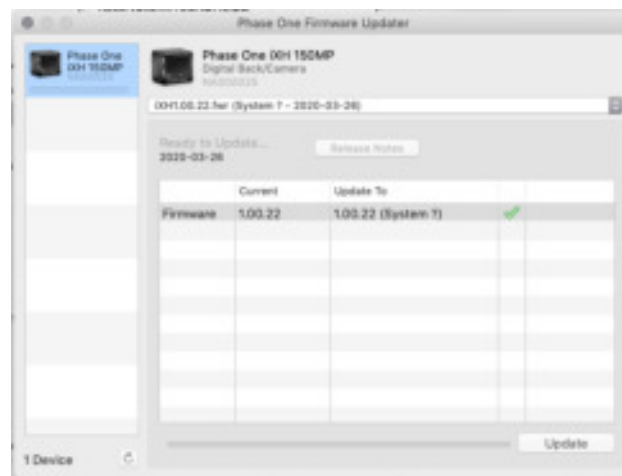
- The camera is powered ON.
- USB-c is connected to the back and to the computer.
- Your computer has the Firmware Updater application installed and the computer is connected to the Internet.

To update the iXH Firmware:

1. Start the Firmware Updater application.
2. The Firmware Updater automatically checks online for a new version of camera firmware and displays a download button if your camera requires an update.
3. If displayed, click the link to download the firmware. The firmware is saved locally.



4. After downloading the new firmware, the download button becomes a Release Notes button.



5. Click the Release Notes button to download the release notes for the newest firmware.
6. To update the camera to the latest firmware, click Update. The firmware is written to the camera and a cog icon is displayed next to the MAIN component and a progress bar displays the progress of the update.
7. Upon a successful completion of the update, the MAIN component is marked with a green check mark icon.
8. If the update fails, disconnect both the USB and the cables and reconnect them again, then repeat the procedure described above.
9. Select Update Firmware from the Firmware menu and the back automatically detects and implements the update from the card.

A progress bar appears on screen during installation.

19. Restoring the iXH Camera Firmware

To restore the camera's firmware to the factory version (camera settings are not affected):

1. Peel off the two plastic covers shown in the image below and remove the two screws and the metal cover.
2. Insert a pin into the hole seen inside and hold it down
3. Connect the camera to power while holding down the pin.
4. Wait 3 – 4 seconds.
5. Put the camera aside for a few minutes while the firmware is restored to the factory version. Do not power off the camera until all LEDs resume normal colors





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