



RED CONNECT INSTALLATION GUIDE

RED CONNECT

RED CONNECT | V1.0, REV. C

RED.COM

TABLE OF CONTENTS

DISCLAIMER III

SAFETY INSTRUCTIONS III

1. INTRODUCTION 1

2. INSTALLING

PREREQUISITES 2

 HARDWARE 2

 SOFTWARE 2

RED CONNECT APP INSTALLATION INSTRUCTIONS 3

CONNECTING THE CAMERA TO RED CONNECT 8

NETWORKING AND CAMERA CONNECTIVITY . 11

 DIRECT CONNECTION (STATIC IP / MANUAL)11

 AUTOMATIC IP ASSIGNMENT (DHCP) 16

 PTP18

3. SETTINGS

REALTIME LATENCY SETTINGS22

ADJUST VIDEO SETTINGS23

SYSTEM SETTINGS25

 SYSTEM SETTINGS 25

 OUTPUT VIDEO SETTINGS26

 BLACKMAGIC SDI SETTINGS 26

 NVIDIA NVENC SETTINGS27

 VIDEO MONITORING SETTINGS28

 FILE SAVE SETTINGS29

 ADVANCED SETTINGS 30

4. REMOTE RECORDING WITH SDK31

DISCLAIMER

RED® has made every effort to provide clear and accurate information in this document, which is provided solely for the user's information. While thought to be accurate, the information in this document is provided strictly "as is" and RED will not be held responsible for issues arising from typographical errors or user's interpretation of the language used herein that is different from that intended by RED. All information is subject to change as a result of changes in local, federal or other applicable laws.

RED reserves the right to revise this document and make changes from time to time in the content hereof without obligation to notify any person of such revisions or changes. In no event shall RED, its employees or authorized agents be liable to you for any damages or losses, direct or indirect, arising from the use of any technical or operational information contained in this document.

This document was generated on 10/6/2023. To see earlier versions of this document, submit a Support ticket at <https://support.red.com>. For comments or questions about content in this document, send a detailed email to OpsGuides@red.com.

COPYRIGHT NOTICE

COPYRIGHT© 2023 RED.COM, LLC

All trademarks, trade names, logos, icons, images, written material, code, and product names used in association with the accompanying products are the copyrights, trademarks, or other intellectual property owned and controlled exclusively by RED.COM, LLC. For a comprehensive list, see www.red.com/trademarks.

TRADEMARK DISCLAIMER

All other company, brand, and product names are trademarks or registered trademarks of their respective holders. RED has no affiliation to, is not associated with or sponsored by, and has no express rights in third-party trademarks. DaVinci and DaVinci Resolve are registered trademarks of Blackmagic. Windows is a registered trademark of Microsoft Corporation.

RESPONSIBLE PARTY

RED Digital Cinema
94 Icon
Foothill Ranch, CA 92610
USA

SAFETY INSTRUCTIONS



WARNING: Class 1 Laser product

Use other than the one described in the user guide may result in hazardous exposure to infrared laser emissions that are not visible to the naked eye. Equipment is to be serviced only by authorized service personnel.



LASER WARNING: Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables. Fiber-optic transceivers and fiber-optic cables connected to transceivers emit laser light that can damage your eyes.



LASER WARNING: Do not leave a fiber-optic transceiver uncovered except when inserting or removing a cable. The rubber safety cap keeps the port clean and prevents accidental exposure to laser light.



CAUTION: Do not bend fiber-optic cables beyond their minimum bend radius. An arc smaller than a few inches in diameter can damage the cables and cause problems that are difficult to diagnose.

- This equipment is intended to be used by instructed personnel and is not intended to be used by children.
- DO NOT use the camera or accessories near water. Avoid exposing your camera to moisture. The unit is not waterproof, so contact with water could cause permanent damage to the unit as well as electric shock and serious injury to the user. DO NOT use the camera in the rain or under other conditions with high moisture without appropriate protection, and immediately remove power source if camera or accessories are exposed to moisture.



WARNING: To reduce the risk of fire or electric shock, do not expose the camera to rain or moisture.

- DO NOT point the camera directly into extreme light sources such as the sun or lasers. Permanent damage to optical path or sensor may occur, which is not covered by manufacturer's warranty.
- DO NOT expose your camera to excessive vibration or impact (shock). Be careful not to drop your camera. Internal mechanisms may be damaged by severe shock. Mechanical alignment of optical elements may be affected by excessive vibration.
- ELECTROMAGNETIC INTERFERENCE: The use of devices using radio or other communication waves may result in the malfunction or interference with the unit and/or with audio and video signals.
- Clean only using a dry cloth. When cleaning your camera, remember that it is not waterproof and moisture can damage electronic circuitry. DO NOT rinse or immerse any element of the camera, lens or other accessory, keep them dry at all times. DO NOT use soaps, detergents, ammonia, alkaline cleaners, and abrasive cleaning compounds or solvents. These substances may damage lens coatings and electronic circuitry.
- Maintain sufficient ventilation—DO NOT block any ventilation openings or obstruct cooling fan airflow.



CAUTION: Proper camera ventilation requires a minimum 0.5" (1.25 cm) clearance between the camera ventilation openings and external surfaces. Verify that objects that can block the fan intake and exhaust ports do not impede airflow. Failure to permit adequate airflow may result in overheating of the camera, degraded operation, and in extreme situations, damage to the camera.



WARNING: Media cards can become very hot during prolonged recording sessions. When ejecting the media card, let it cool before touching it with bare fingers.

- DO NOT operate or store near any heat sources such as radiators, heat registers, stoves, or any other apparatuses that produce heat. Store in a protected, level and ventilated place. Avoid exposure to temperature extremes, damp, severe vibration, strong magnetic fields, direct sunlight or local heat sources during storage. Remove any batteries from the camera before storage. Recommended storage and usage temperatures for your camera, lenses and other accessories are:
 - Operating range: 32° F to 104° F (0° C to 40° C)
 - Storage range: -4° F to 122° F (-20° C to 50° C)

- If there are any performance issues with your camera or accessories when operating within this temperature range, submit a support ticket to <https://support.red.com>.
- DO NOT bypass the third prong of the grounding-type plug on the power cord of the included power adaptor. A grounding-type plug has two blades and a third “grounding” prong. The third prong is provided for your safety. You must connect the plug to an outlet with a protective earth connection. If the grounding-type plug does not fit into your outlet, do not attempt to modify the plug or outlet, consult a qualified electrician.
- Protect all power cords from being pinched, walked on, or driven over by a vehicle. Replace any power cords suspected of sustaining damage due to crushing or other forms physical damage.



CAUTION: Install this camera in a proper support system that can handle the entire weight of the camera and the accessories. Secure the camera by using the ¼-20 and/or the 3/8-16 mounting points located on the bottom of the camera. Always verify that the screws are tightened properly. When the camera is not properly attached, or is placed on an unstable surface, the camera can fall and cause injury or be damaged.



CAUTION: Products marked with this symbol are Class 2 devices. These double insulated devices are not provided with a grounding type plug.



CAUTION: The power cord plug for the included power adaptor is used as the power disconnect. To disconnect all power from the power adaptor, unplug the power cord plug from the wall outlet. During use, the power cord plug should remain easily accessible at all times.



CAUTION: Refer all service and repair to qualified RED service personnel. To reduce the risk of electric shock, and damage to the camera or accessories, DO NOT attempt to perform any servicing other than any procedures that are recommended in the operating instructions.



INDOOR USE ONLY: This device is designed primarily for indoor use.

1. INTRODUCTION

With the launch of V-RAPTOR camera firmware Version 1.3.0 Beta, RED has introduced the ability to deliver full resolution, live R3D video output¹ from the camera through Secure Reliable Transport (SRT).

By simply connecting an Ethernet cable to the V-RAPTOR, a specially designed camera control unit (CCU) can process and output up to 8K at 60p with minimal latency. Once the frame data is on the GPU memory of the CCU, it can shape the data to fit the needs of the live output.

The new RED Connect Module provides a fiber optic solution for connectivity through the CFexpress slot.

Full resolution live R3D output for the RED Connect solution comes from these cameras:

- V-RAPTOR
- V-RAPTOR XL

Purchase a perpetual SRT streaming license from RED to unlock this new feature². The purchase includes special camera firmware and an app that must be installed on the CCU to receive the live output data.

For more information on features and pricing, please contact redconnect@red.com.

1. Current live R3D output supports transmission of video only. Audio, gyro, and other ancillary data streams are not supported at this time.

2. A perpetual license includes 3 years of feature updates and bug fixes.

2. INSTALLING

PREREQUISITES

You must complete the following prerequisites before you can install RED Connect on a CCU.

HARDWARE

CCU BASELINE REQUIREMENTS

Your CCU must meet the following minimum requirements:

The CCU must be capable of handling the bandwidth of the incoming data stream and have GPUs/DPUs/FGPAs that are capable of decompressing and debayering the R3D data with minimal latency.

This GPU-based reference design was tested by RED and confirmed to handle 8K 60p streams for prolonged periods of time.

MOTHERBOARD

ASUS Pro WS WRX80E-SAGE SE WIFI (AMD WRX80 EATX)

CPU

AMD Ryzen Threadripper Pro 3955WX 3.9GHz 16 Core

RAM

128 GB DDR4-3200 REG ECC (eight 16 GB modules)

GPU

Two NVIDIA RTX A6000 48 GB (must support NVIDIA GPUDirect). Install the latest NVIDIA driver for the A6000.

NOTE: Two A6000s are required for 8K 60p. When installing the GPUs, try to give them some physical space so that they aren't on top of one another. Try to give them as much airflow as possible. You may not need to use two GPUs when your target frame rate and resolution are lower (8K 24p).

NETWORKING

NVIDIA ConnectX-6 Ethernet PCI Express 4.0 card (the 10G Ethernet on the ASUS motherboard is not compatible with the 5G input).

You may need to install the NVIDIA WinOF-2 drivers from:

<https://network.nvidia.com/products/adapter-software/ethernet/windows/winof-2/>.

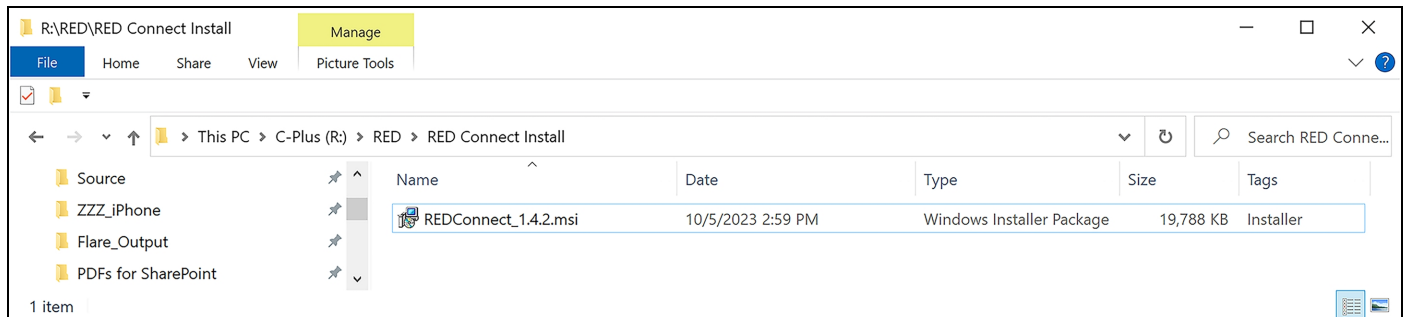
SOFTWARE

Make sure RED Connect is installed on the CCU - there may be newer versions. If upgrading, make sure to uninstall the older version before installing the newer one. The installer is called **REDConnect-version number.msi**.

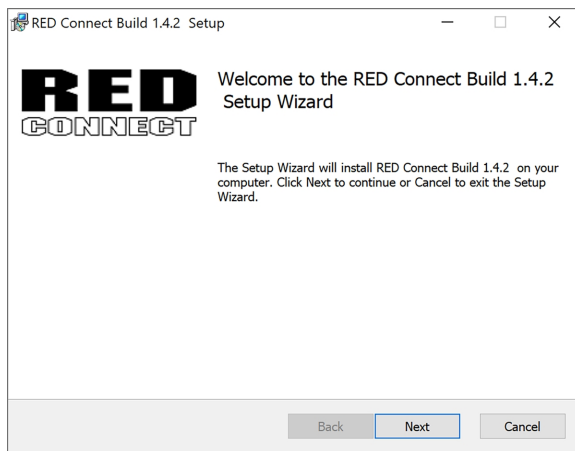
NOTE: When you want to use SDI output from the CCU, make sure that you install the Blackmagic Design Desktop App on the CCU – download the app from <https://www.red.com/download/red-connect>.

RED CONNECT APP INSTALLATION INSTRUCTIONS

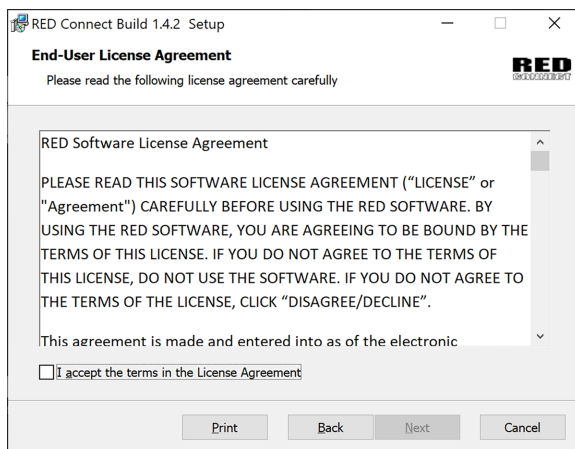
1. Download the RED Connect installation file (RED Connect-X.X.msi) to the desired folder on your CCU.
2. Navigate to the folder where you downloaded the msi file, and double-click on the msi file to start the installation.



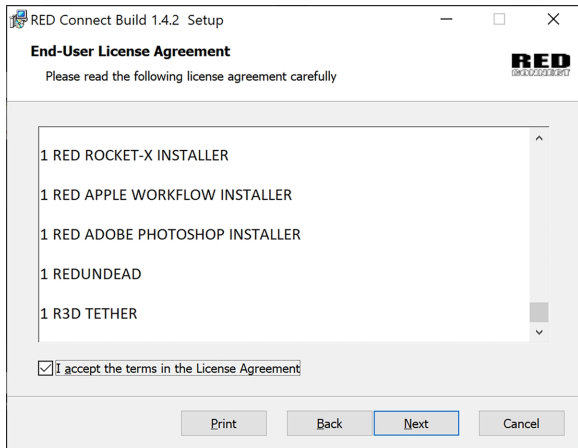
The installation wizard opens:



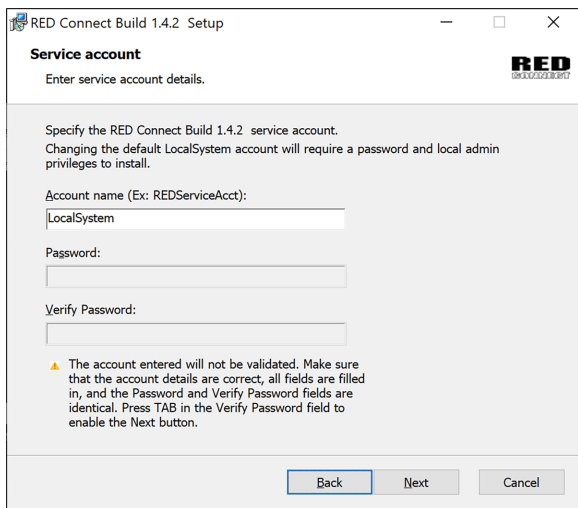
3. Click Next. The End-User License Agreement (EULA) screen displays:



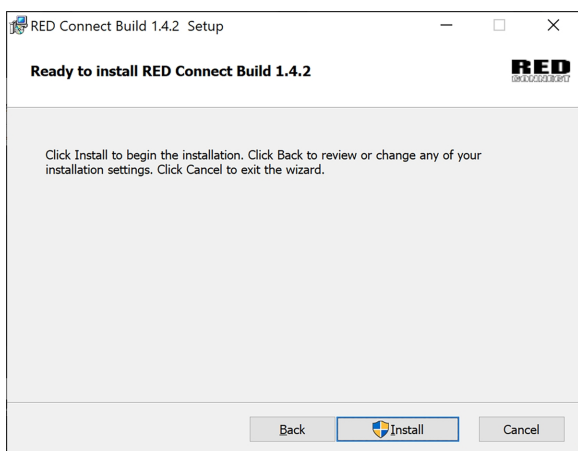
Read the EULA carefully. Accept the EULA, and click next to proceed.



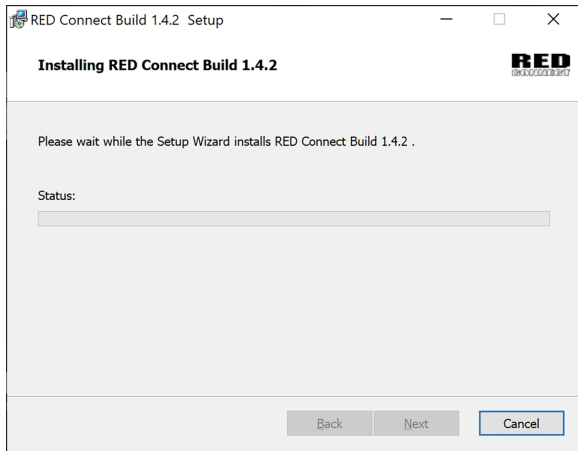
The Service Account screen displays:



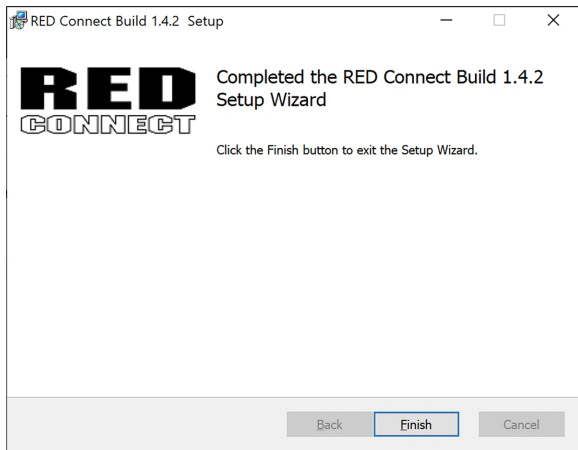
4. Click Next to continue, or enter a new account name and password and click Next. The Ready to Install screen displays:



5. Click Install to begin the installation. The installation status bar displays the progress:



When the installation concludes, the Completed screen displays:



6. Click Finish.

7. Enter 127.0.0.1:8088 in your browser to view the RED Connect home page.

RED Connect - Build 1.4.2 - 127.0.0.1 (Disconnected)

Home - Run Time: 00:00:29:55 Record Time: 00:00:00:00 Current Time: 00:22:45:46 ()

Realtime Latency Settings...

Adjust Video Settings...

System Settings...

Shutdown...

Received Frames0

With good CRCs0

With bad CRCs0

Dropped Camera Frames0

Dropped Decode Frames0

Percent Dropped Decode Frames

Reset

SDI Displayed On Time0

SDI Displayed Late0

SDI Dropped Frames0

SDI Repeated Frames0

Skipped Decoded Frames0

Reset

Output Frames Latency

DestinationAverageRecentMinMax

Video Out Latency150

Reset

Save to FileStart

Save ReplayStart

Destination

☐ Decode Only

Queue	Size	Description
Received Checksum	0	Queue of received frames waiting to have their checksums verified
Received Frames	0	Queue of received frames to be prepared for GPU processing
CPU	0	List of received frames currently being prepared for GPU processing
GPU	0	Queue of frames waiting for GPU processing
Convert To Video Out	0	Queue of frames to be sent to the SDI card (Adjustment:)
Queued by SDI Card	0	Queue of frames in the SDI card

FPS	All Time	Last Second	Min/Second	Max/Second
From Camera	0.00	0.00	0.00	0.00
Decode Starts	0.00	0.00	0.00	0.00
Decoded	0.00	0.00	0.00	0.00
SDI Output	0.00	0.00	0.00	0.00
Sent To SDI				

Chart...

Reset

Realtime Latency Settings...

Adjust Video Settings...

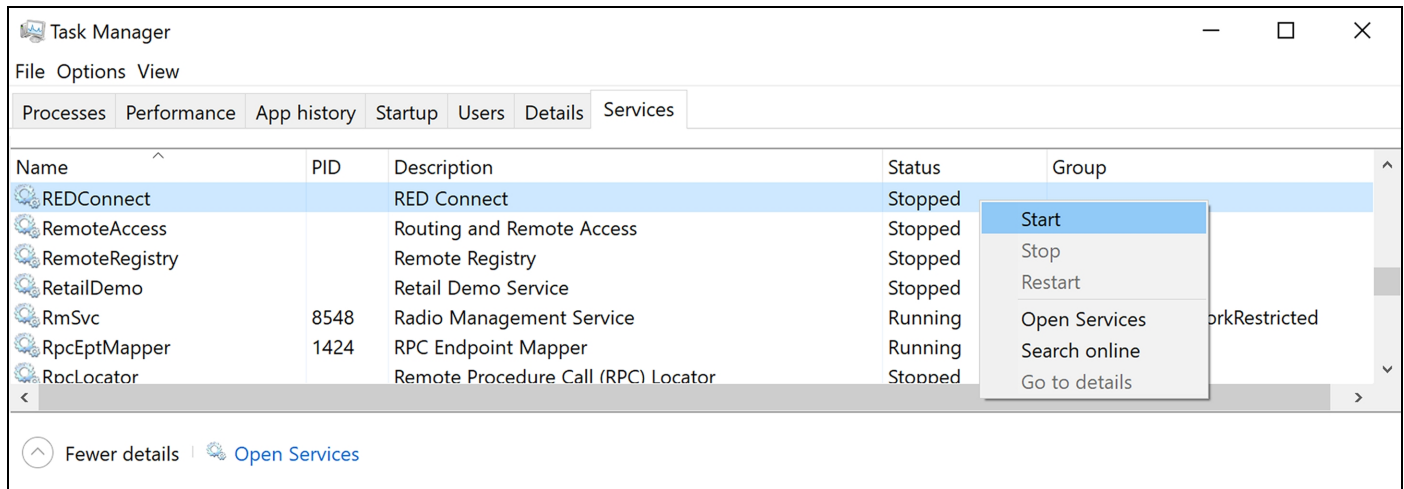
System Settings...

Shutdown...

RED Connect - 1.4.2+de1d692 - 20230907

The home page displays all of the stream statistics and metrics of the stream.

If the browser does not display the home page, press Ctrl+Alt+Del to open Windows Task Manager and confirm that the RED Connect service is running.

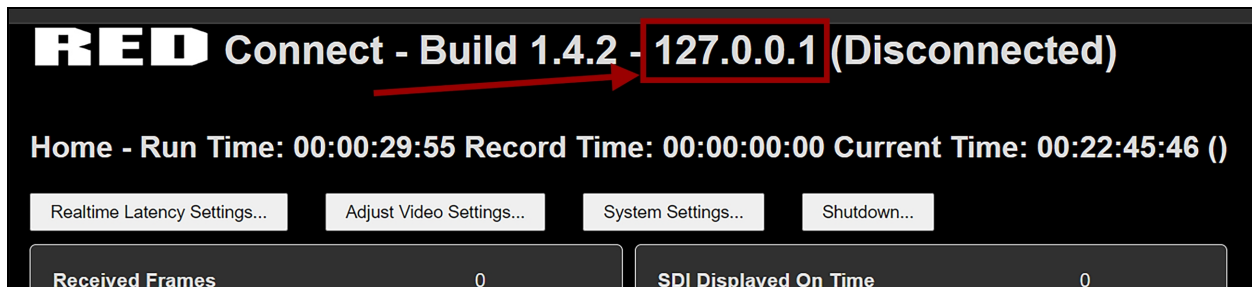


If the RED Connect service is stopped, right-click on the RED Connect service and click Start.

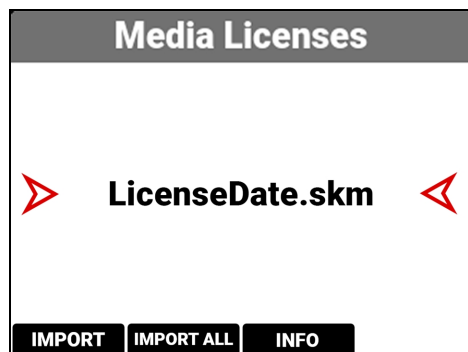
NOTE: A local admin account is required to install and start /stop the RED Connect service.

CONNECTING THE CAMERA TO RED CONNECT

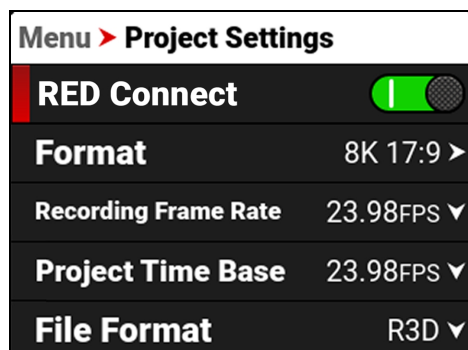
1. Copy the RED Connect IP address from the main screen:



2. Install a valid RED Connect license in your camera.
 - a. Make sure you have valid firmware that supports RED Connect (V-Raptor and V-Raptor XL firmware version 1.5 and beyond).
 - b. Make a folder called "licenses" on your USB-C drive or CFexpress card.
 - c. Copy the *.skm file to the USB-C drive / CFexpress card "licenses" folder.
 - d. Insert the drive or card into the camera.
 - e. In **Menu>System Settings>Licenses>On Media Licenses** find the license file that was loaded above and click the button below IMPORT:



- f. The License should activate. When you navigate the camera menu to **Menu>Project Settings** you should now see RED Connect with a green toggle.



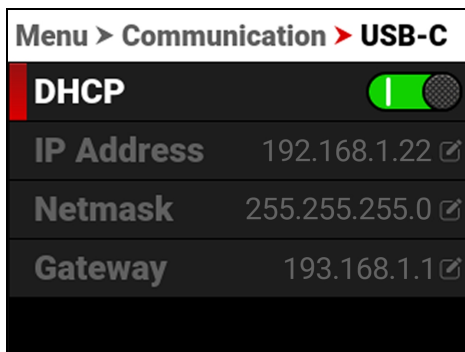
- g. RED Connect must be enabled to start streaming from the camera.

3. Make sure that RED Connect is active in camera by going to **Menu>Project Settings>RED Connect**. If the slider is green, the camera will have RED Connect video streaming enabled.

- a. For USB-C streaming, this is disabled by default.
- b. For Connected Camera Module streaming, this will be enabled as long as the module is installed, and camera power is received through the module.

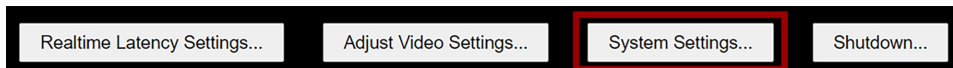
NOTE: The module will not be detected properly when the camera is powered through the power port on the camera, it should be powered through the module port when using the module.

4. The default settings for the RED Connect app are 8K 16:9, 59.94 FPS. If you want to stream with the default app settings, change the camera settings under **Menu>Project** settings to 8K 16:9 and 59.94FPS.
5. In-Camera, under **Menu>Communication**, select either USB-C or the Connect Camera Module, and look for the IP address of the camera.

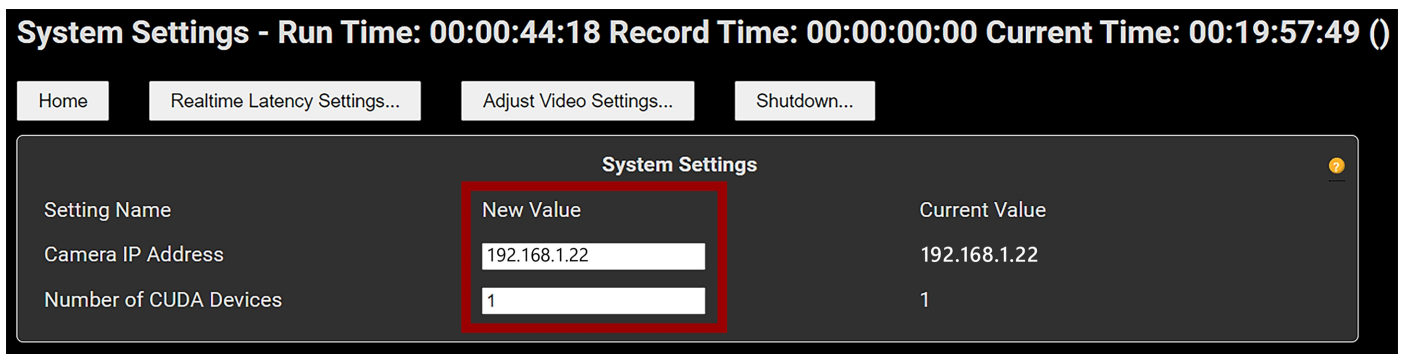


Depending on how the camera is connected to your CCU, you will either want to set this to Automatic (DHCP) or Manual IP. Refer to [Networking and Camera Connectivity](#) for more information.

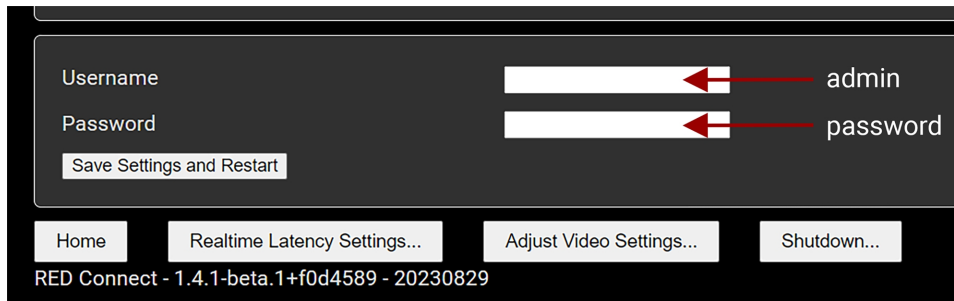
6. On the RED Connect App, click on the System Settings button:



7. Confirm that the IP address of the camera is correct in the RED Connect App:



8. Scroll down to the bottom, and enter “admin” for username and “password” for password, and click Save System Settings And Restart:



Username

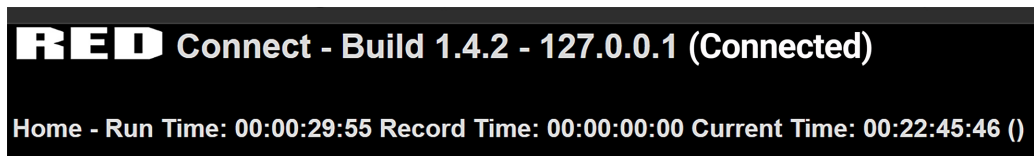
Password

Save Settings and Restart

Home Realtime Latency Settings... Adjust Video Settings... Shutdown...

RED Connect - 1.4.1-beta.1+f0d4589 - 20230829

9. Once the camera and CCU are connected, you will see the “Connected” message at the top of the screen:



10. When you press the Record Button on the camera, the stream starts and values display on the Home page of the RED Connect App.

NETWORKING AND CAMERA CONNECTIVITY

Depending on the way the camera is connected to the CCU, you will want to change your IP settings in order to ensure that the camera and CCU connect.

DIRECT CONNECTION (STATIC IP / MANUAL)

If you are going directly from the camera into your CCU, we recommend setting the Camera and CCU up to use Manual/Static IPs.

CAMERA

Under **Menu>Communication>Connections>USB-C** or **RED Connect Module**, click “Configure IP” and set a Manual IP address.

Menu

Media >

User Settings >

Autofocus >

Communication >

System Settings >

... > Connections

USB-C >

Wi-Fi >

GIG-E >

Serial >

... > Connections > USB-C

IP Assignment Automatic

Configure IP OK

IP Address

Netmask

Gateway

Menu > Communication

Camera >

Connections >

Clients & Services >

Cloud Upload >

USB-C

Configure IP

> IP Assignment Automatic ▾

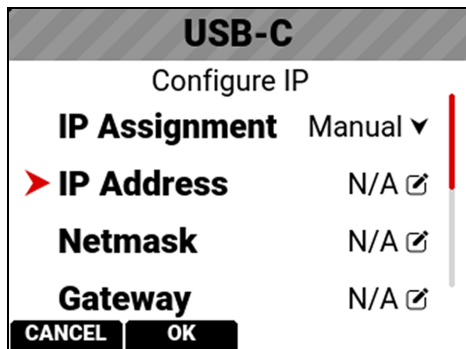
IP Address N/A ☒

Netmask N/A ☒

Gateway N/A ☒

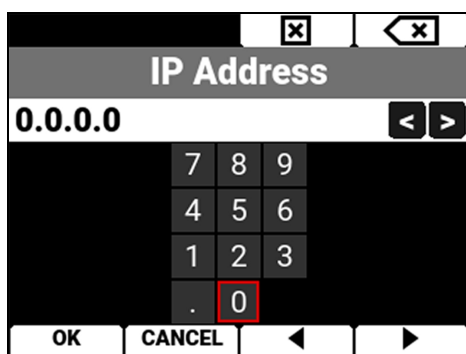
CANCEL OK

1. Change IP Assignment from Automatic to Manual:



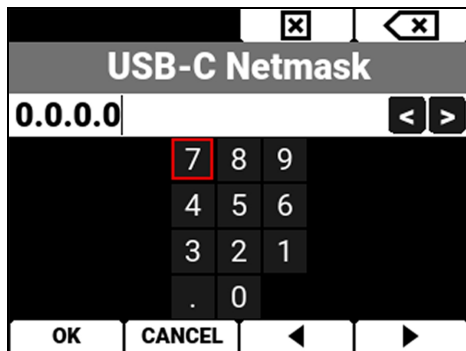
USB-C
Configure IP
IP Assignment Manual ▼
➤ **IP Address** N/A ✎
Netmask N/A ✎
Gateway N/A ✎
CANCEL OK

2. Select IP Address to enter your desired IP address, such as 192.168.10.20:



IP Address
0.0.0.0
7 8 9
4 5 6
1 2 3
0
OK CANCEL

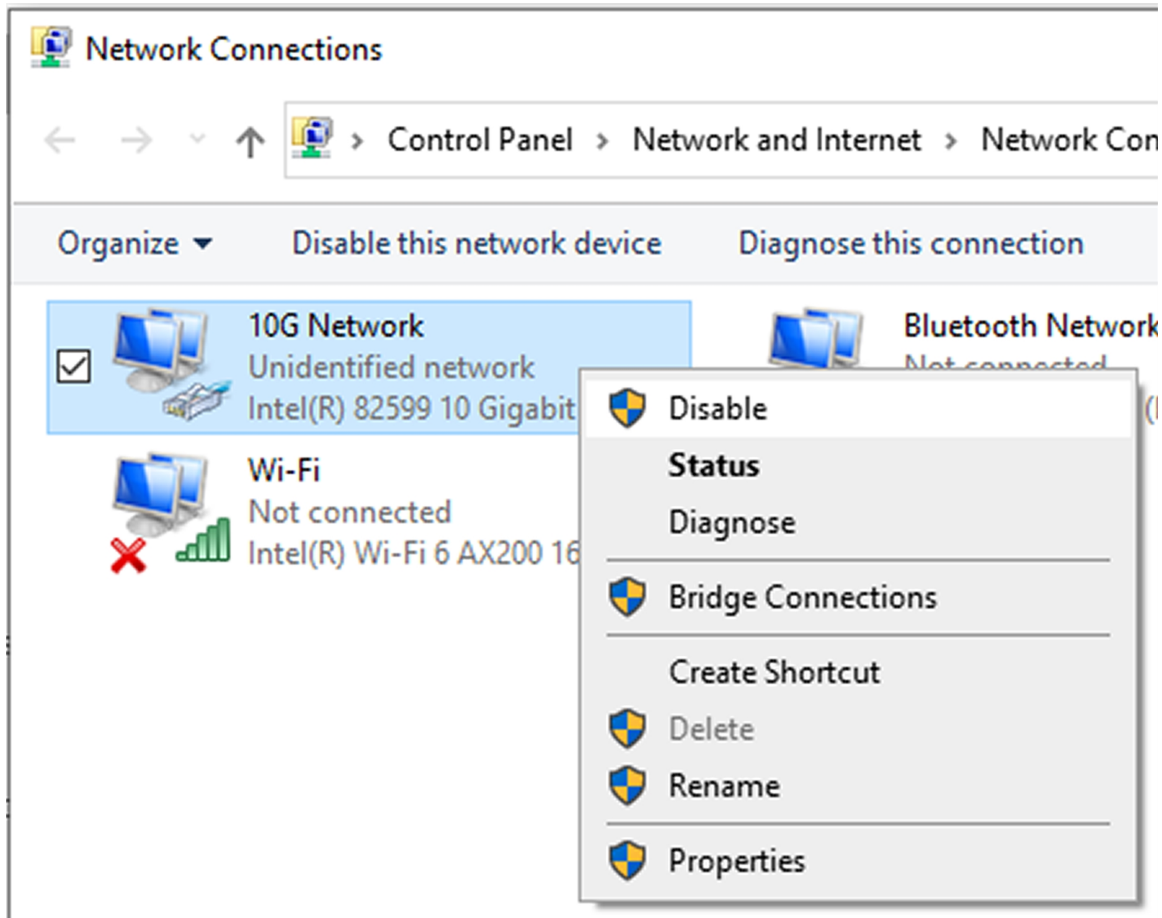
3. Select Netmask to enter 255.255.255.0 for the Netmask, if it has not been entered already:



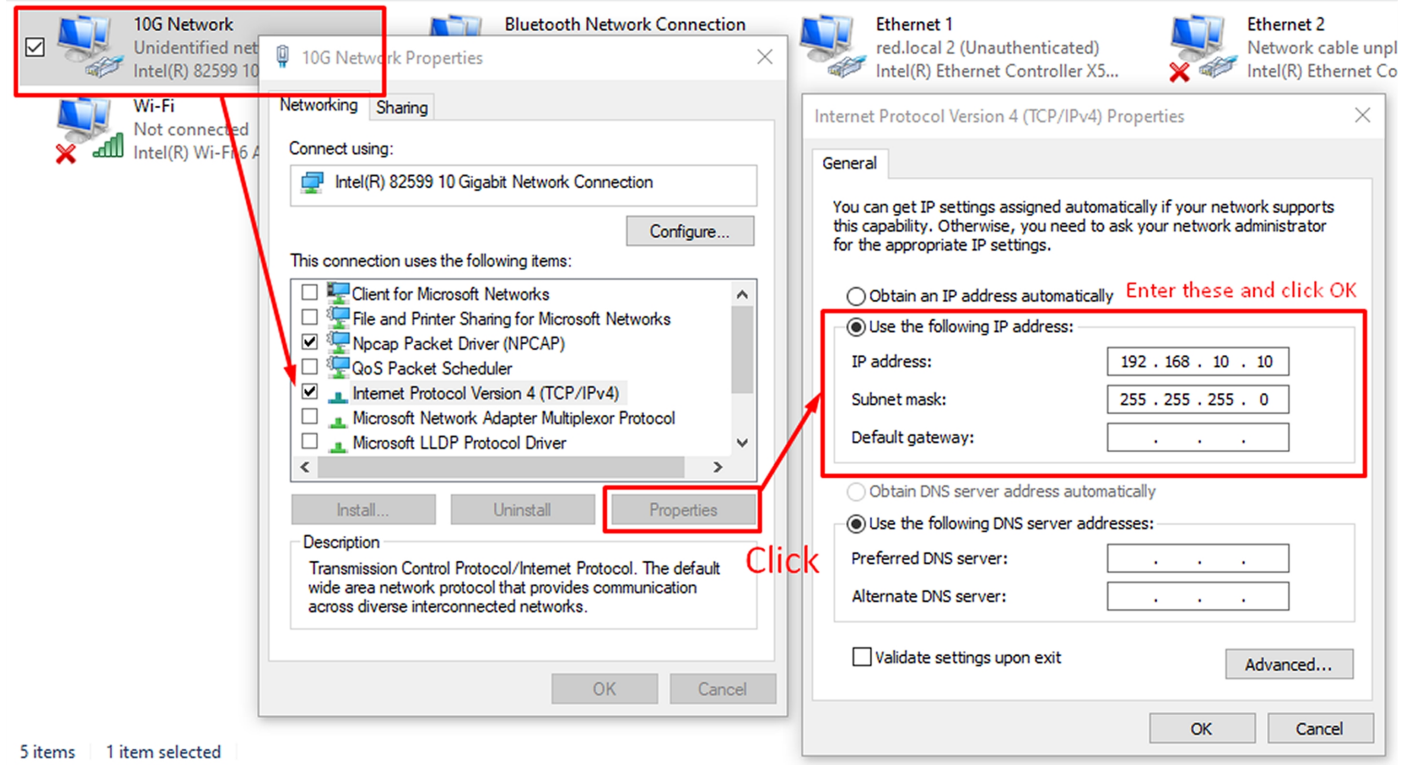
USB-C Netmask
0.0.0.0
7 8 9
4 5 6
3 2 1
0
OK CANCEL

CCU

1. On the CCU, open your computer's Ethernet settings, and right click on the 10G network interface that you are using to connect to the camera:



2. Click Properties, and make sure everything is unchecked besides Internet Protocol Version 4 (TCP/IPv4).



- Click on Internet Protocol Version 4 (TCP/IPv4), click Properties, and enter the following to set the 10G interface up for Static IP:

Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

☐ Obtain an IP address automatically

☒ Use the following IP address:

IP address: . . .

Subnet mask: . . .

Default gateway: . . .

☐ Obtain DNS server address automatically

☒ Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

☐ Validate settings upon exit

Advanced...

OK Cancel

- Check “Use the following IP address”
- IP: Enter 192.168.10.10 (or whatever IP address you prefer, which is different from the IP address set in-camera in the previous step).
- Subnet Mask: 255.255.255.0
- Default Gateway: Blank
- Click OK.

AUTOMATIC IP ASSIGNMENT (DHCP)

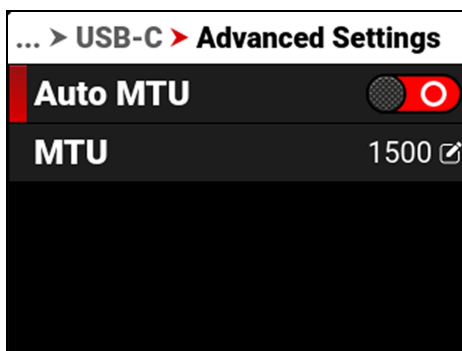
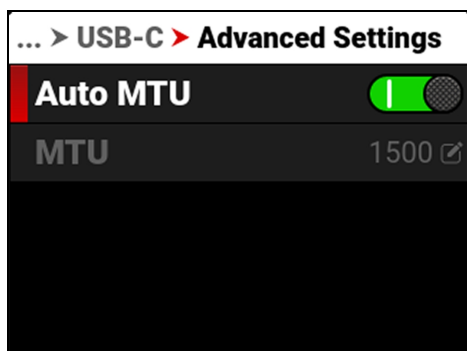
When there is a DHCP server on your network, we recommend leaving the cameras with IP Assignment set to Automatic (the default).

MTU

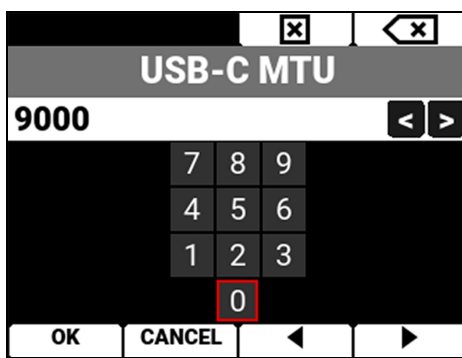
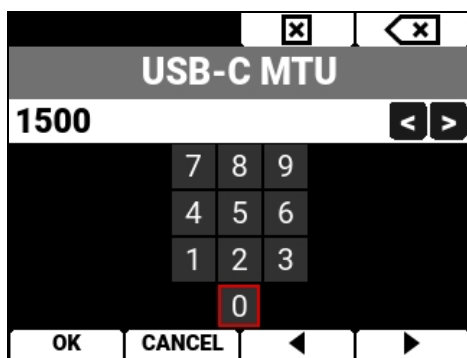
For most network cards, you will want to set the MTU on the 10G interface on your CCU, as well as on your camera, to 9000. Only a few cards, such as the NVIDIA Mellanox ConnectX-5 and ConnectX-6 reliably support video streaming at high bitrates with the default MTU of 1500.

Camera

1. Go to **Menu>Communication>USB-C>Advanced Settings** and disable Auto MTU:



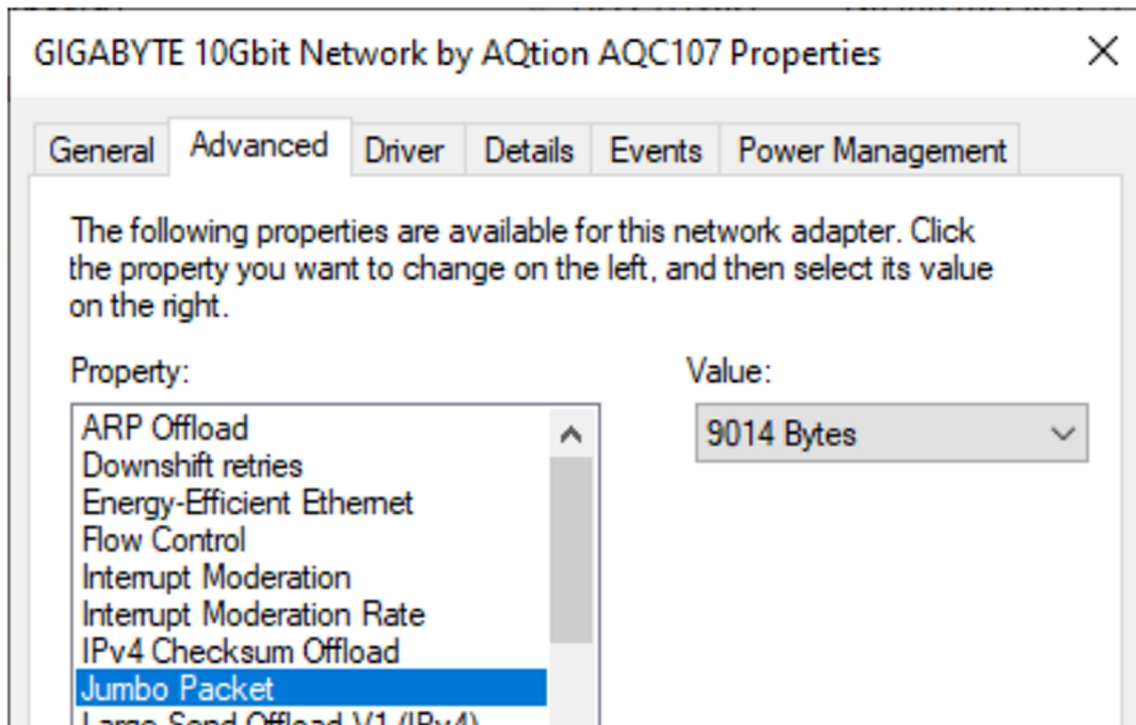
2. Change the MTU to 9000:



3. Press the button under OK to save the change.

CCU

Go into the Ethernet Adapter's Advanced Settings, and set Jumbo Packet to 9014 Bytes.

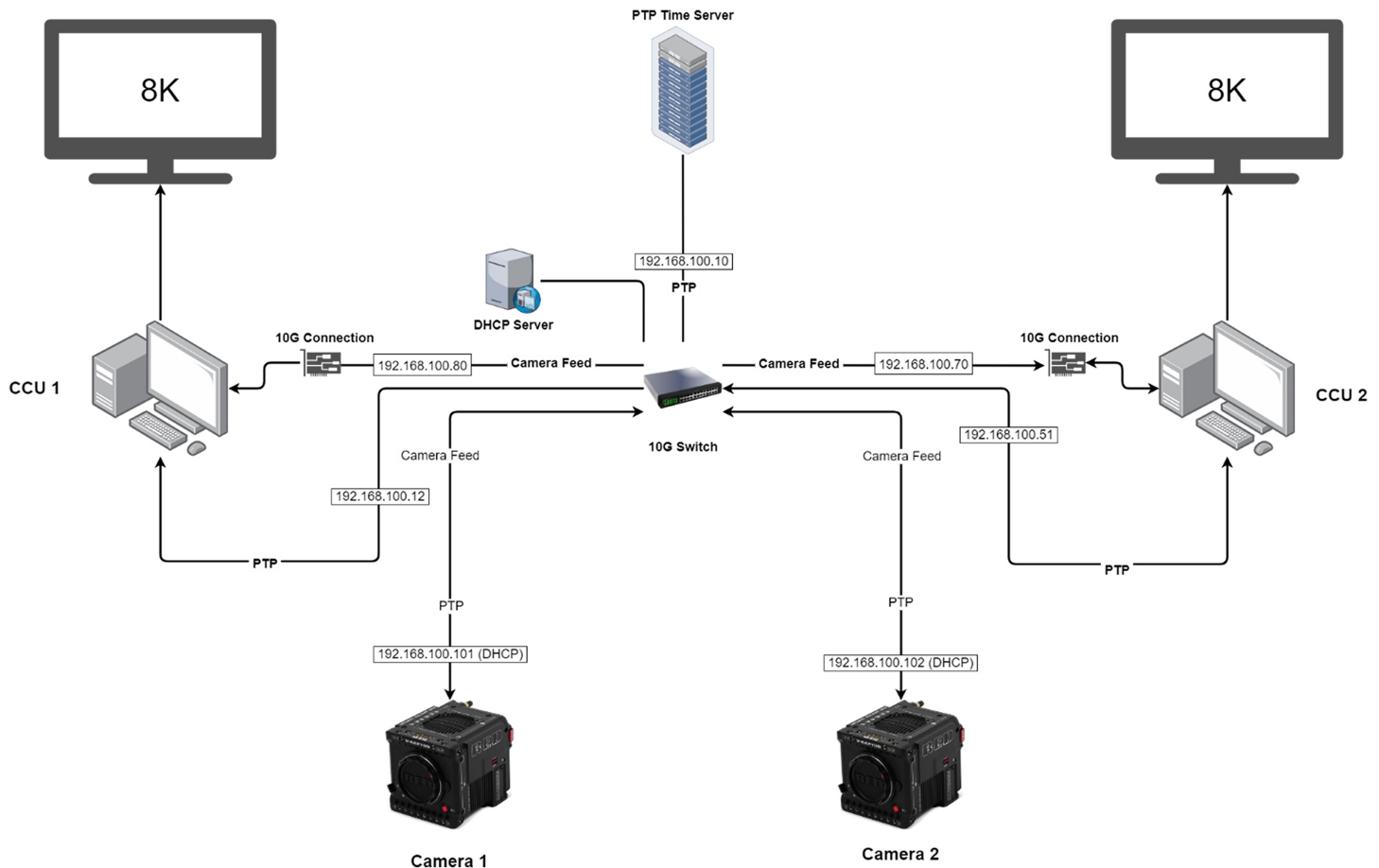


PTP

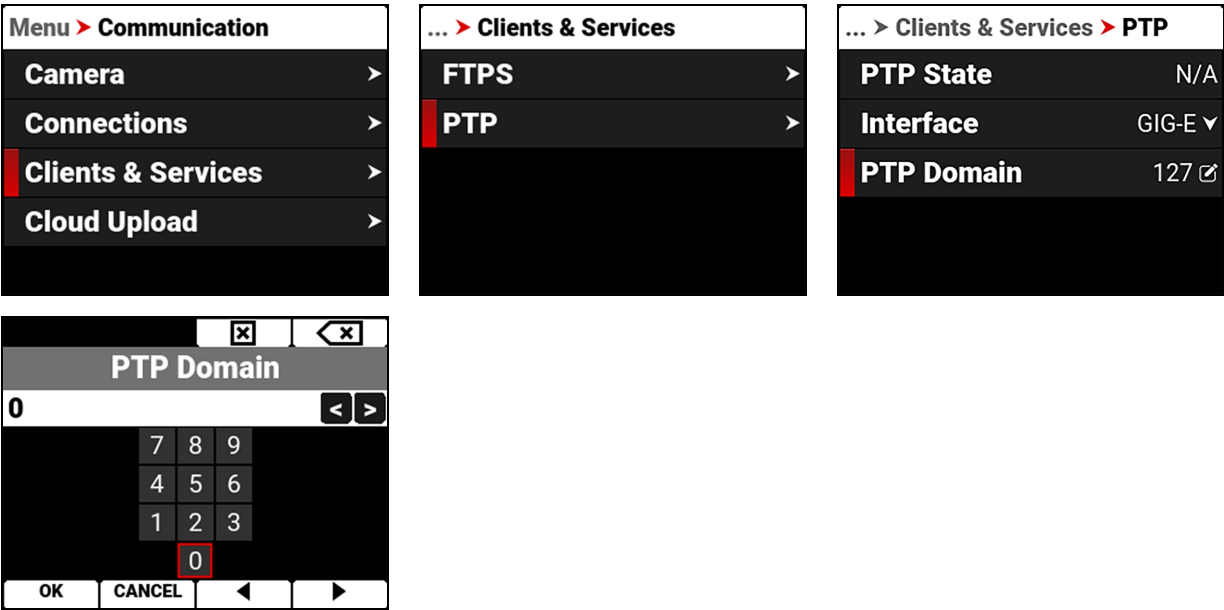
When you want to add PTP to your network, we recommend connecting your PTP source to a PTP compatible switch. Connect the PTP compatible switch to the camera and the CCU.

NOTE: You must enable PTP on both the CCU and the camera to eliminate drift between the internal clocks of the two systems. You must load a SMPTE 2059-02 PTP profile on your timeserver to make it compatible with the RED Connect system.

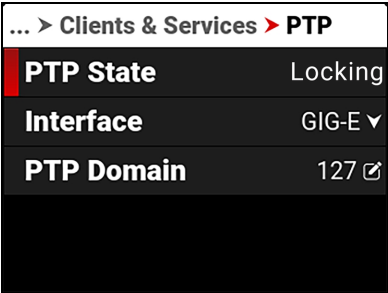
Below is a diagram of a sample system that RED uses extensively:



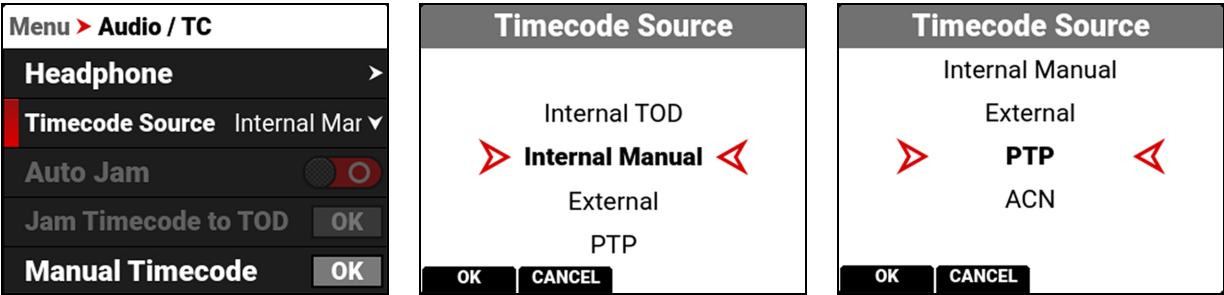
PTP can be enabled by going to **Menu>Communication>Clients & Services>PTP** and changing the PTP domain to the domain of your PTP server.



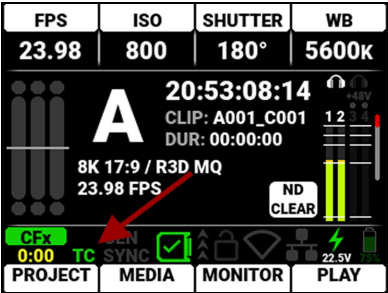
After that is enabled, you should see PTP State change from N/A to Locking, and eventually to Locked.



Once the PTP is locked, you can go to **Menu>Audio / TC>Timecode Source** and change it to PTP.

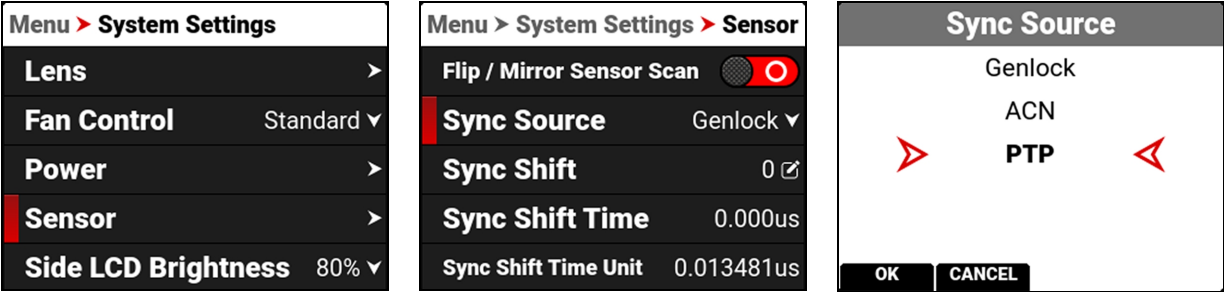


The TC indicator on the main menu of the camera goes from blank to Green. Green indicates that it is locked to PTP.

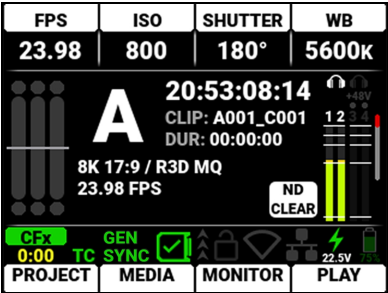


Genlock and Sync (GEN/SYNC indicators on the camera menu) can also be locked onto PTP, although that feature is only available when using the RED Connect Camera Module. This setting will not be available when PTP is locked through USB-C.

To enable GEN/SYNC PTP, go to **Menu>System Settings>Sensor>Sync Source** and change it to PTP.



After a few seconds, the GEN/SYNC indicators on the main menu of the camera will go from blank to red to green. Green indicators that the camera sensor is now also synced over PTP.

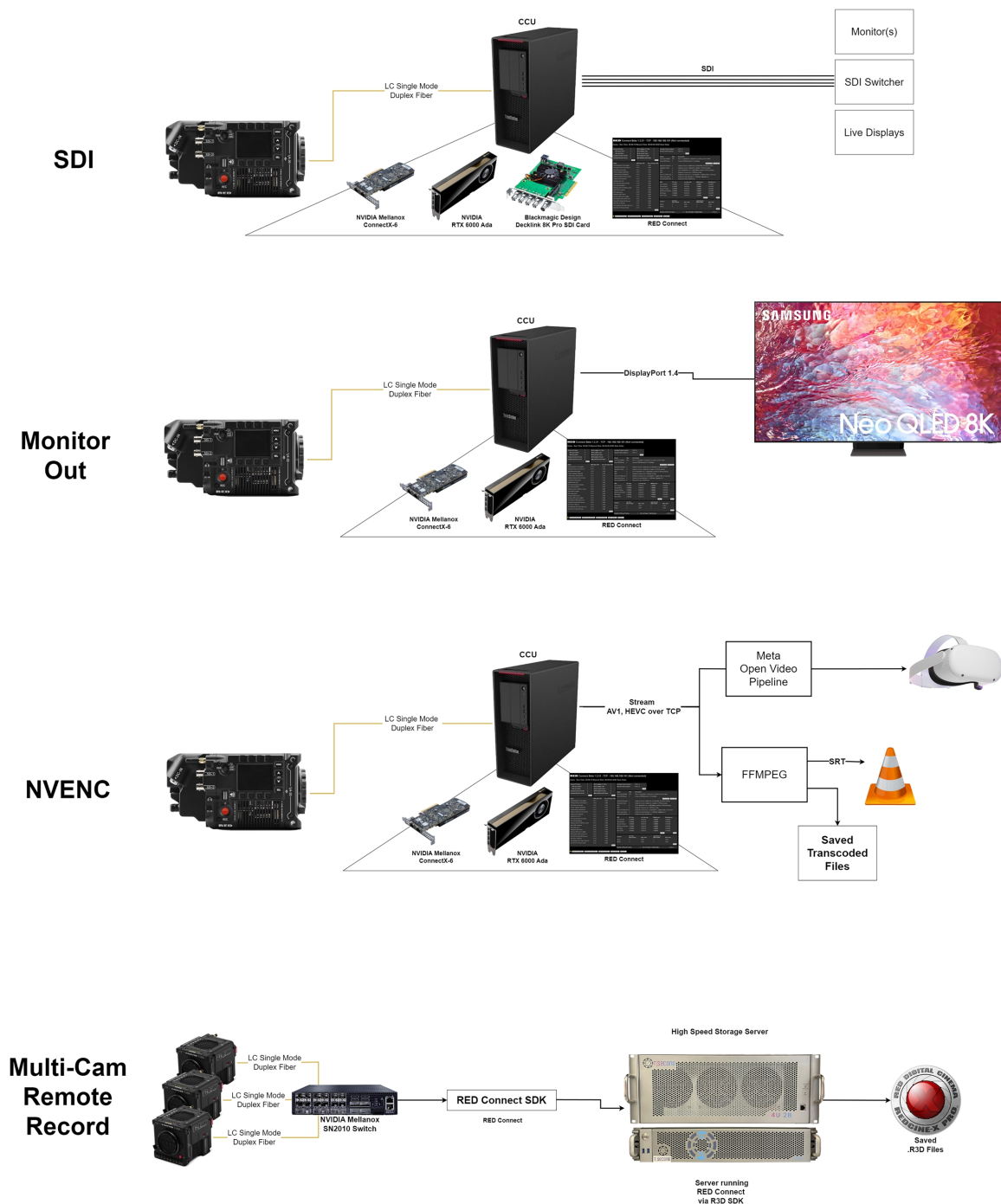


3. SETTINGS

The RED Connect application provides many useful settings for tuning your streaming connection.

The primary modes of operation are SDI out, Monitor Out, NVENC out, and R3D Save only. All of these settings can be directly edited by editing the value in the RED Connect app, or they can be edited in the redconnect.ini file located in C:\ProgramData\red\REDConnect.

RED Connect R3D RAW



REALTIME LATENCY SETTINGS

The settings on this page can be adjusted while streaming, so that you can reduce the latency of the stream, and to give the GPU enough time to decode your frames to display the video smoothly. We recommend running the system, and setting the Video Out Latency according to the GPU Decode Latency of the stream.

Setting Name	New Value	Current Value
Video Out Latency	0	0 ms
SDI Buffered Frame Count	4	4 frames (ms)

The main settings on this page include:

- **Video Out Latency:** Controls the amount of time between when the frame was recorded on the camera and when the frame gets added to the SDI device's SDK for output.
- **SDI Buffered Frame Count:** The number of frames queued in the SDI device.

ADJUST VIDEO SETTINGS

This page has controls for controlling the image settings on the application side. RED Connect alone sends ungraded data from the camera to the CCU. On the CCU side, you have controls to grade the footage to your liking. The image settings set here get applied to the frames as they get decoded in the system.

HomeRealtime Latency Settings...System Settings...Shutdown...

Custom Settings File

File to SaveSave SettingsLoad Settings

Setting Name	Override Value	Camera Value	Output Value	Reset All ?
ISO				Reset
Color Temperature				
				Reset
Tint				
				Reset
Output Color Space	Rec. 709 (1)		1	Reset
Output Tone Map				Reset
Highlight Roll-Off				Reset
Display Preset	SDR (15)		15	Reset
Exposure Adjust				
				Reset
CC Noise Reduction				
	0.10000000149011612		0.1000	Reset
Disable CC Noise Reduction			true	

CDL Settings

HomeRealtime Latency Settings...System Settings...Shutdown...

CDL Settings can also be accessed by clicking the CDL Settings button, and checking the Enable checkbox at the top of the drop-down menu. To disable all CDL changes made, you can uncheck the Enable checkbox.

CDL Settings

Setting Name	Override Value	Camera Value	Output Value	
Enable	☐			Reset All
Power				
Red				Reset
Green				Reset
Blue				Reset
Slope				
Red				Reset
Green				Reset
Blue				Reset
Offset				
Red				Reset
Green				Reset
Blue				Reset
Saturation				Reset

Home

Realtime Latency Settings...

System Settings...

Shutdown...

SYSTEM SETTINGS

The System Settings page allows you to adjust the RED Connect settings after you have already established a connection and started a stream.

RED Connect - Build 1.4.2 - 127.0.0.1 (Connected)

System Settings - Run Time: 00:19:02:56 Record Time: 00:00:00:00 Current Time: 00:17:18:47 ()

Home

Realtime Latency Settings...

Adjust Video Settings...

Shutdown...

System Settings

Setting Name	New Value	Current Value
Camera IP Address	192.168.1.22	192.168.1.22
Number of CUDA Devices	1	1

SYSTEM SETTINGS

System Settings

Setting Name	New Value	Current Value
Camera IP Address	192.168.1.22	192.168.1.22
Number of CUDA Devices	1	1

Camera IP Address: IP address of the camera found under Menu > Communication > RED Connect / USB-C > IP

Number of CUDA Devices: Number of Graphics cards with CUDA enabled. Non-CUDA GPUs are not used.

OUTPUT VIDEO SETTINGS

Output Video Settings		
Setting Name	New Value	Current Value
Destination		
Display Time Scale	60000	60000
Display Duration	1001	1001
Frame Width	7680	7680
Frame Height	4320	4320
CC Noise Reduction	0.1	0.10000000149011612

Destination: Allows user to choose the final destination of the frames being sent from the camera. Options currently supported are R3D Save Only, Blackmagic SDI Out, Monitor Out (DisplayPort out of the GPU directly), and NVENC. Each of these destinations has a set of settings in the other boxes in the app.

Display Time Scale: Numerator of FPS calculation (i.e. $60000/1001 = 59.94$).

Display Duration: Denominator of FPS calculation.

Frame Width: Width of the frame in pixels. (Can be found in Menu > Project Settings > Frame Dimensions in the camera)

Frame Height: Height of the frame in pixels.

CC Noise Reduction: Noise Reduction

BLACKMAGIC SDI SETTINGS

RED Connect supports the use of the Blackmagic Design Decklink 8K Pro SDI card for sending SDI video out from the CCU. When using Blackmagic SDI Out, you will need to set your Format in the camera to match the Frame Height and Frame Width in the RED Connect app and make sure it is one of the supported formats that the Decklink 8K Pro supports. If the format is not a supported Decklink format, no video will show.

Blackmagic SDI Settings		
Setting Name	New Value	Current Value
Blackmagic SDI Card Queue Size	4	4
Blackmagic SDI GPU Direct	☒	true

Blackmagic SDI Card Queue Size: Number of frames queued in the Blackmagic SDI card for sending to the output. Increasing this increases latency, but may improve video stream quality.

Blackmagic SDI GPU Direct: Controls whether or not GPU Direct is enabled.

NOTE: Some GPUs do not support GPU Direct.

NVIDIA NVENC SETTINGS

Usage of the built-in NVENC encoders for video encoding is supported for NVIDIA RTX 6000 Ada graphics card.

To use the NVENC pipeline, navigate to the System Settings - Output Video section, and change the Destination to NVENC Only. Once that is selected, you can scroll down to this NVENC section and change the settings as needed.

NVidia NVENC Settings		
Setting Name	New Value	Current Value
Enable NVENC encoding	☐	false
Pixel Format	ABGR10 (10-Bit ABGR) ▾	abgr10
Split Frame Type	NV_ENC_SPLIT_AUTO_MODE (1) ▾	1
Destination	tcp://192.168.20.124:8080	tcp://192.168.20.124:8080
Init Parameters	-codec hevc -profile main10	-codec hevc -profile main10 -preset p2 - tuninginfo hq -gop 30 -bf 3 -aq 0 - temporalAQ -lookahead 3 -bitrate 100m - maxbitrate 150m

Enable NVidia NVENC encoding: Flag to enable or disable NVENC encoding. This will default to ON if the Destination is NVENC only.

Pixel Format: Determines the pixel format of abgr10 or argb10.

Split Frame Type: Determines Split Frame behavior.

Destination: Determines where the encoded frames are sent. Currently, only TCP is supported as the direct transfer method to your second machine.

Init Parameters: The NVENC Init Parameters are a set of ffmpeg flags that you can pass in to modify the output encoded stream. AV1, HEVC, and h264 are supported as of this time.

VIDEO MONITORING SETTINGS

RED Connect allows you to view the RED Connect stream coming from the camera directly onto a monitor of choice, so long as the monitor is connected to the first (left-most) DisplayPort connection on the graphics card. If the monitor size does not match the incoming video stream dimensions, an internal scaler in the RED Connect app will scale the video to fit to the display.

NOTE: On machines with multiple GPU’s, a second monitor must be attached to the system to properly display the video out. The monitor on which the Monitor Out display is to be shown should be connect to the first, or highest speed DisplayPort / HDMI port on the GPU.

To run video monitoring, navigate to the System Settings page, and change the Destination to Monitor Out Only, and then save the settings. After that, you can go to the desktop and double-click the "Switch to Direct" icon, and you should see a command prompt open, along with a transparent video display window. If everything is setup, you can then press record on the camera, and you should see a live feed of your camera on your connected display.

NOTE: For multiple displays, every Nth frame will be shown, since the frames are distributed amongst the available GPUs.

NOTE: To achieve maximum FPS, you can check the “Disable Noise Reduction” checkbox on the Adjust Video Settings page.

Video Monitoring Settings		
Setting Name	New Value	Current Value
Enable Video Monitoring	☐	
Monitor Device Index		0
Video Frame Buffers		5

Enable Video Monitoring: Enables or Disables Video Monitoring feature. Enabled by default when Destination is set to Monitor Out Only.

Monitor Device Index: Number of the GPU outputting the video.

Video Frame Buffers: Number of Simultaneous Frame Buffers processed for display.

FILE SAVE SETTINGS

Use the File Save Settings to manage how and where clips and replays are saved.

File Save Settings

Setting Name	New Value	Current Value
Output Directory	C:\REDConnect\Output	C:\REDConnect\Output
Clip Sub-Directory	Clips	Clips
Replay Sub-Directory	Replays	Replays
Enable saving stream to R3D clip	☒	true
Enable saving R3D replay clips	☒	true
Save R3D clip on record start	☐	false
Replay / Post Processing Frames	600 secs	600
Save R3D File Clip ID	1	1
Save R3D File Reel ID	1	1

- Output Directory:** Main directory where RED Connect creates the directories for clips and replays.
- Clip Sub-Directory:** Sub-Directory where clips get saved. Clicking Save Clip on the home page records the clip to this sub-directory.
- Replay Sub-Directory:** Sub-directory where replays get saved. Clicking Save Replay saves the replay to this sub-directory.
- Enable saving stream to R3D clip:** Enables saving clips while streaming.
- Enable saving R3D replay clips:** Enables saving replays while streaming.
- Save R3D clip on Record Start:** When this checkbox is checked, whenever the camera starts sending a live feed to the displays, the entire feed will begin to get saved to the designated clip sub-directory, until recording is stopped on the camera. This makes recording behavior function most similarly to typical camera recording.
- Replay / Post Processing Frames:** Number of frames back a replay will record for. The default is 600 frames, so at 60 FPS, you will get at least 10s of footage.
- Save R3D File Clip ID:** Clip number in the clip name of the saved clip.
- Save R3D File Reel ID:** Reel number in the file name of the saved clip.

ADVANCED SETTINGS

On the System Settings page, there are some settings that you might want to adjust after you have already established a connection and started a stream.

Advanced System Settings		
Setting Name	New Value	Current Value
Administrator Username		
Administrator Password		*****
Web GUI Service Port	8088	8088
Logfile Path	%LocalAppData%/red/RedConnect/Logs	%LocalAppData%/red/RedConnect/Logs
CRC Check	☐	false
Use PTP	☐	false
Video Out Latency	150	150
Custom Image Processor	(None)	
Log Level	9	9
Verbose Logging	☐	false

Administrator Username: The username that a user must enter at the bottom of the System Settings page in order to apply the settings made to the page

Administrator Password: The password that must be entered at the bottom of the System Settings page in order to apply the settings made to the page. Default is “password”.

Web GUI Service Port: Changes the port at which the site is hosted. The default is 8088. This can be seen when accessing the page via 127.0.0.1:8088.

Logfile Path: This is where the RED Connect application logs live.

CRC Check: Enabled or Disabled CRC checking of each frame as it arrives to the CCU.

Use PTP: Enables whether or not to use PTP timestamps from the camera and computer.

Video Out Latency: Additional latency before the frame is decoded to the GPU.

Custom Image Processor: These are Custom Image Processor libraries that are included with the app that modify the output image before it is displayed. By default, this setting is blank, meaning that it will not use the included Custom Image Processor. The Sample Custom Image Processor is an example of a lens de-warp library that de-warps the image live. You can include your own Custom Image Processor into the code by using the CustomImageProcessor setting in the RED Connect ini file. Please reach out to RED for more details about custom image processors, and sample code.

Log Level: Controls the level of logging that the app does to the log file located at the Logfile Path setting above. Increasing this value will include more logging, but can slow down system performance. It is not recommended to change this unless debugging an issue with RED.

Verbose Logging: Also controls the amount of information written to the log file located at the Logfile Path setting above. Increasing this will also include more logging done by the system, which can slow it down. This is also not recommended to be increased unless you wish to get a more detailed log of the system.

4. REMOTE RECORDING WITH SDK

Remote recording alone, without GPU decode, can be done by compiling and using the R3D SDK Sample App `ConnectStreamSave`. The sample app can be built on Windows, Mac, and Linux, by performing the following steps on each system.

1. Download the latest beta SDK, and unzip the file.
2. In ALL cases you'll need to either copy the built executable to the appropriate Redistributable folder in the extracted SDK, or copy the appropriate dynamic libraries from the Redistributable folder to sample folder (see below). Otherwise, you'll get an error that the SDK cannot be initialized.

FOR WINDOWS:

1. Download Visual Studio (NOT VS Code!) or the "Tools for Visual Studio" (no IDE, no license needed). If you installed Visual Studio, open it once so things are set up behind the scenes.
2. Open the "x64 Native Tools Command Prompt for VS <version here>" from your Windows start menu
3. Navigate to "Sample code\Creating clips" in your command window in the extracted SDK folder
4. To build: `cl ConnectStreamSaveSample.cpp /nologo /W3 /O2 /D NDEBUG /EHsc /MD /I..\..\Include /link ..\..\Lib\Win64\R3DSDK-2017MD.LIB /out:connectstreamsaver.exe`
The 2017 SDK library is compatible with VS2017 and newer versions, for older you'll need to pick the appropriate one (2013 or 2015)

FOR LINUX:

1. Make sure build tools are installed, on an apt based system it should be "sudo apt install build-essential"
2. Open a terminal and navigate to "Sample code/Creating clips" in the extracted SDK folder
3. To build: `c++ -o connectstreamsaver ConnectStreamSaveSample.cpp -O2 -DNDEBUG -I ../../Include/ -IR3DSDKPIC -ldl -fno-rtti -L../../Lib/linux64`

FOR MAC

1. Get and install Xcode (either from the App store or the Apple developer website). Open Xcode once so everything's set up
2. Open a terminal and navigate to "Sample code/Creating clips" in the extracted SDK folder
3. To build: `c++ -o connectstreamsaver ConnectStreamSaveSample.cpp -O2 -DNDEBUG -I ../../Include/ -IR3DSDK-libcpp -ldl -fno-rtti -L../../Lib/mac64`

To run the app, you can try running `connectstreamsaver` without any input parameters to get a list of the available parameters for the script.

At the time of writing, these are the existing flags that can get passed into `connectstreamsaver`:

```
connectstreamsaver -[c|f|i|r|s]
-c <clip Id> Starting clip ID (1-999).
-f <path> Folder to write the output R3D clips to.
-i <camera IP> Camera IP address.
-r <reel Id> Starting reel ID (1-999).
-R <path> Override folder to the REDR3D-x64.dll (defaults to current folder).
-s Service mode. Don't exit when camera finishes recording, continue to save additional clips.
```