Configure Cameras for Use with Gateways

Introduction

Seamlessly pulling 3rd party cameras into the CheckVideo web portal for client users to see is the foundation of CheckVideo's video-takeover product offering. To do so, we must physically install our gateway devices on the same network as the cameras and virtually assign the cameras to stream to the gateway in Video5. This document outlines the process to do so, assuming that the physical installation is complete, and all cameras and gateways are powered on and on the same local network.

NOTE: Follow this same process for non-cloud CheckVideo IP cameras (e.g., N1504-4 Quad Camera).

Section I: Conditions for Success

Part 1: Required Information

When assigning 3rd party cameras to gateways we should also have the following before beginning:

- Camera local login credentials, to access the cameras' native interface and configure settings
- ONVIF (preferred) profile or RTSP stream credentials, to provide to the gateway so it can tap into the camera's stream
- The current local IP addresses of the cameras being taken over

NOTE: It is recommended to reconfigure credentials the ONVIF/RTSP stream credentials to match the local login credentials to make it easier to remember for service.

Part 2: Compatibility Checklist for 3rd Party Cameras

When preparing to assign 3rd party cameras to work with gateways, we must check to ensure that certain settings are configured to values that the gateway can work with, and make adjustments if not:

- HIGHLY RECOMMENDED: Cameras should be ONVIF compatible to enjoy the most functionality. Cameras with only a configurable RTSP stream profile may be used but may be more difficult to service.
- Frame rate must be set to an interval of 5fps (i.e., 5, 10, 15, 20, etc.)
- I-frame interval, or GOV, must be set to double the frame rate (e.g., frame rate of 10fps → GOV of 20)
- Disable any video compression/encoding settings that could impact the video stream going to the gateway (e.g., Axis Zipstream, Avigilon Smart Codec)

NOTE: Non-cloud CheckVideo IP cameras are preconfigured with settings that are compatible with CheckVideo gateway device. When following the steps outlined below to assign one of these cameras to a gateway, contact CheckVideo Support - support@checkvideo.com - for troubleshooting assistance if encountering an error with these devices.

Part 3: Understanding Verification

Verification is the process of the gateway connecting to a camera and analyzing its stream to determine whether it will function reliably if assigned to the gateway. Once a gateway has been told to verify a camera, it looks for a few specific things:

- Whether the frame rate and resolution of the video stream are following the rules outlined above
- Whether I-frames are being received in an appropriate tempo and whether a significant percentage of the expected I-frames are missing

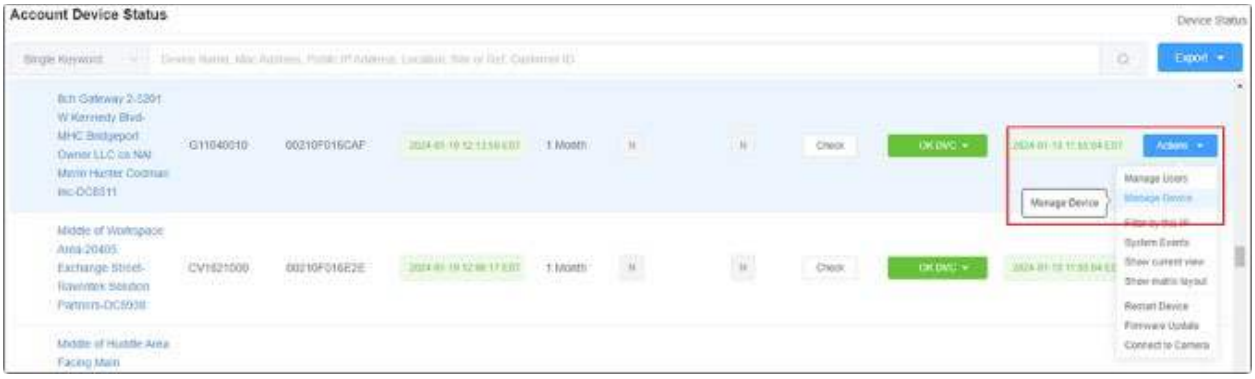
Verification was formally a background process that was automatically performed when assigning any camera to a gateway. As described in later sections, we can now initiate the verification for both already-assigned and discovered-but-not-yet-assigned cameras at any time, so long as we have a valid RTSP URL and associated credentials for the camera.

In situations where the gateway is receiving a stream that is reliably streaming but the stream's settings do not meet all compatibility requirements (e.g., frame rate of 7 fps and a GOV of 10), the gateway may decide to put the camera into Compatibility Mode as a result of the verification process. More on this in Section III, Part A.

Section II: Reaching the Interface

Part A: Navigate to the *Manage Device* Page

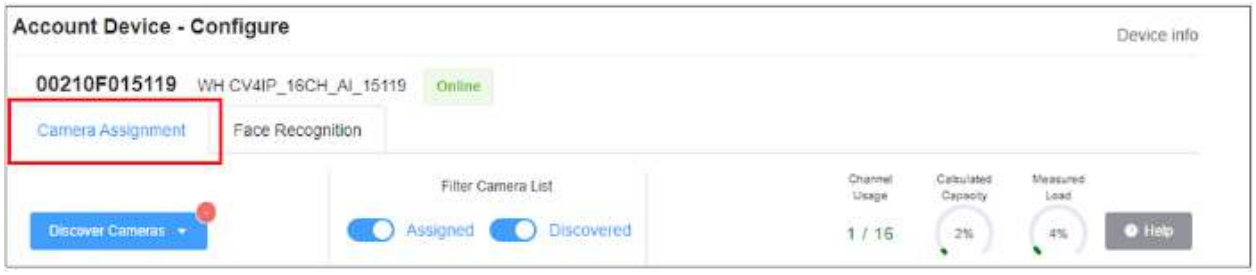
Once a gateway device is located on the *Account Device Status* landing page, click into the *Actions* dropdown, and select *Manage Device*.



NOTE: The Manage Device page will eventually be available to all devices for general device configuration.

Part B: Navigate to the *Camera Assignment* Tab

The *Manage Device* page for IP gateway devices contains the *Camera Assignment* tab - it does not apply to the analog ExpressHD. See below for an overview of tools available within the *Camera Assignment* tab:



Click into Camera Assignment if not already there.

Section III: How to Discover and Assign New Cameras

Part A: Discover and Assign via ONVIF

3rd party cameras that are ONVIF compatible should be configured via their local interface to support an ONVIF profile with the stream settings mentioned in Section I. **Once you've configured the stream and reached the *Camera Assignment* tab, click into the *Discover Cameras* dropdown identified in and select *Find Using ONVIF*.**

Select to find cameras via ONVIF

Once you've selected to find cameras via ONVIF, a pop-up will appear where you can enter the credentials of an ONVIF profile. If looking for a specific camera that you've already located on the network, you may optionally specify it's local IP too - NOTE: some cameras require this to be discoverable, so if not discovering an intended camera, try again with this field populated.

1. Enter known credentials and, optionally, the known local IP address of a particular camera.
    - NOTE: Some 3rd party cameras are designed to only respond via ONVIF when the local IP is provided in the request.
2. Once required information is entered, select to proceed. Or click to Clear entered data or Close the popup.
3. OPTIONALLY: Elect to "Remove Previously Found" cameras from a new search
    - If YES, any previously discovered but unassigned cameras removed from the search results and a new search will be performed from scratch with the currently entered credentials and IP
    - If NO, any previously discovered but unassigned cameras will be retested with the currently entered credentials unless a previous discovery resulted in the camera returning an RTSP URL. In this case, the previously used credentials that returned an RTSP URL will be retained for that camera.

Once an ONVIF-compatible camera is discovered by the gateway, it will fall into 1 of 4 status types:

1. **Discovered, Ready-to-Assign** - the camera returned enough information about its stream (i.e., resolution, frame rate, and URL) via ONVIF to predict compatibility with the gateway.
2. **Discovered, Requires Verification -** a camera was found, and it returned a URL of its stream for verification, but did not provide enough data to indicate compatibility. Successfully verify the camera by clicking the verification icon before assigning the camera to the gateway.

3. **Discovered, Cannot Verify -** a camera was found but it did not return a URL that can be verified by the gateway. Perform a new discovery action with another set of credentials and/or a known IP.
4. **Discovered, Assigned Elsewhere -** a camera was found but it is already assigned to another gateway. Go to that gateway to manage the camera.

Identify cameras that you would like to assign to the gateway and proceed based on their current status. **If verification is required, click the verification icon on the camera's tile and pause while the gateway processes the request**:

1. **Verification Icon** - Click to verify the stream of a discovered or already-assigned camera. If just discovered via ONVIF, the camera must have provided a URL to test before proceeding. You can see such in the camera's info page (Section IV, Part A).
2. **Verification Indicator** - Once you've initiated verification, this icon will blink between yellow and green until verification either passes or fails. **The icon will stop at green if verification is successful, and red if it fails.**
3. **Assignment Icon** - Click to assign the camera to the gateway after successful verification OR immediately upon discovery if it is in the **Discovered, Ready-to-Assign** status.

NOTE: The gateway can only verify two (2) cameras at a time. If attempting to verify more, you'll be instructed to wait until at least one other camera finishes. **Most importantly, you must remain on this page until verification completes and elect to assign any newly discovered camera before leaving - any unsaved verification/assignment results will be cleared once you leave this page.**

Part B: Add via RTSP

Non-ONVIF cameras capable of outputting an RTSP stream may also be added to a gateway. To assign such a camera, first configure its stream via its local interface with the settings mentioned in Section I. Once you've configured the stream and reached the *Camera Assignment* tab, click into the *Discover Cameras* dropdown identified in and select *Find Using RTSP*.

Select to find cameras via RTSP

Begin by entering the known RTSP URL of the camera's stream. If the webpage detects that you have entered an RTSP URL that contains credentials to the stream, the below fields will populate with such, which you may choose to edit or proceed with. If the entered RTSP URL does not already contain credentials, you should enter the known username and password before proceeding.

[insert picture of section]

If the gateway finds a camera based on the entered URL and credentials, it will automatically begin to verify the stream:

- **You can immediately assign the camera to the gateway upon successful verification**, per the assign control identified in Part A above.
- If verification fails, you may edit the trialed RTSP URL and credentials in the Primary Stream section of the camera's information page (Section IV, Part A).

Part C: Understanding Compatibility Mode

In situations where a gateway can access a camera's stream but it determines through verification that any of the settings identified in Section I, Part B are incompatible (e.g., GOV of 18 with a frame rate of 7fps), **it will attempt to maintain a reliable connection to the camera by putting it into Compatibility Mode** - the gateway will take the incoming stream and simplify it to something that can be maintained, typically 720p resolution at 10fps with a GOV of 20. Users can identify whether a camera has been put into this state within its camera information page, identified in Section IV, Part A.

While Compatibility Mode may provide a stable connection to the camera, we will not get the full benefits (e.g., high resolution) of its native stream. **Always attempt to reconfigure the camera's primary stream as described in Section IV, Part B to bring a camera out of Compatibility Mode.**

NOTE: Gateways will attempt to put a camera into Compatibility Mode automatically but will not always be successful in doing so based on the errors encountered during verification.

Section IV: Managing Already-Assigned Cameras

Part A: Reference Camera Information

Information about each camera is available through the Information icon at the bottom of each camera tile:

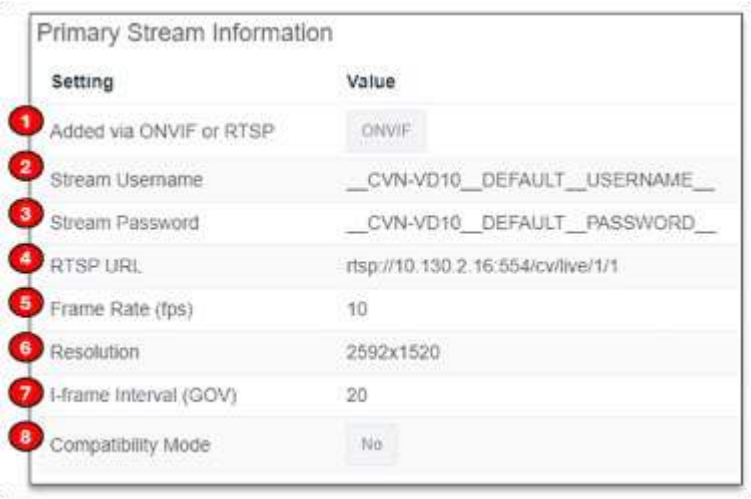
Click into the camera's information page

The information available will depend on whether the camera was discovered or assigned via ONVIF or RTSP and its verification status, but will fall into one of three categories:

Camera Identification - OEM name, model, and serial - available for CheckVideo cameras and 3rd party cameras discovered by ONVIF.

Primary Stream Info - the most recently entered credentials, RTSP URL, and settings (frame rate, resolution, etc.) pertaining to the camera's primary stream, i.e., the video stream being received by the gateway - credentials will be stored for all cameras at the time of discovery, but stream settings may only be available after successful verification.

- When discovering via ONVIF, some cameras may provide stream resolution and frame rate information when supplied with valid credentials. These cameras can still be verified to update these fields with the most accurate information.



The username and password above are a stand-in for CheckVideo cameras - not the actual login.

1. Indicates whether the camera was discovered and/or assigned via ONVIF or RTSP;
2. The **username** used to discover the camera or, if currently assigned, the username used by the gateway during the last successful verification;
3. The **password** used to discover the camera or, if currently assigned, the password used by the gateway during the last successful verification;
4. The RTSP URL either gathered via ONVIF discovery or entered by the user if the camera was added via RTSP. If the RTSP stream or ONVIF profile of the camera has been edited by a user, this will be the RTSP URL used during the last successful verification;
5. The Frame Rate of the camera's stream either gathered during ONVIF discovery or measured by the gateway during the last successful verification;
6. The Resolution of the camera's stream either gathered during ONVIF discovery or measured by the gateway during the last successful verification;

7. The GOV of the camera's stream measured by the gateway during the last successful verification; and
8. Indicates whether the camera is currently in Compatibility Mode.

Secondary Stream Info - frame rate and resolution of the camera's secondary stream (optional settings for DVR and event clip video) - available for all cameras after successful verification.

NOTE: The ONVIF communications standard specifies ***how*** devices need to talk to each other but does not mandate ***what*** information must be made available via the communication. **If the 3rd party manufacturer did not design the camera to provide make, model, firmware, stream details, etc. via ONVIF when requested, the gateway will not be able to present such for reference.**

Part B: How to Update Camera Settings

Updating Primary Stream Credentials

If we've updated the credentials for the RTSP stream or ONVIF profile being used by the gateway, we need to let the gateway know so it can maintain its connection to the camera. To do so, we should enter the new credentials within the camera information page:

[insert picture of section]

1. Click the *Edit* icon next to the section header;
2. Enter the new username and/or password in the open fields; and

3. Click *Reverify and Apply Changes* to test the new credentials and, if the camera stream can be successfully verified, save them. If the camera cannot be successfully verified, which could indicate that they are incorrect, the new credentials will not be saved.

Updating Primary Stream Settings

Primary stream settings (e.g., frame rate, resolution, GOV, etc.) must be configured within the camera's local GUI. To do so remotely, use the *Connect to Camera* function at the bottom of the camera information page:

1. Click *Connect* for the gateway to fetch the URL below;
2. Click to copy the URL and paste into the browser within another window;
3. Once edits are complete, click *Close Connection* to end the link to the camera.

NOTE: Cameras must be successfully verified immediately after changing primary stream settings to confirm that they have taken effect. To re-verify, click the verification icon on the camera's tile identified in Section III, Part A.

Updating Secondary Stream Settings

Secondary stream resolution and frame rate can be updated from within the camera information page. To make changes:

1. Click the *Edit* icon next to the section header;
2. Select the preferred settings from the options presented in each dropdown; and
3. Click *Save*.

Part C: How to Un-Assign Cameras

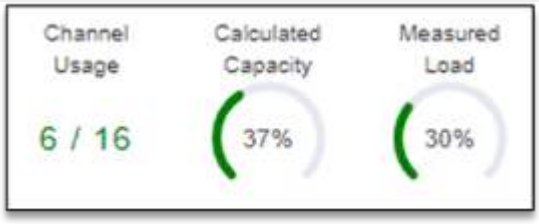
Cameras should be unassigned from the gateway from the camera tile itself. Within tile, click the green chain-link icon identified below to remove the camera from the gateway:

This same icon is used to individually assign cameras to the gateway, if not already assigned elsewhere.

WARNING: Unassigning a camera from the gateway will disassociate any previously recorded DVR and video event clips. To retain this data when replacing a malfunctioned camera, use the Swap function instead of unassigning the old camera and adding the new.

Section V: How to Interpret Gateway Performance Data

NOTE: The Calculated Capacity and Measured Load sections below are only applicable to G1104 and G2104 and newer gateway models.



Three meters track gateway perfomance during and post install.

Part A: Channel Count Meter

As cameras are assigned to and removed from the gateway, this page tracks the number of channels being used vs. the total channels available for this device model.

Part B: Capacity Meter

The Calculated Capacity meter updates immediately each time a new camera is assigned to the gateway and **displays the throughput EXPECTED by the gateway in Megapixels per second (MP/s) as a percentage against the known capacity of the device model**.

This calculation uses the resolution and frame rate obtained through ONVIF or the most recent verification for each camera. As streams may vary slightly over time, note that **this is an**

approximation of the actual processing power that will be used to support all of the assigned cameras.

At the time of installation, the percentage shown here should not be at 100%. Gateways with this meter at 100% may behave unreliably - e.g., seemingly random dropping of cameras.

NOTE: The calculation being done here is related to the calculations used by Sales Engineers to scope how many gateways are needed for a site. **If the gateway was intended to host a number of cameras but the displayed % is at or uncomfortably near 100%, confirm that the resolution and frame rate settings on each camera match what was specified by the SE.**

Part C: Load Meter

The Load Meter reflects the processing power CURRENTLY being used by the gateway to support its assigned cameras in near REAL TIME. Gateways with this feature will measure the current load in Megabits per second (Mbps) and report it up to the Video5 portal each minute.

Different from what we see in the Capacity Meter, **the % in the Load Meter represents a measured value**. As such, you should expect it to vary over time as the camera observes different levels of activity - during periods of high activity, the Load may spike higher than the predicted through the Capacity Meter and during periods of no/low activity, it may dip to near-zero.

The Load Meter should be referenced during service when cameras are observed to regularly “drop” from the gateway - can be seen as periodic recording gaps and/or video-quality-related system events - especially if the drops happen at around the same time each day. In such a situation, it may be

necessary to either remove one or more cameras from the gateway or update camera stream and/or analytic sensitivity settings to consume less bandwidth.