DEWETRON

OXYGEN ALVIUM-CAMERA Setup v1.1

TECHNICAL REFERENCE MANUAL

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Table of Content

1 DRIVER INSTALLATION GUIDE

- Hardware Setup:
  Connect the camera(s) to an USB 3 port of the DEWETRON System if USB cameras are in use. If, for instance, ALVIUM G1 or G5 cameras are used, connect the camera(s) to the CAMERA TRG/POW connector(s) at the DEWETRON System. Connect the network cable(s) of the camera(s) to the switch or connect it directly to a gigabit Ethernet port of the DEWETRON System.

  The following camera types are supported:
  - ALVIUM 1800 U-240 and ALVIUM 1800 U-040
  - ALVIUM G1 (ALVIUM G1-040 and G1-240) and G5

- Driver Installation:
  - To install the drivers, navigate to ……\files\drivers\03_GigE_Alvium_Cam and execute the file Vimba_v6.0_Windows.exe (see Figure 1-1)

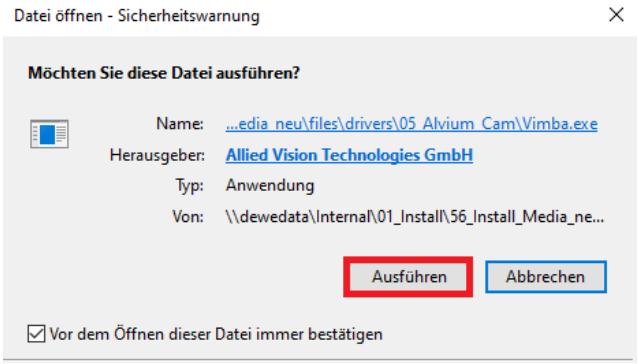

Figure 1-1

- Confirming the execution will lead you to the installation setup.
- Select the Vimba Applications installation level, change your target folders if desired and press Start (see Figure 1-2)

Figure 1-2

- After the installation is finished, you can exit the installation menu (see Figure 1-3). For the correct functionality of the Camera in OXYGEN, no additional drivers are required. A restart of your system may be necessary and is recommended.

Figure 1-3

- After the restart open the Vimba Viewer. If everything is installed and connected correctly, your camera(s) will show up in the *Detected Cameras* section (see Figure 1-4).

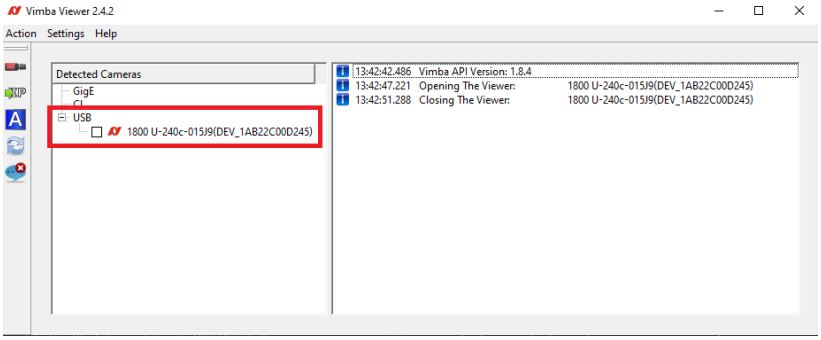

Figure 1-4

INFORMATION: Following points are only relevant for cameras with ethernet connection. It is an introduction how to check and change the current IP-address of the camera.

- Open the camera menu by selecting the respective camera (see Figure 1-5).

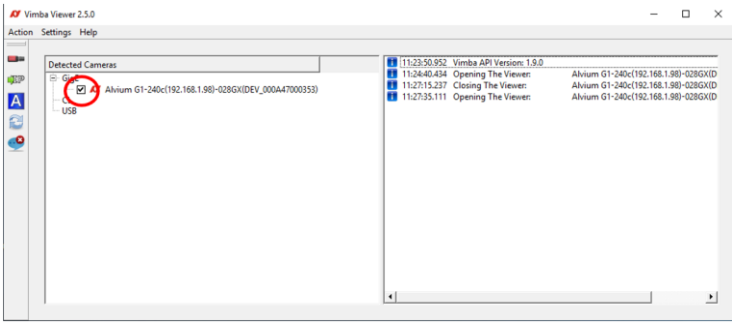

Figure 1-5

- Search for the current IP address in the camera menu (see Figure 1-6).
  It can be found under All > GigE > Current > Current IP Address. It is recommended to use static IP addresses for the camera(s) since the default configuration is set to Obtain an IP automatically.

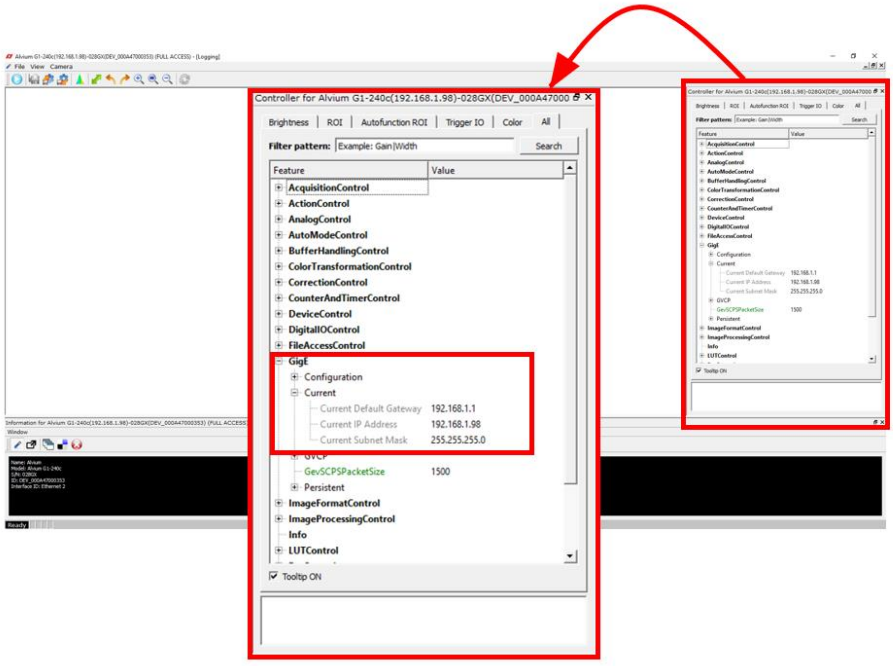

Figure 1-6

2 MANUAL IP ADDRESS CONFIGURATION

INFORMATION: This section is only relevant if cameras are connected via ethernet.

- To change the IP address of the system manually go to the Network and Sharing Center (see Figure 2-1).

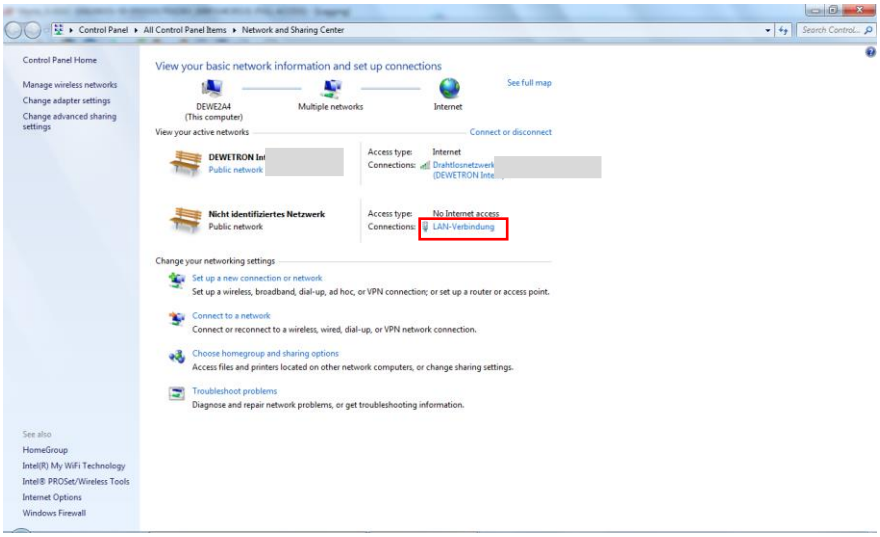

Figure 2-1

- A click on LAN-Connection will open the LAN-Connection Status (see Figure 2-2).
- Clicking on Properties will open the LAN-Connection Properties.

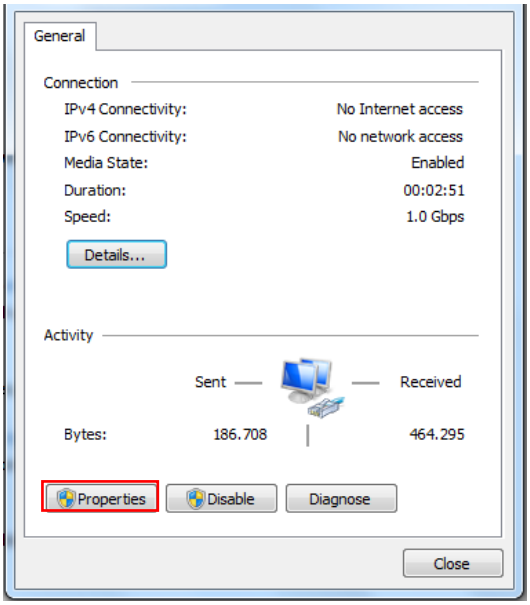

Figure 2-2

- Selecting Internet Protocol Version 4(TCP/IPv4) and clicking on Properties will open the Internet Protocol Version 4(TCP/IPv4) Properties (see Figure 2-3).

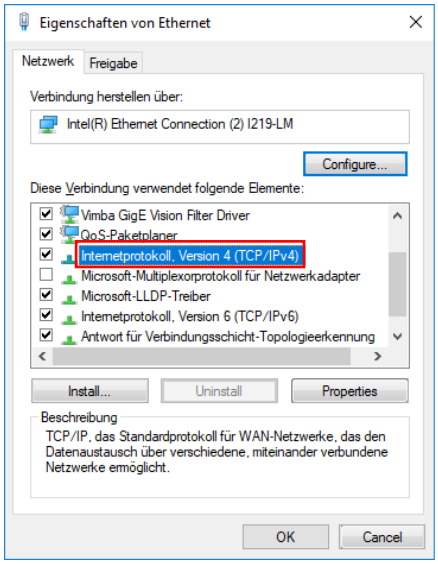

Figure 2-3

- There you can select Use the following IP address: and type an individual one that is within the same subnet range as the cameras (see Figure 2-4). Clicking on OK will save the settings.

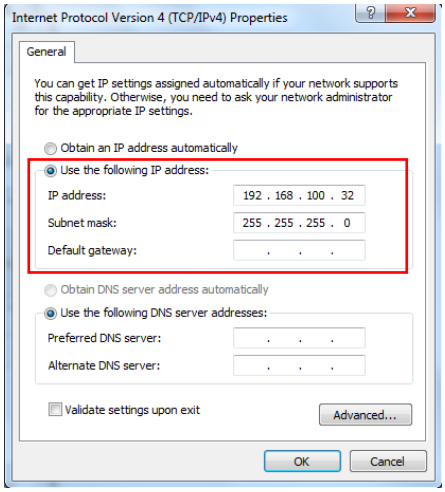

Figure 2-4

3 SOFTWARE SETTINGS IN OXYGEN

Please note that the video acquisition of ALVIUM cameras is an optional OXYGEN feature and requires a separate license!

3.1 ACTIVATING THE CAMERA MODULE

- To use an Alvium camera in OXYGEN, make sure that *GIGECAMERA* is enabled in the *DAQ Hardware* Setup. You can find it in the *OXYGEN Setup* tab (see Figure 3-1).

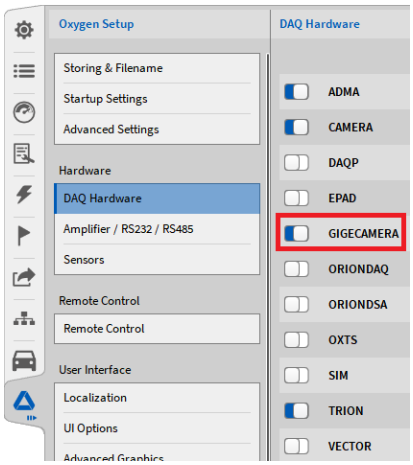

Figure 3-1

- After that, the camera will be listed in the Video Channels section of the Channel List.

3.2 CONFIGURING THE CAMERA WITH A FIXED FRAME RATE

- Go to the Data Channels menu and turn the channel on by switching the Activate Channel button (make sure the Recording button is turned on). Now you can enter the Camera Settings via clicking on the gear symbol and change certain camera properties if desired. Here you can choose also your desired *Fixed Frame Rate* (see Figure 3-2).

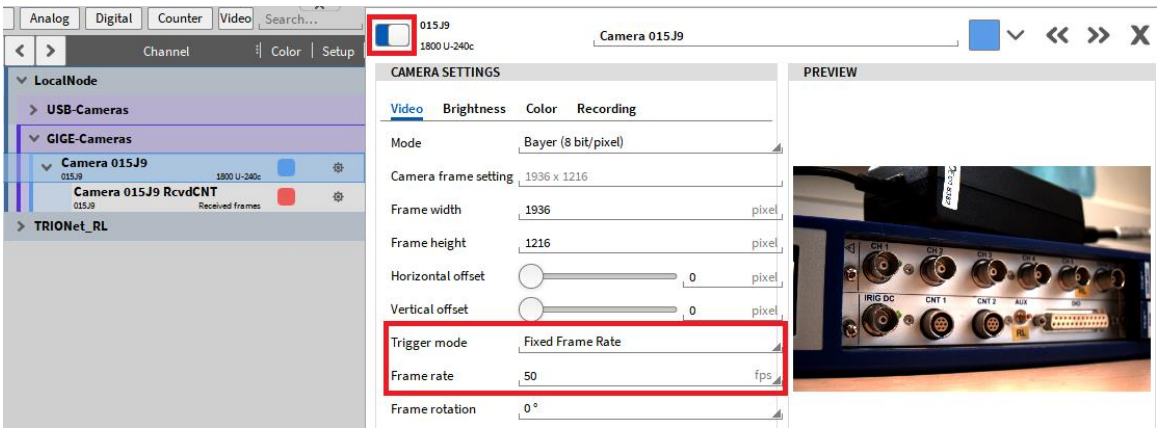

Figure 3-2

If multiple cameras are activated at the same time, they share the same bandwidth. If the bandwidth is not enough OXYGEN will display a warning and the user needs to limit the frame rate.

3.3 SYNCHRONIZING THE CAMERAS WITH EXTERNAL AUX-TRIGGER

The frame update of GIGE cameras can be triggered by OXYGEN. To do so, make sure that the External Aux Output (see Figure 3-3) is connected to the camera (available on TRION-BASE, TRION-TIMING and TRION-VGPS boards). The AUX connector can provide a LVTTL signal to trigger the camera.

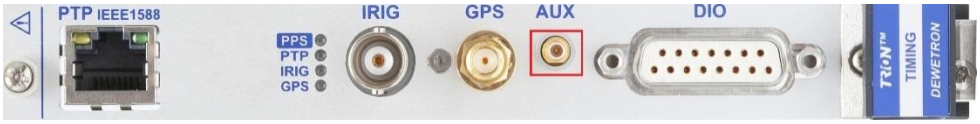

Figure 3-3

- To use the AUX channel, the TRION board must be plugged into the first card slot (the so-called *Star* slot) of your DEWE2/3 system.
- Go to the camera channel setup and switch the *Trigger Mode* to *AUX* (see Figure 3-4).

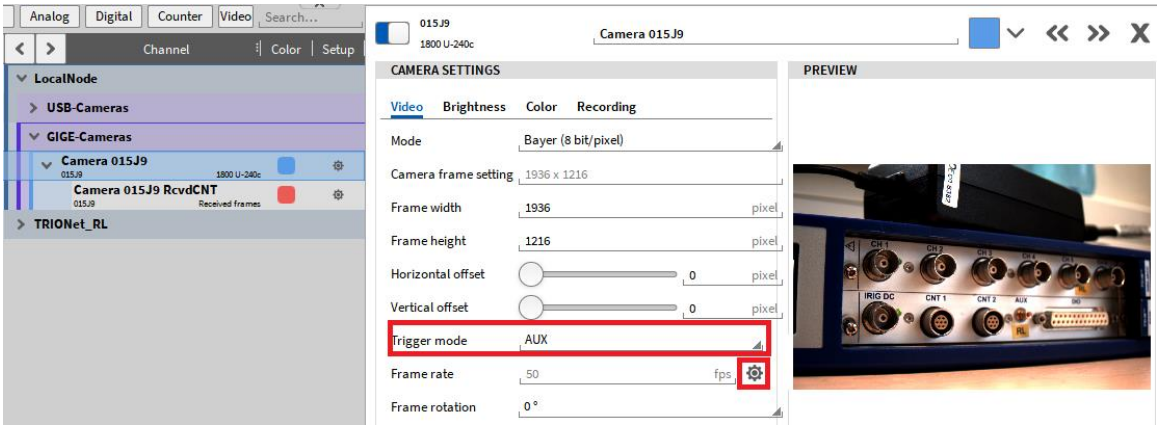

Figure 3-4

- This will lock the Frame Rate field below the Trigger Mode and display a gear symbol button. Now you need to adjust the *Sync Out AUX* Settings in the *Sync Setup* which you can find in the System Settings. By clicking on the gear symbol, you can enter the *Sync Setup* directly.
- Enable the *Frequency (AUX)* output in the *Synchronisation Output* section, select the desired signal *Frequency* (which will be the frame rate of the camera) and set the *StartEdge* to *Rising* (see Figure 3-5).

This means that the camera frame is updated every time, the signal has a rising edge.

Please not that synchronization of Alvium cameras to Falling signal edges is not supported!

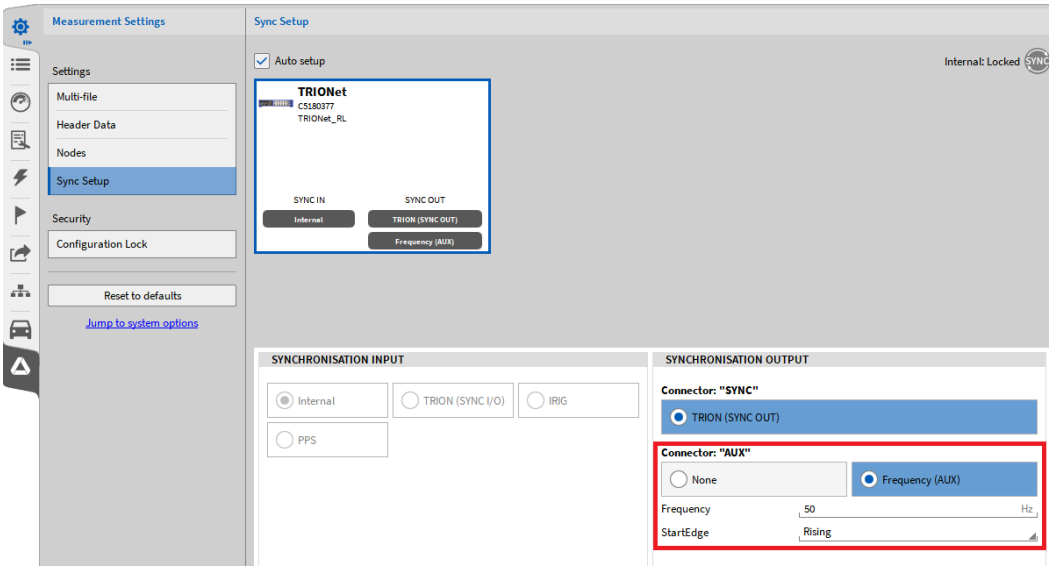

Figure 3-5

3.4 VIDEO SETTINGS

The following *Video settings* (see Figure 3-6) are supported:

- Mode: the following filters can be selected for video data transmission:
- Bayer – 8 bit/pixel
- YUV – 16 bit/pixel
- RGB – 24 bit/pixel
- Monochrome - 8 bit/pixel
- Frame width and height including horizontal / vertical offset
- Trigger mode and frame rate
- Frame rotation by 0°, 90°, 180° or 270°

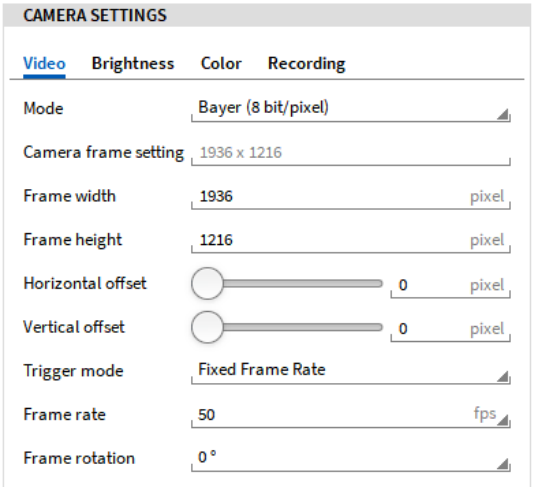

Figure 3-6

3.5 BRIGHTNESS SETTINGS

Exposure and *Gain* settings of the camera can be edited in the *Brightness* section of the *Camera Settings* (see Figure 3-7).

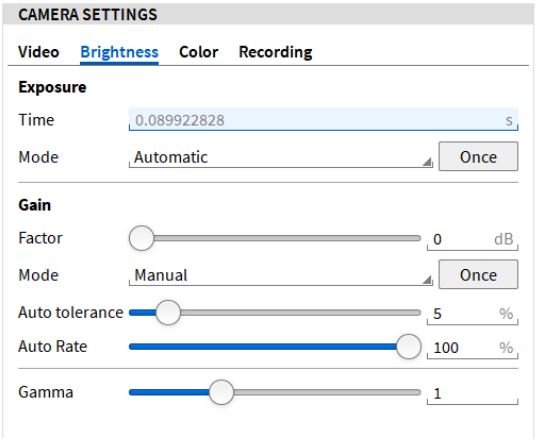

Figure 3-7

- Exposure time: Max. 1 s/frame rate; always slightly less, e.g. at 50 frames/s max. 17.9 ms exposure time.
- The Exposure time setting is saved on the camera and can be very short due to previous settings, e.g. 1 ms. As a result, the image is completely dark (black).
- Gain: If the frame rate is high and/or the light intensity is low, a medium image brightness can be achieved by increasing the factor. Clicking the Once button means “Once automatically” when the Exposure and Gain mode is set to Manual. The Automatic settings are intended for image recording with more changing light conditions.

3.6 Color Settings

Hue, *Saturation* and *Whitebalance* can be edited in the *Color* section of the *Camera Settings* (see Figure 3-8).

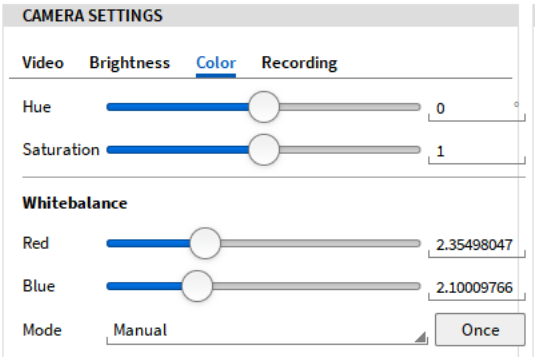

Figure 3-8

3.7 Recording Settings

By default, OXYGEN will store video data in a compressed mkv-format (see Figure 3-9). When recording at high frame rates, it may not be possible to compress the video while recording. In the submenu Recording which can be found in the Camera Settings the compression can be disabled and the video will be stored to a dmv-format.

- VP8 compression – mkv-format
- h.264 compression – mkv-format
- h.265 compression – mkv-format
- Uncompressed – dmv-format

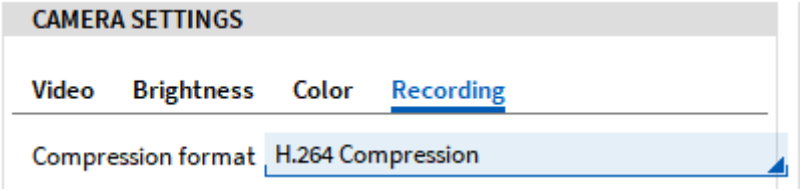

Figure 3-9

3.8 USING FRAME COUNTER CHANNELS

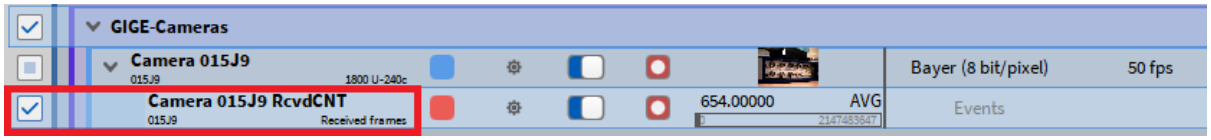

Figure 3-10

For each camera there exists a counter channel that counts the number of received frames since acquisition start. The channel has the same name as the respective camera with RcvdCNT appended (see Figure 3-10). To activate the counter, you need to activate the channel (The channel is not activated automatically).

This channel increases by one every time a new frame is received by OXYGEN from the camera. The instant of time when the frame is updated is stored as well and can be displayed in a table instrument or if the frame counter is visualized in a Recorder.

Thus, the information when the camera frame is updated, is available in this channel.
In case the camera is running with a fixed frame rate (see section 3.2), the instant of time the frame is updated is determined by the camera itself.
In case, the camera is running in AUX mode and is triggered by OXYGEN (see section 3.3), the instant of time the frame is updated is determined by OXYGEN.