User Guide to set up an environment for parallel processing

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EyeVision Version: 3.10

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EyeVision

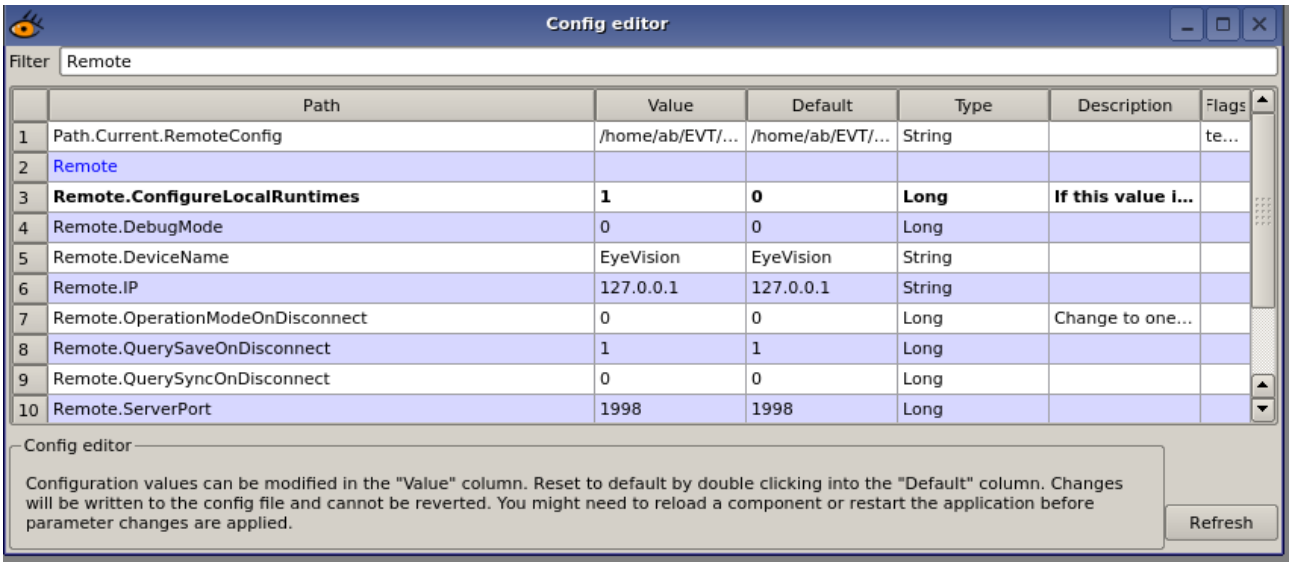
Setting up an environment for parallel processing

This guide will lead through the setup of a multi instance environment with the EyeVision software.

Preparation: Modify GUI to allow configuration of local runtimes

Configuration of local runtimes must be enabled in the configuration.

Edit->ConfigEditor



Set the value

Remote.ConfigureLocalRuntimes to **1**

After having modified this setting, a restart of the software is recommended.

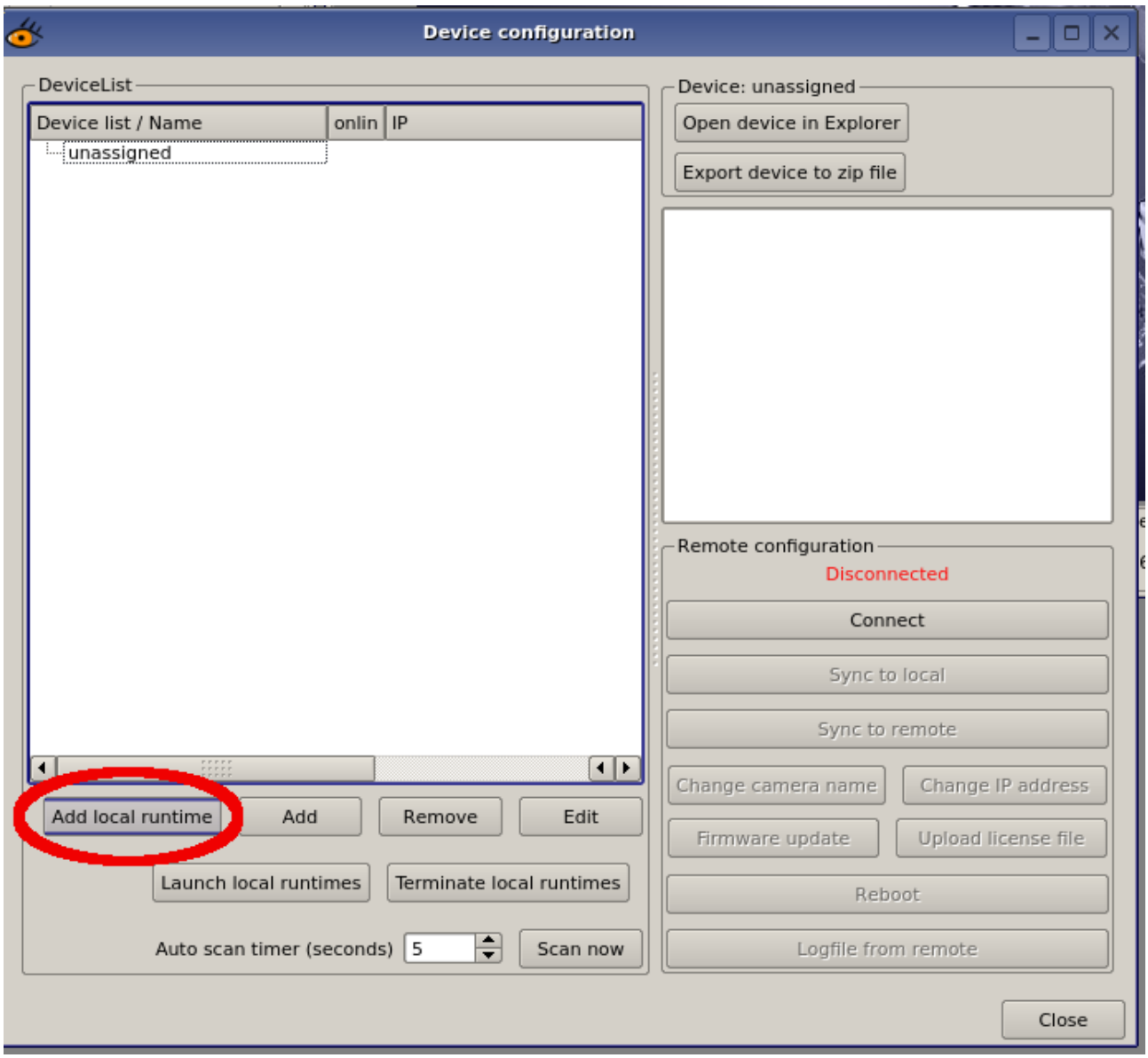
Define local runtimes

Launch the remote client.

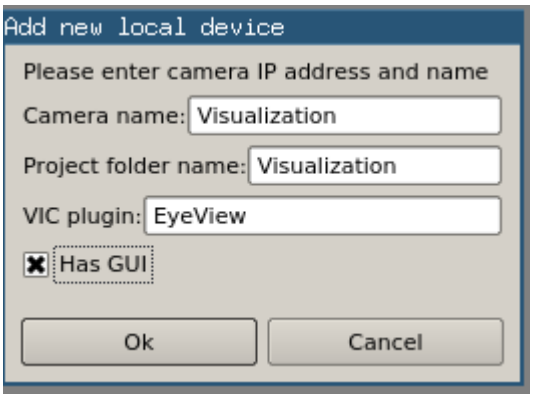
    /opt/EV3/bin/EyeVision -r

Enter the remote device configuration menu.

To define a new local runtime, click the button “Add local runtime”.

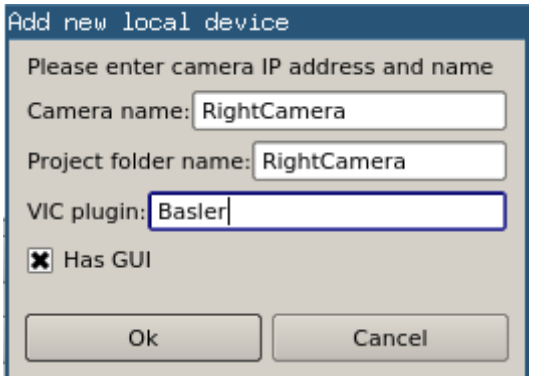


The configuration dialog allows to define the following parameters:

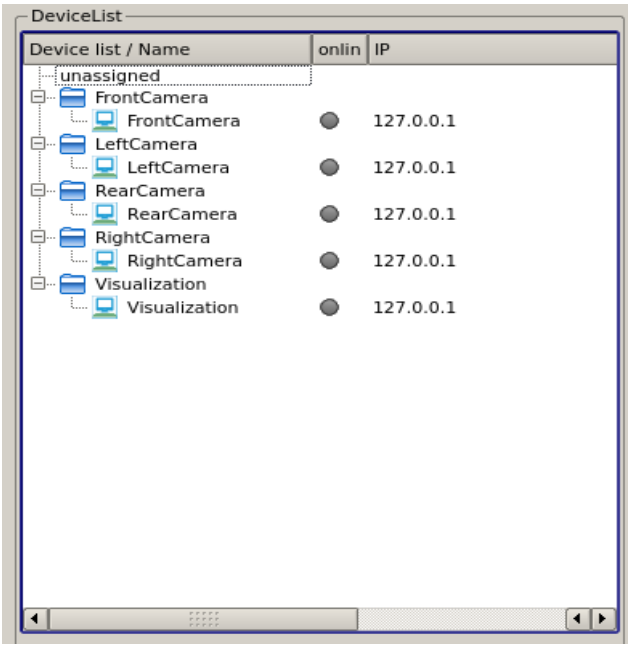


- **Camera name:** The device's name, as it will be listed in the device list.
- P**roject folder name:** Folder, where all the project's related data (programs, images, …) will be stored.
- **VIC plugin:** Name of a camera driver. Please launch the hardware configurator to get a valid list of VIC plugins, that are available on your PC.
  - Plugins may be: Basler, Sentech, MatrixVision, EyeView…
  - EyeView is a special VIC that can be used to display images that have been sent from other runtime instances using the command “Image transfer” via shared memory.
- **Has GUI:** A runtime may have it's own graphical user interface (Main window). A GUI can anytime be assigned or removed from the runtime.

  A typical setup might configure one instance with GUI for visualization and four instances that will actually process the images of four different cameras.

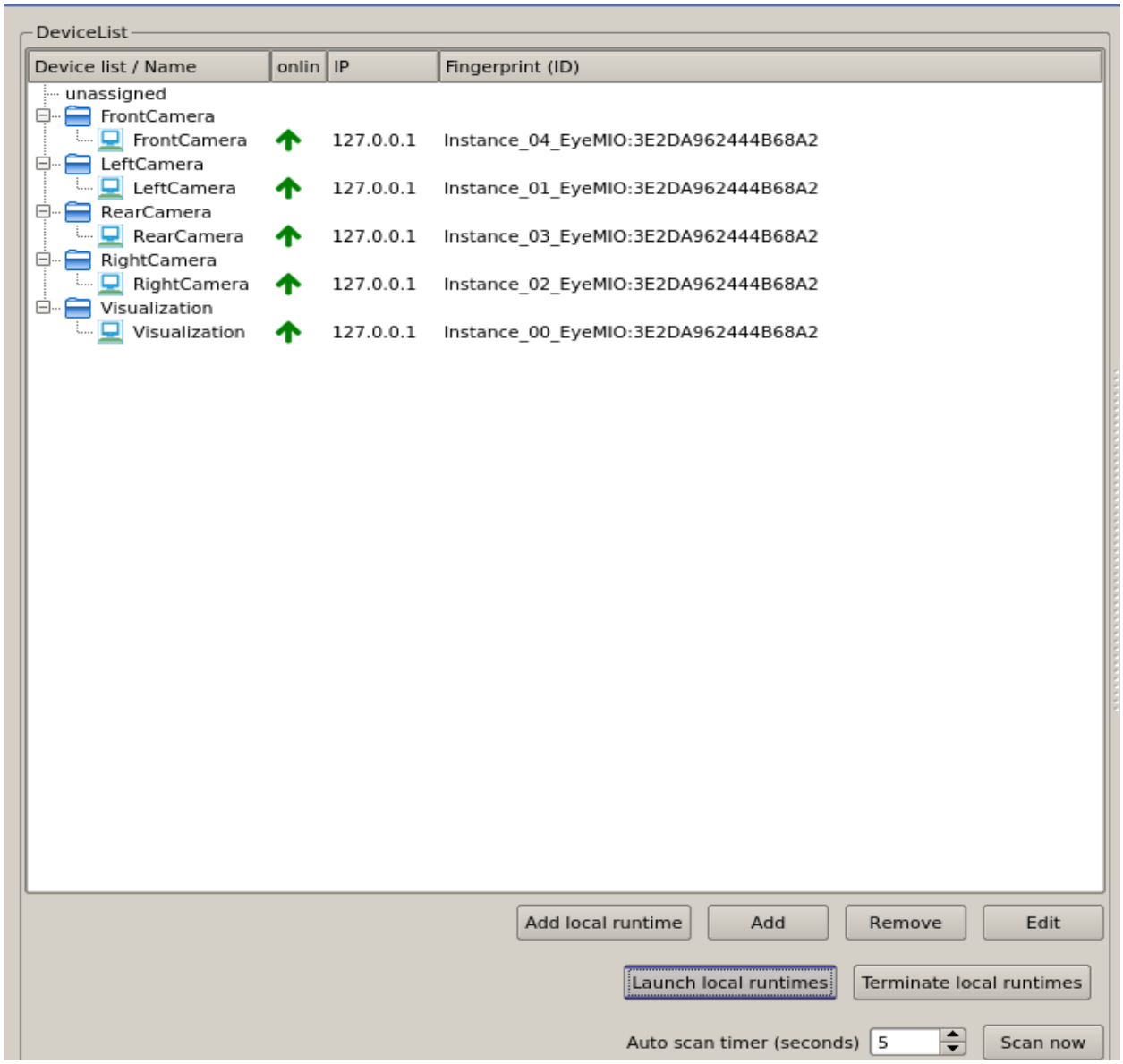


After configuration of the runtimes, the list of available camera devices might look as below: Each runtime has been assigned to it's own project folder.



Launch the local runtimes

After clicking the button “**Launch local runtimes**”, all runtimes will be executed on the local PC. A green upward arrow will indicate that the instances are not yet ready to use, as they still initialize.



A green LED will indicate that the runtimes are ready to use.

If you a GUI has been assigned to the runtime, the system can be used as a stand-alone EyeVision software, if no GUI has been assigned, the runtime can be used like any EyeVision remote server instance: Select the instance and press the button “Connect”.

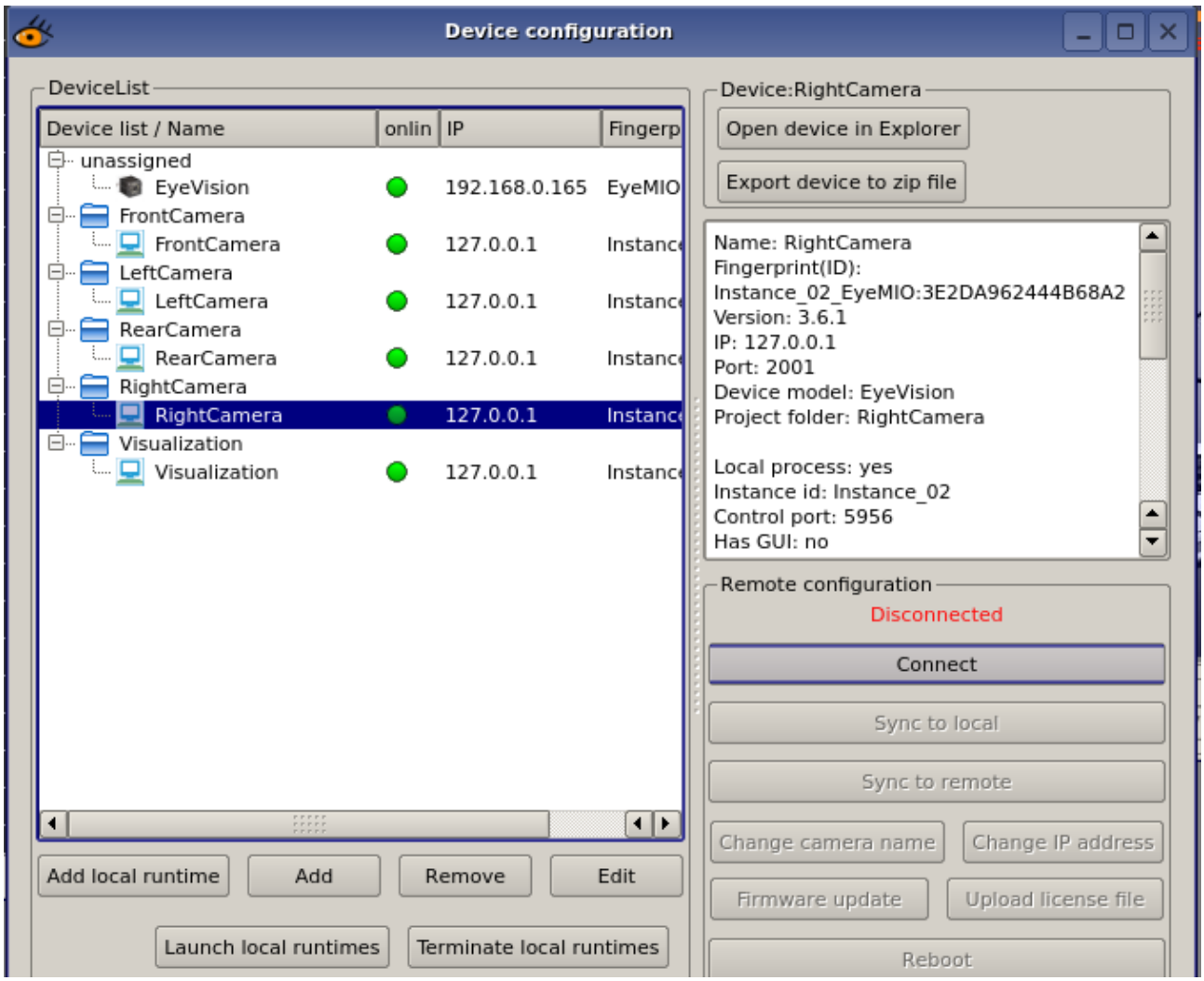
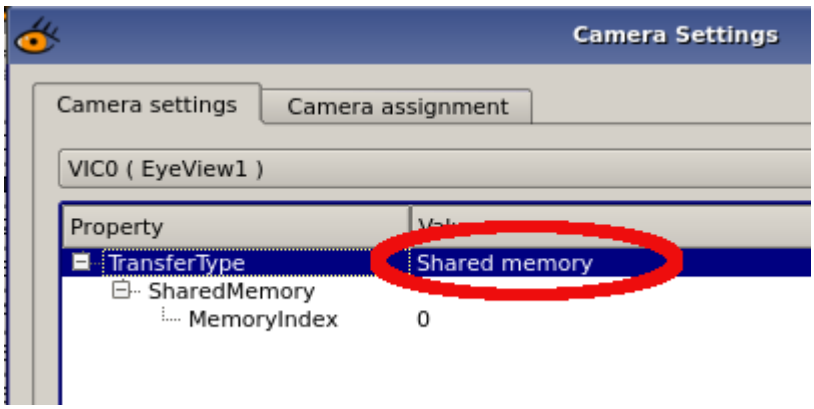


Image transfer between instances

Receiving images

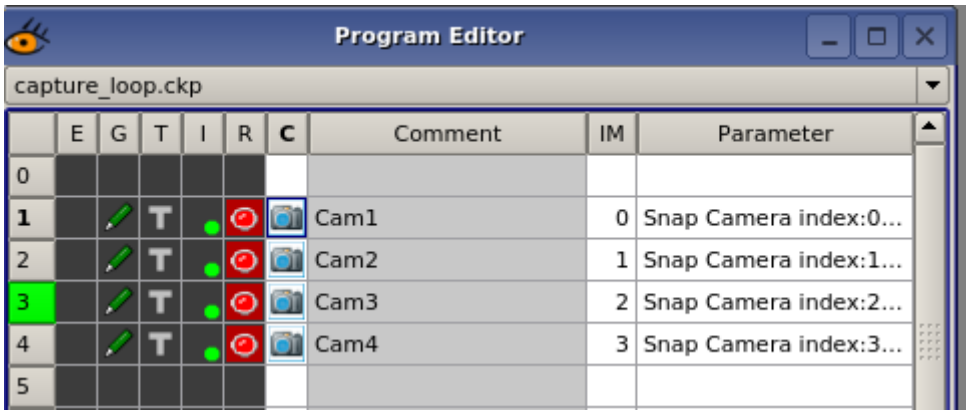
In our example one of the instances “Visualization” has a GUI and EyeView as VIC device.



By default EyeView VIC uses a TransferType “UDP” and needs to to adjusted to “Shared memory” inside the camera Settings menu (Options-> Camera Settings). This must be done for each VIC device.

A basic program for visualization might look like below:

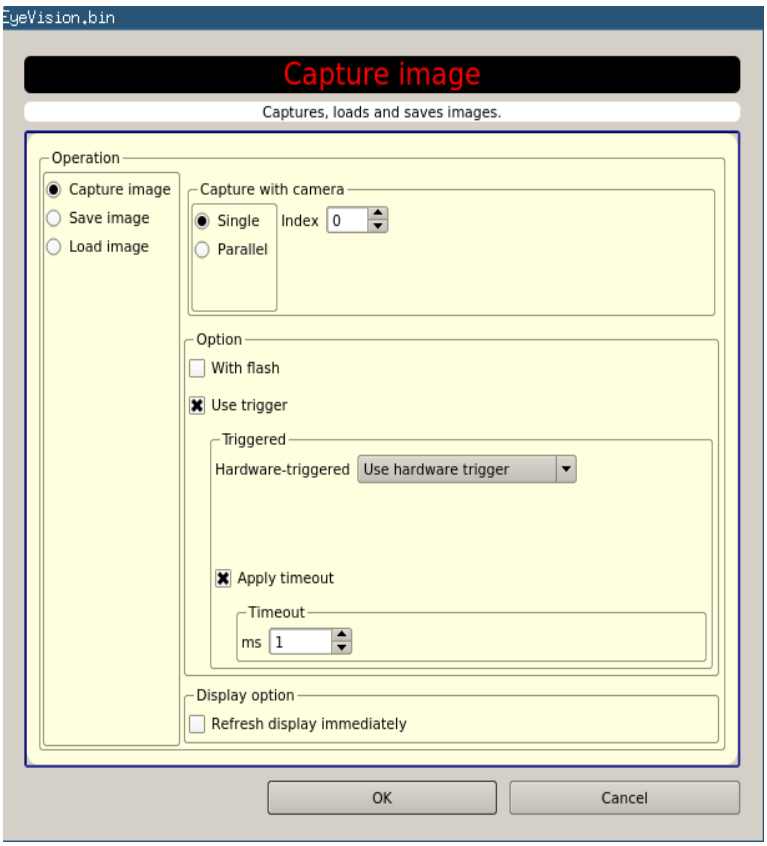
Each VIC has been assigned to a different image memory



As the EyeView VIC will block until an image has been provided, we have defined a short timeout to each instance of the image acquisition command: (Option “use trigger, hardware trigger, apply timeout”)

The commands will fail, if the runtimes do not provide an image.

By default the VIC EyeView allocates shared memory for 4 images with a size of 1280x1024



This setting can be manually adjusted in

PC_Local/Parameters/Hardware/EyeView/EyeView.ini

[SharedMemory]

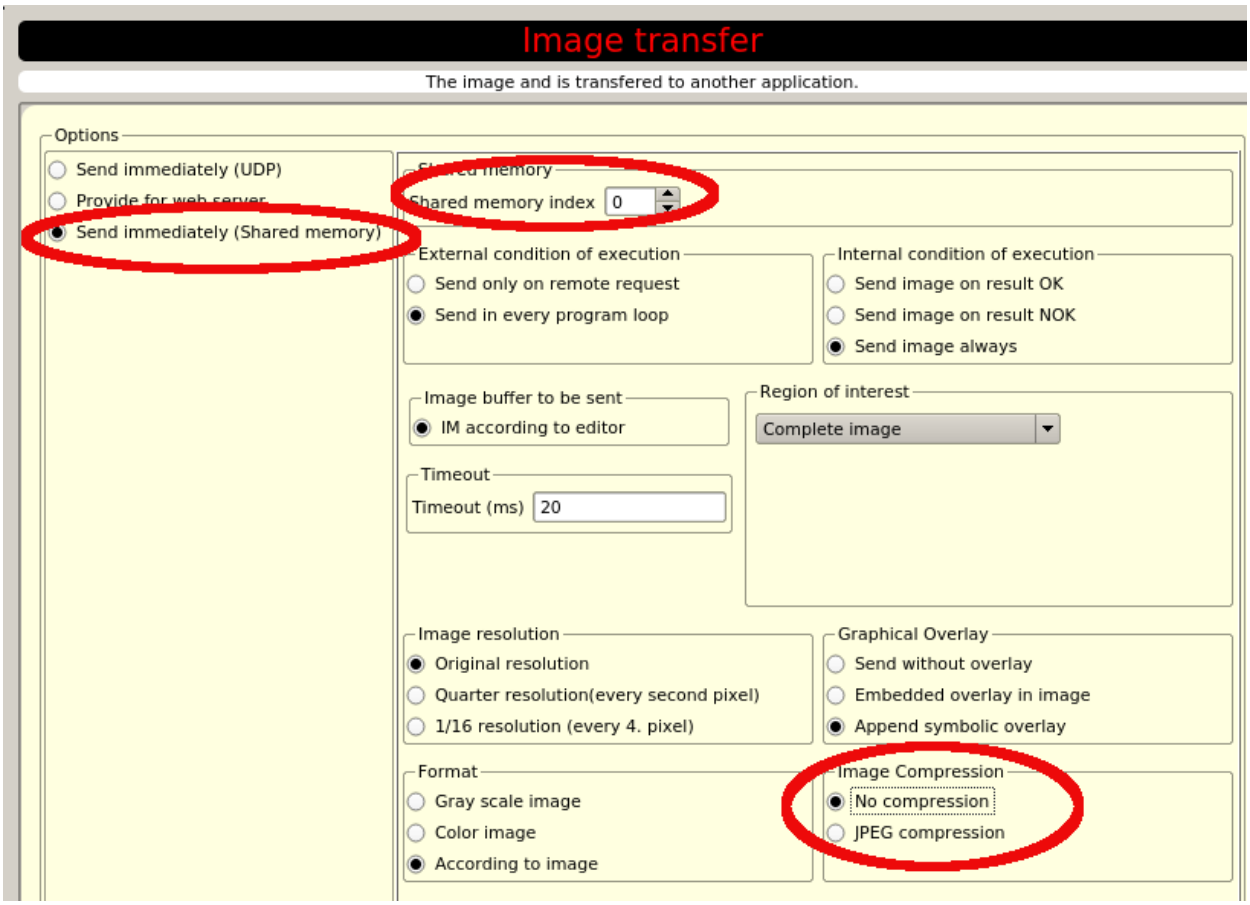
MaximumImagePacketSize = 1310720

NumberOfBuffers = 4

Sending images

A runtime that will send images to the visualization requires at least the two commands “Capture image” and “Image transfer”

To send images via shared memory, asure to select the option “Shared memory” and the correct “Shared memory index”. Please note that for shared memory uncompressed data transfer will be faster.

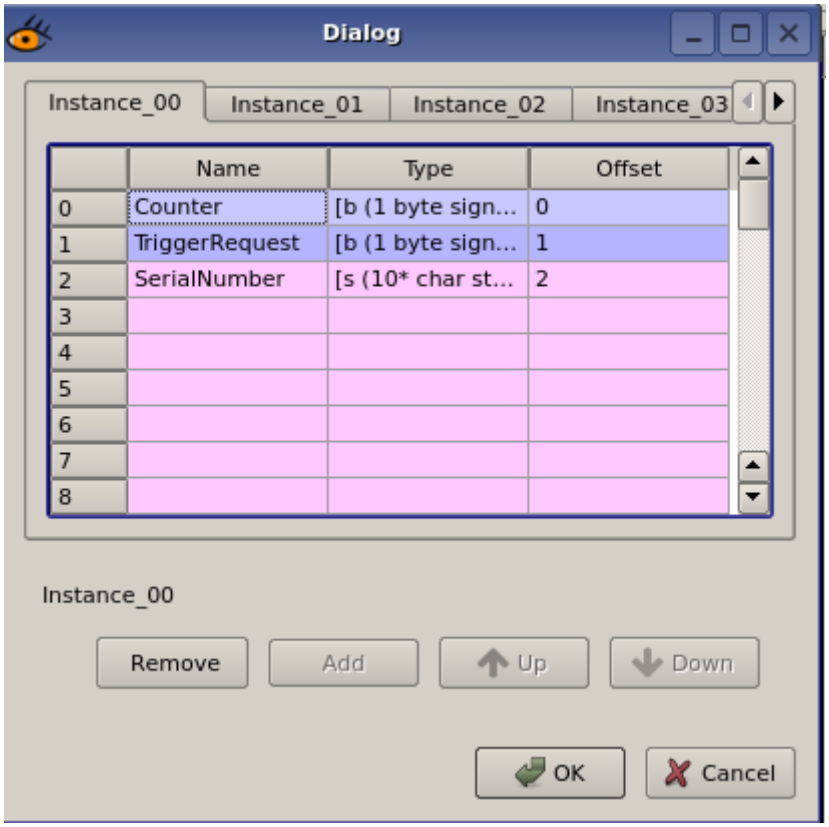


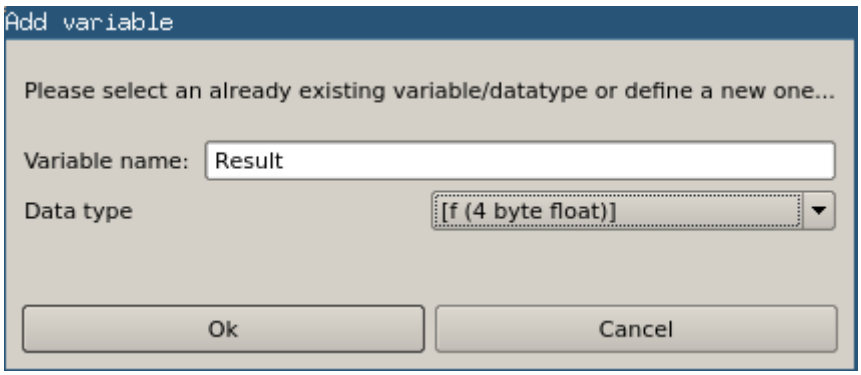
Data transfer using the command “Byte Array Access”

Each instance of the local runtimes has it's own byte array, where it can write values. Any instance can read the byte array from all other instances.

Define the byte array for communication in the Remote client software.

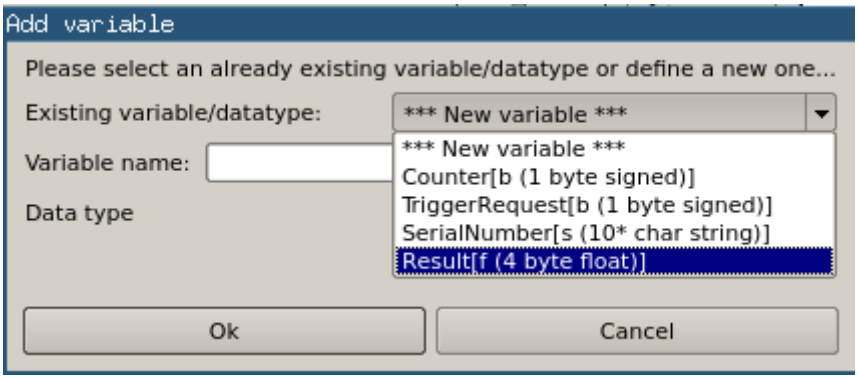
Open **Options->ByteArray configuration**





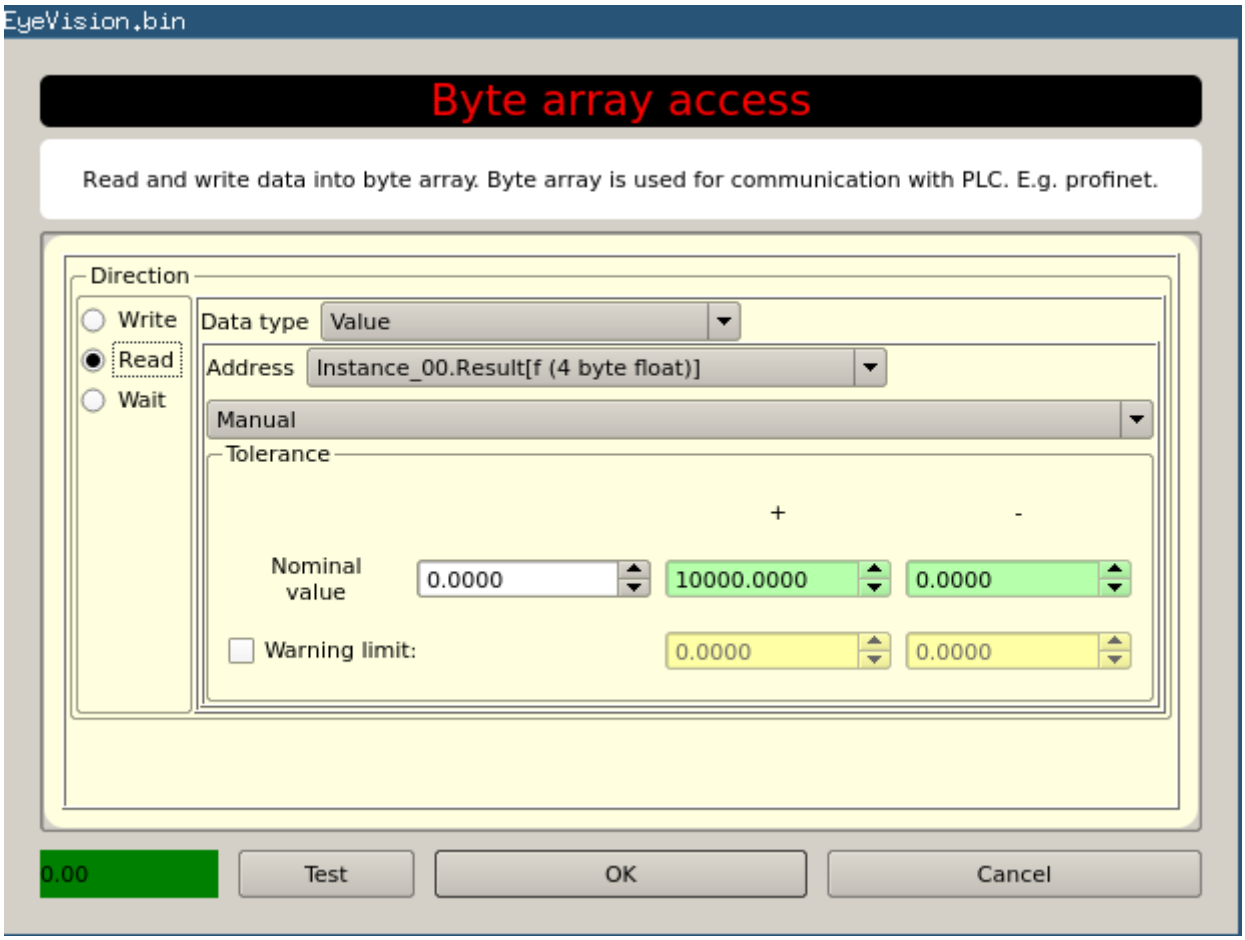
A variable can be added using the Add button.

Specify a variable name and a data type or select from a list of already defined pairs of Variable name and data type.



This can be used to apply the same variable definitions for different instances.

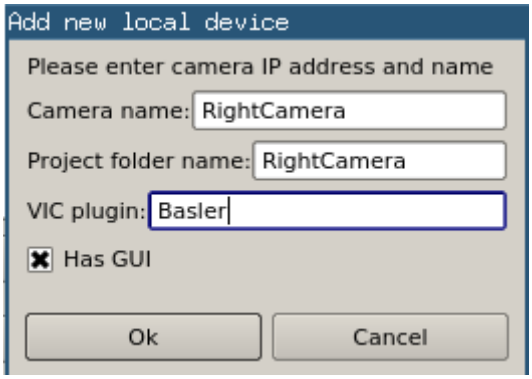
As soon as the variables have defined they can be used with the command Byte array access.



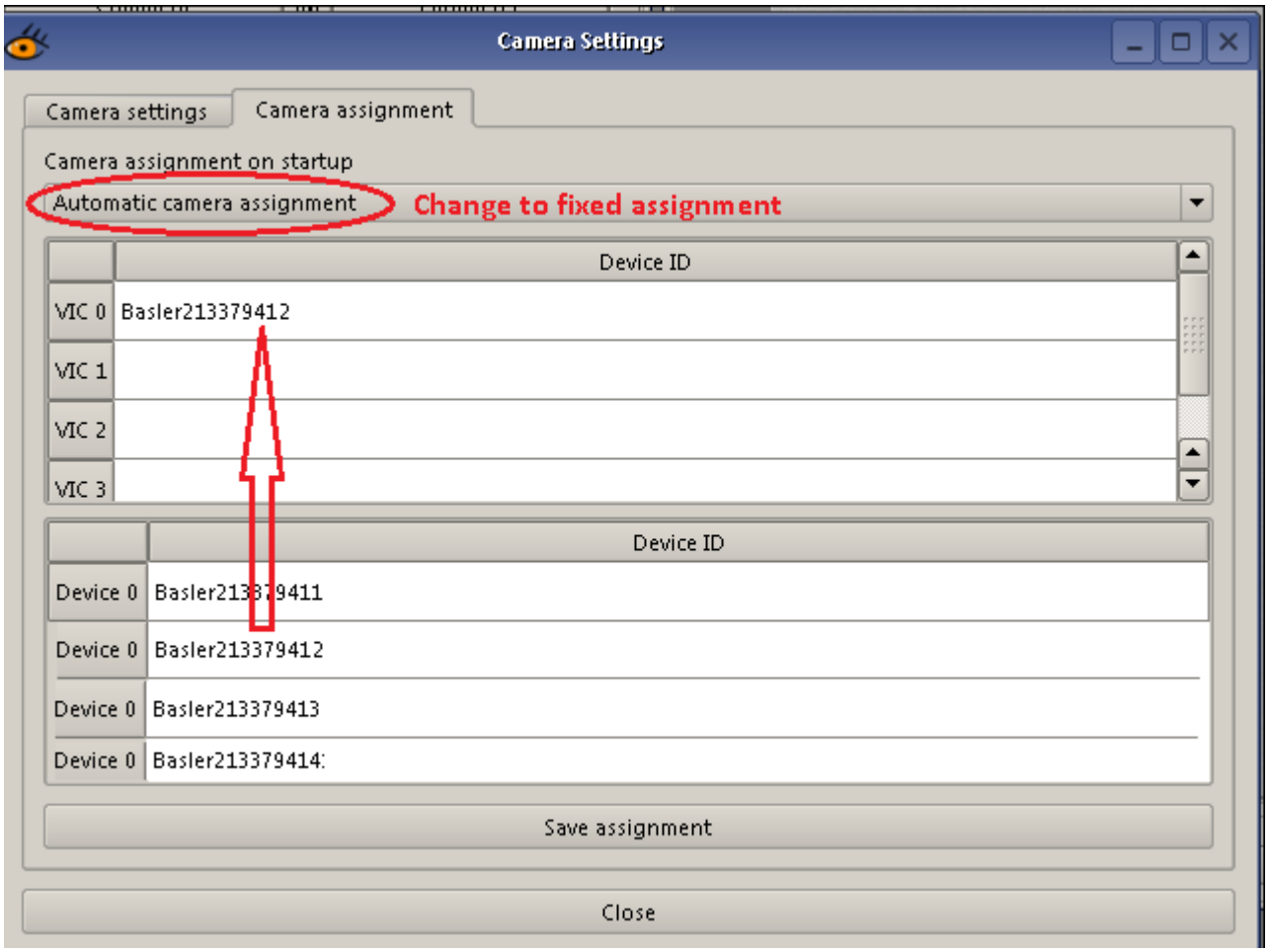
This command can write, read values. Also it can wait until a value has a been set.

Preparing camera hardware

A plugin can be configured with a specific VIC plugin.



To assign a specific camera to a runtime, the easiest way is to initially launch the runtime with a GUI. This will open up an EyeVision instance for this device. Enter the camera settings menu (Options → Camera Settings), navigate to the to the register “Camera assignment” and assign a specific camera to the first video input channel. Assure to select “Fixed assignment” and do not forget to save the assignment by clicking this button.



Launching runtimes at startup

To execute all runtimes on system start, EyeVision may be executed with a command line parameter -l (--launch). EyeVision will start all runtimes and exit directly.

Using an additional parameter -r (--remote), EyeVision will not exit and can be used as remote client.

To finally terminate all runtimes, a command line parameter -t (--terminate) can be used.

Below table lists all command line parameters that may be used to control runtimes.

Short	**Complete**	**Explanation**
-l	--launch	Launch all local instances. EyeVision will terminate instantly.
-t	--terminate	A terminate signal will be sent to all local instances of EyeVision.
-r	--remote	Launch EyeVision as remote client. In combination with parameter –launch, EyeVision will not terminate as soon as the local runtimes have been started.

To launch all local runtimes the following line can be used

Linux: /opt/EV3/bin/EyeVision -l

Windows: EyeVision.exe -l

To launch all local runtimes and start the remote client:

Linux: /opt/EV3/bin/EyeVision -r -l

Windows: EyeVision.exe -r -l