

Using nerian SceneScan in MERLIC

Recommended Camera Configuration

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Requirements

It is preconditioned that the 3D sensor has been installed, configured and calibrated correctly as described in the respective user manual.

To access the sensor with the MVTec GenICamTL interface (GenTL Consumer), you have to install the GenTL Producer which comes with the product.

After the installation, you have to make sure that the environment variable GENICAM_GENTL64_PATH is set and contains the path to the installed producer (.cti files).

Configuration of the Camera Parameters

The nerian GenTL producer offers various devices which you can connect to even if only one physical device is attached.

To use the sensor for 3D height image processing in MERLIC you need to add the respective device as an image source in the "**Image Sources**" tab of the MERLIC RTE Setup. You have to select the device that ends with "disparity", i.e., the device name in MERLIC will look similar to "udp://<IP of the device>/disparity". Otherwise, no special parameters need to be adjusted.

Alternatively, you may use the tool  **Acquisition** → **Acquire Image from Camera** for the image acquisition.

Conversion to Height Images

You can work with the disparity images out of the box. However, please note that the disparity values are inversely proportional to the height values.


If you want to convert the disparity image to a 3D height image, you have to calculate the following parameters for the tool  **Preprocessing** →  **3D Height Image** → **Convert Disparity to Height**

Image:

- Scan3dCoordinateScale
- Scan3dFocalLength
- Scan3dBaseline

For the nerian sensor, the value of the parameter "Scan3dCoordinateScale" is specified by the fixed value of "0.0625".

To calculate the values for the parameters "Scan3dFocalLength" and "Scan3dBaseline" you can use the Q matrix of the calibration of the nerian sensor because the Q matrix is related to the parameters.

The Q matrix can be obtained by the following steps:

- Access the sensor by entering its IP into your browser
- Click on the tab "Review Calibration" to see the Q matrix of the calibration.

The parameters have the following relation to this matrix:

$$Q = \begin{pmatrix} 1 & 0 & 0 & a \\ 0 & 1 & 0 & b \\ 0 & 0 & 0 & Scan3dFocalLength \\ 0 & 0 & 1/Scan3dBaseline & 0 \end{pmatrix}$$

The calculated parameters can then be used in the tool **Preprocessing** → **3D Height Image** → **Convert Disparity to Height Image**.

After converting the images to height images it might be required to further pre-process the images using the tools **Preprocessing** → **3D Height Image** → **Remove Outlier Pixels** and **Preprocessing** → **3D Height Image** → **Scale Gray Range to 8 Bit**. This ensures that pixel errors and invalid pixels are removed from the images to obtain height images that can be used for a smooth image processing in subsequent tools.