

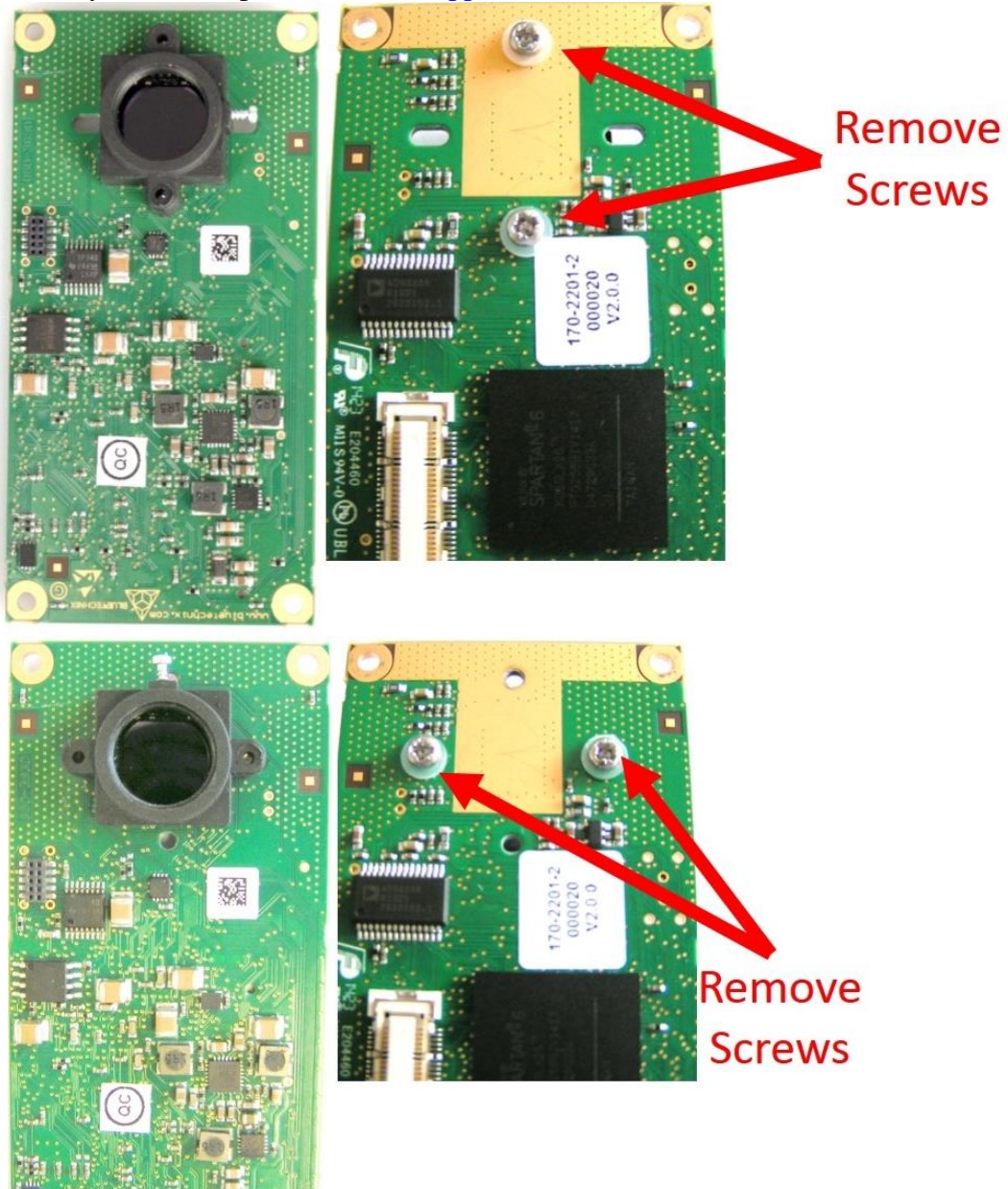
# Modification of TIM Lenses

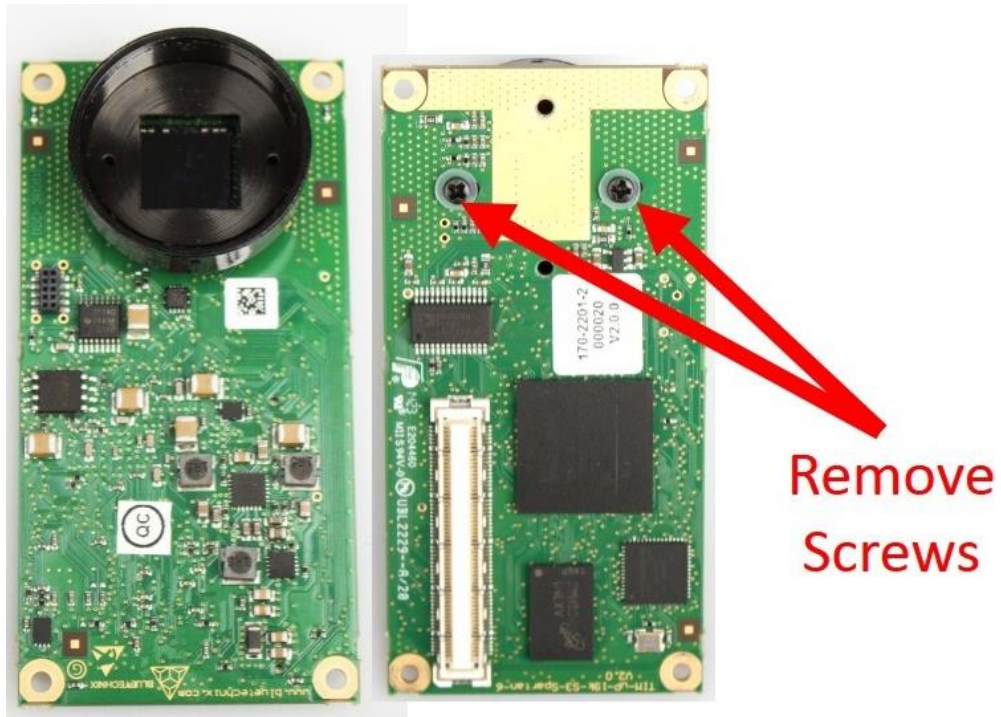
If a different Field of View is needed, the default version with 90° Field of View could be modified, according the method mentioned below:

Note: Please take care and don't touch or scratch the surface of the sensor during the modification.  
Make sure the modification is done in a dust-free environment!

## 1) Mechanical modification:

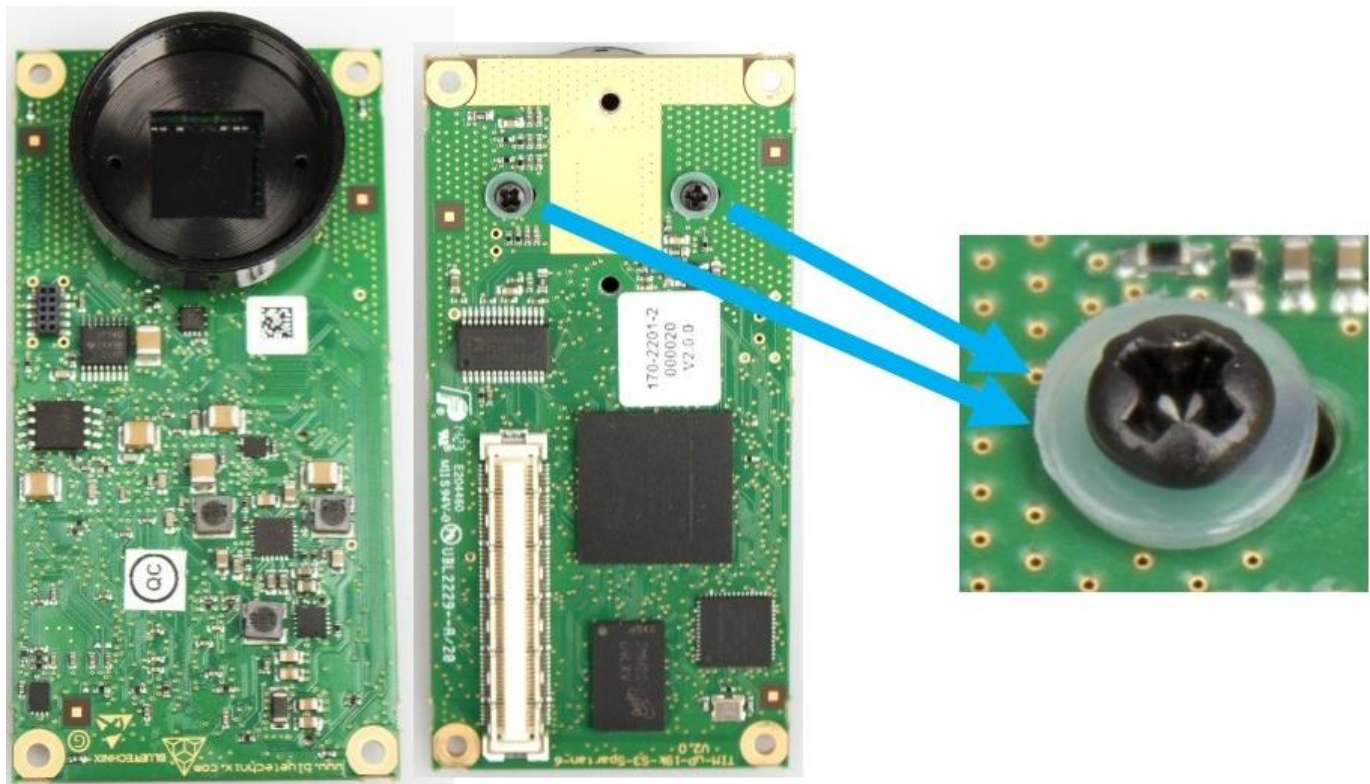
- a) Remove the existing lens-holder including the lens, by removing the two screws on the backside (bottom side) of the TIM module. If the TIM module is mounted in a camera you should be able to change the lens-holder without removing the TIM module. If you cannot reach the screws of the lens-holder on your device please contact [support@bluetechnix.com](mailto:support@bluetechnix.com) for further information.





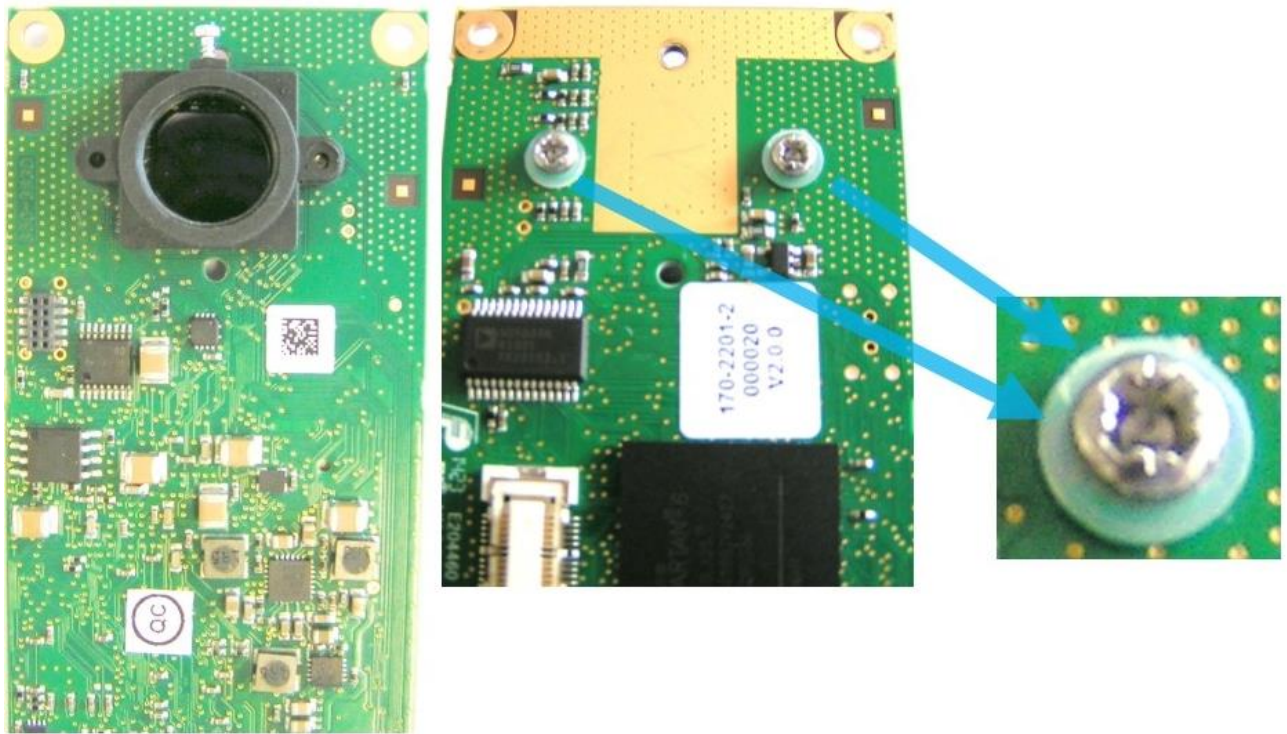
- b) Depending on the Field of View (FoV) there may be different lens holders which fits into different holes in the PCB. Use the holes, depending on your lens KIT as follow:

For CS-Mount:

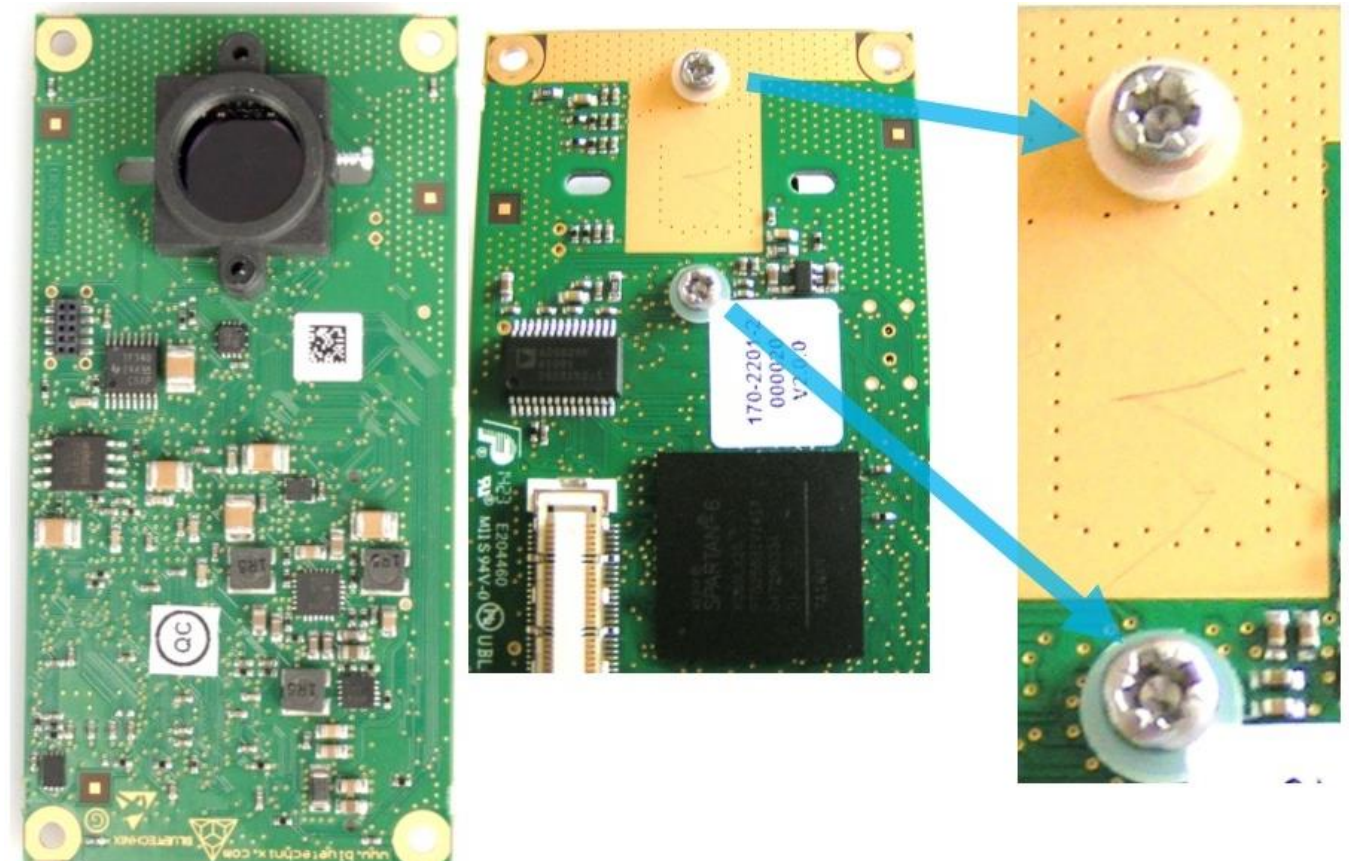




For 30°, 60° and 110°:



For 90°:

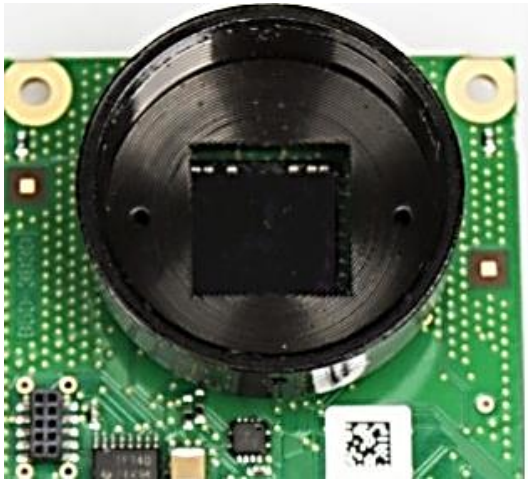


Fix the lens holder with the two screws provided in the lens package.

Note:

When screwing the new lens holder be sure, that plastic washers are between pcb and screws. The holder should be mounted without a gap between the holder and the pcb.

c) Now insert the new lens into the lens-holder



## 2) Next step is the FOCUS-Adjustment:

If you have un-mounted your camera to get the TIM, reassemble the camera.

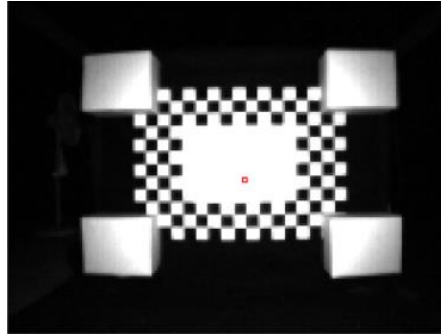
- a) Put the camera in front of a chess pattern in a distance of  $\geq 1,5\text{m}$ .  
An example for a chess pattern can be found on the following link:

Be sure to print it out in a size so that you see enough edges in the amplitude image.

- b) Power the camera and connect it to your PC according to the interface of your camera. Refer to the Quick Start Guide or the Hardware User Manual of your camera to get more information about connecting your camera.
- c) Open the Visualizer Software.
- d) Manually turn the lens either clockwise or counter clockwise until you get a sharp amplitude image.



Note: Be sure to use the right lens holder for your lens. Otherwise you may not be able to put them in focus!



Example of a chess pattern in the amplitude image

### 3) Software modifications:

In order to get the lens corrected point cloud you have to update the lens calibration file according to the mounted lens. Select the right lens calibration file for your ToF device and lens!

Depending on the SDK type (btaP100 or btaeth lib based devices) there are two different processes in applying a lens calibration file.

#### a) **btaP100 based devices (Argos3D-P100, TIM-UP-Spartan6-19kS-3):**

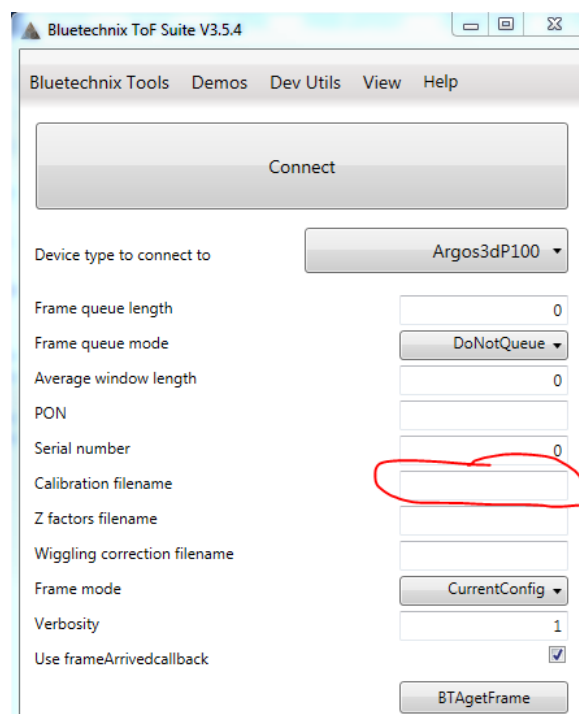
The lens calibration file has to be applied in the BTAopen function of the SDK or in the appropriate field of the BltTofSuite.

#### **Using the SDK:**

Set the path to the lens calibration file in the parameter “*calibFileName*” of the config struct (*BTA\_Config*) which will be passed to the BTAopen function.

#### **Using the BltTofSuite:**

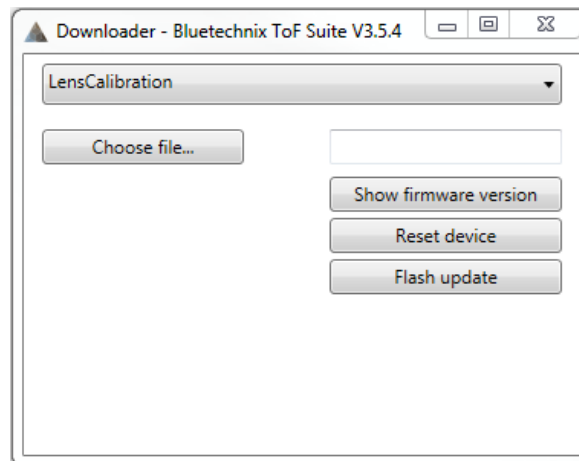
Enter the path to the lens calibration file in the appropriate field of the BltTofSuite configuration window.



b) **btaeth based devices (Sentis-ToF-M100, Sentis-ToF-P509, Sentis-ToF-P510, Argos3D-P310, Argos3D-P320, TIM-UP-19k-S3-ETH):**

The lens calibration file must be loaded onto the camera using the Downloader of the BltTofSuite.

- Open the Downloader from the Drop Down menu of the configuration manager (Dev Utils→Downloader).
- Select “LensCalibration” in the select box.
- Press “Choose file...” and select the appropriate lens calibration file.
- Press the “Flash update” button.



- After a while you should get the message “Flash update success”.
- In order to activate the correct lens calibration file you have to select your lens in the register *HardwareConfiguration* (0x000B). On the following link you can find a table which value you have to enter in this register for the selected lens:  
[https://support.bluetechnix.at/wiki/HOWTO\\_change\\_the\\_TIM\\_lens](https://support.bluetechnix.at/wiki/HOWTO_change_the_TIM_lens).