TRIOPTICS

See the Difference

Installation Instructions

OptiCentric® 9

translation of the original Installation Instructions Draft

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DRAFT: OptiCentric 9 Installation Instructions

1. Installation

1.1. OptiCentric 9

Find the latest release version* on the server:
\\server\pub\SoftwareProducts\OptiCentric 9\
Run the installer (*.msi).

Note: The latest release is the highest version number that is NOT labeled as "-betaXX" or "RCXX".

1.2. Hardware DLLs (device-specific)

Get the required hardware DLLs from the server:
\\server\Fertigung\SOFTWARE\OptiCentric + OptiSpheric\Musterordner\[XX_DEVICE]\OptiCentric 9\
Copy this to C:\ProgramData\OptiCentric9\, replace existing folders if necessary.

Note: The folder C:\ProgramData\ is hidden by default, but can be made visible via "View" -> "Hidden items".

2. Preparing the configuration files

Note: The following file names refer to: C:\ProgramData\OptiCentric9\

2.1. Camera(s)

File	.\Cameras\PointGrey_FlyCapture2_xxx\PointGrey_FlyCapture2.cfg

Entry	`[Camera 1]`
	`ID = xxxxxxxx`
	
	`[Camera 2]`
	`ID = xxxxxxxx`

Note	Query with FlyCap2 software or sticker on the camera

2.2. Stage Controller

File	.\Stages\Trinamic_TMCL_xxx\Trinamic_TMCL.cfg
Entry	`[General]` `PortName = COMxx`
Note	Query via Hardware Manager

2.3. [OPTION] Rotation Controller

File	.\Stages\EposStage_Vxxx\EposRotaryAxis.cfg

Entry	`[General]` `PortName = SN:xxxxxxxxxxxxxx`
Note	Query Epos Studio or OC9 error message when connecting

2.4. [OPTION] LED Controller

File	.\Light\LuconLight\LuconLight.cfg
Entry	`[General]` `PortName = COMxx`
Note	(List of all COM ports in the Hardware Manager)

2.5. [OPTION] TESA

File	.\1DSensors\Tesa_TesaTronic_xxx\Tesa_TesaTronic.cfg
Entry	`[General]` `PortName = COMxx`
Note	(List of all COM ports in the Hardware Manager) If more than one sensor: 1. Rename folder to Tesa1_TesaTronic_xxx 2. Create a copy, rename to Tesa2_TesaTronic_xxx etc. 3. Rename each *.sen1D file accordingly 4. Adapt each *.cfg file (see above)

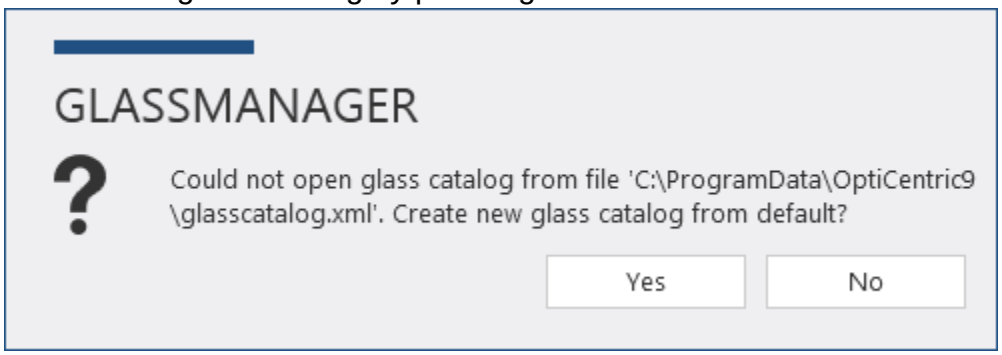
2.6. [OPTION] STIL (CCS Prima)

File	.\1DSensors\STIL_DLL_CHR_xxx\STIL_DLL_CHR.cfg
Entry	(no change needed, USB connection is automatic)
Note	If more than one sensor: 5. Rename folder to STIL1_DLL_CHR_xxx 6. Create a copy, rename to STIL2_DLL_CHR_xxx etc. 7. Rename each *.sen1D file accordingly

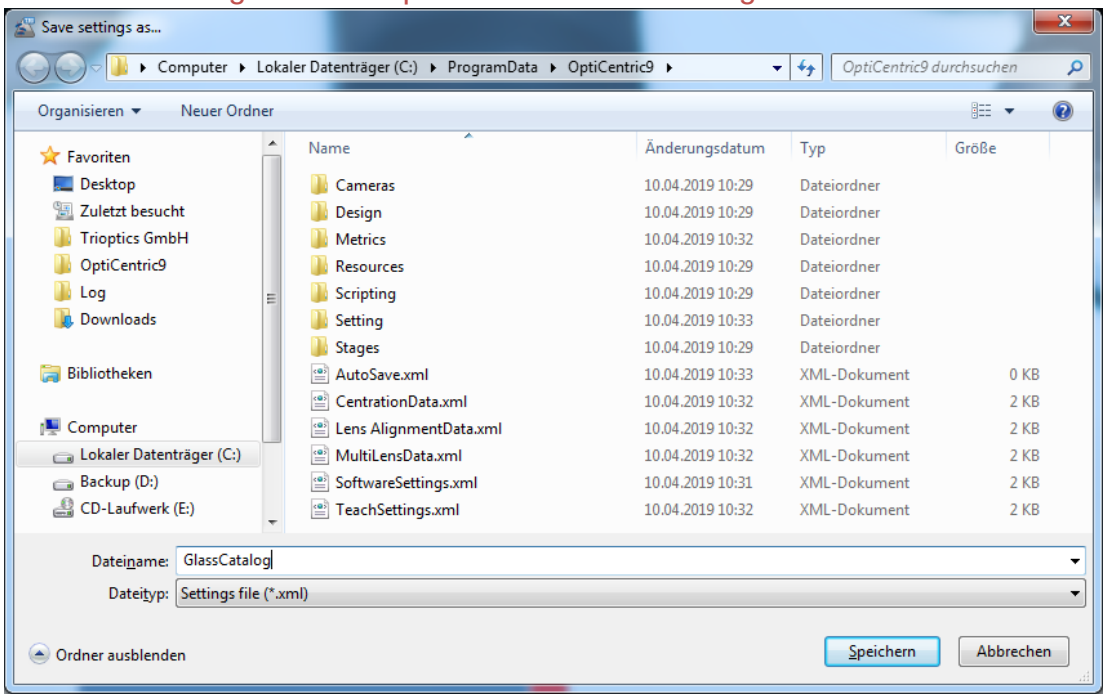
3. Configure the software

3.1. Glass catalog

- Start OptiCentric 9.
- Create new glass catalog by pressing "Yes":

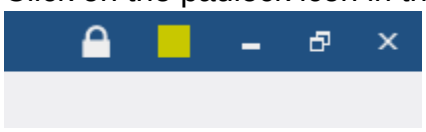


- Save as: C:\ProgramData\OptiCentric9\GlassCatalog.xml



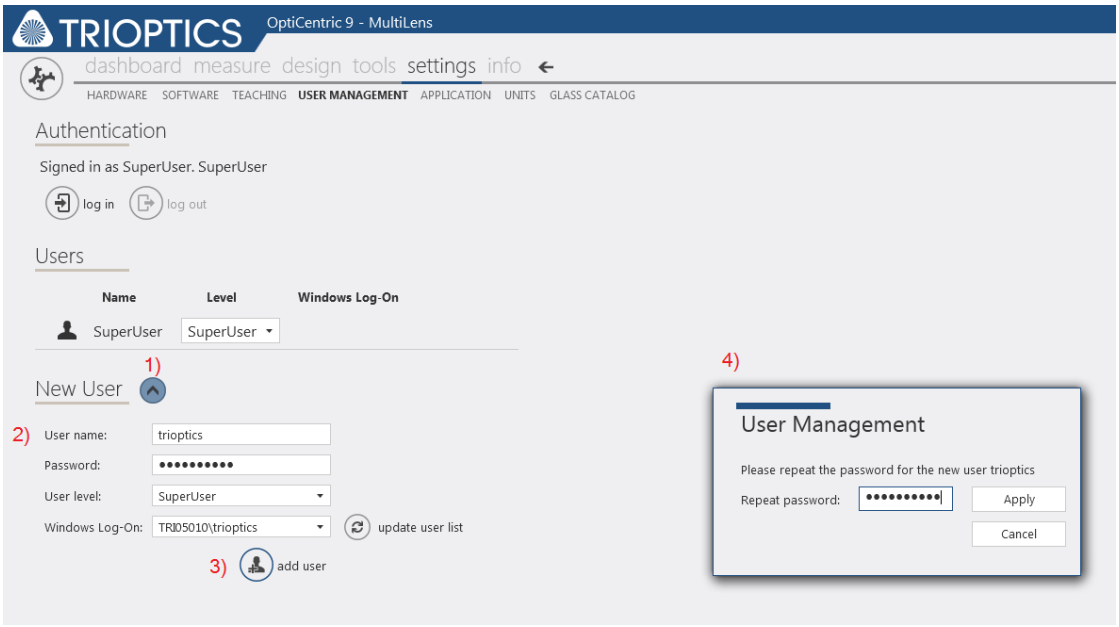
3.2. Permissions

- Click on the padlock icon in the top right corner:



- Log in with "+trioptics" as SuperUser.
- Open Settings → USER MANAGEMENT.

- Create new user:



User name: trioptics
Password: +trioptics
User level: SuperUser
Windows logon: (Select entry in list)

- Restart the software.
  →User "trioptics" is now logged in automatically.

3.3. Connect the hardware

Open Settings → HARDWARE.

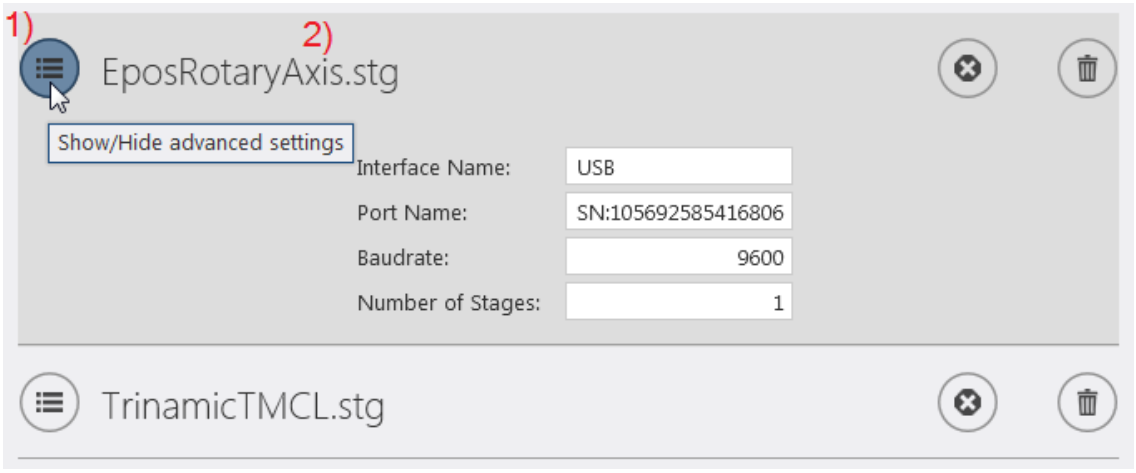
3.3.1. CAMERA CONFIGURATION

- "+ add camera"
- Select .sen file (from ProgramData\OptiCentric9\Cameras).
- If connection is successful,  changes to  .
  Otherwise, check the error message under Info → LOGGING.

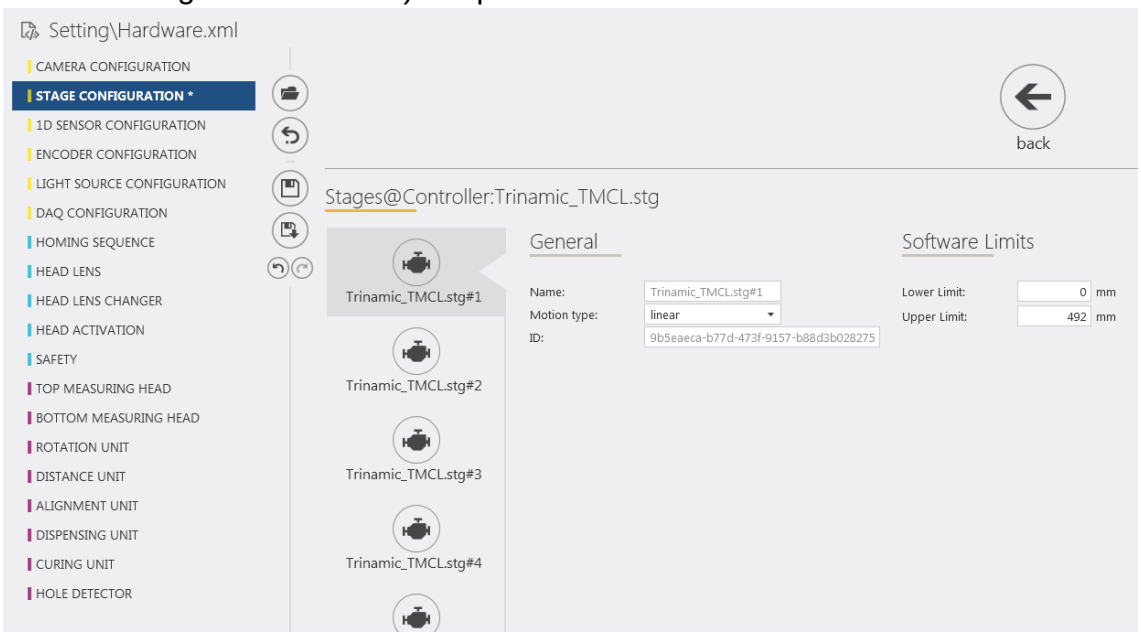
3.3.2. STAGE CONFIGURATION

- "+ add stage"
- Select .stg file (from ProgramData\OptiCentric9\Stages).
- If connection is successful,  changes to  .
  Otherwise, check the error message under Info → LOGGING.

- Button 1) opens connection details – CAUTION: Specifications are ignored, changes only possible via .cfg file (see 2).



- Click the stage name itself 2) to open detail view:



- Make settings according to hardware (no stage can be moved without valid software limits!):
  - Example: Epos
    - Motion type: rotary
    - Lower Limit: -1000000°, Upper Limit: 1000000°
  - Example: Trinamic
    - #1 (Z-stage top)
      - Motion type: linear
      - Lower Limit: 0mm, Upper Limit: e.g. 492mm
    - #2 (Z-stage bottom)
      - Motion type: linear
      - Lower Limit: 0mm, Upper Limit: e.g. 249mm

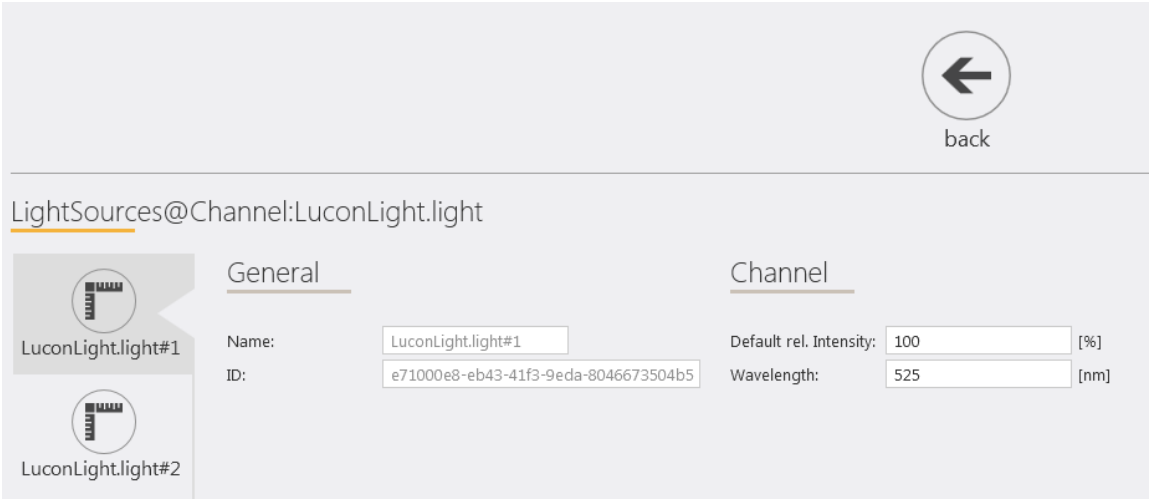
3.3.3. [OPTION] 1D SENSOR CONFIGURATION (STIL, TESA, …)

- "+ add sensor"
- Select .sen1D file (from ProgramData\OptiCentric9\1DSensors).
- If connection is successful,  changes to  .
  (Takes approx. 8 seconds with CCS Prima!).
  Otherwise, check the error message under Info → LOGGING.

3.3.4. [OPTION] LIGHT SOURCE CONFIGURATION

Note: Only if LED controller is available.

- "+ add light"
- Select .light file (from ProgramData\OptiCentric9\Light).
- If connection is successful,  changes to  .
  Otherwise, check the error message under Info → LOGGING.
- Click the controller name to open detail view:

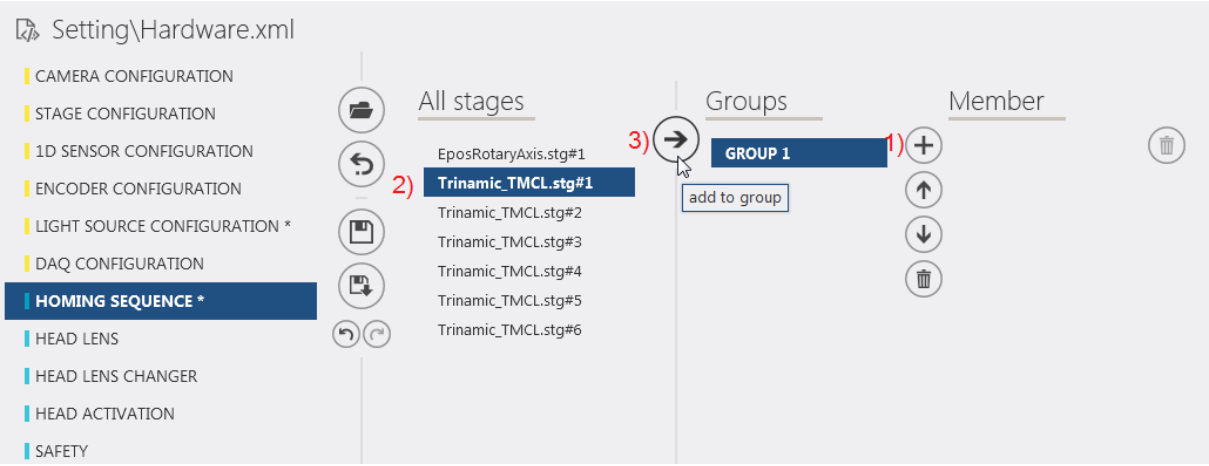


- Make settings according to hardware (wavelength is used for refractive index calculation!).
  - Example: High power LED green
    - Wavelength: 525nm

3.4. Configure the homing sequence and head lenses

3.4.1. HOMING SEQUENCE

- Create new group 1). Select stage 2). Add the group 3).



- Repeat until all stages used are assigned to a group.
  - Example: OC3 method
    - GROUP 1: Z-stage top, Z-stage bottom
    - GROUP 2: Air bearing

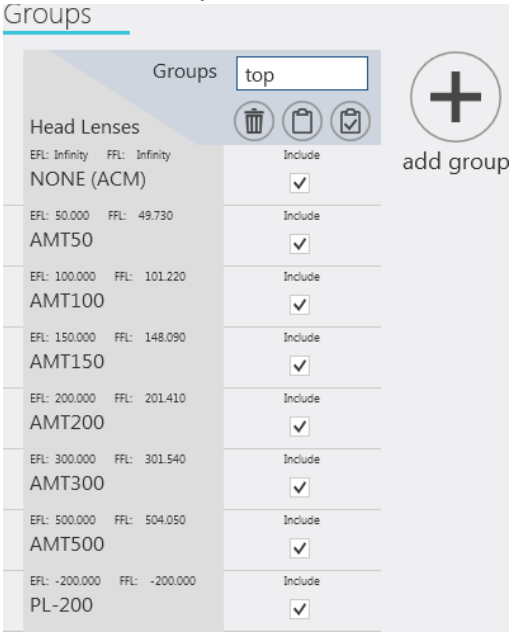
Note: All stages in a group start their homing run at the same time. All groups are processed one after the other.

3.4.2. HEAD LENSES

- Fill in the table with measured FFL values and EFL values, if applicable. Add additional head lenses if required:

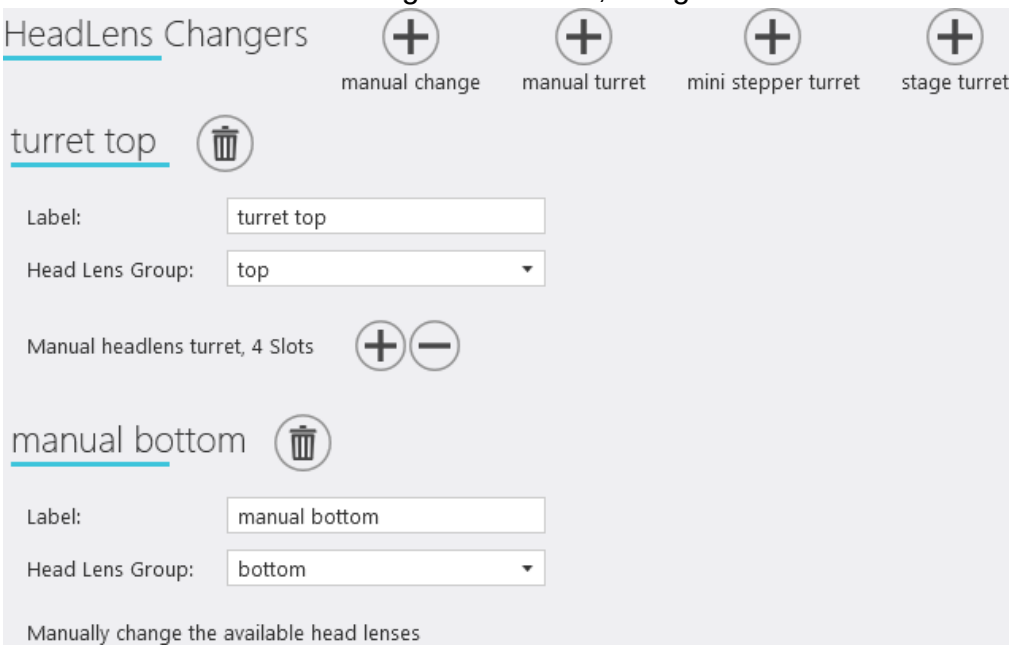
- Create a new group for each measuring head and assign all head lenses to be used by this measuring head. Multiple answers are possible (e.g. for

Extension Set):



3.4.3. HEAD LENS CHANGER

- Create new entries according to hardware, assign suitable Head Lens Groups:

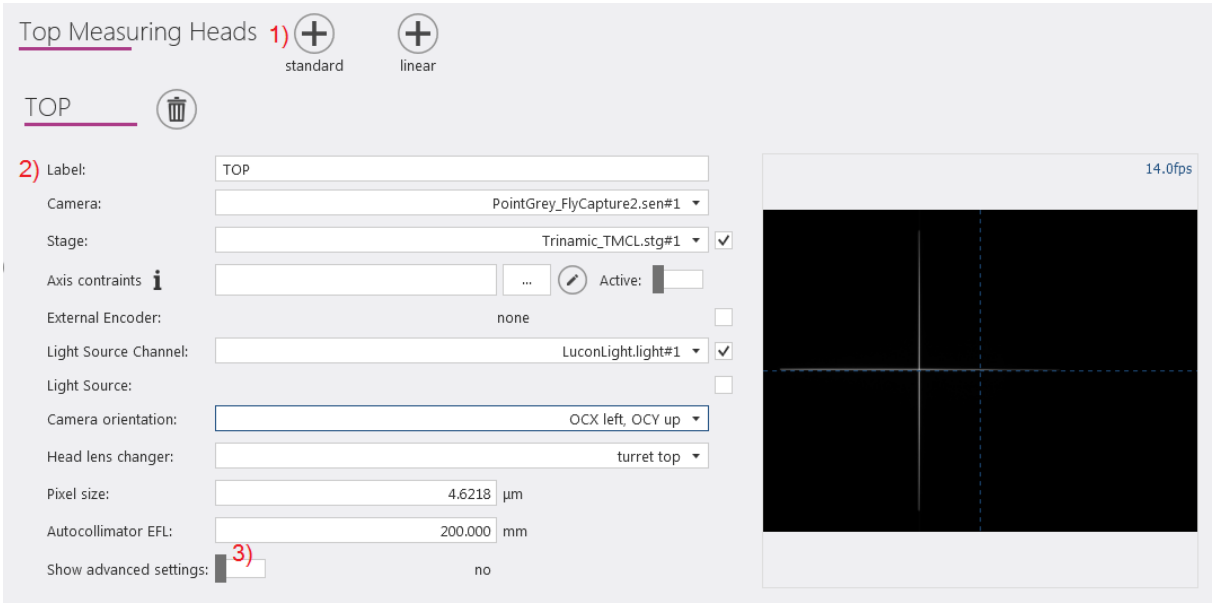


  - Example: OC100
    - Manual 4-way changer top → manual turret, 4 slots
    - Motorized 6- way changer via Stage Controller → stage turret, 6 slots
    - Manual change bottom → manual change

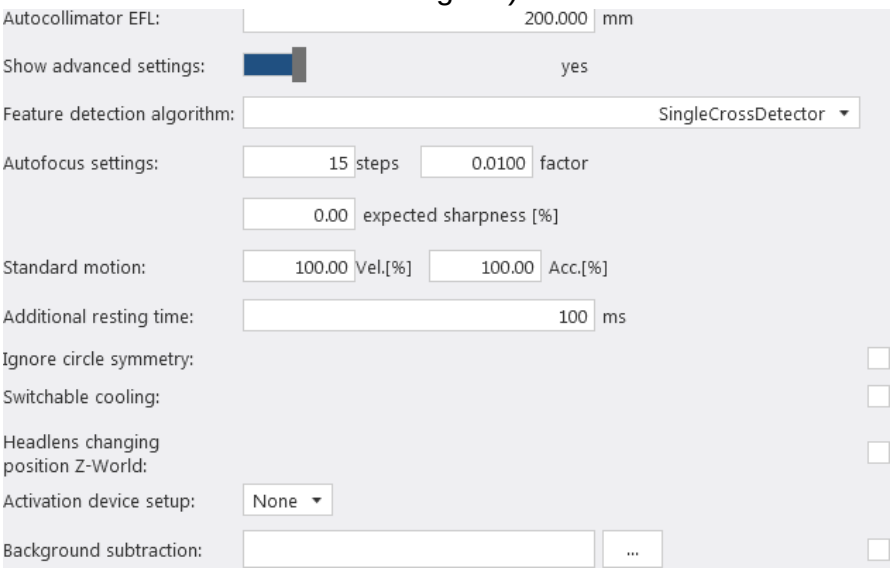
3.5. Configure functional units

3.5.1. TOP MEASURING HEAD

- Add new measuring head 1).
- 2) Label: e.g. TOP or TOP VIS (for IR systems):



- Select associated Camera, Stage, Light Source Channel and Head Lens Changer, see screenshot.
- Enter autocollimator EFL.
- Pixel size: is set later (see 4.2).
- Camera orientation: is set later (see 5.2).
- Enable "Show advanced settings" 3):

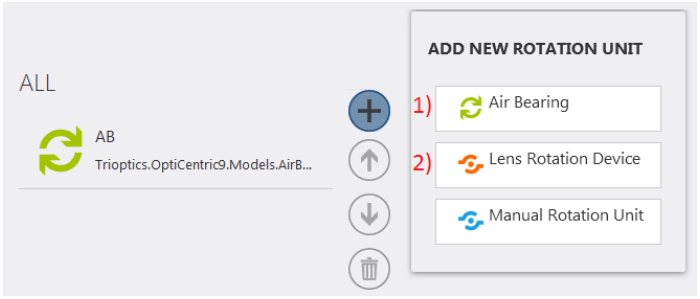


  - Expected sharpness [%] to 0
  - Standard motion: Vel. [%] and Acc. [%] to 100

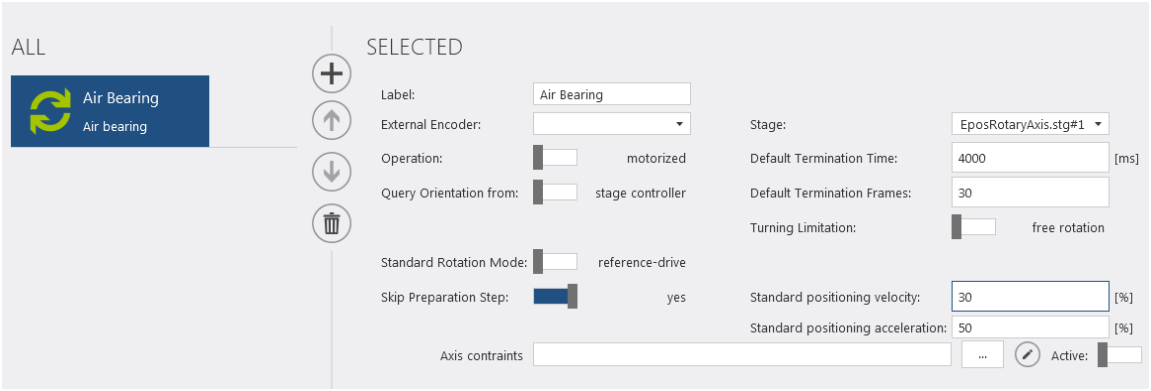
3.5.2. BOTTOM MEASURING HEAD

(same as TOP MEASURING HEAD)

3.5.3. ROTATION UNIT



- Add new Rotation Unit:
- Example OC100 with EPOS:

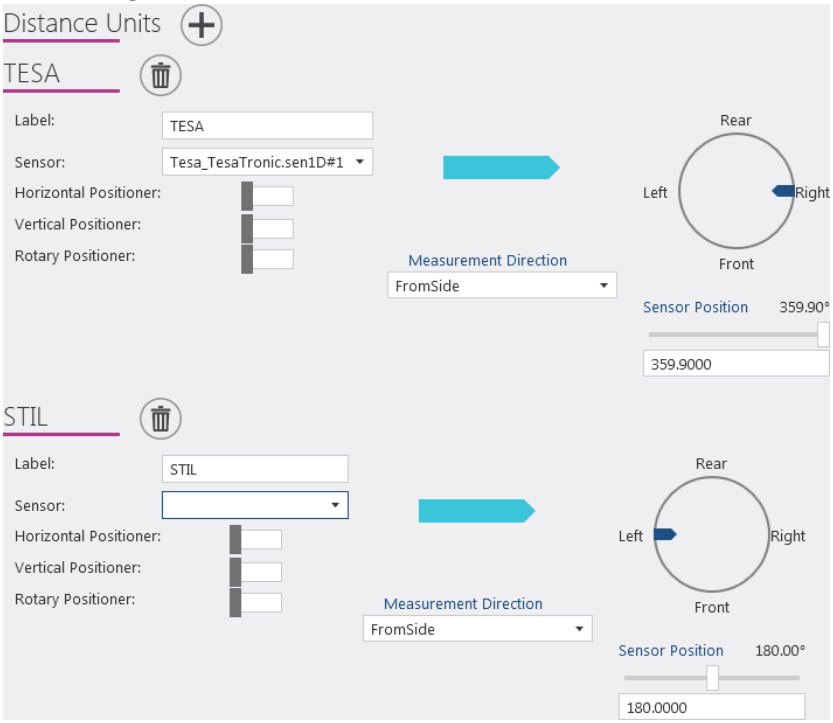


  - Select Stage Device.
  - Enable Skip Preparation Step.
  - Set Standard Positioning Velocity [%] to 30.
    Set Standard Positioning Acceleration [%] to 50.

3.5.4. DISTANCE UNIT

- Add new Distance Unit.

- Select sensor hardware, set measurement direction and sensor position according to the hardware:

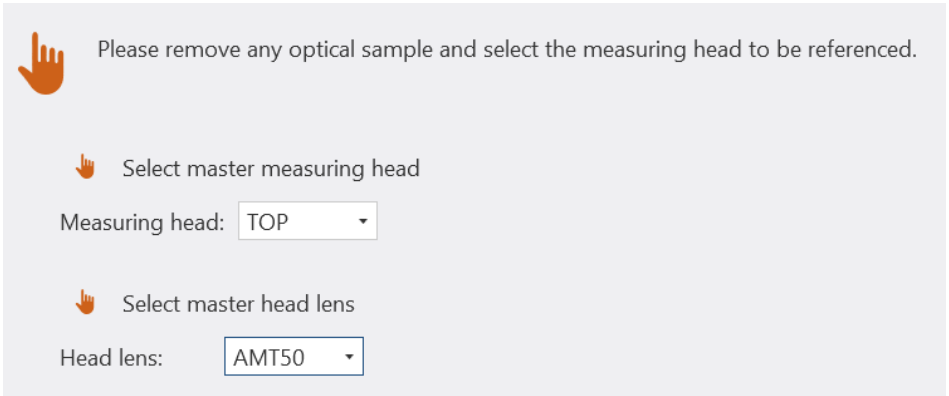


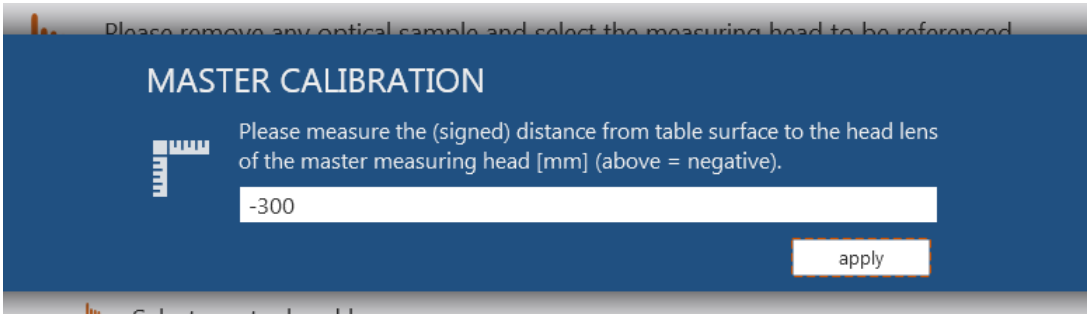
After setting up all hardware: Restart software, perform a homing run.

4. Referencing and calibration

4.1. Referencing the measuring heads

- Open Tools → CALIBRATION → "Single head referencing".
- Follow the instructions:

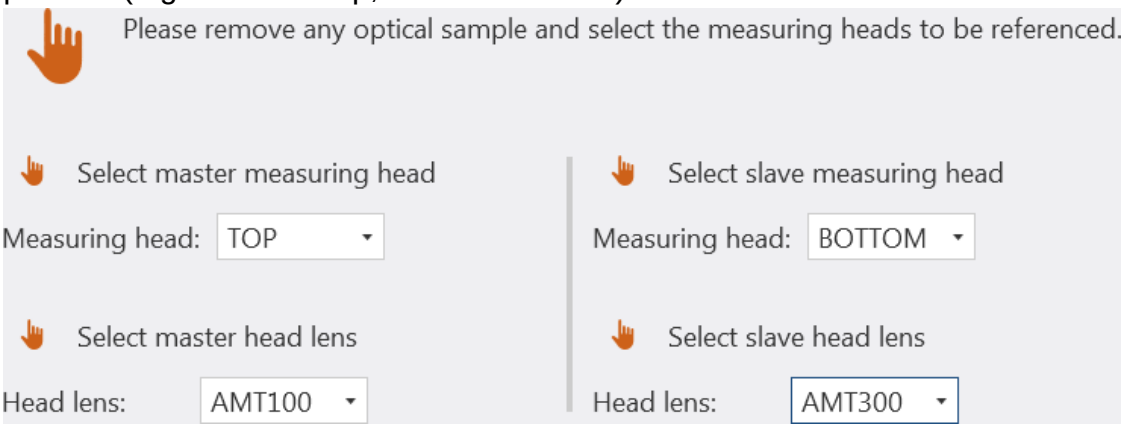




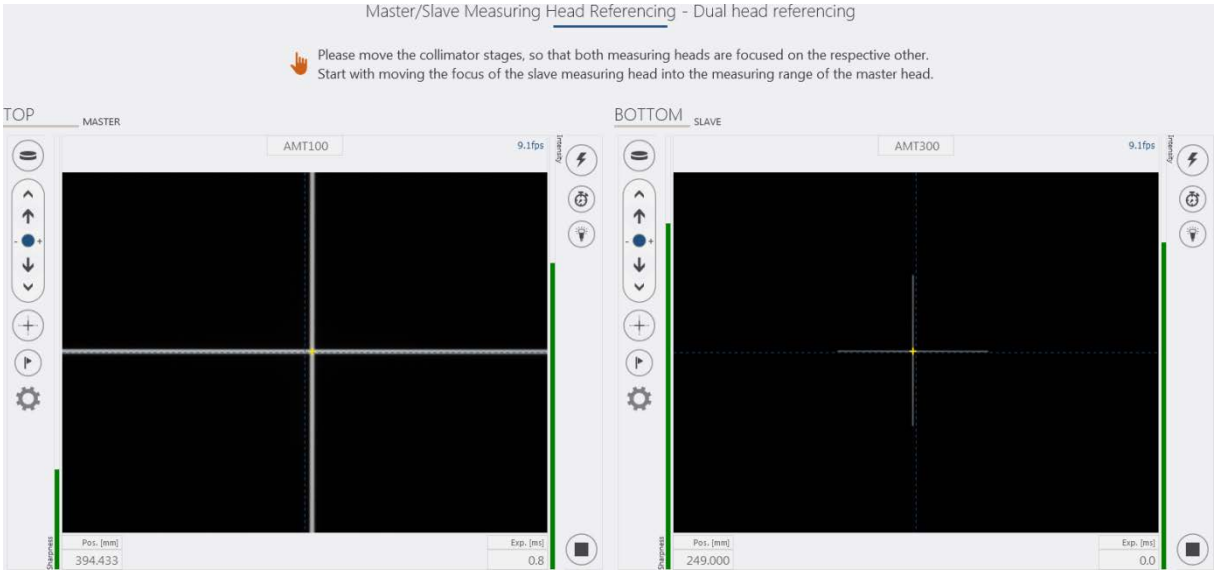
Note: This tells the software where the Z stage is relative to the reference surface of the system (usually top TRT). This allows the height above the table top to be used subsequently as an orientation dimension, e.g. for graphic displays. For best results, place paper on TRT, sharpen with the specified head lens and enter the **FFL of the head lens** with a negative sign.

4.1.1. For DUAL systems

- Open Tools → CALIBRATION → "Referencing of measuring heads".
- Do not perform Master Head calibration again if already done.
- Select the head lenses so that both measuring heads can focus on the same position (e.g. AMT100 top, AMT300 bottom):



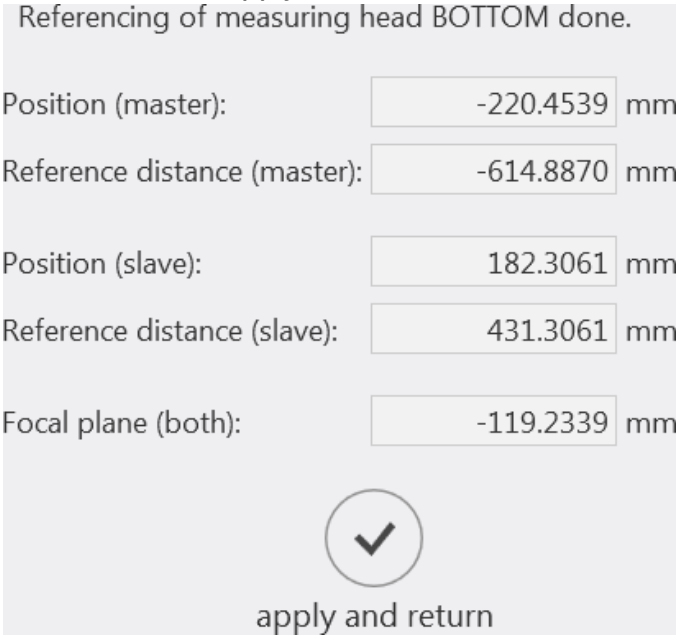
- Move the measuring heads so that the two focal planes coincide and the crosses in the other measuring head are sharp:



BOTH measuring heads can be moved to do this.

Note: Do NOT work with tube extensions!

- "Continue" → "apply and return":



After successful referencing, the measuring heads can be moved and the air bearing rotated in Tools → FIND CENTER.

4.2. Calibration of the measuring heads

- Open Tools → CALIBRATION → "Measuring head calibration".
- Follow the instructions.
- New value is automatically stored under Settings → Hardware.

4.3. Check and certificate for calibration

- Open Tools → CALIBRATION → "Check calibration".
- Follow the instructions.

5. Set the coordinate system

5.1. Definition

OptiCentric 9 works with a right-handed coordinate system:

- X+ to the right
- Y+ forward (toward the operator)
- Z+ down
- Positive rotation angle clockwise around Z-stage

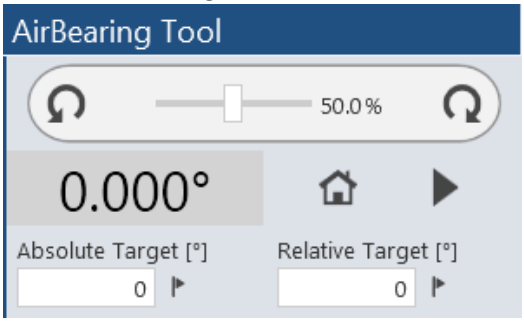
5.2. Setup

During setup, OptiCentric must be told how the camera coordinate systems behave in this regard. This is done by experimenting:

- Focus into the center of curvature of any convex surface (e.g. sphere) with a positive focal length.
- Move the sample X+ (to the right), make a note of the cross movement in the camera image.
- Move the sample Y+ (toward operator), make a note of the cross movement in the camera image.
- Under Tools → HARDWARE → TOP MEASURING HEAD → Camera Orientation, select the appropriate entry.
    - Example 1:
      For X+ cross moves to the left, for Y+ it moves up
      → "OCX left, OCY up"
    - Example 2:
    - For X+ cross moves to the right, for Y+ it moves down
      → "OCX right, OCY down"
- Repeat for BOTTOM MEASURING HEAD.

5.3. Check direction of rotation

- Tools → FIND CENTER
- Use AirBearing Tool to rotate air bearing to the left or right:



- The direction of rotation of the knobs must correspond to the actual direction of rotation of the air bearing. If this is not the case, reverse the +/- sign preceding the distance factor in the corresponding *.cfg file.

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