OrangeApps

TCP.control for KUKA KRC4/5

User documentation

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History of document versions

version	Date	author	Reason for change / comment
1.0	February 5, 2026	Mayer	Initial creation

Validity of the documentation

Version Documentation	Software version		Release	Date
	from	until		
1.0	1.0.x	1.0.x	Mayer	February 5, 2026

Contents

1 Introduction

1.1 Target audience

This documentation is intended for users with the following knowledge:

- KRC4/5 Robot Operation

1.2 Display of notes

These indications mean that death or serious bodily injury is certain or very likely to occur if no precautions are taken.

These indications mean that death or serious bodily injury **can** occur if precautions are not taken.

These indications mean that minor bodily injury **can** occur if no precautions are taken.

These notices mean that property damage **can** occur if precautions are not taken.

These tips contain useful tips or special information for the current topic.

1.3 Terms used

Expression	Description
KRC	KUKA robot control
KSS	KUKA System Software
smartPad	Robot control panel
COP	KUKA Options Package (tech package)
WoV	KUKA WorkVisual

2 Scope of delivery

Included in the delivery:

- TCP.control sensor with 2 permanently installed reflector light barriers
- Adjustable reflector bracket with reflectors
- Mounting plate, fastening screws, dowel pins
- Y-connector M12 plug / 2x M12 socket A-coded. 1x5-pin / 2x 4-pin
- Technology package TCP.control.kop

The TCP.control.kop technology package is available for download on our website.

3 Safety instructions

Read the safety instructions before commissioning.
Connection, assembly, adjustment and commissioning must be carried out by qualified personnel only.
Not a safety component according to the EU Machinery Directive (not suitable for the protection of persons)
Connection, assembly, adjustment and commissioning must be carried out by qualified personnel only.
Not for outdoor use
 Class 1; wavelength 658 nm; frequency 100 kHz; pulse width 6 ns; pulse limit ≤ 0.65 mW (IES 60825-1)
Complies with 21 CFR 1040.10 and 1040.11 except for the deviation according to Laser Note No. 56 of May 2019
For use with types with suffix M3, M3M, M4, M4M, KL4, KM4: Straight or L-shaped M8 metal plug, terminal socket made of R/C (CYJV2)

Intended Use
The sensor is used for the optical, non-contact detection of objects.

Assembly
Attach the sensor to a suitable holder.

Connection
Insert the connector plug while it is de-energized and screw it in place.
Connect the cable. The connection diagram applies (see diagram **Fehler! Verweisquelle konnte nicht gefunden werden.**) .
Insert the connector plug while it is de-energized and screw it in place.
Apply voltage →, LED lights up green
Auto-detect: Simply connect the sensor. The switching load is automatically detected. Important: Supply voltage and load voltage from one supply source Parallel connection of sensors with auto-detect is not possible

4 Product description

TCP.control is a technology package for testing and monitoring the TCP data of rotationally symmetrical robot tools. During the measurement run, the tool being measured is passed by two light sensors sequentially. Based on a reference run performed during commissioning, the system automatically determines the deviations in the current TCP data during each measurement run. Depending on the configuration, the software then adjusts the TCP data stored in the robot accordingly and/or issues messages.

General characteristics

- 2D, 3D - TCP inspection for up to 64 measurement objects (robot-guided and external tools)
- Setup via wizard plugin
- Display of measured values in the display plugin
- Sensor connection via 2 digital inputs on the robot
- Log function of measured values
- Auto-TCP correction within configurable limits
- Inline forms for TCP testing and diameter testing
- Easy on/off switching of the measurement function during operation
- Various notification scenarios when the defined tolerance limits are exceeded.
- Technology as a KUKA Option Package (KOP) or KUKA Setup Package for KSS 8.2, 8.3, 8.5, 8.6, 8.7
- MQTT Ready

Hardware features

- Sensor housing size 52 x 32 x 38 mm (W x D x H)
- 2x laser reflective light barriers per sensor
- Reflector bracket model “Standard” or “Large”
- Operating voltage $+U_B$ 10…30V DC
- Light type: Laser, Class 1 (IEC 60825-1)
- Idle current $I_0 \leq$ 30mA (per light button)
- Output current $I_e \leq$ 100mA (per light switch)
- Connection: Cable with M12 connector, 4-pin (per light barrier)

5 Hardware installation

5.1 Mechanical connection housing

The sensor housing has an M6 thread (12mm deep) and 8 ∅4H7 holes (5mm deep) on the back.

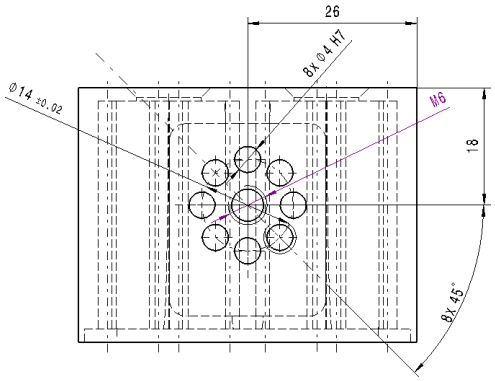

Fig. 5-1: mechanical connection to the rear of the housing

Included in the delivery is a mounting plate (90 x 40 x 8mm), e.g. for mounting the sensor on aluminum profiles.

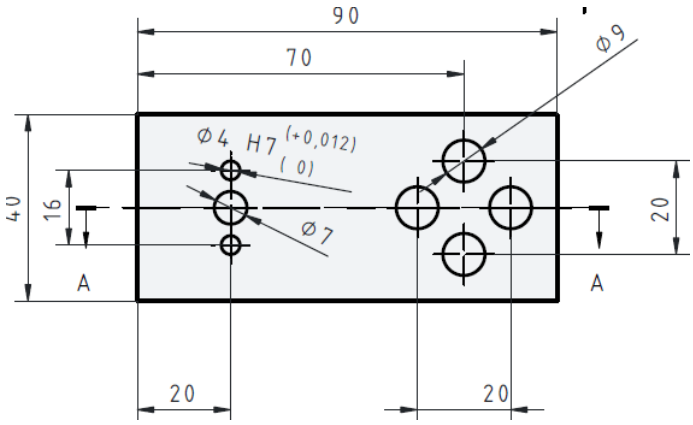

Fig. 5-2: Mechanical dimensions of the mounting plate

5.2 Electrical connection of the reflective light barrier

The housing contains two laser light barriers with 150 mm cable tails and M12 connectors. The circuit diagram shows the connection of a reflective photoelectric sensor. The two photoelectric sensors are connected via a Y-connector.

5.2.1 Connection diagram of a reflective light barrier

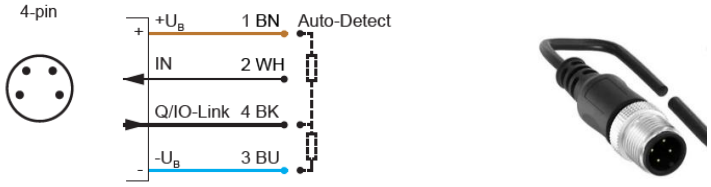

Fig. 5-3: Wiring diagram Light barrier

Pole: 4

Thread: M12x1

5.2.2 Connection diagram of the Y-connector

The two laser light barriers are connected using a Y-connector.

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Fig. 5-4: Y-Connector

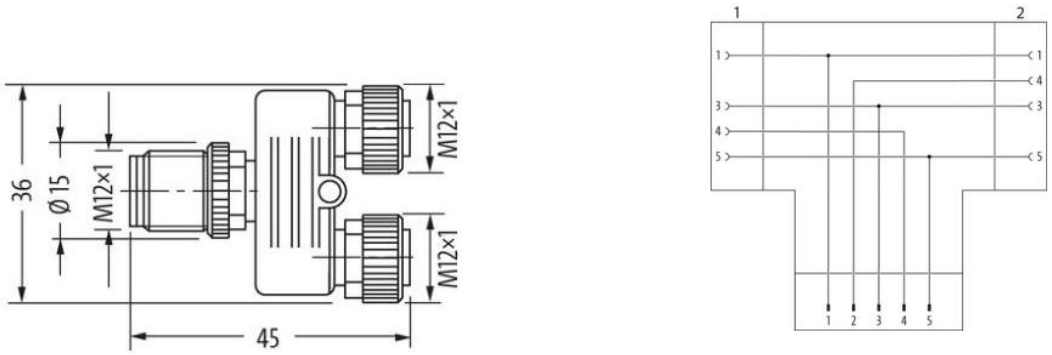


Fig. 5-5: mechanical dimension and wiring diagram Y-connector

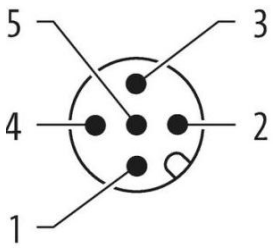


Fig. 5-6: pin assignment output Y-connector

5.3 Reflector bracket

The bracket consists of individual segments that can be flexibly combined to accommodate different installation space sizes and orientations. The standard model comprises four segments plus segment holders, while the **"Large" version** contains a total of seven segments.

"Standard" model is suitable for measuring objects up to a diameter of approximately 25 mm. The **"Large" version is** available for larger diameters.

Depending on the application, the segments can be mounted so that the opening of the bracket is optionally on the **left** or **right** side.

Standard version, right-hand opening; **Large version, right-hand opening**

Top view of "Standard" and "Large" versions, stirrup opening on the right and left

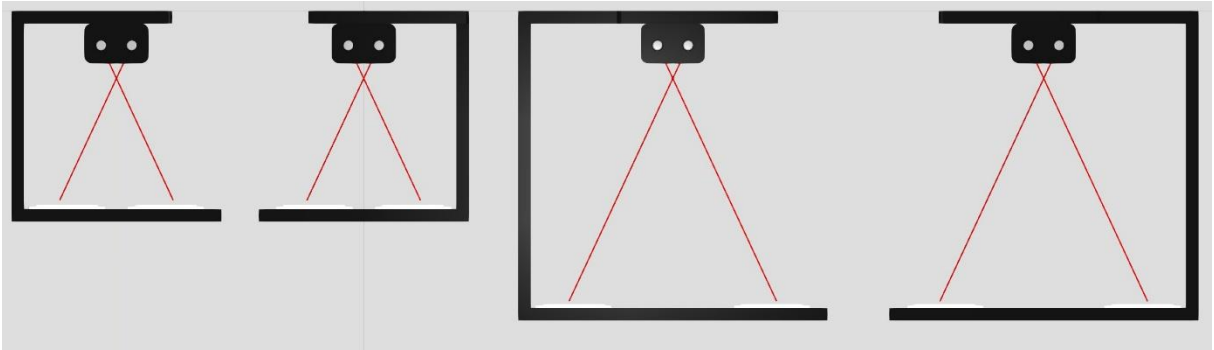
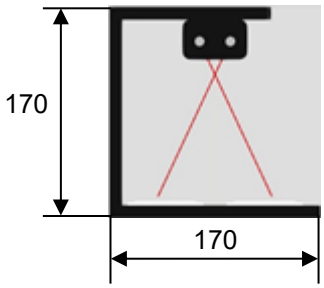
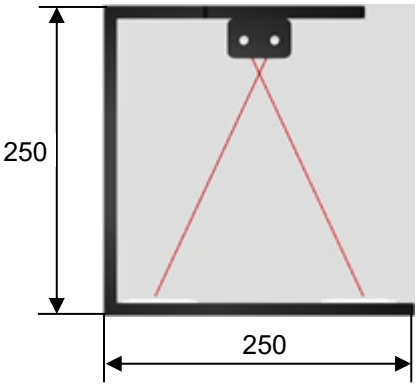


Fig 5-8: Reflector bracket left and right

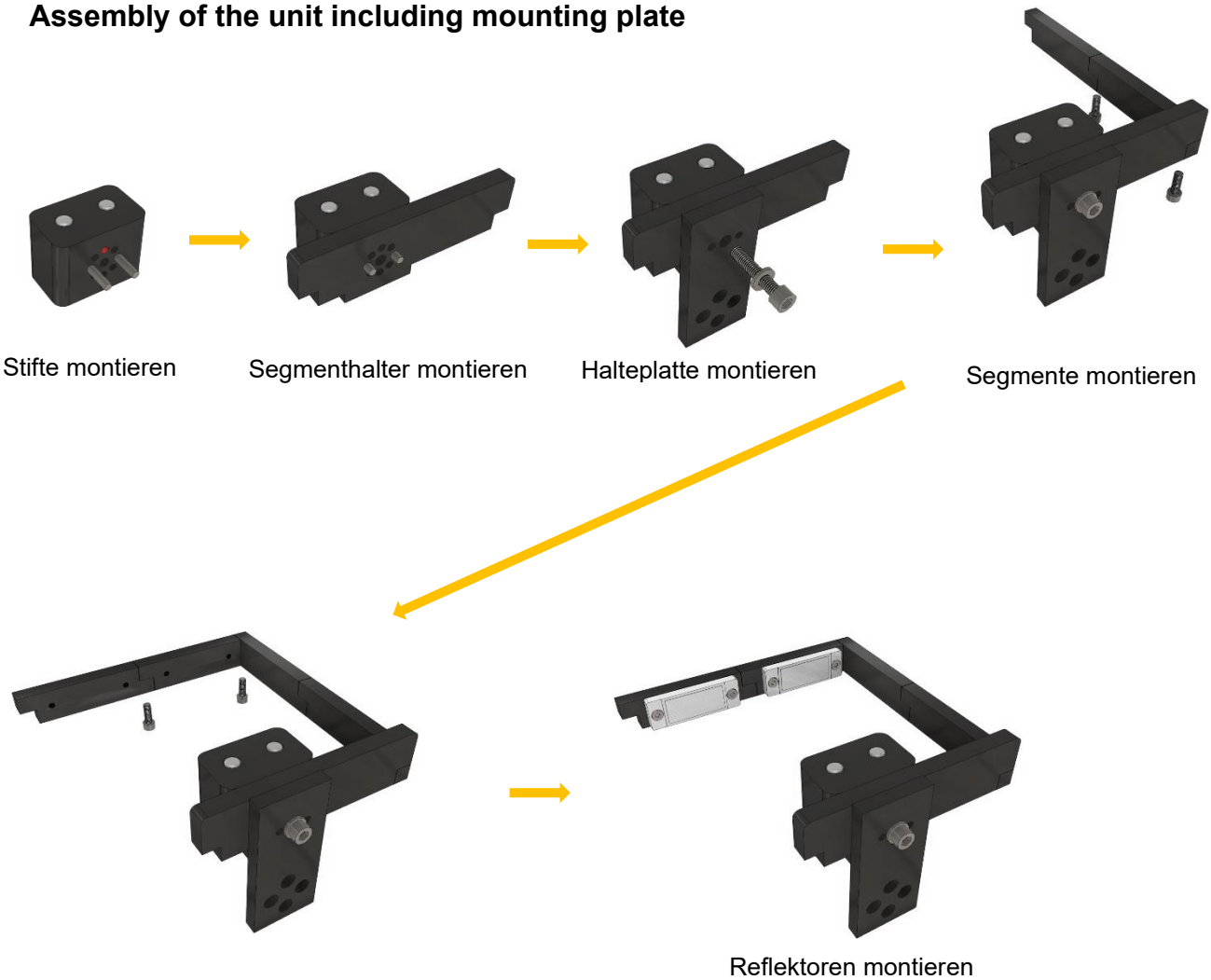
Dimensions of the "Standard" and "Large" versions





The height of the bracket is 20 mm.

5.4 Assembly of the unit including mounting plate



5.5 Scope of delivery

5.5.1 Model “Standard”

- Sensor housing with 2 reflective light barriers
- Y-connector M12 plug / 2x M12 socket A-coded. 1x5-pin / 2x 4-pin
- 2x bracket segment with thread for reflector
- 2x bracket segment without thread
- 1x Segment holder
- 1x mounting plate
- Screws, centering pins and washers

5.5.2 Model “Large”

- Sensor housing with 2 reflective light barriers
- Y-connector M12 plug / 2x M12 socket A-coded. 1x5-pin / 2x 4-pin
- 2x bracket segment with thread for reflector
- 5x bracket segment without thread
- 1x Segment holder
- 1x mounting plate
- Screws, centering pins and washers

6 Software - Installation, Uninstallation, Update

The technology package can be installed either via KUKA WorkVisual (WoV), or directly on the SmartPad by selecting the **Additional Software** option. This option is located in the main menu under **Commissioning**.

Technology package name: TCP.control_1_0_X_X.kop

6.1 System requirements for execution

Minimum software requirements

- KUKA System Software 8.3.23

If the technology is to be installed on KRC4 robots with KSS version older than 8.3.23, this version is available from us. Please contact us for more information.

If KUKA.CPC is used on the robot, a software certificate is required to install the plugin.In this case, please consult our customer service (mailto:info@orangeapps.de) before purchasing the technology.

6.2 Installation via WorkVisual (WoV)

To install the technology package via WorkVisual, the following steps are necessary:

- Install the options package in WoV as a catalog item
- Transfer the current project from the robot to WoV
- Add option to project
- Register as an expert on the robot and transfer the project to the robot

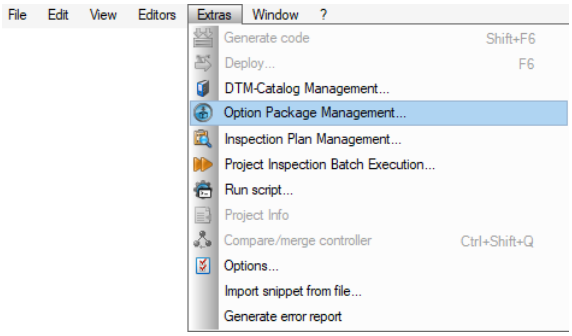
6.2.1 Insert option package in option package management

To install via WoV, the options package must be installed in WoV's option management. It will then be available as a catalog item.

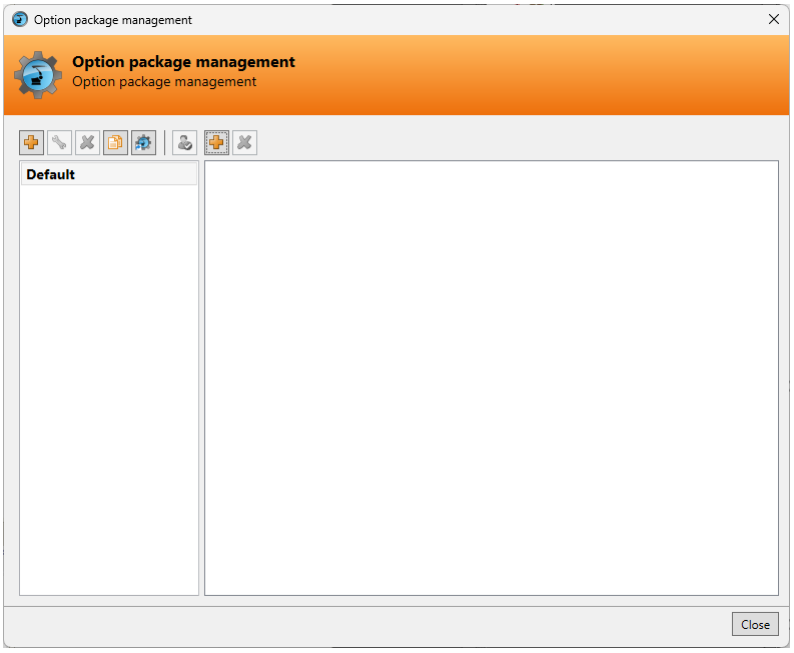
Procedure:

1. Start WorkVisual
2. Open options package management

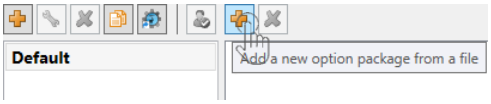
Click on **Extras →Option Package Management**



Options Package Management window opens.

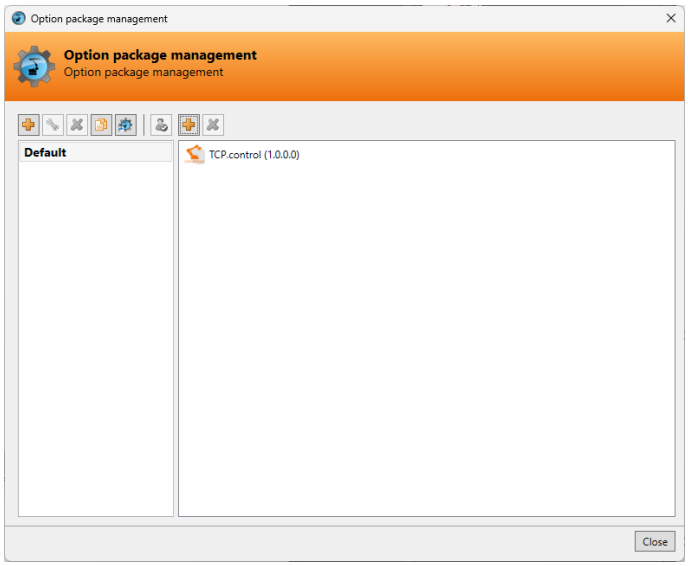


Click on the right plus symbol.



and select the copy option in the file selection. Confirm the selection by clicking **Open** .

The KOP is now displayed in the Options Package Management window:



6.2.2 Install or update TCP.control

Minimum requirement

- WorkVisual 5.0 or higher

Requirement

- At least user group expert
- Operating mode T1 or T2
- No program is selected .
- Network connection for robot control
- The options package is provided as a copy file.

Procedure

1. **Only during an update** : Uninstall the previous version of the TCP.control option package in WorkVisual.
2. Install the TCP.control option package in WorkVisual.
3. Load the current project from the robot control system.
4. Insert the TCP.control options package into the project .
5. Transfer and activate the WorkVisual project on the robot controller .
6. The smartHMI displays the security prompt ***"Do you want to allow the activation of project […]?"*** . Activation will overwrite the active project . If no relevant project will be overwritten, confirm the prompt with ***"*** Yes " .
7. The smartHMI will display an overview of the changes and a security prompt. Answer " ***Yes" to this*** prompt. The option package will be installed and the robot controller will restart .

Information about workflows in WorkVisual can be found in the WorkVisual documentation.

LOG file

A log file will be created in C:\KRC\ROBOTER\LOG.

6.2.3 Uninstall TCP.control

associated data should be archived before uninstallation .

Overview of uninstallation steps via WoV

- Current project of robots pulling
- Remove option from project
- Register as an expert on the robot and transfer the project.

Requirement

- At least user group expert
- Operating mode T1 or T2
- No program is selected .
- Network connection for robot control
- The options package is provided as a copy file.

Procedure

1. Load the project from the robot controller.
2. Remove the TCP.control option package from the project.
3. Transfer and activate the WorkVisual project on the robot controller .
4. The smartHMI displays the security prompt ***"Do you want to allow the activation of project […]?"*** . Activation will overwrite the active project . If no relevant project will be overwritten, confirm the prompt with ***"*** Yes " .
5. The smartHMI will display an overview of the changes and a security prompt. Answer "Yes" to this prompt. The options package will be uninstalled and the robot controller will restart.

Information about workflows in WorkVisual can be found in the WorkVisual documentation.

LOG file

A log file will be created in C:\KRC\ROBOTER\LOG.

6.3 Installation via SmartHMI directly on the robot

6.3.1 Install or update TCP.control

Requirement

- At least user group expert

- Operating mode T1 or T2
- No program selected
- USB stick containing the options package (copy file)
- KSS 8.3 or higher

Procedure

Installation is done via ***the commissioning of →additional software*** in the main menu.

1. Copy the KOP file either to a USB stick or directly to a drive of the target system (e.g. D:\KUKA_OPT).
2. When installing from a USB stick, connect it to the control PC or the smartPad.
3. In the main menu, select ***Commissioning . → Additional software*** out of.
4. Click the ***New Software button*** .
5. You will receive a list of available software for installation. If ***TCP.control*** is not listed, click ***Refresh.*** If the entry is now displayed, proceed to step 8.
6. If the entry is not displayed, the drive from which the installation is to be performed must first be configured. To do this, select ***Configuration .*** In a new window, you can now select the path where the ***TCP.control option*** is located.
7. ***"Installation paths for options"*** section, select an empty cell and choose ***"Path selection."*** The available drives will be displayed. Select the drive where the ***"TCP.control" option*** is available and save your selection ***.*** The window will close. An entry for ***"TCP.control" should now*** appear in the list. If this is not the case, click " ***Refresh"*** and/or repeat steps 7 and 8.
8. Select the entry ***TCP.control*** and click ***Install .*** Confirm the installation message with ***OK.***
9. The smartHMI displays the security prompt ***"Do you want to allow the activation of project […]?"*** . Activation will overwrite the active project . If no relevant project will be overwritten, confirm the prompt with ***"*** Yes " .
10. The smartHMI will display an overview of the changes and a security prompt. Answer " ***Yes" to this*** prompt. The option package will be installed and the robot controller will restart .
11. If necessary, unplug the USB stick.

LOG file

A log file will be created in C:\KRC\ROBOTER\LOG.

6.3.2 Uninstall TCP.control

Requirement

- At least user group expert
- Operating mode T1 or T2
- No program selected

Procedure

Uninstallation is done via ***the "Activate →Additional Software" option*** in the main menu.

12. In the main menu, select ***Commissioning . → Additional software*** out of.
13. Select the entry ***TCP.control*** and press ***Uninstall.***
14. The smartHMI displays the security prompt ***"Do you want to allow the activation of project […]?"*** . Activation will overwrite the active project . If no relevant project will be overwritten, confirm the prompt with ***"*** Yes " .
15. The smartHMI will display an overview of the changes and a security prompt. Answer " ***Yes" to this*** prompt. The options package will be uninstalled and the robot controller will restart.

LOG file

A log file will be created in C:\KRC\ROBOTER\LOG.

6.4 Installed files

The following files are installed to run the software:

Files / Module	path
TCPcheck_lib (src and dat)	R1\TP\TCPcheck
TCPcheck_log (data)	R1\TP\TCPcheck
TCPcheck_user (src and data)	R1\TP\TCPcheck
TCPcheck_util (src)	R1\TP\TCPcheck
TCPcheck.kxr	C:\KRC\TP\TCPcheck\Data
OrangeApps.TCPcheck.dll	C:\KRC\TP\TCPcheck\SmartHMI
OrangeApps.TCPcheck.config	C:\KRC\TP\TCPcheck\SmartHMI

Modified robot system files

-

6.5 Menu items

During installation, various menu entries are created.

Entry in the main menu

Configuration → TCP.control Configuration

Display → TCP.control Display

Entry in the info window

After successful installation, the entry “TCP.control” will be displayed under ***Help →> Info →> Options .***

7 Measurement principle

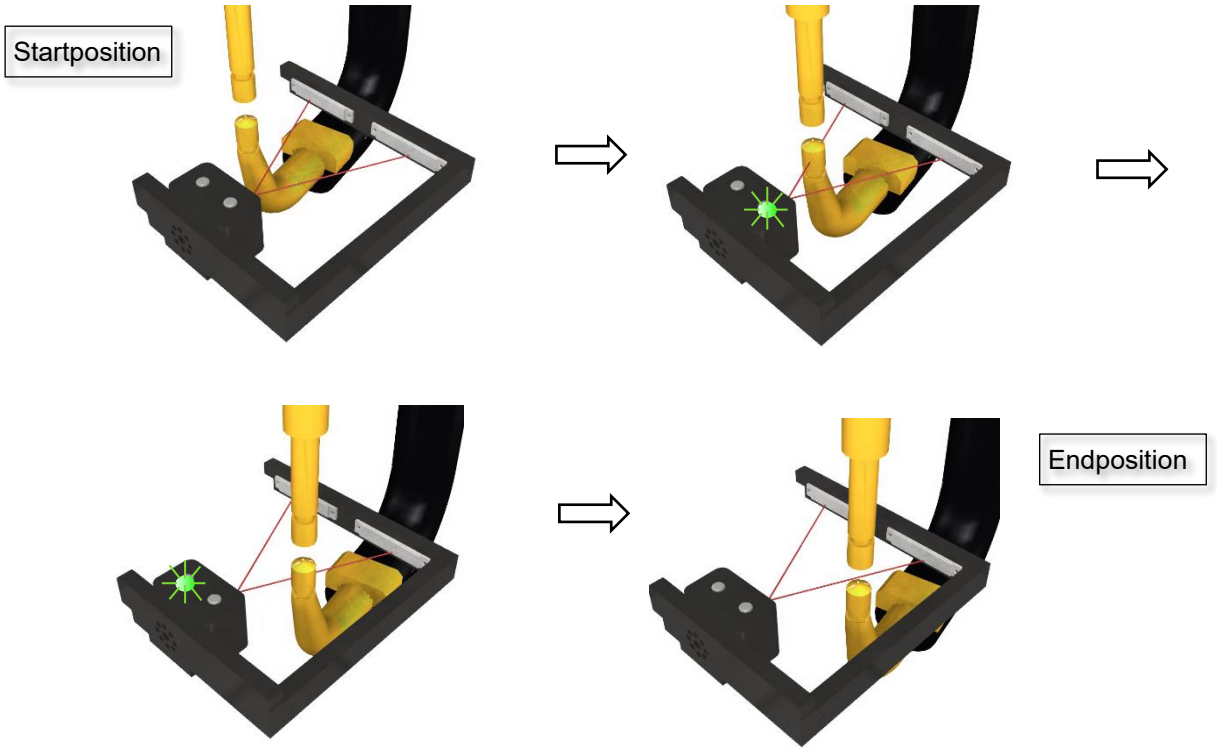
The rotationally symmetrical object being measured is guided once through two light barriers along a path parallel to the sensor. The light barriers detect the object and generate a signal edge in the I/O image for each entry and exit point. The current robot position is recorded and stored for each edge signal.

During commissioning, a reference measurement (master run) is performed for each object being measured. The detected positions are stored as reference data. This reference data forms the basis for the subsequent calculation of the TCP shift during measurement runs. The reference run can be restarted at any time via the HMI.

Measurement runs are triggered programmatically via a specific command within any robot program. A corresponding inline form is available for this purpose.

An assistant is available in the HMI to support commissioning and reference runs.

Measurement run along the sensor



Prerequisite for the reference measurement

- Correctly adjusted robot
- Correct load data
- Correct TCP data

8 Commissioning & Parameterization

For commissioning, an integrated wizard is available via the HMI, guiding the user through all necessary steps in a structured manner. The wizard defines the relevant system parameters, including:

- Selection of measurement objects (TCPs)
- Determination of the measurement method
- Parameterization of the sensor inputs
- Definition of permissible tolerance limits
- Configuration of error and system responses
- Performing the reference measurement

During commissioning, the software automatically monitors the distance between the object being measured and the sensor. If an impermissible minimum distance is detected, the distance is automatically corrected to avoid measurement interference, for example, caused by reflections.

All detected signal edges – including potential interference edges – are subjected to an automatic plausibility check to ensure measurement quality.

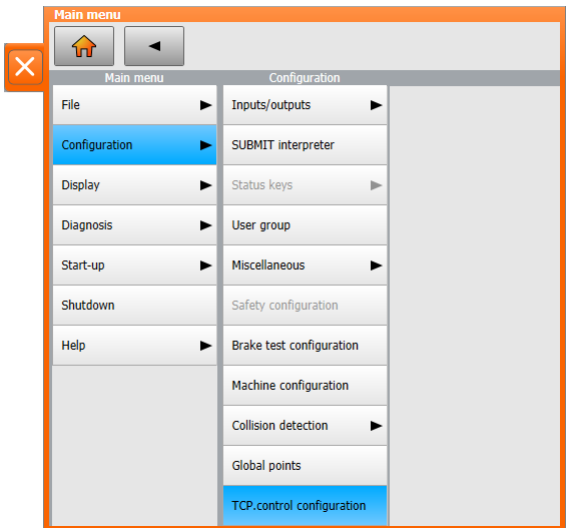
Multiple measurements can optionally be configured for each tool. This allows, for example, the separate measurement of the fixed and moving electrodes in a welding gun.

The measurement function can be enabled or disabled in the settings, both globally for all measurement objects and selectively for individual objects.

8.1 Configuration

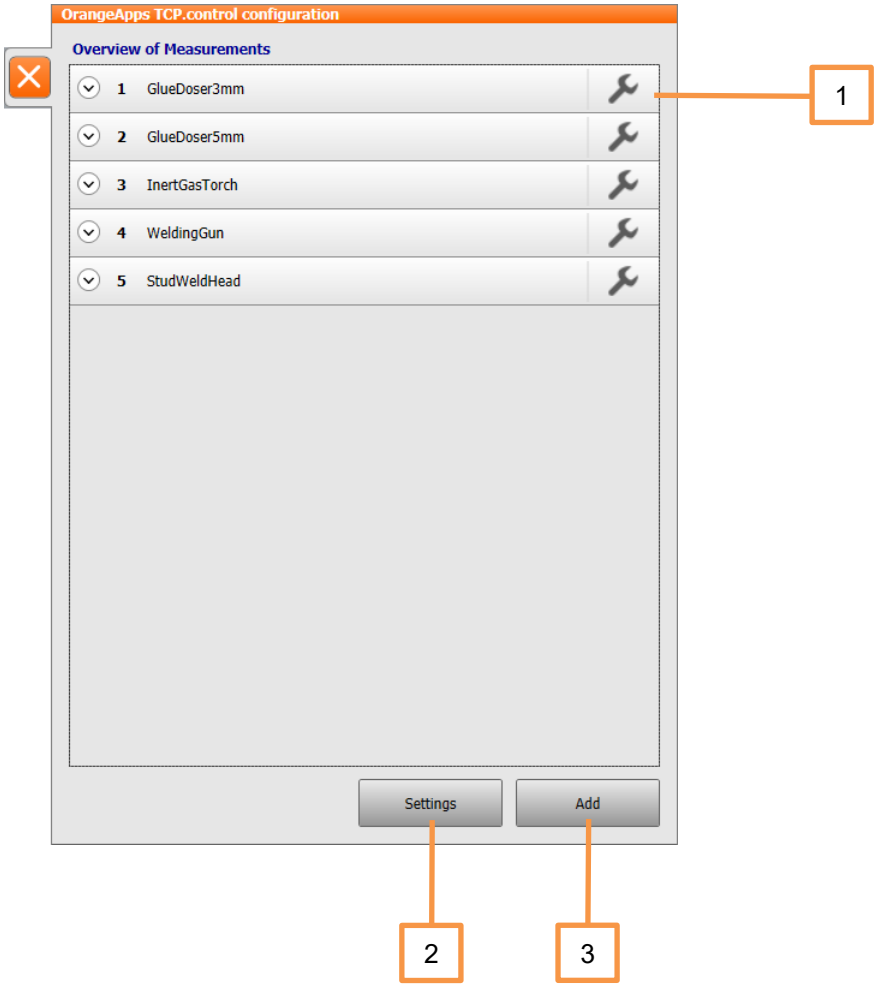
The HMI for configuration is opened via the main menu.

Configuration → TCP.control Configuration



The overview display opens, showing the measurements that have already been configured.

Overview display



1: Edit already configured measurement

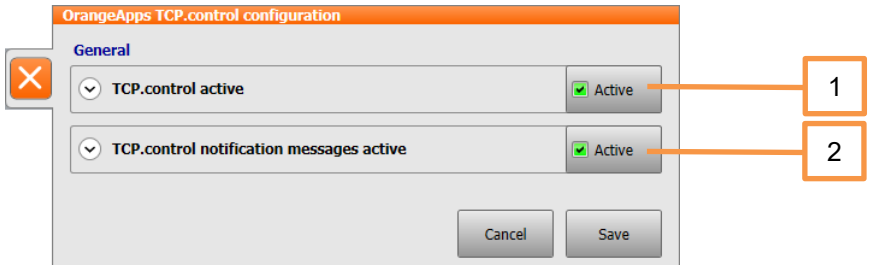
2: Opens the settings window (global settings)

3: Opens the window for adding tools

8.1.1 General (global) settings

If the check is deactivated, no measurement movements are executed for the configured measurement routines.

Additionally, the display of info messages can be enabled or disabled.



1: Enable or disable TCP.control globally (Checkbox checked: →TCP.control is active)

2: Enabling/disabling warning messages in the message window

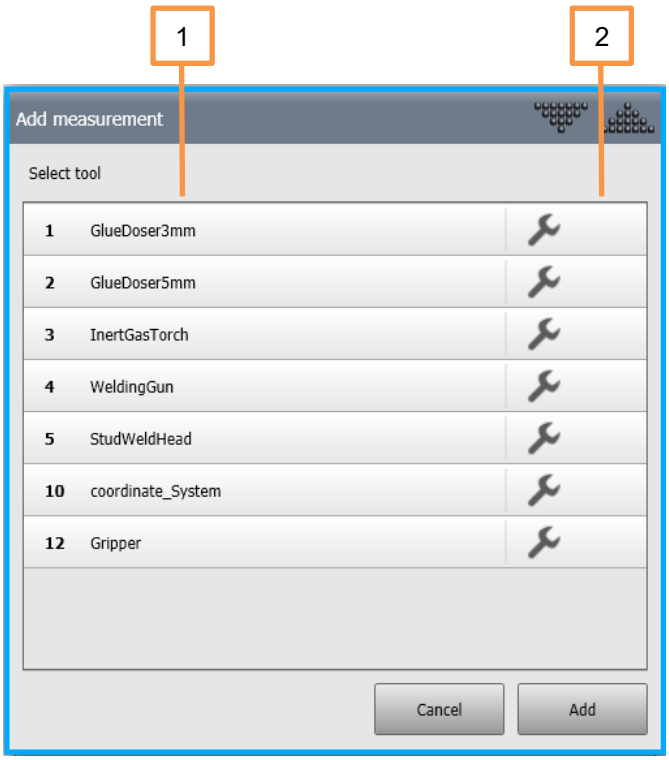
8.1.2 Add measurement

Before configuration and commissioning, each tool to be tested must be added to the measurement list. This is done via the **"Add Measurement" dialog** .

The dialog only displays tools for which a valid measurement exists and a tool name is defined.

Tools without tool data or without an assigned tool name are not selectable and are not displayed.

“Add measurement” dialog



1: Number and name of the tool

2: Type of tool (robot-guided  or external tool)

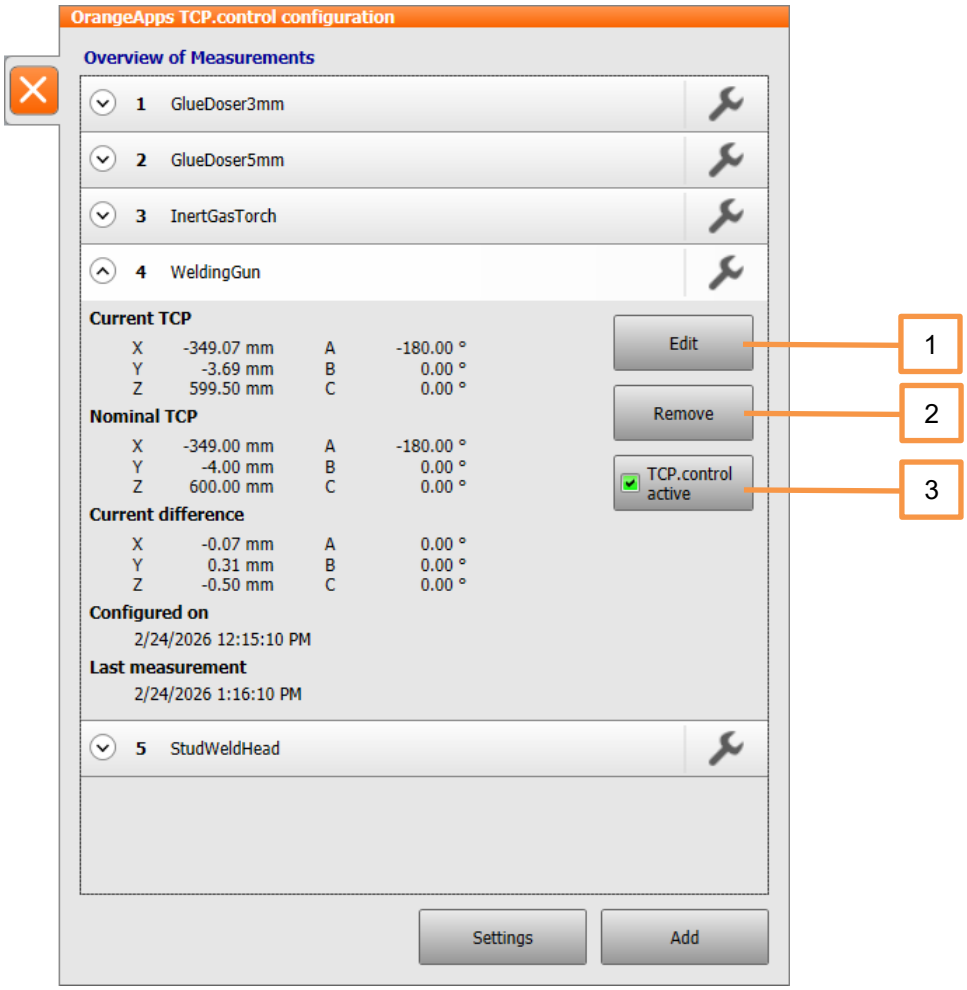
The window displays all tools defined on the controller. To add a tool, select the desired tool in the list and click ***Add*** .

After successful selection, the configuration wizard for the added tool will open.

8.1.3 Edit tool

Selecting an entry in the measurement list opens a drop-down menu.

This menu allows access to available functions for the selected measurement, including the configuration wizard.



1: Opens the configuration wizard

2: Deletes the current measurement

3: Enable or disable TCP.control for this measurement (checkbox set: →TCP.control for this tool is active)

8.1.4 Configuration wizard

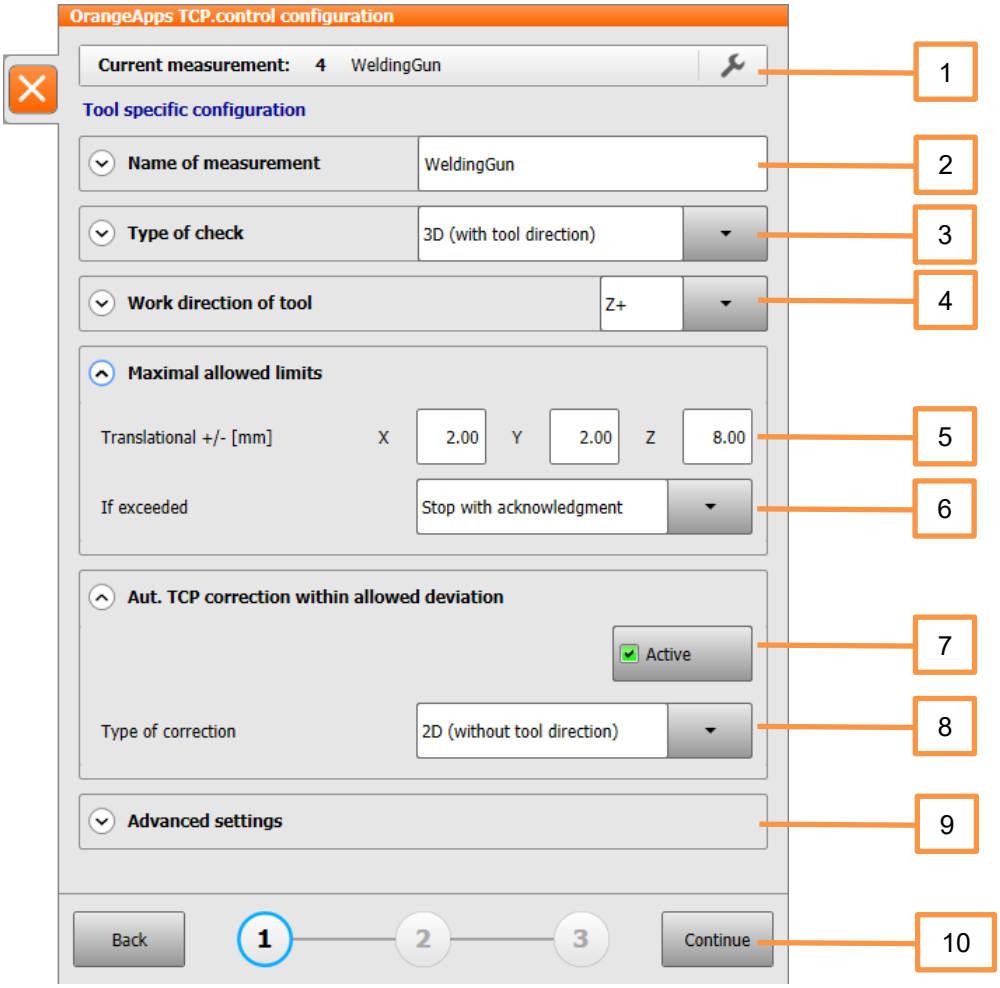
The wizard consists of three steps. The current step is displayed at the bottom of the screen. The user can switch between steps using the ***Back*** and ***Next buttons*** . The selected parameters are retained.

Step 1: Tool-specific settings

Step 2: Sensor settings

Step 3: Set up reference measurement

8.1.4.1 Step 1 – Tool-specific settings



1: Currently selected measurement

2: Name of the measurement. If there are multiple measurements per tool, the name must be different.

3: Type of measurement. 2D, 3D

4: Work direction of the tool

5 : Maximum permissible translational deviation. Depending on the selected check type and the work direction, the fields are shown or hidden. If measurement results are outside the tolerances, the behavior described in section 6 occurs.

6: Behavior when measurement result is outside the tolerance (see below for details)

7: Enables / Disables automatic correction of TCP data (only if measured values are within the set tolerance).

8: Selection of 2D or 3D correction of tool data

9: Advanced settings

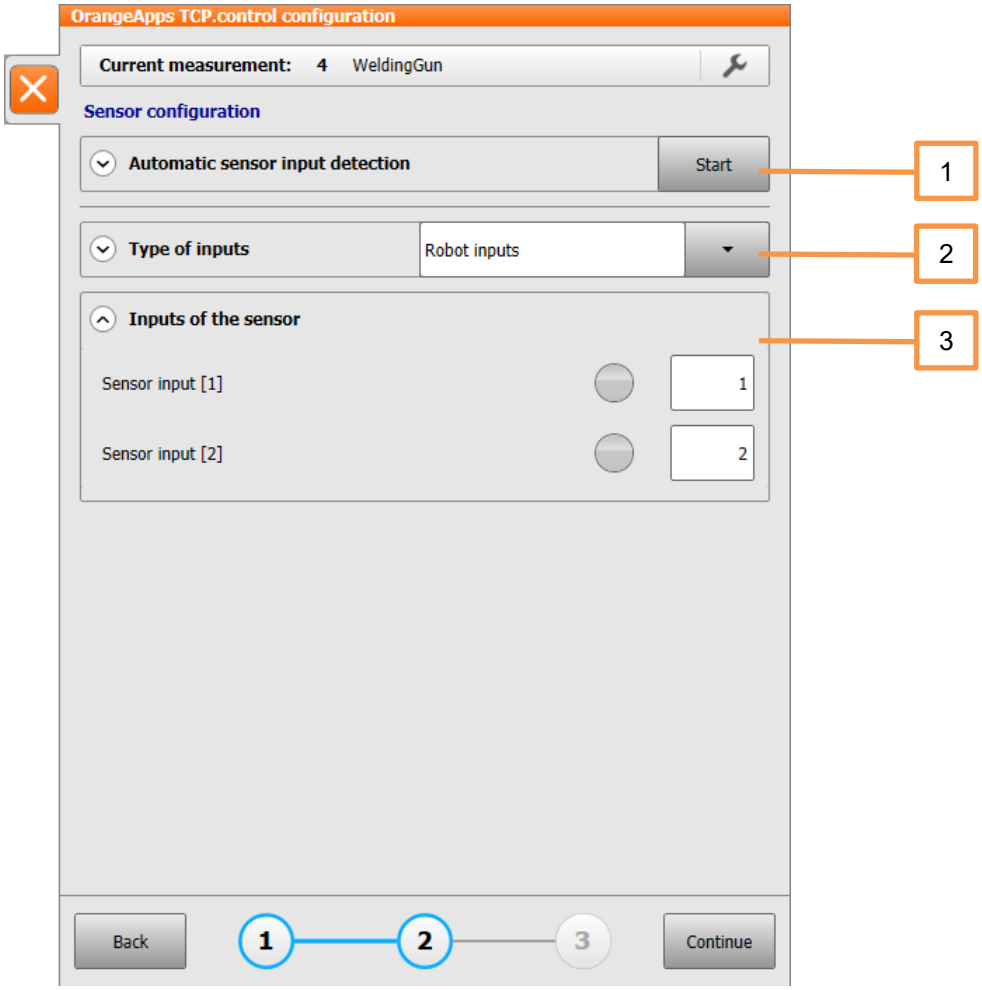
- Measurement speed (Default: 0.02 m/s)
- Speed between measurement runs (Default: 0.15 m/s)
- Maximum number of retries for faulty measurements, e.g., object not clearly detected (Default: 0)
- Tolerance of the measured diameter of the object (Default: 3mm)

10: Display of the current step. ***Back*** leads to the previous step, ***leads*** to the next step.

Behavior when measurement result is outside tolerance (point 6)

Behave	Description
Stop with confirmation message	A confirmation message appears. The program waits until this message has been acknowledged.
Stop with dialog message	A dialog message appears. The program waits until the operator responds.
User program	The routine TCPcontrol_user_Error is called in the program TCPcontrol_user.src. Users can program their own error routine there.

8.1.4.2 Step 2 – Sensor Settings



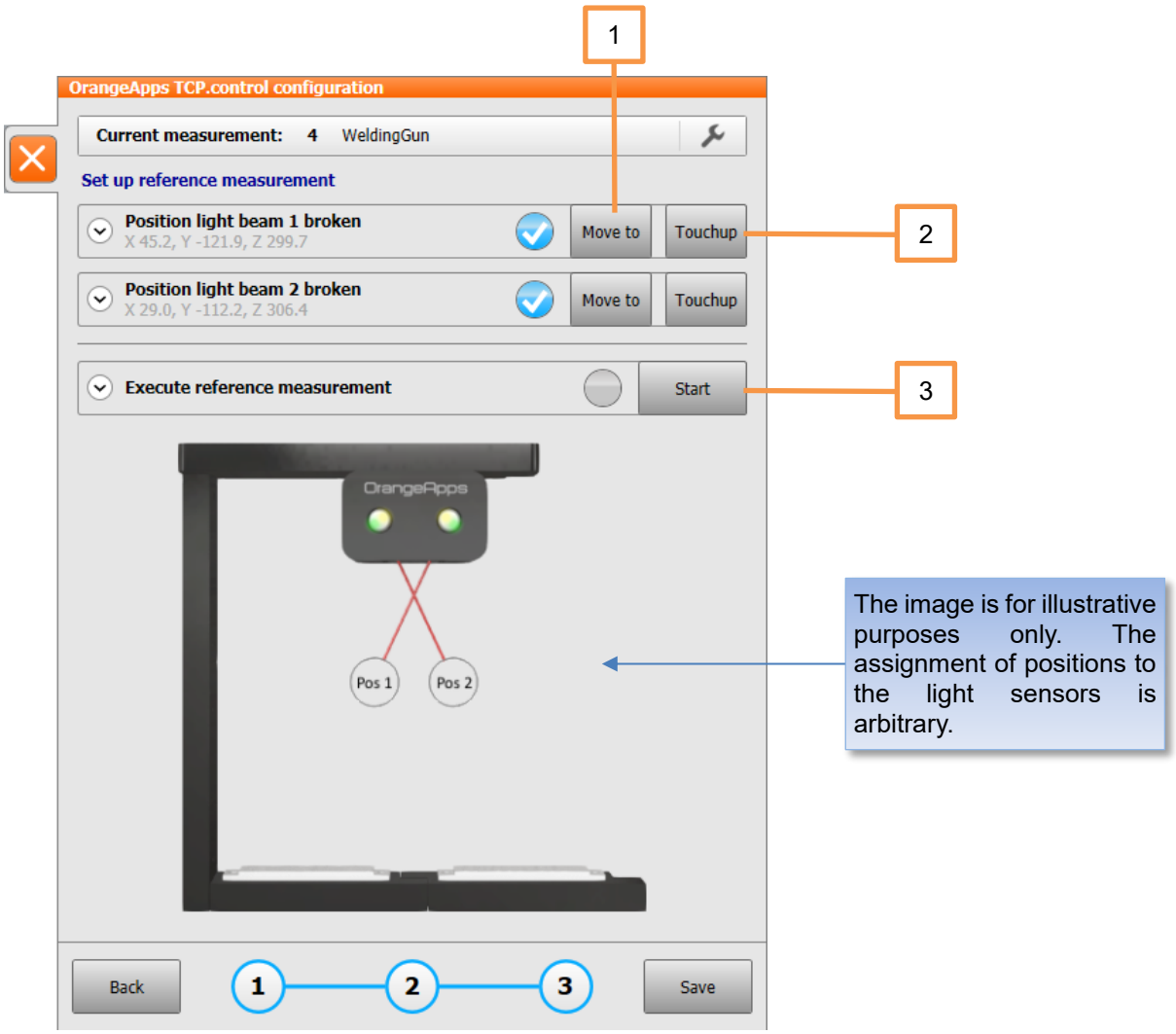
1: Automatic detection of the inputs in use. A wizard opens.

2: Determining the input type to be used (robot inputs / fast measurement inputs).

3: Manual entry of sensor input numbers

8.1.4.3 Step 3 – Set up reference measurement

In this step, the two measurement positions are determined and the reference run is carried out.



1: The teached position is approached.

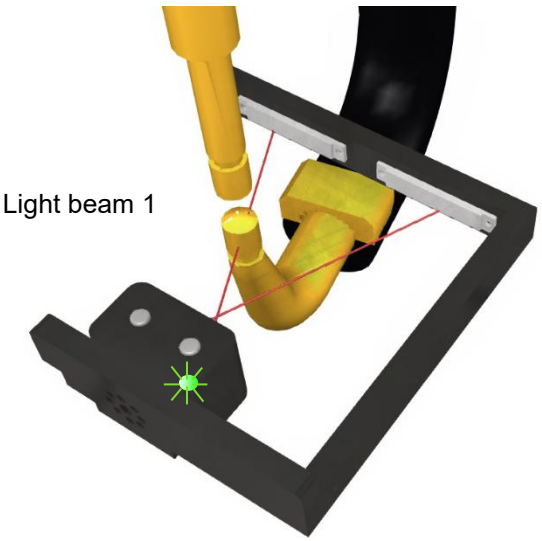
2: The current position is saved.

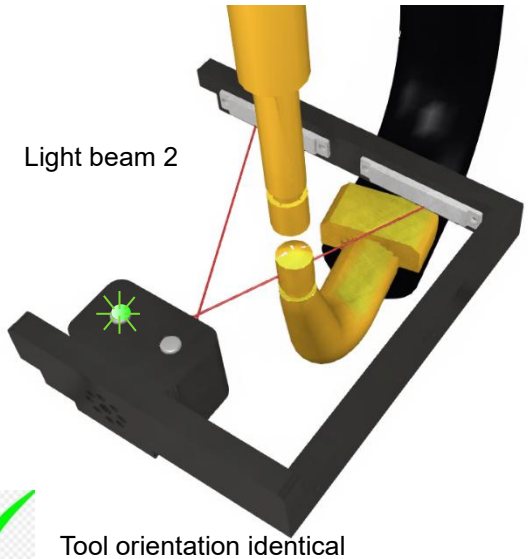
3: The reference run is performed. The reference run is only possible once both positions have been saved.

Please note:

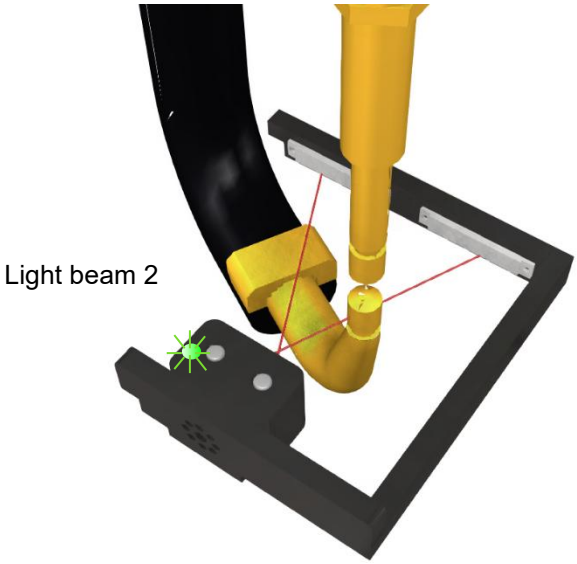
The object being measured should be aligned approximately perpendicular to the sensor, and the light spot should be centered on the object. The rotation of the tool around the direction of impact is irrelevant, but it must be the same for both sensors; that is, when teaching the measurement positions, the tool may **only be moved translationally**.

Only translational movement (shift in X, Y, Z) between sensor 1 and sensor 2 is allowed. No rotation!





Tool orientation identical



Tool orientation different

The distance between the sensor and the tool should be between 15 and 30 mm. A smaller distance reduces the travel time during measurement. The distance to the two sensors does not need to be exactly identical, as this is determined automatically.

It is important to ensure that each object to be measured provides a clear on and off edge.

During the reference measurement, the tool automatically aligns itself with the sensor, ensuring the object being measured moves parallel to the sensor surface. The distance is also checked and automatically corrected if it falls below the minimum required distance. The

angular deviation is displayed in the message window and decreases with each alignment pass. Alignment is considered successful if the deviation is less than 0.2°.

The reference measurement and a test measurement are then performed. The results are displayed in the message window.

During each measurement run, the number of detected edges is checked. If fewer than four edges are detected (one entry and one exit signal per light beam), an error message is generated and the measurement is aborted. If more than four edges are detected, for example, due to interference contours, the correct edges are either automatically identified or the operator selects the correct objects manually via a dialog box.

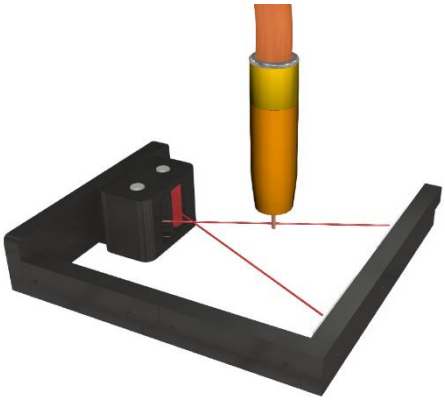
Note:

After commissioning is complete, the tool remains at the starting point of the measurement run. This position can then be taught in the inline form as the ideal starting position for future measurement runs.

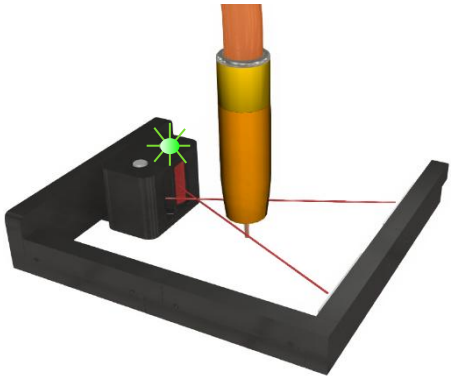
If the angle deviation increases during automatic alignment, this indicates an incorrect measurement, e.g., due to reflection, or detection of a interfering contour on the tool.

Example of welding torch alignment:

Light beam 1

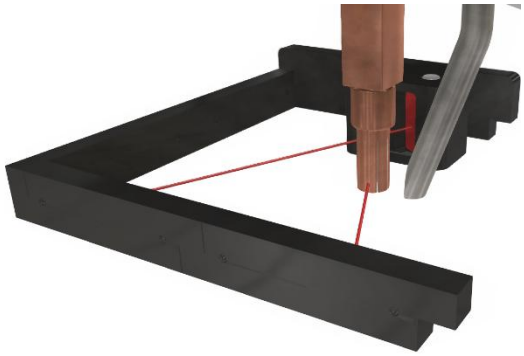


Light beam 2

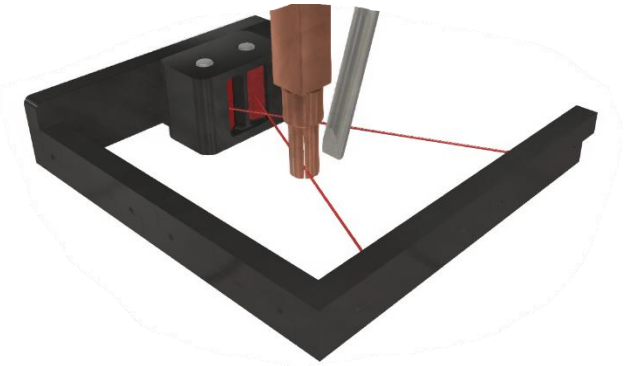


Example of aligning stud welding guns with support foot:

Light beam 1



Light beam 2

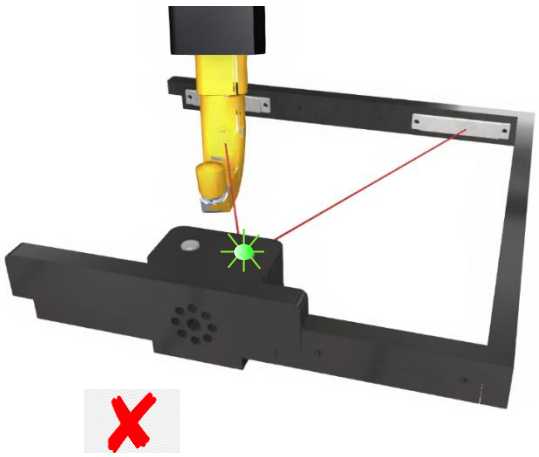


8.2 Tools with interfering contours

Depending on the design of the tool being measured, unwanted interference contours may be detected.

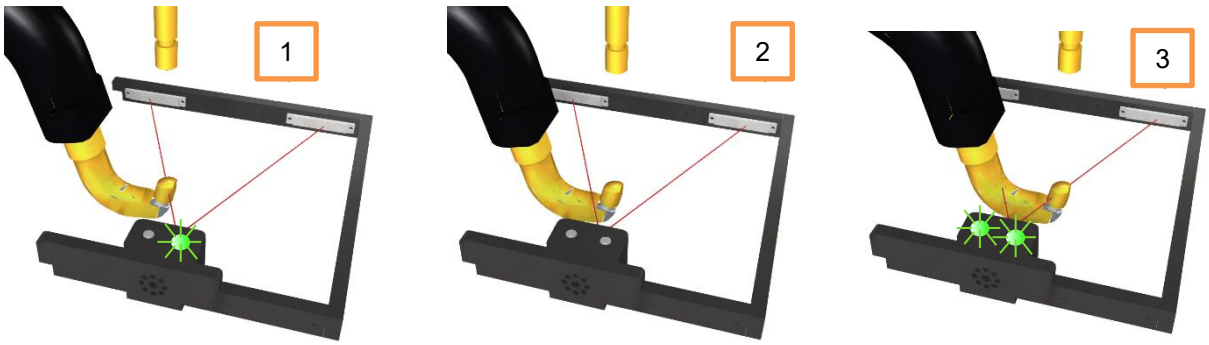
During commissioning, the number of edges detected when the object being measured enters and exits the light beam is evaluated. Exactly four edges must be detected for a correct measurement. If more than four edges are detected, the software performs an internal plausibility check of the detected positions. If no clear assignment to the object being measured is possible, the switching positions are approached individually, and the user manually assigns the correct positions.

The arrangement of the measuring object between the sensor and the measuring object should be chosen so that no contours lying behind or next to the object are detected during the reference run.



With this tool, the clamping arm is also detected in the background during the measurement movement after the object being measured, resulting in an incorrect exit edge for the object being measured. In this case, the tool must be rotated so that the object being measured creates a clearly defined entry and exit edge in the light beam.

The software is capable of processing multiple detected objects. This allows the tool to be aligned in such a way that, during its passage, it detects both the actual object being measured and subsequently the interfering contour, thus specifically avoiding interference contours. Crucially, a clear edge separation must be achieved between the two.



1: Sensor detects object being measured (Sensor HIGH)

2: Sensor emits light between the object being measured and the interference contour (Sensor LOW)

3: Sensor detects interference contour (Sensor HIGH)

8.2.1 Detection of very thin objects, e.g., welding torch wire

When detecting very thin objects, it can happen that too little light is absorbed by the object being measured, because parts of the light spot pass by the object and shine onto the reflector, where they are reflected. As a result, the object is not detected.

This can be remedied by increasing the sensor's sensitivity via the teach-in method.

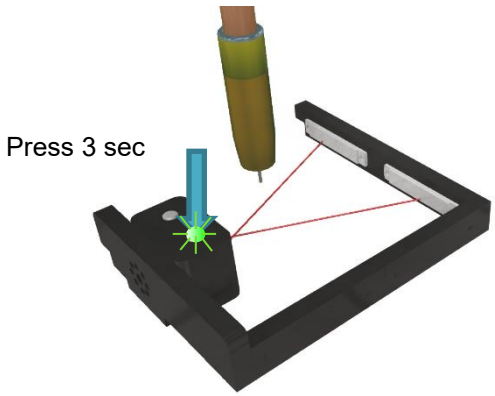
The following must be done once:

1. Teach-in of the reflector
2. Teach-in the contour to be measured

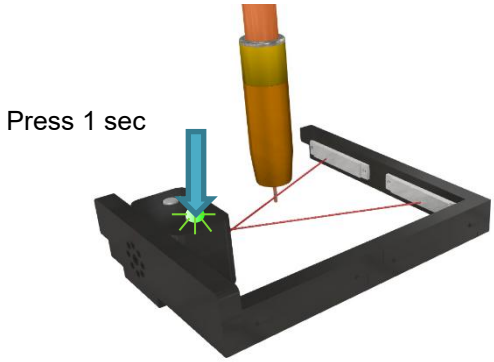
The sensitivity is permanently stored in the sensor.

Procedure:

1. Teach the reflector. To do this, position the object being measured outside the beam. Then press the button on the sensor for at least 3 seconds until the green and yellow LEDs flash.



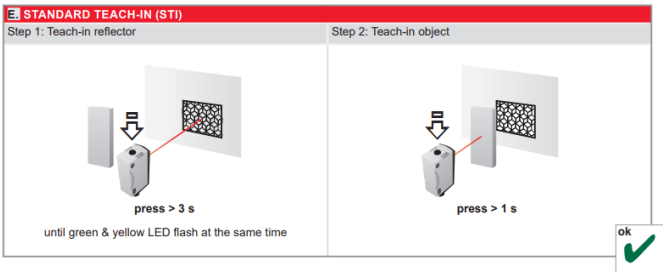
2. Position the object being measured in the light beam and press the button on top of the sensor for 1 second.



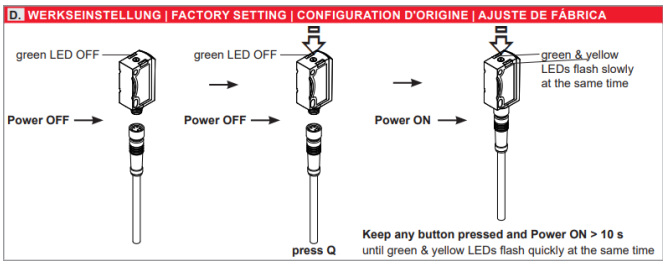
The value is stored in the sensor.

A test drive can now be carried out. If the measurement contour is still not detected, the process must be repeated.

Teach-in of a measuring object



factory reset

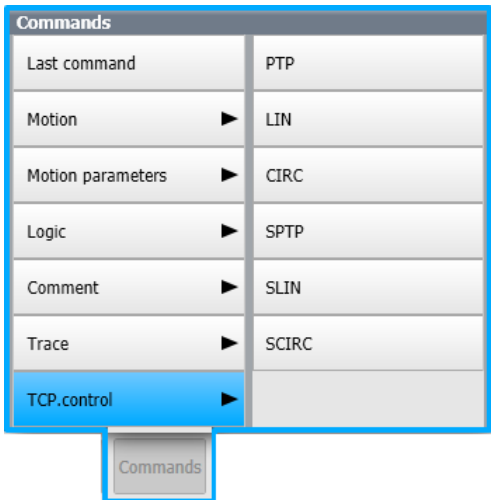


9 Start measurement run via inline form

A measurement run is started using the **TCP.control** command. An inline form is available for this purpose, which can be called from any robot program. To use the inline form, a program must be open or selected. It is an extended motion inline form.

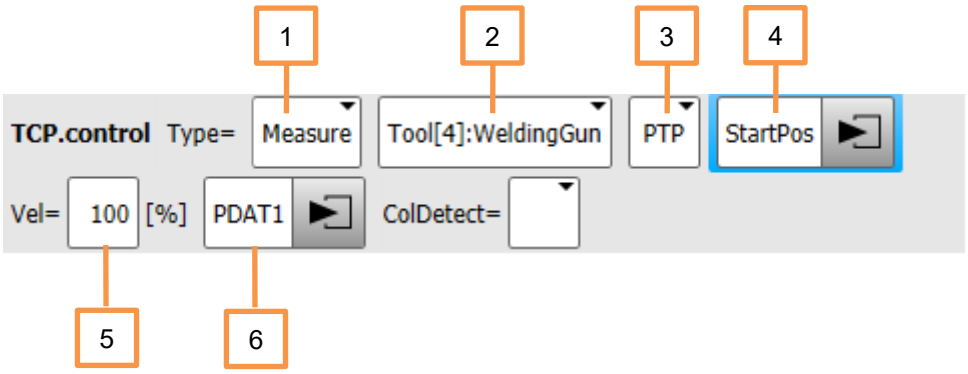
The TCP.control command is inserted into the program via the menu sequence **Commands** → **TCP.control** . Various methods are available for selecting the starting point of the measurement.

Commands Menu



9.1 TCP.control command

Inline form



parameter

1: Type of measurement (Measure: Tool data is measured)

2: Tool to be measured

3: Type of movement to the starting point of the measurement

4: Starting position of the measurement with specification of tool and base data

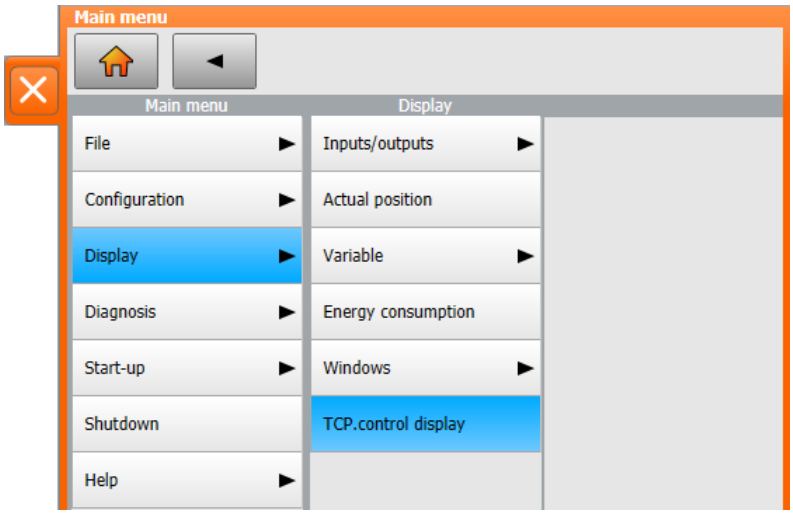
5: Speed of movement towards the starting point

6: Movement parameters

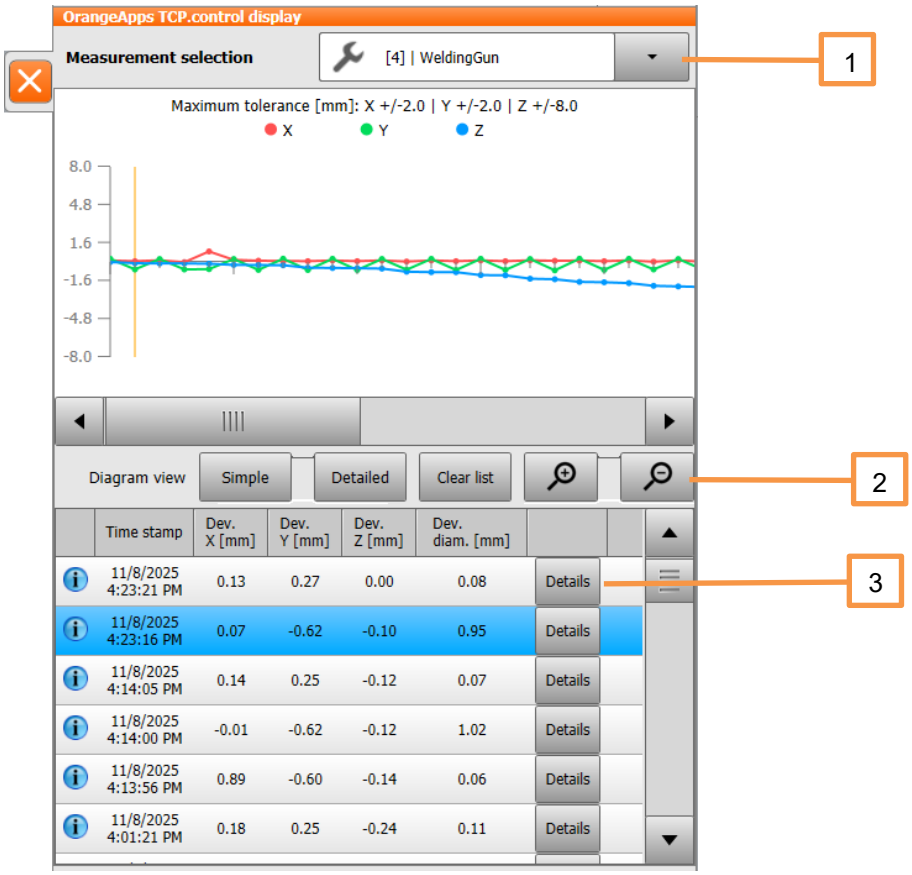
10 Display of measurement results

An HMI is available to display the last 500 measurement results.

Display → TCP.control Display



→ The data display window opens.



1: Selection of the measurement

2: Switching between simple and detailed view, zoom and delete list

3: Detailed display of the respective measurement

11 Application programs

During a measurement, three user programs are called. These can be customized as desired. They are located in the module "TCPcontrol_User".

11.1 TCPcontrol_user_Start

This routine is called when the measurement starts.

11.2 TCPcontrol_user_End

This routine is called after the measurement is complete.

11.3 TCPcontrol_user_Error

This routine is called when the tolerance limit has been exceeded during a measurement and "user program" has been selected as the error response in the configuration.

Description of the variables

variable	Data type	Transfer type	Standard value	Description
bCancel	BOOL	OUT	FALSE	TRUE terminates the measurement
bRepeat	BOOL	OUT	FALSE	TRUE repeats the measurement
bErrDiam	BOOL	IN	-	TRUE when the diameter tolerance limits are exceeded
bErrTrans	BOOL	IN	-	TRUE when the tolerance limits of the tool coordinates are exceeded

12 Reports

Report	Description	remedy
Tool not configured	A test run was started for a tool that was not set up.	Setting up the tool
Output from sensor number not detected, please check position and sensor. Alignment process aborted!	No signal detected from sensor	Check position Check sensor
Sensor detected nothing during search run; please check position and sensor. Alignment process aborted!	No signal detected from sensor	Check position Check sensor
The sensor did not detect enough edges during the search; please check the position and sensor. Alignment is aborted!	No signal detected from sensor	Check position Check sensor
Measurement failed, no input received from the sensor.	No signal detected from sensor	Check position Check sensor