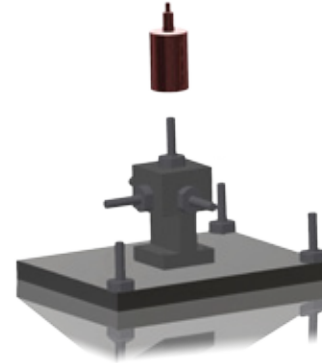


FC Calibration (Force Control Add-On) FlexFinishing Products

FC Calibration is designed to use as an add-on for robots equipped with a force control function package. In the basic configuration the system is able to detect and calibrate the tool center point (TCP Calibration) of the attached tool automatically. As an additional option the workpiece can be defined as well (WObj Calibration).



Improved conditions for production

When using TCP Calibration during operation the robot can perform much more precise due to the fact that the tool center point (TCP) is more accurately defined which results in improved production conditions.

Complete package to define tool center points

Before applying the TCP Calibration function the included hardware needs to be installed in the workcell. A cube with four test prods shall be mounted stationary within the working range of the robot and one calibration test prod has to be attached to the robot (tool). In addition the dedicated Human Machine Interface (HMI) for setup and definition of new Tool TCP's has to be installed on the robot controller.

Extended functional range to define work objects

As an upgrade the setup and definition of new work objects is possible by installing three additional screwable test prods (e.g. by mounting them on the workpiece fixture or on any other reference area). By using this extended function the precision of the processing results can be accessorially improved.

Enabled flexible manufacturing

Certain production conditions need a maximum flexibility (e.g. to be able to handle small batch sizes, frequent fixture changes...) and focus on accuracy (e.g. to obtain improved processing results by concurrently minimizing manual influences...) which can be easily obtained with the use of FC Calibration TCP and WObj.

Significant time savings

It is possible to predefine a huge number of tools, which leads to significant time savings during production. Further savings arise from the tool length adjustment which is needed to e.g. justify offline generated programs with real world conditions.

FC Calibration

FC Calibration TCP

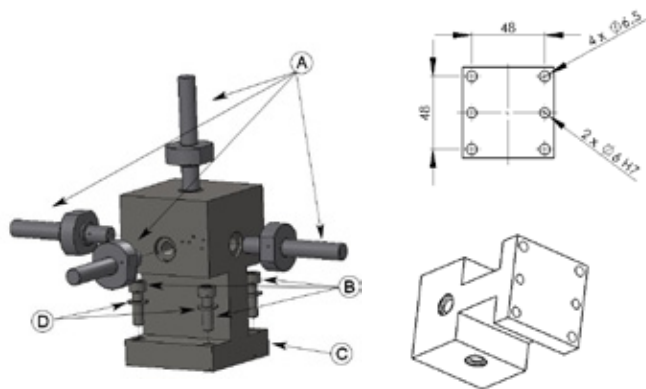


Illustration of the calibration cube (incl. mounting flange hole pattern)

TCP Accuracy

= +/- 0.05 mm-0.15 mm (depends on the robot model)

Measurements of the calibration cube (LxWxH)

app. 50x50x120 mm

Cycletime (Approximate value) for initial TCP definition

app. 120 seconds

Cycletime (Approximate value) for tool length adjustment

app. 5 seconds

Human Machine Interface (HMI)

Features

Setup & Adjustment of the Calibration tool

Creation & Definition of new TCP's and WObj's

Recalibration & Updating of existing TCP's and WObj's

FC Calibration WObj

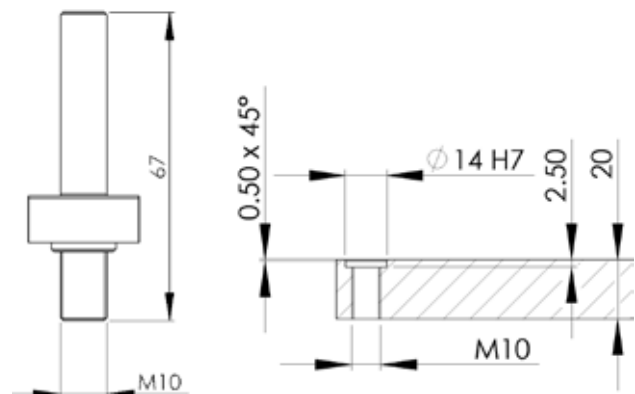


Illustration of the calibration test prod (incl. mounting hole pattern)

WObj Accuracy

= equal to the position repeat accuracy of the robot model

Total length of the test prod

67mm

Cycletime (Approximate value) for initial WObj definition

app. 60 seconds



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