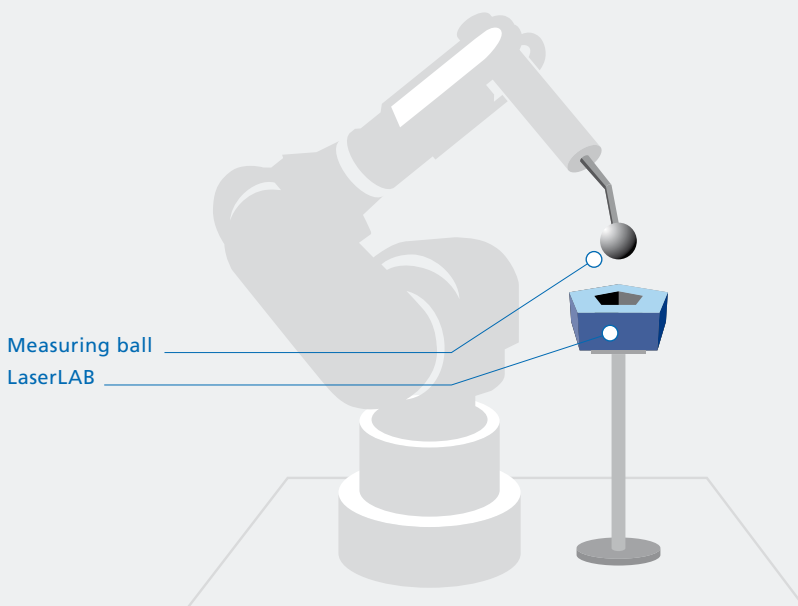


Calibration and Measurement with LaserLAB

Do you not think that it should be possible to measure everything around the robot directly inside the manufacturing cell – namely with only one handy measuring system? This is possible! Thanks to the LaserLAB conceived by WIEST you have a solution for all measurements!

LaserLAB is a patented measuring procedure. It consists of a pentagonal blue measuring sensor with five laser triangulation sensors, measuring balls and suitable software each for one application area. LaserLAB does not remain stationary in one robot cell, but can be used flexibly in several cells. If a measuring ball is placed into the visibility area of the measuring system, the position of the ball centre will be calculated. Due to the direct correlation of the ball centre to the Tool Centre Point (TCP) of the robot, it is possible to measure the robot. As you get a solution for all measurements around the robot, you can save unnecessary costs. With the system from WIEST you will achieve a high accuracy in all measuring tasks and you will be able to carry out all measurements by yourself – and thus save valuable production time! Therefore, LaserLAB is not just another solution, but the permanent solution!



How it is done

LaserLAB consists of two hardware components: The pentagonal sensor and one or more measuring balls, which can be used differently. Such measuring tools, e.g. bones or quadruples, help you to measure special tools like electrode holders and grabs. Depending on the measuring or calibrating task, the LaserLAB operates with different software so that the robot tool, the base, the robot itself, the temperature drift or even cooperating industrial robots can be measured with only one device.

Your Advantage

- :: All measurements with one system
- :: Application for initial operation and maintenance
- :: Automated non-contact measurement
- :: Robot calibration directly inside the manufacturing cell
- :: Easy operation, applicable by yourself!
- :: No teach-in repetition!
- :: Reduction of downtimes to a minimum
- :: Compatible with most of the common robots
- :: Very robust, solid design
- :: Proven in industrial environment
- :: Mobile and flexible use

Compatibility

- :: ABB
- :: Comau
- :: Kuka
- :: Mitsubishi
- :: Motoman
- :: Stäubli



A SOLUTION FOR EVERYTHING – APPLICATIONS

Tool measurement with tool:in

Goal of the measurement is the determination of the Tool Centre Point. You will get the real geometric dimensions of the tool; in 3 as well as in 6 dimensions.

Base measurement with base:in

Goal is to determine the transformation from the workpiece into the coordinate system of the robot. The software carries out the measurement of component holding fixtures (stations) or external, stationary tools.

Robot Measurement with loop:in

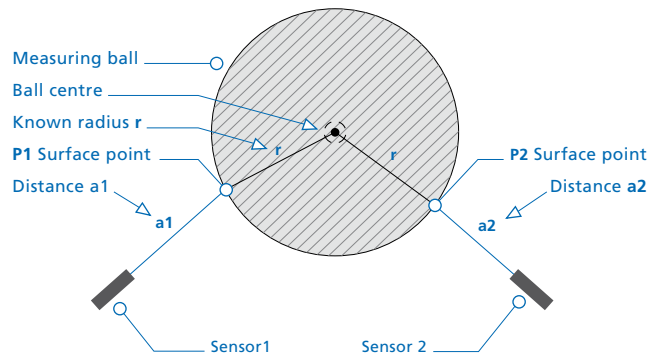
Goal of the measurement is the improvement of the absolute positioning accuracy. You will get an accurate model of the robot axes according to the "Closed-Loop Calibration Method".

Measurement of the Temperature Drift with temp:in

With LaserLAB and temp:in you will be able to continuously measure the temperature drift and straightaway compensate it inside the robot – without having to stop production!

Measurement of Cooperating Industrial Robots with kir:in

Goal is the measurement of one or several additional axes up to cooperating robots. You will get a common coordinate system, within which the kinematics move.



THE PROCEDURE IN DETAIL

Several one-dimensional distance measurements to the measuring ball form a reliable basis for the non-contact measurement of coordinates. The five laser triangulation sensors of the LaserLAB are aligned in such a way that their rays from different directions meet in a common centre. The directions of the laser beams will be exactly determined by calibration factory-made. Surface points on the ball can be determined in three dimensions from the directions and the measured distance of the individual sensors. Due to this information, the position of the ball centre can be calculated. A first approximation for the TCP is obtained after four measurements. This can be transferred to the robot control by pushing a button. Further measurements will be obtained by just re-orientating the ball within LaserLAB. As a rule, 12 measurements are enough to achieve a sufficiently high accuracy.

Specification

- :: Repetition accuracy or resolution < +/- 0.02mm
- :: Absolute accuracy < +/- 0.1mm (typically +/- 0.035 mm)
- :: Measuring range (x, y, z): 39.5 x 38.5 x 36.5 mm
- :: Temperature range: 0° - 55°C (no measurable temperature drift)

Technical Details

- :: 5 laser triangulation sensors, laser class 2
- :: Communication via RS232
- :: Power consumption: 15 V/300 mA
- :: Dimensions: 195 x 195 x 95 mm
- :: Weight: 2.1 kg

