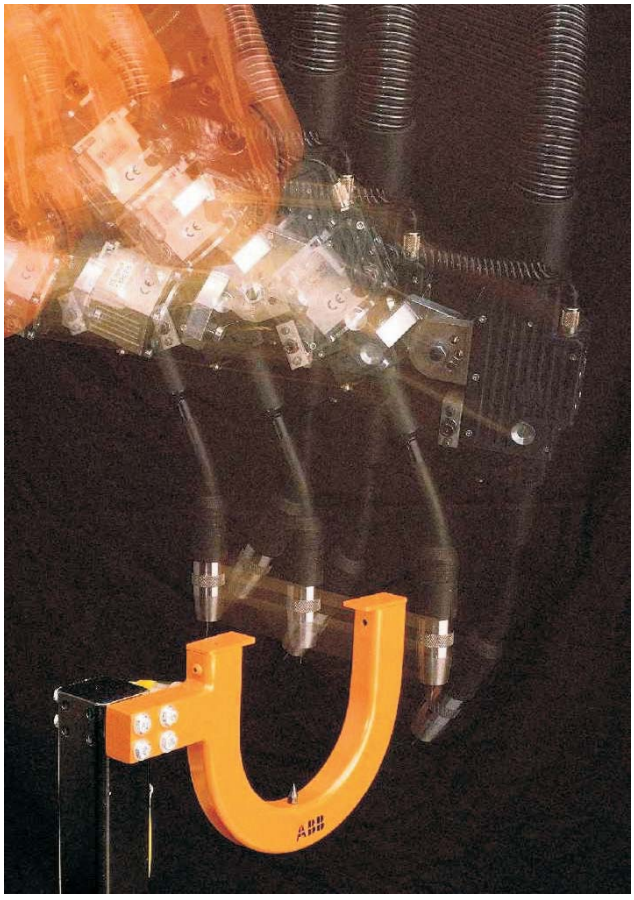
BullsEye®

Automated Tool Center Point Calibration

MAIN APPLICATIONS
Arc Welding



Performs Quick Checks in 8 seconds.

Why you should update the TCP using BullsEye® -

- Keeps the robot in automatic mode and out of the hands of the operator.
- Takes fewer minutes to get a good TCP than the operator can do visually.
- Robot logs TCP variations for statistical information.
- BullsEye adjusts the torch angle which is critical for weld quality, mechanical torch reaming, and through-the-arc seam tracking.
- Eliminates reprogramming when switching fixtures.

Feature/Benefits

To ensure optimum quality production ABB has developed the BullsEye automated torch calibration system. With BullsEye, the robot is instructed to check its own TCP(Tool Center Point) which is an invisible reference point in direct alignment and relationship to all axes of the robot arm. TCP is the precise point where the welding wire tip would touch the workpiece.

Gone is the guesswork; the error-prone "eyeball" method from one operator to the next; the need to stop the robot and maneuver it over to a TCP calibration check point for manual adjustment.

At designated intervals (e.g., every 10, 20, or even 100 parts), your robot can be programmed to zero in on BullsEye, do an 8 second quick check, and go back to work. If the TCP is slightly out of alignment BullsEye automatically recalibrates the TCP and the robot goes back to work without any operator intervention. If the TCP is misaligned more than previously defined by the operator, the operator can either manually align the welding torch using the calibration check pointer and then let BullsEye finish the adjustment, or let BullsEye do the entire recalibration.

During the welding process there are numerous events that can cause the robots TCP to become misaligned. It can vary from a change in the cast of the welding wire, to wear in the contact tip, torch alignment or even torch wear. Also, the operator may inevitably hit a clamp or drive the robot into the part and knock the torch out of alignment while programming. When this occurs the operator runs the BullsEye routine where a fiber optic light beam provides the precise TCP accuracy to the center of the welding wire's diameter and gets the robot alignment back to within +/- 0.006". It can also verify that the robot arm is accurately calibrated and, automatically update the X, Y, and Z axes and the torch angle. With BullsEye, your robot will always operate with a true, accurate TCP.

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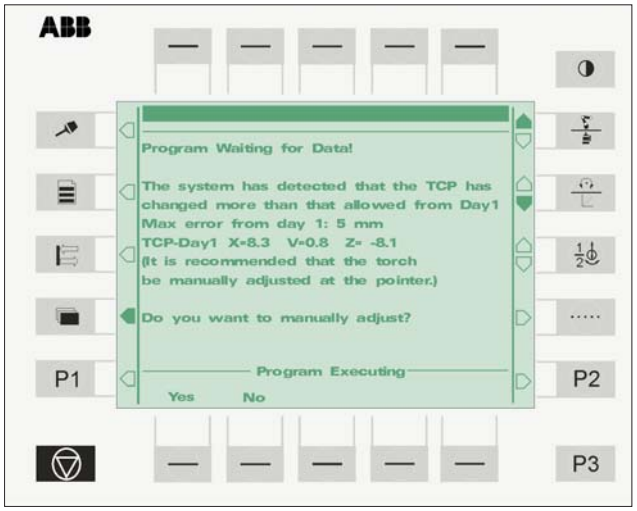
When the robot stores weld points, it stores X, Y, Z and angular data. This allows the robot to automatically run any program without having to do any recalculations of robot joint angles when the TCP is updated. This is especially critical when you have more than one weld routine that you call up at any given time.

BullsEye requires very little floor space to operate. It can be mounted to existing structures within reach of the robot or have its own stand. It has the rugged construction you expect from a close-tolerance measurement tool in a robotic arc welding environment. BullsEye will interface with all ABB System 4 welding robots and is surprisingly affordable.



The Teach Pendant window informs the operator of the alignment process.

BullsEye Specifications	
Electrical	40 ma, 24 VDC
Robot Connection	One interrupt signal
Software	Furnished with unit
Accuracy	+/-0.006" (0.163mm)*

* Radius of sphere within which robot can hold a TCP during a 90 degree orientation change.

Operation

Depending on the workpiece design and process considerations the robot can be instructed to monitor and automatically adjust the TCP alignment at regular intervals. There are three stages of calibration:

1 - A quick 8 second check will verify robot alignment and then the robot will go back to work.

2 - If the alignment is off less than 0.200 inch (operator definable) the full BullsEye routine is executed, the TCP is updated in the X, Y, and Z axes along with the torch angle and the robot automatically returns to production.

3 - If the alignment is off more than 0.200 inch (operator definable) the operator is required to interact with the BullsEye routine. The operator can either manually adjust the TCP, using the calibration check pointer, or have the full BullsEye routine executed and the TCP updated in the X, Y, and Z axes along with the torch angle.

BullsEye can even monitor the robots repeatability.

Any deviation is automatically time stamped and recorded in the System 4 Service Manager™ software program to assist your service personnel when performing maintenance. For complete details and a demonstration or video, contact your Wolf Robotics representative today at 970-225-7600.

ABB reserves the right to change specifications without notice.

Wolf Robotics Inc.
4600 Innovation Drive
Fort Collins, CO 80525-3437
970.225.7600 Phone
970.225.7700 Fax
sales@wolfrobotics.com
wolfrobotics.com

A Division of Rimrock Automation

ABB's Strategic Partner for Arc Welding and Cutting Systems