

Collision Detection RobotWare option



Superior protection for your equipment and work pieces

Collision Detection is a highly advanced robot control option that automatically detects collisions and quickly causes the robot to stop and back up to release the pressure. Not only does it reduce the force of the collision, but also prevents the robot and its tooling from being pressed against an object after a collision.

This built-in function is proven superior to mechanical collision detection devices in several important ways: It detects collisions in all directions, protecting not only the end of arm tooling, but also the work pieces and the robot itself. It has no mechanical parts and requires no cabling, which gives it higher reliability and more cost efficiency. Also, since there is

no device attached to the tool, you do not extend your tool offset distance, which allows bigger maximum tool weight and better reorientation performance. ABB's Collision Detection is active both in teach and automatic modes, so you are protected at all times.

After a collision, the robot can be jogged immediately or its program restarted. Best of all, since Collision Detection works together with the Load Identification functions, you do not have to perform complicated trimming tasks to ensure its proper operation.

Collision Detection

Benefits

Detection in all directions

Abnormal torque levels on any robot axis, even front collisions, are detected and will cause the robot to stop quickly and thereafter back off to relieve forces between the robot and environment. The robot can immediately be jogged or restarted.

Cost efficient solution

A software solution detects and reduces the force of collisions without the need for a mechanical clutch. It adds no weight, has no moving parts and requires no extra cabling. This means reduced costs and improved quality.

High reliability

With no mechanical parts and no cabling involved, the reliability is 100 %.

Less damage on equipment

With collision detection the robot quickly backs away after a collision to release tension. This relieves the force on the equipment and prevents or reduces costly damage.

Range of applications

Collision Detection is extremely useful in all applications and in a number of different situations. Some examples are:

- When running programs for the first time and there are uncertainties of the paths.
- When the arc welding process ends (at the end of the weld seam), it often happens that the wire gets stuck (burned) to the work piece. Collision Detection will stop the robot before it continues its movement thus securing that the equipment does not get damaged.
- In a collision caused by jogging the robot in the wrong direction.
- When a gripper is closed by mistake – e.g. due to electrical problems or programming errors.
- In the common situation where clamps are used to hold the work piece in position in the fixture. If the clamps are not closed, e.g. due to human error, Collision Detection will prevent hard crashes with the clamps.
- In applications where there are other moving objects within the working range (pallets that are stacked, moving conveyors, etc).
- When jogging large work pieces and the operator cannot see the tooling at the far side. For example, if an operator is trying to teach a path for placing a car body side or a frame into a clamping station, he might not see that he is pressing the part against one of the clamps. With Collision Detection, the robot will sense the abnormal force and stop – preventing costly damage to the cell.
- Weld gun tip sticking. Weld tip sticking is a common problem that can result in bending of the gun electrodes or damage to the cell equipment as the robot moves to its next point.

With Collision Detection, the robot stops where it is stuck, allowing the operator to simply jog the robot and replace the damaged tip, preventing hours of downtime for gun or other part replacement.

- Machine Tending. Common problems in machine tending are parts being stuck, doors not opening all the way, part misalignment, etc. Each of these situations can be catastrophic for the robot gripper. With Collision Detection, damage can be avoided or at least minimized, saving downtime and gripper replacement costs.

Customization possibilities

Tuning is normally not required, but the sensitivity can be changed from RAPID, ABB's programming language, or its configuration parameters.

The supervision can even be switched off completely (permanently or temporarily). This may be necessary when strong process forces are acting on the robot.

The sensitivity during default tuning is comparable to the mechanical alternative and in most cases much better. In addition, together with the Load Identification function*, it has the advantages of:

- no added stick-out and weight
- no need for connection to e-stop circuit
- no wear
- the automatic backing out after collision
- adjustable tuning

Two system outputs reflect the activation and the trig status of the function.

*Load identification: This function makes the robot carry out an accurate identification of the complete load data by simply shaking the tool.

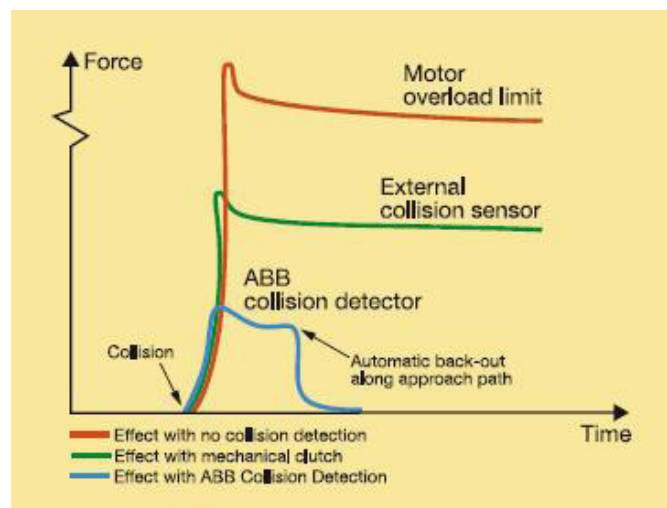


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