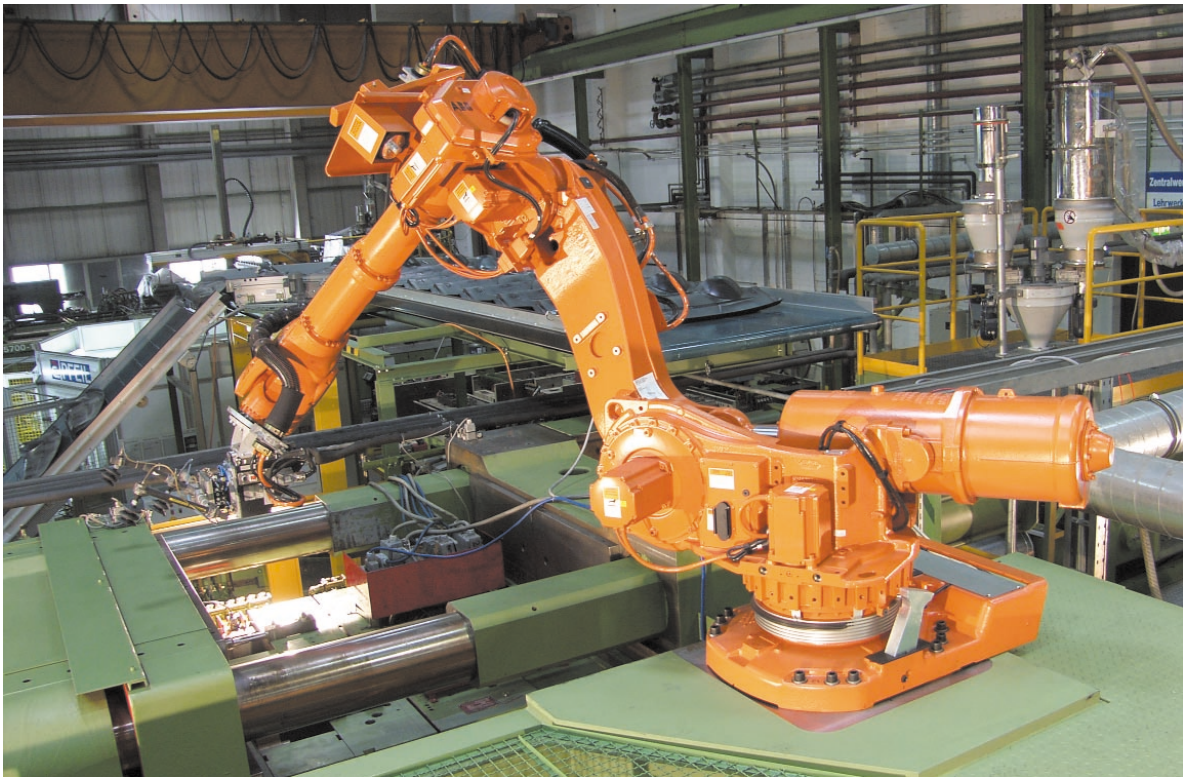
Machine Sync

Software for increased productivity



Saving seconds

Saving time is saving money, and when it comes to reducing the time needed for opening and closing machines for extraction, the seconds saved can be substantial. Machine Sync, based on long experience of robotised machine tending, further increases the output of robot production by coordinating the opening and closing of the machine, thereby reducing cycle time. Furthermore, by synchronising the opening and closing, robot wear will be reduced and collisions can be avoided.

Easy to program

Machine Sync is easily configured with ABB's RAPID programming language. Machine Sync is compatible with the ABB's Euromap/SPI to guarantee redundant machine-robot safety based on international standards. Machine Sync allows for easy robot programming and operation, a state-of the-art system is achieved in optimised cycle time and ease-of-use. Machine Sync can be applied for machine tending and material handling in general, and especially for injection moulding, die casting, machine tools and press tending.

Early enter

When Machine Sync is used, the workflow of robot and machines overlap to save time. With Machine Sync, as soon as there is enough space for the robot between the machine platens at machine opening, the sensor triggers the robot to start to move into the machine, synchronised with the moving platen of the machine. Time is saved by the robot entering early.

Early closing

At mould closing, the robot starts to move out of the machine as soon as the moulded part has been gripped. When the robot has reached the machine closing point on its synchronised path, the machine starts to close. The machine closes safely while the robot moves out. Time is also saved by the machine closing early.

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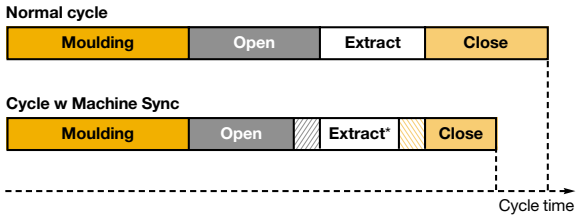
When using Machine Sync, the position of the robot on the robot path is synchronised with the machine reaching different positions. This enables the programmer to always choose the minimal distance between the robot and the machine while considering robot and machine speed and stop distance, which ensures both an optimal cycle and safety.

Increasing production output

The obvious benefit of Machine Sync is the reduced extraction time, thereby improving machine cycle time and increasing production output. In a typical case with an injection moulding machine in the range of 3000 tons moulding a typical automotive part and an IRB 6650 shelf robot, the saving in extraction time using synchronised early enter and early closing is about 10 per cent. Extrapolating this number for a machine running three shifts all year round with an extraction time of 10 seconds and a complete cycle time of 30 seconds would yield 35,000 more parts produced.

Machine Sync applied for Injection Moulding



*The robot extract time overlaps with the machine Open and Close time.
Depending on the characteristics of the cycle about 10% of the extract time can be saved.

Safety included

Since the position on the robot path is synchronised with the machine reaching different positions, Machine Sync also ensures the safety of the application. Compared to just setting one intermediate signal when the machine is half open and then letting the robot enter, Machine Sync has a higher degree of safety and collision avoidance. Special safety zones, which can be configured depending on, e.g., the gripper dimensions and its geometry, allows safe operation in manual as well as in automatic mode.

Reduced robot wear

Since the robot will not have to stop at the machine and wait for it to be fully open, the robot wear caused by stops and starts is also reduced.

Features

By synchronising the robot's movement with a linear sensor on a machine's moving plate:

- Early enter - the robot is synchronized with the machine while entering it,
- Early closing - the machine can safely close early since the robot is synchronised with the moving plate when leaving the machine.

Benefits

- Extraction time reduced by about 10 per cent
- Reduced cycle time
- Increased machine time
- Reduced robot wear
- Avoidance of collisions
- Easy to configure and program.

Applications

Machine tending and material handling, especially injection moulding, die casting, machine tools and press tending

Requirements

- RobotWare option 607-2 Analog sync, optional with Machine Sync Application Layer
- 608-1 World Zones
- 623-1 Multi Tasking
- Machine sync program libraries
- Analog I/O card
- Analog linear sensor with analogue signal e.g. 4 to 20mA

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