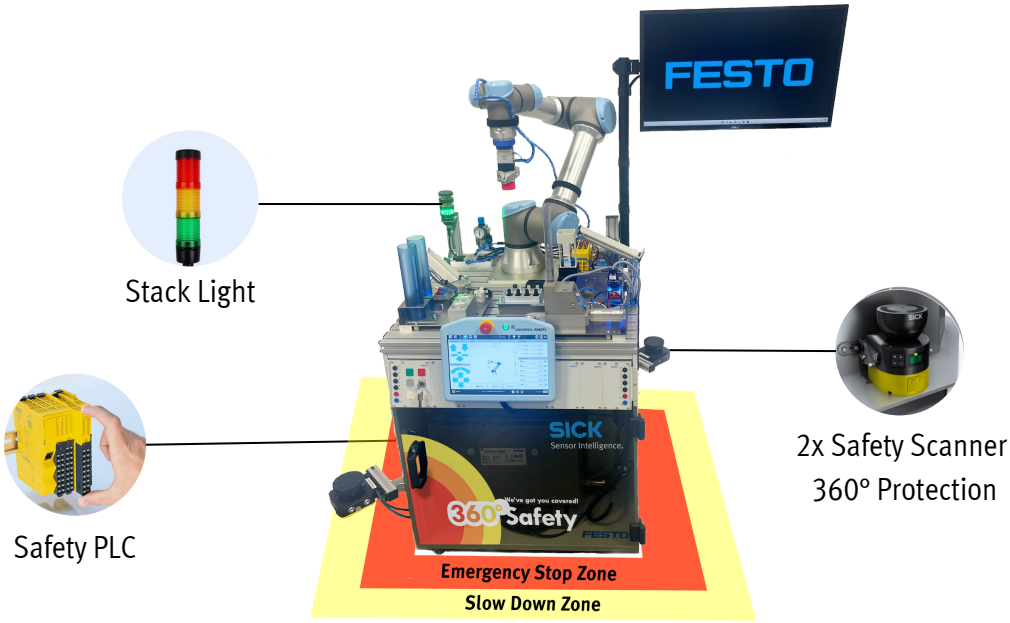
Festo Collaborative Universal Robot Assembly Cell

SICK Safety Awareness Package



Highlights / Deliverables

- Quick Start Guide for rapid deployment of system upon delivery
- Comprehensive curriculum for student learning including instructor notes and guide
- Certification FESTO and NC3
- Compatible with standard mechatronics MPS systems as well and Industry 4.0 versions
- 3-Position Touch pendant
- Node Programming by selecting functions and executing them line by line
- Freedrive interaction by manually moving the arm
- Templates for novice users; API for advanced
- Optional Realtime Condition Monitoring by Olis

The robot assembly module supplies the individual parts for the assembly process of the pneumatic cylinder: A double-acting cylinder pushes the cylinder cover out of the stacking magazine. The pistons are kept on a pallet. A double-acting cylinder pushes the springs out of a slim magazine.

All components of the robot assembly module are attached to a mounting plate that can be repeatedly mounted in the same position on the profile plate of the station. This ensures that the station can be converted quickly.

The robot handling module feeds workpieces to the station via a chute, which the robot transports to the assembly fixture. With the sensor in the gripper, the robot distinguishes workpieces by color (black/not black). The sensor in the mounting fixture also monitors the orientation of the workpiece. From the assembly station, the robot sorts the workpieces into different magazines or forwards them to a subsequent station.

The combination with the robot assembly module also enables the assembly of workpieces.

The two tubular magazines and the mounting fixture are mounted on a mounting plate that can be attached to the base plate of the MPS station robot using the fastening material provided. This means that the entire module can be removed from the station and later reassembled in the same position as required, without having to adjust the relevant robot positions for this module.

PARTNERS

UNIVERSAL ROBOTS

SICK
Sensor Intelligence.

nc3

olis robotics

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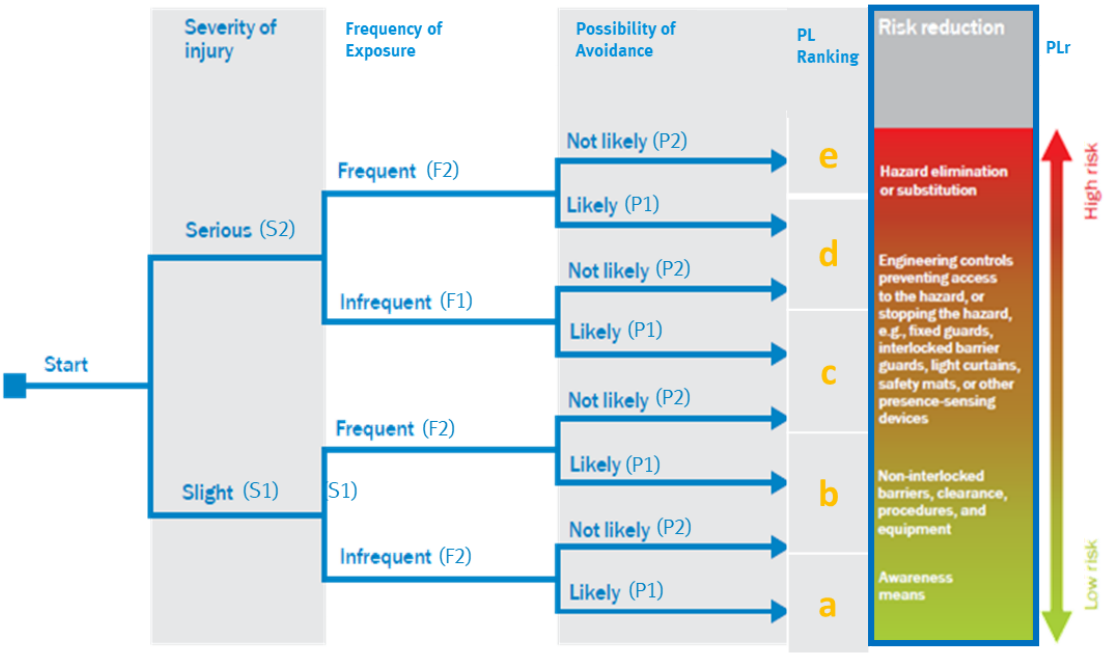
Risk Evaluation Tree



Six Step Method to Overall Risk Assessment:

1. Risk Assessment
2. Safe Design
3. Technical Protection Measures
4. Administrative Measure
5. Overall Machine Validation
6. Deployment of Machinery

Performance Level Ranking Worksheet (PLr)

During a Risk Assessment, a Safety Specialist analyzes and evaluates the 7 hazards and risks associated with robot process using a proven, task-based methodology in accordance with ANSI B11.0:2010, ISO 12100 and/or a corporate risk assessment process.

1) Human Errors
Human error occurs in day-to-day activity, and this is no different regarding a robotic work cell. Whether it is programming, preventative maintenance, or teach pendant control, operators have the potential to place themselves in hazardous positions due to over familiarity or lack of knowledge of the robot's motion path.

2) Control Errors
Errors in the controls software and hardware can lead to hazards within a robotic work cell. If the controls system faults, the system response may lead to a dangerous working environment if it is closely coupled with human interaction.

3) Unauthorized Access
Access by an unauthorized operator into a safeguarded robotic work cell. If an operator is unfamiliar with the safety hardware associated with the robotic work cell, they can find themselves in a dangerous and potentially fatal area.

4) Mechanical Failures
During the design and programming stages, mechanical part failure is not always taken into account.

5) Environmental Sources
Outside factors and communication interference can create an undesirable effect on a robotic work cell. Unsuppressed power surges or power loss can lead to injury if they are not planned for during the initial stages of the project.

6) Power Systems
Power sources that have communication to the robotic cell can be disrupted and lead to undesired actions.

7) Improper Installation
Any time an industrial robot is installed it is vital to the success of the project and safety of the operators that the system is installed correctly before it is fully operational.