MPS Universal Robot Station

Troubleshooting and Safety Training Package

Highlights

- Quick start guide for rapid deployment
- MPS Robot Assembly Station Hardware Platform used in SkillsUSA and WorldSkills competitions
- SICK Safety Awareness Bundle provides 360° protection and comes with certification
- Onsite Training and Consulting Services provided by Festo, Value Added Resellers, and partnering Certification Institutes

Festo Didactic, Universal Robots Academy, and SICK Sensor Intelligence have joined forces to deliver the industry's most comprehensive robotics education platform: the MPS Universal Robot Station - Troubleshooting and Safety Training Package.

Tailored for high schools, colleges, universities, and industries. This innovative learning solution prepares learners with in-demand skills in robotics, safety, and Industry 4.0.

The MPS line of products has a concentrated focus on mechatronic competencies while the Cyber-Physical line introduces students to Industry 4.0 and Smart Manufacturing concepts supported by MES software.

The program integrates advanced training in functional safety, risk assessment, and automation, supported by SICK's cutting-edge 360° safety awareness technology.

The Festo MPS Universal Robot Station is a versatile training platform that provides students with an industrial robotic learning experience encompassing several common industry applications. Through hands-on learning and a robust curriculum, students master real-world applications such as:

- Functional Safety
- Pick and Place
- Handling and Assembly
- Part Orientation
- Optional PLC

PARTNERS

UNIVERSAL ROBOTS

SICK
Sensor Intelligence.

360⁰ Safety Awareness from SICK
What is a risk assessment?

When building an automation manufacturing system it is imperative that a risk reduction strategy is created to allow personnel to carry out their day-to-day tasks without compromising safety. The main goal is to identify the level of existing risk and make an informed decision based on the given scenario. Key considerations include factors such as: severity of injury, possibility of occurrence, possibility of avoidance, and frequency of exposure.

Most workplace injuries do not occur during normal operations but rather when human interaction is most prevalent, such as during programming, inspection, and repair. When workers are up-to-speed on safety, they're in a better position to prevent injuries and hazards, and approach things like change over and predictive maintenance while protecting the integrity of the entire system.

By integrating SICK safety laser scanners and the safety awareness curriculum into the MPS and Cyber-Physical training equipment, students can develop a well-rounded working knowledge of interconnected robot systems. Not only does the curriculum assist students in understanding the importance of risk assessment, it's designed to teach them what to do with the data captured.

The curriculum introduces learners to SICK's Six-Step Method of Robotics and Automation equipment safety, helping them understand critical topics in equipment safety and deployment.

Six-step method to a safe workspace

1. Risk assessment
2. Safe design
3. Technical protective measures
4. Administrative measures/ information about residual risks
5. Overall validation of the machine
6. Deployment of machinery

Certificate of Endorsement

The Certificate of Endorsement is awarded to the classroom instructor upon the successful completion of a Risk Assessment process and system evaluation. To qualify for the certificate:

1. A Safety Application Specialist will dedicate up to 2 hours documenting the robotic system and its surroundings in collaboration with the classroom instructor.
2. The Risk Assessment report must be completed, detailing all safety considerations and system documentation.
3. The classroom instructor must exercise all system functions according to the required safety standards as outlined during the process.

Once all these requirements are met and verified, the instructor will receive the Certificate of Endorsement as formal recognition of compliance and competency in the safe operation of the robotic system.

MPS Universal Robot Curriculum Assets

The curriculum systematically guides learners and educators through the subject material with instructor lesson plans, quick start guides, videos, worksheets, and testing to ensure a thorough understanding of core competencies that complement Industry 4.0 training methods. The six training modules include exercises and knowledge checks to monitor student progress, totaling 29 content hours of instruction.

Module 1: Robot Basics

Learn fundamental principles and components when troubleshooting manufacturing production systems.

Learning Goals:
- Motion Management
- Tool Center Point Confirmation
- Introduction to Singularity

Module 2: Motion Programming

Understand motion types used during system navigation to guide the robot through specific trajectories, paths, or sequences.

Learning Goals:
- Create Program and Change Name
- Motion Types L, P, Circular, Linear Joint

Module 3: Inputs and Outputs

Learn the different digital signals that allow the robot to communicate with peripheral devices.

Learning Goals:
- How to simulate inputs and force outputs
- Different types of I/O signals and devices
- Safety I/O Basics

Module 4: Safety by SICK

Understand the significance of robot safety technology standards for cobot applications and the critical role of risk assessments.

Learning Goals:
- Concept of 360^0 Safety Zoning
- Lockout / Tagout Procedures
- Software and Hardware Implementations
- Laser Safety Scanners Configuration
- Safety PLC Overview and Benefits

Module 5: Non-Motion Commands

Understand the commands used for decision-making within a robot program.

Learning Goals:
- Use several non-motion commands in industrial applications
- Subroutine navigation

Module 6: Connectivity

Learn about the systems approach via software control architecture and how to properly integrate peripheral devices such as safety scanners / safety PLCs back to the robot

Learning Goals:
- Discreet I/O communication
- Field bus communication protocols
- Profinet setup vs Ethernet I/P setup

MPS Universal Robot Certification

Certification overview

Festo is a Universal Robots Academy endorsed solution, curriculum, and training provider for the MPS Universal Robot Station. Students will demonstrate both theoretical and practical understanding of robot programming by troubleshooting an existing program that contains the following instructions and commands. Upon reaching 29 hours of targeted instruction, and successful completion of all curriculum modules and testing, participants can earn industry-recognized certifications.

Conversational data

Refers to an intuitive programstructure that aids the technician in troubleshooting and integration procedures.

Non-motion commands

- Case/Switch Command
- If/Else and Elseif
- Until
- Wait Command
- SubProg Command
- Loop Command
- Set Command
- Assignment of Variables
- Popup
- Sync()
- Force and Direction
- Event Command

Variables

- Pose
- Boolean
- Integer
- Floating Point
- String
- List

Actions

- Digital
- Analog
- Tool
- Configurable
- Boolean register
- Integer/float register
- MODBUS

Motion commands

- MoveI
- MoveL
- MoveC
- MoveP

Motion commands + variable

- MoveI + Pose

Course materials

- Video demonstration
- Student worksheets
- Instructor guide

Recognized by

- Festo Industry 4.0 Certification Program (FICP)
- National Coalition of Certification Centers (NC3)
- NIMS
- UR Academy
- SICK Sensor Intelligence

Certification case structure

Dynamic worksheets guide the assembly process from start to finish, using positional and conversational data.

Cases

- Pick from Input Slide
- Place to Regrip
- Check Color
- Pick from Regrip
- Find Holes
- Pick Piston
- Place Piston
- Pick Spring
- Place Spring
- Pick up + place on regrip
- Regrip cap
- Find cap rotation
- Place on Slide
- Recover

Subprograms

- Open Gripper
- Close Gripper
- Spring Magazine
- Cover Magazine

Events

- Dance

Ready to learn more?

Please contact Festo Didactic or an authorized dealer to confirm product availability, pricing, and technical specifications.

Empowering Tomorrow's Workforce: Universal Robots and Festo Didactic Unveil MPS Universal Robot Station with Safety Training at IMTS 2024

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