



Sciencetech 2311 IO Industry 4.0 Smart Sensor (IO-Link) Training Platform is a hands-on training platform designed to provide practical knowledge of smart sensors, IO-Link communication, industrial networking, and real-time sensor data acquisition. It enables students and professionals to understand how IO-Link-enabled smart sensors collect, process, and communicate detailed digital information for modern industrial automation and Industry 4.0 applications.

The training platform demonstrates how smart sensors communicate with PLCs and control systems through an IO-Link Master, providing access to real-time process values, sensor parameters, diagnostic information, device identification, and configuration data. It helps learners understand the role of IO-Link technology in predictive maintenance, condition monitoring, flexible manufacturing, process optimization, and smart factory applications.

Key Features

- **Industry 4.0 Smart Sensor Training Platform**
Hands-on platform for learning smart sensing and IO-Link technology.
- **IO-Link Smart Sensors**
Practical training with IO-Link-enabled industrial sensors and digital communication.
- **Inductive Proximity Sensor**
Learn non-contact detection of metallic objects with real-time IO-Link data.
- **Through-Beam Sensor (Pair)**
Understand reliable object detection using separate transmitter and receiver units.
- **Diffuse Mode Sensor**
Hands-on learning of object detection using reflected light from the target.
- **Retroreflective Sensor**
Learn object detection using a sensor and reflector arrangement.
- **IO-Link Master Communication**
Learn point-to-point digital communication between smart sensors and the IO-Link Master.
- **Real-Time Sensor Data Monitoring**
Monitor process values, sensor status, and device information in real time.
- **Sensor Parameterization**
Configure and customize sensor parameters using suitable software.
- **Diagnostics & Device Information**
Access diagnostic data, device identification, status, and parameter information.
- **PLC & Industrial Control Integration**
Understand how IO-Link sensor data is transferred to PLCs and industrial control systems.
- **Industry 4.0 & Smart Manufacturing**
Explore the use of connected sensor data for condition monitoring, predictive maintenance, process optimization, and smart manufacturing.
- **Hands-On Practical Training**
Do installation, configuration, experimentation, troubleshooting, and industrial skill development.

Learning Outcomes

- Understand the fundamentals of Industry 4.0 and smart sensing.
- Understand the difference between conventional and smart sensors.
- Explain the working principle and architecture of IO-Link.
- Identify the role of an IO-Link Master in industrial automation.
- Install and connect smart sensors in an industrial training setup.
- Configure and parameterize IO-Link sensors using software.
- Read and interpret real-time process data from smart sensors.
- Access sensor diagnostic, identification, and parameter data.
- Understand communication between sensors, IO-Link Master, PLC, and control systems.
- Develop basic understanding of industrial communication and networking.
- Use sensor data for condition monitoring and predictive maintenance.
- Understand the application of smart sensors in smart factories and connected manufacturing.
- Understand how sensor-level data forms the foundation of Industry 4.0 and IIoT systems.

Technical Specifications

IO Link Master: 1 no.

- No of ports : 8 IO-Link ports class A
- Housing : Sturdy metallic
- Configuration : Web-based

Interface

- Interface type : Industrial Ethernet
- Physical M12 : D-coded
- Protocol : PROFINET IO, EtherNet/IP, EtherCAT®, MODBUS TCP
- Transfer rate fast : Ethernet 10/100 Mbps, full duplex

Inputs/Outputs

Number/type : 8 x IO-Link class A (X1 – X8)

Configurable as:

- Max. 8 IO-Link and 8 digital inputs/outputs
- Max. 16 digital inputs/outputs
- Short-circuit protected
- Output current max. 500 mA per port (X1 – X8) via C/Q (Ch. A/pin 4)

Inductive sensor: 1 no.

- Switching function : Normally open/closed (NO/NC) programmable
- Output type : PNP
- Rated operating distance : 15 mm
- Near operating distance : 10 mm (can be activated by software)
- Operating voltage : 10 – 30 VDC
- Interface type : IO-Link (via C/Q = pin 4)

Diffuse mode sensor : 1 no.

- Detection range : 2 - 1400 mm
- Detection range : Min. 100 - 200 mm
- Detection range : Max. 2 - 1400 mm
- Adjustment range : 200 - 1400 mm
- Interface type : IO-Link (via C/Q = pin 4)
- Switching type : PNP
- Switching voltage : Max. 30 V DC

Thru-beam sensor (pair) : 1 no.

- Effective detection range : 0 - 12m
- Operating voltage : 10 - 30 V DC
- Interface type : IO-Link (via C/Q = pin 4)
- Switching type : PNP
- Switching voltage : Max. 30 V DC

Retroreflective sensor : 1 no.

- Effective detection range : 0 - 15 m
- Operating voltage : 10 - 30 V DC
- Interface type : IO-Link (via C/Q = pin 4)
- Switching type : PNP
- Switching voltage : Max. 30 V DC

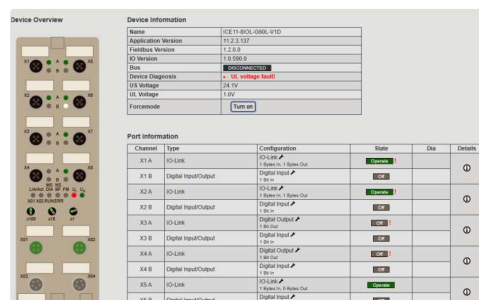
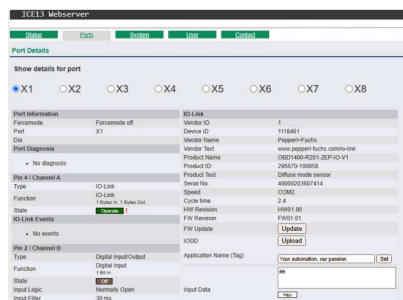
PLC

- Digital Inputs : 16 nos.
- Digital Outputs : 12 nos.
- Communication : Ethernet and RS485

Managed Ethernet Switch : 1 no.

- Ports : 5 nos.
- Power Supply : 100 - 260V AC, 50/60 Hz
- Dimension (mm) : W457 X D165 X H330
- Weight : 5 kg approximately
- Operating condition : 0-40°C, 85% RH

Software window



Application of IO-Link in Industry

Machine Automation



Process Industry



Packaging Industry



Material Handling



Building & HVAC



Data & Predictive Maintenance

