IO-Link in the Wine Industry

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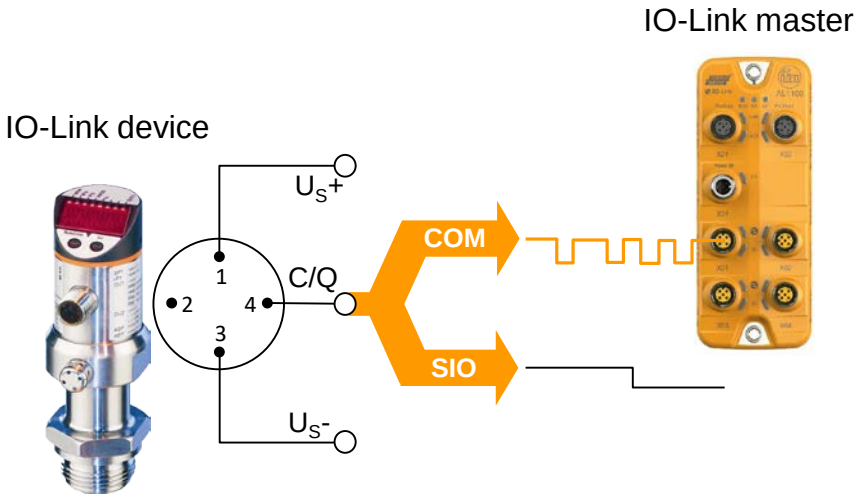
Use IO-Link
Universal · Smart · Easy

What is IO-Link?

- IO-Link is not a fieldbus
- IO-Link is a point-to-point communication system to replace conventional IO signals
  - I/O level ⇔ sensors / actuators
  - Bi-directional information
  - 3-wire standard unscreened cable
- It transmits:
  - Digital / analogue process data
  - Parameters
  - Diagnostic information
- As an interface to Industry 4.0, IO-Link collects additional data directly from machine sensors to permit:
  - Intelligent business management
  - Real time decision making
  - Lean based production



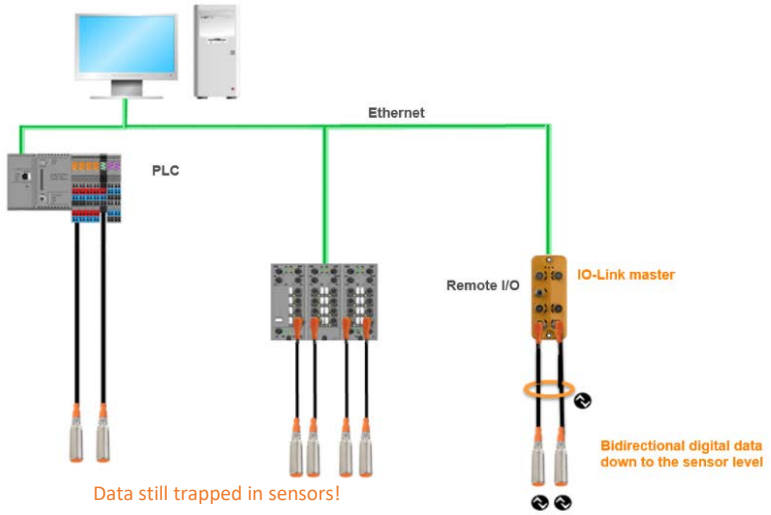
IO-Link sensors operate as normal devices (4-20mA analog transmitter or PNP switch) until connected to an IO-Link master

The IO-Link Consortium

- IO-Link is supported by over 140 companies:
  - Sensor suppliers
  - PLC suppliers
  - Actuator suppliers
  - Integrators & chip suppliers
- Version 1.0 has existed since 2008
- Internationally standardised to IEC 61131-9

IO-Link Basics

- IO-Link allows additional data to be collected with the same control architecture
- Additional information available from the sensors
- Bi-directional communication with sensors possible
- Data can be collected without passing through a PLC or HMI / Scada system
- MES or ERP systems have direct access to sensor level information



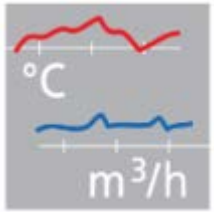
IO-Link Advantages

- Pure digital signal transmission
  - Data transfer is based on a 24 volt signal
  - No conversion losses
  - High EMC resistance, screened cables are not required

- Remote parametisation without incurring unnecessary downtime
  - Parameters can be changed online to optimise the sensor to the application
  - Production can be customised quickly for small production runs

- Simple plug and play sensor replacement
  - Parameters can be stored in the PLC or IO-Link master
  - Less manipulation via local display

- Multiple sensor values can be transmitted
  - All process values can be sent via a standard 3 wire cable



IO-Link Advantages

- Diagnostic information available
  - Automatic wire break and short circuit detection
  - Sensor identification after replacement
  - Process diagnosis, e.g. value outside machine or process specification
  - Predictive maintenance data is available

- IO-Link reduces the cost of analog functionality
  - IO-Link modules similar cost to traditional analog modules, but ports can also be configured as digital inputs or outputs to maximise port usage.
  - Traditional analog devices can be connected via converters

- IO-Link is a scalable technology
  - Can be added to existing fieldbus and Ethernet networks
  - Networks can be easily extended

ifm IO-Link Masters

AL11xx IP67
- 4 or 8 port
- Profinet
- Ethernet IP
- EtherCat
- Modbus TCP
- AS-interface
- CC-Link

AL11xx IP69K
- 4 or 8 port
- Profinet
- Ethernet IP
- EtherCat
- Modbus TCP
- AS-interface
- CC-Link

AY10xx IP20
- 8 port + 12 DIO
- Profinet
- Ethernet IP
- Modbus TCP

AC5225 IP67
- 2 port
- AS-interface

AL10xx IP67
- 8 port
- Profinet
- Ethernet IP
- EtherCat
- Profibus

ifm IO-Link Sensors

- Over 2 million IO-Link sensors from ifm efector already in the market

- Pressure sensors
- Temperature sensors
- Level sensors
- Flowmeters
  - Magnetic
  - Vortex
  - Thermal
  - Mechatronic
  - Air / CO2 / nitrogen
- Ultrasonic sensors
- Photo-electric sensors
- Laser distance sensors
- Inductive switches
- Capacitive switches
- Encoders
- Inclinometers
- Digital IO modules
- Electronic fuses
- Displays
- Light towers
- Memory modules

Parameter setting via LineRecorder software

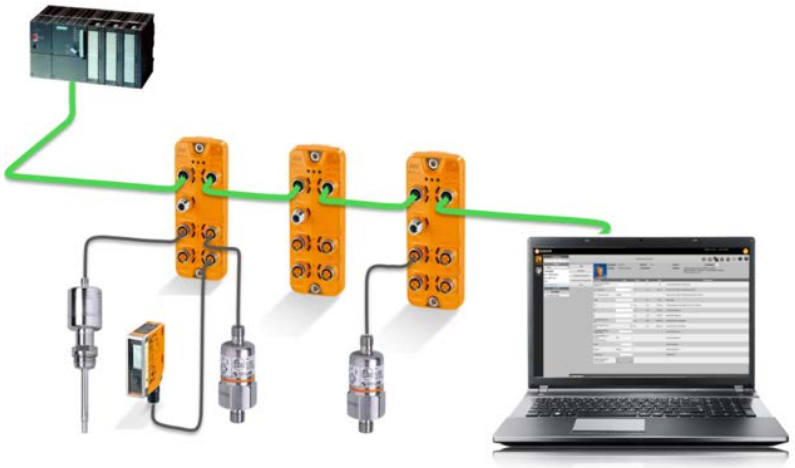
- Parameterisation of IO-Link sensors (non manufacturer specific)
- Sensor parameters can be saved on PC
- Data logging in CSV format

LineRecorder Sensor software

- Offline parametrising using programming interface

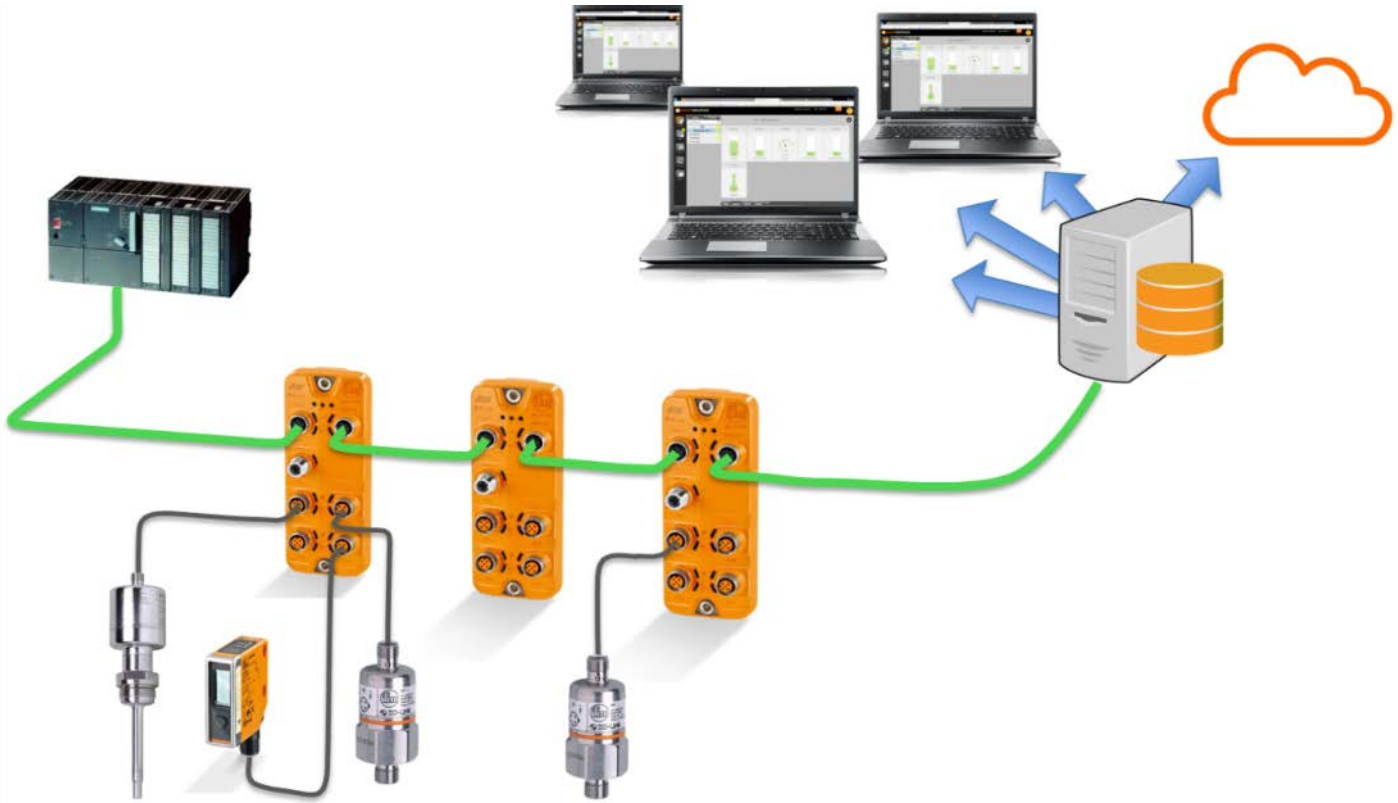
LineRecorder Device software

- Online parametrising thru AL11xx modules over Ethernet
- Offline parametrising using programming interface



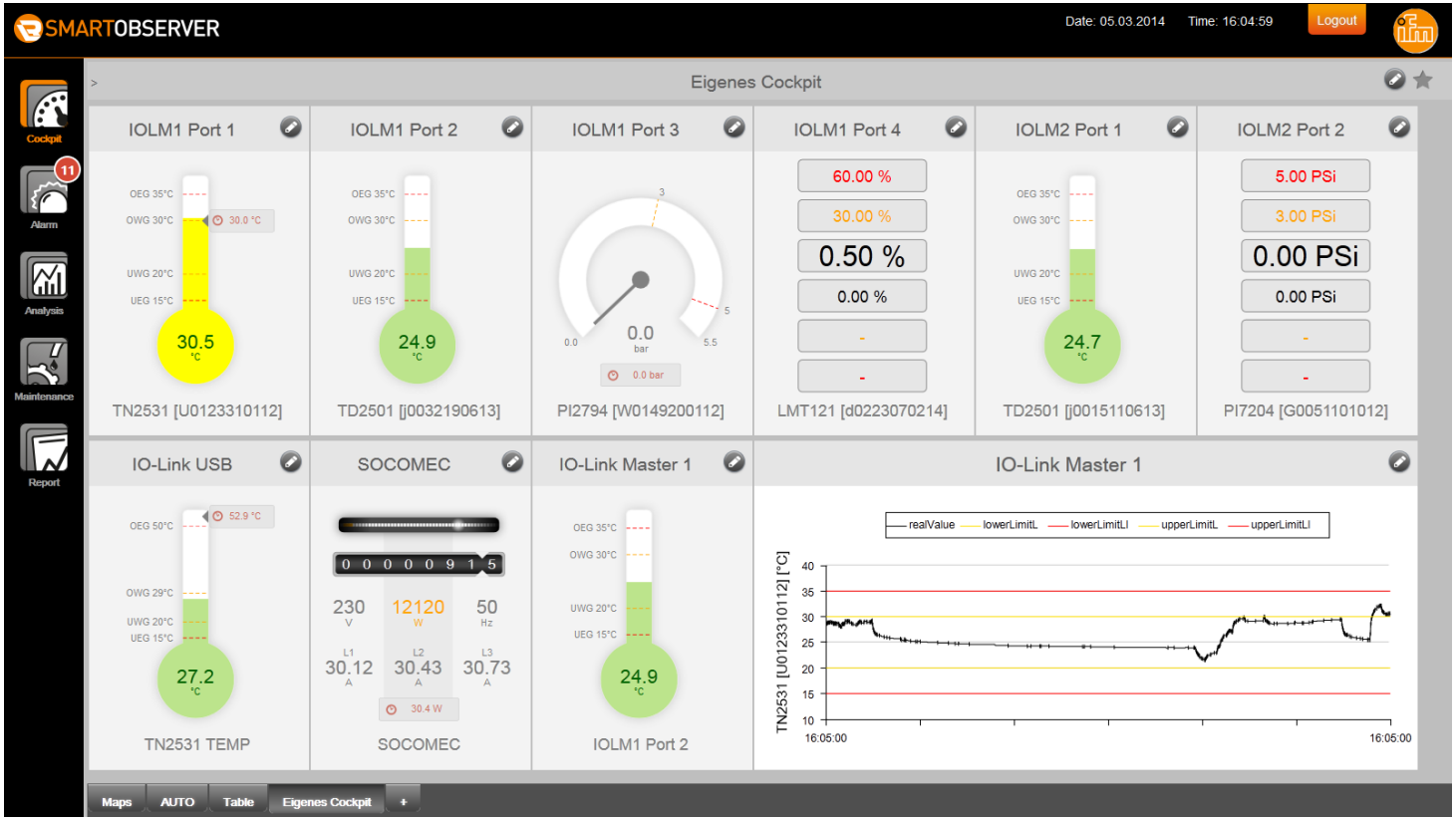
Monitoring sensor information

- Sensor data can be sent directly to SQL database, server, cloud, MES, ERP, IoT, Smart Observer monitoring sortware, etc without passing through the PLC.
- Only sensor data required for control needs to be sent to PLC to reduce PLC load and scan times.



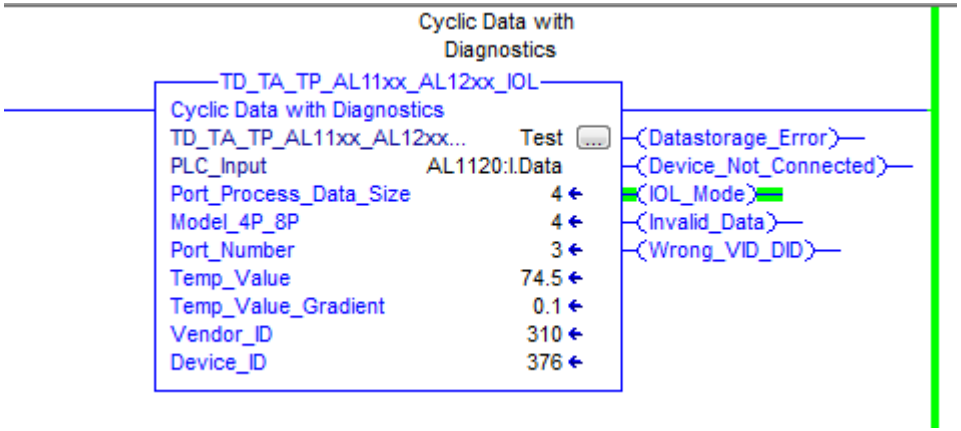
Smart Observer Software

- Monitoring software with user configurable cockpits
- Historian, alarm management, maintenance management, etc.
- Simple connection via LineRecorder agent to ifm IO-Link modules



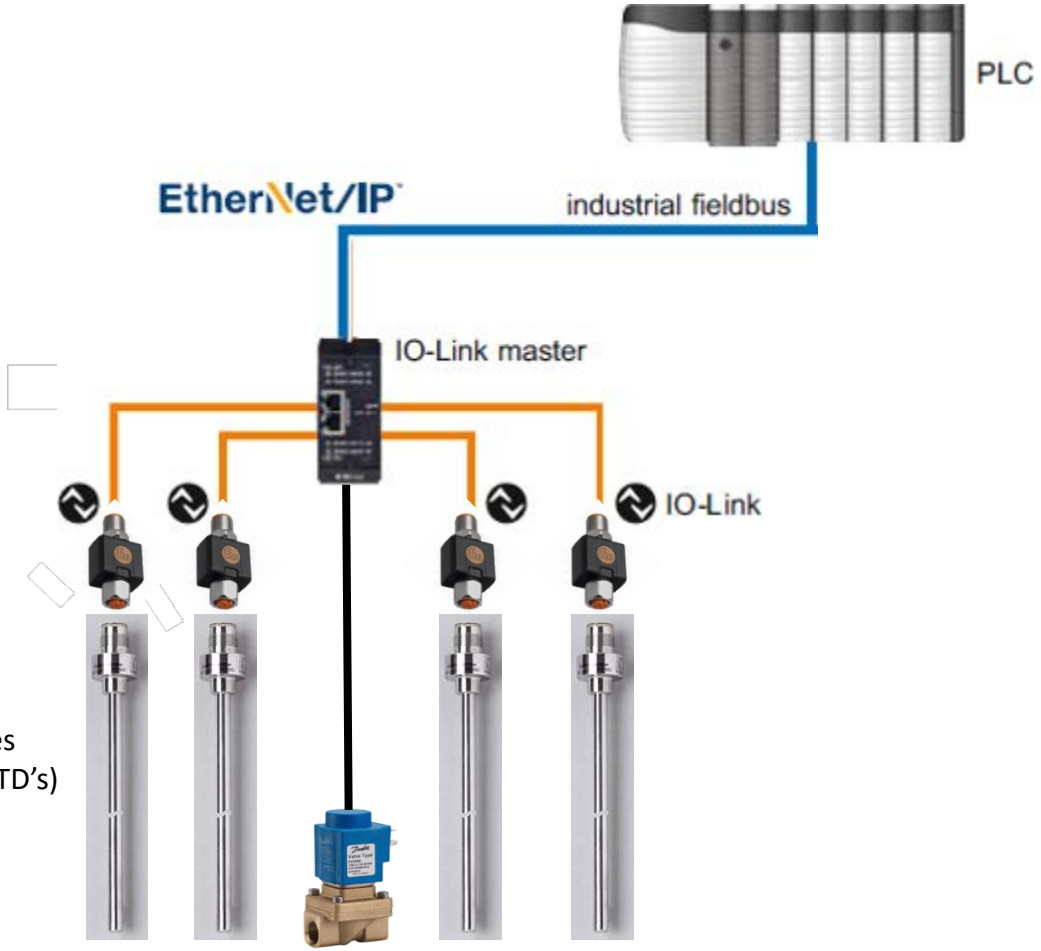
PLC Integration

How do you utilise the additional information from IO-Link devices in your PLC?



Add on instructions and function blocks are available for quick integration of data into Allen Bradley and Siemens PLC’s

Application: Winery tank farm



TP RTD Temperature Converters

TT RTD probes (or existing RTD's)

Brine solenoids x 4

Other Winery Applications

- **Fermenter monitoring**
  - Temperature sensors
  - Valve control
  - Inputs for pnuematic cylinder switches
- **Energy monitoring**
  - Compressed air, CO2 & nitrogen flowmeters
  - Refrigeration temperatures
  - Brine flow monitoring
- **Filter skids**
  - Temperature sensors
  - Magnetic flow meters
  - Pressure sensors
  - Level sensors
  - Valve control
- **Bottling lines**
  - Photo-electric sensors
  - Inductive proximity switches
  - Capacitance sensors for detection of wet boxes
  - Digital input and output modules for non IO-Link products

IO-Link Summary

- ✓ IO-Link uses the same cabling and controls structures as today
- ✓ IO-Link doesn’t add additional cost to sensors
- ✓ IO-Link isn’t complex to use
- ✓ IO-Link implementation offers no software barriers

Additional information

- www.io-link.ifm
- www.io-link.com
- Visit Brian or myself at the ifm efector booth

Thank you very much for your attention!