

ANIE
AUTOMAZIONE



IO-Link

The USB interface of Automation

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BALLUFF



What is IO-Link



IO-Link is the first worldwide standard interface used for the automation I/O (regulated by IEC 61131-9).

Developed for the connection and control of intelligent sensors and actuator.

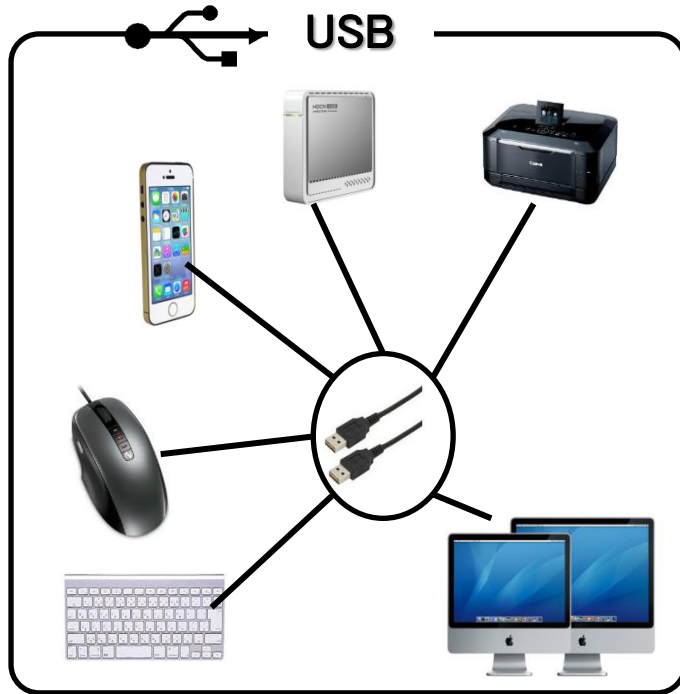
IO-Link is a strong serial communication based on 3 wires cable, the same cable used in automation for sensor and actuator connection.

Use  **IO-Link**
Universal · Smart · Easy

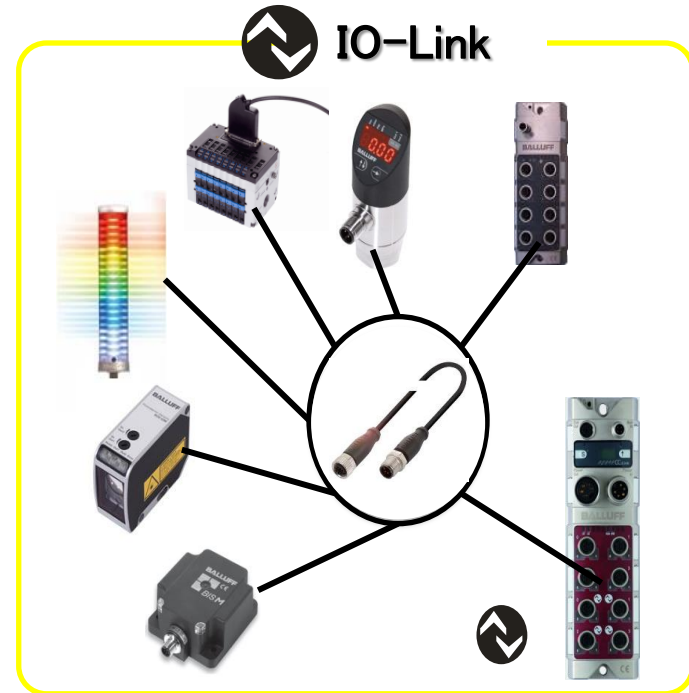
IO-Link is not a new fieldbus
But a simple and powerful system to improve the strenght of fieldbuses

IO-Link, the USB interface of Automation

Compare the cabling



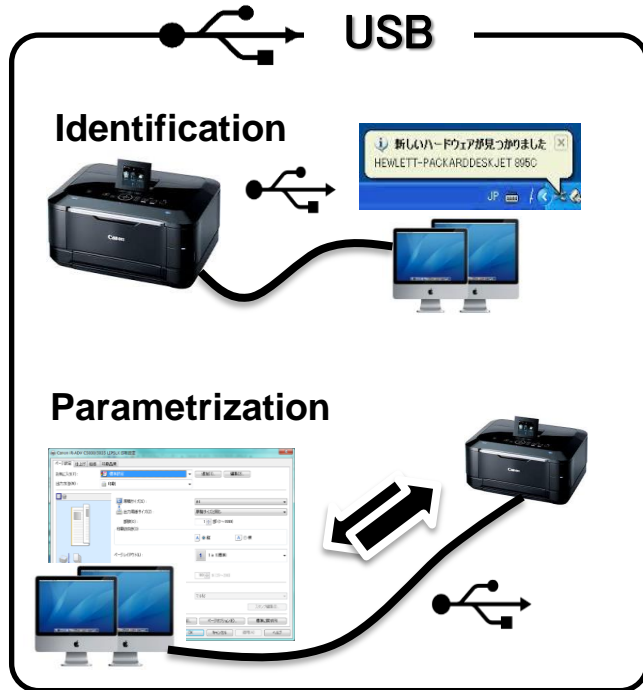
Same cable for each device



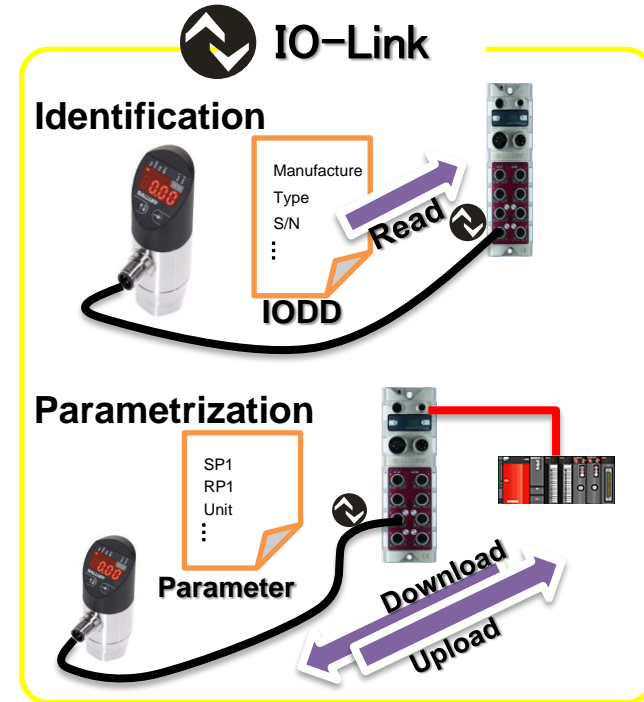
**Same cable for each device
(3 wire M12 unshielded)**

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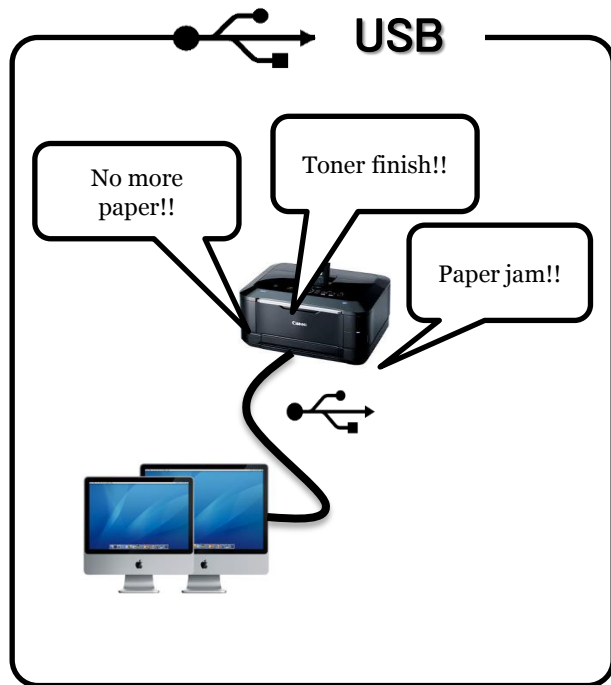
Identification and parametrization



Automatic device recognition

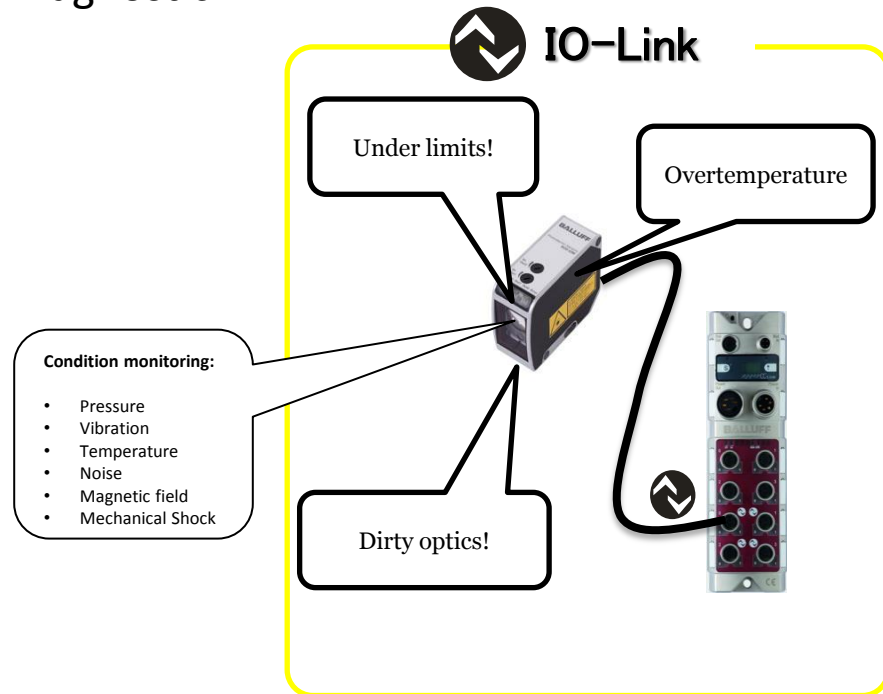


Automatic device recognition



Acyclic events

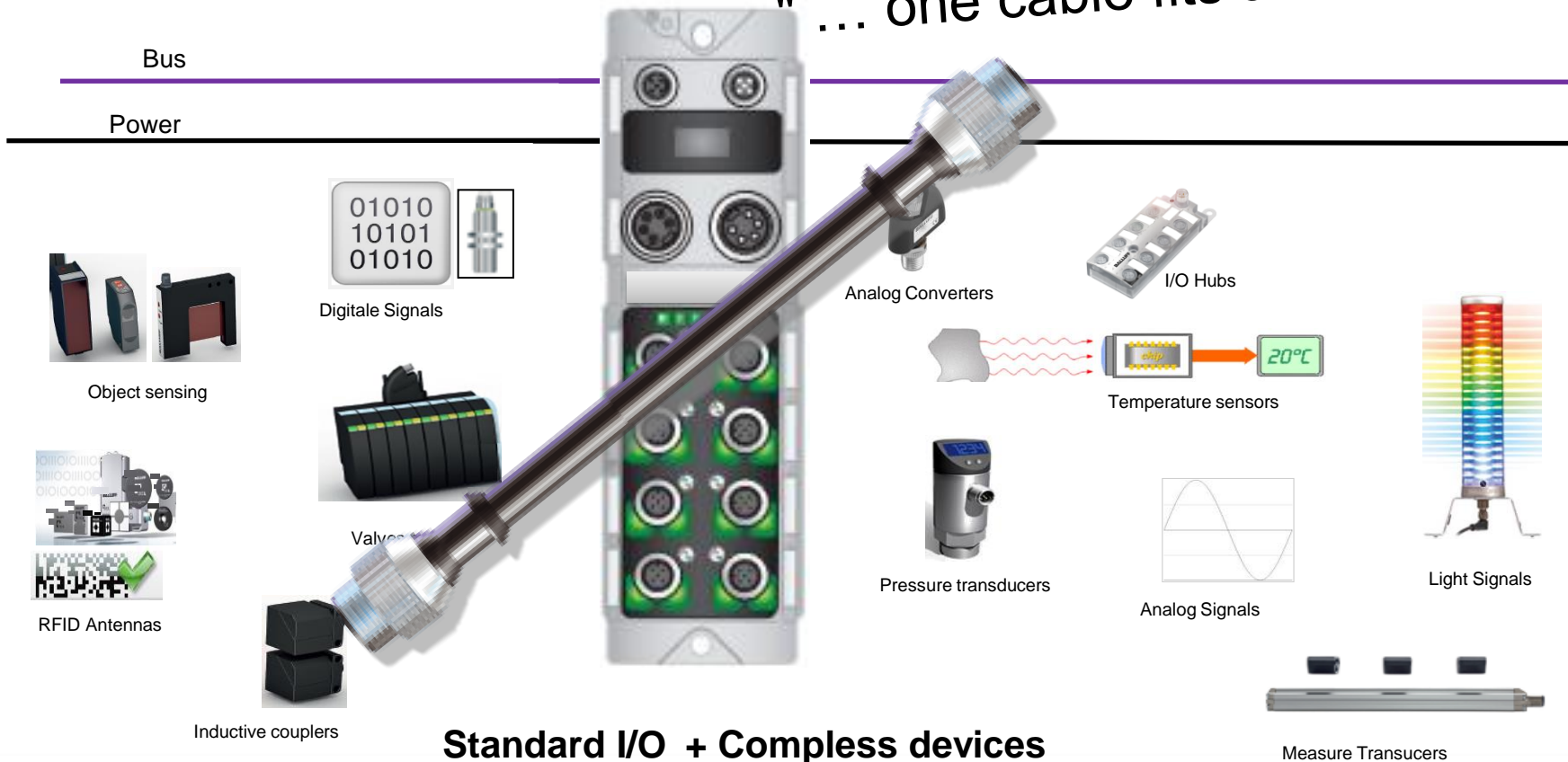
Diagnostic

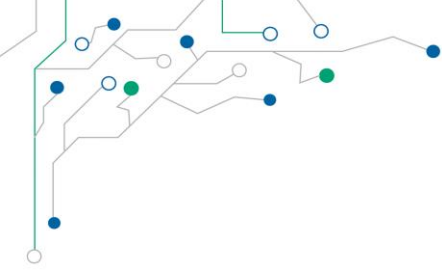


Acyclic events

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"... one cable fits all!"



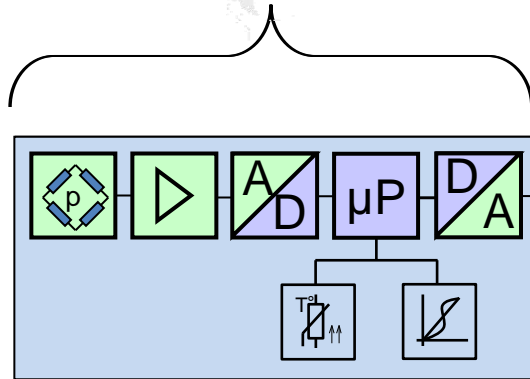


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Analog signals sensing and transmission

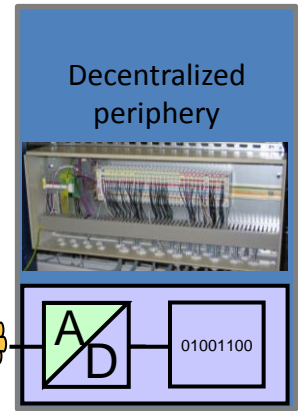
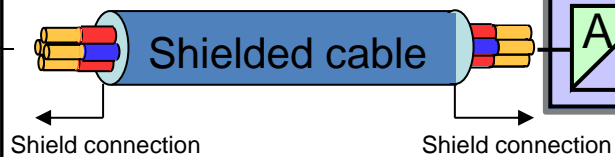


Pressure transducer



Traditional solution

0-10V	0-20mA
±10V	4-20mA



Disadvantage:

1. A/D conversion for signal conditioning, linearization, temp. Compensation
2. D/A conversion for signal transmission
3. A/D conversion for control processing

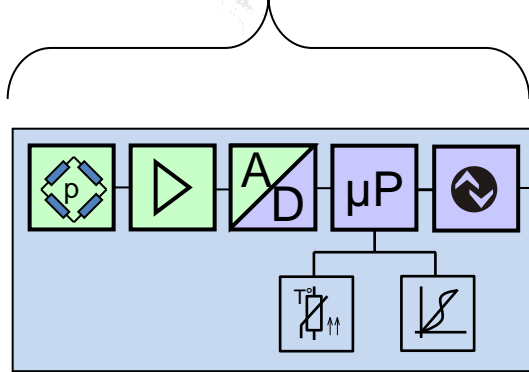
- high (time) effort for cable shielding
- Signal susceptible to interference
- Expensive analog inputs
- variety of standards

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Problem solved with IO-Link



IO-Link
transducer



 **IO-Link**



Power and communication over the same cable instead of a special shielded cable.

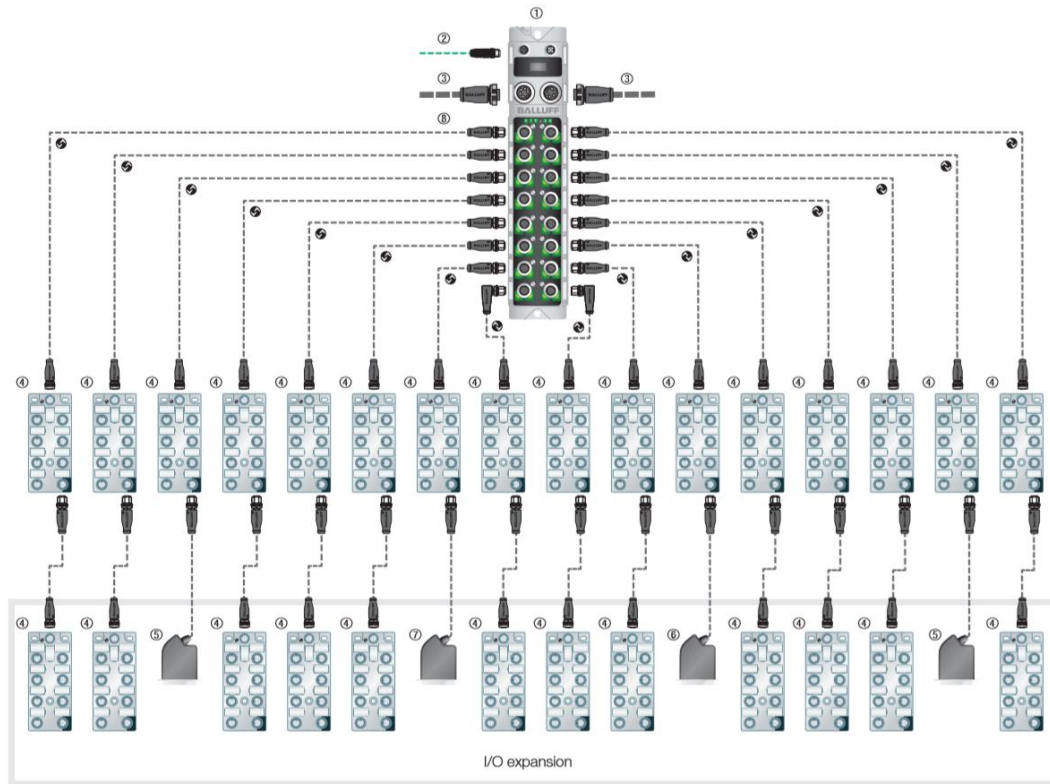


- EtherNet/IP
- DeviceNet
- PROFIBUS
- PROFINET
- EtherCAT
- CC-Link
- CC-Link IE

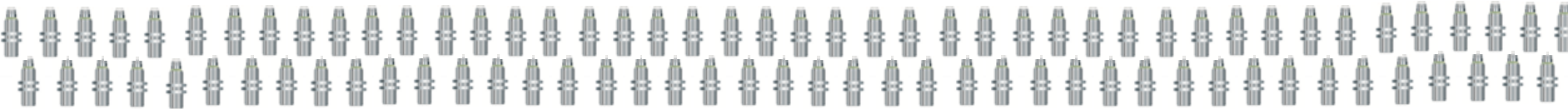
- ✓ Interference-proof transmission
- ✓ Parameter and diagnostic channel included

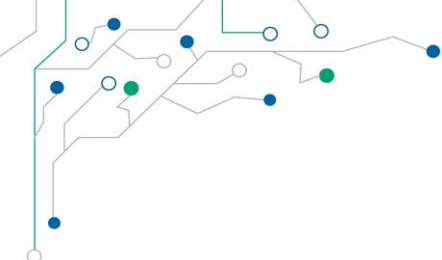
- ✓ Independent by controller and fieldbus
- ✓ No analog inputs on the control side needed

up to 480 I/O - 1 fieldbus node



- ✓ Save cost
- ✓ Save time
- ✓ Improve diagnostic
- ✓ Add functionalities
- ✓ Enanche flexibility

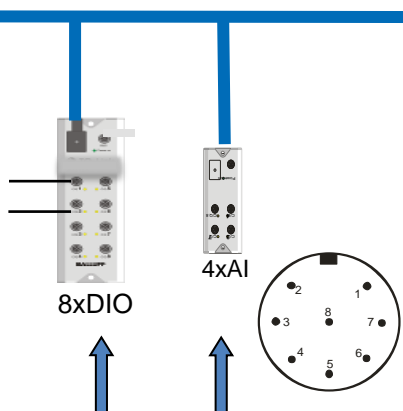




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Mixed Signal Devices Interfacing

Without IO-Link:

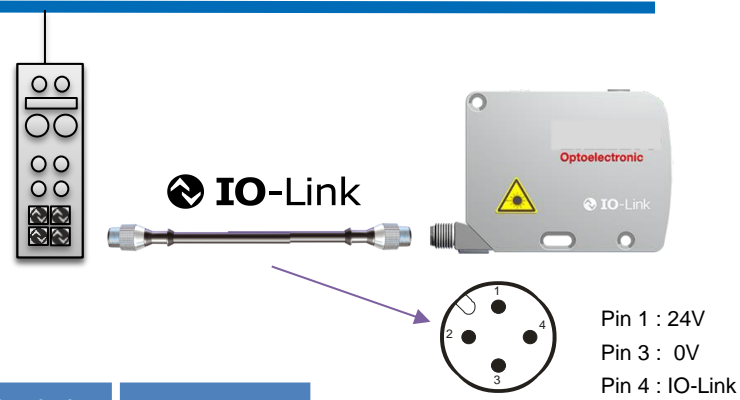


- Analog OUT -
- Analog OUT +
- +UB
- 0V
- Switch Input
- Switch Output
- Error Output
- Shield

Laser distance sensor



With IO-Link:

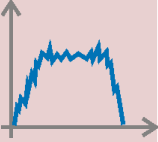




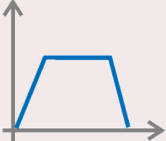
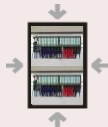





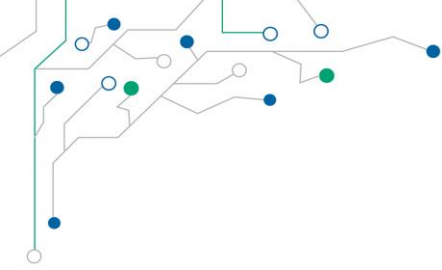
- Pin 1 : 24V
- Pin 3 : 0V
- Pin 4 : IO-Link

	Standard parallel	IO-Link
Connectors	Special	Standard
Number of Pins	8	3
Communication Dig/Anlog	separate	embedded
Cabling errors	high	low

M12 Standard

Summary

	Signal quality	Electrical Cabinet	Access to device	Connections	Change tool solution
Without IO-Link	 Signal disturbed	 big	 „local”	 Cabling	 mechanical
With IO-Link	 Clear signal	 small	 „remote”	 Plug & Play	 Inductive coupling



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Thank you for your attention!

