What is **IO-Link**

The fundamentals of IO-Link: operation, components and technology

<table>
<thead>
<tr>
<th>Technology</th>
<th>Standardized (IEC 61131-9) Serial Communication Protocol</th>
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<td>Area of Application</td>
<td>IO-Link is used to bi-directionally communicate from field devices like sensors and actuators to the controller in order to provide configuration, diagnostics and process data from the devices beyond the switching states.</td>
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**How It Works:** Utilizing a standard sensor cable, the IO-Link slave device speaks point to point with an IO-Link master. The IO-Link master then combines the data with other IO-Link slave devices and communicates over an industrial network or backplane to the controller.

### Three Gotcha's

#### Cable Type & Length

Cable runs between master and slave can be up to 20 meters in length and typically utilize standard automation cables. Most cables, but not all, are M12 A-coded, unshielded, 4-conductor DC sensor cables.

**Star Architecture**

Since IO-Link utilizes a point-to-point serial communication, Star Topology is the only device architecture that can be constructed.

#### Port Class A vs Port Class B Devices

While most devices utilize IO-Link port Class A, output devices like valves are now being offered as IO-Link port Class B. Be sure to know if the master and/or slaves are Class A or Class B type ports. Most Balluff devices are IO-Link port Class A.

#### Smart Devices with Diagnostics

Possible Diagnostics Provided:
- Device Present
- Device Powered
- nominal operation
- Lens dirty
- Target beyond sensing range
- Short circuit detection
- Overload detected
- Open output coil

### Common Applications

#### Standard Sensor Inputs and Discrete I/O

Existing industrial network star architecture.

#### Measurement and Analog I/O

Old Way: Analog output: measuring signal set points, shielded cable, 9 conductors.

IO-Link Measurement: Non-shielded cable, master device, Analog to Digital Conversion.