LISTEN. THINK. SOLVE.®

1734 POINT IO-Link Master

1734-4IOL 4 Channel IO-Link Master Module

Sep 2015

PUBLIC

Allen-Bradley • Rockwell Software

Rockwell Automation

Agenda

Rockwell Automation

- **Introduction to IO-Link**
- IO-Link System Architecture
- Why Rockwell Automation® IO-Link?
- POINT IO-Link Master
- IO-Link Consortium

IO-Link

What Is IO-Link?

Rockwell Automation

- IO-Link or Single-drop Digital Communication Interface (SDCI) is an IEC 61131-9 specification for point-to-point connection between sensor / actuator and field level devices
- IO-Link is NOT a fieldbus but an enhanced development of the current connection technology of sensors and actuators
- An IO-Link system consists of IO-Link devices - often sensors, actuators or combinations thereof - a standard 3-wire sensor/actuator cable and an IO-Link Master
- Point-to-Point communication is based on standard 3-wire sensor and actuator connection without additional requirements to the cable material

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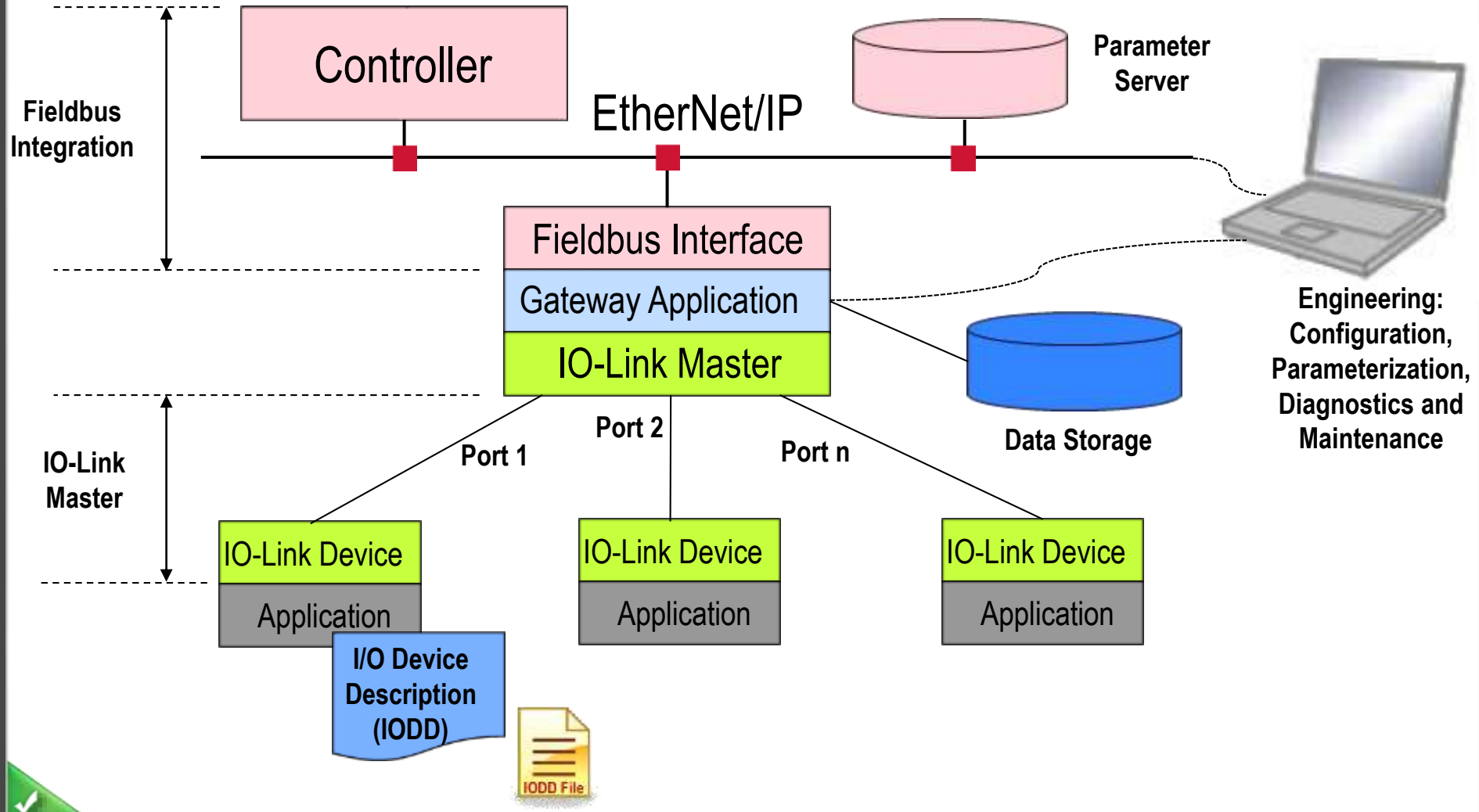
IO-Link

IO-Link Concept



Understanding IO-Link:
How are Field I/O Signals Handled Today?

Rockwell Automation

3 different types of I/Os with:

- Different types of wiring (2/3/4 wires)
- Different types of configuration
- Different types of I/O modules required

Photo-Eye/Color Sensor
(Digital Input)

Actuator/Valve Manifold
(Digital Output)

Measurement Sensor
(Analog Input)

Understanding IO-Link:
How Does It Change with IO-Link?

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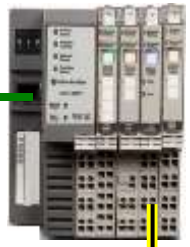

With IO-Link:

- Single type of wiring
- Single configuration platform
- Single I/O module

IO-Link

Photo-Eye Sensor
(Digital Input)

Color Sensor

Actuator/Valve Manifold

Measurement Sensor

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IO-Link

Why Rockwell Automation® IO-Link?

Rockwell Automation

Faster Time to Market

- No change in wiring
- Seamless connection and commissioning with Integrated Architecture
- Ethernet-quality information from device
- Quickly and easily modify device parameters through software
- Intuitive programming simplifies initial setup and helps eliminate logic errors

Lower Total Cost of Ownership

- Flexibility to integrate standard sensors, measurement sensors and actuators using a single IO-Link Master
- Reduce I/O modules inventory with only a single IO-Link Master
- Reduced installation costs
- Scalable solution

Improved Asset Utilization

- Real-time diagnostics optimize preventative maintenance and troubleshooting
- Multiple Profiles facilitate flexible manufacturing
- Easy access to actionable data

Enterprise Risk Management

- Device replacement ensures consistent sensor behavior
- Ensure BOM compliance
- Restrict configuration changes to authorized personnel only

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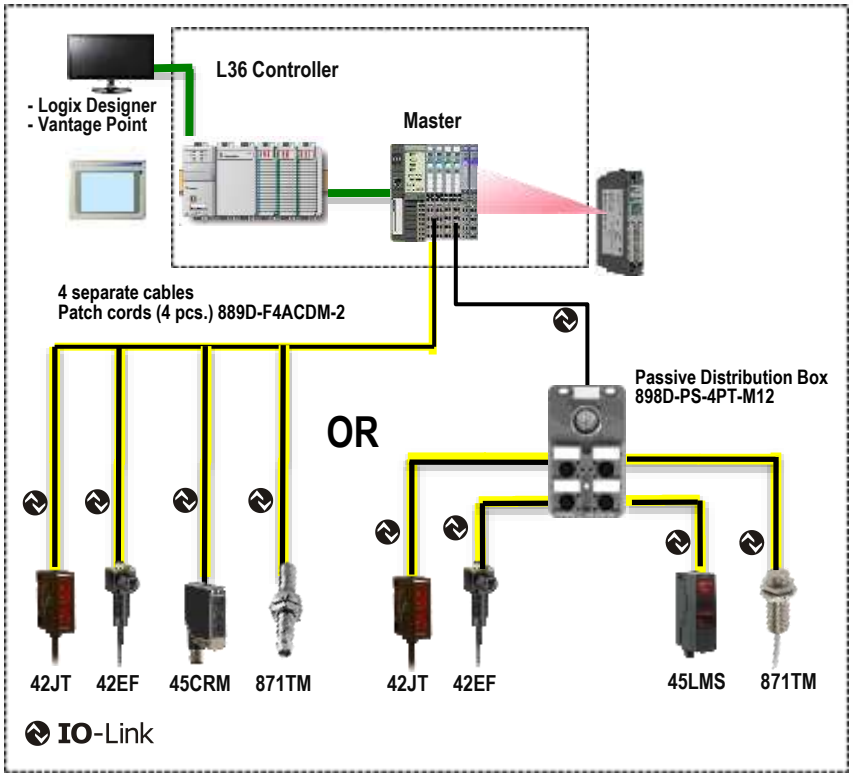
IO-Link

(1) Premier Integration of IO-Link Network



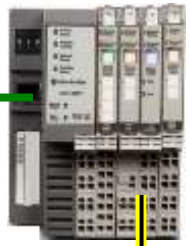
Rockwell Automation®
IO-Link Master Configuration and
IO-Link Device Integration

IO-Link → Studio 5000

- Seamless "Premier Integration" into Allen-Bradley architecture
- Scalable, modular
  - Use same sensors as before
  - Add IO-Link master and devices where they benefit from IO-Link (Diagnostics, health, etc.).
- Compatibility
  - Compatible with all IO-Link sensors, but a better experience with Rockwell Automation® & Encompass Partners' sensors

(1) Premier Integration of IO-Link Network

- AOP for full configuration of IO-Link devices
- ADC feature for seamless replacement of IO-Link Master and device parameters



IO-Link

Photo-Eye Sensor

Color Sensor

Actuator/Valve Manifold

Measurement Sensor

Note: Only supported for integrated IO-Link devices from Rockwell Automation® and Encompass Partners

(1) Premier Integration with IO-Link Devices from Rockwell Automation® and Encompass Partners

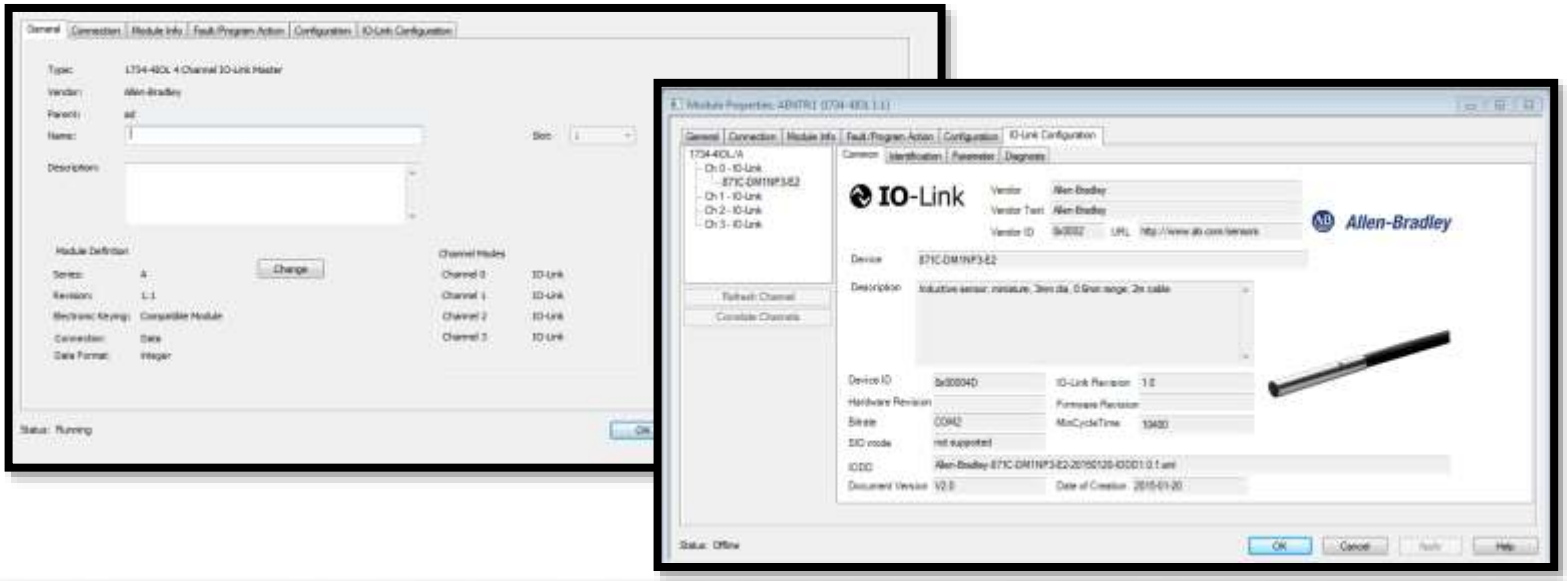
Rockwell Automation

Add-on-Profile (AOP)

- AOP is used to configure the IO-Link Master module as well as the connected IO-Link devices

Auto Device Configuration (ADC)

- The configuration is saved in the controller and Auto Device Configuration (ADC) is supported for IO-Link Master and device during replacement



(1) Premier Integration with IO-Link Devices from Rockwell Automation® and Encompass Partners

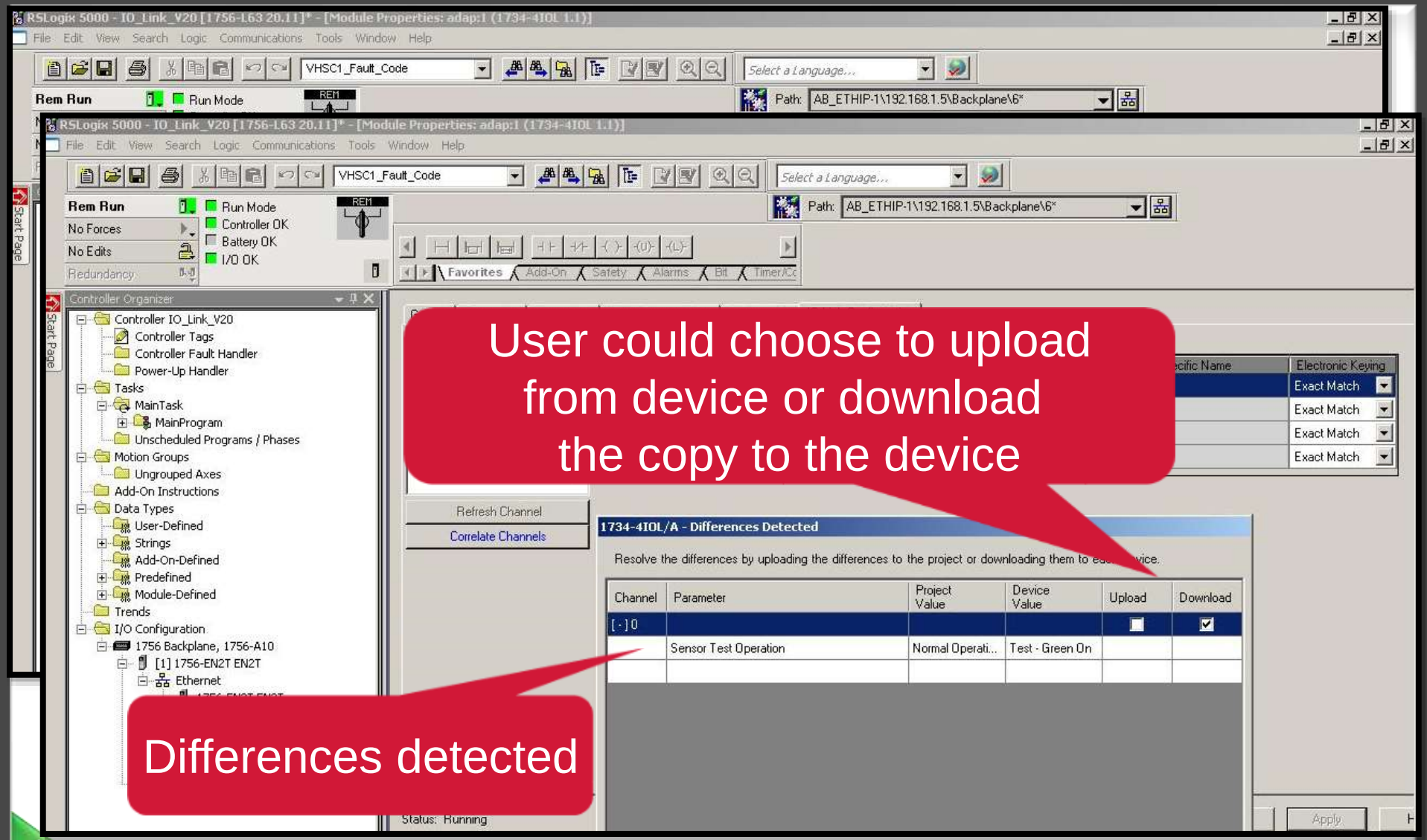
Rockwell Automation

Correlation Feature

- Correlates the Read-Write (RW) parameter values of connected IO-Link devices from Rockwell Automation® and Encompass Partners, and compares with the values stored in the controller
- Differences can happen when device configuration are changed by external configurator such as a device console during operation/running
- If a mismatch is detected in the IO-Link device project profile parameters used versus the stored values on the device, those differences are then displayed for corrective action by the user

This feature allows the user to easily and intuitively track differences between the device configuration and the copy in the controller. User could either converge the differences or force the original configuration back onto the device

How Correlation Is Done

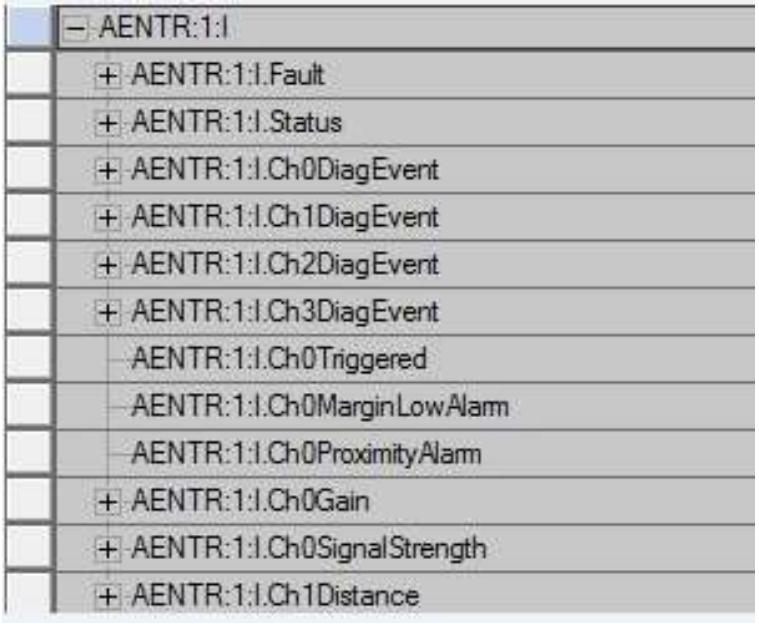


(1) Premier Integration with IO-Link Devices from Rockwell Automation® and Encompass Partners

Rockwell Automation

Auto Generation of Data Tag

- Tag structure and names for the IO-Link Process Data are automatically generated from the IODD files



AOP pulls information from IODD file and generate the TAG structure and names for the IO-Link process data

(2) Basic Integration with non-Rockwell Automation or non-Partners IO-Link Devices based on IODD

Rockwell Automation

- AOP is used to configure the IO-Link Master
- Message instructions are required to configure the parameters of IO-Link Devices; using the IO-Link device parameter object
- The IO-Link Device Parameter object provides a mechanism for a CIP client to access parameters within an IO-Link device

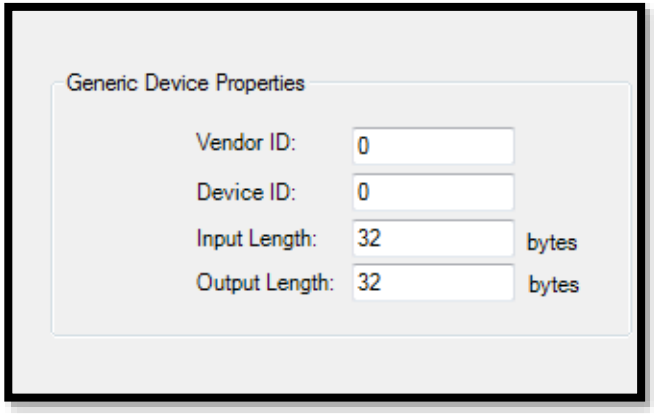
Object Specific Services

Service Code (Hex)	Service Name	Description of Service
$4B_{hex}$	Read_Subindex	Reads a parameter value from the IO-Link device.
$4C_{hex}$	Write_Subindex	Writes a parameter value to the IO-Link device.
$4D_{hex}$	Read_Index	Reads an entire index (all parameters within an index) from the IO-Link device (uses subindex 0).
$4E_{hex}$	Write_Index	Writes an entire index (all parameters within an index) to the IO-Link device (uses subindex 0).

(3) Generic Integration with IO-Link Device using Generic Profile

Rockwell Automation

- This method is used when a generic IO-Link device setup is preferred
  - Similar to competitive masters using Rockwell Automation® PLC's
- The following generic device information needs to be provided:
  - Vendor ID of the IO-Link device
  - Device ID of the IO-Link device
  - Process Data Input Length (default 32 bytes)
  - Process Data Output Length (default 32 bytes)



- Modify runtime changes to the sensors via MSG instructions

User continues to rely on MSG instructions to configure the IO-Link device

Why 1734 POINT IO-Link Master?

Rockwell Automation

- Add-On-Profile (AOP)
  - Seamless configuration in Studio 5000® and integration into Logix controller
- Auto Device Configuration (ADC) Support on EtherNet/IP
  - IO-Link Master module configurations are automatically downloaded to Master and Devices during replacement without software tool
- Replacement and Insertion Under Power (RIUP)
  - “Hot swap” of IO-Link Master module without power interruption to other modules and devices
- Widest Standard Operating Temperature range in entire DIO offering
  - -20 degC to +55 degC

1734 POINT IO-LINK Master supporting 4 IO-Link devices, or Standard I/Os

Rockwell Automation

- The 1734-4IOL IO-Link Master module enables connection of up to 4 IO-Link devices
- Parameterization of IO-Link devices is handled via Add-on Profile (Rockwell Automation® and Encompass Partners only)
- I/O wiring topologies between existing POINT terminal and IO-Link devices are maintained
- Supported by all POINT Series B Ethernet adapters (FW 5.012 and above)
- Minimum RSLogix 5000® V20 and above

IO-Link

Frequently Asked Questions

- **When should I use IO-Link?**
  - On applications where sensors need reconfiguration (multiple profiles)
  - Diagnostics like low margin required to keep machine running etc.
- **What are the advantages of using 1734-4IOL IO-Link Master over standard digital and analog I/O modules?**
  - 1734-4IOL IO-Link Master could handle both on/off devices as well as measurement devices, which would otherwise, require digital input / output modules and analog input / output modules respectively.
  - The convenience of only stocking a single 1734-4IOL IO-Link Master module over multiple digital and analog I/O modules.
  - Single configuration interface (AOP) as well as cabling method makes setting up different devices a breeze.
  - Device parameters are stored in the controller and automatically downloaded to device during replacement (Rockwell Automation® or Encompass Partners devices only)

Frequently Asked Questions

- **Which controller FW supports the 1734-4IOL IO-Link Master?**
  - V20 onwards
- **Can CompactLogix L1 Controller support 1734-4IOL IO-Link Master as local I/O?**
  - No, as CompactLogix L1 does not support COS, which is required for 1734-4IOL
- **Can CompactLogix L1 Controller support 1734-4IOL IO-Link Master through Ethernet adapter?**
  - Yes, just like any other Allen-Bradley controller
- **Can the 1734-4IOL IO-Link Master be used with all POINT adapters?**
  - No, only Ethernet adapter series B (FW5.012 onwards) can be used
- **Can the 1734-4IOL IO-Link Master be connected via Enhanced Rack Optimized Connection?**
  - No, as 1734-4IOL IO-Link Master consumes more data and may limit all other modules connected via Enhanced Rack Optimization

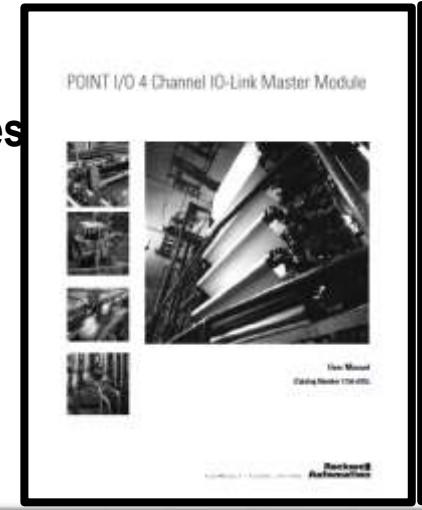
Frequently Asked Questions

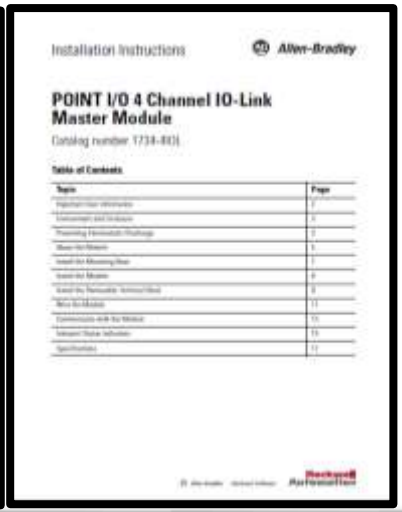
- **How many channels are available per 1734-4IOL IO-Link Master?**
  - 4 channels are available
- **Can any unused channel in the 1734-4IOL IO-Link Master be used as standard digital I/O (Input or Output)?**
  - Yes, any unused channel can be configured as standard input or output
- **What IO-Link specification is the 1734-4IOL IO-Link Master complied to?**
  - Version 1.1.1
- **What is the communication speed for an IO-Link Device?**
  - There are 3 communication speed available:
    - Com1 – 4.8 kbit/s
    - Com2 – 38.4 kbit/s (Commonly supported in most IO-Link devices)
    - Com3 – 230.4 kbit/s
- **What is the maximum cable length for each IO-Link device?**
  - 20 meter based on IO-Link specification V1.1.1
- **What are the limitations?**
  - Maximum of 5 IO-Link master modules / Adapter with the fastest RPI of 4ms*
  - Maximum of 20 IO-Link master modules / Adapter with the RPI of 350ms* or higher

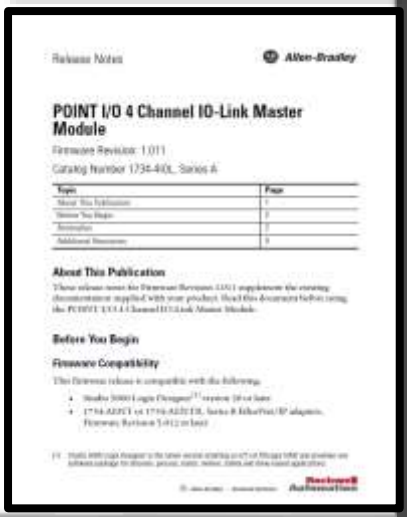
Note: * - RPI may vary with respect to the loading of Point I/O Bus

List of Publications

- IO-Link Product Brochure
  - IOLINK-BR001A-EN-P
- 1734 Product Profile
  - 1734-PP001E-EN-P
- 1734 Selection Guide
  - 1734-SG001F-EN-P
- 1734 IO-Link Master User Manual
  - 1734-UM020A-EN-E
- 1734 IO-Link Master Installation
  - 1734-IN043A-EN-E
- 1734 IO-Link Master Release Notes
  - 1734-RN024A-EN-E







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