IO-Link at a Glance

Viktor Schiffer
Rockwell Automation

Technical Track

Agenda

- Introduction
- The IO-Link Technology
- IO-Link Integration into CIP

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End user requirements

Microcontroller-based intelligent small sensors and actuators (devices) have a lot of different built-in parameters, yet they are not easily accessible. However, users are asking for functionality like

- Expanded diagnostics
- Simplified installation
- Automated parameter setting

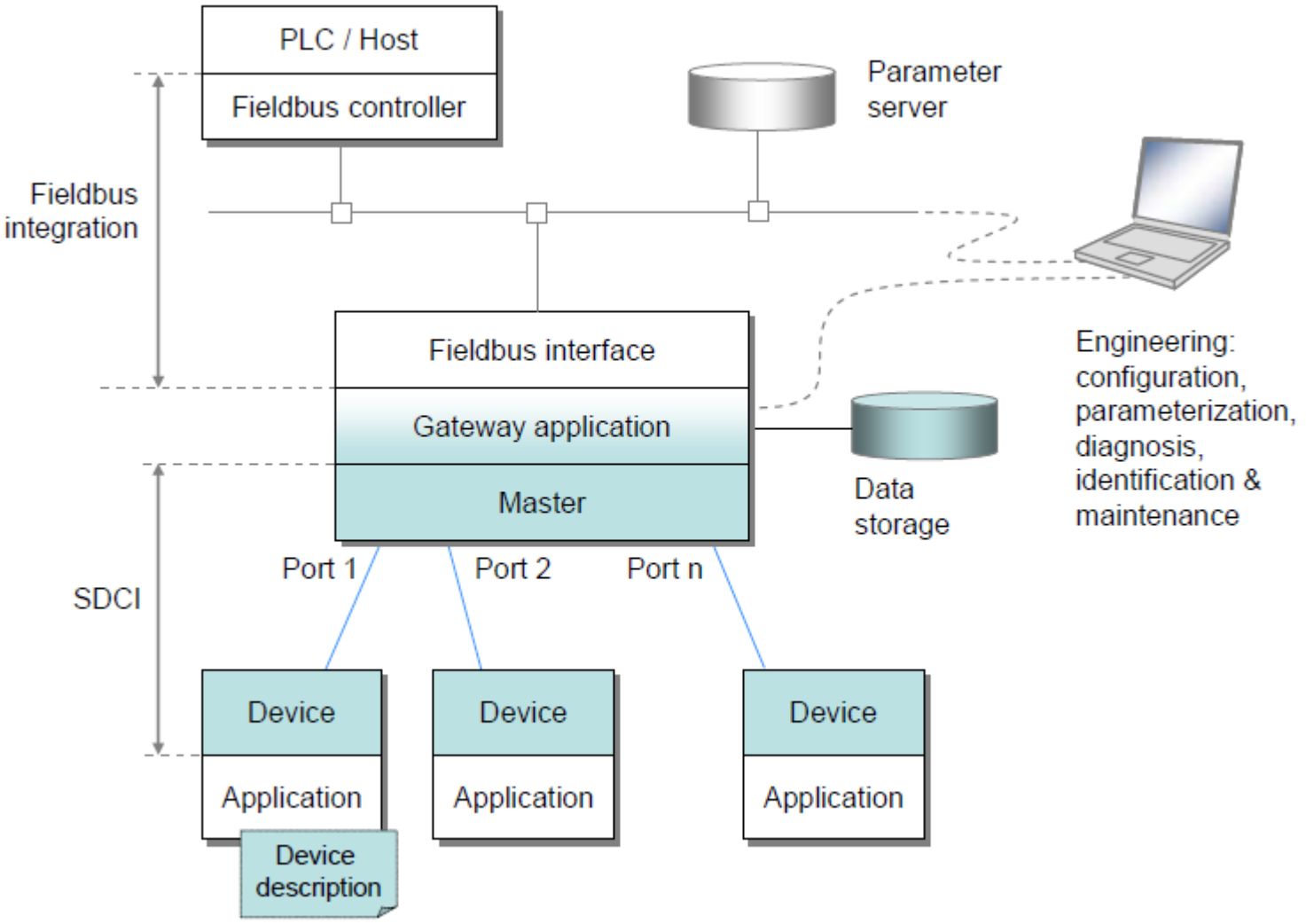
Other Key Requirements

- The communication interface shall have the functionality of transmitting cyclic process data as well as acyclic data.
- Cycle times for process data shall meet the requirements for typical factory automation applications.
- The cycle time shall be scalable, providing process data transmission within 2ms.
- The communication interface shall be suitable for sensors and actuators as well and work reliably in a factory automation environment, therefore meeting all EMC requirements.

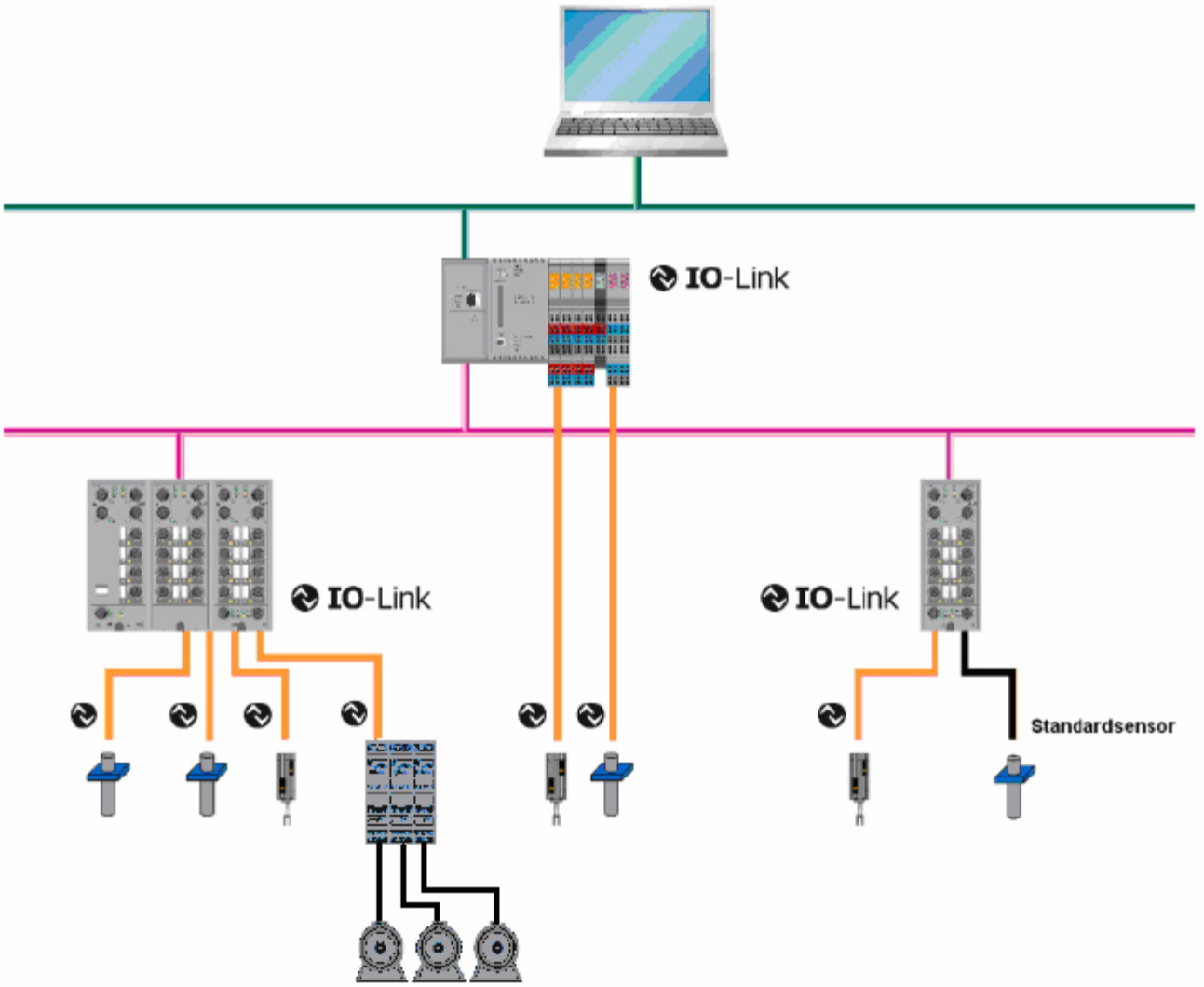
Easy Integration into Different Fieldbuses

- The communication interface standard should have no restrictions and have to be open to any vendor or supplier for masters and devices.
- Users want to have an accepted technology all over the world, fitting into all PLCs and field buses.
- All devices are to be integrated into specific engineering tools in an easy way.
- Management overhead such as using addresses, switches and bus administration should be avoided.

IO-Link Technology Domain



IO-Link on the “Last Mile”



Why IO-Link?

Target use cases

- Precise analog value transmission in harsh environments
- Replacement of analog 4..20mA interfaces
- Parameterization of small devices (sensors and actuators)
- Getting detailed diagnostic data
- Monitoring of device conditions

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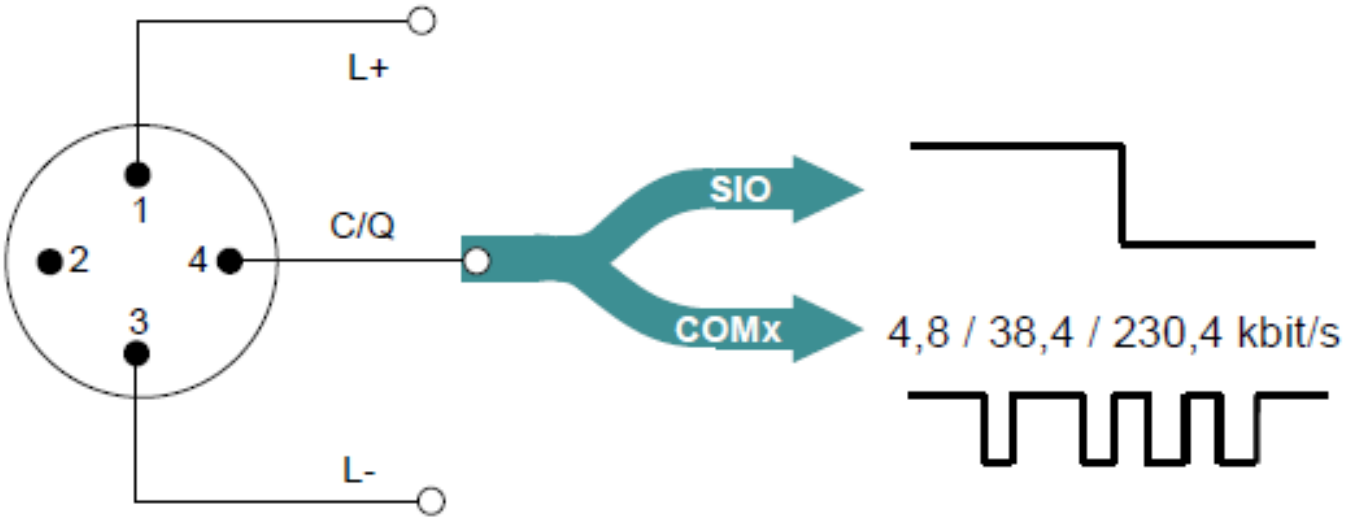
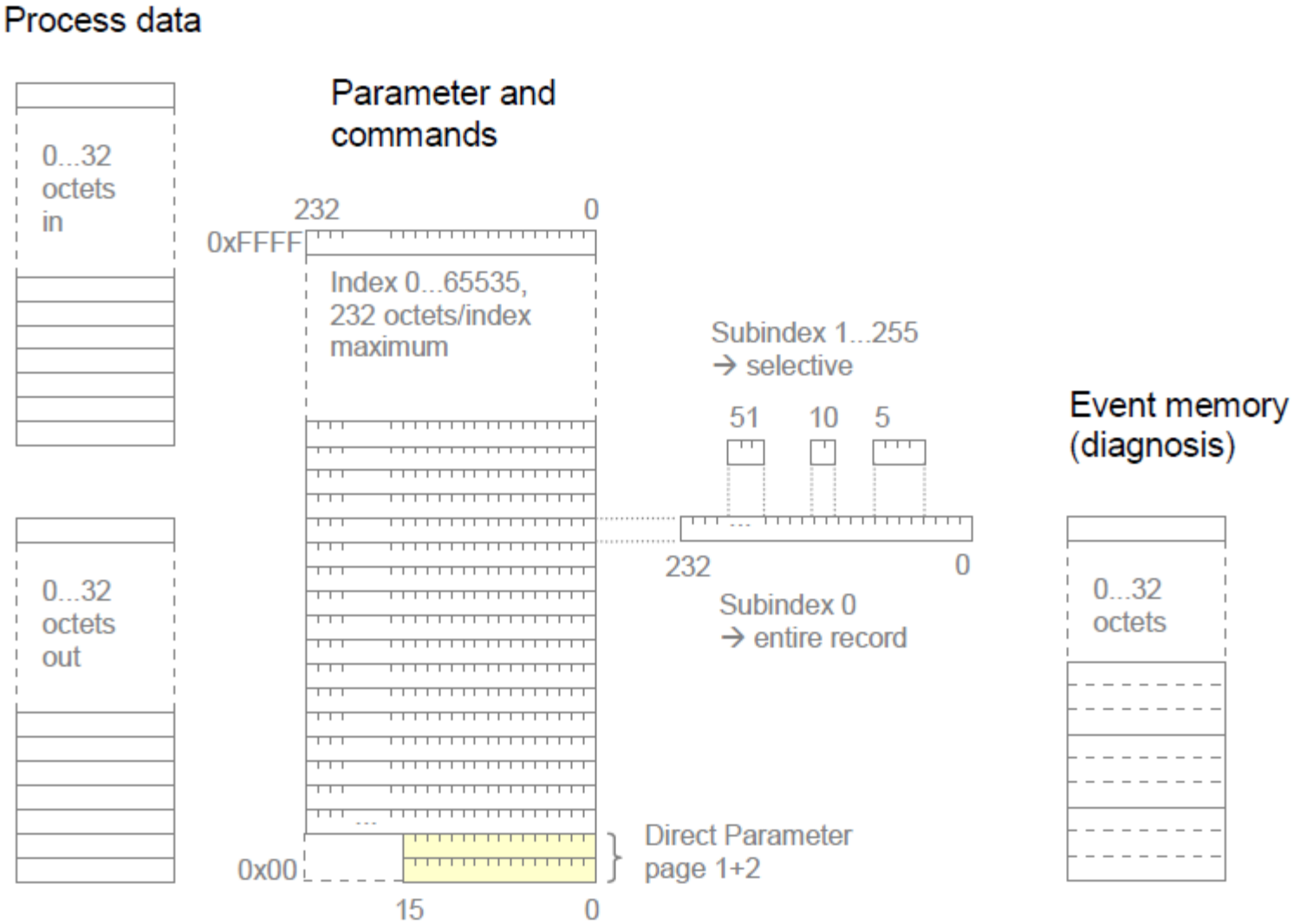
IO-Link Compatibility with IEC 61131-2



IEC 60947-5-2

Pin	Signal	Definition	Standard
1	L+	24 V	IEC 61131-2
2	I/Q	Not connected, DI, or DO	IEC 61131-2
3	L-	0 V	IEC 61131-2
4	Q	"Switching signal" DI, DO (SIO)	IEC 61131-2
	C	"Coded switching" (COM1, COM2, COM3)	IEC 61131-9

Data Model of IO-Link



Device Description IODD

- XML-based
- Mandatory for all devices
- Enables user-friendly integration into PLC engineering tools or into an FDT container environment

```
<?xml version="1.0" encoding="UTF-8" ?>
- <IODevice xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://www.io-link.com/IODD/2009/11" xsi:schemaLocation="http://www.io-link.com/IODD/2009/11
  IODD1.0.1.xsd">
  <DocumentInfo copyright="Copyright 2009, SICK AG." releaseDate="2010-04-29" version="V1.870" />
- <ProfileHeader>
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    <ProfileRevision>1.00</ProfileRevision>
    <ProfileName>Device Profile for IO-Link Devices</ProfileName>
    <ProfileSource>IO-Link Consortium</ProfileSource>
    <ProfileClassID>Device</ProfileClassID>
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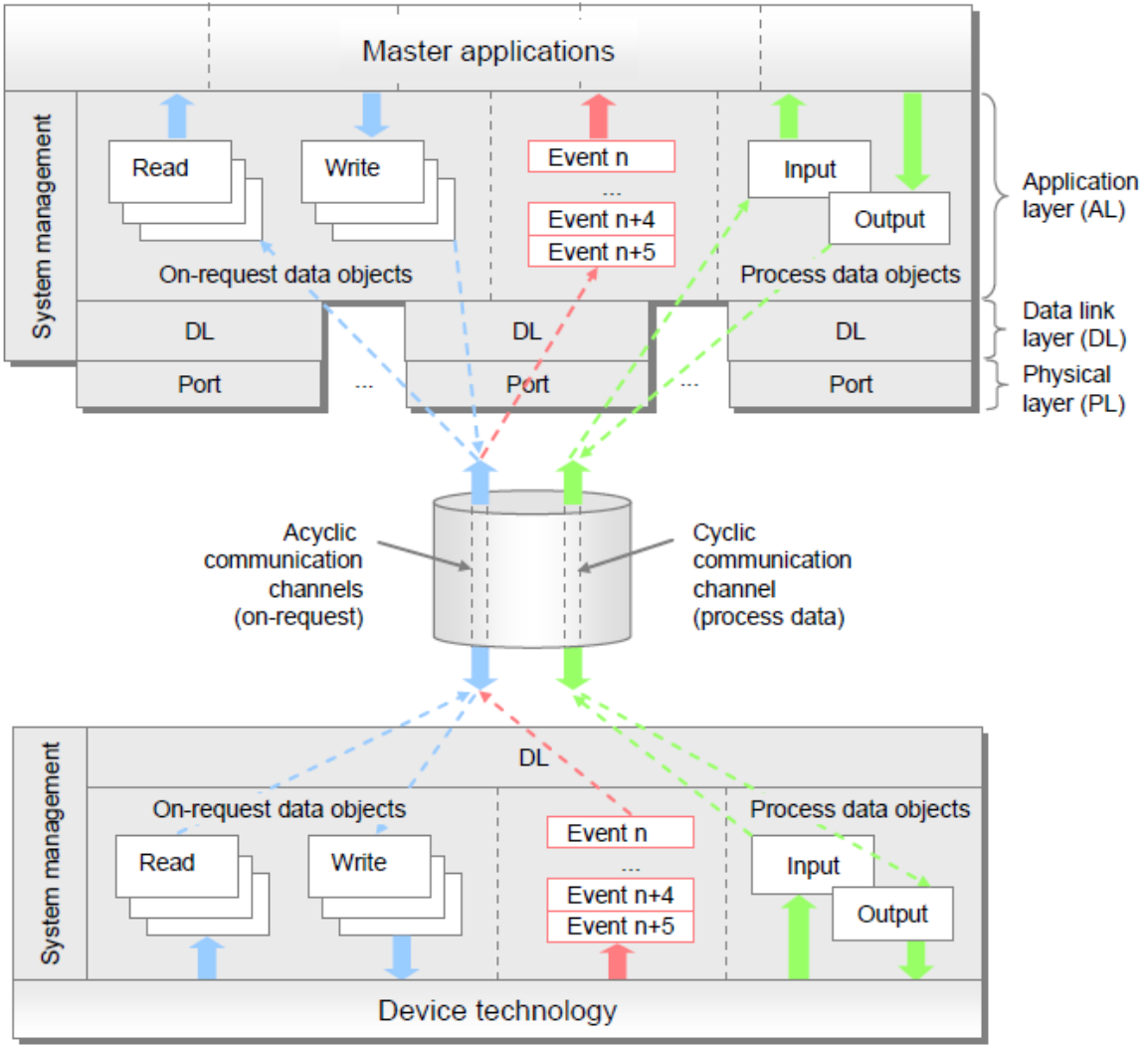
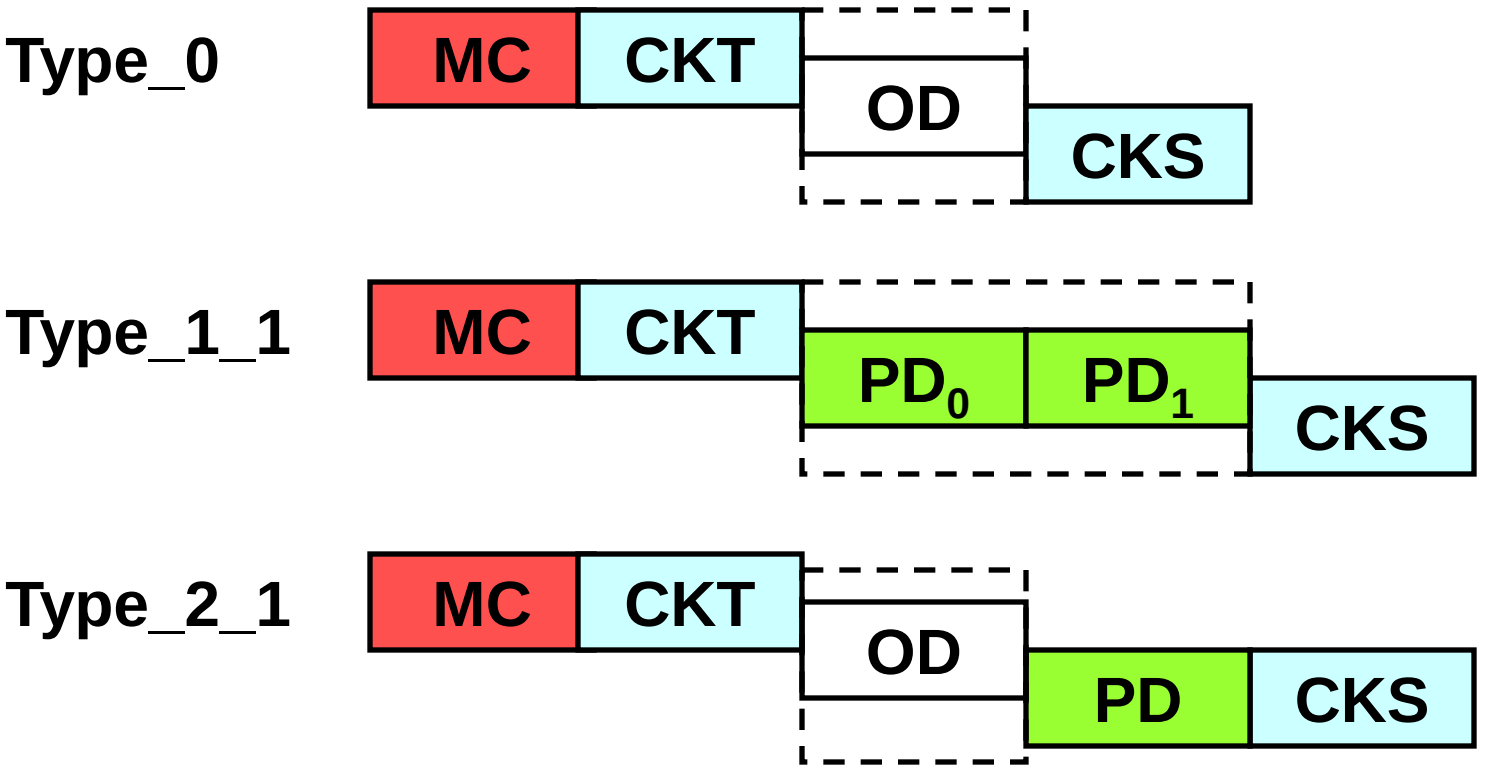
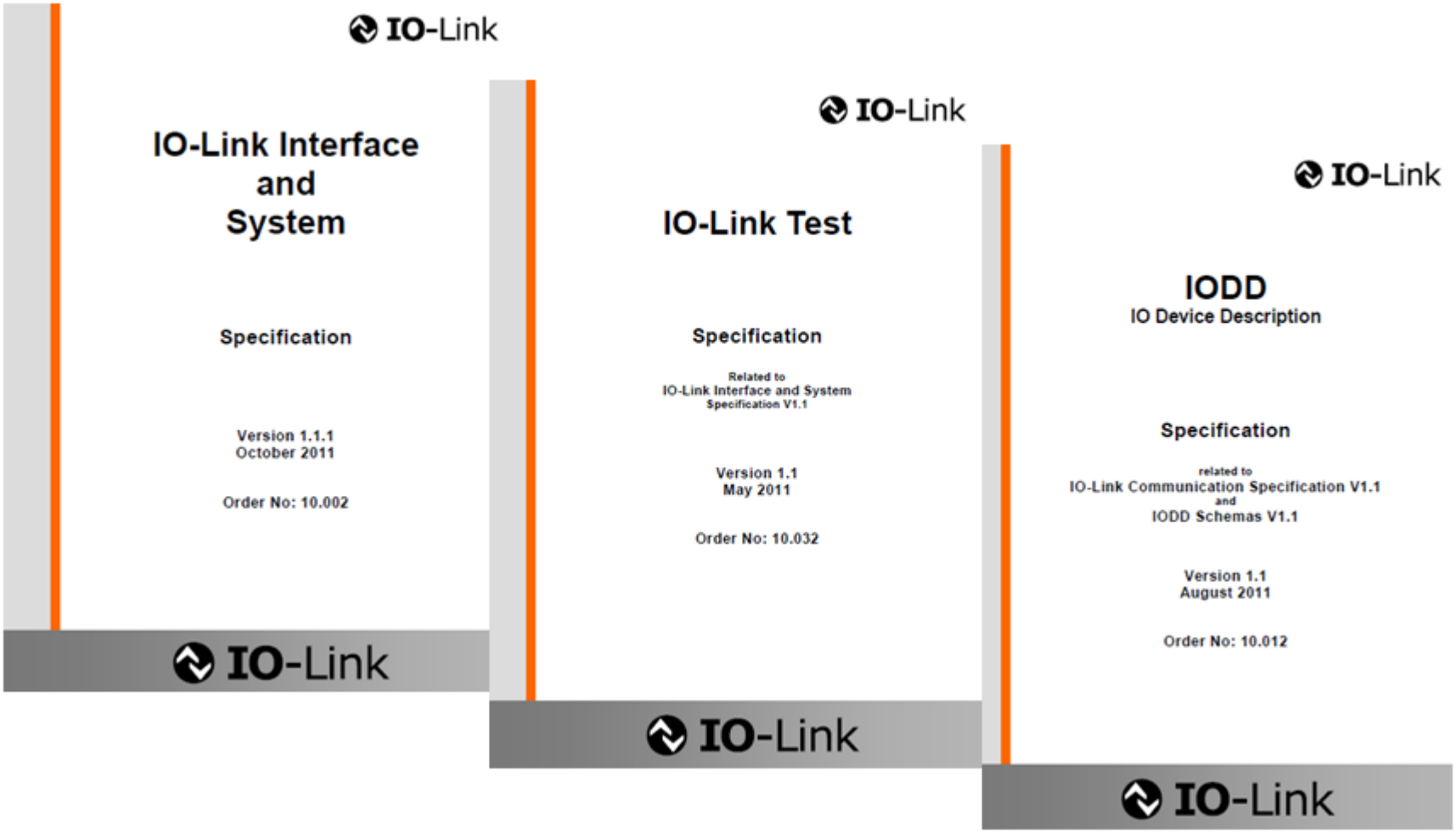
Data Transfer at the Application Layer Level



IO-Link Transmission Frames (Subset)



IO-Link Specifications



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IO-Link functions to be supported

- Process data transmission (1 Bit to 32 Byte)
- Service Data transmission (16 Bit index range)
- Event handling
- Direct parameter page support
- System commands
- Transmission of block parameters
- Easy device exchange based on the identification of devices
- Automatic device data exchange without tooling
- Change from communication into SIO mode and vice versa.
- Hot plug functionality

Current State of SIG Activities

- The SIG and its work plan have been established
- Companies involved in the SIG so far:
  - Balluff, Comtrol, Molex, Murrelektronik, Omron, Panduit, Rockwell Automation, Sick, TMG, Turck
- Two SIG meetings via teleconference have taken place
- The next teleconference is scheduled for October 24, 15:00 hours CEST, 9 a.m. Eastern DST, contact ODVA and Frank Moritz (Frank.Moritz@sick.de) if you want to participate
- Several possible integration concepts will be presented at the October 24 teleconference

Thank you for listening

Any Questions?