



Industrial Automation:

Arrow-ST IO-link Solutions to Unlock Industrial 4.0

Karina Yu
Jun 20, 2024

KARINA.YU@arrowasia.com
+86 13925226037/ +852 24842632



Power & Energy Lab



Bidirectional Charger (250-450V/19.6A, 6600W) for EV, PFC

P/N : 2021P004-ST



Released

Functions	Qty	Charger for EV
SIC MOS	16	SCTW40N120G2VAG- SCT040W120G3-4AG
SIC MOS Gate Driver- 1-CH	12	STGAP2SICS
Gate Driver Isolated Power	12	A6986I*
Aux -30W	1	VIPER31*
Isolated DC-DC/10W	6	STL8N10LF3*
MCU	1	STM32G474VBT6



Energy Storage (ESS) bi-directional 80V/82.5A Output, 6600W, PFC & DC-DC
P/N : 2021P005-ST, 2021P006-ST



Released

Functions	Qty	Energy Storage
SIC MOS	16	SCTW40N120G2-4 -> SCT040W120G3-4AG
SIC MOS Gate Driver- 1-CH	8	STGAP2SICS
Gate Driver Isolated Power	12	A6986I
DC-DC low side FET	32	STP75NF20
Aux	1	VIPER319HDTR
Diode	2	STPS1150A
Digital Isolator	2	STISO621WTR
Isolated DC-DC/10W	6	STL8N10LF3*
ESD Suppression	3	HDMIULC6-4SC6Y
ESD Suppression	2	ESDCAN03-2BWY
MCU	2	STM32G474VBT6



11 kW Battery Formation bidirectional converter

P/N : 2022P001

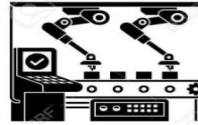
Functions	15kW PFC	Qty
HV SiC MOS	SCT040W120G3-4AG	6
SiC MOS	SCT018W65G3-4AG	6
MCU	STM32G474VBT6	1
Gate DRV	STGAP2SM	12
AUX	VIPER26HD	1

Released



Automation Lab

**Factory Automation
IO-link Master**



Released

**8-CH Master w/
Arrow MCU**
P/N : 2021W001

8-CH IO-link Master	Qty
ARW-IOLM4P-STM32L4 STM32L431RBT6	2
M24256-BRDW6TP	2
USBLC6-4SC6	1
L7986ATR	1
LD1117S33TR	1
LD39050PU33R	1
M93C66-RMC6TG	1
IPS161H	8
L6360	8
SPT01-335DEE	8
STM32F746ZGT6	1
STG3693QTR	2



Released

**8-CH Master w/
Ethernet IP**
P/N : 2021W004

8CH IOLM	Qty
STM32H743ZIT6	1
VN808-32-E	1
L6360	8
M24256-BRDW6TP	1
L7986A	1
SLVU2.8-4A1	2
SMA4F28A	24

**Building
Automation**



*Partner module

Released

KNX-TP	Qty
STKNX	1
STM32G070CBT6	1

8CH Master w/ EtherCAT/ Profinet

**IO-link Slave –
Sensors/ Actuators**

8-CH Digital Input
P/N : 2021W002

DI Module	Qty
SM15T33CA	1
SMA4F5.0A	1
STM32G071RBT6	1
STISO621WTR	2
CLT01-38SQ7-TR	1
L7986ATR	1
SPT01-335DEE	1
LD39050PU33R	1
L6364Q	1
STPS140Z	8
STPS3L60UFN	1
STPS340AFN	1



Released

8-CH Digital Output
P/N : 2021W003

DO Module	Qty
STPS3L60UFN	1
STPS340AFN	1
SM15T33CA	1
SMA4F5.0A	1
L7986ATR	1
SPT01-335DEE	1
LD39050PU33R	1
L6364Q	1
ISO8200AQ	1
STM32G071RBT6	1



Released



Released

Tower-light CTRL
P/N : 2021W005

Tower light	Qty
IPS4260L	1
L6364Q	1
STM32G071	1
M24C08	1
SMB15F24A	2
STG3157CTR	1

In Development

Motor Control Lab



Air-conditioning Compressor

P/N : 2019M002 Customization

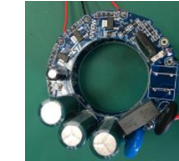


STEVAL-CTM010V1

Released

Func.	HVAC – 2kW	Qty
IPM	STGIB15CH60TS-L	1
MCU	STM32F302RBT6	1
PFC MOS	STP4LN80K5	2
PFC Gate DRV	PM8834	1
PFC Diode	STTH30AC06C	2
TRIAC	T435-800B	1
Valve Stepper Motor CTRL	STSPIN820	1

110 krpm BLDC Motor Driver
P/N : 2021M001



Released

Func.	Fast Hair Dryer	Qty
MCU +GATE DRV	STSPIN32F0601Q	1
MOS	STN6N60M2	6
AUX	VIPER222	1
LDO	LD1117S33TR	1
AUX Diode	BAT41ZFILM	1
AUX Pri. Diode	STTH1L06A	2
TRIAC	T1635T-8FP	1

1kW Servo Motor Driver
P/N : 2022M001



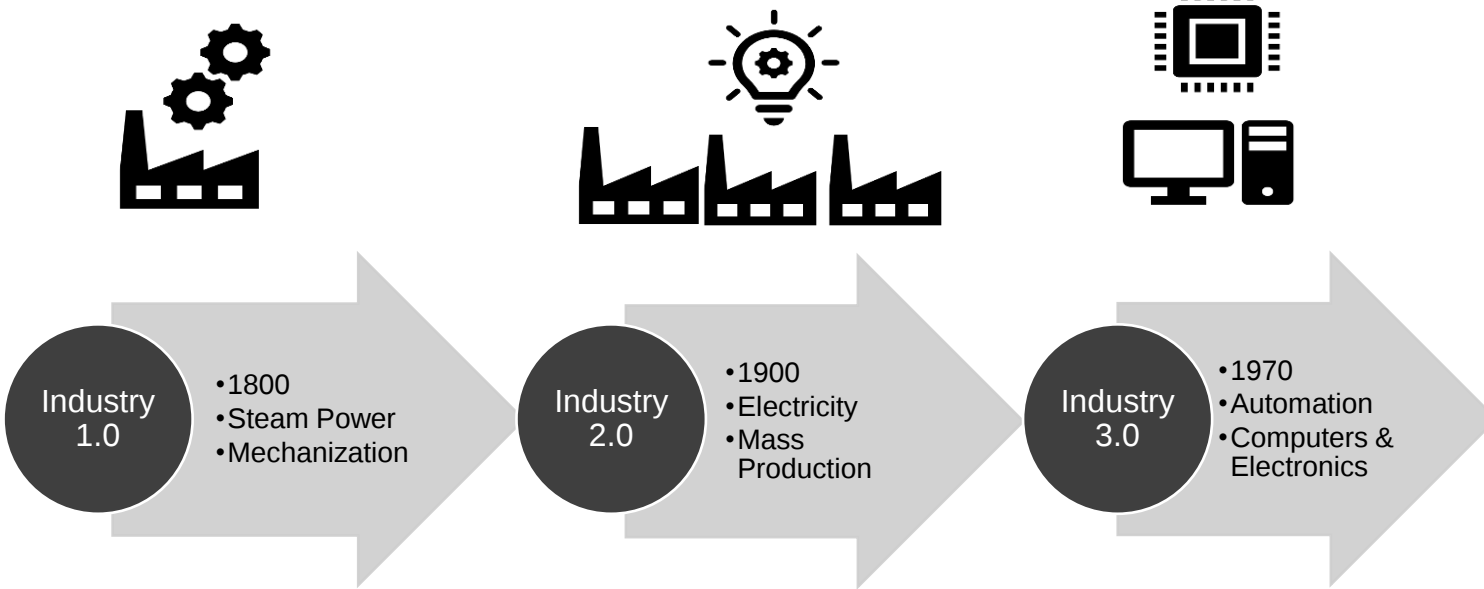
Released

Func.	Servo	Qty
MCU+GATE DRV	STSPIN32G4	1
MOS	STL110N10F7	6
AUX	VIPER319HDTR	1
AUX Diode	STPS1H100A	3
DC-DC	ST1S40IDR	2
LDO	LD1117S12TR	1
Ethernet Protection	ETP01-1621RL	4
Quad. RS-42X	ETP01-1621RL	2



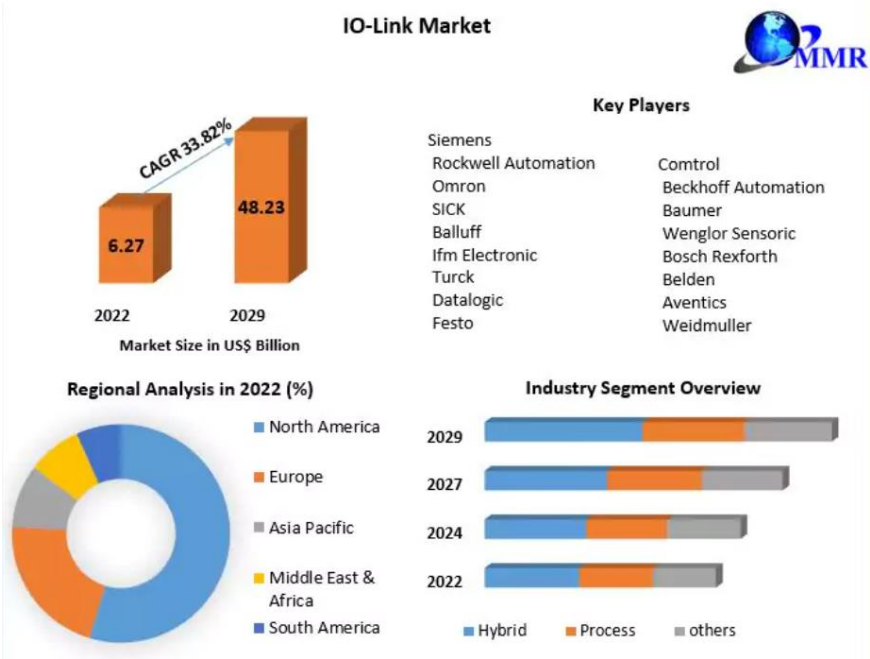
What is IO-link?

Industrial 4.0 & You



Smart
Universal
Easy Customization

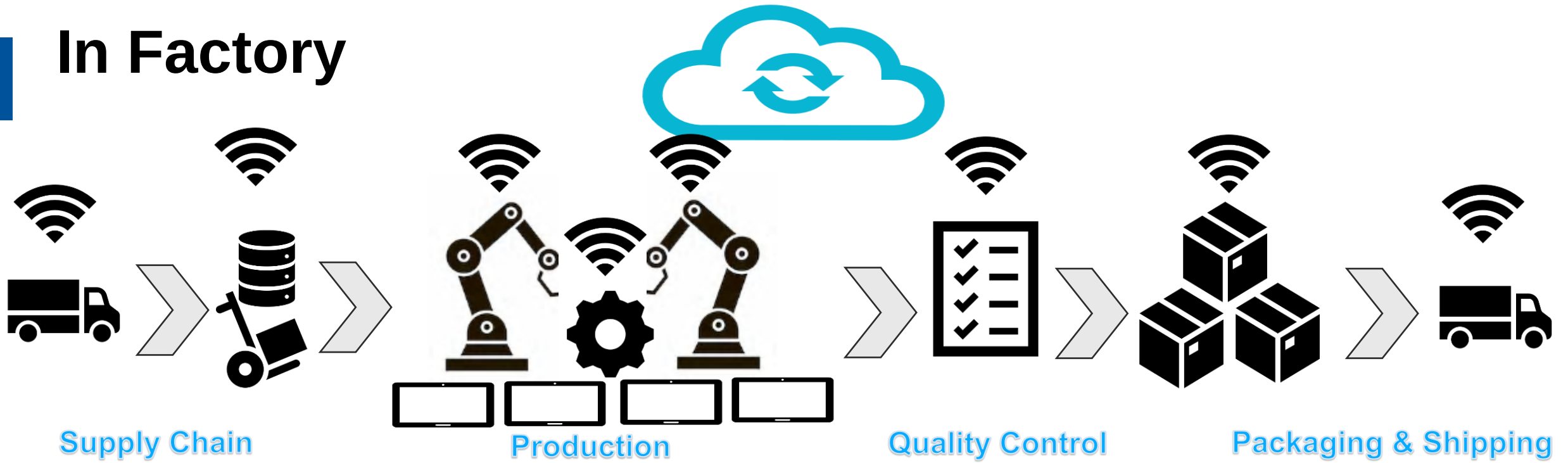
IO-link Market Trend



- IO-Link market is expected to reach **>\$48 billion by 2029**
- Major players in the IO-Link market are Siemens (Germany), Balluff (Germany), Ifm electronic (Germany), SICK (Germany), Rockwell Automation (US), Festo (Germany) Omron (Japan), Banner Engineering (US), Hans Turck (Germany), Pepperl & Fuchs (Germany), and Datalogic (Italy)
- However, **APAC** to hold largest size growth



In Factory



Industrial 4.0 Process Management



How to achieve Industrial 4.0?



Solves All Problems

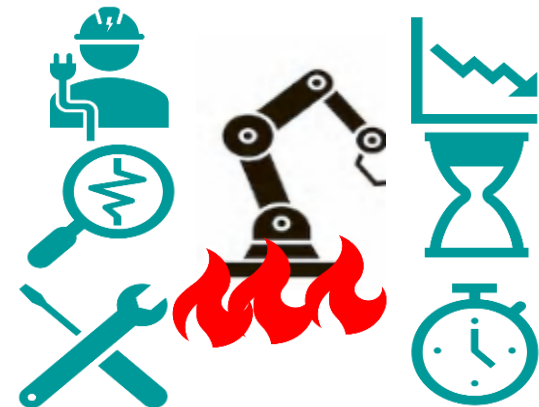
Inside Factory, **Problems** encountered:



Noisy environment for IoT



Nest of different wiring



Production Downtime for Installation/ Repair

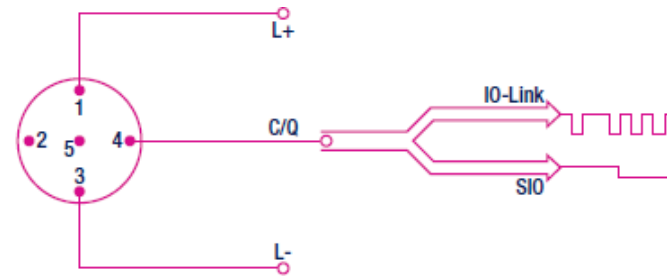
IO-Link Stronger Immunity to Noise

Sensor



Simple 3-wire
Digital Data Transmission

010100011110010100
001000010101010001
001111001010110001

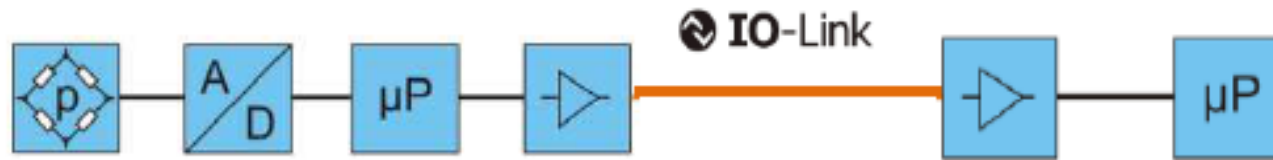


Pin assignment according to IEC 60974-5-2	
1	24 V
3	0 V
4	C/Q switching and communication

Controller

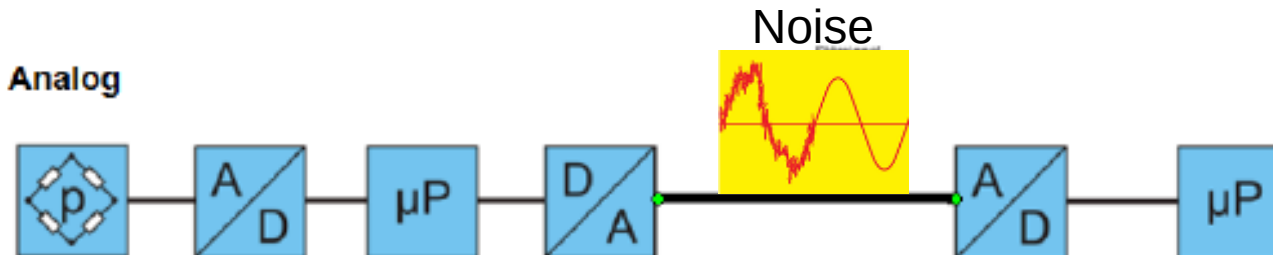


IO-Link



VS

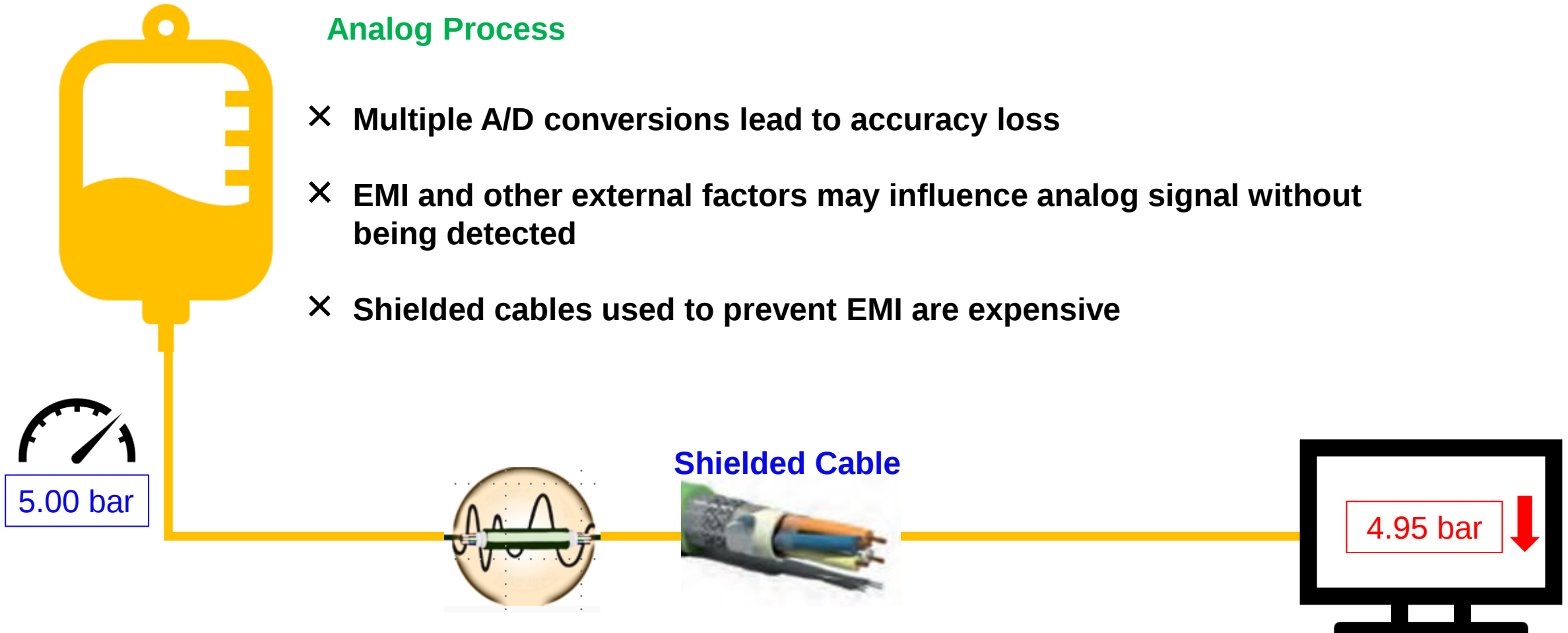
Analog



- ✓ Less conversion loss
- ✓ Faster
- ✓ No need of Shielded cables
- ✓ Save costs
- ✓ Carry Multiple Data

Analog Process

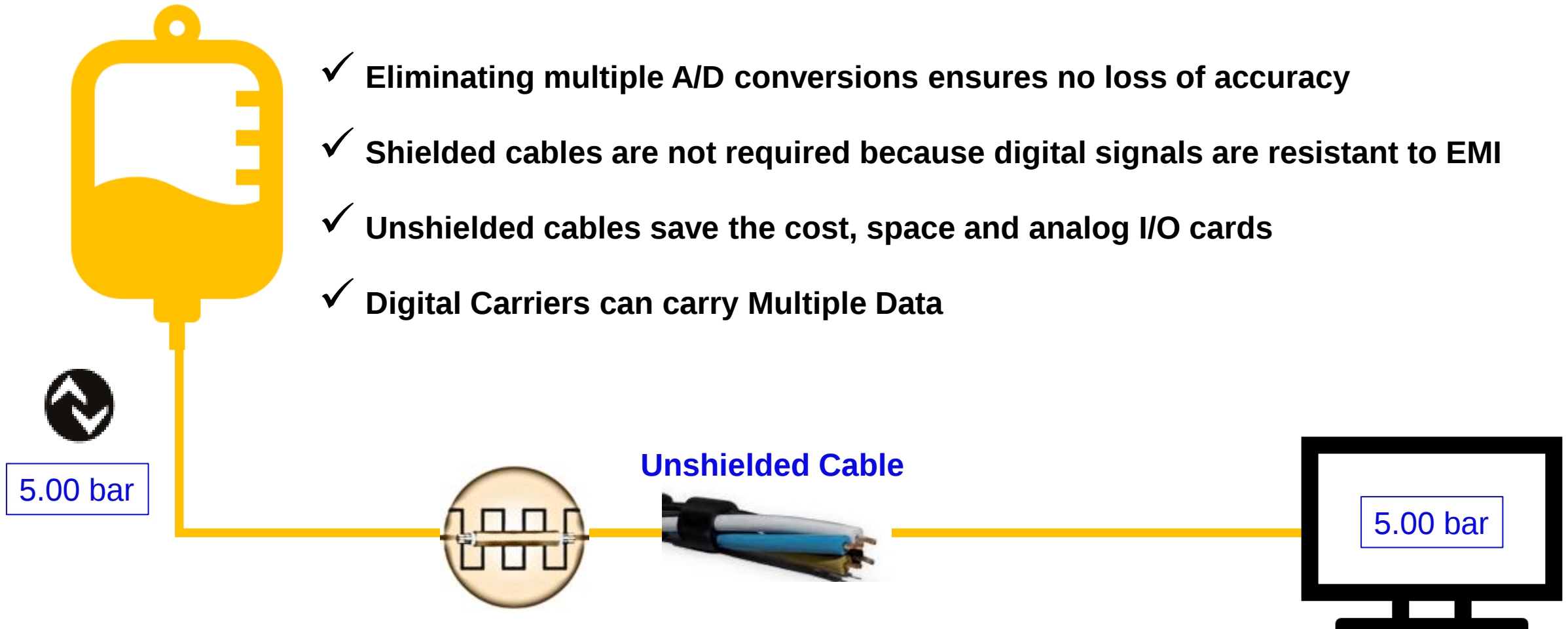
- × Multiple A/D conversions lead to accuracy loss
- × EMI and other external factors may influence analog signal without being detected
- × Shielded cables used to prevent EMI are expensive





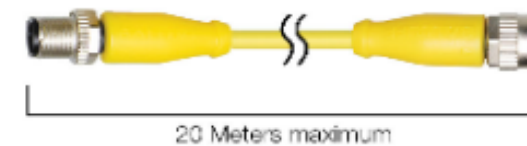
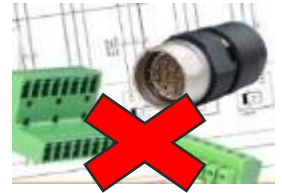
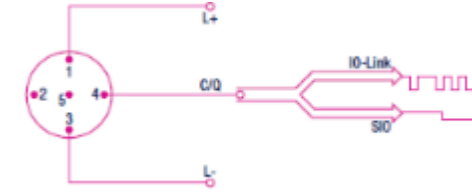
Digital Process

- ✓ Eliminating multiple A/D conversions ensures no loss of accuracy
- ✓ Shielded cables are not required because digital signals are resistant to EMI
- ✓ Unshielded cables save the cost, space and analog I/O cards
- ✓ Digital Carriers can carry Multiple Data

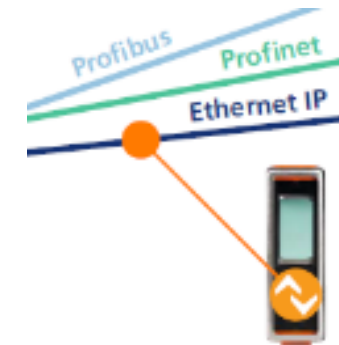


IO-Link *Simple Wiring & Cost Saving*

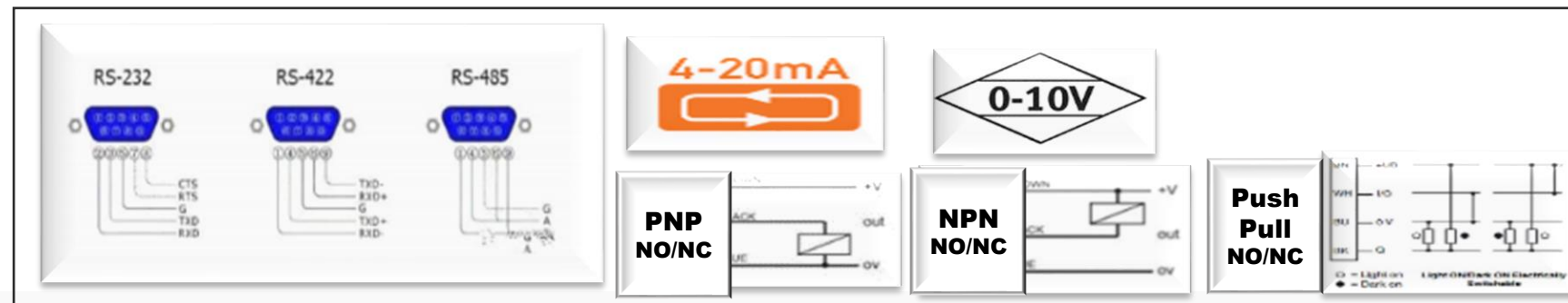
- ✓ 3 instead of Multiple terminals needed
- ✓ Standard Connectors & Cables (Unshielded M12/ M8 Cables)
- ✓ 20 meter cable -> no problem
- ✓ One Port can be Input/ Output, so can connect sensors & actuators
- ✓ Manufacturer Independent, adapt to any existing PLC and bus
- ✓ IO-link – ONE can replace Multiple standards => UNIVERSAL



Space & Cost

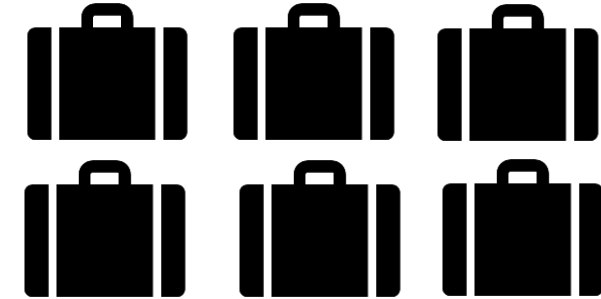
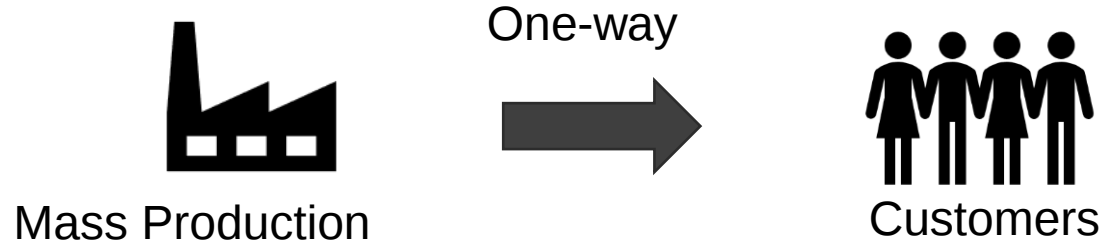


IO-Link



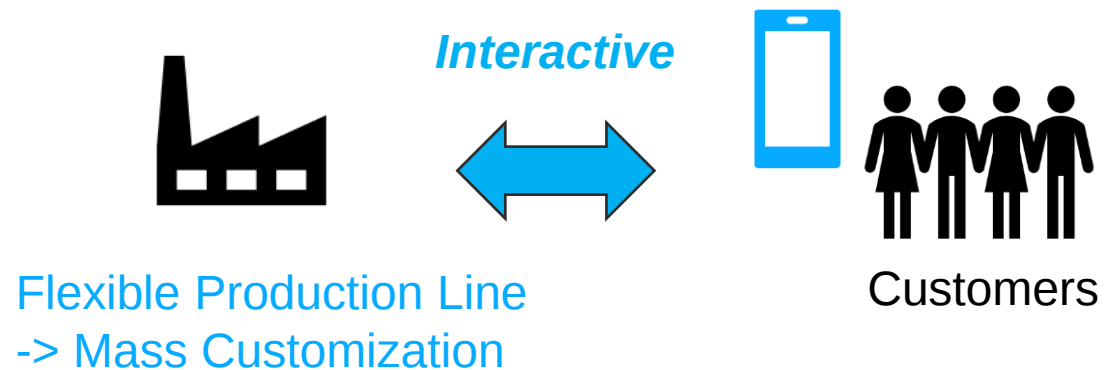
IO-Link *Easy Customization*

Before



Design Your Own

After

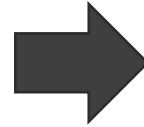


IO-Link *Seamless Remote Monitoring & Control*

Sensor/ Actuator configuration



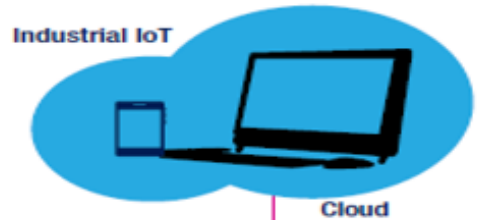
Manual onboard On/Off Push buttons



Automatic and Remote configuration

- ✓ Less downtime for Flexible Recipe
- ✓ Remote Machine condition monitoring enables Predictive Maintenance & Energy Saving

What's IO-link?



Fieldbus

Controller



Master



Device



Sensors

Master



Device

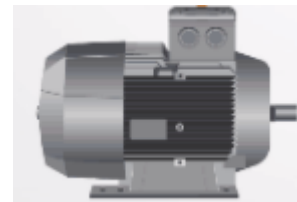


Actuators

Master

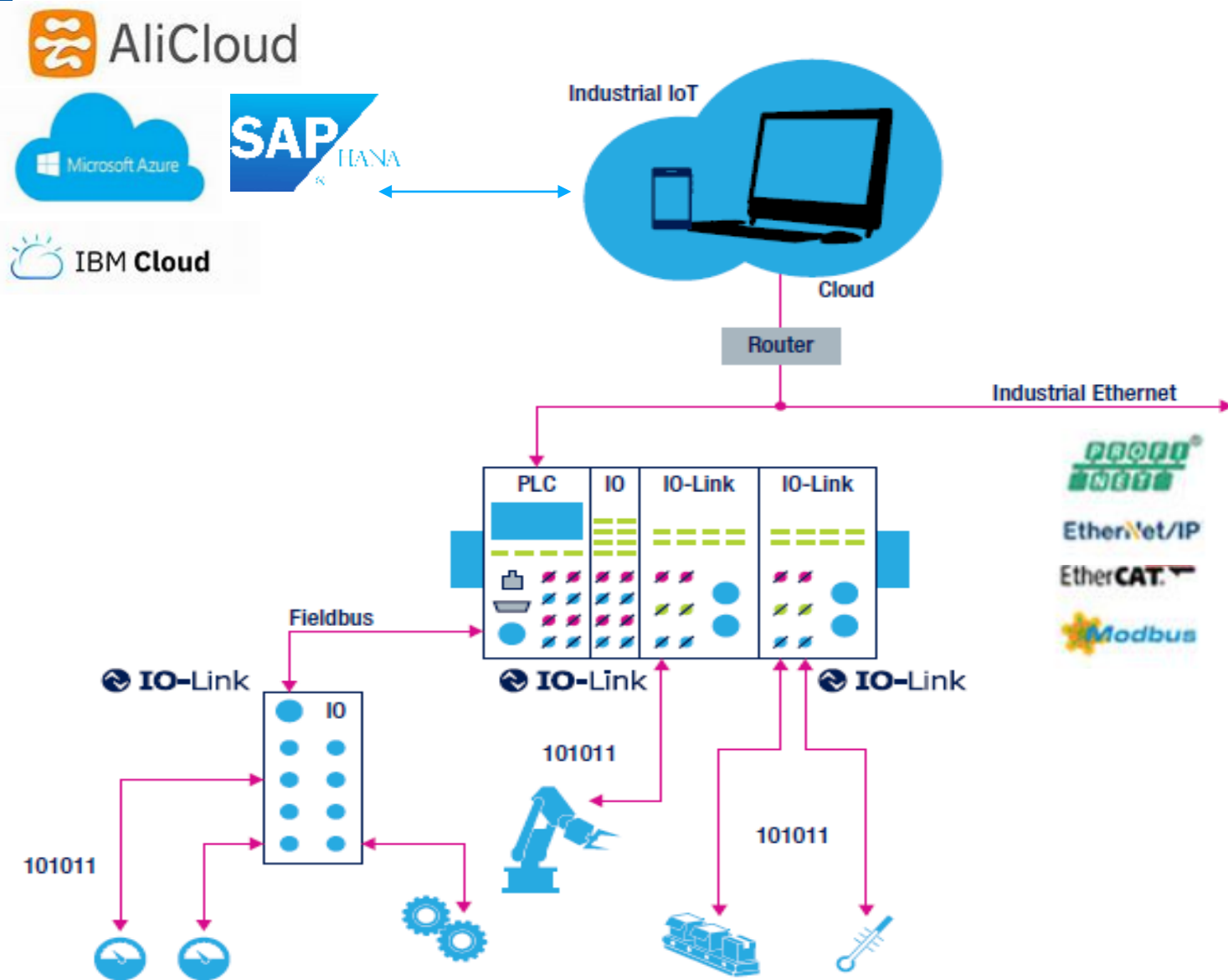


Device



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

IO-link Benefits



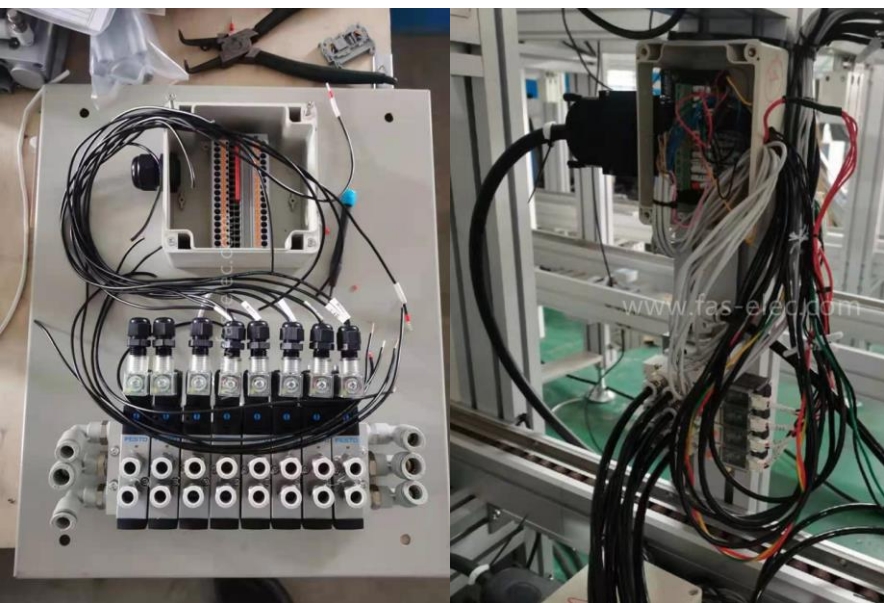
Use  **IO-Link**
Universal · Smart · Easy

- ✓ Bi-directional
- ✓ Easy Adaptation to existing system
- ✓ Easy Installation
- ✓ Easy Online Configuration
- ✓ Easy Diagnosis

*Foundation
of
Industrial 4.0*

IO-link Advantages Example – Valve Island

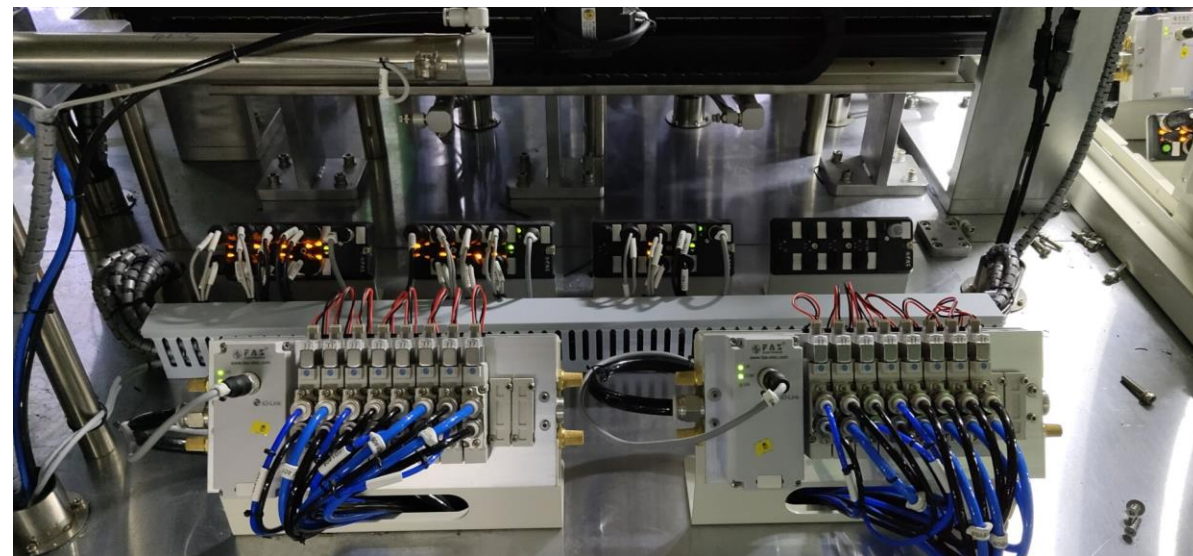
Before



 **IO-Link**



After



- 1、IO-Link阀岛支持多种现场总线协议（Profinet、Ethernet/IP、EtherCAT、CC-Link IE Basic）。
- 2、单套IO-Link阀岛最多可支持24个双线圈电磁阀。
- 3、IO-Link阀岛至主站连接，仅用非屏蔽4芯IO线即可。
- 4、相对传统连接方,IO-Link阀岛抗干扰能力强。
- 5、所有端口具备诊断功能。
- 6、安装空间大大减小。



IO-link Solution Products

What Arrow can offer

ARW-IOLM4P-STM32L4



Point to Point Connection from Controller to Sensor/ Actuator

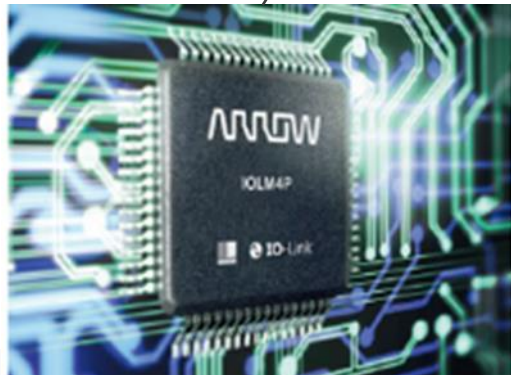
Transmission data rates

COM1:4.8kBit/s

COM2:38.4kBit/s

COM3:230.4kBit/s

Controller



Master



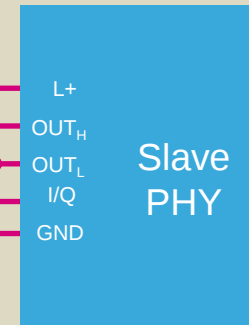
UART
I²C

Master
PHY

L+
C/Q₀
C/Q₁
L-
I/Q



Device

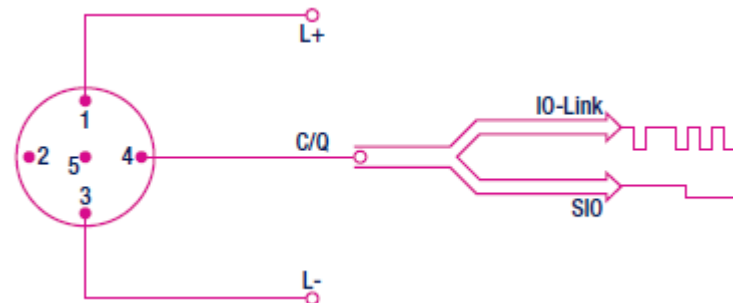


GPIO

MCU

Three-wire cable
up to 20m

- Sensor / Actuator



What Arrow can offer for IO-link Master



ARW-IOLM4P-STM32L4

*(based on **STM32L431RBT6**)*

ARROW

IOLinkChips

with



TEConcept

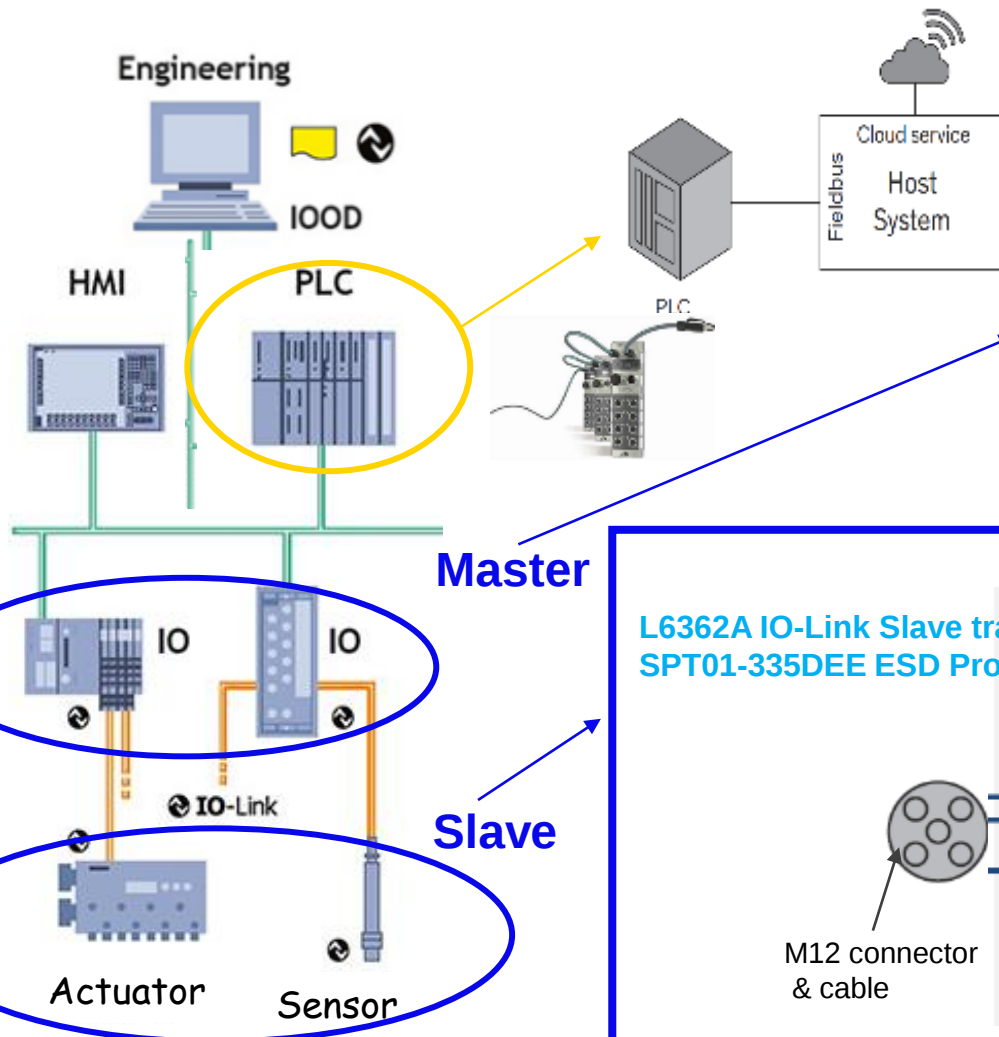
Arrow IO-link Master MCU FEATURES:

- All-in-One IO-Link Master 4-port solution
- Low-power STM32 ARM® Cortex®- M4 MCU
- IO-Link V1.1.3 compliant 4-port master controller stack included
- IEC 61131-9 compliant, IO-Link conformance test for masters passed
- Connection to host CPU via SPI supported

Advantages:

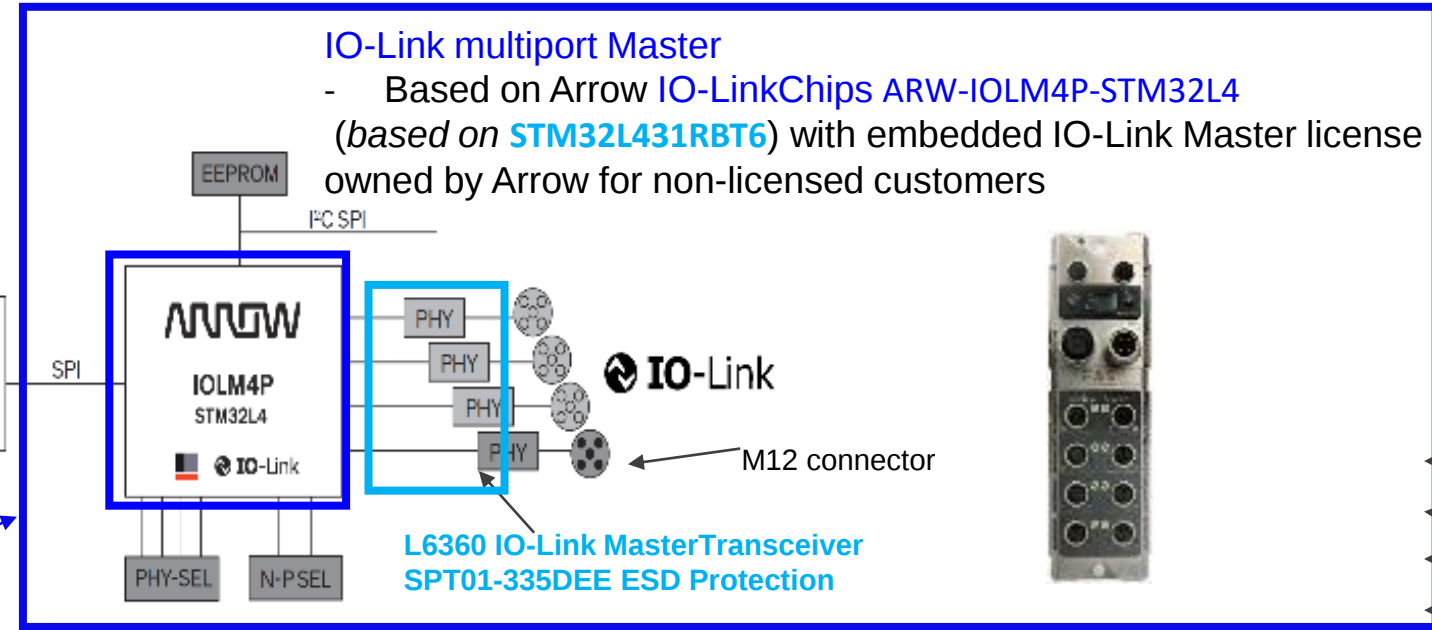
- ☑ Simplify IO-Link Master design
- ☑ Reduce software effort
- ☑ Guaranteed IO-Link functionalities
- ☑ Shorten time to market

Arrow IO-Link Solution for Industrial 4.0



IO-Link multiport Master

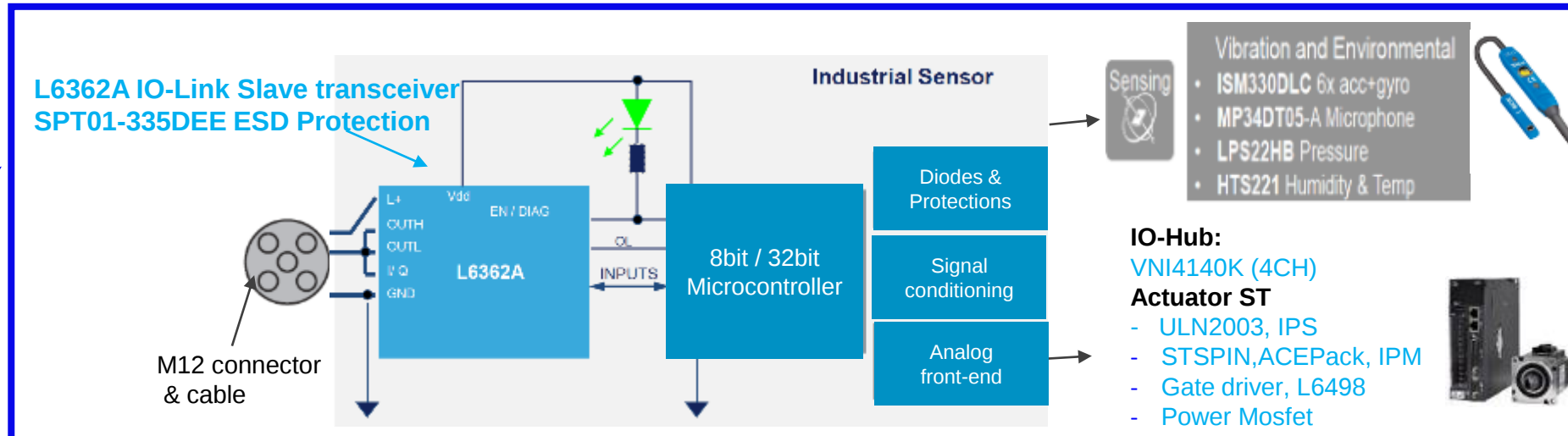
- Based on Arrow IO-LinkChips ARW-IOLM4P-STM32L4 (based on **STM32L431RBT6**) with embedded IO-Link Master license owned by Arrow for non-licensed customers



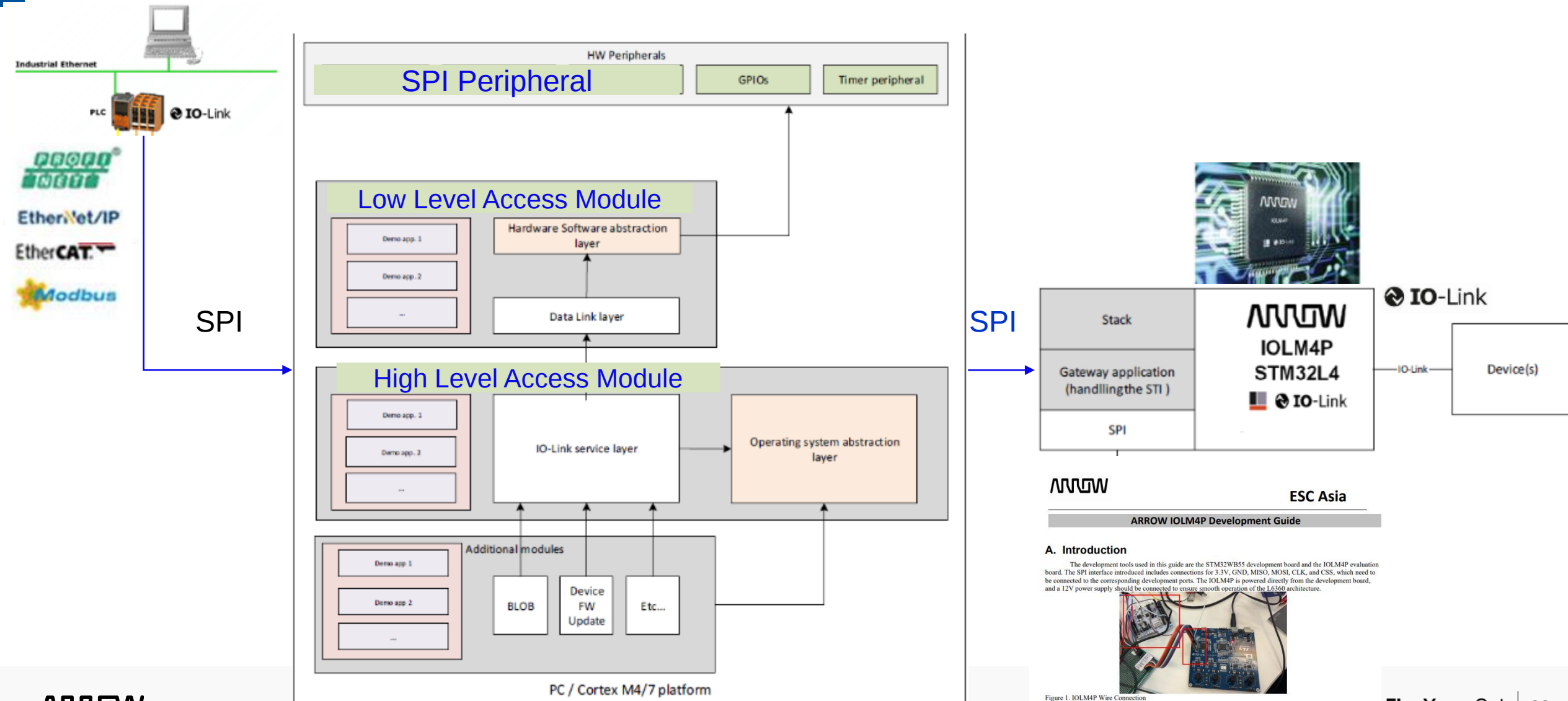
Master

Slave

L6362A IO-Link Slave transceiver SPT01-335DEE ESD Protection



Arrow IO-Link Master MCU Software Access Architecture



Arrow IO-link 4-CH Demo

Tools to use:

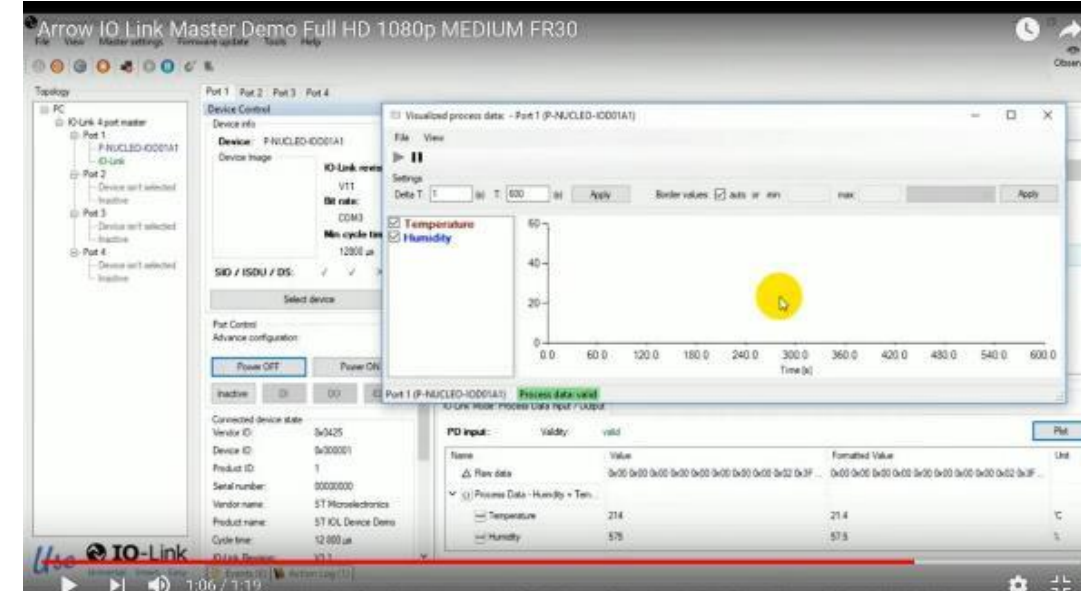
- Arrow IO-link EVAL Boards

Master PHY - ARW-IOLM4P-EVAL02 Master MCU - ARW-IOLM4P-EVAL01



ARW-IOLM4P-STM32L4

- TE-concept Control Tool v3.9
- IO-link Slave
 - Slave device's IODD file
 - ST P-NUCLEO-IOM01M1 is used to read Temperature & Humidity sensor data
- Demo Video – **Arrow IO Link Master Demo**



ST's ministack for IO-link Slave Software



Download here: <https://www.st.com/en/embedded-software/x-cube-iod02.html>

Update History

✓ V1.1.2 / 04-March-2021

Main Changes

V1.1.2

- New library files deployed for all supported NUCLEO boards.
 - This version supports configurability for the following features
 - Process data input buffer size
 - Process data output buffer size
 - M-Sequence capability
 - Phy configuration
 - Phy short-circuit threshold
 - Phy drive mode to use in SIO mode
 - Thermal Shutdown temperature from -40C to 200C
 - Minimum Cycle Time in 0.1 ms units
 - Vendor Id - Direct Parameters 0x07 - 0x08
 - Device Id - Direct Parameters 0x09 - 0x0b
 - IO-Link Baudrate: 38400 bps or 230400 bps
 - IO-Link Stack Uart Mode: Transparent, Single-octet or Multi-octet
 - It furthermore provides a set of API functions to manage the Process DataIn stream

Development Toolchains and Compilers

- IAR Embedded Workbench for ARM (EWARM) toolchain V8.50.5 + ST-LINK/V2
- RealView Microcontroller Development Kit (MDK-ARM) toolchain V5.31.0.0 + ST-LINK/V2
- STM32CubeIDE for STM32 V1.6.0 + ST-LINK/V2

Supported Devices and Boards

- STM32G071RB MCU
- STM32L073RZ MCU
- STM32L452RE MCU
- NUCLEO-G071RB (STM32 Nucleo-64 development board with STM32G071RB MCU)
- NUCLEO-L073RZ (STM32 Nucleo-64 development board with STM32L073RZ MCU)
- NUCLEO-L452RE (STM32 Nucleo-64 development board with STM32L452RE MCU)
- L6364 (IO-Link device transceiver)
- X-NUCLEO-IOD02A1 (expansion board for STM32 Nucleo)

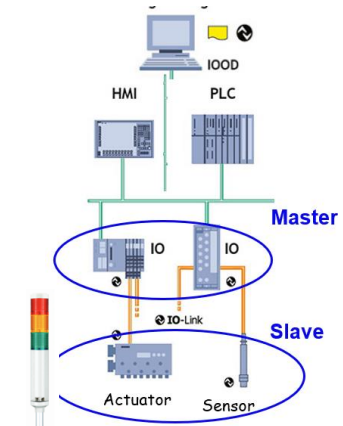
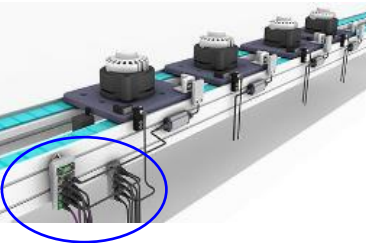
Known Limitations

Features not supported:

- Event management

Arrow- ST IO-Link Master -Slave Solutions for Factory Automation

Released



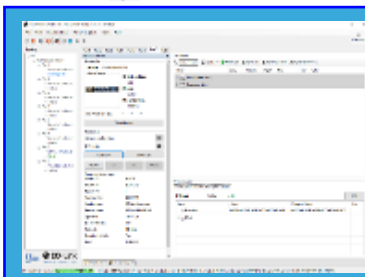
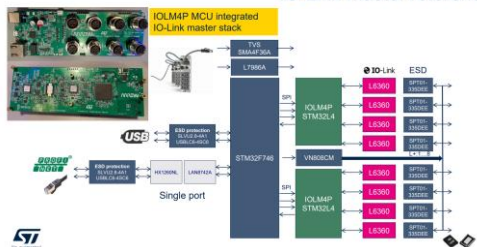
- To provide IO-Link Slave SW platform for 8-CH DI/DO Hub reference design.
- Used for Industrial 4.0-IO-link interface to connect sensors/actuators

Applications:

- Industrial Automation System
 - Profinet/ Ethernet/ Profibus
 - PLC
- Predictive Maintenance

IO-link Master (Part #: 2021W001)

IO-Link master reference



IO-link4-CH Masterw/sensors Demo Video

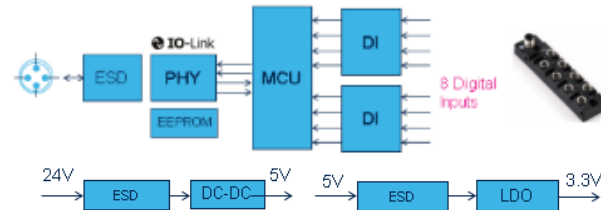


IO-link 8-CH Master Demo Video



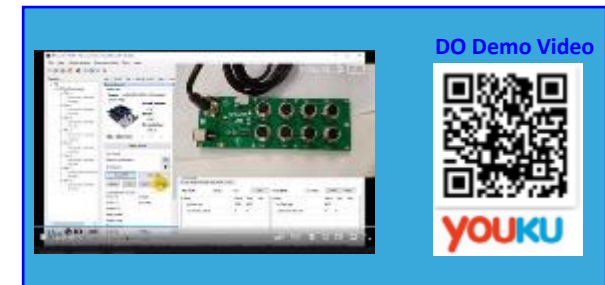
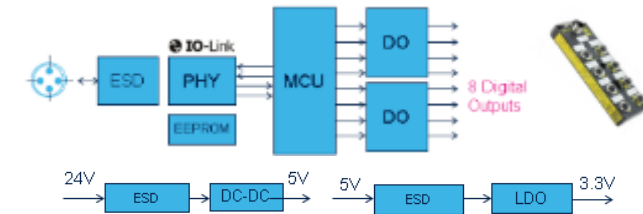
Supplier	Part number	Qty
Arrow/ST	ARW-IOLMAP-STM32L4_001	2
ST	STM32L431RBT6	2
ST	M24256-BRDW6TP	2
ST	USBL6-4SC6	1
ST	L7986ATR	1
ST	LD1117S33TR	1
ST	LD39050PU33R	1
ST	M93C66-RMC6TG	1
ST	IPS161H	8
ST	L6360	8
ST	SPT01-335DEE	8
ST	STM32F746ZGT6	1
ST	STG3693QTR	2
Molex	1200700242	1
FTDI	FT232HL-56Q-TRAY	1
Microchip	LAN8742A-CZ-TR	1
Molex	1050170002	2
muRata	XRCGB25M000F0Z00R0	1
muRata	CSTNE8M00G520000R0	1
muRata	WMRAG32K76CS1C00R0	1
muRata	XRCLH14M745F1QA0J1	2
muRata	CSTNE12M0GH5L000R0	1
Pulse	ESJ88-40LOB4-L	1
Pulse	HX1260FNL	1
TE-Concept	IMS-LSO-HLMIOSL	1

IO-link Slave – Digital Input (DI) Module (Part #: 2021W002)



Supplier	DI Module Part number	Qty
ST	SM15T33CA	1
ST	SMA4F5.0A	1
ST	STM32G071RBT6	1
ST	STISO621WTR	2
ST	CLT01-38SQ7-TR	1
ST	L7986ATR	1
ST	SPT01-335DEE	1
ST	LD39050PU33R	1
ST	L6364Q	1
ST	STPS140Z	8
ST	STPS3L60UFN	1
ST	STPS340AFN	1
Amphenol	M12A-05PFFP-SF8001	8
Amphenol	M12A-04PMMP-SF8001	1
muRata	BLM15BD601SN1D	2
muRata	BLM31SN500SH1L	1
muRata	BLM18AG121S21D	5
muRata	1267AY-220M#	1
muRata	LQH32CN221K23L	1
muRata	WMRAG32K76CS1C00R0	1
muRata	CSTNE8M00G520000R0	1
Kemet	ESL107M050AGMAA	1
Kemet	ESL107M016AC3AA	1

IO-link Slave – Digital Output (DO) Module (Part #: 2021W003)



Supplier	DO Module Part number	Qty
ST	STPS3L60UFN	1
ST	STPS340AFN	1
ST	SM15T33CA	1
ST	SMA4F5.0A	1
ST	L7986ATR	1
ST	SPT01-335DEE	1
ST	LD39050PU33R	1
ST	L6364Q	1
ST	ISO8200AQ	1
ST	STM32G071RBT6	1
muRata	BLM18AG121S21D	6
muRata	BLM31SN500SH1L	1
muRata	BLM15BD601SN1D	2
muRata	1267AY-220M#	1
muRata	LQH32CN221K23L	1
Murata	WMRAG32K76CS1C00R0	1
Murata	CSTNE8M00G520000R0	1
Kemet	ESL107M050AGMAA	2
Kemet	ESL107M016AC3AA	1
CUI Devices	PJ-080BH	1
Amphenol	M12A-05PFFP-SF8001	8
Amphenol	M12A-04PMMP-SF8001	1



Arrow proprietary information

Selective Disclosure only

Five years Out 26



IO-link Master Boards

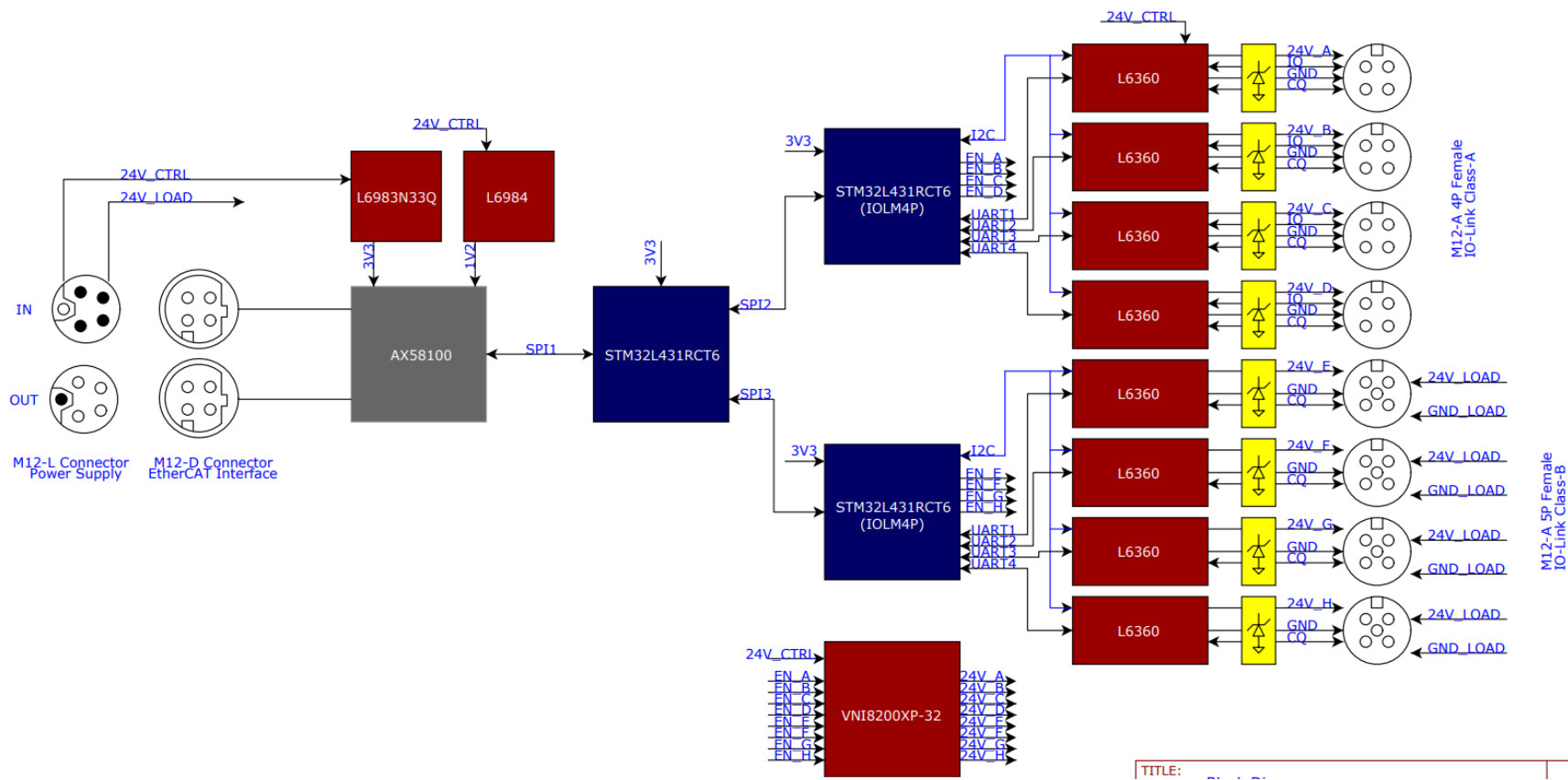
Single MCU IO-link Master /EtherCAT Released

Key Features:

- Support 8 channels of IO-Link devices
- Dual-control architecture (PC or embedded host)
- IO-Link V1.1.3 compliant 8-port master controller stack included
- With 2 integrated EtherCAT interface

Applications:

- IO-Link Master Hub
- PLC
- Factory automation

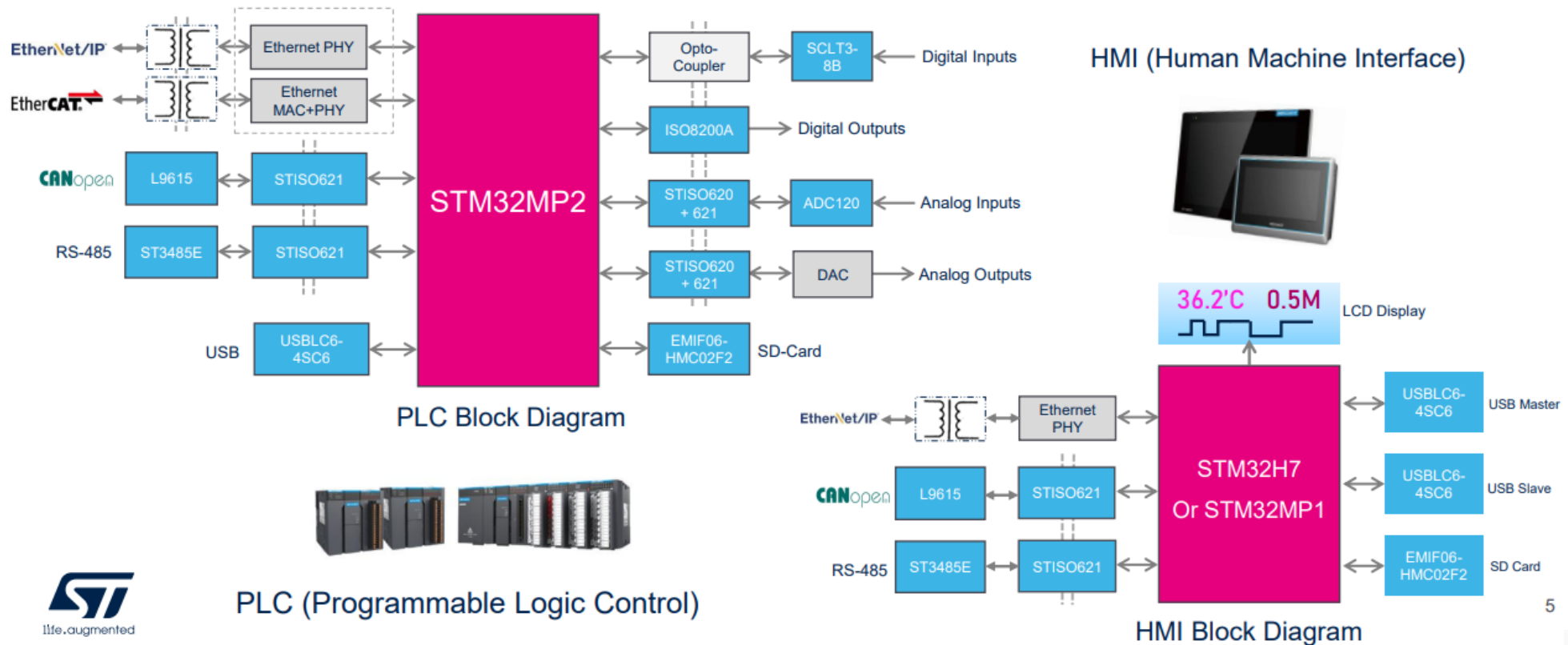


Supplier	Part number	Qty
	ARW-IOLM4P-STM32L4_003	2
Arrow/ST	STM32L431RCT6	3
ST	M24256-BRDW6TP	2
ST	USBLC6-4SC6	1
ST	L6983	1
ST	LD1117533TR	1
ST	LD39050PU33R	1
ST	M93C66-RMC6TG	1
ST	VNI8200XP	1
ST	L6360	8
ST	SPT01-335DEE	8
ST	STM32F746ZGT6	1
ST	STG3693QTR	2
	1200700242	1
FTDI	FT232H-56Q-TRAY	1
Microchip	LAN8742A-CZ-TR	1
Molex	1050170002	2
muRata	XRCGB25M000F0Z00R0	1
muRata	CSTNE8M00G520000R0	1
muRata	WMRAG32K76CS1C00R0	1
muRata	XRCLH14M745F1QA0J1	2
muRata	CSTNE12M0GH5L000R0	1
Pulse	E5J88-40L0B4-L	1
Pulse	HX1260FNL	1
ASIX	AX58100	1
TE-Concept	IMS-LSO-HLMIOSL	1

IO-link Master to PLC

Programmable Logic Control & Human Machine Interface

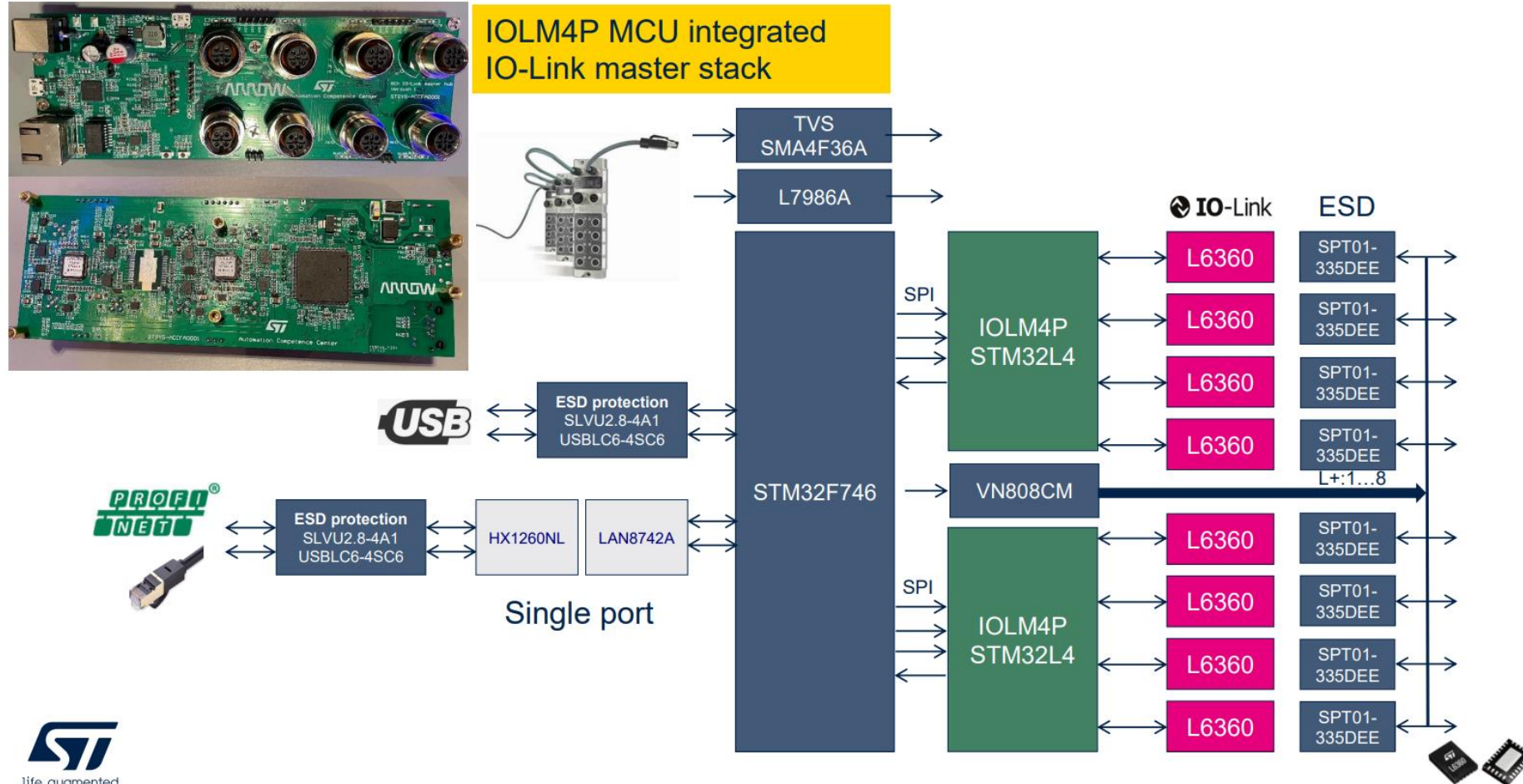
New SIL-2 Compliant Demo: STEVAL-SILPLC01



5

IO-link Master with Arrow IOLM4P MCUs

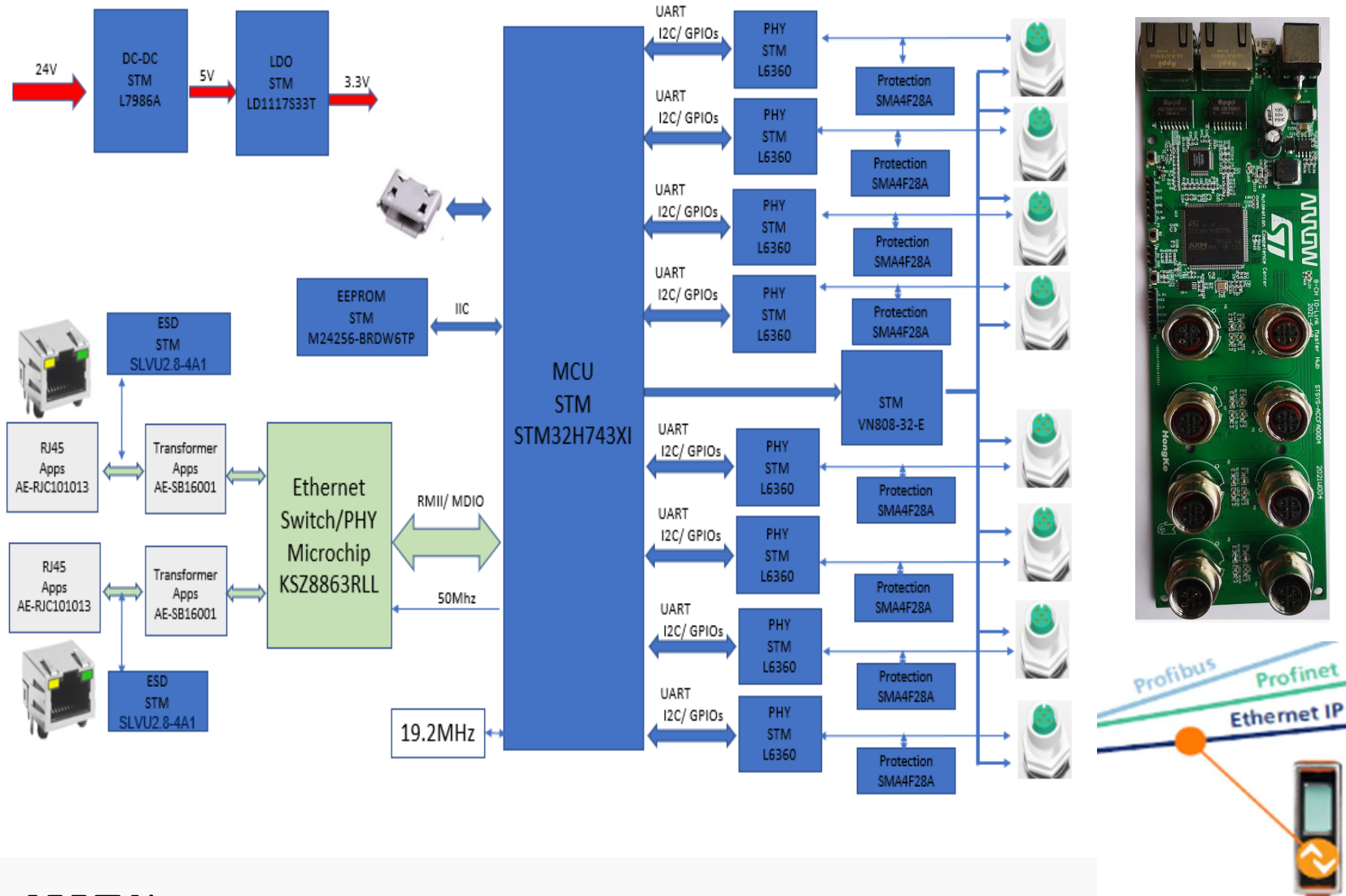
IO-Link master reference



Single MCU IO-link Master /Ethernet IP/ Profinet

Released

In Development



Key Features:

- Support 8 channels of IO-Link devices
- Dual-control architecture (PC or embedded host)
- IO-Link V1.1.2 compliant 8-port master controller stack included
- With 2 integrated EtherNet/IP interfaces

Core Chips:

- 1.STM: STM32H743ZIT6; VN808-32-E;L6360; M24256-BRDW6TP; L7986A; SLVU2.8-4A1; SMA4F28A
- 2.Microchip: KSZ8863RLL
- 3.Amphentol: M12A-05PMMC-SF8B20
- 4.Apps Electronics: AE-RJC101013; AE-SB16001
- 5.Abracon: ABM8W-19.2000MHZ-8-J1Z-T3

Applications:

- IO-Link Master Hub
- PLC
- Factory automation

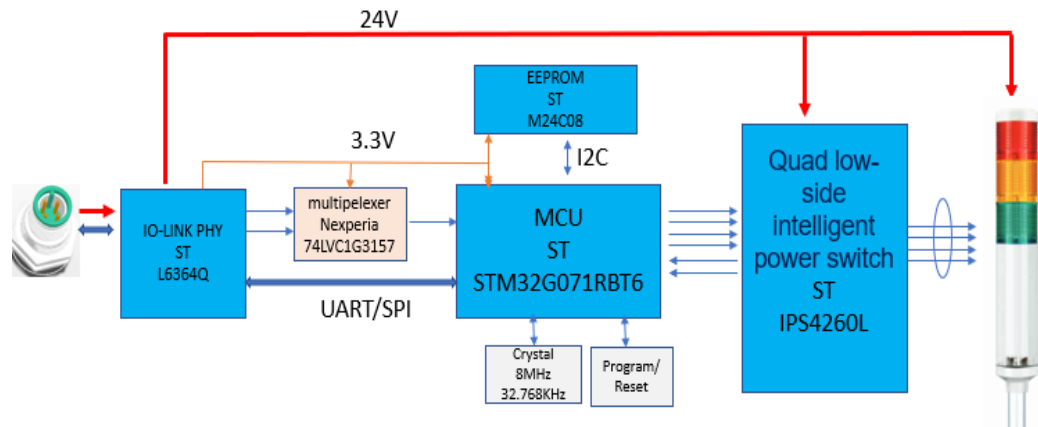
Status:

- TMG software-Ethernet IP version released, test done, documentation in progress
- Profinet stack integration in progress



IO-link Slave Boards

IO-link Tower Light



Key Features

- M12 standard industrial connector
- Actuator Tower light control through IO-LINK interface
- Different modes configurable via IO-Link
- IO-Link version 1.1/1.0 physical layer compliant
- Configurable current limitation threshold of CQ and DIO lines, or CQ//DIO line (Join Mode)
- Quartz-free IO-Link clock extraction and timing generation at COM2 (38.4k Baud) and COM3 (230.4k Baud)

Core Chip

1. **ST** – Quad Low-side Intelligent power switch: IPS4260L; IO-LINK Dual channel transceiver IC: L6364Q, ARM Cortex -M0+ 32-bit MCU: STM32G071; 8Kbit serial EEPROM: M24C08, 1500W TVS: SMB15F24A
2. **ST** – Analog Multiplexer: STG3157CTR
3. **Murata** – MEMS Resonator: WMRAG32K76CS1C00R0; Ceramic Resonator 8MHz: CSTNE8M00G520000R0
4. **Amphenol ICC** – M12 Circular 4 POS ST Thru hole 4 terminal 1 port: M12A-04PMMP-SF8001; BergStik board-to-board connector: 77311-1180xLF

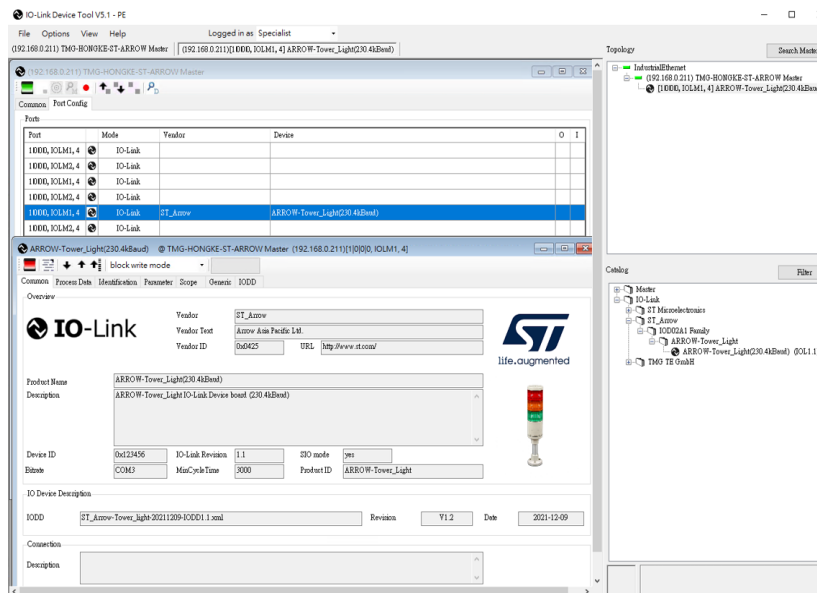
Applications

- Actuator Tower Light control
- Factory Automation and Control
- Building Automation

Demo Video



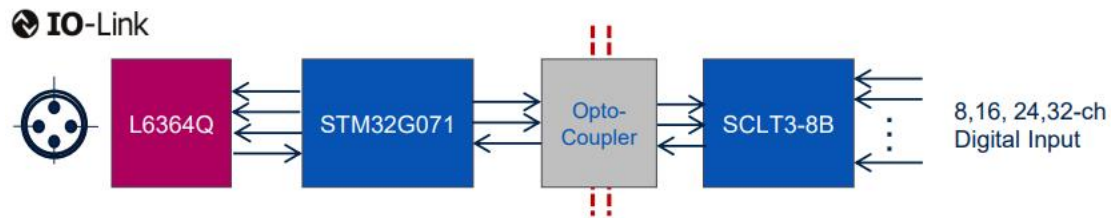
https://v.youku.com/v_show/id_XNTgwO_TgzMjEyOA==.html



IO-link Slave extension – DI/ DO modules

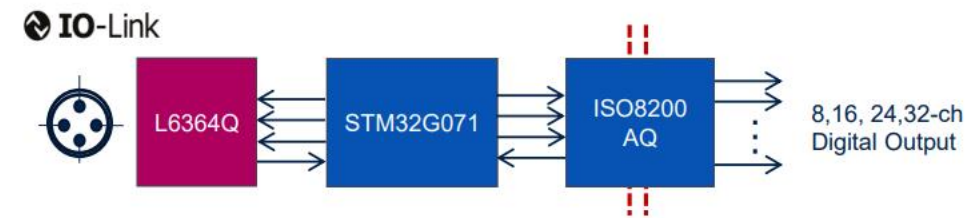
IO-Link to 8-ch Digital Inputs

Highlight: No need additional power source, input port protected with SCLT3-8B.

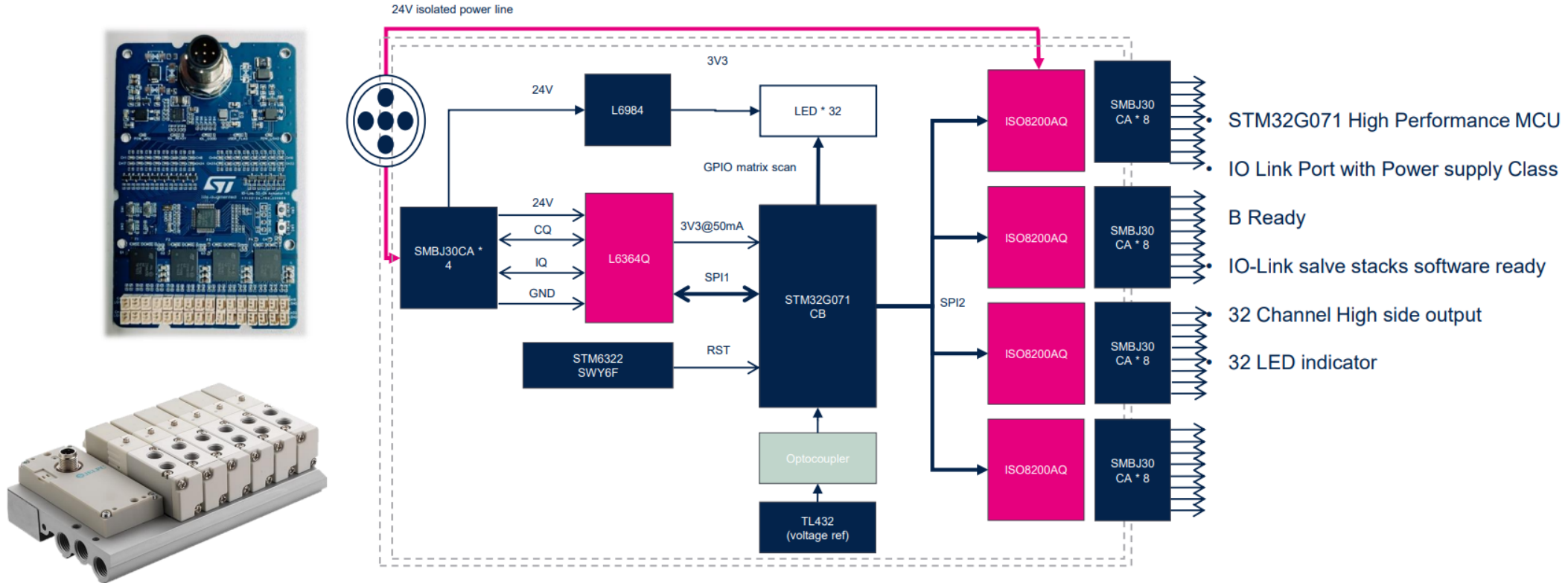


IO-Link to 8-ch Digital Outputs

Isolated High-side Digital Output, with 0.7A Output Current Limit.



IO-link Slave extension – 32-Channel Valve driver

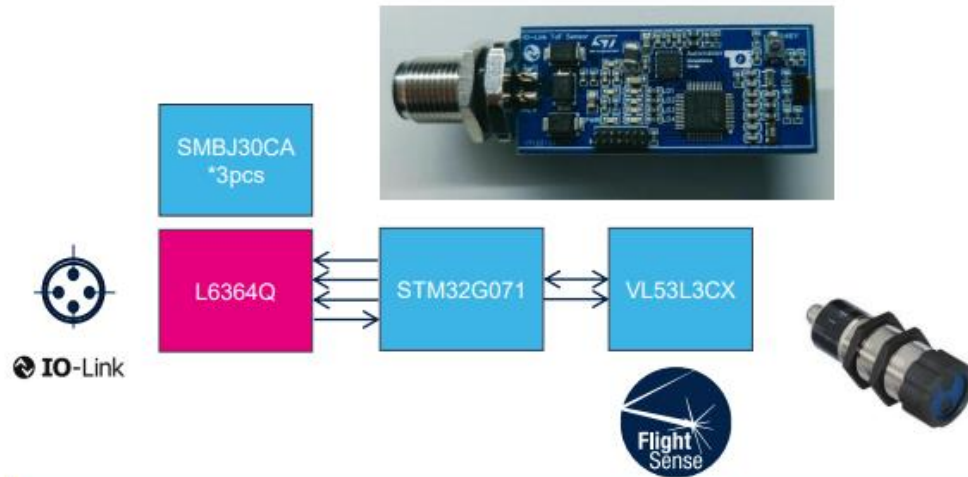


IO-link Slave extension – RFID Tag/ TOF Sensor

STSYS-ACCFA007:

IO-Link TOF Distance Measure Sensor

High Precision, Wide Range from centimeter to meters.

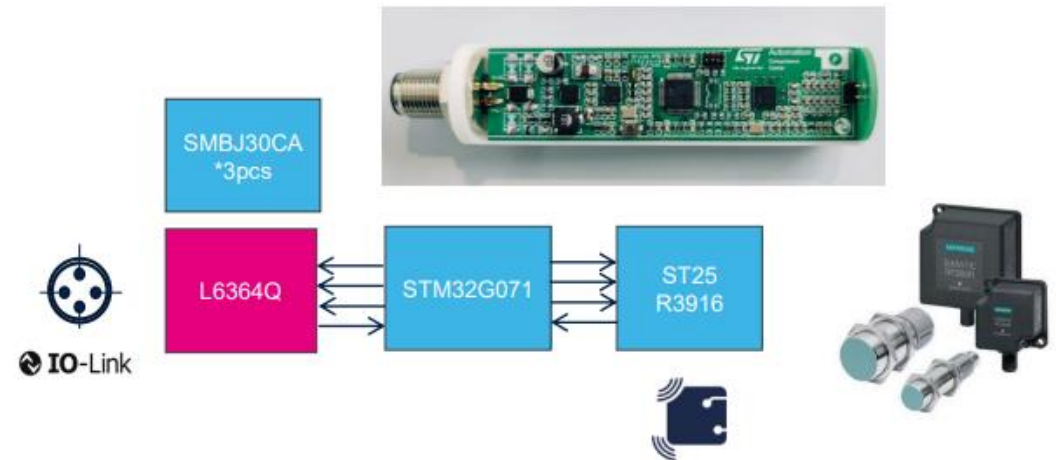


Deliverable: Schematic, PCB layout, User Guide, GUI, Software Code, GUI, Demo Video

STSYS-ACCFA006:

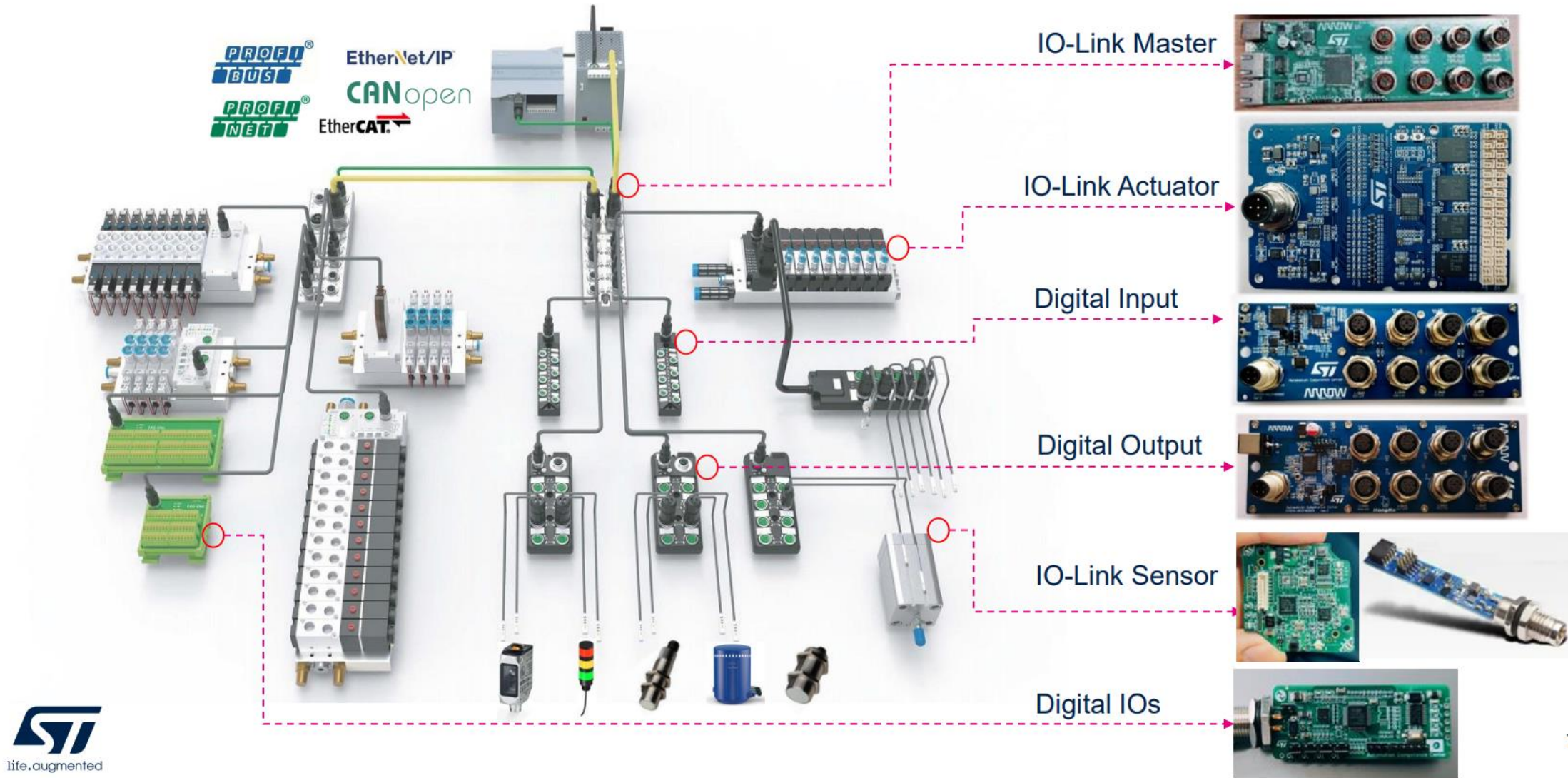
IO-Link RFID Reader

13.56MHz Frequency, no need additional power source.



Deliverable: Schematic, PCB layout, User Guide, GUI, Software Code, GUI, Demo Video

IO-Link ecosystem

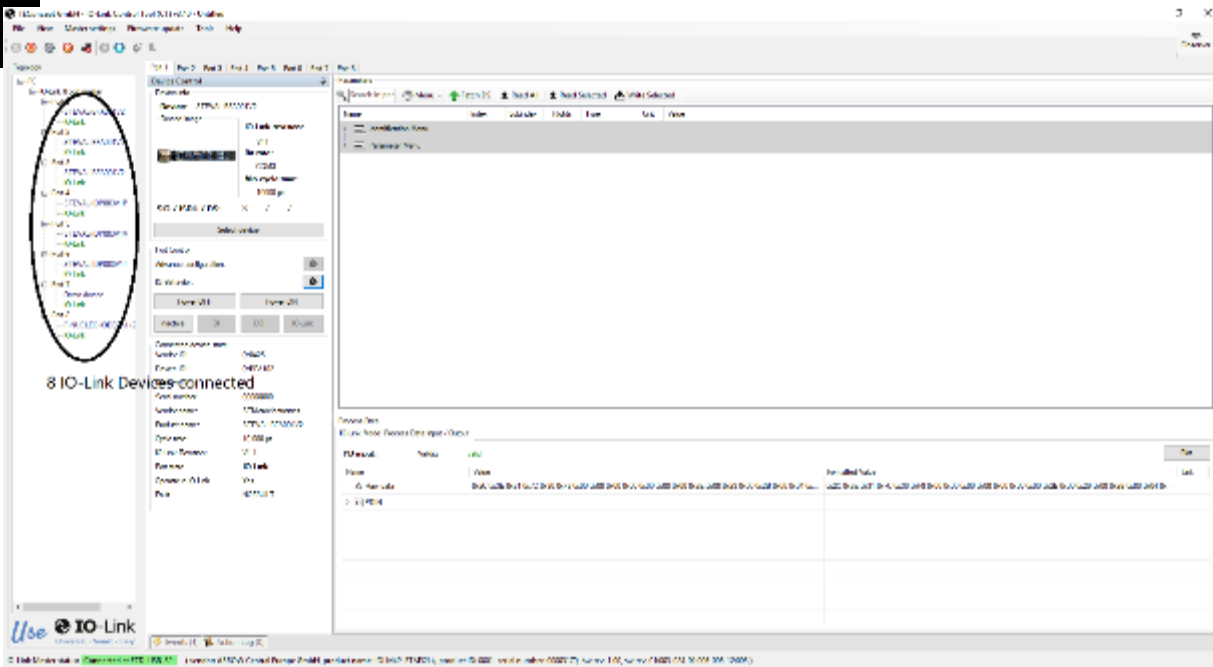




IO-link Compliance Testing

ST helps you to do IO-link Pre-test

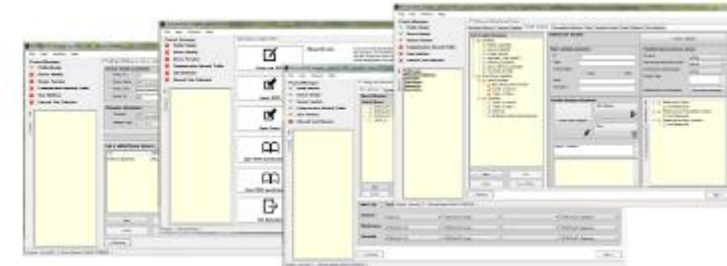
TE-Concept Control Tool



IO-Link Master Tester



IODD Designer



IO-link Diagnosis Tool



EMC-Test-Master for IO-Link



EMC-Test-Device for IO-Link



IO-Link Device Tester



IO-link Product Certification by IO-link.org

Only **THREE** Certified Test Centers globally

Comtrol
100 Fifth Avenue NW
New Brighton, MN 55112
USA
Phone: +1.800.926.6876
Email: Brad.Beale@comtrol.com
Web: www.comtrol.com

TECHNOLOGIE MANAGEMENT GRUPPE
Technologie und Engineering GmbH
Zur Gießerei 10
76227 Karlsruhe
Germany
Phone: +49721828060
Email: willems@tmgte.de
Web: www.tmgte.com

TEConcept GmbH
Wentzingerstraße 21
79106 Freiburg
Germany
Phone: +49 761 214436 40
Email: otto.witte@teconcept.de
Web: www.teconcept.de



Using Arrow IO-link MCU :
(IO-Link V1.1.3 compliant 4-port master controller stack included)

SAVE you Euro 1500 for Protocol Test Fee

TE-concept Test Fee (Arrow Franchise)

IO-link Master Test Fee		Qty	TE-Concept
TE-Concept Part #	Item/ Unit Ref. Price 2022		Euro
ISE-ESG-CONFMTM	Protocol Test w. IO-link Master Tester	1	1500
LAB-FEE-MTTM	Fee for provision of IO-link Master Tester	1	4000
ISE-ESG-PLTM	Physical Layer Test w. IO-link Master	1	3200
ISE-ESG-SEMCTM	EMC test with IO-link Master	1	5960
LAB-FEE-EMCTDR	Fee for provision of IO-link EMC Test Device	1	1600
	Note *Tax & shipment fee NOT included		
Sub-total			16260

IO-link Device Test Fee		Qty	TE-Concept
TE-Concept Part #	Item/ Unit Price		Euro
ISE-ESG-CONFDT	Protocol Test w. IO-link Device Tester	1	1000
LAB-FEE-DTTD	Fee for provision of IO-link Master Tester	1	1400
ISE-ESG-PLTD	Physical Layer Test w. IO-link device	1	800
LAB-FEE-PLTDR	Fee for provision of IO-link Physical Layer Tester for Devices	1	2690
ISE-ESG-SEMCTD	EMC Test with IO-link Device	1	3960
LAB-EMC-EMCTMR	Fee for provision of IO-link EMC Test Master	1	2400
	Note *Tax & shipment fee NOT included		
Sub-total			12250

Key take-aways



- Arrow offers IO-Link Master MCU [ARW-IOLM4P-STM32L4](#) with IO-link license, resulting in shorter development cycle and lower cost.
Evaluation boards -[ARW-IOLM4P-EVAL01/02](#) are available

Demo In YouTube

<https://youtu.be/E0QZa4UehdY>

In Youku

https://v.youku.com/v_show/id_XNDU5NTYyNjlxMg==.html



- Arrow, ST and TE-concept support IO-link Master/ Slave software and Compliance Testing
- Arrow carries multiple suppliers to support you:
 - ❑ [ST](#) for all your electronic component you need
 - ❑ [Amphenol](#) to support your connector/ cable/ modules



ESC Asia

ARROW IOLM4P Development Guide

A. Introduction

The development tools used in this guide are the STM32WB55 development board and the IOLM4P evaluation board. The SPI interface introduced includes connections for 3.3V, GND, MISO, MOSI, CLK, and CSS, which need to be connected to the corresponding development ports. The IOLM4P is powered directly from the development board, and a 12V power supply should be connected to ensure smooth operation of the L6360 architecture.

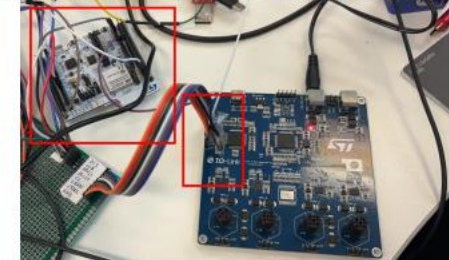


Figure 1. IOLM4P Wire Connection

Arrow IO-link Technical Support Contacts

Region	Contact Person	Mobile	Email
ASEAN	Danny Wong	+65 8126 0150	danny.wong@arrow.com
China (North)	Wayne Y Wang (Beijing/ Tianjin)	+86 159 0149 7507	Wayne.Wang1@arrow.com
China (Central)	Nancy He (Shanghai) Kevin Liu (Suzhou) Tim Lai (Hangzhou) Xuehua Wang (Nanjing)	+86 185 1676 7107 +86 136 2527 4833 +86 137 7749 4049 +86 150 6224 1550	Nancy.He1@arrow.com KevinCF.Liu@arrow.com tim.lai1@arrow.com xuehua.wang@arrow.com
China (South)	Zoril Zhou (Shenzhen) Tom Liu (AE, Shenzhen) Ren Liang (AE, Shenzhen)	+86 186 8899 1046 +86 158 1871 3466 +86 185 6678 0440	Zoril.Zhou@arrow.com TOMJR.LIU@arrow.com liang.ren@arrow.com
Hong Kong	Thomas Lai (AE, Hong Kong)	+852 2484 2477	hokming.lai@arrow.com
Taiwan	Alex Tsai	+886 955 562 737	alex.tsai@arrow.com



Thank You

References

- <https://www.arrow.com/en/campaigns/arrow-iolinkchips>
- <https://www.st.com/en/power-management/io-link-transceivers.html#tools-software>
- https://www.molex.com/molex/products/family/brad_harshio_ip67_modules
- <https://io-link.com/en/index.php?thisID=51>
- <http://sickusablog.com/wp-content/uploads/2017/09/IOLink-basics-technology-7001.jpg>
- <https://www.ifm.com/us/en/shared/technologies/io-link/technology/technology>
- https://io-link.com/en/WirUeberUns/Test_Labs.php?thisID=139