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*Ingenuity for Life*

# IO-Link Solutions

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# DF CP Application Resource Center Applications, Digitalization, and Design



➤ **Provides field application support for technology products**

Focus on Simocode, safety, Sirius networks, Softstarters standards (Synergy / ICP), and FastBus



➤ **Leads CP social media Ambassador Program**

Online awareness and promotion of CP through SN, in collaboration with other DF businesses

➤ **Application and solution approach to customer needs**

Develops repeatable solution based upon applications and value fit. Develops configurators, how-to tools



➤ **Drives Controls Technical community knowledge swaps**

Manages team of 25 channel, and xBU technical community which support CP in the market

**Approved Synergy Builder Partner**

➤ **Increase revenue and community within Synergy program**

Own the control panel Shift from Synergy signage to revenue growth



➤ **Territory aligned to pursue high value conversions**

Regionally aligned to support field and pursue high value conversion accounts



# IO-Link Introduction

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Both are "OPEN" communications



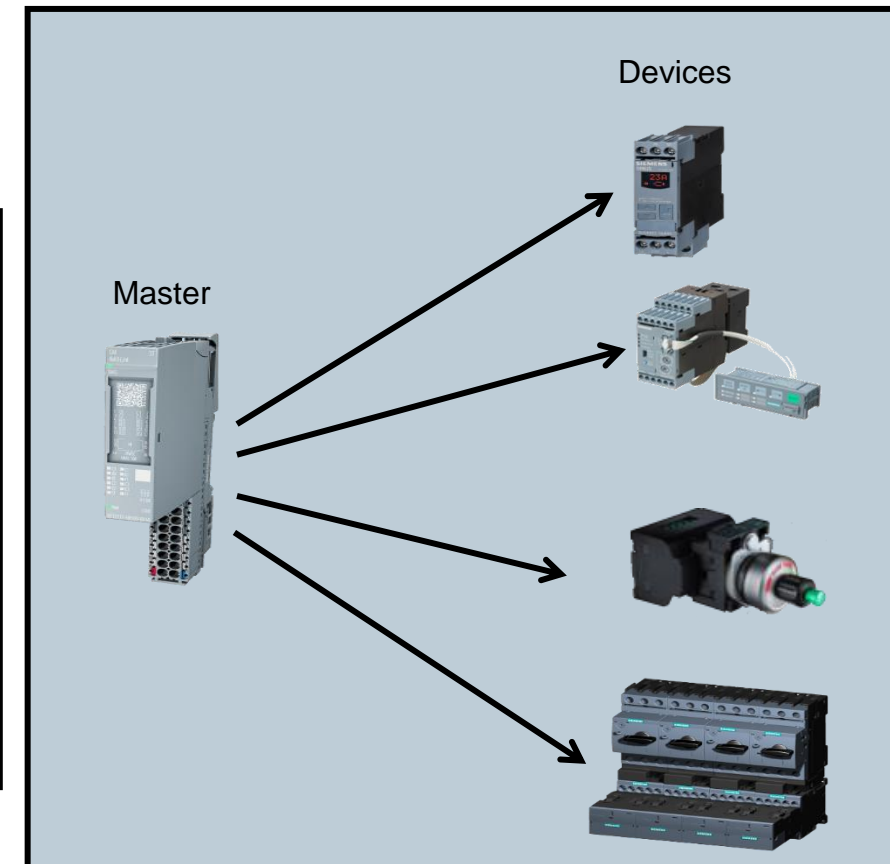
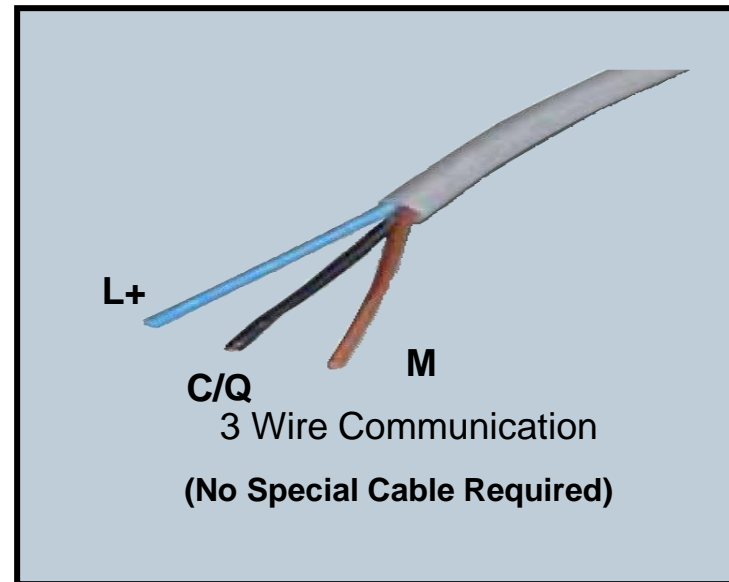



**MASTER TO DEVICE**

# IO-Link Introduction

## **IO-Link**

- 1) Typ. 4 devices (ports) per master
- 2) 60ft. Max. Distance
- 3) No device addressing
- 4) 24VDC Power Supply
- 5) Inside the main cabinet



# IO-Link Key Benefits

Reduce Costs



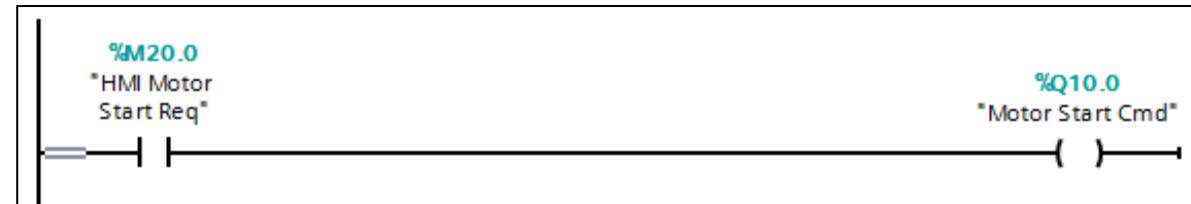
Increase Availability



**CURRENT**



Not a Network  
Direct I/O Addressing



# IO-Link Master Product Portfolio

## IO-Link Master Systems – Connection to PROFIBUS and PROFINET

### S7-1200

### ET 200SP

### ET 200AL

### ET 200pro

### ET 200eco PN

### ET 200eco PN



- 4 IO-Link Ports
- Supports IO-Link specification V1.1 and V1.0
- IP20 enclosure for use in control cabinets

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**PROFIBUS**

**PROFINET**

# K20 Input Modules

Inputs can be parameterized as NC or NO contacts



## K20 Input Modules

### Functions:

- Connect multiple binary sensors to one IO-Link master port
- IP67 enclosure for tough environmental conditions
- IO-Link 3-wire connection
- Available variants:
  - K20 4DI with M12 connector and
  - K20 8DI with M8 connector

### Benefits:

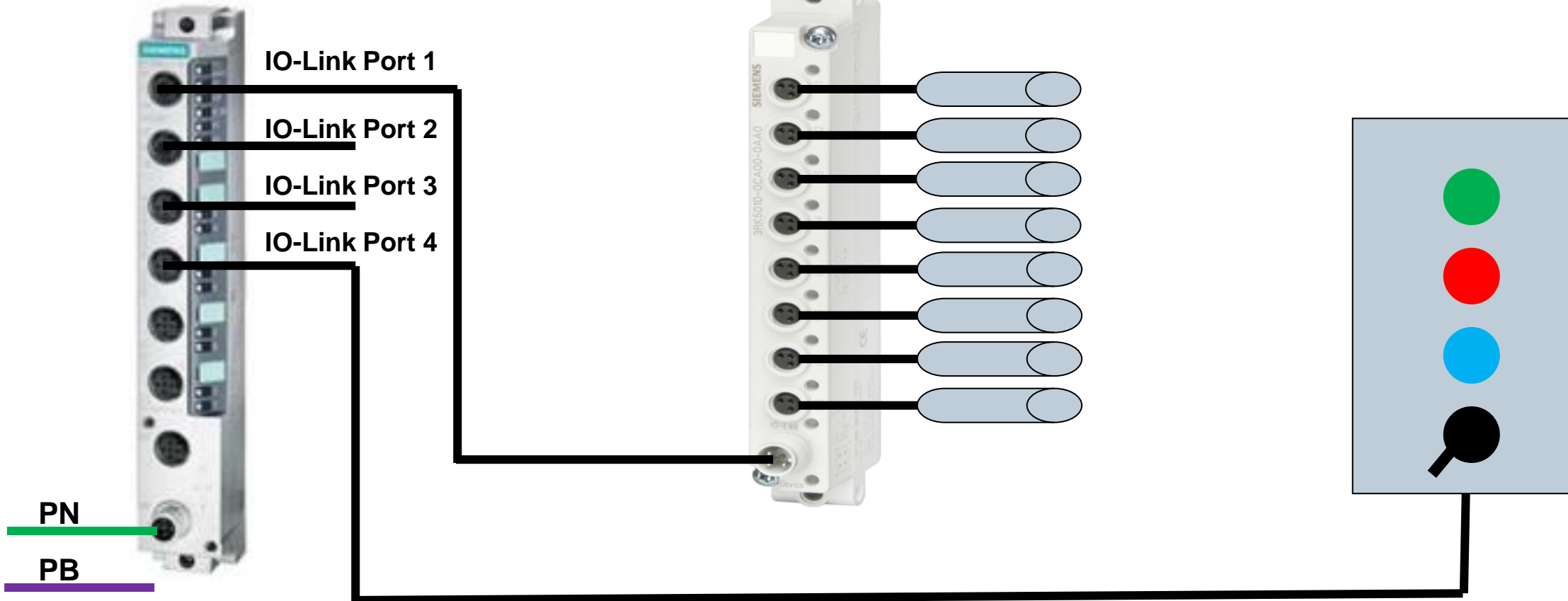
- Economical use of innovative IO-Link technology for binary sensors too
- Reduces digital input modules in the I/O station
- Input modules are used in particular where sensor boxes are currently used to connect binary sensors.

# IP67 IO-Link Sensor Application



ET200eco PN

K20



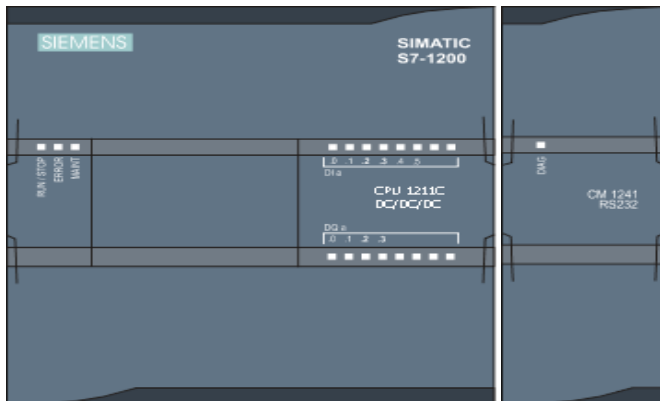


# IO-Link Masters

Solution for less complex applications



## S7-1200 PLC w/ IO-Link Master



## IO-Link Starters



IO-Link

# IO-Link Masters

ET200SP w/ IO-Link Master



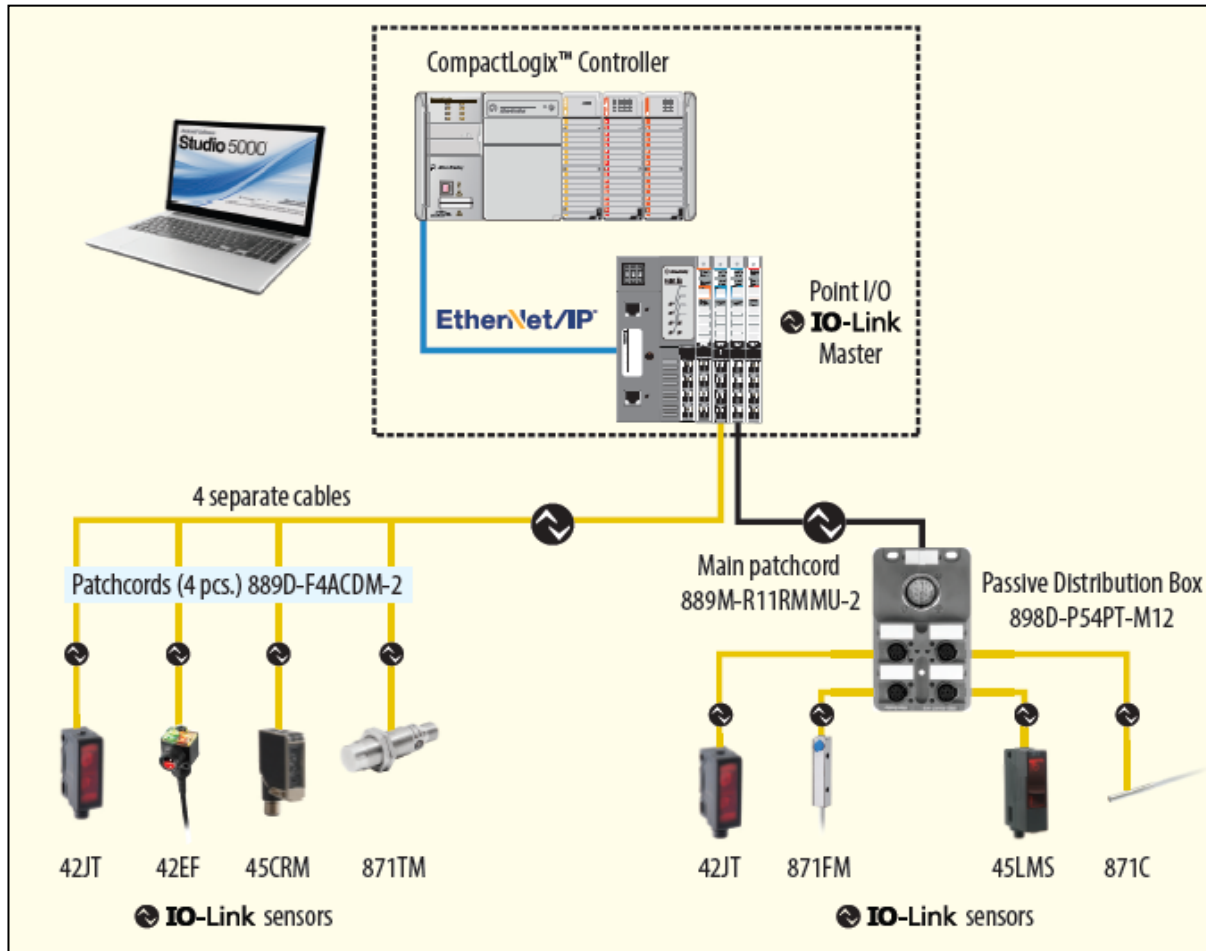

IO-Link Starters



Solution for more complex applications +

IO-Link

# AB Now Supports IO-Link

**1734-4IOL IO-Link Master for Point I/O**

- Enables connection of up to four devices (IO-Link enabled or standard I/O)
- Wired the same way as standard I/O
- Supported exclusively by 1734-AENTR series B Ethernet adapter

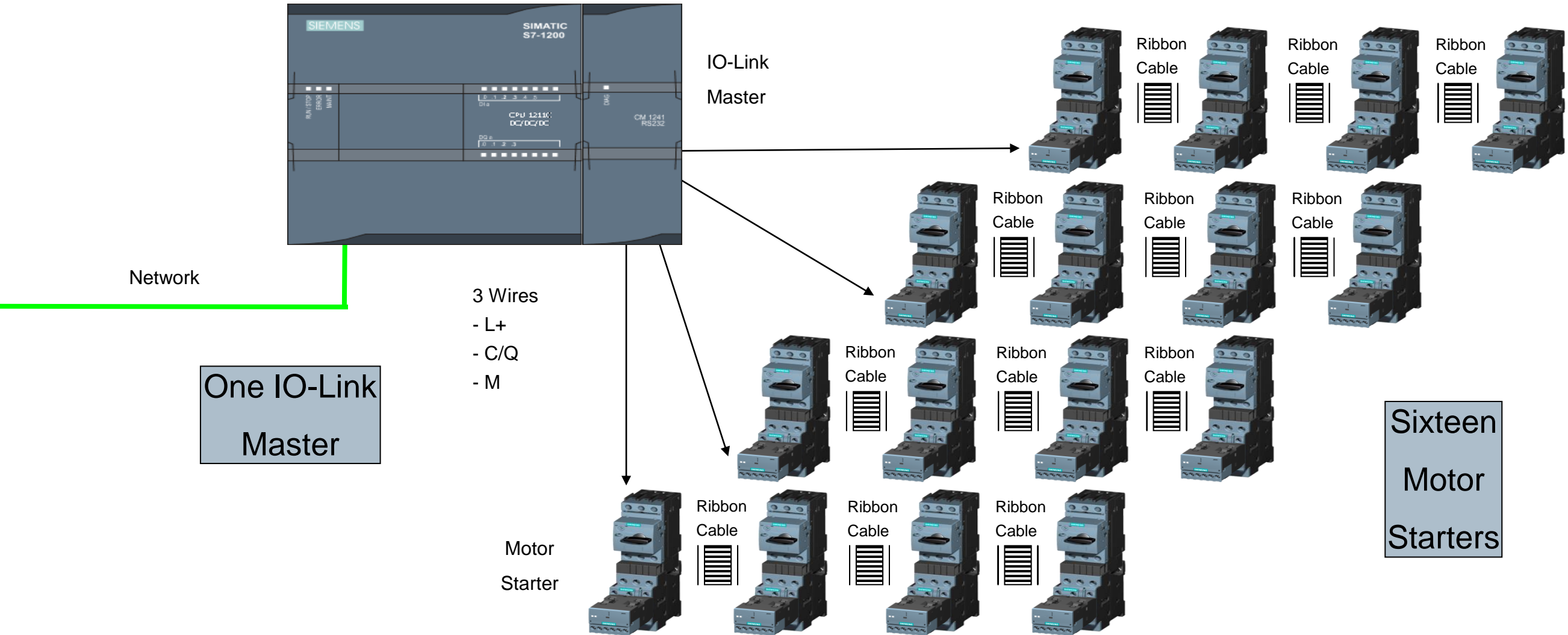
1734 POINT I/O™ I/O-Link Master





# IO-Link Starter Wiring

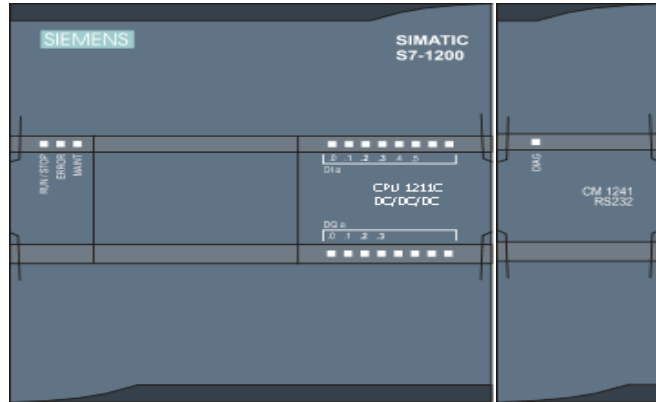
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# PLC Addressing



Master



IO-Link



Device



16 input bits



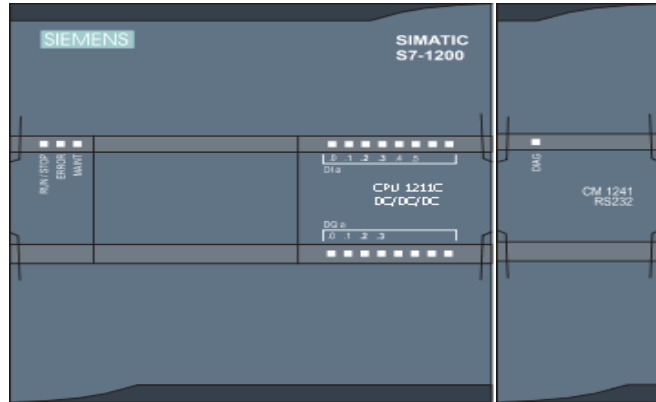
16 output bits



# PLC Addressing



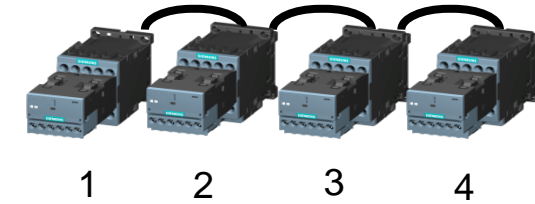
Master



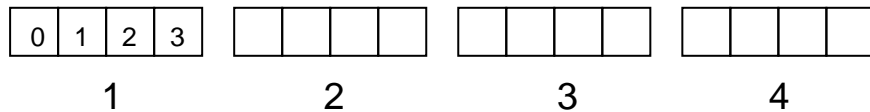
IO-Link



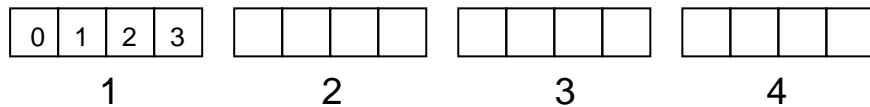
Device



16 input bits



16 output bits



## Inputs per Starter

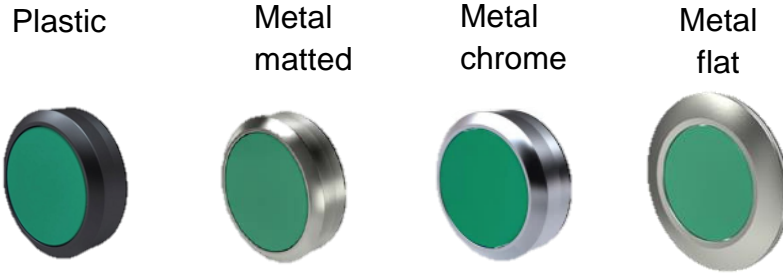
- 0 Ready
- 1 Motor On
- 2 General Warning
- 3 General Fault

## Outputs per Starter

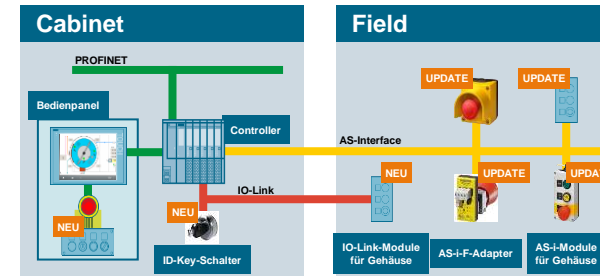
- 0 On Cmd / On Cmd CW
- 1 On Cmd CCW
- 2
- 3

# 4 Unique Value Points

## Design



**+** Scalability: Standard to High End



Easy integration into TIA-Portal **+**

## Communication



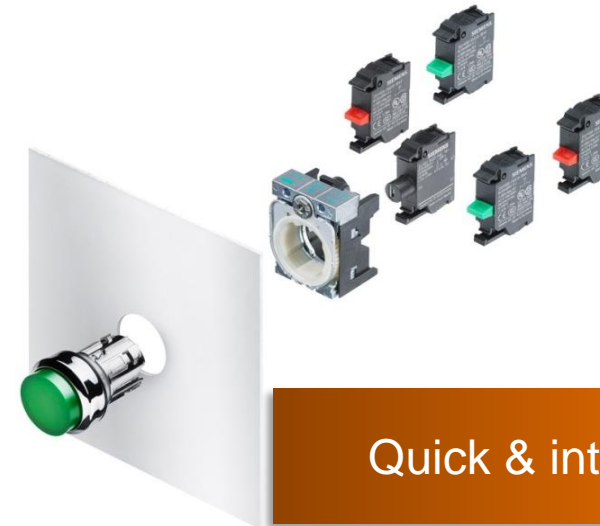
## Robustness



← IP69K as standard  
← ATEX

**+** Suitable for harsh environments

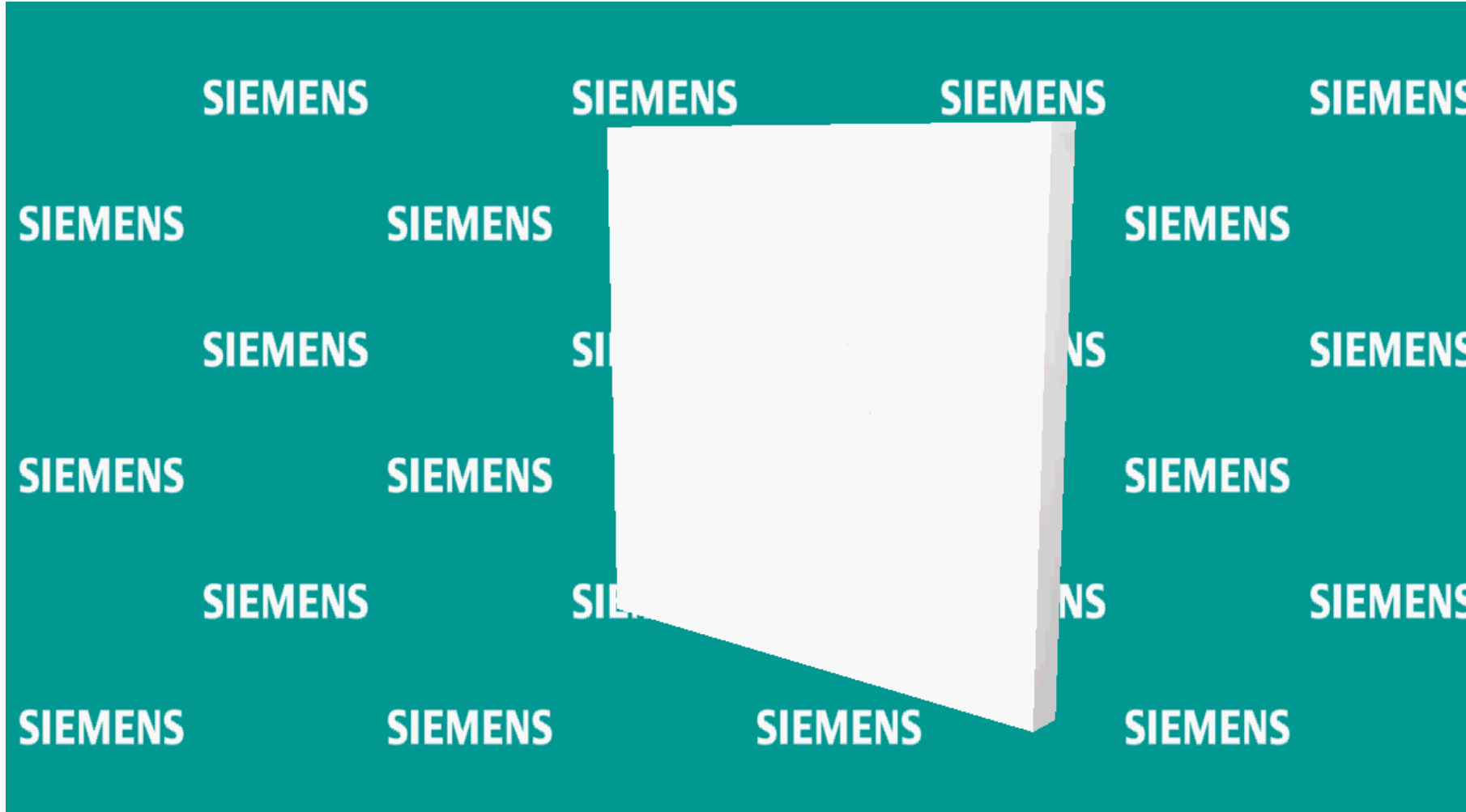
## Easy Installation



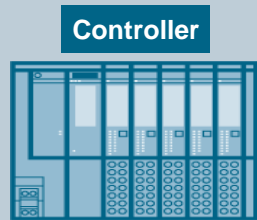
Quick & intuitive installation **+**



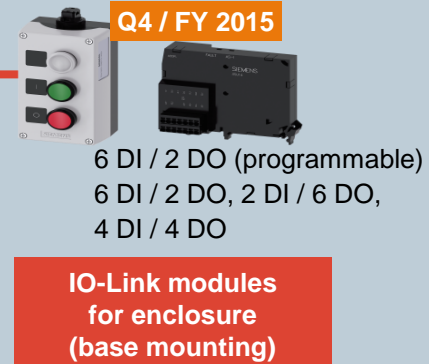
# Easy Assembly!



## IO-Link



IO-Link



### Applications:

Authentication with ID-Key, enclosures for command devices, front plate mounting

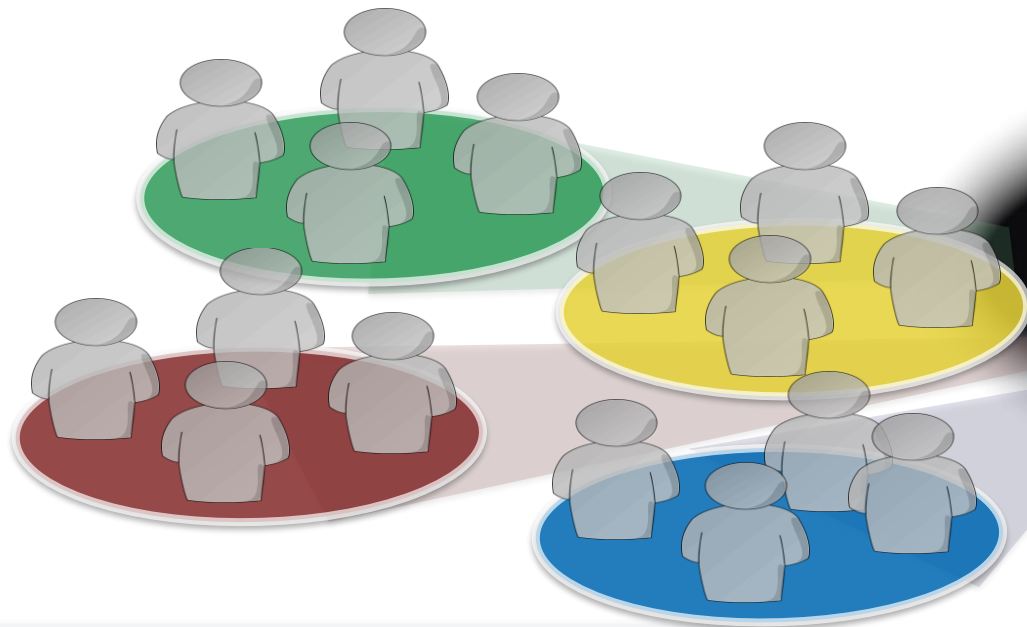
### Suites best for ...

... limited number of devices with low and medium functionality in the field and in the control cabinet.

# SIRIUS ACT ID key: Two smart functions

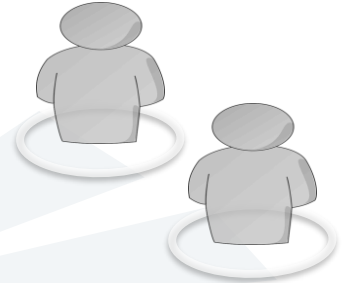
## 1. Authentication

Every user can be authenticated by an individual key



Authentication of groups

Authentication of single persons

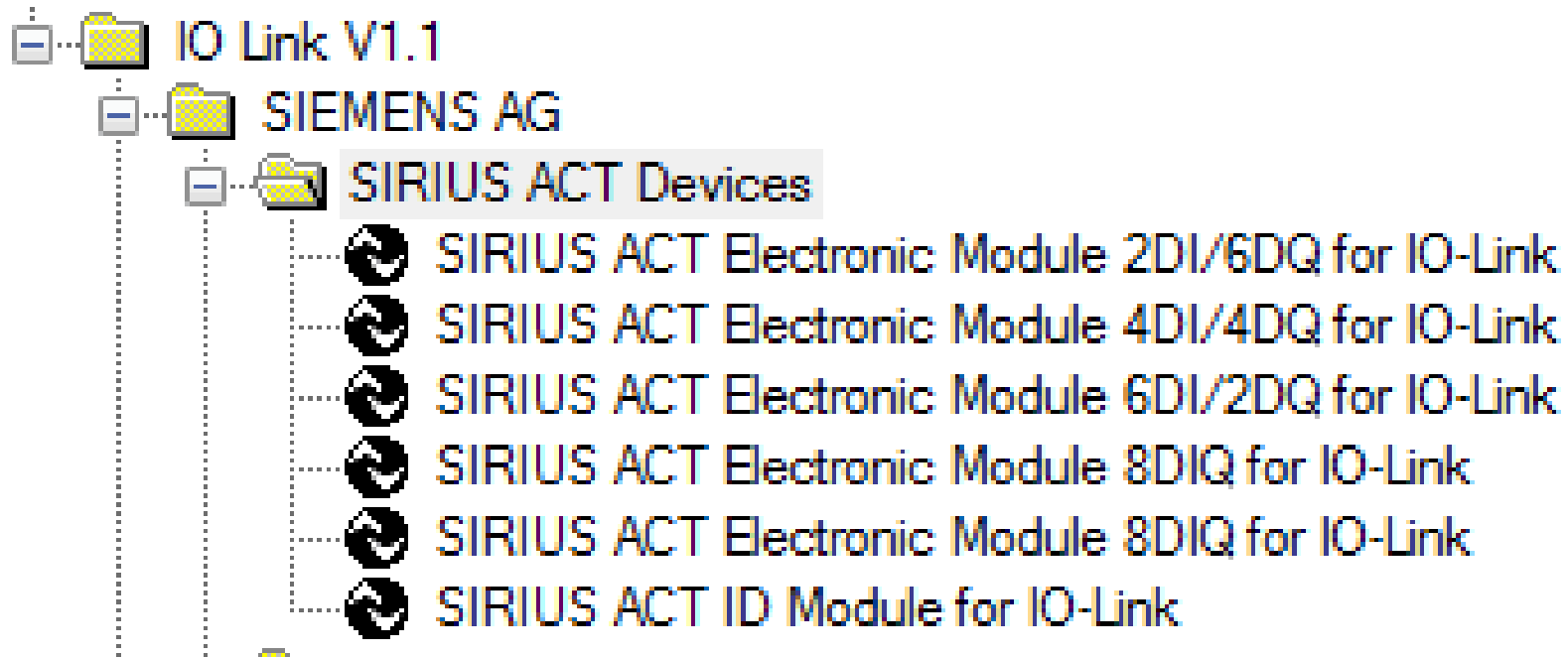


## 2. Authorization

Up to 4 different authorization levels  
can be selected of each group or person!

The SIRIUS ACT ID key - only authorized persons access your plants and machines!

# SIRIUS ACT – IO-Link



- 3SU1400-2HN10-6AA0
- 3SU1400-2HM10-6AA0
- 3SU1400-2HK10-6AA0
- 3SU1400-2HL10-6AA0
- 3SU1400-1HL10-6AA0**
- 3SU1400-1GD10-1AA0



# IO-Link for Panel Mounted SIRIUS ACT

1	Input/Output 0	
	index131 - Functional mode	Static input
	Input parameter	
	index131 - Input delay	3
2	Input/Output 1	
	index131 - Functional mode	Static input
	Input parameter	
	index131 - Input delay	3
3	Input/Output 2	
	index131 - Functional mode	Static input
	Input parameter	
	index131 - Input delay	3
4	Input/Output 3	
	index131 - Functional mode	Static input
	Input parameter	
	index131 - Input delay	3
5	Input/Output 4	
	index131 - Functional mode	Static input
	Input parameter	
	index131 - Input delay	3
6	Input/Output 5	
	index131 - Functional mode	Static input
	Input parameter	
	index131 - Input delay	3

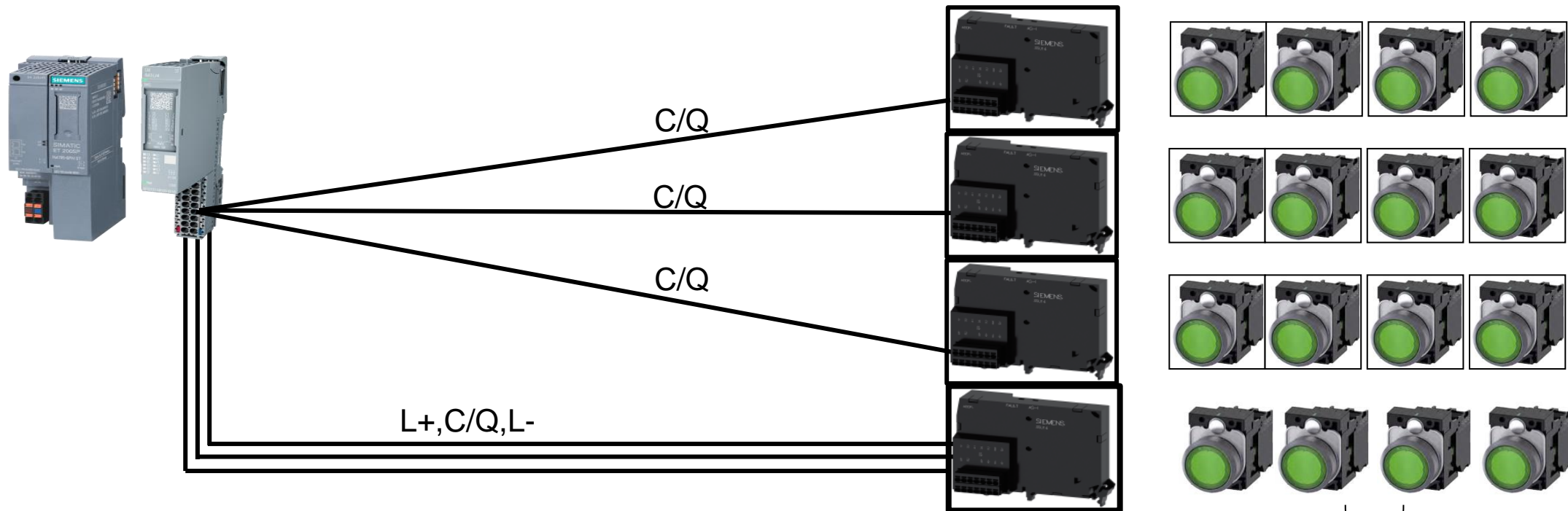
7	Input/Output 6	
	index131 - Functional mode	Static output
	Output parameter	
8	Input/Output 7	
	index131 - Functional mode	Static output
	Output parameter	



# IO-Link for Panel Mounted SIRIUS ACT



ET200SP w/ IO-Link Master



4 Inputs  
4 Outputs  
L+,L-

# Custom Configurator

### Industrial Controls


Product Information | **Configurators**

Select a Configurator: **SIRIUS ACT Pushbutton Units and Indicator Lights**

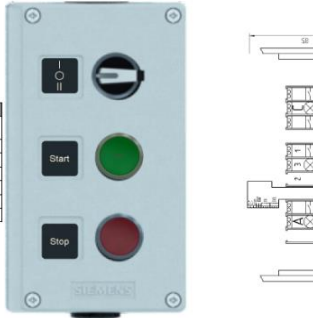
#### SIRIUS ACT Pushbutton Units and Indicator Lights

SIRIUS ACT supports online with an intuitive configurator. Create your own enclosures and inscription. Quick and easy thanks to graphical selection and preview. And with the CIN number you can reorder your product at any time without the need of a reconfiguration.

**Start**

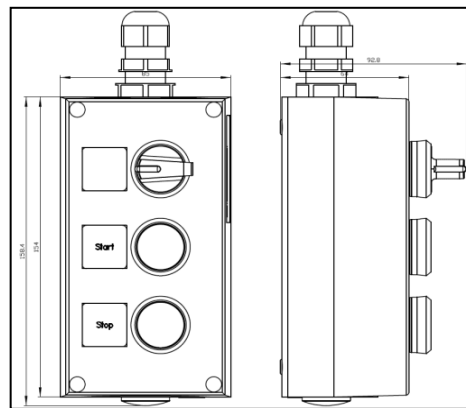
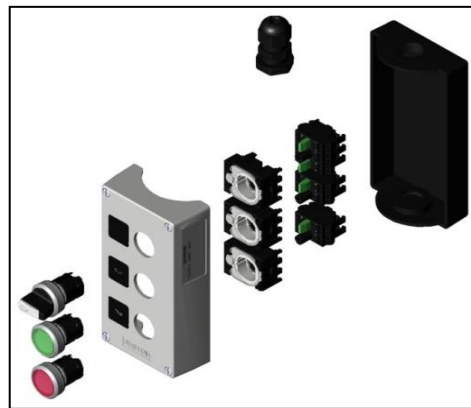
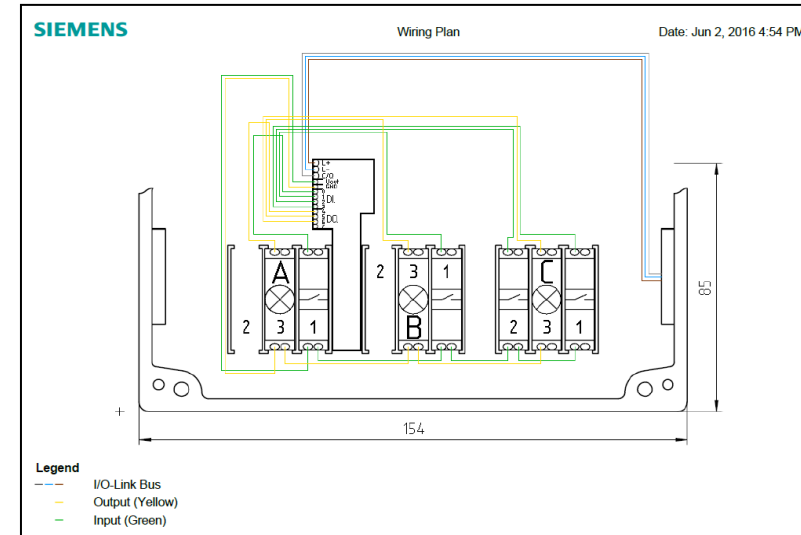


SIEMENS Enclosure design Date: Jun 2, 2016 4:52 PM



Components	
Cable gland round cable:	3SU19000HG100AA0
C Actuator:	3SU10322B6-600AA0
Labeling plate:	3SU19000AF160AZ0
B Actuator:	3SU10310AB400AA0
Labeling plate:	3SU19000AF160DT0
A Actuator:	3SU10310AB200AA0
Labeling plate:	3SU19000AF160DS0

Modules and holders	
Holder:	3SU15000AA100AA0
Position 1:	3SU14002AA103BA0
Position 3:	3SU14012B6603AA0
Position 2:	3SU14002AA103BA0
Holder:	3SU15000AA100AA0
Position 1:	3SU14002AA103BA0
Position 3:	3SU14012B6603AA0
Position 2:	3SU14002AA103BA0
Holder:	3SU15000AA100AA0
Position 1:	3SU14002AA103BA0
Position 3:	3SU14012B6603AA0
Position 2:	3SU14002AA103BA0



# Monitoring Relay

## Process Outputs

DO (2 bytes)	PIQ
DO0.0	1: Start ON-delay time
DO0.1	---
DO0.2	---
DO0.3	1: Reset
DO0.4	---
DO0.5	---
DO0.6	---
DO0.7	---
DO1.0 - DO1.7	---

## Process Inputs

DI (4 bytes)	PII
DI0.0	Ready
DI0.1	---
DI0.2	1: Group error
DI0.3	1: General warning
DI0.4	Status output relay K1 <sup>1)</sup>
DI0.5	---
DI0.6	---
DI0.7	---
DI1.0	Analog value coding bit 0
DI1.1	Analog value coding bit 1
DI1.2	Analog value coding bit 2
DI1.3	Analog value coding bit 3
DI1.4	Analog value coding bit 4

Siemens  
Monitoring Relay



DI (4 bytes)	PII
DI1.5	Analog value coding bit 5
DI1.6	---
DI1.7	---
DI2.0 - DI3.7	Analog value <sup>2)</sup>



# Monitoring Relay

## Diagnostics

<input type="checkbox"/> Operating system functions
index92 - Ready
index92 - Group error
index92 - Group warning
index92 - Parameter setting active
index92 - Wrong parameter
index92 - Fail on self test / Internal error
index92 - Number of wrong parameter

<input type="checkbox"/> Current monitoring
index92 - On-delay time running
index92 - Tripping delay time running (threshold for overshoot)
index92 - Tripping delay time running (threshold for undershoot)
index92 - Tripping delay time running (threshold for current asymm...)
index92 - Restart delay time running
index92 - Threshold for overshoot exceeded
index92 - Threshold for undershoot violated
index92 - Threshold for current asymmetry exceeded
index92 - Warning threshold for overshoot exceeded
index92 - Warning threshold for undershoot violated
index92 - Warning threshold for current asymmetry exceeded
index92 - Phase failure L1
index92 - Phase failure L2
index92 - Phase failure L3
index92 - Blocking current L1
index92 - Blocking Current L2
index92 - Blocking Current L3
index92 - Threshold for fault current exceeded
index92 - Phase sequence L1-L2-L3
index92 - Phase sequence L3-L2-L1
index92 - Phase sequence error

## Measured Values

<input type="checkbox"/> Measured values
index94 - Ip L1 (28)
index94 - Ip L2 (29)
index94 - Ip L3 (30)
index94 - Ip min (31)
index94 - Ip max (32)
index94 - Ip avg (33)
index94 - Is L1 (16)
index94 - Is L2 (17)
index94 - Is L3 (18)
index94 - Is min (19)
index94 - Is max (20)
index94 - Is avg (21)
index94 - U (44)
index94 - CosPhi (43)
index94 - Siemens Current Asymmetry (52)
index94 - IEC/NEMA Current Asymmetry (51)
index94 - Switching Cycle Counter
index94 - Operation Hour Meter

Siemens  
Monitoring Relay



Siemens  
RFID Key Switch



## Data set (index) 94 (ID keys)

### Note

Bits that are not described in the tables below are reserved and should be ignored.

Table A- 9 Data set (index) 94 (ID keys)

Byte.Bit	Subindex	Description
0.0 ... 15.7	1 ... 3	Reserved
16.0 ... 20.7	4	Identification number of the individually codable ID key
21.0 ... 21.2	5	Authorization level
21.3 ... 21.5	6	Key position

# RFID Key Switch

Siemens  
RFID Key Switch



**SIEMENS** SIMATIC HMI

## RFID Key Switch

Inserted Key Color

--	--	--	--

Selected Level

1	2	3	4
---	---	---	---

Inserted Key

00
00
00
00
00

TOUCH

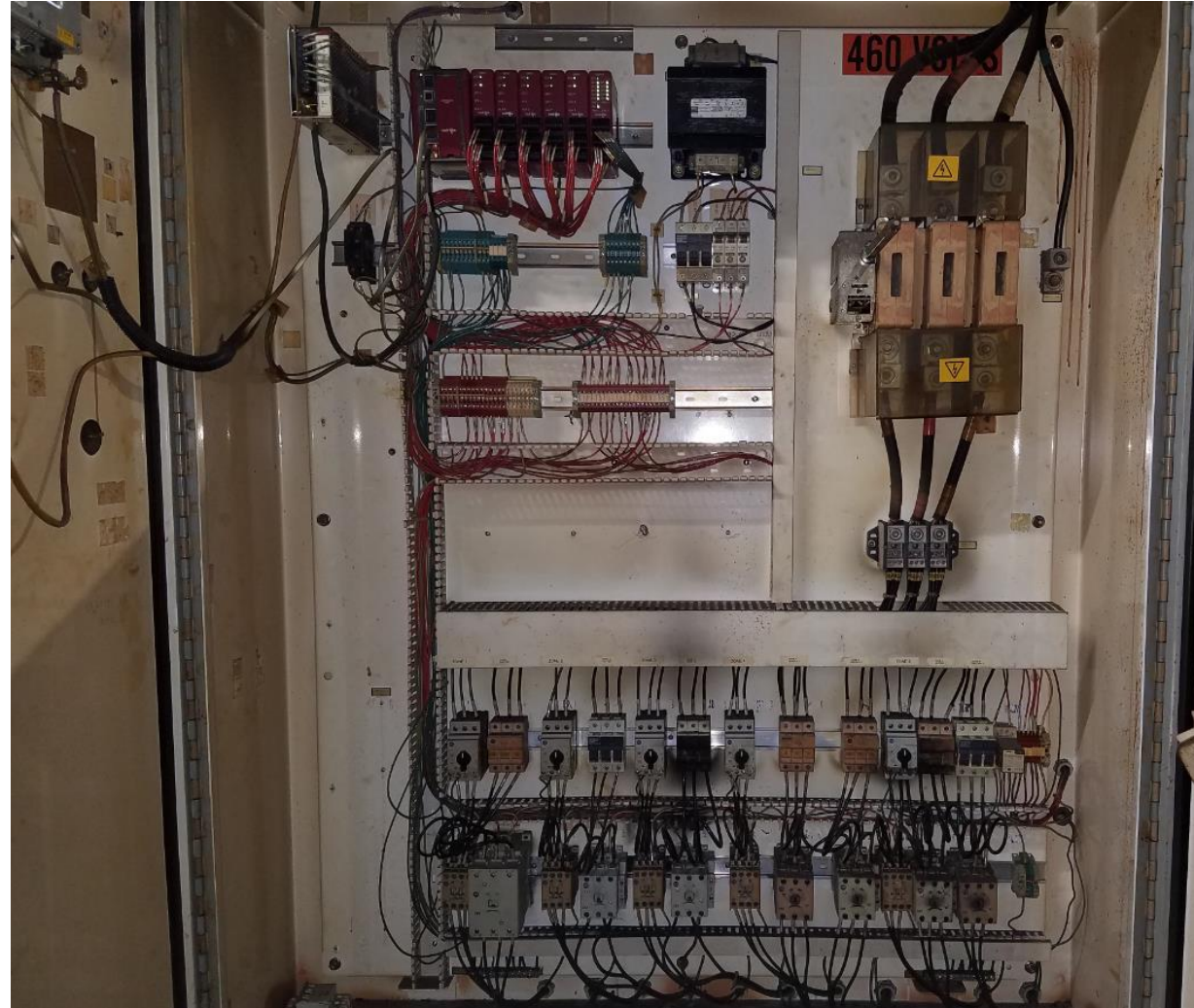
# Customer Application

## Customer Issue:

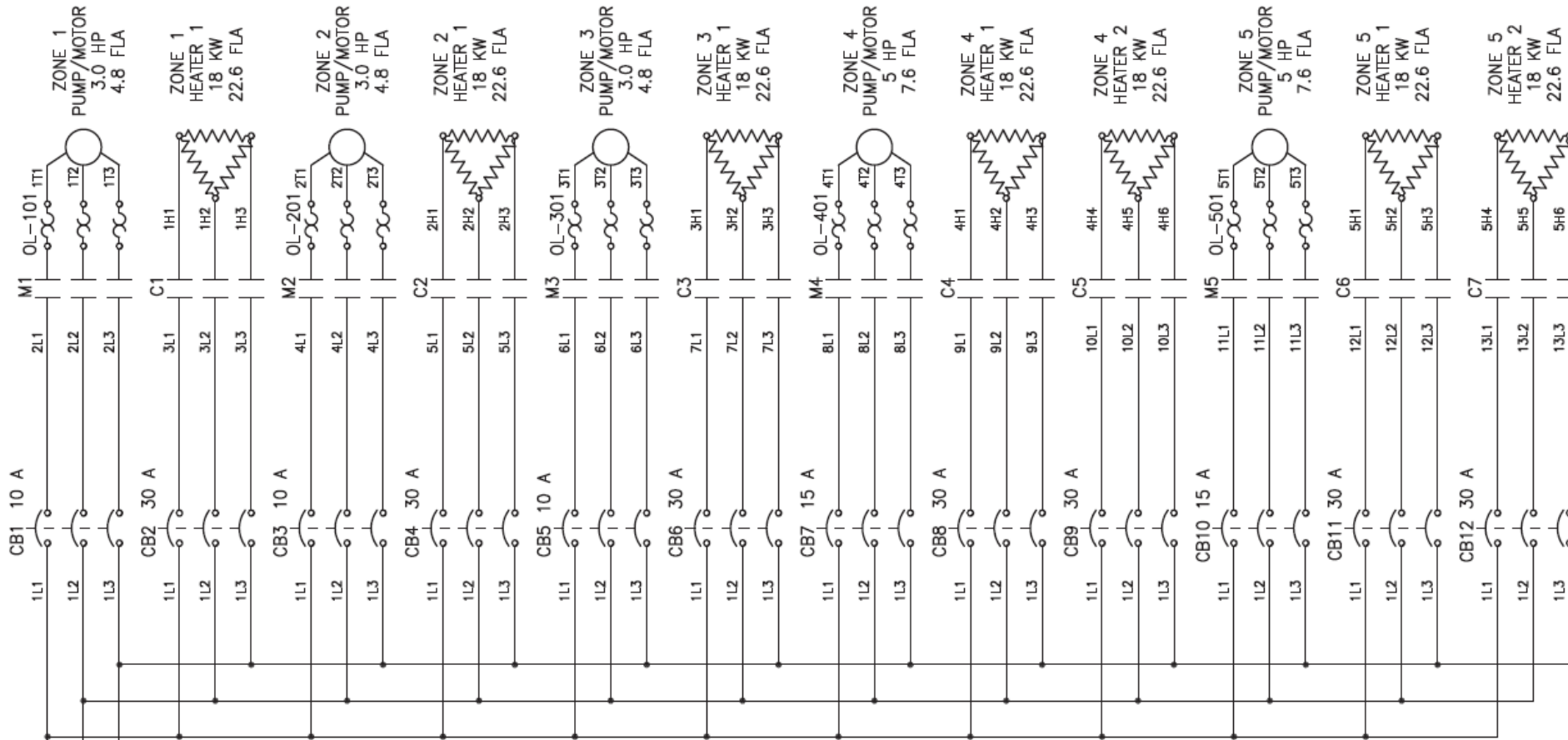
- Heaters are failing and causing a fire on the machine

## Machine Components

- 5 Pump Motors
- 7 Heaters
- 5 Temperature Zones (Type J t/c)
- Red Lion Temperature Controller
- AB CompactLogix PLC



# Customer Application





# Siemens IO-Link Solution

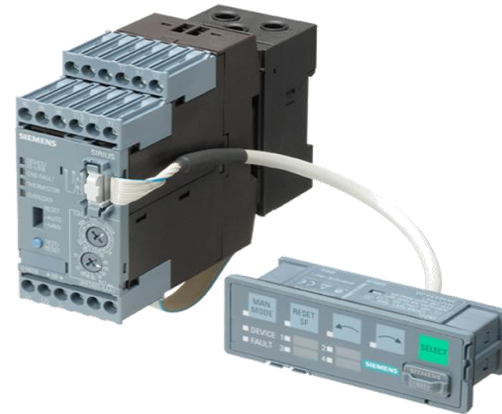
**SIEMENS**  
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**PLC**

**Pump Motors**

**Heaters**

**Temperature/Voltage**



**AB Point I/O**

**3RB24 Overload Relay**

**3RR24 Monitoring Relay**

**3UG4 Monitoring Relay**

# Additional IO-Link Customer Application

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# Questions





# IO-Link (A New Approach to Improving Control Panels)



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