

- ↘ Concept Comparisons
- ↘ Personal Consulting
- ↘ System Solutions

INSTALLATION CONCEPTS

Smart Solutions from Murrelektronik



ESCAPE THE INSTALLATION MAZE



FACTS ABOUT MURRELEKTRONIK

- Represented worldwide with 21 branch offices and many international distributors
- 1,900 employees
- \$260 mil in sales
- 2 million products in stock so you don't have to wait
- 65,000 different products

MURRELEKTRONIK PROVIDES

- Solutions for all standard fieldbus systems
- System solutions for all different kinds of applications
- Comprehensive diagnostics
- Rugged products
- Excellent logistics for fast deliveries

THE RIGHT CHOICE

FOCUS ON COST-EFFECTIVENESS

Efficient installation concepts connect all I/O points in a system or in a machine to maximize cost-effectiveness. However, this can mean different things. The various aspects of cost-effectiveness like...

- Material costs
- Time required for the installation
- Service level: project planning, installation, setup, maintenance, etc.

...play different roles, depending on a company's philosophy.

With Murrelektronik, you can choose from a variety of installation concepts. We always offer more than one solution to a challenge.

Our customers can pick between different installation strategies. You can decide on the concept that meets your technical requirements, as well as focuses on the cost-effective aspects that are important to you.

USE OUR CONSULTING SERVICE

We offer expert consulting services. Our specialists come to your site and take a look at your machine. Together with you, they develop ideas and suggestions for your machine and plant installation. They help you find the right concept: be cost-effective, lower total costs and be more competitive.



CONCEPT COMPARISONS

There are so many different styles: ring structures, line structures, star topologies and more. Finding the right solution for a specific installation requirement is not easy. Several options can often reach the same goal. The question is: which one is the best for you?

We want to create transparency with you our customer. All concepts presented in this brochure are based on installations with 40 inputs and 24 outputs. This makes it easier to compare and focus on transparency. It helps to get an overview of how to proceed.

AT A GLANCE

64 I/Os for optimum comparability

- 40 digital inputs
- 24 digital outputs



WP → Wiring Point



Number of single wires to be connected by hand.

1 WP $\hat{=}$ 120 seconds



CP → Connection Point



Number of connections with connectors: screwed in or plugged in.

1 CP $\hat{=}$ 10 seconds

I/O	40 DI / 24 DO
Time	WP 14 / CP 114 (47 min)
Material	€ 3274
Level	★★★★

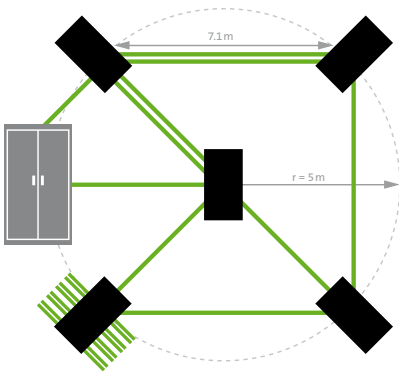
Service Level

The service level describes the level of functionality and technology of an installation concept.

High level = easier planning, quicker setup, more detailed diagnostics, easier maintenance

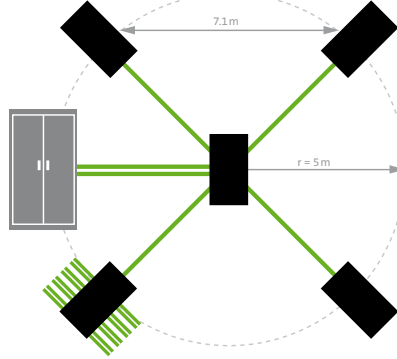
RUGGED CONCEPT

→ Page 6/7



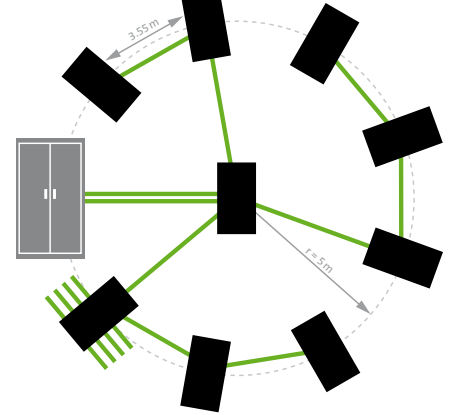
MODULAR CONCEPT

→ Page 8/9



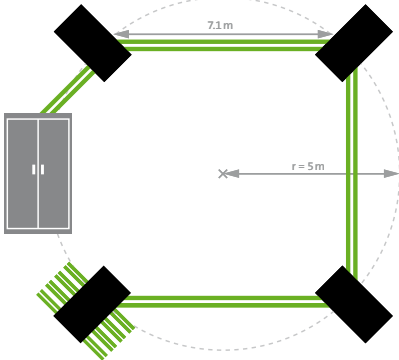
EASY CONCEPT

→ Page 10/11



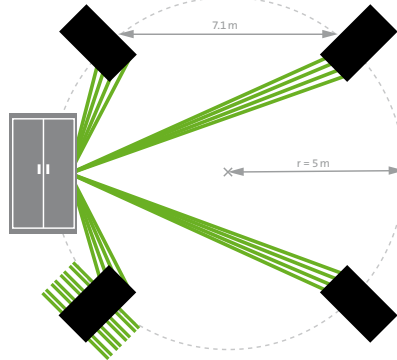
COMPACT CONCEPT

→ Page 12/13



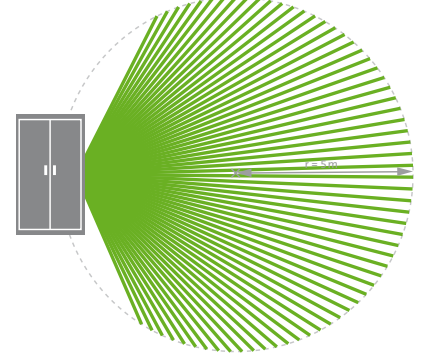
PASSIVE CONCEPT

→ Page 14/15



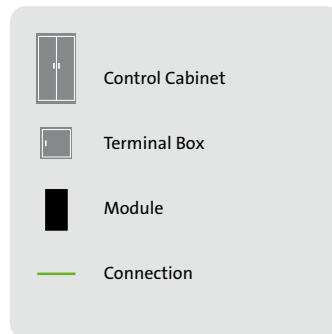
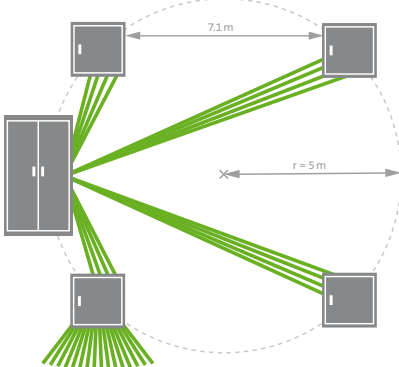
POINT-TO-POINT CONCEPT

→ Page 16/17



TERMINAL BOX CONCEPT

→ Page 18/19

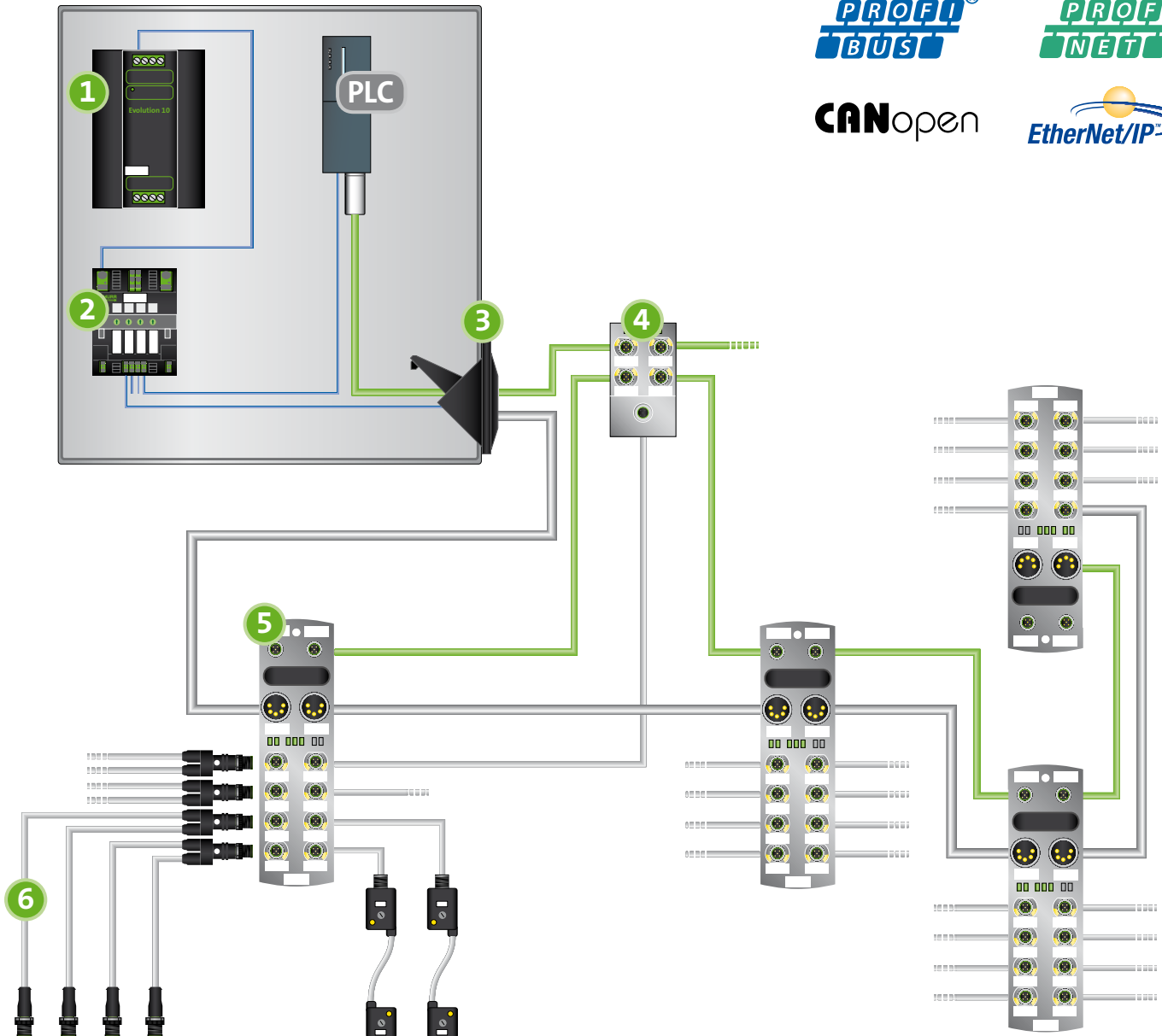


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Digital I/Os

Analog I/Os

IO link

Active safety I/Os

+ more...

SYSTEM COMPONENTS

- 1 EVOLUTION**
- 2 or 3 phase switch mode power supply units
 - Constant current output
 - High performance

- 2 MICO+**
- Electronic current monitoring
 - Indicates when approaching the maximum load
 - Adjustable current ranges

- 3 HYBRID FIELDBUS COUPLING**
- Pluggable connection
 - Allows quick installation and service
 - Very rugged

- 4 SWITCH**
- IP67 – rugged and fully potted
 - Plug and play principle
 - Redundant supply voltage

- 5 MVK METAL**
- Resistant to coolants and lubricants
 - High resistance to shock and vibration
 - Multi-function I/Os

- 6 PUR PRE-WIRED/PTFE**
- 100% quality tested
 - Wide variety
 - Weld spark resistant

RUGGED CONCEPT

The *rugged* concept is a robust and resistant installation concept especially for harsh and demanding environments. It handles high currents and is very resistant to EMC interference. The components feature multifunctional ports and the topology can be easily expanded.

PROS

- Multifunction I/Os lower inventory costs
- Ideal for harsh environments
- Star, linear, and tree topologies with switch or repeater

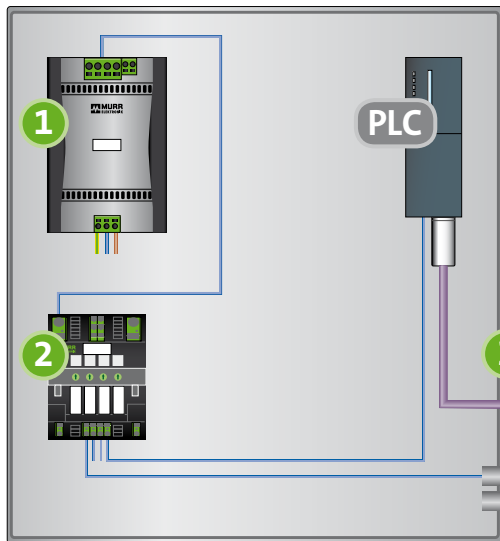
CONS

- High material costs
- Heavy weight

INDUSTRY SECTORS

- Automotive industry
- Forming
- Foundry plants
- Welding machines
- ...

I/O	40 DI / 24 DO
Time	WP 7 / CP 122 (34 min)
Material	€ 3766
Level	★★★★



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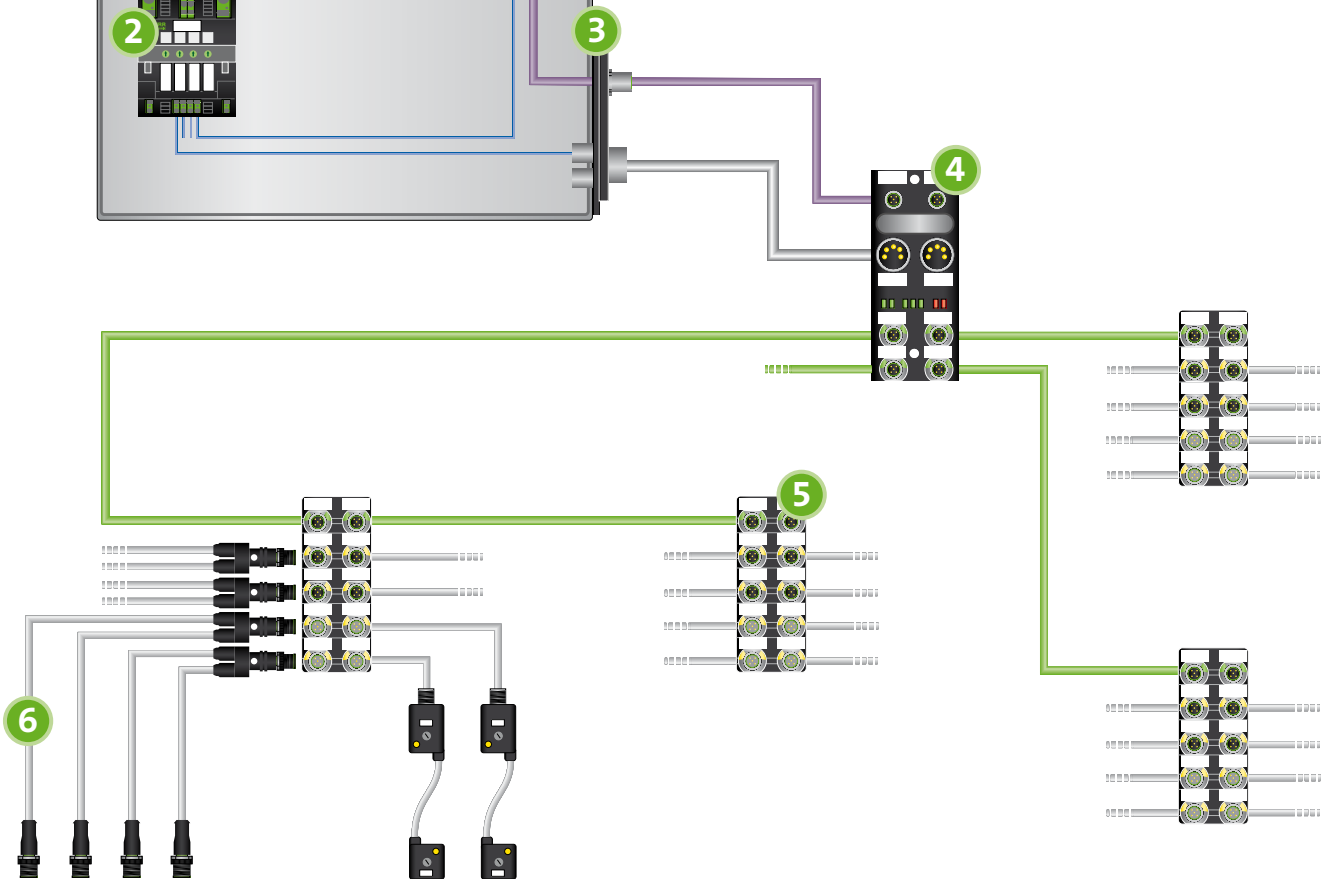
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Digital I/Os	Analog I/Os	Valve clusters	Motors
Serial interfaces	IO link	Passive safety I/Os	Function Modules

SYSTEM COMPONENTS

- 1 EMPARRO**
- Single phase switch mode power supply unit
 - Efficiency up to 95%
 - Slim design

- 2 MICO**
- Electronic current monitoring
 - Indicates when approaching the maximum load
 - Adjustable current ranges

- 3 MPV CONTROL CABINET COUPLINGS**
- Durable connections
 - Modular system
 - High degree of protection

- 4 CUBE67 BUS NODE**
- Change the bus instead of the system
 - Fully potted IP67 modules
 - System cable

- 5 CUBE67 I/O MODULES**
- Many different models
 - Digital/analog/serial/safe
 - M12/M8/valve cluster/cable

- 6 PUR PRE-WIRED**
- 100% quality tested
 - Wide variety
 - Very resistant cable jacket

MODULAR CONCEPT

The *modular* concept provides the most flexibility when planning the system and later for expansions. The systems feature consistent and extensive diagnostics. Pre-wired connectors significantly reduce installation time.

PROS

- Reduced installation costs
- Hybrid cables
- Change the bus without having to change the system
- Minimum space required in the energy chain
- Multifunction I/Os lower inventory costs

INDUSTRY SECTORS

- Handling technology
- Robotics
- Packaging Industry
- Machine tools
- ...

CONS

- High material costs for small systems

I/O	40 DI / 24 DO
Time	WP 7 / CP 110 (32 min)
Material	€ 2888
Level	★★★★

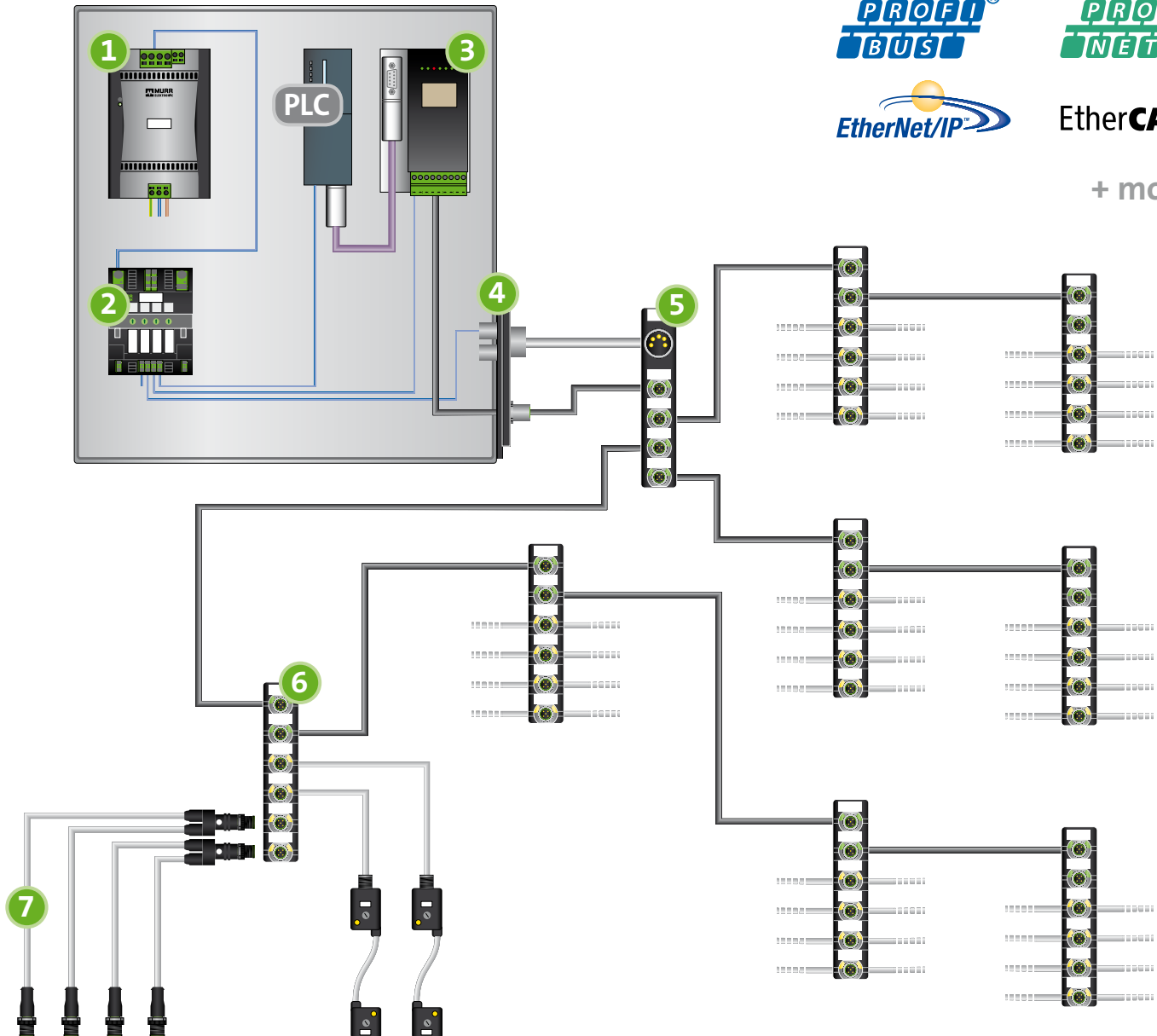
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+ more...



Digital I/Os

Analog I/Os

Passive safety I/Os

+ more...

SYSTEM COMPONENTS

- 1 EMPARRO**
- Single phase switch mode power supply unit
 - Efficiency up to 95%
 - Small width

- 2 MICO**
- Electronic current monitoring
 - Indicates when approaching the maximum load
 - Adjustable current ranges

- 3 ASI GATEWAY**
- Easy and fast set-up
 - Integrated diagnostics
 - Rugged metal housing

- 4 MPV CONTROL CABINET COUPLINGS**
- Durable connections
 - Modular system
 - High degree of protection

- 5 ASI DISTRIBUTION BOX**
- ASI round cabling
 - Star topology system cable
 - 7/8" supply

- 6 MASI68**
- ASI station
 - System connection with M12 round cable
 - Very rugged because module is fully potted

- 7 PUR PRE-WIRED**
- 100% quality tested
 - Wide variety
 - Very resistant cable jacket

EASY CONCEPT

Installations based on the *easy* concept are simple to plan, install and set up. This makes the *easy* concept a simple alternative for almost any application.

PROS

- Flexible design options
- Star, line, ring and tree topologies
- Reduced installation costs
- Hot-wiring capable
- Hybrid cables

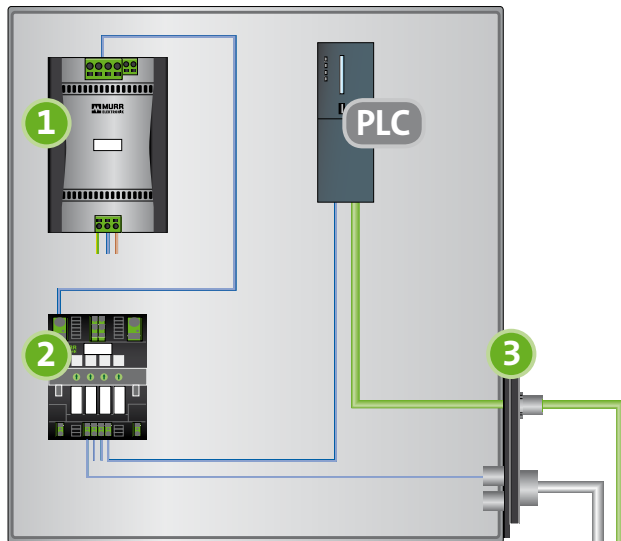
INDUSTRY SECTORS

- Machine building and plant engineering
- Assembly and handling technology
- Logistics and material handling industry
- Packaging industry
- ...

CONS

- No multifunctional I/Os
- Only module diagnostics

I/O	40 DI / 24 DO
Time	WP 12 / CP 110 (42 min)
Material	€ 2769
Level	★★★★☆



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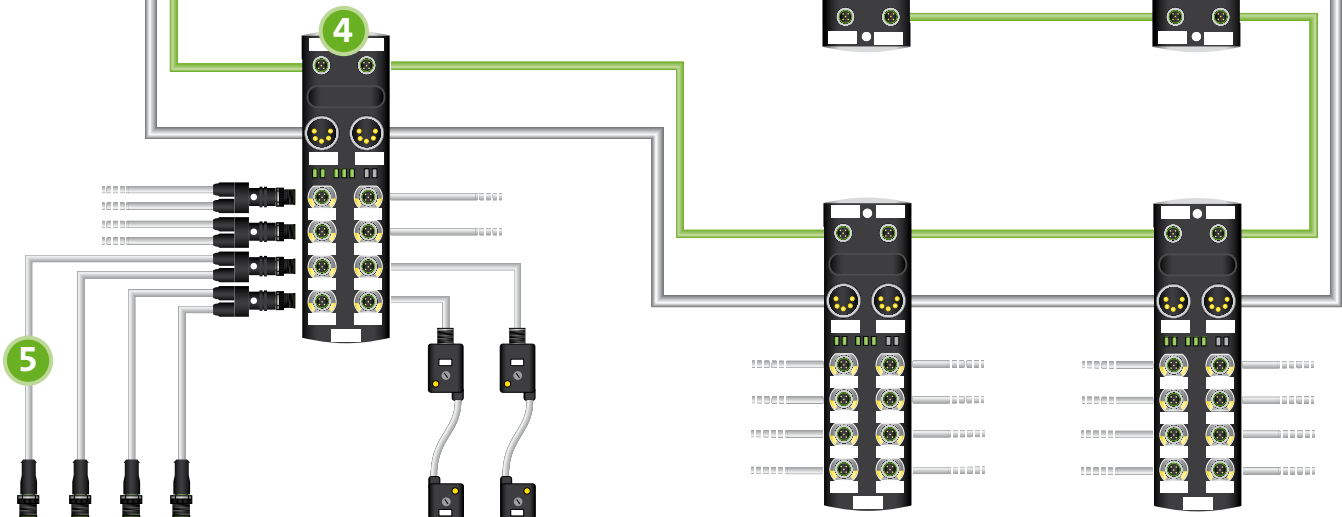
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Digital I/Os

+ more...

SYSTEM COMPONENTS

- 1 EMPARRO**
- Single phase switch mode power supply unit
 - Efficiency up to 95%
 - Small width

- 2 MICO**
- Electronic current monitoring
 - Indicates when approaching the maximum load
 - Adjustable current ranges

- 3 MPV CONTROL CABINET COUPLINGS**
- Durable connections
 - Modular system
 - High degree of protection

- 4 IMPACT67**
- Predefined I/Os
 - IP67 – rugged and fully potted
 - Single channel diagnostics

- 5 PUR PRE-WIRED**
- 100% quality tested
 - Wide variety
 - Very resistant cable jacket

COMPACT CONCEPT

The *compact* concept requires a minimum amount of wiring and does not need parameterization. Good diagnostics support setup and troubleshooting. Using connectors that are pre-wired on one end provides maximum flexibility when wiring the I/O points.

PROS

- Star, linear, and tree topologies with switch or repeater
- Good diagnostic options
- Easy to integrate into the control

CONS

- Fixed I/O structure
- Many cables for bus and power
- Requires a lot of space

INDUSTRY SECTORS

- Logistics
- Sheet metal processing
- Handling technology
- Packaging industry
- ...

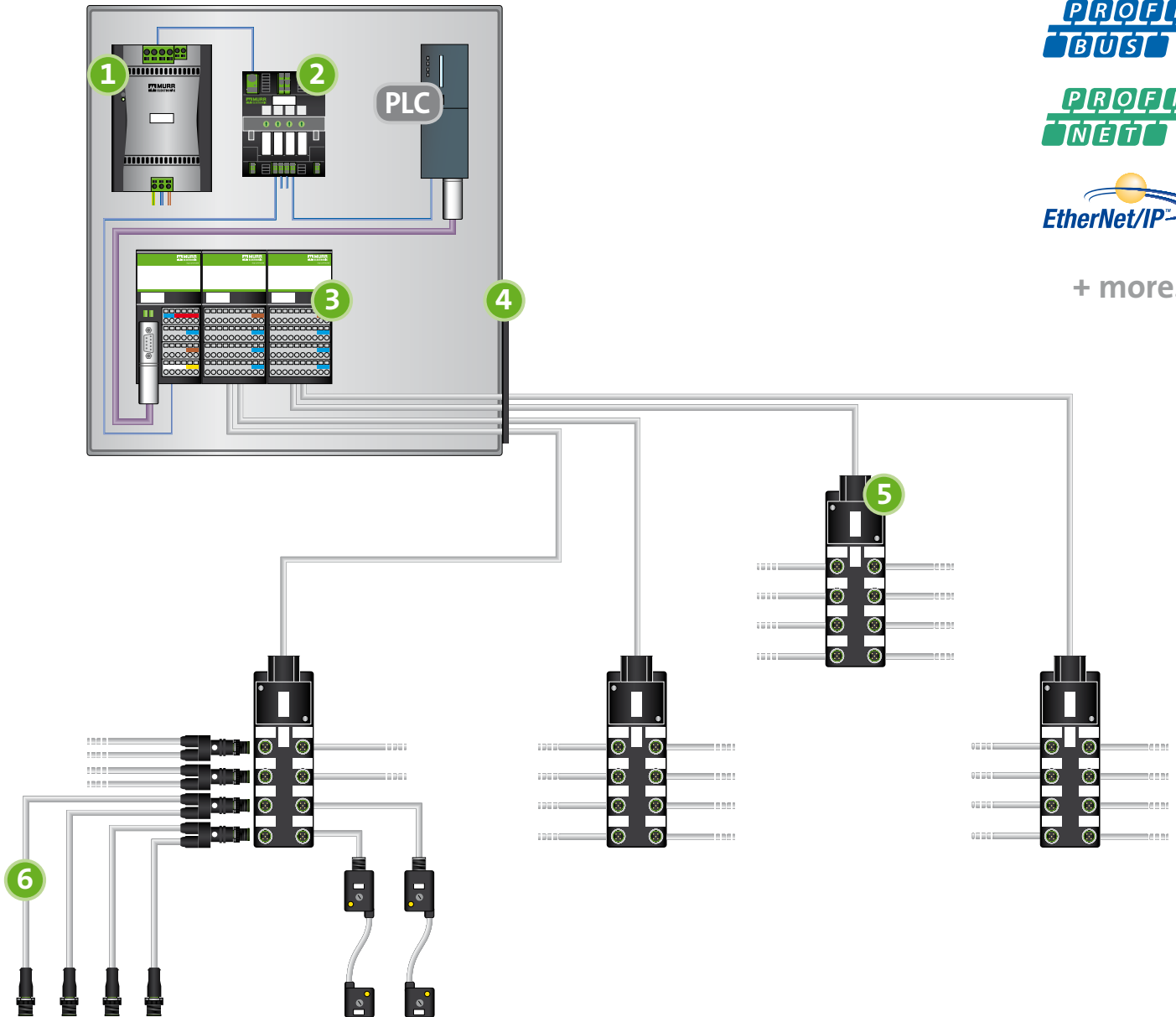
I/O	40 DI / 24 DO
Time	WP 7 / CP 128 (35 min)
Material	€ 2626
Level	★ ★ ★

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+ more...



Digital I/Os

Analog I/Os

+ more...

SYSTEM COMPONENTS

- 1 EMPARRO**
- Single phase switch mode power supply unit
 - Efficiency up to 95%
 - Small width

- 2 MICO**
- Electronic current monitoring
 - Indicates when approaching the maximum load
 - Adjustable current ranges

- 3 CUBE20**
- IP20 I/O system
 - Flat and compact design
 - Easy to operate
 - Up to 488 inputs and outputs

- 4 CABLE ENTRY PLATE**
- Easy to install
 - No separation for transport
 - Low material costs

- 5 EXACT12**
- Passive distribution box
 - Diagnostics via LED
 - Electronics completely molded

- 6 PUR/PVC PRE-WIRED**
- 100% quality tested
 - Wide variety
 - Very resistant cable jacket

PASSIVE CONCEPT

The *passive* concept optimizes I/O wiring by using pre-wired connectors and passive distribution boxes. There is a significantly smaller number of I/O points to connect. LEDs on the connection points facilitate troubleshooting. The risk of wiring errors is reduced, but not eliminated.

PROS

- Low material costs
- Using homerun cables makes laying cables easy
- Wide range of products

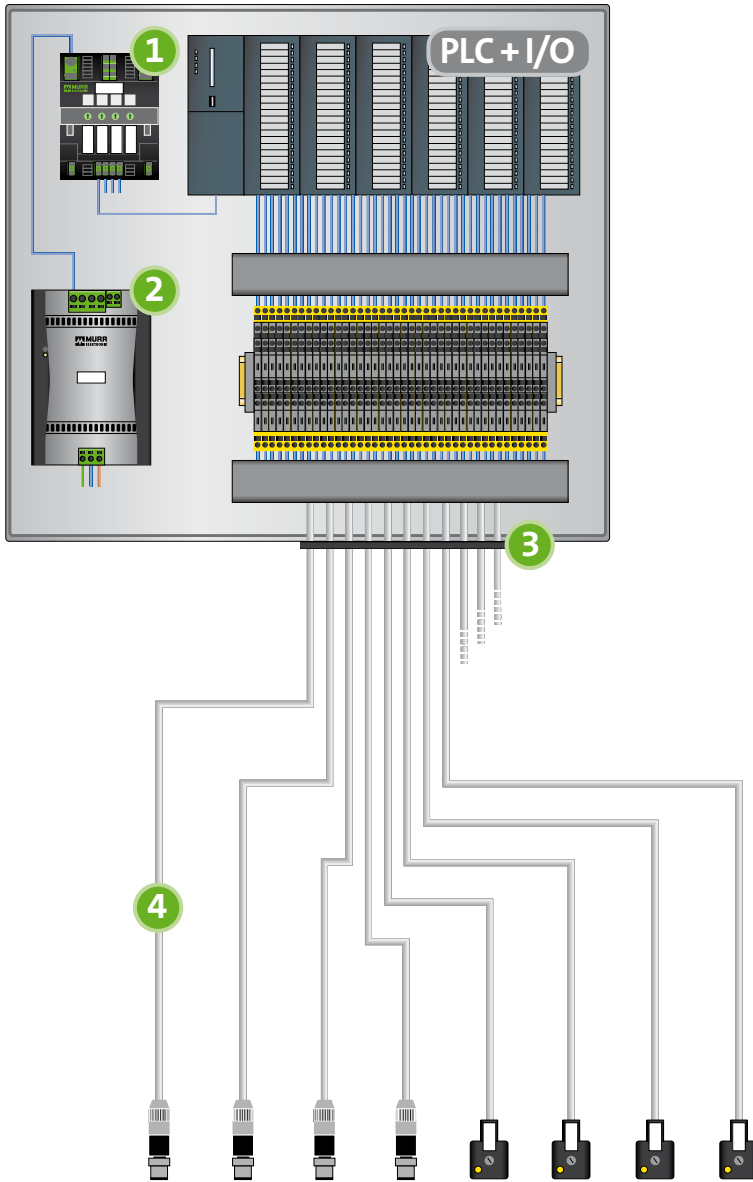
CONS

- Medium amount of wiring
- Large space required in the energy chain
- Still prone to errors
- No diagnostics in the field

INDUSTRY SECTORS

- Handling technology
- Special machines
- Packaging industry
- Machine tools
- ...

I/O		40 DI / 24 DO
Time	WP 90 / CP 112 (199 min)	
Material	€ 2031	
Level	★ ★ ★ ★	



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Digital I/Os

Analog I/Os

Serial interfaces

Passive safety I/Os

Active safety I/Os

+ more...

SYSTEM COMPONENTS

- 1 MICO**
- Electronic current monitoring
 - Indicates when approaching the maximum load
 - Adjustable current ranges

- 2 EMPARRO**
- Single phase switch mode power supply unit
 - Efficiency up to 95%
 - Small width

- 3 CABLE ENTRY PLATE**
- Easy to install
 - No separation for transport
 - Low material costs

- 4 MOSA**
- Field wireable connectors
 - Cabling flexible to install
 - Quick connection technology

POINT-TO-POINT CONCEPT

Wiring concepts with a central control cabinet provide a lot of flexibility. However, the wiring efforts are high. That makes it a system prone to errors. Accessory parts, large control cabinets and comprehensive planning efforts often mean indirect costs are high, reducing the cost-effectivity.

PROS

- Very flexible
- High added value

CONS

- High installation costs
- High risk of wiring errors
- Large space required in the energy chain
- Difficult transport separation

INDUSTRY SECTORS

- Machine building
- Special machines
- System construction
- Process industry
- ...

I/O		40 DI / 24 DO
Time	WP 518 / CP 71 (1048 min)	
Material	€ 2310	
Level	★☆☆☆☆	

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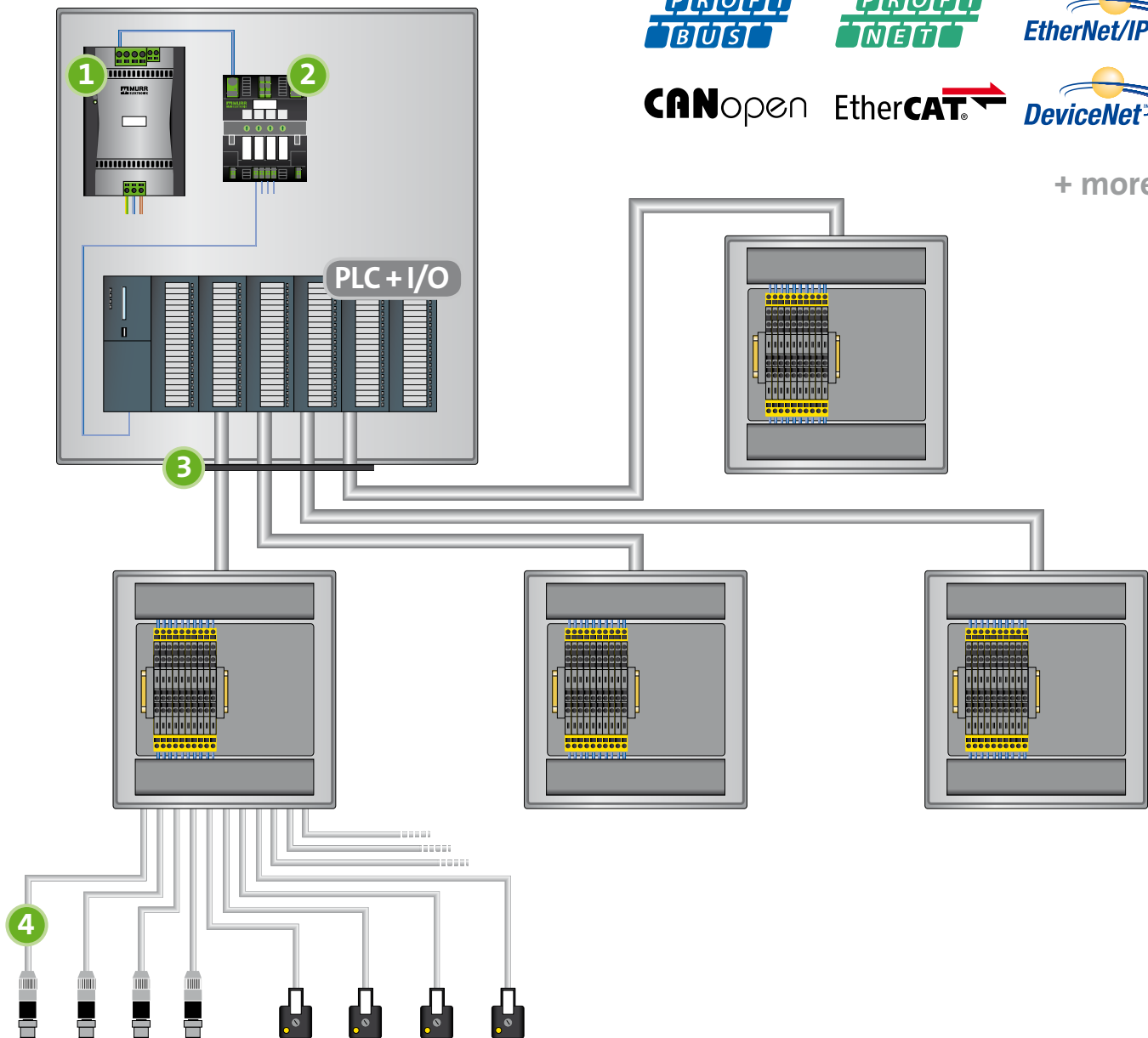
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+ more...



Digital I/Os

Analog I/Os

Serial interfaces

Passive safety I/Os

Active safety I/Os

+ more...

SYSTEM COMPONENTS

- 1 EMPARRO**
 - Single phase switch mode power supply unit
 - Efficiency up to 95%
 - Small width
- 2 MICO**
 - Electronic current monitoring
 - Indicates when approaching the maximum load
 - Adjustable current ranges
- 3 CABLE ENTRY PLATE**
 - Easy to install
 - No separation for transport
 - Low material costs
- 4 MOSA**
 - Field wireable connectors
 - Cabling flexible to install
 - Quick connection technology

TERMINAL BOX CONCEPT

The *terminal box* concept is based on a central control cabinet with passive terminal boxes for field wiring. This is the base for decentralized installation concepts. Many accessories are required and the mechanical and electronic expenses are high, which results in equally high indirect costs. The comprehensive planning efforts also reduce cost effectiveness.

PROS

- Very flexible
- High added value

CONS

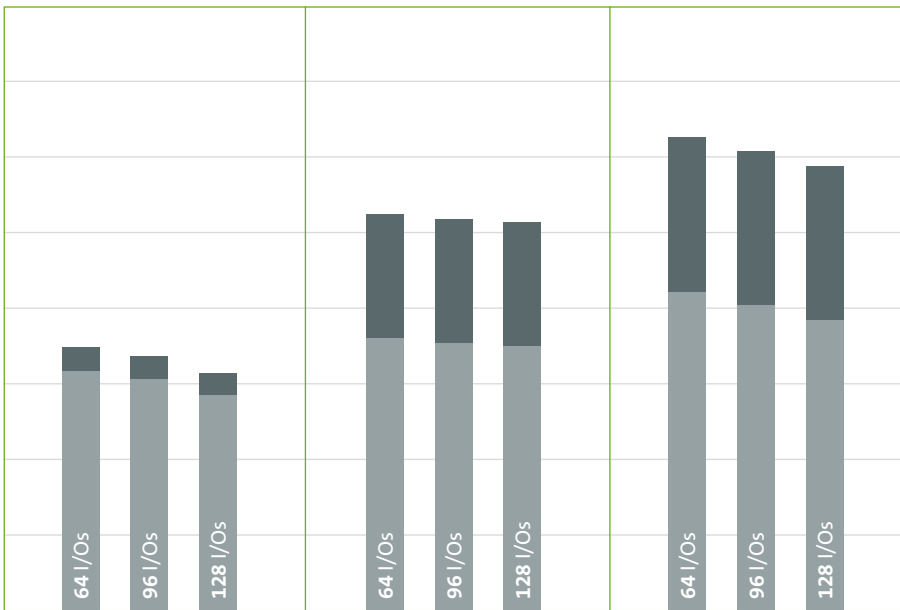
- High installation costs
- No channel diagnostics
- High risk of wiring errors
- Difficult transport separation

INDUSTRY SECTORS

- Machine building
- Special machines
- System construction
- Process industry
- ...

I/O		40 DI / 24 DO
Time	WP 646 / CP 71 (1304 min)	
Material	€ 2704	
Level	★☆☆☆☆	


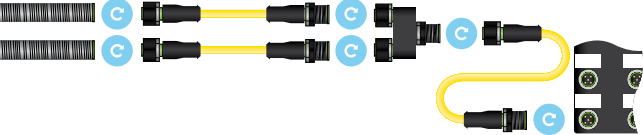


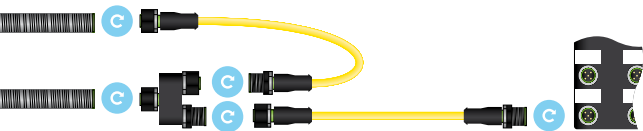


PASSIVE CONCEPT	POINT-TO-POINT CONCEPT	TERMINAL BOX CONCEPT
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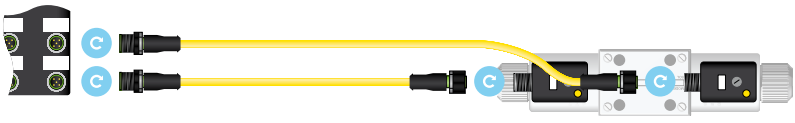




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OPTIONS OF I/O WIRING

➔ INPUTS

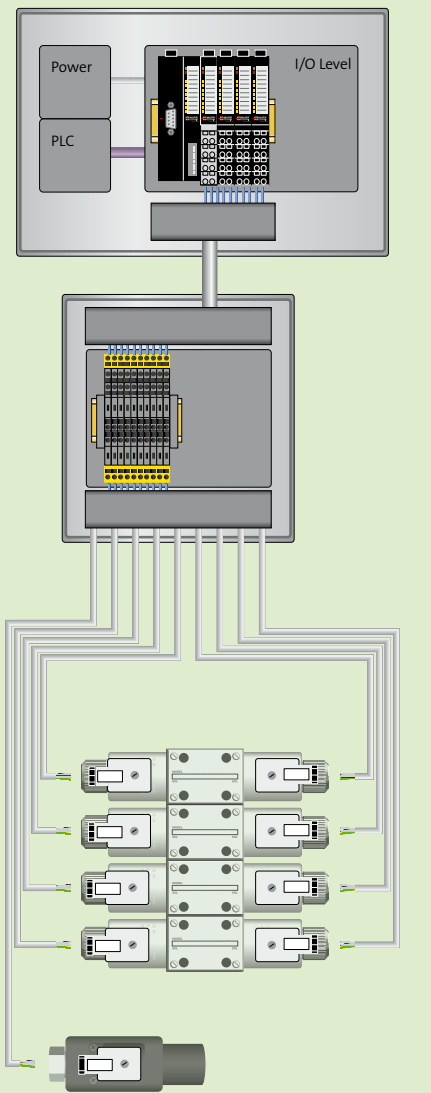
OPTION 1 E		<ul style="list-style-type: none"> • Pluggable on both sides • I/O ports using one signal
OPTION 2 E		<ul style="list-style-type: none"> • Pluggable on both sides • I/O ports using two signals • Easy cable installation
OPTION 3 E		<ul style="list-style-type: none"> • Optimum number of connection points • I/O ports using two signals
OPTION 4 E		<ul style="list-style-type: none"> • Pluggable on both sides • I/O ports using two signals
OPTION 5 E		<ul style="list-style-type: none"> • Pluggable on both sides • I/O ports using two signals • Easy cable installation
OPTION 6 E		<ul style="list-style-type: none"> • Pluggable on both sides • I/O ports using two signals • Easy cable installation • Optimum number of connection points
OPTION 7 E		<ul style="list-style-type: none"> • I/O ports using one signal • Field wireable on one side

➔ **OUTPUTS**

OPTION 1 A		<ul style="list-style-type: none"> • I/O ports using one signal
OPTION 2 A		<ul style="list-style-type: none"> • I/O ports using one signal • Field wireable on one side
OPTION 3 A		<ul style="list-style-type: none"> • Pluggable on both sides • I/O ports using one signal
OPTION 4 A		<ul style="list-style-type: none"> • Pluggable on both sides • I/O ports using two signals
OPTION 5 A		<ul style="list-style-type: none"> • I/O ports using two signals • Easy cable installation
OPTION 6 A		<ul style="list-style-type: none"> • Pluggable on both sides • I/O ports using two signals • Easy cable installation • Optimum number of connection points
OPTION 7 A		<ul style="list-style-type: none"> • I/O ports using one signal • Easy cable installation • Pluggable on both sides

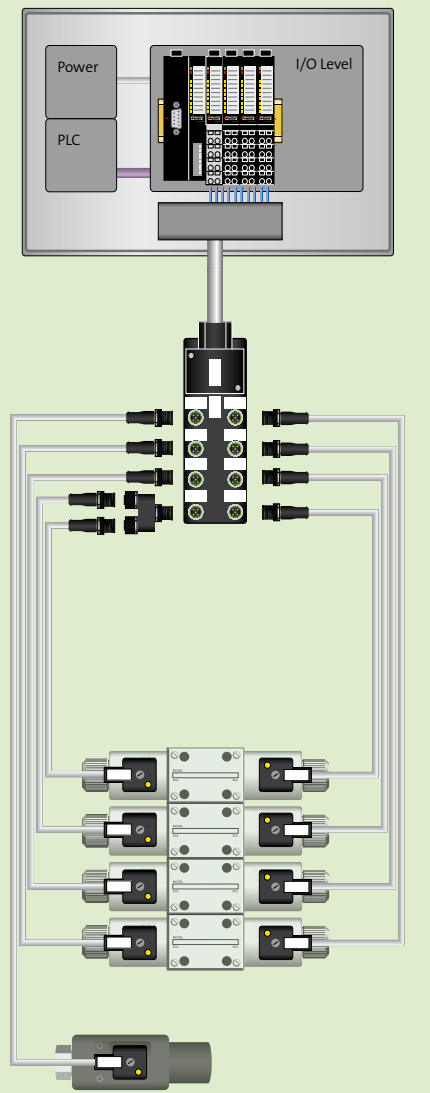
EXAMPLE: HYDRAULIC POWER UNIT

→ SINGLE WIRE CONNECTION



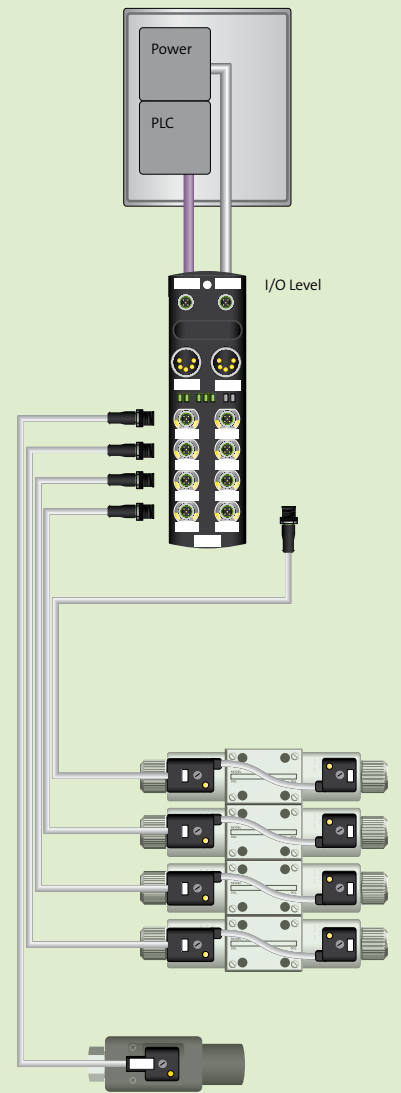
I/O	1 DI / 8 DO
Time	WP92 / CP9 (185 min)
Material	€ 796
Level	★☆☆☆☆

→ PASSIVE DISTRIBUTION BOX



I/O	1 DI / 8 DO
Time	WP24 / CP19 (51 min)
Material	€ 775
Level	★★★☆☆

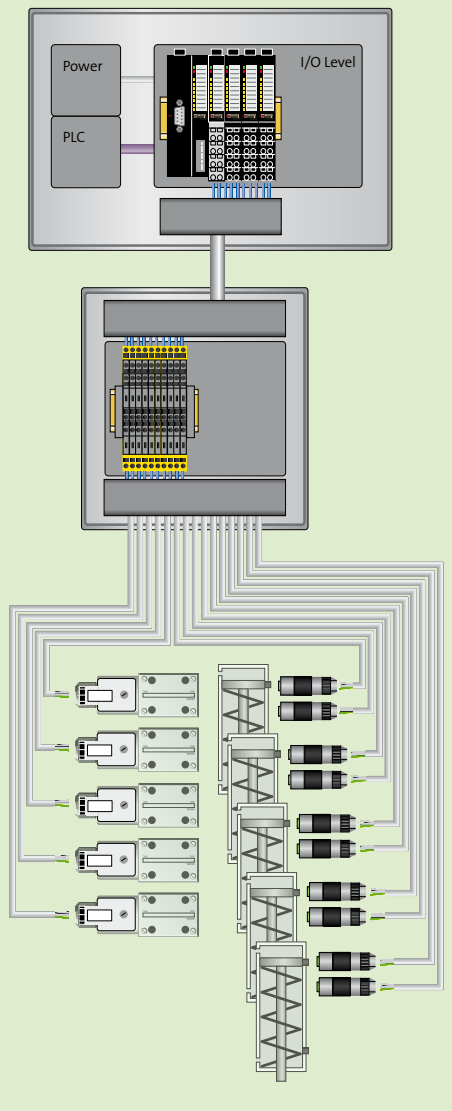
→ FIELDBUS MODULE



I/O	1 DI / 8 DO
Time	WP7 / CP16 (17 min)
Material	€ 614
Level	★★★★☆

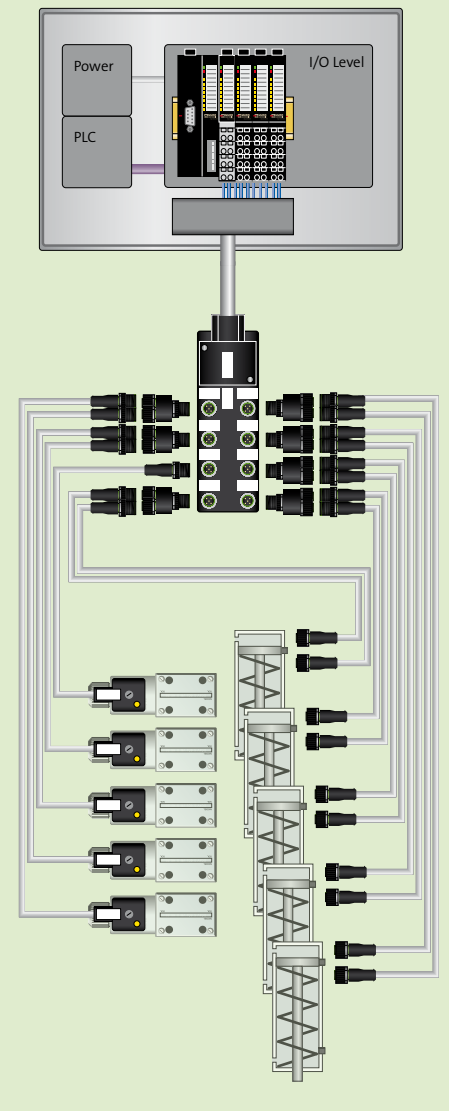
EXAMPLE: PNEUMATIC CYLINDER WITH POSITION SENSORS

→ SINGLE WIRE CONNECTION



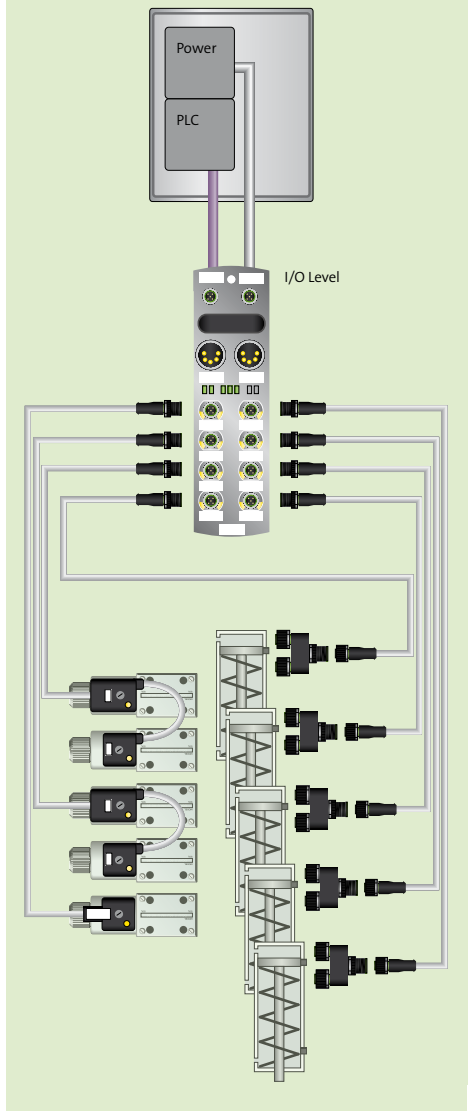
I/O	10DI/5DO
Time	WP 132 / CP 20 (267 min)
Material	€ 830
Level	★☆☆☆☆

→ PASSIVE DISTRIBUTION BOX



I/O	10DI/5DO
Time	WP 23 / CP 42 (53 min)
Material	€ 836
Level	★★☆☆☆

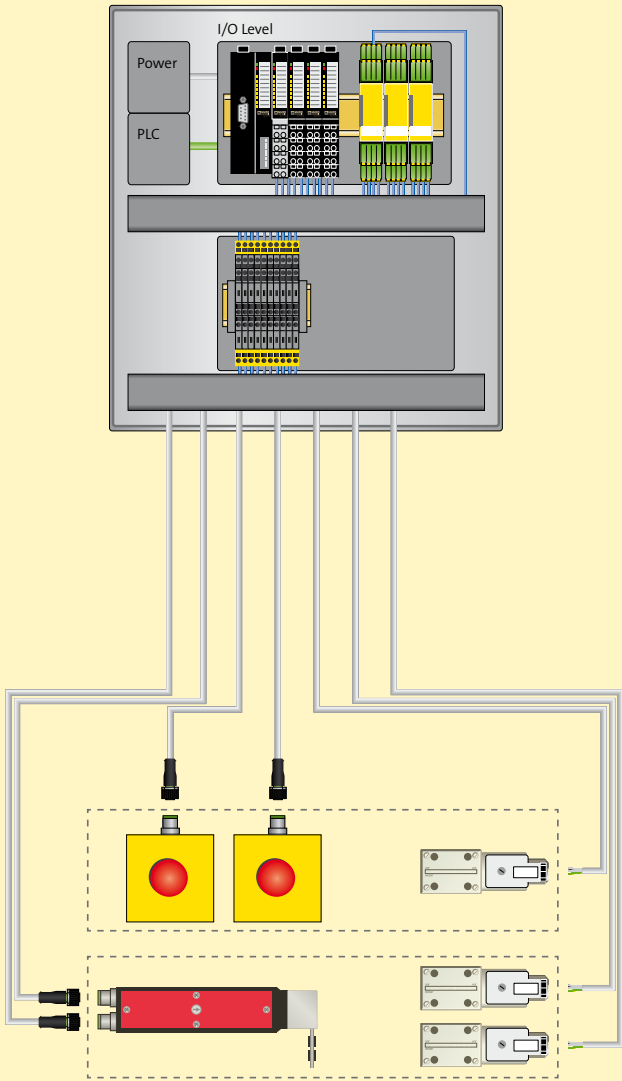
→ FIELDBUS MODULE



I/O	10DI/5DO
Time	WP 7 / CP 30 (19 min)
Material	€ 866
Level	★★★★★

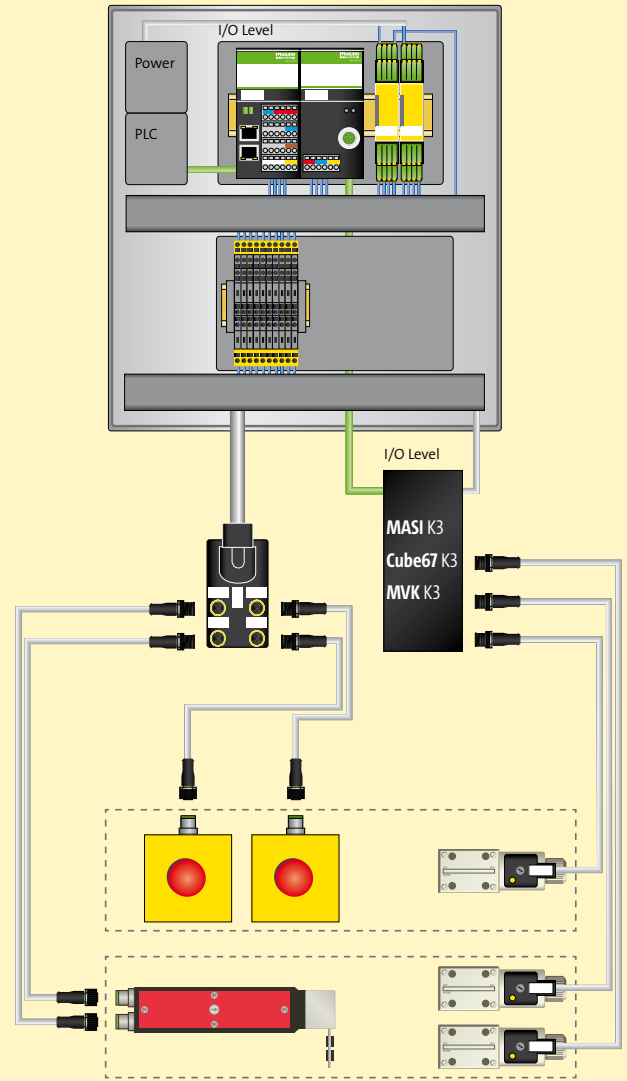
EXAMPLE: SAFETY SWITCH OFF

→ PASSIVE SAFETY OUTPUT CIRCUIT



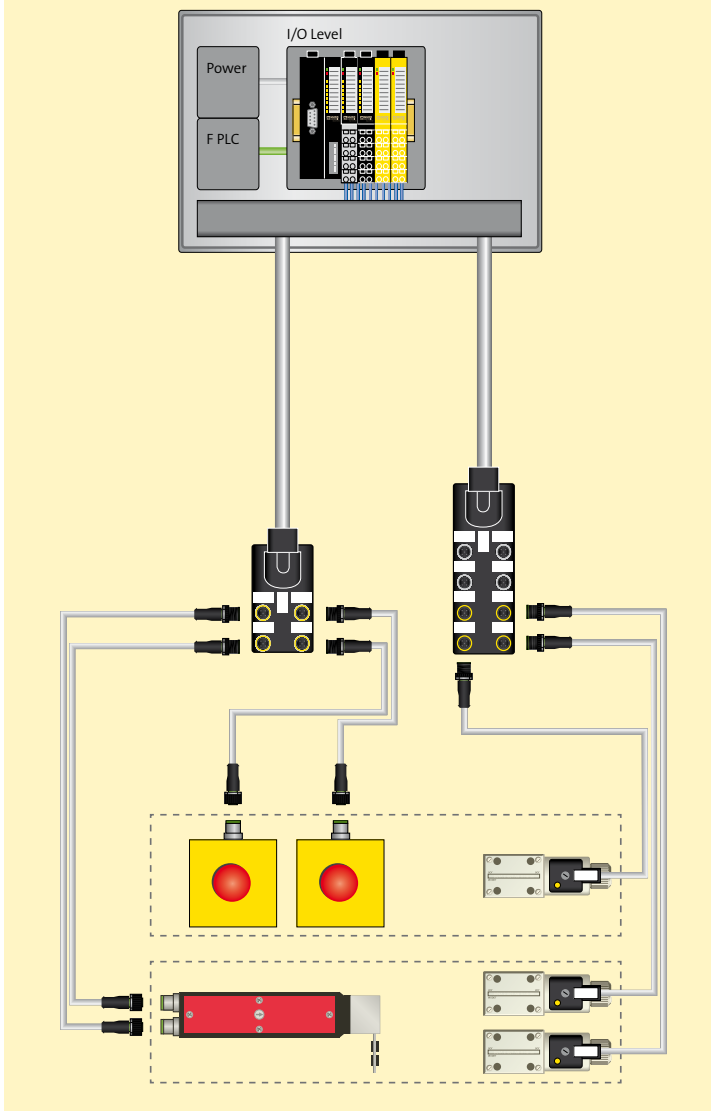
I/O	3 FDI/4 FDO
Time	WP 105 / CP 8 (212 min)
Material	€ 1125
Level	★☆☆☆☆

→ PASSIVE SAFETY BLOCK CIRCUIT



I/O	3 FDI/4 FDO
Time	WP 56 / CP 18 (115 min)
Material	€ 1275
Level	★★☆☆☆

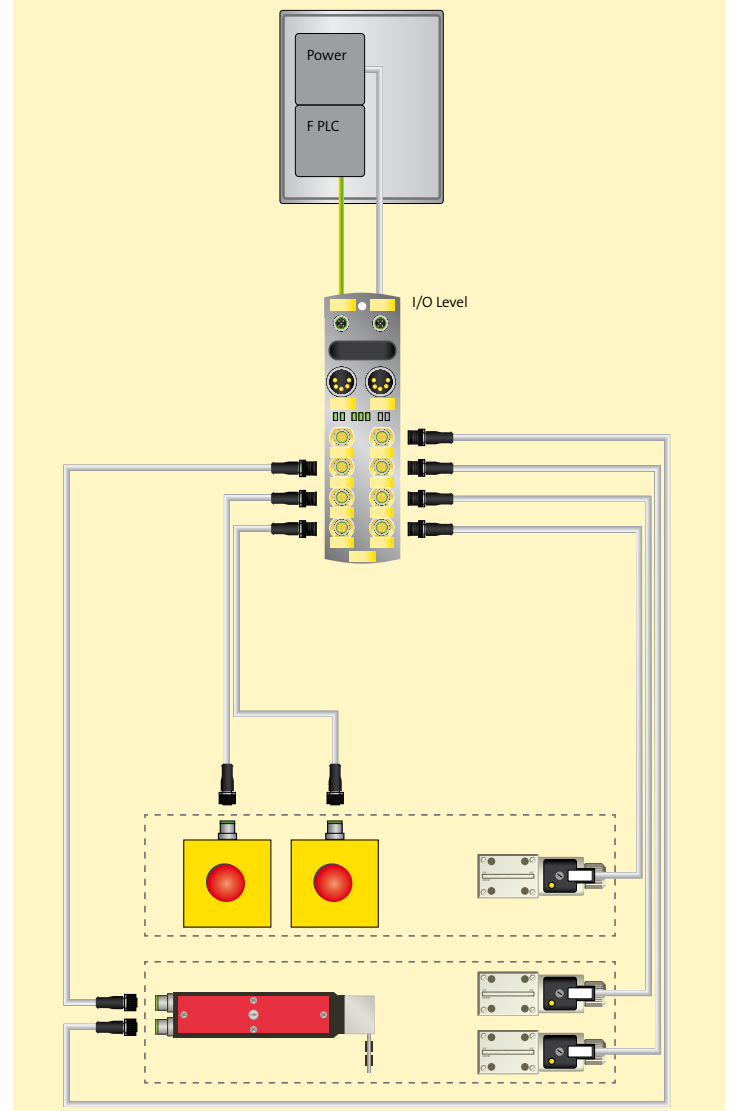
→ ACTIVE SAFETY OUTPUT CIRCUIT



I/O	3 FDI / 4 FDO
Time	WP 27 / CP 18 (57 min)
Material	€ 1212*
Level	★ ★ ★ ★

* Extra charge for F PLC

→ ACTIVE SAFETY DISTRIBUTION BOX



I/O	3 FDI / 4 FDO
Time	WP 7 / CP 15 (17 min)
Material	€ 1188*
Level	★ ★ ★ ★

* Extra charge for F PLC



stay connected

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