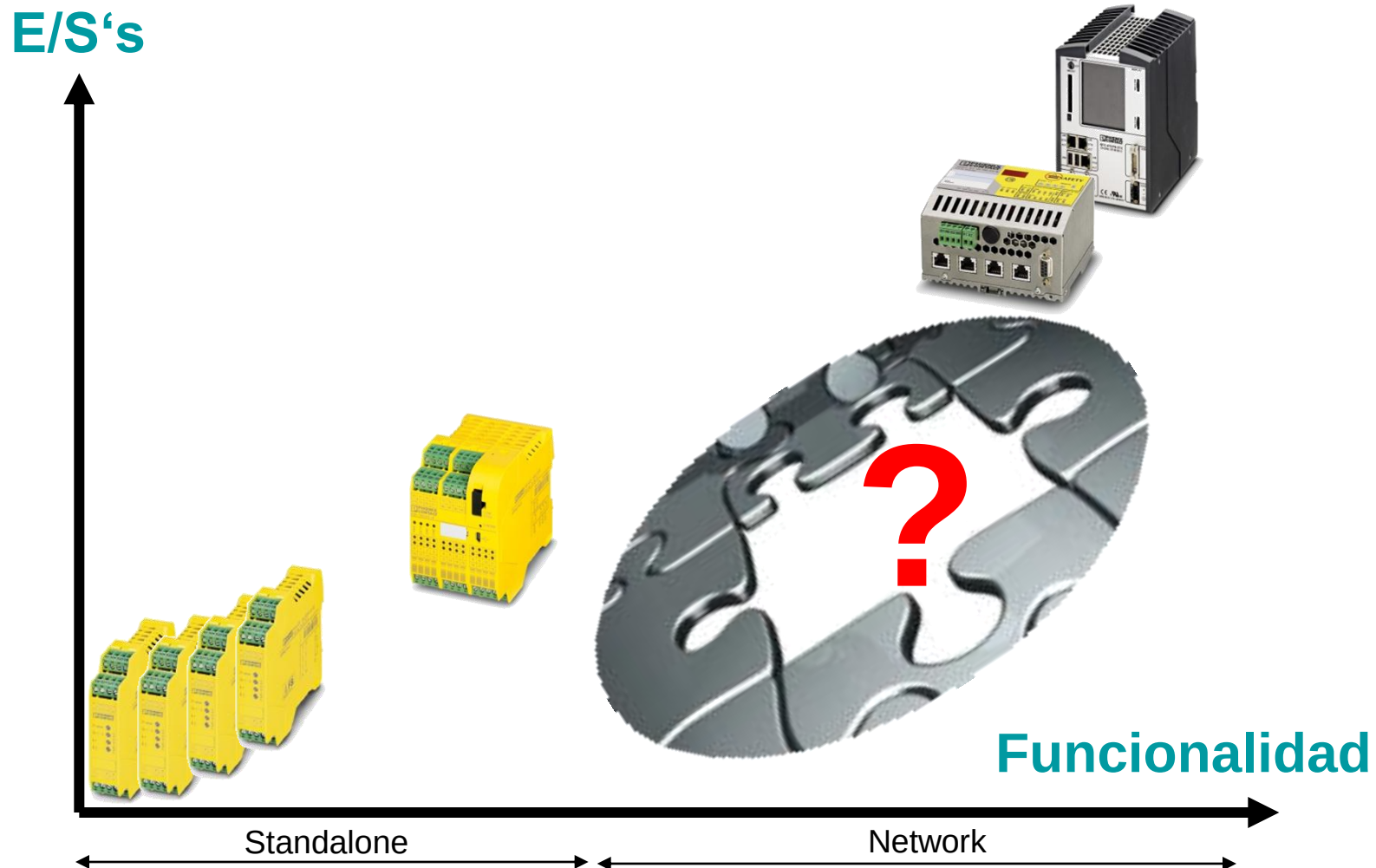


Tecnología SafetyBridge

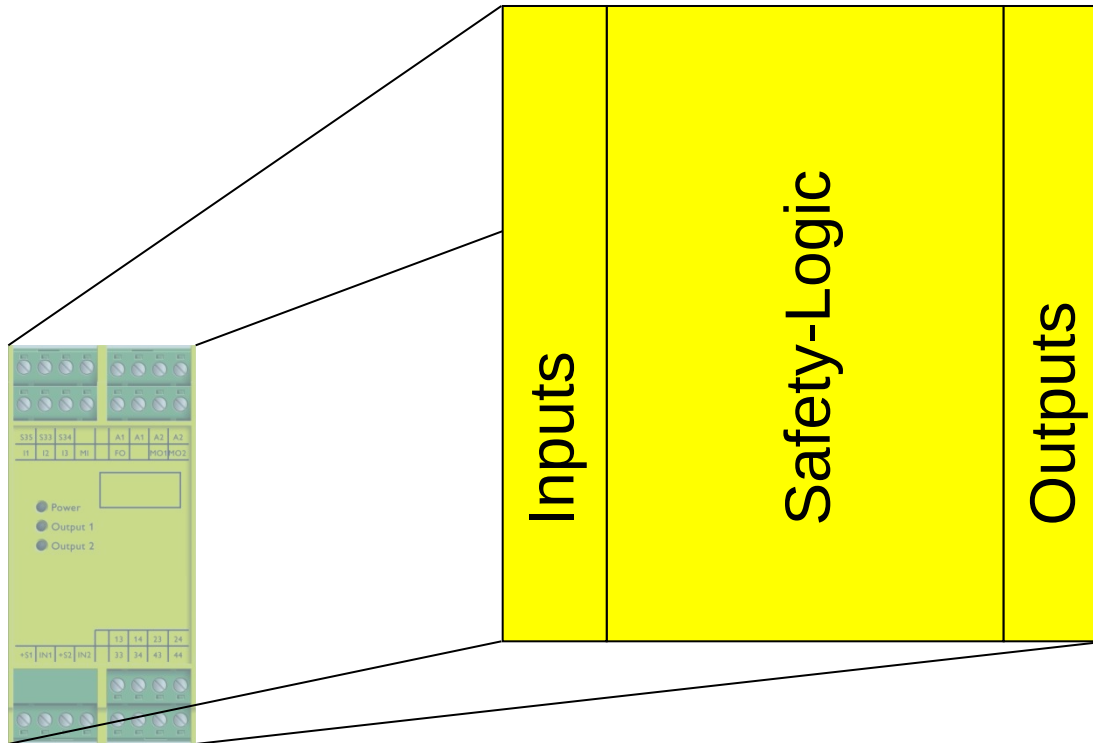


Carlos Fernández

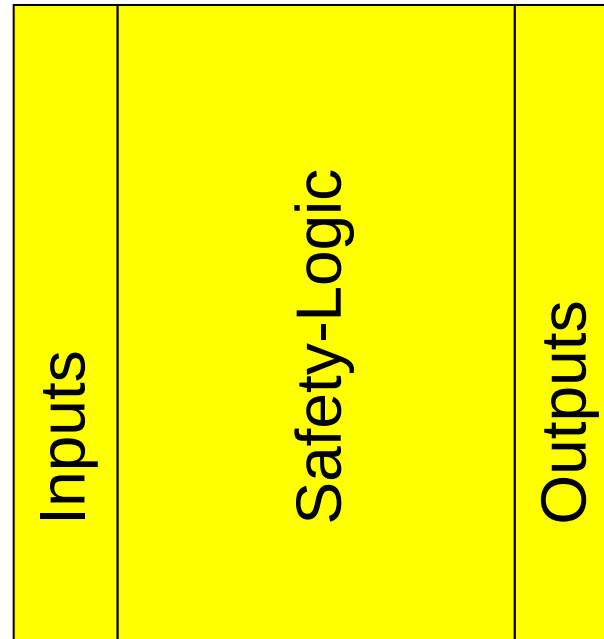
Gama de seguridad Phoenix Contact



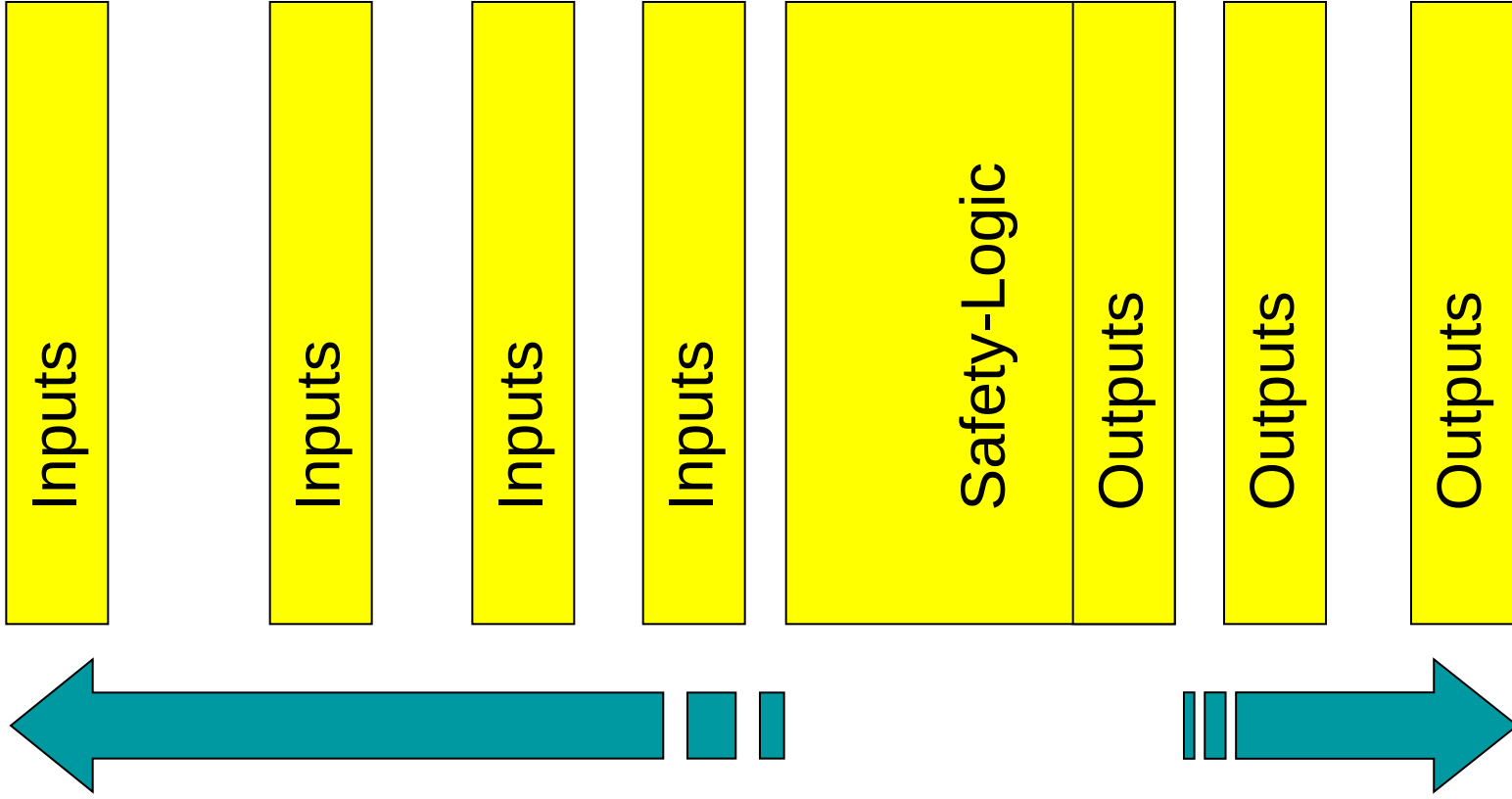
Relés de seguridad



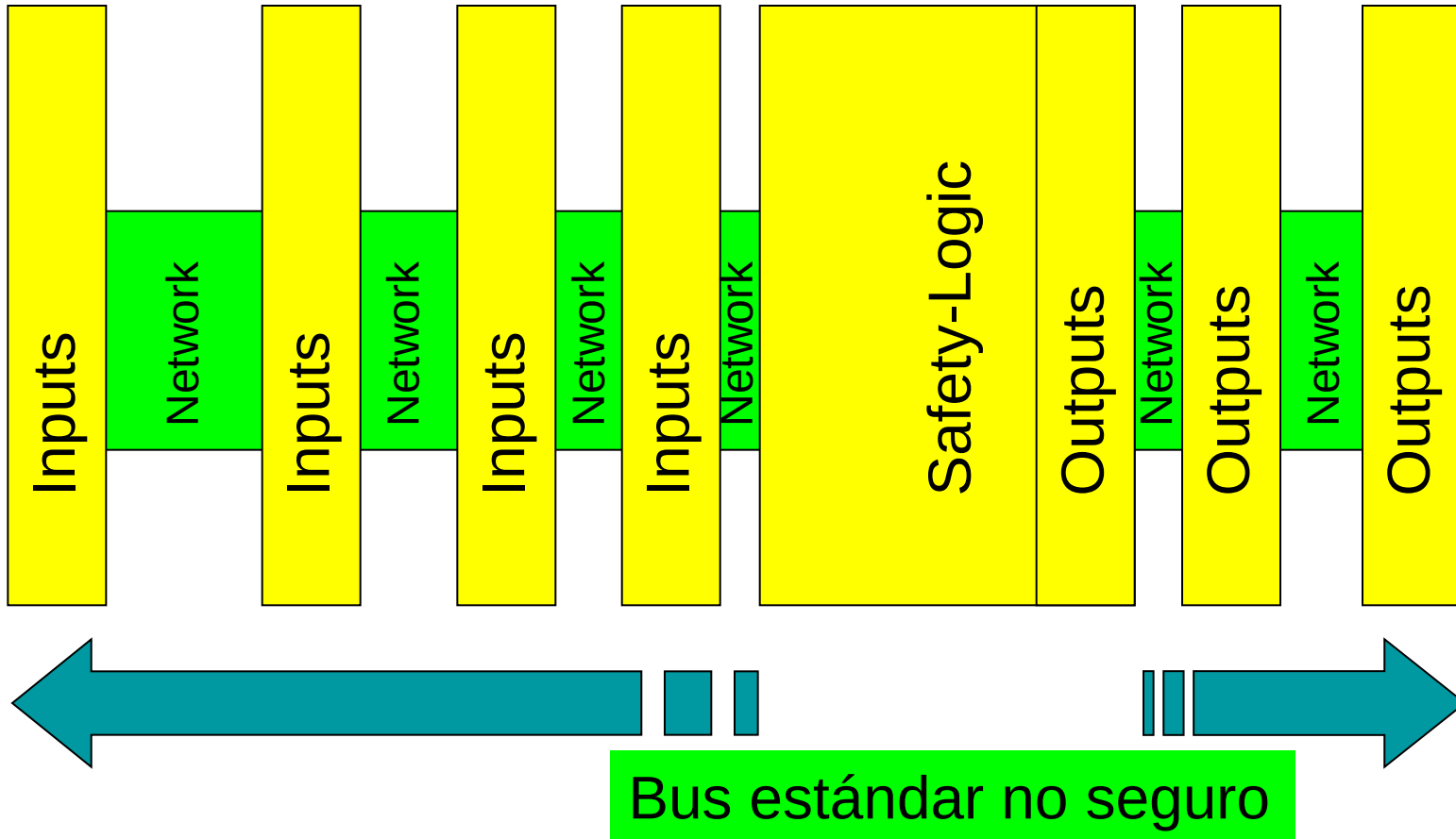
La idea del Safetybridge



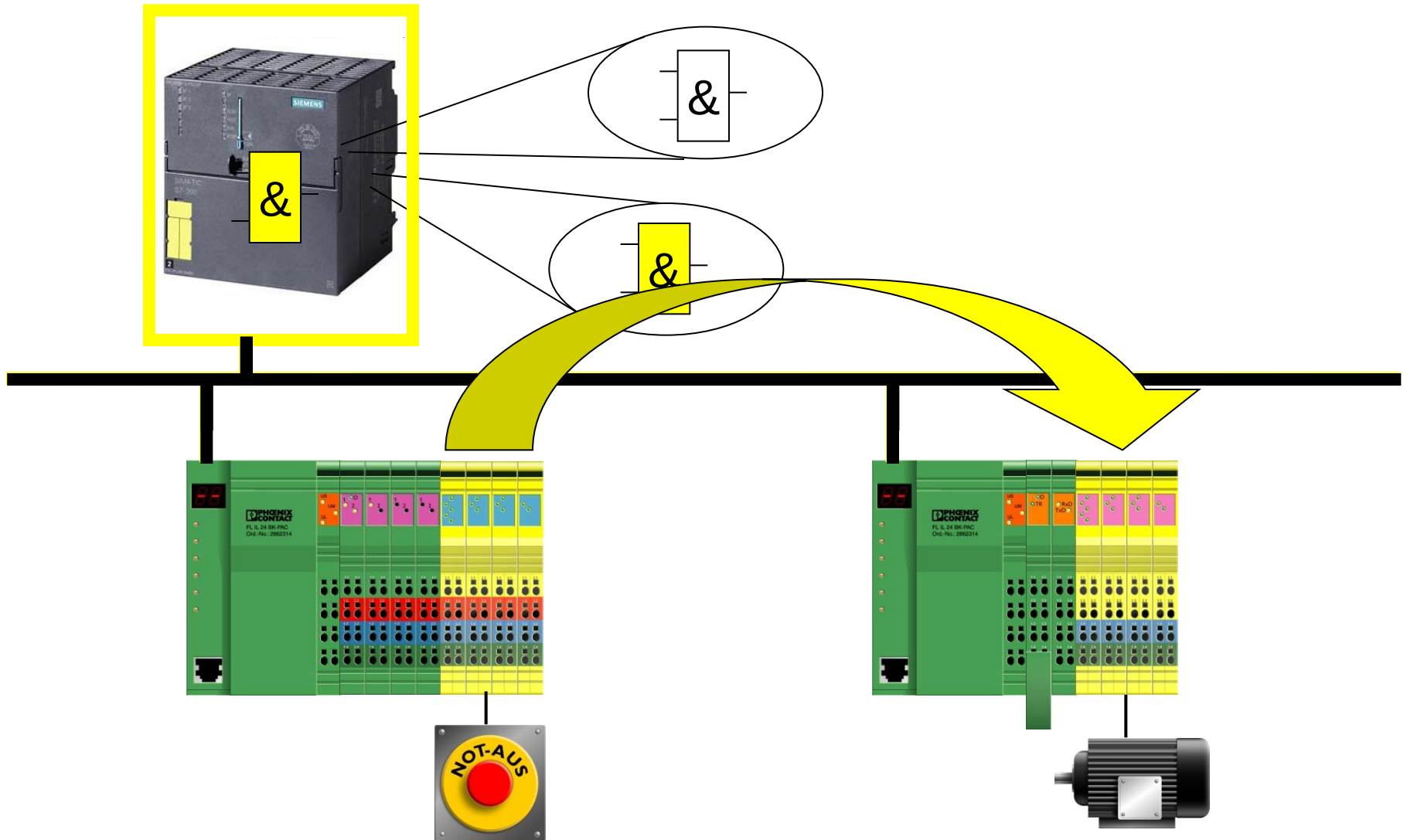
The idea



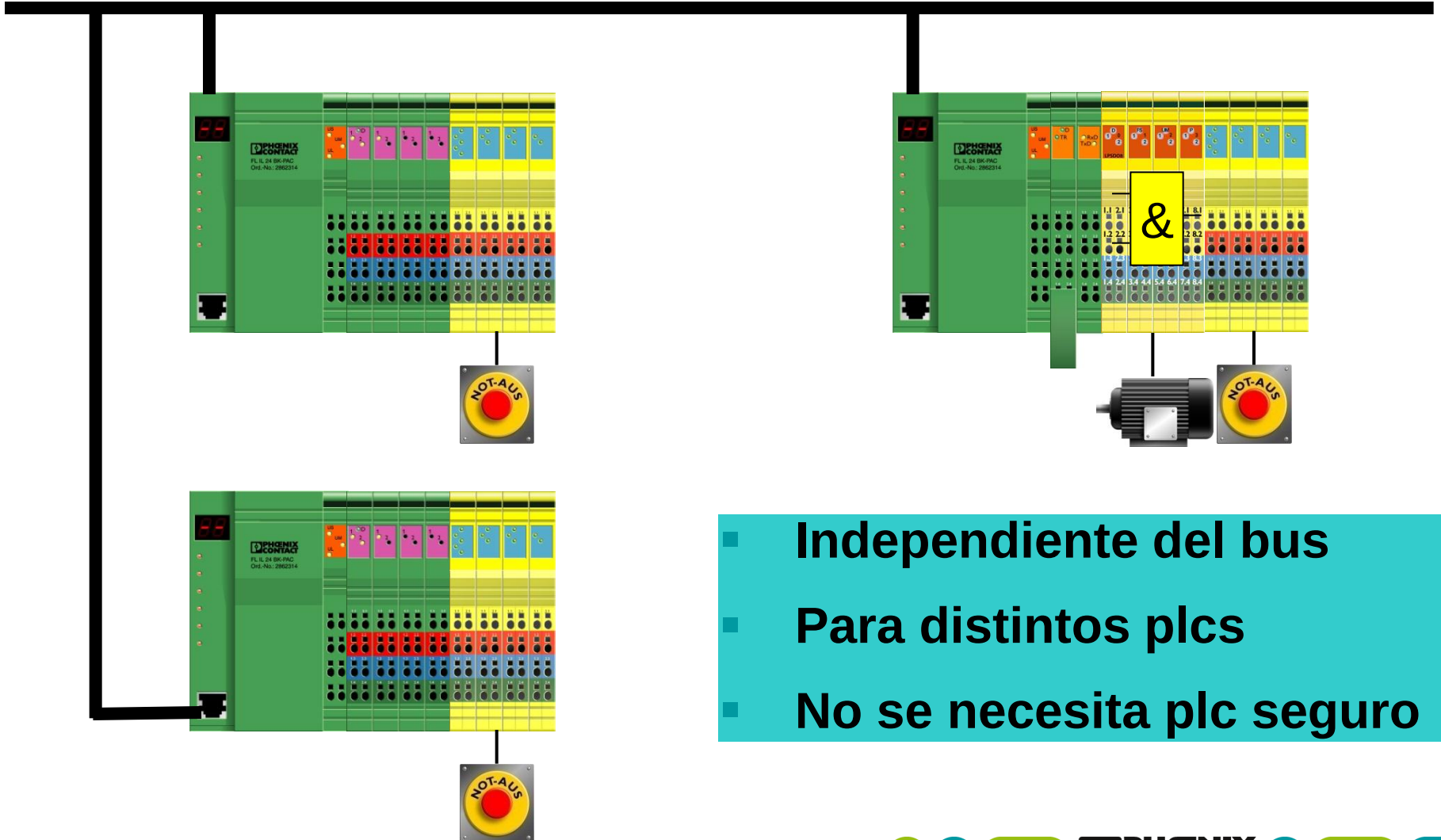
The idea



Principio de funcionamiento



Las ventajas



Sistemas de E/S de seguridad

2 Protocolos de seguridad en 1 equipo
a seleccionar por miniconmutadores dip



Basados en certificados de seguridad E/S seguras



IB IL 24 PSDI 8-PAC
ProfiSafe Digital Input



IB IL 24 PSDO 8-PAC
ProfiSafe Digital Output

Based on certified Phoenix Safe IOs

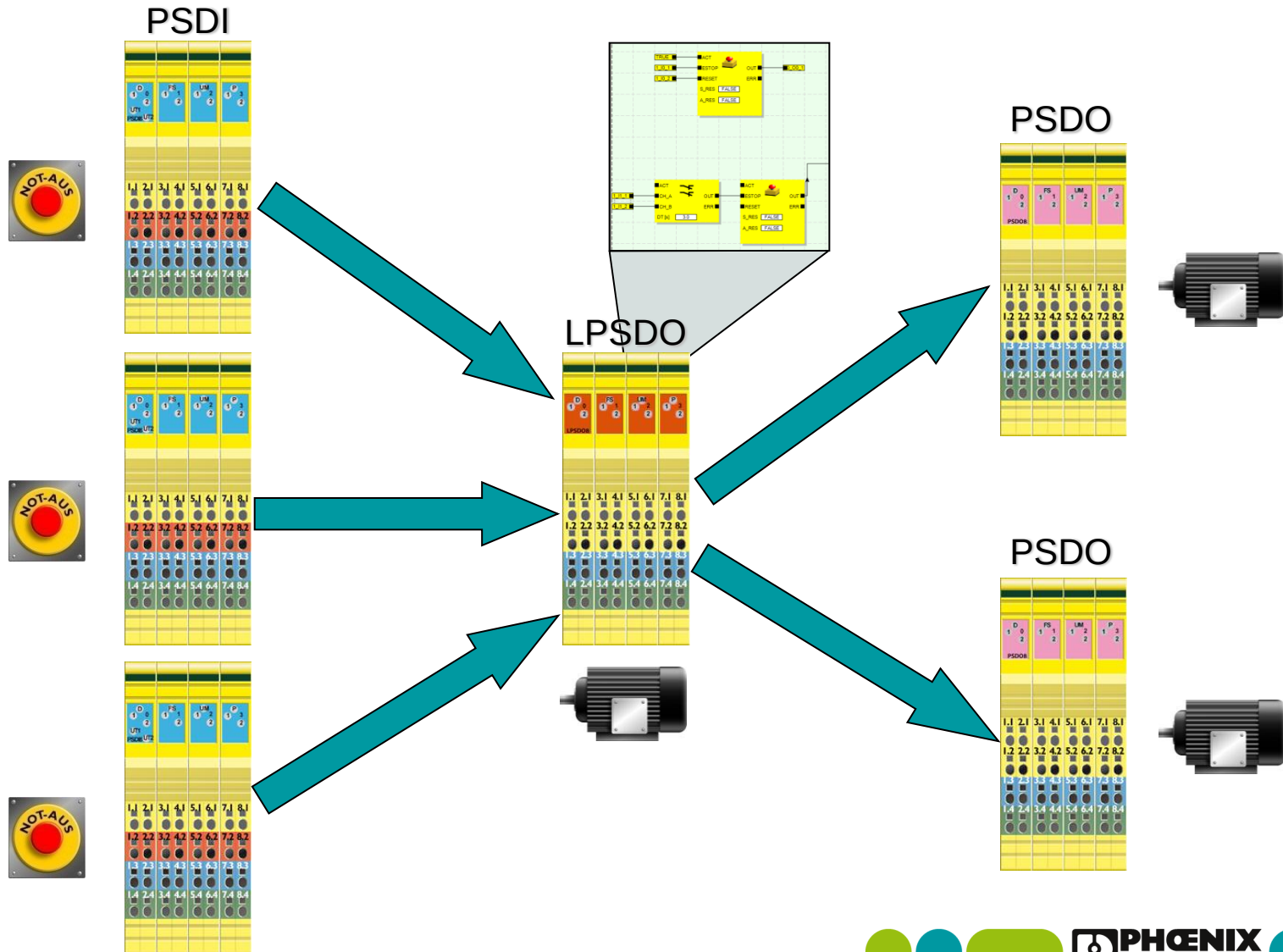


IB IL 24 PSDI 8-PAC
ProfiSafe Digital Input



IB IL 24 **L**PSDO 8-PAC
Logic ProfiSafe Digital Output

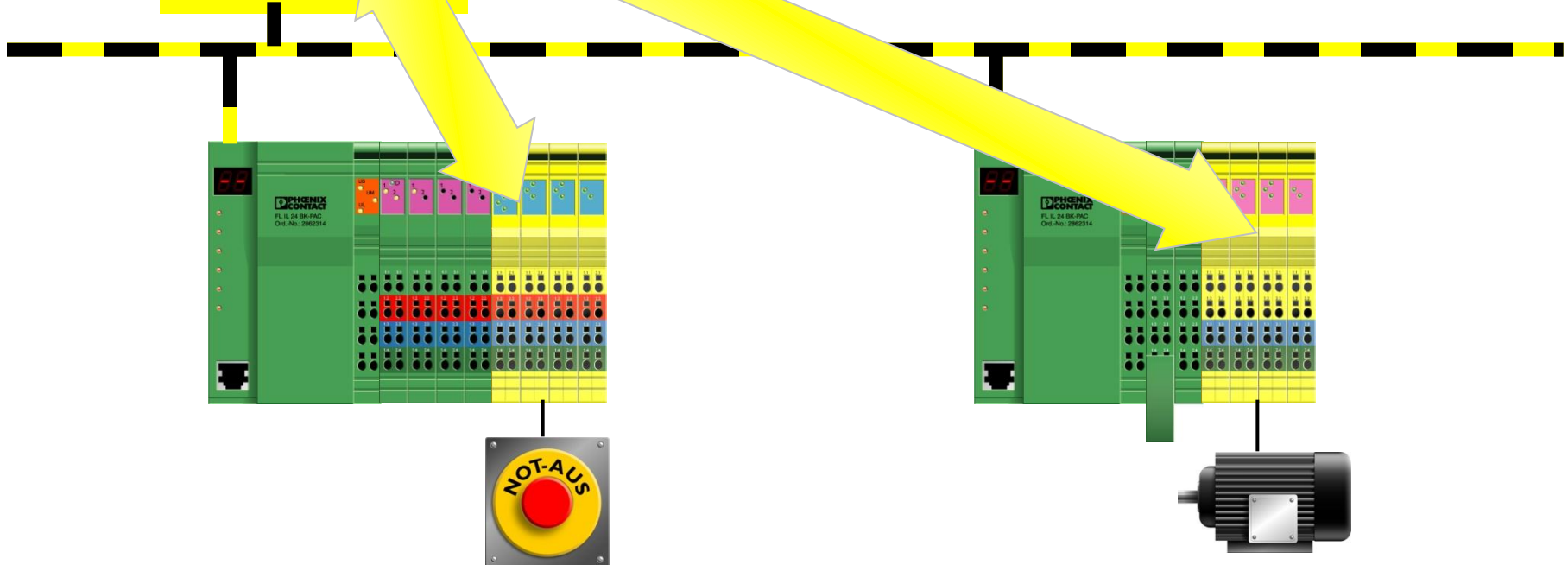
La solución: SafetyBridge SBT!



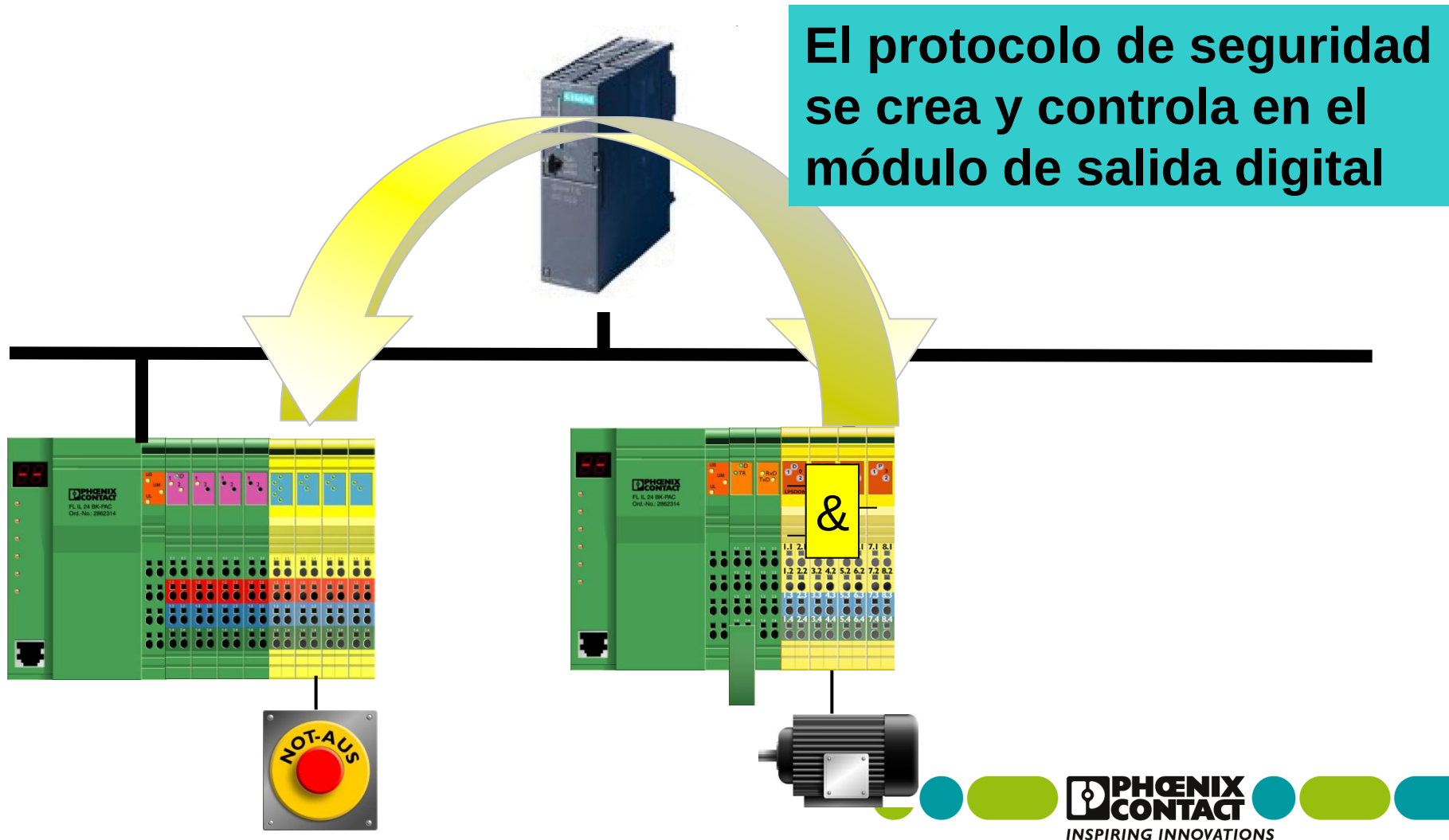
El autómata de seguridad



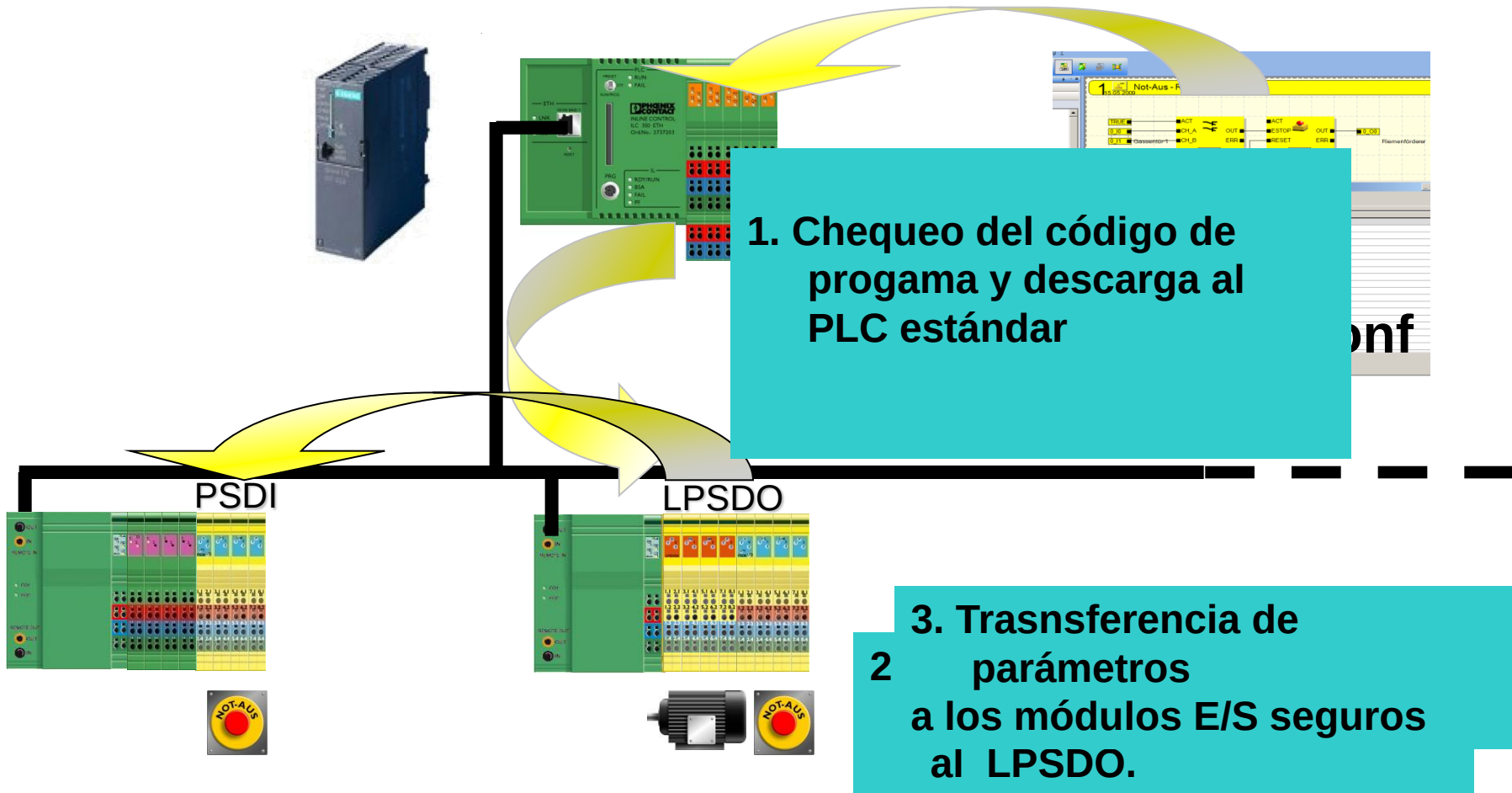
EL protocolo de seguridad se crea y controla en el plc de seguridad



La solución con SafetyBridge

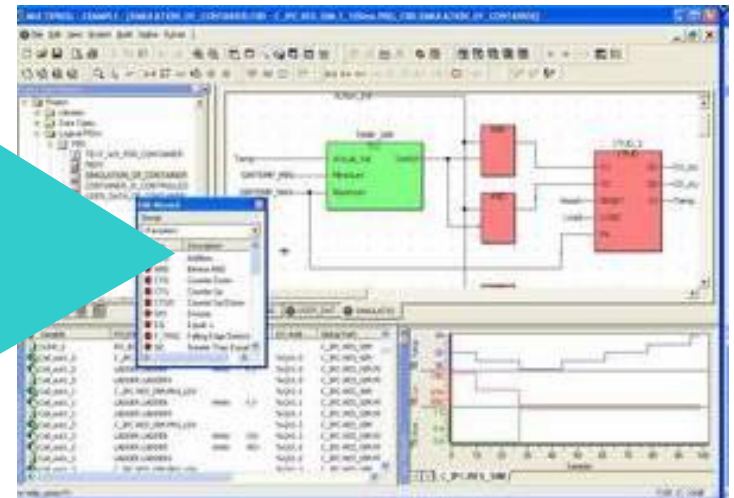
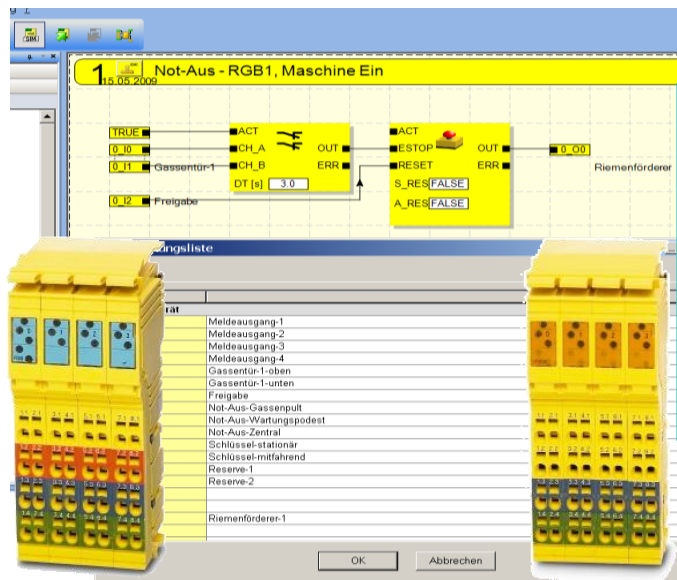


SafetyBridge – Parametrización



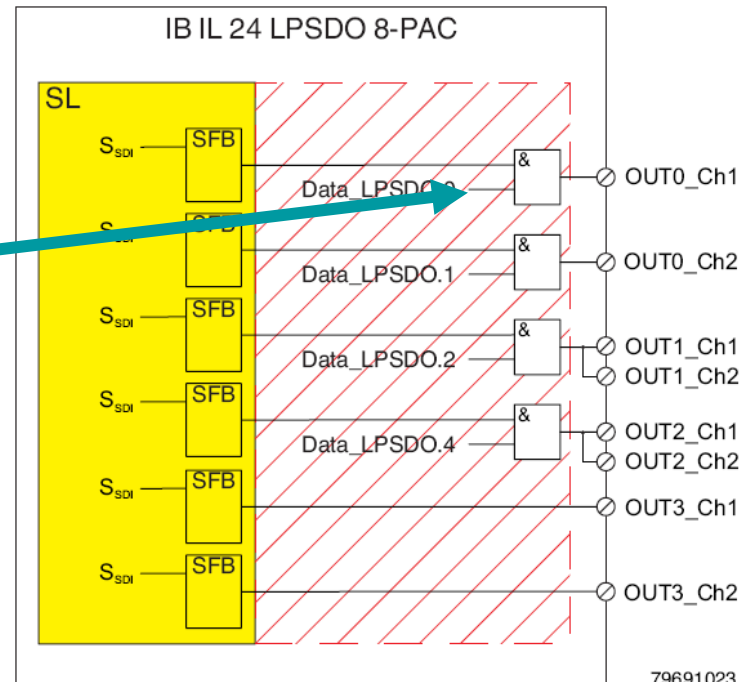
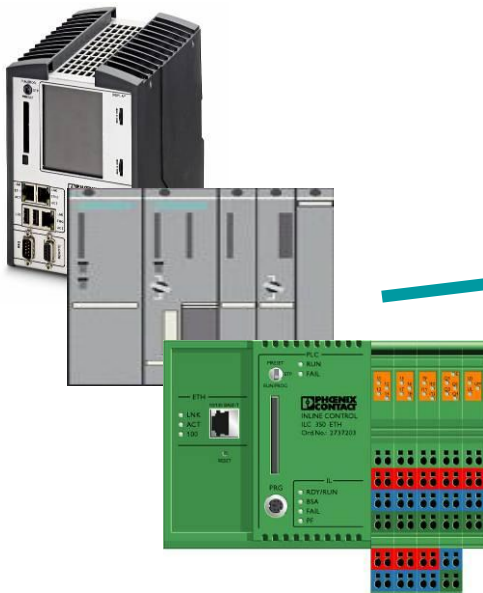
Ventajas del sistema I

El estado de entradas y salidas pueden ser utilizadas en el programa del plc estándar



Ventajas del sistema II

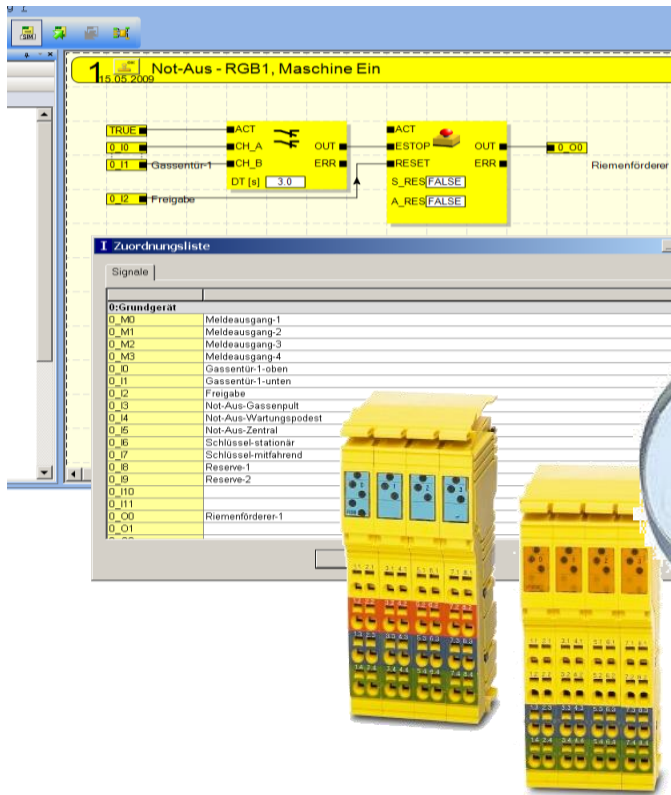
El plc estándar puede escribir directamente en las salidas seguras

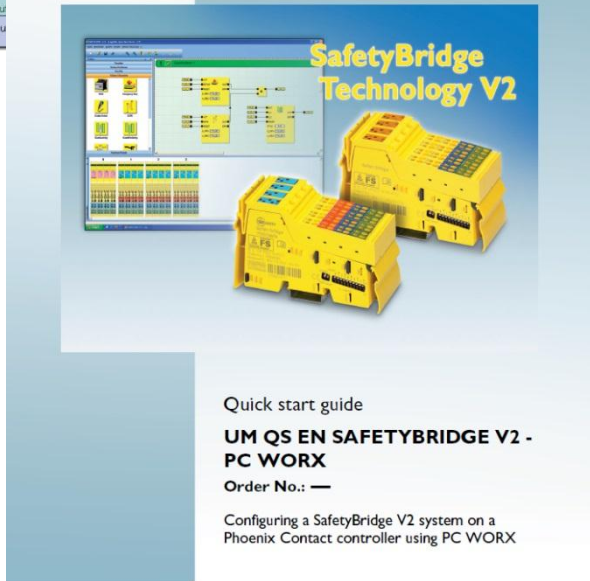


79691023

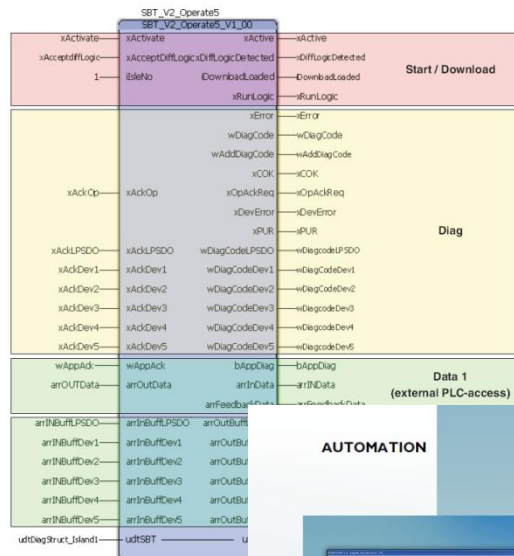
Ventajas del sistema III

Diagnóstico completo de los módulos.

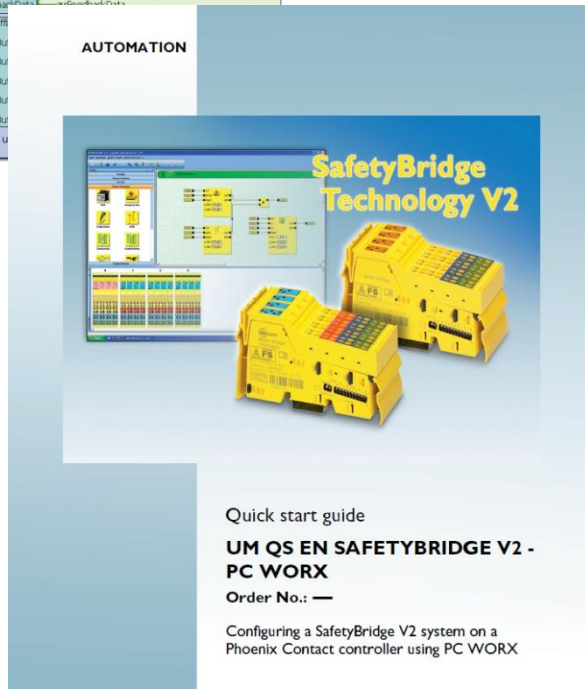




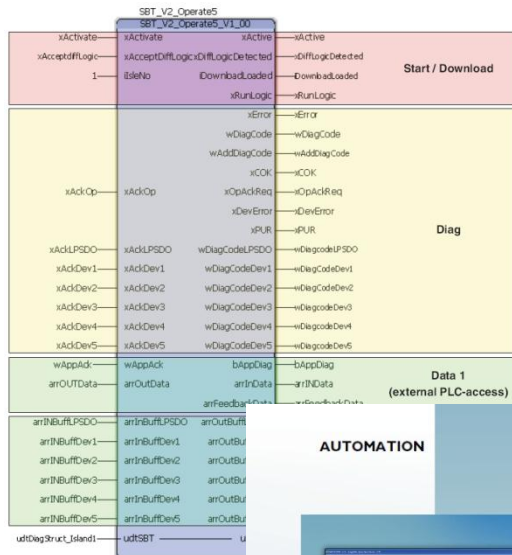
Integración en diferentes plcs SBT V2



- PC WORX
- Rockwell
- Step7 300/400
- Step7 1200
- Mitsubishi Melseq
- Schneider Unity
- CODESYS 3S



Integración en diferentes plcs SBT V3



- PC WORX
- Rockwell
- Step7 300/400
- Step7 1200
- Mitsubishi Melseq
- Schneider Unity
- CODESYS 3S

AUTOMATION

SafetyBridge Technology V2

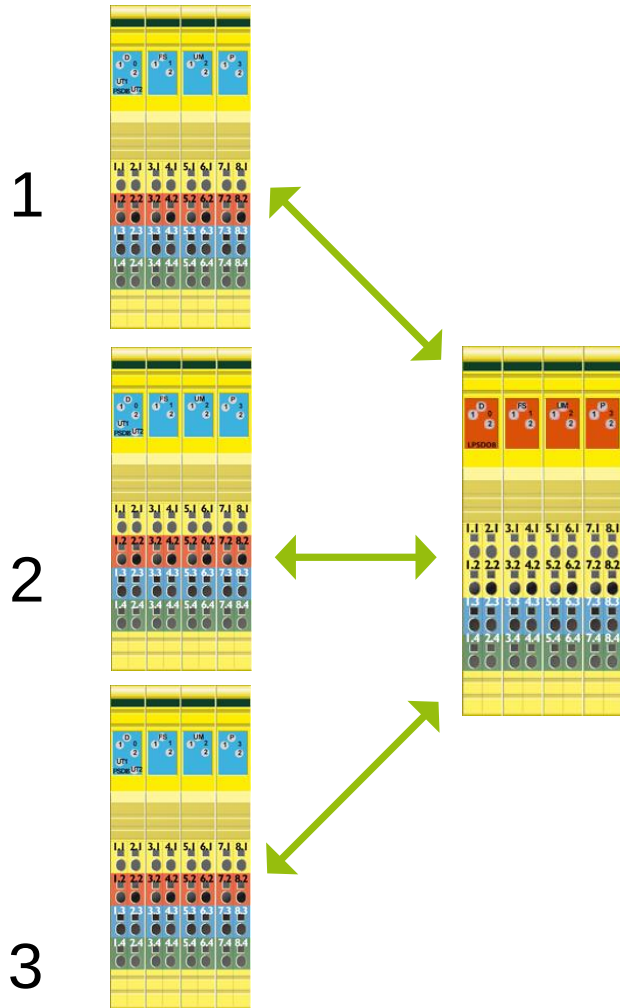
Quick start guide

UM QS EN SAFETYBRIDGE V2 - PC WORX

Order No.: —

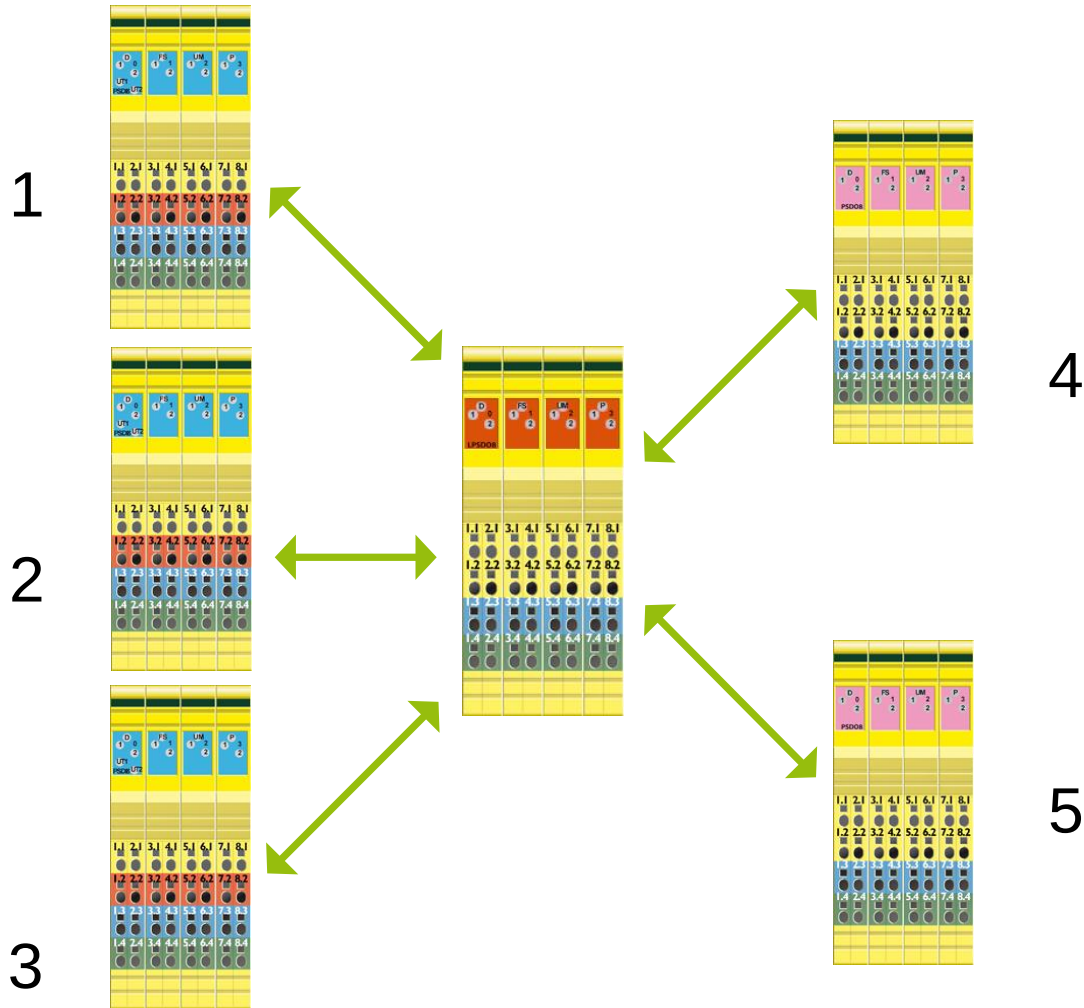
Configuring a SafetyBridge V2 system on a Phoenix Contact controller using PC WORX

SBT V1

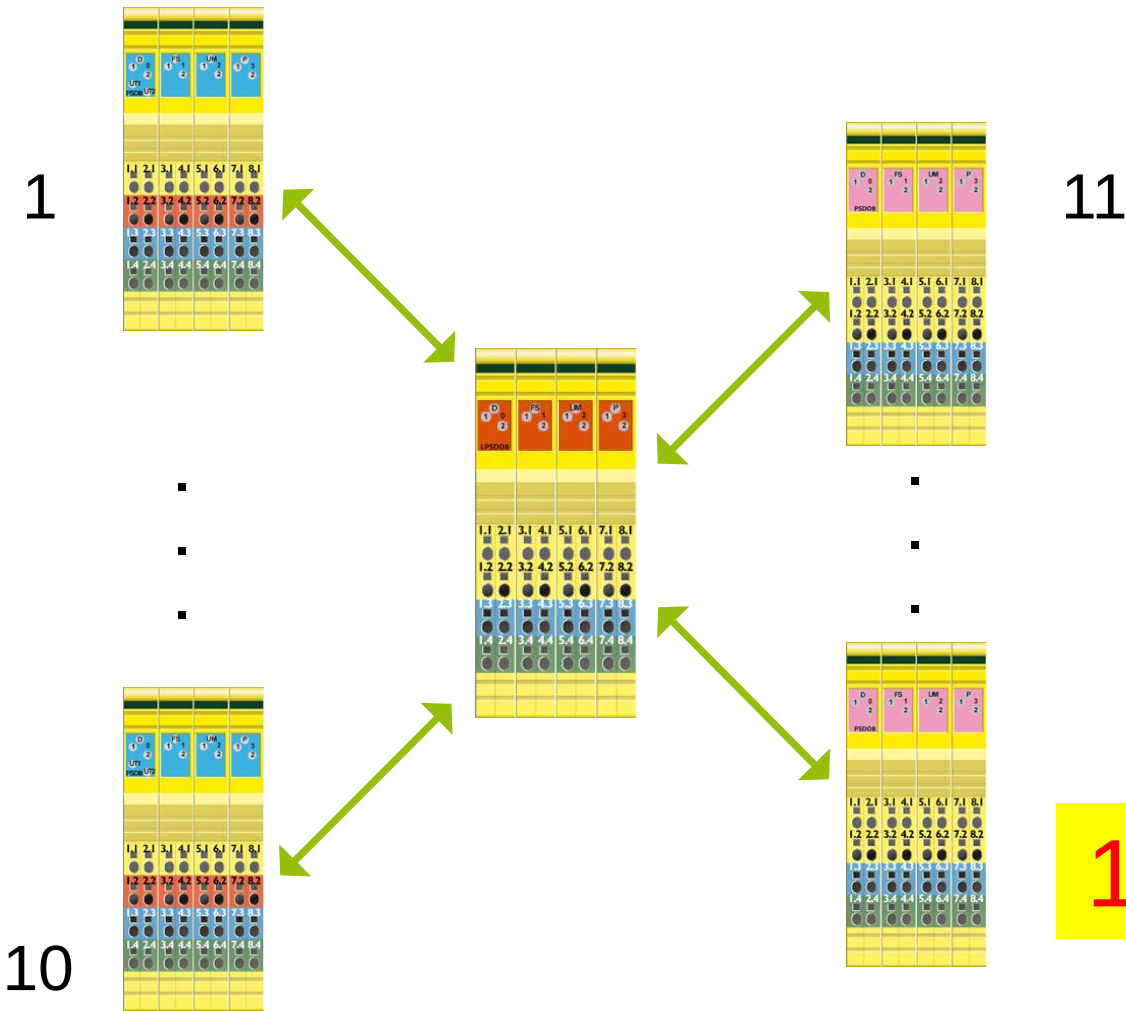


Disponible !

SBT V2



SBT V3



SafetyBridge Technology V3

vista general

	SBT V1	SBT V2	SBT V3
Memory [Bytes]	5000	20000	64000
No. safe satellites	3 input modules	5 input, output and relay modules	16 input, output and relay modules
Max. no. safe inputs (single-channel)	24	40	256
Networks	Interbus, Profibus & Profinet	All networks supported by Phoenix Contact bus couplers	All networks* supported by Phoenix Contact bus couplers
Safe cross communication	No	No	Yes
Online Mode	No	No	Yes

* No CanOpen

SafetyBridge Technology V3

Nuevos modulos E/S seguros

SBT V1	SBT V2	SBT V3
LPSDO 8	LPSDO 8 V2	LPSDO 8 V3
PSDI 8	PSDI 8	PSDI 8
	PSDO 8	PSDO 8
	PSDO 4/4	PSDO 4/4
	PSDOR 4	PSDOR 4
		PSDI 16

SafetyBridge Technology V3

Nuevos productos



LPSDO V3
Order No. 2701625

Características:

- Módulo programación con 8 salidas seguras
- Mayor capacidad de memoria
- Soporta 16 módulos E/S seguros
- Permite comunicación segura con otros 16 LPSDOs

SafetyBridge Technology V3

Nuevos productos



PSDI 16

Order No. 2700994

Características:

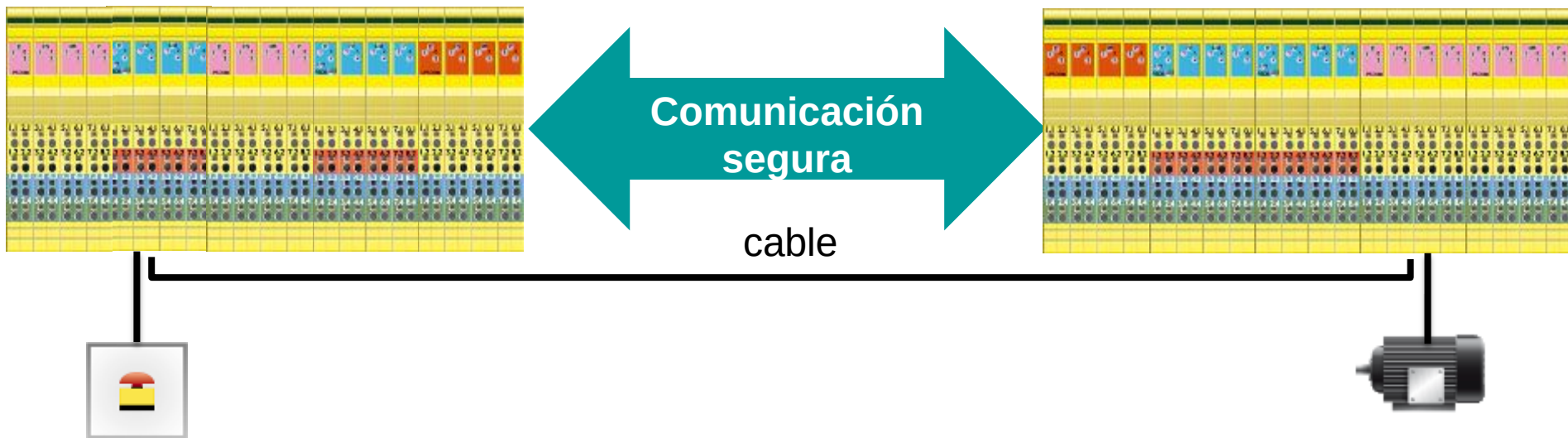
- Reduce el requerimiento de espacio en el armario para 16 entradas al 50%
- Soporta tanto PROFI-safe como SafetyBridge Technology
- Idóneo para descentralizar seguridad

SafetyBridge Technology V3

Comunicación segura

LPSDO V3

LPSDO V3



Entradas digitales seguras

Módulo Inline con entradas digitales seguras
IB IL PSDI8



- Para aplicaciones hasta :
 - SIL CL 3 (IEC 62061)
 - PL e (EN 13849-1)
- 8 entradas canal simple

Entradas digitales seguras

Módulo Inline con entradas digitales IB IL PSDI8

7.4.2 Two-channel equivalent: Supply through UT1 and UT2 (clocking enabled for both)

Possible wiring versions:

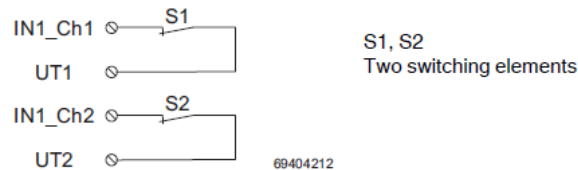


Figure 7-7 Two-channel equivalent assignment of inputs, supply through UT1 and UT2 (both clocked)

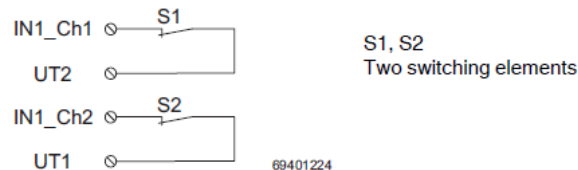


Figure 7-8 Two-channel equivalent assignment of inputs, supply through UT1 and UT2 (both clocked)

Basic specifications

Sensor	Two-channel equivalent
Sensor supply	Internally through clock output UT1 and UT2 (both clocked)
Achievable SIL/SIL CL/Cat./PL	SIL 3/SIL CL 3/Cat. 4/PL e



Salidas digitales seguras

Módulo Inline de salidas digitales seguras **IB IL PSDO8**



- Para aplicaciones hasta:
 - SIL CL 3 (IEC 62061)
 - PL e (EN 13849-1)
- 8 canales salidas
- Switch off delay for stop category 1

Salidas digitales seguras

Módulo Inline de salidas digitales seguras IB IL PSDO8

6.4 Single-channel assignment of safe outputs

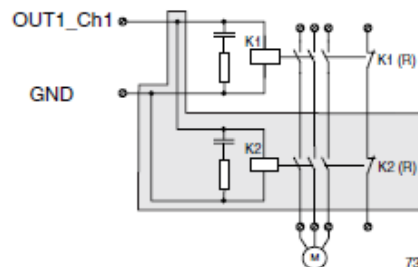


Figure 6-2 Single-channel assignment of outputs



- In order to achieve Cat. 3 or PL d with single-channel assignment of the outputs, a two-channel actuator must be used. The two-channel operation of the actuator with the corresponding connection is represented on a gray background.
- The failure detection time is 20 ms. This means that high pulses of this width can occur in the event of an error. If the application responds to these pulses, use the two-channel assignment of the outputs.

K1 (R) and K2 (R) represent the positively driven N/C contacts for monitoring the state of the relay (readback contacts). Connect these contacts via safe digital inputs. Evaluate the readback and thus the state of the switching elements in your safe application program.



WARNING: Loss of safety function

Connect the actuator ground directly to terminal point GND of the safety module. An external ground may not be used.

Basic specifications

Actuator	Single-channel	Two-channel
Achievable SIL/SIL CL/Cat./PL	SIL 2/SIL CL 2/Cat. 2/PL c	SIL 2/SIL CL 2/Cat. 3/PL d



Salidas digitales seguras

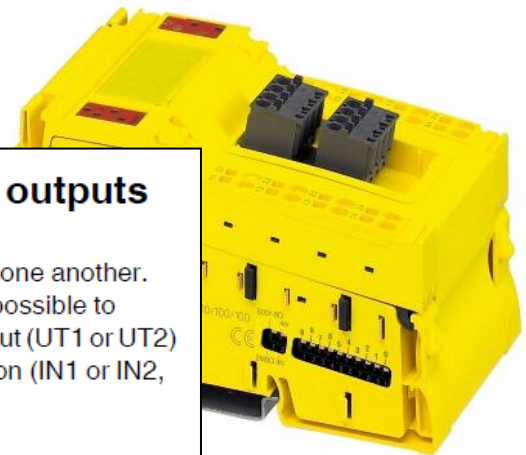
Módulo Inline de salidas seguras por relé **IB IL PSDOR4**



- Para aplicaciones hasta:
 - SIL CL 3 (IEC 62061)
 - PL e (EN 13849-1)
- 4 salidas seguras por relé

Salidas digitales seguras

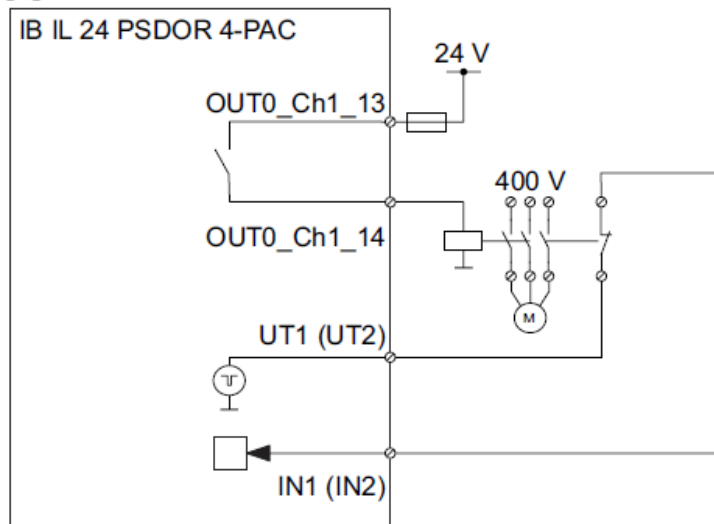
Módulo Inline de salidas seguras por relé IB IL PSDOR4



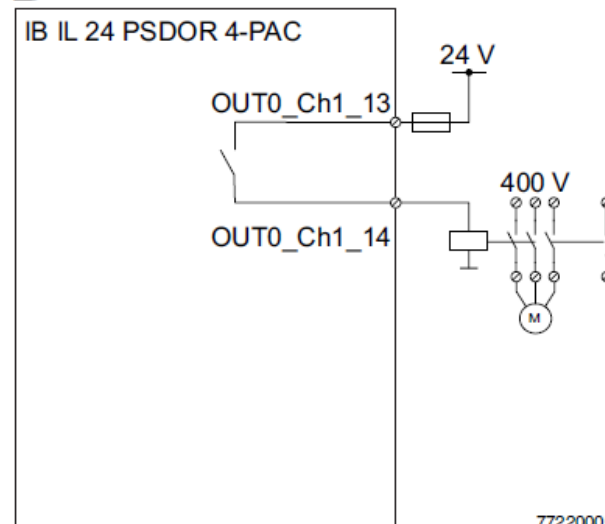
6.4 Single-channel assignment of safe relay outputs

For single-channel assignment, the safety relays operate independently of one another. This means that they are controlled individually by the safe controller. It is possible to monitor external loads and the wiring for errors. In this case, use a clock output (UT1 or UT2) with the associated alarm input. Activate this function in the parameterization (IN1 or IN2, see Section "Parameterization of the safe relay outputs" on page 5-4).

A



B



77220005

Salidas digitales seguras

Módulo Inline de salidas digitales seguras IB IL PSDO 4/4



- Para aplicaciones hasta:
 - SIL CL 3 (IEC 62061)
 - PL e (EN 13849-1)
- 4 plus/minus salidas digitales seguras

Salidas digitales seguras

Módulo Inline de salidas digitales seguras IB IL PSDO 4/4



Safety characteristic data according to IEC 61508/EN 61508

Achievable SIL

SIL 2 (single-channel)

SIL 3 (two-channel)

Depends on the parameterization and wiring (see Section "Connection options for actuators depending on the parameterization" on page 2-6 and Section "Connection examples for safe outputs" on page 6-1)

Probability of a dangerous failure on demand by the safety function (PFD)

SIL 2: 1% of 10^{-2} , maximum (corresponds to 1×10^{-4})
SIL 3: 1% of 10^{-3} , maximum (corresponds to 1×10^{-5})

Probability of a dangerous failure per hour for the entire module (PFH)

SIL 2: 1% of 10^{-6} , maximum (corresponds to 1×10^{-8})
SIL 3: 1% of 10^{-7} , maximum (corresponds to 1×10^{-9})
Depends on the parameterization (see Table 6-3 on page 6-3)

Hardware fault tolerance (HFT) of the module

1

Permissible duration of use

20 years

Seguridad vía Wireless con SBT



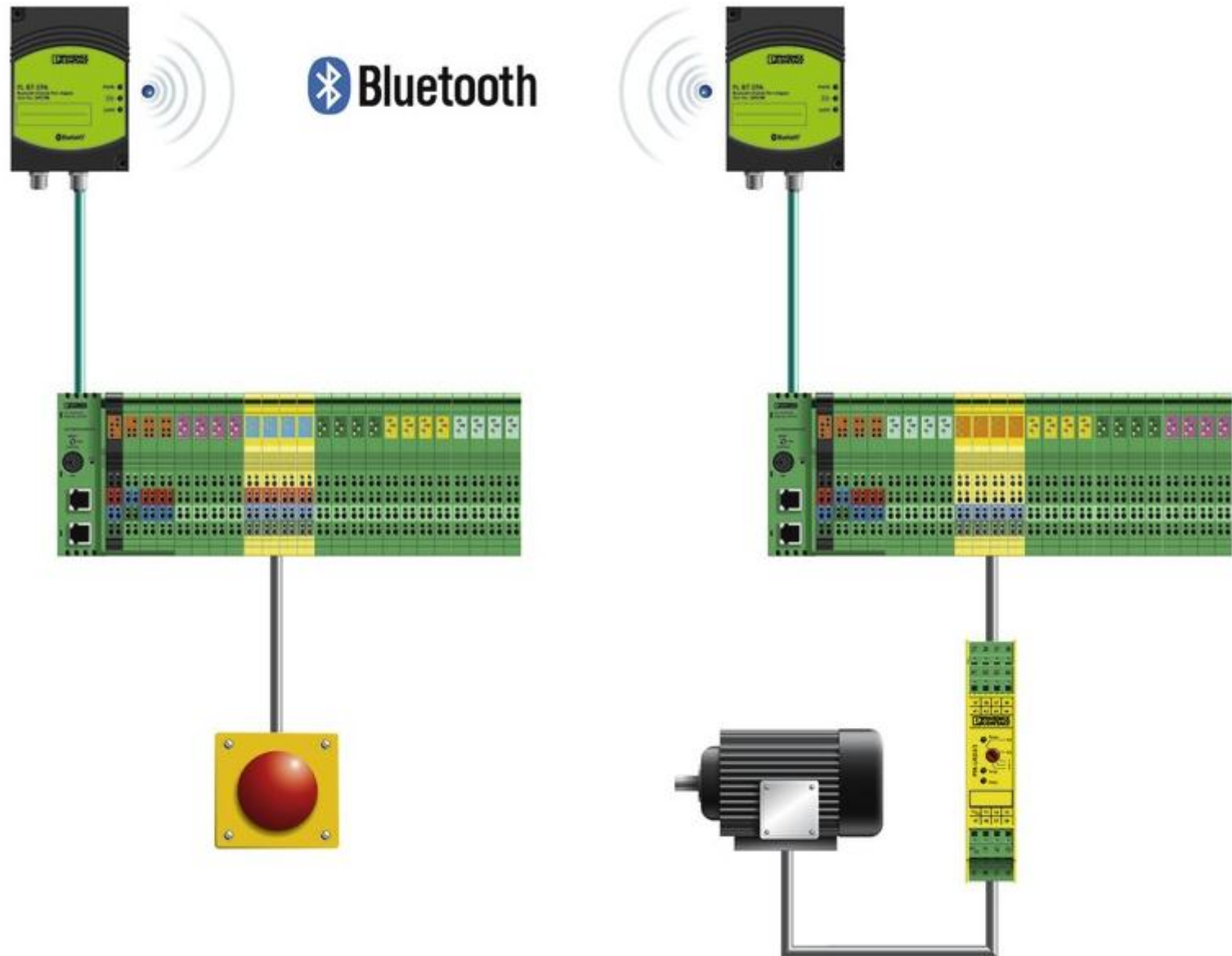
Bluetooth & WLAN!

Interesting applications

- Witron (automatic warehouse)
- Stöcklin (automatic warehouse)
- Vestas (wing production with bluetooth communication)
- Mammoet (transport vehicle with 23 SBT-Islands in MUX-Mode)



Plug & Play Muxmode



Interesting applications



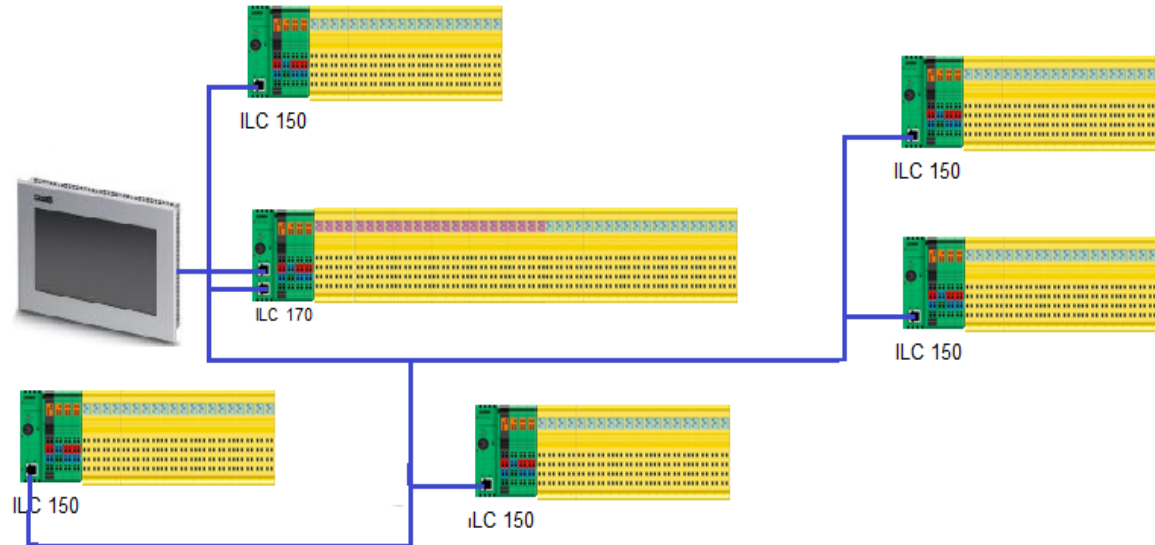
IMELETTA BOGUARD sas di Romagnoli V. e C.
Distributore per Bologna

Application

- Revamping handling system in ceramic sector

Network Safety Solution

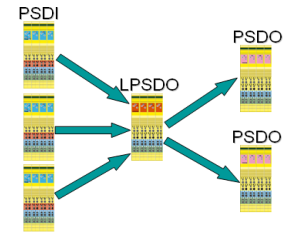
- Controller: ILC 170 Ethernet with UDP communication.
- 6 distributed safety islands each connected via local ILC150 Eth.
- Each safety island with one LPSDO in central cabinet and 5 local PSDIs
- Performance Level: PL d



Interesting applications

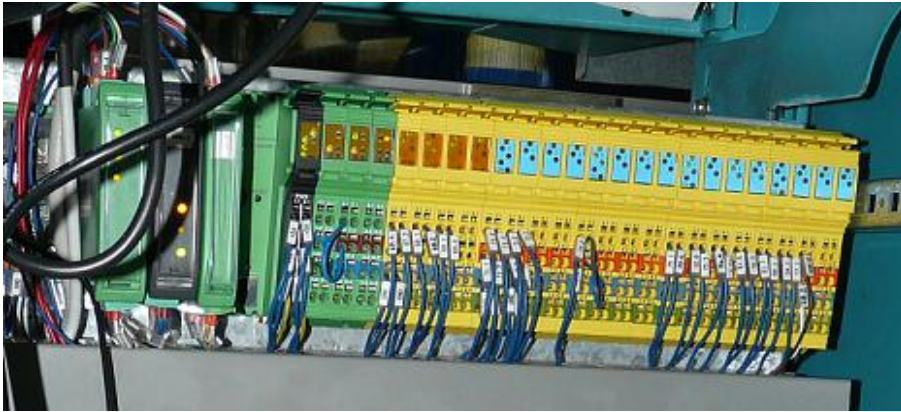


IMELETTA BOGUARD sas di Romagnoli V. e C.
Distributore per Bologna



Application

- Secure Testing System for Hydraulic Pumps



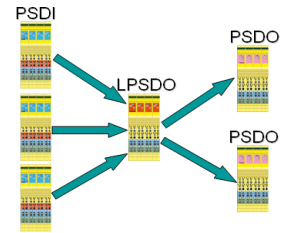
Network Safety Solution

- Controller: ILC 150 ETH
- Only one safety island with one LPSDO and 5 PSDIs in central cabinet
- Performance Level: PL c

Interesting applications

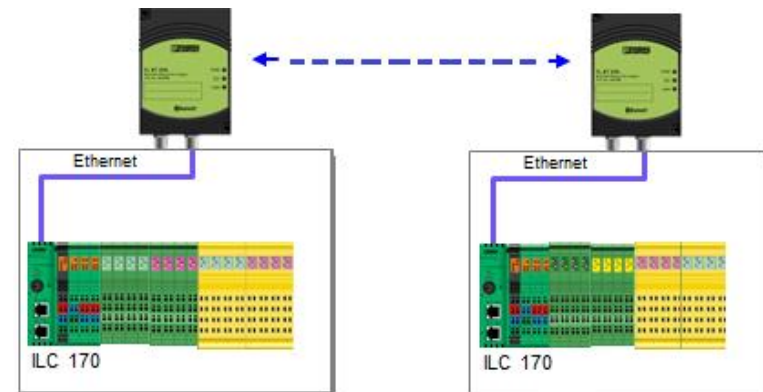
Application

- Bridge-crane automation



Network Safety Solution

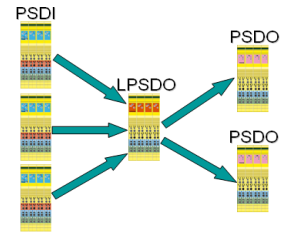
- Controller: ILC 170 Ethernet with Modbus/TCP for I/Os and Ethernet/UDP for safety communication
- Only one safety island with 1 LPSDO and 1 PSDI in the fixed cabinet, 1 PSDO and 1 PSDI on the bridge-crane cabinet
- Wireless communication via FL WLAN EPA



Interesting applications

Application

- Wireless Mux via ILC 170 in FINCANTIERI CARNIVAL SHIPS



Network Safety Solution

- 1 LPSDO and 1 PSDI in the fixed cabinet, 1 PSDO and 1 PSDI in the crane cabinet
- Wireless communication via FL WLAN 24 AP 802-11 XDB

SafetyBridge Technology

