FORTRESS

Configurable Access & Control for Machine Guarding

tGard

Rolf Muri AG • Einsiedlerstrasse 533 • CH-8810 Horgen
Telefon 044 727 99 00 • Telefax 044 727 99 01
office@rolfmuri.ch • www.rolfmuri.ch

PROBLEMLÖSUNGEN MIT SYSTEM

Introduction to tGard

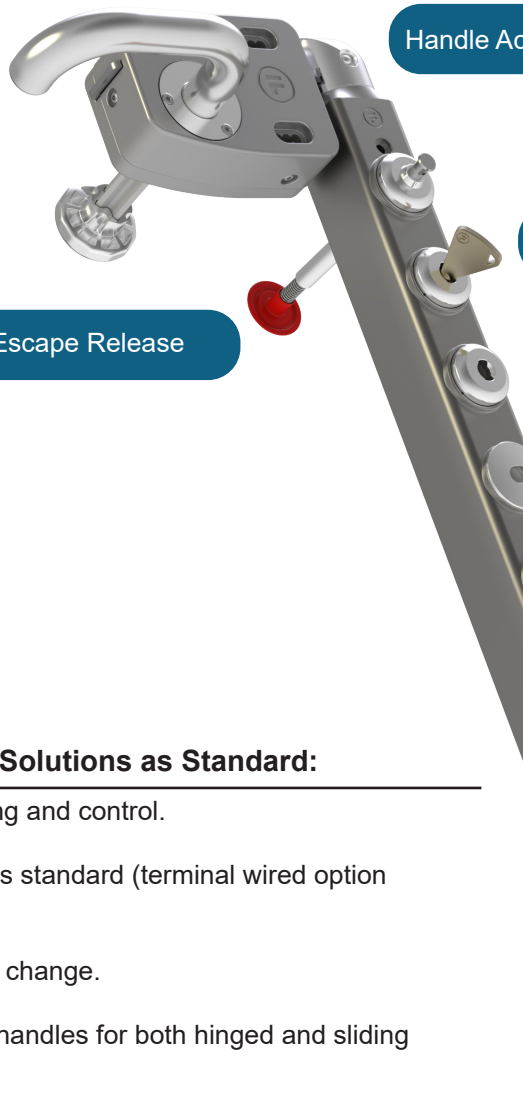
tGard is a compact metal bodied system that enables the configuration of interlocks with or without guard locking, mechanical trapped key interlocks, and electrical operator controls either as separate devices or any combination of these three functions in one device.

tGard offers “a customised safety solution, as standard”. Each order is defined by a range of tGard elements that include interlock safety switches, High Level Coded RFID, personnel keys, escape release, E-Stops, pushbuttons, selector switches, indicator lamps and a choice of operating handles for hinged and sliding guard doors.

tGard’s metal body includes through-holes for quick installation on aluminium profiles, flat surfaces, doors and even back of panels without the need for mounting plates.

tGard is IP65 as standard and has been designed to be fully compliant with machinery safety standards.

Configuration Example

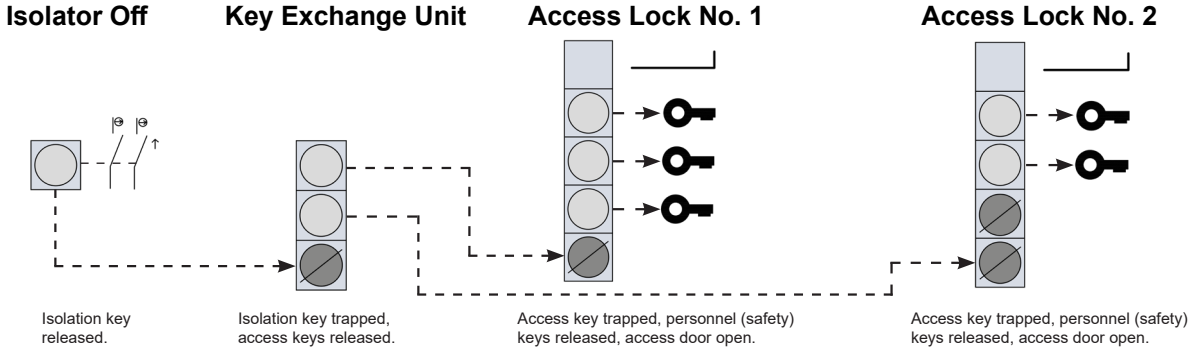


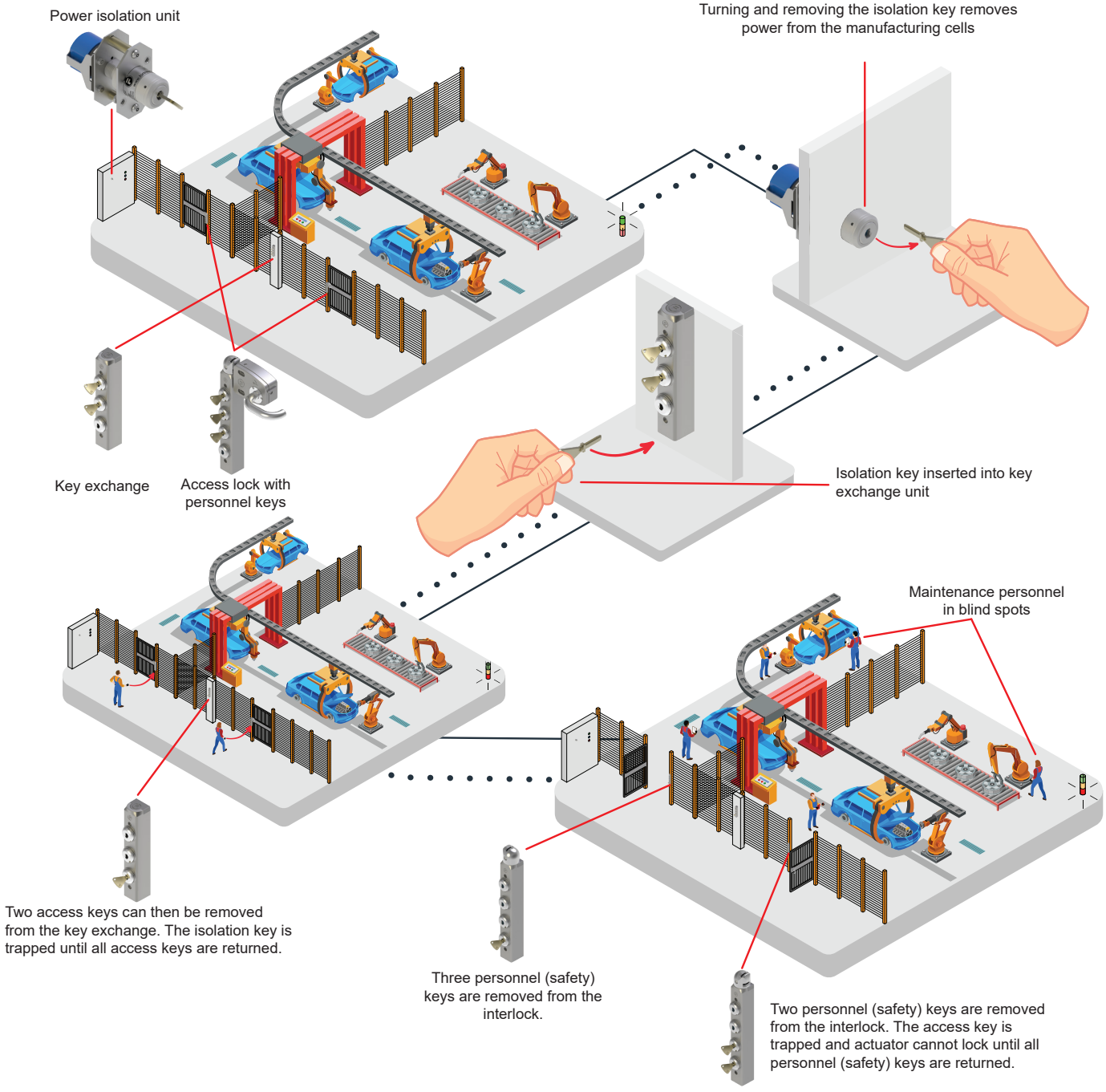
Customised Safety Solutions as Standard:

- Combines interlocking and control.
- Quick Disconnects as standard (terminal wired option available).
- Fast on-site handing change.
- Choice of operating handles for both hinged and sliding guard doors.
- High Level Coded RFID option.

Application Requirement:

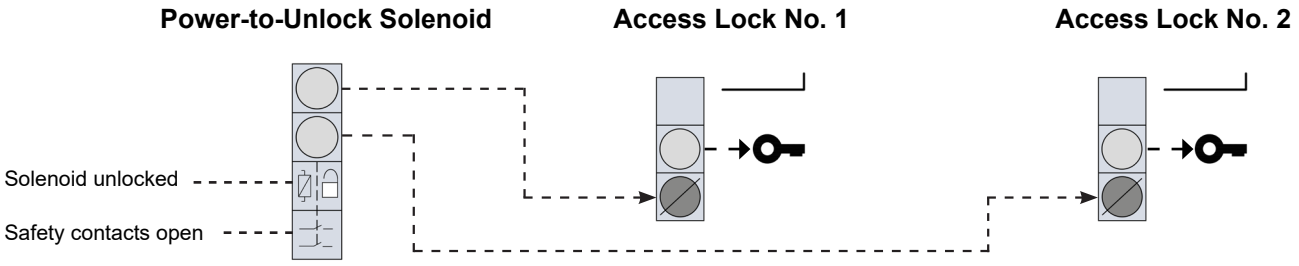
Due to the size of the safeguarded space surrounding body transfer lines in an automotive plant, there are blind spots where maintenance personnel could be performing work unknown to a line operator requesting the line to run. This could lead to the line running while maintenance personnel are still working within the cell. To avoid this, access to the transfer line can only be permitted when power has been isolated. Additionally, power cannot be restored until after all personnel have exited the safeguarded space and have returned their keys to the interlock.

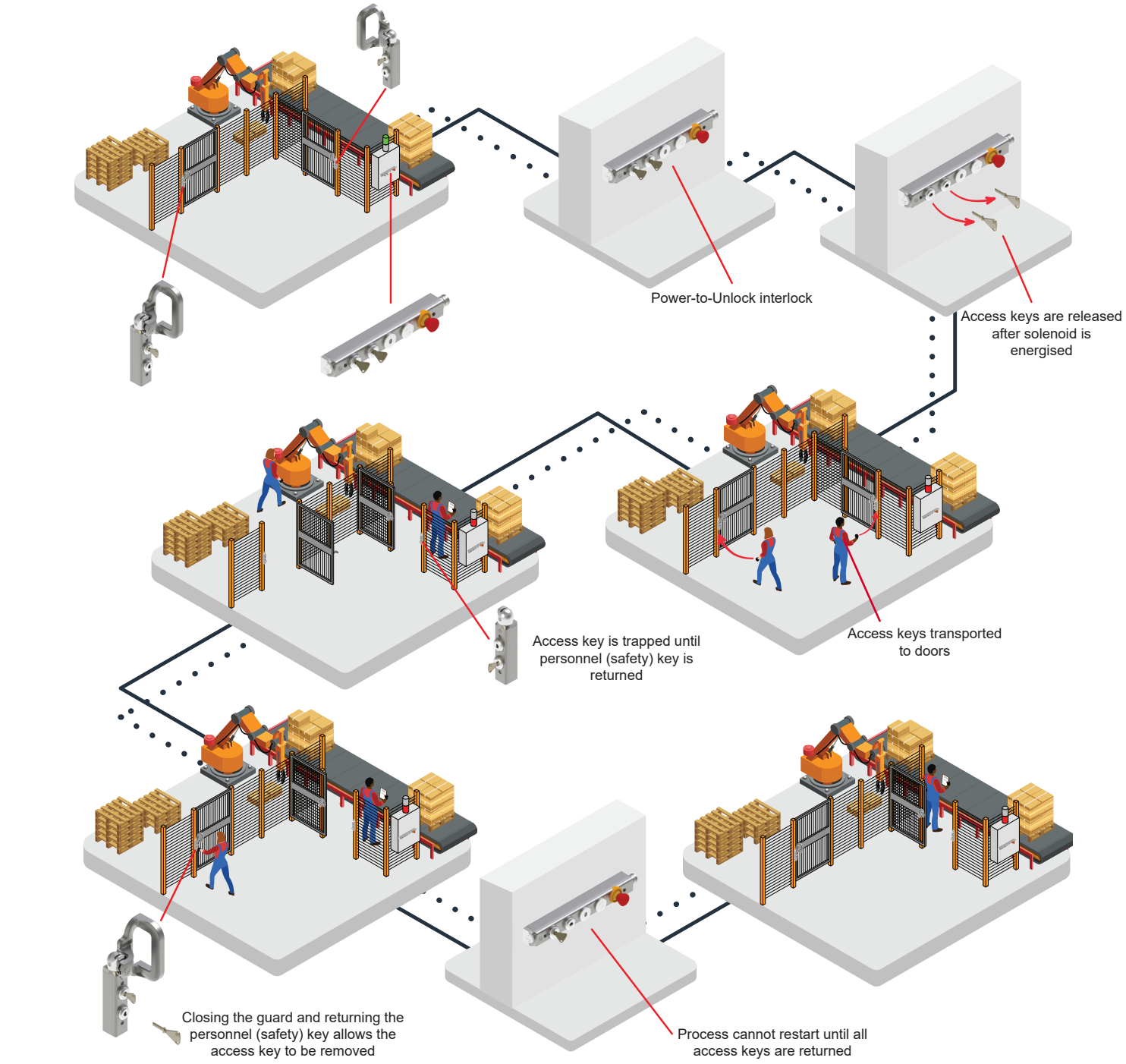




Application Requirement:

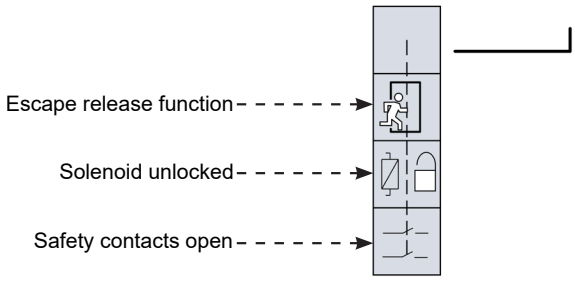
Robots require safeguarding measures during operation and when carrying loads. The robotic palletiser below has two access points and a single central control panel. When the interlock's Power-to-Unlock solenoid is energised and access keys for the access points are released. Mechanical interlocks on the moveable guards can be opened with an access key with each access lock providing a personnel (safety) key for the operator to take inside the cell to prevent restart.

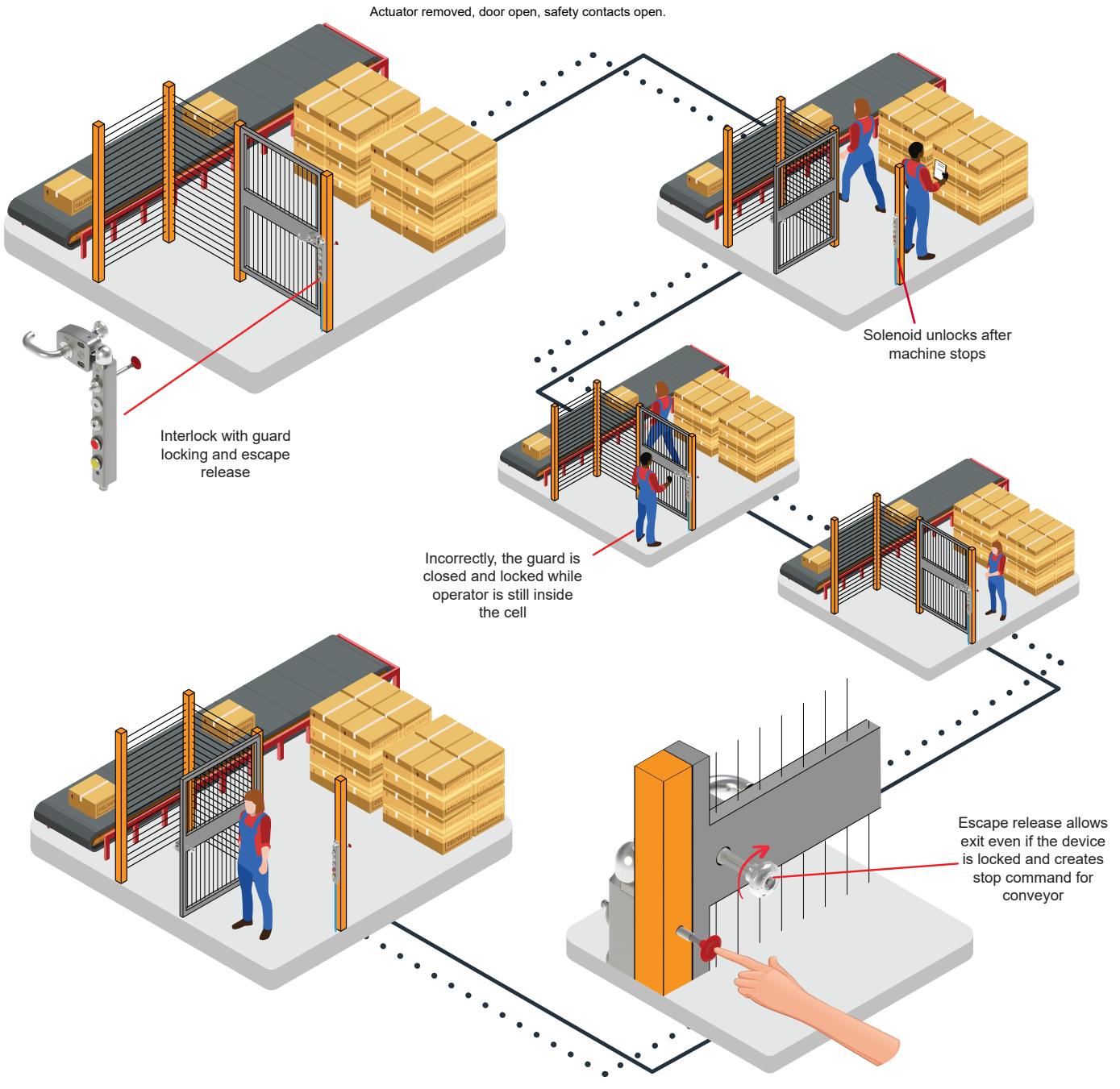




Application Requirement:
The conveyor system in an automated warehousing application below is safeguarded by interlocked guards. Access is required to remove incorrect packages or clear blockages on the conveyor. The interlock with guard locking keeps the guard locked until the conveyor is stopped. An escape release ensures any operator who becomes trapped within the safeguarded space can exit.

Interlock with Guard Locking





Interlock (Safety Switch)

2NC, 1NO safety contacts.

THESMQ3

Interlock with High Level Coded RFID and integrated operator controls

Personnel (safety) key available for operator to carry.

THHSNSMDUEMP6NRQ9

Interlock with Guard Locking

Power-to-Unlock solenoid with safety contacts.

THFSMDUQM

Interlock with Trapped Key and operator controls

Access restricted to key holders, personnel (safety) key available for operator to carry.

THSSNABSMDUEDP6P7P2Q8

Interlock with Guard Locking and Escape Release

Power-to-Unlock solenoid with safety contacts. Escape release overrides locking mechanism and creates stop command.

THERXSMDUQM

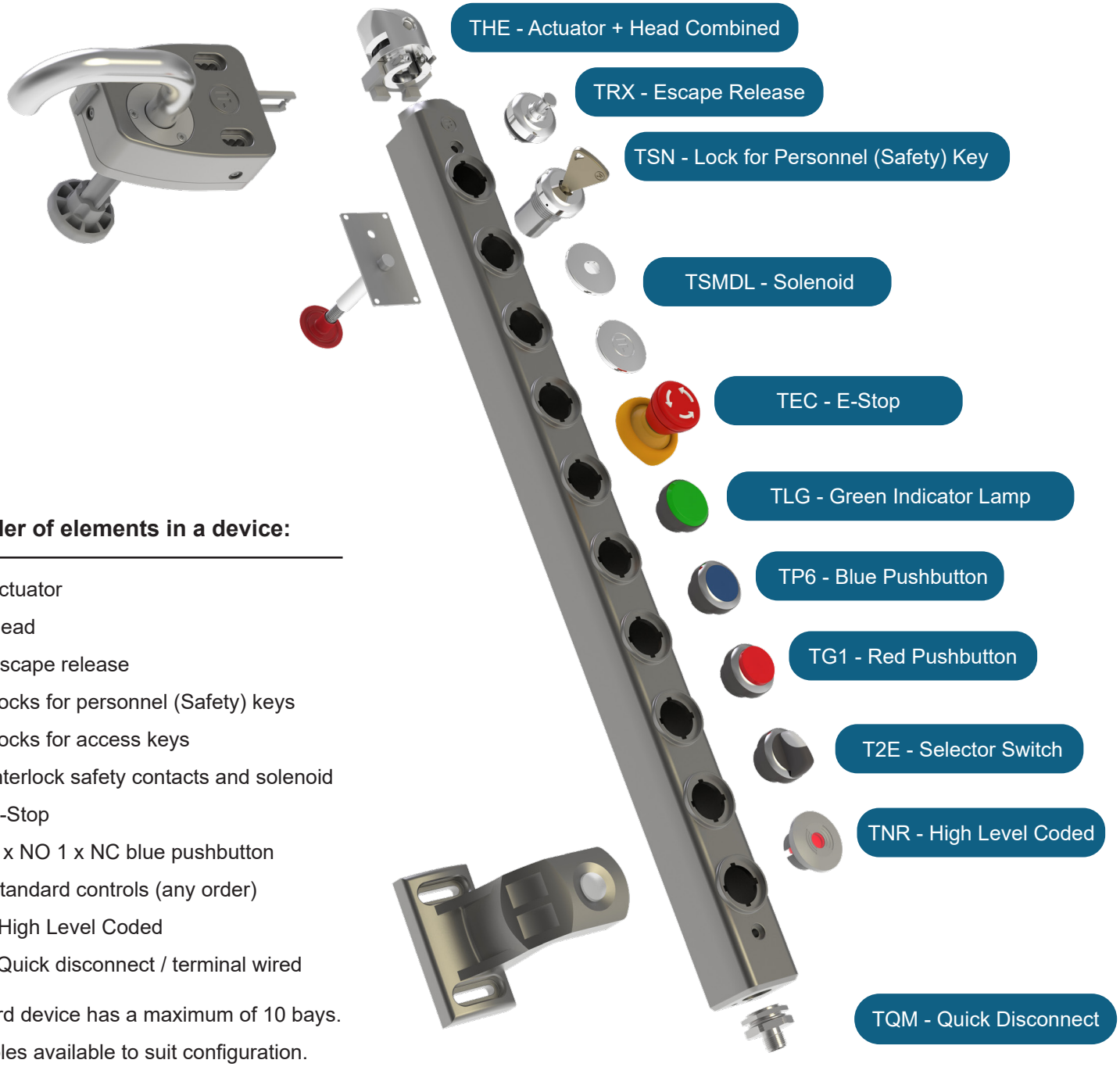
Control Station

Control Station with emergency stop, indicator lamp and pushbuttons.

THCETLGP7P3P1Q8

How to Configure

Configuration tools are available on the Fortress website, www.fortress-safety.com



Order of elements in a device:

1. Actuator
2. Head
3. Escape release
4. Locks for personnel (Safety) keys
5. Locks for access keys
6. Interlock safety contacts and solenoid
7. E-Stop
8. 1 x NO 1 x NC blue pushbutton
9. Standard controls (any order)
10. High Level Coded
11. Quick disconnect / terminal wired

tGard device has a maximum of 10 bays.

Cables available to suit configuration.

Configuration Example

At the end of the selection process, the part numbers drop their “T”, except the first item. Example:

THE + TRX + TSN +TSMDL + TEC + TLG + TP6 + TG1 + T2E + TEB + TQM = THERXSNSMDLECLGP6G12ENRQM

When creating a tGard stack, the wiring of connections follow these rules:

1. Safety circuits are in fixed positions on each connector and comprise of volt free circuits for SSR options, or are +24V taken from the supply voltage for OSSD.
2. Inputs / outputs are allocated from the bottom of the stack, ascending.
3. On any one element, the inputs are assigned first, then the output(s).
4. Outputs are +24v, taken from the +24v supply, except for volt free options.
5. Selection of the connector depends upon the wiring requirements for inputs / outputs / safety circuit of the total stack.

tGard Range

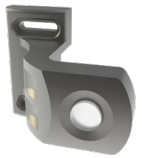
Actuators

Fixed Actuator

Hinged Actuator

Sliding Actuator

High Coded Actuator



Handle Actuator (No Internal knob)

Handle Actuator

Heads

Cap

Head

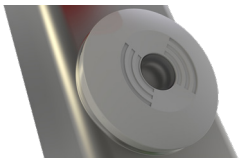
Core Elements

Escape Release

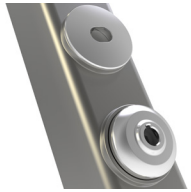
Lock for Personnel (Safety) Keys

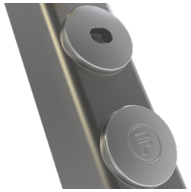
Lock for Access Keys

High Level Coded



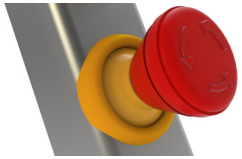
Interlock Safety Contacts & Solenoid Locking





Extension Blank Element

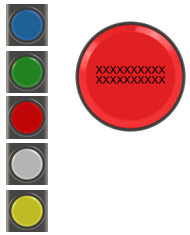
Emergency Stops



Blue Pushbutton with 1xNO & 1xNC Contacts

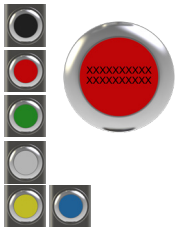
Core Elements

Indicator Lamps



Non-Illuminating Switches

Pushbuttons



2 Position Selector Switch

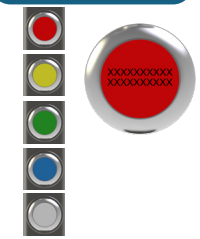
2 Position Selector Key Switch

Mushroom Pushbutton

3 Position Selector Switch

Illuminating Switches

Pushbuttons



2 Position Selector Switch

3 Position Selector Switch

Base Elements

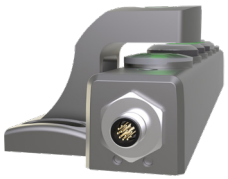
Safety & Control Quick Disconnect Connectors

Foot

Self Wire

AS- interface

OSSD



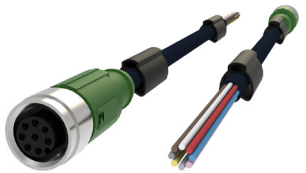
Keys & Accessories

Keys

Padlockable Hasp

Teach Token

Cables



For more information on the padlockable hasp see head & cap element operating instructions.

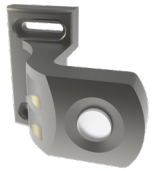
Step 1: Actuators

TAF
Fixed Actuator

All Actuators to be used in combination with a THM head module.

TAH
Handle Actuator - Hinged Door

TAS
Handle Actuator - Sliding Door



TNH
High Coded Actuator

Actuator comes as standard with an High Level Coded RF element

TEN
Handle Actuator - (no internal knob)

TEH
Handle Actuator

The internal knob on TEH handle does not release the solenoid or lock. A TRX/Z (escape release element) must be used to deliver that functionality.

Step 2: Head Modules

You can combine an actuator with a head to generate a single part number.

THC
Cap

THM
Head

THM + TAF = THF
Head module including fixed actuator

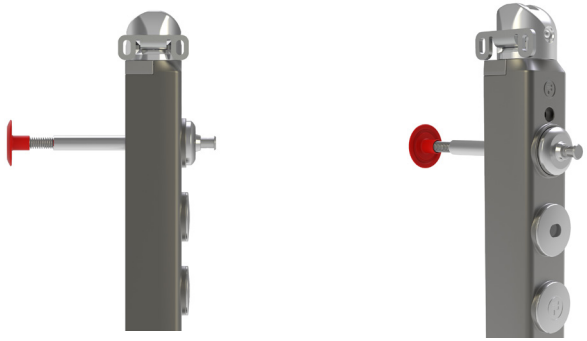
THM + TAH = THH
Head module including hinged actuator

THM + TAS = THS
Head module including sliding actuator

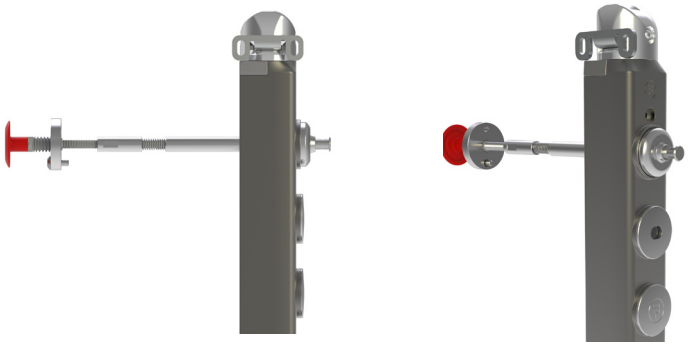
THM + TEN = THN
Head module including handle actuator (No internal knob)

THM + TEH = THE
Head module including handle actuator

Step 3: Escape Release



TRX
Standard 60mm Escape Release



TRZ
Variable length Escape Release

Extended version available (TRZ) - < 300mm.

Step 4: Personnel (Safety) & Access Lock Element

TSN
Standard Personnel (Safety) Lock (No Key)*

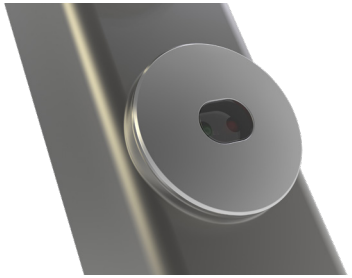
TGN
Master Personnel (Safety) Lock (No Key)*

TAB
Standard Access Lock (No Key)*

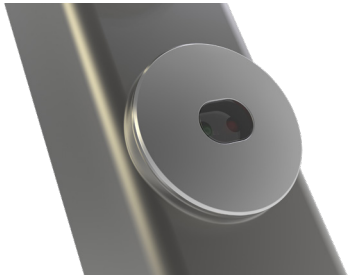
TQB
Master Access Lock (No Key)*

*All keys need to be ordered separately.

Step 5: Safety Contacts for Interlock Safety Switches



TSM
Safety Contacts



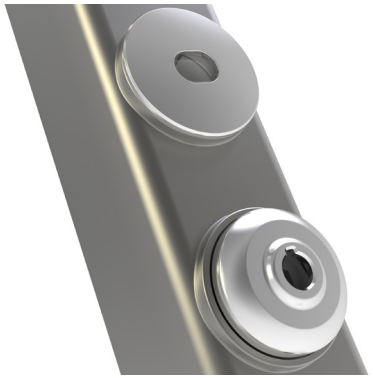
TSP
Safety contacts
with extra retention force

TSS
Safety contacts -
No N/O monitor contact

Location of safety contacts in stack is first element after all mechanical elements (head, internal release and locks).

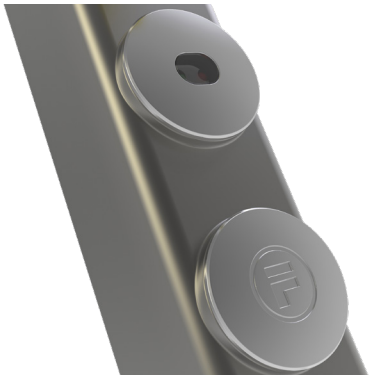
Step 6: Safety Contacts for Interlock Safety Switches with Solenoid Controlled Guard Locking

90% of customers select TSMDU.



TSMDU/L
Head & solenoid safety contacts in series
TSMDU (Power-to-Unlock)
TSMDL (Power-to-Lock)

TSMEU/L
Safety contacts on head element only
TSMEU (Power-to-Unlock)
TSMEL (Power-to-Lock)



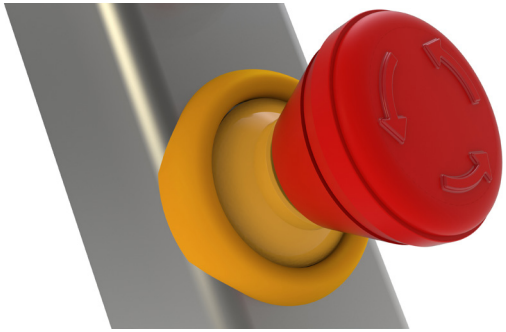
TSSEL
Safety contacts on head element only (no monitoring contact on head)
TSSEL (Power-to-Lock)

Step 7: Extension Blank Element

TEB
Extension Blank Element

Can be used to blank any unused bays in a configuration

Step 8: Emergency Stop Element



TEC, TET, TEM, TEP, TEI
Emergency stop element, version available with a monitoring contact or illumination

An E-Stop is always located below any lock or safety contact elements. An E-Stop is located above any control elements, apart from TEM & TEI E-Stops which are at the bottom of the device.

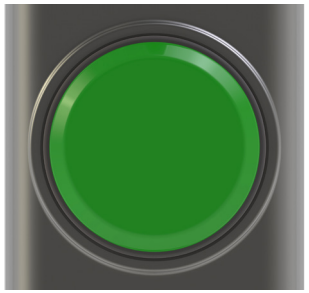
Step 9: Blue Pushbutton with 1xNO & 1xNC Contacts

TSR
Blue Pushbutton with 1xNO & 1xNC Contacts

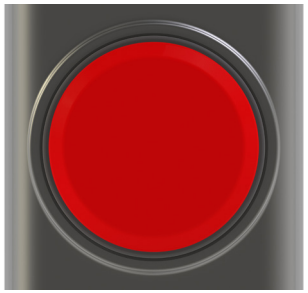
Location of Blue pushbutton with 1xNO & 1xNC Contacts in stack is highest control element after E-Stop's.

Step 10: Indicator Lamp Element

TLB
Indicator Lamp Element - Blue

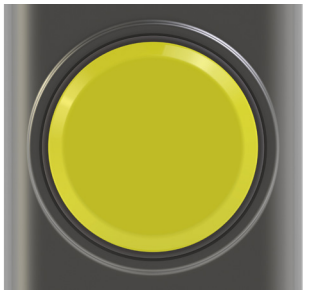


TLG
Indicator Lamp Element - Green



TLR
Indicator Lamp Element - Red

TLW
Indicator Lamp Element - White



TLY
Indicator Lamp Element - Yellow

Step 11a: Non-Illuminating Switches

TPB
1 N/O Pushbutton - Black

TPR
1 N/O Pushbutton - Red

TPG
1 N/O Pushbutton - Green

TPW
1 N/O Pushbutton - White

TPY
1 N/O Pushbutton - Yellow

TPZ
1 N/O Pushbutton - Blue

T2A
2 Position Selector Switch - Latching

T2V
2 Position Selector Switch - 1 N/O & 1 N/C

TK5
2 Position Selector Key Switch - Latching

TMB
1 N/O Mushroom Pushbutton - Black

T3D
3 Position Selector Switches - Momentary

T3H
3 Position Selector Switches - Momentary/Latching

Step 11b: Illuminating Switches

TP1
Pushbutton - Red

TP2
Pushbutton - Yellow

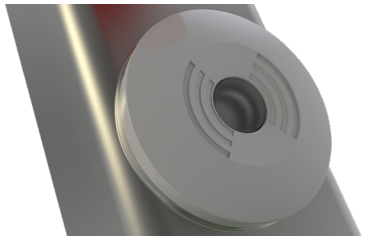
TP3
Pushbutton - Green

TP6
Pushbutton - Blue

TP7
Pushbutton - White

Please see operating instructions for a full range of options.

Step 12: RF Element



I am daisy chaining my unit to operate in series

No

I want to save on cable costs (less cores in my cables)

No

I am hardwiring my unit

Yes

Yes

Yes

Want to save more on your cabling, installation, safety validation and more... Why not check out our Ethernet enabled amGard*pro* range?

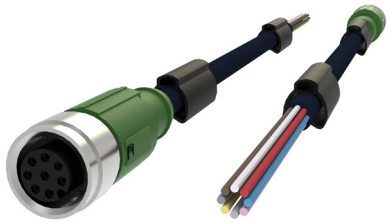
Head (Actuator Locking)

OSSD with Daisy Chain

OSSD without Daisy Chain

SSR

TNC — **TNB** — **TNA**



No Head (Non Contact)

TNT — **TNS** — **TNR**

Step 12a: Safety & Control Connectors

SC = Safety Circuits
I/O = Inputs / Outputs

5 Pin M12 QD

TQ1	2 SC

8 Pin M12 QD

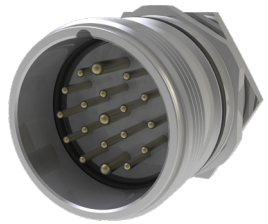
TQ2	5 I/O
TQ3	2 SC, 1 I/O
TQG	OSSD, 2 SC, 3 I/O

12 Pin M12 QD

TQL	9 I/O
TQM	2 SC, 5 I/O
TQO	OSSD, 2 SC, 7 I/O

12 Pin M23 QD

TQ4	9 SC
TQ5	2 SC, 5 I/O
TQH	OSSD, 2 SC, 7 I/O

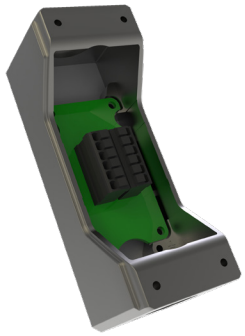


19 Pin M23 QD

TQ8	2 SC, 12 I/O
TQ9	4 SC, 8 I/O
TQJ	OSSD, 2 SC, 14 I/O
TQQ	OSSD, 4 SC, 10 I/O

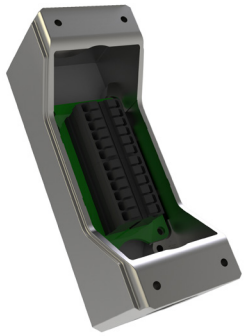
Step 12b: Foot, Self Wire Connectors, AS-interface

TBF
Foot Element



12 Terminals

TW1	2 SC, 6 I/O
TW7	OSSD, 2 SC, 8 I/O

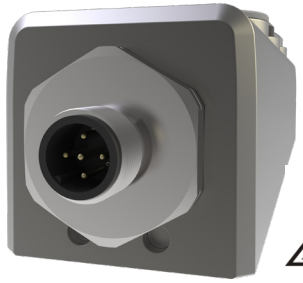


24 Terminals

TW3	4 SC, 14 I/O
TW8	OSSD, 4 SC, 16 I/O

TW4
24 Terminals

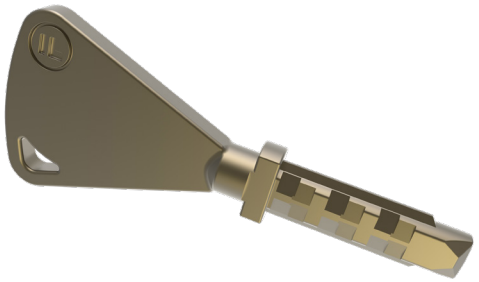
TW4	6 SC, 10 I/O
TW9	OSSD, 6 SC, 12 I/O



TEBB4
Up to 2 AS-i nodes

TEBB8
Up to 4 AS-i nodes

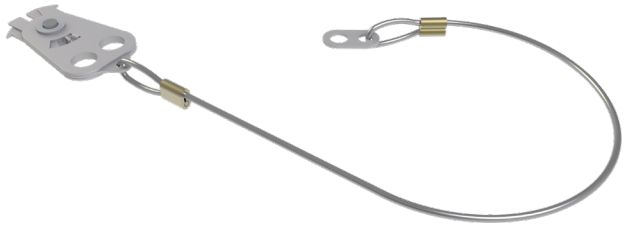
Step 14: Keys



TKS
Standard Key

TKM
Master Key

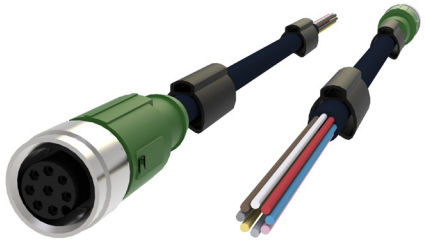
Step 15: Accessories



TLO
Padlockable Hasp

Allows interlock blocking of tGard device. Padlocks / hasps lock the interlock open.

TNX
Teach Token for High Level Coded RF Element



CABLE - ■ M - TQ ■

Cable Length (m)

2
5
10
20

Safety & Control Connector

1	2	L	4	8
	3	M	5	9
	G	O	H	J
				Q

FORTRESS

FORTRESS

> We have the peace of mind that our workers are safe and protected by Fortress equipment.

FORTRESS

> Fortress' best quality is providing each customer the most robust and safe solution - all while being completely customizable and retaining a high level of quality.

FORTRESS

> Fortress is best at providing customised solutions at a rapid turnaround - reacting immensely to a challenge to put the customer's needs first.

FORTRESS

> We value suppliers that can help navigate the standards and provide guidance that is directly linked to our applications.

Fortress Global Offices and Manufacturing Facilities

www.fortress-safety.com

Fortress Interlocks Ltd
+44 (0)1902 349000

Fortress Interlocks Europe
+31 (0)10 7536060

Fortress Interlocks USA
+1 (859) 578 2390

Fortress Interlocks Pty Ltd
+61 (0)3 9771 5350

Fortress Interlocks China
+86 (021) 6167 9002

Fortress Interlocks India
+91 7042358818

Contact us

Notes

Rolf Muri AG • Einsiedlerstrasse 533 • CH-8810 Horgen
Telefon 044 727 99 00 • Telefax 044 727 99 01
office@rolfmuri.ch • www.rolfmuri.ch

PROBLEMLÖSUNGEN MIT SYSTEM