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# Emergency stops and pilot devices




- 6-2**            **Introduction and overview**
  
- 6-6**            **Emergency stop buttons**  
**Smile, INCA, EStrong and Compact**
  
- 6-16**          **Safety stop buttons**  
**Smile, INCA, and Compact**
  
- 6-24**          **Pull wire emergency stop switch**  
**LineStrong**
  
- 6-34**          **Push-button box**  
**Smile 41**
  
- 6-40**          **Reset button**  
**Smile**
  
- 6-46**          **Pilot devices**  
**Modular and Compact range**

# Introduction and overview

## Selection guide

ABB offers a full range of buttons and pull wires for emergency stop functions, as well as pilot devices for e.g. reset functions.

	Emergency stop buttons	Safety stop buttons	Reset buttons
<b>Name</b>	Smile, Inca, EStrong, Compact	Smile, Inca, Compact	Smile
<b>Image</b>			
<b>Description</b>	Emergency stop buttons for external mounting and panel mounting in different sizes and material	Safety stop buttons for external mounting and panel mounting	Small and easy to install reset button
<b>Applications</b>	Safely stop dangerous machine functions	Safely stop a limited part of a dangerous machine	Pushbutton for resetting safety devices
<b>Advantages</b>	Models with: <ul style="list-style-type: none"> <li>- Compact size</li> <li>- Robust enclosure for harsh environments</li> <li>- Quick installation with M12 connectors</li> <li>- LED indication</li> </ul>	Models with: <ul style="list-style-type: none"> <li>- Compact size</li> <li>- Robust enclosure for harsh environments</li> <li>- Quick installation with M12 connectors</li> <li>- LED indication</li> </ul>	<ul style="list-style-type: none"> <li>- Compact size</li> <li>- Quick installation</li> <li>- M12 connector</li> <li>- LED indication</li> </ul>

	Pull wire emergency stop switches	Push button boxes	Pilot devices
<b>Name</b>	<b>LineStrong</b>	<b>Smile 41</b>	<b>Modular range, compact range</b>
<b>Image</b>			
<b>Description</b>	Emergency stop switches in robust enclosures for pull wires of various lengths.	Gathers up to four push buttons, including emergency stop, in a single compact device	Push buttons, selector switches, pilot lights, joysticks and signal towers in a compact and robust design
<b>Applications</b>	Emergency stop line to safely stop conveyor belts and long transportation lines.	Emergency stop and pushbuttons in one device	For control and indication of machines and processes
<b>Advantages</b>	<ul style="list-style-type: none"> <li>- Up to 200 m wire with one switch</li> <li>- Reliable mechanical connection</li> <li>- Robust construction</li> </ul>	<ul style="list-style-type: none"> <li>- Compact size</li> <li>- Quick installation</li> <li>- M12 connector</li> <li>- LED indication</li> <li>- Highly adaptable with several button colors</li> </ul>	<ul style="list-style-type: none"> <li>- Compact size</li> <li>- Up to IP69K</li> <li>- Long life-time thanks to self-cleaning contacts</li> <li>- Quick snap-on design for simple installation without tools</li> </ul>

## Introduction and overview

### Selection orientation

#### Why an emergency stop is necessary

If a machine breaks down or if someone is in danger, anyone should be able to stop the machine, regardless of their knowledge of the specific application.



#### When a safety stop could be used

A safety stop (also called machine stop) should be used to safely stop a part of the machine, e.g. as a stop for an individual hazardous motion. It should not be used as an emergency stop and stop the complete machine. Likewise, an emergency stop with red push button must not be used as a safety stop.



In order to separate the safety stop function from the emergency stop function, the safety stop buttons should be colored black.

#### When a pull wire emergency stop could be used

A pull wire emergency stop is easier to install than a system of several emergency stop buttons along a carriage path which makes it ideal for installations over long distances. LineStrong can handle wires up to 200 m on one single switch and the emergency command can be initiated from any point along the installed wire length.



## Introduction and overview

### Standards

Important standards to follow when implementing emergency stop functions are e.g. EN ISO 13850 and EN ISO 60204-1.

#### Stop categories

The following stop categories are defined in the standards:

Stop Category 0	stopping by immediate removal of power to the machine actuators
Stop Category 1	a controlled stop with power available to the machine actuators to achieve the stop and then removal of power when the stop is achieved
Stop Category 2	a controlled stop with power left available to the actuators

Note that these categories should not be confused with the categories used to describe the architecture when calculating PL in EN ISO 13849. The risk assessment should determine which stop category to use, but stop category 2 is normally considered not to be suitable for emergency stops.

#### Text and symbols

Neither the emergency stop nor its background should be labelled with text or symbols. It has previously been common with white arrows indicating the direction of unlatching, but this is not allowed anymore.

#### Location and signs

The risk assessment should determine the locations of the emergency stop buttons, but they should in general be placed at operator stations, at locations where man/machine interaction is required and at entry/exit points. Signs to mark the location of emergency stops are not required, but if used they should be green with white markings.

# Emergency stop buttons

## Smile, INCA, EStrong and Compact

Emergency stop buttons are used to safely stop dangerous machine functions.

ABB offers a wide range of emergency stop buttons for external mounting or panel mounting, with plastic or metal housing and for different types of connections.



Easy to install

### Compact size

Models with a compact and appealing housing saves space and makes it easy to place.

### Quick installation

Quick and easy installation of models with features such as centered mounting holes, removable terminal blocks and M12 connectors.

### Serial connection

Tina models save cable length and installation time with serial connection.



Optimum interface

### Highly adaptable

Several models to choose between depending on position, installation and function.

### Reliable in extreme conditions

Robust models and models in stainless steel for use in demanding environments.



Continuous operation

### LED diagnostics

Models with integrated LED diagnostics reduce downtime when troubleshooting.

## Models and application

### Emergency stop buttons

#### Models for external mounting

##### Smile

Smile is a small and easy to install emergency stop button. Its size allows mounting in reduced spaces, and its centered mounting holes makes it especially easy to mount on aluminum extrusions (e.g. Quick-Guard fencing system). Smile is available with M12 connectors or cable.

Smile has an integrated LED in the button that shows the status and simplifies error tracking.

The standard models of Smile have 2 contacts and can be used with safety controllers from all brands. Smile Tina models belong to the ABB DYNlink solution, with the advantages of serial connection using only one channel and still reaching Cat. 4/PL e.



##### Compact

Compact emergency stop buttons offer a robust enclosure with a high IP rating that fulfill the demands in severe and humid environments, such as food and beverage industry. Compact can be fitted with a Tina adapter for use in a DYNlink solution (Tina 2A, Tina 2B or Tina 3A).



##### EStrong

EStrong is an emergency stop button designed to provide a robust unit in exposed and severe environments. The unit has a stainless steel enclosure with IP69K rating that withstands high pressure and high temperature wash-down. It is therefore ideally suited for industries with special demands, such as food processing or chemical industry.



#### Models for panel mounting

##### INCA

INCA is an emergency stop button for panel mounting, designed for installation in 22.5 mm holes. Its removable terminal block facilitates connection and exchange.

INCA has an integrated LED in the button that shows the status and simplifies error tracking.

The standard model of INCA has 2 contacts and can be used with safety controllers from all brands. INCA Tina models belongs to the ABB DYNlink solution, with the advantages of serial connection using only one channel and still reaching Cat. 4/PL e.



##### Smile Reverse

Smile Reverse is identical to the regular Smile emergency stop button besides from being reversed in order to be mounted on the back side of a panel. Smile Reverse has an IP65 housing that makes it suitable in panels where moisture and dust may occur.

Smile Reverse has an integrated LED in the button that shows the status and simplifies error tracking.

The standard model of Smile Reverse has 2 contacts and can be used with safety controllers from all brands. The Smile Reverse Tina model belongs to the ABB DYNlink solution, with the advantages of serial connection using only one channel and still reaching Cat. 4/PL e.



## Application

Emergency stop buttons are used to safely stop a dangerous machine function in order to prevent an accident, or minimize the consequences of an accident. An emergency stop should be a complement to other safety devices, and not a replacement for them.



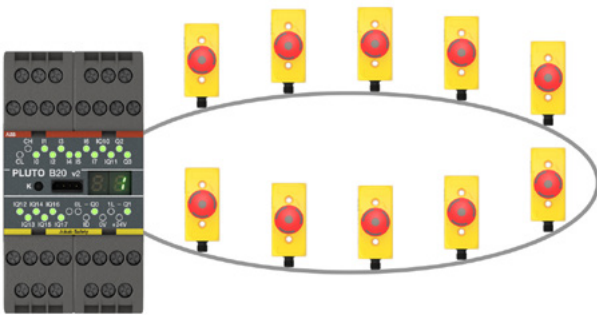
## Features

### Emergency stop buttons

### Communication features

#### DYNlink

Emergency stop buttons with Tina in their name belong to the DYNlink solution, which enables serial connection using only one channel and still reaching Cat. 4/PL e. DYNlink devices must be used with Vital safety controller or Pluto programmable safety controller. Up to 30 DYNlink devices can be connected in series to Vital and up to 10 can be connected to each input on Pluto.



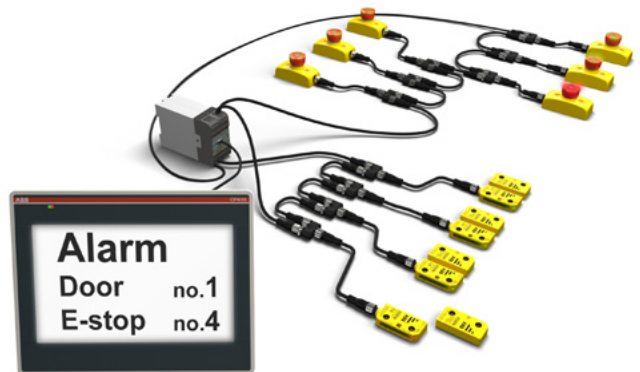
#### AS-i

Smile is available in a model compatible with the AS-i safety bus. Smile AS-i can be used with any AS-i monitor. AS-i is a bus system that offers a very simple connection of up to 31 safety devices to one monitor according to PL e and makes it easy to move, remove and add safety devices. When Smile AS-i is used with Pluto programmable safety controller, no other AS-i master or monitor is necessary, and no specific knowledge of AS-i is required.



#### StatusBus

StatusBus is a simple and cost effective way to collect the status information of emergency stops and safety sensors. The StatusBus functionality is available with some DYNlink devices and allows to collect the status of each individual safety device, even when connected in series. A Pluto programmable safety controller must be used to read the StatusBus information, and a single input on Pluto can collect the status of up to 30 safety devices. The devices are connected using standard cable and M12-5 connectors. No specific bus cable or extra communication module is necessary.





## Ordering information

### Emergency stop buttons



2TLC12863F0201

Smile 10 EA Tina



2TLC12857F0201

Smile 11 EC Tina



2TLC1287F0201

Smile 12 EA



ABB Compact emergency stop shroud



2TLC1288F0201

EStrongZ and EStrongZ LED



2TLC12861F0201

Smile 11 EAR



2TLC12863F0201

INCA 1

#### External mounting

Description	Type of safety signal	Connection type	Feature	Type	Order code
Compact size Plastic housing IP65	DYNlink	1 m cable from bottom	Status LED	Smile 10 EA Tina	2TLA030050R0400
		1 x M12-5 male	Status LED	Smile 11 EA Tina	2TLA030050R0000
		1 x M12-5 male	Status LED, StatusBus	Smile 11 EC Tina	2TLA030050R0900
		2 x M12-5 male	Status LED	Smile 12 EA Tina	2TLA030050R0200
	AS-i	1 x M12-4 male	Status LED	Smile 11 EA AS-i	2TLA030052R0000
	2 NC	1 m cable from bottom	Status LED	Smile 10 EA	2TLA030051R0400
		1 m leads from bottom	-	Smile 10 EK	2TLA030051R0600
		1 x M12-5 male	Status LED	Smile 11 EA	2TLA030051R0000
2 x M12-5 male		Status LED	Smile 12 EA	2TLA030051R0200	
Plastic housing IP66, IP67 and IP69K	2 NC*	2 x M20 conduits	-	CEPY1-1002 (Compact)	1SFA619821R1002
			With shroud	CEPY1-2002 (Compact)	1SFA619821R2002
Metal housing IP67 and IP69K	2 NO + 2 NC	3 x M20 conduits	Status LED	EStrongZ LED	2TLA050220R0222
			-	EStrongZ	2TLA050220R0020

\* Can be adapted to DYNlink with Tina

#### Panel mounting

IP rating	Depth	Connection type	Type of safety signal	Feature	Type	Order code
IP65	26 mm	1 x M12-5 male	DYNlink	Status LED	Smile 11 EAR Tina	2TLA030050R0100
			2 NC	Status LED	Smile 11 EAR	2TLA030051R0100
Button IP65, connector IP20	53 mm	Removable terminal block	DYNlink	Status LED	INCA 1 Tina	2TLA030054R0000
				Status LED, StatusBus	INCA 1 EC Tina	2TLA030054R1400
			2 NC	Status LED	INCA 1	2TLA030054R0100

## Accessories

### Emergency stop buttons



2TLC123034V0201

M12-3S



2TLC12471F0201

Tina 8A



2TLC12906F0201

E-sign 22.5

#### Connection accessories

Description	Type	Order code
<b>Connection accessories</b>		
M12 Y-connector for serial connection of device with StatusBus functionality.	M12-3S	2TLA020055R0600
M12 Y-connector for serial connection of devices without StatusBus functionality.	M12-3A	2TLA020055R0000
Connection block for the serial connection of up to 4 DYNlink devices with 12-5 connectors.	Tina 4A	2TLA020054R0300
Connection block for the serial connection of up to 8 DYNlink devices with 12-5 connectors.	Tina 8A	2TLA020054R0500
Adaptation unit for DYNlink solution with M20 fitting. For e.g. Compact.	Tina 2A*	2TLA020054R0100
Adaptation unit for DYNlink solution, internal assembly. For e.g. Compact.	Tina 2B*	2TLA020054R1100
Adaptation unit for DYNlink solution with M20 fitting and M12 connector. For e.g. connecting Compact to Pluto/Vital.	Tina 3A*	2TLA020054R0200
Termination for Smile 12	JST2	2TLA030051R1300

#### Accessories

Emergency stop sign, yellow, no text, for INCA (22.5mm)	E-Sign 22.5	2TLA030054R0900
Emergency stop sign, yellow, no text, for Smile (32.5mm)	E-Sign 32.5	2TLA030054R1000
Yellow surround for Inca	Surround for Inca	2TLA030054R0400
Yellow shroud for Compact	CA1-8053	1SFA619920R08053
Stainless steel cable gland, for EStrong	Gland M20x1.5	2TLA050040R0002
Stainless steel conduit plug, for EStrong	Conduit Plug M20x1.5	2TLA050040R0004
LED Green/Red 230 VAC, for EStrong	LED 230	2TLA050211R0003

\* For more information about Tina adapter units, please see Pluto and Vital chapters.

#### Cable with connectors

Connector	Female/male	Length	Special feature	Type	Order code
M12-5	Female	3 m		M12-C31	2TLA020056R0500
		6 m		M12-C61	2TLA020056R0000
		10 m	Harsh environment, halogen free	M12-C61HE	2TLA020056R8000
		10 m		M12-C101	2TLA020056R1000
		20 m	Harsh environment, halogen free	M12-C101HE	2TLA020056R8100
		20 m		M12-C201	2TLA020056R1400
	Female + male	0.3 m		M12-C0312	2TLA020056R5800
		0.06 m		M12-C00612	2TLA020056R6300
		1 m		M12-C112	2TLA020056R2000
		3 m		M12-C312	2TLA020056R2100
		6 m		M12-C612	2TLA020056R2200
		10 m		M12-C1012	2TLA020056R2300
			Angled female connector	M12-C1012V2	2TLA020056R6700
		16 m		M12-C1612	2TLA020056R5400
		20 m		M12-C2012	2TLA020056R2400
Male	6 m		M12-C62	2TLA020056R0200	
	10 m		M12-C102	2TLA020056R1200	



2TLC125951F0201

M12-C61



2TLC010003F0201

M12-C61HE



2TLC179657F0201

**M12-C01**

2TLC00098F0201

**C5 cable**


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**Separate cables and connectors**

Description	Type	Order code
<b>Connectors</b>		
M12-5 pole female, straight	M12-C01	2TLA020055R1000
M12-5 pole male, straight	M12-C02	2TLA020055R1100
<b>Cable with 5 conductors</b>		
10 m cable with 5 x 0.34 shielded conductors	C5 cable 10 m	2TLA020057R0001
50 m cable with 5 x 0.34 shielded conductors	C5 cable 50 m	2TLA020057R0005
100 m cable with 5 x 0.34 shielded conductors	C5 cable 100 m	2TLA020057R0010
200 m cable with 5 x 0.34 shielded conductors	C5 cable 200 m	2TLA020057R0020
500 m cable with 5 x 0.34 shielded conductors	C5 cable 500 m	2TLA020057R0050

## Technical data

### Emergency stop buttons

#### Technical data

##### Approvals

Smile, INCA



Smile Tina, INCA Tina



Smile AS-i



EStrong



Compact



##### Conformity

Smile, INCA



2006/42/EC – Machinery  
 2011/65/EU - RoHS  
 EN ISO 12100:2010, EN ISO 13849-1:2008/AC:2009, EN 60204-1:2006+A1:2008, EN ISO 13850:2008

Smile Tina, INCA Tina



2006/42/EC - Machinery  
 2004/108/EC - EMC  
 EN ISO 12100:2010, EN ISO 13849-1:2008, EN 62061:2005, EN 60204-1:2006+A1:2009, IEC 60664-1:2007, EN 61000-6-2:2005, EN 61000-6-4:2007, EN 60947-5-5:2005, EN ISO 13850:2006

Smile AS-i



2006/42/EC - Machinery  
 EN ISO 12100:2010, EN ISO 13849-1:2008/AC:2009, EN ISO 13849-2:2012, EN 60204-1:2007+A1, EN ISO 13850:2008, IEC 60947-5-5:2005

EStrong



2006/42/EG – Machinery  
 2011/65/EU - RoHS  
 EN ISO 12100:2010, EN ISO 13850:2015, EN 60204-1:2006+A1:2009+AC:2010, EN 60947-5-5:1997+A1:2017, EN 60947-5-1:2004+A1:2009

Compact



2006/42/EC - Machinery  
 2014/30/EU - EMC  
 EN 60947-1:2007/A1:2011/A2:2014, EN 60947-5-1:2004/A1:2009, EN 60947-5-5:1997/A1:2005/A11:2013, EN ISO 13850:2008

##### Functional safety data

EN 61508:2010

Up to SIL3, depending on system architecture

EN 62061:2005

Up to SILCL3, depending on system architecture

EN ISO 13849-1:2008

Up to Cat. 4, PL e, depending on system architecture

Smile, INCA

 $B10_d = 100\ 000$ 

Smile Tina, INCA Tina

 $PFH_D = 4.66 \times 10^{-9}$ 

Smile AS-i

 $PFH_D = 1.69 \times 10^{-9}$ 

EStrong

 $B10_d = 1\ 500\ 000$ 

Compact

 $B10_d = 250\ 000$

## Technical data

### Emergency stop buttons

#### Technical data

##### Electrical data

###### Operating voltage

Smile, INCA	17-27 VDC $\pm$ 10%
Smile Tina, INCA Tina	+24 VDC +15% -25%
Smile AS-i	+30 VDC from the AS-i bus. Tolerances 26.5 - 31.6 VDC
EStrong	230 VAC / +24 VDC (the LED is +24 VDC originally, but can be replaced with a 230 VAC accessory)
Compact	230 VAC / +24 VDC

##### Mechanical data

Mechanical life >50 000 operations

###### Operating temperature

Smile, INCA	-10...+55 °C
EStrong	-25...+80 °C
Compact	-25...+70 °C

###### Protection class

Smile, INCA	IP65
EStrong	IP67, IP69K
Compact	IP66, IP67, IP69K

###### Weight

Smile	65 g
INCA	45 g
EStrong	820 g
Compact	108 g, 124 g (with shroud)

###### Material

Smile	Polyamide PA66, Macromelt, polybutylenterephthalate PBT, Polypropene PP, UL 94 V0
INCA	Polyamide PA66, Macromelt, polybutylenterephthalate PBT, Polypropene PP, UL 94 V0
EStrong	Stainless steel 316 housing
Compact	Polycarbonate

#### More information

For more information, e.g. the complete technical information, see product manual for:

Smile [2TLC172097M0201](#)

INCA [2TLC172163M0201](#)

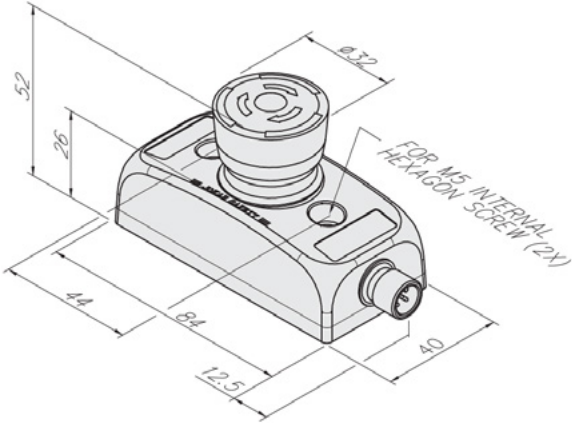
EStrong [2TLC172247M0201](#)

Compact [1SFC151005C0201](#)

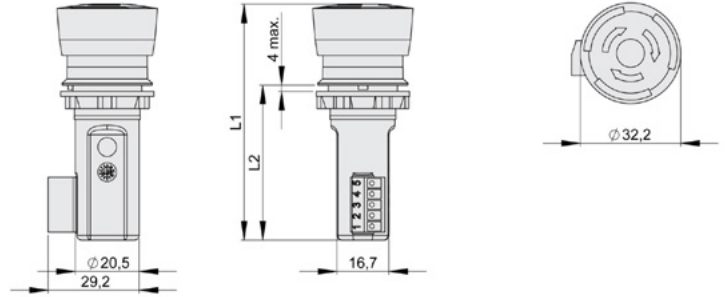
## Dimension drawings

### Emergency stop buttons

#### Smile

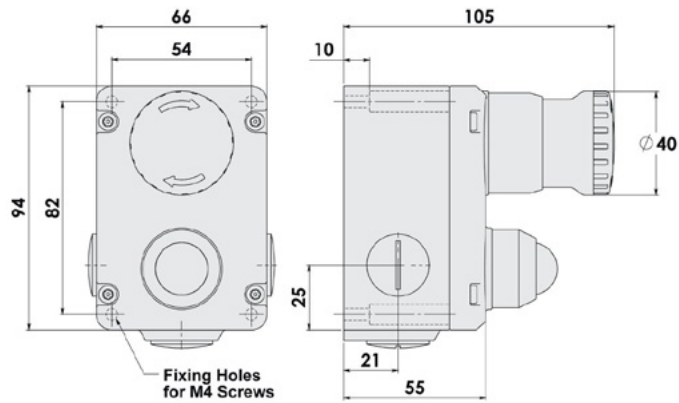


#### INCA

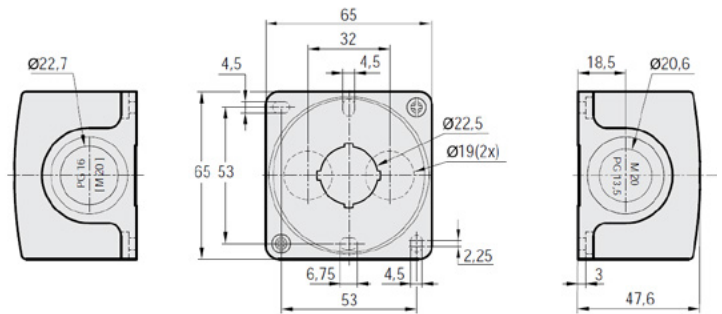


Type	L1 mm	L2 mm
INCA1EC Tina	75.5	49.5 ± 0.5
INCA1	80	54 ± 0.5
INCA1Tina	80	54 ± 0.5

#### EStrong



#### Compact (housing only)



All dimensions in mm



# Safety stop buttons

## Smile, INCA and Compact

Safety stop buttons are used to safely stop a certain part of a dangerous machine.

ABB offers safety stop buttons to suit different needs of connection and communication. Models are available for e.g. external mounting or panel mounting, in compact size or robust design, adapted for the DYNlink solution or with 2 NC contacts.



Easy to install

### Compact size

Models with a compact and appealing housing saves space and makes it easy to place.

### Quick installation

Quick and easy installation of models with features such as centered mounting holes, removable terminal blocks and M12 connectors.

### Serial connection

Tina models save cable length and installation time with serial connection.



Optimum interface

### Highly adaptable

Several models to choose between depending on position, installation and function.

### Reliable in extreme conditions

Robust models for use in demanding environments.



Continuous operation

### LED diagnostics

Models with integrated LED diagnostics reduce downtime when troubleshooting.



## Applications and features

### Safety stop buttons

#### Applications

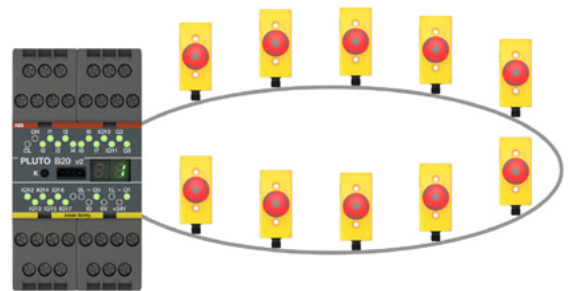
A safety stop (also called machine stop) can be used to safely stop a part of the machine, e.g. as a stop for an individual hazardous machine function. It may not be used as an emergency stop and stop the complete machine or production line. Likewise, an emergency stop with red push button should not be used as a safety stop. In order to separate the safety stop function from the emergency stop function, the safety stop buttons should be colored black.



#### Features

##### DYNlink

Safety stop buttons with Tina in their name belong to the DYNlink solution, which enables serial connection using only one channel and still reaching Cat. 4/PL e. DYNlink devices must be used with Vital safety controller or Pluto programmable safety controller. Up to 30 DYNlink devices can be connected in series to Vital and up to 10 can be connected to each input on Pluto.



## Models

### Safety stop buttons

#### Safety stop buttons for external mounting

##### Smile

Smile is a small and easy to install safety stop button. Its size allows mounting in reduced spaces, and its centered mounting holes makes it especially easy to mount on aluminum extrusions (e.g. Quick-Guard fencing system).

Smile has an integrated LED in the button that shows the status and simplifies error tracking.

The standard model of Smile has 2 contacts and can be used with safety controllers from all brands. The Smile Tina model belongs to the ABB DYNlink solution, with the advantages of serial connection using only one channel and still reaching Cat. 4/PL e.

Smile safety stops are identical to the corresponding Smile emergency stops apart from the color of the button.



##### Compact

The Compact safety stop button offers a robust enclosure with a high IP rating that fulfills the demands in severe and humid environments, such as food and beverage industry. Compact can be fitted with a Tina adapter for use in a DYNlink solution (Tina 2A, Tina 2B or Tina 3A).

Compact safety stop is identical to Compact emergency stop apart from the color of the button.



#### Safety stops for panel mounting

##### INCA

INCA is a safety stop button for panel mounting, designed for installation in 22.5 mm holes. Its removable terminal block facilitates connection and exchange.

INCA has an integrated LED in the button that shows the status and simplifies error tracking.

The standard model of INCA has 2 contacts and can be used with safety controllers from all brands. INCA Tina belongs to the ABB DYNlink solution, with the advantages of serial connection using only one channel and still reaching Cat. 4/PL e.

INCA safety stop is identical to INCA emergency stop apart from the color of the button.



## Ordering information

### Safety stop buttons



2TLCT2918F0201

Smile 11 SA Tina



CEP1-1002



2TLCT2955F0201

INCA 1S



2TLCT2471F0201

Tina 8A

#### Safety stop buttons

Mounting	Type of safety signal	Connection type	Feature	Type	Order code
External	DYNlink	1 m cable from bottom	Status LED	Smile 11 SA Tina	2TLA030050R0500
	2 NC	1 x M12-5	Status LED	Smile 11 SA	2TLA030051R0900
	2 NC*	2 x M20 conduits	-	CEP1-1002 (Compact)	1SFA619811R1002
			With shroud	CEP1-2002 (Compact)	1SFA619811R2002
Panel	DYNlink	5 pole terminal block	Status LED	INCA 1S Tina	2TLA030054R0200
	2 NC	5 pole terminal block	Status LED	INCA 1S	2TLA030054R0300

\* Can be adapted to DYNlink with Tina

#### Accessories

Description	Type	Order code
M12 Y-connector for serial connection of devices without StatusBus functionality.	M12-3A	2TLA020055R0000
Connection block for the serial connection of up to 4 DYNlink devices with 12-5 connectors.	Tina 4A	2TLA020054R0300
Connection block for the serial connection of up to 8 DYNlink devices with 12-5 connectors.	Tina 8A	2TLA020054R0500
Grey shroud for Compact	CA1-8054	1SFA619920R8054
Adaptation unit for DYNlink solution with M20 fitting. For e.g. Compact.	Tina 2A *	2TLA020054R0100
Adaptation unit for DYNlink solution, internal assembly. For e.g. Compact.	Tina 2B *	2TLA020054R1100
Adaptation unit for DYNlink solution with M20 fitting and M12 connector. For e.g. connecting Compact to Pluto/Vital.	Tina 3A *	2TLA020054R0200

\* For more information about Tina adapter units, please see Pluto and Vital chapters.

## Cable and connectors

### Safety stop buttons



M12-C61

2TLC172959F0201



M12-C61HE

2TLC010003F0201

#### Cable with connectors

Connector	Female/male	Length	Special feature	Type	Order code
M12-5	Female	3 m		M12-C31	2TLA020056R0500
		6 m		M12-C61	2TLA020056R0000
			Harsh environment, halogen free	M12-C61HE	2TLA020056R8000
		10 m		M12-C101	2TLA020056R1000
			Harsh environment, halogen free	M12-C101HE	2TLA020056R8100
		20 m		M12-C201	2TLA020056R1400
	Female + male	0.3 m		M12-C0312	2TLA020056R5800
		0.06 m		M12-C00612	2TLA020056R6300
		1 m		M12-C112	2TLA020056R2000
		3 m		M12-C312	2TLA020056R2100
6 m			M12-C612	2TLA020056R2200	
10 m			M12-C1012	2TLA020056R2300	
		Angled female connector	M12-C1012V2	2TLA020056R6700	
16 m			M12-C1612	2TLA020056R5400	
20 m			M12-C2012	2TLA020056R2400	
Male		6 m		M12-C62	2TLA020056R0200
	10 m		M12-C102	2TLA020056R1200	

#### Separate cables and connectors

Description	Type	Order code
<b>Connectors</b>		
M12-5 pole female, straight	M12-C01	2TLA020055R1000
M12-5 pole male, straight	M12-C02	2TLA020055R1100
<b>Cable with 5 conductors</b>		
10 m cable with 5 x 0.34 shielded conductors	C5 cable 10 m	2TLA020057R0001
50 m cable with 5 x 0.34 shielded conductors	C5 cable 50 m	2TLA020057R0005
100 m cable with 5 x 0.34 shielded conductors	C5 cable 100 m	2TLA020057R0010
200 m cable with 5 x 0.34 shielded conductors	C5 cable 200 m	2TLA020057R0020
500 m cable with 5 x 0.34 shielded conductors	C5 cable 500 m	2TLA020057R0050



M12-C01

2TLC172659F0201



C5 cable

2TLC000039F0201

## Technical data

### Safety stop buttons

#### Technical data

##### Approvals

Smile, INCA



Smile Tina, INCA Tina



Compact



##### Conformity

Smile, INCA



2006/42/EC – Machinery  
2011/65/EU - RoHS  
EN ISO 12100:2010, EN ISO 13849-1:2008/AC:2009, EN 60204-1:2006+A1:2008, EN ISO 13850:2008

Smile Tina, INCA Tina



2006/42/EC - Machinery  
2004/108/EC - EMC  
EN ISO 12100:2010, EN ISO 13849-1:2008, EN 62061:2005, EN 60204-1:2006+A1:2009, IEC 60664-1:2007,  
EN 61000-6-2:2005, EN 61000-6-4:2007, EN 60947-5-5:2005, EN ISO 13850:2006

Compact



2006/42/EC - Machinery  
2014/30/EU - EMC  
EN 60947-1:2007/A1:2011/A2:2014, EN 60947-5-1:2004/A1:2009, EN 60947-5-5:1997/A1:2005/A11:2013, EN ISO 13850:2008

##### Functional safety data

EN 61508:2010

Up to SIL3, depending on system architecture

EN 62061:2005

Up to SILCL3, depending on system architecture

EN ISO 13849-1:2008

Up to Cat. 4, PL e, depending on system architecture

Smile, INCA

 $B10_d = 100\,000$ 

Smile Tina, INCA Tina

 $PFH_D = 4.66 \times 10^{-9}$ 

Compact

 $B10_d = 50\,000$ 

##### Electrical data

###### Operating voltage

Smile, INCA

17-27 VDC  $\pm 10\%$ 

Smile Tina, INCA Tina

+24 VDC +15% -25%

Compact

230 VAC / +24 VDC

##### Mechanical data

###### Mechanical life

&gt;50 000 operations

###### Operating temperature

Smile, INCA

-10...+55 °C

Compact

-25...+70 °C

###### Protection class

Smile, INCA

IP65

Compact

IP66, IP67, IP69K

###### Weight

Smile

65 g

INCA

45 g

Compact

108 g, 124 g (with shroud)

###### Material

Smile

Polyamide PA66, Macromelt, polybutylenterephthalate PBT, Polypropene PP, UL 94 V0

INCA

Polyamide PA66, Macromelt, polybutylenterephthalate PBT, Polypropene PP, UL 94 V0

Compact

Polycarbonate

#### More information

For more information, e.g. the complete technical information, see product manual for:

Smile [2TLC172097M0201](#)

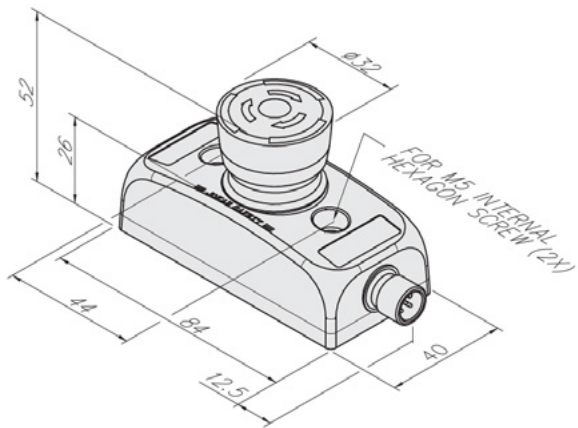
INCA [2TLC172163M0201](#)

Compact [1SFC151005C0201](#)

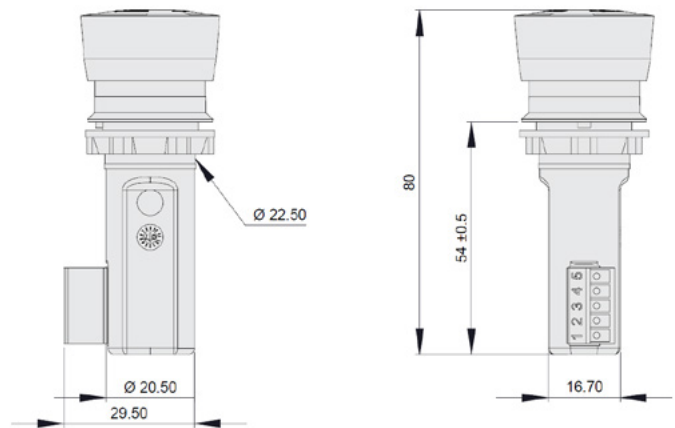
## Dimension drawings

### Safety stop buttons

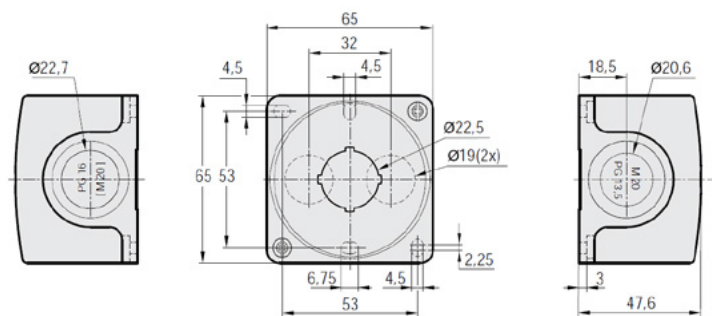
#### Smile



#### INCA



#### Compact (housing only)



All dimensions in mm



# Pull wire emergency stop switch

## LineStrong

LineStrong is a pull wire emergency stop switch, used for easy reach of the emergency stop function along machines and sections of conveyors.

A pull wire emergency stop switch allows to initiate the emergency stop command from any point along the installed wire length by pulling the wire. It replaces a series of emergency stop buttons and is easier to install.

LineStrong is also available in different models for different lengths of wires, with different housing material as well as an explosion proof version.



Easy to install

### Quick installation

A pull wire emergency stop switch is easier to install than a system of several emergency stop buttons along a carriage path.

### Highly adaptable

Several models to choose between gives a variety of mounting possibilities and features.

### Long wire length

Can handle wires up to 200 m on a single switch.



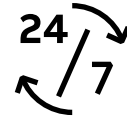
Safety and protection

### Easily accessible

Easy reach of the emergency stop function along machines, conveyors and processes.

### High level of safety

The positive forced disconnect contacts provide a high level of safety and are double switching, i.e. triggers emergency stop in both directions of the wire.



Continuous operation

### Reliable in extreme conditions

Robust construction makes LineStrong ideal for use in demanding environments.

### LED diagnostics

Integrated LED diagnostics ensures status can be seen easily from a distance.



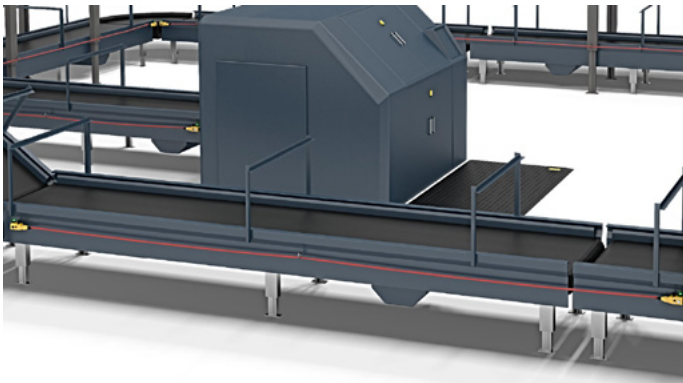
## Applications

### LineStrong

#### Instead of multiple emergency stops

A pull wire emergency stop switch is often placed along conveyor belts or carriage paths where access to the stop function must be possible along the whole line. It is often easier to install a pull wire emergency stop switch than to place multiple emergency stop buttons if the distance is longer.

LineStrong can handle wires up to 200 m on one single switch and since the emergency stop command can be initiated from any point along the wire, this gives better access to the emergency stop function than using emergency stop buttons.

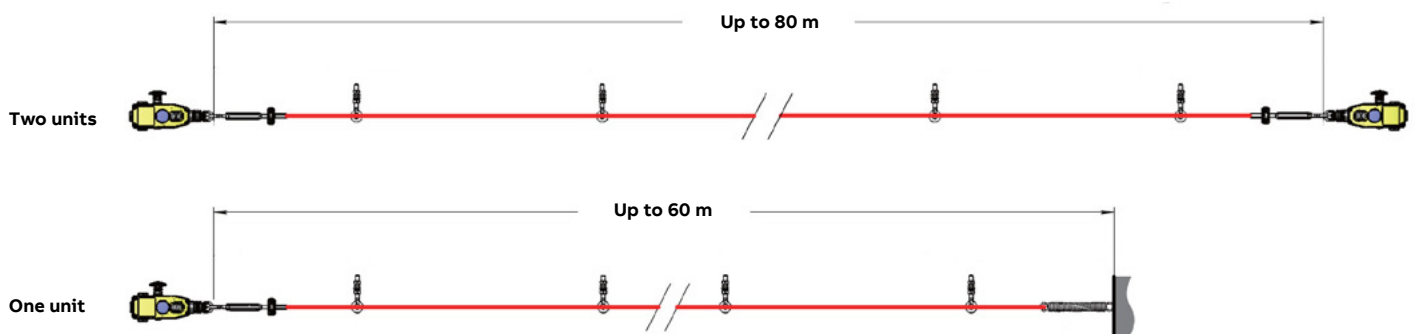


#### As protective device in low risk applications

LineStrong can be used as protection, for example along conveyors with low risks where the wire can be installed at waist height in front of the conveyor, which provides an emergency stop if someone walks or falls towards the conveyor, hence pulling the wire.

#### One, two or several switches

The maximum length of the wire attached to LineStrong depends on if there is a LineStrong unit attached to both ends of the wire or if one end is attached to a wall/fixed object. In the image below LineStrong2 is used as an example.



## Features

### LineStrong

#### Positive forced disconnected contacts

The contacts in LineStrong are positive force disconnected, which ensures that the contacts will not be held in a normally closed position due to a failure of the spring mechanism or the welding/sticking of the contacts.

#### Reset button

All models of LineStrong have an integrated reset button that needs to be pressed in order to reset the emergency stop if the emergency stop function has been triggered.

#### Emergency stop button

Most LineStrong models have an integrated emergency stop button on the housing of the switch. Since the first half meter of the wire is not intended to pull in order to trigger the emergency stop function, the integrated emergency stop button provides quick and simple access to the emergency stop function if you are standing right in front of LineStrong. The emergency stop button of LineStrong 2 can be moved to either side of LineStrong to enable best access depending on position and height of LineStrong.

#### Integrated LED

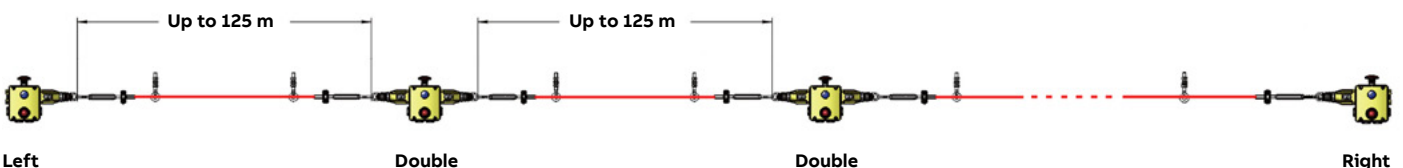
LineStrong2 and LineStrong3 have an integrated 2-color LED that shows if the emergency stop function has been triggered or not. The LED is also available as spare part.

#### Material

LineStrong is available with a housing in yellow die cast aluminum alloy or with a housing in stainless steel 316 which is recommended for severe applications in e.g. the food processing and the chemical industries.

#### Left hand, right hand or both sides

LineStrong1 and LineStrong2 can be mounted in any direction. LineStrong3 is available in different models depending on installation. L (left hand) should be used if the placement of the grab wire switch is to the left in the installation. R (right hand) should be used if the grab wire switch is to the right in the installation. D (double wire) has wire entries from both sides of the grab wire switch.

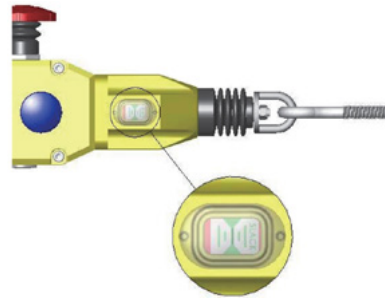


#### Wire breakage monitoring

The contacts are double switching which means that the emergency stop command is given both when someone pulls the wire and if the wire should break.

#### Indication of wire tension

All models are equipped with an indicator of the tension of the wire which simplifies installation and adjustment.



## Features

### LineStrong

#### Easier installation with tensioner/gripper

The tensioner/gripper accessory significantly reduces the installation time. Traditional grab wire systems normally need turnbuckle and clamps, which are difficult to tension and adjust, and normally require frequent re-tensioning. The tensioner gripper integrates an eyehook, a tensioner thimble and a wire strength gripper in one assembly which enables rapid connection to the switch eyebolts and fast and accurate tensioning of the wire.

Thanks to the switch tension indicator, it is easy to adjust the system accurately and quickly. The double clamp mechanism prevents wire slippage and significantly reduces machine downtime which can occur which traditional turnbuckle systems.

For systems longer than 50 m, the tensioner/gripper is necessary on both sides.

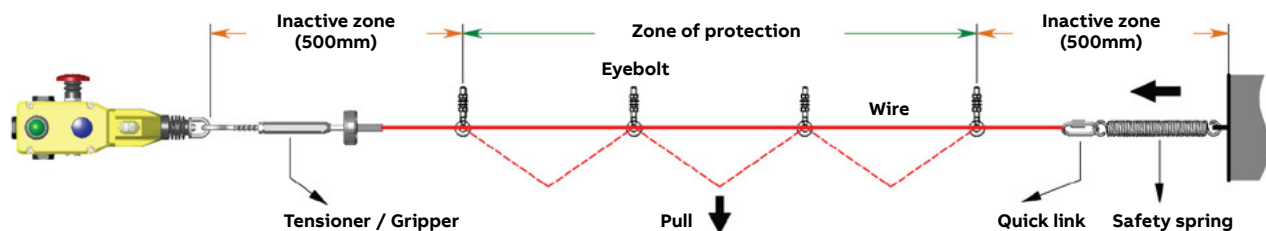
#### Quick-link termination

The quick link termination is available as an accessory in the wire pull kit, for easy connection to the safety spring or the switch eyebolt for systems up to 50 m.

#### Mounting accessories

The wire pull kits contains the suitable accessories for the included wire length.

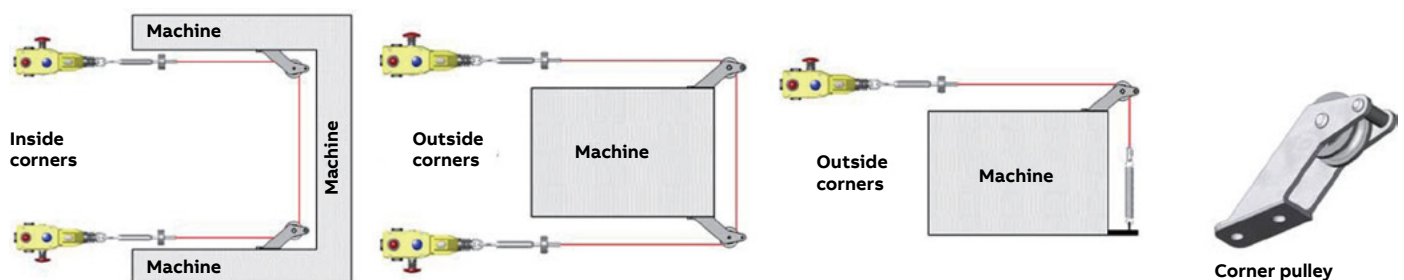
- When using one switch, the wire must be anchored at the other end using a safety spring.
- The first eyebolt support must be placed no more than 500 mm from the switch eyebolt or safety spring.
- The part of the wire from the wire end to the first eyebolt support shall not be used as part of the active protection coverage.
- Wire support eyebolts must be fitted at 2.5 - 3 meters intervals along the complete wire length.
- The tensioner/gripper is used to adjust the correct tension



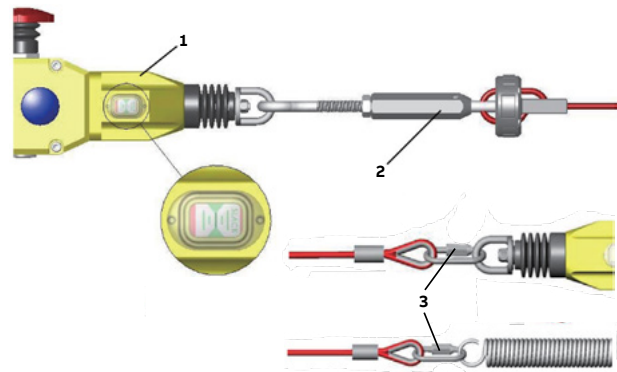
#### Corner pulley

A corner pulley can be used to navigate inside or outside corners without causing damage to the wire. They are in stainless steel and can be rigidly mounted.

When using a safety spring, a maximum of one corner pulley may be used, to ensure that the complete length of the wire is visible from either the switch or the spring anchorage.



Examples of using the corner pulley



1. Tension to mid position as indicated by the green arrows in the viewing window of each switch
2. The tensioner thimble allows immediate accurate and final tensioning of the wire, whilst viewing the tension marker through the viewing window on the switch.
3. Quick Link termination.

## Ordering information

### LineStrong



2TLC172377F0201

**LineStrong1**



2TLC172379F0201

**LineStrong2**



2TLC172501F0201

**LineStrong2Z**



2TLC172389F0201

**LineStrong3L**



2TLC172387F0201

**LineStrong3R**



2TLC172388F0201

**LineStrong3D**

### LineStrong

IP rating	Material	E-stop button	Contacts	Max. wire length (m)		Feature	Type	Order code		
				1 unit	2 units					
IP67	Yellow die cast aluminum alloy	No	2 NO + 2 NC	30	50	-	LineStrong1	2TLA050200R0030		
		Yes	2 NO + 2 NC	60	80	-	LineStrong2	2TLA050202R0332		
			2 NO + 4 NC	100	125	Left hand	LineStrong3L	2TLA050206R0332		
						Right hand	LineStrong3R	2TLA050208R0332		
			200	325	Both sides	LineStrong3D	2TLA050204R0332			
		LineStrong2Z			2TLA050202R0322					
IP67, IP69K	Stainless steel 316	Yes	2 NO + 2 NC	80	100	-	LineStrong2Z	2TLA050202R0322		
			2 NO + 4 NC	100	125	Left hand	LineStrong3LZ	2TLA050206R0322		
						Right hand	LineStrong3RZ	2TLA050208R0322		
						200	325	Both sides	LineStrong3DZ	2TLA050204R0322

## Accessories

### LineStrong



Wire pull kit

2TLC172577F001



Wire tensioner

2TLC172209F001



Corner pulley

2TLC172598F001



Eyebolt

2TLC172399F001



Safety spring

2TLC172221F001



LineStrong Screwdriver

2TLC172315F001



Gland

2TLC172317F001



Conduit plug

2TLC172318F001



LineStrong LED 230

2TLC172302F001

#### Mounting Accessories

Description	Material	Length	Type	Order code
Wire pull kit including wire, eyebolts, tensioner/gripper, quick-link and Allen key in right quantity for the included wire length.	Galvanized	10 m wire	10 m wire kit, gal	2TLA050210R0130
		20 m wire	20 m wire kit, gal	2TLA050210R0330
		80 m wire	80 m wire kit, gal	2TLA050210R0630
		100 m wire	100 m wire kit, gal	2TLA050210R0730
Wire tensioner/gripper	Stainless steel	50 m wire	50 m wire kit, SS	2TLA050210R0520
		100 m wire	100 m wire kit, SS	2TLA050210R0720
Corner pulley	Galvanized		Corner pulley, gal	2TLA050210R6030
	Stainless steel		Corner pulley, SS	2TLA050210R6020
Eyebolt M8 x 1.25 (8 pcs)	Galvanized		Eyebolt M8x1.25, gal	2TLA050210R8030
	Stainless steel		Eyebolt M8x1.25, SS	2TLA050210R8020
Safety spring, 220mm	Stainless steel		Spring 220 mm, SS	2TLA050211R0004

#### Other accessories

Description	Type	Order code
Screwdriver, anti-tamper, Torx T20	Screwdriver T20	2TLA050211R0006
Gland M20 x 1.5	Gland M20x1.5	2TLA050040R0002
Conduit plug M20 x 1.5	Cond.Plug M20x1.5	2TLA050040R0004

#### Spare parts

Description	Type	Order code
LineStrong LED Green/Red +24 VDC	LineStrong LED 24	2TLA050211R0001
LineStrong LED Green/Red 230 VAC	LineStrong LED 230	2TLA050211R0003
LineStrong2 and LineStrong3 Emergency stop button.	LineStrong E-Stop	2TLA050211R0005

## Cables

### LineStrong



M12-C01

2TLC17A657F0201



C5 cable

2TLC010038F0201


#### LineStrong

Description	Type	Order code
<b>Connectors</b>		
M12-5 pole female, straight	M12-C01	2TLA020055R1000
M12-5 pole male, straight	M12-C02	2TLA020055R1100
M12-8 pole female, straight	M12-C03	2TLA020055R1600
M12-8 pole male, straight	M12-C04	2TLA020055R1700
<b>Cable with 5 conductors</b>		
10 m cable with 5 x 0.34 shielded conductors	C5 cable 10 m	2TLA020057R0001
50 m cable with 5 x 0.34 shielded conductors	C5 cable 50 m	2TLA020057R0005
100 m cable with 5 x 0.34 shielded conductors	C5 cable 100 m	2TLA020057R0010
200 m cable with 5 x 0.34 shielded conductors	C5 cable 200 m	2TLA020057R0020
500 m cable with 5 x 0.34 shielded conductors	C5 cable 500 m	2TLA020057R0050
<b>Cable with 8 conductors</b>		
50 m cable with 8 x 0.34 shielded conductors	C8 cable 50 m	2TLA020057R1005
100 m cable with 8 x 0.34 shielded conductors	C8 cable 100 m	2TLA020057R1010
200 m cable with 8 x 0.34 shielded conductors	C8 cable 200 m	2TLA020057R1020
500 m cable with 8 x 0.34 shielded conductors	C8 cable 500 m	2TLA020057R1050

## Technical data

### LineStrong

#### Technical data

<b>Approvals</b>	
LineStrong	
<b>Conformity</b>	
LineStrong	<b>CE</b> 2006/42/EC - Machinery EN ISO 12100:2010, EN ISO 13850:2008, EN 60204-1:2006+A1:2009, EN 60947-1:2007+A1:2011, EN 60947-5-1:2004+A1:2009, EN 60947-5-5:1997+A1:2005
<b>Functional safety data</b>	
EN ISO 13849-1:2008	Up to Cat. 4, PL e, depending on system architecture.
EN/IEC 62061:2005	Up to SILCL3, depending on system architecture.
IEC 61508	Up to SIL3, depending on system architecture.
B10 <sub>d</sub>	1 500 000
<b>Electrical data</b>	
Utilization category	240 VAC / 3 A +24 VDC / 2,5 A
LED	+24 VDC
<b>Mechanical data</b>	
Operating temperature	-25...+80 °C
<b>Protection class</b>	
LineStrong1, LineStrong2, LineStrong3	IP67
LineStrong2Z, LineStrong3Z	IP66, IP67, IP69K
<b>Weight</b>	
LineStrong1	675 g
LineStrong2	880 g
LineStrong2Z	1635 g
LineStrong3L/R	1100 g
LineStrong3LZ/RZ	2000 g
LineStrong3D	1320 g
LineStrong3DZ	2200 g
<b>Material</b>	
LineStrong1, LineStrong2, LineStrong3D/L/R	Die cast painted yellow
LineStrong2Z, LineStrong3LZ/RZ/ DZ	Stainless steel 316
Wire type	PVC sheath steel wire 4.0 mm outside diameter
<b>Conduit entries</b>	
LineStrong1/2	3 x M20 x 1.5
LineStrong3	4 x M20 x 1.5

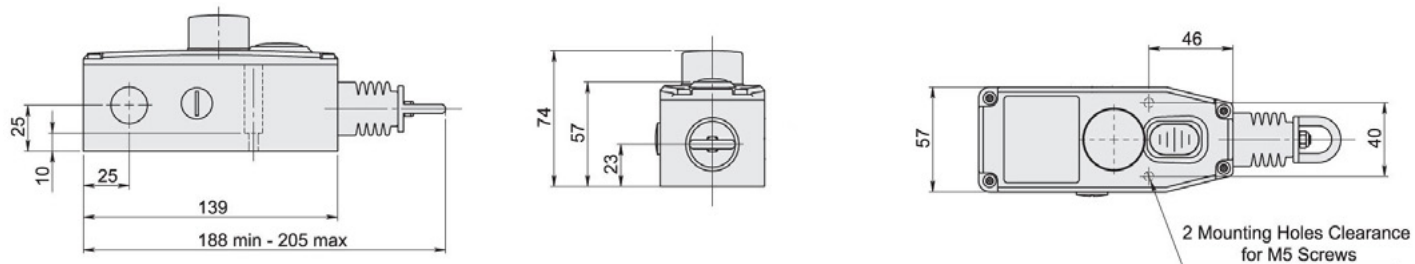
#### More information

For more information, e.g. the complete technical information, see product manual for:  
 LineStrong [2TLC172248M0201](#)

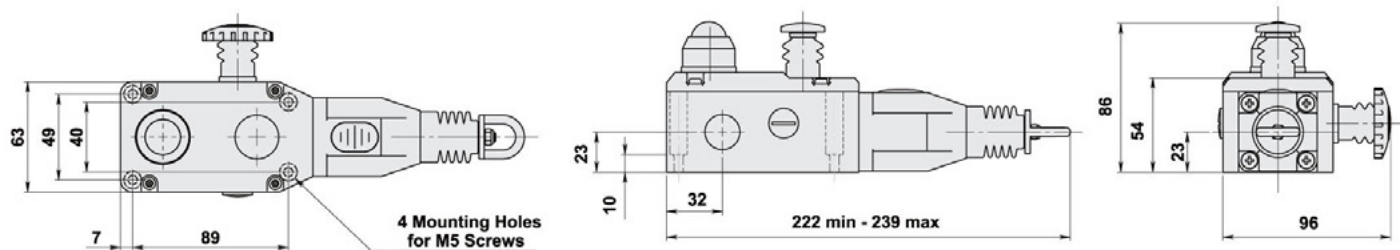
## Dimension drawings

### LineStrong

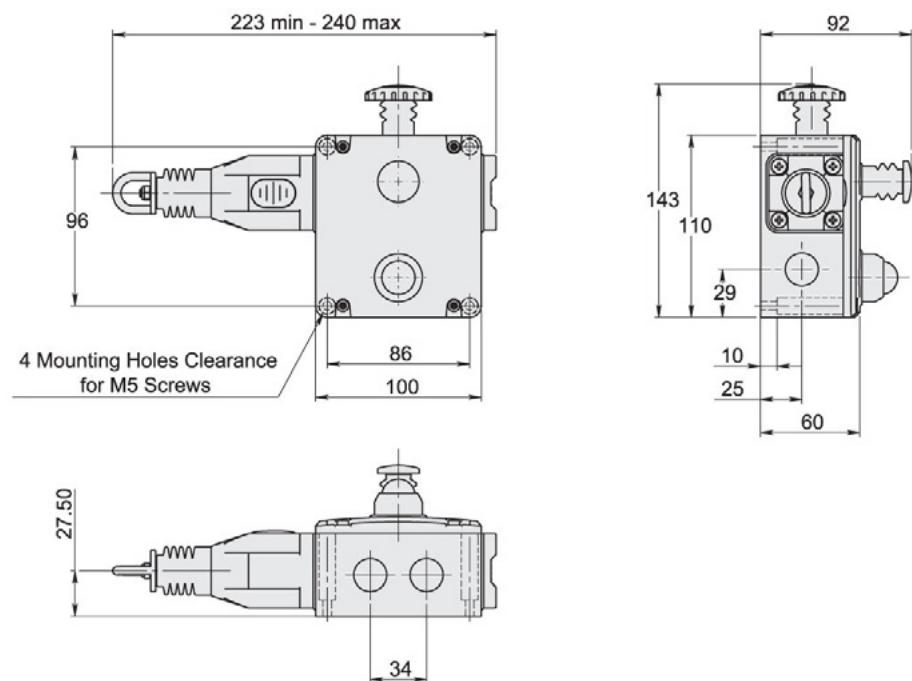
#### LineStrong1



#### LineStrong2



#### LineStrong3L-R



All dimensions in mm





# Push-button box

## Smile 41

Smile 41 is a push-button box that gathers push buttons, an emergency stop button and a safe key selector in a single compact device with only one M12 connector for all functions.

Smile 41 push-button box is available in models for use with Pluto programmable safety controller and models for all types of AS-i safety monitors.

A kit of colored filters is supplied and the color of each button can be chosen after delivery and changed later.



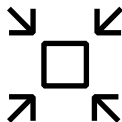
Easy to install

### Easy to attach to profiles

The centered mounting holes makes Smile 41 easy to attach to e.g. aluminum extrusions profiles like Quick-Guard.

### Quick installation

The four buttons are connected with only one M12 connector which speeds up the connection. A maximum of 8 wires need to be connected for the complete push-button box with LEDs. The AS-i models also offer the flexibility of vampire connectors with piercing technology and self-healing cables.



Space saving

### Compact housing

A compact and appealing housing saves space and makes it easy to place.



Optimum interface

### LED indication

All push-buttons and emergency stop buttons are illuminated. The lighting of the push-buttons can easily be managed by the Pluto programmable safety controller, allowing a greater adaptation to the needs.

### Several button colors

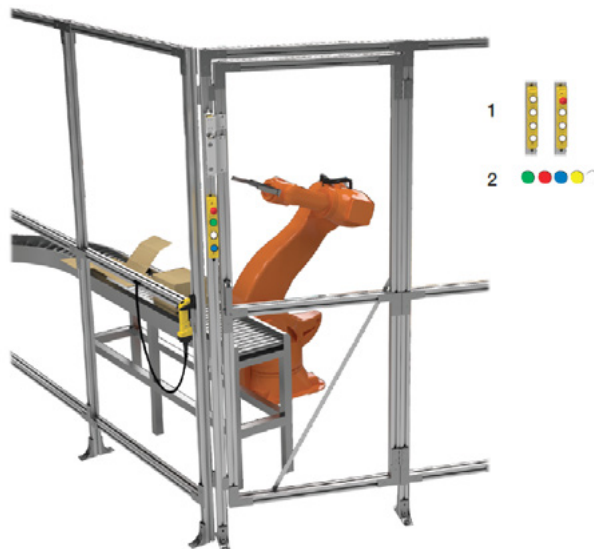
The color of each button can be chosen after delivery and changed later.

## Applications and features

### Smile 41

#### Applications

Smile 41 is a convenient way to gather several buttons at the same place while reducing cabling and installation. For example, an emergency stop button, a push button used to request the unlocking of the door, a push button used as reset button, and a push button used as start button.



#### Features

##### With Pluto programmable safety controller without AS-i function

The Smile 41 models without AS-i function have been developed for use with Pluto programmable safety controller and allow to get all the advantages of the Pluto “light-button function”: only one I/O (IQ) is necessary for both a push-button and its LEDs and the lighting of the reset buttons can be handled by Pluto without any extra programming.

The emergency stop button satisfies the highest level of safety, and although only one cable is used for the signals of the four buttons, a possible short-circuit can be detected by Pluto and the highest level of safety can be reached.

##### Kit of colored filters

A kit of colored filters is supplied with all models and the color of each push button can be chosen after delivery and changed later.



##### With AS-i safety monitor e.g. Pluto AS-i and Pluto B42 AS-i

All AS-i models of Smile 41 can be used with any AS-i safety monitor. The AS-i system significantly reduces the necessary cable lengths and the M12 connector speeds up the connection. The vampire connectors with piercing technology and self-healing cables facilitate changes.

Both the safe key selector and the emergency stop button satisfy the highest level of safety. Moreover, the use of AS-i Safety makes it easy to reach the highest level of safety while eliminating most risks of connection mistakes.

The push buttons and the emergency stop button are equipped with an easily programmed LED for a perfect adaptation to the needs of the application, a better user friendliness and easier troubleshooting.

##### Centered mounting holes

Centered mounting holes facilitate the mounting of Smile 41 on aluminum profiles like Quick-Guard.

## Ordering information

### Smile 41



Smile 41 WWWWP

2TLC12715F001



Smile 41 EWWWP

2TLC12717F001



Smile 41 WWWWN AS-i

2TLC12806F001



Smile 41 EWWWA AS-i

2TLC12809F001



Smile 41 EKWWA AS-i

2TLC12709F001

#### Smile 41 push button box

All Smile 41 push-button boxes are delivered with a kit of filters

Safety controller	Emergency stop button	Other buttons	Connector	Type	Order code
Pluto programmable safety controller	0	4 push-buttons	M12-8 male	Smile 41 WWWWP	2TLA030057R0000
	1	3 push-buttons	M12-8 male	Smile 41 EWWWP	2TLA030057R0100
AS-i monitor*	0	4 push-buttons	M12-5 male	Smile 41 WWWWN ASi	2TLA030056R0000
		3 push-buttons	M12-5 male	Smile 41 EWWWA ASi	2TLA030056R0100
	1	1 safe key selector 2 push-buttons	M12-5 male	Smile 41 EKWWA ASi	2TLA030056R0200

\* E.g. Pluto AS-i and Pluto B42 AS-i

#### Spare parts

Description	Type	Order code
Kit of colored filters	Colored filters	2TLA030059R2600

## Cables and connectors

### Smile 41



M12-C61

2TLC172951F0201



M12-C61HE

2TLC010003F0201



M12-C334

2TLC172931F0201

#### Cable with connectors

Connector	Female/male	Length	Special feature	Type	Order code
M12-5	Female	3 m		M12-C31	2TLA020056R0500
		6 m		M12-C61	2TLA020056R0000
		10 m	Harsh environment, halogen free	M12-C61HE	2TLA020056R8000
		20 m		M12-C101	2TLA020056R1000
		20 m	Harsh environment, halogen free	M12-C101HE	2TLA020056R8100
		20 m		M12-C201	2TLA020056R1400
	Female + male	0.3 m		M12-C0312	2TLA020056R5800
		0.06 m		M12-C00612	2TLA020056R6300
		1 m		M12-C112	2TLA020056R2000
		3 m		M12-C312	2TLA020056R2100
		6 m		M12-C612	2TLA020056R2200
		10 m		M12-C1012	2TLA020056R2300
16 m		Angled female connector	M12-C1012V2	2TLA020056R6700	
20 m			M12-C1612	2TLA020056R5400	
20 m			M12-C2012	2TLA020056R2400	
Male		6 m		M12-C62	2TLA020056R0200
10 m		M12-C102	2TLA020056R1200		
M12-8	Female	6 m		M12-C63	2TLA020056R3000
		10 m		M12-C103	2TLA020056R4000
		20 m		M12-C203	2TLA020056R4100
	Female + male	0.06 m		M12-C00634	2TLA020056R6400
		1 m		M12-C134	2TLA020056R5000
		3 m		M12-C334	2TLA020056R5100

#### Separate cables and connectors

Description	Type	Order code
<b>Connectors</b>		
M12-5 pole female, straight	M12-C01	2TLA020055R1000
M12-5 pole male, straight	M12-C02	2TLA020055R1100
M12-8 pole female, straight	M12-C03	2TLA020055R1600
M12-8 pole male, straight	M12-C04	2TLA020055R1700
<b>Cable with 5 conductors</b>		
10 m cable with 5 x 0.34 shielded conductors	C5 cable 10 m	2TLA020057R0001
50 m cable with 5 x 0.34 shielded conductors	C5 cable 50 m	2TLA020057R0005
100 m cable with 5 x 0.34 shielded conductors	C5 cable 100 m	2TLA020057R0010
200 m cable with 5 x 0.34 shielded conductors	C5 cable 200 m	2TLA020057R0020
500 m cable with 5 x 0.34 shielded conductors	C5 cable 500 m	2TLA020057R0050
<b>Cable with 8 conductors</b>		
50 m cable with 8 x 0.34 shielded conductors	C8 cable 50 m	2TLA020057R1005
100 m cable with 8 x 0.34 shielded conductors	C8 cable 100 m	2TLA020057R1010
200 m cable with 8 x 0.34 shielded conductors	C8 cable 200 m	2TLA020057R1020
500 m cable with 8 x 0.34 shielded conductors	C8 cable 500 m	2TLA020057R1050

#### Cables and connection accessories for AS-i

Description	Type	Order code
Cable for AS-i, power and data, +30 VDC, yellow, EPDM	AS-i cable yellow	2TLA020074R9000
Cable for AS-i, additional power, +24 VDC, black, EPDM	AS-i cable black	2TLA020074R9100
M12-5 female connector with vampire connector for AS-i flat cable.	AS-i T-connector M12	2TLA020073R0000
AS-i flat cable splitter used to make T-connections and to extend cables.	AS-i splitter box	2TLA020073R0300



M12-C01

2TLC172651F0201



C5 cable

2TLC010003F0201






AS-i cable yellow

2TLC172742F0201

## Technical data

### Smile 41

#### Technical data

	Smile 41	Smile 41 AS-i
<b>Approvals</b>	TÜV NORD 	TÜV NORD  
<b>Conformity</b>	<b>CE</b> 2006/42/EC - Machinery 2014/30/EU - EMC 2011/65/EU - RoHS EN ISO 12100:2010, EN ISO 13849-1:2008/AC:2009, EN 62061:2005+A2:2015, EN 60204-1:2006+A1:2009, IEC 60664-1:2007, EN 61000-6-2:2005, EN 61000-6-4:2011, EN ISO 13850:2015	<b>CE</b> 2006/42/EC - Machinery 2014/30/EU - EMC 2011/65/EU - RoHS EN ISO 12100:2010, EN ISO 13849-1:2015, EN 62061:2005/A2:2015, EN 60204-1:2006+A1:2009, IEC 60664-1:2007, EN 61000-6-2:2005, EN 61000-6-4:2011, EN ISO 13850:2015, EN 60947-5-5:2005, EN 61508:2010
<b>Functional safety data</b>		
<b>IEC 61508:2010</b>	Up to SIL3, depending on system architecture	SIL3, $PFH_D = 2.87 \times 10^{-10}$
<b>EN/IEC 62061:2005</b>	Up to SILCL3, depending on system architecture	SILCL3, $PFH_D = 2.87 \times 10^{-10}$
<b>EN ISO 13849-1:2008</b>	Up to Cat. 4/PL e, depending on system architecture	Cat. 4/PL e, $PFH_D = 2.87 \times 10^{-10}$
<b>B10<sub>d</sub></b>	65 000	
<b>Electrical data</b>		
<b>Operating voltage</b>	+24 VDC ± 15%	+30 VDC (AS-i bus)
<b>Mechanical data</b>		
<b>Mechanical life</b>		
<b>Emergency stop button</b>	> 50 000 operations	
<b>Illuminated push button</b>	1 000 000 operations	
<b>Key selector</b>	-	30 000
<b>Operating temperature</b>	-25... +50 °C	
<b>Protection class</b>	IP65	
<b>Weight</b>	190 g	

#### More information

For more information, e.g. the complete technical information, see product manual for:

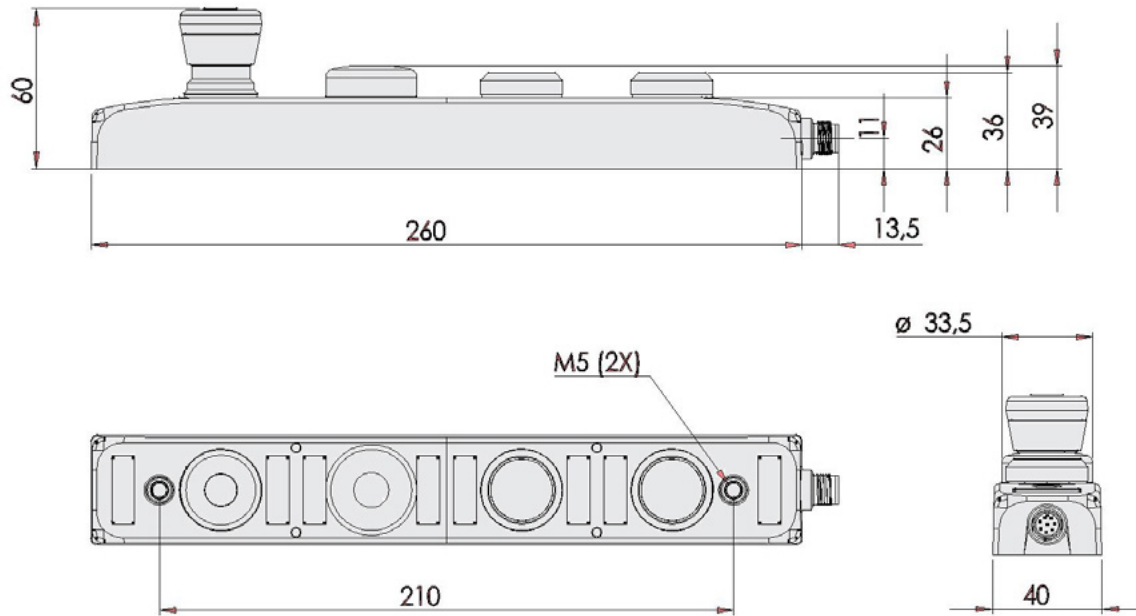
Smile 41 [2TLC172280M0201](#)

Smile 41 AS-i [2TLC172255M0201](#)

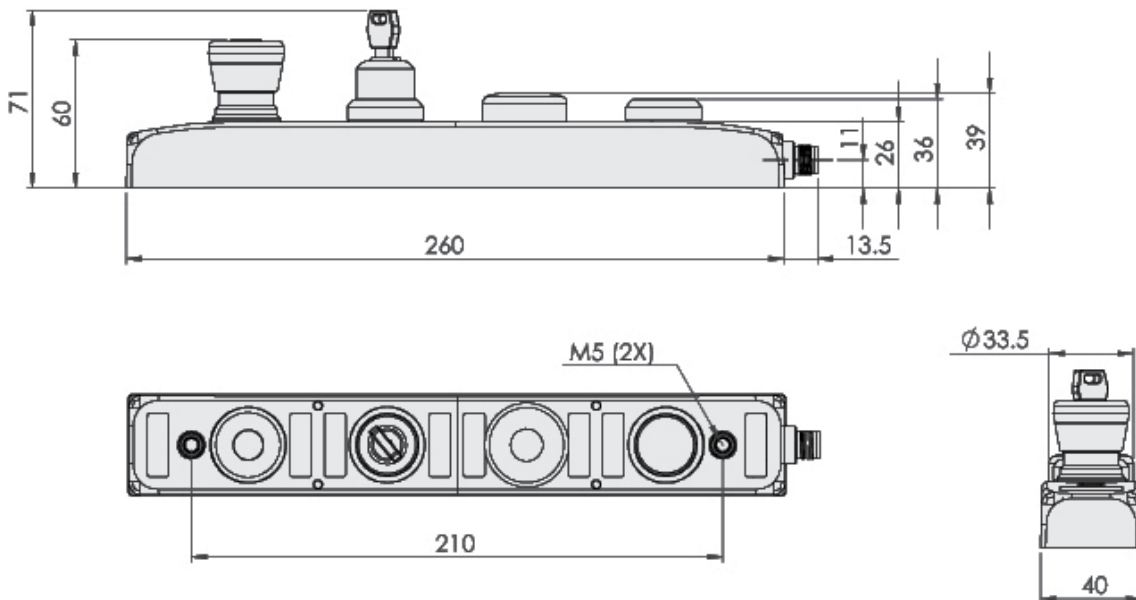
## Dimension drawings

### Smile 41

#### Smile 41



#### Smile 41 AS-i



All dimensions in mm

# Reset button

## Smile

Smile reset buttons have compact housings with M12 connectors for easy connection.

The reset button contains an integrated white LED, and all buttons are delivered with a kit of colored filters to snap on the top of the button. In this way the color of the button can be chosen after delivery and is also possible to be changed later.

The different models also allow a choice of:

- local reset connected directly to the sensor, or
- global reset connected to the safety control module.



Easy to install

### Easy to attach to profiles

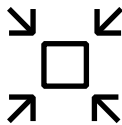
The centered mounting holes make Smile easy to attach to e.g. aluminum extrusions profiles.

### Speed up installation

The housing requires no assembly and the M12 connectors speed up installation and reduce the risk of connection error.

### Local reset

Local reset allows to have the reset button close to the safety device while reducing cabling.



Space saving

### Compact housing

A compact and appealing housing saves space and makes it easy to place.



Optimum interface

### Several button colors

All reset buttons are illuminated with a white LED and the color of each button can be chosen after delivery and changed later using colored snap-on filters.



## Ordering information

### Smile reset buttons



Smile 11 RO1

2TLC120800201

#### Ordering details

Type of contact	Intended use	Connectors	Type	Order code
1 NO	Most reset applications	M12-5 male	Smile 11 RA	2TLA030053R0000
1 NO	Pluto Safety PLC light button function*	M12-5 male	Smile 11 RB	2TLA030053R0100
1 NO	Local reset of Orion1 Base	M12-5 male	Smile 11RO1	2TLA022316R3000
1 NC	Local reset of Orion2 Base and Extended, and Orion3 Extended	M12-5 male	Smile 11RO2	2TLA022316R3100
1 NC	Local reset of Orion3 Base	M12-5 male	Smile 11RO3	2TLA022316R3200
1 NO	Local reset of Eden DYN-Reset M12-5 and Eden OSSD-Reset M12-5	M12-5 male + female	Smile 12 RF	2TLA030053R2600
1 NO	Local reset of Eden OSSD-Reset M12-8	M12-8 male + female	Smile 12 RG	2TLA030053R2700

\* See Pluto hardware manual for more information about the light button function



M12-3x

2TLC12633F0201



Tina 10B

2TLC12475F0201

#### Accessories

Description	Type	Order code
Y-connector for series connection of DYNlink devices with M12-5 connectors, e.g. Eden.	M12-3A	2TLA020055R0000
Y-connector for series connection of Adam OSSD M12-8 with M12-5 cables	M12-3H	2TLA020055R0800
Y-connector for series connection of Adam OSSD M12-8 with M12-8 cables	M12-3G	2TLA020055R0700
Y-connector for connection of Smile reset button to Orion.	M12-3R	2TLA022316R0000
Adaptation unit of OSSD outputs to DYNlink signals for use with Vital control module or Pluto Safety PLC. Tina 10B has an extra M12 connector for connection of a reset button.	Tina 10B v2	2TLA020054R1310



Colored filters

2TLC12725F0201

#### Spare parts

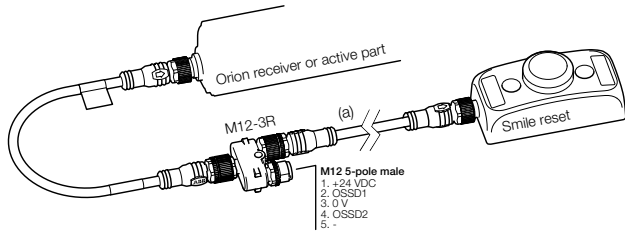
Description	Type	Order code
Kit of colored filters (yellow, green, white, blue, red)	Colored filters	2TLA030059R2600



## Connection examples

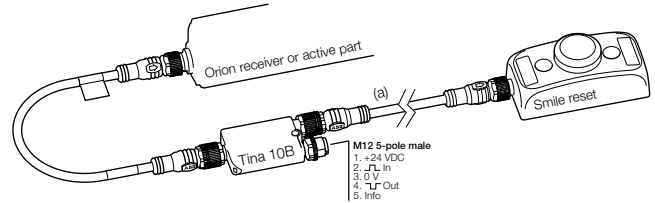
### Smile reset buttons

#### Local reset to Orion with Tina 10A/C



Connection of Smile 11 ROx to Orion through M12-3R. For connection to any control module compatible with OSSD outputs.

#### Local reset to Orion with Tina 10B



Connection of Smile 11 ROx to Orion through Tina 10B. For connection to Vital control module or Pluto Safety PLC.

#### Local reset to Eden



Serial connection of Eden with local Smile reset buttons:

- Adam OSSD-Reset M12-8 with Smile 12 RG and M12-3G or M12-3H
- Adam DYN-Reset with Smile 12 RF and M12-3A


#### Global vs local reset

A global reset is connected directly to the control cabinet with separate cables. The safety controller in the control cabinet supervises the reset and decides the function and actions.

A local reset is connected directly to the safety device, and requires no communication with the control cabinet. The safety device supervises the reset and decides the actions. A local reset simplifies installation and minimizes cabling.

## Technical data

### Smile reset buttons

Approvals	
	
Power supply	
LED operating voltage	+24 VDC (maximum +33 VDC)
LED current consumption	20 mA at +24 VDC, 30 mA at +33 VDC
Push button operating voltage	Min: +5 V, max: +35 V
Push button current	Min: 1 mA, max: 100 mA
Push button rated power	Max: 250 mW
Mechanical data	
Color - Enclosure	Yellow
Color - Push button	White
Material - Housing	Polypropylene PP
Material - Contact	Au
Weight	Approx. 60 g
Protection class	IP65
Mechanical life	1 000 000 operations at 10 mA / +24 VDC
Switching reliability	10 x 10 <sup>6</sup> at 5 mA / +24 VDC
Environmental data	
Ambient temperature	-25...+55 °C
Humidity range	35 to 85% (with no icing or condensation)

#### More information

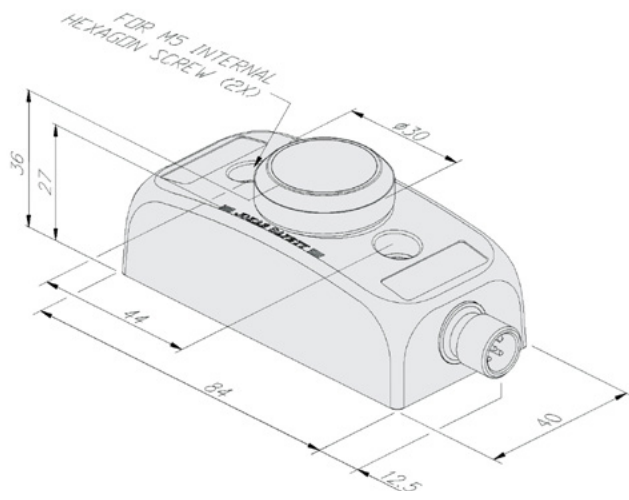
For more information, e.g. the complete technical information, see product manual for:

Smile reset buttons [2TLC172097M0201](#)

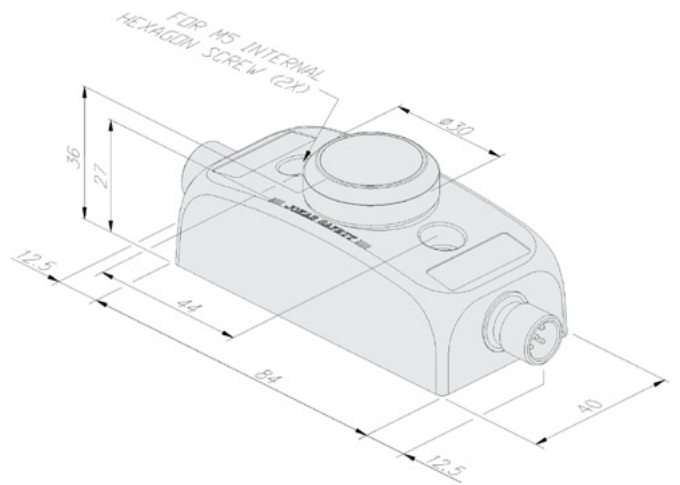
## Dimension drawings

### Smile reset buttons

Smile 11 R



Smile 12 R



All dimensions in mm

# Pilot devices

## Reliable products, easy to select and install

ABB pilot devices are engineered for total reliability. Our products are tested to extremes and proven in the toughest environments. Their innovative designs simplify the entire process, from selection to installation. Enclosures, signal towers and signal beacons complete the portfolio.



Continuous operation



Global availability



Easy to install

### Engineered for tough environments

ABB pilot devices are designed with protection degree of up to IP69K, guaranteeing reliability in extreme environments – making ABB pilot devices ideal for use in demanding industries such as construction and food and beverage. An innovative design that automatically cleans contacts ensures high reliability for all products.

### Simple selection and stock management

ABB's core offering includes the pilot devices most in demand, so product selection is easier, stock management is simpler and product availability is higher. Support for exporters is world-class, thanks to ABB's standardized global range, certified to comply with all major international standards.

### Save time and space

The unique design of ABB's modular range enables tool-free installation that is quick and simple. It provides high flexibility for last-minute changes. With its all-in-one construction, the compact range reduces installation space and saves time.

# Pilot devices

## Overview

### Modular range



Pushbuttons  
Illuminated  
and non-illuminated



Double pushbuttons  
Illuminated  
and non-illuminated



Emergency  
stop pushbuttons  
Illuminated  
and non-illuminated



Pilot lights



Selector switches  
Illuminated  
and non-illuminated



Key-operated  
selector switches



Mushroom  
pushbuttons  
Illuminated  
and non-illuminated



Joysticks



Toggle switches



Potentiometers



Heavy duty  
pushbuttons



Reset pushbuttons

### Accessories for modular range



Signal towers  
and signal beacons



Enclosures  
and stations



Legend  
plates



### Compact range



Pushbuttons  
Illuminated  
and non-illuminated



Emergency stop  
pushbuttons  
Non-illuminated



Pilot lights



Selector switches  
Non-illuminated



Heavy duty  
pushbuttons



Buzzers

