SAFEMASTER STS
Option Module
ST2451

Translation
of the original instructions

0278783

Content

Before installing, operating or maintaining this device, these instructions must be carefully read and understood.

Keep instructions for future reference

The installation must only be done by a qualified electrican!

The installation must only be done by a qualified mechanic!

Do not dispose of household garbage!
The device must be disposed of in compliance with nationally applicable rules and requirements.

To help you understand and find specific text passages and notes in the operating instructions, we have important information and information marked with svmbols.

Symbol and Notes Statement

DANGER:
Indicates that death or severe personal injury will result if proper precautions are not taken.

WARNING:
Indicates that death or severe personal injury can result if proper precautions are not taken.

CAUTION:
Indicates that a minor personal injury can result if proper precautions are not taken.

INFO:
Referred information to help you make best use of the product.

ATTENTION:
Warns against actions that can cause damage or malfunction of the device, the device environment or the hardware / software result.

General Notes

The product hereby described was developed to perform safety functions as a part of a whole installation or machine. A complete safety system normally includes sensors (SAFEMASTER STS System), evaluation units, signals and logical modules for safe disconnections. The manufacturer of the installation or machine is responsible for ensuring proper functioning of the whole system. DOLD cannot guarantee all the specifications of an installation or machine that was not designed by DOLD. The total concept of the control system into which the device is integrated must be validated by the user. DOLD also takes over no liability for recommendations which are given or implied in the following description. The following description implies no modification of the general DOLD terms of delivery, warranty or liability claims.

Notes

Risk!
Danger to life or risk of serious injuries.

- Hazards must be ruled out before a key can be entered and the movable part of the guard can then be opened!

INFO

- For information regarding use in the system and validation according to EN ISO 13849-2, see SAFEMASTER STS application guide.
- Take advantage of the advice of the **E. Dold & Söhne GmbH & Co. KG** specialists regarding the choice of units and combination of a system.

ATTENTION !

- To avoid wrong usage (e.g. by overload, mounting position or usage in acid, alkaline or other hostile ambient conditions) the limitations of the product have to be observed. Please check in advance if your application requires the usage of the more robust stainless steel model of SAFEMASTER STS. The requirements of the mounting and operating instruction must be fulfilled.

SAFEMASTER STS
Option Module
ST2451

0278783

Option module ST2451.001 and ST2451.101 with 1 e-stop button, 2 illuminated push- buttons

Option module ST2451.002 and ST2451.102 with 3 illuminated push-buttons

Product Description

The robust option module ST2451 enables the incorporation of command functions in the safety switch and key transfer system SAFEMASTER STS. It has 3 selectable command devices and allows for starting and stop of safety-relevant functions. Emergency stop buttons, illuminated buttons or selector switches, with or without key operation, are available as command devices.
With just a few individual components from the SAFEMASTER STS system, a great variety of different interlocking units can be created and combined with various option modules. Numerous units with command functions can be created. This enables a switch unit or locking switch to grow into a true "control centre" from where command functions, status displays, release signals, main- and maintenance access gates can be controlled. The special ribbon cable with plug-in connector ensures rapid and problem-free internal connection of the individual components. Installation a standalone command device is also possible through M20 or M25 cable entries and double cage clamp terminals. The standard version made on stainless steel guarantees the highest degree of stability and safety, even in harsh environmental conditions. A comprehensive range of accessories enables simple and time-saving installation directly at the access point.
The SL option module is a separate control and / or display unit without the possibility of combination with other SAFEMASTER STS units. It is intended for use in the hostile ambient conditions.

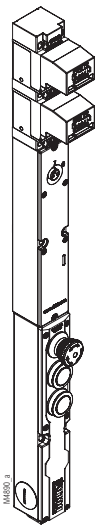
Your Advantages

- Simple incorporation of command functions into the SAFEMASTER STS systems
- High flexibility through comprehensive selection of command functions
- Saves costs through reduction of engineering, assembly and wiring costs
- Increased plant availability through faster access resulting from:
  - Direct installation on protective doors
  - High level of user-friendliness
  - Faster service for the command devices
- Suitable for harsh environmental conditions due to robust stainless steel housing
- Space-saving installation on protective barriers thanks to a slim design
- Can also be incorporated into the safety circuit as standalone command device
- Connection technology and cable entries for heavy industry requirements
- Simple module connection via plug-in connectors
- Different coloured panels and symbol plates selectable

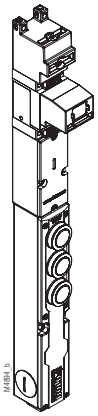
Features

- Command functions via illuminated buttons
- Emergency stop via emergency stop button
- Connection technology with double-spring clamp terminals for wires up to 1.5 mm²
- Enclosure made from stainless steel
- Can be individually mounted
- Can be cascaded
- M20 cable entries underneath and two M25 cable entries on side
- M20 cable entries on top when installed as a standalone option module
- Optional conection set for plug-in connectors between switch module / locking switch module and option module
- Plug-in connection between command device in the cover and option module ST2451

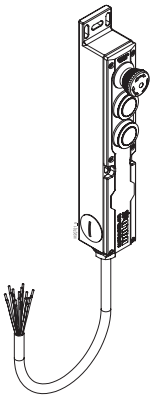
Installation Examples



Option module ST2451.001 with 1 e-stop button, 2 illuminated pushbuttons connected with solenoid lock ZRH02M



Option module ST2451.002 with 3 illuminated pushbuttons connected with switch module SX01A



Option module SL ST2451.102 with 3 illuminated pushbuttons and cable*)

*) Ordered separately Art. No 0065110

Approvals and Markings

CE

Applications

- For machines and systems where emergency stop functions and command devices are required directly at the point of access
- For simple expansion of command functions and enhancement of the connection technology of the SAFEMASTER STS system
- For integration as standalone command device into the safety circuit

Design and Function

There are various option modules available for the integration command functions into the safety switch and key transfer system SAFEMASTER STS. In doing so, up to 3 command devices can be incorporated per module. These may comprise illuminated buttons and emergency stop buttons. The illuminated buttons can be provided with different symbols and colours by the customer. A transparent coloured trim and an unprinted symbol plate are included. Further coloured trims and symbol plates are available as accessories.

The option module is installed underneath electrical modules such as switch modules or locking switch modules. The connection can be implemented via special connection sets or conventional wiring between electrical modules and option modules. With the wiring sets, the connection with plug-in connectors is established by means of a ribbon cable with switch modules or 2 ribbon cables with locking switch modules.
The option module also allows a simple and direct connection of 2 wires per contact with a cross-section of up to 1.5 mm² at a double cage clamp terminal. The double cage clamp terminals can be plugged in and enable option modules to be cascaded. The terminal numbering of the electrical modules will be continued in the option module.
With the incorporation of an option module into the SAFEMASTER STS switch / locking switch units, the attached functionalities can significantly increase the operating speed of the SAFEMASTER STS system. With switch / locking switch units that monitor one or more access points, this can also reduce the down times of the machine.

Technical Data

Mechanical Data

Enclosure:	Stainless steel V4A / AISI 316L
Degree of protection:	IP 54
	*) IP 65 IEC/EN 60529
	(See ordering designation for more information)

Input

Nominal voltage U_N (rated voltage):	AC/DC 24 V
Nominal voltage range:	0.85 ... 1.1 U_N

Output

Max. operating current:	1 A

General Data

Temperature range:	- 25 °C ... + 60 °C
Storage temperature:	- 40 °C ... + 60 °C
Rated impuls voltage:	0.8 kV
Rated insulation voltage:	≤ 50 V
Connection method:	Double cage clamp terminal
Cross-section min. / max.:	0.2 / 1.5 mm²
Cable entry	
Bottom:	1 x M20 x 1.5
Top:	1 x M20 x 1.5 (only when installed as a standalone option module)
Side:	2 x M25 x 1.5
Installation:	According to DIN EN 50041
Repair and replacement:	By manufacturer only
Test intervals	
for PL a to d:	Min. once a year
for PL e:	Min. once at month

Technical Data

E-stop button

For proper, intended use, the applicable requirements for the installation and operation of emergency stop buttons in particular must also be observed:
- EN 60204-1:2006
- EN 13849-1/-2:2008
- EN ISO 13850:2008

Contacts:	2 NC contacts, 1 NO contact (gold contacts)
Tamper proof:	Yes
Switch position display:	Yes
Blocking protection sleeves:	No
Unlock:	Clockwise and anticlockwise
Degree of protection:	IP 54
Temperature range	
Storage:	- 25 °C ... + 80 °C
Operation:	- 25 °C ... + 70 °C
Mechanical life:	5 x 10^4 switching cycles
Electrical service life:	5 x 10^4 switching cycles at rated load
Bouncing time	
NO contact / NC contact:	< 10 ms
Contact elements	
Forced opening NO contact:	IEC EN 60947-5-1 Appendix K

Illuminated pushbutton

Contacts:	1 NC contact, 1 NO contact (gold contacts)
Actuation stroke:	2.3 mm
Mechanical life:	10^6 switching cycles
Electrical service life:	10^6 switching cycles
Insulation resistance	
NO contact / NC contact:	< 50 mΩ (Au)
Bouncing time	
NO contact / NC contact:	< 10 ms
Contact elements	
Forced opening NO contact:	IEC EN 60947-5-1 Appendix K

Indicatior light (not replaceable)

Lamp voltage:	Max. AC/DC 30 V
Lamp power:	Max. 14 mA (at DC 24 V)

Ordering Designation Option module ST (IP 54)

Option module ST2451.001 Article number: 0066342	1 E-stop button, 2 buttons
Option module ST2451.002 Article number: 0066343	3 Buttons
Option module ST2451.003 Article number: 0066989	Separately controlled buttons
Option module ST2451.005 Article number: 0067643	With indicator light
Option module ST2451.006 Article number: 0067702	With blind cover
Option module ST2451.008 Article number: 0067939	3 Buttons, LED, separately connectable

Button connections see „Terminal designation examples“

Ordering Designation Option module SL

Option module ST2451.101 Article number: 0069388	1 E-stop button, 2 buttons (IP 54)
Option module ST2451.102 Article number: 0069389	3 Buttons (IP 65)
Option module ST2451.103 Article number: 0069390	Separately controlled buttons (IP 65)
Option module ST2451.105 Article number: 0069392	With indicator light (IP 54)
Option module ST2451.106 Article number: 0069393	With blind cover (IP 54)
Option module ST2451.108 Article number: 0069395	3 Buttons, LED, separately connectable (IP 54)

Button connections see „Terminal designation examples“

Accessories

For simple and rapid connection of the switch / locking switch modules and the option module, we recommend the special connection sets comprising ribbon cable with plug-in connectors, sealing elements and circuit board adapters.

Connection set solenoid lock ST2453.1 consisting of:
- 2 Flat cable with connector
- 1 PCB adapter A
- 1 PCB adapter B
- 2 Sealing elements (O-rings)

Article number: 0066644

Connection set switch ST2453.2 consisting of:
- 1 Flat cable with connector
- 1 PCB adapter C
- 2 Sealing elements (O-rings)

Article number: 0066645

Coloured cap and symbol plates ST2451.3 consisting of:
- 4 Coloured caps: Red, green, blue, yellow
- 4 Symbol plates: EIN, AUS, ON, OFF

Article number: 0066802

Double spring-cage terminal blocks ST2451.5 consisting of:
- 1 Spring-cage terminal 9 pole
- 1 Spring-cage terminal 12 pole

Article number: 0069397

Cover option module ST2454.1
(Suitable replacement cover for option module ST2451.001)
Article number: 0066800

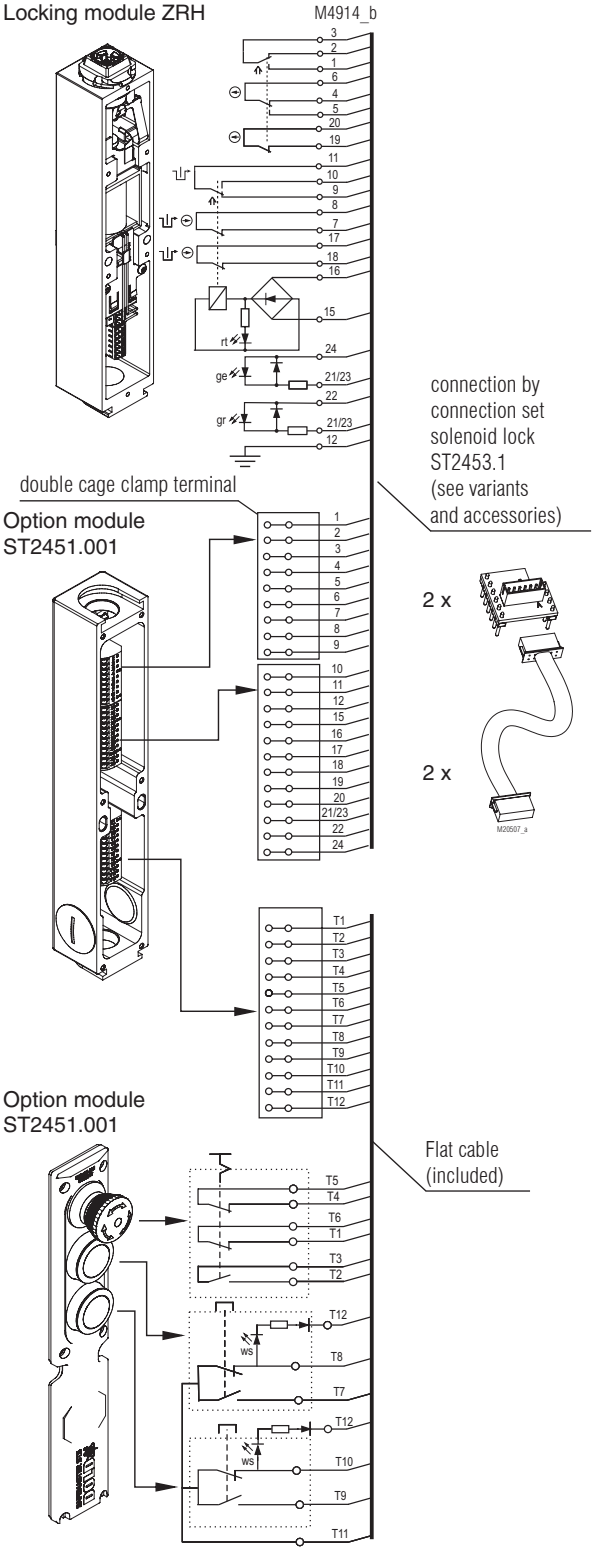
Cover option module ST2454.2
(Suitable replacement cover for option module ST2451.002)
Article number: 0066801

Cover option module ST2454.5
(Suitable replacement cover for option module ST2451.005)
Article number: 0067720

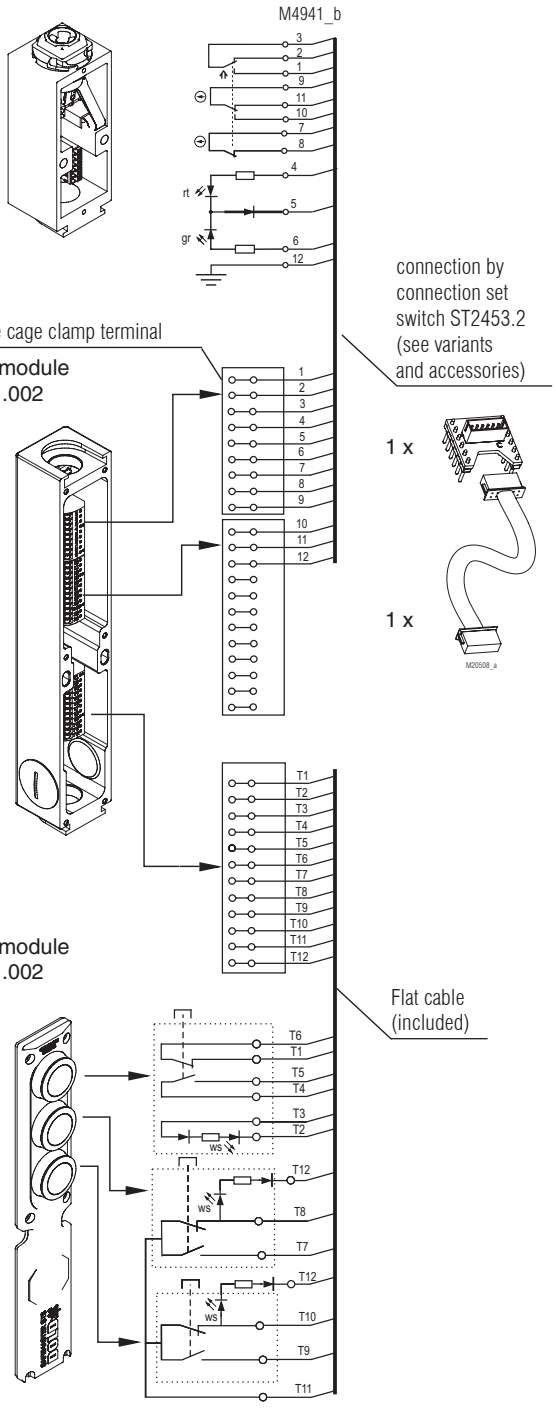
Cable assembled with ferrules at the free end ST2481.100
Cable length: 1000 mm
Article number: 0065110

Terminal designation example

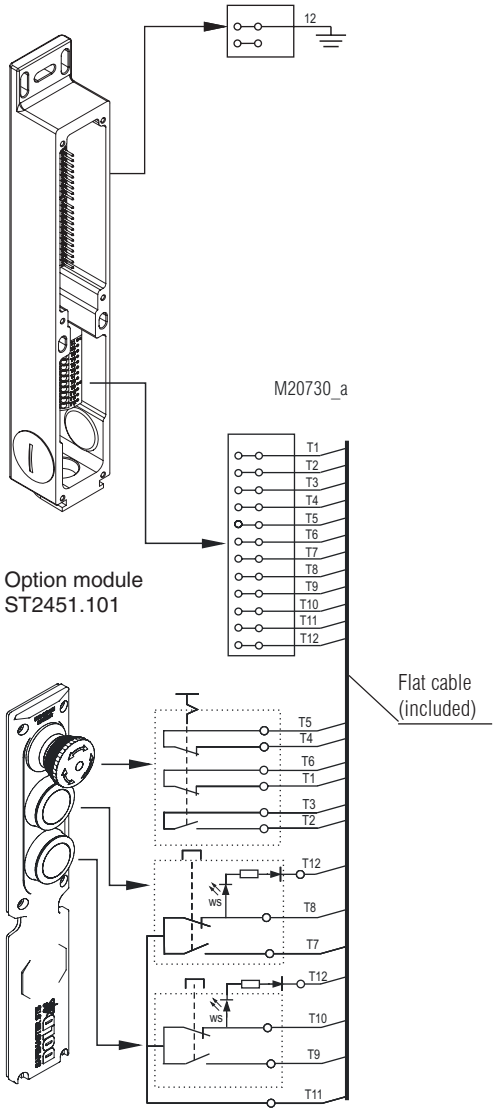
Locking module ZRH



Switch module SX

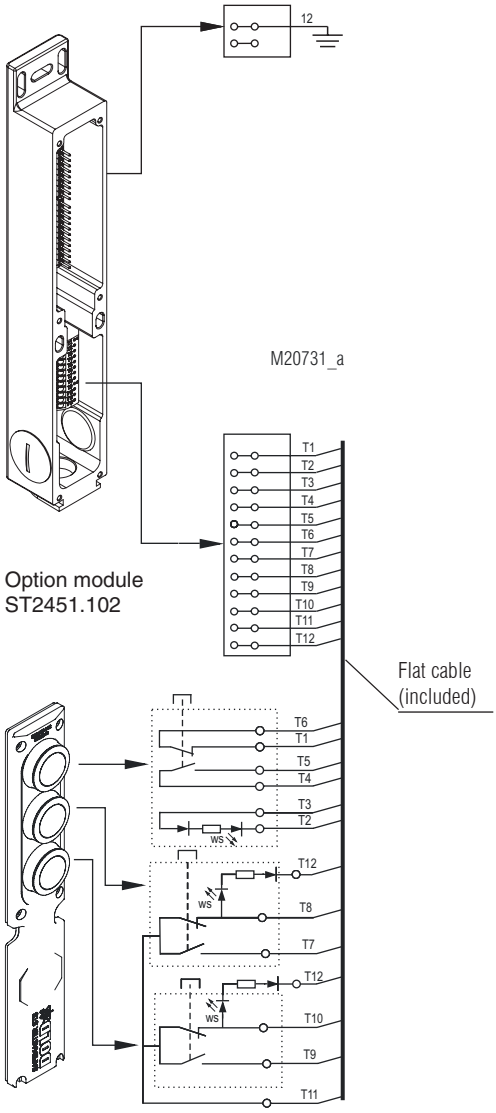


Terminal designation example



Option module
ST2451.101

Option module
ST2451.101

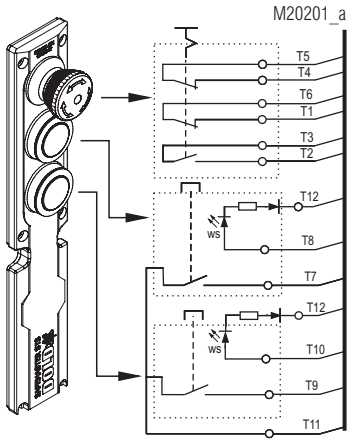


Option module
ST2451.102

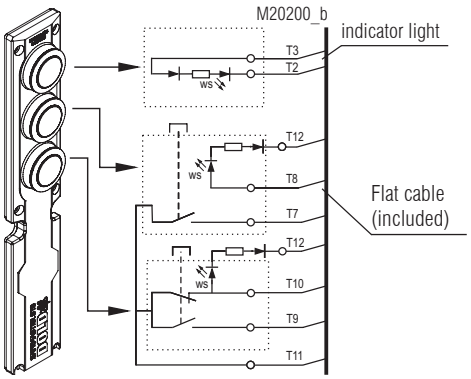
Option module
ST2451.102

Terminal designation example

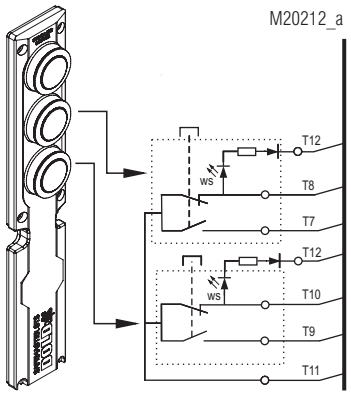
Option module
ST2451.003 / ST2451.103



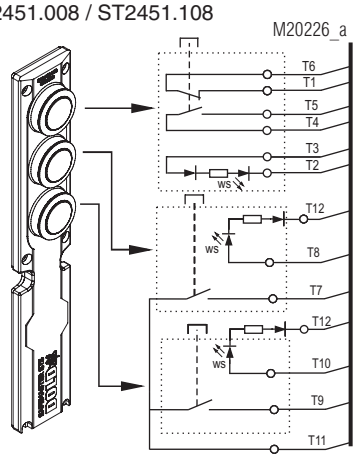
Option module
ST2451.005 / ST2451.105



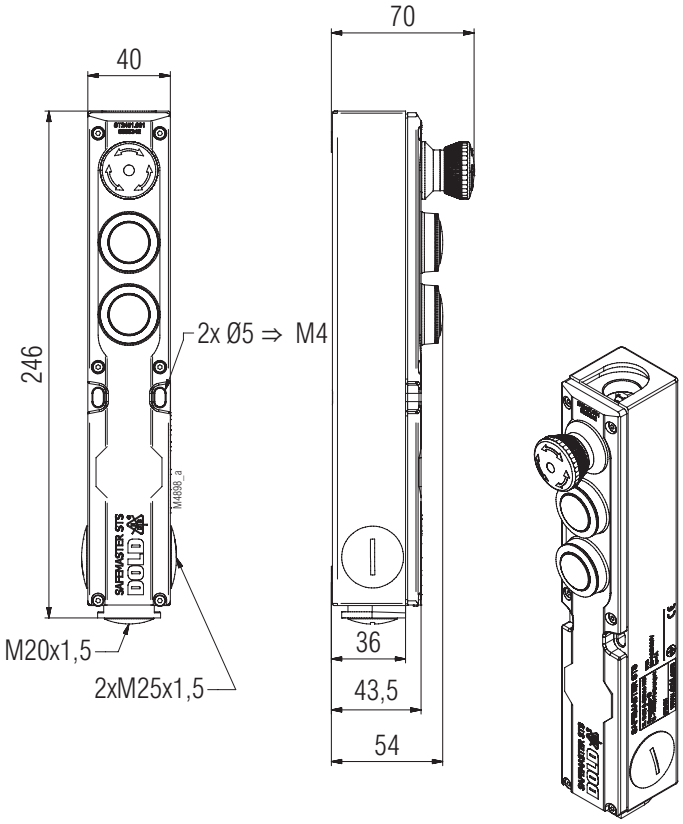
Option module
ST2451.006 / ST2451.106



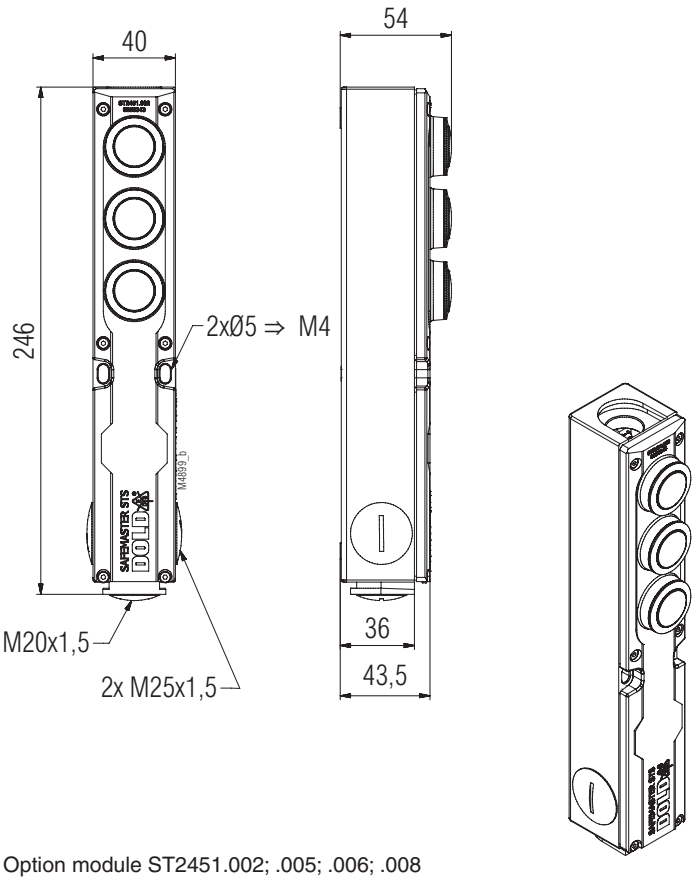
Option module
ST2451.008 / ST2451.108



Dimensional Drawings [mm]



Option module ST2451.001 und ST2451.003

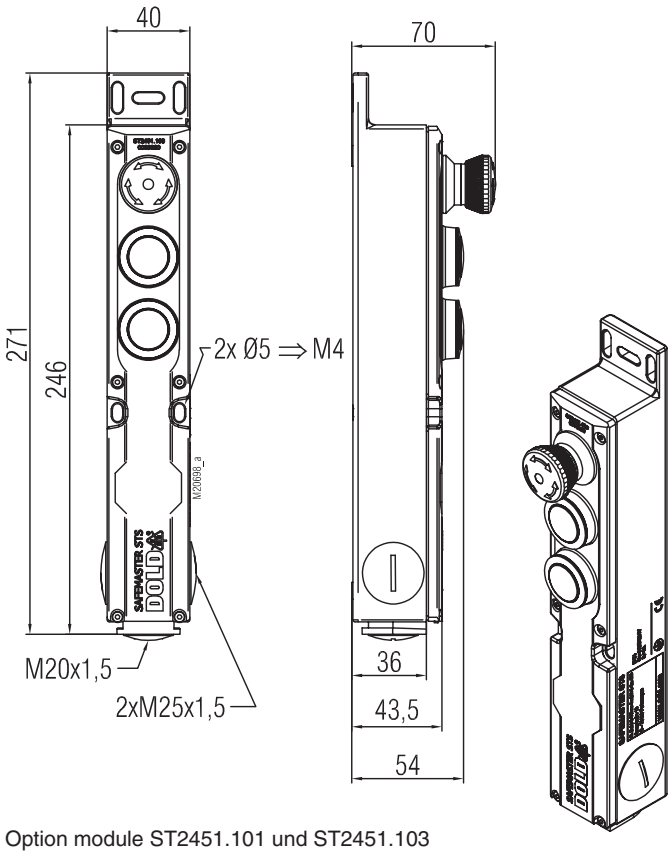


Option module ST2451.002; .005; .006; .008

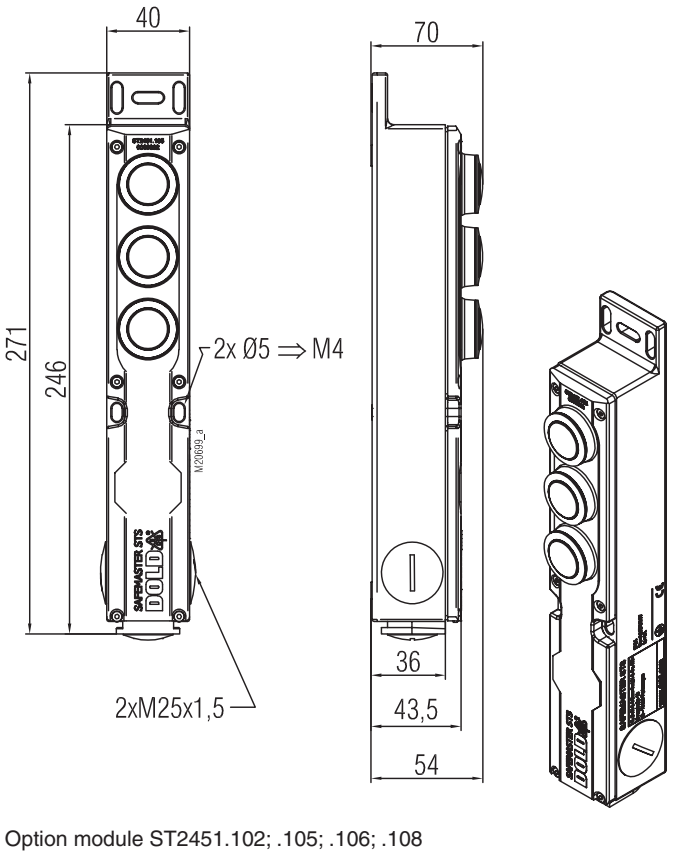
Overview of variants and characteristics

Order designation	Article number	Lower control element		Middle control element		Upper control element	
		Actuator	Contacts	Actuator	Contacts	Actuator	Contacts
Option module TTN ST2451.001	0066342	Illuminated pushbuttons	1 NO, 1 NC with illumination in series	Illuminated pushbuttons	1 NO, 1 NC with illumination in series	E-stop button	1 NO, 2 NC
Option module TTT ST2451.002	0066343	Illuminated pushbuttons	1 NO, 1 NC with illumination in series	Illuminated pushbuttons	1 NO, 1 NC with illumination in series	Illuminated pushbuttons	1 NO, 1 NC, 1 Indicator light (separate control)
Option module TTN ST2451.003	0066989	Illuminated pushbuttons	1 NO, 1 indicator light (separate control)	Illuminated pushbuttons	1 NO, 1 indicator light (separate control)	E-stop button	1 NO, 2 NC
Option module TTL ST2451.005	0067643	Illuminated pushbuttons	1 NO, 1 NC with illumination in series	Illuminated pushbuttons	1 NO, 1 indicator light (separate control)	Indicator light	1 Indicator light
Option module TTX ST2451.006	0067702	Illuminated pushbuttons	1 NO, 1 NC with illumination in series	Illuminated pushbuttons	1 NO, 1 NC with illumination in series	Blind cover	
Option module TTT ST2451.008	0067939	Illuminated pushbuttons	1 NO, 1 indicator light (separate control)	Illuminated pushbuttons	1 NO, 1 indicator light (separate control)	Illuminated pushbuttons	1 NO, 1 NC, 1 Indicator light (separate control)

Dimensional Drawings [mm]



Option module ST2451.101 und ST2451.103



Option module ST2451.102; .105; .106; .108

Overview of variants and characteristics

Order designation	Article number	Lower control element		Middle control element		Upper control element	
		Actuator	Contacts	Actuator	Contacts	Actuator	Contacts
Option module TTN ST2451.101	0069388	Illuminated pushbuttons	1 NO, 1 NC with illumination in series	Illuminated pushbuttons	1 NO, 1 NC with illumination in series	E-stop button	1 NO, 2 NC
Option module TTT ST2451.102	0069389	Illuminated pushbuttons	1 NO, 1 NC with illumination in series	Illuminated pushbuttons	1 NO, 1 NC with illumination in series	Illuminated pushbuttons	1 NO, 1 NC, 1 Indicator light (separate control)
Option module TTN ST2451.103	0069390	Illuminated pushbuttons	1 NO, 1 Indicator light (separate control)	Illuminated pushbuttons	1 NO, 1 indicator light (separate control)	E-stop button	1 NO, 2 NC
Option module TTL ST2451.105	0069392	Illuminated pushbuttons	1 NO, 1 NC with illumination in series	Illuminated pushbuttons	1 NO, 1 indicator light (separate control)	Indicator light	1 Indicator light
Option module TTX ST2451.106	0069393	Illuminated pushbuttons	1 NO, 1 NC with illumination in series	Illuminated pushbuttons	1 NO, 1 NC with illumination in series	Blind cover	
Option module TTT ST2451.108	0069395	Illuminated pushbuttons	1 NO, 1 Indicator light (separate control)	Illuminated pushbuttons	1 NO, 1 indicator light (separate control)	Illuminated pushbuttons	1 NO, 1 NC, 1 Indicator light (separate control)

DE	**Notizen**
EN	**Notice**
FR	**Note**