MECHAN CONTROLS

DESIGNED & MANUFACTURED IN GREAT BRITAIN

Installation Instruction for

Safeline SL4 Grabwire

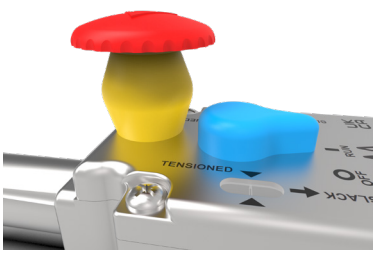
Machine Safety for People and Productivity

Operating Instructions: SafeLine SL4

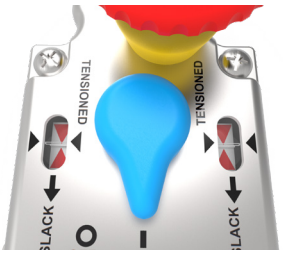
Description	SL4
The stainless steel Safeline 4 cable/push button operated system can be installed where no physical guard is present on conveyors and provide constant emergency stop access. This switch is made from 316 stainless steel or Diecast. The Safeline 4 has the following features in one unit making. 1. The mechanical mechanism helps ensure that the contacts are immediately latched open on actuation and can only be reset by the intentional action of turning the blue reset knob. The design also protects against nuisance tripping and the effects of thermal expansion. 2. A mushroom head emergency stop button is optional on the unit to provide E-Stop access. 3. The cable status indicators make the system easy to set up and maintain for spans up to 75 meters. 4. Four sets of contacts are provided: 2 N.C. + 2 N.O or 3NC + 1NO 5. Sealed to IP66 with rugged construction using 316 stainless steel or Diecast to withstand harsh conditions. 6. Tension indicator windows on both sides of the lid, for ease when tensioning.	

The Mechan Safety Grab wire SL4 conforms to the relevant international standards, such as ISO13850 (EN 418) and IEC60947-5-5. The SL4 has a positive mechanical linkage between the switch contacts and the wire rope mechanism as per IEC60947-5-1. The SL4 switch is brought into the operational condition by pre-tensioning the rope and use of a tensioner/gripper device which clamps the rope and then hooks to the switch eyebolts. Correct tension can be observed by viewing the tension indicators on both sides of the housing. Once tensioned the switch contact blocks can be set to the operational condition (safety contacts closed, auxiliary contacts open) by turning the blue switch to the “run” position, at this point the machine/safety relay is ready to run.

On pulling/pressing the red E-stop or breaking (tension loss) of the rope, the safety contacts will open and the auxiliary contacts will close. The SL4 is mechanically latched and can then only be returned to the operational condition by turning the blue rest switch into the “run” position as required by ISO13850 (EN418).



Lid mounted E-stop button
A mushroom head emergency stop button is included on the unit to provide total E-Stop access even at the extreme ends of the span.



Cable status indicator on lid
The cable status indicators on both sides of the lid make the system easy to setup and maintain for spans up to 75m (246 ft).

Technical Specification: SL4

Technology		Mechanical			
Electrical					
Safety Contacts		2 NC + 2 NO or 3 NC + 1 NO			
Rated Insulation Voltage (Ui)		500V			
Withstand Voltage		2500V			
Switching Current @ Voltage, Min		5mA @ 5V DC			
Rating		Utilisation Category: AC15			
Operational Rating		AC15 A300 240V. 3A / 120V 6A ac 24V. 2.5A dc inductive			
Thermal Current		10A			
Operating Life @100mA load		1 x 10^6			
Operating Characteristics					
Cable Span Between Switches, Max		75m (246 ft)			
Tension Force To Run Position		103N			
Tensioning Force To Lockout		188N			
Operating Force, Min		<125N @ 300mm Deflection			
Actuation Frequency, Max		1 Cycle/s			
General Information					
Construction		316 Stainless Steel or Diecast			
IP Rating		IP66			
Operating Temperature		-25°C to +80°C			
Fixing		4 X M5 Security Screws			
Connection		Contact Block			
Indication Material		Acetal			
Weight		1.55kg			
Colour		316 Stainless Steel or Yellow			
Mechanical Data					
Conduit entries		3 x M20			
Torque settings		Mounting M5 4.0 Nm, Terminals 1.0 Nm			
Vibration resistance		10-500Hz 0.35mm			
Shock resistance		15g 11ms			
Utilization Category					
A600/AC-15	(Ue)	600V	500V	240V	120V
	(Ie)	1.2A	1.4A	3A	6A
DC-13	(Ue)	24V			
	(Ie)	2A			

Safety Standards	
Standards	IEC 60947-5-5, ISO 13850, IEC 60947-5-1 Emergency Stop Device In Accordance With ISO 13850 IEC 13849-1
Certifications	CE marked for all applicable directives

Safety Related Data			
B10d	2,000,000	PFH	1.1 x 15^{-9}
TM (Mission Time)	>100 Years	PFHd	1.12 x 10^{-9}
DC	99%	SFF	99.5%
MTTFd	High > 385 Years (Based on usage rate of 360 Days/Year, 24 Hours/Day, 10 Operations/Hour)		
SIL up to	SIL 3 acc. to EN 62061 (If connected with safety relay or safety PLC)		
Performance Level (PL) up to	PL-e acc. to EN ISO 13849-1 (If connected with safety relay or safety PLC)		
Safety Category up to	CAT4 acc. to EN ISO 13849-1 (If connected with safety relay or safety PLC)		

Note: May be suitable for use in performance levels Ple or Pld systems (according to ISO 13849-1) and for use in SIL2 or SIL3 systems (according to IEC 62061) depending on the architecture and application characteristics.
Note: The safety contacts are described as normally closed (N.C) i.e, wire is tensioned as per indication and the machine is able to start.

Installation

1. Installation of the Mechan Grab wire SL4 system must be in accordance with a risk assessment for the individual application. Installation must only be conducted by competent personnel and in accordance with these instructions.

2. According to ISO13850 (EN418), pulleys may only be mounted such that a complete length of the rope can be observed.

3. Rope support eyebolts must be fitted at 2.5 m. intervals along all rope lengths between switches. The rope must be supported no more than 500mm from the Switch eyebolt or Safety Spring (if used). It is important that the first 500mm is not used as part of the active protection coverage.

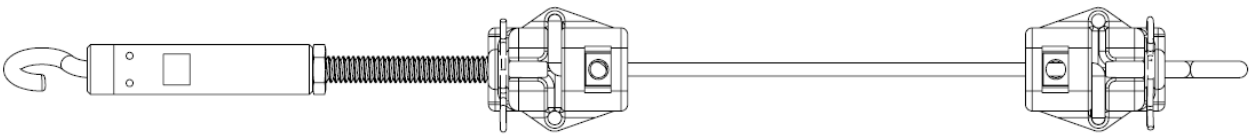
4. M5 mounting bolts must be used to fix the switch. Tightening torque for mounting bolts to ensure reliable fixing is 4 Nm. Tightening torque for the lid screws, conduit entry plugs and cable glands must be 1.5 Nm to ensure IP seal. Only use the correct size gland for the conduit entry and cable outside diameter.

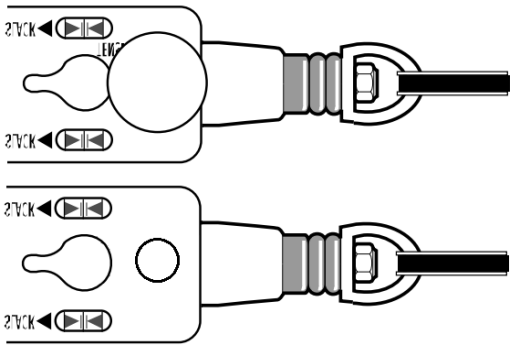
5. Tensioning of rope is achieved by the use of any safety tensioner kit or the Mechan Controls tensioner.

On installation, set the tension to the mid position as indicated by the markers in the viewing windows of each SL4. Check the operation of the SL4 and the control circuits by pulling the rope at various locations along the active protection area and resetting each SL4 by turning the Blue Reset switch. Ensure that each time the SL4 latches off and requires manual resetting by turning the blue reset switch. Increase the system tension further, if required, depending upon the checks along the active length of coverage.

With a Mushroom type E-Stop button (Red) then test and reset each SL4 to ensure correct function of the safety control circuits.

The typical operational condition for the successful operation of the system is less than 75N pulling force and less than 150mm deflection of the rope between the eyebolt supports.





Use M5 or #10-32 bolts to mount the SL4 to the frame of the machine.

Figure 1 - Typical Mounting —Safeline 4 Cable Pull Switch

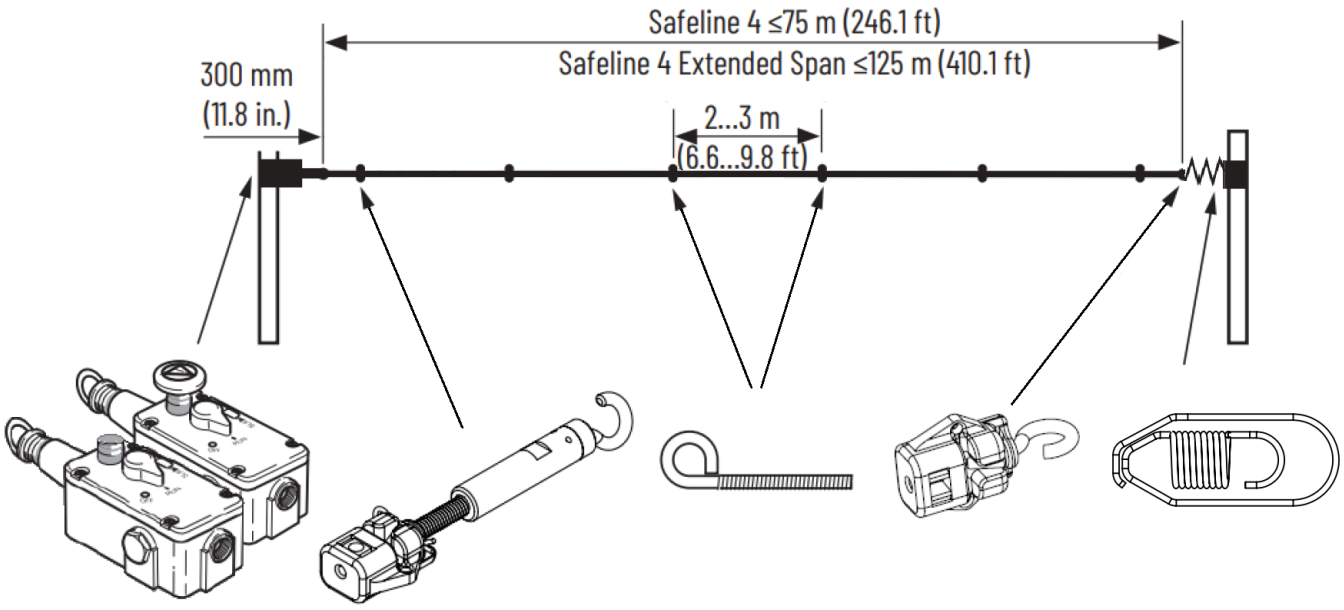
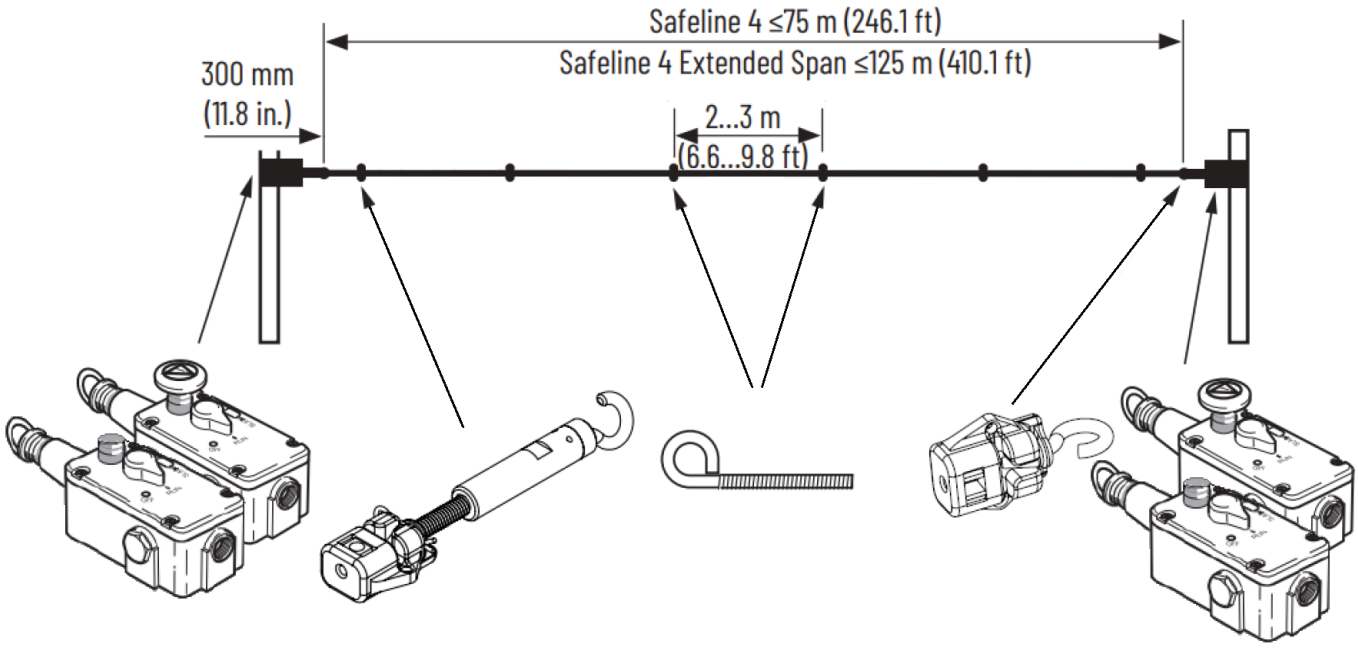
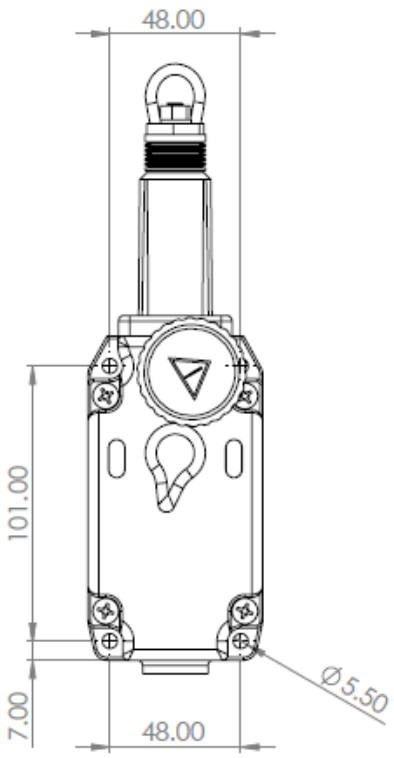
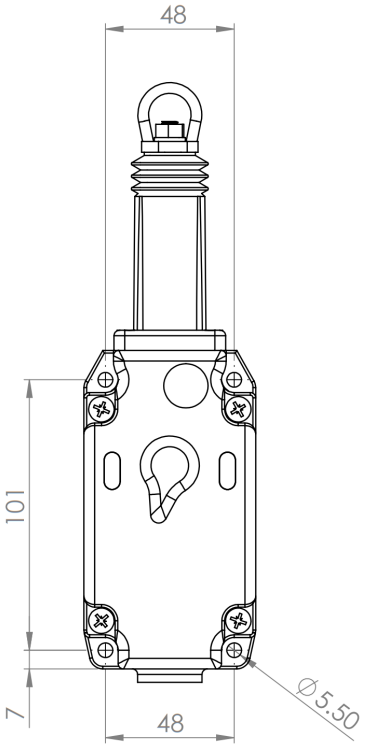


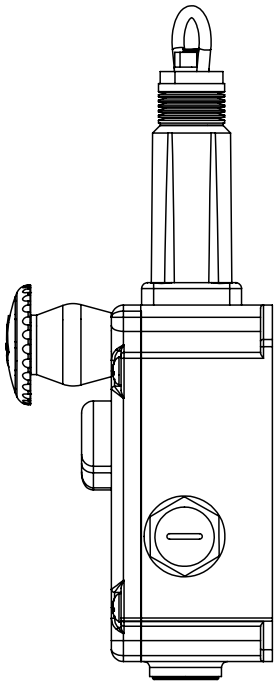
Figure 2 - Typical Mounting —Safeline 4 Extended Span Cable Pull Switch

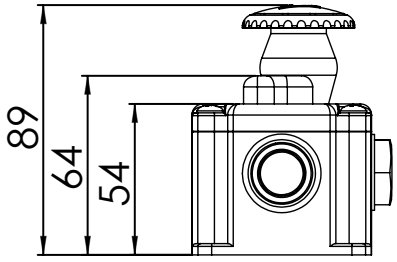


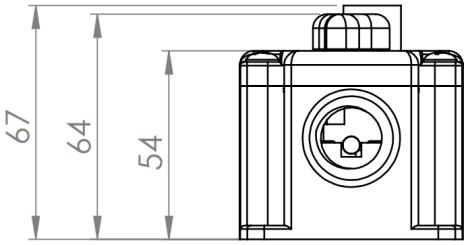
316 Stainless Steel



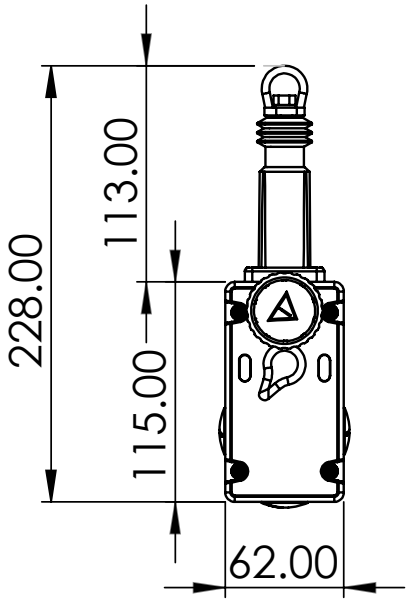


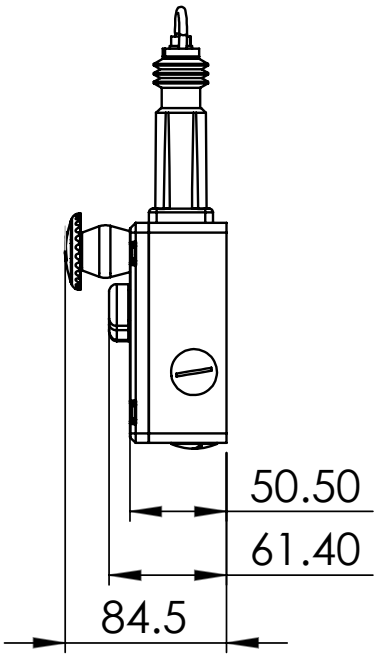






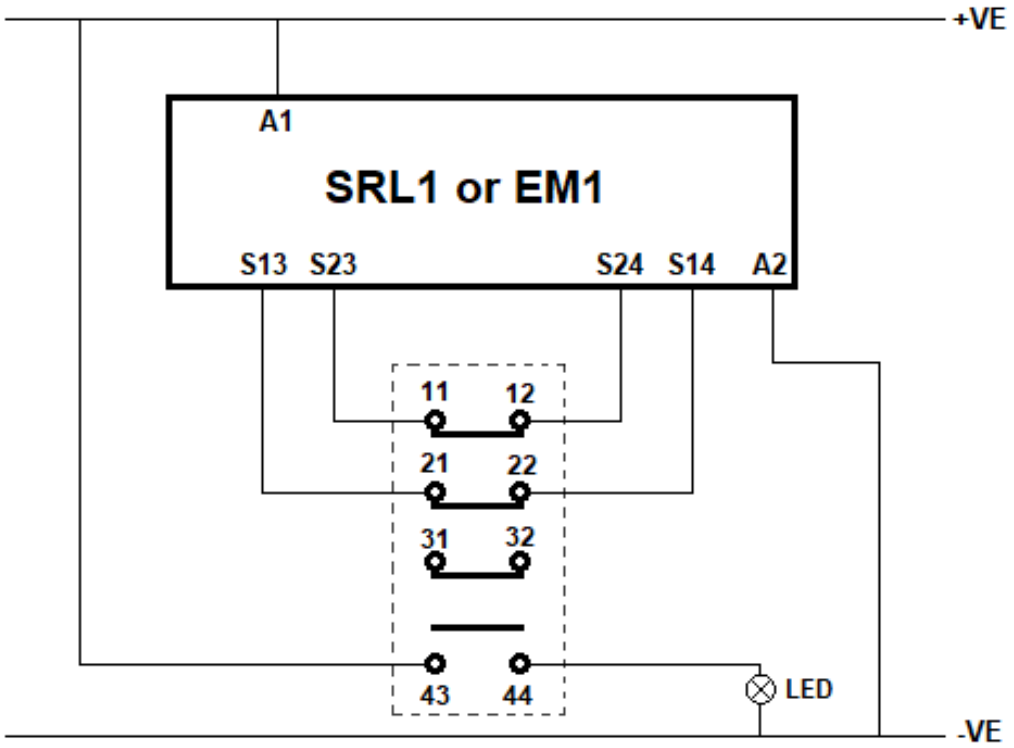
Diecast

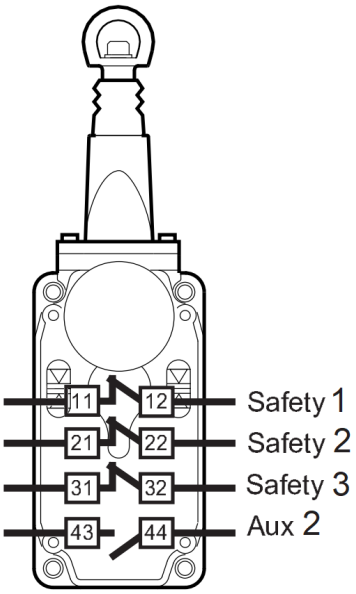




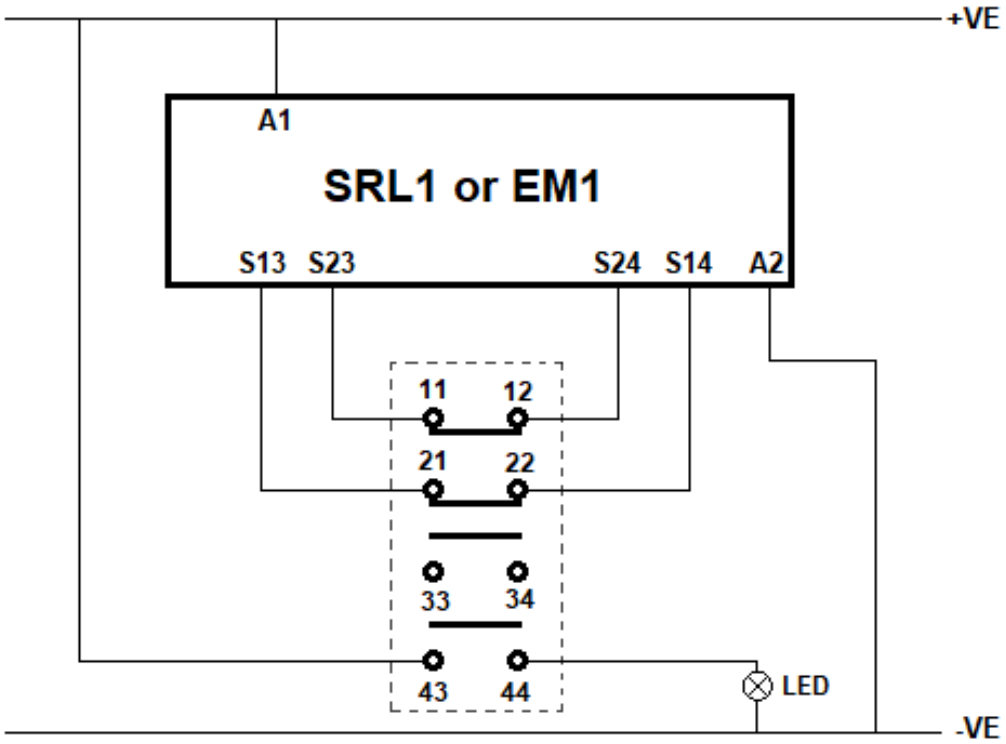
All dimensions are in MM

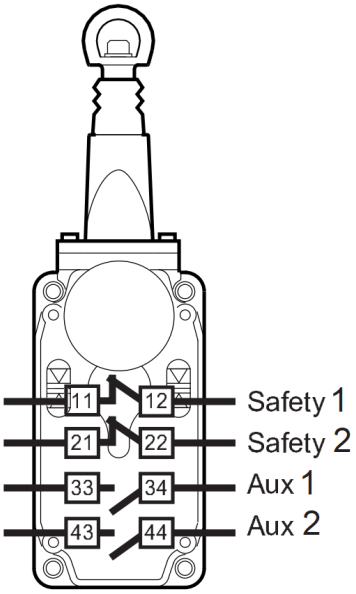
Typical connection for SL4 with Mechan safety relay





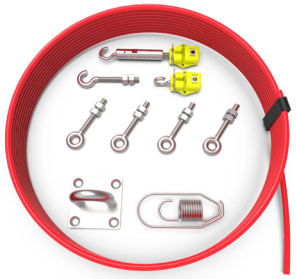
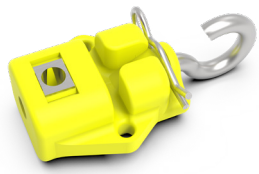
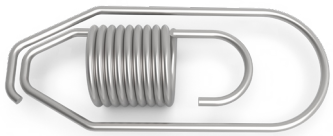
Typical connection for SL4 with Mechan safety relay





NOTE: DO NOT ADJUST POSITION OF CONTACT BLOCK WHEN WIRING THE SL4 AS THIS COULD EFFECT THE PERFORMACE OF THE UNIT.

Accessories

Description		Material	Part Number
	SL4 installation Kit - 5m (16.4 ft)	Polypropylene Plastic 316 Stainless Steel	314.010
	SL4 installation Kit - 10m (32.8 ft)		314.011
	SL4 installation Kit - 15m (49.2 ft)		314.012
	SL4 installation Kit - 20m (65.6 ft)		314.013
	SL4 installation Kit - 30m (98.4 ft)		314.014
	SL4 installation Kit - 50m (164 ft)		314.015
	SL4 installation Kit - 75m (246 ft)		314.016
	Rope Only - 5M	Polypropylene Covered Steel Cable	314.017
	Rope Only - 10M		314.018
	Rope Only - 20M		314.019
	Rope Only - 30M		314.020
	Rope Only - 40M		314.021
	Rope Only - 50M		314.022
	Rope Only - 60M		314.023
	Rope Only - 75M		314.024
	Tensionner	316 Stainless Steel	314.025
	Cable Clamp	Plastic & 316 Stainless Steel	314.026
	Eyebolt M8	316 Stainless Steel	314.027
	Anchor Plate	316 Stainless Steel	314.028
	Open Hook M8	316 Stainless Steel	314.029
	Anchor Spring	316 Stainless Steel	314.030
	Corner Bracket	316 Stainless Steel	314.031

SL4-SS-E-31

Version	
SL4	SafeLine 4

Enclosure	
Blank	Diecast
SS	Stainless Steel

Emergency Stop Button	
E	With E|Stop
NA	Without E|Stop

Auxiliary Contacts	
1	1 NO
2	2 NO

Normally Closed Contacts	
2	2 NC
3	3 NC

SL4 Installation Kit **

Connection Type	
05M	SL4 installation Kit (16.4ft)
10M	SL4 installation Kit (32.8ft)
15M	SL4 installation Kit (49.2ft)
20M	SL4 installation Kit (65.6ft)
30M	SL4 installation Kit (98.4ft)
50M	SL4 installation Kit (164ft)
75M	SL4 installation Kit (246ft)

Example 1: Safeline4 with E|Stop, 2NC & 2NO contacts

SL4-SS-E-22

Standard Grabwire housing

Stainless Steel Enclosure

E|Stop Included

Has 2NC and 2NO output contacts

Example 2: Safeline4 without E|Stop, 3NC & 1NO contacts

SL4-SS-31

Standard Grabwire housing

Stainless Steel Enclosure

Has 3NC and 1NO ouput contacts

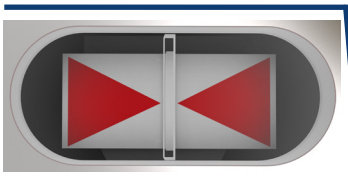
Emergency Stop Button

The SafeLine4 comes with an optional emergency stop button for applications that require an E|stop.

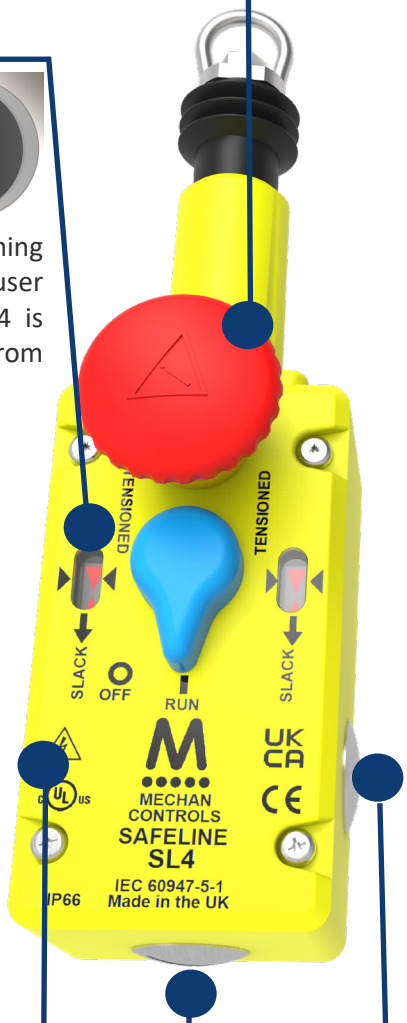
What is the SafeLine4 Grab Wire?

The SafeLine4 grabwire is a cable/E|Stop button operated system that can be installed where no physical guarding is present on conveyors, providing constant emergency stop access.

Tensioning Screen



There are 2 tensioning screens to allow the user to see if the SafeLine 4 is correctly tensioned from multiple angles.

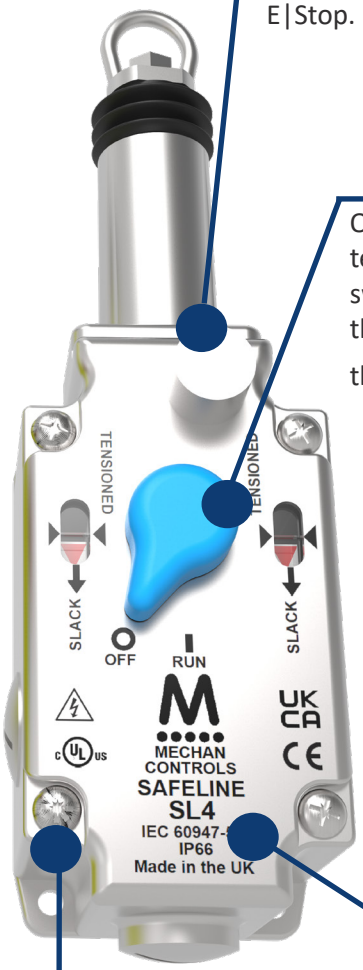


Emergency Stop Button

For situations where an E|Stop would cause nuisance tripping, the SafeLine4 has an option without an E|Stop.

Reset Switch

Once the SafeLine4 is tensioned correctly, the reset switch must be turned into the “RUN” position to allow the machine to be started.



IP Rated

Tested and approved to IP66 suitable for strict wash down environments.

3 Cable Entry Points

Designed for ease of installation, the SafeLine4 has 3 cable entry points.

Security

The SafeLine lid is fixed with M5 security screws.

Safety Assessment

A risk assessment should take place to establish that the specifications of the SafeLine 4 product are suitable for the application required. See Technical Specifications below or contact Mechan Controls for further information.

The products may only be installed, commissioned, operated and maintained by competent persons.

A competent person is a qualified and knowledgeable person who, because of their training, experience and current professional activity, has the specialist knowledge required. An understanding of European and International laws, directives and standards is recommended.

Maintenance

It is recommended to check the safe operation of the unit and look for signs of damage or excessive wear on a weekly basis. Damaged units should be replaced or returned to the manufacturer for repair where practical.

Disclaimer

In the interest of product development specifications are subject to change without notice. It is the responsibility of the user to ensure compliance with any acts or by-laws in place. All information regarding Mechan equipment is believed to be accurate at the time of printing. Responsibility cannot be accepted for errors or omissions.

Warranty

Warranty will be void if the following points are true:

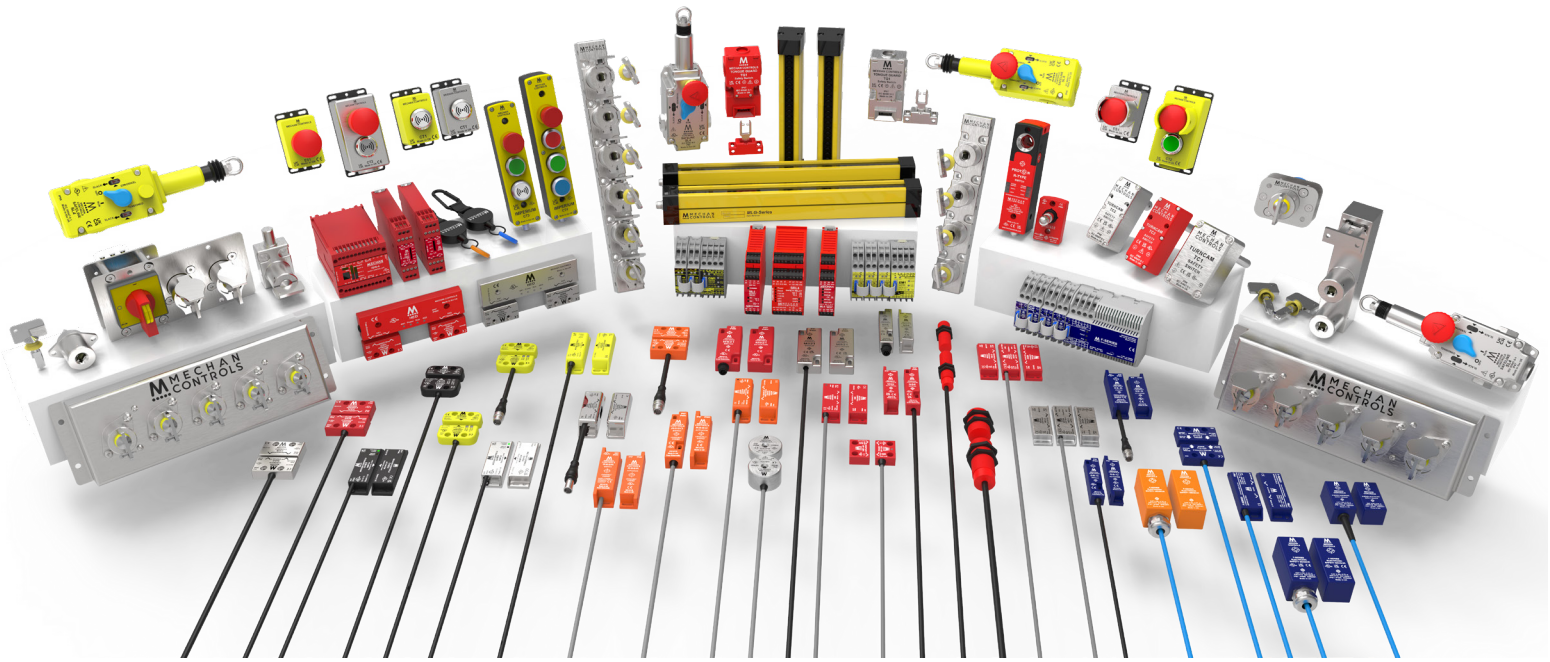
- The product was not used for its intended purpose
- Damaged was caused by usage not stated in the manual
- Modifications have been made to the products (e.g exchanging components)
- Operating personnel are not suitably qualified

Warning!

The Mechan Controls SafeLine 4 Grab Wire system should not be manipulated or overridden.

Security screws are provided with every Mechan product.

Mechan Controls Safety Products



MECHAN CONTROLS

14/16 Seddon Place Stanley Industrial Estate Skelmersdale Lancashire WN8 8EB
Telephone: +44 (0) 1695 722264 Fax: +44 (0) 1695 729664 Email: sales@mechancontrols.co.uk
www.mechancontrols.com