

# Safety module SMSA31



Original datasheet - For safety gates, magnetic switches, safety limit switches in anti-valent mode



## Main features

- **Multiple types inputs.** The safety module can monitor the safety state of emergency gates equipped with safety non-contact or electromechanical limit switches in anti-valent operating mode
- **Machinery Directive compliance.** Cat. 4, PL e in accordance with EN ISO 13849-1
- **Multiple operating modes.** The device can operate with automatic, manual or monitored manual start/reset
- **Safety outputs.** Electromechanical forcibly guided safety relays with 3NO+1NC aux outputs
- **Flexible wiring.** The module is equipped with detachable screw terminals for easy wiring and product maintenance; the terminal blocks are coded so to avoid wiring mistakes
- **Diagnostic.** LED indications for power supply, state of the safety inputs and state of the safety outputs
- **Compact.** 1-DIN, W x H x D: 17,5 x 110,8 x 121,1mm
- **Approval** by TÜV, CE, cULUs

## Description

The SMSA31 safety module is designed in Category 4, Performance Level e in accordance with the Machine Directive and EN ISO 13849-1 to monitor and control safely the safety circuits in safety gates with safety magnetic switches and safety limit switches switching the safety inputs in anti-valent mode (NO+NC signals).

The module can monitor and control single or multiple safety accesses with cascade of safety switches.

## Main functions

- Monitoring of safety circuits in applications with safety gates equipped with safety magnetic or electromechanical safety switches operating the input signals in anti-valent mode
- Double safety channels operation; the device monitors the change of state of the two safety inputs that operate in anti-valent mode (channel-1 NO and channel-2 NC)
- Monitoring of single or multiple safety gates in cascade
- Control of up to 3 NO safety outputs with electromechanical safety relays
- Selectable start/reset operating mode Manual, Automatic or Monitored Manual Start
- Diagnostic of the safety circuit through on-board LED indications for power supply, status of safety channels and status of safety outputs
- 1 NC auxiliary output that can be used for external status indication

## References

### ► Type selection

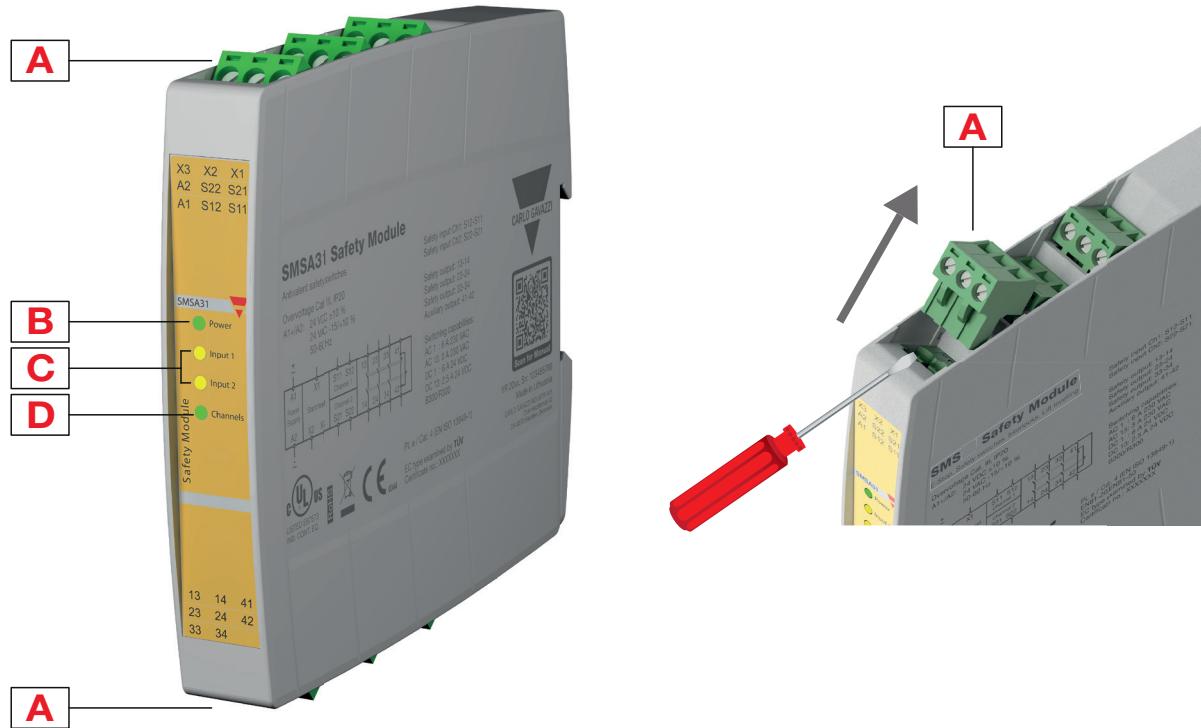
NO safety outputs	Aux NC output	Ordering code
3	1	<b>SMSA31</b>

### ► Further reading

Information	Where to find it	QR
Instruction manual	<a href="http://cga.pub/?240e1c">http://cga.pub/?240e1c</a>	
Software SISTEMA	<a href="http://www.dguv.de/webcode/e34183">http://www.dguv.de/webcode/e34183</a>	

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## Structure

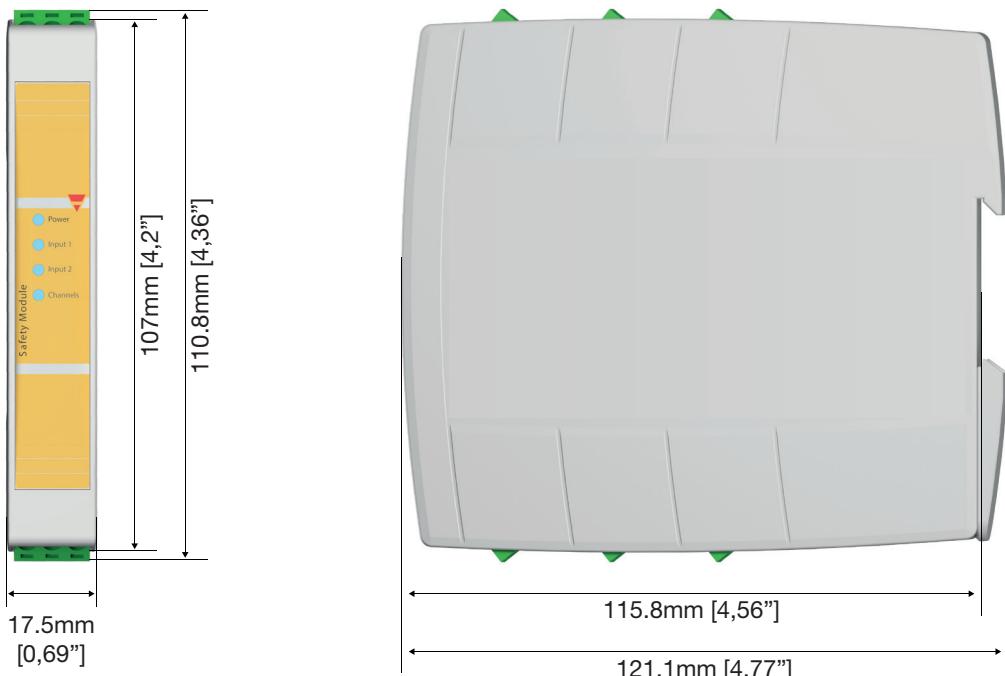


Element	Component	Function
<b>A</b>	Pluggable terminal blocks	Power supply, start signal, safety inputs and outputs
<b>B</b>	LED	Power supply status
<b>C</b>	LED	Safety inputs status
<b>D</b>	LED	Safety outputs status

## Features

### General

<b>Material</b>	PA-GF, self-extinguishing: UL 94 V-0
<b>Weight</b>	239g
<b>Assembly</b>	DIN rail mounting (According to EN 50022)



### Electrical data

<b>Supply voltage</b>	24Vdc $\pm$ 10%; 24Vac -15%/+10%, 50...60 Hz, Class 2
	Overvoltage category III
	Short circuit protection internal PTC
<b>Rated insulation</b>	4 kV coil to contacts 4 kV contact to contact

### Inputs

<b>Number of safety channels</b>	2
<b>Safety inputs (contact inputs)</b>	S11-S12 and S21-S22
<b>Loop resistance</b>	Max. 1 k $\Omega$
<b>Input current</b>	Typical 5 mA

## ► Outputs

<b>NO safety outputs</b>	3
<b>NC auxiliary output</b>	1
<b>Type</b>	Voltage free contact output, relays with forcibly guided contacts
<b>Max current rating - single output</b>	@ 60°C (140°F) operating temperature: AC 1: 250V / 6A / 2000 VA - AC 15: 230V / 3A DC 1: 24V / 6A - DC 13: 24V / 2.5A / 0.1 Hz UL508, pilot duty: B300 / R300
<b>Max quadratic current</b>	Spacing between modules ≥100mm: 72A <sup>2</sup> @40°C (104°F) ambient temperature Modules mounted stacked: 26A <sup>2</sup> @25°C (77°F) ambient temperature Please refer to the derating curves in installation manual
<b>Mechanical life</b>	> 10 <sup>7</sup> operations
<b>Electrical life AC1 (360 s/h)</b>	~ 10 <sup>5</sup> operations

## ► Safety parameters

<b>ISO 13849-1 Safety Category</b>	Cat. 4
<b>ISO 13849-1 Performance Level</b>	PL e
<b>MTTF<sub>D</sub> [a]</b>	420,8
<b>PFH<sub>D</sub> [1/h]</b>	1,85 E-10
<b>DCavg</b>	99%
<b>β</b>	5,00 E-02
<b>β<sub>D</sub></b>	2,00 E-02
<b>Mission time</b>	20 years

## ► Compatibility and conformity

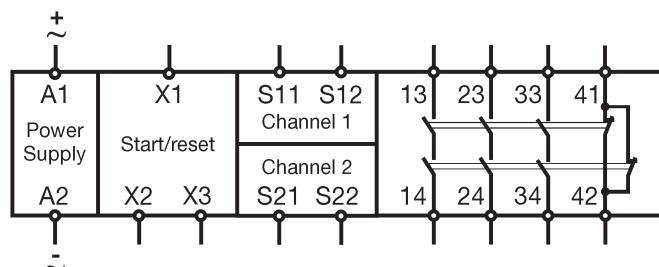
<b>Low Voltage Directive 2014/35/EU</b>	<b>EN 60947-5-1</b> Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
<b>EMC Directive 2014/30/EU</b>	<b>EN 60947-5-1</b> Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
<b>Machinery Directive 2006/42/EC</b> EC type examined by TÜV Rheinland Cert. no. 01/205/6003.00/25	<b>EN ISO 13849-1</b> Safety of machinery - safety related parts of control systems - General principles for design <b>EN 60204-1</b> Safety of machinery - Electrical equipment of machines - General requirements <b>EN 61326-3-1</b> Electrical equipment for measurement, control and laboratory use. EMC requirements. Immunity requirements for safety-related systems and for equipment intended to perform safety-related functions (functional safety) - General industrial applications
<b>Approvals</b>	  



## ► Environmental

<b>Protection grade</b>	IP40 on frontal part of the housing, IP20 on the terminals. The device has to be installed in a cabinet with protection degree of IP54.
<b>Pollution degree</b>	2
<b>Operating Temperature</b>	-25...+60°C (-13...140°F), UL: +40°C (104°F)
<b>Storage Temperature</b>	-30...+70°C (-22...158°F)
<b>Ambient humidity range</b>	R.H. ≤95% non condensing

## Connection Diagrams



Terminal	Function
<b>A1</b>	power supply 24 Vdc (+)/Vac(~)
<b>A2</b>	power supply 24 Vdc (-)/Vac(~)
<b>S11-S12</b>	channel 1 NC input
<b>S21-S22</b>	channel 2 NO input
<b>X1-X2</b>	manual start / automatic start
<b>X1-X3</b>	monitored manual start
<b>13-14</b>	NO safety output
<b>23-24</b>	NO safety output
<b>33-34</b>	NO safety output
<b>41-42</b>	NC auxiliary output

### Double channel mode

