Safety electronics
PLe per DIN EN ISO 13849-1
Model ELMS1

Applications

- Harbour cranes (RTG, STS, RMG)
- Ship and offshore cranes
- Overhead traveling cranes, bridge cranes, gantry cranes and hoists
- Conveyor systems
- Machine building and plant construction, manufacturing

Special features

- Certified safety electronics, certified in accordance with DIN EN ISO 13849-1, PLe
- Certified system solution incl. force measurement, certified in accordance with DIN EN 13849-1 Cat. 3, PLd
- 16 x safe inputs (8 x 4 ... 20 mA analogue inputs, 8 x digital inputs), 2 x safe relay outputs and 6 x safe solid-state outputs (positive switching)
- Additional module with ProfiBus®, ProfiNet®, EtherCat® and CANopen®
- Complex functionality, easy to configure via PC

Safety electronics, model ELMS1

Description

The model ELMS1 safety electronics is a multi-functional and configurable safety switching device. The electronics consist of a control module and individual function modules that can be mounted next to each other. The modules are connected to each other via a redundant, standard DIN-rail bus.
The safety electronics feature a wide range of safety digital and analogue inputs, safety solid-state and safe contact outputs. Several analogue outputs and also fieldbus modules are available for those non-safety-relevant parts of the application during normal operation. The status of the inputs and outputs, operating voltage and other diagnostic messages are displayed on a LED matrix.

The control module of the safety electronics is certified in accordance with DIN EN 13849-1 Category 4 PLe through DGUV. Based on Table 3 of DIN EN 13849-1, this corresponds to SIL 3.

System solution for cranes and hoists
A fully certified system solution for overload protection and slack rope detection for non-tipping cranes is also available. The system solution, consisting of control module, software and force transducers is certified in accordance with DIN EN ISO 13849 and DIN EN 62061 with PL d/SIL 2.

Option

- Implementation and certification of customer-specific applications
- Visualisation of the relevant data via display
- Analogue output 4 … 20 mA / DC 0 … 10 V
- Installation in control panel
- Connection to Fieldbus (ProfiBus®, ProfiNet®, EtherCat® and CANopen® etc.)

Specifications

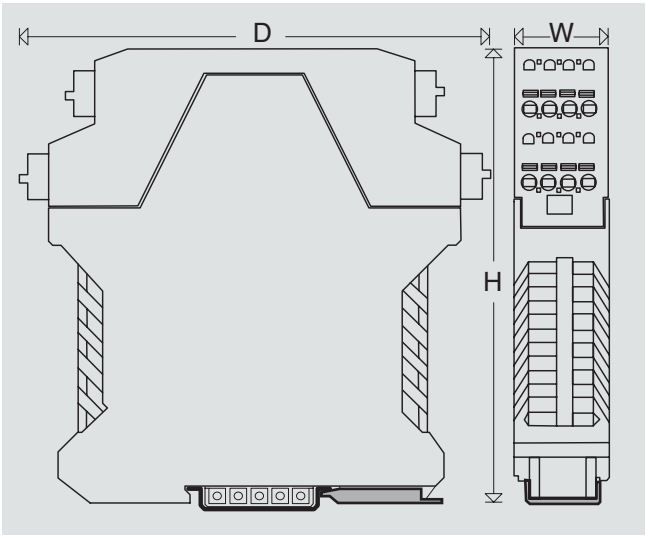
Model ELMS1	
Analog input	
Input signal	4 ... 20 mA / DC 0 … 10 V
Current inputs	4 … 20 mA
Input resistance	4 … 20 mA: approx. 500 Ω, DC 0 … 10 V: > 5 kΩ
Accuracy	±3 % of full scale
Digital input	
Voltage at the inputs	DC 24 V -15 %, +10 %, ≤ 10 % residual ripple
Current supply	max. 4 mA
Input frequency	at I9 to I12 ≤ 500 Hz via 2 sensors e.g. proximity sensors at I9 to I16 ≤ 50 kHz with HTL signals via incremental measuring system
Rated temperature range	-10 … +55 °C
Storage temperature range	-40 … +85 °C
Relay output	
Minimum switching current	10 mA
Switching capacity per DIN EN 60947-4-1/ EN 60947-5-1	DC1: 24 V / 6 A DC13: 24 V / 5 A
Total of switching and continuous currents	K3, K4: ≤ 6 A K5, K6: ≤ 6 A
Service life at switching capacity: DC13	DC 24 V/ 1 A: 1 x 10^5 DC 24 V/ 4 A: 4 x 10^4
Maximum number of cycles	DC13 4 A: 360 cycles/h
Mechanical lifetime	> 10^7 h
Solid-state output	
Minimum switching current	1 mA
Switching current and continuous current	IO1-IO4: 0.25 A O1-O6: 1 A
Total of switching and continuous current	IO1-IO4: 0.8 A O1-O6: 3 A
Other outputs	Profibus® DP, ProfiNet®, EtherCat, CANopen® etc.
Supply voltage	DC 24 V -15 %, + 10 % / max. residual ripple 10 %
Power consumption	3.0 W
Response time	
Operate and disengaging time	100 ms
Total response time of the safety function	typically (relay): 10 ms / 3 ms
Terminals	Spring-loaded terminals, plug-in
Connection cross-section	0.2 .. 1.5 mm^2 (AWG24-16) with end splices
Lead	only 60/75 °C copper
Connection diagram	a wiring diagram will be created and delivered with every project
Case material	Polyamide (PA), non-reinforced
Ingress protection	Cases and terminals: IP20 / minimum requirement for the installation location IP54
Electromagnetic compatibility	DIN EN 61326-1: 2013-07 DIN EN 61326-3-1: 2015-06 EN 55011: 2009+A1: 2010 (class A)
RoHS	EN 50581:2012
Safety	Category 4, PLe based on Table 3 of DIN EN 13849-1: 2016-06, this corresponds to SIL 3
Mounting	on DIN rail, 35 mm, per EN 60715:2001
Weight	approx. 450 g

Model ELMS1	With display	In the control cabinet
Version	Only in combination with a CANopen® module, 4.3“ TFT touchscreen with LED backlighting Dimensions (W x H x D) 140 x 100 x 5 mm	installed
Rated temperature range	0 … 50 °C	-10 … +50 °C
Storage temperature range	-25 … +75 °C	-40 … +85 °C
Supply voltage	AC 230 V	
Ingress protection	IP65	

Approvals

Logo	Description
	ELMS1 module ET 17061 - DGUV per DIN EN 60947-5-1, DIN EN ISO 13849-2, GS-ET 20
	ELMS1 system incl. software and WIKA force measurement HSM 19013 - DGUV per GS-HSM-30 and GS-HSM-11

Dimensions in mm



Module ELMS1	Dimensions in mm		
	Height (H)	Width (W)	Depth (D)
Control module	114	67.5	99
Extensions	114	22.5	99

Accessories

Model		Description
F23S1		**Tension/compression force transducers** ■ Measuring ranges 0 ... 3 to 0 ... 100 kN ■ Material: stainless steel (corrosion-resistant) ■ Integrated amplifier ■ For further technical information, see data sheet FO 51.17
F33S1		**Shear beam** ■ Measuring ranges 0 ... 2 kN to 0 ... 100 kN ■ Material: stainless steel (corrosion-resistant) ■ Integrated amplifier ■ For further technical information, see data sheet FO 51.42
F53S8		**Heavy-duty load pin** ■ Measuring ranges as of 0 ... 10 kN ■ Material: stainless steel (corrosion-resistant) ■ Integrated amplifier ■ For further technical information, see data sheet FO 51.43
F73S1		**Tension link** ■ 0 ... 5 to 0 ... 10,000 kN ■ Material: stainless steel (corrosion-resistant) ■ Integrated amplifier ■ For further technical information, see data sheet FO 51.19
EZE53		**Cable** ■ Resistant to seawater ■ UV-resistant

Your WIKA Sales Partner

ICS Schneider Messtechnik GmbH
Briesestrasse 59
D-16562 Hohen Neuendorf / OT Bergfelde
Tel.: +49 3303 5040-66
Fax: +49 3303 5040-68
E-Mail: info@ics-schneider.de

WIKA Alexander Wiegand SE & Co. KG
Alexander-Wiegand-Straße 30
63911 Klingenberg/Germany
Tel. +49 9372 132-0
Fax +49 9372 132-406
info@wika.de
www.wika.de