SSN3501

Smart Safety Network

Datasheet 111625-900 Rev. 1.26

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Introduction

This document describes the physical, electrical and functional characteristics of the Smart Safety Relay SSN3501.

The Smart Safety Network (SSN) is a networked safety relay system designed for monitoring and controlling safety functions, such as switching off protective devices to secure hazardous areas in industrial machinery applications. This device is intended for industrial environments only.

This document includes information on device input/output connections, network cabling, wiring and configuration of the SSN system.



Technical data

Input	
Supply nominal voltage UN	24V DC ± 10%
Tension range at max. 5% residual ripple	0,85 ... 1,15 UN
Nominal use	< 130 mA (semi-conductor outputs no load)
Power input	< 3,12 VA for UN
Control voltage through T33/T34, T21/T22, T11/12	DC 23 V for UN
Control circuit through T33/T34, T21/T22, T11/12	a 10 mA for UN
Peak switch-on power	< 3,0 A within 4,8 ms (for UN +10%)
Static current	< 240 mA for UN
Minimum voltage on clips A1 (+)/A2(-) Minimum necessary holding level of the activated status	> 12,0 VDC
Protecting the device	T 400 mA
Cable resistance:	T11-T12: < 300 Ω T21-T22: < 300 Ω T33-T34: < 300 Ω
Output	
Contact assembly	2 x NO
Breaking capacity according to EN 60947-5-1, 13/14, 23/24	AC1: 250 V / 6 A AC15: 230 V / 3 A DC13: 24 V / 5 A / 0,1 Hz
Fuse protection of the safety output contacts	230VAC / TG2A, 24VDC / T5A
Mechanical life (number of activations)	>10 Million
Semi-conductor outputs	
Transistor outputs: Y14 , Y24	2 NPN (24 V DC OFF. Max. 20 mA) not protected against short circuit
Network	
Number of units per network	Max 25 units
Cable length between units	< 1000 m
Network connection	Optical fiber cable: SC/SC 62,5 / 125 µm
Communication bus	Optical fiber cable : 0,5MB/s of Baud rate
SSN system response time	< 60 mS (emergency stop), < ca. 600 mS (start up via reset button)

Response times	
Min. response time at nominal load	< 620 ms
Delay of start-up (configuration time)	< 3,1 s
Switch-off delay during Emergency (Ub = 24 VDC)	< 60 ms
Switch-off delay during network failure (Ub)	< 80 ms
Restart time	> 150 ms
Alarm indication	
Device Failure	Alarm indication via 2 x LEDs (R1/R2) Error code indication (refer to the user manual)
Network Failure	Network failed indication via 2 x LEDs (L1/L2)
Self test	
The self test (POST: Power On Test) is performed at power up the SSN device	- Pulse generator function - Safety inputs - Relays switching - DIP-Board settings - Master selection
The self test during the normal RUN condition	- Pulse generator function - Safety inputs - Relay switching
Miscellaneous	
Insulation coordination according to EN 60664-1 (equivalent to UL 840)	2
Contamination level	2
Ambient Temperature, running / storage	-20 - +55°C / -30 - +70°C
Relative humidity for running and storage	10% upto 95%, no condensation
Insulation coordination (rated impulse withstand voltage)	4 kV (pollution degree 2), according to EN 60664-1
Conditional short circuit current	1kA
Maximum installation altitude	3000 m above sea level according to EN 60664-1
Approvals	
Functinal safety	Safety component according to Machinery Directive 2006/42/EC. Certification reference: ET17075 (DGUV Test valid until 2022)
EMC compliance is supported by existing test data and documented risk analysis. No critical gaps identified.	EN 61000-6-4 (industrial emission) EN 61000-6-2 (industrial immunity)

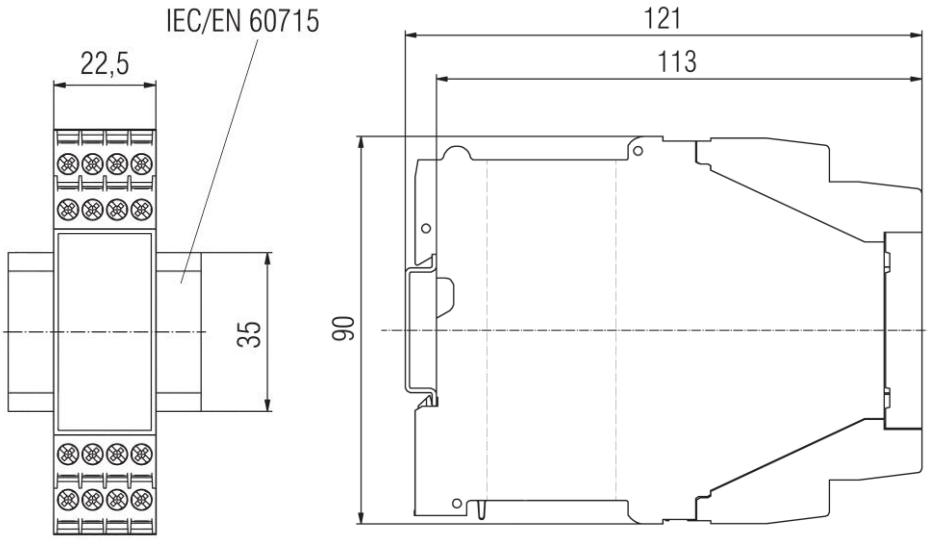
Safety technical Information	Safety-related control system according to EN ISO 13849-1, Category 4, PL e (corresponding to SIL CL 3)		
	Parameter	**Values**	**Unit**
	$MTTF_d$ (CH1) AC15	65.865	Year's
	$MTTF_d$ (CH2) AC15	65.861	Year's
	$MTTF_{davg}$ AC15	67.226	Year's
	$MTTF_d$ (CH1) DC13	68.587	Year's
	$MTTF_d$ (CH2) DC13	68.583	Year's
	$MTTF_{davg}$ DC13	67.222	Year's
	T_{10d}	6,58	Year's
	B_{10d} (AC15)	1 960 000	Cycle's
	B_{10d} (DC13)	780 000	Cycle's
	n_{op}	12	Cycle's
	d_{op}	365	Day's
	h_{op}	24	Hour's
	t_{cycle}	2 628 000	Sec.
	Category	4	
	Performance Level	e	
	Diagnostic coverage DC_{avg}	99	%
	Common Cause Failure CCF	80	
	PFH_d	3.85E-08	

Enclosure

Mechanical	
Dimensions, WxHxD (mm)	22,5 x 90 x 118
Weight:	~ 210 g
Degree of protection, enclosure / terminals	IP40 / IP20
Enclosure material	Technical thermoplastics (PA/PBT/PC)
Installation	Control cabinet installation: Min. IP54
Installation, DIN standard track / screw fastening	EN 60715 / M4 (2 pieces)
Min. / max. connection diameter	0.5 mm2 / 1 x 4 mm2 massive or 1 x 2,5 mm2 strand with sleeve and plastic flange.
Conductor type	Copper conductor. Temperature classification 60 / 75°C
Torque for terminal clips (screws)	< 1 Nm

Scale drawing

Enclosure with pluggable screw clamps



Recommended minimum empty air clearance around the SSN-module:

Top: 15 mm
Below: 15 mm

Between the devices: 203 mm distance.
Recommendation for surrounding temperatures greater than + 40° C / +104°F.

Warranty: 1 year.