

PROGRAMMABLE SAFETY CONTROLLER SIL3 / PL e



- 14 SAFE DIGITAL INPUTS (10 OSSD) · 2 SAFE ANALOG · 2 PULSE OUTPUTS
- 3 SAFE RELAY OUTPUTS OF 6 · UP TO 800 STL INSTRUCTIONS
- SIL3 (IEC 61508) · PL e (EN ISO 13849-1) · DIN RAIL · IP20



IP20

KEY DATA

Property	Value	Property	Value
Safe digital inputs	14, of which 10 OSSD	Safe analog inputs	2 (plus 4 standard)
Relay outputs	6, of which 3 safe	Standard outputs	2
Pulse outputs	2, for cross-fault detection	Expansion	2 modules plus fieldbus
Programming	up to 800 STL instructions	PFH	$3,0 \cdot 10^{-9}$ at cat. 4
Supply voltage	24 VDC, -10 / +15 %	Power	2,4 W
Safety rating	SIL3 · PL e	Order key	C R X X X X X - X X X

A logic device, not a measuring device: it is the safety controller that the SIL3 amplifiers of this range require. Freely programmable, function-plan oriented, with cross-fault detection and external contact monitoring (EMU).



INPUTS AND OUTPUTS

Safe digital inputs	14 · 24 VDC, 20 mA, type 1 to EN 61131-2 · 10 OSSD
Safe analog inputs	2 · a further 4 standard analog inputs
Relay outputs	6 · 24 VDC / 2 A (DC13) · 240 VAC / 2 A (AC15)
Standard outputs	2 · 24 VDC, 2 A
Signalling outputs	24 VDC, 250 mA
Pulse outputs	2 clock outputs · 24 VDC, 250 mA · for cross-fault detection of the digital input signals
Read-back contacts	For relays 3 to 6, on connectors X09 and X10
Expandable to	38 safe digital in · 2 safe digital out · 20 safe I/O · 12 safe relays · 6 signalling out

SAFETY DATA

Performance Level	PL e to EN ISO 13849-1
Safety Integrity Level	SIL3 to IEC 61508
PFH, basic unit	$3,0 \cdot 10^{-9}$ at category 4
PFH, single channel	$20 \cdot 10^{-9}$ per relay, 4 relays maximum
PFH, two channel	$1,0 \cdot 10^{-9}$ per relay, 2 relays maximum
Proof test interval	20 years — the maximum service life

ELECTRICAL DATA

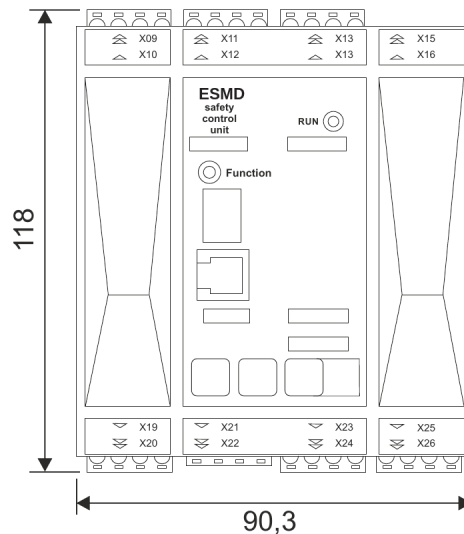
Supply voltage	24 VDC · X11.1: 24 VDC / 2 A
Tolerance	-10 % / +15 %
Power consumption	2,4 W
Connection	Plug-in terminals, screw or spring type
Conductor size	2,5 mm ² maximum
T-bus positions	4

MECHANICS AND ENVIRONMENT

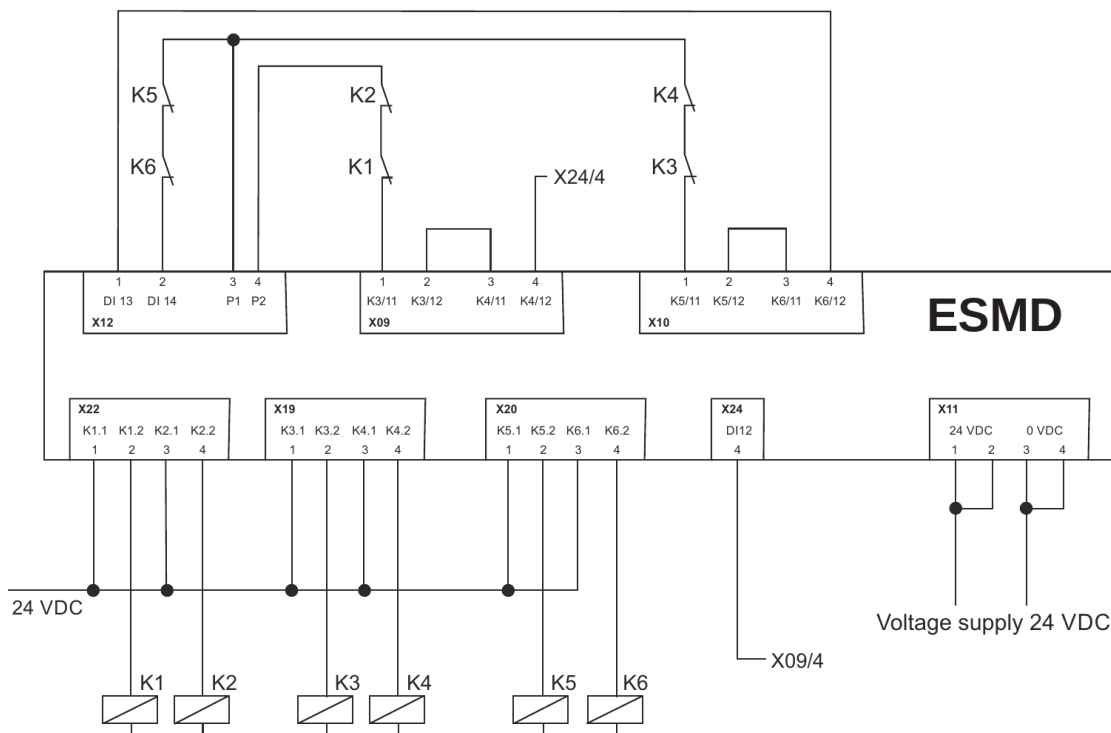
Weight	500 g
Mounting	Snaps onto DIN rail
Operation	Front keys for acknowledge, start and reset
Display	Coded status on a 7-segment display plus status LEDs
Protection	IP20
Temperature, operating	0 ... 50 °C
Temperature, storage	-10 ... +70 °C
Humidity	85 % rH maximum, no condensation
Climate class	3K3 to EN 60721-3



FUNCTION AND FEATURES



The device front with the connectors X09 to X26, the RUN and Function keys and the status display. Dimensions in mm.



Connection example: six relays K1 ... K6 wired to the connectors X09, X10, X19, X20 and X22, with the read-back contacts K3/11 ... K6/12 fed back to X09 and X10 and the cross-fault pulses P1 and P2 on X12. External contact monitoring (EMU) of the connected switching devices is a built-in safety function; contact multiplication through external contactors is possible with that monitoring in place.



CONNECTION

Thirteen connectors with four pins each.

The front panel also carries X15, X16 and X21; they belong to the expansion modules.

CONNECTOR ASSIGNMENT

Conn.	Pin 1	Pin 2	Pin 3	Pin 4	Function
X11	U24_ext	U24_ext	GND_ext	GND_ext	Supply +24 VDC / 0 VDC
X12	DI 13	DI 14	P1	P2	Safe inputs 13, 14 · pulse outputs 1, 2
X14	DI 01	DI 02	DI 03	DI 04	Safe digital inputs 1 ... 4
X23	DI 05	DI 06	DI 07	DI 08	Safe digital inputs 5 ... 8
X24	DI 09	DI 10	DI 11	DI 12	Safe digital inputs 9 ... 12
X25	AI1.1 +	AI1.1 –	AI1.2 +	AI1.2 –	Safe analog input 1
X26	AI2.1 +	AI2.1 –	AI2.2 +	AI2.2 –	Safe analog input 2
X22	K1.1	K1.2	K2.1	K2.2	Relay outputs 1 and 2
X19	K3.1	K3.2	K4.1	K4.2	Relay outputs 3 and 4
X20	K5.1	K5.2	K6.1	K6.2	Relay outputs 5 and 6
X09	K3.11	K3.12	K4.11	K4.12	Read-back contacts relays 3 and 4
X10	K5.11	K5.12	K6.11	K6.12	Read-back contacts relays 5 and 6
X13	NC	NC	DO0.1	DO0.2	No function · standard outputs 1 and 2



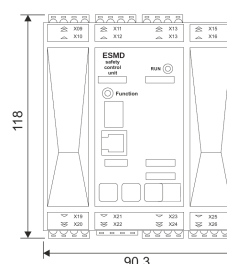
CONFORMITY AND SAFETY

Safety Integrity Level	SIL3 — IEC 61508
Performance Level	PL e — EN ISO 13849-1
Category	4 — for the PFH figure of the basic unit
EMC	EN 61000-6-4, EN 61000-6-2, EN 61000-6-7, EN 61800-3
Further standards	EN 62061, EN 61326-3
Input rating	Type 1 to EN 61131-2
Climate class	3K3 to EN 60721-3
Protection	IP20
Certificate	SIL3 / PL e certificate 01_205_5633_01_20
Proof test interval	20 years, equal to the maximum service life
Safe fieldbus	PROFISAFE or FSoE integrated, both up to PL e / SIL3 — version 30 or 20 in the order key

ORDER INFORMATION

Accessories

- Ten expansion and communication modules, listed below with their type designation. The programming software SCU-PS and the programming unit SCU-PU are needed to use the device — it is freely programmable and is delivered without an application.



EXPANSION AND COMMUNICATION MODULES

Type	Module
SCU-ED	I/O expansion module · programmable safety control up to PL e or SIL3 · 12 × digital IN, 10 × I/O 250 mA, 2 × signalling OUT, 2 × clock OUT
SCU-PS	PLC programming software — needed to program the controller
SCU-PU	Programming unit
SCU-KC	Communication module CAN
SCU-KP	Communication module PROFIBUS-DP
SCU-KN	Communication module PROFINET
SCU-KO	Communication module CANopen
SCU-KE	Communication module ETHERCAT
SCU-TB1	T-bus, standard version, grey
SCU-TB2	T-bus, interrupter version, grey

The manufacturer's key reads C R X X X X X - X X X. Factory setting means no setting and no adaptation. With a customer-specific configuration, any setting possible according to the technical data may be chosen; for values not stated, the factory setting applies.

ORDER KEY

Field	Code	Meaning
Product	ESMD	octogon product code — programmable safety controller SIL3 / PL e
1 Version	10	Standard
	20	With FSoE, ETHERCAT integrated
	30	With PROFISAFE, PROFINET integrated
2 Connection	0	Plug-in terminals — the only option
3 Configuration	0 · 1	Factory setting · customer specific, please state
4 Other	0	Special model

