



FX3-MOC100000

Flexi Soft

SAFETY CONTROLLERS

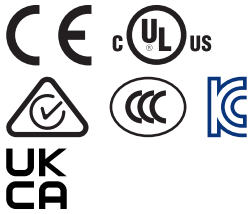
SICK
Sensor Intelligence.



Ordering information

Type	part no.
FX3-MOC100000	1057833

Other models and accessories → www.sick.com/Flexi_Soft



Detailed technical data

Features

Module	Motion Control module
Configuration method	Via software (Flexi Soft Designer, Safe EFI-pro System: Safety Designer)

Safety-related parameters

For axes with two encoders (any combination of sine-cosine, TTL, HTL 24 V, MTL 12 V, RS-422, SSI)	
Safety integrity level	SIL 3 (IEC 61508)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
PFH _D (mean probability of a dangerous failure per hour)	5.0×10^{-9}
Minimum movement for error detection	≥ Selected tolerance limit of the function block used for cross check, e.g., position cross check, At least 1 x within 24 h
T _M (mission time)	20 years (EN ISO 13849)
For axes with one sine-cosine encoder and sin/cos analog voltage monitoring activated	
Safety integrity level	SIL 2 (IEC 61508)
Category	Category 3 (EN ISO 13849)
Performance level	PL d (EN ISO 13849)
PFH _D (mean probability of a dangerous failure per hour)	6.0×10^{-9}
Minimum movement for error detection	≥ 1 Sin/Cos period, At least 1 x within 24 h
T _M (mission time)	20 years (EN ISO 13849)

Functions

Drive safety functions	Safe stop 1 (SS1) Safe stop 2 (SS2) Safe operating stop (SOS) Safe speed monitoring (SSM) Safely-limited speed (SLS) Safe direction (SDI) Safe brake control (SBC) Safe cam (SCA) Safely-limited position (SLP)
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Interfaces

Encoder interface	A/B incremental encoder, TTL A/B incremental encoder, HTL 12 V or 24 V A/B incremental encoder, RS-422 Sin/cos encoder SSI encoder (master / listener) HIPERFACE®
Connection type	Male connector, Micro D-Sub, 15-pin
Data interface	Internal bus (FLEXBUS+)

Electronics

Protection class	III (EN 61140)
Voltage supply	Via FLEXBUS+
Internal power consumption	$\leq 2.5 \text{ W}^{1)}$
A/B incremental encoder, TTL, 2 outputs	
Differential input voltage HIGH	$5 \text{ V} (2 \text{ V} \dots 5.3 \text{ V})^{2)}$
Differential input voltage LOW	$0 \text{ V} (-0.3 \text{ V} \dots 0.8 \text{ V})^{2)}$
Input voltage	$-5 \text{ V} \dots 10 \text{ V}^{3)}$
Input frequency	$\leq 300 \text{ kHz}$
Input resistance	$\geq 35 \text{ k}\Omega$
A/B incremental encoder, TTL, 2 pairs of outputs	
Differential input voltage HIGH	$5 \text{ V} (1.2 \text{ V} \dots 5.6 \text{ V})^{2)}$
Differential input voltage LOW	$-5 \text{ V} (-5.6 \text{ V} \dots -1.2 \text{ V})^{2)}$
Input voltage	$-5 \text{ V} \dots 10 \text{ V}^{3)}$
Input frequency	$\leq 300 \text{ kHz}$
Input resistance	$\geq 35 \text{ k}\Omega$
A/B incremental encoder, HTL 12 V, 2 outputs	
Differential input voltage HIGH	$12 \text{ V} (6.5 \text{ V} \dots 15 \text{ V})^{2)}$
Differential input voltage LOW	$0 \text{ V} (-1 \text{ V} \dots 2.5 \text{ V})^{2)}$
Input voltage	$-5 \text{ V} \dots 20 \text{ V}^{3)}$
Input frequency	$\leq 300 \text{ kHz}$
Input resistance	$\geq 35 \text{ k}\Omega$

¹⁾ Via FLEXBUS+, without streams at analog inputs.

²⁾ Voltage between ENC_x_{y+} and ENC_x_{y-}.

³⁾ Voltage between ENC_x_{y+} and ENC_OV and between ENC_x_{y-} and ENC_OV.

⁴⁾ Peak to peak voltage between ENC_x_{y+} and ENC_x_{y-}.

A/B incremental encoder, HTL 12 V, 2 pairs of outputs	
Differential input voltage HIGH	12 V (4 V ... 15 V) ²⁾
Differential input voltage LOW	-12 V (-15 V ... -4 V) ²⁾
Input voltage	-5 V ... 20 V ³⁾
Input frequency	≤ 300 kHz
Input resistance	≥ 35 kΩ
A/B incremental encoder, HTL 24 V, 2 outputs	
Differential input voltage HIGH	24 V (13 V ... 30 V) ²⁾
Differential input voltage LOW	0 V (-3 V ... 5 V) ²⁾
Input voltage	-10 V ... 40 V ³⁾
Input frequency	≤ 300 kHz
Input resistance	≥ 35 kΩ
A/B incremental encoder, HTL 24 V, 2 pairs of outputs	
Differential input voltage HIGH	24 V (8 V ... 30 V) ²⁾
Differential input voltage LOW	-24 V (-30 V ... -8 V) ²⁾
Input voltage	-10 V ... 40 V ³⁾
Input frequency	≤ 300 kHz
Input resistance	≥ 35 kΩ
A/B incremental encoder, RS-422	
Differential input voltage HIGH	0.2 V ... 5 V ²⁾
Differential input voltage LOW	-5 V ... -0.2 V ²⁾
Input voltage	-7 V ... 7 V ³⁾
Input frequency	≤ 1,000 kHz
Input resistance	≥ 35 kΩ
Differential resistance	120 Ω (100 Ω ... 150 Ω)
Sin/cos encoder	
Differential input voltage	1 V (0.8 V ... 1.2 V) ⁴⁾
Input voltage	0 V ... 5 V ³⁾
Input frequency	≤ 120 kHz
Input resistance	1 kΩ (0.9 kΩ ... 1.1 kΩ)
Voltage monitoring, lower limit for vector length monitoring	0.5 V
Voltage monitoring, upper limit for vector length monitoring	1.5 V
SSI encoder (master / listener)	
Differential resistance	120 Ω (100 Ω ... 150 Ω)

¹⁾ Via FLEXBUS+, without streams at analog inputs.

²⁾ Voltage between ENC_x_y+ and ENC_x_y-.

³⁾ Voltage between ENC_x_y+ and ENC_0V and between ENC_x_y- and ENC_0V.

⁴⁾ Peak to peak voltage between ENC_x_y+ and ENC_x_y-.

Clock frequency	100 kHz ... 1,000 kHz
Cycle gaps between the data packages (monoflop time)	≥ 100 μs
Position data bits per frame	16 ... 62

1) Via FLEXBUS+, without streams at analog inputs.

2) Voltage between ENC_x_y+ and ENC_x_y-.

3) Voltage between ENC_x_y+ and ENC_OV and between ENC_x_y- and ENC_OV.

4) Peak to peak voltage between ENC_x_y+ and ENC_x_y-.

Mechanics

Dimensions (W x H x D)	22.5 mm x 96.5 mm x 126 mm
Weight	120 g

Ambient data

Enclosure rating	IP20 (EN 60529)
Ambient operating temperature	-25 °C ... +55 °C
Storage temperature	-25 °C ... +70 °C
Air humidity	≤ 95 %, Non-condensing

Certificates

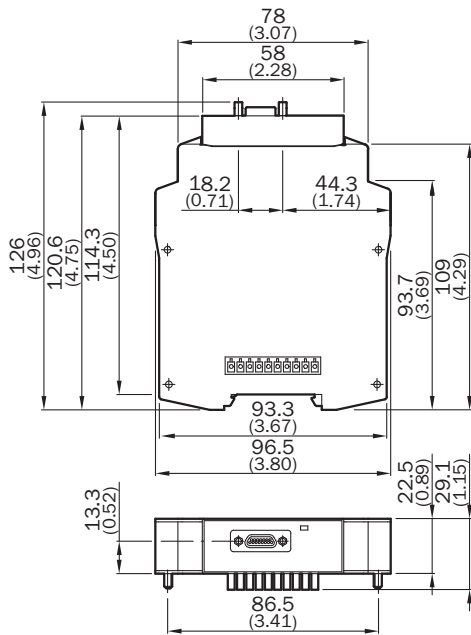
EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
China RoHS	✓
CCC certificate	✓
UK-Type-Examination approval	✓
cULus certificate	✓
KC Mark certificate	✓
cTUVus certificate	✓
EC-Type-Examination approval	✓
Information according to Art. 3 of Data Act (Regulation EU 2023/2854)	✓

Classifications

ECLASS 5.0	27243001
ECLASS 5.1.4	27243101
ECLASS 6.0	27243101
ECLASS 6.2	27243101
ECLASS 7.0	27243101
ECLASS 8.0	27243101
ECLASS 8.1	27243101
ECLASS 9.0	27243101
ECLASS 10.0	27243101
ECLASS 11.0	27243101
ECLASS 12.0	27243101
ETIM 5.0	EC001449

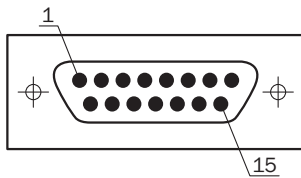
ETIM 6.0	EC001449
ETIM 7.0	EC001449
ETIM 8.0	EC001449
UNSPSC 16.0901	32151705

Dimensional drawing FX3-MOC0, FX3-MOC1



Dimensions in mm (inch)

PIN assignment FX3-MOC0, FX3-MOC1





Pin	Signal	Color-coded connecting cable
1	ENC1_A+	White
2	ENC1_B+	Green
3	ENC1_C+	Gray
4	ENC1_24V	Blue
5	ENC2_24V	Red
6	ENC2_C+	White-green
7	ENC2_B+	Gray-pink
8	ENC2_A+	Black
9	ENC1_A-	Brown

Pin	Signal	Color-coded connecting cable
10	ENC1_B-	Yellow
11	ENC1_C-	Pink
12	ENC_OV	White-yellow
13	ENC2_C-	Brown-green
14	ENC2_B-	Red-blue
15	ENC2_A-	Violet

Recommended accessories

Other models and accessories → www.sick.com/Flexi_Soft

	Brief description	Type	part no.
Safety relays			
	<ul style="list-style-type: none"> Applications: Output expansion module for OSSDs Compatible sensor types: Safety sensors with OSSDs Connection type: Front connector with spring terminals Restart interlock: no External device monitoring (EDM): Via path Outputs: 4 enabling current paths (safe), 1 feedback current path (for use as external device monitoring, not safe), 1 signaling current path (not safe) Housing width: 28 mm 	RLY3-OSSD400	1099971
	<ul style="list-style-type: none"> Applications: Output expansion module for OSSDs Compatible sensor types: Safety sensors with OSSDs Connection type: Front connector with spring terminals Restart interlock: no External device monitoring (EDM): Via path Outputs: 2 enabling current paths (safe), 1 feedback current path (for use as external device monitoring, not safe) Housing width: 18 mm 	RLY3-OSSD100	1085343

SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

WORLDWIDE PRESENCE:

Contacts and other locations –www.sick.com