SICK.COM

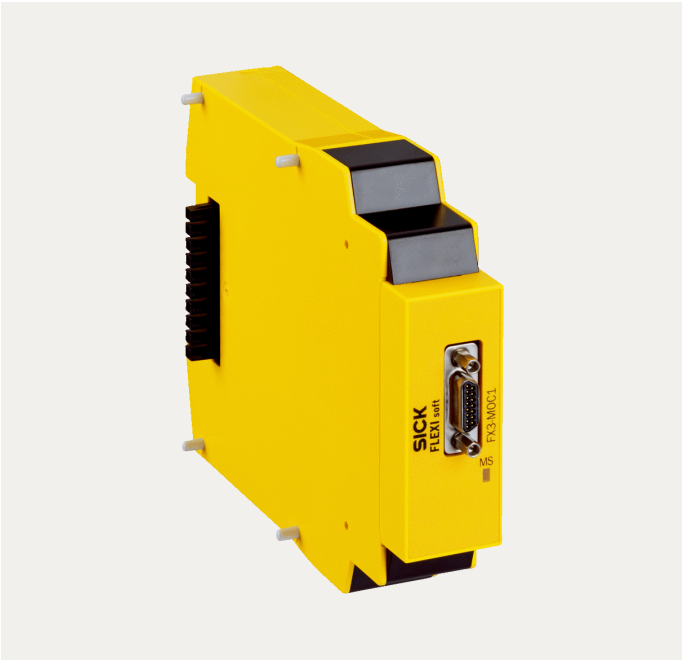


DATA SHEET

FX3-MOC100010

Flexi Soft
Safety controllers

SICK Sensor Intelligence



SAFETY CONTROLLERS

FX3-MOC100010

ORDERING INFORMATION

Type	part no.
FX3-MOC100010	1112300

Further device versions and accessories at www.sick.com/Flexi_Soft

DETAILED TECHNICAL DATA

FEATURES

Module	Motion Control module
Specialty	Protective coating for more challenging ambient conditions (e.g., resistance to sulfur).
Configuration method	Via software (Flexi Soft Designer, Safe EFI-pro System: Safety Designer)
Security Support Period	
End date of the support period	2034-12
Valid for products with a serial number from	26440000

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)

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	≤ 2.5 W [1]
A/B incremental encoder, TTL, 2 outputs	
Differential input voltage HIGH	5 V (2 V ... 5.3 V) [2]
Differential input voltage LOW	0 V (–0.3 V ... 0.8 V) [2]
Input voltage	–5 V ... 10 V [3]
Input frequency	≤ 300 kHz
Input resistance	≥ 35 kΩ
A/B incremental encoder, TTL, 2 pairs of outputs	
Differential input voltage HIGH	5 V (1.2 V ... 5.6 V) [2]
Differential input voltage LOW	–5 V (–5.6 V ... –1.2 V) [2]
Input voltage	–5 V ... 10 V [3]
Input frequency	≤ 300 kHz
Input resistance	≥ 35 kΩ
A/B incremental encoder, HTL 12 V, 2 outputs	
Differential input voltage HIGH	12 V (6.5 V ... 15 V) [2]
Differential input voltage LOW	0 V (–1 V ... 2.5 V) [2]
Input voltage	–5 V ... 20 V [3]
Input frequency	≤ 300 kHz
Input resistance	≥ 35 kΩ
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

[1] Via FLEXBUS+, without streams at analog inputs.

[2] Voltage between ENCx_y+ and ENCx_y–.

[3] Voltage between ENCx_y+ and ENC_0V and between ENCx_y– and ENC_0V.

[4] Peak to peak voltage between ENCx_y+ and ENCx_y–.

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)
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 ENCx_y+ and ENCx_y–.

[3] Voltage between ENCx_y+ and ENC_0V and between ENCx_y– and ENC_0V.

[4] Peak to peak voltage between ENCx_y+ and ENCx_y–.

MECHANICS

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

AMBIENT DATA

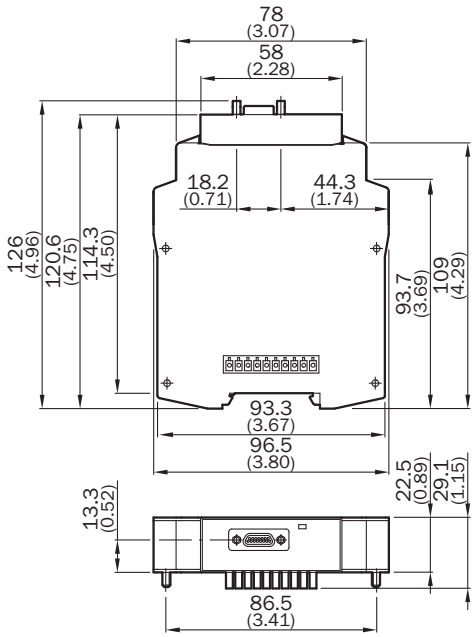
Enclosure rating	IP20 (EN 60529)
Ambient operating temperature	–25 °C ... +55 °C
Storage temperature	–25 °C ... +70 °C
Air humidity	≤ 95 %, Non-condensing
Single gas resistance (sulfur dioxide)	25 ppm, 21 days, 25 °C (IEC 60068-2-42 - Kc)
Mixed gas resistance	100 ppb - H_2S 2000 ppb - NO_2 100 ppb - Cl_2 2000 ppb - SO_2

	21 days, 30 °C (IEC 60068-2-60 Ke)

CERTIFICATES

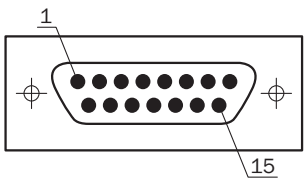
EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
China RoHS	✓
CCC certificate	✓
UK-Type-Examination approval	✓
cULus certificate	✓
cTUVus certificate	✓
EC-Type-Examination approval	✓
EC-Type-Examination approval (Machinery Regulation)	✓
Information according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

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

Pin	Signal	Color-coded connecting cable
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
10	ENC1_B–	Yellow
11	ENC1_C–	Pink
12	ENC_0V	White-yellow
13	ENC2_C–	Brown-green
14	ENC2_B–	Red-blue
15	ENC2_A–	Violet

Further information as well as suitable accessories, example applications and downloads such as CAD dimensional models, operating instructions and software can be found at www.sick.com/1112300

SICK AG
WALDKIRCH
GERMANY
SICK.COM

SICK AT A GLANCE

SICK is a leading global technology company for intelligent sensors and integrated solutions in industrial automation. Our technologies set benchmarks, making your industrial processes more efficient, safer and more sustainable – both in logistics and manufacturing operations.

SICK combines sensor intelligence with industry expertise and certified consulting services. We provide the ideal foundation for scalable as well as tailor-made automation solutions and create added value along the entire value chain. Our close partnerships with our customers are more than just a promise: Together, we optimize productivity, improve quality, protect health and safety, and help build a sustainable future. All with empathy and trust.

Since 1946, we have been developing innovative technologies with passion and a pioneering spirit. With a global network in around 40 countries, SICK has a global presence and is always close by. The company's headquarters are located in Waldkirch near Freiburg, Germany. Our customers benefit from our understanding of both local and global requirements, which enables us to deliver tailor-made solutions

SICK

Sensor Intelligence