DATASHEET
ABSOLUTE MAGNETIC ROTARY ENCODER CANOPEN

Robust rotary sensor based on reliable magnetic technology. Stainless steel housing capable to withstand extreme environmental conditions. Ideal suited for outdoor applications. Sturdy ball bearings for highest shaft loads up to 300N. ROHS compatible maintenance free design,

Main Features

-Heavy Duty Design
-Interface: CANopen (DS406)
CANopen Lift (DSP417)
-Housing: 38.2 mm ∅
-Solid Shaft: 10 mm ∅
-EMC: EN 61000-6-2, EN 61000-6-4
-Max. Revolution Not Limited (typical 15 bit)
-Velocity and Acceleration Output
-LSS services

Applications

-Construction Machinery
-Cranes
-Trucks
-Elevators
-Offshore and Marine Equipment

Mechanical Structure

-Stainless Steel Flange
-Stainless Steel Housing
-Stainless Steel Shaft
-Sturdy Ball Bearings

Electrical Features

-Polarity inversion protection
-Over-voltage-peak protection
-Galvanic Isolation

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Technical data

Electrical data

Interface	Transceiver according ISO 11898, galvanically isolated by opto-couplers
Transmission rate	max. 1 MBaud
Device addressing	Adjustable by SDO telegrams or Layer Setting Services
Supply voltage	10-30 V DC (absolute maximum ratings) *
Current consumption	max. 100 mA with 10 V DC, max. 50 mA with 24 V DC
Power consumption	max 1,2 Watts
Electrical lifetime	> 10^5 h
EMC	Emitted interference: EN 61000-6-4 Noise immunity: EN 61000-6-2

* Supply voltage according to EN 50 178 (safety extra-low voltage)

Sensor data

Singleturn technology	magnetic 2 axis Hall sensor
Singleturn resolution	up to 4096 steps / revolution (12 Bit)
Singleturn accuracy	± 0.35°
Internal cycle time Singleturn	< 1 ms
Multiturn technology	self supplied magnetic pulse counter (Wiegand Sensor)
Multiturn resolution	Can measure up to 200 Billion revolutions

Environmental Conditions

Operating temperature sensor	- 30 ... + 85 °C (-22 …+185 °F)
Storage temperature	- 30 ... + 85 °C (-22 …+185 °F)
Humidity	98 % (without liquid state)
Protection Class (EN 60529)	IP 69 K

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Mechanical data

Housing	stainless steel
Flange	stainless steel
Shaft	stainless steel
Lifetime	Dependent on shaft version and shaft loading – refer to table
Max. shaft loading	axial 270 N, radial 270 N (for 1*10^9 turns)
Friction torque at + 25°C	≤ 3 Ncm
RPM (continuous operation)	max. 12.000 RPM
Shock (EN 60068-2-27)	≤ 300 g (half sine, 6 ms)
Permanent shock (EN 60028-2-29)	≤ 30 g (half sine, 16 ms)
Vibration (EN 60068-2-6)	≤ 30 g (10 Hz ... 1,000 Hz)
Weight (standard version)	≈ 350 g (0.77 lbs)

Minimum (mechanical) lifetime

Flange	Lifetime in 10^8 revolutions with (F_a/F_r)		
S10 Synchro flange (SCM-…-S10G-…)	7.6 (300N/300N)	10 (270N/270N)	200 (100N/100N)

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Interface

Configuration

The standard configuration of the encoder is: node number 32 and baud rate 20 KBaud. For adapting the encoder for a respective application the customer could use SDO telegrams. Valid baud rate range is 20 kBaud up to 1MBaud and node numbers from 0 to 127.

Remark: The encoder adds internal 1 to the adjusted node number.

Electrical interface

The standard connection is a cable with a RJ45 connector. 5 pin circular plug M12 and cable exit are available too (For pin assignment see table below).

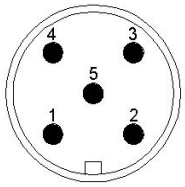
Connection plan

Function	Connector Pin M12
Can High	4
Can Low	5
Can-GND	1
GND	3
+ U_b= 10-30 V	2

Connectors (front view)

M12 Connector

SCM-XXXX-XXXX-XXXX-PAM



5 pin M12 connector male

Programmable Encoder – Parameter

Operating Parameters	This parameter determines the counting direction, in which the output code increases or decreases. As an important operating parameter the code sequence (complement) can be programmed.
Resolution per Revolution	The parameter resolution per revolution is used to program the desired number of steps per revolution.
Total Resolution	This parameter is used to program the desired number of measuring units over the total measuring range. This value may not exceed the total resolution of the absolute rotary encoder. If the encoder is used in a continuous measuring application, certain rules for the setting of this parameter must be followed. These rules are outlined in the manual.
Preset Value	The preset value is the desired position value, which should be reached at a certain physical position of the axis. The position value is set to the desired process value by the parameter pre-set.
Limit Switch, Min. and Max.	Two position values can be programmed as limit switches. By reaching these values one bit of the 32-bit process value is set to high.
Cam	Eight position values can be programmed as cams. By reaching these values bits in object 6300h Cam state register are set.

Programmable CAN Transmission Modes

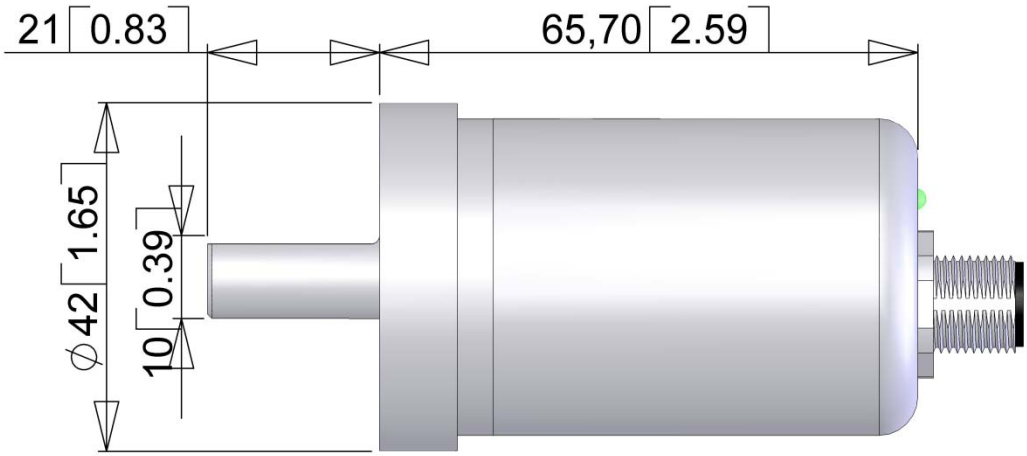
Polled Mode	By a remote-transmission-request telegram the connected host calls for the current process value. The absolute rotary encoder reads the current position value, calculates eventually set-parameters and sends back the obtained process value by the same identifier.
Cyclic Mode	The absolute rotary encoder transmits cyclically - without being called by the host - the current process value. The cycle time can be programmed in milliseconds for values between 1 ms and 65536 ms.
Sync Mode	After receiving a sync telegram by the host, the absolute rotary encoder answers with the current process value. If more than one node number (encoder) shall answer after receiving a sync telegram, the answer telegrams of the nodes will be received by the host in order of their node numbers. The programming of an offset-time is not necessary. If a node should not answer after each sync telegram on the CAN network, the parameter sync counter can be programmed to skip a certain number of sync telegrams before answering again.

Mechanical Models

For detailed drawings please refer our website as drawing, IGES Drawing and STEP 3D Model under contact us

Synchro Flange

SCM-XXXX-XXXX-S10G-XXX



all dimensions mm [inch]

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Models / Ordering Description

Description

Magnetocode	**SCM-**	_ _	**00**	**B** -	_ _	_ _-	S	10	G-	PAM
Interface and Version	CANopen	**CA**								
	CANopen lift (DSP417)	CL								
Current Version	CA		**00**							
	CL		00							
Code	Binary									
Bits for Revolutions	Single turn									
		00								
	Multi turn (4096 turns)									
		12								
	Multi turn (32768 turns)									
		15								
Steps per revolution	4096									
		12								
Flange	Synchro flange (10 mm shaft diameter)									
						S				
Shaft diameter	10 mm							**10**		
Mechanical options	Heavy duty / stainless steel								**G**	
Connection	Connector 5pol M12									PAM

Standard = bold, further models on request

Ordering example:

SCM-CA00B-1512-S10G-PAM

Accessories

Article No	Article	Description
34050515	PAM5	Female cable connector M12x1 5pin A-coded for MCD-…-PAM
10001978	PAM5 2m	Connecting cable PAM5 2m shielded for MCD-…-PAM

Disclaimer

APPENDIX

Same Encoder Series also available …

… with Serial SSI Interface.

… or combined with a draw wire adapter to perform linear measurements