

Data Sheet for Angle Sensors

Hall-Effect Single-Turn Rotary Encoder

Series MAB40



- Serial microcontroller interface (SER)
- Synchronous serial interface (SSI)
- Serial peripheral interface (SPI)
- Redundant outputs (for SPI)
- IP67 protection class
- Electrical angle 360°
- Resolution: 12 bit or 14 bit
- Supply voltage: 3.3 V, 5 V, 24 V
- Ø 40 mm housing with servo mount flange
- Highest life time due to 2 ball bearings

The MAB40 is a very rugged and versatile angle sensor. It is suited for applications in rough environment (IP67). Assembly is done by threads on the front or by servomount fixing nails.

Electrical Data	SSI	SPI	SER
Effective electrical angle	360°		
Resolution	12 bit (4096 steps)	14 bit (16384 steps)	12 bit (4096 steps)
Tolerance independent linearity (IEC 60393)	±0,2%		
Update rate	0,1 ms	0,35 ms	0,1 ms
Supply voltage	5 V ±10% 15..30 VDC	5 V ±10%	3,3 V ±10% 5 V ±10%
Current consumption (no load)	< 20 mA	< 20 mA	< 20 mA
Isolation resistance	2 MOhm, 500 VDC, 1 min		
Dielectric strength	1000 VAC, 50 Hz, 1 min		

Mechanical and Environmental Data	
Mechanical angle	Endless
Maximum rotational speed	1000 rpm
Bearing	2 precision ball bearings
Protection class (IEC 60529)	IP67
Sealing shaft/bearing	radial shaft sealing ring (IP55 equivalent)
Operating temperature	-25..+85°C
Storage temperature	-40..+85°C
Vibration (IEC 60068-2-6)	20 g (±1,5 mm, 10..2000 Hz 16 cycles 3 axis., 3x4 h)
Shock (IEC60068-2-27)	50 g (11 ms, 18x, 6 directions)
Humidity (IEC 60068-2-3)	93% @40°C, 10 days
Material housing	passivated aluminium
Material shaft	stainless steel
Weight	approx. 152 g

Emission / Immunity	
DIN EN 55011 Emission AC/DC power	Class B
DIN EN 55011 Emission housing	Class B
DIN EN 61000-4-2 Immunity housing ESD	Class B
DIN EN 61000-4-3 Immunity RF sine wave	Class A
DIN EN 61000-4-4 Immunity DC power, I/O cable: Burst	Class B
DIN EN 61000-4-5 Immunity DC power, I/O cable: Surge	Class B
DIN EN 61000-4-6 Immunity DC power, I/O cable: Conducted sine wave	Class A

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Order code

Description

Series MAB40	MAB40					
Resolution / Supply Voltage / Output signal						
12 Bit High Speed / 3,3 V / SER (*)				12HS 3,3 SER (*)		
12 Bit High Speed / 5 V / SER (*)				12HS 5 SER (*)		
14 Bit High Speed / 5 V / SPI (*)				14HS 5 SPI (*)		
redundant 14 Bit / 5 V / SPI (*)		X (*)		14HS 5 SPI (*)		
12 Bit / 5 V / SSI (*)				12 5 SSI (*)		
12 Bit / 24 V / SSI				12 24 SSI		
Zero point alignment (only for SPI-interface) (*)					N (*)	
Other shaft length [mm] (*)						Axx (*)
Cable output						
Axial - 1 m						-
Axial [m] (*)						CVxx (*)

short-term stock types can be found on: <http://www.megatron.de/en/stocklists/angle-sensors/lagerliste.html>

bold print = standard option

(*) = on request available for projects

For higher quantities or on-going demand, additional options are available as described below

For example:

- Shielding against magnetic field
- Special shaft design
- Special housing design
- Other operational torque
- Improved IP-protection
- Mounting of cable and connector

For technical advice, projects, samples, questions about pricing, delivery times and availability please contact us

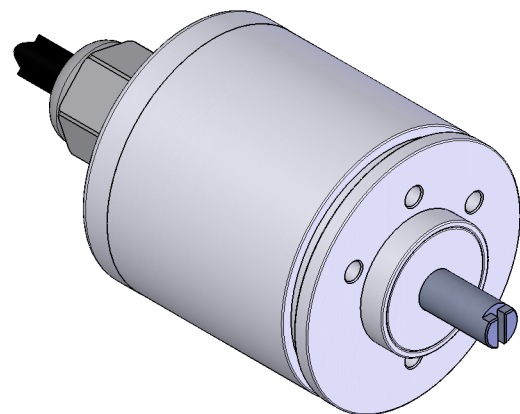
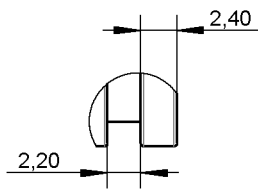
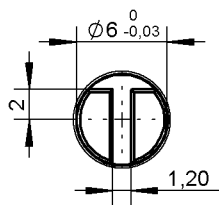
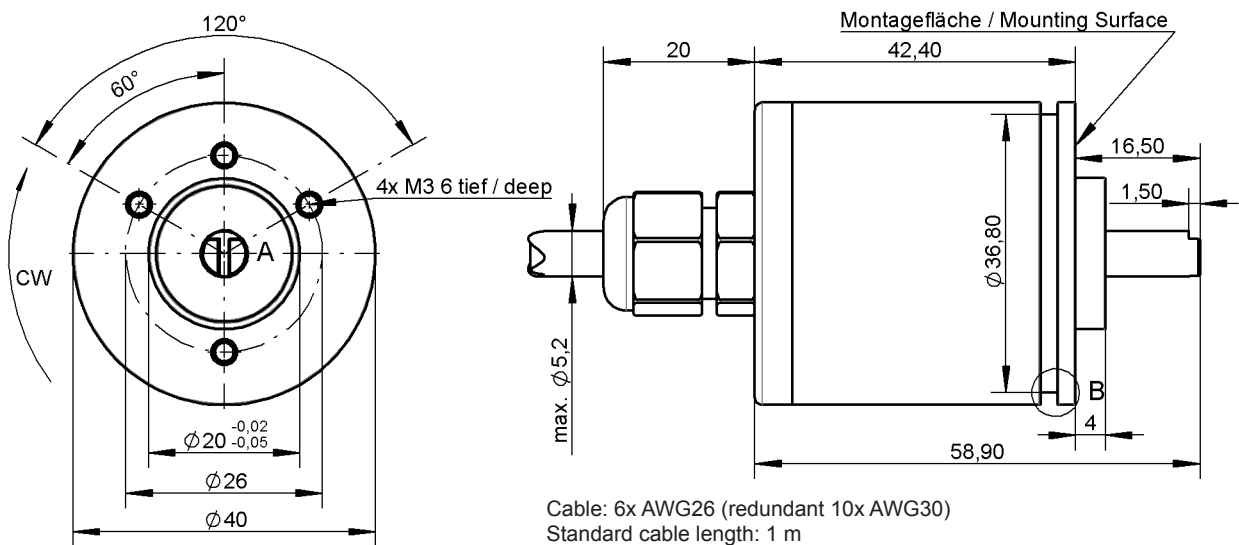
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Drawing

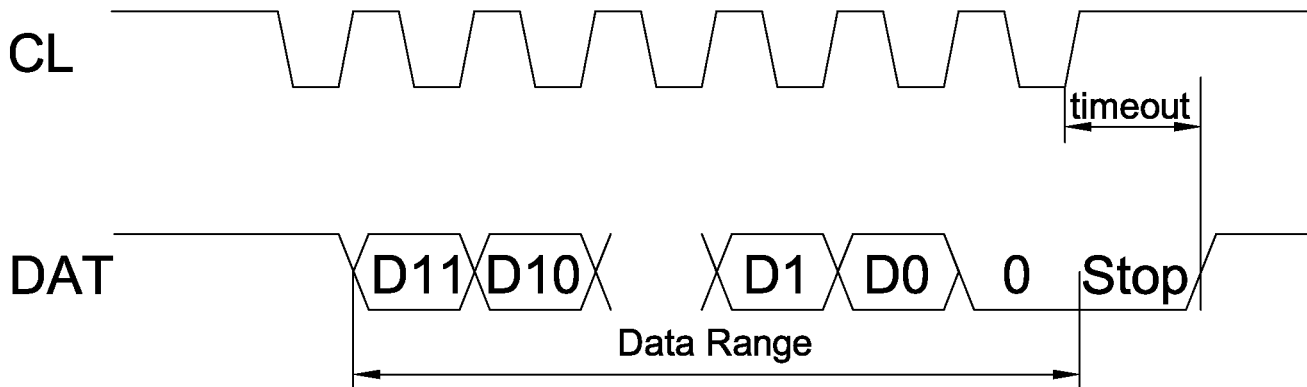


Cable assignment	SSI	SPI	SPI redundant	SER
Black	GND	GND	GND 1	GND
Red	VSUP	VSUP	VSUP 1	VSUP
Brown	CLK+	DATA	DATA 2	DATA
Orange	CLK-	CLK	CLK 1	not connected
Yellow	DATA+	SS	SS 1	CLK
Green	DATA-	not connected	DATA 1	CS
Blue			CLK 2	
Purple			SS 2	
Grey			GND 2	
White			VSUP 2	

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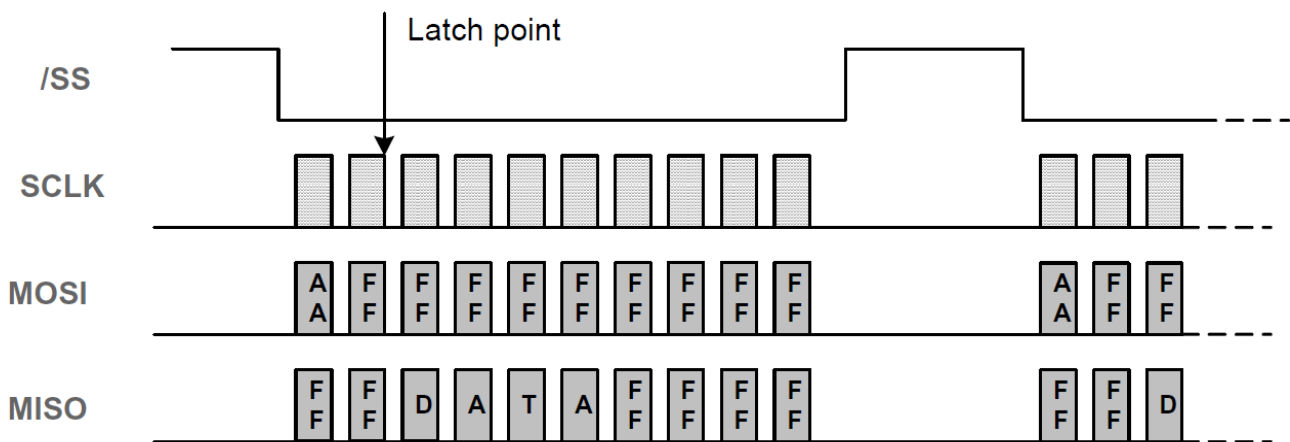
Timing SSI-Interface

SSI-Protokoll



For exact specifications of the output signals please look at the datasheets and application notes of chip producer icHaus:
www.ichaus.de chip: iC-MH

Timing SPI-Interface



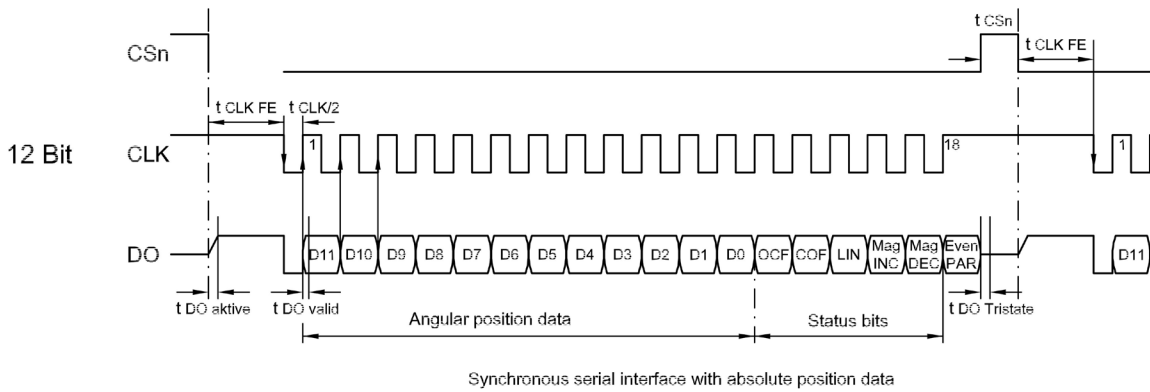
For exact specifications of the output signals please look at the datasheets and application notes of chip producer Melexis:
www.melexis.com chip: MLX90316 (14 Bit SPI)

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Timing SER-Interface



For exact specifications of the output signals please look at the datasheets and application notes of chip producer Austria Microsystems:
www.austriamicrosystems.com chip: AS5045