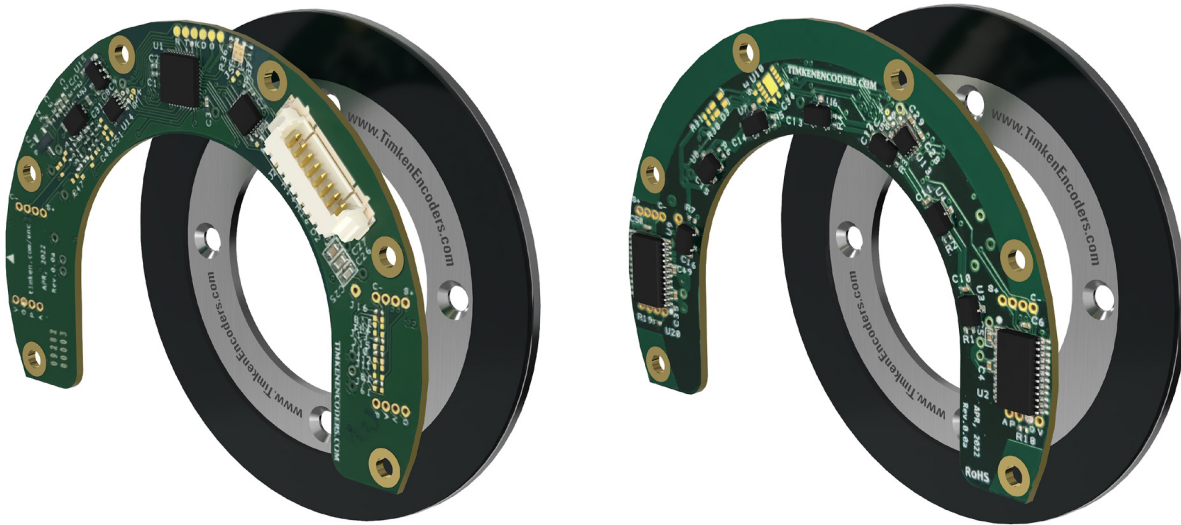


Timken® absolute position magnetic encoder technology offers clear operational and cost benefits over other commonly used technologies. Our superior sensing products provide reliable speed and position data even in demanding operating environments.



FEATURES AND BENEFITS

- ⊖ High resolution magnetic encoders up to 19 bits
- ⊖ 3x larger air gap than competitors
- ⊖ Dual sensor design compensates for target mounting tolerances
- ⊖ Turns count output available at full power
- ⊖ High speed operation
- ⊖ Environmentally robust
- ⊖ Reliable, compact, and cost-effective
- ⊖ Quick and easy installation
- ⊖ Industry leading lead-times
- ⊖ Experienced application engineering
- ⊖ Configurable design with customization available

APPLICATIONS



URNS COUNTER INFORMATION

Timken Encoders offers high resolution absolute position data within a single turn as well as the option to count turns under full power.

Single Turn: For applications where precise absolute position within a single turn is required, the encoder measures absolute position relative to a fixed, defined zero orientation of the magnetic target. This data is available immediately upon system startup and is reported at the desired resolution, up to 19 bits.

Multi-Turn: For applications that require tracking of multiple revolutions, the encoder counts and recalls the number of turns of the system relative to the magnetic target's zero orientation. This data is reported as a 16-bit value that is appended to the single turn absolute position data.

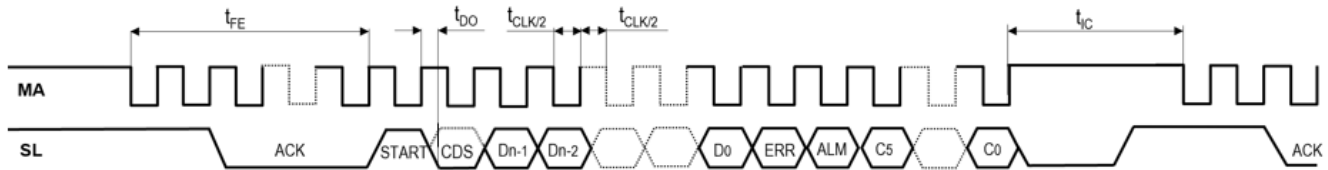
If power to the unit is interrupted, the multi-turn encoder will retain the turns count value, but it cannot track turns while in the power-down state. In the event of power loss, the turns count value and single turn absolute position value are saved to internal memory and recalled when power is restored. Error checking is performed by comparing the saved single turn position at power-down with the refreshed single turn position at power-on. If these positions differ by more than ± 90 degrees, the encoder reports an error and turns on the red LED. Motion that results in a power-on position inside of the ± 90 -degree window will not induce the error state, regardless of the number of revolutions that occurred while in power-down. In the error state, the unit will continue to function even though the turns count value may not be accurate. The turns count value will reset to zero, clearing the error, the next time power is removed or when a user reset is performed.

User Reset: Clear the error flag and reset the turns count value by power cycling the unit or through a BiSS command. 1. Write 0xCD to register 0x48 | 2. Write 0x6D to register 0x49.

61MM DUAL ABS KIT MAGNETIC ENCODERS FULL DATA

MECHANICAL SPECIFICATIONS	Hub Material	400 series stainless steel			
	Magnet Material	Nitrile bonded ferrite			
	Primary Connector	8 pin Molex 0532617008			
	Mating Connector	8 pin Molex 0510210800			
	Max Speed	5,000 RPM			
	Target Mass	15.8 g			
	PCB Mass	6.0 g			
MECHANICAL MOUNTING	Air Gap: Magnet to Sensor Chip	Mounting Hardware Recommendations			Radial Position Tolerance
	Nominal/Ideal: 0.40-0.60 mm Minimum: 0.2 mm Maximum: 1.2 mm	Sensor PCB Fastener: M2, Wafer Head Machine Screw Torque (Max): 0.28 N-m Magnetic Target Fastener: 3M VHB 9469			X-Y: +/- 0.38mm
ENVIRONMENTAL SPECIFICATIONS	Operating Temperature	-30° – 85° C			
	Humidity	0 - 90% non-condensing			
	External Bias Field	12 mT (External fields over 50 mT can permanently damage the magnetic target)			
	ESD Protection	6 kV			
SYSTEM SPECIFICATIONS	Protocol	BiSS-C			
	Interface	BiSS, SSI			
	Resolution	16 – 19 bits			
	Positional Accuracy	+/- 0.06°			
	Max Sampling Rate	18 kHz			
	Data Refresh Rate	> 44 kHz			
ELECTRICAL SPECIFICATIONS		Min.	Typical	Max.	Units
	Main Power Supply Voltage (V _{dd})	4.5	5.0	5.5	V
	Main Power Supply Current Draw	72	92	112	mA
	Data Output Voltage and Current	See datasheets for: Transceiver: MAX22502EATC+T			
	Data Clock		2.5		MHz

BISS-C INTERFACE



BiSS-C Waveforms (n=resolution for single turn; n=16+resolution for multi-turn)

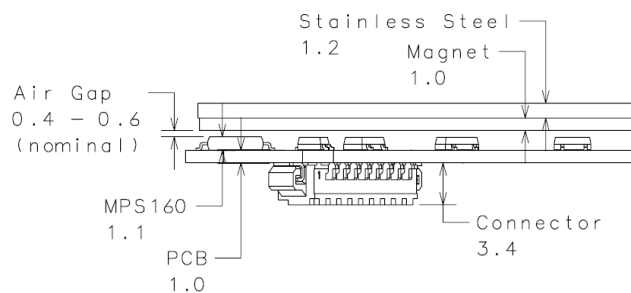
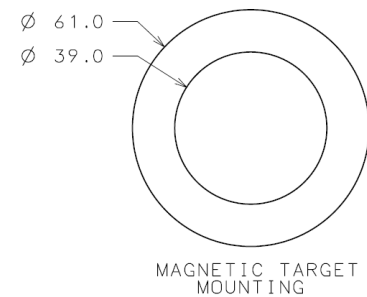
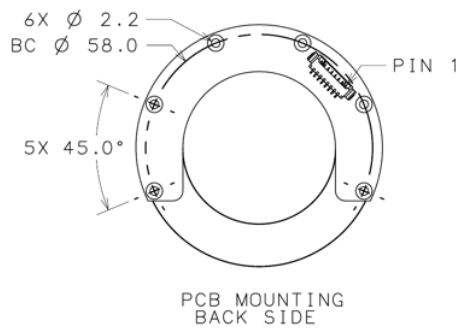
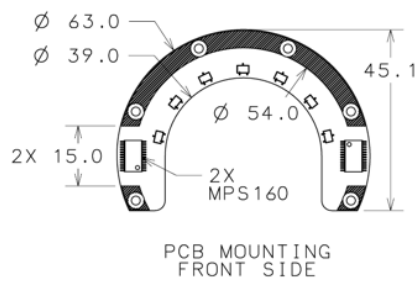
* For bidirectional BiSS-C, please refer to: <http://biss-interface.com/download/biss-c-protocol-description-english>

BISS-C TIMING CHARACTERISTICS	Parameter	Symbol	Min.	Typical	Max.	Unit	Note
	First Data Shifted to Output Register	t_{FE}	2.75			μs	
	Idle Time	t_{IC}	15			μs	
	Data Output Valid	t_{DO}			80	ns	
	Clock Pulse Width	$t_{CLK/2}$		400		ns	
	Clock Frequency	f_{CLK}		2.5		MHz	Other frequencies also available
	Line Delay			2.8		μs	
	ACK			7		Bits	At 2.5 MHz

DATA FRAME BIT DEFINITIONS: BISS-C AND SSI	Field	Description
	Dn-1:D0 n=19 for 19-bit single turn resolution n= 35 = 16 + 19 for 19-bit with 16-bit turns count data	Data output is MSB first With turns counting output: Dn-1:Dn-16 are 16-bit turn count data; Dn-17:D0 are single turn absolute position data
	ERR – Active LOW.	Error Flag: signal error or turns count error.
	ALM – Active LOW.	Alarm Flag: Air gap out of range, ABS data compromised – LED goes red.
	C5:C0	CRC bits. CRC polynomial: $\chi^6 + \chi + 1$, inverted

PRIMARY CONNECTOR PINOUT	Pin #	1	2	3	4	5	6	7	8	
	BiSS-C	V _{dd}	GND	GND	V _B	MA+	MA-	SL+	SL-	
	SSI	V _{dd}	GND	GND	V _B	CLK+	CLK-	MISO+	MISO-	

T: Custom option for an analog temperature sensor.



**3D MODELS AVAILABLE TO DOWNLOAD AT
WWW.TIMKENENCODERS.COM**

CONFIGURATION EXAMPLE: ABS-61 – 19 – B – C – M – 4000 – 0

Type	61 mm OD	Resolution (Bits)	Interface ¹		Connection		Turns Counter		Filtering ²		Options ³
			Select	Description	Select	Description	Select	Description	Select	Max Operating Speed	
ABS	61	16	B	BiSS-C	C	8-pin header	S	Single turn	200	200 RPM	0
		17	S	SSI - differential			M	Multi-turn	4000	4000 RPM	Custom #
		18	P	SPI - differential							
		19									

1: Additional full- or half-duplex interfaces available upon request.

2: Additional filtering options available upon request.

3: Timken Encoders' engineers are experienced in providing specialized solutions to meet the needs of your application. Options include but are not limited to custom data clock rates, custom targets, sensor conformal coating, on-board temperature sensors, on-board super capacitors to support low power operation, and more.

More details regarding specifications, installation, and instructions are available at www.timkenencoders.com.

Timken Encoders

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TIMKEN

The Timken team applies their know-how to improve the reliability and performance of machinery in diverse markets worldwide. The company designs, makes and markets bearings, gear drives, automated lubrication systems, belts, brakes, clutches, chain, couplings, linear motion products and related industrial motion rebuild and repair services.

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