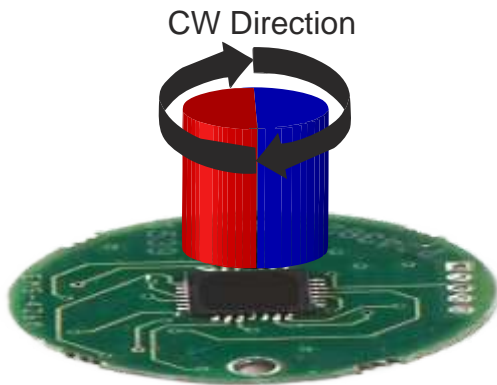


MDB20 - Magnetic encoder module

Based on Dipole Magnet and Hall Sensors

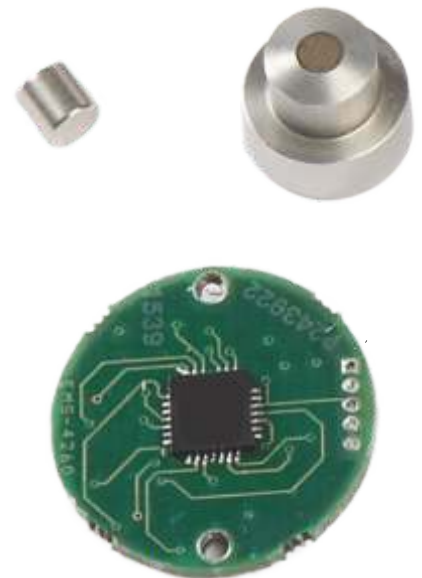


MDB20 magnetic rotary encoder module has a precision sensor having an integrated Hall element for scanning a permanent Dipole magnet. The Sensor itself generates a constant amplitude Sine and Cosine voltages that is used for angle calculations. These Sine and Cosine signals are further interpolated to get the Incremental or Absolute signals with resolutions up to 14 bits per rotation.

MDB20 module is a 20mm PCB assembly which can be used in any small designs with ease of installation.

Salient Features:

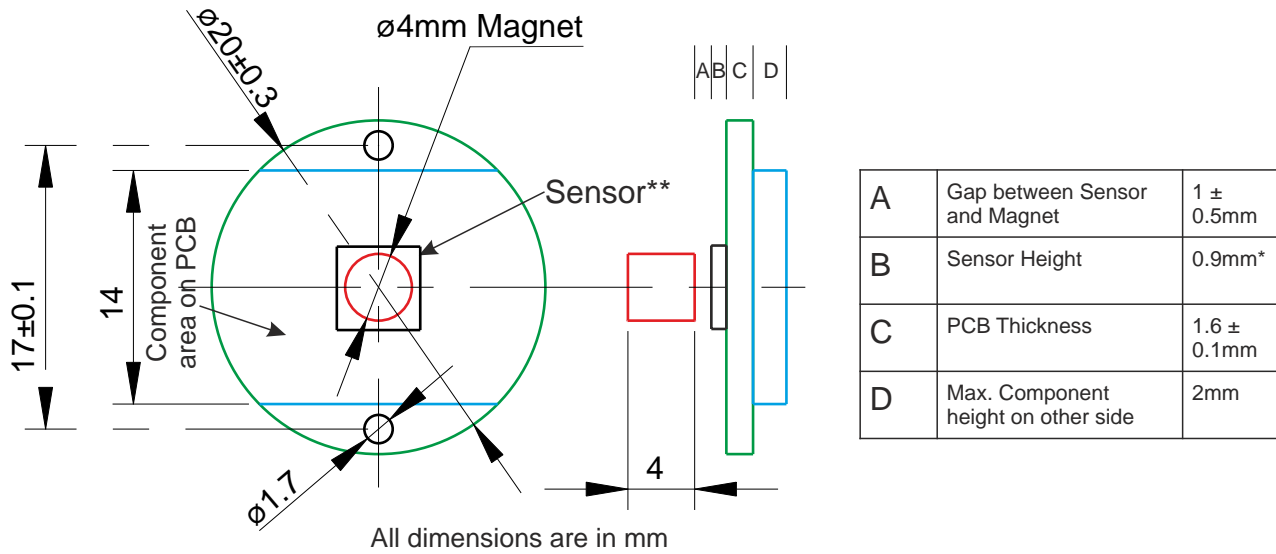
- ☞ 20mm Circular PCB assembly module
- ☞ Operates on 5V power supply
- ☞ Variety of outputs supported like Analog Sin-Cos output, Incremental RS422, Absolute SSI and BiSS-C protocol
- ☞ Supports up to 14 bits (16384 positions) per rotation Absolute and Incremental output
- ☞ Accuracy +/- 0.5 deg
- ☞ High Speed operation up to 20000 rpm at finest resolution
- ☞ 3600 CPR also available to give angular resolutions easier for mathematical calculations
- ☞ Suitable for applications like motor control, Medical instrumentation, paper and textile industry, Industrial automation and many more



Available models:

- ☞ **MDB20AS** - Analog single ended Sine Cosine output with a single sine-cosine cycle per rotation
- ☞ **MDB20AC** - Analog complementary Sine Cosine output with a single sine-cosine cycle per rotation
- ☞ **MDB20LV** - Analog Linear voltage output with 10bit resolution
- ☞ **MDB20IR** - Incremental RS422 A, B and Z output with up to 16384 counts per rotation (CPR)
- ☞ **MDB20SB** - Absolute output on Synchronous Serial interface (SSI) with Binary data up to 13 Bits per rotation
- ☞ **MDB20SG** - Absolute output on Synchronous Serial interface (SSI) with Grey coded data up to 13 Bits per rotation
- ☞ **MDB20BC** - Absolute output on BiSS-C data up to 14 Bits per rotation

Installation drawings:



Note: Magnet center axis and PCB center should be within ± 0.2mm to get the specified accuracy results

MDB20 Specifications:

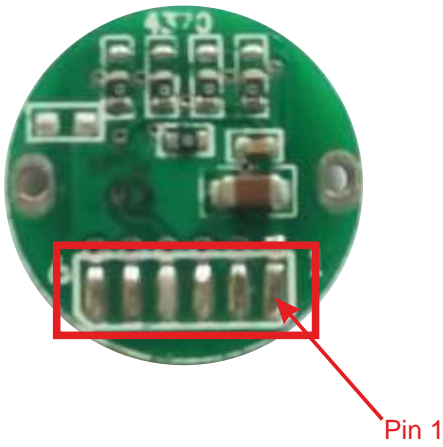
	MDB20AS / AC	MDB20IR	MDB20SB / SG	MDB20BC
Power Supply (V _{dd})			+5V DC (±5%)	
Current consumption	50mA maximum		90mA maximum	
Output	AS-2Vpp each single AC-0.5Vpp each signal	Incremental		
Maximum RPM	120000 RPM	2500 to 120000 RPM		
Operating Temperature	-40°C to +125°C			
Storage Temperature	-40°C to +125°C			
Accuracy	±0.5°			
Clock Frequency	Not Applicable	4MHz maximum	10MHz maximum	
Output data format	Not Applicable	SB - Binary SG - Grey coded	BiSS-C	
SSI Data time out	Not Applicable	16µS	12.5µS to 40µS	
Output driving current	20mA maximum			

Pin Connection details:

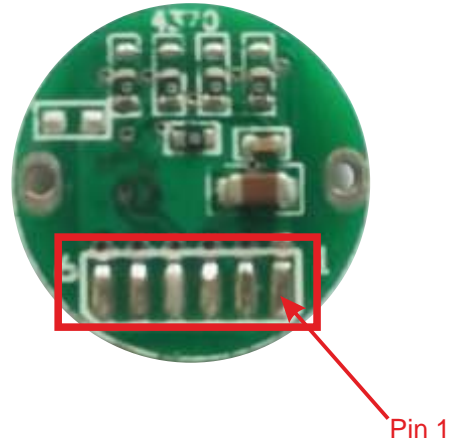
(Pin number "1" marked on the PCB)

Pin No	MDB20AS	MDB20AC	MDB20IR	MDB20SB/SG/BC	MDB20LV
1	Vdd	Vdd	Vdd	Vdd	Vdd
2	GROUND	GROUND	GROUND	GROUND	GROUND
3	SIN +	SIN +	A +	Data +	Vout
4	COSINE +	COSINE +	A -	Data -	
5		SIN -	B +	Clock +	
6		COSINE -	B -	Clock -	
7			Z +		
8			Z -		

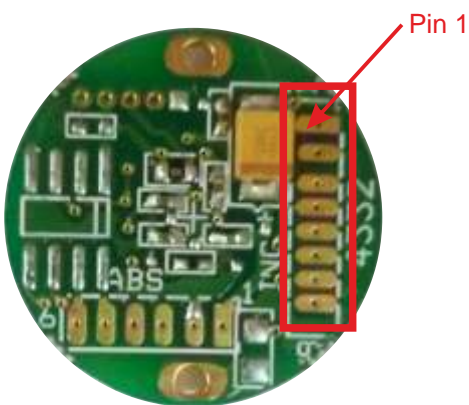
 **MDB20AS**



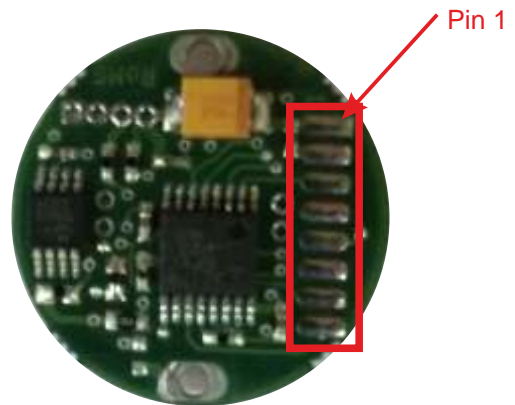
 **MDB20AC**



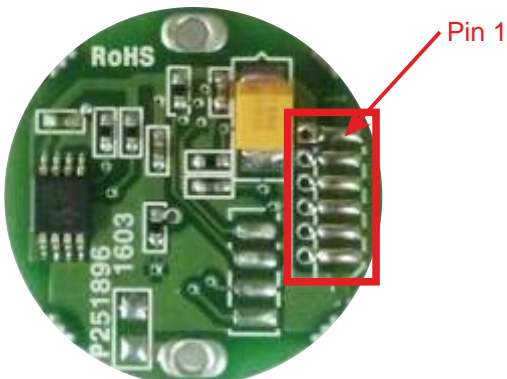
 **MDB20IR (up to 12bit)**



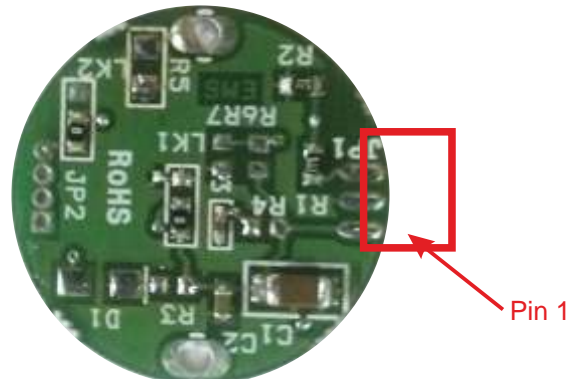
 **MDB20IR (for 13 and 14bit)**



 **MDB20SB/SG/BCBC**

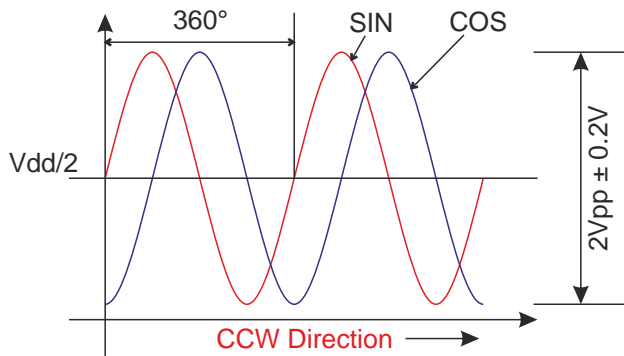


 **MDB20LV**

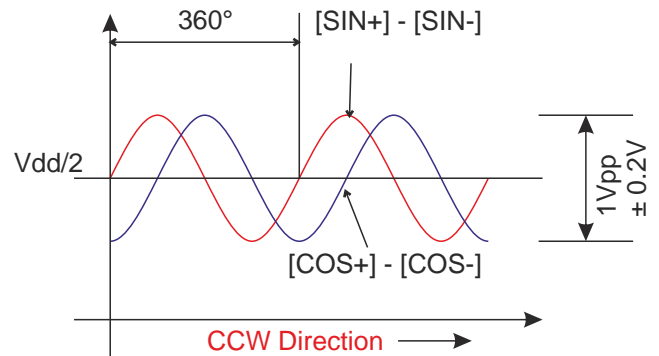


Output waveforms:

MDB20AS

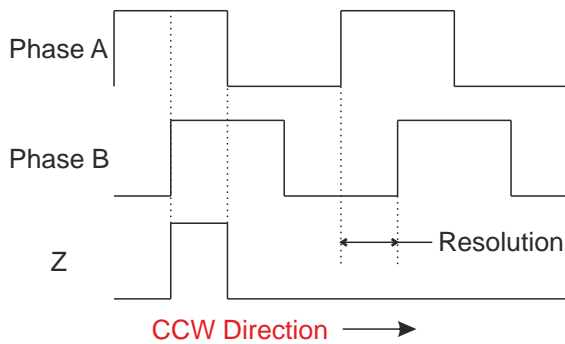


MDB20AC



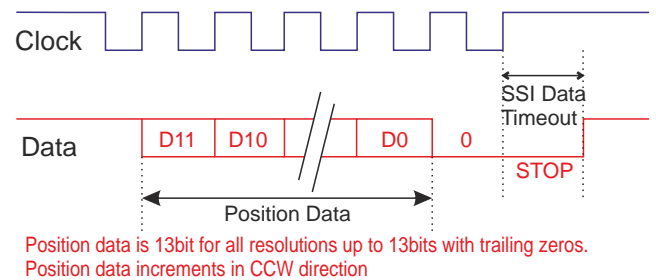
MDB20IR

(Differential signals are not shown)

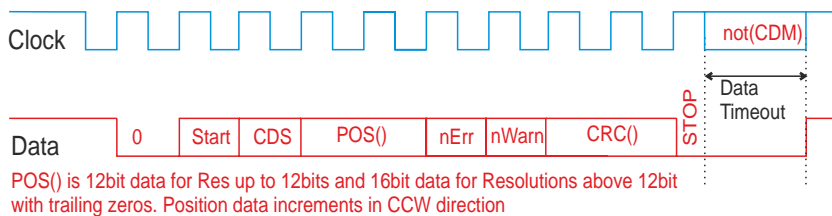


MDB20SB / SG

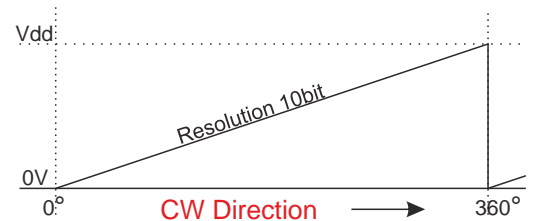
(Differential signals are not shown)



MDB20BC



MDB20LV



Output Resolutions:

MDB20IR

CPR	Hysteresis	Max. RPM
4 to 256*	0.7°	120000
260 to 512*	0.35°	60000
516 to 4096*	0.17°	30000
8192	0.17°	5000
16384	0.17°	2500

MDB20SB / MDB20SG

No of Bits	Hysteresis
9	0.35°
10 to 13	0.17°

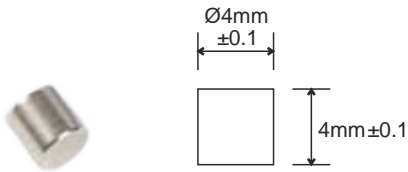
MDB20BC

No of Bits	Hysteresis
8	0.7°
9	0.35°
10 to 12	0.17°
13	0.17°
14	0.17°

* - In increments of 4. Eg 4, 8, 12, till 256 etc

Note: Pulse per Rotation (PPR) can be calculated as counts per rotation (CPR) \div 4

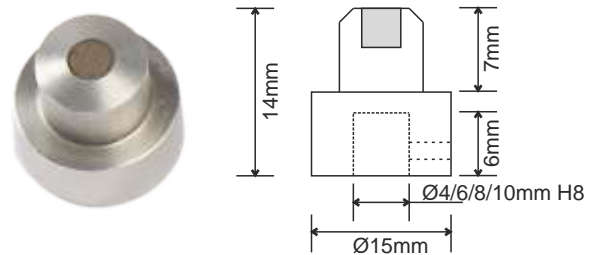
Magnet



Order code - MDG04

Note: Magnet should be glued on a non-magnetic material

Magnet with Holder



Order code - MDH04 / 06 / 08 / 10

Note: M3 Grub screw is provided on the holder for fixing on to Shaft

Ordering Information:

MDB20



Series name

20mm Circular rotary encoder PCB

00 - for Standard

Model name

- AS** - Single ended SIN COS output
- AC** - Complementary SIN COS output
- IR** - Incremental RS422 output
- SB** - SSI with binary data output
- SG** - SSI with grey coded data output
- BC** - BiSS-C with binary data output
- LV** - Linear voltage output

Resolution in CPR

For **AS** and **AC**

00000

For **IR**

00004 to 04096, 08192, 16384

For **SB** and **SG** (no of bits)

00512(9), 01024(10), 02048(11),

04096(12), 08192(13)

For **BC** (no of bits)

00256(8), 00512(9), 01024(10), 02048(11),

04096(12), 08192(13), 16384(14)

For **LV** (no of bits)

01024(10)

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