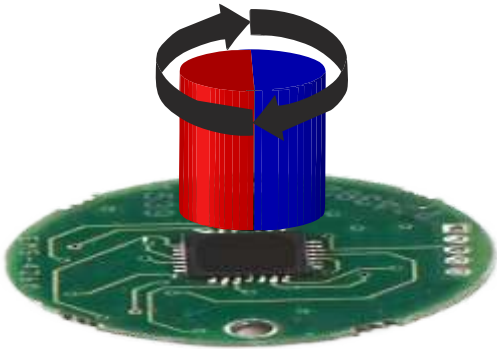


WSB20 - Magnetic encoder module

Based on Dipole Magnet and Hall Sensors



WSB20 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.

WSB20 module is a 20mm PCB assembly which can be used in any small designs with ease of installation.

Salient Features:

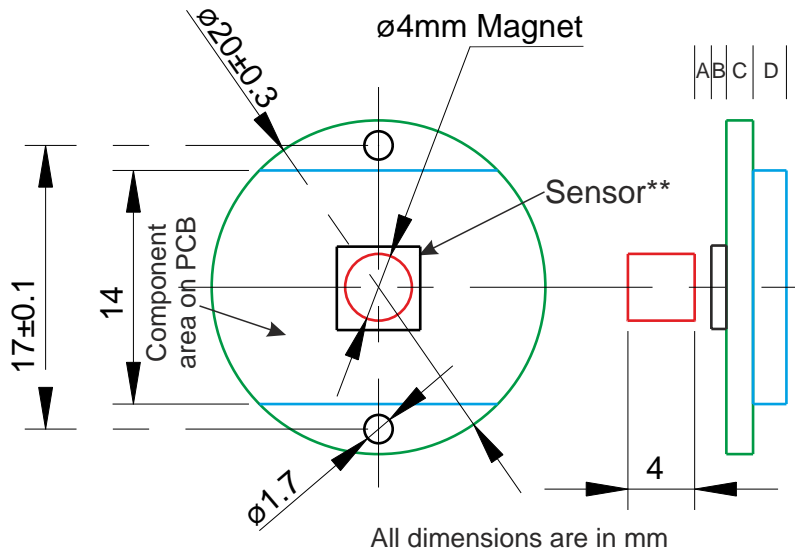
- ☞ 20mm Circular PCB assembly module
- ☞ Operates on 5V power supply
- ☞ Variety of outputs supported like Analog Sin-Cos output, Incremental RS422, Absolute SSI and BiSS-C protocol
- ☞ Supports up to 14 bits (16384 positions) per rotation Absolute and Incremental output
- ☞ Accuracy +/- 0.5 deg
- ☞ 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:

- ☞ **WSB20AS** - Analog single ended Sine Cosine output with a single sine-cosine cycle per rotation
- ☞ **WSB20AC** - Analog complementary Sine Cosine output with a single sine-cosine cycle per rotation
- ☞ **WSB20LV** - Analog Linear voltage output with 10bit resolution
- ☞ **WSB20IR** - Incremental RS422 A, B and Z output with up to 16384 counts per rotation (CPR)
- ☞ **WSB20SB** - Absolute output on Synchronous Serial interface (SSI) with Binary data up to 13 Bits per rotation
- ☞ **WSB20SG** - Absolute output on Synchronous Serial interface (SSI) with Grey coded data up to 13 Bits per rotation
- ☞ **WSB20BC** - Absolute output on BiSS-C data up to 14 Bits per rotation

Installation drawings:



Dimension	Description	Value
A	Gap between Sensor and Magnet	1 ± 0.5mm
B	Sensor Height	0.9mm*
C	PCB Thickness	1.6 ± 0.1mm
D	Max. Component height on other side	2mm

* 1.9mm for WSB20LV

** Sensor size for WSB20LV is 6.2mm X 7.8mm and for others is 5mm X 5mm

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

WSB20 Specifications:

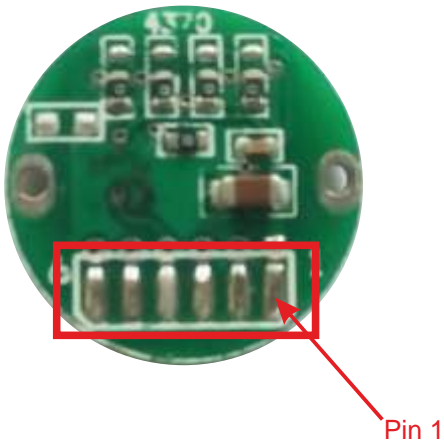
	WSB20AS / AC	WSB20IR	WSB20SB / SG	WSB20BC	WSB20LV
Power Supply (V _{dd})	+5V DC (±5%)				
Current consumption	50mA maximum		90mA maximum		30mA maximum
Output	AS-2Vpp each single AC-0.5Vpp each signal	Incremental RS422	SSI RS422	Biss-C RS422	Linear voltage output 0V to V _{dd}
Maximum RPM	120000 RPM	2500 to 120000 RPM			10000 RPM
Operating Temperature	-40°C to +125°C				
Storage Temperature	-40°C to +125°C				
Accuracy	±0.5°				Linearity <1%
Clock Frequency	Not Applicable		4MHz maximum	10MHz maximum	Not Applicable
Output data format	Not Applicable		SB - Binary SG - Grey coded	BiSS-C	Not Applicable
SSI Data time out	Not Applicable		16µS	12.5µS to 40µS	Not Applicable
Output driving current	20mA maximum				

Pin Connection details:

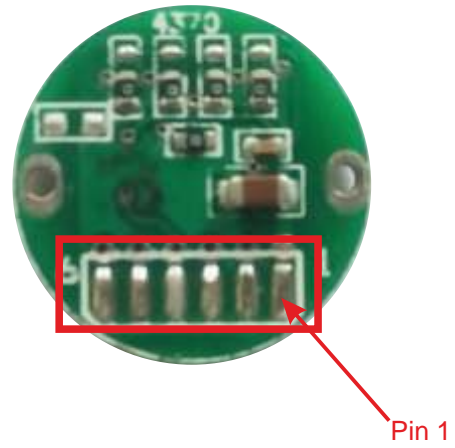
(Pin number "1" marked on the PCB)

Pin No	WSB20AS	WSB20AC	WSB20IR	WSB20SB/SG/BC	WSB20LV
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 -		

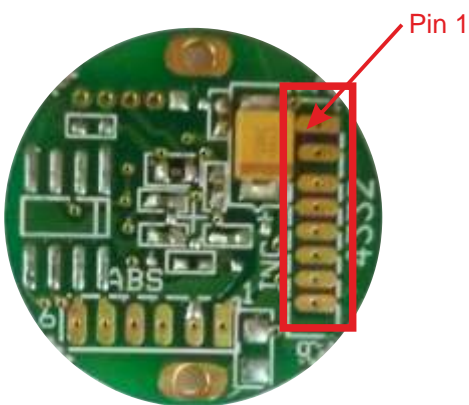
 **WSB20AS**



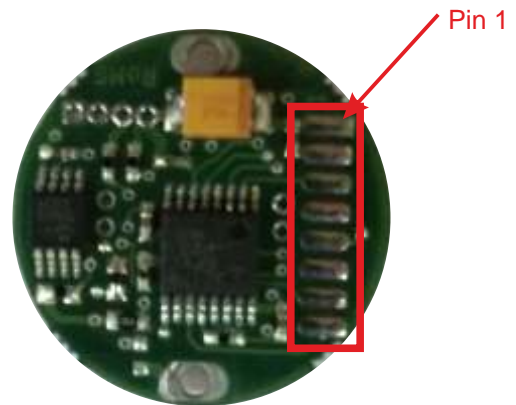
 **WSB20AC**



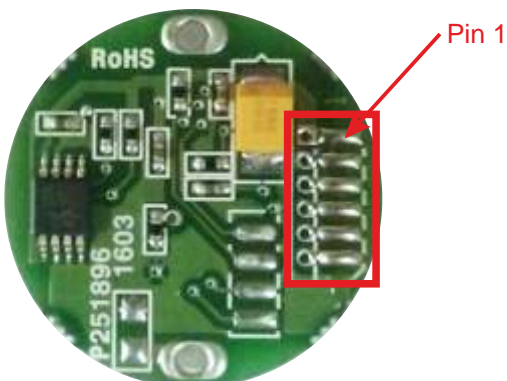
 **WSB20IR (up to 12bit)**



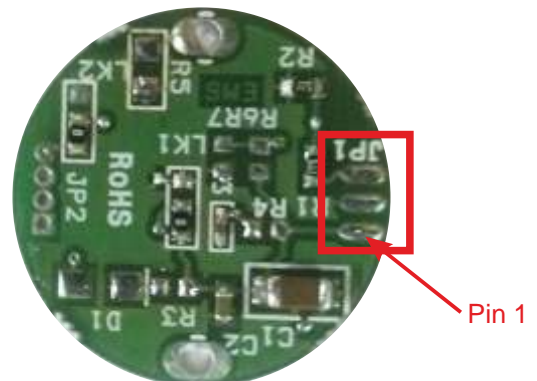
 **WSB20IR (for 13 and 14bit)**



 **WSB20SB/SG/BCBC**

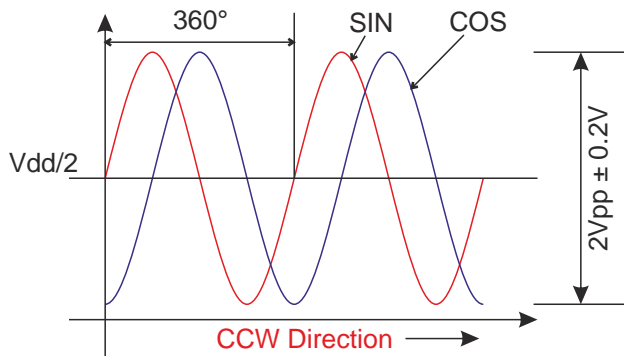


 **WSB20LV**

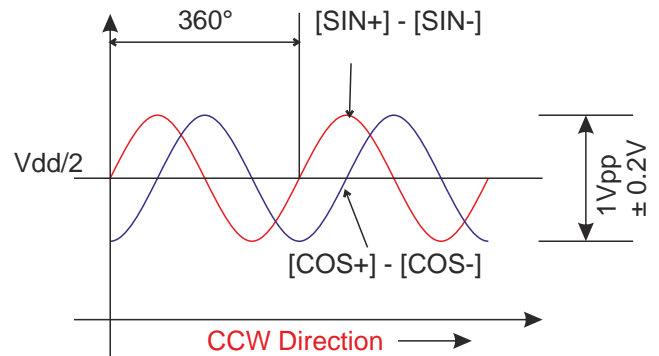


Output waveforms:

WSB20AS

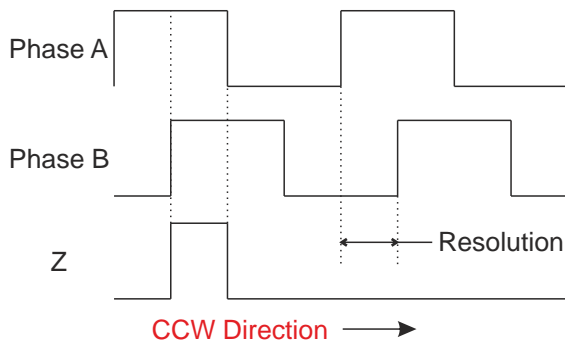


WSB20AC



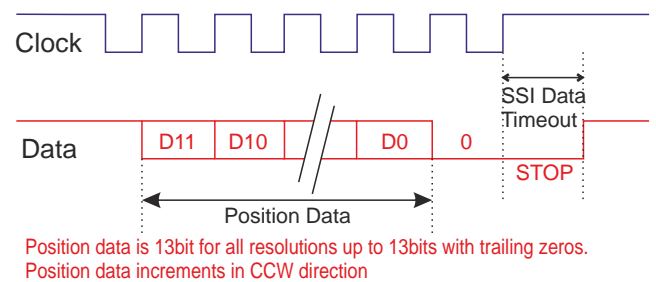
WSB20IR

(Differential signals are not shown)

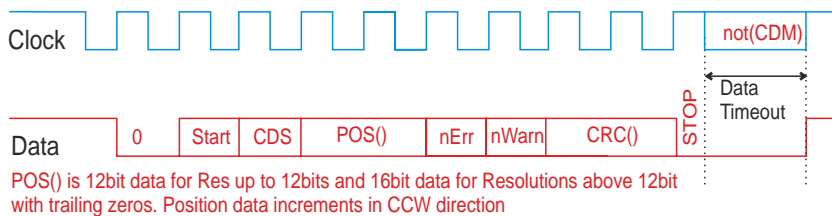


WSB20SB / SG

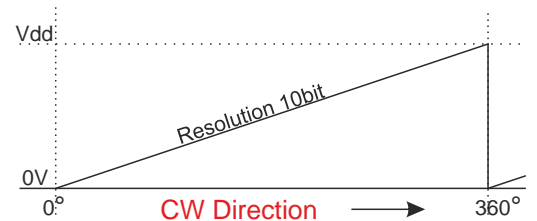
(Differential signals are not shown)



WSB20BC



WSB20LV



Output Resolutions:

WSB20IR

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

WSB20SB / WSB20SG

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

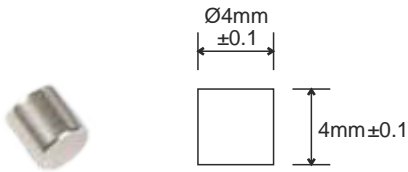
WSB20BC

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

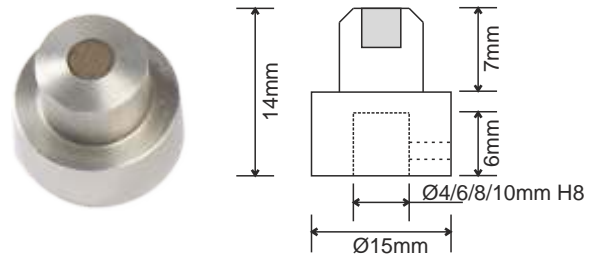
Magnet



Order code - MDG04

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

Magnet with Holder

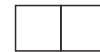
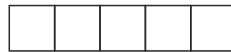


Order code - MDH04 / 06 / 08 / 10

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

Ordering Information:

WSB20



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)

Head office and Factory:

Electronica Mechatronic Systems (I) Pvt. Ltd.

Unit No. 37 & 44, Electronic Co-op. Estate, Pune-Satara Road,
Pune 411009 India
Tel.: +91-20-2422 4440, 2422 2293
Fax: +91-20-2422 1881
Email: enquiry@electronicaems.com
Web: www.electronicaems.com

Distributor for Israel:

WeSense Motion 2012 Ltd

13 Ha'horesh St.
Kiryat-Tivon 36051, Israel
Tel.: +972 4 6445454
Fax: +972 4 6445474
Email: office@wesense.co.il
Web: www.wesense.co.il