

Description

The H1 series ball bearing optical shaft encoder has a glass-filled polymer enclosure. This non-contacting rotary to digital converter is designed to provide digital feedback information.

The H1 is fully assembled with a brass shaft, two 1/4" ID by 1/2" OD ball bearings and a mounting plate. The mounting plate comes with two mounting holes for screws #4 or smaller.

The H1 is designed to drive cables up to 10 feet long. For longer cable lengths, adding a PC4 / PC5 differential line driver is recommended.

A connection to the H1 series encoder is made through a 5-pin standard connector. The mating connectors are available from US Digital with several cable options and lengths.

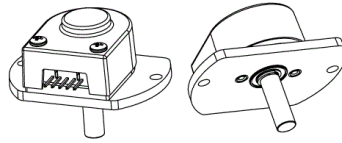


Features

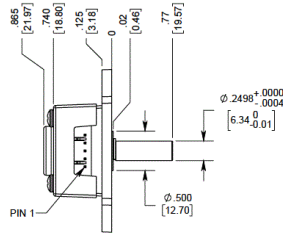
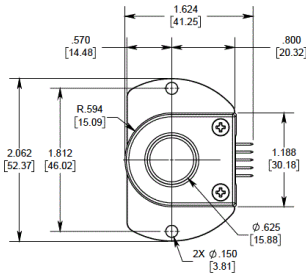
- ▶ Ball bearing option tracks to 10000 RPM
- ▶ 2-channel quadrature, TTL squarewave outputs
- ▶ 3rd channel index option available on some resolutions
- ▶ 32 to 5000 cycles per revolution (CPR)
- ▶ 128 to 20000 pulses per revolution (PPR)
- ▶ Wide operating temperature
- ▶ Single +5VDC supply

Mechanical Drawing

H1 Ball Bearing Optical Shaft Encoder



RELEASE DATE: 04/27/2015



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UNITS: INCHES (MM)
METRIC SHOWN FOR REFERENCE ONLY

Environmental

Parameter	Value	Units
Operating Temperature, CPR < 2000	-40 to 100	C
Operating Temperature, CPR ≥ 2000	-25 to 100	C
Vibration (5Hz to 2kHz)	20	G
Electrostatic Discharge, IEC 61000-4-2	± 4	kV

Mechanical

Parameter	Value
Max. Acceleration	100000 rad/sec ²
Max. Shaft Speed (mechanical)	10000 RPM (1)
Max. Shaft Torque	0.05 in-oz
Max. Shaft Loading	2 lbs.
Bearing Life	life in millions of revs = (90/P) ³ where P = radial load in pounds
Weight	1.49 oz.
Max. Shaft Total Indicated Runout (TIR)	0.006 in.
Moment of Inertia	0.001 oz-in-s ²

Technical Bulletin TB1001 - Shaft and Bore Tolerances

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(1) The maximum speed due to electrical considerations is dependent on the CPR. See the EM1 and EM2 product pages.

Phase Relationship

B leads A for clockwise shaft rotation, and A leads B for counterclockwise rotation when viewed from the shaft side of the encoder.

Electrical

- Specifications apply over entire operating temperature range.
- Typical values are specified at $V_{cc} = 5.0V_{dc}$ and $25^{\circ}C$.
- For complete details, see the EM1 or EM2 product pages.

Parameter	Min.	Typ.	Max.	Units	Conditions
Supply Voltage	4.5	5.0	5.5	V	
Supply Current		27	33	mA	CPR < 500, no load
		54	62	mA	CPR \geq 500 and <2000, no load
		72	85	mA	CPR \geq 2000, no load
Low-level Output			0.5	V	IOL = 8mA max., CPR < 2000
			0.5	V	IOL = 5mA max., CPR \geq 2000
		0.25		V	no load, CPR \geq 2000
High-level Output	2.0			V	IOH = -8mA max. and CPR < 2000
	2.0			V	IOH = -5mA max. and CPR \geq 2000
		4.8		V	no load and CPR < 2000
		3.5		V	no load and CPR \geq 2000
Output Current Per Channel	-8		8	mA	CPR < 2000
	-5		5	mA	CPR \geq 2000
Output Rise Time		110		nS	CPR < 2000
		50		nS	CPR \geq 2000, \pm 5mA load
Output Fall Time		100		nS	CPR < 2000
		50		nS	CPR \geq 2000, \pm 5mA load

Pin-out

Pin	Description
1	Ground
2	Index

Pin	Description
3	A channel
4	+5VDC power
5	B channel

Ordering Information

H1 - - -

CPR	Index	Housing
32 =	NE = <i>No Index</i>	D = <i>Default</i>
50 =	IE = <i>Index</i>	
96 =		
100 =		
192 =		
200 =		
250 =		
256 =		
360 =		
400 =		
500 =		
512 =		
540 =		
720 =		
900 =		
1000 =		
1024 =		
1250 =		
2000 =		
2048 =		
2500 =		
4000 =		
4096 =		
5000 =		

Notes

- Cables and connectors are not included and must be ordered separately.
- US Digital® warrants its products against defects in materials and workmanship for two years. See complete warranty for details.