S1 & S2 Optical Shaft Encoders

Description:

The **S1** and **S2** series optical shaft encoders are non-contacting rotary to digital converters. Useful for position feedback or manual interface, the encoders convert real-time shaft angle, speed, and direction into TTL-compatible quadrature outputs with or without index. The encoders utilize an unbreakable mylar disk, metal shaft and bushing, LED light source, and monolithic electronics. It may operate from a single +5VDC supply.

The **S1** and **S2** encoders are available with ball bearings for motion control applications or torque-loaded to feel like a potentiometer for front-panel manual interface.

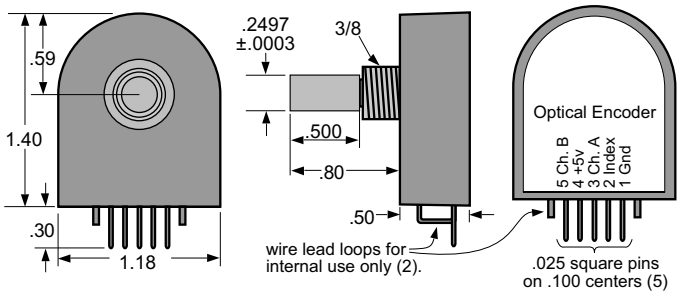
Electrical Specifications:
B leads A for clockwise shaft rotation, A leads B for counter clockwise shaft rotation viewed from the shaft/bushing side of the encoder. For complete details see our **HEDS** data sheet.

Features:

- Small size.
- Low cost.
- 2-channel quadrature, TTL square wave outputs.
- 3rd channel index option.
- Tracks from 0 to 100,000 cycles/sec.
- Ball bearing option tracks to 10,000 RPM.
- -40 to +100°C operating temperature.
- Single +5V supply.
- US Digital warrants its products against defects & workmanship for two years. See complete warranty for details.

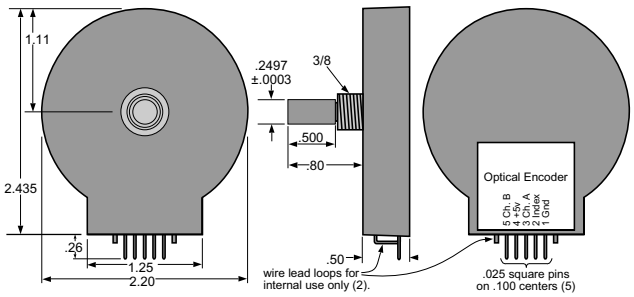
S1

- 50 to 1024 cycles/rev.
- 200 to 4096 codes/rev.



S2

- 1000 to 2048 cycles/rev.
- 4000 to 8192 codes/rev.



Mechanical Notes: (ball bearing)

Acceleration	10,000 rad/sec^2
Vibration	20 g. 5 to 2KHz
Shaft speed	10,000 RPM max. continuous
Acceleration	50K Rad/Sec^2 10K Rad/Sec^2 (**S2** series)
Shaft torque	0.05 in. oz. max.
Shaft loading	1 lb. max.
Bearing life	(40/P)^3 = Life in millions of revs. Where P = radial load in pounds.
Weight	0.7 oz.
Shaft runout	0.0015 T.I.R. max.

Mechanical Notes: (sleeve bushing)

Acceleration	10,000 rad/sec^2
Vibration	20 g. 5 to 2KHz
Shaft speed	100 RPM max. continuous
Shaft rotation	Continuous & reversible
Shaft torque	0.5±0.2 in. oz.
	0.3 in. oz. max. (**NT**-option)
Shaft loading	2 lbs. max dynamic
	20 lbs. max. static
Weight	0.7 oz.
Shaft runout	0.0015 T.I.R. max.

Materials & Mounting:

Shaft	Brass or stainless
Bushing	Brass
Connector	Gold plated
Hole diameter	0.375 in. +.005 - 0
Panel thickness	0.125 in. max
Panel nut max torque	20in.-lbs.

Ordering Information:

S [ ] — [ ] — [ ]

Series:
S1
S2

CPR:

S1	**S2**
50	1000
96	1024
100	2000
110[1]	2048
120[1]	
192	
200	
250	
256	
360	
400	
500	
512	
540[1]	
1000[1]	
1016[1]	
1024[1]	

Options[2]:
I = Index (3rd channel).
B = Ball bearings (free spinning).
HS = Sealed housing.
M6 = Metric 6mm diameter shaft.
NT = Light static drag.

Notes:
[1] Index option not available.
[2] Specify options in order show above.

Cost Modifiers:

- Add $8 for ball bearing option (added torque applies to the sleeve bushing version only).
- Add $5 for metric 6mm diameter shaft.
- Add $14 for **HS**-option (sealed housing).
- On **S1**, add $9 for index and/or resolutions =>1000 CPR.
- On **S2**, add $9 for index and/or resolutions =>2000 CPR.

S1 & S2 Price:
$49 / 1
$45 / 10
$41 / 50
$39 / 100
$38 / 500
$35 / 1000

Notes:
When **M6**-option is not specified the default is .250" diameter shaft.
When **B**-option or **NT**-option is not specified the default is static drag, like a potentiometer.

Technical Data, Rev. 01.10.01, January 2001

All information subject to change without notice.

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