

### Description:

The **E3** offers twice the resolution of our **E2** series. It fits all the shaft diameters of our **E2** series, plus 12mm, 1/2", 3/4", 14mm, 5/8", and 1". Additional diameters may be systematically added.

The **E3** optical kit encoder is a non-contacting, rotary to digital position feedback device designed to easily mount to and dismount from an existing shaft. The internal monolithic electronic module converts the real-time shaft angle, speed, and direction into TTL-compatible outputs. Simplicity and low cost make the **E3** ideal for both high and low volume motion control applications.

The **E3** consists of four parts: base, cover, hub/code wheel, and encoder module.

The base provides mounting holes for: 2 (2-56 or 4-40) screws in a .750" bolt circle, 3 (0-80) screws in a .823" bolt circle, 2 (4-40) screws in a 1.280" bolt circle, and 2 (4-40) screws in a 1.812" bolt circle. For shaft diameters less than .5", the base comes with a .44" hole; for all larger shaft sizes, the hole diameter is 1.44" and only the mounting holes in a 1.812" bolt circle remain. The base and housing are made of reinforced glass polycarbonate.

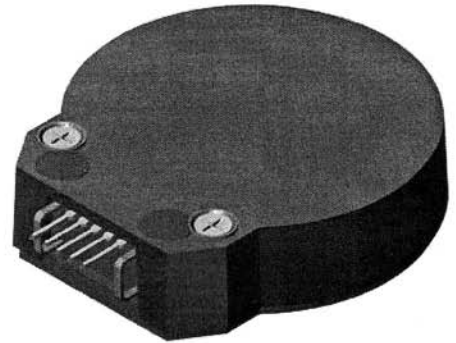
The cover is available in three configurations; the standard is a solid flush back which can accommodate a shaft length up to .53". An optional hole in the back with .55" or 1.05" diameter can be specified for the shaft to pass through.

The hub/code wheel is available in diameters up to 1". A list of standard diameters can be found on the page 4 of this data sheet. Standard diameters are stocked. There is a quick turn around time for most special diameters.

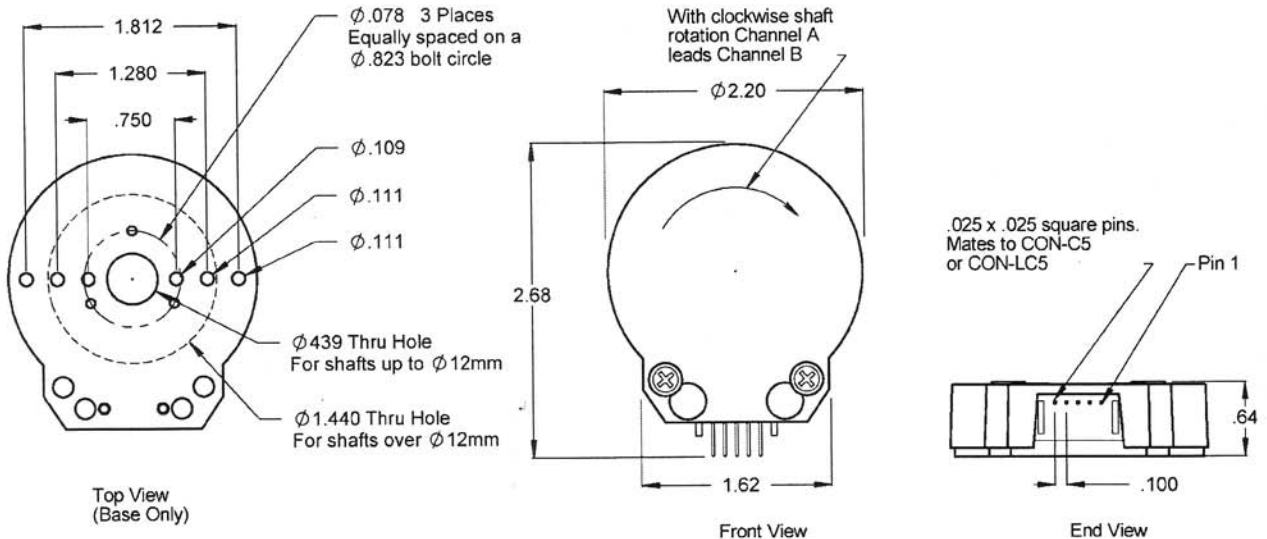
The encoder module incorporates a lensed LED light source and monolithic photodetector array with signal shaping electronics to produce the two channel bounceless TTL outputs.

### Features:

- > Quick, simple assembly and disassembly
- > Rugged screw-together housing
- > Low cost
- > Accepts  $\pm .010$ " axial shaft play
- > Small size
- > Tracks from 0 to 100,000 cycles/sec
- > 64 to 2048 cycles per revolution (CPR)
- > 256 to 8192 pulses per revolution (PPR)
- > 2 channel quadrature TTL squarewave outputs
- > Optional index (3rd channel)
- > -40 to +100°C operating temperature
- > Fits shaft diameters 2mm to 1"
- > Single +5V supply
- > Flush back or through shaft hole
- > US Digital warrants its products against defects in materials and workmanship for two years. See complete warranty for details.



### Mechanical Drawing:



## Disk Optics:

Be sure to keep different diameters, resolutions and options separated. The resolution of the optoelectronic modules and the code wheels must match. Index and non-index parts cannot be mixed since the optical patterns are different.

An additional identifier is stamped on each optoelectronic module. The 2-channel (non-index) version can be identified by a number 9000 or 9100. A 9040 or 9140 identifies the 3-channel (index) version. One letter stamped on each module specifies the resolution as shown in the adjacent table.

\* US Digital's **EM1** optical encoder module. 1 stands for 1" disk, while the second number set is the resolution. (64 CPR uses **EM1-1-32** module).

Disk	Standard	Index
64	1-32*	1-32*
100	S	S
200	C	C
400	E	-
500	A	F
512	A	-
1000	B	B
1024	J	J
2000	T	T
2048	U	T

## Compatible Cables & Connectors:

5-pin:

Locking	Standard	Description
CON-LC5	CON-C5-22*	Connector
CA-1094-1FT	CA-434-1FT	Connector on one end with 4 12" wires
CA-1095-1FT	CA-435-1FT	Connector on one end with 5 12" wires
CA-3935-6FT	CA-3934-6FT	Connector on one end of a 6' shielded round cable
CA-1630-6FT	CA-576-6FT	Connector on both ends of a 6' shielded round cable

\* 22 AWG is standard. 24, 26 and 28 AWG are also readily available.

### Attention:

- > Specify cable length when ordering.
- > Custom cable lengths are available. See the **Cables & Connectors** data sheet for more information.

### Pin-out:

Pin	Description
1	Ground
2	Index
3	A channel
4	+5VDC power
5	B channel

E3 -  -  -  -

CPR:	Code	Size
64***	079	2mm
100	118	3mm
200	125	1/8"
400**	156	5/32"
500	157	4mm
512**	187	3/16"
1000	197	5mm
1024	237	6mm
2000	250	1/4"
2048	312	5/16"
	315	8mm
	375	3/8"
	394	10mm
	472	12mm
	500	1/2"
	551	14mm
	625	5/8"
	750	3/4"
	1000	1"

### Options\*:

- (specify in order shown)
- I** = Index (3rd channel)
  - E** = Provides a cylindrical extension to the housing cover allowing for longer shafts.
  - H** = Adds .55" hole in housing for through shaft sizes equal to or less than 1/2". Adds 1.05" hole in housing for through shaft sizes greater than 1/2".
  - 3** = Changes diameter of all five base mounting holes to .125".\*\*\*\*
  - M** = Adds 4-hole mounting adapter plate (see above for more information).
  - T** = Adds transfer adhesive to base.\*\*\*\*\*

### Notes:

- \* Index / resolutions =>2000 CPR.
- \*\* Index option not available.
- \*\*\* 64 CPR only available with index.
- \*\*\*\* Not available for shaft diameters 12mm or higher.
- \*\*\*\*\* A centering tool is highly recommended when using this option.

### Packaging Options:

- Blank** (default) = Encoder components, one spacer tool and one hex driver per 100 encoders packaged in bulk.
  - PKG1** = Each encoder packaged individually. One spacer tool and one hex driver per 100 encoders packaged in bulk.
  - PKG2** = One spacer tool and one hex wrench individually packaged together with each encoder.
  - PKG3** = One spacer tool, one hex wrench, and one centering tool individually packaged together with each encoder.
- > If you would like individual mounting screws, further instructions, or other custom kits please call.