

Description

The E8T transmissive optical encoder is designed to provide digital quadrature encoder feedback for high volume, compact space applications. The E8T is designed to be a drop in replacement for the E7P/E8P that offers higher maximum speed and increased output drive. The E8T utilizes an innovative, push-on codewheel which accepts shaft diameters of .118" to .375".

The E8T default encoder base provides mounting holes for two #4-40, length 0.188" or two M2.5, length 5mm screws on a 0.75" bolt circle diameter. A 1.28" diameter bolt circle mount is also available, only with #4-40, length 0.188" screws. The encoder cover is easily snapped onto the base and is marked with the connector pin-out.

The single-ended output version is connected using a 4-conductor, high retention, polarized, 1.25mm pitch connector. The differential output version uses a similar 6-pin connector. Mating cables and connectors (see the Cables / Connectors web page) are not included, and are available separately.



Features

- ▶ E8T Miniature Optical Kit Encoder
- ▶ Push-on hub - spring loaded collet design
- ▶ Minimum shaft length of .295"
- ▶ Fits shaft diameters of .118" to .375"
- ▶ 180 to 720 cycles per revolution (CPR)
- ▶ 720 to 2880 pulses per revolution (PPR)
- ▶ Single +5V supply

Rev. 170227124048



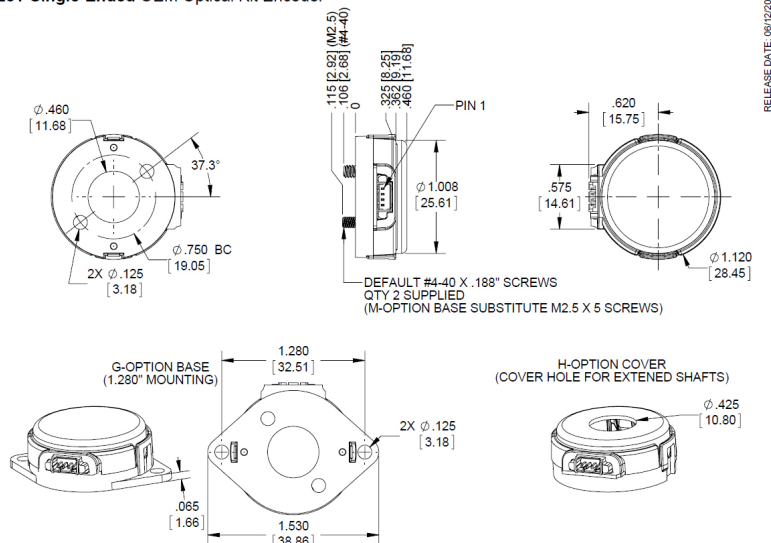
E8T Miniature Optical Kit Encoder

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E8T Single-Ended

E8T Single-Ended OEM Optical Kit Encoder



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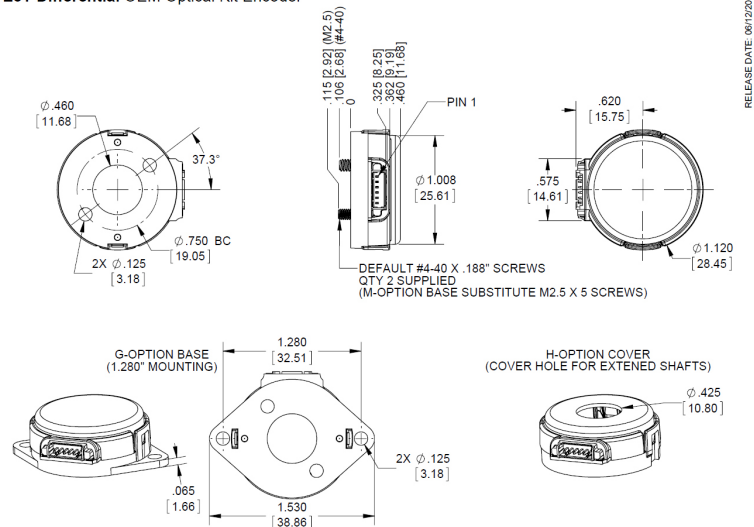
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UNITS: INCHES (MM)
METRIC SHOWN FOR REFERENCE ONLY

E8T Differential

E8T Differential OEM Optical Kit Encoder



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Environmental

Parameter	Value	Units
Operating Temperature	-20 to 100	C
Electrostatic Discharge, IEC 61000-4-2		
Single-ended (-S option)	± 12	kV
Differential (-D option)	± 7	
Shock, 6 millisecond, half-sine	75	G
Vibration (20Hz to 2kHz, sinusoidal)	20	G



Mechanical

Parameter	Value	Units
Max. Shaft Axial Play	± .010	in.
Max. Shaft Runout (TIR)	.002	in.
Max. Acceleration	250000	rad/sec ²
Maximum RPM (1) e.x. CPR = 500, max. rpm = 12000 e.x. CPR = 200, max. rpm = 30000	minimum value of (6000000/CPR) and (60000)	rpm
Codewheel Moment of Inertia	1.789 x 10 ⁻⁶	oz-in-s ²
Mounting Screw Size Default (D-option), 1.28" base (G-option) Metric (M-option)	#4-40, length 0.188" M2.5, length 5mm	
Screw Bolt Circle Diameter Default (D-option), Metric (M-option) 1.28" base (G-option)	.75 ±.005 1.28 ±.005	in.
Minimum Shaft Length (2)	.295	in.
Maximum Shaft Length (2)	.400 (D option) / no limit (H option)	in.
Mounting Screw Torque	2-3	in-lbs
Technical Bulletin TB1001 - Shaft and Bore Tolerances		Download

(1) 60000 rpm is the maximum rpm due to mechanical considerations. The maximum rpm due to the module's 100kHz maximum output frequency is (6000000/CPR).

(2) Including axial play.

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Single-ended Electrical

Specifications	Min.	Typ.	Max.	Units	Notes
Supply Voltage	4.5	5.0	5.5	V	
Supply Current		25	30	mA	no load
Low-level Output			0.4	V	IOL = 8 mA
		0.035		V	no load
High-level Output	2.4			V	IOH = -8 mA
		4.0		V	no load
Output Rise Time		100		ns	no load
Output Fall Time		50		ns	no load

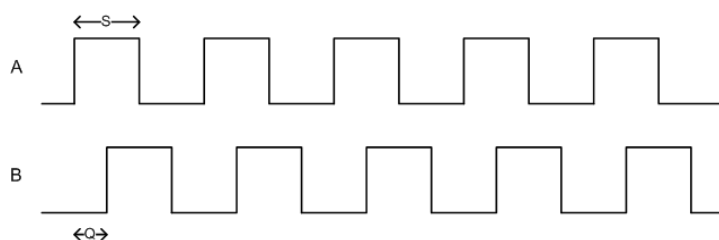


Differential Electrical

Specifications	Min.	Typ.	Max.	Units	Notes
Supply Voltage	4.5	5.0	5.5	V	
Supply Current		27	32	mA	no load
Differential Output Voltage High	4.75	5.0		V	Min. @ 25mA load, Typ. @ no
loadDifferential Output Voltage Low		0.25	0.60	V	Typ. @ no load, Max. @ 4.5mA
loadDifferential Output Voltage	3.0	3.8		V	RL = 100 ohm
Differential Output Rise/Fall Time			20	ns	



Phase Relationship



Parameter	Min.	Typ.	Max.	Units
Symmetry, S	105	180	255	electrical degrees
Quadrature Delay, Q	30	90	150	electrical degrees

(1) A leads B for clockwise shaft rotation, B leads A for counter clockwise shaft rotation viewed from the cover/label side of the encoder.

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(2) Typical values represent the encoder performance at typical mounting alignment, whereas the maximum values represent the encoder performance across the range of recommended mounting tolerance.



Pin-out

4-pin Single-ended		6-pin Differential	
Pin	Description	Pin	Description
1	+5VDC power	1	Ground
2	A channel	2	A channel
3	Ground	3	A- channel
4	B channel	4	+5VDC power
		5	B channel
		6	B- channel



Options

H-option (Hole In Cover)

The **H**-option adds a 0.425" diameter hole in the cover for the shaft to pass through.

M-option (Metric Mounting Screws with Default base)

Provides metric M2.5, length 5mm screws. When **M**-option is NOT specified the default is #4-40, length 0.188" screws. The mounting bolt circle diameter is 0.75"

G-option (1.28" diameter bolt circle mount)

Provides 1.28" diameter bolt circle mount in addition to 0.75" diameter bolt circle mount. Screws are #4-40, length 0.188"



Accessories

1. Centering Tool*

Part #: CTOOL - (Shaft Diameter)

Description: This reusable tool is used to accurately center the **E8T** base on the shaft.

2. Spacer Tool*

Part #: SPACER-E8T

Description: This reusable tool is used to properly gap the codewheel from the encoder sensor.

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**Both the CTOOL and SPACER-E8T tools are included with all packaging options.*

Ordering Information

E8T						
	CPR	Bore	Output	Cover	Base	Packaging
	180 =	118 =	S =Single	D =Default	D =Default, #4-40,	B =Encoder components packaged
	200 =	3mm	Ended	H =Hole in	length 0.188" screws	in bulk. One spacer and one
	250 =	125 =	D =Differential	Cover	M =Metric M2.5,	centering tool per 100 encoders.
	256 =	1/8"			length 5mm screws	1 =Each encoder packaged
	360 =	156 =			G =Adds 1.28" bolt	individually. One spacer tool and
	400 =	5/32"			circle mount, #4-40,	one centering tool per 100 encoders.
	500 =	157 =			length 0.188" screws	2 =Each encoder packaged
	512 =	4mm				individually. One spacer and one
	720 =	197 =				centering tool per encoder.
		5mm				
		236 =				
		6mm				
		250 =				
		1/4"				
		276 =				
		7mm				
		315 =				
		8mm				
		375 =				
		3/8"				

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.

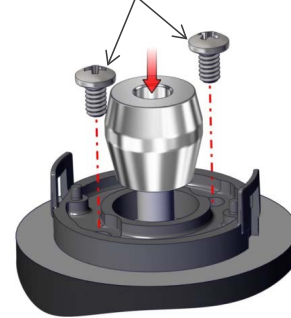
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E8T Assembly Instructions

Step 1:

Place the base over the shaft and onto the mounting surface. Slide the centering tool onto the shaft so that it contacts and aligns the base. While applying light pressure to the centering tool, secure the base to the mounting surface using two screws.

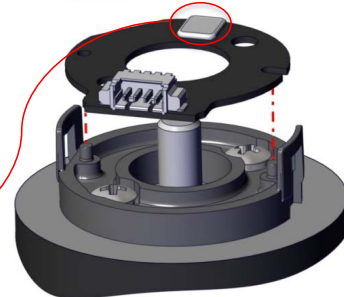
Mounting Screws:
2-3 in-lbs torque



Step 2:

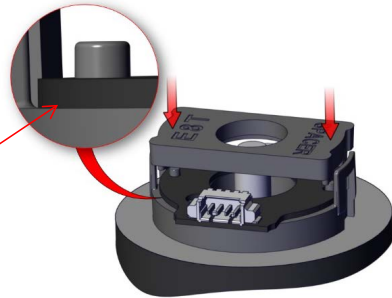
Remove the centering tool and place the PCB onto the base, aligning the hole and slot to the two pins on the base. Note that the base is symmetrical allowing the connector to exit out either side.

Caution: When handling the PCB it is best to avoid directly touching the optical sensor.



Step 3:

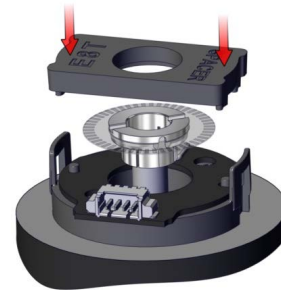
Using the spacer tool, very firmly press down on the PCB in order to push it over the alignment pins and completely onto the base surface. Check to make sure that the PCB is fully seated against the base. If it is not, use the spacer tool to press it again, recheck that it is fully seated.



Step 4:

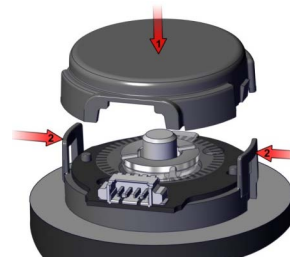
Place the hubdisk onto the shaft with the longer end of hub toward the base. Position the spacer tool onto the hub such that the notches are aligned with the latches of the base. Press down firmly until the tool bottoms out on the PCB. Verify that this action has pressed the PCB flush against the base.

Caution: While installing the hubdisk ensure that the hub bore is parallel to the shaft. Forcing the hub onto the shaft at an angle may cause permanent damage to the hub.



Step 5:

Remove the spacer tool and snap the cover down onto the base, (1). With your thumb and finger, squeeze the base latches together to ensure they are fully engaged with the cover, (2).



We are here for you. Addresses and Contacts.

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