

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

- 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

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

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(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.

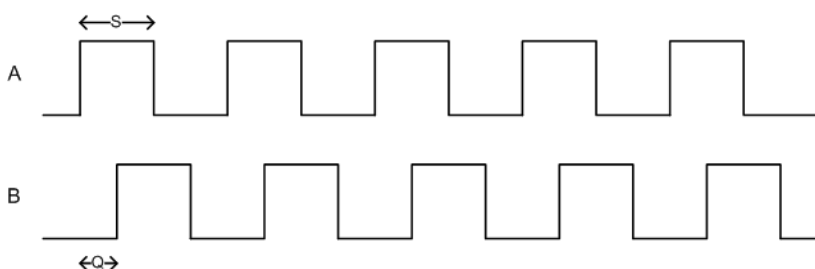
Single-ended Electrical

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 load
Differential Output Voltage Low		0.25	0.60	V	Typ. @ no load, Max. @ 4.5mA load
Differential 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 side of the encoder.

(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 (1)

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

(1) 4-pin single-ended mating connector is CON-MIC4

(2) 6-pin differential mating connector is CON-MIC6

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.

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

Assembly Instructions

E8T Assembly Instructions - http://usdigital.com/assets/assembly/E8T_Assembly_Instructions.pdf

Ordering Information

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