

Description

The T6 incremental inclinometer is a single axis, digital tilt sensor that can measure the angle of an object with respect to gravity. It uses a weight placed on one side of a wheel assembly to keep the wheel stationary with respect to gravity. An optical encoder connected to the wheel provides unlimited range and virtually no linearity errors. There is no external contact to the encoder disk. Internal magnetic damping minimizes overshoot and oscillations as the inclinometer rotates. As the housing moves relative to the encoder disk the motion is converted to TTL quadrature outputs. The quadrature outputs can be used to measure angle, speed and direction. This second generation design virtually eliminates stiction (or hysteresis) which was the primary accuracy limitation of first generation inclinometers.

The T6 inclinometer utilizes an unbreakable mylar disk, LED light source, metal shaft, and high quality ball bearings.

The T6 inclinometer is our high resolution tilt sensor and is available in several different resolutions. It is available with or without an index. The connector is polarized and has either 5 pins for single ended signals or 10 pins for differential signals. The connector is also latched providing a secure connection. The T6 operates from a single +5VDC supply.

The differential version uses a line driver (26C31) that can source and sink 20mA at TTL levels. The recommended receiver is industry standard 26C32. Maximum noise immunity is achieved when the differential signal is terminated with a 110 ohm resistor. Adding a .0047 uF capacitor in series with the termination resistor reduces power consumption by effectively removing the termination while the signal is static.

Typical applications include heavy construction equipment, dredging machinery, mining equipment, solar tracking and warehouse automation.



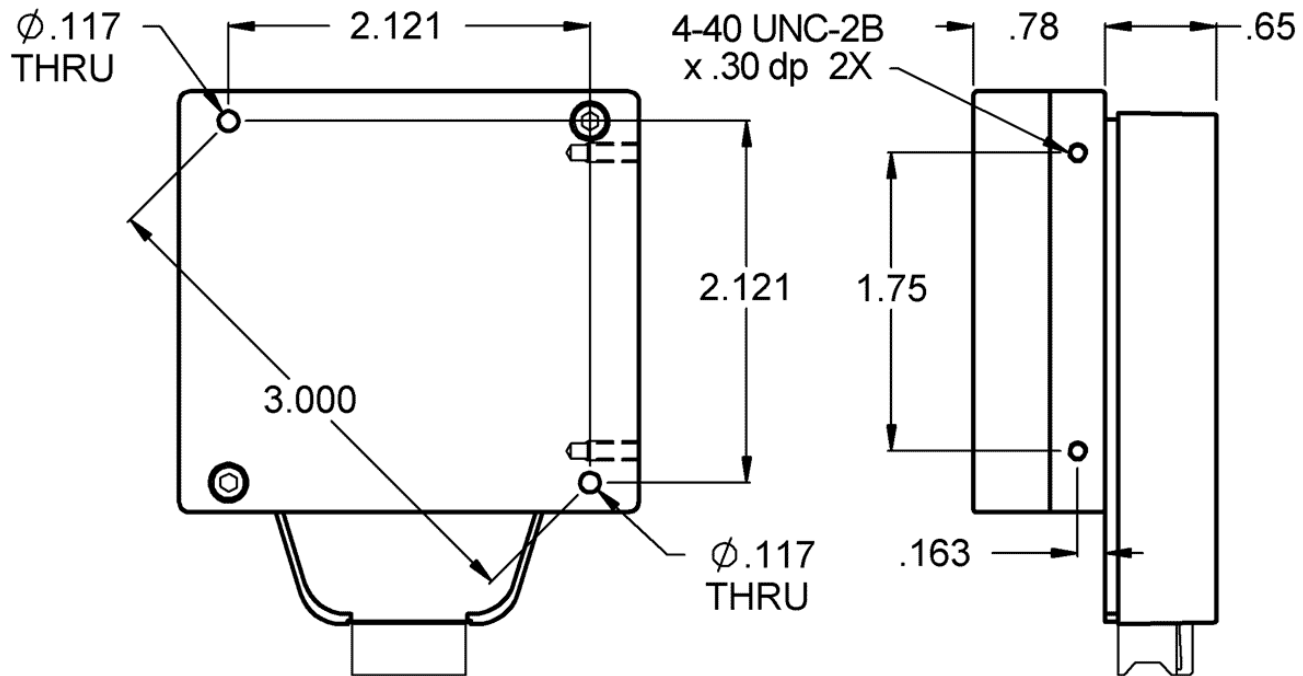
Features

- ▶ High retention snap-in polarized connector
- ▶ -10C to +100C operating temperature
- ▶ Full 360 range inclinometer
- ▶ Near real-time response
- ▶ Virtually free from linearity errors
- ▶ 64 to 2500 cycles per revolution (CPR)
- ▶ 256 to 10,000 pulses per revolution (PPR)
- ▶ 2 or 3 channel quadrature TTL squarewave outputs

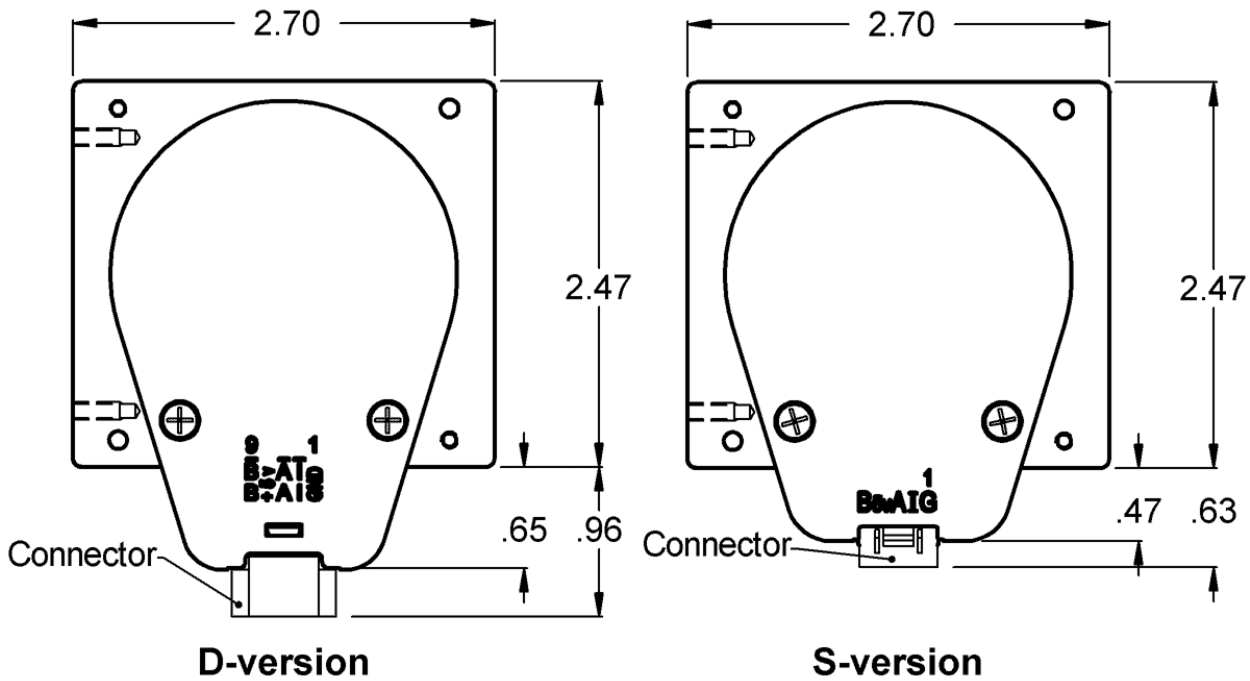
Related Products & Accessories

- ▶ CA-FC10-SH-FC10 10-Pin Latching / Latching Shielded Cable (Base price \$26.20)
- ▶ CA-FC10-SH-NC 10-Pin Latching / Unterminated Shielded Cable (Base price \$13.60)
- ▶ CA-FC10-W8-NC 10-Pin Latching / Unterminated 8-Wire Discrete Cable (Base price \$13.10)
- ▶ CA-FC5-SH-FC5 5-Pin Latching / Latching Shielded Cable (Base price \$16.76)
- ▶ CA-FC5-SH-NC 5-Pin Latching / Unterminated Shielded Cable (Base price \$8.88)
- ▶ CA-FC5-SS-MD6 5-Pin Latching / 6-Pin Modular Silver Satin Cable (Base price \$13.11)
- ▶ CA-FC5-W4-NC 5-pin Latching / Unterminated 4-Wire Discrete Cable (Base price \$8.38)
- ▶ CA-FC5-W5-NC 5-Pin Latching / Unterminated 5-Wire Discrete Cable (Base price \$8.38)
- ▶ CON-FC10 10-Pin Finger Latching Connector (Base price \$8.40)
- ▶ CON-FC5 5-Pin Finger Latching Connector (Base price \$3.15)

Mechanical Drawing 1



Mechanical Drawing 2



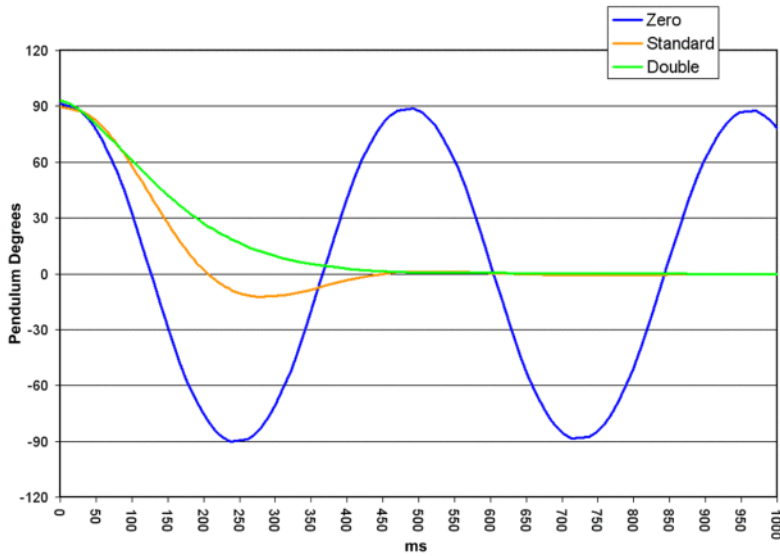
Mechanical

T6S Weight	8.47 oz.
T6D Weight	8.55 oz.

Damping

Damping minimizes overshoot and oscillation and also reduces response time. Standard damping will fit most applications. Double damping reduces the response time even further by more slowly approaching the final position. Damping options can be specified when ordering.

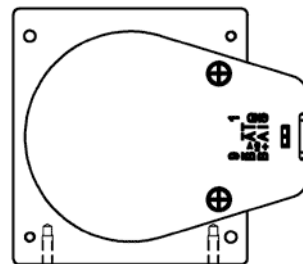
Damping Response



Temperature Ratings

Parameter	Min.	Max.	Units
Storage Temperature	-40	100	C
Operating Temperature	-10	100	C

Index Orientation



If the index option is selected the encoder should be oriented as shown below.

Phase Relationship

B leads A for clockwise rotation and A leads B for counter-clockwise rotation of the inclinometer (viewed from the encoder cover side of the inclinometer).

'D-version' Electrical

64-I, 1800-I, 2500, 2500-I:

Specification	Min.	Typ.	Max.	Units	Notes
Supply	4.5	5.0	5.5	Volts	
Current Consumption - 64 CPR	-	28	33	mA	No load
Current Consumption - 1800-I, 2500, 2500-I CPR	-	56	59	mA	No load
Output Voltage - Sourcing to +5	2.4	3.4	-	Volts	@ -20mA
Output Voltage - Sinking to Ground	-	0.2	0.4	Volts	@ 20mA

For complete details see the EM1 page.

All Other Resolutions:

Specification	Min.	Typ.	Max.	Units	Notes
Supply	4.5	5.0	5.5	Volts	
Current Consumption - Index	-	58	88	mA	No load
Current Consumption - Non-index <1000 CPR	-	18	43	mA	No load
Current Consumption - Non-index >=1000 CPR	-	58	88	mA	No load
Output Voltage - Sourcing to +5	2.4	3.4	-	Volts	@ -20mA
Output Voltage - Sinking to Ground	-	0.2	0.4	Volts	@ 20mA

For complete details see the HEDS page.

'S-version' 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 and HEDS product pages.

	Supply Current	Output voltage low	Output voltage high	
Resolution	Typ / Max	Max	Min	Based on
2000, 2048 CPR, with or without index	57 / 85 mA	0.5 volts @ 8mA	2.4 volts @ -40uA	HEDS
64 CPR, with index	27 / 30 mA	0.5 volts @ 8mA	2.0 volts @ -8mA	EM1
1800, 2500 CPR, with index	55 / 57 mA	0.5 volts @ 8mA	2.0 volts @ -8mA	EM1

Pin-outs

Pin	5-pin single-ended	10-pin differential
1	Ground	Ground
2	Index	Ground
3	A channel	Index-

4	+5 VDC power	Index+
5	B channel	A- channel
6		A+ channel
7		+5 VDC power
8		+5 VDC power
9		B- channel
10		B+ channel

Ordering Information

T6 - - - -

CPR	Index	Output	Damping
64	N = <i>No Index</i>	S = <i>Single-ended</i>	S = <i>Standard</i>
1800	I = <i>Index</i>	D = <i>Differential</i>	D = <i>Double Damping</i>
2000			
2048			
2500			

Rules

- ▶ Index must be equal to I when CPR is 64, 1800 or 2500

Notes

- ▶ US Digital warrants its products against defects in materials and workmanship for two years. See complete warranty for details.

Base Pricing

Quantity	Price
1	\$129.95
10	\$115.78
50	\$106.71
100	\$101.17

- ▶ Add 12% per unit for **Output** of Differential
- ▶ Add \$15.00 per unit for **Damping** of Double Damping