

Coordinate Transformation Electronics

Model LWCT

- Designed for use with Michigan Scientific's Wheel Force Transducer
- Transforms measurements from rotating to stationary coordinates
- Powers transducer and spinning amplifier package
- Shunt calibration control
- Bridge excitation On/Off capability
- Offset adjustment control
- High level voltage outputs
- Stackable for multiple units
- Optional remote control



Description

The LWCT was designed to provide a user interface for Michigan Scientific's 6-Axis Wheel Force Transducer, 6-channel spinning amplifier, and weatherproof slip ring. Its primary use is to transform measurements from rotating coordinates into stationary SAE coordinates (e.g. forces from a rotating wheel transducer to a vehicle chassis coordinate system). The unit continuously measures the wheel angle, and rotating forces/moments and calculates the corresponding stationary values.

Utilizing a 512 PPR quadrature encoder inside the slip ring, the LWCT can determine the angular position of the wheel to within 0.176° . This value is available as a high level output. The unit also measures the angular velocity of the wheel from the encoder and outputs a high level signal..

At power up, the unit downloads calibration information stored within the attached transducer and amplifier. This allows the unit to be swapped with any wheel force transducer package.

A separate setup mode allows the user to perform a shunt calibration of the transducer and also perform a zero to adjust for sensor offset. The high level outputs from the unit can be set to either rotating or stationary coordinates with the push of a button.

A fault light quickly alerts users to any problems in the setup, zeroing, or calibration of the system. A left/right switch is used to configure the unit for the correct wheel location.

The unit utilizes simultaneous sampling of the inputs and simultaneous updates of the outputs for no channel to channel skew.

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Specifications

<u>PARAMETER</u>	<u>SPECIFICATION</u>
Inputs	
6 Analog Inputs	-10 to +10 VDC (Bipolar)
A/D Resolution	14 bit
3 Digital Encoder Inputs	5 V TTL
Outputs	
8 Analog Outputs	
3 Forces (Fx, Fy, Fz)	-10 to +10 VDC (Bipolar)
3 Moments (Mx, My, Mz)	-10 to +10 VDC (Bipolar)
1 Angular Velocity	-10 to +10 VDC (Bipolar)
1 Angular Position	0 to 10V (Unipolar) = 0 - 360°
Rise/Fall Time (10%-90%, 20 V, 1 kHz Square)	75 μ s (Typical)
Time Delay In to Out (20 V, 1 kHz Sine)	125 μ s (Max)
Signal Bandwidth (-3dB)	5 kHz (Typical)
Sample Rate	90 kHz (Typical)
Power	
Voltage	10-36V DC
Box only	5 W (Max)
Box, Amplifier, & Transducer	15 W (Max)
Environment	
Operation	-40 to +85 °C (-40 to +185 °F)
Mechanical	
Weight	3 lbs 5 oz
Size (L x W x H)	8.625" x 8.563" x 2.125"