AD-TEC
ADVANCED TECHNOLOGIES

Torque and Cadence Evaluation Sensor

ADTEC-TS-0EB1-EVAL

Datasheet-Rev01

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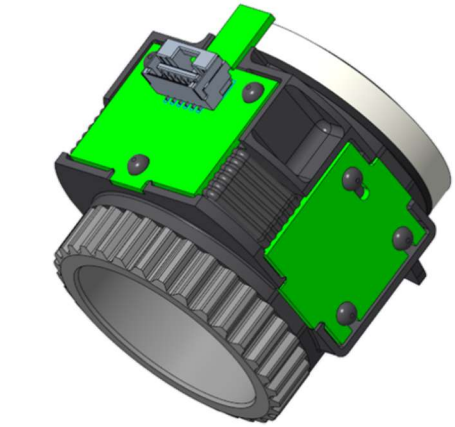
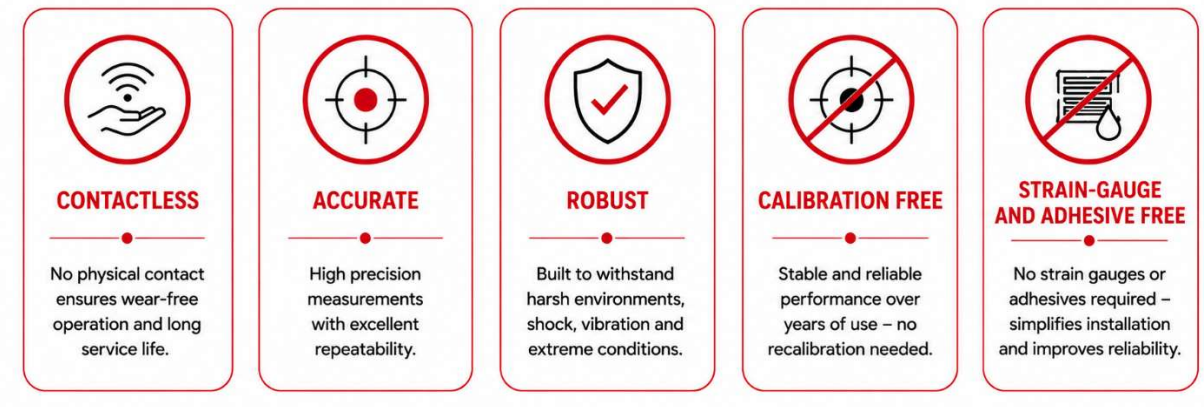


- Torque ranges up to 150 Nm
- Output Signal Type: Digital (UART)
- Service Temperature: 0° to 70°
- Max 200Hz bandwidth
- UART Output
- Integrated Angle Sensor for Speed Measurement
- Perfect Choice for Technology Evaluation Sample

Product Description:

ADTEC-TS-0EB1-EVAL is a Digital Torque Sensor with Integrated Cadence Output for Pedal-Assist E-bike Applications. It Combines the Cadence Measurement Power of the **TI MAG5110** Chip and the Magnetic Field Measurement Power of the **TI DRV425** Fluxgate Magnetometer Interfaced Directly with **TI's MSPM0** Microcontroller for Signal Processing to Get the Best Torque and Cadence Evaluation Sensor Performance.

Torque Measurement is Completely Contactless, Based on the Magneto-Mechanical Technology Developed by ADTEC.
This Unique Technology Gives the Opportunity to Build a Robust, Contactless, Calibration-Free Sensor that Measures Torque via Measuring the Resulting Magneto-Mechanical Field Distortion by Permanently Magnetized Shaft.



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Technical Specifications:

- ## Sensor Specifications:

Parameter	Value	Unit
Torque Sensor		
Sensing Range	150	Nm
Accuracy	±1.5	%FS
Hysteresis	1.5	%FS
Repeatability	0.2	%FS
Rotational Signal Uniformity	±1.5	%FS
Sensitivity	10	LSB/Nm
0Nm Output Accuracy	±1	%FS
Signal BW (-3db)	200	Hz
Operating temperature range	0 to +70	°C
Cadence Sensor		
Output Type	Quadrature A/B Open Drain	
Min Load resistance	1k	Ohm
Output Channels	2	Channels
Pulses per revolution (per channel)	18	PPR
Max angular error	±1	deg
Max Rotation Speed	200	RPM
Interface Specs		
Interface Type	UART, 115200, N,1	
Supply Voltage	5 (±5%)	VDC
Max Supply current	< 50	mA

Do not Use Magnets or Magnetized Tools Close to the Sensor, as They May Alter the Shaft's Magnetic Field. This Can Cause Permanent Damage to the Product and Render it Non-Functional.
Any Modification to the Product will Void the Warranty.

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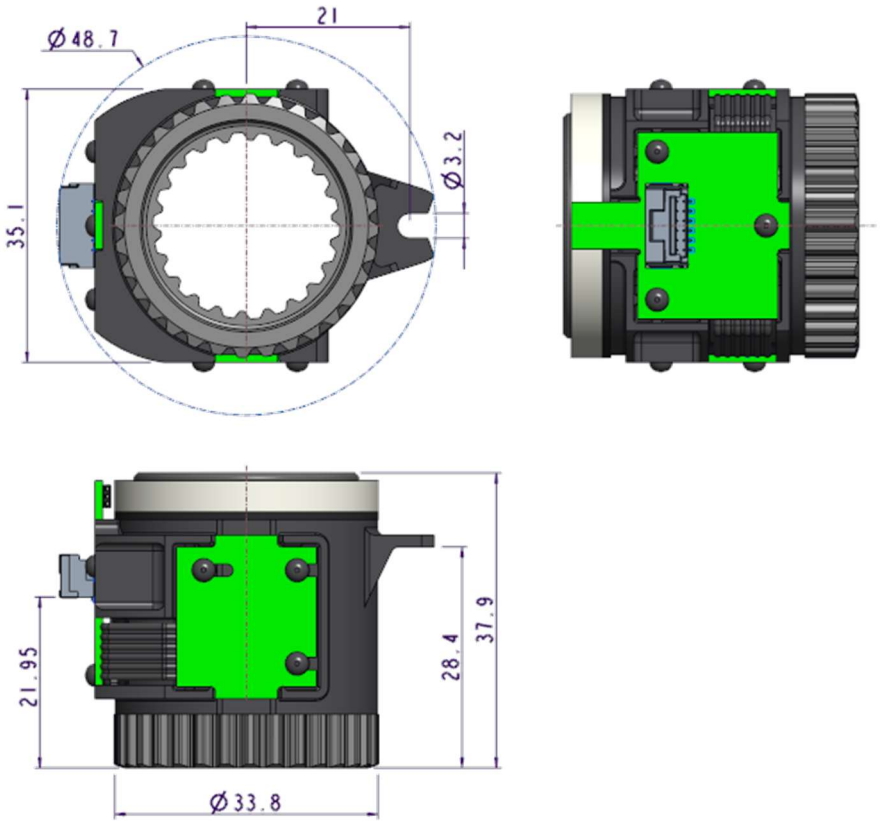
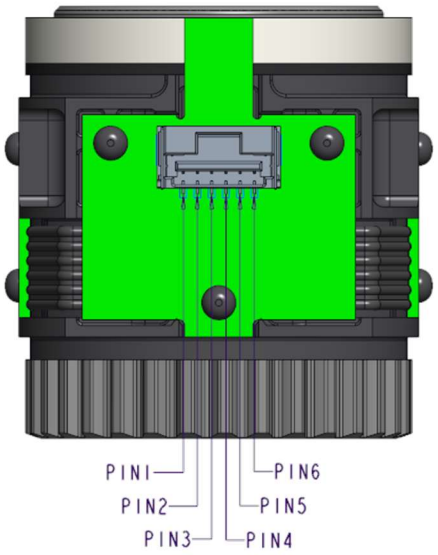
- **Overall Dimensions:**



- **Cable Connection:**



Pin Number	Description
1	VCC
2	GND
3	TX
4	RX
5	Encoder A
6	Encoder B

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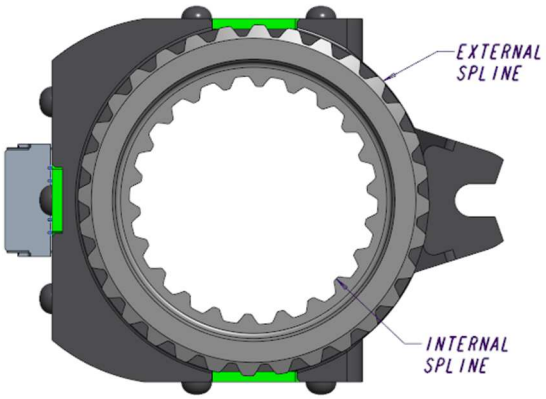
- **Mechanical Interface:**



Internal Spline (Involute)	Description
Tooth Form	Stub Tooth
Module	1
Pressure Angle	20°
Addend Modification Coefficient	0.8
Number of Teeth	22
Reference Pitch Circle Diameter	Ø22
Effective Length	7.1mm

External Spline (Involute)	Description
Tooth Form	Stub Tooth
Module	1
Pressure Angle	20°
Addend Modification Coefficient	0.8
Number of Teeth	32
Reference Pitch Circle Diameter	Ø32
Effective Length	6.5mm

Plastic Carrier Can Rotate around the Shaft, Best Practice for Best Performance is to Fix the Sensor from Rotation Using the Plastic Ear.

- **Angle Sensor Specifications:**

Angle Sensor with 36 Pulses for Precise Determination of Speed and Direction of Rotation.

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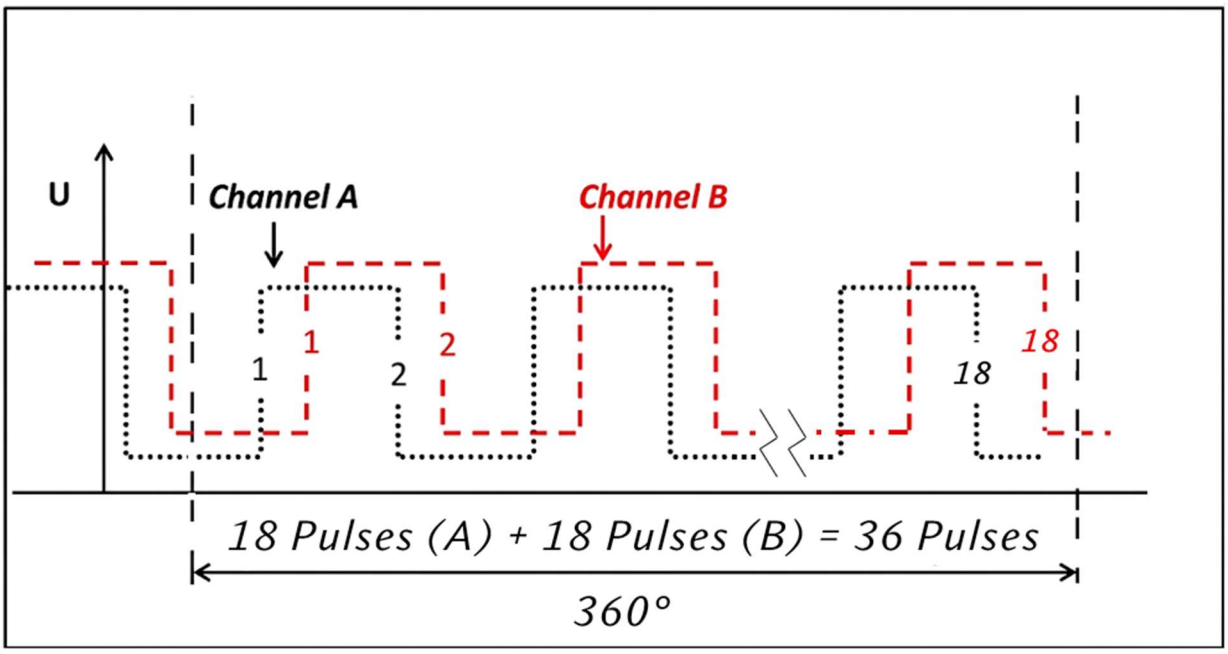

Handling and Transportation:

During Handling and Transportation, Make Sure the Sensor is not Exposed to Magnetic Field (Like Permanent Magnets).
Magnetic Tools when Assembling the Sensor can affect its Performance as well.

Important Technical Safety Instructions:

Sensor is Built from 3D Printed Material for Evaluation Purposes only, it is not Built to Withstand:

- High Temperature (Higher than 70° Can Affect Reading).
- Mechanical Loads: Drops, Vibration, etc...
- Water Exposure: PCBs are not Coated to Protect from Water or Dust.
- Reverse Polarity or Overvoltage on the Connector can Damage the Sensor.

Sensor Disassembly will Permanently Damage the Product.

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Package Contents:

Parameter	Qty
Torque Sensor unit	1
USB-TTL converter (3rd party)	1
USB Cable	1

Manufacturer:

The Manufacturer of ADTEC-TS-0EB1-EVAL is:
AD-TEC GmbH
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Germany
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