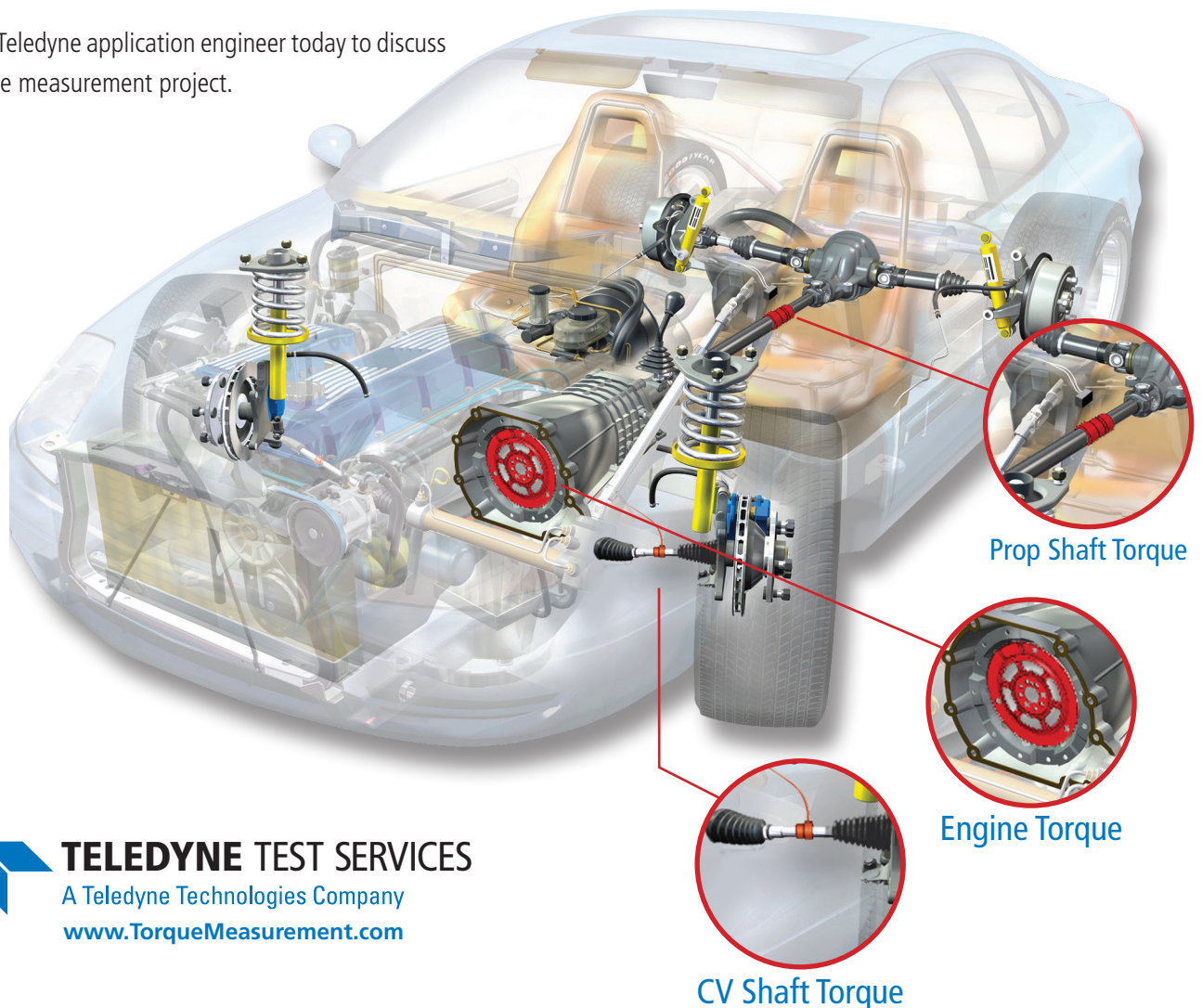


# Automotive Torque Testing Solutions

**M**any disciplines within the automotive industry have a need to measure in-vehicle driveline torque. These include engineers testing powertrain, braking and suspension systems. Ongoing efforts to reduce emissions and improve fuel economy also require accurate and non-intrusive techniques to measure torque and horse power. For many automotive manufacturers, the processes of mapping engine torque and calibrating automatic transmissions are now done with in-vehicle sensors. Additionally, fleet and customer-use testing are emerging as important development tools for engineers who want to collect real world data.

In order to address these many and varied torque measurement challenges, Teledyne Test Services (TTS) specializes in the manufacture of cost effective, custom sensor solutions. TTS has more than a half century of experience in producing laboratory grade, strain-gage based sensors as well as providing stress analysis engineering to the transportation industry.

Contact a Teledyne application engineer today to discuss your torque measurement project.



**TELEDYNE TEST SERVICES**

A Teledyne Technologies Company

[www.TorqueMeasurement.com](http://www.TorqueMeasurement.com)

# FPT100D

## Dynamic, Non-Contacting Measurement of Engine Torque

### ENGINE TORQUE MEASUREMENT SYSTEM



TTS offers a non-contact sensor to address the challenging application of measuring engine output torque. This is accomplished by customizing and instrumenting the flexplate or flywheel that connects the engine crankshaft to the torque converter. No other modifications to the existing powertrain design are required. Teledyne has adapted this technology to a number of engine/transmission interfaces including many hybrid vehicles. The FPT100D is used widely for engine torque mapping and automatic transmission calibration.

#### Features

- Replaces existing flexplate/flywheel, no additional space required
- Measure piston pulses and engine harmonics
- Inductively powered, no batteries or slip rings
- Digital data transfer for a clean signal
- Scalable analog output
- Temperature compensated
- User selectable frequency response
- NIST traceable turnkey installation with 0.5% accuracy
- Remote shunt calibration capability
- Two channel versions available for measuring thrust, strain or temperature
- Racing and dynamometer units available

## SPECIFICATIONS

#### Torque Sensor Flexplate/Flywheel & Rotating Electronics

Torque capacity:	Dependent on production flexplate, typically +/-750 ft-lbs
Calibration range:	0-6000 ft-lbs (8100 Nm)
Operating temperature range:	-40 to +120C
Environmental concerns:	Completely weatherproof
Maximum speed:	Same as production flexplate/flywheel

#### Stationary Electronics

Combined accuracy:	0.5% FS NIST Traceable
Output signal:	0+/-5, 0+/-10 V (scalable)
Sample Rate:	27,000 s/s
System frequency response:	2, 20, 200 or 2000 Hz (-3dB, user selectable)
Input power requirements:	9 to 18 VDC, 0.8 amp (1.8 amp startup surge)
Operating temperature range:	0 to +50C
Physical size:	7.5" W x 7.5" D x 2.0" H

#### Applications

- Engine mapping
- Transmission development
- Hybrid powertrain development
- Torsional analysis
- Racing vehicles
- Fleet & customer use testing



**TELEDYNE TEST SERVICES**

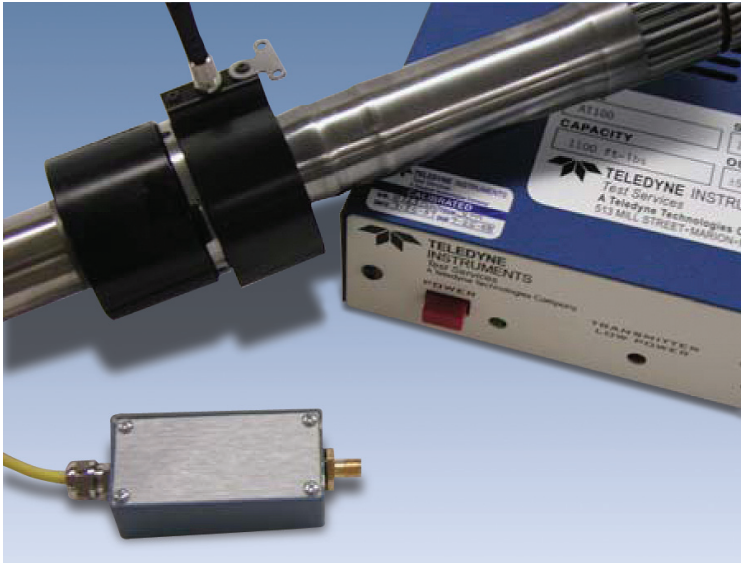
A Teledyne Technologies Company

[www.TorqueMeasurement.com](http://www.TorqueMeasurement.com)

# AT100

## All Weather, Non-Contacting Measurement of Torque on Test Vehicles with CV Shafts

### CV SHAFT TORQUE MEASUREMENT SYSTEM



CV shaft torque is often difficult to obtain because of limited space in this very hostile under-vehicle environment. The AT100 uses non-contact, digital data transfer technology to provide the user with a clean and responsive torque signal. Power is inductively supplied to the rotating collar eliminating the need for batteries.

#### Features

- Low profile for space constrained FWD applications
- All weather operation
- No components or wiring outboard of wheel
- Digital data transfer for a clean signal
- Temperature compensated
- Remote shunt calibration capability
- Scalable analog output
- User selectable frequency response
- Portability to other shafts by Teledyne Instruments
- No batteries or slip rings
- Racing and dynamometer units available

## SPECIFICATIONS

#### AT100 Rotating Electronics (Collar)

Torque capacity:	Dependent on shaft size, typically +/-2500 ft-lbs
Calibration range:	0-6000 ft-lbs (8100 Nm)
Operating temperature range:	-40 to +85C, -40 to +120C optional
Physical size:	2.2" OD x 2.5" W
Environmental concerns:	Completely weatherproof sealed housing/bearings
Maximum speed:	5500 RPM (consult factory for higher speeds)

#### AT100 Stationary Electronics

Combined accuracy:	0.5% FS NIST Traceable
Interface to collar:	Serial Digital
Output signal:	0+/-5, 0+/-10 V (scalable)
System frequency response:	2, 20, 200 or 2000 Hz (-3dB, user selectable)
Input power requirements:	9 to 18 VDC, 0.8 amp (1.8 amp startup surge)
Operating temperature range:	0 to +50C
Physical size:	7.5" W x 7.5" D x 2.0" H

#### Applications

- Engine development
- Transmission development
- Powertrain torque monitoring
- Traction Control
- Racing vehicles
- Fleet & Customer use testing



**TELEDYNE TEST SERVICES**

A Teledyne Technologies Company

[www.TorqueMeasurement.com](http://www.TorqueMeasurement.com)



# RT100D

All Weather, Non-Contacting Measurement of Torque  
on FWD, RWD, and AWD Test Vehicles

## PROP & CV SHAFT TORQUE MEASUREMENT SYSTEM



The RT100D allows the user to obtain an accurate and responsive torque measurement from a variety of prop and CV shaft designs without modifying the existing powertrain. The RT100D eliminates the need to weld or "cut in" heavy, in-line torque sensors that drastically effect the torsional dynamics and critical speed of a drive shaft. Inductive power is supplied across a generous air gap for reliable all-weather performance.



RT100D CV Shaft Application.

### Features

- All weather operation
- No batteries or slip rings
- Remote shunt calibration
- Digital data transfer for a clean signal
- Scalable analog output
- Custom form factors available

- Temperature compensated output
- NIST traceable turnkey installation with 0.5% accuracy
- Non-critical antenna placement ( $\pm 0.75$  inches)
- Light weight collar does not present balance problems
- Racing and dynamometer units available

## SPECIFICATIONS

### Torque Sensor Flexplate/Flywheel & Rotating Electronics

- Torque capacity: Dependent on shaft size, typically +/- 2-5000 ft-lbs
- Calibration range: 0-6000 ft-lbs (8100 Nm)
- Operating temperature range: -40 to +85C, -40 to +120C available
- Physical Size: Collar projects 0.50" from shaft diameter, with 5.25" axial length
- Environmental concerns: Completely weatherproof
- Maximum speed: 5500 RPM (consult factory for higher speeds)

### Stationary Electronics

- Combined accuracy: 0.5% FS NIST Traceable
- Output signal: 0+/-5, 0+/-10 V (scalable)
- Sample Rate: 27,000 s/s
- System frequency response: 2, 20, 200 or 2000 Hz (-3dB, user selectable)
- Input power requirements: 9 to 18 VDC, 0.8 amp (1.8 amp startup surge)
- Operating temperature range: 0 to +50C
- Physical size: 7.0" W x 10.5" D x 3.0" H

### Applications

- Transmission development
- Engine development
- Powertrain torque monitoring
- Traction control
- Customer-use testing
- Racing vehicles



**TELEDYNE TEST SERVICES**

A Teledyne Technologies Company

[www.TorqueMeasurement.com](http://www.TorqueMeasurement.com)

513 Mill Street, Marion, MA 02738 USA

Tel +1 508.748.0103 • Fax +1 508.748.1093 • E-mail: [msullivan@teledyne.com](mailto:msullivan@teledyne.com)

Specifications subject to change without notice. 8/2010. ©2010 TELEDYNE TEST SERVICES, Inc.  
Other products and company names mentioned herein may be trademarks and/or registered trademarks.