

WTT - Compact Wheel Torque Transducer

Data Sheet Version 1.4



WTT-Dx

The WTT Wheel Torque Transducer is a compact wheel torque transducer to measure torque in axial direction at the wheels of road vehicles. The Wheel Torque Transducer is not only waterproof (IP 67), but due to its integrated radio telemetry also highly compact. Up to four WTT measurement wheels can be operated synchronously from one receiver unit, creating one synchronous data stream. All of this without wiring or elaborate constructions—and highly fail-safe due to digital data transmission.

Fully differential amplifiers (incl. bridge supply) provide a maximum of noise suppression.

Due to mechanically induced nonlinearities, accurate calibration for each wheel on a special designed test rig is essential. The in-house CAEMAX calibration test rig has been redesigned to offer optimal calibration.

Highlights

- Measurement of driving and braking torques
- Waterproof
- Transmitter electronics integrated in sensor
- Power supply: rechargeable battery (approx. 50 h operating time)
- Working temperature: -10 °C to +60 °C (standard batteries), -30 °C to +65 °C (special batteries)
- Programmable amplifiers with autozero function
- Telemetry transmitter with analog and CAN output
- Simultaneous recording of up to 4 WTTs

Overview of the available variants

Order Code		article number
• H-SEN-CMX-WTT-DX-3kNm-868	Wheel Torque transducer ± 3 kNm; 868 MHz	1370018
• H-SEN-CMX-WTT-DX-6kNm-868	Wheel Torque transducer ± 6 kNm; 868 MHz	1370019
Wheel Torque transducer WTT including one Dx signal conditioning and transmitter unit (SCT) measurement range ± 3 kNm or ± 6 kNm ; 868 MHz band Requires additional Dx Receiver, Control and Interface unit (RCI); 868 MHz band		
• H-SEN-CMX-WTT-DX-3kNm-2400	Wheel Torque transducer ± 3 kNm; 2.4 GHz	1370011
• H-SEN-CMX-WTT-DX-6kNm-2400	Wheel Torque transducer ± 6 kNm; 2.4 GHz	1370021
Wheel Torque transducer WTT including one Dx signal conditioning and transmitter unit (SCT) measurement range ± 3 kNm or ± 6 kNm; 2.4 GHz band Requires additional Dx Receiver, Control and Interface unit (RCI); 2.4 GHz band		

Included accessories

- AC charging device
 - LEMO connector
- with LEMO connector



Necessary expansions

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| • H-TEL-CMX-DX-RCI | Receiver, Control and Interface unit (RCI)
868 MHz band (863 - 870 MHz)
for H-SEN-CMX-WTT-DX-xxx (1360001, 1360003) | 1360010 |
|--------------------|---|---------|

Optional

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|--------------------------|--|---------|
| • H-SEN-CMX-WTT-Dx-HUB | Hub Adapter for WTT (specification of the wheel hub is needed) | 1370022 |
| • H-SEN-CMX-WTT-CASE | Transportation case for WTT | 1370023 |
| • H-SEN-CMX-WTT-SCR | Mounting bolts (set of 32) for mounting WTT to hub adapter and rim adapter | 1370024 |
| • H-SEN-CMX-WTT-Dx-RIM | Rim Adapter for WTT (specification of the wheel rim is needed) | 1370025 |
| • H-SEN-CMX-WTT-DX-Taccu | Battery modification for advanced temperature range
-30 °C ... +60 °C; special battery 12.8 V, 1100 mAh | 1370026 |
| • H-SEN-CMX-WTT-DX-T | Optional temperature channel type K on the WTT | 1371027 |

Optional Service

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| • D-SEN-CMX-WTT-DX-KAL | Calibration of one Wheel Torque Transducer WTT recommended every 2 years | 1370020 |
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Technical Specs - WTT

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Parameter	Value	Remarks
Measured Variable	axial torque M_y	
Signal transmission	digital-telemetry	
Measurement range	$M_y = \pm 3000 \text{ Nm}$	optional $\pm 6000 \text{ Nm}$
Bandwidth	max. 1 kHz	
Nonlinearity	<0.5 %	of applied load
Hysteresis	<0.5 % FS	
Crosstalk	<0.5 %	of applied load
Sensor diameter	300 mm	
Sensor weight	approx. 4.75 kg	with telemetry unit
Material of sensor	aluminum	
Min. rim-Ø	13"	
Max. hub-Ø	6" with adapter	
Operating temperature	-10 °C to +60 °C -30 °C to +65 °C	standard batteries special batteries
Max. velocity	250 km/h	
Max. acceleration	50 g	
Protection class	IP67 (waterproof)	
Mounting and balancing	free access to wheel bolts	
Power supply	rechargeable battery, approx. 50 hrs operating time	
Autozero	remote control	
Signal output	CAN, analog	

Inputs for Voltage-signals: 1 differential input and 1 single ended input		
Parameter	Value	Remarks
Measurement range	$\pm 0.2 \text{ V}$ to $\pm 22 \text{ V}$	
Accuracy	0.01 % FS	
Resolution	16 Bit	
Sampling rate	max. 4.8 kHz	per channel
Antialiasing filter	6-pol Butterworth filter	cut-off frequency 1/5 of sampling rate

Input for temperature signal		
Parameter	Value	Remarks
Measurement range	-40 °C to +85 °C	type K

