

Torque Measurement

T12 The Digital Torque Transducer



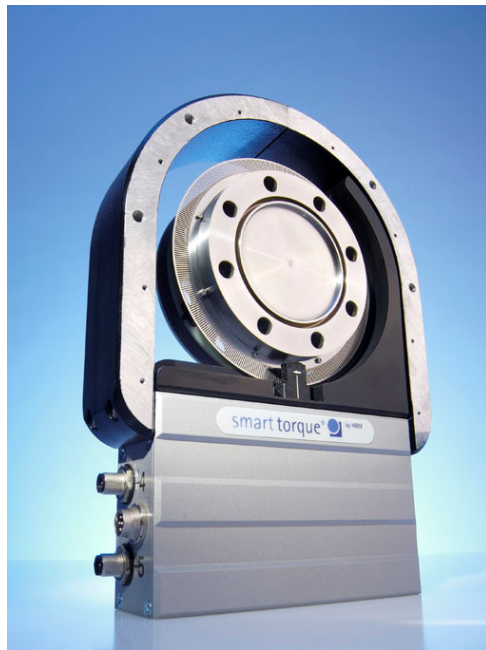
measurement with confidence

Product

T12 Digital Torque Transducer



Photos

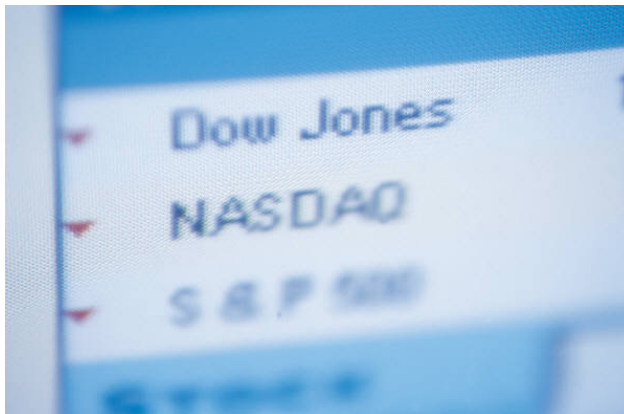


Product

T12 Digital Torque Transducer



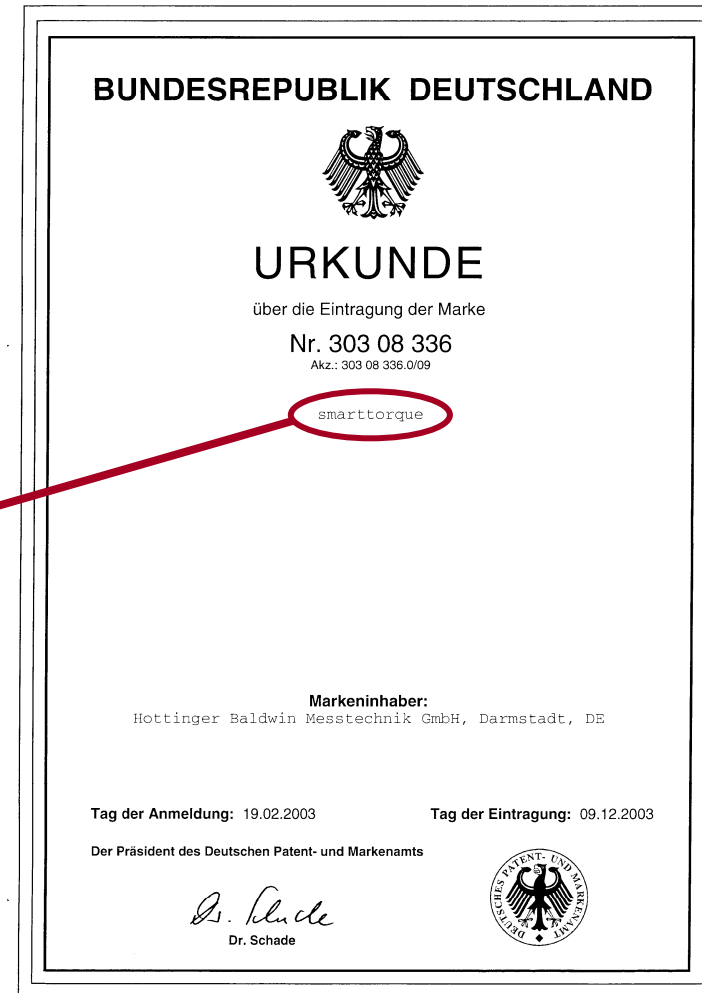
Trade name



smarttorque®

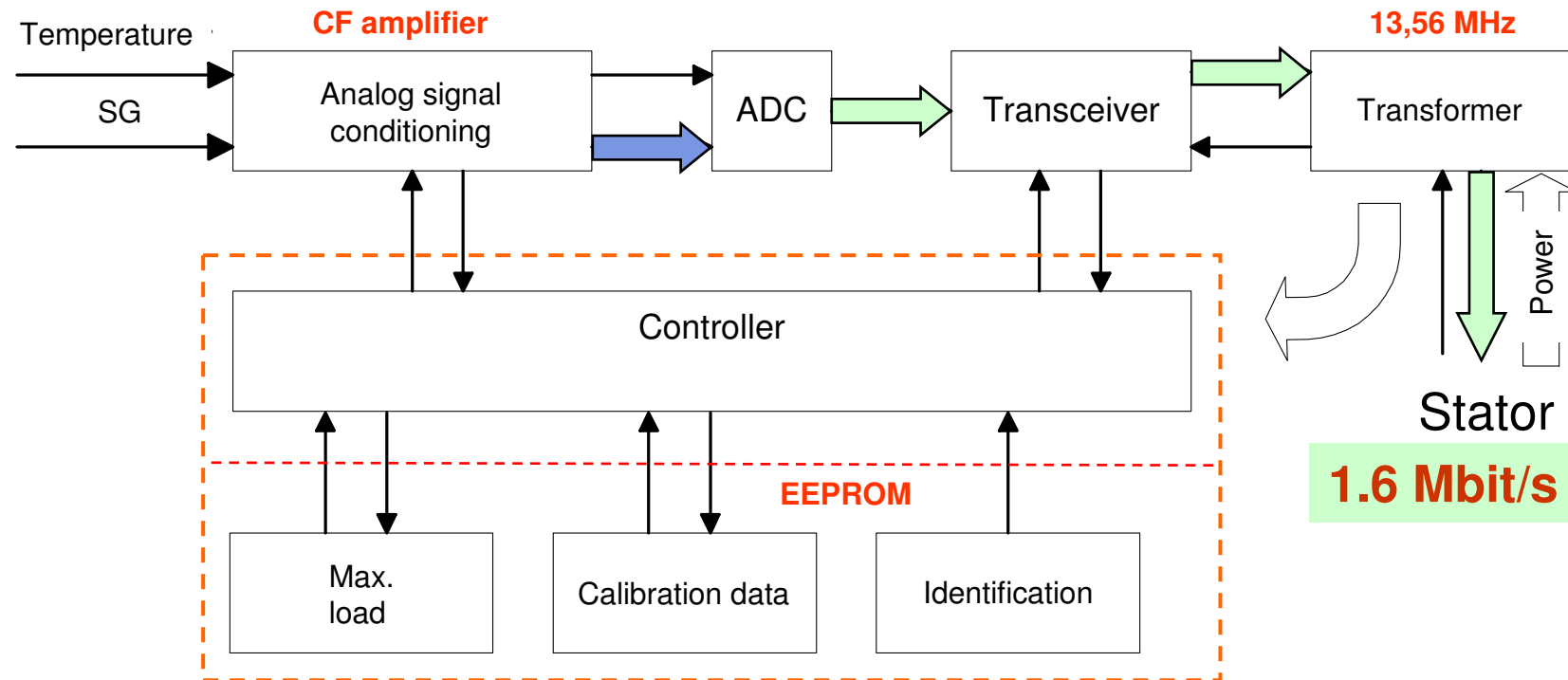
Effective until
2013-02-28

Extension by 10 years each





Functional diagram for the rotor



Target applications



- **Highly dynamic torque measurements**
- *In-Line Torque Measurement* -
In the field of performance and function testing of engines and power train elements
- **Measurement of rotational speed and angle at high resolution**
- **Dynamic performance measurement**
 - ➔ **Engine, transmission and roller test stands**
 - ➔ **Highly dynamic test stands**
 - ➔ **Test stands with only limited space or increased requirements regarding lower weight and mass moments of inertia**










Selected specifications (fieldbuses)

- ➡ Accuracy: 0.03
- ➡ Nominal torques: 500 N·m up to 3 kN·m
- ➡ Sensitivity tolerance: ± 0.05 %
- ➡ Linearity deviation incl. hysteresis: $< \pm 0.02$ % ($< \pm 0.01$ %)
- ➡ Rel. Standard deviation of reproducibility: $< \pm 0.01$ %
- ➡ Tolerance of the calibration signal: ± 0.05 %
- ➡ Temperature effect TC_S : $< \pm 0.03$ % / 10 K
- ➡ Temperature effect TC_0 : $< \pm 0.02$ % / 10 K ($< \pm 0.01$ % / 10 K)



Customer benefit (M_D) I

-  **Maximum accuracy** → **Ensures your competitive edge**
-  **Wide measurement frequency range** → **Enables highly dynamic test stands to be realized**
-  **High resolution** → **No more measuring range switching**
-  **38.4 kS/s sampling rate** → **No internal aliasing**
-  **CAN parameterization** → **Easy maintenance and use**
-  **Transducer ID (TEDS)** → **Easy setup (MGCplus)**
-  **Robust version for industry applications** → **Reduces down time**



Output options



CANopen fieldbus interface

- ➔ Maximum output accuracy for torque, rotational speed, angle, power, temperature
- ➔ T12 Assistant for parameterization



Profibus DPV1 fieldbus interface (optional)

- ➔ Maximum output accuracy for torque, rotational speed, angle, power, temperature
- ➔ Customer interface for parameterization



60 kHz \pm 30 kHz / 10 kHz \pm 5 kHz frequency output

- ➔ High output accuracy for torque LP1 or LP2



\pm 10 V analog output (optional)

- ➔ Torque and rotational speed monitoring



Complementary RS-422 signals

- ➔ Pulse series for rot. speed and angle, reference pulse





Special features (datasheet)

- ➔ **Nominal torques: 500 N·m, 1 kN·m, 2 kN·m and 3 kN·m**
- ➔ **Nom. rotational speeds from 12,000 rpm to 16,000 rpm**
- ➔ **High measurement frequency range of 6 kHz (-3dB)**
- ➔ **Fast digital signal transmission via CAN 4,800 samples/s**
- ➔ **High resolution of 19 bit (integrating method)**
- ➔ **Comprehensive status information**
- ➔ **Optional:**
 - Optical rotational speed measurement system**
 - ± 10V voltage output**
 - Profibus DPV1**
 - Protective housing**

smart torque[®] 
by HBM

T12 functions

Rotor

- Torque measurement
- Temperature measurement
- Calibration signal
- Identification data
- Storage of maximum values and calibration data

Stator

- Temperature compensation
- Rotational speed compensation
- Filter
- Scaling of the analog outputs
- Rotational speed measurement





Interfaces

Standard:

- switchable frequency output (60 kHz +/- 30 kHz or 10 kHz +/- 5 kHz)
- Calibration signal resolution (50 % / 10 %)
- CANOpen interface
- 2 TEDS one-wire chips
- 18 V - 30 V power supply

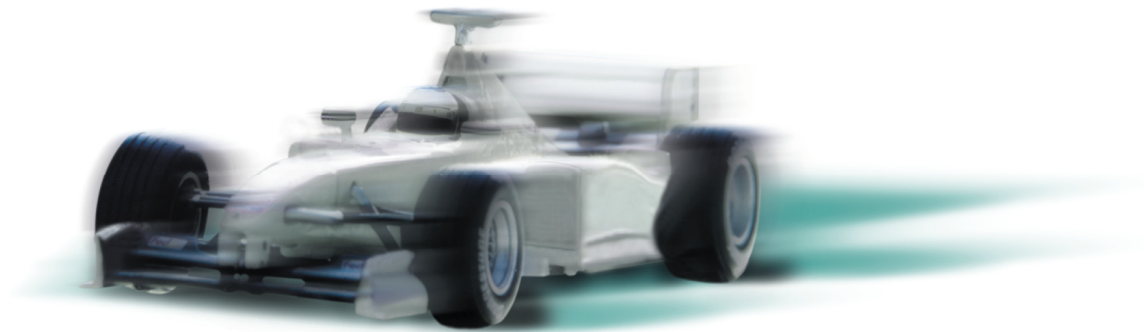
Optional:

- ProfibusDP V1
- $\pm 10V$ analog output
- Rotational speed module with quadrature output
- Reference pulse
- higher accuracy (0.01)
- higher speed 16 000 rpm
- protective housing

Muchas gracias

thank you ...

... for your attention



Danke

Grazie

Merci

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