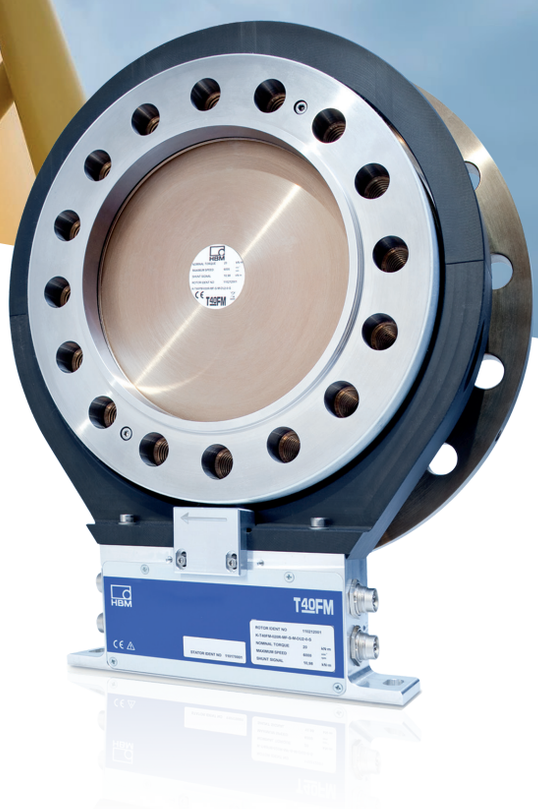
HBK
HOTTINGER BRÜEL & KJÆR

DIGITAL TORQUE TRANSDUCERS

T40 family

The T40FM torque transducer offers an excellent price-to-performance ration, returns reliably precise measurement results and is easy to integrate.



T40 – the all-rounder for test benches and process monitoring

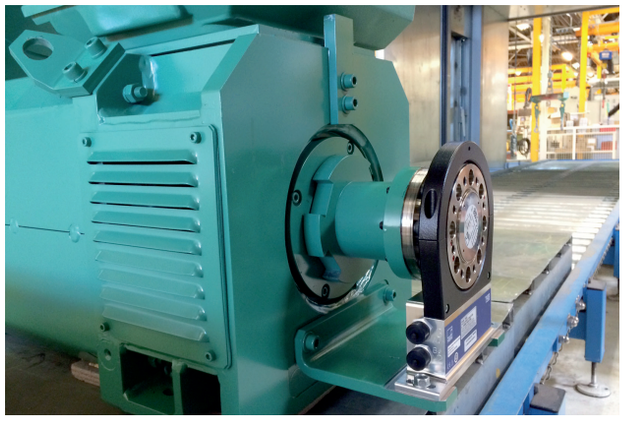
FOR USE ON TEST BENCHES OR IN PROCESS MONITORING – WITH RESULTS THAT COUNT! ONLY A TRUE MULTI-PURPOSE INSTRUMENT GIVES YOU LONG-TERM RELIABLE MEASUREMENT RESULTS: THE T40 TORQUE FLANGE FROM HBM. WE PROVIDE YOU WITH THE RIGHT VERSION FOR EVERY APPLICATION.

Impressive quality and performance all around

Reliable digital data transfer between rotor and stator plus the new magnetic rotational speed measuring system give you many advantages. Even in difficult electromagnetic environments, with humidity or with fluctuating temperatures. A reference signal also provides essential options for regulation.

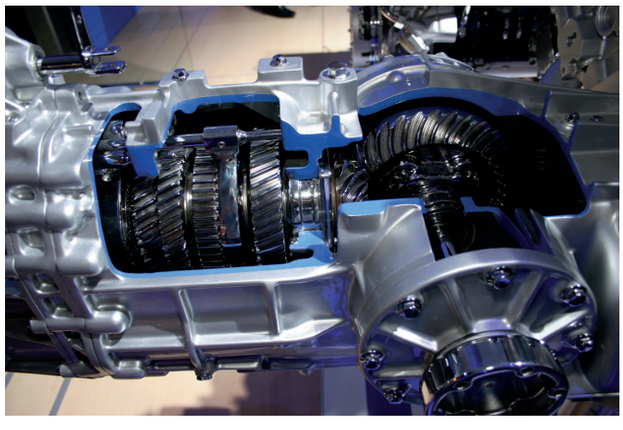
Ideal for numerous applications including

- Power, functionality and optimization
- test benches
- End-of-line testing
- Process monitoring



For testing

- Internal combustion engines
- Electric motors
- Transmissions
- Pumps



Impressive quality and performance all around

The T40 series is the first measurement flange of its class in the world to utilize the advantages of digital data transfer between rotor and stator. Now it is also available with an integrated magnetic rotational speed measuring system. Because the radial distance between the sensor and the magnetic ring is up to 2.5mm, the rotational speed measuring system has a high tolerance of application-related vibrations. This allows for full use of the maximum rotational speed specified for the transducer, in conjunction with the rotational speed measuring system. You can check your T40 measurement flange easily at any time with a simple shunt connection.

Ideal for numerous applications including

The T40 is a true all-rounder for measuring torque.
The compact design of the T40 saves space and money.
The T40 permits high parasitic loading, which makes it possible to attach machine elements directly. Like all torque flanges from HBM, the T40 works without slip rings or bearings, which makes it absolutely wear-free and maintenance-free.

Special features of T40 products

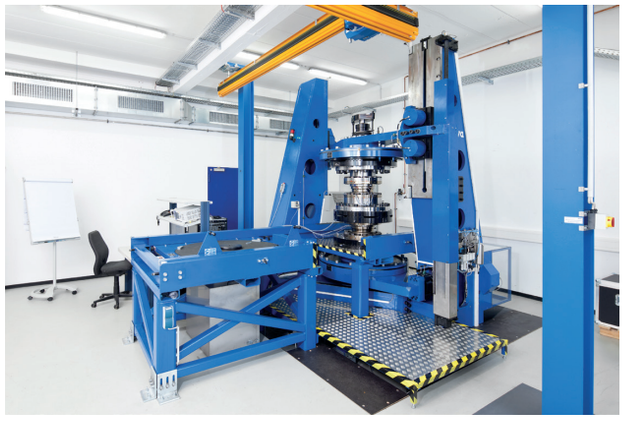
T40B	T40MS	T40FM	T40HS	T40FH	T40CB
Nominal (rated) torques from 50 N·m to 10 kN·m	Nominal (rated) torques from 200 N·m to 2 kN·m	Nominal (rated) torques from 15 kN·m to 80 kN·m	Nominal (rated) torques from 100 N·m to 3 kN·m	Nominal (rated) torques from 100 kN·m to 300 kN·m	Nominal (rated) torque 500 N·m to 1 kN·m**
Nominal (rated) rotational speeds up to 24,000 rpm*	Nominal (rated) rotational speeds up to 30,000 rpm	Nominal (rated) rotational speeds up to 8,000 rpm*	Nominal (rated) rotational speeds up to 45,000 rpm*	Nominal (rated) rotational speeds up to 3,000 rpm*	Nominal (rated) rotational speeds up to 30,000 rpm
Compact design	One rotor size for all torque ranges	Short design	Short design	Short design	Short design
Large measurement frequency range up to 6 kHz (-3dB)	Large measurement frequency range up to 6 kHz (-3dB)	Large measurement frequency range up to 6 kHz (-3dB)	Large measurement frequency range up to 6 kHz (-3dB)	Large measurement frequency range up to 6 kHz (-3dB)	Large measurement frequency range up to 6 kHz (-3dB)
No bearings or slip rings	No bearings or slip rings	No bearings or slip rings	No bearings or slip rings	No bearings or slip rings	No bearings or slip rings
Digital transmission of measured values	Digital transmission of measured values	Digital transmission of measured values	Digital transmission of measured values	Digital transmission of measured values	Digital transmission of measured values
Low rotor weights and mass moments of inertia	Light weight titanium design, low mass moments of inertia	Low rotor weights and mass moments of inertia	Light weight titanium design, low mass moments of inertia	Low rotor weights and mass moments of inertia	Light weight titanium design, low mass moments of inertia
Optional: Speed measurement system, reference signal 1024 pulses/revolution	Optional: Speed measurement system, reference signal 128/512 pulses/revolution	Optional: Speed measurement system, reference signal 1024 pulses/revolution		Optional: Speed measurement system, reference signal 72/86 pulses/revolution	Central bore 37,5mm/46,5mm

** Depending on the measuring range*

*** Other ranges on request*

Your advantages – our commitment

RELIABLE MEASUREMENT RESULTS. AT ANY TIME. UNDER THE MOST DEMANDING CONDITIONS. AT A COMPETITIVE PRICE. THE OPTIONAL MAGNETIC ROTATIONAL SPEED MEASURING SYSTEM ALSO MAKES IT POSSIBLE TO IMPLEMENT ANGLE OF ROTATION MEASUREMENTS IN CONJUNCTION WITH THE REFERENCE SIGNAL.



Top-quality test benches of HBM's own calibration laboratory ensure reliable measurement results of the T40.

	T40B	T40MS	T40HS	T40CB	T40FM	T40FH
Control variables for measured quantity monitoring	**Values**					
Non-linearity including hysteresis, relative to the nominal (rated) sensitivity d_{lh}	< ± 0.03%	< ± 0,03%	< ± 0,05%	< ± 0,03%	< ± 0.05%	< ± 0.1%
Temperature effect per 10K on the zero signal TC0:	< ± 0.05%	< ± 0,05%	< ± 0,05%	< ± 0,05%	< ± 0.05%	< ± 0.07%
Temperature effect per 10K on sensitivity TCS	< ± 0.05%	< ± 0,05%	< ± 0,05%	< ± 0,05%	< ± 0.05%	< ± 0.1%
Relative standard deviation of repeatability as per DIN 1319, relative to variation in the output signal srel	< ± 0.03%	< ± 0,03%	< ± 0,03%	< ± 0,03%	< ± 0.03%	< ± 0.02%

T40 series – a well-rounded investment

Economical purchase price – maintenance-free, no wear during operation

The T40 features measurement technology from the global market and technology leader in torque products – at an attractive price. And best of all:

With T40 you are making a sound decision for the future.

All T40 series transducers have the integrated digital communication interface TMC (Torque Measurement Communication) as a standard feature. The TIM Torque Interface Module extends capabilities of the torque flange in a flash, adding modern Ethernet-based fieldbuses with digital interfaces. For example, the high-performance TIM-EC EtherCAT module is available. See for yourself! automation interfaces allow easy connection to a PLC or control PC.

T40 series with TIM-EC – a talented team of true all-rounders

THE RELIABILITY OF DIGITAL TORQUE MEASUREMENT TECHNOLOGY WITH PERFECTLY MATCHED COMPONENTS

The reliability of digital torque measurement technology with perfectly matched components

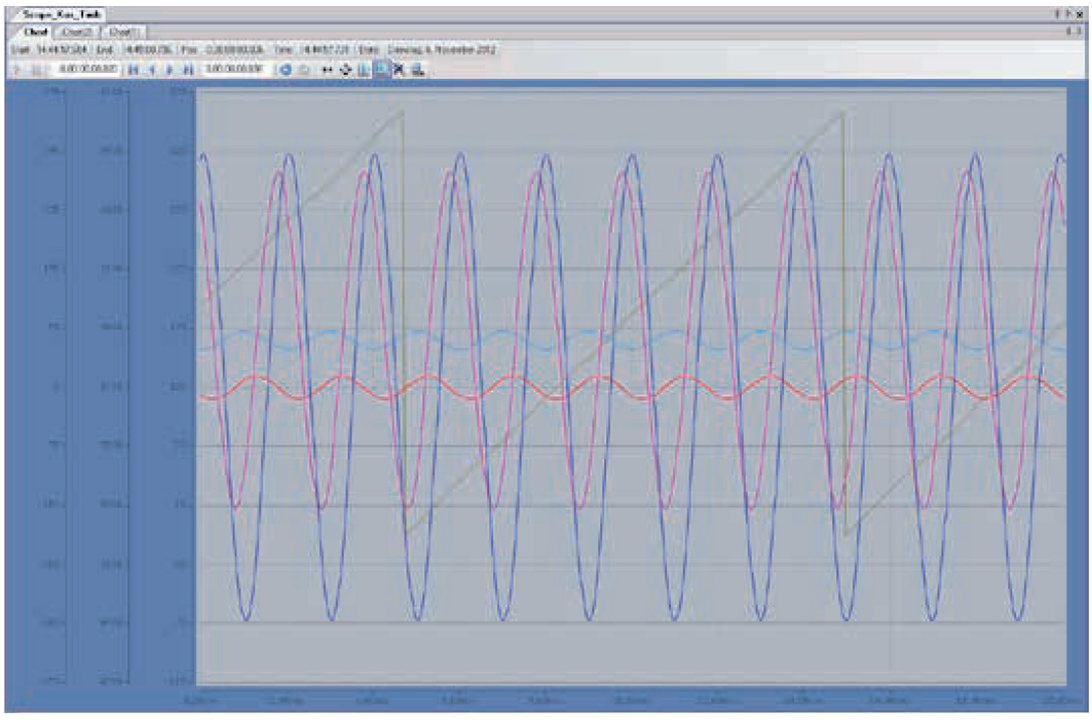
The TIM-EC module features a highly flexible EtherCAT interface with digital data transfer. It supports sampling rates of up to 20,000 measured values per second on the bus and also a very low group delay of approx. 100µs. Rapid data transfer without interference signals is standard. Speed and torque can be recorded and integrated into existing systems at the same time. The angle of rotation and power are accessed simultaneously.

		TIM-PN	TIM-EC	TIM 40
Input	Torque (TMC)	✓	✓	✓
	Torque frequency	✓	✓	x
	Pulses/ revolution	✓	✓	x
	Reference signal	✓	✓	x
	Profinet	✓	x	x
Output	EtherCAT	x	✓	x
	Profibus-DP	x	x	✓
	CAN	x	x	✓
	Voltage	x	x	✓
	Current	x	x	✓
	Frequency	x	x	✓
	Bus cycle	≤ 4 kHz	≤ 20 kHz	≤ 1 kHz
	Group delay	approx. 100µs	approx. 100µs	approx. 150µs
	Diagnostics	+++	+++	+
	Linearization	✓	✓	x
	Torque	✓	✓	✓
	Speed	✓	✓	x
	Power	✓	✓	x
	Angle of rotation	✓	✓	x

Parameterizing, measuring and verifying

As easy as 1-2-3 with your standard Internet browser. No need for time-consuming installation of additional software:

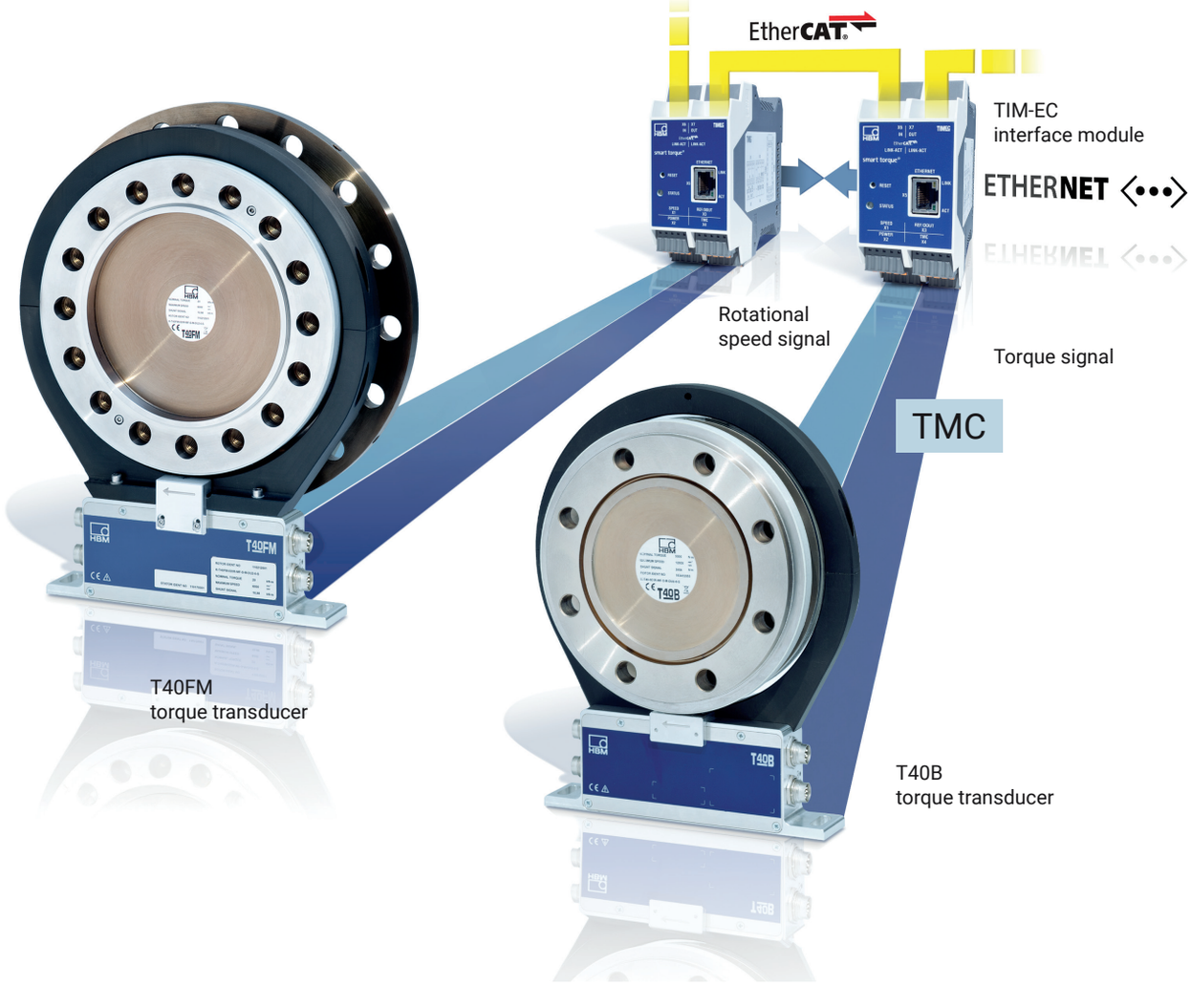
- Full access to all setting options via web browser
- Password protection for enhanced security and protection against incorrect operation
- Option of saving and restoring your settings
- Shunt connection to check the entire signal flow
- Support
- Extensive diagnostics



TIM-EC signals

- Torque
- Speed
- Angle of rotation

Dynamic measurement of torque / rotational speed and angle of rotation



We provide exceptional sensing and insights to create solutions for a cleaner, healthier and more productive world

ACCELERATE YOUR PRODUCT INNOVATION

HBK provides integrated solutions and domain expertise across the test and measurement product life cycle, bridging the gap between the physical world of sensors, testing and measurement and the digital world of simulation, modelling software and analysis.

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