



DEFINING PRECISION

Be a measure of  
Forces and Moments





## Limitations

It's all about potential and how to leverage it, about knowing the boundaries and yet transcending them. Those who are leaders in their fields are driven to exceed limitations. Only then can they fully utilize that potential to address growing requirements and transform it into performance. At GTM, our team has the drive to constantly redefine boundaries – in our company, in our group and especially in our field of business. We overcome limitations because we go above and beyond the usual norms or expectations to develop new solutions.

## Expertise

As a leading global company for measuring forces and moments, we set our goals to meet both current and future market requirements. We constantly adapt the skill sets in our team. Our employees are both thinkers and doers – and are as constructive in their concept designs as they are critical in their communication. We share knowledge and everyone bears responsibility within our team. As a result, each member has the qualifications to manage projects. Our project work is based on three factors: cooperation, learning and problem solving.

GTM was founded in Seeheim-Jugenheim, Germany

Launch of Series K force transducers

DKD accreditation

10<sup>th</sup> patent registration

First subsidiary in the Czech Republic (GTM Praha)

New corporate

1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001

# Standards

Through our team of competent experts in the fields of construction, calculation, measurement and control technologies, GTM provides solutions for highly specific, specialized and complex requirements. We replace outdated structures and other established patterns of thinking and enthusiastically work to find creative solutions for the problem at hand. We apply this same approach whether we are developing standard products and methods or working on individual projects. Each of our solutions sets new standards – and as a standard, we provide a level that goes above and beyond the norm.

We view your individual specifications, conditions and requirements as further motivation and inspiration – but never as a limitation. If you are looking for the right partner for providing precise, reliable measurements of forces and moments, don't just choose the first-best offer. Choose the best ... GTM.

# Pioneers

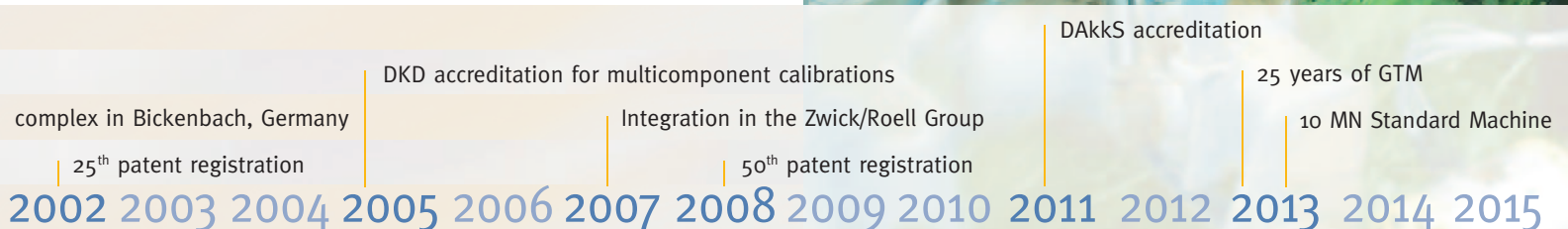
As the global market leader, we set the standard for measuring forces and moments through our vast mechatronic expertise in all aspects of measuring mechanical sizes. We blaze new trails in multi-component measuring techniques. Within Europe, we are also the leading supplier of calibration services for force, torque and multi-component sensors.

# History

In our business, you don't attain market leadership overnight. It is an evolutionary process. We continually work to fortify our position at the forefront through new developments and patents, which have radically transformed the world of force and moment measurements.



# Milestones





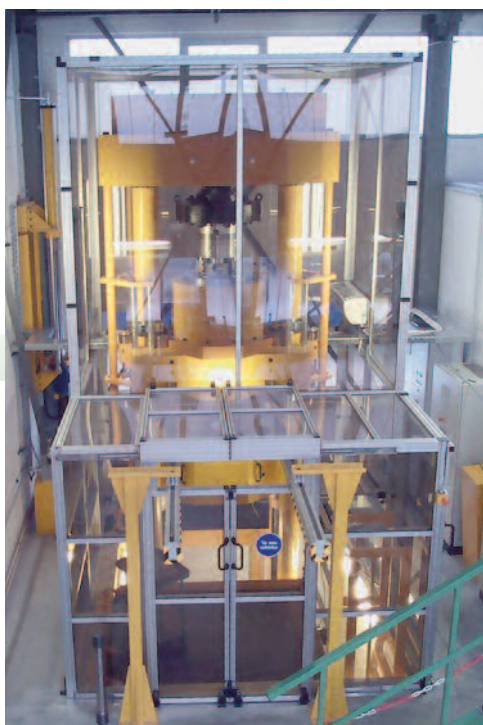


## Mission

Being ahead is no reason to slow down. We are working hard to measure forces and moments as they truly are – as vectors. We will continue to push the current boundaries for measuring ranges and accuracy. Through products, consulting, training and engineering services, we are further building GTM's leading position presence as well as our presence worldwide.

## Primarily global

GTM calibration laboratory: 10 MN Standard Machine



The largest in the world:  
TSM 1.1 MN·m



The most precise in the world:  
FSM 1MN

# Forces and moments

What is our standard for accuracy? Less than 1/10 of a hair's width to a meter. And since we are so exact, we receive contracts from all over the world – from the pyramids in Gizeh to Sugar Loaf Mountain in Rio. In over 40 countries on five different continents, GTM is setting the global scale for forces and moments.

The world is full of both technical and geographical limitations. At GTM, we make it our job to help overcome them.

## Overqualified?

With a measurement accuracy of 0.02 % (referring to the full scale value), our K-series sensors are actually overqualified. No matter. We and our customers can live with that – and a sensor, fortunately, can't get bored on the job.

Our K-series sensors also feature a large 500:1 measuring range. This measures the respective force to exactly 1%, which is even 0.002% of the full scale value. It's no wonder, therefore, that our K-series sensors are second to none.



Series K: Extreme precision



Series DR: Inertia compensation



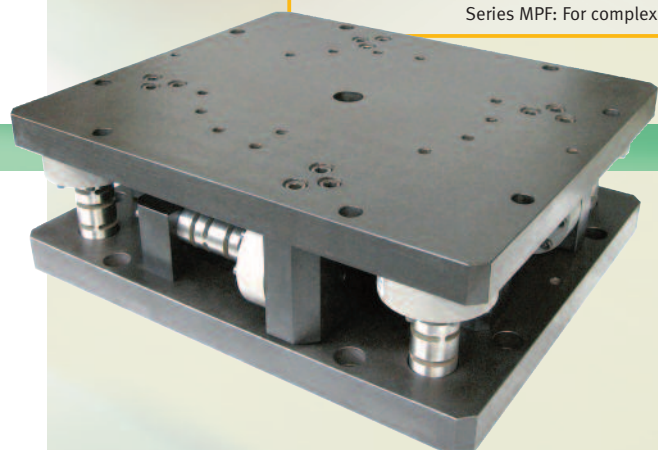
Series RF: For critical loads



Series M: High-precision torque



Modern force multiplication: Build-up 30MN



Series MPF: For complex loads





## Multi-components

GTM comprises the entire world of multicomponent measurements in a closed software system. Users can easily transform measured forces and moments into hexapods or screws, vectors or Cartesian components as well as coordinate movements or rotations – all with a click of a mouse. This ensures an optimal relationship among the six components of a force and moment system.

Due to GTM's extensive knowledge in this area, Deutsche Bahn turned to us for help. The leading global passenger and logistics company based in Germany launched a project to determine which forces were placed on the buffers of its railroad cars. GTM constructed a three-component sensor for axial forces up to 2,000 kN and transverse forces up to 150 kN. With this sensor, Deutsche Bahn's research center could finally measure the strain on the cars' buffers. The railway engineers, in turn, used these findings to optimize the buffers' quality and longevity.

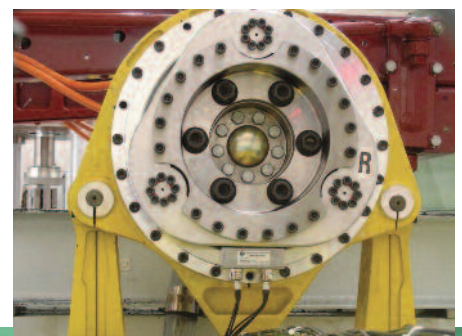
## Measuring vectors



Tire testing



Railway car buffers



Automobile chassis



Calibrations

Force torque

# Whatever you need

To paraphrase an old German saying, calibration is better than contemplation. That is why we offer calibration services with forces ranging between 0.0005 and 10,000 kN as well as moments between 0.02 to 5.000 N·m. If desired, we can also inspect your force and moment measurement systems on site – in all directions and values up to 10 MN or 400,000 N·m.

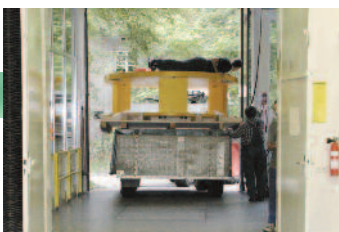
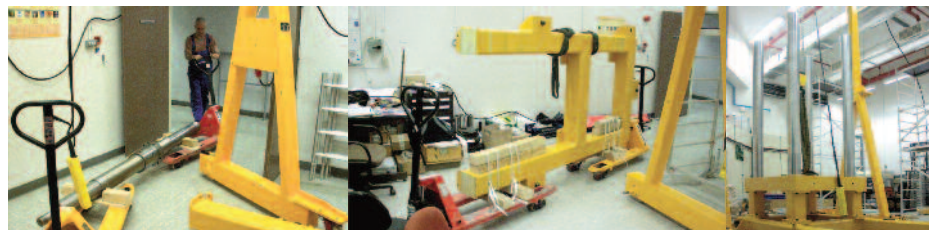
At GTM, we don't just focus on technical issues. Our team applies the same creativity and dedication to professionally process special orders and deliver turnkey solutions – even when faced with challenging transport and assembly conditions.

We have already built customized machines, for example, based on clear specifications and restrictions due to the measurements along transportation routes and at mounting places. On another occasion, our delivery route was blocked – just a few meters from our final destination. Our project manager, therefore, spontaneously thought out “Plan B” – and hired a local farmer to transport the machine with his tractor for the final stretch. As they say, necessity is the mother of invention.

In technical areas, we know no boundaries – beyond, of course, the laws of physics. If you have very specific requirements for measuring something, our GTM engineers will create a customized sensor based on your exact wishes.

GTM Gossmann Testing and Metrology GmbH Prüfplatz-Strasse 6 51646 Gossmann		GTM Gossmann Testing and Metrology GmbH	
akkreditiert durch die / accredited by the <b>Deutsche Akkreditierungsstelle GmbH</b> <b>DAKKS</b> für Kalibrierleistungen im / for calibration services in the <b>Deutschen Kalibrierdienst</b> <b>DKD</b>			
Kalibrierzertifikat Calibration certificate		Kalibrierzertifikat Calibration certificate	
Gegenstand Object		Mehrkraftsensoren (DIN)	
Hersteller Manufacturer		Duminy-Hendeler	
Typ Type		Duminy-Typ	
Platzhalter/Teil-Nr. Placeholder/Part No.		12345	
Auftraggeber Customer		GTM Gossmann Prüfplatz-Strasse 6 51646 Gossmann	
Auftragsnummer Order No.		12345	
Anzahl der Details des Kalibrierzertifikats Number of copies of the certificate		33	
Datum der Kalibrierung Date of calibration		11.08.2012	
Validität Validity		30 Monate 30 months	
Ort Place		Prüfplatz-Strasse 6 51646 Gossmann	
3.7.2012		Gossmann	
GTM Gossmann Testing and Metrology GmbH Prüfplatz-Strasse 6, 51646 Gossmann, Tel.: +49 (0)217 9720-46, Fax: +49 (0)217 9720-77			

Calibration certificate



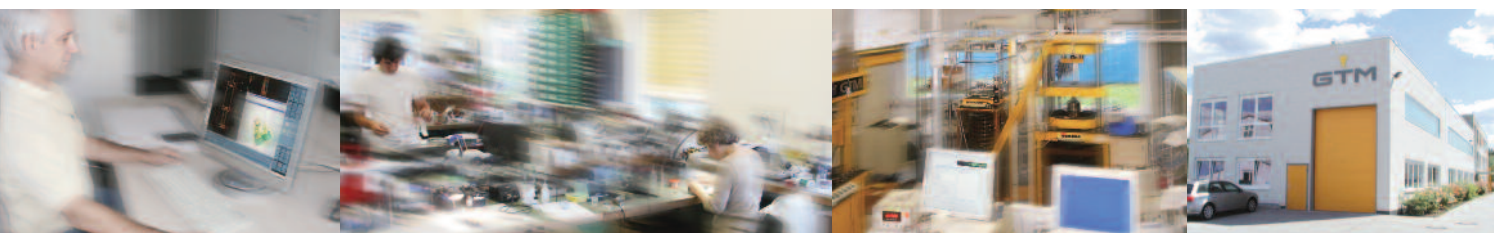




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## Outlook

As a market leader in measuring forces and moments, we are dedicated to providing state-of-the-art technologies and timely solutions for our customers worldwide.



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