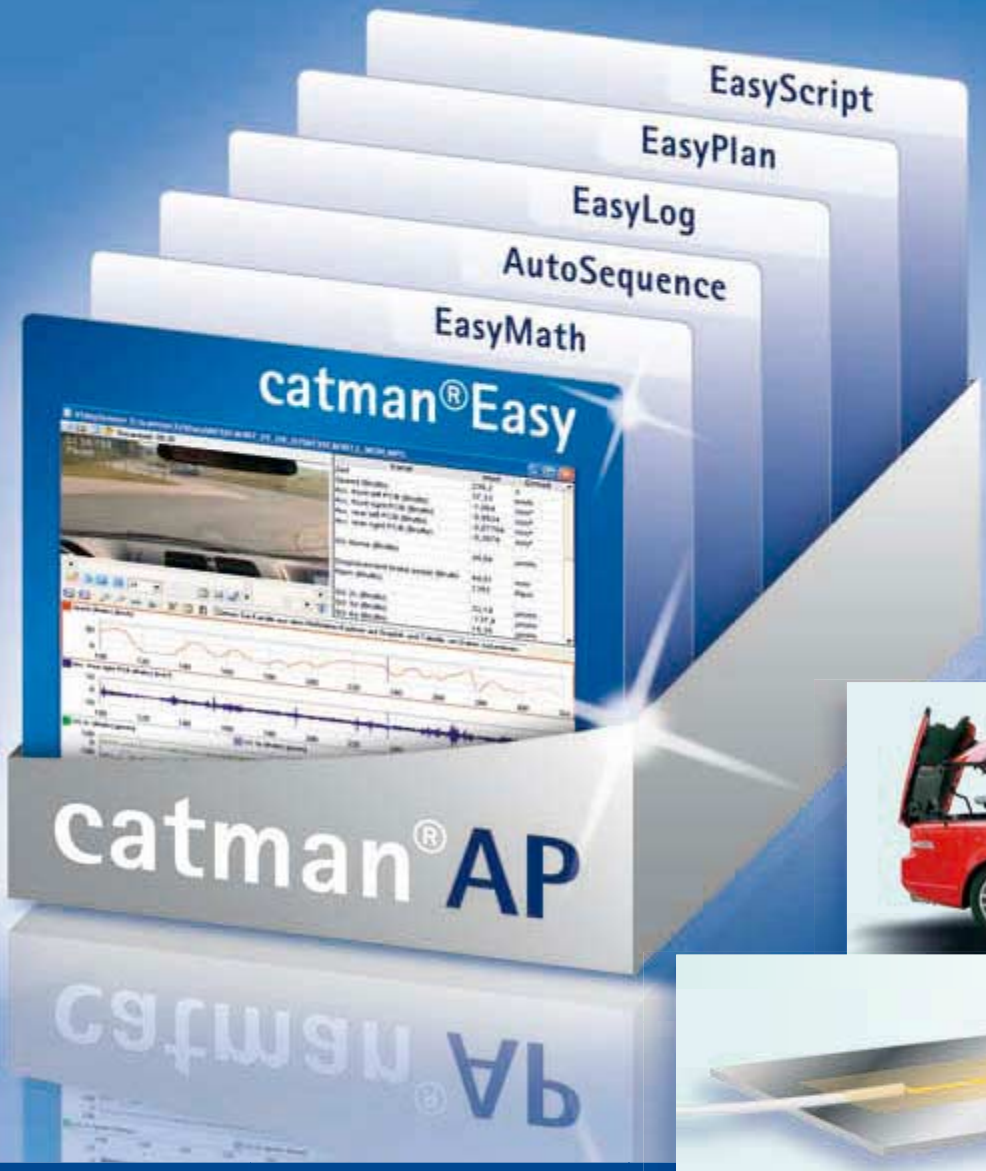
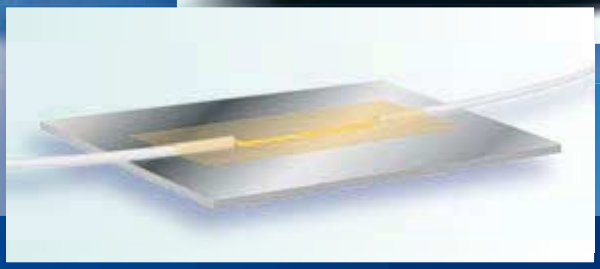
HOTline

News from the world of test and measurement

No. 1/2007





catman®AP:
The new generation of measurement software

An all-inclusive package of powerful modules

New horizons for your measurements

The optical measurement chain from HBM

HBM

Ben Keetman
Director of Sales & Marketing

Expert know-how from HBM ...

... the key to your success!

Dear Reader,

In 2007, we will once again be doing our very best to keep you updated with the latest information about the products, technologies and applications for the electrical measurement of mechanical properties. In this issue of HOTline, you will find various interesting articles covering different applications where HBM has provided innovative and reliable metrological solutions.

HOTline is one of the many ways that HBM provides additional information for you. By drawing your attention to developments, technological changes and new products it helps you appreciate how we can tailor solutions to your specific applications.

The Internet is indispensable in today's business world which means that data sheets, application reports and other information have to be regularly kept up-to-date. Nevertheless, we remain fully committed to maintaining personal contact with our customers, after all we do business with people, not robots!

A few years ago, HBM launched a totally new concept of information events called "HBM On Tour", or "HOT" for short. The program covers information about basic principles and includes theoretical lectures for advanced students, as well as "live" presentations and practical training for the participants. HOT's value as a series of high-quality events was demonstrated by going on tour across Europe – from the United Kingdom to the Ukraine and from Spain to Sweden. In 2006, several thousand measurement technology engineers and technicians from various sectors of industry and training institutes took part.

All topics are regularly updated. Please take a look at the tour schedule on our website at **www.hbm.com/hbmontour**.

There is certain to be a HOT event being staged near you in the near future. In addition to "HBM On Tour", HBM runs the HBM Academy, providing numerous exclusive seminars at the training center in Darmstadt. Here you can specifically extend your know-how of measurement technology issues. These seminars are presented by a team of HBM experts, as well as by outside speakers.

We have more to offer than simply delivering your technical products, as passing on information is an important component of our joint success.

Yours,
Ben Keetman

Applied HBM technology

New products

HBM innovation

Calibration technology

Customized sensors

News

catman®AP

WEBASTO

... relies on catman®AP – the new data acquisition and analysis software from HBM

Andreas Wolf, Webasto

Webasto, the international automotive supplier of auxiliary heating, air conditioning systems and sliding sunroofs, has designed the retractable hardtop for the Volvo C70 Cabriolet. Webasto relied on the MGCplus amplifier system and catman®AP – the new data acquisition and analysis software from HBM, for testing of the hardtops during development.

The following tasks were needed:

- stiffness measurements of the entire roof system and components
- recording the natural frequencies and highway patterns for the entire roof system and complete vehicle
- locking forces
- closing speeds
- functional measurements on the roof system and its components (stresses, currents, forces, pressures, torques, angles, displacements, etc.)

Aim of measurement

When measuring locking forces, Webasto needed to ensure that the roof system components could tolerate locking in the intermediate positions without damage and subsequent functional impairment. The tests were also used to align with the FEM calculation.

Measurement setup

To make it as easy as possible to measure the locking forces, the drive of the C-segment was set up as a component test bench (Fig. 1) and transducers were fitted to capture the following quantities:

- cylinder force - HBM's U3 10 kN force transducer
- cylinder displacement
- cylinder pressures at the piston and rod end - HBM's P8AP 500 bar pressure transducer
- locking force at the driven link - HBM's U3 2 kN force transducer

Fig.1-3: Measurement setup on the component test bench for the hardtop

The chart (Fig. 4) shows the measured quantities of pressure and force, evaluated and displayed as examples by catman®AP.

Conclusion

catman®AP software is easy to operate and helped Webasto in its daily evaluation. The sensor database saved valuable time, particularly when setting up amplifiers and there was a significant reduction in possible errors. As well as being easy to operate, the flexibility of the software proved important, as it ensured a fast response to different measurement jobs.

The second area of application for catman®AP is analysis and documentation. The filter functions and frequency analyses of catman®AP proved particularly useful for the analysis and documentation of the Volvo C70 hardtop. ■

Fig. 4: Force and pressure over time

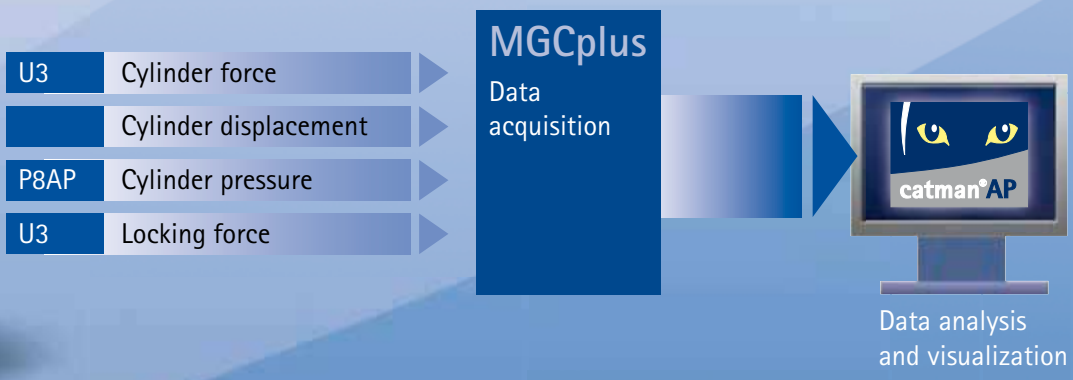


Fig. 5: Volvo C70 Cabriolet with the roof in motion

catman®AP

An all-inclusive package ...
... of powerful modules:

The complete software solution

HBM´s catman®AP provides measurement engineers with a complete software package for their daily metrological tasks. The philosophy of simplified measurement data acquisition with catman®Easy has been enhanced with catman®AP's extra functions.

Simple and complete – that is catman®AP:

- **easy to operate** – thanks to its sophisticated control concept
- **a complete package** – excellent functionality to resolve even complex measurement tasks

As well as the basic functionality of configuring connected amplifiers and acquiring, monitoring, visualizing and storing measurement data, catman®AP also provides the following extended options:

- mathematical evaluation of measurement data
- video analysis, such as synchronizing video and measurement data
- automating measurement sequences with AutoSequence
- preparing a measurement – even without an amplifier
- setting up self-contained PC-card measurement in MGCplus
- integrating specific solutions via scripting

All the functions are readily available without losing sight of the primary objective – acquiring measurement data. Additional functions can be activated if needed when, for example, the measurement task is altered by new requirements.

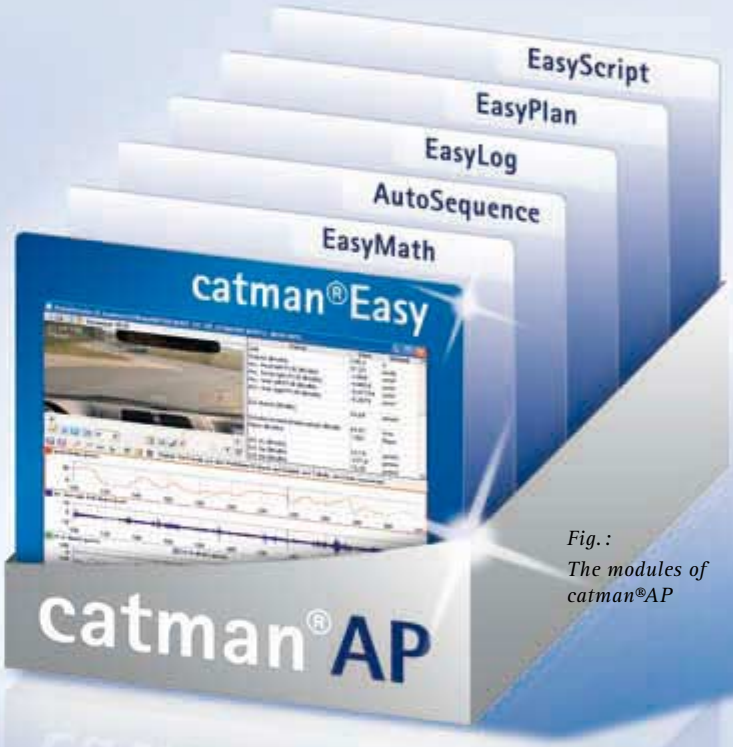


Fig.: The modules of catman®AP

For example, if a measurement is to be self-contained and saved to the internal MGCplus PC-card rather than the PC, all the user has to do is click and define the file name.

AutoSequence automates measurement, including the analysis. This builds on existing settings, such as the channel and measurement parameters. With AutoSequence, every manual step, such as starting measurement, calculating the mean value after measurement, or writing values to Excel, is defined by function blocks and organized graphically.

catman®AP

The new generation of data acquisition and analysis software

MP85A FASTpress

End-of-line testing

for selector controls for automatic transmissions

The use of automatic transmission in the automotive industry has become increasingly widespread as customers, even with subcompact cars, demand more luxury.

DURA Automotive Systems Einbeck GmbH makes selector controls for automatic transmissions. To ensure 100 % error-free functionality and consistent high quality, a test concept was developed in cooperation with a system integrator and HBM.

Test requirements:

All the gears were shifted through for each selector control to evaluate, amongst other things, the actuating force and the associated displacement. The minimum and maximum forces that occur when selecting the individual drive positions are precisely stipulated by the end customer Opel and must be the same for all the selector positions.

An identification label is only printed and attached for a selector control that has tested ok. This label can be used to retrace the unique test file at any time. Selector controls that are not ok are rejected. Each selector control is thoroughly tested because there is a 100 % component test requirement.

The HBM solution:

An HBM measurement chain was designed comprising S2/100 N force transducers for tensile and compressive forces, WA/100 mm-L displacement transducers, and the MP85ADP process monitoring system.

Communication is via Profibus DPV1 between the MP85ADP process monitoring system and the test station PLC. A PC is also available for visualization via the PME Assistant and for storing test results, including all the curve data. Sometimes the storage option of the MMC card in the MP85ADP is used. ■

Fig. 1:
Gear lever of Opel Corsa automatic transmission on DURA test bench

"The detailed measurement of force and displacement and the versatile data storage options of the MP85ADP make it very easy for us to meet the stringent requirements of our end customers.
We also make use of the on-site training and service offered by HBM."

Dipl.-Ing. Udo Beyland, Project Manager,
DURA Automotive Systems Einbeck GmbH, Germany

HBM innovation:
Optical sensor technology

New horizons for y

The optical measurement chain from HBM

Over the past two decades, the most stringent requirements for dynamic response, signal power and immunity from interference in telecommunications have meant tremendous technological advances for optical fibers and optical components.

The development of sensors has also played a major role. Fiber-optic gyroscopes and rotation sensors for measuring the tiniest phase differences and angular speeds in navigation systems or laser interferometers in industrial length and angle measuring systems are typical of the developments in the optical field which have achieved considerable business success in standard production.

Totally new possibilities ...

The technology allows totally new perspectives with regard to fiber-optics in technical sensor applications, particularly when thinking about extended linear and physically distributed arrangements. Possibilities include low-attenuation signal transmission over vast distances with multiplex capability and miniaturized and fiber-integrated functional gratings, to name but a few.

... for metrological sensor technology

The optical fiber grid structures are particularly useful in strain-based measurement technology, where they can be coupled with transducers or applied to evaluate strain states. The possibility of writing periodic structures to fiber cores was discovered by K. O. Hill in 1978 and first put into practice by G. Meltz in 1989.

Working principle of a Bragg grating

The optical refractive index gratings applied to the core of photonic crystal fibers are mechanically fixed and usually permanently resistant. The transmission mechanism of a temperature or quantity of strain relevant to the measuring effect works in the same way as with a resistive electrical converter.

Fig. 1: Interrogator analyzer for fiber-optic sensors

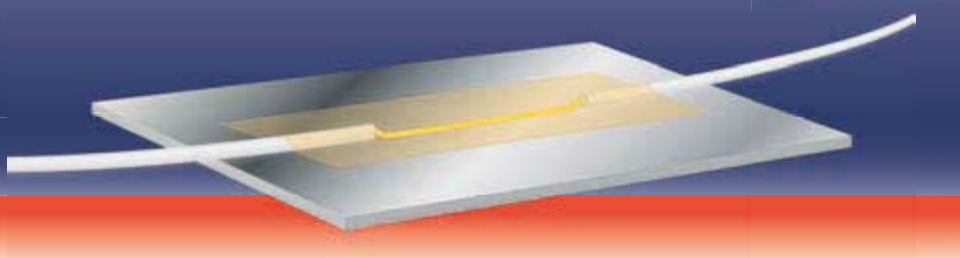


Fig. 2: Optical strain gage

our measurements

Optical sensors supplement HBM sensor technology ...

This does not mean replacing the high-precision, easy to handle and well-proven electrical strain gages with optical sensor technology. But the new technology allows us to make additions to the current HBM product portfolio, for those situations where conventional measurement technology meets its limits in difficult applications. This could, for example, be adverse ambient conditions.

... and are particularly suitable for use in adverse ambient conditions:

- an environment with electromagnetic interference
- fields with a high energetic potential
- high voltage
- critical, as well as radioactively contaminated, positions
- chemically aggressive or corrosive environments
- high temperatures.

... an enhanced range of products at HBM

Optical strain gages also open up new design possibilities for explosion-protected transducers, as electrical isolation from the mains and the permanent zero stability of the applied grating are standard features.

In the first half of 2007, HBM is launching the first optical technology components for use by its customers, as a supplement to the proven device and sensor product program for the measurement of mechanical quantities. Thanks to a special signal conditioning module for optical sensor data, catman®AP software is able to provide a connecting link between electrical and optical data acquisition systems. ■

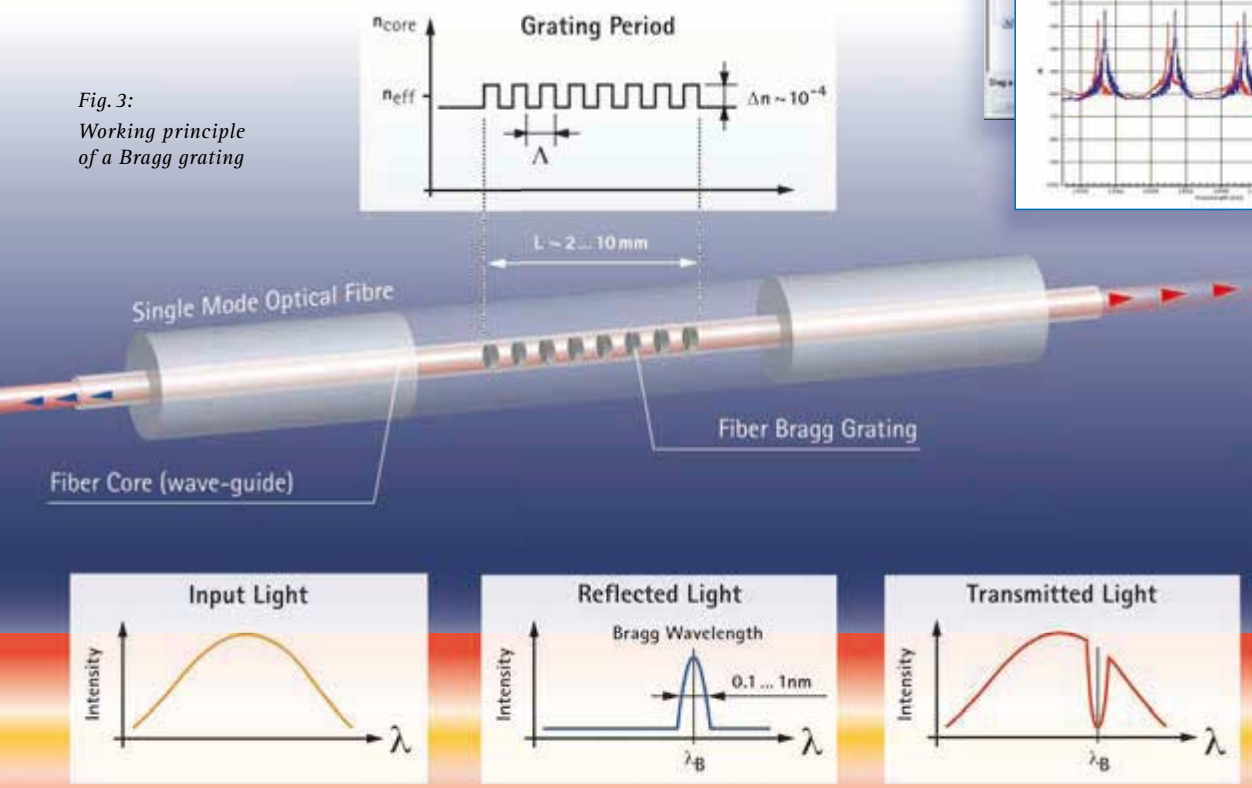


Fig. 3: Working principle of a Bragg grating

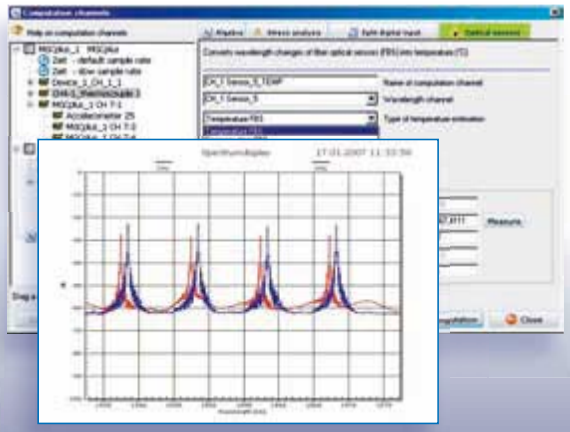


Fig. 4: Display of the spectrum in catman®

Investment securit

smart torque® by HBM

smarttorque® now available for 5 kN·m and 10 kN·m

Customers expect an investment to work consistently over a number of years, especially where engine, transmission and roll test benches are concerned. This is one reason why HBM's T12 digital torque transducer excels. Even with an exceptional dynamic response, it acquires both the torque and the speed and works out the mechanical output power. It is also possible to measure the angle of rotation and the temperature. All of the measurement signal conditioning is integrated in the transducer. This greatly increases the quality of the signal and achieves the lowest uncertainty in the world.

Fig. 2: Horiba test bench with combustion engine simulation by means of an electric motor

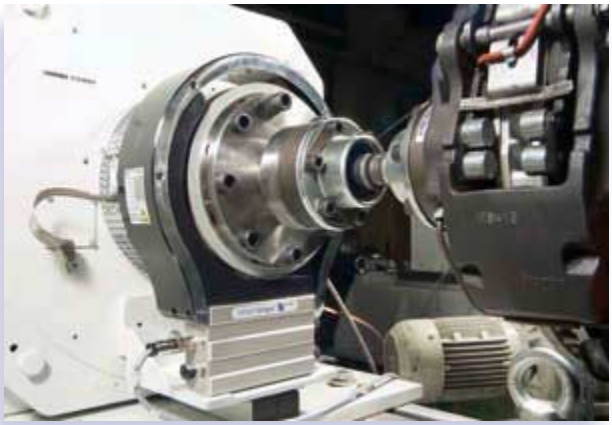


Fig. 3: T12 / 10 kN·m with protective cover in a Horiba all-wheel-drive powertrain test bench

With the new 5 kN·m and 10 kN·m versions of the T12 you can now choose between more nominal (rated) measuring ranges: 500 N·m, 1 kN·m, 2 kN·m, 3 kN·m, 5 kN·m and 10 kN·m. Depending on the measuring range, the T12 can be used up to a nominal (rated) speed of 16,000 rpm.

As far as electrical interfaces are concerned, you have everything you need. The user can choose the best possible interface for their application: CANopen fieldbus interfaces and Profibus DPV1 option, 10 kHz ± 5 kHz or 60 kHz ± 30 kHz frequency outputs and ±10 V analog output option. Complementary RS-422 signals are also available for speed and angle of rotation acquisition.

The T12 has considerable advantages. Its compact design saves space and thus costs in test bench construction. Because the rotor weighs less, the load on the bearings is reduced and the low mass moments of inertia lead to smaller dynamic moments during acceleration and braking. This can be seen, for example, in the four-wheel-drive transmission test rig made by Horiba (Fig. 2). This test bench has a floor area of 8 x 8 m and is used to develop and test all-wheel-drive transmissions. Various simulations, such as cornering, can be performed on it. A combustion engine can be used, but

... even with gre

Fig. 1:
T12 digital torque transducers with and without protective cover

more importantly, the engine can be simulated by an electrical machine with a torque transducer. This achieves a considerable cost reduction, as supply logistics are not required and there are no exhaust emissions.

Processors in the transducer now also make it possible to provide process diagnostics, for example, by monitoring the temperature and the mechanical limit values. The user is made aware of critical operating states, can take remedial action and save money by reducing down time and by preventing destruction. On the other hand, self-diagnosis makes handling easier and also draws attention to operating errors and settings outside the specifications. Further support is provided by the "T12 Assistant" software. This helps with parameterization and ensures that once the test bench manufacturer has set up the T12, it is not re-adjusted by the end user.

In short, the T12 smarttorque® digital torque transducer from HBM is the new dimension in torque measurement - fast - accurate - digital. ■

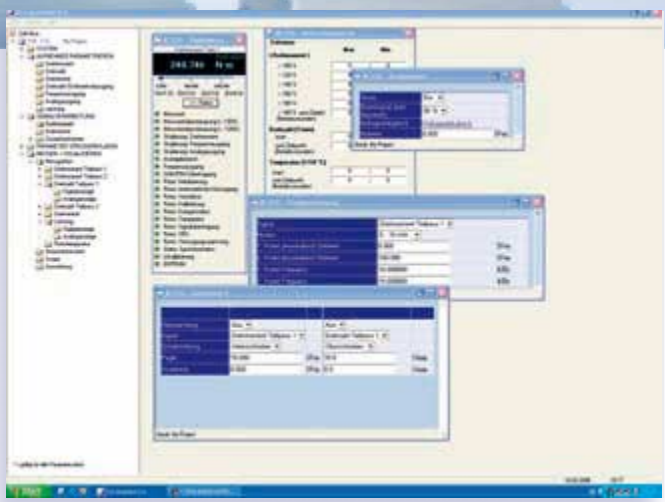


Fig. 4: With the practical T12 Assistant, you can keep an eye on all your measurement data

"As well as the outstanding technical properties, we particularly like the T12 Assistant as an installation program. The defined user hierarchies are very important to us. The options for reading out limit data make it possible to identify and document the transducer history."

Klaus Pätschke, Development Lab Manager,
Horiba Automotive Test Systems, Germany

Calibration at HBM

Linearization with TEDS:

TEDS – the electronic data sheet in the transducer

For a long time now, TEDS has proved its advantage in a variety of applications, such as calibration or production monitoring because TEDS helps you set up the amplifier quickly and reliably. The technical implementation of TEDS comprises a microchip, which can store transducer information from the data sheet and the calibration certificate.

HBM has developed a circuit to drive, write to and read out this chip, making it possible to carry out these procedures without any additional connecting cables. Numerous tests, including temperature response with a TEDS chip in the transducer and investigations carried out at different carrier frequencies, have all verified that the effect of the TEDS chip on measurements, even precision measurements, is negligible.

Realization options for the characteristic curves of the transducer

With TEDS, it is also possible to store non-linear characteristic curves for the transducer. Scaling methods are described in the IEEE 1451.4 international standard.

However, most measurements, for example, the data contained in DKD calibration certificates such as force calibration per ISO 376, have to be converted for the IEEE standard.

If the characteristic curve is only drawn as a straight line between the zero point and the sensitivity, then this is called a two-point linearization. But this approach is often inadequate for transducers with distinctly non-linear characteristic curves, as well as for precision applications. It is possible to get closer to the ideal transducer response if it is calculated with a higher degree polynomial, for example with the following formula for a cubic polynomial:

$$Y_{ph} = A_0 + A_1 Y_{el} + A_2 Y_{el}^2 + A_3 Y_{el}^3$$

Fig. 2:
With TEDS, the amplifier directly detects the transducer data

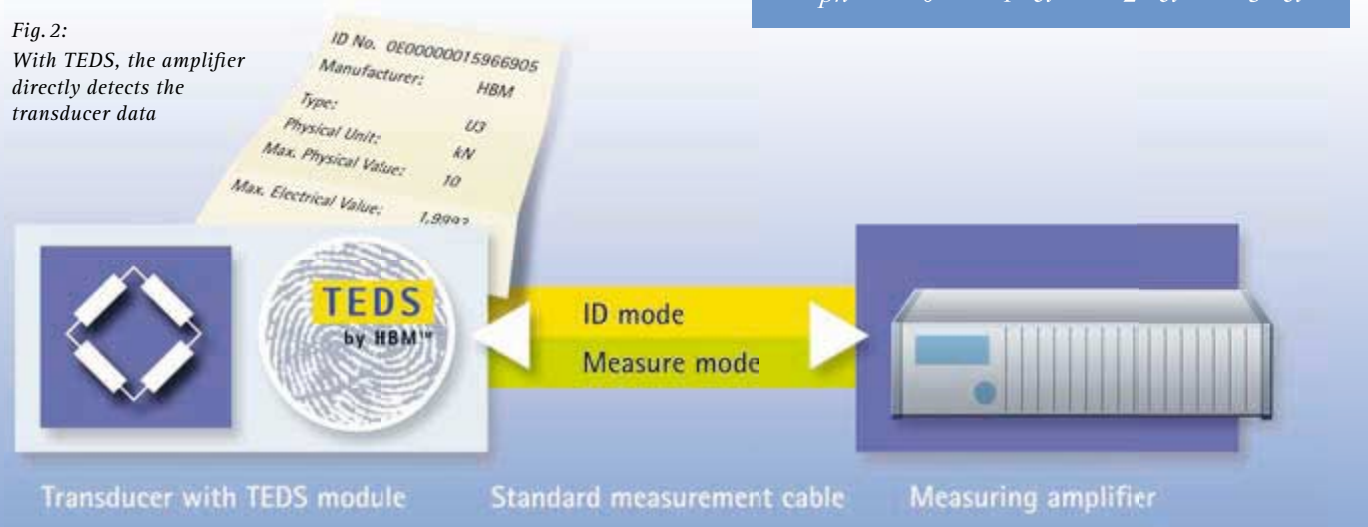


Fig. 1:
MGCplus amplifier system with ML38B and Z30A – the ideal combination for calibration

This describes the physical quantity (such as force or torque), subject to the transducer's electrical output signal (in mV/V, for example).

Figure 3 shows an example of a force transducer with the relative interpolation error (the deviation of the transducer's measured values from the calculated characteristic curve), for a two-point linearization and for a cubic polynomial. With the two-point linearization, the deviation is far greater, as the measurement is less precise.

With HBM's TEDS Editor, the coefficients for the interpolation equation can be taken directly from the DKD calibration certificate and entered in the fields provided. The TEDS Editor makes the necessary conversion to the coefficients required for TEDS, in accordance with the IEEE standard.

Real force calibrations per ISO 376 in HBM's ISO 17025-accredited German Calibration Service Laboratory also show the far lower interpolation error with an activated polynomial (Fig. 4).

The latest generation of HBM transducers is equipped with TEDS. With other transducer types, TEDS can be integrated in the cable or in the plug.

With the ML38B amplifier from the MGCplus system, the stored coefficients can be read out from the TEDS, which sets up the amplifier and the physical measured value then displays the one calculated with the polynomial. This enables the measurement chain to be quickly set up on site, minimizing possible errors and increasing reliability.

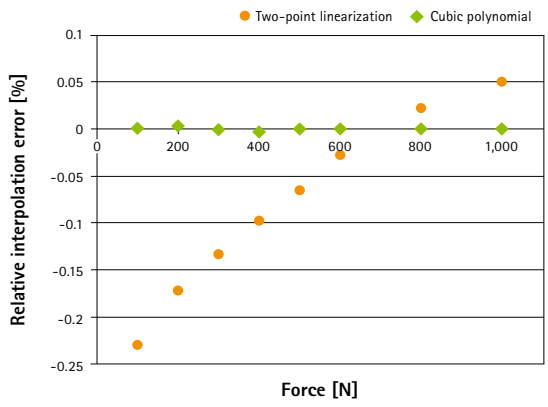


Fig. 3: Far lower interpolation error with the cubic polynomial

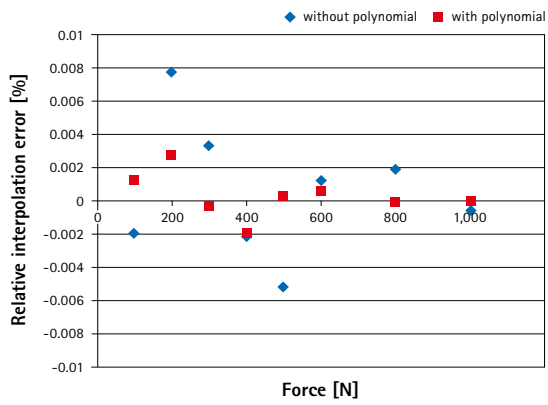


Fig. 4: The activated polynomial from TEDS minimizes the interpolation error

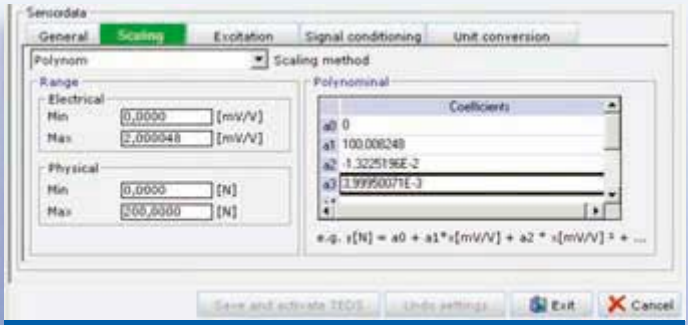


Fig. 5: Easy input of coefficients in the TEDS Editor

Graz Institute of Science and Technology, Austria

Being a champion ...

Mirna Dokic, Graz Institute of Science and Technology; Dirk Eberlein, HBM

Formula Student – the Formula 1 for students

Formula Student is an international design competition for universities, where they have to build a prototype of a single-seater racing car and develop a technical conception for producing 1,000 vehicles per year.

Every year a series of races are held on different track, to determine which university has the "best overall package" of design, driving ability and marketing.

As the engine data and the power are, for the most part, prescribed, the vehicle's weight can give that crucial competitive edge. Concentrating on this design criteria was how the Technical University of Graz racing team managed to win two second places in England and Italy during the 2006 season, plus the Winner Over All in the Formula Student event in Hockenheim, Germany.

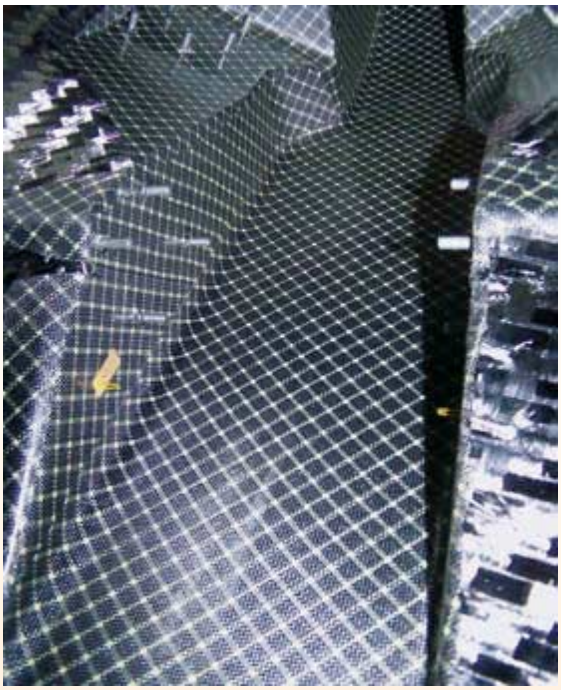


Fig. 2: Carbon fiber reinforced plastics minimize the weight of the monocoque to 15 kg

Fig. 3: The successful Austrian Formula Student Team

In 2006, the racing team from the University of Graz had built a monocoque weighing a mere 15 kg, saving more than 20 kg compared with its predecessor. This weight reduction was made possible by using carbon fiber reinforced plastics with structurally integrated strain gages (LI66-10/350 from HBM). With HBM's help, it was possible to measure stresses during testing that verified the design engineers' findings. It was also possible to monitor loading online while racing.

This meant that the Austrain Formula Student team could make optimum adjustments to the monocoque of their racing body to meet the design constraints.

... with HBM

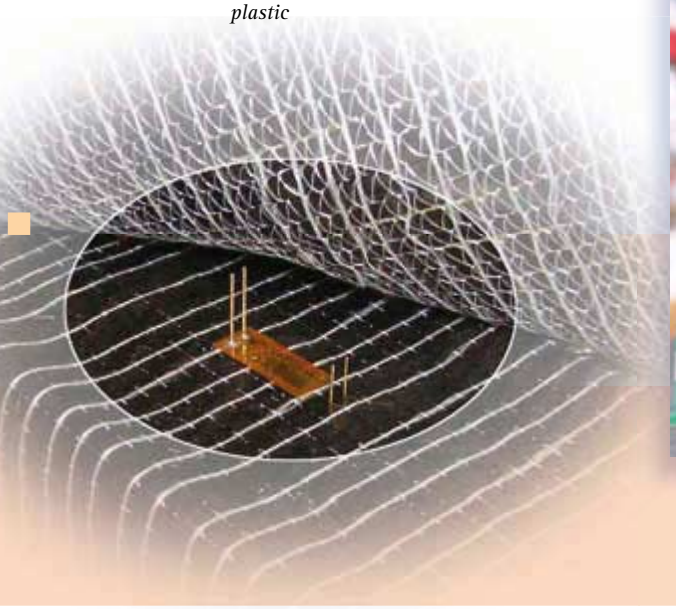


Fig. 1: Structurally integrated strain gages are embedded into the plastic

LI66 series

Embedded strain gages for ...

Strain gage application used to be restricted to installation on the surface of the component. But for fiber composite structures, there are now strain gages that can be embedded in the material. This is made possible by the two contact pins which are vertically attached to the strain gage. The pins enable application during production and contact to be made with the embedded strain gage. The measuring leads are only connected after manufacture, on the structure´s surfaces, which simplifies production.

Embedding strain gages gives new freedom to place the measuring points. Strain gages can be installed during production in places that are not accessible once the component is built. This is the case, for example, with components of a complex shape, sandwich structures or adhesive joints, such as in fiber composite structures. ■

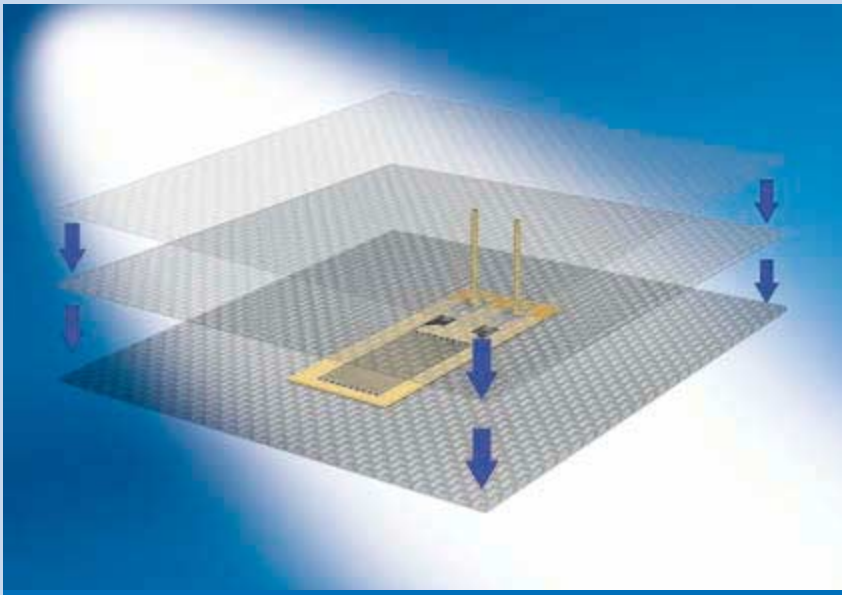


Fig. 1: The strain gages of the "LI" series are specifically designed for integration in fiber composites

... measuring in fiber composites

Too much fertilizer?

A globally unique test bench for investigation and analysis

Cemagref, the French Institute for Agricultural and Environmental Engineering Research is a specialist in spreading fertilizer at one of its nine sites in Montoldre. The equipment to chart the spread of the fertilizer as it is ejected by centrifugal spreaders of mineral fertilizer, is globally unique.

Investigating fertilizer spreading: the limits of the current system of evaluation

Up until 2006, the amount of fertilizer that was spread was expressed as the transverse distribution to the axis of progression of the machine in a complete pass. As an already integrated outcome was provided, extensive analyses were required to optimize the spread of the fertilizer and thus minimize environmental pollution. But increasing the power of the fertilizer spreader produced so many set points that it became virtually impossible to optimize the machines without having recourse to models of the spread, created under real conditions. So the conventional test bench was inadequate for future requirements.

A revolutionary test bench principle...

Fertilizer spreaders distribute fertilizer via two spinning disks, ejecting the fertilizer backwards and sideways out of the machine. The distribution over the soil corresponds to a circular layer of varying density (see Fig. 3). The control station, for which Cemagref has applied for a patent, works on the basis of radial measurement of the distributed quantities:

During a spreading test, the machine is set to rotate around itself (see Figs. 2 and 4). The distributed layer is charted for each angular sector by receiving containers arranged radially around the center of rotation. The result is the actual distribution of the fertilizer on the soil. There are several data processing phases as first, the spread is characterized and then a model of the distribution over the soil is created. Academics and engineers can then work with objective measurement results and are no longer dependent on bold interpretations. This technical innovation also has a practical advantage: at 40 m x 1 m, the place where the test bench is installed is 15 times smaller, which makes it far more economical.

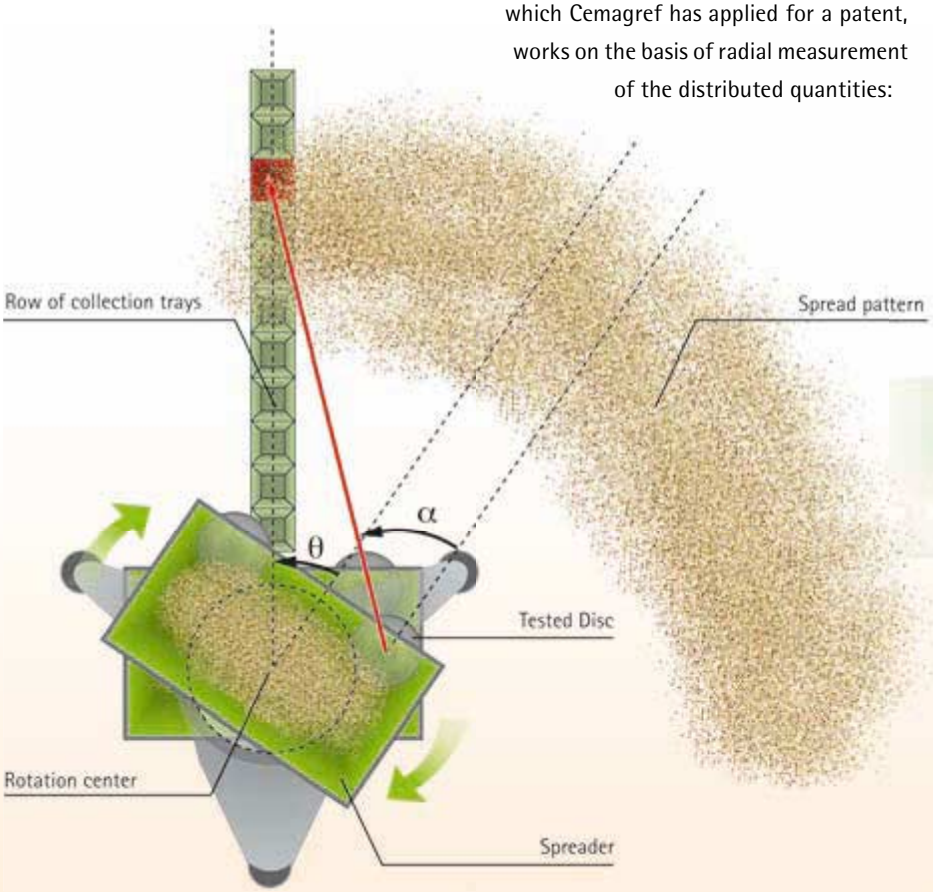


Fig. 2:
The fertilizer spreader is set in rotation. The load cells under the collection trays supply the measured values required for analyzing the spread distribution

Photos: Amazone

Fig. 1: Environmental protection requires an optimized spread of fertilizer

... with measurement technology from HBM

80 load cells with a measuring range of up to 1 kg weigh the quantities of fertilizer received by the 80 containers. All the load cells are continuously and synchronously interrogated with the aid of MGCplus at a frequency of up to 2400 Hz. The obtained resolution of 0.02 g allows the mass accumulation in each container to be measured by the grain. The simultaneous measurement of the relative angle of the centrifugal fertilizer spreader in relation to the series of containers allows the average fertilizer density to be derived in each physical position of the layer.

The chart made of the layer spread over 220° takes one to three minutes, depending on the measurement accuracy required.

Three RTN load cells with a measuring range of up to 2.2 t allow simultaneous measurement of the complex made up of revolving support, fertilizer spreader and fertilizer. The loss in weight is measured continuously at a resolution of 20 g. This allows the flow to be recorded at the outlet of the fertilizer spreader.

Easy data acquisition with MGCplus and catman®

All the load cells used are calibrated or simply tested remotely, without the need for adjustments to be made on the test bench itself. Because there is a direct connection to the MGCplus amplifier system and a useful calibration window in the catman® software, amplifications and offsets are simply adjusted. The recordings of the load cells used guarantee that sequences can be retraced. A series of catman® display windows allow the measurement data of all the load cells to be monitored in real time.

The program supports links to other programs (database, processing software) and no intervention is required from the user.

Thanks to this technology, a new and full test (parameterization, test, saving and processing the data) can be run every five minutes.

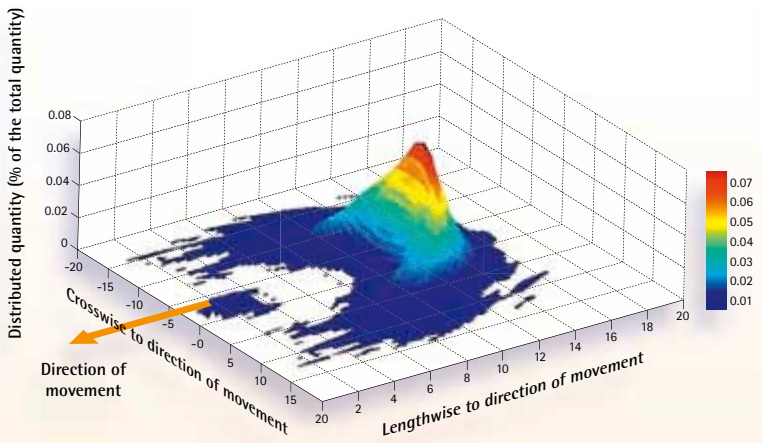


Fig. 3: Physical density of the fertilizer spread over the soil by a fertilizer spreader. With the most powerful machines, the floor area covered can be as much as 100 m x 50 m

Fig. 4: Test bench for the fertilizer spreading test

Measurement technology for drill rods

100 kN·m torque transfer transducers for Aker Kvaerner Maritime Hydraulics

When drilling for oil, drill rods with a defined torque are screwed together. To do this, the Aker Kvaerner Maritime Hydraulics company uses the TorqueMaster™, which applies the torque with two U2A 10-ton force transducers via a lever arm. To calibrate this machine, a custom-made transfer transducer with a nominal (rated) torque of 100 kN·m was needed.

In close contact with the customer, HBM developed a customized transducer. As there was not sufficient space available for a torque transducer with flanges, the chosen design had longitudinal serrations on both sides and a small outside diameter. In the calibration performed by the German Metrology Institute (PTB) to DIN51309, the transducer achieved Class 0.5 at 20 % M_{nom}, thus meeting the high level of accuracy required. ■

Fig. 1: Aker Kvaerner TorqueMaster™ pipe handling machine

Fig. 2: Transfer transducer for 100 kN·m

Special transducers for Newcastle University

Flanged torque transducers with an axial through hole are used to run cables, connections or other mechanical components through them. For a test bench at Newcastle University, HBM developed a torque transducer with such a large through hole that a shaft could be run through the transducer. The transducer has a nominal (rated) torque of 240 N·m, is designed for a maximum speed of 16,000 rpm and uses a contactless telemetry system. The maximum characteristic curve deviation and maximum relative reversibility error are 0.05 %. ■

Fig. 1: Cables and connections are led through the large central hole in the torque transducer

For more information, go to:
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Hyundai Motor Company

Torque measurement with catman® and MGCplus

HBM Korea and the transmission and axle manufacturer Dymos – a division of the Hyundai Motor Company – have developed a control and data acquisition system for automotive transmission test rigs.

Fig. 1: Transmission test rig

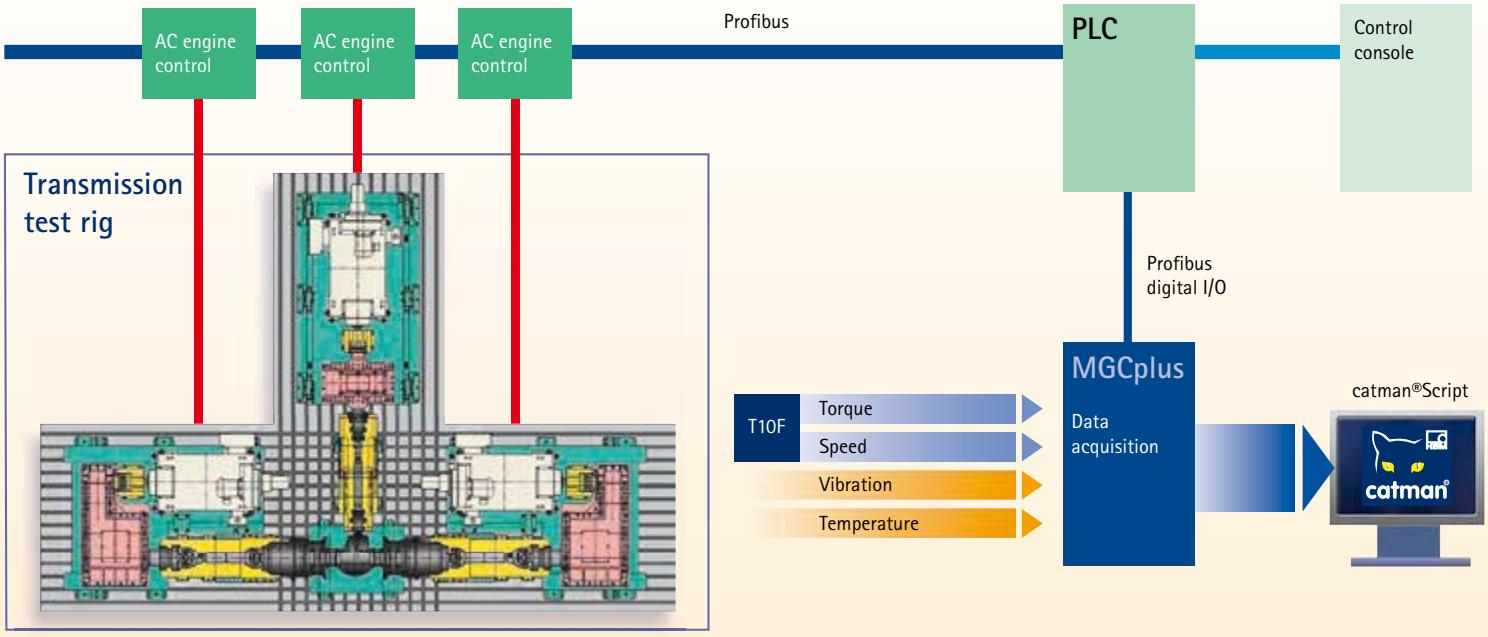
The T10F torque flange is used to measure all the engine and transmission torques at the Hyundai R&D Center for Drive Trains. The MGCplus amplifier system with a script from the catman® software is also used. A significant factor in the choice of the MGCplus data acquisition system was the option of using telemetry equipment to record vehicle data in real time, for example.

Dymos successfully concluded the usual technical tests for this type of torque measurement chain. Each test cell, comprising engine and transmission test benches, requires calibration of the entire torque measurement chain to ensure that engines with identical performance are produced.

Fig. 2: Control room at Dymos

Confirmed quality improvement

In the last three years, a total of eight torque measuring devices have been successfully installed. The Quality Assurance Division of DaimlerChrysler in Germany has confirmed the improvement in quality of the transmissions and axles being produced. ■



Medellín M

More ride comfort ...

Leonel Castañeda, EAFIT University, Medellín; Mauricio Palacio Lopez, Medellín Metro, Colombia

Portable diagnosis system for mobile data acquisition

A major project being run by the EAFIT University – Colombian Institute for the Development of Science and Technology (Colciencias) and the Medellín Metro analyzed the dynamic response of the passenger cars.

The two organizations needed to examine the operating conditions of the metro in Medellín to ensure it conformed with international railroad standard UIC- 518. This contains all the details for testing the ride performance of rolling stock from their dynamic response, in order to assess safety, track stress and ride conditions (stability, comfort, etc.).

Position and mounting of the force and acceleration transducers

HBM's U2B/100 force transducers were selected for mounting on the car axles of the train. The B12/500 acceleration transducers from HBM were installed in the bogie and in the passenger compartment in the vertical and transverse directions.

The MGCplus data acquisition system was used for signal conditioning, together with HBM catman® software. This allowed the measurement results to be read off directly and prepared for further processing by programs such as MATLAB®.

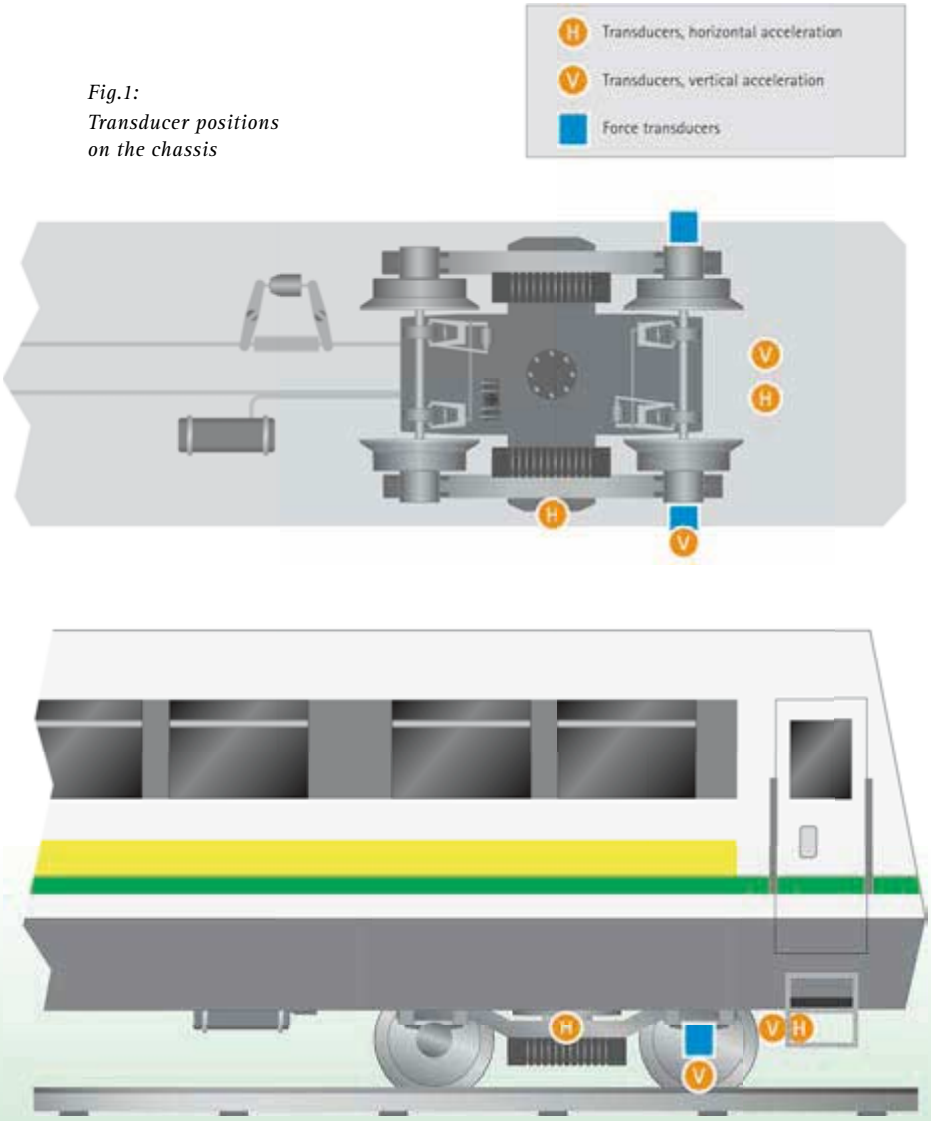


Fig.1: Transducer positions on the chassis

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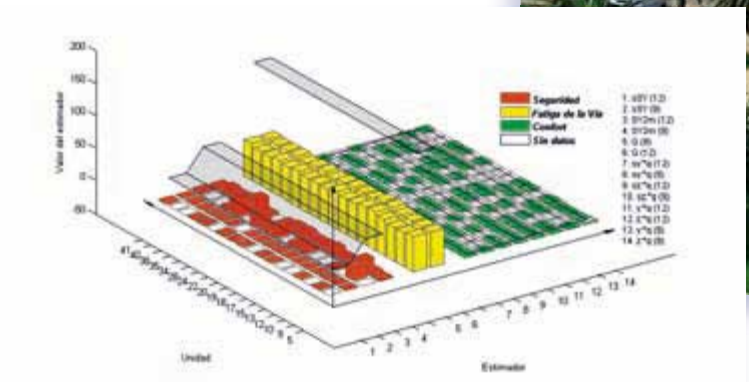

Fig. 2: The railway system of the Medellín subway network comprises 42 km of track

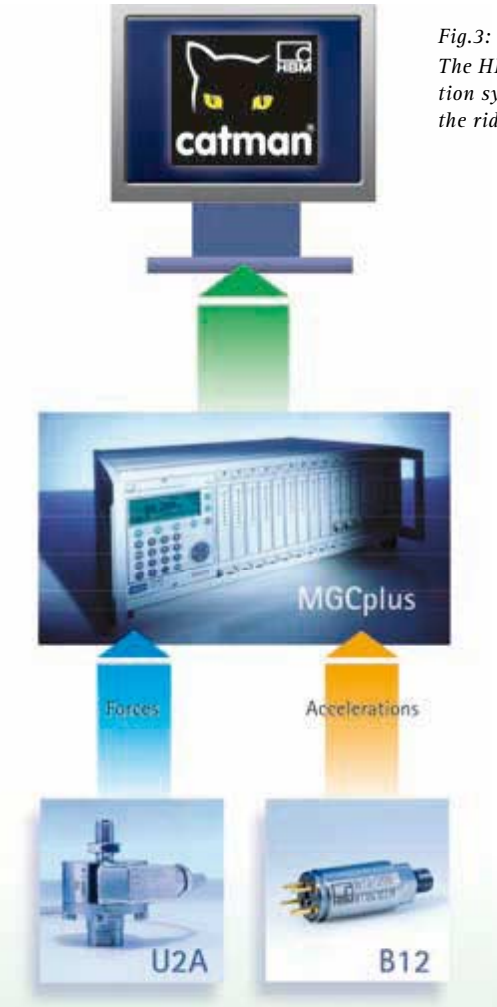

Fig. 3: The HBM data acquisition system for testing the ride performance

The speed of the metro was logged by MGCplus and the time was recorded internally. A total of 3.5 million measured values were logged and managed, at a sampling rate of 400 measured values/s per channel. This means that at a maximum speed of 80 km/h, data is logged after only traveling about 55 mm.

Once the tests were completed, HBM's equipment proved that all the analyzed units satisfactorily met the UIC-518 railroad standard. ■

Fig. 4: Mounting the transducers

... with HBM measurement technology

EMG PRESSES

Fig. 1: Pneumatic press using HBM measurement technology

EMG PRESSES rely on MP85A FASTpress

The company LONG EMG is headquartered at Annecy in France, and has been making mechanical pneumatic and hydraulic presses of 3.5 kN to 800 kN since 1966. They are regular users of HBM´s force transducers and with the recent advent of the MP85A FASTpress, they now have the latest, top-quality measurement technology. At the last MOTEK and EUROBLECH trade shows, LONG EMG displayed a pneumatic press that measured displacement and force with an integrated MP85A FASTpress.

For General Manager Stéphane Long, the reasons for doing this are obvious:

"More and more of our customers from the automotive industry are using transducers and electronics to ensure 100 % accuracy. We also need the performance of the HBM system for a contract from the watch-making industry, to meet the quality requirements for luxury watches."

"During feasibility tests, the precision achieved by the force transducers allows us to discover errors that would otherwise be difficult to find. By saving the results on the MMC card, linked to a PC via Ethernet and having the MP85A toolkit, we are in a position to implement user-specific, graphic interfaces. This means we can meet all the important criteria of the specifications", adds Applications Engineer Michel Puthod.

The new U93 force transducer is ideally suited to the press and its use is easily implemented with TEDS and MP85A FASTpress. The high I / O count during production ensures that the user can operate the press efficiently and smartly. Access rights to certain settings can be restricted, subject to their area of responsibility. This minimizes the risk of incorrect operation and improves safety.

The competitive situation in the press market calls for innovative solutions, so that production can continue in Europe and at the same time, technically attractive tenders can be made. Which is why EMG PRESSES entered into partnership with HBM. ■

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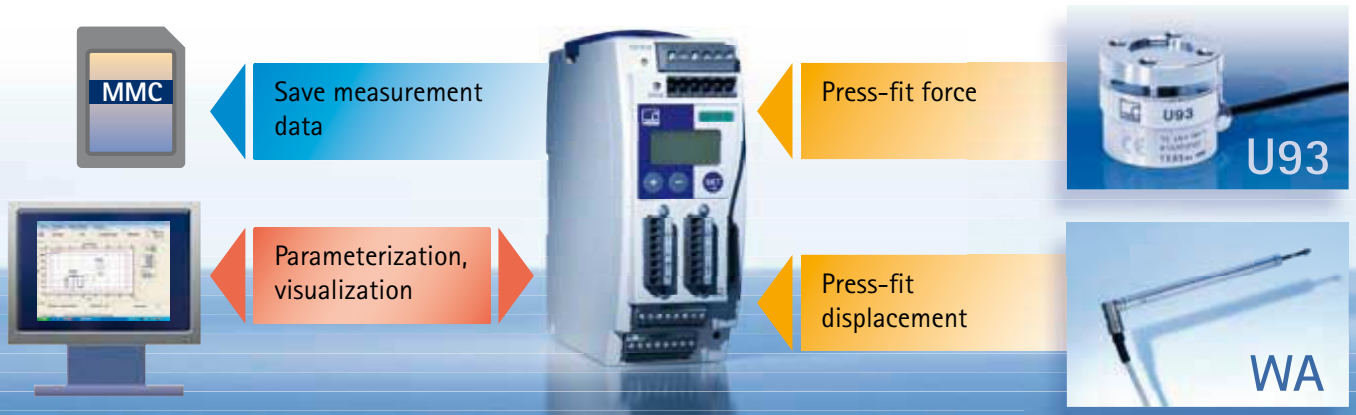

Fig. 2: Data flow with MP85A FASTpress

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