



Simply stronger ... the HBM innovation offensive

... now also including nCode, SoMat and LDS Instrumentation.

___ Data acquisition ...

Maximum precision and high-speed DAQ

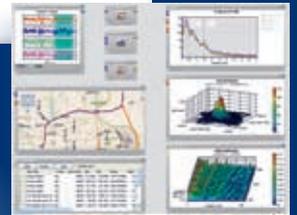
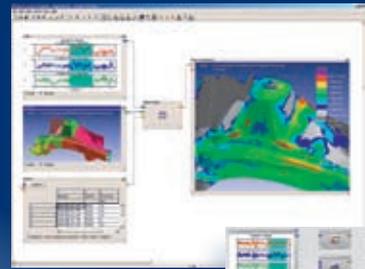
___ Data analysis ...

"One-click" generation of reports and complex analyses.

HBM – solutions for the complete product lifecycle

HBM. Your partner for optimizing product life-cycle performance

Measurement technology and software from HBM helps wide ranging industries reduce their time to launch new products onto the market. HBM has become an "innovation accelerator" for many different industries and constantly introduces new products and services with innovative features.



MANUFACTURE
AND OPERATE

DESIGN
AND OPTIMIZE

TEST AND VERIFY

SOLUTIONS
SUPPORT
CALIBRATION

- Keep to quality targets
- Reduce downtime and setup time
- Make production more efficient
- Minimize total costs

- Shorten development times
- Minimize technical risks
- Optimize materials and cost
- Improve development expenditure

- Speed up testing regimes
- Design more efficient tests
- Maximize the reliability and accuracy of your tests
- Establish the service life of components and products



All the solutions at a glance: www.hbm.com



Editorial



Andreas Hüllhorst,
CEO HBM Group of Companies

Dear Reader,

The current economic crisis makes it important to remember those factors that ultimately determine our business success. Our customers derive enormous benefit from HBM's solutions in terms of the economical development, manufacture and application over the entire lifecycle of their own products.

We see it as our responsibility to support you and help you to optimize the lifecycle of your products. To this end, we have recently reorganized our company structure and strengthened our position through the acquisition of prestigious and established companies. With nCode, we have the specialist for structural durability software. With SoMat, we have the global market leader for ultra-rugged mobile data acquisition. We have measurement technology solutions for sampling rates up to 100MS/s, that used to be sold under the LDS/Nicolet brand. Find out more later in this issue.

HBM is now in a position to offer you a unique combination of expertise and solutions for every phase in the life of your mechanical and mechatronic products. From development, test and manufacture to monitoring. From sensor technology, measurement electronics and data acquisition software to analysis and simulation software. From virtual to physical testing. From reliable single products and measuring chains to complete solutions and services.

All the services we supply are backed up by tried and tested HBM quality and accuracy, based on sixty years of expertise in structural durability, strain measurement, sensor technology, data acquisition and software. We have more than 300 engineers and technicians in seven engineering locations and 26 sales and service units supported by more than 30 specialist agencies worldwide to help you optimize the lifecycle of your products. Put us to the test!

Best regards, Andreas Hüllhorst

In this issue

HBM technology

Break the speed barrier...	
The NEW Genesis HighSpeed series	04
nCode GlyphXE™ – more power for your process	06
eDAQ from HBM SoMat – Rugged mobile data acquisition	08
With a fresh look & feel – catman®AP, Version 3.0	13
Force transducers for extreme temperatures	17
Low-temperature displacement transducers	17
The value-for-money all-rounder – T40-torque flange	19
catman®Enterprise 5.0	
Simultaneous data acquisition of up to 20,000 channels	23

HBM innovations, new products

Increased efficiency in testing, verification and measurement	
QuantumX – the modular product family for recording data for mechanical, thermal and electrical quantities!	10
An addition to the piezoelectric family	
The new CMD600 digital charge amplifier	16

Experimental stress analysis

With QuantumX on the tracks of the Glacier Express	12
Transcending boundaries – underwater strain measurement	14
With QuantumX and catman® in the Aescher tunnel in Switzerland	15
Stress in the PCB	
Strain gages in electronics production	16
CANHEADdirect	
PC communication module for the CANHEAD® amplifier	20

Quality control

Quality you can measure thanks to HBM's complete solution	
Testing switching devices with EASYswitch	18

HBM seminars

Have you seen it yet?	
HBM Application and Training Center	22

HBM technology

The NEW Genesis HighSpeed* series

up to
100 MS/s
 sample rate
 per channel

Break the speed barrier...

...with sampling rates from **100 kS/s** to **100 MS/s** per channel

With the launch of the Genesis HighSpeed product family, HBM is now targeting a frequency range that surpasses that previously achieved by up to a thousand times. The high-end models of this family are state-of-the-art and achieve sampling rates of up to 100 MS/s per channel!

Perception DAQ software

The powerful yet easy to operate Perception software is the basis of every measurement data acquisition system in the GEN series. Perception runs under WinXP and Vista and is available both as a 32-bit application and as a genuine 64-bit application. The software is ready to deploy immediately after installation. Additional network settings are not required, nor is it necessary to program drivers or transfer encoded settings.

Perception covers all three areas of the measuring chain, from device control, acquisition and display in live mode to fast reviewing to versatile reporting – "from sensor to report". The extremely fast display uses patented StatStream technology, which allows gigabytes of data to be reviewed in just a few seconds.

Genesis HighSpeed series

The Genesis HighSpeed family comprises two different hardware series. The most powerful are the GEN DAQ products. These are a series of portable devices that can be used on the bench in a laboratory, in a 19" rack or installed in a PC while sharing all the input modules.

The laboratory and plug-in versions are connected to a PC via Ethernet and can record between 28 and 128 channels per basic device. By connecting several basic devices with full sampling rate and trigger synchronization, you can obtain major systems with up to 1080 channels.

The GEN5i has an integrated PC and five slots which can, in a single housing, record, store, evaluate and provide a report summary of 20 or 40 channels.

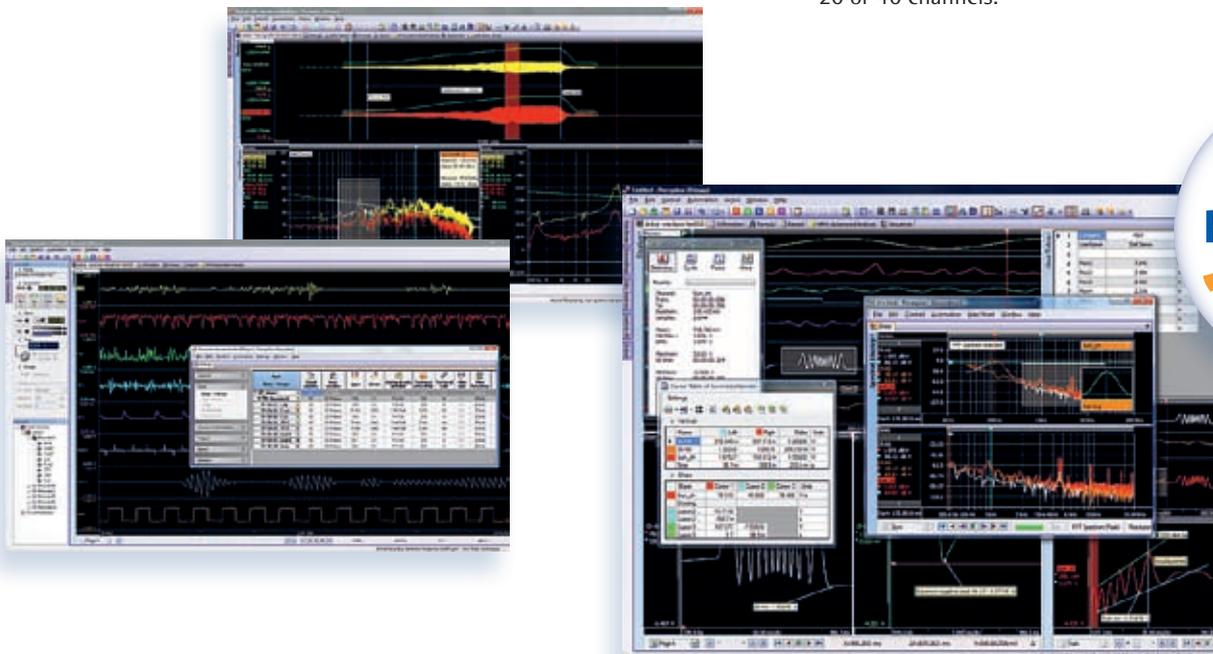


Fig. 1:
 Perception software
 is a complete solution
 "from sensor to report"

Genesis
HIGH SPEED



**Ultra
High-speed
DAQ**

Sampling rates from 100 kS/s to 100 MS/s per channel

All the physical input modules are insulated and have sampling rates from 100 kS/s up to 1 MS/s, including signal conditioning. They can be used for strain gages, load cells, acceleration transducers or simply for voltage signals. These modules are typically used in high-speed, destructive material testing or for commissioning, vibration testing and in engine or transmission test cells.

The "high-speed" digitizers have sampling rates of 25 MS/s or 100 MS/s, with differential inputs and a 14-bit analog/digital converter to ensure high-precision signal rendition. These digitizers are useful in applications with explosive materials, such as in airbag tests and aerospace separation tests. Other uses include momentary ignition applications, such as propulsion units for solid rockets or engine electronics.

A special version of these high-speed digitizers is fully electrically isolated and uses fiber-optic transmission. This allows the measurement hardware to be located at a safe distance of up to several kilometers from the measuring instrument (destructive testing) or to be used for electrically isolated measurements.

*HBM Genesis HighSpeed products were previously marketed under the Nicolet brand. The Nicolet brand is owned by Thermo Fisher Scientific Inc. Corporation.

■ Klaus Lang, HBM

more... www.hbm.com/highspeed



Fig. 2: With up to 1080 simultaneous high-speed channels, major structures such as aircraft turbines can be tested.

HBM technology

Innovative test and measurement software from HBM

nCode Glyph^{XE}™ – more power for your process

Data acquisition systems with hundreds or thousands of measurement channels are increasingly producing many gigabytes of measurement data. Yet it can be difficult to simply process all this data. nCode Glyph^{XE}™, the new, innovative test and measurement software from HBM, meets the challenge by making it simple to evaluate files of 50 GB and provides a program or script for process automation with little time and that is easy to maintain. Avoid data analysis software that has not kept pace with modern requirements.



Extremely quick data processing

nCode Glyph^{XE}™ has an intuitive, graphical interface for creating analytical processes for large volumes of data. It is based on nCode GlyphWorks, a leading tool for special structural durability analysis, and uses this for general signal conditioning tasks – at an attractive price.

Unlike most analysis tools, where the user selects a function which is then applied to a specific data set, with nCode Glyph^{XE}™, you can create a complete end-to-end process by combining predefined functions.

Glyph^{XE} is a natural extension to catman®, for additional analysis after the actual data acquisition and can read the catman® bin-file format. Following data acquisition, Glyph^{XE} can be launched directly from catman®. But it is not restricted to HBM file formats, and can also read MTS® RPC3, NI™ DIAdem, Microsoft® Excel, MathWorks™, MATLAB®, FAMOS and others.



Fig. 1: Synchronizing measurement data with video and GPS data displayed on maps or satellite images

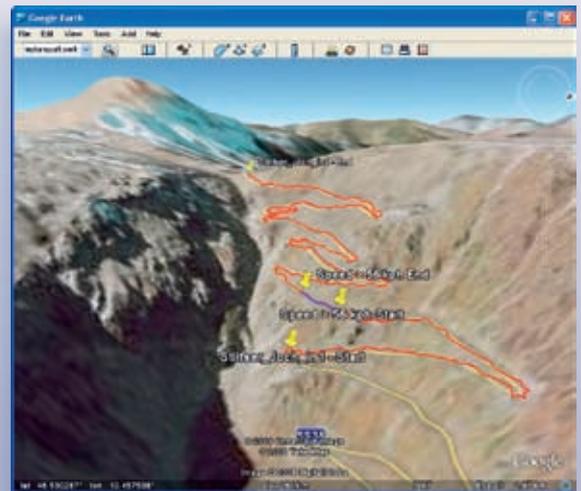


Fig. 2: Direct export to Google Earth whilst retaining defined "feature" ranges

Advantages:

- ___ A clear reduction of the time taken to process test and operational data. The information you need for your decisions is clearly displayed, so you are no longer "drowning" in data.
- ___ Complex analyses for the experts, but easy to operate.
- ___ Processes can be retained for recording existing know-how and for more consistency.
- ___ From raw data straight to the final document results and reports are just a click away to increase productivity.

Additional options:

- ___ Extended DSP with rainflow classification, time-at-level, Markov chains, level-crossing and programming in Python to add user-specific functions or data formats.
- ___ Synchronized display with video displays and special GPS data display for using with satellite images, embedding in Microsoft MapPoint or exporting to Google Earth.
- ___ Noise and vibration with Terz analysis, frequency response, waterfall analysis for rotating machinery and the effect of vibration on people, as per ISO 2631, ISO 5349.

GlyphXE provides special options that depend on the end-user application; the kernel system allows data visualization and reports with analysis functions including statistics, filters (Butterworth and FIT filters), frequency analysis (FFT) and interactive data processing. Thanks to a powerful arithmetic function, new data channels can be calculated from other channels and the innovative method of tracking features allows ranges within the data to be easily identified, for example, within specific GPS coordinates.

Free measurement technology software from the HBM Website

In today's world of Internet applications and downloads, "freeware" has become a business model that everyone can understand. A free, unlicensed version of GlyphXE can be downloaded from the HBM Website. This allows you to visualize the data of all the supported file formats. A trial version of the complete GlyphXE software is also available.

A Quick Start Guide in color gives the first-time user the opportunity to quickly get to know the product. An additional 500 pages of documentation provide details and applications.

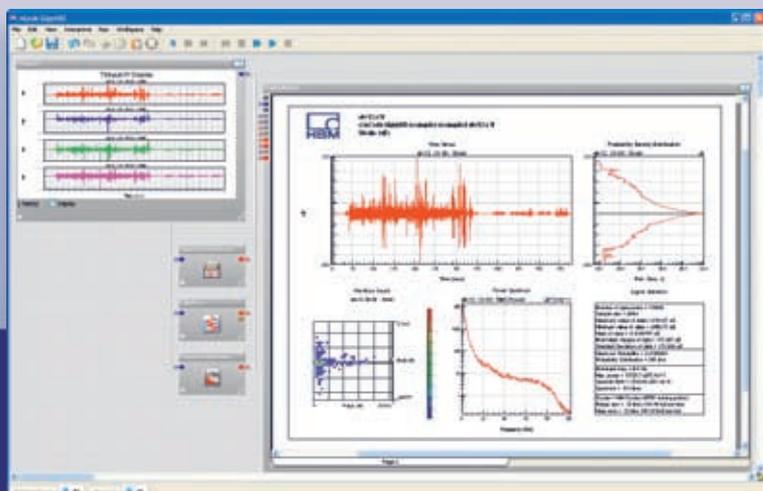


Fig. 3: From raw data straight to the final report in a single, automated process

■ Jon Aldred, HBM

more... www.hbm.com/glyphXE

HBM technology

Introducing SoMat Products

SOMAT[®]

Rugged, Mobile Data Acquisition

Rugged, Mobile Data Acquisition

The HBM SoMat eDAQ is a sealed, stand-alone data acquisition system for testing in the harshest of environments.

The HBM SoMat eDAQ sets the standard for rugged, mobile data acquisition – a sealed stand-alone system for testing in the harshest of environments. The eDAQ is engineered to be rugged and mobile by a team with over 25 years of mobile data acquisition expertise. From this experience comes leading-edge signal conditioning and a capacity to perform a broad range of on-board data processing, triggering, and complex computations.

Rugged

- ___ Sealed systems (IP65)
- ___ Swept sine tested to 98 m/s² (10g)
- ___ -20 °C to 65 °C (-4 °F to 149 °F) temperature specification
- ___ Custom Linux OS
- ___ SIE file format

The term "rugged" can mean many things to different people. For our customers, the meaning could range from: "the instrument (eDAQ) falling off a truck and being dragged by its cables" to "crashing a motorcycle and still being able to upload data". This, of course, is all in a day's work for a system that is swept sine tested to 98 m/s² (10g). The eDAQ is a sealed system – there are no cooling fans, filters, open cards or drives. Our customers are unconcerned when hydraulic hoses rupture and spray oil all over the place, or when wind blows sand everywhere during tests in the desert.

Product testing is an expensive business. And, ruggedness is not just confined to the application aspect – ruggedness can also be equated with reliability. The eDAQ is not built from commercial components; it does not run Microsoft® Windows. It is engineered with proprietary designed layers and specified components for the sole purpose of rugged, mobile data acquisition. The eDAQ has a custom Linux OS and an indestructible SIE file format. The "blue screen and my data is lost" scenario does not happen here!

Mobile

- ___ Designed for vehicle testing
 - Power conditioning for cold starts
 - Input power 10 - 60VDC
- ___ Modular (flexible)
- ___ Ethernet communications
 - Web browser interface
- ___ Supports vehicle bus network and GPS

Few data acquisition systems are truly designed from the ground up to work on mobile equipment. The mobility of an eDAQ is not an afterthought like many other so-called "mobile systems" which are fundamentally laboratory instruments, placed in a rugged housing, and given a different part number. eDAQs are specifically designed for mobile applications; input power for the system operates in a wide range from 10 to 55VDC.



Figures: Rugged, mobile data acquisition in virtually every situation with fast and reliable SoMat eDAQ instrumentation from HBM

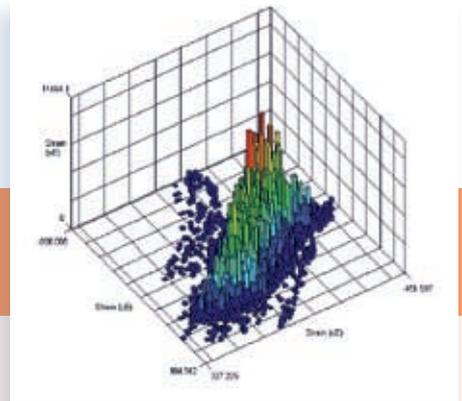


Fig.: Rainflow histogram

Internal back-up batteries protect the eDAQ from unplanned power losses or low voltage events.

The eDAQ leads the way in the correlation of physical data, vehicle bus network, and GPS. Numerous vehicle bus parameters are supported including CAN 2.0B (J1939), J1850 VPW, J1708, and ISO 9141 (KWP 2000). Unlike other data acquisition products, vehicle bus channels (up to 254 per network) do not consume any of the analog input channels. Vehicle bus channel counts are virtually limitless.

The eDAQ utilizes Ethernet communications, and hosts its own web server with a configurable IP. No software is required to start or stop tests, or to upload data. This combination also allows the eDAQ to effortlessly communicate through wireless WWAN modems, bypassing corporate firewalls. You can have access to it anywhere in the world.

Data acquisition

- ___ Testing domain knowledge
- ___ Synchronous data (parallel) and signal conditioning
- ___ SoMat DataModes™
- ___ Advanced computed channels/triggering

Any data logger can collect a time history, however, the eDAQ is not a logger. It is a data acquisition system with a capacity to perform a broad range of on-board data processing. This includes custom-computed channels, triggers, gates, Boolean expressions and SoMat DataModes™. SoMat DataModes™ allows users to save data in multiple, easy-to-manage and analyze formats, which include burst histories, time-at-level, event slice, peak/valley and rainflow histograms. Custom-computed channels can calculate any expression as a separate channel, or as a trigger. Pre-defined computed channels for popular engineering equations such as, anomaly detection, angular velocity, and a state mapper, are also integrated.

When it comes to rugged, mobile data acquisition, nothing gets the job done faster and more reliably than SoMat eDAQ and eDAQlite data acquisition systems. They are built to withstand the most extreme environments at optimal performance levels. With continued development and further enhancements always on the horizon, you are assured to be able to use these systems for years to come. So go ahead, put our expertise to work for you – go anywhere, test anything!

more... www.hbm.com/SoMat



Fig.: The SoMat eDAQ system can be perfectly adapted to every rugged, mobile data acquisition task.



QUANTUMX – the modular product family for recording data for

Increased efficiency in testing, verification and measure



Transducer



XXL hardware

Time is money

With QuantumX, the innovative data acquisition system from HBM, your measurement projects are in the fast lane. Achieve a meaningful result more quickly – without cutting back on accuracy and reliability. QuantumX generates real added value in data acquisition.

For measuring physical quantities: Connect. Measure. Analyze.

QuantumX can acquire data from a wide variety of transducer types, in numerous combinations regardless of how specific your measurement task is. Thanks to its modular structure and numerous interfaces, QuantumX is the first choice for either distributed or centralized data acquisition.

With such flexibility the options range from just a few to several hundred measurement channels with synchronized timing for recording all the channels. The popular Ethernet technology is used for the data and communications interface.

		Full-bridge and half-bridge strain gages
		Inductive full and half bridge
		LVDT
		Piezoelectric transducers (current-fed, resistive)
		Thermocouples (types K, J, S, T, R, E, N, B)
		Resistance thermometers, e.g. PT100, PT1000
		Frequency and pulse counting, SSI, PWM
		Voltage
		Current
		CANbus

mechanical, thermal and electrical quantities!

HBM innovations

ment



XXL software

QuantumX – the modular system with numerous options

For metrological applications, it is usually an advantage for measured values to be digitized close to the measuring point. This requires distributed modules, with a bus link.

Each QuantumX module is supported by two interfaces; Firewire for synchronization and data transport and Ethernet TCP/IP for data transport. This allows up to 24 synchronized modules to run in a sub-system. Several sub-systems can be combined to make a larger system, which can be connected to a PC or in real time, to an automation system. These two connections can also be applied in parallel.

The connection to an automation system is made via an appropriate gateway with a fieldbus interface, such as the Ethernet-based EtherCAT fieldbus.

The system is used in test stations for functional, system or performance testing, in process measurement technology, in the laboratory, for service life tests, long-term monitoring, approval testing and qualifications for temperature tests and also for signal conditioning.

QuantumX – fields of application:

- ___ Transport (aircraft, aviation, railway, marine)
- ___ Energy (hydroelectric and wind power stations)
- ___ Machinery (injection molding machines, hydraulic presses, etc.)
- ___ Environmental engineering
- ___ Industrial processes
- ___ Structural engineering / construction
- ___ Research and development

HBM provides the complete measuring chain and the requisite tools for quickly finding a solution, as well as offering an extensive range of service-oriented pre-sales and after-sales products.

■ *Christof Salcher, HBM*

more... www.hbm.com/QuantumX



Experimental stress analysis

TÜV SÜD Rail: With QuantumX on the tracks of the Glacier Express

On behalf of the Rhätische Bahn railway company, TÜV SÜD Rail is carrying out stress tests on low-floor auto transporters at an altitude of more than 1000 m. In the Swiss canton of Graubünden, auto carrying trains travel through the 20 kilometer long Vereina tunnel, where safety is the top priority.

TÜV SÜD Rail brings safety back on track...

TÜV SÜD Rail offers its services to the railway industry throughout Europe. The railcars and their components are tested under different conditions on the test bench, on measurement runs or during scheduled operation. HBM helps out with devices to measure, process and evaluate the physical quantities.

... with QuantumX in its luggage.

Because the requirements were complex, total reliance was placed on QuantumX. The universal data acquisition instrument from HBM allows precision measurement, even under conditions that are difficult for the measuring train, because there is not enough room for the measurement technology on, beside or below the railcar. The railcar to be measured is located in the middle of the

train, whereas the measuring personnel stayed in a control car. Approximately 100 channels, a sampling rate of 1200Hz and measuring periods of 20-30 minutes are responsible for the high amount of data, with more than 500 MB per measurement.

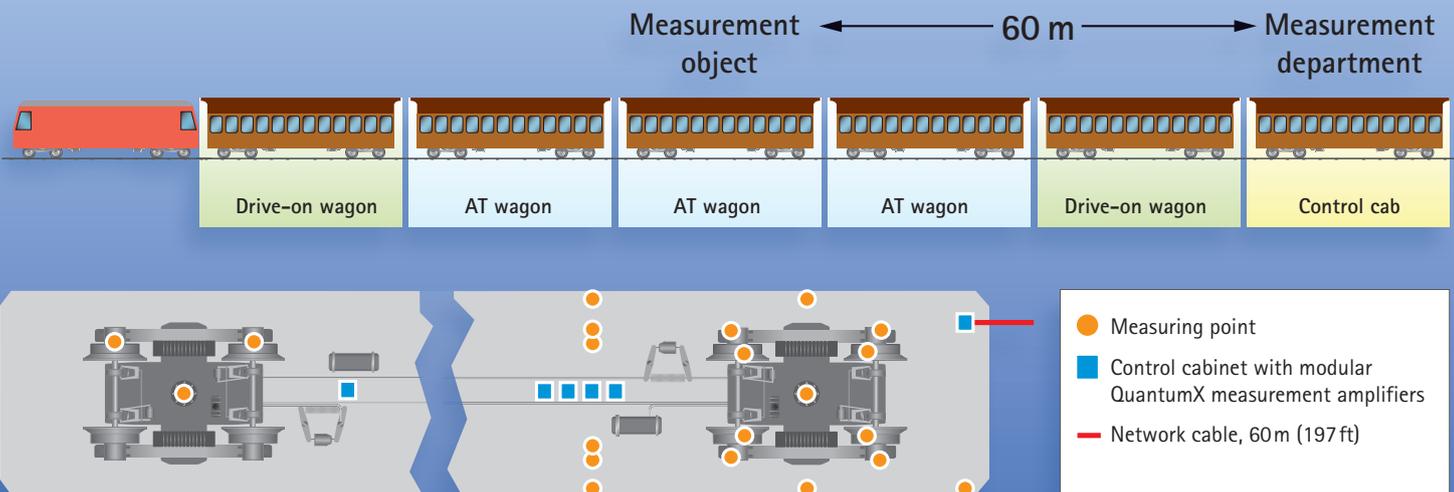
QuantumX makes measurements possible in the first place!

Under these conditions, it was not possible to use existing measurement technology with its large amplifiers and long and complicated cable runs. So a new system had to be found to provide not only A/D conversion, but also to feed the sensors and filter the signals – and it also had to fit under the low-floor railcar. The solution was QuantumX.

more... www.hbm.com/QuantumX



Fig. 1: The QuantumX control cabinet



- Measuring point
- Control cabinet with modular QuantumX measurement amplifiers
- Network cable, 60m (197ft)

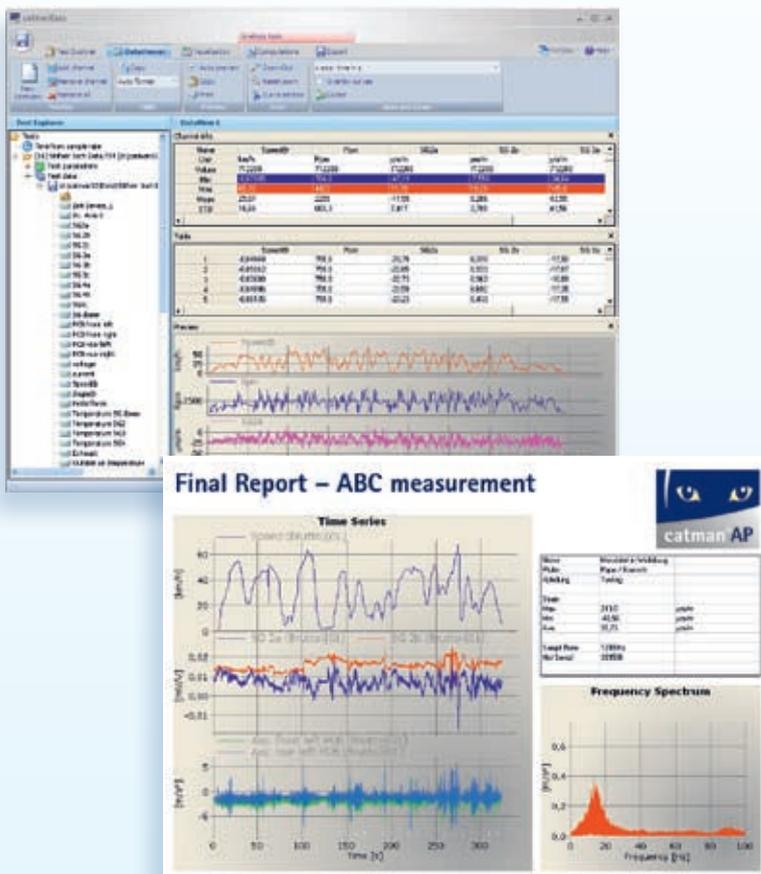
Fig. 2: The arrangement of the strain gage measuring points underneath the railcar



With a fresh look & feel:

catman®AP – the complete solution for measurement engineers

With catman®AP, HBM provides measurement engineers with a complete package for their metrological tasks. These range from measurement preparation to visualization, analysis and reporting, to the individualized automation of complete test sequences.



Version 3.0 has a striking new look, also called the ribbon style. Similar to the new Microsoft style, this development has also been implemented in catman®AP 3.0. With the emphasis placed on task-orientation and with fast navigation through the main functions, the ribbon style user interface is intuitive and easy to use.

catman®AP 3.0 has some totally new functions:

- A channel check module checks the MGCplus amplifier by means of internal reference values and the transducer connection through the internal or external shunt resistance. The results can be displayed and documented before measurement.
- Realization of measured values across the angle with a polar diagram or visualization of the frequency spectrum with a live FFT display.
- The DataView gives a fast overview of the measurement data in a table and a graphic, as well as summarized by a few statistical characteristic quantities and traceability data.

As well as the complete catman®AP package, there is still its basic version, catman®Easy, which focuses on data capture and display. Test versions can be downloaded from the HBM Website under Support and Services.

Jens Boersch, HBM [more... www.hbm.com/catman](http://www.hbm.com/catman)

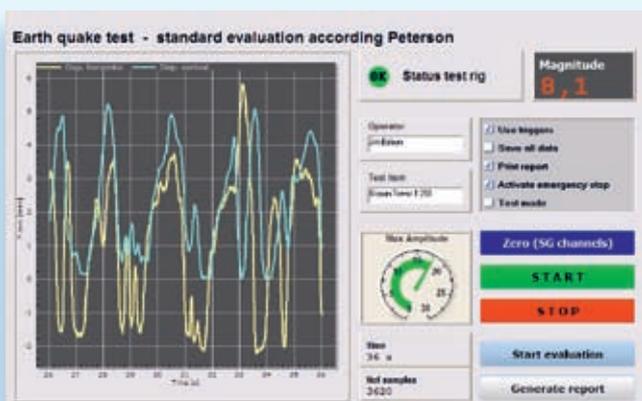


Fig. 1-3: DataView and ribbon style, reporting, screenshot panel – automated test sequence

Experimental stress analysis

Underwater strain measurement

The energy adventure – transcending boundaries

A continually increasing energy requirement and climate change are the challenges of the developing millennium! Making use of alternative energy sources has a prominent part to play.

As suitable areas of land become ever scarcer, wind power stations are even being installed out to sea. These include the first German offshore wind park "alpha ventus" (www.alpha-ventus.de), which is located close to the FINO1 research platform near Borkum in the North Sea.

HBM had developed special covering agents for underwater strain measurement for the FINO1 project in 2003. The strain gage measuring points and MGCplus amplifier provided important data about the behavior of the sand-based steel structures.

OGOWin – with electrical and fiber-optic strain gages from HBM

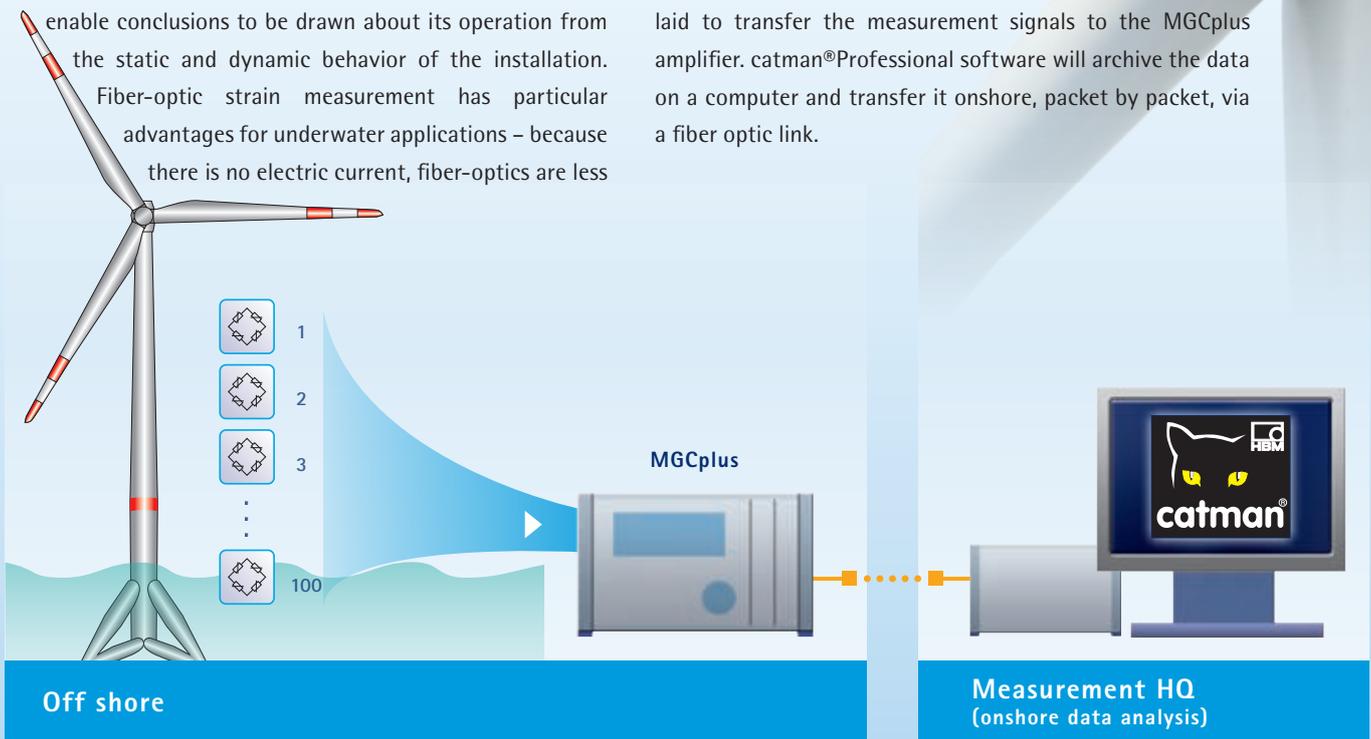
In autumn 2008, we reported on the OGOWin project in our newsletter (www.hbm.com/newsletter). Electrical and fiber-optic strain gages from HBM were used on the prototype of a 5MW installation (jacket structure) in Bremerhaven, to enable conclusions to be drawn about its operation from the static and dynamic behavior of the installation. Fiber-optic strain measurement has particular advantages for underwater applications – because there is no electric current, fiber-optics are less

susceptible to water and as many as 12 strain measurements can be integrated in one supply cable. The combination of electrical and fiber-optic strain gages on one structure allows the two technologies to be compared.

Wind energy system for RAVE with HBM technology

In another project (RAVE), HBM fitted a wind energy system (tripod) with these technologies on behalf of the German Wind Energy Institute in Wilhelmshaven (DEWI), to collect field data on a system based at a depth of a mere 30 meters.

At the Aker dock near Trondheim in Norway, it was full speed ahead with the final assembly of the tripod, as the HBM / DEWI service team laid several kilometers of cable and installed almost 100 strain gages in four weeks. The "cabled" colossus and five similarly designed constructions will officially open at the end of the winter. Hundreds more cables are being laid to transfer the measurement signals to the MGCplus amplifier. catman®Professional software will archive the data on a computer and transfer it onshore, packet by packet, via a fiber optic link.



Off shore

Measurement HQ
(onshore data analysis)

Fig.:
Horizontal tripod design



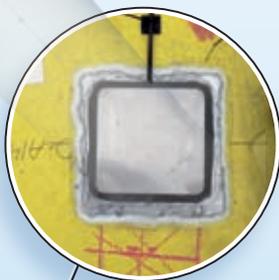
By continuous monitoring from onshore, HBM know-how is helping to assess the loading and ageing of the construction, to optimize maintenance intervals.

New challenges lie ahead

Engineering will be going to the limit of the technology as there is the possibility of wings 90 meters long and steel structures weighing 1,000 tons. Compare this with an Airbus A380 that is about 72 meters long and weighs 280 tons when empty. In spring 2009, HBM measurement technology will monitor a floating wind energy system and in summer, its use is planned on a tidal power station.

■ Jens Kühne, HBM

more... www.hbm.com/stressanalysis



Experimental stress analysis



Tunnel monitoring with QuantumX and catman®Script in the Aescher tunnel in Switzerland



Measurement activation initializes the measuring instruments and starts the measurement process.

The monitoring of structures makes an important contribution to their reliability. Differing demands are placed on the measurement system to ensure optimum monitoring. In the application shown here, a tunnel in Switzerland is being monitored at a low sampling rate. But despite this, it should also be possible to track the on-screen measurement online.

system made up of QuantumX modules and a catman®Script. The Script not only allows the individual measurement points in the tunnel ceiling to measure but also to be displayed, as well as a real-time display in a y(t) diagram. During continuous monitoring, a maximum, minimum and average value are stored every 24 hours.

■ Johannes Mattes and Michael Stahlecker, HBM

more... www.hbm.com/QuantumX

Application and requirements

When monitoring the structure of tunnels, bridges and buildings, it is usually a matter of detecting changes in construction that could become more pronounced over time. If these are noticed early enough, cost can be saved with suitable countermeasures. In the Aescher tunnel near Zurich, this type of monitoring is applied with a measurement



Fig.: East portal of the Aescher tunnel at the Zurich West fork

New products

CMD600 – the new digital charge amplifier

An addition to the piezoelectric family

Piezoelectric sensors are used in many areas of research and manufacturing, because they are small, robust and have a high dynamic response to measurement.

New functionality...

The CMD600 electric charge amplifier from HBM can be used for piezoelectric sensors up to a maximum 600,000 pC (picocoulombs) and a measuring bandwidth of up to 20kHz. The input measuring range is freely scalable and small signals are represented at a high resolution without loss of quality.

This has the advantage that piezoelectric sensors with several measuring ranges can also be used for small forces. The high overload benefits mechanical reliability and increases service life. An overload is indicated by a digital output and an LED.

Operating concept...

The new CMD600 charge amplifier has an Ethernet interface for parameterizing and visualizing the devices found in the network. There is also CMD Assistant software for remote maintenance. Measured values can be recorded over a long time.

If no PC is available, the amplifier can be fully scaled via a digital input, either by applying a load or from teach-in operation, when running through a measurement cycle. In addition to this, an integrated TEDS chip can store all the sensor settings. This allows downstream amplifiers to be quickly parameterized and shortens the installation time.



■ Michael Guckes, HBM

more... www.hbm.com/PACeline

Experimental stress analysis

Strain gages in electronics production

Stress in the PCB

In electronics production, PCBs are becoming increasingly complex and more densely populated. Mechanical stresses, such as those that occur during populating or further processing, can damage the electronic components.

So limits are often specified for mechanical loadings such as strain or mechanical stress. For unpopulated PCBs, these are around 850 µm/m; for populated PCBs, around 450 µm/m. These mechanical stresses can be directly measured with strain gages glued directly to the PCB, such as the strain gages of the Y series – LY4 in linear form and RY9 in rosette form. The new micro strain gages with their tiny dimensions of a mere 1.2 mm x 2 mm,

are particularly suitable for this. Spider8 or MGCplus are suitable amplifiers for this work with the data recorded by catman® software.

Measurements can be taken during depanelization, plug assembly, in-circuit testing, PCB installation and even at high temperatures in a solder bath.

■ Dirk Eberlein, HBM

more... www.hbm.com/stressanalysis

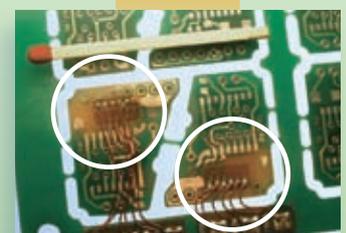


Fig.: With strain gages, it is possible to detect stresses that are too high during PCB assembly

HBM technology

Force transducers for extreme temperatures

Fire and ice

High temperatures, icy cold, moisture and humidity – the ambient conditions demand a lot from force transducers. HBM force transducers have proved most reliable in a wide variety of applications, even in rough conditions like these. At high temperatures, C2 force transducers are recommended for compressive forces and U2B force transducers for measuring tensile and compressive forces. Special versions are also available that can survive +120 °C unharmed. With a nominal (rated) temperature range of -40 °C to +120 °C, the new piezoelectric CFT force transducers and CFW force washers in the HBM product program are ideal for hot and cold applications.

■ Thomas Kleckers, HBM

more... www.hbm.com/PACEline



Fig. 1:
C2 and U2B force transducers



Fig. 2: CFW force washers and CFT force transducers

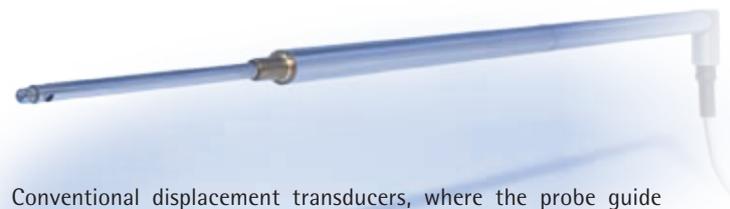
HBM technology

The low-temperature displacement transducer from the WA series

Cool performer

Displacement transducers from the WA series

A renowned supplier of high-performance brake cables to the automotive industry subjects its products to extensive long-term testing over a period of two to three months. Brake cables are exposed to extreme changes in temperature from -40 °C to 120 °C in a climatic chamber. The alternating load frequency is 10 load cycles/min. Displacement transducers from HBM record the possible changes in length, which must not exceed certain tolerances.



Conventional displacement transducers, where the probe guide mechanism is lubricated with oil, break down under these extreme conditions, as the oil becomes increasingly thick at extremely low temperatures. Because the feeler rod has such a high-quality finish and the material of the guide mechanism is particularly suitable, the low-temperature displacement transducers of the WA series do not require lubrication. Numerous practical tests have shown that there is no loss of ability with the WA series to cope with alternating loads.

■ Markus Haller, HBM

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Quality control

Testing switching devices with **EASYswitch**

Quality you can measure thanks to HBM's complete solution

Light switches and switching devices of control and safety engineering must function properly over a long periods of time. This is why checks are made during production to ensure perfect operation and perfect quality. Ease of operation is an additional inspection characteristic for manually operated switches.

These are just the functional characteristics that can be checked and documented with HBM's EASYswitch checking device both in the test laboratory, and later, during production.

The HBM system comprises a piezoelectric PACEline sensor with overload capability, that can detect minimal operating forces. The signals are converted by a charge amplifier and evaluated by the EASYswitch process controller. Both the actuating forces

and the electrical functions of the switching device are measured and evaluated.

HBM's INDUSTRYmonitor software is used for visualization. This allows all the ongoing processes and operating parameters to be displayed and stored on a PC. Because of its user management, INDUSTRYmonitor can be used not only in production, but also for commissioning and system diagnosis, which assures later quality control and traceability. The entire plant is controlled

by a PLC. The TCP/IP protocol, which can run on the Profinet interface of the control system, is used for synchronization with the EASYswitch process controller. This also allows the implementation of a modern, factory-wide network.

■ Michael Guckes, HBM

more... www.hbm.com/production



HBM technology

T40 – torque flange

T40

The value-for-money all-rounder:

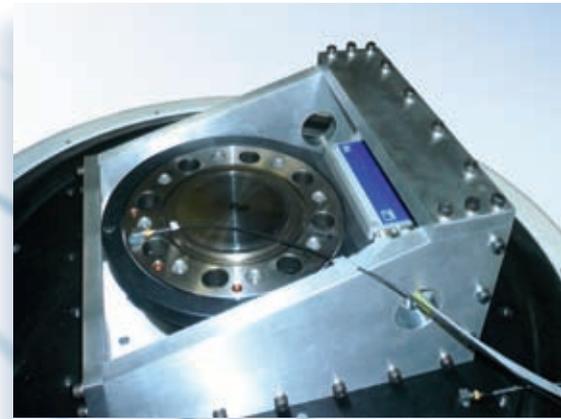
now also with nominal (rated) torques of 5 kN·m and 10 kN·m

Industrial indications are that robust, low-priced torque flanges, especially for engine, transmission and roll test benches, will be needed for the foreseeable future. The new T40 is now available in six nominal (rated) torques, between 500 N·m and 10 kN·m for up to 20,000 min⁻¹.

The T40 sets new yardsticks in torque measurement and guarantees high precision and reproducibility of measurement results in test benches. It is also vastly more robust, and can tolerate acceleration of more than 35g in the frequency range up to 2,000 Hz without damage.

The TIM40 torque interface module supplements the T40, to parameterize measurement signals and integrate them in different fieldbus systems via Anybus® modules. As a standalone transducer, the T40 is suitable for all-round applications.

■ Rainer Schicker, HBM



T40 torque flange in vibration investigations



T40 torque flange with the TIM 40 torque interface module

www.hbm.com/torque



Experimental stress analysis

CANHEADdirect – The new PC communication mod

Save costs and capture data directly at the measuring point

CANHEADdirect enables up to five distributed CANHEAD® amplifiers to be cost-efficiently connected to the PC via USB. The 10-channel CANHEAD® amplifiers capture data directly at the measuring point. Short cables make installation easy and save cost and time.

Versatile principles of measurement

- ___ Single strain gages (SG) in 3- or 4-wire configuration provide cable effect compensation
- ___ Strain gage full and half bridge transducers
- ___ Immunity to external interference and noise thanks to carrier frequency technology
- ___ Measurement of ± 10 V DC voltage sources.

The CANHEADdirect system

- ___ Transducer connection to the 10-channel CANHEAD® amplifier by clamp connections or RJ45 plug (CB1016)
- ___ Linking of 5 CANHEAD® amplifiers to CANHEADdirect by one line
- ___ Data transmission, power supply and synchronization via CANbus
- ___ CANHEADdirect connection to the PC via USB
- ___ Measuring system can be up to 250 m long
- ___ Max. sampling rate of 300 Hz/channel (depending on the number of CANHEAD® modules)
- ___ Synchronous and simultaneous measurement of all channels.

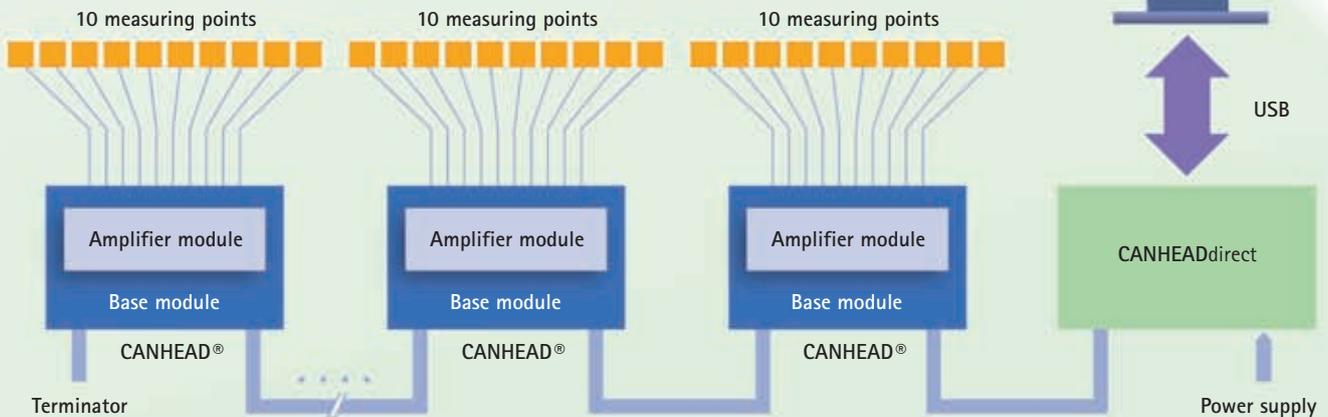


Fig.: System configuration of CANHEAD® amplifier and CANHEADdirect communication module

Module for CANHEAD® amplifiers



The CANHEAD direct module

- ___ Connection to the PC via USB
- ___ Voltage feed of CANHEAD® line via external power supply
- ___ LEDs for function check
- ___ CAN-to-USB conversion
- ___ Driver software and example programs including documentation available on CD.

Fields of application

- ___ Experimental structural and stress analysis
- ___ Data acquisition on small- and medium-scale mechanical structures
- ___ Function tests with different measurement quantities.

Control / Data analysis

- ___ Acquisition and evaluation of measurement data using catman®/Windows XP and Vista analysis software
- ___ Support and documentation for integrating customized programs.

■ Marc Zürn, HBM

[more ...](#)

www.hbm.com/CANHEAD

Amplifier module for 10 measuring points	Base module for 10 measuring points				Communication module
CA1030	CB1014	CB1015	CB1016	CB1010	CANHEAD direct
<ul style="list-style-type: none"> - Separate A/D converter for each channel - Interference-immune 600Hz carrier frequency - Excitation voltage for SGs 	<ul style="list-style-type: none"> Single SGs in 3-wire configuration Cost-efficient for stable measurement environments - Integrated completion resistors; 120Ω, 350Ω, 700Ω, 1000Ω options - Additional measurement channel for temperature compensation - Shunt calibration with internal or external shunt resistor 	<ul style="list-style-type: none"> Single SGs in 4-wire configuration Reliable, for measurement environments with difficult temperature conditions thanks to full compensation of cable effects 	<ul style="list-style-type: none"> Single SGs in 4-wire configuration - Wiring by RJ45 plug - Compensation of cable effects - For difficult temperature conditions - Easy connection 	<ul style="list-style-type: none"> • SG full bridges • SG half bridges • ± 10V DC voltage sources - Transducer type selectable for each channel - RJ45 plug for easy transducer connection 	<div style="text-align: right; font-weight: bold; color: white; background-color: #e91e63; padding: 2px;">NEW</div> <ul style="list-style-type: none"> - Interface for CAN-USB data transmission - Up to 5 CANHEADs can be connected - Current supply by external power supply unit

Fig.: Characteristics of CANHEAD® amplifier and CANHEADdirect communication module

HBM seminars

HBM Application and Training Center

Have you seen it yet?

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academy

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You are also invited to watch and play in our showroom, which is rather like a science museum. There are metrological applications of every kind for you to grasp in the truest sense of the word, as well as sometimes spectacular videos of examples from real life.

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Just speak to one of our sales team or contact us direct at:

Email: hbm-academy@hbm.com

The perfect mix of sound basic know-how and practical training is the trademark of the HBM Academy.

All HBM Academy seminars and workshops take place in our new Application and Training Center in Darmstadt.

■ Thomas Hesse and Angela Bäümel, HBM

[more ...](#)

www.hbm.com/academy



Fig. 2: Instrumentation and solutions are explained and measurements carried out by technical experts



Fig. 1: The new HBM showroom in Darmstadt: Ample space for visitors and state-of-the-art measuring equipment

HBM technology

catman®Enterprise 5.0

Simultaneous data acquisition of up to 20,000 channels

HBM has launched version 5.0 of its catman®Enterprise measurement software for structural analysis of large-scale measurement systems since up to 20,000 channels can be acquired simultaneously. Supporting simultaneous acquisition of up to 20,000 channels, the catman®Enterprise v5.0 is suited for use in structural analysis of large-scale measurement systems. Functionality accelerates the process of setting up measurements, and testing of any strain gage measuring points can be automated for optimal efficiency. In addition to trigger functions for actions as well as notifications, software features open architecture that supports integration of customized functions.

See all benefits in HBM's new catman®Enterprise video at...
www.hbm.com/catman



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