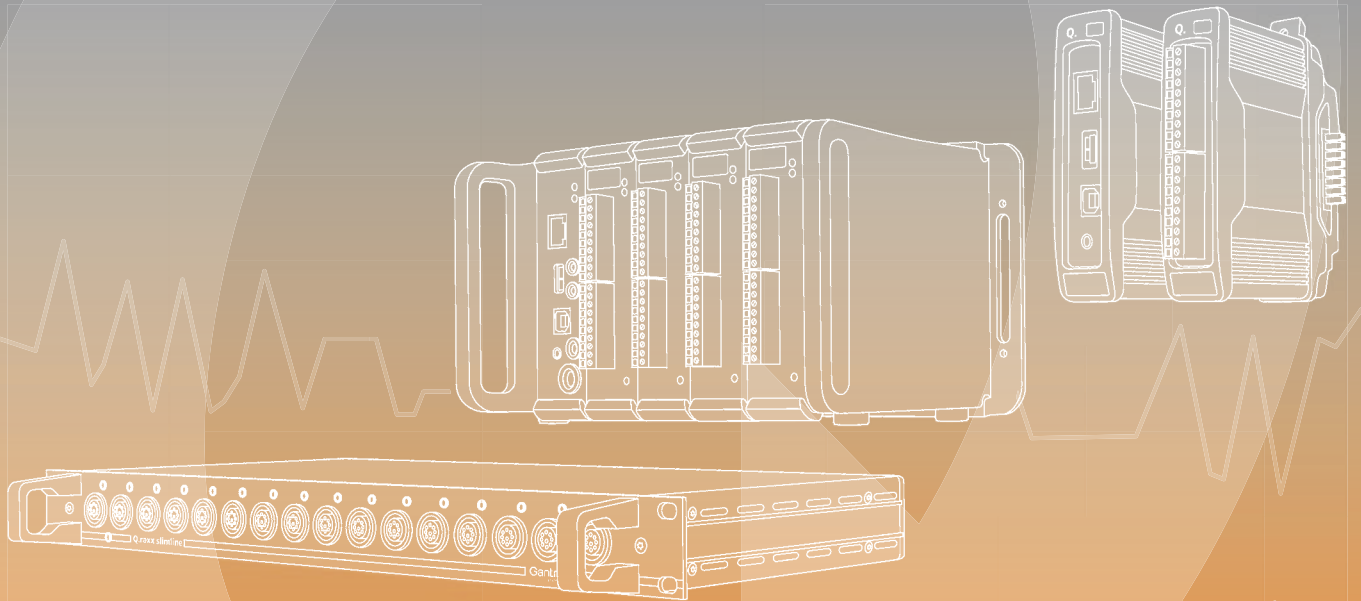


Q.series



ONE INNOVATIVE TECHNOLOGY

Intelligent Solutions for
Measurement and Test Automation

Gantner Instruments – You can count on:

TRADITION AND INNOVATION

Founded by Wilhelm Gantner in 1982, Gantner Instruments is a leader in flexible and distributed measurement and I/O systems. As a pioneer in industrial fieldbus I/O, Gantner Instruments has been delivering innovative I/O solutions for almost 30 years, including the introduction of one of the industry's first Profibus I/O modules (the ISM01) in 1988.

EXPERIENCE AND COMPETENCE

Gantner Instruments is the leader in the acquisition of electrical, thermal and mechanical quantities. You will find our know how in all of our products and services. While our products exhibit high performance and flexibility they remain simple to operate and easy to understand, even in complex applications.

QUALITY AND RELIABILITY

Every Gantner product is designed and built to provide high precision and reliable operation in the most extreme industrial environments. High temperatures and EMC conditions are no problem for us. Our products are manufactured to EN ISO 9001 standards and have an average MTBF (Mean Time Between Failure) of over 20 years.

PRICE AND PERFORMANCE

All Gantner products provide an excellent price to performance ratio. Nowhere else you find more value for the money. First class products with a scalable, modular structure that is built for the future. With Gantner Instruments your investment is safe.

FAIRNESS AND SERVICE

Customers are our partners. We are glad to be working for you. We provide extensive consultation before purchase, practical support during installation, and direct and flexible service for the life of the system. We will work with you to satisfy all your unique system requirements.

Photo: Friedrich Böhlinger

Q.series – The Next Generation in Performance Measurement

INNOVATION IS OUR GOAL

The Q.series has been designed for the high speed, high accuracy measurements found in today's most demanding performance testing environments. The scalability of product range makes it the ideal choice – whether using a single setup for stand alone control or several hundred modules in a large distributed and synchronized measurement system, in the following application areas:

- **Component Testing**
- **Engine Testing**
- **Process Performance Testing**
- **Structural Monitoring**

Data exchange between the measurement modules, the controller, and the automation system can be accomplished in a number of different ways from a simple serial interface (e.g. Modbus), Ethernet TCP/IP or UDP, or a number of industrial fieldbus systems (e.g. EtherCAT, Profibus DP).

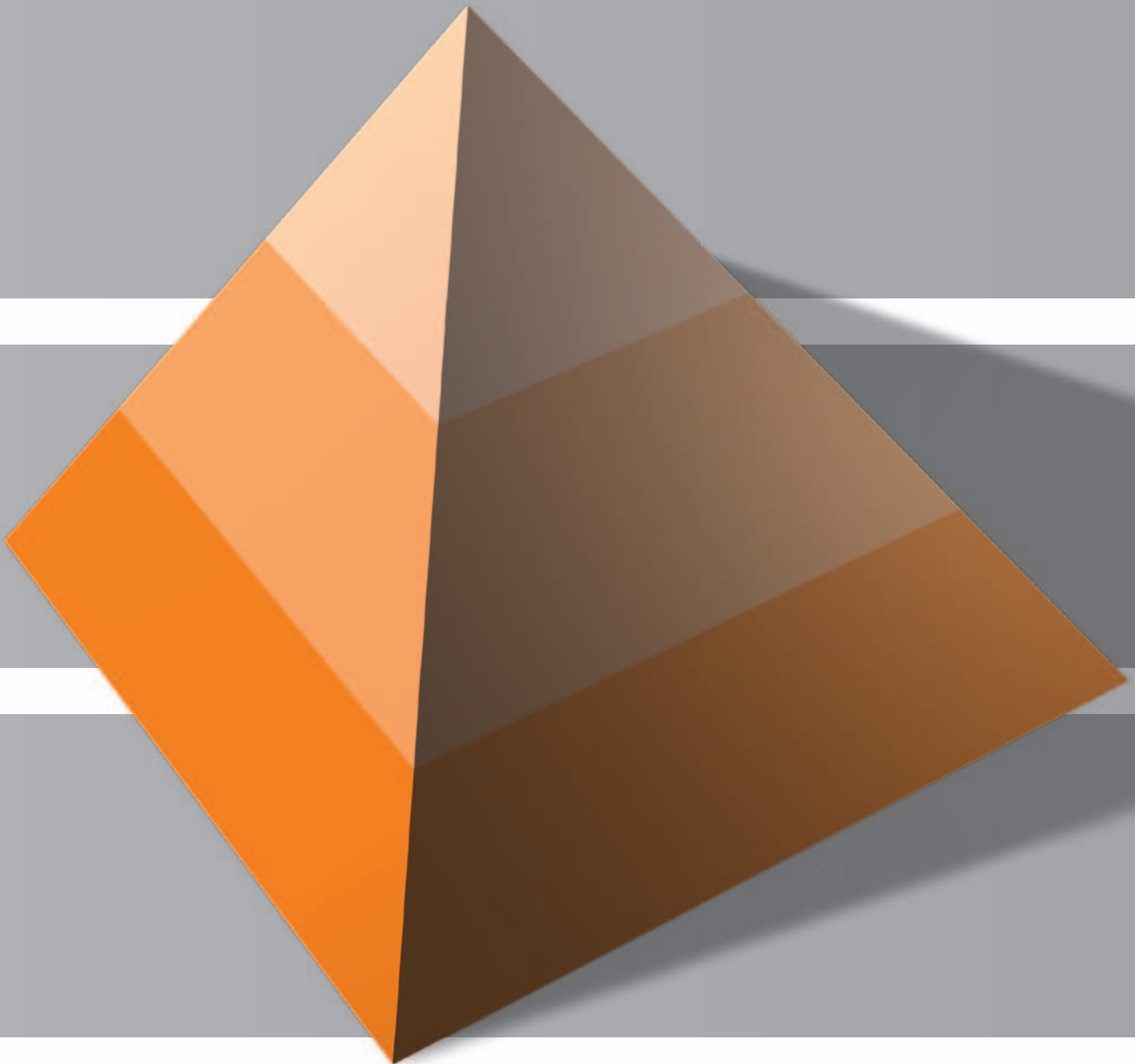
The flexibility of this approach ensures that the Q.series will always be able to adapt to current and future communication interface requirements.

The modular concept of the Q.series allows the design of a system that exactly meets the needs of the application at hand. Q.series modules can be selected based on individual sensor measurement requirements including acquisition rate (from 100 Hz to 100 kHz per channel), input/output type (dedicated, universal, multifunction, etc.). All Q.bloxx and Q.brixx modules are 'Hot Swappable' with auto-loading configurations and addressing, making system scalability and serviceability extremely efficient and effective – at system start up or several years down the road.



Q.series

SIGNAL ACQUISITION, SIGNAL CONDITIONING, DATA TRANSFER

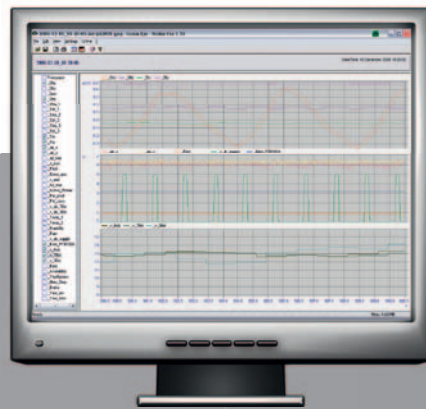


Gantner Instruments specializes in the acquisition of electrical, thermal, and mechanical quantities.

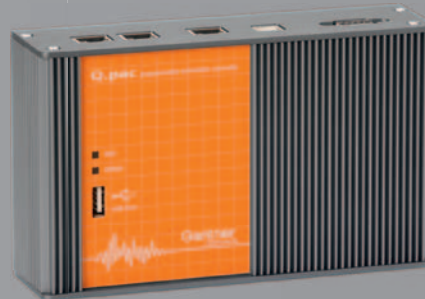
The measurement modules and Test Controllers of the Q.series product family offer an optimal signal acquisition and processing solution on all levels.

All Gantner products are:

- **Dynamic**
- **Precise**
- **Flexible**
- **Durable**
- **Reliable**



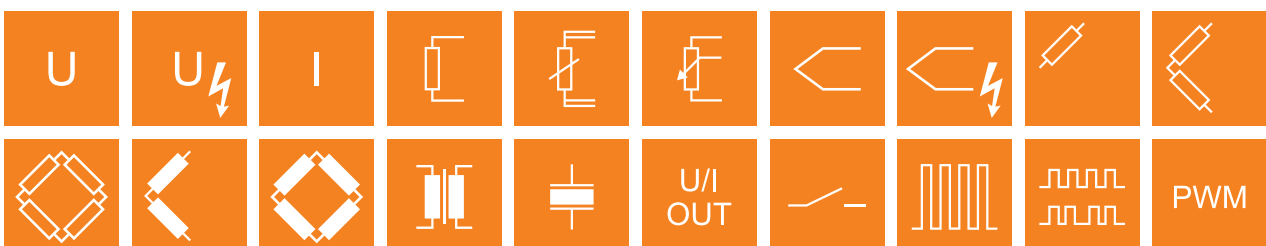
HOST LEVEL



CONTROLLER
LEVEL



MEASUREMENT
AND I/O LEVEL



Q.series

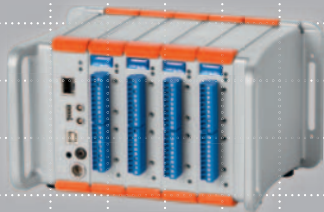
THE MEASUREMENT AND I/O LEVEL

Our innovative Q.series system is available with various types of housings. The technical data for the individual assemblies is therefore identical. For users this offers the advantage that various housing shapes can be mixed with one another; for example, the Q.brixx for mobile measurement and Q.bloxx on a test bench or Q.staxx in a

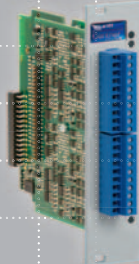
Q.series Hardware Design



Q.bloxx Module



Q.brixx Module



Q.raxx 19" System (3U)



Q.raxx slimline 19" System (1U)



Q.staxx Pallet Handling System

	Functionality	A101	A102	A103	A104	A106
Hardware Design	Q.bloxx	■	■	■	■	■
	Q.brixx	■	■		■	■
	Q.raxx	■	■		■	■
	Q.raxx slimline	■			■	■
	Q.staxx				■	
	INPUT TYPES					
U	Voltage	■	■	■	■	
U _⚡	Voltage (1.2 kV isolation)					
U _⚡	Voltage (range up to 1.2 kV)					
I	Current	■	■	■		
□	Resistance	■				
□	Potentiometer	■				
□	Pt100, Pt1000	■				
⏏	Thermocouple	■			■	
⏏⚡	Thermocouple (1.2 kV isolation)					
⬠	Full Half and Quarter Bridges	■	■			■
⬠	Inductive Full and Half Bridges					■
⏏	LVDT					■
⏏	IEPE/ICP Sensor	■	■			
⏏	Frequency Signal (up to 2 MHz)					
⏏	Pulse Width					
⏏	Counter					
⏏	Time					
⏏	Status	■	■	■		■
	OUTPUT SIGNAL					
U	Voltage		■			■
I	Current		■			■
⏏	Frequency Signal					
⏏	Pulse Width					
⏏	Status	■	■	■		■
	NUMBER OF CHANNELS	2	1	8	8	2
	DATA RATES (HZ)	100 k	100 k	100	100	10 k

test room and Q.raxx slimline in a switch cabinet. This also makes it possible to configure all versions using one single software package and to copy and transfer configurations. The data can also be transferred using the same interface and processed with the same DAQ software.

The functions of a unit (Q.bloxx module, Q.brixx cassette or Q.raxx plug-in unit) are described below for all systems in common without fixed assignment. For example the A104 offers 8 galvanically isolated inputs for thermocouples regardless of the housing shape.

- Galvanic isolation on each channel, low susceptibility to electromagnetic interferences
- Operating temperature range of -20 to +60 °C
- Supply 10...30 VDC, consumption 2 W per module

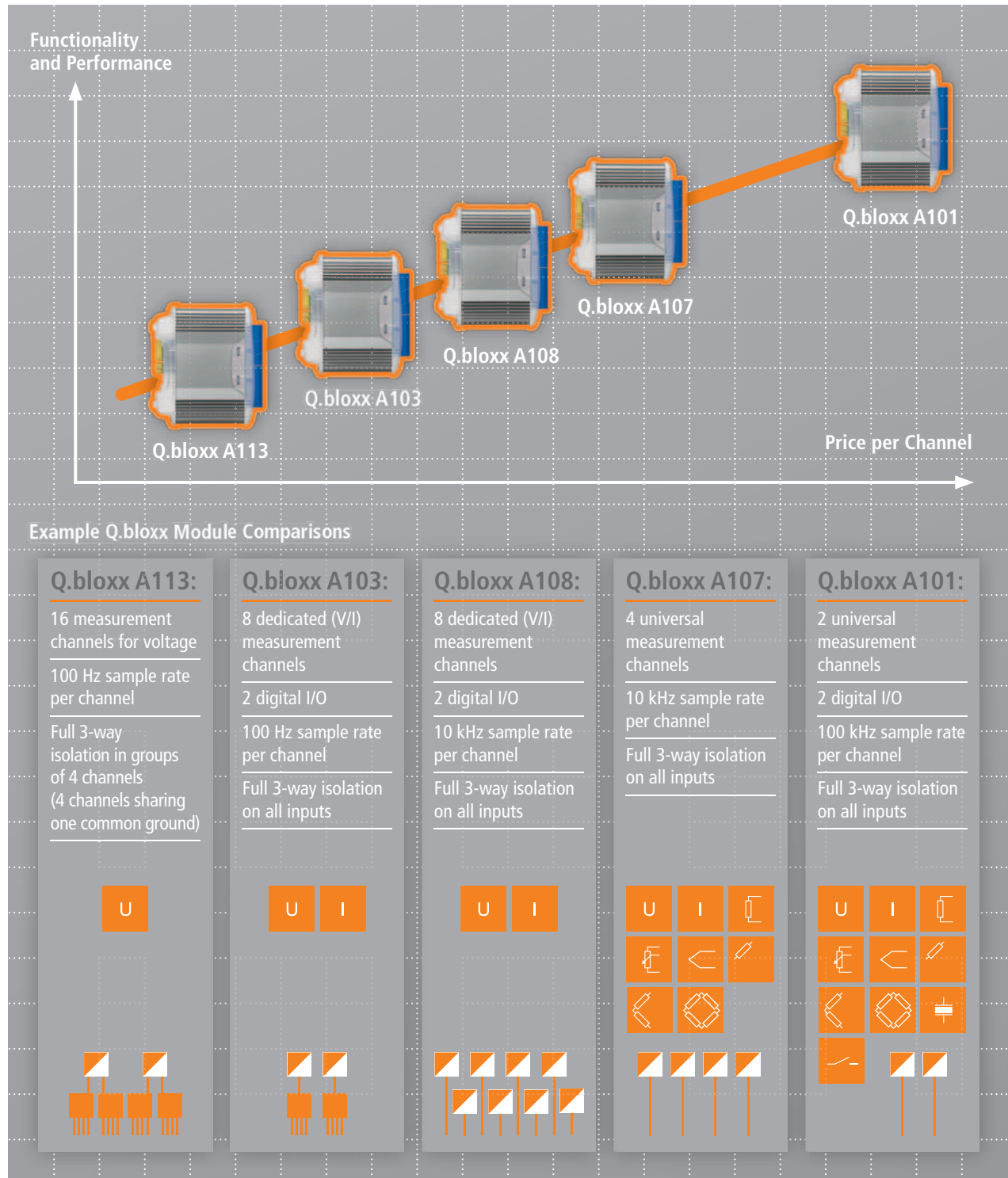
A107	A108	A109	A113	A114	A119	A123	A124	A128	D101	D104	D105
■	■	■	■	■	■	■	■	■	■	■	■
■	■	■				■	■	■	■	■	■
■	■	■				■	■	■	■	■	■
■	■								■		
■	■	■							■	■	■
■	■		■	■							
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		■							■		
		■							■		
	■	■							■		■
4	8	4	16	16	8	4	4	4/2	8	16	16
10 k	10 k	100 k	100	100	100 k	10 k	100	50/100 k	10 k	10 k	10 k

Q.series

THE MEASUREMENT AND I/O LEVEL

Modular approach allows both flexibility and cost efficiency

The wide range of modules available in the Q.series allows the user to design a system optimized for the specific application requirements. From the high performance A101 to the high density A113, each module in the family is designed to provide the best price-performance-ratio available.

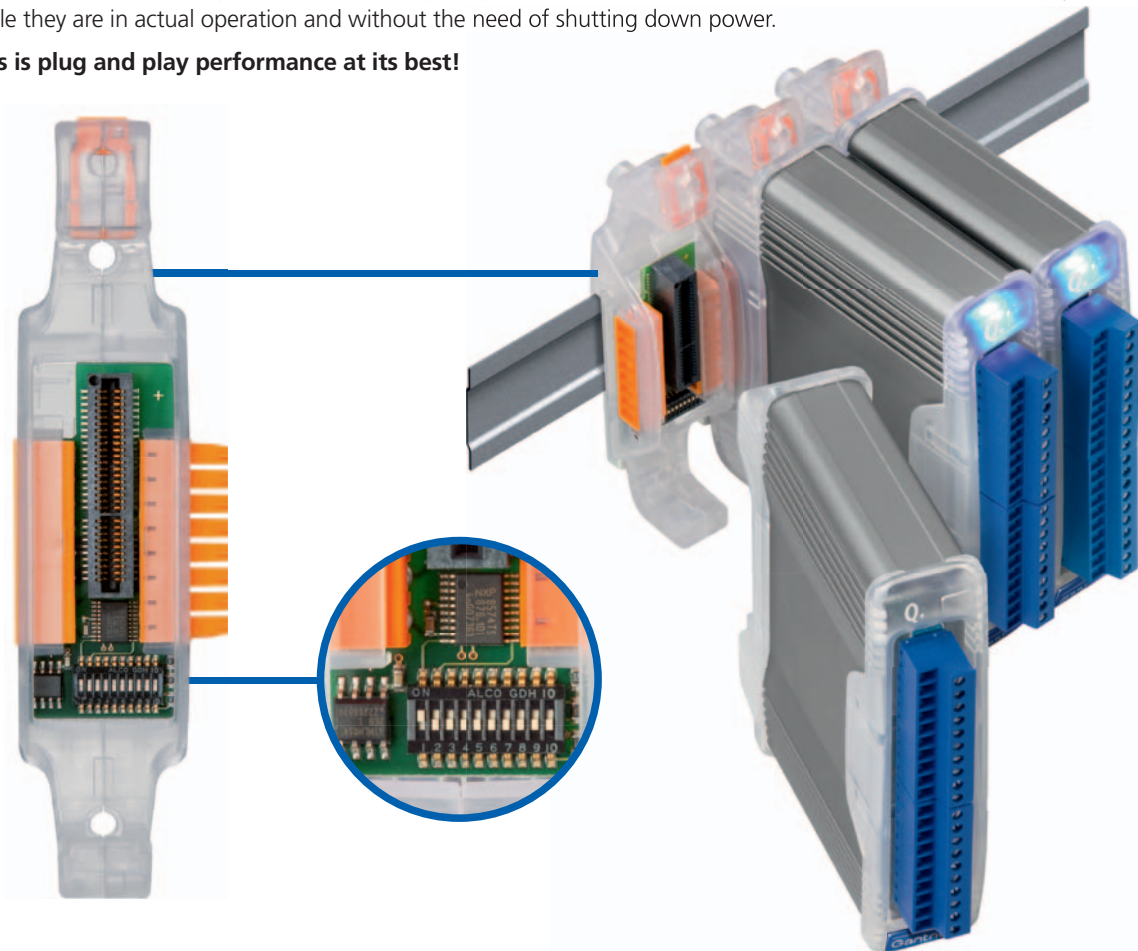


Safe and Reliable System Support

The innovative Q.socket simplifies wiring, installation and support. In addition to providing connections for power, communications and synchronization, the integrated flash memory on the socket supports configuration, and optional selections for addressability and boot mode via software or DIP switches. The Q.socket supports easy and effective Q.bloxx module installation and management.

In addition, The 'Hot Swap' feature allows simple expansion, modification and service of Q.bloxx and Q.brixx systems – while they are in actual operation and without the need of shutting down power.

This is plug and play performance at its best!



Module Communication Interface

The Q.bloxx modules communicate via RS-485 communications, typically to a Q.gate or Q.pac Test Controller for data acquisition, synchronization, and control. With a highly effective and efficient protocol, data transmission rates of up to 48 MBaud are possible.

Additionally, Q.bloxxs can natively support industry standard protocols (Profibus or Modbus) for use as high performance measurement modules with direct connection (no Q.gate/Q.pac required) to automation equipment.

TEDS support (according to IEEE 1451.4)

The universal modules A101 and A102 support connectivity with TEDS configurable sensors. After sensor connection, the Q.bloxx module reads the sensor's information and verifies its compatibility. Once verified, the existing module configuration is overwritten with the TEDS sensor configuration data and this new file is also sent to the controller (Q.gate/Q.pac).

Q.series

THE MEASUREMENT AND I/O LEVEL

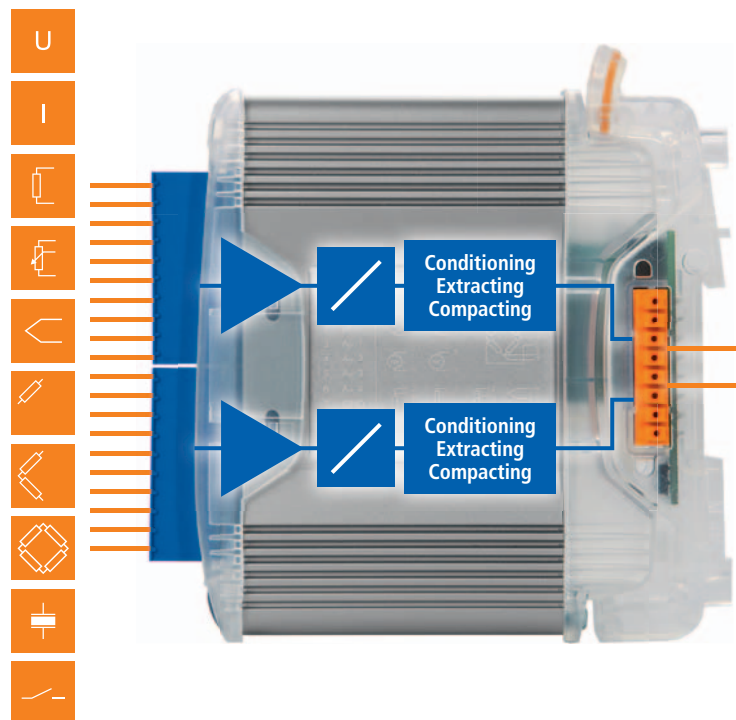
Signal Conditioning: Distributed, Fast, Precise

The A101 and A102 support sampling rates of 100 kHz per channel. With data sampling at this rate, it is possible to perform signal conditioning functions (filtering, logging of min/max values, averaging, true RMS) at high speeds, allowing pre-conditioned and very precise values to be sent for acquisition at slower speeds significantly reducing the amount of data transmitted and the need to perform additional conditioning or calculations with the Test Controller.

A/D Flexibility: Sigma Delta or Successive Approximation

The Q.series modules support precise analog measurements by means of a 24-bit Sigma Delta A/D converter. The integrating nature of this method of A/D conversion allows for extremely stable conversion with a high noise rejection. While this method has long been the preferred method for high accuracy data logging, it is not necessarily the most effective method for the high speed dynamic response required in closed loop systems for control applications.

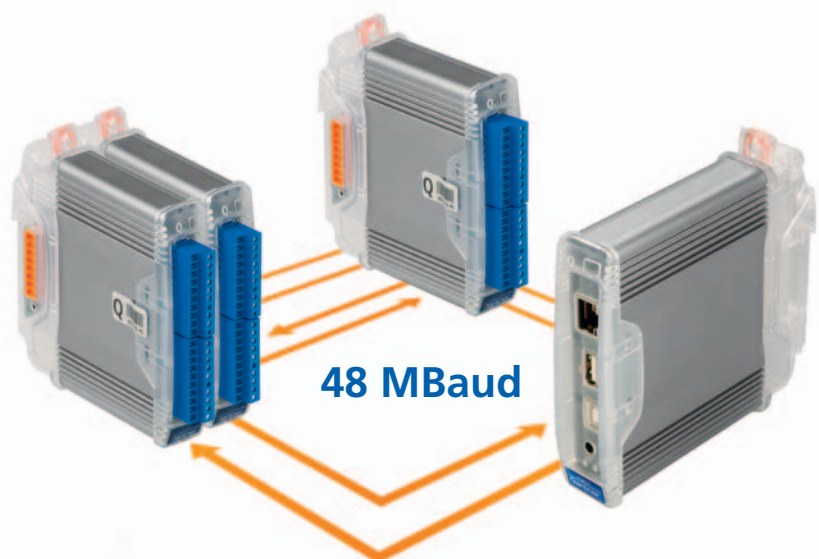
When high speed closed loop control is important, the A102 provide analog inputs and outputs on a single module. This allows measurement signals to be handled with 100 kHz updates, using a 19 bit successive approximation A/D conversion. Q.bloxx modules provide the choices for the best in system performance.



High Speed Performance: Peer-to-Peer Q.series communications

The Q.series modules communicate via a serial bus at speeds up to 48 MBaud. Each module writes its variable information into assigned time slots, ensuring maximum deterministic data transfer.

Modules can also be configured to read this time slot data directly from other modules, supporting high speed peer-to-peer performance at the maximum speed.

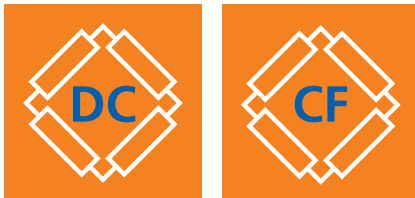


High Performance Strain Gauge Measurements: DC or Carrier Frequency Excitation

Depending on the application requirements, both DC and Carrier Frequency (CF) excitation methods come with their pros and cons. This is why Q.series provides the bridge measuring module A106 that suites for both:

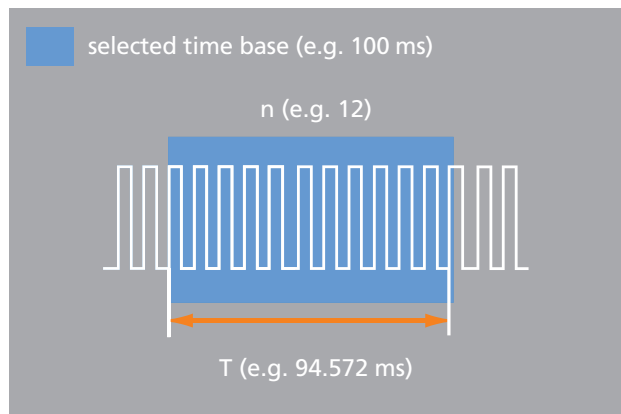
- DC excitation 2.5 VDC or 5 VDC
Full half and quarter bridges
Sampling rate 10 kHz, band width 1 kHz
- Carrier frequency excitation 600 Hz
2.5 Veff or 5 Veff
Full half and quarter bridges
Sampling rate 10 kHz, band width 100 Hz
- Carrier frequency excitation 4.8 kHz
2.5 Veff or 5 Veff
Full half and quarter bridges, inductive bridges, LVDT, RVDT
Sampling rate 10 kHz, band width 1 kHz

Further with A101 and A102 there are DC strain gauge inputs for up to 100 kHz available.



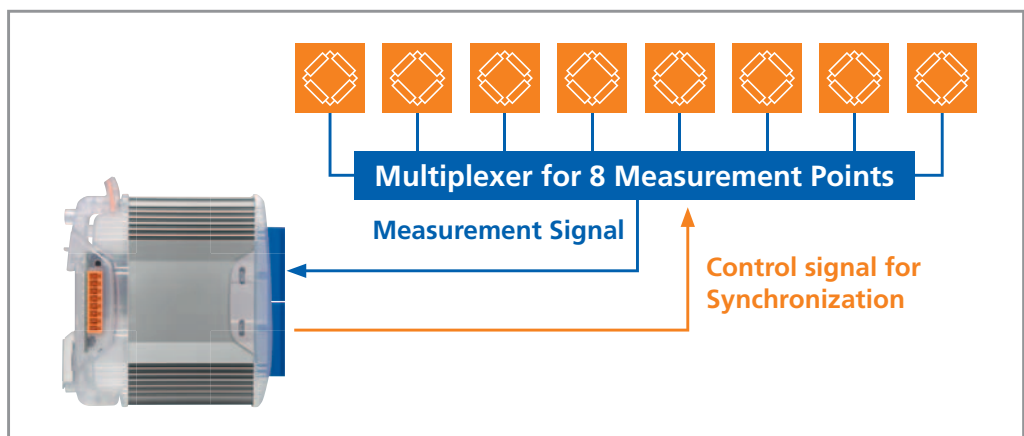
Chronos – The precise way to measure frequency signals

To measure a very low frequency (1 Hz) and a very high frequency (2 MHz) without modification to the measuring method, the digital inputs of the Q.series module D101 employ the Chronos method to measure frequencies accurately. The Chronos method precisely measures in parallel, both the number of pulse edges "n" and the time "T" from the first edge to the last edge within a selectable time window. This is why frequency from 1 Hz to 2 MHz can be measured with high accuracy. The frequency is calculated from the Time "T" and the number of edges "n" combined (e.g. 126,887 Hz).



Long Term Measurements: M108 Multiplexer for a high number of channels

Long term monitoring usually involves many channels (100+) at a very slow sample rate. For these types of applications, the M108 multiplexer is the answer. The M108 supports the connection of 8, 16 or 24 channels to a single Q.series module, providing both extremely high packaging density with an equally optimized price-performance-ratio.



Q.series

THE MEASUREMENT AND I/O LEVEL

Measuring Signals at High Voltage Potential

Future concepts for propulsion focus on electric and hybrid drives. Measuring the power fed to the drive and the power returned to the battery requires measuring modules capable of detecting very small signals at high voltage potential, e.g. an individual cell voltage on cascaded cells of a battery.



Q.series Module A123

4 Voltages in measuring ranges of 100 mV, 1 V or 10 V at DC voltage potential of 1200 VDC (short-term 5000 VDC).
Measuring rate 10 kHz, Resolution 24 bits



Q.series Module A124

4 Thermocouples, at DC voltage potential of 1200 VDC (short-term 5000 VDC). Measuring rate 100 kHz, Resolution 24 bits



The new global battery test lab at GM is equipped with measuring systems from Gantner Instruments.

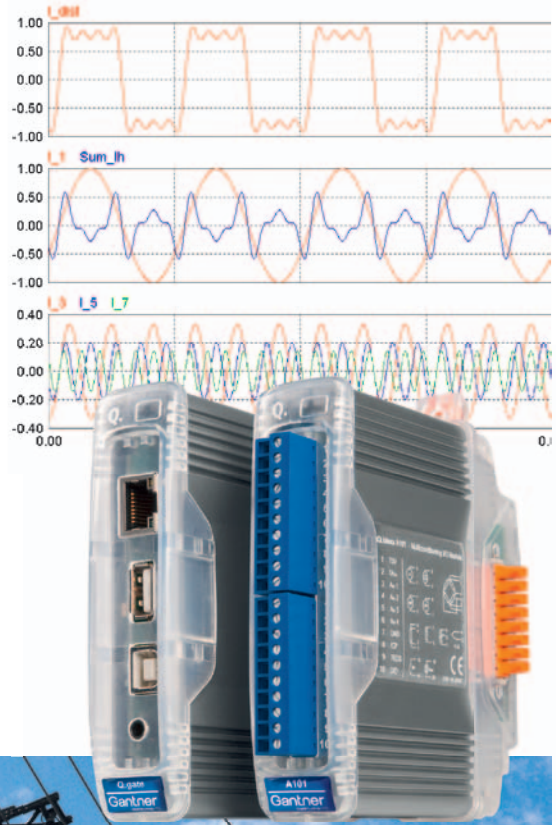
Measuring at High Voltages

In addition to drive technology, measuring high voltages is also a primary point for measuring the quality of a network. This deals with the technical characteristics and network compatibility of wind turbines.



Q.series Module A128

4 Inputs for DC-voltage measurement in measuring ranges 40 V, 120 V, 400 V and 1200 V, resolution 24 bits



Measuring Rate is Decisive

To obtain sufficiently precise information on the network quality it is usual to scan the network voltage at a rate of 2^{10} (1024) times the network frequency. At 50 or 60 Hz this means scanning rates of 51.2 Hz or 61.44 Hz.

The A128 module measures signals from 4 channels at a scanning rate of 50 kHz and from 2 channels at a rate of 100 kHz. The measured data for a transient is buffered in a test controller and then transferred.

Q.series

THE CONTROLLER LEVEL

The addition of a Test Controller transforms the Q.series modules into a powerful test automation and control system. The Test Controller is the interface between the modules and the respective automation system, handling all of the synchronization, data buffering, control, and transfer of data to the automation system (typically on a PC). Different application requirements (number of points, maximum throughput rates, programming and control requirements, etc.) will dictate which Test Controller is best suited.

The Test Controllers connect via Ethernet TCP/IP for configuration of the entire measurement system, and for basic data acquisition and transfer tasks. For more demanding applications, the following additional interfaces are also available:

- **EtherCAT**
- **Profibus-DP**

As new communication protocols become popular, the Test Controller can be adapted to accommodate them. Providing this flexibility at the Test Controller level ensures that your measurement system investment is 'future proof'.

A Q.brixx system is always equipped with a Test Controller. A Q.raxx slimline system can be equipped with a Q.pac EC Test Controller as an option.



Test Controller

HOST INTERFACES

Ethernet TCP/IP

EtherCAT

Profibus-DP

USB Host/Device

RS-232

RS-485

SLAVE INTERFACES

RS-485

DATA STORAGE

16 MByte RAM

128 MByte Flash

USB expandable

MIN. CYCLETIME

REALTIME CLOCK

DIGITAL I/Os

Synchronization possible

Trigger I/Os

FREE PROGRAMMABILITY (PAC)

E-mail over Ethernet

FTP over Ethernet

POWER CONSUMPTION TYPICAL [W]



Q.gate		Q.pac	
IP	DP	DL	EC
■	■	■	■
			■
	■		
■	■	■	■
■	■	■	■
		■	■
2	2	4	4
■	■	■	■
		■	■
■	■	■	■
1 ms	1 ms	0.1 ms	0.1 ms
		■	■
	4 x fix	8 x fix	8 x fix
■	■	■	■
		■	■
■	■	■	■
■	■	■	■
■	■	■	■
2.5	3	4.5	4.5

CONTROLLER LEVEL

Q.series

THE CONTROLLER LEVEL

Q.gate

The Gateway to Automation

The Q.gate is the Test Controller of choice in data acquisition systems that require a low to high number of measurement and control channels and fieldbus communications (typically Ethernet) to the automation system.

Each Q.gate supports:

- Up to 32 modules via 2 UARTS (up to 48 MBaud)
- Synchronization of the I/O modules
- 16 MByte data memory

- Mathematical, control and error checking capabilities
- Ethernet and optional fieldbus interface
- Open file structure for integration into automation systems
- Up to 256 variables per Q.gate

Multiple Q.gates may be synchronized together to support larger system point counts. A Q.brixx system always includes a Q.gate.

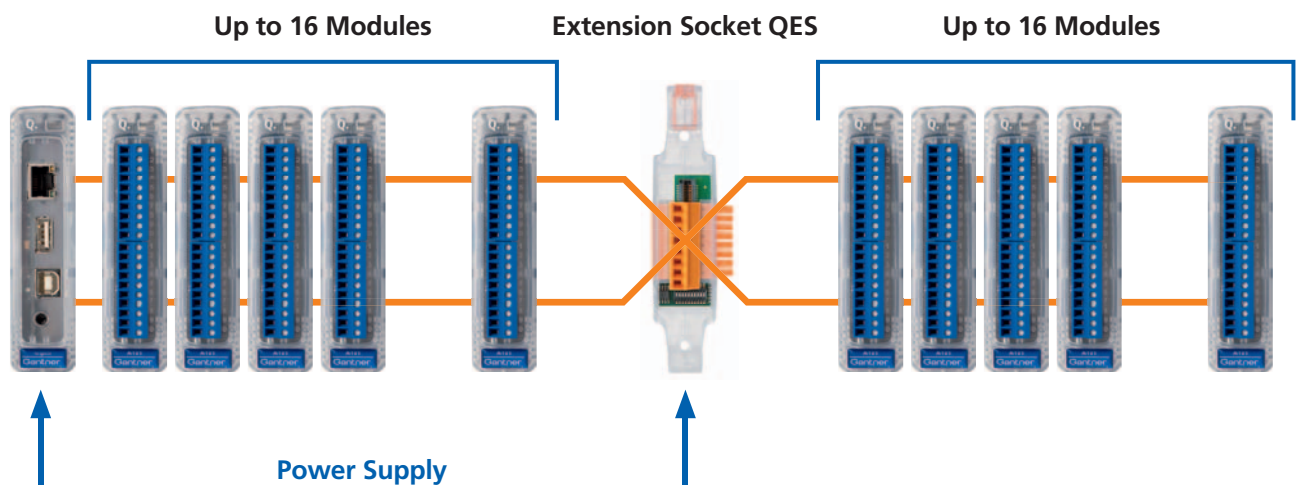
Connect and Go

When you plug a Q.gate into a Q.socket, the power, communications (tied to the first UART) and synchronization signals are automatically sent to up to 16 connected Q.bloxxs/Q.sockets.

To add more modules, you will need to add an additional power supply and switch to the second UART on the Q.gate. This is easily accomplished by using the QES extension socket. The QES extension socket allows for the connection of a second power supply, and it automatically switches all modules connected after it to the second UART (breaking also the power connection to the first 16 modules).

With this approach 32 measurement modules can be connected on a less than a one meter (36 in.) piece of DIN rail without any special cabling – just the power supplies have to be added. Of course, the Q.bloxx modules can also be distributed by cabling between groups of modules located in different locations around the test cell, facility, etc.

So in a very compact way up to 128 universal channels (Q.bloxx A107), 256 galvanic isolated temperature channels (Q.bloxx A104) or 512 digital I/O (Q.bloxx D101) can be connected easily – on less than one meter (36 in.) of DIN rail. Larger systems can be accommodated by adding additional Q.gates for virtually unlimited expandability.





Ethernet TCP/IP · Profibus-DP

Data Rate
Data Logging
Additional Functions
PAC Functionality

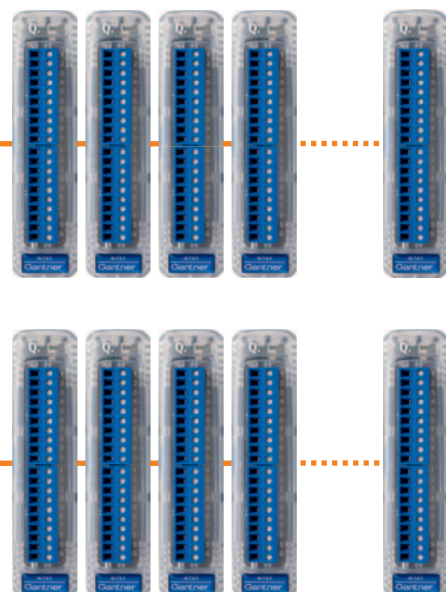


A/D Conversion
Data reduction
(e.g. programmable
filtering, averaging,
min/max, true RMS, etc.)



With the Q.gate the following performance characteristics are possible via Ethernet:

- 128 Real variables with 1 kHz (block transfer)
- 16 Real variables with 10 kHz (block transfer)
- 64 Real variables with 300 Hz (online)



CONTROLLER LEVEL

Q.series

THE CONTROLLER LEVEL

Q.pac

The graphically programmable
Automation Controller



Ethernet TCP/IP · EtherCAT



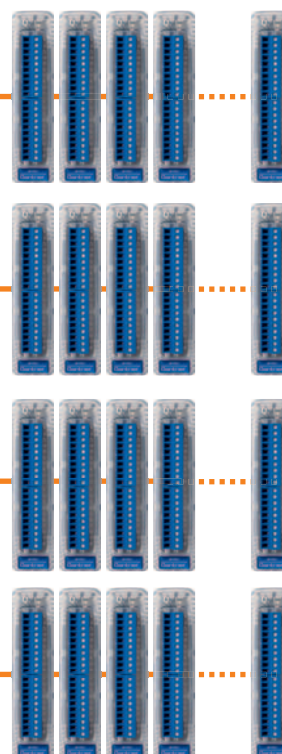
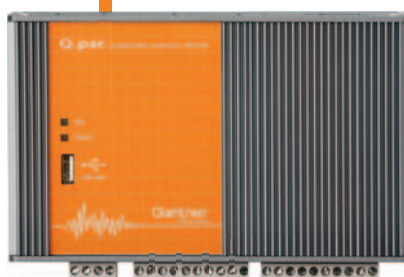
With the Q.pac the
following performance
characteristics are
possible:

via Ethernet

- 128 Real variables with 1 kHz (block transfer)
- 16 Real variables with 10 kHz (block transfer)
- 64 Real variables with 300 Hz (online)

via EtherCAT

- 64 Real variables with 10 kHz (real time)

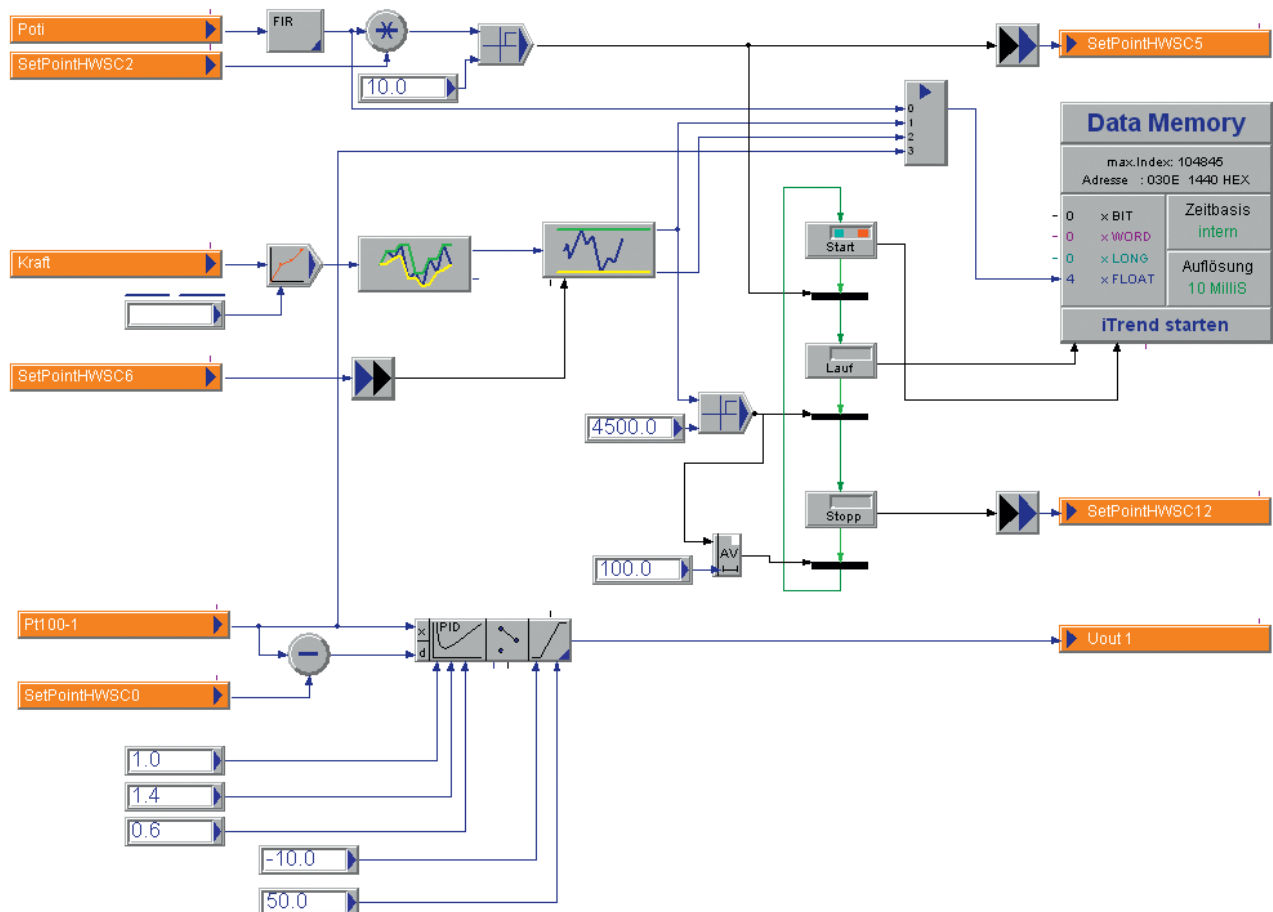


With the Test Controller and the graphic programming tool test.con, advanced measurement and control calculations involving multiple measurement channels, statuses, calculations, timing elements, PID calculations, step control functions, etc., can be defined in a graphical icon-driven program, then downloaded to the Test Controller for stand alone, PC-independent operation.

Example functionalities include:

- Stand alone control of complete test cycles
- Control functionality (PID, Step, Cascade, etc.)
- Extended library of preconfigured function macros (math, logic transfer functions, timing, visualization, etc.)
- Data logging with event driven triggers (time or process)
- Up to 128 MByte RAM and 128 MByte Flash Memory
- Ethernet and optional fieldbus interface
- Up to 64 modules and 256 variables

With a Test Controller and test.con, complete, embedded data acquisition and control can be accomplished with ease.



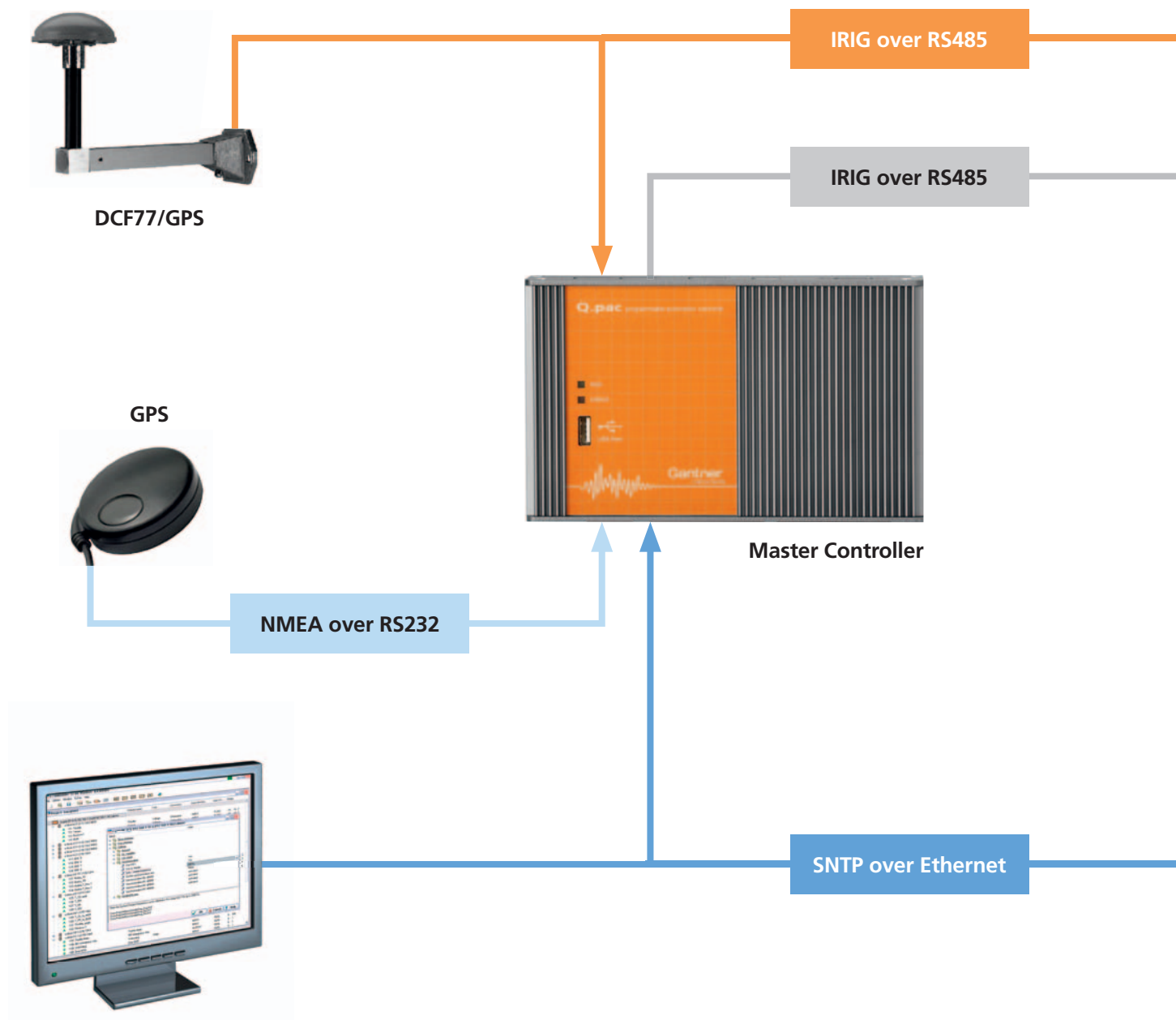
Q.series

THE CONTROLLER LEVEL

Synchronous Measurement and Conditioning

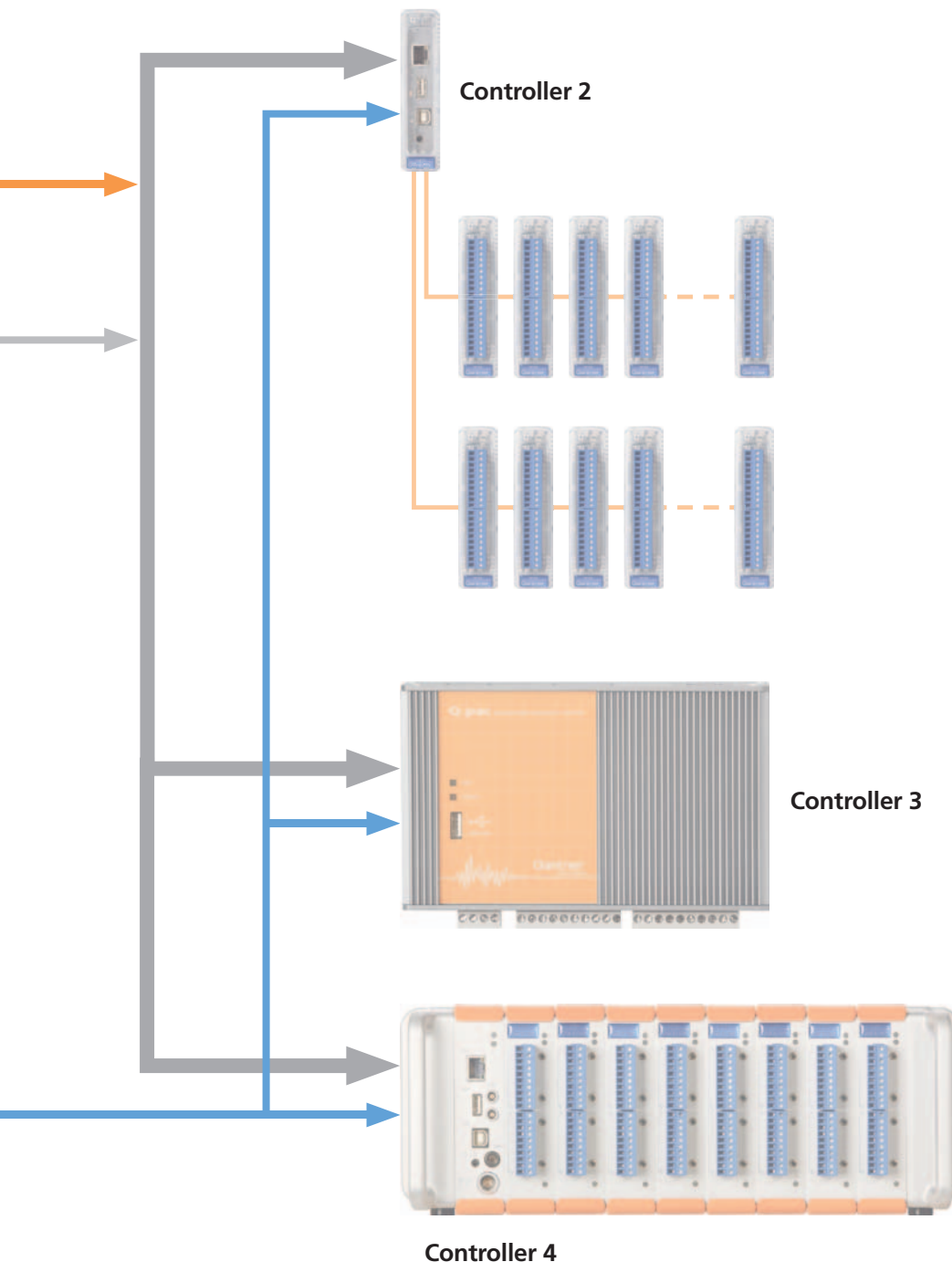
Local systems capture measuring signals distributed over the object to be measured. Synchronized capture of all measured values is essential, particularly for highly dynamic measuring assignments with measuring rates in the kHz range, to allow correlated evaluation of multiple axis acceleration rates, for example.

With the Q.series all measuring modules and slide-in units are queried synchronously by the test controller to minimize jitter to $<5 \mu\text{s}$ within a system.



Synchronization of Large Systems with Several Test Controllers

Based on the IRIG Standard (Inter Range Instrumentation Group) it is possible to precisely synchronize a number of measuring systems depending on the requirements of the application. A standard RS485 interface is used, allowing large distances between controllers.



Method A

Controller 1 is the master and synchronizes controllers 2, 3 and 4, which are configured as slaves.

Method B

A time signal receiver synchronizes all controllers connected.

Method C

The master controller receives the GPS signal over the RS232 interface and transfers it to all slaves via the RS485 interface. Moreover it is possible to capture the GPS position data and link it to the measuring signals.

Method D

All controllers receive the time signal as SNTP via the Ethernet interface.

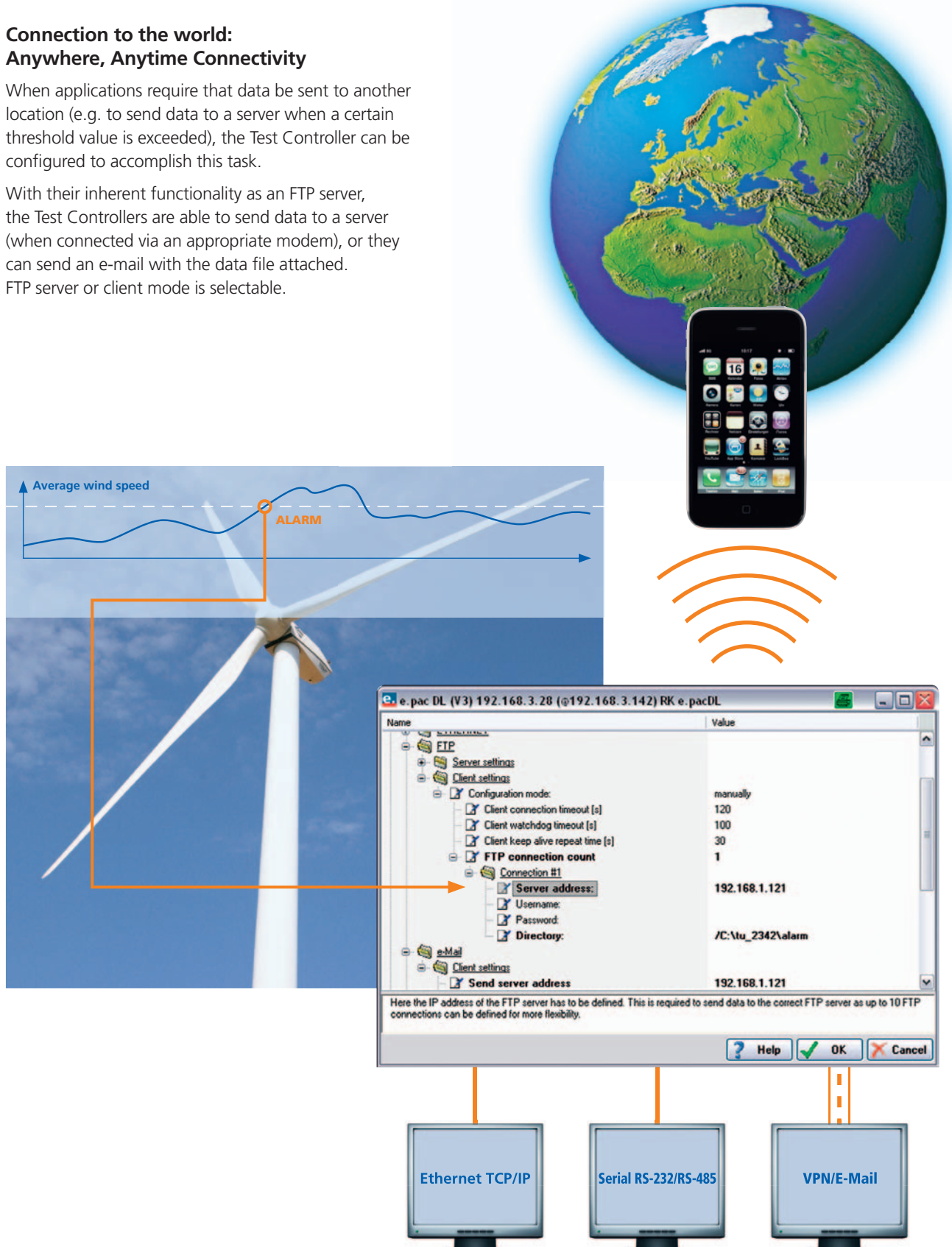
Q.series

THE CONTROLLER LEVEL

Connection to the world: Anywhere, Anytime Connectivity

When applications require that data be sent to another location (e.g. to send data to a server when a certain threshold value is exceeded), the Test Controller can be configured to accomplish this task.

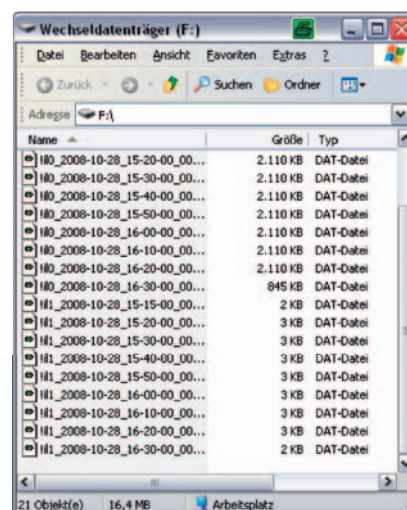
With their inherent functionality as an FTP server, the Test Controllers are able to send data to a server (when connected via an appropriate modem), or they can send an e-mail with the data file attached. FTP server or client mode is selectable.



Logging without limits

The USB interface on the Test Controller makes it possible to extend the internal memory via connection to an external flash drive or hard disk. This allows virtually infinite possibilities. For example, using only an 8GB USB memory stick, it is possible to log 2 billion real variables. This would be the equivalent of 40 channels logged at 500 samples per second for an entire day.

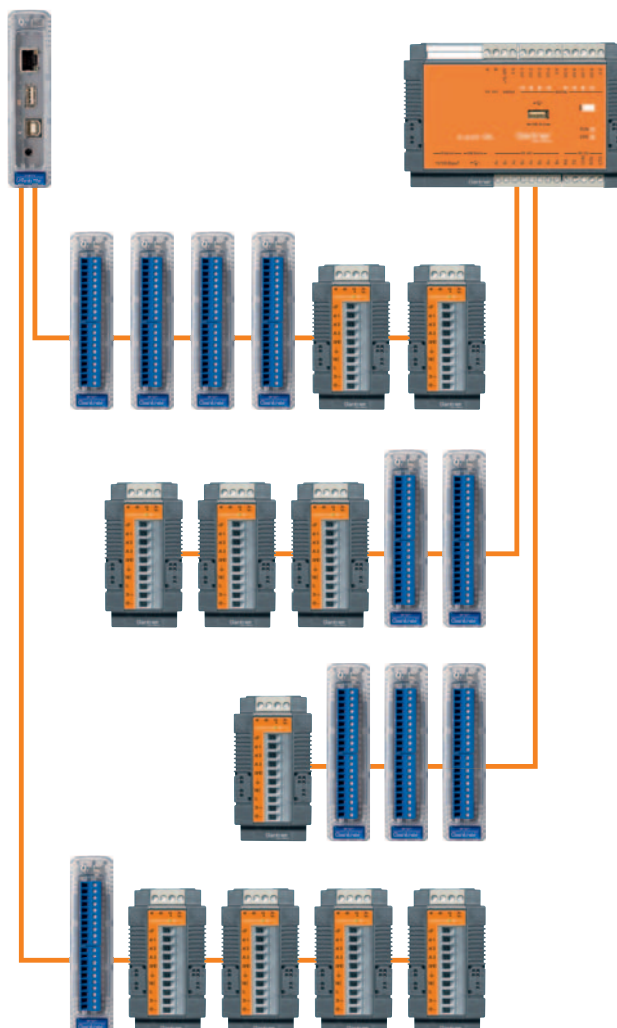
The size of the data files (hourly vs. daily, etc.), the logging rates, and the operation characteristics of the connected memory device are all configurable. It is also possible to define multiple log files, each with its own logging criteria, sample rates, etc. All data is stored in files with unique file names (e.g. YYYY-MM-DD_HH-MM-SS), and in formats easily readable by third party software (GreenEye, Excel, MATLAB, etc.)



Extending an existing e.series system with Q.bloxx modules

To date there are more than 100,000 e.bloxx modules in use. Therefore, it was important to ensure a seamless migration path to allow existing (and future) e.bloxx users to expand their systems with the functionality of Q.bloxx, if desired.

All e.series and Q.series Test Controller allow connection of both e.series and Q.series modules. The modules can also be mixed within one UART line. The only condition to be fulfilled is that the Q.series modules be assigned to the lower bus addresses as the e.bloxx modules.



Q.series

THE HOST LEVEL

The Q.series software is designed with one goal in mind: **Maximum flexibility for the user.**

The key components of the software platform include tools for:

- Configuration of the measurement system
- Visualization and logging of the measurement data
- Archiving of measurement data (via local PCs, data servers, etc.)
- Graphical programming of the PAC functionality (for Q.pac and Q.gate)

The maximum flexibility for the user is further enhanced through:

- Application software packages of our partners
- Drivers for integration into other off-the-shelf packages
- A completely open (and well documented) interface to allow integration of Q.series products into user defined test and automation solutions.

test.commander

Configuration of the measuring system

For quick and easy setup, test.commander is the setup software tool for all of the Q.series systems. Intuitive operation, a logical structure and online help windows guarantee system configuration in minimal time.

The test.commander setup software supports the Ethernet communications standard. As an FTP-Client, test.commander reads and writes configuration data and has access to all system parameters. Included in the test.commander software is the ICP100 module configuration software and the test.viewer visualization software. The concept behind the File-Transfer (FTP-Client) and open data structure of the Q.series is to allow all users with any FTP-Client the possibility to access the Q.series system configuration data. The user can read, modify and write the configuration data back to the system. User access levels can be set to protect the system setup and integrity. Special knowledge of the manufacturer's software is not necessary.

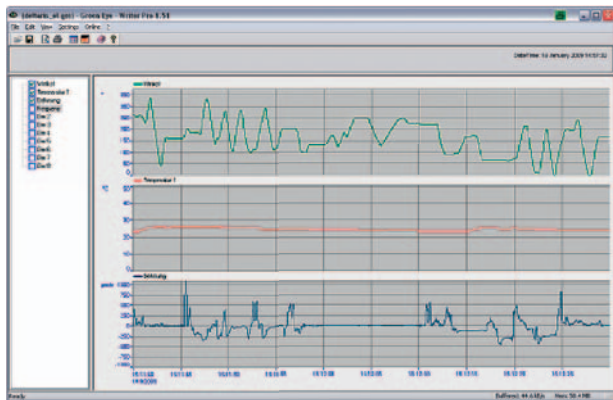


test.viewer

Visualization of measurement data

With this software tool, online visualization and display of logged measurement data in multiple graphic windows or in a numeric, tabular format is possible. With the zoom-functionality and the ability to do some analysis with the signals, test.viewer provides a fast, first look at the measurement data. Additional functionalities include:

- Y/t and Y/X-displays
- Online FFT analysis
- Grouping of signals in the „Explorer-style“ menu
- Conversion of logged data into other formats:
GreenEye (*.ged),
DASYLab (*.ddf),
Famos (*.dat),
MATLAB (*.mat);
Bernard (*.bbl),
WAVE (*.wav) and
Excel (*.csv).

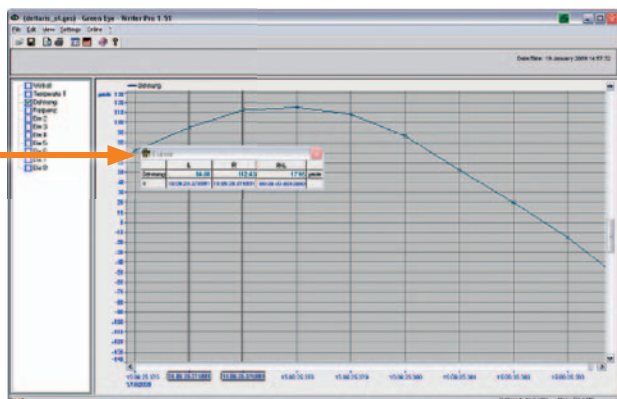
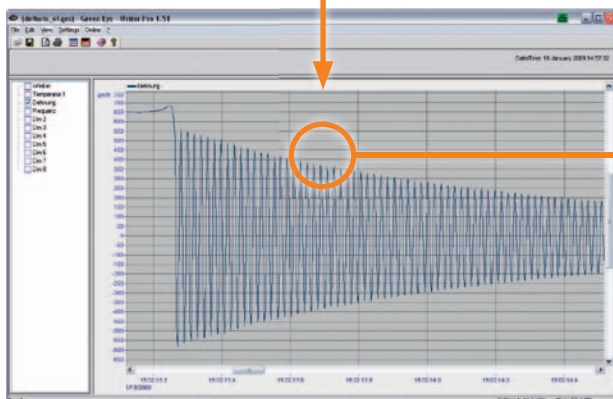
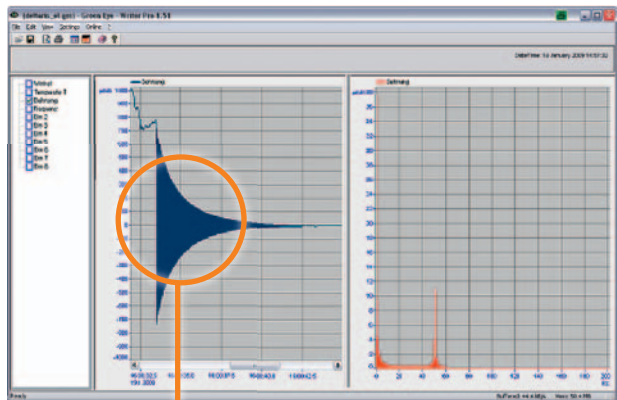


test.node

Archiving of data onto local PCs, networks, data base servers (Server Software)

With the test.node server software it is possible to read data from one or more test controllers, to format and/or convert the data and then store the resulting data files in the desired location (PC, network, server, etc.). The key functions of test.node include:

- Converting data into different formats (see test.viewer)
- Storing data onto a local PC, into a network or into an SQL data base
- Filenames (date, time, directory structure) freely definable
- Copy & Paste or Cut & Paste of Test Controller data files
- Selectable transmission rates and file size
- Visualization of data (online or offline) with test.viewer



Q.series

THE HOST LEVEL

test.con

Graphical programming of the PAC functionality

Applications and PAC functionality are easily graphically programmed on the PC using test.con. Arrange desired functions on your screen with a simple mouse click. Connect the function as desired with a mouse click. Not one line of code is needed to program using test.con.

Drag & Drop

Programming is easy, just drag and drop the desired variable and drag and drop the desired function from our extensive library to the work page on the PC. Connect the input and output of the various function blocks with each other and in a short time the application is built.

Macros

Macros improve the clarity, streamline the program, and save time developing recurring functions.

Function Library

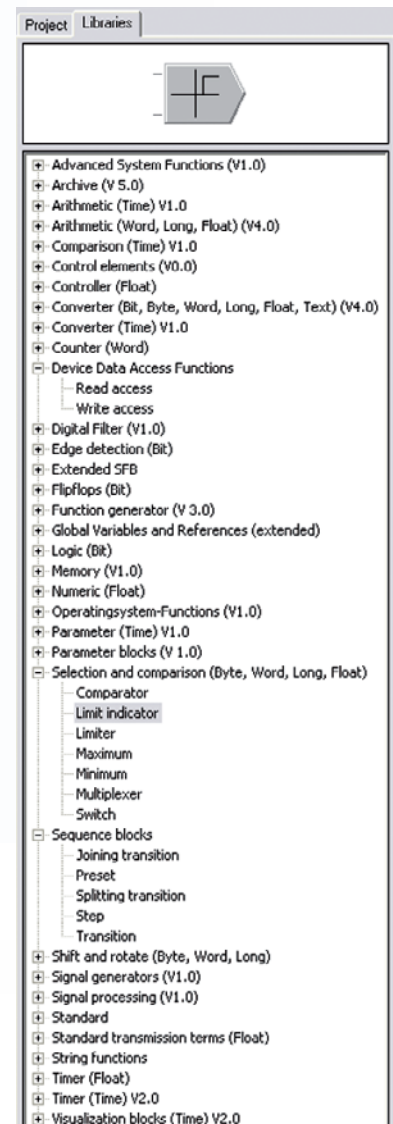
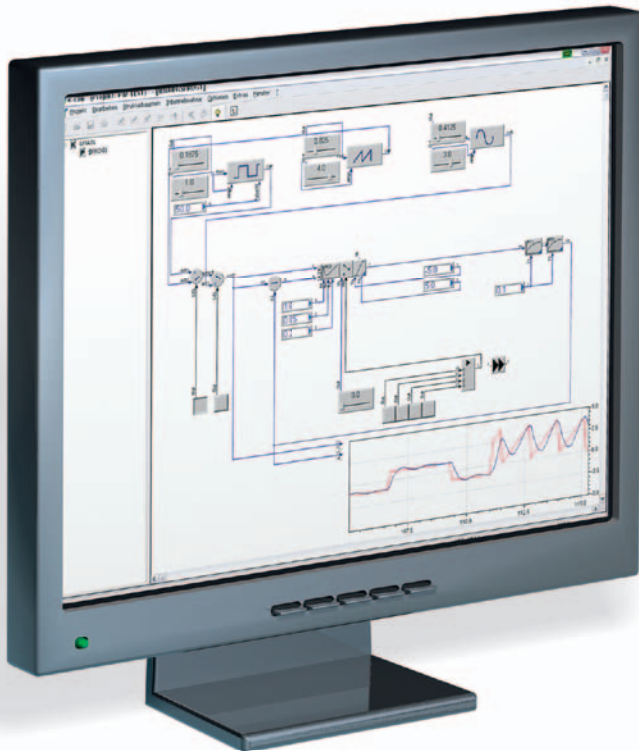
A very extensive function library is available to the user for developing the application.

Documentation and Help

Behind each function is a help page describing the use of that particular function. The extensive help function supports the user at every stage of programming.

Simulation and Online Test

Simulate the application function-by-function in the PC before downloading the application. Also, online testing is possible in the measuring system. In online testing the actual values are used.



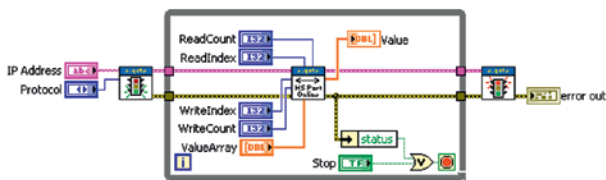
Standard software packages for data acquisition

All Gantner products are designed to work with many standard off-the-shelf software packages, such as MLab/MGraph, PLab/PGraph, DEWESoft and Signasoft. For convenience, we offer these software packages together with our products as a complete solution.

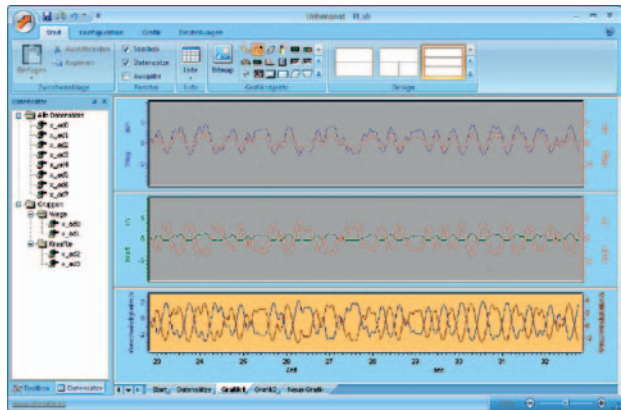
Drivers for other standard software packages

Keep your freedom and flexibility by implementing the Q.series products with software packages that you choose. To support this, we offer:

- Drivers to implement our products in DIAdem projects
- Drivers to implement our products in DASyLab projects
- Drivers to implement our products in MATLAB projects
- Free VI examples to implement our products in LabVIEW
- Free example projects to implement our products in MSCPP60, MSVBASIC60 and DELPHI2006



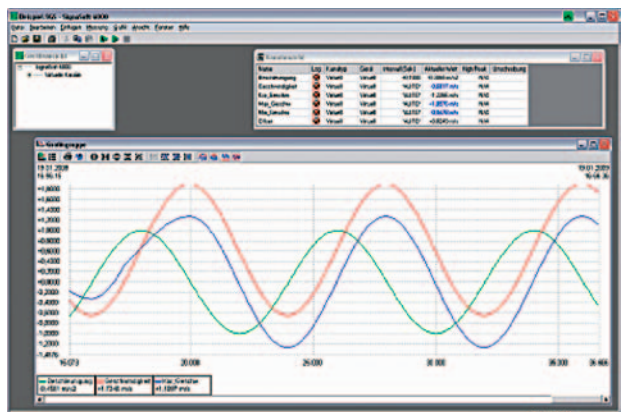
DIAdem®
DASyLab™
LabVIEW®
MATLAB®



MicroLab/PicoLab



DEWESoft



Signasoft

Q.series

HARDWARE DESIGN

The overall design and package of a measurement system depends on the application requirements, the environment, and the overall functionality to the end user. Because of this, the Q.series has been designed to work in a number of different packaging configurations.



Q.bloxx

Modular design for DIN rail mounting

This typical design of a distributed measurement system provides a maximum of flexibility. The ability to 'mix and match' modules based on function and performance allows for an optimized system that is easily scalable, and suitable for systems of all sizes.

Q.raxx

19" System (1U and 3U)

This platform is typically found in, but not limited to industrial test cells. One slimline rack can hold up to 16 I/O. For example 16 universal amplifiers for voltage, current, RTDs (PT100), or strain gauge devices (24 bit/10 kHz) in an 1U high package.

The 3U version allows flexible system layout with up to 12 Q.series functions, in any desired combination.



Q.staxx

Robust design for pallet handling systems

In the Q.staxx packaging configuration, Q.bloxx modules are housed in sealed enclosures, mounted onto a passive backplane that is attached to the skid. Depending on the measurements desired, the modules can be interchanged onto the backplane, and the sensors directly connected to the modules prior to the skid entering the test cell. In this approach a completely functional measurement system is configured, wired and verified prior to entering the system into the test cell. Once in the cell, only a single connection to the automation system is required.



Q.brixx

Portable measuring system for changing tasks

Separate measuring systems in sturdy aluminum housings can be designed for stationary and mobile use with complete flexibility based on the Q.series functions. Up to 16 plug-in modules, for example, offer users 24 parallel universal channels plus 16 inputs for thermocouples plus 8 carrier frequency channels plus 8 counters in one housing. The modular design and infinite combination possibilities of all Q.series functions ensure extremely high system capability.

Q.series

There are many reasons to use Q.series in test and measuring application.

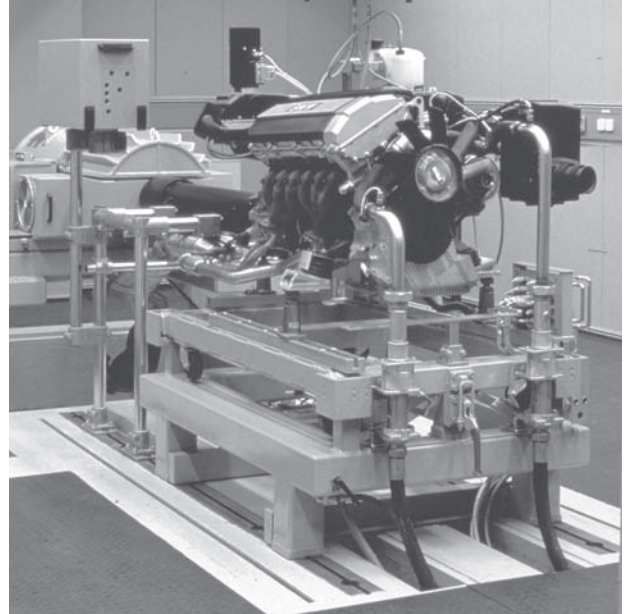
COMPONENT TESTING



Function, Quality, Safety and Lifecycle Testing

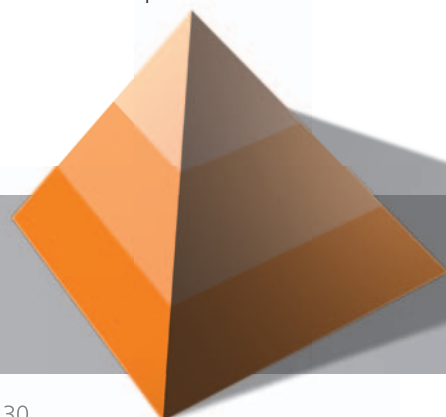
- Support for all common sensors
- Very high accuracy in particular with temperature and strain gauge measurements
- High synchronous data rates
- Carrier frequency amplifier for stable strain gauge measurements
- PAC functionality for control and test sequence flow
- Intuitive and simple operation for an easy and quick system installation
- Various hardware configuration
- Measurement module 'mix and match' capabilities
- Integration with standard software
- A complete solution

ENGINE TESTING



A Reliable and Proven Partner for Test Stand Builders and End Users

- Distributed intelligence – data is acquired at the source
- State-of-the-art fieldbus technology
- High accuracy and stability
- Synchronized data acquisition in a distributed system at high data rates
- Very flexible – the system can expand with the needs of the user
- The open architecture makes it simple and easy to integrate into the test stand automation system
- Robust design and outstanding EMI immunity
- Galvanically isolated inputs
- Different hardware configurations (modular, 19" rack) can be mixed in one application



PROCESS PERFORMANCE TESTING



Monitoring the Process for Quality Assurance and Machine Health

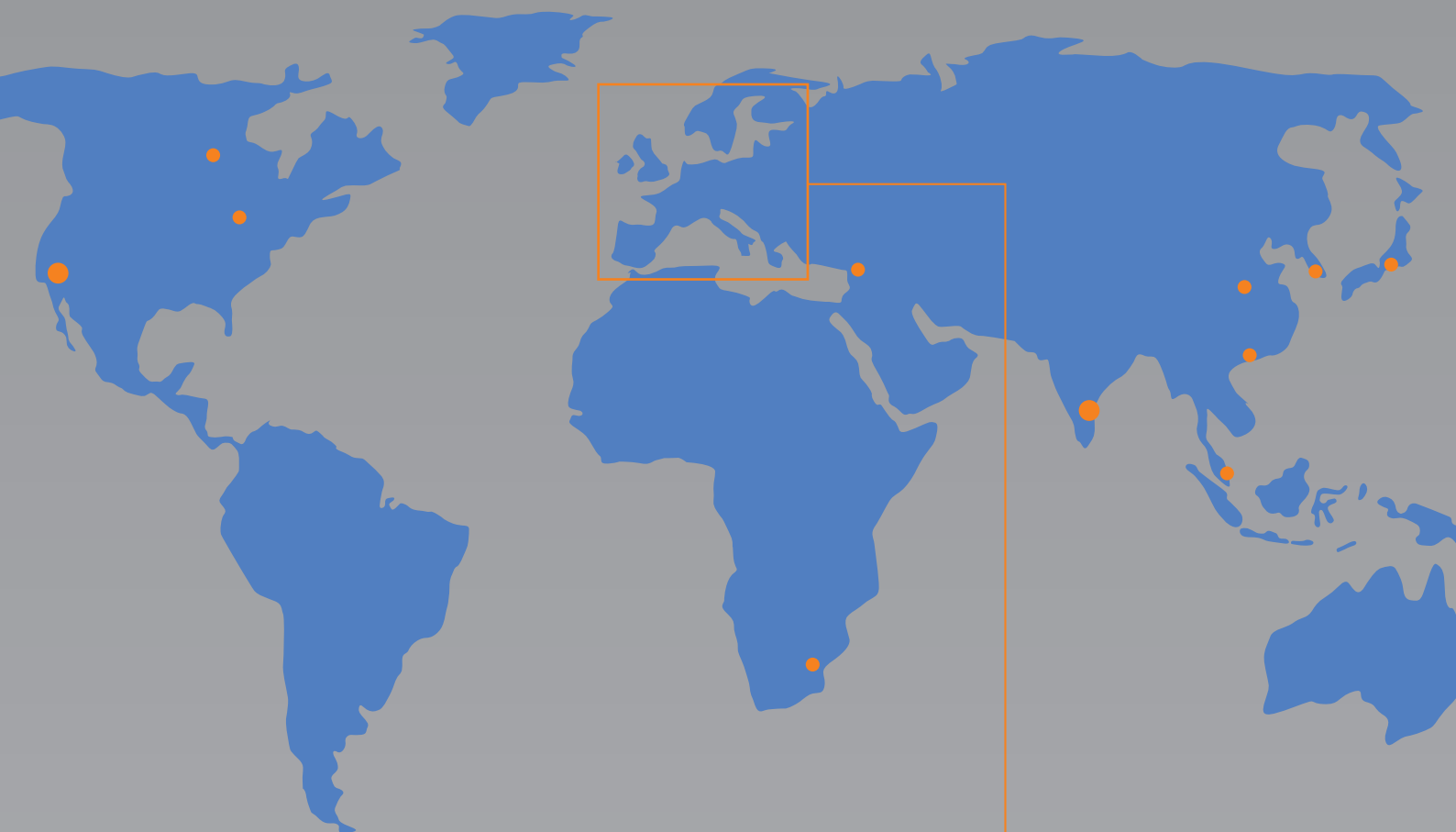
- Modular structure for individual solutions
- Outstanding stability – e.g. carrier frequency technology
- Galvanically isolated inputs
- The open architecture makes it simple and easy to integrate into the automation system
- Robust design and outstanding EMI immunity
- High Reliability – MTBF > 20 years
- Engineering assistance in finding solutions for the application
- Excellent price-to-performance ratio
- Long-time availability offers security in OEM applications
- A worldwide service network

STRUCTURAL MONITORING



Dynamic structural integrity monitoring for wind turbines, bridges, and other structures

- Distributed and Synchronized Measurement System
- High channel density
- Galvanically isolated inputs
- 128 MB internal flash memory (extendable by external USB device)
- Flexible logging features (definable sample rates and event driven operation)
- Local calculation of statistical values (e.g. minimum, maximum, standard deviation and average)
- Automated alarm messages generation in case of critical situations
- Ability to reboot without the need for on-site personnel
- Remote monitoring via auxiliary communication channels
- Robust design and outstanding EMI immunity



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