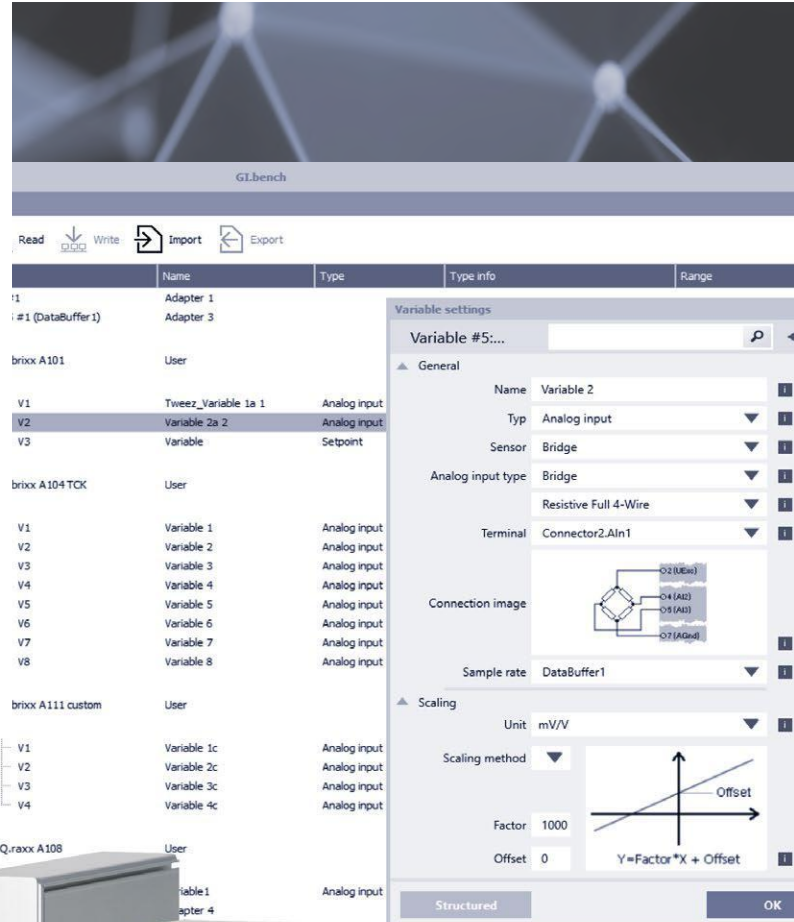


Vertrieb durch 

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Innovative Solutions for
Data Acquisition in Test and
Measurement Technology



The screenshot shows a software interface for data acquisition. At the top, there are icons for Read, Write, Import, and Export. Below is a table listing various variables and their settings.

	Name	Type	Type info	Range
#1	Adapter 1			
#1 (DataBuffer 1)	Adapter 3			
brixx A101	User			
V1	Tweez_Variable 1a 1	Analog input		
V2	Variable 2a 2	Analog input		
V3	Variable	Setpoint		
brixx A104 TCK	User			
V1	Variable 1	Analog input		
V2	Variable 2	Analog input		
V3	Variable 3	Analog input		
V4	Variable 4	Analog input		
V5	Variable 5	Analog input		
V6	Variable 6	Analog input		
V7	Variable 7	Analog input		
V8	Variable 8	Analog input		
brixx A111 custom	User			
V1	Variable 1c	Analog input		
V2	Variable 2c	Analog input		
V3	Variable 3c	Analog input		
V4	Variable 4c	Analog input		
Q-raxx A108	User			
Variable 1		Analog input		
Adapter 4		Analog input		

The 'Variable settings' panel for 'Variable #5...' shows the following configuration:

- General:** Name: Variable 2, Typ: Analog input, Sensor: Bridge, Analog input type: Bridge, Terminal: Connector2.AIn1.
- Connection image:** A diagram showing a bridge circuit with terminals S2 (R1a), S4 (A2), S5 (A3), and S7 (A4a).
- Scaling:** Unit: mV/V, Scaling method: (dropdown), Factor: 1000, Offset: 0. The formula is $Y = \text{Factor} * X + \text{Offset}$.



Gantner Instruments

Test and Measurement Technology.
Designed for You.

Gantner Instruments is a global leader in the development of high precision measurement and control systems. Founded in 1982, Gantner excels in delivering products and services in the fields of electrical, mechanical and thermal measurement. We always prioritize flexibility, usability and accessibility.

Our test automation and performance monitoring solutions can be found in many applications around the world, particularly in the automotive, aerospace, civil engineering, and energy industries.



More Power and More Flexibility:
the new Q.series X

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Going New Ways - Developing Intelligent Solutions

Are you searching for the data acquisition (DAQ) solution that sets the standard for both usability and innovation? Do you need to process and store increasing amounts of high speed measurement data in optimum quality?

Gantner Instruments offers innovative, state-of-the art DAQ solutions that satisfy even the most demanding applications within test and measurement - precisely, efficiently and reliably.



37+

sales offices worldwide

“Our agile product development and customer-centric corporate culture are both reflected in our ability to provide signal inputs for any physical sensor and data interfaces for all main platforms.”

Werner Ganahl,
CEO Gantner Instruments

More than
1 million

measurement channels installed
by Gantner customers annually

Working Together on the Test and Measurement Technology of the Future

Reliability | Appreciation | Openness

Gantner Instruments is motivated and driven by eagerness, enthusiasm, and belief that every innovation can be continuously improved upon. Join us at Gantner Instruments. Experience an inspiring corporate culture and help us shape the test and measurement solutions of tomorrow.

87%

of our employees have been with
us for over 8 years

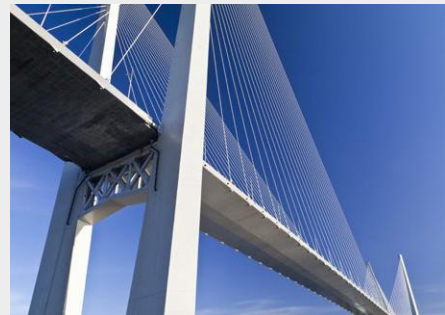
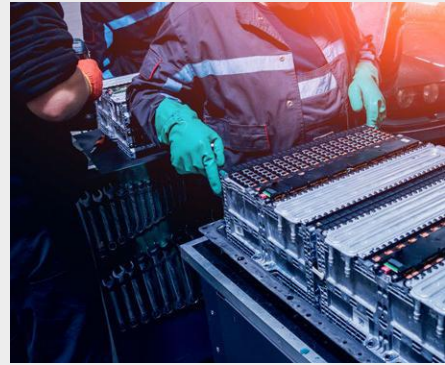


> 320,000

measurement modules currently in
operation, with mean time between
failures (MTBF) rates > 30 years

Innovative Solutions for Data Acquisition in Test and Measurement Technology

Our solutions are ideal for applications such as collecting physical data to monitor load and stress on bridges, measuring vibration and displacement of railway tracks, testing aircraft structure integrity and engine performance, monitoring energy generation assets (e.g. hydro, wind, solar) and measuring energy stored (e.g. batteries).



2000
e.series



1 Hz > 1 kHz
Sampling rates

2009
Q.series



> 100 kHz

Mobility
Aerospace
Energy
Civil Engineering

“We are an enabler of digitalization in monitoring and control applications. We offer extendable, scalable and distributed solutions. Our global sales and support network provides our customers with advanced solutions, today and into the future.”



2018

Q.series eXtended Performance



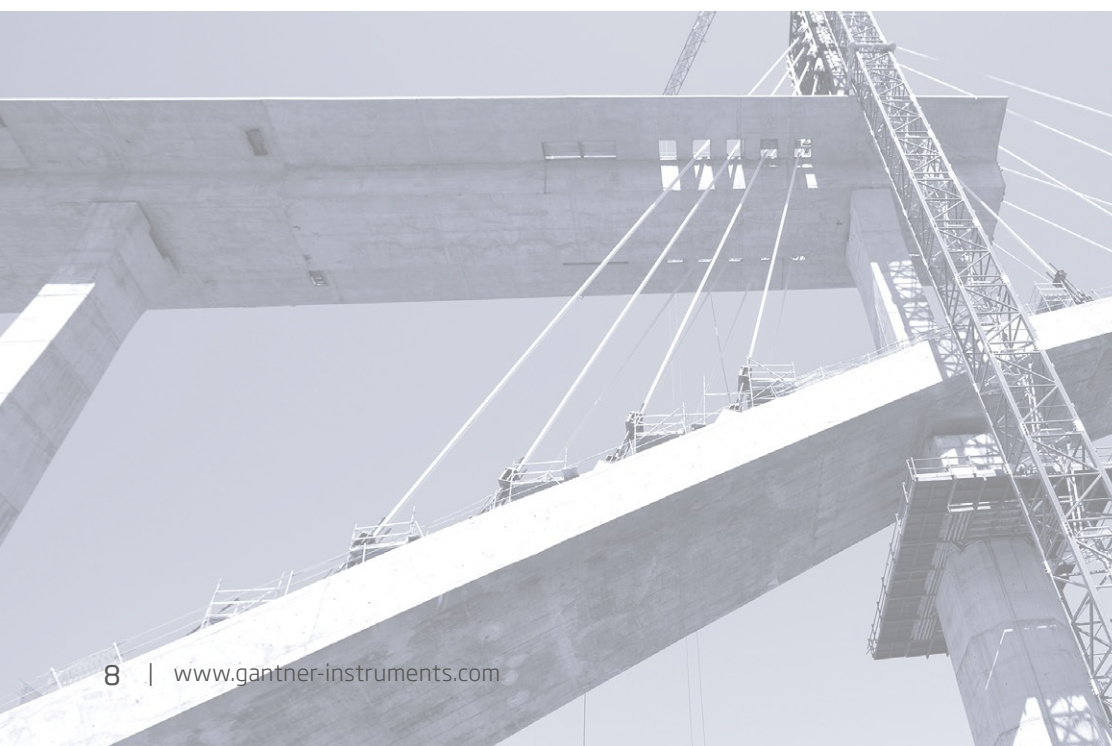
> up to **4 MHz**

Future-proof

All product generations are upward compatible, extendable with our latest products and lifetime calibration support.



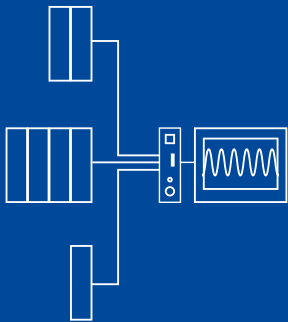
Foto: Volvo Car Group



Q-series X

NeXt Generation

More Power and More Flexibility -
One Module Fits All



Future-Oriented, High-Performance
Industrial Measurement and Data
Processing



More Power and More Flexibility –
One Module Fits All

Q.series X – neXt Generation in Data Acquisition

Gantner Instruments is introducing the new, flexible and more powerful Q.series X – an extended edition of the Q.series.

For many years now, thousands of channels of Gantner’s data acquisition (DAQ) modules have been operating reliably, fulfilling customer demands in various industrial segments, from automotive and civil engineering to aerospace.

Q.series X improves upon the performance of the hugely successful Q.series product line possessing advanced edge computing technologies and more intelligent data filtering and noise reduction. It offers sampling rates up to the MHz range and optical interfaces for harsh environments. Q.series X modules enable the most future-proof solution for advanced DAQ tasks.

Q.series X Comes with Impressive X-tras:

- Powerful signal conditioning, filtering, and channel-to-channel operations
- Higher ADC rates
- Higher data rates
- Customized connectors
- Re-configuration during operation

Features

- Interface upgrade from UART to EtherCAT
- A141 charge amplifier
- A108 with excitation for MEMS sensors
- Q.boost A101 MHz module
- Fiber optic sensor module
- Time synchronization over Ethernet (PTPv2)

Q.series X eXtended Performance Edition

- More power
- Improved features
- Higher flexibility
- New options

Portable and Compact

The ideal DAQ solution for on-the-go applications requiring higher performance in potentially harsh environments.



Portable system



Rail mount

19" rack mount



Multi-channel Measuring System



















Efficient distributed DAQ with high-precision synchronization and gradual expansion up to thousands of channels.

Distributed and Flexible

The DAQ modules can be installed close to the point of measurement and connected to the controller. This reduces cable clutter and is user friendly. Measurements are less prone to noise due to short sensor cables.

DAQ Modules Overview

All electrical, mechanical and thermal parameters can be measured with dedicated Q.seriesX modules. They can be easily combined and extended. Data streams with different sampling rates can be merged together for efficient post-processing.

Signal Inputs		A101	A102	A103	A104	A105	A105CR	A106	A107
U	Voltage	■	■	■	■				■
U _⚡	Voltage (1.2 kV isolation)								
I	Current	■	■	■					■
	Resistance	■				■	■		■
	Potentiometer	■							■
	RTD	■				■	■		■
	Cryogenic thermistor						■		
	Thermocouple	■			■				■
	High voltage (1.2 kV isolation)								
	Full-bridge strain gage	■	■					■	■
	Half-bridge strain gage	■	■					■	■
	Quarter-bridge strain gage	■	■					■	■
	Inductive full-bridge							■	
	Inductive half-bridge							■	
	LVDT							■	
	IEPE	■	■						
	Charge								
	Frequency / Counter								
PWM	Pulse-width modulation								
	Analog out		■					■	
	Time								
	Status	■	■	■				■	
	Number of channels	2	1	8	8	4	4	2	4
	Data rate (Hz)	100k	100k	100	100	100	100	20k	20k

All modules share some key features

- Galvanic isolation (up to 1200 V) for each channel, supply and interface
- Low susceptibility to electro-magnetic interference
- Independent filtering, signal conditioning, and math functionality on every channel
- All 24 bit ADC
- 10 to 30 VDC power
- Operating temperature in the range of -4 °F to +140 °F (-20 °C to +60 °C)
- Re-configuration during operation

A108	A109	A111	A116	A121	A123	A124	A127	A128	A141	A146	C101	D101	D104	D105	D107
■		■		■	■		■	■			■				
					■		■	■							
■				■	■		■				■				
				■							■				
				■							■				
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			■	■							■				
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	■								■			■			■
	■											■			■
	■										■	■			■
■	■										■	■	■	■	■
8	4	4	8	2	4	4	4	4	4	16	4	8	16	16	2-6
20k	100k	100k	20k	100k	100k	20k	100k	100k	100k	20k	20k	100k	20k	20k	0.1-1M



Find out more:
<https://tinyurl.com/y5gfgx8d>

For sampling rates up to 4 MHz: see Q.boost A101

Edge Devices for High Performance Monitoring and Control, Remote Configuration and Universal Connectivity

Converting raw data to preprocessed information for efficient storage, enrichment and analytics.

High-performance Controller

Q.station X is a high-performance data acquisition controller and edge computing device that provides accurate and reliable synchronization of high-speed measurement data and redundant data logging. It offers an optional full-featured programmable environment, designed for sophisticated automation, control and parallel communication over TCP/IP, CAN, ProfiNet, Modbus, and EtherCAT.



Smart Edge Device for Monitoring Applications

Q.monixx is a new addition to the Q.series product family - the ideal edge computing and data logging solution for reliable process control and asset monitoring. The standard I/O configuration for the Q.monixx includes up to 8 universal analog inputs, 8 digital inputs, 4 digital outputs, 2 relay outputs, and 8 serial channels for communication.

Also included are 4 data loggers for parallel data acquisition to either local storage or to a GI.cloud storage solution for easy accessibility, additional analytics, and detailed diagnostics. Third-party apps can also be hosted on the device.



Advanced Features Matching Your Needs

Q.controller

	Q.station X	Q.monixx
Interfaces		
Ethernet TCP / IP	■	■
EtherCAT	■	-
ProfiNet	■	-
RS-485	up to 48 Mbps	7 interfaces
CAN	■	(optional)
SDI-12	-	1
Connectivity		
Configuration (local or remote) via Gl.bench	■	■
Modem	(optional external device)	(optional)
Gl.cloud connection	■	■
Data logging / Control		
Sampling rate	up to 100 kHz ¹⁾	up to 100 Hz
Continuous / event-based logging	■ / ■	■ / ■
Number of data loggers with arithmetics, filters	20	4
Data storage		
RAM [MB] / Flash [MB]	500 / 4000	64 / -
SD card	■	■
USB expandable	2 slots	■
DAQ Modules		
Number of DAQ modules	Connect up to 64 different Q.series X modules	DAQ module integrated
Digital inputs and outputs	6 inputs / 4 outputs	8 input, up to 2 kHz / 4 output / 2 relays
Analog Input	-	8 multi-purpose (voltage, current, resistance, Pt100, Pt1000) ²⁾
Programming		
Programmable edge computing functionality real time / non real time	■ / ■	- / ■
Apps (external) can be installed	■	■
Display with touch (optional)	■	■
Typical power consumption [W]	<12	<8

¹⁾ With Q.boost A101 up to 4MHz sampling

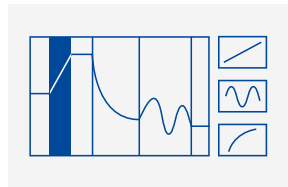
²⁾ Other configurations Q3/2019

test.con

Simple Graphical Programming for Edge Computing Devices

The complete measuring, signal conditioning, data management, control, visualization, and operation tool for your edge-computing controller.

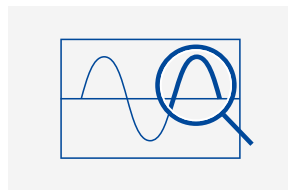
test.con Studio allows graphical programming of application-specific functionalities, which run on the edge in real time.



Curve Generator

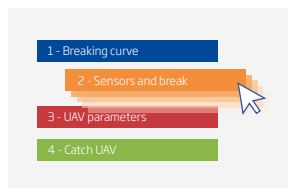
Test and simulate different signals (e.g. Type K, PT100, NTC) in real time

- Simulation signal setups, e.g. Voltage or Current output to control or test various applications
 - Temperature transient simulation as real thermocouple or RTD output
 - Specific curve shapes can be generated by drag and drop
 - PID controller



Power Quality Monitoring

- Real time calculation of active power, apparent power and power factor for sinus shaped signals
- Pre-calculations of rms values, efficiency can be done also in the DAQ Module.
- Effective DC and AC monitoring for converter testing



Flow control

Design and control your measurement setup

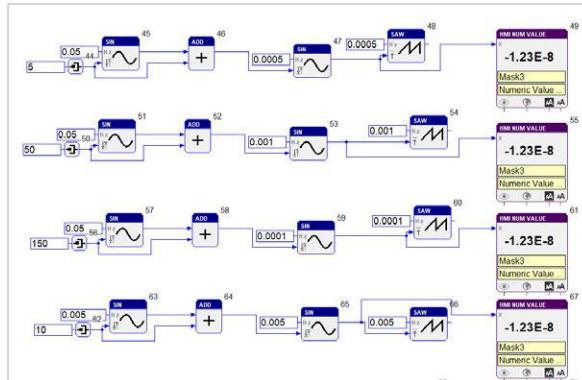
Find out more:

www.gantner-instruments.com/products/test-con



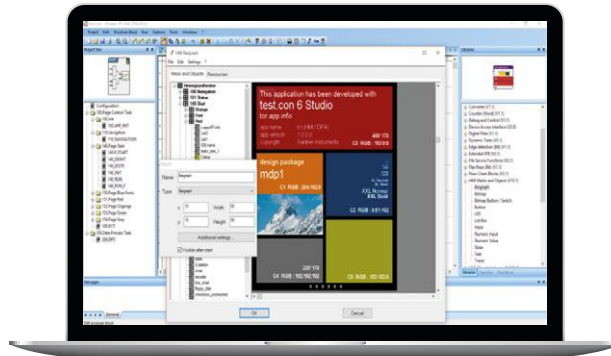
- + Arithmetic (V5.1)
- + Control elements (V0.0)
- Controller (floating) (V1.1)
 - PID-Controller
- + Converter (time) (V3.1)
- + Converter (V7.1)
- + Counter (word) (V1.1)
- + Digital filter (V1.1)
- + Dynamic texts (V0.1)
- Edge detection (Bit) (V1.1)
 - Falling edge (1-0)
 - Rising edge (0-1)
- + Extended SFB (V2.1)
- + Flip-flops (bit) (V1.1)
- + HMI masks and objects (V8.1)
- + HMI parameter blocks (V4.1)
- Logic (Bit) (V2.1)
 - AND
 - NOT
 - OR
 - XOR
- + Numeric (floating) (V2.1)
- + PID-Controller (floating) (2.0)
- + Selection and comparison (V3.1)
- + Sequence blocks (V2.1)
- Signal generators (V1.1)
 - Pulse signal
 - Rectangle signal
 - Sawtooth signal
 - Sawtooth signal
 - Sine signal
 - Triangle signal
- + Signal processing (V2.1)
- + Standard
- Standard transmission terms (floating)
 - Derivative term
 - DT1-Term
 - Integral term
 - Nonlinearity
 - Proportional term
 - PT1-Term
 - PT2-Term (able to oscillate)
- + Timer (floating) (V1.1)

01



Create specific applications with a comprehensive library

02



Individual design of multiple displays for operation and visualization using the mask designer

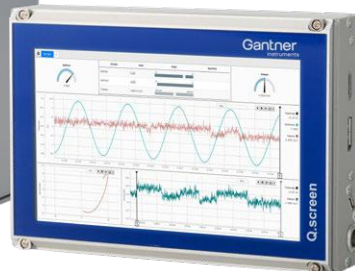
03

After loading the application to the Q.controller, it runs independently of a PC

test.con Studio is a free application and runs on any T version of the Q.controller



Q.station X



Q.screen



Q.monixx

Distributed and Synchronized DAQ

Timer

Depending on the application and environment, different time sources are available.



Radio time (z.B. DCF77)



GPS



Time server



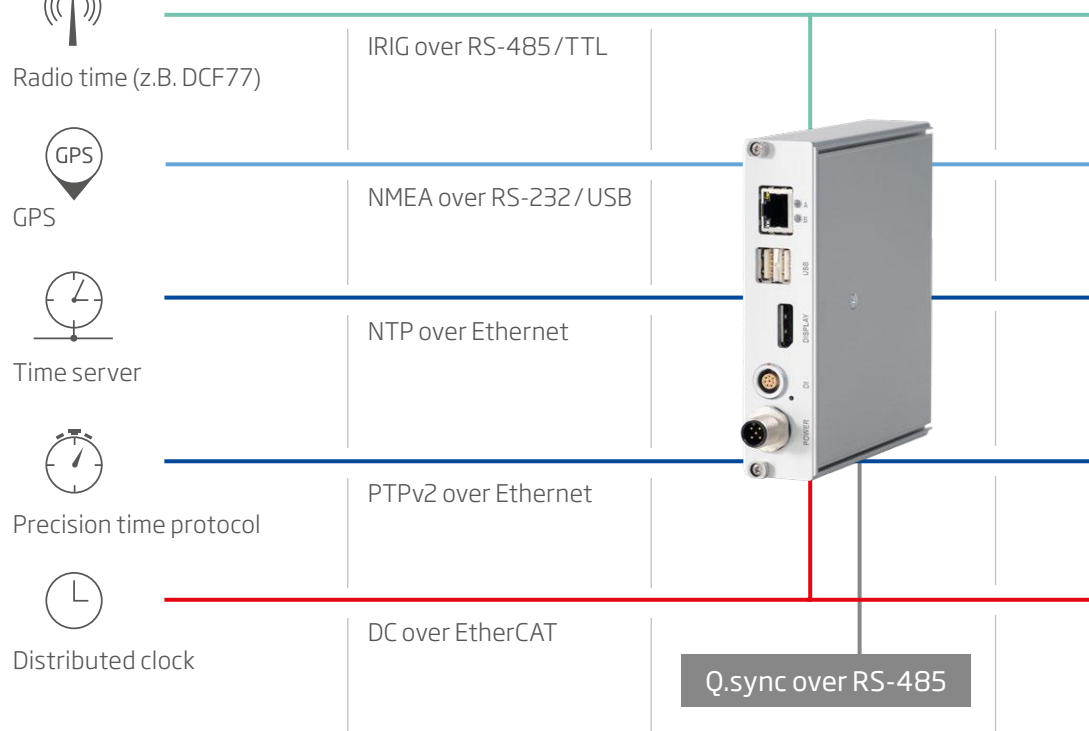
Precision time protocol



Distributed clock

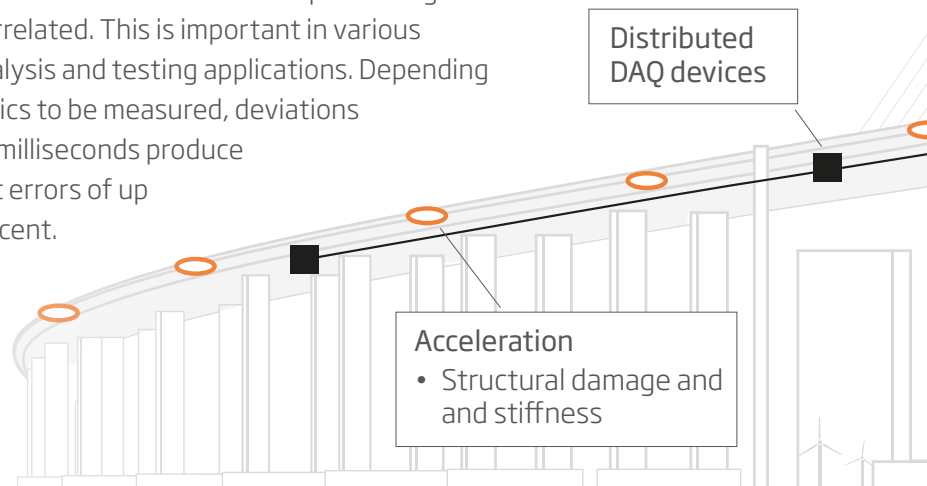
Time Master

The Q.controller receives the time signal and converts it into a Q.sync signal for all subsequent controllers.



Synchronized Measurement

Synchronization of measured data is required if signals have to be correlated. This is important in various structural analysis and testing applications. Depending on the dynamics to be measured, deviations of only a few milliseconds produce measurement errors of up to several percent.



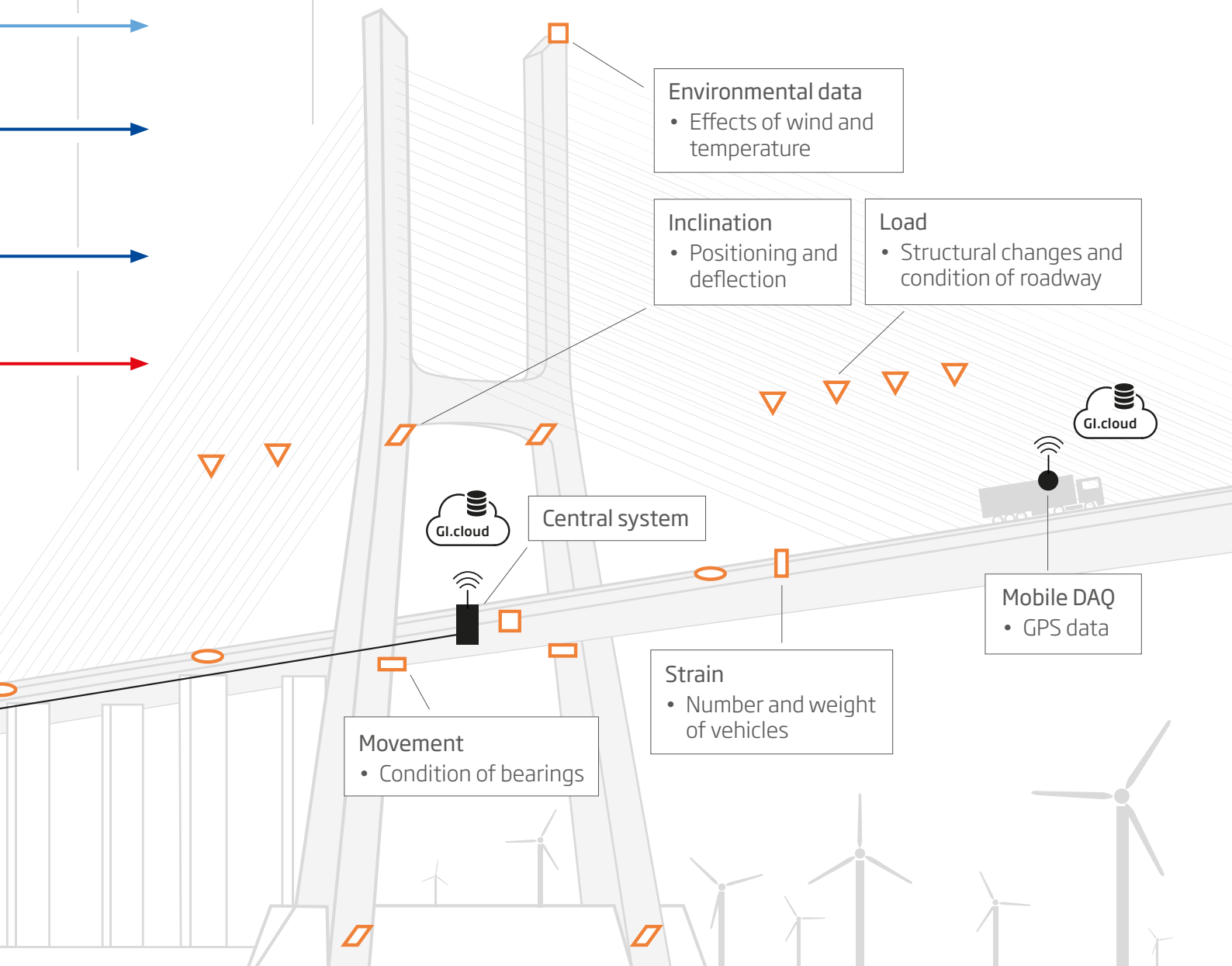
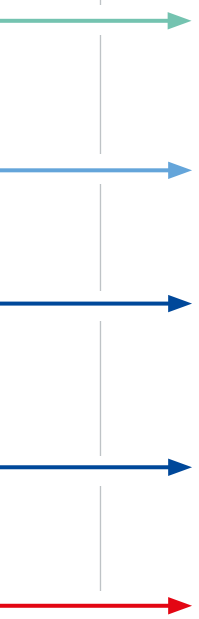
Distributed Monitoring and Control

Q.series modules provide the perfect solution in installations where multiple signals are widely dispersed and require simultaneous sampling and comparison (less than a microsecond). In the structural testing of bridges and wind turbines, where a deviation of only a few milliseconds in the measurement data can result in significant dynamic analysis errors, this functionality is vital.

Time Slaves

The controllers and DAQ modules receive either a Q.sync or an external time signal.

- Typical variables like strain, acceleration, displacement, tilt or forces are acquired, recorded and converted into characteristic values.
- For example, in the bridge application (see figure below), measured values can include traffic load, deflection, misalignment, bearing load or vibration with FFT calculation and damping behavior. This information is processed locally, and the relevant information can be stored and streamed within your IT infrastructure for further decision making.



High Isolation Modules for Electric Vehicle Testing

Leading manufacturers and testing laboratories, such as Bosch Battery Systems, GM and TÜV SÜD, use solutions based on the Q.series. The key benefits of selecting the Q.series include superior channel-to-channel isolation, high noise immunity, and precise high-speed measurements.



Accelerating the Electro Mobility

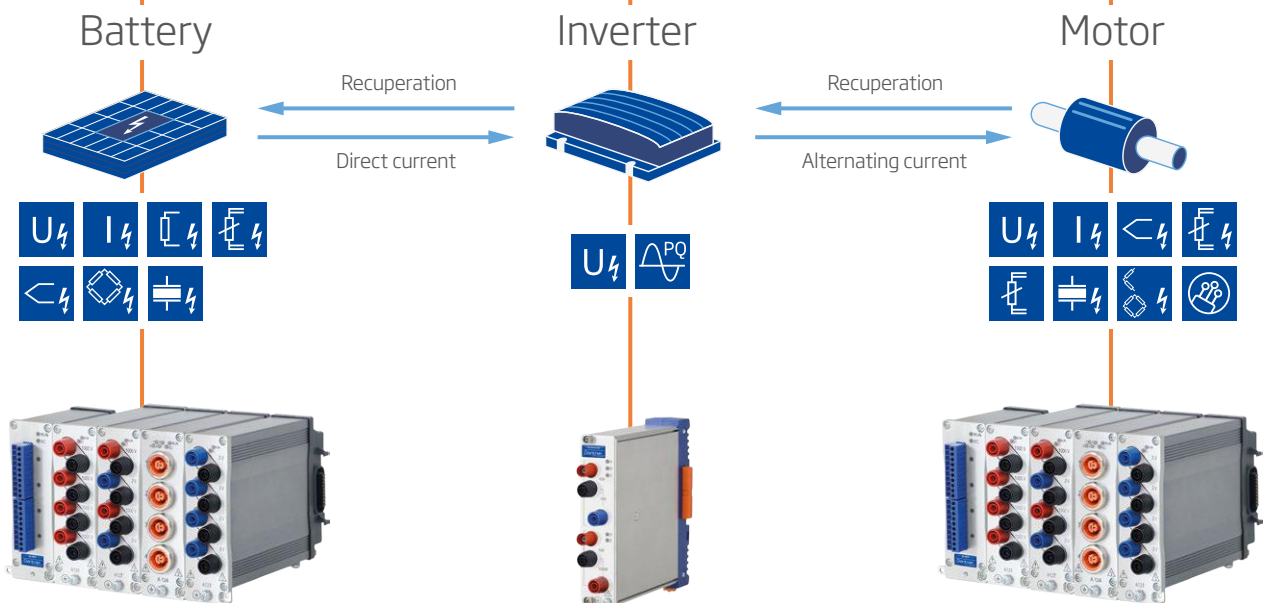
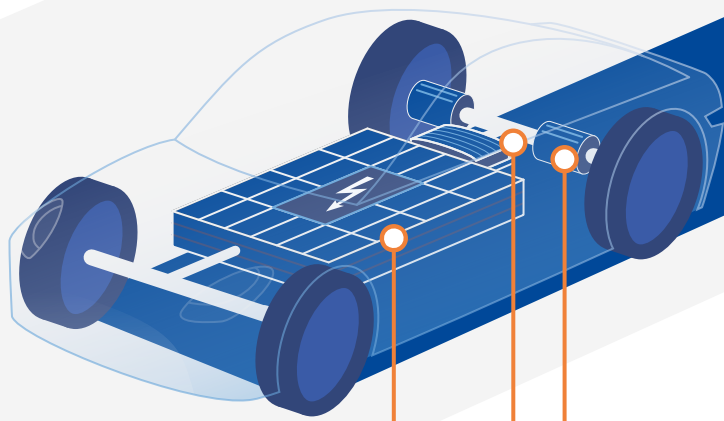
The Q.series modules A121, A123, A124, A127 and A128 provide permanent galvanic isolation of 1200 VDC of each channel, power supply, and communication interface.

Such isolation allows for the measurement of voltages, currents and temperatures at a high voltage potential. The Q.series modules A121, A127 and A128 enable measurements up to ± 1200 VDC. High currents are measured via Hall effect sensors or current shunts.

Isolation 1200 VDC

- Channel to channel
- Channel to power supply
- Channel to interface





Q.series X

- Isolation 1200 VDC
 - Channel to channel
 - Channel to power supply
 - Channel to interface
- A121, A123, A124, A127, A128

Q.boost

- Up to 4 MHz per channel, triggered or continuously
- 2 inputs for voltage and current
- 10 VDC or 1000 VAC range
- Single phase power measurement
- Optional: IEPE/ICP, Piezo, Pulse/Counter
- Q.boost A101

Q.series X

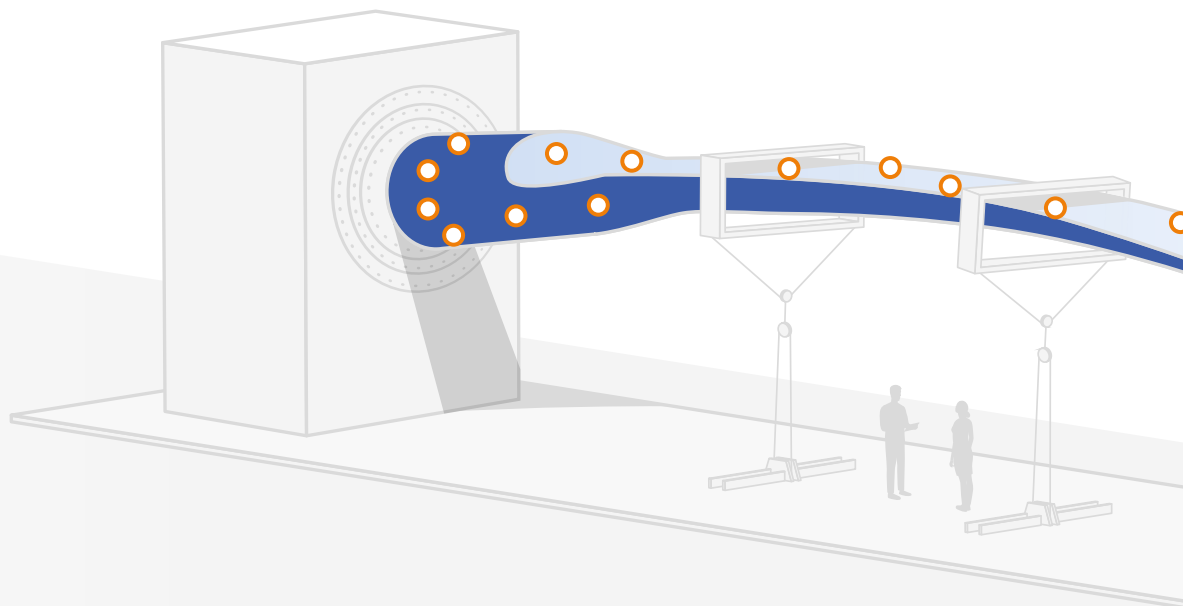
- Up to 100 kHz per channel
- Inputs for voltage, current, thermocouple, Pt100, NTC, IEPE/ICP, full and half-bridge strain gage, and optical sensors
- A121, A123, A124, A127, A128

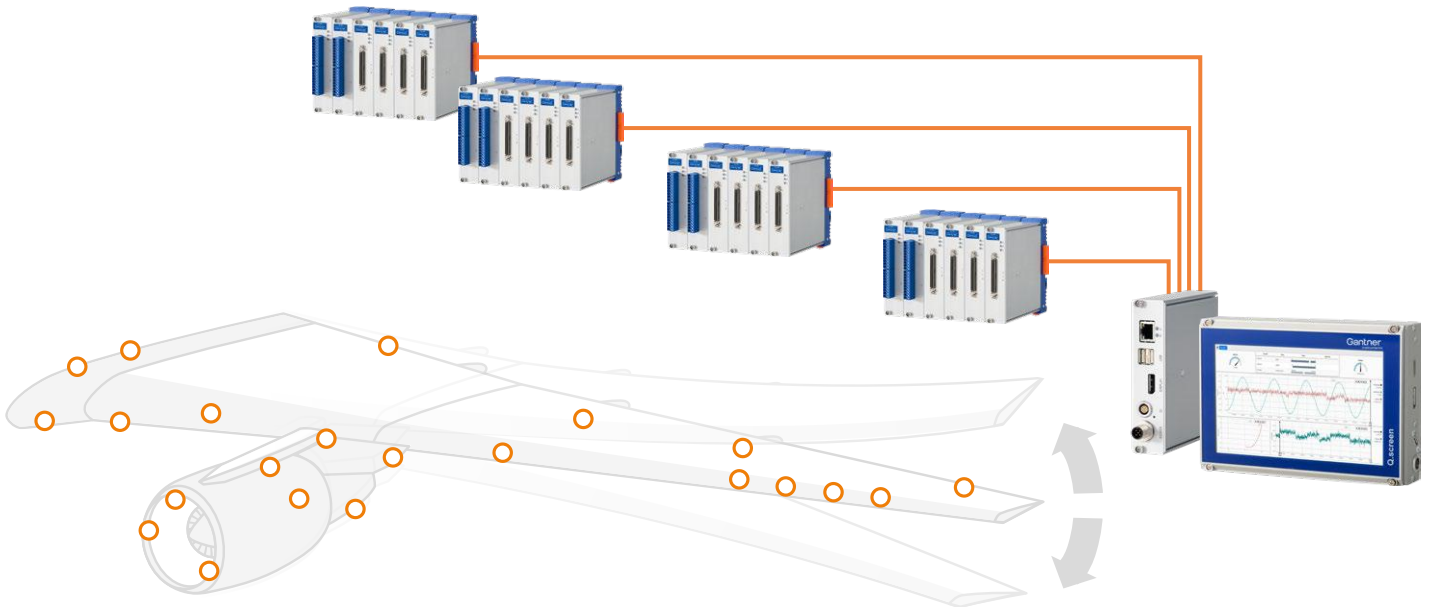
Multi-channel DAQ Solution

The Q.series X is the ideal DAQ solution for multi-channel installations, e.g. applications involving large quantities of strain gauges, temperature sensors or other sensor types. Multiple systems can be connected to facilitate efficient DAQ distribution with high-precision synchronization and gradual expansion up to thousands of channels.

Features

- Flexibility to mix and distribute DAQ modules
- High channel density packaging for minimal footprint
- Quick setup with automatic module detection
- Out-of-the-box time synchronization with less than 1 μ s jitter
- Smart data reduction techniques to minimize data overhead
- Gl.bench software for multi-channel configuration, visualization and, data logging
- Gl.cloud for remote data storage and backup





Q.series X A106

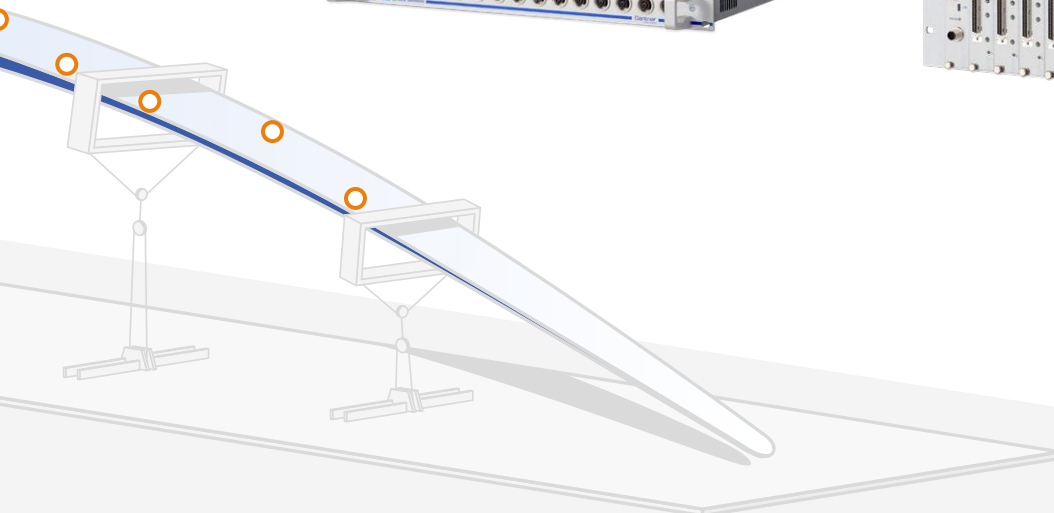
- 2 inputs for full-, half- and quarter-bridge
- Carrier frequency or DC bridge excitation
- 2.5 and 5 VDC excitation
- 600 Hz and 4.8 kHz CF excitation
- 1.25 up to 1,000 mV/V range in 14 steps, scaling function
- 20 kHz sample rate

Q.series X A116

- 8 inputs for full-, half- and quarter-bridge
- Built-in 120 Ω / 350 Ω low TC bridge completion resistors
- Accuracy class 0.05
- 2 and 4 VDC bridge excitation
- 2,000 and 20,000 $\mu\text{m}/\text{m}$ range
- 20 kHz sample rate OCS technique for lead wire compensation

Q.series X A146

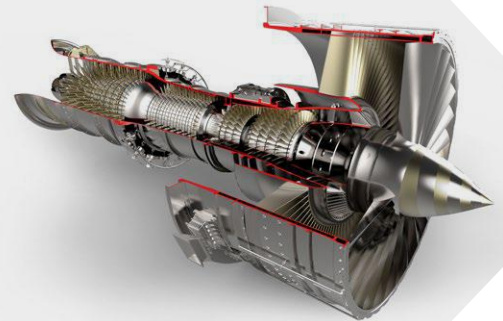
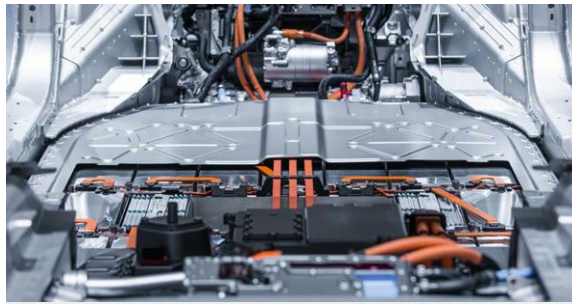
- 16 inputs for quarter-bridge
- Built-in 350 Ω low TC bridge completion resistors
- Accuracy class 0.05
- 2 VDC bridge excitation
- 2,000 and 20,000 $\mu\text{m}/\text{m}$ range
- 20 kHz sample rate
- OCS technique for lead wire compensation



Q.series X F108 Optical Gage Amplifier Ready-to-use Fiber Optic Measurement Technology

Advantages of fiber optic sensors

- High-voltage isolation
- EM and radiation immune
- Inherently intrinsically safe
- Insensitive to lightning strikes
- Cryogenic and high temperature tolerant



Typical operating environments:



Cryogenic and ultra-high temperature



Electromagnetic radiation



High-voltage



Ionizing (gamma) radiation



Hazardous areas

All the benefits of fiber optic measurement without the hassle

The F108 Optical Gage Amplifier seamlessly integrates with the Q.series X data acquisition platform. Benefit from the modularity and versatility of the Q.series X product line to address any of your measurement challenges. Connect with Gl.bench software for the quick and easy setup of your multi-channel DAQ system or Gl.cloud for cloud-based storage and monitoring.

- 8 inputs for strain, pressure, acceleration, temperature measurement



Strain up to 1,100 $\mu\text{m}/\text{m}$



Acceleration up to 1,000 g (peak)

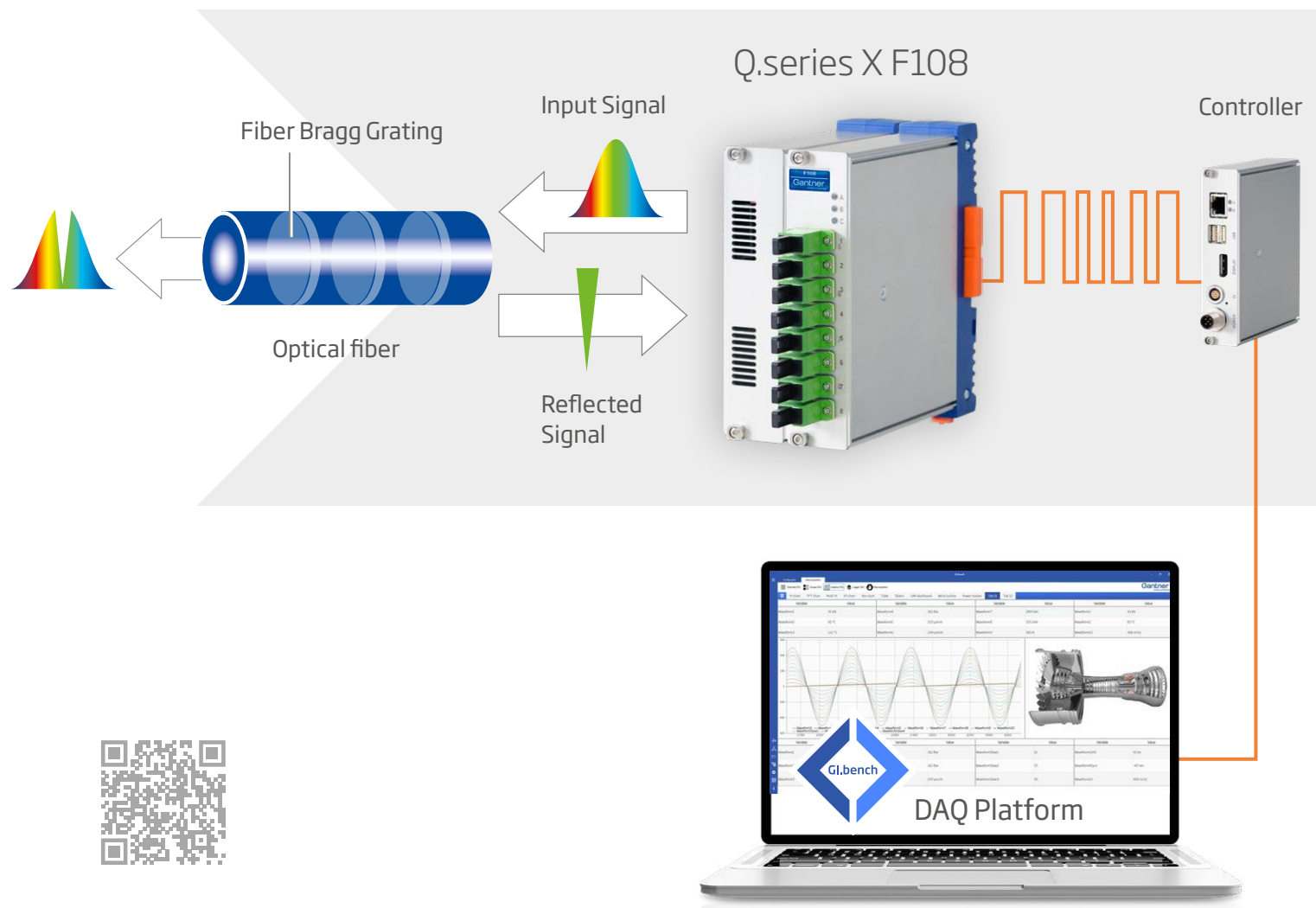


Pressure up to 10,000 PSI



Temperature up to 1,000 $^{\circ}\text{C}$

- Measurement bandwidth up to 50 kS/s
- Transmission distance up to 25 km



Find out more:

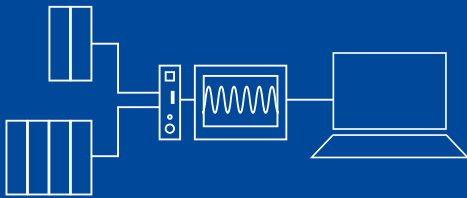
<https://gantner-instruments.com/fiber-optic-measurement>



Connectivity

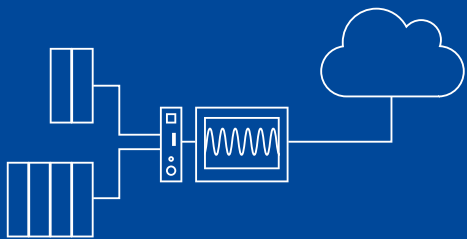
GI.bench

Superior and Scalable Platform
for Modern and Robust
Measurement Setups



GI.cloud

Adaptive and Scalable Platform
for High Performance Edge
Computing Services

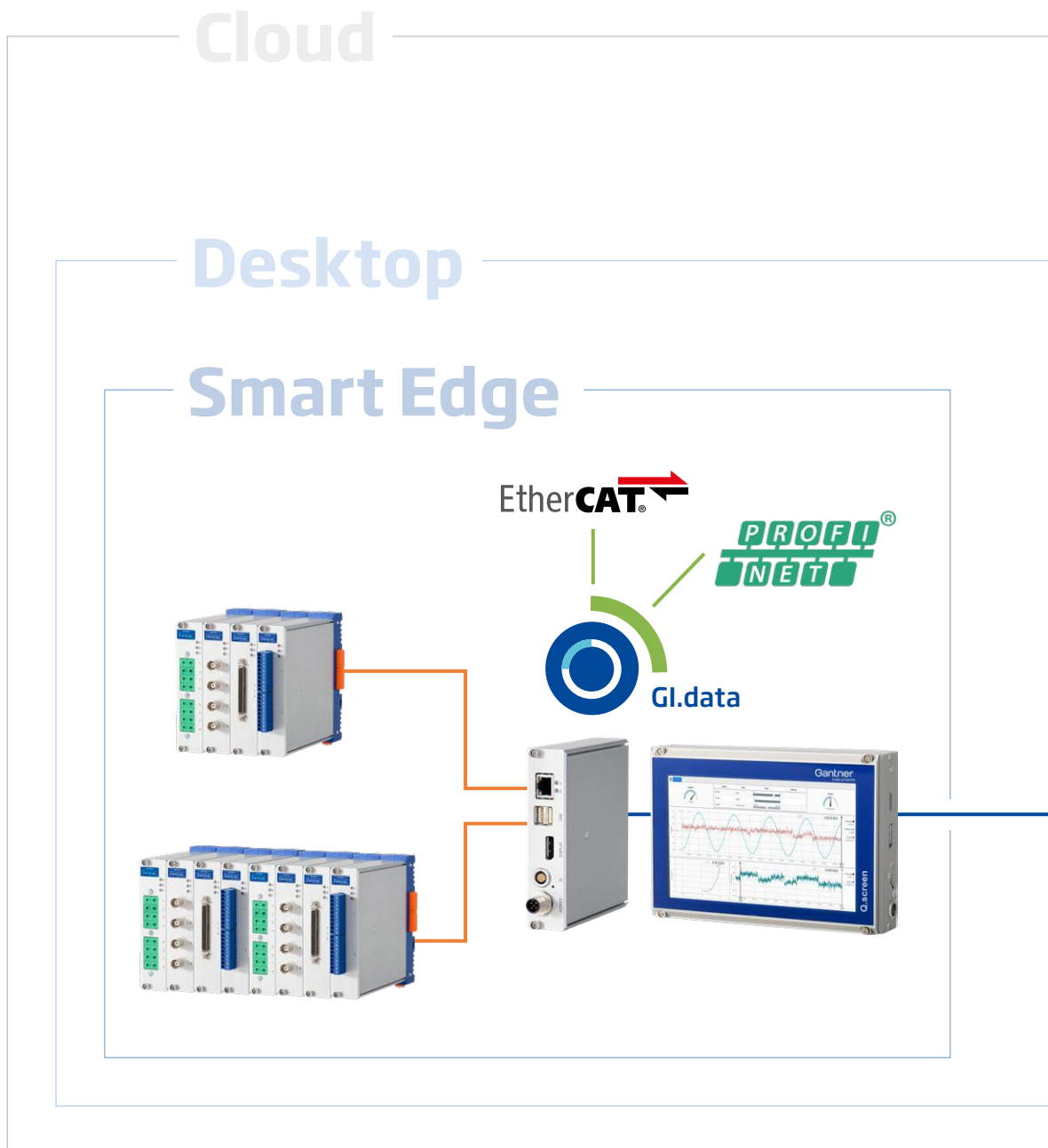


Open and scalable platforms with
scalable and distributed data processing
and analytics. Configure, operate and
visualize your data.



GI.connectivity

Access, store and handle your edge device data with high performance interfaces on GI proprietary platforms or any industrial third-party system



Run Your Data Acquisition on Your Devices, Desktop or Cloud

GI.connectivity fully integrates data storage, security, configuration, authentication and update management from the sensor interface to the data lake.

Customers can perform data acquisition on their devices, desktops, or cloud. APIs and micro-services permit full scalability and flexibility for third-party data processing or via GI.bench and GI.cloud solutions. Multiple combinations are possible if data or control flows need to be aggregated from numerous edge devices.



GI.bench

Superior and Scalable Platform for Modern and Robust Measurement Setups

GI.bench is a multi-function software package which runs on a PC. It provides users with a combination of tools for connectivity, configuration, basic analytics, visualization and data storage.



Setup, Configuration, Operation, Visual and Analysis

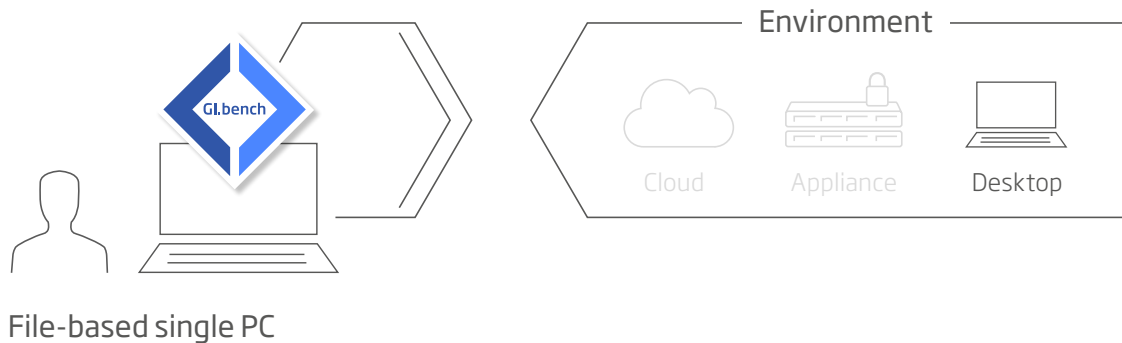
GI.bench permits the configuration, execution and analysis of your test and measurement tasks on the fly. It further enables access to live data and historical measurements anywhere. The required information is transmitted directly to your screen or to any mobile device.

GI.bench offers everything from evaluation and display of real time measured data, data storage based on simple and fast configuration of decentralized measuring systems, through universal data availability in your local network.

Find out more:

<https://gantner-instruments.com/gi-bench>

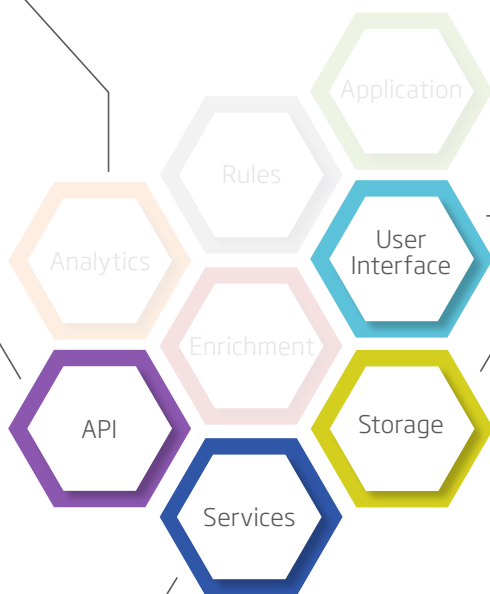




User Interface

- Flexible network-wide visualization
- Show your data in real-time tables
- Customized data dashboard for fast overview
- Data export: raw or aggregated data in various formats (e.g. csv, UDBF)
- Create your own customized user interface
- Rules/notifications: configuration and visualization in WebUI, accessible at API (e.g. system status, ...) or push notification

Upgrade to Gl.cloud
 Gl.bench setup can be upgraded and transferred within minutes to the Gl.cloud platform



API: Application Programming Interface for Open Interfaces

- Binary API: for real-time buffer
- XML-RPC for configuration
- REST for data access, analytics and integration (test.con)

Storage

- Data storage and aggregation in real-time buffer and files
- Event-based data processing
- Third-party data streaming protocols (MQTT, UPC UA, ...)
- Arithmetic stack for data enrichment
- Calculation of key performance indicators
- Your customized analytics plug-in (e.g. test.con)

Services

Gl.config:

- Configuration of parameters, arithmetics and rules
- Easy third-party access

Gl.com:

- Communication between I/O devices, controller and Gl.bench/Gl.cloud
- Secure and reliable information and protocol transport
- No network limits

Gl.data:

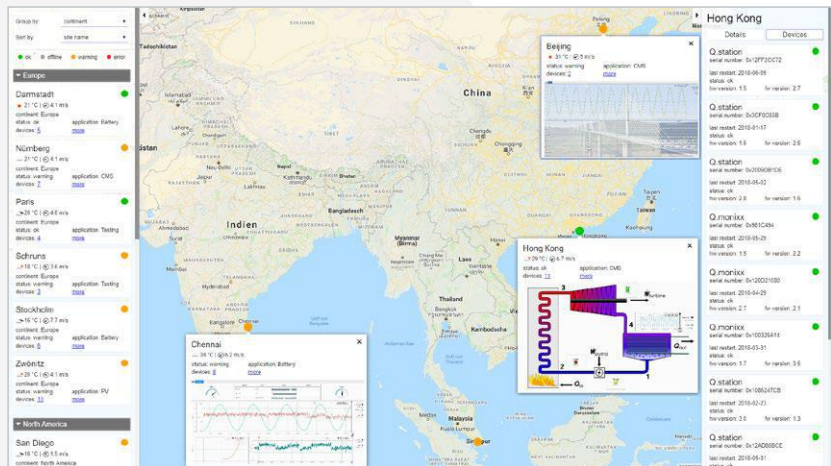
- High-speed data acquisition, storage of all measurement data in shared memory for multiple processes
- Data-logging function with file storage
- Specific data post-processing



GI.cloud

Adaptive and Scalable Platform for High Performance Edge Computing Services

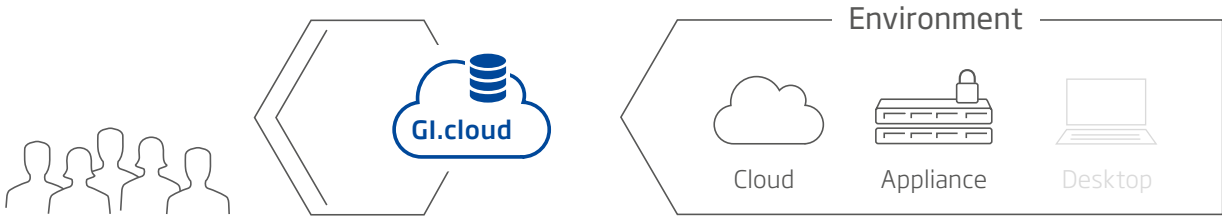
GI.cloud provides integrated high-resolution measurement, advanced big data analytics and secure data accessibility. It facilitates connectivity, as well as acquisition and processing of data from distributed measurement devices. The platform combines Gantner's proven edge-type monitoring and control units, an adaptive and scalable cloud backend, a comprehensive user interface and applications with state-of-the-art APIs.



GI.cloud cockpit

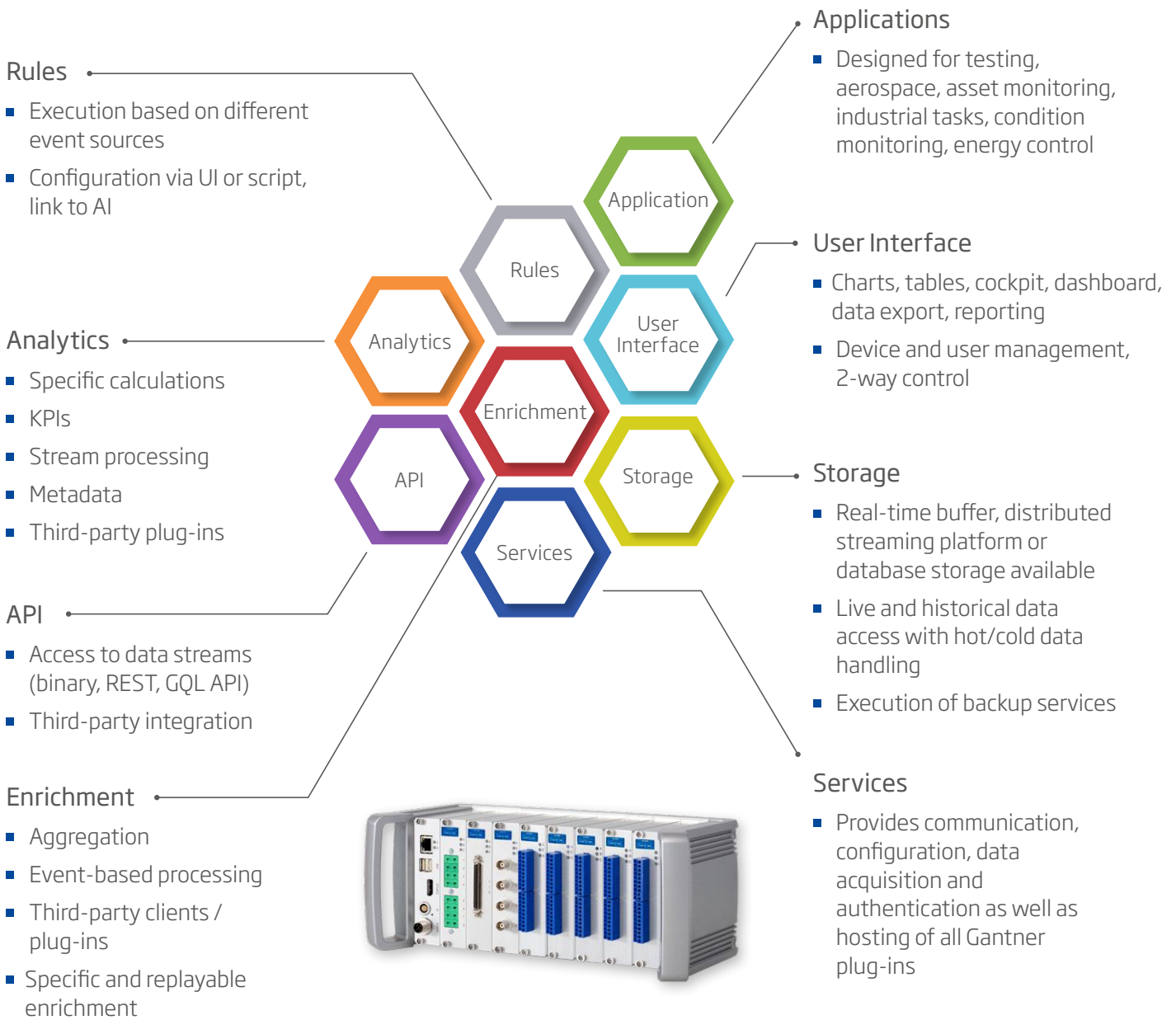
Cloud Benefits

- Seamless combination of Gantner's edge computing devices with cloud platform solutions (micro-services)
- Customizable user interfaces with easy-to-use feature add-ons
- Create your own dashboard for visualization
- API's designed for quick integration into customer platforms and secure data access
- Efficient time series data processing (in microseconds) due to scalable platform
- Clustered hot/cold data storage for minimum running cost
- Unlimited data storage on the device or based on a scalable data stream processing platform (granularity: microseconds to minutes)
- Continuous integration of GI.bench services and configuration to cloud level
- Available platforms: cloud, appliance or desktop



Distributed Streaming Platform and Database

- Scalable
- Clustered



Find out more:

<https://gantner-instruments.com/gi-cloud>



Q.series Classic Edition

The Q.series Classic offers modular and flexible DAQ system configurations.

We are committed to deliver upwards compatibility across our entire range of products and systems to enable our customers to utilize their existing instrumentation and software for decades to come.

Features

- Multi-channel applications with highest density
- High availability, short lead times
- DIN rail mounting
- Connection on front of module
- Distributed setup using test.controller

Q.staxx



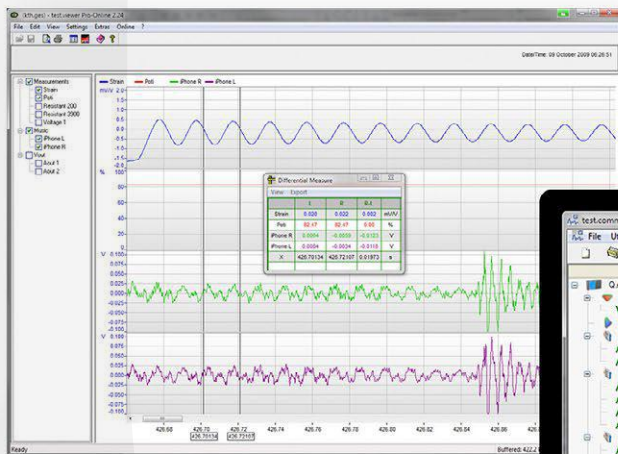
Q.bloxx



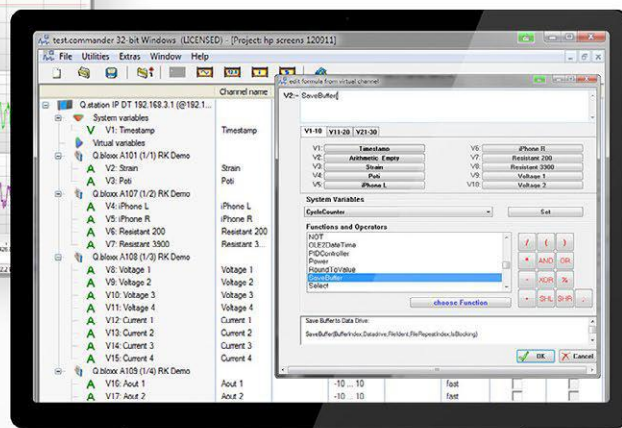
Q.raxx slimline



test.viewer



test.commander



Q.station

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