YOKOGAWA

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Test&Measurement Magazine

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Content

News

Colophon

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Precision Making

OpreX™

AI Product Solutions

AI Analysis
Data Logging Software
SMARTDAC+ GA10

AI

Intelligent monitoring and data collection

Shaping the future with AI and user-friendly tools

In a world where data fuels innovation and efficiency, the technology of monitoring and data acquisition plays a central role. With a combination of real-time monitoring, artificial intelligence (AI), and comprehensive integration capabilities, Yokogawa's GA10 Data Logging Software sets new standards, creating an impressive balance between technical performance and user-friendliness.

Customization for optimal control
Whether you want to optimize production processes or monitor the condition of your equipment and test benches, a flexible user interface is crucial (Figures 3 & 4). The GA10 software offers real-time monitoring with minimal effort. Even better, the user interfaces can be customized to your applications (optional). This makes it easy to change device parameters and conveniently control processes.

Artificial intelligence: round-the-clock vigilance
The integration of AI into the GA10 software takes monitoring to a whole new level. Using machine learning, the software detects unusual conditions at an early stage and reports them automatically. This reliably identifies errors that humans might overlook. Historical data can also be analyzed to establish preventive measures and maximize uptime.

AI-supported forecasts for the future
Thanks to AI, not only is the current status of your systems monitored, but the future is also modeled. Based on the data collected, trends can be identified and early warnings of potential problems can be generated. This allows you to take proactive action and significantly reduce downtime.

Reliable data storage and reporting
Collected data is valuable - its security is essential. GA10 software reliably stores data in binary or text format and allows for easy visualization. Automatically generated reports in Excel, PDF, or printed form offer additional flexibility - ideal for quality assurance, audits, and internal evaluations.

A networked workplace: easy device integration
In modern production environments, isolated data islands are a thing of the past. Different devices can be connected via an Ethernet network and all relevant data can be recorded centrally in the GA10 software. The simple setup allows multi-channel data to be processed quickly and evaluated efficiently using optional mathematical functions.

Data monitoring: anytime, anywhere
Why be tied to a fixed workstation? With the GA10 software, or the optional web-based solution, data can be conveniently

Figure 1: Real-time monitoring

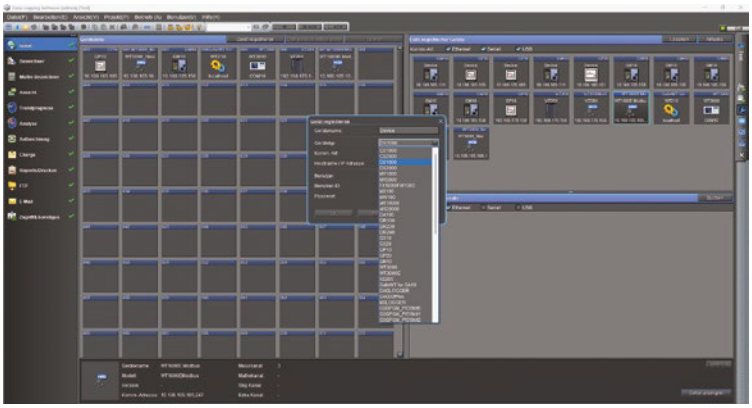
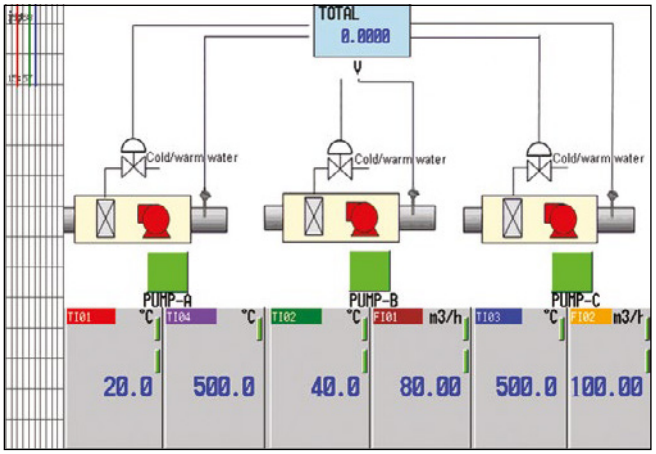
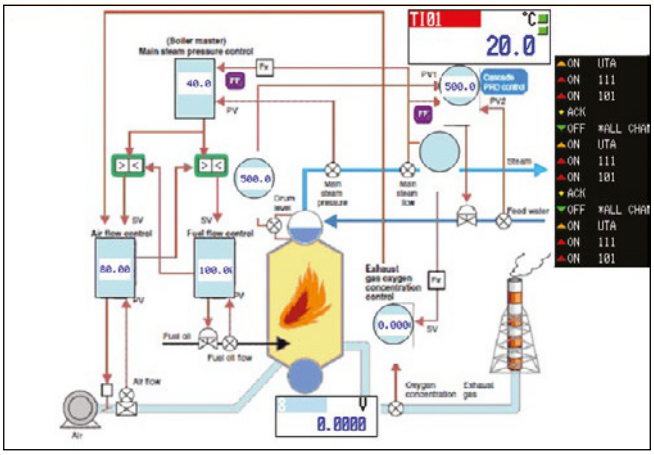


Figure 2: Device overview and registration





Images 3 & 4: Examples of custom displays

monitored from a tablet or PC: in the office, in production, or on the go.

Quickly detect and rectify errors

The integrated alarm functions are an indispensable tool for process monitoring. As soon as an alarm is triggered, users receive audible and/or visual signals – and can also be notified of critical conditions by email . This allows you to react immediately before there are any effects on the entire process.

Conclusion:
Future-oriented technology for maximum efficiency

The combination of real-time monitoring, AI-supported fault detection, and intuitive operation makes the GA10 Data Logging Software an indispensable tool in technology-oriented environments.

With user-defined functions, comprehensive integration, and proactive data utilization, you can take your processes to the next level - more efficient, safer, and future-oriented.

Product Manager, Data Acquisition Systems

The SL2000 ScopeCorder

The somewhat different DAQ system with high-speed acquisition

Yokogawa offers a powerful solution for the increasing demands in dynamic areas such as electromobility and renewable energies. When developing drive systems or conducting endurance tests, high channel counts, fast sampling rates, and long measurement times are required simultaneously - this is where the SL2000 comes in.

Yokogawa rounds off its ScopeCorder family with the SL2000. In addition to the small, compact DL350 with battery operation and the DL950 for laboratory and mobile applications, the SL2000 is optimized for test bench and production applications, offering high-speed data acquisition.

The SL2000 - developed for individual testing and development tasks in automotive, mechatronics, and power electronics - combines the functions of a data logger with those of an oscilloscope, for fast data acquisition.

The modular architecture with eight slots and over 20 available input modules enables the acquisition of almost any type of signal: voltage, temperature, acceleration, strain, frequency, or serial protocols such as CAN/CAN FD/LIN. For example, up to 32 isolated voltage channels or 160 temperature or microvoltage channels are possible.

One of the greatest strengths of the SL2000 is the DualCapture function. It enables the simultaneous acquisition of long-term trends and short-term transient events with a high sampling rate. Long-term observation is performed at a low sampling rate in order to obtain a general overview of the measurement and keep the amount of data low. For high-speed events that occur, a trigger condition activates fast sampling (up to 200 MS/s) so that all signal details are captured.

PC-controlled front end
The SL2000 can be operated as a PC-controlled front end on the test bench or in a combined manner with the existing DL950 for channel expansion. The measurement signals are controlled and visualized using the supplied IS8000 software. In addition, numerous free software components and APIs are available, enabling flexible programming and integration into existing systems.

Optimal control of data
The SL2000 offers five different methods for data storage: storage in the fast internal acquisition memory, recording in flash memory, streaming to an optional internal SSD, and real-time streaming directly to a PC—either via the integrated Ethernet interface or optionally via a 10 Gigabit Ethernet interface. The latter allows continuous data transfer at up to 20 MS/s, with the amount of data limited only by the storage capacity of the PC.

Thanks to its compact design, which can be ideally integrated into 19-inch racks, and its support for the IEEE1588 time standard for precise time synchronization, the SL2000 is a powerful and versatile solution.

The SL2000 is more than a data acquisition system - it is a flexible tool for development, offering high speed, a large number of channels, and adaptable integration.

Business Development Manager,
Oscilloscopes & ScopeCorders

NEW

New PBDH0400 differential probe

High-voltage measurement for modern power electronics

With the new PBDH0400 series, Yokogawa is expanding its range of high-voltage differential transducers for measurement tasks in power electronics, the automotive industry, and the energy sector.

The probes enable measurements of up to ±2000 V (DC + ACpeak) with a bandwidth from DC to 400 MHz – ideal for capturing highly dynamic switching processes in modern systems such as electric drives or renewable energies.

The use of the latest generation of power semiconductors—such as those based on silicon carbide (SiC)—significantly increases the demands on measurement technology.

These components are characterized by extremely short switching times, which in turn places the highest demands on measurement technology.

This is where the differential probes of the PBDH0400 series come into play. Their excellent noise immunity and high common-mode rejection ratio (CMRR) ensure that even the smallest anomalies, such as overshoots or signal distortions, can be reliably detected.

Two models, many possibilities – depending on the version, with Yokogawa probe connection or BNC connector.

- 702922/702924: up to ±2000 V, divider 1000:1 / 100:1
- 702921/702923: up to ±1000 V, divider 500:1 / 50:1

The special Yokogawa probe connection provides the power supply and transmits the appropriate division ratio, which can be set directly on the probe. This minimizes sources of error caused by manual entries.

New: Alternatively, the model can be selected with a BNC connection. This has the advantage that the probe can be used with any measuring device. Power is then supplied via a separate LEMO cable and the Yokogawa device option /P2, /P4, or /P8, or optionally via an external power supply.

Thanks to their small form factor, the probes can be used flexibly in laboratory and test bench environments. Test clip tips are included in the scope of delivery; additional optional accessories allow adaptation to different measurement situations.

The high bandwidth of 400 MHz is particularly valuable in the development of inverters or motor controllers. It allows detailed investigation of effects such as overshoot, ringing, or signal distortion.

Detailed analysis of voltage and current signals during switching operations can minimize switching losses and thus improve the performance of electric vehicles, for example.

In addition, the series is perfectly suited for the validation of energy-efficient household appliances and the diagnosis of industrial high-performance motors.

With the PBDH0400 series, Yokogawa offers a new solution for high-frequency, high-voltage measurement. It is the perfect link between modern power electronics and analysis – and thus an important building block for the development of tomorrow's energy-efficient technologies.

Business Development Manager,
Oscilloscopes & ScopeCorders

Reliably detect microcracks with 40 µm resolution

Precise reflection measurement in optical components

The AQ7420 from Yokogawa detects the finest reflection points and microcracks in optical connectors and modules with high spatial resolution and exceptional measurement accuracy. OLCR technology, simultaneous loss measurement, and dual wavelength operation make it a powerful tool for quality assurance and analysis in high-performance optical applications.

When testing optical components, a single detail can often determine whether a system will operate stably in the long term or not. Reflections in the submillimeter range, unnoticed air pockets, or microcracks in connectors can lead to performance losses or even total failure in the application. Traditional methods such as attenuation or OTDR measurements reach their limits in such cases—especially with short optical distances, multiple interfaces, or complex hybrid assemblies.

The Yokogawa AQ7420 addresses this challenge with high-resolution optical low coherence reflectometry (OLCR) technology. It is based on the principle of time domain optical coherence tomography (TD-OCT) and uses non-coherent light for interferometric evaluation. The measuring range is 100 mm, the spatial resolution is less than 40 µm, and the scanning resolution is as low as 1 µm. A key feature: The AQ7420 achieves a noise level of less than -100 dB, which minimizes artifacts, known as “spurious noise” signals, and ensures clearly interpretable measurement data, even with highly complex component structures.

The practical relevance of this is particularly evident in the testing of connectors: Microcracks in ferrules or end faces that appear inconspicuous during insertion loss measurements can later develop into structural failures, for example due to temperature fluctuations or vibration. The AQ7420 makes these defects visible at an early stage. In combination with the optional sensor head, insertion loss can also be measured with high precision (±0.02 dB). This provides a complete picture: back reflection, loss, and structure—all in a single measurement process, without retooling or changing equipment.

For users, this means real added value: development times are shortened because component quality can be precisely evaluated as early as the prototype stage. Production waste is

reduced because faulty batches are detected early on. And in quality assurance, teams benefit from a traceable, documented evaluation at the micrometer level—even for assemblies that have already been assembled or encapsulated.

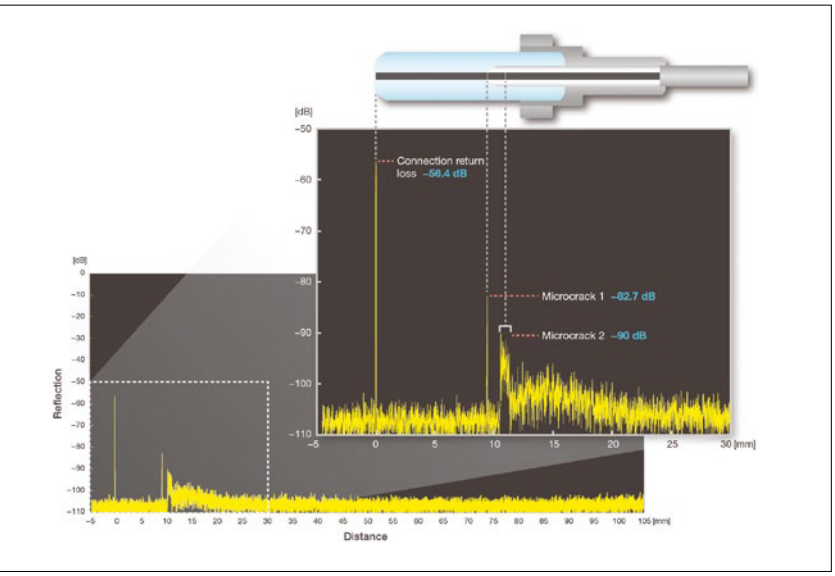
The dual-wavelength version AQ7420-1315, which combines 1310 nm and 1550 nm in one device, makes it even more efficient. The wavelength change takes place internally, eliminating the need for reconnecting. This saves a considerable amount of time, especially for standard-based testing of optical connectors or splitters according to ITU-T G.652. Test cycles can be accelerated, operating errors avoided, and measurement systems standardized.

The AQ7420 has a wide range of applications: In manufacturing, it is used for end-of-line testing of optical connectors. In the analysis of transceivers (TOSA, ROSA, COSA), it allows the localization and evaluation of internal interfaces. In research—for example, in the field of silicon photonics or optical sensor technology—it supports material characterization and process development.

It also provides valuable data on optical integrity in the non-destructive testing of fiber lasers, splitters, and waveguides.

The AQ7420 helps minimize risk, especially in high-availability infrastructures such as FTTA installations, data centers, underwater communications, and space applications. Early detection of potential failure points not only ensures that quality requirements are met, but also reduces warranty costs and service calls.

The system is operated via intuitive PC software with a USB connection. It can be integrated into automated test benches or used manually in the lab. Referencing takes only three minutes. A well-designed accessory concept ensures maximum flexibility: master cords, distance compensation cables, various adapters – even a solution for MPO multi-fiber connections is in the works. This allows the system to be adapted precisely to the respective application, from single-fiber connectors to complex hybrid modules.



Measurement example for microcracks in optical connectors (high sensitivity range)

In a competitive environment, the AQ7420 stands out thanks to its robust signal quality, ease of use, and attractive price-performance ratio. While OFDR (Optical Frequency Domain Reflectometry)-based systems offer high resolution but often struggle with interference signals and high complexity, the AQ7420 delivers clear, reproducible results—with less effort, shorter training time, and better automatability.

For users who value measurable quality, process reliability, and future-proof testing methods, the AQ7420 is more than just another measuring device. It is a strategic tool for ensuring optical functionality—from the laboratory to series production, from research to field analysis. Precise, efficient, and uncompromisingly reliable.

Business Development Manager,
Optical Metrology

Vexlum Case Study: indispensable analyzer AQ6370E

Characterization of modern lasers for the development of quantum computers

Quantum computers could take digital technologies to a whole new level of performance—far beyond what classical computers are capable of. This requires specialized lasers that emit light with precisely defined wavelengths in the visible or near-infrared spectral range. As their development and manufacture become increasingly complex, precise measurements over a wide wavelength range are essential.

How precision lays the foundation

Vexlum, a spin-off from the University of Tampere in Finland, is one of the few companies worldwide capable of manufacturing vertical external-cavity surface-emitting lasers (VECSELs) for quantum computers. Extremely narrow-band emission at a single, precisely defined frequency is crucial for these applications. To ensure this stability, Vexlum precisely controls three key components of a high-power laser: the gain structure, the pump source, and the external resonator. While conventional designs for narrow-band high-power lasers often consist of three separate modules—seed laser, amplifier, and emitter—Vexlum's VECSEL is based on a monolithic design. This compact 3-in-1 architecture significantly reduces system complexity while achieving higher output powers than classic edge-emitting lasers or VCSELs.

Reliable wavelength control

Precise spectral measurement is essential to ensure that the VECSEL operates stably at the desired wavelength. Quantum applications operate at very different wavelengths and therefore require a high-resolution, flexible measurement system.

Reliable analysis without complex test setups

Vexlum relies on optical spectrum analyzers from Yokogawa. These combine two crucial features: maximum wavelength precision for compliance with the tightest tolerances and a wide spectral measurement range from the visible range to the near infrared. This allows a wide variety of VECSEL designs to be reliably analyzed with just one system – without parallel, complex test setups.

The AQ6370E covers 600–1700 nm, offers a typical measurement accuracy of ±0.008 nm, and a resolution of up to 0.02 nm. For detailed analysis, the device features High Close-in Dynamic Range (HCDR) mode, which resolves spectral peaks more sharply and significantly improves the display of side modes.

Vexlum has been working with Yokogawa equipment since its inception as a university research group. The company now employs around 25 people and is preparing for series production of its lasers. Jussi-Pekka Penttinen, co-founder, CEO, and CTO of Vexlum, plays a central role in this development.

“In short, without Yokogawa's AQ6370E, we would not be able to reliably check the characteristics of our VECSELs—the device is indispensable for precise analysis in development and production,” explains Penttinen. “In addition to its technical performance, we are also impressed by the device's user-friendliness. It also enables the automation of many test processes—a decisive factor in increasing efficiency and throughput in the laboratory and production.”

The complete case study can be found here:
yokogawa.magazines.center/case-study-vexlum

110 years of Yokogawa

From the first electricity meter to a global company

Highest accuracy, faster results, greater flexibility, and even better evaluation options: A global leader in test and measurement technology and industrial automation, which began in 1915 with the development of Japan's first electric meter.

Dr. Tamisuke Yokogawa, an architect and civil engineer, founded a research institute for electric meters in Tokyo in **1915**. Supported by his nephews Ichiro Yokogawa (first president) and Shin Aoki, he developed prototypes that led to the first production of electric meters in Japan in **1917**.

Yokogawa Electric Works Ltd. was established in **1920**. In addition to electricity meters, other measuring instruments were soon developed, including a fluxmeter that was more powerful than imported devices. Shin Aoki later became vice president. In **1930**, the company moved to a new factory and expanded its portfolio to include displays, aircraft instruments, and temperature, flow, and pressure measuring devices.

The company went public in **1948**. In the **1950s** and **1960s**, Yokogawa grew rapidly in the field of industrial automation, developing precision wattmeters, Japan's first electronic recorder, and, in **1964**, the vortex flow meter. Collaborations with Foxboro and Hewlett-Packard, as well as a sales office in the US, promoted internationalization. In the **1970s**, branches were established in Singapore and Europe opened.

In **1986**, the company was renamed Yokogawa Electric Corporation. With digital storage oscilloscopes, the company entered the field of high-frequency measurement technology. In 1994, the acquisition of nbn-Elektronik led to the establishment of Yokogawa GmbH in Germany.

At the beginning of the 21st century, Ando Electric, another manufacturer of electronic and optical measuring instruments, was acquired.

Today, Yokogawa Test & Measurement sets standards in precision and efficiency with its innovations: The WT5000 delivers industry-leading power analysis, the DL950 ScopeCorder combines speed with versatility, the AQ series enables reliable optical measurements, and the SMARTDAC+ system flexibly captures data and visualizes it conveniently. Together, these solutions support the research, development, and industry of tomorrow.

Join in the celebrations and take advantage of our current anniversary offer:

tmi.yokogawa.com/de/110-jahre-yokogawa

Dates for 2026

More information about events and registration at **tmi.yokogawa.com/eu/news**

Webinar

Digital training from a first-hand source

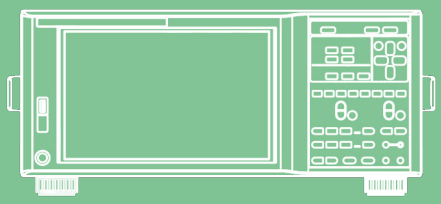
Sessions will be conducted in German

GA10 Data Logging Software – Fundamentals
Thursday, 5 Mart 2026, 10.00 CET // Christian Thoma

WT5000 Power Analyzer: Standards-compliant measurement of standby losses according to IEC 62301 v2.0 – practical example with report generation
Thursday, 12 Mart 2026, 10.00 CET // Andreas Maushammer

High-Speed. High-Flexibility –
The new Yokogawa SL2000 DAQ in practical use
Thursday, 19 Mart 2026, 10.00 CET // Anna Krone

Optical Webinar
Time to follow
Sebastian Gryska



Power-Workshops

Fundamentals of electrical power measurement

Sessions are conducted in German

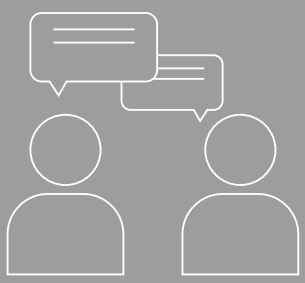
Power Workshop on WT5000
24 - 26 February 2026, Herrsching, Germany

Power Workshop on WT1800E/R
5 - 7 May 2026, Herrsching, Germany

Power Workshop on WT5000
23 - 25 June 2026, Herrsching, Germany

Power Workshop on WT1800E/R
20 - 22 October 2026, Herrsching, Germany

Power Workshop on WT5000
1 - 3 December 2026, Herrsching, Germany



Events

Meet the Precision Makers

Coiltech Deutschland
International trade fair for electromechanics
25 - 26 Mart 2026, Augsburg // Hall 5, Stand G-26

PCIM Expo
Leading trade fair for power electronics
9 - 11 June 2026, Nurnberg // Hall 9, Stand 400

Electronica
World's leading trade fair for electronics
10 - 13 November 2026, Munich // Hall A3, Stand 117

ECOC
European Conference on Optical Communication
21-23 September 2026, Málaga, Spain // Stand 2157