

# Products and services overview





## Trusted measurements for future generations

A century ago, our founder, Tamisuke Yokogawa, encouraged his young colleagues, saying, “**Just learn and improve our technology. You must make products that earn us the respect of our customers.**” At Yokogawa, this is still who we are.

Yokogawa Electric Corporation was established in 1915 to manufacture the first electric meters in Japan. As the foundation of our business, measurement remains a strong and important driver for our activities. Today, Yokogawa Test & Measurement is providing high quality, highly reliable test and measurement solutions that helps to improve our society.

Whether it is at home and office or how we travel between them; how we generate energy and operate within our industries; how we communicate and connect or care for our environment and each other; precision measurement is vital for innovation and progress.

With over a century of experience in precision making, we at Yokogawa have built our reputation

on understanding the needs of scientists and engineers from these industries. Always at the forefront, we further mastery over our core technologies to enable engineers, who rely on precise and reproducible measurements, to make critical development decisions for their next generation of products.

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# YES

Yokogawa  
expert  
support



## YES, Yokogawa expert support

There's a world of precision at your disposal

Whether you have been working with Yokogawa products for some time, or you have just received a brand-new measuring instrument, we want to make sure you get the most out of it. Yokogawa's YES team is a centre of knowledge and experience and is there for you. A team of specialists will answer your questions either by phone or email and are always on top of new functionalities and how these add value to your application.

Just like your company's technology evolves so do our measuring instruments. This continuous cycle of development is our drive to exceed your test and measurement requirements. YES can offer off the shelf- or customized trainings in our training centre or at your location to your entire team.

You can rest assured with YES you get most value out of your new measuring instrument!

Visit [tmi.yokogawa.com/eu/support](https://tmi.yokogawa.com/eu/support) for more information about YES.



## Precision power measurement

### Trustworthy power measurements

As energy efficient technologies gain wider adoption in our homes, offices, transportation and industry, the need for reliability in testing their efficiency, performance and safety has never been greater.

Whether it is in renewable energy, electric vehicles home and office appliances or industrial mechatronics, engineers are constantly dealing with changing test conditions and evolving international standards.

As the leader in power measurement solutions, Yokogawa is dedicated to providing engineers fully specified and trustworthy measurements across the development cycle.

By enabling engineers to validate power consumption and efficiency improvements at high accuracy, for both low and high frequency applications; Yokogawa empowers them to innovate with precision, flexibility and confidence to quickly bring their products from concept to market.





**WT3000E Precision power analyser**

Meet the world's most stable and accurate power analyser offering high bandwidth and unbeatable performance. The WT3000E is the benchmark for energy efficiency measurements and enables products with standby power modes to be tested according to IEC62301 Ed2.0 and EN50564. It supports 50/60 Hz (10/12 cycles) harmonic, interharmonic and flicker measurement and analysis, as required by IEC61000 standards.

- Basic power accuracy: 0.01% of reading + 0.03% range
- Bandwidth DC, 0.1 Hz to 1 MHz
- Harmonic and flicker analysis as per IEC 61000 standards

**WT1800E – Precision power analyser**

With up to 6 input elements the WT1800 is typically used for efficiency measurements on three-phase motors and drives, power supplies with multiple inputs/outputs and LED lighting applications etc. The WT1800E is a universal meter for power electronic and energy analysis.

- Basic power accuracy: 0.1% of reading + 0.05% of range
- Input power frequency range of DC, 0.1 Hz to 1 MHz
- Simultaneous power measurements and dual channel harmonic measurements up to the 500th order



**WT5000 – Precision power analyser**

The WT5000 is the world's most accurate power analyser and represents the next generation in precision power measurements.

With its unmatched accuracy, simultaneous analysis on up to 4 motors and a modular architecture that allows users to swap up to 7 input elements, the WT5000 is an extensible measurement platform that takes the guesswork out of product testing.

Operable by touch and hardware, the WT5000 offers an intuitive measurement experience for applications such as automotive development, efficiency tests of inverter driven motors, renewable energy technologies and traction applications like pumps and fans.

- Basic power accuracy: 0.01% of reading + 0.02% of range
- Input power frequency range of DC, 0.1 Hz to 5 MHz
- Dual harmonic measurements up to the 500th order with Digital Parallel Path filtering to prevent aliasing.



**PX8000 Precision power scope**

The PX8000 brings together Yokogawa's expertise and heritage in power measurement and oscilloscope design to deliver the revolutionary PX8000, the world's first precision power scope. Traditional power measuring instruments cannot provide accurate time measurements and oscilloscopes are not designed to measure power with precision. Compromise is no longer needed. The PX8000 provides the versatility to make accurate time based power measurements on everything from renewable power to advanced robotics.

- Transient power measurements
- Cycle-by-cycle analysis
- Simultaneous high precision harmonic analysis
- Basic power accuracy: 0.1% of reading + 0.1% of range



**WT500 Mid range power analyser**

Specifically designed for evaluating the power conditioning technologies used in renewable energy applications, such as inverters, drives & transformers, the WT500 is available with one, two or three input elements for single and three phase applications.

- Basic power accuracy: 0.1% of reading + 0.1% of (rms) range
- Measurement of bought & sold watt hours
- Frequency range: DC, 0.5 Hz to 100 kHz









**WT310E/WT330E Digital power meters**

The 5th generation of the world's bestselling power meter provides accurate and reliable power measurements. It helps developers and manufacturers in fields such as domestic "white goods", lighting systems and air conditioning equipment to ensure that their products comply with emerging IEC/EN standards.

- Connect currents from 50 mA to 40 Arms
- Bandwidth DC, 0.5 Hz to 100 kHz
- Standby power testing to IEC 62301 and EN50564
- Basic power accuracy: 0.1% of reading + 0.05% of range

# Precision power measurement

Model	WT5000	PX8000	WT1800E
			
<b>Number of Input Channels</b>	1 – 7 Up to 1000V <sub>rms</sub> – 30A	1 – 4 Up to 1000V <sub>rms</sub> – 30A	1 – 6 Up to 1000V <sub>rms</sub> – 50A
<b>Basic Power Accuracy (50-60 Hz)</b>	0.01% of Reading + 0.02% of Range	0.1% of Reading + 0.1% of Range	0.05% of Reading + 0.05% of Range
<b>U &amp; I BW -3dB</b>	10 Mhz I-direct input 5 MHz	20 MHz I-direct input 10 MHz	5 MHz
<b>Power accuracy Bandwidth</b>	DC to 1 MHz	DC to 1 MHz	DC, 0.1 Hz to 1 MHz
<b>Resolution &amp; Sampling</b>	18 Bit 10MS/s	12 Bit 100MS/s	16 Bit 2MS/s
<b>Additional Features</b>	<ul style="list-style-type: none"> <li>■ 10.1 inch touchscreen</li> <li>■ Multi-motor evaluation</li> <li>■ Modular inputs individually calibratable</li> <li>■ Digital Parallel path filtering</li> <li>■ Bidirectional integrations</li> <li>■ Harmonics (DC up to 500<sup>th</sup> order)</li> </ul>	<ul style="list-style-type: none"> <li>■ 10.4 inch display Transient analysis</li> <li>■ Zoom between cursors</li> <li>■ Modular inputs</li> <li>■ Cycle-by-cycle trend analysis</li> <li>■ X-Y display and phase analysis</li> <li>■ De-skew compensation</li> </ul>	<ul style="list-style-type: none"> <li>■ 8.4 inch display</li> <li>■ Motor Evaluation</li> <li>■ Automatic update rates and ranging for integration of fluctuating inputs</li> <li>■ IEC Harmonics (DC up to 500<sup>th</sup> order)</li> <li>■ Compare harmonics simultaneously form 2 inputs</li> <li>■ Bidirectional integrations</li> </ul>
<b>Harmonic fundamental frequency</b>	0.1 Hz to 300 kHz	20 Hz – 409.6 kHz	0.5 Hz – 2.6 kHz

Model	WT3000E	WT500	WT300E
			
<b>Number of Input Channels</b>	1 – 4 Up to 1000V <sub>rms</sub> – 30A	1 – 3 Up to 1000V <sub>rms</sub> – 40A	1, 2 or 3 Up to 600V <sub>rms</sub> – 40A
<b>Basic Power Accuracy (50-60 Hz)</b>	0.01% of Reading + 0.03% of Range	0.1% of Reading + 0.1% of Range	0.1% of Reading + 0.05% of Range
<b>U &amp; I BW -3dB</b>	1 Mhz	>100 kHz	>100 kHz
<b>Power accuracy Bandwidth</b>	DC, 0.1 Hz to 1 MHz	DC, 0.1 Hz to 100 kHz	DC, 0.1 Hz to 100 kHz
<b>Resolution &amp; Sampling</b>	16 Bit 200kS/s	16 Bit 100kS/s	16 Bit 100kS/s
<b>Additional Features</b>	<ul style="list-style-type: none"> <li>■ 8.4 inch display</li> <li>■ Motor evaluation</li> <li>■ Specially calibrated Transformer version for low power factors</li> <li>■ Cycle by cycle evaluation</li> <li>■ IEC Harmonics (DC up to 100<sup>th</sup> order)</li> <li>■ IEC61000, IEC62301 Ed2.0 EN50564 and more</li> <li>■ Bidirectional integrations</li> </ul>	<ul style="list-style-type: none"> <li>■ 5.7 inch display</li> <li>■ 100 ms data update rate</li> <li>■ Harmonics (DC up to 50<sup>th</sup>)</li> <li>■ Bidirectional integrations</li> </ul>	<ul style="list-style-type: none"> <li>■ Compact - 7 segment display</li> <li>■ Autoranging and range skip functions during integration</li> <li>■ Standby power IEC62301, Energy Star, and SPEC power</li> <li>■ Harmonics (up to 50<sup>th</sup> order)</li> </ul>
<b>Harmonic fundamental frequency</b>	10 Hz – 2.6 kHz	10 Hz-1.2 kHz	10 Hz-1.2 kHz

# Sensors and software

## Current sensors

External current sensors are required to measure currents above 50 Arms. The precision sensors from PM Special Measuring Systems and SIGNALTEC complement Yokogawa's high precision power analysers to ensure that measurements from milliwatts to Megawatts are accurate and reliable.



### MACC2Plus - External current sensor

The accuracy and cost effectiveness of the MACC2plus makes it a very popular sensor with a 1000:1 ratio and is suitable for currents up to 850 Apeak (600 Arms).



### CURACC - Zero-FluxTM external current sensor

When currents above 1000 Apeak (700 Arms) need to be measured, the CURACC offers high accuracy measurements up to 6000 Apeak (4240 Arms).



### WTViewerE

WTViewerE software enables PC connectivity for Yokogawa power analysers such as the WT3000E/WT3000, WT1800E/WT1800, WT500 and WT300E through Ethernet, USB, GPIB or RS232. This connectivity allows users to easily control, monitor, collect, analyse, and save measurements remotely.

#### Measurement, Remote Control, Multi-Unit Synchronisation Visualisation and Analysis

- Connect, synchronise and configure up to four WT units via Ethernet, USB, GPIB or RS232
- Remotely monitor, collect, and analyse live or stored multichannel measurements in a numeric, bar, trend, or vector formats
- Save/load configuration and measurement data



### PowerViewerPlus for PX8000

PowerViewerPlus for PX8000 The PowerViewerPlus enables PC-based remote control, acquisition and analysis of high-frequency and transient power signals from a PX8000 Precision Power Scope.PC.

#### Main functions

- Remote control of a single PX8000
- Monitoring screen the PX8000 screen
- Display of: the main waveform, zoom waveform, history memory, XY waveform, and the measurement result
- Calculation of waveform parameters
- Conversion of multiple files (WPF → CSV)
- Saving data
- User-defined computation (32 math expressions)

### LabVIEW drivers

LabVIEW is a graphical programming environment used by millions of engineers and scientists to develop sophisticated measurement, test, and control systems using intuitive graphical icons and wires that resemble a flowchart.

By utilising the LabVIEW driver written for the instrument, a developer can dramatically reduce the amount of work required to enable a PC to control the instrument from within the LabVIEW environment.

### Harmonic analysis software

This software enables harmonic analysis, voltage fluctuation and flicker measurement, compliant to IEC61000-3-12 & IEC 61000-3-3, to be carried out using measurement data from the WT3000E.

The measurement procedures and settings for harmonic/flicker standards testing have been precisely defined. Engineers must also stay current with the specialised knowledge and up-to-date information required to periodically review the contents of the standards and perform the standards conformance tests. The model 761922 Harmonic/Flicker Measurement Software enables engineers without specialized knowledge to perform a range of operations using the WT3000/WT3000E Precision power analyser including judging standards compliance and outputting test reports.

### TMCTL - Control libraries

TMTCL is a DLL (Dynamic Link Library) which enables you to easily develop Microsoft Visual C++, C# and Microsoft Visual Basic programs to communicate between the PC and our instruments. It supports GPIB, RS232, USB, USBTMC, Ethernet and VXI-11 interfaces.

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## Power calibration services

Worlds first non-governmental accredited power calibrations up to 100kHz.

To support Yokogawa's position as the world's foremost supplier of power analysers and meters, Yokogawa Europe offers leading calibration capabilities from its ISO 17025 accredited European Standards Laboratory in the Netherlands.

'Calibration' is the comparison of an instrument's performance with a standard of known accuracy. However, all laboratory and even national standards have uncertainties of measurement, hence it is impossible to be 100% confident that an instrument is operating within its stated tolerance limits. Regular calibration by a laboratory, which can provide very low measurement uncertainties at the specific measurement points applicable to your application, provides confidence in the measurement results.

For example, a power calibration at only 50 or 60 Hz has little value. The latest semiconductor developments are enabling faster switching speeds. This generates higher frequency content which requires wider bandwidth for power measurement. In our European standards laboratory, we provide ISO17025 accredited calibrations for power analysers up to 100 kHz.



Visit [tmi.yokogawa.com/eu/support/calibration](http://tmi.yokogawa.com/eu/support/calibration) for more information about the power calibration.







## Calibrators and standards

### High precision standalone solutions for calibration

Yokogawa provides a range of standalone electrical and process calibrators for calibrating clamp on testers, power meters, multimeters, current transformers, temperature controllers, and analogue and digital panel meters. The latest generation of high compliance bench top AC and DC calibrators are found in analogue meter laboratories and on production lines around the world.



#### LS3300 AC power calibrator

A high precision AC Power Standard that is built upon Yokogawa's history of developing superior sourcing instruments. The LS3300 is an AC signal generator capable of outputting both current and voltage simultaneously, thus allowing it to calibrate power measurement instruments such as current clamps/transformers, panel meters, RMS multimeters, and power meters.

- Best-in-class power accuracy of 100 ppm
- High output current range 0.3 mA up to 62.5 A.
- Output voltage 10 mV to 1250 V



#### 2553A Precision DC calibrator

The 2553A combines precision performance and ease of use for the calibration of measuring instruments including analogue meters, thermometers, temperature transmitters and data loggers. The unit supports all commonly used thermocouple and offers both high accuracy and high stability to provide long term confidence.

- mV to 32.000 V DC
- 10 nA to 120.000 mA DC
- 10 types of thermocouple and Pt100 + user defined



#### 2558A AC voltage current standard

The 2558A is a standalone solution for calibrating meters, clamps and CTs. With ranges up to 1200.0 V AC and 60.00 A AC mean that the 2558A is the instrument of choice for the cost-effective calibration of AC analogue meters. The unit can be intuitively operated via the front panel or controlled by an ATE system.

- mV to 1440 V AC
- mA to 72 A AC
- Sweep, output divider and deviation functions



#### 2560A Precision DC calibrator

With high voltage and high current capabilities, the 2560A is the solution for calibrating and testing a wide range of DC analogue meters. The high accuracy to 50 ppm and high stability ensure that measurements are repeatable. Versatility is offered by user configurable settings such as sweep, output divider and deviation functions.

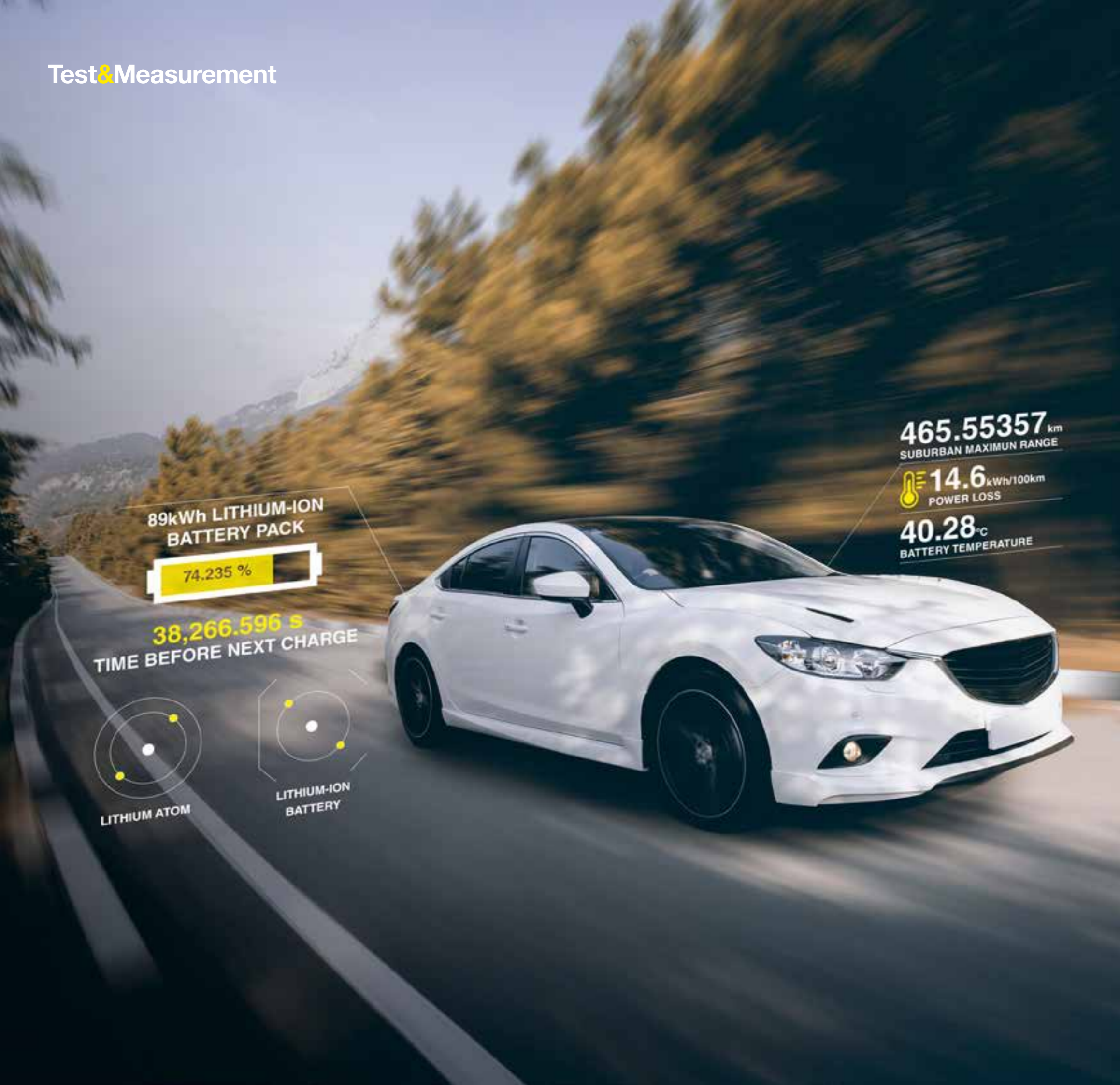
- Generate DC voltages up to 1224V
- Generate DC currents up to 36.72A
- Sweep, output divider and deviation functions

**Note:** Also look at our handheld calibrators in the test tools section on page.

## ScopeCorders

Capture and analyse a wide variety of electrical, physical sensor signals and serial buses.

Perfected over years of continuous innovations, ScopeCorder is Yokogawa's unique range of powerful data acquisition recorder solutions that can capture and analyse both transient events and trends up to 200 days. Using flexible modular inputs, it combines measurements of electrical signals, physical sensors and CAN/LIN/SERIAL serial buses and is able to trigger on electrical power related and other calculations in real-time. As such it is often perceived by users as one of the most powerful portable data-acquisition instruments available on the market.





**DL850EV ScopeCorder Vehicle Edition**

A ScopeCorder Vehicle Edition combines measurements of electrical signals, sensors outputs, together with CAN/CAN FD bus, LIN bus or SENT data transmitted by the powertrain management system to provide thorough insight into the dynamic behaviour of the electromechanical system.

- Compare CAN/LIN/SENT bus data with analogue sensor outputs
- Decode up to 240 CAN sub channels
- Battery powered operation (10 V - 18 V) - /DC option



**DL350 Portable ScopeCorder**

Great value also comes in small packages. For “quick and easy” troubleshooting, such as power line monitoring or sophisticated mixed-signal datalogging with built-in analysis, the DL350 is a portable, powerful, and user-friendly engineering tool. The light weight, battery operation and compact size makes the DL350 the all-round instrument-of-choice in the vehicle and in the field.

- Light weight and A4-sized compact chassis
- Simultaneous isolated inputs up to 100 MS/s
- AC/DC/Battery operated



**DL850E ScopeCorder**

A DL850E ScopeCorder combines the signal fidelity of an oscilloscope with the long-term data recording of a recorder. Measurement data can be thoroughly analysed in fine detail or viewed as a trend over long durations. ScopeCorder stands for reliability and precisely measure signals at high resolution and secure data in the harshest environments with superior isolation technology.

- High-speed sample rates up to 100 MS/s
- 2 to 128 analogue or 128 logic channels
- Isolated inputs up to 1000 V



**SL1000 Data acquisition unit**

The SL1000 is a PC-based high-speed data acquisition unit that delivers independent, isolated channel hardware that captures waveforms at high speeds up to 100 MSamples per channel. Choose from a wide variety of I/O modules for combinations of electrical and mechanical sensor signal measurements to meet the needs of any medium channel count application.

- Ethernet and USB interfaces
- 3.2 MByte/s data streaming rate (1.6 MS/s)
- Up to 128 channels by synchronising 8 SL1000 units



**Flexible input modules**

Whether the measurement signals are derived from the smallest electric drives incorporated in a precision watch, a large turbine found in a power generating facility or a combination of sensors and electronics found in a modern electric vehicle, ScopeCorder input modules offer great flexibility! Choose and combine up to 20 types of plug-in modules and find the ideal fit to the application.

- Voltage and current
- Sensor outputs
- Temperature, vibration/acceleration, strain, frequency
- Logic signals & CAN/CAN FD/LIN and SENT



## Oscilloscopes

### Waveform analysis at your fingertips

Capture, display, analyse, save and export. Alongside 'ease-of-use', these are the principle duties required from any oscilloscope. Using high speed waveform acquisition, large history memory and reliable triggering, Yokogawa's scopes are renowned for their channel count combined with optional Power Math and serial bus analysis features including major automotive buses. The flexible display configuration, dual window zooming and the wealth of high speed measurement features will help you to get the answers you need when you need them. All together Yokogawa scopes are ideally suited for test and debugging applications in the power electronics, mechatronics, and automotive sectors.

 **1.6 MHz**  
POWER SUPPLY SWITCHING FREQUENCY

**0.35 WATT**  
POWER LOSS

 **500 kbps**  
CAN BUS BIT RATE

**145<sub>H</sub>**  
CAN IDENTIFIER

**19.2 kbps**  
CXPI BUS BIT RATE





**DLM3000 mixed signal oscilloscope**

The new DLM3000 builds on Yokogawa's oscilloscope legacy with improved precision and productivity in a compact package and meets the advanced needs of today's mechatronics engineers. Integrating the latest in touchscreen operation, solid-state storage, and high-speed signal processing, the DLM3000 enhances productivity by providing clean signals, extensive processing, and ease of operation.

- 200, 350 MHz and 500 MHz bandwidths
- Up to 2.5GS/s sample rate with all 4 channels used
- Up to 500 Mpoints memory
- Sensitivity from 500uV/div to 10V/div



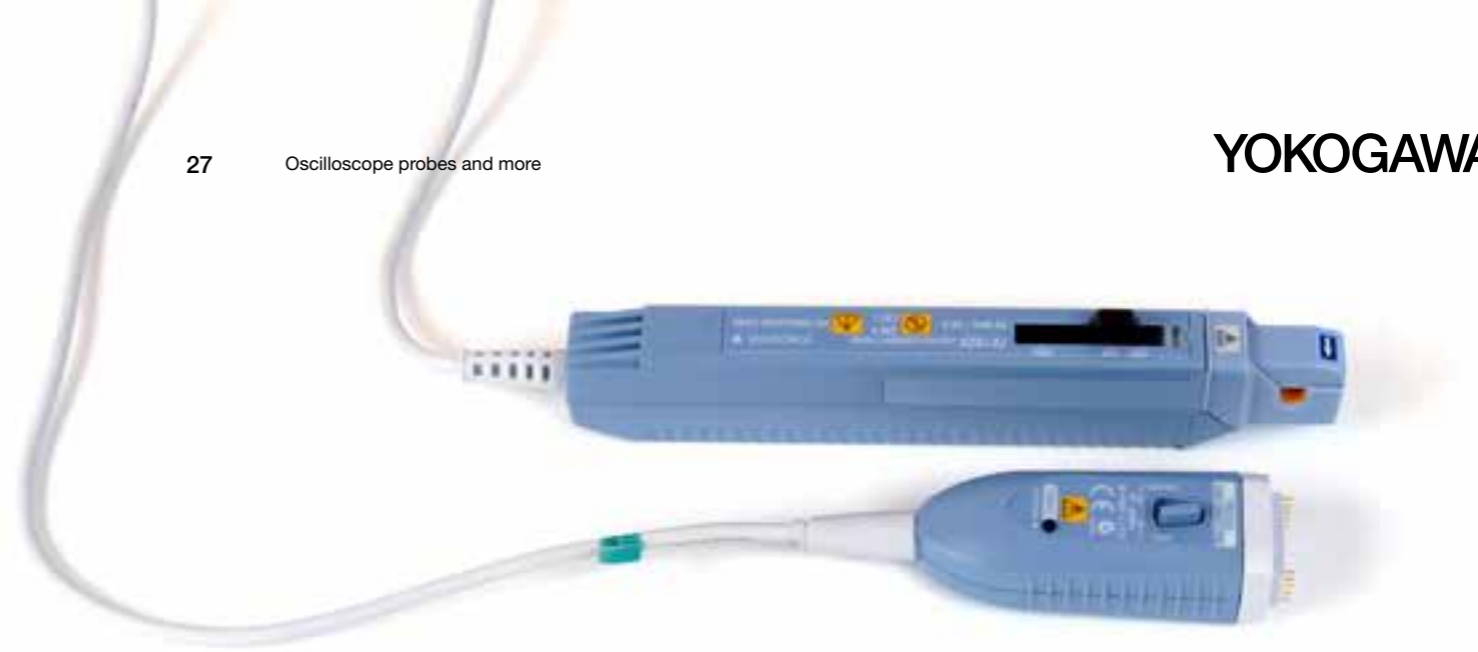
**DLM4000 mixed signal oscilloscope**

The DLM4000 is an eight-channel mixed-signal oscilloscope and comes with a large high-resolution 12.1-inch LCD display, compact landscape format and ergonomic and friendly user-interface. Advanced measurement and analysis features such as power analysis and serial-bus analysis, digital filtering, user-defined math, and record lengths up to 250 Mpoints make the DLM4000 a powerful engineering tool and enables complex measurement challenges to be solved quickly and easily.

- 350 MHz and 500 MHz bandwidths
- 8 analogue channels (or 7 plus 8 logic)
- Up to 24 logic channels
- Up to 250 Mpoints memory

# Oscilloscope probes and more

The scope is only half the solution. Different applications need different probes and accessories. Yokogawa's wide range of probes includes active, differential, low capacitance, passive and current types, and a stand for hands-free probing. Furthermore, a comprehensive suite of software tools is offered to complement and support oscilloscope and ScopeCorder measurement tasks.



### Current probes – PBC050 and PBC100

These probes use a Hall effect sensor, which senses the DC current, and a current transformer, which senses the AC current. The probe simply clips around a conductor, making it unnecessary to make any electrical connection to the circuit.

- 30 Arms continuous measurement
- DC to 50 MHz or 100 MHz
- Direct readout of current values



### Differential probes – 701920 and 701922

These two differential probes enable any oscilloscope to perform day-to-day testing on low voltage differential serial buses.

- 500 MHz and 200 MHz bandwidths
- +/- 12 V and +/- 20 V differential voltage inputs
- Built-in DLM scope option provides probe power

### Differential probe – PBDH0150

A high voltage probe with extended bandwidth covering DC to 150MHz, this probe provides a balanced differential input, to be used with oscilloscopes with single-ended inputs (1 MΩ Input Impedance). 1400 Vpeak capability is suitable for un-grounded and floating voltage measurements in power electronics and mechatronics applications including inverters, motor drives, and power supplies.

- DC to 150 MHz
- 1000 Vrms / ±1400 Vpeak
- The 701927 is a 50:1 or 500:1 high voltage (1400V peak)

### Probe stand and positioner – 701919

Using a probe stand with a flexible arm and heavy base to hold and stabilize probes can simplify circuit board testing. A probe stand gives you stable, pinpoint probing control for high density or three handed operations.

- Hands-free circuit board testing
- Heavy base and flexible arm (1.5 kg)
- For 8 mm to 13 mm diameter probes

### Differential probe – PBDH1000

A 1 GHz differential probe designed to meet the challenge to measure signals in in-vehicle bus development and testing (CAN, FlexRay). Loading on the serial bus is reduced due to the higher input impedance and lower capacitance as a result, and thus displayed signals will be closer to reality.

- 1 M ohm / 1.1 pF input
- +/- 25 V differential voltage input
- Compatible with the FlexRay standard

### Logic probes – PBL100 and PBL250

A flexible MSO such as the DLM3000 and DLM 4000 which converts to a logic analyzer at the push of a button requires one or more logic probes.

- 100 MHz / 250 MHz toggle frequencies
- 1 MΩ, 10 pF / 100 kΩ, 3 pF



### Xviewer for Scopes and ScopeCorder

Display and analyze acquired waveforms, transfer files and control instruments remotely using Xviewer PC software. It features many of the same functions that our instrument offers; zoom display, cursor measurements, calculation of waveform parameters and complex waveform math's. Using Xviewer binary waveform data can easily be converted into to comma-separated values (.csv) and Excel.

This page only provides a glimpse of the complete range of probes and accessories there are. For a complete overview visit <https://tmi.yokogawa.com/eu/solutions/products/oscilloscopes>

## Optical spectrum analysers

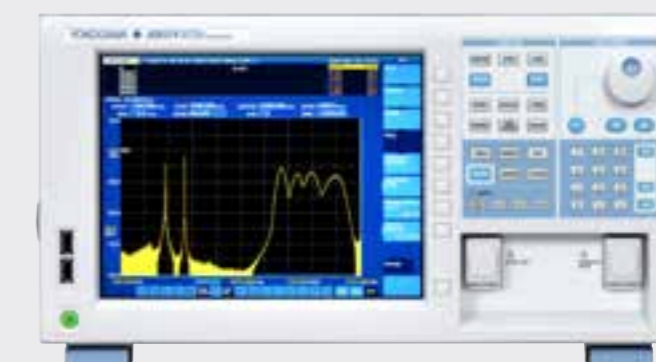
No longer confined to telecommunications, the emergence of photonics in industrial manufacturing, biological studies, healthcare, lighting, imaging and sensing for safety, security and environmental pollution control is today driving the demand for wider ranging wavelengths and higher precision measurement. Our long experience working with customers in the optical Test & Measurement Industry has enabled us to design the world's most reliable and versatile optical spectrum analysers. In fact they feature specific technical characteristics that make them the most efficient and effective instruments for measuring devices and systems used in the various applications of photonics. Yokogawa's optical spectrum analysers can satisfy the specific test and measurement needs of R&D and manufacturing centers belonging to any industry.

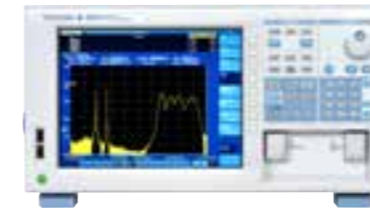
 **1450<sub>nm</sub>**  
WATER ABSORPTION PEAK

**430<sub>nm</sub>, 730<sub>nm</sub>**  
CHLOROPHYLL DETECTION  
| PHOTOSYNTHESIS IN GREEN LEAVES

**2700<sub>nm</sub>**  
CARBON DIOXIDE ABSORPTION BAND

**1930<sub>nm</sub>**  
ABSORPTION PEAK GLUCOSE IN BLOOD





**AQ6374 Optical spectrum analyser**

It is the successor of the renowned ANDO AQ6315 model, very appreciated for its capability of testing with high accuracy devices and systems from the UV region to the U-band of optical communications! It is equipped with a closed-loop circuit for air purging which is very effective in cleaning up the detected spectrum from the water vapor absorptions which may affect the accuracy of the measurement.

- Measurable wavelength range: 350 – 1750 nm
- Resolution setting: 8 choices from 50 pm to 10 nm
- Max. sensitivity: -80 dBm
- Optical input in free space



**AQ6370D Optical spectrum analyser**

The AQ6370D model is the product of the ANDO heritage, the successor of those AQ6317/19 models which established the OSA market benchmark during the telecom bubble era. Its versatile free space input, unmatched sensitivity, resolution and dynamic range are the features which make this instrument unique and so much appreciated in the market.

- Measurable wavelength range: 600 – 1700 nm
- Max. measurement speed: 0.2 sec for 100 nm span
- Resolution setting: 7 choices from 20 pm to 2 nm
- Max. sensitivity: -90 dBm



**AQ6360 Optical spectrum analyser**

Designed for precision, engineered for cost-effectiveness. The new AQ6360 optical spectrum is optimised for testing telecom devices during and after production. It offers high speed measurements, a compact and robust compact design and low capital and operational costs.

- Measurable wavelength range: 1200 – 1650 nm
- Max. measurement speed: 0.2 sec for 100 nm span
- Resolution setting: 5 choices from 0.1 to 2 nm
- Max. sensitivity: -80 dBm



**AQ6150B/51B Fourier-transform optical spectrum analyser**

The AQ6150B/AQ6151B are instruments based on the interferometric technology and characterised by extreme precision in wavelength measurements. The optimised optical design and data processing routine significantly reduces the measurement time, improves the manufacturing throughput and reduces the lifetime cost of ownership.

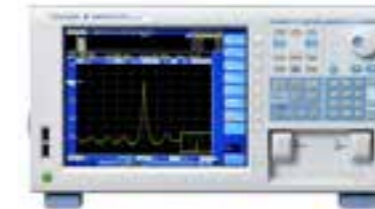
- Measurable wavelength range: 900 – 1700 nm
- Max. number of detectable signals: 1024
- Max. wavelength accuracy: ± 0.2 ppm
- Max. measurement speed: 10 measurements/sec.



**AQ6373B Optical spectrum analyser**

It is our high-performance model optimized for visible light measurement. It features unique characteristics like the special input suitable also for large-core fibers up to 800 µm and the color analysis function which shows the chromatic coordinates of the DUT.

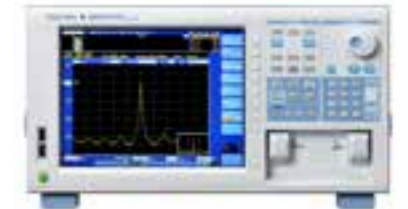
- Measurable wavelength range: 350 – 1200 nm
- Resolution setting: 10 choices from 10 pm to 10 nm
- Max. sensitivity: -80 dBm
- Optical input in free space



**AQ6375B Optical spectrum analyser**

It covers not only the telecommunication wavelengths but also the exNIR region which is nowadays often and often used for environmental sensing and medical applications of photonic technology. It is equipped with a closed-loop circuit for air purging which is very effective in cleaning up the detected spectrum from the water vapor absorptions which may affect the accuracy of the measurement.

- Measurable wavelength range: 1200 – 2400 nm
- Resolution setting: 6 choices from 50 pm to 2 nm
- Max. sensitivity: -70 dBm
- Optical input in free space



**AQ6376 Optical spectrum analyser**

With this model Yokogawa extends its reach to the test and characterisation of devices and systems working in the MWIR region for environmental sensing and medical applications. Also this model is equipped with the closed-loop circuit for air purging from water vapor, which causes a great absorption of light especially around 2700 nm.

- Measurable wavelength range: 1500 – 3400 nm
- Resolution setting: 5 choices from 0.1 to 2 nm
- Max. sensitivity: -65 dBm
- Optical input in free space



## Modular optical testing platform

Nowadays the rapid development of optical technologies in many fields of application requires a reconfigurable and scalable testing platform which can enhance the productivity of devices and systems manufacturers as well as of quality assurance and compliance labs.



### AQ2200 series multi-application test system

A multi-function multi-module scalable test and measurement platform optimized for fast and cost-effective development and compliance testing of optical devices and optical transmission systems. A variety of hot-swappable measurement modules are available, including: grid tunable laser sources, high-speed optical sensors, high-resolution and high-speed variable optical attenuators and optical transceiver interfaces. These modules can be installed in any combination on a single platform, providing an ideal measurement system for a variety of applications. The AQ2200 multi application test system is available in two different frame controller sizes. Each model has a certain number of slots for housing modules, so you can select the best platform size for your testing need. With the remote viewer software and the macro programming function, the AQ2200 series is the ideal solution for full-automated testing work.

# Optical field testers

In 2002, Yokogawa became a leading supplier of optical test and measurement solutions following the acquisition of Ando Electric. Today, with over 35 years of experience in optoelectronic technology applied to lab and field testing, Yokogawa is justifiably qualified to deliver field test equipment solutions with the world renowned quality and exceptional performance expected from an industry pioneer.

Responding to the growing needs for reliable and ease-of-use field test instruments for installation and maintenance of fiber optic networks, Yokogawa nowadays offers a full lineup of optical time domain reflectometers, optical loss test sets and Ethernet Testers.



### AQ1210 Mid-range optical time domain reflectometer

The AQ1210 is a compact and lightweight handheld OTDR available in 6 models, each one with a unique combination of wavelengths to test from the LAN to the WAN. PON optimised and able to test thru high port count splitters.

- Linux-based OS assuring stability and prompt response to commands
- Multi-tasking operation capability
- 5.7" capacitive multi-touch touchscreen and hard-key buttons
- Smart fully-automatic measurements with icon-based view
- Wireless connectivity to transfer files and remotely command the instrument
- PDF reporting with layout configuration directly by the instrument



### AQ1000 Entry-level optical time domain reflectometer

"Good things come in small packages" reads a popular English saying. This is the case of AQ1000 model. It has everything an installer needs to test the last mile of the optical network. One configuration with everything included.

- iTRON-based OS assuring stability and prompt response to commands
- 5.0" capacitive multi-touch touchscreen and hard-key buttons
- OTDR trace view and icon-based view
- Wireless connectivity to transfer files and remotely command the instrument
- PDF reporting with layout configuration directly by the instrument
- Stabilized light source and power checker included



### AQ1100 All-in-one optical loss test set

The AQ1100 Optical Loss Test Set is a compact (A5 size) and lightweight (1Kg) instrument combining in one body both the functions of stabilized light source and optical power meter.

- iTRON-based OS assuring stability and prompt response to commands
- 3 models of light source (2WL SM, 3WL SM and 4WL SM+MM)
- 3 models of optical power meters (standard, high-power and PON)
- Fanless robust design for operation in harsh environments
- Large 5.7" color LCD screen
- Multi-Core Fiber Measurement function and PING Test function



### AQ1300 series Ethernet testers

The AQ1300 series is a compact and lightweight Ethernet tester designed to improve both work efficiency and quality at the same time, with functions optimised for the testing and maintenance of Ethernet networks up to 10GbE.

- iTRON-based OS assuring stability and prompt response to commands
- 2 models to choose from, hosting SFP+ and XFP transceivers up to 10Gbps.
- Compact (A5 size) and robust design for operation in harsh environments
- Large 5.7" color LCD screen
- ITU-T Y.1564 and RFC2544 test standards compatible



### AQ7280 High-end optical time domain reflectometer

Thanks to its modular design with 12 different configurations, the AQ7280 is a scalable solution that can evolve together with the evolution of the optical networks over the years. Able to test from the LAN to the backbone network.

- iTRON based OS assuring stability and prompt response to commands
- Multi-tasking operation capability
- 8.4" capacitive multi-touch touchscreen and hard-key buttons
- Smart fully-automatic measurements with icon-based view
- Wired and wireless connectivity to transfer files and remotely command the instrument
- PDF reporting with layout configuration directly by the instrument



### AQ2170/80 handheld optical power meters

Very compact handheld power meters useful for verifying the power budget of the optical network's last mile. Automatic pairing with AQ4280.

- A standard version (AQ2170, AQ2180) able to measure up to +10 dBm
- a high-power version (AQ2170H, AQ2180H) able to measure up to +26 dBm
- Meas. wavelengths: 850/1300/1310/1490/1550/1625/1650 nm
- Compatible with light sources emitting in CW as well as modulated (270 Hz, 1 kHz, 2 kHz).
- Large memory capacity (up to 999 measurement results)
- USB port for data transfer to a PC in CSV format
- Rubber protector, carrying case and a full lineup of different connector adapters included as standard



### AQ4280 handheld light sources

Very compact handheld light sources useful for verifying the power budget of the optical network's last mile. 3 models based on different wavelengths to test any telecom service plus additional wavelength for maintenance channel. AQ4280A emitting. Automatic pairing with AQ2170/80.

- AQ4280A emitting at 1310/1550 nm
- AQ4280B emitting at 1310/1490/1550 nm
- AQ4280C emitting at 1310/1550/1490/1625 nm
- Rubber protector, carrying case and a full lineup of different connector adapters included as standard



## Data acquisition and recorders

### Network-based data acquisition systems

Yokogawa's latest generation of paperless recorders and data acquisition systems can be used in a wide variety of applications to collect process data. Typical parameters such as temperature, pressure, flow, pH or conductivity provide information about the overall quality of the process whereas the additional measurement of consumed energy gives insight into the overall efficiency.

Standard Ethernet communication interfaces support fast and easy connection to LAN environments, enabling remote monitoring applications and centralised back up services. Standard software for the configuration of measurement devices and applications offer easy setup and minimises preparation time. Advanced software packages are available for connection to other measuring equipment and offer a fully integrated PC-based data acquisition solution.

### SMARTDAC+ paperless recorders and data logging systems

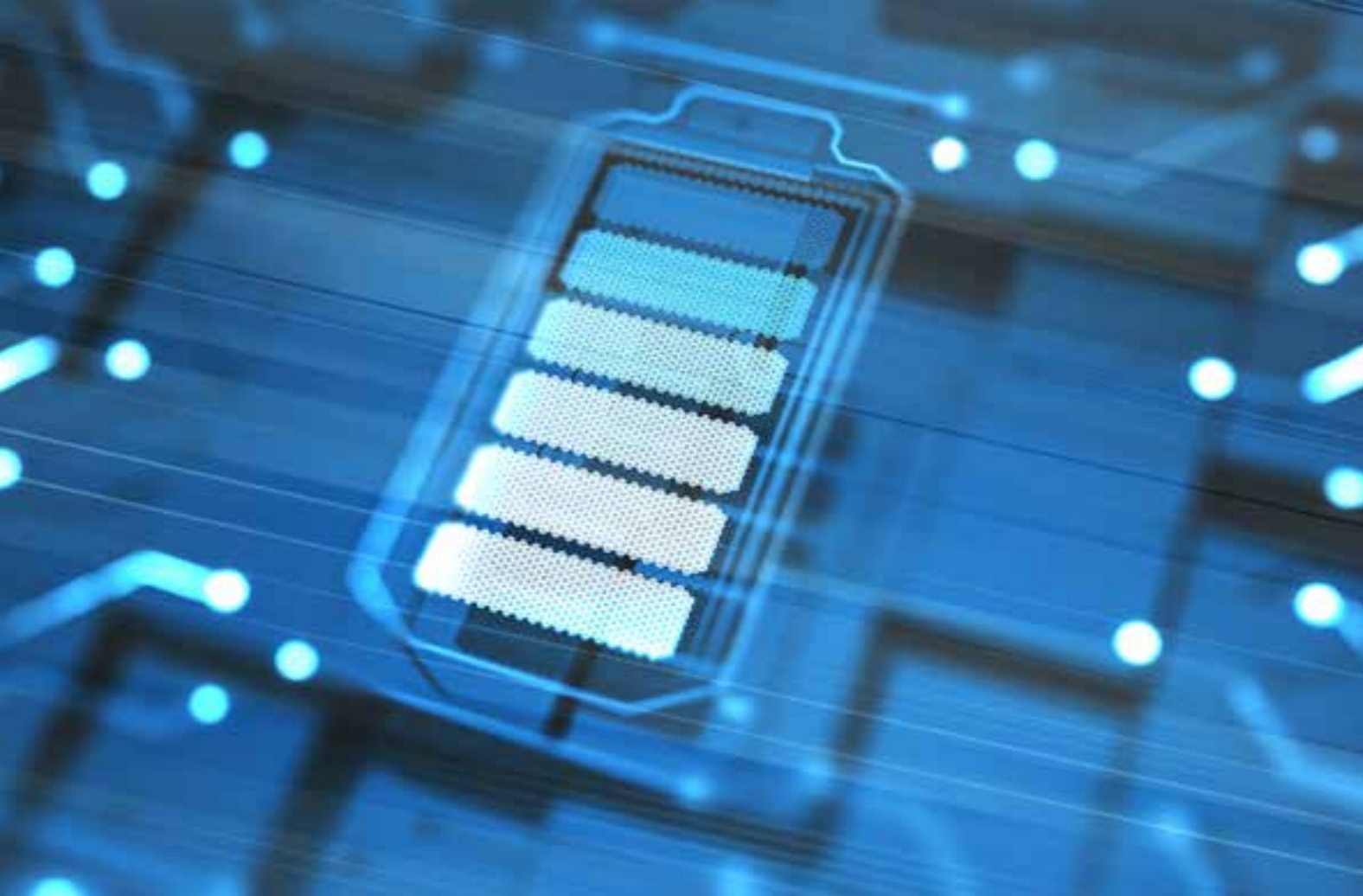
The portable GP and panel mount GX paperless recorders feature a unique touchscreen using swipe technology and pinch operations for fast and easy access to all recording and monitoring functions. The SMARTDAC GM data logging system feature a user-friendly web-based HMI and modular hardware architecture, which does not require base plates. Optional, all SMARTDAC+ devices facilitate full integration with WT power analysers for continuous monitoring and recording of precision power, date and temperatures.

- Bright multi-touch color display (GX/GP only)
- Ethernet communication interface
- Bluetooth interface (option) for easy connection to laptops or Smart Devices (GM only)
- From 4 to 100 input channels on a single device
- Expandable up to 420 Input / output channels
- SD card memory support up to 32 GB
- USB interface for easy backup of memory storage
- Report and printer output functions

### ScopeCorder series

Perfected over years of continuous innovations, ScopeCorder is Yokogawa's unique range of powerful data acquisition recorder solutions that can capture and analyse both transient events at up to 100MS/s and trends up to 200 days. Using flexible modular inputs, it combines measurements of electrical signals, physical sensors and CAN/LIN/SENT serial buses and is able to trigger on electrical power related and other calculations in real-time.

For more information about ScopeCorder series please refer to page 19.



## Signal sources and generators

### Fast, flexible and precise

For general purpose standalone applications or as core components in a high-speed test and measurement system, Yokogawa sources and signal generators are highly accurate and functional. The integration of source and measurement into a single unit greatly simplifies the test process. Semiconductor devices, sensors, displays, batteries, etc. can therefore be quickly and easily characterised.



#### GS200 DC voltage / current source

The GS200 is a programmable DC voltage/current source that combines high accuracy, high stability, and 5 1/2-digit resolution. It can generate extremely low noise DC voltage and current signals that are required for a wide range of applications. It can also be used as a highly accurate constant current load and the optional monitor feature allows variations in the load voltage or current to be monitored and logged.

- Voltage source up to  $\pm 32$  V. Current source up to  $\pm 200$  mA
- Programmable output up to 10,000 points
- Built-in USB mass storage device



#### GS610 Source measure unit

The GS610 is a high accuracy, high speed programmable voltage and current source that incorporates both generation and measurement functions as well as USB storage and an Ethernet interface. As the GS610 can operate as a current source or a current sink, a wide range of electrical characteristics can be evaluated.

- Wide range sink and source operation (3.2 A, 110 V, 60 W)
- Precise pulse generation (down to 100  $\mu$ s width with 1  $\mu$ s resolution)
- Battery simulator version available



#### GS820 Multi channel source measure unit

The GS820 is a highly accurate multi-channel voltage/current source measure unit that incorporates voltage generation/current generation as well as USB storage and an Ethernet interface. Since the two source channels and two measuring channels can be operated arbitrarily, almost all electrical characteristics can be evaluated.

- Dual sink and source operation:  
7 V and 3.2 A or 18 V and 1.2 A
- Precise pulse generation (down to 100  $\mu$ sec width with 0.1  $\mu$ sec res.)
- 50 V version available, 50 V and 0.6 A or 20 V and 1.2 A



#### FG400 Arbitrary function generators

The FG400 provides basic and 25 types of application specific waveforms as standard and generates signals quickly and easily. Acquire signals using a Yokogawa oscilloscope or ScopeCorder and use the 16-bit arbitrary waveform capabilities to reproduce them or add them to other signals.

- 1 or 2 independent or synchronised channels
- 0.01 $\mu$ Hz to 30 MHz
- Precise phase and frequency control between channels
- 20 V peak to peak and 42 V isolation between outputs



## Electrical test tools & handheld calibrators

For daily electrical inspections, testing and calibration of field instrumentation

Portable and handheld test instruments are part of every field technician or engineer's toolkit. This is due to their flexibility, ruggedness in harsh environments, and varied functionality to handle anything from simple measurements to power quality analysis and pressure calibration. They are able to log data quickly to internal memory, as well as perform quick measurements for easy troubleshooting of industrial field equipment. Often times, it is not only impractical but cost-ineffective to bring high-end instrumentation onto the field where such precision is not warranted or needed. Portable instruments are ideal for closing that needed gap.



### Digital multimeters

Yokogawa's TY family of handheld DMMs is packed with advanced functionality, such as frequency, pulse width, duty cycle, temperature, capacitance and dB measurements. The TY series offers memory and USB communication functions, true RMS and mean value measurements, closed case calibration, a low pass filter and safety shutters. Features and functions like these allow the technician to test, troubleshoot and calibrate equipment, regardless of whether it is on the bench or in the field.



### Power quality analyser

The CW500 is both a portable power meter and a power quality analyser with 3 AC voltage inputs, 4 AC current clamp inputs (selectable up to 3000 A) and 2 low voltage DC inputs. It conforms to IEC 6100-4-30 Class S for recording intermittent faults and can measure harmonics and flicker for long term fault analysis. The viewer software supports EN 50160: 2010 voltage characteristics reporting.



### Process multimeter and handheld calibrators

Yokogawa CA series of process multimeters and handheld calibrators are ideal tools for the installation and maintenance of process instrumentation such as transmitters, flow meters, signal conditioners and valve positioners. Calibrate a wide range of instruments from data loggers, temperature controllers, thermometers to multimeters, and pressure transmitters and validate the accuracy of these field instrumentation, which are subject to harsh environmental conditions and wear and tear. No matter the situation, you can count on Yokogawa's calibrators for their minimal training requirement, durability and adaptability.



### Clamp-on testers

The wide range of Yokogawa clamp-on testers enables electric currents in conductors to be measured, without making physical contact or breaking circuits. The CL series consists of AC, AC/DC, and leakage current clamps with assorted ranges and dimensions. The multiple options include RMS, mean, temperature and frequency measurements, and a recorder output.



## Meet the Precision Makers

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“Precision is all around us. In everything we see, everything we touch. It means the difference between success and failure, safe and unsafe, sustainable and unsustainable. But precision doesn’t just happen. It’s made. **We are the Precision Makers.**”

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