5 complementary tools in a single instrument: OSCILLOSCOPE, FFT ANALYSER, MULTIMETER/WATTMETER, HARMONIC ANALYSER on voltage/current/power and RECORDER

NEW Bandwidth up to 200 MHz, versions with 2 or 4 isolated channels (600 V Cat. III)
NEW Sampling rate 2.5 GS/s in one-shot mode and 100 GS/s in ETS mode
NEW Memory depth of up to 50,000 points per channel (OSCILLOSCOPE and RECORDER modes) (option)

NEW Standard "real-time" FFT analysis and calculation functions on channels
NEW 2 or 4 independent TRMS digital multimeters (8,000 counts, 200 kHz)

NEW Triggering on measurement thresholds in OSCILLOSCOPE and MULTIMETER modes
NEW HX0072 and HX0073 FLEX current sensors powered by the instrument
NEW HX0075 application module for your power measurements

NEW Monochrome or colour LCD touch screen
NEW 33 direct-access keys and "windows-like" menu on screen
NEW Probix "plug & play" input terminals and smart sensors
NEW Multi-interface communication: RS232, USB, Centronics and Ethernet

NEW Large storage capacity on removable SD card
NEW Web server with cursors and automatic measurements and FTP server/client
OX 7000 oscilloscopes,
Simplicity serving performance

A UNIQUE INSTRUMENT

From the point of view of innovation, Metrix has not just contented itself with launching the first portable, stand-alone oscilloscope with four 600 V / Cat. III isolated channels on the market. Indeed, everything about the OX 7000 models, including their ergonomics, versatility, safety and various communication features, has been designed to offer the best possible trade-off between safety, service and comfortable use. In performance terms, they are at the top of their category with their brand new 12 bit / 1 GS/s converter, a sampling rate of 50 GS/s on periodic signals and capture of transients lasting 2 ns or more. Because modern means more efficient, these models can be controlled using either the “Windows-like” menus on the touch screen or 33 dedicated keys offering direct access to the most frequently-used functions. For even better performance in the field, the OX 7000 models offer a new patented system of “plug and play” accessories, individual insulation of each of the measurement channels, the extensive remote management possibilities offered by the Ethernet link with a WEB server and a variety of built-in instruments, including a 200 kHz multi-channel multimeter.

Direct access and intuitive navigation

The “Windows-like” ergonomics facilitate user familiarization with the oscilloscope -usually considered difficult. The touch screen makes navigation smooth and easy. The various menus can be opened using the stylus which can also be used to modify the graphical elements such as the cursors, triggers, etc.

Availability of the memory:
- in one-shot mode for time bases from 10 ms to 200 s/div
- in ETS mode for all time bases

SCOPE MODE:
Optimization of the duration/resolution trade-off
- example 1: for a 1 µs resolution, 50 ms duration.
- example 2: for a 100 s duration, 2 ms resolution.

RECORER MODE:
Acquisition of 50,000 samples, maximum resolution 40 µs, x 100 zoom (one mains period).
The oscilloscope, multimeter, harmonic analyser and recorder modes are directly accessible on the instrument’s front panel.

There are 33 keys for direct access to the instrument’s various parameters and modes. Contextual online help concerning the keys on the instrument (in five languages) is available on screen.

A removable μSD card can be used to store up to 2 GB of data.

The extra-large display area for traces (110 x 75 mm) in “FULL SCREEN” mode ensures that screenshots are not cluttered by superfluous information or menus.

In oscilloscope mode, the new totalizing function can be used to record the variations of a signal over time. This is particularly useful for checking signal amplitude or frequency instabilities, modulations and jitters.
The values measured can be recorded automatically on all the active channels over a period from 5 minutes to 1 month.

The power measurement function now offers simultaneous display of the active, apparent and reactive power values. The precise value of the cursor position is displayed at the top of the screen. It is also possible to zoom on this part.

Harmonic analysis is carried out up to the 61st order to comply with the requirements of the EN 50160 standard (THD on 50 orders minimum), with a fundamental frequency of 40 to 450 Hz. It is possible to preselect the frequency of the fundamental for the standards (50 Hz, 60 Hz and 400 Hz). This function helps to improve analysis performance and allows measurement when the level of a harmonic order is greater than the fundamental.

It is possible to view the harmonic analyses of two or four channels simultaneously.

A RECORDER (option)

To monitor the variations of physical or mechanical phenomena over time, a genuine high-speed digital recorder can be incorporated into the instrument as a software module. This allows acquisition rates of up to 40 µs between 2 measurements and the recordings can cover a whole month.

Automatic fault capture is possible by monitoring 1 or 2 thresholds per channel. The fault duration can be set from 160 µs to approximately 8 days. It is also possible to carry out this monitoring on tolerance windows. The capture function triggers storage of the phenomenon observed in long-term memory (up to 50,000 points) or automatic capture of successive time/date-stamped faults (max. 500 faults).

The “faults” are automatically stored either in the internal memory or on an FTP server (PC hard disk).

The analysis can be carried out on the instrument, using the cursors and automatic measurements. It is also possible to perform mathematical calculations between the channels or to export standard “TXT” files into a spreadsheet.

A harmonic ANALYSER (option)

Harmonic analysis is carried out up to the 61st order to comply with the requirements of the EN 50160 standard (THD on 50 orders minimum), with a fundamental frequency of 40 to 450 Hz. It is possible to preselect the frequency of the fundamental for the standards (50 Hz, 60 Hz and 400 Hz). This function helps to improve analysis performance and allows measurement when the level of a harmonic order is greater than the fundamental.

It is possible to view the harmonic analyses of two or four channels simultaneously.

A 200 kHz multi-channel TRMS digital multimeter

Just like for the 4 “instrument” modes, you can access the multimeter simply by pressing the corresponding key. The OX 7000 models are genuine 2 or 4-channel TRMS digital multimeters offering the following measurements:

- amplitude (DC or AC voltage and current, power, thermocouples, etc.)
- resistance, continuity, capacitance
- component test, etc.

Temperature can be measured with the Pt 100 and Pt 1000 sensors. By using 1 or 2 thresholds per channel to monitor the measurements, you can capture faults as short as 48 ms, and you can set the fault duration, beginning at 48 ms. The instrument also allows you to record a list of time/date-stamped faults (up to 100).

Display in normal mode and in fault capture mode
An OSCILLOSCOPE with complex trigger functions so that you only record what you need

Metrix OX 7000 oscilloscopes are the first models in this category to offer advanced triggering modes which are not just limited to a primary edge or pulse-width trigger. The delay mode allows users to observe any event with the maximum resolution, even if it occurs a long time after the effective trigger and even if it occurs on 2 different channels. The counting mode makes it possible to count events prior to triggering so that you can check the content of digital frames, for example. Lastly, the trigger can also be associated with an “auxiliary” signal different from the “primary” signal. A new function offering triggering on thresholds can be used to acquire or analyse the triggering signal, as well as to search for a condition on an automatic measurement (level, duration, etc.).

New & unique on the market!

For the “Oscilloscope” and “Multimeter” modes, fault capture is possible after setting a “Software” trigger based on monitoring the tolerance interval. It is also possible to store and automatically restart threshold overrun captures.

Comprehensive automatic measurements for precise analysis

With a single click, the automatic measurements window displays all the 19 parameters of a signal. For unambiguous analysis, two markers indicate the portion of the signal where the first automatic measurement was made. A specific measurement area can then be selected by framing it with the manual cursors to ensure reliable, more accurate results. Direct comparison of two traces is possible by ticking the “reference memory difference” box, so that the signal’s 19 parameters are displayed as deviations.

The MATH functions

In oscilloscope mode, the math functions (1, 2, 3 and 4) can be used to define a mathematical function for each of the traces, as well as vertical scaling with definition of the actual physical unit. The screen of the mathematical editor is capable of displaying 4 calculated traces on which all the automatic or cursor measurements remain available. This means that it is possible to examine the waveforms such as the power (U x I), for example, and carry out all the associated measurements. A large number of operators are available, such as +, −, x and /, but these oscilloscopes also offer sine, cosine, exponential, logarithm, square root, etc., allowing users to develop specific applications.

Many complex functions are editable, including simulation of a trace on the basis of its mathematical equation and therefore modelling of an expected result. There is almost infinite capacity for saving the functions created so that they can be recalled subsequently.
SOPHISTICATED AND OFTEN UNPRECEDENTED FUNCTIONS

**Real-time Fast Fourier Transform (FFT) for signal frequency analysis**

FFT is used to calculate the discrete representation of a signal in the frequency domain from its representation in the time domain, on the basis of 2,500 points. It is often crucial for effective diagnosis when carrying out qualitative signal analysis:

- measurement of the different harmonics, sub-harmonics and non-harmonics, as well as signal distortion,
- analysis of a pulse response,
- search for noise source in logical circuits,
- etc.

Several weighting windows are available, as well as 2 display modes: linear or logarithmic (scale in dB). The 2 cursors can then be used to make accurate measurements of the frequency lines, levels and attenuations, taking advantage of the 80 dB dynamic range provided by the 12 bit / 2.5 GS/s conversion.

The autoset function helps to obtain optimum spectrum display so that a graphic zoom can then be applied in order to analyse all the details of the spectrum.

**File management**

Each of the traces can be displayed instantly as a reference by pressing a single key for immediate comparison and deviation measurements. Back-ups are possible in two formats: .TRC for recall to the screen or .TXT for direct export into another standard Windows application, such as a spreadsheet.

On the oscilloscope, it is also very simple to copy, transfer or delete files from the 3 storage areas accessible (oscilloscope, µSD card, PC hard disk).

**POWER MEASUREMENTS**

Intended for "electrical energy" and "power electronics" applications, the OX 7042* and OX 7104* models are now available in new "Power" versions, with accessories and a dedicated application module.

With this module, it is now possible to analyse harmonics on the single-phase apparent power in **ANALYSER MODE**, in particular for motor diagnostics. Furthermore, it covers harmonics up to the 61st order, thus complying with the EN 50160 standard (minimum requirement: 50th order).

In **MULTIMETER MODE**, the power measurements are developed as follows:

- single-phase power
- 3-phase power on balanced network without neutral
- 3-phase power on balanced network with neutral
- 3-wire 3-phase power (method with 2 wattmeters)

There are 2 new **ProbiX** accessories dedicated to power measurements:

- **HX0072** (AmpFLEX™ 5 A to 3,500 A / 200 kHz), energy distribution and machines
- **HX0073** (AmpFLEX™ 1 A to 350 A / 3 MHz), switchboards and power electronics

* These models are delivered with all the software options available (see last page).
The system guarantees quick, error-free implementation of the instrument, a crucial advantage with equipment used for troubleshooting. For flawless compatibility, it is always possible to connect BNC accessories and standard banana leads via the safety adapters supplied. Interchangeable plastic rings can be used to match the accessory’s colour to the channel’s colour. The oscilloscope directly powers and calibrates the sensors. Some accessories even include three buttons directly accessible on the probe.

Channel configuration and sensor management

The sensor coefficients, scales and units and the channel configuration are managed automatically. The first two control buttons on the probes can be used to directly modify the parameter settings of the channel to which they are connected. They also control the functions accessible on the front panel of the oscilloscope. The third button is specialized for each accessory. On the voltage probes, for example, it controls lighting of the measurement zone. At connection, all the preferred parameters stored in the accessories (assignment of buttons 1 and 2, colour) are automatically reactivated by means of the Probix “pop-up” shown opposite.

Accessory identification and safety management

A sort of “plug and play” system for measurement, Probix, probes and adapters are immediately recognized when they are connected. The instrument not only identifies them, but also gathers information on their characteristics. Active safety is built in, notably in the form of safety information and recommendations concerning the accessory used.

Use of the WEB server

It is really simple to configure communications because, in most cases, the instrument’s IP address is supplied automatically by the local server. All you have to do is enter the address of the printer to be used.

File transfer

The files can be copied onto the PC using the standard Windows commands.

The OX 7000 oscilloscopes are available in a special version with a high-quality metal carrying case to protect the instrument and store all the probes and measurement accessories.

The ETHERNET interface and the new “SCOPENET” WEB server open the way for new ways of working and communicating, locally or remotely, as well as a level of comfort and efficiency which users quickly learn to rely on. To establish communication, all the other items of equipment (printer, PC, etc.) need to have IP addresses, like the OX 7000. In this way, even when you are on the road, you can print out your results on a network printer or exchange files between the OX and a computer. You can also communicate with the instrument remotely from any PC, view the traces in real time and control the instrument using the control panel.

Whether local or remote, these transfer and exchange operations can be carried out simply, quickly and without installing any software on the computer, thanks to the Web and FTP servers and to the new “SCOPEADMIN” utility. For the first time, these portable oscilloscopes for industrial and electronic maintenance help to solve the traditional problems linked to printing, back-up and documentation of the traces. The distance between the maintenance site and the office becomes virtual.
Technological specifications

**Oscilloscope mode**

- **Vertical deflection:** 40 MHz, 60 MHz, 100 MHz, 200 MHz, 100 MHz, 200 MHz
- **Bandwidth:** 15 MHz, 1.5 MHz or 5 kHz bandwidth limiter
- **Number of channels:** 2 isolated channels, 4 isolated channels
- **Vertical sensitivity:** 16 calibrations from 2.5 mV - 200 m/s/div and up to 56 µV/div in vertical zoom mode (12-bit converter) - Accuracy ± 1 %
- **Probe factors:** 1 / 10 / 100 / 1000 or any scaling - Definition of measurement unit
- **Sweep speed:** 35 calibrations from 1 ns/div to 200 s/div, accuracy ± 0.1 % - Read mode from 100 ms to 200 s/div
- **Horizontal position:** "One Click Winzoom" system (12-bit converter and direct graphical zoom on screen) - x 16 max.
- **Triggering:** On all channels: automatic, triggered, one-shot, auto level 50 %
- **Type:** Edge, pulse width (20 ns - 20 s), delay (120 ns to 20 s), counting (3 to 18,384 events), TV frame or no. of lines (525 - NTSC or 625 = PAL/SECAM) - Continuous adjustment of Trigger position
- **On measurement window:** On one of the 16 automatic measurements - Acquisition and automatic storage of faults
- **Digital memory:** 100 GS/s in ETS mode - 2.5 GS/s in one-shot mode (on each channel) - 12 bits (vertical resolution 0.025 %)
- **Memory depth:** 2,500 points/channel and up to 50,000 points/channel with the "Extended Acquisition Memory" option
- **User memory:** "Windows-like" file management
- **GLITCH modes and averaging:** 2 ns GLITCH Mode, Envelope Mode, Averaging (Factors 2 to 64), XY Mode
- **Digital specifications:**
  - **Sampling duration:** 2 s to 1 month / 800 µs to 18 min (40 µs to 53 s with the "Extended Memory Acquisition" option)
  - **Recording conditions:** On thresholds or window, simultaneous conditions on several channels, with parameterizable duration starting at 160 µs
  - **Recording analysis:** Scales and physical units, automatic or cursor measurements, time-based fault searching, zoom, etc.
- **General specifications:**
  - **PC communication:** 10 Mb local Ethernet, USB or RS 232 (option) (max. 115 kbps) - "Sx-Metro" PC application software (option)
  - **Power supply:** Main power supply NIM battery - Battery life up to 4 hrs - Adjustable standing function - Multi-voltage adapter/high-speed (standard) 98-264 V / 47-63 Hz (15 W)
  - **Safety / EMC:** Safety as per IEC 61010-1 (2001) - EMC as per EN61326-1 - 600 V CAT III
- **Triggering:**
  - **600 mV to 600 VRMS, 800 mV to 800 VDC - VDC accuracy 0.5 % R + 5 D - bandwidth 200 kHZ
  - **Sampling duration:** 2 s to 1 month / 800 µs to 18 min (40 µs to 53 s with the "Extended Memory Acquisition" option)
  - **Recording conditions:** On thresholds or window, simultaneous conditions on several channels, with parameterizable duration starting at 160 µs
  - **Recording analysis:** Scales and physical units, automatic or cursor measurements, time-based fault searching, zoom, etc.

**General characteristics:**

- **AC, DC and AC + DC voltages:** 600 mV to 6000 VRMS, 800 mV to 800 VDC - VDC accuracy 0.5 % R + 5 D - bandwidth 200 kHZ
- **Trigger on measurement window:** 2 or 4 monitored channels, parameterizable fault duration - Up to 100 time/date-stamped faults stored in a "TXT" file
- **Active power and PF:** Single-phase - Balanced three-phase (OX 7104 or OX 7204), with or without neutral and using the 2-wattmeter method
- **Resistance:** 80 Ω to 32 MΩ - accuracy 0.5 % R + 25 ° 10 ms quick sample test
- **Digital memory:** 100 GS/s in ETS mode - 2.5 GS/s in one-shot mode (on each channel) - 12 bits (vertical resolution 0.025 %)
- **Memory depth:** 2,500 points/channel and up to 50,000 points/channel with the "Extended Acquisition Memory" option
- **User memory:** "Windows-like" file management
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