

# SCOPIX IV

OSCILLOSCOPES WITH ISOLATED CHANNELS  
NEW GENERATION



## 5 instruments in 1 good reasons to choose a SCOPIX IV

Oscilloscope, multimeter, analyser and recorder modes, with the recorded files directly viewable on the oscilloscope.

**Safety:** channels genuinely isolated from one another and from the earth, 600 V CAT III & Probix probes

**Ergonomics:** modern, hi-tech environment for oscilloscopes which are simple, compact and practical

**Optimization** of all the tools: communication, storage and operation

**METRIX® expertise** applied to all the modes: bandwidth, sampling, memory, etc.



*Measure up*



# ERGONOMICS

The ergonomics of the **SCOPIX IV** portable oscilloscopes has been designed to simplify their use.

In a casing tailor-made to be as compact as possible, the external mechanical design of the **SCOPIX IV** makes it possible to integrate the hardware components in a very small volume, while the keypad benefits from a new technology developed in the automotive industry.

Identification of the channels and parameters

Each channel and the related parameters can be identified because they have an identical colour against a black background for simpler, quicker viewing.

Easy access via the touch screen

Intuitive pictograms are provided to facilitate their use, even with protective gloves.

Adjustable transport strap

This helps to optimize operation of the oscilloscope in your hand or on your shoulder when working in the field.

A stand is also available to vary the orientation of the oscilloscope when it is placed on a bench. The oscilloscope can be left without supervision thanks to the Kensington locking system

New keypad design for optimum user comfort

Configuration and display of the measurements are simple thanks to the accesses on the front panel in one of the 5 specific areas: Utilities (brightness, full screen, screenshot), Measurements, Vertical, Horizontal, Trigger.

Mains power supply or Li-Ion battery



## TECHNOLOGY!

To allow you to work in peace, there is no longer a fan: the heat is dissipated by conduction through the internal components of the SCOPIX IV models.

IP54

Casing protected against dust and water droplets

7" WVGA wide colour TFT touch screen

This makes it easy to view and read the signals clearly. It also provides a screen resolution of 800 x 480 dpi with manual or automatic brightness.

Space for stowing the touch-screen stylus

Among the essential tools available, the stylus is equipped with a hook for the addition of a cord to make it captive, as required and one end is slightly flattened to prevent it from rolling when placed on a table or bench.

"Magic" Autoset button

Direct settings and set-up

Communication interfaces

These are isolated from one another and from the measurement channels. A dedicated compartment protected by a hatch contains all the different communication interfaces:

- ▶ USB host for communication with a PC
- ▶ wired RJ45 or WiFi for communication with a PC or printing via a network printer
- ▶  $\mu$ SD card for data storage without transfer difficulties and upgrading of the instrument's firmware

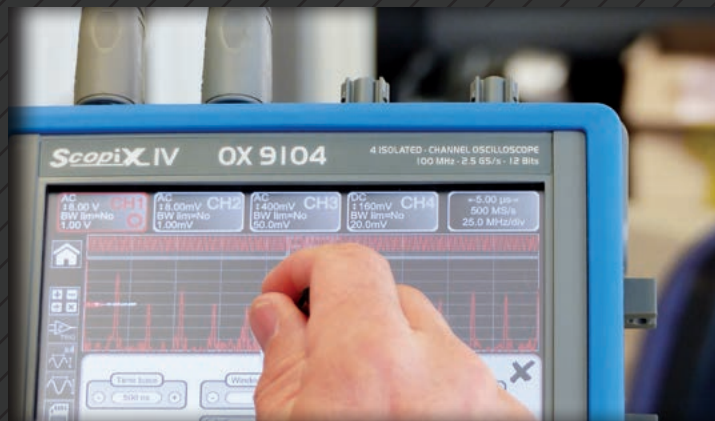
Direct access to the zoom

**ScopiX IV**

# APPLICATIONS

## Electronic maintenance

The **OX 9304** model is ideal for electronics with its 300 MHz bandwidth, 4 x **600 V CAT III** isolated channels, advanced trigger functions, integrated FFT function, complex mathematical calculations on the curves, automatic measurements on 4 channels and the built-in WEB server.



## Fieldbus maintenance

The "bus" version of the **SCOPIX IV** includes a function for testing the physical integrity of buses to ensure the physical quality of the fieldbuses (CAN, LIN, FLEXRAY, UART, SPI, etc.).



## Industrial maintenance

The **OX 9062**'s large 7-inch screen, 60 MHz bandwidth, 2 x **600 V CAT III** isolated channels and Harmonic Analyser and Multimeter modes make it ideal for industrial maintenance applications.



## The accessories

The "plug and play" accessories are recognized automatically when they are connected. This means they can be implemented quickly and in total safety. It is also possible to connect BNC accessories and standard banana leads with the safety adapters supplied.

Interchangeable coloured collars can be used to link each accessory to the colour of its channel. The sensors are powered and calibrated via the oscilloscope.

Some accessories even include three control buttons directly accessible on the probe to optimize your settings without any bother.

## Identification of the accessories and management of safety

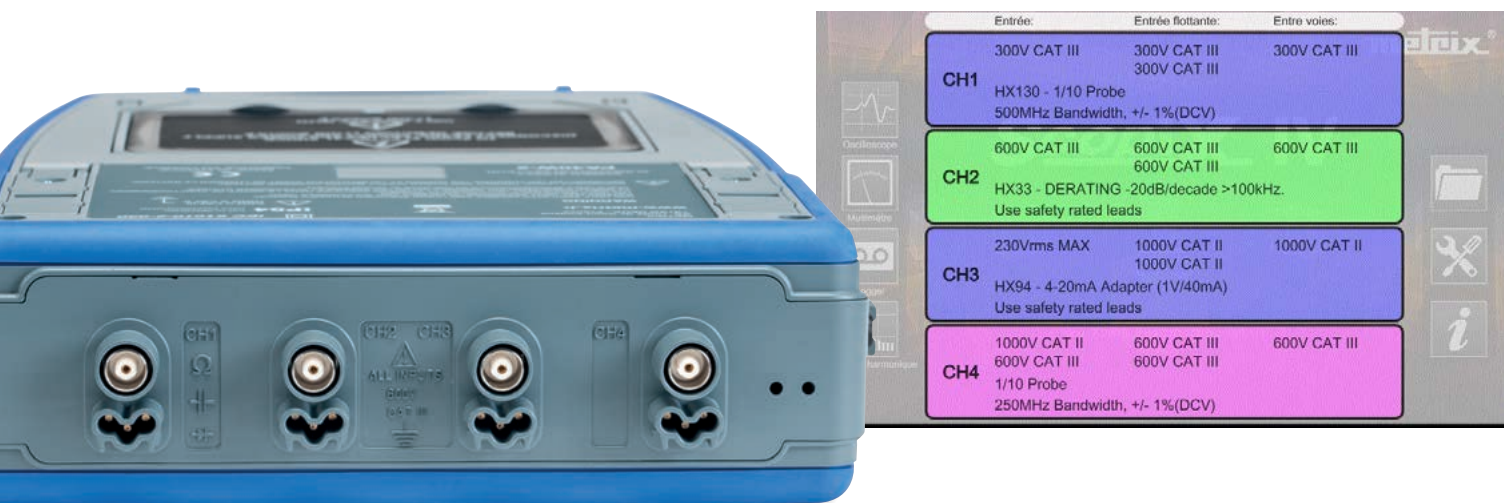
Once they have been hooked up, the probes and adapters are identified by the oscilloscope which retrieves their characteristics. Active safety is built-in, notably in the form of safety information and recommendations concerning the accessory used. All the accessories are powered directly from the oscilloscope.

## Configuration of the channels and management of the sensors

The sensors' coefficients, scales and units are managed automatically, as is the configuration of the channels. Control buttons on the probes can be used to modify the settings of the channel to which they are connected. They also offer the functions accessible on the oscilloscope's front panel.

Probix functions:

- ▶ voltage measurements
  - by probe with different bandwidths and attenuation
  - by BNC or banana connections
- ▶ current measurements
  - by AC or AC/DC clamp
  - directly: banana connections
- ▶ temperature measurements
  - by K thermocouple sensor
  - by Pt100 sensor



## Replacement accessories

HX0030B: Probix probe, 600 V CAT III  
 HX0034B: Probix clamp with round cable, 80A AC/DC 500 kHz  
 HX017g: µSD card (8 GB)  
 HX0080: 1 USB/µSD adapter + USB adapter

P01102155: PA40W battery charger-power pack-2 LI-ION batt.  
 HX0120: METRIX bag for SCOPIX IV  
 HX0121: set of 5 screen styluses for SCOPIX IV  
 HX0122: transport strap for SCOPIX IV

Communication isolated from the measurements for interfacing in total safety

Multiple communication interfaces

You can choose the type of communication to fit your requirements:

- ▶ Wired ETHERNET LAN network with integrated DHCP server for easy connection to your network, with the possibility of activating the WiFi radio link to communicate with a PC, tablet or smartphone using the dedicated interfaces.
- ▶ USB for interfacing with a PC: record, recall or load configurations.
- ▶ μSD > 8 GB, default storage, given priority over the 1 GB internal memory.

File management

Each of the signal traces can be displayed instantaneously as the reference by pressing a single key to obtain a comparison and immediate measurements of the deviation. Backups are possible in various formats for direct export into another standard application such as a “Windows” spreadsheet or word processor.

Using the front panel of the oscilloscope, it is also very simple to take screenshots in .PNG format, print out documents on a network printer and transfer or delete files in the file manager.

Storage possibilities per mode

|                   | Type of file |              |            |            |                  |
|-------------------|--------------|--------------|------------|------------|------------------|
|                   | setup.(cfg)  | traces.(trc) | math.(fct) | meas.(txt) | screenshot.(png) |
| Oscilloscope mode | ✓            | ✓            | ✓          |            | ✓                |
| Multimeter mode   | ✓            |              |            |            | ✓                |
| Logger mode       | ✓            |              |            |            | ✓                |
| Harmonics mode    | ✓            |              |            | ✓          | ✓                |

Data processing

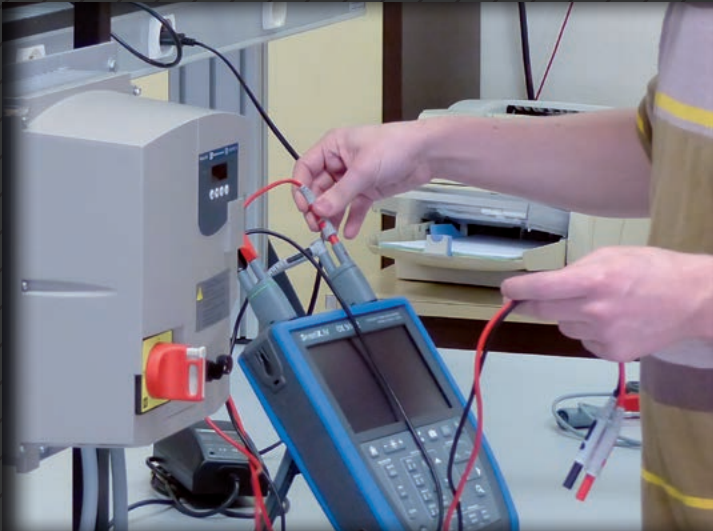
- ▶ Using a viewer on the oscilloscope, recall of the screenshots and the curves stored in memory in the various modes
- ▶ On a PC, via a ScopeNet application in your web browser with USB or Ethernet connection: remote control, programming with SCPI commands

APPLICATIONS

Electrical cabinet



Training bench or measurement system



In the laboratory



# 4 MODES :

# OSCILLOSCOPE MULTIMETER ANALYSER RECORDER

The functions and performance levels of the **SCOPIX IV** have been improved:

- ▶ wider bandwidth up to 300 MHz
- ▶ new possibilities for triggering and recording
- ▶ increased storage capacity

And many other advantages...

## Oscilloscope: trigger functions, automatic measurements, MATH functions

An **OSCILLOSCOPE** with complex trigger functions so that you only record what is necessary, while capturing all the faults.

The **OX 9000** models offer advanced triggers which complement the main edge trigger options: pulse width, counting, delay.

- ▶ The Delay mode enables you to observe any event with maximum resolution, even if it occurs a long time after effective triggering, even on 2 different channels.
- ▶ The Counting mode enables you to count the events before triggering, so that you can check the content of digital frames, for example. The trigger can be linked to a second "auxiliary" signal which is different from the "main" signal.

**Comprehensive automatic measurements** with cursors for precise analysis!

At the touch of a button, the Automatic Measurements window displays all 20 parameters of a signal or on each of the 4 channels. For unambiguous analyses, two H and V cursors can be used to view the part of the signal where the first automatic measurement was performed.

A specific measurement area can then be selected by framing it with manual cursors for more accurate, reliable results.

Direct comparison of two traces can be performed by checking the "reference memory deviation" box, so that these 20 signal parameters are displayed in terms of deviations.



## The MATH functions

In oscilloscope mode, the MATH functions (1, 2, 3 and 4) allow you to define a mathematical function for each of the traces, along with vertical scaling with definition of the actual physical unit.

The mathematical editor is capable of displaying 4 calculated traces on which all the automatic or cursor measurements remain available. This means it is possible to examine the waveforms, such as the power ( $U \times I$ ), for example, and perform all the associated measurements.

A large number of operators are available, including +, -, x and /, as well as more complex operators such as sine, cosine, exponential, logarithm, square root, etc., at last opening the way for specific applications.

## The real-time Fast Fourier Transform (FFT) for frequency decomposition of your signals on 4 channels

The FFT is used to calculate, from 2.5 kpoints upwards, the discrete representation of a signal in the frequency domain from its representation in the time domain. It is often particularly useful for arriving at an effective diagnosis during qualitative analysis of the signals:

- ▶ measurement of the different harmonics or distortion of a signal,
- ▶ analysis of a pulse response,
- ▶ search for the source of noise in the logic circuits,

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

The autoset makes it easier to obtain an optimum spectral representation to which a graphical zoom can be applied to analyse all the details of the spectrum.

## PRACTICAL!

Possibility of viewing simultaneously on all 4 channels:

- waveform + FFT
- waveform + XY
- waveform + zoom

## Analysis of the harmonics

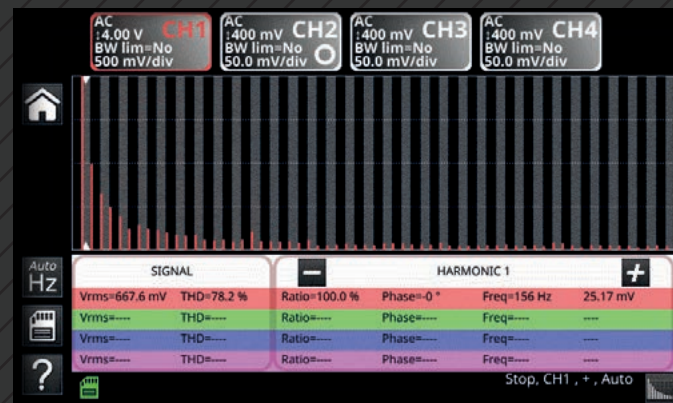
Harmonic analysis is performed on all 4 channels up to the 63rd order to comply with the requirements of the EN 50160 standard (THD on 50 orders minimum), with a fundamental frequency between 40 and 450 Hz.

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 analytical performance and, above all, 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: RMS level, harmonic distortion, harmonic frequency, phase of the harmonic in relation to the fundamental.

## Harmonics



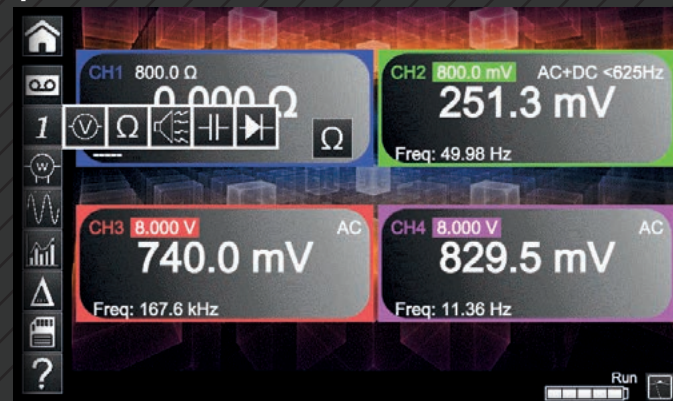
## Multimeter

By simply selecting the dedicated pictogram, you can gain access to the multimeter mode without changing the measurement input channels. The OX9000 models offer a genuine 8,000-count TRMS digital multimeter with two or four channels which can perform the following measurements:

- ▶ amplitude (DC or AC voltage and current, power, temperature, etc.)
- ▶ resistance, continuity, capacitance
- ▶ component tests

Temperature is measured using the Pt 100 and Pt 1000 sensors or K thermocouples via the dedicated PROBIX sensors.

## 4 simultaneous channels

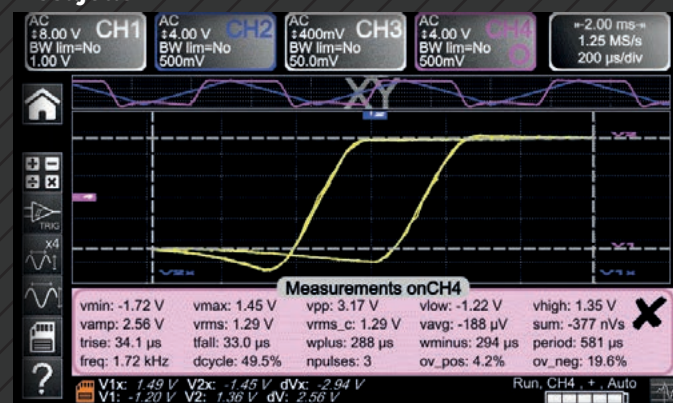


## Power available in Multimeter mode

The power measurements are proposed as follows with choice of the configuration:

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

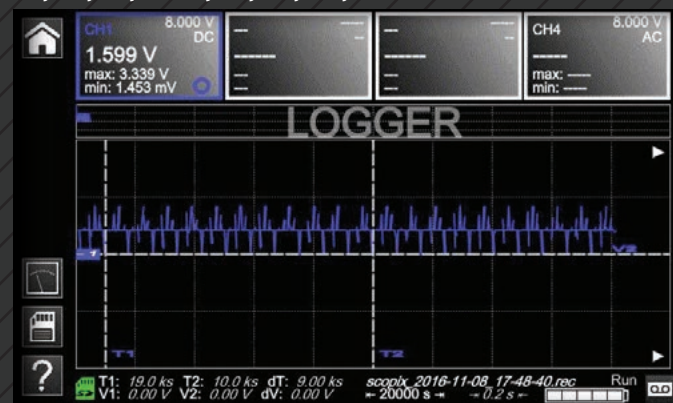
## Lissajous: XY



## Recorder/logger

This is the mode for recording the trends in Multimeter mode. A genuine fast digital logger is provided inside the instrument to monitor the variations of physical or mechanical phenomena over time. It offers acquisition intervals as short as 40 μs between 2 measurements and recording can cover any period from 2 seconds to one month.

## Measurement between H and V cursors: T1, T2, Dt, 1/Dt, V1, V2, dV, Ph



**State at delivery:** 1 SCOPIX IV oscilloscope delivered with a carrying bag, a PA40W-2 mains power pack / charger and 1 2P EURO mains power cable, 1 Li-Ion battery pack, 1 stylus, 1 Ethernet cable, 1 USB cable, 2 safety leads (red, black), 2 x Ø 4 mm test probes (red, black), 2 or 4 voltage probes depending on models, 1 μSD card (8 GB), 1 USB/ μSD adapter, 1 hand strap, 1 PROBIX BNC+1 PROBIX BANANA, USB installation procedure for use of ScopeNet data export software on CD-ROM, 1 PDF user's manual (>5 languages), 1 start-up guide on paper and 1 safety datasheet in 20 languages.

| TECHNICAL SPECIFICATIONS         | OX 9062                                                                                                                                                               |  | OX 9102 |  | OX 9104             |  | OX 9304 |  |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------|--|---------------------|--|---------|--|
| HUMAN-MACHINE INTERFACE          |                                                                                                                                                                       |  |         |  |                     |  |         |  |
| Type of display                  | 7" WVGA colour TFT LCD touch screen, 800x480 – LED backlighting (adjustable standby mode)                                                                             |  |         |  |                     |  |         |  |
| Different display mode           | 2,500 real acquisition points on screen - Vectors with interpolation                                                                                                  |  |         |  |                     |  |         |  |
| Display of curves on screen      | 4 curves + 4 references – Split Screen & Full Screen modes                                                                                                            |  |         |  |                     |  |         |  |
| Screen commands                  | Touch screen – ANDROID-type icons and graphical commands – customizable channel colours                                                                               |  |         |  |                     |  |         |  |
| Choice of language               | 15 complete languages, menus & online help                                                                                                                            |  |         |  |                     |  |         |  |
| OSCILLOSCOPE MODE                |                                                                                                                                                                       |  |         |  |                     |  |         |  |
| Vertical deflection              |                                                                                                                                                                       |  |         |  |                     |  |         |  |
| Bandwidth                        | 60 MHz                                                                                                                                                                |  | 100 MHz |  | 100 MHz             |  | 300 MHz |  |
|                                  | 15 MHz, 1.5 MHz or 5 kHz bandwidth limiter                                                                                                                            |  |         |  |                     |  |         |  |
| Number of channels               | 2 isolated channels                                                                                                                                                   |  |         |  | 4 isolated channels |  |         |  |
| Input impedance                  | 1 MΩ ± 0.5% , approx. 12 pF                                                                                                                                           |  |         |  |                     |  |         |  |
| Maximum input voltage            | 600 V / CAT III (1,000V per Probix) – from 50 to 400 Hz – Probix safety connectors                                                                                    |  |         |  |                     |  |         |  |
| Vertical sensitivity             | 16 calibres from 2.5 mV to 200 V/div and up to 156 µV/div in vertical zoom mode (12-bit converter) – Accuracy ± 2%                                                    |  |         |  |                     |  |         |  |
| Vertical zoom                    | "One Click Winzoom" mode (12-bit converter and direct graphical zoom on screen) – x 16 max.                                                                           |  |         |  |                     |  |         |  |
| Probe factor (non-Probix)        | 1 / 10 / 100 / 1,000 or any scaling – definition of measurement unit                                                                                                  |  |         |  |                     |  |         |  |
| Horizontal deflection            |                                                                                                                                                                       |  |         |  |                     |  |         |  |
| Sweep speed                      | 35 calibres from 1 ns/div to 200 s/div., accuracy ± [50 ppm + 500 ps] – Roll mode from 100 ms to 200 s/div                                                            |  |         |  |                     |  |         |  |
| Horizontal zoom                  | "One Click Winzoom" system (direct graphical zoom on screen) x 1 to x 5 or x 100 – storage 100 kpts/channel                                                           |  |         |  |                     |  |         |  |
| Triggering                       |                                                                                                                                                                       |  |         |  |                     |  |         |  |
| Mode                             | On all the channels: automatic, triggered, one-shot, auto level 50%                                                                                                   |  |         |  |                     |  |         |  |
| Type                             | Edge, pulse width (16 ns-20 s), delay (48 ns to 20 s), counting (3 to 16,384 events)<br>Continuous adjustment of Trigger position                                     |  |         |  |                     |  |         |  |
| Coupling                         | AC, DC GND, HFR, LFR, noise – Level and Hold-Off adjustable from 64 ns to 15 s                                                                                        |  |         |  |                     |  |         |  |
| Sensitivity                      | ≤ 1.2 division p-p up to 300 MHz                                                                                                                                      |  |         |  |                     |  |         |  |
| Digital storage                  |                                                                                                                                                                       |  |         |  |                     |  |         |  |
| Maximum sampling rate            | 2.5 GS/s in one-shot mode on each channel (100 GS/s max. in ETS mode)                                                                                                 |  |         |  |                     |  |         |  |
| Vertical resolution              | 12 bits (vertical resolution 0.025 %)                                                                                                                                 |  |         |  |                     |  |         |  |
| Memory depth                     | 100 kpts per channel and file viewer in the manager                                                                                                                   |  |         |  |                     |  |         |  |
| User storage                     | Internal = 1 GB to store the files: trace, text, configuration, math functions,                                                                                       |  |         |  |                     |  |         |  |
| File management                  | System memory: .pdf print files, .png image files<br>+ high-capacity removable µSD-Card: SD 2 GB, SDHC 4-32 GB and SDXC > 32 GB                                       |  |         |  |                     |  |         |  |
| GLITCH mode                      | Duration ≤ 2 ns – 500,000 Min/Max pairs                                                                                                                               |  |         |  |                     |  |         |  |
| Display modes                    | Envelope, vector, accumulation-, averaging (factors 2 to 64) – XY (vector) and Y(f)=FFT                                                                               |  |         |  |                     |  |         |  |
| Other functions                  |                                                                                                                                                                       |  |         |  |                     |  |         |  |
| AUTOSET                          | Complete in under 5 s, with recognition of the channels – Frequency > 30 Hz                                                                                           |  |         |  |                     |  |         |  |
| FFT analyser & MATH functions    | 2,500-point FFT (Lin or Log) with measurement cursors – Functions +, -, x, / and mathematical function editor                                                         |  |         |  |                     |  |         |  |
| Cursors                          | 2 or 3 cursors: simultaneous V and T with AUTO measurement: T1, T2, Dt, 1/Dt, dBV, Ph                                                                                 |  |         |  |                     |  |         |  |
| Automatic measurements           | Simultaneously with waveform, 20 automatic measurements per channel and on the 4 channels simultaneously with scroll                                                  |  |         |  |                     |  |         |  |
| MULTIMETER MODE                  |                                                                                                                                                                       |  |         |  |                     |  |         |  |
| General specifications           | 2 or 4 channels – 8,000 cts min/max/frequency/relative – TRMS – Time/date-stamped graphical recording in logger mode                                                  |  |         |  |                     |  |         |  |
| AC, DC and AC + DC voltages      | 600 mV to 600 VRMS, 800 mV to 800 VDC – VDC accuracy +/- (0.5 % + 25 D) – 200 kHz bandwidth                                                                           |  |         |  |                     |  |         |  |
| Resistance                       | 80 Ω to 32 MΩ – accuracy 0.5%R+ 25D – Quick continuity test < 10 ms                                                                                                   |  |         |  |                     |  |         |  |
| Other measurements               | Temperature (HX0035 = KTC, HX0036 = Pt100) / Capacitance 5nF to 5mF / Frequency 200 kHz / Diode test 3.3 V                                                            |  |         |  |                     |  |         |  |
| Single and three-phase power     | Active, Reactive and Apparent power values plus Power Factor simultaneously with the U & I measurements                                                               |  |         |  |                     |  |         |  |
| HARMONIC ANALYSER MODE           |                                                                                                                                                                       |  |         |  |                     |  |         |  |
| Multi-channel analysis           | 2 or 4 (depending on model), 63 orders, fundamental frequency 40 to 450 Hz in auto or manual mode                                                                     |  |         |  |                     |  |         |  |
| Simultaneous measurements        | Total Vrms, THD and selected order (% fundamental, phase, frequency, Vrms)                                                                                            |  |         |  |                     |  |         |  |
| LOGGER MODE                      |                                                                                                                                                                       |  |         |  |                     |  |         |  |
| Acquisition                      | Duration: 20,000 s – Interval: 0.2 s – Files: 100,000 measurements                                                                                                    |  |         |  |                     |  |         |  |
| GENERAL SPECIFICATIONS           |                                                                                                                                                                       |  |         |  |                     |  |         |  |
| Configuration memories           | Not limited according to device - variable file sizes                                                                                                                 |  |         |  |                     |  |         |  |
| Printing                         | Network printing via Ethernet/Wifi in .png format                                                                                                                     |  |         |  |                     |  |         |  |
| PC communication – software link | Ethernet (100 baseT), WiFi-USB (device, 12 Mbs) – "ScopeNet" application software for PC                                                                              |  |         |  |                     |  |         |  |
| Software                         | PC: Ethernet and USB, ScopeNet (remote control, data recovery, cursors and automatic measurements)<br>Android tablet – ScopeAdmin Fleet Administration utility        |  |         |  |                     |  |         |  |
| Mains power supply               | Li-Ion rechargeable battery (6,900mAH-40 Wh) – Battery life of up to 8 hrs – Adjustable standby mode<br>Adapter / 2-hour fast charger, universal 98-264 V / 50/60 Hz) |  |         |  |                     |  |         |  |
| Safety / EMC                     | Safety as per IEC 61010-2-30, 2010 – 600 V CAT III / 1000 V CAT II – EMC as per EN61326-1, 2010                                                                       |  |         |  |                     |  |         |  |
| Mechanical specifications        | 292.5 x 210.6 x 66.2 mm – 2.1 kg with batteries – IP54 protection                                                                                                     |  |         |  |                     |  |         |  |
| Reference to order               | OX9062                                                                                                                                                                |  | OX9102  |  | OX9104              |  | OX9304  |  |

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