

# CA 922 - CA 942

## **Oscilloscopes with isolated channels**

### SIMPLE - PRACTICAL - VERSATILE - EFFECTIVE



20 or 40 MHz oscilloscopeDouble 8,000-count multimeter

Double harmonic analyser

Optimized 3.5" colour LCD screen for maximum visibility

Multilingual interactive online help

Data recording and recovery on PC

Practical with its USB communication using the SCPI protocol

Stand-alone, powered by NiMH rechargeable battery with USB chargerB



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## 🛩 portable oscill

002.0mV

000.0mV

C.A 942

## **ERGONOMICS**

Developed as on-site measuring tools, the **HANDSCOPE** oscilloscopes are particularly easy to use. The shockproof IP54 elastomer casing fits perfectly in one hand. The command keys on the front panel are easily accessible, even when wearing safety gloves, with the keys grouped by function. Multilingual interactive help is available to assist users in doubt without having to refer to the user's manual.

The **colour screen** is particularly easy to read and the **LED backlighting** helps to limit the **HANDSCOPE's** power consumption, with measurement remaining possible while charging.



## **APPLICATIONS**

Compact and fitting in one hand, the **HANDSCOPES** are ideal for operations on electrical installations in the field and general maintenance. Thanks to its isolated channels, users can measure in total safety without any particular precautions. The **HANDSCOPE** is a multifunction measuring instrument (Oscilloscope – Multimeter – Harmonic Analyser) which can be used to Measure – Record and then Analyse the results on a PC with the dedicated SX-METRO software.

- measurement on PWM variable speed drive with display of the waveform in oscilloscope mode,
- power measurement in multimeter mode
- analysis of mains supply disturbances with harmonic analysis



The same connection technology for all the modes: 2 BNC inputs

Accessories: Probe or BNC/banana adapter supplied

# oscope with isolated channels

## **PWM MEASUREMENT KIT**

For stable measurements on signals «seen» by the motor at the output from the variable speed drive, a PWM Kit is available.

The kit comprises:

- An MLI01 low-pass sensor
- An E27 AC/DC current clamp

## PERFORMANCE

#### **COMPLETE OSCILLOSCOPE**

On each of the **two isolated channels**, it is possible to select and display automatic measurements chosen among the 19 proposed (Amplitude, Time or Phase). In addition, **MATH** functions can be used to produce a representation over time of a signal derived from the channels by means of a mathematical operation (+,-,x,/ inversion) with automatic scaling.



The **Autoset** of the channels is optimized for **synchronization of the signal parameters.** The waveform display can be stabilized very simply by pressing a single "magic" key.

#### Fast Autoset in <5 s, range >10 Hz from 10 mVpp to 400 Vpp

With its simple or complex edge or pulse triggering and associated HF or LF or Noise filters to optimize display of the waveform, the **HANDSCOPE** offers simple, effective tools which match your needs.

To observe rapid or noise-affected phenomena, several types of acquisition are available: peak detect, averaging or envelope, as well as a time-based zoom.

## TWO INDEPENDENT 8,000-COUNT DIGITAL MULTIMETERS



CJust as for the three instrument modes, a single press on the dedicated key gives access to the multimeter mode allowing you to measure AC, DC and AC+DC voltages and currents, resistance, continuity, capacitance, frequency, power (combination of two measurement channels), temperature (K thermocouple or infrared sensor) and motor rotation speed (optical tachometer). The instrument can also be used to test diodes and components.



Furthermore, power measurement on single-phase or balanced three-phase systems enables you to determine consumption and observe the trend stored as a .txt file or .BMP screenshot.

2 essential modes for a professional multimeter:

- the surveillance mode can be used to measure the MAX, MIN and AVG values
- the relative mode, which gives the relative value, i.e. the difference between the relative value and real value and the deviation in %.

#### HARMONIC ANALYSER

Harmonic analysis is performed on **2 channels** up to the 31st order, with a fundamental frequency between 40 and 450 Hz. At the same time, the **HANDSCOPE** measures values of the total VRMS voltage, the THD and the harmonic order selected (%fundamental, phase, frequency, VRMS). This



function helps to improve analysis performance and, above all, measurement when the level of a harmonic order is greater than the level of the fundamental.

Screen optimization: the menus disappear automatically if there is no operator action on the keyboard for 20s; you lose nothing on the screen and the waveform view is displayed across the whole width of the screen.

#### DATA STORAGE - COMMUNICATION & PC SOFTWARE

The **HANDSCOPE** is equipped with an internal memory for saving configurations and recording traces and acquisitions in multimeter mode (2,700 measurements over a period from 5 minutes to one month). It can communicate with a PC via an optically-isolated USB interface.



Using this interface and the SX-METRO software supplied, users can download stored measurements and traces for processing on the PC and export them in formats compatible with office application suites. They can also display the measurements in progress on the **HANDSCOPE** in real time and manage its configurations. In addition, the multimeters' **SX-DMM PC software** can be used to manage the **HANDSCOPE's** multimeter function to process and analyse the data very easily and generate measurement reports.

**TECHNICAL SPECIFICATIONS** 

CA 922

CA 942

HUMAN ACHINE INTERACE   Str. Colur, TTT - Resolution points on series     Display mode   2.50 rola laquisition points on series     On-accent display of curves   2 curves - 2 references - memory tab towser (main & Secondary Without Endiden menuse)     Interactive help function   14 languages: French. English. German, Spanish, Italian, Sweidsh, Romanan, Russian, Finish, etc.     OSCILLOSCOPE MODE   40 MHz     WETRICAL DEFLECTION   40 MHz     Bandwidth   20 MHz   40 MHz     Bandwidth   20 MHz   40 MHz     Watcal DEFLECTION   20 MHz   40 MHz     Watcal Character   11 Mile 10 Mile   40 MHz     Maximum input violage   600 VCATIII - Peacting 20 dB per docade from 100 Htz   Vertical ensitive     Vertical ensitive   5 m/t to 200 s/div   Sout Violage     Mode   25 ms/div to 200 s/div -Roll mode from 100 ms to 200 s/div     Horizontal zone   25 ms/div to 200 s/div   Sout Violage     Mode   25 ms/div to 200 s/div -Roll mode from 100 ms to 200 s/div     Mode   25 ms/div to 200 s/div   Sout Violage Reduction     TreeGERINO   25 ms/div to 200 s/div   Sout Violage Reduction     Origital			
Diplaymode   2.00 real acquisition points on screen     Or-screen digsby of urves   2.urves 2 references + money trace or malematical calculation     Commands   Direct adjustments on from panel & on-screen measus we hornes (main & secondary influed indidem measus)     Interacture heigh function   14 languages: French, English, German, Spanish, Italian, Swedish, Romanian, Russian, Finnish, etc.     OSELLOSCOPE HODE   Vertical Society and the secondary of the secondary in the secondary of th	HUMAN-MACHINE INTERFACE		
On-scient display of curves   2 curves 2 a for from y this our matchemical calculation     Commands   Diret adjustments on from panels on screem near with our without diret menus/s     Initisacitive help function   14 languages: French, English, German, Spanish, Italian, Swedish, Romanian, Russian, Frinrish, etc.     OSCILIDSSOPE NOPE   40 MHz     Bandwichh   20 MHz   40 MHz     Bandwichh   2 totally isolated channels     Durt in Mit Du Shy, approx. 17 pF   Mutch of 100 MHz     Maintum input Vollage   6600 VCATII - Derating: 20 dB per discale from 100 MHz     Maintum input Vollage   6600 VCATII - Derating: 20 dB per discale from 100 MHz     Vertical sensitivity   5 mH to 200 Vilv     Moxer of Handia   20 more ficients: 1, 2, x5     INFORCEMINAL DEFLECTION   20 more ficients: 1, 2, x5     Mode   Automatic, triggered, one-shot 8 Triggered Roll     Type   Edge. place with 20 on: 20 al)     Mode   Automatic, triggered, one-shot 8 Triggered Roll     Type   2 Coll file Stoader = 50 MS is non-shot med on each channel     Vertical sensitivity   3 L2 divisiones p- put po 40 MHz     OIGTAL MEMORY   2 Coll file Stoader = 50 MS is non-shot mod on each channel	Type of display	3.5" colour TFT – Resolution	320x240 –LED backlighting
Command   Direct adjustments on from panel & on-screen menus via browser (main & scendard) without childden menus)     Interactive high function   14 languages: French, English, German, Spanish, Italian, Swedish, Romanian, Russan, Finnish, etc.     OSEILDSCOPE MODE   40 MHz     Bandwitch   20 MHz   40 MHz     Bandwitch   20 MHz   40 MHz     Bandwitch   20 Listly-isolated channels   1 Mit 3.0 We, approx. 17 pF     Maximum impedance   1 Mit 3.0 We, approx. 17 pF   1 Mit 3.0 We, approx. 17 pF     Maximum impedance   5 mV to 200 Sidn - Roll mode from 100 ms to 200 Sidn   200 Sidn - Roll mode from 100 ms to 200 Sidn     Vertical sensitivity   5 mV to 200 Sidn - Roll mode from 100 ms to 200 Sidn   200 Sidn - Roll mode from 100 ms to 200 Sidn     More A   Automatic, triggered, one-shot & Triggered Roll   20 mode   20 mode     TRIGERING   Automatic, triggered, one-shot & Triggered Roll   20 mode   20 Mit 20 mode     More A   Automatic, triggered, one-shot & Triggered Roll   20 mode   20 Mit 20 mode     TRIGERING   \$12 divisions p- up to 20 Mit 2   \$12 divisions p- up to 40 MHz   21 divisions p- up to 40 MHz     Maximu asempting rate   2 CSS in ETS mode - 50 MS in In one-shot m	Display mode	2,500 real acquisition points on screen	
Interactive help function   14 languages: French. English, German. Spanish, Italian, Swedish, Romanian, Russian, Finnish, etc.     OSCILLOSCOPE (MODE)   40 MHz     Bandwitch   20 MHz   40 MHz     Bandwitch   2 totally-isolated channels   40 MHz     Bandwitch   2 totally-isolated channels   1,5 MAz, 5 MHz     Input impediance   1 MM 20 MHz   40 MHz     Winter of channels   2 totally-isolated channels   1 MM 20 MHz     Bandwitch   6 600 V CAIII - Derating - 200 Bpd per decade from 100 Hz   Vertical sensitivity     Vertical sensitivity   5 MV to 200 VdH   MM 200 MHz   MM 200 MHz     HOREXONTAL DEFLECTION   25 md/dtv to 200 sd/u - Roll mode from 100 ms to 200 sd/u   Mode     Mode   Automatic, triggered, one-shot X fraggered Roll   Mode     TRICOERING   200 MHz   s1.2 divisions p- up to 20 MHz   s1.2 divisions p- up to 40 MHz     Sensitivity   s1.2 divisions p- up to 20 MHz   s1.2 divisions p- up to 40 MHz   S1.2 Mirk MARC     Coursing   AC or D C depending on coupling of triggered nonel   MHz   MM 20     Maximu amanging rate   2 CS/s in ETS mode - 50 M/S is in one-shot mode on each channel	On-screen display of curves	2 curves + 2 references + memory trace or mathematical calculation	
OSCILLOSCOPE MODE   40 MHz     Bandwidth   20 MHz   40 MHz     Bandwidth limiter   1,5 MHz,5 KHz     Bandwidth limiter   2 totally-solated formals     Input impedance   1 MI 40 5%, approx. 17 pF     Maximum input voltage   600 V CATIL - Derating: 20 dB per decade from 100 MHz     Vertical sensitivity   5 mV to 200 Vdiv     MORZONTAL DEFLECTION   20 and add from 100 ms to 200 sdiv     Sweep speed   25 ns/div 020 0 sdiv-Roll mode from 100 ms to 200 sdiv     Morizontal zoom   Zoom conflicient: x1, x2, x5     TRIGERING   Automatic, triggered, anne-shot & Triggered Roll     Triggered Roll   Edge paties with (20 ms - 20 s     Coupling   AC or DC (depending on coupling of triggering channel), HF, LF or noise rejections     Sensitivity   51.2 divisions p- pu to 40 MHz     DIGTAL MEMORY   2 SdS in ETS mode - 50 MS in one-shot mode on each channel     Vertical resolution   9 bits     DIGTAL MEMORY   2 SdS in ETS mode - 50 MS in one-shot mode on each channel     ULTCH mode   Duratin acstal tring tr	Commands	Direct adjustments on front panel & on-screen menus via browser (main & secondary without «hidden menus»)	
VERTICAL DEFLECTION   Image: Comparison of the second of the s	Interactive help function	14 languages: French, English, German, Spanish, Italian, Swedish, Romanian, Russian, Finnish, etc.	
Bandwidth   20 MHz   40 MHz     Bandwidth Imineler   1.5 MHz 5 MHz     Number of channels   2 totally-isolated channels     Input Impedance   6600 VCATIL ID-erating-20 dB predicade from 100 KHz     Wartical sensitivity   6600 VCATIL ID-erating-20 dB predicade from 100 KHz     Vertical sensitivity   5m tb 200 Vd/w     Morizontal Der Efection   2000 recently and the decade from 100 ms to 200 s/d/w     Sweep speed   25 ns/dt v 200 Vd/w     Morizontal zoom   Zoom coefficient: x1, x2, x5     TRIGERING   2000 recently and the docade from 100 ms to 200 s/d/w     Korking   Automatic, triggering, chansel, bitt, E for noise rejections     Sensitivity   s1.2 divisions p- up to 40 MHz     Digrad, MEMORY   2 GS/s in ETS mode = 50 MS/s in one-shot mode on each channel     Vertical resolution   2 MB for file storage: trace (tric), text (tric), tonfiguration (d/g), tage files (bmg)     User memory   2 MB for file storage: trace (tric), text (tric), configuration (d/g), tage files (bmg)     USER FUNCTIONS   Duration 2 Coon	OSCILLOSCOPE MODE		
Bandwith limiter   1.5 MHz 5 Hz     Number of channels   2 totally-isolated channels     Input impedance   1.MB 40.5%, approx. 17 pF     Maximum input voltage   6600 VOLTII - Derating - 20 dB per decade from 100 kHz     Vertical sensitivity   Sensitivity     Vertical versitivity   Sensitivity     Vertical versitivity   Sensitivity     Vertical versitivity   Conn coefficient: x1, x2, x5     Mode   Automatic, triggered, one-shot & Triggered Roll     TRIGGERING   Edge, pulse withit 20 ms - 20 s     Mode   Automatic, triggered, one-shot & Triggered, Roll     TriedGERING   Sensitivity     OliFAL MEMORY   Sensitivity     Maximus ampling rate   2 GSAs in ETS mode - 50 MSis in one-shot mode on each channel     Vertical resolution   9 bits     Maximus ampling rate   2 GSAs in ETS mode - 50 MSis in one-shot mode on each channel     User memory   2 MB for file is torage: trace, fac, lock (LAL), configuration (cfg), image files (Lang)     GITRAL MEMORY   Duration 200 son (TSM) MMA pairs     Display modes   Channel inversion, addition, subtraction, multiplication and viscol (Addition)     Corrad AcC HOC Voltageres	VERTICAL DEFLECTION		
Number of channels   2 totally-isolated channels     Input impedance   1 M2 ±0.5%, approx. 17 pF     Maximum input voltage   6600 VCATIL-Derating-20 dB per decade from 100 kHz     Serve pased   5 mV to 200 Vd/vi     Morizont AL DEFLECTION   20m coefficient: x1, x2, x5     TRIGGERING   20m coefficient: x1, x2, x5     Mode   Automatic, triggered, one-shot & Triggered Roll     Type   Edge.puble width (20 ns - 20 s)     Coupling   Automatic, triggered, one-shot & Triggered Roll     Striggered   1.2 divisions p- up to 20 MHz     Sensitivity   \$ 1.2 divisions p- up to 20 MHz     Sensitivity   \$ 1.2 divisions p- up to 20 MHz     Visitial resolution   9 bis     Maximum sampling rate   2 GS/s in ETS mode - 50 MS/s in one-shot mode on each channel     Visitial resolution   9 bis     Memory depth   2.0 Do prints per channel     User memory   2 MB of the storage trace (rule, law, rule, rul	Bandwidth	20 MHz	40 MHz
Input ingedance   1 MB 10 5%, approx. 17 pF     Maximum input voltage   6 600 VCAT III - Deritina -2008 per decade from 100 kHz     Vertical sensitivity   Sm V to 200 V/div     HORE 2007/LL DEFLECTION   Exceep speed     Sweep speed   25 rs/div to 200 s/div-Roll mode from 100 ms to 200 s/div     HORE 2007/LL DEFLECTION   Exceep speed     REGERING   Common 200 mode from 100 ms to 200 s/div     Mode   Automatin, triggered, one-shot 8 Triggered Roll     TREGERING   Exceep speed     Outpring   Sci 2 divisions p- put to 20 MHz   s1.2 divisions p- put o40 MHz     DiffAL MENORY   Sci 2 divisions p- put to 20 MHz   s1.2 divisions p- put o40 MHz     Maximum sampling rate   2 GS is TES mode - 50 MS/s is none-shot mode neach channel     Vertical resolution   9 bits     Maximum sampling rate   2 GS is TES mode - 50 MS/s is none-shot mode neach channel     User memory   2 MB for filestorage: trace, trigger file change: division adjustore file change     GUTCH mode   Duration 220 ms - 1,250 Min/Max pairs     Display modes   Channel inversion, addition, subtraction, multiplication and division adjustable scaling!     Cursor measurements   2 channels, 8,000-count display + min/	Bandwidth limieter	1,5 MHz, 5 kHz	
Maximum input voltage   600 V CAT III - Dersing - 20 dB per decade from 100 kHz     Vertical sensitivity   SmV to 200 V/div     Morizont AL DEFLECTION   SmV to 200 V/div     Sweep speed   .25 ns/div to 200 s/div -Roll mode from 100 ms to 200 s/div     Horizontal zoom   Zoom coefficient: x1, x2, x5     TRIGERING	Number of channels	2 totally-isolated channels	
Vertical sensitivityGmit to 200 V/divHORIZONTAL DEFLECTIONComcoefficient: x1, x2, x5HORIZONTAL DEFLECTIONComcoefficient: x1, x2, x5RIGGERINGComcoefficient: x1, x2, x5ModeAutomatic, triggered, one-shot & Triggered RollTRIGGERINGCompling on triggering one-shot & Triggered RollSpieEdge, puise width (20 ns - 20 s)CouplingS12.0 divisions p-p up to 20 MHzSensitivityS12.0 divisions p-p up to 20 MHzSensitivityS12.0 divisions p-p up to 20 MHzCoupling of triggering channel), HF, LF or noise rejectionsSensitivityS12.0 divisions p-p up to 20 MHzVertical resolutionS0 Soft Sin one-shot mode on each channelWertical resolutionS0 Soft Sin one-shot mode one each channelVertical resolutionS0 Soft Sin Sin one-shot mode one each channelVertical resolutionS0 Soft Sin one-shot mode one each channelVertical resolutionS0 Soft Sin Sin Sin one-shot mode one each channelVertical resolutionS0 Soft Sin Sin Sin one-shot mode one each channelVertical resolutionS0 Soft Sin	Input impedance	1 MΩ ±0.5%, approx. 17 pF	
HORIZONTAL DÉFLECTION   Horizontal zom     Sweep speed   25 ns/div to 200 s/div -Roll mode from 100 ms to 200 s/div     Horizontal zoom   Zom coefficient: x1, x2, x5     TRIGERING   Automatic, triggered, one-shot & Triggered Roll     Type   Edge, pulse width (20 ns -20 s)     Coupling   ALC or DC (depending on coupling of triggering channel)), HF, LF or noise rejections     Sensitivity   ≤1.2 divisions p-p up to 20 MHz   ≤1.2 divisions p-p up to 40 MHz     DIGTAL MEMORY   2 GS/s in ETS mode - 50 MS/s in one-shot mode on each channel     Warium sampling rate   2 CS/s in ETS mode - 50 MS/s in one-shot mode on each channel     Vertical resolution   9 bits     Memory depth   2.500 points per channel     User memory   2 MB for file storage: trace (tric), text (txt), configuration (cfg), image files (bmp)     GLITCH mode   Duration : 220 ns - 1.250 Min/Max pairs     Display modes   Channel inversion, addition, subtraction, multiplication and division (adjustable scaling)     Cursors: VT, dV, dt simultaneously - 4-digit display resolution   Automatic measurements     MULTIMETER MODE   Cahannels, 80.000-count display + min/max bargraph - Graphical recording of 2,700 measurements (S min to 1 month)     Operating modes   Absolute o	Maximum input voltage	600 V CAT III – Derating -20 dB per decade from 100 kHz	
Sweep speed   25 ns/div to 200 s/div - Roll mode from 100 ms to 200 s/div     Horizontal zoom   Zoom coefficient: x1, x2, x5     RIGGERING   Note     Mode   Automatic, triggered, one-shot 8 Tinggered Roll     Mode   Automatic, triggered, one-shot 8 Tinggered Roll     Coupling   AC or DC (depending on coupling of triggering channel)), HF, LF or noise rejections     Sensitivity   s1.2 divisions p-p up to 20 MHz   s1.2 divisions p-p up to 40 MHz     OlirAL MEADRY   State Sing Sing Sing Sing Sing Sing Sing Sing	Vertical sensitivity	5 mV to 200 V/div	
Horizontal zoom Zoom coefficient: x1, x2, x5   TRIGERING Adde   Mode Automatic, triggered, one-shot & Triggered Roll   Type Edge, pulse width (20 ns – 20 s)   Coupling AC or DC (depending on coupling of triggering channel), HF, LF or noise rejections   Sensitivity ≤1.2 divisions p-p up to 20 MHz ≤1.2 divisions p-p up to 40 MHz   Maximum sampling rate 2 GS/s in ETS mode – 50 MS/s in one-shot mode on each channel   Vertical resolution 9 bits   Memory depth 2,500 points per channel   User memory 2 MB for file storage: trace (trac), etxt (tu), configuration (cfg), image files (Lomp)   OTHER FUNCTIONS Duration - 220 ns – 1,250 Min/Max pairs   OTHER FUNCTIONS Channel inversion, addition, subtraction, multiplication and division (adjustable scaling)   Cursor measurements 12 cursors: 1, 24 vis simultaneously - 4-digit display resolution   Automatic measurements 18 time-based or level measurements and Phase measurement   MULTIMETER MODE Cehannels, 8,000-count display + min/max bargraph - Graphical recording of 2,700 measurements (5 min to 1 month)   Operating modes Ranges from 500 Vto 600 VKRSN 680 OW Vto 800 Vto 200 VCA cocuracy 1%R+100 – 10 ms quick continuity test   Capocalance Ranges from 500 Vto 500 VKRSN 680 OW Vto 9	HORIZONTAL DEFLECTION		
TRIGGENING   Automatic, triggered roll     Mode   Automatic, triggered Roll     Type   Caupling     Caupling   AC or DC (depending on coupling of triggering channel)). HE, LF or noise rejections     Sensitivity   ≤1.2 divisions p- pu to 20 MHz   ≤1.2 divisions p- pu to 40 MHz     DiGTAL LEMORY   <1.2 divisions p- pu to 40 MHz	Sweep speed	25 ns/div to 200 s/div –Roll mode from 100 ms to 200 s/div	
Mode   Automatic, triggered, one-shot & Triggered Roll     Type   Coupling   CA C DC (depending on coupling of triggering channel)), HF, LF or noise rejections     Sensitivity   ≤1.2 divisions p-p up to 20 MHz   ≤1.2 divisions p-p up to 40 MHz     DIGITAL MEMORY    Sensitivity   ≤1.2 divisions p-p up to 40 MHz     Maximum sampling rate   2 GS/s in ETS mode - 50 MS/s in one-shot mode on each channel   Vertical resolution   9 bits     Memory depth   2.500 points per channel   Sensitivity   Sensitivity     User memory   2 MB for file storage: trace (trc), text (txt), configuration (cfg), image files (bmp)   GITCH mode     Display modes   Envelope, Averaging (Facusto 2 to 64) and XY (vector)   Sensitivity     OTHER FUNCTIONS   Channel inversion, addition, subtraction, multiplication and division (adjustable scaling)   Cursor measurements     MULTIMETER MODE   Channels, 8,000-count display + min/max bargraph – Graphical recording of 2,700 measurements (S min to 1 month)   Operating modes     C, Co and Ac-DV ovitages   Ranges from 80 to 32 MD - accuracy 2%R+10D –10 ms quick continuity test   Capacitance     CA Co and AC-DV ovitages   Range from 80 to 32 MD - accuracy 2%R+10D –10 ms quick continuity test   Capacitance     Marge from 8	Horizontal zoom	Zoom coefficient: x1, x2, x5	
TypeEdge, pulse width (20 ns- 20 s)CouplingAC or DC (depending on coupling of triggering channel)), HF, LF or noise rejectionsSensitivity\$1.2 divisions p-p up to 20 MHzDIGTAL MEMORY12.2 divisions p-p up to 20 MHzMaximum sampling rate2 GS/s in ETS mode - 50 MS/s in one-shot mode on each channelVertical resolution9 bitsMemory depth2.500 points per channelUser memory2 MB for file storage: trace (trc), text (txt), configuration (cfg), image files (bmp)GLITCH modeDuration 22 on s - 1,250 Min/Max pairsDisplay modesEnvelope, Averaging (Factors 2 to 64) and XY (vector)MATH functionsChannel inversion, addition, subtraction, multiplication and division (adjustable scaling)Cursors V, T, dV, dt simultaneously - 4-digit display resolutionAutomatic measurements2 channels, 8.000-count display + min/max bargraph - Graphical recording of 2,700 measurements (Sinin to 1 month)Operating modes2 channels, 8.000-count display + min/max bargraph - Graphical recording of 2,700 measurements (Sinin to 1 month)Operating modesRanges from 600 mV to 600 VRMS, 800 mV to 800 VDC-VDC Accuracy 1% Reading + 20D - 50 kHz bandwidthResistanceRanges from 600 to 10 32 ML - accuracy 2%R+10D - 10 m quick continuity testCapacitanceRanges from 600 to 10 32 ML - accuracy 2%R+10D - 10 m quick continuity testCapacitanceSingle-phase and balanced three-phase active power values (with or without neutral), simultaneous display of current - PFHARMONIC ANALYSER MODEMulti-channel analysisCachannels, 31 orders, frequency of fundamental from 40 to 450 Hz <td>TRIGGERING</td> <td></td> <td></td>	TRIGGERING		
Coupling   AC or DC (depending on coupling of triggering channell), HF, LF or noise rejections     Sensitivity   ≤1.2 divisions p-p up to 20 MHz   ≤1.2 divisions p-p up to 40 MHz     DIGTAL MEMORY      Maximum sampling rate   2 GS/s in ETS mode – 50 MS/s in one-shot mode on each channel     Vertical resolution   9 bits     Memory depth   2 DS/s in ETS mode – 50 MS/s in one-shot mode on each channel     User memory   2 MB for file storage: trace (trc), text (txt), configuration (cfg), image files (bmp)     GLITCH mode   Duration >20 ns - 1, 250 Min/Max pairs     Display modes   Envelope, Averaging (Factors 2 to 64) and XV (vector)     OTHER FUNCTIONS   Channel inversion, addition, subtraction, multiplication and division (adjustable scaling)     Cursor measurements   2 cursors X, T dV, dt simultaneously -4 digit display resolution     Automatic measurements   2 channels, 8,000-count display + min/max bargraph - Graphical recording of 2,700 measurements (5 min to 1 month)     Operating modes   2 channels, 8,000-count display + min/max bargraph - Graphical recording of 2,700 measurements (5 min to 1 month)     Operating modes   2 channels, 30 Ord to 20 M2 - accuracy 29 K+100 - 10 ms quick continuity test     Range from 60 m V to 600 VRLMS, 600 m V to 800 VRL Accuracy 1% Reading +200 - 50 KHz bandwidth	Mode	Automatic, triggered, one-shot & Triggered Roll	
Sensitivity   ≤1.2 divisions p-p up to 20 MHz   ≤1.2 divisions p-p up to 40 MHz     DIGITAL MEMORY   A 2 GS/s in ETS mode – 50 MS/s in one-shot mode on each channel     Wartinut sampling rate   2 GS/s in ETS mode – 50 MS/s in one-shot mode on each channel     Vertical resolution   9 bits     Memory depth   2 MB for file storage: trace (tric), text (txt), configuration (cfg), image files (bmp)     GLITCH mode   Duration ≥20 ns – 1,250 Min/Max pairs     Display modes   Envelope, Averaging (Factors 2 to 64) and XY (vector)     OTHER FUNCTIONS   Channel inversion, addition, subtraction, multiplication and division (adjustable scaling)     Automatic measurements   2 carsors: V, T, dV, dt simultaneously – 4-digit display resolution     Automatic measurements   18 time-based of level measurements and Phase measurement     MULTINETER MODE   General specifications     Operating modes   2 channels, 8,000-count display + min/max bargraph – Graphical recording of 2,700 measurements (5 min to 1 month)     Operating modes   Absolute or relative display (basolute, deviation, rel, rel%) – Monitoring (instantaneous, Min, Max, Avg)     Ac, OC and AC+DC voltages   Ranges From 600 mV to 600 VRMS, 800 mV to 800 VDC - VOC Accuracy 1% Reading + 200 - 50 kHz bandwidth     Resistance   Ranges from 5 n f to 5 mF - basic accuracy 2% K+100<	Туре		
DIGITAL MEMORY   Advisor     Maximum sampling rate   2 GS/s in ETS mode – 50 MS/s in one-shot mode on each channel     Vertical resolution   9 bits     Memory depth   2,500 points per channel     User memory   2 MB for file storage: trace (tro), text (ktN, configuration (cfg), image files (bmp)     OUTER FUNCTIONS   Duration 220 ns – 1,250 Min/Max pairs     Display modes   Envelope, Averaging (Factors 2 to 64) and XY (vector)     OTHER FUNCTIONS   Channel inversion, addition, subtraction, multiplication and division (adjustable scaling)     Cursor measurements   2 cursors: V, T, dV, dt simultaneously – 4-digit display resolution     Automatic measurements   18 time-based or level measurements and Phase measurement     MULTIMETER MODE   General specifications     General specifications   2 channels, 8,000-count display + min/max bargraph – Graphical recording of 2,700 measurements (5 min to 1 month)     Operating modes   Absolute or relative display (basolute, deviation, rel. rel%) – Monitoring (instantaneous, Min, Max, Avg)     AC, DC and AC+DC voltages   Ranges From 600 mV to 600 VRMS, 800 mV to 800 VDC -VDC Accuracy 1% Reading + 200 – 50 kHz bandwidth     Resistance   Ranges from 80 to 3 2 ML - accuracy 2%R+100 – 10 ms quick continuity test     Capacitance   Range from 80 to 3 2 M	Coupling	AC or DC (depending on coupling of triggering channel)), HF, LF or noise rejections	
Maximum sampling rate2 GS/s in ETS mode - 50 MS/s in one-shot mode on each channelVertical resolution9 bitsMemory depth2,500 points per channelUser memory2 MB for file storage: trace (trc), text (txt), configuration (cfg), image files (bmp)GLTCH modeDuration 22 0n s - 1,250 Min/Max pairsDisplay modesGENEMONE (txt), txt, (txt), configuration (cfg), image files (bmp)OTHER FUNCTIONSMATH functionsMATH functionsChannel inversion, addition, subtraction, multiplication and division (adjustable scaling)Cursor measurements2 cursors: V, T, V, V di simultaneously - 4-digit display resolutionAutomatic measurements18 time-based or level measurements and Phase measurementMULTIMETER MODEConsort display + min/max bargrap - Graphical recording of 2,700 measurements (5 min to 1 month)Operating modesAbsolute or relative display (absolute, deviation, rel, rel/%) - Monitoring (instantaneous, Min, Max, Avg)AC, DC and AC+DC voltagesRanges From 600 mV to 600 VRMS, 800 mV to 800 VDC - VDC Accuracy 1% Reading + 20D - 50 KHz bandwidthResistanceRange from 80 to 32 MD - accuracy 2%R+10D -10 ms quick continuity testCapacitanceRanges from 50 to to 32 MD - accuracy 2%R+10D -10 ms quick continuity testPOWERMeasurementsMulti-chanel analysis2 channels, 31 orders, frequency of fundamental from 40 to 450 HzSingle-phase and balanced three-phase active power values (with or without neutral), simultaneous display of current - PFHARMONIC ANALYSER MODEMeasurementsGENERAL SPECIFICATIONSUp to 100 files in standard «.bmps format, viewab	Sensitivity	≤1.2 divisions p-p up to 20 MHz	≤1,2 divisions p-p up to 40 MHz
Vertical resolution   9 bits     Memory depth   2.500 points per channel     User memory   2 MB for file storage: trace (trc), text (txt), configuration (cfg), image files (bmp)     GLITCH mode   Duration 220 ns - 1,250 Min/Max pairs     Display modes   Envelope, Averaging (Factors 2 to 64) and XY (vector)     OTHER FUNCTIONS   MATH functions     MATH functions   Channel inversion, addition, subtraction, multiplication and division (adjustable scaling)     Cursor measurements   2 cursors: V, T, dV, dt simultaneously - 4-digit display resolution     Automatic measurements   18 time-based or level measurements and Phase measurement     MULTINETER MODE   General specificationss     Q channels, 8,000-count display + min/max bargraph – Graphical recording of 2,700 measurements (5 min to 1 month)     Operating modes   Absolute or relative display (absolute, deviation, rel, rel%) – Monitoring (instantaneous, Min, Max, Avg)     AC, DC and AC+DC voltages   Ranges From 600 W1 to 600 VDC – VDC Accuracy 1% Reading + 200 – 50 kHz bandwidth     Resistance   Range from 5 n F to 5 m F - basic accuracy 2%R+10D - 10 ms quick continuity test     Capacitance   Range from 5 n F to 5 m F - basic accuracy 2%R+10D     Meter measurements   Single-phase and balanced three-phase active power values (with or without neutral	DIGITAL MEMORY		
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GLITCH mode   Duration ≥20 ns - 1,250 Min/Max pairs     Display modes   Envelope, Averaging (Factors 2 to 64) and XY (vector)     OTHER FUNCTIONS   Channel inversion, addition, subtraction, multiplication and division (adjustable scaling)     Cursor measurements   Channel inversion, addition, subtraction, multiplication and division (adjustable scaling)     Cursor measurements   18 time-based or level measurements and Phase measurement     MULTIMETER MODE   General specificationss     General specificationss   2 channels, 8,000-count display + min/max bargraph - Graphical recording of 2,700 measurements (5 min to 1 month)     Operating modes   Absolute or relative display (absolute, deviation, rel, rel%) - Monitoring (instantaneous, Min, Max, Avg)     AC, DC and AC+DC voltages   Ranges From 600 mV to 600 VRMS, 800 mV to 800 VDC-VDC Accuracy 1% Reading +200 - 50 kHz bandwidth     Resistance   Ranges from 80 Ω to 32 MΩ - accuracy 2%R+10D -10 ms quick continuity test     Capacitance   Ranges from 5 n f to 5 mF - basic accuracy 2%R+10D     Other measurements   Single-phase and balanced three-phase active power values (with or without neutral), simultaneous display of current – PF     HARMONIC ANALYSER MODE   Multi-channel analysis   2 channels, 31 orders, frequency of fundamental from 40 to 450 Hz     Simultaneous measurements   Single-phase and balanced three-p	Memory depth	2,500 points per channel	
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Mechanical specifications 214 x 110 x 57 mm – 1.2 kg with batteries – moulded elastomer casing			
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Warranty 3 years		-	-
	Warranty	Зу	ears

### **STANDARD STATE AT DELIVERY**

**CA 922**: Instrument reference **P01192200** + 2 BNC-Banana adapters + 2 sets of R/B moulded straight-elbowed PVC 1.5 m + 2 sets of R/B crocodile clips + 2 sets of CAT IV 1000V R/B test probes + Jack-USB cable + USB WALLPLUG + USB optical cable + Bag + Paper Quick Start Guide + Safety datasheet + test report + NiMH battery datasheet

#### **CA 942 :** Instrument reference **P01194200** + 1 BNC-Banana adapter + 1 set of R/B

moulded straight-elbowed PVC 1.5 m + 1 set of R/B crocodile clips + 1 set of CAT IV 1000V R/B test probes + Jack-USB cable + USB WALLPLUG + USB optical cable + Bag + Paper Quick Start Guide + Safety datasheet + test report + NiMH battery datasheet

#### Accessories

- A PWM kit = one MLI01 filter + one E27N clamp under the reference **P01102188**
- The **HX0099** calibration software is linked to this project
- Communication kit with jack/USB cable and charger USB **P01103080**



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