Class A Power Quality Analyser
MI 2893 Power Master XT

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The MI 2893 Power Master XT is a hand-held three phase power quality analyzer with a large easy-to-read graphical color display enabling the user to detect harmonics, phasors, waveforms and transients with sampling frequency 1 MSamples/sec in the installation simply by connecting the device. The instrument is designed for a long term recording as well as for troubleshooting power quality problems in three-phase and single-phase power distribution systems. The handy Quick Set buttons makes the instrument more user friendly and are allowing faster data overview for troubleshooting. Advanced PC SW package PowerView3 enables detailed analysis of recorded data, direct and remote reading from the micro SD memory card, analysis of long term records and automatic creation of professional test report.

MEASURING FUNCTIONS

- Voltage: TRMS, peak, crest factor (4-channel);
- Current: TRMS, peak, crest factor (4-channel);
- Power (active, reactive, apparent);
- **Power measurements fully compliant with IEEE 1459 (active, non active, fundamental, harmonic, load un-balance) and classic (vector or arithmetic) method;**
- **VFD (variable frequency drive, 5 Hz – 110 Hz), 400 Hz;**
- Unbalance, flicker measurement;
- Harmonic and interharmonic analysis up to **50th harmonics, THD and TDD measurements;**
- **Energy (active, apparent, reactive, generated, consumed);**
- Capturing and recording of power supply events (shutdowns, interruptions, swells, dips);
- Inrush currents monitoring and recording;
- Waveform/inrush displaying, snapshot and recording;
- **Transients with sampling frequency 1 MSamples/sec;**
- Power quality analysis according to EN 50160, IEEE 519;
- Recording up to 7 adjustable alarms;
- Temperature measurement;
- Power factor, tg fi.

KEY FEATURES

- 4-voltage channels with wide measurement range;
- 4-current channels with support for automatic clamp recognition and “on instrument“ range selection;
- Automatic Smart Clamp detection and Smart Clamp range selection;
- Current clamp auto range selection;
- **Sampling frequency on transients recording > 1 MSamples/sec;**
- **Compliance with power quality standard IEC 61000-4-30 Class A;**
- Complete power quality analysis according to EN 50160 including signalling and interharmonics;
- Support for microSD memory card (8-GB supplied with the instrument) up to 32GB;
- Color-coded input terminals and terminal labels to suit your application region;
- Intuitive main menu and large icons that makes the equipment very easy to navigate and configure;
- Powerful PC SW PowerView3 enables downloading, view, analysis of recorded data and professional report creation;
- Flexible clamps (without additional power supply) are included in the Euro set;
- Remote communication via Ethernet (GPS clock synchronization - optional).

APPLICATION

- **High speed transient capturing;**
- Energy consumption optimization;
- Power quality assessment and troubleshooting in low and middle voltage electrical systems;
- Checking power correction equipment performance;
- Long-term analysis;
- Predictive maintenance;
- Verification of electrical system capacity before adding loads.

STANDARDS

Safety
- EN 61010-1

Measurements:
- IEC/EN 61000-4-30,Class A;
- IEC/EN 61557-12;
- IEC/EN 61000-4-7, Class I;
- IEC/EN 61000-4-15;
- EN 50160;
- IEEE 1448;
- IEEE 1459;
- IEEE 519

Electromagnetic compatibility (EMC):
- EN 61326

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TECHNICAL SPECIFICATION

FUNCTION		
Voltage inputs	**AC+DC**	
Number of inputs	5	
Nominal voltage range		
Three phase connection	Phase (L-N): 50 ... 1000 V RMS Line (L-L): 87 ... 1730 V	
Single phase connection	Phase (L-N): 50 ... 500 V RMS	
Measuring range	10 % ... 150 % of nominal voltage	
Three phase connection	10 % ... 110 % of nominal voltage	
Single phase connection	±6 kV	
Max. transient peak voltage	IEC 61000-4-30 Class A, ±0.1% of nominal voltage,	
Accuracy	7 kSamples per second @ 50/60 Hz, synchronization with main frequency	
Sampling rate	1.7 kSamples per second @ VFD (5 Hz - 110 Hz) 12.2 kSamples per second @ 400 Hz 42,5 ... 69,0 Hz ±10 mHz	
Mains frequency range	5 ... 110 Hz ± 10 mHz (VFD) 335,0 ... 465,0 Hz ± 100 mHz	
Current inputs	**AC+DC**	
Number of inputs	4	
Measuring range (with A 1227/A 1502 flex clamps)	3 ... 6000 ARMS ±1.5% of m.v.	
Measuring range (with A1281 iron clamps)	50 m ... 1200 ARMS ±0.5% of m.v.	
Functions	**Measuring range**	**Accuracy**
Power (P, Q, S, cos ϕ, PF...)	Depends on voltage and selected clamps	IEC 61557-12 Class 1
Energy	Depends on voltage and selected clamps	Active: IEC 62053-21 Class 1 Reactive: IEC 62053-23 Class 2
Harmonics (DC ... 50th) @50/60 Hz Harmonics (DC ... 13th) @400 Hz Harmonics (DC ... 20th) @VFD (5 - 16 Hz) Harmonics (DC ... 13th) @VFD (16 - 33 Hz) Harmonics (DC ... 5th) @VFD (33 - 110 Hz)	0 ... 20% of nom. voltage	IEC 61000-4-7 Class 1
Interharmonics (1 ... 50th) @ 50/60 Hz Interharmonics (1 ... 20th) @VFD (5 - 16 Hz) Interharmonics (1 ... 13th) @VFD (16 - 33 Hz) Interharmonics (1 ... 5th) @VFD (33 - 110 Hz)	0 ... 20% of nom. voltage	IEC 61000-4-7 Class 1
Flicker	0.2 ... 10	IEC 61000-4-15 Class F3
Mains signalling	0 ... 15% of nom. voltage	IEC 61000-4-30 Class A
Unbalance	Voltage: 0 ... 5% Current: 0 ... 20%	
Temperature	-10 ... 85 °C	±0.5 °C
Dips, Swell	10 ... 150% of nom. voltage	±0.2 % of nominal voltage ±1 cycle
Interrupts	0 ... 10% of nom. voltage	±1 cycle
Recorders		
Memory	8GB microSD, up to 32GB supported	
General recorder		
Integration period	1s ... 2h	
Recorded signals	> 1000 (voltages, currents, harmonics, power...) Minimal, maximal, average and average ON value per interval, including - Voltage events (dip, swell, interupt) - Custom alarms (up to 7 programmable alarms) - Signalling (up to two selectable frequecies) - Transients - Inrush - RVC - 200 ms U/I/f	
Duration	> 1 year (depends on size of SD card at 10 min registration period)	
Waveform recorder		
Duration	Up to 60 seconds duration and 30 seconds pretrigger of voltage and current waveform Up to 1500 records	
Trigger	Manual, Voltage Events, Custom Alarms, Voltage or current level (inrush), Time interval	
Transient recorder		
Sampling rate	1 MSamples/sec; simultaneously on all 8 channels	
Duration	One cycle of voltage and current waveforms	
Trigger	Transient selection measurement between L-N/L-GND Envelope and level trigger simultaneously Transient recorder runs simultaneously with general and waveform recorder Set & go transient setup; predefined setup (low and high level) for current and voltage trigger	
General		
Display	4.3 inch color TFT (480 x 272)	
Communication	USB, Ethernet	
Time synchronisation	GPS receiver (A 1355)	
Power supply	With power supply adapter or 6 x NiMh rechargable batteries, size AA	
Overvoltage category	CAT IV / 600 V For three phase connection CAT III / 1000 V	
Weight	1,1 kg	
Dimensions	230 x 140 x 80 mm	

OPTIONAL ACCESSORIES – AC FLEX CURRENT CLAMPS

Part No.	A 1501 / A 1502	A 1503	A 1227 / A 1445	A 1446
				
Nominal range	30/300/3000A	60/600/6000A	30/300/3000A	60/600/6000A
Measurement range	3 ... 6000 A	6 ... 12000 A	3 ... 6000 A	6 ... 12000 A
Accuracy	±1%	±1%	±1%	±1%
Ø	7/14 cm	27 cm	14/19 cm	27 cm
Sensor length	25/48 cm	90 cm	48/68 cm	90 cm
Overvoltage category	CAT IV / 600V	CAT IV / 600V	CAT IV / 600V	CAT IV / 600V
IP	IP 64	IP 64	IP 64	IP 64

OPTIONAL ACCESSORIES – AC IRON CURRENT CLAMPS

Part No.	A 1588	A 1069	A 1281	A 1033
				
Nominal range	0.5/5/50A	10/100A	0.5/5/100/1000A	100/1000A
Measurement range	0.05 ... 100 A	0.5 ... 200 A	0.05 ... 1200 A	5 ... 1200 A
Accuracy	±0.5%	±1%	±0.5%	±2%
Jaw opening	4 cm	1.3 cm	5.2 cm	5.2 cm
Max. conductor	< 50 mm	< 50 mm	< 50 mm	< 15 mm
Overvoltage category	CAT II / 600V	CAT III / 600V	CAT III / 600V	CAT III/600V
IP	IP 40	IP 20	IP 20	IP 20

OPTIONAL ACCESSORIES – AC/DC CURRENT CLAMPS

Part No.	A 1391 PQA	A 1717	A 1636
			
Nominal range	40/300 A	100/1000A	DC: 2000A AC: 1000A
Measurement range	2 ... 300 A	3 ... 1000 A	DC: 40 ... 2000 A AC: 20 ... 1000 A
Accuracy	±3%	±1%±1A	
Jaw opening	2.5 cm	5.1 cm	7.3 cm
Max. conductor	< 22 mm	< 52 mm	< 68 mm
Overvoltage category	CAT IV/600V	CAT III / 600V	CAT II / 600V
IP	IP 40	IP 40	IP 40

OPTIONAL ACCESSORIES – I/U TRANSDUCER

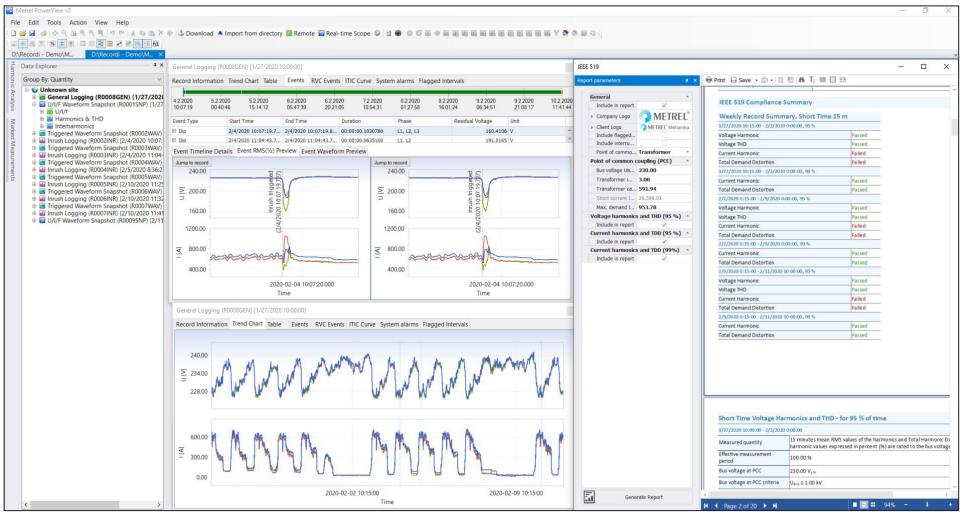
Part No.	A 1037
	
Nominal range	0.5/5 A
Measurement range	0.01 ... 10 A
Accuracy	±0.3%
Overvoltage category	CAT III/600V
IP	IP 40

OPTIONAL ACCESSORIES

Photo	Order No.	Description
	A 1479	Wide range power supply
	A 1355	GPS receiver
	A 1622	3G / Wi-Fi Router
	A 1631	EV monitoring cable
	A 1565	Waterproof case for outdoor application and recordings (pylons, switchyards)
	A 1577	Waterproof case with a telescopic handle and smooth-running wheels
	S 2014	Safety fuse adapter, 3 pcs
	S 2015	Safety flat clamp, 4 pcs
	A 1198	Magnetic contact probe
	A 1354	Temperature probe
	A 1648	Current clamp A 1281 extension cable, 5 m
	A 1673	Micro SD card 32GB
	A 1458	SanDisk microSD card reader

PC SOFTWARE POWERVIEW 3

PC Software PowerView 3 software is a powerful platform for downloading, analysing recorded data and creation of power quality test reports. PC Software contains a package of functionalities needed for profound evaluation of power quality phenomena, data comparison and creation of complex test reports. It works in conjunction with Metrel new generation power quality analysers. For the instruments equipped with GPRS functionality PowerView3 enables remote control and data download.



KEY FEATURES

- User friendly interface: wide range of quick buttons, possibility to customize the environment by dragging, docking and resizing the window tabs.
- Structure: downloaded data is organized into Windows Explorer-like tree structure.
- "Drag and drop": downloaded data can be easily organized into multiple sites and sub-site locations.
- Data filtering: data in a structure can be grouped by quantity or by phase.
- Views: depending on selected record type, different views are available (Record Information view, Trend Chart view, Table view, Waveform Scope view, Voltage Quality view, etc.)
- EN 50160 analysis: automatic voltage quality analysis in compliance with custom or predefined EN 50160 Power Quality criteria and quick report printing.
- Chart zoom: chart can be zoomed depending on selected in a table value range.
- Remore control: via GPRS communication remote handling of the instrument and its data can be executed.
- GPS synchronization: simultaneous measurement on the different network points by using 2 or more synchronized instruments.
- On-line monitoring: real-time observing of signals and parameters is possible via PowerView3 while instrument is measuring / recording in the background.
- Export of test results: test results can be filtered and exported to other programs (MS Excel, MS Word,CSV, TXT).
- Reports: automatic generation of test reports from the selected views and data with attached graphs according specific standards/national specification, like: IEEE 519, GOST 32144/33073, Energy report, Energy demand report Codigo de RED
- SW and FW update: PowerView3 checks for new versions of the application and downloads updates from the Internet if necessary.

ORDERING INFORMATION



MI 2893 Advanced set (AD)

- Instrument Power Master XT
- A 1502 1-phase flexible current clamps 3000 / 300 / 30 A, 4 pcs
- Test probe, (brown, black, grey, green, blue), 5 pcs
- Crocodile clip, (brown, black, grey, green, blue), 5 pcs
- Voltage measurement lead, (brown, black, grey,green, blue), 5 pcs
- Labels for colour coding
- Temperature probe
- microSD memory card 8.0GB
- microSD card reader
- PC SW PowerView3
- RS232, USB and Ethernet patch cable
- Power supply adapter
- 1.2 V NiMH rechargeable battery, 6 pcs
- Professional protective waterproof case (A 1685)
- Instruction manual
- Calibration certificate



MI 2893 Euro set (EU)

- A 1227 1-phase flexible current clamps 3000 / 300 / 30 A, 4pcs (instead of A 1502 flexible current clamps)



MI 2893 Standard set (ST)

- Without flexible current clamps

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