

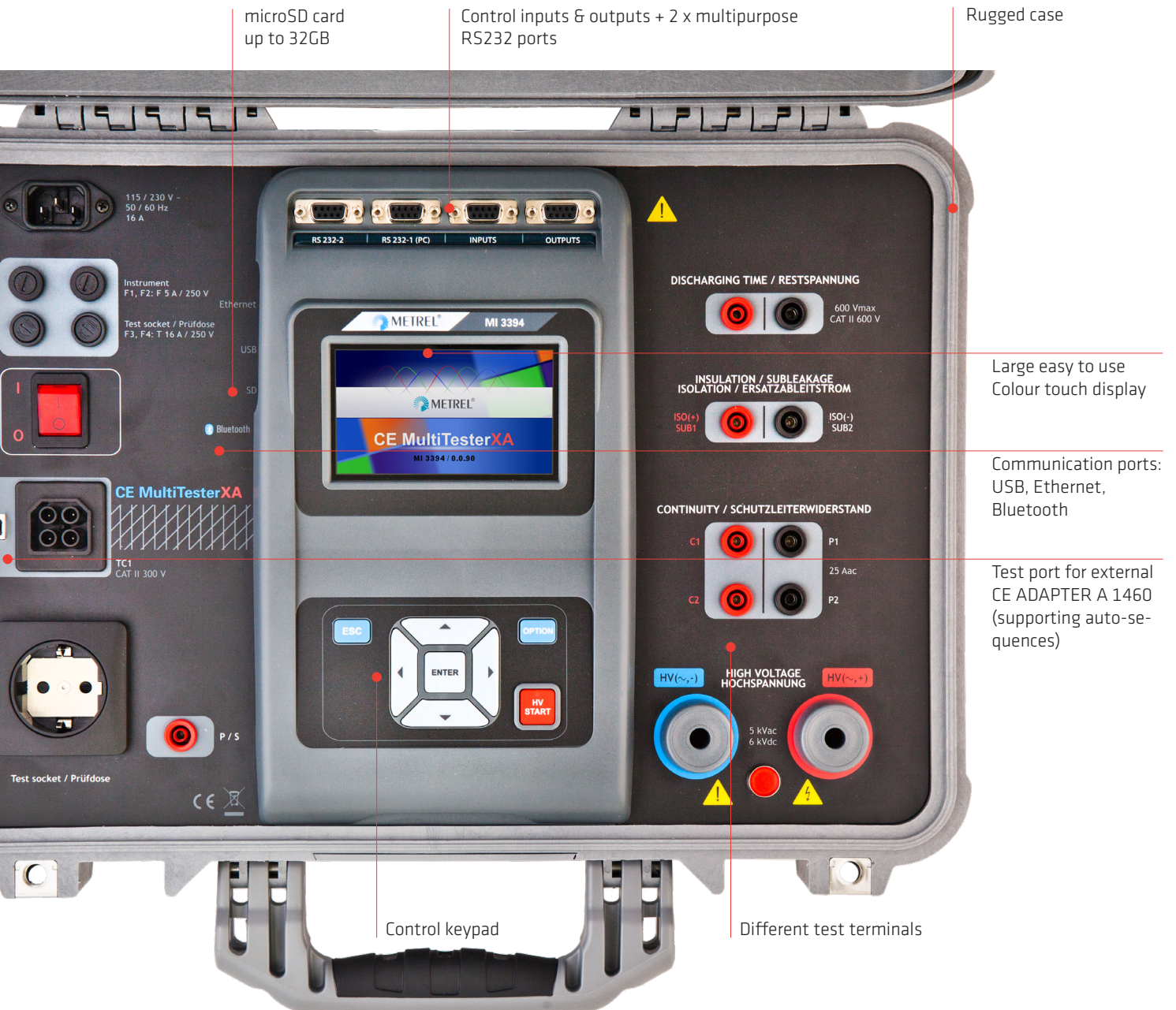


MI 3394 CE MultiTesterXA

Measuring
instruments
and testers

Appliance / Machine / Switchboard safety Instrument Features

The MI 3394 CE MultiTesterXA is a portable instrument intended for electrical safety testing and CE certification of electrical appliances, machines and switchboards during the production. The instrument features in strong data management facility enabling the user to create custom auto-tests with predefined limits for pass/fail evaluation, to import predefined structure including test sequences or complete projects from PC software. The PC software Metrel Electrical Safety Manager enables the upload of automated test sequences, projects, downloading of test results, automatic data storage into a file and printing of test reports. Due to selected test functions, durable construction and accompanying PC SW package CE MultiTesterXA is the perfect instrument for electrical safety testing in the most demanding environments like laboratories, automated production lines or specialized workshops.



Appliance / Machine / Switchboard safety Instrument Description

The new CE MultiTesterXA, in conjunction with the CE Adapter A 1460, provides a thorough and expeditious solution in the execution of auto tests via a single test terminal. By using the PC software, Metrel Electrical Safety Manager, the user can create custom test sequences and upload them to the advanced data management facility on the instrument. There are numerous test sequences consisting of the following test functions: Continuity, Insulation, HV AC/DC programmable (up to 1.5kV), Differential leakage, Ipe leakage, Touch leakage, Power, Leak's & Power and Discharge time. The CE MultiTesterXA provides Hi-Pot (AC 0-5.1kV & DC 0-6kV) tests, state of the art data management facility (MEMORY ORGANIZER) and the ability to create multi level test structures or sequences for fast and reliable execution. The CE MultitesterXA comes complete with a menu driven, 3.4" graphical colour touch screen intuitive display that enables the complete configuration and execution of applied tests.



MEASURING FUNCTIONS

- High Voltage, programmed (AC/DC).
- High Voltage burn-out test with optional A 1560 Burn Link adapter.
- Continuity tests.
- Insulation resistance measurement.
- Substitute / Differential / Touch / PE leakage current.
- Discharge time.
- Functional test (power P/S/Q, voltage, current, cos fi, frequency, ThdU, ThdI, PF).

KEY FEATURES

- Data management: the instrument features in unique user friendly data management facility and state of the art memory organizer.
- Multiple test terminals: different test terminals enabling the user to chose from performing single tests or autosequences from single test socket.
- Support for Test Adapter: A 1460 CE ADAPTER enables execution of auto tests from single test terminal.
- MicroSD: support for microSD memory card (8-GB supplied with the instrument) up to 32GB.
- Colour display: 3.4" colour LCD display with touch screen.
- Hi-pot: high voltage AC (5.1kV at 500VA) and DC (6kV) test.
- Continuity: 4 - wire continuity test with selectable test current (0.2 A, 4 A, 10A, 25A) enabling precise measurements.
- Communication: 4 - RS232, USB, Ethernet and Bluetooth communication ports enabling downloading, uploading and remote control over instrument.
- Multi-system testing: the instrument can be used on TT, TN, IT and 115 V supply systems.

APPLICATION

- Laboratories,
- Automated production lines,
- Specialized workshops.

STANDARDS

Functionality

- IEC/EN 60335
- IEC/EN 60204-1 Ed.5 (VDE 0113-1)
- IEC/EN 61439-1 (VDE 0660-600-1)
- IEC/EN 62368-1 (IEC/EN 60950-1)
- IEC/EN 60598
- IEC/EN 61010
- IEC/EN 61180
- EN 50191 (BGI 891)
- EN 50699
- EN 50678
- VDE 0701-0702
- AS/NZS 3760
- NEN 3140
- IET COP 5th Ed

Safety

- EN 61010-1
- EN 61010-2-030
- EN 61010-031
- EN 61557

ORDERING INFORMATION

Euro set:

- Instrument CE MultiTesterXA
- HV test pistol with 2 m cable, 2 pcs
- Continuity test lead, 2.5 m, 2 pcs
- Continuity test lead, red, 1.5 m, 1pcs
- Insulation test lead, red, 2.5 m
- Insulation test lead, black, 2.5 m
- Crocodile clip, black, 2 pcs
- Crocodile clip, red, 3 pcs
- Discharge time cable
- Mains cable
- Bag for accessories
- Calibration certificate
- RS232 cable
- USB cable
- CD with instruction manual (full version)
- PC SW Metrel ES Manager BASIC*

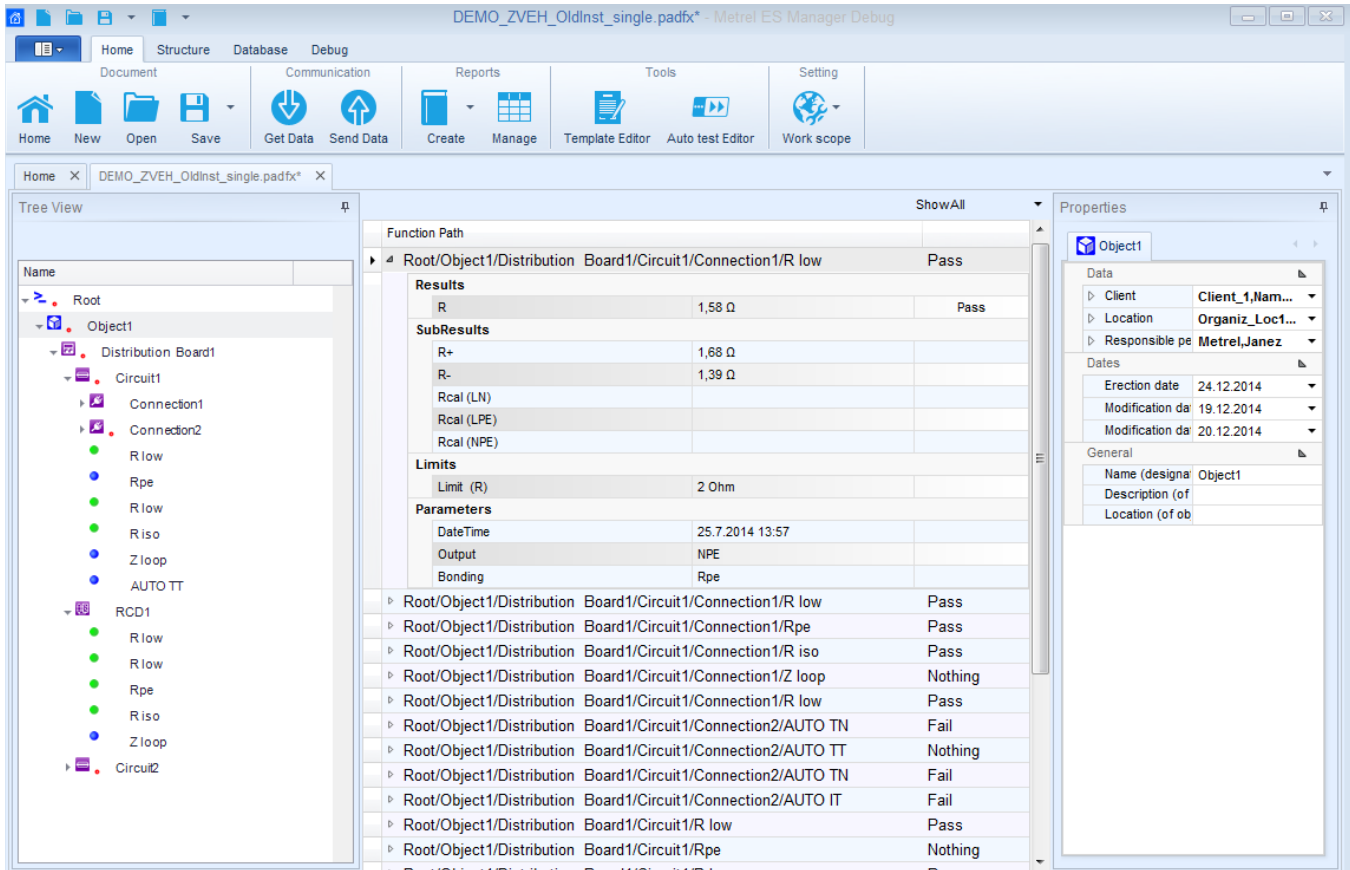
*Metrel ES Manager can be downloaded free of charge from Metrel Web server. license



Appliance / Machine / Switchboard safety Metrel Electrical Safety Manager

The Metrel Electrical Safety Manager is a common application for management of wide palette of Metrel's electrical safety testers, portable appliance testers, machine testers and industrial safety testers. This application has a unified user interface with the new generation of Metrel's instruments - same view same meaning. It enables the pre-treatment for the measurements, viewing and editing of the measurement results and generation of professional reports. Depending on the instrument model or type the user can create AUTOSEQUENCES, custom tests or single tests. They can be integrated into the custom created test structures and then uploaded into the measurement instrument.

The downloaded measurement results can be viewed, analysed, edited and finally a professional report can be created and printed. These professional reports are predefined templates according to national standards and regulatory organisations where the user enters all the needed protocol data while the measurement results are automatically inserted into the predefined forms. This application is fully compatible with the new generation of Metrel's multifunction testers.

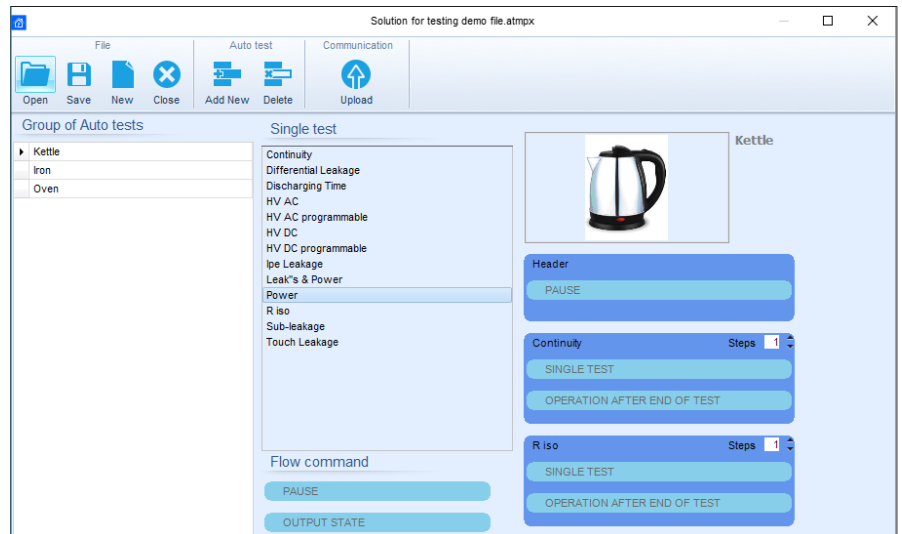
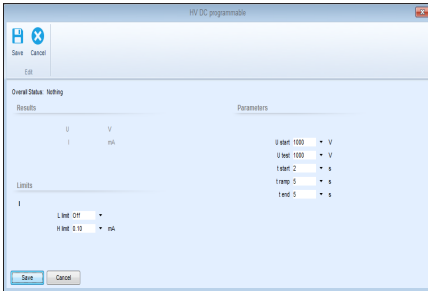


KEY FEATURES

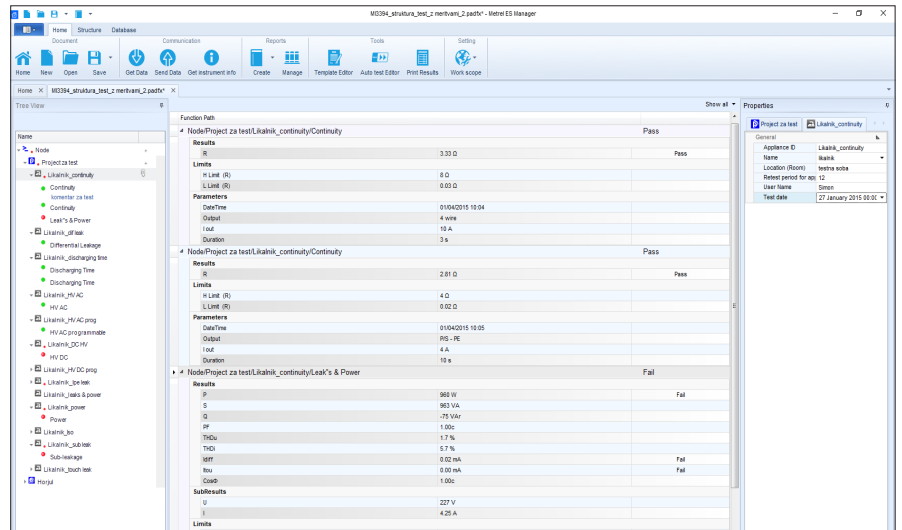
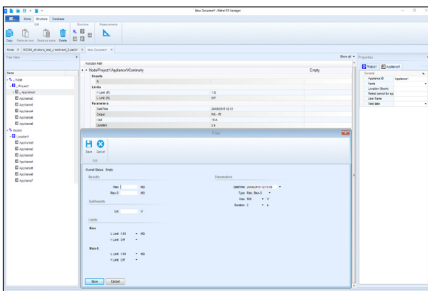
- Common platform for wide range of Metrel's instruments: a Windows based application for most of the future Metrel's instruments.
- Multilevel test structure editor: the structure equipped with custom AutoSequences can be created in advance on the PC and then simply uploaded to your tester.
- Measurement editor: enables definition of tests within the test structure with all parameters and sub parameters. After the structure is uploaded to the instrument, such predefined test can be selected and started without additional settings.
- AUTOSEQUENCE editor: application for easy and efficient preparation of AUTOSEQUENCES or custom tests.
- Report creator: enables automatic generation of professional test reports which include visual inspection of tested object and test results in tabular form.
- Multilingual reports according to local regulations: different languages for the application and reporting are supported
- Export of test results: test results in text (.csv) or .xml format can be exported to other programs.

Appliance / Machine / Switchboard safety Metrel Electrical Safety Manager

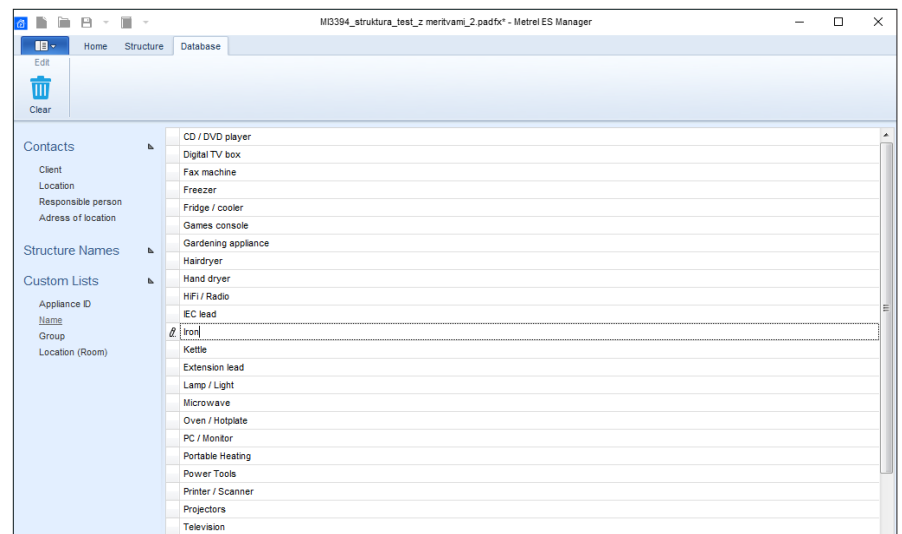
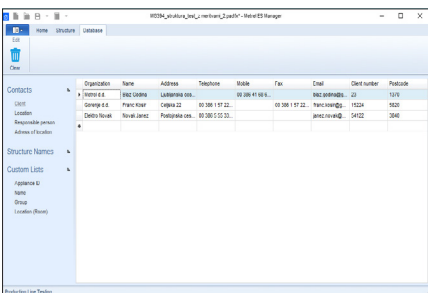
Custom auto sequence, or group of them can be created on the PC SW and then uploaded to the instrument.



User defined structure with measurements and limits can be created on the PC SW and then uploaded to instrument.



User can define several different databases, containing information about Contacts, Structure names and Custom Lists.



Appliance / Machine / Switchboard safety Instruments Sets

Due to the differences in testing standards globally, it has becoming increasingly important for manufacturers to ensure that their products are safe for the consumer and industrial markets. Depending on the application Metrel offers different sets in combination of tester plus accessories.

	MI 3394 EURO SET	MI 3394 LINE SET	MI 3394 ST SET	MI 3394 LAB SET
STANDARD MI 3394 Instrument CE MultiTesterXA	•	•	•	•
A 1460 CE Test adapter		•		
S 2073 HV test lead 5m, without pistols			•	
A 1560 Burn Link adapter				•
A 1105 Barcode scanner		•		
A 1511 Tip Comander		•		
HV test pistol with 2 m cable, 2 pcs	•			•
Continuity test lead, 2.5 m, 2 pcs	•	•	•	•
Continuity test lead, red, 1.5 m, 1pcs	•	•	•	•
Insulation test lead, red, 2.5 m	•	•	•	•
Insulation test lead, black, 2.5 m	•	•	•	•
Crocodile clip, black, 3 pcs	•	•	•	•
Crocodile clip, red, 2 pcs	•	•	•	•
Discharge time cable	•	•	•	•
Mains cable	•	•	•	•
Bag for accessories	•	•	•	•
Calibration certificate	•	•	•	•
RS232 cable	•	•	•	•
USB cable	•	•	•	•
A 1521 USB isolator		•		
CD with instruction manual (full version)	•	•	•	•
Metrel ES Manager BASIC license	•	•	•	•
OPTIONAL A 1496 2-LED signal tower lamp HV	•	•	•	•
A 1497 4-LED signal tower lamp	•	•	•	•
A 1495 Remote pedal	•	•	•	•

THE NEED FOR TESTING

Protecting users from potentially life threatening injuries from electrocution as a result of faulty insulation, or inadequate grounding, is of a paramount importance.

The new CE MultiTesterXA, in conjunction with the A 1460 CE Adapter, provides a thorough and expeditious solution in the execution of auto tests via a single test terminal. This solution is intended for electrical safety testing and CE certification of electrical appliances, machines and switchboards during production.

Metrel has designed and developed three separate models to address various tests and applications as required.

Appliance / Machine / Switchboard safety LINE Set

The **LINE set** is defined to be most ideal for automated testing of equipment on production lines. The MI 3394, in combination with the A 1460, provides the user full hands free operation in executing the tests. Metrel Electrical Safety Manager PC software enables configuration of test procedures (sequences) which are uploaded to the tester and used for automated testing. Test sequences can be started via a remote pedal or tip commander. Predefined test limits are used for the evaluation of PASS/FAIL status, with results being automatically stored on the microSD memory card. Unique ID of the tested equipment can be added via barcode scanner during the test procedure.



* Note: Personal computer is not a part of the set.

KEY FEATURES

- Custom defined automatic test sequences via PC software Metrel Electrical Safety Manager.
- Execution of test sequences via A 1460 CE Adapter.
- Hands free operation.
- PASS/FAIL and warning lamps.
- Programmable inputs and outputs.
- Programmable messages, pauses and several different flow commands.
- Execution of all tests via single test terminal.
- Built-in microSD memory card (8GB supplied with the instrument).
- A 1460 has a built-in robust fuse housing, enabling countless change of protective fuses.
- A 1460 has a built-in parallel test terminals to the test socket (enabling the user to plug in custom made test terminal).
- Test commander has a built in LED torch lamp and PASS/FAIL status LED lamps.
- Execution of test commands via test commander test button.
- Bar-code scanner is enabling identification of barcode labeled appliances.

Appliance / Machine / Switchboard safety STANDARD Set

The **STANDARD set** is defined based on typical requirements of a small production processes. The instrument's intuitive touch screen display enables easy selection of required tests and test limits for fast test execution. Test limits are used for PASS/FAIL evaluation, results of the test can be stored under different memory structure levels. The standars set enables execution of all available single tests. Optionally, the user can also use barcode scanner for entering the equipment's ID.



* Note: Personal computer is not a part of the set.

KEY FEATURES

- Creation of structure with dedicated tests.
- PASS/FAIL evaluation of test results.
- Execution of all single tests.
- Programmable High Voltage (AC + DC) test.
- 4-wire continuity test.

Appliance / Machine / Switchboard safety LAB Set

The **LAB set** is defined to cover requirements that are most often required in test laboratories or RGD department's for type testing. One of the most important test to be carried out is the dielectric withstand test which can be destructive or non-destructive. The MI 3394 supports the execution of both. To execute the destructive withstanding test, the Burn Link Adapter (A 1560) must be used. The lab set includes also a set of professional HV test pistols for carrying out AC + DC HV tests safely. The rest of the available tests can be carried out via different test terminals. All the tested data can be stored on an 8GB micro SD card.



KEY FEATURES

- Execution of all single tests.
- Programmable High Voltage (AC + DC) test.
- HV burn test, with limited breakdown current.
- 4-wire continuity test.
- PASS/FAIL evaluation of test results. Professional high quality HV test pistols.
- Burn link adapter for execution of insulation breakdown test.

Appliance / Machine / Switchboard safety A 1460 CE Adapter Description

A 1460 CE Adapter is intended to support Auto tests of electrical equipment with the Metrel CE Multitester instrument. Operation is completely controlled by the instrument via the TC1 communication connector.

Metrel Electrical Safety Manager Auto test editor enables

List of available flow commands:



Flow Commands
PAUSE
OUTPUT STATE
WAIT INPUT mode
LAMPS Pass/Fail mode
LAMPS HV mode
BUZZER mode
EXTERNAL OK KEY mode
NO NOTIFICATION mode
APPLIANCE INFO
FLOW PROTOCOL

List of available measurements:

Measurement
Continuity
Differential Leakage
Discharging Time
HV AC
HV AC programmable
HV DC
HV DC programmable
Ipe Leakage
Leak's & Power
Power
R iso
Sub-leakage
Touch Leakage

Following tests can be performed via test adapter (note: as an Autotest only).

Measuring function	
Continuity 2W, 4W	0.2 A, 4 A, 10 A, 25 A
Insulation (P)	50 V, 100 V, 250 V, 500 V, 1000 V
HV AC, Programmable HV AC	100 ... 1500 V in 10 V steps (Iout max ...100 mA)
HV DC, Programmable HV DC	100 ... 1500 V in 10 V steps (Iout max ...100 mA)
Discharging time	
Differential Leakage current	
PE leakage current	
Touch leakage current	
Power (P,S,Q,PF,THDU,THDI,Cos fi,U,I)	

Preprogrammed sequences of measurements can be carried out in Auto test menu. The sequence of measurements, their parameters and flow of the sequence testing can be programmed.

The results of an Auto test can be stored in the memory together with all related information.

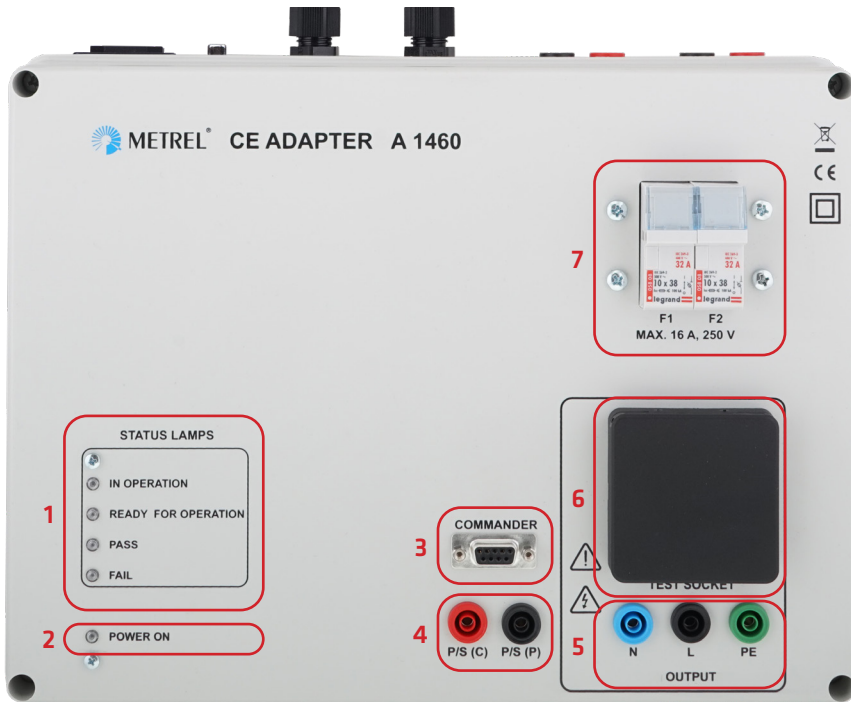
Auto tests can be pre-programmed on PC with the Metrel Electrical Safety Manager software and uploaded to the instrument.

On the instrument parameters and limits of individual single test in the Auto test can be changed / set.

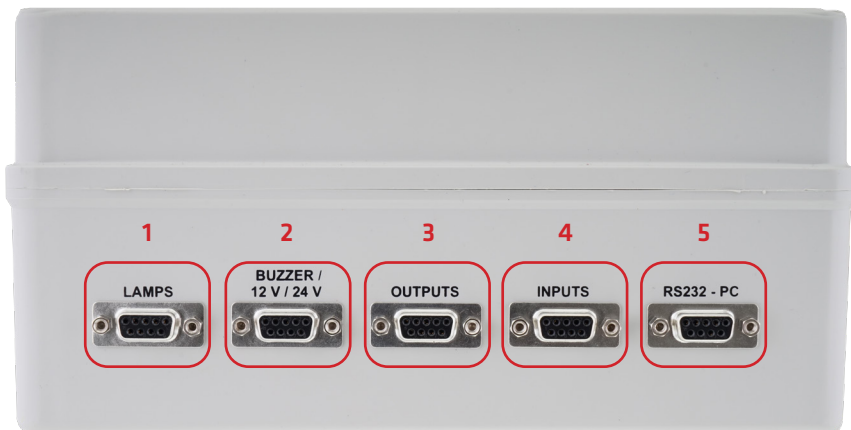
While the Auto test is running it is controlled by pre-programmed flow commands. Examples of actions controlled by flow commands are:

- pauses during the test sequence;
- monitoring of input pins;
- control of lamps, test adapter and other external devices;
- proceeding of test sequence in regard to measured results etc.

Appliance / Machine / Switchboard safety CE Adapter Features



1. External LAMPS status
2. Power ON indication
3. 'COMMANDER' connector
4. P/S (C) (current) output for external probe, P/S (P) (potential) output for external probe
5. L, N, PE test outputs (in parallel with terminals of Test socket)
6. Test socket (in parallel with L, N, PE test outputs)
7. Robust fuse holders in series with L and N test conductors



1. 'LAMPS' connector for connecting (A 1497 or A 1496)
2. 'BUZZER/ VOLTAGE' connector for connecting (A 1497 buzzer mode)
3. 'OUTPUTS' connector (4 - programmable outputs can be used)
4. 'INPUTS' connector (4 - programmable inputs can be used)
5. RS232-PC connector for connection to PC (for service purpose only)

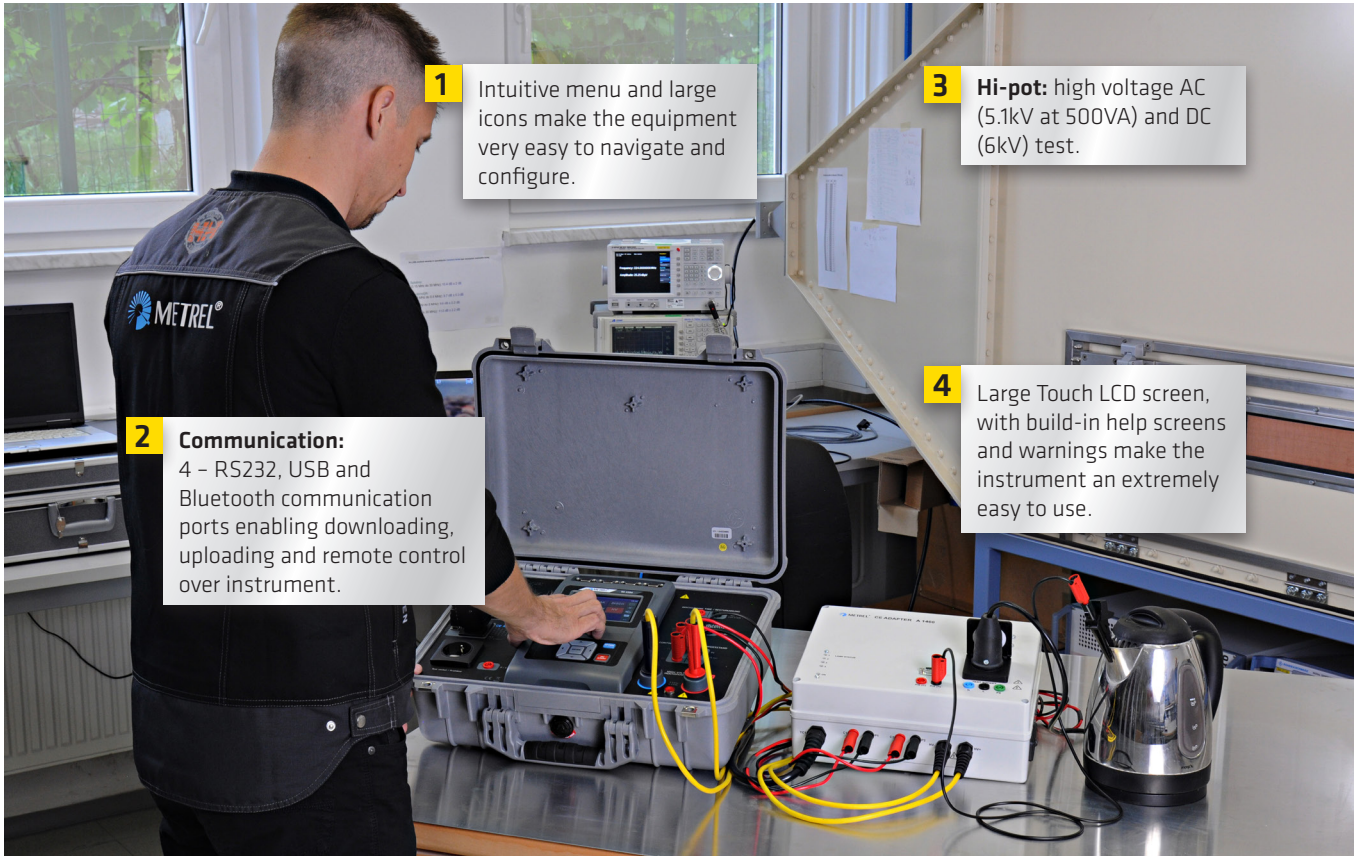


1. Inputs for connection to Continuity 4 wire outputs on the instrument
2. Inputs for connection to HV outputs on the instrument
3. Input for connection to TC1 connector on the instrument
- L,N,PE, P/S outputs of the instrument
- Input / Output command control

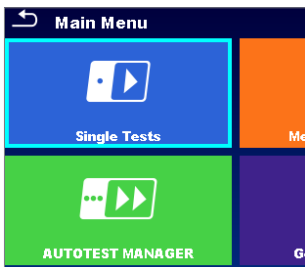
Appliance / Machine / Switchboard safety

CE marking, laboratory type testing and automated line routine testing

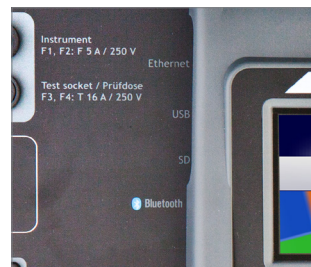
The **CE mark**, is a mandatory conformity marking for certain products sold within the European Economic Area (EEA) since 1985. The CE marking is also found on products sold outside the EEA that are manufactured in, or designed to be sold in, the EEA. This makes the CE marking recognizable worldwide even to people who are not familiar with the European Economic Area. The CE marking is the manufacturer's declaration that the product meets the requirements of the applicable EC directives.



1. Intuitive test menus...



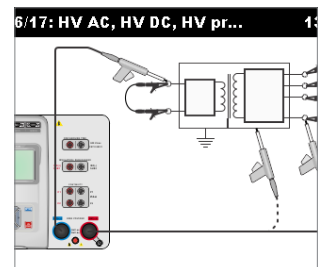
2. Advanced communication facility...



3. HiPot AC/DC...



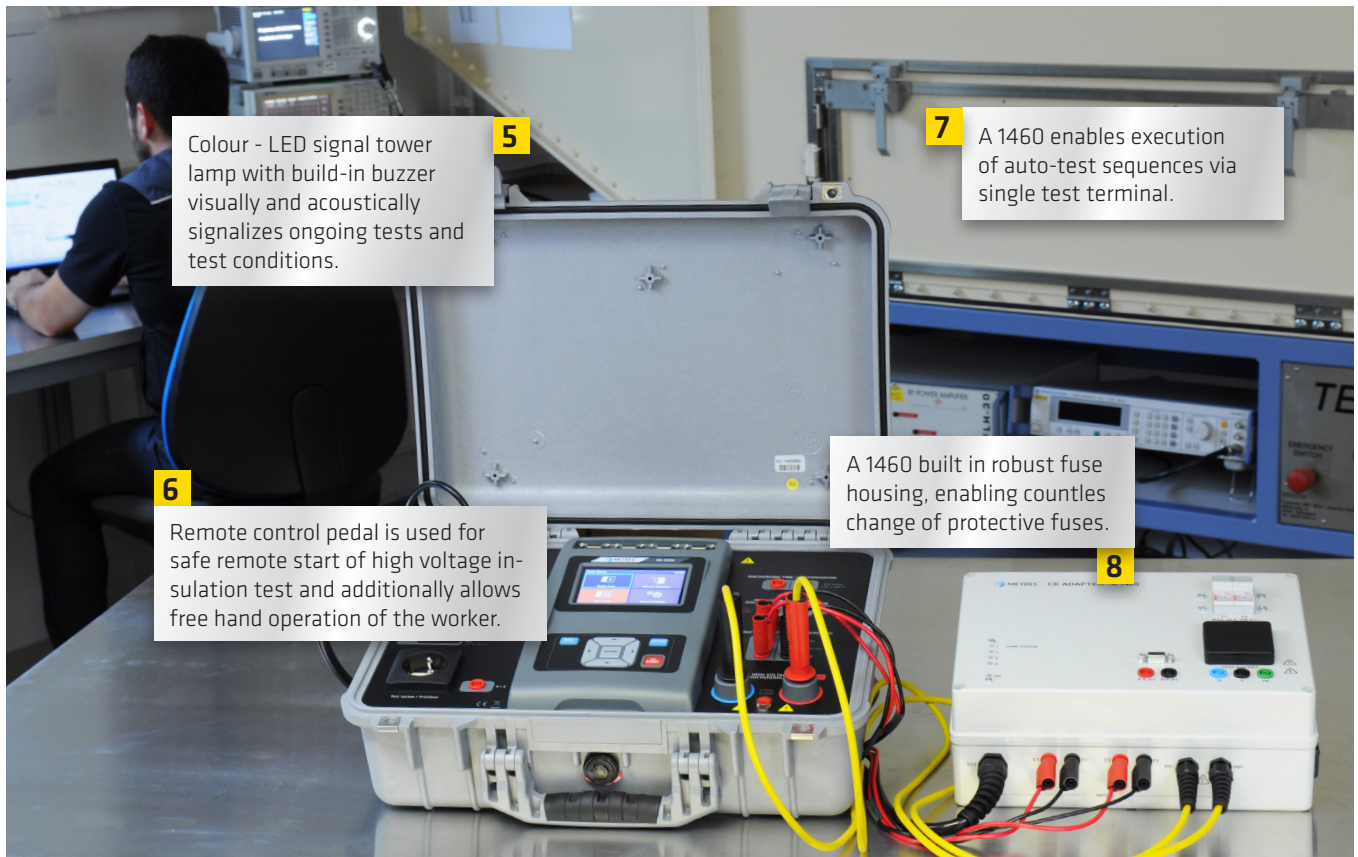
4. Help menus...



Appliance / Machine / Switchboard safety

Multifunctional Portable test System CE MultiTesterXA with CE test adaptor

The new **CE MultiTesterXA**, in conjunction with the CE test adaptor A 1460, provides a thorough and expeditious solution in the execution of auto tests via a single test terminal. This solution is intended for electrical safety testing and CE certification of electrical appliances, machines and switchboards during the production.



5 Colour - LED signal tower lamp with built-in buzzer visually and acoustically signalizes ongoing tests and test conditions.

7 A 1460 enables execution of auto-test sequences via single test terminal.

6 Remote control pedal is used for safe remote start of high voltage insulation test and additionally allows free hand operation of the worker.

A 1460 built in robust fuse housing, enabling countless change of protective fuses.

8

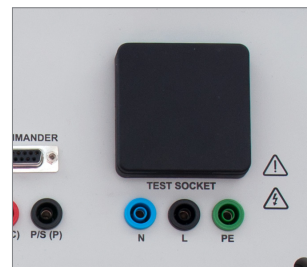
5. Warning light...



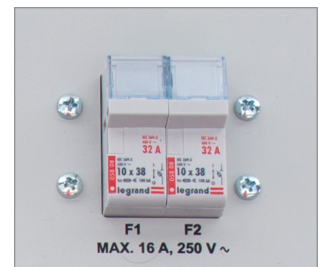
6. Remote test pedal...



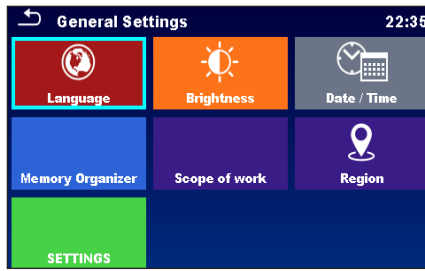
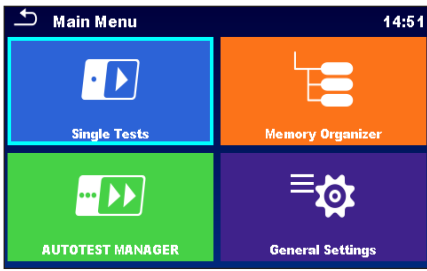
7. One in all test terminal...



8. Safety fuses...

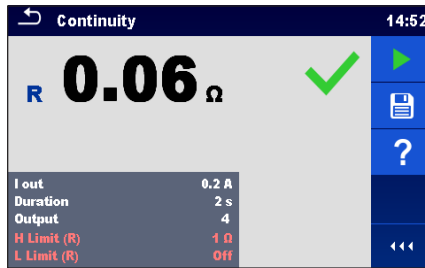
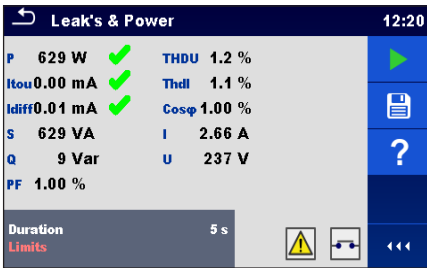


Appliance / Machine / Switchboard safety Instruments Menues



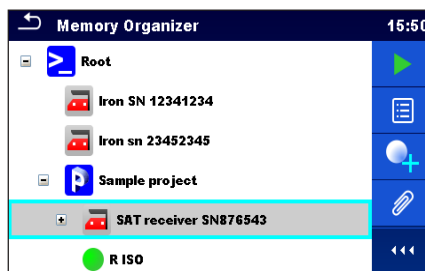
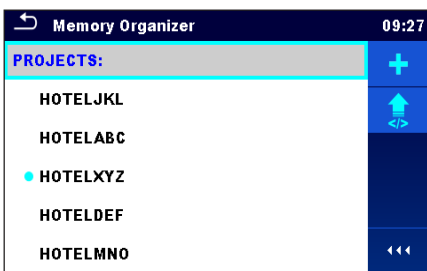
INTUITIVE MENU

Intuitive colour menus, with large icons for simple and quick manipulation and operation with instrument.



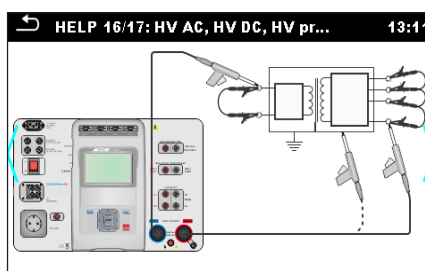
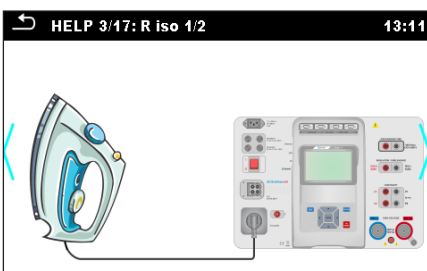
MEASUREMENT MENU

Containing complete information of performed test or test sequence.



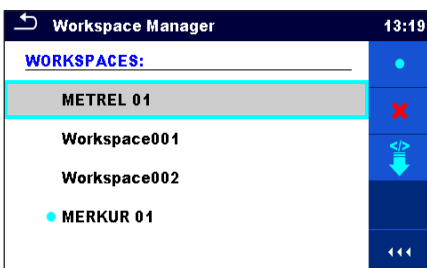
MEMORY ORGANIZER

Is a tool for storing and working with test data, enabling creation of single tests, auto-tests and the tree structure.



HELP SCREENS

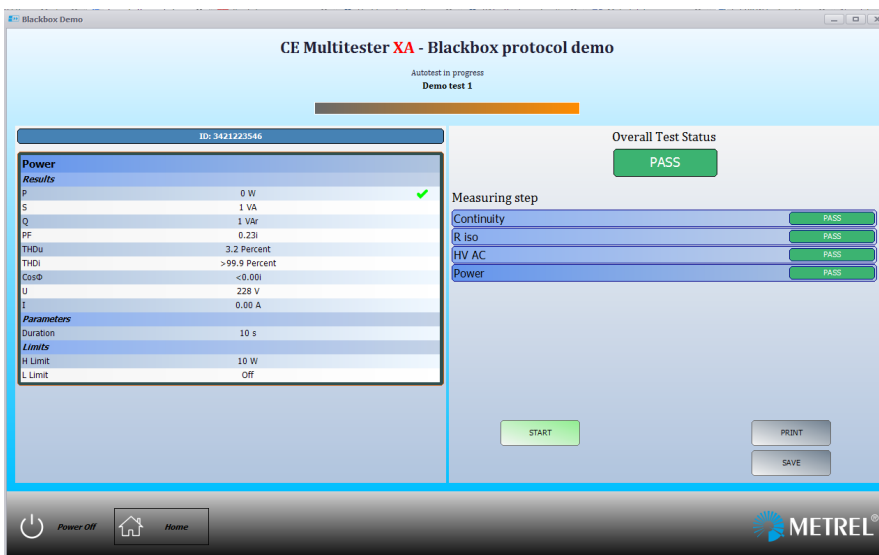
Contain diagrams for proper connection of the instrument and referencing at test site.



WORKSPACE MANAGER

Is intended to manage technology of work with different Workspaces and Exports stored on the microSD card. Each workspace can contain one or more user defined structure with measurement, similar to projects.

Appliance / Machine / Switchboard safety Black-box protocol



BLACK-BOX PROTOCOL

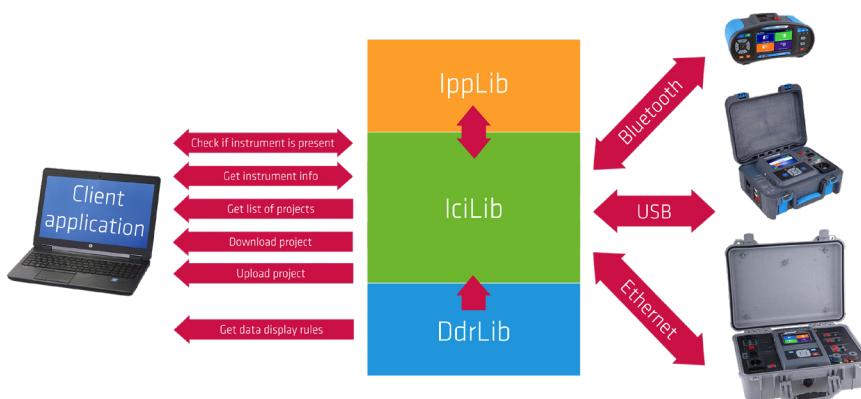
The instrument MI 3394 CE MultiTester XA supports two communication protocols, basic and advanced.

The basic communication protocol called “Black-box protocol” enables two-way communication intended for controlling the instrument as a black-box. It is basically a system of rules that allows a PC as a master to start communication by sending the request command to the instrument, which answers according to the protocol. This enables hands free operation as the control over the tester is delegated to an automatized system. Such solution is suitable for automatized production line testing. For presentation purposes Metrel has developed a PC SW application called Black-Box Demo, which allows remote control over the tester via different communication ports (Ethernet, RS232, USB or Bluetooth).

The Black-Box demo enables the user to start AutoSequence®s from the tester remotely and it enables an automatic print out of the test report after the AutoSequence® is completed. The Black-box protocol is designed also to be used with other PC SW engineering tools such as Visual Basic, C++ and LabView, which, with some effort, can be used to perform remote communications between your computer and test instrument, as well as gather and store data for later analysis. However, if you simply wish to manually enter one command at a time using (Ethernet, RS232, USB or Bluetooth), a communications package, such as HyperTerminal, can be very useful.

API/SDK PROTOCOL

The advanced communication protocol API/SDK is an interface for data communication with the test instrument and can be used to conveniently download and upload of projects and AutoSequences. The protocol itself is a set of subroutine definitions, protocols, and tools for building application software. It is intended for those who want to develop software using .NET platform and needs to interface Metrel instruments.



The Metrel Instrument Communication API/ SDK bundles client libraries for accessing Metrel instruments and provides a unified programming interface using C# language. It includes a set of API calls which enable communication with Metrel instruments and provide a way to manipulate data from instruments using a generic data model and make available a set of rules for extracting and viewing data.

The MICAPI SDK contains three base libraries:

- IppLib – low level communication and protocol library
- IciLib – high level communication and control library
- DdrLib – data display rules library

Appliance / Machine / Switchboard safety Test cage

















Test cage with built in CE test adaptor for execution of AUTO SEQUENCES. Test cage is designed to meet highest safety requirements with built in safety switch, for unavoidable protection against contact according to EN 50191. The safety switch is connected to test cage protective doors and it can prevent contact with the DUT during the generation of dangerous voltages. Once the safety switch is interrupted, there is a forced shutdown of the dangerous voltage or any test sequence. Due to its simple and convenient handling, test cage with built in CE test adapter and safety switch is particularly suitable for the testing of large numbers of DUT on the production lines.

















Key features:

- All in one test cage, enabling safe and fast automated testing;
- Easily exchangeable portable test instrument;
- Automatic custom programmed AutoSequences;
- Black-box or SDK communication protocol;
- Communication protocols enabling remote control over the instrument and automatic printout of test reports;
- Hands free operation;
- 8 configurable output plus 4 configurable input control signals;
- Remote control via PC (Ethernet, WiFi, USB, RS232, Bluetooth);
- Professional test commanderAll test from single test socket.

Appliance / Machine / Switchboard safety Accessories

Photo	Part No.	Description	Target application
	A 1460 XA	CE Adapter	Provides a thorough and expeditious solution in the execution of auto tests via a single test terminal, A 1511 2M5 included in set.
	A 1495	Remote control pedal	Remote control pedal is used for safe remote start of high voltage insulation test and additionally allows free hand operation of the worker.
	A 1584	Rack mount adapter for MI 3394 CE MultiTesterXA	A 1584 is a rack mount adapter for 19" rack, which is designed to hold the MI 3394 CE MultiTesterXA. This product kit includes the parts needed for complete and easy installation of the adaptor kit in RITAL square hole racks, and some third-party racks.
	A 1586	Rack mount adapter for A 1460 CE Adapter	A 1586 is a rack mount adapter for 19" rack, which is designed to hold the A 1460 CE Adapter. This product kit includes the parts needed for complete and easy installation of the adaptor kit in RITAL square hole racks, and some third-party racks.
	A 1511 2M5 A 1511 5M A 1511 10M	Tip Commander 2,5 m Tip Commander 5 m Tip Commander 10 m	Tip commander serves as a remote control for execution of passive tests, has a built in LED torch lamp and PASS/FAIL status LED's.
	A 1105	Barcode scanner	Barcode scanner can be used for identification of barcode labeled appliances.
	A 1105 2D	Barcode scanner 2D RS232 connection	2D Barcode scanner for identification of barcode labelled appliances.
	A 1652	Barcode scanner (Bluetooth)	Barcode scanner for identification of barcode labelled appliances.
	A 1653	QR / Barcode scanner (Bluetooth)	QR / Barcode scanner for identification of barcode labelled appliances.
	S 2062	BT label printer set, (mains operated)	Printer supports printing of simple labels including PASS or FAIL status of result, Appliance name, ID number, User information and test date.
	A 1450	Spare label roll for S 2062	Spare label roll for s 2062, (2500 labels per roll)
	A 1560	Burn Link adapter	For performing insulation breakdown test with limited breakdown current "30mA".
	A 1497	Warning lamp / 4 LED's signal tower with buzzer	Colour - LED signal tower with build-in buzzer visually and acoustically signalizes ongoing tests and test conditions.
	A 1496	Warning lamp / 2-LED signal tower HV	Warning lamps visually signalize ongoing HV insulation test and warn the user about dangerous voltage conditions.
	A 1571	NFC reader / writer	NFC reader / writer allows to read and upload test results and information about tested electrical equipment to the NFC tags (NTAG 216).
	A 1572	NFC tags, fi 34mm self-stick 50 pcs	NFC tags have sufficient memory space to store test results, test code and tested appliance information
	A 1573	NFC labels, fi 29 mm self-stick 50 pcs	NFC labels have sufficient memory space to store test results, test code and tested appliance information

Appliance / Machine / Switchboard safety Accessories

Photo	Part No.	Description	Target application
	A 1574	NFC cable-tie, L 130 mm 50 pcs	NFC cable-ties have sufficient memory space to store test results, test code and tested appliance information
	A 1499	External power supply 24V	If the LED tower lamp is used in combination with CE MultitesterXA the external power supply should be used.
	A 1060	Power splitter for discharge time measurement	T-type power splitter for measurements of discharge time on machinery and switchgear.
	A 1079	Discharge time cable	Adapter for measuring discharge time on internal electronic components.
	A 1458	MicroSD card reader	Move data between your computer and memory card with memory card reader.
	A 1017	Communication cable RS232	RS232 interface cable for connecting the instrument with the PC.
	A 1475	Wi-Fi Router	Wi-Fi Router enables remote control of the measuring instrument via Black-Box protocol.
	A 1521	USB isolator	It is intended as galvanic insulation of USB interface between our products and PC to prevent damage of USB connected equipment in case of accidentally applied voltage difference between two types of equipment.
	P 1101	BASIC to PRO licence key upgrade for Metrel ES Manager	Licence key for upgrading the Metrel ES Manager to advanced version with professional report creation functionality.
	SW 1304	aMESM android SW	The aMESM is an advanced portable appliance safety Testing tool for Android devices.
	S 2073	HV test lead 5m, without pistols	High voltage extension test leads for measurements on larger electrical equipment.
	S 1058	Continuity test lead, 2 x 10 m, 2 pcs	Extension test leads for continuity measurements.
	S 1072	Continuity test lead with crocodile clip, 2 x 2.5 m, 2 pcs	Extension test leads with protection shield and with crocodile clips for continuity testing with high test currents (10 A, 25 A).
	S 2012	Continuity test lead, 10 m, 2 pcs (red, black)	Extension test lead for continuity measurements.

Appliance / Machine / Switchboard safety

Technical Data

FUNCTION	Measuring range	Resolution	Accuracy
HVAC, Programmable HV AC, Output voltage 100 V – 5100 V, 10 V steps			
- Test voltage (AC)	0 ... 1999 V 2.00 ... 5.99 kV	1 V 10 V	±(3 % of reading) ±(3 % of reading)
- Test current apparent	0.0 ... 99.9 mA	0.1 mA	±(3 % of reading + 3 digits)
- Capacitive	0.0 mA ... 99.9 mA	0.1 mA	Indicative
- Resistive	-99.9 mA ... 99.9 mA	0.1 mA	Indicative
- Short circuit current	> 200 mA		
- Output power	500 VAm _{ax}		
HVDC, Programmable HV DC, Output voltage 500 V – 6000 V, 50 V steps			
- Test voltage (DC)	0 ... 1999 V 2.00 ... 6.99 kV	1 V 10 V	±(3 % of reading) ±(3 % of reading)
- Test current	0.01 ... 9.99 mA	0.01 mA	±(5 % of reading + 3 digits)
Discharging time			
- t	0.0 ... 9.9 s	0.1 s	±(5 % of reading + 3 digits)
- Up	0 ... 550 V	1 V	±(5 % of reading + 3 digits)
Continuity (0.2A, 4A, 10A, 25A)			
- R	0.00 Ω ... 19.99 Ω 20.0 Ω ... 99.9 Ω 100.0 Ω ... 199.9 Ω 200 Ω ... 999 Ω	0.01 Ω 0.1 Ω 0.1 Ω 1 Ω	±(2 % of reading + 2 digits) ±(3 % of reading) ±(5 % of reading) Indicative
Voltage drop (I _{out} = 10 A)			
Function	Measuring range	Resolution	Accuracy
- ΔU	0.00 Ω ... 19.99 Ω 20.0 Ω ... 99.9 Ω	0.01 Ω 0.1 Ω	±(2 % of reading + 5 D) ±(3 % of reading)
Insulation resistance (250 V, 500 V, 1000 V), Insulation resistance - S (250 V, 500 V, 1000 V)			
- Riso/Riso-s	0.00 MΩ ... 19.99 MΩ 20.0 MΩ ... 199.9 MΩ	0.01 MΩ 0.1 MΩ	±(3 % of reading + 2 digits) ±(10 % of reading)
- Output voltage	0 V ... 1200 V	1 V	±(3 % of reading + 2 digits)
Insulation resistance (50 V, 100 V), Insulation resistance - S (50 V, 100 V)			
- Riso/Riso-s	0.00 MΩ ... 19.99 MΩ 20.0 MΩ ... 199.9 MΩ	0.01 MΩ 0.1 MΩ	±(5 % of reading + 2 digits) ±20 % of reading
- Output voltage	0 V ... 1200 V	1 V	±(3 % of reading + 2 digits)
(open circuit voltage <50 V a.c.)			
- I _{sub} / I _{sub} s	0.00 mA ... 19.99 mA	10 μA	±(5 % of reading + 3 digits)
Differential Leakage current			
- I _{diff}	0.00 mA ... 19.99 mA	0.01 mA	±(3 % of reading + 5 digits)
PE leakage current			
- I _{pe}	0.00 mA ... 19.99 mA	0.01 mA	±(3 % of reading + 3 digits)
Touch leakage current			
- I _{tou}	0.00 mA ... 19.99 mA	0.01 mA	±(3 % of reading + 3 digits)
Power			
- P	0.00 W ... 19.99 W 20.0 W ... 199.9 W 200 W ... 1999 W 2.00 kW ... 3.70 kW	0.01 W 0.1 W 1 W 10 W	±(5 % of reading + 5 D) ±(5 % of reading) ±(5 % of reading) ±(5 % of reading)
- S	0.00 VA ... 19.99 VA 20.0 VA ... 199.9 VA 200 VA ... 1999 VA 2.00 kVA ... 3.70 kVA	0.01 VA 0.1 VA 1 VA 10 VA	±(5 % of reading + 10 D) ±(5 % of reading) ±(5 % of reading) ±(5 % of reading)
- Q	0.00 VAr ... 19.99 VAr 20.0 VAr ... 199.9 VAr 200 VAr ... 1999 VAr 2.00 kVAr ... 3.70 kVAr	0.01 VAr 0.1 VAr 1 VAr 10 VAr	±(5 % of reading + 10 D) ±(5 % of reading) ±(5 % of reading) ±(5 % of reading)
- PF	0.00 i ... 1.00 i 0.00 c ... 1.00 c	0.01 0.01	±(5 % of reading + 5 digits) ±(5 % of reading + 5 digits)
- THDU	0.0 % ... 99.9 %	0.1%	±(5 % of reading + 5 digits)
- THDI	0 mA ... 999 mA 1.00 A ... 16.00 A	1 mA 10 mA	±(5 % of reading + 5 D) ±(5 % of reading)
- Cos fi	0.00i ... 1.00i 0.00c ... 1.00c	0.01 0.01	±(5 % of reading + 5 digits) ±(5 % of reading + 5 digits)
- U	0.1 V ... 199.9 V 200 V ... 264 V	0.1 1 V	±(3 % of reading + 10 digits) ±(3 % of reading)
- I	0 mA ... 999 mA 1.00 A ... 16.00 A	1 mA 10 mA A	±(3 % of reading + 5 D) ±(3 % of reading)
Power supply	110 V / 230 V AC, 50 Hz / 60 Hz		
Overvoltage category	CAT II / 300 V, CAT II / 600 V (DISCH1 / DISCH2, only)		
Protection class	I		
HV output	5 kV a.c. / 6 kV d.c., double insulation		
COM port	4 x RS232, 1 x USB, 1 x Bluetooth		
Dimensions (w×h×d):	43,5 cm x 29,2 cm x 15,5 cm		
Weight:	17 kg		

Note: Technical specification relates to HW 3 version.

**COSINUS Messtechnik – Ihr Partner für Messlösungen
in allen elektrischen und physikalischen Anwendungen.**

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