

## APPLICATIONS AND SOLUTIONS

### Complete Safety Testing of Integrated IT Installations



#### CONSTRUCTION AND MAINTENANCE

Construction Building Sites, Road Maintenance Vehicles, Central Garages for Repair, Maintenance and Loan of Mobile Units, Integrated IT Generators / Transformers / LV Electrical Installations.

**Applied standards:** IEC/EN 60364-6 Verification; IEC/EN 60364-7-717, Mobile and transportable units.

#### MEDICAL

Medical Sites and Medical Units, Surgery Rooms, Emergency Services Vehicles and Emergency Cars, Emergency Helicopters, Emergency Boats, Mobile Units with Integrated IT Generators / Transformers / LV Electrical Installations.

**Applied standards:** IEC 60364-7-710, Medical locations and associated areas; IEC/EN 60364-7-717, Mobile and transportable units.

#### FIRE

Fire Brigade Engines and Vehicles, Fire Boats, Emergency Vehicles and Cars, Mobile Units with Integrated IT Generators / Transformers / LV Electrical Installations.

**Applied standards:** IEC 61892-6, Mobile and fixed offshore units - Electrical installations, Installation; IEC/EN 60364-7-717, Mobile and transportable units.

#### MILITARY

Military and Police Portable Stations and Units, Military and Police Vehicles and Cars, Airports, Helicopter Mobile Units, Mobile Restaurant Units, Mobile Units with Integrated IT Generators / Transformers / LV Electrical Installations.

**Applied standards:** IEC/EN 60364-6 Verification; IEC/EN 60364-7-717, Mobile and transportable units.

#### INDUSTRY

Industrial Environment Safety, Robotic Production Lines, Welding Machines, Industrial Transformers / Generators / LV Electrical Installations.

**Applied standards:** IEC/EN 60364-6 Verification; IEC/EN 60364-7-717, Mobile and transportable units.

#### AUDIO AND VIDEO

Mobile AV / Cinema / Concert Hall's / Fair playground, Generators on Vehicles, Satellite / TV Video Broadcast Vehicles and Mobile Units with Integrated IT Generators / Transformers / LV Electrical Installations, Mobile Restaurant Units, Event Units.

**Applied standards:** IEC 60364-7-711, Electrical installations in exhibitions, shows, stands, and fun fairs; IEC/EN 60364-7-717, Mobile and transportable units.

#### RACING

Racing Team Mobile Units, Mobile Workshop Unit, Mobile restaurant units, Event units, Mobile Units with Integrated IT Generators / Transformers / LV Electrical Installations.

**Applied standards:** IEC/EN 60364-6 Verification; IEC/EN 60364-7-717, Mobile and transportable units.

#### SHIPS AND MARINA PLACES

Working Ships and Boats Generators, Fishing Boats and Ships, Transport Ships, Tourist Cruisers Ships, Marina places, Mobile Units with Integrated IT Generators / Transformers / LV Electrical Installations.

**Applied standards:** IEC 60364-7-708, Electrical installations in marinas and pleasure craft; IEC/EN 60364-7-717, Mobile and transportable units.

#### Metrel d.d.

Measuring and Regulation Equipment Manufacturer  
Ljubljanska 77, SI-1354 Horjul  
Tel: +386 (0)1 75 58 200; Fax: +386 (0)1 75 49 226  
E-mail: metrel@metrel.si; <http://www.metrel.si>

#### Metrel GmbH

Metrel Mess- und Prüftechnik GmbH  
Orchideenstraße 24, 90542 Eckental  
Tel.: +49 9126 28996-0; Fax: +49 9126 28996-20  
E-mail: metrel@metrel.de; <http://www.metrel.de>

#### Metrel UK Ltd.

Test and Measuring Equipment Unit 1, Hopton House, Ripley Drive,  
Normanton, West Yorkshire, WF6 1QT  
Tel.: +44 (0) 1924 245 000  
E-mail: [info@metrel.co.uk](mailto:info@metrel.co.uk); <http://www.metrel.co.uk>



## APPLICATIONS AND SOLUTIONS FOR AUTOSEQUENCE TESTING OF SAFETY:

### Electrical Installation Safety

- IT Earthing System Voltage Range
- Fuse Trip-Out Ability and Line Impedance Z / I sc
- ISFL Single Fault Leakage Current
- IMD Insulation / ELM Earth Leakage / RCM Residual Current
- Monitor Devices Control
- Alarm Trigger or Trip-Out Check and Adjust

### Machines Appliances Switchboards Safety

- Portable Appliance Testing
- Extension leads and Cables Polarity
- Earth Bonding and Continuity of Connections
- RCD / PRCD protection
- Tracing Leakage and Insulation Faults



**SAFETY ON BOARD**

Construction and Maintenance / Medical / Fire / Military /  
Industry / Audio and Video / Racing / Ships And Marina Places

Note! Photographs in this catalogue may slightly differ from the instruments at the time of delivery.  
Subject to technical change without notice.

APPLICATION\_Maintenance\_December\_2012\_Ang



## APPLICATIONS AND SOLUTIONS FOR AUTOSEQUENCE TESTING OF SAFETY Functional Safety of Electrical / Electronic / Programmable Electronic Safety related Systems

"Functional Safety of Electrical / Electronic / Programmable Electronic Safety related Systems" EN 61508 defining the human error as "human action or inaction that can produce an unintended result".

### AUTO SEQUENCE®

Safety evaluation with Human Error Factor minimized!

Due to unique single and clear **AUTO SEQUENCE®** procedure the Human Error Factor in Functional Safety IEC / EN 61508 is minimized Regardless of Operator competence level.

**AUTO SEQUENCE®** enables all testing to be carried out with a single button press. All tests are Pre-programmed with PASS levels saved against the relevant test result.

**PC SW EuroLink & PATLink** are designed for Creating of Reports based Saved results connected to Memory Structure. PASS or FAIL evaluation on Results, Parameters, Dates and Time of testing are all connected to Memory Structure, prepared for printing Reports to prove Safety and Operational Quality of tested.

#### DANGERS

Electrical installation and Equipment is a source of many dangers. Two most often dangers:

- Overheating through excessive thermal dissipation or insulation fault on installation components and electrical equipment.
- Excessive touch voltage on accessible conductive parts and consequentially dangerous current through human body.

**Both problems can have fatal consequences! Accidents happen daily!**

The WORLDS first instrument designed with a **AUTO SEQUENCE** mode to enable ease of testing for all operator levels.



## APPLICATIONS AND SOLUTIONS FOR AUTOSEQUENCE TESTING OF SAFETY Electrical Installation Safety Portable Appliances / Equipment / Extensions Safety

The MI 3110 EurotestIM is a perfect tool for testing permanent Integrated or mobile IT Earthing Systems with Low Voltage Electrical Installation's Power Supply from Generator or Transformer.

The MI 3110 EurotestIM is the first and unique automatic tester for measuring in single **AUTO SEQUENCE®**

### MI 3309 DeltaGT & MI 3311 GammaGT



Designed for testing Safety of Portable Appliances, Equipment, Extension Leads and Cables.

One single **AUTO SEQUENCE®** with all sub-tests evaluation Safety on all PASS barrier parameters.

#### KEY FEATURES:

The PAT testers MI3309 DeltaGT / MI3311 GammaGT are automatic tester for measuring in single AUTOSEQUENCE:

- Earth Bonding and Continuity of Connections
- Extension leads, Cables and Cords testing
- Portable Appliance Testing
- RCD / PRCD protection
- Tracing Leakage and Insulation Faults

Designed for testing and measuring low resistances of Switches, Relays, Connectors, Bus bars, Power distribution cable joints, Motor & generator winding, Power transformers, Power inductors, Rail track joints, Wire and cable resistances, Welding joints...

#### KEY FEATURES:

The MicroOhm testers MI 3242 MicroOhm 2A / MI 3250 MicroOhm 10A are designed for bidirectional low resistance Earth Bonding and Continuity testing using four wire Kelvin method:

- High Resolution 1 μΩ, 24-Bit
- Four different measuring modes (Single, Continuous, Inductive, Automatic)
- Automatic thermal EMF elimination
- Noise rejection (50/60 Hz)

### MI 3242 MicroOhm 2A



### MD 9270 Leakage clamp TRMS



Designed for localizing excessive leakage currents causing problems is the selective leakage / fault current measurement with current clamps. Base on direct testing method or differential testing method.

#### KEY FEATURES:

The MD 9270 Leakage Current Clamps with Power is Troubleshooting Tool for any Installer to search and analyse problems on Insulation during Installation is under use and voltage presence:

- Tracing Leakage and Insulation Faults
- 50 Hz / 60 Hz Harmonics and Filters also on Leakage Current
- Tracing problems when IMDs, RCMs and ELMs detect excessive currents
- Tracing problems on RCD tripping
- Active Power, Reactive Power and PF for Currents up to 150A

Designed for testing Safety of Integrated IT Earthing System with LV Power Generator or Transformer! One single **AUTO SEQUENCE®** with programmable limits and sub-tests ensuring Safety on all PASS barrier parameters.

## APPLICATIONS AND SOLUTIONS FOR AUTOSEQUENCE TESTING OF SAFETY Standard Sets / Kit Sets Recommended Instruments

Photo	Order No.	Acc. description
	MI 3125B Eurotest Combo	Safety of Electrical Installations in Buildings with Low Voltage Power Generator or Transformer.
	MI 3123 Smartec Earth	Earth resistance testing with most known testig methods for any situation.
	MI 2142 Alpha PAT	Safety of Portable Appliances, Equipment, Extension Leads and Cables with 25 A Earth Bond testing.
	MI 3250 MicroOhm 10A	Precise MicroOhm 2A/10A resistance testing for protection bonding, bus bars, relays, joints, windings, etc in Medical and Industrial environment.
	MI 3242 MicroOhm 2A	Troubleshooting tool for tracing faults on Leakage and Insulation by direct or differential method. Additional functions.
	MD 9270 Leakage Current Clamps	Industrial multifunctional First Class Clamp Meter with AC and DC current for fixed LV Installations and Vehicle Installations.
	MD 9250 Current Clamps	Designed with special functions for Car signals testing, including engine RPM, triggers, ms readings and more.

  

Standard Set MI 3110	Standard Set MI 3309	Standard Set MI 3242	St. Set MD 9270
<ul style="list-style-type: none"> <li>Instrument MI 3110 EurotestIM</li> <li>Soft carrying bag</li> <li>Mains cable</li> <li>Test lead, 1,5 m</li> <li>Crocodile clip, black, green, brown</li> <li>Test probe, black, green, brown</li> <li>NiMH rechargeable batteries, type AA, 6 pcs</li> <li>PC software EuroLink PRO</li> <li>USB and RS232 cable</li> <li>Instruction manual</li> <li>Calibration certificate</li> </ul>	<ul style="list-style-type: none"> <li>Instrument MI 3309 DeltaGT</li> <li>Small soft carrying bag</li> <li>IEC cable, 2 m, 2 pcs</li> <li>Test lead, black, green, brown, 1,5 m</li> <li>Crocodile clip, black, green, brown</li> <li>Test probe, black, green, brown</li> <li>PC software PATLink PRO</li> <li>USB and RS232 cable</li> <li>NiMH rechargeable batteries, type AA, 6 pcs</li> <li>Instruction manual</li> <li>Calibration certificate</li> </ul>	<ul style="list-style-type: none"> <li>Instrument MI 3242 MicroOhm 2A</li> <li>Test cable 4 wire, 2,5 m</li> <li>Crocodile clip, 4 pcs (2x black, 2x red)</li> <li>Test probe, 2 pcs (black)</li> <li>Power supply adapter</li> <li>NiMH rechargeable batteries, type AA, 6 pcs</li> <li>USB and RS232 cable</li> <li>Soft carrying bag</li> <li>PC SW HVLink PRO</li> <li>Instruction manual</li> <li>Calibration certificate</li> </ul>	<ul style="list-style-type: none"> <li>Current clamp MD 9270</li> <li>Test lead with probe, 2 pcs</li> <li>1,5 V battery, type AAA, 2 pcs</li> <li>Pouch</li> <li>Instruction manual</li> <li>Warranty</li> </ul>

  

Kit Set IM/PAT PRO	Kit Set IM/PAT EU
<ul style="list-style-type: none"> <li>MI 3110 EurotestIM</li> <li>A 1314 Plug Commander</li> <li>MI 3309 DeltaGT</li> <li>MD 9270 Leakage CLAMP with POWER</li> <li>IP67 Portable Case</li> </ul>	<ul style="list-style-type: none"> <li>MI 3110 EurotestIM</li> <li>MI 3311 GammaGT</li> <li>IP67 Portable Case</li> </ul>

  

Kit Set IM/2A EU	Kit Set IM PRO
<ul style="list-style-type: none"> <li>MI 3110 EurotestIM</li> <li>A 1314 Plug Commander</li> <li>MI 3242 MicroOhm 2A</li> <li>IP67 Portable Case</li> </ul>	<ul style="list-style-type: none"> <li>MI 3110 EurotestIM</li> <li>MD 9270 Leakage CLAMP with POWER</li> <li>IP67 Portable Case</li> </ul>

  

Alternative IM/10A PRO:
<ul style="list-style-type: none"> <li>MI 3250 MicroOhm 10A</li> </ul>

