



# **Guide to MI 3325** **MultiServicerXD** *Ver 1.2.3, Code No. 20 753 150*

METREL d.d.  
Ljubljanska cesta 77  
1354 Horjul  
Slovenia  
Web site: <http://www.metrel.si>  
E-mail: [metrel@metrel.si](mailto:metrel@metrel.si)

© 2022 Metrel

No part of this publication may be reproduced or utilized in any form or by any means without permission in writing from METREL.

<b>1. Introduction.....</b>	<b>6</b>
<b>2. Getting started .....</b>	<b>7</b>
2.1. MetrelElectricalSafetyManager .....	7
2.2. Introduction .....	7
<b>3. Auto Sequence® Editor.....</b>	<b>8</b>
3.1. Introduction of Auto Sequence® editor .....	8
3.1.1. Main window.....	8
3.2. Creating new Auto Sequence.....	9
3.3. Description of Auto Sequence® group working area .....	9
3.4. Elements of an Auto Sequence ® .....	10
3.4.1. Auto Sequence® steps.....	10
3.4.2. Single tests .....	10
3.4.3. Flow commands .....	17
3.4.4. Number of measurement steps .....	17
3.5. Description of flow commands .....	17
3.5.1. Pause .....	18
3.5.2. Output state .....	18
3.5.3. Wait input mode.....	19
3.5.4. Lamps Pass / Fail mode .....	20
3.5.5. Lamps HV mode.....	20
3.5.6. Buzzer mode .....	21
3.5.7. External TEST / OK key mode.....	21
3.5.8. No notifications mode .....	22
3.5.1. Inspection Expert mode .....	23
3.5.2. Appliance info .....	23
3.5.3. Operation after end of test.....	25
3.5.4. Result screen.....	26
<b>4. Manage sequence step by step.....</b>	<b>27</b>
4.1. Editing test sequence parameters.....	27
4.2. Adding and editing measurements.....	28
<b>5. Examples of Auto Sequences.....</b>	<b>31</b>
5.1. How to enable remote start with optional A 1511 (Using Auto Sequences).....	31
5.2. How to execute Earth continuity and Insulation resistance test using optional A 1511 .....	35

5.3.	How to enable HV lamps & Buzzer .....	39
5.4.	How to enable barcode reader and auto print .....	44
5.5.	How to enable PASS/FAIL status lamps, HV lamps and remote control....	46
5.6.	How to enable test setup with CE Adapter A 1460.....	52
5.7.	How to enable A 1422 Active 3-phase adapter for testing of, Arc / Welding equipment .....	61
5.8.	How to measure low impedance (mΩ) .....	66
5.9.	How to do a diagnostic test on a (EVSE) charging station .....	71
<b>6.</b>	<b>Special features .....</b>	<b>77</b>
6.1.	Working with user custom lists .....	77
6.2.	How to enable remote start with optional A 1511 / A 1495 (Single Tests)..	79
6.3.	Disabling pre-tests for specific measuring functions .....	80
6.3.1.	Load pre-test .....	80
6.3.2.	Disabling (IT) earthing system warning .....	83
6.4.	How to enable Warning lamps & Buzzer (Single tests) .....	84
6.4.1.	HV lamps (A 1496) .....	84
6.4.2.	PASS/FAIL lamps, HV lamps (A 1497).....	88
6.5.	Upgraded Discharging time / Residual voltage, measuring function .....	90
6.5.1.	Measurement of residual voltage.....	90
6.5.2.	IEC 60335-1 Household and similar electrical appliances .....	90
6.5.3.	IEC 60204-1 Safety of machinery - Electrical equipment of machines	90
6.5.4.	IEC 61439 Low-voltage switchgear and controlgear assemblies.....	91
6.6.	1-Phase, P-RCD testing .....	91
<b>7.</b>	<b>Differences between supported types of labels.....</b>	<b>93</b>
7.1.	PAT tag format (size 50mm x 25.5mm).....	93
7.2.	PAT tag format (size 43mm x 99mm).....	95
7.3.	Label format PAT, label size 43mm x 99mm.....	97
7.4.	PAT tag format (NFC tag) .....	97
7.5.	GENERIC tag format (size 50mm x 25.5mm) .....	98
7.6.	GENERIC tag format (NFC tag) .....	99
<b>8.</b>	<b>Differences between basic and PRO MESM reports.....</b>	<b>100</b>
8.1.	Print results (N...selected appliances will be printed on the report) .....	102
8.2.	Basic report (N...selected appliances will be printed on the report) .....	102
8.3.	EETR_PRO report (N...selected appliances will be printed on the report)	103
8.4.	EETR_Single report (Only one appliance is printed per report) .....	104



8.5. EETR_FD_Single report (Only one appliance is printed per report).....	104
8.6. MACHINE / SWITCHBOARD report (Only one Machine/Switchboard is printed per report) .....	105
8.7. EQUIPMENT Report (N...selected appliances will be printed on the report) 106	
<b>9. Differences between basic and PRO MESM license .....</b>	<b>107</b>
<b>10. Demo test sequence.....</b>	<b>107</b>

## **1. Introduction**

The purpose of this document is to present a complete application solution of the MI 3325 MultiServicerXD instrument with associated optional accessories. It will be shown how to connect optional accessories to the instrument and how to use them for measurement purposes. Part of this document is intended for the preparation and use of user-defined AutoSequences® together with the use of work-flow commands, and the use of user-customized visual inspections.

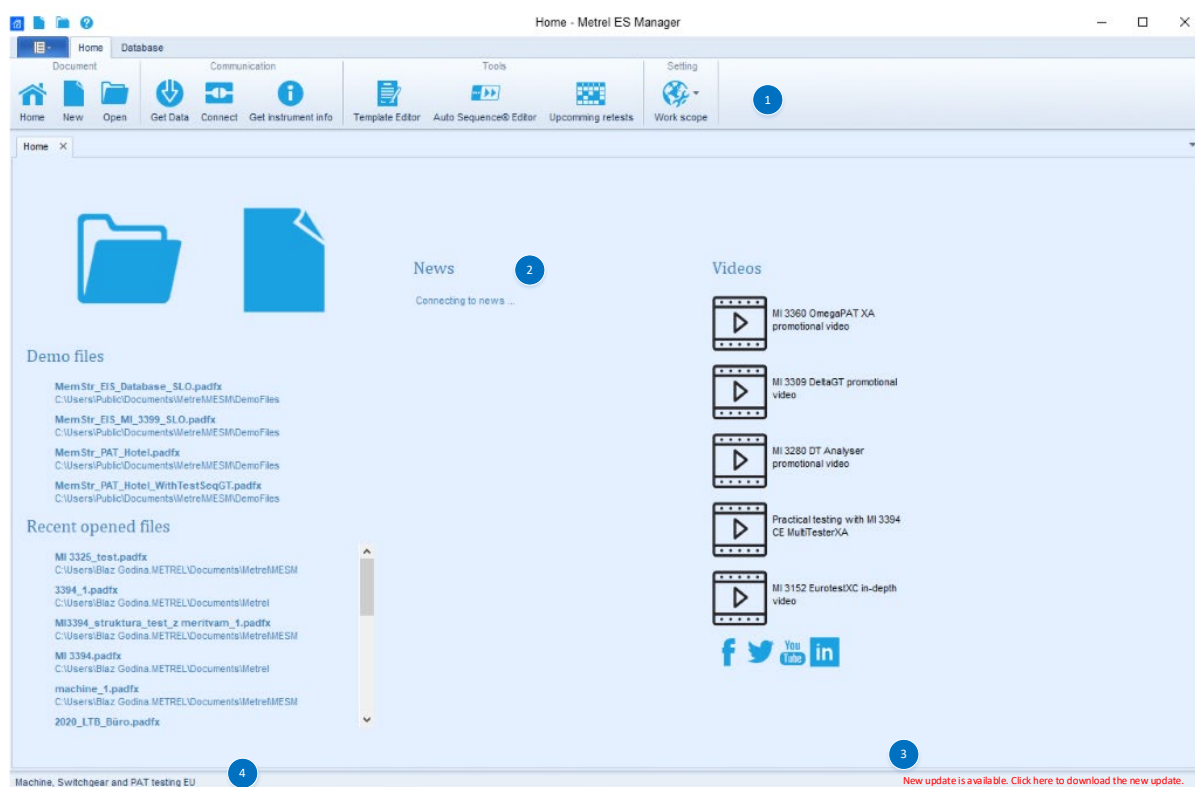
## 2. Getting started

### 2.1. MetrelElectricalSafetyManager

**Metrel Electrical Safety Manager** is a common PC software application for management of the new generation of Metrel's instruments. The wide palette of Metrel's electrical safety testers, portable appliance testers, machine testers and industrial safety testers can be managed by one single application. It has a unified user interface with the new generation of Metrel's instruments – same view same meaning.

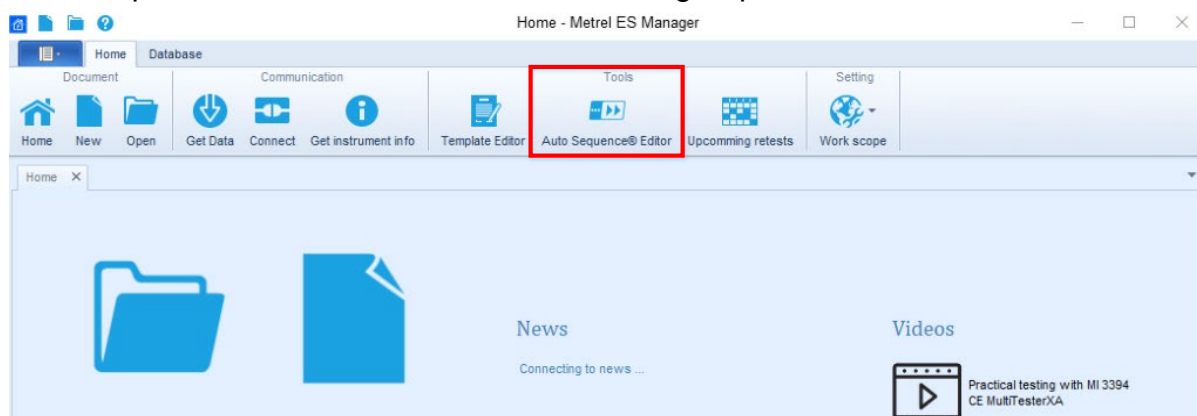
### 2.2. Introduction

After start-up, Metrel ES Manager Welcome screen appear with Menu tabs ( ) on the top and Home tab active in the working area ( ). When connected to the internet, update status presented in bottom right corner ( ) is automatically checked. Default scope of work area is displayed in the bottom left corner of the window ( ). Check Work scope setting before start a new data structure file. When existing data structure file is opened, Work scope is automatically set.



### 3. Auto Sequence® Editor

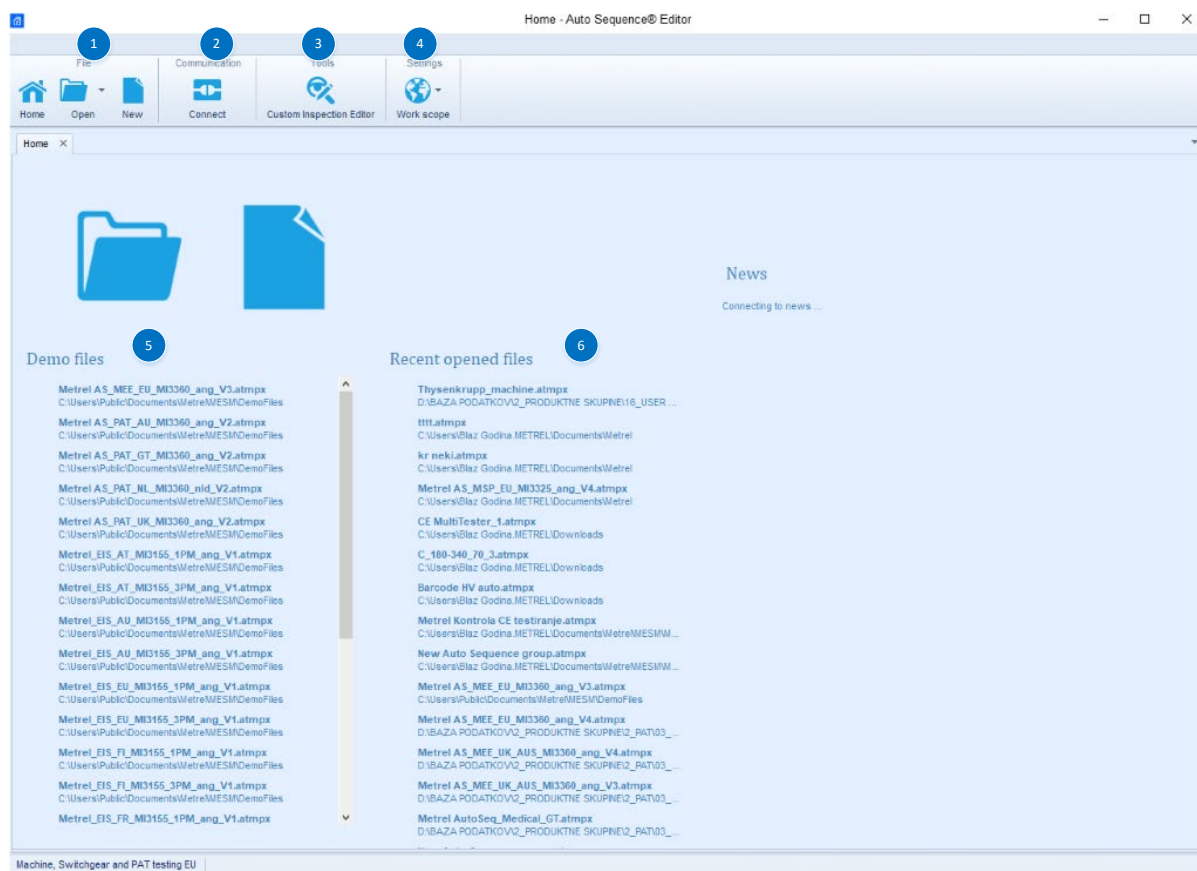
Auto Sequence® editor is available from Tools group of MESM Home tab menu.



#### 3.1. Introduction of Auto Sequence® editor

##### 3.1.1. Main window

After start-up, Auto Sequence® editor Welcome screen appear with following tools ( ) File, ( ) Communication, ( ) Tools, ( ) Settings, (5) Demo files, (6) Recent opened files.

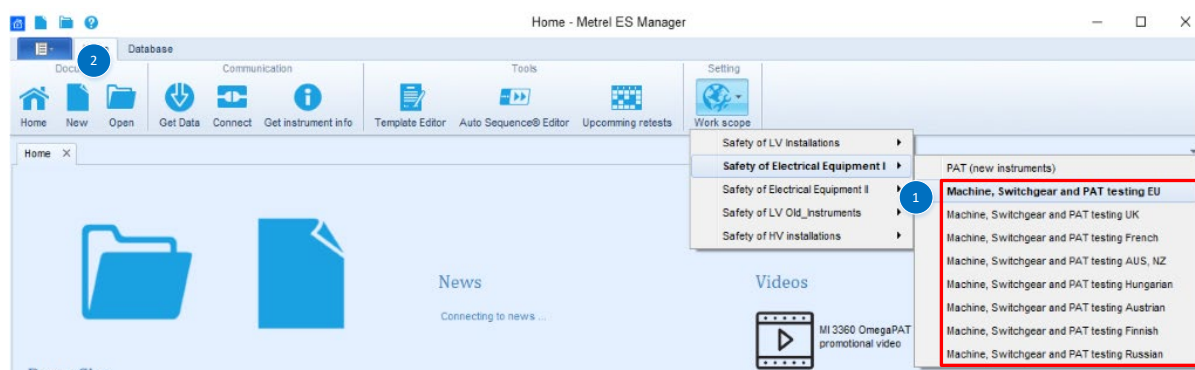


### 3.2. Creating new Auto Sequence

Before creating a new test sequence, it is necessary to select the correct Work scope. The Work scope selected, must be the same as the Work scope in which the instrument we intend to use operates.

The work scope *Safety of electrical equipment I Machine, Switchgear and PAT testing EU* will be used to present the demo test sequence.

This is the work scope dedicated to MultiServicerXD and PAT instruments.

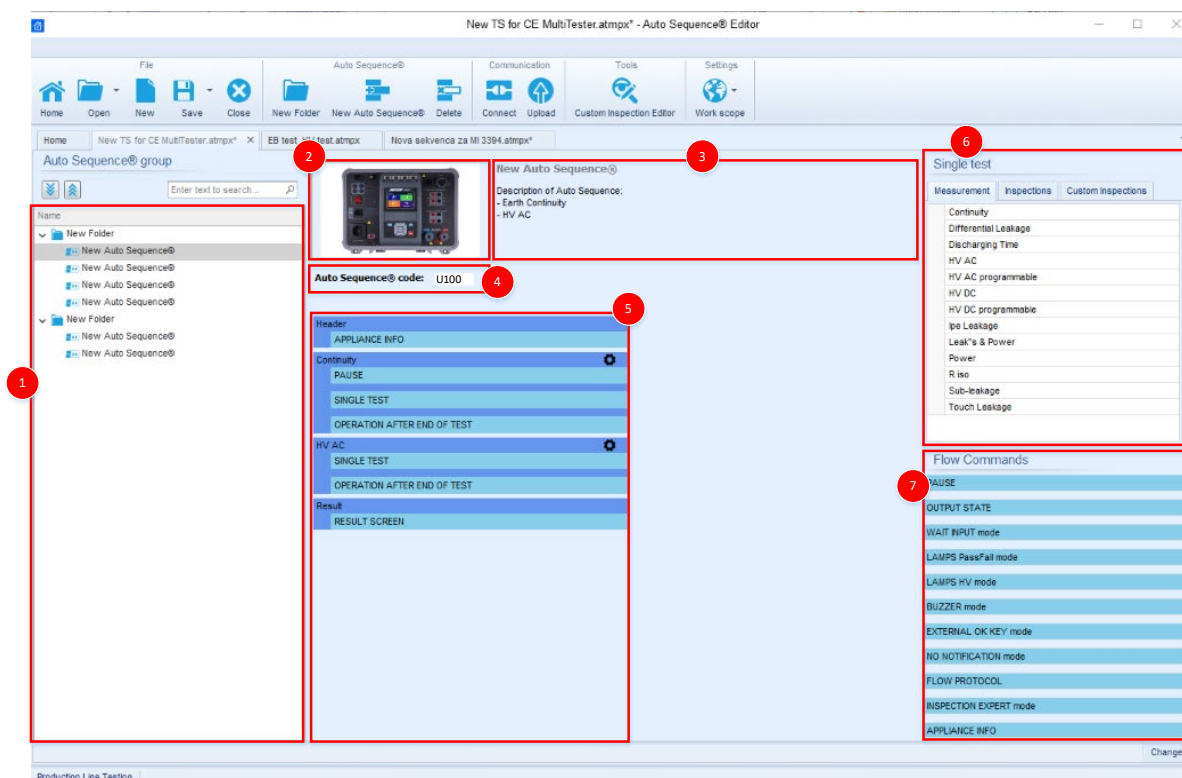


1. Select correct Work Scope (same as used on target instrument)
2. Select New file

### 3.3. Description of Auto Sequence® group working area

Main screen of new Auto Sequence® consists of following modules, parts:

1. **List of available test sequences**; for better transparency and structuring, the test sequences can be organized in a tree structure including folders and subfolders,
2. **Picture dedicated to the selected test sequence**; each test sequence can be equipped with an image, the image is displayed in the PC SW only,
3. **Description of the selected test sequence**; a description can be added to the test sequence, this will be displayed in the PC SW and in the test sequence header on the measuring instrument,
4. **Test sequence, custom specified short code**; a test sequence code will be displayed in the test sequence header on the measuring instrument. Test sequence short code can be used for search of test sequence inside the Auto Sequences® menu of the measuring instrument,
5. **Tests and flow commands of selected test sequence**; the entire workflow of the test sequence including all associated flow commands is listed in this section,
6. **Lists of available Measurements, Inspections and Custom Inspections**; in this section measurements, inspections and custom inspections available for specific work scope are listed,
7. **List of available flow commands**; flow commands available for specific work scope are listed here.



### 3.4. Elements of an Auto Sequence®

#### 3.4.1. Auto Sequence® steps

There are three kinds of Auto Sequence® steps.

##### Header

The Header step is empty by default.

Flow commands can be added to the Header step.

##### Measurement step

The Measurement step contains a Single test and the Operation after end of test flow command by default. Other Flow commands can also be added to the Measurement step.

##### Result

The Result step contains the Result screen flow command by default. Other Flow commands can also be added to the Result step.

#### 3.4.2. Single tests

Single tests are the same as on MI 3325 MultiServicerXD Single tests menu.

Limits and parameters of the measurements can be set. Results and sub-results can't be set.

Measurement menu is divided in 5 subgroups, each containing some specific and generic measurements for certain application.

## Notes!

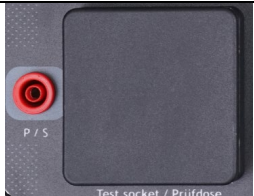



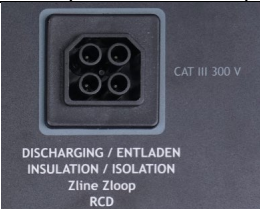

When creating custom AutoSequences®, care must be taken to select the appropriate single test according to the test terminal through which the test will be performed on the instrument.

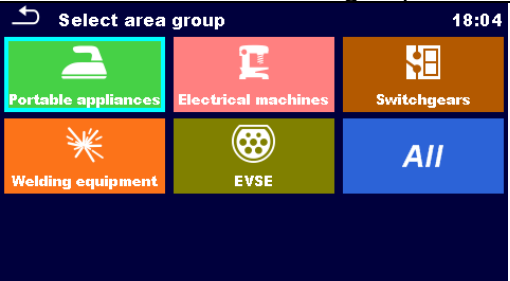
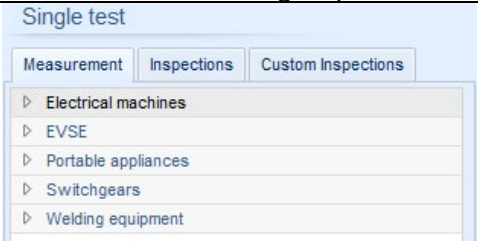
The test instrument supports various active adapters, certain measurements are only supported in combination with a specific active adapter and/or through measuring adapter test terminals. The information in the table below, *given in blue*, describes measurements that are supported using active adapters.

Supported active adapters:

- A 1143 Euro - Z 290 A,
- MI 3143 Euro Z 440 V,
- MI 3144 Euro Z 800 V,
- A 1632 eMobility Analyser
- A 1322 Active 3-phase Adapter
- A 1422 Active 3-phase Adapter Plus
- A 1460 CE Adapter

Test terminals:

Test socket, Probe,	IEC	Continuity 4W
		
High voltage	TP1 (Test terminal)	Clamp current
		

INSTRUMENT area groups	MESM area groups
	

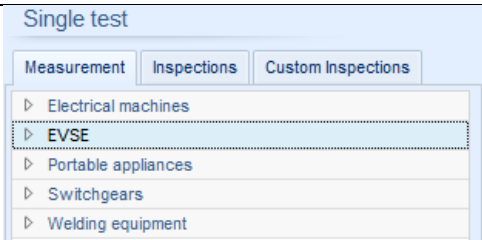
## Electrical machines

Electrical machines (Available single tests)		<div>Single test</div> <div>MeasurementInspectionsCustom Inspections</div> <div><div>Electrical machines</div><div>EVSE</div><div>Portable appliances</div><div>Switchgears</div><div>Welding equipment</div></div>	
Electrical machines (Test instrument only)			
Test socket / Test socket – IEC		TP1 (test terminal)	
<ul style="list-style-type: none"><li>• Continuity (P/S-PE),</li><li>• Continuity (MS_PE-IEC_PE), <b>Socket – IEC</b>,</li><li>• Riso (Riso, Riso-S),</li><li>• Differential Leakage,</li><li>• Ipe Leakage,</li><li>• Sub-leakage,</li><li>• Touch Leakage,</li><li>• Leak's &amp; Power,</li><li>• Power.</li></ul>		<ul style="list-style-type: none"><li>• Rpe,</li><li>• R low,</li><li>• RCD Auto, RCD I, RCD t, RCD Uc,</li><li>• R iso,</li><li>• Varistor,</li><li>• Discharging time,</li><li>• Voltage Drop</li><li>• Voltage</li><li>• Z auto, Z line, Z loop, Zs rcd.</li></ul>	
4W-Continuity (test terminals)	HV (test terminals)	Current clamp	
<ul style="list-style-type: none"><li>• Continuity 4wire</li></ul>	<ul style="list-style-type: none"><li>• HV AC,</li><li>• HV AC programmable.</li></ul>	<ul style="list-style-type: none"><li>• Clamp current (optional clamps)</li></ul>	
Current clamp <b>Bluetoth</b> (optional MD 9273) <b>supported from FW version xxxx</b>			
<ul style="list-style-type: none"><li>• Curren CLAMP</li><li>• Harmonics I CLAMP</li><li>• Harmonics U CLAMP</li><li>• Inrush CLAMP</li><li>• Power CLAMP</li><li>• Voltaeg CLAMP</li></ul>			
Electrical machines (Test instrument + A 1143) <i>The test instrument is used only to control the adapter and to display the test results. All connections and measurements are made on the adapter.</i>			
<ul style="list-style-type: none"><li>• Z line mΩ</li><li>• Z loop mΩ</li></ul>			
Electrical machines (Test instrument + MI 3143) <i>The test instrument is used only to control the adapter and to display the test results. All connections and measurements are made on the adapter.</i>			
<ul style="list-style-type: none"><li>• High Current</li><li>• Z line mΩ</li><li>• Z loop mΩ</li><li>• U touch</li></ul>			
Electrical machines (Test instrument + MI 3144) <i>The test instrument is used only to control the adapter and to display the test results. All connections and measurements are made on the adapter.</i>			
<ul style="list-style-type: none"><li>• Current Clamp Meter</li><li>• ELR Current Injection Test</li><li>• ELR Combination Time Test</li><li>• R line mΩ</li><li>• High Current</li><li>• Z line mΩ</li><li>• Z loop mΩ</li><li>• U touch</li></ul>			
Electrical machines (Test instrument + A 1322 / A 1422) <i>The test instrument is used as a master instrument to control the adapter and to display the test</i>			



<i>results. Connections and measurements are made on the adapter.</i>	
<ul style="list-style-type: none"> <li>• Continuity (P/S-PE), Socket 3ph - Socket 3ph (<b>A 1322 / A 1422</b>),</li> <li>• Riso (Riso, Riso-S),</li> <li>• Differential Leakage,</li> <li>• Sub-leakage,</li> <li>• Touch Leakage</li> <li>• Power (P, Q, S, PF).</li> </ul>	
<b>Electrical machines (Test instrument + A 1460 CE Adapter)</b>	
Test socket A 1460	
<ul style="list-style-type: none"> <li>• Continuity (P/S-PE),</li> <li>• Continuity 4wire,</li> <li>• HV AC, (<b>up to 1.5kV</b>),</li> <li>• HV AC programmable (<b>up to 1.5kV</b>),</li> <li>• Riso (Riso, Riso-S),</li> <li>• Differential Leakage,</li> <li>• Ipe Leakage,</li> <li>• Sub-leakage,</li> <li>• Touch Leakage,</li> <li>• Leak's &amp; Power,</li> <li>• Power.</li> </ul>	

## EVSE

<b>EVSE (Available single tests)</b>	
<b>EVSE (Test instrument only)</b>	
TP1 (test terminal)	
<ul style="list-style-type: none"><li>• R iso,</li><li>• Rpe,</li><li>• RCD Auto, RCD I, RCD t, RCD Uc,</li><li>• R low,</li><li>• Voltage Drop</li><li>• Voltage</li><li>• Z auto, Z line, Z loop, Zs rcd.</li></ul>	
Current clamp <b>Bluetotth</b> (optional MD 9273) <b>supported from FW version xxxx</b>	
<ul style="list-style-type: none"><li>• Curren CLAMP</li><li>• Harmonics I CLAMP</li><li>• Harmonics U CLAMP</li><li>• Inrush CLAMP</li><li>• Power CLAMP</li><li>• Voltaeg CLAMP</li></ul>	
<b>EVSE (Test instrument + A 1632)</b>	
<i>The test instrument is used only to control the adapter and to display the test results. All connections and measurements are made on the adapter.</i>	
<ul style="list-style-type: none"><li>• Diagnostic Test (EVSE)</li></ul>	

## Portable appliances

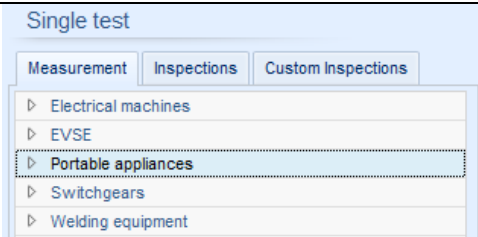
Portable appliances (Available single tests)		<div>Single test</div> <div>MeasurementInspectionsCustom Inspections</div> <div><div>▷ Electrical machines</div><div>▷ EVSE</div><div>▷ Portable appliances</div><div>▷ Switchgears</div><div>▷ Welding equipment</div></div>	
Portable appliances (Test instrument only)			
Test socket / Test socket - IEC		TP1 (test terminal)	
<ul style="list-style-type: none"><li>• Continuity (P/S-PE),</li><li>• Continuity (MS_PE-IEC_PE), <b>Socket – IEC</b>,</li><li>• Riso (Riso, Riso-S),</li><li>• Differential Leakage,</li><li>• Ipe Leakage,</li><li>• Sub-leakage,</li><li>• Touch Leakage,</li><li>• Leak's &amp; Power,</li><li>• Power,</li><li>• Polarity, <b>Socket – IEC</b>,</li><li>• Active Polarity, <b>Socket – IEC</b>,</li><li>• PE conductor (PRCD).</li></ul>		<ul style="list-style-type: none"><li>• RCD (Not supported by this instrument!!!)</li></ul>	
4W-Continuity (test terminals)	HV (test terminals)	Current clamp	
<ul style="list-style-type: none"><li>• Continuity 4wire</li></ul>		<ul style="list-style-type: none"><li>• Clamp current (optional clamps)</li></ul>	
Current clamp <b>Bluetooth</b> (optional MD 9273) <b>supported from FW version xxxx</b>			
<ul style="list-style-type: none"><li>• Current CLAMP</li><li>• Harmonics I CLAMP</li><li>• Harmonics U CLAMP</li><li>• Inrush CLAMP</li><li>• Power CLAMP</li><li>• Voltage CLAMP</li></ul>			
Portable appliances (Test instrument + A 1322 / A 1422)			
The test instrument is used as a master instrument to control the adapter and to display the test results. Connections and measurements are made on the adapter.			
<ul style="list-style-type: none"><li>• Continuity (P/S-PE), Socket 3ph - Socket 3ph,</li><li>• Riso (Riso, Riso-S),</li><li>• Differential Leakage,</li><li>• Polarity, Socket 3ph - Socket 3ph,</li><li>• Active Polarity (Wiring map), Socket 3ph - Socket 3ph,</li><li>• PRCD (RCD-t, type: A, AC, B, B+, F), Socket 3ph - Socket 3ph,</li><li>• Sub-leakage,</li><li>• Touch Leakage,</li><li>• Power (P, Q, S, PF).</li></ul>			
Portable appliances (Test instrument + A 1460 CE Adapter)			
Test socket A 1460			
<ul style="list-style-type: none"><li>• Continuity (P/S-PE),</li><li>• Continuity 4wire,</li><li>• Riso (Riso, Riso-S),</li><li>• Differential Leakage,</li><li>• Ipe Leakage,</li><li>• Sub-leakage,</li><li>• Touch Leakage,</li><li>• Leak's &amp; Power,</li><li>• Power.</li></ul>			

## Switchgears

<b>Switchgears (Available single tests)</b>		<div>Single test</div> <div>MeasurementInspectionsCustom Inspections</div> <div><div>▸ Electrical machines</div><div>▸ EVSE</div><div>▸ Portable appliances</div><div>▸ Switchgears</div><div>▸ Welding equipment</div></div>	
<b>Switchgears (Test instrument only)</b>			
Test socket / Test socket – IEC		TP1 (test terminal)	
<ul style="list-style-type: none"><li>• Continuity (P/S-PE),</li><li>• Continuity (MS_PE-IEC_PE), <b>Socket – IEC</b>,</li><li>• Riso (Riso, Riso-S),</li><li>• Differential Leakage,</li><li>• Ipe Leakage,</li><li>• Sub-leakage,</li><li>• Touch Leakage,</li><li>• Leak's &amp; Power,</li><li>• Power.</li></ul>		<ul style="list-style-type: none"><li>• Rpe,</li><li>• R low,</li><li>• RCD Auto, RCD I, RCD t, RCD Uc,</li><li>• R iso,</li><li>• Varistor,</li><li>• Discharging time,</li><li>• Voltage Drop</li><li>• Voltage</li><li>• Z auto, Z line, Z loop, Zs rcd.</li></ul>	
4W-Continuity (test terminals)	HV (test terminals)	Current clamp	
<ul style="list-style-type: none"><li>• Continuity 4wire</li></ul>	<ul style="list-style-type: none"><li>• HV AC,</li><li>• HV AC programmable.</li></ul>	<ul style="list-style-type: none"><li>• Clamp current (optional clamps)</li></ul>	
Current clamp <b>Bluetooth</b> (optional MD 9273) <b>supported from FW version xxxx</b>			
<ul style="list-style-type: none"><li>• Curren CLAMP</li><li>• Harmonics I CLAMP</li><li>• Harmonics U CLAMP</li><li>• Inrush CLAMP</li><li>• Power CLAMP</li><li>• Voltaeg CLAMP</li></ul>			
<b>Switchgears (Test instrument + A 1143)</b> <i>The test instrument is used only to control the adapter and to display the test results. All connections and measurements are made on the adapter.</i>			
<ul style="list-style-type: none"><li>• Z line mΩ</li><li>• Z loop mΩ</li></ul>			
<b>Switchgears (Test instrument + MI 3143)</b> <i>The test instrument is used only to control the adapter and to display the test results. All connections and measurements are made on the adapter.</i>			
<ul style="list-style-type: none"><li>• High Current</li><li>• Z line mΩ</li><li>• Z loop mΩ</li><li>• U touch</li></ul>			
<b>Switchgears (Test instrument + MI 3144)</b> <i>The test instrument is used only to control the adapter and to display the test results. All connections and measurements are made on the adapter.</i>			
<ul style="list-style-type: none"><li>• Current Clamp Meter</li><li>• ELR Current Injection Test</li><li>• ELR Combination Time Test</li><li>• R line mΩ</li><li>• High Current</li><li>• Z line mΩ</li><li>• Z loop mΩ</li><li>• U touch</li></ul>			
<b>Switchgears (Test instrument + A 1322 / A 1422)</b> <i>The test instrument is used as a master instrument to control the adapter and to display the test results. Connections and measurements are made on the adapter.</i>			
<ul style="list-style-type: none"><li>• Continuity (P/S-PE), Socket 3ph - Socket 3ph (<b>A 1322 / A 1422</b>).</li></ul>			

<ul style="list-style-type: none"> <li>• Riso (Riso, Riso-S),</li> <li>• Differential Leakage,</li> <li>• Sub-leakage,</li> <li>• Touch Leakage</li> <li>• Power (P, Q, S, PF).</li> </ul>
<b>Switchgears (Test instrument + A 1460 CE Adapter)</b>
Test socket A 1460
<ul style="list-style-type: none"> <li>• Continuity (P/S-PE),</li> <li>• Continuity 4wire,</li> <li>• HV AC, (<b>up to 1.5kV</b>),</li> <li>• HV AC programmable (<b>up to 1.5kV</b>),</li> <li>• Riso (Riso, Riso-S),</li> <li>• Differential Leakage,</li> <li>• Ipe Leakage,</li> <li>• Sub-leakage,</li> <li>• Touch Leakage,</li> <li>• Leak's &amp; Power,</li> <li>• Power.</li> </ul>

## Welding equipment

<b>Welding equipment (Available single tests)</b>		
<b>Welding equipment (Test instrument)</b>		
Test socket / Test socket - IEC		TP1 (test terminal)
<ul style="list-style-type: none"> <li>• Continuity (P/S-PE),</li> <li>• Continuity (MS_PE-IEC_PE),</li> <li>• Touch Leakage,</li> <li>• Power,</li> <li>• Polarity, Socket – IEC,</li> <li>• Active Polarity, Socket – IEC,</li> </ul>		
4W-Continuity (test terminals)	HV (test terminals)	Current clamp
<ul style="list-style-type: none"> <li>• Continuity 4wire</li> </ul>		<ul style="list-style-type: none"> <li>• Clamp current (optional clamps) <i>A 1422 shall be disabled/disconnected during measurement</i></li> </ul>
Current clamp <b>Bluetotth</b> (optional MD 9273) <b>supported from FW version xxxx</b>		
<ul style="list-style-type: none"> <li>• Curren CLAMP</li> <li>• Harmonics I CLAMP</li> <li>• Harmonics U CLAMP</li> <li>• Inrush CLAMP</li> <li>• Power CLAMP</li> <li>• Voltaeg CLAMP</li> </ul>		
<b>Welding equipment (Test instrument + A 1422)</b>		
<i>The test instrument is used as a master instrument to control the adapter and to display the test results. Connections and measurements are made on the adapter.</i>		
<ul style="list-style-type: none"> <li>• Continuity (P/S-PE), (Socket 3ph - Socket 3ph),</li> <li>• Riso (LN-PE, LN-W, LN (ClassII) – P/S),</li> <li>• Primary Leakage,</li> <li>• I leak (W-PE),</li> <li>• Polarity, (Socket 3ph - Socket 3ph),</li> <li>• Active Polarity (Wiring map), (Socket 3ph - Socket 3ph),</li> </ul>		

<ul style="list-style-type: none"> <li>• Touch Leakage</li> <li>• Power (P, Q, S, PF).</li> </ul>
<b>Welding equipment (Test instrument + A 1460 CE Adapter)</b>
Test socket A 1460
<ul style="list-style-type: none"> <li>• Continuity (P/S-PE),</li> <li>• Continuity 4wire,</li> <li>• Touch Leakage,</li> <li>• Power.</li> </ul>

### 3.4.3. Flow commands

Flow commands are used to control the flow of measurements. Refer to chapter 3.5 Description of flow commands.

### 3.4.4. Number of measurement steps

Often the same measurement step has to be performed on multiple points on the device under test. It is possible to set how many times a Measurement step will be repeated. All carried out individual Single test results are stored in the Auto Sequence<sup>®</sup> result as if they were programmed as independent measuring steps.

## 3.5. Description of flow commands

Depending on the specific work scope, different lists of flow commands are given. Flow commands are user selectable and can be added to test sequence using drag and drop.

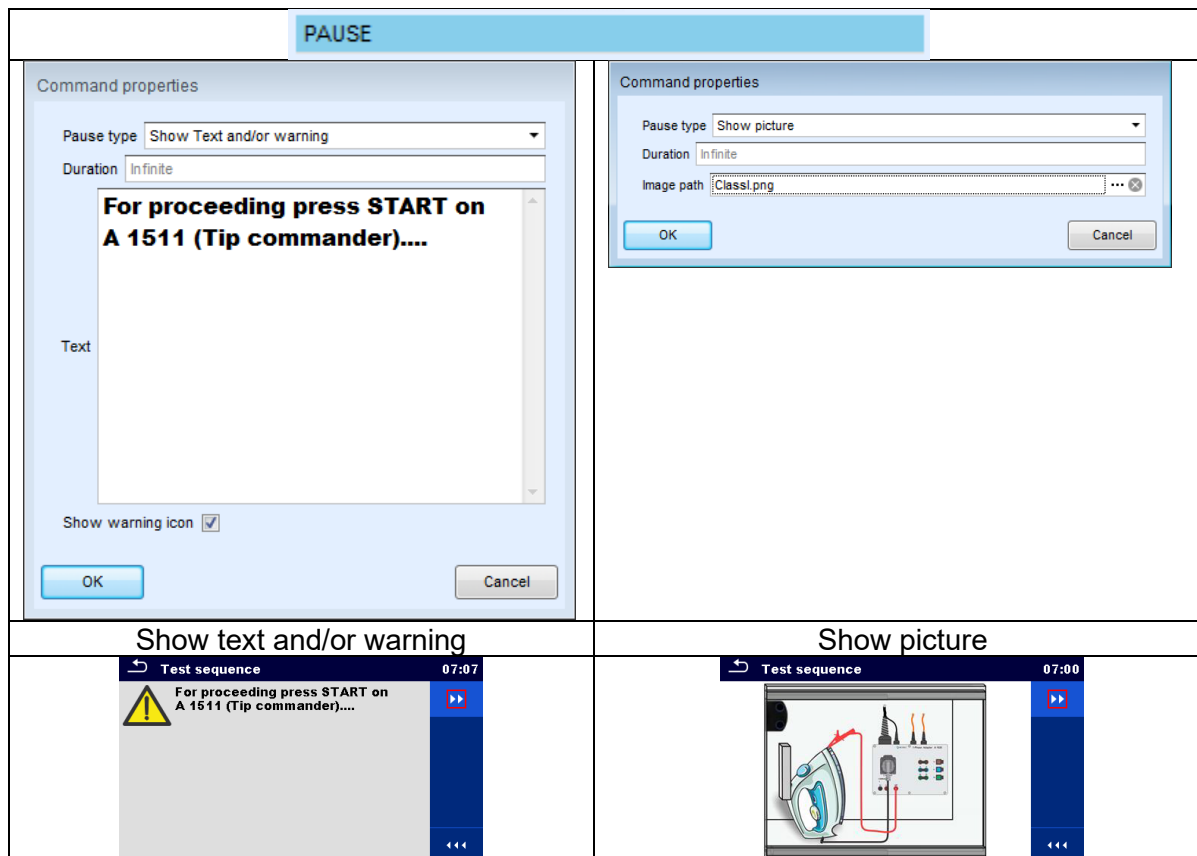
Double click on inserted Flow Command opens menu window, where text or picture can be entered, external signalling and external commands can be activated and parameters can be set.


- Most Flow commands need to switch the state, from inactive to active, for operation.
- Flow command remains active until new (same) Flow command is inserted to Autosequence with the state set to inactive for operation.

Flow Commands	List of flow commands supported in, Work scope: <b>Machine, Switchgear and PAT testing (EU, UK, French, ...)</b>
PAUSE	
OUTPUT STATE	
WAIT INPUT mode	
LAMPS PassFail mode	
LAMPS HV mode	
BUZZER mode	
EXTERNAL OK KEY mode	
NO NOTIFICATION mode	
INSPECTION EXPERT mode	
APPLIANCE INFO	

### 3.5.1. Pause

A Pause command with text message or picture can be inserted anywhere in the measuring steps. Warning icon can be set alone or added to text message. Arbitrary text message can be entered in prepared field Text of menu window.



Pause type	Show text and/or warning ( <input checked="" type="checkbox"/> check to show warning icon) Show picture (  browse for image path)
Duration	Number in seconds, infinite (no entry)

### 3.5.2. Output state

Sets outputs OUT\_1, OUT\_2, OUT\_3, and OUT\_4 on OUTPUT port.

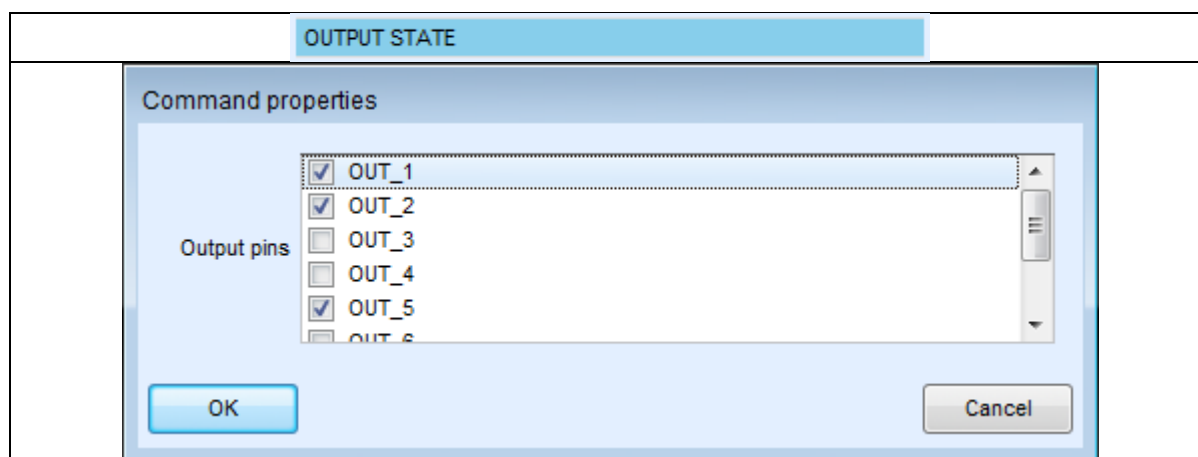
Following settings of this command are ignored:

- OUT\_1 and OUT\_2 while Lamps HV mode is enabled.
- OUT\_3 and OUT\_4 while Lamps Pass / Fail mode is enabled.

All outputs are single normally opened relay contacts if not checked in Menu Output pins window.

Parameters:

<input checked="" type="checkbox"/> OUT_1	Set closed relay contact between OUTPUT pins 4 and 9
<input checked="" type="checkbox"/> OUT_2	Set closed relay contact between OUTPUT pins 3 and 8
<input checked="" type="checkbox"/> OUT_3	Set closed relay contact between OUTPUT pins 2 and 7
<input checked="" type="checkbox"/> OUT_4	Set closed relay contact between OUTPUT pins 1 and 6
<input checked="" type="checkbox"/> OUT_5 <input checked="" type="checkbox"/> OUT_6 <input checked="" type="checkbox"/> OUT_7 <input checked="" type="checkbox"/> OUT_8	Applicable only when using CE Adapter A 1460



### 3.5.3. Wait input mode

Reads input condition on pins IN\_2, IN\_3, IN\_4 and IN\_5 on INPUTS port. Input must be high to proceed with the Auto test.

#### Parameters

State	On – enables Wait input mode; set active INPUTS from Input pins menu
	Off – disables Wait input mode
<input checked="" type="checkbox"/> IN_2	IN_2 reading condition on INPUTS pin 6 is active
<input checked="" type="checkbox"/> IN_3	IN_3 reading condition on INPUTS pin 7 is active
<input checked="" type="checkbox"/> IN_4	IN_4 reading condition on INPUTS pin 8 is active
<input checked="" type="checkbox"/> IN_5	IN_5 reading condition on INPUTS pin 4 is active

### 3.5.4. Lamps Pass / Fail mode

Drives external lamps through OUT\_3 and OUT\_4 outputs.

During measurement the lights reflect status icon in single test.

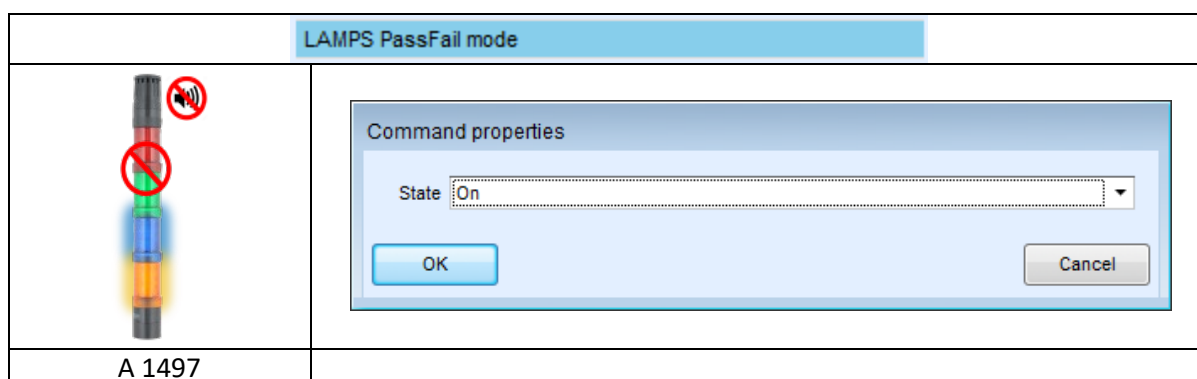
After measurement

- Blue lamp (OUT\_3) lights ON when test has passed. Lamp is lit until next step is started.
- Yellow lamp (OUT\_4) lights ON when test has failed. Lamp is lit until next step is started.
- Lights turn off at the beginning of next step.

While Lamps Pass / Fail mode command is enabled the settings of Drive output command for OUT\_3 and OUT\_4 is ignored.

Parameters

State	On – enables Lamps Pass / Fail mode Off – disables Lamps Pass / Fail mode
-------	--



### 3.5.5. Lamps HV mode

Drives external lamps through OUT\_1 and OUT\_2 outputs. Works only in HV & HV programmable functions.






- Red lamp (OUT\_1) ON means that the instrument is ready for HV test. Red lamp turns on before first flow command in step that contains HV test. Red lamp turns off after end of the HV test.
- Green lamp (OUT\_2) blinking means that high voltage will be applied to WITHSTANDING (HV(~+) and HV(~-)) test terminals as soon as all input conditions will be fulfilled.
- Green lamp (OUT\_2) ON means that dangerous voltage is present at WITHSTANDING (HV(~+) and HV(~-)) test terminals. Green lamp turns on before the measurement and turns off after the measurement.

While Lamps HV mode command is enabled the settings of Drive output command for OUT\_1 and OUT\_2 is ignored.

Parameters

State	On – enables Lamps HV mode Off – disables Lamps HV mode
-------	--



LAMPS HV mode	
	HV AC 
	SINGLE TEST
	OPERATION AFTER END OF TEST
	HV AC programmable 
Works only in HV & HV programmable functions.	
	Command properties
	State: On  OK Cancel
A 1496	

### 3.5.6. Buzzer mode



Passed or failed measurement is indicated with beeps.

- Pass – double beep after the test
- Fail – long beep after the test

Beep happens right after single test measurement.

Parameters

State	On – enables Buzzer mode Off – disables Buzzer mode
-------	--

BUZZER mode	
	Command properties
	State: On  OK Cancel
A 1496	



### 3.5.7. External TEST / OK key mode

Instrument enables external TEST / OK key (OK / ENTER / TEST / HV TEST) by activating INPUT pin 5 reading condition. Functionality of the EXTERNAL OK KEY mode is the same as of the OK / ENTER / TEST / HV TEST key.

Parameters

State	On – enables External TEST / OK key mode (INPUT pin 5 is active)
-------	--

	Off – disables External TEST / OK key mode
--	--

EXTERNAL OK KEY mode	
	<div>Command properties</div> <div>State: <input type="text" value="On"/></div> <div>OK Cancel</div>
A 1511	
	<div>Command properties</div> <div>State: <input type="text" value="On"/></div> <div>OK Cancel</div>
A 1495	

### 3.5.8. No notifications mode

Instrument skips pre-test warnings (for more information see User Manual of specific instrument, chapter “Symbols and messages”).

#### Parameters

State	On – enables No notifications mode Off – disables No notifications mode
-------	--

NO NOTIFICATION mode	
<div>Warning!</div> <div>Resistance L–N is too high(&gt;30 kOhm). Check fuse / switch. Would you like to proceed?</div> <div>YES NO</div>	<div>Command properties</div> <div>State: <input type="text" value="On"/></div> <div>OK Cancel</div>
<div>Warning!</div> <div>Resistance L–N is very low (&lt;10 Ohm). Would you like to proceed?</div> <div>YES NO</div>	<p>Few examples of warnings that will not be displayed on the instrument when using the <b>NO NOTIFICATION mode</b> flow command!!!</p>
<div>Warning!</div> <div>Leakage is high(&gt;3.5 mA). Would you like to proceed?</div> <div>YES NO</div>	

### 3.5.1. Inspection Expert mode

If Inspection Expert mode flow command is set, the Visual inspection screen and Functional inspection screen within Auto Sequence® are displayed for 1 second and an overall PASS is automatically applied at the end of test. In between, the automatic procedure can be stopped and statuses can be applied manually.

Inspection Expert mode is disabled by default.

#### Parameters

State	On – enables automatic settings of tickers in Visual and Functional tests. Off – disables automatic settings of tickers in Visual and Functional tests.
-------	--

The screenshot displays the 'INSPECTION EXPERT mode' interface. On the left, there are two inspection panels. The top panel, 'Visual VDE 0701-0702', lists items like 'no damage or contamination', 'cables and connectors are appropriate', 'condition of mains plug, mains connectors and conductors', 'no defect of bending', and 'no defect of mains lead cleat'. The bottom panel, 'Functional VDE 0701-0702', lists 'essential functions are working properly' and 'safety related parts'. To the right, a 'Command properties' dialog box is open, showing the 'State' set to 'On' with 'OK' and 'Cancel' buttons.

### 3.5.2. Appliance info

Instrument enables to automatically add the appliance name to the Auto Sequence®.

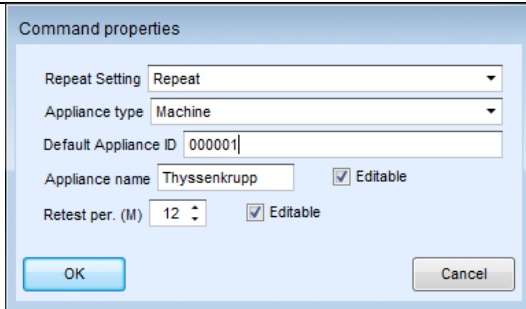
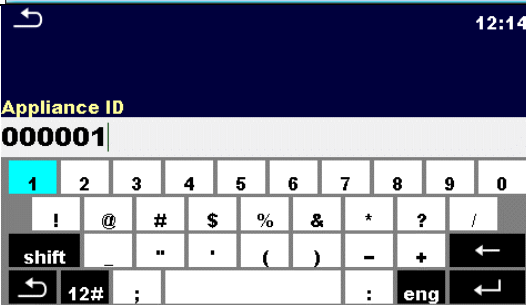
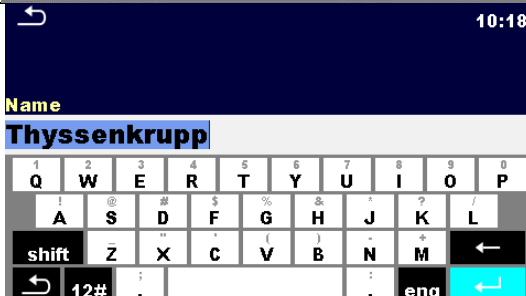
#### Parameters

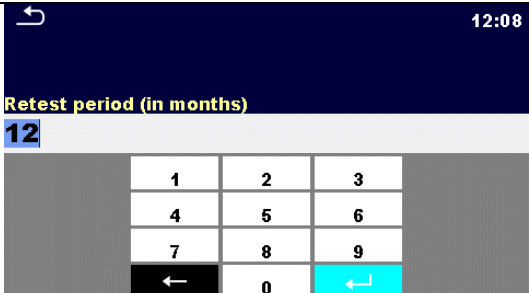
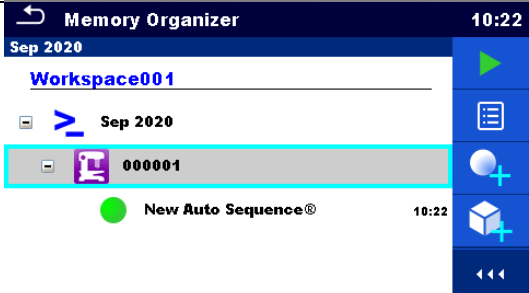
Repeat Setting	Repeat:	The same Appliance ID will be offered each time if the same Auto Sequence® is carried out successively in a loop.
	Increment:	A four digit number will be added to the Appliance ID and incremented each time if the same Auto Sequence® is carried out successively in a loop.
Appliance type	Selects the type of the appliance (Appliance, Appliance_FD, Welding equip., Welding equip_FD., Machine, Switchgear, EVSE)	
Default Appliance ID	Enter default Appliance ID	
Appliance name	Enter Appliance name. Options: <input checked="" type="checkbox"/> Editable – allows Appliance name to be modified while running Auto Sequence®. Menu with a list of Appliance	

	<p>names and possibility to enter custom Appliance name is offered within the test.</p> <p><input type="checkbox"/> Not editable – Default Appliance name is used. Appliance name cannot be modified while running Auto Sequence®.</p>
Retest period	<p>Retest period in months.</p> <p>Options:</p> <p><input checked="" type="checkbox"/> Editable – allows Retest period to be modified while running Auto Sequence®. Numeric keypad for entering custom Retest period is offered within the test.</p> <p><input type="checkbox"/> Not editable – Default Retest period is used. Retest period cannot be modified while running Auto Sequence®.</p>

### Note

- This flow command is active only if Auto Sequence® is started from the Auto Sequences® Main menu.

APPLIANCE INFO		
Appliance info flow command enables following options on the instrument.		
Entering Default appliance ID		
Entering appliance name		

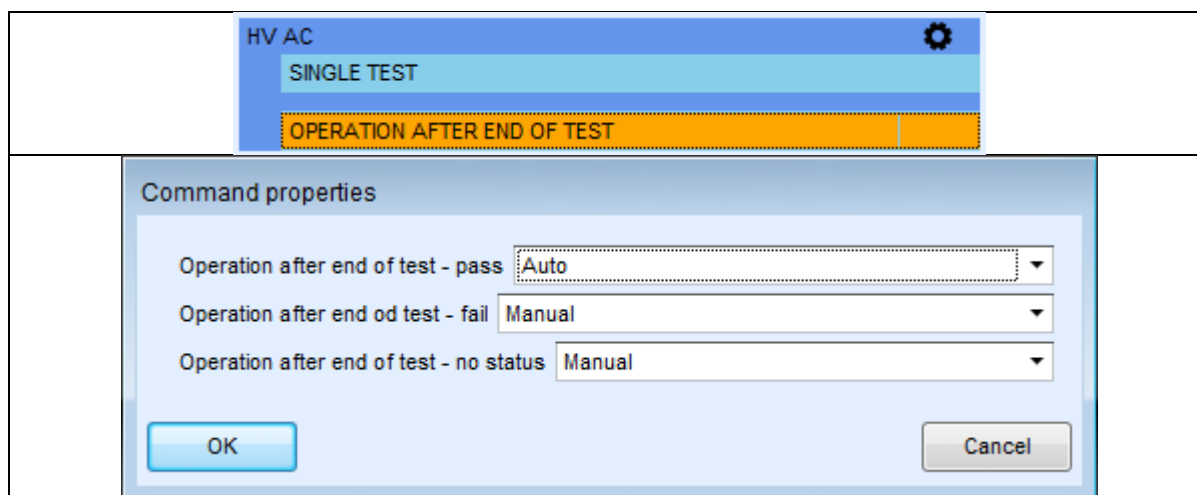
Entering Retest period (in months)		
Automatic generation of Selected Appliance type in the structure		

### 3.5.3. Operation after end of test

This flow command controls the proceeding of the Auto Sequence® in regard to the measurement results.

#### Parameters

Operation after end of test – pass – fail – no status	The operation can be individually set for the case the measurement passed, failed or ended without a status.	
	Manual:	The test sequence stops and waits for appropriate command (TEST key, external command...) to proceed.
	Auto:	The test sequence automatically proceeds.



### 3.5.4. Result screen

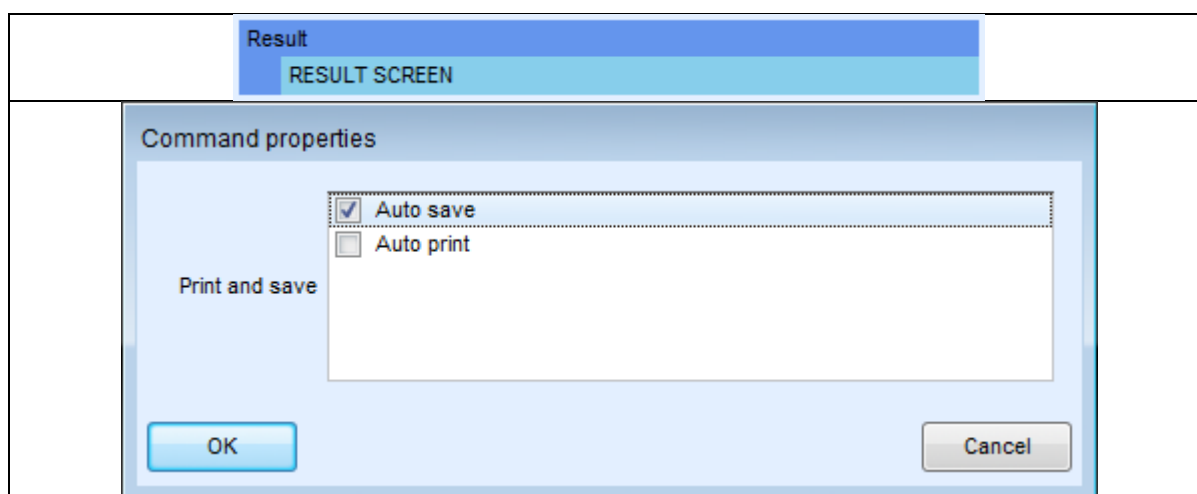
This flow command controls the proceeding after the Auto Sequence® has ended.

#### Parameters

Auto Save	<p>Auto Sequence® results are stored in the momentary workspace.</p> <p>A new Node with the month and year will be created. Under the Node Auto Sequence® results or (if Appliance info flow command is set) a new appliance and Auto Sequence® results will be stored.</p> <p>Up to 100 Auto Sequence® results or appliances can be automatically stored under the same node. If more results / appliances are available, they are split to multiple nodes.</p> <p>Local Save Flow setting is disabled by default.</p>
Auto Print	Auto Sequence® results are automatically printed.

#### Notes

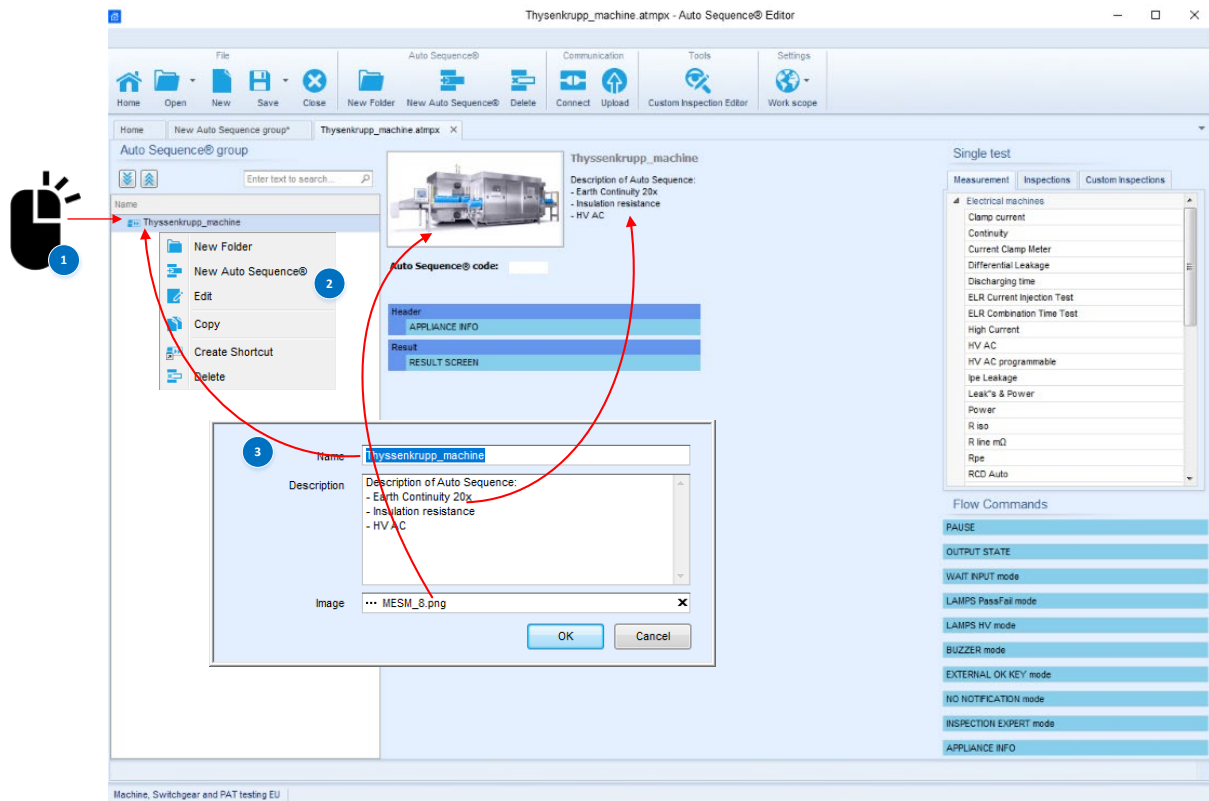
- This flow command is active only if Auto Sequence® is started from the Auto Sequences® Main menu (not from Memory organizer).



## 4. Manage sequence step by step

### 4.1. Editing test sequence parameters

Each test sequence can be custom named, equipped with description and image.

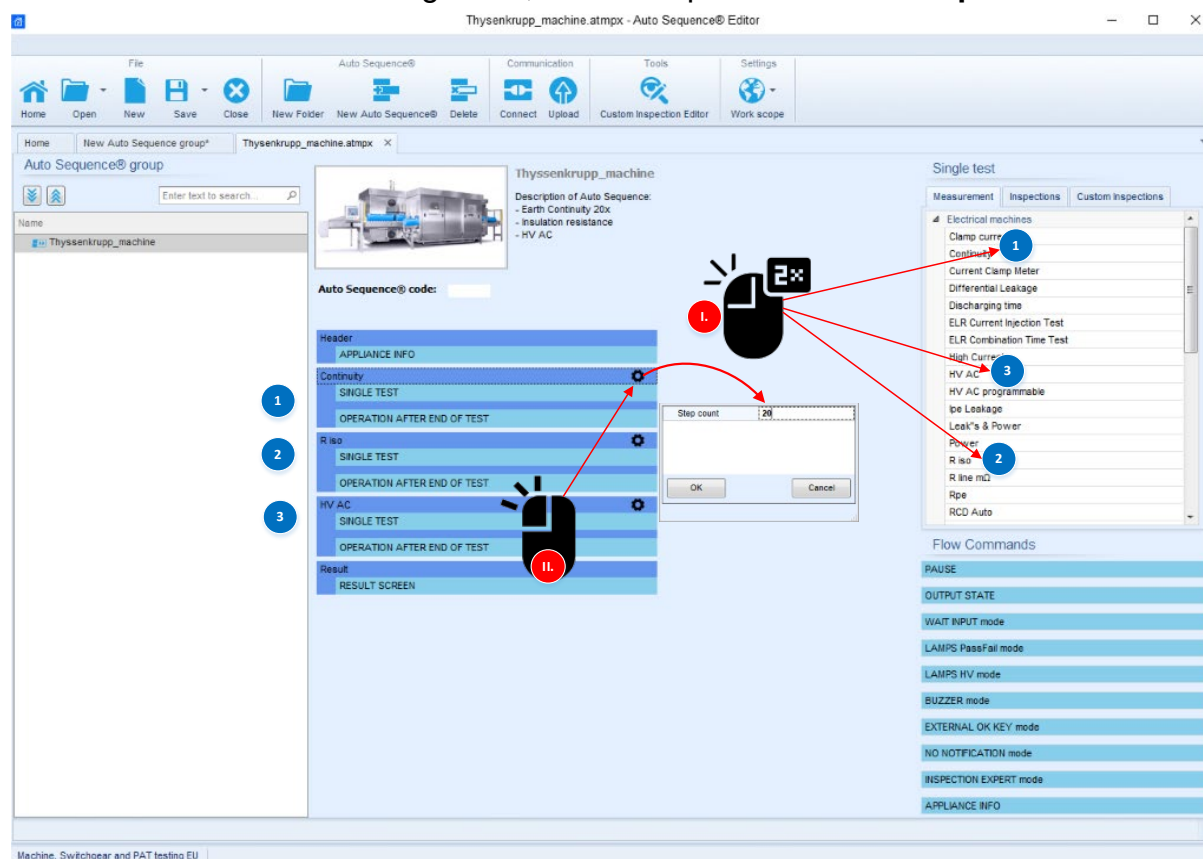


## 4.2. Adding and editing measurements

From the list of available single tests;

- measurements,
- inspections or,
- custom inspections can be added to the sequence structure.

Number of individual measurements is not limited, measurements order is not specified, these enables creation of arbitrary test sequence. Step count can be defined for each individual single test, limit of steps is set to **999 steps**.

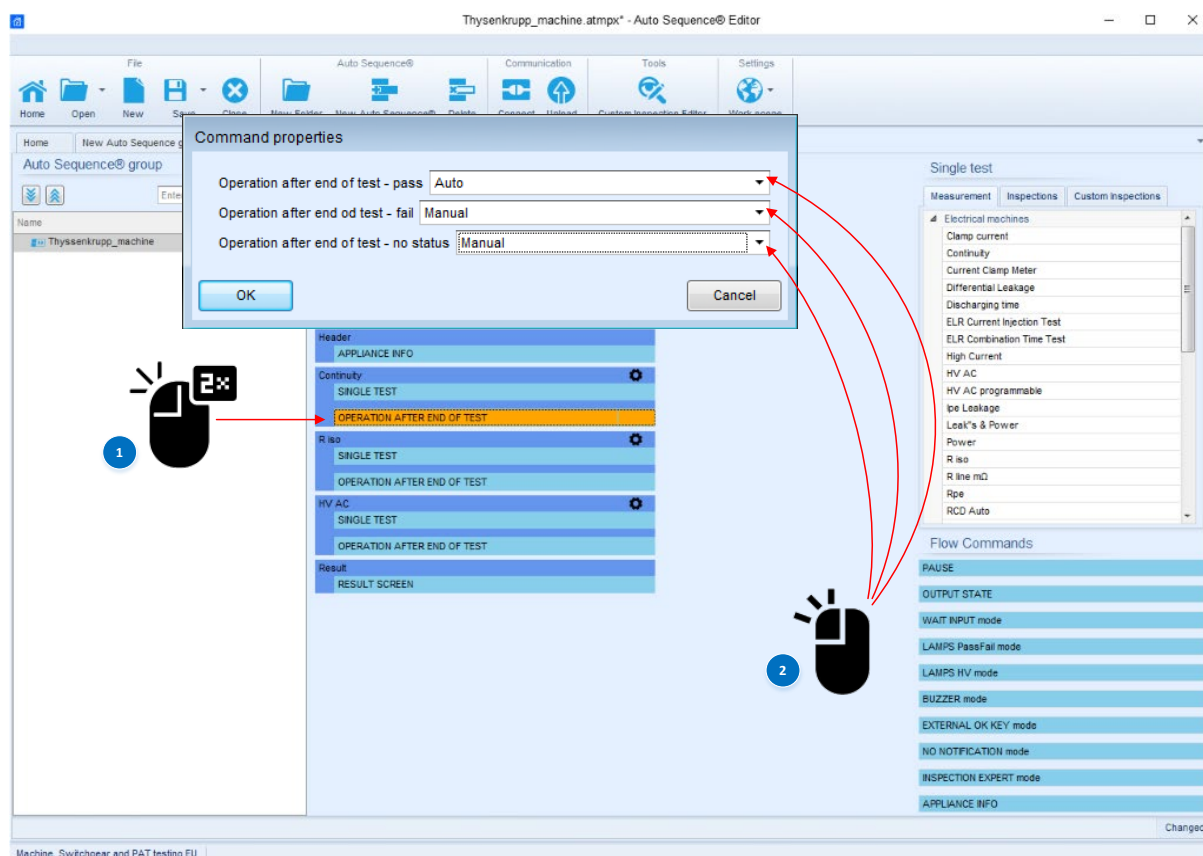


Each individual single test has several editable parameters, depending on the specifics of the test:

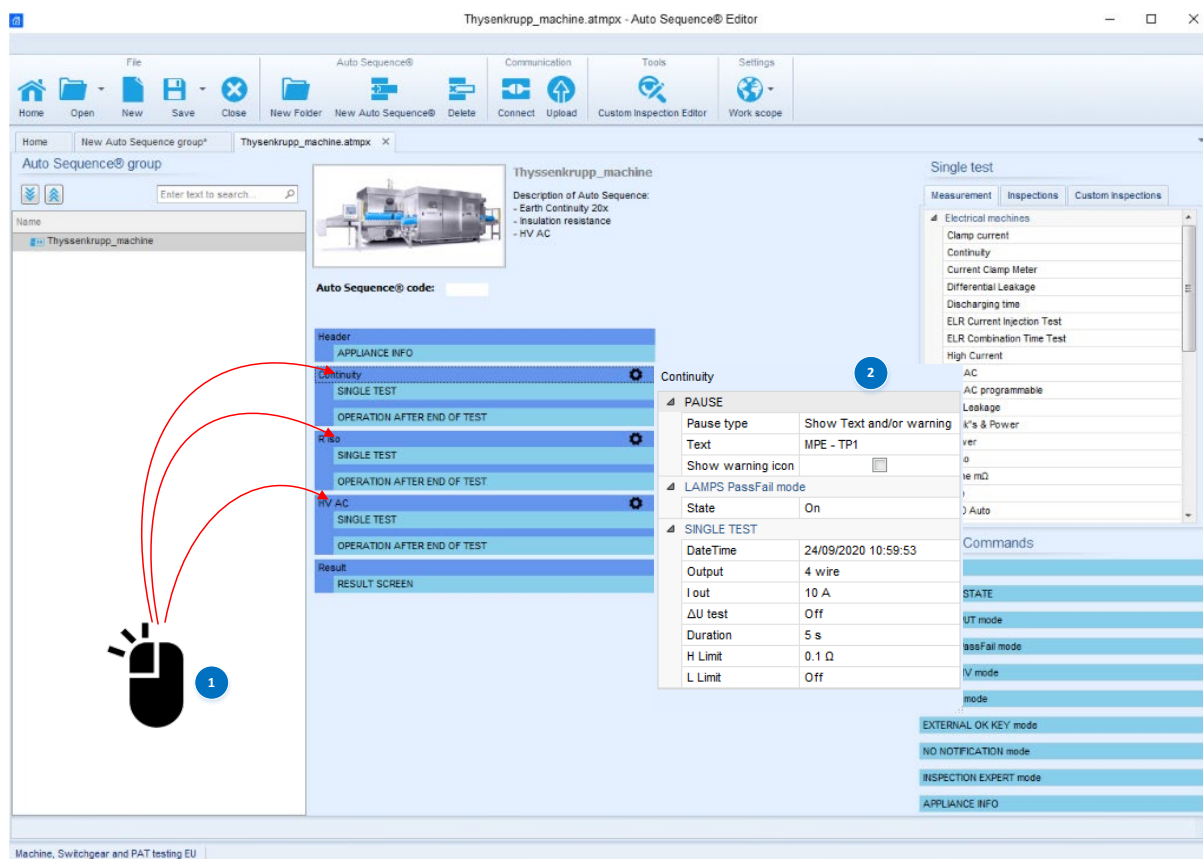
- Outputs,
- Types of measurement,
- Duration,
- Limits (High & Low),
- Comments, etc., can be set.







A quick overview of set parameters is possible by clicking on the header of a specific test.



## 5. Examples of Auto Sequences

The Auto Sequence® consists of a sequence of individual tests. The progress of individual tests can be controlled using flow commands. The MultiServicerXD instrument enables the execution of individual tests via various test terminals. Performing test sequences via different test terminals is often not the most appropriate solution from an application point of view. Various active adapters are available to perform integrated test sequences via a common test terminal. One such is the CE Adapter A 1460.

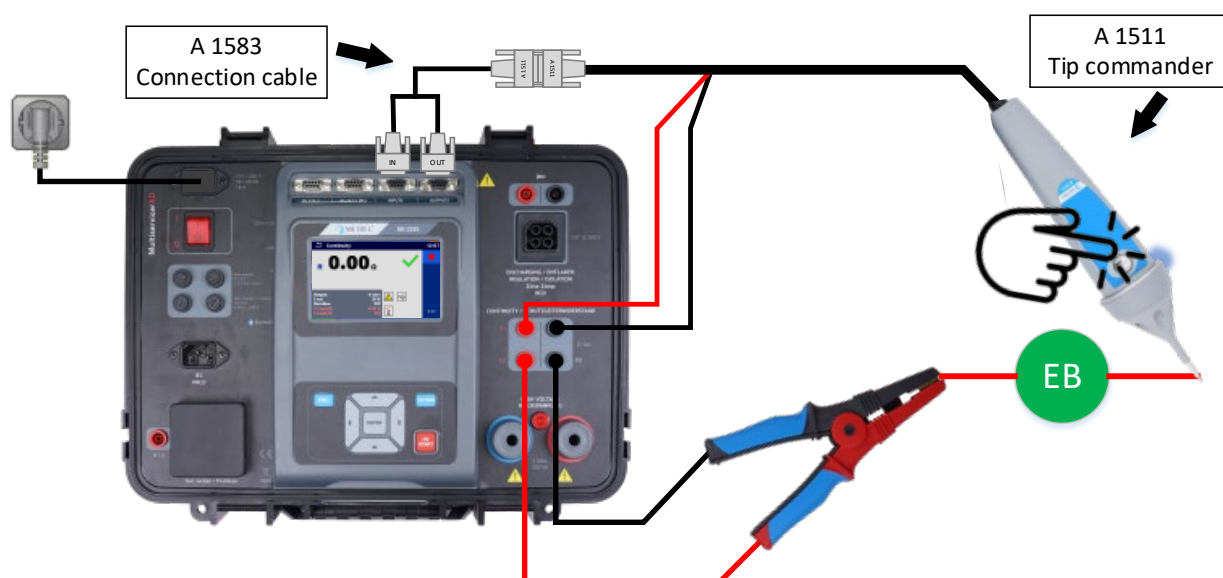
The following sections will show possible execution of test sequences with and without the use of active adapters. It will also be shown how optional accessories controlled by the flow commands can be connected and used.

### 5.1. How to enable remote start with optional A 1511 (Using Auto Sequences)

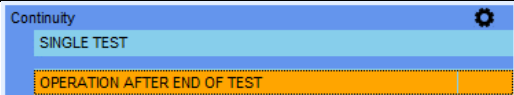
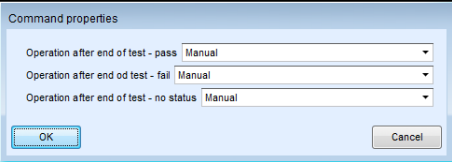
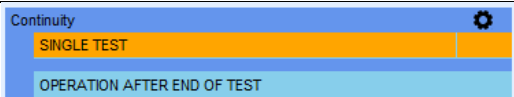
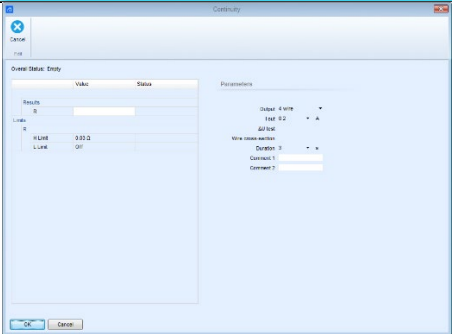
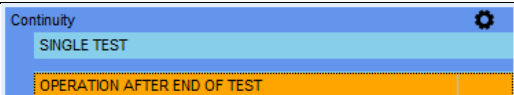
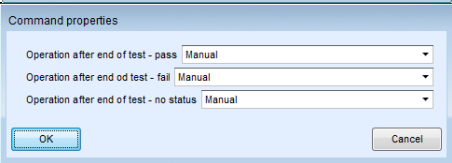

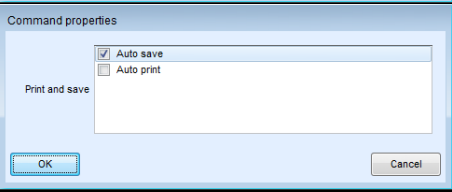
The instrument supports many different optional accessories, one of the more useful ones is certainly the A 1511 Tip commander. In following case Tip commander will be used for remote controlled execution of 4-wire Continuity test and indication of PASS / FAIL status of the measurement with commander's indication LED's.

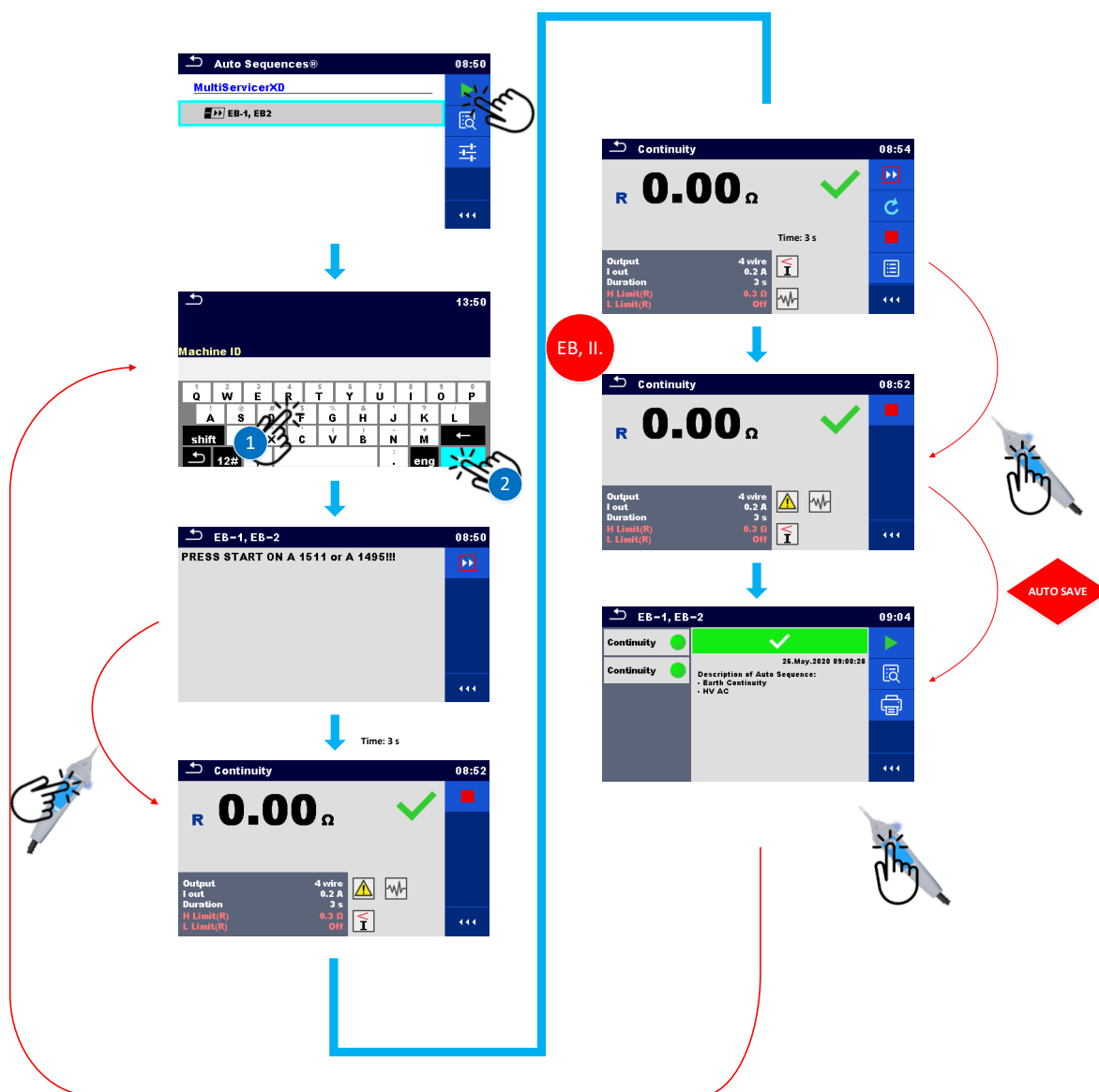
In the following steps it will be shown:

- How to enable remote control with A 1511, using flow commands:
  - o >EXTERNAL OK KEY mode<
  - o >LAMPS PassFail mode<
- Use of flow command >PAUSE<
- Use of flow command >APPLIANCE INFO<
- Execution of 4-wire Earth continuity (EB)
- How to enable Auto save

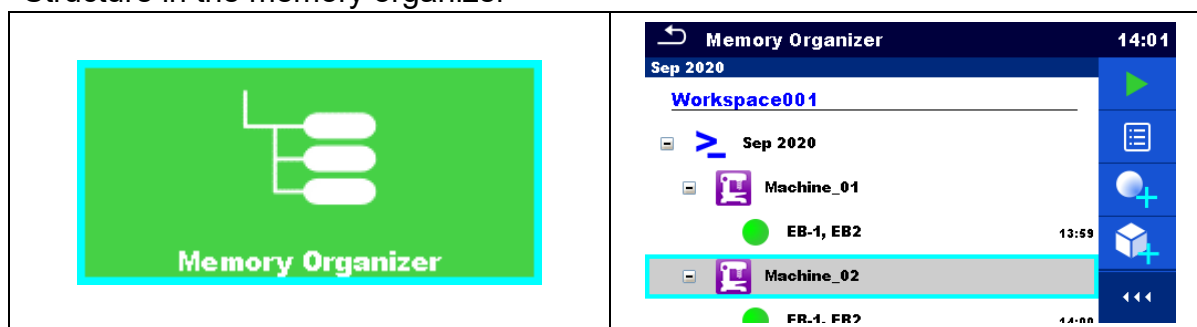






## Structure in the memory organizer

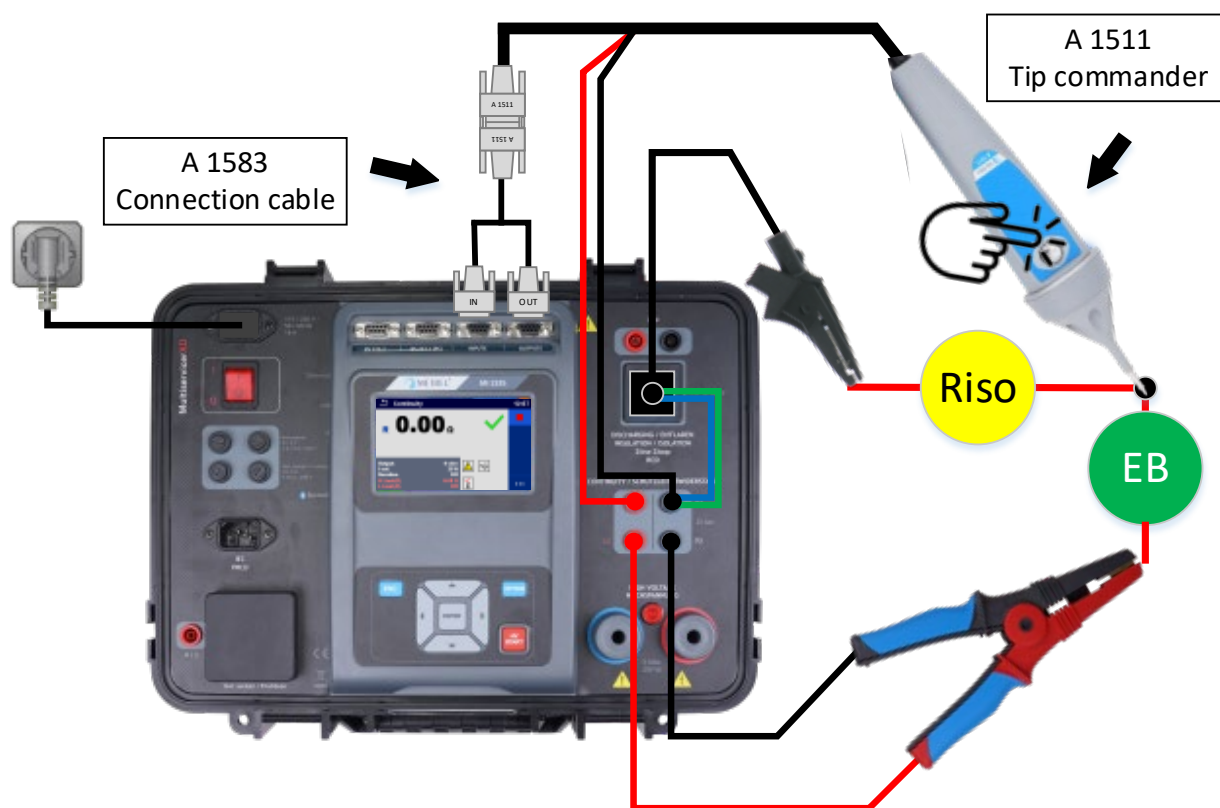


## 5.2. How to execute Earth continuity and Insulation resistance test using optional A 1511

The following example will show how to prepare a test sequence that will allow a specific test step to be repeated within a loop. If it is not necessary to set specific limits for each subsequent test step, this setting saves time when configuring the test sequence. In addition to setting the test sequence itself, it will also be shown how to set the connection of test accessories for the execution of the Earth continuity test and Insulation resistance using A 1511(an external Tip commander).

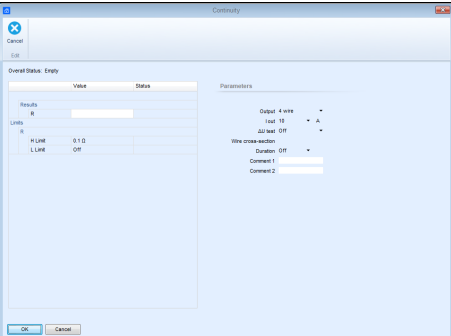
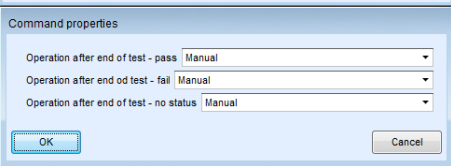
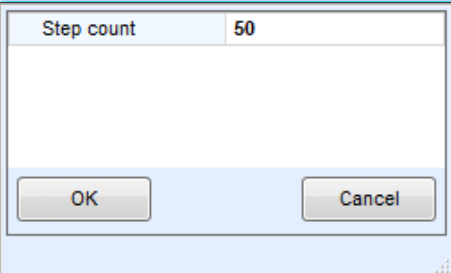
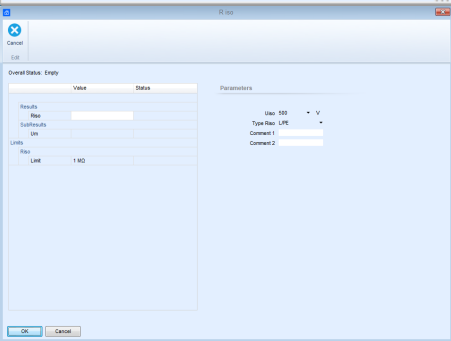
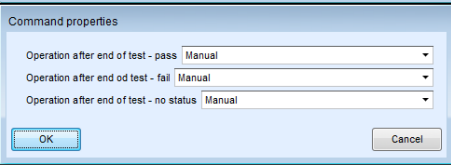
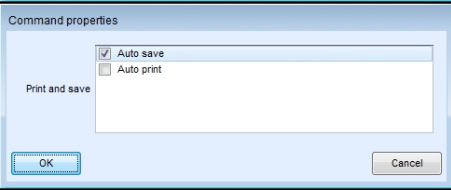
In the following steps it will be shown:

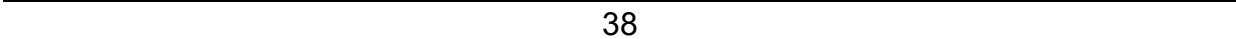
- How to connect test leads & A 1511 for remote control of (EB & Riso functions)
- Execution of 4-W Earth continuity test (EB), >sequence of 50-test steps<
- Execution of Insulation resistance test (Riso), >sequence of 50-test steps<
- How to enable A 1511, using flow commands:
  - o >EXTERNAL OK KEY mode<
  - o >LAMPS PassFail mode<
- Use of flow command >PAUSE<
- Use of flow command >APPLIANCE INFO<
- How to set test Loop within single test
- How to enable Auto save



	<div>Header</div> <div>APPLIANCE INFO</div> <div>EXTERNAL OK KEY mode</div> <div>LAMPS PassFail mode</div> <div>PAUSE</div> <div>Continuity</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> <div>R iso</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> <div>Result</div> <div>RESULT SCREEN</div>	
<div>Header</div> <div>APPLIANCE INFO</div> <div>EXTERNAL OK KEY mode</div> <div>LAMPS PassFail mode</div> <div>PAUSE</div>	<div>Command properties</div> <div>Repeat Setting Repeat</div> <div>Appliance type Machine</div> <div>Default Appliance ID</div> <div>Appliance name Editable</div> <div>Retest per. (M) 0 Editable</div> <div>OK</div> <div>Cancel</div>	
<div>Header</div> <div>APPLIANCE INFO</div> <div>EXTERNAL OK KEY mode</div> <div>LAMPS PassFail mode</div> <div>PAUSE</div>	<div>Command properties</div> <div>State On</div> <div>OK</div> <div>Cancel</div>	
<div>Header</div> <div>APPLIANCE INFO</div> <div>EXTERNAL OK KEY mode</div> <div>LAMPS PassFail mode</div> <div>PAUSE</div>	<div>Command properties</div> <div>State On</div> <div>OK</div> <div>Cancel</div>	
<div>Header</div> <div>APPLIANCE INFO</div> <div>EXTERNAL OK KEY mode</div> <div>LAMPS PassFail mode</div> <div>PAUSE</div>	<div>Command properties</div> <div>Pause type Show Text and/or warning</div> <div>Duration Infinite</div> <div>Next test Earth Continuity. Press, Start on A 1511.</div> <div>Text</div> <div>Show warning icon</div> <div>OK</div> <div>Cancel</div>	
<div>Continuity</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	<div>Step count 50</div> <div>OK</div> <div>Cancel</div>	



<p>Continuity</p> <p>SINGLE TEST</p> <p>OPERATION AFTER END OF TEST</p>	 <p>Continuity dialog box showing Overall Status, Empty, Value, Status, Parameters, Results, and OK/Cancel buttons.</p>
<p>Continuity</p> <p>SINGLE TEST</p> <p>OPERATION AFTER END OF TEST</p>	 <p>Command properties dialog box showing Operation after end of test - pass, Operation after end of test - fail, and Operation after end of test - no status, all set to Manual. Includes OK/Cancel buttons.</p>
<p>R iso</p> <p>PAUSE</p> <p>SINGLE TEST</p> <p>OPERATION AFTER END OF TEST</p>	 <p>Step count dialog box showing Step count 50. Includes OK/Cancel buttons.</p>
<p>R iso</p> <p>SINGLE TEST</p> <p>OPERATION AFTER END OF TEST</p>	 <p>R iso dialog box showing Overall Status, Empty, Value, Status, Parameters, Results, and OK/Cancel buttons.</p>
<p>R iso</p> <p>SINGLE TEST</p> <p>OPERATION AFTER END OF TEST</p>	 <p>Command properties dialog box showing Operation after end of test - pass, Operation after end of test - fail, and Operation after end of test - no status, all set to Manual. Includes OK/Cancel buttons.</p>
<p>Result</p> <p>RESULT SCREEN</p>	 <p>Command properties dialog box showing Auto save and Auto print checkboxes, and a Print and save text area. Includes OK/Cancel buttons.</p>

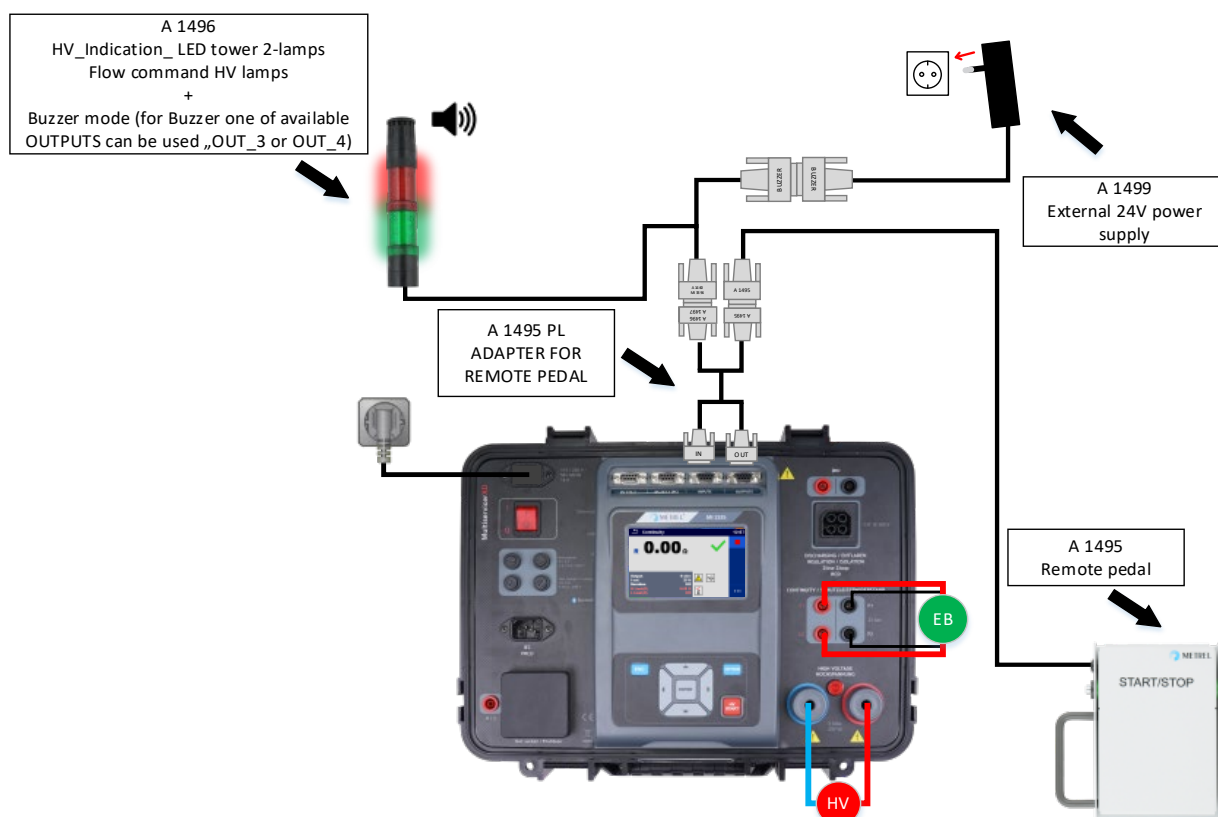


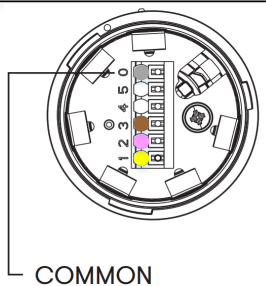

### 5.3. How to enable HV lamps & Buzzer

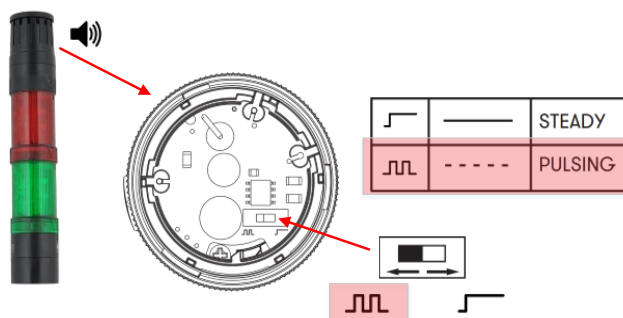
The MI 3325 instrument is intended, among other things, for performing high-voltage tests. With the correct configuration of the test sequence, and the correctly set / connected optional accessories, it is possible to enable the external signal lights required when performing the HV test. The following example will show how to prepare a test sequence that will enable HV lamps & remote start of a test sequence over the remote pedal.

In the following steps it will be shown:

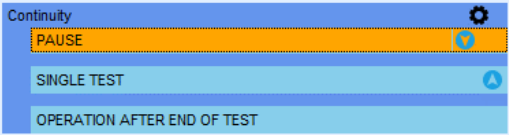
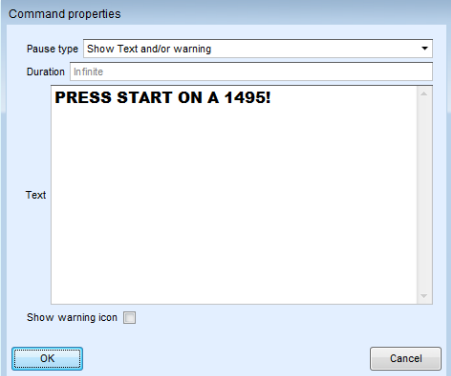
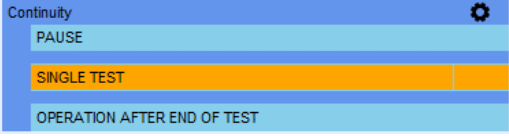
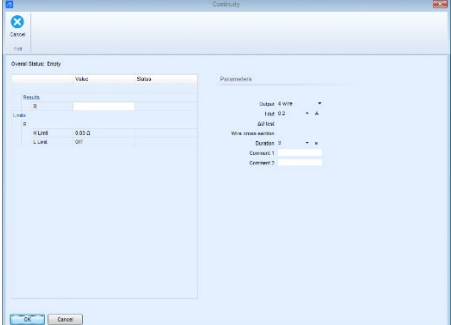
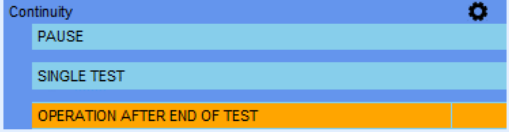
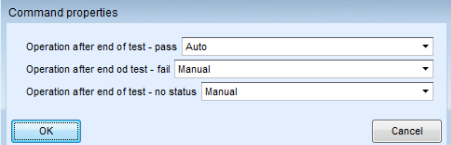
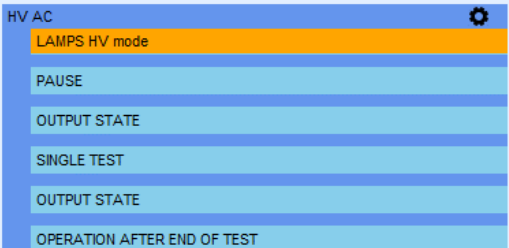
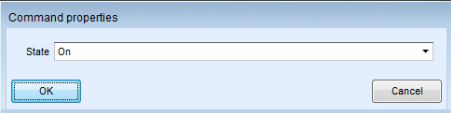
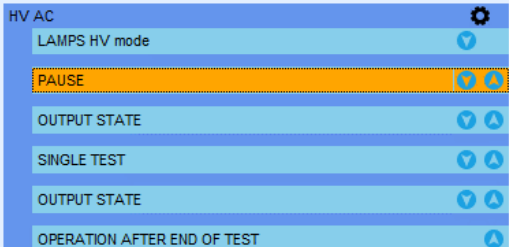
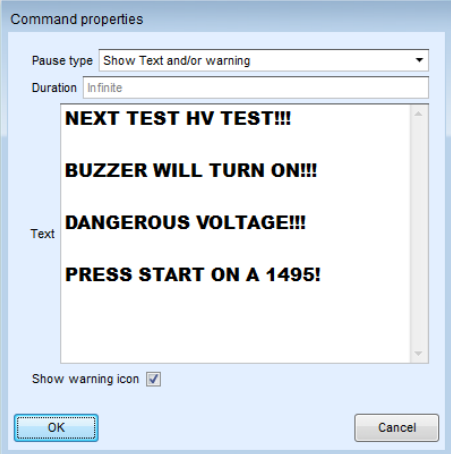
- How to connect and enable HV lamps, using flow command
  - o LAMPS HV mode
- How to connect and enable/disable buzzer, using flow command
  - o OUTPUT STATE
- How to connect and enable remot control with pedal, using flow command
  - o >EXTERNAL OK KEY mode<
- Use of flow command >PAUSE<
- Execution of 4-W Earth continuity test (EB)
- Execution of High voltage test (HV)
- How t manually save results into Memory Organizer

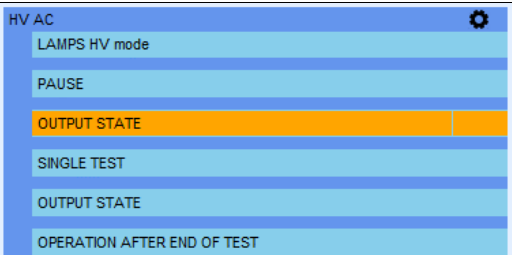
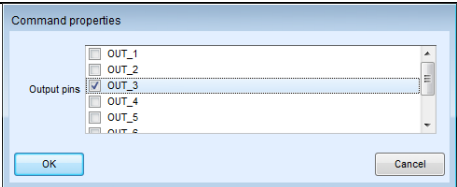
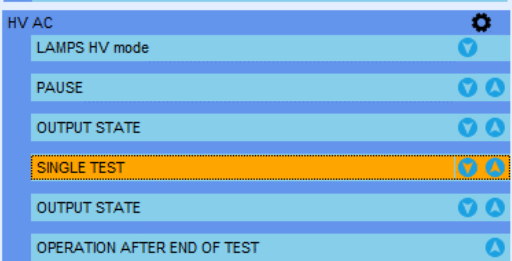
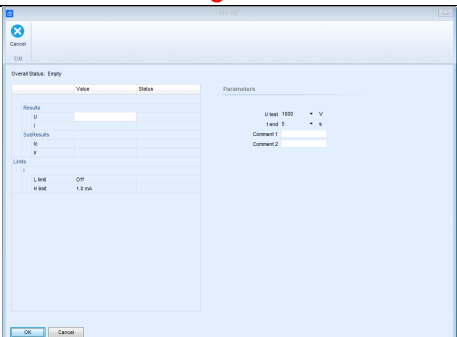
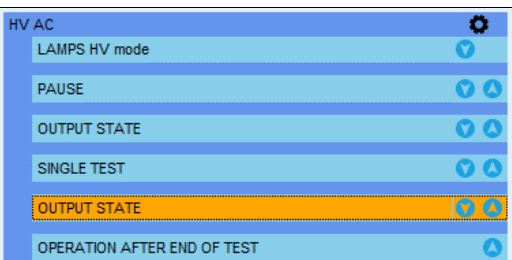
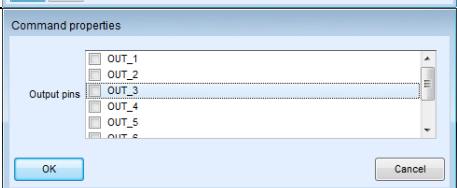
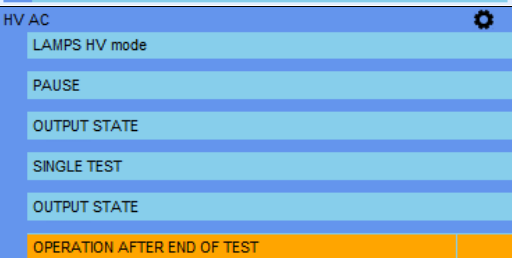
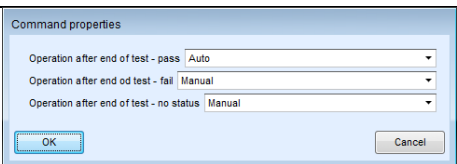

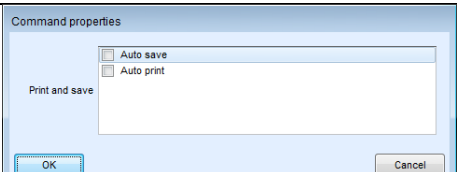


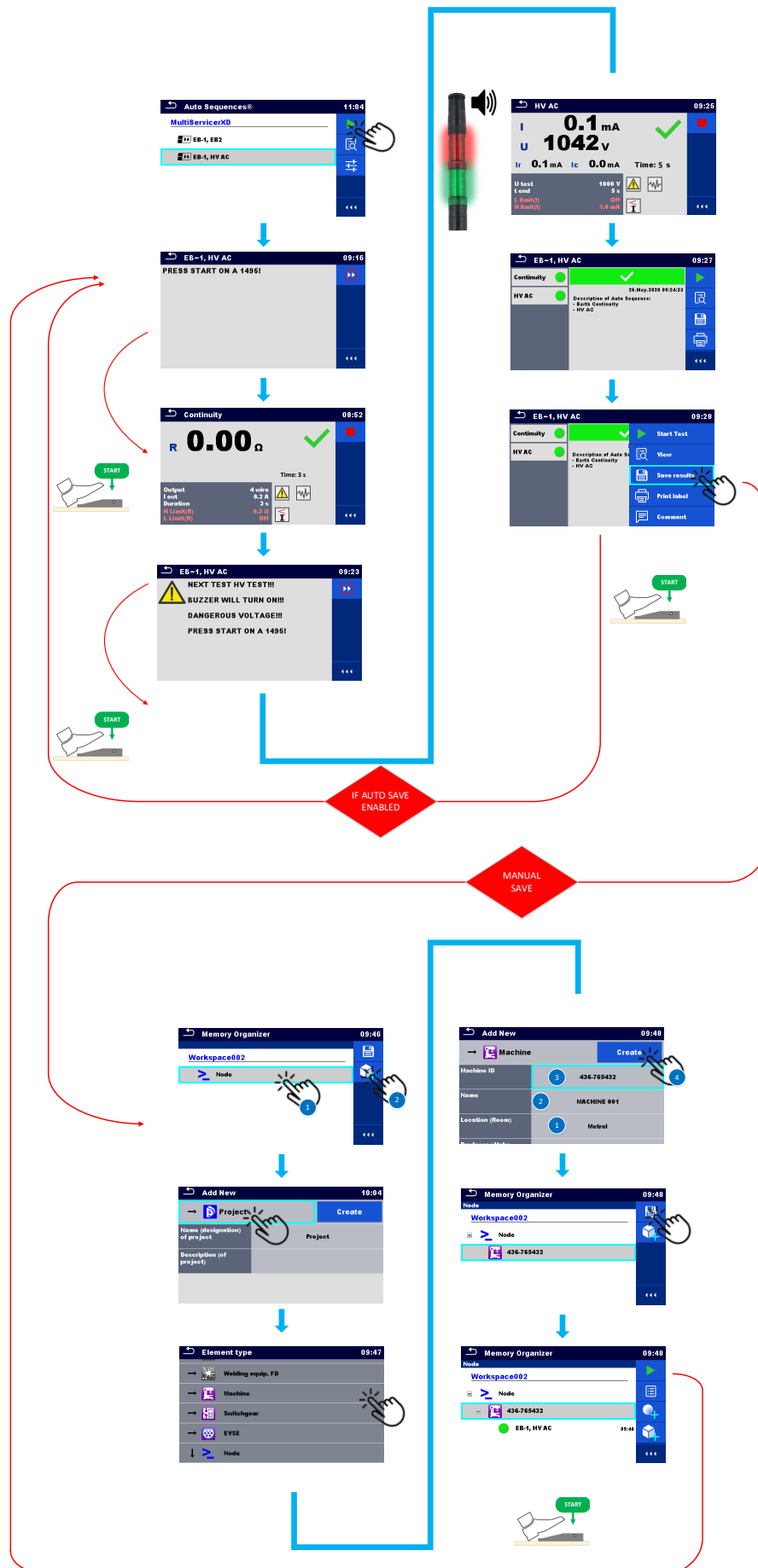
	
Signal tower connetor	RS232 communication cable
<b>Enabling HV lamps &amp; buzzer on A 1496</b>	
<b>LED TOWER (PIN CONNECTOR)</b>	<b>RS232 CABLE</b>
GND (0)	Gray / Grau
/ (5)	/
/ (4)	/
Buzzer (3)	Brown / Braun (Output 3) or White / Weiß (Output 4)
Red LED (2)	Pink / Rosa
Green LED (1)	Yellow / Gelb



	<div>Header</div> <div>EXTERNAL OK KEY mode</div> <div>Continuity</div> <div>PAUSE</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> <div>HV AC</div> <div>LAMPS HV mode</div> <div>PAUSE</div> <div>OUTPUT STATE</div> <div>SINGLE TEST</div> <div>OUTPUT STATE</div> <div>OPERATION AFTER END OF TEST</div> <div>Result</div> <div>RESULT SCREEN</div>	
<div>Header</div> <div>EXTERNAL OK KEY mode</div>	<div>Command properties</div> <div>State On</div> <div>OK</div> <div>Cancel</div>	

	 <p>Enabling buzzer!!!</p>
	
	 <p>Disabling buzzer!!!</p>
	
	

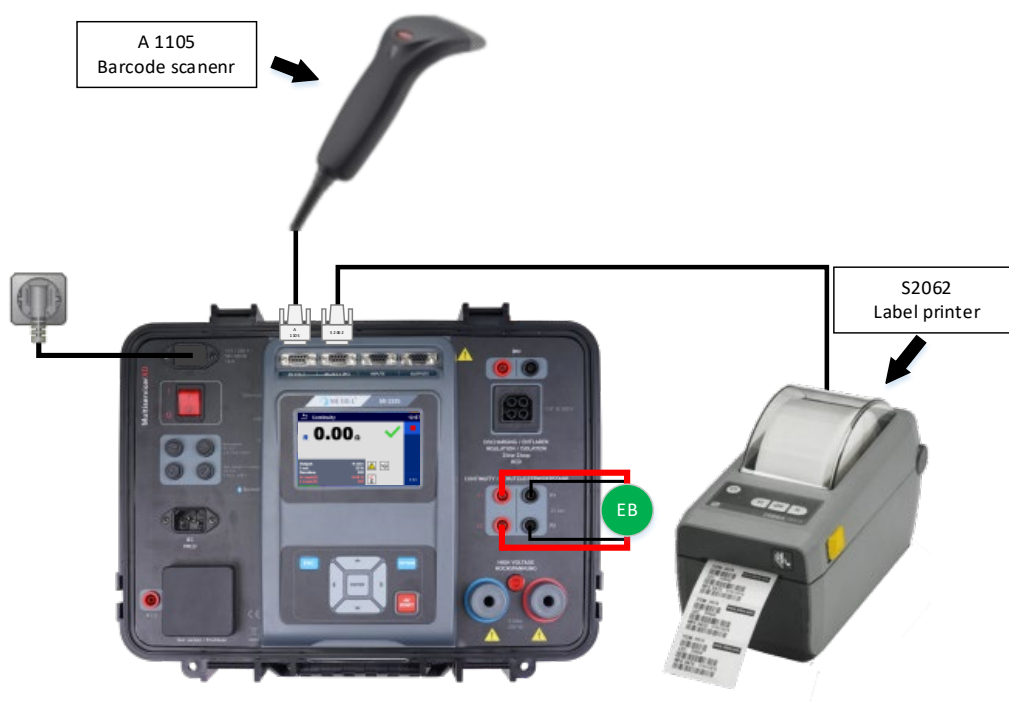


## 5.4. How to enable barcode reader and auto print

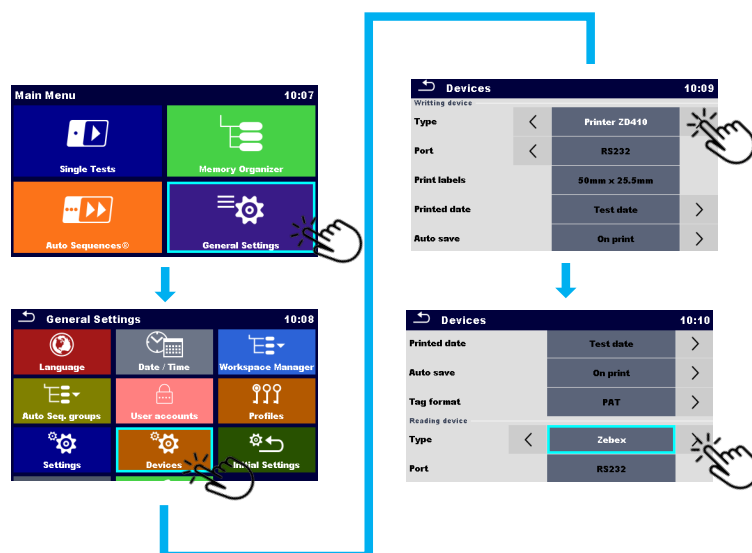
One of the instrument's strong features is the support of optional peripheral devices such as reading and writing devices. The following example will show how to prepare a test sequence that will enable HV lamps & remote start of a test sequence over the remote pedal.

In the following steps it will be shown:

- How to Setup, barcode printer & Barcode scanner
- How to connect and enable Barcode scanner, using flow command
  - o APPLIANCE INFO
- Execution of 4-W Earth continuity test (EB)
- How to enable auto save, using command
  - o Auto save
- How to connect and enable barcode printer, using command
  - o Auto print

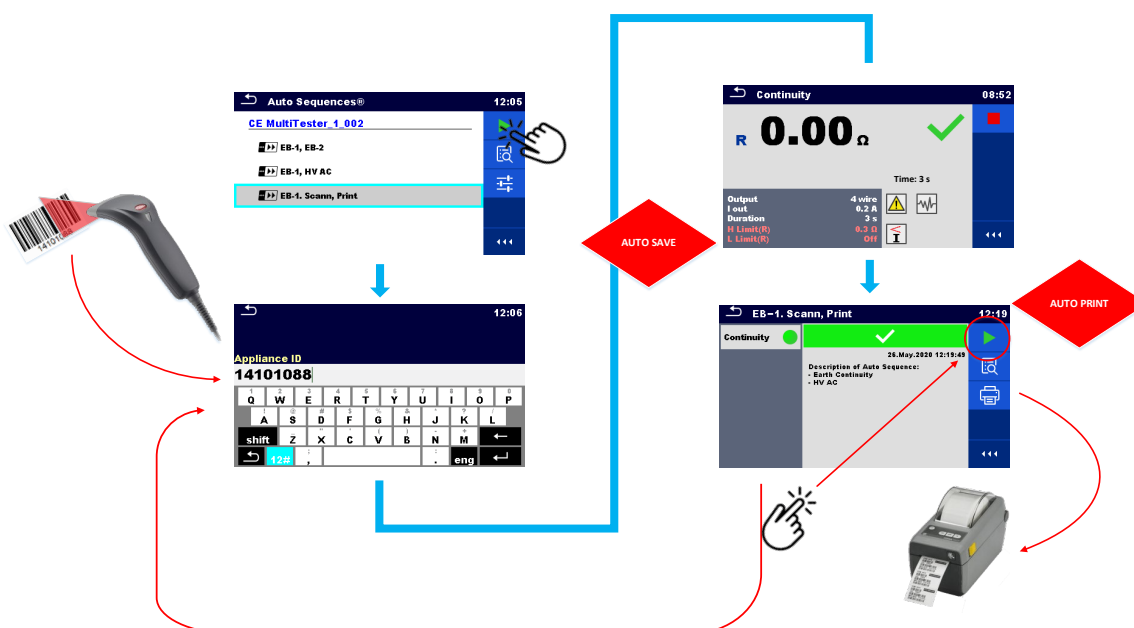




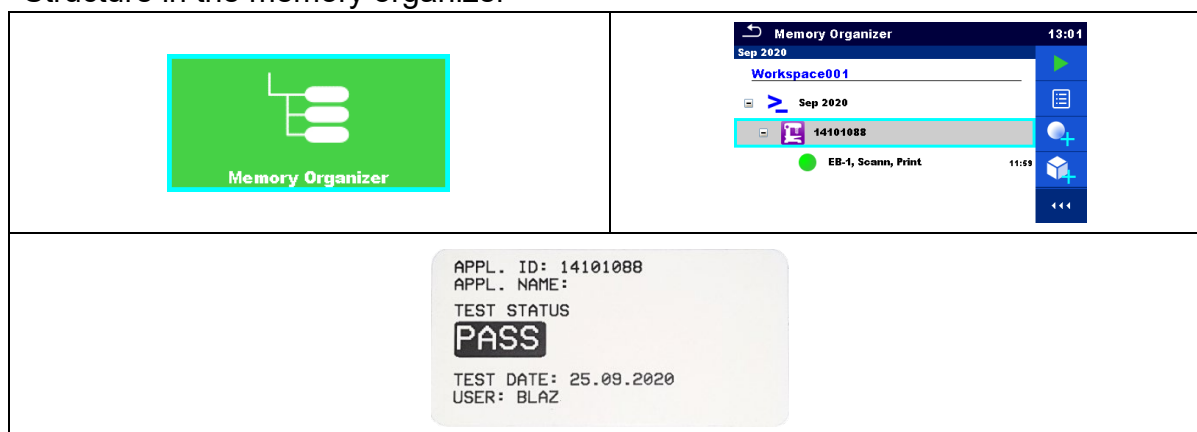


Setup of reading and witing devices

	<p>Header</p> <p>APPLIANCE INFO</p> <p>Continuity</p> <p>SINGLE TEST</p> <p>OPERATION AFTER END OF TEST</p> <p>Result</p> <p>RESULT SCREEN</p>	
<p>Header</p> <p>APPLIANCE INFO</p>		<p>Command properties</p> <p>Repeat Setting Repeat</p> <p>Appliance type Machine</p> <p>Default Appliance ID</p> <p>Appliance name Editable</p> <p>Retest per. (M) 0 Editable</p> <p>OK Cancel</p>
<p>Continuity</p> <p>SINGLE TEST</p> <p>OPERATION AFTER END OF TEST</p>		<p>Continuity</p> <p>Overhaul Status: Empty</p> <p>Results</p> <p>Line 1</p> <p>Line 2</p> <p>Line 3</p> <p>Line 4</p> <p>Line 5</p> <p>Line 6</p> <p>Line 7</p> <p>Line 8</p> <p>Line 9</p> <p>Line 10</p> <p>Line 11</p> <p>Line 12</p> <p>Line 13</p> <p>Line 14</p> <p>Line 15</p> <p>Line 16</p> <p>Line 17</p> <p>Line 18</p> <p>Line 19</p> <p>Line 20</p> <p>Line 21</p> <p>Line 22</p> <p>Line 23</p> <p>Line 24</p> <p>Line 25</p> <p>Line 26</p> <p>Line 27</p> <p>Line 28</p> <p>Line 29</p> <p>Line 30</p> <p>Line 31</p> <p>Line 32</p> <p>Line 33</p> <p>Line 34</p> <p>Line 35</p> <p>Line 36</p> <p>Line 37</p> <p>Line 38</p> <p>Line 39</p> <p>Line 40</p> <p>Line 41</p> <p>Line 42</p> <p>Line 43</p> <p>Line 44</p> <p>Line 45</p> <p>Line 46</p> <p>Line 47</p> <p>Line 48</p> <p>Line 49</p> <p>Line 50</p> <p>Line 51</p> <p>Line 52</p> <p>Line 53</p> <p>Line 54</p> <p>Line 55</p> <p>Line 56</p> <p>Line 57</p> <p>Line 58</p> <p>Line 59</p> <p>Line 60</p> <p>Line 61</p> <p>Line 62</p> <p>Line 63</p> <p>Line 64</p> <p>Line 65</p> <p>Line 66</p> <p>Line 67</p> <p>Line 68</p> <p>Line 69</p> <p>Line 70</p> <p>Line 71</p> <p>Line 72</p> <p>Line 73</p> <p>Line 74</p> <p>Line 75</p> <p>Line 76</p> <p>Line 77</p> <p>Line 78</p> <p>Line 79</p> <p>Line 80</p> <p>Line 81</p> <p>Line 82</p> <p>Line 83</p> <p>Line 84</p> <p>Line 85</p> <p>Line 86</p> <p>Line 87</p> <p>Line 88</p> <p>Line 89</p> <p>Line 90</p> <p>Line 91</p> <p>Line 92</p> <p>Line 93</p> <p>Line 94</p> <p>Line 95</p> <p>Line 96</p> <p>Line 97</p> <p>Line 98</p> <p>Line 99</p> <p>Line 100</p> <p>Line 101</p> <p>Line 102</p> <p>Line 103</p> <p>Line 104</p> <p>Line 105</p> <p>Line 106</p> <p>Line 107</p> <p>Line 108</p> <p>Line 109</p> <p>Line 110</p> <p>Line 111</p> <p>Line 112</p> <p>Line 113</p> <p>Line 114</p> <p>Line 115</p> <p>Line 116</p> <p>Line 117</p> <p>Line 118</p> <p>Line 119</p> <p>Line 120</p> <p>Line 121</p> <p>Line 122</p> <p>Line 123</p> <p>Line 124</p> <p>Line 125</p> <p>Line 126</p> <p>Line 127</p> <p>Line 128</p> <p>Line 129</p> <p>Line 130</p> <p>Line 131</p> <p>Line 132</p> <p>Line 133</p> <p>Line 134</p> <p>Line 135</p> <p>Line 136</p> <p>Line 137</p> <p>Line 138</p> <p>Line 139</p> <p>Line 140</p> <p>Line 141</p> <p>Line 142</p> <p>Line 143</p> <p>Line 144</p> <p>Line 145</p> <p>Line 146</p> <p>Line 147</p> <p>Line 148</p> <p>Line 149</p> <p>Line 150</p> <p>Line 151</p> <p>Line 152</p> <p>Line 153</p> <p>Line 154</p> <p>Line 155</p> <p>Line 156</p> <p>Line 157</p> <p>Line 158</p> <p>Line 159</p> <p>Line 160</p> <p>Line 161</p> <p>Line 162</p> <p>Line 163</p> <p>Line 164</p> <p>Line 165</p> <p>Line 166</p> <p>Line 167</p> <p>Line 168</p> <p>Line 169</p> <p>Line 170</p> <p>Line 171</p> <p>Line 172</p> <p>Line 173</p> <p>Line 174</p> <p>Line 175</p> <p>Line 176</p> <p>Line 177</p> <p>Line 178</p> <p>Line 179</p> <p>Line 180</p> <p>Line 181</p> <p>Line 182</p> <p>Line 183</p> <p>Line 184</p> <p>Line 185</p> <p>Line 186</p> <p>Line 187</p> <p>Line 188</p> <p>Line 189</p> <p>Line 190</p> <p>Line 191</p> <p>Line 192</p> <p>Line 193</p> <p>Line 194</p> <p>Line 195</p> <p>Line 196</p> <p>Line 197</p> <p>Line 198</p> <p>Line 199</p> <p>Line 200</p> <p>Line 201</p> <p>Line 202</p> <p>Line 203</p> <p>Line 204</p> <p>Line 205</p> <p>Line 206</p> <p>Line 207</p> <p>Line 208</p> <p>Line 209</p> <p>Line 210</p> <p>Line 211</p> <p>Line 212</p> <p>Line 213</p> <p>Line 214</p> <p>Line 215</p> <p>Line 216</p> <p>Line 217</p> <p>Line 218</p> <p>Line 219</p> <p>Line 220</p> <p>Line 221</p> <p>Line 222</p> <p>Line 223</p> <p>Line 224</p> <p>Line 225</p> <p>Line 226</p> <p>Line 227</p> <p>Line 228</p> <p>Line 229</p> <p>Line 230</p> <p>Line 231</p> <p>Line 232</p> <p>Line 233</p> <p>Line 234</p> <p>Line 235</p> <p>Line 236</p> <p>Line 237</p> <p>Line 238</p> <p>Line 239</p> <p>Line 240</p> <p>Line 241</p> <p>Line 242</p> <p>Line 243</p> <p>Line 244</p> <p>Line 245</p> <p>Line 246</p> <p>Line 247</p> <p>Line 248</p> <p>Line 249</p> <p>Line 250</p> <p>Line 251</p> <p>Line 252</p> <p>Line 253</p> <p>Line 254</p> <p>Line 255</p> <p>Line 256</p> <p>Line 257</p> <p>Line 258</p> <p>Line 259</p> <p>Line 260</p> <p>Line 261</p> <p>Line 262</p> <p>Line 263</p> <p>Line 264</p> <p>Line 265</p> <p>Line 266</p> <p>Line 267</p> <p>Line 268</p> <p>Line 269</p> <p>Line 270</p> <p>Line 271</p> <p>Line 272</p> <p>Line 273</p> <p>Line 274</p> <p>Line 275</p> <p>Line 276</p> <p>Line 277</p> <p>Line 278</p> <p>Line 279</p> <p>Line 280</p> <p>Line 281</p> <p>Line 282</p> <p>Line 283</p> <p>Line 284</p> <p>Line 285</p> <p>Line 286</p> <p>Line 287</p> <p>Line 288</p> <p>Line 289</p> <p>Line 290</p> <p>Line 291</p> <p>Line 292</p> <p>Line 293</p> <p>Line 294</p> <p>Line 295</p> <p>Line 296</p> <p>Line 297</p> <p>Line 298</p> <p>Line 299</p> <p>Line 300</p> <p>Line 301</p> <p>Line 302</p> <p>Line 303</p> <p>Line 304</p> <p>Line 305</p> <p>Line 306</p> <p>Line 307</p> <p>Line 308</p> <p>Line 309</p> <p>Line 310</p> <p>Line 311</p> <p>Line 312</p> <p>Line 313</p> <p>Line 314</p> <p>Line 315</p> <p>Line 316</p> <p>Line 317</p> <p>Line 318</p> <p>Line 319</p> <p>Line 320</p> <p>Line 321</p> <p>Line 322</p> <p>Line 323</p> <p>Line 324</p> <p>Line 325</p> <p>Line 326</p> <p>Line 327</p> <p>Line 328</p> <p>Line 329</p> <p>Line 330</p> <p>Line 331</p> <p>Line 332</p> <p>Line 333</p> <p>Line 334</p> <p>Line 335</p> <p>Line 336</p> <p>Line 337</p> <p>Line 338</p> <p>Line 339</p> <p>Line 340</p> <p>Line 341</p> <p>Line 342</p> <p>Line 343</p> <p>Line 344</p> <p>Line 345</p> <p>Line 346</p> <p>Line 347</p> <p>Line 348</p> <p>Line 349</p> <p>Line 350</p> <p>Line 351</p> <p>Line 352</p> <p>Line 353</p> <p>Line 354</p> <p>Line 355</p> <p>Line 356</p> <p>Line 357</p> <p>Line 358</p> <p>Line 359</p> <p>Line 360</p> <p>Line 361</p> <p>Line 362</p> <p>Line 363</p> <p>Line 364</p> <p>Line 365</p> <p>Line 366</p> <p>Line 367</p> <p>Line 368</p> <p>Line 369</p> <p>Line 370</p> <p>Line 371</p> <p>Line 372</p> <p>Line 373</p> <p>Line 374</p> <p>Line 375</p> <p>Line 376</p> <p>Line 377</p> <p>Line 378</p> <p>Line 379</p> <p>Line 380</p> <p>Line 381</p> <p>Line 382</p> <p>Line 383</p> <p>Line 384</p> <p>Line 385</p> <p>Line 386</p> <p>Line 387</p> <p>Line 388</p> <p>Line 389</p> <p>Line 390</p> <p>Line 391</p> <p>Line 392</p> <p>Line 393</p> <p>Line 394</p> <p>Line 395</p> <p>Line 396</p> <p>Line 397</p> <p>Line 398</p> <p>Line 399</p> <p>Line 400</p> <p>Line 401</p> <p>Line 402</p> <p>Line 403</p> <p>Line 404</p> <p>Line 405</p> <p>Line 406</p> <p>Line 407</p> <p>Line 408</p> <p>Line 409</p> <p>Line 410</p> <p>Line 411</p> <p>Line 412</p> <p>Line 413</p> <p>Line 414</p> <p>Line 415</p> <p>Line 416</p> <p>Line 417</p> <p>Line 418</p> <p>Line 419</p> <p>Line 420</p> <p>Line 421</p> <p>Line 422</p> <p>Line 423</p> <p>Line 424</p> <p>Line 425</p> <p>Line 426</p> <p>Line 427</p> <p>Line 428</p> <p>Line 429</p> <p>Line 430</p> <p>Line 431</p> <p>Line 432</p> <p>Line 433</p> <p>Line 434</p> <p>Line 435</p> <p>Line 436</p> <p>Line 437</p> <p>Line 438</p> <p>Line 439</p> <p>Line 440</p> <p>Line 441</p> <p>Line 442</p> <p>Line 443</p> <p>Line 444</p> <p>Line 445</p> <p>Line 446</p> <p>Line 447</p> <p>Line 448</p> <p>Line 449</p> <p>Line 450</p> <p>Line 451</p> <p>Line 452</p> <p>Line 453</p> <p>Line 454</p> <p>Line 455</p> <p>Line 456</p> <p>Line 457</p> <p>Line 458</p> <p>Line 459</p> <p>Line 460</p> <p>Line 461</p> <p>Line 462</p> <p>Line 463</p> <p>Line 464</p> <p>Line 465</p> <p>Line 466</p> <p>Line 467</p> <p>Line 468</p> <p>Line 469</p> <p>Line 470</p> <p>Line 471</p> <p>Line 472</p> <p>Line 473</p> <p>Line 474</p> <p>Line 475</p> <p>Line 476</p> <p>Line 477</p> <p>Line 478</p> <p>Line 479</p> <p>Line 480</p> <p>Line 481</p> <p>Line 482</p> <p>Line 483</p> <p>Line 484</p> <p>Line 485</p> <p>Line 486</p> <p>Line 487</p> <p>Line 488</p> <p>Line 489</p> <p>Line 490</p> <p>Line 491</p> <p>Line 492</p> <p>Line 493</p> <p>Line 494</p> <p>Line 495</p> <p>Line 496</p> <p>Line 497</p> <p>Line 498</p> <p>Line 499</p> <p>Line 500</p> <p>Line 501</p> <p>Line 502</p> <p>Line 503</p> <p>Line 504</p> <p>Line 505</p> <p>Line 506</p> <p>Line 507</p> <p>Line 508</p> <p>Line 509</p> <p>Line 510</p> <p>Line 511</p> <p>Line 512</p> <p>Line 513</p> <p>Line 514</p> <p>Line 515</p> <p>Line 516</p> <p>Line 517</p> <p>Line 518</p> <p>Line 519</p> <p>Line 520</p> <p>Line 521</p> <p>Line 522</p> <p>Line 523</p> <p>Line 524</p> <p>Line 525</p> <p>Line 526</p> <p>Line 527</p> <p>Line 528</p> <p>Line 529</p> <p>Line 530</p> <p>Line 531</p> <p>Line 532</p> <p>Line 533</p> <p>Line 534</p> <p>Line 535</p> <p>Line 536</p> <p>Line 537</p> <p>Line 538</p> <p>Line 539</p> <p>Line 540</p> <p>Line 541</p> <p>Line 542</p> <p>Line 543</p> <p>Line 544</p> <p>Line 545</p> <p>Line 546</p> <p>Line 547</p> <p>Line 548</p> <p>Line 549</p> <p>Line 550</p> <p>Line 551</p> <p>Line 552</p> <p>Line 553</p> <p>Line 554</p> <p>Line 555</p> <p>Line 556</p> <p>Line 557</p> <p>Line 558</p> <p>Line 559</p> <p>Line 560</p> <p>Line 561</p> <p>Line 562</p> <p>Line 563</p> <p>Line 564</p> <p>Line 565</p> <p>Line 566</p> <p>Line 567</p> <p>Line 568</p> <p>Line 569</p> <p>Line 570</p> <p>Line 571</p> <p>Line 572</p> <p>Line 573</p> <p>Line 574</p> <p>Line 575</p> <p>Line 576</p> <p>Line 577</p> <p>Line 578</p> <p>Line 579</p> <p>Line 580</p> <p>Line 581</p> <p>Line 582</p> <p>Line 583</p> <p>Line 584</p> <p>Line 585</p> <p>Line 586</p> <p>Line 587</p> <p>Line 588</p> <p>Line 589</p> <p>Line 590</p> <p>Line 591</p> <p>Line 592</p> <p>Line 593</p> <p>Line 594</p> <p>Line 595</p> <p>Line 596</p> <p>Line 597</p> <p>Line 598</p> <p>Line 599</p> <p>Line 600</p> <p>Line 601</p> <p>Line 602</p> <p>Line 603</p> <p>Line 604</p> <p>Line 605</p> <p>Line 606</p> <p>Line 607</p> <p>Line 608</p> <p>Line 609</p> <p>Line 610</p> <p>Line 611</p> <p>Line 612</p> <p>Line 613</p> <p>Line 614</p> <p>Line 615</p> <p>Line 616</p> <p>Line 617</p> <p>Line 618</p> <p>Line 619</p> <p>Line 620</p> <p>Line 621</p> <p>Line 622</p> <p>Line 623</p> <p>Line 624</p> <p>Line 625</p> <p>Line 626</p> <p>Line 627</p> <p>Line 628</p> <p>Line 629</p> <p>Line 630</p> <p>Line 631</p> <p>Line 632</p> <p>Line 633</p> <p>Line 634</p> <p>Line 635</p> <p>Line 636</p> <p>Line 637</p> <p>Line 638</p> <p>Line 639</p> <p>Line 640</p> <p>Line 641</p> <p>Line 642</p> <p>Line 643</p> <p>Line 644</p> <p>Line 645</p> <p>Line 646</p> <p>Line 647</p> <p>Line 648</p> <p>Line 649</p> <p>Line 650</p> <p>Line 651</p> <p>Line 652</p> <p>Line 653</p> <p>Line 654</p> <p>Line 655</p> <p>Line 656</p> <p>Line 657</p> <p>Line 658</p> <p>Line 659</p> <p>Line 660</p> <p>Line 661</p> <p>Line 662</p> <p>Line 663</p> <p>Line 664</p> <p>Line 665</p> <p>Line 666</p> <p>Line 667</p> <p>Line 668</p> <p>Line 669</p> <p>Line 670</p> <p>Line 671</p> <p>Line 672</p> <p>Line 673</p> <p>Line 674</p> <p>Line 675</p> <p>Line 676</p> <p>Line 677</p> <p>Line 678</p> <p>Line 679</p> <p>Line 680</p> <p>Line 681</p> <p>Line 682</p> <p>Line 683</p> <p>Line 684</p> <p>Line 685</p> <p>Line 686</p> <p>Line 687</p> <p>Line 688</p> <p>Line 689</p> <p>Line 690</p> <p>Line 691</p> <p>Line 692</p> <p>Line 693</p> <p>Line 694</p> <p>Line 695</p> <p>Line 696</p> <p>Line 697</p> <p>Line 698</p> <p>Line 699</p> <p>Line 700</p> <p>Line 701</p> <p>Line 702</p> <p>Line 703</p> <p>Line 704</p> <p>Line 705</p> <p>Line 706</p> <p>Line 707</p> <p>Line 708</p> <p>Line 709</p> <p>Line 710</p> <p>Line 711</p> <p>Line 712</p> <p>Line 713</p> <p>Line 714</p> <p>Line 715</p> <p>Line 716</p> <p>Line 717</p> <p>Line 718</p> <p>Line 719</p> <p>Line 720</p> <p>Line 721</p> <p>Line 722</p> <p>Line 723</p> <p>Line 724</p> <p>Line 725</p> <p>Line 726</p> <p>Line 727</p> <p>Line 728</p> <p>Line 729</p> <p>Line 730</p> <p>Line 731</p> <p>Line 732</p> <p>Line 733</p> <p>Line 734</p> <p>Line 735</p> <p>Line 736</p> <p>Line 737</p> <p>Line 738</p> <p>Line 739</p> <p>Line 740</p> <p>Line 741</p> <p>Line 742</p> <p>Line 743</p> <p>Line 744</p> <p>Line 745</p> <p>Line 746</p> <p>Line 747</p> <p>Line 748</p> <p>Line 749</p> <p>Line 750</p> <p>Line 751</p> <p>Line 752</p> <p>Line 753</p> <p>Line 754</p> <p>Line 755</p> <p>Line 756</p> <p>Line 757</p> <p>Line 758</p> <p>Line 759</p> <p>Line 760</p> <p>Line 761</p> <p>Line 762</p> <p>Line 763</p> <p>Line 764</p> <p>Line 765</p> <p>Line 766</p> <p>Line 767</p> <p>Line 768</p> <p>Line 769</p> <p>Line 770</p> <p>Line 771</p> <p>Line 772</p> <p>Line 773</p> <p>Line 774</p> <p>Line 775</p> <p>Line 776</p> <p>Line 777</p> <p>Line 778</p> <p>Line 779</p> <p>Line 780</p> <p>Line 781</p> <p>Line 782</p> <p>Line 783</p> <p>Line 784</p> <p>Line 785</p> <p>Line 786</p> <p>Line 787</p> <p>Line 788</p> <p>Line 789</p> <p>Line 790</p> <p>Line 791</p> <p>Line 792</p> <p>Line 793</p> <p>Line 794</p> <p>Line 795</p> <p>Line 796</p> <p>Line 797</p> <p>Line 798</p> <p>Line 799</p> <p>Line 800</p> <p>Line 801</p> <p>Line 802</p> <p>Line 803</p> <p>Line 804</p> <p>Line 805</p> <p>Line 806</p> <p>Line 807</p> <p>Line 808</p> <p>Line 809</p> <p>Line 810</p> <p>Line 811</p> <p>Line 812</p> <p>Line 813</p> <p>Line 814</p> <p>Line 815</p> <p>Line 816</p> <p>Line 817</p> <p>Line 818</p> <p>Line 819</p> <p>Line 820</p> <p>Line 821</p> <p>Line 822</p> <p>Line 823</p> <p>Line 824</p> <p>Line 825</p> <p>Line 826</p> <p>Line 827</p> <p>Line 828</p> <p>Line 829</p> <p>Line 830</p> <p>Line 831</p> <p>Line 832</p> <p>Line 833</p> <p>Line 834</p> <p>Line 835</p> <p>Line 836</p> <p>Line 837</p> <p>Line 838</p> <p>Line 839</p> <p>Line 840</p> <p>Line 841</p> <p>Line 842</p> <p>Line 843</p> <p>Line 844</p> <p>Line 845</p> <p>Line 846</p> <p>Line 847</p> <p>Line 848</p> <p>Line 849</p> <p>Line 850</p> <p>Line 851</p> <p>Line 852</p> <p>Line 853</p> <p>Line 854</p> <p>Line 855</p> <p>Line 856</p> <p>Line 857</p> <p>Line 858</p> <p>Line 859</p> <p>Line 860</p> <p>Line 861</p> <p>Line 862</p> <p>Line 863</p> <p>Line 864</p> <p>Line 865</p> <p>Line 866</p> <p>Line 867</p> <p>Line 868</p> <p>Line 869</p> <p>Line 870</p> <p>Line 871</p> <p>Line 872</p> <p>Line 873</p> <p>Line 874</p> <p>Line 875</p> <p>Line 876</p> <p>Line 877</p> <p>Line 878</p> <p>Line 879</p> <p>Line 880</p> <p>Line 881</p> <p>Line 882</p> <p>Line 883</p> <p>Line 884</p> <p>Line 885</p> <p>Line 886</p> <p>Line 887</p> <p>Line 888</p> <p>Line 889</p> <p>Line 890</p> <p>Line 891</p> <p>Line 892</p> <p>Line 893</p> <p>Line 894</p> <p>Line 895</p> <p>Line 896</p> <p>Line 897</p> <p>Line 898</p> <p>Line 899</p> <p>Line 900</p> <p>Line 901</p> <p>Line 902</p> <p>Line 903</p> <p>Line 904</p> <p>Line 905</p> <p>Line 906</p> <p>Line 907</p> <p>Line 908</p> <p>Line 909</p> <p>Line 910</p> <p>Line 911</p> <p>Line 912</p> <p>Line 913</p> <p>Line 914</p> <p>Line 915</p> <p>Line 916</p> <p>Line 917</p> <p>Line 918</p> <p>Line 919</p> <p>Line 920</p> <p>Line 921</p> <p>Line 922</p> <p>Line 923</p> <p>Line 924</p> <p>Line 925</p> <p>Line 926</p> <p>Line 927</p> <p>Line 928</p> <p>Line 929</p> <p>Line 930</p> <p>Line 931</p> <p>Line 932</p> <p>Line 933</p> <p>Line 934</p> <p>Line 935</p> <p>Line 936</p> <p>Line 937</p> <p>Line 938</p> <p>Line 939</p> <p>Line 940</p> <p>Line 941</p> <p>Line 942</p> <p>Line 943</p> <p>Line 944</p> <p>Line 945</p> <p>Line 946</p> <p>Line 947</p> <p>Line 948</p> <p>Line 949</p> <p>Line 950</p> <p>Line 951</p> <p>Line 952</p> <p>Line 953</p> <p>Line 954</p> <p>Line 955</p> <p>Line 956</p> <p>Line 957</p> <p>Line 958</p> <p>Line 959</p> <p>Line 960</p> <p>Line 961</p> <p>Line 962</p> <p>Line 963</p> <p>Line 964</p> <p>Line 965</p> <p>Line 966</p> <p>Line 967</p> <p>Line 968</p> <p>Line 969</p> <p>Line 970</p> <p>Line 971</p> <p>Line 972</p> <p>Line 973</p> <p>Line 974</p> <p>Line 975</p> <p>Line 976</p> <p>Line 977</p> <p>Line 978</p> <p>Line 979</p> <p>Line 980</p> <p>Line 981</p> <p>Line 982</p> <p>Line 983</p> <p>Line 984</p> <p>Line 985</p> <p>Line 986</p> <p>Line 987</p> <p>Line 988</p> <p>Line 989</p> <p>Line 990</p> <p>Line 991</p> <p>Line 992</p> <p>Line 993</p> <p>Line 994</p> <p>Line 995</p> <p>Line 996</p> <p>Line 997</p> <p>Line 998</p> <p>Line 999</p> <p>Line 1000</p>
<p>Continuity</p> <p>SINGLE TEST</p> <p>OPERATION AFTER END OF TEST</p>		<p>Command properties</p> <p>Operation after end of test - pass Auto</p> <p>Operation after end of test - fail Manual</p> <p>Operation after end of test - no status Manual</p> <p>OK Cancel</p>
<p>Result</p> <p>RESULT SCREEN</p>		<p>Command properties</p> <p>Auto save</p> <p>Auto print</p> <p>Print and save</p> <p>OK Cancel</p>



### Structure in the memory organizer



## 5.5. How to enable PASS/FAIL status lamps, HV lamps and remote control

In certain cases, in addition to the indication of the high-voltage test, an indication of the status of the results (PASS / FAIL) is also desirable.

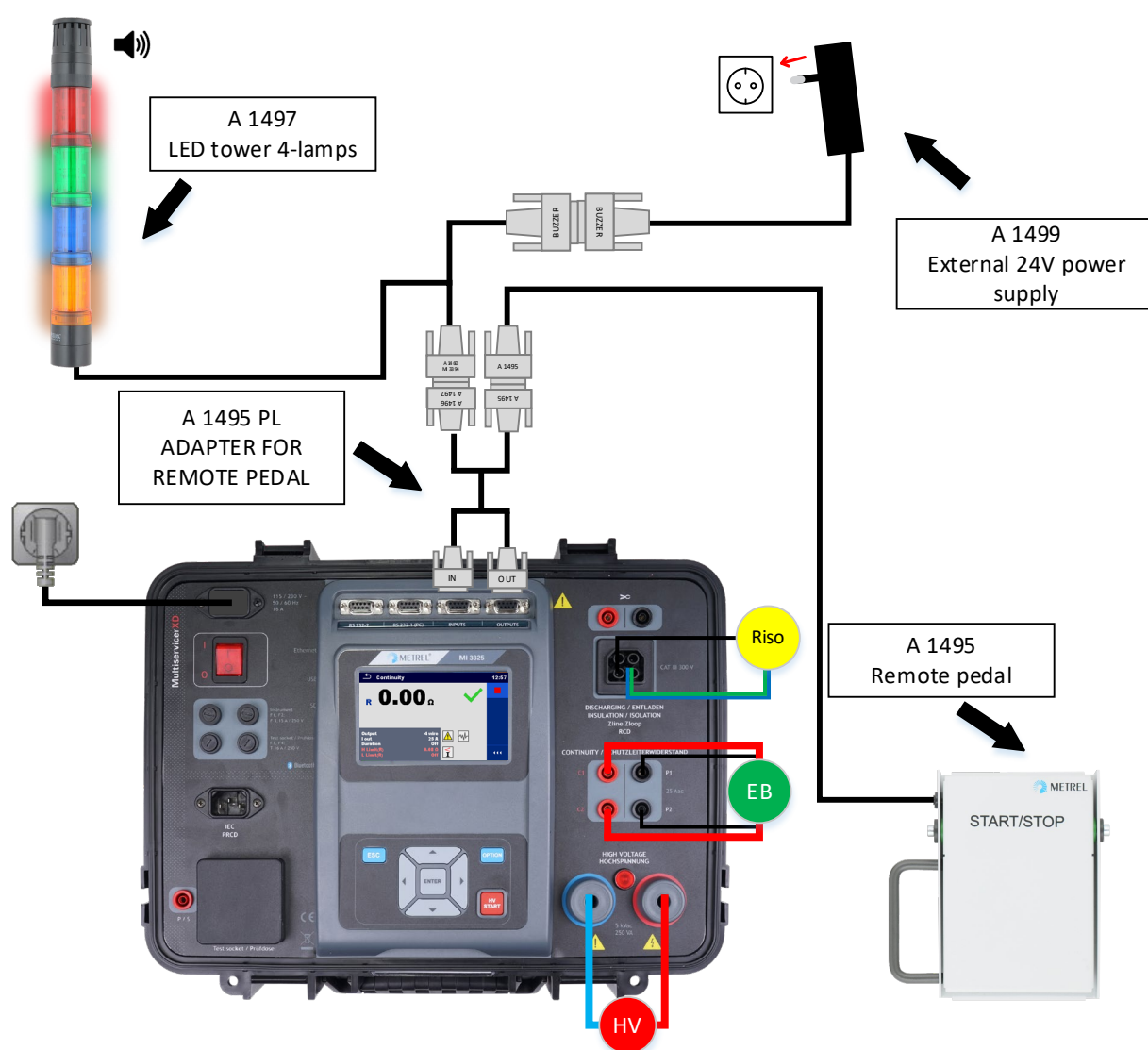
This is especially welcome in applications where tests are run using a remote control (test pedal, or tip commander), and where the user does not always have the option to look at the instrument's screen to evaluate test results.

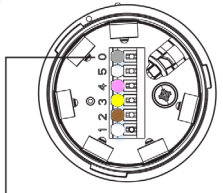

The following example will show how to prepare a test sequence that will enable PASS/FAIL status lamps, HV lamps & remote start of a test sequence over the remote pedal.

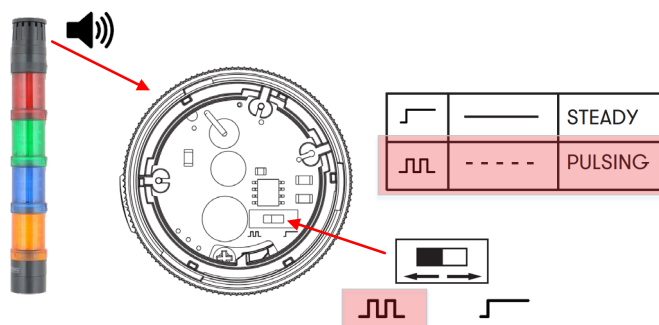
In the following steps it will be shown:




- How to connect and enable remote control with A 1495, using flow command

- >EXTERNAL OK KEY mode<
- How to connect and enable HV + PASS/FAIL lamps (A 1497), using flow commands
  - LAMPS HV mode
  - LAMPS passFail mode
- Use of flow command >PAUSE<
- Execution of Insulation resistance test (Riso)
- Execution of 4-W Earth continuity test (EB)
- Execution of High voltage test (HV)
- How to enable auto save, using command
  - Auto save

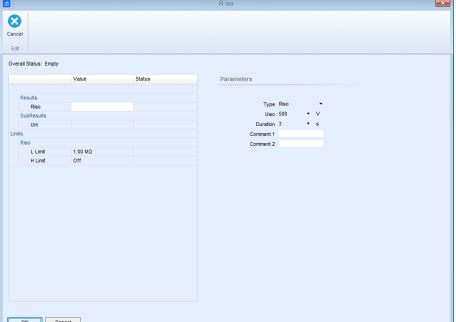
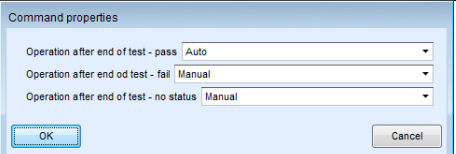
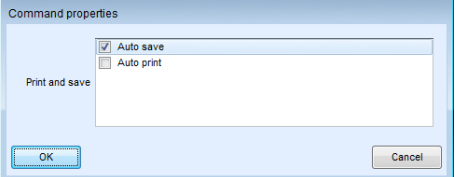


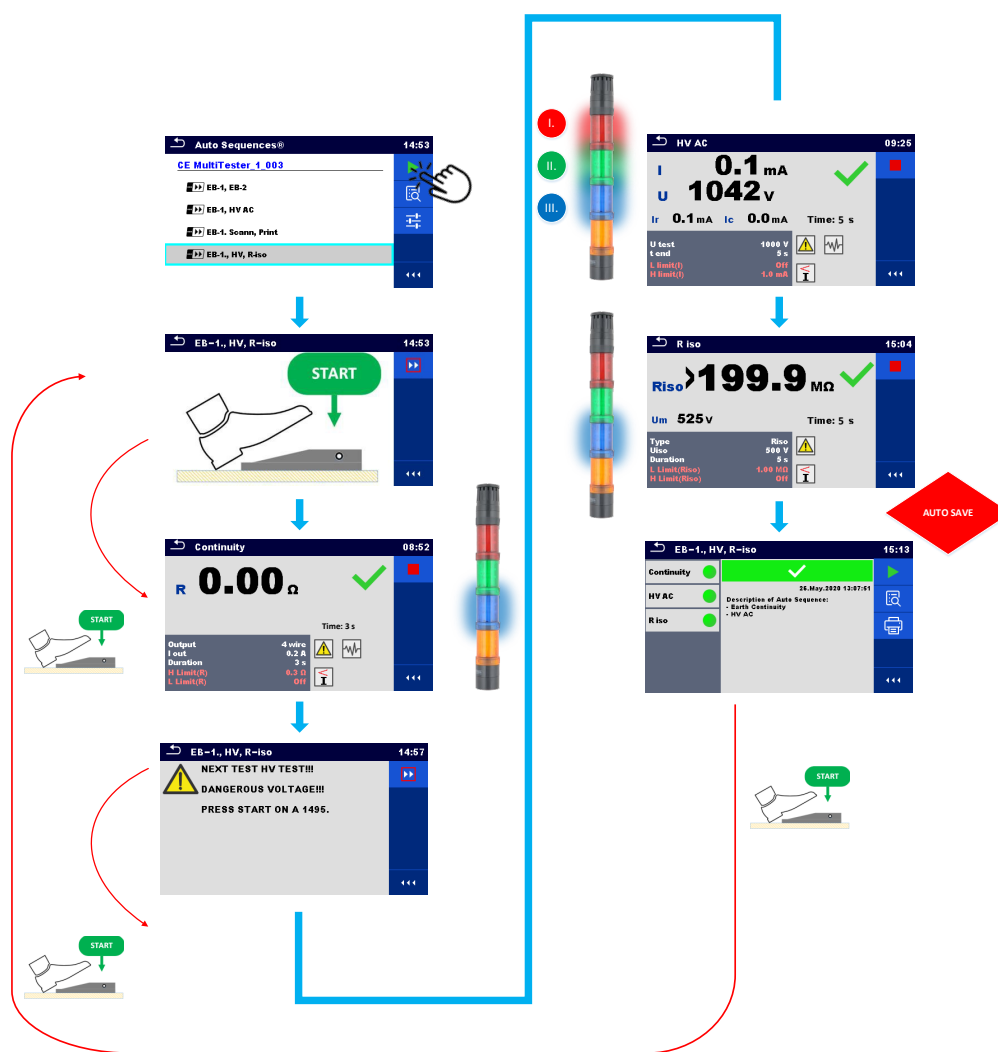
 <p>COMMON</p>	 <p>Rs232 cable</p>
Signal tower connector	RS232 communication cable
<b>Enabling HV lamps &amp; Status lamps A 1497</b>	
<b>LED TOWER (PIN CONNECTOR)</b>	<b>RS232 CABLE</b>
GND (0)	Gray / Grau
Buzzer (5)	Bridge between any of available status lights (PIN5 & PIN1 or 2, or 3, or 4)
Red LED (4)	Pink / Rosa
Green LED (3)	Yellow / Gelb
Blue LED (2)	Brown / Braun
Orange LED (1)	White / Weiß



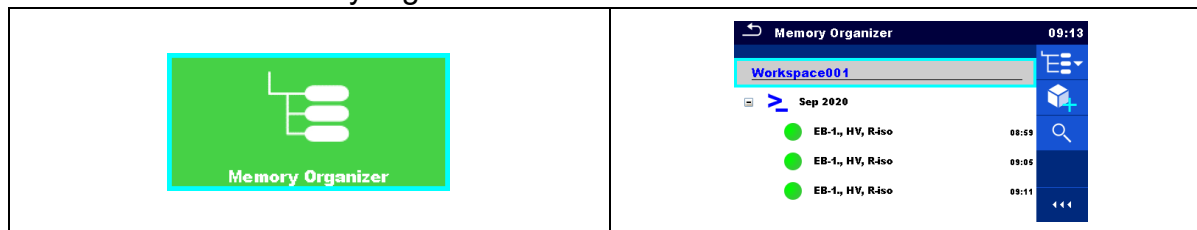
	<p>Header</p> <p>EXTERNAL OK KEY mode</p> <p>LAMPS PassFail mode</p> <p>Continuity </p> <p>PAUSE</p> <p>SINGLE TEST</p> <p>OPERATION AFTER END OF TEST</p> <p>HV AC </p> <p>LAMPS HV mode</p> <p>PAUSE</p> <p>SINGLE TEST</p> <p>OPERATION AFTER END OF TEST</p> <p>R iso </p> <p>SINGLE TEST</p> <p>OPERATION AFTER END OF TEST</p> <p>Result</p> <p>RESULT SCREEN</p>	
<p>Header</p> <p>EXTERNAL OK KEY mode</p> <p>LAMPS PassFail mode</p>		<p>Command properties</p> <p>State On</p> <p>OK Cancel</p>
<p>Header</p> <p>EXTERNAL OK KEY mode</p> <p>LAMPS PassFail mode</p>		<p>Command properties</p> <p>State On</p> <p>OK Cancel</p>

<div> <div>Continuity</div> <div> <div>PAUSE</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> </div> </div>	<div> <div>Command properties</div> <div> <div>Pause type</div> <div>Show picture</div> </div> <div> <div>Duration</div> <div>Infinite</div> </div> <div> <div>Image path</div> <div>start pedal.png</div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div>
<div> <div>Continuity</div> <div> <div>PAUSE</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> </div> </div>	<div> <div>Continuity</div> <div> <div>Overall Status: Empty</div> <div> <div>Results</div> <div> <div>Value</div> <div>Status</div> </div> <div> <div>Unit</div> <div>Value</div> <div>Status</div> </div> </div> <div> <div>Parameters</div> <div> <div>Output: 4 wire</div> <div>Test: 0.2</div> <div>Unit: A</div> </div> <div> <div>Wire break detection</div> <div>Duration: 3</div> <div>Command: 1</div> <div>Command: 2</div> </div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div> </div>
<div> <div>Continuity</div> <div> <div>PAUSE</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> </div> </div>	<div> <div>Command properties</div> <div> <div>Operation after end of test - pass</div> <div>Auto</div> </div> <div> <div>Operation after end of test - fail</div> <div>Manual</div> </div> <div> <div>Operation after end of test - no status</div> <div>Manual</div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div>
<div> <div>HV AC</div> <div> <div>LAMPS HV mode</div> <div>PAUSE</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> </div> </div>	<div> <div>Command properties</div> <div> <div>State</div> <div>On</div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div>
<div> <div>HV AC</div> <div> <div>LAMPS HV mode</div> <div>PAUSE</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> </div> </div>	<div> <div>Command properties</div> <div> <div>Pause type</div> <div>Show Text and/or warning</div> </div> <div> <div>Duration</div> <div>Infinite</div> </div> <div> <div>Text</div> <div> <div>NEXT TEST HV TEST!!!</div> <div>DANGEROUS VOLTAGE!!!</div> <div>PRESS START ON A 1495.</div> </div> </div> <div> <div>Show warning icon</div> <div><input checked="" type="checkbox"/></div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div>
<div> <div>HV AC</div> <div> <div>LAMPS HV mode</div> <div>PAUSE</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> </div> </div>	<div> <div>HV AC</div> <div> <div>Overall Status: Empty</div> <div> <div>Results</div> <div> <div>Value</div> <div>Status</div> </div> <div> <div>Unit</div> <div>Value</div> <div>Status</div> </div> </div> <div> <div>Parameters</div> <div> <div>Output: 1000</div> <div>Lead: 5</div> <div>Unit: V</div> </div> <div> <div>Command: 1</div> <div>Command: 2</div> </div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div> </div>
<div> <div>HV AC</div> <div> <div>LAMPS HV mode</div> <div>PAUSE</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> </div> </div>	<div> <div>Command properties</div> <div> <div>Operation after end of test - pass</div> <div>Auto</div> </div> <div> <div>Operation after end of test - fail</div> <div>Manual</div> </div> <div> <div>Operation after end of test - no status</div> <div>Manual</div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div>

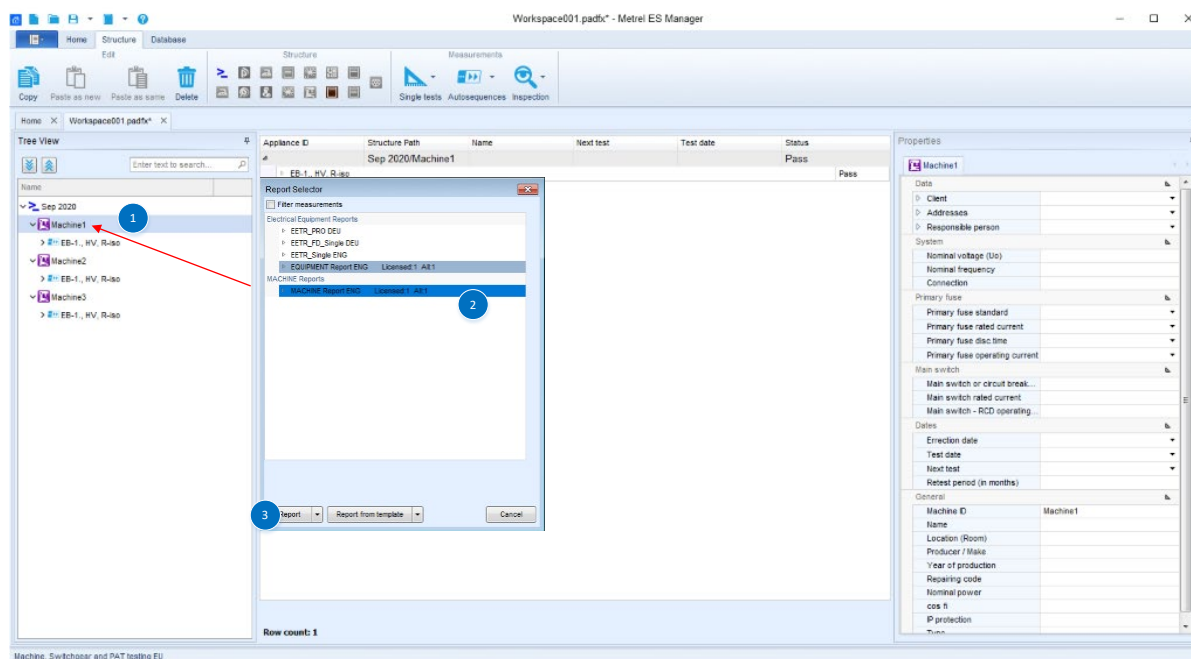
<p>R iso</p> <p>SINGLE TEST</p> <p>OPERATION AFTER END OF TEST</p>	
<p>R iso</p> <p>SINGLE TEST</p> <p>OPERATION AFTER END OF TEST</p>	
<p>Result</p> <p>RESULT SCREEN</p>	



## Structure in the memory organizer



For creation of professional test reports the measurements has to be moved under appropriate structure element: Appliance, Appliance FD, Welding equip., Welding equip. FD, Machine, Switchgear or EVSE. This can be done on the MESM SW.



## **5.6. How to enable test setup with CE Adapter A 1460**

This section shows how to prepare a test sequence to be performed in combination with the MultiServicerXD instrument and the CE Adapter. A number of optional accessories will be used along with the instrument and adapter. The purpose is to show the entire solution of the test flow, from entering the ID number with barcode scanner, performing passive tests including multiple point testing. Continuing with high voltage testing, and active (Leaks&Power) testing at the end. A number of optional accessories will also be included in the test process:

- signal lights
- bar code reader
- printer
- tip commander/pedal

Note!

In certain tests, the measuring instrument checks "in the pre-test" whether the tested device connected to the instrument test terminals meets certain pre-set criteria. If the connected device does not meet the criteria set in the measuring instrument, a warning message appears on the instrument screen.

These warning messages can indicate the user different statuses:

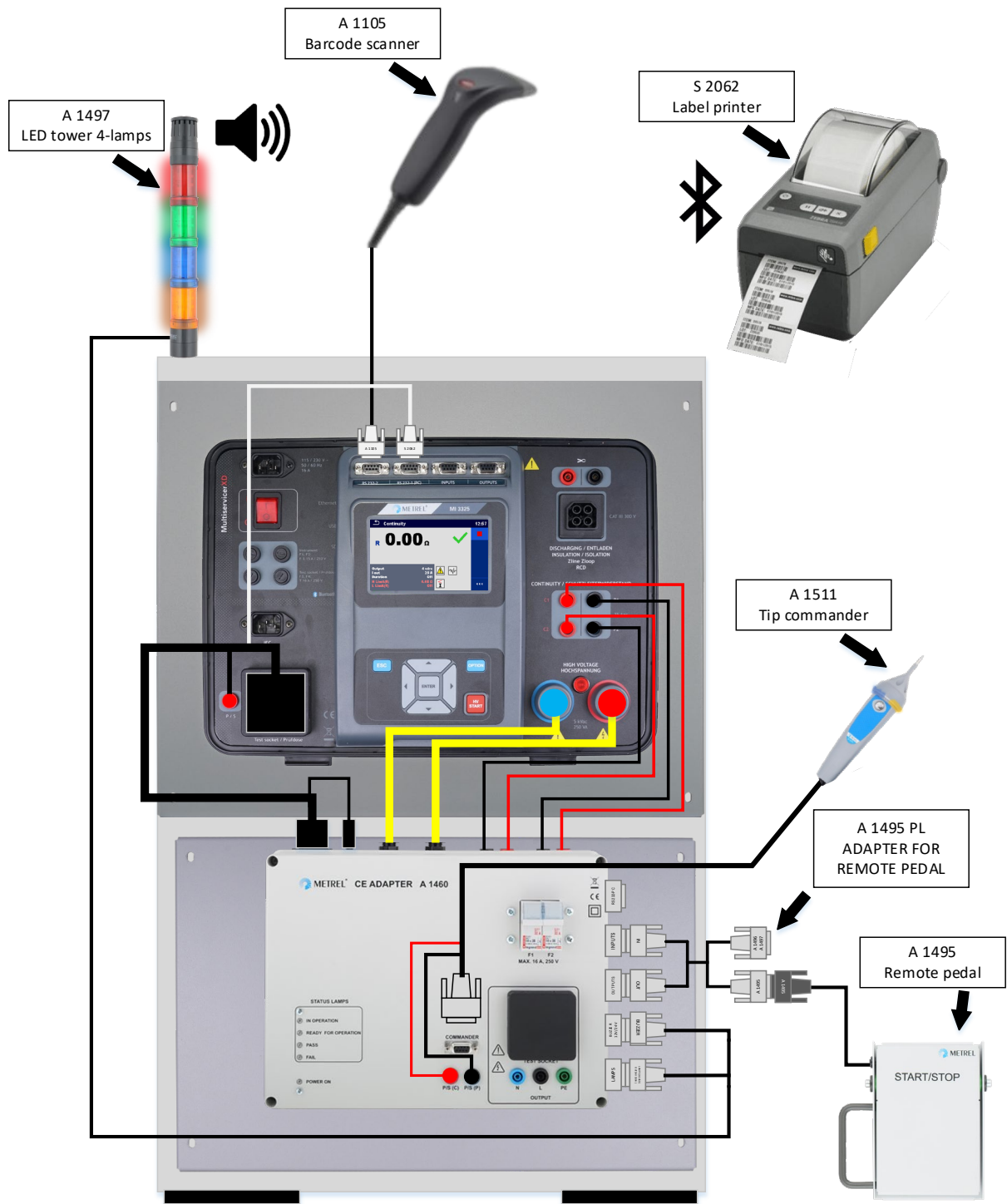
- whether the tested device (ON / OFF) switch must be turned on,
- whether the device connected to the test socket is faulty, etc...

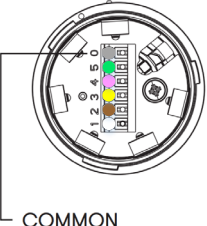

Using Flow command "NO NOTIFICATION mode" these warning messages can be automatically skipped.

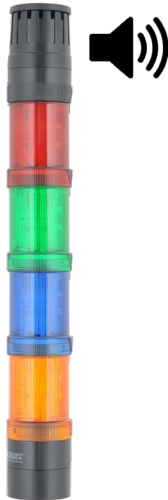
In the following steps it will be shown:

- How to connect and enable Barcode scanner, using flow command
  - o APPLIANCE INFO
- How to connect and enable remote cntrol with A 1511 or/and A 1495, using flow command
  - o >EXTERNAL OK KEY mode<
- How to connect and enable HV + PASS/FAIL lamps + Buzezr (A 1497), using flow commands
  - o LAMPS HV mode
  - o LAMPS passFail mode
  - o BUZZER mode
- Execution of 4-W Earth cntinuity test (EB) >sequence of 3-test steps<
- How to disable notifications, using flow command
  - o NO NOTIFICATION mode
- Execution of Insulation resistance test (Riso)
- Execution of High voltage test (HV)
- Execution of Leaks & Pwer test
- How to enable auto save, using command
  - o Auto save
- How to connect and enable barcode printer, using command
  - o Auto print

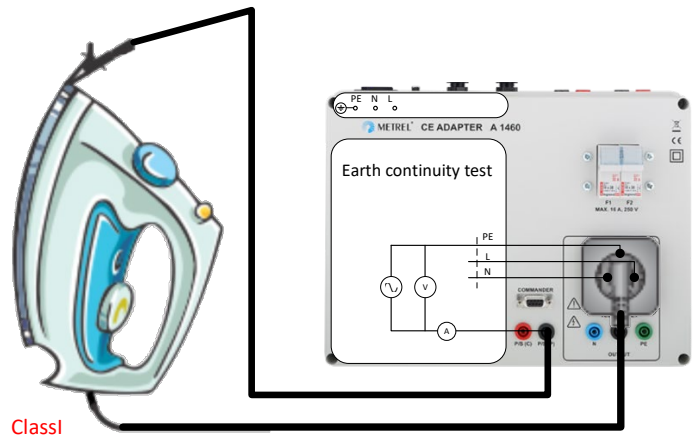




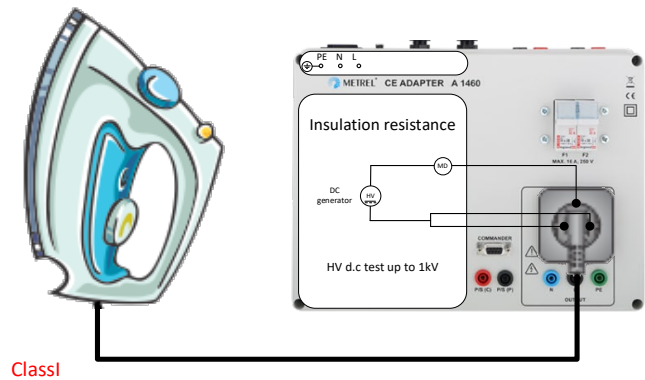
	
Signal tower connector	RS232 communication cable
<b>Enabling HV lamps &amp; Status lamps + Buzzer A 1497</b>	
<b>LED TOWER (PIN CONNECTOR)</b>	<b>RS232 CABLE</b>
GND (0)	Gray / Grau
Buzzer (5)	Green / Grün
Red LED (4)	Pink / Rosa
Green LED (3)	Yellow / Gelb
Blue LED (2)	Brown / Braun
Orange LED (1)	White / Weiß



How testing is performed via CE ADAPTER



Earth continuity test (EB)



Insulation resistance test (Riso)



Class!

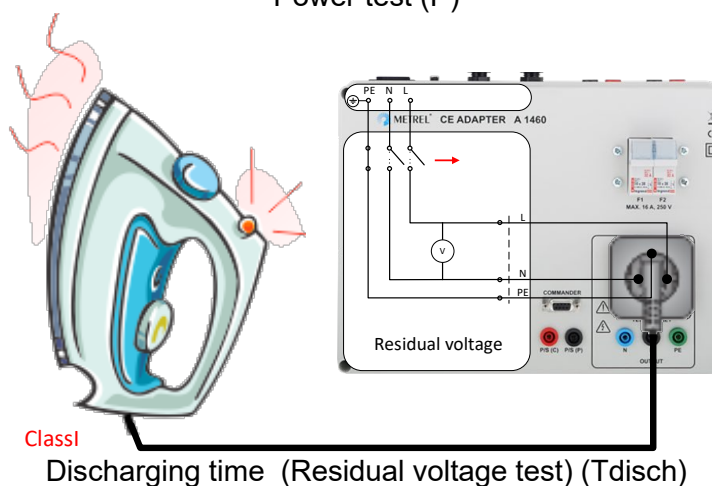
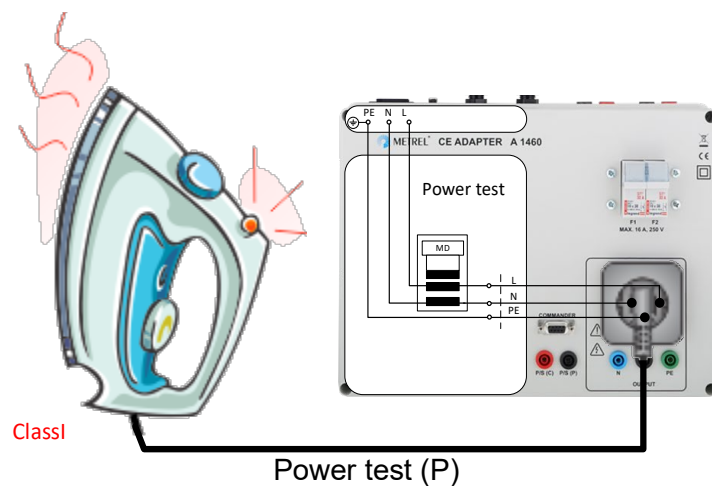


Class!



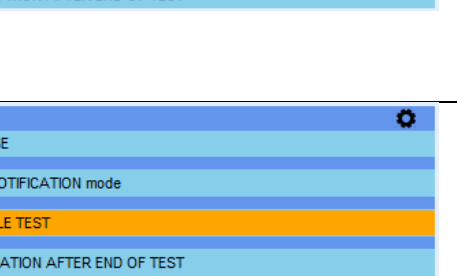


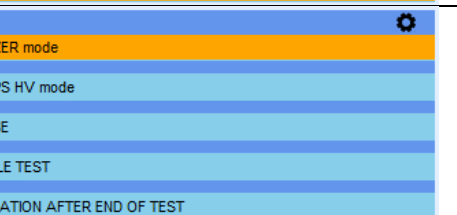
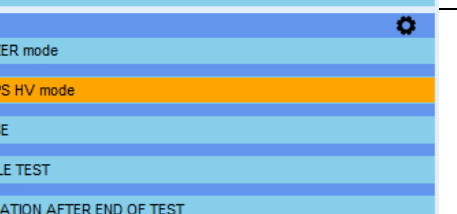
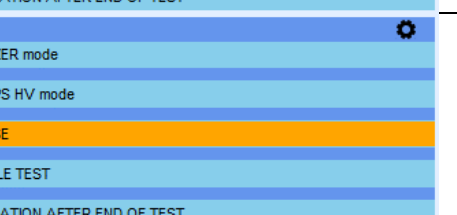
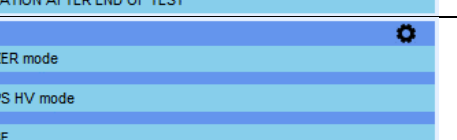
---

55

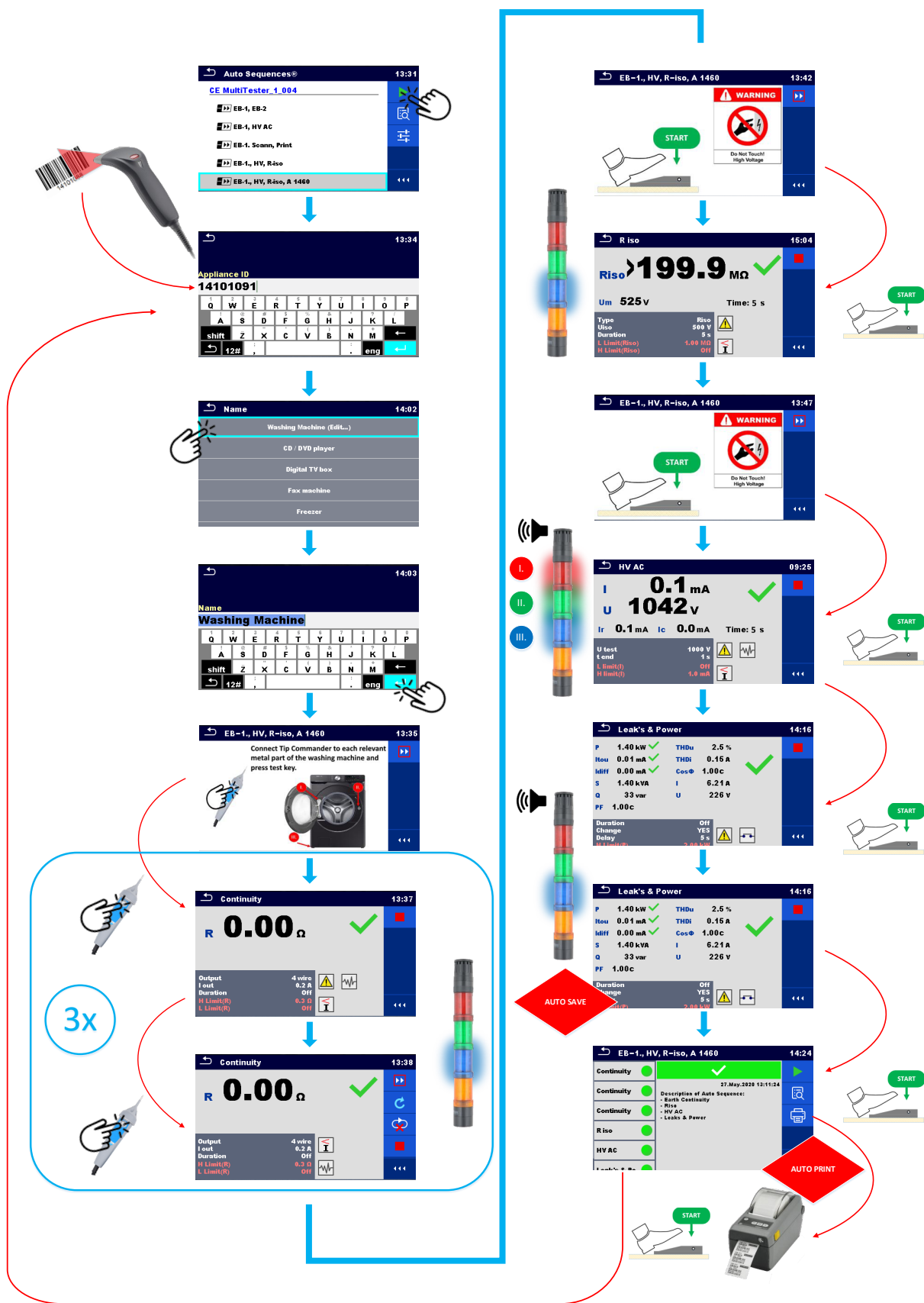


Header	
EXTERNAL OK KEY mode	
LAMPS PassFail mode	
PAUSE	
Continuity	⚙️
SINGLE TEST	
OPERATION AFTER END OF TEST	
R iso	⚙️
PAUSE	
NO NOTIFICATION mode	
SINGLE TEST	
OPERATION AFTER END OF TEST	
HV AC	⚙️
BUZZER mode	
LAMPS HV mode	
PAUSE	
SINGLE TEST	
OPERATION AFTER END OF TEST	
Leak's & Power	⚙️
SINGLE TEST	
OPERATION AFTER END OF TEST	
Result	
RESULT SCREEN	

<div>Header</div> <div>APPLIANCE INFO</div> <div>EXTERNAL OK KEY mode</div> <div>LAMPS PassFail mode</div> <div>PAUSE</div>	<div>Command properties</div> <div>Repeat Setting Repeat</div> <div>Appliance type Appliance_FD</div> <div>Default Appliance ID</div> <div>Appliance name Washing Machine <input checked="" type="checkbox"/> Editable</div> <div>Retest per. (M) 12 <input type="checkbox"/> Editable</div> <div>OK Cancel</div>
<div>Header</div> <div>APPLIANCE INFO</div> <div>EXTERNAL OK KEY mode</div> <div>LAMPS PassFail mode</div> <div>PAUSE</div>	<div>Command properties</div> <div>State On</div> <div>OK Cancel</div>
<div>Header</div> <div>APPLIANCE INFO</div> <div>EXTERNAL OK KEY mode</div> <div>LAMPS PassFail mode</div> <div>PAUSE</div>	<div>Command properties</div> <div>State On</div> <div>OK Cancel</div>
<div>Header</div> <div>APPLIANCE INFO</div> <div>EXTERNAL OK KEY mode</div> <div>LAMPS PassFail mode</div> <div>PAUSE</div>	<div>Command properties</div> <div>Pause type Show picture</div> <div>Duration Infinite</div> <div>Image path EB test.png</div> <div>OK Cancel</div>
<div>Continuity</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	<div>Continuity</div> <div>OK Cancel</div> <div>Over/Under: Supply</div> <div>Results</div> <div>Units</div> <div>Parameters</div> <div>OK Cancel</div>
<div>Continuity</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	<div>Step count</div> <div>3</div> <div>OK Cancel</div>
<div>Continuity</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	<div>Command properties</div> <div>Operation after end of test - pass Manual</div> <div>Operation after end of test - fail Manual</div> <div>Operation after end of test - no status Manual</div> <div>OK Cancel</div>
<div>R iso</div> <div>PAUSE</div> <div>NO NOTIFICATION mode</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	<div>Command properties</div> <div>Pause type Show picture</div> <div>Duration Infinite</div> <div>Image path HV test.png</div> <div>OK Cancel</div>

 <p>R iso</p> <ul style="list-style-type: none"> <li>PAUSE</li> <li>NO NOTIFICATION mode</li> <li>SINGLE TEST</li> <li>OPERATION AFTER END OF TEST</li> </ul>	<div> <div>Warning!</div> <div>Resistance L-N is too high(&gt;30 kOhm). Check fuse / switch. Would you like to proceed?</div> <div>YESNO</div> </div> <div>Possible cause: Device under test is not switched on.</div> <div>Message will be skipped!</div>														
 <p>R iso</p> <ul style="list-style-type: none"> <li>PAUSE</li> <li>NO NOTIFICATION mode</li> <li>SINGLE TEST</li> <li>OPERATION AFTER END OF TEST</li> </ul>	<div>Command properties</div> <div>State On</div> <div>OKCancel</div> <div> <div> <div>Cancel</div> <div> <div>Overall Status: Empty</div> <div> <table> <thead> <tr> <th>Value</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>Results</td> <td></td> </tr> <tr> <td>Real</td> <td></td> </tr> <tr> <td>Imaginary</td> <td></td> </tr> <tr> <td>Lim</td> <td></td> </tr> </tbody> </table> </div> </div> <div>Parameters</div> <div> <div>Type Real</div> <div>Unit 100</div> <div>Duration 3</div> <div>Comment 1</div> <div>Comment 2</div> </div> </div> <div>OKCancel</div> </div>	Value	Status	Results		Real		Imaginary		Lim					
Value	Status														
Results															
Real															
Imaginary															
Lim															
 <p>R iso</p> <ul style="list-style-type: none"> <li>PAUSE</li> <li>NO NOTIFICATION mode</li> <li>SINGLE TEST</li> <li>OPERATION AFTER END OF TEST</li> </ul>	<div>Command properties</div> <div>Operation after end of test - pass Auto</div> <div>Operation after end of test - fail Manual</div> <div>Operation after end of test - no status Manual</div> <div>OKCancel</div>														
 <p>HV AC</p> <ul style="list-style-type: none"> <li>BUZZER mode</li> <li>LAMPS HV mode</li> <li>PAUSE</li> <li>SINGLE TEST</li> <li>OPERATION AFTER END OF TEST</li> </ul>	<div>Command properties</div> <div>State On</div> <div>OKCancel</div>														
 <p>HV AC</p> <ul style="list-style-type: none"> <li>BUZZER mode</li> <li>LAMPS HV mode</li> <li>PAUSE</li> <li>SINGLE TEST</li> <li>OPERATION AFTER END OF TEST</li> </ul>	<div>Command properties</div> <div>State On</div> <div>OKCancel</div>														
 <p>HV AC</p> <ul style="list-style-type: none"> <li>BUZZER mode</li> <li>LAMPS HV mode</li> <li>PAUSE</li> <li>SINGLE TEST</li> <li>OPERATION AFTER END OF TEST</li> </ul>	<div>Command properties</div> <div>Pause type Show picture</div> <div>Duration Infinite</div> <div>Image path HV test.png</div> <div>OKCancel</div>														
 <p>HV AC</p> <ul style="list-style-type: none"> <li>BUZZER mode</li> <li>LAMPS HV mode</li> <li>PAUSE</li> <li>SINGLE TEST</li> <li>OPERATION AFTER END OF TEST</li> </ul>	<div> <div> <div>Cancel</div> <div> <div>Overall Status: Empty</div> <div> <table> <thead> <tr> <th>Value</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>Results</td> <td></td> </tr> <tr> <td>U</td> <td></td> </tr> <tr> <td>I</td> <td></td> </tr> <tr> <td>Capacitance</td> <td></td> </tr> <tr> <td>N</td> <td></td> </tr> <tr> <td>P</td> <td></td> </tr> </tbody> </table> </div> </div> <div>Parameters</div> <div> <div>Unit 100</div> <div>Level 1</div> <div>Comment 1</div> <div>Comment 2</div> </div> </div> <div>OKCancel</div> </div>	Value	Status	Results		U		I		Capacitance		N		P	
Value	Status														
Results															
U															
I															
Capacitance															
N															
P															

<div> <div>HV AC</div> <div>BUZZER mode</div> <div>LAMPS HV mode</div> <div>PAUSE</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> </div>	<div> <div>Command properties</div> <div> <div>Operation after end of test - pass</div> <div>Auto</div> </div> <div> <div>Operation after end of test - fail</div> <div>Manual</div> </div> <div> <div>Operation after end of test - no status</div> <div>Manual</div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div>																										
<div> <div>Leak's &amp; Power</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> </div>	<div> <div>Overall Status: Empty</div> <div> <div>Results</div> <table> <tr><td>P</td><td></td></tr> <tr><td>S</td><td></td></tr> <tr><td>G</td><td></td></tr> <tr><td>IR</td><td></td></tr> <tr><td>THD</td><td></td></tr> <tr><td>THD</td><td></td></tr> <tr><td>WFI</td><td></td></tr> <tr><td>RW</td><td></td></tr> <tr><td>Cash</td><td></td></tr> <tr><td>SubResults</td><td></td></tr> <tr><td>W</td><td></td></tr> <tr><td>P</td><td></td></tr> <tr><td>L</td><td></td></tr> </table> <div> <div>Parameters</div> <div> <div>Downline</div> <div>OFF</div> </div> <div> <div>Charge</div> <div>100</div> </div> <div> <div>Delay</div> <div>1 s</div> </div> <div> <div>Comment 1</div> <div></div> </div> <div> <div>Comment 2</div> <div></div> </div> </div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div>	P		S		G		IR		THD		THD		WFI		RW		Cash		SubResults		W		P		L	
P																											
S																											
G																											
IR																											
THD																											
THD																											
WFI																											
RW																											
Cash																											
SubResults																											
W																											
P																											
L																											
<div> <div>Leak's &amp; Power</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> </div>	<div> <div>Command properties</div> <div> <div>Operation after end of test - pass</div> <div>Auto</div> </div> <div> <div>Operation after end of test - fail</div> <div>Manual</div> </div> <div> <div>Operation after end of test - no status</div> <div>Manual</div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div>																										
<div> <div>Result</div> <div>RESULT SCREEN</div> </div>	<div> <div>Command properties</div> <div> <div> <div>Auto save</div> <div><input checked="" type="checkbox"/></div> </div> <div> <div>Auto print</div> <div><input checked="" type="checkbox"/></div> </div> </div> <div> <div>Print and save</div> <div></div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div>																										





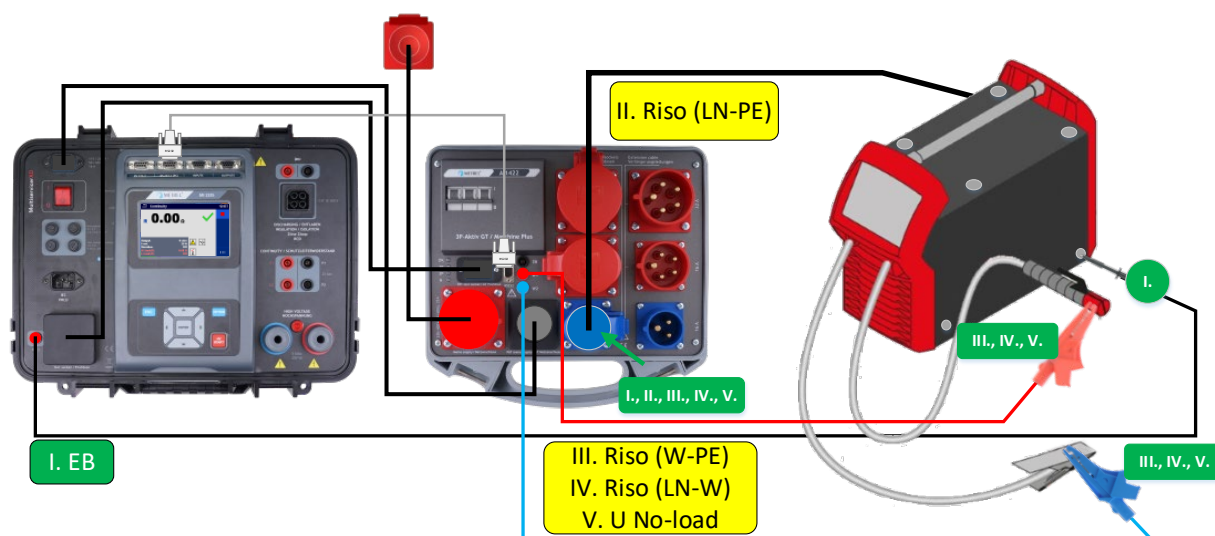
## 5.7. How to enable A 1422 Active 3-phase adapter for testing of, Arc / Welding equipment

MultiServicerXD in combination with A 1422 enables testing of single and three phase welding equipment. The following example describes the testing of a 1-phase, Class I. (d.c. output) welding device, the following tests will be performed:

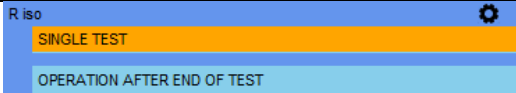
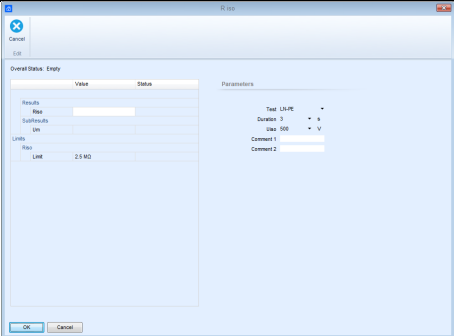
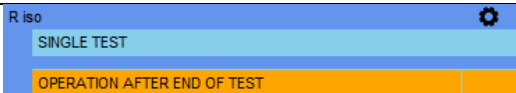
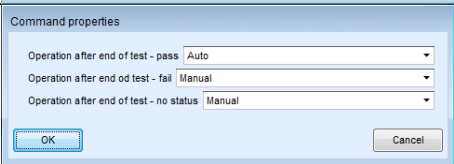
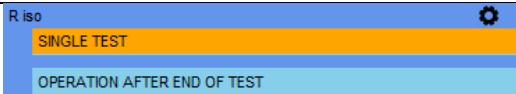
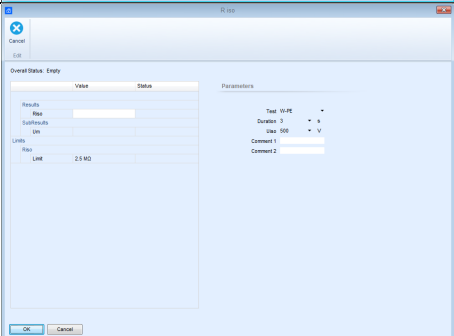
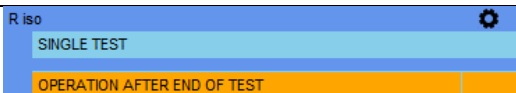
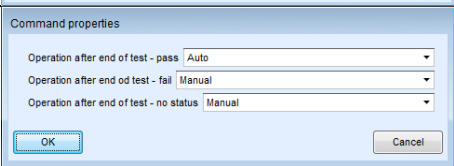
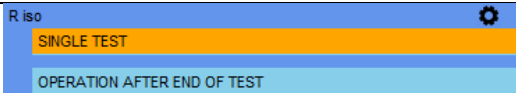
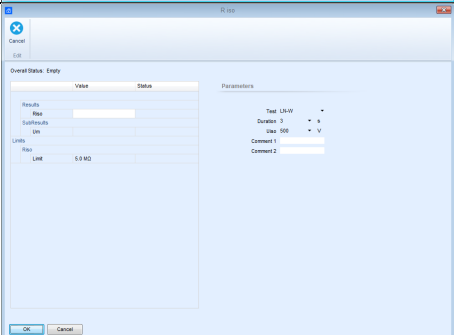
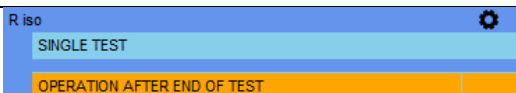
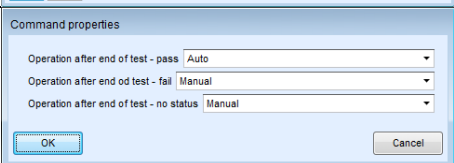
- I. Earth continuity
- II. Insulation resistance (Supply circuit to protective circuit), "LN-PE"
- III. Insulation resistance (welding circuit to protective circuit), "W-PE"
- IV. Insulation resistance (supply circuit to welding circuit), "LN-W"
- V. No-load voltage

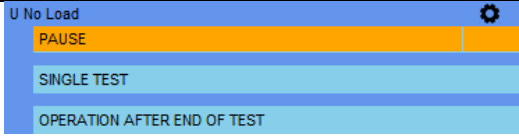
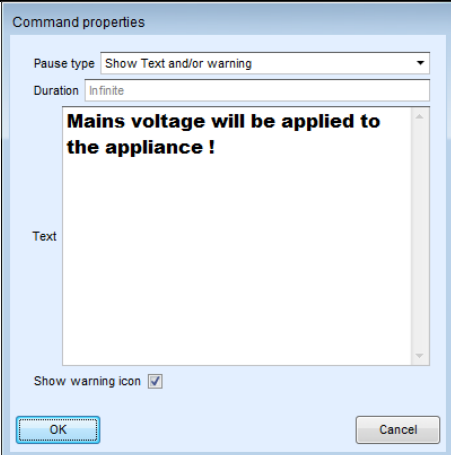
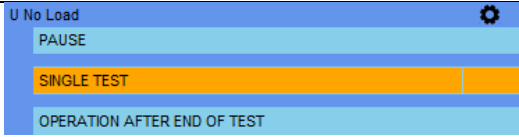
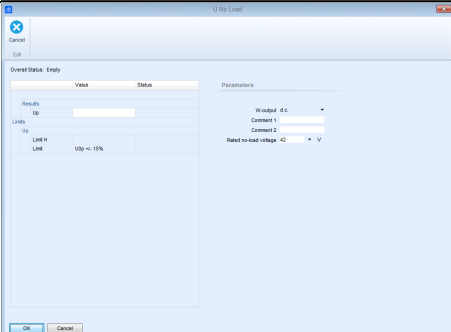
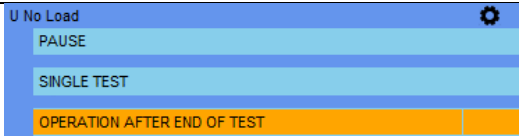
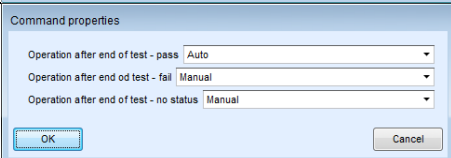

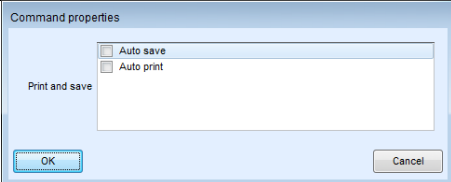
In the following steps it will be shown:

- How to establish connection between MI 3325 and A 1422 to enable Arc/Welding tests
- How to enable and execute Visual inspections
- Execution of Insulation resistance test (Riso "LN-PE")
- Execution of Insulation resistance test (Riso "W-PE")
- Execution of Insulation resistance test (Riso "LN-W")
- Use of flow command >PAUSE<
- Execution of No-load voltage (U No-load)
- How to manually save results into Memory Organizer



	<div> <div>Header</div> <div>Visual IEC/EN 60974-4</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> <div>Continuity</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> <div>R iso</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> <div>R iso</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> <div>R iso</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> <div>U No Load</div> <div>PAUSE</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> <div>Result</div> <div>RESULT SCREEN</div> </div>
<div>Header</div> <div>Visual IEC/EN 60974-4</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	<div>EMPTY</div> <div> <div>EMI Inspection</div> <div>Overall status: Nothing</div> <div> <div>Name</div> <div> <div>Terrakalade holder, welding current return clamp</div> <div>no missing or defective insulation</div> <div>no defective connections</div> <div>no defective, damaged switches</div> <div>no other damage</div> </div> </div> <div> <div>Waste supply</div> <div> <div>no defective, damaged cable</div> <div>effective cable anchorage</div> <div>no deformed, faulty plug</div> <div>no broken or thermally damaged plug pins</div> <div>cables and plugs are suitable for the intended use and performance</div> </div> </div> <div> <div>Welding circuit</div> <div> <div>no defective, damaged cable</div> <div>no deformed, faulty or thermally damaged coupler/sockets</div> <div>effective cable anchorage</div> <div>cables and couplers are suitable for the intended use and performance</div> </div> </div> <div> <div>Enclosure</div> <div> <div>no missing or damaged parts</div> <div>no unauthorised modifications</div> <div>no blocked cooling openings or missing air filters</div> <div>no signs of overload and improper use</div> <div>no missing or defective protective devices, for example, gas cylinder holder</div> <div>no missing or defective safety, lifting means, ladder, etc.</div> <div>no defective wire reel mounting means</div> </div> </div> <div> <div>Conductors and insulation</div> <div> <div>no defective switches, meters and lamps</div> <div>no defective pressure regulator or flowmeter</div> <div>control boxes accessible from outside the enclosure</div> </div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div>
<div>Visual IEC/EN 60974-4</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	<div>Command properties</div> <div> <div>Operation after end of test - pass</div> <div>Auto</div> <div>Operation after end of test - fail</div> <div>Manual</div> <div>Operation after end of test - no status</div> <div>Manual</div> <div>OK</div> <div>Cancel</div> </div>
<div>Continuity</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	<div>Continuity</div> <div> <div>Overall Status: Empty</div> <div> <div>Results</div> <div> <div>R</div> <div>0.0</div> </div> <div> <div>U</div> <div>0.0</div> </div> <div> <div>R (LINE)</div> <div>0.0</div> </div> <div> <div>L (LINE)</div> <div>0.0</div> </div> </div> <div> <div>Parameters</div> <div> <div>Output: RS - RE</div> <div>Test: 0.2</div> <div>Test: A</div> <div>Wire cross section</div> <div>Function: 3</div> <div>Comment 1</div> <div>Comment 2</div> </div> </div> <div>OK</div> <div>Cancel</div> </div>
<div>Continuity</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	<div>Command properties</div> <div> <div>Operation after end of test - pass</div> <div>Auto</div> <div>Operation after end of test - fail</div> <div>Manual</div> <div>Operation after end of test - no status</div> <div>Manual</div> <div>OK</div> <div>Cancel</div> </div>

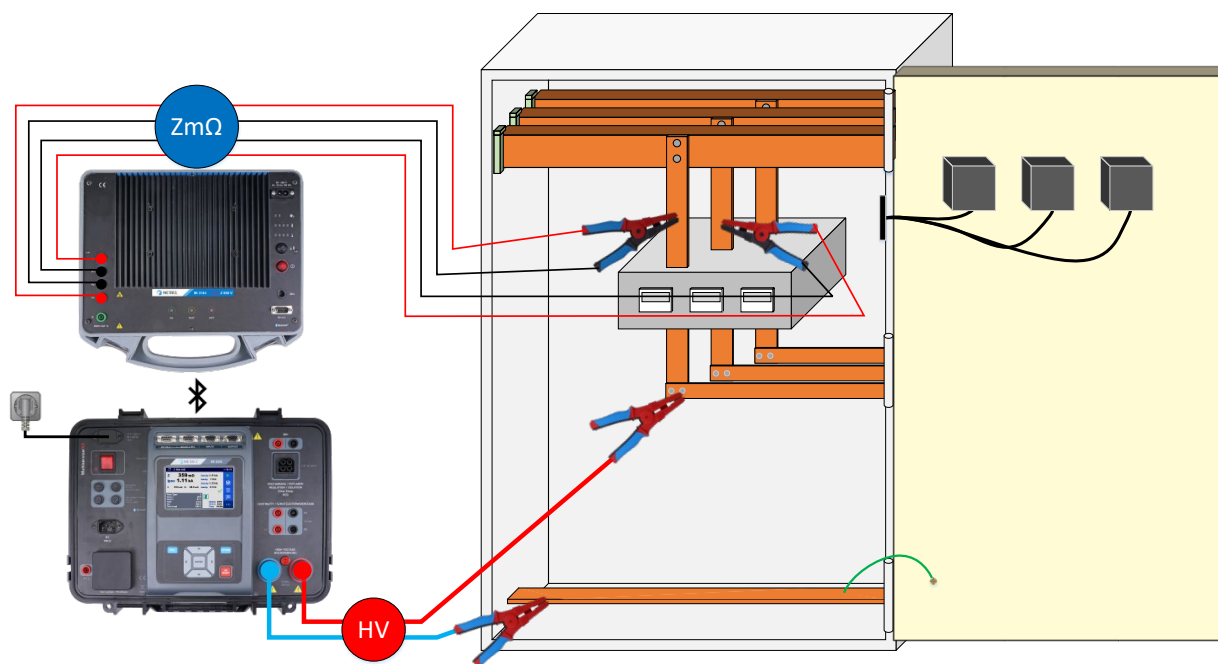


## 5.8. How to measure low impedance ( $m\Omega$ )

Switchboards are typical devices where many safety measurements are performed, including high voltage (HV) measurement and impedance ( $Z$ ) measurement in the  $m\Omega$  range. High precision line and fault loop impedance measurements are performed using high current impulses to assure adequate voltage drop during the test. The following example will show how to execute high voltage measurement using MI 3325 and an impedance measurement in  $m\Omega$  range using MI 3325 + MI 3144. Communication between test instruments will be established via Bluetooth.

In the following steps it will be shown:

- How to establish bluetooth communication between MI 3325 and MI 3144
- How to enable and execute Visual inspections
- Use of flow command >PAUSE<
- Execution of High voltage test (HV)
- Execution of Line Impedance test in  $m\Omega$  range ( $Z\ m\Omega$ )
- How to manually save results into Memory Organizer

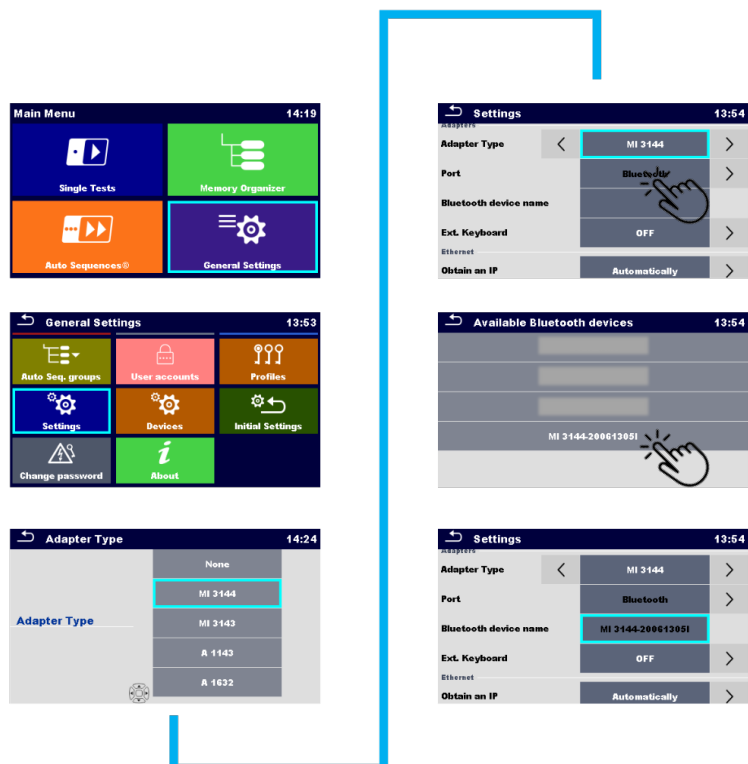


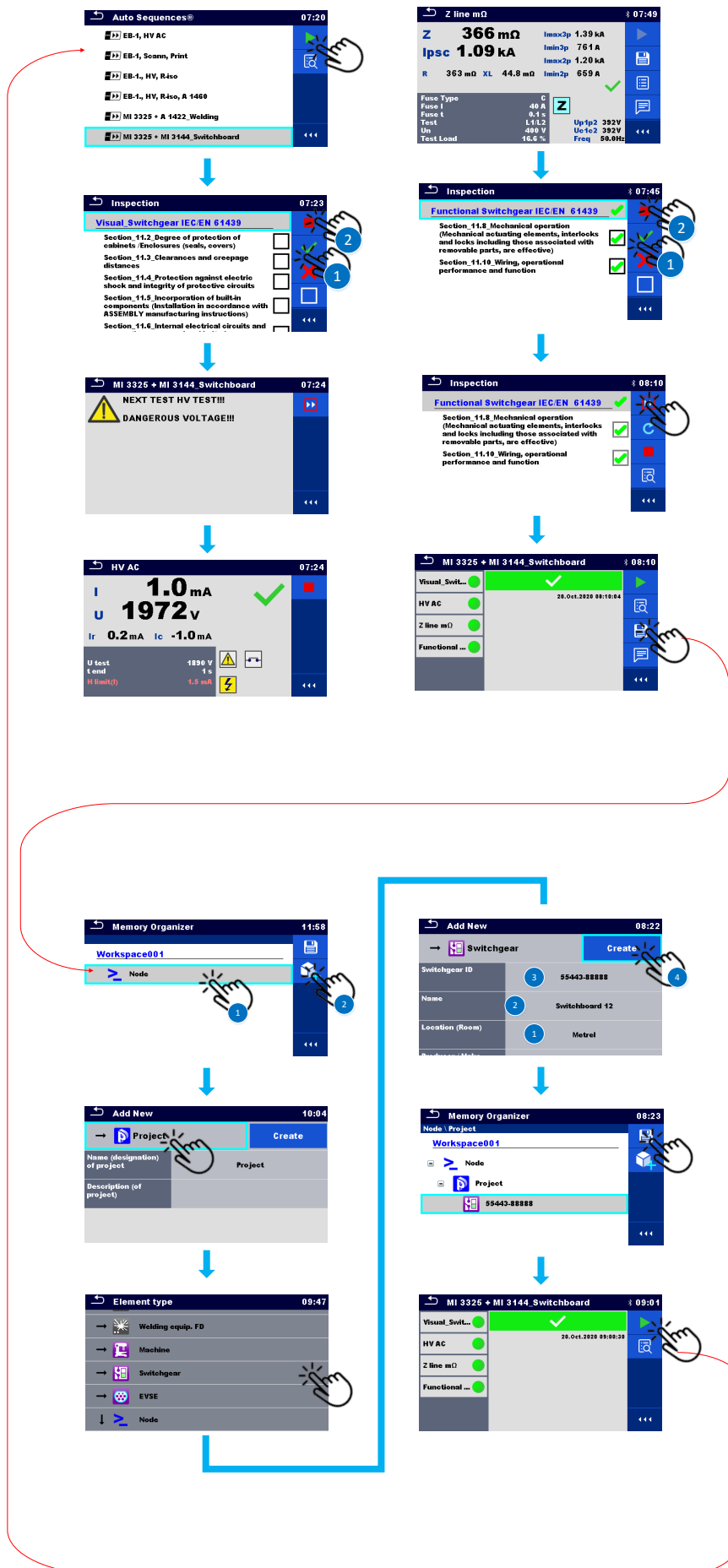
<div>Header</div> <div>Visual_Switchgear IEC/EN 61439</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> <div>HV AC</div> <div>PAUSE</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> <div>Z line mΩ</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> <div>Functional Switchgear IEC/EN 61439</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> <div>Result</div> <div>RESULT SCREEN</div>	
<div>Header</div> <div>Visual_Switchgear IEC/EN 61439</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	<div>EMPTY</div> <div>Empty Inspection</div> <div>Overall status Empty</div> <div>Name</div> <div>Status</div> <div>Section_11.2_Degree of protection of cabinets Enclosure (seals, covers)</div> <div>Empty</div> <div>Section_11.3_Clearances and creepage distances</div> <div>Empty</div> <div>Section_11.4_Protection against electric shock and integrity of protective circuits</div> <div>Empty</div> <div>Section_11.5_Incorporation of built-in components (installation in accordance with ASSEMBLY manufacturing instructions)</div> <div>Empty</div> <div>Section_11.6 External electrical circuits and connections (terminal and listed connections, correctly typed)</div> <div>Empty</div> <div>Section_11.7_Performance for external conductors (cable type, identification of terminals, in accordance with ASSEMBLY manufacturing instructions)</div> <div>Empty</div> <div>OK Cancel</div>
<div>Visual_Switchgear IEC/EN 61439</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	<div>Command properties</div> <div>Operation after end of test - pass Auto</div> <div>Operation after end of test - fail Manual</div> <div>Operation after end of test - no status Manual</div> <div>OK Cancel</div>
<div>HV AC</div> <div>PAUSE</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	<div>Command properties</div> <div>Pause type Show Text and/or warning</div> <div>Duration Infinite</div> <div>NEXT TEST HV TEST!!!</div> <div>DANGEROUS VOLTAGE!!!</div> <div>Text</div> <div>Show warning icon</div> <div>OK Cancel</div>
<div>HV AC</div> <div>PAUSE</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	<div>HW AC</div> <div>Cancel</div> <div>OK</div> <div>Overall Status Empty</div> <div>Value Status</div> <div>Results</div> <div>Test Results</div> <div>Subresults</div> <div>OK</div> <div>Fail</div> <div>Errors</div> <div>L test OFF</div> <div>R test 1.5 mA</div> <div>Parameters</div> <div>Circuit 1000 V</div> <div>Fault 1</div> <div>Comment 1</div> <div>Comment 2</div> <div>OK Cancel</div>

<div>HV AC</div> <div>PAUSE</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	<div>Command properties</div> <div>Operation after end of test - pass Auto</div> <div>Operation after end of test - fail Manual</div> <div>Operation after end of test - no status Manual</div> <div>OK</div> <div>Cancel</div>																												
<div>Z line mΩ</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	<div>2 (see mΩ)</div> <div>Cancel</div> <div>OK</div> <div>Overall Status Empty</div> <div>Results</div> <table border="1"> <thead> <tr> <th>Value</th> <th>Status</th> </tr> </thead> <tbody> <tr><td>Watt</td><td></td></tr> <tr><td>Z</td><td></td></tr> <tr><td>Subtractions</td><td></td></tr> <tr><td>Temp</td><td></td></tr> <tr><td>XL</td><td></td></tr> <tr><td>R</td><td></td></tr> <tr><td>U<sub>0</sub></td><td></td></tr> <tr><td>WattUp</td><td></td></tr> <tr><td>WattUp</td><td></td></tr> <tr><td>WattUp</td><td></td></tr> <tr><td>WattUp</td><td></td></tr> </tbody> </table> <div>Limits</div> <table border="1"> <thead> <tr> <th>Unit</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>400 A</td> </tr> </tbody> </table> <div>Parameters</div> <div> <div>Fuse Type C</div> <div>Fuse1 40</div> <div>Fuse1 0.1</div> <div>Test U<sub>0</sub>2</div> <div>U<sub>0</sub> 400</div> <div>U<sub>0</sub> 400</div> <div>Test Load 16.6</div> <div>Average OFF</div> <div>Bus factor 1</div> <div>Tolerance 10</div> <div>Comment 1</div> <div>Comment 2</div> </div> <div>OK</div> <div>Cancel</div>	Value	Status	Watt		Z		Subtractions		Temp		XL		R		U <sub>0</sub>		WattUp		WattUp		WattUp		WattUp		Unit	Value	A	400 A
Value	Status																												
Watt																													
Z																													
Subtractions																													
Temp																													
XL																													
R																													
U <sub>0</sub>																													
WattUp																													
WattUp																													
WattUp																													
WattUp																													
Unit	Value																												
A	400 A																												
<div>Z line mΩ</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	<div>Command properties</div> <div>Operation after end of test - pass Auto</div> <div>Operation after end of test - fail Manual</div> <div>Operation after end of test - no status Manual</div> <div>OK</div> <div>Cancel</div>																												
<div>Functional Switchgear IEC/EN 61439</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	<div>ESB Inspection</div> <div>Cancel</div> <div>OK</div> <div>Overall status Empty</div> <div>Name</div> <div>Section_11_5_Mechanical operation (Mechanical actuating elements, interlocks and locks including those associated with removable parts, are effective)</div> <div>Section_11_5_3_Starting operational performance and function</div> <div>Empty</div> <div>Empty</div>																												
<div>Functional Switchgear IEC/EN 61439</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	<div>Command properties</div> <div>Operation after end of test - pass Auto</div> <div>Operation after end of test - fail Manual</div> <div>Operation after end of test - no status Manual</div> <div>OK</div> <div>Cancel</div>																												
<div>Result</div> <div>RESULT SCREEN</div>	<div>Command properties</div> <div>Auto save</div> <div>Auto print</div> <div>Print and save</div> <div>OK</div> <div>Cancel</div>																												



Before performing the measurement, it is necessary to establish communication (wireless or wired) between MI 3325 MultiServicerXD and MI 3144 Euro Z 800V. This is done according to the following procedure.





## **5.9. How to do a diagnostic test on a (EVSE) charging station**

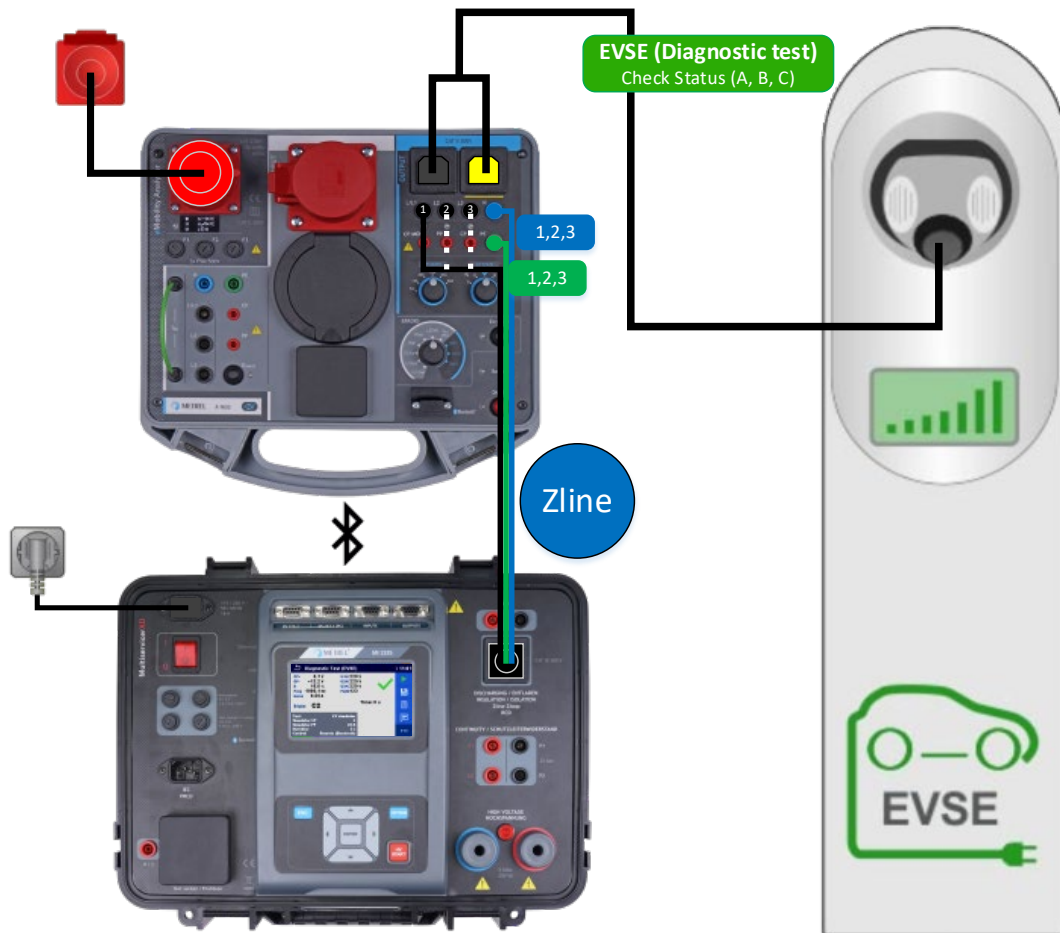
One other application covered by MultiServicerXD is the verification of (EVSE) charging stations. To perform the tests on the (EVSE) station, it is necessary to use the optional adapter (A 1632, eMobility Analyzer), which allows us to establish the appropriate states of the (EVSE) station, to enable execution of safety and diagnostic tests on the charging station.

In the following example, two measurements will be shown:

- (EVSE) station diagnostic test,
- line impedance measurement.

In the following steps it will be shown:

- How to establish bluetooth communication between MI 3325 and A 1632
- How to connect instrument and adapter for execution of impedance test
- Execution of Disagnostic test (Simulation of state A)
- Execution of Disagnostic test (Simulation of state B)
- Execution of Disagnostic test (Simulation of state C)
- Execution of Impedance test (Zline "L1-N")
- Execution of Impedance test (Zline "L2-N")
- Execution of Impedance test (Zline "L3-N")
- Execution of Functional inspection (Functional EVSE)
- How to manually save results into Memory Organizer

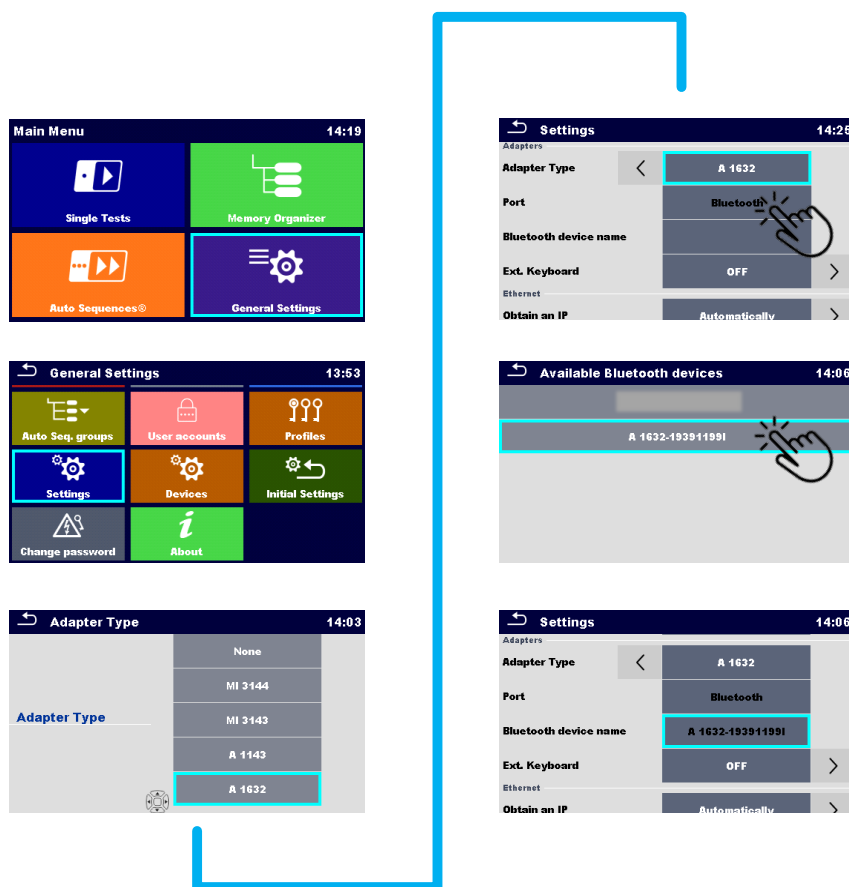


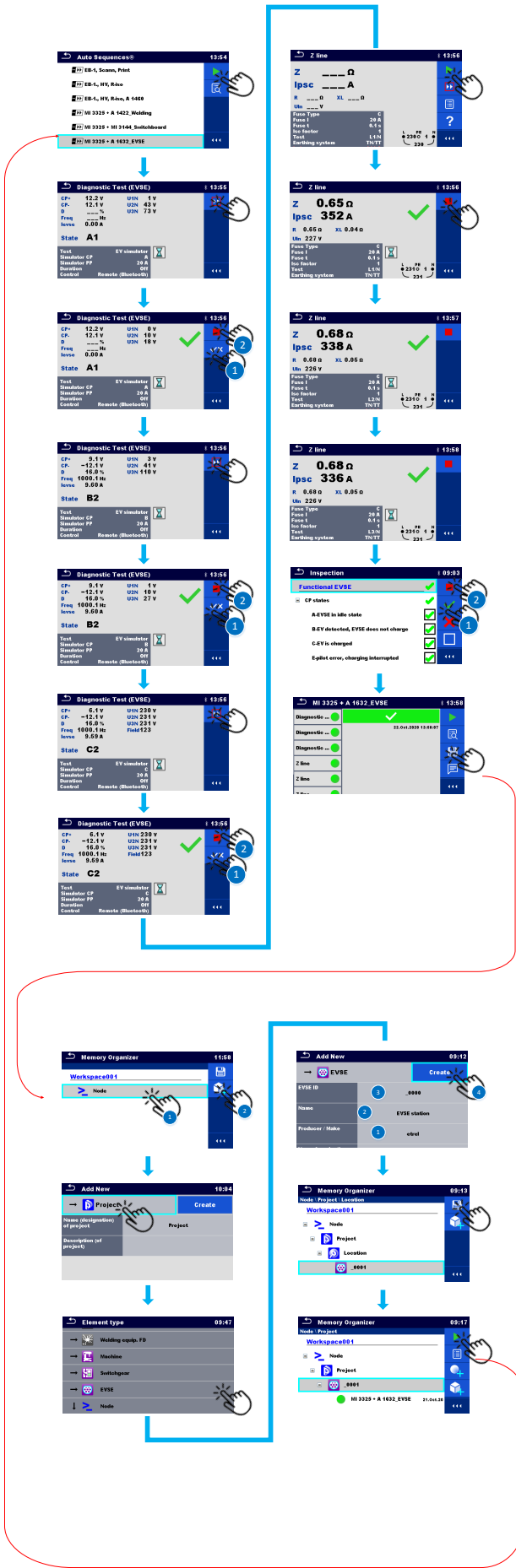
Header		
Diagnostic Test (EVSE)		
SINGLE TEST		
OPERATION AFTER END OF TEST		
Diagnostic Test (EVSE)		
SINGLE TEST		
OPERATION AFTER END OF TEST		
Diagnostic Test (EVSE)		
SINGLE TEST		
OPERATION AFTER END OF TEST		
Z line		
SINGLE TEST		
OPERATION AFTER END OF TEST		
Z line		
SINGLE TEST		
OPERATION AFTER END OF TEST		
Z line		
SINGLE TEST		
OPERATION AFTER END OF TEST		
Functional EVSE		
SINGLE TEST		
OPERATION AFTER END OF TEST		
Result		
RESULT SCREEN		
Header		EMPTY

<div>Diagnostic Test (EVSE)</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	
<div>Diagnostic Test (EVSE)</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	
<div>Diagnostic Test (EVSE)</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	
<div>Diagnostic Test (EVSE)</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	
<div>Diagnostic Test (EVSE)</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	
<div>Diagnostic Test (EVSE)</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	
<div>Z line</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div>	

<div> <div>Z line</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> </div>	<div> <div>Command properties</div> <div> <div>Operation after end of test - pass</div> <div>Auto</div> </div> <div> <div>Operation after end of test - fail</div> <div>Manual</div> </div> <div> <div>Operation after end of test - no status</div> <div>Manual</div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div>																		
<div> <div>Z line</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> </div>	<div> <div>Z line</div> <div> <div>Overall Status: Empty</div> <div> <div>Results</div> <table> <tr><td>Watt</td><td></td></tr> <tr><td>Z</td><td></td></tr> <tr><td>Subresults</td><td></td></tr> <tr><td>W</td><td></td></tr> <tr><td>R</td><td></td></tr> <tr><td>Watt 30</td><td></td></tr> <tr><td>Watt 70</td><td></td></tr> <tr><td>Watt 10</td><td></td></tr> <tr><td>Watt</td><td></td></tr> </table> <div> <div>Units</div> <div>W</div> <div>200 A</div> </div> </div> <div> <div>Parameters</div> <div> <div>Fuse Type: C</div> <div>Fuse1: 20</div> <div>Fuse1: 0.1</div> <div>No. Stages: 1</div> <div>Test: LIR</div> <div>Starting system: THVT</div> <div>Comment 1</div> <div>Comment 2</div> </div> </div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div>	Watt		Z		Subresults		W		R		Watt 30		Watt 70		Watt 10		Watt	
Watt																			
Z																			
Subresults																			
W																			
R																			
Watt 30																			
Watt 70																			
Watt 10																			
Watt																			
<div> <div>Z line</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> </div>	<div> <div>Command properties</div> <div> <div>Operation after end of test - pass</div> <div>Auto</div> </div> <div> <div>Operation after end of test - fail</div> <div>Manual</div> </div> <div> <div>Operation after end of test - no status</div> <div>Manual</div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div>																		
<div> <div>Z line</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> </div>	<div> <div>Z line</div> <div> <div>Overall Status: Empty</div> <div> <div>Results</div> <table> <tr><td>Watt</td><td></td></tr> <tr><td>Z</td><td></td></tr> <tr><td>Subresults</td><td></td></tr> <tr><td>W</td><td></td></tr> <tr><td>R</td><td></td></tr> <tr><td>Watt 30</td><td></td></tr> <tr><td>Watt 70</td><td></td></tr> <tr><td>Watt 10</td><td></td></tr> <tr><td>Watt</td><td></td></tr> </table> <div> <div>Units</div> <div>W</div> <div>200 A</div> </div> </div> <div> <div>Parameters</div> <div> <div>Fuse Type: C</div> <div>Fuse1: 20</div> <div>Fuse1: 0.1</div> <div>No. Stages: 1</div> <div>Test: LIR</div> <div>Starting system: THVT</div> <div>Comment 1</div> <div>Comment 2</div> </div> </div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div>	Watt		Z		Subresults		W		R		Watt 30		Watt 70		Watt 10		Watt	
Watt																			
Z																			
Subresults																			
W																			
R																			
Watt 30																			
Watt 70																			
Watt 10																			
Watt																			
<div> <div>Z line</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> </div>	<div> <div>Command properties</div> <div> <div>Operation after end of test - pass</div> <div>Auto</div> </div> <div> <div>Operation after end of test - fail</div> <div>Manual</div> </div> <div> <div>Operation after end of test - no status</div> <div>Manual</div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div>																		
<div> <div>Functional EVSE</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> </div>	<div> <div>EVSE Inspection</div> <div> <div>Overall status: Empty</div> <div> <div>CP status</div> <div> <div>A-CV in the state</div> <div>B-CV selected, EVSE does not charge</div> <div>C-CV is charged</div> <div>Cable error, charging interrupted</div> <div>PP (check)</div> </div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div> </div>																		
<div> <div>Functional EVSE</div> <div>SINGLE TEST</div> <div>OPERATION AFTER END OF TEST</div> </div>	<div> <div>Command properties</div> <div> <div>Operation after end of test - pass</div> <div>Auto</div> </div> <div> <div>Operation after end of test - fail</div> <div>Manual</div> </div> <div> <div>Operation after end of test - no status</div> <div>Manual</div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div>																		
<div> <div>Result</div> <div>RESULT SCREEN</div> </div>	<div> <div>Command properties</div> <div> <div> <div>Auto save</div> <div>Auto print</div> </div> <div> <div>Print and save</div> <div></div> </div> <div> <div>OK</div> <div>Cancel</div> </div> </div> </div>																		

Before performing the measurement, it is necessary to establish wireless communication between MI 3325 MultiServicerXD and A 1632 eMobility Analyser. This is done according to the following procedure.







## 6. Special features

This chapter describes special features supported by the instrument. Some of the features are specially developed to help the user be more efficient, safe, and make the instrument easier to handle. Some of these are unique (implemented due to the specific needs of certain markets) therefore need further explanation for understanding how to handle the instrument.

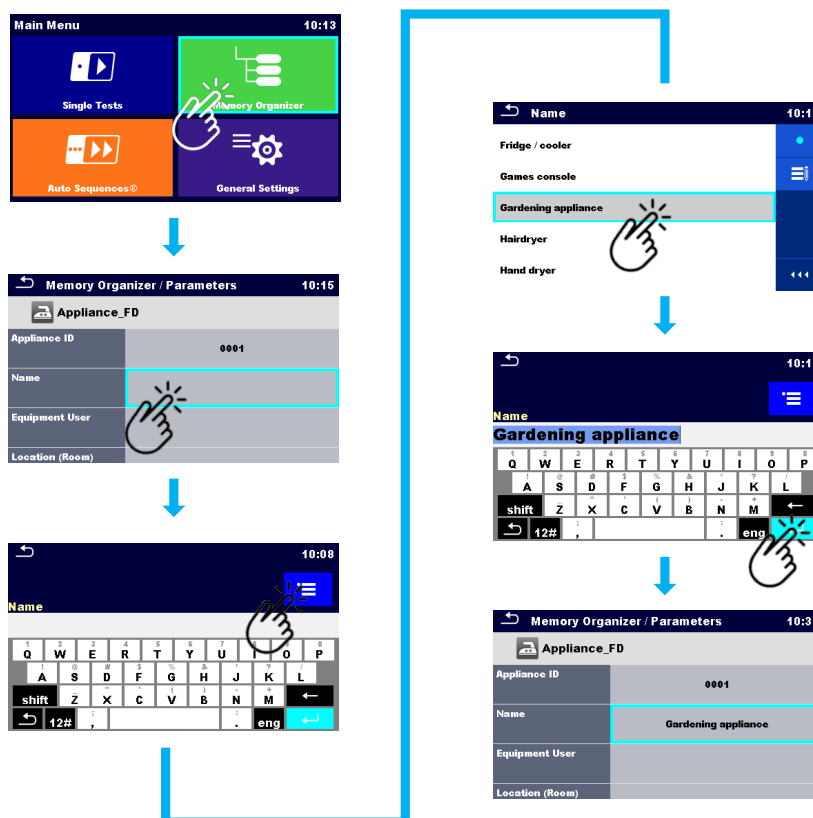
### 6.1. Working with user custom lists

MultiServicerXD supports many different structural elements where test results can be stored. These structural element parameters will be printed on professional reports. Due to the nature of work, many of these parameters are repeating, therefore Metrel has integrated custom lists, which can be filled on the fly, and re-used from the drop-down lists.

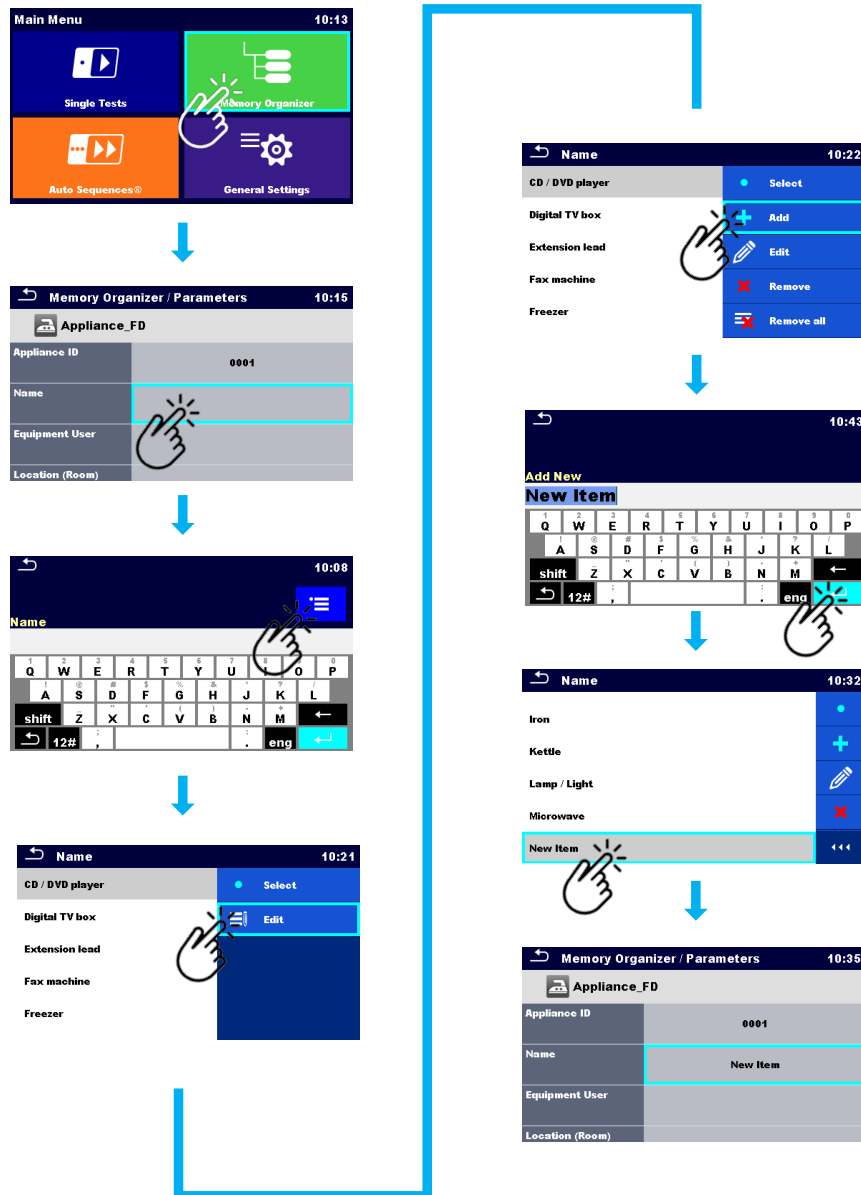
Custom lists are available for various parameters present in the memory organizer, such as:

- Device ID,
- Device name,
- Location of the appliance,
- Producer,
- Etc.

For testing itself, this means a significant speedup, as the user can select items from the lists instead of manually entering item names during the testing procedure.



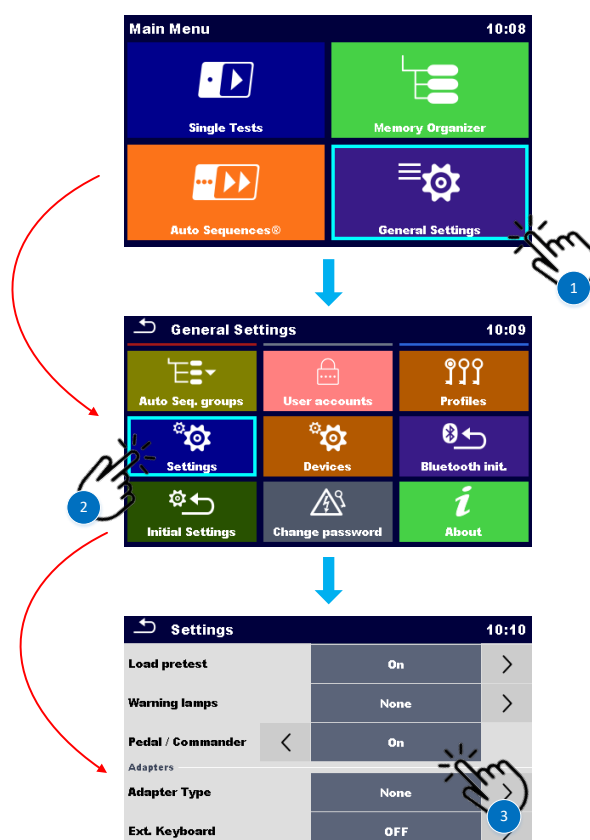
Custom lists can be filled on the fly, by choosing the drop-down list symbol and entering a new value.



## 6.2. How to enable remote start with optional A 1511 / A 1495 (Single Tests)

In the General Settings of the instrument, the external commander/pedal can be set for remote control over single tests.

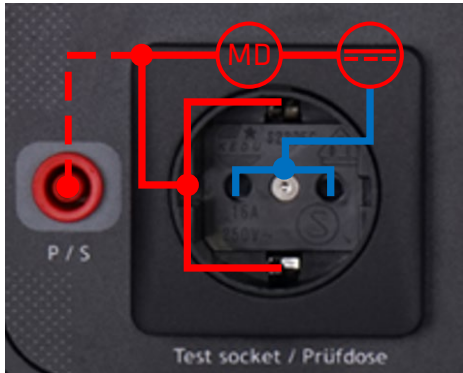
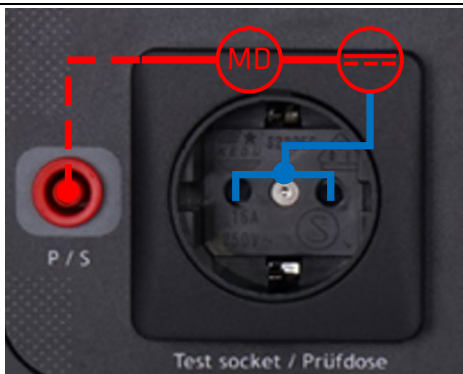
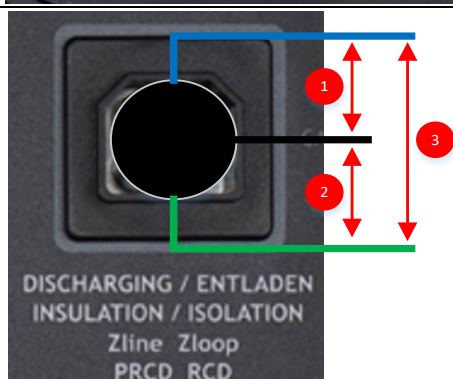
The Remote commander is in general intended to be used for the execution of Earth continuity measurement (4-wire test method), but it can also be used for the execution of Insulation resistance measurement when properly connected to corresponding instrument test terminals. Appropriate connection is described in chapter 5.2 (*How to execute Earth continuity and Insulation resistance test using optional A 1511*).

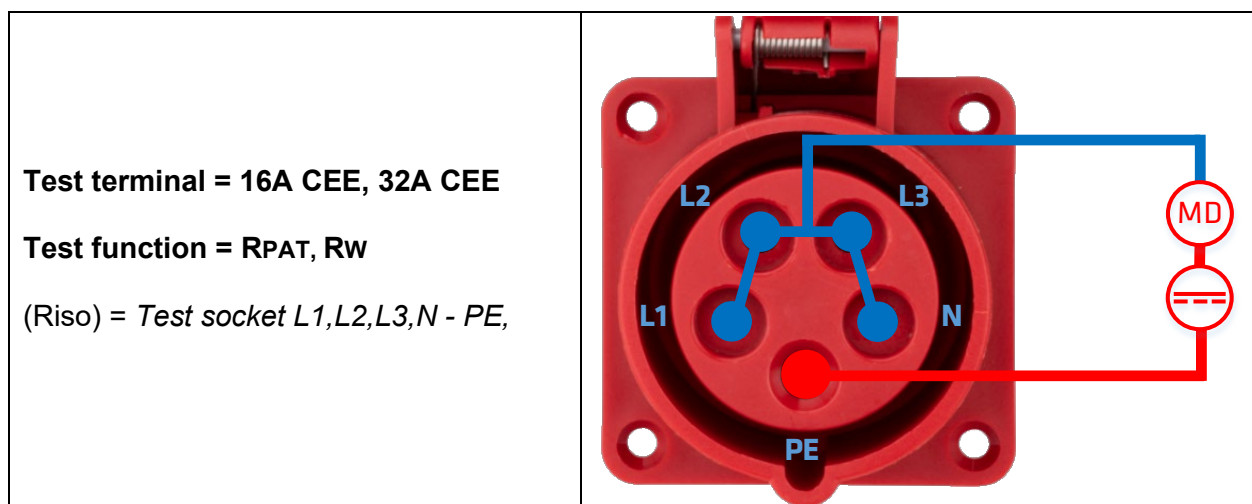


## 6.3. Disableing pre-tests for specific measuring functions

### 6.3.1. Load pre-test

MultiServicerXD enables the measurement of insulation resistance via various test terminals:

<p><b>Test terminal = Test socket + P/S probe</b></p> <p><b>Test function = RPAT, Rw</b></p> <p>(Riso) = <i>Test socket LN - PE, P/S</i></p>																												
<p><b>Test terminal = Test socket + P/S probe</b></p> <p><b>Test function = RPAT, Rw</b></p> <p>(Riso-S) = <i>Test socket LN - P/S</i></p>																												
<p><b>Test terminal = TP1</b></p> <p><b>Test function = ISO</b></p> <table><tr><th>Test function</th><th>Type Riso parameter</th><th>Load pretest terminals</th></tr><tr><td>Riso</td><td>-</td><td></td></tr><tr><td></td><td>L/N</td><td></td></tr><tr><td></td><td>Lx/N</td><td>L-N (1)</td></tr><tr><td></td><td>L/L</td><td></td></tr><tr><td></td><td>Lx/Ly</td><td></td></tr><tr><td></td><td>L/PE</td><td></td></tr><tr><td></td><td>Lx/PE</td><td>L-PE (2)</td></tr><tr><td></td><td>N/PE</td><td>N-PE (3)</td></tr></table>	Test function	Type Riso parameter	Load pretest terminals	Riso	-			L/N			Lx/N	L-N (1)		L/L			Lx/Ly			L/PE			Lx/PE	L-PE (2)		N/PE	N-PE (3)	
Test function	Type Riso parameter	Load pretest terminals																										
Riso	-																											
	L/N																											
	Lx/N	L-N (1)																										
	L/L																											
	Lx/Ly																											
	L/PE																											
	Lx/PE	L-PE (2)																										
	N/PE	N-PE (3)																										



The main purpose of such functionality is that the instrument supports testing in various applications:

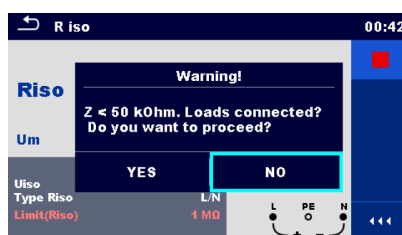
- Testing of Electrical Machines,
- Electrical Switchgears,
- Testing of Portable Devices,
- Testing of electrical equipment and,
- Testing of electrical installations.

#### ISO test function

This test function is primarily intended for testing fixed connected devices or testing electrical installations, as the user can apply the test voltage between different test terminals.

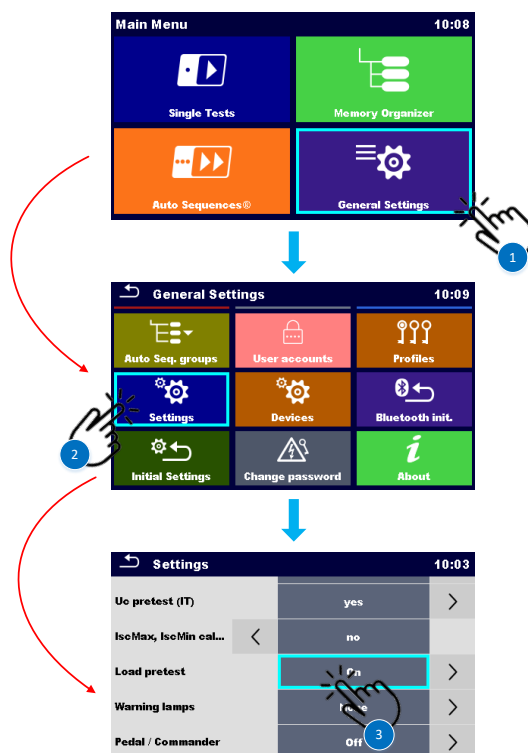
In some applications loads connected between phase and neutral conductor can be damaged if too high voltage is applied during test, this applies mainly to insulation resistance test which is executed through **TP1 test** terminal.

High Insulation voltage can potentially damage the connected appliances during the Insulation measurement. This misuse can be prevented by enabling Load pre-test functionality in Settings menu. Load pre-test measures the impedance on test terminals with low and safe a.c. voltage. If impedance lower than 50 kΩ is detected, warning message is displayed, allowing to disconnect the appliances before test voltage is applied.



Insulation measuring voltage is applied to the test terminals only after YES is selected. NO will abort the measurement.

If impedance higher than 50 k $\Omega$  is measured during the Load pre-test, Insulation test will follow automatically.



How to enable Load pre-test functionality is shown on bellow flow diagram.

#### *RPAT, RW test function*

This test function is primarily intended for testing electrical equipment (PAT):

- Electrical equipment with a power cord (1-phase and 3-phase),
- IEC leads / Connection cables,
- Extension leads (1-phase and 3-phase).

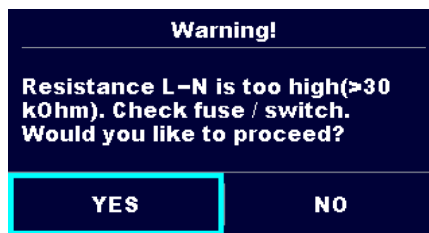
#### *Electrical equipment with power cord*

When testing Electrical equipment with power cord it is important that On/Off switches are closed.

If after the switches were closed all safety-relevant parts are not included the results will be impaired. This is often the case in electronic or relay-driven On/Off circuits. In this case leakage current, tests can be performed as an alternative.

In order to warn the user that the On/Off switch of the device under test is placed in the correct position, and that the input fuses of the device under test are not blown, the test instrument has a built-in load pre-test function, which is executed before the insulation resistance test.

If the resistance between the Phase and Neutral conductors measured in the pre-test is greater than 30 k $\Omega$ , we can assume that the tested device switch is not in the correct position or that it has blown input fuses.

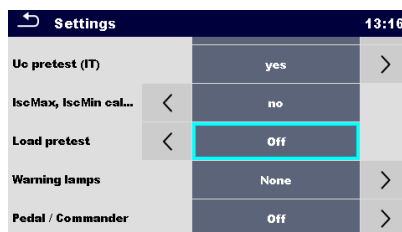


This pre-test is active by default, in the settings menu it must be set to On.

#### *IEC Connection cables, Extension leads (1-phase and 3-phase)*

When testing the IEC leads or other Extension leads without installed protective devices the Load pre-test can be annoying, as the resistance measured in the pretest between Live and Neutral conductors will always be greater than 30 kOhm.

In such application the Load pre-test can be set to off.



Note!

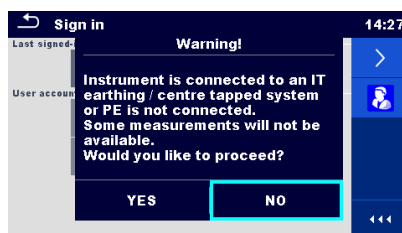
When testing electrical equipment, it is obligatory to perform complete sequence of tests. When using Metrel AutoSequences® the Load pre-test can be disabled using flow command No-notification mode, as explained in chapter 3.5.8 (*No notifications mode*), and chapter 5.6 (*How to enable test setup with CE Adapter A 1460*).

### **6.3.2. Disabling (IT) earthing system warning**

The MultiServicerXD supports operation in different earthing systems (TN/TT and IT), by default, it is set for operation in TN/TT earthing system.

Laboratory rooms, medical facilities, construction sites, repair workshops, mobile electrical installations, and other environments where there is an increased risk of insulation faults, often use an IT earthing arrangement supplied from isolation transformers. The main purpose of such an arrangement is related to safety issues.

When the test instrument is connected to and IT system for the first time a warning message is displayed.



The operator of the MultiServicerXD can confirm that the instrument is connected to the IT earthing system, in such case the warning message will be disabled, and the test instrument will start operating in an IT earthing system mode. Some measurements will be disabled (for more information refer to user manual).

#### **6.4. How to enable Warning lamps & Buzzer (Single tests)**

Certain measuring functions, supported by MultiServicerXD, for safety reasons require that all personnel present, during the testing procedure, are notified that the measurement is being performed. This is especially important when performing a high voltage measurement, where it is required by standard EN 50191, that signal lights shall be installed to indicate the operational status inside the test area and that they must be clearly visible to people outside the test area.

The green light indicates status ready for operation, and the red light indicates status in operation.

In addition to HV lamps it is possible to set status lights indicating PASS/FAIL status of ongoing measurement plus enabling buzzer to indicate one of available statuses.

##### **6.4.1. HV lamps (A 1496)**

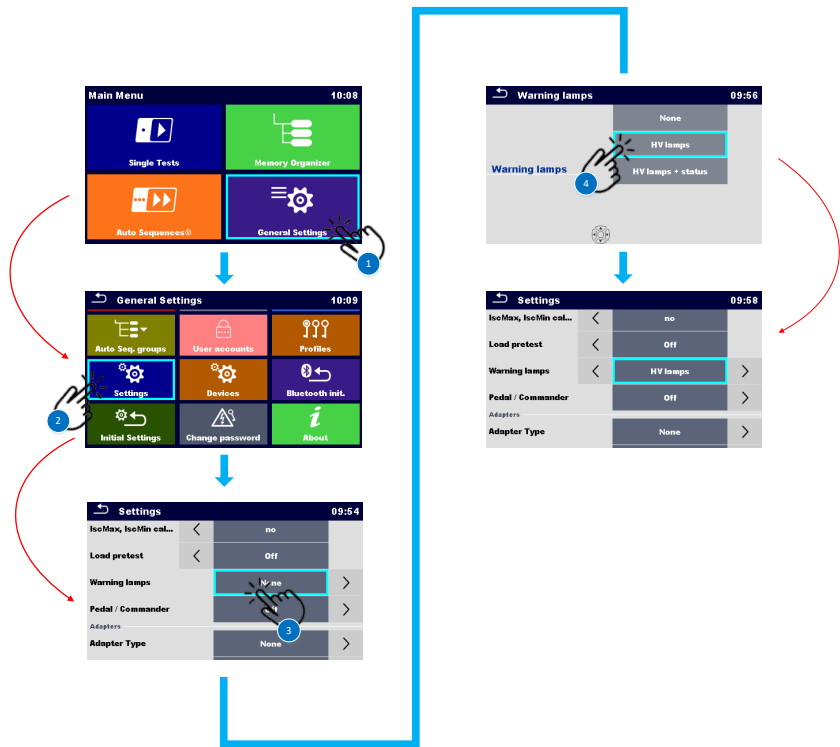
HV lamps are designed to be used in High Voltage measuring functions, but can also be used for indication of PASS/FAIL statuses. Alongside to light indication external buzzer can be set to indicate one of the states (ready for operation, or in operation).

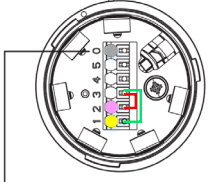

##### *HV status indication:*

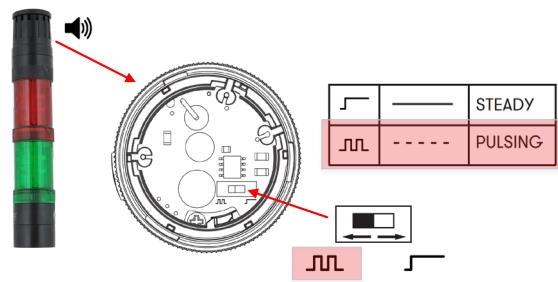
Indication of Operating States for the MultiServicerXD:

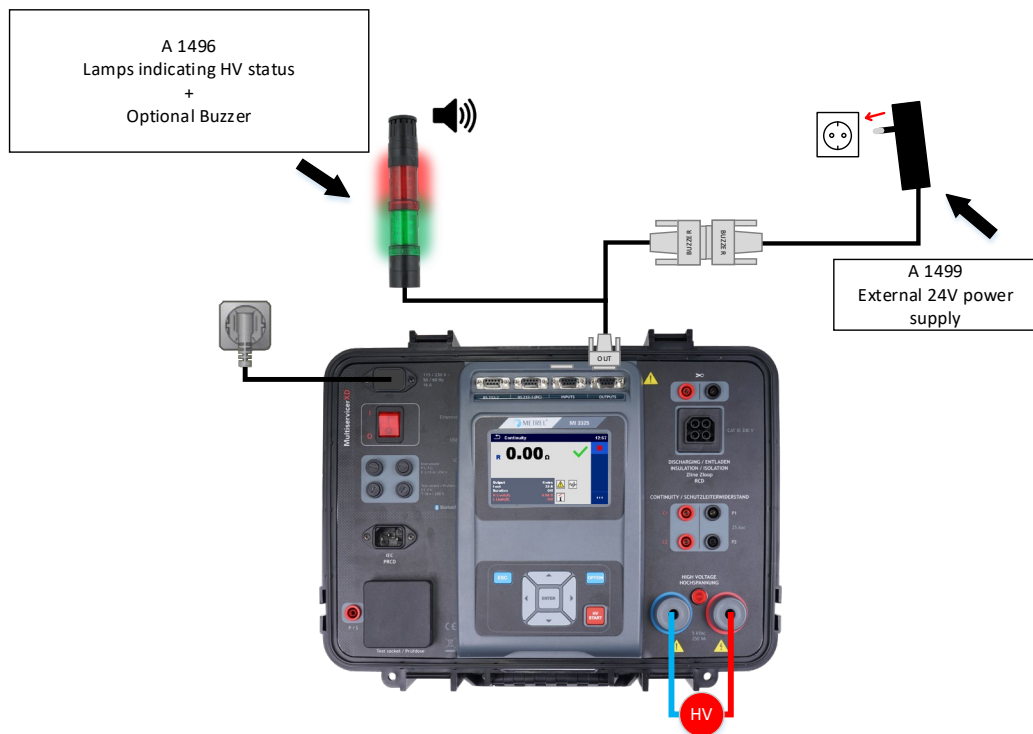
- Green status light indicates that test instrument is ready for operation. Instrument is ON and HV function is selected, the test voltage supply circuit is still switched off and secured with a password.
- Red status light indicates that the (HV) dielectric strength test has been activated and the measurement is in process, voltage is applied to test terminals.





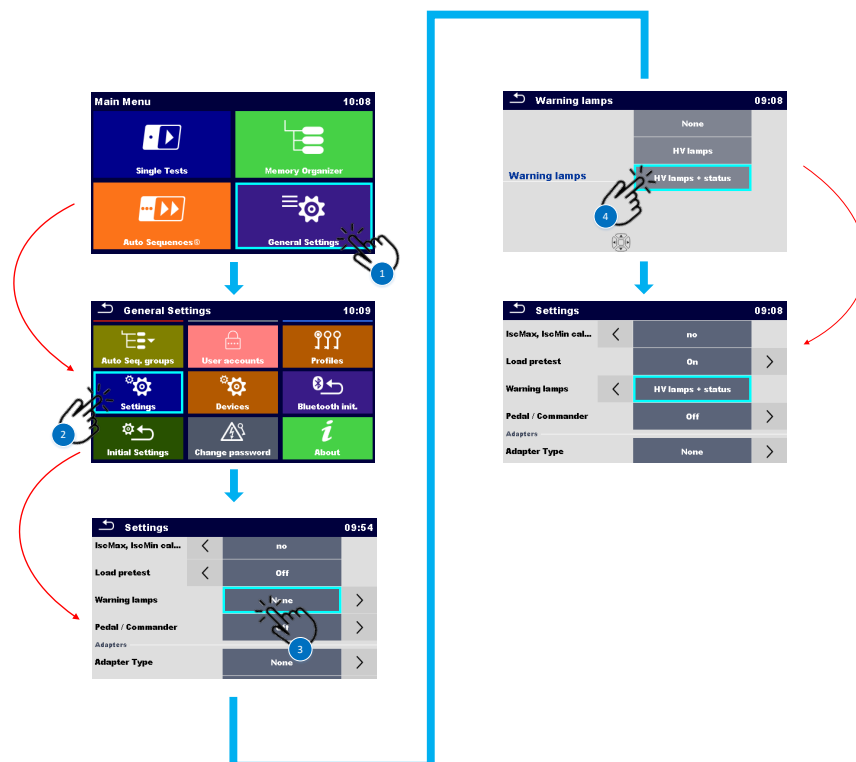
	
COMMON	Rs232 cable
Signal tower connector	RS232 communication cable
Enabling HV lamps & buzzer on A 1496	
LED TOWER (PIN CONNECTOR)	RS232 CABLE
GND (0)	Gray / Grau
/ (5)	/
/ (4)	/
Buzzer (3)	(Option 1) or (Option 2)
Red LED (2)	Pink / Rosa, [enabling buzzer = bridge (PIN2&PIN3)] - (Option 1)
Green LED (1)	Yellow / Gelb, [enabling buzzer = bridge (PIN1&PIN3)] - (Option 2)

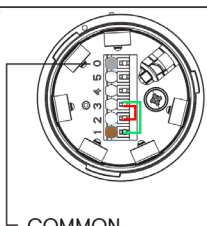



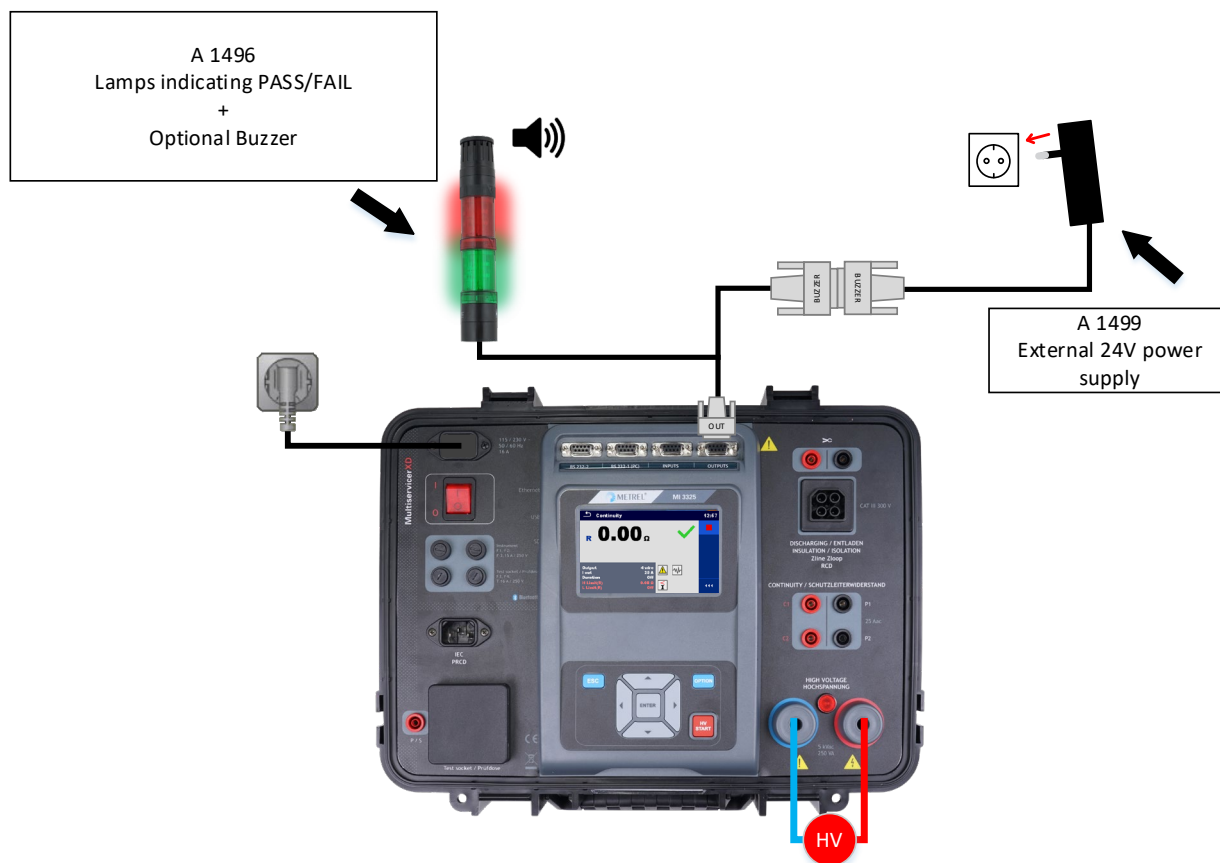
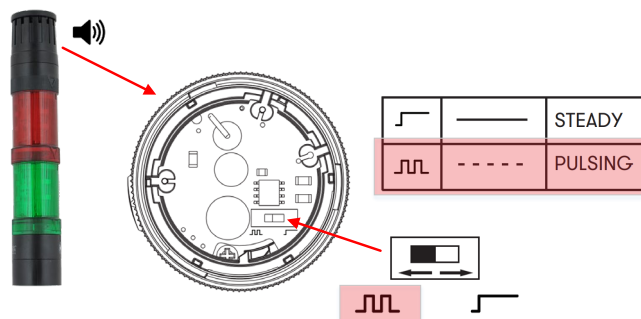


### PASS/FAIL status indication

With correct wiring the A 1496 signal tower can be used for indication of PASS/FAIL statuses.

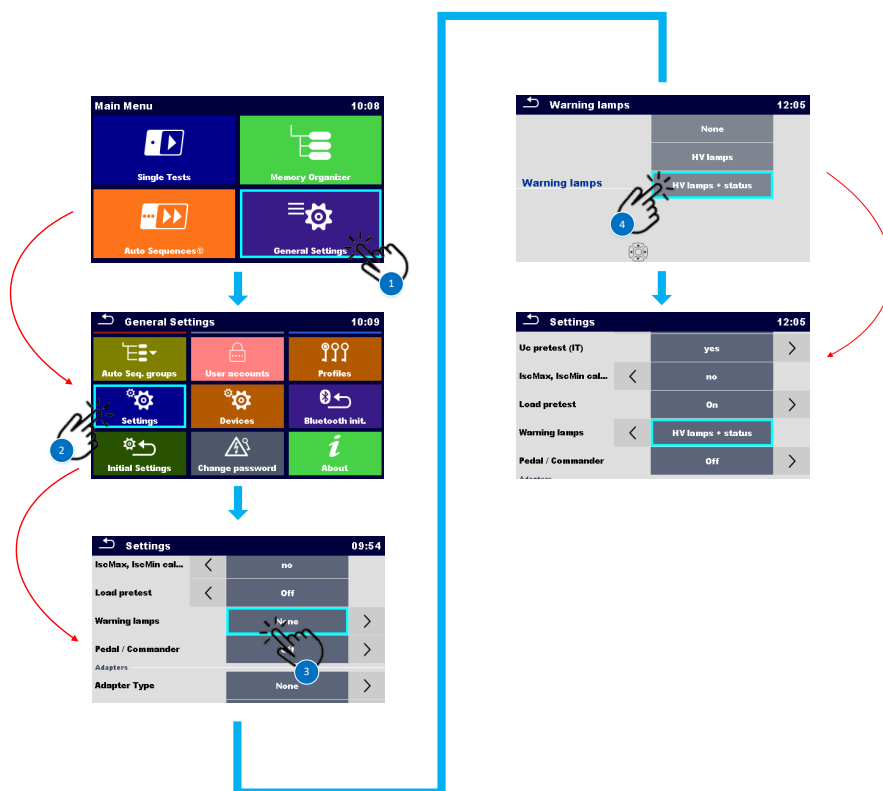


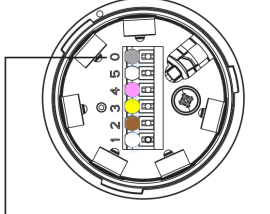

 <p>COMMON</p>	 <p>Rs232 cable</p>
Signal tower connector	RS232 communication cable
<b>Enabling A 1496 for PASS / FAIL status &amp; (optional) buzzer</b>	
<b>LED TOWER (PIN CONNECTOR)</b>	<b>RS232 CABLE</b>
GND (0)	Gray / Grau
/ (5)	/
/ (4)	/
Buzzer (3)	(Option 1) or (Option 2)
Red LED (2)	White / Weiß (OUTPUT 4) [enabling buzzer = bridge (PIN2&PIN3)] - (Option 1)
Green LED (1)	Brown / Braun (OUTPUT 3) [enabling buzzer = bridge (PIN1&PIN3)] - (Option 2)

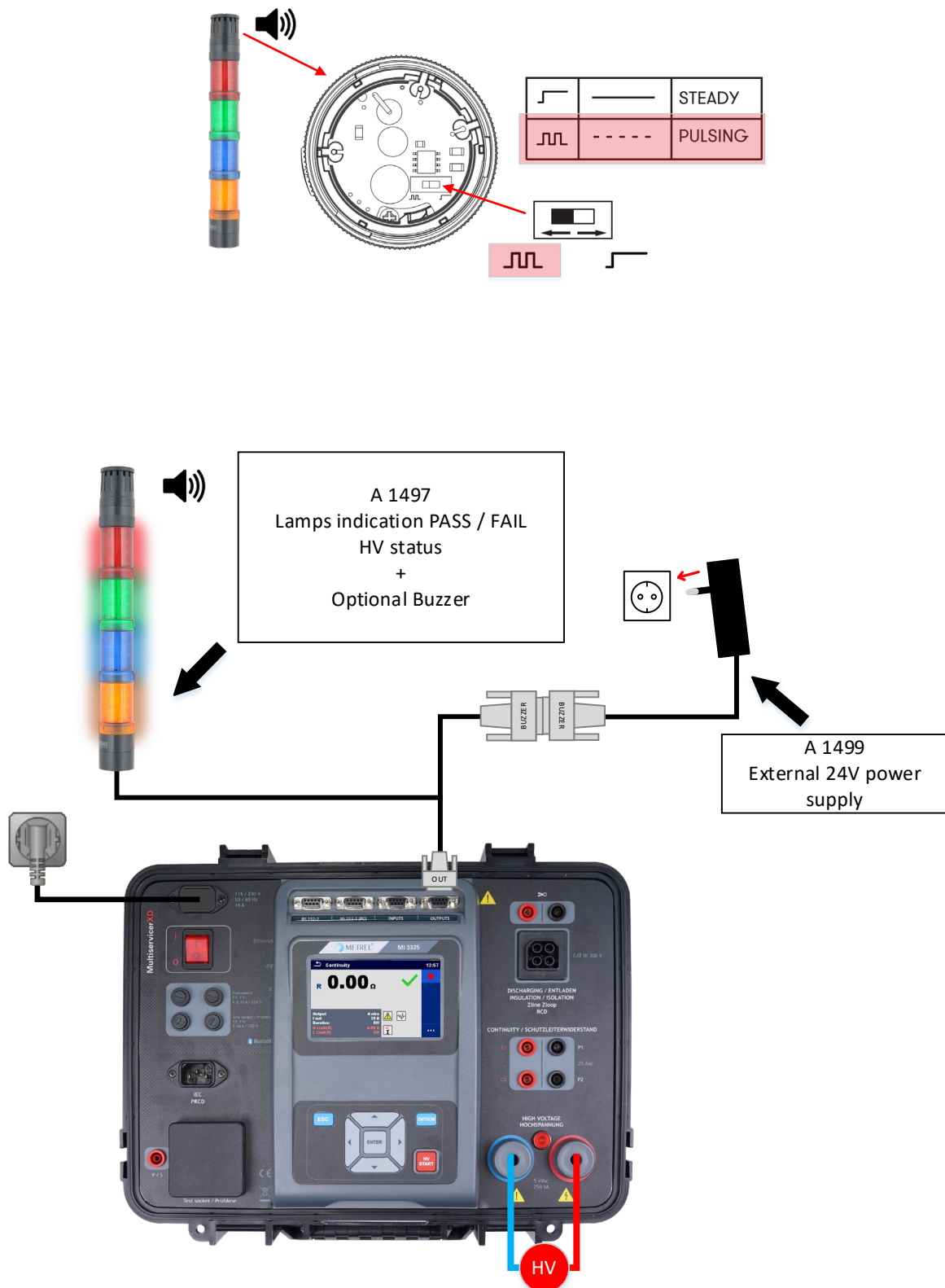


### 6.4.2. PASS/FAIL lamps, HV lamps (A 1497)

Signal tower with 4 LED lamps & buzzer, alongside to indication of HV warning status also enabling indication of PASS/FAIL status for every measurement where the limits are set.



	
Signal tower connetor	RS232 communication cable
Enabling HV lamps & Status lamps A 1497	
LED TOWER (PIN CONNECTOR)	RS232 CABLE
GND (0)	Gray / Grau
Buzzer (5)	Bridge between any of available status lights (PIN5 & PIN1 or 2, or 3, or 4)
Red LED (4)	Pink / Rosa
Green LED (3)	Yellow / Gelb
Blue LED (2)	Brown / Braun
Orange LED (1)	White / Weiß



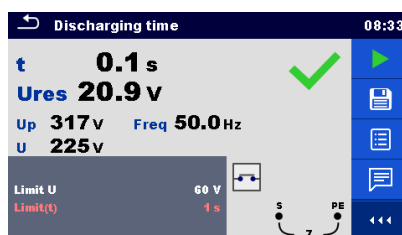
## 6.5. Upgraded Discharging time / Residual voltage, measuring function

Different application standards have different requirements regarding permissible residual voltages. Few examples are listed here bellow. Measuring technique is described in the IEC 61557-14.

### 6.5.1. Measurement of residual voltage

If the equipment has the ability to measure the residual voltage, the operating uncertainty to measure this voltage shall be within 0% to + 15% of the 60 V limit, and the operating uncertainty to set the measuring time limit shall be within 0% to - 15% of the 1 s limit or 5 s limit. Evaluated voltages in linear systems shall be calculated as if they were measured during the highest amplitude of the interrupted voltage. If the manufacturer specifies the test equipment to be used in non-linear systems, the measuring method shall be explained in the operating instructions.

The input impedance of the voltage measurement circuit shall be at least **20 MΩ**.



### 6.5.2. IEC 60335-1 Household and similar electrical appliances

Appliances intended to be connected to the supply mains by means of a plug shall be constructed so that in normal use there is no risk of electric shock from charged capacitors having a rated capacitance exceeding 0,1 µF, when the pins of the plug are touched.

Compliance is checked by the following test.

The appliance is supplied at rated voltage. Any switch is then placed in the off position and the appliance is disconnected from the supply mains at the instant of voltage peak. 1 s, after disconnection, the voltage between the pins of the plug is measured with an instrument that does not appreciably affect the value to be measured.

The voltage shall not exceed 34 V.

### 6.5.3. IEC 60204-1 Safety of machinery - Electrical equipment of machines

Live parts having a residual voltage greater than 60 V after the supply has been disconnected shall be discharged to 60 V or less within a time period of 5 s after disconnection of the supply voltage provided that this rate of discharge does not interfere with the proper functioning of the equipment.

Exempted from this requirement are components having a stored charge of 60  $\mu\text{C}$  or less.

In the case of plugs or similar devices, the withdrawal of which results in the exposure of conductors (for example pins), the discharge time to 60 V shall not exceed 1 s.

#### 6.5.4. IEC 61439 Low-voltage switchgear and controlgear assemblies

If the assembly contains items of equipment that may have charges after they have been switched off (capacitors, etc.), a warning plate is required.

Small capacitors such as those used for arc extinction, for delaying the response of relays, etc., shall not be considered dangerous.

Unintentional contact is not considered dangerous if the voltages resulting from static charges fall below a DC voltage of 60 V in less than 5 s after disconnection from the power supply.

Touch currents are limited by ensuring exposed-conductive-parts are effectively connected to the protective circuit.

### 6.6. 1-Phase, P-RCD testing

Many electrical tools are used on construction and assembly sites where they are connected to sockets whose functionality and reliability can't be checked in advance. In case electric tools are connected to the faulty socket can lead to a dangerous situation. To avoid such risk, craftsmen are using P-RCD devices for protection. These devices must also be regularly inspected and tested. One of the easiest ways to test them is to connect them directly to the test instrument. With such an approach tripping of other protective devices used on the construction site or assembly can be avoided.

Tests that can be executed on MI 3325 related to P-RCD testing are following:

- Trip out time,
- Trip out current (@PRCD-K set sensitivity to  $I_{pe}$  monitoring)



- PE conductor test,
- Polarity test (@PRCD-K, result=PE open)





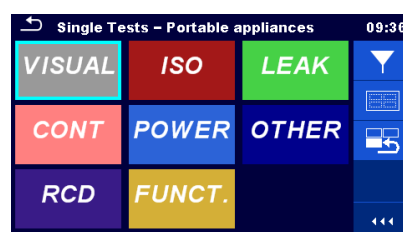
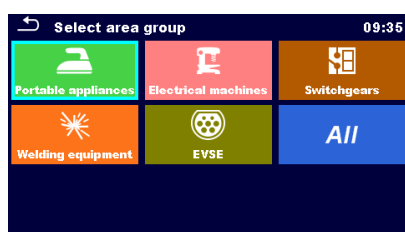
## 7. Differences between supported types of labels

It is intended for tagging of individual appliance with Auto Sequence® test data. To start printing, Auto Sequence® should be finished and saved or reopened from memory structure. When required, printing of two labels of the same test can be set.

User has an option to choose between two tag formats, **PAT** and **GENERIC**.

### Note!

PAT tag format can only be used for printing results which are a part of measurements from **PAT area group**.



### 7.1. PAT tag format (size 50mm x 25.5mm)

Printers (S 2062, A 1488, A 1489)

Label format PAT, label size 50mm x 25.5mm.

Available tag data presented in text area are:

Auto Sequence® short Test code

Appliance ID

Appliance name

Test date

Retest date

Auto Sequence® test status

User name (who currently performed test or who performed saved test, if printed from memory)

Label type	Form size W x H (mm)	Tag content arrangement	Data 1 <sup>st</sup> label	Data 2 <sup>nd</sup> label
Classic	50 x 25.5	Barcode	Test code, appliance ID	Appliance ID
		Text	Test code, appliance ID, test or retest date, status, user	Appliance ID, test or retest date, status, user
QR	50 x 25.5	QR	Test code, appliance ID, appliance name, test date, test period, location, user, status,	Appliance ID, appliance name, test date, test period, location, user, status

			measurement results.	
		Text	Test code, appliance ID, appliance name, test or retest date, status, user	Appliance ID, appliance name, test or retest date, status, user
Simple		Text	Appliance ID, appliance name, status, test or retest date, user	

### Notes:

2nd label is intended to mark supply cords.

Data not available will not be printed on the label.

Test or Retest date: is set in the General Settings => Devices => Writing devices menu.

If Auto Sequence® was modified, its short code is marked with asterisk (\*).

### TEST DATE

Simple label_1tag	Classic label_1tag	QR label / NFC tag_1tag
APPL. ID: 0001 APPL. NAME: Kettle TEST STATUS <b>PASS</b> TEST DATE: 24.04.2018 USER: Blaz G.	Code: PA01 APPL. ID: 0001 PA01\$0001  TEST DATE: 24.04.2018 USER: Blaz G. <b>PASS</b>	 Code: PA01 0001 Kettle 24.04.2018 Blaz G. <b>PASS</b>
Simple label_1tag	Classic label_2tag	QR label / NFC tag_2tag
	Code: PA01 APPL. ID: 0001 PA01\$0001  TEST DATE: 24.04.2018 USER: Blaz G. <b>PASS</b>	 Code: PA01 0001 Kettle 24.04.2018 Blaz G. <b>PASS</b>
	PWR. SUP. CORD \$0001  TEST DATE: 24.04.2018 USER: Blaz G. <b>PASS</b>	 PWR. SUP. CORD 0001 Kettle 24.04.2018 Blaz G. <b>PASS</b>

## RE-TEST DATE

Simple label_1tag	Classic label_1tag	QR label / NFC tag_1tag
APPL. ID: 0001 APPL. NAME: Kettle TEST STATUS <b>PASS</b> RE-TEST DATE: 24.04.2019 USER: Blaz G.	Code: PA01 APPL. ID: 0001 PA01\$0001  RE-TEST DATE: 24.04.2019 USER: Blaz G. <b>PASS</b>	 Code: PA01 0001 Kettle 24.04.2019 Blaz G. <b>PASS</b>
Simple label_1tag	Classic label_2tag	QR label / NFC tag_2tag
	Code: PA01 APPL. ID: 0001 PA01\$0001  RE-TEST DATE: 24.04.2019 USER: Blaz G. <b>PASS</b>	 Code: PA01 0001 Kettle 24.04.2019 Blaz G. <b>PASS</b>
	PWR. SUP. CORD \$0001  RE-TEST DATE: 24.04.2019 USER: Blaz G. <b>PASS</b>	 PWR. SUP. CORD 0001 Kettle 24.04.2019 Blaz G. <b>PASS</b>

## 7.2. PAT tag format (size 43mm x 99mm)

Printer, S 2062

Label format PAT, label size 43mm x 99mm.

Note!



Logo for PASS and FAIL must be uploaded to printer manually.

<i>Label type</i>	<i>Form size W x H (mm)</i>	<i>Tag content arrangement</i>	<i>Data 1<sup>st</sup> label</i>	<i>Data 2<sup>nd</sup> label</i>
Classic L	43 x 99	Barcode	Test code, appliance ID	Appliance ID
		Text	Test code, appliance ID, test and retest date, status, user	Appliance ID, test and retest date, status, user
QR L		QR	Test code, appliance ID, appliance name, test date, test period, location, user, status, measurement results.	Appliance ID, appliance name, test date, test period, location, user, status
Text		Test code, appliance ID, appliance name, test and retest date, status, user	Appliance ID, appliance name, test and retest date, status,	

				user
--	--	--	--	------

**Notes:**

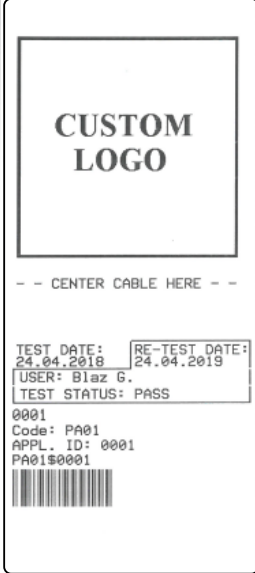
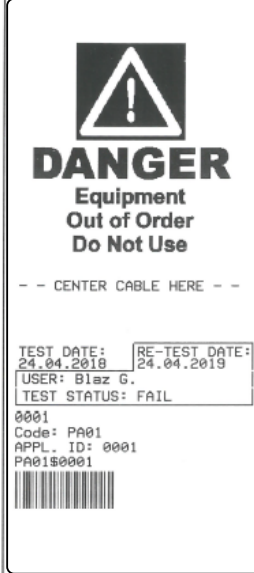
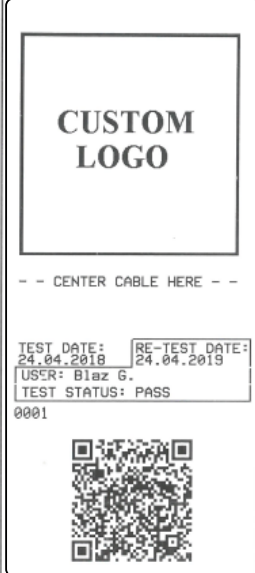
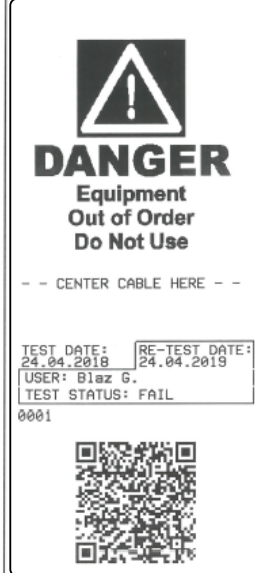
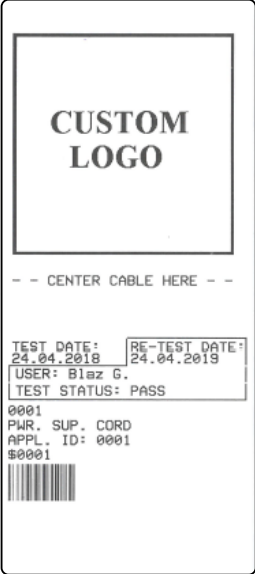
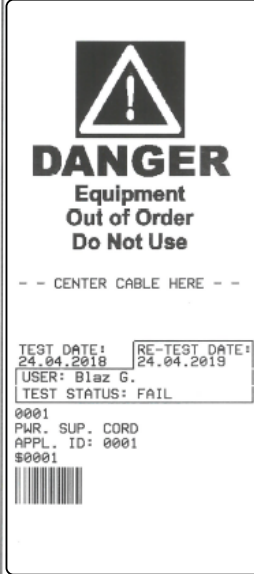
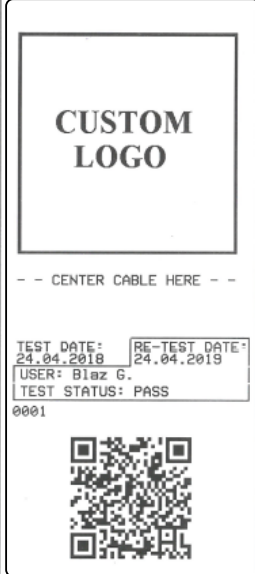

2nd label is intended to mark supply cords.

Data not available will not be printed on the label.

Test or Retest date: is set in the General Settings => Devices => Writing devices menu.

If Auto Sequence® was modified, its short code is marked with asterisk (\*).

### 7.3. Label format PAT, label size 43mm x 99mm.

Classic barcode		QR code	
Classic label_1tag / PASS	Classic label_1tag / FAIL	QR label_1tag / PASS	QR label_1tag / FAIL
			
Classic label_2 <sup>nd</sup> tag / PASS	Classic label_2 <sup>nd</sup> tag / FAIL	QR label_2 <sup>nd</sup> tag / PASS	QR label_2 <sup>nd</sup> tag / FAIL
			

### 7.4. PAT tag format (NFC tag)

RFID / NFC tag type	Data
NTAG216	Test code, appliance ID, appliance name, test date, test period, location, user, status, measurement results.

## 7.5. GENERIC tag format (size 50mm x 25.5mm)

Printers (S 2062, A 1488, A 1489)

Label format PAT, label size 50mm x 25.5mm.

It is intended for tagging structure objects (element, appliance, equipment), which could be tested and their location under parent structure object is important. Label printing can be started from selected structure object (element, appliance, equipment), even if no Auto Sequence® is associated with it, or from finished Auto Sequence® saved under it.

Tag data presented in text area are:

Parent structure object ID (name) (← Object\_name)

Auto Sequence® short test code (if printing from Auto Sequence®; if printing from object field is omitted)

Object ID (name)

Test date (|→ DD.MM.YYYY) or Retest date (→| DD.MM.YYYY), which one is selected in General Settings => Devices => Writing devices menu

Status (printing from object: overall status of all tests appended to the object or sub-structure objects; printing from Auto Sequence®: its status)

User name (Printing from Auto Sequence: user who performed test; printing from object: current signed-in user)

Following table describes tag content arrangement and its data for supported label form size.

<b>Form size W x H (mm)</b>	<b>Tag content arrangement</b>	<b>Data</b>
50 x 25.5	Text	Parent object name, Test code, Object ID, test or retest date, status, user
	QR	Parent object name, Test code, Object ID, test date, test period, Auto Sequence® status, Object status, user.

### Notes:

Data not available will not be printed on the label.

Object without appended Auto Sequence® test has no status!



If Auto Sequence® was modified, its short code is marked with asterisk (\*).

Object status depends on all measurements (Auto Sequences® or Single tests) appended to the object or sub-structure objects, refer to user manual of MI 3360 for details.

## GENERIC\_TEST DATE

PASS	FAIL
 <p>                     &lt;- Room 102                      0001                      Code: PA01                      Blaz G.                      !-&gt; 24.04.2018  <b>PASS</b> </p>	 <p>                     &lt;- Room 102                      0001                      Code: PA01                      Blaz G.                      !-&gt; 24.04.2018  <b>FAIL</b> </p>

## GENERIC\_RE-TEST DATE

PASS	FAIL
 <p>                     &lt;- Room 102                      0001                      Code: PA01                      Blaz G.                      -&gt;! 24.04.2019  <b>PASS</b> </p>	 <p>                     &lt;- Room 102                      0001                      Code: PA01                      Blaz G.                      -&gt;! 24.04.2019  <b>FAIL</b> </p>

## 7.6. GENERIC tag format (NFC tag)

Following table describes data content written on RFID / NFC tag.

RFID / NFC tag type	Data
NTAG216	Parent object name, Test code, Object ID, test date, test period, Auto Sequence® status, Object status, user.

## 8. Differences between basic and PRO MESM reports

The MESM SW, supports printing of the following test reports.

### Basic:

- Print Results
- Basic report

### Professional (EETR Electrical\_Equipment\_Test\_Report):

- EETR\_PRO = (Multiple report)
- EETR = (Single report)
- EETR\_FD = (Single report)
- MACHINE / SWITCHBOARD Report = (Single report)
- EQUIPMENT Report (Multiple report)
- EVSE = (Single report)

### Notes!

Measuring results will be printed on reports, only when stored under the correct structure element.

Test reports are structure element dependent and are enabled only when an appropriate structure element containing measured results is selected.
























Basic reports can be printed regardless of the selected structure element.

\* EQUIPMENT REPORT enables printing of results stored under structure elements (Appliance, Appliance FD, Welding, Welding\_FD, EVSE, MACHINE, SWITCHBOARD, EVSE), regardless of parent element used in the structure, as long as elements for printing are stored under the same node.

\*\* EETR\_PRO & EQUIPMENT REPORT enables printing of results stored under structure elements (Appliance, Appliance FD, Welding, Welding\_FD, EVSE), regardless of parent element used in the structure, as long as elements for printing are stored under the same node.

\*\*\*EETR & EETR\_FD reports are single reports and can only be printed when appropriate structural elements are selected. For EETR reports these are Appliance & Welding devices. For EETR\_FD reports these are Appliance\_FD & Welding device\_FD.



STRUCTURE ELEMENTS						REPORTS						
						Free	Licensed					
						Continuous reports			Single reports			
Symbol	Level 1	Level 2	Level 3	Level 4	Default name	Print results Basic report	EQUIPMENT *	EETR_PRO **	Machine Switchgear	EETR ***	EETR_FD ***	EVSE
					Node	✓	N/A					
					Project	✓						
					Location	✓						
					Client	✓						
					Element	Basic report only			✓			
					Appliance	✓	✓	✓		✓		
					Appliance FD	✓	✓	✓			✓	
					Welding device	✓	✓	✓		✓		
					Welding device FD	✓	✓	✓			✓	
					Machine	✓	✓		✓			
					Level1	✓			✓			
					Level 2	✓			✓			
					Level 3	✓			✓			
					Switchgear	✓	✓		✓			
					Level1	✓			✓			
					Level 2	✓			✓			
					Level 3	✓			✓			
					EVSE	✓	✓	✓				✓
					Level1	✓						✓
					Level 2	✓						✓
					Level 3	✓						✓
					Single test	✓	N/A					
					Auto sequence	✓						

Parameters		
Date Time	04/01/2022 08:00:36	
Output	4 wire	
I out	10 A	
ΔU test	Off	
Duration	2 s	
Comment 1	PE-P1	
R compensation	Off	
R iso		Pass
Results		
Riso	>200 MΩ	Pass
SubResults		
Um	263 V	
Limits		
U limit (Riso)	1 MΩ	
Parameters		
Date Time	04/01/2022 08:01:27	
Uiso	250 V	
Type Riso	NIPE	
HV AC		Pass
Results		
U	1044 V	
I	0.0 mA	Pass
SubResults		
Ic	0.0 mA	
I <sub>r</sub>	0.0 mA	
Limits		
I <sub>r</sub> limit (I)	1.0 mA	
Parameters		
Date Time	04/01/2022 08:02:29	
U test	1000 V	
t end	5 s	
Z line		Pass
Results		
Ipsc	652 A	Pass
Z	0.35 Ω	
SubResults		
XL	0.01 Ω	
R	0.35 Ω	
U <sub>lin</sub>	226 V	
Limits		
I <sub>a</sub> (Ipsc)	160 A	
Parameters		
Date Time	04/01/2022 08:03:23	
Fuse Type	C	
Fuse I	16 A	
Fuse t	0.4 s	

Signature:

Created date: 05/01/2022

2/4

## 8.2. Basic report (N...selected appliances will be printed on the report)

---

102

### 8.3. EETR\_PRO report (N...selected appliances will be printed on the report)

Customer No.: 112-655	Inspect. rec. No.: 5525-6546	Order No.: 00104/04/18	METREL®
<b>ELECTRICAL EQUIPMENT TEST REPORT</b>			
<b>GENERAL DATA</b>			
Customer address: Gorenje s.d. Partičanska 12 Velenje Slovenija		Contract: Metrel d.d. Mojstul 135A Ljubljanska cesta 77 Slovenija	
Description: Periodic testing of appliances			
Type of equipment:		Reason for the test:	
<input type="checkbox"/> Portable appliance <input type="checkbox"/> Switchgear <input type="checkbox"/> Machine <input type="checkbox"/> Other		<input type="checkbox"/> Welding <input type="checkbox"/> In service <input type="checkbox"/> Periodic test <input type="checkbox"/> Repair <input type="checkbox"/> Other	
Test in accordance with:			
<input type="checkbox"/> DIN VDE 0701-0702 <input type="checkbox"/> Scan of testing: 24/04/2018 <input type="checkbox"/> End of testing: 24/04/2018			
Measuring instruments used:			
Model: MI 3350 Serial No.: 16410005		Model: Serial No.: Model: Serial No.:	
Customer contact details: Janez Novak		Test engineer contact details: Jade number	
Attachments: <input type="checkbox"/> Test results <input type="checkbox"/> Description of faulty equipment <input type="checkbox"/> Checklist <input type="checkbox"/> Other			
<b>INSPECTION AND TEST RESULTS</b>			
Statement		Date of next inspection:	
All electrical equipment was tested in accordance with the latest regulations and technical standards. All equipment that passed the inspection and tests is marked appropriately. Remarks: It is recommended that this equipment can be used for safe working on the equipment technical rules. The inspection and test results are summarized in the pages enclosed with this document, and a separate test data file has also been generated. Equipment that failed the inspection and tests are unique to site and they are marked appropriately. The inspection and test results are summarized in the pages enclosed in this document. Further information for the provision of danger is enclosed in this report.		24/04/2019	
Results: <input type="checkbox"/> No faults found <input type="checkbox"/> Faults found		Method of labelling	
Notes:		<input type="checkbox"/> Pass/Fail tags <input type="checkbox"/> Barcoded tags <input type="checkbox"/> RFID tags <input type="checkbox"/> QR code	
<b>SIGNATURE AND STAMP</b>			
Client:		Operator:	
<input type="checkbox"/> Report is fully accepted. Client is informed about inspection and test results. <input type="checkbox"/> Client is informed about status of faulty equipment.		<input type="checkbox"/> Electrical equipment was tested according to valid regulations and technical standards. <input type="checkbox"/> Faulty equipment and measures are appropriately noted	
Location: Gorenje Date: 24/04/2018 Signature:		Location: Gorenje Date: 24/04/2018 Signature:	

1 / 3

Customer No.: 112-655	Inspect. rec. No.: 5525-6546	Order No.: 00104/04/18	METREL®
<b>ELECTRICAL EQUIPMENT TEST REPORT</b>			
LOCATION:	TEST DATE:	SERIAL:	
Room 102	24/04/2018	16410005	
TYPE:	RETEST DATE:	USER:	
Kettle	24/04/2019	Blaz G.	
APPLIANCE:	COMMENT:	TEST SITE:	
0001	Room 405	Blaz G.	
Cl_1_Iso - Visual Inspections			
Visual			Pass
wiring connection points			Pass
cables			Pass
covers, housing			Pass
inscriptions and markings			Pass
Cl_1_Iso - Single tests			
Results:			Status:
Continuity			Pass
R: 0.13 Ω	R: 0.3 Ω	Date/Time: 24/04/2018 08:13:15 Output: PIS - PE I out: 0.2 A Duration: 5 s	
R Iso			Pass
Riso: >100.9 MΩ Uin: 525 V	Riso: 1.00 MΩ	Date/Time: 24/04/2018 08:13:24 Type: Riso Uiso: 500 V Duration: 5 s	
Sub-leakage			Pass
Isub: 0.02 mA	Isub: 3.50 mA	Date/Time: 24/04/2018 08:13:31 Type: Isub Output: 110V/230 V Duration: 5 s	
Cl_1_Iso - Visual Inspections			
Functional			Pass
mechanical operation			Pass
electrical operation			Pass
safety relevant functions			Pass
LOCATION:	TEST DATE:	SERIAL:	
Room 102	24/04/2018	16410005	
TYPE:	RETEST DATE:	USER:	
Kettle	24/04/2019	Blaz G.	
APPLIANCE:	COMMENT:	TEST SITE:	
0002	Room 102	Blaz G.	
Cl_1_Iso - Visual Inspections			
Visual			Pass
wiring connection points			Pass
cables			Pass
covers, housing			Pass
inscriptions and markings			Pass
Cl_1_Iso - Single tests			


2 / 3

Customer No.: 112-655	Inspect. rec. No.: 5525-6546	Order No.: 00104/04/18	METREL®
<b>ELECTRICAL EQUIPMENT TEST REPORT</b>			
Results:	Limits:	Parameters:	Status:
Continuity			Pass
R: 0.14 Ω	R: 0.3 Ω	Date/Time: 24/04/2018 12:47:18 Output: PIS - PE I out: 0.2 A Duration: 5 s	
R Iso			Pass
Riso: >100.9 MΩ Uin: 525 V	Riso: 1.00 MΩ	Date/Time: 24/04/2018 12:47:23 Type: Riso Uiso: 500 V Duration: 5 s	
Sub-leakage			Pass
Isub: 0.02 mA	Isub: 3.50 mA	Date/Time: 24/04/2018 12:47:26 Type: Isub Output: 110V/230 V Duration: 5 s	
Cl_1_Iso - Visual Inspections			
Functional			Pass
mechanical operation			Pass
electrical operation			Pass
safety relevant functions			Pass

3 / 3

## 8.4. EETR\_Single report (Only one appliance is printed per report)


Customer No.:	112-555	Inspect. rec. No.:	5525-5546	Order No.:	00124/04/18
---------------	---------	--------------------	-----------	------------	-------------

**ELECTRICAL EQUIPMENT TEST REPORT** 

<b>GENERAL DATA</b>	
<b>Customer address:</b> Gorenje d.d. Partizanska 12 Velenje Slovenija	<b>Contractor:</b> Metrel d.d. Hovulj 1354 Ljubljana cesta 77 Slovenija
<b>Description:</b> Periodic testing of appliances	
<b>Type of equipment:</b> <input type="checkbox"/> Portable appliance <input type="checkbox"/> Machine <input type="checkbox"/> Switchgear <input type="checkbox"/> Other	<b>Reason for the test:</b> <input type="checkbox"/> In service <input checked="" type="checkbox"/> Periodic test <input type="checkbox"/> Repair <input type="checkbox"/> Other
<b>Test in accordance with:</b> <input checked="" type="checkbox"/> DIN VDE 0701-0702 <input type="checkbox"/>	<b>Start of testing:</b> 24/04/2018 <b>End of testing:</b> 24/04/2018
<b>Measuring instruments used:</b> Model: MI 3360 Model: Serial No.: 16410005 Serial No.:	
<b>Customer contact details:</b> Janez Novak	<b>Test engineer contact details:</b> Jozse Kuhar
<b>Attachments:</b> <input type="checkbox"/> Test results <input type="checkbox"/> Description of faulty equipment <input type="checkbox"/> Checklist <input type="checkbox"/> Other	
<b>INSPECTION AND TEST RESULTS</b>	
<b>Statement:</b> All electrical equipment was tested in accordance with the latest regulations and technical standards. All equipment that passed the inspection and tests is marked appropriately. However, it is confirmed that this equipment can be declared as safe according to the accepted technical rules. The inspection and test results are summarized in the pages enclosed with this document and a suitable test date has also been recommended. Equipment that failed the inspection and tests are unsafe to use and they are marked appropriately. The inspection and test results are summarized in the pages enclosed in this document. Further information for the prevention of danger is enclosed in this report.	
<b>Date of next inspection:</b> 24/04/2019	
<b>Method of labelling:</b> <input type="checkbox"/> Pass/Fail tags <input type="checkbox"/> Barcoded tags <input type="checkbox"/> RFID tags <input checked="" type="checkbox"/> QR labels	
<b>Results:</b> <input checked="" type="checkbox"/> No faults found <input type="checkbox"/> Faults found	
<b>Notes:</b>	
<b>SIGNATURE AND STAMP</b>	
<b>Client:</b> <input checked="" type="checkbox"/> Report is fully accepted. Client is informed about inspection and test results. <input type="checkbox"/> Client is informed about status of faulty equipment.	<b>Operator:</b> <input checked="" type="checkbox"/> Electrical equipment was tested according to valid regulations and technical standards. <input type="checkbox"/> Faulty equipment and measures are appropriately noted.
<b>Location:</b> Gorenje <b>Date:</b> 24/04/2018 <b>Signature:</b>	<b>Location:</b> Gorenje <b>Date:</b> 24/04/2018 <b>Signature:</b>

1 / 2

Customer No.:	112-555	Inspect. rec. No.:	5525-5546	Order No.:	00124/04/18
---------------	---------	--------------------	-----------	------------	-------------

**ELECTRICAL EQUIPMENT TEST REPORT** 

<b>LOCATION:</b> Room 102	<b>EQUIP. USER:</b> Bill	<b>TEST DATE:</b> 24/04/2018
<b>APPLIANCE ID:</b> 0001	<b>LOCATION:</b> Room 405	<b>RETEST PER. (M):</b> 12
<b>NAME:</b> Kettle	<b>INVENTORY NO:</b> 1912	<b>NEXT TEST:</b> 24/04/2019

**CI\_1\_Iso - Visual Inspections**

<b>Visual</b>	<b>Pass</b>
wiring connection points	Pass
cables	Pass
covers, housing	Pass
inscriptions and markings	Pass

**CI\_1\_Iso - Single tests**

<b>Results:</b>	<b>Limits:</b>	<b>Parameters:</b>	<b>Status:</b>
<b>Continuity</b>	<b>Pass</b>		
R: 0.13 Ω	R: 0.3 Ω	DateTime: 24/04/2018 08:13:15 Output: PIS - PE Test: 0.2 A Duration: 5 s	
<b>R iso</b>	<b>Pass</b>		
Riso: >150.9 MΩ Um: 525 V	Riso: 1.00 MΩ	DateTime: 24/04/2018 08:13:24 Type: Riso Um: 500 V Duration: 5 s	
<b>Sub-leakage</b>	<b>Pass</b>		
Isub: 0.02 mA	Isub: 3.00 mA	DateTime: 24/04/2018 08:13:31 Type: Isub Output: 110V/230 V Duration: 5 s	

**CI\_1\_Iso - Visual Inspections**


<b>Functional</b>	<b>Pass</b>
mechanical operation	Pass
electrical operation	Pass
safety relevant functions	Pass

**Signature:** **Customer:** **Operator:**

2 / 2

## 8.5. EETR\_FD\_Single report (Only one appliance is printed per report)


Customer No.:	112-555	Inspect. rec. No.:	5525-5546	Order No.:	00124/04/18
---------------	---------	--------------------	-----------	------------	-------------

**ELECTRICAL EQUIPMENT TEST REPORT** 

<b>GENERAL DATA</b>	
<b>Customer address:</b> Gorenje d.d. Partizanska 12 Velenje Slovenija	<b>Contractor:</b> Metrel d.d. Hovulj 1354 Ljubljana cesta 77 Slovenija
<b>Description:</b> Periodic testing of appliances	
<b>Type of equipment:</b> <input type="checkbox"/> Portable appliance <input type="checkbox"/> Machine <input type="checkbox"/> Switchgear <input type="checkbox"/> Other	<b>Reason for the test:</b> <input type="checkbox"/> In service <input checked="" type="checkbox"/> Periodic test <input type="checkbox"/> Repair <input type="checkbox"/> Other
<b>Test in accordance with:</b> <input checked="" type="checkbox"/> DIN VDE 0701-0702 <input type="checkbox"/>	<b>Start of testing:</b> 24/04/2018 <b>End of testing:</b> 24/04/2018
<b>Measuring instruments used:</b> Model: MI 3360 Model: Serial No.: 16410005 Serial No.:	
<b>Customer contact details:</b> Janez Novak	<b>Test engineer contact details:</b> Jozse Kuhar
<b>Attachments:</b> <input type="checkbox"/> Test results <input type="checkbox"/> Description of faulty equipment <input type="checkbox"/> Checklist <input type="checkbox"/> Other	
<b>INSPECTION AND TEST RESULTS</b>	
<b>Statement:</b> All electrical equipment was tested in accordance with the latest regulations and technical standards. All equipment that passed the inspection and tests is marked appropriately. However, it is confirmed that this equipment can be declared as safe according to the accepted technical rules. The inspection and test results are summarized in the pages enclosed with this document and a suitable test date has also been recommended. Equipment that failed the inspection and tests are unsafe to use and they are marked appropriately. The inspection and test results are summarized in the pages enclosed in this document. Further information for the prevention of danger is enclosed in this report.	
<b>Date of next inspection:</b> 24/04/2019	
<b>Method of labelling:</b> <input type="checkbox"/> Pass/Fail tags <input type="checkbox"/> Barcoded tags <input type="checkbox"/> RFID tags <input checked="" type="checkbox"/> QR labels	
<b>Results:</b> <input checked="" type="checkbox"/> No faults found <input type="checkbox"/> Faults found	
<b>Notes:</b>	
<b>SIGNATURE AND STAMP</b>	
<b>Client:</b> <input checked="" type="checkbox"/> Report is fully accepted. Client is informed about inspection and test results. <input type="checkbox"/> Client is informed about status of faulty equipment.	<b>Operator:</b> <input checked="" type="checkbox"/> Electrical equipment was tested according to valid regulations and technical standards. <input type="checkbox"/> Faulty equipment and measures are appropriately noted.
<b>Location:</b> Gorenje <b>Date:</b> 24/04/2018 <b>Signature:</b>	<b>Location:</b> Gorenje <b>Date:</b> 24/04/2018 <b>Signature:</b>

1 / 2

Customer No.:	112-555	Inspect. rec. No.:	5525-5546	Order No.:	00124/04/18
---------------	---------	--------------------	-----------	------------	-------------

**ELECTRICAL EQUIPMENT TEST REPORT** 

<b>LOCATION:</b> Room 102	<b>EQUIP. USER:</b> Bill	<b>TEST DATE:</b> 24/04/2018
<b>APPLIANCE ID:</b> 0002	<b>LOCATION:</b> Room 102	<b>RETEST PER. (M):</b> 12
<b>NAME:</b> Kettle	<b>INVENTORY NO:</b> 1979	<b>NEXT TEST:</b> 24/04/2019
<b>GROUP:</b> white goods	<b>PRODUCER:</b> Gorenje	<b>YEAR OF PROD.:</b> 2018
<b>NOM. VOLTAGE:</b> 230	<b>NOM. FREQ.:</b> 50 Hz	<b>NOM. POWER:</b> 2500 W
<b>CURRENT:</b> 11 A	<b>COS-PHI:</b> 0.9	<b>FUSE RATING:</b> 16 A
<b>INSPECTOR:</b> Bob	<b>TEST STANDARD:</b> VDE 0701-0702	<b>MEANS OF PROT.:</b> Class I
<b>REPAIRING CODE:</b> 1102	<b>COMMENT:</b>	

**CI\_1\_Iso - Visual Inspections**

<b>Visual</b>	<b>Pass</b>
wiring connection points	Pass
cables	Pass
covers, housing	Pass
inscriptions and markings	Pass

**CI\_1\_Iso - Single tests**

<b>Results:</b>	<b>Limits:</b>	<b>Parameters:</b>	<b>Status:</b>
<b>Continuity</b>	<b>Pass</b>		
R: 0.14 Ω	R: 0.3 Ω	DateTime: 24/04/2018 12:47:18 Output: PIS - PE Test: 0.2 A Duration: 5 s	
<b>R iso</b>	<b>Pass</b>		
Riso: >150.9 MΩ Um: 525 V	Riso: 1.00 MΩ	DateTime: 24/04/2018 12:47:23 Type: Riso Um: 500 V Duration: 5 s	
<b>Sub-leakage</b>	<b>Pass</b>		
Isub: 0.02 mA	Isub: 3.50 mA	DateTime: 24/04/2018 12:47:28 Type: Isub Output: 110V/230 V Duration: 5 s	

**CI\_1\_Iso - Visual Inspections**

<b>Functional</b>	<b>Pass</b>
mechanical operation	Pass
electrical operation	Pass
safety relevant functions	Pass

**Signature:** **Customer:** **Operator:**

2 / 2

## 8.6. MACHINE / SWITCHBOARD report (Only one Machine/Switchboard is printed per report)

Customer No. <input type="text"/>		Inspector No. <input type="text"/>		Order No. <input type="text"/>	
<b>SAFETY OF ELECTRICAL MACHINES</b>					
<b>GENERAL DATA</b>					
Client:		Contractor:			
Client's representative:		Inspector:			
Machine:		Machine1			
Group/model: Breg 123		ID:		Year: 2018	
Producer: Siemens		Serial No.:		No. of sockets:	
Report covers:		Test in accordance with:			
<input type="checkbox"/> New installation <input type="checkbox"/> Service, repair <input type="checkbox"/> Periodic test <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/>			
Measuring instruments used:					
Model: C.A.6165		Model:		Test date:	
Serial No.: 17370720		Serial No.:			
Attachments:		<input type="checkbox"/> Test results <input type="checkbox"/> Description of faulty equipment <input type="checkbox"/> Checklist <input type="checkbox"/> Other			
Results:		<input type="checkbox"/> No faults found <input type="checkbox"/> Faults found			
Notes:					
<b>SYSTEM</b>					
Earthing system: <input type="checkbox"/> TN-C <input type="checkbox"/> TN-C-S <input type="checkbox"/> TN-S <input type="checkbox"/> TT <input type="checkbox"/> IT					
Mains:		Public utility:		Line: 230    Phase: 50	
Conductor type:		Conductor cross-section:			
<b>Overcurrent protection</b>					
Type: <input type="checkbox"/> RCD <input type="checkbox"/> RCD type: <input type="checkbox"/> Overvoltage protection:    Type:    In:    Is:    Is:    Is:    Is:					
<b>SIGNATURE AND STAMP</b>					
Client:		Operator:			
<input type="checkbox"/> Report is fully accepted, Client is informed about inspection and test results. <input type="checkbox"/> Client is informed about status of faulty equipment.		<input type="checkbox"/> Electrical equipment was tested according to valid regulations and technical standards. <input type="checkbox"/> Faulty equipment and measures are appropriately noted.			
Location:		Location:			
Date:		Date:			
Signature:		Signature:			
<input type="checkbox"/> Enclosures					
					Page 1/4

Customer No. <input type="text"/>		Inspector No. <input type="text"/>		Order No. <input type="text"/>	
<b>SAFETY OF ELECTRICAL MACHINES</b>					
<b>Machine1</b>					
#Lampes_Pass-Fail - Single tests					
Result:		Limit:		Parameters:	
Continuity Machine1				Status:	
R: >999 Ω		R: 0,1 Ω R: OFF		DateTime: 29/10/2020 12:02:34 Output: 4 wire Load: 0,2 A Duration: 5 s Comment 1: test de continuité Comment 2: du PE	
				Fail	
Continuity Machine1				Pass	
R: 0,00 Ω		R: 0,1 Ω R: OFF		DateTime: 29/10/2020 12:03:41 Output: 4 wire Load: 0,2 A Duration: 5 s Comment 1: test de continuité Comment 2: du PE	
				Pass	
Continuity Machine1				Pass	
R: 0,00 Ω		R: 0,1 Ω R: OFF		DateTime: 29/10/2020 12:03:50 Output: 4 wire Load: 0,2 A Duration: 5 s Comment 1: test de continuité Comment 2: du PE	
				Pass	
Continuity Machine1				Fail	
R: >999 Ω		R: 0,1 Ω R: OFF		DateTime: 29/10/2020 12:04:25 Output: 4 wire Load: 0,2 A Duration: 5 s Comment 1: test de continuité Comment 2: du PE	
				Fail	
Continuity Machine1				Fail	
R: >999 Ω		R: 0,1 Ω R: OFF		DateTime: 29/10/2020 12:07:17 Output: 4 wire Load: 0,2 A Duration: 5 s Comment 1: test de continuité Comment 2: du PE	
				Fail	
Continuity Machine1				Fail	
R: >999 Ω		R: 0,1 Ω R: OFF		DateTime: 29/10/2020 12:07:25 Output: 4 wire Load: 0,2 A Duration: 5 s Comment 1: test de continuité Comment 2: du PE	
				Fail	
Continuity Machine1				Pass	
R: 0,00 Ω		R: 0,1 Ω R: OFF		DateTime: 29/10/2020 12:07:38 Output: 4 wire Load: 0,2 A Duration: 5 s Comment 1: test de continuité Comment 2: du PE	
				Pass	
Continuity Machine1				Pass	
R: 0,00 Ω		R: 0,1 Ω R: OFF		DateTime: 29/10/2020 12:08:46 Output: 4 wire Load: 0,2 A Duration: 5 s Comment 1: test de continuité Comment 2: du PE	
				Pass	
Continuity Machine1				Pass	
Signature:		Customer:		Operator:	
					Page 2/4

Customer No. <input type="text"/>		Inspector No. <input type="text"/>		Order No. <input type="text"/>	
<b>SAFETY OF ELECTRICAL MACHINES</b>					
R: 0,00 Ω		R: 0,1 Ω R: OFF		DateTime: 29/10/2020 12:09:04 Output: 4 wire Load: 0,2 A Duration: 5 s Comment 1: test de continuité Comment 2: du PE	
Continuity Machine1				Pass	
R: 0,00 Ω		R: 0,1 Ω R: OFF		DateTime: 29/10/2020 12:12:21 Output: 4 wire Load: 0,2 A Duration: 5 s Comment 1: test de continuité Comment 2: du PE	
R iso Machine1				Empty	
R iso: 0,30 MΩ		R iso: 0,30 MΩ		Type: R iso, R iso	
R iso: OFF		R iso: OFF		U iso: 500 V	
R iso: OFF		R iso: OFF		Duration: 5 s	
HV AC programmable Machine1				Empty	
I: 1,0 mA		I: 1,0 mA		U test: 1000 V	
				I test: 4 s	
				I test: 5 s	
				Comment 1: test diélectrique	
				Comment 2: 29-09-05	
Signature:		Customer:		Operator:	
					Page 3/4

Customer No. <input type="text"/>		Inspector No. <input type="text"/>		Order No. <input type="text"/>	
<b>SAFETY OF ELECTRICAL MACHINES</b>					
<b>VISUAL AND FUNCTIONAL INSPECTION</b>					
<b>COMMENTS</b>					
Signature:		Customer:		Operator:	
					Page 4/4

**8.7. EQUIPMENT Report (N...selected appliances will be printed on the report)**

Customer No.: 548546	Inspect. rec. No.: 89866788	Order No.: 06555666	
----------------------	-----------------------------	---------------------	--

## ELECTRICAL EQUIPMENT REPORT

### GENERAL DATA

<b>Client:</b> Metel d.d. Aston Kovač Ljubljanska cesta 77 00 386 01 75 58 300	<b>Contractor:</b> Alagrowil Čigari Kovač Ljubljanska cesta 55 00 386 05 55 21 544
--	--

<b>Client's representative:</b> Metel d.d.o Janez Dolenc Ljubljanska cesta 77 00 386 01 75 58 300	<b>Inspector:</b> Peter Koper Cesta brigad 55 00 386 01 25 66 601
---	--

<b>Machine:</b>	
Group/model: THYSENKRUPP	ID: 000002
Producer: CARVALO	Year: 2021
Serial No: _____	No. of sockets: _____

<b>Report covers:</b>		<b>Test in accordance with:</b>	
<input type="checkbox"/> New installation	<input type="checkbox"/> Service, repair	<input type="checkbox"/> EN 60204	<input type="checkbox"/>
<input type="checkbox"/> EN 50699	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>Measuring instruments used:</b>			
Model: MI 3125	Model: _____	Test date: _____	_____
Serial No: 18460253	Serial No: _____		

<b>Attachments:</b>		<input type="checkbox"/> Checklist	<input type="checkbox"/> Other
<input type="checkbox"/> Test results	<input type="checkbox"/> Description of faulty equipment		

<b>Results:</b>	
<input type="checkbox"/> No faults found	<input type="checkbox"/> Faults found

**Notes:**

### SYSTEM

Earthing system:	<input type="checkbox"/> TN-C <input type="checkbox"/> TN-C-S <input type="checkbox"/> TN-S <input type="checkbox"/> TT <input type="checkbox"/> IT	
Mains:	Public utility:	U <sub>nom</sub> : 100/200 V    From: 50 Hz

Conductor type:	Conductor cross-section:
<b>Overcurrent protection</b>	
Type: _____	_____
I <sub>nom</sub> : _____	I <sub>sc</sub> : _____
<input type="checkbox"/> RCD	RCD type: _____
<input type="checkbox"/> Overvoltage protection	Type: _____

### SIGNATURE AND STAMP

<b>Client:</b> <input type="checkbox"/> Report is fully accepted. Client is informed about valid regulations and test results. <input type="checkbox"/> Client is informed about status of faulty equipment.	<b>Operator:</b> <input type="checkbox"/> Electrical equipment was tested according to valid regulations and technical standards. <input type="checkbox"/> Faulty equipment and measures are appropriately noted
--	--

Location: _____	Location: _____
Date: _____	Date: _____
Signature: _____	Signature: _____

☐ Enclosures

Page 1/6

Customer No.: 548546		Inspect. rec. No.: 89866788		Order No.: 06535666	
<b>ELECTRICAL EQUIPMENT REPORT</b>					
<b>LOCATION:</b> Location <b>MACHINE ID:</b> 2 <b>NAME:</b> THYSENKRUPP <b>LOCATION (ROOM):</b> METREL <b>MECHANICA:</b> <b>PRODUCER / MAKE:</b> CARVALLOO		<b>NOMINAL POWER:</b> <b>CS F1:</b> <b>IP PROTECTION:</b> <b>TYPE:</b> <b>REPAIRING CODE:</b>		<b>TEST DATE:</b> 04.01.2022 <b>RETEST PERIOD (in MONTHS):</b> 6 <b>NEXT TEST:</b> 04.07.2022 <b>YEAR OF PRODUCTION:</b> 2021	
<b>Z line</b> <b>User:</b> BLAZ				<b>Pass</b>	
Spec: 096 A I <sub>sc</sub> : 0.39 A No: 0.03 G R: 0.37 G U <sub>br</sub> : 227 V		Spec: 160 A		Date/Time: 04/01/2022 07:56:31 Fuse Types: C Fuse R: 38 A Fuse B: 0.4 A Ref. function: 3 Test: Earthing system: TN/TT	
<b>Z line</b> <b>User:</b> BLAZ				<b>Pass</b>	
Spec: 096 A I <sub>sc</sub> : 0.39 A No: 0.03 G R: 0.38 G U <sub>br</sub> : 227 V		Spec: 160 A		Date/Time: 04/01/2022 07:56:36 Fuse Types: C Fuse R: 38 A Fuse B: 0.4 A Ref. function: 3 Test: Earthing system: TN/TT	
<b>Z line</b> <b>User:</b> BLAZ				<b>Pass</b>	
Spec: 096 A I <sub>sc</sub> : 0.37 G No: 0.03 G R: 0.37 G U <sub>br</sub> : 227 V		Spec: 160 A		Date/Time: 04/01/2022 07:56:41 Fuse Types: C Fuse R: 38 A Fuse B: 0.4 A Ref. function: 3 Test: Earthing system: TN/TT	
<b>LOCATION:</b> Location <b>MACHINE ID:</b> 000000_0000 <b>NAME:</b> THYSENKRUPP <b>LOCATION (ROOM):</b> <b>PRODUCER / MAKE:</b>		<b>NOMINAL POWER:</b> <b>CS F1:</b> <b>IP PROTECTION:</b> <b>TYPE:</b> <b>REPAIRING CODE:</b>		<b>TEST DATE:</b> 04.01.2022 <b>RETEST PERIOD (in MONTHS):</b> 6 <b>NEXT TEST:</b> 04.07.2022 <b>YEAR OF PRODUCTION:</b>	
<b>Continuity</b> <b>User:</b> BLAZ				<b>Pass</b>	
R: 0.02 G		R (in Limit): 0.1 G		Date/Time: 04/01/2022 08:00:24 Output: 0 V Load: 10 A Duration: 2 s Comment 0: RE-P1 R compensation: Off	
<b>Continuity</b> <b>User:</b> BLAZ				<b>Pass</b>	
R: 0.02 G		R (in Limit): 0.1 G		Date/Time: 04/01/2022 08:00:30 Output: 0 V Load: 10 A Duration: 2 s Comment 0: RE-P1 R compensation: Off	
<b>Continuity</b> <b>User:</b> BLAZ				<b>Pass</b>	
R: 0.02 G		R (in Limit): 0.1 G		Date/Time: 04/01/2022 08:00:36 Output: 0 V Load: 10 A Duration: 2 s Comment 0: RE-P1 R compensation: Off	
Signature:		Customer:		Operator:	
				Page 26	

Customer No.: 548546		Inspect. rec. No.: 89966788		Order No.: 06555666	
<b>ELECTRICAL EQUIPMENT REPORT</b>					
<b>R line</b>				<b>Pass</b>	
<b>User: BLAZ</b>					
Phase: ~230 VMS Unbr: 230 V		Phase: 1 MEG		Date/Time: 04/01/2022 08:01:27 Unbr: ~230 V Type Result: N/PE	
<b>HV AC</b>				<b>Pass</b>	
<b>User: BLAZ</b>					
Un: 15044 V I: 0.0 mA Is: 0.0 mA Ish: 0.0 mA		I (H line): 1.0 mA		Date/Time: 04/01/2022 08:03:29 Unbr: 15000 V I: 0.0 S: 0	
<b>Z line</b>				<b>Pass</b>	
<b>User: BLAZ</b>					
Izpec: 652 A Z: 0.28 Ω XLI: 0.03 Ω XLI: 0.05 Ω Unbr: 226 V		Izpec: 160 A		Date/Time: 04/01/2022 08:03:23 Phase: 0 Phase 2: 16 A Phase 1: 0.4 A Isr Factor 1: 1 Unbr: - Earthling system: TN/TT	
<b>Z line</b>				<b>Pass</b>	
<b>User: BLAZ</b>					
Izpec: 652 A Z: 0.28 Ω XLI: 0.03 Ω XLI: 0.05 Ω Unbr: 226 V		Izpec: 160 A		Date/Time: 04/01/2022 08:03:28 Phase: 0 Phase 2: 16 A Phase 1: 0.4 A Isr Factor 1: 1 Unbr: - Earthling system: TN/TT	
<b>Voltage</b>				<b>Pass</b>	
<b>User: BLAZ</b>					
Unbr: 226 V Unbr: 226 V Unbr: 0.1 V Pwep: 50.0 Hz		Unbr (Low level): 207 V Unbr (High level): 251 V Unbr (Low level): 207 V Unbr (High level): 251 V Unbr (Low level): 0 V Unbr (High level): 10 V		Date/Time: 04/01/2022 08:04:12 System: 3 phases Tact: L1 Limit type: voltage Earthling system: TN/TT Duration: 10F	
<b>Voltage</b>				<b>Pass</b>	
<b>User: BLAZ</b>					
Unbr: 226 V Unbr: 226 V Unbr: 0.1 V Pwep: 50.0 Hz		Unbr (Low level): 207 V Unbr (High level): 251 V Unbr (Low level): 207 V Unbr (High level): 251 V Unbr (Low level): 0 V Unbr (High level): 10 V		Date/Time: 04/01/2022 08:04:18 System: 3 phases Tact: L1 Limit type: voltage Earthling system: TN/TT Duration: 10F	
<b>Zs red</b>				<b>Pass</b>	
<b>User: BLAZ</b>					
Izpec: 630 A Z: 0.24 Ω XLI: 0.04 Ω XLI: 0.04 Ω		Izpec: 160 A		Date/Time: 04/01/2022 08:04:51 Protection: TN Phase Tact: C Phase 2: 16 A Phase 1: 0.4 A Isr Factor 1: 1 Unbr: - Tact: Standard	

Signature:

Customer:

Operator:

Page 3/6

## 9. Differences between basic and PRO MESM license

The comparison table presents differences between basic and PRO license. All instruments are always equipped with at least basic license. The PRO license is usually optional.

License (basic or PRO) is always stored in the instrument, therefore each instrument, can be contented to any available installation of MESM SW and the user will have full functionality, depending on installed license.

Metrel Electrical Safety Manager		
	MI 3325	
	Basic license	PRO license
Data Download	*	*
Data Upload	*	*
AutoSequence <sup>®</sup> Editor	*	*
AutoSequence <sup>®</sup> Download	*	*
AutoSequece <sup>®</sup> Upload	*	*
Print out of test results	*	*
Print out of basic report	*	*
Export to Excel	*	*
Export to Xml	*	*
Upcoming retests (Scheduler)	*	*
Print out of professional reports		*
PRO Export to excel		*

## 10. Demo test sequence

Demo test sequences are available from the following link.

[https://www.metrel.si/assets/Metrel/PS\\_SW\\_dokumentacija/Autosequence/MetrelAutoSeq\\_MI\\_3325.zip](https://www.metrel.si/assets/Metrel/PS_SW_dokumentacija/Autosequence/MetrelAutoSeq_MI_3325.zip)