GOSSEN METRAWATT

QUICK SETUP GUIDE

SECULIFE IP

SECULIFE®

The SECU**LIFE** IP is capable of executing all measurements for testing the effectiveness of safety measures in electrical systems as required by IEC 60364-4 / VDE 0100-600, and as specified in the individual sections of EN61557 / VDE 0413. Consequently, it's ideally suited for approvals and periodic testing of stationary electrical installations. With measuring category IV, the SECULIFE IP provides the user with maximum possible safety.

A broad-range measuring device permits use of the test instrument in all alternating and 3-phase electrical systems with voltages from 65 to 500 V and frequencies of 15.4 to 420 Hz.

Key

Test Instrument and Adapter

1 Control panel with keys and display panel with detent for ideal viewing angle

2 Eyelets for attaching the shoulder strap

3 Rotary selector switch

4 Measuring adapter (2-pole)

5 Plug insert (country specific)

6 Test plug (with retainer ring)

7 Alligator clip (plug-on)

8 Test probes

9▼key ON/START

10 I key IΔN/compens./ZOFFSET

11 Contact surfaces for finger contact

12 Test plug holder

13 Fuses

14 Holder for test probes

Connections for Current Clamp, Probe and PRO-AB Adapter

15 Current clamp connection 1

16 Current clamp connection 2

17 Probe connection

Interfaces, Charger Jack

18Bluetooth®

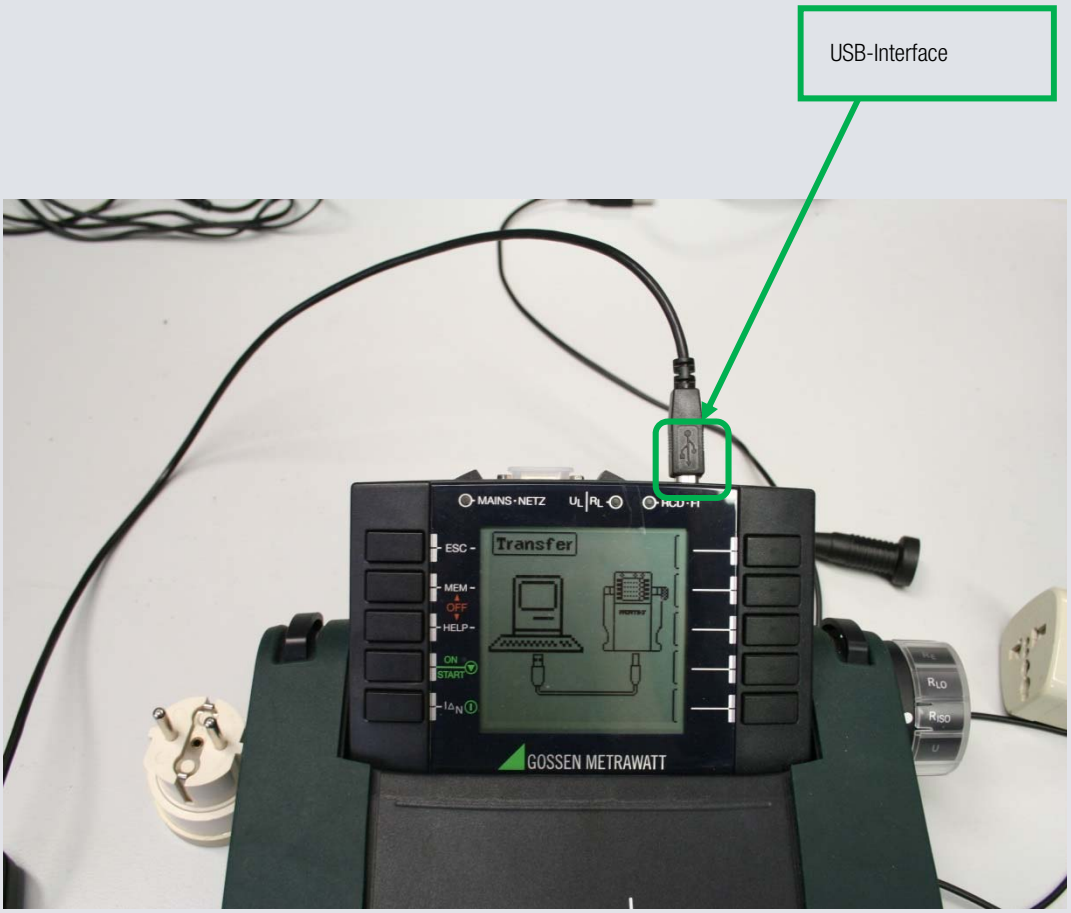
19 USB slave for PC connection

20 RS 232 for connecting barcode scanner or RFID reader

21 Jack for Z502P charger
Attention! Make sure that no batteries are inserted before connecting the charger.

22 Battery Compartment Lid (compartment for batteries and replacement fuses)

With the free software ETS it is possible to design a measurement report. With it you can set the dates of the DUT and the inspector. Via an USB-cable you can transfer the dates to the device.

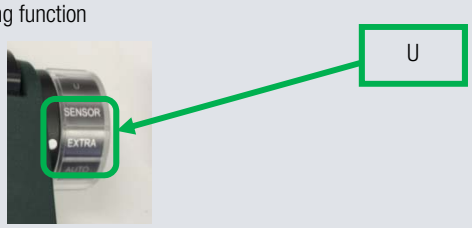


Transfer of the dates to the SECU**LIFE** IP

Measurement report on the device

Measuring of voltage and frequency

1. Select measuring function

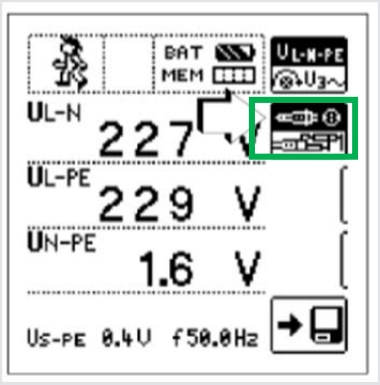


2. Switch between single and 3-phase measurement
   Press the softkey shown at the left in order to switch back and forth between single and 3-phase measurement. The selected phase measurement is displayed inversely (white on black)

3. For the right connection press the 

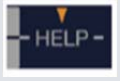
key.

4. Single-Phase-Measurement:
   Voltage between L and N (U_{L-N}), L and PE (U_{L-PE}) and N and PE (U_{N-PE}) with Country Specific Plug insert, e.g. SCHUKO: Press the softkey highlighted in green in order to switch back and forth between the country-specific plug insert, e.g. SCHUKO, and the 2-pole adapter. The selected connection type is displayed inversely (white on black)



Voltage between L-PE, N-PE and L-L with 2 Pol-Adapter: Press the softkey highlighted in green (but invers colors) in order to switch back and forth between the country-specific plug insert, e.g. SCHUKO, and the 2-pole adapter. The selected connection type is displayed inversely (white on black).

5. 3-Phase Measurement (line-to-line voltage) and Phase Sequence:

   For the right connection press the 

key.

   The measuring adapter (2-pole) is required in order to connect the instrument, and can be expanded to a 3-pole measuring adapter with the included measurement cable.
   ➪ Press softkey U3~.
   A clockwise phase sequence is required at all 3-phase electrical outlets.
   • Measurement instrument connection is usually problematic with CEE outlets due to contact problems. Measurements can be executed quickly and reliably without contact problems with the help of the Z500A variable plug adapter set available from GMC.
   • Connection for 3-wire measurement, plug L1-L2-L3 in clockwise direction as of PE socket

Testing RCDs

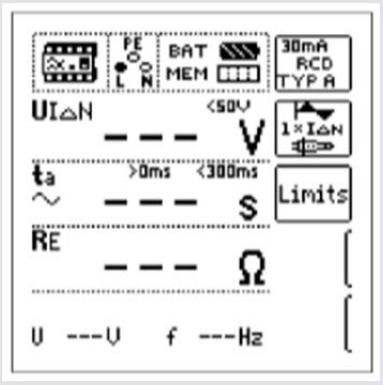
The testing of residual current devices (RCDs) includes:
• Visual inspection
•Testing
• Measurement
Use the test instrument for testing and measurement.

Measuring Method

The following must be substantiated by generating a fault current downstream from the RCD:
• That the RCD is tripped no later than upon reaching its nominal fault current value
• That the continuously allowable contact voltage value UL agreed upon for the respective system is not exceeded

This is achieved by means of:
• Contact voltage measurement, 10 measurements with full waves and extrapolation of IΔN
•Substantiation of tripping within 400 ms or 200 ms with IΔN
• Substantiation of tripping with current rising residual current: This value must be between 50% and 100% of IΔN (usually about 70%).
• No premature tripping with the test instrument, because testing is begun with 30% residual current (if no bias current occurs within the system)

1. Measuring Contact Voltage (with reference to nominal residual current) with 173 Nominal Residual Current and Tripping Test with Nominal Residual Current: Select Measuring function



2. Connection:
For the right connection press the 

key.

3. Set parameters for IΔN

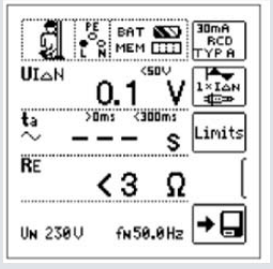
1) **Measuring Contact Current Without Tripping the RCD**

Measuring Method

The instrument uses a measuring current of only 1/3 nominal residual current for the determination of contact voltage UIΔN which occurs at nominal residual current. This prevents tripping of the RCCB.This measuring method is especially advantageous, because contact voltage can be measured quickly and easily at any electrical outlet without tripping the RCCB. The usual, complex measuring method involving testing for the proper functioning of the RCD at a given point, and subsequent substantiation that all other systems components requiring protection are reliably connected at low resistance values to the selected measuring point via the PE conductor, is made unnecessary.

2) **Tripping Test after the Measurement of Contact Voltage**

➪Press the IΔN key.
The tripping test need only be performed at one measuring point for each RCCB.If the RCCB is tripped at nominal residual current, the MAINS/NETZ LED blinks red (line voltage disconnected) and time to trip ta and earthing resistance RE appear at the display panel. If the RCCB is not tripped at nominal residual current, the RCD/FI LED lights up red.



.

For special testing, like

- Special Testing for Systems and RCDs
- Testing systems and RCCBs with Rising Residual Current (AC) for Type AC, A/F, B/B+ and EV/MI RCDs
- Testing RCCBS with 5* IΔN
- Testing of RCCBs which are suited for pulsating DC residual current
- Testing for special RCDs
- System, type RCD-S selective RCCBs
- PRCDs with non-linear type PRCD-K elements
- SRCD, PRCD-S (SCHUKOMAT, SIDOS or comparable)
- Type G or R RCCB
- Testing residual current circuit breakers in TN-S systems
- Testing RCD protection in IT Systems with High Calce Capacitance (e.g. in Norway)

Go to https://www.gossenmetrawatt.com/resources/p1/profitestmaster/ba_gb.pdf , pages 19-25

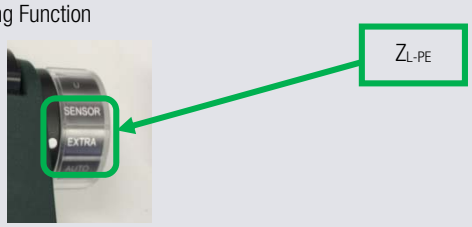
Testing of Breaking Requirements Overcurrent Protective Devices, measurement of loop Impedance and Determination of Short-Circuit Current (functions Z_{L-PE} and I_K)

Testing of overcurrent protective devices includes visual inspection and measurement. Use the PROFITEST MASTER or SECULIFE IP to perform measurements.

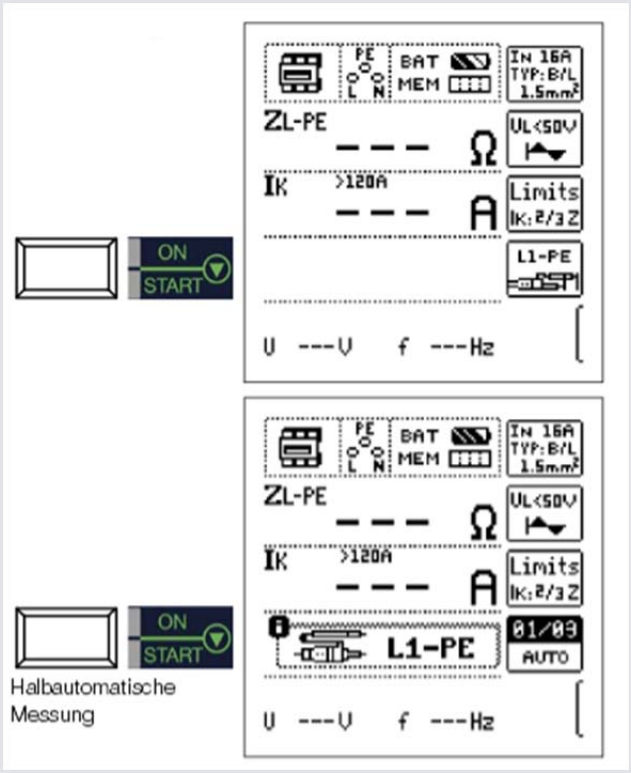
Measuring Method

Loop impedance ZL-PE is measured and short-circuit current IK is ascertained in order to determine if the breaking requirements for protective devices have been fulfilled. Loop impedance is the resistance within the current loop (utility station – phase conductor – protective conductor) when a short-circuit to an exposed conductive part occurs (conductive connection between phase conductor and protective conductor). Short-circuit current magnitude is determined by the loop impedance value. Short-circuit current IK may not fall below a predetermined value set forth by DIN VDE 0100, so that reliable breaking of the protective device (fuse, automatic circuit breaker) is assured.
Thus the measured loop impedance value must be less than the maximum allowable value.
In order to measure loop impedance ZL-PE, the instrument uses a test current of 3.7 to 7 A (60 to 550 V) depending on line voltage and line frequency. At 16 Hz, the test has a duration of no more than 1200 ms.

1. Select Measuring Function



2. Set Parameters
3. Start measurement: display

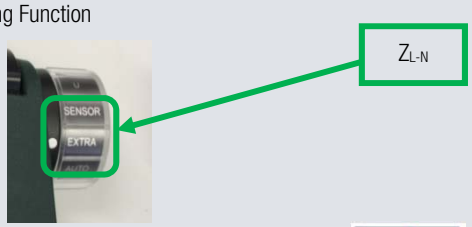


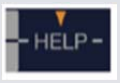
4. Evaluation of measured values

Measuring Line impedance (function Z_{L-N})

Measuring Method (internal line resistance measurement)
Supply impedance ZL-N is measured by means of the same method used for loop impedance ZL-PE. However, the current loop is completed via neutral conductor N rather than protective conductor PE as is the case with loop impedance measurement.

1. Select Measuring Function



2. Connection Schuko. For the right connection press the 

key.
3. Set parameters
4. Setting for Short-circuit current Calculation – Parameter I_K
5. Start measurement
6. Display of U_{L-N} (U_N/f_N)
7. Displaying the Fuse table

Example of an Z_{L-N} Measurement

Earthing Resistance Measurement (Function R_E)

Earthing resistance RE is important for automatic shutdown in system segments. It must have a low value in order to assure that high short-circuit current flows and the system is shut down reliably by the RCCB in the event of a fault.

Test Setup

Earthing resistance (RE) is the sum of the earth electrode's dissipation resistance and earth conductor resistance. Earthing resistance is measured by applying an alternating current via the earth conductor, the earth electrode and earth electrode resistance. This current, as well as voltage between the earth electrode and a probe, are measured. The probe is connected to the probe connector socket (17) with a 4 mm contact protected plug.

Direct Measurement with Probe (mains powered measurement)

Direct measurement of earthing resistance RE is only possible within a measuring circuit which includes a probe. However, this means that the probe and reference earth must be of like potential, i.e. that they are positioned outside of the potential gradient area. The distance between the earth electrode and the probe should be at least 20 m.

Measurement without Probe (mains powered measurement)

In many cases, especially in extremely built-up areas, it is difficult, or even impossible, to set a measuring probe. In such cases, earthing resistance can be measured without a probe. In this case, however, the resistance values for the operational earth electrode RB and phase conductor L are also included in the measurement results.

Measuring Method (w. probe) (mains powered measurement)

The instrument measures earthing resistance RE by means of the ammeter-voltmeter test. Resistance RE is calculated from the quotient of voltage UE and current IE where UE is between the earth electrode and the probe.
The test current which is applied to earthing resistance is controlled by the instrument. A voltage drop is generated which is proportional to earthing Resistance.

Measuring Method with Suppression of RCD Tripping (mains powered earthing measurement)

The test instrument generates a direct current to this end, which saturates the RCCB's magnetic circuit. The test instrument then superimposes a measuring current which only demonstrates half-waves of like polarity.
The RCCB is no longer capable of detecting this measuring current, and is consequently not tripped during measurement. A four conductor measuring cable is used between the instrument and the test plug. Cable and measuring adapter resistance is automatically compensated for during measurement and does not effect measurement results.

Limit Values

Earthing resistance (earth coupling resistance) is determined primarily by the electrode's contact surface and the conductivity of the surrounding earth.
The specified limit value depends on the type of electrical system and its shutdown conditions in consideration of maximum contact voltage.

Evaluation of Measured Values

Example of a $R_{E(L-PE)}$ Measurement- 2-Pole measuring with 2-Pole-Adapter

More Earthing Resistance Measurements:

- Earthing Resistance Measurement - Mains Operated

(2-pole-measurement via 2-pole adapter,

2-pole measurement via earthing contact plug,

3-pole measurement via 2-pole adapter and probe,

Selective measurement: 2-pole measurement with probe and current clamp sensor)

- Earthing resistance Measurement – Battery Powered (only MPRO & MXTRA)

(3-pole measurement via PRO-RE adapter,

4-pole measurement via PRO-RE adapter,

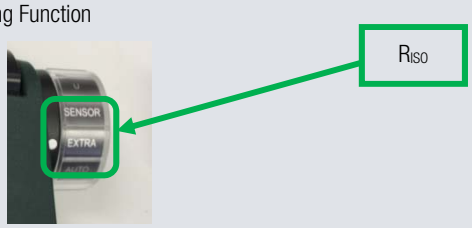
Selective measurement with clamp meter (4-pole) via PRO-RE adapter,

2-clamp measurement via PRO-RE/2 adapter,

Measurement of soll resistivity ρ_E via PRO-RE adapter)

Measuring Isolation Resistance

1. Select Measuring Function



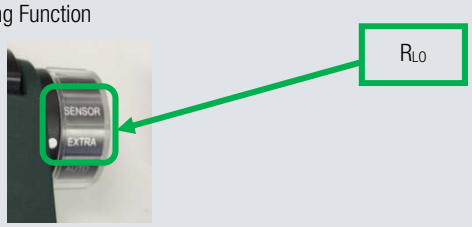
2. Connection via 2-pole adapter or test plug. Connection Schuko. For the right connection press the 

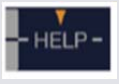
key.
3. Set Parameters
4. Polarity Selection
5. Breakdown current for ramp function
6. Limit values for Breakdown voltage
7. Limit values for Constant test Voltage
8. Start measurement – Rising Test Voltage (ramp function)
9. General notes Regarding Isolation Measurements with Ramp Function
10. Start Measurement – Constant test Voltage
11. Discharge the Device Under Test
12. Evaluation of Measured Values

Measuring Low-Value Resistance up to 200 Ohm (protective conductor and equipotential bonding conductor)

According to the regulations, the measurement of low-value resistance at protective conductors, earth conductors or bonding conductors must be performed with (automatic) polarity reversal of the test voltage, or with current flow in one (+ pole to PE) and then the other direction (– pole to PE).

1. Select Measuring Function



2. Connection via 2-pole adapter only! For the right connection press the 

key.
3. Set Parameters
4. Measuring with Constant Test Current: Start Measurement
5. Automatic Polarity Reversal
6. Evaluation of Measurement Results
7. Evaluation of Measured Values
8. Calculation of Cable Lengths for Common Copper Conductors

Example of a R_{LO} Measurement

ProfiScan

App for PROFITEST MXTRA (new)

The ProfiScan app enables the user of a PROFITEST MXTRA test instrument to perform the following functions on smartphones or tablet PCs with android operating system.

Functions of the ProfiScan APP:

- Read-out of a database (xml-file) and transmission per e-mail
- Reception of a database (xml-file) per e-mail and transfer to a test instrument
- Convenient online creation of system structures, e.g. of clients, distributors, electric circuits and RCDs
- Creation, management and designation of files
- Processing of visual inspection questions
- Keyboard mode - when the test instrument is in on-screen keyboard mode
- Troubleshooting - creation of screenshots and transmission per e-mail to the Technical Support

System Requirements for Smartphone or Tablet PC:

- Operating system: Android 2.3.3 or higher
- Interface: Bluetooth 2.1 + EDR, class 2 or higher

Illustrations of how users see their ProfiScan app:

QR-Code leads to ProfiScan APP

GMC INSTRUMENTS

GOSSEN METRAWATT

CAMILLE BAUER

GMC-I Messtechnik GmbH
Südwestpark 15 □ 90449 Nürnberg □ Germany
TEL +49 911 8602-111 □ FAX +49 911 8602-777
www.gossenmetrawatt.com □ info@gossenmetrawatt.com