

GRID IMPEDANCE ANALYSER



SAFETY GUIDE & USER MANUAL

V2.7



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Thank you!

Thank you very much for your investment in our unique instrument. These are top-quality instruments which are designed to provide you years of reliable service. This guide has been prepared to help you get the most from your investment, starting from the day you take it out of the box, and extending for years into the future.

Support

When you are working with our products we want to provide you with the greatest possible benefits. If you need any support, we are here to assist you.



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Warning

Failure to follow the warnings and/or instructions for use may damage the device and/or its components and pose a risk to the user.

Always use the newest version of the user manual for instructions on how to use the measurement device. The latest User Manual is available at:

www.neo-messtechnik.com

1 Introduction

This manual contains important instructions for the use and operation of NEO Messtechnik instruments safely, properly and efficiently. Its purpose is to help you to avoid danger, repair costs, and down time as well as to help maintain reliability and life of the instruments. For this reason, it is important to ensure that the manual is always available to authorised and trained personnel. Operating personnel should read the manual thoroughly. The manufacturer will not be held liable for any injury or damage to personnel or property through failure to observe the safety precautions contained in this handbook. The specific standards and regulations in each country must also be observed. It is important to observe the general electrical regulations of the country in which the device will be installed and operated, as well as the current national accident prevention regulations and internal company directives (work, operating and safety regulations). The system may only be installed by an authorised electrician. Use genuine accessories to ensure system safety and reliable operation. The use of other parts is not permitted and invalidates the warranty.



The instrument allows measuring the single-phase or three-phase grid impedance (phase to ground or phase to phase) in a frequency range up to 150 kHz (optional: 420 kHz). The instrument is used together with the PQA8000H instrument.




Main Features

- Measurement of frequency dependent grid impedance
- Amplitude and Phase / imaginary and real part
- Safety: CAT III 600V / CAT IV 300V
- Up to 150 kHz / 420 kHz

The instrument is designed to conform to the IEC61010 Safety Standards and has been thoroughly tested for safety prior to shipment. However, using the instrument in a way not described in this manual and instructions may negate the provided safety features. Before using the instrument be certain to carefully read the following safety notes.

Warning sign	Type of safety instruction
	This symbol indicates cautions and hazards that may/will result in death or serious injury to the operator.
	This symbol indicates that dangerous high voltage. If a particular safety check is not performed, this may give rise to a hazardous situation. The operator may receive an electric shock, may be fatally injured or may be burnt.

Tips and recommendations

	This symbol indicates a double-insulated device.
NOTE	This symbol indicates advisory items related to the performance or correct operation of the instrument.

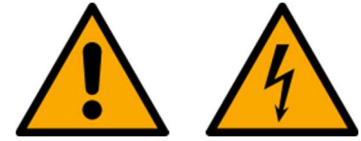


Mishandling during use could result in injury or death, as well as damage to the instrument. Be certain that you understand this instructions and precautions in the manual before use.

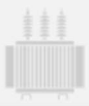


2 Safety Information

2.1 General Safety and Operating Precautions



- Carefully read this manual before using the instrument.
- Use the instrument according to these instructions only.
- Use the instruments only under environmental conditions described in the technical data.
- Personnel assigned to use the instrument must have read this reference manual and fully understood the instructions herein.
- The instruments may only be operated by trained personnel. Any maloperation can result in damage to property or persons.
- The input voltage shall not exceed the values rated in the technical data. With this product, only use the power cable delivered or defined for the host country.
- There is no guarantee if you exceed the values for your safety.
- The power supply must be within the limits given in the technical data.
- Always make a visual inspection of used equipment such as leads and clamps before use.
- Use fuses if you connect the instrument directly to voltage where no fuse is available or high short circuit power is given (e.g. > 120 kA).
- The product heats during operation. Make sure there is adequate ventilation. Ventilation slots must not be covered!
- When connecting to the banana plug sockets, only use cables with 4mm/0.16" safety banana connectors and plastic housing. Always insert plugs completely.
- DO NOT insert objects into sockets or ventilation slots.
- DO NOT open the instrument or remove any of its housing components. Don't carry out any modifications, extensions or adaptations at the instrument. If instrument is opened by the customer, all guarantees are invalidated.
- DO NOT use the system if equipment covers or shields are removed.
- DO NOT use the system in rooms with flammable gases, fumes or dust or in adverse environmental conditions.
- The use of the measuring system in schools and other training facilities must be observed by skilled personnel.
- Please contact a professional if you have doubts about the method of operation, safety or the connection of the system.
- Please be careful with the product. Shocks, hits and dropping it from already lower level may damage your system.
- Do not switch on the system after transporting it from a cold into a warm room and vice versa. The thereby created condensation may damage your system. Acclimatize the system unpowered to room temperature.
- Maintenance must be executed by qualified staff only.
- DO NOT operate damaged equipment: Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture, or any other reason, REMOVE POWER and do not use the product until safe operation can be verified by service-trained personnel. If necessary, return the product to NEO Messtechnik sales and service office for service and repair to ensure that safety features are maintained.
- This manual is to be supplemented by existing national safety standards for accident prevention and environmental protection.
- The instructions provided in this manual and the associated software and hardware manuals are considered part of the rules governing proper usage.
- Observe local laws when using the instrument.
- The use of measuring devices under CAT II, III or IV conditions can be dangerous! Under these conditions, only appropriately trained / tested / informed about safety precautions may



take measurements (for safety categories see also technical reference manual). If a measuring device, a cable or an accessory of a lower category or voltage is used, this lower category / voltage applies to the entire group (device + cable + accessories)



- Use GIA-1 and GIA-3 only together with PQA8000H. A usage with any other device is strongly forbidden.
- During shipment of the device , handle it carefully so that it is not damaged due to vibration or shock.
- To avoid electrical shock don't remove the instrument case. The internal components of the instrument carry high voltages and may become very hot during operation.
- Don't use the instrument in environments containing ignitable gases, explosive powders etc. (Risk if explosion)
- Don't place the instrument on an unstable table or an inclined place. Dropping or knocking down the instrument can cause injury or damage to the instrument.
- Don't use the instrument at circuits exceeding its rating and specifications. Doing so may damage the instrument or cause it to become hot, resulting in electric shock or injury to persons.
- Before using the instrument inform those around you of your intention to use it.
- Before using the instrument, verify that it operates normally to ensure that no damage occurred during storage or shipping. If you find any damage, contact your authorized NEO Messtechnik sales partner or contact NEO Messtechnik directly.
- If a test lead or the instrument is damaged, there is a risk of electrical shock. Perform inspection before using the instrument. Check the coating of the test leads that they are neither ripped nor torn and that no metal parts are exposed. Using the instrument under such conditions could result in electric shock. Replace the test leads with those specified by NEO. Verify that the instrument operates normally to ensure that no damage occurred during storage or shipping. If you find any damage, contact NEO Messtechnik or an authorized sales partner.
- During shipment of the instrument, only use the packaging of the original delivery and handle it carefully so that there is no damage due to vibration or shock.
- If the product is damaged, mark it clearly so that no other person use it inadvertently.
- Touching any high voltage points inside the equipment is very dangerous. Customers are not allowed to modify, disassemble or repair the instrument. Doing so may cause fire, injury or electrical shock.
- The instrument is not drip-proof. Water droplets may result in malfunctions.
- The instrument is designed for the application in low-voltage grids (100V – 230V line-earth and 400V line-to line). Any use in other than specified voltage levels is strongly forbidden.
- Don't short the measurement test leads with metal portion or tips of the test lead. Doing so may cause fire, injury or electrical shock.
- To avoid electrical shock or short-circuit don't touch the metal parts of the connecting cable clips.
- To prevent electrical shock when measuring the voltage or connecting the GIA to the power line use only the specified test lead.
- To prevent electrical shock don't exceed the the lower of the ratings shown on the instrument and test leads.
- The system may only be installed by an authorised electrician.
- The operating safety is only guaranteed if the delivered system is used as intended. Incorrect use may result in danger to the operator, to the system and the connected equipment.
- The operation of NEO Messtechnik products in direct contact with water, aggressive substances and inflammatory gases and vapours is prohibited.
- The system may only be operated whilst it is in perfect working condition. In the event of damage, irregularities or malfunctions that cannot be resolved with the assistance of the operating instructions, the system must be shut down immediately and labelled accordingly. In such an event, the relevant management must be informed. Please contact NEO



Messtechnik Service immediately to eliminate the malfunction. The system may only be started up again once the malfunction has been eliminated.



- The instrument is intended for use in a dry environment only.
- In order to ensure safe operations of this instrument, all notes and warnings in these instructions must be observed at all times.
- Never disconnect the test leads during an active measurement. This may result in electrical arcing or electrical shock.
- Wear protective gear to prevent electrical shock. Use appropriate protective insulation and adhere to applicable laws and regulations.
- With regards to the electrical supply, there are risks of electrical shock, heat generation, electrical arc, fire and short circuits. Individuals using an electrical measuring device the first time must be supervised by a technician with experience in electrical measurements.

2.2 Residual risks

The GIA device is designed in accordance with the state of the art and current safety requirements. Nevertheless, residual risks remain that require prudent action.

2.3 Personal protective equipment

Personal protective equipment is used to protect persons from health and safety hazards. The specific regulations of the respective area or country as well as company regulations for safety in electrical engineering and the safe handling of electronic devices in accordance with EN50110 must be observed.

2.4 Measurement Categories

To ensure safe operation of measuring instruments the IEC 61010 safety standard defines several categories for various electrical environments – called measurement categories.



Using a measurement instrument in an environment designated with a higher-numbered category than that for which the instrument is rated could result in a severe accident, and must be carefully avoided.



Never use a measuring instrument that is not labelled with a measurement category according to IEC61010.

Measurement category CAT II



Measurement category II is for measurements performed on circuits directly connected to the low-voltage installation. Examples are measurements on household appliances, portable tools and similar equipment

Measurement category CAT III

Measurement category III is for measurements performed in the building installation. Examples are measurements on distribution boards, circuit-breakers, wiring, including cables, bus-bars, junction boxes, switches, socket-outlets in the fixed installation, and equipment for industries

Measurement category CAT IV

Measurement category IV is for measurements performed at the source of the low-voltage installation. Examples are electricity meters and measurements on primary overcurrent protection devices and ripple control units.



For working on equipment under voltage use the guidelines given in EN50110.

Always follow the 5 golden safety rules:



1. Always switch off.

Meaning that the electrical installation must be disconnected from live parts on all poles. Block all poles of the power source for every part of the operation. Switchgear of home or factory, low voltage switch mode, the power of the machine control switch should be cut off. The power supply circuit to be supplied to the electric appliance such as lamps and motors should be cut off. If you remove the low-voltage rapid fuse, you should wear braces, a helmet, and front shields. If there is a capacitor, the residual charge must be discharged using appropriate tools.

2. Secure against reconnection.

Reliably prevent an accidental re-connection of an installation where work is in progress. This is achieved for example by just replacing the unscrewed fuses in the low-voltage system by lockable lock-out devices. Appropriate warning signs should be posted for viewing on the operating device (switch handle, instrument actuator, control device, circuit breaker, etc.). It should also be posted to closed electrical operating areas or locked switch cabinets. The contents of the warning cover should warn you that you don't manipulate the switch. In addition, provide a name for the workplace location and supervisor. The power-off device should be locked to a mechanical device. All keys must be kept in a safe place. If it is operated with the control voltage of the energy or controller, such as springs, compressed air, it must take measures to prevent the release or operation of energy.

3. Verify that the installation is dead

Use a suitable measuring / test equipment such as a voltage detector to verify on all poles that the installation is dead. Check the correct function of the voltage detector prior to using it.

4. Carry out earthing and short-circuiting.

An important point of the five safety rules is earthing and short-circuiting at the workplace. This measure ensures a voltage-free state for the duration of the work, also with regard to influencing voltages, atmospheric overvoltage or accidental restarting. Earthing and short-circuit areas should be visible at the workplace. Important: The relevant parts must be earthed before they are short-circuited!

5. Provide protection against adjacent live parts

According to the five safety rules, adjacent parts are parts located in the vicinity zone. If parts of an electrical installation in the vicinity zone of the work location cannot be disconnected, additional precautions must be taken before work starts. In this case use insulating protective



shutters or covering material as protection against accidental contact. The hazard area should be marked for clarity.

2.5 Cleaning of the device

Before cleaning, all cables must be disconnected and any connection to the power supply or other devices must be disconnected. Do not clean the device with alcohol or other organic solvents. Only use a soft, lint-free, dry cloth for cleaning. When cleaning, make absolutely sure that no liquid gets into the inside of the device. This could cause a short circuit and destroy the appliance or pose a danger to persons.

2.6 Warranty

The warranty for the instrument is 2 years – usual operating conditions preconditioned. This warranty does not cover wear parts, fuses, batteries and accumulators. NEO Messtechnik warrant that at the time of delivery NEO Messtechnik products are free from manufacturing or material defects which might considerably reduce their value or usability. This warranty is not applicable to faults in the software supplied. During the period of warranty, NEO Messtechnik agree to repair faulty parts or replace them with new parts or parts as new according to their choice. Each measure to remedy a claim under warranty shall exclusively be carried out by NEO Messtechnik or an authorized service partner. NEO Messtechnik reject all further claims under warranty, in particular those from consequential damage. Each component and product replaced in accordance with this warranty becomes the property of NEO Messtechnik.

This warranty does not apply to any fault or damage caused by exposing a product to conditions not in accordance with this specification, by storing, transporting, or using it improperly, or having it serviced or installed by a workshop not authorized by NEO Messtechnik.

2.7 Recycling

- This is an electronic instrument and must be recycled according to the WEEE – directive. Do not throw away.
- More information see:
http://ec.europa.eu/environment/waste/wEEE/index_en.htm
- Dispose of the test set in accordance with the legal environmental regulations in the country.





2.8 CE Conformity

- This instrument is compliant with the CE - requirements.
- **EMC Directive 2014/30/EU**
- **Test Procedure:**
 - EN 55011:2022 Class A
 - EN 61326-1: 2021-06
- **EMI (EN55011):**
 - Conducted Emission (CE)
 - Radiated Emission (RE)
- **EMS (EN61000-4-):**
 - Electrostatic discharge (ESD: EN61000-4-2)
 - Radiated RF immunity (RS: EN61000-4-3)
 - Voltage dip/interruption (DIP: EN61000-4-8)

Note (-4-4 and -4-5 and -4-6 by PQA8000H)
- **Safety: EN 61010-1: 2010**
 - IEC 61010-1:2010,
 - IEC 61010-1:2010/AMD1:2016;
 - IEC 61010-2-030:2017

Note about Radiated Emissions:

The device is intended for operation in the industrial segment in accordance with EN55011 – CLASS A. When used at private houses it could cause interference with other equipment (such as the radio or television). The radiation level complies with the limit curve A (industrial area). If the living area is sufficiently far away from the planned area of operation (industrial area), equipment there will not be impaired.

2.9 RoHS

- This product is compliant with the RoHS - Directive.
- For further information see:
http://ec.europa.eu/environment/waste/rohs_eee/index_en.htm

2.10 Electrical Units

SI units are always used in this manual.

pico

p

10^{-12}

1pF = 10^{-12} F



nano	n	10^{-9}	1nA = 10^{-9} A
micro	μ	10^{-6}	1 μ A = 10^{-6} A
milli	m	10^{-3}	1mA = 10^{-3} A
kilo	k	10^3	1k Ω = 1000 Ω
mega	M	10^6	1MHz = 10^6 Hz
giga	G	10^9	1GHz = 10^9 Hz

2.11 Environmental and Others

- Use instrument only for indoor use
- Altitude up to 2 000 m;
- Ambient temperature from 0 °C to 55 °C;
- Protection IP 20 / Protection Class II
- CAT IV 300V / Pollution Degree 2 respective / CAT III 600V / Pollution Degree 2
- Maximum relative humidity 80 % at temperatures up to 31 °C, decreasing linearly up to 50 % relative humidity at 40 °C;
- Fluctuations of the mains supply voltage up to ± 10 % of the nominal voltage;
- Only use the auxiliary equipment provided
- Only use the cables (ODU-ODU, ODU-DSUB, banana test lead) provided
- Always use safety test leads (CAT III 1000V / CAT IV 600V) with full isolated plugs
- Don't connect the instrument to any other power supply or any other device. It is only intended to be used with PQA8000H instrument.
- The instrument always needs to be closed at operation. Never open the hinged lid during measurement. Always close the hinged lid before measurement.



- Don't turn around the instrument and always use it standard position





3 Hardware

3.1 Instrument

3.1.1 3-Phase GIA

The following picture shows the side view of the Grid Impedance Analyser GIA.



- The voltage at the Point of Connection (PCC) is connected to the banana plugs
Red Plug: Phases
Black Plug: Neutral
- The RS485 cable needs to be connected to the PQA8000H instrument.
- The GIA-ODU cable needs to be connected to the **I4** port of the PQA8000H instrument.



- Use only safety test leads (CAT III 1000V / CAT IV 600V)



3.1.2 1-Phase GIA

The following picture shows the side view of the Grid Impedance Analyser GIA.



- The voltage at the Point of Connection (PCC) is connected to the banana plugs
Red Plug: Phase
Black Plug: Neutral (Phase 2)
- The RS485 cable needs to be connected to the PQA8000H instrument.
- The GIA-ODU cable needs to be connected to the **I4** port of the PQA8000H instrument.



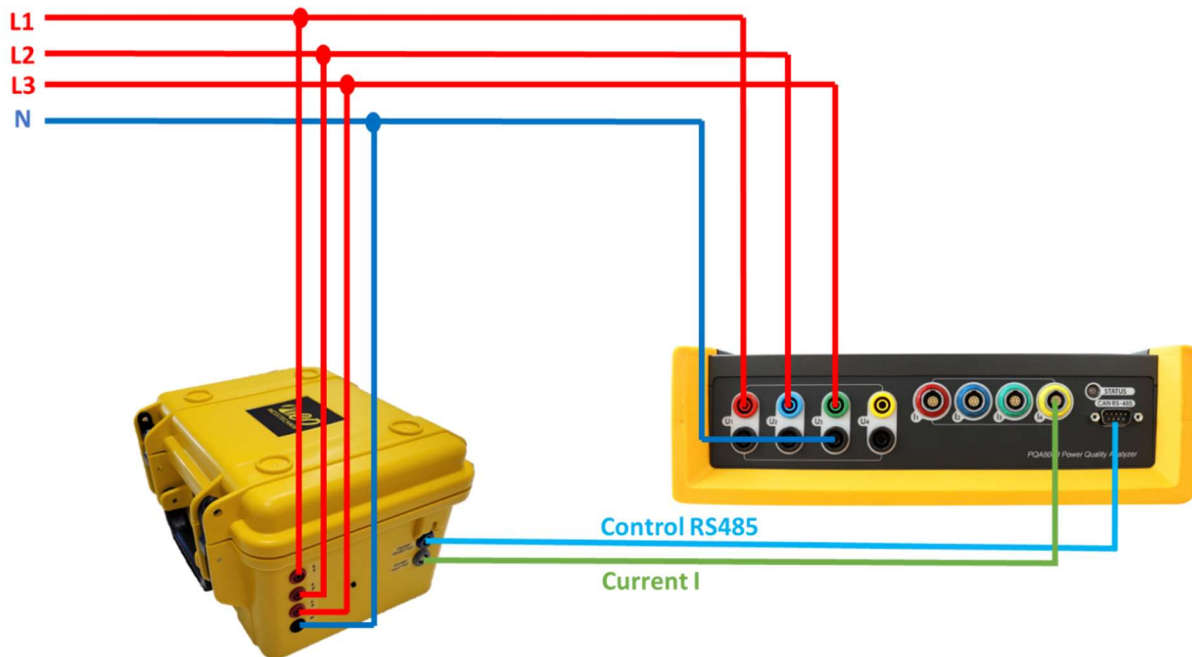
- Use only safety test leads (CAT III 1000V / CAT IV 600V)



3.2 Wiring / Connection

3.2.1 Three Phase – Line to Earth

The following picture shows the simplified connection diagram for the GIA-3 instrument together with the PQA8000H instrument for connection to a 3-phase system.



- 1) Connect RS485 cable from GIA to PQA
- 2) Connect GIA-ODU Cable from GIA to PQA8000
- 3) Connect Voltage to GIA
- 4) Connect Voltage to PQA8000

Warning: The work can only be carried out safely while guaranteeing the protection of the health of all those involved in the work by employing suitable working procedures and using suitable protective equipment. For that reason, the electrical connection of the device must absolutely conform to the nationally applicable regulations for work on live equipment.

Warning: Only use CAT IV measurement cables / test leads when measuring in CAT IV environment! The GIA-3 instrument has built-in high power fuse (>150 kA). For measuring the voltage at PQA8000H it is recommended to use safety test leads with integrated fuse (CAT IV 600V).

Note: 4-wire method is only ensured if measurement lead of both – GIA and PQA – is connected to PCC. If voltage is guided via one of the instruments, the results will be affected by cable impedance. For the voltage measurement lead it is highly recommended to use fused safety test leads CAT IV 600V. In case test leads with integrated fuses are used to connect voltages to GIA unit the current rating of the fuse needs to be minimal 5A.

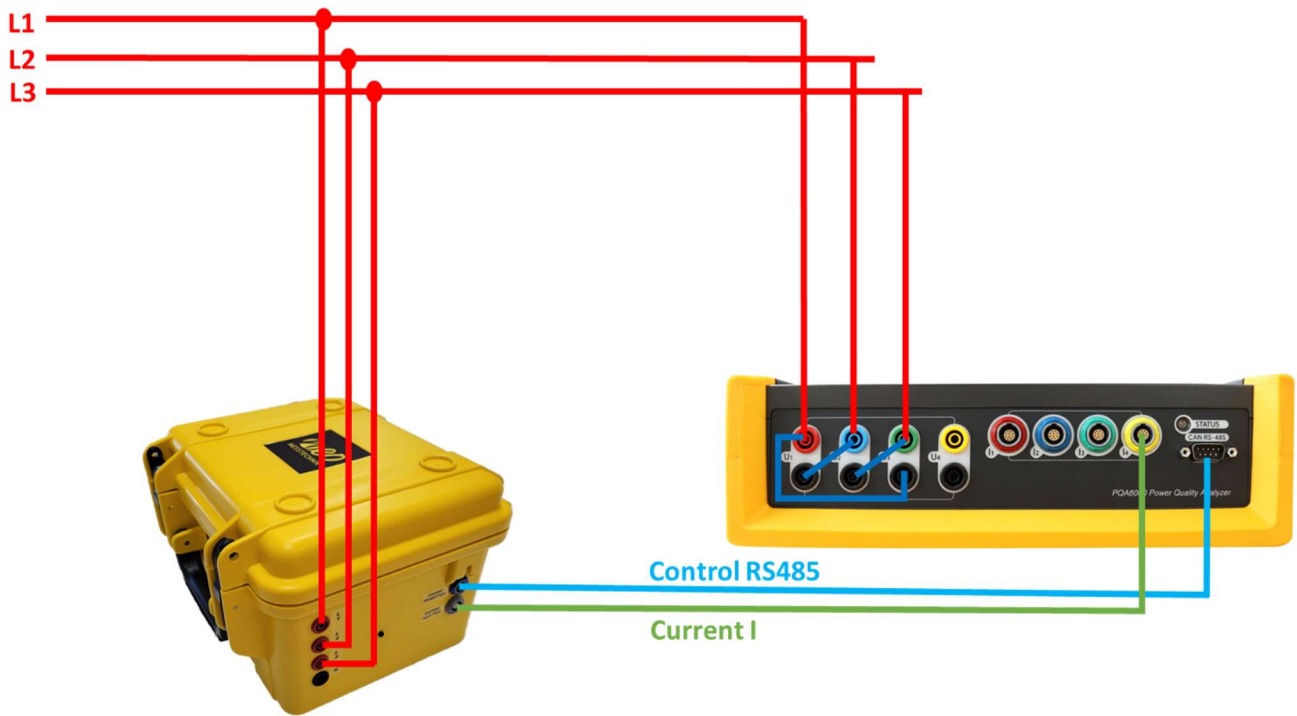
Note: In case of wrong wiring the accuracy of the test results might be affected strongly.





3.2.2 Three Phase – Line to Line

The following picture shows the simplified connection diagram for the GIA-3 instrument together with the PQA8000H instrument for connection to a 3-phase system.



- 1) Connect RS485 cable from GIA to PQA
- 2) Connect GIA-ODU Cable from GIA to PQA8000
- 3) Connect Voltage to GIA
- 4) Connect Voltage to PQA8000

Warning: The work can only be carried out safely while guaranteeing the protection of the health of all those involved in the work by employing suitable working procedures and using suitable protective equipment. For that reason, the electrical connection of the device must absolutely conform to the nationally applicable regulations for work on live equipment.

Warning: Only use CAT IV measurement cables / test leads when measuring in CAT IV environment! The GIA-3 instrument has built-in high power fuse (>150 kA). For measuring the voltage at PQA8000H it is recommended to use safety test leads with integrated fuse (CAT IV 600V).

Note: 4-wire method is only ensured if measurement lead of both – GIA and PQA – is connected to PCC. If voltage is guided via one of the instruments, the results will be affected by cable impedance. For the voltage measurement lead it is highly recommended to use fused safety test leads CAT IV 600V. In case test leads with integrated fuses are used to connect voltages to GIA unit the current rating of the fuse needs to be minimal 5A.

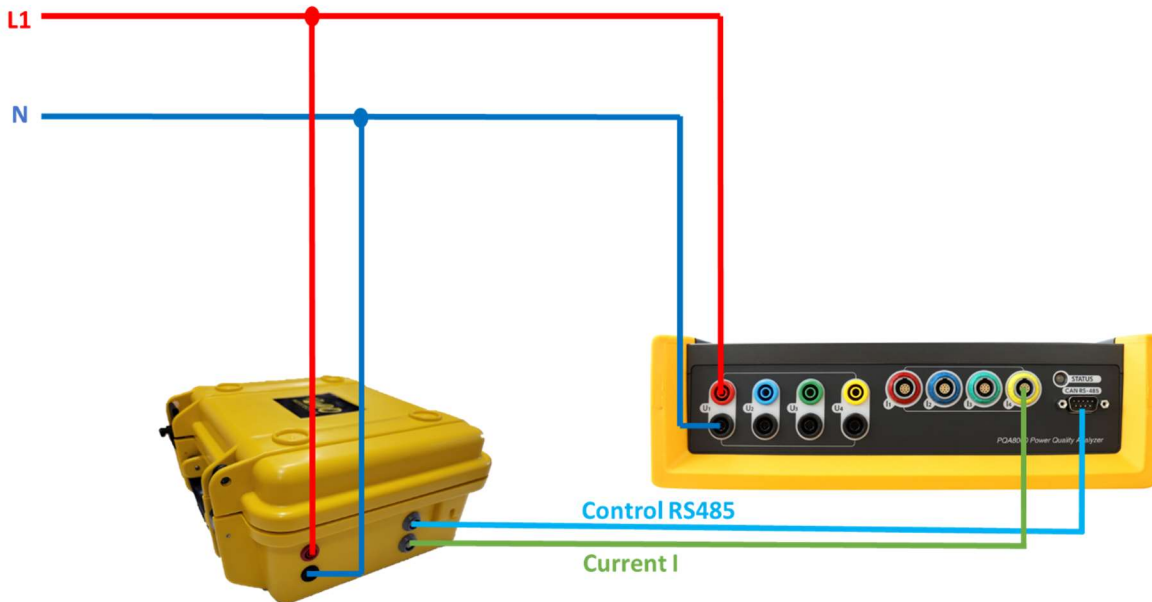
Note: In case of wrong wiring the accuracy of the test results might be affected strongly.





3.2.3 Single Phase

The following picture shows the simplified connection diagram for the GIA-3 instrument together with the PQA8000H instrument for connection to a 1-phase system.



- 1) Connect RS485 cable from GIA to PQA
- 2) Connect GIA-ODU Cable from GIA to PQA8000
- 3) Connect Voltage to GIA
- 4) Connect Voltage to PQA8000

Warning: The work can only be carried out safely while guaranteeing the protection of the health of all those involved in the work by employing suitable working procedures and using suitable protective equipment. For that reason, the electrical connection of the device must absolutely conform to the nationally applicable regulations for work on live equipment.

Warning: Only use CAT IV measurement cables / test leads when measuring in CAT IV environment! The GIA-1 instrument has built-in high power fuse (>150 kA). For measuring the voltage at PQA8000H it is recommended to use safety test leads with integrated fuse (CAT IV 600V).

Note: 4-wire method is only ensured if measurement lead of both – GIA and PQA – is connected to PCC. If voltage is guided via one of the instruments, the results will be affected by cable impedance. For the voltage measurement lead it is highly recommended to use fused safety test leads CAT IV 600V. In case test leads with integrated fuses are used to connect voltages to GIA unit the current rating of the fuse needs to be minimal 5A.

Note: In case of wrong wiring the accuracy of the test results might be affected strongly.





3.3 Battery Mode PQA8000H

In the battery mode of the PQA8000H it is recommended to connect the Ground (GND) input on the side of the PQA8000H instrument to the ground (e.g. GND of power supply socket or a well earthed frame ground):



This is important for accurate high-frequency signal analysis (>150 kHz).

If you use PQA8000 with OPT-DC an adapter cable can be ordered.

3.4 Specification

Specification	
Measurement Range	230 V / 400 V / (Option 690 V)
Safety Category	CAT IV 300V (Option 600V)
Frequency Range	up to 150 kHz (Option 450 kHz)
Nominal Frequency	50 Hz / 60 Hz / 16.7 Hz
Resolution	18 bit
Signal-to-Noise Ratio (SNR)	>100 dB
Measurement time	400ms per Excitation
Max. Current	5A rms
Wiring	L-N / L-L (Option: 3-Phase)
Battery	4 hours (powered by PQA8000H)
Export	CSV, RAW, JPG
Weight	2 kg
Dimensions (LxBxH)	265 x 255 x 125 mm

NOTE: Due to the dynamics of the electrical network, it is possible that not all excitations can be evaluated, e.g. if another load is switched on at the same time. The faulty excitations are detected by an intelligent algorithm and are not taken into account any further



Accuracy (preliminary specifications)

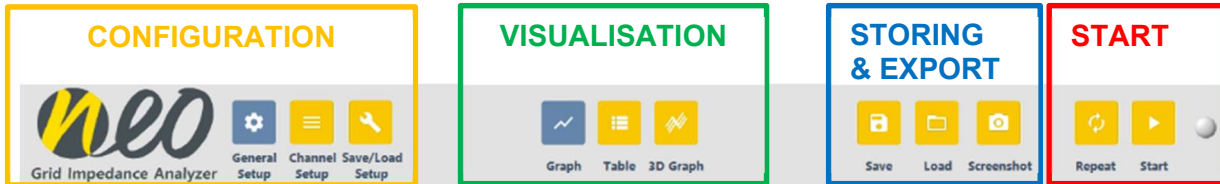
Frequency Range	Accuracy	Phase error
Up to 10 kHz	2%	2°
10 to 50 kHz	5%	5°
50 to 100 kHz	5%	10°
100 to 150 kHz	10%	>10°



4 Software

Overview

The following picture gives an overview of the configuration, visualization, storing and export functions.



4.1 Configuration

4.1.1 General Setup

Single Measurement

① **Number of Excitations:** This defines the number of measurements which should be considered for the measurement of the grid impedance. Multiple excitations are averaged to increase the accuracy of the measurement. Typically, 5 to 8 excitations are recommended.

NOTE: Due to the dynamics of the electrical network, it is possible that not all excitations can be evaluated, e.g. if another load is switched on at the same time. The faulty excitations are detected and not taken into account

② **Excitation Interval:** How much time passes between each excitation.

③ **Phase:** This option is unused in a single phase GIA measurement unit. In three phase measurement units the phases between which the Grid Impedance is measured can be chosen.

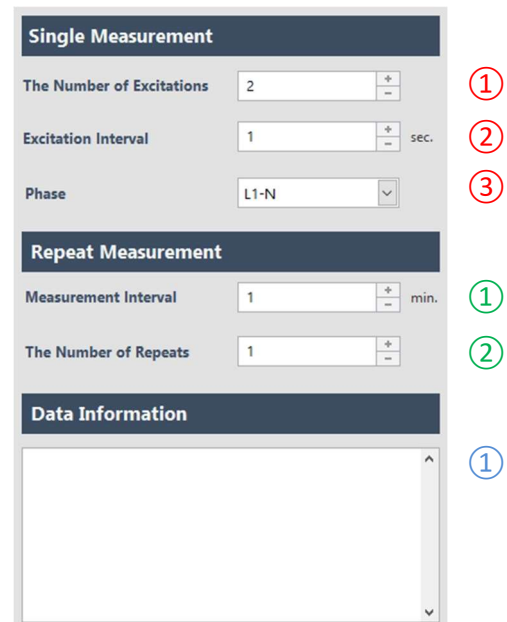
Repeat Measurement

① **Measurement Interval:** For a repeating measurement the time interval for the repeated measurements can be defined. E.g., Long-term measurement with measurement of the grid impedance each hour.

② **The Number of Repeats:** Number of repeats per measurement.

Data Information

① Quick overview about previous measurements loaded in this session.





4.1.2 Channel Setup

① Channel Selection:

- Voltage Measurement (Channel 0)
- Current Measurement (Channel 4)

② Range: The measuring range can be changed here

③ Scaling: The scaling factor can be changed here

Standard selection:

- Voltage Measurement
Range: 800 V (Channel 0)
- Current Measurement
(Channel 4)
Range: 1V
Scale Factor: 1x
Offset: 0

①

②

③

4.1.3 Save and Load Setup

Storing

① **Filename:** Enter your filename in this window

② **Date/Time:** By clicking on these switches the current date and/or time can be added to the filename

① **File Format:** Choose a fileformat (currently only csv available)

② **Storing Raw Data:** Switch between including and excluding raw data. Raw data storing takes longer and occupies more space, but can be used to recalculate the data, when sent to NEO Messtechnik.

③ **Storing Data:** Storing all measurements in a single big file or every measurement in it's own file.

Load

① **Loading Data**

② **File Format Order**

①

②

①

②

③

①

②



4.1.4 Plot Setup

① **Selection Spectrometer:** Choose here to which Spectrometer you want to add plots or from which you want to remove plots:

② **Upper Spectrometer**

③ **Lower Spectrometer**

① **Display Data:** The selected data will be added to the spectrometer if the Add button is pressed. Im and Re will be added in a future software version.

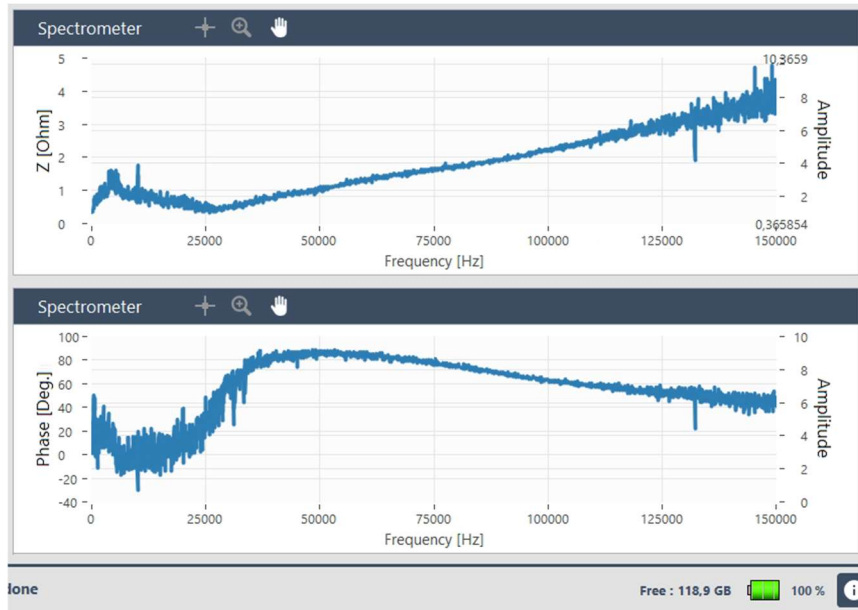
② **Measurement:** Select the measurement from which you want to add data to the spectrometer.

③ **Excitation:** Select the excitation you want to add to the spectrometer.



4.1.5 Exemplary result

Graph:



3D Graph:

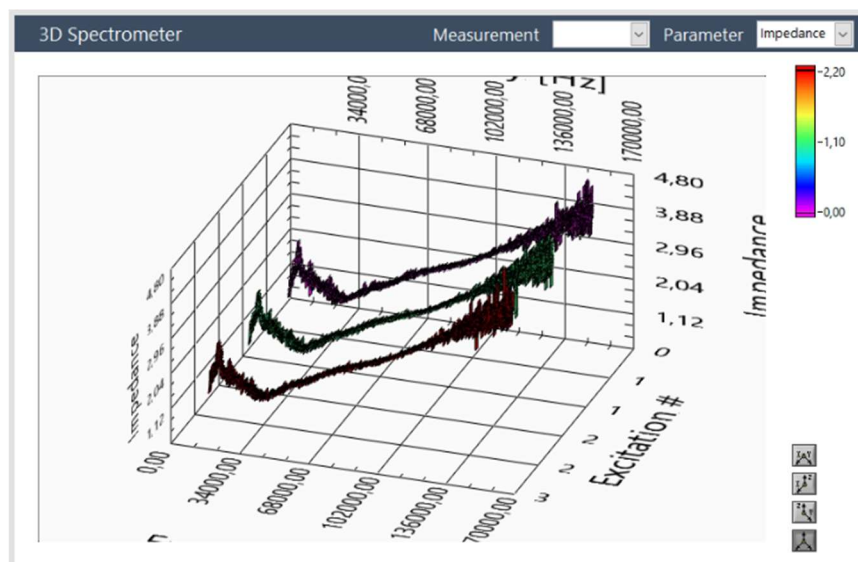


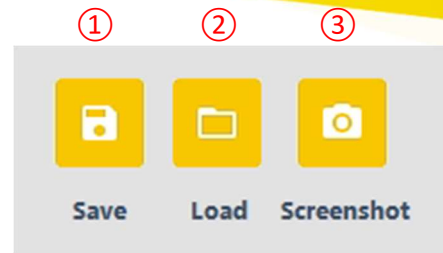
Table:

	Freq_1	Z_1	Phase_1	Freq_2	Z_2	Phase_2	Freq_3	Z_3
1	0	0.401424	0	0	0.377626	0	0	0.362238
2	50.0025	0.344112	14.861979	49.990002	0.353071	16.769006	50.005001	0.372534
3	100.005	0.300046	9.419504	99.980004	0.331209	8.813077	100.010001	0.326212
4	150.0075	0.339061	17.806343	149.970006	0.349398	18.70119	150.015002	0.348727
5	200.010001	0.349232	8.461684	199.960008	0.367002	19.271588	200.020002	0.359822
6	250.012501	0.378181	23.384622	249.95001	0.419624	24.557988	250.025003	0.417177
7	300.015001	0.424976	14.737757	299.940012	0.432414	14.156136	300.030003	0.413534
8	350.017501	0.446504	38.639195	349.930014	0.404767	43.621388	350.035004	0.451837
9	400.020001	0.515951	40.308074	399.920016	0.464929	47.186717	400.040004	0.461386
10	450.022501	0.481138	42.914795	449.910018	0.505481	47.62904	450.045005	0.504809
11	500.025001	0.465356	49.841592	499.90002	0.505554	44.343281	500.050005	0.491968
12	550.027501	0.593199	45.197471	549.890022	0.691299	37.373859	550.055006	0.632665
13	600.030002	0.744155	34.123379	599.880024	0.749692	30.38078	600.060006	0.694683
14	650.032502	0.639172	51.909101	649.870026	0.681418	46.104574	650.065007	0.686062
15	700.035002	0.751321	28.263404	699.860028	0.713521	26.081326	700.070007	0.925782
16	750.037502	0.676925	11.968926	749.85003	0.924332	16.331266	750.075008	0.836223
17	800.040002	0.780207	22.926986	799.840032	0.828835	22.803318	800.080008	0.75437
18	850.042502	0.717913	18.648906	849.830034	0.651173	24.689255	850.085009	0.771655
19	900.045002	0.701171	-4.884199	899.820036	0.886076	5.739988	900.090009	0.704399
20	950.047502	0.684449	31.533793	949.810038	0.704272	29.259128	950.09501	0.696075
21	1000.050003	0.670953	19.490339	999.80004	0.750092	9.532197	1000.10001	0.670361
22	1050.052503	0.743121	23.867061	1049.790042	0.739551	26.945395	1050.105011	0.874279
23	1100.055003	0.885346	25.929981	1099.780044	0.970198	8.269461	1100.110011	0.884434
24	1150.057503	0.70291	20.291709	1149.770046	0.746464	20.632	1150.115012	0.728367
25	1200.060003	0.694509	22.269692	1199.760048	0.816822	12.947026	1200.120012	0.815272



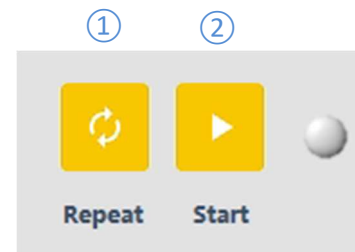
4.1.6 Save, Load, Screenshot

- ① **Save:** By clicking on save, the data is saved according to the parameters defined in the Save/Load Setup.
- ② **Load:** By clicking on load saved data can be loaded to be displayed, in the software.
- ③ **Screenshot:** Saves a screenshot of the current screen.



4.1.7 Start Measurement

- ① **Repeat:** Repeats the measurement in time intervals defined in “Measurement Interval” option in the General setup and saves each measurement at a chosen location.
- ② **Start:** Starts a one or more measurements according to number of excitations defined. Between each measurement



Please check the latest USER MANUAL on www.neo-messtechnik.com for detailed information and instructions for the software.

5 Scope of delivery

1x GIA Grid Impedance Analyser



1x ODU to ODU cable for Current Input and Power Supply



1x ODU to DSUB cable for Control via RS485



2x Safety Test leads CAT IV 600V





6 Maintenance and Care

Regular calibration

The Instrument must be calibrated at regular intervals as determined by the accuracy requirements of the application. For most applications a one-year cycle is appropriate. Accuracy specifications are only guaranteed if adjustments are made at regular calibration intervals. Accuracy specifications are not guaranteed unless a one-year calibration cycle is followed. Calibration cycles beyond 2 years are not recommended for any application.

Regardless of which calibration cycle you choose, it is always a good to perform a complete readjustment at each calibration cycle. This keeps the instrument within specification for the next calibration cycle and provides the best stability in the long run. Before your instrument is delivered, it is calibrated. Detailed calibration reports can be requested.

Service & Repair

The team of NEO Messtechnik performs any kinds of service and repairs to your system to assure a safe and proper operation in the future. Contact us for more information.

Repair and maintenance work has to be carried out by NEO Messtechnik or an authorised service partners using original spare parts only. NEO Messtechnik recommends having the system tested and maintained at a Megger service centre once a year. It is not necessary to open the housing of the device to commission and operate the system. Opening the housing causes the immediate termination of all warranty claims!

The connections and connection leads of the system must be regularly tested to ensure that they are free of defects and intact, in accordance with the applicable national and company-specific arrangements.

Storage

If the device is not used for a lengthy period, it should be stored in a dust-free and dry environment.

Display

Do not clean the display with aggressive products such as solvents or spirits. Instead, use lukewarm water and a soft, lint-free cloth for wet wiping, or a microfiber cloth for dry wiping

Training

We offer various training options (In-House, On-Site, Remote). Contact your local distributor or NEO Messtechnik directly.



Revision History

08.09.2022	Version 0.1	Initial Version of Manual
09.01.2023	Version 1.2	Updated Version
27.03.2023	Version 1.3	Updated Version / Visualizations / Wiring
25.05.2023	Version 1.5	Specifications / Multi-Plot
07.11.2023	Version 2.0.	Three-Phase Unit
15.01.2024	Version 2.1	Cleaning Instructions
18.03.2024	Version 2.2	Software
30.03.2024	Version 2.2	Safety Instructions Update, Wiring Update
30.03.2024	Version 2.3	Safety Instructions
10.04.2024	Version 2.4	Software
28.05.2024	Version 2.5	Updated Version
24.06.2024	Version 2.6	Updated Version
09.07.2024	Version 2.7	Battery Mode PQA8000H

Contact

When you are working with our products we want to provide you with the greatest possible benefits. If you need any support, we are here to assist you.

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