SENECA R203 ModBUS Network Analyzers Instruction Manual

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PRELIMINARY WARNINGS

The word WARNING preceded by the symbol indicates conditions or actions that put the user's safety at risk. The word ATTENTION preceded by the symbol indicates conditions or actions that might damage the instrument or the connected equipment
The warranty shall become null and void in the event of improper use or tampering with the module or devices supplied by the manufacturer as necessary for its correct operation, and if the instructions contained in this manual are not followed.

WARNING: The full content of this manual must be read before any operation. The module must only be used by qualified electricians. Specific documentation is available using the QR-CODE shown on page 1.

The module must be repaired and damaged parts replaced by the Manufacturer. The product is sensitive

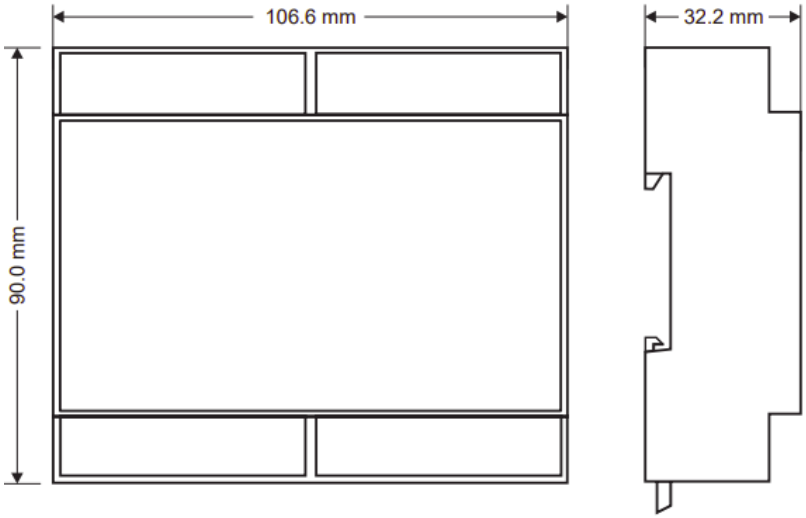
to electrostatic discharges. Take appropriate measures during any operation

 Electrical and electronic waste disposal (applicable in the European Union and otherountries with recycling). The symbol on the product or its packaging shows the product must rendered to a collection center authorized to recycle electrical and electronic waste

CONTACT INFORMATION

Technical support	supporto@seneca.it	Product information	commerciale@seneca.it

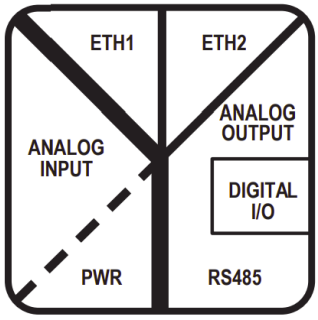
MODULE LAYOUT

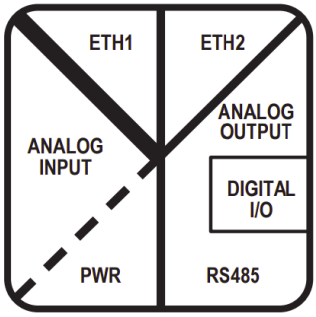


Weight: 170 g; Enclosure: UL94-V0 self-extinguishing PC/ABS material, black **SIGNALS VIA LED ON FRONT PANEL**

LED	STATUS	LED meaning
DO1	On	Output 01 activated
	Off	Output 01 deactivated
DO2	On	Output 02 activated
	Off	Output 02 deactivated
DI1	On	Input 01 activated
	Off	Input 01 deactivated
DI2	On	Input 02 activated
	Off	Input 02 deactivated
DATA LOGGER	ON	Data Logger function enabled
	Flashing	LOG sending error
	Off	Data Logger function disabled
STS (Only R-203-2)	On	Set IP address (powered module)
	Flashing	Waiting for the IP address from the DHCP (powered module)
STS(Only R-203-2-P)	Off	No IP address set
	On	IP address set
	Flashing	Active Profinet communication
WIRING ERROR	Flashing	Wiring error
	Off	Correct wiring
RX	On	RS485 connection anomaly
	Flashing	Reception of data packet completed on RS485
TX	Flashing	Transmission of data packet completed on RS485
ETH TRF (Yellow)	Flashing	Packet transit on Ethernet port
ETH LNK (Green)	Flashing	Ethernet port connected

TECHNICAL SPECIFICATIONS

<table>
<tr><td>CERTIFICATIONS</td><td colspan="3"></td></tr>
<tr><td>INSULATION</td><td> 

R203-2-H</td><td> 

R203-2-L</td><td>KEY
50 V
1500 Vac
3000 Vac*
3500 Vac*
Rated withstand voltage K</td></tr>
<tr><td>ENVIRONMENTAL CONDITIONS</td><td colspan="3">Temperature: – 25°C ÷ +65°C
Humidity: 30% ÷ 90% non condensing.
Storage temperature: -30°C÷ + 85°C
Degree of protection: IP20</td></tr>
<tr><td>ASSEMBLY</td><td colspan="3">DIN rail 35mm IEC EN60715, wall or panel with screws</td></tr>
<tr><td>CONNECTIONS</td><td colspan="3">Screw terminals 5 mm, 7.5 mm and 3.5 mm pitch (RS485), cable with section</td></tr>
<tr><td>POWER SUPPLY</td><td colspan="3">Voltage: 90 ÷ 264Vac @ 50 ÷ 60Hz, max absorption: 2.5W / 4VA (only R203-2-H)
Voltage: 10 ÷ 30Vdc, max absorption: 2.5W / 4VA (only R203-2-L)</td></tr>
<tr><td>COMMUNICATION PORTS</td><td colspan="3">RS485: Baud rate: 1200 ÷ 115200 baud (for further information see the user manual). Ethernet ports 2 (model R203-2); 1 (model R203-1)</td></tr>
<tr><td>VOLTAGE INPUT</td><td>Voltage</td><td colspan="2">Up to 600 Vac, frequency 45 ÷ 65Hz
Minimum voltage 5 V (F.S. 150 Vac); 20 V (F.S. 600 Vac)</td></tr>
<tr><td rowspan="2">ANALOGUE INPUT TA / TA (mV)</td><td>Current input</td><td colspan="2">Current input for TA: 1 ÷ 5A full scale.
Voltage input (mV) for TA with voltage or Rogowski output: up to 333 m</td></tr>
<tr><td>Base prec. (*)</td><td colspan="2">Network frequency: 50 ÷ 60 Hz. Voltmeter: 0.2% Ammeter: 0.2%, wattmeter: 0.5%</td></tr>
<tr><td colspan="4">(*) Accuracy is guaranteed in the ranges: CosΦ > 0.5; Vims: 40 ÷ 600 Vic; Arms: 5 – 100% Rogowski current (error due to external Rogowski sensors excluded). See the user manual for the error limits.</td></tr>
</table>

ANALOGUE OUTPUT	**Voltage: 0÷ 10Vdc,** minimum load resistance: 2kΩ **Current: 0 ÷ 20 mA**, max. load resistance: 500Ω **Transmission error**: 0.1% of maximum field **Response time**: 1 s (10% ÷ 90%) **Temperature drift**: 100 ppm/K
DIGITAL INPUT	For the technical specifications, see the electrical connection diagrams on page 5
DIGITAL OUTPUT	For the technical specifications, see the electrical connection diagrams on page 5
COUNTERS	Number of counters: 2 at 32 bit, maximum speed: 5 KHz
INSTALLATION CATEGORY	Category III (up to 600 V) in a direct connection (only R203-2-H) Category III (up to 300 V) in a direct connection (only R203-2-L)

CAUTION

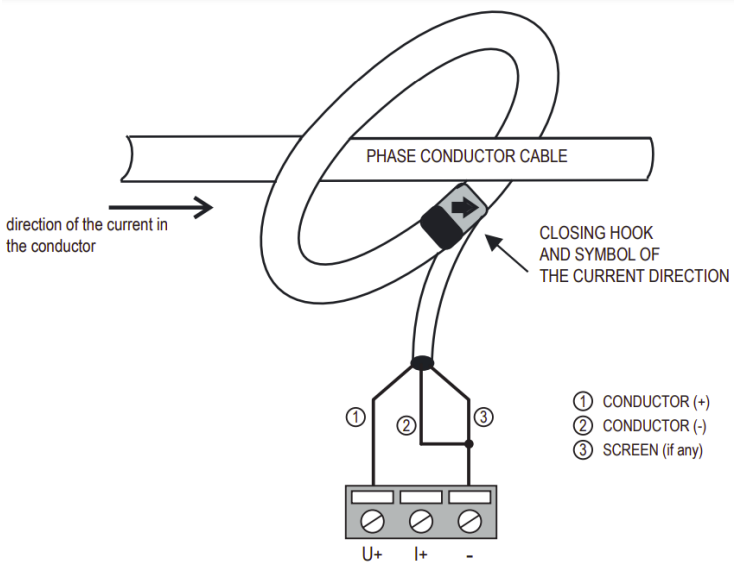
This is a Class A product. In a residential environment this equipment may cause radio interference. In this case, the user may have to take adequate countermeasures

ROGOWSKI SENSOR

The Rogowski sensor is a ring-shaped device designed for measuring AC, impulsive or complex waveforms. For its correct use

- wrap the ring on the conductor so that the arrow symbol on the ring points in theme direction as the current in the conductor
- make sure the connections are made correctly
- for a more precise measurement, the conductor wire must be placed in a centrosition with respect to the ring
- for a correct measurement, calibrate the Rogowski sensor by writing the calibration coefficient in the corresponding

.Modbus register (see the user manual).
Example: if the sensor is supplied with a characteristic of 90 mV / 1000 A, on the calibration registresponding to the phase in which the Rogowski sensor is applied, the value to be set is: 1000/ (90 · 10) = 1.11
NOTE ON ACCURACY: The product has a nominal accuracy of 0.5%. The total accuracy is the sum between the accuracy of the device and the accuracy of the Rogowski sensor connected to it.



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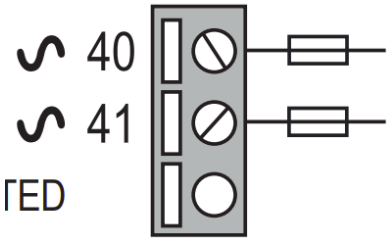
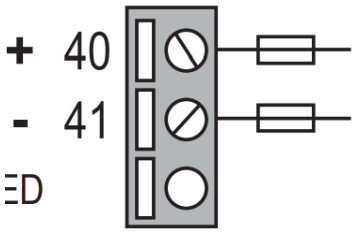
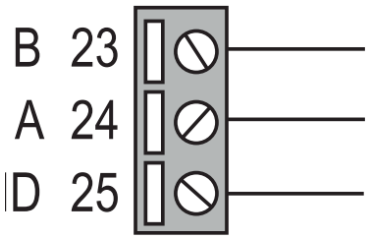
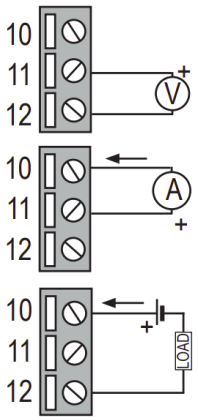
WARNING

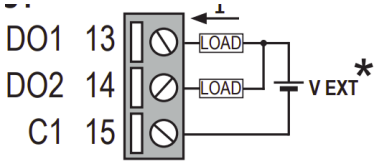
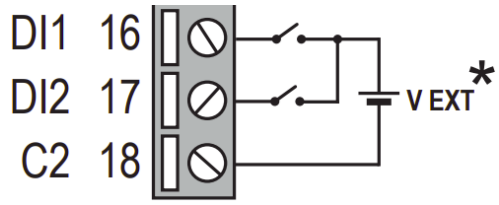
The DIP-switch settings are read only at boot time. At each change, perform a restart. For use and settings via DIP-SWITCH, see the user manual available on the website on the web page dedicated to the product.

Contents

ELECTRICAL CONNECTIONS

ELECTRICAL CONNECTIONS

SUPPLY R203-2-H4041  	The power supply is connected to terminals 40 and 41.Th e supply voltage must be:90 ÷ 264 Vac, 50 ÷ 60 HzIt is ad visable to insert a 1 A slow-blow fuse
SUPPLY R203-2- L+ 40**–** 41  	The power supply is connected to terminals 40 and 41.Th e supply voltage must be: 10 ÷ 30Vdc.It is advisable to in sert a 1 A slow-blow fuse
RS485  	There is no isolation between RS485 and analogue outpu t
 **ANALOGUE OUTPUT**10 **Voltage** +**plied** Current+ **Supply current external**	The device provides a voltage output (0 ÷ 10 Vdc) or prog rammable active or passive current (0 ÷ 20 mA). For the electrical connections, screened cables are recommende d. There is no isolation between RS485 and retransmitted output. It is necessary to program the outpu ts to use them correctly.

DIGITAL OUTPUT 	The device has two digital outputs. Capacity: Imax = 50 m A Vmax = 28V. See the user manual for the functions.*: R eversible polarity.
DIGITAL INPUTDI1 	The device is equipped with two digital inputs that can be activated with voltage from 12 to 24 V. See the user manu al for the functions.*: Reversible polarity.

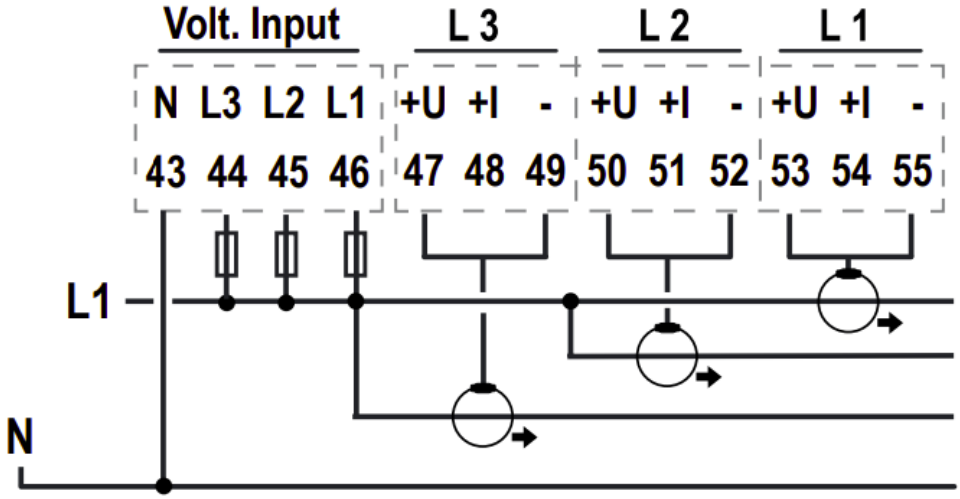
ELECTRICAL CONNECTIONS

CAUTION

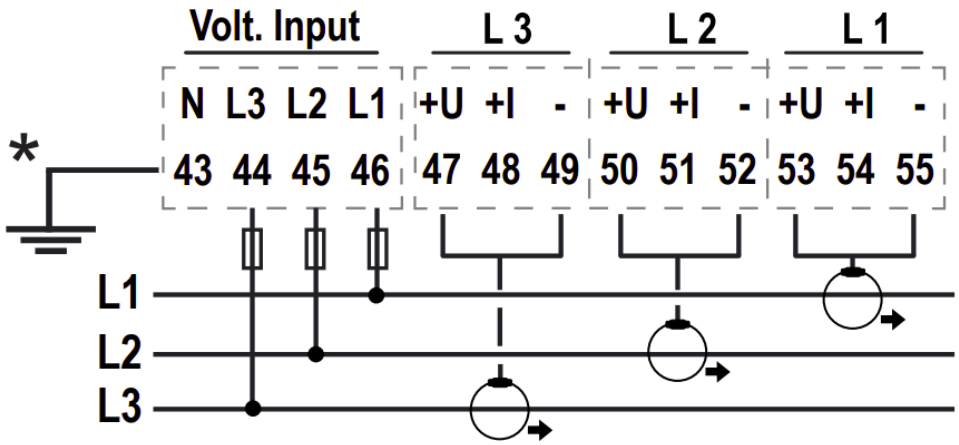
The installation of this appliance must only be carried out by qualified personnel
Check that the device plate data (measurement voltage, auxiliary power supply voltage, measurement current, frequency) match the actual data of the network to which the instrument is connected. In the wiring, strictly observe the insertion
diagram; inaccuracy in the connections inevitably causes false measurements or damage to the instrument.
Once the instrument is connected, complete the installation with the device configuration
The earth connection of the secondary of CTs with current, voltage or Rogowski output is possible on the negative terminal. In the case of Rogowski sensors, the screen must always be connected to the negative terminal.
Current measurement is only possible using current transformers
It is advisable to insert a slow-blow 1 A fuse as indicated in the diagrams below.

CONNECTIONS FOR ROGOWSKI SENSORS

SINGLE-PHASE (with load sharing)

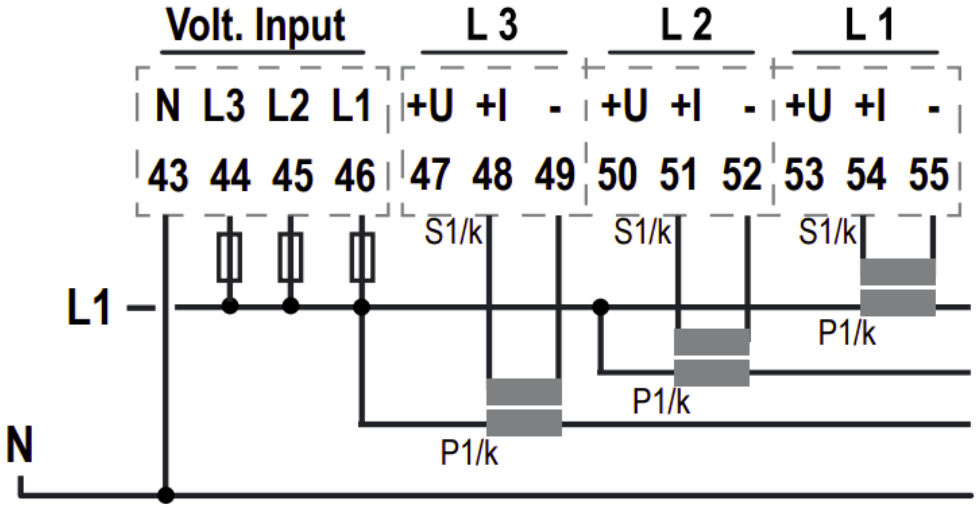


THREE-PHASE: 3 wires

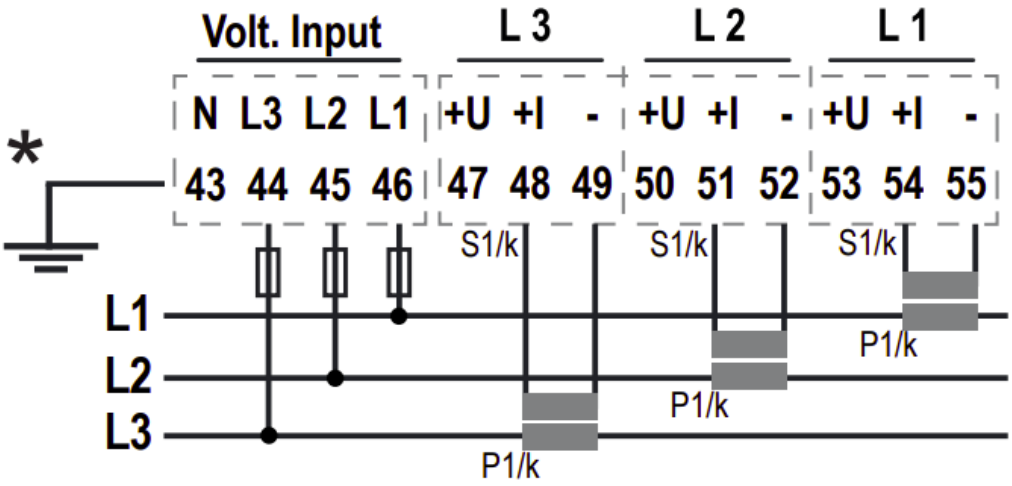


CONNECTIONS FOR CURRENT OUTPUT TA

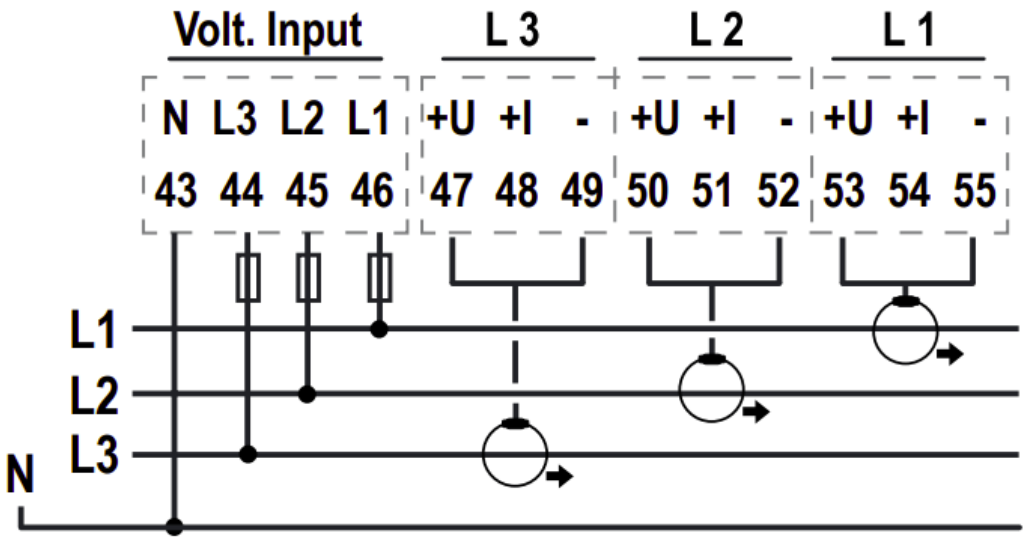
SINGLE-PHASE (with load sharing)



THREE-PHASE: 3 wires



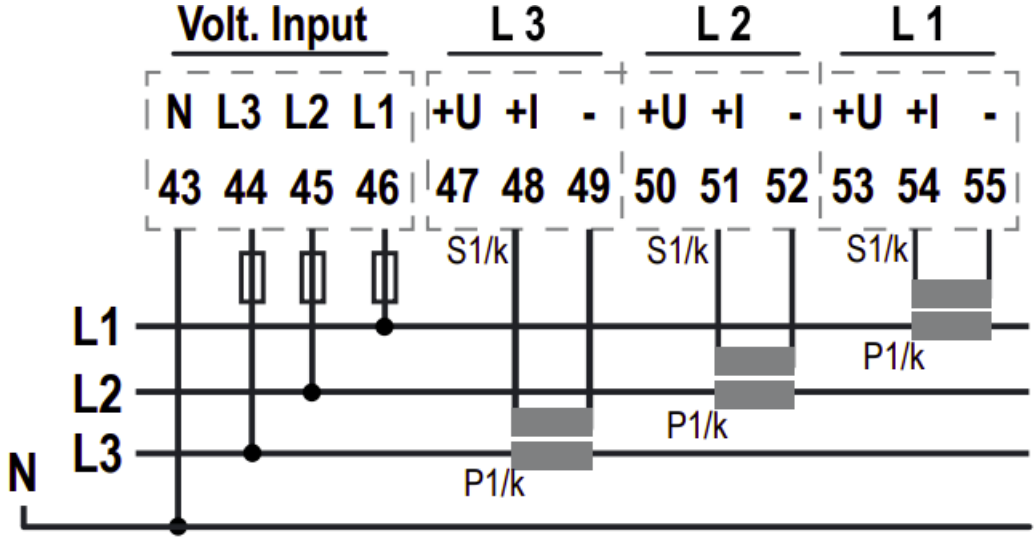
THREE-PHASE: 4 wires



CAUTION

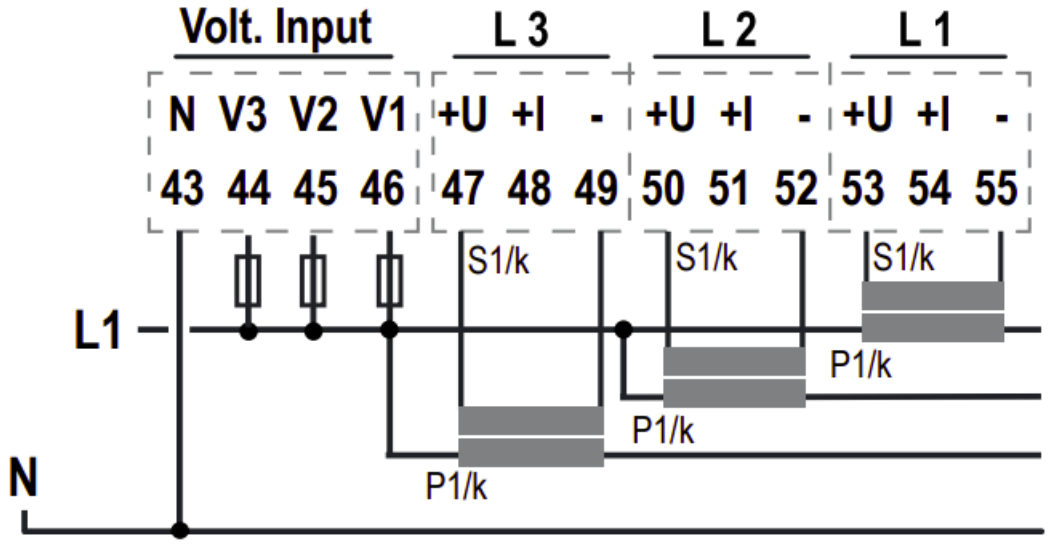
The inputs for the Rogowski sensors are of the **non-inverting type.**
For the electrical connections, refer to the Rogowski sensor manual.

THREE-PHASE: 4 wires

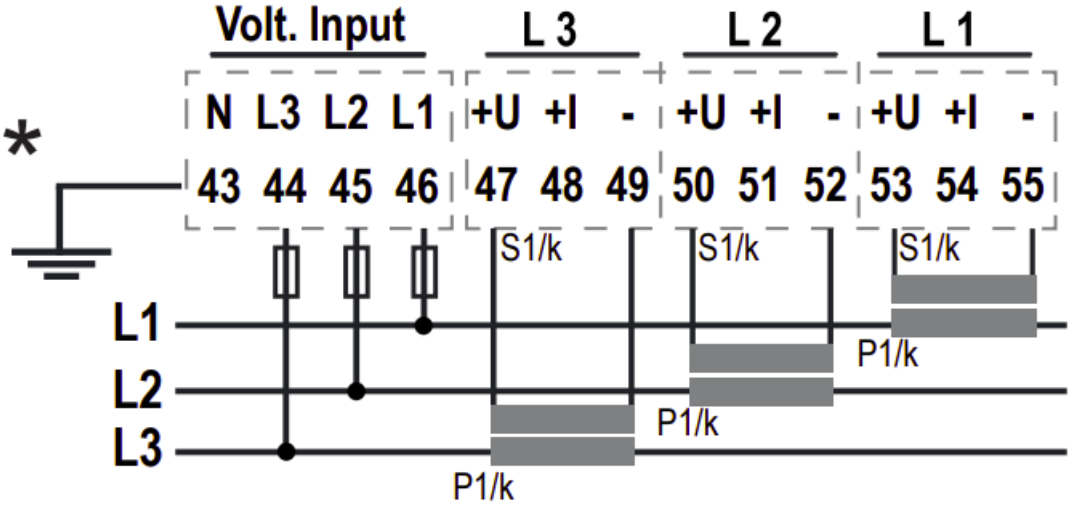


CONNECTIONS FOR VOLTAGE OUTPUT TA (mV)

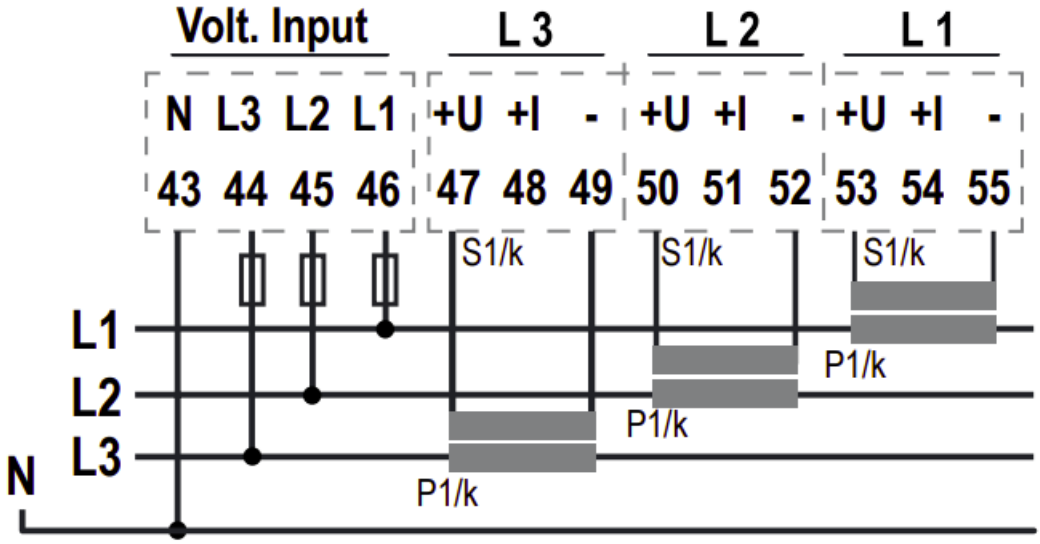
SINGLE-PHASE (with load sharing)



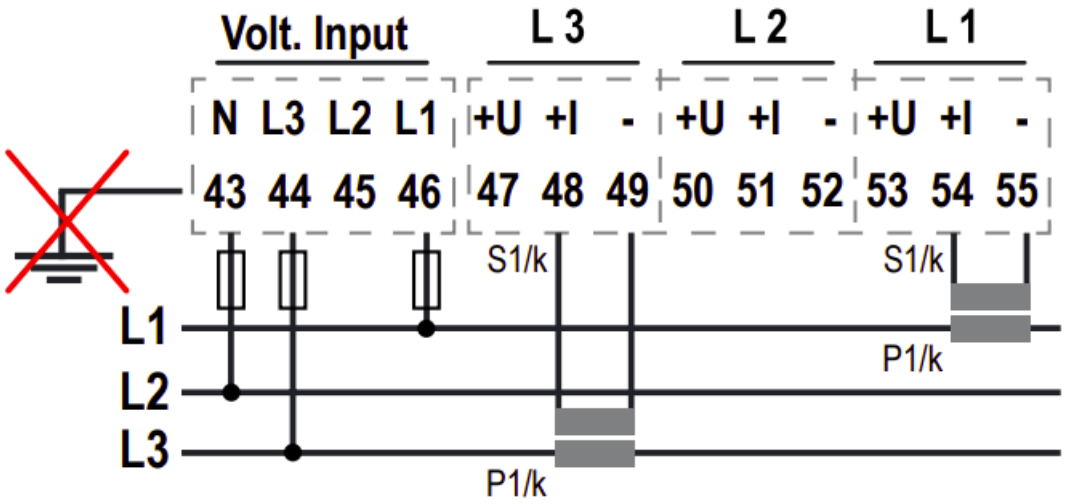
THREE-PHASE: 3 wires



THREE-PHASE: 4 wires



CONNECTIONS FOR ARON INSERTION



TV CONNECTIONS

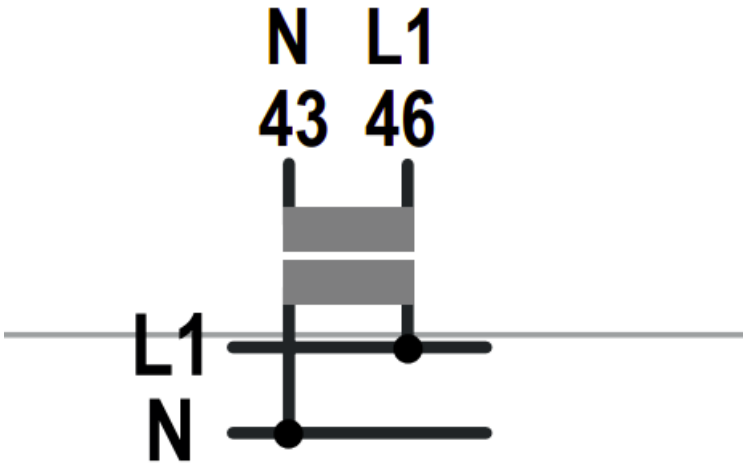
The Aron insertion link is usable from Firmware revision 1030 for model R203 and Firmware revision 1024 for model R203-P.

ATTENTION

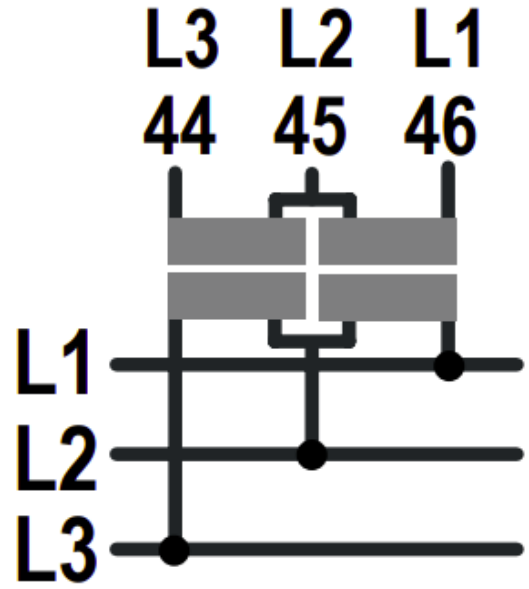
Grounding via terminal 43 is forbidden, otherwise the system to which the instrument is connected will be damaged.

TV CONNECTIONS

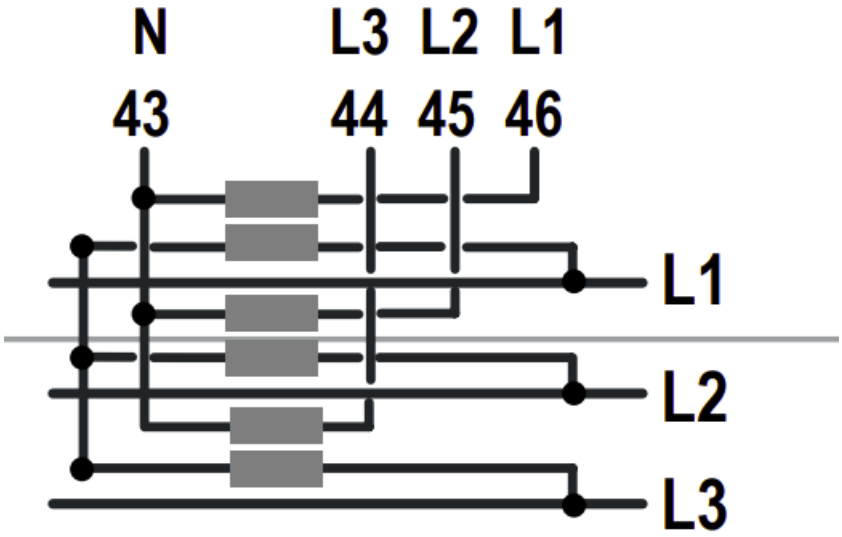
SINGLE-PHASE



THREE-PHASE: 3 wires



THREE-PHASE: 4 wires



FACTORY IP ADDRESS (ONLY R203-2-H AND R203-2-L)

The default module IP address is static: 192. 168. 90. 101

WEB SERVER (ONLY R203-2-H AND R203-2-L)

To access the Web Server with the factory IP address above, use the following credentials: Username: admin; Password: admin

CAUTION

DO NOT USE DEVICES WITH THE SAME IP ADDRESS IN THE SAME ETHERNET NETWORK.

ETHERNET CONNECTION RULES

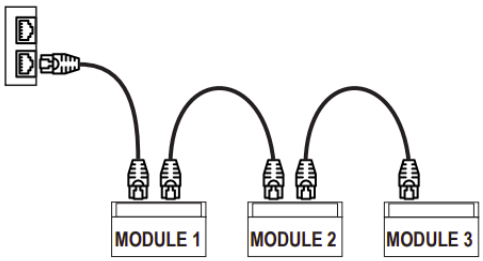
For the Ethernet cabling between the devices, the use of the shielded CAT5 or CAT5e cable is required.

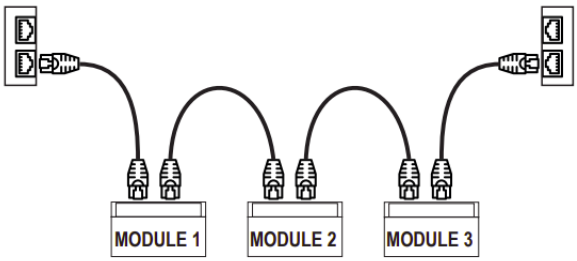
DAISY-CHAIN ETHERNET CONNECTION

CAUTION

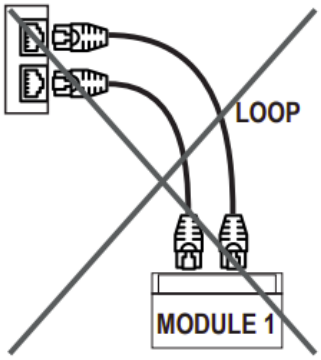
IT IS NOT ALLOWED TO CREATE LOOPS WITH ETHERNET CABLES

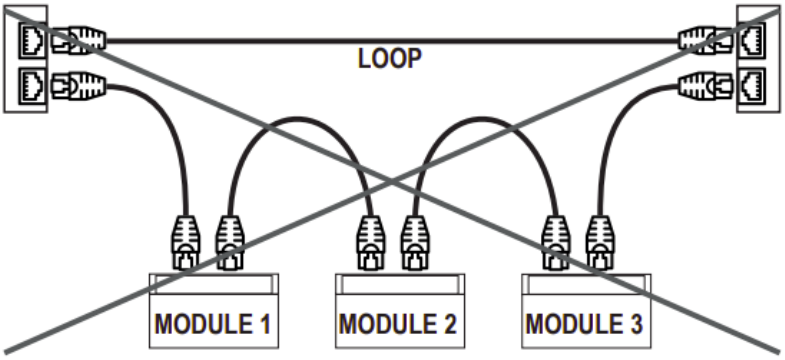
Using the daisy-chain connection it is not necessary to use switches to connect the devices. Hollowing examples show the correct connections





There must be no loops in the Ethernet cabling, otherwise the communication will not work. The modules and switches must be connected eliminating any loops. The following examples show the incorrect connections





The LAN fault-bypass function allows you to keep the connection between the two Ethernet ports of the device ON, in the event of a power failure. If a device turns off, the chain is not interrupted and the devices downstream of the switched-off one will still be accessible. This function has a limit duration: the connection remains active for a few days, typically 4. The fault-bypass function requires that the sum of the lengths of the two cables connected to the switched off module is less than 100m.

Documents / Resources

	SENECA R203 ModBUS Network Analyzers [pdf] Instruction Manual R203 ModBUS Network Analyzers, R203, ModBUS Network Analyzers, Network Analyzers, Analyzers

References

- User Manual