SENECA S203RC-D Advanced Three Phase Network Analyzer with Display Installation Guide

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SENECA S203RC-D Advanced Three-Phase Network Analyzer with Display

GENERAL SPECIFICATIONS

Model S203RC-D is a complete three-phase network analyzer, with display, that can be used only with Rogowski's coil: up to 600Vac voltage range, max current equal to 2000 A connected to the inputs. The instrument provides all the following electrical measurable quantities: and. All Vrms, Irms, Watt, VAR, VA, Frequency, and Cos Active Energy measurements given above (except frequency) are available in both single-phase and three-phase.

Measurements are read through serial communication both in floating point and normalized format (except Frequency and Active Energy). It is possible the analog retransmission of any Vrms, Irms, Watt, and Cos quantity either a single phase or three–phase, or any phase chosen (by specific display or MODBUS registry).

The module is also distinguished by

- Communication configurability through software.
- RS485 serial communication with MODBUS-RTU protocol, maximum 32 nodes.
- Easy-wiring of power supply and serial bus using the bus housed in the DIN rail.
- High precision: 0,5 %.
- Measure input insulation: 4000 Vac towards all the other circuits.
- Insulation between communication and power supply: 1500Vac.
- Insulation between retransmitted output and power supply: 1500Vac.
- Analog output signal settable in voltage or current.

Digital output for energy counter

- All kinds of insertion possible: single phase, Aron, four wires
- Possibility to compensate errors caused by frequency change in places where network
- frequency is not stable (frequency changes > 30 mHz).

TECHNICAL FEATURES

Communication port

RS485	Baud rate: 1200..115200 baud. Protocol: Modbus RTU
USB	Mini-USB, for programming (software Easy)

Input

Base Precision (1)	Network Frequency: 50 or 60 Hz.Voltmeter : 0,5 %. Amperometer : 0,5 %. Wattmeter : 0,5 %.
Voltage input	Up to 600 Vac, frequency 50 or 60 Hz
Rogowski sensor input	Max. 200 mVac RMS
Seneca Rogowski Sensor	

Digital output for energy counter

Type	Passive (it has to be powered on), no protection for short circuit
Range	50 mA / 28 V

Analog Output

Analog Output	
Voltage Output	0..10 Vdc, 0..5 Vdc, Min. load resistance: 2 kn.
Current Output	0..20 mA, 4..20 mA, Max load resistance: 500 n.
Transmission error	0,1 % (max range).
Response time	2 s (10%..90%)
Thermal stability	100 ppm / K
Other Specifications	
Voltage	11 ..40 VDC or 19 ..28 VAC @ 50 ..60 Hz
Consumption	Max 2,5 W
Installation	
Installation category	II (up to 300 V)
Environmental conditions	
Temperature	-20 ..+65°C
Humidity	30 ..90%
Storage temperature	-20 ..+85°C
International	IP20

Connections

Connections	Screw terminals, 5,08 / 7,5 pitch

Dimensions/case/display

Dimensions	105 x 89 x 60 mm
Case	Plastic UL 94 VO, grey color.
Display	Front LCD 2 lines x 16 characters alphanumeric (backlighted)

Isolations

Insulation voltage	4000 Vac between the input and all the other circuits. 1500 Vac between power supply and communication. 1500 Vac between power supply and analog output.

Standards

Reference standards

- EN61000-6-4 (electromagnetic emission, industrial environment).

- EN61000-6-2 (electromagnetic immunity, industrial environment).
- EN61010-1 (safety)

PIRATING LOGIC
The module measures the following electrical quantities: Vrms, Irms, Watt, VAR, VA, Frequency, Cos, and Active Energy, and provides the values in the corresponding MODBUS registers. In three-phase environments, the measurements given above correspond to any phase available, other than the three-phase value (except the frequency).

These measurements are rendered in both floating point and normalized format (except Frequency and Active energy) between 0..+10000 (-10000 ..+10000 for VAR e Cos). The active energy value is stored in memory and when the instrument is switched off, the last value before switching is kept in memory. The module output can transmit one of the following quantities: Vrms, Irms, Watt, cos as either a current or voltage value. If the instrument is set for three-phase measurements, it transmits automatically the three-phase value of the selected measurement. However, via the MODBUS register, the user can choose to transmit the measurement corresponding to any phase: A, B, or C.

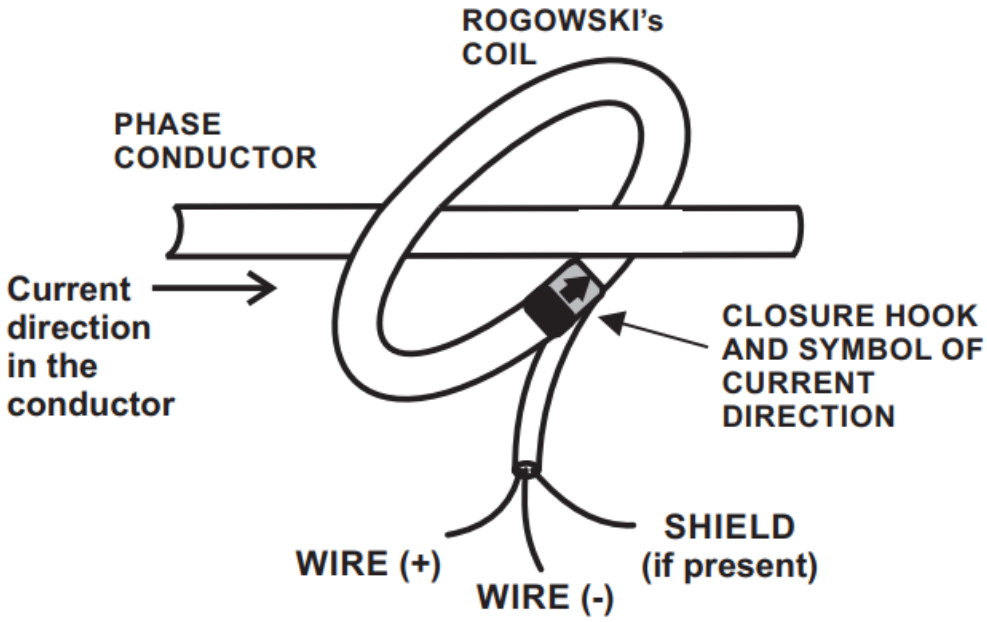
The user can set through MODBUS the values of the MIN MAX measurement to transmit corresponding to 0% and 100% of the analog output. For example, if the signal is transmitted as current 4..20 mA and the quantity to transmit is voltage Vrms in the 10..300 V range, (therefore), MIN=10, MAX=300 then if Vrms measured is 10V, the analog output will be 4mA, while if Vrms=300V output will be 20mA. In the intermediate points, the behavior is linear. The analog output values saturate at approximately 11 V for voltage output and at 22 mA for current output (analog output clamped at 110 %).

If network frequency oscillates more than 30 mHz from rated values (50 o 60 Hz), it’s possible to compensate for errors in measurements of Power and Energy caused by these variations. This option is selectable via the MODBUS register. Vrms and Irms measurements are not influenced by these variations. When the module is switched on, the appropriate setting coefficients are measured (depending on the choice of 50 or 60 Hz frequency). All the settings made will be automatically loaded when the module is reset.
NOTE: without a load connected to the S203RC-D, only the (displayed) voltage and frequency assume a corrected value

ROGOWSKI’S COIL
Rogowski’s coil has been designed for accurate non-intrusive measurement of AC, pulsed DC, or complex waveforms. To use appropriately,

- wrap the ring on the conductor so that the arrow symbol (stamped in the ring) is oriented in the same direction as the current in the conductor.
- For a more accurate measurement, place the cable conductor in a central position concerning the ring.
- For a correct measurement, calibrate the Rogowski’s coil: write the calibration coefficient to the corresponding Modbus register (refer to the user manual) or set it using the menu on the display (see display programming manual).

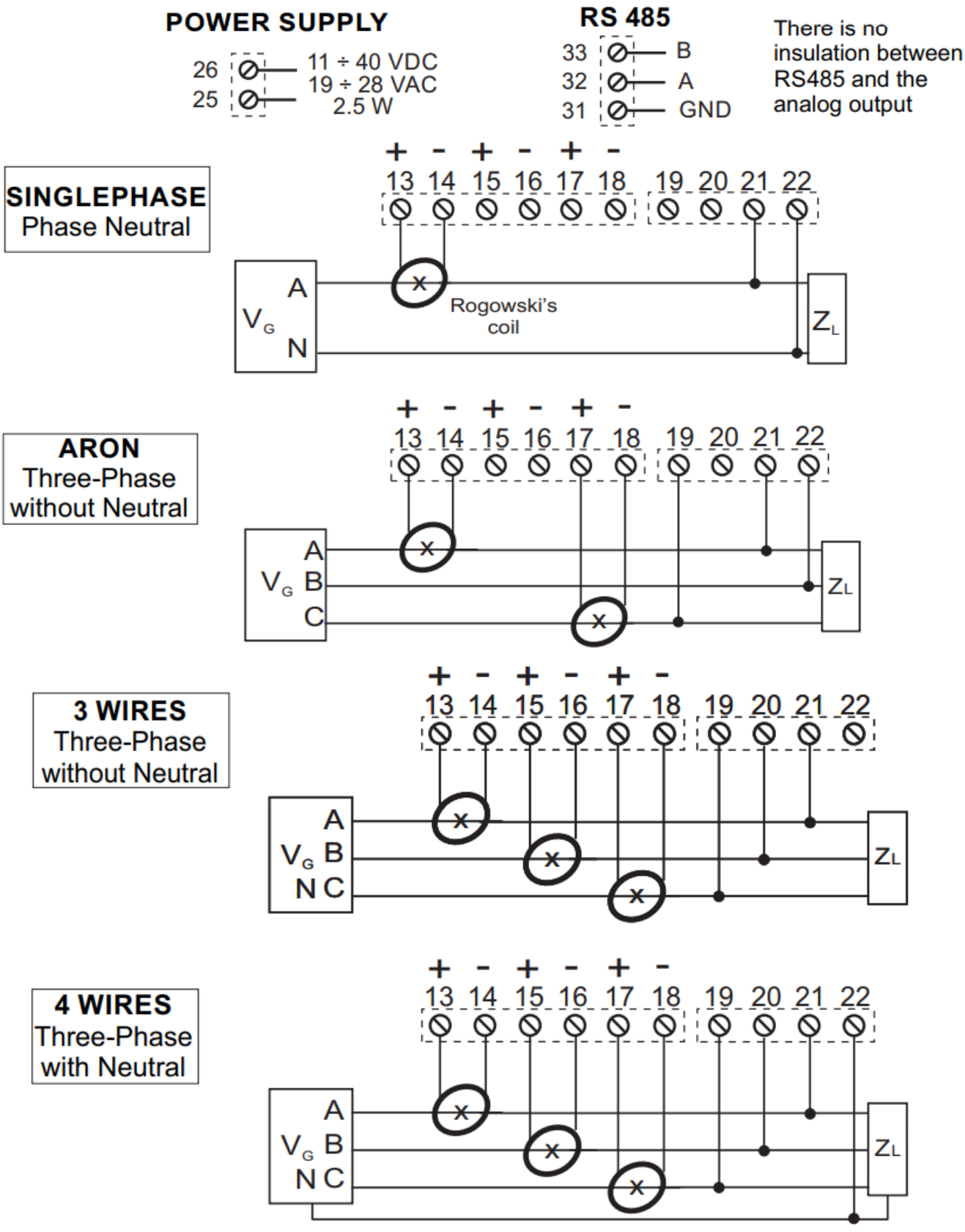
Example: if the Rogowski’s coil feature is 90 mV / 1000 A, set the literature register (corresponding to the phase where the Rogowski’s coil is applied) with the value: 1000 / (90 · 10).
NOTE ABOUT ACCURACY: For example, the total accuracy of the S203RC-D the system coupled to a Rogowski Seneca RC150 ring will have a total measurement error of 2% of the measurement: the scale formed by the basic error of the Rogowski transducer (1%) plus the basic error of the S203RC-D meter (0,5%) plus the impedance coupling error (5%).
WARNING: The instrument is without inverting input, for cable polarity refer to the Rogowski sensor manual.



Retransmission range

Electrical Quantity	Measurement Range
V rms	0..600 Vac
I rms	0..2000 A
Active Power	(0..1000 * 600)W
Reactive Power	(0..1000 * 600)VAR
Apparent Power	(0..1000 * 600)VA
Cos	0..1
Frequency	40..70 Hz

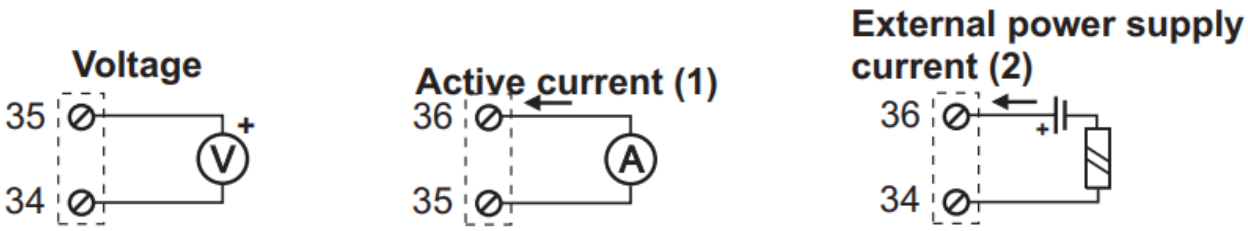
ELECTRIC CONNECTIONS



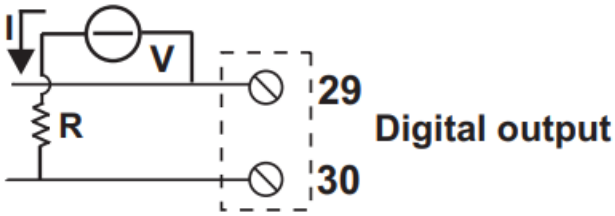
Note: Connect the shield of the Rogowski's coil at negative (-), so one of the terminals 14, 16, 18, 22. Terminals 14, 16 18, and 22 are internally connected.

ANALOG OUTPUT

The module provides a programmable, analog output in voltage (0..10 Vdc) or active and passive current (0..20 mA). We recommend using shielded cables for the electric connections. There is no insulation between RS485 and the analog output.



DIGITAL OUTPUT
The module has a digital output: each pulse corresponds to a given number of increments about the energy counter. Imax=V/R=50 mA, Vmax=28V. For more information, see the display settings manual.



LEDs signallings

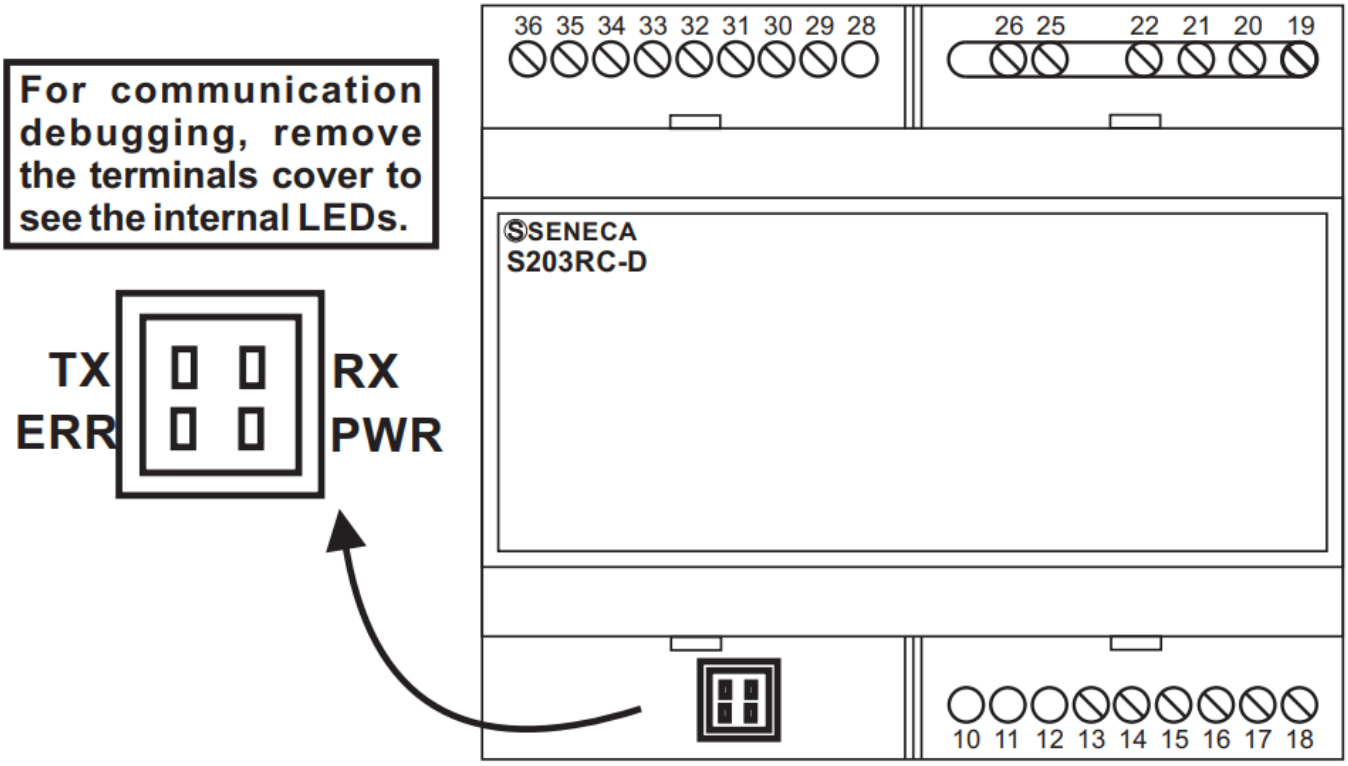
LED	STATUS	LEDs signallings
PWR	ON (GREEN)	The module is powered on
ERR	ON	At least one of the active phases' voltage
	(YELLOW)	is less than 40 Vac
TX	Blinking	Data are being transmitted through the
	(RED)	RS485 comm. port
RX	Blinking	Data are being received through the
	(RED)	RS485 comm. port

SERIAL INTERFACE

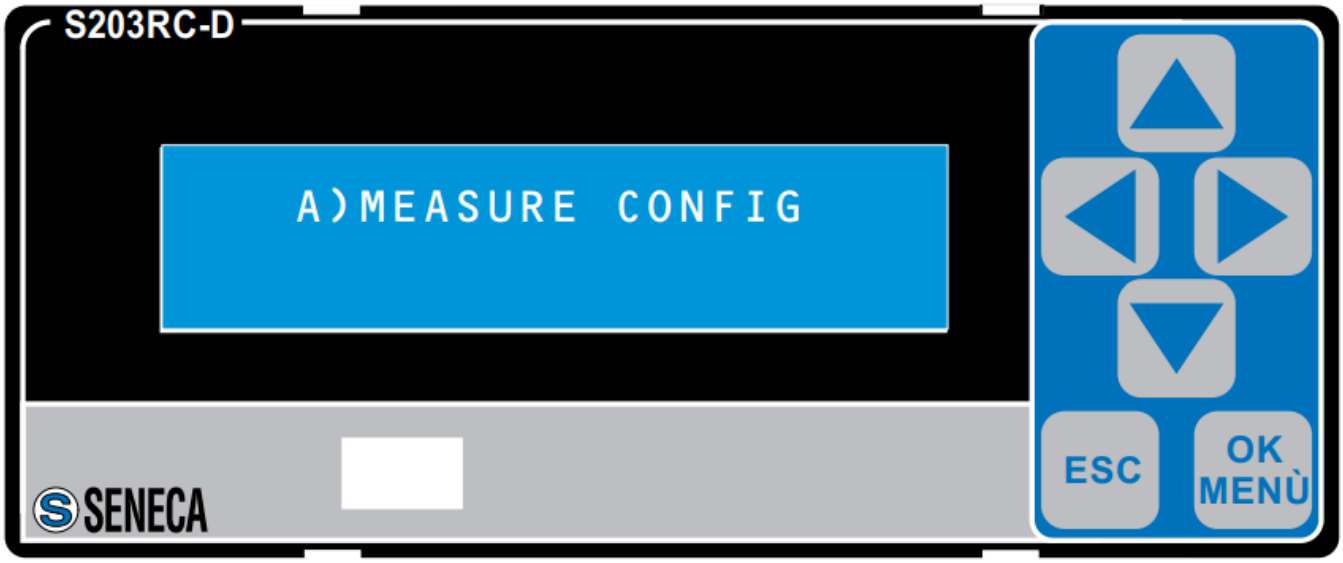
For detailed information on the RS485 serial interface, consult the documentation provided by the website **www.seneca.it**, in the section.

One tramite LED Programming.
The communication parameters have the following default values:: baudrate=38400, no parity, bit number=8, and bit stop=1. These values can be modified by display or Modbus protocol. To program the device, download the free software Easy Setup from the website **www.seneca.it**.

CASE AND SCREW TERMINAL NUMBERS



FRONT PANEL



DISPLAY PROGRAMMING

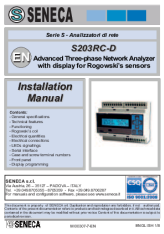
For detailed information on display programming, consult the documentation provided by the website [www.seneca.it.](http://www.seneca.it)

Disposal of Electrical & Electronic Equipment (Applicable throughout the European Union and other European countries with separate collections programs). This symbol, found on your product or its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical & electronic equipment.

By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. For more detailed information about the recycling of the product, please contact your local city office or, the waste disposal service of the retail store where you

purchased this product.

Documents / Resources

	SENECA S203RC-D Advanced Three Phase Network Analyzer with Display [pdf] Installation Guide S203RC-D, S203RC-D Advanced Three Phase Network Analyzer with Display, Advanced Three Phase Network Analyzer with Display, Three Phase Network Analyzer with Display, Network Analyzer with Display, Analyzer with Display, Display

References

- SENECA | Automation Interfaces | Official Website
- User Manual