

R203

THREE-PHASE POWER METER WITH DUAL ETHERNET INTERFACE AND UNIVERSAL INPUT

Highlights

- **Universal input TA with A/mV output, TV, Rogowski sensors**
- **Measurement input full scale: 600 Vac (voltage), 5A (CT), 333 mV (CT or Rogowski)**
- **Output: mA/V**
- **Accuracy: 0.2% for Voltage/ Current; 0.5% for Power**
- **Operating Temperature: -25..+55°C**
- **Communication Ports: RS485, Micro USB, Dual Ethernet ports switch**
- **Ethernet Daisy Chain connection**
- **Configuration via web server**

R203 three-phase power meter accepts current measurement inputs for CTs with current/voltage output, TVs and Rogowski sensors (with Rogowski sensors (with voltage output up to 333 mV), with single-phase, three-phase, 3/4 wire 3/4 wires and with support of ModBUS RTU, ModBUS TCP-IP protocols, Peer-To-Peer.
Like most of the “space-saving” products of the R series, R203 has 2 Ethernet ports that can also be used for daisy chain connections with automatic bypass protection. with automatic bypass protection. The analyzer provides an output signal in voltage (0..10Vdc), current (0/4..20mA). R203 offers also the measurement and recording of harmonics in voltage / current up to 55th order with THD (total harmonic distortion) calculation. distortion). The instrument includes also a web server for reading and configuring the main parameters and it operates as a datalogger. configuration of the main parameters and works as a datalogger to acquire, download and export data and acquire, download and export data and events.

100% Made & Designed in Italy

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R203 THREE-PHASE POWER METER WITH DUAL ETHERNET INTERFACE AND UNIVERSAL INPUT

UNIVERSAL ANALOG INPUTS

R203 is a three-phase network analyzer able to accept as input universal signals with settable scales up to 600 Vac (voltage), 5A (CT with current output), 333 mV (CT with voltage output or Rogowski sensors).

HARMONICS

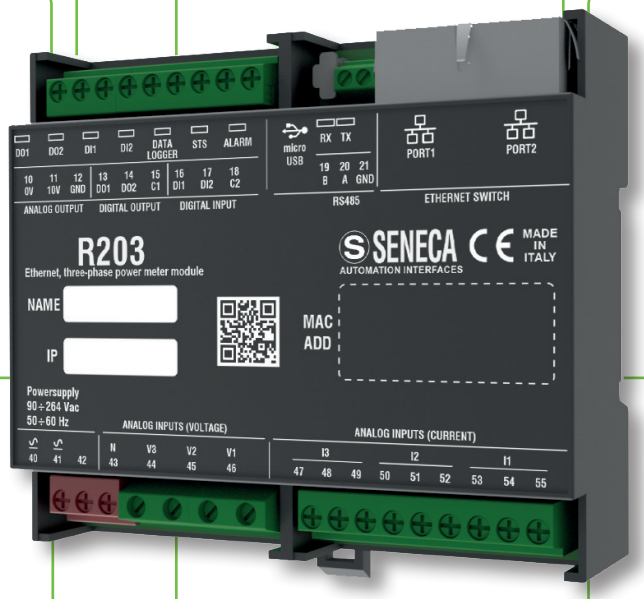
R203 offers measurement and recording of voltage and current harmonics up to 55th order with THD (total harmonic distortion) calculation.

ACCURACY

The instrument provides an accuracy of 0.2% for CT/ voltage current measurements and 0.5% for active/reactive and Rogowski currents.

PROGRAMMING

From embedded Web Server (or EASY SETUP software) it is possible to make basic and advanced settings; diagnostics; I/O configuration, measurements, communication, data and ModBUS registers.



FORM FACTOR

With only 32 mm depth installers can realize applications with restricted mounting conditions. Thanks to the space-saving design of the R series can also be used in home and building applications.

MEASUREMENT

R203 returns singlephase and three-phase values of the main electrical quantities: voltage, current, power and active, reactive, apparent, frequency, period, power factor, harmonics up to 55th and THD. The configurable analog output allows to use the analyzer also as a measurement converter.

ENERGY COUNTER

R203 is equipped with impulsive digital output and retention memory for active, reactive and apparent energy metering.

DATALOGGER

R203 operates as a data logger (up to 30 variables per tag and about 55,296 samples storable in the internal flash) and event datalogger with recording of up to 32,768 samples with relative time tag.

DUAL ETHERNET / DAISY CHAIN

Thanks to the 2 Ethernet switch ports, a daisy chain connection to the next Ethernet device is possible, avoiding expensive industrial switches and simplifying cabling.

SPECIAL FUNCTIONS

R203 enables the operation of an internal switch even if the device is faulty or not powered for up to 4 days (LAN function with bypass in case of failure). It is also possible to copy inputs to remote outputs without the aid of a master device (peer-to-peer function). Another advanced function is the “ModBUS Passthrough”, thanks to which the module can divert on RS485 the requests coming from Modbus TCP-IP behaving as a gateway.

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MEASUREMENT PARAMETERS

INSTANT VALUES	
Voltage	VL1-L2, VL2-L3, VL3-L1, VL1-N, VL2-N, VL3-N
Current (+/-)	IL1, IL2, IL3, IN
Active Power (+/-)	P1, P2, P3, Ptot
Reactive Power (+/-)	Q1, Q2, Q3 e Qtot
Apparent Power (+/-)	S1, S2, S3 e Stot
Power Factor (inductive and capacitive)	PF1, PF2, PF3 e PFtot
Frequency	F1, F2, F3
Period	PER1, PER2, PER3
Voltage-Current Phase Shift [°]	Delta VIL1, VIL2, VIL3
Line Voltage Phase Shift [°]	Delta VL1-L2, VL2-L3, VL3-L1
Total Harmonic Distortion of Voltage (THD)	THD % VL1-N, VL2-N, VL3-N
Total Harmonic Distortion of Current (THD)	THD % IL1, IL2, IL3
AVERAGE VALUES IN DEMAND TIME	
Average Voltage	VL1-N, VL2-N, VL3-N, VL1-N MIN, VL1-N MAX, VL2-N MIN, VL2-N MAX, VL3-N MIN, VL3-N MAX
Average Current (+/-)	IL1, IL2, IL3, IL1 MIN, IL1 MAX, IL2 MIN, IL2 MAX, IL3 MIN, IL3 MAX
Average Active Power (+/-)	P1, P2, P3, P1 MIN, P1 MAX, P2 MIN, P2 MAX, P3 MIN, P3 MAX, Ptot
Average Reactive Power (+/-)	Q1, Q2, Q3, Q1 MIN, Q1 MAX, Q2 MIN, Q2 MAX, Q3 MIN, Q3 MAX, Qtot
Average Apparent Power (+/-)	S1, S2, S3, S1 MIN, S1 MAX, S2 MIN, S2 MAX, S3 MIN, S3 MAX, Stot
Average Power Factor (inductive and capacitive)	PF1, PF2, PF3, PF1 MINIMO, PF1 MASSIMO, PF2 MINIMO, PF2 MASSIMO, PF3 MINIMO, PF3 MASSIMO, PFtot
ABSOLUTE / MAXIMUM / MINIMUM VALUES	
Voltage	VL1-N MIN, VL1-N MAX, VL2-N MIN, VL2-N MAX, VL3-N MIN, VL3-N MAX
Current (+/-)	IL1 MIN, IL1 MAX, IL2 MIN, IL2 MAX, IL3 MIN, IL3 MAX
Active Power (+/-)	P1 MIN, P1 MAX, P2 MIN, P2 MAX, P3 MIN, P3 MAX, Ptot
Reactive Power (+/-)	Q1 MIN, Q1 MAX, Q2 MIN, Q2 MAX, Q3 MIN, Q3 MAX, Qtot
Apparent Power (+/-)	S1 MIN, S1 MAX, S2 MIN, S2 MAX, S3 MIN, S3 MAX, Stot
Power Factor (inductive and capacitive)	PF1 MIN, PF1 MAX, PF2 MIN, PF2 MAX, PF3 MINIMO, PF3 MAX, PFtot
COUNTERS	
ACTIVE ENERGY [Wh]	IMPORTED ACTIVE ENERGY L1 (+) Q1/Q4
	IMPORTED ACTIVE ENERGY L2 (+) Q1/Q4
	IMPORTED ACTIVE ENERGY L3 (+) Q1/Q4
	EXPORTED ACTIVE ENERGY L1 (-) Q2/Q3
	EXPORTED ACTIVE ENERGY L2 (-) Q2/Q3
	EXPORTED ACTIVE ENERGY L3 (-) Q2/Q3
	IMPORTED ACTIVE ENERGY TOT (+) Q1/Q4
	EXPORTED ACTIVE ENERGY TOT (-) Q2/Q3
	TOTAL ACTIVE ENERGY BALANCE (+-)
REACTIVE ENERGY [VARh]	IMPORTED IDLE ENERGY L1 (+) Q1/Q2
	IMPORTED REACTIVE ENERGY L2 (+) Q1/Q2
	IMPORTED REACTIVE ENERGY L3 (+) Q1/Q2
	EXPORTED REACTIVE ENERGY L1 (-) Q3/Q4
	EXPORTED REACTIVE ENERGY L2 (-) Q3/Q4
	EXPORTED REACTIVE ENERGY L3 (-) Q3/Q4
	IMPORTED REACTIVE ENERGY L1 (+) Q1
	IMPORTED REACTIVE ENERGY L2 (+) Q1
	IMPORTED REACTIVE ENERGY L3 (+) Q1
	IMPORTED REACTIVE ENERGY L1 (-) Q2
	IMPORTED REACTIVE ENERGY L2 (-) Q2
	IMPORTED REACTIVE ENERGY L3 (-) Q2
	IMPORTED REACTIVE ENERGY L1 (+) Q3
	IMPORTED REACTIVE ENERGY L2 (+) Q3
	IMPORTED REACTIVE ENERGY L3 (+) Q3
	IMPORTED REACTIVE ENERGY L1 (-) Q4
	IMPORTED REACTIVE ENERGY L2 (-) Q4
	IMPORTED REACTIVE ENERGY L3 (-) Q4
	IMPORTED REACTIVE ENERGY TOT (+) Q1/Q2
	EXPORTED REACTIVE ENERGY TOT (-) Q3/Q4
	TOTAL REACTIVE ENERGY BALANCE (+-)
APPARENT ENERGY [VAh]	TOTAL APPARENT ENERGY BALANCE (+-)
HARMONIC ANALYSIS	
Voltage harmonics from fundamental to 55th [V].	VL1-N, VL2-N, VL3-N
Current harmonics from fundamental to 55th [A].	IL1, IL2, IL3
Voltage harmonics from 2nd to 55th [% with respect to fundamental]	VL1-N, VL2-N, VL3-N
Current harmonics from 2nd to 55th [% with respect to fundamental]	IL1, IL2, IL3

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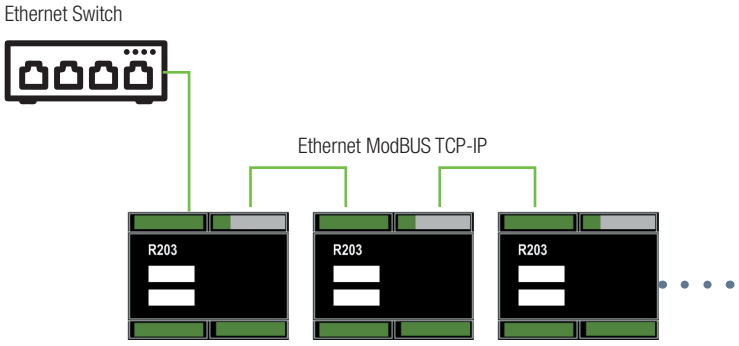


Three-phase power meter with inputs for CT, TV, Rogowski, Dual Ethernet connection, harmonic measurement

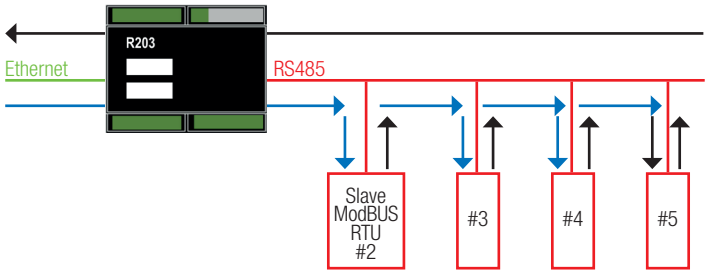
DATI TECNICI

GENERAL DATA	
Power supply	90-264 Vac (50-60 Hz)
Power consumption	Max 2.8 W, 5.4 VA
Isolation	4 kVac (from/to power circuits) 1,500 Vac (other circuits)
Status Indicators	Power supply, DI/DO, RS485 communication, Data logger, status, wiring error, Ethernet port
Installation category	600 V CAT III
Type of insertion / Connection mode	Single-phase, 3-phase 3-wire, 3-phase 4-wire, CT, CT with mV output, Rogowski transducers
Frontal protection degree	IP20
Accuracy	0.2% (CT Current/Voltage); 0.5% (Active/Reactive Power, Rogowski Current)
Mounting	35mm DIN Rail IEC EN60715, Wall or Panel Mount via Screws
Connections	Screw terminals
Operating temperature	-25..+55 °C
Storage temperature	-30..+ 85°C
Humidity	30% ÷ 90% non condensing
Dimension	90 x 107 x 32 mm
Weight	170 g
Case	PC/ABS self-extinguishing UL94-V0, black color
MEASUREMENT AND CALCULATION TIMES	
Sampling times	8.000 sps (for voltage/current channels)
RMS values settling time	580..700 ms
Harmonic attack time	30s
PROGRAMMING	
Web Server	Connection diagnostics, device configuration, alarm and I/O configuration, datalogger, USB connection, special functions (ModBUS Pass Through), firmware upgrade
DATALOGGER	
Data logger	Max 30 variables per tag and about 55.296 samples storable in the internal flash; sample time between 1s and 24h
Events Datalogger	Recording of up to 32,768 samples with relative time tag, threshold, time window, date/time
COMMUNICATION	
SERIAL	
Interfaces	Nr.1 RS485 port
Protocol	ModBUS RTU Slave
Distance	Up to 1,200 m
Speed	1,200..115,200 baud
Connectivity	Max 128 Seneca device nodes
ETHERNET	
Ports	Nr.2 100 Mbps Ethernet port
Connections	Daisy Chain
Protocols	ModBUS TCP-IP, Seneca P2P I/O Mirror with broadcast (UDP based)
USB	
Ports	Nr.1 Micro USB programming port
BUILT-IN I/O	
Channels	2DI, 2DO, 1 AO
Digital Inputs	Nr.2 digital inputs activated with voltage from 12 to 24V
Digital Outputs	Nr.2 digital outputs, capacity Imax = 50 mA Vmax = 28V
Analog Output	VOLTAGE 0..10 Vdc, min load resistance 2kΩ CURRENT 0..20, 4..20 mA, max load resistance 500Ω Transmission error: 0.1 % of maximum range Thermal drift: 100 ppm/K
VOLTAGE/CURRENT INPUTS	
Measurement Inputs	VOLTAGE up to 600 Vac, freq. 45 ÷ 65 Hz CURRENT: CT 1 ÷ 5 A full scale; voltage (mV) for CT with voltage output or Rogowski: up to 333 mV f.s.
Rogowski Analog Inputs	VOLTAGE: up to 600 Vac, frequency 45..65 Hz ROGOWSKI (supplied by SENECA): 100 ↔ 1000 A @ 50 Hz (sinusoidal); 120 mV ↔ to 1000 A @ 60 Hz (sinusoidal); Max measurable current: 3 kA @ 50 Hz; 2.5 kA @ 60 Hz
STANDARDS	
Approvals	CE
Norms	EN 61000-6-4, EN 61000-6-2, EN 60950

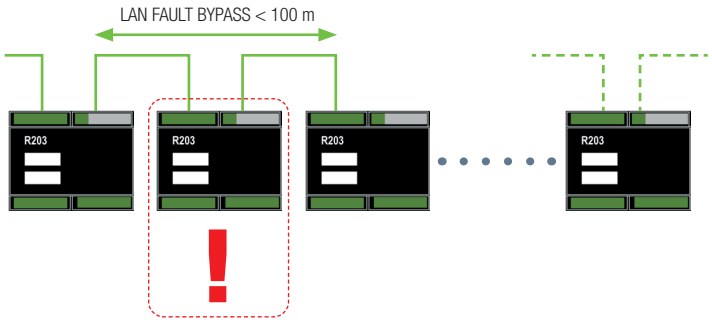
DAISY CHAIN CONNECTION



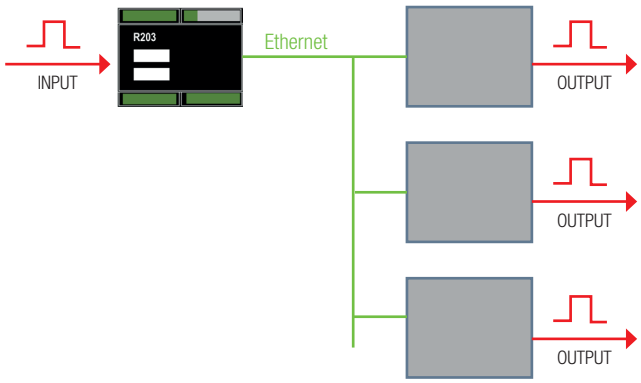
MODBUS PASS THROUGH



FAULT-BY-PASS CONNECTION



I/O COPY WITH PEER-TO-PEER FUNCTION



ORDER CODES

Code	Decription
R203	Three-phase power meter with dual Ethernet interface and universal input

ACCESSORIES:
www.seneca.it/linee-di-prodotto/energia-e-misure-elettriche/accessori/

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