100% Made & Designed in Italy

MULTI-FUNCTION POWER METERS

S203 | R203 | T203PM Series



SENECA

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QUICK SELECTION GUIDE

	S203TA-D	S203RC-D	R203	T203PM
				
GENERAL DATA				
Accuracy Class	0,20%	0,50%	0,2..0,5%	1%
Ethernet interface	-	-	x	-
ModBUS RTU interface	x	x	x	x
USB interface	x	x	x	x
Power supply	10..40 Vdc; 19..28 Vac	10..40 Vdc; 19..28 Vac	90..264 Vac	11,5..28 Vdc
Display	Front LCD	Front LCD	Widget on external HMI	-
PROGRAMMING				
Web Server	-	-	x	-
EASY SETUP 2 / Z-NET4	x	x	-	x
EASY SETUP app	x	x	-	-
DIP Switch	x	x	-	-
INPUTS/OUTPUTS				
Input	Up to 600 Vac / 5 Arms	Up to 600 Vac / Rogowski 100 mV RMS	Up to 600 Vac, 5A (CT), 333 mV (CT with voltage output or Rogowski coil)	Up to 600 A / 590Vac (AC/DC TRMS); ±600A /±1000Vdc (TRMS)
Counters	-	-	Nr.2 @32bit, max 5kHz	-
Analog output retransmitted	x	x	x	x
Digital output (alarm/pulses)	x	x	x	-
MEASUREMENTS				
Direct measurement	-	-	-	x
Star voltage measurement	x	x	x	-
Between lines voltage measurement	-	-	x	-
Three-phase measurement Aron	x	x	x	-
Single-phase measurement	x	x	x	x
Harmonic Measurements / THD	-	-	Up to the 55th	Up to the 21st
External CT	x	-	x	-
Rogowski sensors	x	x	x	
SPECIAL FUNCTIONS				
Datalogger	-	-	x	x
Energy Counter	x	x	x	x
Daisy Chain	-	-	x	-
LAN By Pass	-	-	x	-
Peer-To-Peer	-	-	x	-
ModBUS PASS Through	-	-	x	-
MQTT(s) / http(s)	-	-	x	-

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S203 SERIES

MODBUS POWER METERS WITH ANALOG OUTPUT

Power meters analysers are specifically designed to detect the characteristics of the power supply in the single-phase or three-phase networks and utilities. They allow the analysis of energy and power and thus controlling of the power supply quality. At the same time in many versions they are also used to continuously record the progress of the alternating quantities available.
The measurement and event reporting functions provide a basis of information useful for controlling the correct functioning of a machine, maximising energy efficiency.

HIGHLIGHTS

600 Vac

INPUT VOLTAGE

The S203 Series analysers support voltage inputs with a maximum range of up to 600 Vac (50-60 Hz)

100 mA
5 Arms
4,000 A

CURRENT INPUT

The S203 Series analysers manage current inputs up to 5 Arms, S203TA-D), 4,000 A (S203RC-D).

MEASURED VALUES

The S203 Series power meters provide the single-phase and three-phase values of the main electrical quantities via the analogue mA/V output: effective voltage, effective current, active power, reactive power, apparent, frequency, power factor, energy (bidirectional). The configurable analog output also allows the analyser to be used as a measuring transducer.

ENERGY COUNTING

The S203TA-D and S203RC-D models are equipped with pulsed digital output and retentive memory for energy metering.

Modbus

COMMUNICATION

Equipped with a mini-USB and RS485 programming port, all models support the ModBUS RTU protocol up to a maximum of 32 nodes and 115,200 bps without the use of amplifiers or repeaters.

PROGRAMMING

All models can be configured using the free EASY SETUP2 software and with an easily accessible front USB port connection.

LCD

DISPLAY

The S203 Series includes models with high brightness LCD display front (2 lines x 16 characters) backlit

CONNECTIONS

Depending on the versions, the main types of insertion possible are: single-phase, Aron three-phase, 4-wire three-phase. The analysers can be connected to commercial ATs with secondary max 5A, accuracy transformers with f.s. from 15 to 100 A, Rogowski sensors max 4,000 A.

ISOLATION CONFIGURATION

The versions with display are configurable through the Android EASY SET-UP APP downloadable from Play Store

4,000 Vac

APP

The analysers have protection against ESD discharges up to 4 kV, insulation between power input and other circuits up to 4,000 Vac and insulation between communication (or analog output) and power supply of 1500 Vac.

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MULTI-FUNCTION POWER METERS

TECHNICAL DATA

	S203TA-D	S203RC-D
		
	Three-phase network analyser, 600 Vac / 5 Arms, analog and impulsive outputs, LCD display	**Three-phase network analyser, 600 Vac for Rogowski transducers, analog and pulse outputs, LCD display**
GENERAL DATA		
Power supply	10..40 Vdc; 19..28 Vac (50-60 Hz)	10..40 Vdc; 19..28 Vac (50-60 Hz)
Max consumption	2.5 W	2.5 W
Isolation	4 kV Vac (from/to power circuits) 1.500 Vac (other circuits)	4 kV Vac (from/to power circuits) 1.500 Vac (other circuits)
Status indicators	Power supply, Fail, RS485 communication	Power supply, Fail, RS485 communication
Installation Category	350 V CAT II	350 V CAT II
Display	Front LCD 2 lines x 16 alphanumeric characters backlit	Front LCD 2 lines x 16 alphanumeric characters backlit
Retransmission error	0.1%	0.1%
Passing band	7 kHz	7 kHz
Accuracy class	0.2% (voltmeter, ammeter, wattmeter)	0.5% (voltmeter, ammeter, wattmeter)
Insertion type	Single-phase, Aron three-phase, 4-wire three-phase	Single-phase, Aron three-phase, 4-wire three-phase
Connections	CT with secondary current rating of 5A,, typical accuracy 0.5%	Rogowski Transducers with max output 100 mV RMS
Protection degree	IP20	IP20
Installation	DIN Rail 35 mm (IEC/EN 60715)	DIN Rail 35 mm (IEC/EN 60715)
Connections	Screw terminals, 5.08 mm pitch	Screw terminals, 5.08 mm pitch
Operating temperature	-10..+65°C	-10..+65°C
Dimension	105 x 89 x 60 mm	105 x 89 x 60 mm
Weight	200 g	200 g
Case	UL V0 plastic	UL V0 plastic
COMMUNICATION		
Interfaces	Nr..1 RS485 port, Nr..1 USB port	Nr..1 RS485 port, Nr..1 USB port
Speed	1 reading every 25 ms	1 reading every 25 ms
Protocol	ModBUS RTU	ModBUS RTU
Distance	Up to 1,200 m	Up to 1,200 m
Connectivity	Max 32 nodes	Max 32 nodes
I/O		
Channels	1 input, 2 outputs	1 input, 2 outputs
Input type	VOLTAGE Up to 600 Vac (50-60 Hz); CURRENT Up to 5 Arms	VOLTAGE up to 600 Vac (50-60 Hz), CURRENT from Rogowski transducers with max output 100 mV RMS
Output Type	VOLTAGE 0..5, 0..10 Vdc min load resistance 2 kΩ, CURRENT 0..20, 4..20 mA, max load resistance 500 Ω DIGITAL/PULSE for energy meters (50 mA)	VOLTAGE 0..5, 0..10 Vdc, min load resistance 2 kΩ CURRENT 0..20, 4..20 mA, max load resistance 500 Ω DIGITAL/PULSE for energy meters (50 mA)
PROGRAMMING		
Configurations	Front keys DIP switch Software (EASY SETUP / Z-NET4) Android App (EASY SETUP APP)	Front keys DIP switch Software (EASY SETUP / Z-NET4) Android App (EASY SETUP APP)
STANDARD		
Certifications	CE	CE

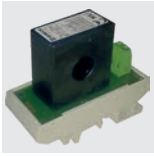
ORDER CODE

Code	Description
S203RC-D	Three-phase Power Meter for Rogowski's sensor
S203TA-D	AC three phase network analyzer with energy meter
TA100	CT for S203TA-D, 100A/100mA, 0,1% of accuracy
TA15	CT for S203TA-D, 15A/100mA , 0,1% of accuracy
TA25	CT for S203TA-D, 25A/100mA, 0,1% of accuracy
RC-V250-100	Rogowski coil, 100 mv/kA output, 50-60 Hz, Ø 65 mm
RC-V400-050	Rogowski coil, 50 mv/kA output, 50-60 Hz, Ø 115 mm
RC-V400-100	Rogowski coil, 100 mv/kA output, 50-60 Hz, Ø 115 mm
RC-V500-100	Rogowski coil, 100 mv/kA output, 50-60 Hz, Ø 147 mm

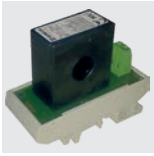
The technical data and the diagrams in this document are indicative and not binding.

ACCESSORIES

CURRENT TRANSFORMERS FOR S203TA-D



TA25
Accuracy amperometric transformer (f.s. 25 A)



TA15
Accuracy amperometric transformer (f.s. 15 A)



TA100
High accuracy current transformer (f.s.100A)

ROGOWSKI SENSORS FOR S203RC-D



RC-V250-100
First generation Rogowski sensor, output 100 mV/kA, 50-60 Hz, Ø 115 mm

RC-V400-050
First generation Rogowski sensor, output 50 mV/kA, 50-60 Hz, Ø 115 mm



RC-V400-100
First generation Rogowski sensor, output 100 mV/kA, 50-60 Hz, Ø 115 mm

RC-V500-100
First generation Rogowski sensor, output 100 mV/kA, 50-60 Hz, Ø 147 mm



RC150
Second generation, high performance Rogowski sensor, max error <1%, Ø 8 mm, 100 mV / 1k

SOFTWARE



Z-NET4

- Input / output settings
- Communication parameters
- Variable addressing
- Setting of counters and retransmitted output
- CT/VT parameters
- Energy accounting

EASY SETUP • EASY SETUP APP



- Communication parameters
- Modbus parameters
- Reading, writing, testing
- Setting of measured and retransmitted variable values

Mobile Phone with USB OTG support

Google play

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R203 SERIES

MULTIFUNCTION POWER METERS WITH UNIVERSAL INPUT

R203 three-phase power meter accepts current measurement inputs for CTs with current/voltage output, VTs and Rogowski coils(with voltage output up to 333 mV), with single-phase, three-phase 3/4-wire insertion types and with support for ModBUS RTU, ModBUS TCP-IP, Peer-To-Peer protocols. Like most of the “space-saving” R-series products, R203 has 1 or 2 Ethernet ports that can also be used for daisy chain connections with automatic bypass protection. The analyzer provides an output signal in voltage (0..10Vdc), current (0/4..20mA). R203 also offers measurement and recording of harmonics in voltage/current up to 55th order with THD (total harmonic distortion) calculation. The instrument also operates as a Web Server and datalogger for reading key parameters and downloading from data and events.

HIGHLIGHTS

UNIVERSAL ANALOG INPUTS

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

CURRENT INPUT

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

ACCURACY

The instrument ensures an accuracy of 0.2% for TA/voltage current measurements and 0.5% for active/reactive powers and Rogowski currents.

PROGRAMMING

From Web Server (or dedicated software built into the instrument, it is possible to make basic basic and advanced settings diagnostics; I/O configuration, measurements, communication, ModBUS data and registers.

INTEGRATED MONITORING SYSTEM

Through facilitated integration with the multifunctional IIoT HMI (SSD), R203 enables the analysis of all electrical parameters and their visualization in the intuitive icon and widget interface. With only one SSD installed, it is possible to manage up to 40 analyzers at simultaneously.

MEASURED VALUES

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

ENERGY COUNTING

R203 is equipped with pulse digital output and memory retentive for metering energy active, reactive and apparent. On both digital inputs are a filter and a 32-bit incremental counter with backup to FeRAM 1 time per second.

DATALOGGER

R203 operates as a datalogger (up to 30 variables per tag and about 55,296 samples storable in the internal flash) and event datalogger with recording up to 32,768 samples with associated time tag. It is also possible to send log files in csv format to an FTP server.

DAISY CHAIN

Thanks to the Ethernet interface, a chain connection to the next device Ethernet (daisy chain) avoiding expensive industrial switches and simplifying the wiring.

LAN BYPASS

R203 enables the operation of an internal switch even if the device is faulty or unpowered up to 4 days (LAN function with bypass in case of of failure)

PEER-TO-PEER

R203 can copy and update in real time an input channel to a remote output channel without the aid of a master controller. It is also possible to copy an input to an output of multiple remote devices.

MODBUS PASS-THROUGH

With the advanced function “ModBUS passthrough” the module can forward to RS485 requests coming from Modbus TCP-IP by behaving, in effect, as a gateway.

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MULTI-FUNCTION POWER METERS

	R203	R203-ROG-025/-040/-060/-090	R203-TA50
			 CT x3
	Three-phase power meter with inputs for TA, TV, Rogowski, Ethernet connection, THD measurement	**Three-phase power meter kit, Ethernet, universal input and 3 rogowski sensors L25 (40/60/90) Ø12, 100mV/1KA-50Hz**	**Power meter kit, Ethernet, universal input, 3xTA 50/5A, cl.0.5/1, D23mm**
GENERAL DATA			
Power supply	90-264 Vac (50-60 Hz)	90-264 Vac (50-60 Hz)	90-264 Vac (50-60 Hz)
Max. power consumption	2.8 W, 5.4 VA	2.8 W, 5.4 VA	2.8 W, 5.4 VA
Isolation	4 kVac (to/from power circuits) 1,500 Vac (other circuits)	4 kVac (to/from power circuits) 1,500 Vac (other circuits)	4 kVac (to/from power circuits) 1,500 Vac (other circuits)
Status indicators	Power supply, DI/DO, RS485 communication, data logger, status, wiring error, Ethernet port	Power supply, DI/DO, RS485 communication, data logger, status, wiring error, Ethernet port	Power supply, DI/DO, RS485 communication, data logger, status, wiring error, Ethernet port
Installation category	600 V CAT III	600 V CAT III	600 V CAT III
Insertion type/connection mode	Single-phase, 3-phase 3-wire, 3-phase 4-wire, CT, CT with mV output, Rogowski transducers	Single-phase, 3-phase 3-wire, 3-phase 4-wire, CT, CT with mV output, Rogowski transducers	Single-phase, 3-phase 3-wire, 3-phase 4-wire, CT, CT with mV output, Rogowski transducers
Protection degree	IP20	IP20	IP20
Accuracy	0.2% (CT Current/Voltage); 0.5% (Active/Reactive Power, Rogowski Current)	0.2% (CT Current/Voltage); 0.5% (Active/Reactive Power, Rogowski Current)	0.2% (CT Current/Voltage); 0.5% (Active/Reactive Power, Rogowski Current)
Mounting	IEC EN60715 35mm DIN rail, wall or panel mounted via screws	IEC EN60715 35mm DIN rail, wall or panel mounted via screws	IEC EN60715 35mm DIN rail, wall or panel mounted via screws
Connections	Screw terminals	Screw terminals	Screw terminals
Operating temperature	-25..+55 °C	-25..+55 °C	-25..+55 °C
Storage temperature	-30..+ 85°C	-30..+ 85°C	-30..+ 85°C
Humidity	30% ÷ 90% noncondensing	30% ÷ 90% noncondensing	30% ÷ 90% noncondensing
Dimensions	90 x 107 x 32 mm	90 x 107 x 32 mm	90 x 107 x 32 mm
Weight	170 g	170 g	170 g
Case	PC/ABS self-extinguishing UL94-V0, color black	PC/ABS self-extinguishing UL94-V0, color black	PC/ABS self-extinguishing UL94-V0, color black
Sensor bundle	-	3xRogowski sensor L25 (40 / 60 / 90) Ø12, 100mV/1KA-50Hz	3xTA 50/5A, cl.0.5/1, D23mm
Approvals	CE	CE	CE
MEASUREMENT AND CALCULATION TIMES			
Sampling times	8.000 sps (for voltage/current channels)	8.000 sps (for voltage/current channels)	8.000 sps (for voltage/current channels)
RMS value settling time	580..700 ms	580..700 ms	580..700 ms
Harmonic update time	30s	30s	30s
PROGRAMMING			
Web Server	Connection diagnostics, device configuration, alarm and I/O configuration, datalogger, USB connection, special functions (ModBUS Pass Through), firmware upgrade	Connection diagnostics, device configuration, alarm and I/O configuration, datalogger, USB connection, special functions (ModBUS Pass Through), firmware upgrade	Connection diagnostics, device configuration, alarm and I/O configuration, datalogger, USB connection, special functions (ModBUS Pass Through), firmware upgrade
DATALOGGER			
Data Datalogger	Max. 30 variables per tag and about 55,296 samples storable in the internal flash; sample time between 1s and 24h	Max. 30 variables per tag and about 55,296 samples storable in the internal flash; sample time between 1s and 24h	Max. 30 variables per tag and about 55,296 samples storable in the internal flash; sample time between 1s and 24h
Event Datalogger	Recording up to 32,768 samples with associated time tag, threshold, time window, date/time	Recording up to 32,768 samples with associated time tag, threshold, time window, date/time	Recording up to 32,768 samples with associated time tag, threshold, time window, date/time
COMMUNICATION			
SERIAL			
Interfaces	N°1 porta RS485	N°1 porta RS485	N°1 porta RS485
Protocol	ModBUS RTU Slave	ModBUS RTU Slave	ModBUS RTU Slave
Distance	Fino a 1.200 m	Fino a 1.200 m	Fino a 1.200 m
Speed	1.200..115.200 baud	1.200..115.200 baud	1.200..115.200 baud
Connectivity	Max 128 nodi device Seneca	Max 128 nodi device Seneca	Max 128 nodi device Seneca
ETHERNET			
Ports	Nr. 1 or 2 100 Mbps Ethernet ports	N°1 o 2 porte Ethernet 100 Mbps	N°1 o 2 porte Ethernet 100 Mbps
Connections	Daisy Chain	Daisy Chain	Daisy Chain
Protocols	ModBUS TCP-IP, Seneca P2P I/O Mirror with broadcast (UDP based), MQTT(s), HTTP(s) REST API	ModBUS TCP-IP, Seneca P2P I/O Mirror with broadcast (UDP based), MQTT(s), HTTP(s) REST API	ModBUS TCP-IP, Seneca P2P I/O Mirror with broadcast (UDP based), MQTT(s), HTTP(s) REST API
USB			
Ports	Nr. 1 Micro USB programming port	Nr. 1 Micro USB programming port	Nr. 1 Micro USB programming port
I/O			
Channels	2 digital inputs/outputs, 1 analog output	2 digital inputs/outputs, 1 analog output	2 digital inputs/outputs, 1 analog output
Measurement Input	VOLTAGE up to 600 Vac, freq. 45 ÷ 65 Hz CURRENT: TA 1 ÷ 5 A full scale; voltage (mV) for TA with voltage or Rogowski output: up to 333 mV f.s.	VOLTAGE up to 600 Vac, freq. 45 ÷ 65 Hz CURRENT: TA 1 ÷ 5 A full scale; voltage (mV) for TA with voltage or Rogowski output: up to 333 mV f.s.	VOLTAGE up to 600 Vac, freq. 45 ÷ 65 Hz CURRENT: TA 1 ÷ 5 A full scale; voltage (mV) for TA with voltage or Rogowski output: up to 333 mV f.s.
Rogowski Analog Input	VOLTAGE: up to 600 Vac, frequency 45..65 Hz ROGOWSKI (supplied by SENECA): 100 ↔1000 A @ 50 Hz (sine); 120 mV ↔ 1000 A @ 60 Hz (sine); Max measurable current: 3 kA @ 50 Hz; 2.5 kA @ 60 Hz	VOLTAGE: up to 600 Vac, frequency 45..65 Hz ROGOWSKI (supplied by SENECA): 100 ↔1000 A @ 50 Hz (sine); 120 mV ↔ 1000 A @ 60 Hz (sine); Max measurable current: 3 kA @ 50 Hz; 2.5 kA @ 60 Hz	VOLTAGE: up to 600 Vac, frequency 45..65 Hz ROGOWSKI (supplied by SENECA): 100 ↔1000 A @ 50 Hz (sine); 120 mV ↔ 1000 A @ 60 Hz (sine); Max measurable current: 3 kA @ 50 Hz; 2.5 kA @ 60 Hz
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 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 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
Digital Inputs	Nr.2 digital inputs that can be activated with voltage from 12 to 24V	Nr.2 digital inputs that can be activated with voltage from 12 to 24V	Nr.2 digital inputs that can be activated with voltage from 12 to 24V
Digital Outputs	Nr.2 digital outputs, range Imax = 50 mA Vmax = 28V	Nr.2 digital outputs, range Imax = 50 mA Vmax = 28V	Nr.2 digital outputs, range Imax = 50 mA Vmax = 28V

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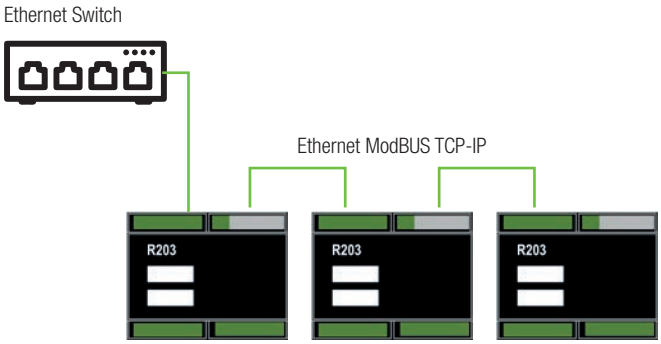
MEASUREMENT PARAMETERS

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

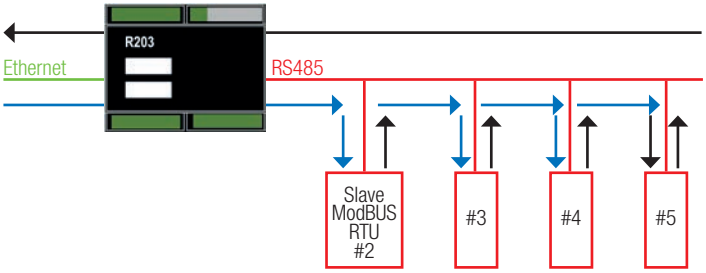
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CONNECTION EXAMPLES (R203-2)

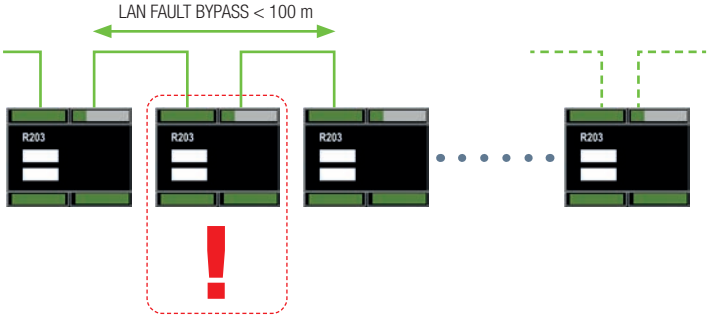
DAISY CHAIN CONNECTION



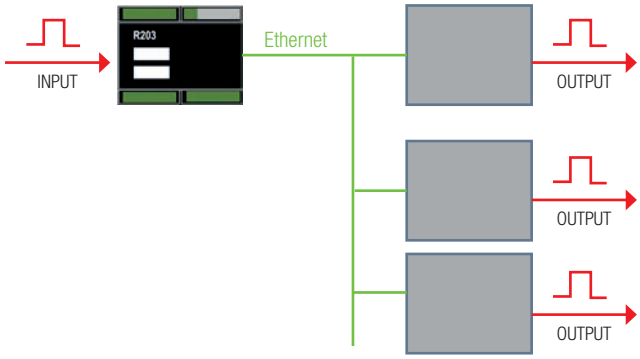
MODBUS PASS THROUGH



FAULT BYPASS CONNECTION



I/O COPY WITH PEER-TO-PEER FUNCTION



ORDER CODE

Code	Description
R203-1	Three-phase power meter single Ethernet and universal input
R203-1-ROG-025	Three-phase power meter kit, single Ethernet, universal input and Rogowski coil (x3) L25 D12, 100mV/1KA-50Hz, 3mt
R203-1-ROG025-10	Three-phase power meter kit, single Ethernet, universal input and Rogowski coil (x3) L25 D12, 100mV/1KA-50Hz, 10mt
R203-1-ROG-025-5	Three-phase power meter kit, single Ethernet, universal input and Rogowski coil (x3) L25 D12, 100mV/1KA-50Hz, 5mt
R203-1-ROG-040	Three-phase power meter kit, single Ethernet, universal input and Rogowski coil (x3) L40 D12, 100mV/1KA-50Hz, 3mt
R203-1-ROG040-10	Three-phase power meter kit, single Ethernet, universal input and Rogowski coil (x3) L40 D12, 100mV/1KA-50Hz, 10mt
R203-1-ROG-040-5	Three-phase power meter kit, single Ethernet, universal input and Rogowski coil (x3) L40 D12, 100mV/1KA-50Hz, 5mt
R203-1-ROG-060	Three-phase power meter kit, single Ethernet, universal input and Rogowski coil (x3) L60 D12, 100mV/1KA-50Hz, 3mt
R203-1-ROG060-10	Three-phase power meter kit, single Ethernet, universal input and Rogowski coil (x3) L60 D12, 100mV/1KA-50Hz, 10mt
R203-1-ROG-060-5	Three-phase power meter kit, single Ethernet, universal input and Rogowski coil (x3) L60 D12, 100mV/1KA-50Hz, 5mt
R203-1-ROG-090	Three-phase power meter kit, single Ethernet, universal input and Rogowski coil triplet L90 D12, 100mV/1KA-50Hz, 3mt
R203-1-TA50	Power meter kit, 1xETH, univ. input, 3xTA 50/5A, cl.0.5/1, D23mm
R203-2	Three-phase dual Ethernet power meter and universal input
R203-2-ROG-025	Three-phase power meter kit, dual Ethernet, universal input and Rogowski coil triplet L25 D12, 100mV/1KA-50Hz, 3mt
R203-2-ROG025-10	Three-phase power meter kit, dual Ethernet, universal input and Rogowski coil (x3) L25 D12, 100mV/1KA-50Hz, 10mt
R203-2-ROG-025-5	Three-phase power meter kit, dual Ethernet, universal input and Rogowski coil (x3) L25 D12, 100mV/1KA-50Hz, 5mt
R203-2-ROG-040	Three-phase power meter kit, dual Ethernet, universal input and Rogowski coil (x3) L40 D12, 100mV/1KA-50Hz, 3mt
R203-2-ROG040-10	Three-phase power meter kit, dual Ethernet, universal input and Rogowski coil (x3) L40 D12, 100mV/1KA-50Hz, 10mt
R203-2-ROG-040-5	Three-phase power meter kit, dual Ethernet, universal input and Rogowski coil (x3) L40 D12, 100mV/1KA-50Hz, 5mt
R203-2-ROG-060	Three-phase power meter kit, dual Ethernet, universal input and Rogowski coil (x3) L60 D12, 100mV/1KA-50Hz, 3mt
R203-2-ROG060-10	Three-phase power meter kit, dual Ethernet, universal input and Rogowski coil (x3) L60 D12, 100mV/1KA-50Hz, 10mt
R203-2-ROG-060-5	Three-phase power meter kit, dual Ethernet, universal input and Rogowski coil (x3) L60 D12, 100mV/1KA-50Hz, 5mt
R203-2-ROG-090	Three-phase power meter kit, dual Ethernet, universal input and Rogowski coil (x3) L90 D12, 100mV/1KA-50Hz, 3mt
R203-2-TA50	Power meter kit, 2xETH, univ. input, 3xTA 50/5A, cl.0.5/1, D23mm

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T203PM

SINGLE-PHASE POWER METERS WITH DIRECT CURRENT MEASUREMENT

T203PM is single-phase AC/DC TRMS power meter series with, ModBUS interface, analog and digital output, . Available inputs are 100, 300 or 60 Aac/dc full scale current depending on the version (T203PM100-MU, T203PM300-MU, T203PM600-MU) and 590 Vac or 1000 Vdc for voltage. The instruments carry out the direct measurement of current and energy without using external CTs. T203PMs measure voltage values, AC/DC current, active/reactive/apparent power, power factor, frequency, voltage, current, current, reactive apparent power, power factor, frequency, harmonic distortion (THD), transmitting them on a 0-10V analog voltage output. 0-10V analog voltage output. T203PM analyzers are particularly reliable as they can rely on a wide operating temperature range, - 25..+65 C, isolation up to 3 kVac (on bare conductors), safety class CAT. III 600V (bare conductors) and 1kV (isolated conductors).

HIGHLIGHTS

DIRECT MEASUREMENT OF CURRENT AND ENERGY

The following measurements are available without external CTs the following measurements: TRMS voltage and current AC voltage, DC voltage, bipolar DC current, instantaneous power, active power, active energy, reactive energy, apparent energy, power factor, THD, mains frequency.

ANALOG VOLTAGE OUTPUT

The analog output can replicate any of the of the input measurements.

HARMONIC ANALYSIS

The input measurement bandwidth of 1.4 kHz guarantees the measurement of voltage and current with harmonic components up to the 21st (at a mains frequency of 60 Hz).

DIGITAL OUTPUT

The digital output is used for signaling alarms signaling of alarms that may occur for a given measurement

MODBUS RTU

ModBUS RTU (Slave) protocol supported both via RS485 communication port up to 115.200 bps and via USB port for programming operations.

MICRO USB PORT

The front USB port allows easy connection connection for configuring the device device via software. Through the USB port to update the firmware.

SOFTWARE CONFIGURATION

T203PM are configurable through EASY SETUP2 and connection by front USB port easily accessible.

ENERGY METER

The analyzers have 64-bit integer counters whose energy values (active, reactive, apparent) are saved on “Non volatile” memory.

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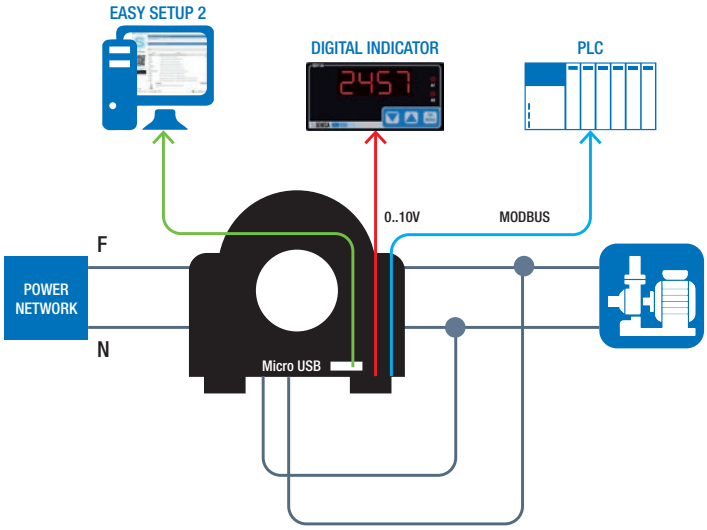
TECHNICAL DATA

	T203PM100-MU	T203PM300-MU	T203PM600-MU
			
	Single-phase AC/DC TRMS power meter, inputs up to 100 Vac/dc, ModBUS, analog and digital output	**Single-phase AC/DC TRMS power meter, inputs up to 300 Vac/dc, ModBUS, analog and digital output**	**Single-phase AC/DC TRMS power meter, inputs up to 600 Vac/dc, ModBUS, analog and digital output**
GENERAL DATA			
Power supply	11.5 - 28 Vdc	11.5 - 28 Vdc	11.5 - 28 Vdc
Power consumption	Typical: < 70 mA @ 24 Vdc	Typical: < 70 mA @ 24 Vdc	Typical: < 70 mA @ 24 Vdc
Isolation	3 kVac (on bare conductors)	3 kVac (on bare conductors)	3 kVac (on bare conductors)
Led status indicators	Power supply, USB communication, digital output	Power supply, USB communication, digital output	Power supply, USB communication, digital output
Installation / Overvoltage Category	CAT. III 600V (bare conductor) CAT. III 1kV (insulated conductor)	CAT. III 600V (bare conductor) CAT. III 1kV (insulated conductor)	CAT. III 600V (bare conductor) CAT. III 1kV (insulated conductor)
Frontal protection degree	IP20	IP20	IP20
Accuracy class	0.5% f.s.at 50/60 Hz, 23 °C (> 2% f.s.) 1% f.s.a. 50/60 Hz, 23 °C (< 2% f.s.)	1% of full scale at 50/60 Hz, 23 °C	1% of full scale at 50/60 Hz, 23 °C
Programming	EASY SETUP 2 software	EASY SETUP 2 software	EASY SETUP 2 software
Mounting	35mm DIN rail IEC EN60715, wall mounting by plugs, suspension by clamps	35mm DIN rail IEC EN60715, wall mounting by plugs, suspension by clamps	35mm DIN rail IEC EN60715, wall mounting by plugs, suspension by clamps
Connections	Removable 6-way screw terminals, pitch 5 mm for cables up to 2.5 mm^2 Micro USB for programming and fw update	Removable 6-way screw terminals, pitch 5 mm for cables up to 2.5 mm^2 Micro USB for programming and fw update	Removable 6-way screw terminals, pitch 5 mm for cables up to 2.5 mm^2 Micro USB for programming and fw update
Operating temperature	-25..+70°C	-25..+70°C	-25..+70°C
Dimension	95 x 75 x 35 mm	95 x 75 x 35 mm	95 x 75 x 35 mm
Weight	150 g	150 g	150 g
Case	PA6, black color	PA6, black color	PA6, black color
Approvals	CE	CE	CE
MEASUREMENT AND CALCULATION TIMES			
Sampling time	47.000 sps	47.000 sps	47.000 sps
RMS values settling time	500..1000 ms	500..1000 ms	500..1000 ms
MEASURED PARAMETERS			
nstantaneous values	Voltage, AC/DC Current, Active / Reactive / Apparent Power, Power Factor, Frequency, THD	Voltage, AC/DC Current, Active / Reactive / Apparent Power, Power Factor, Frequency, THD	Voltage, AC/DC Current, Active / Reactive / Apparent Power, Power Factor, Frequency, THD
Average / max / min values	Voltage, AC/DC Current, Active / Reactive / Apparent Power, Power Factor, Frequency, THD	Voltage, AC/DC Current, Active / Reactive / Apparent Power, Power Factor, Frequency, THD	Voltage, AC/DC Current, Active / Reactive / Apparent Power, Power Factor, Frequency, THD
Harmonics	Up to the 21st	Up to the 21st	Up to the 21st
COMMUNICATION			
SERIAL			
Interfaces	Nr.1 RS485 port	Nr.1 RS485 port	Nr.1 RS485 port
Protocol	ModBUS RTU	ModBUS RTU	ModBUS RTU
Distance	Up to 1,200 m	Up to 1,200 m	Up to 1,200 m
Connectivity	Max 32 nodes	Max 32 nodes	Max 32 nodes
USB			
Ports	Nr.1 Micro USB programming port	Nr.1 Micro USB programming port	Nr.1 Micro USB programming port
MEASUREMENT INPUTS			
Voltage / Current	Up to 0 - 100A or 0 - 90Vac (AC/DC TRMS); ±100A or 0 - +1000Vdc (DC Bipolar TRMS) Crest Factor: 100A = 1.7 / 300A = 1.9 / 600A = 1.9 Bandwidth: 1.4 kHz Overload: 3 x IN continuous	Up to 0 - 300A or 0 - 290Vac (AC/DC TRMS); ±300A or 0 - +1000Vdc (DC Bipolar TRMS) Crest Factor: 100A = 1.7 / 300A = 1.9 / 600A = 1.9 Bandwidth: 1.4 kHz Overload: 3 x IN continuous	Up to 0 - 600A or 0 - 590Vac (AC/DC TRMS); ±600A or 0 - +1000Vdc (DC Bipolar TRMS) Crest Factor: 100A = 1.7 / 300A = 1.9 / 600A = 1.9 Bandwidth: 1.4 kHz Overload: 3 x IN continuous
BUILT-IN IOS			
Channels	1DO, 1 AO	1DO, 1 AO	1DO, 1 AO
Digital Output	ACTIVE 0 - Vdc, 50mA max load	ACTIVE 0 - Vdc, 50mA max load	ACTIVE 0 - Vdc, 50mA max load
Analog Ouput	VOLTAGE: 0..10Vdc, minimum load 2kΩ. Reverse polarity and overvoltage protection Resolution: 13.5 f.s.AC Error for EMI: < 1 % Coeffic. Temperature: < 200 ppm/°C Hysteresis on measurement: 0.2% f.s. Response Speed: < 200 ms	VOLTAGE: 0..10Vdc, minimum load 2kΩ. Reverse polarity and overvoltage protection Resolution: 13.5 f.s.AC Error for EMI: < 1 % Coeffic. Temperature: < 200 ppm/°C Hysteresis on measurement: 0.2% f.s. Response Speed: < 200 ms	VOLTAGE: 0..10Vdc, minimum load 2kΩ. Reverse polarity and overvoltage protection Resolution: 13.5 f.s.AC Error for EMI: < 1 % Coeffic. Temperature: < 200 ppm/°C Hysteresis on measurement: 0.2% f.s. Response Speed: < 200 ms

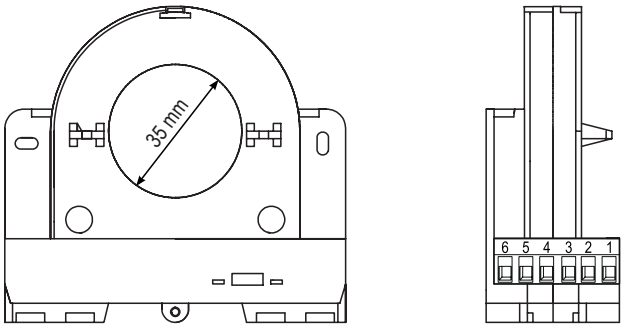
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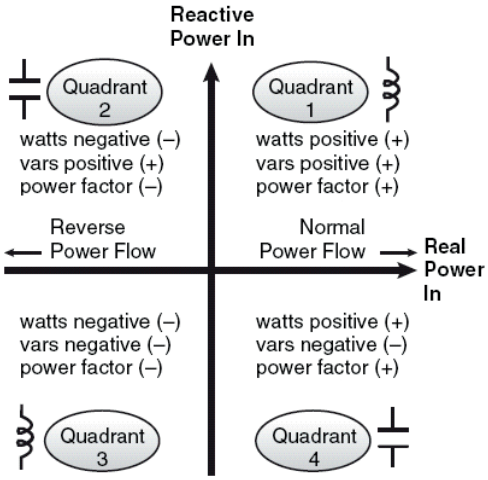
TYPICAL APPLICATION



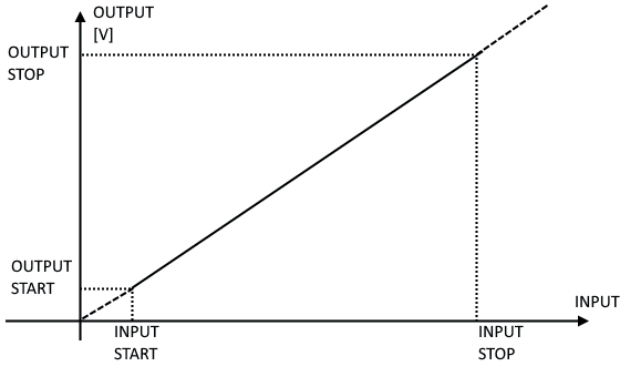
MODULE LAYOUT



AVAILABLE MEASURES VIA SERIAL



ANALOG OUTPUT



INSTANTANEOUS, MINIMUM AND MAXIMUM MEASURED VALUES

Voltage	V
AC / DC Current (+/-)	I
Active Power (+/-)	P
Reactive Power (+/-)	Q
Apparent Power (+/-)	S
Power Factor	PF
Frequency	F (frequency measured on the mains voltage)
THD	% (measured on current)

COUNTERS

ACTIVE ENERGY [Wh/10] (TOTAL (+/-))
REACTIVE ENERGY [VARh/10] (TOTAL (+/-))
APPARENT ENERGY [VAh/10] (TOTAL (+/-))

ORDER CODES

Code	Description
T203PM100-MU	Single-phase power meter AC/DC TRMS, inputs up to 100 Vac/dc, ModBUS, analog and digital output
T203PM300-MU	Single-phase AC/DC TRMS power meter, inputs up to 300 Vac/dc, ModBUS, analog and digital output
T203PM600-MU	Single-phase AC/DC TRMS power meter, inputs up to 600 Vac/dc, ModBUS, analog and digital output
CU-A-MICROB	Micro USB-A USB-B cable 5 P

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CONTATTI E INFORMAZIONI

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