MRG 96RM-E RCM Flex & MRG 512-PRO PQ Flex



Chapter 02 MRG 96RM-E RCM Flex & MRG 512-PRO PQ Flex

Areas of application



- High quality PQ analysis at class A level (IEC 61000-4-30)
- Temporary measurement e.g. for the design of power factor correction systems
- Analysis of electrical disturbances in the event of PQ problems
- Fault analysis with power quality problems
- High quality comparative measurement of energy measurement devices and meters
- Calibration of measurement devices (ISO 50001 audit)
- Recording of residual currents over an external current transformer (not included in the scope of delivery)

Main features

- Monitoring of the power quality
- Capturing of all power quality parameters (harmonics, short-term interruptions, asymmetries etc.)
- Remote access via Ethernet and embedded web server
- GridVis® PQ analysis software
- Standard PQ reports, depending on the version: EN 50160 , IEEE519, ITIC, EN 61000-2-4
- Cost centre report
- Large 256 MB internal memory for storing measurement data
- UPS-supported power supply for up to 3 hours



MRG 512-PRO PQ Flex: User-friendly, colour graphical display with intuitive user guidance

- High resolution graphics display
- User-friendly, self-explanatory and intuitive operation
- Clear and informative representation of online graphs and further power quality events



Modern communications architecture via Ethernet

- Ethernet interface and web server
- Faster, better cost-optimised and more reliable communication system
- High flexibility due to the use of open standards



Large measurement data memory

- 256 MByte
- Recording range of up to 2 years, depending on the recording configuration
- Recording freely configurable





Fig.: MRG 512-PRO PQ Flex – Portable power quality analyser with RCM (Image similar)



Fig.: MRG 96RM-E RCM Flex – Portable energy measurement device with RCM (Image similar)





RCM (Residual Current Monitoring)

- Continuous monitoring of residual currents (Residual Current Monitoring, RCM)
- Alarming in case a preset threshold fault current reached
- Near-realtime reactions for triggering countermeasures
- Permanent RCM measurement for systems in permanent operation without the opportunity to switch off
- Ideal for the central earthing point in TN-S systems



Graphical programming (only MRG 512-PRO)

- Comprehensive programming options (PLC functionality)
- Jasic[®] source code programming
- Sustainable functional expansions far beyond pure measurement
- Complete APPs from the Janitza library

Scope of delivery for the MRG product range

- Compact, robust plastic housing with measurement device and all connections
- UPS-supported power supply for up to 3 hours
- Supplementary description for each measurement device
- Operation manual for each measurement device
- DVD with following content:
- Programming software GridVis®-Basic
- Functional description GridVis®
- Carry soft bag for accessories
- Mains connection cable
- 1 Crossover patch cable, CAT5e
- 1 set of voltage measuring cables with fuses (brown, black, grey, blue, green/yellow)
- Voltage tap-offs
- 2 connection cable 3 m for residual current measuring with connector
- Incl. Rogowski coil Ø 95 mm, length 300 mm (MRG 96RM-E RCM Flex); Ø 175 mm, length 600 mm (MRG 512-PRO PQ Flex)

Optional accessories:

Differential current transformer on request.



Fig.: Colour graphical display MRG 512-PRO PQ Flex – Example voltage profile over time

Obersch	nwingungen	Strom L	2
95.8%-			
76.6%			
57.5%			
38.3%-			
19.2%5			
5	10 15 20 2	5 30 35	40
•	L3 Spannur	ig 🕨 🕨	Home

Fig.: Colour graphical display MRG 512-PRO PQ Flex – Example harmonics analysis



Fig.: Measurement connection for current transformer and voltage; auxiliary voltage and ethernet connection



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Device overview and technical data

	MRG 96RM-E RCM Flex	MRG 512-PRO PQ Flex
Item number	52.16.906	52.16.905
Interfaces		
Ethernet 10/100 Base-TX (RJ-45 socket)	•	•
Measurement of the power quality		
Harmonics per order / current and voltage	1. – 40.	1. – 63.
Harmonics per order / active and reactive power	1. – 40.	1. – 63.
Interharmonics - current / voltage	-	•
Flicker: Short term, long term, present	-	•
Measurement data recording		
Memory (Flash)	256 MB	256 MB
Measured voltage input		
Overvoltage category	600 V CAT III	600 V CAT III
Displays and inputs / outputs		
LCD display	LCD display with backlight, 2 buttons	Colour graphical display 320 x 240, 256 colours, 6 buttons

General	MRG 96RM-E RCM Flex	MRG 512-PRO PQ Flex
Use in low and medium voltage networks	•	•
Accuracy of measurement with voltage	0.2 %	0.1%
Accuracy of measurement with current	0.2 %	0.1%
Accuracy of measurement with active energy (kWh,/5 A)	Class 0.5S	Class 0.2S
Number of measurement points per period	426	512
Uninterrupted measurement	•	•
RMS - momentary value		
Current, voltage, frequency	•	•
Active, reactive and apparent power / total and per phase	•	•
Power factor / total and per phase	•	•
Energy measurement		
Active, reactive and apparent energy [L1, L2, L3, L4,	_	_
Σ L1–3,Σ L1–4]	•	-
Recording of the mean values		
Voltage, current / present and maximum	•	•
Active, reactive and apparent power / present and	•	•
maximum		•
Frequency / present and maximum	•	•
Requirement calculation mode (bi-metallic function) /	•	•
thermal	-	
Other measurements		
Operating hours measurement	•	•
Clock	•	•
Measurement of the power quality		
Distortion factor THD-U in %	•	•
Distortion factor THD-I in %	•	•
Current and voltage, positive, zero and negative	•	•
sequence component		
Transients	-	> 39 µs
Error / event plotter function	•	•
Short term interruptions	-	•
Oscillogram function (wave form U and I)	-	•
Under and overvoltage recording	•	•
Measurement data recording		
Mean, minimum, maximum values	•	•
Alarm messages	•	•
Time stamp	•	•
Time basis mean value	freely user-defined	freely user-defined
RMS averaging, arithmetic	•	•
Displays and inputs / outputs		
Analogue inputs (RCM, analogue)	•	•
Voltage and current inputs	L1, L2, L3 + N	every 4
Password protection	•	•

Comment: For detailed technical information, please refer to the operation manual and the Modbus address list.

• = included - = not included





Fig.: Rogowski coil with measurement transducer



Fig.: Voltage taps

Comment:

For detailed technical information, please refer to the operation manual and the Modbus address list.

- = included - = not included
- *1 Optional additional functions with the packages GridVis®-Professional, GridVis®-Service and GridVis®-Ultimate.
- *2 The UMG 96RM-E can only determine measured values if a voltage L1-N greater than 20 Veff (4-wire measurement) or a voltage L1-L2 greater than 34 Veff (3-wire measurement) is applied at the voltage measurement input V1.
- *3 The UMG 512-PRO can only determine measured values, if an L-N voltage of greater than 10 Veff or an L-L voltage of greater than 18 Veff is applied to at least one voltage measurement input.

	MRG 96RM-E RCM Flex	MRG 512-PRO PQ Flex
Protocols		
ModbusTCP, Modbus RTU over Ethernet	•	•
HTTP (homepage configurable)	•	•
SMTP (email)	•	•
NTP (time synchronisation)	•	•
TFTP (automatic configuration)	•	•
FTP (file transfer)	•	•
SNMP	•	•
DHCP	•	•
TCP/IP	•	•
BACnet (optional)	•	•
ICMP (Ping)	•	•
GridVis [®] Basic software ^{*1}		
Online graphs	•	•
Historical graphs	•	•
Databases (Janitza DB, Derby DB)	•	•
Manual reports (energy, power quality)	•	•
Graphical programming	-	•
Topology views	•	•
Manual read-out of the measuring devices	•	•
Graph sets	•	•
Programming / threshold values / alarm management		
Application programs freely programmable		7
Graphical programming		•
Programming via source code Jasic®	_	•
Comparator (5 Groups with 10 comparators each)	•	-
Tophnical data		
Nominal voltage, three-phase, A-conductor (I-N, I-I.)	277 / 480 \/ AC	/17 / 720 \/ AC
Nominal voltage, three phase, 3-conductor (L-I.)	180 V AC	600 V AC
Measurement in which quadrants	400 V AO	4
Networks		TN TT
Measurement in single-phase/multi-phase networks	1 nh 2 nh 3 nh 4 nh	1 nh 2 nh 3 nh 4 nh
	1 pii, 2 pii, 6 pii, 4 pii	and up to 4 times 1 ph
Measured voltage input		
Metering range, voltage L-N, AC (without transformer)	0*2 to 300 V	0*3 to 600 V
Metering range, voltage L-L, AC (without transformer)	0*2 to 520 V	0*3 to 1000 V
Resolution	0.01 V	0.01 V
Impedance	3 MOhm / phase	4 MOhm / phase
Frequency measuring range	45 to 65 Hz	15 to 440 Hz
Power consumption	approx 01VA	approx 01VA
Measured current input		
Rated current	5.0	5.0
Besolution	0.1 mA	0.1 mA
Metering range	0.005 - 6 4	0.005 - 7 A
Measurement voltage surge	2 KV	6 KV
Power consumption	(Ri = 5 mOhm)	(Ri = 5 MOhm)
Overload for 1 sec.	120 A (sinusoidal)	120 A (sinusoidal)
Sampling rate	20 kHz	25.6 kHz
Mechanical properties		
Weight	approx. 3.4 kg	approx. 14.2 kg
Device dimensions in mm (L x W x H)	350 x 295 x 150	Approx. 500 x 390 x 230
Protection class per EN 60529	Front: IP40; Back: IP20	Front: IP40; Back: IP20
Safety		
Europe	CE labelling	CE labelling

Janitza®