

3. Technical characteristics

3.1. Description of the device

M4M 20 is ABB's network analyzer range that provides complete and accurate electrical parameters monitoring and basic power quality analysis.

Equipped with graphic color display for advanced visualization of the measured parameters and Bluetooth module for smart commissioning.

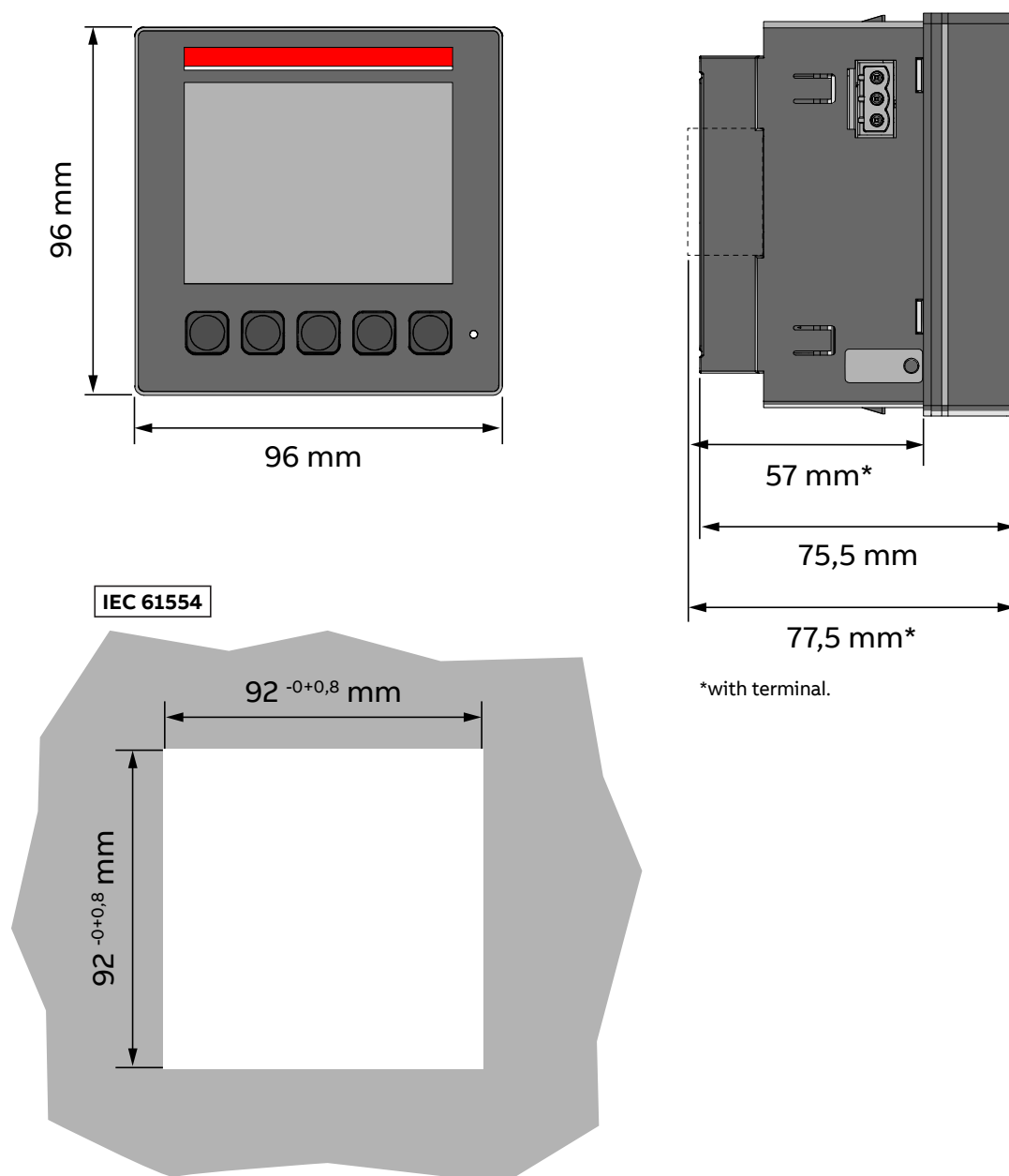
3.2. Main functionalities

Real-time	
TRMS current	•
TRMS Voltage	•
Frequency	•
Active, Reactive and Apparent Power	•
Power Factor	•
Operating timer, countdown timer	•
Energy	
Active, Reactive and Apparent Energy	•
4 quadrant Energy (Import/Export)	•
Power quality	
THD (I, VLN, VLL)	•
Neutral current	Calculated
Data recording and logs	
Single alarms	25
Warnings, alarms and errors logs	•
Demand values (average) Basic Advanced	Basic
Min/Max Demand values Basic Advanced	Basic
HMI	
Graphs visualization	Basic
Notifications	•
Homepage and favourite page	•
Password protection	•
Connectivity	
Automatic integration in ABB Ability™ EDCS	•
Bluetooth Low Energy	•
Communication Protocols	Modbus RTU, Modbus TCP/IP, Profibus DP-V0, BACnet/IP

3.3. Versions

Product Name	I/O	Communication protocol
M4M 20	2 Digital Outputs	Bluetooth
M4M 20 MODBUS	2 Digital Outputs	Modbus RTU, Bluetooth
M4M 20 ETHERNET	2 Digital Outputs	Modbus TCP/IP, Bluetooth
M4M 20 PROFIBUS	2 Digital Outputs	Profibus DP-V0, Bluetooth
M4M 20 I/O	2 Programmable I/O	Modbus RTU, Bluetooth
	2 Digital Outputs	
	2 Analogue Outputs	
M4M 20 ROGOWSKI	2 Digital Outputs	Modbus RTU, Bluetooth
M4M 20 BACNET	2 Digital Outputs	BACnet/IP, Bluetooth

3.4. Overall dimensions



3.5. Technical data

Auxiliary power supply		
Voltage range	[V]	48 to 240 VAC/VDC $\pm 15\%$
Frequency	[Hz]	50-60 Hz
Power consumption	[VA]	10 VA max
Installation category		CAT III 300V class per IEC 61010-1 edition 3
Protection fuse		T1 A - 277 VAC
Measurement accuracy*		
Measurement type		True RMS up to the 40th harmonic 128 samples per cycle, zero blind
IEC 61557-12		IEC 61557-12 PMD/S/K70/0,5
Active energy		Class 0,5 acc. to IEC 61557-12 Class 0,5S acc. to IEC 62053-22
Reactive energy		Class 2 acc. to IEC 61557-12 Class 2S acc. to IEC 62053-23
Active power		Class 0,5 acc. to IEC 61557-12
Reactive power		Class 2 acc. to IEC 61557-12
Apparent power		Class 0,5 acc. to IEC 61557-12
Voltage		Class 0,2 acc. to IEC 61557-12
Current		Class 0,2 acc. to IEC 61557-12
Neutral current		Calculated
Frequency		Class 0,1 acc. to IEC 61557-12
Unbalances		Class 0,2 acc. to IEC 61557-12
Harmonics, THD (Current, voltage)		Class 1 acc. to IEC 61557-12
*Accuracy referred to insertion with .../5A CT or Rogowski coils. Derating for .../1A CT.		
Voltage measurement inputs		
Measurement range	[V]	50 - 400 VAC (L-N) 87 - 690 VAC (L-L)
Measurement category		400V~ (CAT III)
Rated frequency	[Hz]	50/60
Max. VT secondary (indirect connection)	[V]	400 VAC (L-N)
Max over voltage	[V]	800 VAC (L-L)
Protection fuse	[V]	T1 A - 277 VAC
Current measurement inputs		
Number of current inputs		3 (L1, L2, L3)
Indirect insertion with CT		
CT secondary		5 A (Class 0.5S) 1 A (Class 1)
Measurement range without accuracy derating		50 mA - 6 A
Starting current		5 mA
Burden		0.024 VA at 6 A
Indirect insertion with Rogowski coils		
		(only M4M 20 Rogowski)
Rated current		10000 A
Measurement range without accuracy derating		100 A - 12 kA
Starting current		10 A

I/O**Digital Output**

Voltage (min - max)	5 - 240 VAC/DC
Current (min - max)	2 - 100 mA
Max ON state drop voltage	1,5 V
Max R value at Min voltage conditions (5 V)	1750 Ohm
Min R value at Max voltage conditions (240 V)	2400 Ohm
Pulse duration	[ms] 20 ms ON, 20 ms OFF
Pulse frequency	25 Hz
Alarm activation delay	[s] 1 - 900 s (programmable)
Alarm return hysteresis	0 - 40% (programmable)

Digital Input

Maximum Voltage	240 VAC/DC
Max voltage for OFF state on input	20 VAC/DC
Min voltage for ON state on input	45 VAC/DC

Analogue Output

Programmable electrical parameters	Span [0 - 20 mA or 4 - 20 mA]
Load	Typical 250 Ohm, max 500 Ohm

Mechanical characteristics

Overall dimensions	96 mm x 96 mm x 77,5 mm (Depth inside the switchboard: 57mm)
IP degree of protection (IEC 60529)	Front: IP54 Terminals: IP20
Weight	[g] 400

Terminal characteristics

Voltage inputs	Nominal cross section: 2,5 mm ² Solid/stranded wire: 0,2 - 2,5 mm ² (AWG 24 - 12) Pitch: 7,62 mm Poles: 4
Current inputs	Nominal cross section: 2,5 mm ² Solid/stranded wire: 0,2 - 2,5 mm ² (AWG 24 - 12) Pitch: 5,08 mm Poles: 6 Screw flanges for fixing
RS-485 Serial port	Nominal cross section: 2,5 mm ² Solid/stranded wire: 0,2 - 2,5 mm ² (AWG 24 - 12) Pitch: 5,08 mm Poles: 3
I/O	Nominal cross section: 2,5 mm ² Solid/stranded wire: 0,2 - 2,5 mm ² (AWG 24 - 12) Pitch: 5,08 mm Poles: 3 (Programmable I/O, only on M4M 20 I/O) Poles: 3 (Digital outputs) Poles: 3 (Analogue outputs, only on M4M 20 I/O)
Rogowski current probes	Only with ABB Rogowski probes: - R4M-200: 200 mm diameter (2CSG202150R1101) - R4M-80: 80 mm diameter (2CSG202160R1101)

Climatic conditions	
Operating temperature	-25 to 70 °C (K70 acc. to IEC 61557-12)
Storage temperature	-40 to 85 °C (K70 acc. to IEC 61557-12)
Relative humidity	Max 93% (non-condensing) at 40°C
Pollution degree	2
Altitude	< 2000 m
User Interface	
Access to device	5 pushbuttons
Display type	Graphic color display
Display dimensions	70 x 52 mm (3.5")
Communication protocol	
Modbus RTU	M4M 20 Modbus, M4M 20 I/O, M4M 20 Rogowski
Communication interface	RS485 with optical isolation
Baud rate	9.6, 19.2, 38.4, 57.6, 115.2 kbps
Parity number	Odd, Even, None
Stop bit	1, 2
Address	1-247
Connector	3 pole terminal
Profibus DP-V0	M4M 20 Profibus
Protocol	Profibus with slave DP-V0 function in compliance with IEC 61158 regulations
Communication interface	RS485 with optical isolation
Baud rate	Automatic detection [9.6 - 12 Mbps]
Address	0-126
Connector	DB 9 female connector (do not use connectors with 90° cable outlet)
LED indicators	Green for communication status
	Red for communication error
Modbus TCP/IP	M4M 20 Ethernet
Protocol	Modbus TCP/IP
Communication interface	RJ45
BACnet	M4M 20 Bacnet
Protocol	BACnet/IP
Communication interface	RJ45
Bluetooth	
Type	BLE (Bluetooth Low Energy)
Standards	
Power metering and monitoring devices (PMD)	IEC 61557-12 (IEC 62053-22, IEC 62053-23)
Electrical safety	IEC 61010-1
EMC	IEC 61326-1 (IEC 61000-3-2, IEC 61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11)