M4M Network analyzers

Accurate electrical measuring and power monitoring.

Simple in every aspect, M4M enables accurate energy efficiency evaluations and perfectly fits the ABB solution for monitoring, optimization and control of electrical system.

Smart commissioning
Bluetooth module for easy configuration through EPiC Mobile App unique commissioning tool.

Accurate measurement
Class 0.5 measurement according to IEC 61557-12 and advanced power quality functionalities, including historical measurements.

Intuitive access
Simplified access to the device via touch screen display or 5 pushbuttons keypad.

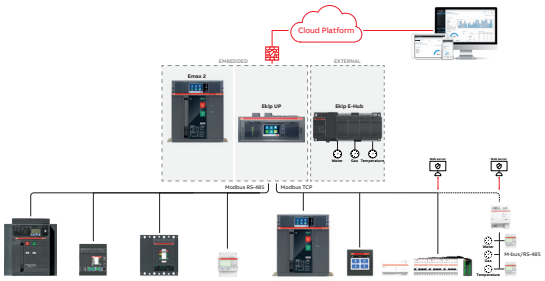
Clear visualization
Color display and App-structured menu for advanced graphic visualization.

Easy to install
Fast one-hand mounting and comfortable installation with clips in only 57 mm depth inside the panel.

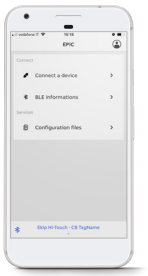
Full communication
ABB Ability™ native network analyzers with complete communication protocols and I/O options for integration in any system.

Fast wiring
All-removable terminals and one tool process to speed up the wiring activities.

Intuitive interface
Touchscreen display and easy-to-access App-structured menu make network analyzers' configuration and operation simple and quick. Graphic color display for advanced visualization of the Class 0,5S accurate parameters, interactive pop-ups and complete notifications. Quick navigation is ensured by Homepage and favorite page setting.



Full integration
ABB Ability™-native network analyzers, automatically integrated in ABB Ability™ Electrical Distribution Control System cloud-computing platform, allowing to monitor, optimize and control the complete electrical system.
Wide integration in all main applications through embedded communication protocols (Modbus RTU, Modbus TCP/IP, BACnet/IP, Profibus DP V0).



Smart commissioning
All M4M network analyzers are equipped with Bluetooth BLE module, ensuring smart configuration and quick visualization via unique EPiC commissioning tool, both available as mobile App and desktop software. Availability of remote firmware update regularly at any time guarantees the latest and the most secure version of the device with no impact on operations.

Installation in any panel
Comfortable installation and secure fix on the panel is ensured by the easy-to-use clips, with different thickness setup for compatibility with any panel. One-hand mounting of the device thanks to the hooks on the housing.
The reduced depth of only 57 mm inside the panel makes M4M suitable even in small-size switchboards.

Fast installation and wiring
All terminals on M4M are removable, including the current transformers (CTs) inputs for current measurement, allowing to carry out the wiring directly on the terminals and speeding up the process. Moreover, the vertical disposition of the terminals makes the cabling inside the switchboard more comfortable.

Rogowski coils compatibility
Specific M4M versions compatible with ABB's R4M Rogowski coils allow to retrofit in existing installations, integrating power quality metering with 0 downtime. The pre-wired terminals of R4M coils allow to save up to 70% time for current transformers cabling compared to standard CTs.

Technical features

		M4M 20	M4M 30
Auxiliary power supply			
Voltage range	[V]	48 - 240 VAC/VDC ±15%	
Frequency	[Hz]	50 or 60 ± 5%	
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	Class 1 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	Class 0,2 acc. to IEC 61557-12
Frequency		Class 0,1 acc. to IEC 61557-12	
Unbalances (Current, Voltage)		Class 0,2 acc. to IEC 61557-12	
Harmonics, THD (Current, voltage)		Class 1 acc. to IEC 61557-12	

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 Hz	
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	

*Accuracy referred to insertion with .../5A CT or Rogowski coils, according to product version. Derating for .../1A CT.

		M4M 20	M4M 30
Current measurement inputs			
Number of current inputs		3 (L1, L2, L3)	4 (L1, L2, L3, N)
Indirect insertion with CT			
CT rated secondary current		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		**M4M 20 Rogowski**	**M4M 30 Rogowski**
Rated current		10.000 A	
Measurement range without accuracy derating		100 A - 12 kA	
Starting current	[A]	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 span	Span [0 - 20 mA or 4 - 20 mA]
Load	Typical 250 Ohm, max 500 Ohm

Technical features

M4M 20

M4M 30

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

Terminal characteristics			
Voltage inputs		Nominal cross section: 2,5 mm2 Solid/stranded wire: 0,2 - 2,5 mm2 (AWG 24 - 12) Pitch: 7,62 mm Poles: 4	
Current inputs		Nominal cross section: 2,5 mm2 Solid/stranded wire: 0,2 - 2,5 mm2 (AWG 24 - 12) Pitch: 5,08 mm Poles: 6 Screw flanges for fixing	ominal cross section: 2,5 mm2 Solid/stranded wire: 0,2 - 2,5 mm2 (AWG 24 - 12) Pitch: 5,08 mm Poles: 8 Screw flanges for fixing
RS-485 Serial port		Nominal cross section: 2,5 mm2 Solid/stranded wire: 0,2 - 2,5 mm2 (AWG 24 - 12) Pitch: 5,08 mm Poles: 3	
I/O		Nominal cross section: 2,5 mm2 Solid/stranded wire: 0,2 - 2,5 mm2 (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)	Nominal cross section: 2,5 mm2 Solid/stranded wire: 0,2 - 2,5 mm2 (AWG 24 - 12) Pitch: 5,08 mm Poles: 5 (Programmable I/O) Poles: 3 (Programmable I/O only on M4M 30 I/O) Poles: 3 (Analogue outputs, only on M4M 30 I/O)
Rogowski current probes		Only with ABB Rogowski probes: - R4M-200 2CSG202150R1101 (200 mm diameter) - R4M-80 2CSG202160R1101 (80 mm diameter)	

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	< 2.000 m

User Interface		
Access to device	5 pushbuttons	Touchscreen
Display type	Graphic color display	
Display dimensions	70 x 52 mm (3.5")	

M4M 20

M4M 30

Communication protocol		
Modbus RTU	**M4M 20 Modbus, M4M 20 I/O, M4M 20 Rogowski**	**M4M 30 Modbus, M4M 30 I/O, M4M 30 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**	**M4M 30 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**	**M4M 30 Ethernet**
Protocol	Modbus TCP/IP	
Communication interface	RJ45	RJ45 (2 ports for daisy-chain)
BACnet	**M4M 20 Bacnet**	**M4M 30 Bacnet**
Protocol	BACnet/IP	
Communication interface	RJ45	

Bluetooth	
Type	BLE (Bluetooth Low Energy)

Real-time clock		
Clock drift	-	~ 0.4 seconds per day
Battery backup time	-	~ 3 years without control power

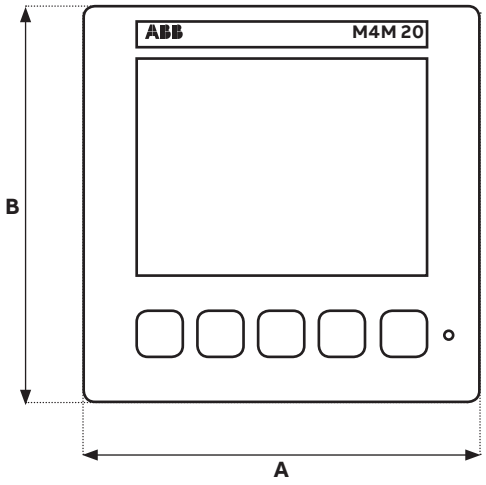
Standards	
Power metering and monitoring devices (PMD)	IEC 61557-12 (IEC 62053-22, IEC 62053-23)
Electrical safety	IEC 61010-1
EMC	IEC 61326-1 (IEC 61000-3-2, IEC 61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11)

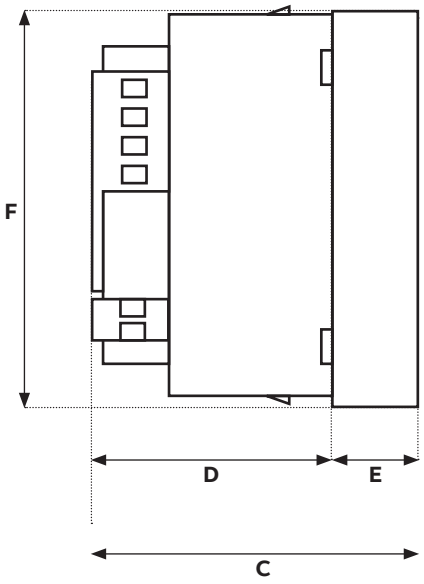
M4M 20 and M4M 30
Comparing the two versions

Accuracy	**M4M 20 -** Class 0,5S	**M4M 30 -** Class 0,5S
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 quadrants Energy (Import/Export)	•	•
Tariffs	/	•
Power Quality		
THD (I, VLN, VLL)	•	•
Individual Harmonics	/	40th
Unbalances (I, VLN, VLL)	/	•
Neutral current	Calculated	Measured
Phasors (I, VLN)	/	•
Waveforms (I, VLN, VLL)	/	•
Data recording and logs		
Single alarms	25	25
Warnings, alarms and errors logs	•	•
Complex alarms with logics	/	4
Demand values (average)	Basic	Advanced
Min/Max Demand values	Basic	Advanced
Energy Trending logs	/	•
RTC	/	•
HMI	**Graphic color**	**Graphic color touchscreen**
Graphs visualization	Basic	Advanced
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	Modbus RTU, Modbus TCP/IP, Profibus DP-V0, BACnet/IP
RJ45 Daisy Chain (Ethernet version)	/	•

Overall dimensions

Dimensions
A: 96 mm
B: 96 mm
C: 77,5 mm
D: 57 mm
E: 20,5 mm
F: 92 mm





Same dimensions for all M4M 20 and M4M 30 versions

Ordering codes

M4M 20

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.

		Bbn	Order details		Weight	Pack
Communication protocol	I/O	8012542 EAN	Type code	Order code	[1 piece kg]	unit pc
BLE	2 Digital out.	511519	M4M 20	2CSG251151R4051	0,400	1
BLE, Modbus RTU	2 Digital out.	511410	M4M 20 Modbus	2CSG251141R4051		
BLE, Modbus TCP/IP	2 Digital out.	044710	M4M 20 Ethernet	2CSG204471R4051		
BLE, Profibus DP-V0	2 Digital out.	511311	M4M 20 Profibus	2CSG251131R4051		
BLE, BACnet/IP	2 Digital out.	368311	M4M 20 Bacnet	2CSG236831R4051		
BLE, Modbus RTU	2 Progr. I/O, 2 Digital out., 2 Analogue out.	511618	M4M 20 I/O	2CSG251161R4051		

M4M 20 - ROGOWSKI VERSION

M4M 20 is also available as compatible with ABB's R4M Rogowski coils for current measurement, increasing the flexibility of network analyzers offer and allowing retrofit in any existing installations.

M4M 20 Rogowski together with R4M Rogowski coils ensures the integration of basic power quality metering in any existing system with 0 downtime.

		Bbn	Order details		Weight	Pack
Communication protocol	I/O	8012542 EAN	Type code	Order code	[1 piece kg]	unit pc
BLE, Modbus RTU	2 Digital Outputs	070818	M4M 20 Rogowski	2CSG207081R4051	0,400	1

M4M 30

M4M 30 is ABB's network analyzer range that allows complete power quality analysis and energy efficiency evaluations.

Equipped with touchscreen color display for simplified access to the device and with Bluetooth module for smart commissioning.

		Bbn	Order details		Weight	Pack
Communication protocol	I/O	8012542 EAN	Type code	Order code	[1 piece kg]	unit pc
BLE, Modbus RTU	4 Progr. I/O	747611	M4M 30 Modbus	2CSG274761R4051		
BLE, Modbus TCP/IP	4 Progr. I/O	746812	M4M 30 Ethernet	2CSG274681R4051		
BLE, Profibus DP-V0	4 Progr. I/O	367918	M4M 30 Profibus	2CSG236791R4051	0,400	1
BLE, BACnet/IP	4 Progr. I/O	024514	M4M 30 Bacnet	2CSG202451R4051		
BLE, Modbus RTU	6 Progr. I/O, 2 Analogue out.	024712	M4M 30 I/O	2CSG202471R4051		

M4M 30 - ROGOWSKI VERSION

M4M 30 is also available as compatible with ABB's R4M Rogowski coils for current measurement, increasing the flexibility of network analyzers and allowing retrofit in any existing installations. M4M 30 Rogowski together with R4M coils ensure integration of complete PQ analysis in any existing system with 0 downtime.

		Bbn	Order details		Weight	Pack
Communication protocol	I/O	8012542 EAN	Type code	Order code	[1 piece kg]	unit pc
BLE, Modbus RTU	4 Prog. I/O	024613	M4M 30 Rogowski	2CSG202461R4051	0,400	1

R4M ROGOWSKI COILS

R4M Rogowski coils are flexible current transformer based on Rogowski technology, ideal to retrofit existing installa-tions up to 12kA. Available in two different sizes (80mm or 200mm diameters), R4M coils are directly equipped with pre-wired removable terminals that perfectly fit M4M 20 Rogowski (3 Rogowski coil inputs) and M4M 30 Rogowski (4 Rogowski coil inputs), with no need for external integrators.

	Bbn	Order details		Weight	Pack
Diameter (mm)	8012542 EAN	Type code	Order code	[1 piece kg]	unit pc
80	021605	R4M-80	2CSG202160R1101	0,150	1
200	021506	R4M-200	2CSG202150R1101	0,250	

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