

## 3. Technical characteristics

### 3.1. Description of the device

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

All M4M 30 network analyzers are equipped with touchscreen color display for simplified access to the device and with Bluetooth module for smart commissioning.

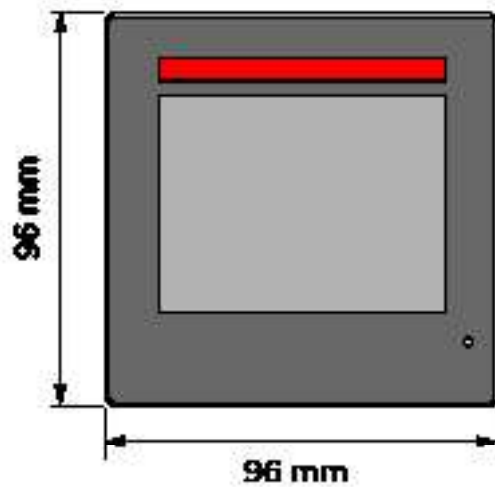
### 3.2. Main functionalities

<b>Real-time</b>	
TRMS current	•
TRMS Voltage	•
Frequency	•
Active, Reactive and Apparent Power	•
Power Factor	•
Operating timer, countdown timer	•
<b>Energy</b>	
Active, Reactive and Apparent Energy	•
4 quadrant Energy (Import/Export)	•
Tariffs	•
<b>Power quality</b>	
THD (I, VLN, VLL)	•
Individual Harmonics	40th
Unbalances (I, VLN, VLL)	•
Neutral current	Measured
Phasors (I, VLN)	•
Waveforms (I, VLN, VLL)	•
<b>Data recording and logs</b>	
Single alarms	25
Warnings, alarms and errors logs	•
Complex alarms with logics	4
Demand values (average)	Advanced
Min/Max Demand values	Advanced
Energy Trending logs	•
RTC	•
<b>HMI</b>	
Graphs visualization	Advanced
Notifications	•
Homepage and favourite page	•
Password protection	•
<b>Connectivity</b>	
Automatic integration in ABB Ability™ EDCS	•
Bluetooth Low Energy	•
Communication Protocols	Modbus RTU, Modbus TCP/IP, Profibus DP-V0, BACnet/IP
RJ45 Daisy Chain (Ethernet version)	•

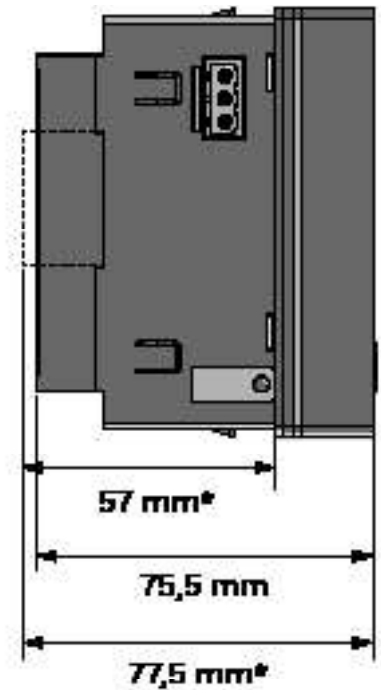
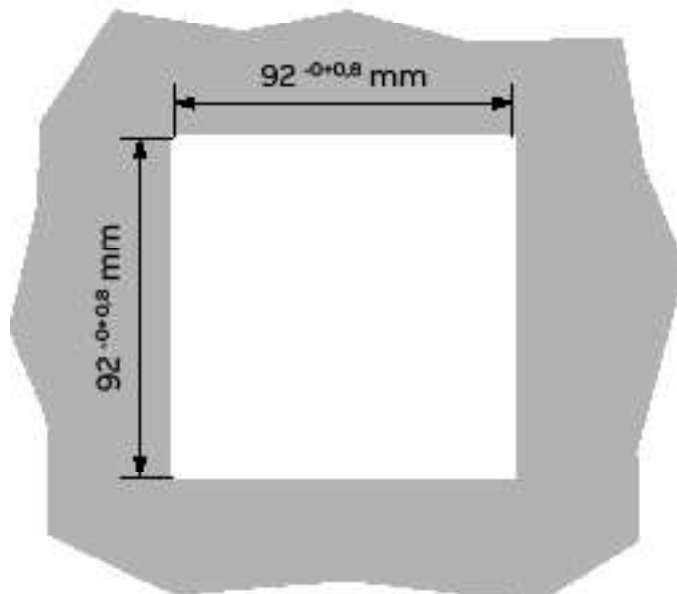
### 3.3. Versions

Product Name	I/O	Communication protocol
M4M 30 MODBUS	4 programmable I/O	Modbus RTU, Bluetooth
M4M 30 ETHERNET	4 programmable I/O	Modbus TCP/IP, Bluetooth
M4M 30 PROFIBUS	4 programmable I/O	Profibus DP-V0, Bluetooth
M4M 30 I/O	6 programmable I/O, 2 analogue outputs	Modbus RTU, Bluetooth
M4M 30 ROGOWSKI	4 programmable I/O	Modbus RTU, Bluetooth
M4M 30 BACNET	4 programmable I/O	BACnet/IP, Bluetooth

### 3.4. Overall dimensions



IEC 61554



\*with terminal.

### 3.5. Technical data

<b>Auxiliary power supply</b>		
Voltage range	[V]	48 to 240 VAC/VDC $\pm 15\%$
Frequency	[Hz]	50/60 Hz $\pm 5\%$
Power Consumption	[VA]	10 VA max
Installation category		CAT III 300V class per IEC 61010-1 edition 3
Protection fuse		T1 A - 277 VAC
<b>Measurement accuracy*</b>		
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 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		Class 0,2 acc. to IEC 61557-12
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.		
<b>Voltage measurement inputs</b>		
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		T1 A - 277 VAC
<b>Current measurement inputs</b>		
Number of current inputs		4 (L1, L2, L3, N)
<b>Indirect insertion with CT</b>		
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
<b>Indirect insertion with Rogowski coils</b>		
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 <sup>2</sup> Solid/stranded wire: 0,2 - 2,5 mm <sup>2</sup> (AWG 24 - 12) Pitch: 7,62 mm Poles: 4
Current inputs	Nominal cross section: 2,5 mm <sup>2</sup> Solid/stranded wire: 0,2 - 2,5 mm <sup>2</sup> (AWG 24 - 12) Pitch: 5,08 mm Poles: 8 Screw flanges for fixing
RS-485 Serial port	Nominal cross section: 2,5 mm <sup>2</sup> Solid/stranded wire: 0,2 - 2,5 mm <sup>2</sup> (AWG 24 - 12) Pitch: 5,08 mm Poles: 3
I/O	Nominal cross section: 2,5 mm <sup>2</sup> Solid/stranded wire: 0,2 - 2,5 mm <sup>2</sup> (AWG 24 - 12) Pitch: 5,08 mm Poles: 5 (Programmable I/O) Poles: 3 (Programmable I/O only on M4M 30 I/O) I/O) Poles: 3 (Analogue outputs, only on M4M 30 I/O)
Rogowski current probes	Only with ABB Rogowski probes: -R4M-200: 200 mm diameter (2CSG202150R1101) -R4M-80: 80 mm diameter (2CSG202160R1101)

<b>Climatic conditions</b>	
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
<b>User Interface</b>	
Access to device	Touchscreen
Display type	Graphic color display
Display dimensions	70 x 52 mm (3.5")
<b>Communication protocol</b>	
<b>Modbus RTU</b>	<b>M4M 30 Modbus, M4M 30 I/O, M4M 30 Rogowski</b>
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
<b>Profibus DP-V0</b>	<b>M4M 30 Profibus</b>
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
<b>Modbus TCP/IP</b>	<b>M4M 30 Ethernet</b>
Protocol	Modbus TCP/IP
Communication interface	RJ45 (2 ports for daisy-chain feature)
<b>BACnet</b>	<b>M4M 30 Bacnet</b>
Protocol	BACnet/IP
Communication interface	RJ45
<b>Bluetooth</b>	
Type	BLE (Bluetooth Low Energy)
<b>Real-time clock</b>	
Clock drift	~ 0.4 seconds per day
Battery backup time	~ 3 years without control power
<b>Standards</b>	
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)