

M1PRO 80

Single-phase Digital Energy meters Direct connection 80 A

Operating instructions

- This family of metering equipment provides the essential measurement capabilities required to monitor a single phase electrical installation.
- There are 3 models, mainly distinguished by the type of remote communication:

(*) certification parameters: 0.2S-5 (80) A, Class B, 230 VAC 50 Hz, -25 °C ... +40 °C, 4 quadrants, 3 tariffs.

- Active Energy Class B (according to EN 50470)
- and Reactive Energy Class 2 (according to IEC 62053-23)
- Direct connection (up to 80 A)
- Backlight LED display and 3 push buttons keys (to reset Energies, V, L, PF, F, F, Q and to configure some parameters)
- Display with 8 digits
- Self supplied by the input voltage itself
- 2 DIN modules width (36 mm)
- 2 tariffs controlled by a 230VAC digital input
- Depending on the models:
 - communication via Modbus RTU or
 - communication via M-Bus (1 unit load)

RISK OF ELECTRIC SHOCK, BURNS OR EXPLOSION

This device must be installed and maintained **ONLY** by qualified and duly authorized personnel.

During its installation, be sure there is no voltage applied.

Ordering Information

Code	Model	Description
MBS-120	M1PRO 80 Mod	2...3 digit out, 2 tariffs, Mod certified
MBS-120	M1PRO 80 M-Bus	2...3 digit out, 2 tariffs, M-B certified
MBS-120	M1PRO 80 Modbus	2...3 digit out, 2 tariffs, Mod certified

(*) For active market only active energy on display

Display

- kWh / kvarh display
- Running tariff, called tariff
- Energy value
- Precision control LED

Energy export (needed) →
Energy import (delivered) ←

Commands

- Scroll Key:** This key is used to scroll pages and to modify parameters value. Its pushing is accepted only if it is shorter than 1.5 second.
- OK key:** This key is used alone to enable a new menu function or to confirm a parameter value during its modification. Its pushing is accepted only if shorter than 1.5 seconds.
- ESC key:** This key is used alone to exit from a sub-menu, to cancel a parameter modification or to go back to the main page. In these cases, its pushing is accepted only < 1.5 seconds.
- A long pushing (>1.5 seconds) of the "ESC" key is used in the Partial Energy Registers Pages to reset their values.
- Push these 2 keys together, for at least 1.5 seconds, to enter into the Configuration Menu

Symbols

- Measuring elements
- Protected by double insulation

MID calibrated

A) Device code and certification data indicators

B) Safety-sealing between upper and lower housing part

Dimension

Cable stripping length and terminal screw torque

- 80 A direct connection main terminals
- Screw driver P22
- Tariff and Pulse outputs terminals
- Screw driver blade 0.8x3.5 mm
- Communication terminals
- Screw driver blade 0.8x3.5 mm

Device Switch-on and Main Page

M1PRO 80: 2 PULSES
M1PRO 80 M-Bus: M-BUS
M1PRO 80 Modbus: MODBUS

85231 kWh

Main Page:
This page appears not only at device switch-on, but also in case for 30 seconds no key is pushed. The value is the sum of 2 registers.
Imported Act. Energy Tariff T1 → Imported Act. Energy Tariff T2 (or alternatively, the sum of the Exported ones).

Display Back Light

If no button is pushed for 40 seconds, the display goes back to the Main Page and the backlight is switched off.

The 3 button pushing does not change the page but is used to switch the backlight on.

Main Menu

85231 kWh
908664 kWh
17465238 kWh
96 kvarh
TAR IFF-2

Instantaneous Measurements List

Watt: 1846 W
kW: 1.846 kW
var: 687 var
kvarh: 687 kWh
T1: 23031 U
T2: 6185 A
PF: 0.904 PF
Hz: 50.12 Hz
Fr: 50.12 Hz

PFc = Capacitive
PFI = Inductive

Partial Energy Registers Reset Procedure

25437 kWh

Reset Procedure: 000 kWh

Access to the Configuration Menu

23031 U

Default Password = 0010

Confirm the Digit, Increase the Digit, Password Correct, Parameters Menu

Technical Data

Data in compliance with EN 50470-1, EN 50470-3, EN 62053-23 and EN 62053-31	Direct Connection 80 A Pulse output SO	Direct Connection 80 A built-in Comm. Modbus/M-Bus
General characteristics		
• Housing	DIN 43880	DIN
• Mounting	EN 60715	35 mm DIN rail
• Depth		mm 70
• Weight		g 175
Operating Features		
• Connection	to single phase network	
• Storage of energy values and confs.	Internal Flash memory	
• Tariff	for active and reactive energy	
Approval (according to EN 50470-1, EN 50470-3)		
• Reference Voltage (Un)	VAC	230
• Reference Current (Iref)	A	5
• Minimum Current (Imin)	A	0.25
• Maximum Current (Imax)	A	80
• Starting Current (Ist)	A	0.015
• Reference Frequency (fn)	Hz	50
• Number of phases (number of wires)		1 (2)
• Certified Measures		
• Accuracy	Active Energies (acc. to EN 50470-3) and Active Powers	classe 5
	Reactive Energies (acc. to EN 62053-23) and Reactive Power	classe 2
Supply Voltage and Power Consumption		
• Operating Supply Voltage range	V	92...276
• Maximum Power Dissipation (Voltage circuit)	VA (W)	<=2 (1)
• Maximum VA burden (Current circuit) @ Imax	VA	<=1
• Voltage Input Waveform		AC
• Voltage impedance	MΩ	1
• Current impedance	mΩ	<=20
Overload capability		
• Voltage	VAC	276
	VAC	300
• Current	continuous	A 80
	temporary (10 ms)	A 2400
Measuring Features		
• Voltage range	VAC	92...276
• Current range	A	0.015...80
• Frequency range	Hz	45...65
• Measured Quantities		V, A, kWh, kvarh, PF, Hz, kW, kvar
Display features		
• Display type		LCD backlight
• Energy digits dimension	mm	6.2 x 3
• Active Energy	min. - max. kWh	0.01...99999.99
• Reactive Energy	min. - max. kvarh	0.01...99999.99
• Voltage	V	92.00...276.00
• Current	A	0.00...80.00
• Power factor		0.000...1.000
• Frequency	Hz	45.00...65.00
• Active Power	kW	0.00...17.40
• Reactive Power	kvar	0.00...17.40
• Running Tariff		T1 / T2
• Display refresh period	s	1
Optical metrological LED		
• Front mounted red LED (meter constant)	proportional to active /imp/exp Energy	p/kWh 1000
Safety		
• Protective class	classe	II
• AC voltage test (EN 50470-3, 7.2)	kV	4
• Degree of pollution		2
• Operational voltage	V	300
• Impulse voltage test	1.2/50 µs-kV classe	6
• Housing material flame resistance	UL 94	V0
• Safety-sealing between upper and lower housing part		yes
Pulse Outputs (SO signals, acc. to IEC 62053-31)		
• Pulse Output 1 or 2	selectable	
		kWh →, kWh →, kWh →, kWh →, kWh (T1) →, kWh (T2) →
• Pulse Rate	adjustable	p/kWh - p/kvarh 1...1000
• Pulse ON duration	adjustable	msec 30...100
• Operating voltage	Min. - Max.	VAC (DC) 5...28 (5...39)
• Pulse ON maximum current	in the range 3...28 VAC (5...39 VDC)	mA 90
• Pulse OFF leakage current	in the range 3...28 VAC (5...39 VDC)	µA 1
• Isolation class		SELV
Tariff		
• Tariff 1		open contact
• Tariff 2		open contact
• Input impedance	VAC	230 ±20%
	kΩ	224
Embedded communication		
• Modbus RTU	RS-485 - 3 wires	
• M-Bus	2 wires	
• Isolation class		SELV
IR Connectable Communication Modules		
• For communication module connection (LAN-TCP/IP / M-Bus / Modbus RTU / KNX)		yes
Connection terminals		
• Screwdriver for main terminals	head with 2 +/-	P22/P22
• Screwdriver for tariff and commun. terminals	slotted head	P22
• Terminal capacity main current paths	solid wire min. (max)	mm² 1.65 (3.5)
	stranded wire with sleeve min. (max)	mm² 1.65 (3.5)
• Terminal capacity for tariff and communication	solid wire min. (max)	mm² 1.14
	stranded wire with sleeve min. (max)	mm² 1.2 (2.5)
Environmental conditions (storage)		
• Temperature range	°C	-25...+70
Environmental conditions (operating)		
• Temperature range	°C	-25...+55
• Mechanical environment		M1
• Electromagnetic environment		E2
• Installation		yes
• Altitude (max)	m	<=2000
• Humidity		yearly average, not condensing <=75% <=95%
• IP rating		IP51/IP40

Wiring diagram

Model SO

Common
Modbus RTU

Model M-Bus

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• Reference Frequency (fn)	Hz	50
• Number of phases (number of wires)		1 (2)
• Certified Measures		
• Accuracy	Active Energies (acc. to EN 50470-3) and Active Powers	classe 5
	Reactive Energies (acc. to EN 62053-23) and Reactive Power	classe 2
Supply Voltage and Power Consumption		
• Operating Supply Voltage range	V	92...276
• Maximum Power Dissipation (Voltage circuit)	VA (W)	<=2 (1)
• Maximum VA burden (Current circuit) @ Imax	VA	<=1
• Voltage Input Waveform		AC
• Voltage impedance	MΩ	1
• Current impedance	mΩ	<=20
Overload capability		
• Voltage	VAC	276
	VAC	300
• Current	continuous	A 80
	temporary (10 ms)	A 2400
Measuring Features		
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• Active Power	kW	0.00...17.40
• Reactive Power	kvar	0.00...17.40
• Running Tariff		T1 / T2
• Display refresh period	s	1
Optical metrological LED		
• Front mounted red LED (meter constant)	proportional to active /imp/exp Energy	p/kWh 1000
Safety		
• Protective class	classe	II
• AC voltage test (EN 50470-3, 7.2)	kV	4
• Degree of pollution		2
• Operational voltage	V	300
• Impulse voltage test	1.2/50 µs-kV classe	6
• Housing material flame resistance	UL 94	V0
• Safety-sealing between upper and lower housing part		yes
Pulse Outputs (SO signals, acc. to IEC 62053-31)		
• Pulse Output 1 or 2	selectable	
		kWh →, kWh →, kWh →, kWh →, kWh (T1) →, kWh (T2) →
• Pulse Rate	adjustable	p/kWh - p/kvarh 1...1000
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Schema di cablaggio

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