

AD1-80MBIC

Energy Meters Single-Phase

Application

The AD1-80MBIC is the latest in the range of 1 phase 2 wire, 80 Amp, 230 Volt Din Rail meters which has MID appendix “B” and “D” certification. This new meter has been specifically designed with communication as its priority. This new meter has RS 485 Modbus communication (Autometers V6 protocol) built in as standard.

By using the Modbus channel for communication it is possible to view up to 15 different registers displaying kWh, kVarh, Amps, Volts, Power, Power Factor, Frequency, Import and Export energies and two tariffs.

Overview

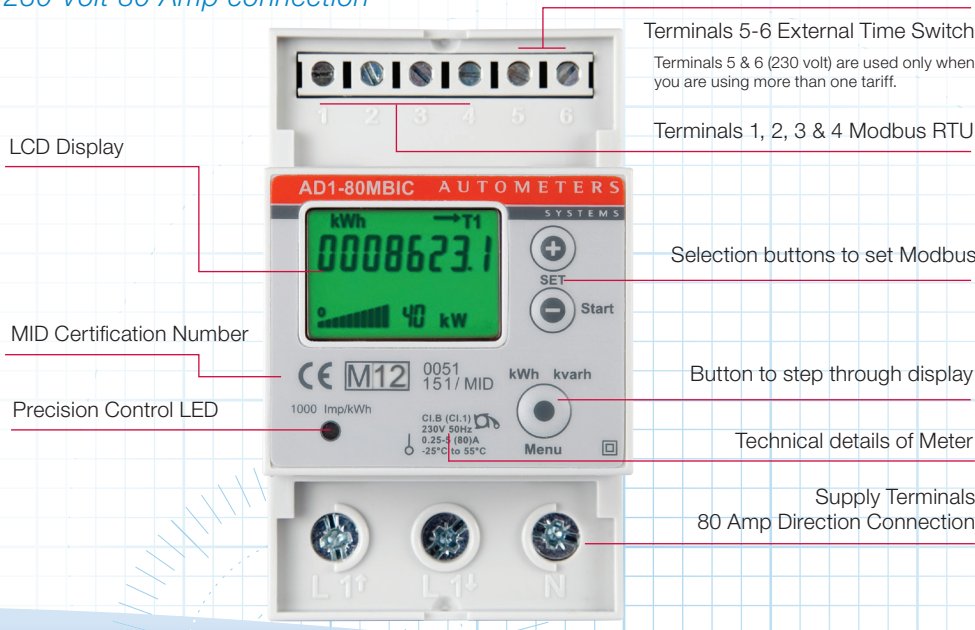
This family of devices provides a set of single phase energy meters designed to be directly connected to a system where high current is required. All the meters are equipped with an easy to read LCD with a green back light display. The meter can display kWh, kVarh, Import and export energies, Power bar indicator showing a percentage of (Pmax) and two tariffs. (An external time switch will be required to switch the tariffs over) The meter is also fitted with a red light which blinks in proportion to the measured active energy and with an optocoupler that allows the storage of energy on two different tariffs.

Function

Display	Unit	ID	Indication	
Active Energy	Tariff 1	kWh	-	Import Indication
	Tariff 2	kWh	-	Export Indication
Reactive Energy	Tariff 1	kVarh	-	Import Indication
	Tariff 2	kVarh	-	Export Indication
Tariff	T1, T2	↔	Will illuminate indicating present tariff	-
Phased Disconnection		Phase Error		-

3 Standard Module Housing

230 Volt 80 Amp connection



Installation



The meter must be fitted in a suitable enclosure. (See Autometers full range of enclosures).

Technical Data

Data in compliance with EN 50470-1, EN 504470-3 and EN 62053-31

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AD1-80MBIC
direct connection 80 A
inbuilt commun. Modbus

General characteristics

• Housing	DIN 43880	DIN	3 modules
• Mounting	EN 60715	35 mm	DIN rail
• Depth		mm	70

Operating features

• Connectivity	to single-phase network	n° wires	2
• Storage of energy values and configuration	digital display (EEPROM)	-	yes
• Display tariffs identifier	for active and reactive energy	n° 2	T1 and T2

Supply

• Certified voltage range <i>Un</i>		VAC	230 ±20%
• Operating voltage range		VAC	110 ... 276
• Certified frequency <i>fn</i>		Hz	50 ±2%
• Operating frequency range		Hz	48 ... 62
• Rated power dissipation (max.) <i>Pv</i>		VA (W)	≤8 (0.6)

Overload capability

• Voltage <i>Un</i>	continuous	VAC	276
	momentary (1 s)	VAC	300
• Current <i>I_{max}</i>	continuous	A	125
	momentary (10 ms)	A	3750

Display

• Display type	LCD	n° digits	8 (2 decimal)
• Active energy: 1 display, 7-digit + display import or export (arrow)	digit dimensions	mm x mm	6.00 x 3
	tariffs 2	kWh	0.01
	overflow	kWh	999999.99
• Reactive energy: 1 display, 7-digit + display import or export (arrow)	tariffs 2	kvarh	0.01
	overflow	kvarh	999999.99
• Instantaneous active power: 1 display, 3-digit		W, kW or MW	000 ... 999
• Instantaneous reactive power: 1 display, 3-digit		var, kvar or Mvar	000 ... 999
• Instantaneous tariff measurement		-	1
	1 display, 1-digit	-	T1 or T2
• Display period refresh		s	1

Measuring accuracy

• Active energy and power	acc.to EN 50470-3	class	B
• Reactive energy and power	acc.to EN 62053-23	class	2

Measuring input

• Type of connection	phase/N	-	direct
• Operating range voltage	phase/N	VAC	110 ... 276
• Current <i>I_{ref}</i>		A	5
• Current <i>I_{min}</i>		A	0.25
• Operating range current (<i>I_{st} ... I_{max}</i>)	direct connection	A	0.020 ... 80
• Operating frequency		Hz	48 ... 62
• Certified frequency		Hz	50 ±2%
• Starting current for energy measurement (<i>I_{st}</i>)		mA	20

Optical interfaces

• Front side (accuracy control)	LED	imp/kWh	1000
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Safety acc. to EN 50470-1

• Indoor meter		-	yes
• Degree of pollution		-	2
• Operational voltage		VAC	300
• AC voltage test (EN 50470-3, 7.2)		kV	4
• Impulse voltage test		1.2/50 µs-kV	6
• Protection class (EN 50470)		class	II
• Housing material flame resistance	UL 94	class	V0
• Safety-sealing between upper and lower housing part		-	yes

Embedded communication

• Modbus RTU	RS-485 - 3 wires	-	up to 38.400 bps
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Lateral IR interfaces

• For communication moduls connection (LAN-TCP/IP / M-Bus / KNX / SD-Card Datalogger)			- yes
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Connection terminals

• Type cage main current paths	screw head Z +/-	POZIDRIV	PZ2
• Type cage pulse output	blade for slotted screw	mm	0.8 x 3.5
• Terminal capacity main current paths	solid wire min. (max.)	mm ²	1.5 (50)
	stranded wire with sleeve min. (max.)	mm ²	1.5 (50)
• Terminal capacity pulse output	solid wire min. (max.)	mm ²	1 (4)
	stranded wire with sleeve min. (max.)	mm ²	1 (2.5)

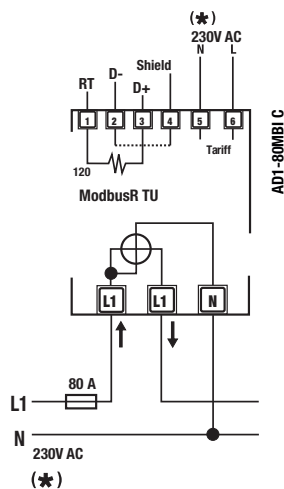
Environmental conditions

• Mechanical environment		-	M1
• Electromagnetic environment		-	E2
• Operating temperature		°C	-25 ... +55
• Limit temperature of transportation and storage		°C	-25 ... +70
• Relative humidity (not condensation)		%	≤80
• Vibrations	50 Hz sinusoidal vibration amplitude	mm	±0.075
• Degree protection	housing when mounted in front (terminal)	-	IP51(*)/IP20

(*) For the installation in a cabinet at least with IP51 protection.

Circuit Diagrams

1 Phase 2 Wire Connection Diagram



Terminals 5 & 6 only require 230 Volt from an external time switch when using more than one tariff

A fuse of 80A is recommended for the line protection.

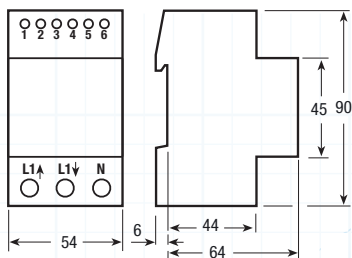
Modbus connections.

- D+ = TX+ Terminal 3
- D- = TX- Terminal 4
- RT = Internal resistor 1

Please note for the last meter on the Lan add a link connection between terminal 1 and terminal 3.

(There is an internal resistor built into the meter)

Dimensions



Display Registers

Main Menu

Page 1:
In this page, the value of the currently growing Active Energy is represented (or the last one that has grown). The energy may be Consumed or Generated, with Tariff T1 or T2, depending on the current Energy flowing

Page 2:
By pushing any key the back light turns on

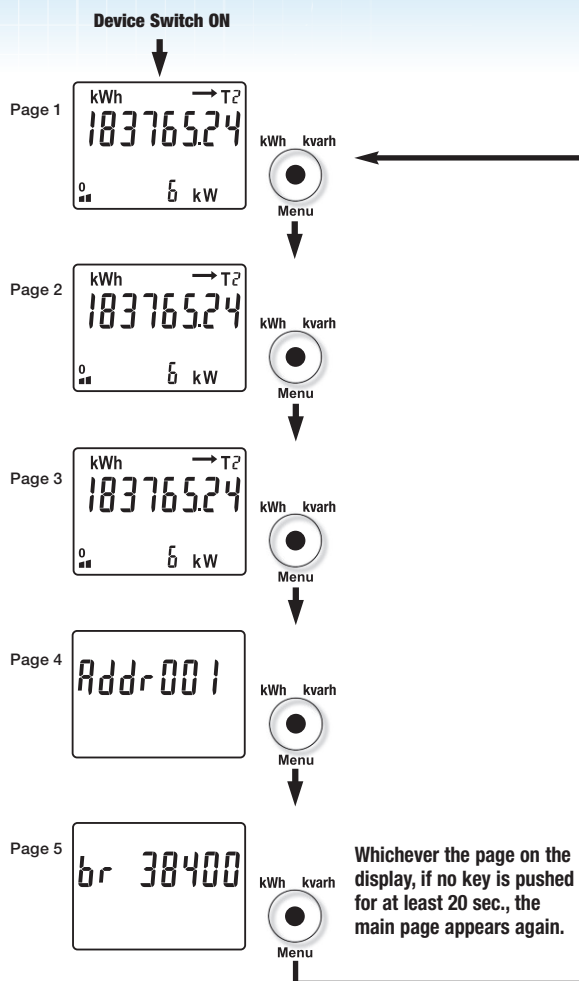
Page 3:
The next 8 "Menu key" presses allow the display of the 8 energy counters.

- The counters are:
- Active import energy on tariff 1
 - Active export energy on tariff 1
 - Reactive import energy on tariff 1
 - Reactive export energy on tariff 1
 - Active import energy on tariff 2
 - Active export energy on tariff 2
 - Reactive import energy on tariff 2
 - Reactive export energy on tariff 2

When is displayed an energy counter corresponding to the running tariff, on the bottom row the power is displayed

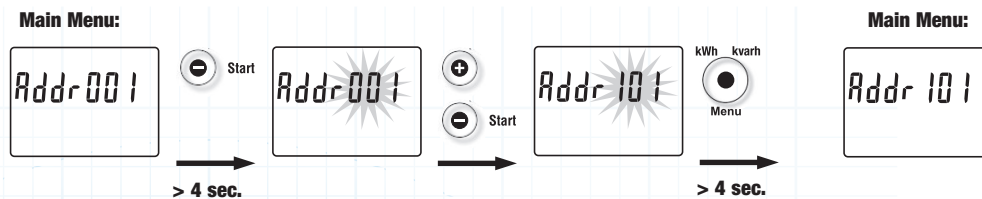
Page 4:
In this page the Modbus address or the primary address appears. This value can be altered, see the section Communication Address.

Page 5:
In this page the communication baud rate appears. This value can be altered, see the section Communication Baudrate.



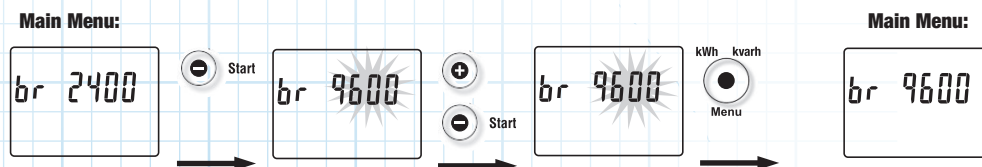
Communication Address

In the Address page by kept pushed for 4 sec. the "Start (-) key" the value of the Address blink on the display: Push "Start (-) key" or "(+)" charge the value. Push the "Menu key" to confirm, otherwise within 5 seconds the modification will be lost.



Communication Baudrate

In the Baudrate page by kept pushed for 4 sec. the "Start (-) key" the value of the Baud rate blink on the display. Push "Start (-) key" or "(+)" change the value. Push the "Menu key" for 4 sec. to confirm, otherwise within 5 seconds the modification will be lost.



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