

# 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.

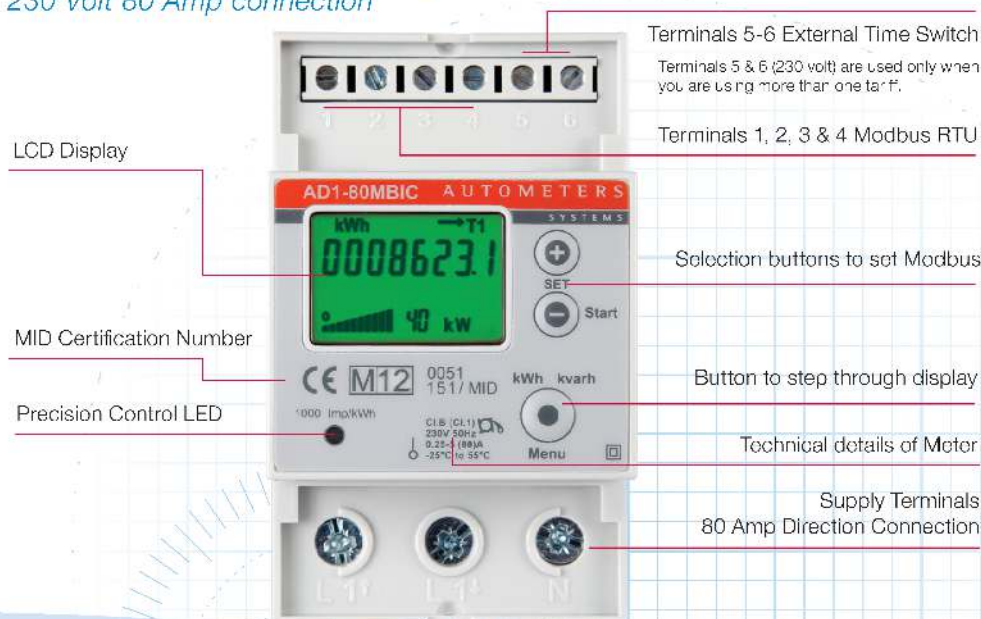
### Function

#### 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 (3.6)

**Overload capability**

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

**Display**

• Display type	LCD	n° digits	8 (2 decimal)
	digit dimensions	mm x mm	6.00 x 3
• Active energy: 1 d display, 7-dig t	tariffs 2	kWh	0.01
+ display import or export (arrow)	overflow	kWh	999999.99
• Reactive energy: 1 d display, 7-dig t	tariffs 2	kvarh	0.01
+ display import or export (arrow)	overflow	kvarh	999999.99
• Instantaneous active power: 1 d display, 3-dig t		W, kW or MW	000 ... 999
• Instantaneous reactive power: 1 d display, 3-dig t		var, kvar or Mvar	000 ... 999
• Instantaneous tariff measurement		-	1
	1 d display, 1 digit	-	11 or 12
• 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 62053-31	class	2

**Measuring input**

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

**Optical interfaces**

• Front side (accuracy control)	IPD	ims/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	8
• 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 modules 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	P22
• Type cage pulse output	blade for slotted screw	mm	0.8 x 3.5
• Terminal capacity main current paths	solid wire min. (max.)	mm <sup>2</sup>	1.5 (5C)
	stranded wire with sleeve min. (max.)	mm <sup>2</sup>	1.5 (5C)
• Terminal capacity pulse output	solid wire min. (max.)	mm <sup>2</sup>	1 (4)
	stranded wire with sleeve min. (max.)	mm <sup>2</sup>	1 (2.5)

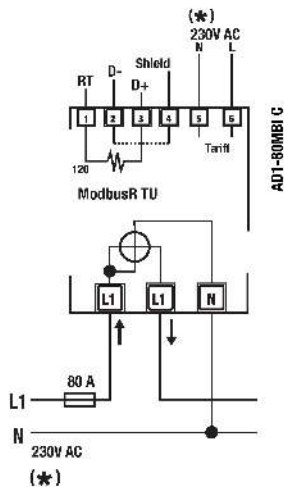
**Environmental conditions**

• Mechanical environment		-	M1
• Electromagnetic environment		-	E2
• Operating temperature		°C	25 ... +55
• Limit temperature of transportation and storage		°C	-25 ... +70
• Relative humidity (not condensation)		%	≤90
• 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 230V AC from an external time switch when using more than one tariff

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

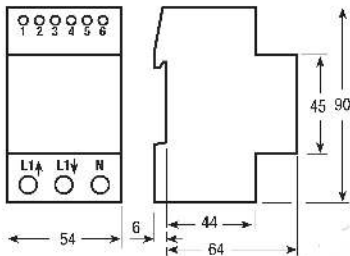
## Modbus connections.

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

Please note for the last meter on the line 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

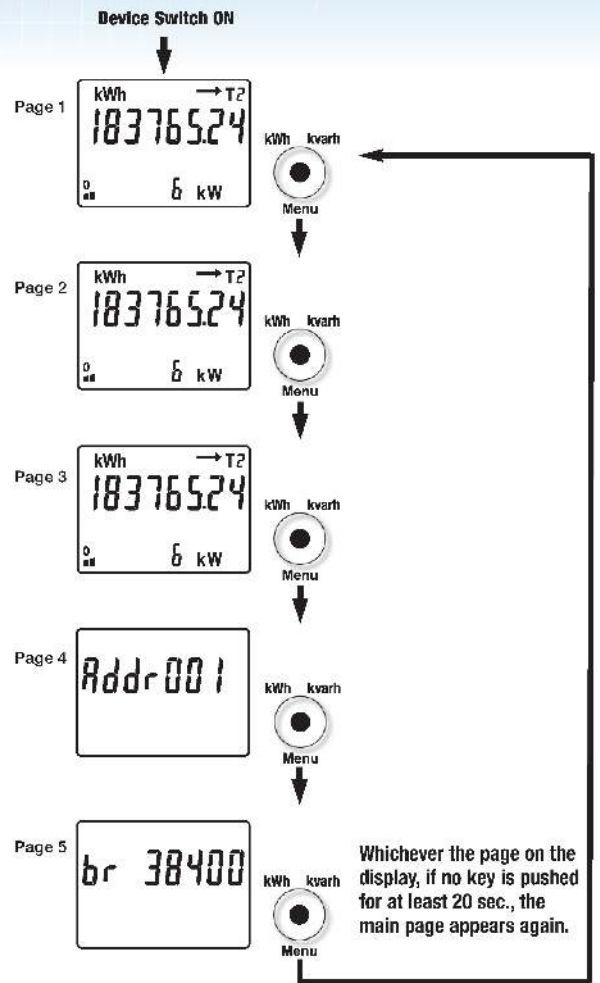
**Page 3:**  
The next 8 "Menu key" presses allow the display of the 8 energy counters.

- 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

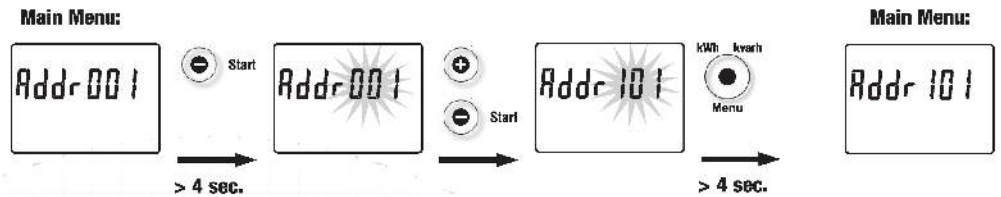
**Page 4:**  
In this page the Modbus address or the primary address appears. This value can be altered, see the section Communication Address.

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



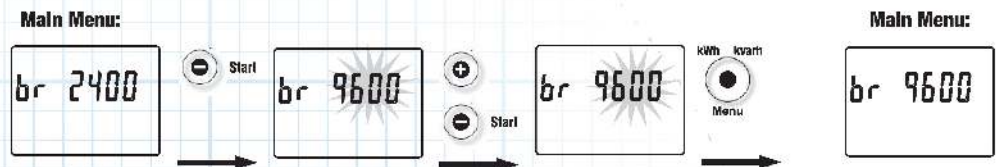
## Communication Address

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 "(+)" change 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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