iEM2050 Series Single Phase Energy Meter

User Manual

PHA6516400-03
03/2020

www.se.com

Legal Information

Safety information

Important information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that accompany this symbol to avoid possible injury or death.

⚠⚠DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

Failure to follow these instructions will result in death or serious injury.

⚠WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Please note

Electrical equipment should be installed, operated, serviced and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material. A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

About this manual

This manual discusses features of the iEM2050 series single phase energy meter and provides installation and configuration instructions.

Throughout the manual, the term “meter” / device” / “equipment” / “product” refers to all models of the iEM2050. All differences between the models, such as a feature specific to one model, are indicated with the appropriate model number or description.

This manual assumes you have an understanding of single phase energy meters and are familiar with the equipment and power system in which your meter is installed.

This manual does not provide configuration information for advanced features where an expert user would perform advanced configuration. It also does not include instructions on how to incorporate meter data or perform meter configuration using energy management systems or software, other than Modbus tool.

Please contact your local Schneider Electric representative to learn what additional training opportunities are available regarding iEM2050 series meter.

Make sure you are using the most up-to-date version of your device’s firmware in order to access the latest features.

The most up-to-date documentation about your device is available for download from www.se.com.

Scan the book QR code below to access documentation related to the iEM2050 series meter.

Schneider Electric Download Center

Related documents

Document	Number
iEM2050 series installation sheet	PHA6516600

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Safety precautions

Installation, wiring, testing and service must be performed in accordance with all local and national electrical codes.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E in the USA, CSA Z462 or applicable local standards.
- Turn off all power supplying this device and the equipment in which it is installed before working on the device or equipment.
- Always use a properly rated voltage sensing device to confirm that all power is off.
- Do not exceed the device's ratings for maximum limits.

Failure to follow these instructions will result in death or serious injury.

⚠WARNING

UNINTENDED OPERATION

Do not use this device for critical control or protection applications where human or equipment safety relies on the operation of the control circuit.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠WARNING

INACCURATE DATA RESULTS

- Do not rely solely on data displayed on the display or in software to determine if this device is functioning correctly or complying with all applicable standards.
- Do not use data displayed on the display or in software as a substitute for proper workplace practices or equipment maintenance.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Introduction

Meter overview

The iEM2050 series meter is a single phase meter which measures the forward and reverse energy.

All meters in the iEM2050 series range comply with Class 1 or Class B accuracy standards and feature high quality, reliability and affordability in a compact and easy to install format.

Meter Features

The key features of iEM2050 series meter are listed below:

- Measurement of active and reactive energy,
- 2 tariffs configured through Modbus communication,
- Pulse outputs,
- LCD display (current, voltage, power and energy measurements, and basic configuration),
- Communication via Modbus.

For applications, feature details and complete specifications of the iEM2050 series meters, see the iEM2050 series technical datasheet at www.se.com.

Feature summary

Parameter	iEM2050	iEM2055
4 quadrant energy measurements	√	√
Power: • Active power (kW) • Apparent power (kVA) • Reactive power (kVAR)	√	√
Current	√	√
Voltage	√	√
Frequency	√	√
Power factor	√	√
2 tariffs configured through Modbus communication	√	√
Pulse outputs	√	√
Communication	RS-485 Modbus RTU	RS-485 Modbus RTU
MID compliant	–	√
Class 1 as per IEC 62052-11 and IEC 62053-21	√	√
Class B as per EN 50470-1/3	–	√

Meter configuration

Meter configuration can be performed through the display or through communication.

Hardware references

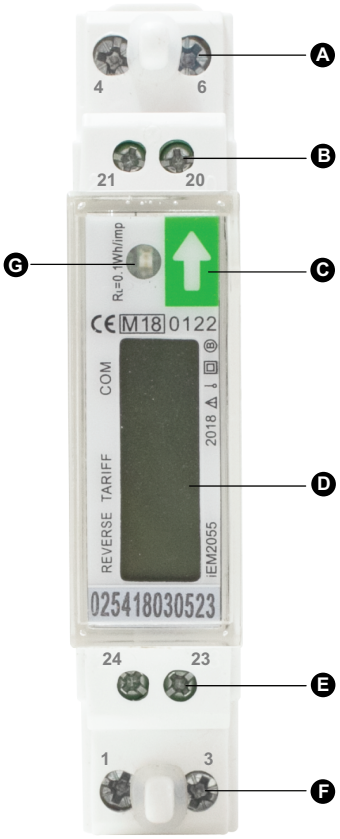
iEM2050 meter models

The iEM2050 series meter is available in one physical form factor and two different variants.

Meter models

Model	Commercial reference	Description
iEM2050	A9MEM2050	Class 1 accuracy as per IEC 62052-11 and IEC 62053-21
iEM2055	A9MEM2055	Class 1 accuracy as per IEC 62052-11 and IEC 62053-21 Class B as per EN 50470-1/3 MID compliance

DIN mount energy meter



A	Neutral in (4) and Neutral out (6)
B	Pulse output (20 and 21)
C	Button
D	LCD display
E	Modbus communication (23 and 24)
F	Line in (1) and Line out (3)
G	Energy flow LED indicator

Supplemental information

This document is intended to be used in conjunction with the installation sheet that ships in the box with the meter.

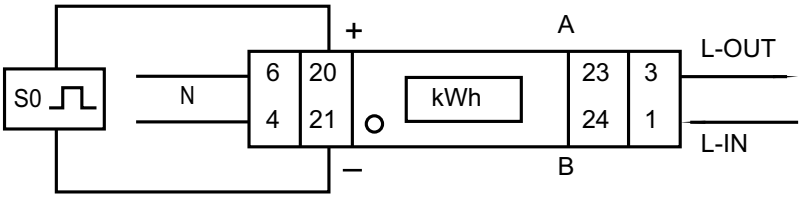
See the meter's installation sheet for information related to installation.

See the product's catalog pages at www.se.com for information about your meter and its options.

You can download updated documentation from www.se.com or contact your local Schneider Electric representative for the latest information about your product.

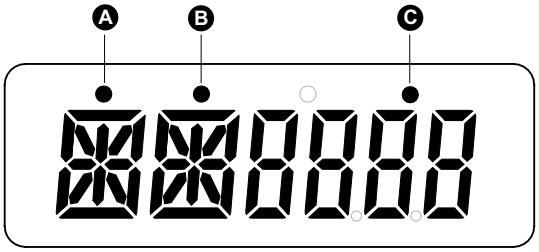
Meter wiring

The meter is equipped with 2 tariff functions, which is configured through Modbus communication between terminals 23 and 24.



Display and meter setup

Display overview



A	Reverse indicator
B	Tariff 2 (T2) indicator
C	Communication indicator

Energy flow indicator

The red LED on the front panel indicates the power flow measured by the meter. When power flows, the LED flashes. The faster the LED flashes, the more power is consumed. The LED flashes at 10000 times per kWh.

LCD display

The meter is equipped with a 6 digit LCD. For the energy consumption the meter displays 9999.99 kWh and switches to 99999.9 kWh when over this value and so on.

The LCD display has two rows. The upper row contains dots. The most left one (A) indicates energy flow direction (reverse).The centre one (B) indicates Tariff 2 (T2). The most right one (C) flashes when there is communication to an external device. The lower row displays all other metering information.

The first display indication of the meter in scrolling mode is either FW (forward) or RV (reverse).

On power up, the meter scrolls through five pages in an interval of 10 seconds. Press the button to view the 32 LCD pages.

Backlight

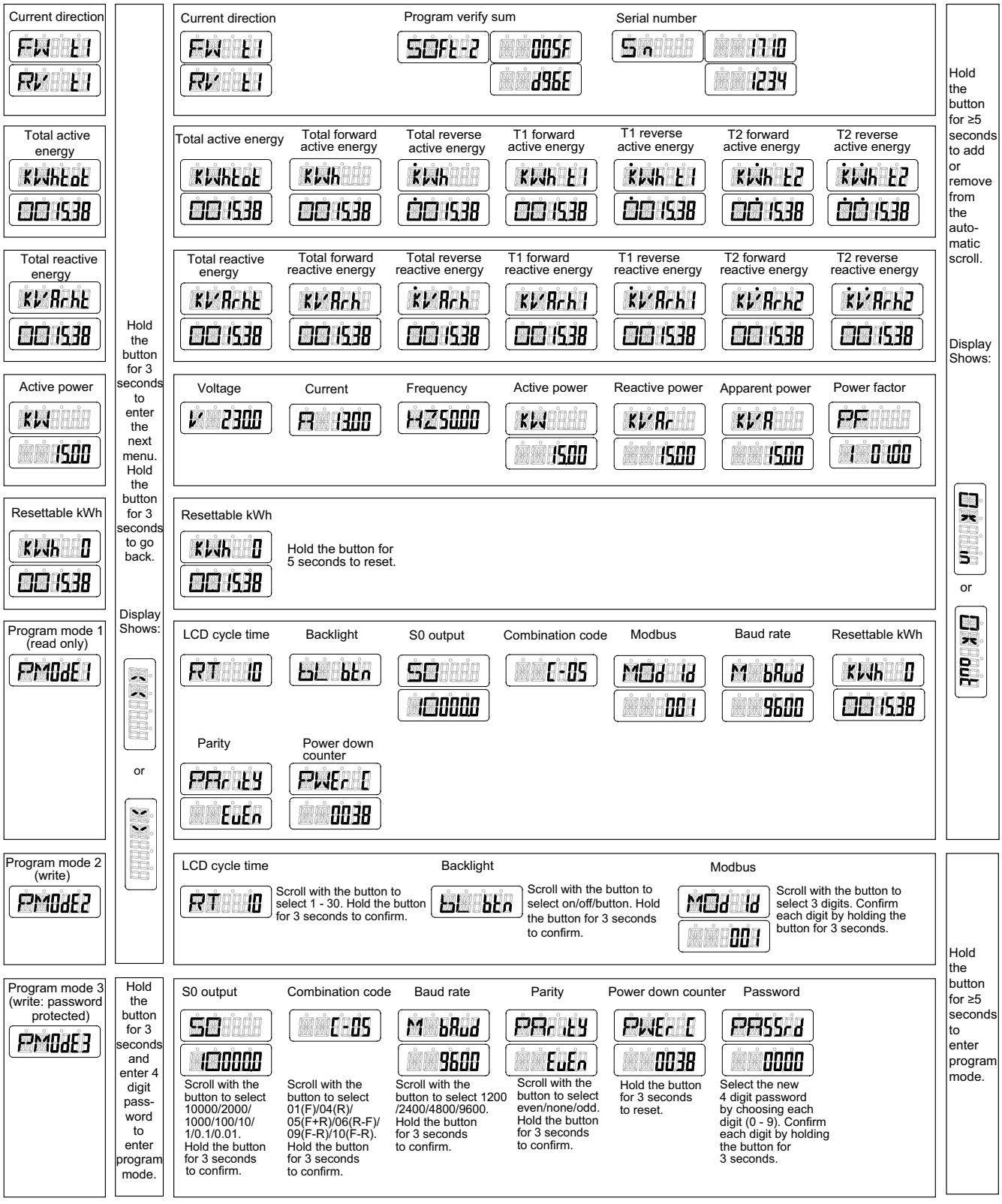
The meter is equipped with a blue backlight. The backlight can be set to **on**, **off** or **btn** (button) mode. After 30 seconds of inactivity, the back light switches **off**.

Button functions

Action	Button function
Press the button for less than 3 seconds	To enable scroll. **NOTE:** After 30 seconds of no interaction the meter goes back to automatic scroll mode.
Press the button for 3 seconds	To enter the next menu/to go back to previous menu. To confirm parameter settings.
Hold the button for more than 5 seconds	To add or remove from the automatic scroll mode. To enter program mode.

Display pages

The meter screens are grouped logically, according to their function. The meter's display screen and the button allows you to view the various parameters:



Scrolling function

Automatic scroll

Every 10 seconds (default setting) the meter displays the next programmed data page.

Setting up Scrolling time

1. Scroll with the button to Program mode 2 (**PM0dE2)**.
2. Hold the button for 3 seconds to enter the menu.
3. Scroll to LCD cycle time (**RT xx**) page.
4. Hold the button for 5 seconds to enter program mode.
5. When the value starts blinking: select the new value between 1 – 30 seconds.
6. Hold the button for 3 seconds to confirm the new scrolling time.
7. The LCD displays **OK** when the setting is confirmed.

Setting up registers

To add or remove registers to/from automatic scroll, follow these steps:

1. Scroll to the register [1] that you would like to add or remove.
2. Hold the button for 5 seconds to add or remove the register.
3. The LCD displays **OK in** or **OK out** .

Setting up backlight

1. Scroll with the button to Program mode 2 (**PM0dE2**).
2. Hold the button for 3 seconds to enter the menu.
3. Scroll to LCD backlight setting (**bL xx**) page.
4. Hold the button for 5 seconds to enter program mode.
5. When the value starts blinking: select **on**/**off**/**btn**.
6. Hold the button for 3 seconds to confirm the new setting.
7. The LCD displays **OK** when the setting is confirmed.

Resetting day counter

The meter is equipped with a day counter for consumed energy. The consumed energy can be reset to zero (0).

To reset the day counter to zero (0), follow these steps:

1. Scroll to LCD resettable kWh (**KWh 0**) page in the main menu.
2. Hold the button for 3 seconds to enter the menu.
3. When the value starts blinking: hold the button for 5 seconds to reset the day counter (**KWh 0**).
4. The LCD displays **OK** when the day counter (**KWh 0**) is reset.

Setting up pulse output rate

The meter is equipped with a pulse output which is optically isolated from the inside circuit. The meter generates pulses in proportion to the measured

1. Only the registers in the sub-menu after: Current direction, Total active energy, Total reactive energy, Active power and Program mode 1 can be added or removed to/from the automatic scroll.

consumption for purpose of remote reading or accuracy testing. The pulse output is a polarity dependent, open-collector transistor output which requires an external voltage source for correct operation. For this external voltage source, the voltage (U_i) should be less than 27 V DC. The maximum switching current (I_{max}) is 100 mA. To connect the impulse output, connect 5 – 27 V DC to connector 20 (collector), and the signal wire (S) to connector 21 (emitter).

To change the pulse output (SO) rate, follow these steps:

1. Scroll with the button to Program mode 3 (**PM0dE3**).
2. Hold the button for 3 seconds to enter the menu.
3. Enter the 4 digit password: scroll with the button and select each digit 0 – 9, hold the button for 3 seconds to confirm each digit. Default password is **0000**.
4. Scroll to LCD SO output (**SO xxxxxx**) page.
5. Hold the button for 5 seconds to enter program mode.
6. When the value starts blinking: select **10000/2000/1000/100/10/1/0.1/0.01**.
7. Hold the button for 3 seconds to confirm the new setting.
8. The LCD displays **OK** when the setting is confirmed.

Setting up combination code

The meter allows you to display the total energy (usage) based on the combination code. The combination code is in accordance with different calculation methods as shown below:

Code	Total (active) energy
C-01	Forward only
C-04	Reverse only
C-05	Forward + Reverse
C-06	Reverse - Forward
C-09	Forward - Reverse
C-10	Forward - Reverse

To change the combination code, follow these steps:

1. Scroll with the button to Program mode 3 (**PM0dE3**).
2. Hold the button for 3 seconds to enter the menu.
3. Enter the 4 digit password: scroll with the button and select each digit 0 – 9, hold the button for 3 seconds to confirm each digit. Default password is **0000**.
4. Scroll to LCD combination code (**C-xx**) page.
5. Hold the button for 5 seconds to enter program mode.
6. When the value starts blinking: select **01/04/05/06/09/10**.
7. Hold the button for 3 seconds to confirm the new setting.
8. The LCD displays **OK** when the setting is confirmed.

Setting up Modbus ID

The Modbus ID can be set from 001 to 247. The default Modbus ID is **001**.

To change the Modbus ID, follow these steps:

1. Scroll with the button to Program mode 2 (**PM0dE2**).
2. Hold the button for 3 seconds to enter the menu.
3. Scroll to LCD Modbus ID (**MOd Id xxx**) page.
4. Hold the button for 5 seconds to enter program mode.
5. When the value starts blinking: select 3 digits (**001 – 247**).
6. Hold the button for 3 seconds to confirm each digit.
7. The LCD displays **OK** when the setting is confirmed.

Setting up baud rate

The Modbus baud rate can be set from 1200 to 9600.

To change the baud rate, follow these steps:

1. Scroll with the button to Program mode 3 (**PM0dE3**).
2. Hold the button for 3 seconds to enter the menu.
3. Enter the 4 digit password: scroll with the button and select each digit 0 – 9, hold the button for 3 seconds to confirm each digit. Default password is **0000**.
4. Scroll to LCD baud rate (**M bAud xxxx**) page.
5. Hold the button for 5 seconds to enter program mode.
6. When the value starts blinking: select **9600/4800/2400/1200**.
7. Hold the button for 3 seconds to confirm the new setting.
8. The LCD displays **OK** when the setting is confirmed.

Setting up parity

The Modbus parity can be set to **even**, **none** or **odd**.

To change the parity, follow these steps:

1. Scroll with the button to Program mode 3 (**PM0dE3**).
2. Hold the button for 3 seconds to enter the menu.
3. Enter the 4 digit password: scroll with the button and select each digit 0 – 9, hold the button for 3 seconds to confirm each digit. Default password is **0000**.
4. Scroll to LCD parity (**PArity xxxx**) page.
5. Hold the button for 5 seconds to enter program mode.
6. When the value starts blinking: select **even/none/odd**.
7. Hold the button for 3 seconds to confirm the new setting.
8. The LCD displays **OK** when the setting is confirmed.

Resetting power down counter

The power down counter registers the number of times the meter has been turned off.

To reset the power down counter, follow these steps:

1. Scroll with the button to Program mode 3 (**PM0dE3**).

2. Hold the button for 3 seconds to enter the menu.
3. Enter the 4 digit password: scroll with the button and select each digit 0 – 9, hold the button for 3 seconds to confirm each digit. Default password is **0000**.
4. Scroll to LCD power down counter (**PWEr C xxxx**) page.
5. Hold the button for 5 seconds to enter program mode.
6. When the value starts blinking: hold the button for 3 seconds to reset.
7. The LCD displays **OK** when the power down counter (**PWEr C xxxx**) is reset.

Setting up password

The Program mode 3 is protected with a password. The default password is **0000**.

To change the password, follow these steps:

1. Scroll with the button to Program mode 3 (**PM0dE3**).
2. Hold the button for 3 seconds to enter the menu.
3. Enter the 4 digit password: scroll with the button and select each digit 0 – 9, hold the button for 3 seconds to confirm each digit.
4. Scroll to LCD password (**PASSrd xxxx**) page.
5. Hold the button for 5 seconds to enter program mode.
6. When the value starts blinking: select each digit 0 - 9, hold the button for 3 seconds to confirm each digit.
7. The LCD displays **OK** when the setting is confirmed.

Communication via Modbus

Communication through Modbus output

There are different software systems and methods you can use to access or display the meter data. This can range from using a simple Modbus register interface to read stored values in the meter's registers, to viewing intelligent information from the meter through an energy management system. The cable should be connected to terminals 23 and 24. The default communication address of the meter is 01.

The Modbus implementation used is Modbus basic (standard) with the following settings:

- Baud rate 9600
- 8 data bits
- Even parity
- 1 stop bit

The baud rate values can be changed to 4800, 2400, 1200. The parity can be set to none or odd. Data and stop bit cannot be changed.

NOTE:

When connecting the meter through a serial converter (RS-485) for testing, position an additional resistor (120 Ω/ 0.25 W) across the terminals (23 and 24) on the meter side.

Register list column description

Address	A 16-bit register address in hexadecimal. The address is the data used in the Modbus frame.
Register	A 16-bit register number in decimal (register = address + 1)
Action	R = Read only register W = Write only register RW = Read Write register RWC = Read register, write through Command register
Size	Data size in number of registers
Type	Data type
Units	Unit of the register value
Description	Information about the register and the range and values that apply

The Modbus register list data types are as follows:

Type	Description	Range
UInt16	16 bit unsigned integer	0 to 65535
UInt32	32 bit unsigned integer	0 to 4294967295
Int64	64 bit signed integer	−9223372036854775808 to +9223372036854775807
UTF8	8 bit field	Multibyte character encoding for Unicode
Float32	IEEE 754-1985 single precision floating-point value	-3.4E38 to +3.4E38
4Q FP PF	Four quadrant floating point power factor	-2 to +2
Bitmap	—	—

Register list

System

Address	Register	Action	Size	Type	Units	Description
0x001E	31	R	20	UTF8	-	Meter name
0x0032	51	R	20	UTF8	-	Meter model
0x0046	71	R	20	UTF8	-	Manufacturer
0x005A	91	R	1	UInt16	-	Meter code
0x0082	131	R	2	UInt32	-	Serial number
0x0088	137	R	5	UTF8	-	Hardware revision in x.x.x format (for example, 1.0.0) **NOTE:** The first number is the major version, the second number is the minor version, and the third number is normally not used.
0x0665	1638	R	1	UInt16	-	Present firmware version

Meter setup and status

Address	Register	Action	Size	Type	Units	Description
0x0725	1830	R	1	UInt16	-	Power on off counter
0x07DE	2015	R	1	UInt16	-	Number of phases (always 1)
0x07DF	2016	R	1	UInt16	-	Number of wires (always 2)
0x07E0	2017	R	1	UInt16	-	Power system (always 0 = 1PH2W L-N)
0x07E1	2018	R	1	UInt16	Hz	Nominal frequency
0x07E4	2021	R	2	Float32	A	Meter Amps

Command interface

Address	Register	Action	Size	Type	Units	Description
0x1482	5251	W	1	UInt16	-	Requested command
0x1483	5252	W	1	UInt16	-	Reserved for future use
0x1484 - 0x14FE	5253 - 5375	W	1	UInt16	-	Command parameter 001 -123
0x14FF	5376	R/W	1	UInt16	-	Command status
0x1500	5377	R/W	1	UInt16	-	Command result codes: • 0 = Valid and successful command • 3000 = Invalid command • 3001 = Invalid parameter • 3002 = Invalid number of parameters • 3007 = Command is valid but the operation was not performed

Display

Address	Register	Action	Size	Type	Units	Description
0x17D4	6101	R/WC	1	UInt16	-	LCD cycle time

Communication

Address	Register	Action	Size	Type	Units	Description
0x1965	6502	R/WC	1	UInt16	-	RS-485 communication port address
0x1966	6503	R/WC	1	UInt16	-	RS-485 communication baud rate: • 1= 9600 • 2= 4800 • 3= 2400 • 4 = 1200
0x1967	6504	R/WC	1	UInt16	-	RS-485 communication parity: • 1 = Even • 2 = None • 3 = Odd

Energy pulse output

Address	Register	Action	Size	Type	Units	Description
0x1968	6505	R/WC	2	Float32	-	S0 output rate

Energy settings

Address	Register	Action	Size	Type	Units	Description
0x196A	6507	R/WC	1	UInt16	-	Combined Code (Refer to section *Setting up combination code, page 15* of this user manual)

Meter data

Current, voltage, power, power factor, and frequency

Address	Register	Action	Size	Type	Units	Description
Current						
0x0BB8	3001	R	2	Float32	A	Current
Voltage						
0x0BD4	3029	R	2	Float32	V	Voltage
Power						
0x0BEE	3055	R	2	Float32	kW	Active power
0x0BFC	3069	R	2	Float32	kVAr	Reactive power
0x0C04	3077	R	2	Float32	kVA	Apparent power
Power factor						
0x0C0C	3085	R	2	4Q_FP_PF	-	Total power factor: • -2 < PF < -1 = Quad 2, active power negative, capacitive • -1 < PF < 0 = Quad 3, active power negative, inductive • 0 < PF < 1 = Quad 1, active power positive, inductive • 1 < PF < 2 = Quad 4, active power positive, capacitive
Frequency						
0x0C26	3111	R	2	Float32	Hz	Frequency • Range : 40 to 70

Energy and energy by tariff

Energy values – 64-bit integer

Address	Register	Action	Size	Type	Units	Description
Total energy (cannot be rest)						
0x0C84	3205	R	4	Int64	Wh	Forward active energy
0x0C88	3209	R	4	Int64	Wh	Reverse active energy
0x0C8C	3213	R	4	Int64	Wh	Total active energy
0x0C94	3221	R	4	Int64	VARh	Forward reactive energy
0x0C98	3225	R	4	Int64	VARh	Reverse reactive energy
0x0C9C	3229	R	4	Int64	VARh	Total reactive energy
Partial energy						
0x0CB8	3257	R	4	Int64	Wh	Forward partial active energy
Energy by tariff						
0x105F	4192	R/WC	1	UInt16	-	Tariff (01 - T1, 02 - T2)
0x1064	4197	R	4	Int64	Wh	T1 Forward active energy
0x1068	4201	R	4	Int64	Wh	T2 Forward active energy
0x106C	4205	R	4	Int64	Wh	T1 Reverse active energy
0x1070	4209	R	4	Int64	Wh	T2 Reverse active energy
0x1074	4213	R	4	Int64	Wh	T1 Total active energy
0x1078	4217	R	4	Int64	Wh	T2 Total active energy
0x107C	4221	R	4	Int64	VARh	T1 Forward reactive energy
0x1080	4225	R	4	Int64	VARh	T2 Forward reactive energy
0x1084	4229	R	4	Int64	VARh	T1 Reverse reactive energy
0x1088	4233	R	4	Int64	VARh	T2 Reverse reactive energy
0x108C	4237	R	4	Int64	VARh	T1 Total reactive energy
0x1090	4241	R	4	Int64	VARh	T2 Total reactive energy

Energy values – 32-bit floating point

Address	Register	Action	Size	Type	Units	Description
Total energy (cannot be rest)						
0xB02C	45101	R	2	Float32	Wh	Forward active energy
0xB02E	45103	R	2	Float32	Wh	Reverse active energy
0xB030	45105	R	2	Float32	VARh	Forward reactive energy
0xB032	45107	R	2	Float32	VARh	Reverse reactive energy
0xB038	45113	R	2	Float32	Wh	Total active energy
0xB03A	45115	R	2	Float32	VARh	Total reactive energy
Partial energy						
0xB034	45109	R	2	Float32	Wh	Forward partial active energy
Energy by tariff						
0xB040	45121	R	4	Float32	Wh	T1 Forward active energy
0xB042	45123	R	4	Float32	Wh	T2 Forward active energy
0xB044	45125	R	4	Float32	Wh	T1 Reverse active energy
0xB046	45127	R	4	Float32	Wh	T2 Reverse active energy

Energy values – 32-bit floating point (Continued)

Address	Register	Action	Size	Type	Units	Description
0xB048	45129	R	4	Float32	Wh	T1 Total active energy
0xB04A	45131	R	4	Float32	Wh	T2 Total active energy
0xB04C	45133	R	4	Float32	VARh	T1 Forward reactive energy
0xB04E	45135	R	4	Float32	VARh	T2 Forward reactive energy
0xB050	45137	R	4	Float32	VARh	T1 Reverse reactive energy
0xB052	45139	R	4	Float32	VARh	T2 Reverse reactive energy
0xB054	45141	R	4	Float32	VARh	T1 Total reactive energy
0xB056	45143	R	4	Float32	VARh	T2 Total reactive energy

Diagnostics

Address	Register	Action	Size	Type	Units	Description
0x4E23	20004	R	5	Bitmap	-	Err-02 • 0 = No error • 3 = Software error • 5 = Memory error

Command list

Tariff

Command Number	Action (R/W)	Size	Type	Unit	Range	Description
2008	W	1	UInt16	—	—	(Reserved)
	W	1	UInt16	—	1, 2	Tariff: 1 = T1 2 = T2

Pulse output

Command Number	Action (R/W)	Size	Type	Unit	Range	Description
2003	W	1	UInt16	—	—	(Reserved)
	W	2	Float32	kW/pulse	10000, 2000, 1000, 100, 10, 1, 0.1, 0.01	Pulse constant

Reset partial energy counters

Command Number	Action (R/W)	Size	Type	Unit	Range	Description
2020	W	1	UInt16	—	—	(Reserved)

Combined code

Command Number	Action (R/W)	Size	Type	Unit	Range	Description
2958	W	1	UInt16	—	—	(Reserved)

Command Number	Action (R/W)	Size	Type	Unit	Range	Description
	W	1	UInt16	—	01, 04, 05, 06, 09 and 10	Combined code

LCD cycle time

Command Number	Action (R/W)	Size	Type	Unit	Range	Description
4001	W	1	UInt16	—	—	(Reserved)
	W	1	UInt16	—	1 - 30 seconds	LCD cycle time

Communication

Command Number	Action (R/W)	Size	Type	Unit	Range	Description
5000	W	1	UInt16	—	—	(Reserved)
	W	1	UInt16	—	—	(Reserved)
	W	1	UInt16	—	—	(Reserved)
	W	1	UInt16	—	1 – 247	Meter ID (Modbus)
	W	1	UInt16	—	1 – 4	Baud Rate: 1 = 9600 2 = 4800 3 = 2400 4 = 1200
	W	1	UInt16	—	1 – 3	Parity: 1 = Even 2 = None 3 = Odd
	W	1	UInt16	—	—	(Reserved)

Maintenance and upgrades

Maintenance overview

The meter does not contain any user-serviceable parts. If the meter requires service, contact your local Schneider Electric Technical Support representative.

NOTICE
EQUIPMENT DAMAGE • Do not open the device case. • Do not attempt to repair any components of the device. **Failure to follow these instructions can result in equipment damage.**

Do not open the meter. Opening the meter voids the warranty.

Troubleshooting

Problem	Probable cause	Possible solution
The red consumption LED is not flashing (Pulse LED).	There is no load connected to the meter.	Connect load to the meter.
	The load on the line is very low.	Check with multimeter, if the load value is very low.
The register does not count.	There is almost no load connected to the meter.	Check if the red consumption LED is flashing.
No pulse output.	The pulse output is not supplied with DC power. The pulse output is not connected correctly.	Check the external voltage source (U_i) is 5 – 27 V DC with a voltmeter. Check if the connection is correct: the 5 – 27 V DC should be connected to the collector connection (pin 20 +) and the signal wire (S) to the emitter connection (pin 21-).
The pulse output rate is wrong.	Is the correct pulse rate set via the Modbus tool or in Program mode 3?	Use the Modbus tool which can be bought separately.

If the problem is not fixed after troubleshooting, contact Technical Support for help.

Display errors

Display shows	Kind of errors	Solution
Err 01	Memory error	Please contact your local Schneider Electric representative for meter replacement
Err 02	Program code checksum error	

Technical assistance

Visit www.se.com for support and assistance with lost passwords or other technical problems with the meter.

Meter specifications

The specifications contained in this section are subject to change without notice.

For installation and wiring information, refer to the meter installation sheet.

Mechanical characteristics

IP degree of protection (IEC 60529-1)	Front display: IP51
Mounting position	Vertical
Display type	6 digit LCD
Keypad	1 button
Front panel LED indicator	Energy flow LED
Weight	~ 0.08 kg
Dimensions W x H x D	17.5 x 117 x 63 mm max

Electrical characteristics

Measurement accuracy

Active Energy	**A9MEM2050** • Class 1 as per IEC 62052-11 and IEC 62053-21 **A9MEM2055** • Class 1 as per IEC 62052-11 and IEC 62053-21 • Class B as per EN 50470-1/3

Voltage inputs

Nominal voltage (U)	230 V AC
Operational voltage	195 to 253 V AC
Insulation capabilities	AC voltage withstand: 4 KV for 1 minute Impulse voltage withstand: 6 KV for 1.2 µS waveform
Operational frequency	**A9MEM2050**: 50/60 Hz ± 10%
	A9MEM2055: 50 Hz ± 10%

Current inputs

Basic current (I_b)	5 A
Maximum rated current (I_{max})	45 A
Operational current	0.4%I_b – I_{max}
Overcurrent withstand	30 I_{max} for 0.01 s
Operational frequency	**A9MEM2050**: 50/60 Hz ± 10%
	A9MEM2055: 50 Hz ± 10%

Power consumption

Internal power consumption	≤2 W/Phase - ≤10 VA/Phase

Pulse characteristics

Test output flash rate (Red LED)	10000 imp/kWh
Pulse output rate	10000/2000/1000/100/10/1/0.1/0.01 imp/kWh
Pulse width	≤5625 W: 32 ms >5625 W: 11.2 ms

Environmental characteristics

Operating temperature	-25 °C to +55 °C (-13 °F to +131 °F)
Storage temperature	-30 °C to +70 °C (-22 °F to 158 °F)
Operating humidity	≤75%
Storage humidity	≤95%

Safety

Protective Class	II, Insulated encased meter of protective class

Basic errors

$0.05I_b$	Cosφ = 1 ±1.5%
$0.1I_b$	Cosφ = 0.5Lag ±1.5% Cosφ = 0.8Lead ±1.5%
$0.1I_b – I_{max}$	Cosφ = 1 ±1%
$0.2I_b – I_{max}$	Cosφ = 0.5Lag ±1% Cosφ = 0.8Lead ±1%

RS-485 communications

Bus type	RS-485
Protocol	Modbus RTU with 16 bit CRC
Baud rate	1200, 2400, 4800, and 9600 (default)
Address range	1-247 user configurable
Maximum bus load	60 meters per bus
Range	1000 m

Data storage

Backup period	The data can be stored for more than 10 years without power

Schneider Electric
35 rue Joseph Monier
92500 Rueil Malmaison
France

+ 33 (0) 1 41 29 70 00

www.se.com

As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

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