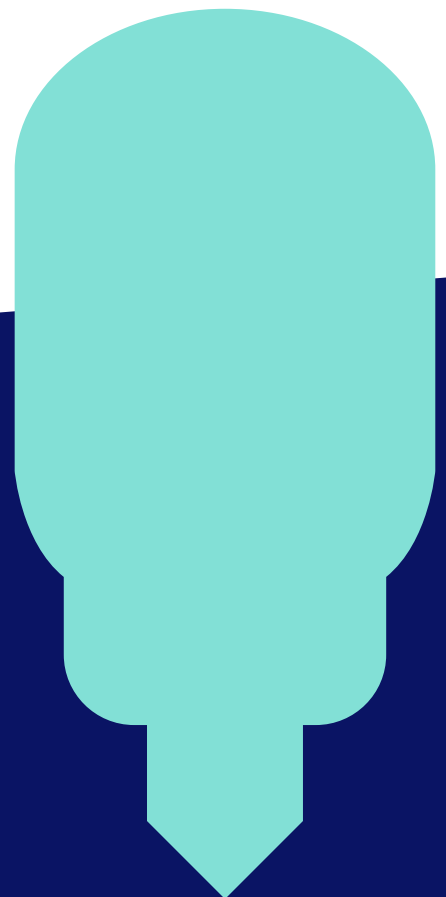




SGM1430-B Smart meter Polyphase electricity meter

User manual

Version 1.0



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Product description

The SGM1430-B meter from Aclara is one of an advanced, modular designed family of products for small to medium enterprise and commercial installations. The SGM1430-B is available in different polyphase variations, and it forms an integral part of a complete two-way, secure, end-to-end solution.

The SGM1430-B offers flexibility and the choice of home area network (HAN) and wide area network (WAN) communications. As standard, the SGM1430-B supports different advanced metering infrastructure (AMI) technologies, including the UK communications service provider (CSP) hub solution. This hub mechanically connects directly to the electricity meter and communicates with it using the ZigBee communication protocol. A manufacturing option that provides direct communications via a hardwired interface is also available.

The on-board ZigBee radio frequency (RF) interface uses an industry-standard Smart Energy Profile for HAN communications to the UK communications hub and in-home displays (IHDs).

The standard meter is supplied with an integrated 3 x 100 A switch for consumer supply connection/disconnection. Certain models of the SGM1430-B meter offer an optional 2 A load control relay for controlling other ancillary devices such as night storage heating and pumps.

The meters also support a comprehensive tariff developed in association with the UK Great Britain Companion Specifications Standard, plus both seasonal time of day (STOD) and block tariffs.

Additionally, the meters offer storage for two years of load profile data and support independent profiling of voltage profile data (e.g. line voltage, current, frequency). The SGM1430-B meter also provides, as standard, enhanced power quality features offering support for sag/swell and under/over voltage.

Designed with easy installation in mind, the SGM1430-B meter offers a means for quick and secure deployment, and a custom-designed Liquid Crystal Display (LCD) provides added value information. For example, when ZigBee is used, information such as HAN pairing progress, notification of pairing complete, local signal strengths for HAN is displayed to improve the installation experience. All SGM1430-B meters have a common layout for buttons, optical port, display, and pulse indicators. The communications hub interface is also standardised across all meter models. It's possible to customise the SGM1430-B meter with optional variants and extras, including the following:

- Back-lit LCD
- Hardwired communications interface
- Magnetic detection
- Removal of the HAN

General information

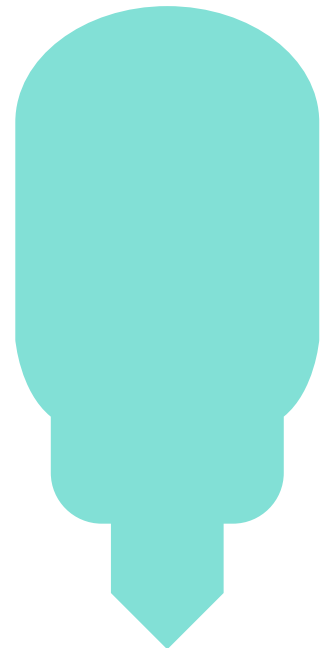
Key features

- Product life of 20 years
- Polyphase direct connected (whole current)
- Optional one or two 2 A auxiliary relay
- A field-replaceable CSP communications hub that prevents disruption of service
- Comprehensive metrology – active, reactive, and apparent energy; import and export
- Extensive tariff capability – 48 x standard time of day time of use (TOU) registers and 4 x 8 block tariff
- Two years of load profile data storage
- Three months of voltage profile data
- Daily, weekly, and monthly billing data
- Voltage sag/swell, under/over voltage
- Over and under frequency
- Power factor threshold
- Comprehensive event logging with over 100 unique event codes, as well as Security, Power Event, Standard Event, and Auxiliary Load Control Switch (ALCS) logs for event storage
- Enhanced physical and electronic security (tamper, password levels)
- HAN support of industry-standard Smart Energy Profile
- General Packet Radio Service (GPRS) WAN for remote retrieval of data to a head-end system via CSP communications hub
- Device Language Message Specification (DLMS) and Companion Specification for Energy Metering (COSEM) compliant via the optical port
- Firmware over-the-air (FOTA) full upgrades
- Change of tenancy (CoT) and change of supplier (CoS)
- Dual firmware versions, with rollback feature during firmware update
- Extensive data storage

- Simultaneous local and remote communication without performance loss
- Enhanced power quality monitoring including voltage, frequency, and power factor
- Control of external loads via auxiliary relay
- Short terminal cover

Tariff structure

- Active and deferred tariffs
- 50 special days
- 48 ToU registers
- 200 switching times
- 4 x 8 block tariffs
- 13 end of month billing dates
- 4 seasons
- 5 weekly billing dates
- 5 week profiles
- 31 daily billing sets
- 16 day profiles



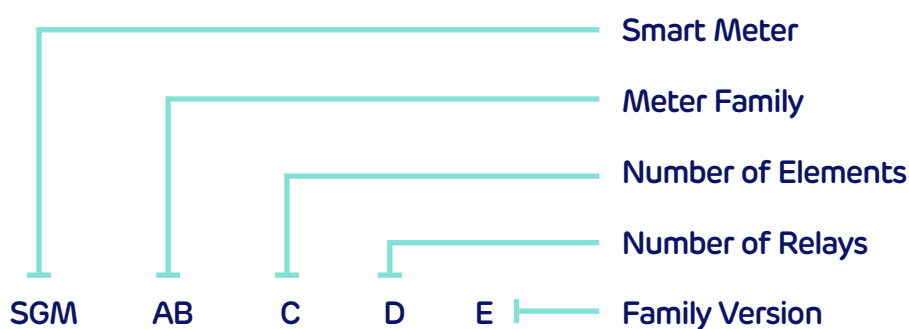
General information

Features

- Processor internal memory with 1.5 MB of flash memory for program and boot, plus 640 KB of internal RAM
- External serial flash memory with 16 MB for configuration and operational data, as well as for firmware upgrade image storage
- Configurable display with auto and manual scroll lists and user-defined fields
- Independent communication ports: local optical port, AMI interface port (GPRS as standard), and ZigBee HAN port
- Configurable ToU operation to support fully flexible tariffing
- Flexible calendar definition that supports up to 48 daily time periods, 16 day types, four week types, 50 designated holidays or special days, and four seasons
- Configurable measurement profile with independent measurements for each element
- Select demand measurement for demand calculation, including selected measurement profile and selectable demand interval
- Prepayment mode of operation
- Field-replaceable CSP communications hub that provides flexibility for WAN communications
- Tamper detection for meter cover, terminal cover, and communications hub cover

Models

The SGM1430-B smart meter family consists of meters with common physical characteristics and functionality. The nomenclature of the meter models indicates the following:



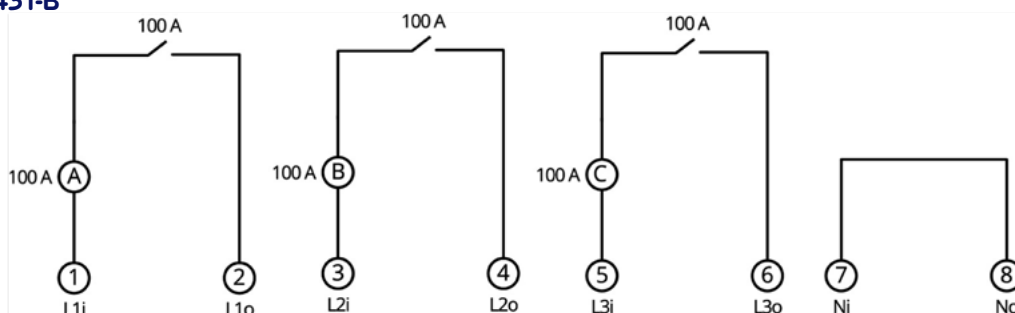
The following models are currently available:

Model	Connect type	Phase	Current elements	3 x 100 A contactor	2 A auxiliary relay	Itr – Iref (I _{max})
SGM1431-B	Direct	Poly	3	Yes	No	0.5-10 (100 A)
SGM1432-B	Direct	Poly	3	Yes	Yes x 1	0.5-10 (100 A)
SGM1433-B	Direct	Poly	3	Yes	Yes x 2	0.5-10 (100 A)

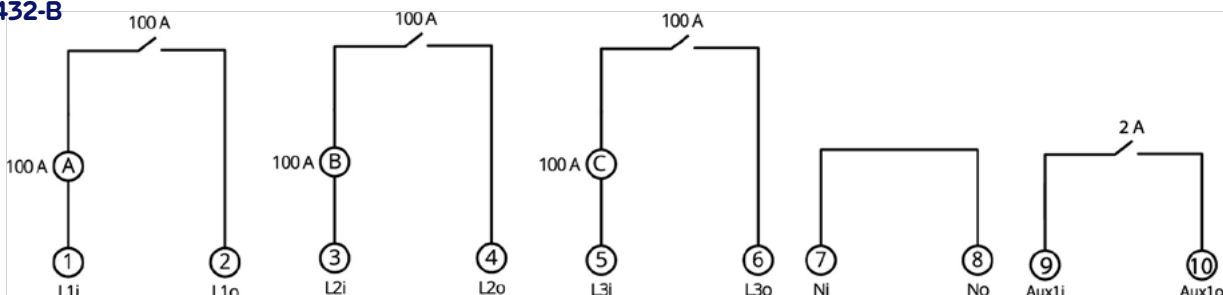
Terminal arrangements

The SGM1430-B polyphase meters conform to the British Standard Institute code of practice (BS 7856:2013).

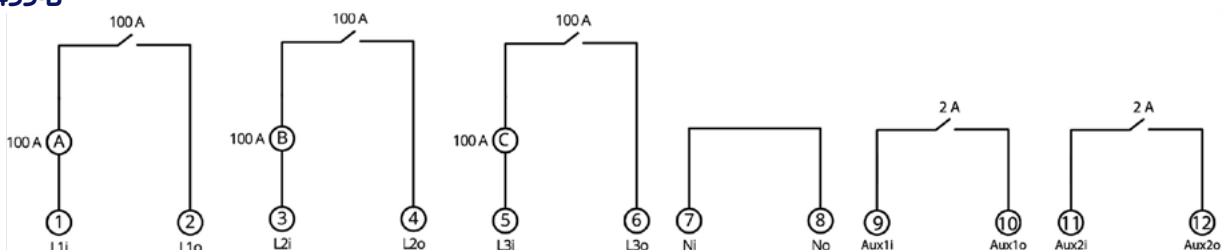
SGM1431-B



SGM1432-B

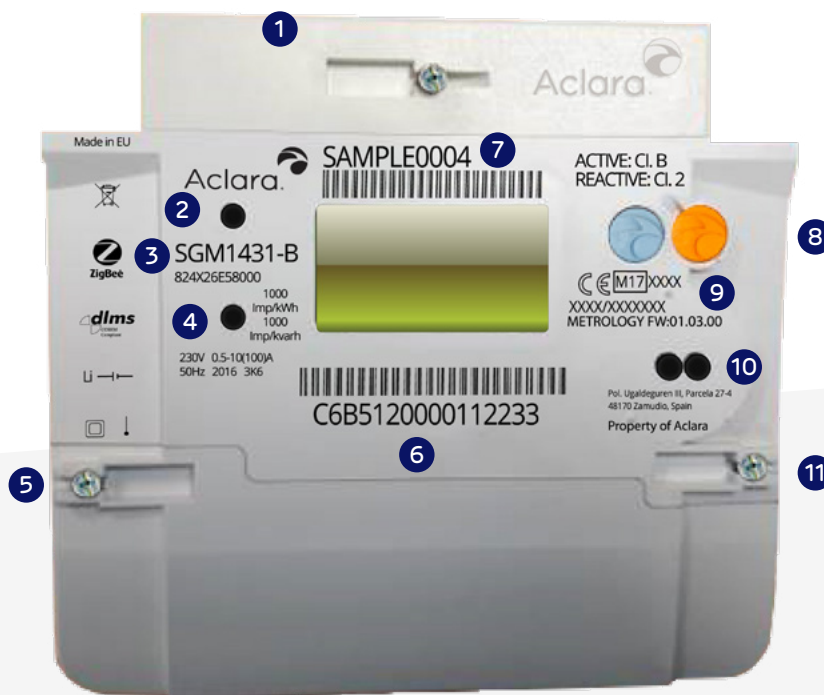


SGM1433-B



Physical components

The SGM1430-B smart meter family comprises several polyphase variants, with and without 2 A auxiliary relay outputs. The main physical features of a SGM1430-B meter are shown below.



1 Communications Module Sealing Point

2 Active kWh Calibration LED

3 Meter Model

4 Reactive kVArh Calibration LED

5 Terminal Cover Sealing Point

6 GUID Identifier

7 Meter Serial Number

8 Push Buttons A and B –
Push Button B is Sealable

9 MID Approval Number

10 Optical port

11 Metrological Seal

Physical components

Enclosure and covers

The SGM1430-B meters use a thermally stable, UV-protected polycarbonate enclosure that is double insulated to protective Class II. The enclosure provides an Ingress Protection Rating of IP54 in accordance with IEC 60529. The following cover segments are constructed of polycarbonate 10% GF (Grade Lexan 503RS):

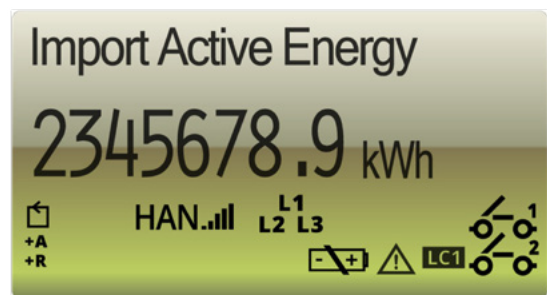
- Meter cover - When the meter is fully installed, the main cover cannot be removed while the terminal cover is fitted to the meter.
- Terminal cover – This protects the terminal screws from external contact. Inside the terminal cover is a diagram identifying the connections on the terminal block. This includes a schematic diagram and description of all physical elements on the terminal block, the arrangement of active and neutral terminals for the conductors, and an identifying number defining the specific variant of terminal.

Cover seals

The meter cover and terminal cover are secured by standard single sealing screws. Each screw head, which has a torque value of 0.6-0.9 Nm, features a recessed hole and slot to accommodate a 0.914 mm diameter thread wire seal. The sealing wire is crimped close to the body of the meter using a tool with die indents. As a manufacturing option, the meter can be supplied with an ultrasonic permanent seal.

Display

The SGM1430-B meter face has a backlit LCD that consists of graphical elements and segments. The graphical section displays the meter status in quantities up to eight digits, including the unit of measure. It can also display end user instructions to advise installation teams that commissioning is complete. The LCD backlight will illuminate the display when a button is pressed. The automatic scroll duration, manual scroll timeout, backlight duration, and contrast adjustment are configurable via the display settings.



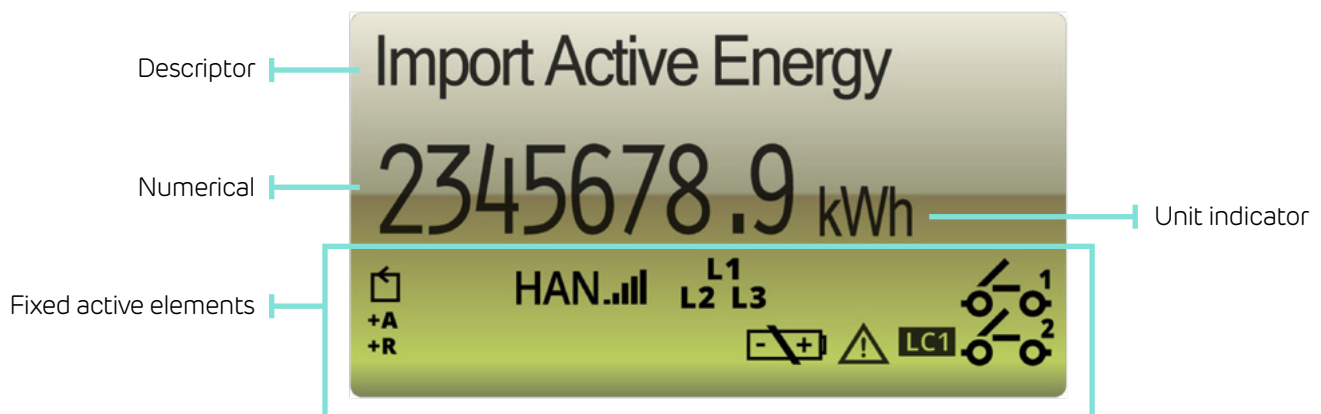
The display shows the following:

- Units of measure
- Constant display of the meter status
- State of the primary supply contactor
- State of the auxiliary control relay (applicable to SGM1432-B and SGM1433-B)
- Voltage state per phase
- Direction of current per phase
- Signal strength as reported by the HAN module
- Communication status of the HAN network
- Direction of energy (e.g. flowing from the premises to the network)
- Battery status
- Various data values, meter status, and indications
- Current and historical energy and demand registers

Physical components

There are four basic types of indicators on the display: descriptor, numerical, unit indicator, and fixed active elements. Each are described as:

- The top line descriptor supports 32 characters.
- The numerical line supports up to eight digits, along with a decimal and other separators.
- The unit indicator is always to the right of the numerical line.



Customer support

For help with your meter's functions, please contact us.



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