

System-ready three phase compact meter Advanced measuring device

SGM-C4

THREE/ONE-PHASE DIRECT CONNECTION
+A/-A, SINGLE/DUAL TARIFF
RS-485 INTERFACE
HISTORICAL DATA

PRODUCT INFORMATION



Three-phase compact meter

SGM-C4

Features

The system-ready SGM-C4 three-phase meter is a standard device for measuring active power with residential and commercial customers and can be used as an advanced measuring device. The meter has an integrated RS-485 interface for system integration. Designed as a compact unit, it fulfils the functional requirements of the FNN industry standard. The SGM-C4 can be connected directly for both energy directions (consumption and delivery) and is also available as a dual-tariff meter with external control.

With the LMN-BAB adapter connected externally to the RS-485 interface, the SCM-C4 can be upgraded to a smart measurement system. The SGM-C4 is a sturdily built standard device with the following features:

- Case compliant with DIN standard for three-point mounting with terminal cover suitable for holding a BAB adapter
- Flexible measurement via shunts with intrinsic immunity to harmonics and external magnetic fields: +A or -A with reverse running lock, +A/-A bi-directional, |A| direction independent
- RS-485 bus interface for remote communication
- PIN-protected data display and output
- Front-side optical interface for local data provision
- Multi-functional display for meter data and historical data over 2 years
- Robust, low-radiation power supply
- Output of readings and parameters for network quality
- Optional dual-tariff version with external control via accessory terminals

Use

In the 5(60)A / 5(100)A, MID Class A/B versions, the meter can be deployed as a stand-alone device (advanced measuring device) in all customer systems directly connected via four lines. Typical application areas include residential customers, customers with self-generation and in-feed into the public power grid, small commercial operations and site facilities.

In combination with the secure gateway via the LMN-BAB adapter, the SGM-C4 forms a smart measurement system as prescribed for customer installations with an annual consumption greater than 6,000 kWh and installations with feed-in into the public power grid as described by the German Renewable Energy Resources Act (EEG). The Smart Grid meter provides the measurement data required for these network service tasks.



Functions

In accordance with statutory requirements, the meter acts as a reliable and safe measurement device for acquisition of billing-related active energy quantities and network-related measurement data and parameters, such as effective values of line voltages and currents, power values, phase angle and line frequency.

The active energy is measured in both directions, with the following measurement modes being available:

- Measurement in one direction with reverse running lock
- Measurement of absolute amounts $|A|$: direction-independent sum of amounts in all lines
- Measurement in two directions: $+A$ and $-A$
- Measurement of power consumption over two phases with delivery over one line

The current sensors used are sturdily mounted, accurate shunts, suitable for accuracy class B. The actual energy values in all lines are measured internally and are available over the data interfaces. The measurement mode can be set in the factory according to metering requirements.

The meter also provides the following grid functions:

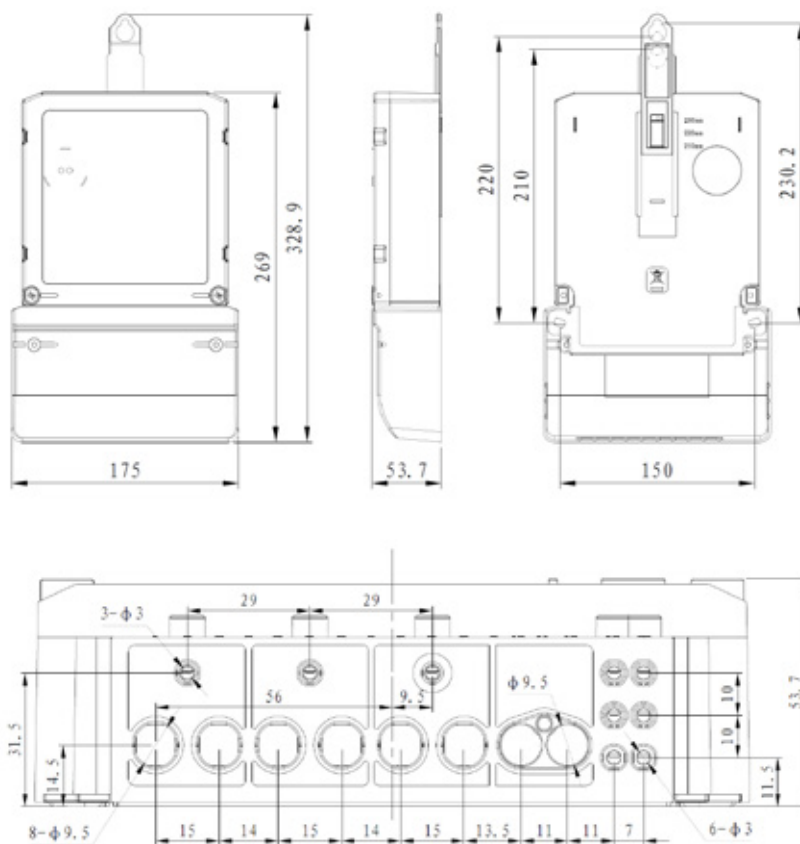
- Active power P_{L1}, P_{L2}, P_{L3} , calculated as an average over 1 second, resolution 0.1 W
- Effective values of line and line-to-line voltages U_{L1}, U_{L2}, U_{L3} , calculated as an average value over 1 second, accuracy 1 % of measured value, resolution 0.1 V
- Effective values of line currents I_{L1}, I_{L2}, I_{L3} , calculated as an average value over 1 second, resolution 0.1 A, accuracy 1 % of measurement
- Phase angles $\varphi_{L1}, \varphi_{L2}, \varphi_{L3}$, accuracy and resolution 1 ° referenced to the fundamental frequency
- Line frequency f_{line} , accuracy 1 %, resolution 0.1 Hz

The daily, weekly, monthly and annual values of active energy over a period of two years are recorded in the ring buffer as historical data and displayed under PIN protection. The front-side optical interface is used for local provision of measurement data and device information in accordance with SML/COSEM at one-second intervals. This function is also PIN protected. PIN entry is via the front-side button or optionally via the optical button.

The RS-485 interface serves for system communication with a baud rate of 9.6 kbit/s.
The protocols employed are SML/COSEM in the application layer.

As an option, the dual-tariff function with external control is available via terminals 13 and 15.
The tariff registers in both energy directions and the current tariff are shown on the display.
Removing the terminal cover is detected as tampering and logged.

Dimensions



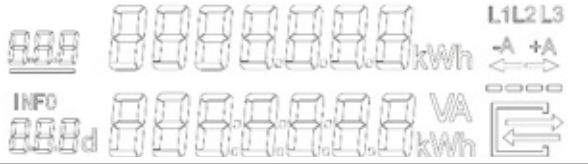
TECHNICAL DATA

Active energy measurement with direct connection:	One direction: +A, -A
	Absolute value: A
	Two directions: +A, -A

Nominal voltage U_N	400/230 V
Voltage range	$(0,8 - 1,2) U_N$
Nominal frequency	50 Hz, $(0,9 - 1,3 F_{nom})$
Transition current I_{tr}	0,5 A
Reference current I_{ref}	5 A (10 A)
Maximum current I_{max}	100 A (60 A)
Minimum current I_{min}	$< 0,05 I_{ref}$
Starting current I_{st}	$< 0,004 I_{ref}$

Accuracy	Class A (B)
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Test output	LED (infrared LED optional)
Meter constant R_L	1000 pulses/kWh 5000 pulses/kWh 10000 pulses/kWh
Continuous light	Standstill (startup)

Display	2-line LCD display
	
Digits	> 8 mm x 3 mm
Manual operation	Front button / optical button (optional)

Display of historical kWh values	730 x "1d" 104 x "7d" 24 x "30d" 2 x "365d"
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Optical interface	D0
Protocol	EN 62056/-21 (push mode)
Transmission rate	9,6 kbit/s

Communication interface	RS-485 (terminals 27/28)
Screw terminals	> 1,5 mm ²
Protocols	SML, EN 62056-22

Power consumption	Voltage: < 1,0 W/8 VA per phase
	Current: < 0,05 VA per phase

Operating temperature range	-40 °C to + 70 °C
Storage/transport temperature range	-40 °C to + 85 °C
Relative humidity	Max. 95 %, non-condensing

Case:	DIN 43857
Dimensions	177,4 x 234,9 x 53,7
Protection class	II
Protection rating	IP54 interior
Material (recyclable)	Glass-fibre reinforced polycarbonate
Fire characteristics	Flame resistant to IEC 62052-11

Mechanical strength	MID M1
EMC	MID E2




Weight	Approx. 1,1 kg
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Current terminals 100 A	L1, L2, L3, N
Screws	M6 x 14
Torque	< 3 Nm, max. 3,5 Nm
Wire interfaces	2 x RJ12 jacks
Accessory terminals	∅ 2,5 mm
External tariff control (option)	Terminals 13, 15
Registers	2 x 2

APPLICABLE PROVISIONS, STANDARDS AND TESTS

Governing provisions		Manufacturing certifications	
Statutory requirements	MID Directive (2014/32/EU)	Quality management	ISO 9001:2008 00116Q28921ROM /3300 ISO 9001:2008 163512-2014-AQ-GER-DAkKS
General requirements	Annex I	Environmental management	ISO 14001 00116E22562ROM /3300
Specific requirements	Annex MI-003	Approvals / conformities	
Test standards		Type tests	MID Annex B National according to PTB
General requirements	EN 50470, Part 1 (governing)		
Specific requirements	EN 50470, Part 3 (governing)	Conformity test / certificate	MID Annex D
Other applicable standards	EN-CLC/TR 50579, Class B IEC 62052-11 IEC 62053-21		CMI 0513-SJ-A006-16 CSA DE MTP 17 B 003 MI-003

TYPE DESIGNATION

SGM-C4									Standard Compact Meter with RS 485 Bus Interface
	1								Four wire whole current 5/60 A
	2								Four wire whole current 5/100 A
		A							Accuracy class A (2 according IEC 62053-21)
		B							Accuracy class B (1 according IEC 62053-21)
			6						Terminal bore hole Ø 6.5 mm for 5/60 A
			9						Terminal bore hole Ø 9.5 mm for 5/100 A
				0					Import with reverse blocking 
				2					Import/Export 
				3					Absolute sum of both directions, no reverse blocking 
					0				Single tariff function
					T				Two tariff rates controlled via the auxiliary terminals 13, 15
						I			Transparent meter cover, Infrared LED, manual control via Info interface
						R			Transparent meter cover, Red LED
						M			Non-transparent meter cover, Infrared LED, manual control via Info interface
						L			Non-transparent meter cover Red LED

								Accessories code
	N							Standard Terminal Cover
		L						Long Terminal Cover
			S					Plastic Seals
				W				Wired Seal
					P			Pins

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