

SMARTsens energygate

Wireless transmission of energy data

The SMARTsens energygate is designed for use in an industrial environment and is an energy node in the distribution cabinet. This transmits all energy data from the distributor wirelessly. Together with the SMARTenergy gateway, a wireless mesh system configures itself automatically throughout the building - without further configuration!

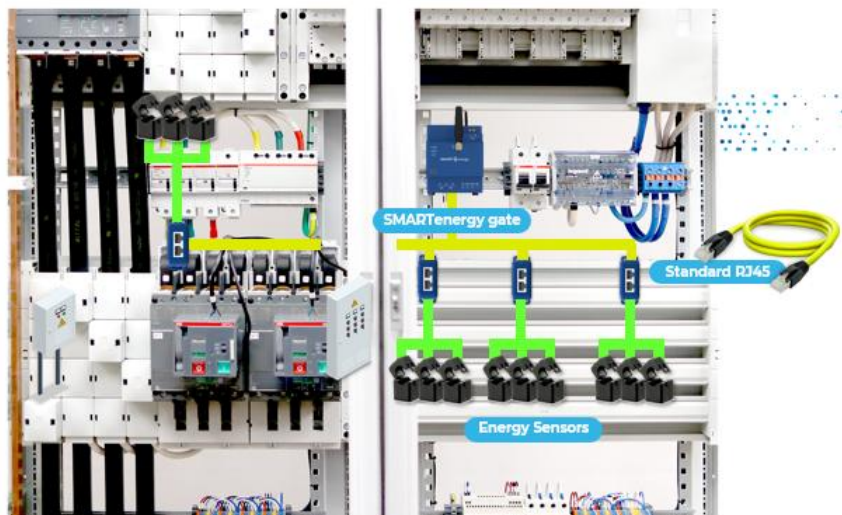
The SMARTsens energygate offers the connection of 3 current transformer sensors, the measurement point extension with SMARTenergy sensors and a radio interface to other radio beacons such as temperature/humidity and presence. Inventory meters can be integrated into the radio transmission via other interfaces such as MBus, Modbus, SO, DO.

The autodetect function on the SMARTsens energygate ensures that all wired and wireless sensors are automatically detected.



Keyfeatures

- Energy data collection and radio transmission from distribution cabinet via wireless mesh
- 3 x current transformer connection pluggable via RJ10 (Type: 20A-50A-100A-250A-400A und 800A, Rogowski Spule 80mm/240mm)
- Energy consumption in kWh, active power and load curves in a 15-minute rhythm
- Connection of Temp/Humidity/Presence Wireless Sensors
- Autodetect function of the sensors
- Connection of 8 x SMARTenergy sensors
- Other interfaces (Mbus, Modbus, DO, SO)
- DIN rail mounting



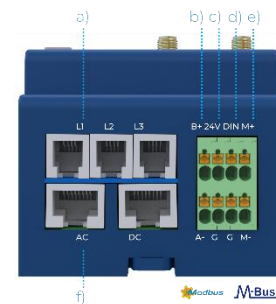


External connections

Layout

Sensor inputs

- a) Clamp Meter PSSystec L1/ L2/ L3 for AC measurement, note phase sequence! (20/ 50/ 100/ 250/ 400/ 800A)
- b) Modbus RTU, B+/ A-
- c) Supply voltage for external devices 24V/G (max. 50mA – without connected SMARTenergy sensors)
- d) Digital input, DIN/ G
- e) M-Bus, M+/ M-
- f) SMARTenergy sensors, extensions for AC or DC measurement (max. 8 sensors)



General	Material	ABS Housing
	Protection	IP40, Terminal Terminals: IP20
	Clamp	Type: removable. Maximum cross-section: 1.5 mm ² , Tightening torque: 0.2/0.25 Nm
	Surge Category	Cat. III (EN 61000-4-5)
	Degree	2
	Class	Protection class II (61010-1), double-isolation test voltage: 4.2 kV AC 1 min. + impedance limit
	Assembly	From Hutschiene
	Weight	190g without antenna
	Diagnostic LED	RUN Led, IoT LED, LTE LED
	Identification code	QR code labeled on device
Environmental conditions	Operating temperature	From -25 to +55 °C / from -13 to +131 °F (Info: relative humidity < 90%, non-condensing, at 40 °C (104 °F))
	Storage	From -30 to +70 °C / from -22 to 158 °F (Info: relative humidity < 90%, non-condensing, at 40 °C (104 °F))
Electrical System and Circuits	Controlled electrical system	Single-phase (2 wires), three-phase without neutral (3-wire), three-phase with neutral (4-wire)
	Number of Circuits Monitored	Single-phase systems: up to 3 single-phase loads, three-phase systems: 1x three-phase load
	Voltage connection	Directly or via VT

Voltage Measurement Input	Nominal voltage L1-N (from Un min. to Un max.)	From 100Vac to 240Vac Attention: L1 must be used to measure the voltage
	Voltage tolerance	-10%, +10%
	Overload	Continuous: 1.1 Un max.
	Frequency	From 47 to 63 Hz
	Measurement Accuracy Phase Neutral Voltage	From (Un min. -10%) to (Un max. +10%) $\pm(2\% \text{ rdg})$
Current Measurement Input	Power connection	via clamp meter PSCTxxx via RJ10
	Rated Current (In)	20A 50A 100A 250A 400A 800A 680A (Rogowski Coil)
	Minimum current (Imin)	0.05 in
	Maximum current (Imax)	1.2 in
	Overload	Continuous: 1.2 in For 100 ms: 2 in
	Insert Impedance	< 0.2 VA
	Current Measurement Accuracy	From 0.05 In to Imax $\pm(0.5\% \text{ rdg})$
	Measuring accuracy active power (PF=1)	From 0.05 In to Imax $\pm(2.5\% \text{ rdg})$
Available measurements Folding transducer	Method	Digital Sampling (active power: multiplication of the sampled instantaneous values of current and voltage and averaging in the MCU)
	Scanning	40,000 samples/s @50Hz
	Energy	Digital calculation as integral of the power over time in Wh
	Active power	Average in the set interval in W, peak load in W of the last 15 minutes
Bus interfaces		Modbus Master up to 20 participants (Modbus Slaves) Adjustable baud rate/parity/stop bit from the cloud Configuration of the Modbus address and registers to be read per Modbus slave is set in the cloud platform
		Mbus Master up to 20 participants Secondary Address search Attention: All connected MBus slaves must be set to 2400 baud. Primary address is not to be assigned.
	Impulse	Pulse interface max. 1kHz. Pulse sensors for connection
Power supply	Self-powered, between L1 and N	
Consumption	5W	
Interface Wireless BLE Sensor	Temp/Humidity	PSsystemec Temp/Humidity Beacon: T: -30 to 60°C with a typical accuracy of $\pm 0.3^\circ\text{C}$ and long-term drift of < 0.02°C per year

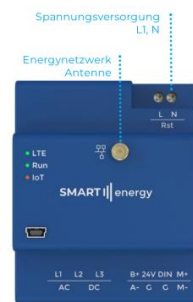
		H: 0 to 100% with a typical accuracy of ± 3.0 and long term drift of <0.25 per year
	Presence	PSsystec PIR Sensor: Sensortyp: Motion, Pyroelectric, PIR (Passive Infrared), Sensing Range 7m
	Interface	BLE 2.4Ghz Schnittstelle.
BLE Interface	Bluetooth	v5.0 (Bluetooth low energy)
	Tomboy	Max. 1400m
	Output power	8 dBm
	Sensitivity	-94 dBm (1 Mbit/s)
	Function	Scanning/Advertising/Open Mesh/Repeater
Radio Energy Network	Protocol	Mesh Network (Tinymesh)
	Frequency	868MHz~870MHz
	Data rate	100Kbps
	Power - Output	10dbm
	Sensitivity	-110dBm
	TN	Max. 100 participants
Dimensions	72 x 85 x 60 mm (size of a RCCB)	
Sim card	4FF	
Approval		
Conformance	2014/53/EU (Radio Equipment Directive) Funk EN 301489-17 v3.1.1 for Bluetooth with low energy	
	EMC (Electromagnetic Compatibility) EN 301489-1 v2.2.0 General Part EN 301489-52 v1.1.0 DIN EN 61000-6-2 DIN EN 61000-6-3 DIN EN 61326-1 - 2018-09 Electrical safety DIN EN 61010-1:2020-03; VDE 0411-1:2020-03	
Guarantee	1 year	

ELECTRICAL ASSEMBLY



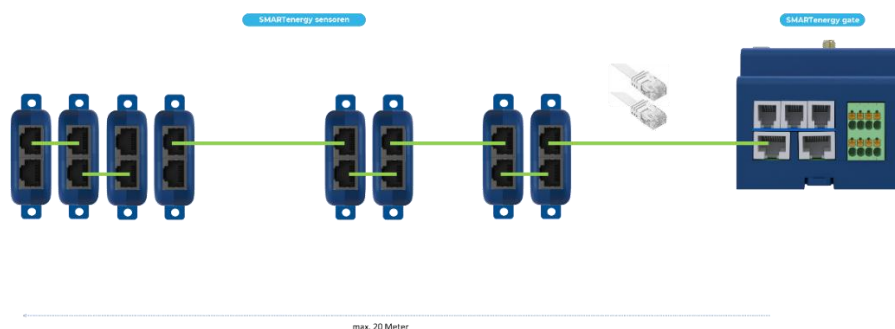
Connection

- Applying the power supply to terminals L1 and N. It is important to make sure that L1 of the feed-in of the lower or main distribution is used here. This reference voltage is then used for all SMARTenergy sensors connected to the hub via RJ45.
- Mount the LTE antenna and optionally the energy network antenna. Pay attention to the correct assignment of the 868MHz and LTE antenna.



Assembly

DIN rail mounting

Connection
SMARTenergy

The SMARTsens energy sensors are connected via standard RJ45 AWG27 network cable. Up to 8 SMARTsens energy sensors can be connected to the SEB junction box. The maximum distance between the connection of the SMARTsens energygate and the last SMARTsens energysensor is 20m.

LED
Diagnostics

Run

- 10 Hz Communication timeout
- 1 Hz Idle state (wait for address assignment)
- 2 Hz In Assignment Process
- 4sec Off/1sec On HW Fail
- Steady Run

IoT

- 10 Hz Sending
- Steady Device is active in the Network

LTE

WELL

The IoT LED must be on permanently. When it transmits, it flickers in a 10Hz rhythm. If the LED is not permanently on, no other participants in the network will be found. The Run LED signals whether connected sensors are being found. It can be a SMARTenergysensor or Mbus or Modbus participants.

Reset

The kWh can be manually reset to 0 via the RESET button (RST). This refers exclusively to the folding converters/Rogowski coils connected to the SMARTenergy gateway. To do this, hold down the button for 5sec. The sensor must be connected to the patch cord and have power.

Connection
Current
transformer



Compatible sensors:

PSSystec type- Folding Transducer 20A

PSSystec type- Folding Transducer 50A

PSSystec type- Folding instrument transformer 100A

PSSystec type- Folding transducer 250A

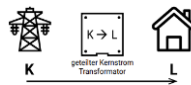
PSSystec type- Folding instrument transformer 400A

PSSystec type- Folding transducer 800A

PSSystec type- Rogowski Coil 80/240

Connection direction

On the bottom of the folding transducer, you will see an arrow indicating the direction of the energy flow. This is **not** to be observed!



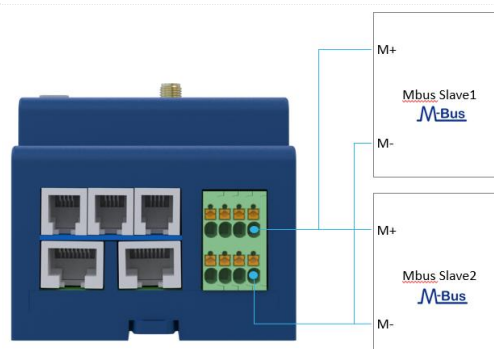
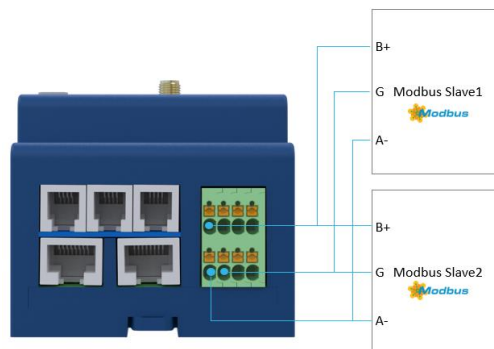
Phase sequence

When connecting the sensors, pay attention to **the phase sequence** of L1-L2-L3!

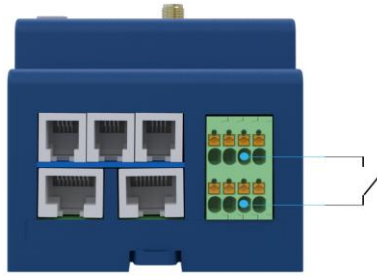
Connection order

If current flows in the conductor to be measured during installation. The CT's must first be connected to the box and only then be attached to the conductor with the folding mechanism. Uninstall in reverse order.

Connection
diagram
Interfaces



Impulse



IDENTIFICATION CODE



The QR code is applied to the page.

The QR code includes

- the serial number
- the serial number of the BLE transmitter, if available
- the use case

General structure

:: PSS06; [MACBLE]; [MACSTM]; [Messcase]

Identification
code

Example:



The information and instructions contained in this datasheet have been compiled with the greatest possible care. Nevertheless, we assume no liability for any errors, inaccuracies or incompleteness in the datasheet. The use of the datasheet is at your own risk.