

## SMARTenergy sensor

### Energy sensor for measuring currents from 20A to 800A

The SMARTenergy sensor offers connections for up to 3 current transformer sensors. The transformers are available from 20A to 800A with accuracy class 1. It captures energy consumption in kWh, active power, and load profiles in W.

The sensor stands out for its simplicity: No configuration is necessary. The current clamps are plugged in with the desired size, e.g., 800A. The SMARTenergy sensor does not require L1/L2/L3. It is sufficient to connect the sensors with a network cable to the SMARTenergy gateway in any order.

The SMARTenergy gateway autodetect function automatically recognizes the size and number of split-core transformers and the number of installed SMARTenergy sensors.



### Key features

- 3 x current transformers
- Pluggable current transformer connection via RJ10 (Types: 20A, 50A, 100A, 250A, 400A, and 800A)
- Energy consumption in kWh, active power, and load profiles in 15-minute intervals
- Various mounting options (DIN rail, cable ties, magnet)
- Small dimensions: 50mm x 50mm



## Specifications



|                                |                                          |                                                                                                                                                                                                                                             |
|--------------------------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General                        | Material                                 | PC UL 94 V-0                                                                                                                                                                                                                                |
|                                | Protection class                         | IP40, terminal connections: IP20                                                                                                                                                                                                            |
|                                | Terminals                                | RJ10 and RJ45 connectors                                                                                                                                                                                                                    |
|                                | Overvoltage category                     | Cat. III (EN 61000-4-5)                                                                                                                                                                                                                     |
|                                | Pollution degree                         | 2                                                                                                                                                                                                                                           |
|                                | Protection class                         | Class III (Surge Level 1 (EN 61000-4-5))                                                                                                                                                                                                    |
|                                | Mounting                                 | DIN rail or distribution panel mounting                                                                                                                                                                                                     |
|                                | Weight                                   | 80g                                                                                                                                                                                                                                         |
|                                | Diagnostic LED                           | RUN Led                                                                                                                                                                                                                                     |
|                                | Identification code                      | QR code labeled on the device                                                                                                                                                                                                               |
| Environmental Conditions       | Operating temperature                    | -25 to +55 °C (-13 to +131 °F)<br>(Note: Relative humidity < 90%, non-condensing at 40 °C (104 °F))                                                                                                                                         |
|                                | Storage temperature                      | -30 to +70 °C (-22 to 158 °F)<br>(Note: Relative humidity < 90%, non-condensing at 40 °C (104 °F))                                                                                                                                          |
| Electrical System and Circuits | Controlled electrical installation       | Single-phase (2 wires), three-phase without neutral (3 wires), three-phase with neutral (4 wires)                                                                                                                                           |
|                                | Number of monitored circuits             | Single-phase systems: up to 3 single-phase loads<br>Three-phase systems: 1x three-phase load<br>The SMARTenergy sensor is an extension to the SMARTenergy gateway. Up to 8 SMARTenergy sensors can be connected to one SMARTenergy gateway. |
| Voltage Measurement Input      | Voltage Measurement                      | Voltage is only measured at the SMARTenergy gateway.                                                                                                                                                                                        |
| Current Measurement Input      | Current connection                       | Via PSCTxxx current transformer block over RJ10                                                                                                                                                                                             |
|                                | Nominal current (In)                     | 20A<br>50A<br>100A<br>250A<br>400A<br>800A                                                                                                                                                                                                  |
|                                | Minimum current (Imin)                   | 0.05 In                                                                                                                                                                                                                                     |
|                                | Maximum current (Imax)                   | 1.2 In                                                                                                                                                                                                                                      |
|                                | Overload                                 | Continuous: 1.2 In, for 100ms: 2 In                                                                                                                                                                                                         |
|                                | Insertion impedance                      | <0.2 VA                                                                                                                                                                                                                                     |
|                                | Current measurement accuracy             | From 0.05 In to Imax ±(0.5% rdg)                                                                                                                                                                                                            |
|                                | Active power measurement accuracy (PF=1) | From 0.05 In to Imax ±(2.5% rdg)                                                                                                                                                                                                            |
|                                | Measurement method                       | Digital sampling (active power: multiplication of sampled instantaneous current and voltage values and averaging in the MCU)                                                                                                                |
|                                | Sampling                                 | 40,000 samples per second @50Hz                                                                                                                                                                                                             |
| Available Measurements         | Energy                                   | Digital calculation as an integral of power over time                                                                                                                                                                                       |
|                                | Active power                             | Total load, average over the set interval, maximum in the set interval (in next FW version 1.03)                                                                                                                                            |
|                                | Power Supply                             | Via RJ45 cable (24VDC)                                                                                                                                                                                                                      |

|            |                                                                                                                                                                            |     |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
|            | Consumption                                                                                                                                                                | <1W |
| Dimensions | 70 x 70 x 50 mm                                                                                                                                                            |     |
| Approval   |                                                                                           |     |
| Conformity | EMC (Electromagnetic compatibility)<br>DIN EN 61000-6-2<br>DIN EN 61000-6-3<br>DIN EN 61326-1 - 2018-09<br>Electrical safety<br>DIN EN 61010-1:2020-03; VDE 0411-1:2020-03 |     |
| Warranty   | 2 years                                                                                                                                                                    |     |

## Electrical Installation



### SMARTenergy Connection



The connection of SMARTenergy sensors is done via standard RJ45 network cables (AWG27) to the SEB socket (SMARTenergy bus). Each SMARTenergy sensor has 2 RJ45 sockets for daisy-chaining the signal.

### Connection Network



### Diagnostic LED

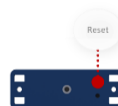


|                                                                                     |                  |                                          |
|-------------------------------------------------------------------------------------|------------------|------------------------------------------|
|  | 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                                      |

After connecting the SMARTenergy sensor to the SMARTenergy gateway, the control LED should switch to RUN after approximately 60 seconds.

### Reset

The kWh can be manually reset to 0 using the RESET button. Hold the button for 5 seconds. The sensor must be connected with the patch cable and have power. The control LED will briefly turn off.



### Maximum Distance

Maximum distance between the SMARTenergy gateway and the last SMARTenergy sensor: 20m

### Connection Sensors

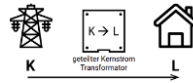
Compatible Sensors

PSsystem type - Split-core transformer 20A  
 PSsystem type - Split-core transformer 50A  
 PSsystem type - Split-core transformer 100A  
 PSsystem type - Split-core transformer 250A

PSsystem type - Split-core transformer 400A  
 PSsystem type - Split-core transformer 800A  
 (Note: No configuration required)

On the underside of the split-core transformer, there is an arrow indicating the direction of energy flow. **This can be ignored.**

Connection Direction



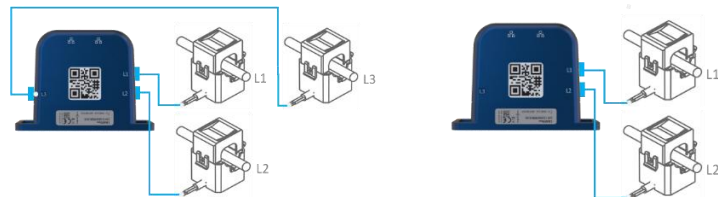
Phase Sequence

When connecting the sensors, ensure the correct **phase sequence** of L1-L2-L3!

Connection Order

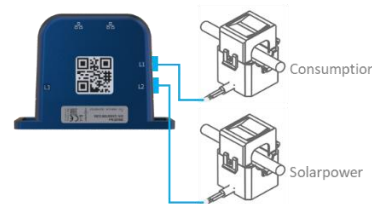
If current is flowing through the conductor during installation, the CTs must first be connected to the box and only then attached to the conductor using the clamp mechanism. Uninstallation must be done in reverse order.

3-phase network  
 2-phase network



Wiring Diagram

1-phase/solar power



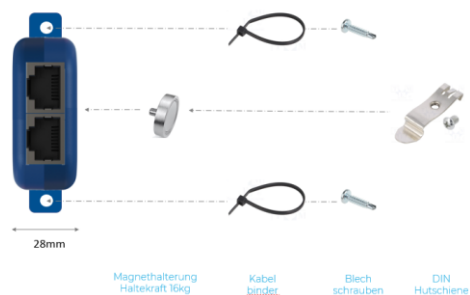
1-phase network  
 Differential current



## Mechanical Installation



Connection



The following options are available for the mechanical installation of the SMARTenergy:

### Mounting Options

- Magnetic mounting
- Cable ties
- Screw mounting
- DIN rail holder



## Identification Code

The QR code is affixed on the side.

The QR code contains:

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

### General structure

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

Example:

Identification Code



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