GOSSEN METRAWATT

ENERGYSENS
Power Measurement for Energy Data Management

3-349-973-03
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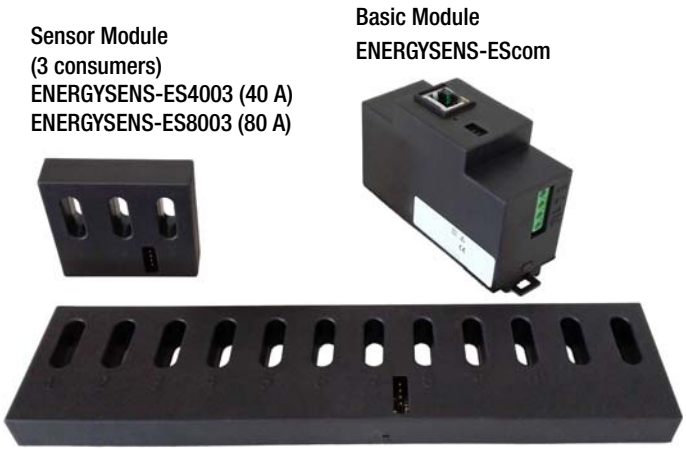
- Measurement of
  voltage, current, frequency, power and energy
  at up to 120 measuring points
- Simple installation (new or retrofit)
- Minimal installation height
- Very low energy consumption
- Direct connection to EDM systems, data loggers and PLCs



Applications

Energy, power, current, voltage and frequency can be measured at individual consuming devices in low-voltage systems with the ENERGYSENS intelligent sensor system.

You can quickly and efficiently manage corrective measures within the framework of an energy management system for the improvement of energy efficiency or the minimization of downtime by means of preventive maintenance.

Modular System

Measurement is performed at conductors in low-voltage distributors, e.g. at circuit breakers in the control cabinet. The system concept with 1% measuring accuracy permits easy installation for new systems, and in particular where existing systems will be retrofitted with energy logging as well.

The modular system consists of the ENERGYSENS EScom basic module and one or more sensor modules (e.g. ENERGYSENS ES4003). In turn, these sensor modules have multiple measuring points by means of which power can be measured for individual consuming devices.

Up to 120 measuring points are connected to the basic module via ribbon cables in a flexible fashion with regard to length and allocation. The high-speed buss system make it possible to ascertain power values thanks to individual allocation of voltage to each separate current measuring point. The basic module is mounted to a top-hat rail, and the sensor modules are mounted on top of the circuit breakers.

All measured values are made available by the ENERGYSENS EScom basic module via Modbus protocol (TCP/RTU).

Programs for Configuration and Operation

The ENERGYSENS can be quickly integrated into any system environment without programming knowledge with the help of a configuration program. This software can be downloaded from our website free of charge. An energy data management program, for example SMARTCOLLECT, is required for operation. A free test version of this program can also be downloaded from our website.

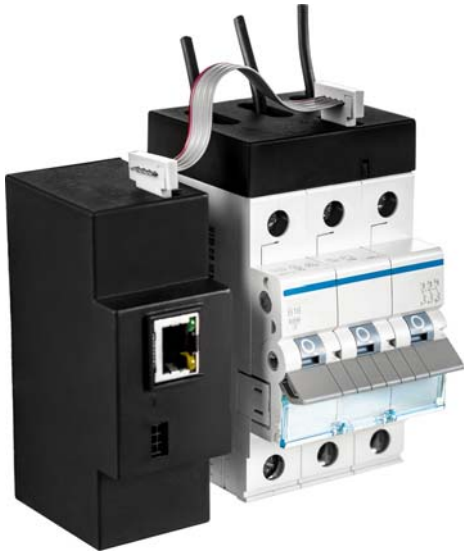


Figure 1 Application Example: Basic Module, Sensor Module and 3 Single-Pole Circuit Breakers

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Characteristic Values

Measuring Technology	Nominal Value	Accuracy
Voltage measurement	3~230/400 V	Class 1 per DIN EN 60688
Current measurement	40 A 80 A	Class 1 per DIN EN 60688
Frequency measurement	50 / 60 Hz	Class 1 per DIN EN 60688
Active power measurement	9.2 kW 18.4 kW	Class 1 per DIN EN 62053-21 (applied [1])

[1] Active power measurement accuracy corresponds to the definition specified in DIN EN 62053-21.
Influence of relevant influencing quantities on measuring accuracy complies with DIN EN 62053-21.

Technical Data, Basic Module

Electrical Connection of the ENERGYSENS EScom Basic Module	
Voltage (L1)	230 V, 50/60 Hz
Power (maximum value for the central unit with 10 sensors)	5 W
Current (min. connected load for fuse)	1 A

Configuration of the ENERGYSENS EScom Basic Module	
ENERGYSENS EScom basic module	Up to 10 sensors
Sensors	Variants with 3 and 12 measuring points, various amperages
Length of connection via the ribbon cable (maximum value)	5 m

Dimensions of the ENERGYSENS EScom Basic Module	
Height	91 mm
Width	35 mm (2 standard width units)
Depth	59 mm

Communications Interfaces, ENERGYSENS EScom Basic Module	
1 ea. RS 485	Modbus RTU, 115.2 kBaud
1 ea. Ethernet	Modbus TCP, 100 MBit

Technical Data, Sensor Module

Dimensions of the ENERGYSENS ES Sensor Module	
Height	13 mm
Width	17.5 mm (1 standard width unit) per measuring point
Depth	47 mm

Maximum operating conditions of the voltage inputs, each with reference to the N input	
Supply voltage (L1)	230 V ±10%
Measuring voltages (L2, L3)	0 ... 230 V + 10%

Maximum operating conditions of the current inputs	
Current measurement	0 ... I_{Nom} + 10%

General Technical Data

Ambient Conditions	
Storage temperature	-20 °C...+65 °C
Operating temperature	-20 °C...+55 °C
Max. altitude	2000 m above sea level
Max. relative humidity	90%, no condensation
Deployment	Indoors only

Electrical Safety	
Protection category	II
Installation category	300 V CAT III
Pollution degree	2

Interface Operating Conditions

Maximum Operating Conditions of the RS 485 Interface
Permissible operating conditions can be found in the ANSI/TIA/EIA-485-A-98 standard.

Maximum Operating Conditions of the Ethernet Interface
Permissible operating conditions can be found in clause 25 of the IEEE 802.3 standard and in TIA-568A/B.

Maximum Operating Conditions of the Sensor Bus Interface
This proprietary interface may only be used to connect sensors included in the **ENERGYSENS** measuring system.

Applicable Regulations and Standards

	Standard	Date
Radio disturbance characteristics	55022, class B EN 61000-6-3 EN 61000-6-4	2010 + AC 2011 2007 + A1 2001 2007 + A1 2001
Interference immunity	EN 61000-6-1 EN 61000-6-2	2007 2007
Harmonic current	EN 61000-3-2	2006 + A1 2009 + A2 2009
Voltage fluctuation	EN 61000-3-3	2008
Discharging of static electricity	EN 61000-4-2	1995 + A1 1998 +A2 2001
High-frequency electromagnetic fields	EN 61000-4-3	2006
Fast transient bursts	EN 61000-4-4	2004
Conducted interference	EN 61000-4-6	1996 + A1 2001
Power frequency magnetic fields	EN 61000-4-8	1993 + A1 2001
Voltage dips	EN 61000-4-11	2004
Overvoltage, CAT III	IEC 61010-1	2010
General safety regulations	IEC 61010-1	2010

Order Information

Description	Type	Article Number
Basic module for connection of up to 10 type ES4003, ES4012, ES8003 or ES8012 ENERGYSENS sensors, voltage measurement: 3 ~ 230/ 400 V, 50/60 Hz, communication via Modbus TCP or Modbus RTU, includes 5 m flat ribbon cable and 10 pcs flat ribbon cable connectors	ENERGYSENS-EScom	U100A
Sensor module for connection to the ENERGYSENS-EScom, logging of power, energy, current, voltage and frequency for up to **3** individual power consumers, current measurement up to **40 A**, accuracy: 1%	ENERGYSENS-ES4003	U100B
Sensor module for connection to the ENERGYSENS-EScom, logging of power, energy, current, voltage and frequency for up to **12** individual power consumers, current measurement up to **40 A**, accuracy: 1%	ENERGYSENS-ES4012	U100C
Sensor module for connection to the ENERGYSENS-EScom, logging of power, energy, current, voltage and frequency for up to **3** individual power consumers, current measurement up to **80 A**, accuracy: 1%	ENERGYSENS-ES8003	U100D
For connection to the ENERGYSENS-EScom, logging of power, energy, current, voltage and frequency for up to **12** individual power consumers, current measurement up to **80 A**, accuracy: 1%	ENERGYSENS-ES8012	U100E

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Prepared in Germany • Subject to change without notice • PDF version available on the Internet

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