

SEM One



SEM One is a single-phase power analyzer that allows to monitor electrical parameters of your installation including energy, voltage, current, power and more. The design, of compact dimensions, allows that SEM One can be placed easily at any installation.

The device has removal connectors for power supply (85-265 Vac), external current transformers (250 mA output) and RS-485 communications.

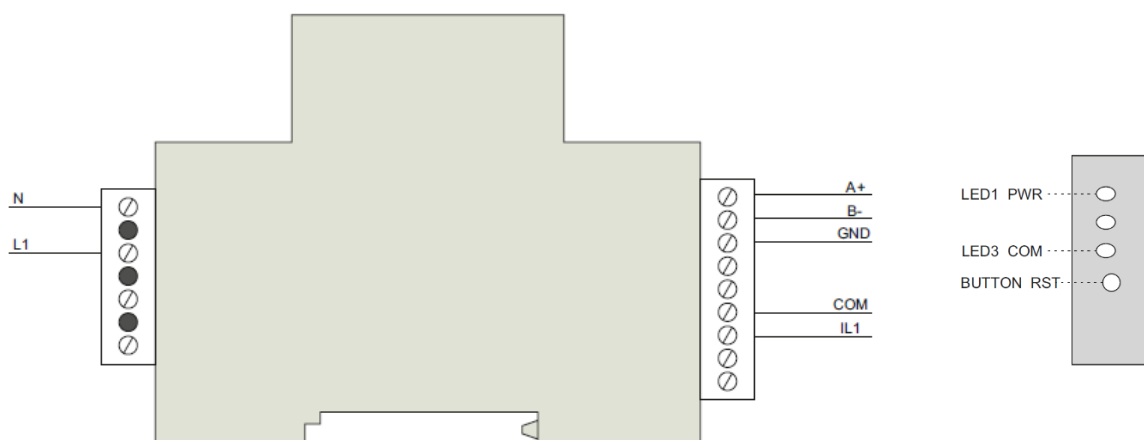
The communication of measured data works over Modbus RTU standard protocol.

TECHNICAL CHARACTERISTICS

| | |
|--|---|
| Power circuit | |
| Input voltage | 110 264 Vac |
| Frequency | 47 63 Hz |
| Maximum consumption | 2,5 4,5 VA |
| Environmental conditions | |
| Temperature range | -10 +60°C |
| Humidity range | 5 95% |
| Mechanical characteristics | |
| Enclosure material | Plastic UL94 – V0 Self-extinguishable |
| Protection grade | IP30 |
| Unit dimensions (Width x Height x Length) | 18 x 70 x 109 mm |
| Weight | 70 g |
| Mounting | DIN Rail (1 module) |
| Maximum working altitude | 2000 m |
| Serial interface | |
| Type | RS-485 three wires |
| Baud rate | 9600 / 19200 / 38400 / 57600 / 115200 bps configurable |
| Data bits | 8 |
| Parity | Without parity / Even configurable |
| Stop bits | 1 / 2 configurable |
| Characteristics and electrical security | |
| Security | CAT III 300 V under EN 61010 |
| Protection class | Class II |
| External current transformers | Series TRC and TRA (In / 0,250 A) |
| Standards | |
| Standards | UNE EN 61010-1:2010, UNE-EN 61000-6-2, UNE-EN 61000-6-4 |

CONNECTIONS AND LEDS

Input voltage of **SEM One** is connected at terminals L1 and N and external current transformers are used for current metering. Next are detailed all connections and leds:



INSTALLATION

The SEM One unit must be installed on an electric panel or enclosure, attached to a DIN rail (IEC 60715).

The unit must be connected to a power circuit that is protected with gI (IEC 269) or M type fuses with a rating of 0.5 to 2 A. It must be fitted with a circuit breaker or equivalent device, in order to be able to disconnect the unit from the power supply network. The power circuit must be connected with cables that have a minimum cross-section of 1mm². The secondary line for the current transformer shall have a minimum cross section of 2.5 mm². The temperature rating of insulation of wires connected to the device will be at minimum 62°C.

COMMUNICATION

The device comes equipped with a RS-485 communication port to read and write the parameters of the device or other devices connected. The protocol used is Modbus RTU.

By default the device is configured with **peripheral number 64** (decimal) and **communication mode 4** (9600 bps, 8, N, 1). Using the command for changing the device number it is possible to assign any other number (maximum FF in hexadecimal or 255 in decimal).

In case you remember the slave number, you can return to default number and communication mode following this steps:

- Power off the device.
- Press permanently reset button.
- Power on the device and stop pressing the reset button.

MODBUS RTU COMMANDS

| Magnitude | Symbol | Input Registers | Holding Registers | Unity | Function |
|------------------------------|--------|-----------------|-------------------|---|--------------|
| Peripheral number | | | 0x00 | | 3,6,16(0x10) |
| Communication parameters | | | 0x01 | 0: 9600, 8, E, 1 1: 19200, 8, E, 1 2: 9600, 8, N, 2 3: 19200, 8, N, 2 4: 9600, 8, N, 1 5: 19200, 8, N, 1 | 3,6,16(0x10) |
| Hardware version | | | 0x07 | | 3 |
| Software version | | | 0x08 | | 3 |
| Model | | | 0x0B | | 3 |
| Current transformer XX/250mA | | | 0x32 | Default value 100A | 3,6,16(0x10) |
| Voltage | VI1 | 0x02-0x03 | | V x 10 | 4 |

| | | | | | |
|----------------------------|-------|-----------|--|--------|---|
| Current | AI1 | 0x04-0x05 | | mA | 4 |
| Active power | API1 | 0x06-0x07 | | w | 4 |
| Reactive power | RPI1 | 0x08-0x09 | | w | 4 |
| Apparent power | VAI1 | 0x0A-0x0B | | w | 4 |
| Power factor | PFI1 | 0x0C-0x0D | | x 1000 | 4 |
| Cos ϕ | COSI1 | 0x24-0x25 | | x 1000 | 4 |
| Frequency | FQI1 | 0x28-0x29 | | x 100 | 4 |
| Active energy | AE | 0x3C-0x3D | | w.h | 4 |
| Inductive reactive energy | IE | 0x3E-0x3F | | w.h | 4 |
| Capacitive reactive energy | CE | 0x40-0x41 | | w.h | 4 |
| Maximum demand | MDI | 0x44-0x45 | | w/VA | 4 |
| Apparent energy | VAE | 0x56-0x57 | | w.h | 4 |

MODEL REFERENCE


| Model | Reference | Current measure | Protocol | Communication |
|---------|-----------|-----------------|------------|---------------|
| SEM One | M009 | 250 mA | Modbus/RTU | RS-485 |

CURRENT TRANSFORMERS REFERENCES

PickData recommends the use of efficient transformers from series TRA and TRC for SEM One:

| Model | Reference | Maximum current | Power class | Inner diameter |
|-----------|-----------|-----------------|-------------|----------------|
| TRA1 80A | T004 | 80 A | 1 | 10 mm |
| TRA1 100A | T005 | 100 A | 1 | 16 mm |
| TRC1 100A | T006 | 100 A | 0,5 | 12 mm |
| TRC1 250A | T007 | 250 A | 0,5 | 19 mm |

SAFETY PRECAUTIONS

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|---|---|
|  | <p>DANGER</p> <p>Warns of a risk, which could result in personal injury or material damage caused by an incorrect handling or installation of the unit. In particular, handling with voltages applied may result in electric shock, which may cause death or serious injury to personnel. Defective installation or maintenance may also lead to the risk of fire. Read the manual carefully prior to connecting the unit. Follow all installation and maintenance instructions throughout the unit's working life. Pay special attention to the installation standards of the National Electrical Code.</p> |
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DISCLAIMER

PickData, SL reserves the right to make modifications to the device or the unit specifications set out in this instruction manual without prior notice.

PickData, SL on its web site, supplies its customers with the latest versions of the device specifications and the most updated manuals.

MAINTENANCE AND TECHNICAL SERVICE

Device doesn't require maintenance.

In the case of any query in relation to unit operation or malfunction, please contact the PickData, SL technical support service.

PickData, SL – Technical support service
 Calle Innovació, 3
 08232 – Viladecavalls (Barcelona), SPAIN
 Tel: (34) 937 362 940 (España)
 Email: info@pickdata.net