

## 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.

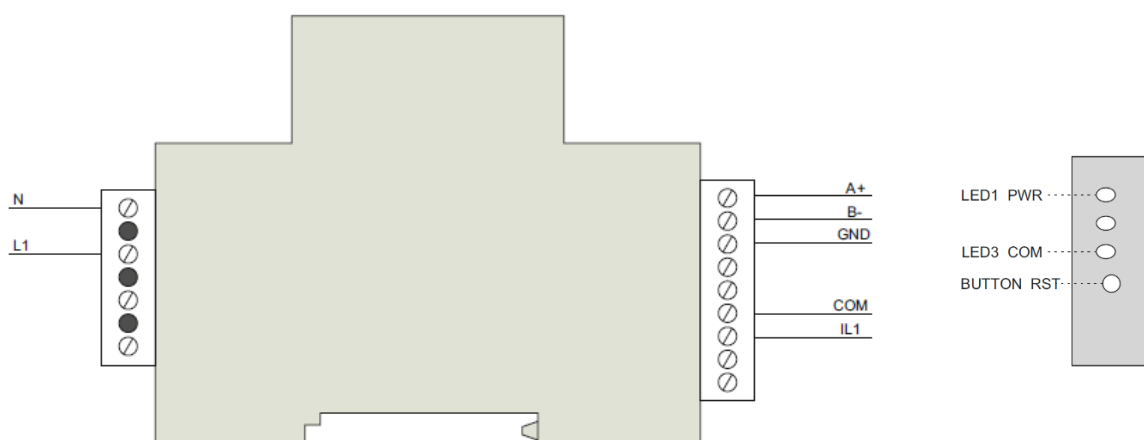
The communication of measured data works over Modbus RTU standard protocol.

### TECHNICAL CHARACTERISTICS

<b>Power circuit</b>	
Input voltage	110 .... 264 Vac
Frequency	47 .... 63 Hz
Maximum consumption	2,5 .... 4,5 VA
<b>Environmental conditions</b>	
Temperature range	-10 .... +60°C
Humidity range	5 .... 95%
<b>Mechanical characteristics</b>	
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
<b>Serial interface</b>	
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
<b>Characteristics and electrical security</b>	
Security	CAT III 300 V under EN 61010
Protection class	Class II
External current transformers	Series TRC and TRA (In / 0,250 A)
<b>Standards</b>	
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 1mm<sup>2</sup>. The secondary line for the current transformer shall have a minimum cross section of 2.5 mm<sup>2</sup>. 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	Registers	Format	Unity	Function
Peripheral number		0x00	Unsigned INT16		3,6,16(0x10)
Communication parameters		0x01	Unsigned INT16	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	Unsigned INT16		3
Software version		0x08	Unsigned INT16		3
Model		0x0B	Unsigned INT16		3
Current transformer XX/250mA		0x32	Unsigned INT16	Default value 100A	3,6,16(0x10)
Voltage	VI1	0x02-0x03	Unsigned INT32	V x 10	4
Current	AI1	0x04-0x05	Signed INT32	mA	4

Active power	API1	0x06-0x07	Signed INT32	w	4
Reactive power	RPI1	0x08-0x09	Signed INT32	w	4
Apparent power	VAI1	0x0A-0x0B	Signed INT32	w	4
Power factor	PFI1	0x0C-0x0D	Signed INT32	x 1000	4
Cos $\phi$	COSI1	0x24-0x25	Signed INT32	x 1000	4
Frequency	FQI1	0x28-0x29	Unsigned INT32	x 100	4
Active energy	AE	0x3C-0x3D	Unsigned INT32	w.h	4
Inductive reactive energy	IE	0x3E-0x3F	Unsigned INT32	w.h	4
Capacitive reactive energy	CE	0x40-0x41	Unsigned INT32	w.h	4
Maximum demand	MDI	0x44-0x45	Signed INT32	w/VA	4
Apparent energy	VAE	0x56-0x57	Unsigned INT32	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 20A	T024	20 A	1	16 mm
TRA1 80A	T004	80 A	1	10 mm
TRA1 100A	T005	100 A	1	16 mm
TRA1 250A	T025	250 A	1	24 mm
TRC1 20A	T026	20 A	0,5	13 mm
TRC1 100A	T006	100 A	0,5	12 mm
TRC1 250A	T007	250 A	0,5	19 mm

## SAFETY PRECAUTIONS

	<p><b>DANGER</b></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.

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