

Description

SEMS Terminal is able to generate the consumption profile of its associated appliance thanks to a 1kHz sampling of multiple electrical parameters such as (total and partial) energy, current, voltage, active and reactive power, $\cos \varphi$, frequency and the first harmonic.

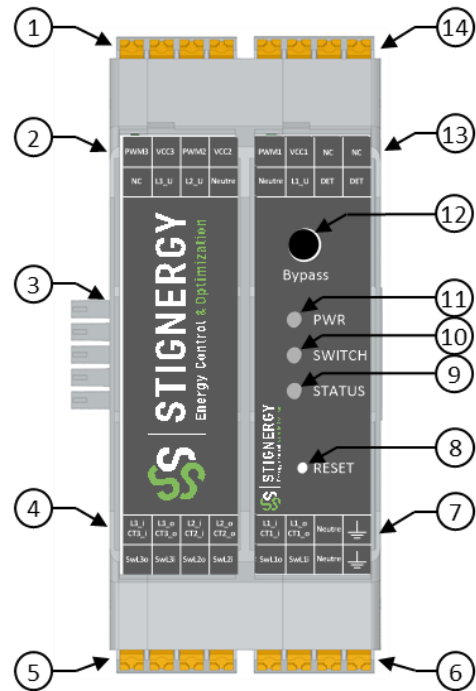
Several Terminals may be gathered together to form a cluster where each one communicate with all others using its RS485 communication interface.

Build on a collective intelligence principle, the SEMS Terminal embeds an algorithm that is able to make and apply ON/OFF decisions or dynamically generates a command to control and reduce the energy demand of the appliance that is under its control.

Features

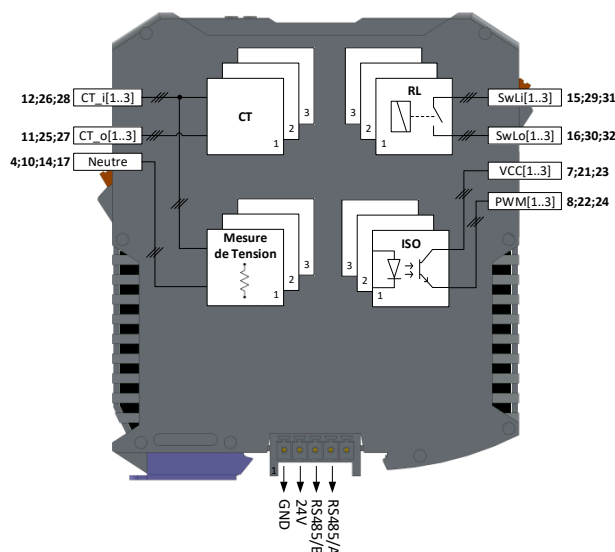
- Modular structure, due to the TBUS connectors. Thus, up to 255 Terminals may be interconnected.
- RS485 communication interface.
- Current measurement using internal CT up to 16A and external CTs or Rogowski coils up to 10kA.
- Detection of “consumption start” in 3ms.
- Analog detection on 48V DC/100mA or 250V AC/40mA command line.
- 3 relay outputs supporting up to 250V AC/16A or 35V DC/8A.
- 3 digital outputs (PWM) protected from 5V DC to 50V DC.

Assembly



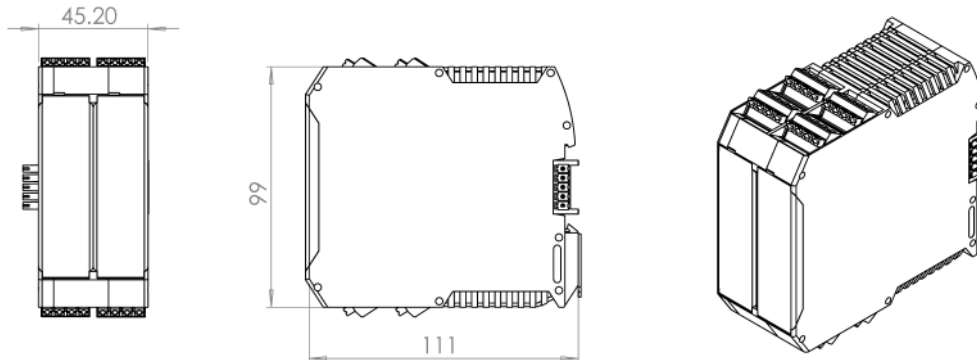
Position	Designation
1, 5, 6, 14	Push-in spring connections
2, 4, 7, 13	Mapping of Input/Output
3	TBUS connector
8	RESET button
9	LED STATUS (Program running)
10	LED SWITCH (Relays state)
11	LED PWR (Power supply)
12	Security button to bypass the SEMS Terminal

Connections



Technical specifications

Dimensions



Dimensions

W x H x D 45.2mm x 99mm x 111mm

General specifications

Overvoltage category	III
Mounting position	Any, on 35 mm DIN mounting rail acc. to EN 60715
Degree of protection according to VDE 0470-1	
Housing	IP20
Connection terminal	IP20
Mounting position	IP54 min
Housing material	Polyamide PA non-reinforced
Degree of pollution	2
Flammability rating according to UL 94	V0

Supply

Rated voltage	24V DC via TBUS connector
Voltage range	20V to 30 V DC
Max. current consumption	50mA /24VDC at 25°C
Protection against transient overvoltage	Yes (bidirectional TVS Diode)

Serial interface RS485 (2-wire)

Connection	TBUS connector
Baud rate	Up to 1 Mbps

Command line input

Inputs number	1
Maximal DC voltage	48V
Maximal AC voltage	250V
Maximal DC current	100mA
Maximal AC current	40mA
Protection type	Optocouplers protection

Measurements input

	Measurements \leq 16A	Measurements > 16A
Inputs number	3	3
Maximal AC voltage	250V	250V
Maximal AC current	16A	10kA
Protection type	Transient protection	Transient protection

Digital output (PWM)

Outputs number	3
Maximal DC voltage	50V
Maximal DC current	60mA
Protection type	Optocouplers protection

Relays outputs

Outputs number	3
Contact type	AgSnIn
Maximum DC switching voltage	35V
Maximum AC switching voltage	250V
Maximum DC switching current	8A
Maximum AC switching current	16A
Mechanical lifetime	1 x 10 ⁷ cycles
Electrical lifetime	1 x 10 ⁵ cycles
Maximum switching frequency	100Hz
Switching power	4000VA

Connection data

Connection method	Push-in spring connections
Conductor cross section solid	0,2mm ² to 2,5mm ²
Conductor cross section flexible	0,2mm ² to 2,5mm ²
Conductor cross section	14AWG/kcmil to 24AWG/kcmil
Stripping length	10 mm

Ambient conditions

Ambient temperature (operation)	-20°C to 70 °C
Ambient temperature (storage/transport)	-40°C to 80 °C
permissible relative humidity (operation)	10% to 95%

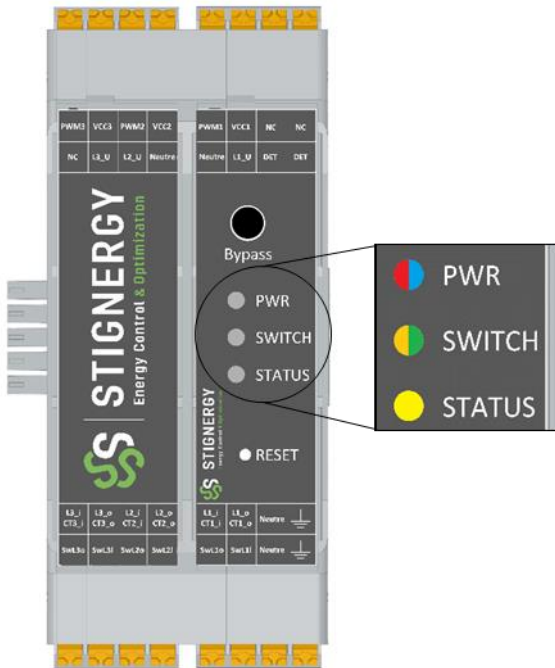
Standards

Conformance	CE-compliant
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Directive conformity

Electromagnetic compatibility	Low voltage 2006/95/CE CEM-EMC 2004/108/CE
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Operating mode and diagnostic LEDs of SEMS Terminal



Status display

Three LEDs to indicate the different states of the SEMS Terminal.

LEDs symbols means :

LED OFF ●

LED ON ☀

Blinking LED ●/☀

Slow blinking : f = 1Hz

Fast blinking : f = 2Hz

Table 2. LED state

LED	State	Meaning
PWR	●	Power supply OFF
	☀ Blue	Power supply ON
	☀ Red	Bypass mode ON
	☀ Purple	Warning
SWITCH	●	Power supply OFF
	☀ Green	All relay are closed
	☀ Orange	At least one relay is open
STATUS	●	Power supply OFF
	●/☀ Yellow	Program is running



Table 1. Operating mode of SEMS Terminal

Operating mode	Meaning
Normal	SEMS Terminal in normal mode, it can take ON/OFF decisions
Bypass	SEMS Terminal in normal mode, it cannot take ON/OFF decisions anymore
Boot	SEMS Terminal in boot mode

Table 3. Status of SEMS Terminal

PWR	SWITCH	STATUS	Meaning
●	●	●	☞ Power is off. No power supply from the TBUS
☀ Blue	☀ Green	●/☀ Yellow (slow)	☞ SEMS Terminal is working in Normal mode
☀ Blue	☀ Orange	●/☀ Yellow (slow)	☞ SEMS Terminal is working in Normal mode
☀ Red	☀ Green	●/☀ Yellow (slow)	☞ SEMS Terminal is working in Bypass mode
☀ Blue	●/☀/☀ Green and orange (fast)	●/☀ Yellow (fast)	☞ SEMS Terminal is working in Boot mode

Connection Terminals

Designation	Terminal bloc N°	Function	
		Measure $\leq 16A$	Measure $> 16A$
DET	1	Command line input and output	
DET	2		
L1_U	3	-	Input external voltage L1
Neutre	4	Neutral	
NC	5	Not Connected	
NC	6	Not connected	
Vcc1	7	Power supply for PWM1 command	
PWM1	8	PWM1 command output	
Terre (PE)		Earth	
Neutre	10	Neutral	
L1_L/CT_o	11	Output phase L1	Terminal L of external CT, phase L1
L1_L/CT_i	12	Input phase L1	Terminal K of external CT, phase L1
Terre (PE)		Earth	
Neutre	14	Neutral	
Sw_L1_i	15	Relay L1 input/output	
Sw_L1_o	16		
Neutre	17	Neutral	
L2_U	18	-	Input external voltage L2
L3_U	19	-	Input external voltage L3
NC	20	Not connected	
Vcc2	21	Power supply for PWM2 command	
PWM2	22	PWM2 command output	
Vcc3	23	Power supply for PWM3 command	
PWM3	24	PWM3 command output	
L2_L/CT_o	25	Output phase L2	Terminal L of external CT, phase L2
L2_L/CT_i	26	Input phase L2	Terminal K of external CT, phase L2
L3_L/CT_o	27	Output phase L3	Terminal L of external CT, phase L3
L3_L/CT_i	28	Input phase L3	Terminal K of external CT, phase L3
Sw_L2_i	29	Relay L2 input/output	
Sw_L2_o	30		
Sw_L3_i	31	Relay L3 input/output	
Sw_L3_o	32		

Accessories

- TRACO - TBL 030-124

Power module for SEMS Terminals : 24VDC rated output currents up to 1.25A via the TBUS connector.

- DIN Rail Terminal Blocks, PHOENIX CONTACT, ME 22.5TBUS1.5/5-ST 5P DIN RAIL BUS CONN – 2713722

Plug component with nominal current $I_n = 8A$

- Printed-Circuit board connector, PHOENIX CONTACT, IMC 1,5/ 5-ST-3,81 – 1857919

Type : Plug component, Nominal current: $I_n 8A$, Rated voltage (III/2): 160V,

Number of positions: 5, Pitch: 3.81mm , Connection method: Screw connection with tension sleeve

Color: Green

Contact surface: pewter