

SenNet **OPTIMAL**

INTELLIGENT ENERGY EFFICIENCY



SENNET OPTIMAL

Intelligent energy efficiency

SenNet Optimal is our energy consumption monitoring solution for commercial and industrial buildings. It was designed for companies and entities who wish to know the breakdown of their consumption (electricity, gas, thermal energy, water) so they may improve their efficiency.

Companies in both the service (hotels, schools, gyms, banks, public buildings) and industrial sectors (metallurgy, steel, chemical, petrochemical, food and beverage, textile, pharmaceutical, automotive, household appliances, etc.) could **save up to 30%** on their energy costs by monitoring and subsequently controlling their consumption through the application of SenNet Optimal.

If your company is a...



you can now control its **consumption**.

The first step towards **energy efficiency** is to collate **real-time consumption data**

SenNet Optimal offers you **the power to:**



Measure and control energy consumption

Metering

Analysis

Establish control systems:

- At management level, by implementing an automated warning and reporting system.
- At an unmanned level, through automatic control over loads.



Save

- Energy savings achieved by controlling consumption.
- Savings on energy bills thanks to contracted rate and power optimisation strategies.
- Reduced consumption as any inefficiencies are detected by the system which generates a notification alarm.



Create an energy-saving culture

- Raise employee awareness.
- Corporate Social Responsibility.
- ISO 50001 compliance.

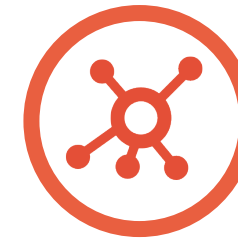
Special features of SenNet Optimal

SenNet stands above other options thanks to:

- ✓ A datalogger which covers all consumption needs:
 - Any type of consumption.
 - With the option to include integrated electric meters, saving time, space and money.
- ✓ A standard Linux-based data logger, which is of free and open use regardless of:
 - The variable being measured, **as it is fully configurable**.
 - The way data are managed, since it is **totally compatible with any platform**.
- ✓ Devices are interconnected using radio frequency meaning the system's installation is simple, quick and inexpensive.
- ✓ Control options which are based on strong performance rules that regulate the device's output or that of external equipment.

SenNet Optimal, Additional Services

We also offer the following services to help you achieve control of your company's energy expenditure:



Solution design

Including a site visit by one of our technicians, if required, to characterise the circuits, establish communication strategies, etc.



Installation and commissioning



Establishing energy saving warning and control parameters



Staff training

to attain and monitor efficiency targets.

A fully detailed technical proposal.
We can provide **turnkey solutions**.

SenNet Optimal

a complete solution

for metering

- Complete, scalable and easy-to-install system thanks to its multiple communication options (cable, radio frequency, Wi-Fi, etc.).
- Solutions which cover all types of consumption at your facilities: electricity, gas, oil, hot water, steam, cold domestic water, etc.; as well as other variables: temperature, humidity, luminosity, occupancy (counters measuring the number of people entering and exiting a room)...

for consumption data management

- Compatible with all energy management platforms on the market.
- Independent system featuring the All-in-One integrated management server option.

for control

- Automatic load and equipment control which automates efficiency and optimises savings.



SenNet Optimal:
a complete, scalable and
easy-to-install system



SenNet Optimal

How does it work?

1

The data logger

First our technicians install a data logger in the building which is capable of collecting **data from up to 100 measuring and metering devices**.

We have a wide assortment of data loggers that can be tailored to the requirements of each project.

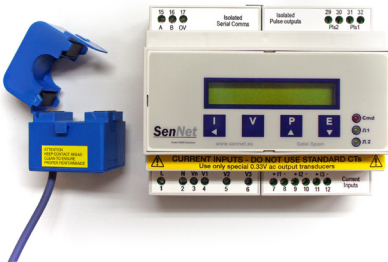


2

Consumption metering devices

Our data loggers are compatible with any metering device we may come across at your facilities and with a large number of devices for measuring other consumption-related variables (temperature, humidity, luminosity, radiation, pressure, etc.).

We also have our own range of **SenNet consumption meters**, featuring a wide spectrum of characteristics, compatibility with all measuring device currently on the market and a 5-year guarantee. Another outstanding feature are the electric meters integrated into our data loggers (up to 6 three-phase or 18 single-phase meters), saving **space, time and money**.



3

Connectivity

Metering devices are connected using **cable, radio, Wi-Fi, GSM, etc.** which facilities or enables all kinds of installation.

The user can choose between an energy-management platform or an integrated energy-management server.

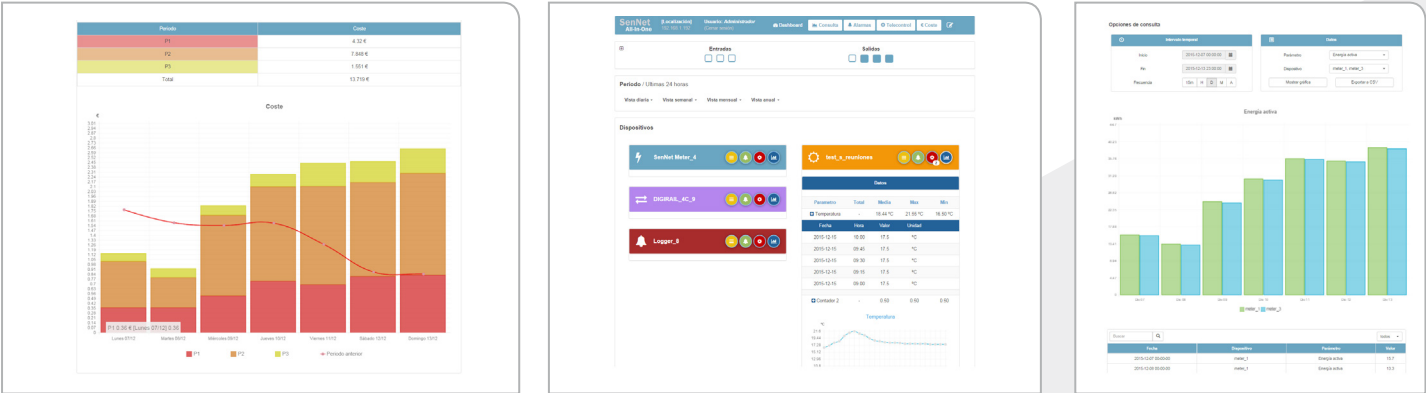
Data transfer is mediated by integrated GPRS/3G devices or over the facility's own ADSL.

Equipment 100%
compatible with your facilities

Management Software

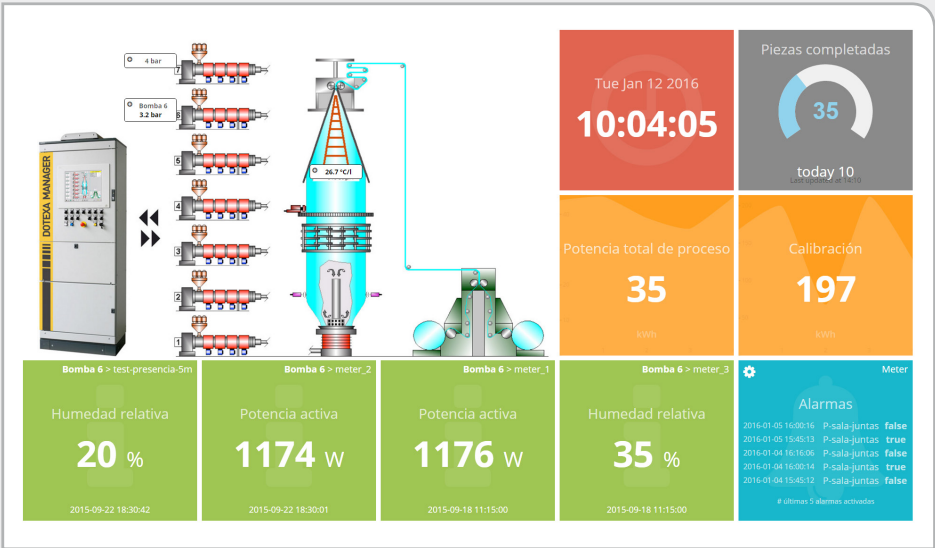
All in One

- Recommended for customers with **one headquarters** or with one facility.
- **Integrated** platform that can be run on the actual datalogger.
- Without recurrent costs.
- **Visual.** Using windows and buttons you will be able to define control actions, warnings and charts.
- **Monitoring, remote control** and electricity bill forecast.



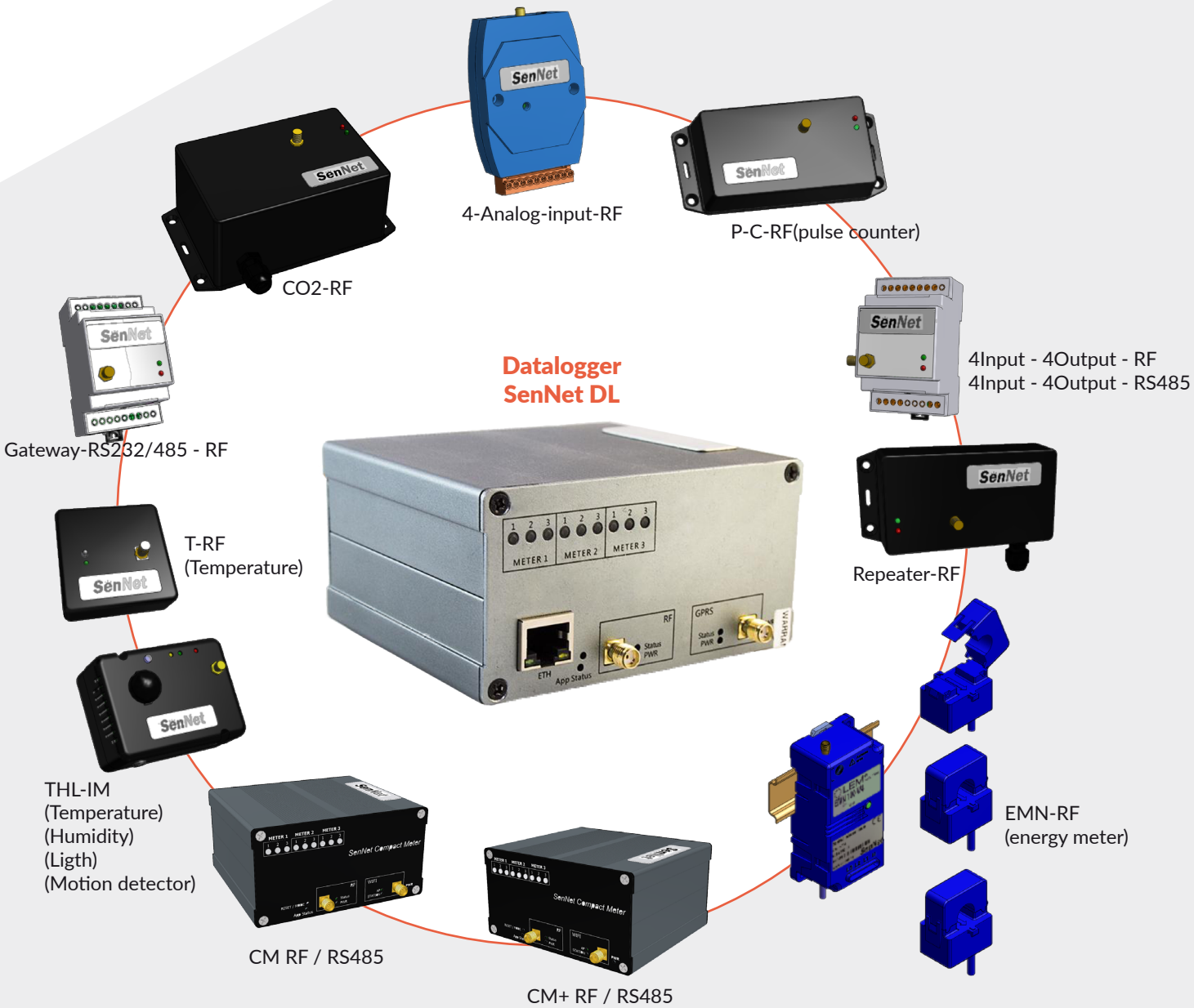
Scope

- Recommended for **multisite customers**.
- To be run in the **cloud or on your facility's server**.
- Without recurrent costs.
- It **works as a control panel** and as an energy management platform. Users can customize the screen to have the information they need on hand.
- No learning curves. Easy and **intuitive** use with maximum power.



Equipment

used in the solution



Data loggers:

A wide range is available with the following options:

- integrated electric meters
- GPRS/3G
- radio frequency (RF)
- inputs and outputs

Radio frequency network devices:

Temperature, humidity, luminosity, presence, air quality and input status sensors.

Transparent gateways to connect meters with standard data outputs via RF.

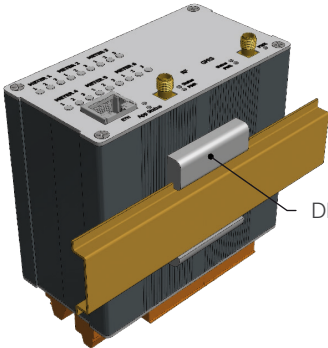
Electric meters:

Any brand of electric meter can be installed through either direct connection or via radio using our RF Gateway.

Data loggers

We have a broad range of data loggers to fulfil the needs of your project

Datalogger SenNet	Connectivity				Interface		I/O			RF		Extend storage (micro-SD)	Platform All-In-One	Energy Meter (CT or Rogowsky)
	PWR	(CT or Rogowsky)	GPRS	WIFI- USB	RS485	RS232	output power (5V @ 300mA)	output standard (VinpUT @100mA)	input standard	SenNet RF	Z-wave			
DL150	5Vdc	✓	-	✓	✓	-	-	-	-	optional	optional	optional (internal)	✓	-
DL151	5Vdc	✓	-	✓	✓	-	-	-	-	optional	optional	optional (internal)	✓	3
DL170	8..30Vdc	✓	✓	optional	✓	✓	✓	4	3	✓	optional	✓	✓	-
DL171	8..30Vdc	✓	✓	optional	✓	✓	✓	4	3	✓	optional	✓	✓	3
DL172	8..30Vdc	✓	✓	-	✓	✓	✓	4	3	✓	-	✓	✓	6



DIN Rail support

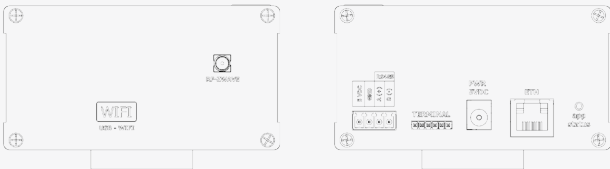
DL - 150



They can capture data from up to 100 devices

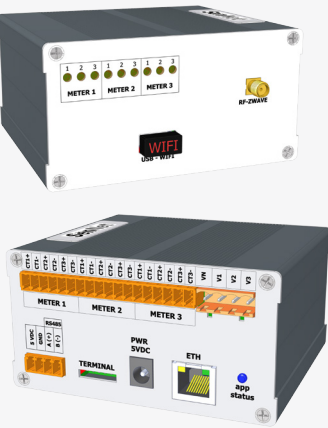
Power supply	5Vdc	Power supply with DC power jack or terminal input	
Connectivity	Ethernet	WIFI (usb port)	Z-Wave (optional)
Interface	RS485		Terminal (TTL levels)
SO / processors	Linux 3.8.13	ARM® Cortex®-A8-based core from 300MHz up to 1GHz	
RAM memory	512MB		
Internal eMMC (SO)	2GB / 4GB		
Extend storage (micro-SD)	4GB		
Battery	Internal battery for backup 45 minutes aprox.		
RTC	Real time clock		
Accessory RF	SenNet RF 868MHz (optional)		Zwave® (optional)
Mounting	DIN Rail		
Dimensions (mm)	106x95x55		

DL 150

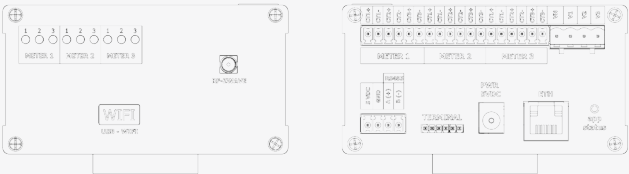


Data loggers

DL - 151



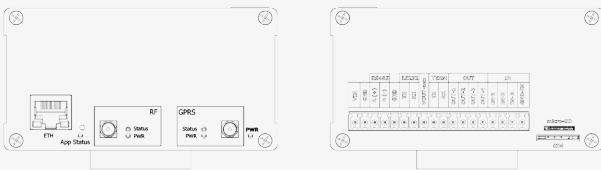
Power supply	5Vdc	Power supply with DC power jack or terminal input	
Connectivity	Ethernet	WIFI (usb port)	Z-Wave (optional)
Interface	RS485		Terminal (TTL levels)
SO / processors	Linux 3.8.13	ARM® Cortex®-A8-based core from 300MHz up to 1GHz	
RAM memory	512MB		
Internal eMMC (SO)	2GB / 4GB		
Extend storage (micro-SD)	4GB (optional)		
Battery	Internal battery for backup 45 minutes aprox.		
RTC	Real time clock		
Accessory RF	SenNet RF 868MHz (optional)		Zwave® (optional)
(x3) Internal energy meter	internal meter for 3-phase system (CT 0,33Vac / Rogowski coil)		Energy (reactive-active-apparent) Power (reactive-active-apparent) Power factor Current Voltage Frequency
	3-phase system voltage reference		
Mounting	DIN Rail		
Dimensions (mm)	106x95x55		



DL - 170

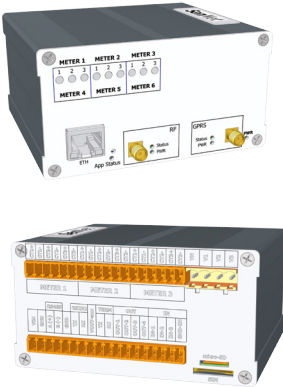


Power supply	8...30Vdc			
Connectivity	Ethernet	GSM-GPRS (2G) (3G) optional	WIFI (usb port) (optional)	Z-Wave (opcional)
Interface	RS485	RS232	RS232 (terminal)	
I/O	(x1) Output power (5V @ 300mA)	(x3) Output standard (Vinput @100mA)	(x4) Input standard	
SO / processors	Linux 3.8.13		ARM® Cortex®-A8-based core from 300MHz up to 1GHz	
RAM memory	512MB			
Internal eMMC (SO)	2GB / 4GB			
Extend storage	extern micro-SD			
Battery	Internal battery for backup 45 minutes aprox.			
RTC	Real time clock			
RF	SenNet RF 868MHz		Zwave® (optional)	
Mounting	DIN Rail			
Dimensions (mm)	106x95x55			

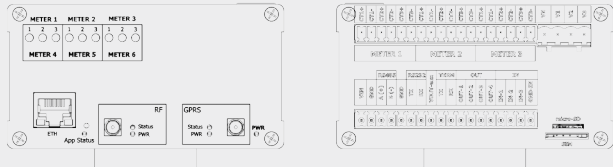


Data loggers

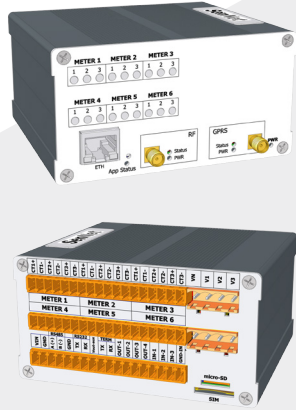
DL - 171



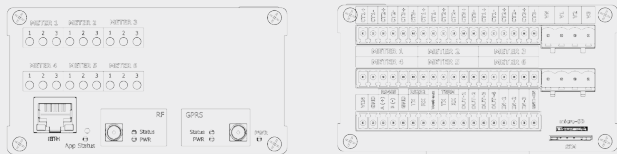
Power supply	8...30Vdc			
Connectivity	Ethernet	GSM-GPRS (2G) (3G) optional	WIFI (usb port) (optional)	Z-Wave (opcional)
Interface	RS485	RS232	RS232(terminal)	
I/O	(x1) Output power (5V @ 300mA)	(x3) Output standard (Vinput @100mA)	(x4) Input standard	
SO / processors	Linux 3.8.13		ARM® Cortex®-A8-based core from 300MHz up to 1GHz	
RAM memory	512MB			
Internal eMMC (SO)	2GB / 4GB			
Extend storage	extern micro-SD		Necessary to use platform embedded All-In-One	
Battery	Internal battery for backup 45 minutes aprox.			
RTC	Real time clock			
RF	SenNet RF 868MHz		Zwave® (optional)	
(x3) Internal energy meter	internal meter for 3-phase system (CT 0,33Vac / Rogowski coil)		Energy (reactive-active-apparent) Power (reactive-active-apparent) Power factor Current	
	3-phase system voltage reference		Voltage Frequency	
Mounting	DIN Rail			
Dimensions (mm)	106x95x55			



DL - 172



Power supply	8...30Vdc		
Connectivity	Ethernet	GSM-GPRS (2G) (3G) optional	
Interface	RS485	RS232	RS232(terminal)
I/O	(x1) Output power (5V @ 300mA)	(x3) Output standard (Vinput @100mA)	(x4) Input standard
SO / processors	Linux 3.8.13		ARM® Cortex®-A8-based core from 300MHz up to 1GHz
RAM memory	512MB		
Internal eMMC (SO)	2GB / 4GB		
Extend storage	extern micro-SD		Necessary to use platform embedded All-In-One
Battery	Internal battery for backup 45 minutes aprox.		
RTC	Real time clock		
RF	SenNet RF 868MHz		Zwave® (optional)
(x6) Internal energy meter	internal meter for 3-phase system (CT 0,33Vac / Rogowski coil)		Energy (reactive-active-apparent) Power (reactive-active-apparent) Power factor Current
	3-phase system voltage reference		Voltage Frequency
Mounting	DIN Rail		
Dimensions (mm)	106x95x55		



RF devices

		POWER SUPPLY	
	Features	Battery	External
THL-I	Temperature / humidity / light / counter pulse	(x1) battery 3.6v pack battery 3.6v (optional)	5...12Vdc
THL-IM	Temperature / humidity / light / counter pulse / motion sensor	(x1) battery 3.6v pack battery 3.6v (optional)	5...12Vdc
T-RF	Temperature sensor	(x1) battery 3.6v	-
P-C-RF	(x2 input) pulse counter	(x1) battery 3.6v	5...24Vdc
Gateway-RF	radio link with RS485 or RS232	-	100-265Vac
CO2-RF	CO ₂ sensor	-	100-265Vac
4-Analog-Input	4 differential input mV / V / mA	-	10...24Vdc
4IO-RF / RS485	4 input logical 4 relay output (6A@250Vac)	-	10...24Vdc
Repeater-RF	RF Signal repeater	-	100-265Vac
EMN-RF	3-phase energy meter with 0.33Vac CT included and calibrated	-	100-265Vac
CM RF / RS485	3-phase energy meter (1-3 meters) with RS485 or Radio Frequency connectivity	-	5 Vdc
CM+ RF / RS485	3-phase energy meter (4-6 meters) with RS485 or Radio Frequency connectivity	-	5 Vdc



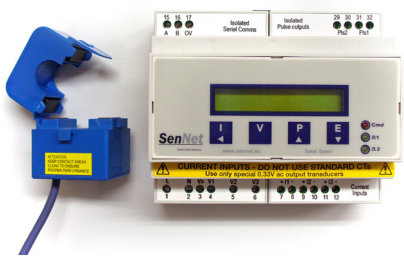
Meters

SELECTION OF THE ELECTRIC METER

Electric meter		N° 1-phase meter	N° 3-phase meter	Modbus RTU RS485	RF	Pulse output	Current transformer	Harmonic measurement	Accuracy
SenNet Meter 1-phase		3	-	✓	-	✓	CT 0,33Vac / Rogowski coil with integrator	to 15th	Class 1 (kWh)
SenNet Meter 3-phase		3 (different fases)	1	✓	-	✓	CT 0,33Vac / Rogowski coil with integrator	to 15th	Class 1 (kWh)
SenNet Modular	(min) (max)	6...60	2...20	✓	-	✓	CT 0,33Vac / Rogowski coil with integrator	-	Class 1 (kWh)
	each module added (max. 10 modules)	6	2						
SenNet CM		1...9	1...3	✓	Optional	-	CT 0,33Vac / Rogowski coil	-	Class 1 (kWh)
SenNet CM+		10...18	4...6	✓	Optional	-	CT 0,33Vac / Rogowski coil	-	Class 1 (kWh)

SELECTION OF THE CURRENT TRANSFORMER (CT) BASED ON WIRE DIAMETER AND CURRENT

Current transformer	50 A	150 A	250 A	300 A	400 A	500 A	800 A	1000 A	1500 A	2000 A	3000 A	5000 A
CT 0,33Vac	10mm	19,1mm			31,8mm		50,8mm		76,2mm	76,2mm		
Rogowski Coil with integrator			160mm	160mm	160mm	160mm	160mm	160mm	160mm	160mm	160mm	160mm
Rogowski Coil			160mm	160mm	160mm	160mm	160mm	160mm	160mm	160mm	160mm	160mm



SenNet Meter



SenNet Modular



Rogowski coil flexible CTs



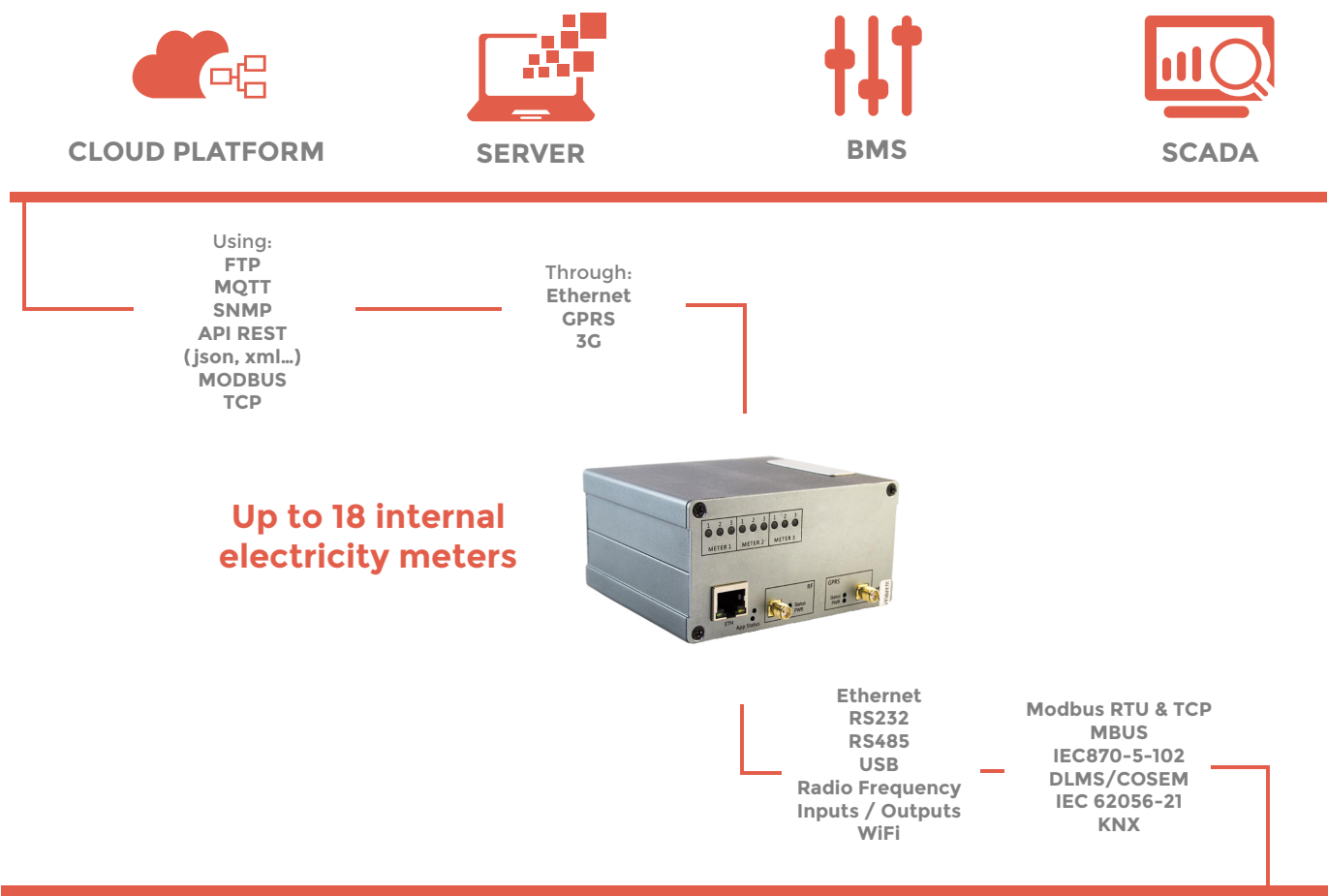
Split-core CTs



CM RF / RS485



CM+ RF / RS485



GENERAL METERS
Electricity, water, gas...



SUBMETERING
Network analysers,
thermal meters...



ENVIRONMENTAL SENSORS
Humidity, luminosity,
temperature...



INPUTS AND OUTPUTS
Analog and digital



SenNet

Monitoring Solutions

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Unión Europea

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