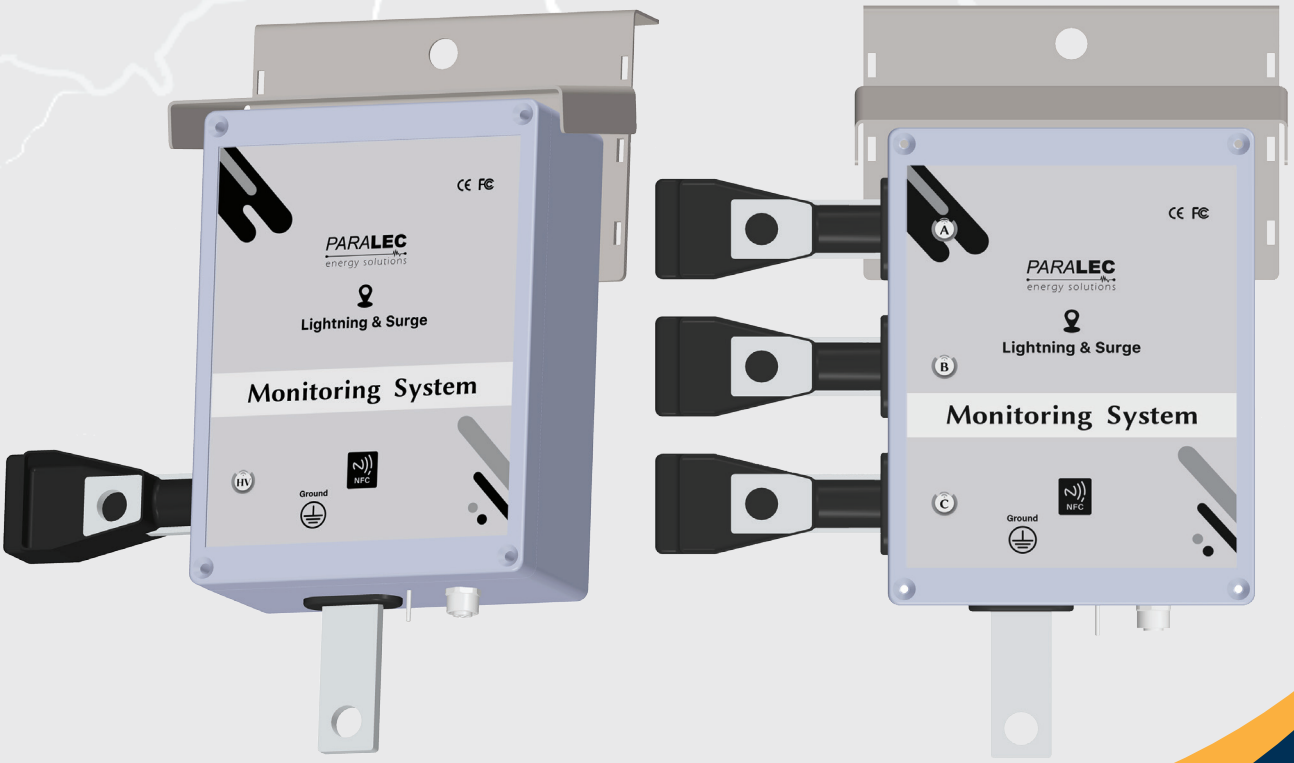
Surge & Lightning
Monitoring Device

For Metal Oxide Surge Arresters from 6 to 800 kV AC



Monitoring of surge arrester, EGLA, MOA, MOR, SPD, TLA.

- LoRa and NFC wireless solution. Wired via RS485, Digital output.
- Solar supply & external supply versions.
- Unique condition monitoring : resistive leakage current & total discharged energy monitoring system, lightning, surge events and discharges records.
- Durable device: stainless steel, polycarbonate UV resistant, aluminum. Outdoor device : IP65.
- Up to 3 phases / surge arresters on the same device.
- Monitoring software
- GPS localisation and timestamp

See lightning & surges, clearly

Paralec has dedicated its research activities to lightning and surges qualification. This new range of products aims at helping our customer to understand the origin of surges, thier parameters and impact on equipment.

It involves diagnostic of metal oxide based surge arresters (MOR,TLA, MOA) in service, record peak currents, historical data, number of events, cumulative charges discharged by equipment.

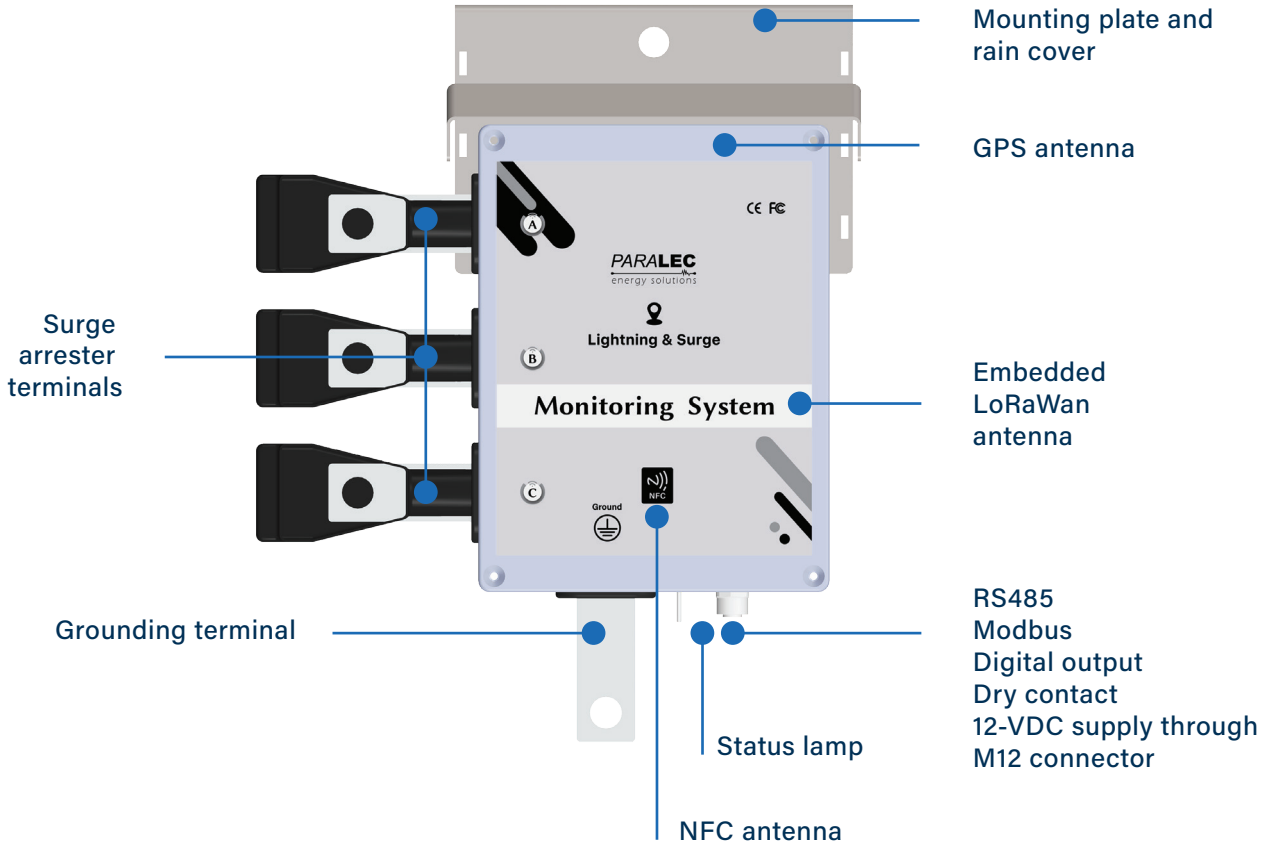
It allows ageing and problems qualification to reach higher accuracy in order to optimize reliability and expenditure.

With a communication range of 2.5 km LoRaWan standards allows the user have a safe and remote connection.

SM Series Surge Monitoring can be installed easily on ground conductors.

Thanks to its IP65, housing, rugged materials and self power, the SM Series suitable for outdoors.

Power supply is ensured through supercap cell and solar panels. Optional DC power supply can also be arranged.



TECHNICAL CHARACTERISTICS

REFERENCE	SMC
EARTHING CONNECTION	
CONDUCTOR DIAMETER RANGE	5 to 25 l 35 to 300 mm^2
INSTALLATION ON THE CONDUCTOR	Terminals, 13.5 mm hole in series
SURGE EVENT COUNTER	
MINIMUM DISCHARGE PEAK CURRENT DETECTED - 8/20 us waveform - IEC 62561-6	200 A*
MAXIMUM DISCHARGE PEAK CURRENT DETECTED - 10/350 us waveform - IEC 62561-6	100 kA
WAVEFORM REGISTRATION RESPONSE TIME	1.3 µs
MINIMUM TIME BETWEEN 2 STROKE FOR REGISTRATION, RESPONSE TIME	10 µs
LONG DURATION CURRENT WITHSTAND CAPABILITY	2500 A for 4 ms
HIGH CURRENT WITHSTAND CAPABILITY	100 kA
IMPULSE CURRENT PEAK MEASUREMENT	YES
IMPULSE DURATION	YES
IMPULSE POLARITY	YES
MEASUREMENT	
MINIMUM DISCHARGE PEAK CURRENT MEASURED - 8/20 us waveform - IEC 62561-6	200 A*
MAXIMUM DISCHARGE PEAK CURRENT MEASURED - 10/350 us waveform - IEC 62561-6	40 kA*
PEAK LIGHTNING CURRENT ACCURACY 8/2us	10%
FOLLOW CURRENT / GROUND FAULT RANGE	70 to 10 000 A*
FOLLOW CURRENT / GROUND FAULT (50/60Hz) ACCURACY	10%
TOTAL LEFT THROUGH I^2t	YES
CHARGE RANGE	0 to 65C
LEAKAGE MEASUREMENTS	
TOTAL LEAKAGE CURRENT	50 µA to 50 mA
ACCURACY (at Tamb ≤ 40 °C)	± 10%
SURFACE POLLUTION & HUMIDITY INGRESS DETECTION (UNDER EVALUATION)	YES
THIRD HARMONIC LEAKAGE CURRENT	50 - 5000 µA
ACCURACY (at Tamb ≤ 40 °C)	± 15%
RESISTIVE LEAKAGE CURRENT	50 - 5000 µA
ACCURACY (at Tamb ≤ 40 °C)	± 15%

*other ranges on request

TECHNICAL CHARACTERISTICS

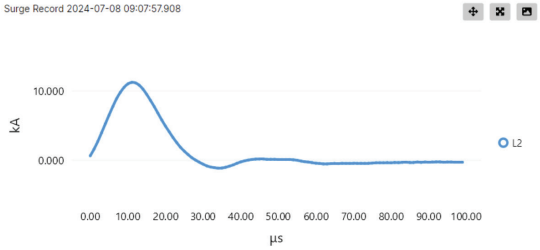
SM MV/HV — PARALEC energy solutions

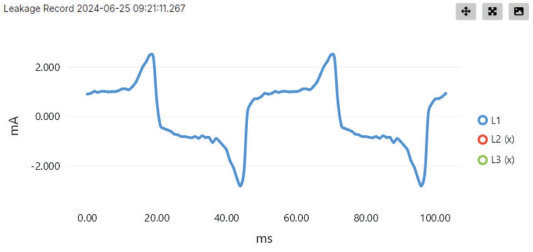
ENVIRONMENTAL CONSTRAINTS	
TEMPERATURE - °C	Class C2: -40 to +70
PROTECTION CLASS	IP65, NEMA 4X
TEMPERATURE CHANGE RATE - °C/min	Class C2: 1,0
RELATIVE HUMIDITY - %	Class C2: 10 to 100
MAX ABSOLUTE HUMIDITY - g/m3	Class C2: 35
MAX ALTITUDE - m	2000
ATMOSPHERIC PRESSURE - kPa	70 to 106
STANDARDS/TEST	IEC 62561-6:2018
TYPE OF SURGE COUNTER as per IEC 62561-6	Type 1 and Type 2; outdoor
RECORDS	
NUMBER OF EVENTS	100 Events, with up to 300 components of 3 phases. Example see below
NUMBER OF LEAKAGES	300 components & waveforms for 3 phases
LOGS (WARNING,COMMUNICATION...)	400 records
1st IMPULSE	100 µs at 1 MSPS l 600 records for 3 phases
GPS	Time stamp and location
COUNTERS	I^2t lightning, lightning charges (C) I^2t power frequency currents,power frequency charges (C) I^2t switching, switching charges (C) I^2t total, total charges (C)
MAXIMUM	Max power frequency current Max switching Max lightning
LIFE SPAN WARNING / ALARM	
% OF LIFE REMAINING	%, ratio total I^2t / maximum I^2t
PROSPECTIVE END OF LIFE	Days
ALARM TRIGGER	Overcurrent 50/60Hz > 1 cycle 10 components registered < 10 days Maximum total I^2t reached

EVENT COMPONENTS RECORD EXAMPLE

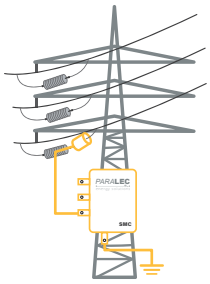
EVENT COMPONENTS RECORDS LEAKAGE	Unit	Example of value
Date	Date	2021-05-06
Time	Time	14:30:05Z
Tot max mA	mA	0.5
Res max mA	mA	0.05
Cap max mA	mA	0.4
Temp °C	°C	37
I^2t (A^2s)	A^2s	0.0002
Capacitance	pF	120
Tot min mA	mA	0.5
Res min mA	mA	0.05
Cap min mA	mA	0.4
EVENT COMPONENTS RECORDS LIGHTNING	**Unit**	**Example of value**
Date	Date	2021-05-06
Time	Time	14:30:05Z
Peak Current (1)	kA	-1
Changes Coulomb (1)	C	0.6
Duration (1)	µs	30
I^2t (A^2s) (1)	A^2s	34

(1) available for 3 phases

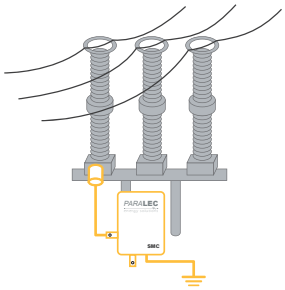




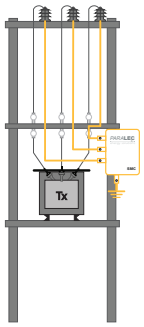
INSTALLATION



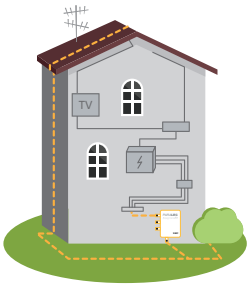
On overhead lines with TLA or EGLA



On substation MOA

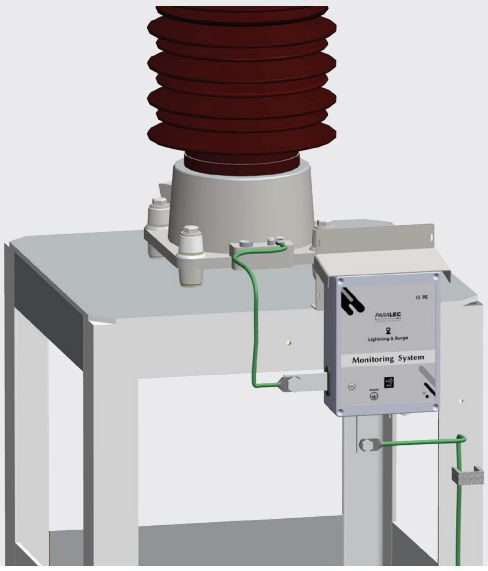


PMT MOA

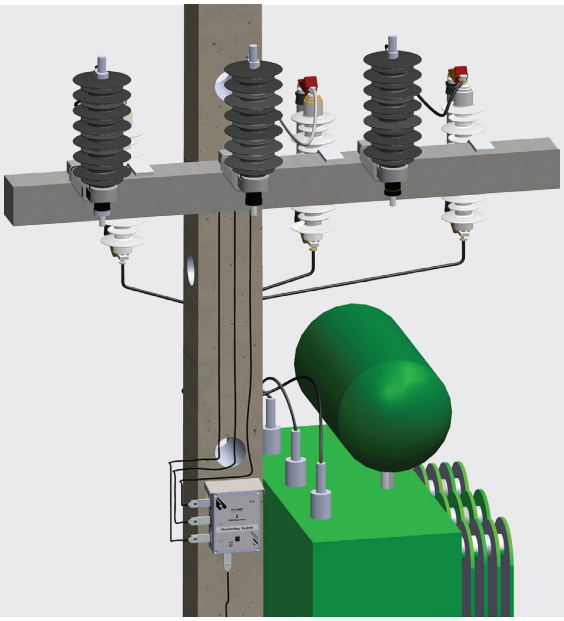


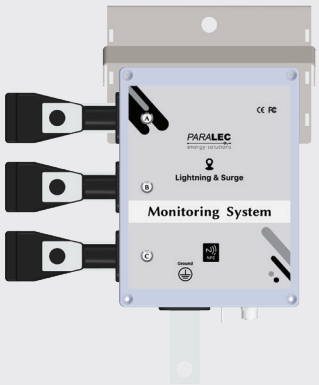
On building SPD

On MOA in Substation



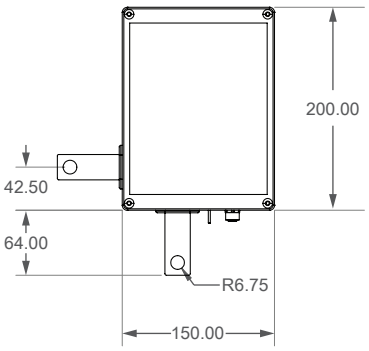
On MOA on PMT

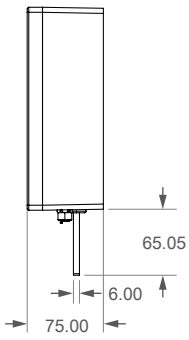


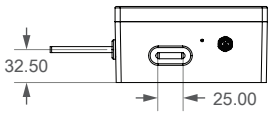


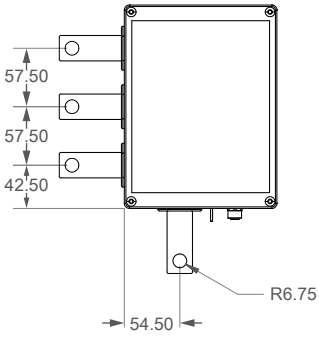
DIMENSIONS

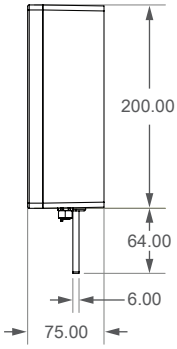
SM

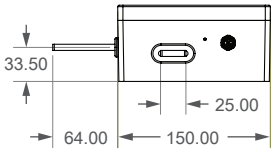


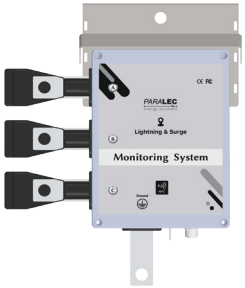




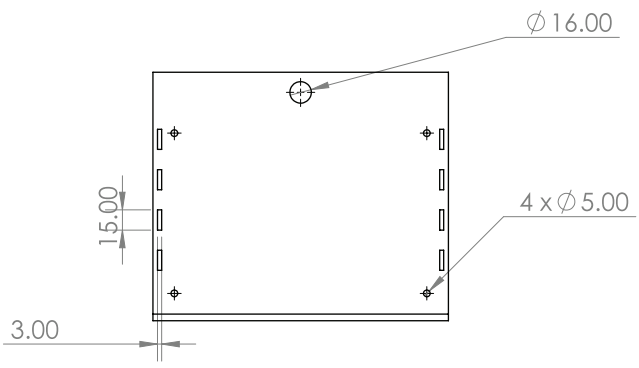


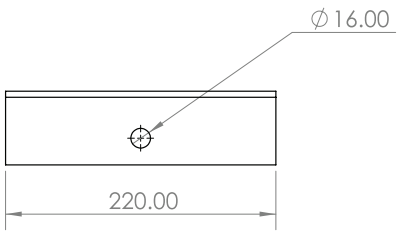


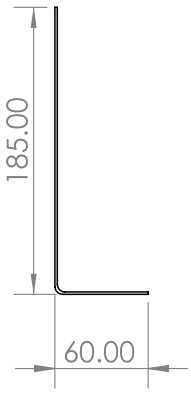




Mounting plate (included)





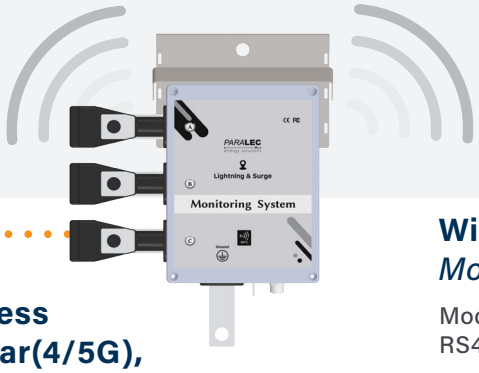


COMMUNICATION

SM MV/HV
PARALEC energy solutions

Short Range

Wireless
NFC
Contact



Wireless
cellular(4/5G),
Wi-Fi

Wired
Modbus
Modbus RTU via 2 wires,
RS485 to master

Long Range

Wireless
LoRaWan
Up to 3 km line of sight
LoRaWAN®
Gateway

Concentrator
Equipped with HMI, DataBase

LAN or broadband
cellular network (4/5G)
IEC61850, DNP3, MODBUS, REST API

SCADA / BMS

Concentrator Lora Full l CL2H

Equipped with HMI, DataBase

LAN or broadband
cellular network (4/5G)
IEC61850, DNP3, MODBUS, REST API
HMI touch panel 12"
LoRA gateway
Database Memory : 256Gb

Concentrator Lora Light l CL2S

Mini DataBase

LAN or broadband
cellular network (4/5G)
IEC61850, DNP3, MODBUS, REST API
LoRA gateway
Database Memory : 64Gb

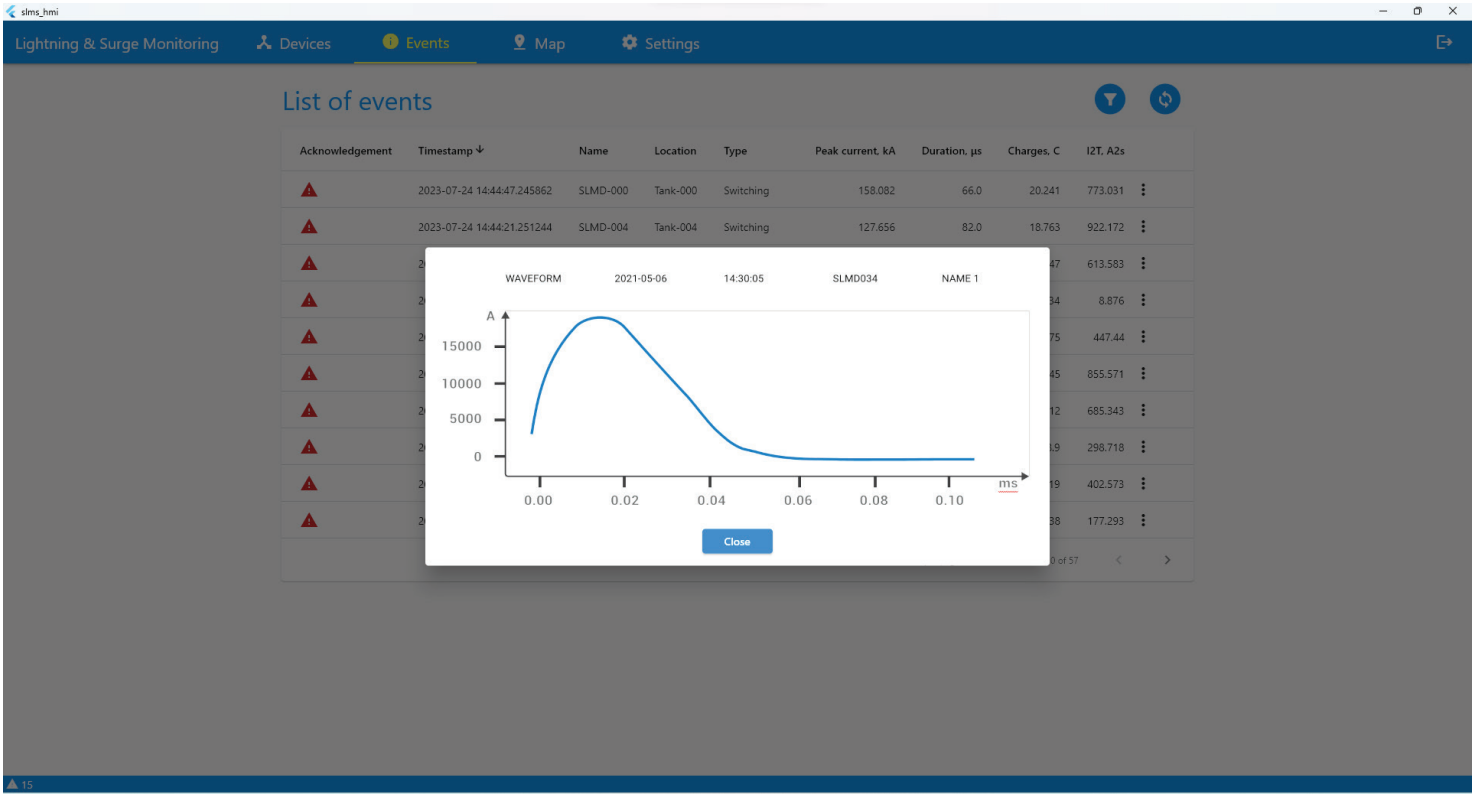
Concentrator Wifi Light l CL2W

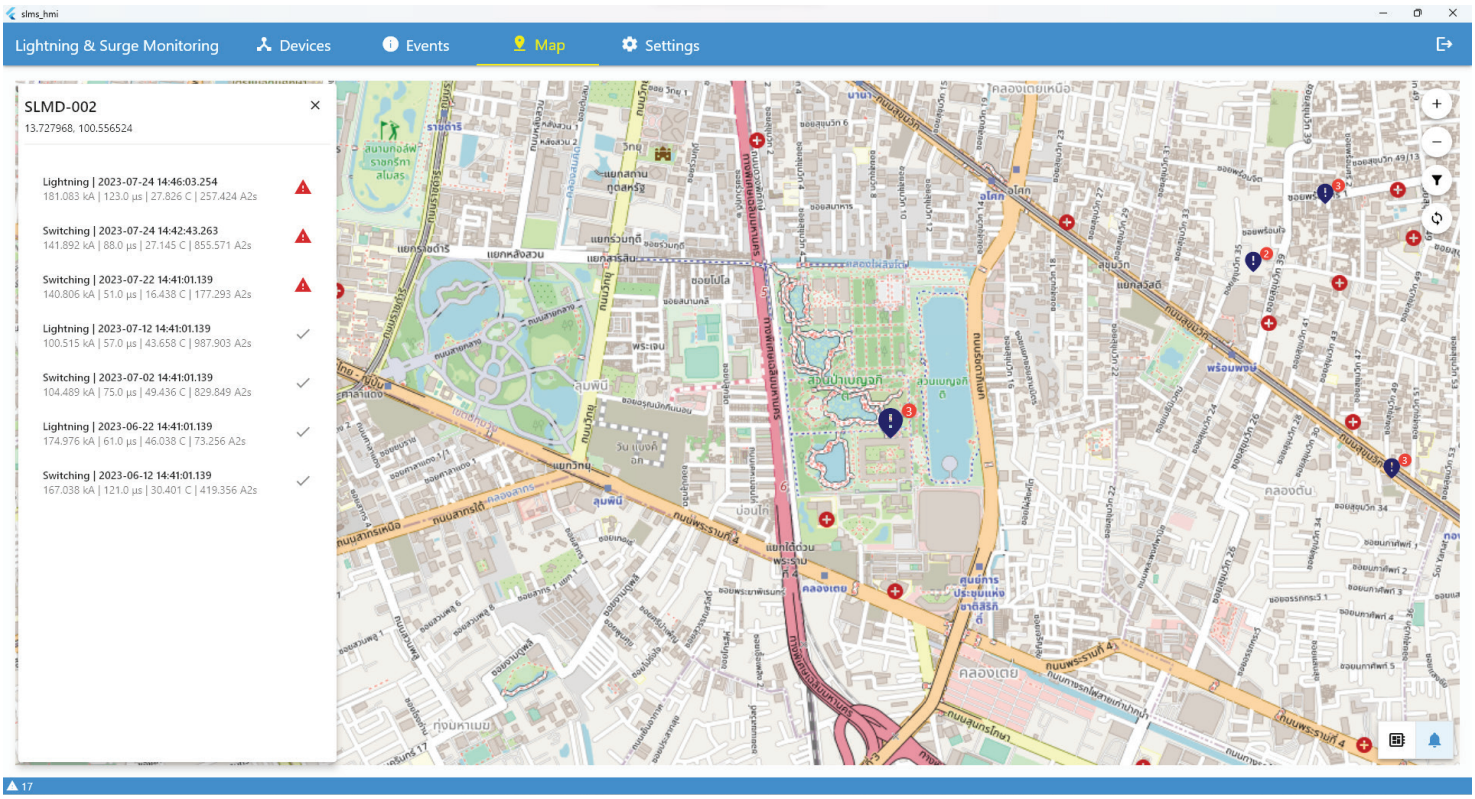
Mini DataBase

Data visualisation
PostGRE Database
Planar Antenna

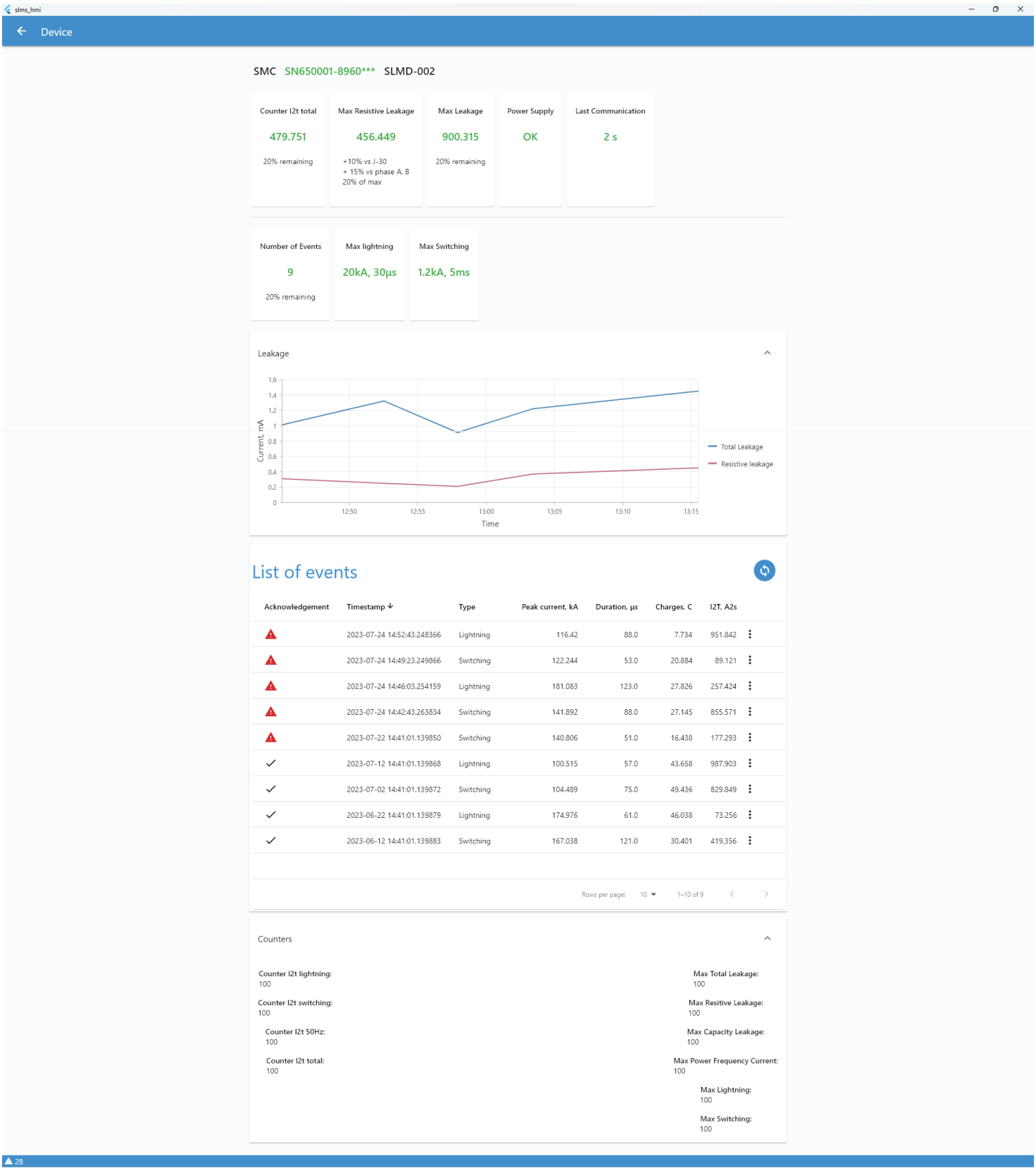
Concentrator **Computer**

SOFTWARE CONCENTRATOR

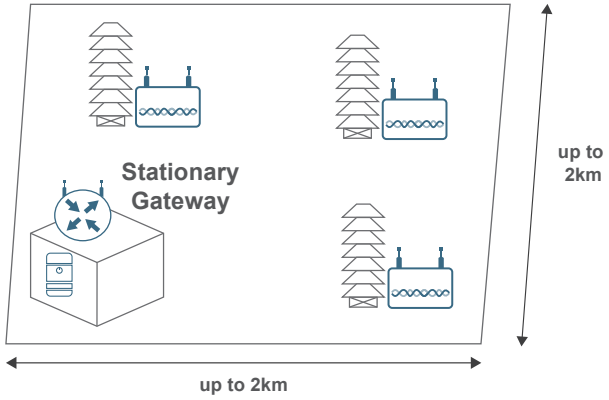




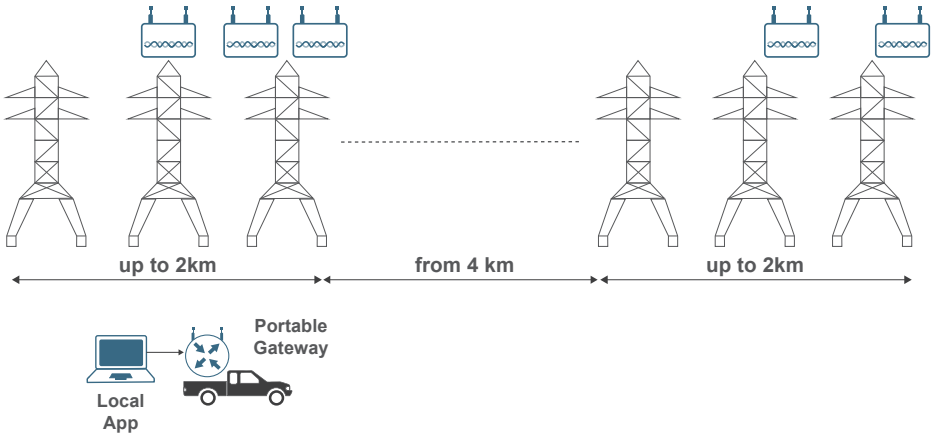
SOFTWARE CONCENTRATOR

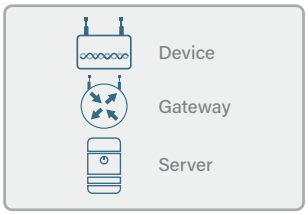


Substation - LoRaWan local private network

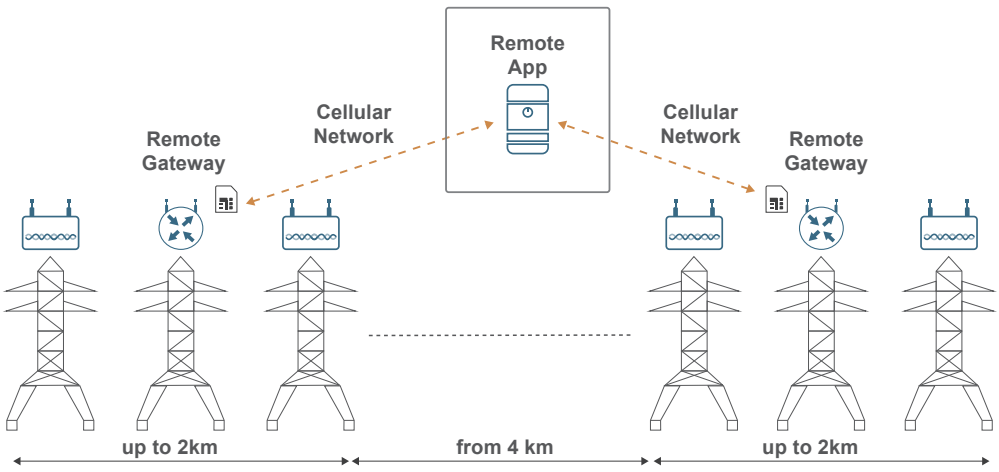


Transmission Line - LoRaWan temporary communication





Transmission Line - LoRaWan private network



PRODUCT RANGE

SM MV/HV

PARALEC energy solutions

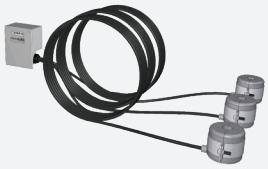
1,2,3	4	5	6	7	8	9	10
104	.....	.....	.....	.....	.....	1	1
SMC	Phases	Spare	Communication	Current range	LoRa frequency band	Brand	Version

4		5		8	
1	1 phase			1	EU863-870
2	3 phase			2	US902-928
		7		3	CN470-510
6		1	200A - 40kA	4	AU915-928
1	RS485	2	100A - 20kA	5	AS920-923
2	LoRa	3	300A - 60kA	6	AS923-925
3	Digital Output	4	500A - 100kA	7	KR920-923
		5	750A - 150kA	8	IN865-867
		6	1000A - 200kA	9	None

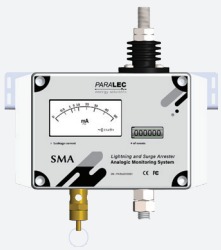
Communication Devices

10742111	LORA gateway
10762111	Concentrator light LORA
10712121	Concentrator full LORA

Also Available



SC250
Surge Counter



SMA
Surge Counter and leakage current

SLC
Gapped arrester monitoring device

PARALEC ENERGY

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