

P LIGHTNING ROD PREVECTRON 3[®] connect

IOT
CONNECTED

*Smart Effective Lightning
Protection Technology*

Made
 In
Safety

 **Indelec**
connect



WHAT ARE THE EXPECTATIONS OF BUILDING DEVELOPERS AND MANAGERS?



A RELIABLE LIGHTNING PROTECTION SYSTEM.

It must ensure maximum safety against direct lightning damages to structures and occupants. Laboratory tests, real lightning test campaigns, standards compliance, international certifications by independent organizations are required. That offers building developers and owners a long-term state-of-the-art protection.



A PERMANENTLY CONNECTED PRODUCT.

Predictive maintenance, real time fault detection, data collection during the product complete life cycle ... are expected features by engineers. They require the capability to supervise the lightning protection system conditions on demand with a user-friendly interface.

For more than 3 years, the Lightning Innovation and Research Institute LIRI engineers have been working on these requirements: **develop a new version of the PREVECTRON 3® lightning rod to meet real time 24/24 connection expectations. Researches were carried out with three priorities:**

1

Maintain the unique PREVECTRON 3® high-tech advantages, that make the product so successful.

2

Develop a permanent connection to the lightning rod thanks to the IoT technology.

3

Confirm the PREVECTRON 3® Connect reliability in compliance with latest international standards.

PREVECTRON 3[®] connect

PREVECTRON 3[®] UNIQUE ADVANCED TECHNOLOGY

The patented **OptiMax** technology provides the Early Streamer Emission air terminal a perfect performance and protection repeatability. This innovative system leads to a 40% reduction of the standard deviations measured in High Voltage Laboratory: Less variations mean a more reliable upward streamer development process. **It significantly improves the lightning protection performance and reliability.**

**OptiMax
Technology**

**Optimized
Performance**



Launched in 2015, the PREVECTRON 3[®] has been the **first ever Early Streamer Emission lightning rod tested and certified by two international certification organizations:** Bureau Veritas and Underwriters Laboratories (UL). Thanks to its LIRI research center and scientific partnerships in several countries, INDELEC continues to conduct very stringent test campaigns to qualify its products. The PREVECTRON 3[®] is for example the first ESE air terminal successfully submitted to more than 200,000 A discharges in laboratory.

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 **In-planet**

SUSTAINABLE TECHNOLOGY.



Besides the test campaigns and certification processes, the sustainability of the PREVECTRON 3[®] design and development has been permanently taken into account: 100% made in France, reduced weight, increased life cycle, modular design... Its reduced carbon footprint meets current sustainable development expectations. **The PREVECTRON 3[®] has been awarded the Prize of Excellence by the AvniR jury, promoting its eco-design expertise and innovation.**



IOT CONNECTIVITY

IoT technology spreads quickly into the industry. It supports the connection of industrial components to Internet.

Users have a permanent access to monitor their equipment remotely: condition, temperatures, voltage, safety parameters etc... can be remotely monitored.



www.indelec-connect.com



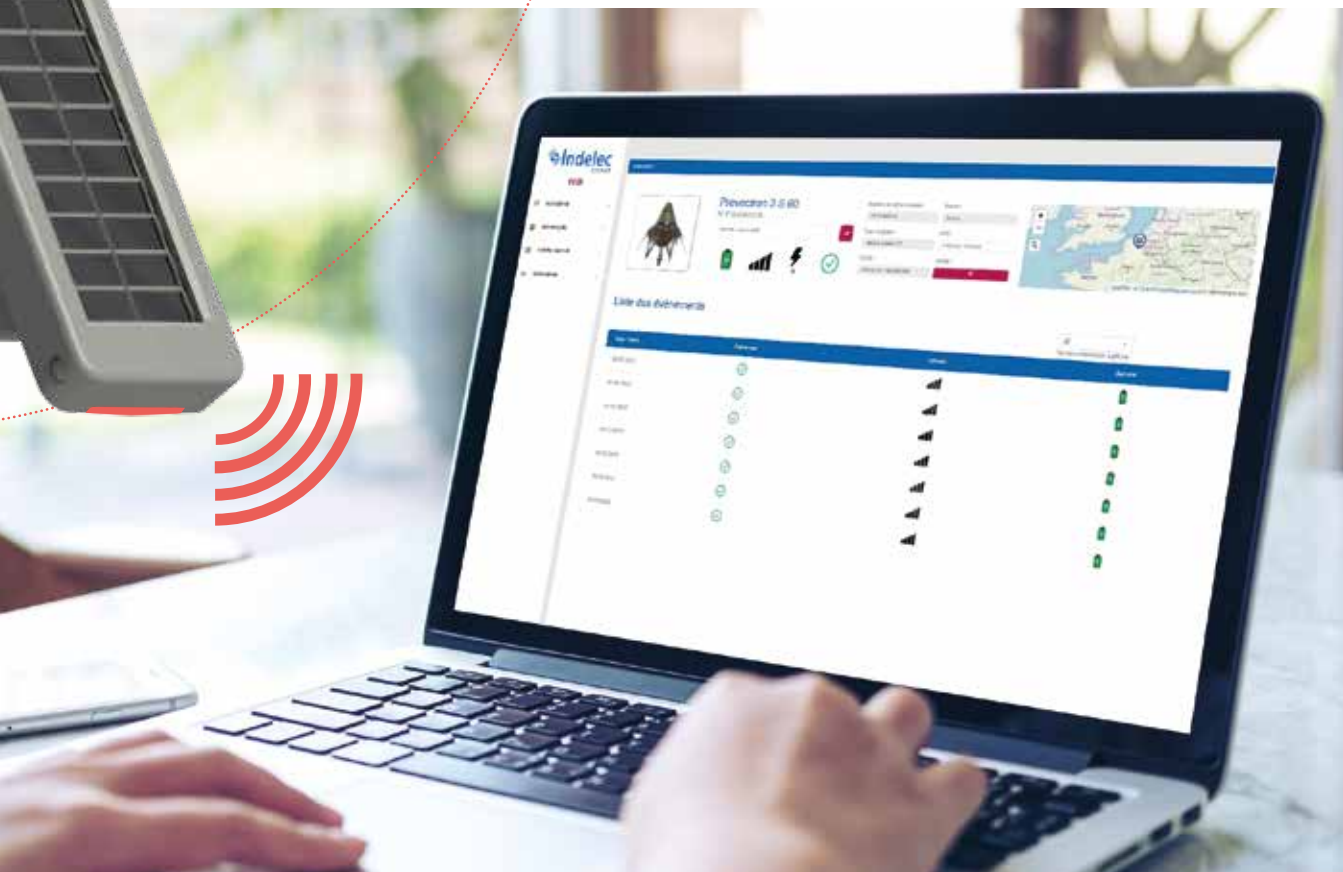
M2M (Machine to Machine) technology has been selected by the Lightning Innovation & Research Institute. The PREVECTRON 3® Connect uses the widely available GSM/GPRS Quad-Band telecom networks.

The lightning rod communicates its information to the user on a dedicated and secured web portal www.indelec-connect.com: condition, lightning discharge, battery charge, network quality etc...

Thanks to this innovation, the system does not require a specific emitter – receiver installation on site, no local

network connection, no space on the client servers, no impact on client internet bandwidth... As a pure "Plug & Play" solution, the PREVECTRON 3® Connect simply and automatically logs on Internet as soon as it's installed on site.

Indelec-connect.com site is available on every type of browser and devices: desktops, laptops, iOS and Android smartphones,...). Users access to the list of installed PREVECTRON3® Connect lightning rods, with detailed information to monitor and maintain the air terminals.



THE PROTECTION AREA

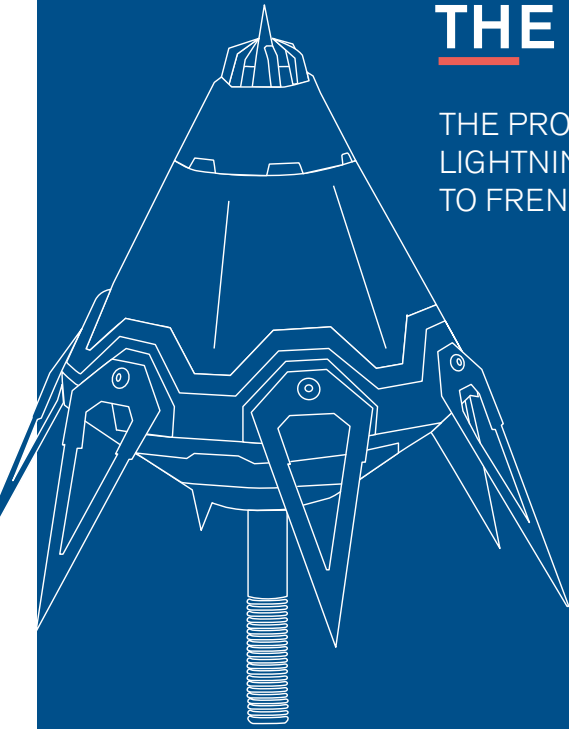
THE PROTECTION RADIUS (R_p) OF A PREVICTRON 3[®] LIGHTNING CONDUCTOR IS CALCULATED ACCORDING TO FRENCH STANDARD NF C 17-102 : 2011, THUS :

$$R_p(h) = \sqrt{2rh - h^2 + \frac{\Delta(2r + \Delta)}{5}}$$

for $h \geq 5m$
et
 $R_p = h \times R_p(5)/5$ for $2m \leq h \leq 5m$

The protection radius depends on a number of factors :

- **h(m)** : is the height of the ESEAT tip over the horizontal plane through the furthest point of the object/area to be protected.
- **r(m)** : 20 m, 30m, 45m or 60m according to the Protection Level I, II, III or IV assessed for the site using the Risk Analysis calculation (NF C 17-102 : 2011 Annex A).
- **Δ (m)** : $\Delta = \Delta T \times 10^6$. Field experience has proved that is equal to the efficiency obtained during the ESEAT evaluation tests.



PROTECTION RADIUS

PROTECTION LEVEL I : **r = 20 m**

H (m)	2	3	4	5	10
S 60	31	47	63	79	79
S 50	27	41	55	68	69
S 40	23	35	46	58	59
TS 25	17	24	34	42	44
TS 10	10	15	21	26	28

PROTECTION LEVEL II : **r = 30 m**

H (m)	2	3	4	5	10
S 60	34	52	68	86	88
S 50	30	45	60	76	77
S 40	26	39	52	65	67
TS 25	19	29	39	49	51
TS 10	12	19	25	31	34

PROTECTION LEVEL III : **r = 45 m**

H (m)	2	3	4	5	10
S 60	39	58	78	97	99
S 50	34	52	69	86	88
S 40	30	45	60	75	77
TS 25	23	34	46	57	61
TS 10	15	22	30	38	42

PROTECTION LEVEL IV : **r = 60 m**

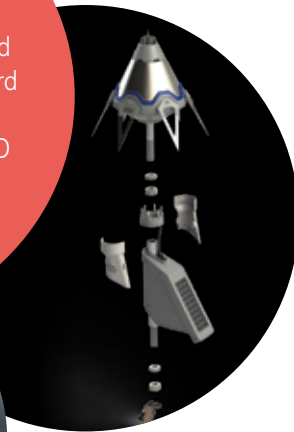
H (m)	2	3	4	5	10
S 60	43	64	85	107	109
S 50	38	57	76	95	98
S 40	33	50	67	84	87
TS 25	26	39	52	65	69
TS 10	17	26	34	43	49

		S range			TS range	
ADVANCED TRIGGERING	▶ ΔT	60 μ s	50 μ s	40 μ s	25 μ s	10 μ s
DIMENSIONS	▶ Height	654 mm			609 mm	
	▶ Diameter (body)	200 mm			140 mm	
	▶ Diameter (Maxi)	317 mm			261 mm	
	▶ Diameter (rod)	20 mm			20 mm	
WEIGHT	▶ kg	6,9kg	6,3kg	6,0kg	5,0kg	4,8kg
CONNECTION	▶ Thread	M20			M20	

STANDARD COMPLIANCE AND TECHNICAL VALIDATION

The PREVECTRON
3[®] Connect is a
fully innovative product.

Substantiating its compliance and reliability requires multiple standard references, test campaigns and field tests, conducted by our R&D engineers in more than 20 countries, from arctic to tropical areas.



Lightning is a natural phenomenon. Lightning air terminals are exposed to a very large range of events: extreme climatic conditions (temperatures, humidity...), high intensity electrical shocks up to several hundreds of thousands of Amperes, unpredictable lightning frequency...

Lightning Protection standards such as NF C 17 102, UNE 21 186 or NP4426 include detailed testing procedures that covers such extraordinary tough conditions. The PREVECTRON 3[®] Connect successfully passed these series of tests. Its integrated Lightning Counter was also tested according to the IEC 62 561 – 6 Edition 2 standard, confirming its full compliance to all relevant standards in the industry.

Lastly, the IoT connected system requires specific attention to work in severe electro-magnetic lightning conditions and meet the CE marking requirements. **INDELEC develops dedicated testing processes, both in the LiRi Lab and in real lightning conditions**, to confirm the PREVECTRON 3[®] Connect compatibility in such environment.



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