

satelit+

The background of the entire image is a dramatic night sky filled with dark, swirling clouds. Several bright yellow lightning bolts are visible, striking down from the clouds. At the bottom of the image, a city skyline is visible, with numerous lights from buildings and streets. In the center of the image, a white satellite dish antenna is shown from a low angle, pointing directly upwards towards the top of the frame. The antenna has a long, thin, pointed tip. The overall mood is one of high-tech communication and global connectivity.

DUVAL MESSIEN





satelit+ :

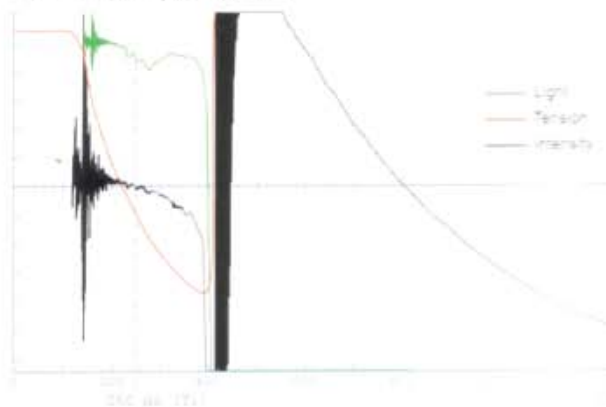
CERTIFIED PERFORMANCE

DUVAL MESSIEN's position as one of the leading world companies in lightning protection is endorsed by research and development, and tests performed to NF C 17-102 standard.

The SATELIT+ range products have been tested at the EDF High Voltage Test Laboratories (Les Renardières), and at the Bazet Test Center (CEB) approved by COFRAC, with the assistance and under the control of the Central Laboratory for the Electrical Industrie (LCIE), official certifying organization.



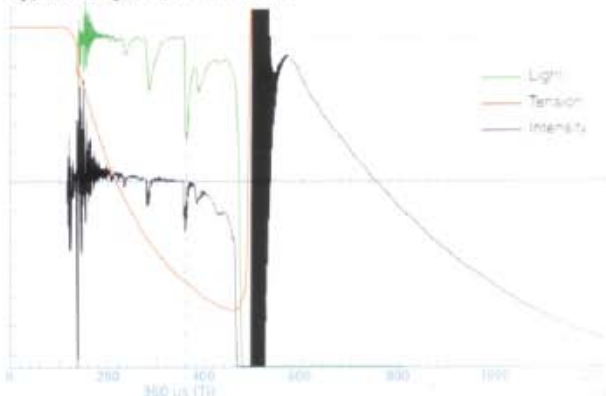
ESE SATELIT+ typical curves



SATELIT+ superiority is shown by comparing the upward triggering leader times (Ti).

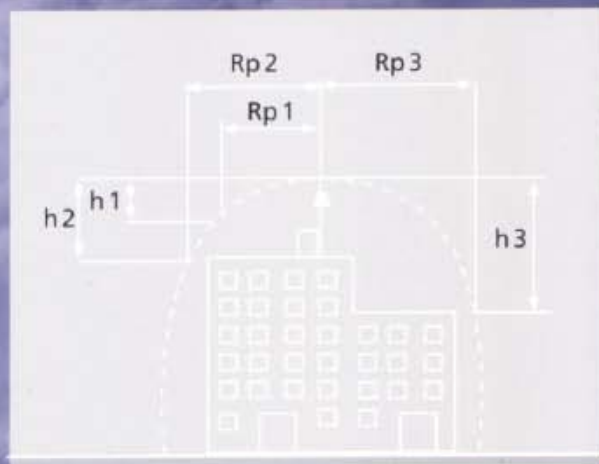
The SATELIT+ triggering advance (ΔT) is shown by comparing the «light» and «current» curves.

Typical single rod -SR- curves





satelit+ :



PROTECTION PERFORMANCE

Ref. No.	$\Delta T_{\mu s}$
ESE 1000	10
ESE 2500	25
ESE 4000	40
ESE 5000	50
ESE 6000	60

Protection radii are calculated according to the following formula (NF C 17-102 § 2.2.3.2).

$$R_p = \sqrt{h(2D-h)} + \Delta L(2D + \Delta L) \text{ for } \geq 5m.$$

R_p : ESE protection radius

h : height of SATELIT+ tip above the area to be protected.

D : triggering distance defined by NF C 17-102, $D_{(m)} = 10 \cdot I^{1/2}$ that is :
 20 m at Level 1 (high protection)
 45 m at Level 2 (improved protection)
 60 m at Level 3 (standard protection)

ΔL : upward leader length gain

$$\Delta L_{(m)} = v_{(m/\mu s)} \cdot \Delta T_{(\mu s)} \quad (v = 1_{m/\mu s})$$

ΔT : triggering advance

Protection levels are specified in annex B of standard NF C 17-102.

Protection radius (m)

Types of SATELIT +	h = height of conductor tip (m)								
	2	4	5	7	10	15	20	45	60

Protection Level 1

ESE 1000	10	20	26	27	28	30	30	-	-
ESE 2500	17	34	42	43	44	45	45	-	-
ESE 4000	24	46	58	59	59	60	60	-	-
ESE 5000	28	55	68	69	69	70	70	-	-
ESE 6000	32	64	79	79	79	80	80	-	-

Protection Level 2

ESE 1000	15	30	38	40	42	46	49	55	-
ESE 2500	23	45	57	59	61	63	65	70	-
ESE 4000	30	60	75	76	77	80	81	85	-
ESE 5000	35	69	86	87	88	90	92	95	-
ESE 6000	40	78	97	98	99	101	102	105	-

Protection Level 3

ESE 1000	18	37	43	46	49	54	57	68	70
ESE 2500	26	52	65	66	69	72	75	84	85
ESE 4000	33	66	84	85	87	89	92	99	100
ESE 5000	38	76	95	96	98	100	102	110	110
ESE 6000	44	87	107	108	109	111	113	120	120



Duval Messien

A CENTURY OF EXPERIENCE

The DUVAL MESSIEN company, which resulted from the merger of DUVAL⁽¹⁾ (established in 1835) and MESSIEN⁽²⁾ (established in 1927), has become one of the leading world companies for Early Streamer Emission (ESE) Lightning Conductors, and the SATELIT range is distributed throughout the world using a network of mainly exclusive distributors.

Based on continuous Research and Development, DUVAL MESSIEN now offers a new even more efficient Early Streamer Emission (ESE) Lightning Conductor, the SATELIT+.

DUVAL MESSIEN is a French company with an international reputation, having manufacturing facilities in Chennevières-Marne, in the Paris region, and in Velaux, near Marseille.

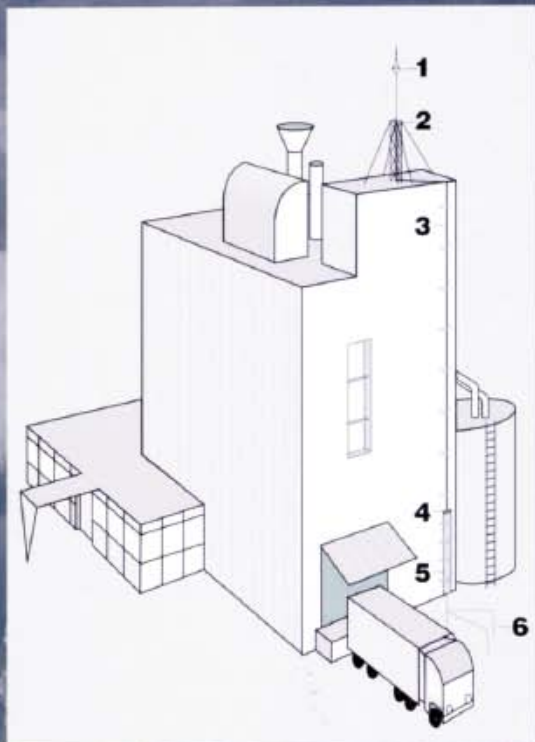
The commercial departments for France and export are in Chennevières-Marne, along with the technical and design departments.

DUVAL MESSIEN manufactures and distributes equipments required for all kinds of lightning protection, together with flexible braided cables

⁽¹⁾ Bronze medal at the 1900 Universal Exhibition in Paris.

⁽²⁾ Georges Messien set up his company to exploit his patent on grounding principles.





TYPICAL INSTALLATION

One or more SATELIT+ are required to protect a building, structure or zone, depending on the area to be protected and the protection level required.

Each SATELIT+ is installed at the top of the building, structure or zone to be protected, and each SATELIT+ is directly connected to the ground by one or more down conductors.

Internal or external metal masses located close to a down conductor must be linked to it equipotentially.

The grounding method must be in accordance with the lightning current flow. A triangular shape is recommended, which must be equipotential with the ground for the electrical installations.

- 1** SATELIT+ ESE
- 2** Mast
- 3** Down conductor
- 4** Inspection joint
- 5** Protection sheath
- 6** Grounding

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