PREVISTORM®
THUNDERSTORM WARNING

‣‣ PREVISTORM® THUNDERSTORM WARNING SYSTEM

Precision electric field sensor for thunderstorms prediction, detection and early alerts generation.

‣ description

The **PREVISTORM® Thunderstorm Warning System** for preventive lightning protection continuously measures and analyses the evolution of the atmospheric electric field. This system supports the monitorization of the thunderstorm cloud electrification process, the generation of early warnings and alerts and the detection of lightning discharges in a radius of up to 20km.

Lightning discharges constitute a real threat that causes many victims every year. Damages caused by lightning to goods are also of considerable magnitude and, occasionally, cause partial or complete stoppage of key and important activities.

The **PREVISTORM® Thunderstorm Warning System** lightning prevention system monitors the clouds electrification process. The alarms generated by this system provide knowledge in advance that lightning occurrence risk has increased. This knowledge provides a valuable time advantage for the activation of preventive measures for protecting and preserving lives and goods.

This system is suitable for installation as an autonomous system and as well as part of more complex systems with multiple sensors. Working as an autonomous system, the **PREVISTORM® Thunderstorm Warning System** can be used for generating visual and audible alerts that indicate the start and end of periods of high electro-atmospheric discharges occurrence risk.

The **PREVISTORM® Thunderstorm Warning System** can be integrated into automated ambient monitoring and scientific research systems for continuous monitoring of the electro-atmospheric field.

‣ operation

The **PREVISTORM® Thunderstorm Warning System** lightning prevention system employs the "electric field mill" operating principle for making measurements of the atmospheric electric field intensity. The methods and real-time processing algorithms implemented in this system make possible the determination of the moments of increase and decrease of the risk of lightning occurrence. The operation parameters controlling the alarms generation, as well as the ones controlling the adaptation to the installation site, are completely customizable.

The **PREVISTORM® Thunderstorm Warning System** also supports two isolated relay outputs. These outputs support, amongst other functions, the activation of external acoustic alarms and visual indicators. The software included in the system supports the creation of various independent signalling patters for discriminating between the indications of start and end of high risk periods.
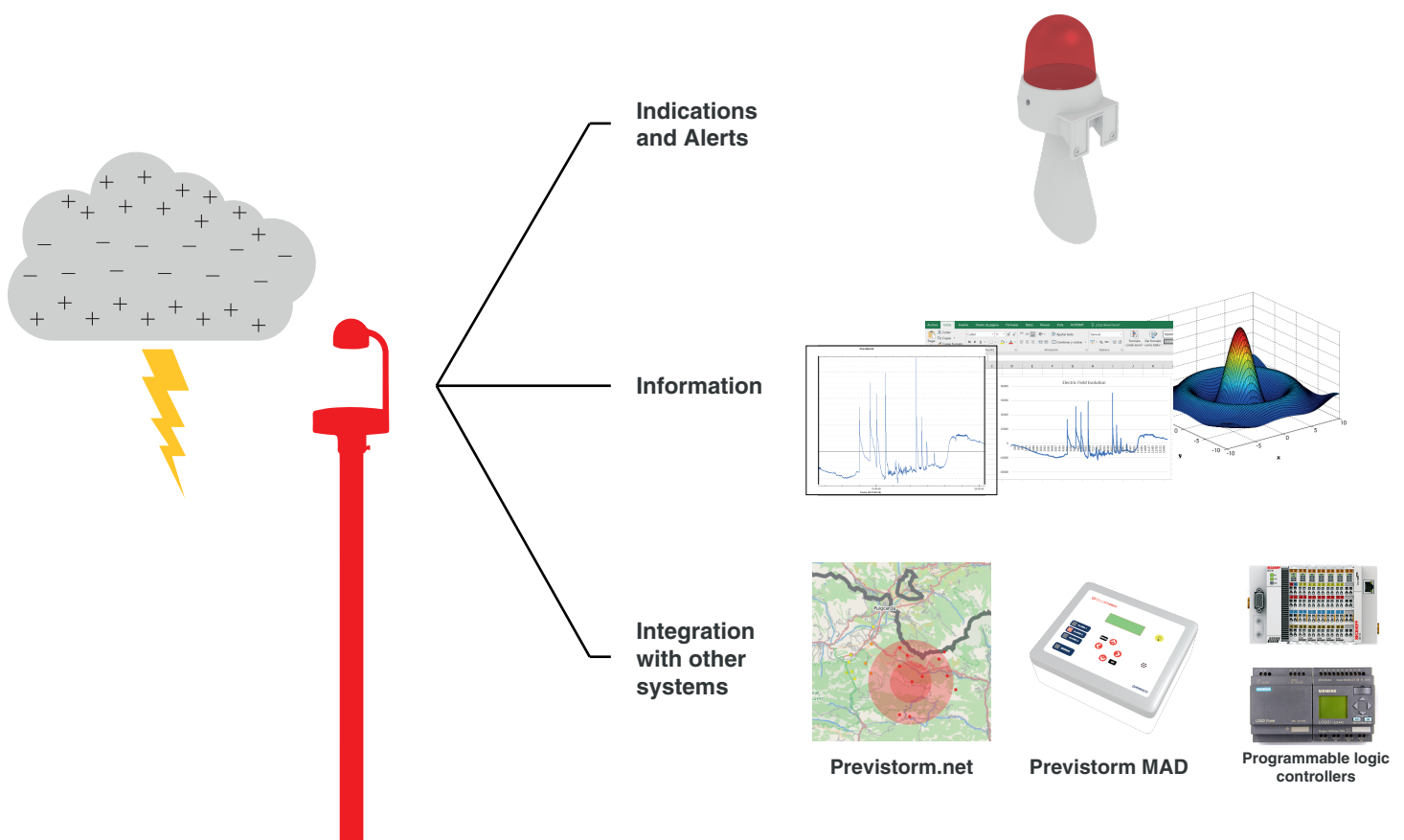
▶ advantages

- Being warned about the existence of high risk of lightning occurrence before the first lightning flash happens.

- Guarantee of life and goods protection by taking effective preventive actions.

- Take of more precise measurements than similar storm detectors.

- Monitoring of the electrostatic field intensity and its variations.

- Detection of lightning discharges occurring in the detection range.

- Mechanical design that guarantees higher immunity to rain noise.

- Availability of models supporting de-icing and anti-freezing.

- In accordance with standard IEC 62793:2016, Protection against lightning – Thunderstorm warning systems.

▶ software

The **PREVISTORM® Thunderstorm Warning System** is shipped with the software package which is required for its configuration, personalization and use. The software package supports, amongst others, the following features:

- Supports connections to a virtually unlimited number of **PREVISTORM® Thunderstorm Warning System** systems, being limited only by actual computer resources.

- Access to all configuration features which are required for its personalization and adaptation during installation and maintenance.

- Visualization of current electric field value as reported by the **PREVISTORM® Thunderstorm Warning System**.

- Visualization of current alarm levels and states.

- Strip chart graph with the evolution of taken measurements.

- Continuous datalogging of received data and system state.

- Support for the integration of other signals provided by other systems.

- Modular and extensive design supporting the addition of new customized features.

Indications and Alerts

Information

Integration with other systems

Previstorm.net   Previstorm MAD   Programmable logic controllers

▸ technical specifications

Normative:

• IEC 62793:2016. CLASS A.

• EN 55011/22 (Radiated and Conducted)

• EN 61000-3-2, EN 61000-3-3

• EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11

Environmental:

• Operating temperature: -23ºC a +50ºC.

• Humidity: 0% a 100%.

• IP Level: IP65.

Construction:

• Operating principle: Electric Field Mill.

• Motor type: brushless.

• Material: Stainless steel and aluminium.

• Fixation: Direct insertion into the mast top.

• Weight: 1,85kg.

Electric:

• Cabling: 20 meters multi-via cable. Contact INGESCO for other lengths and customizations.

• Power:

   Standard model: 24V±10%@500mA(max).

   Extended model with de-icing: 48V±10%@2.0A(max).

• Communications interface: Isolated RS232, 57600, 8n1, Full-duplex.

• Signalling outputs: 2 isolated relay outputs.

Operation:

• Measurement range: ±100kVm-1.

• Resolution: 1Vm-1 (when operating at highest sensitivity).

• Precision: ±10Vm-1 (when operating at highest sensitivity).

• Data rate: 4 samples per second.

• Lightning detection range: up to 20km.

• Response time: 150ms (with data filtering disabled).

• Alarm levels: 4 (No alarm, Level 1, Level 2 and Level 3).

Options and extras:

• Power supply: Consult INGESCO.

• Customized cable: Contact INGESCO.

• De-icing and heaters: Available only for the 48V model. Recommended for installation in sites where snow and frost occur.

• Remote console: Console with LCD display, integrated power supply, and four (4) dry relay outputs. Contact INGESCO specifying the product code "**PREVISTORM® Thunderstorm Warning System MAD**".

Autonomous alarms system for crowded events

Lightning occurrence constitutes a risk during the celebration of highly crowded events. The **PREVISTORM® Thunderstorm Warning System** allows creating autonomous systems for alerting participants and organizers about the existence of lightning risk. The signalling outputs provided by this system are ideal for controlling external acoustic and visual signalling devices.

Alerting system for mine exploitations

Persons and machinery displacements in areas which are exposed to lightning are usual in mine exploitations. The **PREVISTORM® Thunderstorm Warning System**, combined with the **PREVISTORM® Thunderstorm Warning System MAD** console, facilitate the creation of a complex signalling and control system. It is possible to indicate the beginning and finalization of high lightning occurrence risk periods using distributed visual and audible signalling devices. The dry contact relay outputs provided by the **PREVISTORM® Thunderstorm Warning System MAD** console can be used for controlling the automatic initiation of backup energy generators. These outputs are also suitable for disconnecting valuable equipment and devices that must be preserved and protected from lightning during thunderstorms.
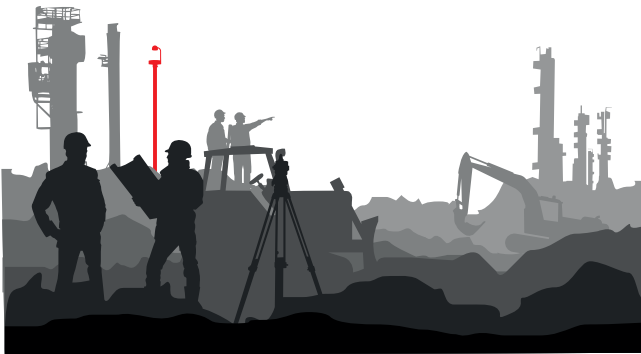
Integration to automatic weather monitoring systems in ports and airports

Aircraft refuelling operations, as well as charge and discharge of luggage and goods and passenger displacements in airports constitute high risk operations during thunderstorms in airports. Obtaining precise measurements of the electric field intensity and its evolution in time is of great help during the decision-making process for preventive protection in ports and airports. The **PREVISTORM® Thunderstorm Warning System** constitutes a valuable instrument for monitoring the evolution of the atmospheric electric field and can be easily integrated into more complex automated ambient monitoring systems.
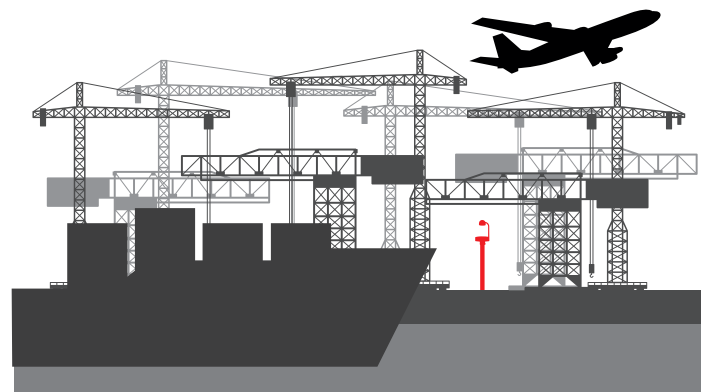
Other applications

The **PREVISTORM® Thunderstorm Warning System** is an ideal option for implementing preventive protection systems in golf courses, gas processing camps, renewable energies, theme parks, firefighting preservation and many other applications.

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