



SPIDER Rockfall Alert Device

Spider is a **patented**, compact and robust **device**, made with a **special metal alloy, specifically designed for alerting in protection systems such as rockfall barriers, grip nets**, etc. The technical solutions adopted and the materials chosen, allow Spider to operate in any environment and withstand extreme conditions. Designed to detect events (rockfall, stress, failure) on a single network module or module blocks, even from different directions.

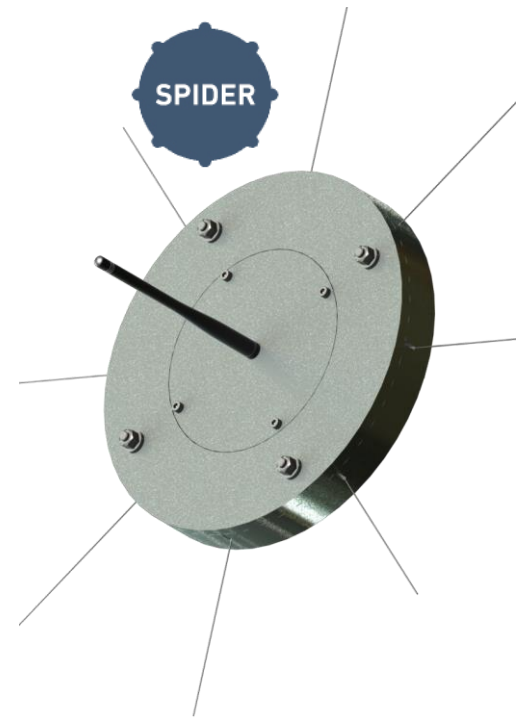
The activation of the rockfall protection network, at **SEL**, or at **MEL**, or at another threshold, is immediately identified by a **series of redundant electronic sensors** and the relative **alarm immediately sent. The sending of the alarm from a single sensor is managed in a redundant way.**

Each alarm is routed on the network with the most modern technologies (from IoT, to GPRS / UMTS, to the satellite), capable of covering **wide areas with a limited or without need of radio repeaters.**

A sophisticated electronic onboard, allows a battery operation with an **autonomy of years; no auxiliary power supply systems are therefore required.**

The integration of an **internal GPS** allows in addition, the identification of the place of the event, also mapping the alarmed areas (land registry).

Simple to install, it does not alter existing structures in any way and consequently **does not affect the certification installed protection systems.** It does not require any configuration and its recovery in case of an event is instantaneous and easy to implement. The economic advantage in terms of use and costs is immediate.



Highlighted specs

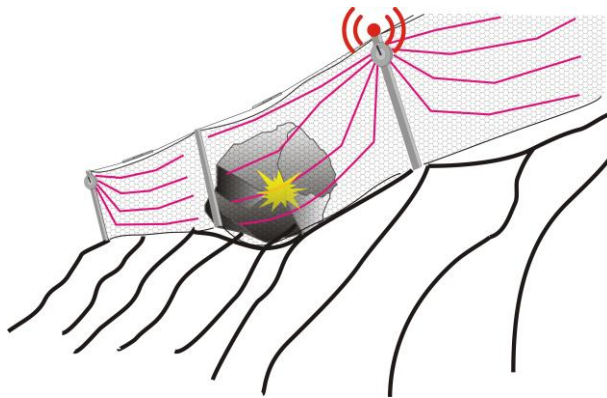
- Up to eight sensors for each SPIDER that do not require calibration or maintenance
- Automatic re-entry of false alarms and mechanical memory of the most important events
- **Data transmission via redundant radio**, does not require any wiring or laying of cables
- Integrated electronics designed for extreme operating conditions
- Very low consumption with battery power and autonomy over 5 years
- Alarm signaling, device status, position and battery level
- Easy to transport and install without the need for special equipment
- No need for configuration but offers the possibility of a functional test during installation or maintenance
- Digital data transmission with IoT technology that allows a total or partial bypassing of classic network infrastructures
- Conforms to **CE** norms

Technical Data

Norms (Standard)	Technical standards for buildings 2018 - geotechnical design on the need for performance checks on the works. Guidelines for planning and planning activities to combat hydrogeological risk - Presidency of the Council of Ministers - September 2017.
Category barriers	Adherence networks and barriers provided by the ETAG - EOTA standard classification of rockfall barriers based on service energy from 0 to 8 classes for SEL and MEL
Sensors	1÷8 electro-mechanical detection sensors
Minimum sensitivity	Settable before installation according to the energy level per minimum barrier category 100N
Response time	< 5 sec
Power Supply	Standard lithium polymer AA battery - 5 year autonomy
Frequency	868MHz (Europe) - 915MHz outside europe
Status and control information	"Alive" signal with daily frequency
Informations transmitted	Alarm status, device status, battery level and position
Working conditions	-40 ÷ +60°C
Made of	Ergal and aluminum alloy
Maintenance	None
Weight and dimensions	8 Kg and 30cm diameter

Why choose Spider

When a barrier is hit by a rock or by a flow, it loses its security becoming an element of criticality and danger for all that is below: inhabitants, infrastructures, public places, roads, railways, etc. This danger looms without its existence being known **because the control of the protection infrastructure is often difficult to implement, expensive and not always applicable.** **Spider has been developed to overcome all of this,** alerting you whenever a dangerous condition is generated, reducing drastically the risk the loss of life on one hand and reducing significantly costs on the other.



What Spider does

A unlike traditional monitoring systems, which are complex to install and expensive in terms of energy, costs and maintenance, **Spider is simple, robust, can be installed in any single barrier module and is immediately fully functional.**

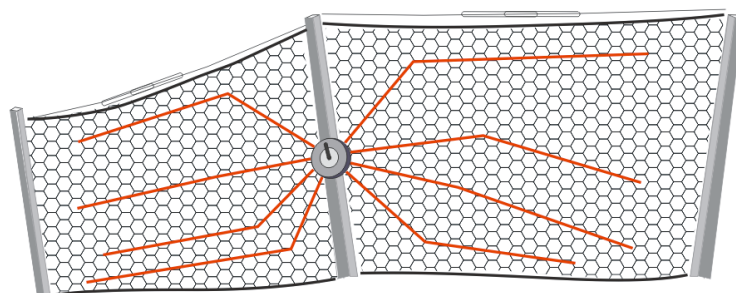
This alert solution **informs you about each event** allowing you to check and restore only the affected portion. **It does not need maintenance,** the long life of the batteries and the exceptional technology with which it was developed, allow to cover very large areas, even isolated and in extreme weather conditions.

How it works

A Spider alert system is made up of a certain number of devices installed in the rockfall barrier modules or adherent nets (cortical strengthening). In the simplest configuration, these **devices transmit their data directly to the network** without using concentrators or radio links. In more critical situations they transmit the data **to a concentrator located within a radius of a few kilometers.** Then it is the concentrator that forwards data and alarms according to the communication channels provided (cable, GPRS / UMTS, satellite, etc.) by means of standard (FTP, SFTP) or specific (ANAS) protocols. **The data can be collected in a server for their management and / or dissemination** according to the required implementation methods (SMS, EMAIL)

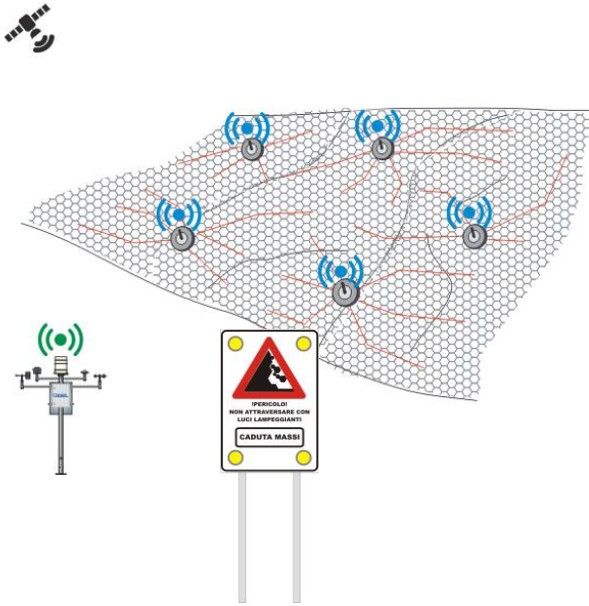
How to install and Place Spider

Spider **can be easily installed in the main uprights** of rockfall barriers, in a protected position. From it the "legs" branch out in the form of 1-2mm of thin steel wires which are fixed solidly to the net at different lengths and heights according to the planned conformation based on the installation. In case of activation, the voltage of one or more "legs" generates the alarm. Each wire can stretch to a certain load to break if exceeded.



The failure is mechanically "memorized" by the system. **The restoration is immediate simply by replacing the wire of the legs or restoring the mechanical memory by means of a special screw.** In the case of adhesion nets, the installation principle is the same, even in the absence of a riser.

The Transmission of the alarm



When a barrier is hit by a boulder or a casting, one or more spider "legs" are alerted by activating the relevant sensors. The internal electronics **in a few milliseconds identifies which sensor corresponds to the event, encodes the message and sends the alarm via radio**. The radio system used is based on the power of **LPWan technology or SigFox or LoRa 868/915MHz free frequency**, optimized to have a coverage degree of several kilometers from the transmission point.

Spider System is designed to offer **different ways of transmitting data in redundancy**:

- Through SigFox network with at least three existing radio bridges
- Via proprietary protocol or LoRa on a special concentrator within 4-5 km from the point of transmission and data transmission from concentrator to cable, fiber, GPRS / UMTS, Satellite. **In this case, the concentrator also assumes the function of local control for traffic lights or hazard warning signs**
- Automatic switching between the two systems for maximum redundancy and guarantee data transmission

In this way it is always possible to have coverage even in the most remote areas, maintaining simplicity of use and installation.

What and when is transmitted

Spider has two data transmission modes:

- **NORMAL STATE**
- **ALARM STATUS**

In the *normal state*, once a day an **"alive" message** is sent to indicate its correct functioning, allowing a supervision software to have complete control of the status of the monitoring network

In the *alarm state*, upon activation, the alarm message is continually sent until it returns (if the event was elastic) or until the batteries run out and it is reset.

In both cases the message sent contains:

device identifier, date, time, sensor status, alarm status, battery level, GPS position



Therefore, in the event of an alarm, imagining **to represent the devices on a cartographic map**, one has the immediate identification of the potential danger situation

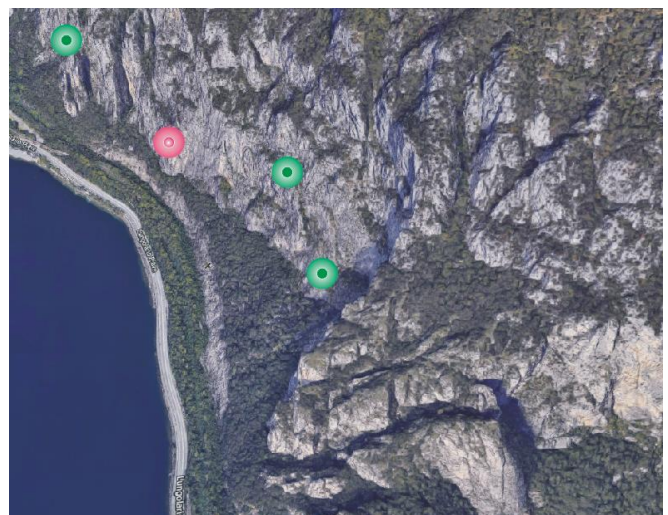
Control and diagnosis Software

Nesa as the same time of spider system has developed, **an optional platform for data collection, management and display**.

A web platform that, through a simple territorial **cartographic representation**, allows the identification of the status of a monitoring network at a glance. Behind this representation, a powerful SQL engine allows you to view alarms and send text messages or emails to on-site intervention managers.

All events are recorded by date, time and location, allowing a cadastral mapping of the devices.

The Nesa system is designed for interfacing with ANAS, ARPA and Civil Protection systems with standard protocols.

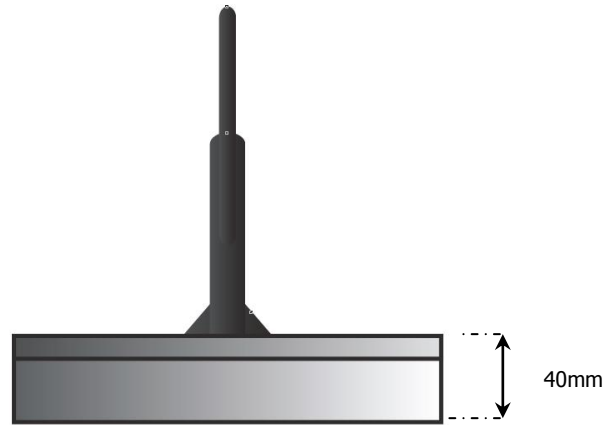
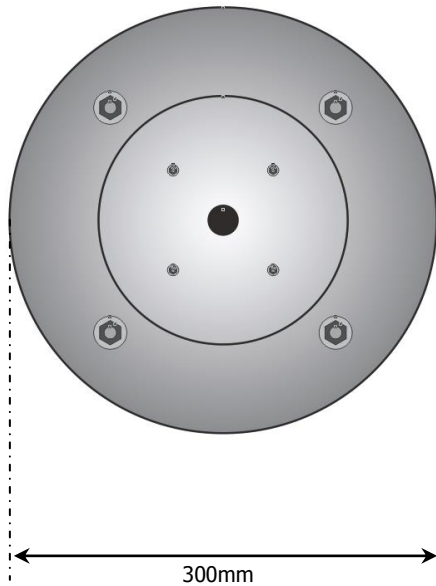


Maintenance?

No, **Spider does not need maintenance**, except for the simple replacement of the batteries after years of operation and only if necessary, since the battery level data is transmitted together with the other data in the daily "alive" message. Simple operation designed for a technician to do it easily in the field.

In the event of an alarm activation, either the entire barrier is restored and at the same time the spider or, simply, it is replaced on the spot with a new device and the previous one is reset, based on operating conditions, on site or by a easier position

Dimensions and connections



Order Form

Sensor	Spider	SPIDER		
Output				
Accessories	Battery as spare parts		BATT	

Example of order code

SPIDER			
---------------	--	--	--