

Figure 1: Capabilities enabled by Gridvisor

Localization

Pinpointing faults is simple with **Gridvisor's** multisensing capability which simultaneously employs fault location with FCI functionalities, GPS signature, and mechanical impact detection. **Gridvisor** sensors are mounted directly on each phase of overhead electric conductors at strategically preselected locations.

Mechanical sensing

Often a fault is the result of a physical failure of a component on the pole, or the power line coming in contact with an object like a tree branch. In such cases, the **mechanical impact** on the power line itself is also detected by **Gridvisor's** on board accelerometer to substantiate whether the fault occurred due to a local physical impact.

Application example

If information about vegetation of a specific circuit route is known, the areas with high risk under strong winds can be targeted for continuous monitoring with sensors. When a storm passes through (observable by general weather information), if a fault occurs the sensor may detect abnormal vibration, characteristic of a tree branch falling on a line. When this is detected, the grid operator is notified of the fault current, GPS location, and likely cause: that it was a tree branch falling on a specific area of a circuit, caused by strong winds. In this way, the grid operator can dispatch its restoration crew with the appropriate equipment to resolve the issue quickly and restore supply to customers.



The key differentiator of **Gridvisor** from existing FCIs and power line sensors, is that it combines information derived from **vibration-based sensing** and situational awareness filling information straight into the SCADA system.

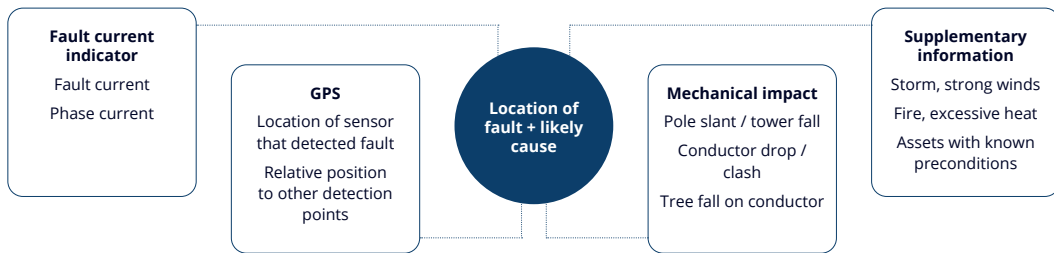
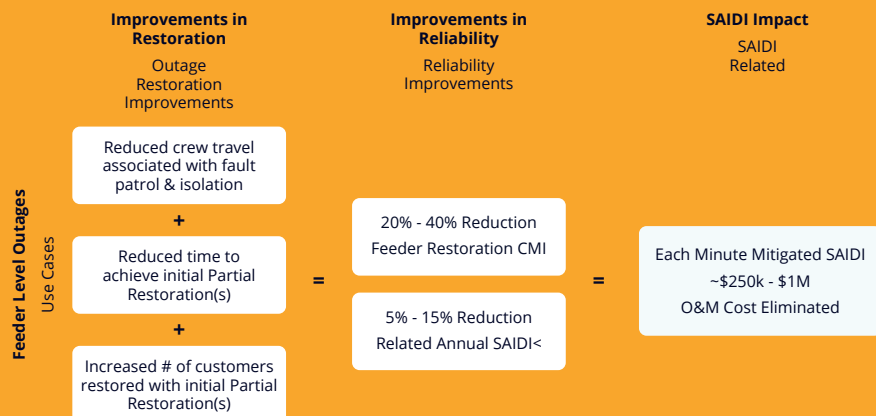


Figure 2: How Gridvisor enables Fast fault response

Quantifiable Business Case through SAIDI reduction

Figure 3: How ROI is secured by improving outages statistics



A clip-on smart line sensor for power distribution

Faster Outage Response, Reduced Fire Risk, Root Cause Identification, Field data for Network Planning

Sensing capabilities	
Phase Current measurement	10 ... 1000 ARMS Display resolution 1A Measurement accuracy 1mA Min/max/RMS threshold alarm: Alarms can be triggered by programmable values or RMS-based thresholds or current in-rush patterns
Fault Current (FC) Detection	Detection of momentary and permanent faults. Fully compatible with IEEE-495 standard with multiple types of electrical faults detection capabilities.
Visual fault indication	High luminosity local red LED 90% ON, 10% OFF – permanent fault 50% ON, 50W% OFF – momentary fault Reset by dedicated SMS command
Mechanical Analysis (MA) for: <ul style="list-style-type: none"> • Ice detection • Pole displacement • Broken conductor • Galloping 	Sag fluctuation detection (tilt based) 3D acceleration pattern recognition
Conductor temperature	-20 to +85 Celsius degrees
Localization	Embedded GPS chip
Functionality and applications	
Reporting interval	Customizable (5min... 24h)
Time-stamping	Accurate GPS timestamping
Alarming - electrical	Programmable thresholds, Adaptive limits or di/dt changes
Alarming - thermal	Programmable thresholds
Alarming - mechanical	Excessive sag, ice accretion, fallen pole, fallen tower
Installation conditions	
Phase to Ground Voltage	1 ... 69 kV
Frequency / Phase arrangement	50 Hz and 60 Hz / Single phase, Three phase
Conductor diameter	0,198" – 1,104" (5 mm – 29 mm)
Mounting method	Hot stick supported – suitable for live installation
Weight	Approx. 2 kg
Dimensions	Approx. 17 x 17 x 27 cm
Power Source	Inductively upon installation
Energy Storage	Lithium-Ion Battery
No on-field calibration required	
Physical and Environmental	
Ingress Protection	IP65
Short-circuit current withstand	25 kA/200 ms
Operating Temperature / Humidity	-40°C ... +85°C, When battery operated: -20°C ... +55°C, etc. 0 – 95 % RH.
Storage temperature	-40°C ... +85°C
Data acquisition / interface	
Connectivity	Cellular SMS 3G / 4G
Security	Hash Message Authentication Code (HMAC)
Communications protocols	HMI interface and customizable alerts (email, SMS) DNP3 SCADA connectivity
Design and test standards	IEEE 495, IEC 60068-2, IEC 60255 Aging (atmospheric exposure, solar irradiation, ...) Climatic chamber tests Salt spray (mist), Damp heat Short-circuit withstand Shock and vibrations, wind
Software HMI	Telemetry dashboard (status/alarms/info) live map sensor fleet, measurements, charts, thresholds/parameters, detailed data per sensor Events table Alarm panel Historian
Designed and manufactured in Belgium by Ampacimon	ISO 9001