DMK Labs

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Real-time automatic remote power lines monitoring

Using electromagnetic signals wave analysis

Proven technology: 9 years of successful 24/7 commercial operation

State-of-the-art algorithms based on digital analysis of electromagnetic waves

Key metrics	
Per line monitoring distance	320 mi
Number of lines	7–23
Supported voltage	Up to 1500kV and higher
Lines types	Air and cable
Distance measurement error	<0.012%

Unique capabilities:

1. **Prevents emergency shutdowns on power lines, reduces losses from accidents.** The reduction in the number of emergency events on the power line is due to registration of the distances to developing* damages and ability to dispatch teams on a proactive basis to inspect and eliminate the cause. Start, duration, end, level and distance to damage risk* are recorded. In other words, the registration of developing* damages.
2. **Extends the service life of power equipment.** Protects equipment from short-circuit currents. The HSC does not allow automatic re-activation of the line to a fatal short circuit by monitoring for the presence of damages on the disconnected lines. Power equipment is not exposed to short-circuit currents more than once.
3. **Reduces power losses, monitors leakage currents.** Reduces "undersupply" of electric power.
4. **Protects the integrity of lines.** Monitors both switched on and disconnected power lines.
5. **Significantly reduces the duration of technological disturbances** related to power supply interruption
6. **Helps to monitor safety.** Monitoring of installed/removed portable grounding at working sites near disconnected power lines, as well as presence of "ground."
7. **Reduces time spent searching for locations of damage**** (accurate, prompt, and selective determination of distances to places where damage has already occurred**)
8. **Improves "energy security".** Prevents "fan" outages by monitoring a large number of lines at the same time, keeping most redundant power circuits in operation. Increases reliability of power supply to both individual consumers and several regions.

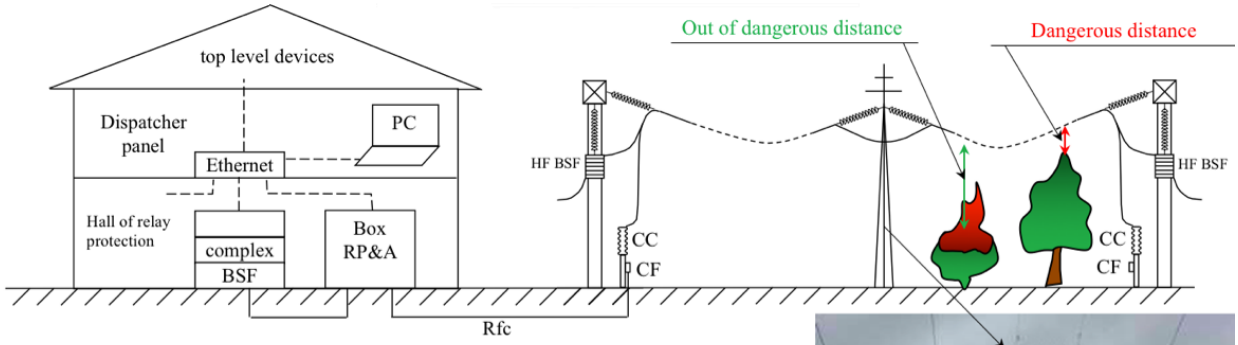
* - Threats of damage (or developing damage or damage that has not yet occurred or has not yet resulted in power line shutdown) include: wood-shrub vegetation, unauthorized works in the security zone of the line, bird nesting areas, wire dancing, increase in the boom of the creep, dangerous places of morning flooring, damage to the thunderstorm, grass-roots fires, reduction of the overall distances of the power line, insulation reduction and linear formation.

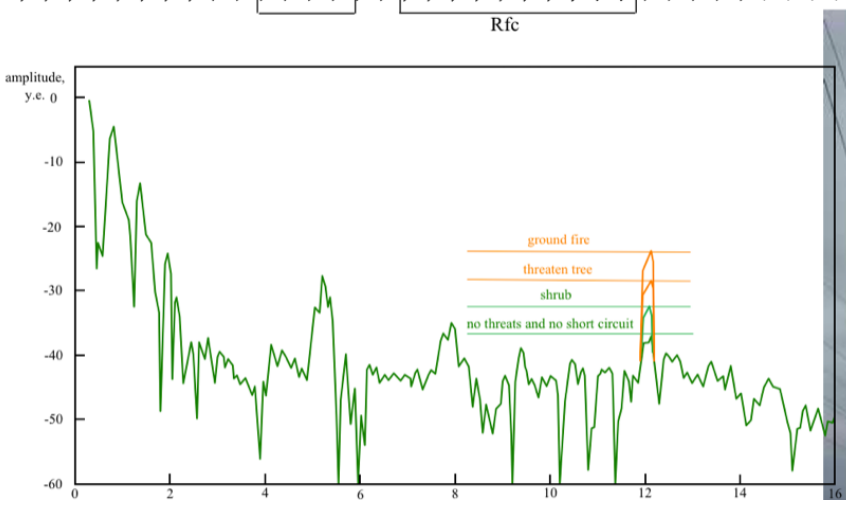
* * - Types of damage that may have already occurred on the power line include single-phase, two-phase, three-phase, inter- phase and ground faults, as well as faults with metal and transient resistance, stable and unstable damage, breaks, etc.

Principle schema:

Complex consists of an electronic device which is placed in a standard 19-inch case and is connected to power transmission lines via a high-frequency connection.

System is designed for 24-hour remote automatic monitoring of air and cable power transmission lines of various voltage classes of federal and regional importance, as well as for super-emergency consumers of electricity, submarine cables, etc.





Installation:

Installation location is selected to guarantee easy service access and avoid any negative environmental factors. Installation on customers' main station location near the power line end point is recommended. A network connection required to organize monitoring and alerts.

Complex is connected to a power line with RF cable through a connection filter.

Installation point can be in any private customers' location – secure, easy to service and maintain. Does not require high-altitude wire-mounted devices. Cost-effective setup and service.

Global market volume

Lines operators, mostly large enterprises with significant budgets, are highly motivated to acquire proven and reliable solutions to protect their main capital investments in infrastructure. Predictable and accurate modern power lines monitoring solutions help to significantly improve vendors reliability and resources utilization, reducing the number of unexpected outages and related losses.
Based on open and verified electricity generation metrics and a reasonable assumption of ~1000 MW for an average power substation our estimates regarding global market are:

Region	Electricity generation (GW*h)	Capacity (pc)
World	24 816 400	21 609
China	6 495 140	5 656
USA	4 350 800	3 789
European Union	3 247 300	2 828
CIS countries	1 526 179	1 329
India	1 400 800	1 220
Russia	1 091 000	950
Japan	999 600	870
Canada	663 000	577
Germany	648 400	565
Brasil	581 700	507
France	553 400	482
Korea Republic	551 200	480