

**LiSa<sup>®</sup> – system for detection of cut-off power lines,  
failures in transformer stations, remote control,  
measuring, data transfer and reports about  
quality of power supply according to SIST EN50160**

**MAIN FEATURES**

- **Detection of cut off power lines due to different reasons:**  
discharges  
trees, snow, sleet...  
stealing of conductors and equipment
- **Usage of standard mobile communications, GPRS, SMS**
- **Data transfer from transformer station**
- **Analysis of quality of power supply according to EN50160**
- **Remote trip**



**BASICS**

Power lines in electro distribution network are often severed for different reasons. In most cases such interruptions of a power line is detected by a conventional protection unit which also assures disconnection of damaged line. This type of protections normally works on the basis of detection of current changes, which appears when a fallen power line makes electrical contact with the ground. However, there are several situations when the fallen line creates a fault that conventional protections are not able to detect. For example soil conditions with a high resistive value; such as dry sand, rocks or asphalt... Similar problem appears with usage of half-isolated conductors, which despite all the benefits they have, usually when cut-off, do not make the contact with the ground. An additional problem is for example that if a feeder line collapse near to the end of that line or feeder line stays in the air...

All above cases of “down” power-lines present a dangerous situation. Humans or animals that come in contact with such conductors can suffer grievous injuries or even death. Arcing can start uncontrolled fires...

ISKRA MIS d.d. has developed the system that eliminates this threat and even more. The system also gives an indication about possible failure in transformer station and is capable of sending the complete spectrum of measurements including report about the Quality of Energy regarding to the standard EN50160, to the distribution centre.

Since the system is detecting any interruption it is also very useful as a protection against thefts of conductors and equipment which in also presents a big problem in some areas.

## PRINCIPLE OF OPERATION

Conventional protections are usually working on the principle of sensing changes in current at the beginning of the line. LiSa<sup>®</sup> system is on the other side using new approach, by sensing differences in the system of voltages at the end of the line.

Vital parts of the system are new Measuring Centre MC760L and MI480L GPRS communication adapter with a built in logic for control and self-testing of the system, UPS module to assure autonomy of the system at interruptions. All this is placed in metal housing, connected to the MV network via capacitive dividers or measuring transformers and/or directly to the LV side of the transformer station (depends of the version and demands). When fault occur, communication adapter sends alarm via SMS to special SMS concentrator.

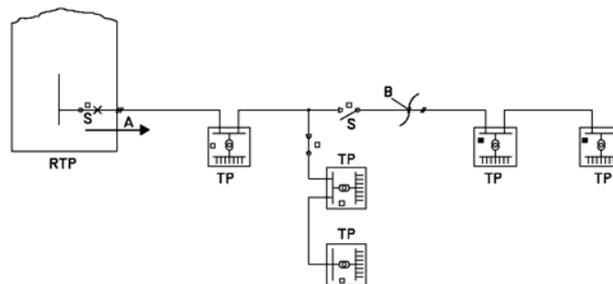
SMS concentrator is composed of GSM modem for receiving SMS messages and special software with built in network topology and positions of detectors. In case of alarm it collects all SMS messages, alarms, and forms logical, sensible information and forwards them to the responsible stuff via SMS or e-mail. Depending of the settings it could also trip the damaged line.

A part of the system is also data server running on the Linux platform and user interface with different levels of access in order to configure detectors and collecting data and quality reports from devices. All data are saved in MySQL database and can be viewed in tabular or graphical form or exported to existing SCADA systems. GPRS communication is used for connection between server and the units.

## SETTING EXAMPLE

Legend:

- Active device
- Inactive device
- B Interrupted power line
- S Remote switch



- A Energy flow
- RTP Separating transformer station
- TP Transformer station

With appropriate setting of LiSa<sup>®</sup> detectors and usage of remote controlled switches, interruption can be detected and damaged line tripped.