MONITORING AND ANALYSIS SYSTEM OF ELECTRICAL OBJECTS STATUS

ANTRAKS FUTURE TODAY

Инновации в энергетике ЭНТЕЛС

Software for monitoring and analysis system of electrical objects status

SCADA – completed solution for creation of intelligent monitored grids. This is a modern multilevel hardware and software complex system. The main feature of our product is to provide observability each transformer and distribution substation of the network.

SCADA – solve a wide range of tasks, related to power grids management, electricity accounting, monitoring and technological problems.

Software is included in the unified register of Russian programs for electronic computers and databases by КОМРОСТАН (№№ 2018618205, 2018618206, 2018618207).

Software for infrastructure automation

SCADA/IoT platform for building industrial automatization, telemetry and monitoring system for power grids objects.

Soft-logic EnLogic is a programming system for industrial controllers and computers for automated process control systems, telemechanics, resource accounting and technological tasks.

Data transmission protocols (IEC 60870-5-104, IEC 61850-8.1 и IEC 61850-9-2) and flexible settings for user.

Installed info security functions.

+

Multifunctional controllers
for telemetry, automated process control systems телемеханики, dispatching and industrial automatization.

END CONSUMER

- Combining the tasks of telemechanics and accounting in accordance with the requirements of international legislation and standards.
- Support of the final product throughout the life cycle.

Implementation effect of SMART GRID project

The amount of installed devices: **321 pcs.**

Reduce electrical energy losses
over $8 mln

Extended the usable life of existing equipment
$700 000

Cut down on number of accidents SAIFI
x2

Reduced operatingcosts
$360 000

Reduced operating costs
$290 000

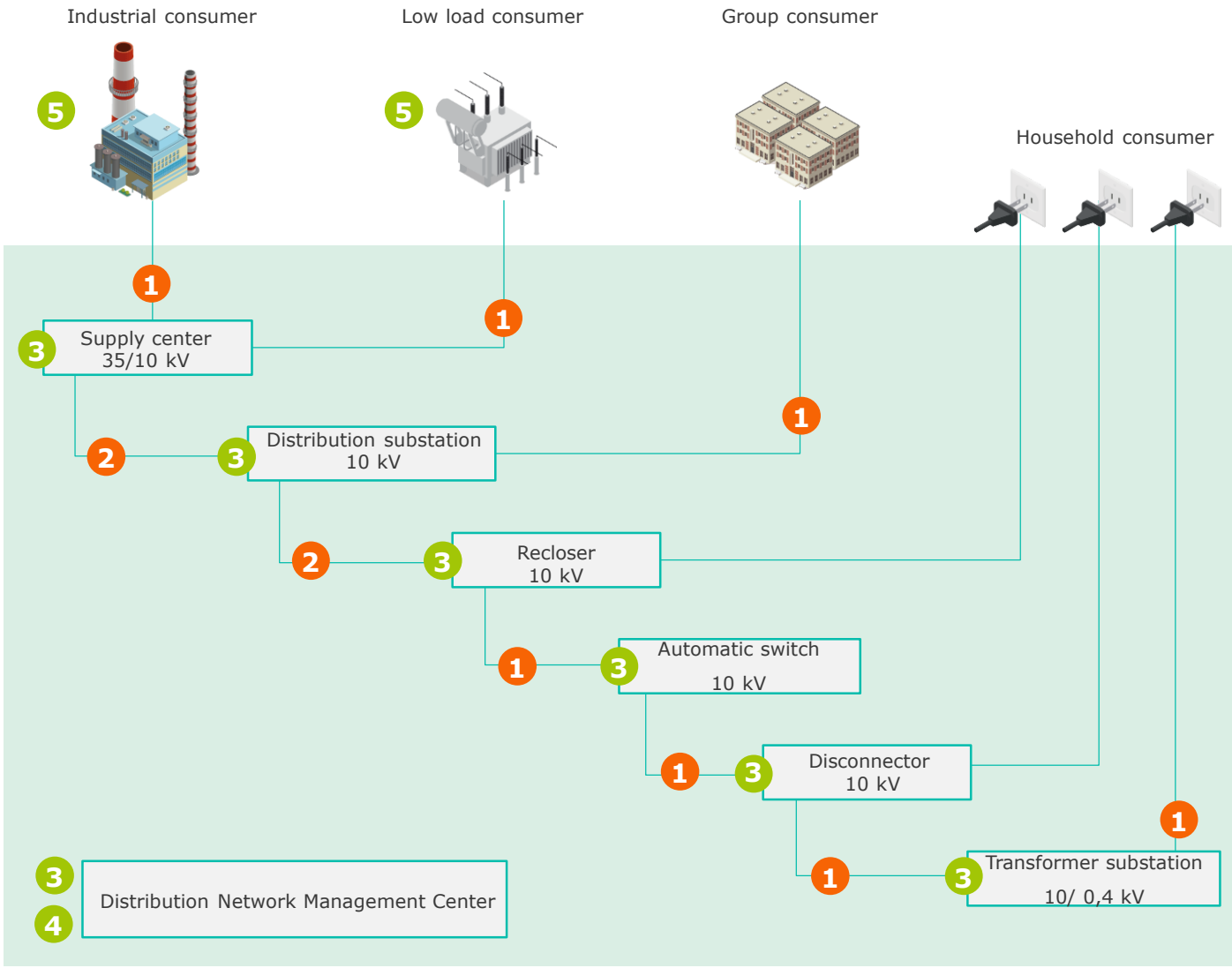
Improved KPI
up to 10%

Power released
Up to 45 mW

TOTAL REDUCED COSTS IN ONE YEAR

over $10 mln

Industry solutions for the electric power industry



Инновации в энергетике ЭНТЕЛС

АНТРАКС
ЭНЕРГИЯ ПОД КОНТРОЛЕМ

1. Controller and modules for automation of transformer, recloser, disconnector

Automation of small objects of the 6-20 kV distribution network

Controlled disconnectors and switches of 6-35 kV load

2. Automation controller of substations of 10 kV and 35 kV

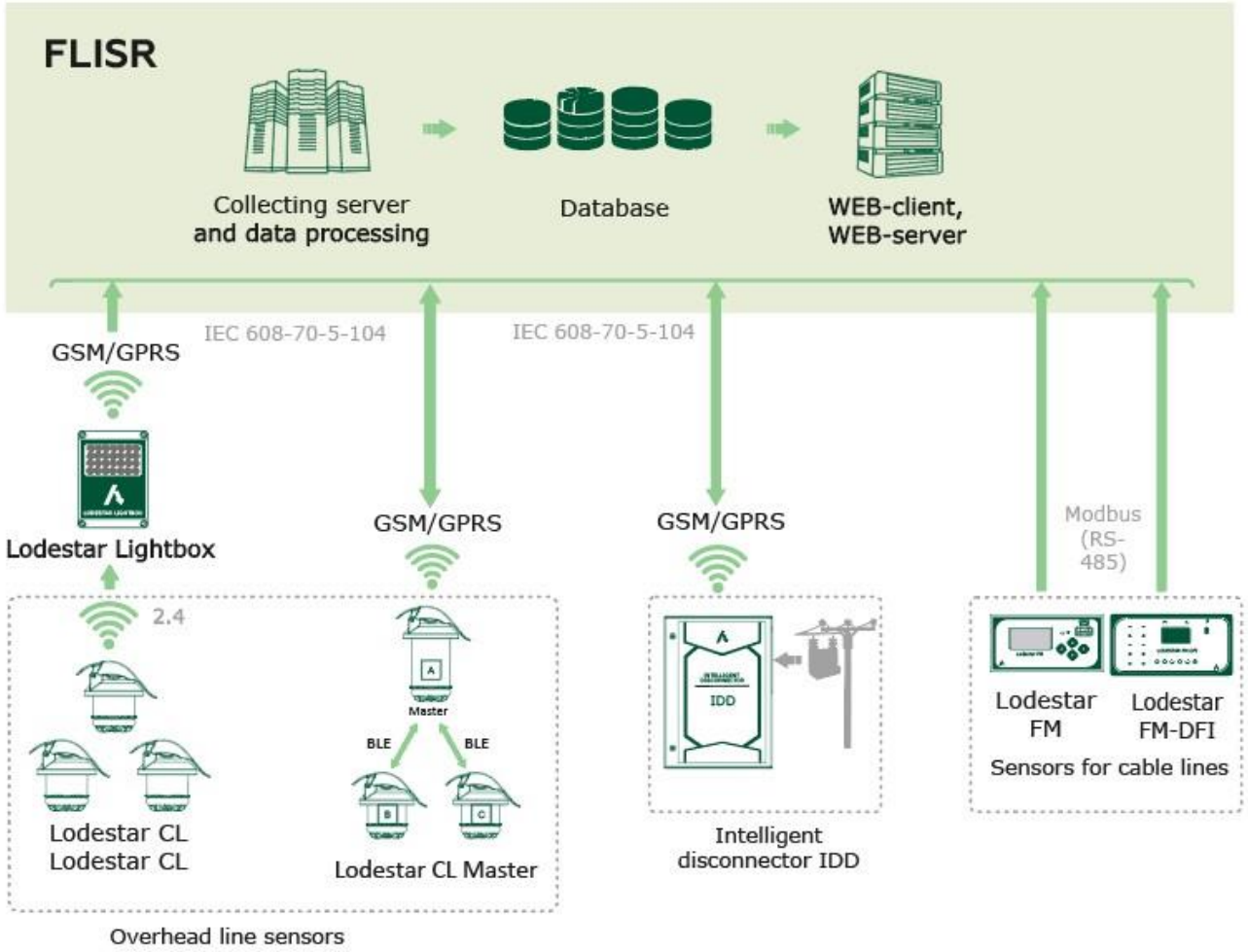
Automation of substations of *10-35 kV*

3. FEP of data collection from power grid facilities

4. SCADA system for automated control systems of substations

5. SCADA for enterprise automation

Dispatcher management



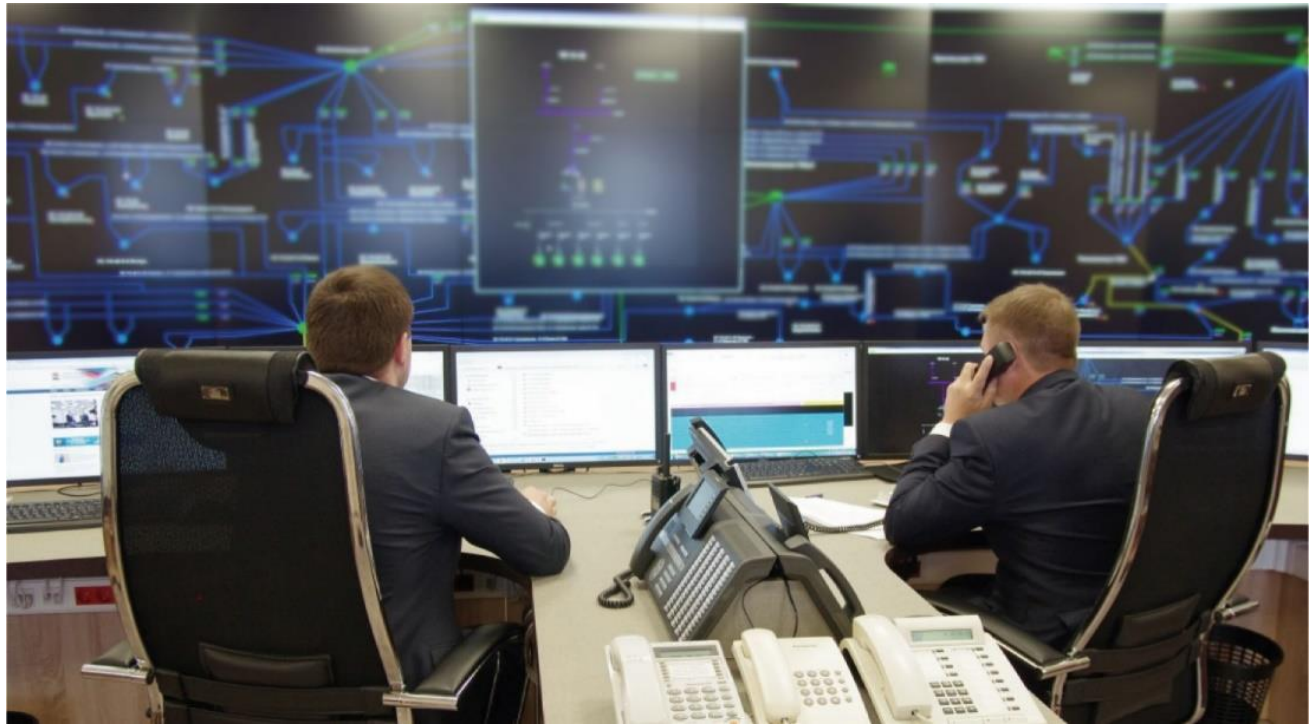
Depending on the requirements of a particular power system, the KOMORSAN may include various **control and monitoring devices for the the network status**:

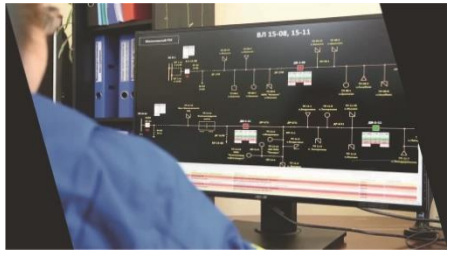
- Fault location indication devices
- Disconnectors and switchers
- Icing sensors, temperature sensors, etc.

Components of the client-server solution KOMORSAN:

- Data collection and information processing server
- Database
- Software products WEB server and WEB client

Dispatcher management





Инновации в энергетике ЭНТЕЛС

АНТРАКС
ЭНЕРГИЯ ПОД КОНТРОЛЕМ

HMI (Human Machine Interface) – the core component designed to display the power distribution system with real-time data acquisition. The interface allows operators to remotely monitor and control equipment and to process historical data.

flexibility and usability

• Flexible and easy user-configurable HMI allows creating extensible mimic diagrams with thousands of objects. Standard visualization features such as dynamic coloring provide operators a quick access to information about the powered and un-powered sections of the network and state of equipment (Closed/Open/Earthed) for circuit breakers, load break switches, disconnectors and other objects.

single database

• Collected data is stored in the database. Event logging module allows users to easily access and process information about faults, switching operations and various historical trends which creates a strong basis for accurate system performance analysis.

monitoring and notifications

• Alarm module is designed to signal any failures, malfunctions or warnings which demand the operator's attention to abnormal system conditions requiring action.

• Power monitoring – optional module for real-time power monitoring which ensures that the system fulfils the requirements set for power quality.

• All the important information (THD, active/reactive/apparent power and energy, power factor and others) is stored in the database and can be easily converted into the meaningful report.

Dispatcher management

Reducing maintenance costs

SCADA provides constant grid supervision to detect any failures, which reduces the need for scheduled and emergency maintenance

Minimizing outage time

The advanced distribution automation and management functions reduce outage time from hours to minutes without the involvement of field personnel.

Maximum reliability and ease of use

Redundant architecture enhances availability and increases the reliability of the system. User-friendly and functional interface guarantees safe and error-free operation

Standards compliance

Developed to meet industrial standards for data communications such as such IEC 60870-5- 101/103/104 and cyber security standards such as IEC 62351, IEC 61850

Инновации в энергетике ЭНТЕЛС АНТРАКС ЭНЕРГИЯ ПОД КОНТРОЛЕМ

SCADA ENTEK system is designed for real-time monitoring and control of primary and secondary equipment in power distribution systems. It provides all the functionality that is expected from a traditional SCADA system, allowing the operator to safely and effectively interact with protection and control IEDs (Intelligent Electronic Device) achieving the maximized efficiency and reliability of the grid.

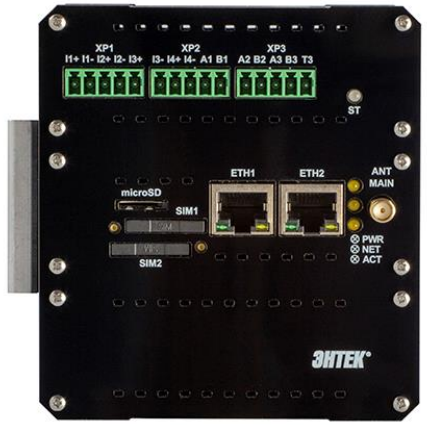
SCADA is optimized for managing hequipment in power distribution systems. However, it is compatible with any IED supporting standard industrial interfaces which enableselectric utilities to integrate all their equipment into the same system.

SCADA ENTEK supports an extensive range of standard communication protocols and open interfaces, such IEC 60870-5-101/103/104, Modbus RTU/TCP and DNP3.0 RTU/TCP. It also supports OPC DA 2 and OPC UA server and client interfaces which enables easy integration with application specific systems and devices.

RTU specification

Ethernet

- IEEE 802.3, IEEE 802.3u standards
- 3 x LAN 10/100 Mbps Ethernet ports
- 1 x WAN 10/100 Mbps Ethernet port
- Supports auto MDI/MDIX



WiFi

- IEEE 802.11b/g/n WiFi standards
- 2x2 MIMO
- AP and STA modes
- 64/128-bit WEP, WPA, WPA2, WPA&WPA2, EAP-PEAP
- 2.401 – 2.483 GHz WiFi frequency range
- 20 dBm max WiFi TX power
- SSID stealth mode and access control based on MAC address

Electrical, Mechanical & Environmental

Dimensions (H x W x D)	80 mm x 106 mm x 46 mm
Weight	265 g
Power supply	100 – 240 VAC
Input voltage range	9 – 30 VDC
Power consumption	< 7 W
Operating temperature	-40 °C to 70 °C
Storage temperature	-45 °C to 80 °C
Operating humidity	10 % to 90 % non-condensing
Storage humidity	5 % to 95 % non-condensing

Инновации в энергетике ЭНТЕЛС

АНТРАКС
ЭНЕРГИЯ ПОД КОНТРОЛЕМ

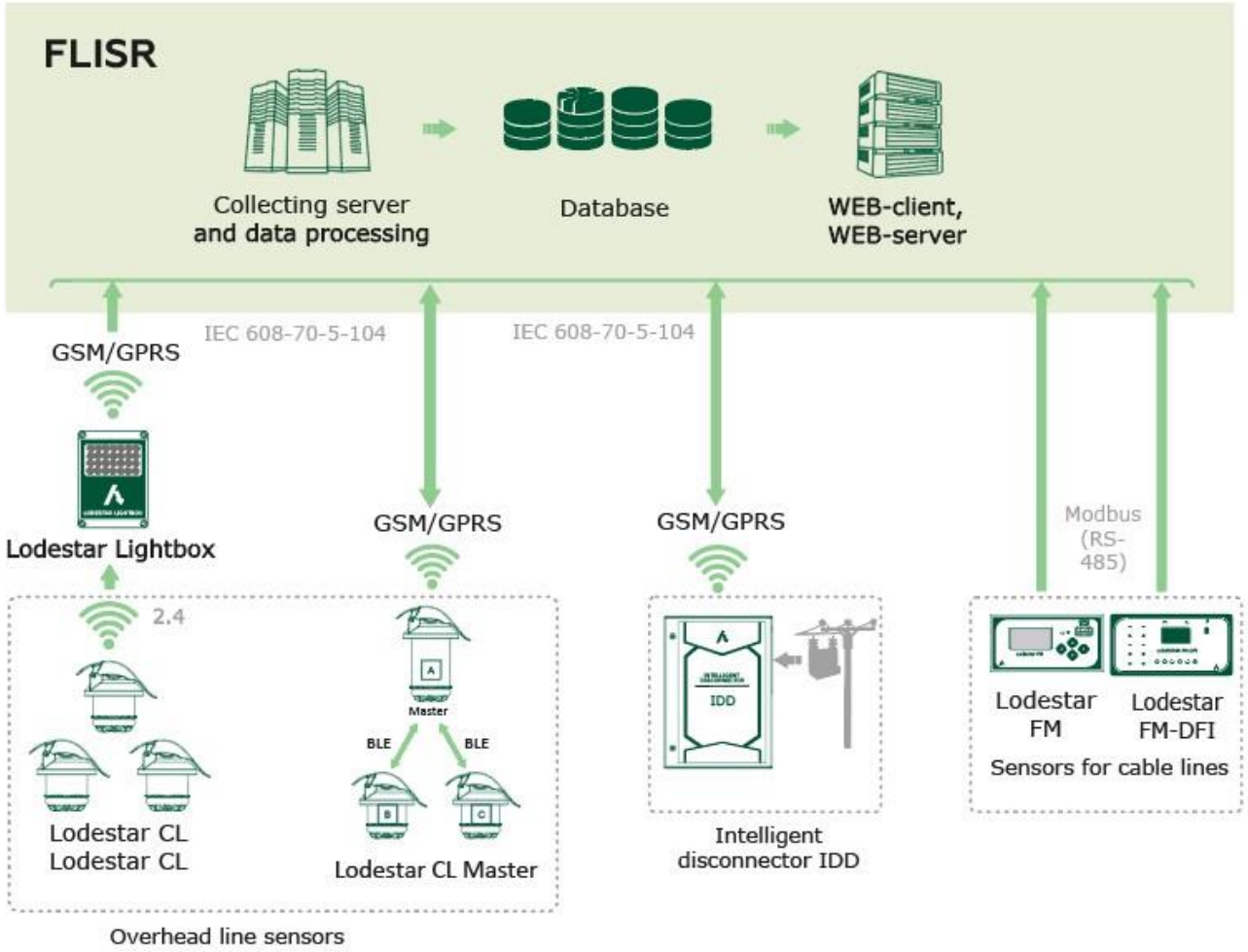
Hardware

- High performance 560MHz CPU with 128MB DDR2 memory
- 2 pin industrial DC power socket
- 4 pin industrial socket for 2/4 wire RS485
- 10 pin industrial socket for inputs/outputs
- DB9 socket for full-featured RS232
- Reset/restore to default button
- 2 x SMA for LTE, 1 x SMA for GPS, 2 x RP-SMA connectors
- Indication LEDs
- Reset/restore to default button
- Attachable DIN rail adapter

Software

- OpenVPN, IPsec, GRE, L2TP, PPTP, PPPoE
- Backup WAN
- Dynamic DNS
- Monitoring by SNMP, SNMP trap
- Event logging
- VRRP
- Web filter
- Wireless hotspot
- SIM card control by signal
- RS232/485 serial console, RS232/485 over IP
- SMS/e-mail control and indication
- Firmware update via WebUI
- Configuration backup

Dispatcher management



Depending on the requirements of a particular power system, the KOMORSAN may include various **control and monitoring devices for the the network status**:

- Fault location indication devices
- Disconnectors and switchers
- Icing sensors, temperature sensors, etc.

Components of the client-server solution KOMORSAN:

- Data collection and information processing server
- Database
- Software products WEB server and WEB client

Mobile App abilities

Online synchronization

Quality Control

Setup Instructions

Photofixation

Measurements Recording

Protection against changes

Subtracting information from tags using NFC

Subtracting information from tags using RFID

Synchronization of time and coordinates by GPS

Data synchronization in online 3G mode

Built-in encryption of the communication channel

* Depend on SCADA configuration

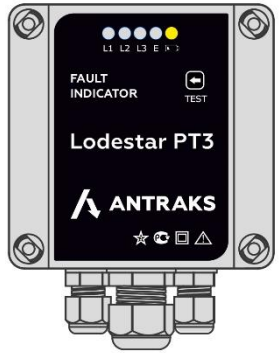
Equipment

LODESTARS FOR OVERHEAD LINES

- Reliable determination of PtP, PtG faults with direction
- Maximum sensitivity to short circuit currents
- Mounting on overhead lines of voltage class 0.4 - 110 kV;
- Wires up to Ø 42 mm
- Recording and transmission of oscillograms
- Sending SMS and e-mail about events on the network to up to 5 different subscribers
- Setting up devices using the mobile application
- Integration into KOMORSAN according to IEC 60870-5-104 protocol

FEEDER MONITORS

- Determination of all types of faults and directions to the PtG
- Registration of multiple parameters
- Monitoring from 1 to 10 feeders of one section of tires with the allocation of a damaged feeder
- Determination of the damage location with an accuracy of up to 300 m
- A reliable method for determining the PtG faults with a direction, including with double circuits through the ground
- Recording and transmission of oscillograms
- Sending SMS and e-mail about events on the network to up to 5 different subscribers
- Integration into KOMORSAN according to IEC 60870-5-104 protocol



Инновации в энергетике ЭНТЕЛС

АНТРАКС
ЭНЕРГИЯ ПОД КОНТРОЛЕМ

Provide observing and energy system control

Protect human life and health, emergency prevention

Improvement SAIDI & SAIFI index

Reduce electrical energy losses

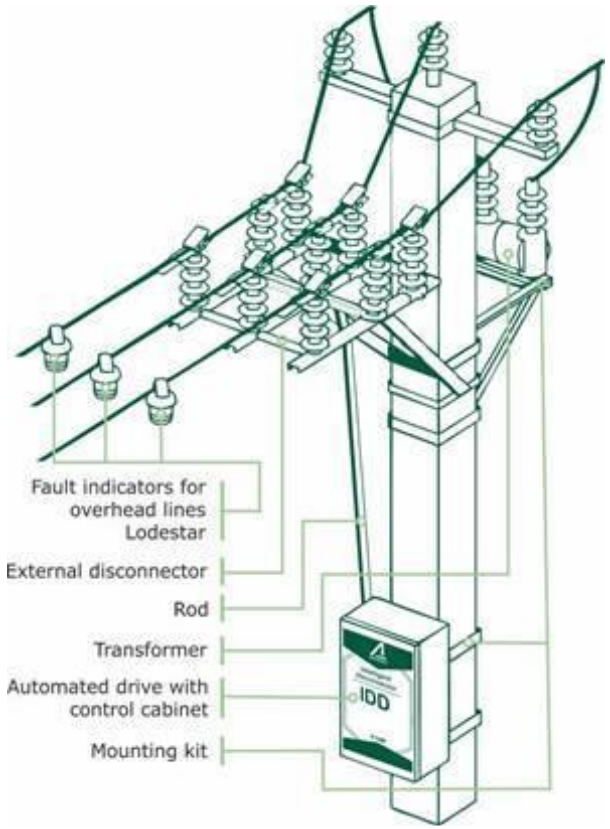
Reduce the time of searching for fault on the line 3 times

Decline of CAPEX while increasing the level of automation and controllability of power transmission lines

Equipment

IDD

- Damaged area sectioning
- Determine fault directions
- High current sensitivity (0.5 A)
- SMS and e-mail up to 5 users
- Integration into KOMORSAN with IEC 60870-5-104 protocol
- Remote or manual control



IDD - VN

- Detect all fault types with directions
- Reconfigure the network into a shockless pause AR
- Line switching with currents up to 630 A
- Disconnect and divide the load the line without disconnecting the upstream switches or overhead reclosers
- Integration into KOMORSAN with IEC 60870-5-104 protocol

Инновации в энергетике ЭНТЕЛС

АНТРАКС ЭНЕРГИЯ ПОД КОНТРОЛЕМ

- **Provide observing and energy system control**
- **Protect human life and health, emergency prevention**
- **Improvement SAIDI & SAIFI index**
- **Reduce electrical energy losses**
- **Reduce the time of searching for fault on the line 3 times**
- **Decline of CAPEX while increasing the level of automation and controllability of power transmission lines**

References

Russian Federation

«Rossety Volga», JSC

«Rossety Center & Volga region», JSC

«Rossety Center», JSC

«Rossety North-west», JSC

«Rossety Ural», JSC

«Rossety Siberia», JSC

«Rossety Moscow region» JSC

«Bashkirenergo» LLC

Altum Group LLC

«Network Company» JSC

«SK ENERGY» LLC

«CH-MNG» PJSC

Samara Electric Grid Company LLC

«Electricservice» LLC

RAY International L.L.C

«Orenburgneft» JSC

JSC «OEK»

Egypt

«North Delta Distribution Company»

«South Delta Distribution Company»

«Bouhiyra Distribution Company»

Инновации в энергетике ЭНТЕЛС

АНТРАКС ЭНЕРГИЯ ПОД КОНТРОЛЕМ

Over 100,000 installations

THANK YOU
FOR ATTANTION!

ANTRAKS
FUTURE TODAY

Инновации в энергетике
ЭНТЕЛС

+7 495 991-12-30

antraks.ru