ANTRAKS

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FAULT MANAGEMENT SOLUTION LODESTAR

Fault management solution for MV overhead lines Lodestar allows effective localization of fault areas via conductor-mounted indicators of Lodestar CL series, pole-mounted communication equipment Lightbox and software solutions mobile app for on-site configuration & maintenance Lodestar and KOMORSAN Fault Management Software. The system detects all types of faults, collects basic telemetry parameters and transfers the data to KOMORSAN.

FAULT INDICATORS
LODESTAR CL0.5 / CL2 / CL4 / CL25B

Fault indicators of Lodestar CL series is an effective and time-proven solution for fault registration in MV OHL. The model range covers fault sensing requirements of all types of lines with any neutral grounding.

Benefits:

- Detection and differentiation of all types of faults.
- Sensitivity to earth faults 0.5 A.
- Forward/backward direction detection.

- Installation on-load.
- Smart configuration and maintenance.
- Integration to Fault Management Software.

PARAMETER	VALUE
Operating parameters	
Operating voltage	6-35 kV 36-70 kV (option with Faraday cage)
Operating current	0-1000 A
Operating frequency	50/60 Hz
Conductor size	5-40 mm / 19,6-1256 mm²
Fault sensing	
Type of faults	PtP faults PtG faults Transient faults
Detection of earth fault direction	Forward & Backward (Lodestar CL0.5)*
Absolute threshold	20 A … 1000 A
Differential thresholds	20 A … 500 A / 50 % … 500 %
Minimum fault sensing (PtG) Zero sequence thresholds/3I0	0.5 – 100 A (Lodestar CL0.5) 2 – 100 A (Lodestar CL2) 4 – 100 A (Lodestar CL4)
Response time	20 ms
Fault notification	
Visual	Ultra bright LED (white) ≥ 100 m – day time @sunny weather ≥ 500 m – night time
Resistance	
Current withstand	25 kA /500 ms
In-rush resistance	0-200 ms /step 20 ms
Communication	
Short-range communication technology	Built-in BLE module, 50 m
On-site configuration and control	Mobile App Lodestar (Android, iOS)
Long-distance communication	Pole-mounted communication box (GSM)
Fault management software	KOMORSAN
Reset	
By timer	1 hour … 8 days (configurable)
Remote	Lodestar App KOMORSAN
Reenergized line	By voltage
Manual	Magnet

*Only for isolated neutral grounding. Min 5 km behind FPIs is required.

Physical characteristics	
Dimensions	140 x 114 x 158 mm
Weight	0.55 kg
Housing	UV resistant polycarbonate
Ambient conditions	
Temperature range	-40 ... +75 °C
IP protection	IP68
Salty fog	Resistant (IEC 60068-2-11)
Installation	
Installation tools	Dielectric rod Lodestar hotstick tool adaptor
Installation method	Live line
Battery	
Battery type and capacity	Lithium, 19 Ah, 3.6 V
Battery life time	>1000 h, >7 years
Low battery alarm	At 20 % of remaining battery load - visual by LED blinking (yellow color) - KOMORSAN notification
Other	
Applicable standards	ANSI / IEEE 495
Internal memory	20 000 events
Measured telemetry parameters	Currents (10-15% accuracy) Voltage absence/presence
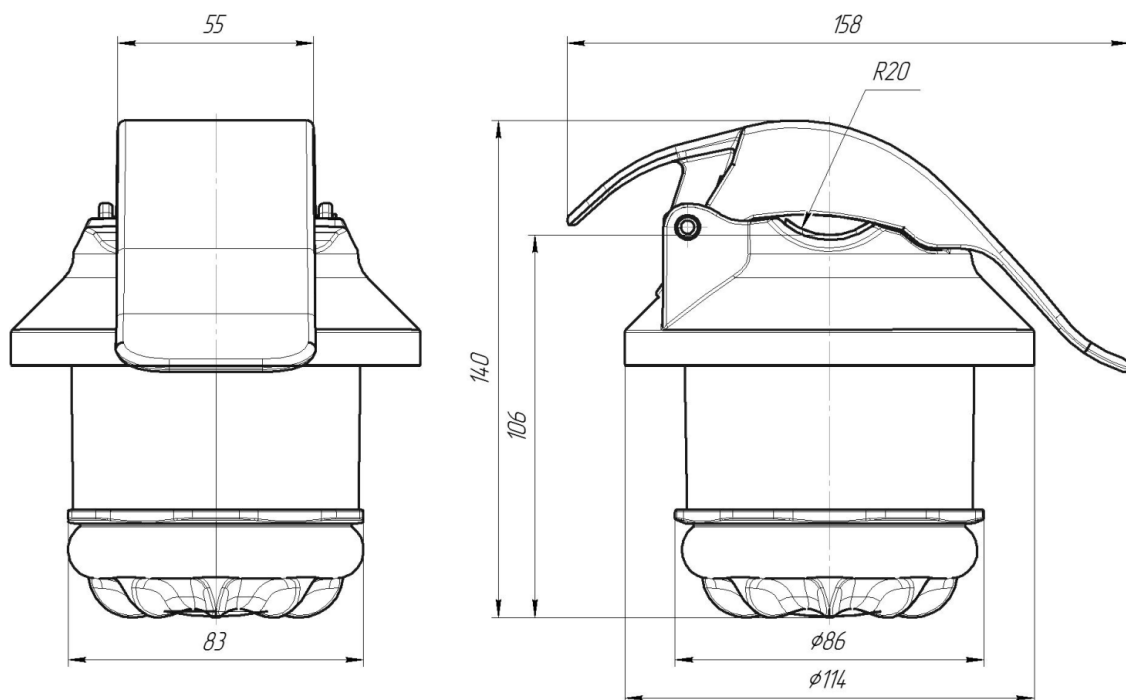
LIGHTBOX COMMUNICATION UNIT TO LODESTAR FAULT INDICATORS

The communication unit Lightbox is a reliable pole-mountable solution that works together with conductor-mounted Fault Indicators Lodestar. It provides detailed information about fault events and the actual state of distribution overhead lines.

Lightbox is an effective tool for transmission of the data to Fault Management System KOMORSAN and/or to Customer's SCADA (via KOMORSAN and by IEC104 protocol).

Benefits:

- Minimal weight and size.
- Easy mounting. Simple to position and connect without de-energizing the line.
- Simple configuration.

- No need for external power sources.
- Additional indication about the fault via blinker.

PARAMETER	VALUE
Installation	
Mounting	Pole-mounted
On-load mounting	Yes
Number of connected FPIs	Up to 6 sets (50 m maximum)
Communication	
Lightbox-FPIs	BLE 2,4 GHz (50 m)
Lightbox-Lodestar App	BLE (100 m)
Lightbox-KOMORSAN	GSM/ GPRS/ 3G / 4G
Sim card	2 mini-sim cards slots
Necessary GSM signal	- 85 dbm (standard version) - 100 dbm (external antenna)
Physical characteristics	
Dimensions	175,5 x 80 x 125,5 mm
Weight	1.05 kg
IP protection	IP66
Operating temperature	-40 ... +75 C°
Configuration and control	
Remote controller (on site)	Mobile App Lodestar for Android or iOS
Remote control (dispatcher desk)	KOMORSAN Fault Management Software. Customer's SCADA via KOMORSAN and IEC104 protocol
Collected and transmitted data	
Fault information	PtP, PtG faults Transient faults Phase of fault PtG direction: backward/forward (Lodestar CL0.5) Currents during the fault
Telemetry	Line currents (10-15 % accuracy) Voltage presence/absence/relative values (measured electromagnetic field)
Self-diagnostics	Communication (FPIs, FPI-Lightbox, Lightbox) Battery state

| Battery	
Type and quantity	Lithium battery x 4 pcs.
Life time	7 years
Other	
Visual fault indication	Blinker
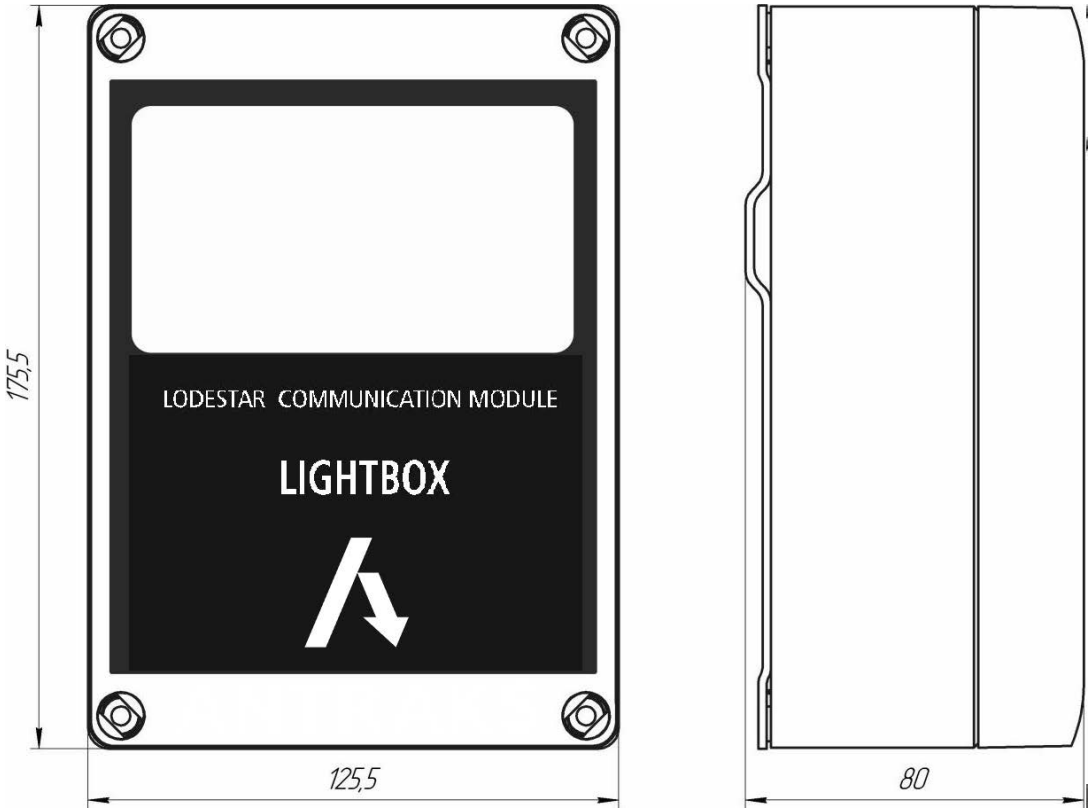
LODESTAR
MOBILE APP
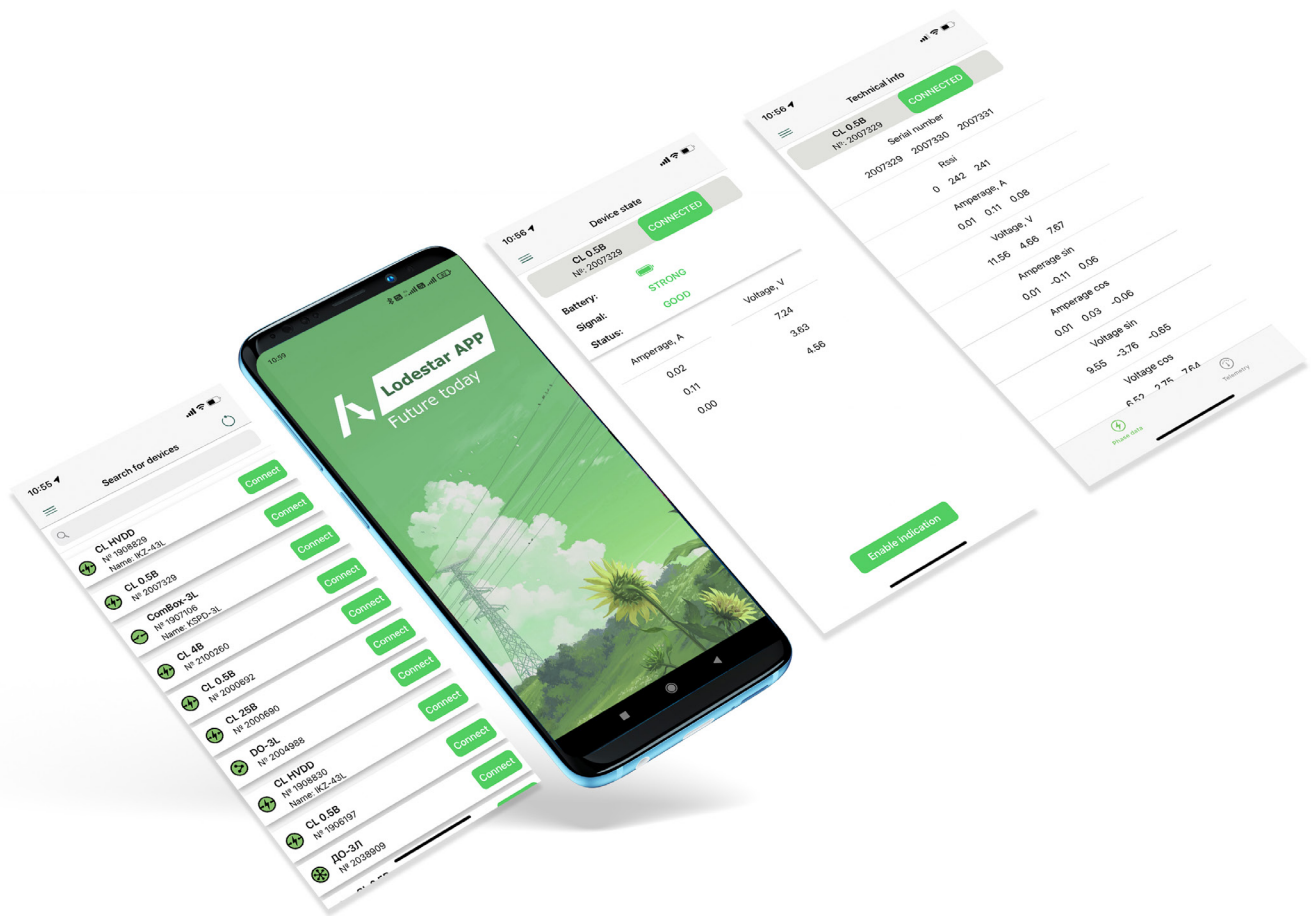
Lodestar App is a mobile software for installation and maintenance crew. It is installed at Customer's smartphone and allows on-site configuration and collection of data from fault indicators Lodestar and its Communication Boxes via BLE channel.

Benefits:

- Customization of fault management as per Customer's grid.
- Easy to use from any client's smartphone (Android or iOS).

- Events logs. Each fault stored in Lodestar memory can be read via smartphone.

PARAMETER	VALUE
Smartphone	Android or iOS
Connected devices	- Fault Indicators Lodestar CL - Communication Boxes - Intelligent Disconnector Lodestar
Communication channel	BLE
Maximum connection distance	100 m
Configuration of device functioning	Absolute and differentiate thresholds and triggers
Devices diagnostics	RSSI Battery State Indication status
Telemetry	Current (10-15% accuracy) Voltage (absence/presence, relative values)

KOMORSAN
FAULT MANAGEMENT
SOFTWARE
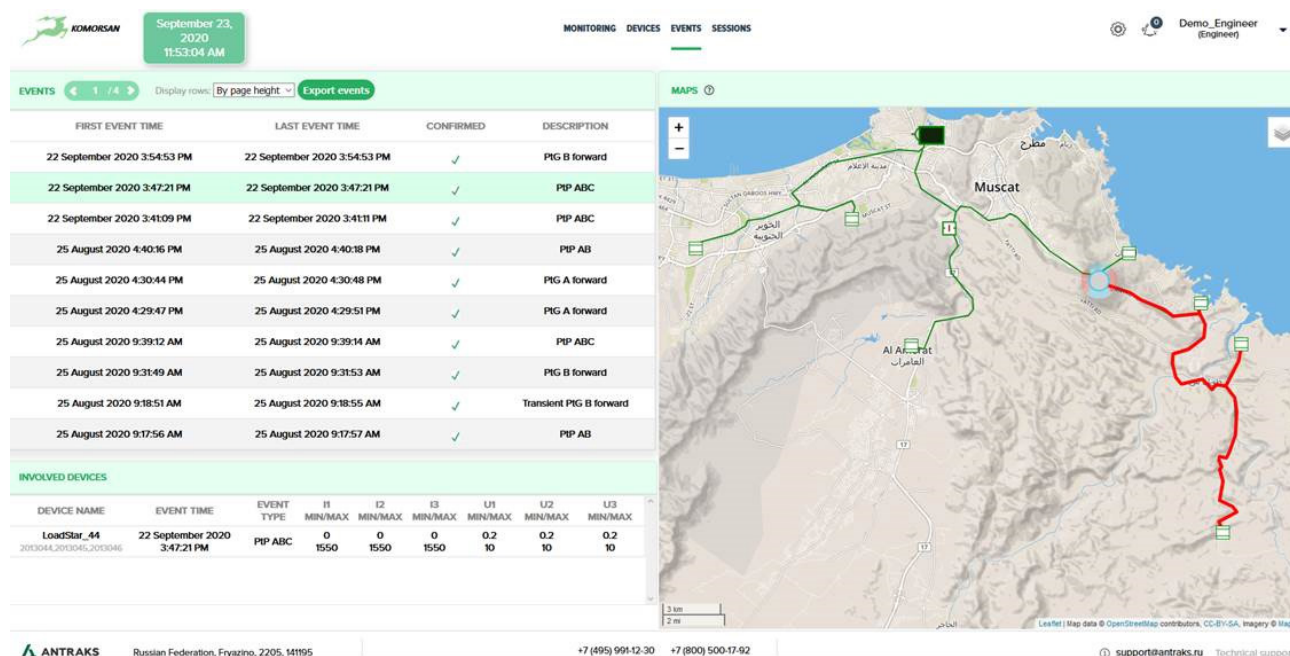
KOMORSAN is a modern multi-module software that combines grid monitoring, control and management functionality. Working as Fault Management mini-SCADA, it ensures that every power grid node and emergency process is monitored and effectively managed.

KOMORSAN is an additive system allowing to expand its scale and functionality together with the growth of on-site fault management infrastructure. This allows optimizing the financial investment through the gradual development of the system.

Benefits:

- Integration to any SCADA system (IEC104).
- Immediate detection of the damaged section.
- Telemetry collection.
- Logging of personnel actions.
- Alerts via sms and e-mails.

LIST OF DEVICES Lightbox ⓘ ◀ 1 /1 ▶ FILTER ✖

DEVICE TYPE	DEVICE STATUS	DEVICE NAME
☰ CL25B	Ⓐ ● ● ●	ASIG.F.loc-F3-Wfra 1909813,1909814,1909815

EVENTS ◀ 1 /1 ▶ Display rows: By page height ▼

FIRST EVENT TIME	LAST EVENT TIME	CONFIRMED	DESCRIPTION
06 August 2021 7:37:20 PM	06 August 2021 7:37:20 PM	CONFIRM	PtP Yellow Blue
20 September 2020 7:57:17 AM	20 September 2020 7:57:17 AM	✓	PtG Blue

TELEMETRY EXPAND ALL COLLAPSE ALL

Device ip: 37.38.245.101:3992
+ Telemetry:
Error:
Clock drift: -31
Device timestamp: 1632387068
Connect reason: 1
Raw data: C8 00 00 00 54 18 7C E3 06 00 C8 00 01 00 00 00 00 36 7A 5
BE 68 9D AD BD 6E 10 20 C1 A4 B5 A1 C0 35 24 1D 00 00 00 00 00 F1 8D
1B 00 00 01 00 52 4C 00 04 00 00 C8 00 00 00 00 00 00 00 DD BA A1 3C
F9 9F BD 6C CC 7D 3E 1A C9 E1 C0 36 24 1D 00 00 00 00 00 C7 8F 1B 00
EE 01 00 58 DE 00 04 00 00 C8 00 00 00 00 00 00 4E 70 87 3D 38 19 A
BD BC 9B F1 3F 11 73 F4 BF 37 24 1D 00 00 00 00 00 9F 8F 1B 00 FA 01 0

L1   i:0.23139752   u:0.011207913
L2   i:0.08056948   u:0.00706015
L3   i:0.10731833   u:0.0025988123

ADD PHONE NUMBER

🇵🇪 ▾   912 345 678

ADD   CANCEL

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ADD EMAIL ➕

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Enter email

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PARAMETER	VALUE
System components	
Data collection and processing	Server-based solution
Web-application	Browser-based software solution
Functionality	
Fault registration	Type of fault Phase of fault Transient fault Direction (Lodestar CL0.5 in isolated grids) Registration time Fault currents Triggered indicators
Grid topology	Map with electricity objects Localization of damaged section Fault direction (Lodestar CL0.5 in isolated grids)
Telemetry	During regular communication sessions: currents (10-15% accuracy), voltage (presence, absence, relative values)
Configuration of fault management devices	Fault indicators Communication equipment Intelligent disconnector
Alerts	E-mail Sms Sound and visual alarms
Registration journal	Personnel sessions Confirmation of events by the dispatcher
Roles	
Dispatcher	Events monitoring Alerts
Engineer	Events monitoring Alerts Access to sessions Devices configuration

Admin	Events monitoring Alerts Logs of personnel actions Devices configuration Managing user's accounts and roles Downloading personnel's actions Map edition
System requirements	
Requirements to server	Rack mounted platform 1U 4-core CPU; 3.5 GHz, RAM – 16 Gb, 1TB ROM RAID1, external RAID controller
Web-server OS	Linux
Web-client OS	Any devices and OS (browser based)
Integration with third party' SCADA	
Integration protocol	IEC 60870-5-104