SENTRISENSE

Line guard product datasheet

Sentrisense - Making the grid smarter

Revision history

Revision	Date	History
v1.0	11/11/2022	Release version
v1.1	20/01/2023	Text enhancement

Index

Product description

Sentrisense is a comprehensive solution for monitoring power lines. It is made up of a cloud-based platform that processes data and uses various calculations and Artificial Intelligence algorithms, as well as a physical device that is installed on the power line conductors.

Our offering includes a suite of interconnected solutions to enhance the power grid in three key areas: real-time incident detection, predictive maintenance, and power grid optimization:

1. Real-time incident detection enables the maintenance team to quickly and accurately locate failures.

2. Predictive maintenance allows asset managers to schedule replacements for damaged power lines, improving early fault detection capabilities of power line maintenance teams.

3. Power grid optimization improves the capacity of the grid, enabling power line operators to increase energy transmission through the grid using existing infrastructure.

This datasheet covers all the technical details of the physical device.

Product Applications

Feature	Use case
Motion detection	• Cable theft detection • Broken or fallen cables detection • Fallen tower detection • Strong winds
Inclination and sag monitoring	• Fallen tree detection (even with or without cable cut). • Tower inclination detection • Bushfire alert
Oscillation frequency monitoring	• Aeolian vibration measurement • Galloping measurement • Corrosion fatigue and aging analysis

Device description

The Sentrisense device is designed for both ease of installation and ease of use. Its durable metal casing features electromagnetic shielding and is equipped with an industrial-standard clamp for quick and secure mounting on hot power lines or using drones. The built-in solar panels are strategically placed to optimize solar radiation gathered in a variety of mounting positions and throughout the day.

The device is activated by pressing its single button, which also features a built-in LED indicator for displaying various status updates. Additionally, it has two antenna connectors for 4G communication.

1. Power on button
2. Solar panel
3. Screws
4. Snap fast clamp
5. Vent
6. Antenna connectors

Technical specs

Electrical characteristics

Characteristics	Value or condition
Power supply	Powered by solar energy
Battery Type and shape	Lithium-Ion cylindrical 18650
Battery nominal voltage	3.7 V
Battery nominal capacity (recommended)	3500 mAh
Power consumption	The device can consume as low as 45 µA while in sleep mode. Note: Sleep mode time depends on the device configuration and the kind of measurements it is performing.
Device autonomy	The device runs using solar energy from its solar panels. In the event of limited sunlight, the device also has a rechargeable battery as a backup power source. When fully charged, the battery can provide enough energy to operate the device for up to eight months. The estimated battery life (the overall lifespan of the battery) is more than 10 years.

Special device features

Feature	Value or condition
Upgrading capability (Firmware over the air)	The device is fully upgradeable remotely. Meaning it can receive software updates while installed in the line, for improving its capabilities.
Voltage rating	0 V to 330 kV
Vibration detection range	3 Hz - 150 Hz
Reporting alerts	Generated by SMS or email.
Certifications and lab tests	The device is tested under: • IEC 61284 Ed.2:1997, CISPR TR 18-2 Ed.3.0:2017. Measured value of the corona extinction voltage phase-to-earth corresponds to a phase-to-phase voltage of 284 kV • Windtunnel test according to FNN Standards • UV radiation test - Accelerated aging - according to PN-EN ISO 4892-2:2013-06 • Environmental test - Change of temperature - According to PN-EN 60068-2-14:2009 • Environmental test - Corrosion resistance - According to PN-EN ISO 9227:2017-06

	• Environmental test - Resistance to humidity - According to PN-EN ISO 3270-2:2018-02 • Environmental test - Cold resistance - According to PN-EN 60068-2-1:2009 • Environmental test - Heat cycle - According to PN-EN 60068-2-30:2008
System security	Encrypted communication at device level and SSL for the web platform and API interface.
Integration with 3rd systems (e.g SCADA)	Yes, through Sentrisense line guard API
Devices per conductor per kilometer	Depending on the line characteristics, generally one device per kilometer per line.
Hardware version	Sentrisense v2.0.7

Connectivity capabilities

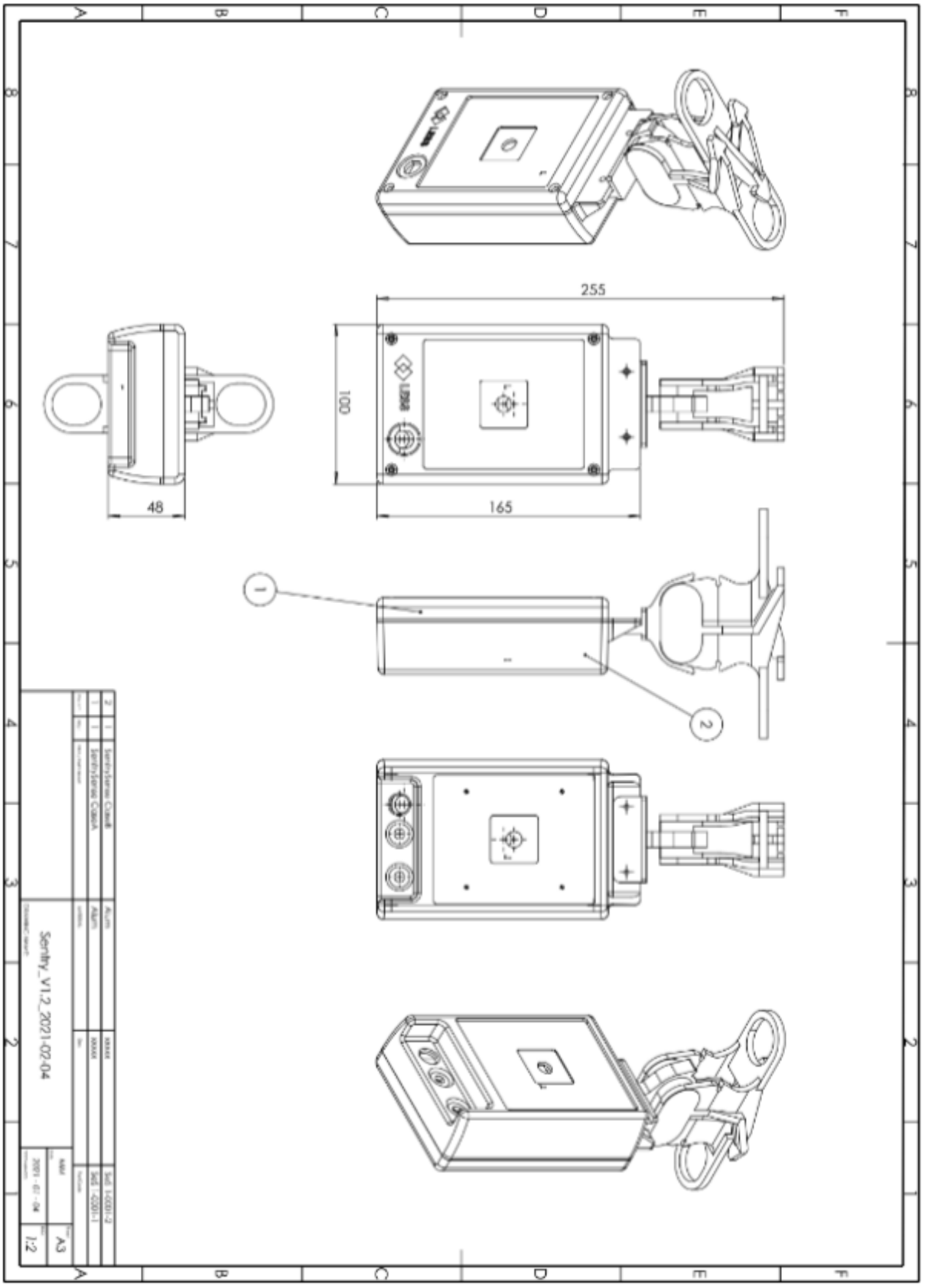
Type of networks	Supported bands
4G	Twelve Bands FDD-LTE: 700, 800, 850, 900, 1700/2100 (AWS), 1800, 1900, 2100, 2600 MHz (bands 1, 2, 3, 4, 5, 7, 8, 12, 18, 19,20, 28)
3G	Seven Bands UMTS (WCDMA/FDD): 800, 850, 900, 1700/2100 (AWS), 1800, 1900 and 2100 MHz (bands 1, 2, 4, 5, 8, 9, 19)
2G	Quad Band GSM: 850, 900, 1800 and 1900 MHz
WiFi	IEEE 802.11 b/g/n-compliant

Sensing capabilities

Type	Function
Orientation	The device is able to perform various types of analysis by measuring the angular position of the device, such as detecting tilting alerts and identifying abnormal installation positions.
motion	The device uses the measurement of acceleration to detect various types of motion events, as well as to measure oscillation frequency which is crucial for analyzing the behavior of the power line.
Temperature (for internal device use only)	The device monitors its internal temperature to protect the battery from overheating and maximizing its lifetime.

Physical and environmental characteristics

Characteristic	Values and ranges
Device dimensions	• 100 mm x 165 mm (3.9 in x 6.5 in) • 100 mm x 255 mm (3.9 in x 9.5 in) (with the clamp installed)
Weight	Aprox. 1 kg
Operating temperature	-20 to +60 °C Note 1: To avoid any damage to the battery or risk of explosion, if the internal temperature of the device goes above 45°C, the device will stop the battery charging process. Note 2: The device might work over 60°C but the expected performance specially for the battery is not guaranteed
Operating wind condition	Up to 200 km/h
Environmental and electrical condition of operation	• Fully weatherproof • Corona-free operation through 284 kV rated voltage. Functional up to 330kV
Mounting method	• Energized (hot stick) • De-energized • Suitable for bundled conductor applications • Suitable for drone installation
Mounting time	Sentrisense can be install in up to 2 minutes
Cable size compatibility	• Cable size 10–70 mm (0.39–2.75 in.) • Cable size 4–16 mm (0.16 to 0.63 in.)
Device material	• Metal (aluminum) case • Plastic clamp
Device lifespan	At least 10 years
Device warranty	5 years for manufacturing defects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