Total Lightning Sensor LS7002

Total Lightning™ Sensor network detects cloud and cloud-to-ground lightning with high detection efficiency and excellent location accuracy. It uses combined technology and provides large area coverage with fewer sensors, which leads to lower lifetime network ownership costs than any other technology.

Features

- The most precise cloud-to-ground lightning detection, geolocation, and calibrated lightning parameters
- Detects a high percentage of cloud lightning for early thunderstorm identification
- Detects lightning events at long ranges (> 1500 km)
- Independently validated 150 m median location accuracy for cloud-to-ground lightning strokes
- Up to 95 % network detection efficiency for cloud-to-ground lightning and better than 50 % network detection efficiency for cloud lightning

The latest in precision lightning geolocation technology

LS7002 is a Total Lightning Sensor. It detects low frequency (LF) electromagnetic signals generated by lightning in order to provide extremely accurate geolocation capability with industry leading measurement of lightning strength and lightning type classification. LS7002 is the most cost-effective network-based lightning detection solution for customers demanding high accuracy, reliability, ease of installation, and ease of maintenance.

LS7002 network uses a combination of magnetic direction finding and time-of-arrival techniques to deliver superior detection efficiency, optimal location accuracy, and system redundancy with fewer sensors than any other method for detecting cloud lightning pulses and cloud-to-ground lightning strokes. It provides large area coverage with fewer sensors, which leads to lower lifetime network ownership costs than any other technology.

Lightning data for a wide range of applications

LS7002 provides real-time data that is recommended for operations that focus on tracking cloud and cloud-to-ground lightning threats to ground-based and airborne assets, including applications in:

- Aviation
- Defense
- Forestry
- Meteorology/Climatology
- Power utilities
- Telecommunications

Benefits

- Calibrated parameters for lightning events including time, location, amplitude, polarity, and waveform features
- Data buffering capability at the sensor in case of communication failure between sensor and Total Lightning Processor™
- Lightning magnetic field waveform storage capability at the sensor
- Capability to generate and save raw sensor data locally for offline reprocessing and archiving
- Efficient lightweight electronics module allows for ease of installation and maintenance with stand-alone, rooftop and indoor electronic mounting options
- Sensor electronics can be installed separately from the antenna, for example tower-mounted with custom cable sets or indoors to reduce potential physical damage from severe weather environments
- Compatible with previous generation Vaisala sensors: LS7000 and LS7001

Support services

Training, technical support, and spare parts are available for maintaining optimal network and sensor performance. Contact your Vaisala Sales Representative for service agreement information.

Standard warranty

Vaisala warrants all products manufactured by Vaisala to be free from defects in workmanship or material for one year from the date of delivery. Contact your Vaisala Sales Representative for specific product service warranty details.

Technical data

Measurement performance

Lightning type	Cloud (IC) and Cloud-to-ground (CG) lighting events and flashes
Network flash detection efficiency [1) 2)]	CG: 95 % IC: 50 %
Network median location accuracy [2)3)]	150 m (492 ft)
Recommended baseline distances between sensors	15 ... 350 km (9 ... 217 mi)
Min. number of sensors per network	4
LF band	1 ... 350 kHz
Performance monitoring	Complete automatic system calibration and self-test with manual capability
Remote configuration	Operational parameters are remotely configurable

1) IC flash detection efficiency higher than 50 % can be achieved with network baseline distances shorter than 150 km.
2) Performance specifications are applicable to LS7002 networks that use the latest version of Vaisala Total Lightning Processor™.
3) Median network location accuracy can be better than 150 m in the interior of the network.

Operating environment

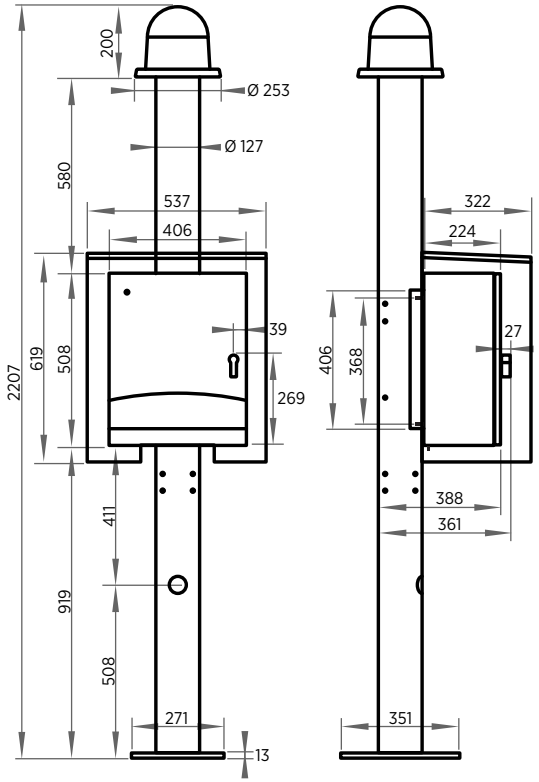
Operating temperature	−40 ... +55 °C (−40 ... +131 °F)
Operating humidity	0 ... 100 %RH, condensing
Maximum wind speed	240 km/h (149 mph)
Maximum operating altitude	5500 m (approx. 18000 ft)
Hail	Ø 2.0 cm (0.79 in)
Ice	8.0 cm (3.15 in)
Rain	8.0 cm/h (3.15 in/h) at wind speed 65 km/h (40 mph)
IP rating	IPX4

Inputs and outputs

Time synchronization	Source: GPS receiver Accuracy: 50 ns to UTC
Communication interfaces	
TCP/IP	Max. 64 kbps per data stream depending on network geometry and gain settings
RS-232 serial	Maintenance port for optional on-site connection
AC input to 48 V DC output power supply options	
Indoor AC/DC power supply	90 to 264V AC at 50/60 Hz input
Outdoor AC/DC power supply	100 to 130 V AC at 50/60 Hz input
Outdoor AC/DC power supply	200 to 240 V AC at 50/60 Hz input

Mechanical specifications

Dimensions (H × W × D)	220 × 54 × 50 cm (86.61 × 21.26 × 19.69 in)
Weight	50.1 kg (110 lb)
Mounting	Concrete ground pad Non-ground mounting options available



Dimensions in mm

Compliance

UL standard	UL 61010-1
CAN/CSA certfication	C22.2 NO. 61010-1

Intertek

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operations.

VAISALA

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