Thunderstorm Warning System

BTD-1



INTRODUCTION

The BTD-1 is a standalone thunderstorm warning system designed to detect the presence and range of lightning flashes by monitoring the background quasi-electrostatic field. In addition to lightning detection, it provides early warning of overhead thunderstorm conditions and includes a Severe Storm feature to identify storm cells most likely to generate damaging events such as large hailstones.
The BTD-1 is ideal for safety-critical outdoor applications, including renewable energy sites, airports, industrial plants, marine and harbour facilities, outdoor sports venues, and construction sites.
With its plug-and-play architecture, optional modules, and integration-ready communication interface, it offers a flexible solution for both standalone deployment and complete warning systems.

FEATURES

Advance warning

Warns of overhead thunderstorm conditions before the first nearby lightning strike.

Severe Storm feature

Identifies highly active storm cells with an increased risk of hail and damaging weather.

Best-in-class detection efficiency

High sensitivity, including intra-cloud flash detection, for earlier and more reliable warnings.

Unique lightning detection

Low-frequency analysis delivers high detection efficiency with minimal man-made interference.

Long detection range

Measures lightning activity **up to 35 km as standard**, extendable **up to 83 km**.

Plug-and-play architecture

M12 connectors, preassembled leads, and modular accessories simplify installation.

System integration ready

ASCII interface with broadcast messaging, internal relays, and optional expansion modules.

Ethernet connectivity with PoE

Optional Ethernet module combines power and data in a single cable.

Flash Signal Generator

Optional module simulates lightning conditions for advanced remote hardware testing.

Low maintenance outdoor design

Robust IP66 construction with no moving parts.

CONFIGURATION & MEASUREMENT

Lightning and storm event detection

Detects cloud-to-ground, intra-cloud, and cloud-to-cloud lightning, as well as charged precipitation, strong electric fields, and severe storm conditions.

Configurable risk management

Four risk levels - **All-Clear, Caution, Warning, and Alert** - can be configured for site-specific requirements.

Accurate timing and optional direction

Integrated GPS/GNSS provides accurate flash timing, while the optional Direction Finder adds lightning bearing.

Flexible communications

RS-422 communication provides broadcast output every 2 seconds. An optional PoE module adds Ethernet connectivity, combining power and data in a single cable.

Remote hardware testing

The optional Flash Signal Generator simulates lightning conditions to verify sensor operation remotely.

Monitoring and integration

Three internal relays and Lightning Eye software support system integration, monitoring, diagnostics, configuration, and data handling.

ADVANCE WARNING
Early warning of overhead thunderstorm conditions.

SEVERE STORM FEATURE
Highlights storm cells with increased risk of large hailstones.

BEST-IN-CLASS DETECTION EFFICIENCY
Detects more storm activity earlier, with a very low false alarm rate and reduced interference from man-made sources.

UP TO 83 KM RANGE
35 km standard range, extendable up to 83 km.

GPS/GNSS TIMING
Integrated GPS/GNSS supports highly accurate flash timing and UTC-based time reference.

PLUG-AND-PLAY MODULARITY
Easy installation with optional accessories and integration modules.

General specifications

Output	RS-422, relays, Ethernet (opt.)
Power supply	9...36 Vdc
Power consumption	2 W typical; up to 50 W with extreme heater module
Connection	M12 Connectors (Stainless Steel)

ENVIRONMENTAL

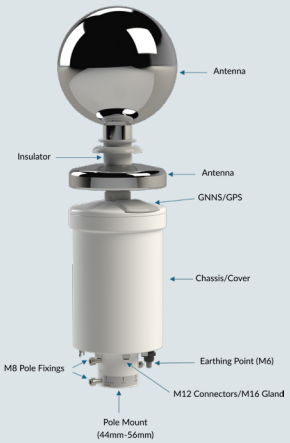
Operating temperature	-40...+60 °C
Relative humidity	0...100% RH
Protection rating	IP66

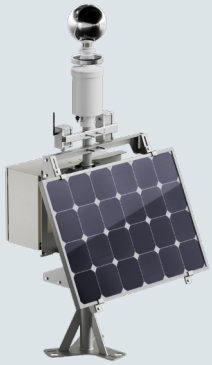
PHYSICAL

Material	Housing: Aluminium Sphere Antenna: Stainless Steel Insulators: PTFE/Acrylic
Weight	4.3 kg approx.

RELATED STANDARDS

- EN50536:2011+A1:2012, Class 1 Detector
- IEC 62793, Class A Detector
- EN61326-1:2021, Industrial Limits





BTD-1 fully equipped with direction finder, radio module, solar kit, and field mounting kit.

Ordering codes

BTD-1

Extreme heating option
00 = without heating option
EH = with extreme heating option

Flash Signal Generator Option:
000. = not fitted
FSG. = fitted

Communication
S. = RS-422 Communication
E. = Ethernet

Range
35. = 35 km
83. = 83 km

Version
SA. = stand-alone version
OM. = OEM version

Example: BTD-1.SA.35.S.000.EH

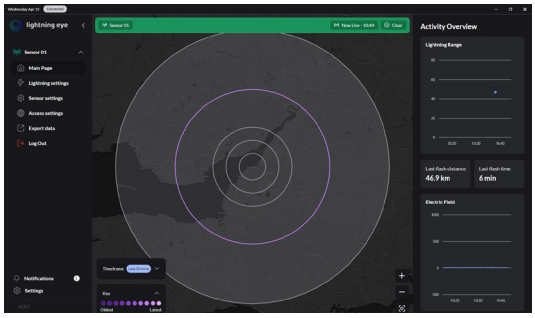
Warranty: 2 years.
The standard stand-alone version includes the configuration kit, power supply, cables, converter, and software license. The OEM version includes field-wireable signal and power connectors. PoE and FSG modules can be factory-fitted or retrofitted. Other accessories must be ordered separately.

Measurement specifications

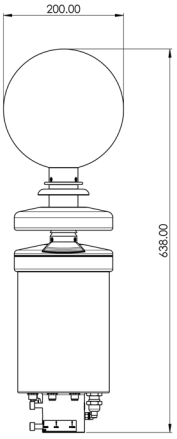
Lightning detection	Triggered by cloud-to-ground, intra-cloud and cloud-to-cloud lightning
Lightning events Detected	Charged Precipitation (Prewarning) Strong Electric Field (Prewarning) Severe Storm
Measuring range	35 km (Default) / 83 km (Option)
Range resolution	1 m
Range accuracy	For flashes within 20 km : ±5 km For flashes within 83 km : ±10 km
Detection efficiency	For flashes within 35 km 97% for a single lightning flash 99.9% for a storm with 2 lightning flashes For flashes within 56 km 95% for a single lightning flash 99% for a storm with 2 lightning flashes 99.9% for a storm with 3 lightning flashes
False alarm rate	For flashes within 35 km <1% For flashes within 83 km <2%
Maximum flash rate	120 flashes per minute
Flash Latency	2 seconds

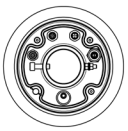
Lightning Eye Software Overview

- Multi-user capability
- Remote connectivity
- Map overlay
- System status overview
- Sensor diagnostics
- System configuration
- Automatic data logging
- Export of logged data



Dimensions in mm





DOC101872.00B - vs1.1

Senseca UK Ltd
Unit 8, Harbour Road Trading Estate - Portishead
Bristol - UK - BS20 7BL
www.senseca.com - info.bristol@senseca.com