

**Biral** *visibly better*

# BTD-200 LIGHTNING WARNING SYSTEM

Self-contained, standalone lightning warning system designed for industrial and meteorological applications. Ideal upgrade for field-mill based systems.



**METEOROLOGICAL SENSORS**



The BTD-200 lightning warning system is a complete detection and warning system which has been developed from the Biral range of professional aviation grade lightning detection systems. Its proven detection technology reliably detects the presence of all forms of lightning out to a range of 35km (22 miles) from the sensor. Designed to be quickly and easily installed, it comes complete with a universal mains voltage power supply and the essential PC server application Lightning Works for monitoring, warning and data logging of approaching thunderstorms.

## Unique Lightning Detection

The BTD-200 makes quasi-electrostatic measurements to avoid the problems of false alarms and mechanical failures associated with the detection of lightning using radio wave and field-mill based sensors. Most importantly, it is able to issue warning of potential overhead lightning before the first strike. Such early warning is not possible using radio based detection. Many of the lower cost commercially available lightning warning systems use radio waves generated by lightning discharges as the primary detection technique. Whilst providing a sensitive method of detection there are many other sources of these radio waves such as arcs from electrical equipment, vehicle ignition systems and fixed or mobile transmitters, all of which can result in high false alarm rates for these types of systems. Due to these limitations, most standalone lightning detectors use secondary measurements such as optical flash detection in an attempt to reduce false alarms and employ complex signal analysis to estimate range. These techniques are only partially effective, giving these older technology lightning detectors a poor reputation due to their high false alarm rate, poor distance accuracy and often short working lifetimes.

## True Thunderstorm Detection

In many applications the lightning warning system is used to help protect people and equipment from the dangers of a lightning strike by providing advanced warning of a storm's approach. This is all the more important for highly combustible industrial processes such as oil refineries and storage facilities as well as for petro-chemical production where lightning strikes can be extremely hazardous. Detectors which rely upon lightning detection alone are only effective if the storm is already producing lightning at some distance before moving closer towards the detector. If the thunderstorm is building overhead, then the first strike of the storm is likely to be very close-by. These older systems can give no advanced warning of this type of event and therefore offer no protection.

The advanced detection principle of the BTD-200 enables it to monitor the strength of the local electric field and the presence of charged precipitation, both of which are strong indicators of lightning risk from a developing overhead storm-cloud. This allows the BTD-200 to provide warnings of the risk of an overhead strike even before any lightning has been produced. This advanced warning can be up to 20 minutes before the lightning begins, giving time to alert staff and to begin safe operating protocols such as shutting down vulnerable equipment and processes and initiating purging activities.



## Applications

There are many industrial applications and processes where the ability to reliably warn of the presence of thunderstorms can mitigate risks, increase site safety and maximise productivity.

- Oil and gas processing terminals
- Petro-chemical plants
- Fine chemicals production
- Electricity generation
- Solar / wind farms
- Computer server farms
- Open cast mining
- Munitions factories
- Power line maintenance

The BTD-200 has many significant advantages over field-mill devices, including greater detection range, no moving parts resulting in longer life and lower service costs and most importantly, lower false alarm rates. Therefore the BTD-200 is an ideal upgrade for users of field-mills in both the industrial and the meteorological sectors. Reliable thunderstorm detection allows these operations to take the appropriate safety precautions in a timely manner and only when necessary. Once the storm threat has passed, normal operations can be resumed quickly and safely, so protecting plant and life whilst maximising operating efficiencies. In meteorological applications, site specific detailed information can be fed into client warning systems and also into numeric models improving the data density and significantly aiding the now-casting or forecasting systems.

## The System

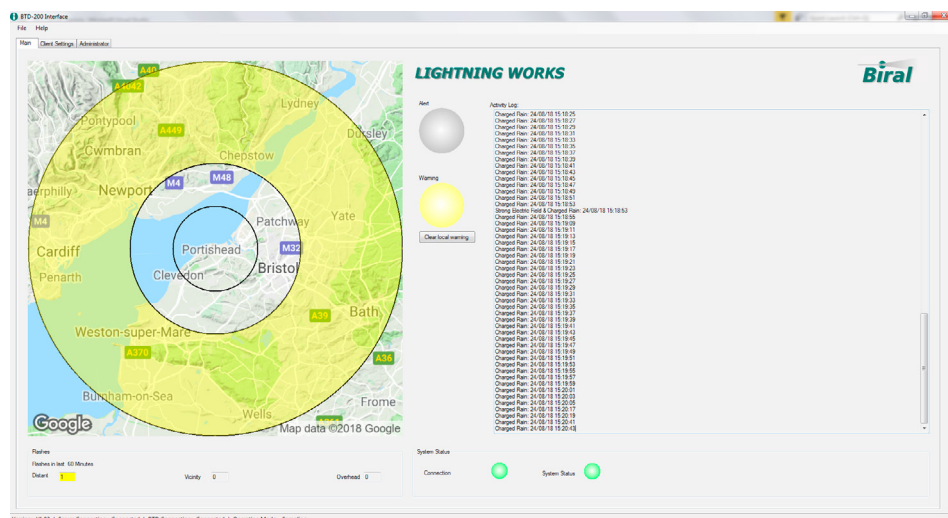
The BTD-200 lightning warning system is a modular system which is designed to operate out-of-the-box, but is also expandable as requirements grow or change. The essential system comprises of a lightning detector which is placed outside, whilst a PC located indoors runs the supplied **Lightning Works** server software. The system includes a universal mains power supply and (optionally) the cabling to connect to the power and the host PC.

The BTD-200 can be connected directly to an appropriately sized warning sounder if required, using the built in relays.

## Lightning Works - Graphical Alarm Software

Included with the BTD-200 lightning warning system is the control and display software – **Lightning Works**. This comprehensive server software package allows the administrator to configure the BTD-200 to meet their warning needs via user adjustable warning zones based upon distance from the sensor. It displays the lightning location in real-time on a map of the local area whilst displaying the current lightning alarm level. It offers the following features:

- Multi-user capability, with up to 5 simultaneous users (one administrator, 4 viewing stations)
- Map overlay showing lightning distance warning zones (user adjustable)
- Current lightning warning state (shown in real-time)
- Sensor health status display (ensures system is fully operational)
- System configuration window
- Automatic data logging of lightning events (for later data retrieval and review)



## Key Features & Benefits

- ✔ Complete, out-of-the-box warning system with minimal installation
- ✔ Fully automatic alarm triggering
- ✔ Warns of the most dangerous (overhead) lightning risk even before the first lightning strike
- ✔ Advanced, automatic self-test to ensure system operation
- ✔ Accurate 35km (22miles) detection range
- ✔ Detects cloud-to-ground, intra-cloud and cloud-to-cloud lightning
- ✔ Significantly higher detection efficiency compared to network systems
- ✔ Detects charged precipitation and strong atmospheric electric fields
- ✔ Ideal upgrade for users of field-mill sensors
- ✔ Compliance with EN50536:2011+/A1:2012 for a Class 1 detector
- ✔ Performs in accordance with IEC62793 for a Class A detector



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