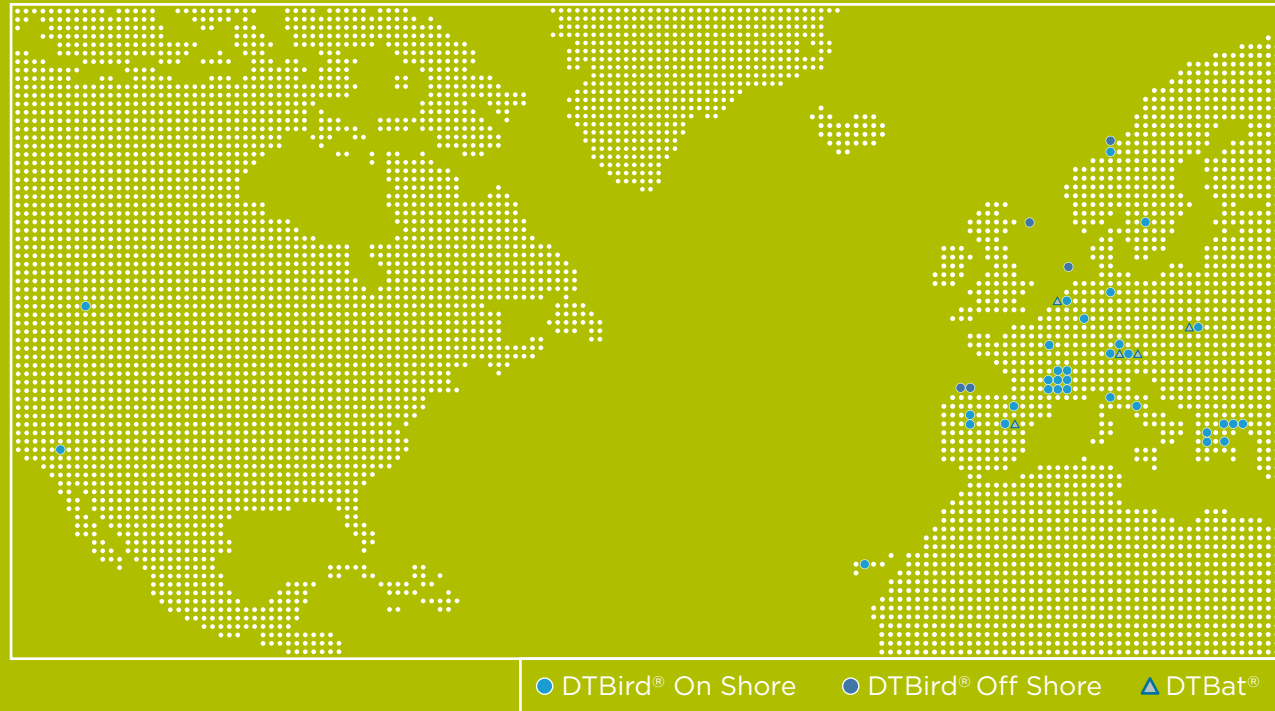


# DTBat<sup>®</sup> System: a Worldwide Reference for Bat Protection at Wind Farms

MARCH 2019



DTBird<sup>®</sup> & DTBat<sup>®</sup> features are demanded by environmental administrations of an increasing number of countries.

153 DTBird<sup>®</sup> & DTBat<sup>®</sup> units have been installed at 50 existing / projected, onshore / offshore wind farms in **13 countries** (Austria, France, Germany, Greece, Italy, Norway, Poland, Spain, Sweden, Switzerland, The Netherlands, the United Kingdom and the United States).

DTBird<sup>®</sup> is operating at WTG since 2009 and DTBat<sup>®</sup> since 2012.



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# Bat Monitoring & Reduction of Collision Risk with Wind Turbines

DTBAT<sup>®</sup> SYSTEM

MARCH 2019



# Bat Protection Automatic & Real-Time

DTBat® System automatically surveys the airspace around Wind Turbines (WTG) detecting bat passes in real-time; and optionally, reduces the collision risk by triggering WTG Stops linked to bat activity thresholds and/or environmental variables measured in real-time.

DTBat® has 2 modules available: Detection and Stop Control.

## Bat Detection

Automatic and real-time detection of bats with ultrasound recognition.

### Features

- ❖ **Detection sensors:** Bat detectors installed at WTG height (1 - 3 units).
- ❖ **Environmental sensors:** Temperature, Rain and Humidity (optional) and Wind Speed (from the WTG).
- ❖ **Location:** WTG Tower (steel or concrete) and/or Nacelle.
- ❖ **Surveillance area:** Rotor Swept Area.
- ❖ **Service period:** Continuous monitoring during bat activity periods.
- ❖ **Precision** of real-time detection > 0.97 (97% of detections are actual bats).

### Recorded Data

- ❖ Sonograms of every bat pass.
  - ❖ Bat pass time.
  - ❖ Environmental data and WTG operational parameters.
- Species or group identification can be noted from sonograms review.

## Stop Control

Automatic WTG Shutdown linked to real-time bat detection.

### Features

- ❖ **Interface with WTG:** DTBat® hardware and software compatible with all WTG manufacturers.
- ❖ **Automatic Stop trigger:** linked to real-time bat activity thresholds and/or environmental variables.
- ❖ **Stop trigger:** < 2 s after bat pass detection.
- ❖ **Rotor Stop init time:** Depending on WTG manufacturer, 2 - 18 s after DTBat® stop trigger.
- ❖ **Complete rotor Stop:** Depending on WTG manufacturer, 15 - 35 s after WTG stop init.
- ❖ **Stop duration** according to bat activity detected. Typical stop program covers > 90% of bat activity. Adjustable to Client/Environmental Authority requirements.
- ❖ **Automatic restart** of the WTG.
- ❖ Automatic **notification** of every Stop: Trigger (first notification), end time and duration (second notification).

### Recorded Data

- ❖ Stop time data: Init time, end time and duration.
- ❖ Sonograms of all bat passes detected.



## Data Analysis Platform

DTBat® online Data Analysis Platform provides:

- ❖ Access to bat calls, environmental data, WTG operational parameters, and shutdown actions.
- ❖ Data summarization in charts and graphics.
- ❖ Automatic Service Reports.

