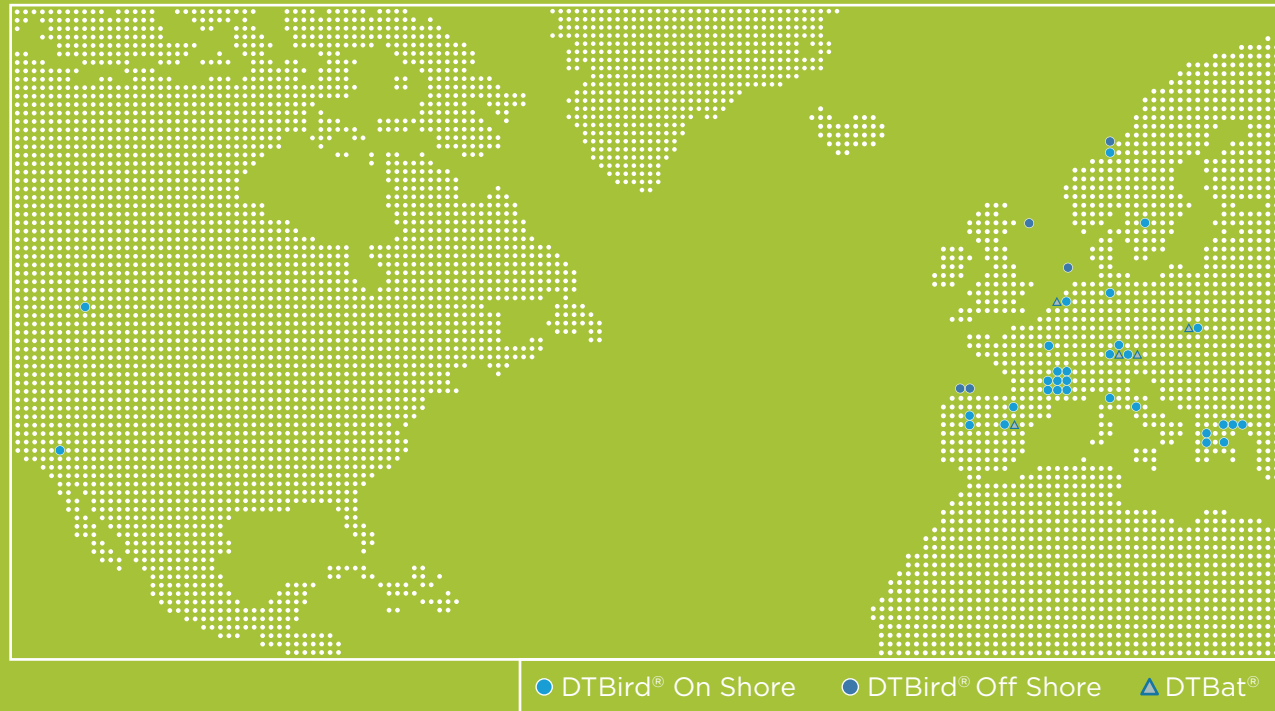


DTBird® & DTBat®,
world wide reference
for bird & bat protection
at wind farms

SEPTEMBER 2018



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

131 DTBird® & DTBat® units have been installed in 47 existing / projected, onshore / offshore wind farms in **13 countries** (Austria, France, Germany, Greece, Italy, Norway, Poland, Spain, Sweden, Switzerland, The Netherlands, United Kingdom and the United States).

DTBird® is operating at WTG since 2009 and DTBat® since 2012.

dtbat®

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Bats
Smart and
Transparent
Wind Power

AUTOMATIC COLLISION RISK REDUCTION

SEPTEMBER 2018

dtbat®

Bat Protection Automatic & Real-Time

DTBat® is a self-working System that detects bat passes in real-time, and takes automatic actions linked to bat detection. For the Wind Industry, DTBat® System automatically surveys the airspace around Wind Turbines (WTG) detecting bat passes in real-time; and optionally, reduces the collision risk 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 height (1 - 3 units).
- ✦ **Environmental sensors:** Temperature, Rain and Humidity (optional) and Wind Speed (from the WTG).
- ✦ **Surveillance area:** Rotor Swept Area.
- ✦ **Service period:** Continuous monitoring in 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/Group identification.

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 length** 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

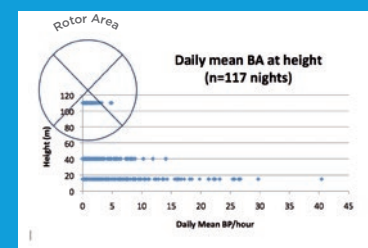
- ✦ Stop time data: Init time, end time and duration.
- ✦ Sonograms of all bat passes detected.



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.



Time	Species	Height (m)	Duration (s)	WTG Status
2014-08-01 00:00:00	Myotis	100	1.2	Stop
2014-08-01 00:05:00	Myotis	100	1.5	Stop
2014-08-01 00:10:00	Myotis	100	1.8	Stop
2014-08-01 00:15:00	Myotis	100	2.1	Stop
2014-08-01 00:20:00	Myotis	100	2.4	Stop
2014-08-01 00:25:00	Myotis	100	2.7	Stop
2014-08-01 00:30:00	Myotis	100	3.0	Stop
2014-08-01 00:35:00	Myotis	100	3.3	Stop
2014-08-01 00:40:00	Myotis	100	3.6	Stop
2014-08-01 00:45:00	Myotis	100	3.9	Stop
2014-08-01 00:50:00	Myotis	100	4.2	Stop
2014-08-01 00:55:00	Myotis	100	4.5	Stop

