

# Bird Monitoring & Reduction of Collision Risk with Wind Turbines

**DTBIRD® SYSTEM**

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**dtbird®**

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**DTBird<sup>®</sup>** is an automatic system that monitors bird activity in real-time, and detects any bird flying during the day or night all year round.

**DTBird<sup>®</sup>** System can be installed in Wind Turbines (WTGs), Meteorological Towers and other facilities on & offshore.

In operating Wind Farms, **DTBird<sup>®</sup>** System includes specific modules that take automatic actions to reduce the collision risk of birds with the WTGs: **DTBird<sup>®</sup>** Collision Avoidance Module and **DTBird<sup>®</sup>** Stop Control Module. In addition, **DTBird<sup>®</sup>** Collision Control registers bird collisions.

**DTBird<sup>®</sup>** **efficiency** in detectability and collision risk reduction has been tested by independent environmental consultancies, research institutions and bird protection organizations.

**DTBird<sup>®</sup>** features and operational specifications are available to the public in the download section of **DTBird<sup>®</sup>** website.



DTBird® has 4 modules available:



## Detection

Automatic and real-time detection of flying birds by AI during the day or night.



## Collision Control

Video and audio recording of high collision risk flights, including bird collisions (with the blades, tower and nacelle) and injured birds that fly away.



## Collision Avoidance

Emission of Discouraging Sounds adjusted to bird collision risk and legal requirements.



## Stop Control

Automatic triggering of signals to stop and restart the WTG based on real-time collision risk.

Videos of every bird flight, environmental data, WTG operational parameters and DTBird® actions are recorded and uploaded daily to an online Data Analysis Platform (NEST), available through the Internet. It also provides automatic statistics that summarize service profiles, bird flights, DTBird® actions, and bird collisions detected.

DTBird® Systems are customized for every wind farm depending on WTG characteristics, target species, local weather and collision risk mitigation actions selected. New models offered are: F4, F6, F8, A4, A6, A8, A10, A12 and Autonomous PTZ.



Check the Catalogue!





# Detection Module

## Features

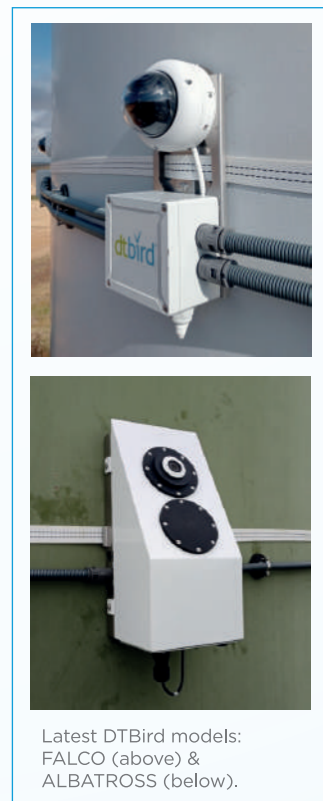
- ❖ **Installation sites:** WTGs (with steel and/or concrete tower), meteorological towers and other facilities (on & offshore).
- ❖ **Detection sensors:** Daylight and Thermal cameras.
- ❖ **Surveillance area:** Up to 360° horizontal and 90° vertical.
- ❖ **Detection distance:**

BIRD SPECIES (WINGSPAN)	AVG. MAX DETECTION DISTANCE		
	MODELS F4-A4	MODELS F8-A8	AUTONOMOUS PTZ 15° Lens angle
Golden Eagle (2 m)	400 m	1.400 m	3,5 km
Northern Gannet (1,7m)	350 m	1.200 m	3 km
Red Kite (1,5 m)	300 m	1.000 m	2,6 km
Atlantic Puffin (0,5 m)	100 m	350 m	800 m

- ❖ **Daily service period:** Continuous monitoring during the day and/or night.
- ❖ **Bird Detectability:** > 76 %.\*
- ❖ **Detection within blades.**

### Observations:

\* Sensitivity 76% - Annual average value, which can vary by up to ±10% depending on configuration settings, filters and software improvements.





# Collision Avoidance Module

## Features

- ✦ **Installation sites:** WTGs (with steel and/or concrete tower).
- ✦ **Dissuasion units:** 4 to 10 speakers per WTG installed at several heights, covering the whole Rotor Swept Area.
- ✦ **Sound features:**
  - Discouraging sounds to birds flights in High Collision Risk/Rotor Swept Area.
  - Trigger in real time: milliseconds after detection of flight collision risk.
  - Power adjusted to legal requirements and bird sensitivity.
  - Sound emission covering the whole Rotor Swept Area.
- ✦ **Collision risk reduction:** Already reported.\*

### Observations:

\* H.T. Harvey & Consultants for the [American Wind Wildlife Institute](#) (AWWI) in 2018 reported the deterrence response rate for Golden Eagles is 52-83%, for Buteos is 36-76%, and for all Raptors is 39-78%.

[ECOCOM](#) in 2016 reported a reduction in flight time in the risk area of the rotor between 61-87%. It triggers avoidance behaviour in 88% of cases where the bird is on a collision course with the WTG.

## Recorded Data

- ✦ Discouraging Sounds time data: Init time and total length.
- ✦ Video and sound recordings of bird flights and Discouraging Sounds.



DTBird® Collision Avoidance Module Speakers installed on the WTG tower. 4 to 10 Speakers can be installed per WTG.





# Stop Control Module

## Features

- ❖ **Interface with WTG:** DTBird® system hardware and software compatible with all WTG manufacturers.
- ❖ **Automatic Stop trigger:** Linked to real-time flight detection at the collision risk distance.
- ❖ **Collision risk distance:** Configured according to WTG complete rotor Stop time and Target Species flight features in the installation site.
- ❖ Three **shutdown programs:** basic, standard, and high protection.
- ❖ **Stop duration:** Linked to real-time flight detection in collision risk.

## Recorded Data

- ❖ Stop time data: Init time, end time and total time transpired.
- ❖ Video recordings of bird flights and the whole Stop.



# Collision Control Module

## Features

- ❖ **Installation sites:** WTGs towers and/or offshore Transition Pieces.
- ❖ **Detection sensors:** Daylight and Thermal cameras.
- ❖ **Daily service period:** Continuous monitoring during the day and night.
- ❖ **Surveillance area:** according to DTBird model.
- ❖ **Register of potential collisions in > 96% of flights detected.**
- ❖ **DTBird models with Collision Control Module:** F4, A4, A8, A10, A12 and Thermal.
- ❖ Optional **continuous video recording**

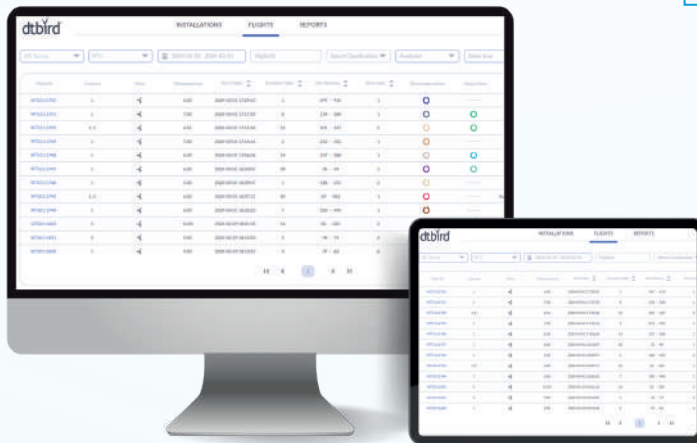
# Nest Platform

## Features

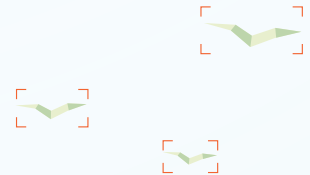
- **Online access 24/7** to videos, wind speed, WTG operational parameters and system actions.
- **Integrated video zoom**
- **Downloadable Statistics** for selected time periods



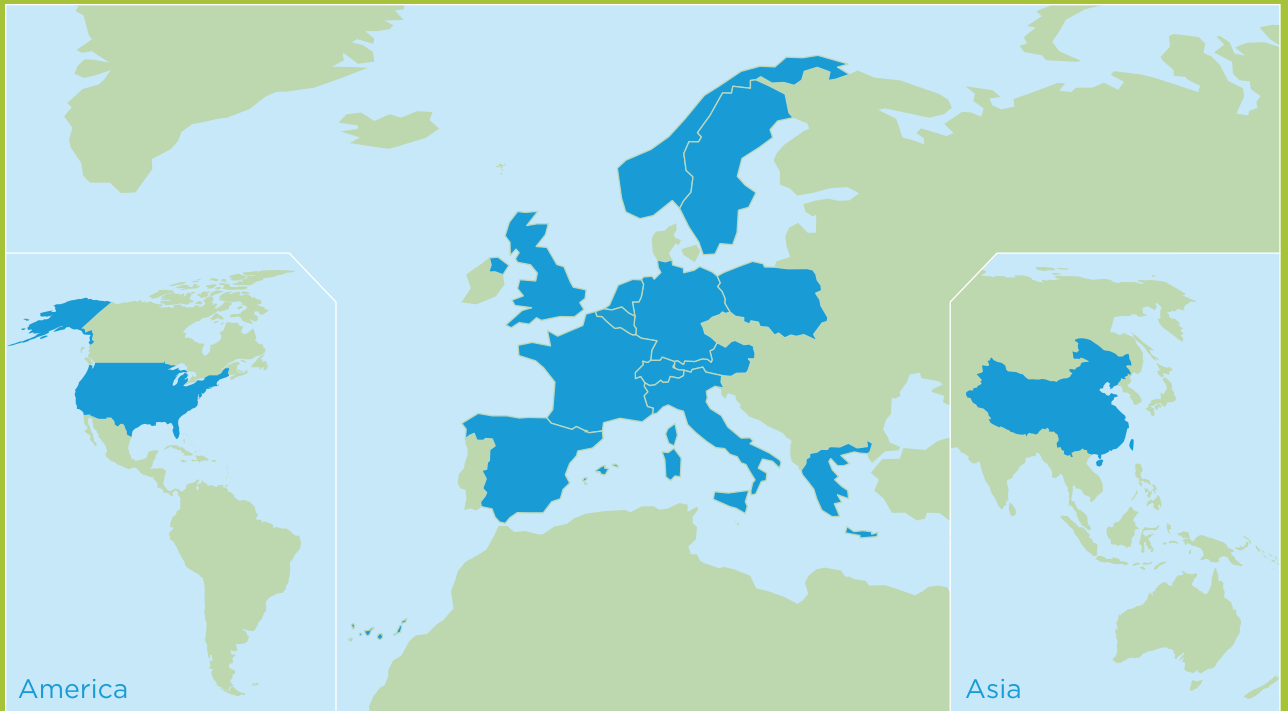
DTBird flight video record.



NEST Online Data Analysis Platform.



# DTBird® System: a Worldwide Reference for Bird Protection at Wind Farms



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

+450 DTBird® & DTBat® units have been installed at 90 existing / projected, onshore / offshore wind farms in 16 countries (Austria, Belgium, China, France, Germany, Greece, Italy, Norway, Poland, Spain, Sweden, Switzerland, Taiwan, The Netherlands, the United Kingdom and the United States).

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



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