dtbird®
BIRD DETECTION AND DISSUASION

Joining energy to save birds

PRESENTATION

August 2013

www.dtbird.com

What is dtbird® ?

- ✓ DTBird® is a self-working system developed to detect flying birds, that is able to perform real-time actions linked to bird detection.
- ✓ Bird detection is performed by means of artificial vision techniques, used in military applications.
- ✓ DTBird® is a trademark of Liquen, an independent Spanish environmental consulting firm specialized in renewable energies.

Which are the applications of dtbird® for Wind Energy projects?

- ✓ Bird Monitoring in sites proposed for Wind energy development, and in operating Wind farms.
- ✓ Bird Mortality reduction through real-time actions: Warning and dissuasion signals, and Wind turbine automatic Stop.
- ✓ Bird Collision control.
- ✓ Environmental Impact Assessment of Wind farms.
- ✓ Scientific studies of Wind energy impacts on birds.

Which are the standard sites for dtbird® installation?

- ✓ Individual Wind Turbines.
- ✓ Whole Wind farms.
- ✓ Meteorological towers on and offshore.
- ✓ Buildings (light house, etc.).

Which are dtbird® components?

- ✓ Analysis unit
- ✓ Modules:
  - ✓ Detection
  - ✓ Dissuasion
  - ✓ Stop control
  - ✓ Collision control

Where are located dtbird® components?

- ✓ The Analysis unit, inside the tower of a wind turbine or in outdoors waterproof cabinets.
- ✓ The modules, on the tower of the wind turbine or on the mast of meteorological towers.

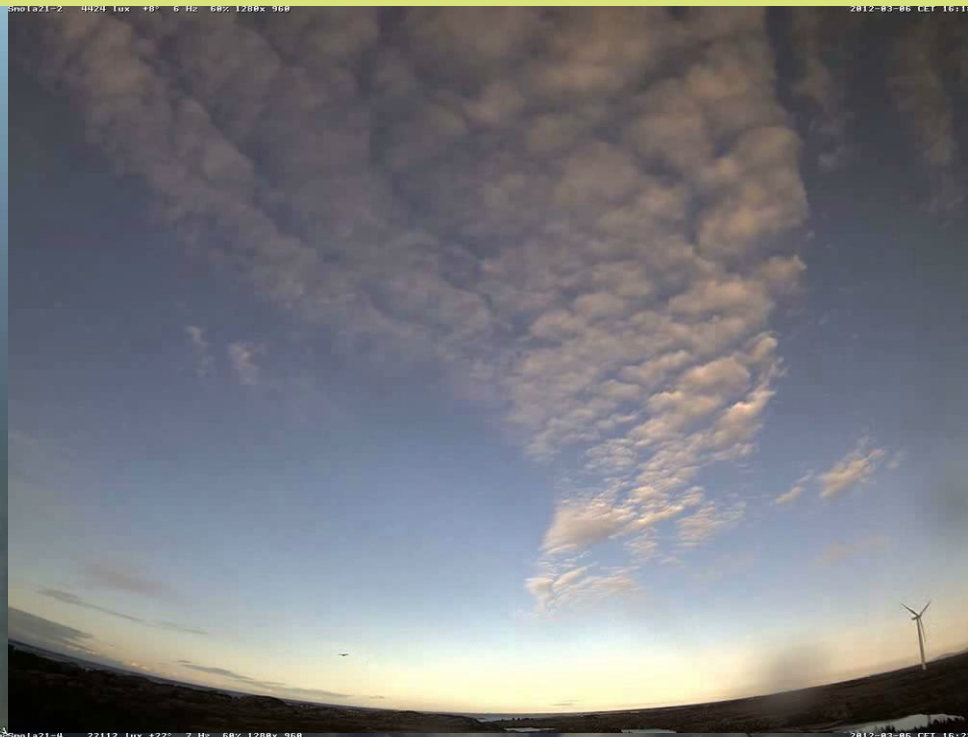
How is dtbird® controlled?

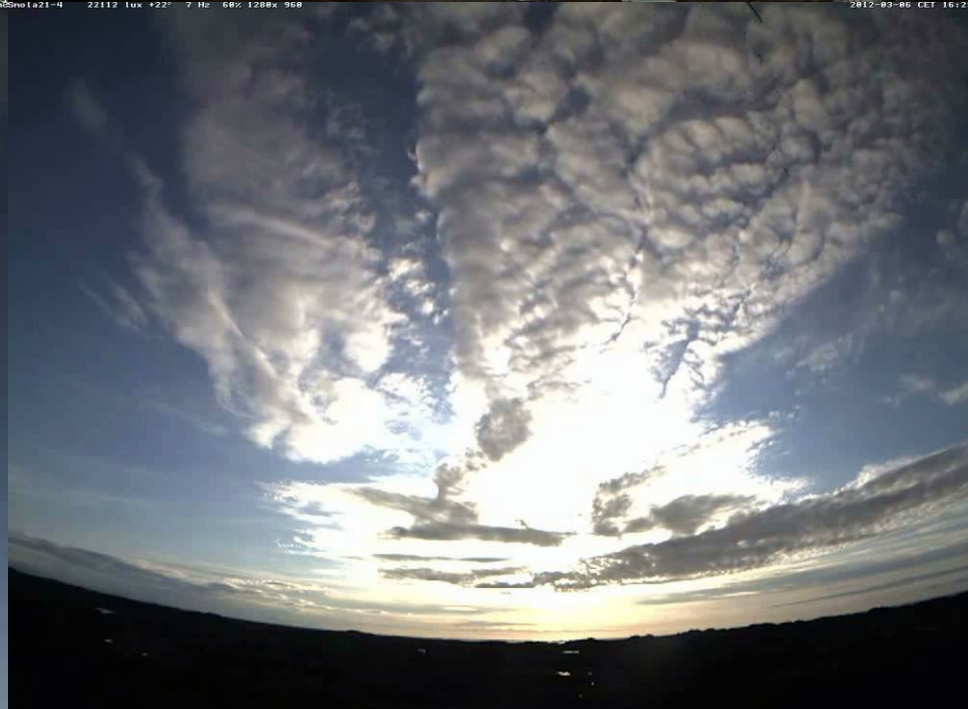
- ✓ DTBird® is an autonomous system, with continuous unattended operation.
- ✓ DTBird® is controlled trough Internet connection.

Which is the Service provided by dtbird® ?

- ✓ Daylight continuous monitoring.
- ✓ Real-time Actions, to reduce Bird mortality:
  - ✓ Warning and dissuasion signals to birds in collision risk with wind turbines.
  - ✓ Automatic Wind turbine Stop.
- ✓ *Data Analysis Platform access with database* of detected bird flights and DTBird actions, available to the user through the web.
- ✓ *Automatic Service reports*, summarizing Service profile, Bird flights, DTBird actions, and accidental Collisions detected.

How does dtbird® observe?


Snola21-2 4424 lux +8° 6 Hz 60% 1280x 960
2012-03-06 CET 16:1


Snola21-4 22112 lux +22° 7 Hz 60% 1280x 960
2012-03-06 CET 16:2

How does dtbird® operate?

DTBird® has a modular design, and every module has a specific function, that is controlled by the Analysis Unit.

- ✓ **DTBird® Detection** continuously monitors surveillance area and detects flying birds in real time.
- ✓ **DTBird® Dissuasion** emits warning and dissuasion signals to birds flying in moderate/high collision risk areas.
- ✓ **DTBird® Stop Control** sends a stop signal to the wind turbine according to collision risk of birds.
- ✓ **DTBird® Collision Control** detects and records potential collisions.

DTBird® Dissuasion and Stop Control modules have an independent configuration with an additional effect in bird mortality mitigation.

Please, see video examples in DTBird® website (select HD view):

- ✓ ***Examples of Bird Detection*.** DTBird Detection. Real-time bird monitoring in wind farms. Bird-smart wind power. Video with sound, use your headphones. **Link**.
- ✓ ***Examples of Bird Dissuasion*.** DTBird. Bird mortality mitigation in wind farms: Real-time Warning & Dissuasion. **Link**.

What is dtbird® Data Analysis Platform?

✓ It is a tool that provides objective, transparent, independent, and non-erasable data and videos for Environmental Agencies, Ornithologist and Wind Energy Developers, including:

- ✓ Access to detected bird flights, environmental variables and DTBird actions.
- ✓ *Automatic Service reports*, summarizing Service profile, bird flights, DTBird actions, and accidental Collisions detected.

dtbird® Data Analysis Platform access and update

- ✓ The access to the Platform is done through www.dtbird.com, with 2 access right levels.
  - ✓ Administrator. Total access, data editing, export data and videos and allows to request automatic reports.
  - ✓ Reader. Export data and videos and allows to request automatic reports.
- ✓ Daily automatic download of videos and data.

dtbird® HIGHLIGHTS

Detection module

- ✓ DTBird® detectability tested by NINA: 86 – 96 % of all birds in a radius of 150 m to the wind turbine and 76 – 92 % in a radius of 300 m. Dec 2012. **Link**. Not affected by topography.
- ✓ DTBird® Offshore, one of the two "most complete systems by not only detecting actual collisions but also providing visual data for potential collision events". Bureau Waardenburg - The Netherlands). Feb 2012. **Link**.
- ✓ Operation from sunrise to sunset (over 200 Lux), even in extreme environmental conditions.
- ✓ Detection of any kind of bird: from small passerines to large raptors.
- ✓ Identification of species/groups from video recordings.
- ✓ Detection distance: from a few meters to 1,5 km, according to configuration parameters.
- ✓ Record of environmental variables and wind turbine operation parameters.
- ✓ Easy installation and maintenance in Wind turbines and meteorological towers (on and offshore).
- ✓ Low power consumption: from15 W/hour Onshore and 50 W/hour Offshore.

dtbird® HIGHLIGHTS

Dissuasion module

- ✓ Continuous operation.
- ✓ Real-time warning and dissuasion of birds flying in collision risk areas.
- ✓ Warning and dissuasion signals adjusted to bird sensibility and legal requirements.
- ✓ Video and data recording of every dissuasion.
- ✓ Identification of species and bird behavior analysis from video recordings.
- ✓ Reduction of number and length of Wind turbine stops.
- ✓ Easy installation and maintenance in the Wind turbine.
- ✓ Selective installation in Wind turbines with higher collision risk.

dtbird® HIGHLIGHTS

Stop Control module

- ✓ Wind turbine stop linked to real time detection of birds flying into moderate and high collision risk areas.
- ✓ Adjustment to target species and legal requirements.
- ✓ Adjustment to minimize losses in energy production, with automatic restart of the wind turbine when the collision risk disappears.
- ✓ Video and data record of every Stop, for Identification of species and bird behavior analysis.
- ✓ Selective installation in Wind turbines with higher collision risk.

dtbird® HIGHLIGHTS

Collision Control module

- ✓ DTBird® Offshore, one of the two "most complete systems by not only detecting actual collisions but also providing visual data for potential collision events". Bureau Waardenburg - The Netherlands). Feb 2012. **Link**.
- ✓ Continuous operation from sunrise to sunset (over 200 Lux), even in extreme environmental conditions.
- ✓ Monitoring of rotor swept area, and collision risk areas: 360º wind turbine.
- ✓ Video and data record of every bird flight in the rotor swept area, for species identification, and bird behavior analysis.
- ✓ Register of potential collisions in 95% of flights detected.
- ✓ Automatic identification of potential collisions.

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dtbird® presence in independent published Guidelines of Environmental Impact Assessment at wind farms

✓ Evaluation of DTBird® detection capabilities: 86 – 96 % of all birds in a radius of 150 m to the wind turbine and 76 – 92 % in a radius of 300 m. NINA. Dec 2012. **Link**.

✓ Good Practice Guidance and associated Toolkit. GP Wind project. June 2012. **Link**.

✓ A review of methods to monitor collisions or micro-avoidance of birds with offshore wind turbines. Bureau Waardenburg bv, commissioned by: The Crown Estate, SOSS, through the British Trust for Ornithology. February 2012-September 2011. **Link**.

✓ Guidelines of Environmental Impact Assessment of wind farms on birds and bats (Directrices para la evaluación del impacto ambiental de los parques eólicos en aves y murciélagos). SEO/Birdlife. January 2012. **Link**.

✓ Methodological Guide for environmental analysis of projects in Natura 2000 Sites (Guía metodológica para el análisis de proyectos y otras actuaciones en Natura 2000). Junta de Castilla y Leon (Spanish Regional Government). December 2011. **Link**.

dtbird® presence in the world

dtbird® is currently operating in:

- ✓ France. EDF (Government Electric firm), REpower WTG.
- ✓ Greece. RenInvest (Swiss firm), Vestas WTG.
- ✓ Italy. LeitWind (Italian Wind turbine manufacturer).
- ✓ Norway. Statkraft (Government Electric firm), Siemens WTG.
- ✓ Spain:
  - ✓ Grupo SAMCA (Spanish wind energy developer), Made/Gamesa WTG.
  - ✓ Offshore Experimental Station. Campus of International Excellence.
- ✓ Poland: Planned installation this summer.

Why dtbird® ?

- ✓ Already tested, with more than 4 years in operation at wind farms.
- ✓ Integrated solution for bird and bat monitoring and mortality reduction at wind farms.
- ✓ DTBird® recordings are objective, transparent, easy to understand for everybody (without special skills required), and non-erasable. Essential tool for Wind Energy Companies, Ornithologist and Environmental Agencies.
- ✓ Overcomes widely radar capabilities, with much higher bird detectability and unique DTBird® features (Species identification, bird collision control, real-time actions, etc.). **Link**.
- ✓ Clients repeat: 3er contract with Leitwind Group in Italy, 2º contract with Offshore Experimental Station (Campus of International Excellence) in Spain, 3 years extension contract in Norwegian installation of Statkraft .
- ✓ 2 Years warranted worldwide (on & offshore).

CONTACT

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UPDATED INFORMATION IS AVAILABLE IN THE ENGLISH VERSION OF dtbird® WEBSITE:

www.dtbird.com

We are working in the continuous improvement of dtbird® system current features and the addition of new features. Therefore, this presentation can be considered out of date in 2 months from issued (August 2013).