



TOP7[®]

MAKING DRONES SMARTER.

Autonomous drone inspection

Visual inspection and contactless lightning protection measurement for on- and offshore wind turbines



by TÜV SÜD



Patent EP 3 596 570



The Company

Business Model

Overview

- Hands-on training included
- TOPseven training and documentation manuals
- Software: TOPseven Pilot, TOPseven Navigator, TOPseven Inspector
- TOPseven Hardware (3D field sensor, signal generator)
- Only the mission results are being charged



TOPseven

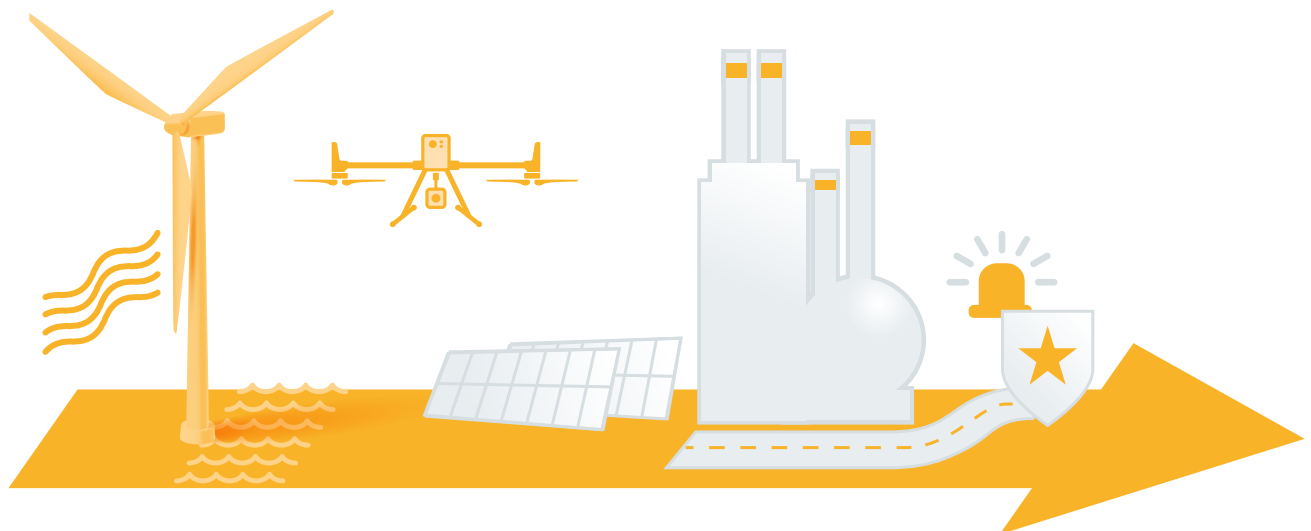
TOPseven is a software- and technology company focusing on drone technology, cloud-computing and artificial intelligence.

We offer our customers an automated, drone-based inspection of industrial facilities. The patented technology is currently primarily being used for visual inspection and contactless

lightning protection measurement of wind turbines. The established work flow is being introduced into other inspection market segments.

Technology at a glance

Software solutions for autonomous inspection with drones



Wind Onshore | Wind Offshore

PV | Industry | Infrastructure | Security | Moving plants

Key advantages

Your benefits

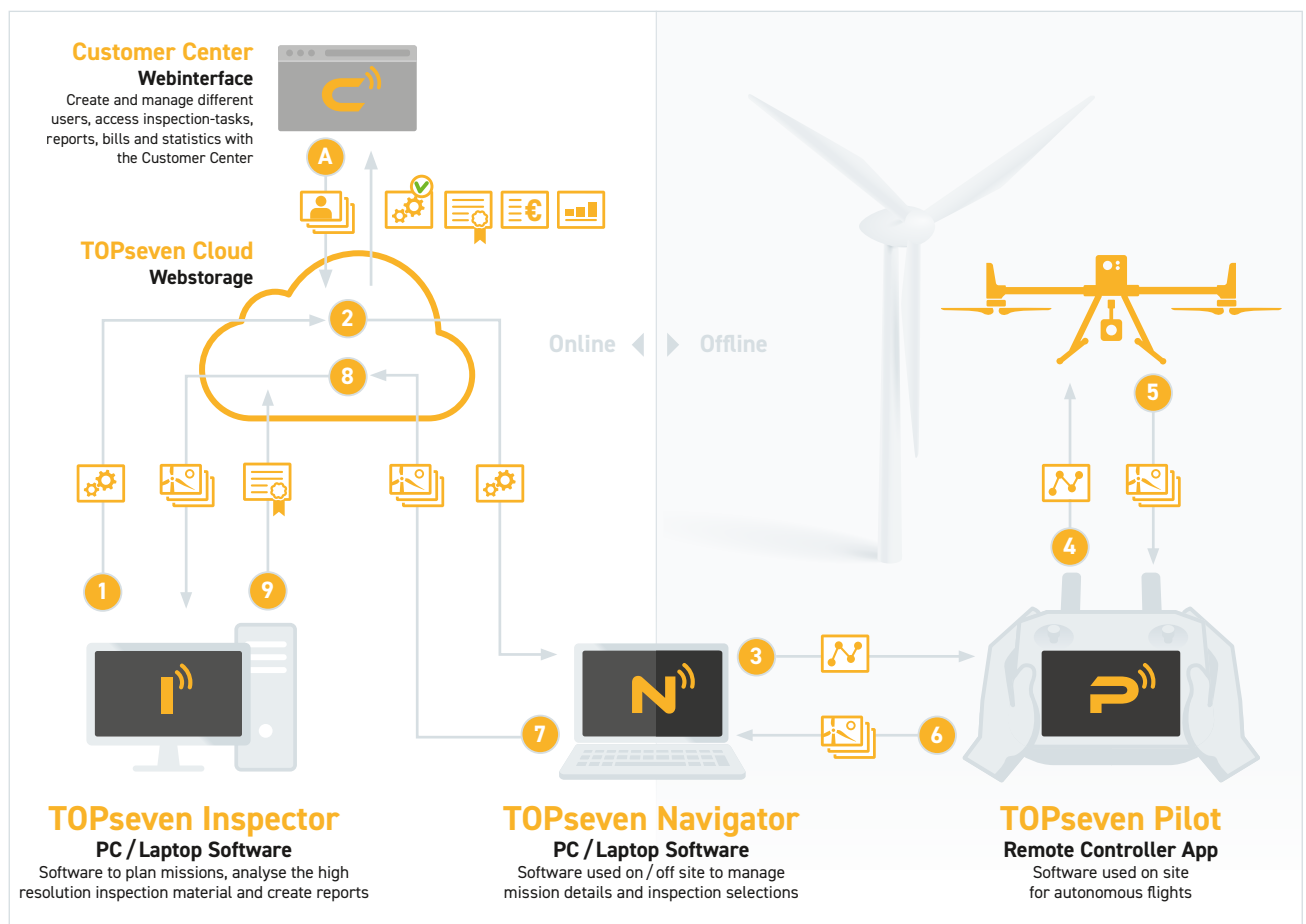
- Visual inspection of rotor blades and tower
- Contactless drone-based LPS measurement
- LPS measurement with exact localization of interruption
- No specialized pilot needed
- Measurement of partial sections possible
- On- and Offshore
- Minimim training required – enabling of your employees to operate independantly
- Low downtime and costs
- Efficient analyses with automated expert report generation
- Higher safety for all involved
- Easy, routine workflow

TOPseven ECO System

The TOPseven ECO System in a nutshell. There are three major software components: TOPseven Inspector, TOPseven Navigator and TOPseven Pilot. The TOPseven Customer Center provides a status overview of all inspection missions and costs.

With the TOPseven Inspector software you plan and initiate the inspection missions. It is also the tool to visually inspect the flown inspection images, marking possible damages and providing a semi-automatic inspection report in pdf and web versions. The TOPseven Navigator is used in the field to build in real-time the 3D model of the wind turbine for autonomous drone inspection missions.

It also allows changes to mission scheduling and selection in case of environment changes. The TOPseven Pilot is an app running on the DJI Enterprise Smart Remote Controller which communicates directly with the DJI drone providing real time safety checks, battery and current mission status. It also communicates with the TOPseven Navigator for mission image transfers to the TOPseven Cloud storage.



Operating principle

How the software interacts

- A** Create company and personal profile once
- 1** Create an inspection-task with TOPseven Inspector
- 2** Store the inspection-task in TOPseven Cloud
- 3** Calculate flight path for task with TOPseven Navigator
- 4** TOPseven drone flies missions and takes images
- 5** Transmit images to TOPseven Pilot
- 6** Transmit images to TOPseven Navigator
- 7** Transmit images to TOPseven Cloud
- 8** Store images in TOPseven Cloud
- 9** Access & inspect images, create report with TOPseven Inspector

TOPseven Hardware

The hardware consists of the TOPseven hardware (signal generator and 3D field sensor), the DJI equipment and a laptop.

What you need: a DJI M300 drone with RTK-modul, the smart remote controller, the TOPseven signal generator, the TOPseven 3D-field sensor, H20 camera, batteries and of course a

laptop with the TOPseven Navigator Software. (Note: The TOPseven hardware is included, all other hardware must be sourced separately).

Equipment

What you need



Workflow

How the inspection process works



Enabling

The initial training enables your employees to carry out an inspection by themselves. We provide documentation and training material.



Evaluation

The evaluation of your inspection is realized in the TOPseven cloud. The data is available at all times and remains your property. Easy generation of the industry standard reports of your inspection.



Execution

You determine the number of missions and the timing of inspections by yourself. The TOPseven hardware and software are provided for you.



Pricing

Simple and transparent prices: Only the actually performed missions are charged. The training, the training material as well as the TOPseven software are included.



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