# Multikopter - Solutions
## *MikroKopter*

## HiSystems.de

# Product Overview
## *Professional drones & flying robots*

## HiSystems -
*High Tech  from Lower Saxony*

**HiSystems** has been developing and distributing MultiKopter hardware and software since 2008 under the name **MikroKopter**.

Meanwhile, there are many more MultiKopter systems based on our electronics. From the north-west part of Germany we send MikroKopter components worldwide.

Another field of **HiSystems GmbH** is the development and production of electronics for industrial applications.

In 2015 and 2016 products, in which we participated with development, has been awarded with the Innovation Award and the Federal Award of craft.
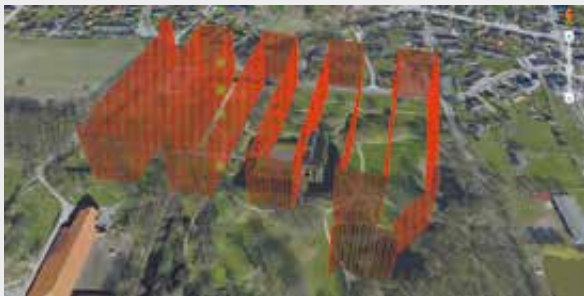
## Made in Germany

*The development, the final assembly and testing of the MikroKopter takes place in Germany. Key components of the electronics are also made in the region. When choosing the supplier of MikroKopter components we try, if possible, to rely on local companies.*

### The MikroKopter-Tool
### – a powerful tool



To create a 3D model (in this case the castle Evenburg in Leer) sufficient aerial photographs from a low height of the object or area need to be available.

In the MikroKopter-Tool the areal survey flight can be planned and simulated with specific waypoints.

Since 2008 the **MikroKopter** technology has been continuously developed. In that time we have always pushed ahead the functions of our flight systems. In this case, the performance, and especially the safety of the **MikroKopter** is in the foreground. Of course, we have set ourselves for the increasing demands by opening up various fields of activity. We have not lost our focus for higher accessibility.

Through our developed redundancy system  **MikroKopter** is the first Multicopter system at all which received the the so-called D-registration in Austria.

The fact, that the safety has supreme priority for our customers shows also that we hold tight on our Okto principle. 8 motors offer even more safety and performance as 6 or 4.

## *The most important features and functions:*

**GPS-flight assistant / Autopilot**
With this feature the drone is maintaining the course and position. Position Hold / Coming Home and Waypoints control the Kopter reliably through the air.

**Failsafe**
During a reception failure the drone flies back autonomously and lands at the nstarting point. If an undervoltage occures the pilot will be warned via a voice output and a display.

**Autostart + Auto-landing**
Via a switch the drone starts automatically and hovers in approx. 2m in front of you. With the same switch the Kopter goes into a gentle landing.

**Logbook / Flight recorder**
The data of the flight will be saved on a SD-card. Logged will be GPS position, height, speed, voltage, switch position, flight attitude and much more.

**Camera integration**
Flexibly configurable control of various cameras and camcorder.

**Auto-ComingHome**
If the battery voltage reaches a critical value the MikroKopter flies back automatically to the starting point and goes independently into a descent flight.

**Redundancy**
Increased safety throughout doubly existing flight electronic. The failure of a component or a motor can be compensated.

**Telemetry and Voice Assistance**
Via a button the voltage, height, distance etc. can be announced. Own menu operation in the transmitter – i.e. Storing and retrieving waypoints.

# The 6sTHERMO-II
## The complete solution for survey systems and geodesy



The **thermography** (visualization of infrared radiation) has become an important part of our life in the recent years. That can be found in industrial applications, research and technology, nature and animal observation or agriculture.

The **6sTHERMO-II** drone allows inspections of solar- and wind-power plants, high-voltage power lines and pipelines as well as the search for humans and other creatures.
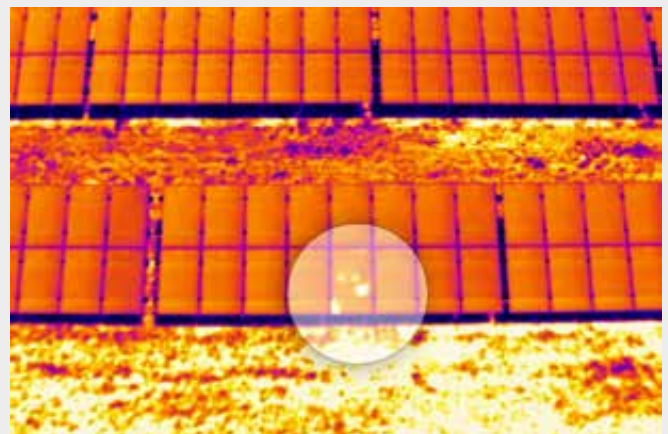
**Camera: Flir TAU2 IR**



### Application: Inspection of photovoltaic systems

In this example the drone is flying over the photovoltaic systems so that damages and inefficiency can be found from the air and via a live video transmission.



The drone is flying to the target area. The pilot can switch between live- and thermo image.



Via thermo images defects can be detected easily. In this example a defect in a solar panel can be seen.

## Application: Inspection of wind-power plants

With the KopterTool an inspection route around a wind-power plant can be planned. Later on the drone flies automatically the planned waypoints.
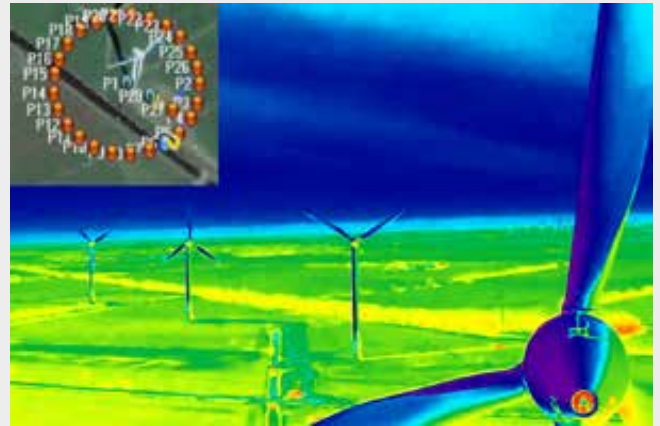




## Application: Search and Rescue

In this example the Kopter is used for fawn search. Every year many fawns die while mowing the fields, because they do not escape from the machines.



With the ground station waypoints will be transfered via a wireless interface to the drone.



According to the waypoints and equipped with a thermal imaging camera the drone flies along the field.
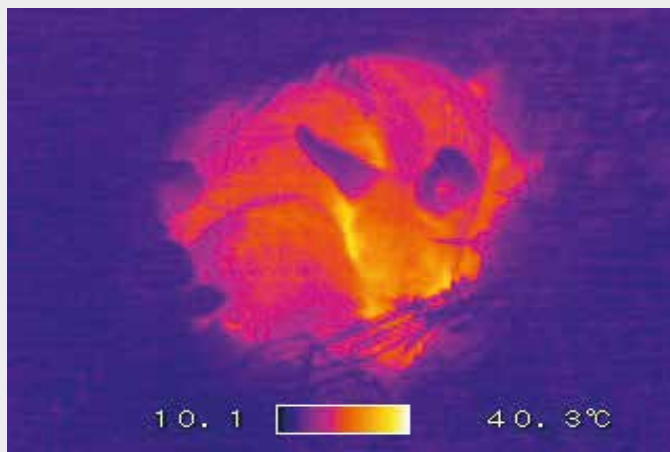


If a heat source is found the pilot can save the position of the MikroKopter or can stop GPS controlled at that spot.



The fawn will be found and brought to safety.

# The 6sGEO-II
## The complete solution for survey systems and geodesy



Achieving the necessary amount of points with conventional methods of geodesy and object surveying is only possible with enormous efforts of personell expenses and cost. Furthermore there are also risks to personnel and material.

Our **6sGEO-II** takes the relevant data from the air, which makes it possible to effortlessly survey even hard to reach objects. Our solution guarantees an extremely high ground resolution in the range of just **few millimeters per pixel.**

**Camera: Canon EOS 100D**



### Application: Calculating Volume

In the following example, the volume of two sandhills should be calculated. By analyzing the image- and flight data of the drone and the camera an appropriate software package makes that possible without any problems.



The volume of the two sandhills should be calculated.



The created Point Clouds with the 6sGEO-II and an appropriate software reveals the volume of the needed area.

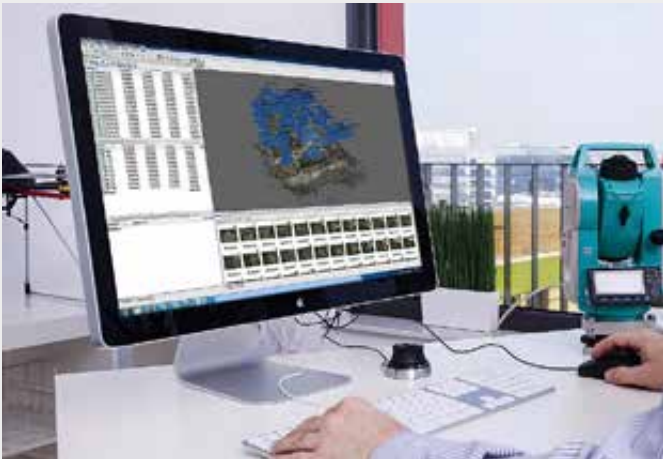## Application: From the real ruins to the 3D model

On the occasion of refurbishment measures of castle ruins an extensive documentation was created which shows the condition before and after partial reconstruction.



An ancient ruined castle should be surveyed.



The drone flies the route, planned with the MikroKopter Tool.



Later on the aerial images and the flight data will be processed to a Point Cloud.



The final result: an extreme accurate 3D model of the ruined castle.

## Application: Derivation / Highlighting areas of water

By highlighting water areas those can be accurately determined and measured.

# The 6sAGRAR-II
## *Precision Farming*



As a part of the continuous reforming of the agricultural work, terms such as **Precision Farming** and **Farming 4.0** are getting more and more important. The analysis of cultivated fields are nowadays done with computerized systems by the farmer. The analysis of fields from the air with multispectral cameras is becoming increasingly important.

In this way it is i.e. possible to detect a plant infestation very early. For this the **Near Infrared Range (NIR)** measures the reflectivity of the green light spectrum. With a special software everybody can analyze the condition of their plants.

**Camera: MicaSense RedEdge**



**Application: Pest analysis of a forest from the air**

After the **MikroKopter** has flown a forest area with appropriate planned waypoints, the images will be evaluated by a specific software package. The data obtained show very quickly, which plants are infested with a pest.
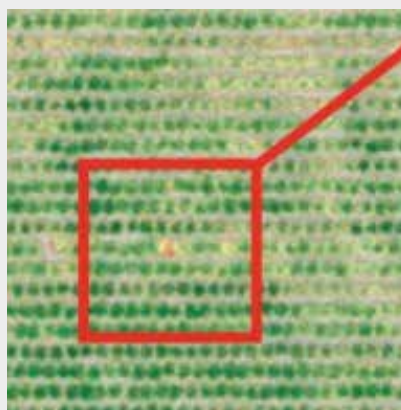
# Accessories

### Transport box

Robust, compact and easy to handle: The clever case design of the 6s Series offers comfort and shapeliness with a maximum of safety.

**Dimensions:** 70 x 60 x 75 cm
**Weight incl. drone:** ca. 31 kg

### Video transmission HD / SD

### Wether analog or digital:

Our video system transmitts the video signal of the Kopter reliably over long distances and in a very sharp quality.

### The ground station

The ground station with telemetry and voice output is the connecting link between copter and the pilot. The drone, camera and various functions are controlled via the ground station.

### Charging station

This space-saving charging station of the latest generation, 2 flight batteries can be charged simultaneously.

# Traffic research
## *Automatic evaluation of overtaking*

**Powered by HiSystems:**
On behalf of the Federal Highway Research Institute, the **Fraunhofer Institute**, in cooperation with Company **Airclip** developed a flight robot which can analyze permanently overtakings. On this occasion it came to an daily airtime of **about 9 hours.**
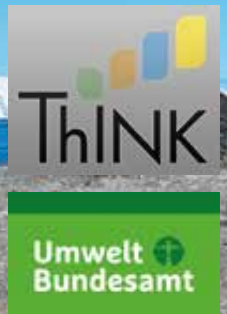
**bast**
Bundesanstalt für Straßenwesen

# Antarctic
## *Reliability in harsh areas*

The Thuringian Institute for Sustainability and Climate Protection examines on the 15.000 kilometer far away King George Island research on changes in penguin-populations, commissioned by the Federal Environment Agency.

**ThINK**

**Umwelt Bundesamt**

# Animal research
## *Whale research in the Pacific*

A drone, equipped with **MikroKopter** Technology, is for the **NOAA** (Weather- and Oceanography Agency of the USA) in collaboration with the **Vancouver Aquarium** in use for the research of whales.

vancouver aquarium

NOAA

# Chilean Plateau
*Reliability even in extreme heights*

The Chilean filmmakers Company Octocam is working successfully for years with drones based on **MikroKopter** technology. Even under the most adverse conditions they succeed breathtaking filmings in the rough areas of the Chilean Plateau.

OCTOCAM
*Un punto de vista diferente*

# Search & Rescue
*Life rescue from the air*

Through image transfer in real time and high-resolution cameras with zoom functions **MikroKopter** will be used in finding missing people.

# Wild life
*Wildlife photography in Africa*

With the **MikroKopter** shootings from a low altitude is possible without scaring the animals. The wildlife photographer *Benny Rebel* demonstrates this very impressive during a shooting in Africa.

# Multikopter - Solutions

## *MikroKopter*



# Camera integration

Depending on the payload and the used **Mikrokopter**, different photo-, video- or thermal imaging cameras etc. can be carried. For this we offer, depending on the camera, different camera mounts.