**4D IT**
Consulting
Service
Software Development



## Enhance your UAV for survey-grade mapping

The **4DU-Scanner** combines the advantages of UAV-based mapping and airborne laser scanning. The system integrates two Velodyne LiDAR Puck LITE™ scanner and a camera system for texture mapping. The system is ready for various topography related applications such as terrain modeling, vegetation mapping, geological mapping, documentation of pit-mining activities, or land slide monitoring, and for high-quality 3D documentation of building facilities, industrial sites, or archaeology.

Ask for a quote for the unique **4DU-Scanner** or for services provided by 4D-IT GmbH.

## Measurement principle

LiDAR mapping is based on the measurent of individual points of the area of interest. Implementing the dual return measurement principle, the LiDAR sensor enables the separation of vegetation points and terrain. The camera system allows for texture mapping, and georeferencing is realized using a survey-grade GNSS/IMU sensor. An accuracy of 4 cm may be achieved by means of direct georeferencing, using L1/L2/dGPS-based post-processing.
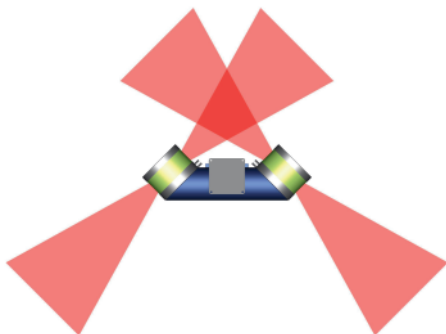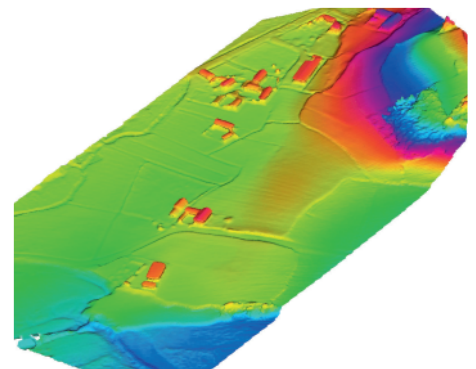




## Complete coverage

The arrangement of the two LiDAR systems allows for a complete horizontal coverage with a homogeneous point distribution of the area of interest for every single flight-path. Vertical structures are measured at different incidence angles to capture complex details. The integration of the camera system allows for mapping texture to the 3D-point-cloud for photo-realistic visualization, enhancing the applicability of the derived products.

## 1-Click application

The **4DU-Scanner** is an autonomous sensor system. It may be mounted at any UAV suitable for payloads of minimum 2.6 kg. The concept is "Start - Fly - Stop". By using the UAV's autopilot to follow a predefined flight-path, topographic mapping is as easy it can be. Colored 3D-point-clouds are generated using the **4DU-ScanManager** and can easily be processed using standard software for topographic data processing, analysis and visualization.



**Start**
**Stop**
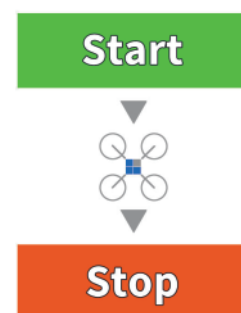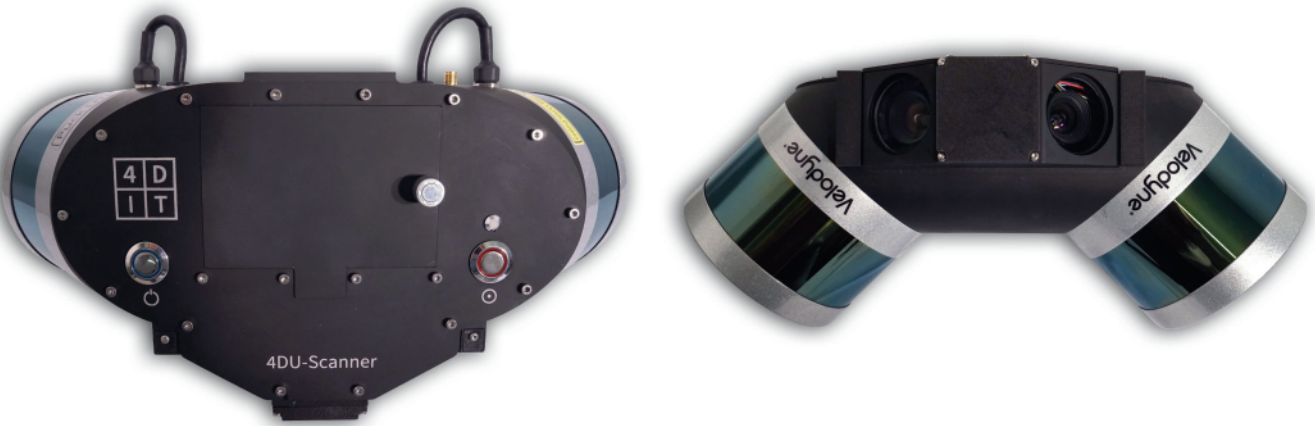
## System specification

| | |
|---|---|
| Size[1] | 34 x 12.5 x 14.1 cm (width x length x height) |
| Weight | 2.6 kg (incl. battery and data storage device) |
| Mounting | 4DU-Scanner mount for 15 cm railing systems |
| | GNSS antenna (top of UAV) |
| Flight time | approx. 40 min autonomously |

## Sensor system

| | |
|---|---|
| LiDAR system | 2 x Velodyne LiDAR Puck LITE™ |
| Sampling rate | up to 1.200.000 points per second |
| Ground sampling resolution (mean) | ~5 cm @ 50 m flight-height above ground & 5 m / sec. flight-speed |
| Precision[1] | ± 3 cm |
| Max. measurement distance[1] | 100 m |
| Field-of-view | horizontal: 360° \| vertical: 360° (except area shadowed by UAV) |
| Camera system | point-cloud texture mapping |
| Direct georeferencing | Applanix APX-15 UAV GNSS/IMU (100 Hz position, roll, pitch, heading output) |
| Positioning accuracy[2] | ± 4 cm |

[1] dependent on surface structure and reflectivity | [2] dependent on GNSS configuration

## Add-ons

| | |
|---|---|
| Training | system integration, mission planning, data processing |
| Extended maintenance | hard- and software |
| Multirotor UAV | 4DU-CamCopter, DJI Matrice 600 pro |
| GNSS reference station | L1/L2/RTK GNSS Base / Rover |
| Data processing software | on request |

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