

# Solution Report



Hesotech



## DocuCam Landslide



## Optical Landslide Monitoring

24.06.2016/nk

## Preliminary remarks

DocuCam Landslide is a patented process of the German company Hesotech, a software service provider for operation and documentation. Customers of Hesotech are world leading in industry (VW, Audi, Mercedes, ThyssenKrupp, Schaeffler), Aerospace (Lufthansa, MT Aerospace), food (Coca Cola, Gerolsteiner), research (Max Planck Institutes, FZ Jülich, universities) and utilities.

The DocuCam Landslide system is a service to monitor hillsides with one or more cameras via optical gigapixel monitoring. Time lapse movies in various zoom levels are documented and stored in the cloud in almost real time. Any desired data, such as weather or operating information can be linked. Evaluation of the data takes place at any time using a web browser.

**With this technology, hillsides can be monitored with an accuracy not possible before at relatively low cost.** From a distance of 500m images can be archived with a resolution of 1cm and compared over any period of time. Digital image processing and facilitates the identification of relevant motion in the monitored area.

The necessary hardware, the camera, the battery module and control PC as well as the licenses for the use of the software will be paid at a monthly rate. The engineering for the development of customized solutions is calculated once at the start of a project.

## Process

The Software is based on

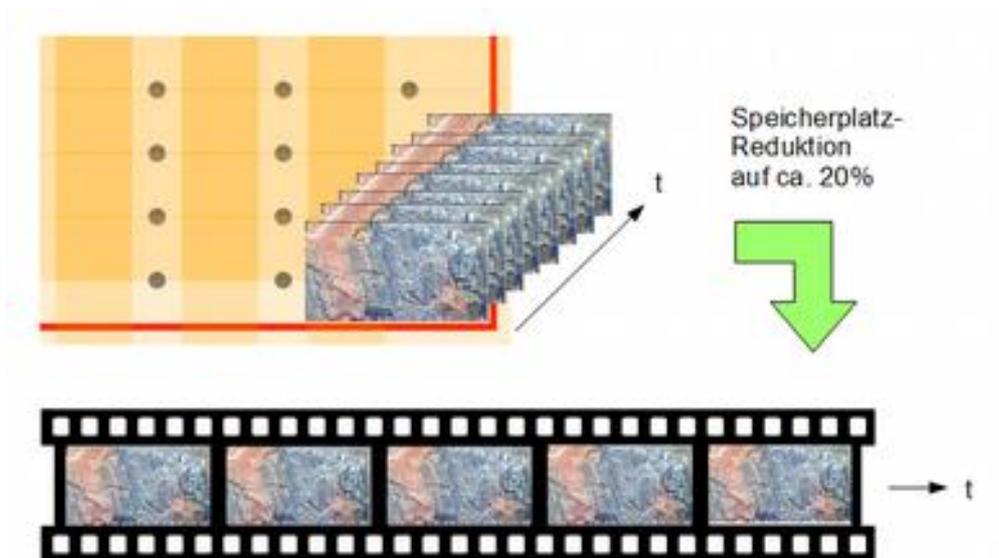
- Hesotech's iMaster Toolkit for collection, storage, administration and visualisation of measurements, as
- Hesotech's **patented DocuCam-Process** for landslide monitoring with GigaPixel resolution. At a distance of 500 m, a pixel corresponds to about one centimeter.

The patented method for slope monitoring scans the region of interest on the hillside (scene) with a pan-tilt-zoom camera systematically in relation relative space and time with different zoom levels. Two hours is typically periodicity in time. The overall picture is called a mosaic, which is depending on the zoom level from different numbers of frames, called tiles. Each frame has a HD resolution of 1920x1080 pixels. The images of one zoom level are the tiles of this mosaic.

### Scan einer Szene: 4 Ebenen, 85 Einzelbilder



The coordinates of a tile are consisting of the three numbers: level, column, row. A sequence of consecutive tiles with identical coordinates (identical region of scene) is called a tilesequence.



Using tilesequences, landslides can be monitored over a long period of time:



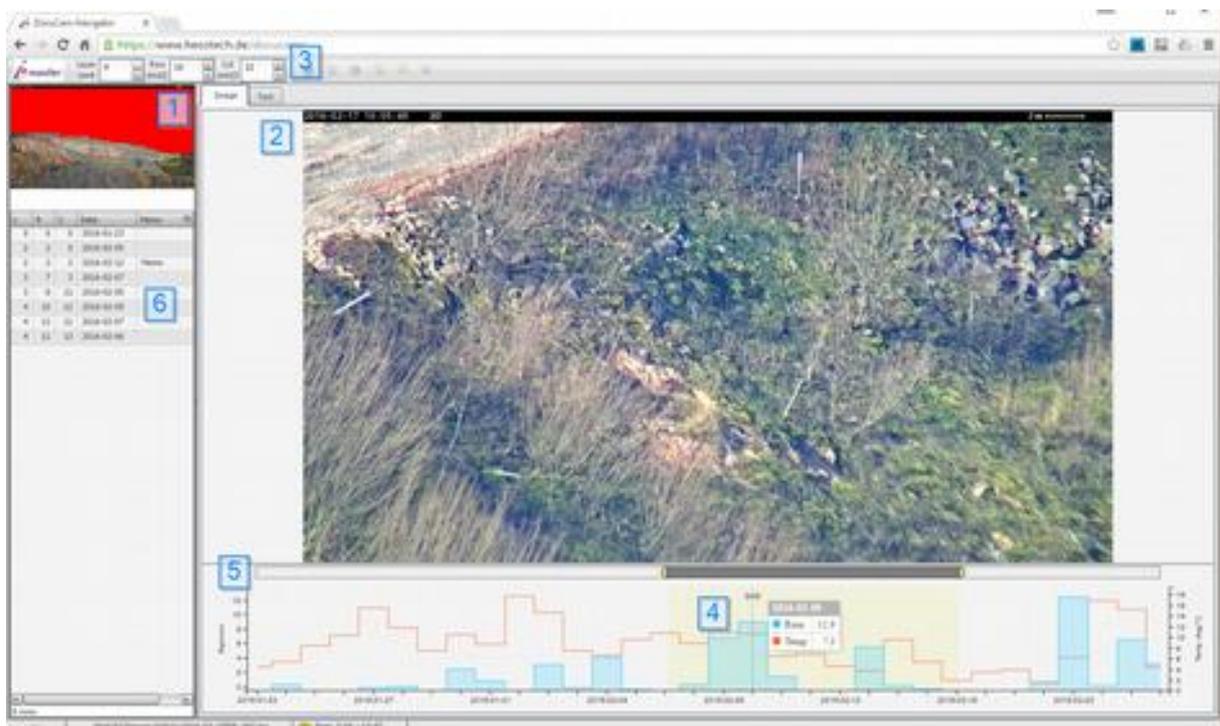
This image is animated and can be view on:

<http://www.hesotech.de/docucam/docu/Kachelsequenz.gif>

## Graphical User Interface

Operation, viewing of images and creation of tilesequences is done via internet and browser. So, installation of software is not required. Access is secured by authentication via user name and a password.

The following screenshots is made from our demo system  
<http://www.hesotech.de/docucam/>, online available for test.



Graphical user interface; browser Firefox, full screen (F11)

1. Overview of region of interest.
2. Detail image = tile
3. Coordinates of tile
4. Additional related data (rain, temperature)
5. Time scale
6. Tilesequences for documentation

After selecting the coordinates, two points in time can be selected via two handles of the timescale. Using the mouse wheel, switches between the two tiles. After double-clicking in the detail screen, the images can be placed exactly above one another with the cursor keys, so optimizing visually detection of landslides.

We would be happy to advise you personally, concerning the use of iMaster DocuCam Landslide.

Please call us or send us an email to make an appointment.

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