

Weekly Automatic Data Report

DEMO Project

Monitoring Project Bridge Diepoldsau

Phase 1

Geotechnical sensors and GNSS sensors

Prepared for:

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- when it has to be **right**

Leica
Geosystems

This automatic report provides an overview of the Leica Monitoring Testfield – Bridge Diepoldsau.

This report covers the data from 14/02/11 14:00 to 21/02/11 14:00



Monitoring object "Bridge Diepoldsau" in numbers

Length: 250 m

Width: 14.5 m

Main wingspan: 97 m

Number of main pylons: 2 H-Pylons

Height of main pylons: 32 m

Number of deck pillars: 6

The Bridge is located in east Switzerland between the towns Widnau on the west side of the river and Diepoldsau on the east side of the river. The cable-stayed bridge spans the Rhein River.

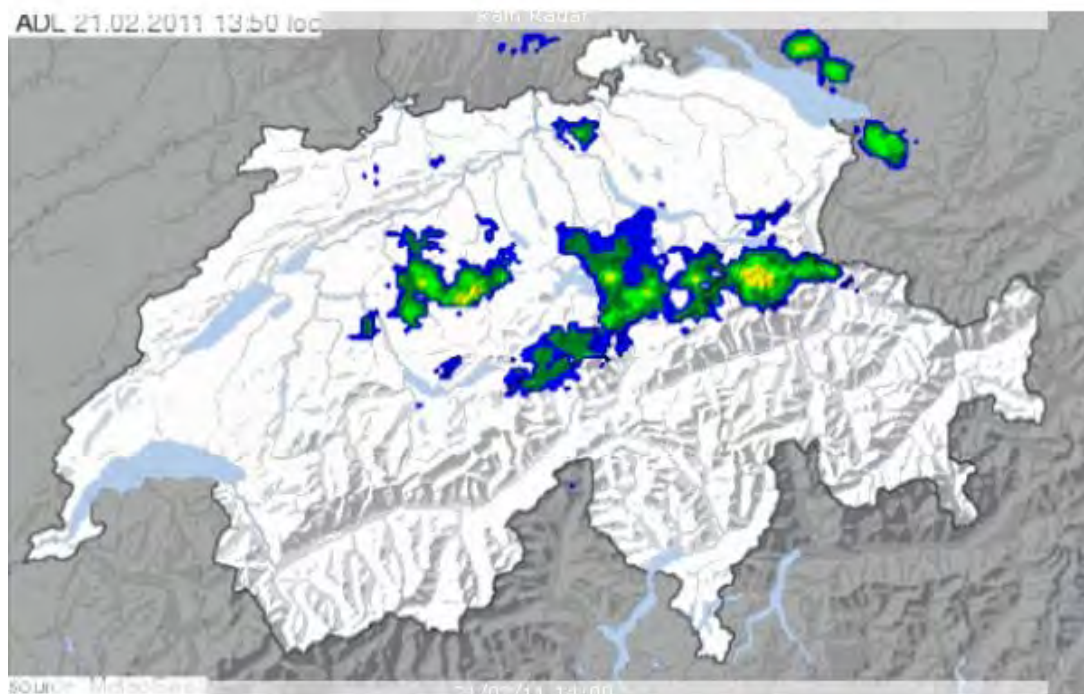


The webcam image below documents the weather conditions at the monitoring area.



This image was taken from a Mobotix webcam, at the creation time of the report. The webcam is located in the middle of the bridge deck and shows the view to the south. In addition, every 24 hours a new picture is taken and stored in the database for future reference and documentation.

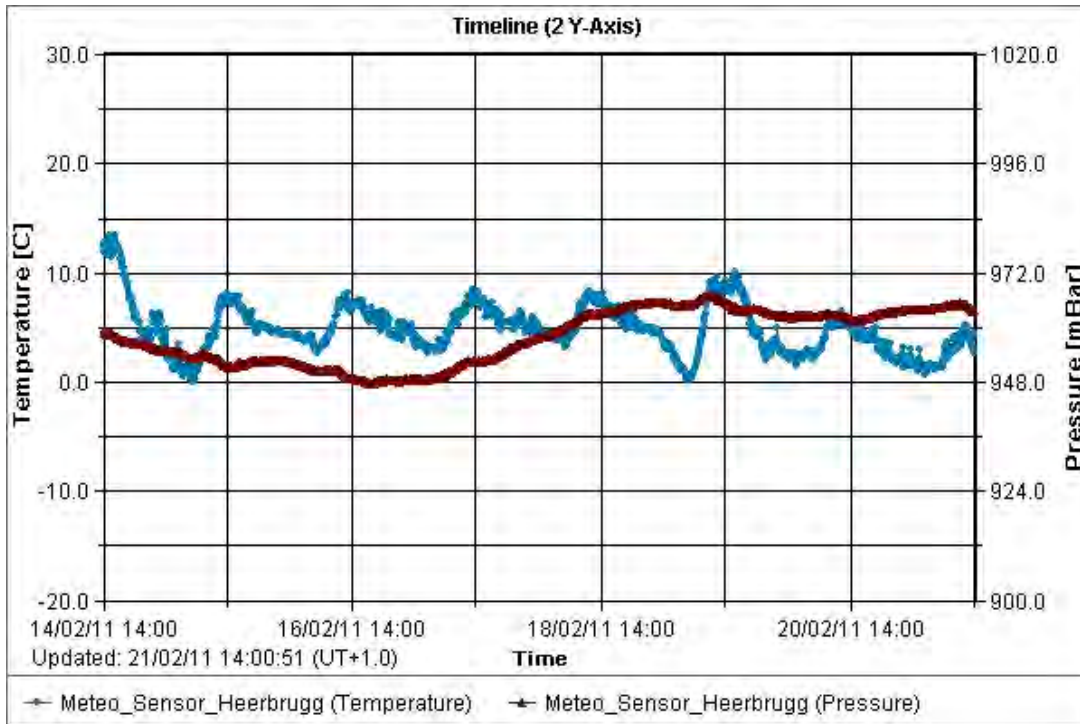
The rain radar image below documents the precipitation over the entire area of Switzerland.



This image is taken from www.meteoschweiz.ch, at the creation time of the report. Three radar stations measure rain, hail and snow with a resolution of 1 km³. The results are combined and displayed on the image as the total amount of precipitation.

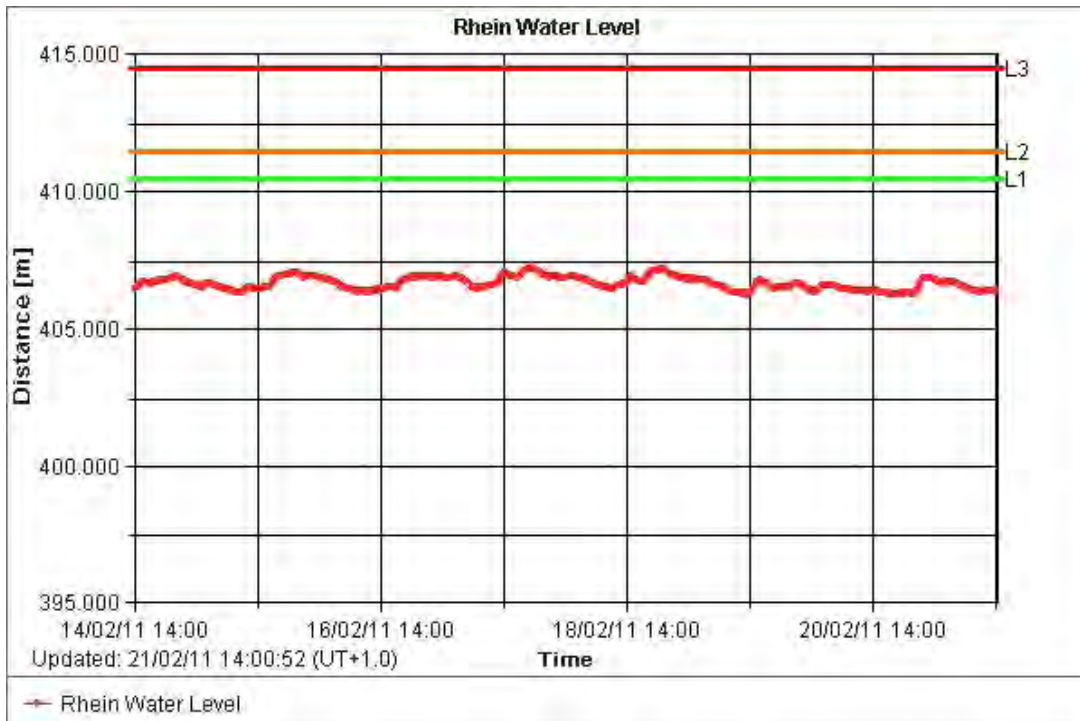
The image is accessed from GeoMoS Web, live via its unique URL. On this image the Bridge Diepoldsau is located in the east part of Switzerland, south of Lake Constance. The precipitation directly affects the water level of the Rhein River.

The timeline graph below documents the temperature and pressure at the Leica Geosystems weather station in Heerbrugg. The station is located approx. 2 km from the Bridge Diepoldsau.



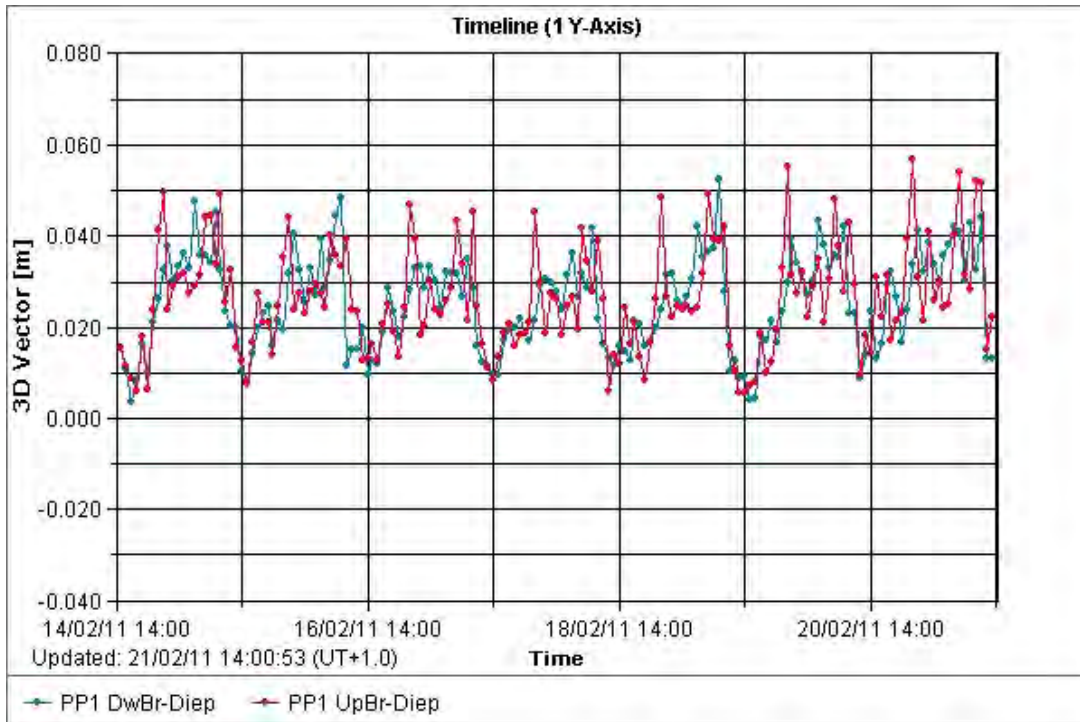
This data is measured with a WuT Meteo Station. The station is located on the roof of Leica Geosystems, in the shade on the north side of the building. The temperature is displayed in °C, the pressure in mBar at the station height (QFE).

The timeline graph below documents the absolute height above sea level of the Rhein River below the bridge deck.



This data is measured with the geotechnical sensor SmartScan 25. The sensor is located in the middle of the bridge deck and is connected to a Campbell datalogger that pre-stores the data before it is retrieved from GeoMoS and pushed to GeoMoS Web. The lines marked with L1, L2 and L3 show the three levels of the supporting dams. When level L1 is reached the communities beside the Rhein River go on alert. Level L2 and L3 are the water levels when the first and second dam are flooded. The short term changes in the water level are caused by river power stations (e.g. Bonaduz) located upstream.

The timeline graph below documents the 3D movements with 1 hour post processing products of the two GNSS points that are measured in real time.



The Point ID UpBr-Diep is located on the south side of the bridge deck and Point ID DwBr-Diep is located on the north side.



Both GNSS points are equipped with AR10 antennas and GMX902 receivers. The current data rate is 1Hz and can be increased to 20Hz.

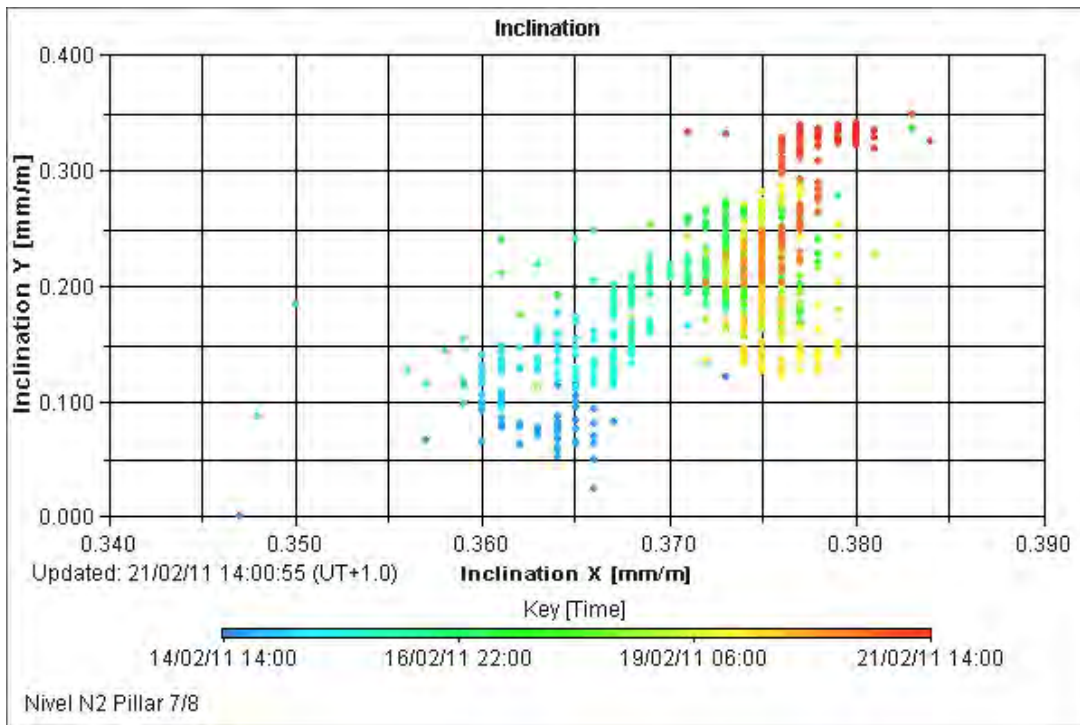
The circular level graph below documents the latest inclination of the four Nivel220 sensors.



The data is measured with Nivel220 sensors that are installed at the top of the pillars below the bridge deck. The resolution of the Leica Geosystems Nivel220 is 0.001 mrad. All Nivel220 are installed with the same orientation in the shade. Inclination Y is measured in the length direction of the bridge and inclination X is measured transverse to the roadway. In the circular level graph above this orientation corresponds with the image.

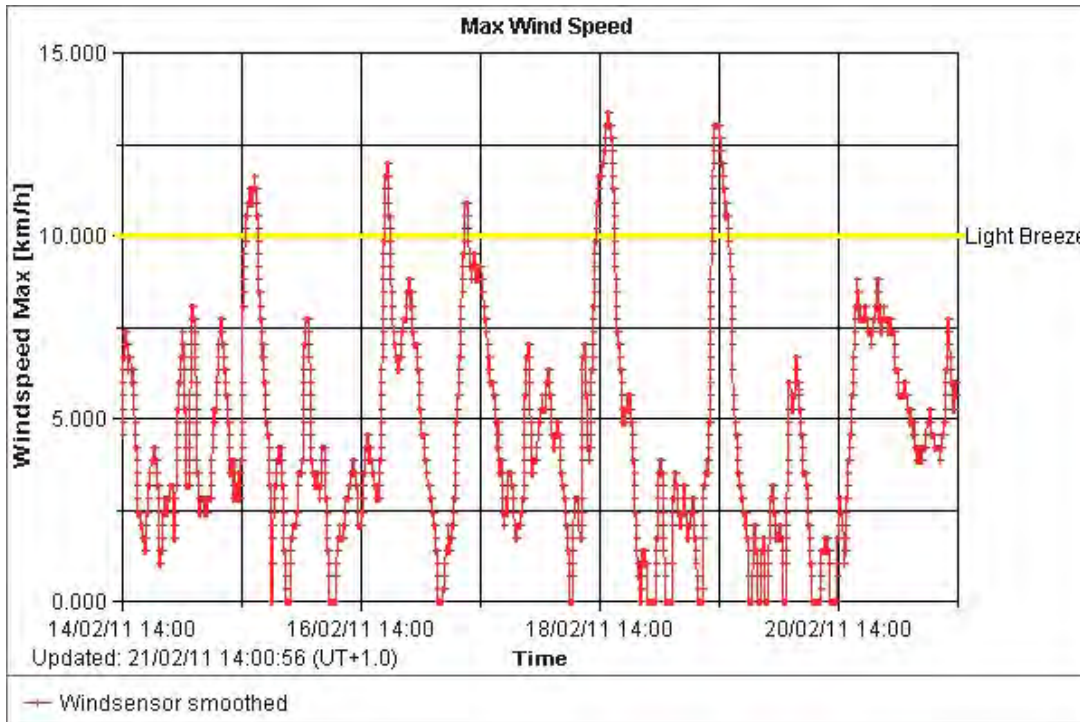


The scatter graph below shows the inclination of one Nivel220 sensor.



The Nivel220 sensor is installed on the pillar 7/8. The graph shows the distribution of the Inclination X and Inclination Y over the entire report length. The time related information of the inclination measurements is added using colour variation. The oldest data is blue, the latest data is red, the data in between changes from blue to red according to the scale. In addition, a scatter graph can be used to verify correlations between two different measurements.

The timeline graph below documents the wind speed on the bridge deck.



This data is measured with the geotechnical sensor YOUNG. The timeline graph above is smoothed with a median filter and the wind speed is displayed in km/h. The wind speed and direction is of interest to verify the movements of the bridge caused by natural influences. The wind sensor is located in the middle of the bridge deck and is connected to a Campbell datalogger that pre-stores the data before it is retrieved from GeoMoS and pushed to GeoMoS Web.

The monitoring project is a cooperation of the Tiefbauamt Kanton St. Gallen and Leica Geosystems.

The GeoMoS Web report is automatically generated by GeoMoS Web version 2.0 at 21/02/11 14:00.

Leica GeoMoS Web is a web based service for the visualization and analysis of monitoring data via the Internet. Each authorized user, including customers and partners, can access their monitoring project anywhere, anytime – just by using a web browser, PDA, or mobile phone.

When it has to be right.

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Please contact your local Leica sales representative for User ID and password.