



Full-scale monitoring system of levees

Aleksandra BORECKA, Klaudia KORZEC, Jacek Stanisław

Department of Geology, Geophysics and Environmental
Protection, UST AGH, Krakow



AKADEMIA GÓRNICZO-HUTNICZA
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Reference sensors

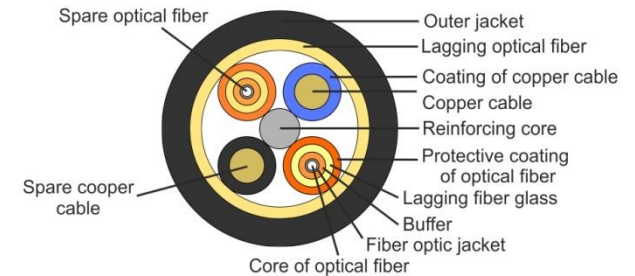
GLÖTZL
PP4 RS VW 0,7



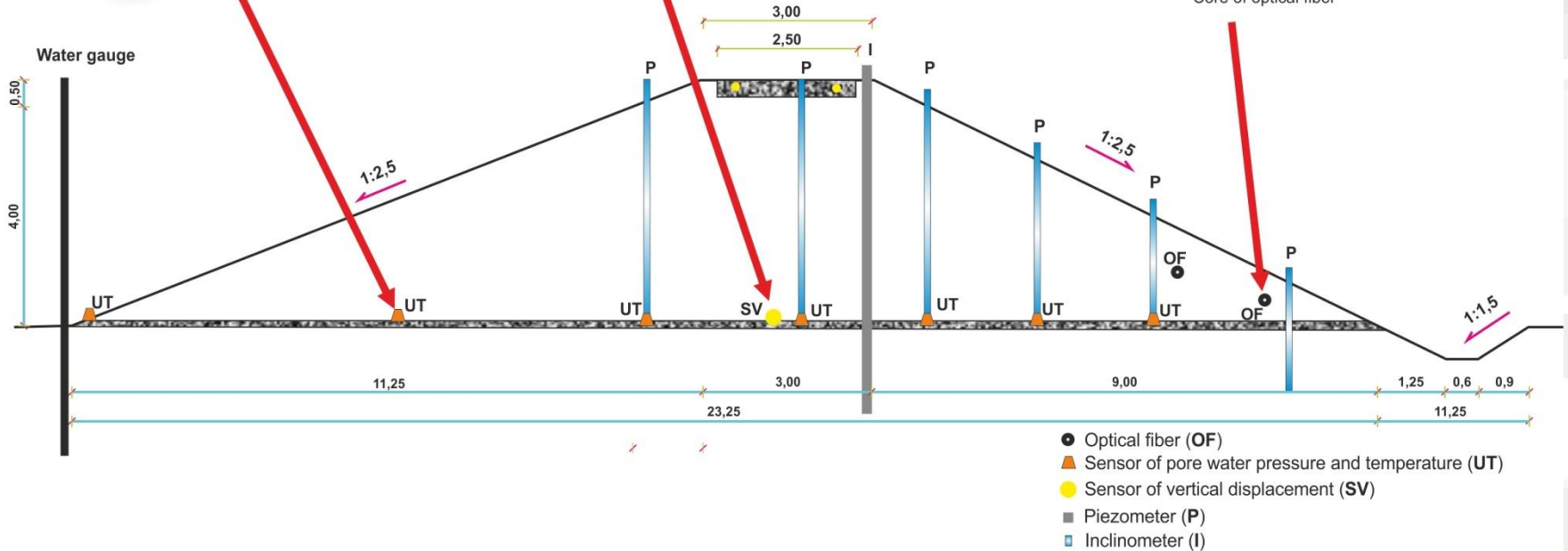
GLÖTZL
EE VW 20/30 K2 C



GESO
DATA S



Cross-section A-A'



Heavy-Duty and Push-In Pore Water Pressure Sensor - Piezometer

This kind of piezometer Type PP4 RS in the heavy-duty model with an extra ring filter made of sintered metal.

The piezoresistive piezometer is used to monitor pore-water pressures. The pressure sensor of heavy-duty piezometer is encapsulated in a waterproof housing made of stainless steel with a diameter of 40 mm and a length of 230 mm.

Filter area: 57cm²





Electric Stress Sensor

Model with Hydraulic Pressure Pad and Pressure Sensor

The electric stress sensor with hydraulic pressure pad and pressure sensor is used for measurements of earth pressure. The pressure pad connected to an electric transducer is filled with a hydraulic fluid in a closed system. When loading the pressure pad, the arising hydraulic pressure is transferred to the diaphragm of the electric transducer and converted into a stress proportional to the loading.

E VW 20/30 K2 C



Pressure and measuring range:
0 – 2 bar



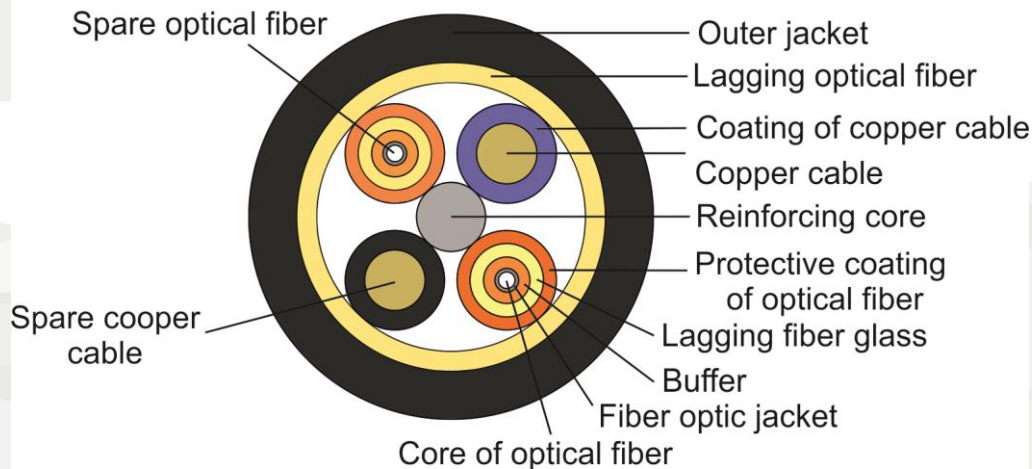


FIBER OPTIC – GESO DATA S

Distributed Temperature Sensing (DTS)

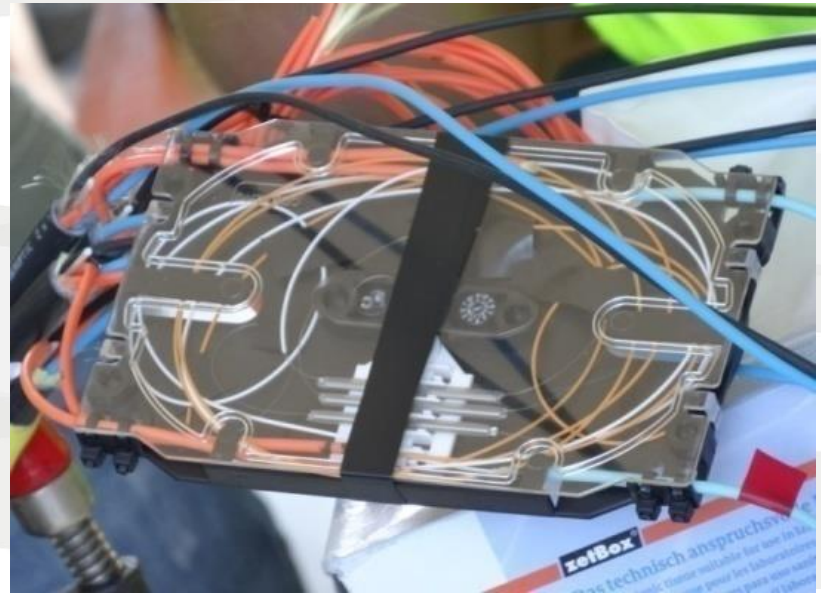
The product being developed by GEOS are based on the fiber optic Distributed Temperature Sensing Technology (DTS). This technology provides temperature readings along the length of an optical fibre with a high temperature resolution as well as a high spatial resolution. The temperature is measured simultaneously at regular intervals of normally 1 meter over the whole length of the fibre; the temperature over each metre being averaged.

GESO DATA S

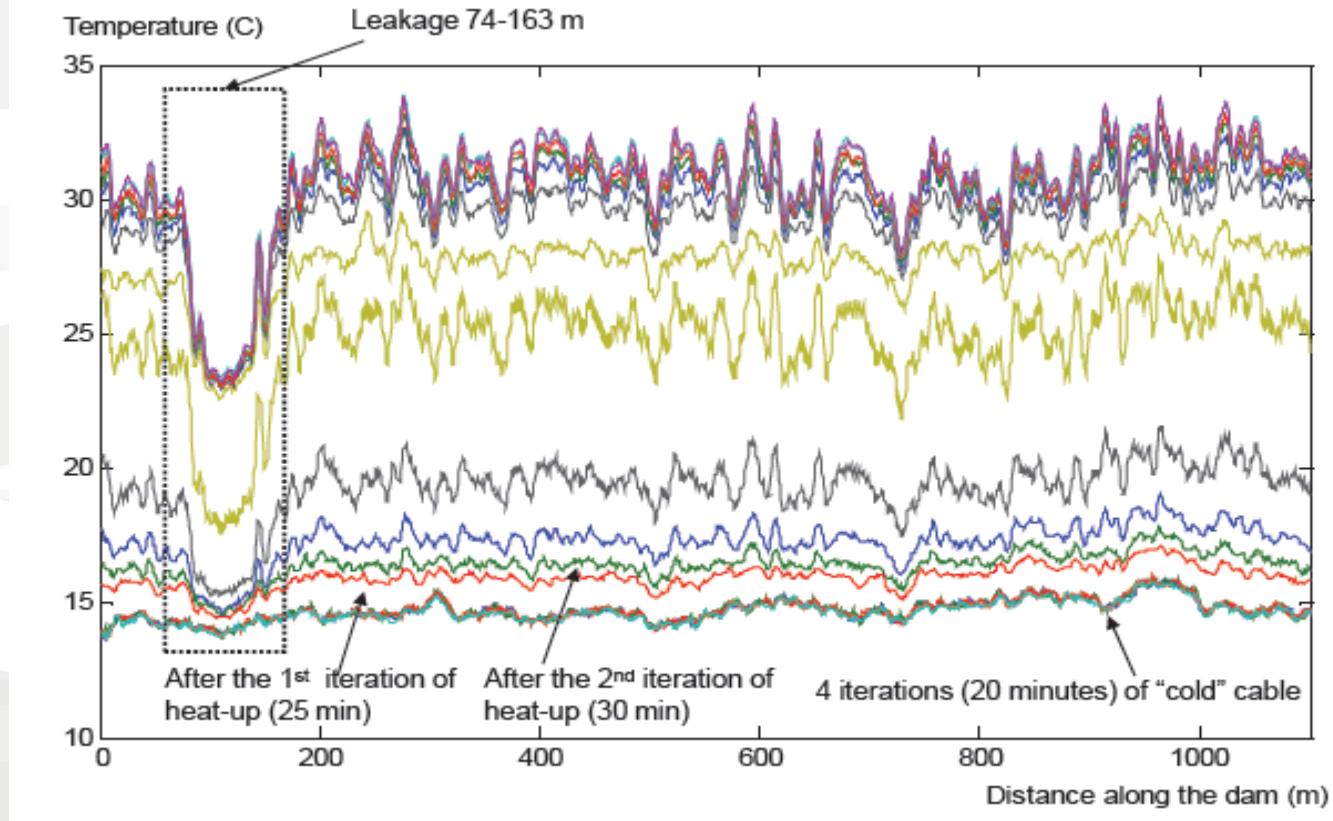


Parameters of the Measurement Technology

Range of the sensor cable per channel *)	GESO DATA S max. 2 km GESO DATA M max. 4 km GESO DATA L max. 8 km GESO DATA XL max. 12 km
Number of measurement channels	1, 2, 4
Spatial resolution	1 m (Standard)
Temperature Accuracy* *)	better than $\pm 1^\circ\text{C}$
Temperature resolution *)	at 1 min./4 km $\pm 0,47\text{K}$



EXAMPLE



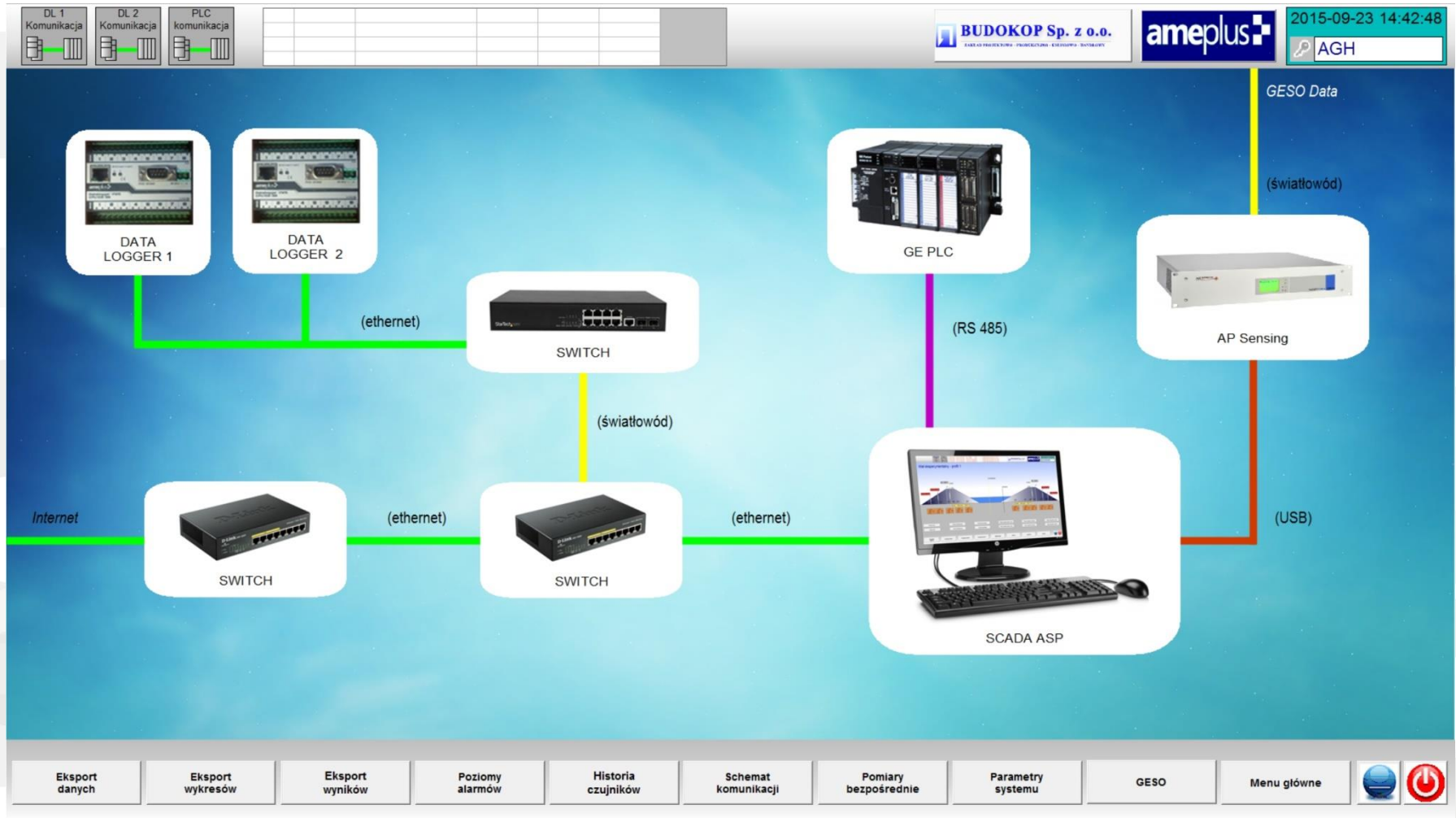
Weather station

Measurement parameters:

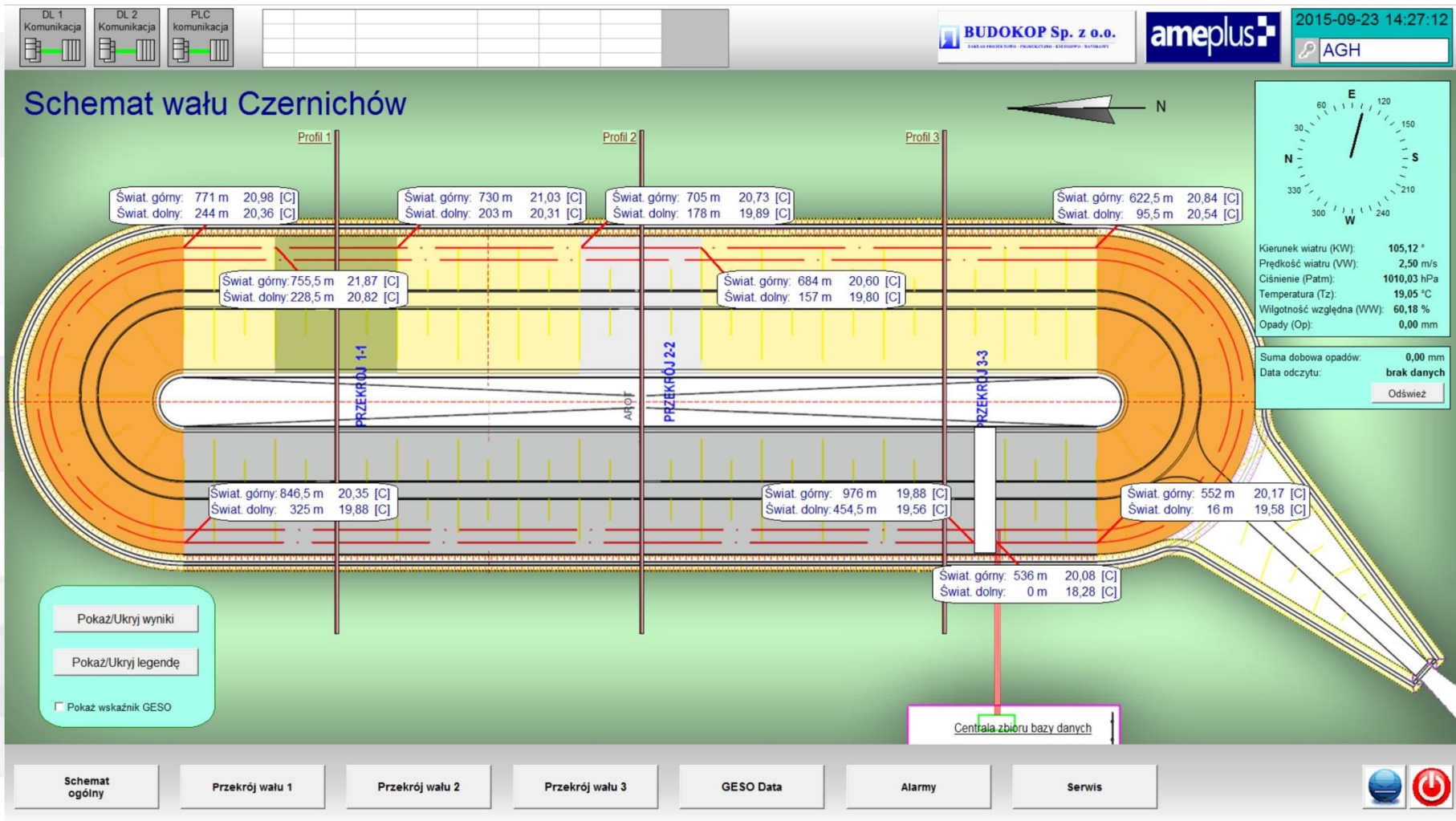
- ✓ Temperature
- ✓ Humidity
- ✓ Pressure
- ✓ Precipitation
- ✓ Air flow (wind speed)



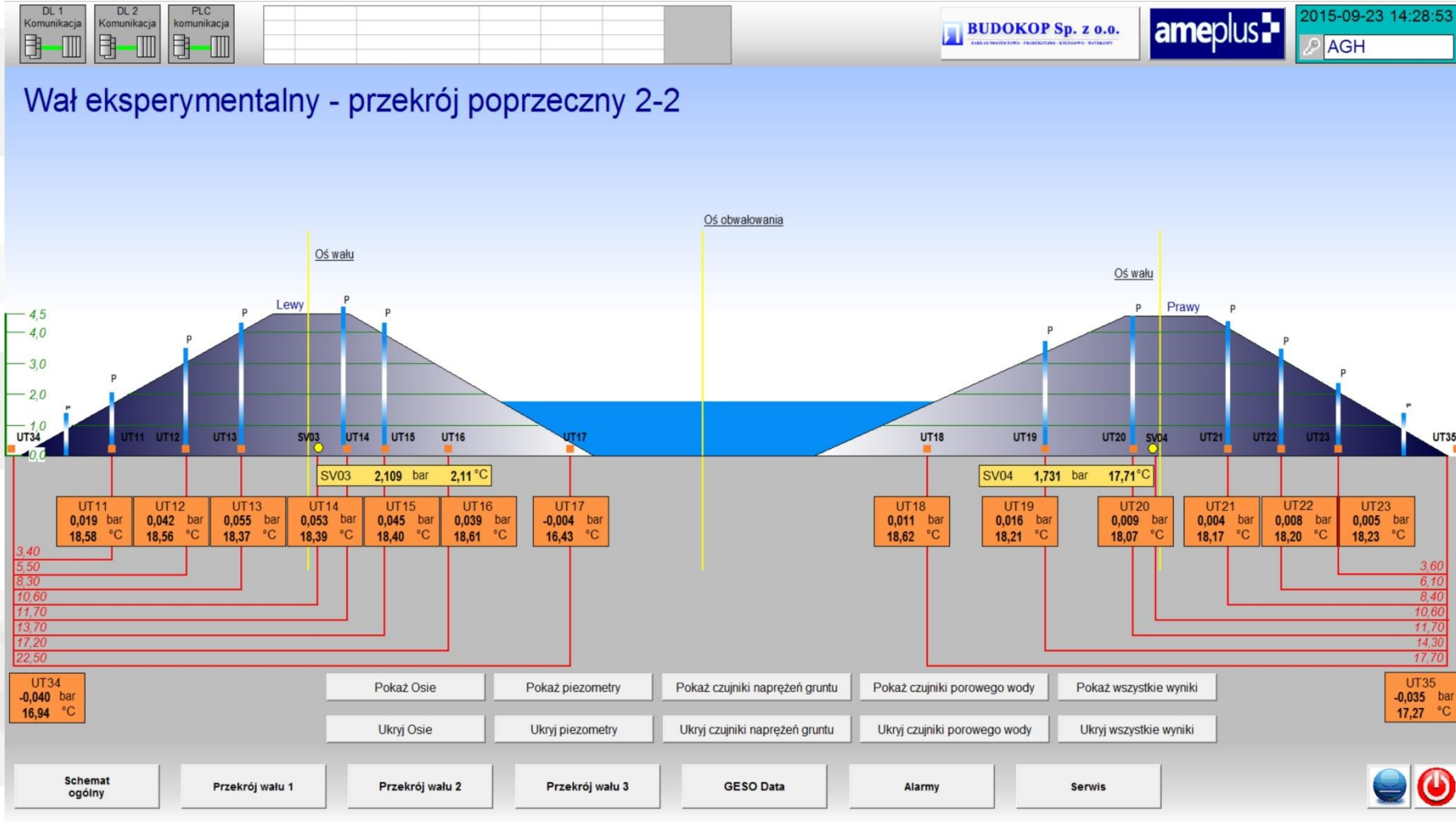
Automatic Measurement System (AMS)



AMS – scheme of levee



AMS – view of cross-section



AMS – Reading from the optical fiber





<http://www.ismop.edu.pl>

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W KRAKOWIE

