

Motion-Controlled Leica and Zeiss Optical Digital Levels

Solexperts has developed a motioncontrol unit for Leica and Zeiss optical digital levels which enables fullyautomated, computer-controlled operation of the instrument. With help from motioncontrol motors and the automated data acquisition and monitoring system Solexperts GeoMonitor, one or more levels can monitor settlement and heave of numerous targets around the clock.

Automated, high-precision monitoringof vertical displacement











The Instrument

Digital levels work on an optical principle. In the framework of automatic operation, the GeoMonitor sends commands to the instrument to search out bar-code staffs, focus the optics, carry out multiple measurements, and send the measurement values back to the PC.

The bar-code staffs can be mounted at distances of 2 to 40 meters away from the instrument. The Optical measurements require that the staffs be artificially illuminated for night measurements.

The light attached to the level is sufficient to illuminate staffs up to about 20 meters away. Separate lights are installed for the illumination of staffs at distances greater than 20 m.

Automatic Data Acquisition and

Control with Solexperts GeoMonitor GeoMonitor is a powerful data acquisition and monitoring software which can simultaneously monitor a hugh number of sensors, control positioning units and record measurements from optical levels, and perform on-line calculations and compensations. The GeoMonitor can be set to trigger a variety of alarms, such as a fax, warning light, etc., for alerting when measurements exceeding a given tolerance. (For more information see separate documentation.)

Real-time Results

Displacements are automatically calculated on-line by taking the difference between measurements of a reference staff and the staffs mounted on the structure. For more in-depth calculations of structural deformation, simultaneous temperature measurements are taken, and «real-time» temperature-compensated results are automatically produced. Typically, this procedure allows detection of displacement less than 0.3 mm.

Data Visualisation

For data management and visualisation of complex monitoring installations Solexperts developed the software DAVIS and WebDAVIS. A graphical representation of the monitoring site provides the user an overview of sensors and measuring points. DAVIS contains additional flexible tools for graphs and analysis.

WebDAVIS provides a password protected access to the data over the internet. Graphs are linked to the monitored object and are displayed in an easy to use DAVIS design.

Ideal for Automated Vertical Displacement Measurements for:

- Tunnelling in urban areas
- · Deep excavations and their effects on adjacent structures
- Grouting under structures where heave must be detected as early as possible
- Unstable slopes and potential landslides
- Pile load tests
- Construction and positioning of large machinery

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