SOLEXPERTS

Swiss Precision Geomonitoring

Leica Total Station with Solexperts GeoMonitor

Automated 3-D Displacement Measurements for Structures and Unstable Slopes

The Instrument

The motorized total station represents a new generation of high precision total stations designed for rough field environments. Motorization enables autonomous control of the instrument for monitoring goals. By using Automatic Target Recognition (ATR) measurements are made by aiming at the exact centre of fixed mounted target prisms. Coordinates of the target are determined from precise measurements of distance, vertical and horizontal angle. Displacements in spatial directions are calculated in real time. As a standard routine measurements in both faces are used to eliminate instrument errors (error of sighting axis, horizontal axis, vertical collimation).

Data Acquisition and Analysis

Leica Total Stations are controlled with Solexperts GeoMonitor data acquisition software. Additional software options for the target and for measuring mode can be set to optimize accuracy, reliability and measuring time. Station coordinates are checked and determined (free stationing) by measuring reference points. Targets are measured and atmospheric influences on the distance measurements are compensated. Spatial coordinates are calculated and transformed into a local system. Displacements are referenced to an initial measurement. The coordinate axes are rotated so that they represent a main displacement axis of the monitored object.

Additional calculation often calculations using different sensors measurements can be set up in the software. The results (displacements, settlements, inclinations, etc.) are provided in real time.

The GeoMonitor system is a total solution for geotechnical monitoring, supporting total stations as well as a wide range of other sensors such as pore water pressure, groundwater level, tilt meters, temperature, extensometers etc.

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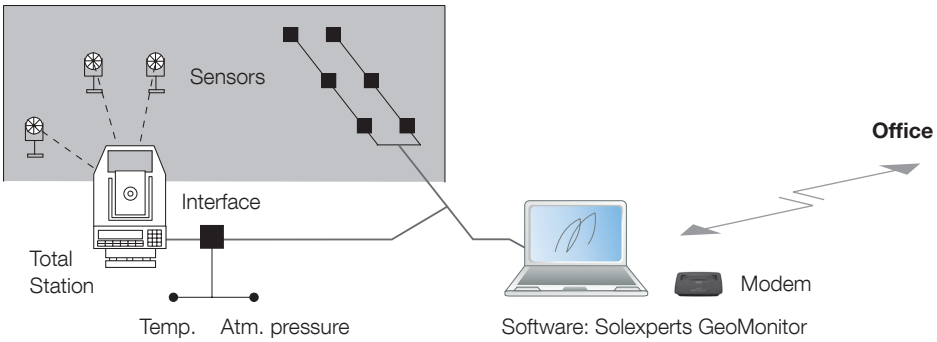
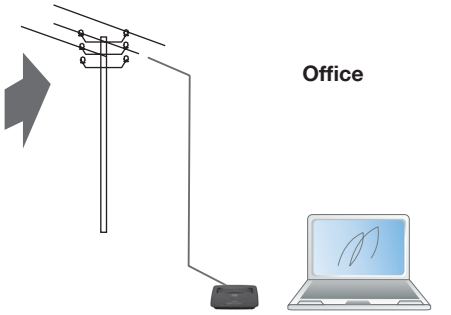
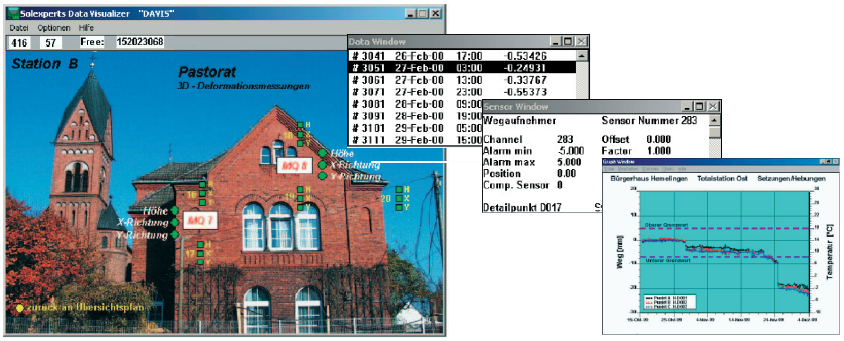
The GeoMonitor offers many advantages including:

- Control of multiple total stations and other sensors with one GeoMonitor system
- Versatile alarm functions (alarm on site, telefax, SMS, e-mail)
- Remote site monitoring and automatic data transfer via modem or network

Monitored Object







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.

Application

- Tunnel monitoring, tunnel renovation
- Long term monitoring of dams, locks, slopes, rock falls, buildings
- Monitoring of structures influenced by deep excavations or tunnelling in urban areas

Technical Specifications

- Accuracy (TCA 1800)
  Horiz. and Vert. angles: 0.3 mgon (0.5 mm/100 m)
- Distance: 1 mm + 2 ppm
- Measuring Range: 2.5 to 1000 m ATR-Modus
- Temperature Range: -20°C to +50°C
- Compensator: 2-axis in +/- 0.1 gon range
- Automatic Error Correction: Target Lines, Altitude Index and Tilt Axis

Technical specifications subject to change

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