General

The Chain Deflectometer is a multiple deflectometer used for the automatic monitoring of subsurface deformations such as in slopes, around excavations, or beneath dams.

The Chain Deflectometer is installed in a specially machined casing, normally of HPVC, which is bonded to the soil, rock or concrete by grouting. Unlike the inplace inclinometer, the Chain-Deflectometer can be installed in boreholes of any direction or inclination. The rotation between two rods of the Chain-Deflectometer is measured in two directions, x and y, by a highly sensitive electronic joint.

After the Chain Deflectometer is installed in the borehole, it is connected to the Solexperts Data Controller and can be automatically monitored remotely, if connected with a personal computer. The values can then be displayed numerically and graphically. If the system is connected to a modem, the data can be transmitted to the offices of the engineers in charge.

Components

The Chain Deflectometer consists of heads with electronic joints, connecting rods, and heads at each end of the chain.

Each head with an electronic joint holds the element which measures deflections in the x and y directions between two connecting rods. This element also includes the amplifier, the signal conditioner and the multiplexer. This arrangement enables readings of all elements of the Chain Deflectometer over one cable.

The heads are connected to each other with connecting rods. The connecting rods, with lengths of 1 or 2 m (or longer) also serve as the lead-through for the signal cable.

Using the Solexperts Data Controller (SDC), all the measurement values of the Chain Deflectometer can be manually read using local mode; the address of the electronic joint to be read is entered via the keyboard, and its values, x and y, are displayed on the digital display. The Solexperts Data Controller is battery operated and can be used with various other portable instruments.
Data Acquisition

The sensors within the Chain-Deflectometer can be integrated into the Solexperts GeoMonitor, an automatic, computerized data acquisition and monitoring system. The GeoMonitor system monitors up to 240 different sensors including temperature sensors, flow meters (gas and liquid), pressure sensors, extensometers, strain gauges, clinometers, etc. Separate documentation describes this system.

Technical Specifications

**Head with electronic joint**
- Signal handling: integrated signal conditioner (amplifier) and multiplex-system
- Diameter outside: 42 mm
- Measuring range per 1m base length*: +/- 17.5 mm deviation
  " (optional double measuring range upon special request)
- Sensitivity (one digit on SDC): 5 µm/1 m base length
- Individual calibration of every measuring head Linearity: < +/- 1%
- Water resistance: 15 bar

**Connecting Rods**
- Base length: 1 m or 2 m or longer
- Water resistance: 15 bar

**Casing**
- Diameter inside/outside: 50 mm/60 mm
- Interval between couplings: 1 or 2 m or longer
- Recommended diameter of borehole or borehole casing (int.): min. 86 mm to 115 mm

**Data Acquisition**
- With Solexperts GeoMonitor: (see separate data sheet)

* Technical specifications subject to change