



# Penetrologger with GPS and soil moisture sensor

- New robust design
- Precise and fast internal GPS-system; data are auto-stored
- Soil moisture indicator can be connected: record one moisture percentage per measurement. Moisture recordings allow comparison of data
- Display of Vehicle Cone Index
- Memory for 1500 measurements
- Numerous different projects can be defined; projects can be selected at any moment
- Velocity indicator stimulates correct pushing
- Field and office programmable / read-out
- Will show, upload or print any reading
- Will show averages and spreading

The penetrologger has been especially developed to measure the resistance to penetration of the soil and to save the measuring results to digitally process them on a computer. The penetrologger is ergonomically designed, lightweight and easy to use. It can be used to measure to a depth of 80 cm. The penetrologger gives the Cone Index (CI) per measurement.

## GPS

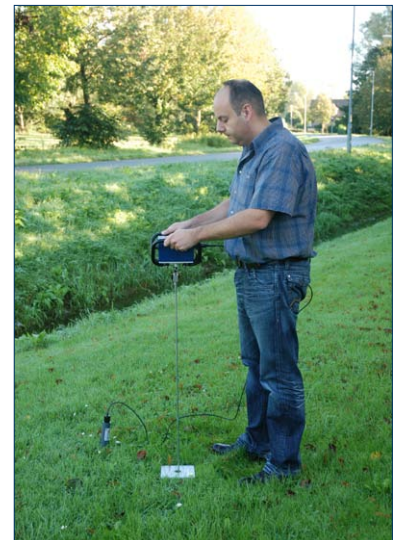
The penetrologger comprises an accurate internal GPS-system to determine the exact measuring point. The coordinates saved in the penetrologger can be linked to a place or map using software (or less accurately via Internet).

## Soil moisture sensor

Optionally, a soil moisture sensor (art. no. 06.15.50) can be connected to make a one point measurement and record the soil moisture percentage at the measuring point (applying the Frequency Domain technique).

The sensor has a measuring range of 5-55% and an accuracy of 5%. The soil moisture data are stored together with the coordinates and the measured resistance to penetration.

The sturdy, watertight synthetic housing which contains the electronics is fitted with 4 stainless steel measuring probes at one end that can simply be pushed into the soil (or other material).



**All it takes for environmental research**



## Carrying capacity

The carrying capacity of the soil is simple to measure with the penetrometer.

The penetrometer measures the resistance of the soil or the shallow subsurface and is a suitable instrument for use in civil engineering, soil science, agriculture, sports field maintenance and park and public garden management.

Both in the case of civil engineering and agriculture it is very important to be aware of the degree of penetration resistance. For civil engineering purposes a high degree of resistance is generally desirable. This concerns the ability to determine the suitability for foundations for buildings and infrastructure projects.

Conversely, for agricultural purposes an excessively high resistance can present problems. A high degree of compaction (the carrying capacity of the soil) can impede root development and the oxygen supply to the roots. When the resistance is too low this can mean too little carrying capacity for cattle to walk round or for agricultural machinery to operate.

## USCS

The so-called Unified Soil Classification System (USCS) determines whether a vehicle carrying a load is able to drive across a certain piece of land. The classification is expressed in figures, one for the vehicle and one for the soil.

The figure for the vehicle, the Vehicle Cone Index (VCI), has no dimension and is based on various factors, e.g. soil accessibility, soil pressure and the ratio between engine capacity and weight of the vehicle.

The Cone Index (CI) represents the soil figure. This figure can be determined by means of a cone-penetrometer.

A comparison of both indexes shows the suitability of the terrain for driving over.



### Technical specifications

Operating temperature	0 - 50 °C
Operating humidity	IP 54 (splash water proof)
Penetrologer weight (excl. rod, incl. battery)	3.4 kg
Overall carrying weight	15.5 kg
Dimensions for transport	58 x 29 x 25 cm
Memory	1500 measurements
Maximum penetration force	1000 N
Force resolution	1 N
Depth registration	80 cm
Depth resolution	1 cm
GPS accuracy	< 2.5 CEP (Circular Error Probable)
Soil moisture resolution	1%

### Technical specifications

Measuring range	5-55%
Accuracy	5%
Resolution	1%
Output signal	0-1 Vdc
Measuring pens material	stainless steel
Length measuring pens (4)	60 mm
Diameter measuring pens	3,2 mm

