

IGS Technical Note

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Geotechnical Services

CPT & Piezocone

Dilatometer

Seismic Dilatometer

Vane Shear

Tee-Bar

Push-Sampling

Piezometer Installation

In Situ Permeability

Field Fleet ("the girls")

Esme – 10-20t all-terrain



Beryl – 15t 4 wheel drive



Eunice – 20t 6x4 bogey



Baby Jayne – 15t portable



Our New Soil Moisture Probe (SMP)

We have very recently acquired our first non-purely-geotechnical probe, a Soil Moisture Probe (SMP) from Geomil in Holland.

Details are shown below - a straight copy of the Geomil literature.

Soil Moisture Probe SMP

Geomil
equipment

The Soil Moisture Probe has been developed to enable in-situ measurements of the soil moisture content, the electrical conductivity, and the temperature. It can also be used as a screening tool for various pollutants.

The complete SMP-system composes of a SMP module containing 4 measuring electrodes. It measures directly the dielectricity (s) and the electrical conductivity (EC) up to ~ 200 mS/m. A fourth parameter, the permittivity (e), is measured indirectly by Campanella et al (1986).

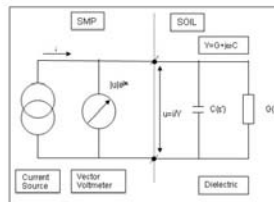
The digital output of the module is transmitted to the surface by means of a RS 232 signal to the second serial port (or USB/COM port simulation) of the CPT computer.

It comes complete with a special 16 pins cable for communication and power supply purposes, a connection box for the supply of power to the SMP-module and also to split the arriving geotechnical and environmental signals.

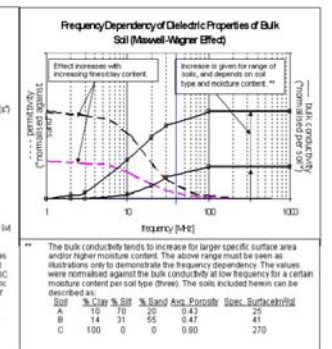
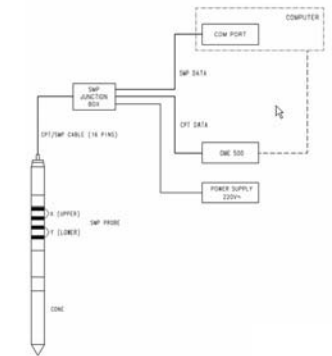
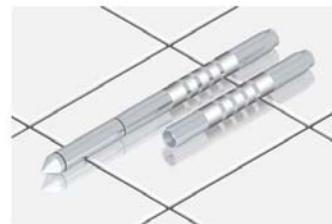
The module can either be used in combination with one of GeoMil's 15 cm² cones (enabling simultaneous monitoring of the geotechnical stratigraphy) or as a stand alone unit with a dummy tip.

In a combined CPT(U) / SMP set-up, the junction box splits the incoming signals for the CPTU data, processed and A/D converted in the GME 500, as well as SMP data.

The GeoMil logging program CPTtest - running on a Windows XP computer - provides real-time data visualization and storage. Further data processing, interpretation and reporting is realized by the analyzing software CPTask, usually applied as office version.



Electric Model for measuring the dielectric properties of materials. The current i will create a voltage v across the admittance Y , with amplitude $|i|$ and phase shift α with respect to i . The quadrature components of the admittance, i' and i'' , can be calculated from Y . This simple model forms the very basis of the SMP module that comprises two sets (channels), each consisting of two ring-shaped carefully isolated electrodes, and an Application-Specific Integrated Circuit (ASIC). The ASIC uses synchronous detection for accurate measurements, free from electric interference. This frequency (50kHz) technique involves the multiplication of two sine waves, one modulated by the unknown capacitance and conductance, the other by a reference signal. To avoid phase errors, a second measurement cycle is used with 180° phase shift. After A/D and RS232 conversion, the resulting signal is processed and stored in the CPTtest software package.



Note that, as always, IGS does not hold itself out to be a consultant. It is up to our clients to decide on the applicability of this cone for their purposes and to interpret the data from it.

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The probe is mounted above one of our S15 (15cm²) piezo-cones, so conventional IGS-2 piezo-cone data is available from the same push.

The probe is already busy on its first project and a second is planned.

reducing geotechnical uncertainty