Metallic Time Domain Reflectometry

Description

Metallic Time Domain Reflectometry (TDR) is a simple and economical way of detecting and interpreting rock and soil mass response to underground and surface mining using coaxial cables grouted in boreholes. TDR can be used effectively to locate rock and soil mass movements.

TDR involves the installation of a coaxial cable in a borehole filled with grout that matches existing soil or rock conditions. A TDR unit is employed to generate a voltage pulse along the cable and receive reflections. Reflections are generated by cable deformations, abrasions and severing. Crimps at known locations along the cable are used to provide depth datum.

As movement occurs, the reflections along the cable change as the cable deforms. By connecting the TDR200 to a PC through Type A Micro B USB cable, TDR reflections can be interpreted by software, thereby inferring location, type and rate of earth movement. TDR systems can be combined with data loggers and multiplexers to allow remote readings of multiple cables.

Specifications

Item	Specification
Tensile Strength	113 kg
Maximum Tensile Force	1100 N (247 lb)
Maximum (Recommended) Clamp Spacing	0.6 / 1 m (2 / 3.25 ft)
Minimum Bending Radius, Single Bending	70 mm (3 in.)
Minimum Bending Radius, Repeated Bending	125 mm (5 in.)
Bending Moment	6.5 Nm (4.79 lb-ft)
Installation Temperature	- 40 to +60 °C (-40 to 140 °F)
Operation Temperature	- 50 to +85 °C (-58 to 185 °F)
Storage Temperature	- 70 to +85 °C (-94 to 185 °F)
Inner Conductor	Copper-Clad Aluminium Wire, 4.8 mm (0.19 in.)
Dielectric	Foam Polyethylene, 11.9 mm (0.47 in.)
Outer Conductor	Corrugated Copper, 13.8 mm (0.54 in.)
Jacket Material	Polyethylene, PE 15.8 mm (0.62 mm)
Weight	0.2 kg/m (0.14 lb/ft)
Characteristic Impedance	50 ± 1 ?
Relative Propagation Velocity	88%
Capacitance	76 pF/m (23.2 pF/ft)
Inductance	0.19 ?H/m (0.058 ?H/ft)
Maximum Operating Frequency	8.8 GHz
Jacket Spark Test RMS	8000 V
Peak Power Rating	38 kQ
RF Peak Voltage Rating	1950 V
DC Resistance, Inner Conductor	1.57 ?/km (0.45 ?/1000ft)
DC Resistance, Outer Conductor	2.7 ?/km (0.82 ?/1000ft)

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