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WHEN MEASUREMENTS MATTER

TDR200

Time-Domain Reflectometer

Overview

The TDR200 Time-Domain Reflectometer is the core of the Campbell Scientific time-domain reflectometry (TDR) system. TDR systems accurately determine soil volumetric water content, soil bulk electrical conductivity, rock mass deformation, or user-specific time-domain measurement. One Campbell Scientific datalogger can control multiple TDR200 reflectometers.

Benefits and Features

- Low power (half the power of the TDR100)
- Robust
- High sensitivity
- High resolution
- Low noise
- Advanced waveform filtering
- Advanced waveform analysis algorithm
- Backward compatible with TDR100 systems (CRBasic dataloggers only)
- 60 Hz frequency rejection

Technical Description

The TDR200 (1) generates a short rise time electromagnetic pulse that is applied to a coaxial system that includes a TDR probe for soil water measurements and (2) samples and digitizes the resulting reflection waveform for analysis or storage.

The elapsed travel time and pulse reflection amplitude contain information used by the on-board processor to quickly and accurately determine soil volumetric water content, soil bulk electrical conductivity, rock mass deformation or user-specific, time-domain measurement.

The datalogger collects a 250-point waveform and analyzes it in approximately two seconds. Each waveform can have up to 10,112 data points for monitoring long cable lengths used in rock mass deformation or slope stability. Advanced noise filtering and averaging makes accurate measurements possible in noisy environments.

Complete System

A complete TDR200-based system includes the TDR200, SDM8X50 multiplexers, datalogger, power supply, enclosures, and probes. PCTDR version 3 software supports TDR200 and sensor setup, troubleshooting, and program generation. This software is included on the ResourceDVD and available, at no charge, from our website.

The SDM8X50 Multiplexer brochure, TDR Probes component category brochure, and Time-Domain Reflectometer System brochure provide additional information about the TDR system components. These brochures are available at:

www.campbellsci.com/product-literature

Specifications

- Pulse generator output: 250 mV into 50 Ω
- Output impedance: 50 Ω ±1%
- Time response of combined pulse generator and sampling circuit: ≤ 85 ps
- Pulse generator aberrations: ±16% within first 1 ns; ±1% after 1 ns
- Pulse length: 25.5 µs
- Waveform sampling: 20 to 10112 waveform values over chosen length

	distance (Vp=1)	time (1 way travel)
range	0 to 3800 m	0 to 27.75 µs
resolution	1.35 mm	< 4.4 ps

- Waveform averaging: 1 to 128
- Electrostatic discharge protection: ±8 kV @ 2 Ω air; ±4 kV @ 2 Ω contact
- Surge Protection: ±2 kV @ 2 Ω
- Operating temperature range: -40° to +85°C
- Power supply: Unregulated 12 Vdc (9.6 to 16 Vdc), 150 mA maximum, USB powered (5 Vdc)
- Weight: 0.79 kg (1.75 lb)
- Height: 10.7 cm (4.2 in)
- Width: 5.1 cm (2.0 in
- Length: 21.6 cm (8.5 in)

Current drain

- During measurement: 120 mA
- Sleep mode: 1 mA