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WHEN MEASUREMENTS MATTER

TDR200
Time-Domain Reflectometer



Core of the TDR System

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 a user-specific time-domain measurement. One Campbell Scientific data logger 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 data loggers only)
- 60 Hz frequency rejection

Detailed Description

The TDR200 generates a short rise time electromagnetic pulse that is applied to a coaxial system that includes a TDR probe for soil water measurements. Then the reflectometer 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 a user-specific time-domain measurement.

The data logger 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 make accurate measurements possible in noisy environments.

A Complete System

A complete TDR200-based system includes the TDR200, SDM8X50 multiplexers, data logger, power supply, enclosures, and probes. PC-TDR version 3 software supports TDR200 and

sensor setup, troubleshooting, and program generation. This software is available, at no charge, from our website.

The SDM8X50 Multiplexer brochure, TDR Probes component category brochure, and Time-Domain Reflectometry System brochure provide additional information about the TDR system components.

Specifications

Pulse Generator Output	250 mV into 50 Ω
Output Impedance	50 Ω ±1%
Time Response of Combined Pulse Generator & Sampling Circuit	≤ 85 ps
Pulse Generator Aberrations	⟩ ±1% (after 1 ns) ⟩ ±16% (within first 1 ns)
Pulse Length	25.5 µs
Waveform Averaging	1 to 128
Operating Temperature Range	-40° to +85°C
Power Supply	Unregulated 12 Vdc (9.6 to 16 Vdc) 150 mA maximum, USB powered (5 Vdc)
Dimensions	21.6 x 5.1 x 10.7 cm (8.5 x 2.0 x 4.2 in.)
Weight	0.79 kg (1.75 lb)

Waveform Sampling

-NOTE-	*20 to 10112 waveform values over chosen length* *Distance is V_p=1. Time is one-way travel.*
Range	⟩ 0 to 3800 m (distance) ⟩ 0 to 27.75 µs (time)
Resolution	⟩ 1.35 mm (distance) ⟩ < 4.4 ps (time)

Electrostatic Discharge Protection

Air	±8 kV @ 2 Ω
Contact	±4 kV @ 2 Ω
Surge	±2 kV @ 2 Ω

Current Drain

During Measurement	120 mA
Sleep Mode	1 mA

For comprehensive details, visit: www.campbellsci.com/tdr200

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