



Overview

The TDR100 Time-Domain Reflectometer is the core of the Campbell Scientific time-domain reflectometry system. This system is used to accurately determine soil volumetric water content, soil bulk electrical conductivity, rock mass deformation, or user-specific time-domain measurement. Up

to 16 TDR100s can be controlled using a single Campbell Scientific datalogger. PC-TDR software is used with our TDR100-based systems during system setup and troubleshooting. It can be downloaded from the Downloads section of the web page.

Benefits and Features

- › Compact, low-cost reflectometer
- › Designed for use in remote applications
- › Determines volumetric water content and electrical conductivity in soil and other porous media
- › Compatible with CR800, CR850, CR1000, and CR3000 dataloggers

Technical Description

The TDR100 (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 data logger collects a 250-point waveform and analyzes it in approximately two seconds. Each waveform can have up to 2,048 data points for monitoring long cable lengths used in rock mass deformation or slope stability. Averaging up to 128 readings makes accurate measurements possible in noisy environments.

Specifications

Pulse Generator Output	250 mV into 50 Ω
Output Impedance	50 Ω ±1%

Time Response of Combined Pulse Generator & Sampling Circuit	≤ 300 ps
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Pulse Length	14 μ s
Timing Resolution	12.2 ps
Waveform Averaging	1 to 128
Electrostatic Discharge Protection	Internal clamping
Power Supply	Unregulated 12 V (9.6 to 16 V) 300 mA maximum
Operating Temperature Range	-40° to +55°C
Pulse Generator Aberrations	› \pm 0.5% (after 10 ns) › \pm 5% (within first 10 ns)
Dimensions	23.6 x 5.9 x 12.6 cm (9.3 x 2.3 x 5.0 in.)
Weight	726 g (1.6 lb)

Waveform Sampling

-NOTE-	20 to 2048 waveform values over chosen length
	Distance is $V_p=1$. Time is one-way travel.
Range	› -2 to 2100 m (distance) › 0 to 7 μ s (time)
Resolution	› 1.8 mm (distance) › 6.1 ps (time)

Current Drain

During Measurement	270 mA
Sleep Mode	20 mA
Standby Mode	2 mA

For comprehensive details, visit: www.campbellsci.eu/tdr100 



80 Hathern Road, Shepshed, LE12 9GX UK | +(0)1509 828888 | sale@campbellsci.co.uk | www.campbellsci.eu
 AUSTRALIA | BRAZIL | CANADA | CHINA | COSTA RICA | FRANCE | GERMANY | INDIA | SOUTH AFRICA | SPAIN | THAILAND | UK | USA

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