



A new TDR multiplexing system for reliable electrical conductivity and soil water content measurements

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Time domain reflectometry (TDR) is a standard method to estimate soil water content and bulk soil electrical conductivity. In many applications, several TDR probes are installed in soil columns or field setups, and they are measured using a multiplexing system. It has been reported that commercially available multiplexers share a common ground, which might lead to inaccurate TDR measurements when probes are installed close together or at sites with high electromagnetic noise. Therefore, a new eight-channel differential multiplexer (50C81-SDM) was developed that allows communication with standard TDR equipment. The 50C81-SDM multiplexer was tested using measurement in electrolyte solutions and a sand tank. In contrast to multiplexers with a common ground, they showed no interference of closely spaced TDR probes. Measurements at a test site also showed the applicability of the 50C81-SDM multiplexer in an environment contaminated with high electromagnetic noise.