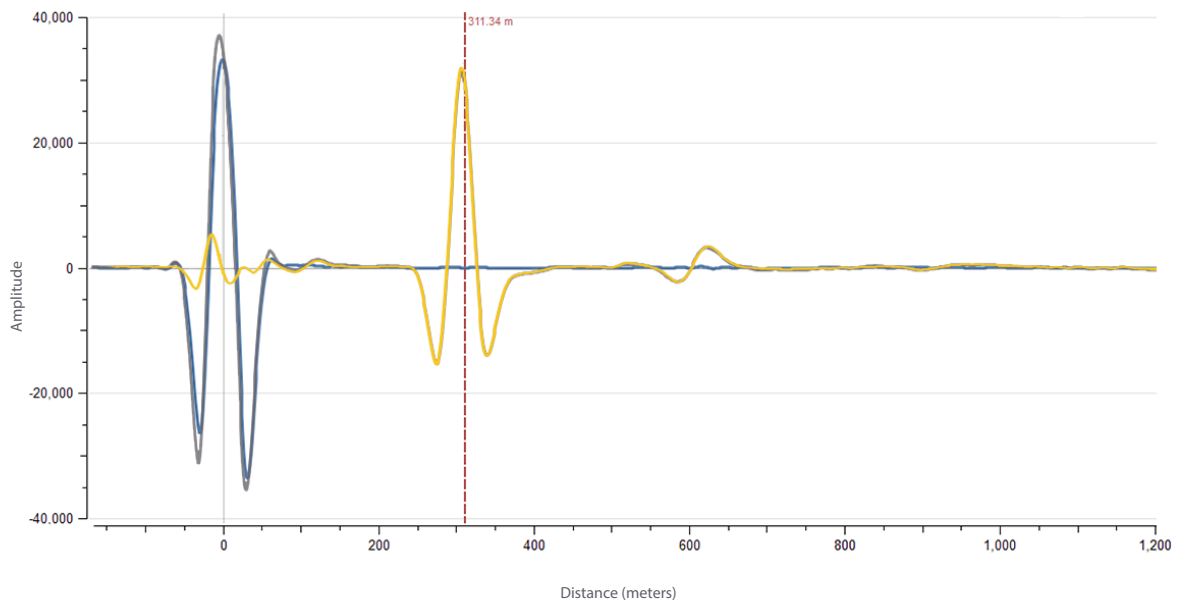


**AWARD WINNING
PRODUCTS AND SERVICES
TAKING OUT COST AND
INCREASING OPERATING
EFFICIENCY**

INTRODUCING SPREAD SPECTRUM TIME DOMAIN REFLECTOMETRY LIVE CONDUCTOR FAULT MONITORING



Baseline

Waveform

Difference

WHAT IS SPREAD SPECTRUM TIME DOMAIN REFLECTOMETRY (SSTDR)?

To understand SSTDR we will first explain the traditional Time-Domain Reflectometry Technique (TDR).

The Time Domain Reflectometry (TDR) technique is comparable to radar, whereby a pulse is sent out and a reflection is received and interpreted. TDR uses transmission line theory and pulse reflection principles to detect changes in electrical cables. TDR transmits high-energy electrical pulses along the cable which reflect off changes of characteristic impedance. Analysing the magnitude and shape of the reflected pulse the system features and potential faults can be determined.

One of the biggest drawbacks of TDR is that its accuracy is impacted by other signals on the line, requiring the system to be powered down to carry out the test. Most TDR testers require someone with the skill, experience and system knowledge to interpret the results.

THE SSTDR TECHNIQUE

SSTDR uses the same physics as traditional TDR and incorporates the use of Pseudorandom Noise and Spread Spectrum frequencies.

Pseudorandom Noise signals are specific digital signals that aren't interfered by and do not interfere with other signals on the line. The digital signals are so low that they sit within the noise floor of the system. Like TDR, the signals are sent and reflected. However, SSTDR correlates the reflection against the transmitted signal to generate a waveform. The SSTDR algorithms are then applied to automatically identify fault type and provide a location information to the user without the need for interpretation.

A Spread Spectrum of frequencies can be used to carry out the test. The spread of frequencies provide, accuracy at shorter distances by using higher frequencies, whilst the low frequencies allow monitoring of longer cables.

TDR will always have its place for carrying out spot tests on failed systems and periodic testing. SSTDR, however, provides a legitimate alternative to this regime as its continuous monitoring of live systems enables the user to respond to emerging and critical faults as they happen while eliminating the requirement for powering down the system to carry out intrusive tests.

Key Point

- Live monitoring of data, communications and power systems
- No interruptions of operations for diagnostics
- Electrical fault location; open and short circuits and intermittent faults.
- 24/7 collection of valuable data to predict / prevent
- System operators can monitor electrical/comms/control infrastructure
- Distances of up to 4 miles

