TDR Saved Traces

Abstract

Tempo's Time Domain Reflectometer (TDR) cable testers offer the ability to save traces for later analysis using software on mobile devices or PC. Here we describe the file format and capabilities that may allow you to create your own reporting process if needed for specific purposes.

By

Mark Govier, March 2025

File Format

JSON. Java Script Object Notation is the underlying scheme used to store the result files. This is fundamentally a text file that is not encrypted or encoded in any way. Therefore it is possible to easiliy create your own reports from these files if necessary. Tempo does not tie you into needing custom software from us to interpret the traces. All data is stored in “raw” format but with sufficient supporting information that will allow you or us to create a usable trace.

File Structure

The files have the extension “.tdr”.

Each contains a “header” section that relates to the TDR instrument used, giving the model name, software versions used and serial number.

Following this is the cable parameter section which includes the name, velocity of propagation, typical loss per 100m etc.

Next comes the trace data. There are at least two blocks of data here, one for the “detail” window shown on the screen at the time of saving, the other for the “overview” window. If a “max” trace is saved then multiple blocks of data will be present (more on that later).

The final section lists any “markers” that may be present on the traces. The cursor, the “beginning of cable” (BOC) marker, “Wizard” (automatically generated event markers) and any manually added event markers.

The closing section of the file includes the used calibration data and calibration date along with the zero offset used by the unit.

All timings are in nanoseconds.

Trace Structure

Standard (“min”) Trace Structure

Standard traces are stored as groups of 794, 12-bit samples with a “start” and “end” time xMin and xMax defining the bounds of the “Window” at time of acquisition. Also recorded is the gain, pulse-width and averaging in operation at the time.

Combined (“max”) Trace Structure

When a “max” trace is saved the TDR will make multiple captures: -

1. 25408 samples of the first 2.60us
2. 22232 samples of the first 4.54us
3. 15880 samples of the first 6.49us
4. 11116 samples of the first 9.08us
5. 7940 samples of the first 12.97us
6. 5558 samples of the first 18.16us
7. 3176 samples of the first 20.76us

All are captured using the current settings for gain, pulse width and number of averages. This is why it can take several seconds to capture a “max” trace. But this does mean that you have available to you data at several effective levels of “zoom” for later interpretation.

Reviewing/Editing “.tdr” Files

It is recommended that an advanced text editing program such as Notepad++ along with any suitable JSON formatting extensions be used to review “.tdr” files.

Next Steps

We invite you to experiment with this open file format to create report systems that are specific to your own needs. Please save a few .tdr files and examine them for experimentation. If you would like further information, please get in touch using the contact details below.

1.888.610.7664 www.calcert.com sales@calcert.com

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