1001: Scanning a Cable

This application note will walk you through taking a scan of a cable and saving the result. Always begin by making sure to electrically short your cable before connecting it to the CT100B.

Set Vp

Once your cable has been connected to the CT100B[1], you need to make sure that the CT100B tester is configured for that cable.

Adjust the Vp (Velocity of the pulse). This is the fraction of the speed of light that electricity travels in this cable. The Vp fraction is displayed in the top-center of the screen (press the M-FUNC button until it is shown) and is adjusted by turning the M-FUNCTION knob.

An approximate value to use is the number that the cable manufacturer supplies. Typical values range from 0.6 to 0.9. An exact value can be determined by actually measuring a sample of cable.
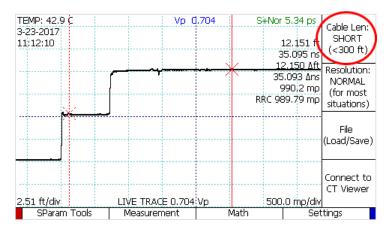

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[1] How you connect the tester to the cable is very important. High quality, controlled impedance connectors are recommended. Alligator clips and similar adapters should only be used as a last resort.

Choose Cable Length
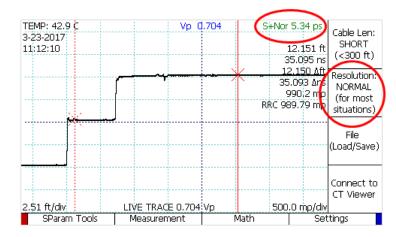
Press the BLUE button once to load the main menus.

The Cable Length is the top-right menu. Generally "Short" is good for cables up to 300 feet in length, "Medium" is for cables up to 1500 feet, and "Long" can measure up to a mile or so. Setting too short a length will mean that the end of the cable is not scanned. Setting too long a length will unnecessarily slow the CT100B's scanning process.

If you are not sure of the length, you can start with the short setting. Running Autofit (described below) will increase the length setting if necessary.

Set Resolution Mode

We'll use "Normal" Resolution (5.34 ps time step for Short cables) for this example.
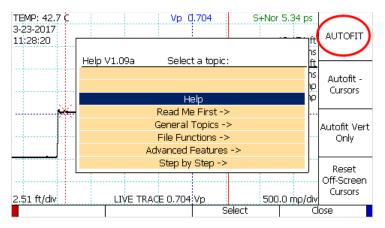
Pressing the Resolution menu button will toggle through two other choices as well: Screen and Fixed.

Screen resolution is very fast, but a trace has only 480 data points. The resolution is dynamically established by taking a single sample for each pixel on the display. For long cables, the resolution is not very good.

Fixed resolution allows you to specify a picosecond time step between data points, and can be set as low as 0.76 ps.
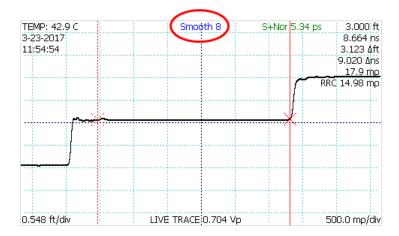
Autofit

Now press the orange AUTOFIT/HELP button and choose the AUTOFIT menu item. This will change the horizontal scale settings so your cable trace is nicely sized on the screen, with the cursors moved close to the beginning and end of the cable. Use the horizontal position knob to precisely set the cursor to the end of the cable.
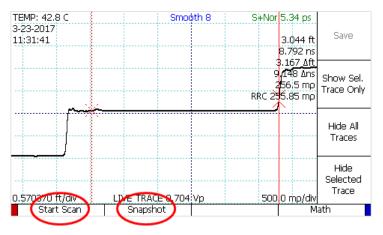
Smoothing

Some signals are inherently noisy. There is a smoothing feature available which calculates a running average of successive scans to draw a smoother trace. Press the M-FUNC button until the Smooth value appears at the top of the display. Then use the M-FUNCTION knob to adjust the value.

Scan

Finally, press the SCAN button to load the SCAN menu. The second menu item on the bottom allows you to choose "Snapshot" or "Cursor". We'll use Snapshot for this demo.
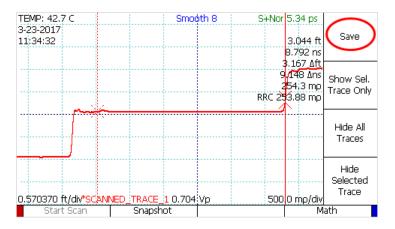
- Snapshot: used to take a scan that simply replicates what you see on the display.
- Cursor: takes a scan between the two cursor locations, even if one or both is off-screen.
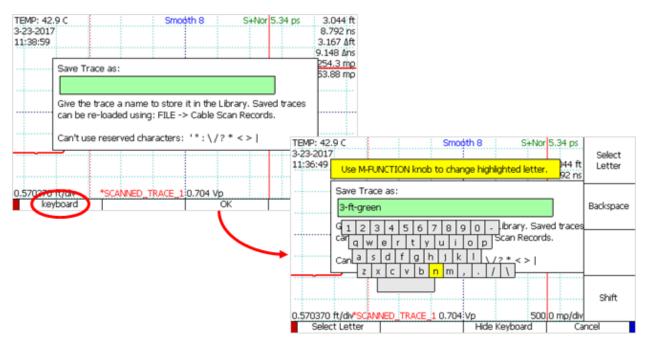

Once you have chosen a scan setting, press the Start Scan menu item to actually create your scan. This will create a red SCANNED TRACE superimposed on top of the live trace.

Save the Scan

You can use the Save menu item to give the new scan a name and save it to the FILE library in the CT100B.

Enter a name for the saved scan. You use a USB keyboard or use the software keyboard that is built-in to the CT100B.

The file library will store the scan so you can load it again at a future time, or you can run the CT Viewer program on a connected PC and copy the file to the PC for archiving or further analysis.