Chapter 1: Getting Started using WinTDR

Installing the Program

Check List

It is recommended that before installing the program you have the following items.

- ✓ This Document.
- ✓ WinTDR installation program
- ✓ PC Pentium class or equivalent VGA display, running under Windows 9x or newer, with 5 MB hard drive space.
- ✓ A Tektronix 1502 B/C (or 1503 B/C) Metallic TDR unit.
- ✓ Tektronix SP232 (RS232 INTERFACE).
- ✓ A serial cable, 25-pin port on one end and 25 or 9-pin port to computers COM port on the other end.
- ✓ A three-prong (or equivalent) probe.

Installing

Unzip the files that you have downloaded from our web site. You can choose to put the files anywhere you want.

- Go to the **Start** button and select **Run**
- Browse through c:\temp (or the appropriate directory) until you find **setup.exe.** Select it. Press **OK**. Installation then starts.
- Follow the options as presented by the installation program.
- A new folder called "WinTDR 6.1.<build date>" will be placed under the Programs Folder in the start menu (unless you change the default).

You should be set to go. If there are any problems with the installation contact support at:
tdrsupport@mendel.usu.edu

Running the program for the First Time

Run WinTDR by going to the Start Menu, Programs, WinTDR 6.1.<build date>, WinTDR (by default). The TDR need not be connected to you computer before starting the program.

Controls and Window Names

This section gives in brief discussion to the parts of the program described in the following walk-throughs. For detailed information on the various parts in the program interface, and what they do, see **Chapter 2** *The WinTDR Interface*.
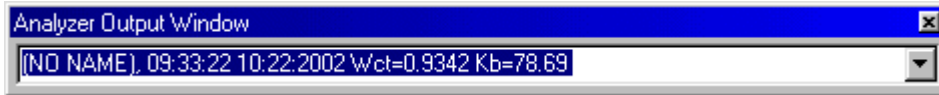
Analysis Output Window (AOW)

Figure 1. The Analysis window.

The **Analysis Output window** shows the last fifty analyses taken. To view any of them just click the down arrow on the side.

Menu Bar

Figure 2. The Menu Bar

The **Menu Bar** contains pull down menus that in turn contain selectable options.
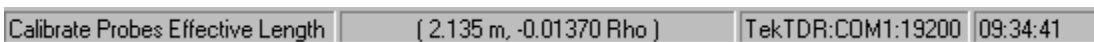
The Status Bar

Figure 3. The Status Bar

The **Status Bar** is located at the bottom of the display. It displays important information (from left to right): hints, cursor position (if over the graph), if the TDR is connected and if so at what speed, and Time as recorded in the internal CPU clock.

Control Panel

There are two different control panels in WinTDR, the Probe Setup and Wave File Control panels. While different, each contains many of the same features. The Probe Setup Control Panel is shown in Figure 4.
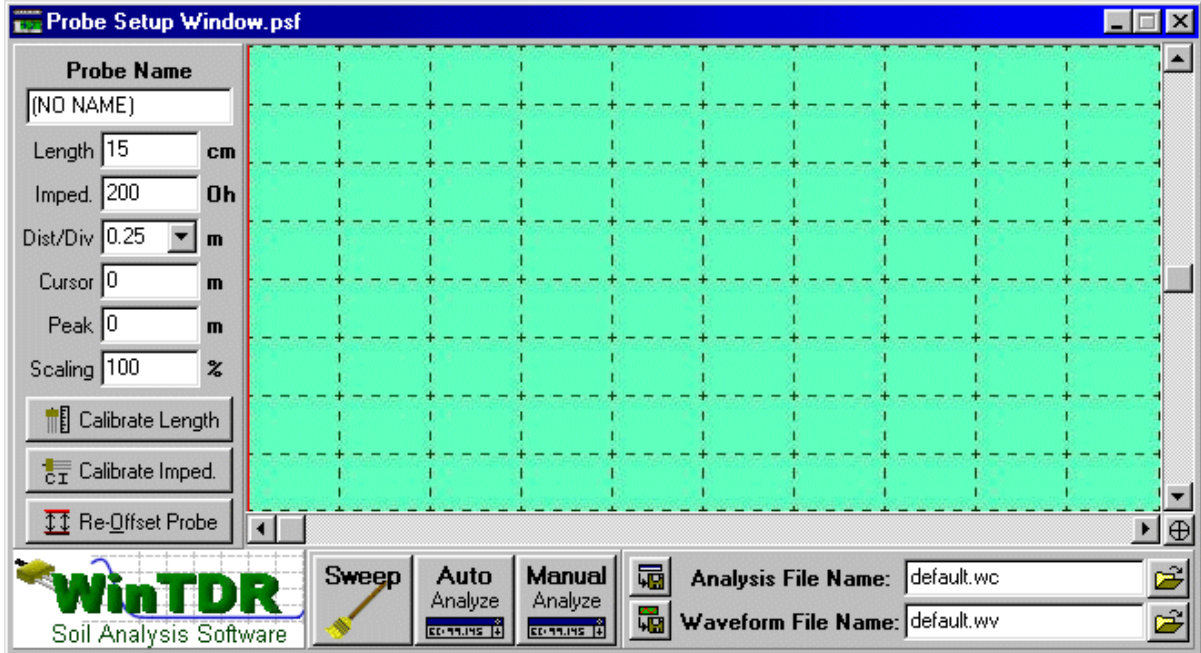

Figure 4. The Probe Setup Control Panel

The Control Panel contains various items. The **Control Buttons**, **Destination File Control**, **Probe Information Window,** and **Display Window**. Each is described in more detail below.

Control Buttons

Figure 5. Control Buttons

Located at the bottom left of the control panel, the Control Buttons act to control communications with the TDR and to analyze the current wave.
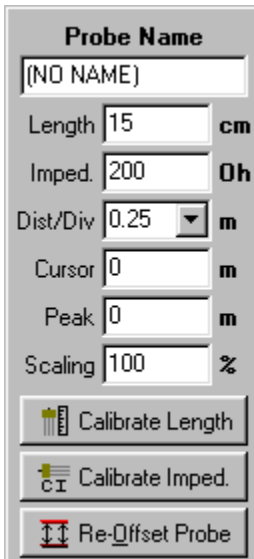
Destination File Control

Figure 6. Destination File Control

Located at the bottom right of the control panel. These are the names of the files where read and analyzed data are stored.

Probe Information Window

This window contains probe specific information and functions.

Boxes:

Length	The length of the probe
Imped.	Impedance of the probe
Dist/Div	Distance per division
Cursor	Cursor position in the TDR device
Peak	Position of the user set peak
Scaling	Stretches the waveform out vertically

Buttons:

Calibrate Length	Finds the Probes Effective Length
Calibrate Imped.	Finds the Probes Characteristic Impedance
Re-Offset Probe	Used in calculating Rho Values

Figure 7. The Probe Information Window

The Graph Window (not shown)

Displays the most recent graph of the current waveform obtained from the TDR for the current probe. As you change the probes values, this graph will update and display the parts of the graph that is visible under those new settings.

A Waveform File Walk-Through

WinTDR can re-analyze saved waveform data. Though you have not yet retrieved any data, we provided a sample waveform file that you can use for this walk-through. We will now open that waveform file and re-analyze them.

1. Open the waveform file "Examples.wv" by clicking on **File | Open Waveform File** or by clicking on the 📂 icon.
2. Choose "Examples.wv" from the Open Waveform File dialog box.

3. The Waveform File control window will appear. Note it looks a little different from the Probe control window.
4. The first waveform to appear should be a waveform named "De-ionized Water Probe". Click Auto Analyze. The analysis lines appear and the AOW (Analysis Output Window) shows the results.
5. Change the waveform to "Air Probe 1" by clicking the down arrow on the box under the heading "Waveforms".
6. Set the peak by double clicking the graph near middle of the first rise in slope.
7. Click Auto Analyze. You will note that the left tangent seems a little off, lets fix that.
8. Click the Analysis Options 🐢 icon and change *Slope Averaging Tolerance* to 5. Click OK to close the window.
9. Click Auto Analyze again. Much Better! The problem before was we were averaging to many points to determine the slope of the tangent line… thus incorrect results.
10. Try analyzing the other waveforms in the file. Notes: 1) For Air Probe 2 you should have to reduce the *Slope averaging tolerance* again. 2) For the Air Probe/Cell waveforms the peak should be set to about the middle of the first rise in slope.

Some Things to play with:
- You can make the waveforms fit better in the graph display by moving the vertical scroll bar and changing the scaling to a higher percentage.
- **Drag** around the reflection point and press the **Manual** button. An analysis with *user specified* parameters is generated.
- Try zooming in on a waveform location by changing the Dist/Div to a lower number and moving the cursor position.

A Simple, Single Probe, Walk-Through

Before doing anything, you should now connect the TDR to the Computer if you have not previously done so. To Connect the TDR do the following:

- Plug the SP232 interface into the Tektronix 1502B cable analyzer and screw it in tight. Make sure it is securely nestled in. (Refer to page 1-4 in the SP232 manual)
- Plug in the 25-pin end of the serial cable to the SP232 interface.
- Plug the 9 or 25-pin end of the serial cable into the COM port on the back of your computer. (COM port 1 is preferred, but not required)
- Plug the three-prong probe into the coaxial cable receptor located on the lower left hand corner of the face of the TDR. Place the probe in the solution you wish to analyze (de-ionized or tap water will do fine).
- Turn on the TDR. Ensure a waveform and grid on displayed on the LCD.

1. Begin by selecting **File** | **New** | **Probe**. (or click the 🔳 or Ctrl+N). This will spawn a probe information window. (See Figure 8). At first nothing will appear because the WinTDR is attempting to connect to the TDR. After a moment either a window will appear or a warning saying the TDR was not found. If the TDR was not found, follow the suggestions given in the warning to connect it correctly.
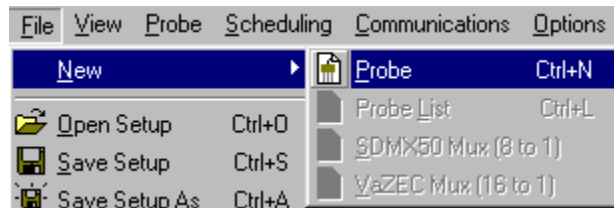

Figure 8. Mux Setup can be used to start *new* setups.

You might notice the window has a probe name available for you, here you may name many different probe variations and this keeps the settings for each probe name. (The default name is "(No Name)")

2. Modify the information in the Probe Information Window (See Figure 7), such as changing the Dist/Div value to 1.0, and hit the "Sweep" Button.

This will change how the wave looks and then will display that changed graph on both the Graph Window and the TDR display. Play with the settings in the Probe Information Window a bit to see how each one affects the wave.

3. Modify the Probe settings in order to get a graph that looks similar to Figure 9. Make sure you can see a "Peak" and "Reflection Point".

4. If you wish, mark the Peak position by double clicking near the top of the peak. This peak is **constant**. By default, the peak (when set) will appear as a red vertical line (you can change this color using the Display Options Window).
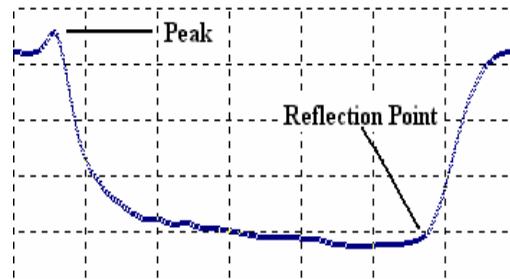

Figure 9. A sample trace with a higher Dist/Div setting.

5. Press the "**Auto**" Analyze Button. Finished! You have just set up a single probe and analyzed the graph.

Some Things to play with:
- You can **drag** the peak position to get it closer to the first peak.
- **Drag** around the reflection point.
- Press the **Manual** button; an analysis with *user specified* parameters is generated.