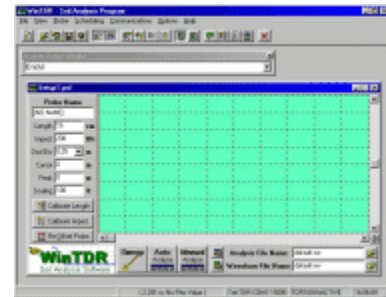


Chapter 2: The WinTDR Interface

This chapter will describe in detail each component of the WinTDR interface. This includes: The Main Window, Probe Setup Window, Waveform File Window, and the Display Options Dialog. Other items, such as Analysis Options etc. are described in their respective chapters.

The Main Window

Contains a menu bar, a tool bar, two or more windows, and a status bar. The names of the two main types of windows are Probe Setup Window (also similar is the Waveform File Window) and the Analysis Output Window. These are referred to in the help as the Setup window and the AOW.



Located at the top of the screen, the Menu Bar and the Tool Bar contain various environment settings featured to save, back up system settings, or run specific functions.

The AOW is used to keep track of the calculated results. By clicking on the side arrow, you can also look at past results (up to 50).

The status bar at the bottom of the main window is used to provide relevant information to the user. It gives help tips, time, and other useful items to make it easier to run the program.

The Setup window is used to control settings directly linked to the calculations and in getting the information from the TDR or Waveform Files. Each probe has its own distinct set of parameters allowing a wide range of possibilities.

Note: Because of the continuous nature of this software, the software may contain more features that are not listed here.












The Menu Bar and Tool Bar





Figure 1: The Menu Bar and tool bar icons.

The Menu Bar features is broken into seven main areas: File, View, Probe, Scheduling, Communications, Options, and Help. Below is a description of each main area and their components.





File

New	 <i>Probe</i>	Creates a Single Probe Setup File
	 <i>Probe List</i>	Creates a Probe List Setup File
	 <i>SDMX50 (8 to 1)</i>	Opens Setup Manager and Setup File
	 <i>VaZEC (16 to 1)</i>	Opens Setup Manager and Setup File
 <i>Open Setup</i>		Will open a Probe Setup File (.psf) or old style TDR setup file (.tdr).
 <i>Save Setup</i>		Will save the active Setup to file.
 <i>Save Setup As</i>		Will prompt the user to save the active Setup to file.
 <i>Open Waveform File</i>		Will prompt the user to select a waveform file (.wv) to open for viewing and re-analysis in a Waveform File Setup Window.
 <i>Save Analysis</i>		Will save the probes most recent analysis information to file. This is also located in the Setup Windows.
 <i>Save Waveform</i>		Will save the probes current waveform to file. This is also located in the Setup Windows.
 <i>Exit</i>		Will close the WinTDR Program. The user will be prompted to save changed setup files that are still open.

View



 <i>Capture Waveform</i>		Displays the captured waveform for each setup in the background of the Graph Window (behind the current waveform).
 <i>Analysis Output Window</i>		Hides or Shows the Analysis Output Window (AOW).

Probe



 <i>Capture Waveform</i>		Will copy the currently displayed waveform into the background of the Graph window. If <i>View Capture Waveform</i> is enabled when a new waveform is swept or displayed, the user can view both the captured waveform and the new waveform simultaneously.
 <i>Copy Probe</i>		Copies the Current Probe into the WinTDR clipboard. You can then paste the probe values in any Setup window. You can not paste a copied probe into a document other than WinTDR
 <i>Paste Probe</i>		This pastes the probe found in the WinTDR clipboard to the active Setup window's probe values.
 <i>Reset Probe</i>		This will return the probes values to the initial values.

Calibration and Re-Offset will be described later in this chapter when we describe the Probe Information Window.





Scheduling

-  *Start Reading Cycle* Begins sweeping and analysis of the probes scheduled for Automated readings.
-  *Adjust Scheduling* Allows you to determine what probes will be automatically swept and analyzed during Automated readings. Including the interval rate.



Communications (See Chapter 3 for more information)

-  *Activate / De-activate Tektronix TDR* Will attempt to connect to or disconnect from the Tektronix 150X B/C TDR units.
-  *Tektronix Settings* Allows you to change the settings WinTDR uses to connect to the TDR.

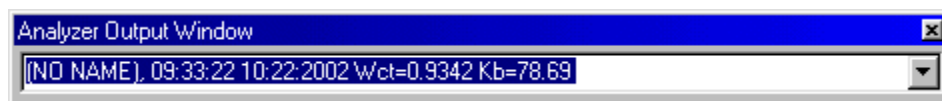
Options

-  *Waveform Analysis* Opens the Analysis Options Dialog (See Chapter 5)
-  *Length Calibration* Opens the Length Calibration Dialog (See Chapter 4)
-  *File Formats* Opens File Format Options Dialog (See Chapter 8)
-  *Display Options* Opens the Display Options Dialog described later in this chapter.

Help

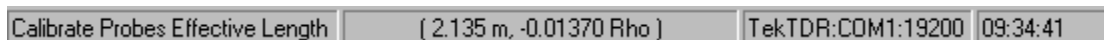
-  *About WinTDR* Displays Version and Build numbers, including contact information
-  *Help with WinTDR*

The Analysis Output Window (AOW)



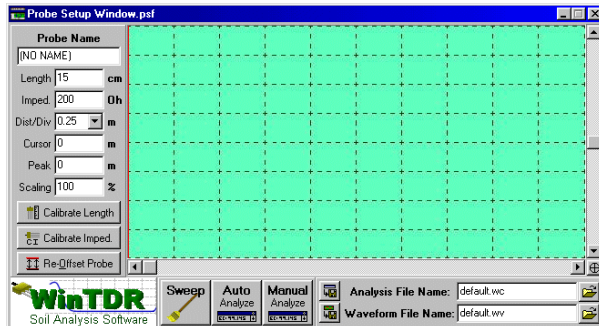
The Analysis Output Window is where the results of any calculations are sent after an analysis. Depending on what is selected, the output window will contain a line with the probe name, the time of the analysis, the date of the analysis, the bulk dielectric value, the water content value, and if analysis performed an Electrical Conductivity calculation, the Ec. By pressing the arrow on the side you can view the last 50 readings taken by the program.

The Status Bar

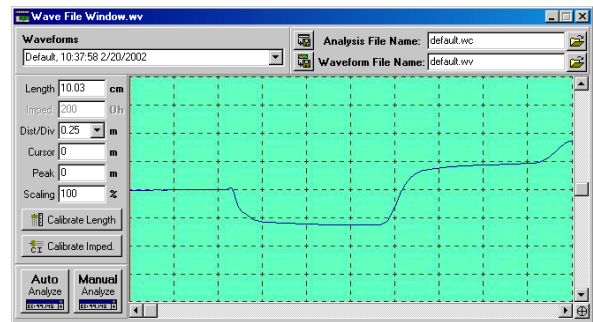


The Status Bar contains information about the status of WinTDR. Each section represents the following (from left to right): Hints displayed when over a control; Waveform distance and Rho value. This value is updated when the mouse is moved over the graph; Tektronix TDR status. Either Inactive or active displaying the COM port and baud rate at which the user is connected; and System Time. This is the time recorded from the Operating System Clock.

The Probe Setup Window / Waveform File Window



The Probe Setup Window



The Waveform File Window

The Probe Setup and Waveform File Windows contain various components, many of which are similar. For convenience we will break them into four sections: the Control Buttons, Destination File Control, Probe Information, and the Graph.

Control Buttons

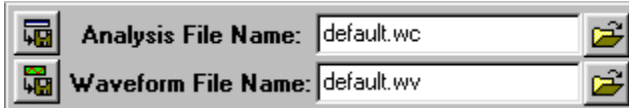


Located at the bottom left of the window, the Control Buttons act to control communications with the TDR and to analyze the current wave.

- *Sweep* – Will communicate with the TDR and retrieve a waveform from the specified probe settings. Accuracy of each waveform comes from the *Tektronix Settings* described in Chapter 3. (The sweep button is not available for the Waveform File window seeming it makes no communications to the TDR)
- *Auto Analyze* – Will analyze the current waveform. Depending on the *Analysis Settings* many things might occur by clicking it from: Offsetting the Probe, Retrieving a waveform, retrieving a Long waveform (for Ec Calculation), and analyzing the probe. The peak position is automatically determined if not previously set. The second reflection line will always be automatically determined. Tangent lines will be drawn.

- *Manual Analyze* – Will analyze the current waveform but will not automatically determine the second reflection line. The second reflection line is set before manual analysis by the user. This is done by clicking and dragging the second reflection line in the graph window to the desired location. Tangent lines will not be drawn. NOTE: Clicking this button before the waveform has been analyzed will result in an *Auto Analyze* operation. Also, the second reflection line cannot be moved before the peak line.

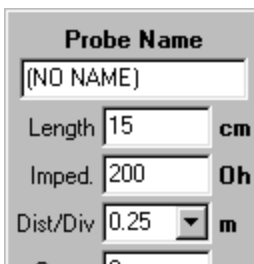
Destination File Control



Located at the bottom right of the Probe Setup Window (or the top right in the Waveform File Setup). These are the names of the files where waveform and analyzed data are stored. The buttons on the left are the same as described from the **Main Menu**. The two buttons on the right open a file dialog allowing the user to select an existing file to save data to. The text in the edit boxes are the file names where the data will be saved. NOTE: If there is no path information (ex. filename.wv) the file is saved to the “WaveAnalysis” Folder created during installation.

Probe Information

The probe information differs from Probe Setup to Waveform File Windows. Probe name only occurs in the Probe Setup. In the Waveform File Window *Probe Name* is replaced with a *Waveform* box at the top of the Window. This Waveform box allows the user to select any waveform that was in the opened waveform file for display and re-analysis. **Note:** If there are two waveforms that have the same header information in the .wv file, they are assumed to be the same waveform and only one is loaded.



This window contains probe specific information and functions.

Boxes:

- Length The effective length of the probe (in centimeters)
- Imped. Impedance of the cable, and the probe in a known given dielectric. This value can be set manually, or set by calibrating for the probe impedance in a container of the known dielectric solution.

Dist/Div Distance per division. Each graph has 10 divisions, so a graph starting at 0 meters (see Cursor) with a dist/div of 0.25 will be a graph from 0 to 2.5 meters. For more information see the Tektronix TDR manual.

Cursor Cursor position in the TDR device. This is where the waveform will begin. (in meters). In reality it corresponds more to the side-to-side control. In this case the cursor always marks the start of the screen. Waveform sampling is taken from the cursor position forward. For more information see the Tektronix TDR manual.

Peak Position of the user set peak. (in meters)

Scaling Stretches the waveform out vertically allowing a more detailed view of the waveform. Will not effect the waveform Rho values. Scaling is for viewing convenience only.

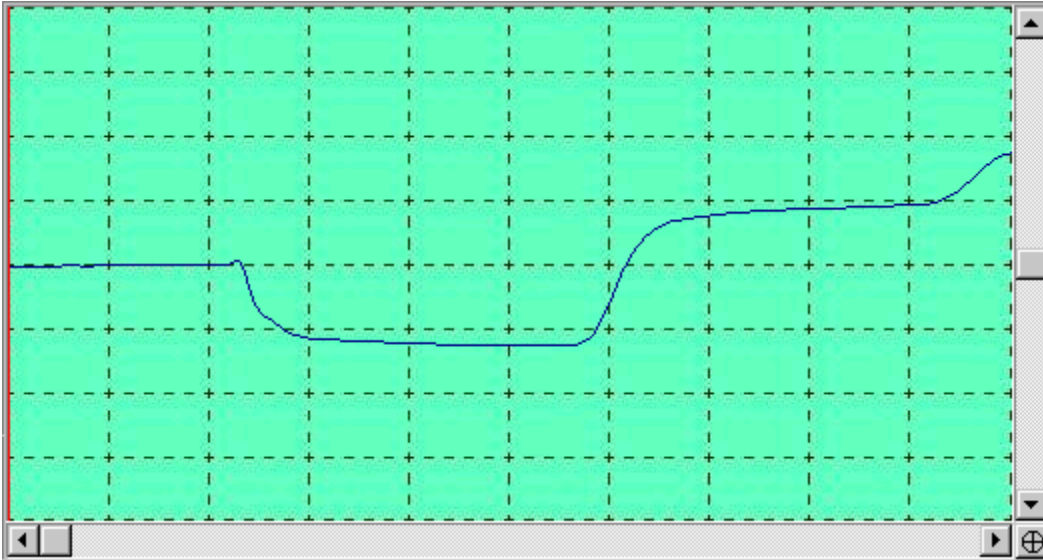
Buttons: (See Chapter 4)

Calibrate Length Finds the Probes Effective Length

Calibrate Imped. Finds the Probes Characteristic Impedance

Re-Offset Probe Used in calculating Rho Values. The re-offset button takes two readings from the TDR. The first waveform, not displayed in the graph window but in the TDR LCD, is a reading from -.6m with a small distance per division. This allows two averages to be calculated. These averages are needed to compute the reflection coefficient waveform (Rho data points) The second reading from the TDR is the same as clicking the sweep button. **NOTE:** Not found in the Waveform File Window.

The Graph Window



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.

To position the graph vertically use the vertical scroll bar. Moving the horizontal scroll bar allows the user to change the cursor position quickly for far distances down the cable. (The Tektronix has a range of -0.6 to 624.3 meters). For fine tuning the cursor position use the arrows on the horizontal scroll bar or type in the value manually.

The \oplus icon located in the bottom right corner of the graph when clicked will put the graph back to the settings it was swept at and reset the vertical scroll bar to center.

Display Options Dialog

The Display Options Dialog allows the user to change various display options for the *Graph*. Below is a screen shot of the dialog box with explanations of each function.

Graph Line Colors

Lines drawn in the graph can have specified colors. *Peak* refers to the user defined peak. *Wave* is the waveform color. *Tangents* are the tangent lines drawn to find the second reflection. *Analysis* lines are the Analyzed Peak position and the second reflection. *Captured* is the captured waveform color.

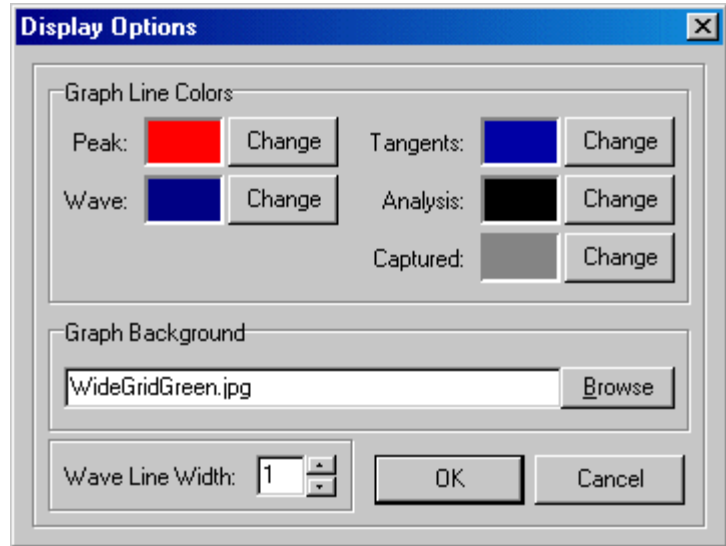
Graph Background

You can specify what type of background you want on the graph, say it be a grid with different colors or a background specific to research you are currently doing. WinTDR comes with different backgrounds that can be loaded by clicking the browse button and choosing a different filename.

Graph backgrounds can be any .JPG or .BMP image and should be of the dimensions 502 x 256 pixels. If you load a different sized graph background it will be stretched to accommodate all the graph space.

Wave Line Width

You can specify how thick the waveform will be drawn. The thicker it is the easier it is to see it but the less accurate it will appear to be in the graph.



The Display Options Dialog