

Olson Instruments, Inc. Manual

Windows Impact Echo (IE) Software – Version 1.13

1.0 INTRODUCTION AND SETUP INSTRUCTIONS


The Windows TFS software is a real-time data acquisition program. This quick guide covers step-by-step data acquisition, data analysis and output generation. An accompanying guide covers hardware setup and use for the Olson Instruments Freedom Data PC IE-1/IE-2 systems.

The followings are steps to install the WinTFS software

1. Run Setup.exe from the install CD
2. Type any numbers for Serial number
3. Follow the default setup
4. After finishing the installation, the WinTFS.exe file will be put in c:\program files\olson instruments\WinTFS. We suggest you make a shortcut from the desktop.
5. Copy “IEdefault.prm” file from the CD to the root directory in the freedom data PC hard drive and/or your personal computer

2.0 STEP-BY-STEP GUIDE TO WinTFS (IE) SOFTWARE DATA ACQUISITION

2.1 Start the Program

To run the Impact Echo software, simply execute “WinTFS.exe” and the dialog box shown in Fig. 1 should appear on your screen. Click on  to proceed to the Impact Echo program.

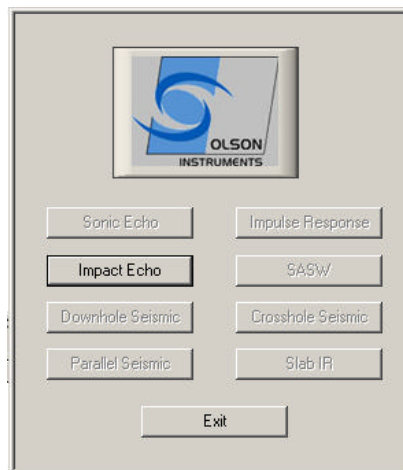


Fig. 1 – Main Menu of WinTFS Software

2.2 Setup Data Parameter

The next screen as shown in Fig. 2 should appear on your screen

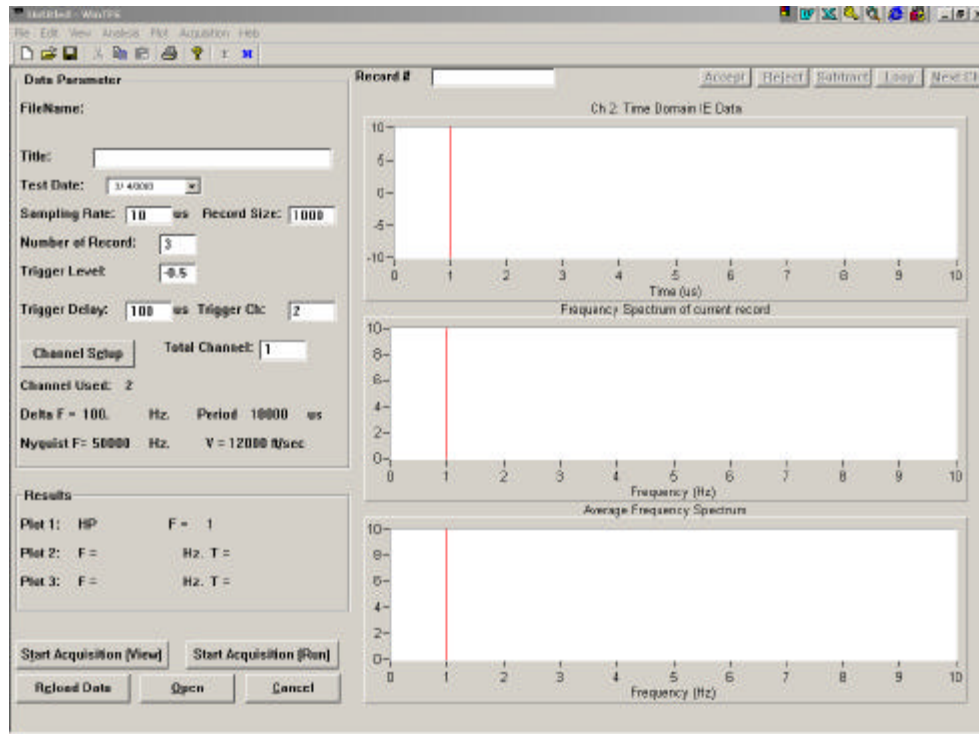
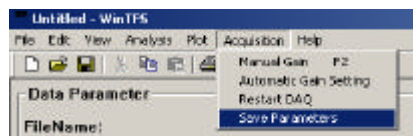


Fig. 2 – Main Screen for Impact Echo Software

The IE program will be loaded with the data parameters saved in the IEdefault.prm in your C: drive. You can change any of the data parameters. If you want to keep these parameters for future use, you have to save the parameters by going in to Acquisition/Save Parameter



There are 7 parameters effecting the IE data acquisition:

- Sampling Rate means how often (in time domain) the system will acquire data. In this case, the default was set at 10 microseconds. This means the system will acquire data at 10 microsecond intervals.
- Record Size is number of sampling points for each waveform. The higher this value, the more data acquired in each waveform (also dependent on Sampling Rate).
- Number of Record is a total number of IE data records you want to save
- Trigger Level is the minimum signal amplitude to trigger data acquisition
- Trigger Delay is amount of time before the triggering point that data collection starts

- Trigger Ch is the channel that the data acquisition triggers on
- Channel Setup is the place to turn on the channels used in data acquisition. The dialog box in Fig. 3 should appear on your screen for channel setup.

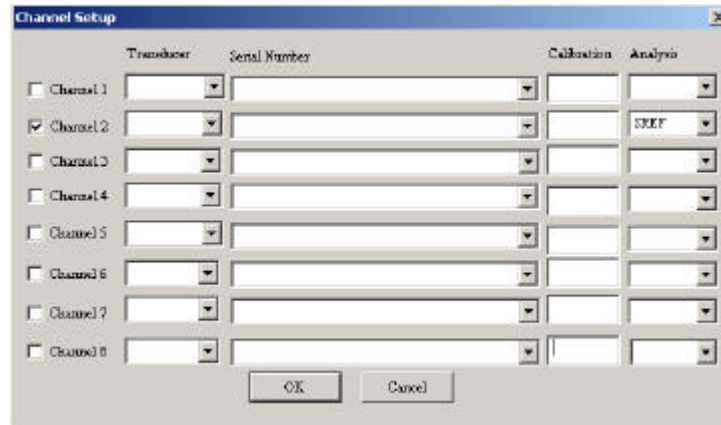
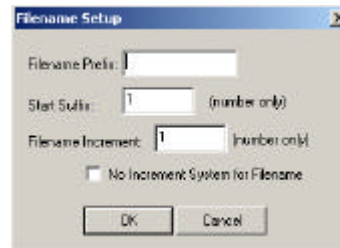


Fig. 3 – Channel Setup

2.3 Setup Filename System

The software allow user to setup a filename system with a prefix and an increment for speed testing. To activate this option, go to File/Setup FileName.. The dialog box below should appear in your screen. Once the prefix , first start suffix and increment are set, automatic naming system will be assigned to the data when the user click on “Start Acquisition” either in VIEW or RUN mode.



2.4 Start the IE Test in View Mode

To start IE data acquisition in the view mode, simply click on **Start Acquisition [View]** , after which the file dialog box shown in Fig. 4 should appear on your screen. In the view mode, accepting and rejecting the data is required. Note that a minimum period for the IE test is 2000 micro second, the program will automatically increase the record size accordingly. Enter the filename and click on Save button.

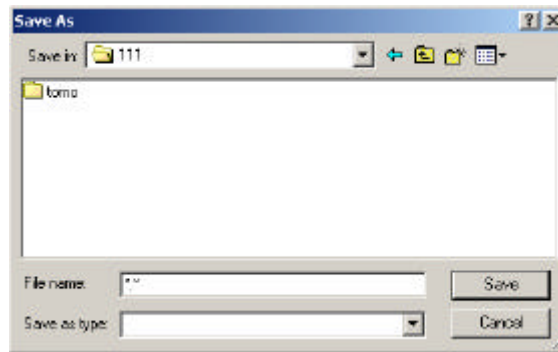


Fig. 4 – Filename Dialog Box

When the status bar (top bar) shows “Waiting for Data”, it means that the program is ready to take data. Once the program receives the data, the top trace shows IE time domain data and the middle trace shows frequency of data in the top trace. At the top of the screen next to the status bar is the suggestion to accept or reject the record (Fig. 5). The suggestion will be “Good Data” if the maximum amplitude of the signal is between 3 – 7.5 Volts. Otherwise, the suggestion will be “Suggest to Reject – AG” and gain will be automatically adjusted. Then click on either **Accept** or **Reject** to either accept or reject the signal, respectively. Repeat the IE test until all the data are recorded. Once the number of acquired IE data equals Number of Records specified in the data parameter, the data acquisition will stop and the data parameter portion will be enable and ready for a new test. To start a new test, simply click on **Start Acquisition [View]** and repeat Step 2.3.

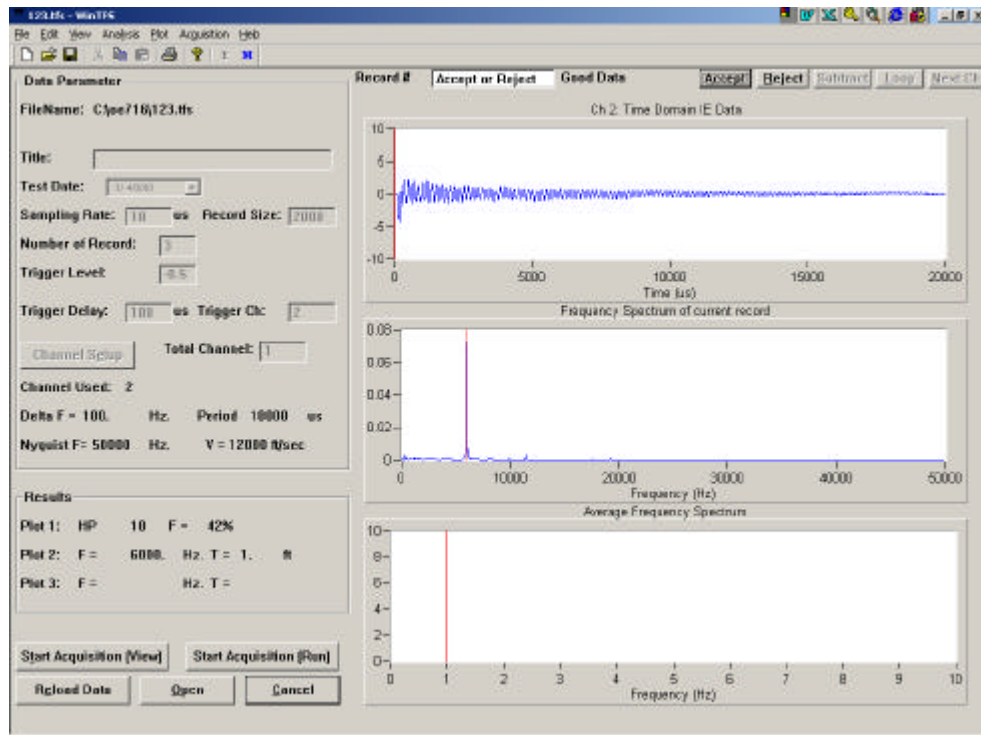


Fig. 5 – Data Acquisition with Time Domain Data in Top Trace and Frequency Spectrum in Middle Trace – Testing on 12 inch long concrete cylinder

2.5 Start the IE Test in Run Mode

In Run mode, automatic accepting will be applied to all the acquired data. Before start data acquisition in this mode, gain needs to be established. To established the gain, go to Acquisition/Automatic Gain Setting. Gain will be set based on the signal amplitude. If the maximum amplitude is less than 3.5 Volts, gain will be increased. If the maximum amplitude is higher than 7.0 Volts, gain will be decreased. Gain is set when user accepts the data.

After gain is established, click on **Start Acquisition (Run)** to start recording data.

2.5 Data Analysis

There are two ways to recall the data. If the currently loaded file is to be reviewed, simply click on **Reload Data**. Otherwise, click on **Open** to open a new file.

2.5.1 Filter Function

If filtering is required for the IE data, go to Analysis/Digital Filter or press F4 to set the desired filter. The dialog box in Fig. 6 should appear on your screen. There are four options for digital filtering; Butterworth, Chebyshev, Elliptic and Inverse Chebyshev. Digital filter will be applied to all the data. To disable filtering, simply leave all the filter options unclicked.

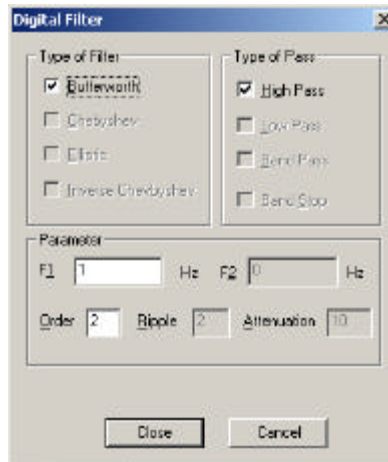


Fig. 6 – Digital Filter

2.5.2 Window Function

If the IE data in the time domain need to be windowed out due to noise or other factors, A window function should be applied to the data. To activate the Window function, go to Analysis/Window or press F3. To set the first time cut (T1), right click on the T1 entry box (in the Window Dialog Box) and then click on the top trace plot where T1 will be set. In the case of BinBandPass, to set the second cut (T2), right click on the T2 entry box (in the Window Dialog Box) and then click on the top trace plot where T2 will be set. See Fig. 7 for example of data

with Band Pass Window function. Please note that the Window Dialog Box needs to be opened (it can be minimized) as long as the windowing function is required.

2.5.3 Output File

To activate the exporting feature, click on File/Setup Output File and enter the name of the output file. Once the output file has been setup, the program will automatically write the thickness results from the file to the output file (text file) until the output file has been closed (File/Close Output File).

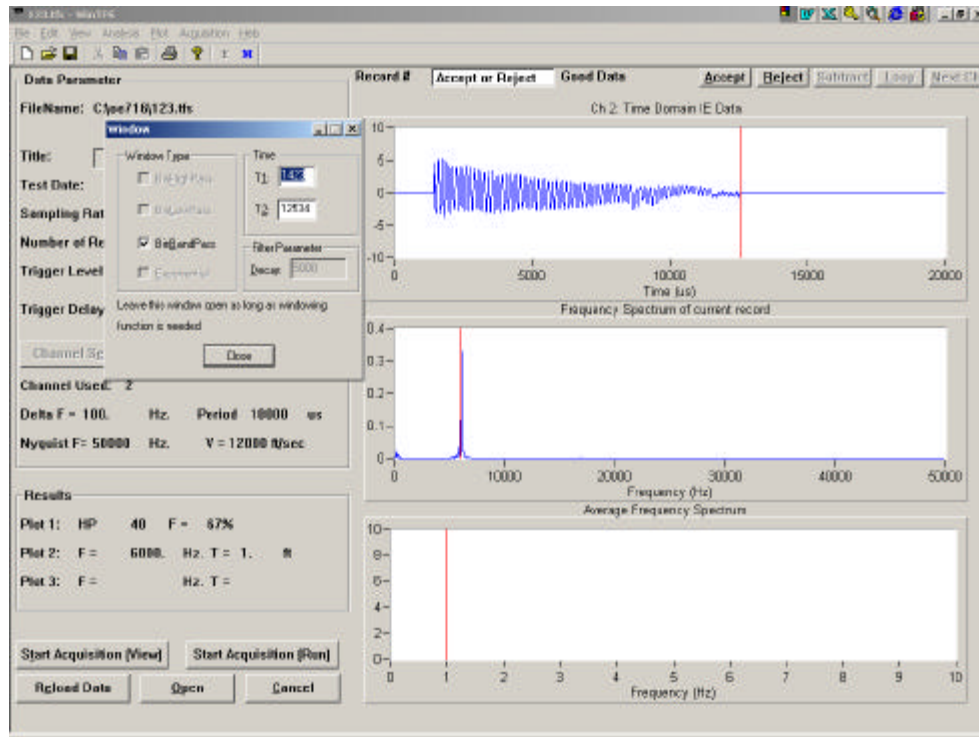


Fig. 7 – BinBandPass Window Applied to IE Data in Time Domain