

WavesView v2.02

User's Guide

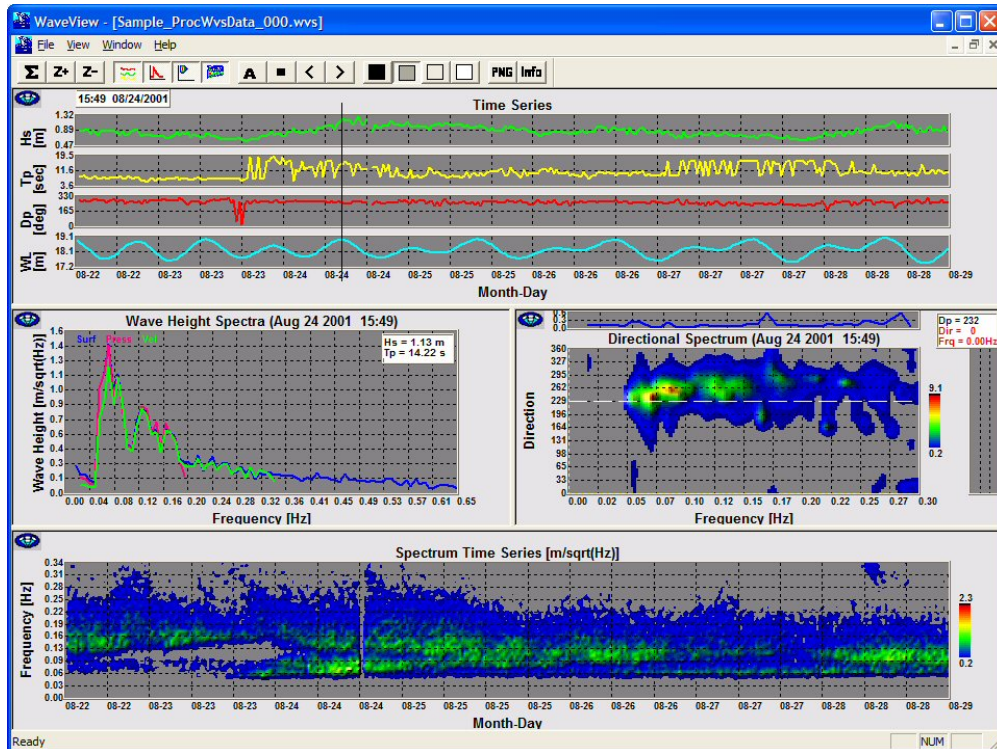


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WavesView User's Guide

1 Introduction

WavesView is geared toward analysis and presentation of processed wave data created by the software program *WaveMon*. *WavesView* allows you to view time series and search for interesting events or wave climate. The software reads files containing wave records (*.wvs). The wave record is an extensible structure like an ADCP Ensemble. Each wave record can contain raw time series, processed data, and information about the data collection for a burst. For details on how to use *WavesView*, see “Using *WavesView*,” page 4.

Use the **File** menu to load a wave record (*.wvs) file. *WavesView* allows you to zoom, average, and animate wave height spectra, and directional spectra. Any of the displays can be saved to text files, saved as a bitmap or Portable Network Graphic (PNG), and printed.

1.1 How to Contact Teledyne RD Instruments

If you have technical issues or questions involving a specific application or deployment with your instrument, contact our Field Service group:

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1.2 Conventions Used in this Guide

Conventions used in the *WavesView* User's Guide have been established to help you learn how to use these programs quickly and easily.

Windows menu items are printed in bold: **File** menu, **Import Mission**. Items that need to be typed by the user or keys to press will be shown as <F1>. If a key combination were joined with a plus sign (<ALT+F>), you would press and hold the first key while you press the second key. Words printed in italics include program names (*BBTalk*, *PlanADCP*) and file names (*dpl1_6.dpl*).

Code or sample files are printed using a fixed font. Here is an example:

```
WorkHorse Broadband ADCP Version 16.XX  
TELEDYNE RD INSTRUMENTS (c) 1996-2006  
ALL RIGHTS RESERVED  
>
```

You will find three other visual aids that help you: Notes, Cautions and Recommended Settings.



NOTE. This paragraph format indicates additional information that may help you avoid problems or that should be considered in using the described features.



CAUTION. This paragraph format warns the reader of hazardous procedures (for example, activities that may cause loss of data or damage to the ADCP).



Recommended Setting. This paragraph format indicates additional information that may help you set command parameters.

1.3 System Requirements

The *WavesView* software requires a Windows® compatible computer with the following specifications:

- Windows XP® or Windows 2000®
- Pentium III 400 MHz class PC (higher recommended)
- 64 megabytes of RAM (128 MB RAM recommended)
- 10 MB Free Disk Space plus space for data files (A large, fast hard disk is recommended)
- One Serial Port (two or more High Speed UART Serial Port recommended)
- Minimum display resolution of 1024 x 768, 256 color (higher recommended)
- CD-ROM Drive
- Mouse or other pointing device

1.4 Software Installation

To install *WavesView*, do the following.

- a. Insert the compact disc into your CD-ROM drive and then follow the browser instructions on your screen. If the browser does not appear, complete Steps “b” through “d.”
- b. Click the **Start** button, and then click **Run**.
- c. Type **<drive>:launch**. For example, if your CD-ROM drive is drive D, type **d:launch**.
- d. Follow the browser instructions on your screen.

2 Using WavesView

WavesView is used to view the Wave Record (*.wvs) file that was created by *WavesMon*.

- a. Start *WavesView*.
- b. On the **File** menu, select **Open**.
- c. Select the *.wvs wave record file to open. Click **Open**.



NOTE. A sample wave record file is on the Waves CD. It is not copied to your hard drive during software installation.

2.1 WavesView Displays

There are four main displays, the **Time Series** view, the **Wave Height Spectra** view, the **Directional Spectrum** view, and the **Spectrum Time Series** view. The **View Selection** buttons on the toolbar allow you to quickly choose the views that you would like to see and remove the ones that are not of interest. The views automatically resize to fill the space available.

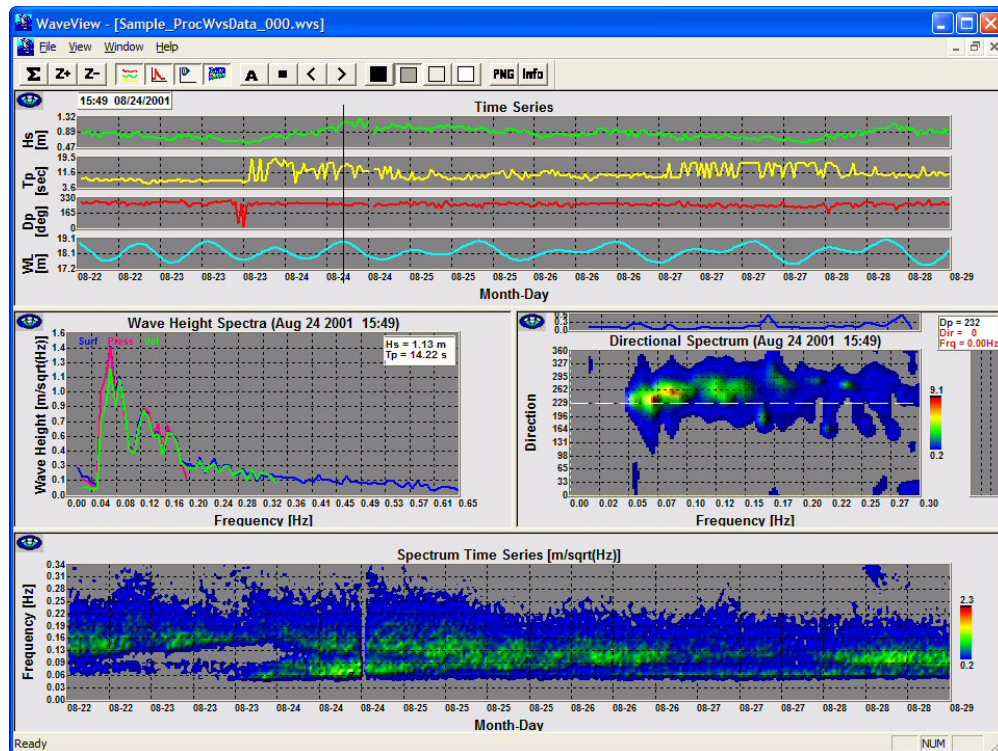


Figure 1. WavesView Displays

2.2 Customizing Views

By clicking the left mouse button in the **Time Series** view you can select a particular burst of data. The data from this time period will then be displayed in the **Height Spectrum** and **Directional Spectrum** plots.

Zoom. If a region in the **Time Series** view window is selected by dragging the mouse, and the **Zoom +** button is clicked, the chosen region will be zoomed to the full plot width. When Time Series are very long, this feature can allow you to zoom in on a particular time. **Zoom -** always restores the screen to its full extent. If a region in the **Spectrum Time Series** view window is chosen this will be zoomed by the same buttons.

Average. By dragging the mouse in the **Time Series** view window one can select a range time to average over. Clicking the **Average** button will then average the Wave Height Spectrum and Directional Spectrum over the interval selected. The data is averaged as power spectra even though it is displayed as height spectra.

Background Color Buttons. The background color for all of the view windows can be chosen with these buttons. You can choose your preference or select a white background when printing to save ink.

PNG Button. The **PNG** button saves all of the views on the screen to *.PNG (Portable Network Graphics) files. Using this button, the file names are generic and their location is the current directory. The file names are: *Time-Series.png*, *SpecTime.png*, *HeightSpec.png*, *DirSpec.png*. Alternatively, to save the views to PNG image files with a specific name and path, right click the particular view then click the **Save *PNG** button. This will prompt you with the standard windows file dialog box.

INFO Button. The information button is designed to provide a quick summary of the data set being viewed. Information includes how the data was collected, how it was processed, and when it was sampled. The **Save To File** button saves this information summary to a text file exactly as it appears in the dialog.

2.3 Display Options

To change the settings in any of the views *right* click the mouse in that view. Each view can be printed, saved to bit map (*.bmp), saved to Portable Network Graphic (*.png), or saved to a text file.

- The Bitmap or Portable Network Graphics allows you to import the images into papers or reports. The PNG (Portable Network Graphics) file is a loss-less image compression format that can be easily ported into a Web page. The PNG files are typically 100 times smaller than the equivalent Bitmap file.

- The text files can be loaded into MatLab or a spreadsheet program for further analysis. There are comments at the beginning of the text files describing the file. These comments are preceded by a “%” so that MatLab will perceive them as comments.

2.3.1 Time Series

The Time Series view displays time series of significant wave height, peak period, peak direction, and water depth. Data that is missing or bad is not shown. To select a time in the series click the left mouse button over the data of interest. To average or zoom, drag the mouse from the start time to the stop time that you wish to operate on, then click the **Average** or **Zoom** tool bar button.

To mark a wild data point bad, select the region you wish to mark and right-click the mouse. The dialog that pops up has a **Mark Burst Bad** button; click this. **Markers** can be turned on if you wish to see the exact location of each data point or if the plot is to be printed on a non-color printer. Individual time series plots can be added or removed to optimize the available space for your preference. For example one can turn off the period, direction and the water level plots if more detail of the Hs plot is most important. As with all the views you can print, print preview, save a bit map image or PNG image, and save the data to text file.

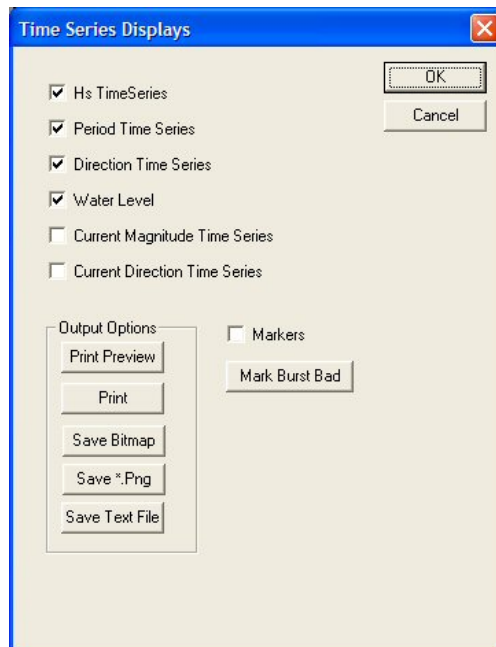


Figure 2. Time Series Display Options

2.3.2 Wave Height Spectra

The wave height spectra view displays height spectra in units of meters/sqrt(Hz) for the pressure sensor, orbital velocities, and surface echo location. Individual plots may be turned on or off as desired. The tabular significant wave height and peak period are calculated on the basis of the displayed data. The displayed data may be an individual burst in the time series or averaged data.

Enabling the **Error Bars** shows the noise floor level of each particular spectrum. If you wish to print the plots on a non-color printer you may turn on the **Markers** to distinguish between lines. The Y-axis automatically scales the plot to fill the screen, however if you are doing an animation and wish to compare absolute level you may want to select a level that is fixed. The X-axis uses the automatically calculated cutoff frequencies for each plot unless you manually choose the cutoffs. As with all the views you can print, print preview, save a bit map image or PNG image, and save the data to text file.

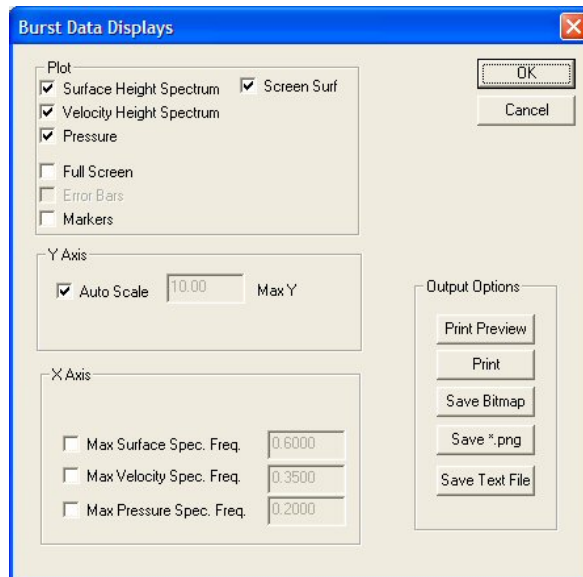


Figure 3. Wave Height Spectra Display Options

2.3.3 Directional Spectrum

The directional spectrum is plotted in units of meters/sqrt(Hz)/degree. The data has been smoothed by a radial interpolation algorithm to give it 16 times as much resolution for the display. Further shading has been added to enhance the 3D nature of the plotted data. The tabular direction displayed in the upper right corner is the peak direction.

By *right* clicking the mouse over the plot a dialog appears which allows the plot to be modified. You can choose between **Cartesian** or **Polar** displays by selecting that option. The range of the X and Y-axis can be manually set to focus on a particular part of the spectrum. The X-axis defaults to 0.25 Hz upper cutoff frequency unless you manually choose the cutoff. You can adjust the lower threshold for the contour colors and still take advantage of the automatically adjusted upper threshold. As with all the views you can print, print preview, save a bit map image, and save the data to text file.

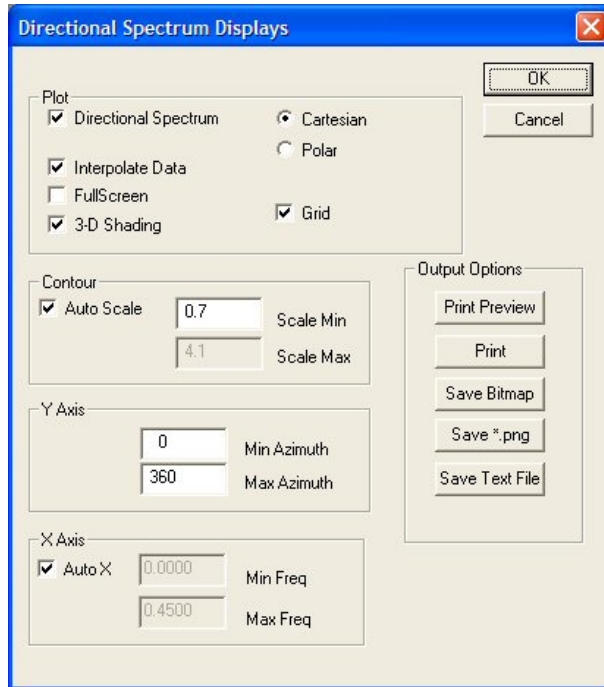


Figure 4. Directional Spectrum Display Options

2.3.4 Spectrum Time Series

The spectrum time series provides a big picture view of the evolving wave climate. Wave Height spectra are plotted vertically with time on the X-axis. Storm swell can be seen arriving and dissipating. You can see the dispersion relation in the slope of the low frequency waves with time. The data has been smoothed by a radial interpolation algorithm to give it 16 times as much resolution for display. Further shading has been added to enhance the 3D nature of the plotted data.

By *right* clicking the mouse over the plot a dialog appears which allows the plot to be modified. The range of the X and Y-axis can be manually set to focus on a particular part of the spectrum. To zoom in on a particular region drag the mouse to select a rectangular region, then click the **Zoom** button on the tool bar. **Zoom-** will restore the plot to full view. As with all the views you can print, print preview, save a bit map image, and save the data to text file.

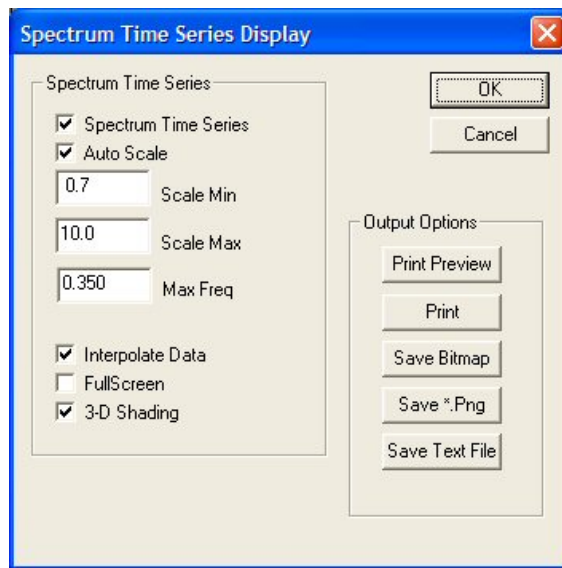


Figure 5. Spectrum Time Series Display Options

3 WavesView Command Line Options

The command line options for *WavesView* are as follows:

WaveView.exe [filename.wvs] [Auto]

- The first item on the command line is always the Wave Record (*.wvs) file that you wish to view.
- If this is followed by the word "Auto", *WavesView* will open the file, display the latest (last) burst in the file, and output the views that are on the screen to PNG files. After this the program will close itself automatically. This feature is designed to make it easier to automate displaying wave data on the WEB in real-time.

4 WavesView File Formats

The file extensions have the following meanings.

Table 1: File Naming Conventions

Extension	Description
*.wvs	Waves Record file created by processing data using <i>WavesMon</i> and viewed with <i>WavesView</i> .
*.wks	Workspace file for <i>WavesView</i> . Saves how the screens looked when the file was closed. The *.wks file is automatically saved/created when the file is closed.

4.1 WavesView Input

Wave Records. The program input is wave record (*.wvs) files. The *WavesMon* software creates Wave record files.

4.2 WavesView Output

Print. Each plot can be printed. The size of the resulting print can be controlled by the size of the plot on the screen. Use **print preview** to check your results.

BitMap. The views can all be saved as bitmaps so that they can easily imported into papers.

PNG. The PNG (Portable Network Graphics) file is a loss-less image compression format that can be easily ported into a Web page. The PNG files are typically 100 times smaller than the equivalent Bitmap file.

Text. The views can be saved to text files so that the results can be imported into *MatLab*, or a spreadsheet program for further analysis.

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