



# HorizonADV

## Read Me First!

### Contents

<b>1 .... 1. Getting Started</b>	
1 .... 1.1 Overview	
2 .... 1.2 System Requirements	
2 .... 1.3 Software Installation	
<b>3 .... 2. Starting HorizonADV</b>	
<b>5 .... 3. Collecting Data</b>	
5 .... 3.1 Connecting to a Single ADV	
6 .... 3.2 ADV Probe Configuration & Diagnostics (BeamCheck)	
	7 ..... 3.3 Changing the ADV Settings
	8 ..... 3.4 Changing the Data Collection Settings
	9 ..... 3.5 Starting Data Collection
	10 ... 3.6 Recording Data
	<b>11 ... 4. Viewing Data Files</b>
	<b>13 ... 5. Software Layout and Features</b>
	<b>15 ... 6. ADV Principles</b>
	<b>16 ... 7. Support &amp; Contact Information</b>

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## 1. Getting Started

### 1.1 Overview

This document is a quick instruction and reference guide to using the HorizonADV software with your ADV. The topics covered in the following sections include a brief description of the instrument, software installation, system configuration, recording data and loading of recorded files. For more detailed information on any of these topics please refer to either the ADV or HorizonADV Manuals.

The SonTek HorizonADV software offers a flexible and dynamic user interface designed to easily guide the user through the data collection and display process. The program can be used with either a single ADV or a series of ADVs working in parallel.

The software requires the use of either Windows 2000 or XP and is designed to combine a high degree of flexibility with ease of use, allowing you to use a single package for all your ADV requirements.

The HorizonADV software can be used for:

- Collection of data using a single ADV
- Collection of data using multiple ADVs connected to a MultiPort system
- Configuration of ADV systems
- Display of data files collected using ADV systems



## 1.2 System Requirements

The minimum hardware and software requirements needed to operate the HorizonADV software are:

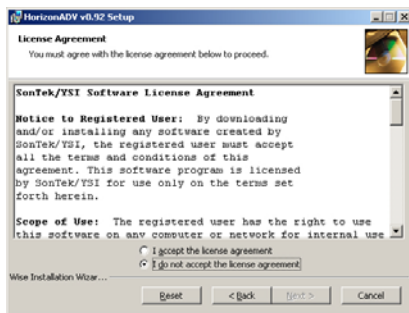
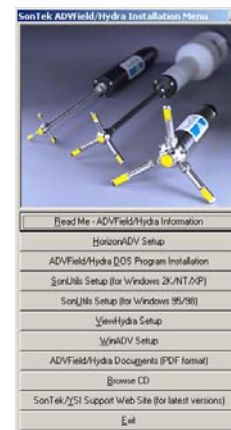
- SonTek ADV Field (Standard ADV, MicroADV or ADVOcean) required for real-time data collection
- Microsoft Windows 2000/XP (XP recommended)
- 700 MHz processor (1 GHz recommended)
- 128 MB physical memory (256 MB recommended)
- 200 MB available disk space (500 MB recommended)
- Monitor capable of 1024 x 768 resolution, 16-bit color

Computer systems that do not meet the listed minimum requirements will experience a decrease in performance that may result in a loss of data.

## 1.3 Software Installation

To install the HorizonADV software on your PC, insert the HorizonADV CD into your CD-ROM drive. The program should automatically start and display the **Installation Menu** (shown to the right), if not then use Windows Explorer to navigate to the CD-ROM drive and then double click on **setup.exe**.

Select the **HorizonADV Setup** option to begin installation of the software.



The HorizonADV Installation will start and the **License Agreement** screen (shown to the left) will be displayed. Follow the on-screen instructions to complete installation of the software.

Other items available in the **Installation Menu** are:

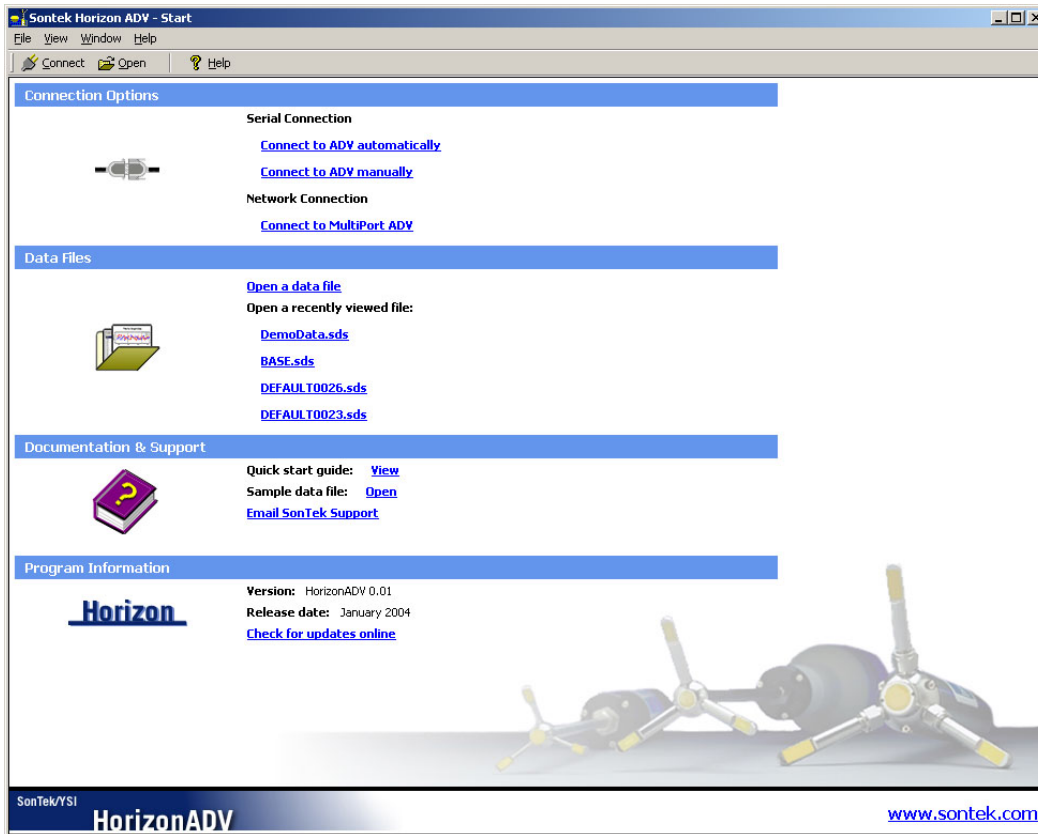
- Online documentation
- Installation of SonUtils– general utilities and diagnostics software
- Installation of other ADV software – DOS and Windows software
- Links to the SonTek/YSI website



## 2. Starting HorizonADV

**Important Note** - Ensure that all other software programs that access the serial ports are closed prior to starting the HorizonADV software.

Start the HorizonADV software by pressing the **Start** button and then **Programs | SonTek Software | HorizonADV**.



The software will start and the HorizonADV **Start Screen** will be displayed (shown above). This page serves as a launching point for all other functions of the program. To activate an option on this page, click on the bright blue text.

The options available on the Start Screen are as follows:

**Connect Options** – Select this option for real-time data collection using a single ADV or multiple ADV's connected to a MultiPort data acquisition system. The ADV must be connected to the serial port of your computer.

Automatic and manual options are available to connect to a single ADV. Beginning users are recommended to use the **Connect to ADV automatically** option to connect to their system.



To use the MultiPort connection you must have the MultiPort hardware connected to the local network. Additional information can be found in **Appendix B** of the HorizonADV manual.

**Data Files** – Select this option to open either an .ADV or .SDS (SonTek Data Session) file. Horizon uses SDS files for all operations so .ADV files are automatically converted to the SDS format when opened (the original .ADV file will not be modified or deleted). The last four files that were opened in HorizonADV are also displayed for easy access. Click on the file name to open the file directly.

**Documentation & Support** – Links to the online Quick Start guide (this document) and the sample ADV data that is included with the installation are displayed here. A shortcut to email SonTek Support if you have any questions is also available.

**Program Information** - The HorizonADV version information and a link to check for program updates on the SonTek website can be found here.

The **Connect to an ADV** and **Open a data file** options are also on the toolbar.



## 3. Collecting Data

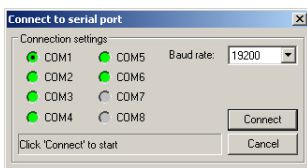
There are a number of important points to consider prior to data collection:

- Make sure that the serial, power and sync cables (only for MultiPort systems) are connected and not disrupted during the measurement.
- The instrument must be fixed mounted/rigid during data collection – particularly for systems without an internal compass.
- The transducers must be submerged during data collection. Though the system will not be damaged if it is left running out of the water, the velocity data reported by the instrument during this time will be meaningless.
- The sampling volume (detailed in Section 1.2) must be free from obstruction and clear of any boundaries.
- Ideally the transducers should be clean.
- Ensure that the correct probe configuration is loaded into the ADV
- An appropriate data collection/sampling strategy has been selected.

Each of these items is described in further detail in the ADV manual.

### 3.1 Connecting to a Single ADV

Connect to your ADV by selecting the **Connect to ADV automatically** option with the mouse. This option will scan each of the serial ports on your computer to find a connected ADV. This is the recommended option for beginning users to connect to their system.



Select the **Connect to ADV manually** option to select the serial port and baud rate (speed of data transmission) of your system. This will display the **Connect to serial port** dialog (shown to the left). The default settings are COM1 at 19200 baud.

The data collection screen will now be displayed (shown below).

This screen has options for starting data collection, configuring the ADV and several tools and diagnostic options. To close this screen and return to the start screen press the **Disconnect** button or select **File | Close** from the menu.

If your system is unable to either open the port or connect to the system during the connection or data collection phases, check your cables, communication settings and try again.





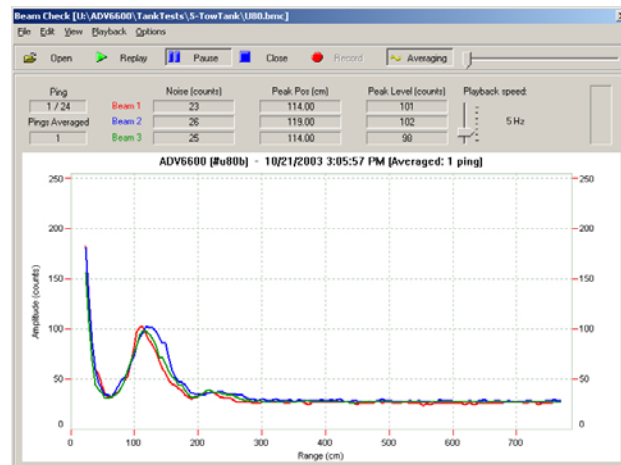
### 3.2 ADV Probe Configuration & Diagnostics (BeamCheck)

Before starting data collection it is strongly recommended that you verify that you have loaded the correct probe configuration for your system and to run the **BeamCheck** diagnostics module.

To load the probe configuration select the **Load probe configuration** option from the **System Information** category. Select the probe configuration file that matches your system and press the **Open** button.

The Diagnostics module (or BeamCheck) can be started by selecting **Check ADV beams** under the **System Information** category.

It is good practice to run BeamCheck both at the start and end of a data collection session. This can assist in locating any problems should they occur.





Collect BeamCheck diagnostic data by pressing the **Start** button. Log this data to a file by pressing the **Record** button.

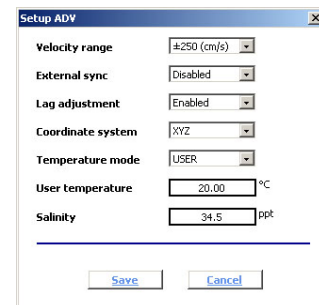
Typical examples of hardware and environment problems are described below:

- **No signal for all three beams (receivers) or a blank graph** – The signal-conditioning module is not connected or the high-frequency cable is damaged.
- **No response after initial pulse (peak)** - The probe is not connected or the transmitter has malfunctioned. Position near a boundary to confirm problem.
- **Small or non-existent peak for sampling volume** – There is insufficient scattering material in the water (very clear, quiet water).
- **One beam is significantly different from the other(s)** – The receivers should have a similar response and signal strength. Clean the transducers.
- **The horizontal location of the sampling volume is different for each beam** – One of the receiver arms may be bent. Contact SonTek for repair.
- **Excessive noise past the boundary** – This may be caused by excessive acoustic noise in the tank. Commonly seen in small glass or acrylic tanks.

For more information on BeamCheck please refer to the **Section 4 - Hardware Diagnostics** of the **ADV Software Manual**.

### 3.3 Changing the ADV Settings

Press the **Change** button in the **System Settings** category. The **Setup ADV** dialog will be displayed (shown to the right). Please refer to the ADV manual for a detailed description each of these parameters and how to use them.



Some general guidelines are listed below:

The **Velocity Range** determines the maximum velocity that can be measured by the ADV. Remember that a higher velocity range setting will have higher variability in any low velocities that are measured. In general, you should select the lowest velocity range setting that will cover the maximum expected velocity.

By default, **External sync** should be disabled.

In most situations you will not need to change any of the parameters in this dialog, however it is important to review the settings prior to data collection. Press the **Save** button to save your settings or **Cancel** to discard any changes.



## 3.4 Changing the Data Collection Settings

The **Data Collection** category contains the settings related to the frequency, mode and method of data collection. These settings can be changed by pressing the **Change** button. This will display the **Data Collection Settings** dialog (shown to the left).

Each of the parameters displayed in this dialog are described below:

### ***Sampling Rate***

This is the rate at which the velocity data will be collected. The maximum sampling rate is 25Hz for the ADV and ADVOcean, and 50Hz for the MicroADV.

### ***Recording Mode***

The Recording Mode can be set to either **Continuous** or **Burst**. Continuous mode is used for sampling regularly without any breaks or interruptions. Beginning users are suggested to start with the Continuous sampling option, as it is the standard mode of operation. Burst mode is used to collect samples into sets (or bursts) at regularly timed intervals. Bursts mode also requires the input of additional parameters: **Samples per burst** and **Burst interval**. More information on burst data collection can be found in the ADV manual.

### ***Output file and Output Folder***

These parameters are used to select the name and destination of the output file that will be created during real-time data collection.

### ***File comments***

These lines of text are used to describe the details of data acquisition.

### ***Show boundary info***

When this option is enabled, upon starting data collection the ADV(s) will first continuously scan the region in front of each probe to detect the presence of a solid or surface boundary. For each ADV in operation, the probe number, the distance from the tip of the probe to the boundary, the distance from the center of the sampling volume to that boundary, and the velocity range setting is displayed. If no boundary is detected, "NOT DETECTED" is shown.

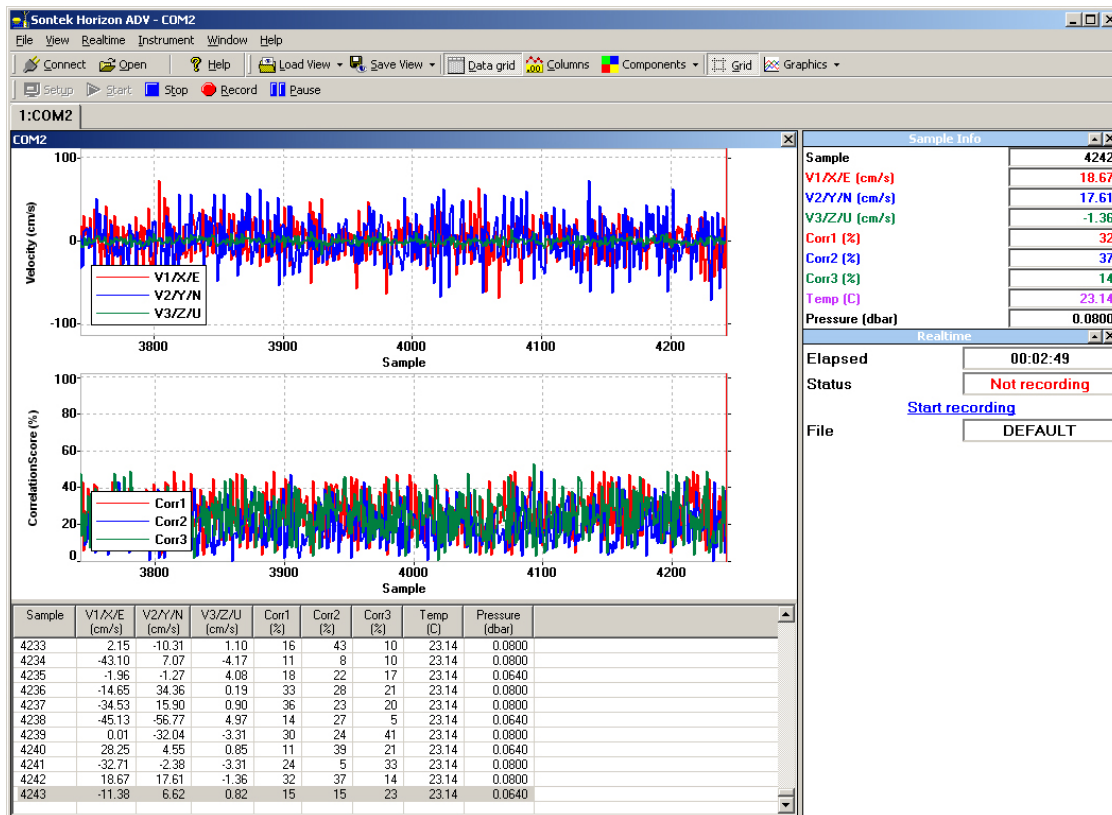




### 3.5 Starting Data Collection

Press the **Start Data Collection** button in the **Data Collection** category to start the real-time data collection or the **Disconnect** button to return to the Start Screen. If the **Show boundary info** option is enabled (see Section 3.4), a dialog will be shown with the boundary information displayed.

The main screen will change to show a number of graphs that are now regularly updating as data is received from the ADV (shown below). **Section 5. Software Layout and Features** details the functionality and layout of the display.





### 3.6 Recording Data

To start recording to a data file press the **Record** button on the toolbar or select the **Start recording** option in the **Realtime** Tools display (on the right side of the screen below the **Sample Info**).

The **Realtime** display will update as the samples are collected and the data file increases in size. Controls for recording data and starting burst collection are also displayed here.

The **Pause** button on the toolbar will freeze the current display, but not interrupt the data collection process. This feature is useful when observing events before they scroll off the side of the graph.

To stop recording press the **Record** button on the toolbar again. This will stop writing samples to the data file but the system will continue to sample and the collected data will be displayed on the screen.

To collect samples to additional data files, press the **Record** button again and repeat the process. Each time the **Start recording** option is pressed a new data file will be created and named automatically.

Press the **Stop** button or select the **Stop recording** option on the Realtime display to end the data collection process.

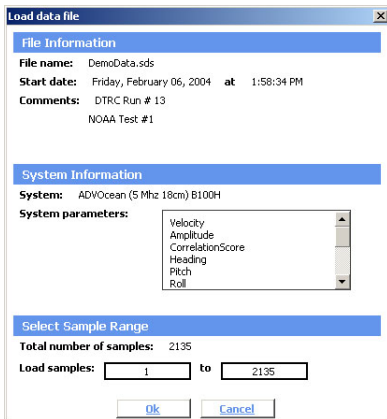
Data files (by default) will be stored to the C:\SonData directory. Opening these data files for viewing is covered in the following section.



# 4. Viewing Data Files

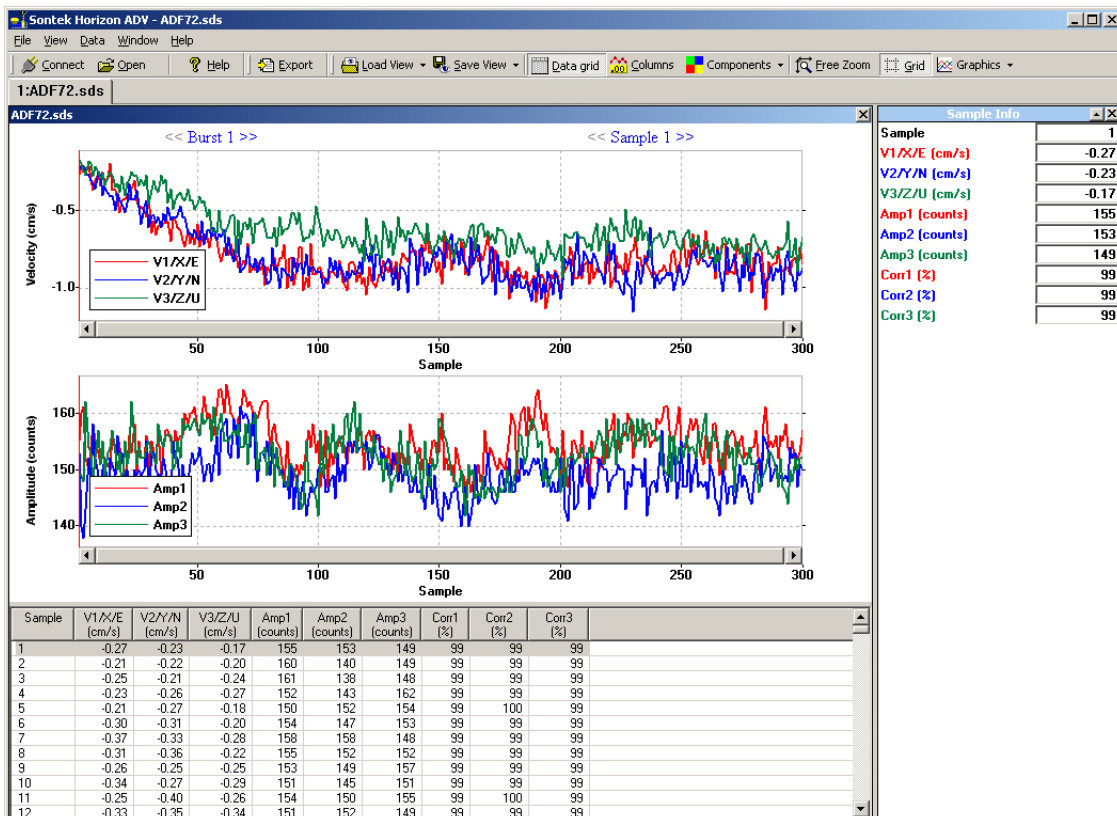
This section covers the opening, viewing and export of data files.

Select the **Open a data file** option from the **Start Screen** or press the **Open** button on the toolbar. An **Open ADV File** dialog will be displayed, prompting you to select either an ADV or SDS (SonTek Data Session) file. ADV data files contain the raw (unprocessed) data. SDS files contain the fully processed data and any settings. By opening the ADV file you will go back to the original data. Select a file to open.



The **Load data file** dialog will be displayed. This dialog shows the time of the measurement as well as the system information and parameters stored. Select the range of samples or bursts that you would like to load. By default all samples or bursts will be loaded. Press **OK** to open this file.

The screen will change to a similar style to data collection mode. A series of graphs will be displayed and a tabular display of the values for the current selected sample will be shown on the right side of the screen (shown below).

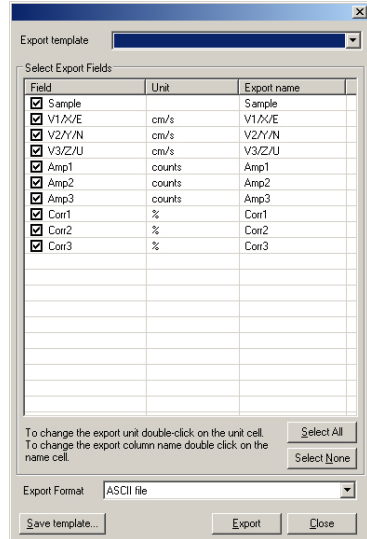




The range of samples displayed in the graphs can be changed by left clicking in the plot area. Right click in the plot area to zoom back out.

The range of each parameter displayed in the graphs can be changed by double clicking on the vertical axis and selecting either an automatic (default) or a manual (user-selected) range.

To export data select the **Export** button from the toolbar or **Data | Export** from the menu. The **Export Data** dialog will be displayed (shown to the right). By default all parameters stored in the file will be exported in ASCII format. To change the fields that will be exported, check or uncheck the boxes. Click the **Export** button to export the file. You will be prompted to select the style, output options and output path for the exported files.





## 5. Software Layout and Features

This section briefly covers the parts of the screen and some of the more advanced features and aspects of the HorizonADV software that are available during data collection and/or display.

The screen display is made up of a number of different controls and displays. Each of these items are shown and described below:

The screenshot shows the SonTek Horizon ADV software interface. The main window is titled '1:COM2'. It features a menu bar at the top with options like File, View, Realtime, Instrument, Window, and Help. Below the menu bar is a toolbar with buttons for Connect, Open, Help, Save View, Data grid, Columns, Components, Grid, and Graphics. The central area contains two graphs: the top one shows Velocity (cm/s) vs. Sample, and the bottom one shows Correlation (%) vs. Sample. To the right of the graphs is a 'Sample Info' panel displaying various parameters like V1/X/E, V2/Y/N, V3/Z/U, Cor1, Cor2, Cor3, Temp, and Pressure. Below the graphs is a 'Data Grid' table. At the bottom right, there is a 'Realtime Tools' panel with buttons for 'Not recording', 'Start recording', and 'File'. A 'Tool Palette' is also indicated at the bottom right.

Sample	V1/X/E [cm/s]	V2/Y/N [cm/s]	V3/Z/U [cm/s]	Cor1 (%)	Cor2 (%)	Cor3 (%)	Temp [C]	Pressure [dbar]
4233	-2.15	-10.33	1.10	16	43	10	23.14	0.0000
4234	-43.10	7.07	-4.17	11	8	10	23.14	0.0600
4235	-1.96	-1.27	4.08	18	22	17	23.14	0.0640
4236	-14.05	34.36	0.19	33	38	21	23.14	0.0600
4237	-34.53	15.90	0.90	36	23	20	23.14	0.0600
4238	-45.13	-56.77	4.97	14	27	5	23.14	0.0640
4239	0.01	-32.04	-3.21	30	24	41	23.14	0.0600
4240	28.25	4.55	0.95	11	39	21	23.14	0.0640
4241	-32.71	-2.38	-3.31	24	5	30	23.14	0.0600
4242	18.67	7.61	-1.36	32	37	14	23.14	0.0600
4243	11.38	6.62	0.82	15	15	23	23.14	0.0640

### Menu

The **Menu** is used to access all the commands and features available. Clicking on a menu item will open up a submenu displaying a number of new items.

### Toolbar

The **Toolbar** provides quick access to some of the more commonly used menu commands. Buttons on the toolbar are grouped into categories (Standard, Data and Data View). Each of these categories may be repositioned on the toolbar.

### Graphs

The **Graphs** show a time-series of one or more variables as they change over time. Up to 5 graphs can be shown at one time by pressing the **Graphics** button on the toolbar or by selecting **View | Graphics** from the menu.





Each graph has a number of features that allows them to be customized:

- **Left-click on the plot area** to zoom in on the graph.
- **Left-click and drag** to select a specific area of interest on the graph.
- **Right-click on the plot area** to zoom back out to the full extents of the data.
- **Double-click on either vertical axis** to change the scale of this axis.
- **Right-click on either vertical axis** to display a popup menu that allows you to modify the graph settings/format, change the displayed parameter or hide the graph (menu shown to the right).
- **Right click on the horizontal axis** to select a variable to display against the currently displayed parameter. A graph may also display one variable against another. This can be used to show correlation between two parameters. This feature not available during data collection.



### Data Grid

The **Data Grid** shows the entire data set in a spreadsheet format. Samples are displayed in the rows and parameters are displayed in the columns. The selected sample will be highlighted on the grid. The Data Grid can be shown or hidden by pressing the **Data Grid** button on the toolbar.

Sample	V1/V1E (cm/s)	V2/V1N (cm/s)	V3/V2U (counts)	Amp1 (counts)	Amp2 (counts)	Amp3 (counts)	Cor1 (%)	Cor2 (%)	Cor3 (%)
Hide	0.23	0.17	150	143	143	99	99	99	
Unit	-0.21	0.24	161	138	148	99	99	99	
Decimals	0.26	0.27	152	143	162	99	99	99	
Properties...	0.27	0.18	150	152	154	99	100	99	
	-0.31	-0.20	154	147	153	99	99	99	
	-0.33	-0.28	158	158	148	99	99	99	
8	-0.31	-0.36	155	152	152	99	99	99	
9	-0.26	-0.25	153	149	157	99	99	99	
10	-0.34	-0.27	151	145	151	99	99	99	
11	-0.25	-0.40	154	150	155	99	100	99	
12	-0.33	-0.35	151	152	149	99	99	99	

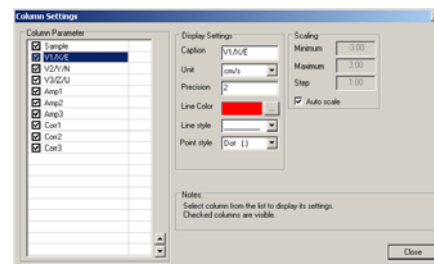
Left click on a specific parameter to change its status, display properties or units. Right click on the column headings to select the variables that will be displayed in the grid.

### Tool Palette

The **Tool Palette** displays the **Sample Info** (values for the current or selected sample) and the **Realtime Tools** categories. The Tool Palette is visible by default and can be shown by selecting **View | Show Tool Palette** from the menu.

### Data columns

Each parameter can be thought of as individual column in the Data grid. Each column (or parameter) has its own individual settings related to its display in the time-series graphs, units and scaling range. These settings affect the way each parameter is displayed in all parts of the program (from the graphs, to the Data grid and data display). The column settings are displayed by pressing the **Columns** button in the toolbar.



### View Templates

View Templates are used to save or restore all display settings. These settings include the screen layout, displayed parameters and column settings. Use templates to quickly switch between different preset views of your data.



## 6. ADV Principles

An **ADV** (or **A**coustic **D**oppler **V**elocimeter) is a single-point current meter that accurately measures the three components of water velocity in both high and extremely low flow conditions. Velocities are measured in a sampling volume located a distance away from the probe head (shown in the figure below).

The probe head is made up of a single transmitter located in the center of the probe head and either two or three receivers mounted on arms. The transmitter generates a narrow beam of sound that is projected through the water. Reflections from particles or “scatterers” (such as suspended sediment, biological matter or bubbles) in the water are reflected and sampled by the highly sensitivity receivers. The intersection of the receiver axes designates the location of the sampling volume. More information on the working of ADVs can be found in the **ADV Manual – Principles of Operation** section.



There are three types of ADVs supported by the HorizonADV software. These instruments are detailed below:



### 10-MHz ADV

The 10-MHz ADV is suitable for a wide range of applications ranging from the laboratory to field and full oceanographic applications. Sampling rates may be as high as 25Hz and a number of probe configurations are available to accommodate most application requirements. The sampling volume is located 5 or 10cm from the probe.

### 16-MHz MicroADV

The MicroADV is optimal for use in the laboratory. High frequency sampling (up to 50Hz) combined with a tiny sampling volume makes this system perfect for measuring low flow conditions. This system excels in applications such as the measurement of turbulence, orbital velocities in a wave field and precise flow field studies. The sampling volume is typically 5cm from the probe.



### ADVOcean

A rugged and robust housing combined with a reinforced probe head, makes the ADVOcean suitable for a wide range of environments including such hostile conditions as the surf zone. The ADVOcean can be integrated with other sensors. The sampling volume is 18cm from the probe.



## 7. Support & Contact Information

Technical support is available to all ADV users.

Please refer to the **ADV Manual** first before contacting Technical Support. Most of the frequently asked questions are covered in the manual.

You can contact SonTek Technical Support by mail, phone, fax or email

In any correspondence or before contacting SonTek Technical Support you should include the following information:

- Your ADV serial number
- Your ADV firmware version  
(found in the System Report – select **Data | System Report** from the menu)
- Version number of the HorizonADV software that you are using  
(select **Help | About** from the menu)
- Windows platform you are using (Windows 2000/XP)

### **Mailing Address:**

SonTek/YSI, Inc.  
6837 Nancy Ridge Dr, Ste A  
San Diego,  
CA 92121  
USA

### **Phone:**

USA +1-858-546-8327

### **Fax:**

USA +1-858-546-8150

### **Support Email:**

[support@sontek.com](mailto:support@sontek.com)

### **General Inquiry and Sales Email:**

[inquiry@sontek.com](mailto:inquiry@sontek.com)

### **SonTek Website:**

[www.sontek.com](http://www.sontek.com)