3 Software Setup For Operation

This chapter describes how to configure the WinSDR software for long-term seismic recording, real-time display, automatic event detection and automatic FTP upload of data files to remote storage servers. Details of site-specific information initialization, software data filtering, data management and long-term logging of data are among the topics discussed.

3.1 Specify WinSDR Operating Parameters

WinSDR has a variety of parameters that control the operation of the system.

3.1.1 SYSTEM SETTINGS

In the **System Settings** box ([**F6**] or Menu Bar **Settings | System**) each dialog box is used to specify site-specific information. Controls in any of the System Settings boxes generally apply to all channels.

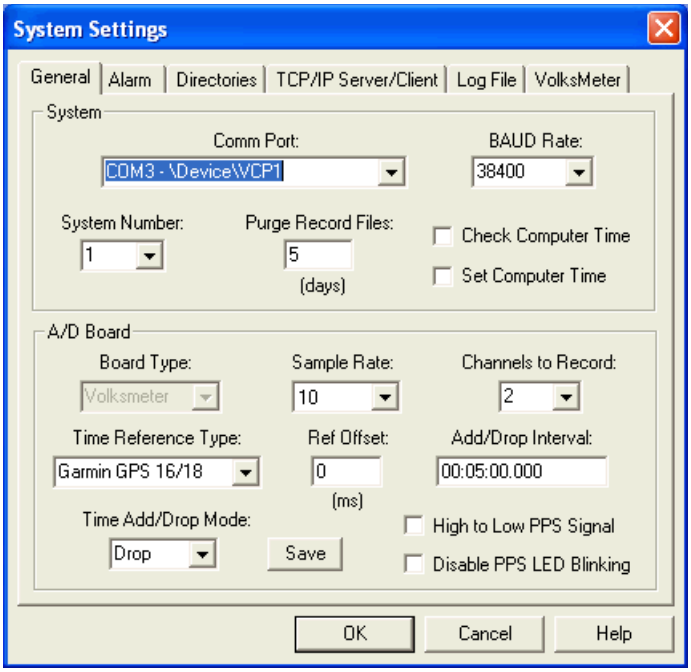
3.1.1.1 General

The **General** tab of the *System Settings* dialog box is used to set the number of channels to record, sample rate and other system wide settings.

System Group Box:

Comm Port Select Box:

Sets the RS-232 communication port that will be used to communicate to the **VolksMeter Interface Board**. If set to *None - Replay Only Mode*, WinSDR will go into a Replay Only mode. In this mode WinSDR can only be used to Replay daily record files generated by another WinSDR system located on a LAN. **This parameter was set in section 2.5.**



BAUD Rate Select Box:

Sets the RS-232 communication port speed. WinSDR will display an error message if you select a baud rate that is too slow for the number of channels being recorded and the sample rate. **This parameter was set in section 2.5.**

System Number Select Box:

Used if you are running more then one copy of WinSDR. Each WinSDR system, either running on the same computer or on another system located on a LAN, should have a unique system number. **In a typical installation, no change from the default value of 1 is required.**

Purge Record Files Edit Box:

Controls how many days worth of data to save. Data from the **VolksMeter** is saved in a daily record file. WinSDR uses the data in the record files to create PSN formatted event files and for Replay and Real-time window display. The value in this field should be based on how much disk space you would like WinSDR to use. Depending on the sample rate, ADC Bits (resolution)

and number of channels you are recording, the daily record file can be anywhere from a few megabytes to over 80 MB. **With the VolksMeter, the maximum data volume will be with 24-bit resolution, 2 channels and 80SPS. With these settings, the daily raw data file will use about 82MB. Due to noise considerations, you would not normally record 24-bit data at 80SPS. More typically, a system recording 2 channels at 20 bit resolution and 25 SPS will use about 12MB per day. The default value is 5 days. You should select a value that is compatible with the data storage space available on your support computer as well as the length of the historical record of raw data you wish to maintain for review. Note that the Alarm system discussed below will create permanent Event Files automatically when the incoming data meets the alarm trigger parameters you have set. It is also possible to flag these data record files as "NO DELETE". Use menu bar File | Replay | Open to display the current list of record data files, select the file you wish to flag and click the "Set No Delete Flag" button. Files flagged for no deletion will be shown as such on the list.**

Check Computer Time Check Box:

If checked, WinSDR will compare the support computer time with the time on the VolksMeter Interface Board. The time difference will be written to the winsdr.log file and displayed in the Log File Display window every 5 minutes. The line below is an example of the time difference message:

DLL: Time difference between A/D Board and Host Computer=0.026 seconds

The default for this function is unchecked (OFF). Check the box if you are curious about how the clock on the Interface Board varies with respect to the internal clock of the support computer.

Set Computer Time Check Box:

If checked, WinSDR will set the local computer time if the time difference between the VolksMeter Interface Board and WinSDR gets larger then 250 milliseconds. This check box should be checked if you are using **GPS or WWV** references. This check box will be disabled if you use the ***Local*** computer as the time reference. **The default is unchecked (OFF).**

A/D Board Group Box:

Board Type List Box:

This list box controls or displays the ADC board type. This list box will be grayed out once WinSDR knows what type of ADC board is connected to the Comm port. If the board type is unknown you can force WinSDR to use either ADC board. **This parameter is set to "VolksMeter" in section 2.5.**

Sample Rate Select Box:

Sets the sample rate that the will be used to convert the incoming analog signal to digital data. This field can be set to 5, 10, 20, 50, 100 or 200 SPS. Note: Version I boards can only record up to 4 channels at 200 SPS. **For the VolksMeter version of WinSDR, the Sample Rate values are 10, 20, 25, 40, 50 and 80 Samples Per Second. This parameter was set to 10 SPS in section 2.5. The long-term sample rate you select will depend on the characteristics of the data you intend to record. There is a trade-off between Sample Rate and bits of resolution. The issues to consider for setting these parameters are discussed in detail in section 3.2.**

Channels to Record Select Box:

Sets the number of channels that WinSDR will record. This field can be set to 1 through 8. Note: Version I boards can only record up to 4 channels at 200 SPS. **The VolksMeter version of WinSDR defaults to 1 and offers choices of 1 or 2. If you have a 2 channel VolksMeter, select 2 (unless you only wish to record channel 1).**

Time Reference Type Select Box:

Controls the time reference source that the VolksMeter Interface Board should use for time keeping. VolksMeter options are: **Computer Time** or **Garmin GPS 16/18.**

The **Computer Time** option uses the time of the support computer that is running WinSDR as the time reference. The WinSDR system should be connected to some type of time reference source. This could be a GPS system or a NTP (Network Time Protocol) program. To use NTP, you must have a full time Internet connection. Windows XP offers an "Internet Time" option in the **DATE and TIME Properties** box

The **Garmin GPS 16/18** option uses a Garmin GPS 16 or 18 OEM antenna/receiver combination for time keeping.

Note: The **Computer Time** option should be selected if no timing reference source is available.

Computer Time is the default. If you have the GPS Time Reference option, this parameter was changed to Garmin GPS 16/18 in section 2.8.

Reference Offset Edit Box:

Used to compensate for the travel time of the radio waves of the WWV/WWVB time standard transmissions and the tone detector's capture time. This number is in milliseconds. The tone detector has a capture time around 20 to 25 ms. You should add 1 ms for every 300km (186 miles) between you and the transmitting station. GPS users should place a 0 in this field. **The default is 0 and that is appropriate for either Computer Time or Garmin GPS 16/18.**

Add/Drop Interval Edit Box:

Time Adjust Add/Drop Interval time. See below for more information on this setting.

Time Add/Drop Mode List Box:

Time Adjust Add/Drop Interval mode. See below for more information on this setting.

Save Button:

This button saves the new Add/Drop Time Interval and Mode to the time.dat file.

Time Adjust Mode and Time Adjust Interval Information:

The Time Adjust Interval count is used to compensate for the timing reference crystal oscillator on the Serial Output A/D board not being exactly 4.000 MHz (8.0 MHz on the Version II ADC board) . The A/D board uses a 500 us interrupt generated the reference oscillator. If the oscillator is a little fast or slow, the time of day will slowly drift. By adding or dropping 1 millisecond at some interval, it is possible to compensate for the oscillator being off frequency. The Add/Drop number is the number of milliseconds to wait before a millisecond is added to or dropped from the time accumulator. The time adjustment information is stored in a file called *time.dat.* This file is located in the root directory of WinSDR.
If you use one of the time reference options (GPS, WWV, WWVB, or Comm Port), WinSDR will calculate the Add/Drop interval number and direction (add or drop) for you. .

High to Low PPS Signal Check Box:

This check box sets the direction of the GPS 1 PPS signal applied to the VolksMeter Interface Board. The Garmin GPS 16/18

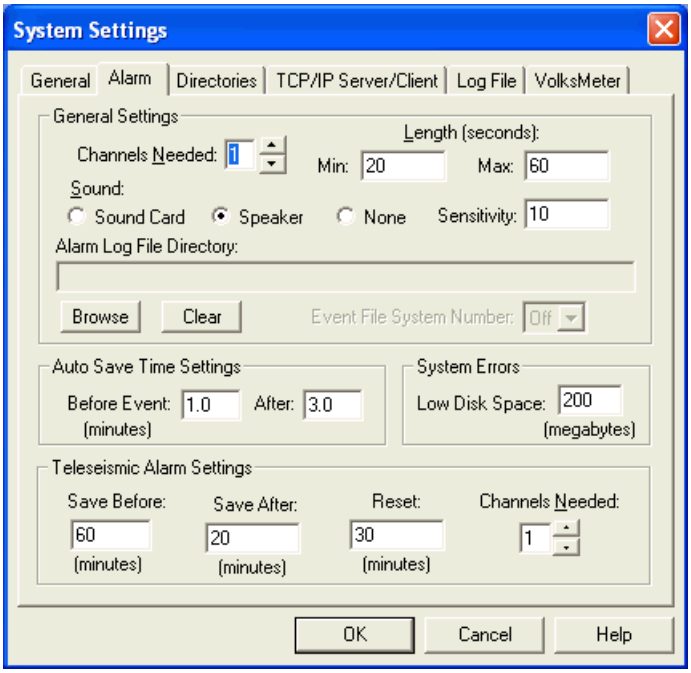
models supply a positive signal at the top of the second. **The default is "unchecked" (Low to High) which is appropriate for the Garmin GPS 16/18.**

Disable PPS Led Blinking Check Box:

When checked, the LED on the VolksMeter Interface Board will not blink at the top of the seconds. This feature was added because the 1 PPS signal can show up in the version I A/D boards event files with high gain Amp/ Filter channels. This is not a problem with the version II boards. **The default is "unchecked" (Blinking LED is enabled). This is appropriate for the VolksMeter Interface Board.**

3.1.1.2 Alarm

The **Alarm** tab of the *System Settings* dialog box is used to control the alarm settings. The Alarm functions enable WinSDR to automatically detect seismic "events" using a variety of user specified criteria. An event detection can trigger an audible alarm at the support computer as well as saving the data associated with the "event" in a permanent Event file.



General Settings Group Box:

Channels Needed Edit Box:

The number of channels that must be in a triggered state for the alarm to sound and auto save event to occur.

Length

Min Edit Box:

Minimum time, in seconds, to sound the alarm when an event is detected. WinSDR has a proportional alarm feature. Small events will sound the alarm for a short period of time. Larger events will sound the alarm for a longer period of time.

Max Edit Box:

Maximum time, in seconds, to sound the alarm when an event is detected.

Sound Check Boxes:

Controls what sound device to use or to disable all alarm sounds. Select the ***Sound Card*** option if you have a sound card in the system or select ***Speaker*** to use the internal speaker. Select ***None*** to disable all alarm sounds.

Sensitivity Edit Box:

Used to control the proportional alarm feature. This sets the sensitivity of the alarm tone and length change based on the size of the event. The larger the number the larger the event must be before the sound length will change and the alarm tone to proportionally change.

Alarm Log File Directory:

If a directory is placed in this field, WinSDR will create a file called ALARM.LOG in the directory whenever WinSDR goes into an alarm state. In the ALARM.LOG file WinSDR will place the time that the alarm occurred. The application using the alarm

log file may delete the file after using it. If the file is already in the directory, WinSDR will append the new alarm time to the end of the file. A typical line in the ALARM.LOG file will look like this:

TRIGGER=12/01/2001 15:04:14

Event File System Number Select Box:

Used to trigger another WinSDR system on the same computer or a computer on a network. Enter the WinSDR system number to trigger in this field. When WinSDR goes into an alarm state it will use the ***Event Log File Directory*** field to create a ALARM. LOG file that another WinSDR system can use to save Event files.

Auto Save Time Setting Group Box:

Before Event Edit Box:

Sets how many minutes to save before the event trigger time when WinSDR auto saves Event file(s). Number maybe entered as a fraction. Example: 1.5 = 90 seconds.

After Edit Box:

Sets how many minutes will be saved after the event trigger time. Number may be entered as a fraction.

System Errors Group Box:

Low Disk Space Edit Box:

Used to set the number, in megabytes, to test for low disk space. If the free disk space of the drive used to save the daily record files gets below this number WinSDR will sound an alarm. If you enter 0 (zero), no low disk test will take place.

Teleseismic Alarm Settings Group Box:

Save Before Edit Box:

Sets how many minutes to save before the event trigger time when WinSDR auto saves Event file(s).

Save After Edit Box:

Sets how many minutes will be saved after the teleseismic event trigger time.

Reset:

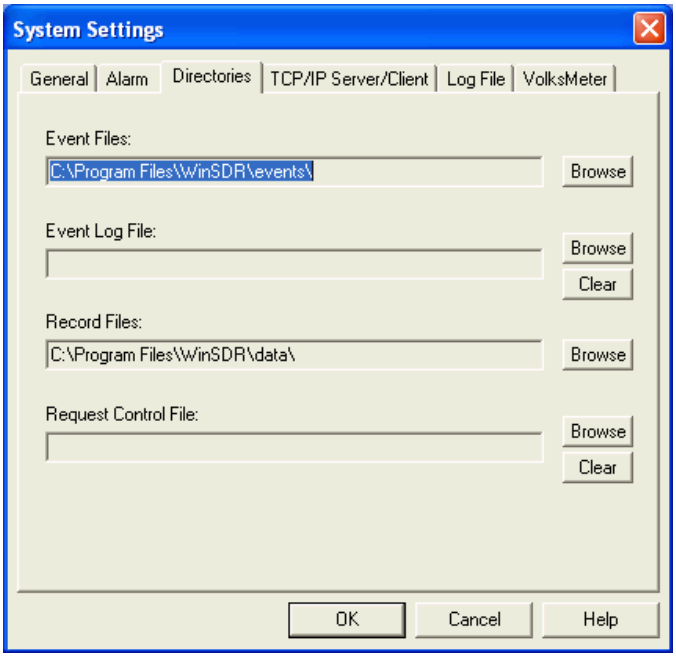
The edit box controls how long WinSDR should wait after a teleseismic event to reset and begin looking for new events.

Channels Needed Control:

This is the number of channels that must be in a teleseismic event alarm condition before WinSDR will save event files and sound the alarm.

3.1.1.3 Directories

On the **Directories** tab, you may specify the locations on your support computer (or on another computer using a LAN and remote drive sharing) where various WinSDR data files are stored.



Event Files are user-selected segments of data from any of the WinSDR data display windows (Real-Time, Single Line or Replay) or automatically-selected, when an "Alarm" is

triggered. These data files are in PSN Type 4 format. They can be viewed and analyzed with WinQuake. The default location of the Event File root directory is **C:\Program Files \WinSDR\events**. Event Files are stored in a sub-directory derived from the current year and month(**drive:\Root_Directory\YYMM**\). Use the ***Browse*** button to change or create the new directory. **We suggest that you change the root directory from the Program Files \WinSDR\ folder to a dedicated data storage area on your system (e.g. C: \WinSDR\events).**

Event Log File - If a directory is specified in this field, WinSDR will create a file called EVENT.LOG in this directory whenever WinSDR saves event files. In the EVENT.LOG file, WinSDR will place the UTC time that the files were saved, the number of files saved, the directory where the files were saved, and then the Event file name(s). Fields are delimited by a coma. The application using the event log file may delete the file after using it. If the file is already in the directory, WinSDR will append the new event information to the end of the file. A typical line in the EVENT.LOG file will look like this:

03/17/02 00:38:06,2,c:\tmp\0203\,lcv.psn,lc8.psn

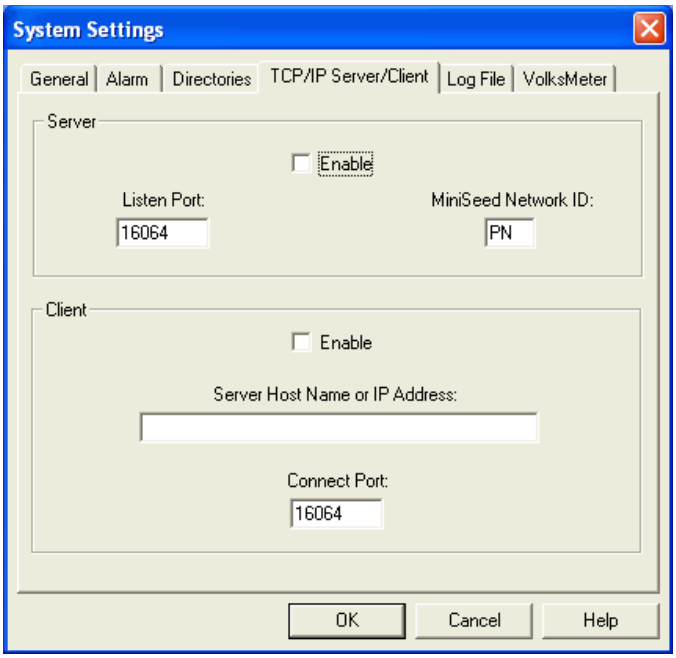
Record Files - Specifies the directory location for the daily record file. The daily record file holds ALL the data collected from the VolksMeter. A new record file is created each day at 00:00 UTC. The directory holding the record files should be a drive on the same system that is running WinSDR. Using a LAN network and disk sharing, it is possible to place the record files on another system. The problem with this arrangement is your LAN and remote computer must be working all of the time. If the WinSDR system can not save data to the remote drive, due to the LAN not working or the remote system being down, data will be lost. It will also take longer for the Replay and Real-time windows to read the data from the remote disk.

Use the ***Browse*** button to change or create the new directory. **The default location is C: \Program Files\WinSDR\data. We suggest that you specify a dedicated data folder (e.g. C:\WinSDR\data).**

Request Control File - Sets the directory that WinSDR will use to monitor for a request file. See Request Event File documentation for more information on this option. Use the ***Browse*** button to change or create the new directory or the ***Clear*** button to clear this field.

3.1.1.4 TCP/IP Server/Client

The **TCP/IP Server/Client** tab of the *System Settings* dialog box is used to control the Server/Client TCP/IP settings.



TCP/IP Server Group:

Enable Check Box:

This check box enables the TCP/IP Server feature.

Listen Port Edit Box:

The TCP/IP listen port is the port that WinSDR will listen on for client connections. This number can be in the

range of 1 to 65535.

MiniSeed Network ID:

This two character string will be used when WinSDR saves MiniSeed event files or sends MiniSeed packets to a TCP/IP Client.

TCP/IP Client Group:

Enable Check Box:

This check box enables the TCP/IP Client feature.

Server Host Name or IP Address Edit Box:

This edit box is used to enter the host name (Example: data.mydomain.com) or the IP address (Example: 10.0.0.3) of the WinSDR server system.

Connection Port Edit Box:

The connection port is the TCP/IP port that will be used to connect to the WinSDR server system. This number must match the *Listen Port* number in the Server settings group. This number can be in the range of 1 to 65535.

To use the Server/Client feature the user must have two computers connected together using a LAN or over the Internet. The *server* is the system that connects to the VolksMeter instrument and the *client* receives data over the TCP/IP connection as if it was getting the data from the VM Interface Board directly. The client does not control the server; it just receives the raw data from the server that the server is receiving from the VolksMeter. The user must have a static IP address on the server side for this to work.

The server/client feature is enabled in the Systems Settings dialog box. The user needs to know the IP address of the server so it can be entered in the client system. This can be done by opening a DOS box on the server and typing "ipconfig". This command will display the IP address(s) of the system. On the client side the user enters the IP address of the server and then enables the client feature. Once the System Settings dialog box is closed the server will wait for a connection from a client system. On the client side, WinSDR will try and connect to the server and once it does it will start to receive, display and store the VM data locally.

Once the client connects to the server the user can transfer the channel information settings from the server by using the **File | Get Remote Channel Information** menu items.

While the details of Internet Protocol and IP address assignment are beyond the scope of this manual, here are a few tips:

If the server is on a LAN, the server **must** be assigned a static IP address. While most LAN's today use DHCP (Dynamic Host Control Protocol) to automatically assign IP addresses when a system on the LAN is booted up, they do allow fixed IP addresses to be reserved and assigned.

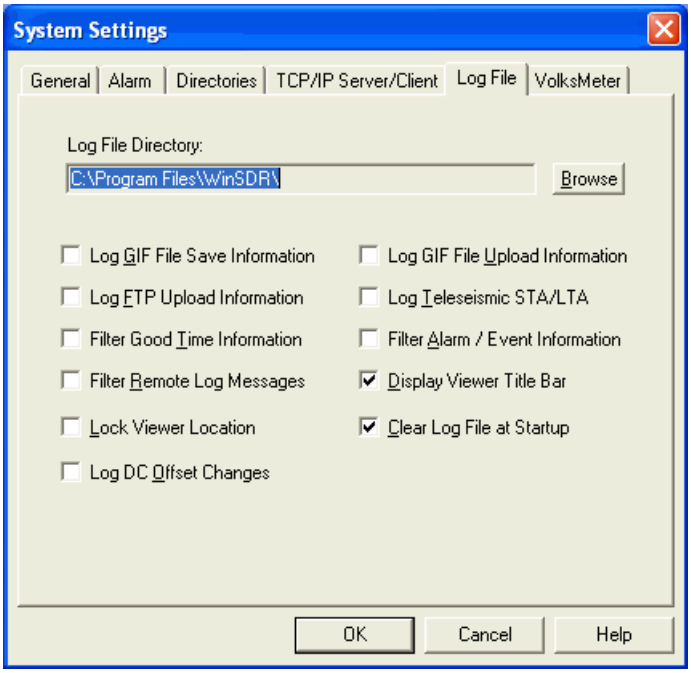
If the server is located behind a router (and the client is on a different LAN, elsewhere on the Internet) and that router does Network Address Translation (NAT), the router must be setup to do port forwarding to the server. The default port number is 16064. This value is specified in the dialog boxes for both the client and server (Listen Port on the server side, Connect Port on the client side).

If the server is connected to the Internet through an ISP and the IP address of the connection is "dynamic" , then the requirement for a "static" IP address is not met and the WinSDR Client/Server functionality won't work. There may be ways to work around this, by establishing and constantly maintaining an Internet connection, but this is asking for trouble.

If you wish to control a VolksMeter system remotely, a 3rd-party remote console software application is required: PC Anywhere or Carbon Copy are examples. Windows XP Pro has this function built in. See Appendix 2, Reference List, for more information.

3.1.1.5 Log File

The **Log File** tab of the *System Settings* dialog box is used to control the location of the winsdr.log file, what information will be saved in the log file and displayed in the Log File Viewer window.



Log File Directory:

Sets the directory where the debug log file (winsdr.log) will be located. This directory can be located on a local or remote drive. Use the ***Browse*** button to change or create the new directory.

Log GIF File Save Information Check Box:

If checked, WinSDR will save more GIF file generation messages in the log file.

Log GIF File Upload Information Check Box:

If checked, WinSDR will save more GIF file upload information messages in the log file.

Log FTP Upload Information Check Box:

If checked, WinSDR will save FTP upload information messages in the log file for both GIF file and event file uploads.

Log Teleseismic STA/LTA Check Box:

Displays and saves teleseismic trigger information in the log file.

Filter Good Time Information Check Box:

If checked, WinSDR will filter out normal time reference information messages generated by the VolksMeter Interface Board. Time error messages will not be filtered out..

Filter Alarm / Event Information Check Box:

If checked, WinSDR will filter out messages from the alarm / event detection process.

Filter Remote Log Messages:

Used when WinSDR is running in the TCP/IP Client mode. If checked, log messages generated at the WinSDR server system will be filtered from the local client's log file and display window.

Display Viewer Title Bar Check Box:

Toggles the Log File Viewer title bar on or off. By turning the title bar off, the viewer occupies less room on the desktop. When the title bar is turned off, the viewer can be moved by placing the mouse on the frame window and pressing and holding the left button. The title bar can also be toggled by double clicking on the window frame.

Lock Viewer Location Check Box:

If checked, the Log File Viewer will move with the main WinSDR window. If not checked, the viewer will stay in the same location on the desktop when the main WinSDR window is moved.

Clear File at Startup Check Box:

If checked, WinSDR will delete the current log file at program startup.

Log DC Offset Changes:

If checked, WinSDR will calculate the DC offset of each channel and display the offset number in the Log File Viewer and write the offset number to a file called Offset.log. A typical entry in the offset log file looks like this:

12/27/06,04:52:42,LCTST,-1123784

The line contains the Date, Time, Sensor ID

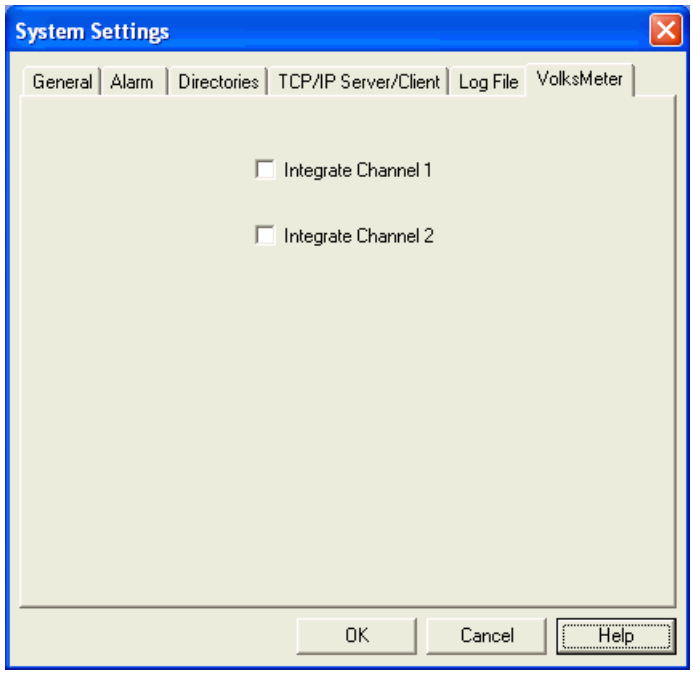
and DC offset in CDC (VolksMeter) counts.

[this column intentionally left blank]

3.1.1.6 VolksMeter

The **VolksMeter** tab of the *System Settings* dialog box is used to enable integration of the VolksMeter data. Integration of the raw **acceleration** data produces **pseudo-velocity** data on a separate channel to better display and detect teleseismic events. This tab of the dialog box will only be accessible if WinSDR is collecting data from a VolksMeter.

This is now on the integrate page.



Integrate Channel 1:

Enables integration of channel 1 data. If 1 channel recording is specified in **System Settings | General, Channels to Record**, the integrated data will be on channel 2. If **Channels to Record** is set to 2, the integrated data (for channel 1) will be on channel 3.

Integrate Channel 2:

Enables integration of physical channel 2 data. If data integration for channel 1 is enabled the integrated channel 2 data will be on channel 4. If integration for channel 1 is not enabled the integrated channel 2 data will be on channel 3.

3.1.2 Channel Settings

Each data channel has its' own collection of settings. These settings are available for viewing and editing in the **Channel x Settings** dialog box (where **x** is the channel number).

The Channel x Settings box may be accessed by pressing **Ctrl + x** (where is the number key corresponding to the channel number, e.g. **Ctrl + 1** will bring up the Channel 1 Settings box. Also Menu Bar **Settings | x: CHx** will bring up the box for channel x. If the Real-Time display is on top, then **Alt + x** will bring up the box for channel x (Alt + x will do nothing when the Single Line display window is on top). When Ctrl + x is used, the box defaults to the Alarm/Filter Control tab. When any of the other methods are used, the box defaults to the Trace Display tab.

The Channel x Settings dialog box has several buttons along the bottom edge that are common to each tab:

Channel Spin Control:

Changes the current channel number.

Save As Button:

Used to save the current channel settings to a file. The channel settings file should end in *.ini*.

OK Button:

Closes the dialog box. New information entered will be used by WinSDR.

Cancel Button:

Closes the dialog box without making any changes to the channel settings.

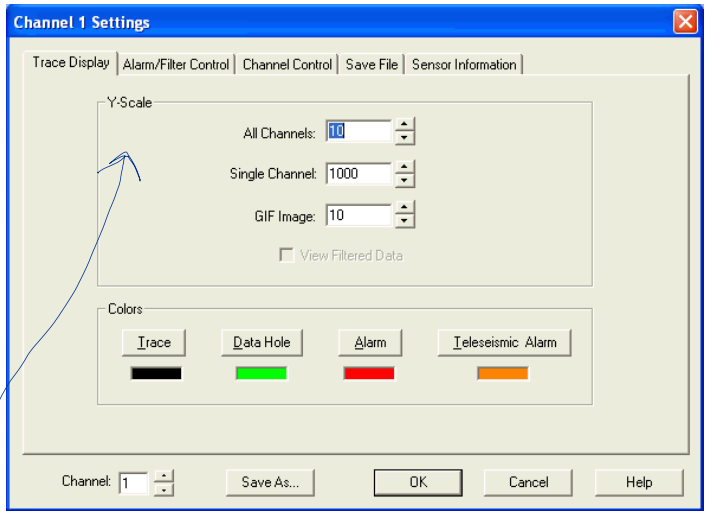
Help Button:

Opens the on-line documentation

We will now describe the functions of each tab.

3.1.2.1 Trace Display

The **Trace Display** tab of the *Channel Settings* dialog box is used to control the trace Y-Scale and colors.



Y-Scale Group Box:

All Edit Box:

Sets the vertical (amplitude) compression / expansion factor of the trace when the display window is displaying *all* channels. 1 = no compression or expansion. A positive number will compress and a negative number will expand the data.

Single Edit Box:

Sets the vertical (amplitude) compression / expansion factor of the trace when the display window is displaying *only* this channel. 1 = no compression or expansion. A positive number will compress and a negative number will expand the data.

GIF Edit Box:

Sets the vertical (amplitude) compression / expansion factor of the trace when WinSDR creates GIF file images of the data. 1 = no compression or expansion. A positive number will compress and a negative number will expand the data.

View Filtered Data Check Box:

If checked, WinSDR will display the filtered data instead of the raw data from the Interface Board. This check box will be disabled if the high-pass and low-pass filters are not enabled.

Colors Group:

Trace Button:

Sets the normal trace color for this channel.

Data Hole Button:

Used by the Replay window to indicate a hole in the data. The first minute of data after a time hole in the record file will be this color.

Alarm Button:

Sets the trace color when the channel is in an alarm or triggered state.

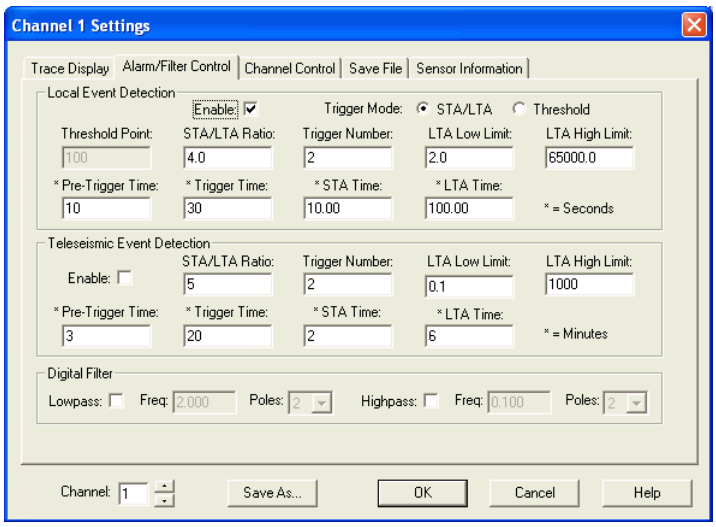
Teleseismic Alarm Button:

Sets the trace color when the channel is in a teleseismic event alarm or triggered state.

We suggest that you specify unique, distinguishable colors for the Traces if you are recording / displaying more than one channel.

3.1.2.2 Alarm / Filter Control

The **Alarm/Filter Control** tab of the *Channel Settings* dialog box is used to control event detection and digital filter parameters. If you



want WinSDR to automatically recognize and save local and teleseismic events in the Event File directory, you must set up trigger parameters to allow WinSDR to recognize these events. The actual parameters depend on your specific noise environment and the types of events you are interested in. We suggest that you start with the default values and then adjust them according to your needs and the results you are getting. Of course you can monitor and review the recorded data (up to the day limit of the Purge Record Files you specified in System Settings) and manually save any events of interest.

Local Event Detection Group Box:

Enable Check Box:

If checked, WinSDR will enable triggering and alarm functions for the channel based on the ***Triggering Mode***.

Triggering Mode:

STA/LTA (Short/Long Term Averaging) triggering will be enabled if this button is selected or ***Threshold*** triggering will be enabled if this button is selected.

Threshold Point Edit Box:

Used for simple amplitude alarm triggering. Sets the threshold for the selected channel, if the alarm feature is enabled. Enter a positive number above your normal background noise level.

STA/LTA Ratio Edit Box:

Sets the STA/LTA threshold point. See WinSDR STA/LTA Triggering for more information.

Trigger Number Edit Box:

This field is used for both simple threshold (amplitude) and STA/LTA triggering modes. Sets the number of data points that must exceed the Threshold Point or STA/LTA Threshold to trigger an alarm and auto save the event file(s). A number between 20 and 50 should be fine for amplitude triggering and 2 to 4 for STA/LTA triggering. See WinSDR STA/LTA Triggering for more information.

LTA Low Limit Edit Box:

Sets LTA minimum value. See WinSDR STA/LTA Triggering for more information.

LTA High Limit Edit Box:

Sets LTA maximum value. See WinSDR STA/LTA Triggering for more information.

Pre-Trigger Time Edit Box:

Sets the time in seconds the channel stays in the pre-trigger state. See WinSDR STA/LTA Triggering for more information.

Trigger Time Edit Box:

Sets the time in seconds the channel stays in an alarm or triggered state. See WinSDR STA/LTA Triggering for more information. This field is used for both simple threshold (amplitude) and STA/LTA triggering modes.

STA Time Edit Box:

Sets the STA average time, in seconds. Fractions of a second can be entered. See WinSDR STA/LTA Triggering for more information.

LTA Time Edit Box:

Sets the LTA average time, in seconds. Fractions of a second can be entered. See WinSDR STA/LTA Triggering for more information.

Teleseismic Event Detection Group Box:

Enable Check Box:

If checked, WinSDR will attempt to detect teleseismic events.

STA/LTA Ratio Edit Box:

Sets the STA/LTA threshold point. See WinSDR STA/LTA Triggering for more information.

Trigger Number Edit Box:

This field is used for both simple threshold (amplitude) and STA/LTA triggering modes. Sets the number of data points that must exceed the Threshold Point or STA/LTA Threshold to trigger an alarm and auto save the event file(s). A number between 20 and 50 should be fine for amplitude triggering and 2 to 4 for STA/LTA triggering.

LTA Low Limit Edit Box:

Sets LTA minimum value.

LTA High Limit Edit Box:

Sets LTA maximum value.

Pre-Trigger Time Edit Box:

Sets the time in minutes the channel stays in the pre-trigger state.

Trigger Time Edit Box:

Sets the time in minutes the channel stays in an alarm or triggered state.

STA Time Edit Box:

Sets the STA average time, in minutes.

LTA Time Edit Box:

Sets the LTA average time, in minutes.

Digital Filter Group Box:

Lowpass Check Box:

Enables lowpass filtering of the data going to the alarm / event detection process.

Lowpass Frequency Edit Box:

Sets the lowpass filter cutoff frequency.

Lowpass Poles:

Sets the number of poles, or the steepness of the filter, used to attenuate the incoming data.

Highpass Check Box:

Enables highpass filtering of the data going to the alarm / event detection process.

Highpass Frequency Edit Box:

Sets the highpass filter cutoff frequency.

Highpass Poles:

Sets the number of poles, or the steepness of the filter, used to attenuate the incoming data.

Once again, setting the Digital Filter parameters depend on your environment and the types of events you are interested in.

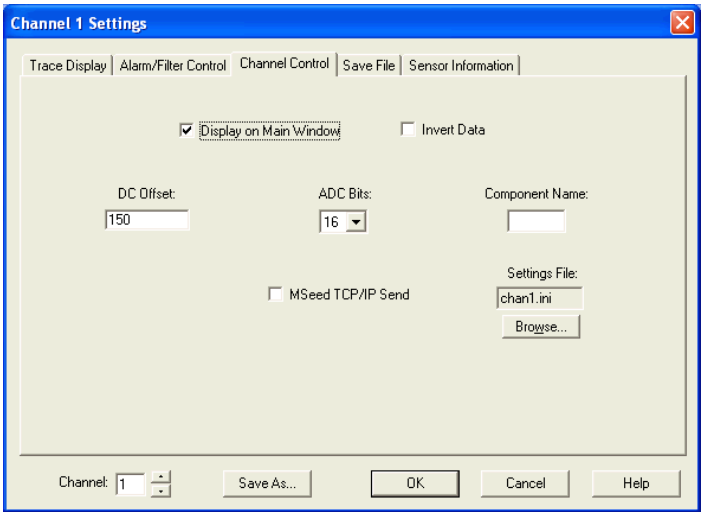
As starting points, we suggest that Raw Data channels may be Lowpass filtered at 0.5 Hz to provide a "cleaner" trace (or none) and Highpass filtered at 0.01 Hz to keep the trace always visible on the displays (removing the effects of secular drift such as that due to temperature changes). You may achieve a display on the Integrated Data channels that is similar to that of Broadband Force-Feedback instruments, such as those used by the USGS, by setting both the Lowpass and Highpass filters to the same value, such as 0.08 Hz. Note that the Highpass filter is permanently enabled on Integrated Data channels, however you may change the default frequency (.05 Hz) and the number of poles (1).

Since the Raw Data channels are always saved as such, integration and other filtering may be applied to the saved data after the fact, in WinQuake and other analysis applications.

Note the effect that Digital Filtering has on the data that gets saved: Raw Data from the instrument gets saved as raw data regardless of the Digital Filter parameters (the filtering affects raw data only in the display windows. Integrated Data (pseudo-velocity) is saved after filtering.

3.1.2.3 Channel Control

The **Channel Control** tab of the *Channel Settings* dialog box is used to control various parameters of the selected channel.



Display on Main Window Check Box:

Enables or disables the displaying of the selected channel on the real-time window when "all" channels are being displayed. Note: Data is still recorded if the channel is not displayed and event files will be produced when the system detects an event. The Replay mode can also be used to extract event files.

Invert Data Check Box:

Inverts the data for this channel.

DC Offset Edit Box:

Used to correct for any DC offset on this channel.

ADC Bits Select Box:

Selects how many CDC Bits to get from the Interface Board. For the VolksMeter sensor the options are 16 to 24 bits.

MSeed TCP/IP Send Check Box:

If checked, WinSDR will send data to a TCP/IP client when the client requests MiniSeed packets.

Component Edit Box:

Sensor Component Name. Used to describe the sensor. Example: BHZ or SHN

Settings File:

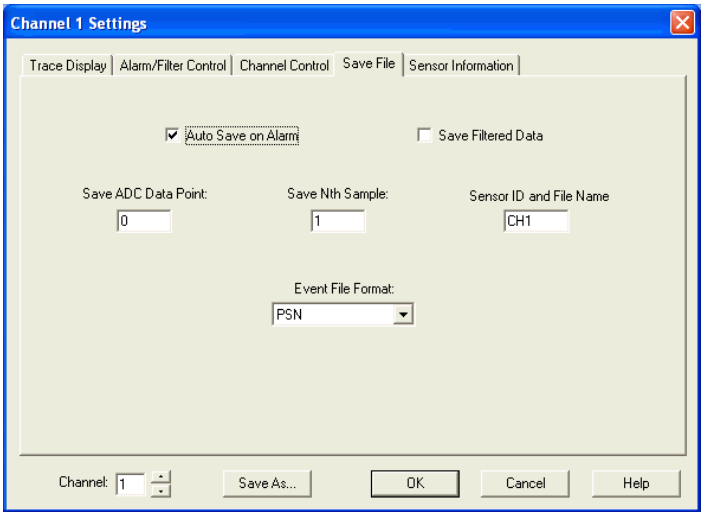
Used to select the settings file for this channel. Use the ***Browse*** button to select a new *.ini file.

As described in Chapter 2, the critical fields under this tab are the ADC Bits and DC Offset values, which should already be set to their initial operating values. If the instrument settles further over time, it may be necessary to adjust the DC Offset value to compensate. The eventual setting of the ADC Bits value (and the Sample Rate) will be discussed in section 3.2.

Unless you plan to have multiple standard settings for these values, there is normally no reason to change the default Settings File name. Any settings you change under this or any of the other Channel Settings tabs are saved automatically to the specified Settings File when you click the OK button at the bottom of the box.

3.1.2.4 Save File

The **Save File** tab of the *Channel Settings* dialog box is used to control various parameters used when WinSDR saves Event files.



Auto Save on Alarm Check Box:

If checked, WinSDR will save an Event file for this channel when an Event is detected. (Detection of "Events" is controlled by settings under the Alarm tab.)

Save Filtered Data Check Box:

If checked, and if a digital low-pass and/ or high-pass filter is enabled in the Alarm/Filter Control tab of the channel settings dialog box, the filtered data will be used for display and saved in the daily record file. **Please Note: When this option is enabled, you will lose any data outside of the filter cutoff frequencies. It's best to save the raw data and do post filtering on the PSN event files using a program like WinQuake.**

Save ADC Point Edit Box:

Used to filter automatically saved Event files. If a value other than 0 is entered, the peak data count during an alarm for this channel must be higher then the number entered in this field before an Event file will be saved. A value of 0 disables Event file filtering. This setting should only be used if more than one channel is being recorded.

Save Nth Sample Edit Box:

When WinSDR automatically saves an Event file it will use this number for the Save Nth value. Save Nth controls the sample rate of the Event file.

Sensor ID and File Name Edit Box:

Sets the sensor ID string and Event file extension from this channel. The sensor ID string should be 3 to 6 characters long.

Event File Format List Box:

Sets the Event file output format. Currently WinSDR can save Event files in the following formats: PSN, SAC Binary and MiniSeed (with Steim 2 encoding).

Note that, unlike the raw data Record files, which are automatically purged after the number of days specified in the System Settings | General tab, Event files are retained indefinitely. If too many Event files are saved, either manually or automatically, the storage device to which they are directed (in System Settings | Directories) can, eventually be filled. This means that you must periodically monitor the amount of disk space used by the Event files and delete files that you no longer want or move them to another medium, like CD-ROM or DVD-ROM.

The Event files are saved in the root directory specified in System Settings | Directories | Event Files. WinSDR will create a new sub-directory in this

root directory each month named *ymm,* where y is the current year and mm is the current month (e.g. March 2007 would be named 703). The Event files stored in the monthly sub-directory are named in the format:

date.time.sensor name.file type

For example, the file:

070312.235457.ch3.psn

Holds the Event data for:

March 12, 2007

23:54:57UTC

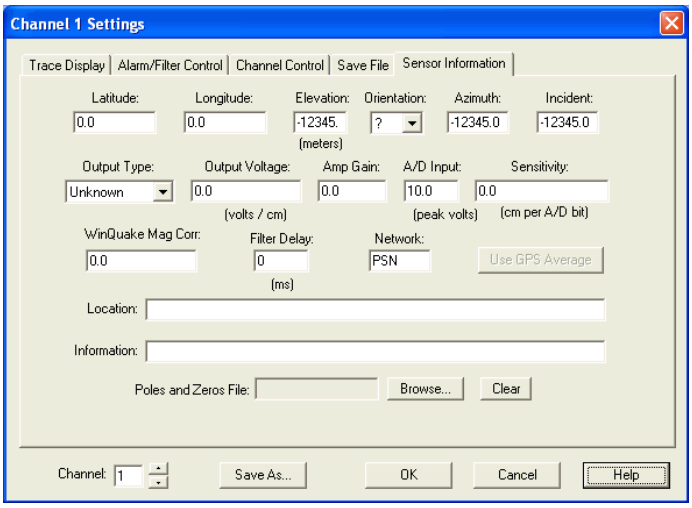
from channel 3

in PSN format

The Sensor Name (ch3 in the example) is specified in the Sensor ID and File Name field of this tab. This is a 6-character alpha-numeric value that defaults to CHx, where x is the channel number. You may want to add an identifier that is unique to your site to the channel number. For example, if you are at the University of Colorado at Boulder, you could prefix "UCB" to the channel number to get "UCBCH1", or more simply "UCB1".

3.1.2.5 Sensor Information

The **Sensor Information** tab of the *Channel Settings* box is used to control various parameters regarding your specific VolksMeter instrument and site. Several of the parameters do not apply to the digital VolksMeter sensor and are so noted below.



If you have the GPS Time Reference option, see "Use GPS Average", below, to set the Latitude, Longitude and Elevation values.

Latitude Edit Box:

Enter the Latitude of the sensor in degrees and decimal point not in degrees, minutes, seconds. Use a negative number for the Southern Hemisphere.

Longitude Edit Box:

Enter the Longitude of the sensor in degrees and decimal point not in degrees, minutes, seconds. Use a negative number for the Western Hemisphere.

Elevation Edit Box:

Elevation of the sensor in meters above or below (negative number) sea level. Use -12345.0 if unknown.

Orientation Select Box:

Set to Z for a vertical sensor, N for a North-South oriented sensor, E for a East-West sensor or ? if unknown. **The VolksMeter standard pendulum sensors are oriented horizontally, so "N" or "E" are the options.**

Azimuth Edit Box:

Sensor azimuth angle in degrees with respect to the north through east. For a N-S or vertical sensor use 0. For a E-W sensor use 90. Set to -12345.0 if unknown.

Incident Edit Box:

Sensor incident angle in degrees with respect to vertical. For a N-S or E-W sensor use 90. For a vertical sensor use 0. Set to -12345.0 if unknown. **Use 90 for the VolksMeter.**

Output Type Select Box:

Select the sensor output type to either ***Acceleration***, ***Velocity***, ***Displacement*** or ***Unknown***. See below, *Additional Information, Sensor Sensitivity Field*, for more information. **The Raw data channels from the VolksMeter are acceleration. The Integrated data channels are (pseudo) velocity.**

Output Voltage Edit Box:

Output voltage of the sensor in volts per centimeter of movement. **Leave at 0.0 for VolksMeter, not applicable.**

Amp Gain Edit Box:

Gain of the amplifier/filter channel that is between the sensor and the ADC input. **Leave at 0.0 for VolksMeter, not applicable.**

A/D Input Edit Box:

Specifies the maximum peak input voltage of the ADC channel. For the PSN-ADC-SERIAL this is usually set to 10 volts. **Leave at 10.0 for VolksMeter, not applicable.**

Sensitivity Edit Box:

The sensitivity of the sensor if known. See below for more information. **Leave at 0.0 for VolksMeter, not applicable.**

Mag Corr Edit Box:

A floating point number used by WinQuake to calculate magnitude. See the WinQuake documentation for more information.

Filter Delay Edit Box:

Used to compensate for any propagation delay through the low-pass filter for this channel. The number entered is in milliseconds. See below, *Additional Information, Sensor Filter Delay Field,* for more information. **Leave at 0 for VolksMeter, not applicable.**

Network Edit Box:

Network affiliation. Example: **PSN. Unless you specifically join or create a named network of sensors, leave this field at PSN or change to blank.**

Use GPS Average Button:

This button will set the sensor's latitude, longitude and elevation fields to the average GPS position data. (Remember, this is actually the location of the GPS Receiver.) This button will only be enabled if you have performed the following steps:

1) You have installed and activated the GPS Time Reference option (section 2.8), and

2) You have clicked on **Settings | GPS | GPS Location,** checked the **Enable Location Averaging** check box and accumulated at least 100 readings to average (value in Average Number box). (The GPS Location box must be closed in order to open any other box.)

When the button is enabled, clicking it will copy the current averaged latitude, longitude and elevation to the appropriate fields in this box.

Once the fields are set, you should re-open the **GPS Location** box and uncheck the **Enable Location Averaging** check box. This will eliminate unnecessary GPS traffic on the VolksMeter connection to the support computer.

Location Edit Box:

Sensor location string. Typically, this is the permanent site City, State and Country. Please keep as short as possible. Example: **Redwood City, CA USA**

Information Edit Box:

Sensor information string. The is the sensor type or name. Example: **VolksMeter II**

Poles and Zeros File:

If specified, WinSDR will save the Poles and Zeros (frequency response information) contained in the file into the PSN Event file. See [*insert filename here*] for an example of a Poles and Zeros file. Use the *Browse* button to locate the file and the *Clear* button to delete the file.

Additional Information

Sensor Sensitivity Field:

The Sensor Sensitivity field number depends on the Sensor Output Type field. If the sensor output is acceleration, sensitivity is in cm/sec/sec per A/D bit, if the output is velocity cm/sec per bit and if the output is displacement in cm per bit. This web page can be used to calculate the sensitivity number if you know the output voltage level of your sensor.

The Channel Settings need to be specified for each channel that you will be recording; the Raw Data channels and the Integrated Data channels. On a 2-channel VolksMeter up to four sets of Channel Settings should be specified.

3.1.3 Other Operational Settings

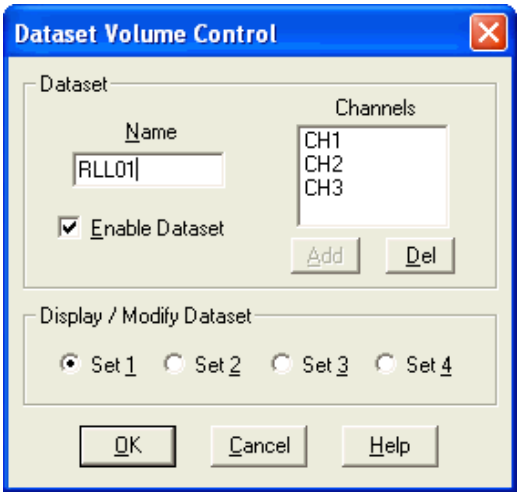
Once the System Settings and the Channel Settings are specified, there are still a variety of miscellaneous parameters that should be specified, depending on which additional functions that you wish WinSDR to perform. The following sections describe these settings.

Additional functions that are enabled with these settings include:

Saving multiple-channel Event files
Linking WinSDR to WinQuake
Setting parameters for the Real-Time and Single Line display windows
Uploading Event files to FTP servers
Creating GIF Images of Record files and uploading them

3.1.3.1 Saving Multiple-Channel Event Files

Up to now, the operational parameters that have been specified support the creation and saving of Event files that contain only a single channel of data. If events occur on more than one channel, which is usually the case, then a separate Event file is saved for each channel. The **Dataset Volume Control** settings specify how multiple channels are saved in a single Dataset Event file.



Note: WinQuake version 2.9.2 or higher is required to view Dataset files.

The ***Dataset Volume Control*** dialog box is used to specify what channels are saved in dataset files. This dialog box is opened using the **File | Dataset Volume Control** menu item. Up to four datasets can be defined and each dataset can have two or three channels associated with the dataset.

Name Edit box:

Enter the dataset name. This is used as the file extension when WinSDR creates the dataset file name. The format of the file name is the event file start time, dataset name and then "PSN". Example: 030208.123023.LCL15B.PSN

Channels list box:

Lists the channels associated with the dataset.

Enable Dataset checkbox:

Used to enable or disable the dataset volume. If enabled, WinSDR will save the channels in the dataset volume. If turned off, the channels will be saved as individual Event files.

Add button:

Opens the ***Add Channel*** dialog box. This dialog box lists the available channels that can be added to the dataset. Up to three channels can be added to the dataset list.

Del button:

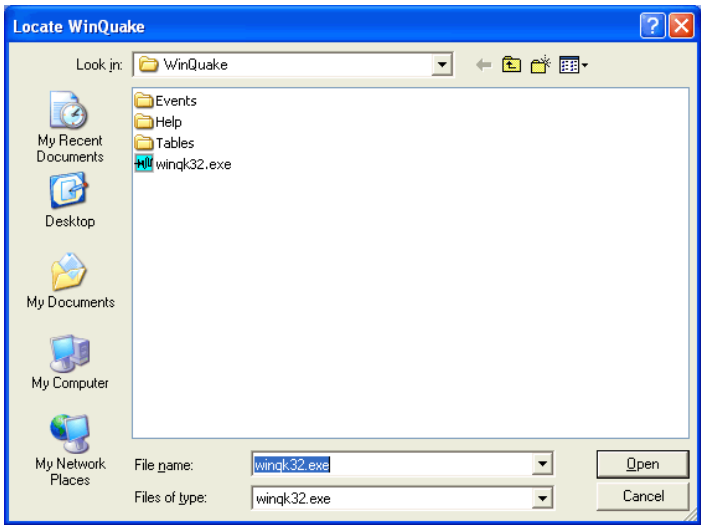
Used to delete the currently selected channel in the *Channels* list box.

Sel 1 to Sel 4 radio buttons:

Used to display and modify one of the four dataset volumes that can be created in WinSDR.

3.1.3.2 WinQuake Location

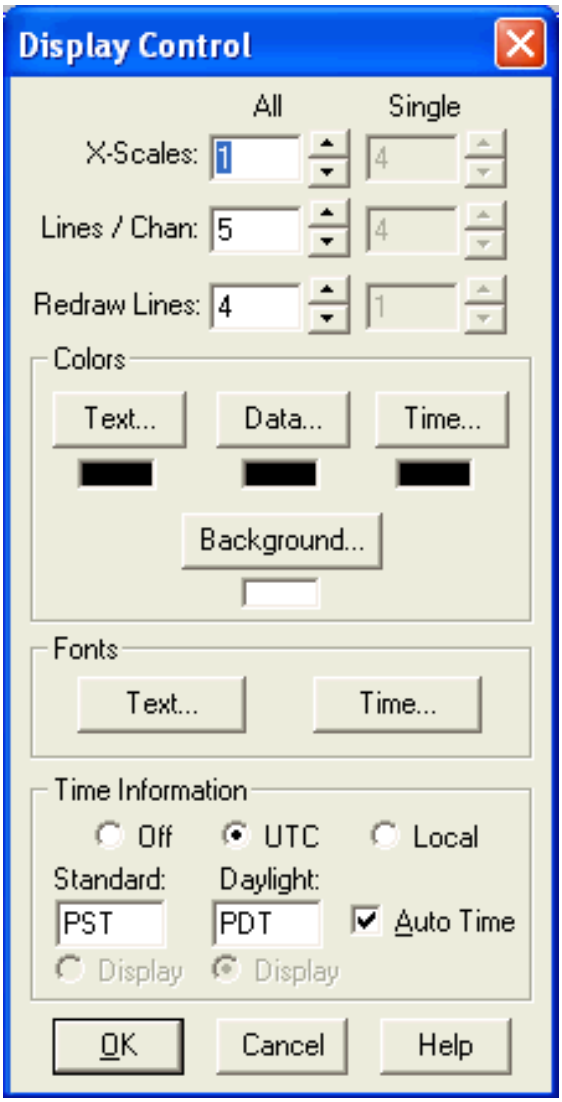
Used to specify the location of the WinQuake program file winqk32.exe. WinSDR can open WinQuake after saving event files if it knows the location of this file. See the Save Event dialog box for more information.



This dialog box is activated from the menu bar with **File | WinQuake Location**. If WinQuake is installed using the default location, it will be located in the directory **C:\Program Files\WinQuake**.

3.1.3.3 Real-Time Display Parameters

The appearance of the Real Time display is specified by clicking on the menu bar **Settings | Display** or pressing the **[F5]** key.



The terms ***All*** and ***Single*** below refer to the two display modes offered by the Real-Time display. The mode is selected by clicking on **All** or **CHx** in the **View** menu or the context menu of the display window. When in ***All*** mode, every channel enabled for ***All*** display (**Display on Main Window** box checked under **Channel Settings | Channel Control;** see section 3.1.2.3) will be displayed and the display appearance is controlled by the ***All*** parameters. When only channel **x** is specified, by selecting **CHx**, then only that channel is displayed and the display appearance is controlled by the ***Single*** parameters.

All Edit Boxes:

X-Scale:

Trace speed, in minutes per line, when WinSDR is displaying ***all*** channels.

Lines per Channel:

Number of lines to display when displaying ***all*** channels.

Redraw Lines:

Number of lines to redraw after the trace reaches the end of the screen. Must be less then the *Lines per Channel* setting. Entering 0 will disable any history information from being displayed.

Single Edit Boxes:

X-Scale:

Trace speed, in minutes per line, when WinSDR is displaying a single channel.

Lines per Channel:

Number of lines to display when displaying a single channel.

Redraw Lines:

Number of lines to redraw after the trace reaches the end of the screen. Must be less then the *Lines per Channel* setting. Entering 0 will disable any history information from being displayed.

Colors Group Box:

Text Button:

Opens the *Colors* dialog box. The dialog box is used to change the color of the text part of the status information displayed on the bottom of the window.

Data Button:

Opens the *Colors* dialog box. The dialog box is used to change the color of the data part of the status information displayed on the bottom of the window.

Time Button:

Opens the Colors dialog box. This dialog box is used to set the color of the GMT/UTC time information on the left hand side of the Real-time and Replay windows. This button will be enabled if UTC or Local Time is selected in the Time Information group box.

Background Button:

Opens the *Colors* dialog box. This dialog box is used to change the background color of the window.

Fonts Group:

Text Button:

Opens the *Font* dialog box. This dialog box is used to change the font of the status information text.

Time Button:

Opens the *Font* dialog box. This dialog box is used to change the font of the time information on the left hand side of the Real-time and Replay windows. This button will be enabled if UTC or Local Time is selected in the Time Information group box.

Time Information Group Box:

Off Button:

Turns off the time information text on the left hand side of the Real-time and Replay windows.

UTC Button:

Enables the time information text on the left hand side of the Real-time and Replay windows. UTC time is displayed.

Local Button:

Enables the time information text on the left hand side of the Real-time and Replay windows. Local time is displayed.

Standard Time Edit Box:

Enter your local Standard Time Zone abbreviation in this edit box. Example: PST (Pacific Standard Time) or EST (Eastern Standard Time).

Standard Time Display Button:

If checked, and the *Auto Time* check box is not checked, WinSDR will always display the Standard Time string in the GIF image files, if both GMT and Local time are being displayed, and in the Real-time window.

Daylight Time Edit Box:

Enter your local Daylight Time Zone abbreviation in this edit box. Example: PDT (Pacific Daylight Time) or EDT (Eastern Daylight Time).

Daylight Time Display Button:

If checked, and the *Auto Time* check box is not checked, WinSDR will always display the Daylight Time string in the GIF image files, if both GMT and Local time are being displayed, and in the Real-time window.

Auto Time Check Box:

If checked, WinSDR will automatically change the Standard and Daylight string based on the current day and time. If not checked, WinSDR will display the Time Zone string based on the *Display Time* check boxes. WinSDR gets the current Standard / Daylight Saving Time mode from Windows.

OK Button:

Closes the dialog box. New information entered will be used by WinSDR.

Cancel Button:

Closes the dialog box without making any changes.

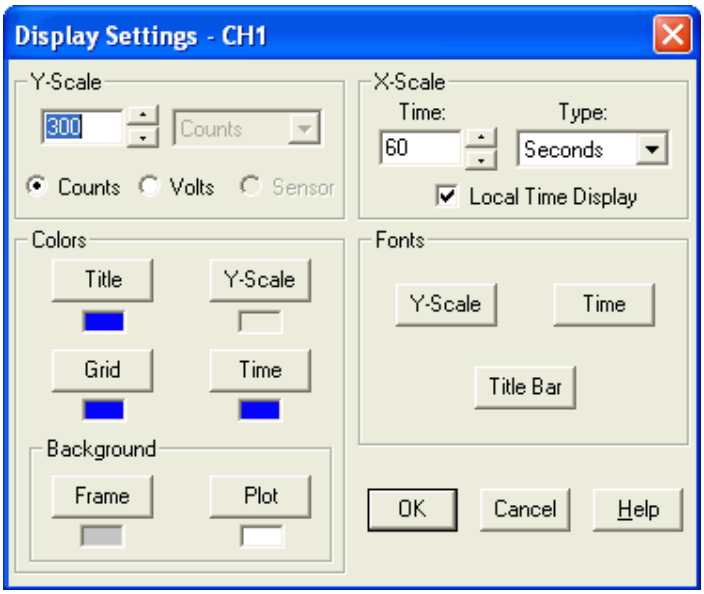
Help Button:

Opens the Help file.

The Y-scale and other parameters for the individual channel traces are controlled by the **Trace Display** tab of the specific **Channel x Settings** boxes. See section 3.1.2.1.

3.1.3.4 Single Line Display Parameters

The appearance of the **Single Line** display is specified by clicking on the menu bar **Settings | Single Line Display,** selecting **Display Settings** from the context menu of the Single Line display, or



pressing **CTRL + [F5]**. If the Single Line display window is not open, the **Single Line Display** Settings menu item will be grayed out and the **CTRL + [F5]** keyboard shortcut will do nothing. When the **Single Line Display Settings** box is opened, it will control only the parameters of the channel that is being displayed in the window. This channel number will be shown on the title bar of the **Display Settings** box. To edit the parameters of a different channel, you must close the Settings box, change the channel being displayed and then reopen the Single Line Display Settings box.

Y-Scale Group:

Y-Scale Edit Box:

Used to control the Y-Scale range. For a Y-Scale setting of 1000, the range on the display is ±1000. This value is also controlled by the position of the Vertical Scroll Bar slider on the Single Line display window. The Edit Box allows setting the Y-Scale value to values between the standard increments of the Vertical Scroll Bar slider.

Counts Button:

If selected, the Y-Scale will be displayed in A/D counts. **This is the appropriate choice for the VolksMeter sensor, where the display is in CDC counts.**

Volts Button:

If selected, the Y-Scale will be displayed in volts into the A/D converter channel. (FYI: Since the VolksMeter uses a direct Capacitance to Digital Converter, there really are no "volts" to display. However, if Volts are selected, the Volt to Count conversion factor depends on the current ADC Bits value (Channel x Settings | Channel Control) and the A/D Input Peak Volts (Channel x Settings | Sensor Information). For example, if the ADC Bits are 16, giving a possible data range of ±32768 CDC counts, and the A/D Peak Input value is 10.0, the default, then 10.0 Volts will correspond to +32768 counts.)

Sensor Button:

Currently not implemented.

X-Scale Group:

Time Edit Box:

Used to control the X-Scale (time). Enter the number of seconds, minutes or hours to display across the Single Line plot. The X-Scale value is also controlled by the **Last**

item on the Single Line display context menu.

Type List Box:

Used to set the X-Scale time to seconds, minutes or hours.

Local Time Display:

If selected, local time will be displayed instead of UTC/GMT time.

Colors Group:

Title Button:

Opens the *Colors* dialog box. This dialog box is used to change the color of the title of the display.

Y-Scale Button:

Opens the *Colors* dialog box. This dialog box is used to change the color of the Y-Scale text.

Grid Button:

Opens the *Colors* dialog box. This dialog box is used to change the color of the plot grid lines.

Time:

Opens the *Colors* dialog box. This dialog box is used to change the color of the time or X-Scale text.

Frame:

Opens the *Colors* dialog box. This dialog box is used to change the color of the frame around the plot window.

Plot:

Opens the *Colors* dialog box. This dialog box is used to change the color of the window background.

Fonts:

Y-Scale Button:

Opens the *Fonts* dialog box. This dialog box is used to change the font of the Y-Scale text.

Time Button:

Opens the *Fonts* dialog box. This dialog box is used to change the font of the Time or X-Scale text.

Title Bar Button:

Opens the *Fonts* dialog box. This dialog box is used to change the font of the plot title bar.

OK Button:

Closes the dialog box. New information entered will be used by WinSDR.

Cancel Button:

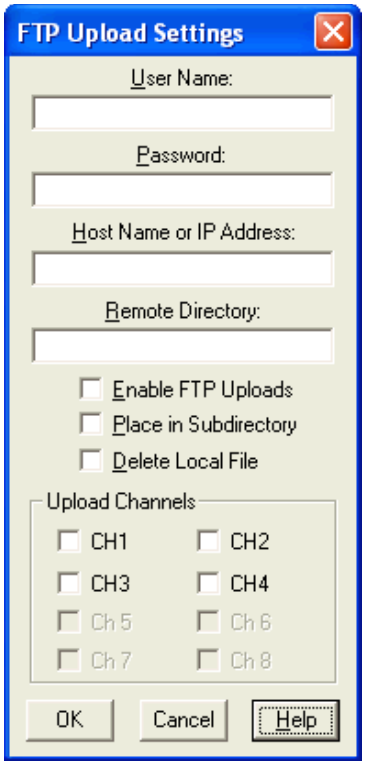
Closes the dialog box without making any changes.

Help Button:

Opens the Help file.

3.1.3.5 FTP Upload Settings

The **FTP Upload Settings** dialog box is used to control the uploading of new Event files to an FTP server after WinSDR has saved them to the local disk drive. This will happen when WinSDR detects an event using the Alarm detection process or if the user forces WinSDR to produce Event files by using the **File | Force Event Files** menu item. By forcing WinSDR to produce and transfer Event files, the user can check that everything is working correctly. Currently, if you save Event file(s) using the Replay or Real-time windows, the Event files will not be transferred to the FTP server. If the **Log FTP Upload Information** check box in the **Log File Settings** dialog box is checked, WinSDR will save FTP upload status information in the Log file and Log File Viewer. This information can be used to debug any problems you may be having uploading files to the FTP server. To control the uploading of GIF image files using the FTP protocol see the GIF Image Upload Settings dialog box (section 3.2.3.7).



User Name Edit Box:

Enter the user name in this edit box. You must have a user name and password for Event file transfers to an FTP server located on the Internet or local LAN.

FTP Password Edit Box:

Enter the FTP server password in this edit box.

Host Name or IP Address Edit Box:

Enter the host name (Example: ftp.somedomain.com) or IP address (Example: 196.100.1.1) of the FTP server.

FTP Remote Directory Edit Box:

Enter the directory where WinSDR should place the new Event file(s). WinSDR will create this directory if needed.

Enable FTP Uploads Check Box:

This is the master On / Off switch. If checked, WinSDR will upload new Event file(s).

Place in Subdirectory Check Box:

If checked, WinSDR will save the Event files in a subdirectory under the directory specified in the *FTP Remote Directory* edit box. The subdirectory name is based on the year and month of the event file. The format is YYMM (YY = year MM = Month). Example: If the remote directory is set to **quakes** and the event happened March 2002, WinSDR will save the Event file(s) in **/quakes/0203/**.

Delete Local File:

If checked, WinSDR will delete the file on the local drive after the file has been transferred to the remote system.

Upload Channels Check Boxes:

Used to select the channel(s) that will be uploaded to the FTP server.

Ok Button:

Closes the dialog box. New information entered will be used by WinSDR.

Cancel Button:

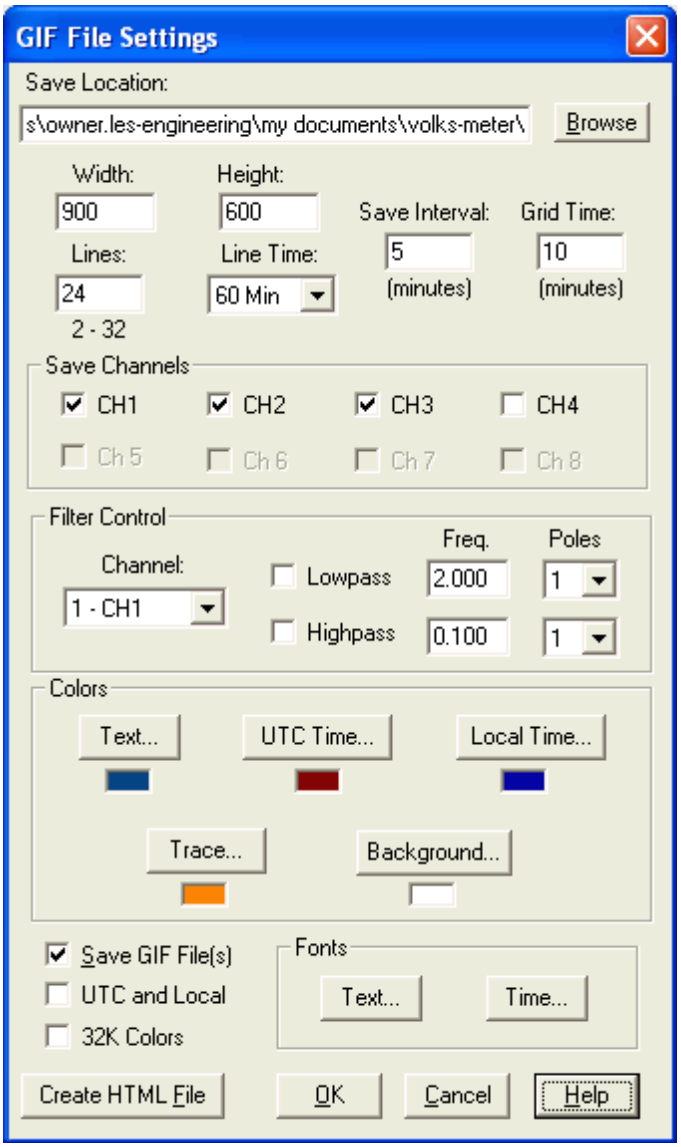
Closes the dialog box without making any changes.

Help Button:

Opens the Help file.

3.1.3.6 GIF Image File Settings

The **GIF File Settings** dialog box is used to control GIF image file creation. This box is displayed by clicking on the menu bar **Settings | GIF Files… | Settings...** GIF images are helicord style graphs that are used to visually document data recorded by WinSDR. The actual GIF image files are created automatically at the rate specified by the **Save Interval** value described below or by clicking **Create GIF Files** in the **GIF Files...** submenu.



The images will be saved in the directory specified in the ***Save Location*** edit box. The file name of each image is the Sensor_ID.gif (Sensor_ID is specified in the **Sensor ID** field of the **Save File** tab of the **Settings | Channel x Settings** box.)

Save Location Edit Box:

Used to enter the directory of the GIF file(s). You can also use the ***Browse*** button to select a directory.

Browse Button:

Used to select the directory that will be used to save the GIF image file(s).

Width Edit Box:

Controls the pixel width of the image.

Height Edit Box:

Controls the pixel height of the image.

Lines Edit Box:

Controls the number of lines to display. The input range is 2 to 32.

Line Time Select Box:

Controls how many minutes each line will be.

Save Interval Edit Box:

Controls how often WinSDR saves image file(s). **Note that each time a new GIF image file is saved, the prior file is overwritten, so that these files do NOT accumulate. For example, if Lines = 24 and Line time= 60 minutes, the saved GIF image will show 24 hours of data. Even if the file is saved every 5 minutes, it includes the 24 hours prior to the last save point.**

Grid Time Edit Box:

Controls how many grid lines WinSDR will display. 0 = No grid lines.

Save Channels Check Boxes:

This is the On / Off switch for each channel. If enabled WinSDR will create a GIF file for that channel.

Filter Group:

This group controls digital filtering of the data used to create the GIF images. A lowpass and / or a highpass filter can be enabled for each channel.

Channel Select Box:

Used to select the channel to enable or disable digital filter.

Lowpass Check Box:

Enables lowpass filtering of the selected channel.

Lowpass Frequency Edit Box:

Sets the lowpass filter cutoff frequency.

Lowpass Poles:

Sets the number of poles, or the steepness of the filter.

Highpass Check Box:

Enables highpass filtering of the selected channel.

Highpass Frequency Edit Box:

Sets the highpass filter cutoff frequency.

Highpass Poles:

Sets the number of poles, or the steepness of the filter, used to attenuate the incoming data.

Colors Group:

Text Button:

Sets the text information color.

GMT Time Button:

Sets the GMT or UTC time information color.

Local Time Button:

Sets the Local time information color if the *GMT and Local* check box is checked..

Trace Button:

Sets the data trace color.

Background Button:

Sets the window background color.

Save GIF File Check Box:

This is the master on/off switch for creating GIF images. If checked, WinSDR will save GIF image file(s).

GMT and Local Check Box:

If checked, WinSDR will display GMT and local time on the left hand side of the GIF image. Your local time zone strings (Example: PST or PDT) should be entered in the Display Control dialog box before enabling this option.

32K Colors Check Box:

Check this box if you have your video display set to 32 K colors.

Fonts Group:

Text Button:

Opens the *Font* dialog box. This dialog box is used to change the font of the information text.

Time Button:

Opens the *Font* dialog box. This dialog box is used to change the font of the time information on the left hand side of the image.

Create HTML Button:

Used to create a HTML file called CURRENT. HTML. This HTML file will display all of the selected channels in a web page. After creating this file, you can use the **View | View GIF Images** menu items to open the PSNExplorer Web browser and display the images in a browser window. The file will be created in the root directory of WinSDR. Any Web Browser, such as Internet Explorer or Firefox, may be used to view HTML files. **The creation of HTML images is strictly manual and occurs only when you click the button.**

OK Button:

Closes the dialog box. New information entered will be used by WinSDR.

Cancel Button:

Closes the dialog box without making any changes.

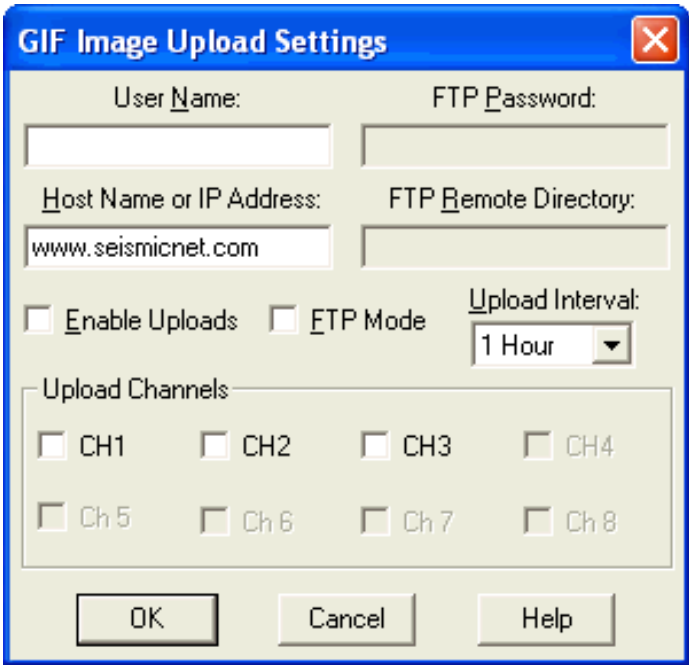
Help Button:

Opens the Help file.

The vertical compression factor for traces displayed in the GIF images is specified in the Channel x Settings | Trace Display box.

3.2.3.7 GIF Image Upload Settings

The **GIF Image Upload Settings** dialog box controls the uploading of GIF image files to an FTP server or the PSN web site. This box is activated by clicking menu bar **Settings | GIF Files | Upload Settings...**



User Name Edit Box:

Enter the user name in this edit box. This field is used for both FTP transfers and uploading to the PSN Web site. **[Uploading to the PSN website is not currently supported. (Mar-07)]**

You must have a user name, and password for FTP transfers, to upload image files to the PSN Image Server or an FTP server located on the Internet or local LAN. Please contact Larry Cochrane, lcochrane@rllinstruments.com, if you would like to upload your image files to the PSN Web site.

FTP Password Edit Box:

Enter the FTP server password in this edit box. This field is only enabled if the *FTP Mode* check box is checked.

Host Name or IP Address Edit Box:

Enter the host name or IP address of the PSN web site or FTP server that will receive the image file(s). This field should be set to www.seismicnet.com or psn.seismicnet.com for **non** FTP transfers.

FTP Remote Directory Edit Box:

Enter the directory where WinSDR should place the GIF image file(s). This field is only enabled if the *FTP Mode* check box is checked. WinSDR will create this directory if needed.

Enable Uploads Check Box:

This is the master On / Off switch. If checked, WinSDR will upload GIF image file(s).

FTP Mode Check Box:

If checked, WinSDR will use the FTP protocol to transfer GIF image files. **This box should be checked. The alternative PSN protocol is not currently implemented (Mar-07).**

Upload Interval Select Box:

Controls the upload interval. Possible settings are 10, 15, 30, and 60 minutes.

Upload Channels Check Boxes:

Used to select the channel(s) that will be uploaded to the FTP server or PSN web site.

Ok Button:

Closes the dialog box. New information entered will be used by WinSDR.

Cancel Button:

Closes the dialog box without making any changes.

Help Button:

Opens the Help file.

3.2 Selecting Sample Rate and Resolution

The VolksMeter II / WinSDR system provides several choices of data sample rate and sensor resolution. There is a tradeoff between these two parameters. High sample rates do not work well with high bit resolutions. Basically, at high sample rates, the internal signals in the Capacitance to Digital Converters do not have time to settle completely and the noise in the data under these conditions swamps the additional bits of resolution. This noise is internal to the CDC and in the raw data before any signal processing or lowpass filtering done by WinSDR.

A sample VolksMeter II was tested with the Moving Plate mechanically locked to the Fixed Plates with a rubber band so that the capacitance of the sensor array was constant during the tests. Here are the results:

Sample Rate (Samples/sec)	ADC Bits	Range	Data Variation (Counts)
10	16	±32768	2-3
25			14-16
50			22-23
10	22	±2,097,152	224
25			947
80			1419

The Data Variation is the difference between the minimum number of counts and the maximum number of counts recorded over a 60 second period as displayed on the Real-Time window with a single channel being displayed, a 60 second X-scale and the min/max display at the bottom of the window cleared (press the [F7] key) at the beginning of the time period. These numbers represent the minimum intrinsic noise of the VolksMeter sensor before any filtering.

The signal noise can be reduced, at the cost of maximum frequency detectable, by signal averaging (lowpass filtering) of the raw data in WinSDR or WinQuake.

In general, you probably want to set the system for the highest resolution consistent with the highest frequency you want to monitor. For resolutions of 22-24 bits, the highest sample rate should probably not exceed 10 samples per second (SPS). At 10 SPS, you can reliably detect signals up to 5Hz. On the other extreme, if you run at sample rate of 80 SPS (40Hz maximum frequency), your practical resolution will be limited to 16 bits.

Depending on the kind of signals you are interested in, higher resolutions and sample rates, combined with lowpass and highpass filtering and other signal processing, may work for you. For very low frequencies of seismic data, the real forte of the VolksMeter II, 10 SPS, 24 CDC Bits and Lowpass filtering at .5Hz, 2 poles, yields good results in a low-noise environment. High resolution, low sample rate settings with lowpass filtering are also appropriate for measuring tilt.