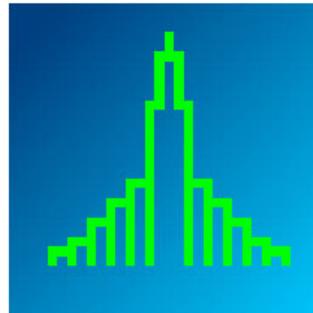

**AI-5120
Instrument Suite**



Users Manual

Advent Instruments Inc.

Release 1.0.39 - April 2007

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Printed in Canada

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1 Getting Started

1.1 Introduction

The AI-5120 Instrument Suite is a Windows software package and AI-5120 firmware package which allow the AI-5120 Telephone Line Monitor to operate as a digital oscilloscope and spectrum analyzer. The software enables the user to investigate the time domain and frequency domain representation of signals through an intuitive instrument-like software interface. The following sections describe how to set-up and start using the AI-5120 Instrument Suite software.

1.2 Minimum System Requirements

Computer/Processor:	PC with Pentium 1500 MHz or greater with USB support
Memory:	128 MB of RAM
Screen Resolution	1024x768 pixel display
Hard Disk Space:	20 MB
Operating System:	Microsoft Windows 98 Second Edition or greater

It may be possible to use this software package with different PC configurations containing less RAM, and different operating systems. Under most conditions it is likely that the software operates correctly; however being outside our testing environment we cannot ensure system resource limitations will not occur. Due to the size of the windows used in this program the minimum screen resolution is essential. This program will only connect to an AI-5120 connected on USB.

1.3 Installing the Instrument Suite

The AI-5120 Instrument Suite can be installed on your PC by executing the self-extracting setup utility which is available on the [Advent Instruments Web Site](#). Follow the on screen instructions and the setup program will guide you through the installation process. Once the installation is complete you may install the USB drivers (see following section).

1.4 Installing USB Drivers

To install the AI-5120 USB drivers:

1. Power on the AI-5120 and the PC
2. With no applications running on the PC, connect the AI-5120 to the PC using a USB cable.
3. The Windows OS will indicate that it has found a new device and is locating the software for it. It will prompt you for a driver location. Specify that the driver is located in the \USBDrivers\ subdirectory of the DLL installation path and press OK.
4. Windows will complete the installation and the AI-5120 can be used on USB!

2 Software Overview

2.1 Using the Controls

This section outlines some of the new controls in the AI-5120 Instrument Suite, which haven't been present in other Advent Instrument Software releases.

2.1.1 Control Knobs

Some of the controls on the instruments are implemented as control knobs. There are two types of knobs in the application, multi-turn knobs, and positional knobs. A multi-turn knob (shown in Figure 1) can be identified by the small dimple on the button face. The knob control can be adjusted by clicking on the dimple and then moving the mouse cursor in a circular motion around the button. Moving the button in a clockwise direction increases the knob control value, while moving the knob in the counter-clockwise direction decreases the knob control value.



Figure 1 Multi-turn Knob

The positional knobs have a white line (in place of the dimple) and have tick marks around the knob face - as shown in Figure 2. These knobs can be adjusted in the same manner as described for the multi-turn knobs, however these knobs have a fixed number of positions (as demonstrated by the tick marks).



Figure 2 Positional Knob

2.2 Illuminated Buttons

There are several illuminated button controls on the instrument panels. They are a rounded rectangle shape with either text or a small graphic displayed on the front of the button. Examples of illuminated buttons are shown in Figure 3. In this example the “Single” button is activated (since it appears illuminated) and the other buttons are deactivated. Simply clicking on the button face can activate most of the illuminated buttons.



Figure 3 Illuminated Buttons

3 Instrument Suite Basics

3.1 Connecting to an AI-5120

Before running the AI-5120 Instrument Suite software you should first connect an AI-5120 to the computer using the USB cable provided. When the software is started, it will automatically search for a licensed AI-5120.

- If a licensed device is located then the two instrument windows will begin to operate normally.
- If no AI-5120 units were located then the software will display an error message and the instruments will operate in “Demonstration Mode”. In this mode all the settings, controls, and menus can be accessed and manipulated for the purposes of software evaluation.
- If an unlicensed device is detected then the software will prompt the user to enter a software license key. Once the correct software license key is entered then the instruments will begin to operate. For more information on the software licenses see Section 3.3.

3.2 Demonstration Mode

In order to allow users to evaluate the AI-5120 Instrument Suite software without an AI-5120 unit connected, the software will change to “Demonstration Mode” whenever it is unable to connect to a licensed AI-5120. In this mode all the menus and controls will be available for the user to adjust and several demonstration signals can be loaded into the instrument to demonstrate the signal display and cursors.

When in demonstration mode, a dialog will appear similar to the one shown in Figure 4.

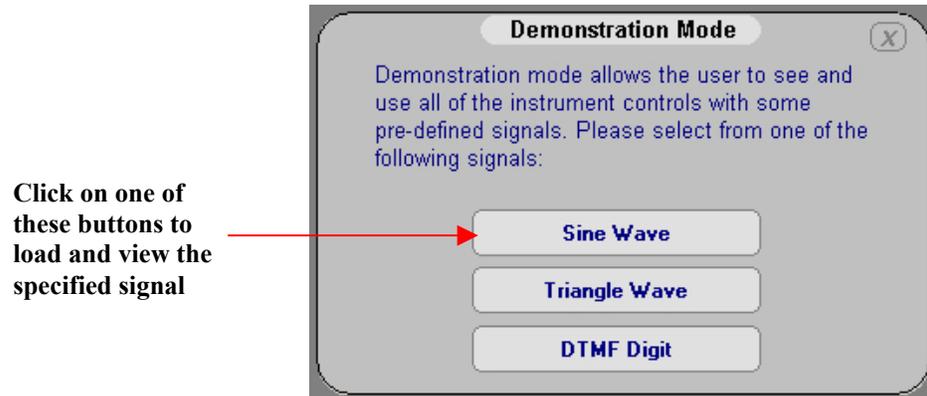
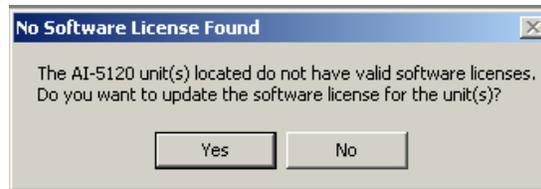


Figure 4 Demonstration Mode Dialog

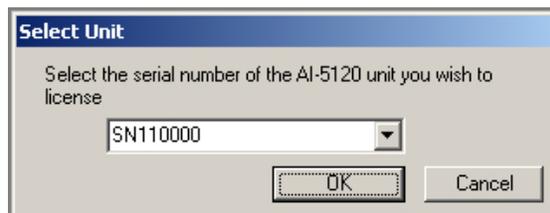
Note: While all of the controls are available, some of the signal scaling and formatting may not operate the same as when a device is connected to the unit. The demonstration signals are available strictly to demonstrate the signal display and the available controls.

3.3 Software Licenses

The AI-5120 instrument suite requires a software license in order to operate with an AI-5120. When the software locates an unlicensed AI-5120 it prompts the user if they would like to license the unit with the following dialog.



Click “Yes” then the software will prompt you to select the device to license with the following prompt.



Select the serial number of the device to license and click OK. The software will then prompt them to enter the software license key for the unit.

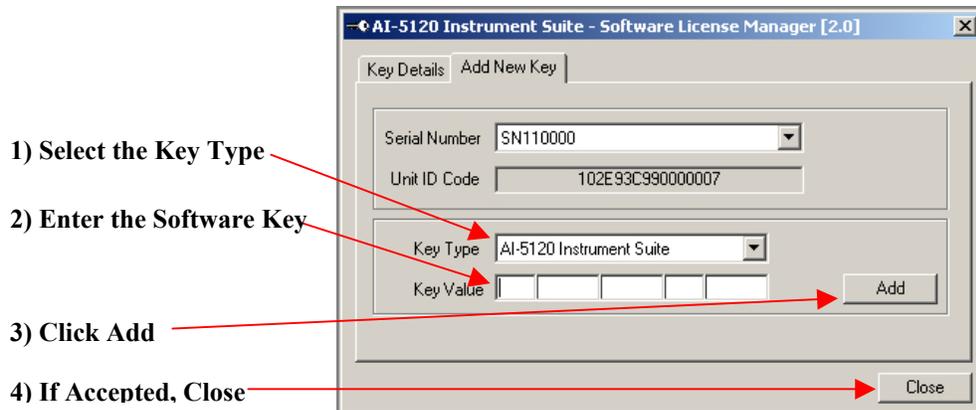


Figure 5 License Manager Window

Once the key has been accepted the software will begin to communicate with the AI-5120 and the instruments will operate normally. To add or remove software keys the user can click on the [Help] [Software License Manager] to access the license manager.

3.4 Checking For Software Updates

If you have installed the AI-5120 Instrument Suite software on a computer which is connected to the Internet then you can check for newer software versions simply by clicking the [Check for Software/Firmware Updates] item under the [Help] menu.

The latest software versions will then be downloaded from the Advent Instruments web site. The software will display a window similar to the dialog shown in Figure 6.



Figure 6 Software Update Dialog

If a newer version is available then several links will appear which allow you to download the latest version of the software or firmware or to get additional information on the software product. If the software is up to date then a green check mark will appear next to the product name and “(Up to Date)” will appear after the product name.

3.5 Program Preferences

Many of the program settings can be adjusted through the [File] [Preferences] menu. The program preferences dialog is shown in Figure 7.

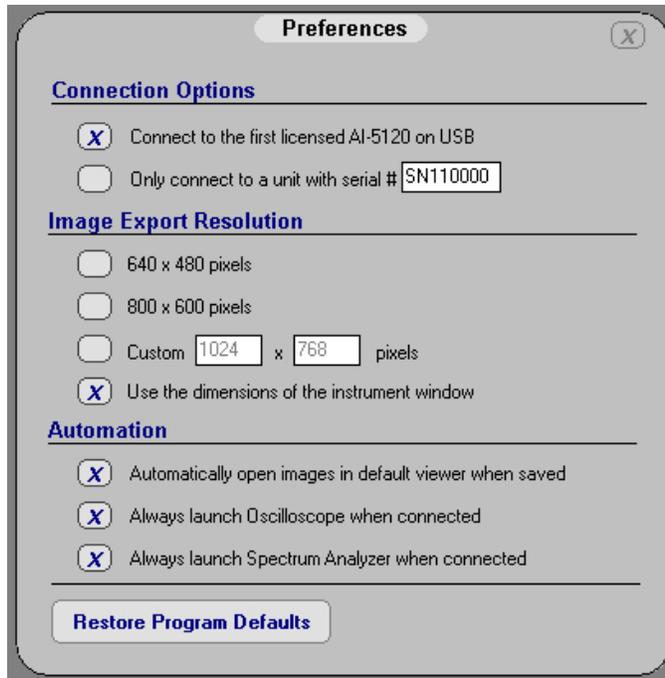


Figure 7 Program Preferences Dialog

Connection Options - There are two connection options in the preferences dialog. The software will either connect to the first properly licensed AI-5120 located on USB or, if the user chooses, the software will only connect to a unit with a specific serial number.

Image Export Options – The user can select the resolution of the images created when the “Save” button is pressed on either of the instruments. By default the images are stored with the same dimensions as the instrument window.

Automation Options – A few “automation options” have been added to the Instrument Suite to make the software more convenient to use. If selected, the software will automatically show either or both instruments on program boot (regardless of whether they were shown when the program was shut down). Also, the software can automatically preview any saved images in the default viewer (set by Windows) when a new image is saved.

Restore Program Defaults – Sometimes it is desirable to reset the application to use the original manufacturer settings. Clicking the “Restore Program Defaults” button at the bottom of the preferences window will re-boot any connected AI-5120 and the AI-5120 Instrument Suite Software with the manufacturer’s default settings.

3.6 Instrument Docking

To avoid the instrument windows from overlapping they can be docked together – which forces the horizontal edges to lock together. To dock or un-dock the instruments click the [Window] [Dock Instruments] menu. If you want to swap the order of two docked windows, undock them, move the desired window to the top and re-dock the window. Whichever window was the highest will be docked on top.

3.7 Saving and Loading Configurations

The AI-5120 Instrument Suite is able to store and load all the instrument settings and screen traces to a single configuration file.

To store the instrument settings to a configurations:

- Stop the Oscilloscope and Spectrum Analyzer
- Click [File] [Save Configuration]
- Select a file with the extension .cfg and click OK

To load the instrument settings click [File] [Load Configuration]. The software will then prompt the user with the dialog shown in Figure 8. The user can then choose if they want to view the signal data in the file, or simply load the instrument settings.

Clicking here will disconnect from the AI-5120, load all the instrument settings, and display the signal from the configuration file

Clicking here only load the instrument settings. The instrument will still stay connected to the AI-5120



Figure 8 Load Configuration File Dialog

3.8 Signal Filtering

The AI-5120 Instrument Suite allows several filters to be inserted in the signal path before all the instruments to reject unwanted signals. The Filter Setting dialog (shown in Figure 9) can be accessed by clicking the “Filter” button on either of the instruments.

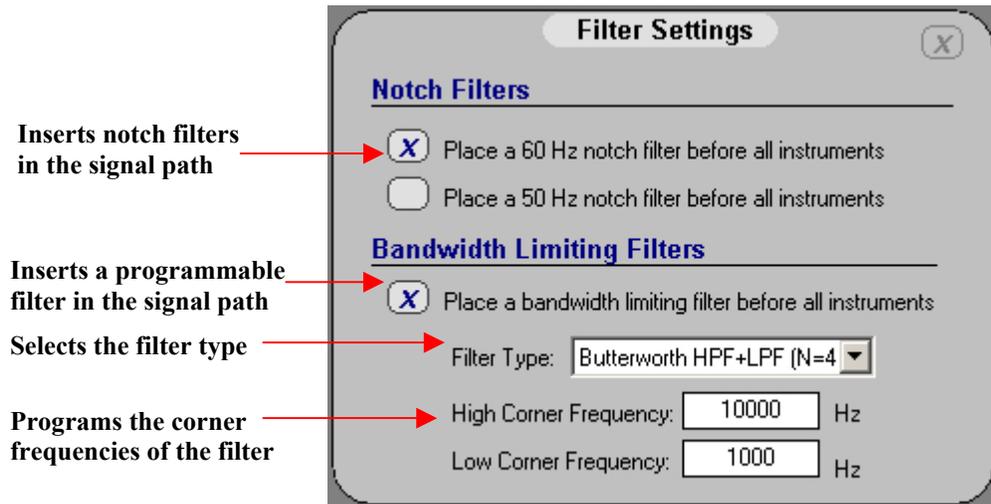


Figure 9 Filter Settings Dialog

When ANY filter is engaged, the “Filter” button on both of the instruments will be illuminated. This is intended to alert the user that the signal visible on the instruments will be modified from the original signal at the telephone jack.

4 Using the Oscilloscope

The display for the AI-5120 Digital Oscilloscope is designed to represent the front panel of a typical oscilloscope that one might have on a lab bench. The controls and displays are also designed to operate in a manner similar to the lab bench equivalent. The oscilloscope window is shown in Figure 10.

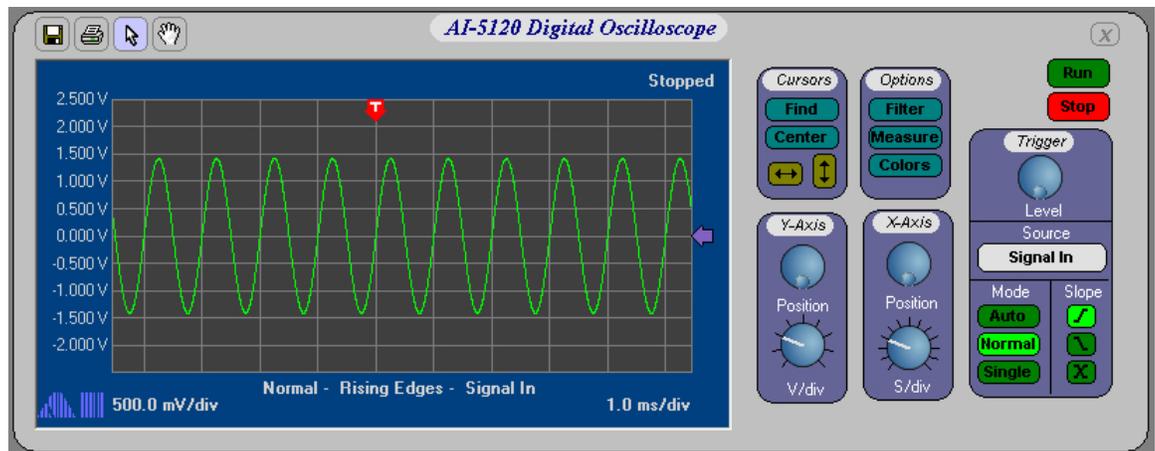


Figure 10 Oscilloscope Form

4.1 The Oscilloscope Screen

The major oscilloscope settings are displayed on the screen – and will appear on all screen captures and printouts. Figure 11 shows a typical oscilloscope display with all the settings labeled.

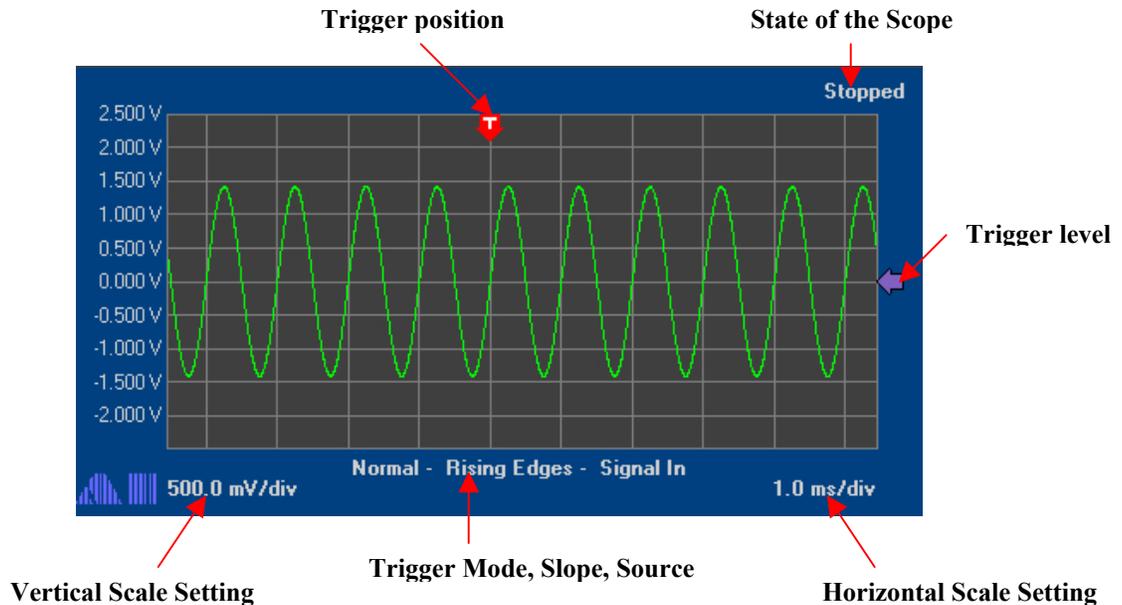


Figure 11 Digital Oscilloscope Screen

Trigger Position – The current trigger position indicates the location on the screen where portion of the signal which met the trigger criteria will be drawn. The trigger position is displayed with a red arrow with a white “T” character on the top of the scope display. The trigger position is automatically adjusted when the horizontal position is moved either through the horizontal position knob or my moving the screen with the pan tool.

Scope State – The current state of the scope is indicated by a short text field in the upper right corner of the scope screen. This indicates if the scope is stopped, triggered, waiting for a trigger, or buffering into RAM.

Trigger Level – The trigger level is indicated and controlled through a purple arrow on the rightmost portion of the display. The user can adjust the trigger level by clicking and dragging the arrow on the screen or through the trigger level knob in the main controls.

Vertical Scale Setting - The vertical scale is indicated by a text field in the lower left corner of the screen. This will indicate the volts pre division being displayed on the screen. Also note that the actual voltage is also displayed on the vertical axis for quick reference.

Horizontal Scale Setting – The horizontal scale is indicated by a text field in the lower right corner of the screen. This indicates the number of seconds per division for the current display.

Trigger Mode, Slope, Source - A small text field in the lower center portion of the screen indicates the current trigger settings. The left most portion of the field indicates the current trigger mode (Normal, Auto, or Single). The center portion of the text

indicates the trigger slope (Rising Edges, Falling Edges, or Both Edges). The right most portion of the text indicates the trigger source (Signal In, Digital In A, or Digital In B)

4.2 The Oscilloscope Controls

Most of the scope settings can be adjusted using the control panel on the right side of the oscilloscope window.

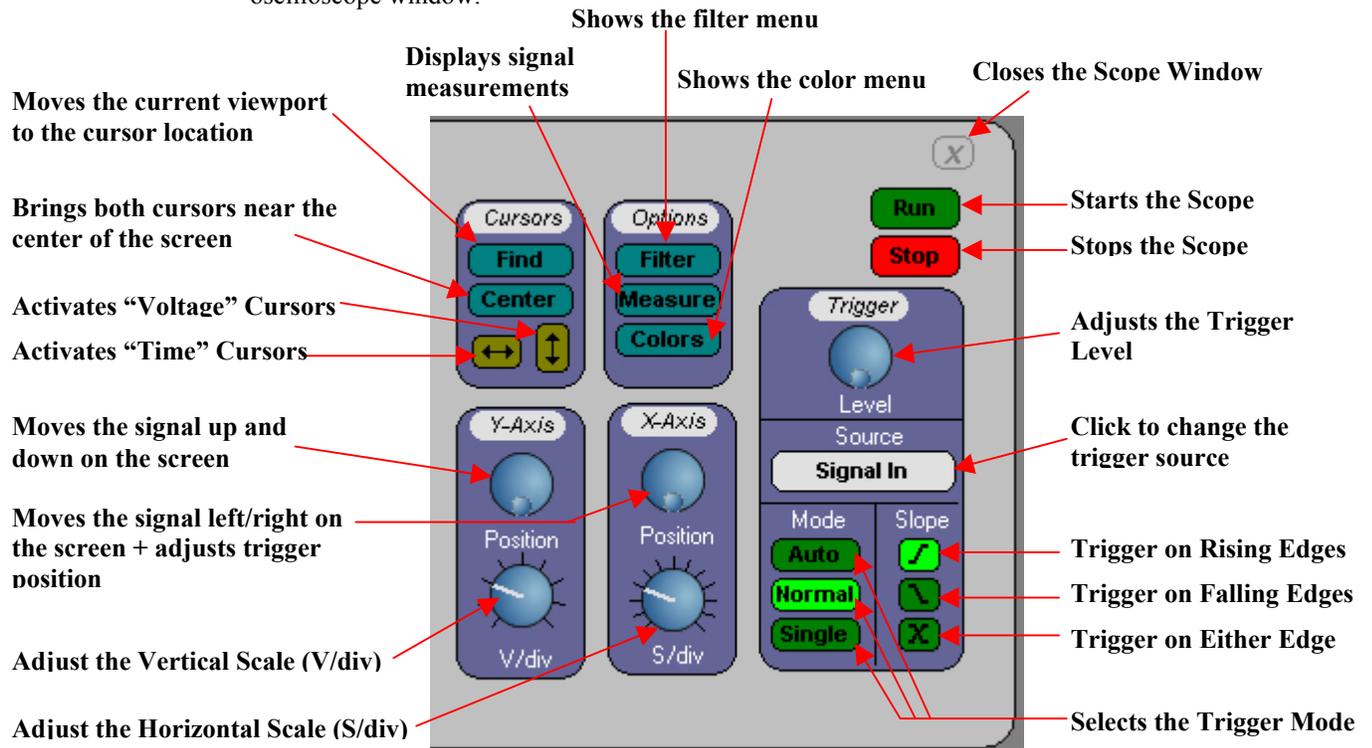


Figure 12 Oscilloscope Controls

4.2.1 The Run/Stop Controls

There are two buttons labeled Run and Stop on the top right hand corner of the oscilloscope window. To start the oscilloscope with the current mode settings, simply click the green "Run" button. It will become illuminated when the scope has started running. To stop the scope (and freeze whatever signal is being displayed) click red the "Stop" button. When the scope is stopped, the stop button will flash.

4.2.2 The Trigger Controls

The trigger controls are grouped on the right side of the oscilloscope below the run/stop buttons.

Trigger Level Knob – Clicking and rotating the trigger level knob will adjust the trigger level for the oscilloscope. The trigger level icon on the right side of the screen will move, and a line will be temporarily drawn across the screen at the trigger level. Note: The trigger level can also be adjusted by clicking and dragging the trigger level icon on the screen.

Trigger Source – The signal source for the oscilloscope triggering is displayed in a gray button below the trigger level knob. Repeatedly clicking on the trigger source button will cycle through all the possible trigger sources.

Trigger Mode – The trigger mode can be selected by clicking on one of the three green buttons in the lower left portion of the trigger control group. These buttons are labeled “Normal”, “Single”, and “Auto”. In Single trigger mode the oscilloscope will wait for a single trigger condition and then automatically stop the scope. This mode is especially useful for capturing singular events. In Normal mode, the scope will wait for a trigger condition, display the signal to the screen, and then continue to wait for the next trigger condition. If no trigger conditions occur, the screen will remain blank. In Auto mode, the scope will automatically trigger after a time delay in the absence of a trigger condition. This mode is useful if you are not sure what signal is present to trigger on.

Trigger Slope – The trigger slope can be adjusted by clicking on one of the three green buttons on the lower right portion of the trigger control group. As indicated in Figure 12, three different slopes can be selected: Rising Edges, Falling Edges, or Both Edges.

4.2.3 Horizontal And Vertical Axis Controls

There is a group for both the horizontal and vertical axis controls on the lower left of the scope controls (see Figure 12). Each control group has a control knob for the position and scale setting. These settings can be adjusted by grabbing and rotating the knobs, or by double clicking on the settings (on the screen) and manually entering a value.

4.2.4 Options

The oscilloscope options group is located in the upper center region of the oscilloscope controls.

Filter Button – Clicking the filter button will display the filtering menu on the screen. From this menu, the user can engage several different signal filters before both instruments. Note: If any filters are engaged the filter button will be illuminated.

Colors Button – Clicking the colors button will display the color selection dialog, which allows the user to select the colors for the screen display – as shown in Figure 13.



Figure 13 Instrument Colors Dialog

Measure Button – The measure button toggles the display for the signal measurements. When enabled, a series of signal measurements will appear on the right hand portion of the screen as shown in Figure 14.

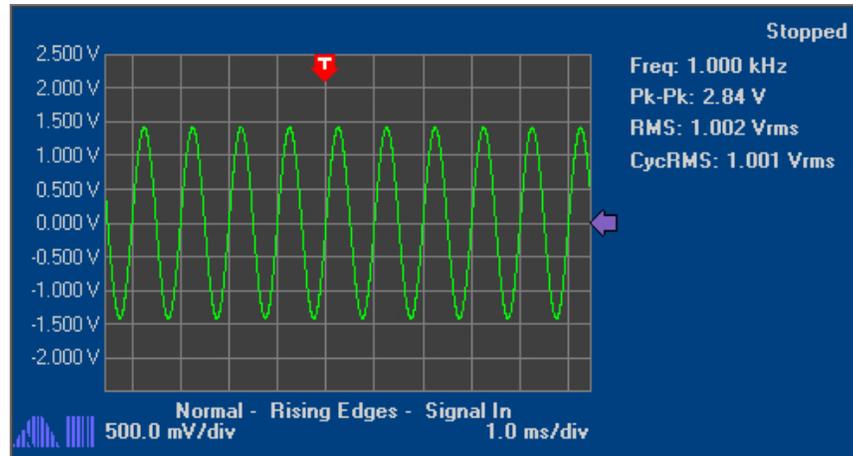


Figure 14 DSO Screen with Measurements Displayed

4.2.5 Cursor Controls

The cursor controls are grouped at the top left portion of the oscilloscope controls. The two yellow cursor controls enable the two different types of cursors available. Clicking on the  button will activate the horizontal or “Time” mode cursors. Clicking the  button will enable the vertical or “Voltage” mode cursors. Clicking on an illuminated cursor button will turn off the cursors. For more information on the cursors see Section 4.4.

Clicking on the “Find” button (with cursors enabled) will cause the current window to be moved to the position of a cursor. Continually pressing the button will toggle between each of the cursors positions. Clicking the “Center” button will bring each of the cursors into the current display window.

4.2.6 Panning and Zoom Window Controls

The top left corner of the scope contains some additional controls for panning and zooming the scope signal. These controls are shown in Figure 10.

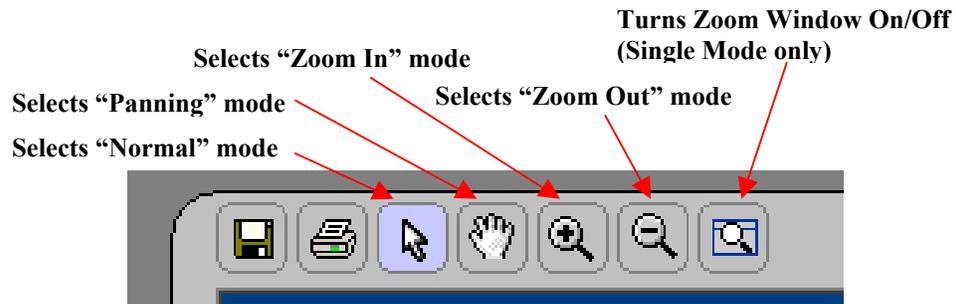


Figure 15 Panning and Zooming Controls

Normal Mode – This mode can be selected by clicking the normal mode button as illustrated above. In this mode, the mouse will not cause any pan or zoom operations when the button is clicked on the screen area. All the cursors may be manipulated normally.

Panning Mode - This mode can be selected by clicking on the panning mode button as illustrated above. In this mode the user can pan the scope signal up, down, left, or right by simply clicking and dragging anywhere on the screen. This operation is equivalent to adjusting the horizontal and vertical position knobs and they will be automatically adjusted accordingly.

Zoom In/Out Mode (Single Mode Only) – When the user has captured a trace on the screen in single mode, they have the option of selecting “Zoom In” or “Zoom Out” mode by clicking on the buttons illustrated above. They can then zoom in by drawing a rectangle on the screen, or zoom out with a single click anywhere on the screen.

Zoom Window On/Off - When the user has captured a trace on the screen in single mode, they also have the option of turning on a zoom window by clicking on the “Zoom Window” button. This zoom window allows the user to zoom in on a small portion of the screen while still being able to view the entire signal in a “Full Signal View”. See Section 4.3 for more information.

4.3 Using the Zoom Window

When the user has captured a trace in single mode, they have the option of activating the zoom window by clicking on the “Zoom Window” button – see section 4.2.6. When the user selects the zoom window then the screen will appear similar to the screen shown in Figure 16.

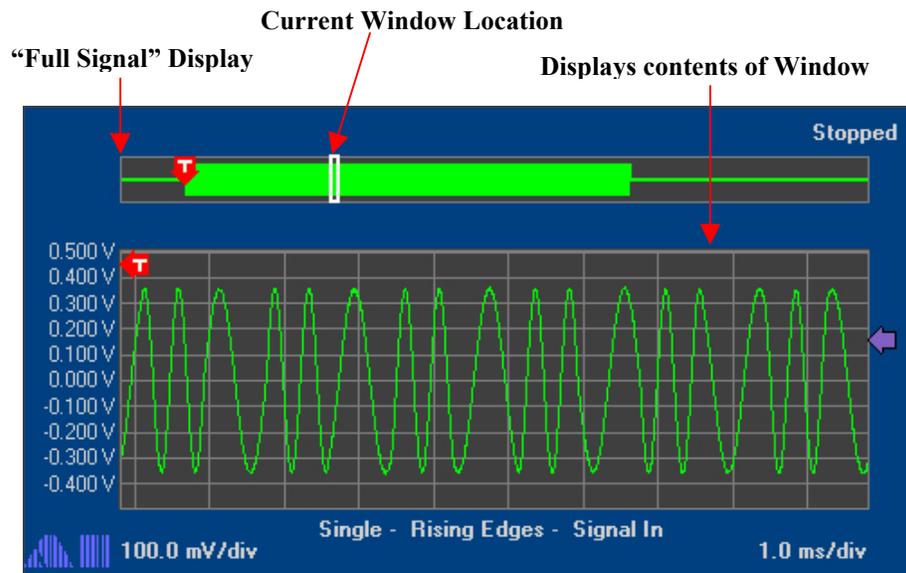


Figure 16 Oscilloscope Display with Zoom Window On

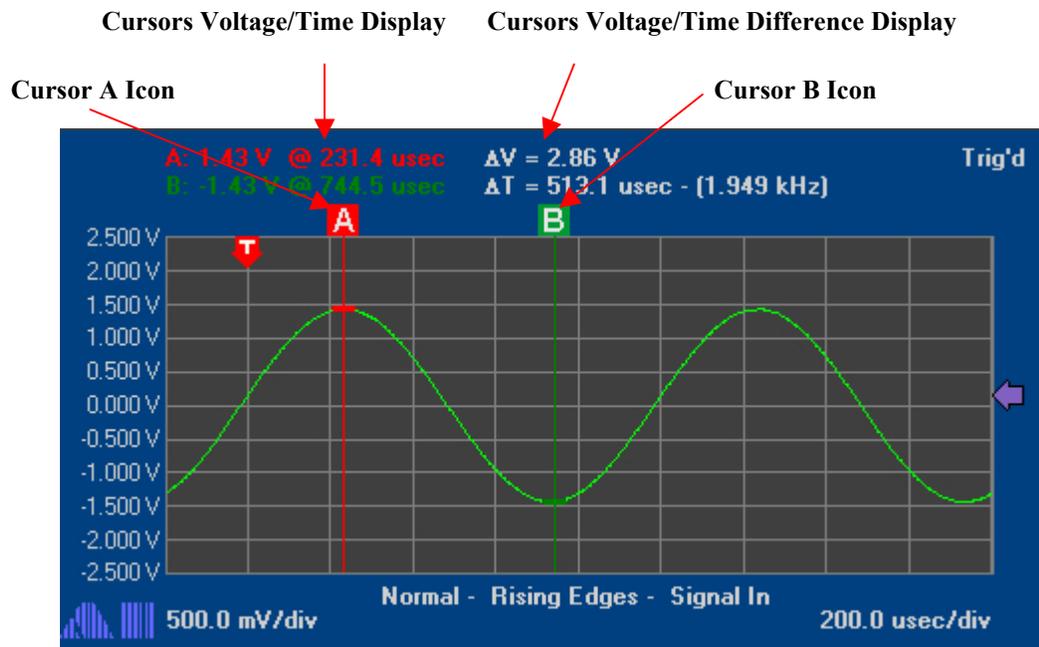
The top portion displays the entire trace while the lower window displays the contents of the current window. Note that the trigger position is displayed on both the zoom window and the full signal window. The location of the current zoom window is also displayed with a white box on the full signal display so that the user can quickly see which part of the signal is being viewed. When the Zoom Window is activated the horizontal and vertical scale controls can be used to adjust the scale and position of the zoom window – it will not affect the time scale of the overall capture. Pressing run again will trigger another capture, which will appear in the same windows with the same zoom window.

4.4 Using the Cursors

The scope has two different types of cursors available for measuring signals. The two yellow cursor controls enable the two different types of cursors available. Clicking on the  button will activate the horizontal or “Time” mode cursors. Clicking the  button will enable the vertical or “Voltage” mode cursors.

4.4.1 Time Mode Cursors

When the time mode cursors are enabled the oscilloscope screen will appear similar to the illustration in Figure 17.



Each of the cursors has a rectangular icon along the top of the screen, which indicates the cursor position. The cursor position can be changed by clicking and dragging the icon to a new position. If an exact time value is desired then the user can double click on the cursor icon to enter an exact time in seconds. Note: all times are relative to the current trigger time. For example: a value of 0.1 is 100ms after the trigger and a value of -0.1 is 100ms before the trigger position.

At the top left of the screen, the time value and the associated signal voltage value is displayed for each cursor (once again color coded for easy identification). The difference in time and voltage is also displayed just to the right of the cursor time/voltage display.

When the cursors are placed in a position outside the current view port, they will appear as an arrow pointing in the direction of the cursor as illustrated in Figure 18.

Cursors Is Off Screen

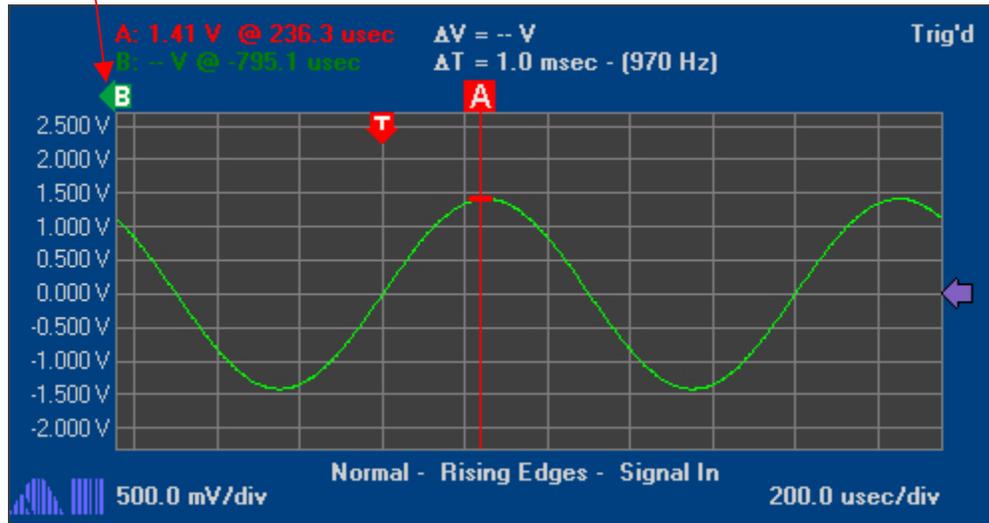


Figure 18 Cursors Off Screen

The cursor value will be displayed as "--" indicating that no value is available for that cursor position. The cursor can still be quickly brought back on screen simply by clicking and dragging the cursor icon to a new position on the screen.

4.4.2 Voltage Mode Cursors

When the time voltage cursors are enabled the oscilloscope screen will appear similar to the illustration in Figure 19.

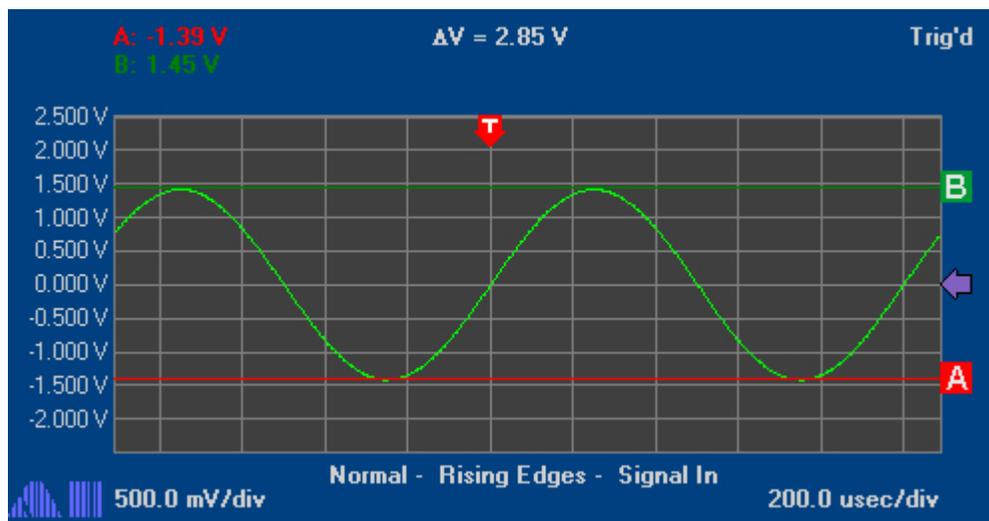


Figure 19 Voltage Mode Cursors

The display for the voltage mode cursors is nearly identical to the display for the time mode with the exception that there are no time references for the cursors. The cursors position can be moved by clicking and dragging the icon to the new cursor location on the screen.

5 Using the Spectrum Analyzer

The display for the AI-5120 Spectrum Analyzer is designed to represent the front panel of a typical spectrum analyzer that one might have on a lab bench. The controls and displays are also designed to operate in a manner similar to the lab bench equivalent. The spectrum analyzer window is shown in

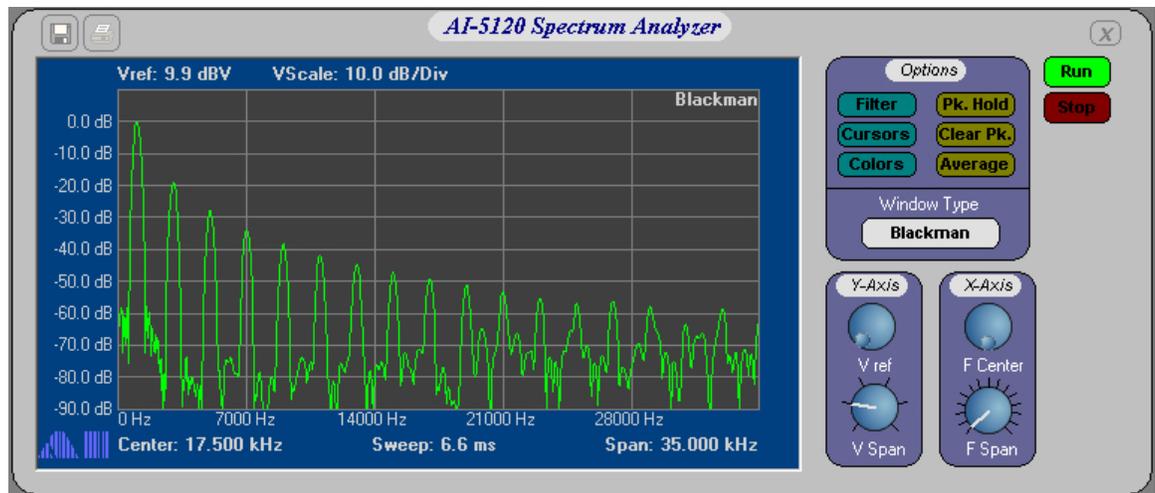


Figure 20 Spectrum Analyzer Window

5.1 The Spectrum Analyzer Screen

Most of the major settings for the spectrum analyzer are displayed on the spectrum analyzer screen. Figure 21 shows a typical oscilloscope display with all the settings labeled.

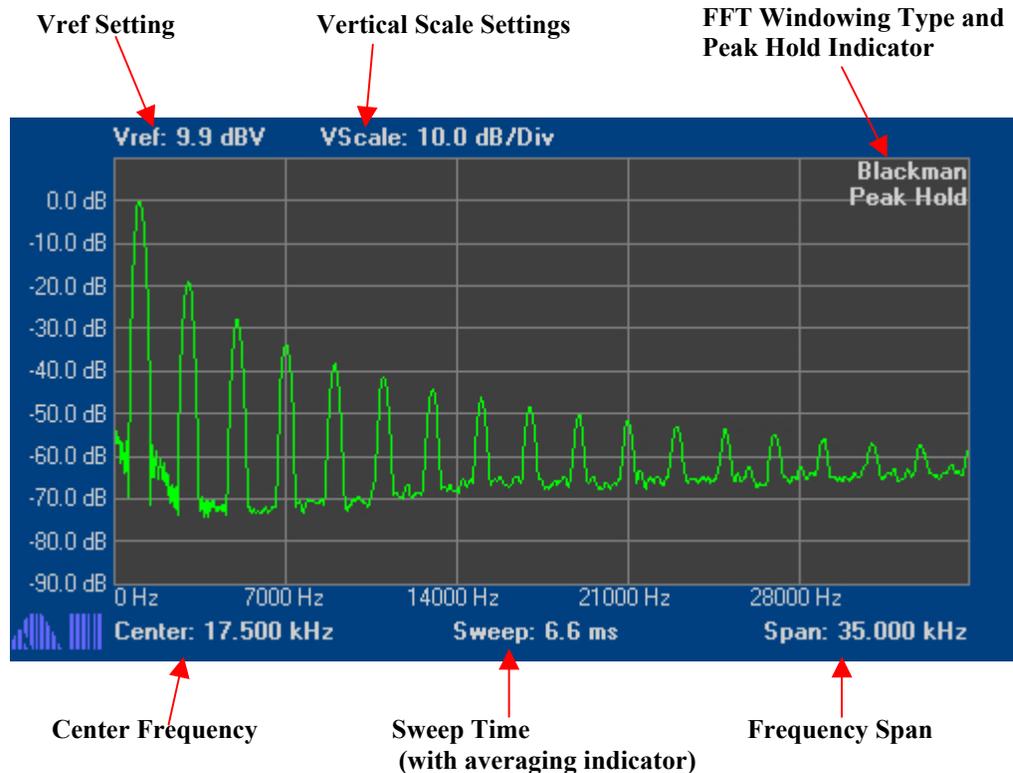


Figure 21 Spectrum Analyzer Screen

Vref Setting - This setting indicates the reference voltage used for the top of the display screen. Adjusting this setting will move the trace up and down on the screen. Note: You can directly set this value by double clicking on the display and entering a value in dBV.

Vertical Scale Setting – The vertical scale setting indicates the scale used for the Y-axis in dB per division. Note: for easy reference the y-axis is labeled with the dBV value.

FFT Windowing Type – The window function used in the FFT calculations is displayed in the top right corner of the spectrum analyzer window.

Peak Hold Indicator – If the peak hold function is enabled, the words “Peak Hold” will be printed in the top right corner of the screen as a reminder to the user that the feature is enabled.

Center Frequency – The center frequency indicates the frequency at the center of the instrument window. The center frequency can be adjusted directly by double clicking the value on the screen and entering a value in Hz. Note: Since the spectrum analyzer cannot extend below 0Hz or 35KHz, the center frequency may be clamped to a certain range depending on the frequency span setting.

Sweep Time - The sweep time is a value calculated based on the horizontal span and averaging setting. The sweep time indicates the time required to accumulate the signal data, calculate the FFTs, average the results, and display them to the screen. Note: This value can be significantly less than the actual screen refresh rate, however, it is an accurate representation of the time required for the calculations.

Averaging Indicator - If averaging is enabled then the number of samples being averaged will appear behind the sweep time. The number of samples used in the average calculation can be modified by double clicking on the value (where it says “N=”) and entering the number of samples directly. The sweep time will be updated to reflect the new averaging value.

Frequency Span – The frequency span display indicates the frequency range displayed on the x-axis. The frequency span can be adjusted by double clicking on the value displayed on the screen and entering a new value in Hz.

5.2 The Spectrum Analyzer Controls

Most of the spectrum analyzer controls can be adjusted from the control panel on the right side of the screen.

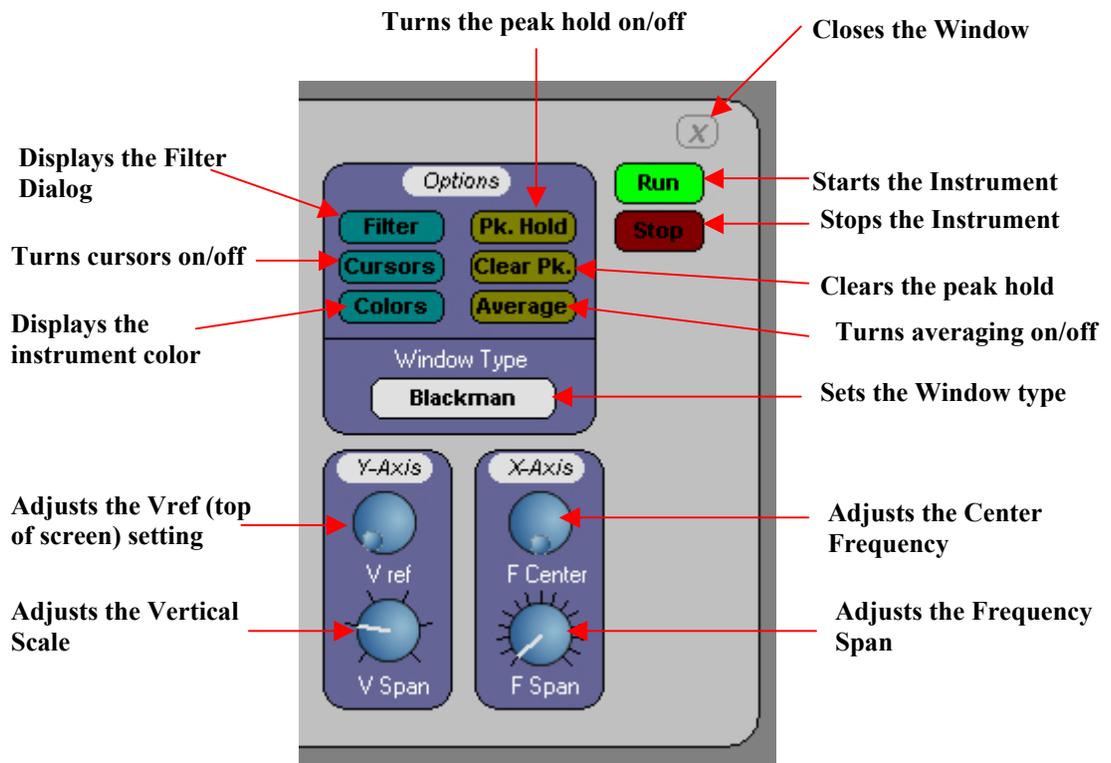


Figure 22 Spectrum Analyzer Controls

5.2.1 The Run/Stop Controls

There are two buttons labeled Run and Stop on the top right hand corner of the spectrum analyzer window. To start the spectrum analyzer with the current mode settings, simply click the green “Run” button. It will become illuminated when the instrument has started

running. To stop the spectrum analyzer (and freeze whatever signal is being displayed) click red the “Stop” button. When the instrument is stopped, the stop button will flash.

5.2.2 Options

The spectrum analyzer options group is located at the top right corner of the instrument as shown in Figure 22.

Filter Button - Clicking this button will display the Filter Dialog. From this dialog the user can engage several different filters that are placed before all the instruments. If any filters are engaged the filter button will be illuminated.

Cursors Button – Clicking the cursors button will turn the spectrum analyzer cursors on or off. See the section related to the cursors for more information. If the cursors are enabled then the Cursors button will be illuminated.

Colors Button – Clicking the colors button will display the instrument colors dialog where the user can customize the colors used for the instrument.

Pk. Hold Button - The peak hold button will engage or disengage the peak hold feature. When the peak hold feature is engaged the spectrum analyzer will persistently display only the maximum signal produced by the FFT. If the peak hold feature is on then the Pk. Hold button will be illuminated.

Clear Pk. –The Clear Peak Hold button will clear the values stored in the peak hold buffer, and allow the instrument to start collecting data. This is useful if the input signal has changed and the user wants to begin analyzing a new envelope.

Average Button – The average button enables or disables the FFT averaging feature. When enabled the averaging button is illuminated and the number of averaging points appears in the lower center region of the screen. The number of data points used in the average calculation can be modified by double clicking on the display for the number of points.

Window Type Button – The FFT window type is displayed in a gray button at the bottom of the spectrum analyzer options group. Repeatedly clicking on this button will cycle through all the available window types.

5.2.3 Vertical And Horizontal Axis Controls

Each of the Center Frequency, Frequency Span, Vref, and Vertical Scale settings has an associated control knob. Grabbing and rotating the corresponding control will adjust the setting accordingly.

5.3 Using the Cursors

The spectrum analyzer cursors can be enabled by clicking on the “Cursors” button in the options control group. When the cursors are enabled the spectrum analyzer screen will look similar to Figure 23.

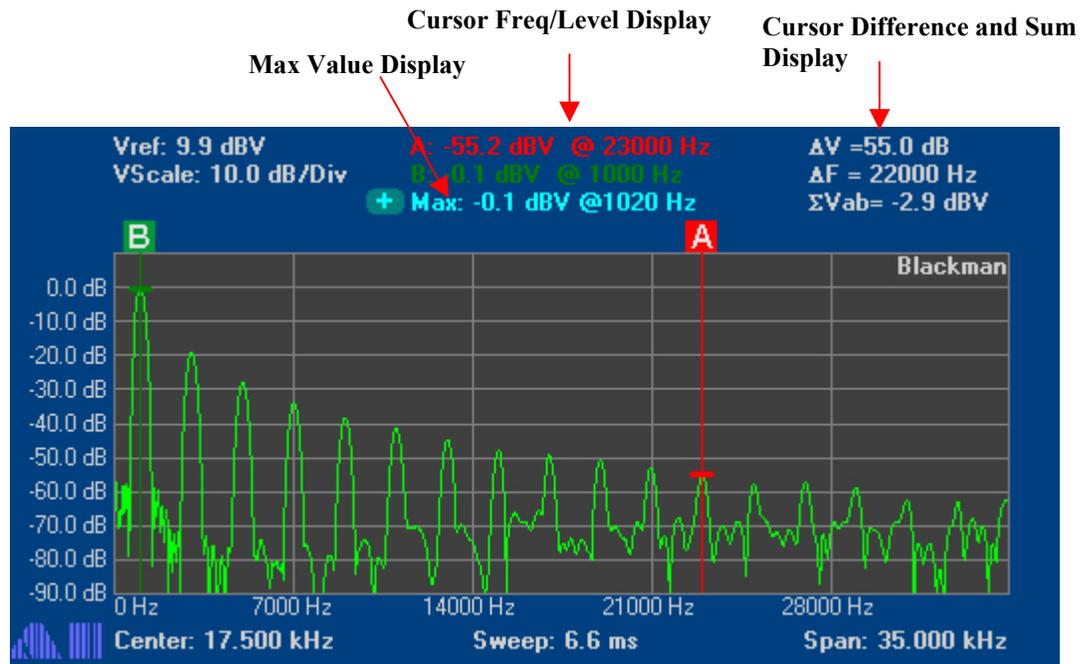


Figure 23 Spectrum Analyzer Cursors

Just like the oscilloscope, the cursors for the spectrum analyzer each have a rectangular icon, which can be clicked and dragged to change the cursor position. Also, the user can double click on the cursor icon to set the cursor frequency directly (in Hz).

The frequency and corresponding level is displayed for each of the cursors at the top of the screen (color coded for quick identification). The difference in level and frequency is displayed at the top right hand corner of the screen. Also, the software calculates the sum of all the voltages between the two cursors and returns the value in dBV. This value is indicated by ΣV_{ab} label. This sum is useful for calculating the power in a specific frequency band.

Below the cursor value display is the maximum signal display. This maximum signal display indicates the frequency and level of the largest signal in the spectrum being displayed on the screen. A set of crosshairs, which identify the location of the maximum signal, can be enabled by clicking the  button next to the maximum display, as shown in Figure 24.

Maximum Signal Crosshairs

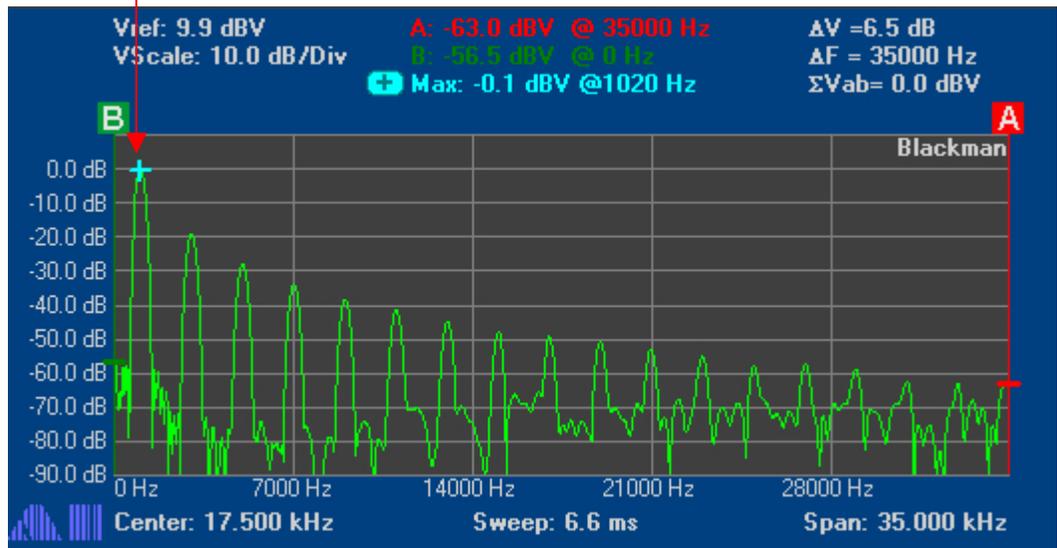


Figure 24 Maximum Signal Crosshairs

5.3.1 Using the Peak-Find Feature

The cursors on the spectrum analyzer have a peak-find feature, which can automatically locate the nearest peak in the spectrum to the left or right of the cursor position. When the mouse cursor is placed over a cursor icon, two icons will appear on either side of the cursor as illustrated in Figure 25.

Peak Find Left Icon

Peak Find Right Icon

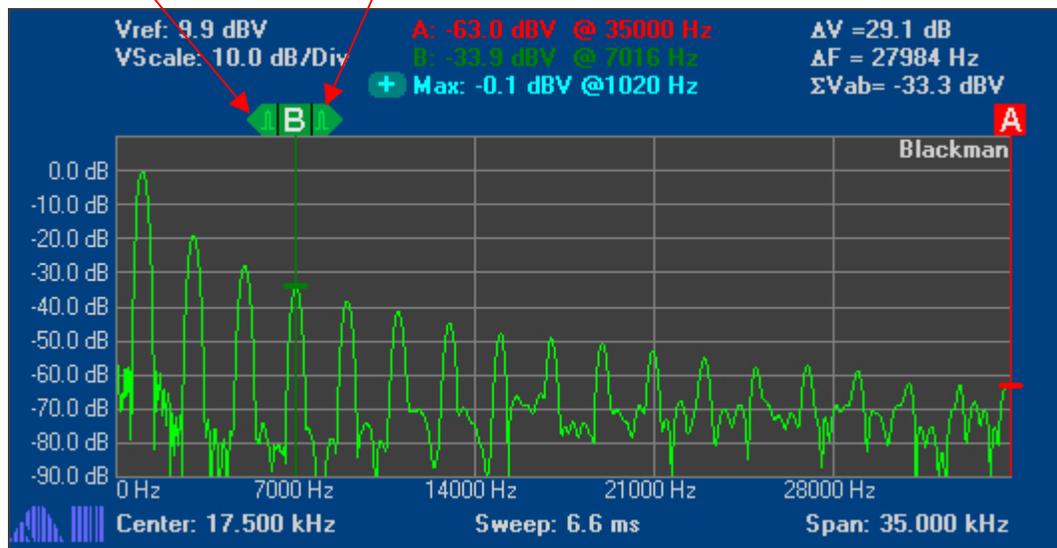


Figure 25 Peak Find Feature

Clicking on the icon to the left will cause the cursor to locate the nearest peak to the left of the cursor location, and clicking the icon to the right will cause the cursor to locate the

nearest peak to the right of the cursor location. The icons will disappear after a few seconds if they aren't clicked (to reduce the clutter on the screen).

Note: The peak-find feature may have difficulty resolving very low amplitude signals amongst the surrounding noise. This feature is most effective on large amplitude signals.

6 Printing and Saving Images

When a trace has been captured on either of the instruments, and the instrument has been stopped, the contents of the screen can be either saved to an image file or printed directly using the buttons on the top left of the instrument window (shown in Figure 26).

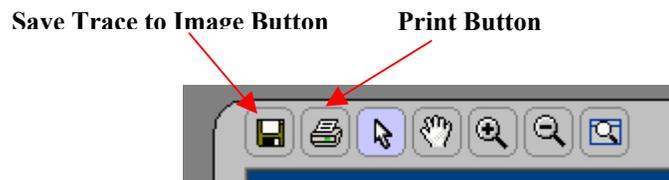


Figure 26 Print and Save Buttons

6.1 Saving to Image

When the “Save” button is clicked on either of the instruments, the software will prompt the user for an image filename. Once the user has specified a filename, the software will write the image on the instrument’s screen to the specified file. The dimensions of this image file can be set through the program preferences dialog accessible through the [File] [Preferences] menu. The preferences dialog is shown again in Figure 27 for clarity. By default the images will be the exact dimensions of the current instrument window, although the user can select a custom dimension if they wish.

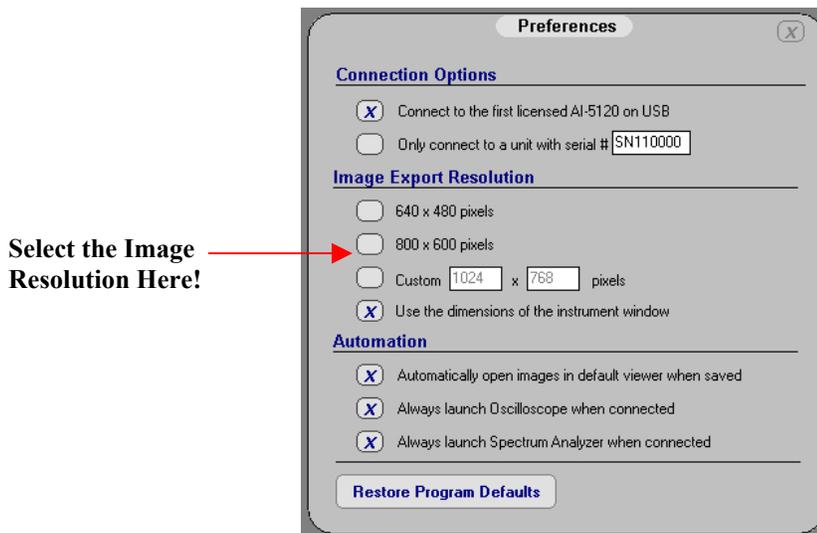


Figure 27 Image Export Resolution Settings

6.2 Printing

When the user clicks the print button the software will generate a print preview of the current trace – as shown in Figure 28.

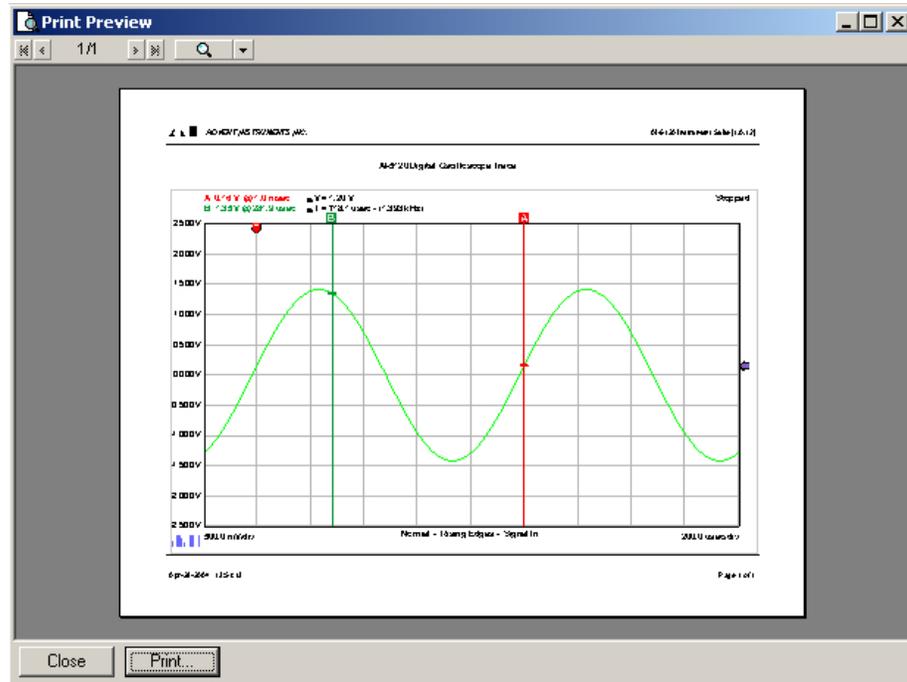


Figure 28 Print Preview Dialog

The user can then press the “Print” button at the bottom of the screen to print the document.

Note: To change the page layout between portrait and landscape, you must click the “print” button, then select the desired page layout and click the print button. The software will automatically generate a new print preview with the desired page layout. If the page layout is not modified then the document will be printed to the specified printer.

The user can adjust margin settings, append notes, headers, footers, and modify several other customizable options through the [File] [Page Setup] menu. The page setup dialog will appear as displayed in Figure 29.

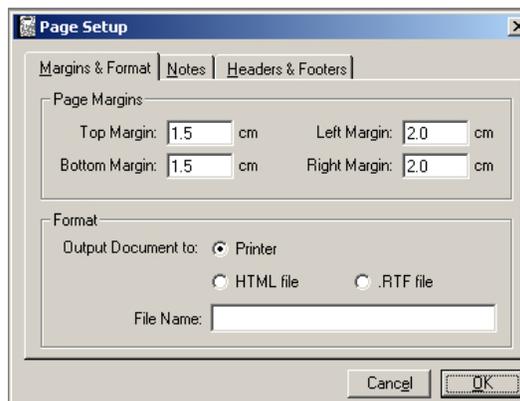


Figure 29 Page Setup Dialog

7 Specifications

7.1 AI-5120 Hardware

Since the AI-5120 Instrument Suite software is built for the AI-5120 hardware platform, please see the AI-5120 Hardware Specification for a complete list of hardware specific specifications.

7.2 Oscilloscope Specifications

Bandwidth	100Hz to 10kHz
Accuracy*	± 0.2 dBV (100Hz to 10kHz)
Maximum Capture Time	5 seconds
Maximum Signal Level	4 Vrms (sine wave)
Trigger Sources	Signal In, Digital In A, Digital In B
Trigger Modes	Auto, Normal, Single
Trigger Slopes	Rising, Falling, Both Edges
Measurements	Frequency, Peak-Peak Voltage, RMS, Cycle RMS
Cursors	Voltage and Time measurement modes

* Accuracy is specified with no signal filters engaged

7.3 Spectrum Analyzer Specifications

Bandwidth	100Hz to 35kHz
Accuracy**	± 0.5 dB (100Hz to 35kHz)
Maximum Signal Level	4 Vrms (sine wave)
FFT Window Types	Rectangular, Blackman, Hanning
Frequency Span Settings (Hz)	35000, 19531, 9766, 7813, 4883, 3906, 2441, 1953, 1563, 976, 781, 390, 312.5, 156.3, 62.5
Center Frequency	Min: 0 Hz + 1/2 frequency span Max: 35 kHz - 1/2 frequency span
Other Features	Peak Hold, Programmable Averaging, Automatic maximum peak locator, Power-in-band measurement, Dual cursors

** Accuracy is specified with Blackman windowing, and no signal filters engaged

8 Revision History

Release 1.0.24

- First public release

Release 1.0.37

- Fixed knobs on DSO controls to stop a ‘fidgeting’ problem under certain settings
- Modifications to layout and visible components to avoid flicker and improve user interface

Release 1.0.38

- Fixed problem which prevented switching AI-5120 device mode when multiple units are connected on USB
- Resolved issue that caused some script-blocking virus scanners to halt the Instrument Suite application.

Release 1.0.39

- Fixed run-time error 401 caused by screen resolutions less than 1024x768

Release 1.0.40

- Changed splash screen so it will not hide run-time errors

9 Support

For assistance in hardware setup, program installation, software operation, or general questions, please contact us in any of the following methods.

- Email: Technical Questions: techsupport @adventinstruments.com
 Sales Inquires: sales@adventinstruments.com

- In North America:
 - Tel: (604) 944-4298
 - Fax: (604) 944-7488
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