



NAVIGATING VISI 7

FOR THE SIA-3000

Features of VISI 7

- Complete solution for testing jitter.
- Comprehensive and versatile jitter analysis software enables users to quickly understand the performance of their clock/PLL circuits as well as data communications protocols (dataCOM).
- Macros further simplify and accelerate the tool setup and analysis of clock and data signals.
- Setup Wizard quickly configures the appropriate tool needed by the user.
- Plot Interpreter helps the user understand the various plots shown by VISI.

Introduction

This guide introduces a new user to the basic controls and features of *Virtual Instruments Signal Integrity Software™* (VISI) version 7. Refer to the user's manual and the Help files provided in the VISI software for more detailed information on the VISI functions and features. The Initial VISI screen is shown at the right (Figure 1).

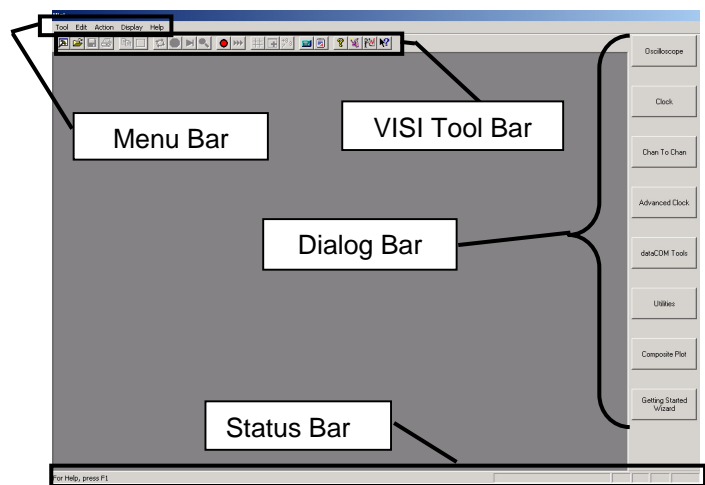



Figure 1. Initial VISI Screen

Initial Dialog Bar

There are two main sections of this initial screen that users should familiarize themselves with. The Dialog Bar menu along the right side of the screen allows the Oscilloscope tool, Composite Plot tool or a broad category of application tools to be opened directly. Each category contains one or more analysis tools specific to that category. The Dialog Bar is present throughout testing and provides menus that control each tool. The Dialog Bar changes to control the current active tool (window). Figures 2-6 illustrate the breakdown of each category. The option of initiating the Getting Started Wizard  is also available on this initial screen.

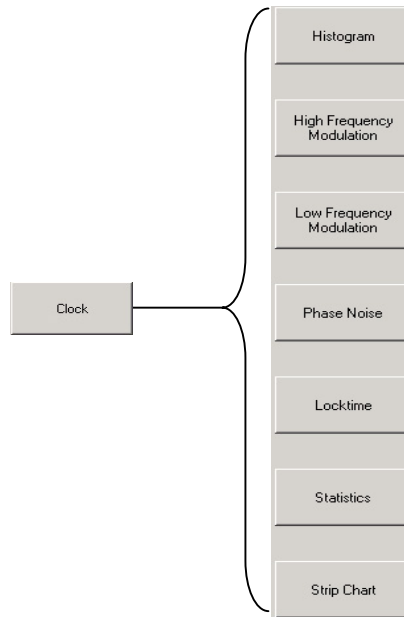


Figure 2. Clock Category

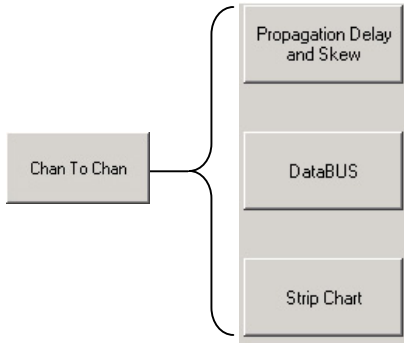


Figure 3. Multi-Channel Category

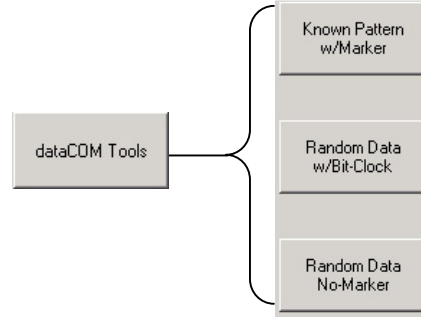


Figure 4. DataCOM Category

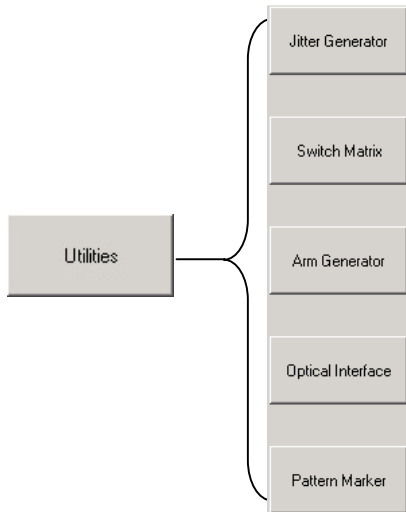


Figure 5. Utilities Category

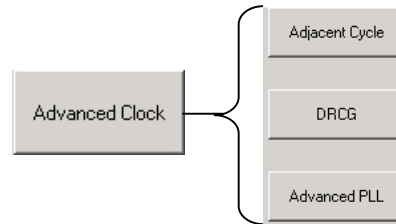


Figure 6. Advanced Clock Category




"Getting Started Wizard": The Getting Started Wizard asks questions concerning the signal being tested. The wizard will help determine an appropriate tool and show how to set up and make a measurement.

Choose "Getting Started Wizard" from the Main Dialog Bar or the Icon on the toolbar. Figure 7 shows an example of the end of a question tree that directs the user how to setup and make a measurement.

← Back Home
Comprehensive Analysis


① Verify Setup

Connect:
 CH1 → Clock signal



If making a single ended measurement, connect the signal to the top (non-inverting) input.

Signal



② Make a measurement 👉 Perform Measurements

③ See your measurement results 👉 RETURN TO VISI

NOTE: This measurement may take a few moments to complete. It is finished when the "SINGLE/STOP" light turns off.

Figure 7. Getting Started Wizard Example

VISI Toolbar



Figure 8. VISI ToolBar

The toolbar (see Figure 8) along the top of the screen contains the essential controls needed to take measurements with all of the VISI analysis tools. This toolbar will be present during all operations in VISI and will show the controls for the current active tool (window). Some of these icons are not active until a tool has been selected. Many of these controls are also buttons on the Front Panel.

The following is an overview of each of these controls:



“New Tool” button: Opens a new tool or tools allowing many tools to be utilized at one time. “Tool” on the Front Panel (Figure 9) performs the same function. When chosen, the dialog bar seen on the right side of the initial VISI screen (Figure 1) will appear allowing the selection of a new tool. The new tool appears as a new window.



Figure 9. Front Panel Acquire Controls

Multiple Tools

Displayed clockwise from top-left are the Oscilloscope, dataCOM w/Marker, dataCOM Data w/ Bit Clock, and Databus tools (Figure 10). Notice that the Oscilloscope (top-left window) is highlighted, signifying that it is the active window. This also means that the dialog bar menus correspond to the active window/tool controls.

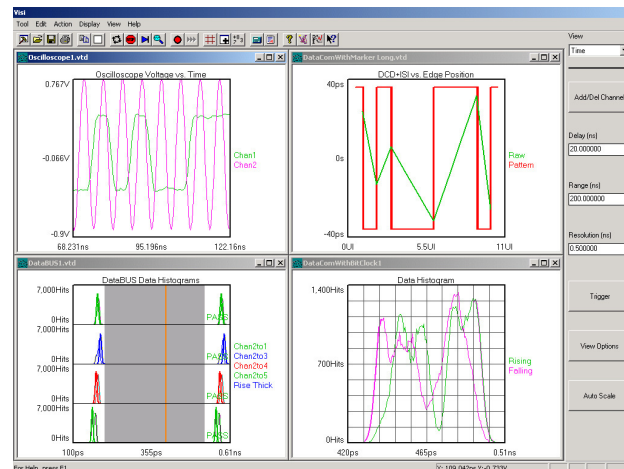


Figure 10. Multiple Tools Open



“Open Tool” Button: This function allows users to open previously saved VISI files.



“Save Tool” Button: This function allows users to save VISI files.

The VISI software allows users to recall and save measured data and tool settings. Actions such as changing views, zooming and enabling markers can be performed on recalled data. Setup and data files can be shared to simplify site-to-site correlation or configurations.

Files can be saved in a variety of formats. Figure 11 shows the file save formats. The following is a brief overview of each of these formats:

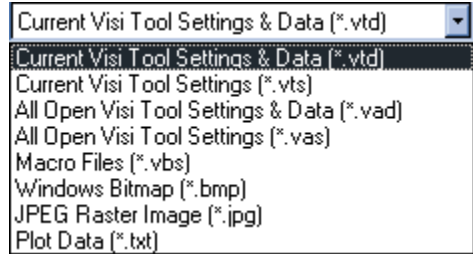


Figure 11. Save Tool Formats

- **Current Visi tool Settings & Data (*.vtd):**
Use of this file extension saves the measurement data that appears in all the available views / plots of the analysis tool that is currently being using. Regardless of how many tools were open, users should be aware that when saving data as a .vtd file, only the active window / tool will be saved. When a (.vtd) file is opened the saved tool will open to the default view regardless of the number of plots that were being displayed at the time that the user saved the tool and the data. Once open, the user may display the other saved views.
- **Current Visi tool Settings (*.vts):**
Use of this file extension saves the current active Tool settings only. It does not save any measurement data. When a (.vts) file is opened, the saved tool will open all the views of the tool that were open at the time that the file was created. Also, the dialog bar menu settings will be the same as when the file was created. In cases where geographically separated groups of VISI users are working on the same or associated projects, (.vts) files can be sent via e-mail to run the same test with the same settings. Once open, a user can immediately begin testing.
- **All Open Visi Tool Settings & Data (*.vad):**
Use of this file extension saves all tools that are open along with their respective dialog bar settings *and* the measurement data that appears in all the available views for those tools. This allows an entire "study" to be saved. When a (.vad) file is opened, the saved tools will open to the views that were open at the time that the user created the file and display measurement data that was displayed at the time. Once open, the views of the saved tool/s and measurement data can be manipulated.
- **All Open Visi Tool Settings (*.vas):**
Use of this file extension saves all tools that are open along with their respective dialog bar settings. It does not save any measurement data. When a (.vas) file is opened, the saved tools will open to the views / plots that were open at the time that the user created the file. Assuming that an instrument is connected, once the file is open users can immediately begin to take measurements.
- **Macro Files (*.vbs)**
File extension used with saved macro files.
- **Windows Bitmap (*.bmp):**
This option saves the current active View as a graphics (.bmp) image. The user can then access this file through a draw or paint program for inclusion into a document and/or printing. (.bmp) files save images in great detail so these file types are typically large.
- **JPEG Raster Image (*.jpg):**
This option saves the current active View as a graphics (.JPEG) image. The user can then access this file through a draw or paint program for inclusion into a document and/or printing. This format has less detail than (.bmp) files and uses less memory than the (.bmp) format.
- **Plot Data (*.txt):**
This option saves the XY coordinates of the active VISI window as a (.txt) file. A few tools, like histogram, store the raw histogram measurements. These values can be imported into a spreadsheet for further analysis.



“Print” Button: Bring up the print dialog box, to start a print job.



“Copy” Button: Copies the current active view to the clipboard.



“Clear” Button (also on Front Panel, see Figure 9): ERASES measurements (plot and summary) in the current active tool. The dialog bar settings are not changed.



“Run/cycle” button (also “Run” on Front Panel, Figure 9): This button repetitively acquires or cycles new measurements. Either the Disable All button or the Single Acquire/Stop Run button will stop cycling.



“Disable All” button: The Stop command halts all measurements. (“Disable” on the Front Panel, Figure 9, will halt ALL measurements in ALL tools.)



“Single Acquire/Stop Run” button (also “Single/Stop on Front Panel, Figure 9): Acquires a single measurement (a histogram, for example). It is also used to stop a series of measurements from being taken after the “Run” button is pressed. This controls only the current active tool.



“Pulse find” button (also “Pulse Find” on Front Panel, Figure 9): Determines the threshold voltages based on the current Tool settings. This function is only available with the Auto option under the Voltage menu in any tool.



“Toggle Marker Mode” Button: Activates marker bars. Pressing the button toggles between horizontal, vertical and both sets of markers. Once the marker bars are activated, they may be moved by right clicking on them to drag and drop. From the Front Panel (Figure 9), press “Enable” to activate markers and “Select” to choose a marker to move. Once a marker is selected, use the thumbwheel knob to position it. Marker values and Delta are displayed to the right (Figure 12).



Figure 12. Markers Enabled



“Record/Stop Macro” Button: Record a series of steps or keystrokes that can then be saved. To save a particular macro, go to the Menu Bar and select Action, Macro, Save (Figure 13).



“Playback Macro” Button: After recording or recalling a saved macro (.vbs file) use the playback button to run the macro. To load a particular macro, go to the Menu Bar and select Action, Macro and Load.



Figure 13. Front Panel Macro Buttons

The SIA-3000 provides the capability of creating custom macros to repeat common keystrokes using the Macro Record and Playback. The Macro interface is based on Microsoft’s Visual Basic Script Language that includes the ability to control program execution using conditional and looping statements.

Note that in the initial VISI screen (see Figure 1) the macro record button is highlighted indicating that the option to begin recording a macro is available to the user at this point. The Playback button is grayed out because a specific macro has not been selected. To select a macro file, on the Menu Bar go to **Action**, select **Macro** and **Load...** This panel (see Figure 14) will list the *.vbs files residing in whichever folder or directory is chosen. Macro files (.vbs) will be depicted with a visual basic script icon. Once a macro file is opened, users can select to run the macro by pressing the Playback Button on the top toolbar.

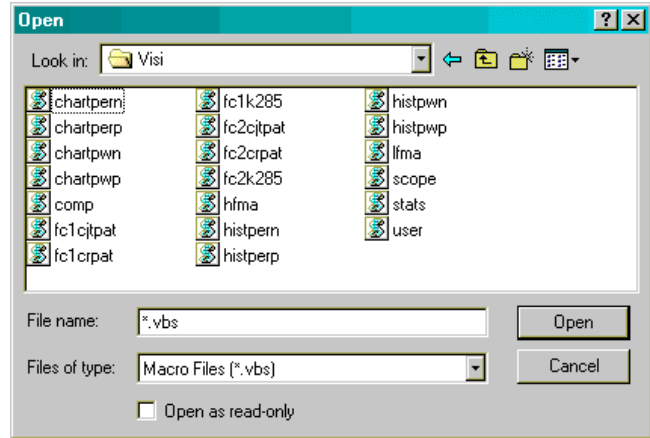


Figure 14. Open Macro Dialog Box

Macros can also be edited. This capability provides the ability of adding and/or deleting steps. Message boxes can be added to the macro to prompt other users to connect the instrument in a specific manner or to adjust certain external parameters.

To edit a macro, go to the Menu Bar and select **Action**, **Macro** and **Edit...** This will open the Macro Edit Dialog Box (see Figure 15).

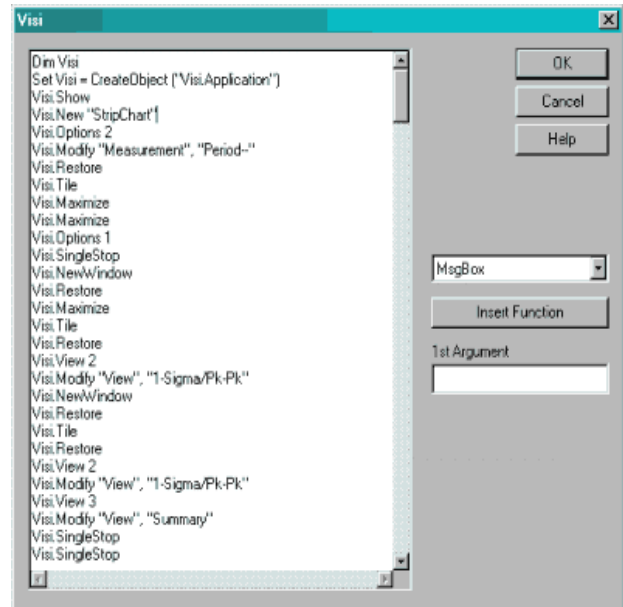


Figure 15. Macro Edit Dialog Box



“New View” Button: Adds a new view of the currently Active Tool. Each tool has many different views associated with it (Figure 16). By adding a new view you can see many views of the same tools simultaneously. To change views in a particular window, select that window and use PgUp or PgDn on the keyboard or use the “View” selection on the Dialog Bar.

Multiple Views

The example on the right shows multiple views of the Histogram tool with Tail-Fit™ algorithm enabled. The top window shows the histogram; the middle window, a bathtub curve view; and the bottom window, a statistics view.

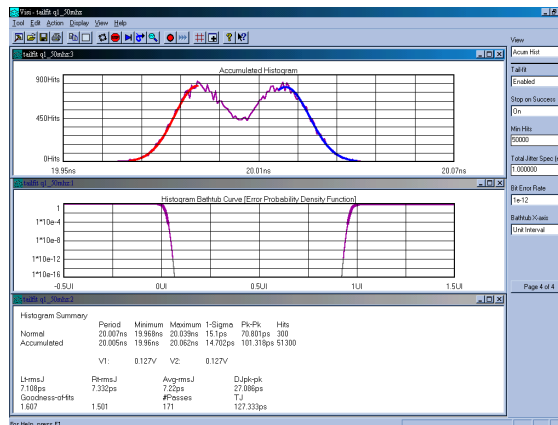


Figure 16. Multiple Views

As with all Microsoft® Windows based programs, the dimensions of any window added during this procedure can be changed to facilitate better viewing. Regardless of subsequent measurements, these window dimensions will remain the same until another window / view is added or a window is closed. See Figure 16.

Front panel controls in Figure 17 allow you to perform operations on the currently active view. Maximize View will expand the active view to full screen. Next will move change which view/tool is active. Close View will close the current view/tool. Add View will add a copy view of the active view that can then be changed.



Figure 17. View Controls on the Front Panel



“Values on Plot”: Displays chosen Summary values on the plot. To display only some values, go to the Menu bar, select **Display, Values on Plot...** From the list of choices, select specific measurement values to display. Annotations such as part numbers, environmental conditions, or other pertinent test setup notes may be added to the Summary View. To add an annotation, go to the Menu Bar, select **Edit, Annotation**. This will open a dialog box for text entry.



“Calculator” Button: This button opens the Microsoft® Calculator.



Windows Explorer: This button opens the file explorer window. Use this to search, move or delete files from the SIA-3000 internal hard drive..



“Wordpad” Button: This button opens the Microsoft® Wordpad. You can cut and paste items into this text editor that you can then use in a report or spreadsheet.



“Help Topics” Button: This button opens the SIA-3000 VISI help. From here you can explore the help contents and search for help topics.



“Getting Started Wizard” Button: This button will open a wizard that can help you open and setup the correct tool for the application that you want to measure. Answer the questions and follow the instructions to make the desired measurement.



“Plot Interpreter” Button: This button opens up the Plot Interpreter (See Figure 18). Simply select the tool you are using. You will then see a number of different plots that represent possible outputs of the tool you have selected. Simply click on the plot that looks most like the plot you have. This will open a description of what you are seeing and what your next measurement step should be.



“Help arrow” Button: This button can be used to inquire about any tool control/setting on the Dialog Bar. If you don't know what a control/setting in a tool is for, you can first click on this button and then click on the setting to open a help file about this setting. You can also use this to access help about anything else in the VISI window.

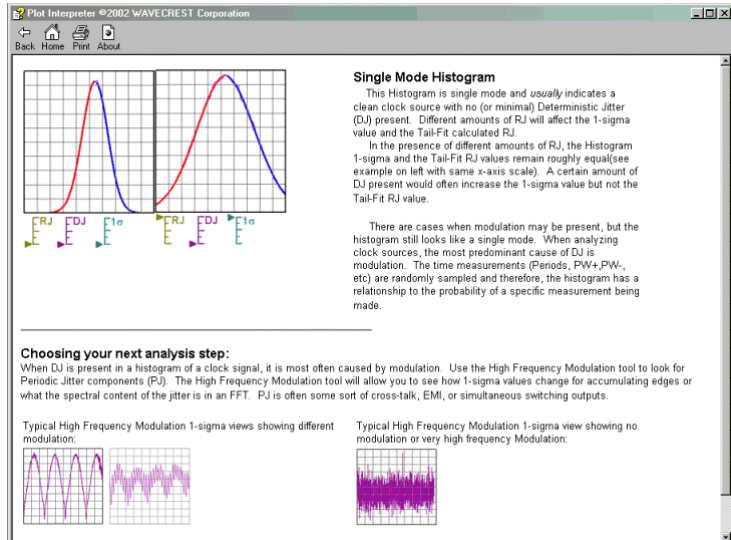


Figure 18. Plot Interpreter

Configuration Menu

Go to the Menu Bar and select **Edit**, then **Configuration**; the panel in Figure 19 is displayed.

- Customize Plot line, grid line, background and font colors.
- This window also allows you to configure GPIB addresses for external Wavecrest hardware.
- The “Pattern Path” and “Data Path” buttons allow you to change directories if you frequently save data patterns and measurement data to directories other than C:\Visi
- Typically, Margins and Axis labels are displayed (Figure 20). When the “No Margins” option is selected or checked, plot legends and labels will not be displayed when more than one tool or view is open (Figure 21). “No Margins” allows many plots to be displayed on the screen. To see legends, select a view and maximize it.

For Configuration Menu changes to be activated, the **Apply** button must be clicked on before closing and exiting the configuration menu panel. Clicking on **Reset** will set all parameters to default settings.

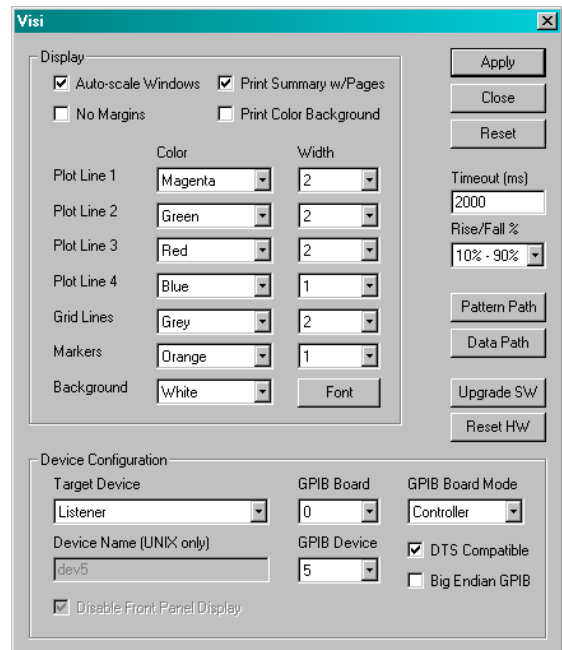


Figure 19. Configuration Menu

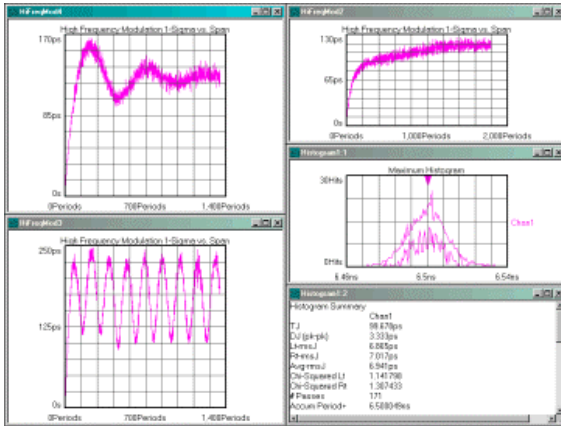


Figure 20. No Margins (de-selected)

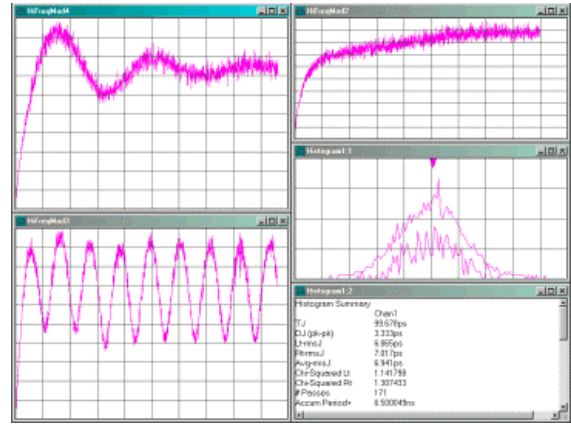


Figure 21. No Margins (selected)

Print Previews

On the Menu Bar, under **Tool**, choose **Print Preview**. The active tool will become the file that is printed. The preview shows what will be printed. The information from the Summary view is automatically added to each plot for printing including annotations.

A print options dialog appears when “print” is chosen. Each possible view for that tool is shown as a page to print. Single pages may be printed or all pages in a range. Also the print view colors are changed to provide a white background with black text—no matter the configuration. To Print with Background colors, select “Print Color Background” in the Configuration menu (Figure 19).

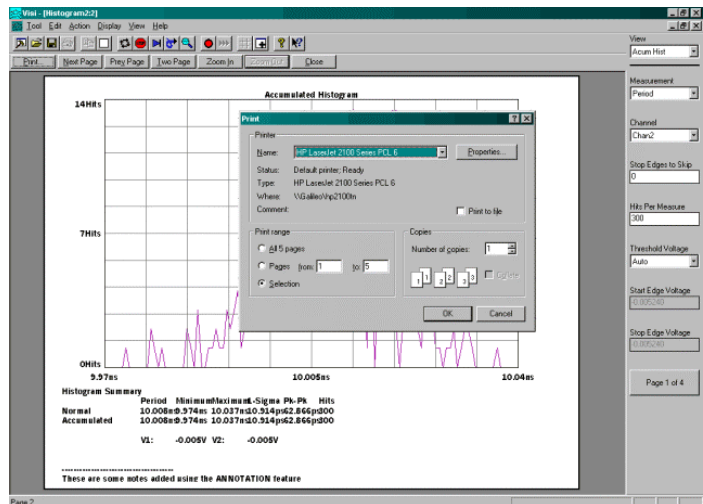


Figure 22. Print Preview

Status Bar

Since some measurements may take longer to acquire than others, the VISI screen includes a status bar in the lower right corner.



Figure 23. Status Bar

The status bar is located at the lower right hand corner of the VISI screen. The word “RUN” will appear along with a horizontal black bar that will grow and move from left to right to indicate progress (refer to Figure 23) as well as a measurement timer which shows the total elapsed time of the current measurement. This feature is active whenever the instrument is taking a measurement or a series of measurements.

There is also a section of the status bar that display the XY coordinates of the mouse. When the mouse is moving over a plot, this area displays the XY coordinates of the mouse. The units are the units of the plot that the mouse is over.

Zoom on plot

The “Hold Zoom” feature holds zoom settings from the mouse and cursor when “RUN” is pressed (see Figure 24).

To zoom in on area of interest and remain zoomed in during subsequent measurements, activate the “Hold Zoom” feature. Go to the Menu Bar, select **Display**, and **Hold Zoom**. With “Hold Zoom” active, the Vertical and Horizontal scaling knobs on the front panel have the same effect as using the mouse.

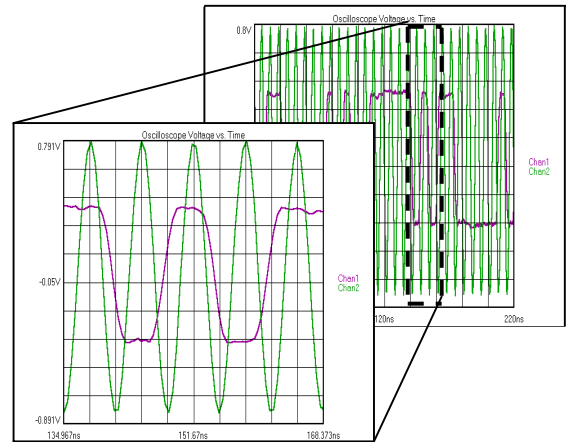


Figure 24. Zoomed-In View

Composite Plot

The composite tool overlays or displays several different views of saved (similar) data. Any data sets (with the same XY axes) can be used such as FFT, histogram, 1sigma vs. period, etc. Figure 25 depicts a composite plot of the High Freq Mod Analysis tool 1-sigma views of an input (magenta trace) to a clock recovery circuit and the recovered clock output (green trace). This allows “golden” data to be compared to current measurements.

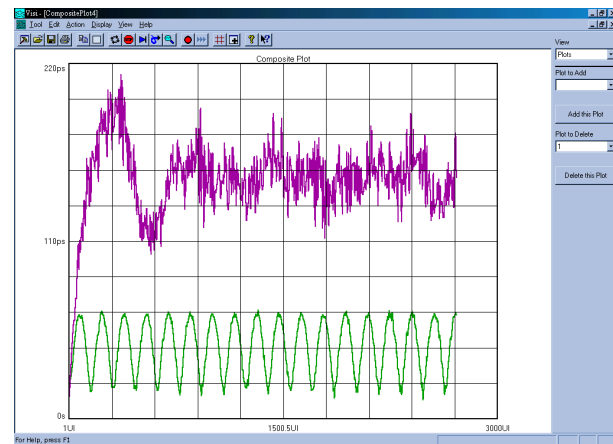


Figure 25. Composite Plot Tool

Summary

The features of the SIA-3000 VISI software provide a versatile user interface and analysis environment. The VISI diagnostic tools combine to form a user-friendly and powerful analysis package for jitter and timing measurements.

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