TECHTIP 40101

Creating Layout Windows to enhance your DASYLab® data acquisition application
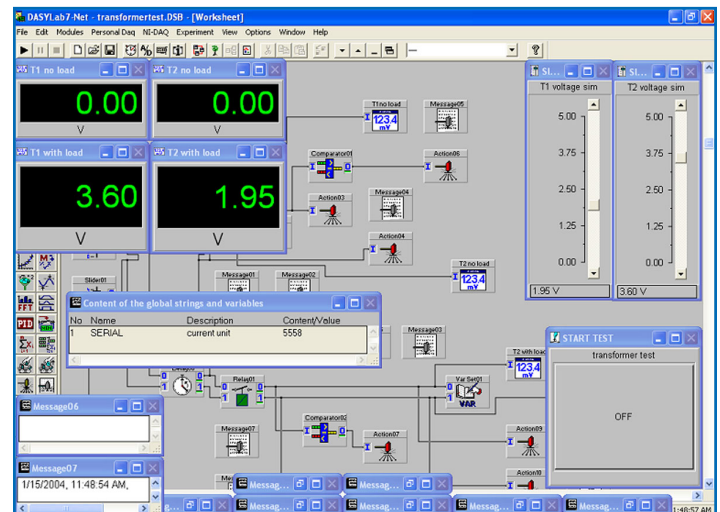
INTRODUCTION

This TechTip discusses how to create Layout Windows in DASYLab® using the VITool.

DASYLab is an icon-based, data acquisition, control, and analysis software package that is easy to use, requires no knowledge of traditional programming languages, and allows the user to create very powerful PC based data acquisition interface programs. DASYLab software is a popular choice with users of IOtech's data acquisition hardware products. It allows for a quick and efficient way to create powerful user interfaces for PC based test applications.

DASYLab software uses a "graphical" approach to writing programs, which are called worksheets. The worksheet designer works in an environment that involves linking function module blocks together and creating logical data flow paths that define the operation of a given application. At anytime during the creation of a program, the PLAY button can be pressed, which will execute the current worksheet. Individual data display screens can be placed over top of the programming area to display data that has been acquired and calculated. There are displays that can replicate oscilloscopes, digital and analog meters, bar graphs, and LEDs, just to name a few. In most cases, users of DASYLab will simply fit the different display windows over top of the worksheet programming area to form the user interface. Many DASYLab users are unaware of the ability of the VITool to create custom graphical interfaces for their worksheet environment. These interfaces, called layout windows, give the DASYLab worksheet a professional look and also hide the actual DASYLab program from test operators and non-programmers. Using layout windows reduces the risk of critical data being lost from accidental changes made to the worksheet program by the operator. The programmer also has the ability to use custom graphic files such as bitmaps to show a picture on the screen of the actual unit under test. The DASYLab VI tool comes standard with DASYLab/Full and DASYLab/Pro (both available from IOtech, Inc.).

DISCUSSION

The following graphic shows a typical DASYLab test application. This worksheet is used in a production floor environment along with the IOtech DaqBook™ series data acquisition system to monitor electrical properties of transformers for final production test. You can clearly see the DASYLab worksheet programming area in the background which is made up of function blocks which are connected by lines. The menus and toolbars around the perimeter of the screen are used to create and modify the worksheet programming. The data display screens have been placed randomly throughout the worksheet area by this programmer. The test operator is required to hunt around the screen to find the display that is currently showing the data they are interested in seeing. Anyone who has access to the keyboard and mouse of this computer has the ability to modify the actual DASYLab program.

A typical DASYLab worksheet that is designed to run as a production test station

The next graphic shows the same DASYLab worksheet with a Layout Window in place. You can see that this is a much improved graphical interface to present to a test operator. The actual program and programming controls are hidden from the user, and the over all presentation is much easier to view. The graphical interface has the appearance of one that might be created in a high-level programming environment such as Visual Basic®. The test application now fills the entire viewing area of the computer screen, which gives the appearance that this computer is a dedicated test station.
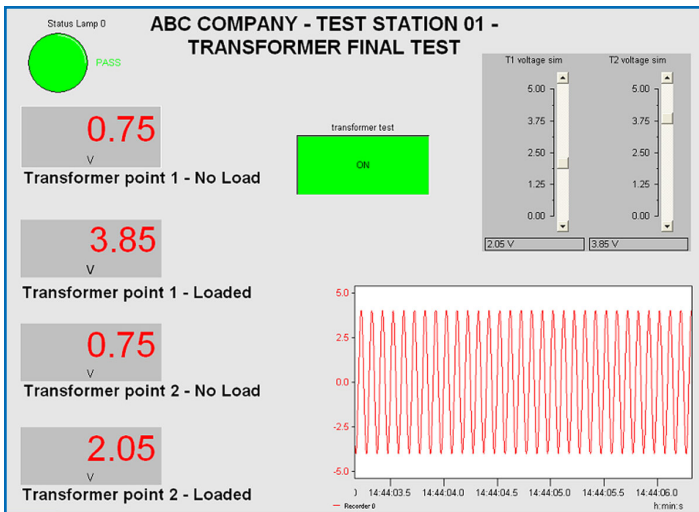
Layout Window created with VITool. This is the interface screen that the test operator will see. This screen occupies the entire viewing area of the computer monitor.
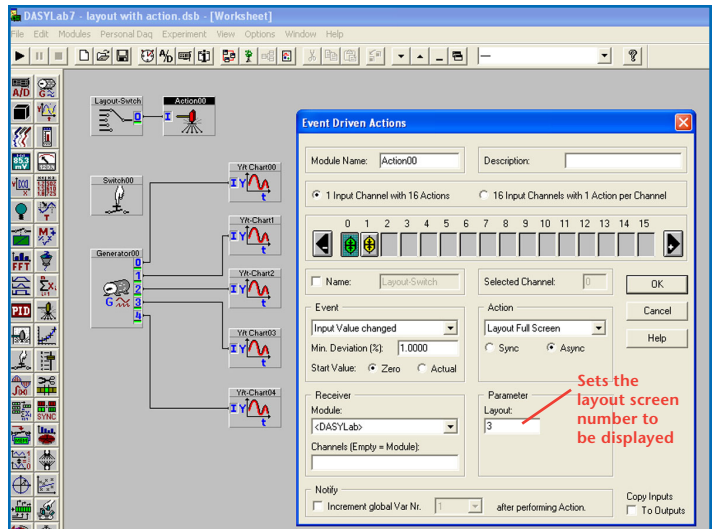
Creating a Layout Window in DASYLab

1. Start by creating a simple DASYLab worksheet or by loading one of the included example programs. Include as many different types of display modules in the worksheet as possible.

2. Using the main DASYLab menus located at the top of the screen, select the WINDOW pull down menu and select NEW LAYOUT.

3. You are now presented with a visual work area that represents the layout screen.

   Pressing CTRL-F at anytime while in this view will switch to the full screen view. This is useful for testing your layout to see how it will look as a full screen.

   You cannot modify the layout while in full screen mode. Press CTRL-F again to switch back to the layout design mode.

4. Right mouse click anywhere on the layout design area to bring up the layout menu.

5. Select OBJECT, then select VISUALIZATION, then select GRAPH.

6. Now draw a box in the layout design area that is the approximate size of one of the displays that you want to have visible in the layout. Hold down the left mouse button and drag the mouse to draw a box. The size can be adjusted at any time.
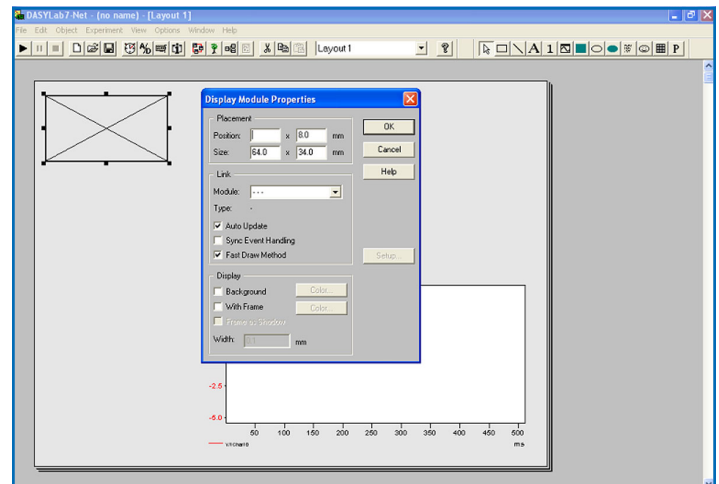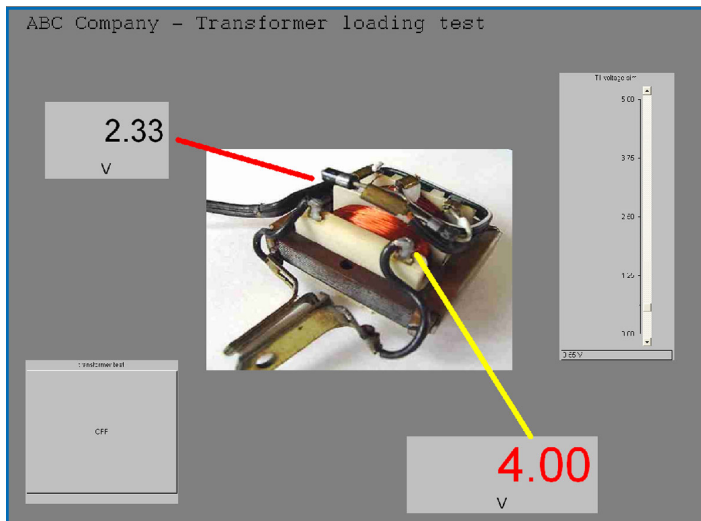

The Layout Window design screen

7. Highlight the newly drawn box and select PROPERTIES.

8. Use the MODULE pull-down menu box, located inside the properties area, to select the DASYLab display module that you would like to bring into the layout from your worksheet. The modules in the list represent all of the display modules that you have used in the worksheet area of your DASYLab experiment. Press OK and you will see that the box takes on the properties of the display that you just selected. You can grab the corners of the new display to resize it. You can grab the entire display and adjust its position in the layout window. At any time, you can right mouse click on the display and return to the properties screen and make further adjustments to the display properites. You can customize the display colors, background settings, and text fonts.

9. Another method of accessing the Layout design selections is to use the layout window toolbar. Select the VIEW pull down menu in DASYLab and check the TOOLBAR selection. This will enable the Layout Window toolbar. Use this toolbar to access the features used to customize your Layout Window.

   - add your own text using the text functions
   - add data displays and user controls from the worksheet using the graph function
   - draw lines to visually link information
   - draw circles, boxes, and other shapes to add your own graphics

10. Now that you have created a basic Layout Window, press the PLAY button and press CTRL-F to switch the layout window to full screen mode. This allows you to view your new layout window. Press CTRL-F again to return to the design area and press the STOP button. You can now make adjustments to the objects in the Layout Window that were not correctly positioned in the full screen view. At any time, you can select the WINDOW pull down menu in DASYLab, and select WORKSHEET to return to the main worksheet programming screen. You can return to the Layout Window design view by using the same WINDOW pull down menu.

11. Use the BITMAP feature located in the layout toolbar to bring your own picture file into the layout window. This is a very powerful feature that allows you to show a picture of the actual part under test. A digital camera can be used to take a real life photo of the test application, which can then be shown in the layout window. Lines can then be drawn to point to areas of the picture to show where test data is being taken from.

12. Finally, use the ACTION module in your worksheet to control which Layout Windows are visible and to set the Layout Window to full screen upon the beginning of the test. The action module can be configured to trigger on the "start of experiment" event and then set to switch to the layout of your choice in full screen mode.

- multiple Layout Windows can be created and can be sequenced through during the test using the action module
- the action module can cause the layout module to go to full screen mode immediately upon the start of the experiment

An example of a Layout Window that uses a custom picture file
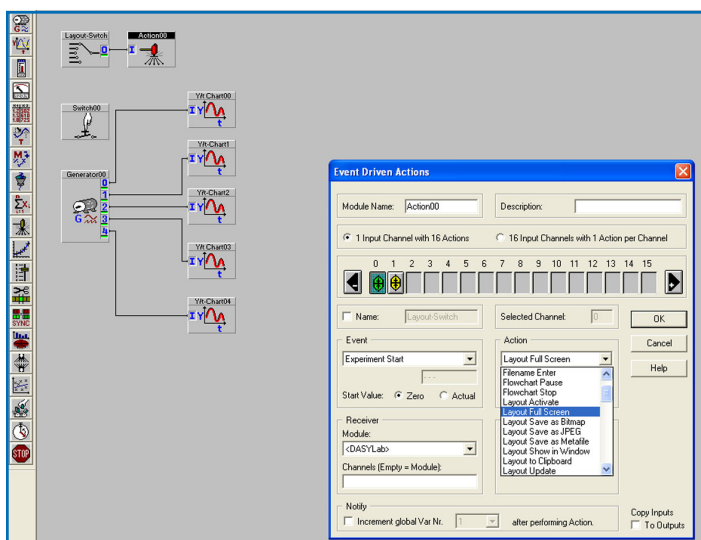
Action module configured to set the Layout Window to full screen mode when the experiment is started

Action module configured to switch to layout window #3 in full screen mode when the value connected to this action module changes by more than 1%

CONCLUSION

With minimal time and effort you can easily add a professional looking GUI to your DASYLab worksheet experiment by using the DASYLab VITool. Improving the look of your experiment interface can lead to increased efficiency and productivity while performing tests and experiments using data acquisition systems.

A runtime only version of DASYLab is also available (DASYLab/RT), which allow you to install the program worksheet you have created onto computers that you would like to use as dedicated test stations only. DASYLab Runtime will run the worksheet without allowing access to the worksheet design area. A worksheet that is created with layout windows will display in layout mode upon startup, if the worksheet has been designed to do so. At least one copy of DASYLab/Full or greater is always required to create the original worksheets that will run on the runtime version locations.