Using Graphics with a UniOP Panel

With our new line of hardware and the release of our new software package comes the ability to implement graphics with our larger (16 lines X 40 characters and up) display panels. The user is now capable of importing, displaying, and manipulating graphics. Once the graphic is imported into the project file, it may be easily moved or resized. By selecting the *Graphics* pull down menu, the user will be presented with five different selection possibilities, including *Import Bitmap Graphics*, *Graphics Library*, *ISA Symbols*, *Dynamic Graphics*, and *Transparent Graphics*. All of these may also be accessed through the *Extra ToolBelt* by simply clicking on the appropriate icon, with the exception of *ISA Symbols*.

Note that if the *Graphics* menu is not present, the user can select *Panel Setup* from the *Project* menu and select the check box entitled *Enhanced graphics support* to make the menu appear.

Importing Bitmap Graphics

The first option the user is presented with in the *Graphics* menu is *Import Bitmap Graphics*. Any file having the extension .BMP or .DIB may be imported. Simply highlight the area in which the graphic is to be placed, select *Import Bitmap Graphics* from the *Graphics* menu (or click on the appropriate icon in the *Extra ToolBelt*), select the graphic file to be used, and click on *OK*. This will bring up a dialog box in which the user can select the graphic label, as well as the dithering and imaging options. It is suggested to import the graphic using the default values. If the user is unsatisfied with the result, import the graphic again using different settings. These options are discussed further in the section *Recommendations & Tips*.

Graphics Library

Another method of bringing a graphic into a project file is by using the *Graphics Library*. Simply highlight the area in which you wish to place the graphic and select *Graphics Library* from within the *Graphics* menu (or click on the appropriate icon in the *Extra ToolBelt*). This will bring up a dialog box, which is shown in Figure 1.

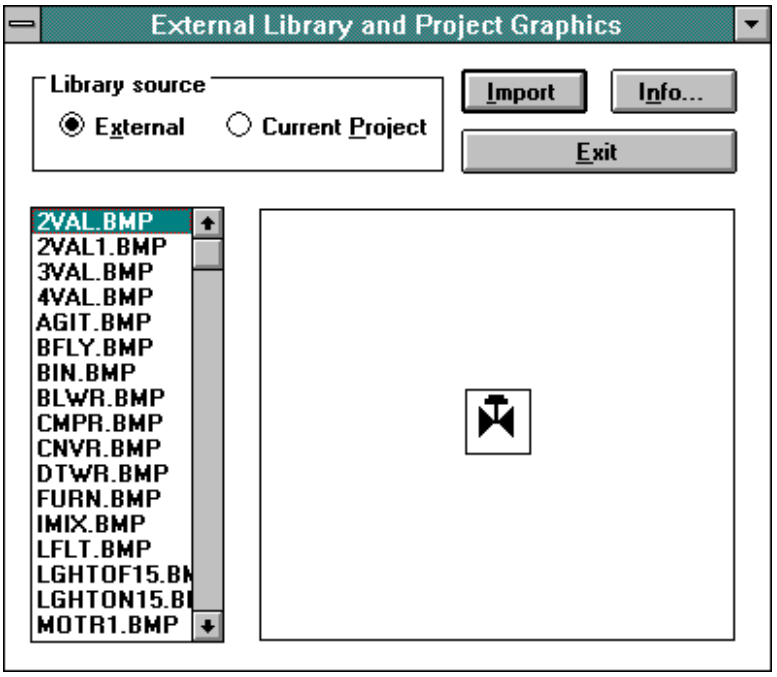


Figure 1

When the 'External' Library source radio button is selected, the dialog box will list all of the bitmap graphic files that are contained within the Graphics subdirectory. This subdirectory is located within the main directory of Designer that was created upon installation of the software. It is recommended that the user place all graphics files that they frequently use in the Graphics subdirectory. If the 'Current project' Library source radio button is selected, the dialog box will list all of the bitmap graphic files that are in use within the current project.

A graphic can be selected by single clicking the left mouse button on the filename you wish to use. Once a graphic is selected, a preview of the image will be shown within the dialog box.

Example

For this example, assume the user wants to use the graphics library to put a picture of a blower into the project file. To do this, the following steps must be performed. Note that this is the standard procedure when using the graphics library, regardless of the graphic file.

1. Highlight the area on the screen in which the graphic is to be located.
2. Either select *Graphics Library* from the *Graphics* menu or click on the appropriate icon in the *Extra ToolBelt*.
3. Select the file BLWR.BMP. A picture of a blower will appear in the dialog box.
4. Click on the *Import* button. This will bring up a dialog box in which the user may enter the label, as well as imaging and dithering options. It is recommended to use the default selection initially. If the result is not satisfactory, try using different combinations to see what gives the best results. See the section *Recommendations & Tips* for further details.
5. Click on *OK* and choose *Exit*. This will return you to the page editor workspace.

ISA Symbols

The ISA (Instrument Society of America) Symbols floating toolbar allows the user to have an easy access library of standard industrial symbols. This feature can be accessed by selecting *ISA Symbols* from the *Graphics* menu. Doing so will bring up the floating toolbar of symbols that is shown above. By placing the cursor over a symbol, the user will see a popup tip containing the name of that symbol. The user may add one of these symbols to their project file by using one of two methods. The first method is to highlight the area in which the symbol is to be placed, select *ISA Symbols* from the *Graphics* menu, and click and drag the desired symbol to the highlighted area. The second method is to select *ISA Symbols* from the *Graphics* menu and click and drag the symbol to the desired location. The symbol may then be resized by selecting the image and using the handles that appear around it's outer border.

Dynamic Graphics

This feature allows the user to display different graphics based upon a numeric value in the controller. It can be accessed by either selecting *Dynamic Graphics* from the *Graphics* menu or by selecting the proper icon from the *Extra ToolBelt*. For example, a user may want to display two graphics, one when a blower is on and one when a pump is on. Depending upon which machine is on, the respective graphic will be displayed at a single screen location. If neither machine is on, then no graphic will be displayed. In another scenario, a user may wish to have a graphic appear at a different location on the screen, depending upon which machine is on. Examples of these situations are given below.

Example
In this example, assume a user has a situation in which there are three possible occurrences. Either a blower can be on, a pump can be on, or neither can be on. Depending upon the situation, the user wants to display a graphic at the same location on the panel. This can be accomplished by referencing the graphics to a single register in the controller. A value of 0 in this register indicates that neither the blower nor the pump is on. A value of 1 in this register indicates that the blower is on. A value of 2 in this register indicates that the pump is on.

1. Highlight the location in which the graphic is to be displayed.
2. Either select *Dynamic Graphics* from the *Graphics* menu or click on the appropriate icon in the *Extra ToolBelt*.
3. This will bring up a dialog box allowing the user to select the memory location in the controller in which the values 0, 1, or 2 will be written. Since we are using more than two

values, the data format can be selected as a byte. If we had only used one or two values, we could have selected the data format as a bit (assuming the selected driver supports these data formats).

4. We have three different values being written into the controller, either a 0, 1, or 2. Therefore, our minimum value is 0 and our maximum value is 2. Once these have been entered into their respective locations in the dialog box, click on the *Edit Graphics* button.
5. This will bring up another dialog box in which the user can associate the graphic with a value. To assign a value to a graphic, either click on the value that is to be used or select the value by using the up and down arrow keys located next to the *'Current value'* box. Since we do not need a graphic for the value of 0 (remember, a 0 indicates that nothing is operating), leave this value blank and select the value of 1. This is the first value that will have a graphic associated with it.
6. Once the value is selected, a graphic needs to be associated with it. Since we are using graphics that are available from the *Graphics Library*, click on the *From Library...* button. Note that if the graphics were not located in the *Graphics Library*, we would need to click on the *Import New...* button and select the proper location of the graphic, as well as it's filename.
7. A dialog box will appear, allowing the user to select a graphic. This is the same dialog box that appears whenever *Graphics Library* is selected (see Figure 1). We have the value of 1 selected, which is indicative of a blower being on. Selecting the filename BLWR.BMP will give the user a preview of the graphic for a blower. Click on the *Import* button. This will bring up a dialog box in which the label, as well as imaging and dithering options can be selected. Once these have been set, clicking on *OK* will return the user to the dialog box that was present upon entering step 6.
8. Perform the same procedure for selecting the value of 2 and the graphic of a pump (the filename for the pump is PUMP.BMP). Once this is completed, the dialog box that contains the graphics and their values will look similar to the screen capture shown in Figure 2. Clicking on *OK* will take the user back to the dialog box in which the address and the minimum and maximum values were set up. Clicking on *OK* from within this dialog box will complete the procedure and return the user to the page editor workspace.

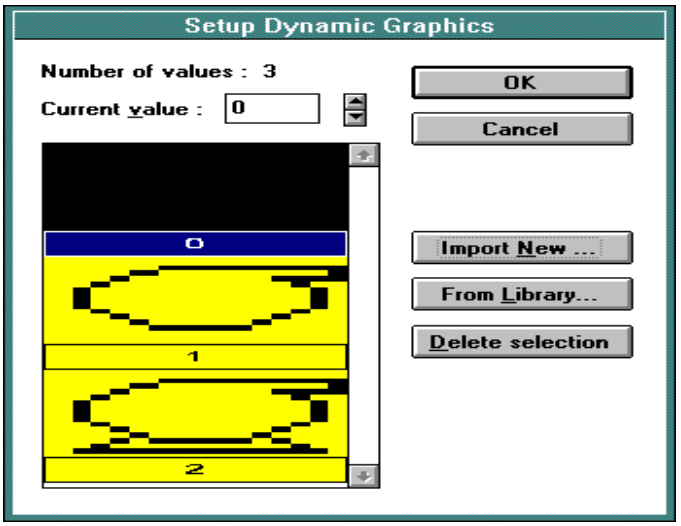


Figure 2

Example

In this example, assume a user wants to have a graphic appear in one of three different locations on the screen, depending upon what is happening. Assume there are four possible occurrences. Either a blower can be on, a pump can be on, both can be on, or neither can be on. If there is nothing on, the display screen will be blank. If the blower is on, the graphic of the blower will appear in the second screen location. If the pump is on, the graphic of the pump will appear in the third screen location. This can be accomplished by using a different memory location for each graphic that is to be displayed.

> *Since there is to be nothing displayed on the screen when neither the pump nor the blower is on, we only need to create two graphics fields in the project file. One field for the graphic of the blower and the other field for the graphic of the pump.*

1. Highlight the area in which you wish the graphic of the blower to appear.

2. Either select *Dynamic Graphics* from the *Graphics* menu or click on the proper icon in the *Extra ToolBelt*.

3. This will bring up a dialog box that allows you to select the memory location in the controller you wish to use. Since we are using a memory location for each graphic, the data format of these fields can be set as a bit (again, if the selected driver supports this data format). This is because there are only two possible cases, either the graphic associated with the memory location is displayed or it isn't.

4. Since there are only two scenarios, the minimum value can be set to 0 and the maximum value can be set to 1. If the selected memory location has a value of 1, the graphic will get displayed. If the memory location has a value of 0, the graphic will not be displayed. Once the minimum and maximum values have been set up, click on the *Edit Graphics* button.

5. This will bring up another dialog box in which the user can associate the graphic with a value. To assign a value to a graphic, either click on the value that is to be used or select the value by using the up and down arrow keys located next to the *'Current value'* box. Since we do not need a graphic for the value of 0 (remember, a 0 indicates that no graphic is displayed), select the value of 1.

6. Once the value is selected, a graphic needs to be associated with it. Since we are using graphics that are available from the *Graphics Library*, click on the *From Library...* button. Note that if the graphics were not located in the *Graphics Library*, we would need to click on the *Import New...* button and select the proper location of the graphic, as well as it's filename.

7. A dialog box will appear, allowing the user to select a graphic. This is the same dialog box that appears whenever *Graphics Library* is selected (see Figure 1). We have the value of 1 selected, which means that the graphic will be displayed. Selecting the filename BLWR.BMP will give the user a preview of the graphic for a blower. Click on the *Import* button. This will bring up a dialog box in which the label, as well as imaging and dithering options can be selected. Once these have been set, select *OK*. This will return you to the dialog box that is shown in Figure 3. Since this is the only graphic that needs displayed from this memory location, click on *OK* to return you to the page editor workspace. You are now ready to make another graphic field in which to place the graphic for the pump.

8. Highlight the area in which you wish to place the graphic for the pump. Repeat steps 2 through 6. In step 7, select the filename PUMP.BMP for the pump instead of selecting

the filename BLWR.BMP for the blower. A dialog box representing this is shown in Figure 4. Once you have imported the graphic and have returned to the page editor workspace, the procedure is complete.

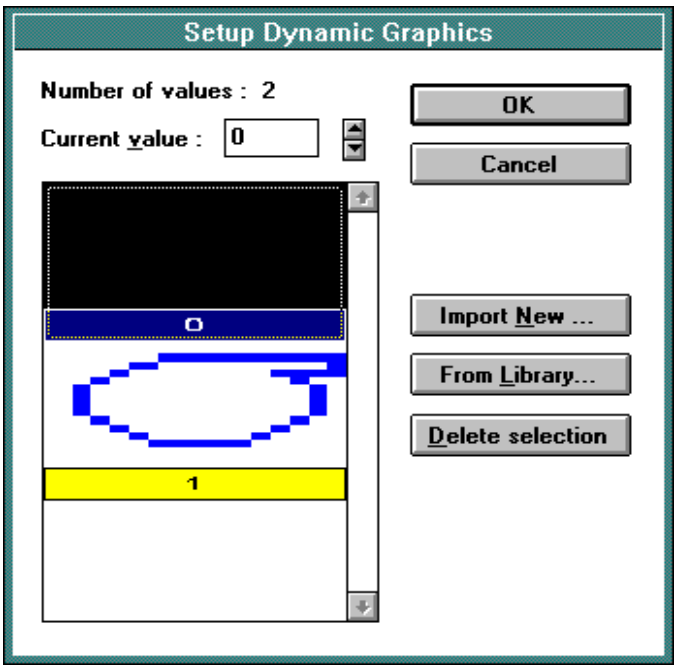


Figure 3

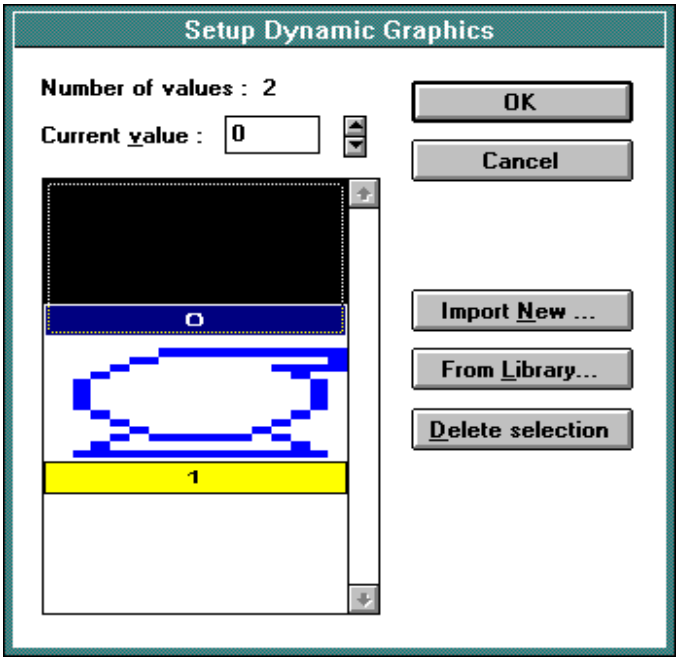


Figure 4

Transparent Graphics

Transparent graphics allow the user to overlay dynamic fields or static text in front of a bitmap graphic. An example using this feature is given below.

Example:
Assume a user wants to simulate the fill level of a tank. In this case, a transparent graphic of a tank could be used along with a bargraph to simulate the fill level. The procedure for implementing this feature is as follows:

1. Highlight the area in which the graphic is to be placed.
2. Import the graphic that is to be used (a tank in this case).
3. Either select *Transparent Graphics* from the *Graphics* menu or click on the appropriate icon in the *Extra ToolBelt*. The graphic will disappear, but will be present whenever the project file is downloaded to the panel. *Note that the graphic can be toggled from visible to invisible by simply re-selecting Transparent Graphics from the Graphics menu or the Extra ToolBelt.* This allows the user to be able to reposition or resize the graphic. Also note that it is necessary to have *Transparent Graphics* toggled on in order to place static text or dynamic fields at the same screen location as the graphic.
4. Highlight the area in which the field (a bargraph field in this case) is to be placed.

5. Select the field type by either selecting *Bargraph* from the *Edit - Data Field Type* menu or by clicking on the proper icon in the *Extra ToolBelt*.
6. This will bring up a dialog box allowing the user to configure the bargraph. Click on *OK* once the field is configured. The procedure is now complete.

Recommendations & Tips

1. If the user is importing graphics using *Import Bitmap Graphics* or the *Graphics Library*, there will be a button labeled *Info...* present in the initial dialog box. Clicking on this button will bring up an additional dialog box that contains information specific to the graphic file that is selected. This information includes the *name of the file, the file format, the width and height of the graphic in pixels, the number of colors used, and if there is any type of file compression*. This allows the user to know the resolution of the graphic before it is actually imported into the project file. If visual effects are of importance to the user, we recommend using a *professional image processing package* to edit color graphics before importing them into a monochrome panel.

2. In most cases, a complex image which contains many colors or many levels of gray looks the best when imported using *Bayer dither*. An image composed of only a few colors (or monochrome - only one color) generally looks the best when imported using the *no dither* option.

3. Color graphics *can* be imported onto a monochrome panel. Designer will attempt to cast the graphic in monochrome the best that it can by using the *dithering* method. The dithering method is a process that uses single dots containing different levels of gray. These dots are used to simulate the brightness of colors.

4. Graphics can be no larger than the size of the entire screen. In other words, you can not place a graphic that is 640 X 400 on a 500 X 300 screen.

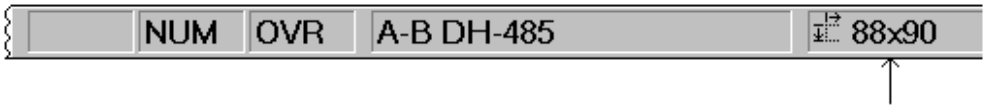
5. Graphics that do *not* take up the entire screen can be *moved*, *resized*, and *copied*. Single clicking the left mouse button anywhere on the graphic will select it, bringing up selection handles. The user can utilize these handles to either move or resize the graphic.

6. For best visual effects, we recommend resizing graphics in *integer multiples*. For example, if the graphic is 32 X 30, recommended sizes would be 64 X 60, 128 X 120, etc. It is also recommended to use graphics whose resolution best matches that of the panel. For example, importing a graphic that has 1024 X 1024 resolution onto a panel that has 640 X 400 resolution will result in distortion.

7. When using more than one graphic, they *cannot* overlap one another.

8. Note that neither static text nor dynamic controller fields (such as the bargraph in the transparent graphics example) can be placed in the leftmost column of the transparent graphic.

9. When importing a graphic, the user can see the resolution of the graphic by looking at the right side of the *status bar* located at the bottom of the Designer screen. The selection size status bar indicator, which shows the pixel width and height of the selected graphic, will be present. This is a good way for the user to monitor the change in the size of the graphic.



Selection size status bar indicator

10. If a single graphic is to be used more than once in a project with *different* imaging and/or dithering options, there must be a separate label (name) assigned to each *unique* imaging/dithering combination.

Technical assistance may be obtained :
In North America EXOR at 1 -513-874-4665.
In Europe EXOR Italy +39 045 - 8779068