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Chapter 1 - Getting Started

1.1 - Introduction

The *Designer for Windows™* manual is intended to give the reader a complete overview of project development. For information regarding hardware operation, please see the *UniOP Installation & Operation Guide*.

This manual is divided into the following chapters:

- **Chapter 1** *Getting Started*
- **Chapter 2** *Creating a Project File*
- **Chapter 3** *Controller References*
- **Chapter 4** *The Keyboard Macro Editor*
- **Chapter 5** *Passwords*
- **Chapter 6** *Alarms*
- **Chapter 7** *The Reserved Data Area*
- **Chapter 8** *The Interlock Mailbox*
- **Chapter 9** *The Font Editor*
- **Chapter 10** *Graphics*
- **Chapter 11** *Color*
- **Chapter 12** *Recipes*
- **Chapter 13** *The UniNet Network*
- **Chapter 14** *TouchScreen Programming*
- **Chapter 15** *Multilanguage*
- **Chapter 16** *Designer's Initialization Files*
- **Chapter 17** *Documenting a Project*
- **Chapter 18** *Application Notes*

1.2 - System Requirements

The following *minimum* computer hardware is required to use *Designer for WindowsTM*:

- 386 Processor
- MS Windows - 3.1, 3.11, 95, 98 or NT
- 13 MB of free hard disk space
- One RS-232C serial port to communicate with the panel

1.3 - Software Installation

Note: MS-WindowsTM must be installed before installing Designer.

To install Designer, insert the first installation disk into your computer. Start Windows and select *Run* from the *File* menu (if you are running Windows 95 or 98, click on the *Start* button and select *Run* from the popup menu). The installation file that you need to run is entitled *INSTALL.EXE*. You will be prompted for a destination drive and directory. Once these have been defined, select the menu option *Install UniOP Designer*. You will be prompted to insert the installation disks one at a time until all of the necessary files to run Designer for Windows are installed. This procedure will create a program group entitled *UniOP Designer* within Windows. Following this, you can either select *Install Sample Project Files* or *Exit*. If you choose to install the sample project files, a subdirectory entitled *Samples* will be created. If you choose not to install the sample project files, clicking on *Exit* will complete the installation procedure.

1.4 - Solving Installation Problems

- The installer will report various types of errors when it runs low on disk space during the installation. *You must have at least 13 megabytes of free disk space to install the Designer software.*
- The installer will also report various types of errors when it runs low on memory (RAM) during the installation.

1.5 - What Install Does

All executable files, dynamic link libraries, and help files are copied into to the user-specified directory:

The following files are copied to the *Windows* directory:

DESIGNER.INI	Designer initialization file
DISPLAYS.INI	Display and Model descriptions

All font files are copied to the *Windows-System* directory.

xxx.FON	Font files for supported display types
---------	--

Chapter 2 - Creating a Project File

2.1 - Overview

Developing applications for a UniOP panel is quick and painless when using our *Designer for Windows™* software. The common functionality found among many Windows™ applications can also be found in Designer. This familiar interface style will allow new users to quickly adapt to the Designer software.

A completed project file (*.PRJ) contains all the information needed to display your page images and controller data values in the formats defined during development. The panel hardware will handle all of the underlying communications necessary to transfer data to and from the controller, leaving you free to concentrate on the appearance and functionality of your data and display pages.

Designer makes it possible to work in a more natural and intuitive way using the logic behind your control application to guide you through development. Instead of writing computer programs in BASIC, PASCAL or C, you use Designer to create one or more display pages that outline and control your application. The multiple page capability of each panel allows any application to be broken down into as many pages as you want, depending only on the size of your target system memory. Display pages can be created quickly and easily by using either the pull-down menus or the icons from Designer's *ToolBelt* and *Extra ToolBelt*.

Completed projects can be recalled from disk or from the panel itself for further modification. For instance, a simple project may have only a single page and a few data fields. To update this project, either connect to the panel and upload the existing project or open the file from disk.

The panel must be in Configuration Mode in order to communicate with the PC (see the section entitled Get Panel Resources for more information).

2.2 - Creating a Project File

When Designer initially starts, the user is presented with a blank project page where they may begin editing. A new project may also be created by selecting *New* from the *File* menu (or click on the appropriate icon in the *ToolBelt*). When this option is selected, the current configuration parameters (for the controller and the panel) are carried over for use with the new project. This approach relieves the user from having to reset the parameters each time a new project is created. The latest configuration is saved on exit for use the next time Designer is started.

When switching between two projects with different configurations, the latest project to be opened overrides the previous and becomes the new default state for Designer.

To prevent accidental reset of the configuration parameters, the user will be prompted to confirm the *New* operation if there are pending modifications that have not been saved.



Figure 2-1

If *Yes* is selected, the user will be prompted to enter the filename (if this is the first time the project file has been saved) and the project file will be saved to disk. If *No* is selected, the current modifications will be lost. Pressing *Cancel* will return the user to the current project.

2.3 - Identifying a Project File

There are two ways to identify a project file. First, the user may decide to give the project file a descriptive name when saving the file to disk. This method can be handy to recognize files quickly without opening them, but is often not sufficient. By selecting *Project - Application Name*, it is possible to attach a forty character description to a project file. When this information is provided, it will be stored in the project file and will appear on all printed documents produced by Designer.



Figure 2-2

2.4 - Opening Existing Project Files

To open an existing project, select *Open* from the *File* menu (or click on the appropriate icon in the *ToolBelt*). The dialog box shown in Figure 2-3 will appear, allowing the user to view the files in each directory.

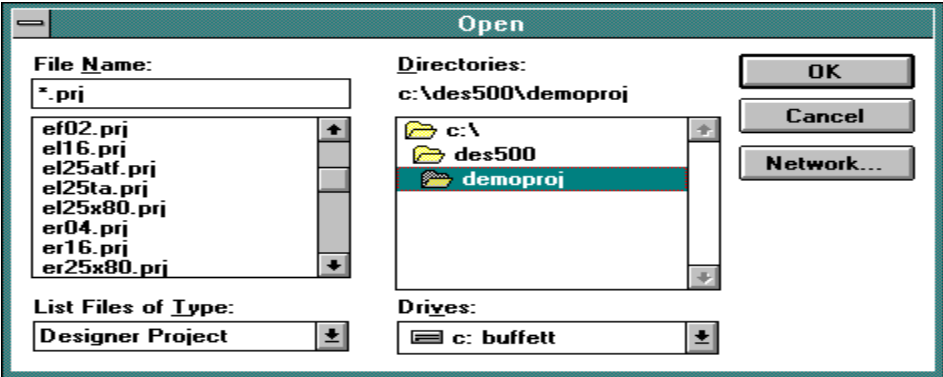


Figure 2-3

Creating a Project File

Enter the name of the file to be loaded, or use the list box to select from the existing files. If the extension is not specified, ".PRJ" is assumed.

2.5 - Saving a Project File

To save a project, select *Save* from the *File* menu (or click on the appropriate icon in the *ToolBelt*). The cursor will be momentarily replaced with an hourglass while the file is being saved. If the application has not been named, the *Save As* dialog box will appear. This dialog box can also be used to save your project under a different name. The *Save As* dialog box shows the current directory path and the current filename. A new name and path may be entered, or the default parameters may be accepted. If the extension is omitted, ".PRJ" is assumed.

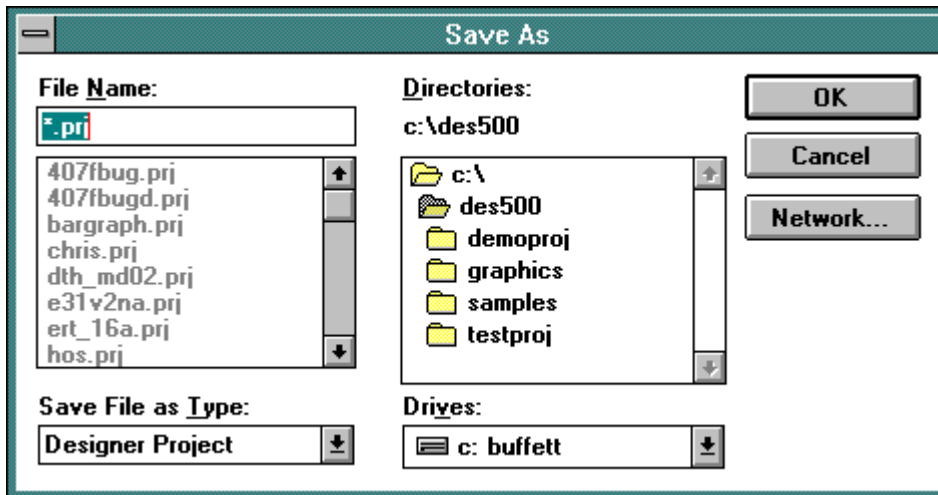


Figure 2-4

If the file already exists in the selected directory, the user will be prompted to confirm the *Save As* operation in order to overwrite the existing file.

2.6 - Get Panel Resources

Before you begin working on a particular project, you need to specify the type of display that your panel contains. The physical size of the screen, as well as its type (backlit LCD, vacuum fluorescent, electroluminescent, passive color) must be specified. Failure to do this may result in the loss of text and data whenever you attempt to download the project file into the panel.

The *Get Panel Resources* option provides a means of automatically configuring the software for the panel you are working with. The following list of steps illustrates how to use this feature.

1. The UniOP panel must be connected to the PC with a CA1 or CA2 cable.
2. Connect the correct cable to an available PC port.
3. Put the panel in *Configuration Mode* by holding down the *ENTER* key for a few seconds. When the Panel Command Menu appears, use the cursor keys to highlight the *Configuration* option and then press *ENTER*.

The panel must be in Configuration Mode in order to communicate with the PC.

4. Select *Get Panel Resources* from the *Transfers* pull down menu (or click on the appropriate icon in the *Extra ToolBelt*).
5. Select *Yes* to copy the panel resources into the current project file. This transfers the panel size and type automatically from the panel's memory and updates the Designer display.

It is also possible for the user to manually configure the software. This is done by selecting *Panel Setup* from within the *Project* menu. This procedure is discussed later in this chapter in the section entitled *Panel Setup*.

2.7 - Quick Start Tutorial

The following tutorial assumes that you have already installed the software as described in section 1.3.

- STEP 1 Connect the PC programming cable to the panel.
- STEP 2 Connect the controller's communication cable to the panel.
- STEP 3 Locate the UniOP Designer program group.
(This group was created when the Designer software was installed)
- STEP 4 Click on the icon for Designer.
(Looks like a small UniOP panel)
- STEP 5 Once Designer is open, select *Communications* from the *Options* menu. Set up the communications port that Designer uses to communicate with the panel.
- STEP 6 To choose a port, simply click on a radio button with the mouse. To communicate with a panel, use the following parameters: 9600 baud, no parity, and 1 stop bit.
(Ports that are unavailable will be grayed out)
- STEP 7 Next, select *Project - Change Controller Driver*. Select the appropriate driver for your application.
- STEP 8 Next, select *Project - Panel Setup*. Select the type of display that the UniOP panel has.
- STEP 9 Next, choose *Project - Controller Setup* to select the particular controller model being used. Set up the communication parameters by selecting the *PLC Comm* button.
- STEP 10 We are now ready to begin designing the project page. Using the PC keyboard, type the words "This is a data value =" on the first page of the project.

- STEP 11 Place the cursor after the equals sign that was typed above and press ENTER.
- (The Define Field dialog box will appear on the screen - see Fig. 2-5.)*
- STEP 12 Fill in the controller reference portion of the define field dialog box with the appropriate data.
- The data reference MUST already exist in the controller.*
- STEP 13 Click on the OK button in order to confirm the operation and create the field (see Fig. 2-6).
- STEP 14 Select *Save* from the *File* menu to save the project to disk.
- (Optional for tutorial)*
- STEP 15 Power up the UniOP panel and make sure it is in Configuration Mode. The panel MUST be in Configuration Mode to communicate with the Designer software! When the unit is in Configuration Mode, the words CONFIGURATION MODE will appear on the panel.
- If you do not see the words CONFIGURATION MODE displayed on the panel:*

STEP 1: Hold down the ENTER key until the command menu appears.

STEP 2: Use the arrow keys to highlight CONFIG or CFG and press ENTER again.
- STEP 16 Select *Transfers-Download* from the main menu to send the project to the panel.
- (If the default setup of the Designer software has not been changed, the project will start automatically after being downloaded)*

Creating a Project File

STEP 17 After a short pause, check the display:

The text that was typed in step 10 should be visible, along with the data value read from the controller.

The *Fault* light should be off.

The *Com* and *Run* lights (if present) should be ON.

A blinking Com light indicates a communications error.

Step 8 could have been eliminated by placing the panel in *Configuration Mode* and selecting *Get Panel Resources* from the *Transfers* menu.

Figure 2-5 shows the define field dialog box described in step 11. Keep in mind that this dialog box is controller specific.

Figure 2-6 shows what the user's computer screen should resemble once step 13 is completed.

Siemens Simatic TI 305/405 Define Field ver. 3.04

PLC Reference

Data Type User Area	Address Offset 1400	Address Reference V1400
Data Format DBLE WORD(Bin)		PLC Slave ID

Low Priority High Priority

Display Format
NUMERIC

Numeric Base
 Decimal
 Hexadecimal

Data Access
 Read Only
 Read/Write

Field Dimensions
 Field Width: 4 Max. 19
 Field Height: 1 Max. 1

Scaling
 Y = 1 / 1 X + 0

Fixed point Placement: 0

Min. value: Max. value:

OK

Cancel

Delete

Help

Figure 2-5

Creating a Project File

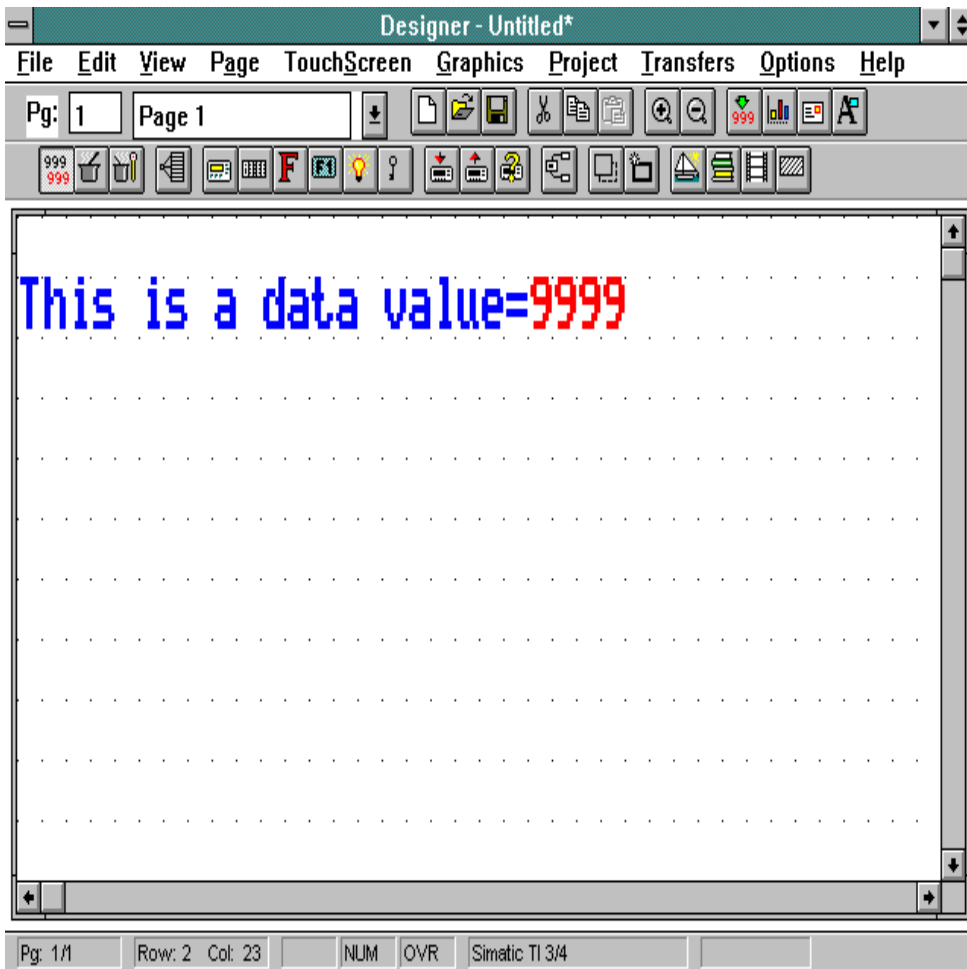


Figure 2-6

2.8 - Change Controller Driver

Designer offers support for all major brands of PLCs and other controllers. By selecting *Change Controller Driver* from the *Project* menu, the user will be able to select the controller family that they will be working with (i.e., Allen Bradley, Mitsubishi, etc.). *Note that Designer uses the current controller setup and applies this setting to all subsequent projects.*

Whenever a project file is saved, Designer stores the project type ID within the project file. This ID is used to recall the selected driver whenever the project file is opened.

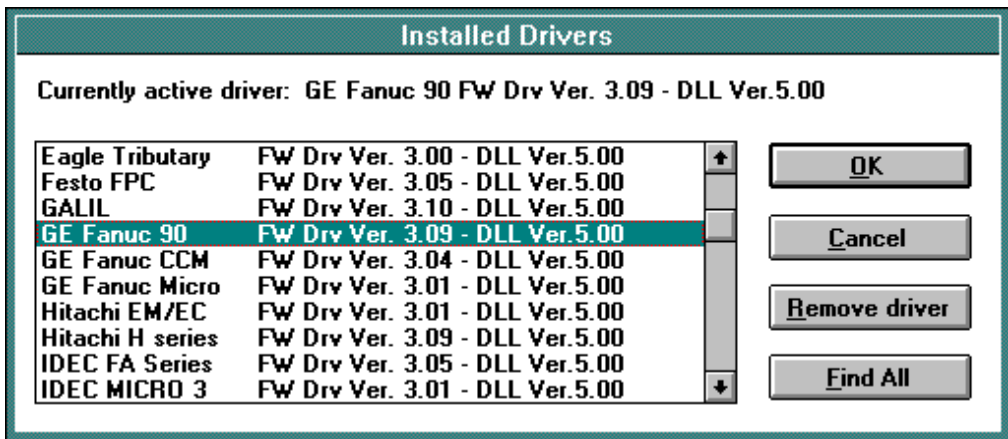


Figure 2-7

2.9 - Panel Setup

By selecting *Panel Setup* from the *Project* menu (or by clicking on the appropriate icon in the *Extra ToolBelt*), the user will be presented with a dialog box that allows them to configure the software for the panel that they are using. This dialog box allows the user to specify the time and date format that the panel will display, whether or not to enable the UniNET network for this panel (note that the UniNET network must first be configured before this option will become available), and if the panel is capable of touchscreen and/or enhanced graphics support.

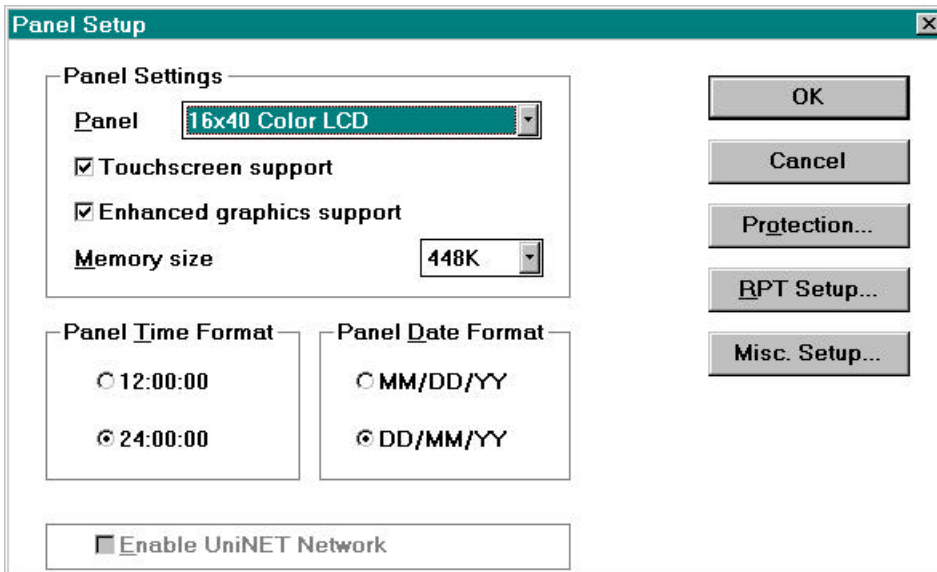


Figure 2-8

To choose a new panel model, click on the down arrow located to the right of the panel description window. A drop-down list will appear that shows the available panels that can be selected. To select a panel, simply single click the left mouse button on its description and click on OK. The page editor workspace will change in order to reflect the available screen area on the selected model.

The panel model may be changed at any time during development. However, be aware that some restrictions apply regarding the screen area. The user can change the display from a small screen size to a larger screen size without affecting the contents of the project. However, changing from a large screen size to a smaller screen size may cause some data fields to be deleted if they are beyond the new screen boundary. If this occurs, the user will be given the chance to cancel the operation before any fields are deleted.

The communication parameters between the panel and the PC can be defined by selecting *Communications* from the *Options* menu. All UniOP panels are capable of communicating with a PC at a speed of at least 9600 baud.

Upload Protection

This feature allows the user to password protect the project file so that unauthorized uploads cannot occur. By selecting *Project – Panel Setup*, and clicking on the *Protection...* button, you are able to specify a case-sensitive password of up to eight characters.



Figure 2-9

Once this password is specified, every time you attempt to upload the project from the panel onto your computer, Designer will ask you to enter the password. If the password that you enter matches the one that was defined in the project file, the upload operation will be performed properly.

Creating a Project File

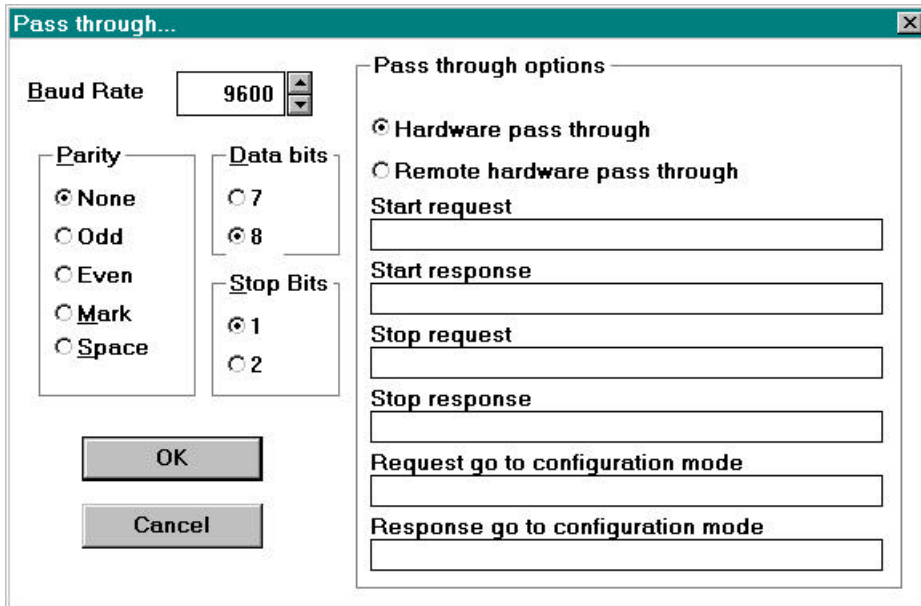
However, if you enter a password that doesn't match the one that was specified in the project file, the panel will not start the upload process.

Note: Your panel must contain firmware version 4.10 or later to use this feature.

Remote Passthrough

This feature will allow you to remotely put a UniOP panel into either Configuration Mode or Operation Mode via a modem. In this manner, you will be able to remotely upload or download a project file, start the panel, or use passthrough mode to access the programming port on the PLC. *Your UniOP must contain firmware version 4.10 or later to use this feature.*

To set up Designer for Remote Passthrough, select *Project – Panel Setup* and click on the *RPT Setup...* button. This will bring up the following dialog box.



The image shows a dialog box titled "Pass through...". It contains several configuration options:

- Baud Rate:** A numeric spinner set to 9600.
- Parity:** Radio buttons for None (selected), Odd, Even, Mark, and Space.
- Data bits:** Radio buttons for 7 and 8 (selected).
- Stop Bits:** Radio buttons for 1 (selected) and 2.
- Pass through options:** Radio buttons for Hardware pass through (selected) and Remote hardware pass through.
- Start request:** A text input field.
- Start response:** A text input field.
- Stop request:** A text input field.
- Stop response:** A text input field.
- Request go to configuration mode:** A text input field.
- Response go to configuration mode:** A text input field.

At the bottom left, there are "OK" and "Cancel" buttons.

Figure 2-10

To configure Designer for remote passthrough via a modem, you need to select *Remote hardware pass through*. If you select *Hardware pass through*, it will not work correctly. *Hardware pass through* needs to be selected *only* if you are wanting to use pass through mode locally and not via a modem.

You can enter the commands that you wish to enter in order to put the panel into Configuration Mode, to start pass through mode and to stop pass through mode in the 'request' boxes. Likewise, you can enter the response that you will receive back from the panel in the 'response' boxes.

The communication parameters that you set up here need to match the communication parameters of your modem. Once you have everything configured, you can use a terminal program to dial up the panel.

The configured dialog box for *Remote hardware passthrough* may look something like what is shown in Figure 2-11.

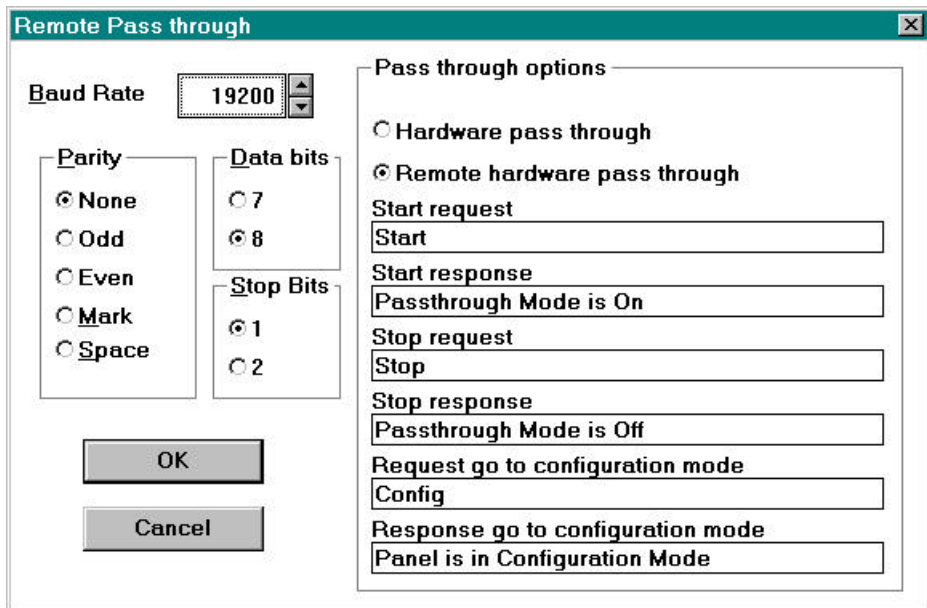


Figure 2-11

Configuration of the Modem Attached to the Local PC

The following commands are necessary for the modem that is attached to the local end (the PC that is running Designer).

```
AT &D0 &K0 &Q0 &W &Y
```

Term	Explanation
&D0	DTR is ignored (according to &Q setting)
&K0	Disable flow control
&Q0	Direct asynchronous operation
&W	Stores setting in profile 0
&Y	Profile 0 is loaded on power up

Configuration of the Modem Attached to UniOP

The following commands are necessary for the modem that is attached to the remote end (the UniOP panel).

```
AT &D0 %C0 &K0 &Q0 S0=1 &W &Y
```

Term	Description
&D0	DTR is ignored
%C0	Disable data compression
&K0	Disable flow control
&Q0	Direct asynchronous operation
S0=1	Auto answer after 1 ring
&W	Stores setting in profile 0
&Y	Profile 0 is loaded on power up

Passthrough Commands from Designer

When remote passthrough has been configured in Panel Setup, a new entry will be available in the Transfers menu of Designer. This new entry is called *Start remote pass-through*. This entry will allow the user to select one of three remote passthrough commands: Go to Configuration Mode, Start Passthrough and Stop Passthrough.

Passthrough Status Control Variable

When passthrough mode has been activated, the UniOP does not communicate with the controller and the dynamic data displayed on the screen may no longer be correct. It may be useful to inform the user that the passthrough option is active. A new control variable has been defined for this purpose. The control variable name is PassThrough Status. This variable can take on two values; zero meaning that passthrough is not active, one meaning that passthrough is active.

Miscellaneous Panel Parameters

The *Misc. Setup* button allows the user to configure several different panel parameters, including:

- Display Selected Page on Communication Error
This is the page the panel will go to when a communication error is reported.
- Timeout for Panel Command Menu Display
When you are in the Panel Command Menu, this is the period of time the panel will wait for a keystroke before returning to normal operation.
- Timeout for Data Entry

Creating a Project File

When you are in the data entry screen, this is the period of time the panel will wait for a keystroke before returning to normal operation.

- **Timeout for Field Selection for Data Entry**
This is the time period the panel will wait for a field selection to be made before returning to normal operation.
- **Screen Saver for LCD Backlight**
This option allows the user to turn off the backlighting on an LCD panel when no keys or touchcells have been pressed for a certain amount of time.
- **Enable Buzzer**
This option allows the user to toggle on and off the touchscreen response enunciator.
- **Disable Battery LED**
This option allows the user to disable the low battery LED (the FAULT LED) on the UniOP. Whenever the battery becomes low, the FAULT LED will begin flashing. This option allows the user to disalbe this in cases which the battery low alarm is not required. This feature requires firmware version 4.20 or greater.

2.10 - Select Font

To choose a new panel font, either click on the down arrow at the right of the font window, select the appropriate icon from the *Extra ToolBelt*, or choose *Select Font* from the *Project* menu. A drop-down list will appear showing the available fonts for the current panel. Click on the font name to be used and press the OK button to confirm the change. Existing text on the current page will change to reflect the new selection. Any future text additions will also appear in the newly selected font. Selecting a new font for an existing project can alter any special characters, message fields, and bargraphs that are contained in the project file.

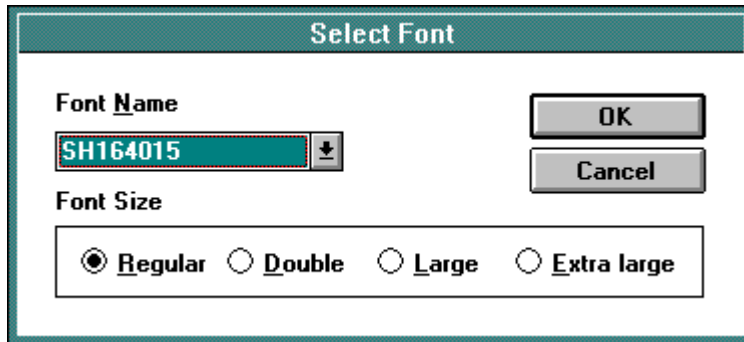


Figure 2-12

The *Font Size* buttons can be used during programming to change the character size of any text or variable field. Regular characters are simply a single character. Double characters are twice the size of a regular character (2x2). Large characters are four times the size of a regular character (4x4). Extra large characters are eight times the size of a regular character (8x8). *Note that the only panels in which it is possible to enlarge the font size are those that are capable of graphics.*

2.11 - Controller Setup

Different models of controllers require different parameters in order to communicate properly with the operator interface panel. Once the controller family (i.e., Allen Bradley, Mitsubishi, etc.) has been selected by choosing *Change Controller Driver* from the *Project* menu, it is necessary to select the controller model. This can be accomplished by selecting *Controller Setup* from the *Project* menu (or by clicking on the appropriate icon in the *Extra ToolBelt*). This will bring up a dialog box that allows the user to select the correct controller model that is being used.

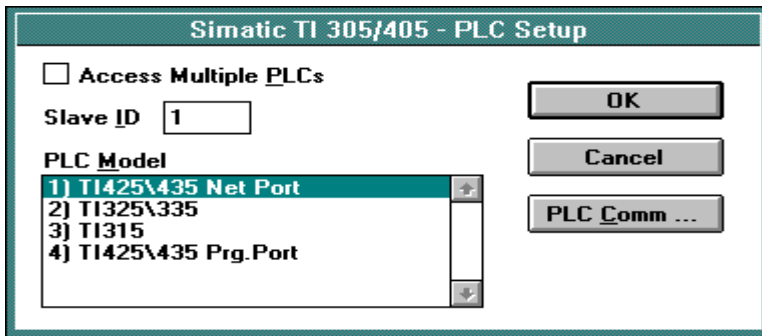


Figure 2-13

The *Access Multiple PLCs* checkbox shown in the above dialog box will allow the panel to exchange data with more than one controller. The user will be asked to enter the slave IDs of the different controllers from which the panel will be accessing data. This option is not available with all controllers.

The communication parameters for any particular controller are set automatically when the selection is made. However, if there is a need to change the default setting, the user may press the *PLC Comm* button in the *PLC Setup* dialog box.

This will bring up the *Communications Parameters Setup* dialog box, which is shown in Figure 2-14.

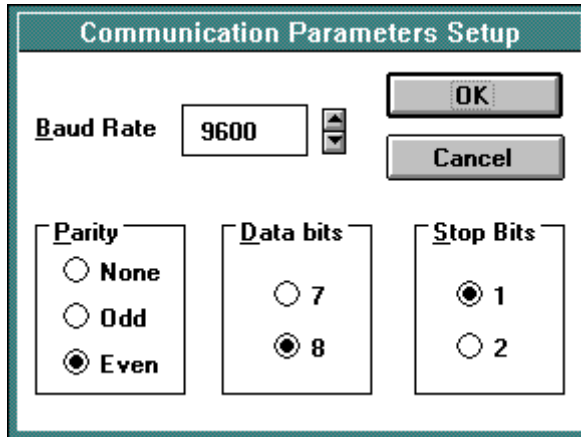


Figure 2-14

Baud Rate

This option specifies the baud rate to be used in communication between the target panel and the controller. The baud rate can be changed by using the selection arrows located to the right of the Baud Rate window.

Parity

Specifies the parity to be used in communication between the target panel and the controller. To select a different parity, click on the appropriate radio button.

Stop Bits

Specifies the number of stop bits to be used in communication between the target panel and the controller. To change the number of stop bits, click on the appropriate radio button.

2.12 - Printing From the Panel

The printing routines from the panel have been greatly enhanced. With the new features, it is now possible to define the printer device driver and the communication parameters, the report format and the timetable on which a report is printed. It is even possible to print a report by configuring a key or touchcell to print a report, or to request a printout by using the Interlock Mailbox. *In order to use these new features, your panel must contain firmware version 4.10 or higher.*

To setup a serial printer, select *Project – Report on Panel Printer - Printer Setup*. This will display the dialog box that is shown in Figure 2-15. From this dialog box, you can choose the printer you will be using and set the communication parameters. If you will be using a printer that is not listed, you can use the *Add...* button to add a new printer to the list of available printers. Doing so will bring up another dialog box in which you can define the parameters for the newly added printer. Similarly, you can use the *Edit...* button to redefine the parameters for an existing printer. It is also possible to define the page size that you will be using.

Note that if the user will be printing reports, the paper height should be defined here before the report is defined. If you change the paper height with some reports already defined, the report layouts that have already been defined will not automatically be rearranged.

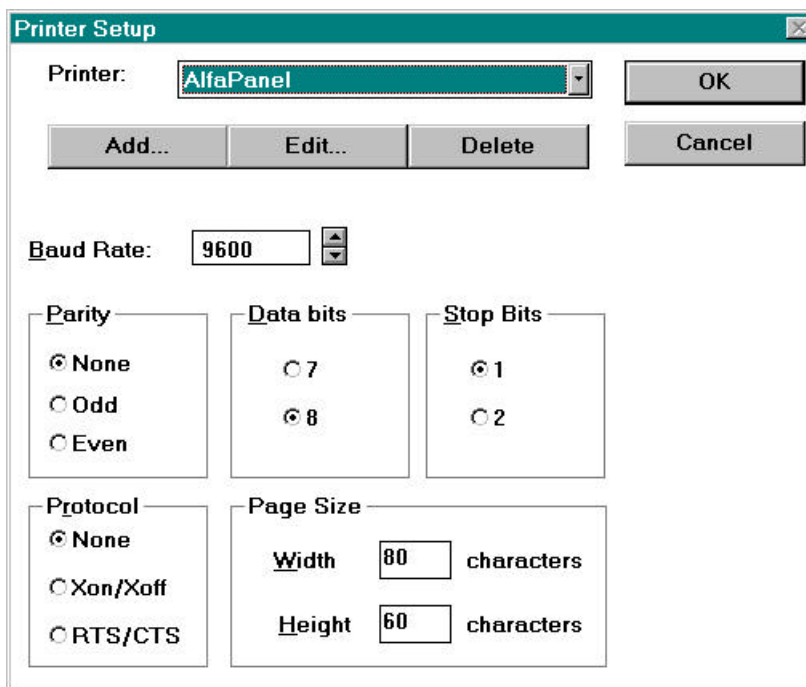


Figure 2-15

Reports

A report is a collection of project file pages (or parts of project file pages). Each report is divided into two parts. One is a common part, such as the header and footer. These will be common to each and every page of the report. The second is the display page that is the body of the report.

To define a report, select *Project – Report on Panel Printer – Reports*. The user can use the dialog box in Figure 13 to configure a basic report. For those users who will be creating more advanced reports, an *Advanced* button and a *Properties...* button are present.

Creating a Project File

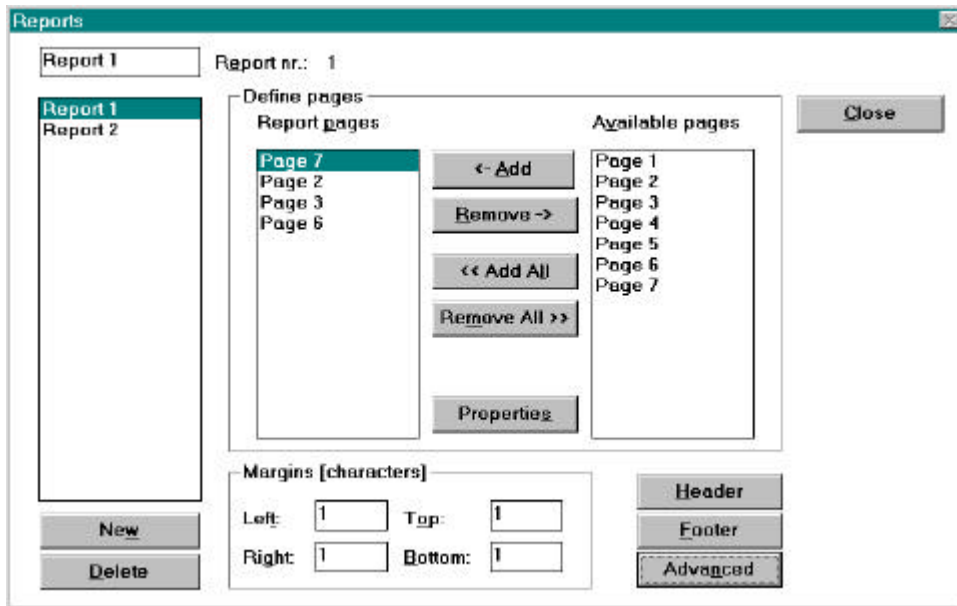


Figure 2-16

You can add a report by selecting the *New* button and giving the report a name. All of the pages of your project file will be shown within the *Available pages* box. To add a page to the current report, select the page from within *Available pages* and click on the *<- Add* button. Doing so will place the page name into the *Report pages* box. To add all of the pages of your project file to a report, select the *<< Add All* button.

Similarly, to remove a page from the current report, select the page name from within the *Report pages* box and click on the *Remove ->* button. To remove all of the pages from the report, click on the *Remove All >>* button. By selecting the page that you are interested in and pressing the *Properties* button, the user is able to specify what part of the project file page to print and where to start printing on the page. The dialog box is shown in Figure 2-17.

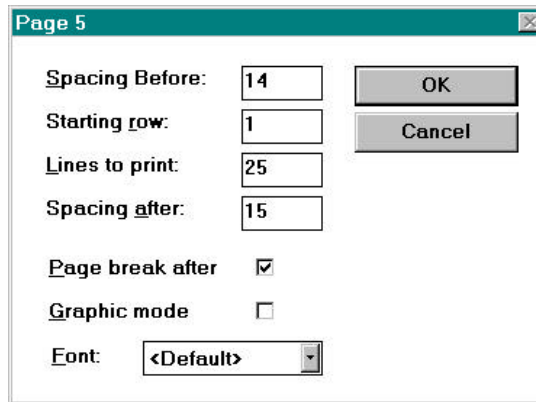


Figure 2-17

By selecting the *Advanced* button, the user is able to select the following parameters, which are common for every page in the report. The dialog box is shown in Figure 2-18.

- Condensed or Enlarged Mode Printing
- Wrapping – If wrapping is selected, if a line is longer than the width of the page, it will be printed on the next line. Otherwise, it will be truncated.
- Packing – If the page width is longer than the display width, it is possible to print two or more rows on a single line.
- Non-printable characters can be printed as blanks, asterisks, or with downloadable fonts. The downloadable options are grayed out if they are not supported by the printer.
- Display attributes can be transformed into another printer attribute, such as normal, underlined, bold or italicized.
- The Page separator is a character that can be optionally defined as a place-holder for empty lines in the printed page.
- The field font specifies the default font to use when the user has not selected a particular font to use in the page definition dialog box (see Figure 2-17).

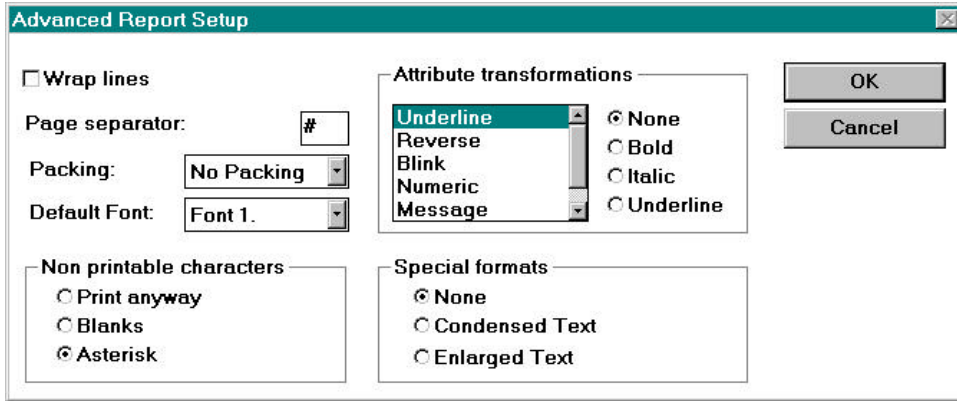


Figure 2-18

Header/Footer Definition

The last two buttons used for configuring a report are the *Header* and *Footer* buttons. The structure of the header and the footer are the same. It is possible to define the height of the header and the footer, and several predefined fields that can be inserted into the header or footer.

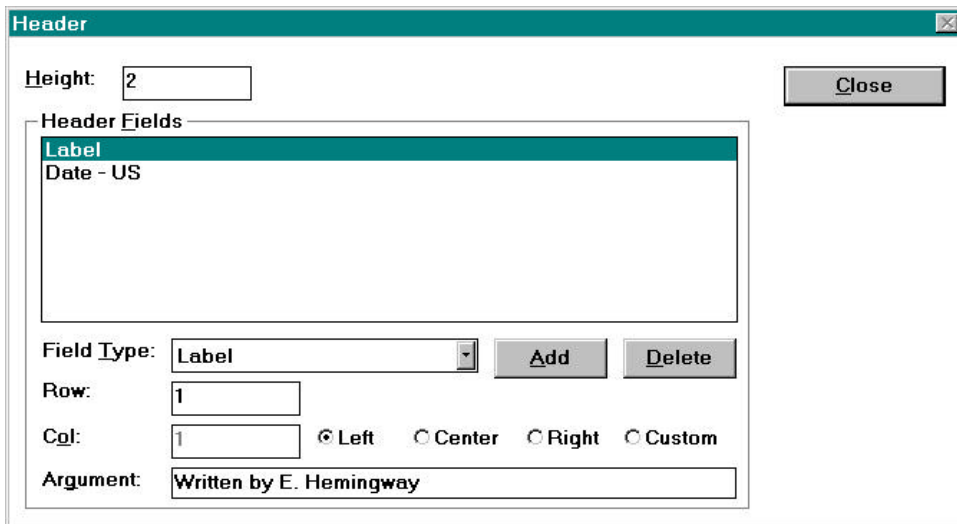


Figure 2-19

Within this dialog box, the user can specify the height of the header/footer, the fields that are inserted into the header/footer, where they are inserted at and how they are positioned. The fields that can be used are the time and date, the page number, the report name and a label (which allows the user to enter static text).

Starting a Report Printout

A report printout can be triggered in three different ways:

- With a macro that is associated to a function key or a touchcell.
- Cyclically at a specified time.
- From a PLC request issued through the Interlock Mailbox.

In the Keyboard Macro Editor, there is a new macro entitled *Print Report*. When this icon is selected, the user will be presented with a dialog box which will allow them to select which report is to be printed when this key (or touchcell) is pressed.

Any report can be printed cyclically in two different modes: any day at a specific time or cyclically after an interval of time. The dialog box shown in Figure 2-20 allows the user to define these characteristics. This dialog box can be chosen by selecting *Project – Report on Panel Printer – Triggers*.

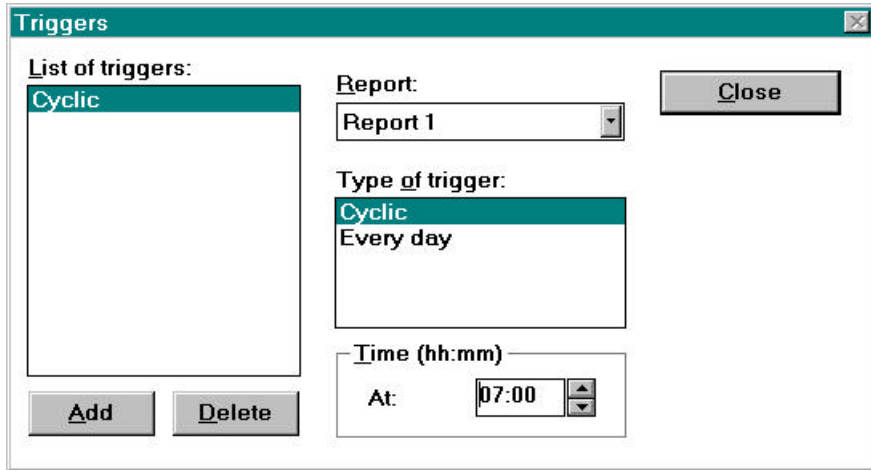


Figure 2-20

The third way to start a report printout is to use the Interlock Mailbox. There are two new Mailbox commands that are introduced for this procedure.

Start Report Printout:

Command Word: 113

Parameter 0: Report Number

Responses: 0 = OK

1 = Error, printer process already active (if START command is issued more than once.

Error, printer process already inactive (if CANCEL command is issued more than once)

2 = Error, illegal report number

3 = Error, activation queue is full

Stop Report Printout:

Command Word: 114

Parameter 0: None required

Responses: 0 = OK

1 = Error, printer process already inactive

Note that it is possible to start the printing of more than one report. Up to 10 printer requests can be stored in a FIFO (first in first out) buffer.

Printer Device Driver Parameters

This section highlights the device driver parameters for the main printer types that are supported in the Designer for Windows programming software. The following four printer types are currently supported:

- ALFAPANEL.PRN – Driver for AlfaPanel printer from Edue Italia
- IBMPRO.PRN – Driver for the IBM Proprinter (dot matrix)
- HPLJ40.PRN & HPLJ80.PRN – Drivers for the HP LaserJet printer; the first one for use with a 40 column operator interface panel and the second one for use with an 80 column operator interface panel.

HP LaserJet III (or HP laser compatible printer)

The escape sequences given in this section have been tested with:

- HP LaserJet III;
- HP LaserJet IV;

The list of escape sequences for text and graphic control is given in table 2-1. The printer control code is 0.

Command	Sequence (decimal codes)
Initial Settings	See note ¹
<ul style="list-style-type: none"> • reset printer • set draft mode • set letter quality mode 	27 69 27 40 115 49 81 27 40 115 50 81
BOLD set	27 40 115 51 66
BOLD clear	27 40 115 48 66
ITALIC set	27 40 115 49 83
ITALIC clear	27 40 115 48 83
UNDERLINE set	27 38 100 49 68
UNDERLINE clear	27 38 100 64
CONDENSED set	27 40 115 50 48 72
CONDENSED clear	27 40 115 49 48 72
ENLARGED set	27 40 115 53 72
ENLARGED clear	27 40 115 49 48 72
Graphic mode	
75 dpi	27 42 48 65 27 42 116 [resolution] ² 82
150 dpi	27 42 114 49 85 27 42 98 [line
300 dpi	length] ³ 87
600 dpi ⁴	[resolution]=55 53
	[resolution]=49 53 48
	[resolution]=51 48 48
	[resolution]=54 48 48
Graphic LF	See note ⁵

Table 2-1

The ratio of the character width in text and graphic mode depends on the resolution of the graphical printout in the following way:

¹ It is possible to use any combination of these escape sequences.

² These bytes specify resolution. It is specified with two or three bytes that represents resolution value in the ASCII format. Allowed values are given bellow.

³ Line length depends on the width of the printed slide and the quality. See the explanation bellow for more information. Line length is specified with the value represented in the ASCII numeric format.

⁴ Allowed on the HP LaserJet V and higher versions.

⁵ In case of HP PCL it is not necessary to insert graphical new line separately, since the sequence that starts new graphical line forces starting at new line.

Resolution (dots per inch)	Ratio
75	1
150	2
300	4
600	8

Table 2-2

The line length depends on the following facts:

- Width of the page that is being printed. When printing pages with a maximum of 40 columns, one line contains a fixed number of 60 bytes. In the case of an 80 column page, one line contains a fixed number of 100 bytes.
- Line length varies with rasterisation quality. When rasterisation quality is normal, line lengths have the values mentioned above. As rasterisation level is increased, line length is doubled for each level, as it is shown in table 2-3.

		WIDTH OF THE SLIDE	
		40	80
RASTERISATION LEVEL	LOW (1)	60	100
	NORMAL (2)	120	200
	HIGH (3)	240	400

Table 2-3

Creating a Project File

IBM Proprinter (or IBM matrix compatible printer)

The escape sequences defined in this section have been tested with:

- Epson LQ-400;

The list of escape sequences for text and graphic control is given in table 2-4.

Command	Sequence (decimal codes)
Initial Settings	27 64 27 77 27 120 0 27 107 2
BOLD set	27 69
BOLD clear	27 70
ITALIC set	27 52
ITALIC clear	27 53
UNDERLINE set	27 71
UNDERLINE clear	27 72
CONDENSED set	27 103
CONDENSED clear	27 77
ENLARGED set	27 80
ENLARGED clear	27 77
Graphic mode	See note ⁶
60 dpi	27 42 0 8 0
90 dpi	27 42 6 8 0
120 dpi	27 42 1 8 0
240 dpi	27 42 3 8 0
Graphic LF	13 27 74 24
Font n	See note ⁷

Table 2-4

⁶ Available printing modes depends on the printer type. Escape sequence given here should work on all 9-pin dot matrix IBM Proprinter compatible devices.

⁷ Available fonts depend on the printer type. A number of older Proprinter compatible devices support only one default font. In this case these escape sequences are obsolete and should be set to zero.

The ratio of the character width in the text and graphic mode depends on the resolution of graphical printout in the following way:

Resolution (dots per inch)	Ratio
60	1
90	3:2
120	4
240	8

Table 2-5

The length of the graphical data block is always set to the value 8, regardless of the display width. In this case, the data block width is specified with the last two bytes in the sequence that starts graphic mode. The length is specified with the equation $a + 256 * b$, where a is the 4th byte in the sequence and b is 5th number in the sequence. Both numbers are integers in the range of 0 to 255. The structure of the sequence can be different in the case of different Proprinter compatible printers.

AlfaPanel Printer

The escape sequences described in this section have been tested with:

- AlfaPanel 2;

The list of escape sequences for text and graphic control is given in table 2-6. The printer control code is 2, and the ratio of the character width in the text and graphic mode should be set to 1.

Command	Sequence (decimal codes)
Initial Settings	
• normal writing	27 78
• upside down writing	27 82
ENLARGED set	03
ENLARGED clear	00
Graphic Mode	17
Graphic LF	13

Table 2-6

2.13 - Memory Used by the Project File

The user can determine how much memory is used by the current project file by selecting *Memory Use* from the *Project* menu. A dialog box (shown below in Figure 2-21) will appear that contains information on the amount of memory that is used by the project file, how many bytes of Recipe data are contained within the project file and the amount of memory used by the graphic information (bitmaps and touchcells) in the project file.

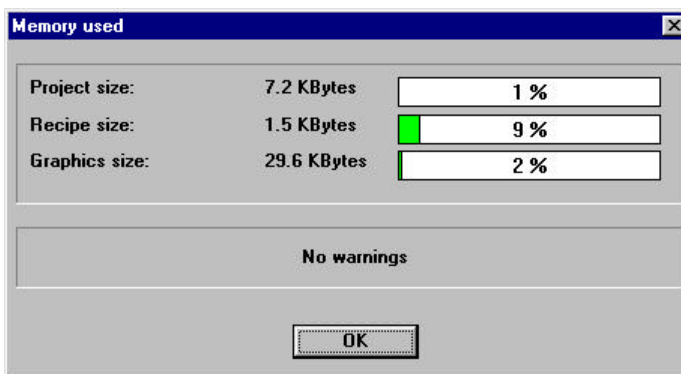


Figure 2-21

Chapter 3 - Controller References

Controller references are those data items that the Designer software uses to display information from the controller. These data items come in the form of numeric fields (which can be displayed in numeric format or in ASCII format), bargraphs, message fields, and attributes. Each of these are discussed in detail below and on the following pages.

3.1 - Numeric Fields

1. There are four different ways to create a numeric field. One way is to position the cursor at the desired location and click on the *Controller Data* icon in the *Extra ToolBelt*. Then, either double click the left mouse button or single click the right mouse button on the location where you want the field. Another way is to position the cursor on the desired location and select *Data Field Type - Numeric/ASCII* from the *Edit* menu. The third and perhaps simplest way to create a numeric field is to simply position the cursor on the desired location and click on the *Numeric Field* icon in the *ToolBelt*. Finally, you may click and drag an area in which the field is to be located, then click on the *Numeric Field* icon in the *ToolBelt*. This method will automatically set the height and width of the field.
2. Once the numeric field is created using one of the four methods described above, a dialog box (shown in Figure 3-1) will appear.

Demo Controller Define Field ver. 3.05

PLC Reference

Data Type: Data Block DB: 10 Offset: 0 Address: DB10 DW0

Data Format: WORD(Bin) Left/Right Byte: L R

Low Priority High Priority

Display Format: NUMERIC

Numeric Base: Decimal Hexadecimal

Data Access: Read Only Read/Write

Field Dimensions: Field Width: 4 (Max. 25) Field Height: 1 (Max. 1)

Scaling: Y = 1 / 1 X + 0

Fixed point Placement: 0

Min. value: -32767 Max. value: 32767

Buttons: OK, Cancel, Delete, Help

Figure 3-1

3. The upper portion of the dialog box is the *PLC Reference* section. This area is dependent upon the type of controller selected. The data type, data format, and address reference are all configured in this area.
4. The lower portion of this dialog box is not controller specific. This area is used to direct the panel in the manner to display the data. The following items can be configured:

- Display format
- Data access (read only, read/write field)
- Data scaling
- Numeric base
- Field dimensions
- Min. & max. values (read/write field only)

3.2 - Bargraphs

1. There are four different ways in which a user can create a bargraph field. One method is to first click and drag the mouse to select the size and location of the bargraph, followed by selecting the *Bargraph Field* icon located in the *ToolBelt*. Another way is to position the cursor at the location in which the bargraph is to begin and select the *Bargraph Field* icon from the *ToolBelt*. A third method of creating a bargraph is to position the cursor at the location in which the field is to begin and select *Data Field Type - Bargraph* from the *Edit* menu. A final method is to click and drag the mouse to select the size and location of the bargraph and then select *Data Field Type - Bargraph* from the *Edit* menu. Regardless of the method, the define field dialog box will automatically appear, allowing the user to select an address in which to dynamically fix the bargraph.
2. Once the field is created using one of the above methods, a dialog box will appear that is very similar to the one that appears when a numeric field is created. The address that was chosen in the *PLC Reference* section will be dynamically linked to the bargraph. In other words, the value of the register will correspond to the fill level of the bargraph. The maximum value of the field is represented when the bargraph is full. Likewise, the minimum value is represented when the bargraph is empty.
3. Figure 3-2 represents a bargraph with a field width of 20, a field height of 3, a minimum value of 0, and a maximum value of 100. The minimum value is the point at which the bargraph is empty. Likewise, the maximum value is the point at which the bargraph is full.

Controller References

The border around the bargraph can be drawn by highlighting the area around the bargraph field and then selecting *Rectangles & Symbols* from the *Edit* menu. Doing so will bring up a dialog box that contains two different borders that can be placed around the bargraph. The Designer software considers this border as a graphic. Therefore, this feature can only be accessed on a graphics capable panel.

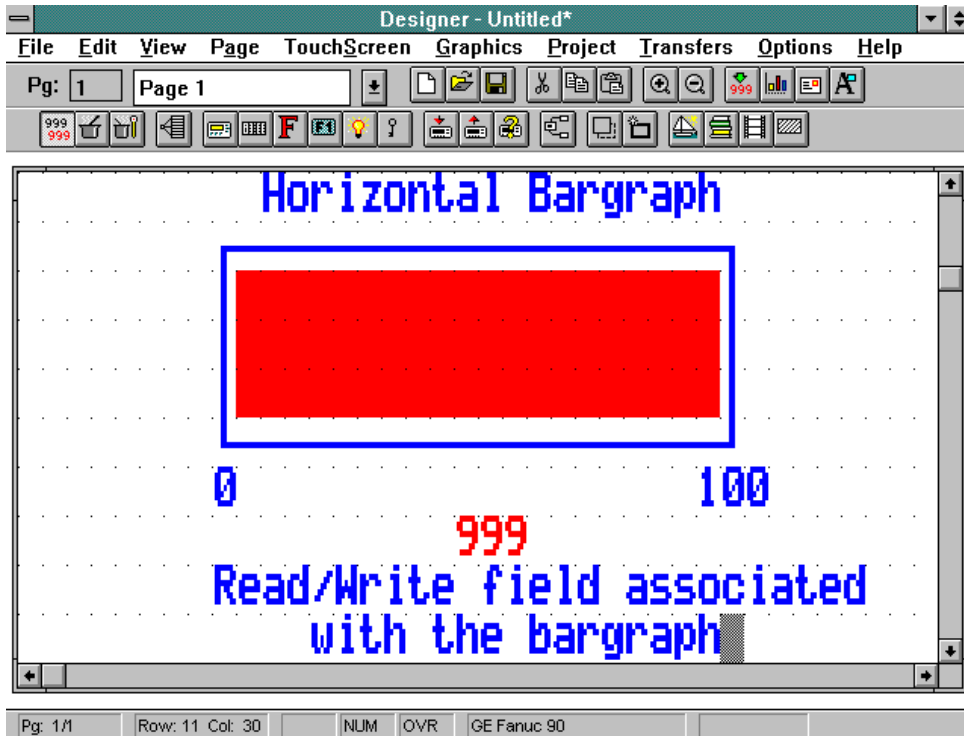


Figure 3-2

3.3 - Message Fields

Message fields can be used instead of numerical values to inform the user that an event is occurring. For example, assume the message ‘Voltage too high’ is attached to the value 32. Whenever the value of the register in the controller reaches 32, the message will be displayed. In this manner, a text message is displayed on the panel, which is often more beneficial and meaningful to the operator than displaying a numerical value.

Note: The maximum number of messages that can be displayed is 1024.

1. Message fields can be created in one of two ways. One method is to first click and drag the mouse to highlight the area in which the message field is to be placed and then select the *Text Message Field* icon from the *ToolBelt*. The other possible way to create a message field is to place the cursor at the desired screen location and select *Data Field Type - Message* from the *Edit* menu.
2. Once the message field is created using one of the methods described above, a dialog box will appear that is very similar to those that appear when creating numeric fields and bargraph fields. *The number of messages to be displayed is set by the values for the minimum and maximum values.* For example, if the message is fixed to a bit, the field will have a maximum of two messages. *The width of the field is equivalent to the maximum number of characters the message field can contain.* Once the parameters are configured, click on the *Edit Message* button to begin entering messages for the different data values.
3. Select the message you wish to edit by clicking the left mouse button on the desired value and begin typing the message. The dialog box in which the messages will be entered is shown in Figure 3-3.

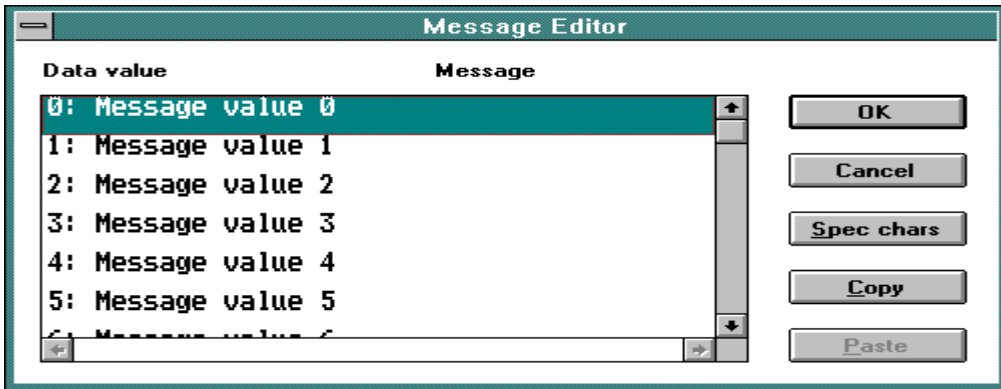


Figure 3-3

- Special characters may be added to the message by clicking on the *Spec chars* button. This will bring up a dialog box (shown below in Figure 3-4) in which the user can select the character(s) to be used by double clicking on them or by single clicking on them and pressing *Select*. After confirming the operation, the characters will appear in the last position the cursor was in before entering the special characters dialog box.

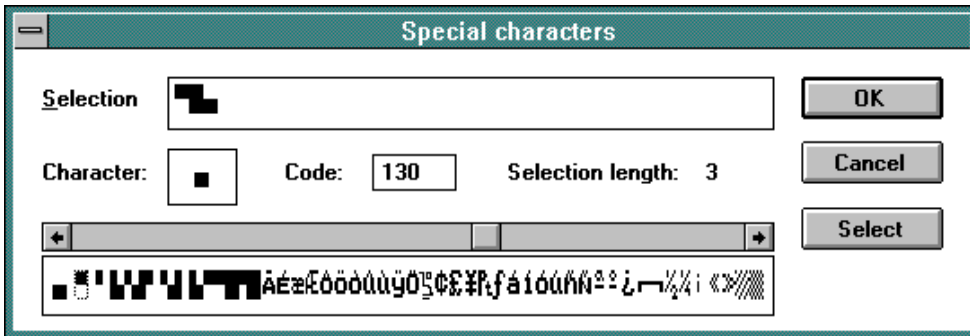


Figure 3-4

The familiar Windows™ features cut, copy, and paste are also available for use in editing messages. If you have several messages that are similar, you can use the *Copy* and *Paste* features to copy messages and then make any necessary changes.

Simply select which messages to copy by highlighting them. If you want to copy several messages that are in successive order, click on the first one and drag the mouse down until the last one is highlighted and release the mouse button. If you have several messages to copy that are not in successive order, hold down the *Ctrl* key, click on each of the messages that you want to copy, and release the *Ctrl* key. All of these methods will select the text to be copied.

Now, click on the *Copy* icon to copy the messages into Windows' Clipboard. Highlight the message number where you want to paste the first message and click on *Paste* to copy the messages into their new locations. You can also use a Windows based text editor, such as Notepad, to create a list of messages. To do this, place each message on a separate line. Use the *Copy* function of the editor to copy the text to the Clipboard and then use the *Paste* feature to copy the messages into their new locations.

3.4 - Attributes

Attributes allow the user to make an area of the screen stand out by highlighting the area, reversing the area, or blinking the area. A description of how to use and create attributes follows.

1. Attribute fields can be created by clicking and dragging the mouse to select the area in which the attribute is to be displayed.
2. Either select *Data Field Type - Attribute* from the *Edit* menu or click on the appropriate icon in the *ToolBelt*. Doing so will bring up a dialog box in which the user can choose between using static attributes and dynamic attributes. This dialog box is shown in Figure 3-5.

The dialog box is titled "Allen-Bradley - ver. 3.07". It contains several sections for configuring a PLC reference:

- PLC Reference:** A table with columns: File Type (Integer), File Num (7), Element (0), Sub Elem (0), Logical Address (N7:0\0), Data Format (BIT), Bit Number (0), and PLC Node (empty). Below this are radio buttons for Low Priority (selected) and High Priority.
- Display Format:** A dropdown menu set to "ATTRIBUTE".
- Numeric Base:** Radio buttons for Decimal (selected) and Hexadecimal.
- Data Access:** Radio buttons for Read Only (selected) and Read/Write.
- Field Dimensions:** Field Width (21, Max. 30) and Field Height (3, Max. 15).
- Attribute Type:** Radio buttons for Static and Dynamic (selected).
- Screen Attribute:** Checkboxes for Blink, Reverse, and Highlight, all of which are currently unchecked.

On the right side of the dialog, there are five buttons: OK, Cancel, Delete, and Help.

Figure 3-5

3. If *static* is selected, any combination of the *blink*, *reverse*, and *highlight* attributes may be used.
4. If *dynamic* is selected, the screen attribute will be fixed to a value of a word or bit in the controller. The address of the controller's memory location can be entered in the upper portion of the dialog box as was previously done with the other data fields.

A Note on Dynamic Attributes:

- If the attribute is referenced to a *word*, the attribute will be dependent upon the *three least significant bits* in the controller's memory location.

Decimal Value	Bit 2	Bit 1	Bit 0	Attribute
0	0	0	0	Normal
1	0	0	1	Blinking
2	0	1	0	Highlight
4	1	0	0	Reverse

- If the attribute is referenced to a *bit*, there will be *no attribute* displayed when the bit has the value of *0*. The *blink attribute* will be displayed whenever the bit has a value of *1*.

Keep in mind that not all attributes are supported on every panel.

Color Attributes

All UniOP color panels support a new type of dynamic attribute field that will allow the user to dynamically control the color of an area on the display. The color attributes have been introduced as an extension to the existing monochrome dynamic attributes (blink, reverse and highlight).

The word in the controller memory referenced by the dynamic attribute will be interpreted as shown in the table below.

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	F0-F3				B0-B3								C	M0-M2		
	Foreground color				Background color								Monochrome attribute			

Controller References

C is the bit that enables the color attribute mode:

c	Color attributes
0	Disabled
1	Enabled

The Color attributes are interpreted according to the table below.

Bit				Numeric value	Color
3	2	1	0		
0	0	0	0	0	Black
0	0	0	1	1	Dark Red
0	0	1	0	2	Dark Green
0	0	1	1	3	Dark Yellow
0	1	0	0	4	Dark Blue
0	1	0	1	5	Dark Magenta
0	1	1	0	6	Dark Cyan
0	1	1	1	7	Dark Gray
1	0	0	0	8	Light Gray
1	0	0	1	9	Red
1	0	1	0	10	Green
1	0	1	1	11	Yellow
1	1	0	0	12	Blue
1	1	0	1	13	Magenta
1	1	1	0	14	Cyan
1	1	1	1	15	White

Note that the Foreground color and the Background color can be independently controlled. UniOP firmware 4.20 or later is required to support dynamic color attributes.

3.5 - Scaling

Our software is capable of scaling data being sent to or being displayed from the controller. Scaling can be done to a field from within the define field dialog box (see Figure 3-6).

Another feature that parallels with scaling is the ability to use fixed point numbers. This allows the user to display decimal values on the panel. Simply select the *Fixed Point* radio button and enter the number of decimal places to be displayed in the *Placement* box (see Figure 3-6). *Keep in mind that the decimal point will take up one position in the field (i.e., a field with a width of four and a placement of 1 can display at most the number 99.9).*

The Scaling Equation

The scaling equation is defined as:

$$Y = (A / B) * X + C$$

Where,

Y = Scaled value displayed

X = Controller data value

A,B,C = Scaling operators - these are the three entry boxes located within the scaling equation

The image shows a dialog box titled "Scaling". Inside the box, the equation $Y = 1 / 1 * X + 0$ is displayed, with the numbers 1, 1, and 0 each in its own input box. Below the equation, there is a radio button labeled "Fixed point" which is selected, and a "Placement" label followed by an input box containing the number 2.

Figure 3-6

Controller References

There are two important concepts to understand about scaling. *First and foremost, the scaling operators (A, B, and C) are 16 bit integers. Internal calculations are done using 32 bit arithmetic, which **allows the panel to report a more precise result than if it were using only 16 bit arithmetic.***

*Secondly, **the maximum and minimum fields refer to the scaled value, not the value that is in the controller.***

Two examples of using scaling follow. The first is an example in which a user has a Celsius temperature in the controller and wishes to display a Fahrenheit temperature on the UniOP panel. The second is an example in which a user has a controller memory location that can range in value from 0 to 4095. Depending upon the value in the controller, the user wishes to display that value as a percentage of the maximum possible value on the panel.

Example 1

Assume a user has a controller that is displaying the temperature of a motor in Celsius. The person operating the Exor UniOP panel is only familiar with temperatures in the Fahrenheit scale. By using scaling, the user is capable of having the Celsius temperature from the controller appear as a Fahrenheit temperature on the display panel.

1. Create a numeric field and reference it to the address in the controller that is reporting the temperature. For this example, assume the address is DM155. Once the numeric field is created, the define field dialog box will appear.
2. We know that to convert a value from Celsius to Fahrenheit, we need to multiply the Celsius temperature by 9/5 and add 32 to the result.
3. Consider the scaling equation again : $Y = (A/B) * X + C$. Since X is the

- Celsius temperature in the controller, this is the value we want to multiply by 9/5. To implement this, we would need to set A equal to 9 and B equal to 5.
- Adding 32 to this value can be accomplished by setting C equal to 32.
 - Clicking on OK will confirm this operation. The value displayed on the panel will be in Fahrenheit, while the controller data will be in Celsius. The dialog box should look similar to the one shown in Figure 3-7.

Keyence KV Define Field ver. 3.01

PLC Reference

Data Type: Data Memory | Address Offset: 155 | Address Reference: DM155

Data Format: WORD(Bin)

Low Priority High Priority

Display Format: NUMERIC

Numeric Base: Decimal Hexadecimal

Data Access: Read Only Read/Write

Field Dimensions: Field Width: 4 (Max. 64) | Field Height: 1 (Max. 1)

Scaling: Y = 9 / 5 × + 32

Fixed point | Placement: 0

Min. value: 0 | Max. value: 65538

Buttons: OK, Cancel, Delete, Help

Figure 3-7

Example 2

Assume a user has a controller memory location whose numeric value can range from 0 to 4095. The user wants to display the actual value in the controller as a percentage of the maximum value.

1. Create a numeric field and reference it to the address in the controller that is reporting the value. For this example, assume the address is V2040. Once the numeric field is created, the define field dialog box will appear.
2. Since the user wishes to display the actual value in the controller as a percentage of the maximum value, we need to use scaling. If the actual value in the controller is 0, then the panel should display a 0. If the actual value in the controller is 4095, the panel should display a 100.
3. This can be accomplished by using the following method. Simply divide the value in the controller by the maximum possible value and multiply this result by 100 to turn it into a percentage. To do this we need to set A=100, B=4095, and C=0. The dialog box should be similar to the one shown in Figure 3-8.

PLC Direct Koyo Define Field ver. 3.04

PLC Reference

Data Type User Area 1	Address Offset 2040	Address Reference V2040
Data Format WORD(Bin)		PLC Slave ID

Low Priority High Priority

Display Format
NUMERIC

Numeric Base
 Decimal
 Hexadecimal

Data Access
 Read Only
 Read/Write

Field Dimensions

Field Width	3	Max. 28
Field Height	1	Max. 1

Scaling

Y = 100 / 4095 × + 0

Fixed point Placement 0

Min. value	Max. value
0	100

Figure 3-8

3.6 - Indexed Addressing

Indexed addressing mode allows the user to reference many controller memory locations from a single numeric field. This enables the user to monitor the values of many memory locations while using only one field. This feature can be accessed by either clicking on the appropriate icon in the *Extra ToolBelt* or by selecting *Indexed Addressing Mode* from the *Edit* menu. An example of using indexed addressing is given below.

Example

For this example, assume a user has a plant in which industrial equipment is washed. There are three stages comprising the wash process. The user wants to be able to monitor the water temperature, the water pressure, the amount of time the equipment was in a particular stage, and the stage the process is in; all without pressing a key on the panel. The controller memory locations and their contents for this example are as follows:

*DB10 DW0 - Temperature in Stage 1 (ranges between 0 and 9999)
DB10 DW1 - Temperature in Stage 2 (ranges between 0 and 9999)
DB10 DW2 - Temperature in Stage 3 (ranges between 0 and 9999)
DB10 DW3 - Pressure in Stage 1 (ranges between 0 and 9999)
DB10 DW4 - Pressure in Stage 2 (ranges between 0 and 9999)
DB10 DW5 - Pressure in Stage 3 (ranges between 0 and 9999)
DB10 DW6 - Time in Stage 1 (ranges between 0 and 9999)
DB10 DW7 - Time in Stage 2 (ranges between 0 and 9999)
DB10 DW8 - Time in Stage 3 (ranges between 0 and 9999)
DB10 DW9 - The stage the process is currently in (ranges between 1 and 3)*

The numeric values are written into the controller by the machine and are changing constantly. Note that the memory locations are controller specific; those listed above are done so only to be able to more easily explain the procedure of using indexed addressing.

This example can be broken down into four basic steps:

1. Creating the 'Temperature' indexed addressing field,
2. Creating the 'Pressure' indexed addressing field,
3. Creating the 'Time' indexed addressing field, and
4. Creating the 'Stage' numeric field.

These fields are all related in that the values that are displayed within them are dependent upon the stage of the process. The indexed fields will be addressed in a manner so that whenever the field number is written into the 'Stage' numeric field location (DB10 DW9), the corresponding information will be displayed in each of the indexed fields. For example, when a value of 2 is written into DB10 DW9, each of the indexed fields will display the corresponding data: the temperature in stage 2, the pressure in stage 2, and the amount of time spent in stage 2.

Creating the Temperature Indexed Field

1. Either select *Indexed Addressing Mode* from the *Edit* menu or click on the appropriate icon in the *Extra ToolBelt*.
2. The addressing mode has been set to indexed. Now create a field on the screen where the temperature information for the process will be displayed. This can be done in the same manner as when creating a numeric field.
3. This will bring up a define field dialog box. The top portion of this dialog box is controller specific. The address we are using is DB10 DW9 and can be entered in this area of the dialog box. Since the values written into this memory location will be between 1 and 3, we can enter these as the minimum value and maximum value, respectively. This field needs to be a read only field, because we have the controller set up so that it will write the numeric value of the current state (either a 1, 2, or 3) into this location. A screen capture of this dialog box is shown in Figure 3-9.

Demo Controller Define Field ver. 3.05 - Index

PLC Reference

Data Type: Data Block DB: 10 Offset: 9 Address: DB10 DW9

Data Format: WORD(Bin) Left/Right Byte: L R

Low Priority High Priority

Display Format: NUMERIC

Numeric Base: Decimal Hexadecimal

Data Access: Read Only Read/Write

Field Dimensions: Field Width: 4 (Max. 73) Field Height: 1 (Max. 1)

Scaling: Y = 1 / 1 x + 0

Fixed point Placement: 0

Min. value: 1 Max. value: 3

Buttons: OK, Cancel, Delete, Help, Indexed ...

Figure 3-9

- Clicking on the *Indexed* button will bring up a dialog box that allows the user to specify which memory location's contents will be displayed when a particular value is written into DB10 DW9. For example, whenever a value of 1 gets written into DB10 DW9, we want the temperature for stage 1 to be displayed. Likewise for the values 2 and 3. To specify the address, simply click on the value you wish to link to an address and click on the *Reference* button. This will bring up a dialog box (see Figure 3-10) in which you can specify the address. Since we want a value of 1 to display the temperature in state 1 (whose value is located in DB10 DW0), the value of 1 gets referenced to DB10 DW0. This is done in a similar fashion with similar reasoning for DB10 DW1 and DB10 DW2.

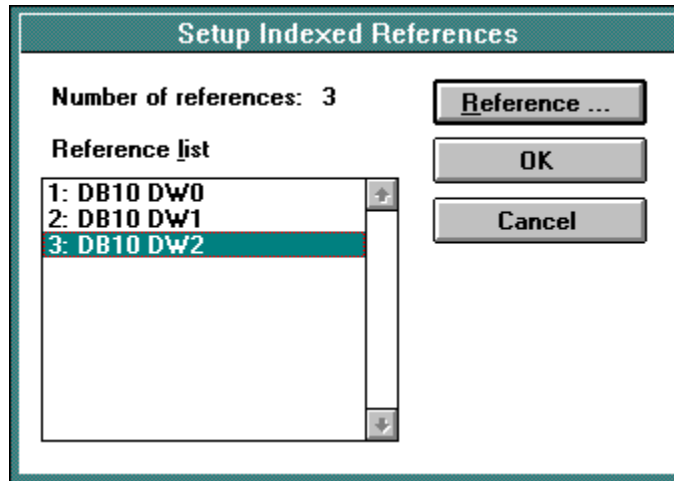


Figure 3-10

Creating the Pressure Indexed Field and the Time Indexed Field

1. Repeat steps 1 through 3 exactly as stated underneath *Creating the Temperature Field*.
2. Repeat step 4 as stated underneath *Creating the Temperature Field*, with the following exceptions:
 - When creating the *pressure indexed field*, the value of 1 should be referenced to DB10 DW3. Likewise, the value of 2 should be referenced to DB10 DW4, and the value of 3 should be referenced to DB10 DW5. A configured dialog box is shown in Figure 3-11.

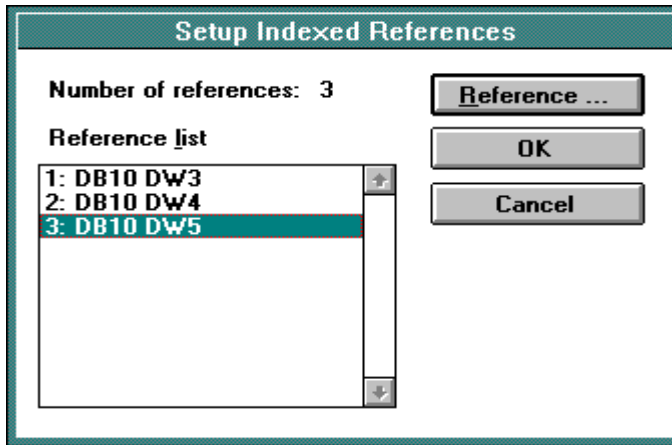


Figure 3-11

- When creating the *time indexed field*, the value of 1 should be referenced to DB10 DW6. Likewise, the value of 2 should be referenced to DB10 DW7, and the value of 3 should be referenced to DB10 DW8. A configured dialog box is shown in Figure 3-12

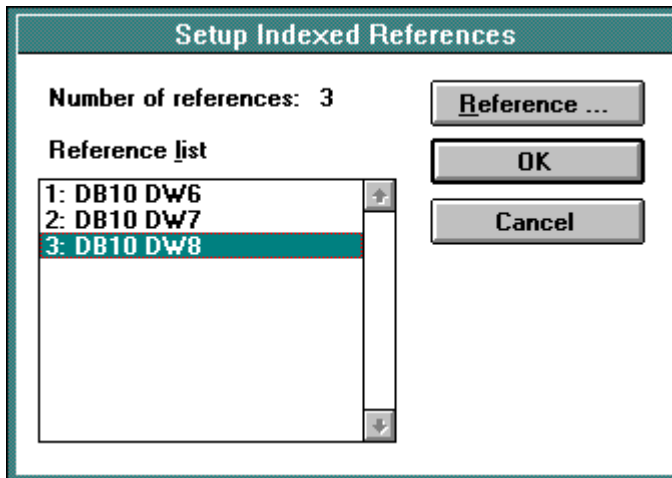


Figure 3-12

Creating the Stage Numeric Field

1. Since we want to create a numeric field, we need to turn off the indexed addressing mode. This can be done by either selecting *Indexed Addressing Mode* from the *Edit* menu or by clicking on the proper icon in the *Extra ToolBelt*.
2. Now simply create a numeric field and address it to DB10 DW9. The dialog box of this is shown in Figure 3-13. Note that since this field is only going to be displaying a single digit, the field width has been reduced to 1.

The screenshot shows a dialog box titled "Demo Controller Define Field ver. 3.05". It contains the following fields and options:

- PLC Reference:** Data Type: Data Block; DB: 10; Offset: 9; Address: DB10 DW9.
- Data Format:** Data Format: WORD(Bin); Left/Right Byte: L (selected), R.
- Priority:** Low Priority (selected), High Priority.
- Display Format:** Display Format: NUMERIC; Numeric Base: Decimal (selected), Hexadecimal.
- Field Dimensions:** Field Width: 1 (Max. 74); Field Height: 1 (Max. 1).
- Scaling:** Y = 1 / 1 x + 0; Fixed point Placement: 0.
- Data Access:** Read Only (selected), Read/Write.
- Buttons:** OK, Cancel, Delete, Help.

Figure 3-13

Note that if it were desirable for the user to be able to edit the stage of the process, that numeric field could have been created as a read/write field instead of a read only field.

Controller References

The Finished Project

A dialog box representing what the finished setup may look like is shown in Figure 3-14.

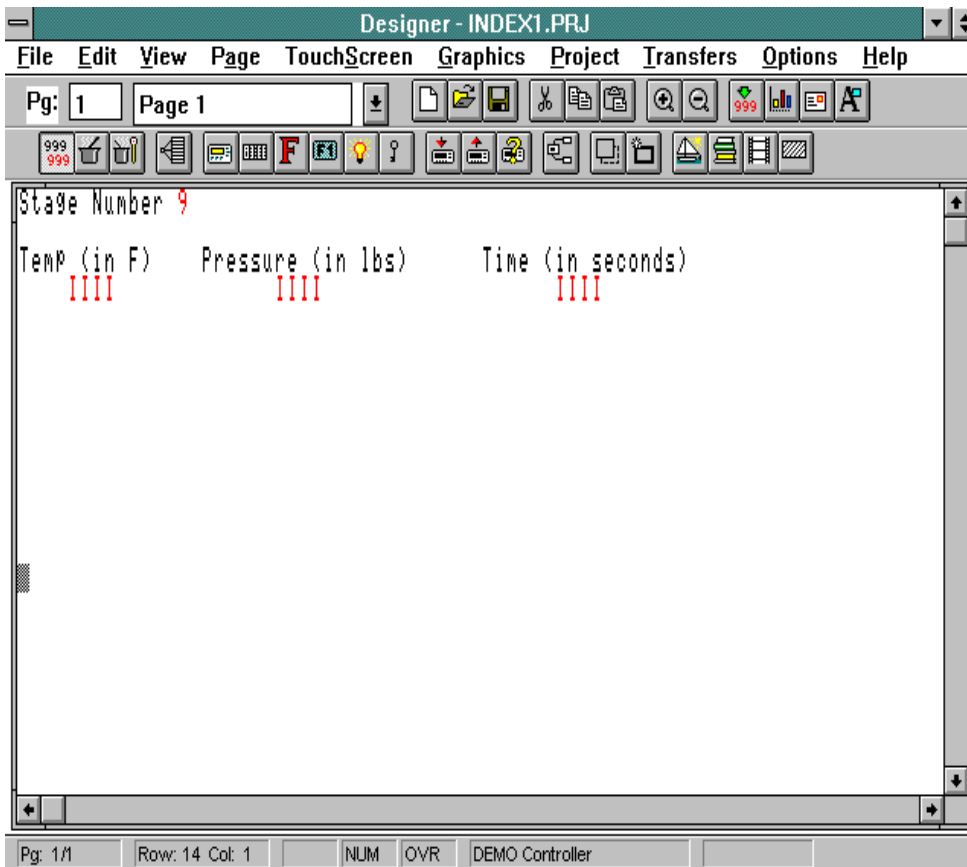


Figure 3-14

Chapter 4 - The Keyboard Macro Editor

4.1 - Introduction

The *Keyboard Macro Editor* is a feature in our *Designer for WindowsTM* software package that allows the user to associate certain functions with keys or touchcells on a UniOP panel. This feature may be accessed by either selecting *Keyboard Macro Editor* from the *Project* menu or clicking on the appropriate icon in the *Extra ToolBelt*. The Keyboard Macro Editor dialog box is shown in Figure 4-1.

Each of the available functions are called *elementary macro commands*. They can be accessed by clicking on the proper icon in the *Commands* toolbar from within the Keyboard Macro Editor. Advanced commands, called *complex macro commands*, are composed of two or more elementary macro commands. For example, *Go to page 2* is an elementary macro command. *Select field 5, Begin data entry* is a complex macro command composed of two elementary commands. Complex macro commands function by executing each of the elementary macro commands in the sequence in which they were entered.

4.2 - Keyboard Macro Editor Dialog Box

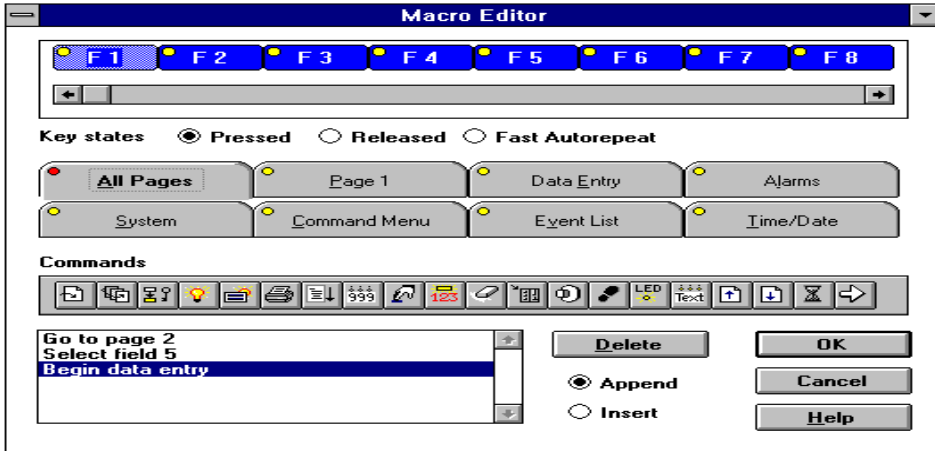


Figure 4-1

At the top of the Keyboard Macro Editor dialog box is a scrollable toolbar of panel keys that are available for programming. Use the arrow keys located beneath the toolbar to maneuver through the panel keys. *Note that not all keys are available on every panel.* A key is selected by single clicking on it with the left mouse button. The selected key will be displayed in a lighter color than the other keys.

Below the toolbar of panel keys are the *Key states* radio buttons. The state can be selected by simply clicking on the proper radio button. The user can program a key to be active whenever it is *pressed*, *released*, or held down. The latter method is referred to as *fast autorepeat* and is useful when dramatically changing the value of a register. For example, suppose the user has programmed the F1 key to step a register up by a value of 1. If the user wants to change the value in the register from 20 to 200, they would have to press the F1 key 180 times if it were programmed in the pressed state. However, by programming the key in the fast

autorepeat key state, the user can press and hold the key until it reaches the value of 200.

Underneath the *Key states* radio buttons are the *index tabs*. Each index tab represents an operating mode of the UniOP panel. The operating mode that is selected is indicated by the index tab being displayed in the foreground with respect to the other tabs. The small circle located in the upper left-hand corner of each index tab is a program indicator. If the circle is red, this indicates that a key is programmed in that particular operating mode. Similarly, if the circle is yellow, there are no keys programmed in that particular operating mode.

Located beneath the index tabs is the *Commands* toolbar. Each elementary macro command is represented by an icon in this toolbar. If there is not enough room to display all of the icons, left and right arrow keys will be present at the ends of the toolbar, allowing the user to access all of the elementary macro commands available for a particular mode of operation. Once a command is selected, it will be displayed in the list box at the bottom left side of the dialog box. Commands can be inserted, appended, and deleted by using the buttons located to the right of the list box.

4.3 - Quick Start Example

This example describes the steps necessary to create a simple macro.

1. Place the panel into *Configuration Mode*.
2. Connect the panel to the personal computer using either a CA1 or a CA2 cable.
3. Start the *Designer for Windows™* software package. Make sure that the project file is set up to work with the panel you are using. This can be accomplished by selecting *Get Panel Resources* from the *Transfers* menu and choosing *OK*.
4. Activate the *Keyboard Macro Editor* by either selecting the proper icon in the *Extra ToolBelt* or by selecting *Keyboard Macro Editor* from the *Project* menu.

The Keyboard Macro Editor

5. The *Macro Editor* dialog box will be displayed. Click on the key you wish to assign a macro to and click on *Pressed* beside of *Key states*. Click on the *All Pages* index tab. The macro is now set up to function whenever the key is pressed on any page of the project.
6. Click on the leftmost icon in the *Commands* toolbar. This icon represents the elementary macro command *Go to page*.
7. Another dialog box will pop up, allowing the user to enter the page number that the panel is supposed to go to whenever the key is pressed. In this case, we are going to have the panel go to page 2 whenever the key is pressed. Therefore, enter a 2 in this box and click on *OK*.
8. The list box located at the bottom left hand side of the *Macro Editor* dialog box will list the defined macro. Press *OK* to confirm the command. This will return the user to the page editor workspace.
9. Type the text 'Page 1' in the topmost row of the current page.
10. Press the *F7* key to create another page. Press the *Page Down* button on the keyboard to move to this page. Type the text 'Page 2' in the topmost row of this page.
11. Select *Download* from the *Transfers* menu. The project file will be downloaded to the panel.
12. When the download is completed, the panel will go into *Operation Mode* and display the text 'Page 1' that was entered in step 9.
13. Press the key to which the macro was assigned. The panel will go to the second page of the project, indicated by the text 'Page 2' appearing on the display.

It is suggested to repeat this example using other macros in order to gain familiarity with the Keyboard Macro Editor and the effects the macros will have on the functionality of the panel.

4.4 - Available Operation Modes

The Keyboard Macro Editor has eight different modes of operation. **Not all elementary macro commands are available in each operating mode.** The Keyboard Macro Editor will only display those macros that are available for a particular mode.

The following modes of operation are available for programming:

- **System** - this mode is used for the global setup of toggle keys.
- **All Pages** - macros defined here will be active on every page of the project file.
- **Page n** - macros defined here will be active only when the panel is on page n (where n is an integer).
- **Data Entry** - keys programmed in this mode will be active only when the panel is in Data Entry Mode.
- **Alarm** - macros defined here will be active only when the panel is in Alarm Mode.
- **Command Menu** - macros in this mode will be active only when the panel is in the Panel Command Menu.
- **Event List** - keys programmed in this mode will be active only when the panel is in the Event List Mode.
- **Time & Date** - macros defined here will be active only when the panel is in the Time and Date Mode.

A Note About the Relationship between All Pages Mode and Page n Mode

The relationship between the *All Pages* mode and *Page n* mode is particularly important to understand. A *single key* can be programmed in different operating modes to perform different functions. A macro programmed in *All Pages* mode will be active in all pages of the project. A macro programmed in *Page n* mode will be active only when the panel is on page n (where n is the page number).

A macro that is programmed in Page n mode will override a macro that is programmed in All Pages mode only when the panel is on page n.

For example, suppose a user has F1 programmed to *go to page 2* in *All Pages* mode, while also having it programmed for *begin data entry* in *Page n* mode (say, page 5). In this case, the only time that the panel will go into Data Entry Mode when the F1 key is pressed is when the panel is on page 5. On all other pages of the project, pressing F1 will take the user to page 2.

4.5 - Available Elementary Macros

The available elementary macro commands for each mode of operation are listed below. The name of the macro is identical to the text that is displayed whenever the user moves the mouse over the icon.

System

- **Set toggle key** - The key that is assigned to this elementary macro command will function like a toggle push-button, changing the value of the bit each time the key is activated. The bit may take on values of either 0 or 1. The user will be asked to specify the control relay bit which is to be toggled. *Note that a key programmed in this mode will function as a toggle push-button in all other modes as well.*

All Pages

- **Go to page** - This command will cause the panel to display a specific page. The user will be asked to input the page number.
- **Return to initial page** - This will cause the panel to display the page that was displayed before the ‘Go to page’ macro command was executed.
- **Password protect** - This command allows the user to require that a password be entered before executing any macros that follow. *The panel will not prompt the user to enter the password, rather the user must enter the password by using the*

Password selection in the panel command menu. If the password is not active, the panel will simply not execute any macro commands that follow. A dialog box will appear, allowing the user to specify which password(s) must be active. This dialog box is shown in Figure 4-2.

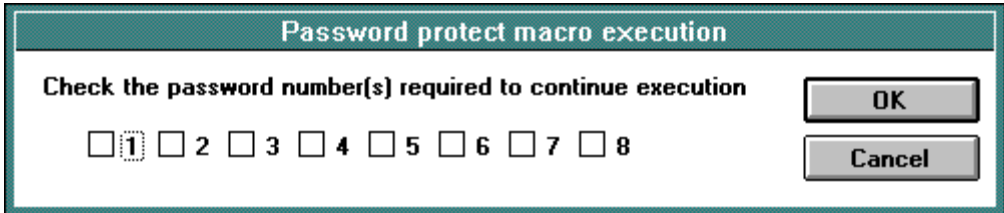


Figure 4-2

- **Show Alarm List** - This command will switch the panel to Alarm mode and display the currently active alarms. This is designed to be used when a user does not want the alarm list to appear every time there is an alarm active. Rather, the user wants to be able to bring up the alarm list on demand. This macro will work only if there are active alarms.
- **Show Event List** - This command will display all of the events that are currently stored in the event list. This macro will work *only* if there are events in the list.
- **Printout on/off** - This allows the user to print the current page, the alarm list, or the event list. This command toggles the printer; therefore if the printer is not printing, then toggling the key will cause the printer to begin printing. Likewise, if the printer is printing, then toggling this command will cause the printer to cease printing.
- **Print Report** - This command allows the user to print any of the reports that have been configured.
- **Scroll to line** - This command allows the user to specify the page row that is to be considered the topmost row of the display. Activating this command will scroll the panel to the 'new' topmost row. This is useful when there are more lines on a page than there are viewable lines on the panel. This macro will function only when there are enough defined lines to make the selected line the topmost line (for

The Keyboard Macro Editor

example, the user can not specify line 30 to be the topmost line, since there are only 32 displayable lines).

- **Select data entry field** - This command allows the user to select the field they wish to edit. This only *selects* the field; to edit it the user must begin data entry. Note that fields are counted from *left to right, top to bottom* on the panel. **Attributes, time data fields, date data fields and touchcells attached to the controller are counted as fields.** The user should keep this in mind whenever selecting the field number. From Designer version 5.05 and forward, all references used in this macro will be re-indexed as fields are inserted or deleted.
- **Begin data entry** - This command will switch the panel into Data Entry Mode. The user may now select the field and press ENTER to begin editing the value.
- **Data editing** - This command will allow the user to begin editing the value. This functions mainly as an ENTER key and should be used in a complex macro command following *begin data entry*.
- **Send command** - This command allows the user to send ASCII commands to the controller. Note that this command is only available with certain PLCs and motion controllers. When used with a motion controller, the user will be able to enter the ASCII string that is to be sent. When used with a controller, the user will only be able to select from a given string of commands.
- **Data Entry Popup toggle** - This command is used with a touchscreen panel and will either enable or disable the numeric keypad that appears on the panel once the user enters Data Entry Mode and presses the ENTER key (or uses the complex macro command *begin data entry* and *data editing*). The numeric keypad will appear on the panel by default. This command is mainly used when a user wishes to turn this keypad off.
- **Clear Event List** - This command will clear all of the entries from the queue of events.
- **Send Command** – This allows the user to send ASCII commands to the controller. Note that this command is only available with certain PLCs and motion

controllers. When used with a motion controller, the user will be able to enter the ASCII string they wish to send. When used with a PLC, the user will be able to select from a list of commands.

- **Write to Controller** - This command allows the user to write constant values to the controller memory. The user will be prompted for the specific memory location, as well as the value to be written.
- **Toggle Relay** - Allows the key to behave as a toggle push-button. The user will be prompted for the controller bit which is to be toggled.
- **LED state** - This allows the user to set the state of any LED that is attached to the keys on the panel. The LEDs may take the value of ON, OFF, BLINK, or DEFAULT. The DEFAULT state is determined by the value of the corresponding LED bit in the reserved data area (RDA).
- **Scroll up** - This command will scroll the display up one line.
- **Scroll down** - This command will scroll the display down one line.
- **Wait** - Allows the panel to pause for a specified amount of time before executing the next macro command. The time entered for this command is in tenths of a second.
- **Step** - This command allows the user to increase or decrease the numeric value of a register. The user may enter the step size, as well as the minimum or maximum values the register is not to exceed.
- **Display Text** - This command allows the user to display a text message on the panel. The user will be asked to enter the row and column number at which the message is to be displayed.
- **Attribute** - This allows the user to specify the display attribute of an area on the page. Available attributes are reverse, blink, and highlight. The user will be prompted for the row, column, width, and height of the area that the attribute is to affect.

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- **Recipe Control** - Allows the user to perform different Recipe functions, including downloading a particular parameter set, uploading a particular parameter set, and selecting a particular parameter set. The user must enter the page number and the parameter set that is to be affected. Entering a 0 for either will cause the current page/parameter set to be chosen.
- **Passwords** - This will request the user to enter a password. If passwords are not defined in the project, this command will have no effect.
- **Next page** - This will cause the panel to display the next page of the project, providing the user is not on the last page.
- **Previous page** - This will cause the panel to display the previous page of the project, providing the user is not on the first page.
- **Brighter display** - This command increases the brightness of a vacuum fluorescent display panel and the contrast of an LCD display panel.
- **Dimmer display** - This command decreases the brightness of a vacuum fluorescent display panel and the contrast of an LCD display panel.
- **Pass-through Mode** - This allows the user to enable or disable passthrough mode. This is designed so the user can go on-line with the controller without disconnecting any cables. This feature is known to work with some controllers using RS-232. Later versions of our software will include more protocols and controllers.
- **Clear Event List** - This command will clear all of the entries from the queue of events.
- **Control Variable Step** - This command allows the user to increment or decrement a control variable field (such as parameter set select or to change the language).

- **Go to Recipe Menu** – This macro sets the Recipe Page for Selection and jumps to the specified page. Please see the section on Recipe Menus in the Recipe chapter of this manual for further explanation.
- **Scroll Recipe Menu** – This macro is used to move the selection in the Recipe Menu field. Please see the section on Recipe Menus in the Recipe chapter of this manual for further explanation.
- **Confirm Recipe Menu Selection** – This macro accepts the selected parameter set name and sets the current recipe parameter set to the new value. Please see the section on Recipe Menus in the Recipe chapter of this manual for further explanation.

Page n

Each specific page can use the same elementary macros that are available in All Pages mode. In this mode, the programmed macro instruction will be active only in the selected page.

Data Entry

- **Next field** - This will position the cursor on the next read/write field. Fields are sorted in the direction left to right, top to bottom. This directionality defines what is considered to be the 'next' field.
- **Previous field** - This will position the cursor on the previous read/write field.
- **Field down** - This will position the cursor on the next read/write field directly below the currently selected field. If the data fields are not aligned vertically, this command will have no effect.

The Keyboard Macro Editor

- **Field up** - This will position the cursor on the next read/write field directly above the currently selected field. If the fields are not aligned vertically, this command has no effect.
- **Step** - This allows the user to increase or decrease the numeric value of a register. The user may enter a step size, as well as the minimum and maximum values the register is not to exceed.
- **Confirm** - This confirms the entered value and exits Data Entry Mode.
- **Cancel** - This cancels the entered value and exits Data Entry Mode.
- **Erase** - This will erase the text that has been entered in the data field.
- **Begin data entry** - This will switch the panel into Data Entry Mode. The user can now select the field and press ENTER to begin editing the value.
- **Data editing** - This command will allow the user to begin editing the value. This functions mainly as an ENTER key and should be used in a complex macro command following *begin data entry*.
- **Write to Controller** - This command allows the user to write values to the controller memory. The user will be prompted for the specific memory location, as well as the value to be written.
- **Toggle Relay** - Allows the key to behave as a toggle push-button. The user will be prompted for the controller bit which is to be toggled.
- **Wait** - Allows the panel to pause for a specified amount of time before executing the next macro command. The time entered for this command is in tenths of a second.
- **Control Variable Step** - This command allows the user to increment or decrement a control variable field (such as parameter set select or to change the language).

Display Scroll

This is a feature that is useful in UniOP panels with small displays. In the Data Entry Mode, the macro commands Next Field, Previous Field, Field Down and Field Up, have a new option that allows the panel to scroll the page to reach data entry fields that may not be visible at the moment data entry is started. This feature is useful when multiple data entry macro sequences have been defined. Firmware version 4.20 or greater is required to use this feature.

Alarm Mode

- **Write to Controller** - This command allows the user to write values to the controller memory. The user will be prompted for the specific memory location, as well as the value to be written.
- **Toggle Relay** - Allows the key to behave as a toggle push-button. The user will be prompted for the controller bit which is to be toggled.
- **Wait** - Allows the panel to pause for a specified amount of time before executing the next macro command. The time entered for this command is in tenths of a second.
- **Page Mode** - This is used to return the panel to current page mode from alarm mode.
- **Acknowledge alarm** - This is used to acknowledge an active alarm.
- **Scroll up** - This will shown the next alarm, assuming more than one alarm is active.
- **Scroll down** - This will show the previous alarm, assuming more than one alarm is active.
- **Print alarms** - This will print all of the active alarms.

The Keyboard Macro Editor

- **Go to alarm page** - If an alarm page has been specified for the currently active alarm, this macro command will take the user to that specified page.
- **Control Variable Step** - This command allows the user to increment or decrement a control variable field (such as parameter set select or to change the language).

Command Menu

- **Page Mode** - This is used to return the panel to current page mode.
- **Left** - Positions the cursor on the next command to the left of the currently selected command.
- **Right** - Positions the cursor on the next command to the right of the currently selected command.
- **Up** - Positions the cursor on the command directly above the currently selected command.
- **Down** - Positions the cursor on the command directly below the currently selected command.
- **Confirm** - Used to select the currently highlighted command (this functions as the ENTER key).
- **Control Variable Step** - This command allows the user to increment or decrement a control variable field (such as parameter set select or to change the language).

Event List

- **Clear Event List** - This command will clear all of the entries from the queue of events.
- **Page Mode** - This is used to return the panel to current page mode.
- **Scroll up** - Used to scroll the event list up.
- **Scroll down** - Used to scroll the event list down.
- **Control Variable Step** - This command allows the user to increment or decrement a control variable field (such as parameter set select or to change the language).

Time/Date

- **Page Mode** - This is used to return the panel to current page mode.
- **Next field** - Positions the cursor on the next read/write field. Fields are considered in the direction from left to right, top to bottom.
- **Increment** - Increments the selected field to the next value.
- **Decrement** - Decrements the selected field to the next value.
- **Control Variable Step** - This command allows the user to increment or decrement a control variable field (such as parameter set select or to change the language).

4.6 - Tips and Techniques

1. Execution of the macro command requires time and processing power that comes from the panel's main processor. While a macro command is being executed, any type of keystroke on the panel will be queued and executed as soon as possible. This may lead to unexpected results if too many keys are pressed before the macro has time to execute. An example of a macro that might take a relatively long time to execute is given below. This type of macro should either be avoided or used at times when the panel's application is not critical.

Go to page 1
Print page toggle
Wait 50 tenth(s) of a second
Go to page 2
Print page toggle
Wait 50 tenth(s) of a second
Go to page 3
Print page toggle
Wait 50 tenth(s) of a second
Go to page 4
Print page toggle
Wait 50 tenth(s) of a second
Go to page 5
Print page toggle

2. When using the macro command *Attribute*, the command will be written to the specified *screen location*. For example, assume a user has a 4 line panel and has a key programmed to assign an attribute of reverse to the screen location of row 2, column 1, height of 1, width of 1. Wherever the user is at on the page, executing this macro will assign the reverse attribute to the second *displayed* row on the panel.

3. **Do not program the ENTER key.** Doing so may keep the user from being able to get into Configuration Mode, confirming data entry, etc.
4. If the user decides to program the 0 numeric key, *they may not be able to edit values on a page where 0 is also used as the INSERT key.*
5. If the user decides to program the arrow keys, they may lose the ability to scroll between pages and/or numeric fields within the project.
6. A key can be programmed in *both* the pressed and released states.
7. **In general, macro commands that switch operating modes are not valid!** Programming a key to function in more than one operating mode within a single macro command will *not* work. For example, the following macro command goes from Password Mode to Data Entry Mode to Page Mode and *will not* work properly.

Enter Password
Begin Data Entry
Confirm Data Entry
Go to Page 7

4.7 - Multiple Field Data Entry

UniOP panels with firmware version 4.07G and greater offer the capability of multiple field Data Entry Mode. This feature allows the user to edit more than one field without exiting Data Entry Mode. This feature *cannot* be implemented by using a touchcell; the user must use a physical panel key.

In order to use this feature, the user will need to create a macro key that is programmed in the following manner:

- In the *Pressed* state, the key needs to be programmed in *All Pages Mode* or *Page n Mode* with the macro Begin Data Entry.
- In the *Released* state, the key needs to be programmed in *Data Entry Mode* and perform the following elementary macro commands *in sequence*:
 - 1) Confirm Data Entry
 - 2) Begin Data Entry
 - 3) Go to Next Field
 - 4) Begin Editing Value

Example

If you want to have F1 programmed as the key that performs this function, you would perform the following steps:

1. Select *Keyboard Macro Editor* from the *Project* menu (you can also click on the Keyboard Macro Editor icon in the Extra ToolBelt).
2. Click on the *F1* icon at the top of the page.
3. Click on the *Pressed* radio button beside *Key* states.
4. Click on either *All Pages* or *Page n*, depending upon if you want this key to function in all pages or on only one specific page.
5. Click on the *Begin Data Entry* icon in the *Commands* toolbar (this icon shows a hand pressing a key).
6. Click on *OK*.

Figure 4-3 shows the Macro Editor dialog box after these steps have been completed.

The Keyboard Macro Editor

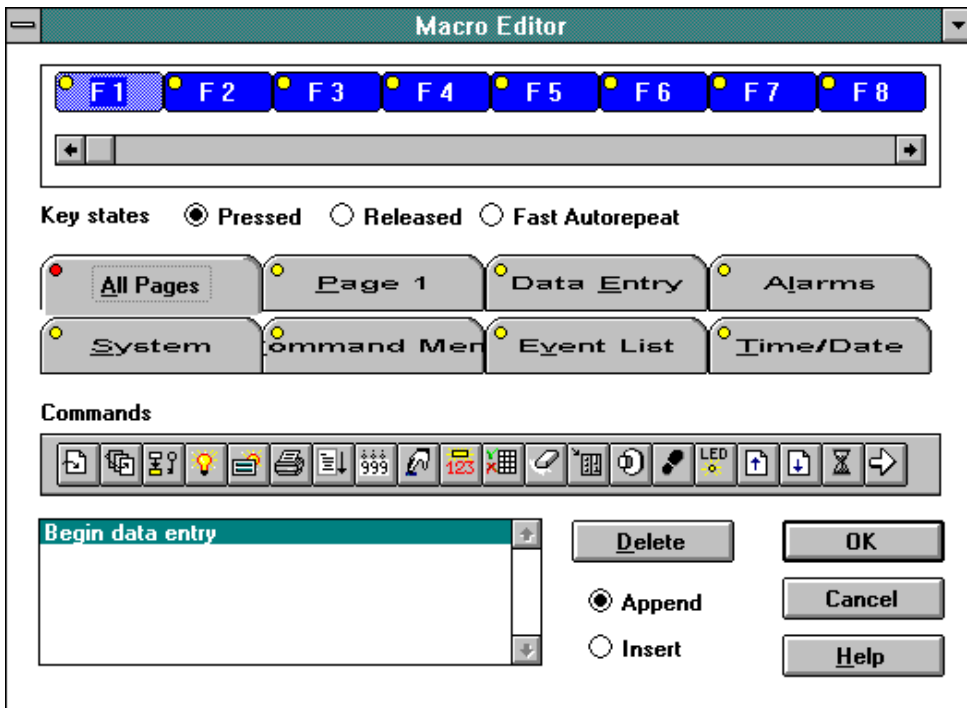


Figure 4-3

Now we need to program the key for the Released state:

1. Enter the *Keyboard Macro Editor* as previously described.
2. Click on the *F1* icon at the top of the page.
3. Click on the *Released* radio button beside *Key states*.
4. Click on the *Data Entry* index tab.
5. Click on the *Confirm Data Entry* icon in the *Commands* toolbar (this icon is a green check mark).

6. Click on the *Begin Data Entry* icon in the *Commands* toolbar (this icon shows a hand pressing a key).
7. Click on the *Go To Next Field* icon in the *Commands* toolbar (this icon has of a yellow box with a crooked arrow pointing down to a white box).
8. Click on the *Begin Editing Value* icon in the *Commands* toolbar (this icon is a small box with the numbers 1, 2, and 3 below it).
9. Click on *OK*.

Figure 4-4 depicts the Macro Editor dialog box following the completion of these eight steps.

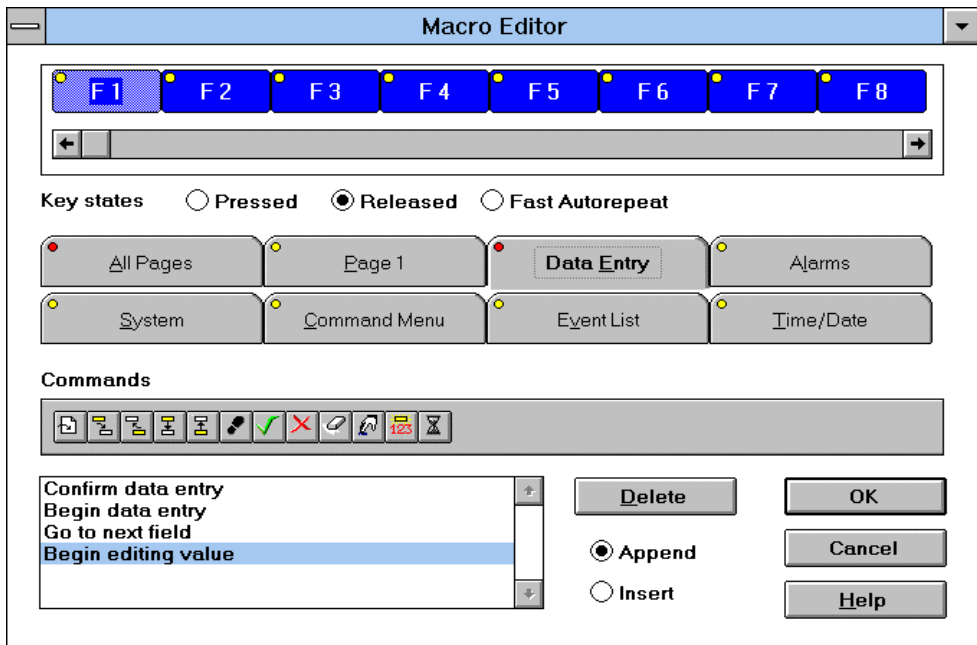


Figure 4-4

The Keyboard Macro Editor

Using the Macro to Edit Multiple Fields

To use the macro that was just created, simply press the *F1* key. A *read/write* data field will be selected, allowing you to enter the value for that field. Pressing *F1* again will confirm your data entry and advance you to the next *read/write* field on the page. Repeat this process until all of the fields have been edited. Pressing the *ENTER* key will return the panel to normal operation.

Chapter 5 - Passwords

5.1 – Defining Passwords

UniOP panels have eight different levels of passwords, enabling supervisors to restrict the amount of control an operator has over the functionality of the panel. A dialog box representing these levels is shown below in Figure 5-1.

The screenshot shows a dialog box titled "Passwords" with a table of password levels. The table has columns for Password, CONF, TIME, ACK, PRINT, PAGE, ALOGI, ALOGO, Data entry enable (From page, To page), and buttons for OK and Cancel. The first row (password 1234) is highlighted with a blue border.

Password	CONF	TIME	ACK	PRINT	PAGE	ALOGI	ALOGO	Data entry enable		OK	Cancel
								From page	To page		
1234	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	10		
1111	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	3		
2413	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	4		
2698	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1	10		
0989	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	8		
7406	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2	6		
4184	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3	9		
6932	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5	8		

Figure 5-1

The person having the highest level password has access to all of the panel functions. This is done by default so as to allow at least one person the ability to change the project file contained within the panel.

Passwords

All UniOP panels provide password protection for the following:

- CONF** - Access to the Configuration Mode. In this mode, the user may choose to alter the project file and re-download it from the PC.
- TIME** - Access to the Time & Date Mode. In this mode, the user may change the time and date information that is stored within the panel.
- PAGE** - Access to Direct Page Selection Mode. In this mode, the user can access specific pages of the project.
- ACK** - The ability to acknowledge alarms.
- PRINT** - The ability to request printouts.
- ALOGI** - Automatic login. This is used to automatically load a specified password whenever there is no valid password in the system (e.g., when the panel goes from Configuration Mode to Operation Mode, or when an incorrect password is entered. This option can only be assigned to one password and will work only if there are no other valid passwords in the system..
- ALOGO** - Automatic logoff. This is used to automatically disable a specified password ten minutes after it has been entered. This time is currently a fixed value and is not changeable.
- Data entry enable** - Access to Data Entry Mode for specific pages. In this mode, the user will be able to edit any read/write fields contained within the specified pages.

If a checkbox is selected, the user will have access to the respective area providing the correct password is entered. If an incorrect password is entered, asterisks will be displayed on the panel and the previous valid password is lost.

Example

Assume there are three users who will have access to the operator panel. User 1 is to have access to all areas of the project. User 2 is only allowed to acknowledge alarms and enter data on pages 2, 3, and 4. User 3 is capable of entering data throughout the project and is allowed into Configuration Mode. It is also desired to have User 3 automatically logged out of the system after 10 minutes.

1. Select *Passwords* from the *Project* menu. This will bring up a dialog box similar to the one shown in Figure 5-1 in which we will configure our passwords for the project.
2. Since User 1 is to be allowed full access to all areas of the panel, we can assign the highest level password to him. Simply click in the top password box and enter the password for User 1.
3. User 2 is allowed to acknowledge alarms and enter data on pages 2, 3, and 4. Click on the second password box and enter the password for User 2. To allow access to acknowledge alarms, click on the *ACK* box. Doing so should place a check mark in the box. Allowing data entry from page 2 to page 4 can be accomplished by entering a 2 in the *Data entry enable From page* box and entering a 4 in the *Data entry enable To page* box.
4. User 3 can enter data on all pages of the project, will be automatically logged out after ten minutes, and can access Configuration Mode. Click on the third password box and enter the password for User 3. By selecting the *CONF* box, we can give User 3 access to Configuration Mode. Similarly, by selecting the *ALOGO* box, User 3 will be logged out after ten minutes. Because data entry is possible throughout the entire project, no modifications need to be made to the *Data entry enable* boxes.
5. The passwords should now be configured correctly for this situation. The dialog box resembling this situation is shown in Figure 5-2.

Password	CONF	TIME	ACK	PRINT	PAGE	ALOGI	ALOGO	Data entry enable	
								From page	To page
1234	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	10
4321	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2	4
5690	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	10
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	10
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	10
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	10
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	10
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	10

Figure 5-2

5.2 - Changing Passwords from the Panel

In previous versions of Designer, if you wanted to change a password, it was necessary to go into the Designer software, change the desired password, and then re-download the project file to the panel. This feature allows you to change any of the seven possible user passwords defined in the project file directly from the panel. In order to use this feature, there must be at least two passwords defined, with one of them setup to be automatically logged in (see Figure 5-3). This means that whenever the panel goes from Configuration Mode to Operation Mode, the specified password is logged in.

In order to use this feature, your panel must be equipped with firmware version 4.10 or later.

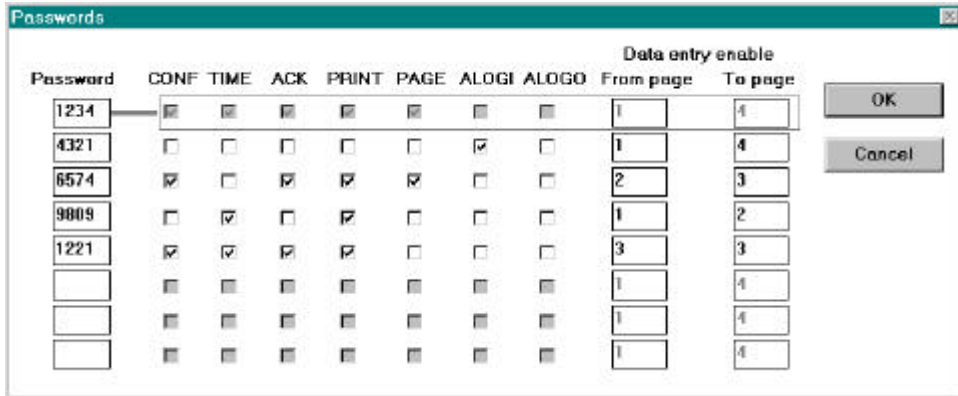


Figure 5-3

Once you have the passwords defined in the project file, you will need to make an ASCII control variable field for each password that you want to be able to change. To make a control variable field, you need to perform two steps:

- Select the *Control Variable* icon in the *Extra Toolbelt*. The *Control Variable* icon is the third from the left in the *Extra Toolbelt*.
- Create a control variable field. You can do this in the same way that you create a numeric field (you can either double click the left mouse button, position the cursor where you want the field to begin and select the *Numeric Field* icon in the *Toolbelt* or select *Edit – Data Field Type – Numeric/ASCII*). Make sure that you change the display format to ASCII. Once you do this, you will be able to select which password (two through eight) you want to create the field for.

For example, suppose that you want to be able to change passwords 2, 3 and 4 (which are 4321, 6574 and 9809, respectively) from the panel. Once you have clicked on the *Control Variable* icon and created the field, you should see the dialog box shown in Figure 5-4. Again, make sure that you change the display format to ASCII!

Passwords

The screenshot shows a dialog box titled "Control Variable Define Field - ver. 0.01". It contains the following elements:

- Control Variable Reference:** A dropdown menu for "Data Type" set to "Password", a text box for "Password" containing "2", and a text box for "Address" containing "PAS2".
- Data Format:** A dropdown menu set to "ASCII".
- Priority:** Radio buttons for "Low Priority" and "High Priority".
- Display Format:** A dropdown menu set to "ASCII".
- Numeric Base:** Radio buttons for "Decimal" and "Hexadecimal".
- Data Access:** Radio buttons for "Read Only" and "Read/Write" (selected).
- Field Dimensions:** Text boxes for "Field Width" (4) and "Field Height" (1), with "Max. 50" and "Max. 1" labels respectively.
- Scaling:** Text boxes for "Y=" and "X=" with a "/" symbol between them.
- Fixed point:** A radio button labeled "Fixed point".
- Placement:** A text box containing "0".
- Min. value:** and **Max. value:** text boxes.
- Buttons:** "OK", "Cancel", "Delete", and "Help" buttons on the right side.

Figure 5-4

Since you are going to be changing the value of this field (the actual password), select *Read/Write* within the *Data Access* box. As you can see, this control variable is addressed for password 2. Whenever you click on the OK button, you will see CCCC on your panel, indicating that you have created a control variable field.

If you follow the same procedure for creating control variable fields for passwords 3 and 4, your screen may look something like Figure 5-5 when you are finished. These control variable fields can be edited in the same manner as numeric fields.

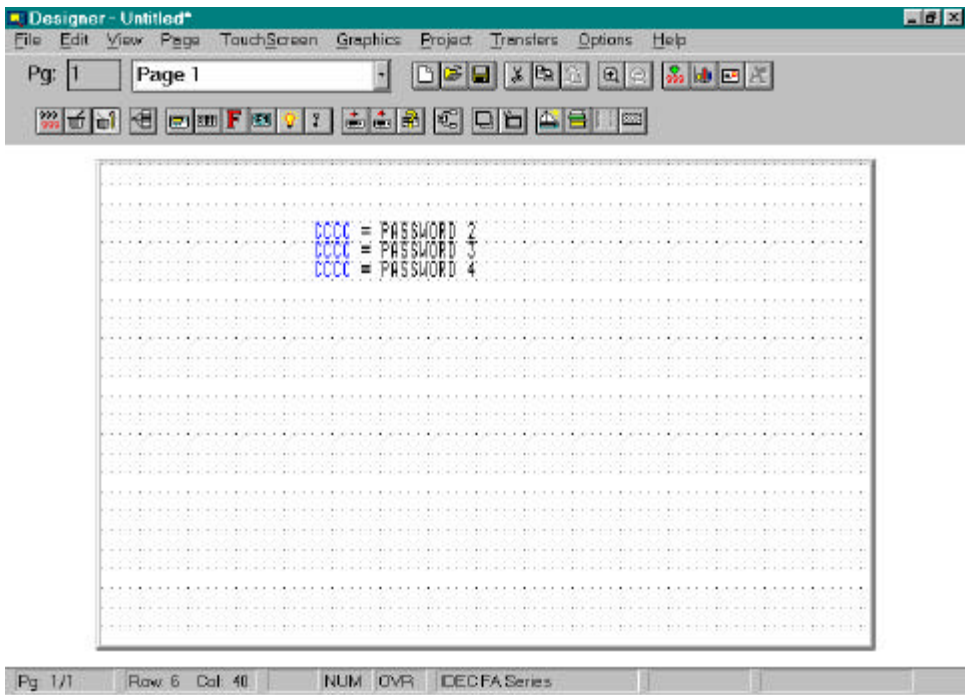


Figure 5-5

Chapter 6 - Alarms

6.1 - Enhanced Mode Alarms

Enhanced Mode alarms offer the user a maximum of 1024 alarms, which are broken into 4 blocks (there are some models which offer 256 total alarms in 4 blocks). The lower the numerical value assigned to the alarm, the higher it's priority. Each block can be addressed to any register within the controller's memory. Each alarm is referenced to a bit in the controller. Whenever a bit goes high, the respective alarm message will be displayed. The features contained within Enhanced Mode alarms and their functionality are given below. Following these descriptions are two examples of using Enhanced Mode alarms.

It is strongly suggested to use Enhanced Mode alarms. Compatibility Mode alarms are included in the software only to provide compatibility with older project files. Future releases of the panel's firmware may not support Compatibility Mode alarms.

If the user wishes to use Enhanced Mode alarms and the RDA, they must first disable the Alarms area of the RDA.

Select *Alarms* from the *Project* menu. This will bring up the *Alarms* dialog box shown in Figure 6-1 (unless the RDA is enabled, in which case the user will be presented with a dialog box in which they can choose between Compatibility Mode alarms and Enhanced Mode alarms).

Alarms

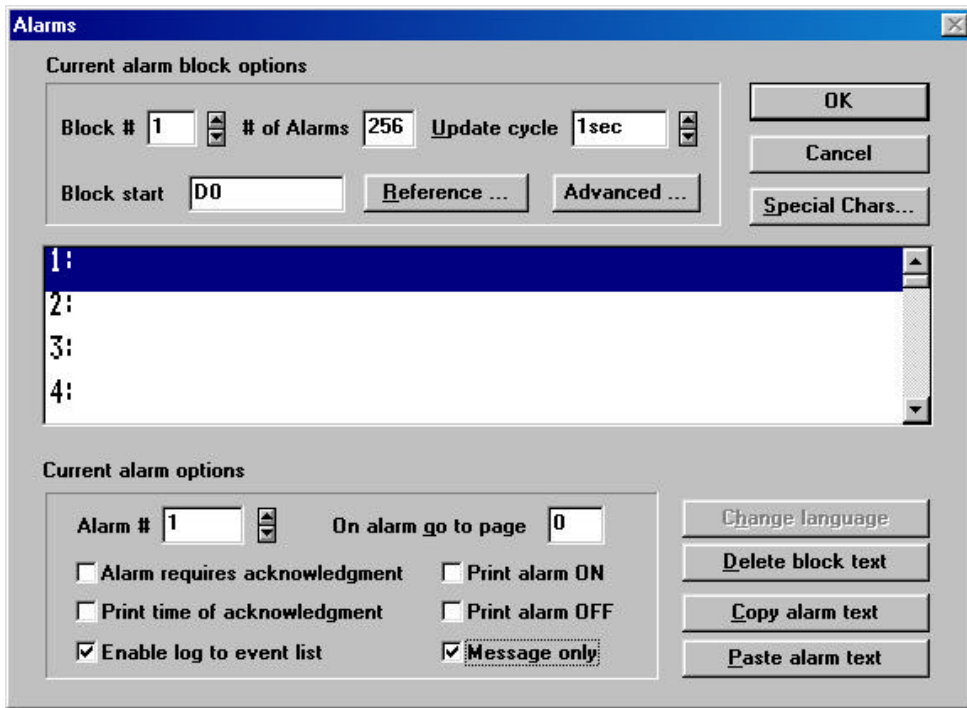


Figure 6-1

The *Block #* field allows the user to choose either block 1, 2, 3, or 4.

The *# of Alarms* field is used to specify how many alarms will be used in a particular block. The software will automatically round off the specified number to a multiple of 16 because the alarms are addressed as words of information.

The *Update cycle* field allows the user to specify how often the alarms are updated.

The *Block start address* field allows the user to specify the starting address of the current block. Clicking on the *Address Reference* button will bring up a detailed dialog box for addressing. If the panel is accessing multiple controllers, the user will also have to specify the controller slave ID numbers within this dialog box.

Clicking on the *Advanced* button will present the user with a dialog box in which they can choose how they want the alarm popup window to appear once an alarm occurs. This dialog box is shown below in Figure 6-2.

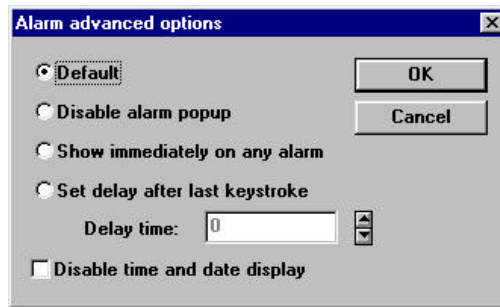


Figure 6-2

Default - Alarms are displayed immediately if no keys are pressed *and* no keys have been pressed within the last three seconds.

Disable Alarm Popup - The alarm popup window will not be displayed.

Show Immediately On Any Alarm - The alarm popup window will be displayed as soon as an alarm occurs.

Set Delay After Last Keystroke - The user can have the alarm popup window appear at a specified amount of time after the last keystroke or touchcell press (between 1 second and 127 seconds).

Disable Time and Date Display – This option allows the user to disable the time and date display in the UniOP alarm page. This feature is interesting in all cases where the time and date information is not of interest to the user. This feature requires firmware version 4.20 or greater.

The alarm messages can be scrolled through by using the scroll arrows located to the right of the alarm message list box. To create or edit a message, either click on the desired value or use the *Alarm #* field to select the value and then enter the message. Special characters may be added to the message by clicking on the

Alarms

Special Chars button. This will bring up a dialog box (shown in Figure 3-4) in which the user can select the character(s) to be used by double clicking on them or by single clicking on them and pressing *Select*. After confirming the operation, the characters will appear in the last position the cursor was in before entering the special characters dialog box.

The *On alarm go to page* field can be used to make the panel jump to a specified page whenever the alarm is activated. The user will need to program a key in Alarm Mode in the Keyboard Macro Editor using the following elementary macro commands in sequence: Acknowledge Alarm (if required), Go to Alarm Page, Page Mode. Whenever the alarm occurs, the panel will switch to the alarm screen. The user can implement the arrow keys to select the proper alarm and press the key that was programmed in the Keyboard Macro Editor to take them to the correct page.

The *Alarm requires acknowledgment* field can be selected if it is desired to have the operator press a key to acknowledge that the alarm is active. Once the alarm is activated, the panel will enter Alarm Mode and display the currently active alarms. The operator must acknowledge the alarm by pressing the ENTER key for a few seconds. Pressing the CLEAR key will return the user to Operation Mode. Note, however, that *it is still necessary to reset the proper alarm bit*.

By selecting *Print alarm ON*, *Print alarm OFF*, or *Print time of acknowledgment*, the user can have the specific alarm data printed via a serial printer.

The checkbox *Enable log to event list* will allow the user to send the selected alarm to the historical event list. If it is not desired to send the alarm to the event list, the user can simply unmark this box.

The checkbox *Message Only* allows the alarm message to be treated strictly as a message and not a true alarm. If this checkbox is marked for a specific message, the Alarm LED on the panel will remain off for the specific event and the first row of the message will NOT contain the familiar 'A', as is the standard for an alarm message. It is possible to require that these messages be acknowledged, just as a standard alarm message. These messages can also be logged to the Event List if the *Enable log to event list* checkbox is marked. This feature requires firmware version 4.22 or greater.

The familiar Windows™ features cut, copy, and paste are also available for use in editing messages. If you have several alarm messages that are similar, you can use the *Copy alarm text* and *Paste alarm text* features to copy messages and then make any necessary changes.

Simply select which messages to copy by highlighting them. If you want to copy several messages that are in successive order, click on the first one and drag the mouse down until the last one is highlighted and release the mouse button. If you have several messages to copy that are not in successive order, hold down the *Ctrl* key, click on each of the messages that you want to copy, and release the *Ctrl* key. All of these methods will select the text to be copied.

Now, click on the *Copy* icon to copy the messages into Windows' Clipboard. Highlight the alarm message number where you want to paste the first message and click on *Paste alarm text* to copy the messages into their new locations. You can also use a Windows based text editor, such as Notepad, to create a list of messages. To do this, place each message on a separate line. Use the *Copy* function of the editor to copy the text to the Clipboard and then use the *Paste alarm text* feature to copy the messages into their new locations.

Example 1

Assume a user is using a Siemens Simatic TI 435. They want to use alarms that begin at V7377 (a word) for their particular controller. Their alarm messages and their respective locations in the controller are as follows:

Alarm Location in the Controller	Alarm Message
V7377 - Bit 0	Pressure too high
V7377 - Bit 1	Temperature too high
V7377 - Bit 2	Pressure too low
V7378 - Bit 1	Temperature too low

*Keep in mind that each alarm message is referenced to a **BIT** in the controller.*

Alarms

1. Once the user has Designer set up for their particular panel and controller, the Enhanced Mode Alarms can be accessed by choosing Alarms from the Project menu. The Alarms dialog box will appear, allowing the user to specify the starting address for the alarms. In this example, the alarms begin at memory location V7377.
2. The alarm list box is located beneath the Current alarm block options box. This list box is where the alarm messages are entered. Each numeric value corresponds to a bit. For example, since the alarms begin at V7377, the numeric value 1 in this list box corresponds to the address V7377 - bit 0. The numeric value 2 in this list box corresponds to the address V7377 - bit 1, and so on. In a similar nature, the numeric value 17 corresponds to V7378 - bit 0 (since these are word locations and there are 16 bits in a word).
3. The numeric values in the list box and their corresponding alarm messages would be as follows:
 - 1: Pressure too high
 - 2: Temperature too high
 - 3: Pressure too low
 - 18: Temperature too low

Example 2

Assume a user wants the panel to go to page 3 whenever alarm 1 is active. Assume that the alarm requires acknowledgment.

1. Select *Alarms* from the *Project* menu.
2. Make sure that all of the alarm data is entered correctly, as far as the alarm message and the beginning address of the alarm block.
3. Enter a 1 in the *Alarm #* field. Following this, enter a 3 in the *On alarm go to page* field and click on OK.
4. Select *Keyboard Macro Editor* from the *Project* menu. Assume that the F1 key is to perform the function of acknowledging the alarm and going to page 3. The dialog box shown in Figure 6-3 is a representation of how this key should be configured.

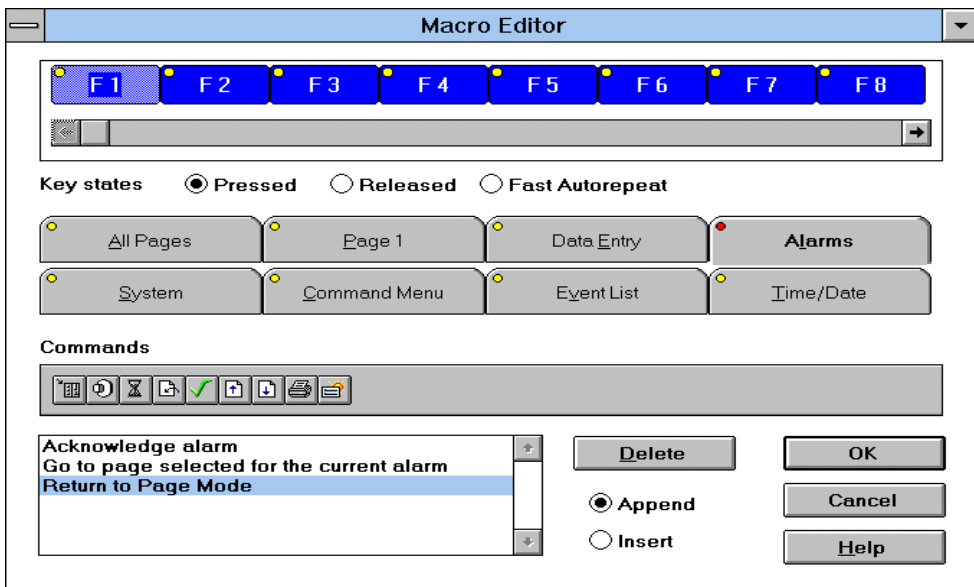


Figure 6-3

5. Keep in mind that the alarm bit must still be reset. This may be done by including the macro command ‘Write to Controller’ to the above complex macro and clearing the proper alarm bit.

6.2 - Compatibility Mode Alarms

The UniOP offers the storage and automatic display of up to 256 alarm messages in Compatibility mode. Priority levels (0 - 255) can be assigned to handle simultaneous alarms. Alarm importance decreases as the priority level increases. Therefore, the most important alarms should be given the lowest possible numerical value. Alarms are each assigned an individual bit in the *Alarm Update Area* of the *RDA*. Alarms are triggered by a high bit from the controller.

It is strongly suggested to use Enhanced Mode alarms. As was mentioned previously, Compatibility Mode alarms are provided solely for compatibility reasons with older projects. Future releases of the panel’s firmware may not support Compatibility Mode alarms.

Select *RDA Setup* from the *Project* menu, and select the *Enabled* checkbox in the area marked *Alarms*.

Select *Alarms* from the *Project* menu. This will bring up a dialog box in which the user can select between enhanced mode and compatibility mode alarms. Select *Compatibility Mode* and click on *OK*.

The Compatibility Mode alarm dialog box (shown in Figure 6-5) will appear, allowing the user to enter their alarm messages. Special characters may be added to the message by clicking on the *Special chars* button. This will bring up a dialog box (shown in Figure 3-4) in which the user can select the character(s) to be used by double clicking on them or by single clicking on them and pressing *Select*. After confirming the operation, the characters will appear in the last position the cursor was in before entering the special characters dialog box.

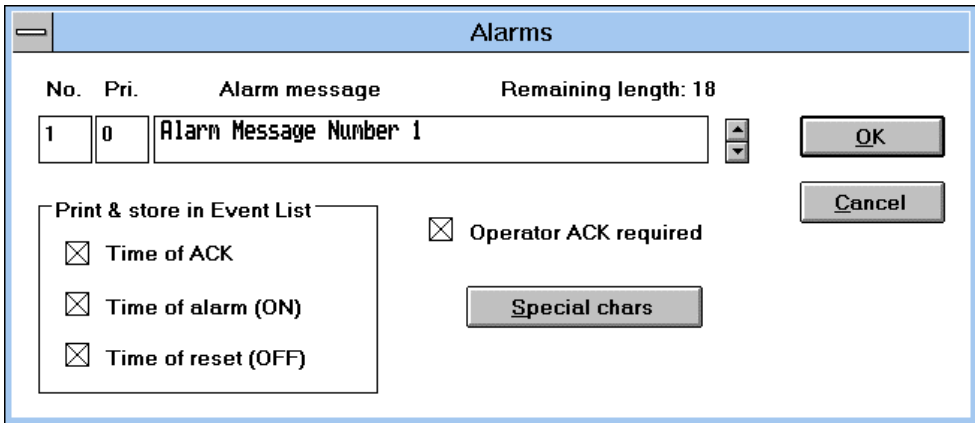


Figure 6-5

As was mentioned earlier, each alarm is triggered by a *bit* in the *RDA*. A mapping of the *Alarm Update Area* of the *RDA* is shown below in Figure 6-6.

		bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit
<u>ALARM UPDATE AREA</u>	21	A16	A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1		
	22	A32	A31	A30	A29	A28	A27	A26	A25	A24	A23	A22	A21	A20	A19	A18	A17		
		----- (break) -----																	
	35	A240	A239	A238	A237	A236	A235	A234	A233	A232	A231	A230	A229	A228	A227	A226	A225		
	36	A256	A255	A254	A253	A252	A251	A250	A249	A248	A247	A246	A245	A244	A243	A242	A241		

Figure 6-6

By selecting *Time of ACK*, *Time of alarm (ON)*, or *Time of reset (ACK)*, the user can have the specific alarm data written into the Event list or printed via a serial printer.

Alarms

The *Alarm requires acknowledgment* field can be selected if it is desired to have the operator press a key to acknowledge that the alarm is active. Once the alarm is activated, the panel will enter alarm mode and display the currently active alarms. The operator must acknowledge the alarm by pressing the ENTER key for a few seconds. Pressing the CLEAR key will return the user to Operation Mode. Note, however, that *it is still necessary to reset the proper alarm bit*.

6.3 - Long Alarm Strings in 20 Character Displays

Beginning with Designer 5.06 and firmware version 4.22, the user will be able to define an alarm message up to 40 characters in length for all UniOP operator interfaces that have a 20 character display.

In these cases, the complete message associated with an alarm will take up 3 lines on the display. The first line will be for time and date indication, the second and third lines will be for the alarm message itself.

Chapter 7 - The Reserved Data Area (RDA)

Each UniOP panel may use up to four small reserved areas of controller memory to establish an interface with the controller. Each of these four areas are described on the following pages. The user can select the starting address of each of these areas by selecting *RDA Setup* from the *Project* menu.

It is not necessary to have a full working knowledge of the reserved data areas to complete a project. *It is entirely possible to toggle bits in the controller, display messages and controller data, edit read/write fields, etc. without having any areas of the RDA enabled.* For this reason, the RDA is *disabled* by default. This also helps to optimize communication between the panel and the controller. There are, however, several functions that are only available through the RDA.

Figure 7-1 shows the flow of communication for each of the reserved data areas, while Figure 7-2 shows a memory map of the entire reserved data area.

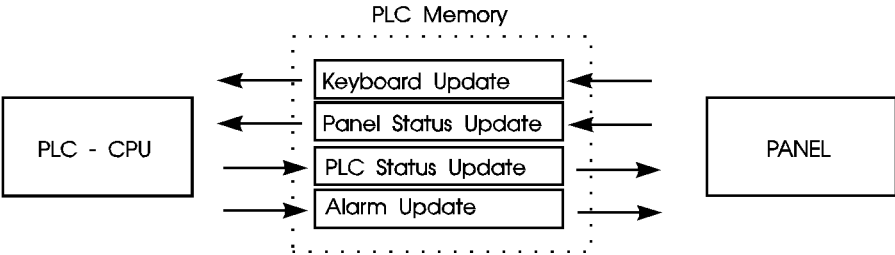


Figure 7-1

The Reserved Data Area

		bit														bit	
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
KEYBOARD UPDATE AREA	0	F16	F15	F14	F13	F12	F11	F10	F9	F8	F7	F6	F5 _E	F4 _D	F3 _C	F2 _B	F1 _A
	1	F32	F31	F30	F29	F28	F27	F26	F25	F24	F23	F22	F21	F20	F19	F18	F17
	2	7	6	5	4	3	2	1	0	K4	K3	K2	K1	up	dwn	right	left
	3	K16	K15	K14	K13	K12	K11	K10	K9	K8	K7	K6	K5	+/-	.	9	8
PANEL STATUS AREA	4	Reserved Byte								Day of the week							
	RTC	Day								Month							
	RTC	Year								Hour							
	RTC	Minute								Second							
	Panel Status Word	S15	S14	S13					S8	S7	S6	S5	S4	S3	S2	S1	S0
		CP (Current page)															
		Reserved Word															
		Reserved Word															
	Reserved Word																
	Reserved Word																
CONTROLLER UPDATE AREA	14	PR (Page request)															
	LED Control	L16	L15	L14	L13	L12	L11	L10	L9	L8	L7	L6	L5	L4	L3	L2	L1
	LED Control	L32	L31	L30	L29	L28	L27	L26	L25	L24	L23	L22	L21	L20	L19	L18	L17
	Controller Control Word	C15	C14	C13	C12	C11	C10	C9	C8	C7	C6	C5	C4	C3	C2	C1	C0
		Reserved Word															
		Reserved Word															
		Reserved Word															
ALARM UPDATE AREA	21	A16	A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1
	22	A32	A31	A30	A29	A28	A27	A26	A25	A24	A23	A22	A21	A20	A19	A18	A17
		----- (break) -----															
	35	A240	A239	A238	A237	A236	A235	A234	A233	A232	A231	A230	A229	A228	A227	A226	A225
36	A256	A255	A254	A253	A252	A251	A250	A249	A248	A247	A246	A245	A244	A243	A242	A241	

Figure 7-2

7.1 - The Keyboard Update Area

This reserved area is formatted to contain flags for each key on the panel and extended keyboard. These flags are set *HIGH* when a key is pressed and set *LOW* when released. Each key status flag occupies one bit in the controller memory. These bits can be used by the controller to detect when a particular key has been pressed and then in turn perform a specific operation. *It is recommended to use the Keyboard Macro Editor to program keys.* This method is easier and more efficient than programming a key using ladder logic.

Note: In the Keyboard Update Area of the RDA, the ENTER key is mapped to K1, the CLEAR key is mapped to K16, and the HELP key is mapped to K15.

7.2 - The Panel Status Area

This reserved area is formatted to contain time and date information from the panel's real time clock, a two-byte panel status word, and a current page register.

7.2.1 - The Real Time Clock

The real time clock contains the time and date information. Depending upon the type of controller that is being used, this information will be stored in either binary or BCD. A listing of various PLCs and how the RTC is stored can be found in the back of the Installation & Operation Guide that came with the panel.

7.2.2 - The Panel Status Word

The panel sets and resets bits S0-S8 and S13-S15 in the Panel Status Word to indicate its current status. Your application logic can monitor these bits to determine how and when it should interact with the panel. Table 7-1 shows a brief description of each status bit.

The Reserved Data Area

Bit #	Function
S0	Link status monitor flag
S1	Data entry active
S2	Printing in progress
S3	Printer status
S4	Date and time update in progress
S5	Attempt to access protected function
S6	Battery low
S7	Alarm active
S8	Unacknowledged alarm active
S13	Recipe upload in progress
S14	Recipe download in progress
S15	Recipe file status

Table 7-1

S0 - Link Status Monitor Flag

Bit S0 in the Panel Status Word can be used by the controller to monitor the communication status between the panel and the controller. The value of this bit is changed by the panel with a cycle time of approximately one second. If a transition is not detected within 1 second, the controller should consider that the panel is either not connected or not operating properly.

If the cycle time of the controller program is longer than one second or if there are numerous communication errors, one transition of the Link Status flag can go undetected.

S1 - Data entry active

Bit S1 is set whenever the panel is in Data Entry Mode.

S2 - Printing in progress

Bit S2 is set whenever the panel is in the course of sending data to the printer.

S3 - Printer status

Bit S3 contains the current logic state of the CTS (clear to send) line. This line is being driven by the printer and indicates the printer's readiness to accept data.

S4 - Date and Time Update in progress

Bit S4 in the Panel Status Word is used to synchronize access to the panel's real time clock (RTC). Before writing a new time and date record, the panel sets bit S4 in the Panel Status Word to indicate that it is about to update this data. The panel then writes the time and date information to the Reserved Data Area and resets bit S4. The controller program should always check the update flag before reading the time and date record. If the bit is set, the controller should not use the time and date information. *Note that this bit is not set when the panel updates only the seconds field.*

S5 - Attempt to access protected function

Bit S5 is set when the user tries to access a function that is not accessible with the current password. Since in this case no message is displayed by the panel itself, the controller can be used to check this status bit and notify the user that the function they are trying to access is protected.

S6 - Battery Low

Bit S6 is set when the backup batteries become weak. These batteries maintain Recipe data as well as time and date information, which is stored in RAM.

The Reserved Data Area

S7 - Alarm Active

Bit S7 is set when at least one alarm is active. Bit S7 is reset when all alarm bits are reset to zero.

S8 - Unacknowledged Alarm Active.

Bit S8 is set whenever there is at least one active alarm that requires acknowledgment. It is reset when all alarms have been acknowledged.

Enabling the "Operator ACK Required" attribute when creating alarm messages guarantees that bit S8 will remain set until the alarm is acknowledged. It does not guarantee that the bit associated with the alarm in the RDA will remain set. Those alarm bits are controlled by your application logic, not the panel.

S13 - Recipe Upload in Progress

Bit S13 is set whenever a Recipe is being uploaded from the controller into the panel. It is reset whenever the upload process is complete.

S14 - Recipe Download in Progress

Bit S14 is set whenever a Recipe is being downloaded from the panel into the controller. It is reset whenever the download process is complete.

S15 - Recipe File Status

Bit S15 displays the Recipe file status. A 0 indicates that the Recipes contain valid data. A 1 indicates that the Recipe data is corrupt or still contains the default values defined in the project file.

7.2.3 - Current Page (CP) Register

The panel writes the number of the currently displayed page into the CP register whenever the panel is in Page mode or Data Entry Mode. In all other modes, a zero is written into this register, indicating that page data is not currently being displayed.

Page numbers are stored in either binary or BCD format, depending on the controller being used. A list of these can be found in the UniOP Installation & Operation Guide.

7.3 - The Controller Update Area

The Controller Update Area allows the controller to access and control certain aspects of the panel. All front panel LED's can be controlled from this area to provide feedback to the operator. The controller may also request a specific page to be displayed by writing the appropriate value into the Page Request register. The controller control word allows the controller to request the printing of a page, disable data entry, select an alarm mode, or enable the mailbox function.

All panels include a standard set of dedicated indicators that allow the user to monitor the status of the panel. Along with these dedicated indicators, certain models include a subset of user defined LED's that can be monitored and controlled by your application logic. The control of these LED's is carried out through the Controller Update Area. Each of the registers found there can be copied to bit address contacts so that the status bits can be referenced as control relays.

7.3.1 - Page Request (PR) Register

The page to be displayed can be selected either by the operator from the front panel keypad or by the controller itself. The controller selects the page to be displayed by writing the corresponding page number into the PR register in the Controller Update Area. Note that once the panel has changed to the corresponding page, the user needs to write a 0 back into the PR register in order to return control back to the keys on the panel. If this is not done, the user will be ‘stuck’ on that page. When the panel detects a page request from the controller, it checks the front panel keyboard and the Expanded Keyboard (if present). If no key has been pressed for the last three seconds, the page selected by the controller is displayed.

While a controller page request is active (PR not 0), the operator will not be able to change pages using the arrow keys.

Page numbers are stored in either binary or BCD format, depending on the controller being used. To determine which format your controller uses, refer to the UniOP Installation & Operation Guide.

7.3.2 - LED Control Bits

Bits L1 through L32 control the LED indicators that can be found on various panel models. The mappings of these bits are shown below. Note that the LEDs can be controlled via the Keyboard Macro Editor (see Chapter 4).

Table 7-2 shows how these LED’s are mapped. For example, the F1 key is mapped to L1 and the 0 numeric key is mapped to L17. All of the panels *except* those that have the eight user LEDs are mapped according to this.

<i>LED</i>	<i>KEY</i>
L1	F1
L2	F2
L3	F3
L4	F4
L5	F5
L6	F6
L7	F7
L8	F8
L9	F9
L10	F10
L11	F11
L12	F12
L13	F13
L14	F14
L15	F15
L16	F16
L17	0
L18	1
L19	2
L20	3
L21	4
L22	5
L23	6
L24	7
L25	8
L26	9
L27	.
L28	+/-

Table 7-2

The Reserved Data Area

The mapping in Table 7-3 represents the panels that have the eight user LEDs. These panels include: MKDF-02, MKDF-04, MKDR-02, MKDR-04, MKDL-16, MKDR-16, and MKDR-16T. For example, the F8 key is mapped to L8 and the number 5 user LED is mapped to L30.

<i>LED</i>	<i>KEY</i>
L1	F1
L2	F2
L3	F3
L4	F4
L5	F5
L6	F6
L7	F7
L8	F8
L9	F9
L10	F10
L11	F11
L12	F12
L13	F13
L14	F14
L15	F15
L16	F16
L25	USER LED 0
L26	USER LED 1
L27	USER LED 2
L28	USER LED 3
L29	USER LED 4
L30	USER LED 5
L31	USER LED 6
L32	USED LED 7

Table 7-3

7.3.3 - Controller Control Word

The bits of the Controller Control Word are set and reset by the controller according to the application logic. The panel responds to these bits as shown in the following table.

Bit #	Function
C0	Print Screen
C1	Disable data entry
C2	Select alarm mode
C15	Enable Mailbox

Table 7-4

C0 - Print Screen

When bit C0 in the Controller Control Word is set, the panel sends the currently displayed page to the printer. The bit must be reset to 0 before another print request can be processed.

If the current password enables the user to request printouts, the currently displayed page can be printed directly from the front panel by pressing the "Prt Scr" or "9 / PRT" keys (depending on the panel model).

C1 - Disable Data Entry

When bit C1 in the Controller Control Word is set, the operator cannot enter the Data Entry Mode on the panel, even if the password otherwise enables them to do so. In this way, the controller can temporarily or permanently inhibit modification of variable values in a way defined by its program.

C2 - Select Alarm Mode

When C2 is set, the display will NOT switch to Alarm mode automatically. Instead, the operator will have to select ALARM from the Panel Command menu with the proper keyboard actions. Once inside the ALARM menu, the user will be

The Reserved Data Area

able to view and acknowledge any active alarms (*If there are no pending alarms, the user will not be able to enter the ALARM menu*). When the bit is reset to zero, the display will automatically switch to Alarm mode when at least one alarm is active.

Bit C2 only disables the automatic display of the alarm screen. Any alarm attributes that were set during project development remain active.

C15 - Enable Mailbox

Setting bit C15 enables the panel to cyclically read the data in the Mailbox. Note that the Mailbox must be configured prior to setting this bit (see Chapter 8). When this bit is not set, the panel will not read the data in the Mailbox, thus reducing communication time and increasing system performance.

7.4 - Alarm Update Area

This area of the RDA is used in conjunction with Compatibility Mode alarms. This area controls the display of up to 256 alarm messages. Each alarm is assigned one bit in the Alarm Update Area. To inform the panel that an alarm has occurred, the controller application logic must set the corresponding bit. When an alarm has been set, the display switches to Alarm Mode and displays the corresponding alarm message. All alarms are archived in a circular buffer called the Event List. This historical data can be viewed or printed via the Event Mode.

While it is possible to use this area of the RDA with alarms, it is strongly recommended to use Enhanced Mode alarms instead. Doing so will result in added flexibility in structuring the alarms, as well as having a greater number of alarms to work with.

Chapter 8 - The Interlock Mailbox

The *UniOP Interlock Mailbox* is a facility designed to allow the operator interface panel to interact with the controller's ladder logic program. The Mailbox is simply a group of registers in the controller memory (from a minimum of 2 registers to a maximum of 20). The Mailbox can be placed anywhere in the controller memory at an address selected by the user. When the Mailbox is enabled, the operator panel cyclically reads the contents of the Mailbox from the controller. The controller can command the UniOP panel to perform certain tasks by placing data in the memory area used by the Mailbox. When the panel detects that the controller has written data in the Mailbox, it interprets the data as a numeric code for a required command. If the panel recognizes the command, it immediately executes it. If the command requires a response from the panel, then the panel places the response back into the Mailbox itself.

8.1 - Definition of the Mailbox

To enable the Mailbox, select *Interlock Mailbox* from the *Project* menu. The dialog box shown in Figure 8-1 will then be displayed.

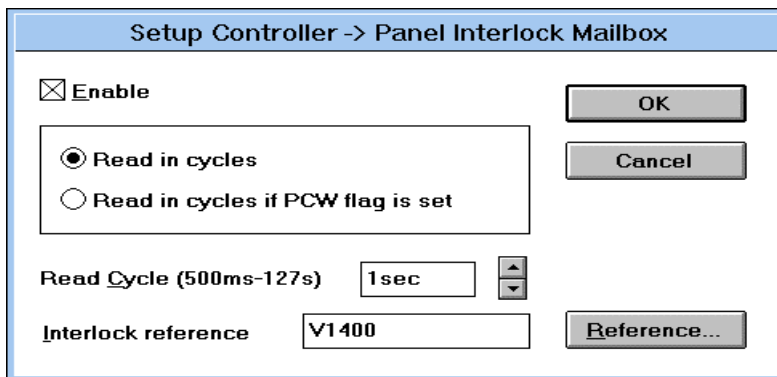


Figure 8-1

The Interlock Mailbox

The Mailbox is disabled by default. To enable it, simply mark the checkbox entitled *Enable* within the dialog box. The two radio buttons allow the user to read the Mailbox in two different modes:

- Read in cycles
- Read in cycles if CCW (Controller Control Word) flag is set

In the latter case, the panel will cyclically read the data in the Mailbox only when bit C15 in the Controller Control Word of the Reserved Data Area is set. The purpose of this mode is to reduce the overhead of the communication time when there is no need for the controller to send commands to the panel.

The *Read Cycle* time specifies how frequently the operator panel will read the data in the Mailbox to check to see if it contains a new command. The faster the Mailbox *Read cycle*, the faster the panel will respond to commands from the controller. However, the update of the variables shown on the display will be slower.

The *Interlock reference* is the address of the first Mailbox register in the controller memory. The address can be entered directly as a string or with a fill-in-the-blank dialog box displayed by clicking on the *Reference* button. When entering the starting address, care must be taken to ensure that the controller memory used by the Mailbox does not overlap with the memory areas reserved for other panel functions such as alarms, I/O update, keyboard update, etc.

8.2 - Structure of the Mailbox

The controller can issue different commands depending upon the values written to the Mailbox. Some commands require parameters (which have a binary numeric format) to be included with the command, while other commands require the panel to respond with data. The structure of the Mailbox in the controller memory is shown below in Table 8-1. *The Status Word* and the *Command/Response Word* are always required for the Mailbox. Parameter 0 - Parameter 17 Words are only used if required by the particular Mailbox command.

Offset	
0	Status Word
1	Command/Response Word
2	Parameter 0
3	Parameter 1
...	
19	Parameter 17

Table 8-1

The user can determine the controller memory addresses of all the data elements in the Mailbox by using the starting address of the Mailbox area (set in the *Designer* software) and the memory map shown in Table 8-1.

Status Word

The *Status Word* is the main handshaking register of the Mailbox. Both the controller and the panel can write to this register. The status word contains a binary number, the meaning of which is described in Table 8-2.

Code	Status	Written by
0	No request, Mailbox is available	Controller
1	Pending request	Controller
2	Mailbox busy	Panel
3	Error code: Illegal command	Panel
4	Command completed	Panel
5	Panel restart	Panel

Table 8-2

Command/Response Word

The controller specifies which Mailbox command it wants to execute by placing the command code of the desired command in the Command/Response Word. The available Mailbox commands and their command codes are given in Table 8-3. The UniOP panel writes a binary value to the Command/Response Word when it has executed the command requested by the controller to indicate the result of the operation.

Parameters

The Parameter Words are used only when required by a specific command. Some commands do not require any parameters at all. The following section describes how to use and what Parameter Words are required for each Command Word.

8.3 - Available Mailbox Commands

The Mailbox commands are listed in Table 8-3. The command codes must be written by the controller into the Command/Response Word register.

Command	Description
1	Recipe Status
2	Start Recipe Download
3	Start Recipe Upload
4	Set Parameter Set Number
5	Get Parameter Set Number
6	Get Recipe Transfer Priority
7	Set Recipe Transfer Priority
17	Request Data Entry Mode
33	Password Status
49	Start Controller to Controller Transfer With No Confirmation
50	Start Controller to Controller Transfer With Confirmation
81	Set RTC
97	Clear Event List
113	Start Report Printout
114	Stop Report Printout
129	Get Current Language
130	Set Current Language
145	Start Screen Saver
146	Stop Screen Saver
147	Enable Screen Saver in Alarm Mode
148	Disable Screen Saver in Alarm Mode

Table 8-3

The Interlock Mailbox

After performing the operation, the panel will respond back to the Command/Response Word with one of the codes listed in Table 8-6. Note that a Recipe transfer may take several seconds, depending mainly on the number of bytes that have to be transferred.

Code	Description
0	OK, Transfer completed successfully
2	Error: There are no Recipes defined
3	Error: Error in project file
4	Error: Illegal Page number has been requested
5	Error: Illegal number of parameter set has been requested
6	Error: The requested parameter set is locked (that is, it is being used by the operator panel for a data entry operation)
7	Error: A communication error occurred during the transfer

Table 8-6

Set Parameter Set Number

The controller can use this command to select a given Recipe parameter set.

Command code: 4

Two parameters are required by this command:

- Parameter 0 Page Number
(1 - max. number of pages in the project file)
- Parameter 1 Parameter Set Number
(1 - max. number of pre-defined parameter sets)

After performing the operation, the panel will respond back to the Command/Response Word with one of the codes listed in Table 8-7.

Code	Description
0	OK
2	Error: Recipes not defined in project file
3	Error: Error in project file
4	Error: Illegal page number requested
5	Error: Illegal record number requested
6	Error: Requested record locked

Table 8-7

Get Parameter Set Number

The controller can use this command to get the current Recipe parameter set number.

Command code: 5

Only one parameter is required by this command:

Parameter 0 Page Number
 (1 - max. number of pages in the project file)

After performing the operation, the panel will respond back to the Command/Response Word with one of the codes listed in Table 8-8.

Code	Description
0	OK
2	Error: Recipes not defined in project file
3	Error: Error in project file
4	Error: Illegal page number requested

Table 8-8

Get Recipe Transfer Priority

The controller can use this command to get the current Recipe transfer priority level.

Command code: 6

This command requires no parameters.

After performing the operation, the panel will respond back to the Command/Response Word with one of the codes listed in Table 8-9.

Code	Description
0	Normal
1	Highest
2	Error: Recipes not defined in project file

Table 8-9

Set Recipe Transfer Priority

The controller can use this command to set the current Recipe transfer priority level.

Command code: 7

Only one parameter is required by this command:

Parameter 0 Priority Level (0=Normal, 1=Highest)

After performing the operation, the panel will respond back to the Command/Response Word with one of the codes listed in Table 8-10.

Code	Description
0	OK
2	Error: Recipes not defined in project file
3	Error: Illegal priority setting requested

Table 8-10

Request Data Entry Mode

The controller can use this command to switch the operator panel to Data Entry Mode.

Command code: 17

Two parameters are required by this command:

- Parameter 0 Index Number of required Page
(1 - max. page number in project file)
- Parameter 1 Index Number of required Data Field
(1 - max. number of data fields in the page)

After performing the operation, the panel will respond back to the Command/Response Word with one of the codes listed in Table 8-11.

Code	Description
0	OK
1	Error: Illegal page number has been requested
2	Error: Illegal field number has been requested
3	Error: Panel is not ready for Data Entry Mode

Table 8-11

Password Status

The controller can use this command to request information about the current password status.

Command code: 33

The command requires no parameters.

After performing the operation, the panel will respond back to the Command/Response Word with one of the codes listed in Table 8-12.

Code	Description
0	No passwords are defined in the project file
1	No valid password has been entered
2	A valid password has been entered
3	The system default password (0007) has been entered

Table 8-12

If Code 2 is returned, the Parameter Words will contain additional information as follows:

- Parameter 0 Current password level
- Parameter 1 First character (ASCII coded) of the current password
- Parameter 2 Second character (ASCII coded) of the current password
- Parameter 3 Third character (ASCII coded) of the current password
- Parameter 4 Fourth character (ASCII coded) of the current password

Start Controller to Controller Transfer With No Confirmation

This feature allows the user to transfer data in two different manners:

- 1) Between two controllers. In this case, the controllers can be connected by a controller network or with the UniNET network.
- 2) Between two registers located within the same controller.

*Note: Once more than one job has been created, it will be **impossible** to entirely delete the first job without also deleting the second job. For example, assume there are three jobs, created in the order Job 1, Job 2, Job 3. If the user wishes to delete Job 2, they must also first delete Job 3. On the other hand, **modifications** can be made to any job at any time.*

We will call one complete data transfer a *job*. When the controller requests a job to be executed, the panel responds immediately back to the controller and executes the job as soon as possible. Therefore, the controller does not know when, or if, the requested job will be executed.

To set up a transfer, select *Data Transfer* from the *Project* menu. The dialog box shown in Figure 8-2 will then be displayed.

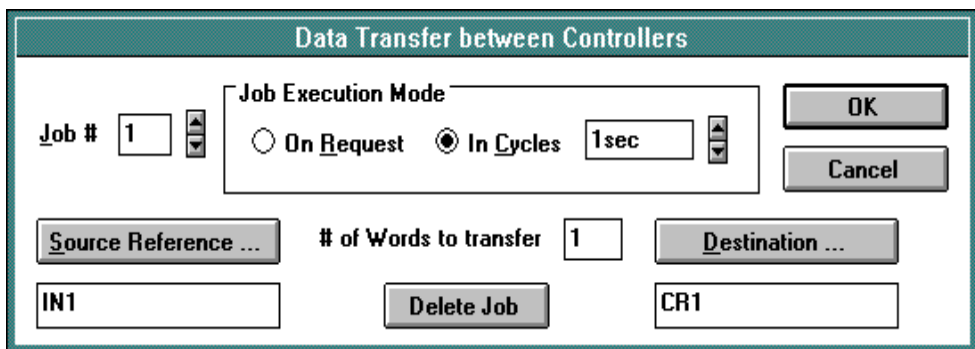


Figure 8-2

The Interlock Mailbox

The *Job #* field is used to select between the different jobs. Click on the *Source Reference* button to specify the register to be read. The dialog box shown in Figure 8-3 will then be displayed.

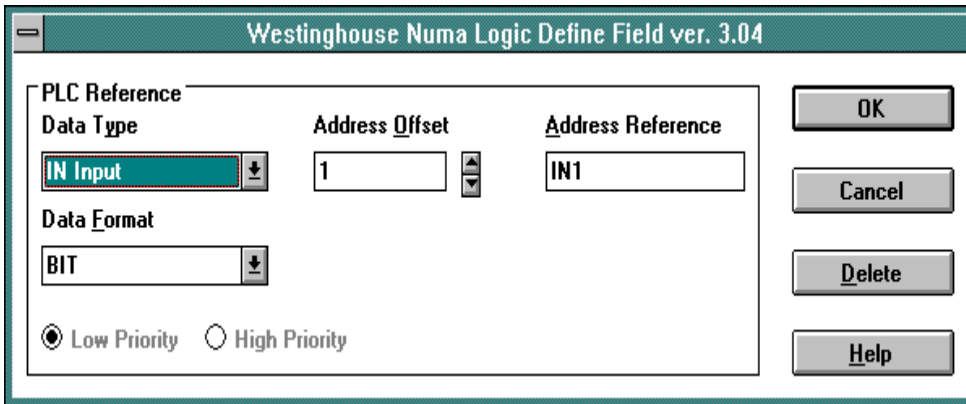


Figure 8-3

These fields will be slightly different depending on the controller that is being used. Use these fields to specify the type of data, format, and address of the register that is to be read. Once this information is entered, pressing OK will return the user to the dialog box shown in Figure 8-2. Enter the number of words to be transferred in the appropriate box. Clicking on the *Destination* button brings up a dialog box similar to the one shown above in Figure 8-3 and allows the user to enter the address in which the data is to be written.

If the *Job Execution Mode* is set to *In Cycles*, the panel will automatically transfer the data on each cycle. The cycle period can be set between 1 second and 127 seconds. Remember the faster the cycles, the faster the panel will transfer data, but this will slow down the rest of the system. If the *Job Execution Mode* is set to *On request*, the controller must send a request to the Interlock Mailbox before the data will be transferred. After completely setting up the dialog box, click on *OK*. Now select *Interlock Mailbox* from the *Project* menu. Set up the Mailbox as described within the section entitled *Definition of a Mailbox*. When the controller sends a request to the Mailbox, the Mailbox will read the command word and the

parameter. The panel will then send a response word back to the controller and execute the command.

Command code: 49

This command requires only one parameter:

Parameter 0 Job Number (1-255)

After performing the operation, the panel will respond back to the Command/Response Word with one of the codes listed in Table 8-13.

Code	Description
0	OK
1	Error: Controller to Controller not defined at all
2	Error: Illegal job number
3	Error: Queue is full

Table 8-13

Start Controller to Controller Transfer With Confirmation

This command is set up in the same manner as the command *Start Controller to Controller Transfer With No Confirmation*.

Command code: 50

This command requires only one parameter:

Parameter 0 Job Number (1-255)

After performing the operation, the panel will respond back to the Command/Response Word with one of the codes listed in Table 8-14.

The Interlock Mailbox

Code	Description
0	OK
1	Error: Controller to Controller not defined at all
2	Error: Illegal job number
3	Error: Not used
4	Error: Communication error while reading source data
5	Error: Communication error while writing destination data

Table 8-14

Set RTC (Real Time Clock)

This command enables the controller to set the Real Time Clock located within the panel.

Command code: 81

This command requires six parameters:

- Parameter 0 Day (1-31)
- Parameter 1 Month (1-12)
- Parameter 2 Year (94...99, 00....)
- Parameter 3 Hour (0-23)
- Parameter 4 Minute (0-59)
- Parameter 5 Second (0-59)

After performing the operation, the panel will respond back to the Command/Response Word with one of the codes listed in Table 8-15.

Code	Description
0	OK
1	Error: RTC error
2	Error: Requested setting out of range

Table 8-15

Clear Event List From Controller Mailbox

The controller can use this command to request that the UniOP panel clear its event list.

Command code: 97

The command requires no parameters.

After performing the operation, the panel will respond back to the Command/Response Word with a 0, indicating that the event list has been cleared.

Start Report Printout

This command is used to start a report printout. The method used in defining reports is described in Chapter 2.

Command code: 113

This command requires only one parameter:

Parameter 0 Report Number

After performing the operation, the panel will respond back to the Command/Response Word with one of the codes listed in Table 8-16.

The Interlock Mailbox

Code	Description
0	OK
1	Error: Printer process already active (if START command is issued more than once) Error: Printer process already inactive (if CANCEL command is issued more than once)
2	Error: Illegal report number
3	Error: Activation queue is full

Table 8-16

Stop Report Printout

This command is used to stop a report printout. The method used in defining reports is described in Chapter 2.

Command code: 114

This command requires no parameters.

After performing the operation, the panel will respond back to the Command/Response Word with one of the codes listed in Table 8-17.

Code	Description
0	OK
1	Error: Printer process already inactive

Table 8-17

Get Current Language

The controller can use this command to get the number of the currently active language from the panel.

Command code: 129

This command requires no parameters.

After performing the operation the panel will respond back to the Command/Response Word with one of the codes listed in table 8-18.

Code	Description
0	OK
1	Error, the project is not multilanguage.

Table 8-18

If Code 0 is returned, the Parameter Word 0 will contain the number of the active language.

Set Current Language

The controller can use this command to change the language in the operator panel.

Command code: 130

Parameter 0 Language number

After performing the operation the panel will respond back to the Command/Response Word with one of the codes listed in table 8-19.

Code	Description
0	OK
1	Error, the project is not multilanguage.
2	Error, illegal language number requested

Table 8-19

Start Screen Saver

The Interlock Mailbox

The controller can use this command to immediately activate the screen saver function.

Command code: 145

No parameters are required by this command. After performing the operation the panel will respond back to the Command/Response Word with one of the codes listed in table 8-20.

Code	Description
0	OK
1	Error, screen saver not enabled in the project file

Table 8-20

Stop Screen Saver

The controller can use this command to immediately deactivate the screen saver function.

Command code: 146

No parameters are required by this command. After performing the operation the panel will respond back to the Command/Response Word with one of the codes listed in table 8-21.

Code	Description
0	OK
1	Error, screen saver is not enabled in the project file

Table 8-21

Enable Screen Saver Function in Alarm Mode

The controller can use this command to enable the default behavior of the screen saver in Alarm Mode. If UniOP is in Alarm Mode and the time for the screen saver activation has elapsed, the screen saver will start. To stop the screen saver, simply touch a key. This command code can be used following command 148 (see next description) in order to go back to the default setting.

Command code: 147

No parameters are required for this command. After performing the operation the panel will respond back to the Command/Response Word with one of the codes listed in table 8-22.

Code	Description
0	OK

Table 8-22

Disable Screen Saver Function in Alarm Mode

The controller can use this command to disable the screen saver function when UniOP is in Alarm Mode. If UniOP has the screen saver activated and an alarm occurs, UniOP will turn off the screen saver and display the alarm page. The alarm page will be displayed as long as there is one currently active alarm. Use command 147 (see previous description) to go back to the default behavior.

Command code: 148

No parameters are required for this command. After performing the operation the panel will respond back to the Command/Response Word with one of the codes listed in table 8-23.

The Interlock Mailbox

Code	Description
0	OK

Table 8-23

8.3 - Mailbox Programming

To use the mailbox successfully, the panel and the controller must interact tightly. The interaction between the panel and the controller can be thought of as a short conversation between two people.

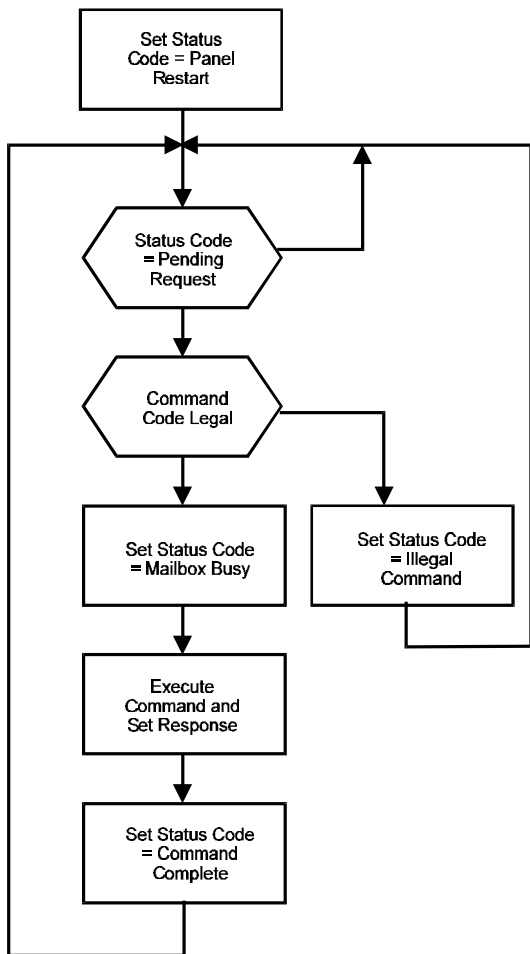
The first person (the controller) tries to start a conversation with the second person (the UniOP panel) on a particular topic (the Mailbox command code). After the first person has introduced himself and the topic of the conversation, the second person decides whether he feels competent enough to join in. If the second person decides not to join in the conversation, he politely informs the first person that he feels he does not know enough about that particular topic to make an informed comment and waits for a change in the topic of the conversation. If the second person does decide to enter into the conversation, he ponders the topic and then expresses his well-considered opinion. The vital ingredient in a successful conversation is that nobody is interrupted while they are talking.

The flow chart in Figure 8-4 describes the program sequences that must be executed in parallel by both the UniOP panel and the controller ladder logic program to ensure a successful Mailbox session.

The following important notes should be kept in mind:

- At system start-up, the UniOP panel writes the special Status Code *Panel Restart* to inform the controller that the panel itself has been reset.
- Both the panel and the controller can write to the Status Word and the Command/Response Word; however, they must not write at the same time to the same memory location. Proper operation of the Mailbox is ensured if the sequence described in the figure is followed.
- The controller program must always wait for the completion of the current Mailbox session before attempting to start a new one.
- The controller program should always check the status returned by the UniOP panel on completion of a session.

Sequence for the Panel



Sequence for the Controller

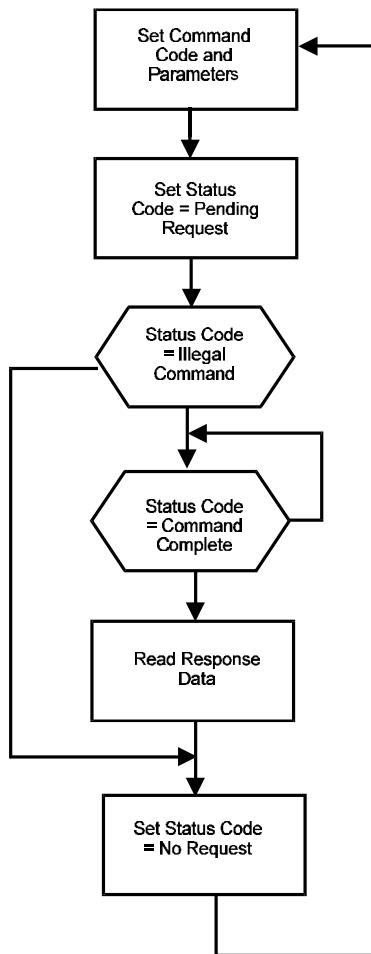


Figure 8-4

Chapter 9 - The Font Editor

The Font Editor allows the user to modify the downloadable font of semi-graphical displays. Each font consists of 256 characters that can be edited or changed. This allows the user to create any necessary characters for a particular project. In most cases, the user would not want to edit any of the standard characters such as letters, numbers, large character blocks, or bargraph blocks.

9.1 - Editing Characters

1. Select *Run Font Editor* from the *Options* pulldown menu.
2. The font will appear on the display in the Font Editor as shown below in Figure 9-1.
3. By double clicking on a particular pixel, the user is able to toggle the appearance of that pixel. For example, if a pixel is initially black, double clicking on it will change it's color to white.

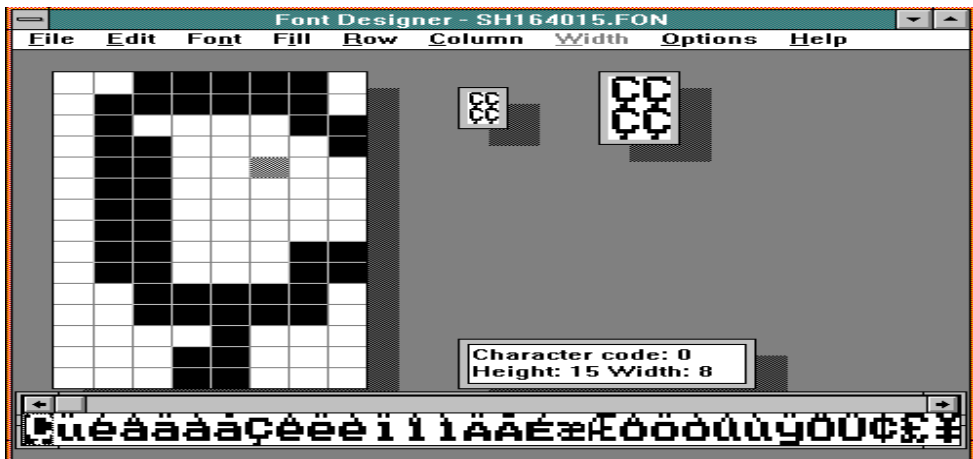


Figure 9-1

9.2 - Defining Symbols

The Designer software offers the user the ability to create their own symbols. While still included in the software, this feature has become obsolete with the current graphical release.

1. To select symbol mode, select *Define Symbol* from the *Options* pulldown menu.
2. Select *Symbol Dimensions* and enter the height and width of the symbol you would like to define. Select *OK*.
3. Select *Define Symbol - Draw New Symbol* from the *Options* menu.
4. The display will then change to the symbol dimensions that were selected. The editor will put the selected number of characters from the font in this symbol edit box, starting with the character that was highlighted.
5. Select *Define Symbol - Compose Symbol* from the *Options* menu. Double click on each character that makes up the symbol. Start with the character that will be in the upper left-hand corner and move across. The light gray character box will automatically move to the next character location. If a mistake is made, simply single click on the character location to move the cursor box and then double click on the correct character in the font bar. When the symbol contains all the correct characters, click in the small upper box. Give the symbol a name by typing it in this box and clicking on *OK*.

9.3 - Saving a Font

1. When finished modifying the font, it can be saved by selecting *Save* or *Save As* from within the *File* menu. Fonts need to be saved to the Windows System directory. When changing a font, it is recommended to use *Save As* and give the font a new name so as not to change the original font.
2. The font must then be installed by selecting *Install-View installed Fonts* under the *File* menu within the *Font Editor*. Select which display panels this font is to be used with and click on the *Install Font* button.
3. Now the user can choose *Select Font* from the *Project* pulldown menu from within *Designer* and be able to select the customized font.

9.4 - Bargraph Characters, Box Drawing Characters, and Large Characters

The Font Editor also provides a method of editing characters that are used in basic character formation. Each of these are available from within the Font Editor by selecting the *Options* menu.

- **Bargraph Characters** - The start code for bargraphs is the first non-blank character within the bargraph character set. Keep in mind that the bargraph character set must be kept continuous (i.e., the characters must be kept in numerical order). An example of the start code is shown in Figure 9-2. *Note that the character code will not remain the same for each font.*

The Font Editor

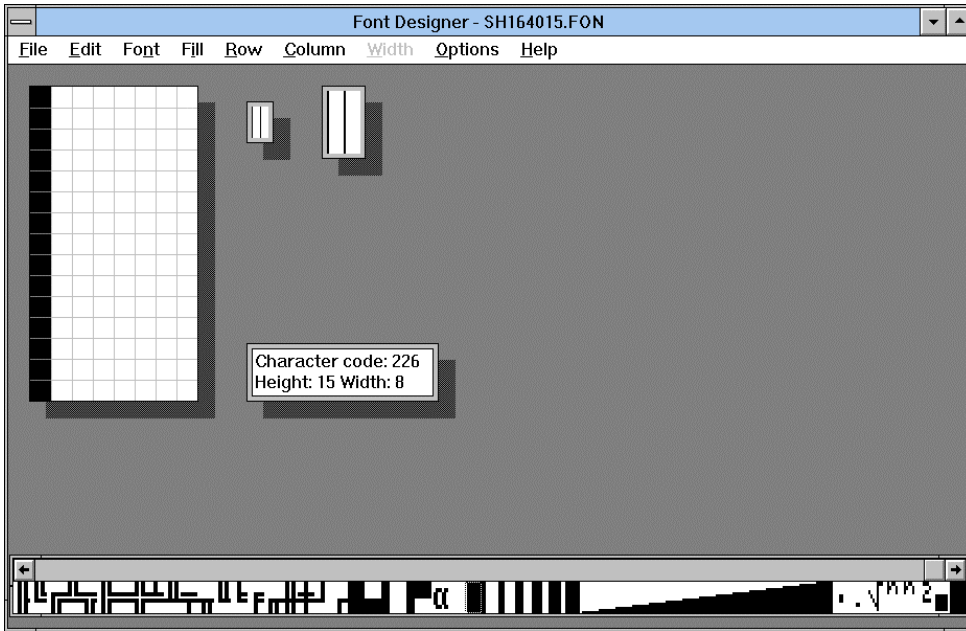


Figure 9-2

- **Box Drawing Characters** - By selecting *Rectangles* from the *Options* menu, the user is able to edit the characters that form each of the two rectangles that are implemented in the Designer software. Simply highlight the area on the rectangle you wish to change and double click on the character that you wish to replace it with. Figure 9-3 shows the dialog box that will appear when you select this option.

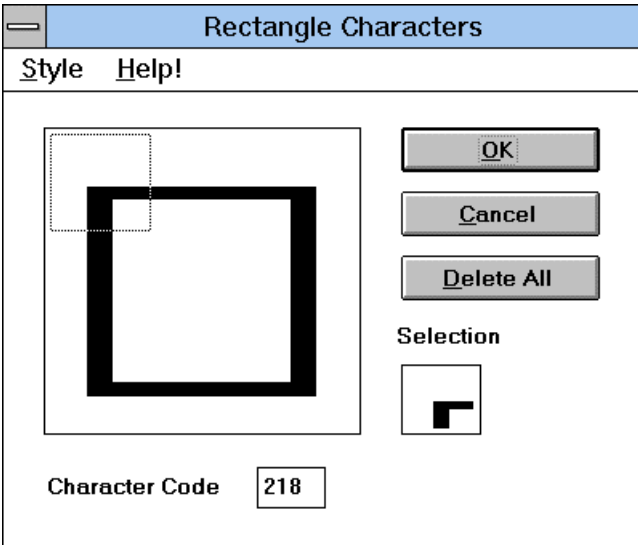


Figure 9-3

- **Large Characters** - The large character set must be kept continuous. A dialog box is shown in Figure 9-4 that represents the starting character in a large character set. *Note that this starting character is not the same for every font.*

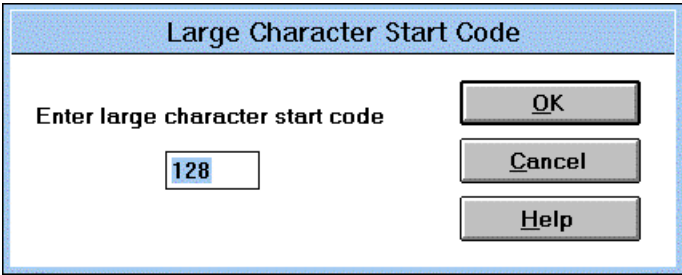


Figure 9-4

Chapter 10 - Graphics

By using a UniOP graphics-capable panel , the user is capable of importing, displaying, and manipulating graphics in a project file. 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*.

10.1 - 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*.

From Designer version 5.06 and firmware version 4.22, it is possible to import a 256 color bitmap into a project file for any of the UniOP operator interfaces that utilize a color VGA display (i.e., ETT-VGA, MKDC-VGA, etc.). To set the Designer software up to allow for this, select *Project-Panel Setup* and choose the model *VGA 256 Colors*.

Example

The following steps will help the user to import a bitmap file:

1. Make sure that the *Enhanced graphics support* is enabled in the *Panel Setup* dialog box under the *Project* menu.
2. Highlight the area in which the graphic is to be placed by clicking and dragging the mouse.
3. Select *Import Bitmap Graphics* from the *Graphics* menu. This will open a dialog box that allows the user to select a file. Select the filename that is to be used and click on *OK*. Another dialog box, shown in Figure 10-1, will open that allows the user to label the bitmap and select import options.

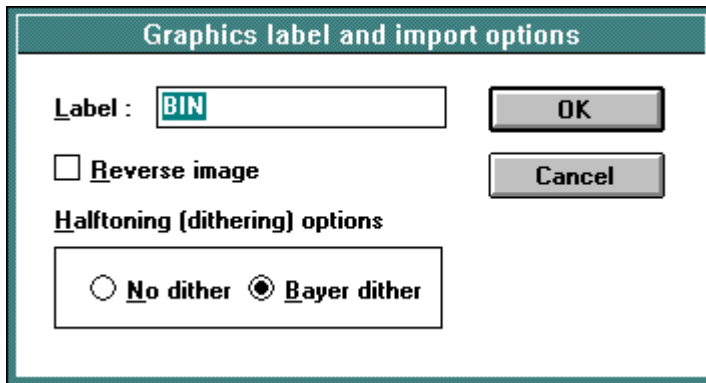


Figure 10-1

4. The *Label* will default to the filename of the bitmap file. However, this label can be changed. This label is used to recall the bitmap if it is used again in the project file.
5. The user can also choose different imaging and dithering options. It is suggested to import the graphic using the default values. If the result is undesirable, the user can simply re-import the graphic and change these settings.
6. Figure 10-2 shows how the bitmap file will look after it is imported into the project file.

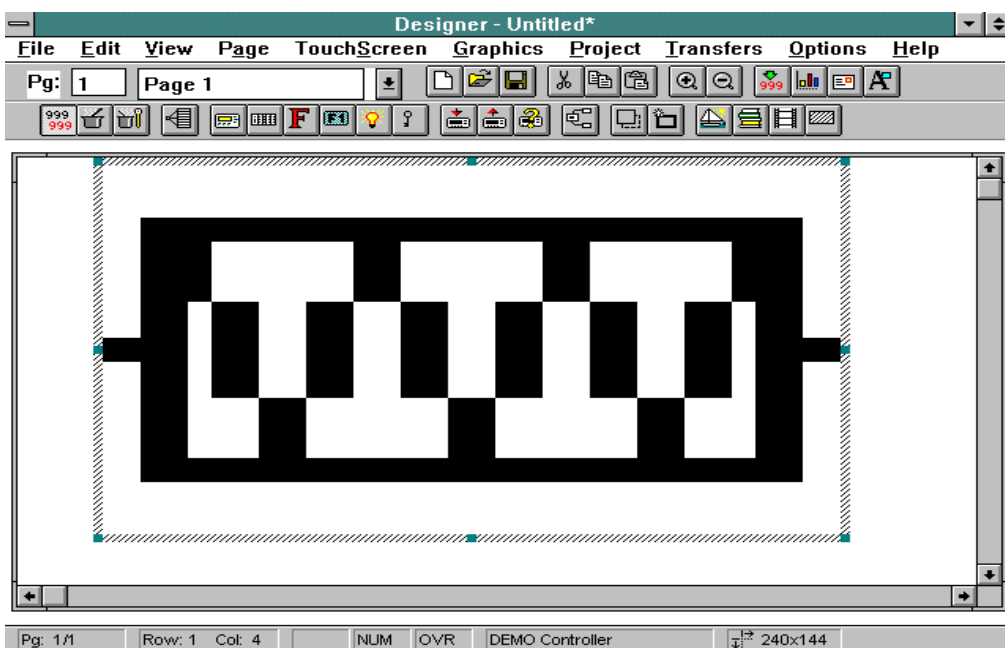


Figure 10-2

7. A graphic can be moved or resized once it is imported. To move a graphic, simply single click the left mouse button over the graphic and move it to the desired location. To resize a graphic, single click the left mouse button once on the graphic and use one of the selection handles that will appear.
8. To duplicate or copy a graphic within the same page, hold the Ctrl key down and click on the graphic. Drag the duplicated graphic to a new location and release the mouse button.
9. To delete a bitmap graphic, click on the graphic to select it and either press the *Delete* key or click on the *Cut* tool.

10.2 - 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 below in Figure 10-3.

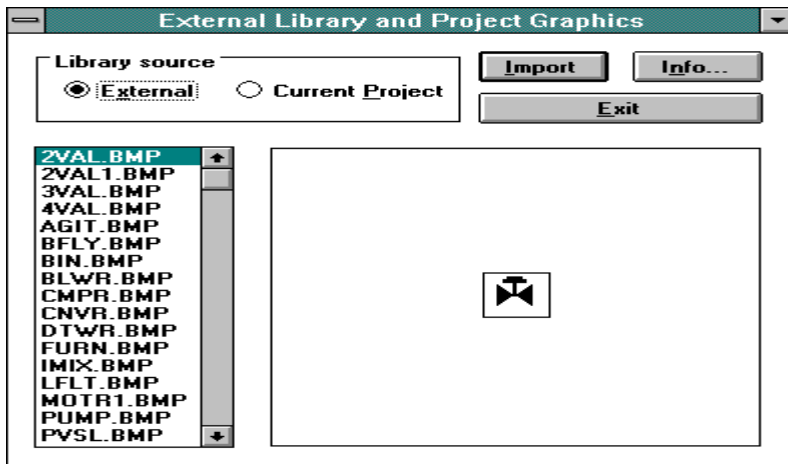


Figure 10-3

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.

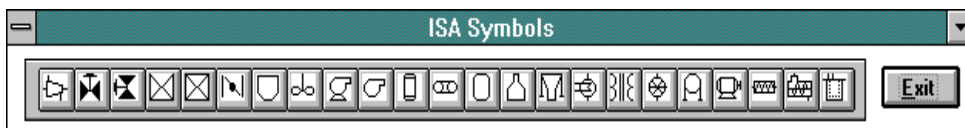
A graphic can be selected by single clicking the left mouse button on the filename you wish to use. Once a graphic is selected, a preview of the image will be shown within the dialog box.

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 importing the graphic 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.

10.3 - 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.

10.4 - 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 1

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 two values, we could have selected the data format as a bit (assuming the 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 its 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 10-3). 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 5.
 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 10-4. 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.

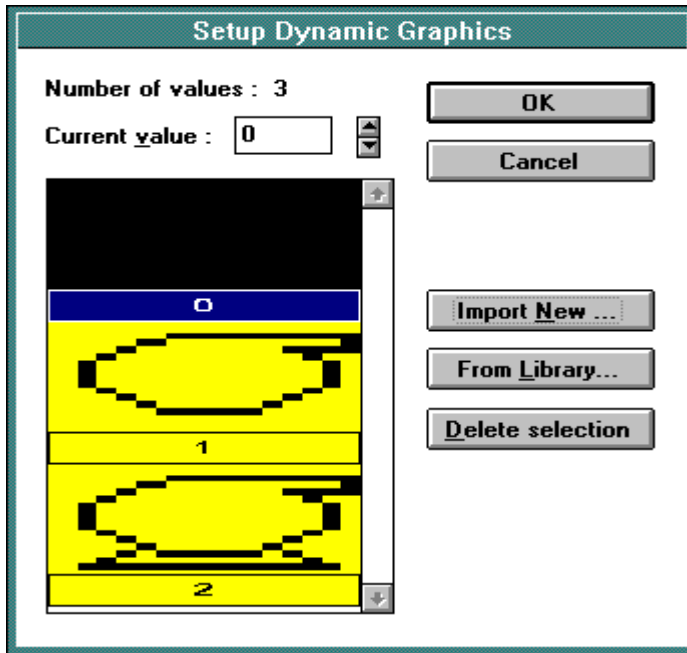


Figure 10-4

Example 2

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 the graphic of the blower is 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 the user to select the memory location in the controller that is to be used. 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 be 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 its 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 10-3). 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

Graphics

- 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 5. Since this is the only graphic that needs displayed at this memory location, click on *OK* to return the page editor workspace. We 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. Once the user has imported the graphic and returned to the page editor workspace, the procedure is complete. Figure 10-5 shows the what the dialog boxes should look like when the graphic for the pump and the blower have been correctly imported.

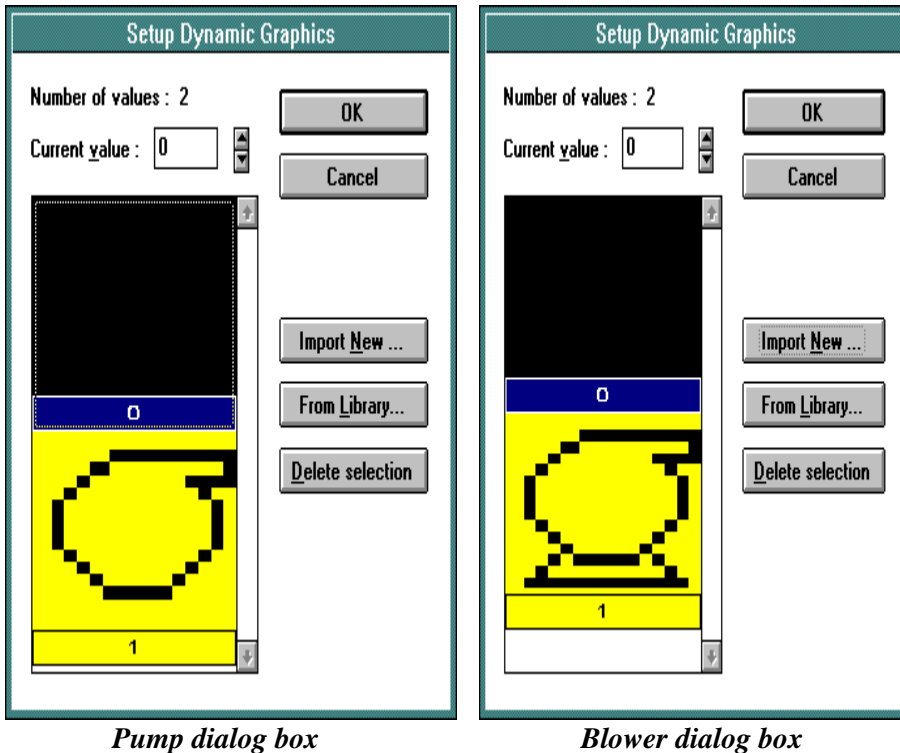


Figure 10-5

10.5 - 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

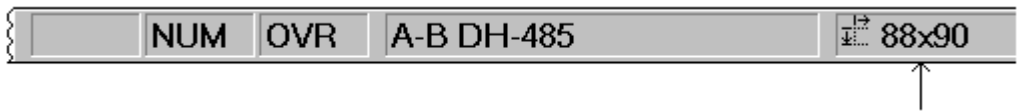
Assume a user wants to simulate the fill level of a tank. In this case, a transparent graphic of a tank could be used along with a bargraph to simulate the fill level. The procedure for implementing this feature is as follows:

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*. *Note that the graphic can be toggled from visible to invisible by simply re-selecting Transparent Graphics from the Graphics menu (or by using the icon in 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.

10.6 - 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 that 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. 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.
4. 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.
5. 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.
6. Color graphics *can* be imported onto a monochrome panel. Designer will attempt to cast the graphic in monochrome the best that it can. This will produce *halftoning* effects, which are dots that simulate different levels of gray using different densities of monochrome pixels.
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 it's size in pixels 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.

Chapter 11 - Color

It is now possible to display any combination of up to 16 different colors on certain models of UniOP panels. To access the color option within the software, the user can select *Color palette* from the *Edit* menu, or click on the appropriate icon in the *Extra ToolBelt*. Doing so will bring up the dialog box that is shown below.

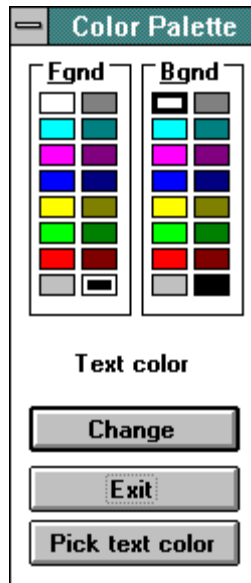


Figure 11-1

This dialog box allows the user to change the background color and the foreground color (either static text or data fields). The user can select whether to change these colors on a global level or on a current selection. If the user wishes to make the colors the default setting for all subsequently created pages, selecting the colors and clicking on the *Pick text color* button will accomplish this. Likewise, if the user wishes to change the colors only for the currently selected area, this can be accomplished by selecting the colors and clicking on the *Change* button. The area below the palette bars and above the buttons will indicate the global setting for the project file. For example, in the dialog box shown above, the colors

are set for a white background and a black foreground. Every page that is created will have these colors as a default setting unless the user specifies otherwise by selecting different colors and clicking on the *Pick text color* button.

NOTE: The button entitled *Pick text color* will change to *Pick field color* whenever a data field is selected. Likewise, the area below the palette bars that shows the global setting will also change from *Text color* to *Field color* whenever a data field is selected.

11.1 - Changing the Background / Foreground Color Globally

1. Either select *Color palette* from the *Edit* menu or click on the appropriate icon in the *Extra ToolBelt*.
2. Select the color(s) to be used and click on the *Pick text color* button.

11.2 - Changing the Background / Foreground Color for a Highlighted Area

1. Highlight the area that is to be affected.
2. Either select *Color palette* from the *Edit* menu or click on the appropriate icon in the *Extra ToolBelt*.
3. Select the color(s) to be used and click on the *Change* button.

11.3 - Making the Colors of a Data Field or Static Text the Global Default Colors

1. Position the cursor somewhere on the data field or on the static text.
2. Either select *Color palette* from the *Edit* menu or click on the appropriate icon in the *Extra ToolBelt*.
3. Click on the *Pick text color* button.

11.4 - Finding Out the Colors of a Particular Area or Field

1. Either select *Color palette* from the *Edit* menu or click on the appropriate icon in the *Extra ToolBelt*.
2. Position the cursor on the desired location by single clicking the left mouse button.
3. Click on the title of the dialog box. The currently selected colors for the area will be reflected in the color palette bars.

11.5 - 256 Color Support

From Designer version 5.06 and firmware version 4.22, it is possible to import a 256 color bitmap into a project file for any of the UniOP operator interfaces that utilize a color VGA display (i.e., ETT-VGA, MKDC-VGA, etc.). To set the Designer software up to allow for this, select *Project-Panel Setup* and choose the model *VGA 256 Colors*.

11.6 - Application Notes

1. Each field can be in only one color. For example, assume the user has a field that displays a two digit number. If the first digit is blue, the second digit can not be displayed in any other color but blue.
2. If the user tries to make the background color and the foreground color the same, the software will display a text message asking the user if this is what they wish to do. If the background color and the foreground color are the same, everything will appear transparent and no data fields or static text will be visible.

Chapter 12 - Recipes

12.1 - Introduction

All versions of Designer above or equal to 4.00 offer the possibility of storing data inside the panel in data retentive memory. The available amount of data retentive memory varies depending on the UniOP model. This data retentive memory can be used to permanently store data for use by an attached controller. This data can be written to the controller, and, conversely, the data can be read from the controller and then placed in the data retentive memory. This concept is termed *Recipes* and offers a powerful way to extend the capabilities of the controller. This is especially true for controllers that have a limited amount of internal memory.

All UniOP panels offer memory for usage with Recipes, with the exception of the CP11, CP13, MD00, MD01 and the MD03, which are not Recipe capable.

Recipes are configured by simply adding the required controller data items to the page as Recipe data items. To add a Recipe data item, the user can perform the same procedure used to create a numeric field almost exactly. The only change necessary is to select *Data Field Source - Recipe Data* from the *Edit* menu *instead* of selecting *Data Field Source - Controller Data* (or select the *Recipe* icon from the *Extra ToolBelt* instead of the *Controller Data* icon).

Recipe data items contain all the information associated with normal controller data items, but rather than the data being read and written directly to the controller during the course of normal operation, the data is instead read from and written to the UniOP memory that is reserved for the data item. Only when the user explicitly asks the UniOP panel to write the data to the controller is the data sent to the controller. Similarly, only when the user explicitly asks the UniOP panel to read the data from the controller is the data actually read from the controller.

12.2 - A Quick Start Example

It is not necessary to create a complex project to try Recipes. This example will show the user how to define a very simple Recipe in a few steps.

1. Make sure that the panel is in *Configuration Mode*.
2. Connect the panel to the personal computer and the controller using the correct cables.
3. Start the *Designer* software.
4. Define some background text and two numeric fields with different addresses as shown in Figure 12-1.

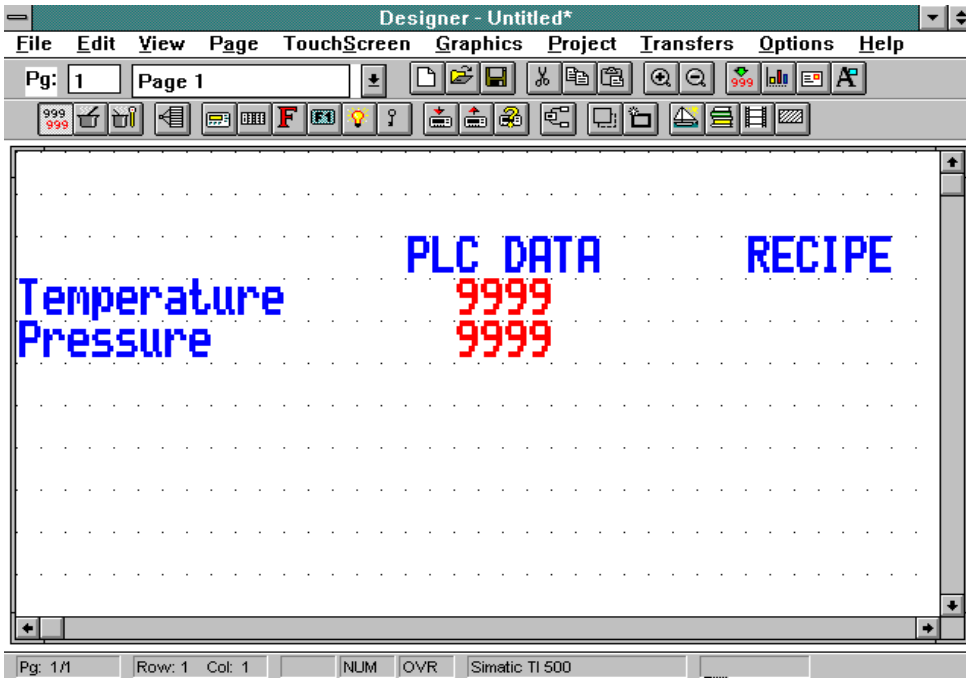


Figure 12-1

5. Go to the *Edit* menu and select *Recipe Data* from the *Data Field Source* option or choose the *Recipe* icon in the *Extra ToolBelt*.

6. Define two Recipe data items with the same addresses as given to the numeric fields that were created in step 4. The two Recipe data fields will be shown on the Designer page with the placeholder 'R' instead of the '9' used for numeric fields (see Figure 12-2)

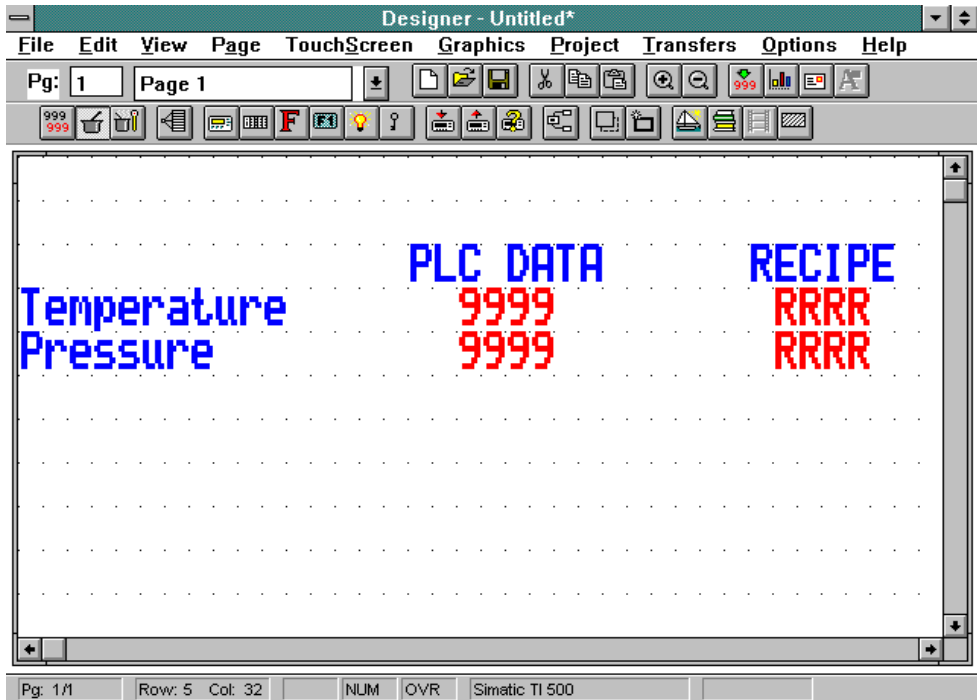


Figure 12-2

7. Go to the *Page* menu and select the option *Recipe Configuration*. This will bring up the dialog box that is shown in Figure 12-3.
8. Enter 4 for the *Number of Parameter Sets* and initialize the Recipe values as shown in Figure 12-3. Note that the Recipe Item addresses will be the addresses of the fields that were defined earlier. Select *OK* to confirm the operation.

Recipes

Recipe Item		1	2	3	4	5
V1	1	241	334	147	980	
V2	2	32	31	14	56	
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					

Figure 12-3

9. Enter the *Keyboard Macro Editor* and configure the *F1* key using the command *Recipe Control* to download the current parameter set.
10. Download the project to the panel either by pressing the *F2* key on the *computer keyboard*, by selecting the *Download* icon in the *Extra ToolBelt*, or by choosing *Download* from the *Transfers* menu.
11. When the download is finished, the panel will go into *Operation Mode*. The variables in the left column represent the content of the controller memory. The column on the right will represent the content of the first *Recipe* parameter set once the *F1* key is pressed.
12. Pressing the *F1* key will cause the panel to begin downloading the current *Recipe* parameter set (which is parameter set 1). After a few seconds, the operation will be completed and the content of the controller memory will show the same values as those that are stored in parameter set 1.

12.3 - Adding Recipe Data Items with Designer

The user can add Recipe data items to a page using Designer by selecting *Data Field Source - Recipe Data* from the *Edit* menu. From the *Data Field Source* menu, the user can specify that the data item is either *Controller Data* (the default), *Recipe Data*, or a *Panel Control Variable*. The *Control Variable*, which will be discussed later, offers a means of controlling and monitoring Recipes.

Note: *When Recipe Data has been selected in the Data Field Source menu (or with the icon), all data items that are subsequently added to the page by the user will be Recipe data items.*

Specifying Initial Values for Recipe Data Items

A Recipe is associated with a particular page and is composed of all the Recipe data items on that page. However, there can be different parameter sets of a Recipe. A Recipe parameter set is created by assigning particular values to the Recipe data items on a page. It is possible with Designer to create many parameter sets that are contained within a single Recipe. All of these different parameter sets of the Recipe can contain different values and control different processes. This allows the user to enter many different sets of parameters for the controller. One set may be used to configure the controller to control the production of 2 mm screws, another set may be used to configure the controller to control the production of 5 mm screws, and yet another to control the production of 7 mm screws. Each set of parameters would be stored in a different parameter set within the same Recipe.

The user can specify the number of parameter sets contained within a Recipe, as well as assign the initial values to the different parameter sets of a Recipe with the *Recipe Configuration* dialog box. This dialog box is accessed by selecting *Recipe Configuration* from the *Page* menu. The initial values entered for a particular Recipe data item are in the format that was specified in the define field dialog box for that data item. For example, if a numerical format of hexadecimal was entered in the define field dialog box for a Recipe data item, then all the values entered in the *Recipe Configuration* dialog box for this Recipe data item will also be in

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hexadecimal. If the user specifies a numeric data format of hexadecimal for a Recipe data item, and then enters a value of 10 in the *Recipe Configuration* dialog box, the 10 will be interpreted as 10 hexadecimal (16 decimal).

Note: The user must have Recipe data items defined on the current page before entering the Recipe Configuration dialog box.

The *Recipe Configuration* dialog box is in the form of a spreadsheet. *Each row is associated with a particular Recipe data item.* The controller address of the Recipe data item is displayed at the far left hand side of the row, enabling the user to tell which row is associated with which Recipe data item.

Each column is associated with a particular parameter set of the Recipe. The initial values for a particular parameter set can be fully specified by entering a value for each row in the column. Each parameter set is identified by a numeric number. The first column corresponds to parameter set 1, the second column to parameter set 2, and so on.

12.4 - Selecting Parameter Sets & Controlling Transfers

As mentioned earlier, *Control Variables* offer a means of controlling and monitoring the Recipes. Control Variables are special data items that are stored in the UniOP panel memory. The user can control certain operations of the panel by modifying the values held in these internal variables. Control Variables can be added to the project in exactly the same way as controller variables. The user must first select *Data Field Source - Panel Control Variable* from the *Edit* menu. With this selection in force, all newly added data items will be Control Variables.

There are 8 types of Control Variables: *Recipe File Status*, *Recipe Parameter Set Selection*, *Recipe Action*, *Data Entry Status*, and *Data Entry Field Number*, *Recipe Page for Selection*, *Language and Passthrough Status*. The first five will be discussed here. The other control variables can be found within their respective sections in the text (i.e., Language is explained in the Multilanguage section, Recipe Page for Selection is explained with Recipe Menus, Passthrough Status is explained with Remote Passthrough).

Recipe File Status

In the UniOP panel memory there is a single memory location that is used to store the status of the entire Recipe data in the panel. This memory location is called the *Recipe File Status*.

The *Recipe File Status* cannot be modified by the user of the panel; it is controlled by the internal logic in the panel. The *Recipe File Status* can take on only 2 values, 0 or 1. A value of 0 indicates that all of the Recipe data for every page in the project is valid. A value of 1 indicates that an error in some part of the Recipe data was found. This means that the integrity of the Recipe data is compromised. It is very rare for this to happen, but it can feasibly occur if the UniOP panel is powered off while the user is modifying the value of a Recipe data item.

If the *Recipe File Status* has a value of 1 the user must physically change the value of one of the Recipe data items to reset the *Recipe File Status* to 0. Until this occurs, the user will not be able to perform Recipe transfers.

Recipe Parameter Set Selection

For each page that contains a Recipe, the UniOP panel reserves a separate memory location for the *Recipe Parameter Set Selection* for each Recipe page. The *Recipe Parameter Set Selection* memory location stores the numeric identifier of the currently selected Recipe parameter set for the Recipe page.

The user can add *Recipe Parameter Set Selection* data items to the project. These data items can then be used to visually display the currently selected Recipe parameter sets of the various Recipes in the project.

When the user adds these data items to the project, they must specify which Recipe is to be monitored by the data item. This is done by specifying the page number that contains the required Recipe.

For example, a project might contain three Recipes, one on page 2, one on page 3 and the other on page 7. To monitor the currently selected Recipe parameter sets of

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these three different Recipes, it is necessary to add three Recipe Parameter Set Selection data items to the project. One of these data items will be used to monitor the Recipe on page 2, one to monitor the Recipe on page 3 and the other to monitor the Recipe on page 7. These three Recipe Parameter Set Selection data items could all be placed on any page of the project. Regardless of where they are placed in the project, the address of the first data item would be Recipe Parameter Set Selection 2, the address of the second data item would be Recipe Parameter Set Selection 3 and the address of the third data item would be Recipe Parameter Set Selection 7.

*The user can also change the parameter set of a Recipe on a particular page by modifying the value held in the Recipe Parameter Set Selection variable. This is done in the same way as changing the value of a normal controller data item. For example, to make Recipe parameter set number 3 the current parameter set, the user would enter a value of 3 in the appropriate Recipe Parameter Set Selection variable. In order to do this, the user must select the Recipe Parameter Set Selection variable as a **Read/Write** variable.*

Recipe Action

For each page that contains a Recipe, the UniOP panel reserves a separate memory location for the *Recipe Action* for that Recipe page. The Recipe Action memory location stores the current status of operation of the Recipe for the page.

The user can add Recipe Action data items to the project. These data items can then be used to visually display the current state of the various Recipes in the project.

When the user adds these data items to the project, they must specify which Recipe is to be monitored by the data item. This is done by specifying the page number that contains the required Recipe.

A Recipe Action data item can take on only 3 values: 0, 1 or 2.

A value of 0 indicates that the Recipe is in its normal state of operation. In this mode of operation, the values of the Recipe data items are displayed on the screen of the panel and the user can modify the values of the Recipe data items.

A value of 1 indicates that the Recipe data for the currently selected parameter set is being transferred to the controller. When the transfer is complete the value is automatically reset to 0.

A value of 2 indicates that the Recipe data for the currently selected parameter set is being transferred to the panel. When the transfer is complete the value is automatically reset to 0.

The user can start a Recipe transfer by entering a value of 1 or 2 for the Recipe Action data item. By entering a value of 1, the user can force the UniOP panel to send the Recipe data for the currently selected parameter set to the controller. By entering a value of 2, the user can force the controller to transfer the Recipe data for the currently selected parameter set to the panel.

Data Entry Status

This control variable will be set to a 1 while the UniOP panel is in Data Entry Mode. In all other modes it will be set to 0.

Data Entry Field Number

This control variable simply contains the field number of the selected data entry field whenever the panel is in Data Entry Mode.

12.5 - Recipes and the Keyboard Macro Editor

Recipe transfers can also be performed by using the Keyboard Macro Editor. *When doing so, the user should program the keys using Page n mode (where n is the page on which the Recipe of interest is located).* By selecting the *Recipe Control* macro command from within the *Commands* toolbar of the Keyboard Macro Editor, the user can either download, upload, or select a parameter set on any given page. By using the *Control Variable Step* macro command, the user can assign a key or touchcell to toggle through the different parameter sets.

12.6 – Recipe Menu Support

A **Recipe Menu** is a feature that simplifies recipe parameter set selection on UniOP through a user-friendly interface. It provides a menu-like field that will can contain names to describe the parameter set instead of using numbers. Each name represents one Recipe Parameter set.

In order to make usage of Recipe Menu possible, each Recipe Parameter set must be given a name. This is achieved by adding a Recipe Data Item field with a display format of ASCII on the page where the recipe is located and filling the Recipe Item values with a name for each parameter set. This ASCII field is called a **Recipe Name** field.

***Note:** This field is not a field type name; it only describes the field's purpose. A Recipe Name field must be defined to enable Recipe Menu support.*

There are three specific fields that support the Recipe Menus:

- Recipe Menu field,
- Recipe Page For Selection field and
- Recipe Key field.

The **Recipe Menu** field is the actual field that displays the menu with recipe names. The currently selected recipe parameter set is indicated using user defined attribute combinations (blink, highlight, reverse).

The **Recipe Page For Selection** field shows the number of the page containing the actual recipe data referred to by the Recipe Menu.

The **Recipe Key** field is not directly connected with Recipe Menus. It is a less user-friendly way of selecting a recipe parameter set by name. In order to choose a recipe parameter set, the user has to edit the field and type the wanted recipe name (instead of being able to select it from a menu). It can also be used to show the currently selected Recipe Parameter Set name for a specific page. The Recipe Key field must refer to a specific page with a defined Recipe Name.

All three of these fields do not depend on each other and can be freely put on any page in the project in any combination.

A set of keyboard macro commands support Recipe Menu:

- Go To Recipe Menu,
- Scroll Recipe Menu and
- Confirm Recipe Menu Selection.

The **Go To Recipe Menu** macro jumps to a specified page and sets the value of the Recipe Page For Selection.

The **Scroll Recipe Menu** macro is used to move the selection in the Recipe Menu field. This is the way that a new Recipe Parameter set name is chosen from the list.

The **Confirm Recipe Menu Selection** macro changes the current recipe parameter set to the one selected in the Recipe Menu field.

Defining a Recipe Name

The Recipe Name should be defined for all of the pages containing recipes that are going to be handled using Recipe Menu. It is also necessary for the pages that are referred to by Recipe Key field(s).

The Recipe Name is defined by adding a Recipe Data Item field of ASCII display format on the page with recipes and filling the Recipe Item values with a name for each Parameter set.

Note: This ASCII field is not an internal variable in the panel memory. It needs to be addressed to a physical location in the PLC memory. The amount of memory required depends on the length of the ASCII string: one byte per character.

Here is the procedure that describes how to add a Recipe Name definition. It assumes that the current page is the page with defined recipes and that it is the page for which you want to add a Recipe Name. Figure 12-4 shows the Recipe Configure dialog box.

1. Add one Recipe Data Item field.
2. Set the Display format to *ASCII*.
3. Set Data Access to *Read/Write* if you want to make recipe names editable.
4. From the Page menu choose “Recipe Configuration ...” to open Recipe Configure dialog box.
5. Fill the new Recipe Item with names for each Recipe Parameter Set.
6. Select this new Recipe Item by clicking on the button with the record number. Note that the entire row highlights.
7. Click on the Set As Recipe Name button to set this Recipe Item to be the Recipe Name. Note that the asterisk (“*”) appears to the right of the Recipe Item name.
8. Click on the OK button to accept the changes.

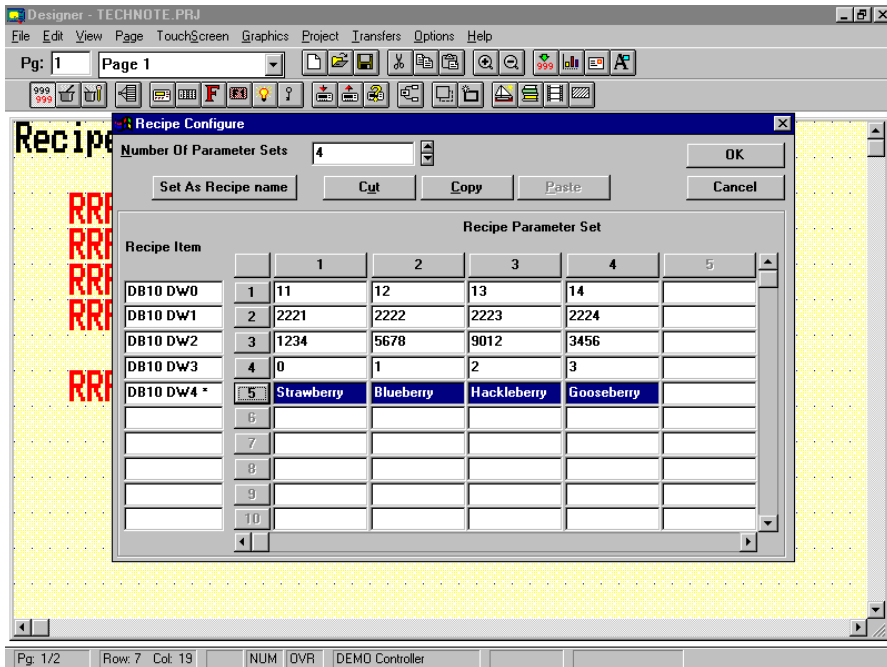


Figure 12-4

Creating a Recipe Menu Field

The Recipe Menu field is the field that displays the menu with the Parameter Set names. It displays recipe names for the page which number is contained in the Recipe Page For Selection internal UniOP variable. The value of this variable can be displayed and changed using the Recipe Page For Selection field. Its value can be automatically set by the Go To Recipe Menu macro command.

The currently selected recipe name is indicated with a user defined attribute combination (blink, highlight, reverse).

To enable Recipe Menu support, at least one page with Recipe Name must be defined.

Recipes

Note: The only field on the page needed for displaying a Recipe Menu is the Recipe Menu field. Other fields can show additional information but are not necessary.

If Recipe Page For Selection contains the page number of a page without a Recipe Name field defined, the Recipe Menu field will display asterisks (“*”).

The following procedure describes how to add a Recipe Menu field.

1. Select an area on the panel screen by dragging the mouse. This area will contain the Recipe Menu field.
2. From the Edit menu choose Recipe Menu or press Ctrl-R. Click once anywhere on the panel screen to clear the selection; a solid box represents the Recipe Menu field.
3. Double click on the Recipe Menu field to open the Recipe Menu dialog box (see Figure 12-5).
4. Adjust the width and height if not satisfied.
5. Choose the attribute combination for indicating the selected recipe name.
6. Select *Yes* or *No* for Shown Record Numbers before Record Name, depending on whether you want to show record number (which is just the parameter set number) together with the recipe name.
7. Click on the OK button to accept changes.

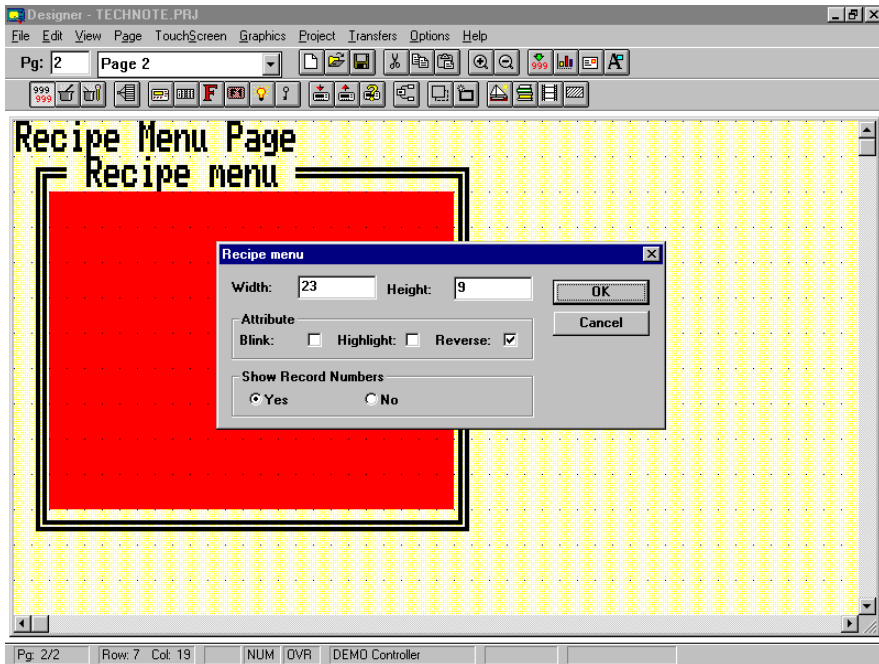


Figure 12-5

Recipe Page for Selection Field

The Recipe Page For Selection is a Control Variable. The purpose of the Recipe Page For Selection field is to show the number of the page containing the actual recipe data referred to by the Recipe Menu.

It can be placed on the same page with a Recipe Menu field to show the “recipe page number”. It can also be edited to change the page for which Recipe Menu field displays information. If Recipe Page For Selection contains the page number of a page without a Recipe Name field defined, the Recipe Menu field will display asterisks (“**”). After powering up the UniOP, the Recipe Page For Selection is set to zero.

Recipe Key Field

The Recipe Key field is an ASCII field of type Control Variable. The Recipe Key field displays the currently selected Recipe Parameter Set name for the referred page. Like a Recipe Menu field, it can be used to change the selected recipe parameter set by name but in a less user-friendly way. Using this method, the user has to edit the field and type the wanted recipe name (versus selecting it from a menu of choices).

The page to which a Recipe Key field refers to must have a defined Recipe Name field. If the referred page has no Recipe Name field defined, the Recipe Key field will display asterisks (“*”).

Recipe Menu Keyboard Macros

Three special keyboard macros support Recipe Menus (see 12-6).

They are:

- Go To Recipe Menu,
- Scroll Recipe Menu and
- Confirm Recipe Menu Selection.

The **Go To Recipe Menu** macro sets the Recipe Page For Selection and jumps to the specified page. This is the preferred way of going to a Recipe Menu page (page with Recipe Menu field). The other way is to set the page number in the Recipe Page For Selection field and then go to the Recipe Menu page using any other page changing macros (Go To Page, Next Page, etc.).

The **Scroll Recipe Menu** macro is used to move the selection in the Recipe Menu field. With this macro command you can choose a new Recipe Parameter Set from the list. Positive values for the scroll step move the selection down, while negative values move the selection up.

If there are many recipe parameter sets, more than one key can be assigned to Scroll Recipe Menu macros: two keys with step of 1 (-1) for “fine” scrolling and two other keys with step greater than 1 for “fast” scrolling.

The **Confirm Recipe Menu Selection** macro accepts the selected parameter set name and sets the current recipe parameter set to the new value. It can be assigned to a key together with Return To Initial Page macro to “close” the Recipe Menu page and return to the page jumped from with the Go To Recipe Menu macro.

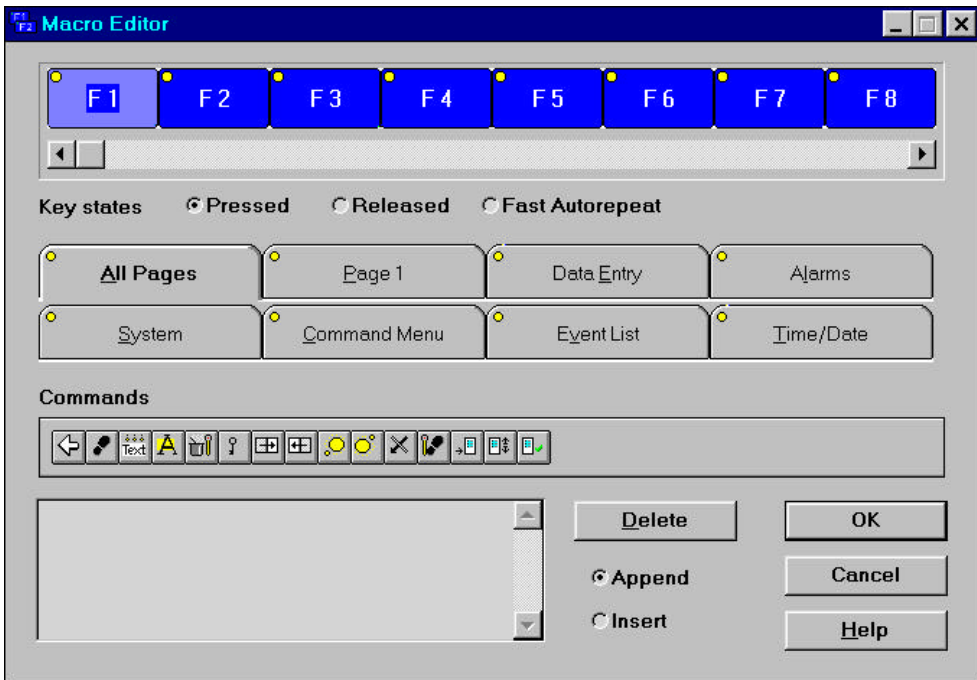


Figure 12-6

12.7 - Recipes and the Interlock Mailbox

The Interlock Mailbox offers a powerful way to control the operation of Recipes from the controller. There are seven mailbox commands available to function with Recipes:

- start Recipe download
- start Recipe upload
- Recipe status
- get parameter set number
- set parameter set number
- get Recipe transfer priority
- set Recipe transfer priority

The mailbox commands allow the choice of the Recipe page and also of the parameter set. All mailbox commands related to Recipes return a completion code describing the results of the operation. The mailbox interface to Recipes is particularly useful if it is necessary to transfer a sequence of Recipes to and/or from the panel.

Please refer to the chapter on the Interlock Mailbox for command specific information.

12.8 – Multipage Recipe Support

So far, UniOP has supported a straightforward recipe organization: while many recipes could be defined in a UniOP Project, each one was limited to a single project page. Many users found this solution to be clear and easy to use and quite sufficient for their application.

This chapter describes the Multipage Recipe organization introduced Designer 5.05 and supported by firmware version 4.20 and later. In these versions of UniOP firmware and Designer software, the ‘one page-one recipe’ restriction has been removed. Now, the data which is logically part of a single recipe can be scattered over several project pages and still be selected, downloaded or uploaded with a single command

A recipe spanning several pages is called “Multipage recipe”.

Multipage Organization

Currently, the user can define only one multipage recipe and as many standard, single-page recipes as he/she wishes. The multipage recipe can contain any number of pages, even all pages in the Project.

This simple solution with just only one multipage recipe per project results in only a minor change in Designer software use for the user.

Designer Configuration

Recipes

In order to enable Multiple Page Recipe feature in Designer software you should define the desired number of single page recipes in your project and for each of these pages you should check the “Multipage recipe” checkbox in the Recipe Configuration dialog box as shown in Figure 12-7.

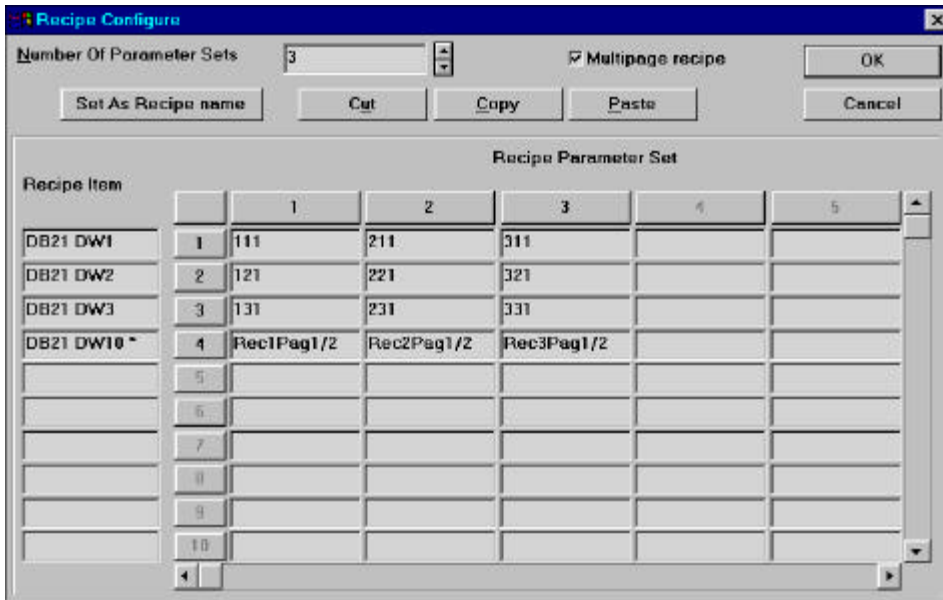


Figure 12-7

By marking the checkboxes, all multipage recipe pages are linked together and any recipe-related action done in run-time (i.e. on the UniOP) on any linked page will result in the same action being done for all the pages. This refers to parameter set selection, upload and download.

In other words, the set selection, the download and upload process can be done by referring to each page contained in the multipage recipe.

You should respect the fact that in Designer, the definition of parameter sets number and values for the multipage recipe is still done pagewise, as it was for standard, single-page recipes.

You should make sure to define an equal number of parameter sets in all pages belonging to the multipage recipe, otherwise the upload and download of the recipe may be aborted in the middle. In addition you have to make sure that the variables on the pages of the multipage recipe are different. Otherwise, you could have problems in data integrity during download and upload operations.

For any recipe page not contained in the multipage recipe, the user should simply leave the checkbox unchecked, as it is by default. In all pages belonging to the multipage recipe, the checkbox must be checked.

Menu Recipe Feature in Multipage Recipe

Of course, the Recipe Menu features are enabled on multipage recipe and you can manage it with the menu in the same way as single page recipes.

You should make sure that the recipe name is defined in only one page of the multipage recipe. If you want to display names in the recipe menu for the multipage recipe the Recipe Page for Selection field must refer to the page that contains the ASCII field declared as "Recipe Name".

Chapter 13 - The UniNET Network

13.1 - UniNET Network Overview

The *UniNET Network* is a feature of the operator panels that enables them to be connected together in a network and to communicate with each other. It is now possible to connect two or more panels (the maximum number is 32) with a simple RS-232, RS-422, or RS-485 connection. This offers the ability of displaying on one panel either the data from the controller attached to the panel itself, or data from other controllers attached to other panels on the network.

Symbols Used

The following are descriptions of the symbols used in this section.



Bus Terminal and RS-232 to RS-485 converter without termination resistor



Bus Terminal and RS-232 to RS-485 converter with termination resistor



Bus terminal with termination resistor



Bus terminal without termination resistor



Network cable

Clients and Servers

The operator panels attached to the UniNET Network can be classified in two categories, depending on the type of communication that they can support once they are placed in the network: Server type panels and Client type panels

- A panel is a Server when it is connected directly to a controller. It makes available to other panels in the network the data in the controller to which it is attached.
- A panel is a Client when it requests data from a controller attached to a Server on the network.

Note: MD00, MD01 and MD03 panels can only act as clients since they do not have a PC/Printer port with the following exception: When using the Aux port for connection to the PLC (as in a bus network), these panels can act as a server in the UniNET network.

A panel can be, in certain cases, both a Server and a Client. This means that the panel both satisfies the requests from other panels that require access to the data in the controller to which it is attached, and also requests data from the controllers attached to other Servers.

- The configuration shown in Figure 13-1 allows many panels to access data from a single controller via a panel acting as the single Server. The client panels can perform all of the normal operations as if they were connected directly to the controller, including: displaying of variables, modifying of variables, handling of Recipes, handling of the Reserved Data Area, etc.

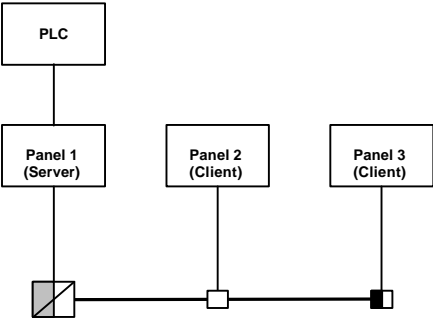


Figure 13-1

- Figure 13-2 shows a configuration in which many controllers are accessed. The panels that are connected to a controller can function both as Servers and Clients. Therefore, they can read data from the controller to which they are directly attached and also from the controllers attached to other Servers. The Client panel can also read data from the controllers attached to the Servers. In this way, every single panel in the network has access to every single controller attached to the Servers in the network.

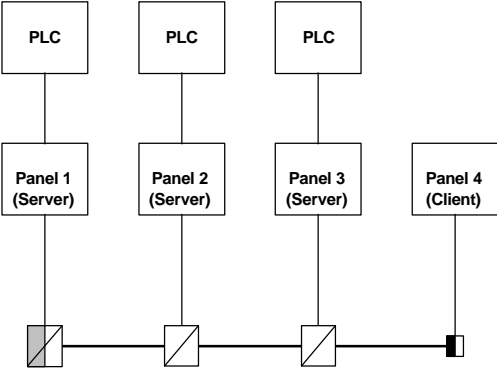


Figure 13-2

The UniNET Network

***Note:** An external RS-232 to RS-485 converter is required for each panel used as a **Server**. This is because Servers must be connected to the network using their PC/Printer port which, in the current hardware version, only has an RS-232 interface. The Client panels do not need an external converter to be attached to the UniNET network because they can be attached to the network using their PLC port which has an RS-485 interface as well as an RS-232 interface.*

The TSI01 Bus Terminal and Converter provides additional optical isolation between the panel and the UniNET network. If you are using a Client panel attached to the network through a simple TSI02 Bus Terminal, there is no optical isolation. Optical isolation is recommended whenever panels are to be operated in a noisy environment or powered by different power sources. A completely optically isolated network can be obtained using a TSI01 Bus Terminal and Converter for each panel attached to the network.

Network With Different Controller Types

The network configuration shown in Figure 13-2 works even if the controllers are of different model types or if they are of different manufacturer brands. Designer allows the user to specify the addresses of the data items added to the project file using controller-specific addressing.

It is also possible to transfer data from one controller to another using the 'Data Transfer' feature supported by the operator panels. The transfer of data can be performed even if the controllers are of different manufacturer brands. The panels act as bridges connecting different controller worlds.

Technical Data

The main technical features of the UniNET Network are shown in the table below:

Maximum speed:	19200 baud
Physical interface:	RS-485 Half Duplex
Connection cable:	Shielded twisted pair
Maximum length:	1200 m
Access control:	Token passing
Maximum number of stations:	32

One of the main benefits of the token passing method is that every station on the network gets the chance to communicate, even in conditions of heavy communication load.

13.2 - Network Configuration

The UniNET network can be configured using Designer. The configuration entails specifying the number of Clients and the number of Servers on the network, amongst other things. The following sections describe the steps that need to be taken to configure the UniNET network.

The Configure Network Option

By selecting *Configure Network* from the *Options* menu, the network configuration required by the application can be initially defined or subsequently modified. The *Network Type Selection* dialog box, shown in Figure 13-3, will be displayed.

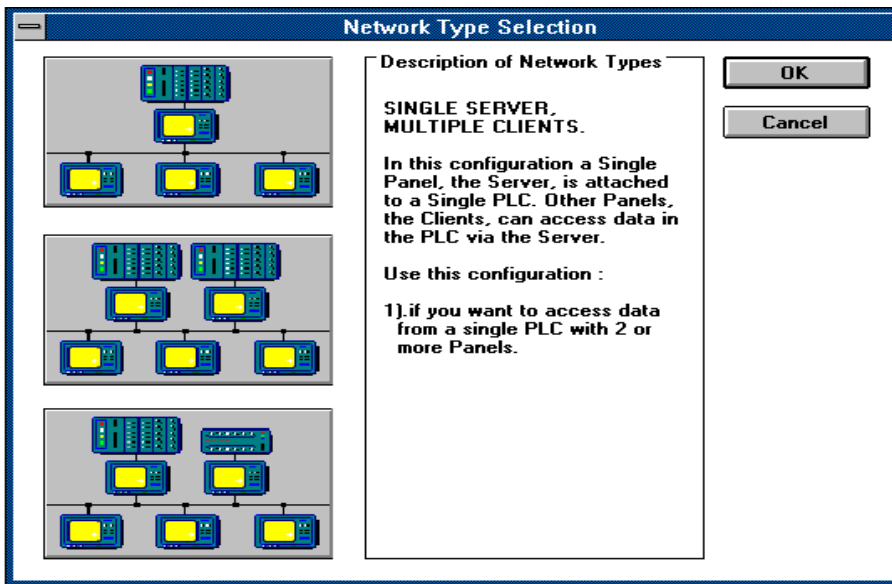


Figure 13-3

This dialog box allows the choice between the three main network configurations supported by UniNET:

- Single Server, multiple Clients
- Multiple Servers, multiple Clients (same controller types)
- Multiple Servers, multiple Clients (different controller types)

In the first case, Designer will ask the user to enter the number of Clients to be included in the network and then choose the optimal default values for all of the network configuration parameters.

In the second case, Designer will ask the user to enter both the number of Servers and the number of Clients to be included in the network and will then choose the optimal default values for all of the network configuration parameters.

The third case is the most advanced option. With this type of network, the user has complete control over the network to be configured. This allows the user to make full use of the powerful capabilities of the UniNET network such as adding multiple Servers for different controller manufacturer brands. This complete control over the network is gained at the expense of having to explicitly specify all of the configuration parameters for the network.

The parameters for the network are automatically configured if it is selected to be of either the Single Server, Multiple Client type or of the Multiple Server, Multiple Client (same controller types) type. However, Designer allows the user to make slight modifications to the network parameters, by using the *Network Configuration* dialog box shown in Figure 13-4. This dialog box is invoked by again selecting *Configure Network* from the *Options* menu.

Similarly when the Multiple Servers, Multiple Clients (different controller types) option is selected, the Designer will automatically display the *Network Configuration* dialog box to allow the user to explicitly enter all of the parameters for the required network.

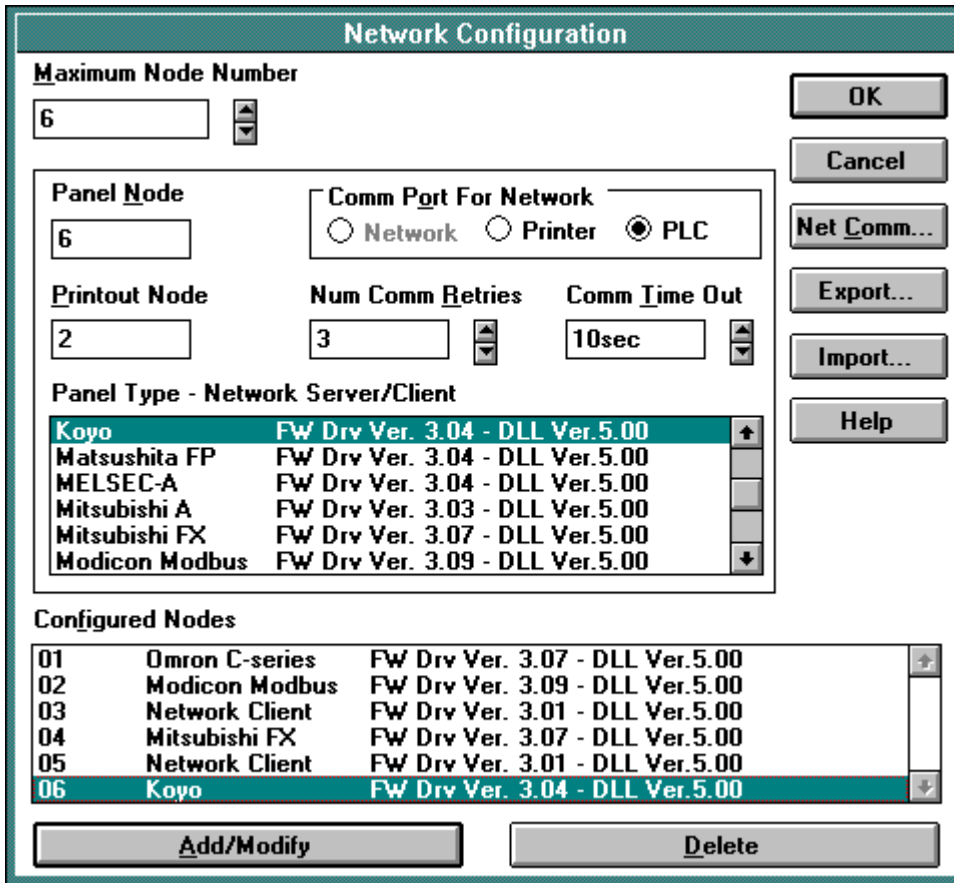


Figure 13-4

The main elements of the *Network Configuration* dialog box are as follows:

Maximum Node Number: This specifies the node number of the highest node that will be allowed to receive the network token. Nodes that have a node number higher than this value will not be able to communicate over the network. The *Maximum Node Number* should be set as low as possible to minimize the amount of time that will be required for the token rotation.

Panel Node: Node number of the node being selected for configuration. It must be a number greater than 0 and smaller or equal to the *Maximum Node Number*.

Printout Node: Node number of the node to be used for the network printout function. This feature is currently not available.

Comm Port for Network: Selection of the Communications port to be used for attaching the panel to the UniNET network. The Server panels **MUST** be configured to use the Printer port; the Client panels should be configured to use the PLC port. Currently the hardware does not support the Network port; so this option is disabled.

Num Comm Retries: Number of times a network message is retried in case of communication errors.

Comm Time Out: Value of the time out interval used in the network communication.

Panel Type - Network Server/Client: List of communication protocols available for the network configuration. During the configuration process all the Client panels must be assigned the 'Network Client' protocol, all the Server panels must be assigned the protocol of the controller they are directly attached to. This list becomes active only when a valid node number is entered in the *Panel Node* field.

Configured Nodes: List of the already configured network nodes. Each node in the list is described by its node number, controller protocol and version numbers of protocol and Designer DLL. Client panels are identified by the 'Network Client' protocol.

Add/Modify: Click this button to add a new node to the list of configured nodes or to modify the parameters of an existing node. To modify an existing node you must first select the required node from the list of already configured nodes. The parameters for the configured node will then be displayed. When the data has been modified as required, pressing *Add/Modify* will make the changes permanent.

The UniNET Network

Delete: Click this button to remove an already configured node from the list of configured nodes. To delete a node from the list you must first select the required node from the list of already configured nodes.

Net Comm: Pressing this button displays the dialog box for the configuration of the communication parameters for the UniNET network. In the current version, communication speeds up to 19200 baud are supported. To obtain the best results the highest baud rate possible should be used.

Import: Any UniNET network configuration may be saved to disk for later use or for sharing it between multiple project files designed for the same network. Click on the *Import* button to load an existing configuration from disk. The UniNET network configuration files have extension .NET.

Export: Click on this button to save the existing network configuration to a disk file. The network configuration may be loaded from disk with the *Import* button. The UniNET network configuration files have extension .NET.

The Panel Setup Dialog Box

Once a network configuration has been defined, you must assign a valid network node to the current project file. The *Panel Setup* dialog box includes the checkbox *Enable UniNET Network*. If the network is enabled, checking this checkbox will cause the dialog box to unfold to show the current list of all configured UniNET nodes. To assign a node number to the current project just select one item from the list.

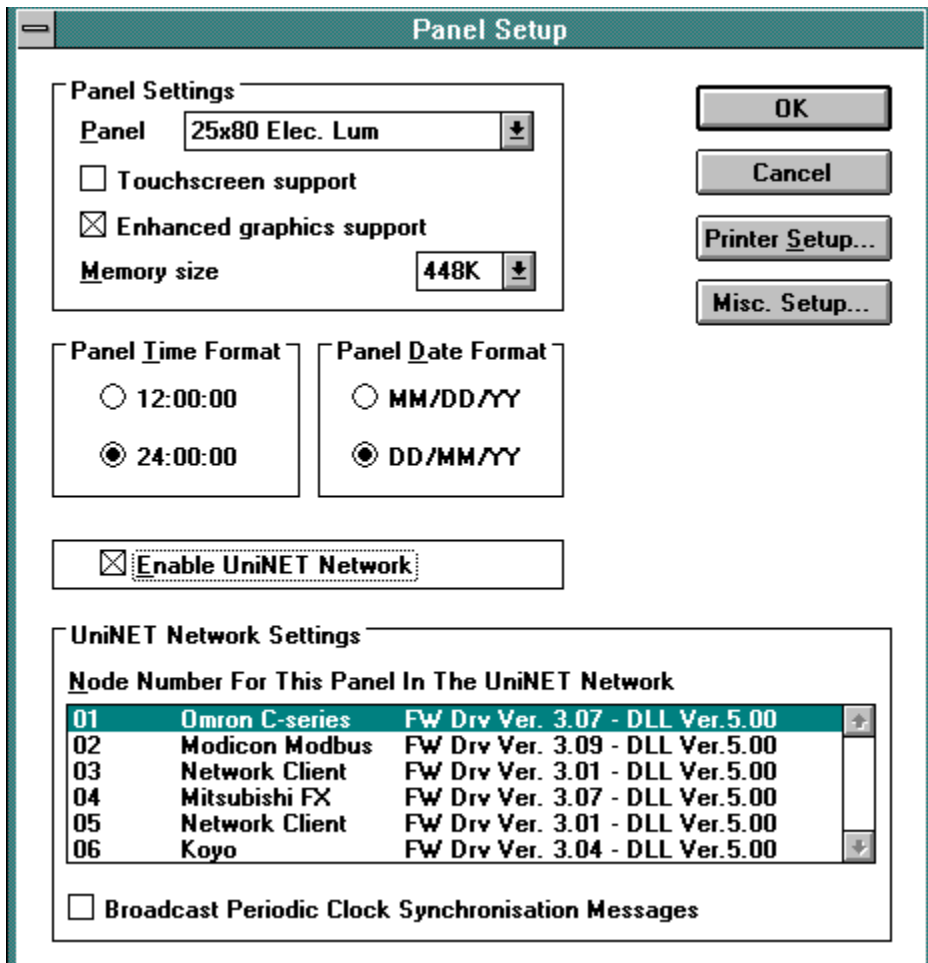


Figure 13-5

The Data Field Definition Dialog Box

When designing a project for a network application, the *Data Field Definition* dialog box is used to specify the addresses of the required data items in the same way as for non-network projects. The only difference is that if the network contains more than one Server, it becomes necessary not only to specify the address of the controller data item, but also to specify which controller the data item is to be read from. This is specified by first selecting the node number of the panel that is attached to the controller that contains the required data item. The *Data Field Definition* dialog box, specific to the controller type, is used to specify the address of the data item within the controller. Depending on the type of network configuration selected, the Designer will operate as described below:

- Single Server, multiple Clients

In this configuration, data can only be read from a single controller (the one that is attached to the single Server). In this case, there is no need for Designer to prompt the user for the node number of the Server, as there is only one. Therefore, there is no need to specify any additional addressing information.

- Multiple Servers, multiple Clients (same controller type):

In this configuration, data can be read from more than one controller. Therefore, it is necessary for Designer to prompt the user for the node number of the required panel before allowing the user to enter the address of the data item. Before showing the *Data Field Definition* dialog box, Designer will display the *Node Selection* dialog box, which will display the list of available Servers. The user can select the required panel from this list. Doing so will then cause the *Data Field Definition* dialog box for that node to be displayed. Since the controllers connected to the servers are all of the same type, the same *Data Field Definition* dialog box will be shown regardless of the panel selected in the *Node Selection* dialog box.

- Multiple Servers, multiple Clients (mixed controller types):

In this configuration, data can be read from more than one controller. Therefore it is necessary for Designer to prompt the user for the node number of the required panel before allowing the user to enter the address of the data item. Therefore, before showing the *Data Field Definition* dialog box, Designer will display the *Node Selection* dialog box which will display the list of available Servers. The user can select the required panel from this list. Doing so will then cause the *Data Field Definition* dialog box for that node to be displayed. Since the controllers connected to the Servers are of different types, the *Data Field Definition* dialog box specific to the controller type of the selected Server will be shown.

The *Node Selection* dialog box in the case of a mixed controller network configuration is shown in Figure 13-6.

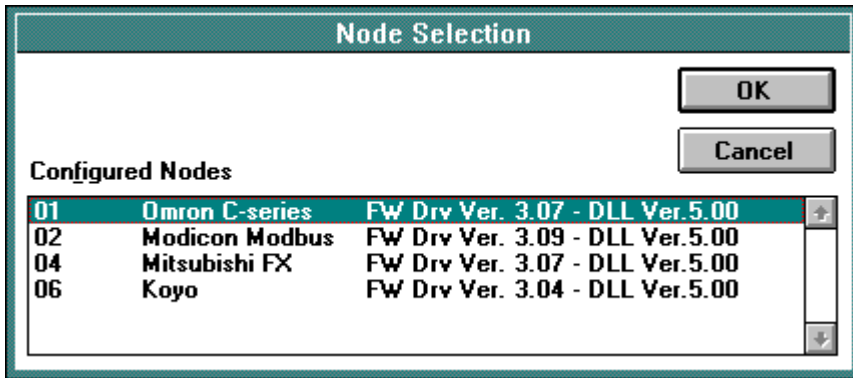


Figure 13-6

13.3 - A Quick Start Example

Most of the features of the UniNET Network can be tried by using a very simple configuration. This section will describe the steps required to set up a UniNET network composed of a single Server operator panel connected to a controller and two Client operator panels which will access the controller data via the Server through the network services.

*Note: The complete system is composed of three operator panels; you will have to create an individual project file for each of them. All three project files must include the same network configuration information in order to enable the three panels to exchange information. To ensure that the project files contain the same network configuration information, you can define the network configuration once in the first project file. Save the network configuration to disk by exporting the network configuration by selecting *Export* in the *Network Configuration* dialog box. When creating the other two project files, you can then import the network configuration from disk by selecting *Import* in the *Network Configuration* dialog box.*

Setting Up the Network Configuration

1. Select *New* from the *File* menu to clean up the workspace.
2. Select the *Change Controller Driver* from the *Project* menu and choose the controller type required for the Server.
3. Select the *Configure Network* from the *Options* menu.
4. Choose the first option *Single Server, Multiple Clients* by clicking on the topmost button and then selecting *OK*.
5. When the dialog box *Number of Clients/Servers* is shown, enter 2 for the number of Clients and click *OK* to configure a network with one Server and two Clients.

The network configuration is now completed. Designer will automatically assign default values to node numbers and to all of the other network parameters.

Creating the Project File for the Server

6. Select *Panel Setup* from the *Project* menu.
7. Click on the *Enable UniNET Network* checkbox. The dialog box will unfold and show the network configuration with the list of existing nodes.
8. Choose the node number 1 corresponding to the Server panel.
9. Create the first page of the application with some text and one data field with the Read/Write option enabled.
10. Connect the computer to the operator panel that is designated as the Server and download the project. When the transfer is complete, detach the cable from the PC/Printer port of the panel and connect the RS-232/RS-485 converter.

Creating the Project File for the First Client

11. Repeat steps 1 through 5.
12. Select *Panel Setup* from the *Project* menu.
13. Click on the *Enable UniNET Network* checkbox. The dialog box will unfold and show the network configuration with the list of existing nodes.
14. Choose the node number 2 corresponding to the first client panel.
15. Create the first page of the application with some text and one data field with the Read/Write option enabled.
16. Connect the computer to the operator panel that is designated as the first Client and download the project. The panel must be attached to the network through its PLC port.

Creating the Project File for the Second Client

17. Repeat steps 1 through 5.
18. Select *Panel Setup* from the *Project* menu.
19. Click on the *Enable UniNET Network* checkbox. The dialog box will unfold and show the network configuration with the list of existing nodes.
20. Choose the node number 3 corresponding to the second Client panel.

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21. Create the first page of the application with some text and one data field with the Read/Write option enabled.
22. Connect the computer to the operator panel that is designated as the second Client and download the project. The panel must be attached to the network through its PLC port.

Running the Network

Once all three panels are in Operation Mode, they should display the variable on the screen. In the case of the Client panels, the variable is read from the controller after the Server receives a request from the Client to read the data.

23. Verify that all three panels do not report any communication error.
24. The variable itself may be modified using the Data Entry Mode. A change in the value of the data entered from any operator panel, will quickly be shown by the other panels.

13.4 - Advanced Network Programming

Handling the Reserved Data Area

The UniNET network fully supports the use of all of the panel Reserved Data Areas (RDA), including Alarms and Mailboxes. These Reserved Data Areas can be placed in any controller attached to any Server on the network. This is especially interesting since the RDA concept offers a simple and efficient method to have the controller program interact with the operator panel. Note, however, that since most RDA activities are carried out on a cyclical basis, even with a small number of nodes in the network, the result may be that most of the network traffic will be for the RDA updates. This may cause an exceedingly slow update time for the displayed variables.

Network and Recipes

Recipes may also be used in a UniNET network system. A single Recipe may contain data items for different controllers attached to different Servers on the network.

The following considerations should, however, be taken into account:

- Recipe transfers may be considerably slower when they contain data items for controllers attached to other Servers in the network than when they only contain data items for the controller attached directly to the operator panel.
- The panels in the network can be configured so that they each store copies of the same Recipe parameter set. In this case, special care must be taken to ensure the consistency of the parameter sets stored in the different nodes. It is recommended that in a network configuration, only one node be assigned for the storage of the Recipe data.

13.5 - Connecting Operator Panels to the Network

Pinout for the PLC Communications Port

The PLC Communications port is used to connect Client panels to the network using a bus terminal unit. The pinout of the PLC port is shown here for easy reference.

Note: Panels to be used as Servers **must** have a dedicated PC/Printer port.

Pin #	Description	Pin #	Description
1	Frame Ground	9	
2	RXD	10	RTS
3	TXD	11	CTS
4	+5V	12	
5	Signal Ground	13	
6	CHA-	14	CHA+
7	CHB-	15	CHB+
8			

Table 13-1

Pinout for the PC/Printer Communications Port

Use the PC/Printer Communications port to connect Server panels to the network using a bus terminal unit with an RS-232 to RS-485 converter. The pinout of the Printer port is shown in Table 13-2 for easy reference.

Pin #	Description	Pin #	Description
1	Frame Ground	9	
2	RXD	10	RTS
3	TXD	11	CTS
4	+5V	12	
5	Signal Ground	13	
6		14	
7		15	
8			

Table 13-2

The TSI01 Bus Terminal with RS-232 to RS-485 Converter

The TSI01 Bus Terminal is a special module designed for use in the UniNET network. It is an optically isolated RS-232 to RS-485 converter that can be directly connected to the Printer port of an operator panel. The power supply is derived from the panel connector; an on-board isolated DC/DC converter provides the power for the RS-485 section of the converter. The converter additionally provides the possibility of properly terminating the line with a simple switch.

The pinout of the RS-232 connector of the converter is shown in Table 13-3. The connector type is D-type 15 pin male.

The UniNET Network

Pin #	Description	Pin #	Description
1	Frame Ground	9	
2	TXD	10	CTS
3	RXD	11	
4	+5V external	12	
5	Signal Ground	13	
6		14	
7		15	
8			

Table 13-3

The pinout of the RS-485 terminal block of the converter is shown in Table 13-4.

Pin #	Description
1	Frame Ground
2	A (-)
3	B (+)
4	Shield

Table 13-4

The TSI02 Bus Terminal

The TSI02 Bus Terminal is a special module designed for use in the UniNET network. The use of the TSI02 Bus terminal makes it easier to wire a panel to the network and additionally provides the possibility of properly terminating the line by means of a switch. The TSI02 has been designed for connection to the PLC port of an operator panel equipped with RS-485 interface.

The pinout of the RS-485 connector of the converter is shown in Table 13-5. The connector type is D-type 15 pin female.

Pin #	Description	Pin #	Description
1	Frame Ground	9	
2		10	
3		11	
4		12	
5	Signal Ground	13	
6	CHA-	14	CHA+
7		15	
8			

Table 13-5

The pinout of the RS-485 terminal block of the converter is shown in Table 13-6.

Pin #	Description
1	Frame Ground
2	A (-)
3	B (+)
4	Shield

Table 13-6

RS-232 Cable to TSI01 Bus Terminal with Converter (Printer port)

Use the cable CA74 to connect the Printer port of a Server panel to the TSI01 Bus Terminal with converter. The maximum length of the cable is 12m.

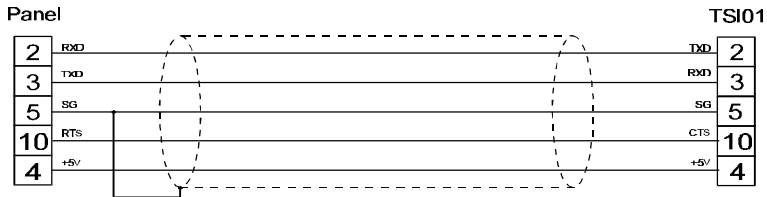


Figure 13-7

Panel connector: D-type 15P

TSI02 connector: D-type 15S

RS-232 Cable to TSI01 Bus Terminal with Converter (PLC port)

Use the cable CA73 to connect the PLC port of a Client panel to the TSI01 Bus Terminal with converter. The maximum length of the cable is 12m.

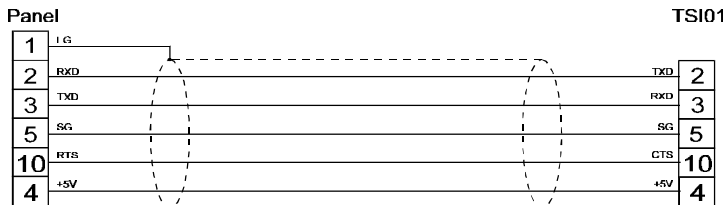


Figure 13-8

Panel connector: D-type 15S

TSI01 connector: D-type 15S

RS-485 Cable to TSI02 Bus Terminal

Use the cable CA75 to connect the PLC port of a Client panel to the TSI02 Bus Terminal. The maximum length of the cable is 1 m.

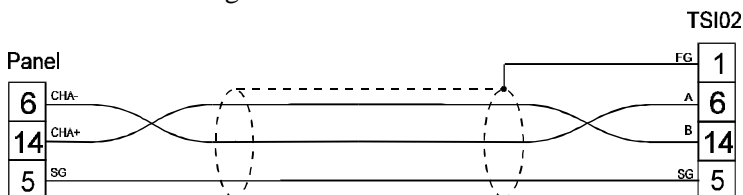


Figure 13-9

Panel connector: D-type 15S
 TSI02 connector: D-type 15P

Installing the Network Cable

The UniNET communication cable consists of a number of cable segments daisy chained together connecting all the network nodes. The total length of the cable segments cannot exceed 1200 m. It is recommended to use a shielded cable with one twisted pair.

Note: Only a daisy-chained network is recommended. For example a star-like connection is not recommended.

The Bus Terminals at both ends of the networks must have the termination resistance connected with the switch. This connects the termination impedance (120 Ohms) that is built in each Bus Terminal. Intermediate Bus Terminals must **not** have the termination connected.

13.6 - UniNET Technical Description

The UniNET network has been designed to pass information between operator interface panels operating on the plant floor.

The UniNET network features are the following:

- interconnection of up to 32 operator panels
- multi-master capability
- token-passing capability
- maximum network length of 1200 m

All operator panels connected to the network may initiate a message transfer. The network protocol uses a token passing algorithm to determine which initiator has the right to transmit. A node holding the token is allowed only one transmission each time it receives the token. After a node sends one message packet, it attempts to give the token to its successor by sending a 'token pass' message. If no network activity occurs, the initiator will attempt to find a new successor.

The maximum node address that the initiator will search before wrapping to zero is the value of the configurable parameter *Maximum Node Number* (see the *Network Configuration* dialog box).

Chapter 14 - TouchScreen Programming









14.1 - Introduction

The method for creating touchcells has been improved tremendously. There is now a floating toolbar for creating touchcells. This toolbar is shown below in Figure 14-1.



Figure 14-1

Below is an explanation of each key in the toolbar and it's functionality:

- | | |
|---|--|
|  | Used for selecting and resizing an object |
|  | Used for creating a touchcell as an ASCII character |
|  | Used for creating a touchcell as an illuminated pushbutton |
|  | Used for creating an indicator lamp |
|  | Used for creating a touchcell as a panel key (i.e., F1, ENTER, -->) |
|  | Used for creating a touchcell as a pushbutton |
|  | Used for creating a touchcell as a 2, 3 or 4 position selector switch |
|  | Generic command button used for creating a touchcell as a panel key (i.e., ENTER, -->), macro command (i.e., show alarm list), or ASCII character. |

14.2 - A Note on Touchscreen Projects

To aid in programming, whenever a user touches a read/write numeric field, a keypad will appear, allowing the user to enter data.

In order to use the features described in this chapter, the operator interface panel being used must contain firmware version 4.20 or greater.

If a user attempts to create a touchcell in a project file that was created using a previous version of Designer, they will be asked if they wish to transform their old touchcells into the new format that is used.

If the panel being used *doesn't* have firmware version 4.20 or greater, select *No*. The user will then be able to create touchcells using the methods implemented in previous versions of Designer for Windows (see section 14-12, Alternative Touchcell Creation).

If the panel being used *does* contain firmware version 4.20 or greater, select *Yes*. Doing so will transform the touchcells into the new format.

Data Entry Page for Touchscreens

The default data entry page in all touchscreen UniOP panels now includes the display of the minimum and maximum value associated with the field under data entry. Note that if the user tries to define their own custom data entry page, the min and max values will no longer be displayed. This feature requires firmware version 4.20 or greater.

14.3 - The Display Window

The display window is a preview window that will appear whenever the user begins defining a touchcell. This window allows the user to see how the touchcell will look before it is actually created and placed into a project file.

Clicking the left mouse button on the touchcell in the preview window will simulate pressing the touchcell. Clicking the right mouse button in the preview window will simulate the indicator light or the light on the illuminated touchcell changing state.

14.4 - The TouchScreen Menu

The TouchScreen menu will appear whenever the user has selected a touchscreen panel in the Designer software. The menu items include:

Show Touchscreen Grid – This will show the grid in which touchcells can be created. Touchcells can be made as small as a single character and as large as the entire screen.

Show Touchscreen Cells – This feature gives the user the ability to view or not to view the touchcells in the project file. If this item is selected, the user will be able to see the touchcells as they will appear on the panel. If this item is not selected, the user will not be able to see the touchcells in the project file. Note: Whenever the project file is downloaded, all touchcells will be visible on the operator interface panel.

Show Toolbox – This selection allows the user to toggle the Toolbox on and off. The Toolbox is a floating toolbar that is used to create various types of touchcells and indicators. *In order for the user to create touchcells, this item must be selected.*

Delete All Touchcells – This allows the user to delete all of the touchcells and associated graphics and commands on the current page of the project file.

Select Touch Font – This allows the user to select the font to be used for a particular touchcell. Once a font is selected, it will continue to be used for all touchcells that are subsequently created. *This font is NOT a global font and may be changed at any time without affecting any of the previously created touchcells.*

14.5 - Creating a Touchcell as a Panel Key

To create a touchcell as a panel key, select the area where the touchcell is to be located and click on the *Panel Key* icon in the Toolbox. Doing so will bring up the dialog box shown in Figure 14-2.

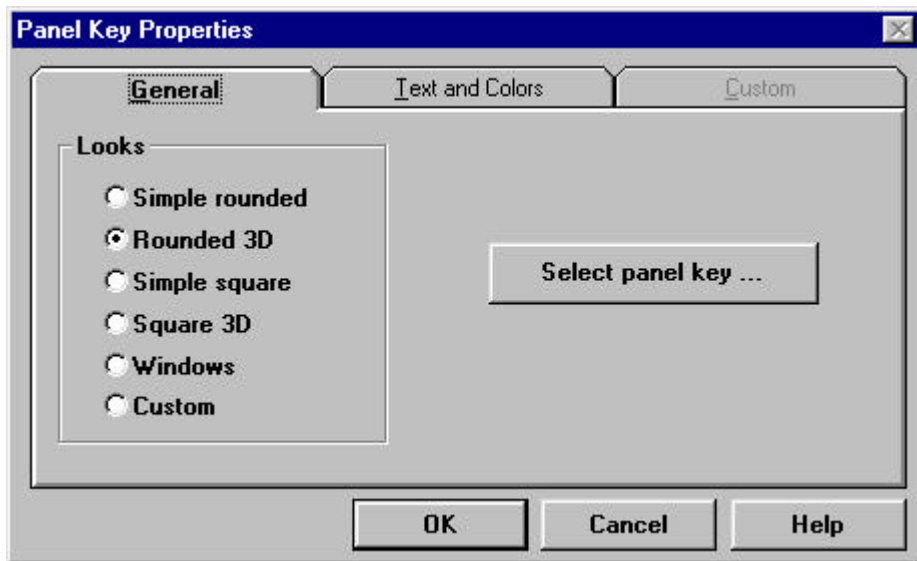


Figure 14-2

Within the *General* index tab, the user can specify how the touchcell is to look by selecting one of the radio buttons within the *Looks* area of the dialog box.

By clicking on the *Select panel key ...* button, the user will be able to select the panel key that the touchcell is to represent. The key that is selected will be highlighted so that it appears as a different shade from the other keys. To access keys other than F1 through F8, click on the right arrow located on the slide bar underneath the function keys.

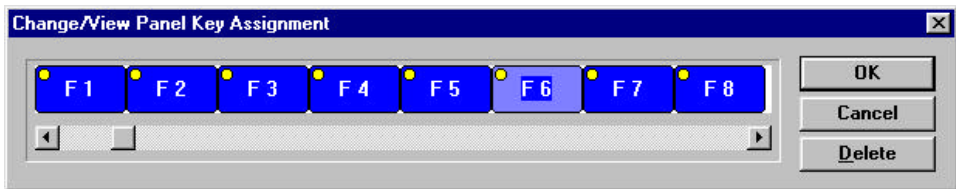


Figure 14-3

Clicking on the *Text and Colors* index tab, will display the dialog box shown in Figure 14-4.

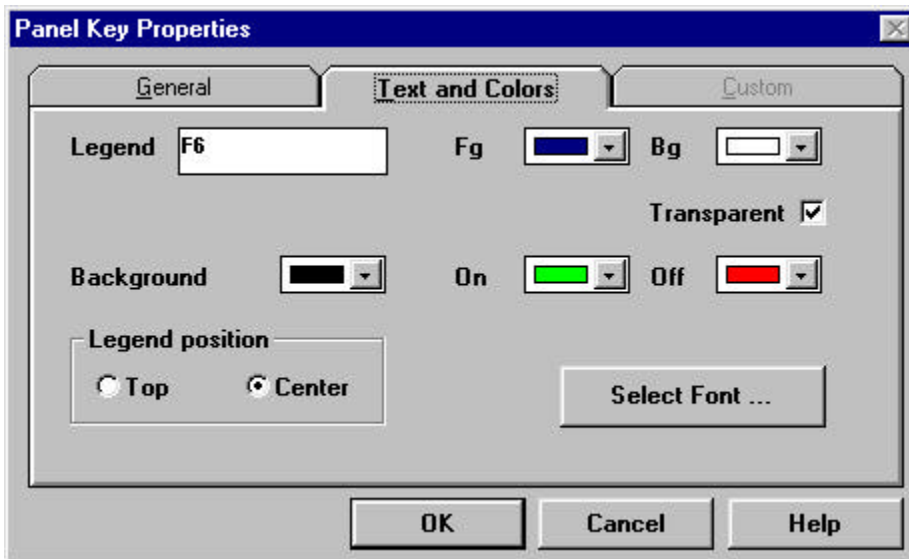


Figure 14-4

Legend allows the user to specify the text that is placed either on or on top of the touchcell. The position can be selected by choosing either the *Top* or *Center* radio button within the *Legend position* section of the dialog box.

On shows the color that the touchcell will be when it is pressed, while *Off* indicates the color that the touchcell will be when it is in the not-pressed state. *Background* color is the color of the touchcell background. The touchcell background is a part of the rectangle around the circular or elliptical touchcell not covered by the cell. Rectangular touchcells have no background if the touchcell text is centered, but if it is positioned on top, a strip of background appears above the cell.

Fg indicates the color of the touchcell text. *Bg* indicates the background color of the touchcell text. This color will only be seen when the *Transparent* checkbox is not marked, otherwise the background of the touchcell text will appear either in *On* or in *Off* color for centered text and in the *Background* color if the text is on top.

Clicking on the *Select Font ...* button will allow the user to select the font for the touchcell. This is shown in Figure 14-5. Keep in mind that this is NOT a global setting. It is possible to use different fonts on all of the touchcells in a single project file.

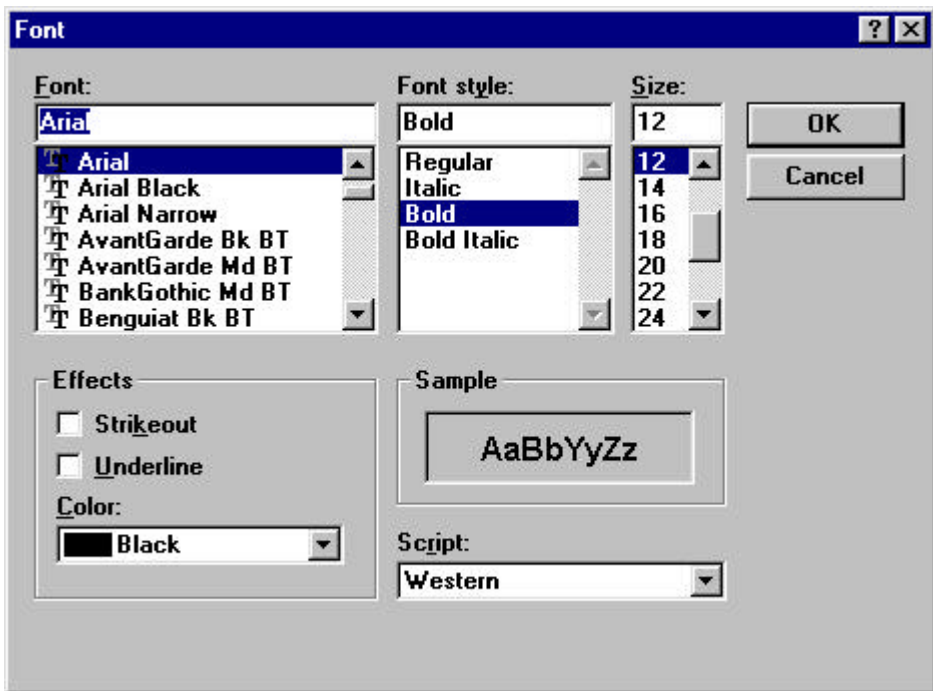


Figure 14-5

Within the *General* index tab, if *Custom* is selected within the *Looks* portion of the dialog box, the user will be able to import bitmap graphics for the different states of the touchcell. For example, if *Custom* were selected in this example, the *Custom* index tab would appear as is shown in Figure 14-6.

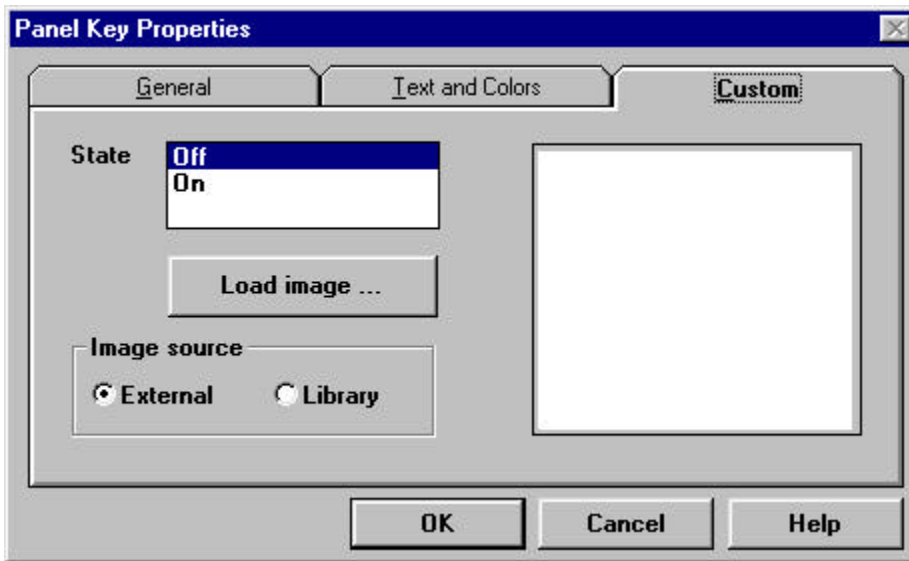


Figure 14-6

The graphic to be imported can be loaded from disk or from the Graphics Library that is installed with the Designer software.

To import a graphic from disk, perform the following steps:

- Click on the *External* radio button within the *Image source* portion of the dialog box.
- Click on the *Load image ...* button.
- Select the path and the filename of the bitmap graphic that you wish to import.
- This will bring up a dialog box that will allow the user to specify the label that is associated with the graphic (which defaults to the filename without the extension) and whether or not to reverse the image.

To import a graphic from the Graphics Library, perform the following steps:

- Click on the *Library* button within the *Image source* portion of the dialog box.
- Click on the *Load image ...* button.
- This will bring up a dialog box in which the user can choose to use a graphic from the Graphics Library or a graphic that is already used elsewhere in the project file. To use a graphic from the Graphics Library, select the *External* radio button within the *Library source* portion of the dialog box. To use a graphic that is used in the current project file, select the *Current Project* radio button.
- Click on the name of the graphic that is to be used (a preview of the graphic that is selected will be shown) and click on the *Import* button.
- Another dialog box will appear that allows the user to specify the label that is associated with the graphic (which defaults to the filename without the extension) and whether or not to reverse the image.

14.6 - Creating a Touchcell as an ASCII Character

To create a touchcell as an ASCII character, select the area where the touchcell is to be located and click on the *ASCII Character* icon in the Toolbox. Doing so will bring up the dialog box shown in Figure 14-7.

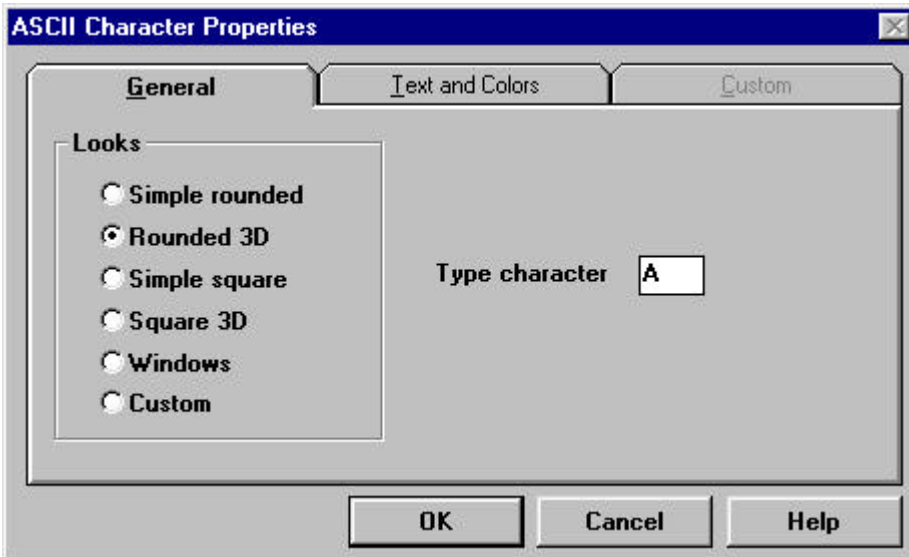


Figure 14-7

The user can specify how the touchcell appears by selecting one of the radio buttons the *Looks* portion of the *General* index tab. The ASCII character that is to be transmitted when the touchcell is pressed can be entered in the *Type character* box.

The legend and colors of the touchcell can be specified within the *Text and Colors* index tab. Custom images can be imported by selecting the *Custom* radio button within the *General* index tab and then selecting the *Custom* index tab.

14.7 - Creating a Touchcell as a Pushbutton

To create a touchcell as a pushbutton, select the area where the touchcell is to be located and click on the *Pushbutton* icon in the Toolbox. Doing so will bring up the dialog box shown in Figure 14-8.

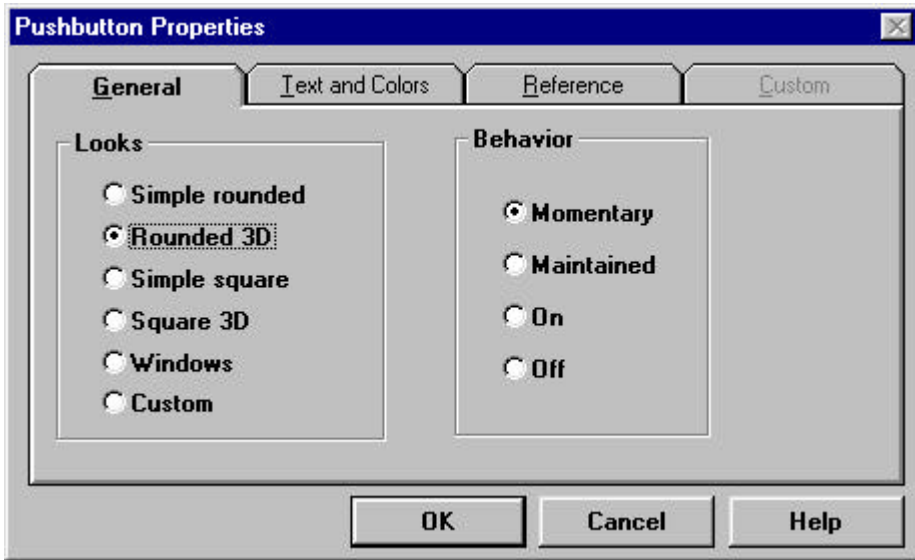


Figure 14-8

The appearance of the pushbutton can be chosen by selecting a radio button from the *Looks* portion of the *General* index tab. The action of the pushbutton can be selected by picking a radio button from within the *Behavior* portion of the *General* index tab.

The legend and colors of the pushbutton can be specified within the *Text and Colors* index tab. Custom images can be imported by selecting the *Custom* radio button within the *General* index tab and then selecting the *Custom* index tab.

The memory location that the pushbutton affects can be set up by selecting the *Reference* index tab and clicking on the *Button reference ...* button. This will bring

TouchScreen Programming

up the dialog box shown in Figure 14-9, which allows the user to select the exact memory location to be written to. This dialog box will contain the data types that are present in the PLC being used.

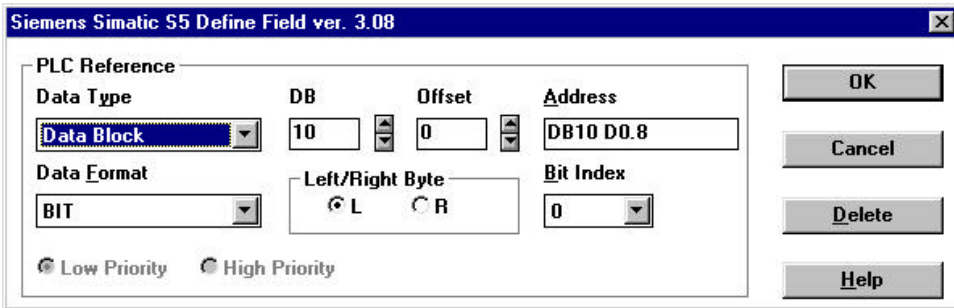


Figure 14-9

14.8 - Creating a Touchcell as an Illuminated Pushbutton

To create a touchcell as an illuminated pushbutton, select the area where the touchcell is to be located and click on the *Illuminated Pushbutton* icon in the Toolbox. Doing so will bring up a dialog box exactly like the one shown in Figure 14-8.

The only difference between an illuminated pushbutton and a pushbutton is that the face of the illuminated pushbutton can reflect the status of a bit in the PLC. The memory location whose status is shown on the face of the button can be specified by selecting the Reference index tab and clicking on the *Light reference* button.

14.9 - Creating a Touchcell as a Selector Switch

To create a selector switch of N states (where N represents an integer from 2 through 4), the user must select an area that is N characters wide, or some integer multiple of N characters and then click on the *Selector Switch* icon in the Toolbox.

For example, if the user wishes to create a 3 position selector switch, the selected area must be either 3, 6, 9, 12 ... characters wide.

Once the user clicks on the *Selector Switch* icon, the dialog box shown in Figure 14-10 will appear.

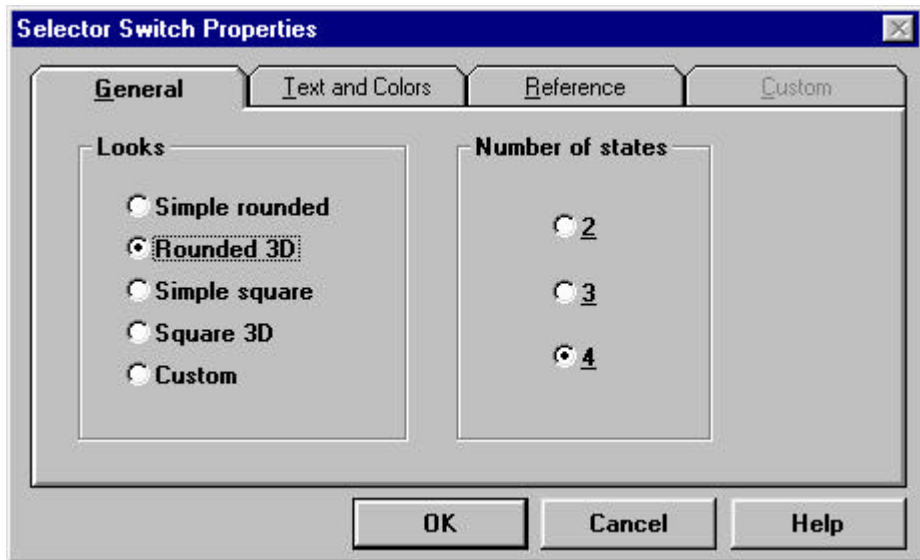


Figure 14-10

From within this dialog box, the user can specify the looks of the selector switch, as well as the number of states.

By selecting the *Text and Colors* index tab, the user can define the legend for each state of the touchcell, as well as the color scheme **for each state** (in other words, each state of the selector switch can have a different color), which is shown in Figure 14-11.

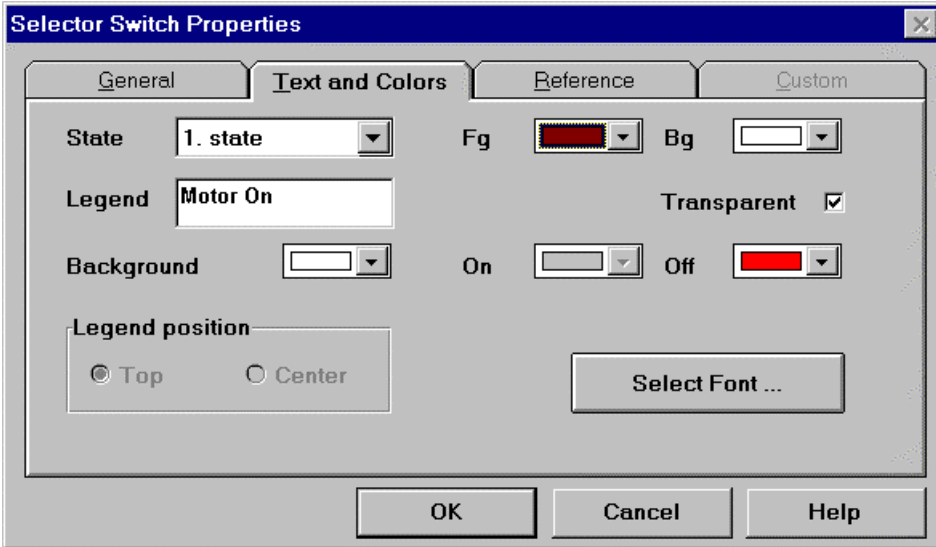


Figure 14-11

Likewise, by selecting the *Reference* index tab, the user can configure what memory location in the controller is affected by each state of the selector switch. This is depicted in Figure 14-12.

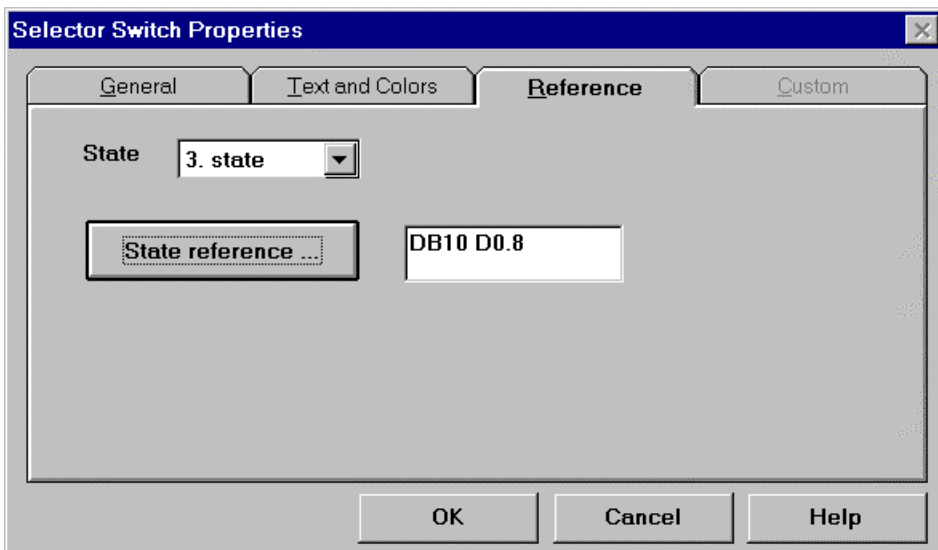


Figure 14-12

14.10 - Creating an Indicator Light

To create a touchcell as an indicator light, select the area where the touchcell is to be located and click on the *Indicator Light* icon in the Toolbox. Doing so will bring up the dialog box shown in Figure 14-13.

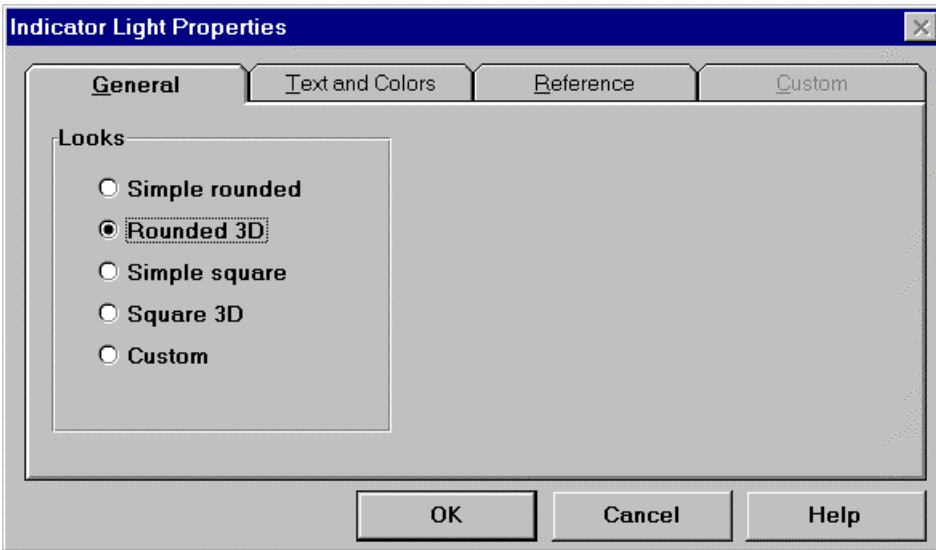


Figure 14-13

The legend and colors of the indicator light can be specified within the *Text and Colors* index tab. **Note that the indicator light can be configured to handle up to 4 different states.** A different color can be assigned to each state in order to reflect the contents of the memory location in the controller. The memory location in the controller that the indicator light is to reflect can be specified within the *Reference* index tab.

14.11 - Creating a Touchcell as a Generic Command

To create a touchcell as a generic command, select an area for the touchcell and then click on the *Generic Command* icon in the Toolbox. This will bring up the dialog box that is shown in Figure 14-14.

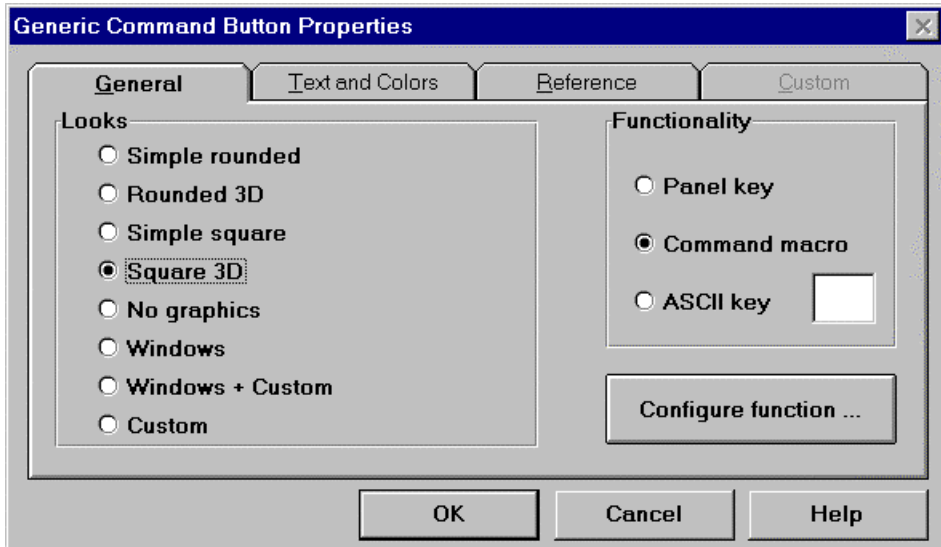


Figure 14-14

The looks of the touchcell are defined exactly as they were before. To define the functionality of the touchcell, select one of the three radio buttons within the *Functionality* portion of the dialog box and click on the *Configure function ...* button.

Depending on the functionality selection, the user will get either a list of panel keys to choose from or the list of macro commands available. If *ASCII key* is chosen, the user simply needs to enter the character to be sent in the box beside of the ASCII key radio button.

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The legend and colors of the pushbutton can be specified within the *Text and Colors* index tab.

An LED indicator can be added to a touchcell if, within the *Looks* portion of the *General* index tab, *Windows*, *Windows + Custom*, or *Custom* is selected. If this is the case, the Reference index tab will appear as is shown in Figure 14-15.

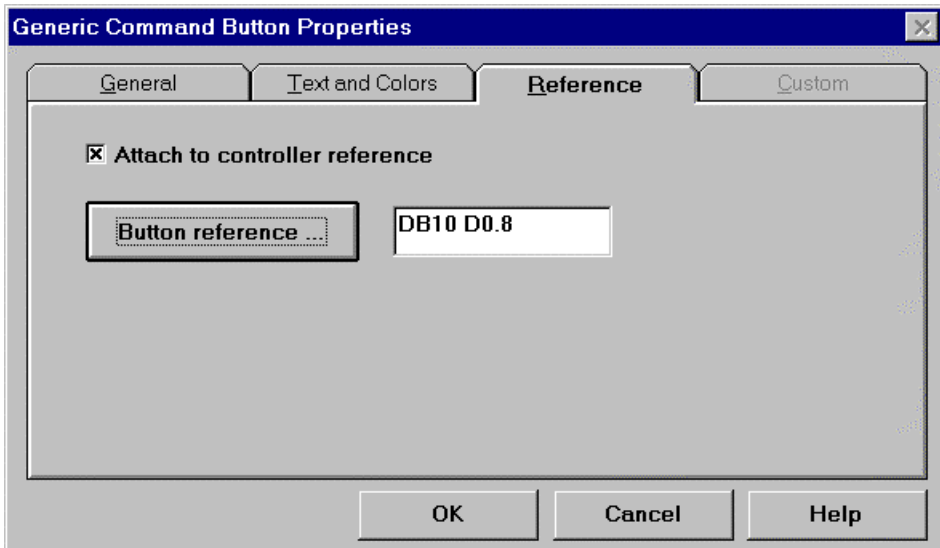


Figure 14-15

By marking the *Attach to controller reference* box, the user will be able to click on the *Button reference ...* button. This will allow the user to specify a bit in the controller whose status will be reflected by the LED on the touchcell.

14.12 – Multilanguage with Touchcells

With Designer version 5.05 and later, and firmware version 4.20 and later, it is possible to integrate multiple languages within the same touchcell. Whenever a user defines a touchcell in a project file that has more than language created, an additional button will be present in the *Text and Colors* index tab called *Change Language*. Clicking on this button will bring up the *Language* floating toolbar which allows the user to choose the language that they wish to work in. The user may specify the text for the touchcell in each language that is used in the project file. See the chapter on Multilanguage for more information about multiple languages within a single project file.

14.13 – Alternative Touchcell Creation

If the operator interface panel does not contain firmware version 4.20 or later, the user will need to create touchcells using methods implemented in previous versions of the Designer for Windows programming software.

To do this, the user will need to select the Generic Command icon in the floating toolbar. Doing so will display the dialog box shown in Figure 14-16.

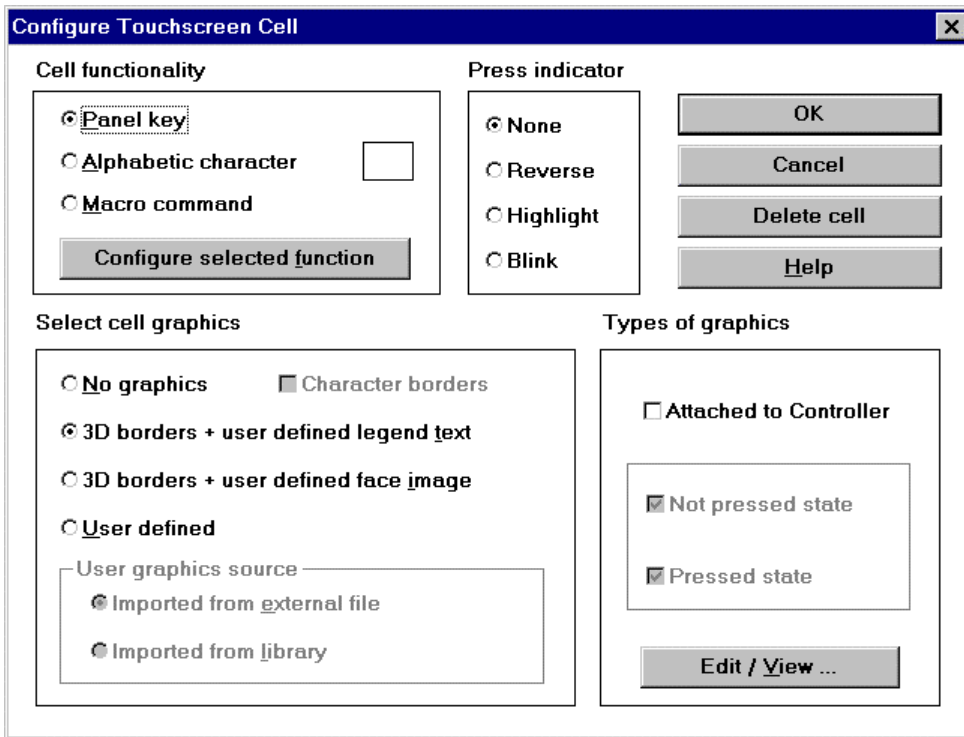


Figure 14-16

Each of the sections of the dialog box are explained on the following pages.

Cell Functionality

Cell functionality

Panel key

Alphabetic character

Macro command

A touchcell may be configured as a *panel key*, an *alphabetic character*, or a *macro command*.

- *Panel keys* represent all of the function keys, numeric keys, and arrow keys, as well as the help key, the clear key, the enter key, the +/- key, and the decimal point key.
- *Alphabetic characters* represent all of the upper case and lower case letters. **This allows the user to enter alphanumeric characters in Data Entry Mode.**
- *Macro commands* represent all of the elementary macro commands that are available from the Keyboard Macro Editor.

Press Indicator

Press indicator

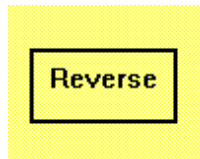
<input checked="" type="radio"/> None
<input type="radio"/> Reverse
<input type="radio"/> Highlight
<input type="radio"/> Blink

The different radio buttons within this group box represent the attribute that the touchcell will have whenever it is pressed. Note that the press indicator can be used with touchcells that have graphics associated with them; however, attributes can best be seen on touchcells that are not associated with graphics.

- *None* - There will be no attribute associated with the touchcell when it is pressed and the user *will not* be able to tell when the key has been pressed. Therefore, this option should be used only when there are graphics associated with a touchcell.
- *Reverse* - A touchcell having this attribute will have its colors inverted upon being pressed. For example, if the touchcell has a black border with black text and a light background when it is *not pressed*, it will have a white border with white text and a dark background when it is *pressed* (see the screen capture shown below).



Not Pressed



Pressed

Figure 14-17

- *Highlight* - With this attribute, the touchcell will toggle between two appearances when it is pressed. These appearances are a combination of the reverse attribute and the blink attribute.
- *Blink* - When the touchcell is pressed, it will alternate between the appearance of a normal touchcell and a blank screen.

Select Cell Graphics

Select cell graphics

No graphics **Character borders**

3D borders + user defined legend text

3D borders + user defined face image

User defined

User graphics source

Imported from external file

Imported from library

The user has the capability of implementing graphics with their touchcells. The different possible choices are:

- *No graphics, no character borders*
- *No graphics, character borders*
- *3D graphics + user defined legend text*
- *3D graphics + user defined face image*
- *User defined*

TouchScreen Programming

The first option, *no graphics, no character borders* will create a touchcell that is entirely invisible. An example of the functionality of this feature is as follows. A user may have a graphic that encompasses the entire screen. For descriptive purposes, let's say that this graphic represents a control process in a factory. It

contains images of flow control valves, motors, and blowers. By using this option, the user can create touchcells on the separate images and configure them to perform certain tasks. For instance, if the user presses the touchcell that is on the image of the motor, the motor may turn on. If the user presses the touchcell that is on the image of a valve, the valve may close, etc. All that will be seen on the screen will be the image of the process; the touchcells will be invisible.

If *no graphics, character borders* is chosen, a touchcell will be created that is visible only by the border that surrounds its outer limits. The user can choose between two borders, which are shown in the screen capture below.

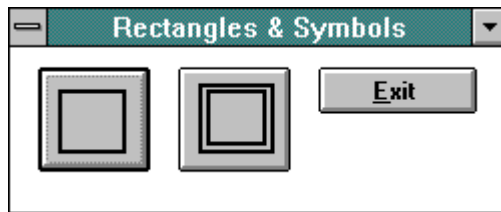


Figure 14-18

Choosing *3D borders + user defined legend text* gives the user the ability to implement a touchcell with text and 3D borders. The 3D border will give the touchcell the appearance that it is moving into the panel when it is pressed. This allows the cell to appear that it is three dimensional (having height, width, and depth) as opposed to being two dimensional (having only height and width). The text that appears on the face of the touchcell must be entered by the user.

Selecting *3D borders + user defined face image* allows the user to specify the image that appears on the face of the touchcell. The 3D border will have the same characteristics as the border that was discussed above in *3D borders + user defined legend text*. The image that is selected will appear on the touchcell in both the *pressed* and *not pressed* states.

If *User defined* is chosen, the user can select the source of the graphic that is to be used on the face of the touchcell. This feature gives the user the ability to import separate graphics for the *pressed* and *not pressed* states. These graphics can be imported either from an external file or from a library.

Types of Graphics

Types of graphics

Attached to Controller

Not pressed state

Pressed state

Edit / View ...

There are two different selections available from within the *Types of graphics* group box. The first, *Attached to Controller*, allows the user to attach the graphic to a bit in the controller. This option is available whenever the *3D borders + user defined legend text* radio button, *3D borders + User defined face image* radio button, or the *User defined* radio button is selected. Whenever you use this option with either of the *3D borders* graphics options, an LED indicator will be present on the graphic. This indicator will be ‘on’ whenever the controller memory location that the graphic is referenced to is in the on state (a value of 1 in the controller memory location corresponds to the *on* state, while a value of 0 corresponds to the *off* state). The other selection, *Not pressed state* and *Pressed state*, is only available when the *User defined* radio button is selected. This allows the user to select the image that is to be displayed on the face of the touchcell whenever the cell is pressed, as well as when it is released.

14.14 - Special Pages and Page Modes

The items located within the *Special Pages and Page Modes* portion of the *Page* menu include *Data Entry Screen*, *Command Menu*, *System*, *Passwords*, *Direct Access*, *Direct Page Selection*, *Time & Date*, *Alarm Page*, *Event Page*, and *Current Page Mode*. This option allows the user to place any combination of static text and touchcells on these pages. Note that these items should be placed on the lower portions of the page, due to the fact that these modes reserve some of the area contained in the upper portions of the page for display information.

Whenever the panel enters *Password* mode or *Data Entry Mode*, a default numeric keypad will appear on the screen. In all of the other modes, a row of default keys will appear that contains the arrow keys, an ENTER key, and a CLEAR key. If the user wishes to create their own screen that contains static text and touchcells, they may do so by selecting *Special Pages and Page Modes* from the *Page* menu.

Please be aware that a screen created in any of the panel's special pages will result in the default keys for that mode not being displayed.

14.15 - Digital TouchScreen Menu

As was mentioned earlier, users with our digital touchscreens will have a different set of menu options presented to them upon opening the *TouchScreen* menu. The two choices available are *Show Touchscreen Grid* and *Show Key Assignments*. The touchcells can be programmed using the Keyboard Macro Editor.

Show Touchscreen Grid

Selecting this option will produce a grid on the screen which will assist the user in programming the touchcells. This allows the user to know the true boundaries of each and every touchcell on the page.

Show Key Assignments

This option becomes available after the user has selected Show Touchscreen Grid. Selecting this will show the key assignments for the panel (see Figure 14-19). Note that the touchcells are fixed in their location. The HELP, CLEAR, and ENTER keys are pre-defined and do not need to be configured. This is also true for the numeric keypad and the left and right ARROW keys.

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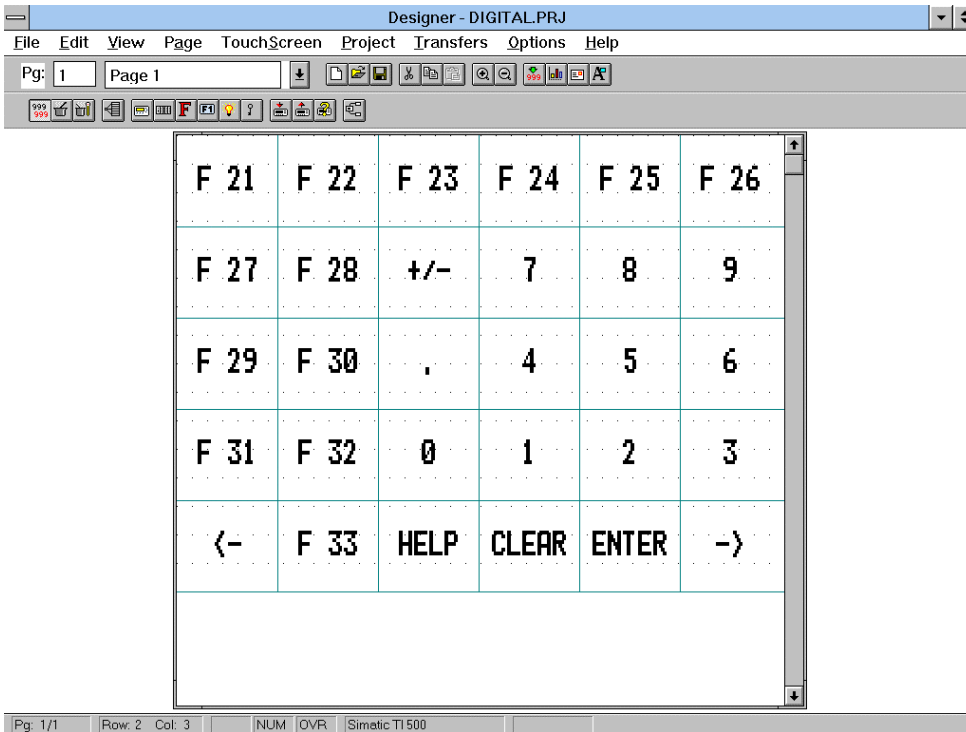


Figure 14-19

The touchcells can be programmed using the Keyboard Macro Editor to perform a vast array of functions, such as changing pages of the project file, scrolling down a line, entering Data Entry Mode, and writing a value to the controller.

Example

In this example, the user will configure a touchcell to write a value to the controller.

1. Select *Show Touchscreen Grid* from the *Touchscreen* menu. This will present the user with a grid, which will be helpful when we are ready to program the functionality of the touchcell.
2. Highlight the area in which the touchcell is to be located. In this example, let's assume that if the user presses touchcell locations F21 or F22, the panel will write a value to the controller. In order for this to occur, we need to click and drag the mouse to highlight the area encompassing cells F21 and F22.
3. *It is suggested to program the touchcells with a reversed attribute when they are pressed. In this manner, the operator will have immediate feedback when the cell is pressed.* This can be done within the Keyboard Macro Editor. Since we have already highlighted the area in which we are working with, we can enter the Keyboard Macro Editor by either clicking on the proper icon in the *Extra ToolBelt* or by selecting *Keyboard Macro Editor* from the *Project* menu.
4. This will bring up the Keyboard Macro Editor dialog box. Since we are programming this cell for area F21 and F22, we need to program *both* of the keys. Let's begin with F21. Scroll through the keys at the top of the dialog box until F21 is highlighted.
5. Click on the *Pressed* radio button and then select the *Page n* index tab. This will allow the touchcell to perform its assigned function only on this page in the project.
6. Select the *Attribute* icon from within the Commands toolbar. Select the *Reverse* attribute. Since we already highlighted the area in which this attribute is to occur, the dimensions are set automatically.
7. It is necessary to set a small delay before turning off the attribute in order to give the user time to see the attribute. Click on the *Wait* icon and enter a 3 in the dialog box that will appear. This will add a 3/10 second delay.

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8. Now we need to turn the attribute off. This is done by selecting the *Attribute* icon and unchecking all of the attribute options.
9. The next step that needs to be taken is to write the value to the controller. Let's assume that we want to write a value of 10. Click on the *Write to Controller* icon. This will bring up a dialog box in which we can enter the specific address within the controller that we want to write to. Enter the address and click on *OK*. This will bring up a dialog box that allows us to specify the value that is to be written. Enter a 10 and select *OK*.
10. The macro screen should look as shown below in Figure 14-20.

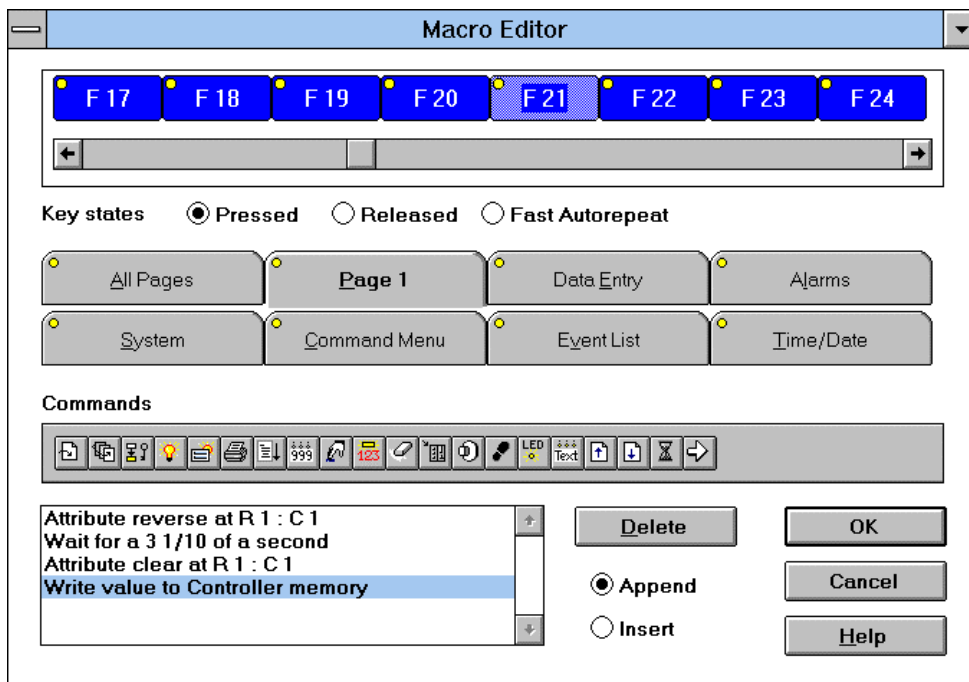


Figure 14-20

The same programming needs to be repeated for the F22 key. Simply select the F22 key and repeat steps 5 through 9. Once this is finished, we can add some static text or a rectangle to the area to let the operator know the functionality of the touchcell.

Note: Rectangles can be added by selecting *Rectangles & Symbols* from the *Edit* menu. This will bring up a dialog box (see Figure 14-21) in which the user can simply select which one to use and press *Exit*. Text can then be added by simply moving the cursor inside the rectangle and entering the information.

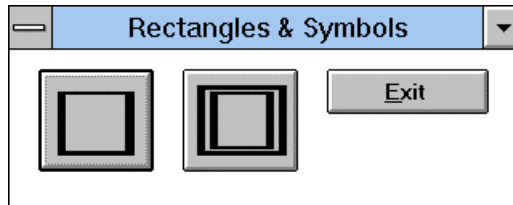


Figure 14-21

The result may resemble Figure 14-22 below.

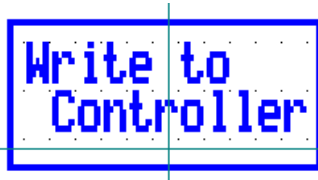


Figure 14-22

Chapter 15 – Multilanguage

15.1 - Introduction

This feature allows you to create a single project file that contains multiple languages. Your panel must contain version 4.10 or later to utilize this feature. The language that the project file uses can be selected at run-time. To set up your languages, go to the *Project* menu and select *Languages*. Doing so will bring up the dialog box shown in Figure 15-1 in which you can define the languages that you are going to be using.

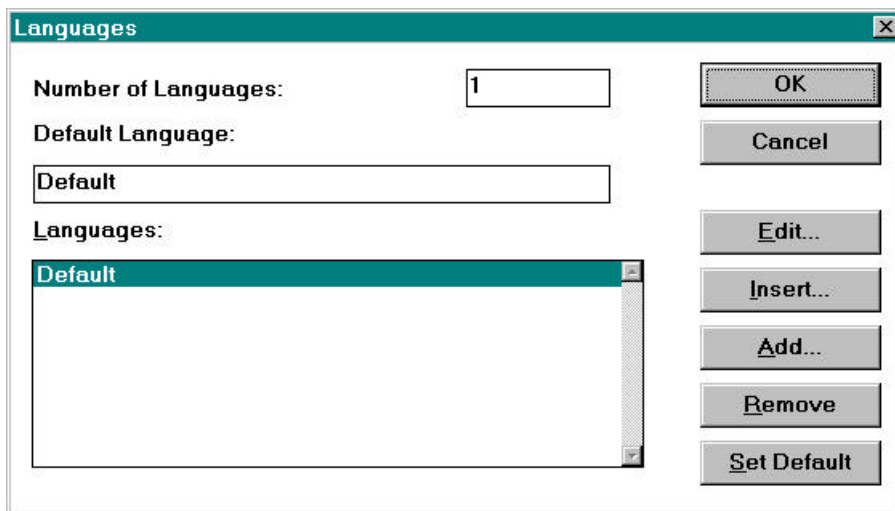


Figure 15-1

You can use the *Add...* or *Insert...* buttons to add a new language. When you do this, it will give you the opportunity to name the language and the option to copy the default language's character set. The *Edit...* button can be used to change the name of a language. The *Remove* button can be used to remove a language from

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the list and the *Set Default* button can be used to make the selected language the default language for programming.

For example, assume you want to have a project file that contains text in English, Italian, German, Spanish and French. Your *Languages* dialog box may resemble the one shown in Figure 15-2.

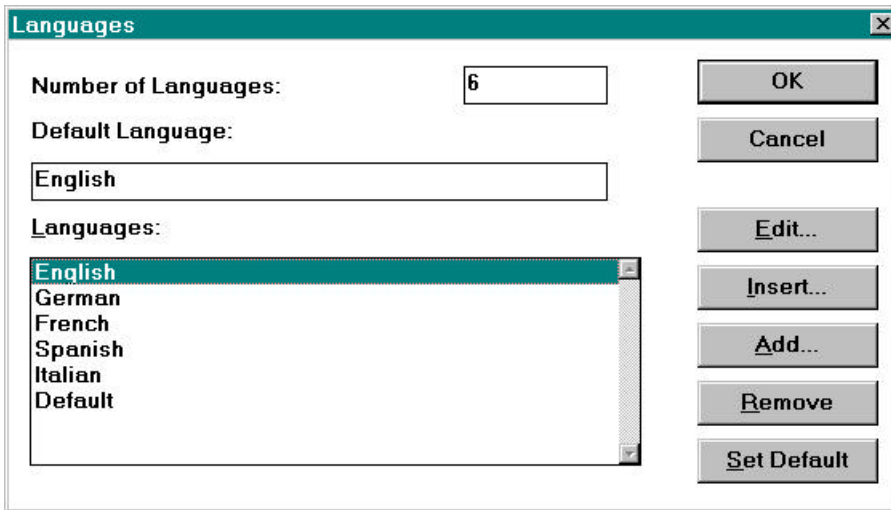


Figure 15-2

You will now be able to enter text in any of the languages listed in Figure 15-2. Keep in mind that you will still be using the standard ASCII character set. *Also note that Designer does not translate between languages.* In other words, if you enter text in English and then select Spanish as the language, you will also have to enter the text in Spanish. To choose a language to work in, select *Project-Select Language*. This will bring up the dialog box that is shown in Figure 15-3.

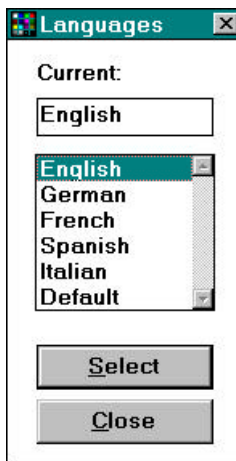


Figure 15-3

To select a language to work in, simply click on the language and then click on the *Select* button. The advantage of this feature is that it allows you to create a single project file with multiple languages used. For one application, you may need to use the English language. For another application, you may want to use the same project file with the Spanish language.

For example, Figure 15-4 shows the project file used with the English language, while Figure 15-5 shows the *same* project file used with the Spanish language.

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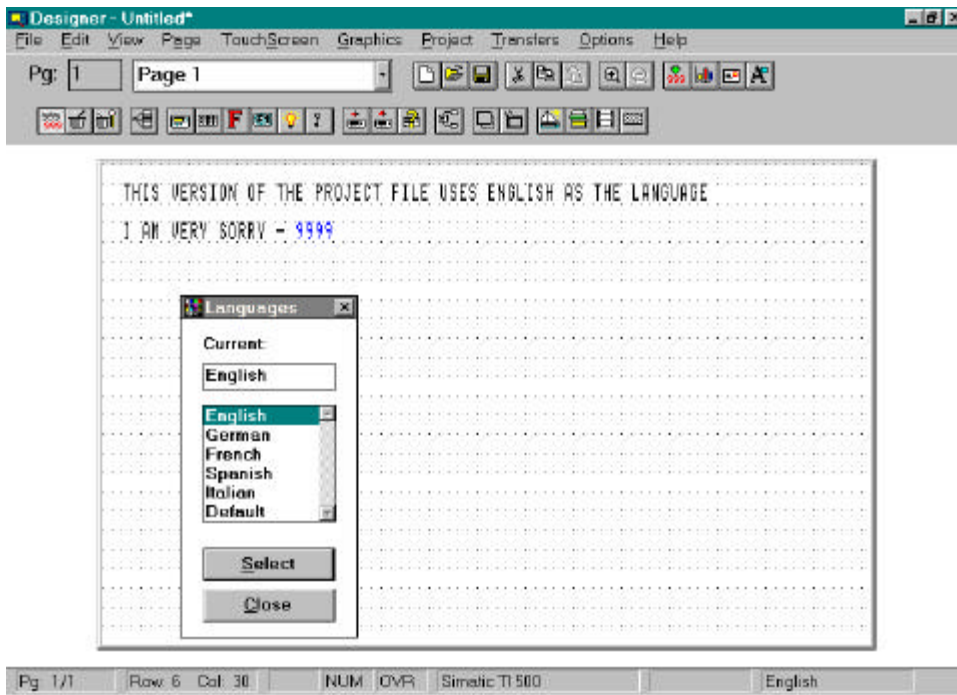


Figure 15-4

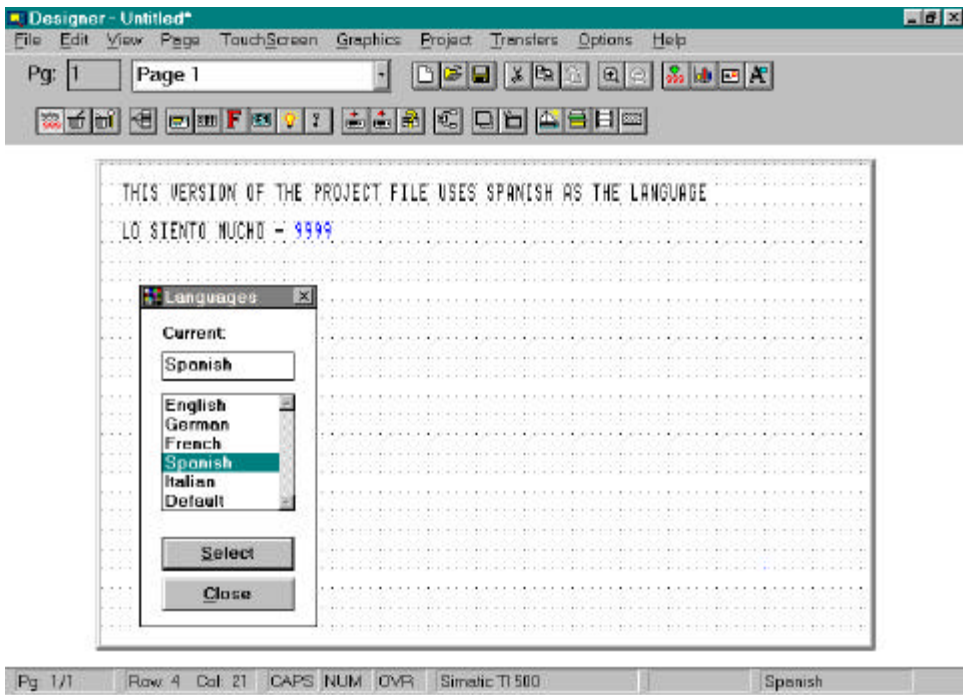


Figure 15-5

In Designer version 5.05 and later, the cut/copy/paste commands work in the usual way unless the 'Multilanguage Mode' in the Edit menu is set. When working on multilanguage projects, the default behavior of the cut/copy/paste commands is to operate only on the language currently active. If 'Multilanguage Mode' is set, the commands operate on all the languages.

It is important to mention that multilanguage can also be used with the alarms and message fields.

15.2 - Changing the Language After Downloading

In order to change the language that the project file uses once it has been downloaded to the UniOP, the user can create a control variable with a data type of *Language*. To create this control variable, three steps need to be performed:

- Select *Edit – Data Field Source – Panel Control Variable*
- Select *Edit – Data Field Type – Numeric/ASCII*

This will bring up the Control Variable field dialog box. Then,

- Underneath *Data Type*, select *Language*. Make sure that this field is created as read/write so that it can be edited.

To change the language that is being used, the user will need to increment or decrement this field. This can be done in one of two ways. One way is to simply edit the field and enter the number of the language that you want to use (in our example above, English would have a value of 1, German would have a value of 2, etc.). The other way is to program a key or a touchcell using the macro command *Control Variable Step*. The user could program one key (or touchcell) to step up the value of the language control variable field, and another key (or touchcell) to step down the value of the language control variable field.

Chapter 16 - Designer's Initialization Files

16.1 - DESIGNER.INI

DESIGNER.INI is used to store the latest configuration of the Designer software upon exit. Each time you start the Designer, this information is used to restore the page editor workspace, panel setup, and communications parameters.

<i>[Designer]</i>	<i>Default startup values</i>
ToolBelt	1=Show, 0=Hidden
ToolBelt1	1=Show, 0=Hidden
Statusbar	1=Show, 0=Hidden
ZoomSize	Initial zoom just after startup, allowed values are: 1 - 5
GridMode	0=No grid, 1=Point grid, 2=Line grid
TargetLib	Last controller library used
ApplPath1	Last project file opened
ApplPath2	Second most recent project file opened
ApplPath3	Third most recent project file opened

<i>[Graphics Library]</i>	
ApplPath1	Where graphics files are located

<i>[Communications]</i>	<i>(PC to UniOP)</i>
CommPort	1=COM1, 2=COM2, 3=COM3, 4=COM4
BaudRate	300, 600, 1200, 2400, 4800, 9600, 19200, 38400
Parity	None, Odd, Even
StopBit	1 or 2
DataBits	7 or 8

<i>[Net Communications]</i>	
BaudRate	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600
Parity	None, Odd, Even
StopBit	1 or 2

Designer's Initialization Files

DataBits 7 or 8

[Panel Setup]

Default values for panel setup dialog

DisplayType	Last display used
Font	Last font used
InternalRam	Panel memory
DateFormat	MM/DD/YY or DD/MM/YY
TimeFormat	12:00:00 or 24:00:00
TouchUsed	0=Not used in last project, 1=Used in last project
LastTouch	Touchscreen code

[Touch Font]

FaceName	Last touch font used
LFDData	Various font characteristics

[PLC Communications]

BaudRate	300, 600, 1200, 2400, 4800, 9600, 19200
Parity	None, Odd, Even
StopBit	1 or 2
DataBits	7 or 8

[Panel Printer]

PrinterType	TTY-printer
BaudRate	300, 600, 1200, 2400, 4800, 9600, 19200
Parity	None, Odd, Even
DataBits	7 or 8
StopBit	1 or 2
PageWidth	Number of characters printable across page
PageLength	Number of printable rows per page
AutoLF	0=Off, 1=On
UseFFLF	0=Off, 1=On
Protocol	0=None, 1=XON/XOFF

[Look]

Look	0=Light Background, 1=Dark Background
------	---------------------------------------

[Panel Capabilities]

- 1.2 Flags for creating ROM files
- 3.19 When creating ROM files with Designer, the user
- 3.99 should select the highest firmware version closest
- 4.2 to the one contained in their panel

[Modem Info]

- Enable 0=No phone list or dialing menu present, 1=Present
- LastCall Last number dialed
- DialPrefix Modem dialing prefix
- DialSuffix Modem dialing suffix
- Init Modem initialization string
- Hangup Modem hangup string
- DropDTROnHangup 0=No, 1=Yes
- Connect Modem connection message
- NoConnect1 First non-connection message
- NoConnect2 Second non-connection message
- NoConnect3 Third non-connection message
- NoConnect4 Fourth non-connection message

[Phone List] *Filled in when modem menu options are used*

[IOModules]

- NumModules Number of supported I/O modules

16.2 - DISPLAYS.INI

DISPLAYS.INI should NOT be altered. Designer uses this file internally to initialize various dialogs and other data. DISPLAYS.INI will expand in the future as more display models and features are added. Contact your distributor for details.

Chapter 17 - Documenting a Project

17.1 - Overview

Once a project has been completed, it may be documented by generating a printed report. With the desired project loaded into Designer, select *Print* from the *File* menu. This will bring up the dialog box that is shown in Figure 17-1.

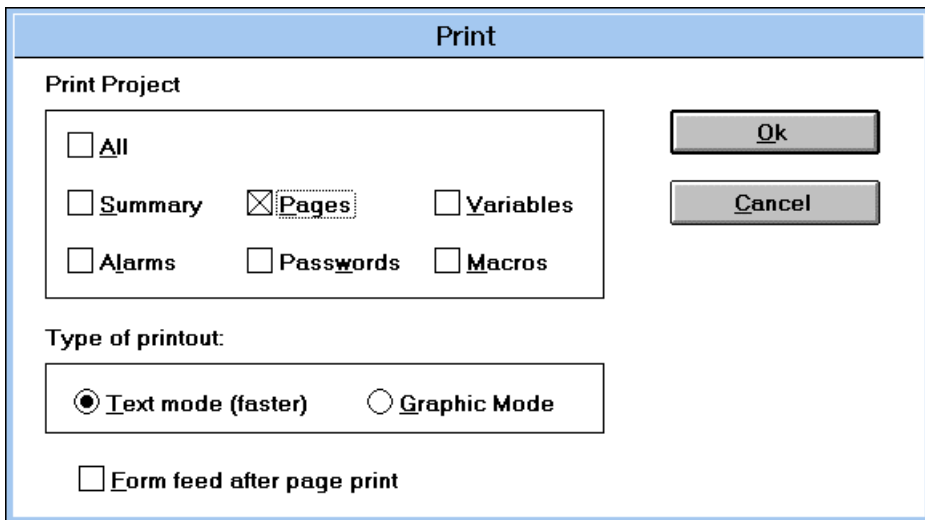


Figure 17-1

Select the desired report style by marking the respective checkbox.

Summary

Includes application setup parameters and page statistics.

Pages

Prints all page data, including a complete description of page text and data fields.

Documenting a Project

Variables

Prints all the variables defined in the project.

Alarms

Prints a complete list of alarm messages defined in the project including the priority level and alarm attributes.

Passwords

Prints a list of all passwords and privileges.

Macros

Prints a complete list of macros defined in the project.

All

Includes all the information contained in the options above.

- *It is recommended to print in Text mode.*

Chapter 18 - Application Notes

18.1 - Communication Optimization

When in Operation Mode, the panel cyclically updates all dynamic fields that are displayed in the current page. Generally, the panel will use a different communication session to update each field. This is because the user variables may be stored at locations very far from each other. Different communication sessions will be required when different data types require specific communication messages.

It is however possible to use a single session communication message to update more than one displayed field, provided that the controller addresses of all the data fields are limited in a pre-defined range and are of the same type:

The general rule is as follows:

Max Address - Min Address \leq 30 words

Due to the high overhead of some controller communication protocols, it may be convenient to create an optimized message even for only two variables that are not stored in contiguous addresses.

Example: The Siemens AS511 protocol has an overhead of about 40 characters per session, that is, if two bytes must be read from the controller, the whole session will require more than 40 characters exchanged between UniOP and the controller. If UniOP wants to read the word 0 and the word 14 in a data block, it will be still more convenient to start a single session to read all words 0-14 (it will be 30 bytes in all) and not to start two separate communication sessions.

- Therefore, for best update times, it is an advantage to have displayed data on a page that is of the same type and close in address to each other.

<p><i>Some data types for specific controllers cannot be optimized due to the characteristics of the controller communication protocol.</i></p>

18.2 - Allen Bradley

Connecting to SLC500

The panel is interfaced to SLC500 using either DH485 or DF1 protocols. On some models, you may connect either to the 9-pin programming port (DF1) using a CA12 cable or to the DH485 port with a CA25 cable. Selection of DF1 or DH485 is made under "*Project - Change Controller Driver*" in the Windows Designer configuration software. The communication protocol is embedded in the configuration software and downloaded to the panel during the configuration stage.

Another way to connect to the SLC is via a AIC link coupler, useful in cases where more than one panel is connected to a controller or when you want to put a display panel on the DH485 network. An additional advantage in using the AIC link coupler is that you can monitor and program the SLC while the display is operating by connecting the programming terminal to the peripheral port on the AIC.

For DH485 networks, UniOP is considered an *initiator* and acts as a unique node. DF1 protocol is RS232 and used as a point to point connection.

DH485 communication can be made using a CA25 cable connected to the programming port of the fixed I/O brick type (1747), 501, 502, and 503 processors. If it is desired to monitor / program the SLC while the UniOP is communicating, use an Allen Bradley AIC Link coupler and connect the UniOP panel to the AIC on the screw terminals using a CA29 cable. The Allen Bradley programming software can then connect to the J2 port on the AIC using a CA26 cable.

It is possible to connect more than one display panel to a network of controllers by using an AIC link coupler. Attach each panel to the AIC DH-485 Interface as shown in Figure 18-1.

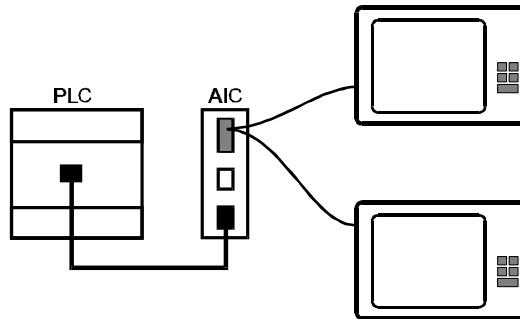


Figure 18-1

Communication Parameters:

DH-485	DF1 channel setup
19200 Baud	9600 Baud
Even parity	Even parity
One stop bit	One stop bit
	No handshaking
	Remote mode change disabled
	Duplication detection off
	ACK time out = 100 ms
	BCC check
	NAK retries = 3
	DF1 ENQs = 3

Table 18-1

The baud rate, parity, stop bits, and stop bits must be set to the same values in Designer. This can be accomplished by selecting Controller Setup from the Project menu and clicking on the PLC Comm button.

Slave ID's and Nodes

Note that the *Slave ID* field is actually the node of the SLC. Normally your SLC will be node number one. *Panel Node* is the node address of UniOP.

- Set the panel node to the next consecutive node after the controller.

$$\text{Panel node} = (\text{PLC node} + 1)$$

- Max nodes for the panel should be equal to the panel node.

$$\text{Max nodes} = \text{Panel node}$$

- For best performance, PLC max nodes should be equal to the panel node.

$$\text{PLC Max nodes} = \text{Panel Node}$$

Node	Used by..
0	Programming Software
1	Controller
2	Panel 1
3	Panel 2

Table 18-2

Logical Addressing

When addressing Allen Bradley I/O data, the panel uses logical addressing rather than physical addressing. Physical addressing refers to the element number as simply the slot number. Logical addressing, UniOP method, refers to the first element for the first I/O card of a specific file type.

For example, consider a modular I/O system consisting of the CPU in slot 0, an output card in slot one, an input card in slot 2, an input card in slot 3, and an output card in slot 4.

The output card in slot 1 would be logically addressed as follows:

File Type: Discrete Output
File Number: 0
Element: 1

The output card in slot 4 would be logically addressed as follows:

File Type: Discrete Output
File Number: 0
Element: 2

The input card in slot 2 would be logically addressed as follows:

File Type: Discrete Input
File Number: 1
Element: 1

The input card in slot 3 would be logically addressed as follows:

File Type: Discrete Input
File Number: 1
Element: 2

Testing Communications

To test the communication between the panel and the controller, make a simple project file with one numeric field. Reference this field to S4:0. *Keep in mind that all fields must exist in the SLC.* If you try to read a file or element that does not exist, a communications error will occur.

Once the project file has been downloaded to the panel, a value should appear on the display. Hold the ENTER key in for about four (4) seconds. This will cause the panel command menu to appear. Select the SYSTEM option and press ENTER again. Cursor down to the PLC field. If all is well, the system will report COM ON. If there is a problem with communications, the system will report COM OFF or COMM ERROR.

On the CP-series and MD-series panels, the LED will flash ON during a communication error. On all other panels, the LED will flash OFF. Note that on all panels that are not CP-series or MD-series, the LED will be ON even if the panel is not attached to the controller. This is because the panel is always transmitting trying to attach to DH-485. If you check the SYSTEM option from within the panel command menu with the cable not connected to the controller, the status will be reported as COMM OFF.

Connecting to SLC5/04

The SLC5/04 DB9 connector supports 2 protocols on an RS-232 signal. UniOP panels are capable to utilize DH485 and DF1 Channel 0. However, it is recommended to use the DF1 protocol for the 504 processor.

Example using DF1 protocol

Access Multiple PLC:	No
PLC Node:	1 (refer to PLC settings (source ID))
PLC Model:	SLC500
Data Bits:	1
Stop Bits:	8

Match Baud Rate, Parity with controller settings

Channel 0 Configuration

Current Communication Mode:	System
System Mode Driver:	DF1 Full Duplex
User Mode Driver:	Generic ASCII
Write Protect:	Disable
Mode Change:	Disable
Mode Attention Character:	\1B
System Mode Character:	S
User Mode Character:	U
Edit Resource File:	60
Pass-thru Lind ID:	2

Channel 0 System Mode Configuration

Baud Rate:	9600
Duplication Detect:	Disable
Ack Time Out:	50
Source ID:	1
Control Line:	No Handshaking
Parity:	Even
Error Detection:	BCC
Nak Retries:	3
Enq Retries:	3

Embedded Response:

Enable

Connecting to PLC 5

UniOP can be connected to a PLC 5 on channel zero using cable CA7 and the DF1 protocol.

Channel zero (RS232 Port) is included on models:

PLC5-11

PLC5-20

PLC5-40

PLC5-60

Other models that ***DO NOT*** have channel zero include:

PLC5-10

PLC5-15

PLC5-25

To connect to a PLC5-10, PLC5-15 or PLC5-25, you must use either:

A 1785-KE or 1770-KF2 module with DF1 protocol, or

A 1760-RB module with a defined protocol.

Connecting to Micrologix

When using a Micrologix PLC, the user cannot directly access timer presets and counter presets with the Designer software. The user can access these areas by simply using a register instead of the preset and then using a ladder logic statement to move the contents of the register into the memory location of the preset.

18.3 - Simatic TI and Koyo

Koyo 205 Series

The Koyo DL240 has 2 ports that either can be connected to a UniOP panel using a CA71 cable.

Connecting to TI 425/435 or Koyo 405 Series

The Simatic TI435 and the Koyo 405 series have two ports that can be used for communication with UniOP. The top port is used for programming the PLC. This port uses a communications protocol called the "K" protocol. The lower 25-pin port on the PLC is the network port. The network port uses a protocol called "N" protocol, but it also supports the "K" protocol. UniOP supports both of these protocols as defined by a PLC model change in "*Project - Controller Setup*". You may connect to the network port on a TI435 with cable CA9 or CA7 and use the "N" protocol *or* the "K" protocol. Usage of the programming port requires that you use cable CA8 and the "K" protocol only. The TI425 does not have a network port and you must use cable CA8 only. On the series 305 PLC's connect to the DCU with cable CA7 or CA13 (depending on DCU model) and use the "N" protocol only. The communication protocol is embedded in the Designer configuration software and transferred to panel when you download your project file.

“N” protocol:

1. Select *Project- Controller Setup* to open the Controller Setup dialog box.
2. Choose "**1) TI435 Net port**" from the PLC Model list box.
3. Use cables CA7 or CA9 to connect to the **network port only**.

“K” protocol:

1. Select *Project- Controller Setup* to open the Controller Setup dialog box.
2. Choose "**4) TI425/435 Prog. Port**" from the PLC Model list box.
3. Use cables CA7 or CA9 to connect to the network port or CA8 on the program port.

Application Notes

If you are using a TI435 with the network port you may need to configure this port. Use TISOFT and connect on-line. Select "AUX", then "Set Secondary address", then "Protocol mode" = HEX. UniOP defaults to the HEX mode.

If you are using the "K" programming port protocol, you must leave the CPU switch in the TERM position, otherwise UniOP will not be able to write data to the PLC.

TI 425/435 Communication Parameters

When you select either of the TI 425/435 drivers ("N" or "K" protocols) the Screen Designer software will preset the following default communications parameters: Baud Rate = 9600, Parity = Odd, and Stop Bits = 1.

Setting the Dip switches on the TI 435:

- SW1 ON = CPU battery DISABLED
OFF = CPU battery ENABLED
- SW2 ON = Station Address is one
OFF = Station Address set by programming system
- SW3 Baud rate selection - Baud rate = 9600 ON
- SW4 Baud rate selection - Baud rate = 9600 OFF

Connecting to TI 505

UniOP connects to the RS232 programming port on TI505 models using cable CA12. On TI models with an additional RS485/422 port, use cable CA42 (RS422). It is possible to connect one panel to each port. You may also connect UniOP to the remote base controller using a CA12. CTI offers a module that adds 4 more ports. Verify the configuration of the PLC switch settings. On the TI545, the switches are located on the front of the CPU under the access cover.

- Switch 1 ON (1) for RS422
- Switch 3 OFF (0) for 9600 baud (RS232)
- Switch 4 ON (1) for 9600 baud (RS232)
- Switch 5 ON (1) for 9600 baud (RS232)
- Switch 6 OFF (0) for 9600 baud (RS422)
- Switch 7 ON (1) for 9600 baud (RS422)

Switch 8 ON (1) for 9600 baud (RS422)

18.4 - Siemens S5 and Westinghouse PC 50 / 55 / 500 / 2000

3964R Applications

The UniOP driver referred to as “Siemens 3964R” supports the communication with SIMATIC S5 systems equipped with the CP524 or CP525-2 Communication Processors. The communication supports the RK512 Interpreter and the 3964R protocol. More information on this can be obtained from TechNote 20.

Using the Siemens S5 PLC with AS511

The UniOP driver referred to as Siemens S5 (AS511) supports communication with SIMATIC S5 systems connected to the program port. Connection to the program port is via a 20 mA current loop with a CA97 cable (panels with a -004x suffix ONLY).

18.5 - Simatic S7 - MPI

The Designer software offers support for the Simatic S7-300 and S7-400 family of controllers. In order to use the MPI protocol, the user must have a panel with a -0044 suffix. More information can be obtained by requesting TechNote 61.

18.6 - API Motion Controller

Designer offers support for the API motion controller. More information can be obtained by requesting TechNote 50.

18.7 - Unidrive and Quantum III

Designer supports both the Control Techniques' Unidrive and Quantum III. CA81 is an RS-232 cable used only for the Unidrive. However, the CA116 is a RS-422 cable that can be used on both the Unidrive and the Quantum III. For more information on these, please request TechNote 69.

18.8 - Omron C Series

All models of the Omron C-series PLC's have an LK201(RS-232) or LK202(RS-422) Host Link Unit except the C20H, CPM1, and CQM1 that have a built in communication port. The LK201 unit connects to UniOP by cable number CA7 (RS-232) or CA65(RS-422). The C20H is RS232, but uses cable CA44. The CQM1 series use a CA58 cable, while the CPM series uses either CA58 (RS-232) or CA126 (RS-422).

The Omron C-series PLC's have panel setup defaults when using the Designer for Windows. You must change these defaults according to your Omron PLC settings.

1. **Model:** The default is C2000H, change according to your particular model.
2. **Multiple point:** *This is often overlooked, and can lead to no communication from UniOP to your PLC.* The Screen Designer for Windows defaults to single link. If you have problems with communication then you must verify your configuration. This depends on the setting of the switch on the back of the LK201 Host Link Unit, and your system configuration. Most systems default utilize multiple point connection.
3. **Slave Number:** The default is zero. This setting depends on the LK201 front panel switches - **MACHINE NUMBER**. The switches are numbers 1 and 2. Number 1 is the most significant digit and number 2 is the least significant digit. A unit from 00 to 31 can be set.
4. **Baud Rate:** This next setting must match the transmission speed of the Host Link Unit and the UniOP. The switch on the LK201 is number 3. The settings on this LK201 switch and the designer panel setup can be selected from 300 to 19,200 baud, but the UniOP will only communicate from 1200 to 19,200 baud.

5. **Command Level, Parity, and Transmission Format:** The UniOP panel setup default is even parity and 7 bits with 2 stop bits. The switch numbered 4 on the LK201 front panel must match a setting you select with the UniOP Designer Panel Setup dialog box.

The dip switches on the back of the LK201 are used to select multilink or single link operation via switch number 3.

All of these settings on the LK201 host link unit are initialized when the unit's power is cycled. If a setting is changed on the LK201, you must restart the PLC.

Typical Settings for the Designer and LK201

Project-Panel Setup:

MODEL =	C200H
1:N MULTIPLE POINT	YES
SLAVE =	0
BAUD RATE =	19,200
PARITY =	EVEN
BITS =	7
STOP BITS =	2

LK01 Front Panel:

UNIT # SWITCHES 1 AND 2 ARE 0

This number coincides with the slave number for "Project-Panel Setup"

TRANSMISSION SPEED SWITCH #3 SET AT 6 FOR 19,200 BAUD

*This setting coincides with the baud rate set in
"Project - Panel Setup - PLC communications"*

COMMAND LEVEL, PARITY, AND
TRANSMISSION FORMAT SWITCH #4 IS SET AT 2

This setting is synonymous with a Designer Panel Setup consisting of even parity, 7 bits and 2 stop bits

18.9 - Eagle Micro 190

UniOP supports Eagle Signal's Micro 190 and Micro 190+ ECOM networks. The UniOP operator interface can be connected on a secondary link to communicate with all of the PLC's on that link. You can read/write data, messages, bargraphs, attributes, etc., referencing any of the PLC's on the link. One PLC link will operate on the Reserved Data Area or RDA, the main interface for controlling the UniOP with ladder logic. The RDA is 23 registers long, reduced from it's standard 37 registers due to the limited memory of the Micro 190 series. The total number of alarms is 32.

The Micro 190 series operate at 9600 baud max. It is sometimes necessary to reduce the baud rate down to 4800 baud when the control system includes PID loops. The smaller CP type display panels can operate at 4800. All other standard panels must be ordered as an LB (4800, low baud) panel.

To connect to the Micro 190, use cable number CA19.

18.10 - GE Fanuc Series 90

The GE 9020 fixed I/O brick has only one port, a second port is not possible. All other GE 90 series PLCs have an option of adding a CMM module. Use a CA10 cable to connect a UniOP panel to the programming port on all models. Use a CA90 (RS-422) or CA7 (RS-232) to connect to a CMM module.

The panel uses a feature of the communication protocol, (SNP) whereas all of the defined data on each page is optimized (regardless of data type or address range) in one communication exchange (Datagrams). Designer now offers support for the SNP-X protocol, which will offer better communication performance in most cases.

18.11 - Aromat / Matsushita

With the FP1 controllers, the panel connects directly to the programming port using cable CA15 using RS422. A switch next to the programming port under an access cover can select the baud rate, 9600 or 19200. On some PLC models it is possible to use an additional RS232 port. You must configure the port using the PLC programming software in order to make the port active. Refer to the PLC manual for further details.

Designer also supports FP3, FP5, and FP10, all of which do not have an additional RS-232 port.

18.12 - Idec

UniOP can connect directly to the IDEC programming port, or to the link adapter. If connected to the programming port directly, the signal exchanges are not purely RS232. A special cable is used containing signal conditioning electronics. The Micro³ PLC uses a CA76 cable to connect to a UniOP panel.

Information on addressing the FA-series controllers is available by requesting TechNote 57.

18.13 - Keyence

Use a CA61 cable to connect a UniOP panel to the programming port on the KV300 PLC. A second port can be added using a KV-L2 module. Use a CA80 cable to connect to this module.

18.14 - Mitsubishi A Series

Use a CA66 cable to connect a UniOP panel to the A series PLC programming ports. The driver “Mitsubishi A” is used for the programming port. A second port may be added using a MELSEC module. Use a CA32 cable to connect to this module and select the “MELSEC A” driver. More information is available by requesting TechNote 49.

18.15 - Telemecanique

Use a CA94 cable to connect a UniOP panel to a TSX17. A second port can be added using a Unitelway coupler module. Use a CA72 to connect to this module. A TSX47 can have a Unitelway module added, but a CA84 cable is used to connect to this module.

Designer also supports TSX-07 and TSX-27, using Unitelway on their programming ports. The panel is also capable of acting as a Unitelway slave station. See TechNote 34 for more information on Unitelway

18.16 - Klockner-Moeller

Designer offers support for Klockner-Moeller. More information can be obtained by requesting TechNote 51. The following PLCs are supported:

- PS4-200

- PS306
- PS316
- PS416

18.17 - Compumotor

Several models of Compumotor products are supported by the Designer software. When using a Compumotor motion controller, the following lines **MUST** be at the top of the motion control program for initialization:

```
ERRBAD13,10,63,32  
ERRDEF13,10,45,32  
ERROK13,10,62,32  
ECHO0  
ERRLVL3
```

If you are using the Compumotor network, where you are daisy chaining two or more Compumotors together, you need to replace the last two lines in the above initialization with the following two lines:

```
ECHO1  
ERRLVL1
```

18.18 - Hitachi

Designer offers support for the following Hitachi PLCs:

- H Series
- EM Series
- EC Series

18.19 - The VT100 Driver

For additional information on the VT100 driver, request TechNote 27.

Description

The VT100 panels can be configured in either point to point or multi-drop configurations. In the multi-drop configuration, a number of panels, each sharing a common transmit line and a common receive line, can be attached to a single host. The host unit might be a computer or a PLC, programmed to control the multi-drop network. A separate document is available for VT100 that provides complete details for VT100 applications.

The type of configuration required can be specified in the Communication menu of the panel. The default configuration is point to point. The multi-drop configuration can be enabled by specifying YES for the Multi Drop option. The communications port is the lower port labeled "PLC".

In the multi-drop configuration each panel can be enabled or disabled as a Receiver. A disabled Receiver only listens for the multi-drop commands from the host. It ignores any other data that is transmitted from the host. Each panel can also be disabled as a Transmitter or enabled as a Permanent Transmitter or as a Short Span Transmitter.

A Disabled Transmitter does not transmit any data at all to the host. A Permanent Transmitter is free to transmit to the host until the host disables it as a transmitter. A Short Span Transmitter uses a simple token passing mechanism. A Short Span Transmitter transmits all of the current data in its' transmit buffer to the host. When the transmit buffer is empty it terminates its transmission by passing the transmission token (the right to transmit) back to the host together with the ID of the next panel that should receive the token. The host can then enable the specified panel as the next Short Span Transmitter.

Application Notes

In the multi-drop configuration, each panel must be assigned a unique ID number between 1 and 255. An ID of 0 is used as a NULL ID. A panel can be assigned a NULL ID but in this case it does not transmit or receive in the multi-drop configuration. Each panel is also given the node ID of the next panel that it is attached to in the network. In this way a network ring can be created

In VT100 mode, panels have the following characteristics:

- A 7-bit character set is used.
- There is no local echo.
- Characters are received from the host in a queue before processing and XON/XOFF protocol can be enabled to prevent overload of that queue.
- Characters to be sent to the host are placed into a queue before transmission. The host can use XON/XOFF protocol to control the transmission of these characters, if XON/XOFF is enabled in the panel, to prevent overload of its own queue.
- Characters received from the host are displayed by the panels if they are within the ASCII range 20 - 7E Hexadecimal.
 - Received escape sequences that are erroneous, not recognized or unsupported are ignored.
 - Control functions are performed without displaying character(s) to represent the function.
 - Characters moved outside the margins are lost.
 - Cursor can not be positioned outside the margins.
 - All displayed characters can be erased.
 - Received characters replace characters at the cursor position.
 - Keyboard can not be disabled.
 - Positioning units are characters and lines.

Escape Sequences

The following table lists the supported control characters and the response of the VT100 panel when they are received:

	Short	HEX	Function
Null	NUL	00	ignored
Backspace	BS	08	move cursor left
Tab	HT	09	move cursor to the next tab stop
Line feed	LF	0A	linefeed or new line
Vertical tab	VT	0B	same as line feed
Form feed	FF	0C	same as line feed
Return	CR	0D	left margin of current line
XON	DC1	11	continue transmitting
XOFF	DC3	13	stop transmitting
*BELL	BEL	07	sounds the bell tone
Escape	ESC	1B	start escape sequence

Two types of escape sequences are recognized and at least ignored if sequence is not supported.

- Escape sequence (ANSI): ESC + 0 or more chars
in range 0x20 - 0x2F + final character in range 0x30 - 0x7E
- Control sequence (ANSI): ESC + [+ 0 or more chars
in range 0x20 - 0x3F + final character in range 0x40 - 0x7E

Application Notes

The following table lists the escape sequences supported by the VT100 panels:

Command	Command Sequence
Cursor up one line	ESC [A
Cursor down one line	ESC [B
Cursor right one column	ESC [C
Cursor left one column	ESC [D
Cursor up	ESC [nn A
Cursor down	ESC [nn B
Cursor right	ESC [nn C
Cursor left	ESC [nn D
Cursor position	ESC [ll ; cc H
Cursor home	ESC [H
Cursor On	ESC [? 25 h
Cursor Off	ESC [? 25 l
Autowrap On	ESC [? 7 h
Autowrap Off	ESC [? 7 l
Horizontal and Vertical position	ESC [ll ; cc f
Index	ESC D
Reverse Index	ESC M
Next Line	ESC E
Save cursor and attributes	ESC 7
Restore cursor and attributes	ESC 8
Scroll Up	ESC [nn S
Scroll Down	ESC [nn T
Exit attribute mode	ESC [m
Exit attribute mode	ESC [0 m
Bold	ESC [1 m
Blink	ESC [5 m
Reverse	ESC [7 m
Double height line (top)	ESC # 3
Double height line (bottom)	ESC # 4
Single width line	ESC # 5
Erase to end of line	ESC [K
Erase to end of line	ESC [0 K
Erase from beginning of line	ESC [1 K
Erase entire line	ESC [2 K
Erase to end of screen	ESC [J

Application Notes

Erase to end of screen	ESC [0 J
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Erase from beginning of screen	ESC [1 J
Erase entire screen	ESC [2 J
Show page	ESC [nn P
Set LED on	ESC [nn q
Set LED off	ESC [nn x
Set all LED's off	ESC [0 x
Set Buzzer on	ESC [65 q
Set Buzzer off	ESC [65 x
Increase Panel Brightness	ESC [? 5 h
Decrease Panel Brightness	ESC [? 5 l
Identify Terminal	ESC Z
Receive Control	ESC [nn {
Transmit Continuous Control	ESC [nn }
Transmit Short-Span Control	ESC [nn

Only graphic units will support VT100 double size characters.