xycom

SoftScreen Development System
for Windows User's Guide

Revision	Description	Date
A	Manual Released	2/96
B	Manual Updated	4/96
C	Manual Updated (incorporated PCN 196)	6/96
D	Manual Updated (incorporated PCN 198)	7/96
E	Manual Updated (incorporated PCN 201)	9/96
F	Manual Updated	1/97
G	Manual Updated (incorporated PCN 209)	3/97
H	Manual Updated	8/97
I	Not Released	
J	Manual Updated	12/97

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Table of Contents

i

ii

iii

v

vi

Chapter 1 – SoftScreen Overview

This chapter provides an overview of the *SoftScreen*® Development System for Windows, describing important features and resources.

SoftScreen Features

The *SoftScreen* Development System for Windows offers a flexible, powerful man-machine interface development tool. Using this tool, you are able to connect the Focal Point™ 3000 family of workstations to a variety of popular programmable logic controllers and other intelligent plant floor devices.

SoftScreen consists of a development system and a run-time engine.

The Development System

The development system is an intuitive, object-oriented tool that allows a designer to create intelligent user interface screens to replace less flexible hard-wired control and monitoring devices. The powerful screen layout functions support quick and easy placement of symbols, fundamental graphic shapes, and 256-color and monochrome bitmaps.

Minimum system requirements for the development system are

- 80486, 66 MHz CPU (Pentium 100 MHz recommended)
- 3½-inch (1.44 Mbyte) floppy disk drive
- 16 Mbytes DRAM (20 Mbytes recommended)
- SVGA graphics capability (800 x 600, set to 256-color mode or higher, recommended)
- 15 Mbytes hard drive space
- Microsoft Windows® 95/NT Operating System
- Mouse

> ## Caution
> We also recommend you let Windows allocate virtual memory to guarantee system integrity.

The Run-time Engine

The run-time engine executes applications downloaded to a 3000 workstation from the development system. Its operating system supports prioritized scanning of I/O points.

The run-time engine makes full use of the 3000 workstation's advanced features:

- Screen animation

- Downloadable programs and drivers through serial ports

- Optional analog touch screen, providing various button sizes and placement options

- Interface to standard PLCs, as well as high-speed networks

- Keypad access

Resources

In addition to this user's guide, there are two other resources to which you can refer when you have questions: on-line help and Xycom technical support.

Using On-line Help

On-line help provides a way for you to get assistance for the development system quickly. There are several ways to access information in the help system:

- Click on the Index command on the Help menu or the Index button, then locate the topic on which you would like more information.

1-2

- Click on the Search for Help On command on the Help menu or the Search for Help On button, then locate the topic on which you would like more information.

- Press F1 while pointing to a dialog box or menu command to open the help topic that corresponds to that dialog box or menu command.

- Press F1 anywhere in the window (but not on a dialog box or menu command) to open the help Contents window, and then select a topic.

- Press the Help button located in most dialog boxes.

Words or phrases in the help system that appear underlined and in green will display a help window when clicked on. Words or phrases that appear in green with a dotted underline will display a definition when clicked on.

For more information on using the Help system, select the Using Help command on the Help menu.

Contacting Technical Support

Xycom provides technical support to its *SoftScreen* users. If you have a problem and cannot find its solution in the manual or on-line help, you can call our technical support personnel at 1-800-289-9266 ext. 450.

You can also contact our support personnel via Internet e-mail. Our e-mail address is support@xycom.com. Leave your name and phone number if you want to be contacted by phone.

1-3

Chapter 2 – Installing SoftScreen

This chapter describes how to install and uninstall the *SoftScreen* for Windows Development System.

Making Backup Copies

Before installing *SoftScreen*, you should make backup copies of the *SoftScreen* disks. Refer to your Microsoft Windows® 95 or Windows NT™ Operating System documentation for information on making backup copies.

Installing the Software

Because *SoftScreen* is a Microsoft Windows 95/NT Operating System program, you must install it in Windows 95/NT. If *SoftScreen for Windows* is already on your system, this installation will overwrite the current files.

To install *SoftScreen*...

1. Start Windows 95/NT.

Technical Note

We recommend you close all Windows applications before you install *SoftScreen*.

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2. Double-click on the Control Panel folder, then double-click on the Add/Remove Programs icon.

3. Click on the Install button in the Add/Remove Program Properties dialog box.

4. Insert *SoftScreen* Disk 1 in your local drive (usually drive A:).

5. Follow the on-screen prompts to complete the installation. There are several installation disks which the program will prompt you to insert as they are needed.

As files are being copied to your hard drive, three icons will display on the left side of your workstation screen indicating your progress.

The far left icon indicates how much of an individual file has been transferred. The middle icon indicates how much of a floppy has been transferred. The far right icon represents the amount of space occupied on the system's hard drive before you install the driver.

Technical Note

To end the installation process at any time, select the Cancel button in the setup dialog boxes. A prompt will inform you that setup is not complete. Select the Exit Setup button if you still want to exit the installation program. If you wish to continue the installation, select the Resume button.

Once *SoftScreen* has been installed, a prompt will ask if you want to view the readme.txt file. We recommend that you read this file and print it out to refer to, as it provides important information that you will not find in the manual or on-line help.

If you want to access the readme.txt file later, it is located in the same directory in which you have installed your *SoftScreen* program files. You can also access it from the *SoftScreen* on-line help system.

Converting a SoftScreen Version 1.x Application to Version 2.x

The TRNSLAT.EXE utility provided with SoftScreen Version 2.x converts a Version 1.x application to Version 2.x. To complete this conversion, follow the steps below:

1. Execute TRNSLAT.EXE either by double clicking on the name in the Explorer with the left mouse button or by typing in TRNSLAT.EXE in the Start/Run dialog box.

2. The TRNSLAT dialog box appears.

3. Type in or browse for the existing 1.x application where specified.

4. Type in or browse for the new application directory where specified. The path name must be different than what you used in Step 3.

2-2

14

Technical Note
If you used the browse feature in Step 3, your current working directory is set to that of the 1.x application. You *must* change to a new directory.

5. Click OK to convert the application. *It is not uncommon for the conversion to take up to 15 minutes, depending on the size of the version 1.x application.*

Converting Customized SoftScreen Symbols from Version 1.x to 2.x

The SYMTRSLT.EXE utility provided with SoftScreen version 2.x converts Version 1.x symbols to Version 2.x. To complete this conversion, follow the steps below:

1. Execute SYMTRSLT.EXE either by double clicking on the name in the Explorer with the left mouse button or by typing SYMTRSLT.EXE in the Start/Run dialog box.

2. The SYMTRSLT.EXE dialog box appears.

3. Click OK to convert the custom symbols.

Uninstalling SoftScreen

To uninstall *SoftScreen...*

1. From Windows 95/NT, click the Start button. Select the Settings command, then Control Panel.

2. From the Control Panel, double-click on Add/Remove Programs.

3. Double-click on the SoftScreen Development System for Windows entry in the list of removable programs on the Install/Uninstall page.

4. Select Yes in the Confirm File Deletion dialog box.

You will be notified once the uninstall has been successfully completed.

After the uninstall, Windows leaves one file in the directory in which you stored the SoftScreen program. To delete this file, it is recommended that you delete the directory in which the SoftScreen program resided.

Connecting to the Target Workstation

You can download from the development system workstation to the target workstation via RS-232C or RS-485 connections.

Connecting via RS-232C

Figures 2-1 and illustrates the 9-pin pinout to connect from a development system PC to a Focal Point™ target workstation.
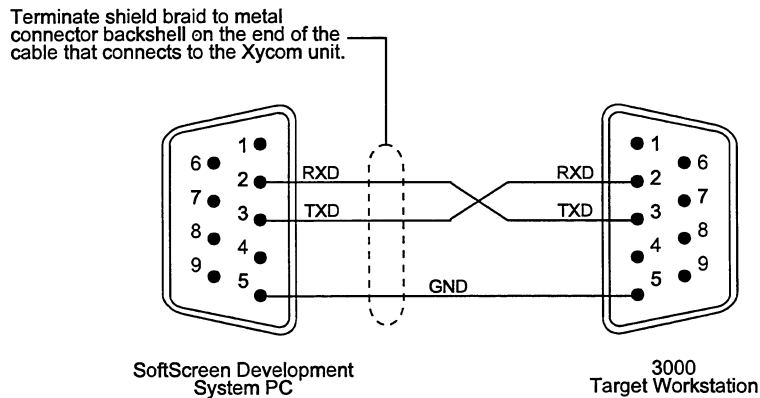
Figure 2-1. 9-pin RS-232C Interface from Development System to Target Workstation

Connecting via RS-485 Multidrop

Use a Belden 8302, maximum length 4000 feet, when connecting to the RS-485 port of the run-time engine. Pinouts are shown in Figure 2-2.

2-4
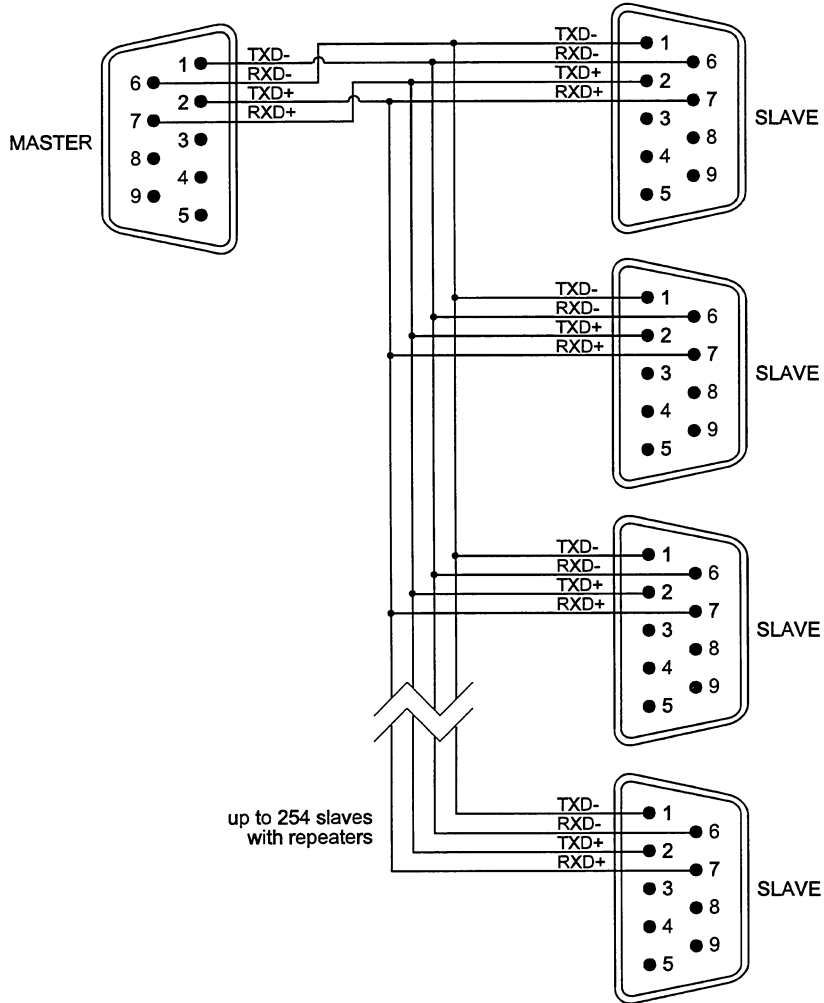
Figure 2-2. RS-485 Multidrop Interface Pinouts

Up to 31 (254 with repeaters) run-time engines can be connected on a multidrop network to the development system workstation. This allows you to make changes from a central location, and then download to any engine on the RS-485 interface. Figure 2-3 depicts a sample multidrop configuration. Termination is required on the Master and the last Slave on the network.

Sample Multidrop Configuration
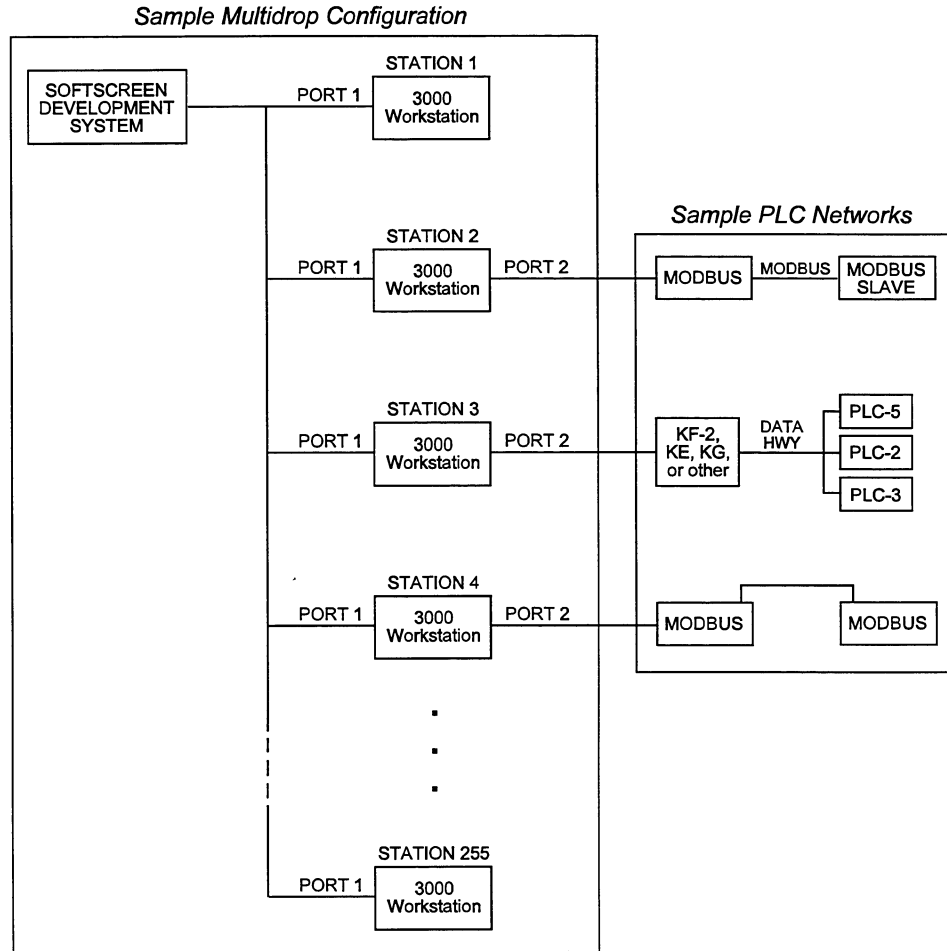
Figure 2-3. Sample Multidrop Configuration

Contacting Technical Support

If you encounter problems when installing *SoftScreen*, try re-installing it. If that does not solve the problem, call our customer support personnel at 1-800-289-9266 ext. 450.

2-6

You can also contact our customer support personnel via Internet e-mail. Our e-mail address is support@xycom.com. Leave your name and phone number if you wish to be contacted by phone.

Registering SoftScreen

SoftScreen users are registered when they order the software. However, if you want to change the registration information, contact Xycom at 1-800-289-9266 x344. We recommend you register as a *SoftScreen* user. As a registered user, you will receive technical support, as well as information on product upgrades.

2-7

Chapter 3 – Configuring Tags

SoftScreen is a tag-based system, in which tags are linked to data points or internal system variables (i.e., expressions, strings, and constants). These tags are then used to manipulate shapes through animations, event/actions, recipes, and alarms.

Using Data Editor Forms

Tags are configured in Data Editor forms. Table 3-1 defines the buttons available on every Data Editor form.

Table 3-1. Buttons on Data Editor Forms

Button	Definition
Add	Adds the configured tag to the list box
Remove	Removes the selected tags
Move Up	Moves the selected tags up in the list
Move Down	Moves the selected tags down in the list

Creating Tag Names

Tag names identify tags. Following are several guidelines for creating tag names:

- Tag names must begin with a letter, and may contain up to 32 alpha-numeric characters, underscores, or colons.

- Each tag name must be unique.

- Tag names are case sensitive, so be consistent when typing tag names. You might want to create tag names that contain all upper case letters or all lower case letters, but not a combination of both).

Addressing Driver Data Points

Tag names can be defined in the following areas of an application:

- Internal driver
- PLC driver
- Strings
- Screen names
- Data entry shapes
- Alarm names

- Keyboard driver
- Constants
- Expressions
- Touch zones
- Recipe names

The following sections define how to assign tags to internal and keyboard drivers.

Refer to your *SoftScreen* driver documentation for information on defining tag names for specific PLC addresses.

Once you have configured device data points, you may want to duplicate them in an application for another driver.

To duplicate device data point tags...

1. Open the application from which you want to copy device data point tags.

2. Select the Save As command on the File menu to save the application with a new name.

3. In the Save Application As dialog box, type a new name in the Application name text box, then click on the Save button.

4. Select Drivers from the Data drop-down list box in the Application Navigator.

5. Double-click on the name of the driver from the associated list. This opens the driver form that contains the tags you want to copy.

6. Select the Drivers command on the Configure menu.

7. In the Configure Physical Drivers dialog box, configure a driver of the same type with a new name. Configure the port as None.

8. Press Add to add the new driver to the application.

9. Press OK to exit the Configure Physical Drivers dialog box.

3-2

10. Select Drivers from the Data drop-down list box in the Application Navigator.

11. Double-click on the name of the new driver from the associated list. This opens the driver form to which you will copy the tags.

12. With both driver forms open, duplicate each of the tags in the old driver form in the new driver form.

13. After you duplicate a tag in the new driver form, delete it in the old driver form.

14. Click the Add button in the new driver form to add the tag once it has been deleted in the old driver form.

15. When you have finished duplicating the tags, select the Drivers command on the Configure menu.

16. Highlight the old driver name in the Configure Physical Drivers dialog box, and then click on Remove. This deletes the old driver.

17. Highlight the new driver name in the Driver Names list box, and then select a port.

18. Click the Add button to add the new port configuration to the driver.

19. Select the Save Application button to save changes to the application.

Using the Internal Driver

Every 3000 engine incorporates an internal driver. The internal driver accesses the system clock, system-generated and system performance variables, and internal registers.

To assign tag names...

1. Select Drivers from the Data drop-down list box on the Application Navigator form.

2. Double-click on the Internal entry in the list box to access the Internal Driver form, as shown in Figure 3-1.

3-3
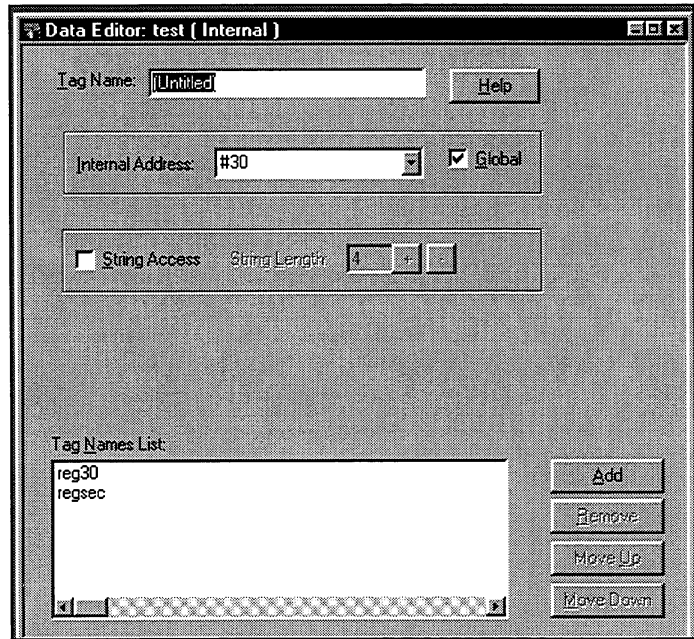
Figure 3-1. Internal Driver Form

Table 3-2 defines the fields in the Internal Driver form.

Table 3-2. Fields in the Internal Driver Form

Field	Definition
Tag Name	Defines the tag to be addressed.
Internal Address	Specifies the internal address to which the tag will be linked (see valid address ranges in tables 3 through 5).
Global	Guarantees that the data point retains its value even if it is not used by the current screen.
String Access	Allows string access when checked. This field is available only when specifying register address types. When this option is selected, you must provide a string length, from 1 to 128 characters.

3. Click Add to add the tag to the list box.

3-4

24

Once specified, internal driver tags can be used in animations, event/actions, recipes, and alarms.

Addressing Valid Data Points

This section defines valid addresses for the internal driver. There are four types of internal addresses:

- Register
- System clock
- System-generated variables
- System-performance variables

Technical Note

Registers and the contrast adjustment are read/write. Registers also support strings. System variables are read only.

Internal Register Addresses

Internal registers can be used in any value or conditional expression. To address a register, type the # sign, and then a value (from 1 to 9999) in the Internal Address field. For example, if you wanted to address register 30, you would type #30 in the Internal Address field.

Technical Note

The state of an internal register is not retained on power down.

System Clock Addresses

System clock addresses provide information on system date and time. You can display this information by configuring a data display shape.

Table 3-3 defines the system clock addresses and ranges supported.

Table 3-3. System Clock Variables

System Clock	R/W	Return Value Range
Hour	R/W	0-23
Minute	R/W	0-59
Second	R/W	0-59

3-5

System Clock	R/W	Return Value Range
Month	R/W	1-12
Day	R/W	1-31
Year	R/W	0-99
Day of Week	R/W	0-6: 0=Sunday, 1=Monday, etc.
SysTime	R/W	Returns the system time. This number is updated approximately every quarter second. *Note: Use data display shapes to view the system time during run-time. Refer to Chapter 5 for more information on data display shapes.*
SysDate	R/W	Returns the system date. This number is updated approximately every quarter second. *Note: Use data display shapes to view the system date during run-time. Refer to Chapter 5 for more information on data display shapes.*

Testing and Debugging Variables

Testing and debugging variables can be used to test and debug your application before placing it into a production environment. These are most frequently used to test animations, alarms, and event/actions.

Table 3-4 defines the system-generated variable addresses and ranges supported by the internal driver.

Table 3-4. Testing and Debugging Variables

Variable	R/W	Return Value Range
Random	R	Returns a random number from 0.0 to <1.0 approximately every quarter second
RampUp	R	Cycles from 0.0 to 1.0 approximately every eight seconds in .03125 increments
RampDown	R	Cycles from 1.0 to 0.0 approximately every eight seconds in .03125 increments

3-6

Variable	R/W	Return Value Range
RampUpDown	R	Cycles from 0.0 to 1.0 to 0.0 approximately every 16 seconds in .03125 increments
OscSin	R	Cycles from -1.0 to 1.0 (Sine values) approximately every nine seconds in 9° increments
OscCos	R	Cycles from -1.0 to 1.0 (Cosine values) approximately every nine seconds in 9° increments

System Performance Variables

You can address system-performance variables, allowing you to check the performance of your system.

Table 3-5 defines the system performance variable addresses and ranges supported by the internal driver.

Table 3-5. System Performance Variables

System Performance Variable	R/W	Return Value
RenderCYC	R	Returns the Render cycle time (in msecs), which indicates how long it takes to draw the current screen. This number is updated approximately every quarter second.
EvalCYC	R	Returns the evaluate cycle time (in msecs), which indicates how long it takes to evaluate all the expressions in the current screen and the Graphic Editor. This number is updated approximately every quarter second.

3-7

27

System Performance Variable	R/W	Return Value
ActionCYC	R	Returns the service cycle time (in msecs), which indicates how long it takes to perform event/actions in the current screen and the Graphic Editor. This number is updated approximately every quarter second.
Contrast	R/W	Adjusts system contrast. To change the contrast, you must write a positive or negative constant to this address. This constant is relative, not absolute, and indicates the amount the current contrast setting will be altered by, not what it is set to. For example, if you write a +3 to this address, and the current contrast setting is 10, the contrast will be altered by 3, to 13. The contrast setting range is -128 to +127. So if you write a +3, and the current contrast setting is +127, the contrast will not change. *Note: On 3200 and 3300 target workstations with monochrome flat panel displays, contrast is automatically adjusted every 10 minutes, based on the temperature. On the 3100 target workstation with monochrome or touch screen flat panel display, contrast is updated only at boot-up. You should add contrast controls to the application so you can update your screen contrast while the application is running.*

3-8

Using the Keyboard Driver

Every 3000 engine incorporates a keyboard driver. This driver allows you to create tags that address keyboard and keypad keys.

For example, you can create a tag named Color that addresses the F1 key. You can then use the Color tag to animate a shape's color when F1 is pressed.

Also, if you relegend the function keys on your workstation's keypad, you can use the keyboard driver to rename the function keys internally to reflect these new legends. This will make it easier to assign and track these keys.

To assign a tag to the keyboard driver...

1. Select Drivers from the Data drop-down list box on the Application Navigator form.

2. Double-click on the Keyboard entry in the list box to access the Keyboard Driver form, as shown in Figure 3-2.

Figure 3-2. Keyboard Driver Form

Table 3-6 defines the fields in the Keyboard Driver form.

3-9

29

Table 3-6. Fields in Keyboard Driver Form

Field	Definition
Tag Name	Assigns the tag name
Key	Specifies the key that the tag will address. You can select any key from the drop-down list.

For example, if you relegend the F1 key on the workstation keypad to "START," you can configure the F1 key as illustrated in Figure 3-3.
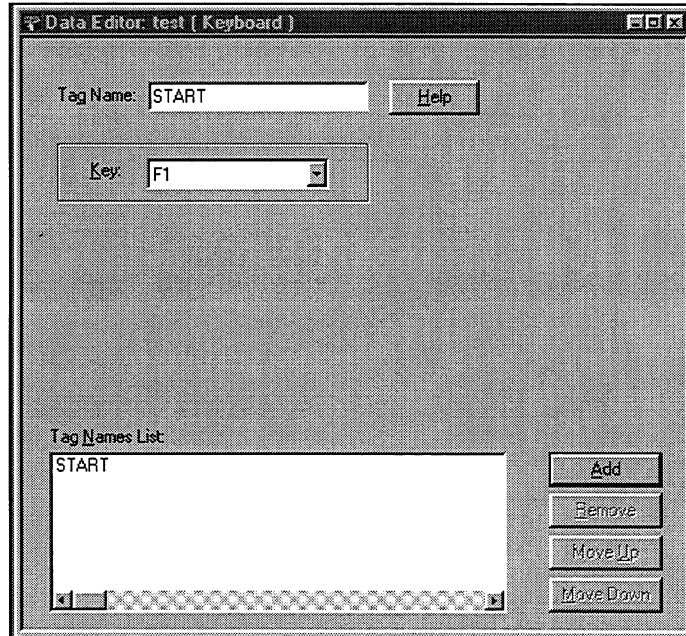
Figure 3-3. Keyboard Driver Example

3-10

> ## Technical Note
>
> Keys configured in this form will only reflect the current state of the key. For example, a tag tied to F1 will evaluate to 1 while the key is pressed and 0 while the key is not pressed. To detect changes in the state of keys, use key press and key release event/actions. Refer to Chapter 11 for information on event/actions.
>
> Also, data for keys is invalid on the run-time engine until each key has been pressed once.

3. Click Add to add the tag to the application.

This tag name can now be used in animations, recipes, and alarms.

Configuring Internal System Variables

In *SoftScreen*, you are able to configure tags that address internal system variables, which consist of constants, strings, and expressions.

Creating Constant Tags

In the Constants form, you are able to link numbers and arrays of numbers to tags. These tags can then be used in expressions.

To configure a constant tag...

1. Select Application from the Data drop-down list box on the Application Navigator form.

2. Double-click on the Constants entry in the list box to access the Constants form, as shown in Figure 3-4.

3-11
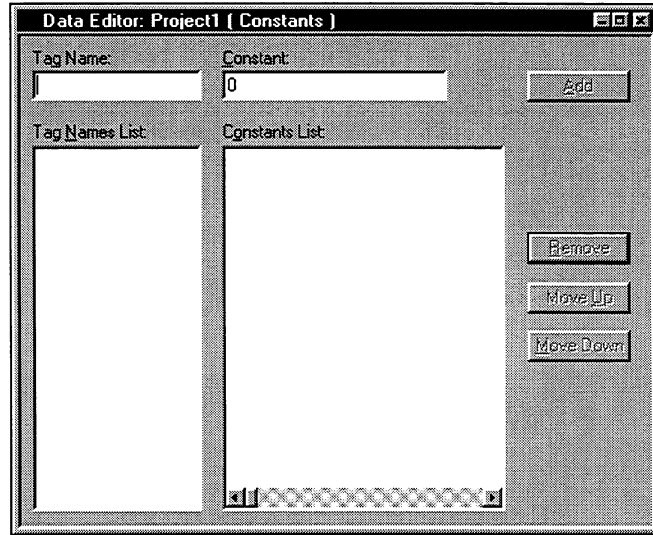
Figure 3-4. Constants Form

Table 3-7 defines the fields in the Constants form.

Table 3-7. Fields in Constants Form

Field	Definition
Tag Name	Assigns the tag name
Constant	Specifies the constant or constants that the tag will address. You can enter these values in exponential notation.

For example, you can configure a tag that addresses a single constant or you can configure one that indexes an array of constants, as shown in Figure 3-5.

3-12

32
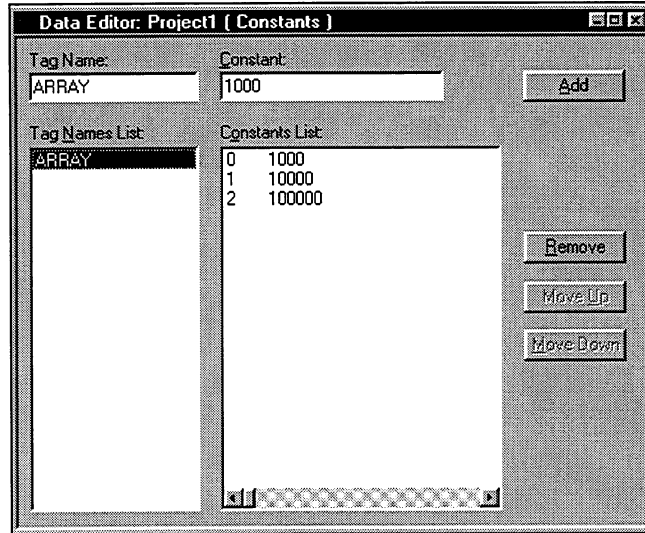
Figure 3-5. Constant Example

In the Constants List box in Figure 3-5, the first number is the index (0, 1, and 2), and the second number is the assigned value (for example, 1000).

Technical Note

Each time you add a new value to a tag, the index automatically increments.

---

3.   Click Add to add the tag to the list box.

You can now use this tag in expressions. Refer to the *Creating Expression Tags* section later in this chapter for information on using constant tags in expressions.

Creating String Tags

In the Strings form, you can configure a tag to address a string or an array of strings. Strings created in the Strings form are constants that cannot be changed by the run-time engine. These tags can then be used in expressions.

3-13

33

To configure a string tag...

1. Select Application from the Data drop-down list box on the Application Navigator form.

2. Double-click on the Strings entry in the list box to access the Strings form, as shown in Figure 3-6.
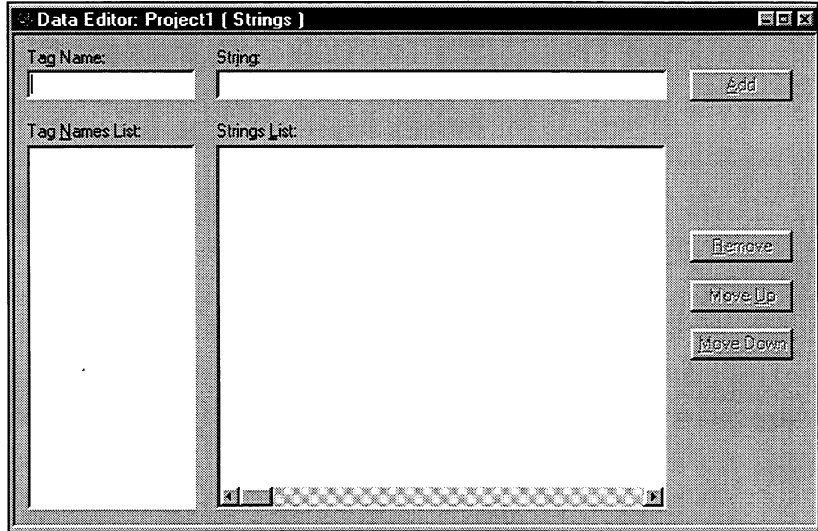
Figure 3-6. Strings Form

Use the fields in this form to create tags that address string constants. Table 3-8 defines these fields.

Table 3-8. Fields in Strings Form

Field	Definition
Tag Name	Assigns the tag name
String	Specifies the string or strings that the tag will address. Strings can be up to 254 characters. *Note: Some drivers only support 128 characters, so a string that contains more than 128 characters may be truncated.*

In the example in Figure 3-7, the tag Message is configured as an array of strings, which can then be indexed in an expression.

3-14
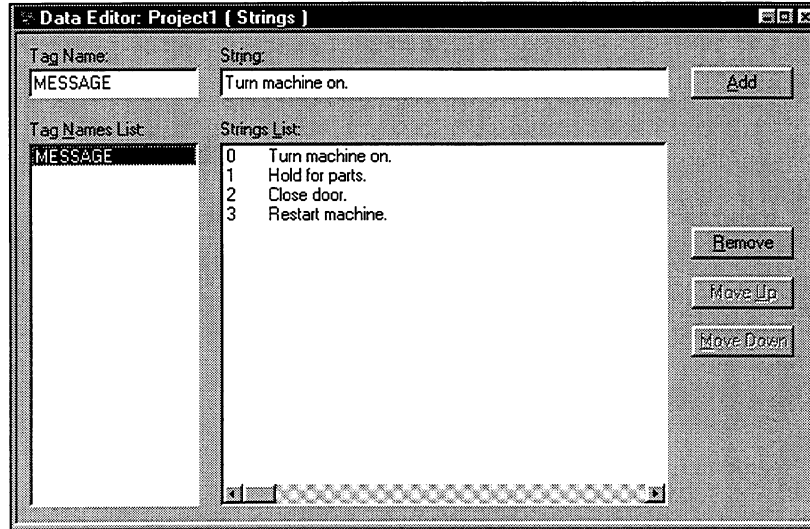
Figure 3-7. String Example

In the Strings List box in Figure 3-7, the first number is the index (0, 1, 2, and 3), and the second part is the assigned message (for example, Turn machine on).

Technical Note

Each time you add a new string to a tag, the index automatically increments.

---

3. Click Add to add the tag to the list box.

You can now use this tag in expressions. Refer to the *Creating Expression Tags* section for information on using string tags in expressions.

Creating Expression Tags

Expressions consist of one or more operators, operands, and/or tags.

To configure an expression...

1. Select Application from the Data drop-down list box on the Application Navigator form.

3-15

2. Double-click on the Expressions entry in the list box to access the Expressions form, as shown in Figure 3-8.

Figure 3-8. Expressions Form

Use the fields in this form to create tags that address expressions. Table 3-9 defines these fields.

Table 3-9. Fields in Expressions Form

Field	Definition
Tag Name	Assigns the tag name
Data Type	Sets the data type of the expression to float or string. The default is float.
Length	Sets the length of the expression in bytes to 4 if float is the data type, and from 1 to 254 if string is the data type
Scan Rate	Sets how often the run-time engine will read the data point, from ASAP to once every eight hours. The default is ASAP.
Expression	Specifies the expression that the tag will address. Expressions can incorporate tags that address strings, constants, and keyboard, internal, and PLC data points, as well as operators and operands. Expression strings can be up to 254 characters. ***Note:*** *Some drivers only support 128 characters, so a string that contains more than 128 characters may be truncated.*

Table 3-10 defines valid numeric operators.

3-16

Table 3-10. Valid Numeric Operators

Operator	Description	Precedence*	Result of Evaluation
!	Logical negation	1	True or false
*	Multiplication	2	Value
/	Division	2	Value
%	Modulus (remainder)	2	Value
+	Addition	3	Value
-	Subtraction	3	Value
<<	Left shift	4	Value
>>	Right shift	4	Value
==	Equality comparison	5	True or false
!=	Inequality	5	True or false
<	Less than	6	True or false
>	Greater than	6	True or false
<=	Less than or equal to	6	True or false
>=	Greater than or equal to	6	True or false
|	Bitwise inclusive OR	7	Value
&	Bitwise AND	7	Value
^	Bitwise exclusive OR	7	Value
||	Logical OR	8	True or false
&&	Logical AND	8	True or false

**Operators at the same precedence level are evaluated from left to right.*

3-17

37

Table 3-11 defines valid string operators.

Table 3-11. Valid String Operators

Operator	Description	Precedence*	Result of Evaluation
!	Logical negation	1	True or false
+	Addition	2	String
<<	Left shift	3	String
>>	Right shift	3	String
==	Equality comparison	4	True or false
!=	Inequality	4	True or false
<	Less than	5	True or false
>	Greater than	5	True or false
<=	Less than or equal to	5	True or false
>=	Greater than or equal to	5	True or false
||	Logical OR	6	True or false
&&	Logical AND	6	True or false

Operators at the same precedence level are evaluated from left to right.

3. Click Add to add the tag to the list box.

This expression tag can now be used in animations, event/actions, recipes, and alarms.

You can also use expressions to index a constant or string array.

To index a constant or a string in an expression...

1. Create a tag that addresses a constant or string array in the Constant form or the String form. See Figure 3-7 for an example of a string array.

2. Next, configure a tag that will return the index values of the constant or string, to be used in the expression. For example, you might create the tag "INDEX" in the internal driver form to address the runtime engine's seconds register.

3. Select Application from the Data drop-down list box on the Application Navigator form.

3-18

4. Double-click on the Expressions entry in the list box to access the Expressions form, as shown in Figure 3-9.
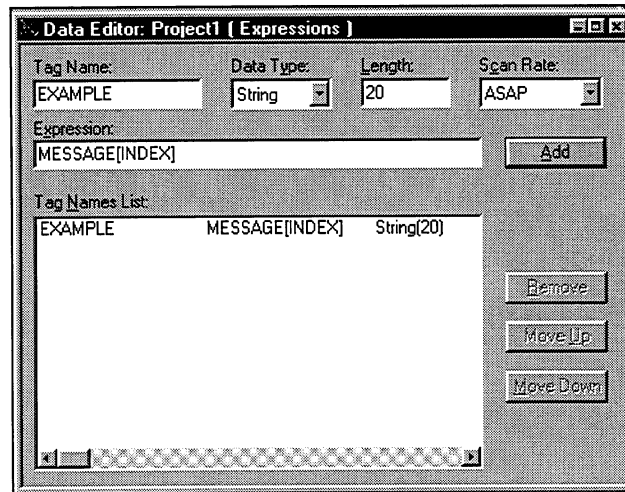
Figure 3-9. Expression Indexing Example

5. Type a name in the Tag Name text box. In this example, type "EXAMPLE."

6. Type an expression in the Expression text box. For example, if you used the string tag created in Figure 3-7 and the internal driver tag created in Step 2, you would type the following: "MESSAGE[INDEX]".

7. Select String or Float as the Data Type. In this example, select String.

8. Specify a length if you select String as the Data Type. In this example, specify 20 as the length.

9. Set the Scan Rate. This is how often the run-time engine will scan this tag. In this example, specify 1 minute.

10. Click Add to add the tag to the list box.

You could then configure a data display object attached to the EXAMPLE tag, to display the messages configured in the MESSAGE tag. During run-time, MESSAGE 0 will display when INDEX is equal to 0, MESSAGE 1 will display when INDEX is equal to 1, etc.

3-19

```
┌─────────────────────────────────────────────────┐
│                 Technical Note                   │
│  If an indexed tag is used in an expression      │
│  without an index refer-                         │
│  ence, then the data at index 0 is used in the   │
│  expression.                                     │
└─────────────────────────────────────────────────┘
```

Evaluating Tags

There are four types of tags in *SoftScreen*: data point, string, constant, and expression. Data point tags are evaluated during run-time based on the point scan rate set in the driver form (internal and keyboard driver data points are evaluated approximately once every quarter second). Constant and String tags are not evaluated because they do not change.

Defining Global Tags

A PLC tag's value is invalid when the screen it is on is first opened until the engine gets its data. Also, when you switch to another screen, the tag's value is not updated, unless that same tag is on the new screen.

To guarantee that the tag's value is up to date even if it is not used by the current screen, it must be specified as a global tag. To do this, you must configure it on the Master Template (because all objects and tags on the Master Template are global) or as an alarm, because alarms are global actions. You can also specify internal driver tags as global.

Ordering Tags

In the development system, you are able to change the order of animations (which are based on tags). You are also able to specify the order of expression, string, constant, and data point tags within their respective forms (for example, you can order all expression tags in the Expressions form). However, changing the tag order does not always have an impact during run-time.

For instance, the order of string, constant, internal driver, and keyboard driver tags has no effect during run-time. The Move Up and Move Down fields in the associated forms are for your convenience only, if you want to group certain tags.

3-20

The order of expression tags in the Expression form can have an impact during run-time, depending on the content of the expression.

Tag Name Type-Ahead Feature

This feature allows you to locate tag names using either the Data Editor (screens, recipes, and alarms) or the Animation Editor. As you begin typing in each character of a tag name, the tag name edit box is filled with the closest match to the defined tag name.

Expressions – Forward and Circular Referencing

Note
Forward and circular references are not allowed in expressions.

During runtime execution, expressions are evaluated in the order they appear in the expression data form list box. A tag name that appears on the right-hand side of an expression, may not be used on the left-hand side of the current or following expression examples, listed in Table 3-12.

Table 3-12. Expression Examples

Expression Errors	**Definition**
y = y + 1	Wrong. y is used on the right and left-hand side of the current expression (*circular reference*).
y = x + 1 x = z	Wrong. x is used on the right-hand side of the first expression and is used on the left-hand side of the second expression (*forward reference*).
Correct Expression Usage	**Definition**
y = 25 x = y *3	Correct. y is defined in the first expression and then used in the second expression.

Expression errors will be found when generating an application.

3-21

Locating Tags with the Tag Browser

The Tag Browser, located in the Tools menu, is a convenient way to quickly search for tag names. This tool provides an alphabetical, on-screen display of all defined and referenced tag names.

The Tag Browser form is shown in Figure 3-10.
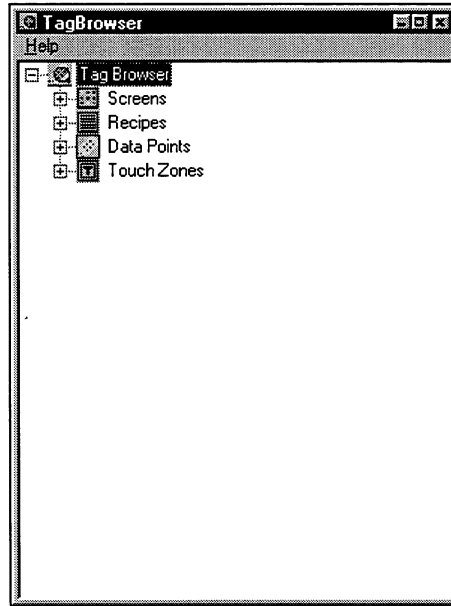
Figure 3-10. Tag Browser Form

Drag and Drop Tag Names

The drag and drop method allows you to drag a tag name, from the graphical display of the Tag Browser, to any place in the Data Editor (including animations) that a tag is used (not defined).

Copying Tags

To copy tags used in SoftScreen from one field to another perform the following steps:

3-22

42

1. Using your mouse, double-click to highlight the tag name.

2. Press the right mouse button to access a pop-up menu. Select Copy (this menu offers shortcuts to the cut, copy, paste, delete and undo commands).

3. Go to your destination and select the Paste command.

Cross Reference Tool for Tag Names

The Cross Reference tool allows you to generate reports containing information on where tag names are used and where they are defined. Select either Tag Names Used or Tag Names Defined to generate a report. More than one report may be generated without closing the first one.

Figure 3-11 shows the Cross Reference Configuration dialog box that displays when you select the Cross Reference command on the Tools menu.
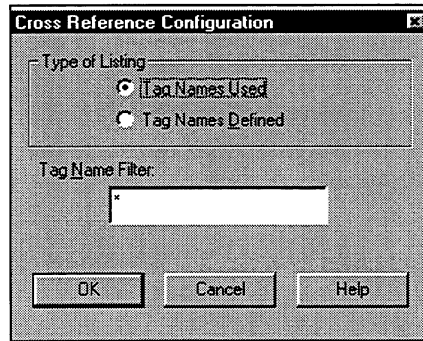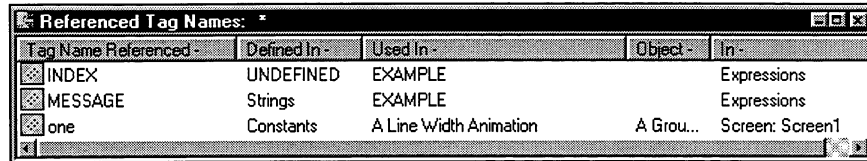
Figure 3-11. Cross Reference Configuration Dialog Box

Tag Names Used Option

Clicking on Tag Names Used in the Cross Reference Configuration dialog box brings up the Referenced Tag Names form (Figure 3-12). This form lets you generate a report that lists where tags are defined and used. The report may also contain undefined and duplicate tags (if you used the same tag name in more than one place). Click on the column headers to sort the distribution by that column, in descending order.

3-23

Figure 3-12. Referenced Tag Names form

Table 3-13 defines the fields in the Referenced Tag Names form.

Table 3-13. Fields in Referenced Tag Names Form

Field	Definition
Tag Name Referenced	Tag name displays in this column
Defined In	Specifies where the tag is located
Used In	Displays where the tag is used; in an animation, event, action, or expression
Object	Specifies the shape (if the tag is used in an animation)
In	Specifies if the tag is in a screen, recipe, or alarm

Tag Names Defined Option

Click on the Tag Names Defined in the Cross Reference Configuration dialog box to bring up the Defined Tag Names form (Figure 3-13). This form generates a report of all defined tag names in your application. Click on the column headers to sort the distribution by that column, in descending order.

3-24

44
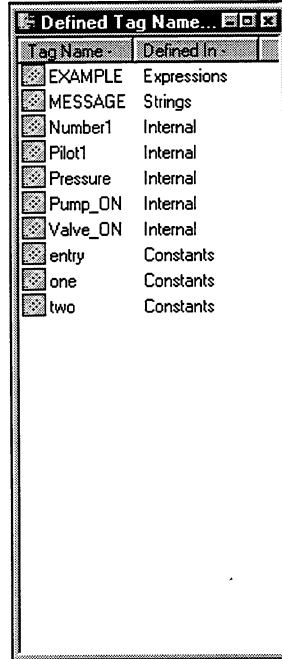
Figure 3-13. Defined Tag Names Form

Table 3-14 defines the fields in the Defined Tag Names form.

Table 3-14. Fields in Defined Tag Names Form

Field	Definition
Tag Name	Displays the tag name
Defined In	Specifies where the tag is defined

Tag Name Filter Option

Use this option to search for specific tags. This text box accepts the wild card characters * and ?, where * is used For example, if you want to search for undefined tags that begin with "N," you would select the Tag Names Used option and type N* in the Tag Name Filter text box. The Referenced Tag Names form will open, displaying all tags (if there are any) beginning with "N."

3-25

45

Chapter 4 – Getting Started

This chapter walks you step by step through creating a *SoftScreen* application, from opening the software and naming an application, to generating and downloading it to the run-time engine.

The example application demonstrates the basic steps to create and save an application. Also, advanced animation functions will be defined to help you create powerful screens quickly. This application is saved in the directory you store SoftScreen program files.

Technical Note
This tutorial was designed to run on a 3100 workstation.

Helpful Hints

This section provides hints to help as you create your application:

- Remember that tag names are case sensitive.

- Use the Minimize and Maximize buttons located in the top-right corner of all windows and forms to manage your desktop as you are creating your application. Often times, you will have to switch between windows and forms. Using the Minimize and Maximize buttons will save you time, while also keeping unused windows and forms out of your way.

- Use your right mouse button to quickly cut, copy, paste, or delete text in text boxes in *SoftScreen*. Just highlight the text you want to cut, copy or delete, and, while your cursor is in the field you want to edit, press the right mouse button. To paste cut or copied text, place your cursor in the field you want to paste it to, then press the right mouse button and select Paste. To undo a cut, copy, or paste command, press the right mouse button, and select Undo.

Creating the Application

This section describes how to begin by creating an application.

1. Open *SoftScreen* by clicking on the Windows 95/NT Start button, selecting Programs from the menu, and clicking on the SoftScreen Development System for Windows icon.

   The Select New Target Workstation dialog box opens, as shown in Figure 4-1.
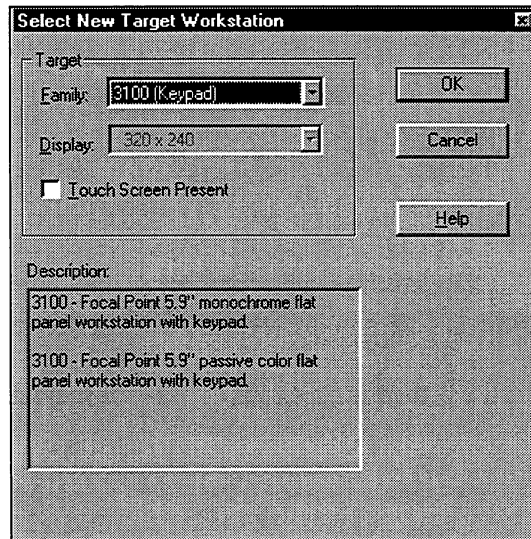
Figure 4-1. Select New Target Workstation dialog box

   Because applications are target specific, you must select the target workstation for which you are configuring your application.

   The development system specifies a 3100 unit as the default target workstation.

2. From the Target: Family drop-down list, select the family of workstations for which you are creating your application: 3100, 3200, or 3300.

3. Select the Touch Screen Present option if the target workstation has a touch screen. This option is selectable for 3100 and 3200 workstations. It is automatically selected for 3300 workstations, as they come equipped with touch screens.

4-2

Technical Note

If the target workstation has a touch screen and you do not specify a touch screen model on the development system, you cannot configure touch zones for your application.

---

4. Click OK once you have specified the target workstation. *SoftScreen* opens, with the Application Navigator form displayed, as shown in Figure 4-2.

Figure 4-2. Application Navigator Form

This form provides a quick and easy way of creating applications and configuring the drivers, screens, alarms, recipes, event/actions, and data associated with them.

There are two types of information associated with every application: graphic and data. The Graphic Editor tool is used to create graphic elements for your application; the Data Editor tool is used to associate data with your application, tags, alarms, recipes, function keys, and touch zone definitions. When a screen is created, a corresponding data editor entry is created.

4-3

5. Select the Open command from the File menu to access the Open Application dialog box.

6. Select the Shellapp folder from the Softwin folder, then double-click on the Shellapp.ssw file. This opens the Shell application. This application provides a framework for creating a new application. You can use it to get started quickly.

7. Select the Save As command on the File menu. The Save Application As dialog box opens, as shown in Figure 4-3. These steps will save Shellapp as a new application.
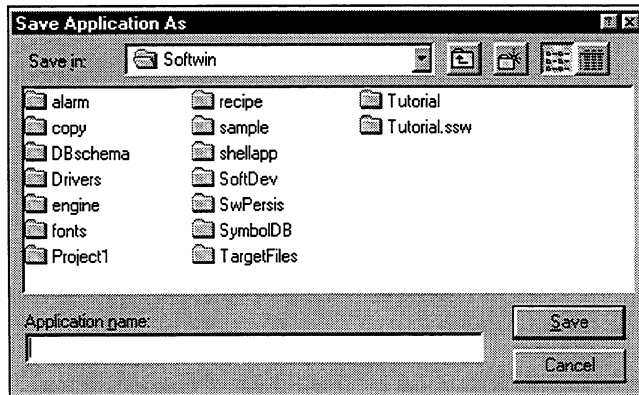
Figure 4-3. Save Application As Dialog Box

8. Select the drive on which you want to save the application from the Save in drop-down list box, if it is not already selected.

9. Double-click on the folder in which you want to save the application, if it is not already selected.

10. Type "Tutorial" in the Application name text box.

11. Click the Save button. *SoftScreen* creates a Tutorial folder in which the Tutorial application is stored. Its new name appears in the Application Navigator title bar.

    After you have saved the application, selecting the Save Application command automatically saves changes to "Tutorial."

4-4

Configuring the Master Template

This section describes how to configure a Master Template. Shapes placed on this screen display as a background on every screen during run-time.

Technical Note

If you want to view shapes placed on the Master Template on all screens on the development system, choose the Set Visibility command on the View menu when the Graphic Editor is active and the Master Template screen is not being edited. Then select the Show Master Template Shapes option. The shapes are shown on all screens to help position other shapes; however, you can only edit them on the Master Template.

---

1. On the Application Navigator form, select Screens from the Graphic drop-down list box, and then double-click on the Master Template entry. Maximize the window if necessary.

2. Select the Insert Bitmap command on the Edit menu.

3. Double-click on Xycom.bmp in the Softwin directory. It is placed in the top left-hand corner of your screen, as shown in Figure 4-4. If you have a small bitmap (approximately 100 x 50) of your company logo, select it now.
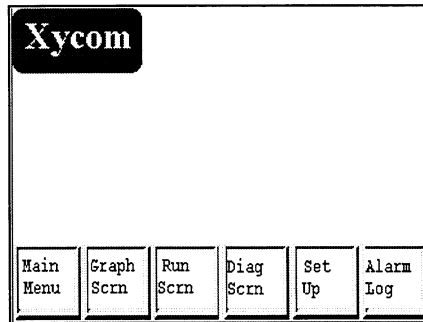

Figure 4-4. Master_Template Screen with "Xycom Logo"

4-5

This "logo," as well as the rest of the objects on the Master Template, will display on every screen in your tutorial application during run-time. All other screens will "overlay" the Master Template. Which means objects placed in the same location as the "logo" or the function keys will be placed on "top" of the logo or function keys.

4. Double-click on the function key text you want to change. For instance, if you want to change "Graph" to "Fault," double-click on "Graph." This accesses the Shape Properties form.

5. Click on the Text tab to access the Text properties page, as shown in Figure 4-5.
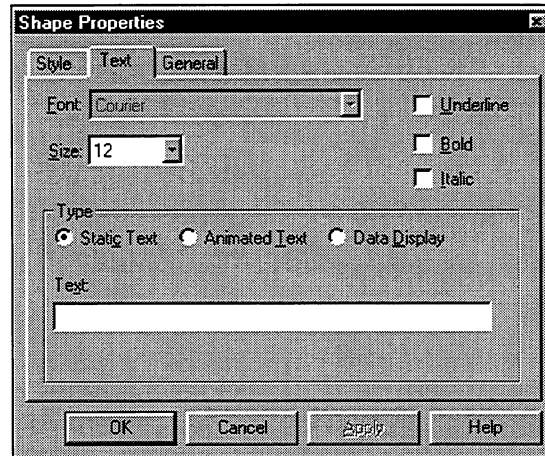
Figure 4-5. Text Properties Page

6. Highlight "Graph" in the Text box, and type "Fault."

7. Click OK or press ENTER when you have finished making changes.

8. Repeat steps 4 through 7 for each function key label you want to change.

9. In the Application Navigator there are event/actions assigned to function keys F11-F16, which are the six function keys located on the bottom of the 3100 front panel. To view these event/actions, select the Data Editor button on the Tool bar or select Data Editor command from the Tools menu.

10. Select Screens from the Type drop-down list box, then double-click on the Master Template entry in the Name list box.

11. Click on the first event/action to view which data is defined.

4-6

The first six event/actions listed in the Event/Actions list box are configured for function keys F11-F16.

Technical Note

If you change the screen names associated with these event/actions, you must also change the names of the screens. Or, if you change the screen names, you must change the screens to which the event/actions are attached.

---

12. Close the Event/Actions form and the Master Template Graphic Editor by clicking the Close button in the top-right corner of each window.

Inserting Symbols

This section describes how to insert symbols on a screen.

1. From the Application Navigator form, double-click on the Main_ Menu entry in the Graphic list box.

2. Select the Insert symbol button from the tool bar or the Insert Symbol command on the Symbol menu to access the Insert Symbol dialog box.

3. Click on the ISA Symbol Library tab then click on the _horz_valve_w_man_act symbol. Note that a preview of the symbol appears in the Preview window and a description displays in the Description box, as shown in Figure 4-6.

4-7
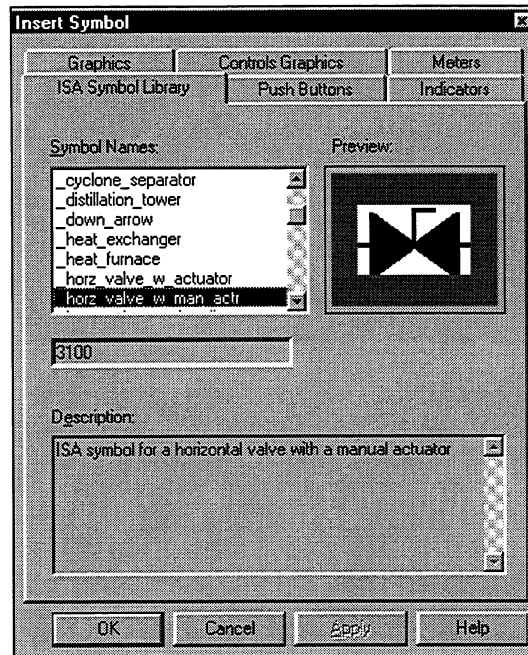
Figure 4-6. Insert Symbol Dialog Box

4. Click OK or press enter to insert the symbol on the Main Menu screen.

5. To reposition the symbol, position the cursor on it, click and hold the mouse button, and drag it to the center of the screen. Then release the mouse button. See Figure 4-8.

6. Repeat steps 2 through 4, inserting the _pressure_storage_vessel and the _pump symbols.

7. To reposition the pump/vessel, position the cursor on it, click and hold the mouse button, and drag it to the right/left side of the screen. Then release the mouse button. See Figure 4-8.

8. To align the pump and the vessel, select both shapes by drawing a box around them, and then select the Align button from the toolbar or select the Align command from the Arrange menu. The Align dialog box opens, as shown in Figure 4-7.

4-8
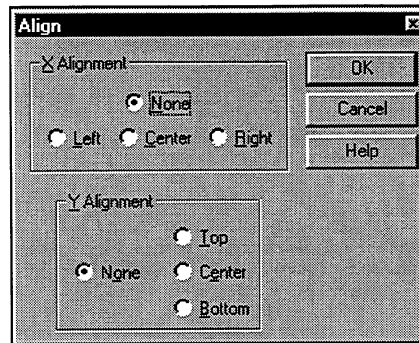
Figure 4-7. Align Dialog Box

9. Click on the Bottom radio button under Y Alignment, and click OK. The two symbols are aligned by the bottom of the shapes outline box.

Technical Note

Be aware of where you place the symbols, so they do not overlap the shapes placed on the Master Template.

To connect symbols using polylines ...

10. Click on the Polyline button in the Drawing Palette, located to the right of the drawing area.

11. To connect the three symbols, as shown in Figure 4-8, click on a starting point (either the top or bottom of a symbol) and drag the mouse to the first point the line will change direction and click to set the point.

Figure 4-8. Symbols Connected by a Line

4-9

55

12. Continue drawing the line and setting change points where required. To complete a line, double-click on the end point.

To change symbol properties...

16. To change symbol properties, double-click on the symbol you want to change. This accesses the Shape Properties form, as shown in Figure 4-9.
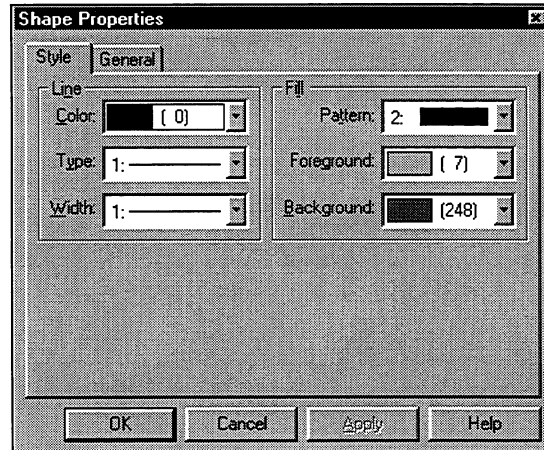
Figure 4-9. Shape Properties Form
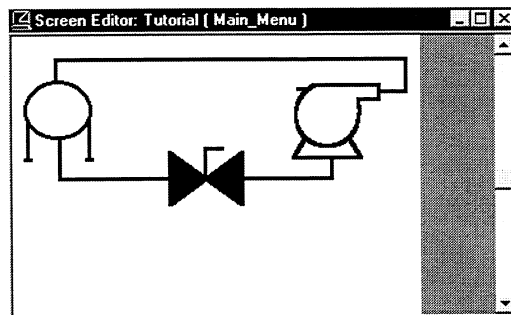

Technical Note

The symbol is comprised of several shapes that have been grouped. Since no properties have been defined for the group, the fields in this form are empty. To change properties of individual shapes within a symbol, ungroup the symbol and then select the shapes whose properties you want to change. Remember to regroup when finished.

In this form, you can access style properties (line color, type, and width, and fill pattern, foreground color, and background color) and general properties (internal name and description).

2. Select Width 3 to match the symbols line width, then click OK.

3. When you have finished changing style properties, click OK or press ENTER.

4. Click on the Close button on the top-right corner of the Main_Menu screen to close it.

4-10

Configuring Tags

SoftScreen uses tags to attach values to shapes and objects. Tag names are defined in device drivers, internal driver, touch zones, keyboard driver, expressions, constants, and strings. Tag names are used by shape animations, event/actions, recipes, alarms, screen name, alarm name, recipe name, and object name.

This section describes how to assign tags to the internal driver. Refer to Chapter 3 or the specific driver manual for information on assigning tags in other instances.

This section also builds a screen with a pilot light that is controlled by the state of the F1 key. The screen will include an analog meter to display the value of a tag.

1. From the Application Navigator form, double-click on the Run_ Scrn entry in the Graphic list box.

2. Select the Insert Symbol button on the toolbar or select the Insert Symbol command on the Symbol menu.

3. Click on the Indicators tab to access the Indicator symbol page.

4. Select the _pilot_light_red symbol, as shown in Figure 4-10.
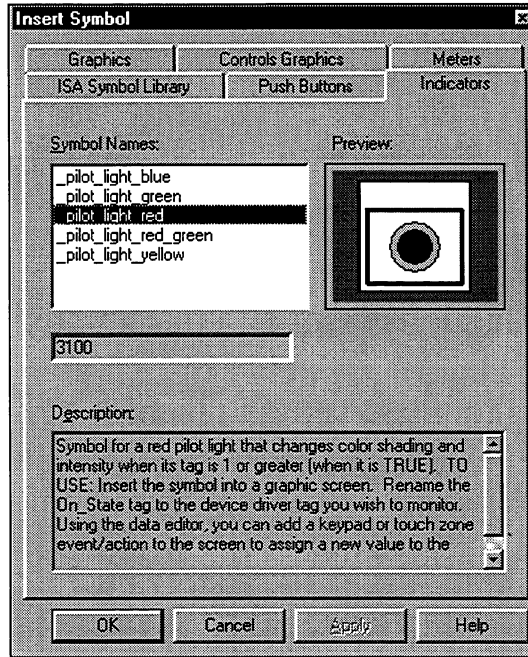
4-11

Figure 4-10. Preview of Pilot Light Symbol

5. Press ENTER to insert the symbol on the screen.

6. The Resolve Tag Names dialog box appears, as shown in Figure 4-11.

4-12
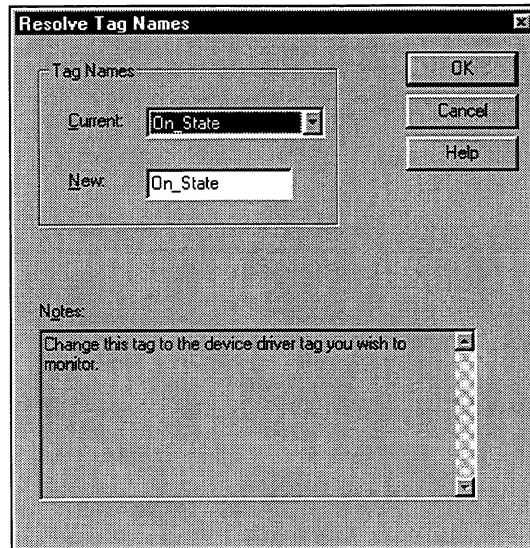
Figure 4-11. Resolve Tag Names Dialog Box

This dialog box allows you to rename unresolved tags assigned to a symbol. Unresolved tags are tags that reference a device data point. Since device data points are not saved along with the symbol, these tags are unresolved and need to be renamed.

In this example, you are going to rename the tag On_State.

7. Highlight the On_State tag in the New text box, and type "Pilot1" (this name is case sensitive).

8. Click OK or press ENTER.

9. From the Application Navigator, select the Data Editor button on the tool bar or select the Data Editor command from the Tools menu to access the Select Data Form dialog box.

10. Select Drivers as the Type. Then double-click on the Internal driver in the Name box.

11. Type "Pilot1" in the Tag Name text box.

12. Leave the Internal Address as #30, which addresses internal register #30.

13. Click the Add button to add the tag to the Name list box, as shown in Figure 4-12.

4-13

Figure 4-12. Internal Driver Form

14. Minimize the Data Editor with the windows icon.

15. To return to the Run_Scrn, maximize the Screen Editor window.

16. Select the Insert Symbol button on the toolbar or select the Insert Symbol command on the Symbol menu to access the Insert Symbol dialog box.

17. Click on the Meters group tab.

18. Select the _analog_meter_0_to_1 symbol, as shown in Figure 4-13.

4-14
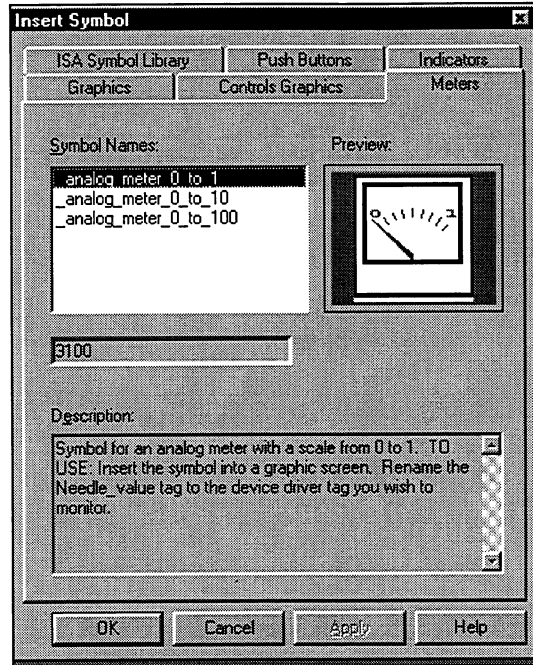
Figure 4-13. Preview of Analog Meter

19. Click OK to insert the symbol on the screen.
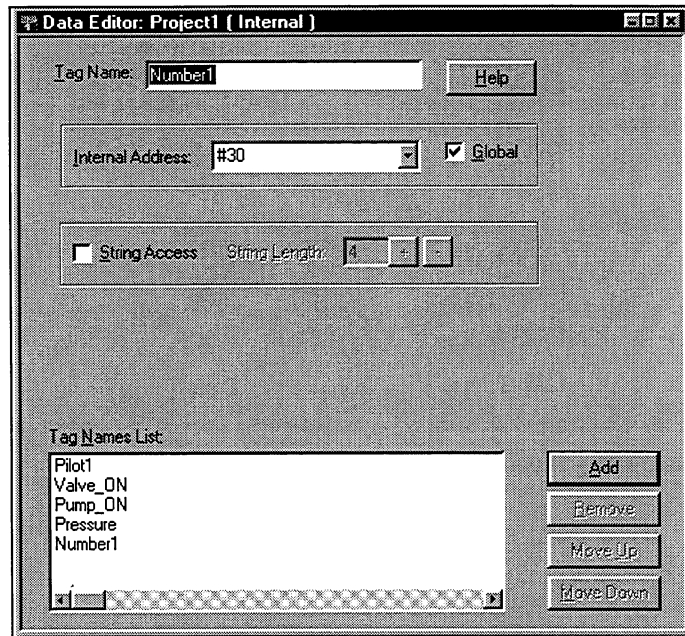
20. In the Resolve Tag Names dialog box, highlight the Needle_Value tag in the New text box, and type "Meter1." Remember that this name is case sensitive.

21. Click OK.

22. Click on the analog meter symbol, drag it to the right of the pilot light, and then release the mouse button.

23. Return to the Data Editor window. Minimize the screen editor, and then maximize the Data Editor. (Alternate method is to select the Window menu and then select Tile Vertical to display all open windows).

24. Type "Meter1" in the Tag Name text box.

25. Select RampUpDown from the Internal Address drop-down list box.

26. Click Add to add the tag to the list box.

27. Close the Data Editor.

4-15

28. Select the Save Application command on the File menu to save changes to the application.

Adding Text to a Meter

1. Return to the Run_Scrn Editor.

2. Select the Text button [T] from the Drawing Palette or select the Text Box command from the Shapes menu.

3. Draw a box in the bottom of the meter.

4. Inside the text box, type in "Meter1."

5. Select the Style tab.

6. Set the foreground color to Black #0 and the background color to Cyan #9.

7. Click OK.

8. Select the selection tool from the drawing palette and resize the width of the text box as necessary.

9. Close the Graphic Editor.

Assigning Event/Actions

This section describes how to assign event/actions for a screen.

4-16

62

Keypad Configuration

1. Open the Data Editor

2. Select Screens as the Type, and Run_Scrn as the Name.

3. Click OK or press ENTER.

4. Configure keypad event/actions, as described in Table 4-1.

Table 4-1. Configuring Key Press/Release Event/Actions

Event	Key	Tag name	Action	Tag name (Destination)	Tag name (Source)
Key press	F1	N/A	Assignment	Pilot1	One
Key release	F1	N/A	Assignment	Pilot1	Zero

*One and Zero are constants to change the state of Pilot1

5. Open the Tag Browser (shown in Figure 4-14) located on the Tools menu.

6. Drag and drop Pilot1 into Tag name (Destination) or type in Pilot1

7. Drag and drop One into Tag name (Source) or type in One.

8. Click the Add button

9. Repeat Steps 1 through 9 for Key release.
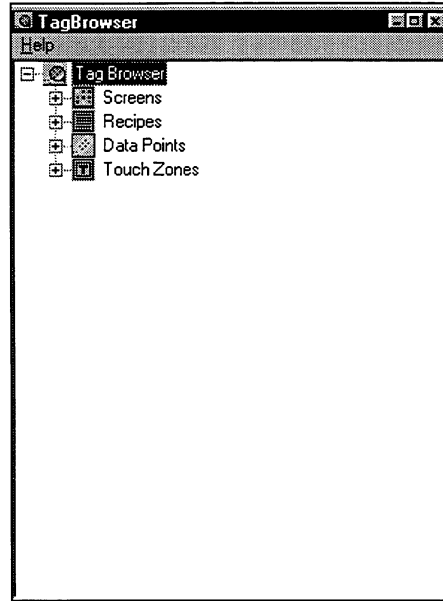
4-17

Figure 4-14. Tag Browser

Touch Zone Configuration (Optional)

1. Select the Touch Zone button on the Drawing Palette.

2. Click the cursor in the top left corner of the pilot light and drag the touch zone until it is the same size as the pilot light. Then release the mouse button. The touch zone now covers the pilot light, as shown in Figure 4-15.

4-18

64
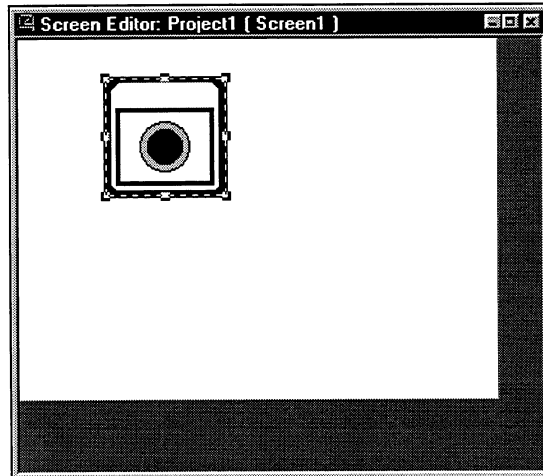
Figure 4-15. Touch Zone Example

3. Click on the Selection tool on the Drawing Palette, then double-click on the Touch Zone.

4. Click on the General tab to access the General properties page.

5. Change the name of the object to Pilot_TZ.

6. Highlight the "Pilot_TZ" text, and then press the right mouse button.

7. Select Copy. Windows copies the text, so you can paste it in other fields.

8. Press ENTER to return to the screen. This name identifies the touch zone.

9. Configure two touch zone event/actions, as described in Table 4-2.

4-19

65

Table 4-2. Configuring Touch Zone Event/Action

Event	Key	Tag name	Action	Tag name (Destination)	Tag name (Source)
Touch zone press	N/A	Pilot_TZ (use right mouse button to paste text copied in Step 8)	Assignment	Pilot1	One
Touch zone release	N/A	Pilot_TZ (use right mouse button to paste text copied in Step 8)	Assignment	Pilot1	Zero

*One and Zero are constants to change the state of Pilot1

10. Click on the Close button in the top-right corner of the Event/Action form to close it.

11. Select the Save Application button on the toolbar or select the Save Application command on the File menu to save changes to the application.

Generating the Application

You must generate the application before you can download it to the run-time engine. Generating allows *SoftScreen* to compile the application into a form the run-time engine can understand. If the application contains undefined tags, they will be found during generate.
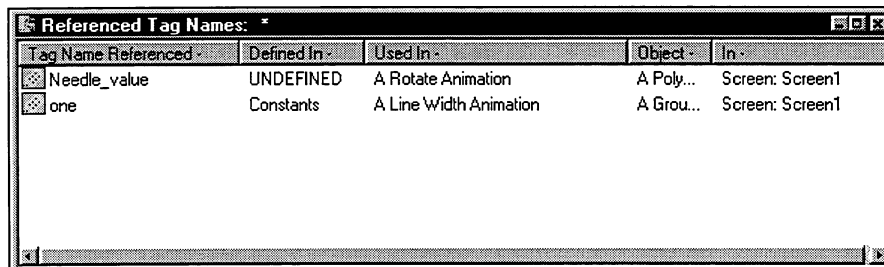
To generate the application...

1. Select the Generate command on the Tools menu or click the Generate button.

4-20

```
┌──────────────────────────────────────────────────────────┐
│                    Technical Note                        │
│                                                          │
│  You will get an error message if you have not specified │
│  a startup screen in the Application Navigator. Specify  │
│  a startup screen, and then regenerate.                  │
└──────────────────────────────────────────────────────────┘
```

2. If there are unresolved references in the application, a message states this. Unresolved references refer to undefined tags, and forward and circular references. You cannot download an application until you have corrected all unresolved references.

3. Click OK and the Generate window will display.

4. To print the listing in the Generate window, select the Print command on the File menu or press the Print button.

5. Select Cross Reference from the Tools menu to obtain a listing of undefined tags.

6. Choose the Tag Names Listed option and a list of all tags used in your application appears in the Referenced Tag Names form, as shown in Figure 4-16.

Tag Name Referenced	Defined In	Used In	Object	In
Needle_value	UNDEFINED	A Rotate Animation	A Poly...	Screen: Screen1
one	Constants	A Line Width Animation	A Grou...	Screen: Screen1

Figure 4-16. Referenced Tag Names Form

4-21

67

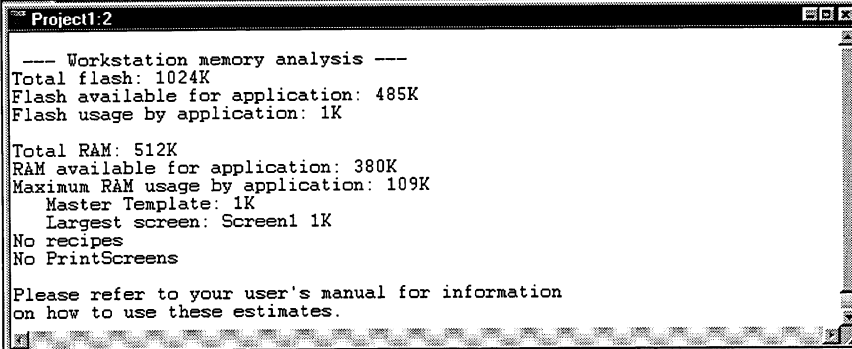Table 4-3 defines the fields in the Referenced Tag Names form.

Table 4-3. Fields in the Referenced Tag Names Form

Field	Definition
Tag Name Referenced	Displays the tag name
Defined In	Specifies where the tag is defined or undefined
Used In	Indicates where the tag is used: in an animation, event, action, or expression
Object	Specifies the shape (if the tag is used in an animation)
In	Specifies if the tag is in a screen, recipe, or alarm

7. Locate the undefined tags. Undefined tags must be defined in the Data Editor in one of six places:

   • PLC driver

   • Internal driver

   • Keyboard driver

   • Constants

   • Expressions

   • Strings

8. Once all unresolved references are resolved, generate the application again.

   You may receive a message that states that "Possible memory problems were detected." This message indicates one of two things:

   • Flash usage by the application is greater than or equal to the Flash available for the application or

   • RAM usage by the application is greater than or equal to the RAM available for the application

9. Click OK, and the Successful Generation message displays.

10. Click OK again. The Memory Analysis window displays, as shown in Figure 4-17.

4-22

```
Project1:2                                           ▢▢▢

    --- Workstation memory analysis ---
 Total flash: 1024K
 Flash available for application: 485K
 Flash usage by application: 1K

 Total RAM: 512K
 RAM available for application: 380K
 Maximum RAM usage by application: 109K
     Master Template: 1K
     Largest screen: Screen1 1K
 No recipes
 No PrintScreens

 Please refer to your user's manual for information
 on how to use these estimates.
```

Figure 4-17. Memory Analysis Window

To determine where the memory problem is, compare the Flash usage by the application to the Flash available for the application and RAM usage by the application and the RAM available for the application.

Once you determine the problem, make changes to the application to correct it. For more information on the memory analysis tool, refer to Chapter 13.

11. Once all problems have been corrected, regenerate the application. You will receive a Successful Generation message. Click OK.

You are now ready to download the application. If you have not done so already, connect the development system to the target workstation. Refer to Chapter 2 for cabling information.

Downloading the Application

Once you have successfully generated the application, you are ready to download it to the run-time engine.

If you have not done so already, refer to Chapter 2 for instructions on how to connect the development system workstation to the target workstation.

4-23

69

Technical Note
You may want to password protect the screen that uses "Prepare for Download" action.

1. Click the Download button from the toolbar or select the Download command on the Tools menu to access the File Download dialog box, as shown in Figure 4-18. The factory defaults should work with all new units and demo units.
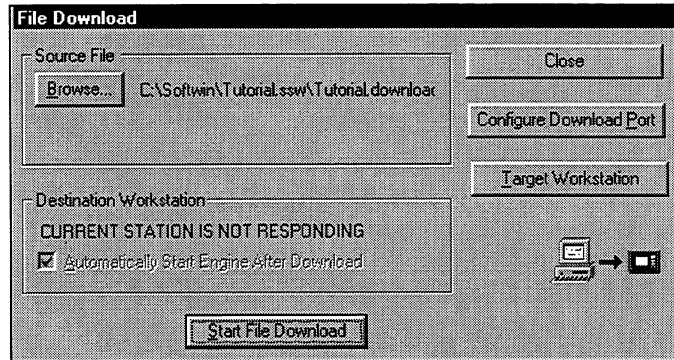

Figure 4-18. File Download Dialog Bo

2. Select the Workstation Address button if you need to change the target workstation address or verify the link between a target workstation and the development system workstation. This opens the Target Workstation Address dialog box, as shown in Figure 4-19.
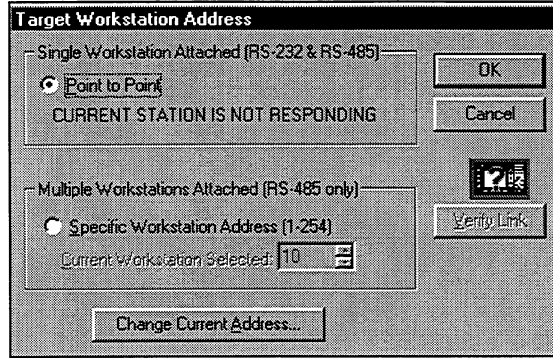
4-24

Figure 4-19. Target Workstation Address Dialog Box

If you receive an error that says the COM port you have selected cannot be opened, it may be because

- The port is in use

- Another copy of Download is open, causing a conflict

If you resolve these problems and still receive an error, close and re-open the File Download dialog box.

3. Select Point to Point to connect to one target workstation. Refer to Chapter 12 if you want to connect to more than one target workstation.

4. Click on the Configure Download Port button to open the Configure Download Port dialog box, as shown in Figure 4-20.
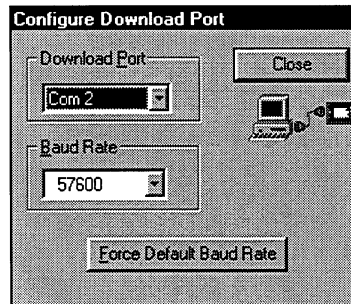

Figure 4-20. Configure Download Port Dialog Box

5. Select a Download Port. Choices are COM 1, COM 2, COM 3, or COM 4. The default is COM 1.

4-25

6. Select a baud rate.

Technical Note

Some PCs may have problems communicating at baud rates higher than 9600. If you have trouble downloading an application, select a slower baud rate.

---

7. Click OK once you have changed the download port settings.

    The Tutorial.download file associated with the most recent application you have successfully generated will be specified in the File Download dialog box.

8. Click on the Start File Download button to begin downloading.

    If the connection between the development system workstation and the target workstation is working properly, you will see the message "Shutting down drivers, please wait," on the engine.

Technical Note

Some devices, such as PLCs, may take a long time to shut down or may not respond. If it appears that the device is not responding, cycle the target workstation's power.

Once the workstation is ready for you to download, a Triangle with "OK" will appear.

The File Download Results dialog box will appear on the development system screen. As the files associated with the application are successfully downloaded, the results are posted in this box.

9. Click OK once the application files have been "updated." The application will begin running on the target workstation.

    If the files are not successfully downloaded, a failed message will appear in the dialog box. If you receive a failed message, download the application again. If it does not successfully download this time, cycle the target workstation's power, then repeat Step 8.

4-26

Using the Run-time Engine

> ## Technical Note
>
> In the 3100 the six up arrow keys located directly below the display are configured as F11-F16.

This section describes how to manipulate the application on the run-time engine.

- Press function key F11 to access the Main_Menu screen.

- Press function key F13 to access the Run_Scrn screen.

- Press F1 to see the pilot light change from red to green (on a color workstation) or dark gray to light gray (on a monochrome workstation). Release F1 to return the pilot light to its original color.

Animating Shapes

This section describes how to configure animations for a shape on the development system. The tags used in this section have been predefined and the Tag Browser tool will be used for placing tag names into animation dialogs. The Tag Browser windows will stay in the foreground to allow access to the tag names.

To place a tag name in an animation...

1. Open the Tag Browser, located in the Tools menu or click on the Tag Browser button on the toolbar.

2. Click on the tag name and drag the pointer to the tag name box, and release the mouse button.

3. The tag name is now configured.

If you wish to hide the Tag Browser, click on the minimize button to place it on the Windows toolbar. Click on the Tag Browser from the Windows toolbar to restore.

4-27

Applying a Foreground Color Animation

1. On the development system, double-click on the Main_Menu entry in the Graphic drop-down list box on the Application Navigator form.

2. By using the Circle button from the Drawing Palette, add a small circle above the horizontal valve, as shown in Figure 4-21.
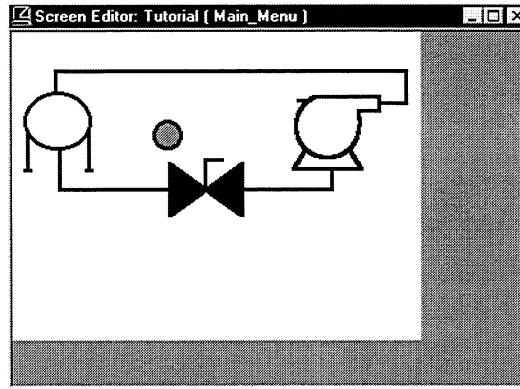

Figure 4-21. Adding a Circle to Main_Menu Screen

3. Click on the Selection button on the Drawing Palette, then double-click on the circle to access the Shape Properties form.

4. Change the circle's foreground color to Red (#249) for color displays or white (#255) for monochrome displays.

5. Click OK or press ENTER to accept the new foreground color.

6. Select the Animations button form the toolbar or select the Animations command on the Edit Menu to access the Shape Animations dialog box.

7. Select the Foreground Color tab to access the Foreground color page.

8. Type "Valve_ON" in the Tag Name text box or use the Tag Browser and drag and drop the name into the text box.

9. Select green (#250) for color units, or gray (#250) for monochrome units, from the Color drop-down list box.

10. Click Add to add the animation to the list box, as shown in Figure 4-22.

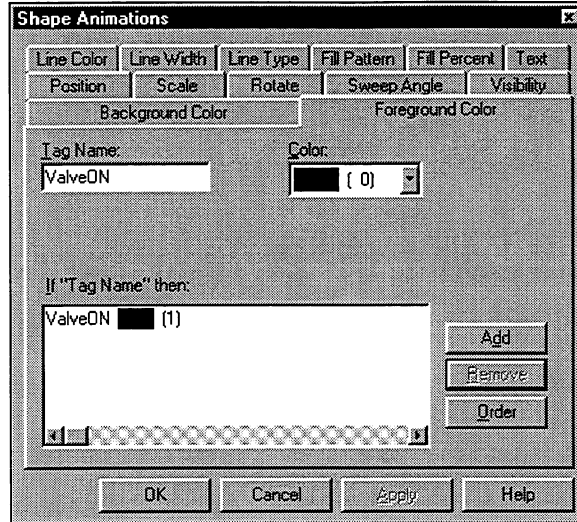11. Click OK to close animations dialog box.

4-28

Figure 4-22. Configuring a Foreground Color Animation

Applying a Visibility Animation

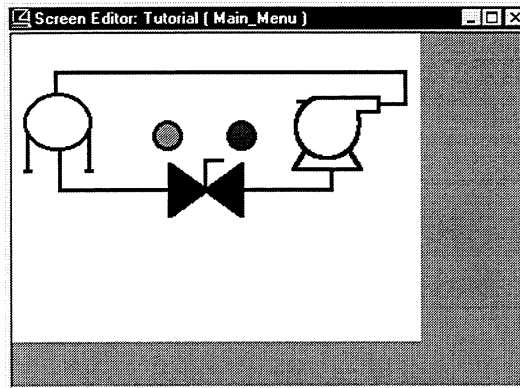1. Add another small circle above the horizontal valve, as shown in Figure 4-23.

Figure 4-23. Adding a Circle to Main_Menu Screen

2. Use the Selection button from the Drawing Palette and double-click on the circle to access the Shape Properties form.

4-29

75

3. Change the circle's foreground color to red (#1) for color displays or gray (#248) for monochrome displays.

4. Click OK or press ENTER to accept the new foreground color.

5. Select the Animations command on the Edit menu to access the Shape Animations dialog box.

6. Select the Visibility tab to access the Visibility animation page.

7. Type "Pump_ON" in the Tag Name text box or use the Tag Browser and drag and drop the name into the text box, then select the Blink option.

8. Click Add to add the animation to the list box, as shown in Figure 4-24.
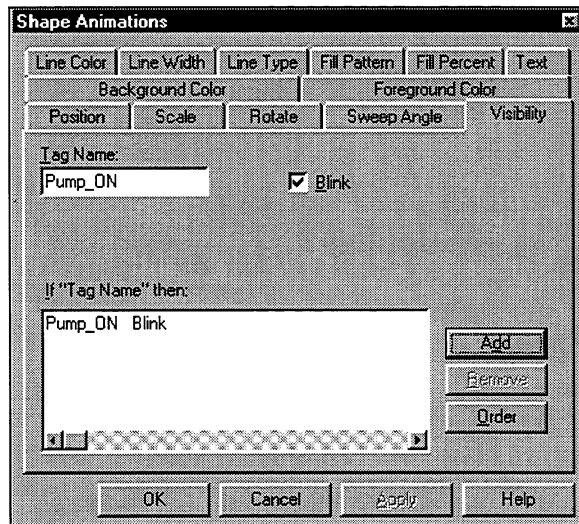
Figure 4-24. Configuring a Visibility Animation

9. Click OK to accept the animation changes.

Applying a Fill Percent Animation

1. Return to the Main_Menu screen, and draw a small rectangle next to the pressure storage vessel, above the horizontal valve, as shown in Figure 4-25.
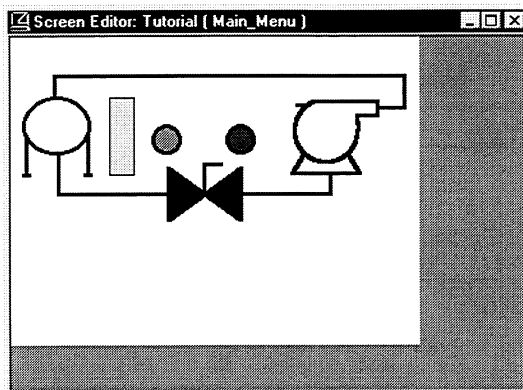
4-30

Figure 4-25. Adding a Rectangle to the Main_Menu Screen

2. Using the Selector tool from the Drawing Palette, double-click on the rectangle to access the Shape Properties form.

3. Change the rectangle's foreground color to yellow (#251) for color units or gray (#248) for monochrome units.

4. Click OK or press ENTER to accept the new foreground color.

5. Select the Animations command on the Edit menu to access the Shape Animations dialog box.

6. Select the Fill Percent tab to access the Fill Percent animation page.

7. Type "Pressure" in the Tag Name text box or use the Tag Browser and drag and drop the name into the text box.

8. Specify Up as the Direction.

9. Leave the Minimum Data Point Value as 0, and specify 1 as the Maximum Data Point Value.

10. Click Add to add the tag to the list box, and then click OK to accept the animation changes.

11. Close the Graphic Editor.

In the Data Editor...

1. Open the Data Editor using icon on the toolbar or from the Tools menu.. Select Screens as the Type, and then double-click on the Main_Menu entry in the list box. This accesses the Event/Actions form for the Main_Menu screen, as shown in Figure 4-26.
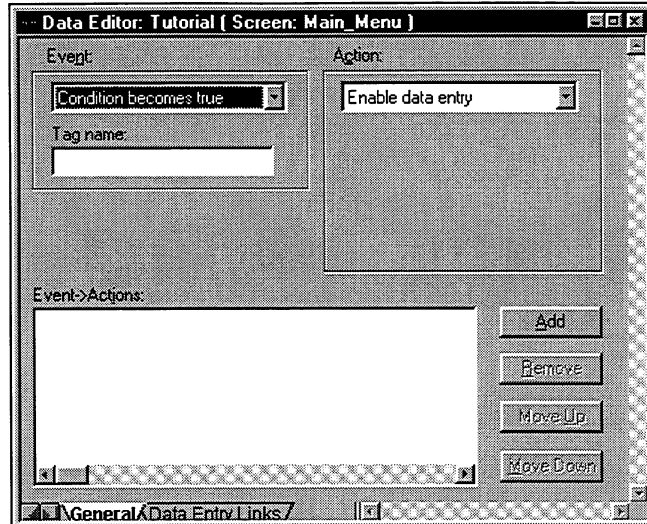
4-31

Figure 4-26. Main_Menu Event/Actions Form

2. Add a Key press event attached to F6.

3. Choose Assignment as the Action, and type "Valve_ON" in the Tag name (Destination) text box, and "One" in the Tag name (Source) text box.

4. Click Add to add the event/action to the list box.

5. Add a key release event attached to F6.

6. Choose Assignment as the Action, and enter "Zero" in the Tag Name (Source) text box, and "Valve_ON" in the Tag name (Destination) text box.

7. Click Add to add the event/action to the list box.

8. Close the Data Editor.

Applying a Rotate Animation

1. Double-click on the Graph_Scrn entry in the Graphic drop-down list box on the Application Navigator form.

2. Select the Polygon button on the Drawing Palette.

4-32

78

3. Create a polygon that looks like the one depicted in Figure 4-27. To create a polygon, click where you want to place a point. Continue placing points to complete the polygon, then double-click when you want to complete the polygon.
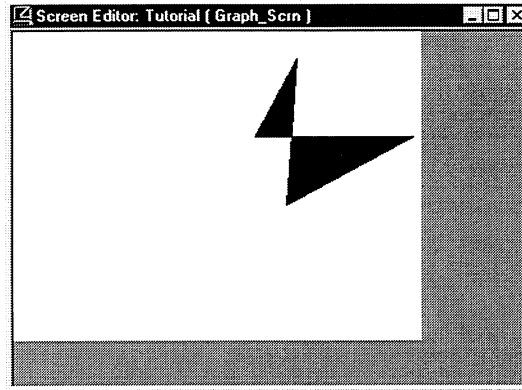

Figure 4-27. Adding a Polygon to the Graph_Scrn

4. Use the Selection button from the Drawing Palette and double-click on the polygon to access the Shape Properties form.

5. Change the polygon's foreground color to blue (#4) (for monochrome and color units).

6. Click OK or press ENTER to accept the new foreground color.

7. Select the Animations command on the Edit menu to access the Shape Animations dialog box.

8. Select the Rotate tab to access the Rotate page.

9. Type "Pressure" in the Tag Name text box or use the Tag Browser and drag and drop the name into the text box.

10. Set the Reference to Center.

11. Specify 0 as the Minimum Data Point Value and 1 as the Maximum Data Point Value.

12. Change the Maximum Angle to 255 degrees.

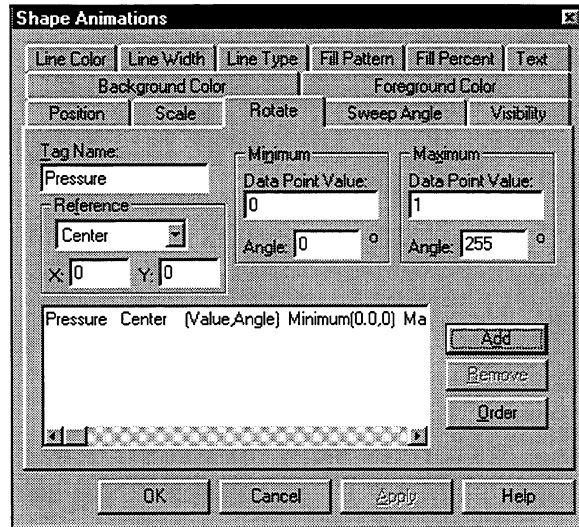13. Click Add to add the animation to the list box, as shown in Figure 4-28.

4-33

Figure 4-28. Configuring a Rotate Animation

14. Click OK to exit the Shape Animations form.

Applying Position and Sweep Angle Animations

Return to the Graph_Scrn screen and click on the Pie button on the Drawing Palette.

1. To draw a pie, click the cross hairs over the drawing area and draw a circle.

2. Release the mouse button when the circle is the desired size.

3. Position the cross hairs (the radius will move with them) at the place on the circle where you want the pie to start, then click and release the mouse button. This sets the starting point.

4. Drag the cross hairs clockwise until a "wedge" of the pie is removed, and then click to complete the pie, as shown in Figure 4-29.
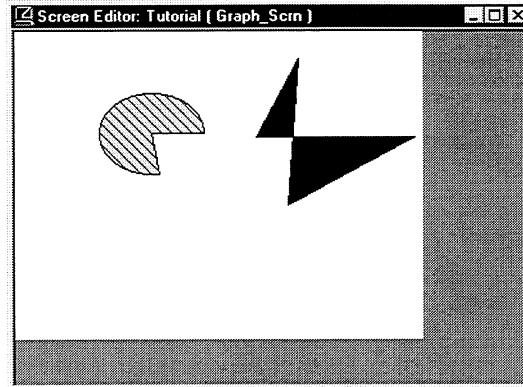
4-34

Figure 4-29. Adding a Pie to the Graph_Scrn

5. Click on the Selection button from the Drawing Palette.

6. Double-click on the pie to access its Shape Properties form.

7. Choose pattern #9 from the Pattern drop-down list box.

8. Select blue (#4) for color and monochrome units, as the foreground color and yellow (#251) for color units, or light gray (#7) for monochrome units, as the background color.

9. Click OK to accept the property changes.

10. Select the Animations command on the Edit menu, and then select the Position tab from the Shape Animations form.

11. Type "Pressure" in the Tag Name text box or use the Tag Browser.

12. Leave the Minimum Data Point Value at 0, but change the Maximum Data Point Value to 1.

13. Leave the minimum X and Y values at 0, and set the maximum X value to 100 and the maximum Y value to -100. This will move the pie right 100 pixels (X) and up 100 pixels (Y) based on the value of the Pressure tag.

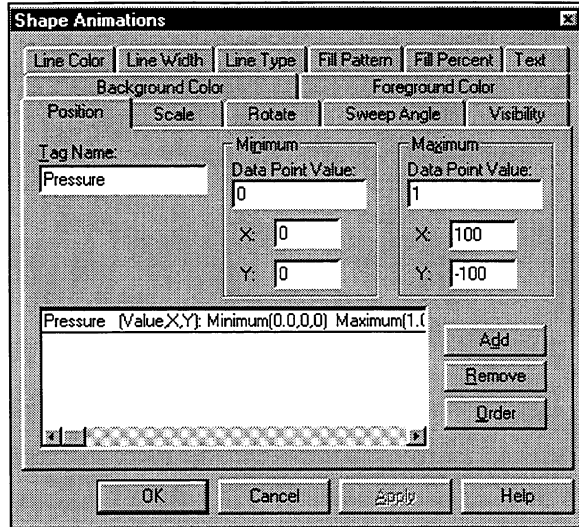14. Click Add to add the animation to the list box, as shown in Figure 4-30.

4-35

81

Figure 4-30. Configuring a Position Animation

15. Select the Sweep Angle tab, and type "Pressure" in the Tag Name text box or use the Tag Browser.

16. Set value ranges of 0 for the minimum Data Point Value and 1 for the Maximum Data Point Value.

17. Set the minimum angle to 0° and the maximum angle to 275°.

Technical Note

Positive numbers in the angle field sweep clockwise, while negative values sweep counterclockwise.

---

18. Click Add to add the animation to the list box, as shown in Figure 4-31.

4-36
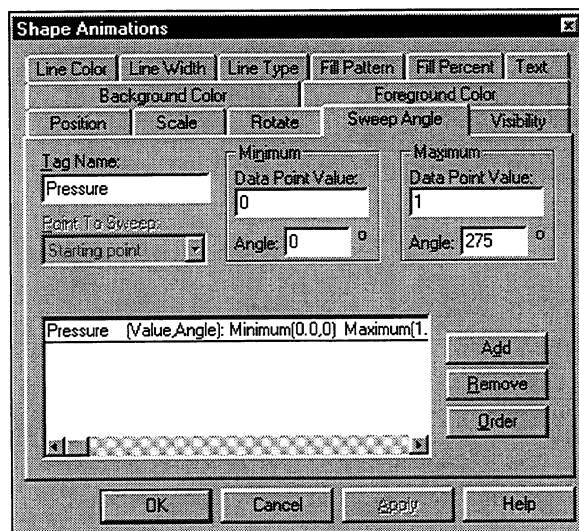
Figure 4-31. Configuring a Sweep Angle Animation

19. Click OK to exit the Shape Animations form.

20. Click on the Save Application button to save changes to your application.

Configuring Data Entry and Data Display Shapes

This section builds a data entry point with a data display on top to simplify the screen layout.

1. Click on the Data Entry shape button on the Drawing Palette, and draw a data entry shape on the Graph_Scrn screen.

2. On the Shapes Properties page, type "Number1" in the Tag Name text box or use the Tag Browser to drag and drop into the text box.

3. Leave the default settings in the remaining fields, as shown in Figure 4-32.
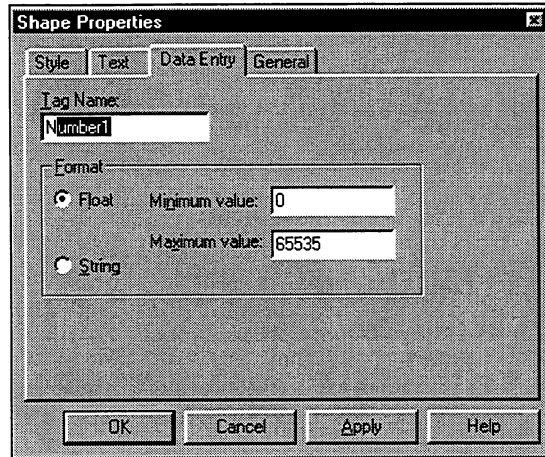
4-37

83

Figure 4-32. Data Entry Properties Page

4. Click on General and type "Entry1."

5. Click OK to exit the Shape Properties form.

6. Click on the Text Box button on the Drawing Palette, and draw a text box that covers the data entry shape.

7. Click on the Data Display radio button under Type, and then type "Number1" in the Tag Name text box, as shown in Figure 4-33.
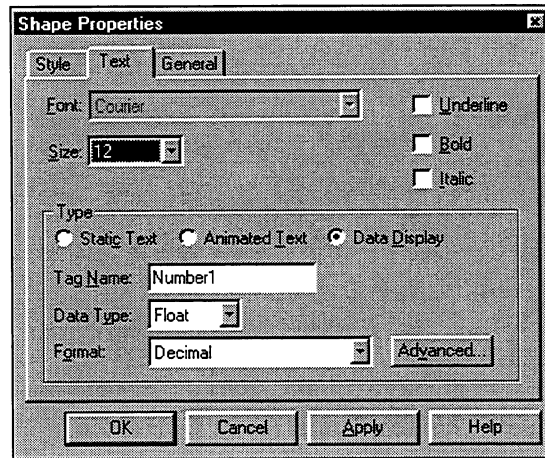

Figure 4-33. Specifying Data Display Options

4-38

84

8. Click OK to accept these formatting changes, and then click OK to exit the Shape Properties form.

9. Close the Graphic Editor.

10. Select the Data Editor command on the Tools menu, and then select Screens as the Type.

11. Double-click on the Graph_Scrn entry in the Name list box.

12. Select Key press as the Event, and I-CURSOR (this is the cursor key in the center of the arrow keys near the end of the list) as the Key.

13. Select Enable data entry as the Action. During run-time, this event/action will allow you to enter data in the data entry shape.

14. Select Add to save the event/action.

15. Close the Event/Action form.

Creating an Alarm

This section describes how to configure, and define an alarm text display, and alarm symbol for your application. The text display and symbol appears when the tag goes into an alarm. They will be on top of the current screen being displayed.

1. Select the Data Editor command on the Tools menu, and then select Alarms as the Type, as shown in Figure 4-34.
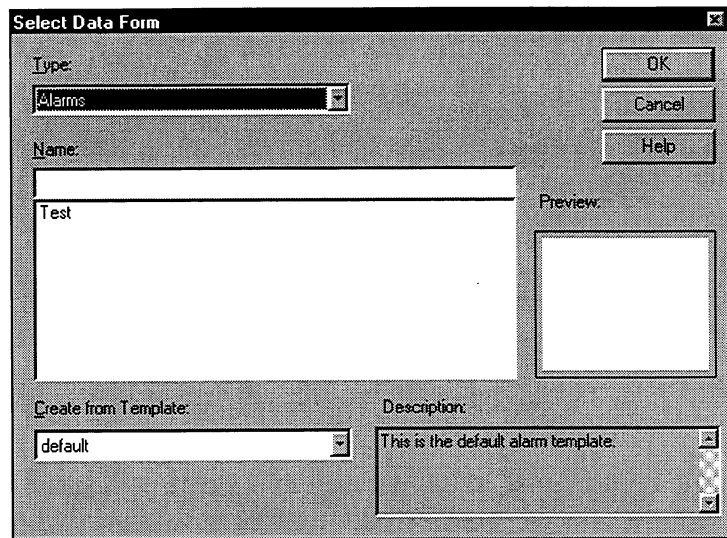
4-39

Figure 4-34. Creating an Alarm

2. Type "Test" in the Name text box, and then press ENTER. The Alarm Form opens. At the same time, a corresponding alarm screen is automatically generated.

3. Type "Pressure" in the Tag Name text box or use the Tag Browser. You may recall that the "Pressure" tag is tied to the RampUpDown internal variable that ranges from 0-1-0.

4. Specify 0.9 as the Hi Value.

5. Click on the Into tab at the bottom of the form to access the Into Alarm page.

6. In the Message box, type "Test into alarm."

7. Select Assignment as the Action, and specify Pump_ON as the Destination tag name and One as the Source tag name.

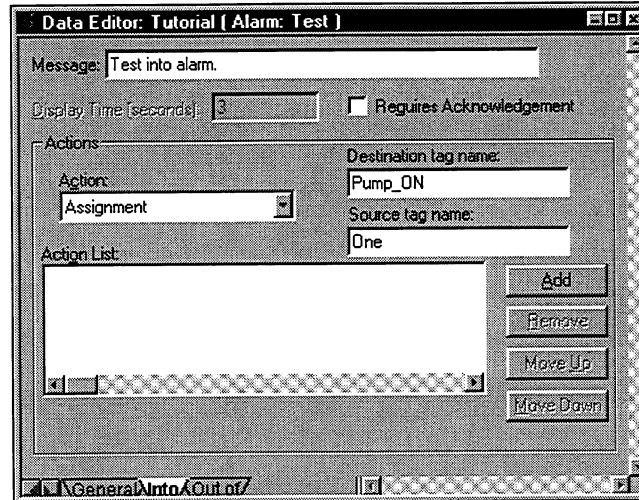8. Add the into alarm settings to the list box, as shown in Figure 4-35.

4-40

Figure 4-35. Specifying Into Alarm Page Settings

9. Close the Data Editor.

10. Select the Graphic Editor command on the Tools menu, and select Alarms as the Type.

11. Double-click on the Test entry.

12. Select the Text button and draw a text box on the screen.

13. Choose the Animated Text option, then click OK. The message entered on the Into Alarm page ("Test") will display during run-time when the attached value goes into alarm.

14. Select the Insert Symbol icon or button to access the Insert Symbol dialog box.

15. Click on the Graphics tab and select the _alarm_circle_in symbol.

16. Click OK to place the symbol on the Test screen.

17. Close the Graphic Editor.

18. Select the Save button to save changes to your application.

You are now ready to generate and download the application.

4-41

Generating and Downloading the Application

You must generate the application before you can download it to the run-time engine. Generating allows *SoftScreen* to "compile" the application into a form the run-time engine can understand. If the application contains undefined tags, they will be found during generate.

Refer to the previous section, *Generating the Application*, for more information on the generate function. Once you have successfully generated the application, you can download it to the run-time engine.

If you have not done so already, refer to Chapter 2 for instructions on how to connect the development system workstation to the target workstation.

Refer to the previous section, *Downloading the Application*, for detailed information on downloading your application.

Closing the Application

To close the application on the development system, select the Close command on the File menu.

If you have previously saved all changes, *SoftScreen* automatically closes the application. If changes have been made, but not saved, a message box prompts you to save them. Once you have responded to this prompt, *Soft-Screen* closes the application.

Exiting SoftScreen

To close the *SoftScreen* development system, select the Exit command on the File menu. If the application is still open and you have previously saved all changes, *SoftScreen* automatically closes. If modifications have been made, but have not been saved, a message box prompts you to save them. Once you have responded to this prompt, *SoftScreen* closes.

4-42

Chapter 5 – Creating Applications

An application consists of a Master Template, screens, and the shapes on screens. Applications can include recipes, alarms, and event/actions.

- The Master Template is a global screen. Shapes drawn on this screen appear on every screen in the current application during run-time. Refer to Chapter 6 for more information on the Master Template.

- Screens contain shapes and bitmaps. Each shape contains properties and can contain animations. Animations cause a shape to change during run-time. Refer to Chapter 6 for more information on screens. Refer to Chapter 7 for more information on animations.

- Recipes are a list of assignments from one tag to another. Recipes are loaded (read and then sent to the PLC) through an event/action. Refer to Chapter 9 for more information on recipes.

- Alarms signal that an analog value has gone too high or too low, or that a discrete value has been turned on or off. Refer to Chapter 10 for more information on alarms.

- Event/actions are powerful and flexible events that occur during run-time, triggering specific actions. Refer to Chapter 11 for more information on event/actions.

Applications are essentially layers of these elements. The following list describes the order in which these elements are layered during run-time:

1. Master Template (bottom-most layer)

2. Local Screen

3. Recipe shapes

4. Alarm shapes

5. Data entry shapes

6. Password entry (top-most layer)

5-1

89

Creating a New Application

SoftScreen automatically creates an application when you open it for the first time. This temporary application is "Untitled." You can save this application under a new name (see the section, *Saving an Application*, below) or you can create a new application.

To create a new application...

1. Select the New Application command on the File menu or the New Application button.
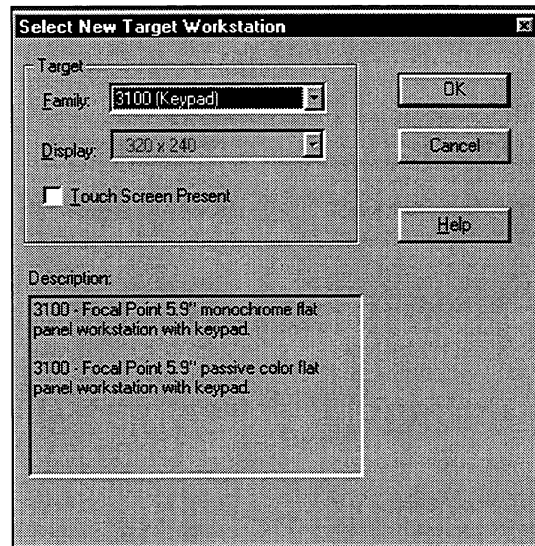
   The Select New Target Workstation dialog box appears, as shown in Figure 5-1.

Figure 5-1. Select New Target Workstation Dialog Box

2. Select a specific target workstation from the Target Workstation drop-down list box. A corresponding description of the workstation you choose appears in the Description box. The default is 3100M.

3. Click OK or press ENTER to close the Target Workstation dialog box. The target you specified appears on the Application Navigator form under Target Workstation.

5-2

The Application Navigator window opens, along with the new application. To change the default name of the application, you must save it, as described in the following section.

Saving an Application

There are two ways to save an application. You can use the Save Application command to save a new application or you can use the Save As command to rename an existing application.

To save a new application...

1. Select the Save Application command on the File menu or click on the Save Application button. The Save Application As dialog box opens, as shown in Figure 5-2.
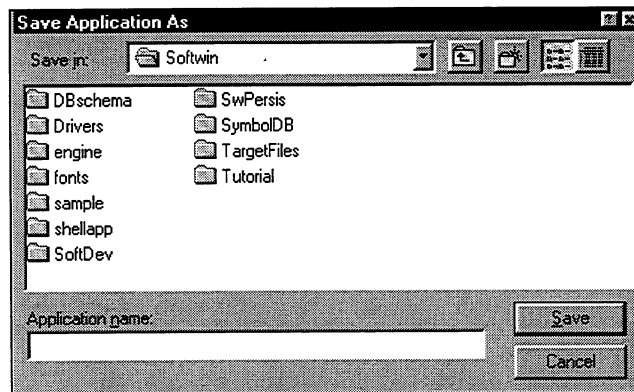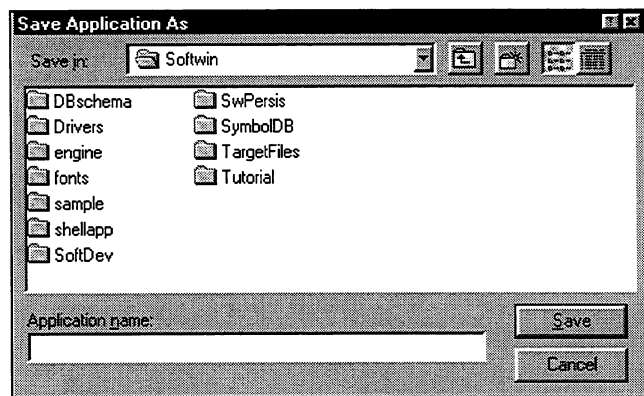

Figure 5-2. Save Application As Dialog Box

2. Select the drive on which you want to save the application from the Save in drop-down list box if it is not already selected.

3. Double-click on the folder in which you want to save the application if it is not already selected.

4. Type a name in the Application name text box, using up to 245 characters.

5. Click the Save button. *SoftScreen* saves the application. Its new name appears in the Application Navigator title bar.

5-3

After you have saved an application, selecting the Save Application command or the Save Application button automatically saves changes to the application.

Caution

The system will display the following error message if it runs out of memory:

    PANIC: out of memory

To avoid running out of memory, save your application often.

To rename an existing application...

1. In the Application Navigator form, type an optional description in the Description text box. This feature can be useful if you have numerous applications.

2. Select the Save As command on the File menu. The Save Application As dialog box opens, as shown in Figure 5-3.

Figure 5-3. Save Application As Dialog Box

3. Select the drive on which you want to save the application from the Save in drop-down list box, if it is not already selected.

4. Double-click on the folder in which you want to save the application, if it is not already selected.

5. Type the new name in the Application name text box, using up to 245 characters.

5-4

6. Click the Save button. *SoftScreen* saves the application. Its new name appears in the Application Navigator title bar.

After you have saved an application, selecting the Save Application command or the Save Application button automatically saves changes to the application.

Opening an Existing Application

To open an existing application...

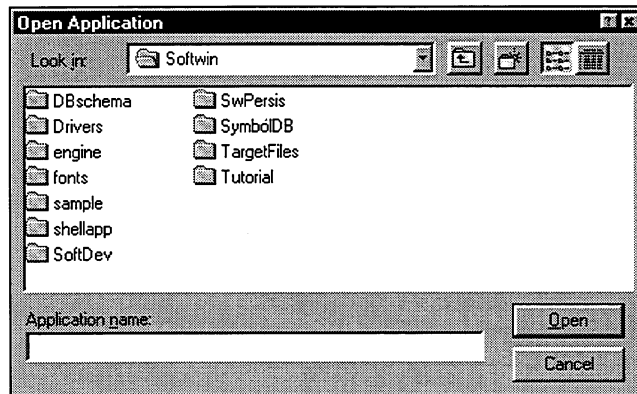1. Select the Open command on the File menu or the Open button. The Open Application dialog box appears, as shown in Figure 5-4.

Figure 5-4. Open Application Dialog Box

2. In the Look in drop-down list box, double-click on the drive on which the desired application is stored, if it is not already selected.

3. Double-click on the folder in which the desired application resides, if it is not already selected (when you name an application, it is saved in a folder with the same name).

4. Double-click on the application name. The application will have the same name as the folder, as well as an .ssw extension. The selected application opens, and its name appears in the *SoftScreen* title bar.

5-5

93

Engine/Alarm Configuration

General engine and alarm configuration is accomplished with a tabbed dialog box. This section describes Engine and Alarm configuration.

General Engine Configuration

1. From the Application Navigator form, select Engine from the Configure menu.
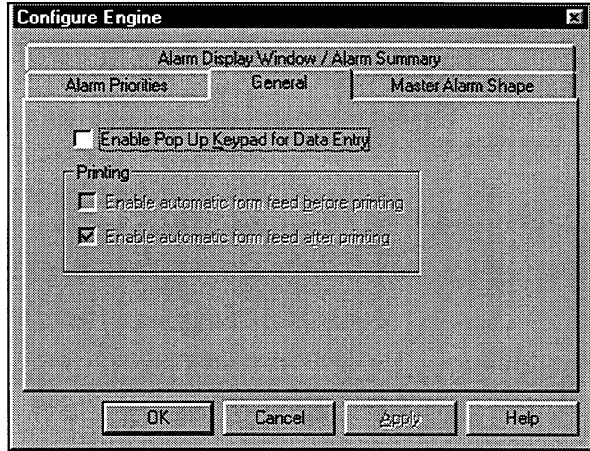
Figure 5-5. Configure Engine Form – General Page

2. Click on the General tab. Table 5-1 lists the choices on the General page.

Table 5-1. Configure Engine - General Page Description

Action	Description
Enable Pop-Up Keypad for Data Entry. *Note: This choice is grayed out for non-touch workstations.*	Displays the pop-up keypad on the target workstation screen when a data entry is pressed. Default is enabled.
Enable automatic form feed before printing	This option is not available.
Enable automatic form feed after printing	This option is not available.

Refer to Chapter 14, "Entering Data," for more information.

5-6

Alarm Priority Configuration

There are 16 alarm priorities with a choice of up to 16 colors for each priority. Refer to Chapter 14, "Alarm Priorities" for more information.
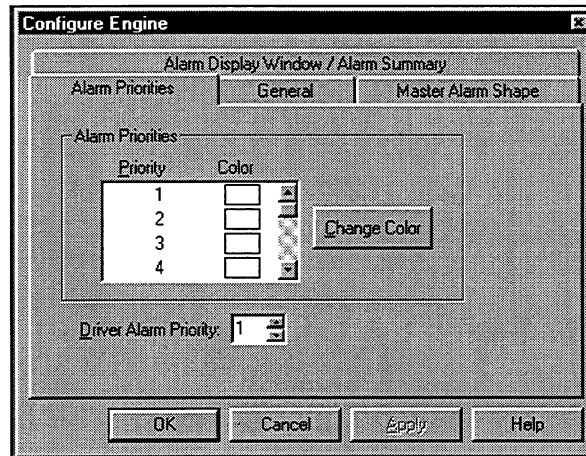
Figure 5-6. Configure Engine - Alarm Priorities Page

To configure alarm priority...

1. From the Application Navigator, select Engine from the Configure menu. The Configure Engine form opens, as shown in Figure 5-6.

2. Click on "Alarm Priorities" tab. Table 5-2 describes the choices on the Alarm Priority page.

Table 5-2. Alarm Priority Page

Action	Description
Alarm Priorities Priority/Color	To change the alarm's priority color, double-click on the line you want to change to bring up the color chart . Click on the new color. The default color is white. *Note: the "Change Color" button also brings up the color chart once you select a line.*
Driver Alarm Priority	Sets the priority/color of any alarms that originate from drivers.

5-7

Master Alarm Shape Configuration

Master alarms are alarms that come from drivers or alarms that are config-
ured to use the Master Alarm Shape. Refer to Chapter 14, "Master Alarm
Shape," for more information.
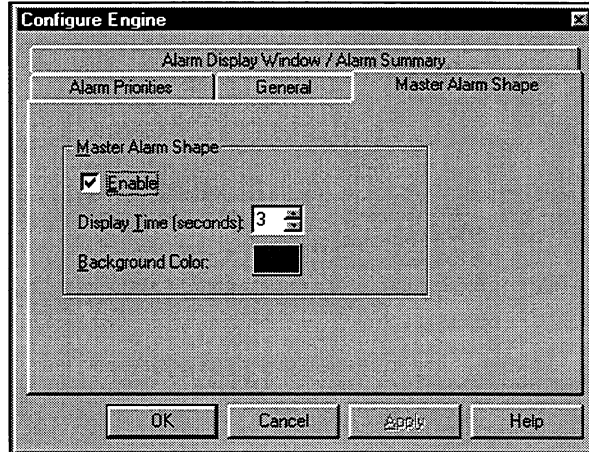
Figure 5-7. Configure Engine Form – Master Alarm Shape Page

To configure a master alarm shape...

1. From the Application Navigator, select Engine from the Configure
   menu. The Configure Engine form opens, as shown in Figure 5-9.

2. Click on the Master Alarm tab. Table 5-3 describes the choices on the
   Master Alarm Shape page.

Table 5-3. Master Alarm Shape Page

Action	Description
Enable	Enables the use of Master Alarm shape.
Display Time (seconds)	Amount of time to display the Master Alarm Shape ranges from 1 to 30 seconds. When configuring an alarm to use the Master Alarm shape, the time specified here will be used as the timeout for that alarm.

5-8

Action	Description
Background Color	There is a choice of 16 different background colors for the Master Alarm shape. *Note: The foreground color of an alarm is chosen when configuring an individual alarm's priority. See Chapter 10, Alarm Editor Form.*

Alarm Display Window Configuration

Refer to Chapter 14, "Alarm Display Window," for more information.

1. From the Application Navigator, select Engine from the Configure menu. The Configure Engine dialog box opens.
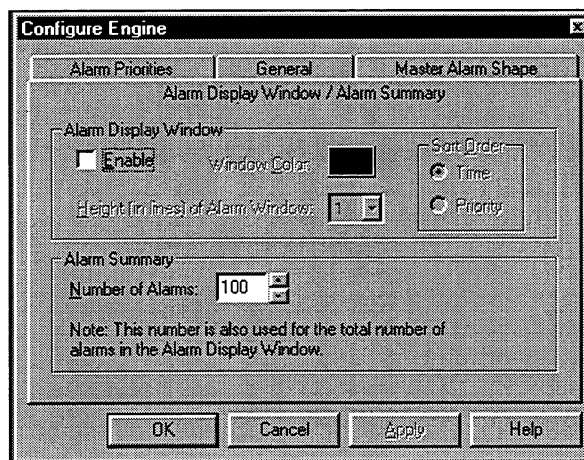
Figure 5-8. Configure Engine Form – Alarm Display Window/Alarm Summary Page

2. Click on the Alarm Display Window/Alarm Summary tab. Table 5-4 describes the choices on the Alarm Display Window/Alarm Summary Configuration page.

5-9

Table 5-4. Alarm Display Window/Alarm Summary Configuration Page

Action	Description
Enable	Enables the Alarm display window
Window color	There is a choice of 16 colors
Height (in lines) of Alarm Window	Number of lines that alarms occupy can be from 2 to 12 for the 3100 target workstation and 1 to 24 for the 3200/3300 target workstations.
Alarm Summary Number of Alarms	Number of alarms that are displayed in the Alarm Summary are 10 to 255. *Note: This number is also used for the total number of alarms in the Alarm Display Window.*
Sort Order	Selects the way alarms will be displayed in the alarm display window. Sorted by time or sorted by priority.

Printing Alarms During Run-time

When alarms occur during run-time, they are logged in the alarm summary. The alarm summary includes the following information in each entry:

- The user-defined message associated with the alarm

- The value at which the alarm was triggered

- The time and date when the alarm occurred

- The alarm's state of acknowledgment

Note

If you have selected a 3200 or 3300 target workstation, you can configure individual alarms to print under certain circumstances during run-time.

5-10

To print an alarm entry (3200/3300 only) during run-time...

1. Select the Print tab on the bottom of the Alarm form (Figure 5-11) to access the Print alarm settings page, as shown in Figure 5-12.

Figure 5-9. Data Editor Alarm Form (3200/3300 only)

Figure 5-10. Print Alarm Settings Page

5-11

99

2. Specify Into and Out of print settings. You can specify from one to six options for each alarm. Table 5-5 describes the options on this page.

Table 5-5. Alarm Print Settings

Option	Description
Detected	Prints when the associated value goes into or out of alarm
Acknowledged	Prints when the alarm is acknowledged
Removed	Prints when you delete the alarm in the alarm summary

Configuring Drivers

You must configure the drivers that you will use during run-time.

To configure a driver...

1. Select the Drivers command on the Configure menu in the Application Navigator or click on the Drivers button. The Configure Physical Drivers dialog box opens, as shown in Figure 5-11.
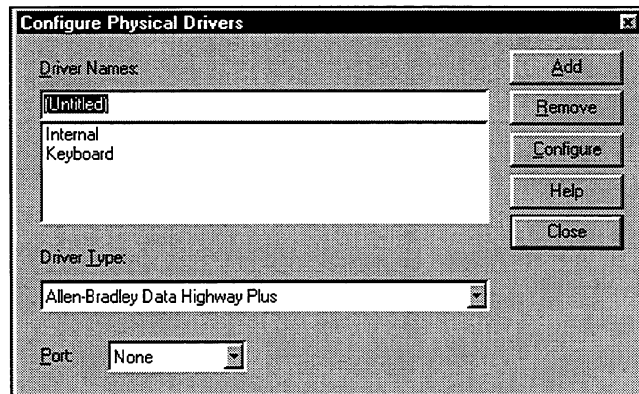
Figure 5-11. Configure Physical Drivers Dialog Box

2. Select the appropriate driver from the Driver Type drop-down list box.

3. Type a name in the Driver Names text box. This name, which must begin with a letter, can contain up to 32 alphanumeric characters, including underscores. It *cannot* include colons.

5-12

4. Select a port from the Port drop-down list box. Choices are None, COM1, COM2, and Special. The default is None.

5. Click the Add button. The name is added to the Driver Names list box.

6. Select the name from the Driver Names list box, and then click on the Configure button. The corresponding Configuration dialog box opens.

    This form varies, depending on the driver selected. For more information on configuring and addressing drivers, refer to the appropriate driver manual. For more information on addressing the internal and keyboard drivers, refer to Chapter 3.

If you have configured drivers that you no longer need, you can delete them.

Caution

When you delete a driver, you also delete its data points. If you still want to use the data points in the application, do not delete the driver.

To delete a driver...

1. In the Application Navigator, select the name of the driver you want to remove in the Drivers Configured list box (you cannot delete the internal or keyboard drivers).

2. Select the Delete command on the Edit menu. A message displays telling you this action will delete the selected device and all data points associates with it.

3. Click Yes if you still want to delete the driver and its associated data points. Click No if you do not want to delete the driver and its associated data points.

Converting Applications

Because applications are target specific, you must convert your application if you want to change the application's target workstation.

1. Select the Convert Application command on the File menu or the Target Workstation button. If you have made changes to the application that have not been saved, a message box asks if you want to save changes.

    After you respond to this message, the Select New Target Workstation dialog box opens, as shown in Figure 5-12.
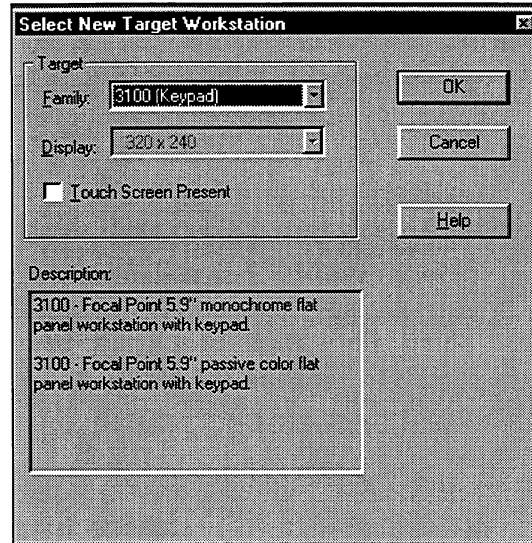
5-13

Figure 5-12. Select New Target Workstation Dialog Box

2. From the Target: Family drop-down list, select the family of workstations for which you are creating your application: 3100, 3200, or 3300.

3. Select the Touch Screen Present option if the target workstation for which you are developing your application has a touch screen. This option is selectable for 3100 and 3200 workstations. It is automatically selected for 3300 workstations, as 3300s come equipped with touch screens.

Technical Note

You cannot convert an application created for a target with a touch screen to a target without a touch screen.

Technical Note

If you select a conversion that is not allowed (such as converting a 3300 application to a 3100 application), the OK button is grayed. Once you select an allowable conversion, the OK button becomes active.

5-14

> ## Technical Note
> If the target workstation has a touch screen and you do not select the touch screen option in the Select New Target Workstation dialog box, you cannot configure touch zones for your application.

4. Click OK once you have specified the target workstation. The Save Application As dialog box opens, so you can rename the application.

5. Select the drive on which you want to save the application from the Save in drop-down list box, if it is not already selected.

6. Double-click on the folder in which you want to save the application, if it is not already selected.

7. Type the new name in the Application name text box, using up to 250 characters.

8. Click the Save button. *SoftScreen* saves the application. Its new name appears in the Application Navigator title bar.

Your application has been converted, and the new target workstation specified appears on the Application Navigator form under Target Workstation.

Closing an Application

To close an application, select the Close command on the File menu or the Close button (☒).

If you have previously saved all changes, *SoftScreen* automatically closes the application. If changes have been made, but not saved, a message box prompts you to save them. Once you have responded to this prompt, *Soft-Screen* closes the application.

5-15

Chapter 6 – Creating Screens

The Graphic Editor provides the necessary tools to quickly and easily create graphical user interface screens. It allows you to create and place fundamental graphic shapes, symbols, and monochrome, 16-color, and 256-color bitmaps.

Creating a New Screen

You can create new screens by selecting the Graphic Editor command on the Tools menu or using the Application Navigator form, shown in Figure 6-1.
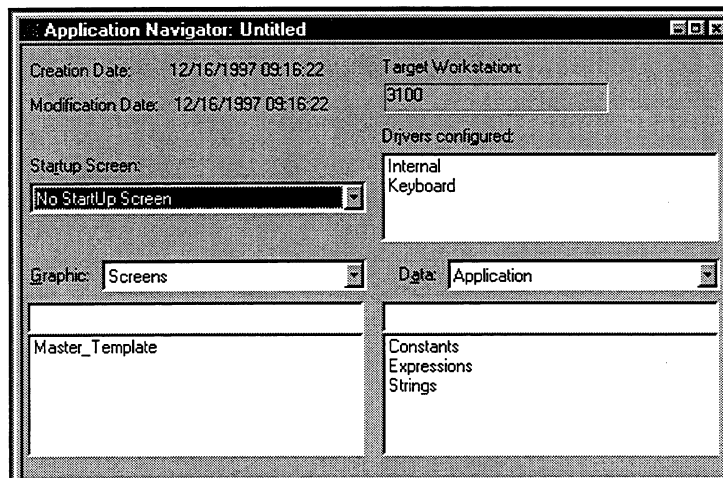
Figure 6-1. Application Navigator Form

The Application Navigator is the tool which allows you to navigate among the various elements of your application. The Application Navigator form displays on your screen when you open *SoftScreen*.

To create a new screen from the Application Navigator form...

1. Select Screens from the Graphic drop-down list box on the Application Navigator form.

2. Type a unique screen name in the Name text box. See Chapter 3 for information on creating valid names.

    If you have created a default screen template, this screen will incorporate all elements of that template.

3. Press ENTER. A new Graphic Editor window opens, with the name of the new screen in its title bar.

To create a new screen using the Graphic Editor tool...

1. Select the Graphic Editor command on the Tools menu or the Graphic Editor button. The Select Graphic dialog box opens, as shown in Figure 6-2.
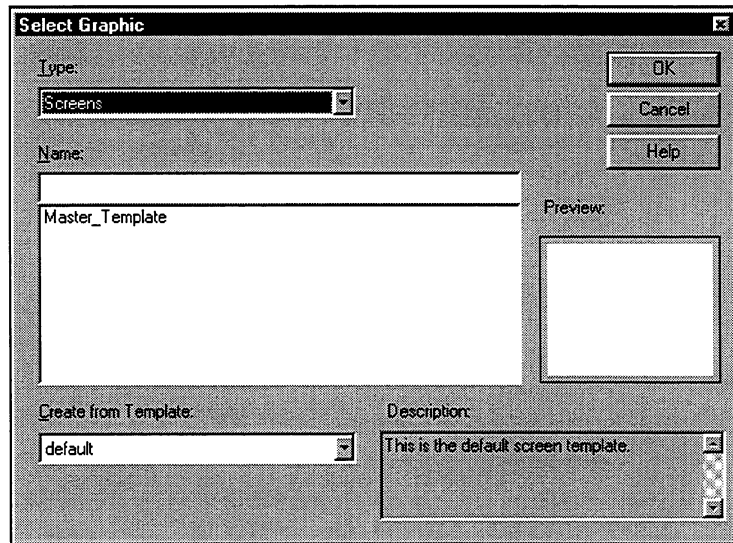
Figure 6-2. Select Graphic Dialog Box

2. Select Screens from the Type drop-down list box.

3. Type a unique screen name in the Name text box. See Chapter 3 for information on creating valid names.

4. If you want to create this screen based on an existing screen template, select the template from the Create from Template drop-down list. The Preview window displays the elements on the selected template, and the Description box provides a description of the template, if there is one.

5. Click OK or press ENTER. A new Graphic Editor window opens with the name of the new screen in its title bar.

You can open several windows in *SoftScreen* simultaneously. Each time you select the Graphic Editor command on the Tools menu and choose an existing screen or create a new one, a new window opens.

If you want to open a duplicate window of a screen that is active, select the New Window menu command on the Window menu.

If you have several windows open, use the commands on the Window menu to organize and move among them. (Refer to Appendix A for more information on Window menu commands.)

Technical Note

The number of screens you are able to create is limited by the amount of available memory on your workstation. Refer to Chapter 13 for more information on the number of screens you can create in your application.

The number of windows you can open during a *SoftScreen* session is limited by Windows resources. That is, if you have several Windows programs open at the same time as *SoftScreen*, you will be more limited in the number of windows you can open within *SoftScreen* than if you do not have any other programs open at the same time.

Opening an Existing Screen

You can open an existing screen in several ways.

To open an existing screen...

- Select Screens from the Graphic drop-down list box in the Application Navigator form, then double-click on the desired screen name in the associated list box. A Graphic Editor window opens, displaying the selected screen, as shown in Figure 6-3.

6-3
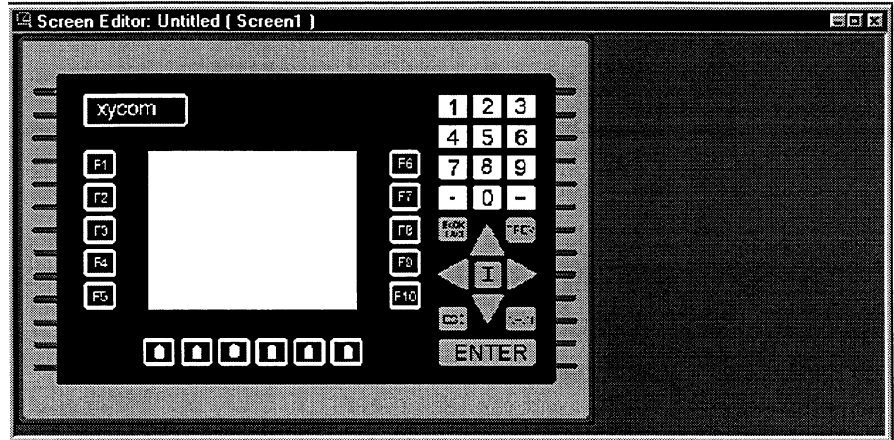
Figure 6-3. Graphic Editor with Bitmap of 3100 Front Panel Visible

or

- Select the Graphic Editor command on the Tools menu. When the Select Screen dialog box opens, type in the name of the existing screen or double-click on it in the list box. A Graphic Editor window opens, displaying the selected screen.

or

- Select the Graphic command on the View menu when the Graphic Editor is open. In the Select Screen dialog box, type the name of the screen or double-click on it in the list box. The selected screen replaces the screen displayed in the currently selected Graphic Editor window.

Opening the Master Template

The Master Template is a global screen. Shapes drawn on this screen appear on every screen in the current application during run-time. For example, if you place your company logo on the Master Template, it will appear on every screen in your application during run-time.

To open the Master Template...

1. Select Screens from the Graphic drop-down list box on the Application Navigator form.

6-4

2. Double-click on the Master Template entry in the associated list box. The Graphic Editor opens, with the Master Template drawing area displayed.

Technical Note

If you want to view shapes placed on the Master Template on all screens on the development system, choose the Set Visibility command on the View menu. Then select the Show Master Template Shapes option. The shapes are shown on all screens to help position other shapes; they cannot be edited except on the Master Template.

You are now ready to place shapes on the screen. For more information on creating shapes, refer to the *Working with Shapes* section in this chapter.

Specifying Screen Properties

You can do the following in the Screen Properties dialog box:

- Change screen color

- Set security level

- Provide a screen description

Changing Screen Color

You can choose a screen color from a 256-color palette.

Technical Note

You cannot change the screen color of the Master Template.

To change screen color...

1. Open the screen in your application whose color you wish to change.

2. Select the Properties command on the Edit menu. A submenu opens.

3. Select the Screen command from the submenu. The Screen Properties dialog box opens, as shown in Figure 6-4.

6-5
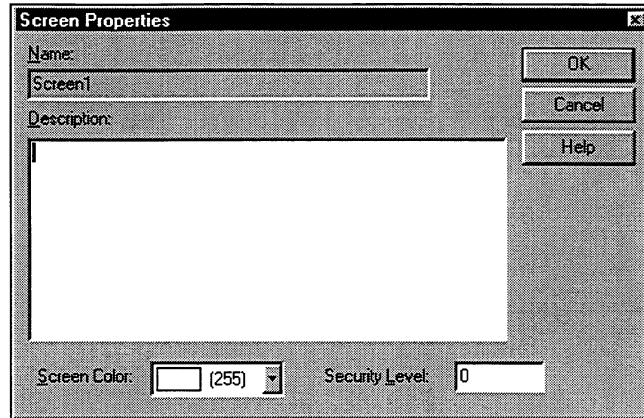
Figure 6-4. Screen Properties Dialog Box

4. Select the desired color from the Screen Color drop-down list box. The number in parentheses next to the color indicates the color's palette number for reference. The default color is white (255).

5. Click OK or press ENTER to apply the new color.

Copying and Pasting Screens

To copy and paste a screen...

Technical Note

You cannot copy and paste the Master Template.

---

1. From the Application Navigator, select Screens from the Graphic list box, and then highlight the screen you want to copy.

2. Select Copy from the Edit menu.

3. Open the application in which you want to copy the screen.

4. In the Application Navigator, select the Paste command on the Edit menu. The Change Paste Names dialog box appears, as shown in Figure 6-5.

6-6
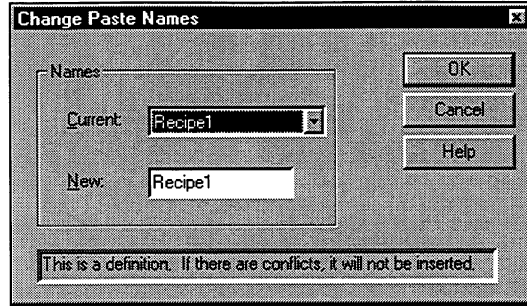
Figure 6-5. Change Paste Names Dialog Box

5. To avoid a conflict with a tag name in the new application, type a new recipe name in the New text box.

6. Click OK. The recipe graphic screen has been added to your application with the name you specified in the New text box.

Assigning a Security Level

SoftScreen allows you to assign a security level to the target workstation to restrict access during run-time to authorized personnel. To use security levels, you must assign passwords. Refer to Chapter 14 for information on the use of passwords during run-time.

To define passwords...

1. In the Application Navigator, select the Passwords command on the Configure menu or the Passwords button. The Configure Passwords dialog box opens, as shown in Figure 6-6.

6-7
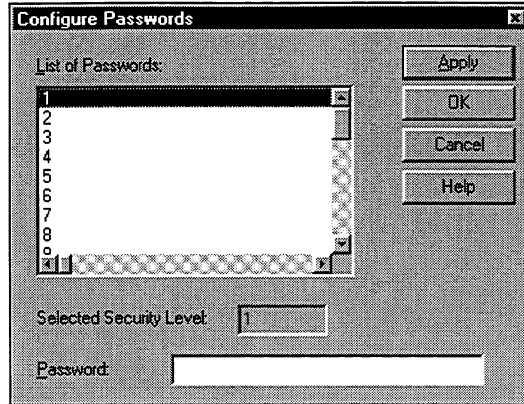
Figure 6-6. Configure Passwords Dialog Box

2. Select the security level for which you want to assign a password from the List of Passwords box. There are 32 levels from which to select, from 0-31.

Technical Note

Zero is the default security level on the engine. If you enter 0 in the password box during run-time, the engine security level is reset to 0.

---

3. Type the password in the Password text box. Passwords must begin with a letter, and can contain up to 32 alphanumeric characters. Use only numbers if the run-time engine has no external keyboard.

4. Click Apply or press ENTER to accept the new password.

    For example, when you first start the run-time engine, it is set to security level 0. If a "Go to Screen" action attempts to open a screen set to level 10, a password text box will display. You must enter a password that is set for security level 10 or above to open the screen. If you enter the password for level 15, then the run-time engine's new security level will be 15. This means that any screens set to security levels from 0-15 can be opened without providing a password.

To change or delete a password on the development system...

1. In the Configure Passwords dialog box, select the security level.

2. Click in the Password text box and highlight the current password.

6-8

3. Press DEL, then type in the new password.

4. Click Apply or press ENTER.

5. Click OK when you have finished defining passwords.

To assign a security level to a screen...

1. Open the screen in your application to which you want to assign a security level.

2. Select the Properties command on the Edit menu to access a submenu.

3. Select the Screen command. The Screen Properties dialog box opens, as shown in Figure 6-7.
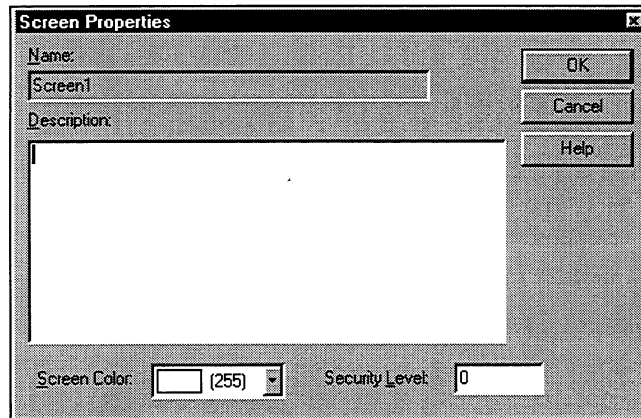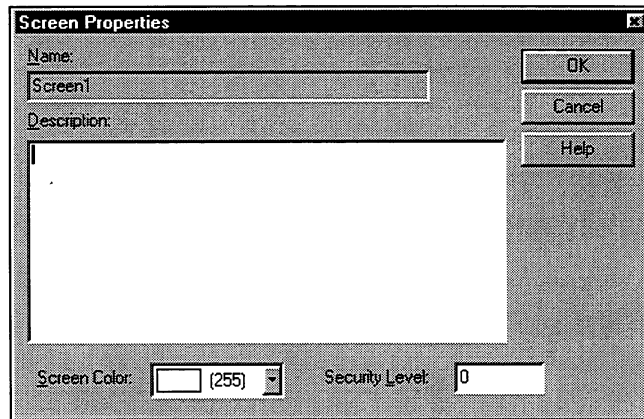

Figure 6-7. Screen Properties Dialog Box

4. Type the desired level in the Security Level text box, from 0 to 31, with 0 being the least secure and 31 being the most secure. The default is 0.

5. Click OK or press ENTER to apply the security level to the screen.

Technical Note

If you have changed the security level of the run-time engine and want to change it back to 0, you must provide the password (0). However, if the run-time engine security level is currently set to 0, you do not have to provide a password.

6-9

Providing a Screen Description

To enable you to identify a screen more easily, you can provide a description in the Screen Properties dialog box. You can also use this feature to log application changes.

To provide a screen description...

1. Open the screen for which you want to provide a description.

2. Select the Properties command on the Edit menu. A submenu opens.

3. Select the Screen command. The Screen Properties dialog box opens, as shown in Figure 6-8.

Figure 6-9. Screen Properties Dialog Box

4. Type a description of the screen in the Description text box. This description can be up to 32 Kbytes.

5. Click OK or press ENTER to save the description.

Working with Shapes

As you draw and place shapes, the status bar displays their X and Y coordinates and width and height (in pixels), as shown in Figure 6-10. Also, when pasting an object, it will be offset by 10 pixels to the right and to the bottom. Use these numbers as a reference when drawing and placing shapes.

6-10

114
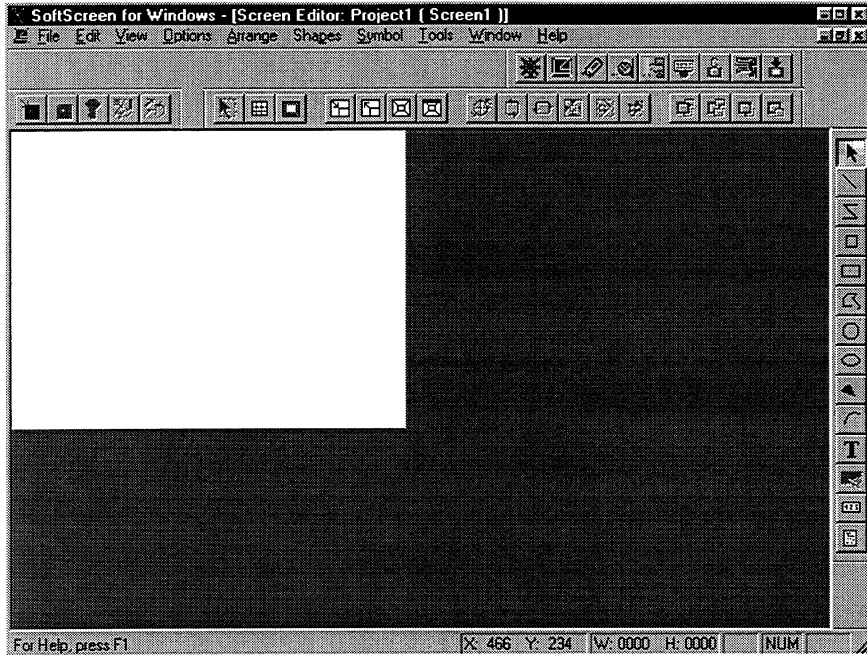
Figure 6-10. Screen Coordinates on Graphic Editor Status Bar

Technical Note

To provide flexibility when animating shapes, it is possible to draw and move shapes outside the boundaries of the development system drawing area.

Undoing Mistakes

Before you begin using Graphic Editor tools, you should understand how to undo mistakes.

Select the Undo command on the Edit menu or click on the Undo button to undo your last action in the current Graphic Editor session.

6-11

> ## Caution
>
> If you are in the Graphic Editor and open one of the other *SoftScreen* tools, you cannot undo the previous action in the Graphic Editor. Also, if you save the application or apply an animation to a shape, Soft-Screen empties the undo buffer and you will not be to undo the previous action.

Changing Screen Magnification

There are several ways you can increase or decrease screen magnification to help you draw and place shapes:

- Select the Zoom command on the View menu to access the Zoom Settings dialog box.

  Select from preset Zoom Settings of 50% to 400%. The default setting is 100%.

  or

  Click on the Custom option, and then type the desired percentage in the text box, from 10% to 1000%.

- Click on the Zoom Selected command on the View menu to magnify a select area of the screen. Press and hold the left mouse button at the corner of the area you want to magnify, and then drag the mouse until the bounding box surrounds the area. Release the left mouse button to magnify the selected area.

- Choose the Zoom In command on the View menu to increase the screen magnification to twice its current size. For example, if magnification is currently set to 100%, selecting Zoom In changes it to 200%.

- Select the Zoom Out command on the View menu to decrease screen magnification to half its current size. For example, if magnification is currently set to 100%, selecting Zoom Out changes it to 50%.

6-12

116

• Select the Zoom to Window command on the View menu to resize the Graphic Editor so you can view the entire target front panel (if it is displayed; refer to the *Arranging Shapes* section later in this chapter for more information on the target front panel), as well as the drawing area, or just the drawing area (if the target front panel is not displayed).

Selecting and Deselecting Shapes

Once something is placed on the development system screen—whether it is a shape you draw, a symbol you insert, or a bitmap you import—it is considered a shape, and commands can be applied to it and actions can be performed on it.

There are several ways to select a single shape, and a group of shapes, using the mouse and keyboard.

To quickly select all shapes on the screen, choose the Select All command on the Edit menu or the Select All button. All shapes on the screen are enclosed within a bounding box. You can then apply actions or commands to all the shapes within the bounding box.

To select individual shapes...

1. Choose the Selection command on the Shapes menu, or click on the Selection tool on the Drawing Palette. This changes the cursor from cross hairs (if you just finished drawing a shape) to a pointer.

2. Click on the first shape you want to select. A bounding box, with sizing handles, appears around the shape.

3. Press SHIFT + click to select each additional shape. The bounding box expands to include each shape as it is selected.

To select more than one shape...

1. Position the pointer on the drawing area outside the shapes you want to select.

2. Press and hold the left mouse button, then drag the mouse so the bounding box encompasses every shape you want to select (this is called rubberbanding).

6-13

117

Technical Note

To select an arc or a pie, treat it as if it is an ellipse and select the entire shape, not just the arc or pie.

---

3. Release the left mouse button. The bounding box now surrounds all the shapes you selected.

Once shapes have been selected, you can deselect them in several ways, as indicated in Table 6-1.

Table 6-1. Deselecting Shapes

Selection	Action to Deselect
Single shape	Click on another shape. Or Click anywhere on the screen.
Multiple shapes	Click anywhere on the screen (except on a selected shape). To deselect a particular shape, press SHIFT + click on the shape.

To move selected shapes...

Use the arrow keys and the Selection tool to move selected shapes. The arrow keys will move the shape one pixel at a time. By pressing the CTRL key and the ARROW key at the same time, the shape will shift 10 pixels at a time. The Selection tool lets you drag the shape to any location on the screen.

Drawing Shapes

You can use the Graphic Editor to draw lines, polylines, squares, rectangles, polygons, circles, ellipses, pies, arcs, text boxes, touch zones, and data entry shapes.

Technical Note

Hit the ESC key on your keyboard to abort the current action.

6-14

Creating Lines

You can draw two types of lines in *SoftScreen*: lines and polylines.

To draw a line...

1. Select the Line command on the Shapes menu, or click on the Line drawing tool on the Drawing Palette.

2. Position the cross hairs over the drawing area where you want the line to start.

3. Press and hold the left mouse button, then drag the mouse in any direction until the line is the desired length and orientation.

4. Release the left mouse button to complete the line.

To draw a polyline...

1. Select the Polyline command on the Shapes menu, or click on the Polyline drawing tool on the Drawing Palette.

2. Position the cross hairs on the drawing area where you want the polyline to start, and click.

3. Move the cross hairs to another point on the screen, and click to place the line segment.

4. Continue to move the cross hairs, clicking once at the end of each segment.

5. Double click to complete the polyline.

Creating Squares and Rectangles

To draw a square...

1. Select the Square command on the Shapes menu, or click on the Square drawing tool on the Drawing Palette.

2. Position the cross hairs over the drawing area where you want to place a corner of the square.

3. Press and hold the left mouse button, then drag the mouse in any direction until the square is the desired size.

6-15

> ## Technical Note
>
> When drawing a square, you are constrained to drawing only a square. However, once the square is completed, you can resize it into a rectangle.

4. Release the left mouse button to complete the square.

To draw a rectangle...

1. Select the Rectangle command on the Shapes menu, or click on the Rectangle drawing tool on the Drawing Palette.

2. Position the cross hairs over the drawing area where you want to place a corner of the rectangle.

3. Press and hold the left mouse button, then drag the mouse in any direction until the rectangle is the desired size.

4. Release the left mouse button to complete the rectangle.

Creating Polygons

To draw a polygon...

1. Select the Polygon on the Shapes menu, or click on the Polygon drawing tool on the Drawing Palette.

2. Position the cross hairs over the drawing area where you want to place a corner of the polygon, and click.

3. Move the cross hairs to another point on the screen, and click to draw the first side.

4. Continue to move the cross hairs, clicking once at the end of each side.

5. Double-click on the last point to complete the polygon.

6-16

Creating Circles and Ellipses

To draw a circle...

1. Select the Circle command on the Shapes menu, or click on the Circle drawing tool on the Drawing Palette.

2. Position the cross hairs over the drawing area where you want the circle to begin.

3. Press and hold the left mouse button, then drag the mouse in any direction until the circle is the desired size.

4. Release the left mouse button to complete the circle.

Technical Note

When drawing a circle, you are constrained to drawing only a circle. However, once the circle is completed, you can resize it into an ellipse.

To draw an ellipse...

1. Select the Ellipse command on the Shapes menu, or click on the Ellipse drawing tool on the Drawing Palette.

2. Position the cross hairs over the drawing area where you want the ellipse to begin.

3. Press and hold the left mouse button, then drag the mouse in any direction until the ellipse is the desired size.

4. Release the left mouse button to complete the ellipse.

Creating Pies and Arcs

To draw a pie...

1. Select the Pie command on the Shapes menu, or click on the Pie drawing tool on the Drawing Palette.

2. Position the cross hairs over the drawing area where you want the pie to begin.

6-17

121

3. Press and hold the left mouse button, then drag the mouse in any direction until the pie is the desired size.

4. Release the left mouse button.

5. Position the cross hairs (the radius will move with them) at the place on the circle where you want the pie to start, then click and release the left mouse button. This sets the starting point.

6. Drag the cross hairs until the pie is the desired size, then click to complete the shape.

Technical Note

If you move the cross hairs counterclockwise, you will start with no shape and draw the pie within the confines of the shape you created in Step 3. If you move the cross hairs clockwise, you will create the desired pie by "erasing" the rest of the shape.

To draw an arc...

1. Select the Arc command on the Shapes menu, or click on the Arc drawing tool on the Drawing Palette.

2. Position the cross hairs over the drawing area where you want the arc to begin.

3. Press and hold the left mouse button, then drag the mouse in any direction until the arc is the desired size.

4. Release the left mouse button.

5. Position the cross hairs (the radius will move with them) at the place on the circle where you want to start the arc, then click and release the left mouse button. This sets the starting point.

6. Drag the cross hairs until the arc is the desired size, then click to complete the shape.

Technical Note

If you move the cross hairs counterclockwise, you will start with no shape and draw the arc within the confines of the shape you created in Step 3. If you move the cross hairs clockwise, you will create the desired arc by "erasing" the rest of the shape.

6-18

Creating Text Boxes

There are three types of text boxes you can create: static text, animated text, and data display.

T **To draw a static text box...**

1. Select the Text box command on the Shapes menu, or click on the Text drawing tool on the Drawing Palette.

2. Position the cross hairs over the drawing area where you want to place a corner of the text box.

3. Press and hold the left mouse button, then drag the mouse in any direction until the text box is the desired size.

4. When you release the left mouse button, the Shape Properties form opens, with the Text page active, as shown in Figure 6-11.
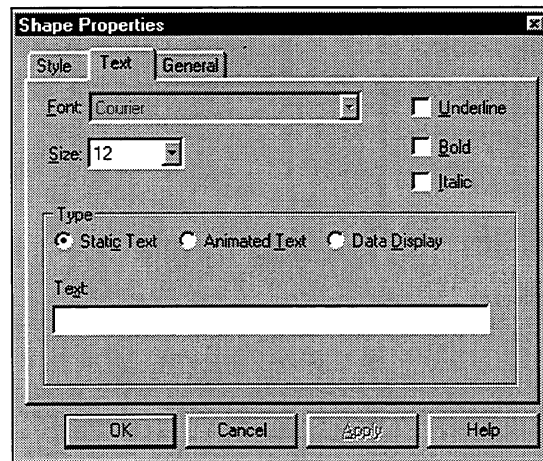
Figure 6-11. Static Text Properties Page in the Shape Properties Form

---

Caution

The text box will not be inserted if you choose Cancel in the Shape Properties Form

---

5. Select the text size you want: 8, 12, 24, or 48 points. The default is 12.

6-19

Technical Note

Underline is unavailable when 8 point text is selected.

---

6. Choose the Static Text option from the Type group.

7. In the Text box, type the text you want to display during run-time.

Technical Note

Although you can type in all the ASCII characters on the development system, the run-time engine will only display ASCII characters from 20h (32 decimal) to 7Eh (126 decimal).

---

8. When you have finished setting text properties, click OK or press ENTER. The specified text appears in the text box.

Technical Note

Text may look slightly different on the engine than it looks on the development system.

To draw an animated text box...

1. Select the Text box command on the Shapes menu, or click on the Text drawing tool on the Drawing Palette.

2. Position the cross hairs over the drawing area where you want to place a corner of the text box.

3. Press and hold the left mouse button, then drag the mouse in any direction until the text box is the desired size.

4. When you release the left mouse button, the Shape Properties form opens, with the Text page active, as shown in Figure 6-12.

6-20
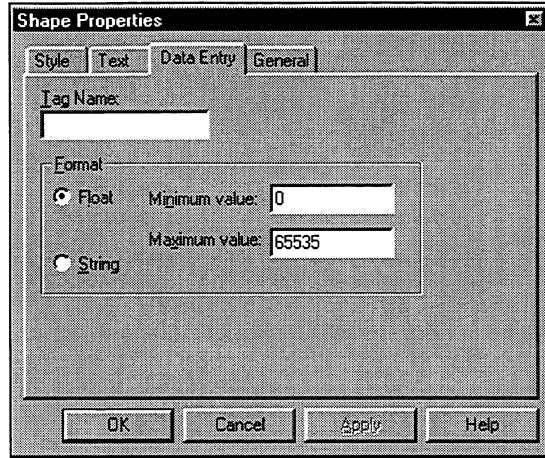
124
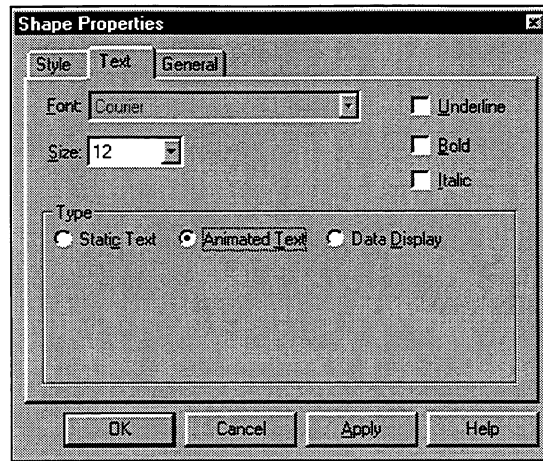
Figure 6-12. Animated Text Properties Page in the Shape Properties Form

---

Caution

The text box will not be inserted if you choose Cancel in the Shape Properties Form

---

5. Select the text size you want: 8, 12, 24, or 48 points. The default is 12.

Technical Note

Underline is unavailable when 8 point text is selected.

---

6. Choose the Animated Text option from the Type group.

7. When you have finished setting text properties, click OK or press ENTER.

In order to animate this text box, you *must* apply a text animation. Refer to Chapter 7, *Animating Shapes*, for information on animating text.

You can use data display shapes to view tag values. For example, you can use them to display system time and system date.

6-21

T **To draw a data display shape...**

1. Select the Text box command on the Shapes menu, or click on the Text drawing tool on the Drawing Palette.

2. Position the cross hairs over the drawing area where you want to place a corner of the text box.

3. Press and hold the left mouse button, then drag the mouse in any direction until the text box is the desired size.

4. When you release the left mouse button, the Shape Properties form opens, with the Text page active, as shown in Figure 6-13.
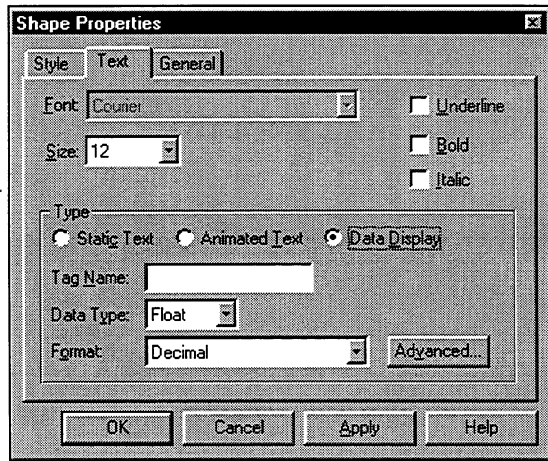
Figure 6-13. Data Display Text Properties Page in Shape Properties Form

---

Caution

The text box will not be inserted if you choose Cancel in the Shape Properties Form

---

5. Select the text size you want: 8, 12, 24, or 48 points. The default is 12.

Technical Note

Underline is unavailable when 8 point text is selected.

6-22

6. Choose the Data Display option from the Type group. The Data Display options appear, as shown in Figure 6-13.

You must provide the information described in Table 6-2 to configure data display text.

Table 6-2. Data Display Options

Field	Definition
Tag Name	Assigns a tag name. The value of this tag will be displayed during run-time.
Data Type	Sets the data display type to Float (default) or String. If you select Float, you must specify a format. The default is Float.
Format	Sets the format to date, time, decimal, hexadecimal, octal, or binary. If you select Decimal, Hexadecimal, Octal, or Binary, you can specify Advanced properties. The default is Decimal.
Advanced	Accesses the Advanced page if you select Decimal, Hexadecimal, Octal, or Binary as the format so you can specify advanced format properties.

The Advanced page is shown in Figure 6-14.

Figure 6-14. Advanced Page

6-23

Table 6-3 defines the fields in the Advanced Page.

Table 6-3. Fields in the Advanced Page

Field	Definition
Total Character Space	Sets the total number of characters in the data display. This number should be greater than or equal to the number of left and right digits, plus the decimal point and the sign. The default is 8.
Align to Column	Sets the column to which you want to align the decimal point. The default is 0, which means no column alignment. Column number begins at 1, which is the first character space on the left in the text box.
Suppress leading zeros	Suppresses leading zeros when selected. The default is on.
Suppress trailing zeros	Suppresses trailing zeros when selected. The default is on.
Display +	Displays a "+" when selected and the number is positive. The default is set to suppress the sign. (The minus sign is always displayed if it is a negative number.)
Left digits	Sets the number of digits to the left of the decimal point. The default is 5.
Right digits	Sets the number of digits to the right of the decimal point. The default is 2.
Minimum value	Sets the minimum value of the number being displayed. The range is IEEE 32-bit floating point minimum and maximum. The default is 0.
Maximum value	Sets the maximum value of the number being displayed. The range is IEEE 32-bit floating point minimum and maximum. The default is 65,535.

7. When you have finished setting data display text properties, click OK or press ENTER.

Number signs (#) reflecting the number of digits appear in the data display shape on the development system screen (for example, if you specify four left digits and four right digits on the Advanced page, you would see ####.####). These number signs will not display during run-time.

Creating Data Entry Shapes

Data entry shapes allow users to enter strings or numbers during run-time that will be written to the associated tag.

Caution

Do not place data entry shapes on the Master Template, as you cannot access them during run-time.

To create a data entry shape...

Technical Note

You cannot configure data entry shapes unless they are visible. To view data entry shapes, you must select the Set Visibility command on the View menu, and then check the Show Data Entry Objects option.

---

1. Select the Data Entry command on the Shapes menu, or click on the Data Entry drawing tool on the Drawing Palette.

2. Position the cross hairs over the drawing area where you want to place a corner of the data entry shape.

3. Press and hold the left mouse button, then drag the mouse to create a data entry shape of the desired width.

4. When you release the left mouse button, the Shape Properties form opens, with the Data Entry page active, as shown in Figure 6-15.

6-25

Figure 6-15. Data Entry Properties Page in the Shape Properties Form

---

Caution

The data entry shape will be deleted if you choose Cancel in the Shape Properties form.

---

5. Type a tag name in the Tag Name text box. This tag name identifies the data point to which you will be sending data.

6. Select the format in which you want to enter the data: Float or String. The default is Float.

7. If you select Float, specify a minimum and maximum value. The range is -65535 to +65536. The defaults are 0 for the minimum value, 65535 for the maximum.

8. Select the Style tab if you want to change the default settings.

Technical Note

In the Style page, the Foreground color sets the text color; background color sets the box color.

---

9. Click OK or press ENTER to complete the shape.

10. To turn off display of the data entry shape on the development system screen, select the Set Visibility command on the View menu.

6-26

11. Deselect the Show Data Entry Objects option.

Technical Note

A data entry shape is only visible during run-time at the time data entry is enabled. You will never see more than one data entry shape displayed at one time on the run-time screen.

A screen that contains data entry shapes *must* have an event/action defined to enable them at run-time. Refer to Chapter 11, *Assigning Event/Actions*, for more information.

If you have more than one data entry shape on a screen, you *must* specify the order in which the cursor will move from one data entry shape to another. If you do not, the cursor will not move from the first data entry object you place on the screen.

To specify data entry links...

1. Select the Data Editor command on the Tools menu to open the Select Data Form dialog box.

2. Double-click on the screen in which the data entry shapes are configured. This opens the associated Event/Action form.

3. Click on the Data Entry Links tab located at the bottom of the form. The Data Entry Links page opens.

   An example of data entry links is shown in Figure 6-16.

6-27
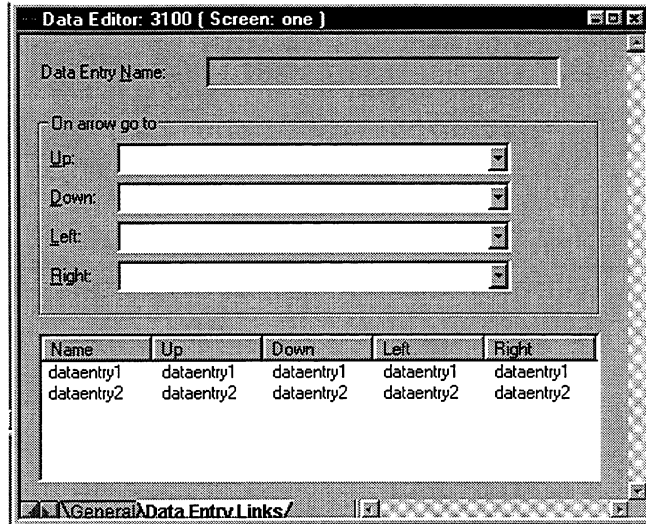
Figure 6-16. Data Entry Links Page

4. From the list box, select the internal name of the data entry shape whose links you want to change. This name displays in the Data Entry Name box, and the associated links will appear in the Up, Down, Left, and Right boxes.

5. Choose the links you want to set from each of the drop-down list boxes.

6. Repeat steps 4 and 5 for each of the data entry shapes whose links you want to change.

7. Save the application to preserve these changes.

During run-time, you will be able to move among the data entry shapes in the order in which you have specified.

Creating Touch Zones

You can create touch zones on a screen if the target workstation has a touch screen. Touch zones can then be linked to an action (such as acknowledging an alarm or changing a password level) which is triggered when the touch zone is pressed on the run-time engine.

6-28

> ## Technical Note
>
> You cannot create touch zones on alarm or recipe screens.

To create a touch zone...

> ## Technical Note
>
> To configure touch zones on the development system, they must be visible. With the Graphic Editor open, select the Set Visibility command on the View menu, and select the Show Touch Zones option.

1. Create a shape that you want to cover with a touch zone. (Touch zones are not visible during run-time. Therefore, you want to "attach" the touch zone to a visible shape so you know where the touch zone is located on a screen).

2. Select the Touch Zone command on the Shapes menu, or click on the Touch Zone drawing tool on the Drawing Palette.

3. Place the cross hairs on the drawing area near the shape you want to cover with the touch zone.

4. Press and hold the left mouse button, then drag the mouse so that the touch zone covers the selected shape.

5. Release the left mouse button to complete the touch zone. The Shape Properties form opens, with the General page displayed. You *must* enter a name for the touch zone.

6. Type a name in the Name text box and a description of what the touch zone does in the Description text box, then press OK.

7. To hide the touch zone on the development system screen, select the Set Visibility command on the View menu.

8. Deselect the Show Touch Zone option. All touch zones on the development system will become invisible.

Now you must create a touch zone event that is linked to an action. Refer to Chapter 11, *Assigning Event/Actions*, for more information.

6-29

Importing Bitmaps

In addition to creating shapes and placing symbols, you can import bitmaps in the Graphic Editor.

Caution

You cannot insert bitmaps that are larger than the display of your target workstation. A bitmap can be up to 320 x 240 x 256 colors on a 3100, and up to 640 x 480 x 256 colors on a 3200 or 3300.

Also, be aware that bitmaps use large amounts of memory on the target workstation. Refer to Chapter 13 for information on available memory.

To import bitmaps...

1. Select the Insert Bitmap command on the Edit menu. The Open dialog box appears.

2. If the bitmap you want is not located on the current drive, select the appropriate drive from the Look In drop-down list box.

3. Double-click on the desired folder.

4. From the resulting list, double-click on the bitmap you want to insert. The selected bitmap is inserted in the top left-hand corner of the development system screen.

Technical Note

You can move bitmaps once you have placed them on screen. However, you cannot resize, rotate, or flip them.

Applying Shape Properties

All shapes display static properties. Default properties can be set for the shapes. You can also apply specific properties to individual shapes.

There are four shape property pages in the Shape Properties form.

- The Style property page sets line color, type, and width, fill pattern, foreground color, and background color. All properties on this page do not apply to all shapes.

6-30

- The Text Property page sets the specifications for text boxes. This page appears only when you draw or edit a text box.

- The Data Entry Property page sets the specifications for data entry shapes. As such, it only appears in the Shape Properties form when you draw or edit a data entry shape.

- The General page sets the internal name and description for all shapes, so it is always available in the Shape Properties form.

Table 6-4 describes the style properties.

Table 6-4. Style Properties

Style Property	Definition
Line Color	Sets the color of lines and borders around shapes. You can choose from 255 colors. The default is black (0). This property does not apply to data display shapes, touch zones, data entry shapes, or text.
Line Type	Sets the line type of lines and borders around shapes to solid (1), large dashed (2), or small dashed (3). The default is solid (1). This property does not affect data display shapes, touch zones, data entry shapes, or text. *Note: All line types will display as a solid line on the development system. However, the selected line type will display properly during run-time.*
Line Width	Sets the width of lines and borders around shapes to 1, 2, or 3. The default is 1. This property does not affect data display shapes, touch zones, data entry shapes, or text. *Note: If you select line width option 2 or 3, line types 2 and 3 will not display on the development system. However, the selected line type will display properly during run-time.*
Fill Pattern	Sets the fill pattern of a shape. You can choose from 32 patterns. You can also choose not to set a fill pattern. The default is 2. This property does not affect lines, polylines, arcs, text, touch zones, data display shapes, and data entry shapes.
Foreground Color	Sets the foreground color of shapes. You can choose from 256 colors. The default is gray (7). This property does not affect lines, polylines, arcs, text, touch zones, data display shapes, and data entry shapes.

6-31

135

Style Property	Definition
Background Color	Sets the background color of shapes. You can choose from 256 colors. The default is dark gray (248). This property does not affect lines, polylines, arcs, text, touch zones, data display shapes, and data entry shapes.

Table 6-5 defines Text properties.

Table 6-5. Text Properties

Text Property	Definition
Font	Sets the font to Courier. Underline is available in all font sizes except 8 point.
Size	Sets the point size of the text to 8, 12, 24, or 48. The default is 12.
Type	Specifies whether text is Static, Animated, or Data Display. The default is Static.
Text	Defines the message to be displayed if Static is the specified type

Table 6-6 defines the General properties.

Table 6-6. General Properties

General Property	Definition
Name	Provides the internal name of the shape. You can change this name if you like.
Description	Allows you to provide a description of the shape

Changing Style Properties for Individual Shapes

You can change the properties of individual shapes.

To change line properties of a shape...

1. Choose the Selection tool on the Drawing Palette.

2. Double-click on the shape or shapes whose properties you want to alter.

   or

6-32

136

Select the shape or shapes. Click the Properties command on the Edit menu and then the Shape command or the Shape Properties command.

The Shape Properties form opens, with the Style Properties page active, as shown in Figure 6-17.

Technical Note

If you double-click on a text box, the Shape Properties form opens with the Text Properties page active.
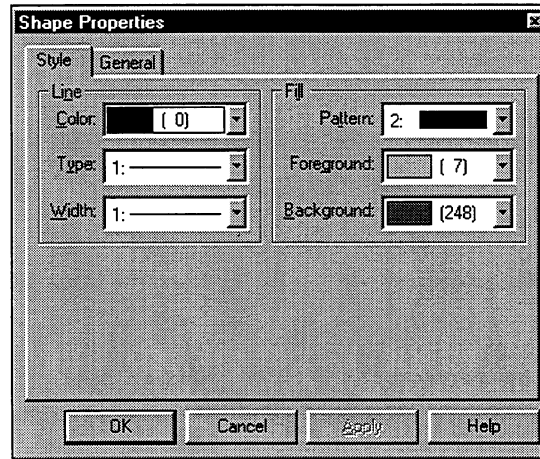
Figure 6-17. Style Properties Page in the Shape Properties Form

3. Select a color from the 256-color palette in the Color drop-down list box.

4. In the Type drop-down list box, choose a line type.

Technical Note

All line types will display as a solid line on the development system. Also, if you select a line width other than option 1, line types other than 1 will not display. However, the selected line type will display properly during run-time.

---

5. Choose the desired width from the Width drop-down list box.

6-33

6. Click Apply to apply these styles to a shape without exiting the dialog box.

or

Click OK or press ENTER to exit the dialog box and apply the styles to the selected shapes.

To change the fill pattern and color of a shape...

1. Choose the Selection tool on the Drawing Palette.

2. Double-click on the shape or shapes whose properties you want to alter.

or

Select the shape or shapes. Then select the Properties command on the Edit menu and then the Shape command, or click on the Shape Properties button.

The Shape Properties form opens, with the Style page active, as shown in Figure 6-18.
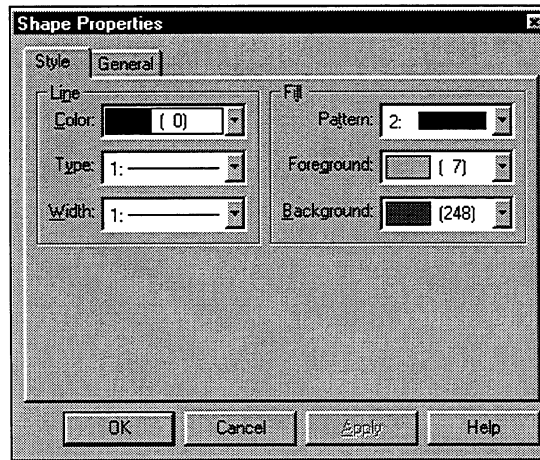
Figure 6-18. Style Properties Page in the Shape Properties Form

3. Select one of 32 patterns from the Pattern drop-down list box.

4. Choose a foreground color from the Foreground drop-down list box. If you select the white pattern, foreground color determines the color of the shape. If you select the solid black pattern, changing the foreground color does not affect the shape.

6-34

5. Choose the desired background color from the Background drop-down list box. If you select the solid black pattern, background color determines the color of the shape. If you select the white pattern, the background color does not affect the shape.

6. Click Apply to apply these styles to a shape without exiting the dialog box.

    Or click OK or press ENTER to exit the dialog box and apply the styles to the selected shapes.

Specifying Default Shape Properties

You can change the default settings of shape properties without changing the properties of shapes you have already created.

To change the default shape properties...

1. Select the Properties command on the Edit menu, then select the Shape (default) command. The Default Shape Properties form opens, with the Style page displayed, as shown in Figure 6-19.
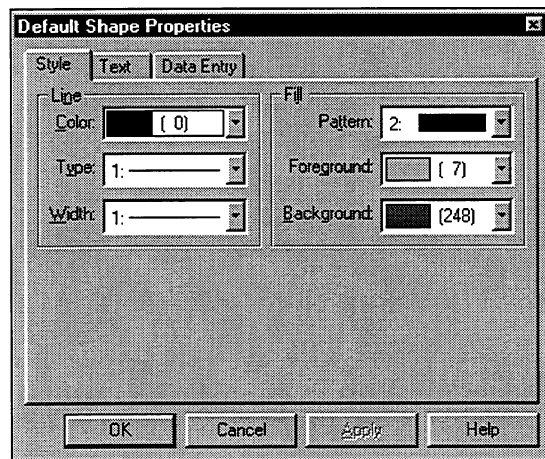
Figure 6-19. Style Properties Page in the Default Shape Properties Form

2. If you want to change Style default settings, you can specify Line Color, Type, and Width, as well as a Fill Pattern, Foreground Color, and Background color.

3. Select the Text tab if you want to change the default settings of text in text boxes. Change the Text Size, Style (Underline), and Type, as well as the message if you specify Static Text as the format.

4. Select the Data Entry tab to change the default settings for Data Entry shapes.

5. Click OK or press ENTER to set the new default properties.

All shapes you create during the current *SoftScreen* session will display these new default settings.

Technical Note

These default settings are not saved when you exit *SoftScreen*.

Providing a Shape Description

You can provide a description for each shape (up to 32 Kbytes), to help you identify it more easily. You can also use the description as a log of changes to a shape, as well as a place to list assigned tags.

To provide a shape description...

1. Choose the Selection tool on the Drawing Palette.

2. Double-click on the shape to access the Shape Properties form.

3. Click on the General tab to access the General Properties page, as shown in Figure 6-20.

6-36
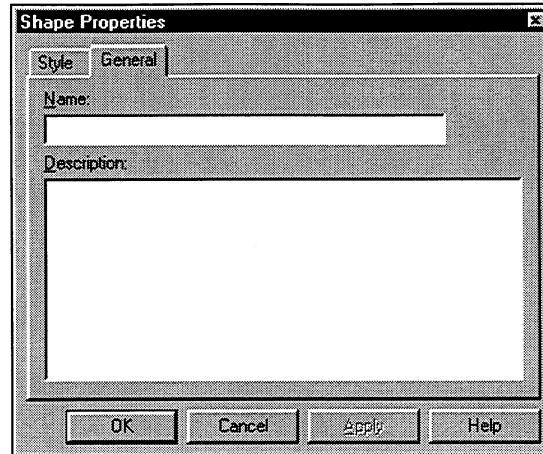
Figure 6-20. General Properties Page

4. Type a unique name for the shape in the Name text box, using up to 32 characters.

5. Type a description in the Description text box, up to 32 Kbytes. This can be used to store details about the shape's purpose or revision history.

6. Click OK or press ENTER to save the name and description.

Arranging Shapes

You can quickly change the way shapes are arranged using the following commands:

- Grid
- Align
- Group
- Ungroup
- Order

If you are configuring an application for a either a 3100, 3200 or 3300 target workstation, you can also use a bitmap of the target workstation's front panel to help you place shapes on the drawing area and align them with elements on the target's front panel. If you specified a 3100 Front Panel target, this bitmap is displayed on your screen when you open the Graphic Editor. If you do not want to view this bitmap, select the Set Visibility command on the View menu and click the Show Target option to turn it off.

6-37

Using the Grid

SoftScreen automatically displays a grid on the development system screen to help in positioning shapes (this grid does not display on the run-time engine). To change the grid default settings, select the Grid command on the View menu or the Grid button. The Grid Settings dialog box opens, as shown in Figure 6-21.
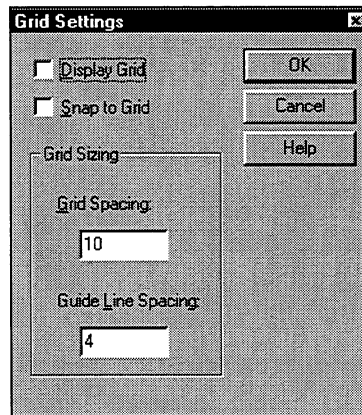
Figure 6-21. Grid Settings Dialog Box

6-38

142

Table 6-7 defines the fields in this dialog box.

Table 6-7. Fields in the Grid Settings Dialog Box

Field	Definition
Display Grid	Turns display of the grid on and off. When selected (the default), the grid will display on the development system screen, and a check mark will appear next to the Grid command on the View menu.
Snap to Grid	Causes shapes you draw to snap to intersecting points of the grid, allowing you to precisely align shapes. The default is off. This feature works even if the grid is not displayed. To toggle the Snap to Grid setting, press and hold the CTRL key as you are drawing or moving shapes. Once you release the CTRL key, Snap to Grid reverts to the settings specified in the Grid Settings dialog box. *Note: If you draw a shape the size of one grid square with the Snap to Grid feature turned on, you will not be able to move the shape. To alleviate this problem, use the CTRL key to toggle the Snap to Grid feature on and off. For example, if you have Snap to Grid on and you draw a circle that is one grid square, press and hold down the CTRL key to move the circle.*
Grid Spacing	Sets the size of the squares forming the grid (small dashed lines), from 2 to 200 pixels. The default is 20.
Guide Line Spacing	Sets the spacing between guide lines (thick dashed lines), from 2 to 20 grid squares. The default is 4.

To change grid sizing settings...

1. Select the Grid command on the View menu or the Grid button to open the Grid Settings dialog box (see Figure 6-21).

2. Choose a number from 2 to 200 for the Grid Spacing setting. The value in this field sets the size of the squares forming the grid (small dashed lines), from 2 to 200 pixels.

3. Choose a number from 2 to 20 for the Guide Line Spacing setting. The value in this field sets the spacing between guide lines (thick dashed lines), from 2 to 20 grid squares.

6-39

4. Click OK or press ENTER. The new grid settings are implemented.

Any changes made in the Grid Settings dialog box become the default settings for any new screens you create and for the screen that is currently active. However, if multiple graphic windows are open, changes do not affect them until they are closed and then reopened.

Aligning Shapes

The Align command allows you to align two or more shapes on the development system screen.

To align shapes...

1. Choose the Selection command on the Shapes menu, or click on the Selection tool on the Drawing Palette. This changes the cursor from cross hairs (if you just finished drawing a shape) to a pointer.

2. Select two or more shapes that you wish to align.

3. Choose the Align command on the Arrange menu or the Align button. The Align dialog box opens, as shown in Figure 6-22.
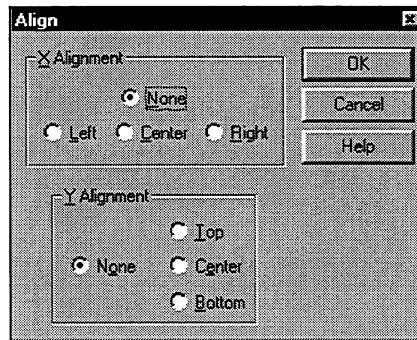
Figure 6-22. Align Dialog Box

4. Choose an alignment option. You can align shapes along the X axis, along the Y axis, or along both axes. Table 6-8 defines the alignment options.

6-40

Table 6-8. Alignment Options

Alignment Option	Definition
None	Does not align the selected shapes along the X or Y axis. This is the default setting.
Left	Aligns the selected shapes with the left edge of the left-most selected shape
Center X	Aligns the horizontal center of the selected shapes with the horizontal center of the area that contains the shapes
Right	Aligns the selected shapes with the right edge of the right-most selected shape
Top	Aligns the selected shapes with the top edge of the top-most selected shape
Center Y	Aligns the vertical center of the selected shapes with the vertical center of the area that contains the selected shapes
Bottom	Aligns the selected shapes with the bottom edge of the bottom-most selected shape

5. Click OK or press ENTER to align the selected shapes.

Once you exit the dialog box and the selected shapes are aligned, the dialog box reverts to its default settings (None for both X and Y).

Technical Note

The bounding boxes around the shapes are aligned, not the shapes themselves. So if you align an arc and a circle to the top, the top of the arc might not align with the top of the circle.

Grouping Shapes

The Group command lets you group shapes so you can apply commands (such as Delete and Cut), actions (such as resizing or moving), and animations to them as if they were a single shape.

6-41

145

| **Technical Note** |
| Data entry shapes cannot be grouped. |

To group shapes...

1. Choose the Selection command on the Shapes menu, or click on the Selection tool on the Drawing Palette. This changes the cursor from cross hairs (if you just finished drawing a shape) to a pointer.

2. Select the shapes you want to group.

3. Select the Group command on the Arrange menu or the Group button. The selected shapes are "locked" together as one shape.

To ungroup grouped shapes, select the Ungroup command on the Arrange menu or the Ungroup button, then click outside the bounding box. The shapes revert to their individual status.

| **Caution** |
| If you ungroup a group of shapes that are animated, the animations will be deleted. |

Ordering Shapes

As shapes are created, they are stacked in the order they are placed. This concept is not obvious unless shapes overlap each other.

To change the order in which shapes are stacked, use the Order command on the Arrange menu. This command accesses a submenu of five commands, as defined in Table 6-9.

6-42

Table 6-9. Order Commands

Order Command	Definition
Bring to Front	Places the selected shape on top of all shapes on the screen
Send to Back	Places the selected shape below all shapes on the screen
Bring Forward	Places the selected shape on top of the shape above
Push Backward	Pushes the selected shape below the shape underneath

Technical Note

You can only apply the Order command to one shape at a time.

Transforming Shapes

You can change the appearance and orientation of shapes by applying the following transformations:

- Size
- Rotate
- Flip

Sizing Shapes

Once a shape has been selected, a bounding box with handles surrounds it. The handles are used to resize the shape.

To resize shapes...

1. Choose the Selection command on the Shapes menu, or click on the Selection tool on the Drawing Palette. This changes the cursor from cross hairs (if you just finished drawing a shape) to a pointer.

6-43

2. Position the pointer over one of the sizing handles. The pointer changes into an arrow. You can now resize the selected shape in the direction of the arrow heads.

3. Press and hold the left mouse button, then drag the handle until the shape is the desired size.

4. Release the left mouse button to resize the shape.

Rotating Shapes

You can rotate shapes once they have been placed on the development system screen. This rotation only affects shapes on the development system. To rotate shapes during run-time, refer to Chapter 7, *Animating Shapes*.

Technical Note

You cannot rotate, data entry shapes, touch zones, text, and bitmaps.

To rotate shapes...

1. Choose the Selection command on the Shapes menu, or click on the Selection tool on the Drawing Palette. This changes the cursor from cross hairs (if you just finished drawing a shape) to a pointer.

2. Select the shape or shapes you want to rotate.

3. Select the Rotate command on the Arrange menu or the Rotate button. The Rotate dialog box opens.

4. Choose the angle at which you would like to rotate the shape or shapes: 90, 180, or 270 degrees.

5. Click OK or press ENTER to rotate the selected shapes at the specified angle.

6-44

Flipping Shapes

You can flip shapes once they have been placed on the development system screen. This action has no effect on shapes during run-time.

To flip shapes...

1. Choose the Selection command on the Shapes menu, or click on the Selection tool on the Drawing Palette. This changes the cursor from cross hairs (if you just finished drawing a shape) to a pointer.

2. Select the shape or shapes you wish to flip.

Technical Note

You cannot flip text or bitmaps. However, if they are part of a group that is flipped, they will move with the group while retaining their original orientation.

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3. Select the Flip Horizontal command on the Arrange menu or the Flip Horz. button to flip shapes from left to right.

    or

4. Select the Flip Vertical command on the Arrange menu or the Flip Vert. button to flip shapes from top to bottom.

The selected shapes are automatically flipped.

Positioning Shapes with the Arrow Keys

You can move a shape or selected shapes by using the arrow keys on your keyboard.

To position a shape(s)...

1. Select the shape or shapes you want to move.

    To move all shapes, choose Select All from the Edit menu. To move some of the shapes, hold the SHIFT key down while selecting the shapes you want to move.

2. Press an arrow key to move the shape(s) one pixel. To move the shape(s) 10 pixels, press the CTRL key while pressing an arrow key.

6-45

149

> ## Technical Note
>
> If you have the snap-to-grid option turned on and you use the arrow keys to move shapes, the snap-to-grid function is overridden.

Editing Shapes

Cut, copy, paste, and delete are basic operations you can perform on shapes in *SoftScreen*.

To copy shapes...

1. Choose the Selection command on the Shapes menu, or click on the Selection tool on the Drawing Palette. This changes the cursor from cross hairs (if you just finished drawing a shape) to a pointer.

2. Select the shape or shapes you want to copy.

3. Select the Copy command on the Edit menu, the Copy button, or press CTRL+C.

   The selected shapes are copied to the Windows clipboard. Each shape is saved on the clipboard with its associated animations (Scale, Rotate, etc.) and properties (Fill Pattern, Line Style, etc.).

To cut shapes...

1. Choose the Selection command on the Shapes menu, or click on the Selection tool on the Drawing Palette. This changes the cursor from cross hairs (if you just finished drawing a shape) to a pointer.

2. Select the shape or shapes you want to cut.

3. Select the Cut command on the Edit menu, the Cut button, or press CTRL+X.

The selected shapes are erased from the screen and placed on the Windows clipboard. Each shape is saved with its associated animations (Scale, Rotate, etc.) and properties (Fill Pattern, Line Style, etc.).

6-46

To paste shapes...

Select the Paste command on the Edit menu, the Paste button, or press CTRL+V.

The clipboard contents are placed on the screen . Objects are offset from the location from which they were cut by 10 pixels to the right and to the bottom. Each shape is placed with its associated animations (Scale, Rotate, etc.) and properties (Fill Pattern, Line Style, etc.).

Saving Changes to a Screen

To save changes to a screen, you must save the current application. To do this, select the Save Application command on the File menu or the Save Application button in any of the tools. If you have not previously saved the screen, refer to the section, *Creating a New Screen*, at the beginning of this chapter.

Caution

Whenever you select Save Application, all changes to the application are saved, not just changes made in the current tool.

Selecting a Startup Screen

In the development system, you can choose the screen you want to display when the run-time system starts. If you do not specify a startup screen, an error will occur when you try to generate the application.

To specify a startup screen...

1. In the Application Navigator form, click on the Startup Screen dropdown list box. This box provides a list of all the screens configured for the current application.

2. Click on the screen you want to display upon run-time start-up.

3. Save the application.

6-47

151

Printing Screens

There are three parts to printing a development system screen:

- Setting up the printer
- Previewing the screen you want to print
- Printing from the default printer

Setting up the Printer

Because *SoftScreen* uses the Windows Printer settings, you should only use the Print Setup command if you want to change these settings or you want to print from a printer other than the default. The Print Setup command on the File menu accesses the Print Setup dialog box. The options in this dialog box depend upon the selected printer.

Refer to your printer manual for more information on printer settings.

Previewing a Screen

You can view a screen exactly as it will look when printed, before sending it to the printer.

To preview a screen before printing...

1. Select the Print Preview command on the File menu. The Print Preview window opens with the screen displayed.

2. From this window, you can select the Zoom In button to better view the screen. Once you have selected the Zoom In button, the Zoom Out button is activated, allowing you to return the view of the screen to its original size (the Zoom In and Zoom Out buttons have no effect on the size of the printed screen).

3. Select the Close button to close the Print Preview window and return to the Graphic Editor window.

6-48

Printing a Screen

Once you have chosen a printer and specified its settings in the Print Setup dialog box, you are ready to print.

To print the current screen...

1. Select the Print command on the File menu, the Print button, or the Print button in the Print Preview window.

2. The Print dialog box appears. The options in this dialog box depend upon the default printer you have selected.

3. Click OK or press ENTER to send the screen to the printer. *SoftScreen* will print a graphical image of the shapes on the screen. If the Target front panel is displayed, it will also print.

Deleting a Screen

The Application Navigator form is the only place from which you can delete screens.

Technical Note

You cannot delete the Master Template.

To delete a screen...

1. Select Screens from the Graphic drop-down list box on the Application Navigator form.

2. Select the screen you want to delete from the accompanying list box.

3. Select the Delete command on the Edit menu to delete the screen.

Technical Note

You cannot use the DEL key to delete a screen. The DEL key can be used to delete characters in the screen name, not the screen itself.

6-49

Chapter 7 – Animating Shapes

This chapter defines *SoftScreen* animations. Animations are dynamic properties that are configured on the development system and applied to shapes during run-time. They allow you to animate shapes in your applications, using them to emulate real-life processes and I/O.

There are two types of animations: spatial and non-spatial.

- Spatial animations (such as rotate or position) change a shape's (or group of shapes') location or orientation.

- Non-spatial animations (such as foreground color or line width) do not change a shape's location or orientation. They just change a shape's (or group of shapes') appearance. ·

Technical Note
Multiple animations can be applied to a single shape, allowing a variety of capabilities.

Using Animation Pages

Every animation provides a page in which you specify the its parameters. Table 7-1 defines the fields available on every animation page.

Table 7-1. Fields on the Animation Page

Field	Definition
Tag Name	Specifies a tag name for the animation. You can type in an existing tag name or you can specify a new tag name. If you specify a new tag name, you must define it in the Data Editor before you download the application. Refer to Chapter 3 for more information on configuring tags. *Note: Tag Name Type Ahead feature allows you to locate existing tag names. As you type in each character of a tag name, the tag name edit box is filled with the closest match to the defined tag name.*
Add	Adds the configured animation to the list box.
Remove	Removes the selected animations.
Order	Accesses the Animations Ordering dialog box, allowing you to alter the order in which all animations are applied to a shape (a shape can be an individual shape or a group of shapes).

Technical Note

Fields in animation pages requiring data point minimums and maximums will accept IEEE 32-bit floating point values.

Applying Non-spatial Animations

Non-spatial animations are conditional. They occur when the attached tag is true (or non-zero). They differ from spatial animations in that they do not change location or orientation. Also, you cannot combine non-spatial animations of the same type because only the last animation that evaluates true will be applied to the shape.

For example, if you configure an animation to apply a blue background color to a shape and another animation to apply a yellow background color to the same shape, the shape will not turn green. Instead, the last animation that evaluates to true will take effect (refer to Chapter 3, *Configuring Tags*, for information on how tags are evaluated).

Non-spatial animations are Background Color, Foreground Color, Line Color, Line Width, Line Type, Fill Pattern, Text, and Visibility.

7-2

Technical Note

Non-spatial animations applied to an individual shape in a group take precedence over non-spatial animations of the same type applied to the group. For example, apply a background color animation to a shape. Next, group that shape with other shapes and apply a background color animation to the group. During run-time, the individual shape will retain its background color animation and it will take precedence when both the individual shape's and the group's background color animations are true.

You cannot apply certain non-spatial animations to all shapes. Table 7-2 defines which non-spatial animations apply to which shapes.

Table 7-2. Non-spatial Animations

Shape	Background Color	Foreground Color	Line Color	Line Width	Line Type	Fill Pattern	Text	Visibility
Line			x	x	x			x
Polyline			x	x	x			x
Square	x	x	x	x	x	x		x
Rectangle	x	x	x	x	x	x		x
Polygon	x	x	x	x	x	x		x
Circle	x	x	x	x	x	x		x
Ellipse	x	x	x	x	x	x		x
Pie	x	x	x	x	x	x		x
Arc	x	x	x	x	x	x		x
Text	x	x					x	x
Touch zone								
Data entry								
Data display	x	x						
Bitmap								x

Foreground, Background, and Line Color

SoftScreen lets you animate foreground, background, and line colors. If you apply a color animation to a shape, the shape's color will change during run-time when the attached tag is true (or non-zero). Refer to Chapter 3, *Configuring Tags*, for information on how tags are evaluated.

To animate color...

1. Select the shapes whose color you want to animate.

2. Select the Animations command on the Edit menu or the Animations button to open the Shape Animations form.

3. Choose the Background Color, Foreground Color, or Line Color tab, depending on which you want to animate. The corresponding page will display. For example, if you choose the Background Color tab, the Background Color animations page will display, as shown in Figure 7-1.
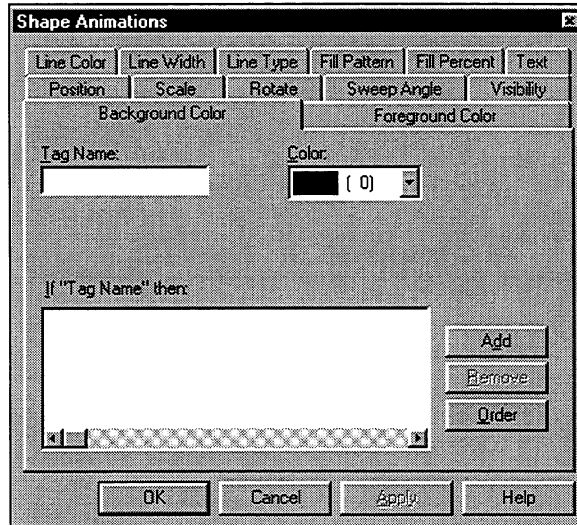
Figure 7-1. Background Color Animation Page

4. Type the tag name to which you want to link the animation in the Tag Name text box.

5. Select the color which you want the shape to change into from the Color drop-down list box.

6. Click Add to add the animation to the list box.

7. Click OK or press ENTER to apply the animation.

7-4

Line Width

If you apply a line width animation to a shape, the shape's line width will change during run-time when the attached tag is true (or non-zero). Refer to Chapter 3, *Configuring Tags*, for information on how tags are evaluated.

To animate a shape's line width...

1. Select the shape or group of shapes whose line width you want to animate.

2. Select the Animations command on the Edit menu or the Animations button to open the Shape Animations form.

3. Choose the Line Width tab to access the Line Width animation page, as shown in Figure 7-2.
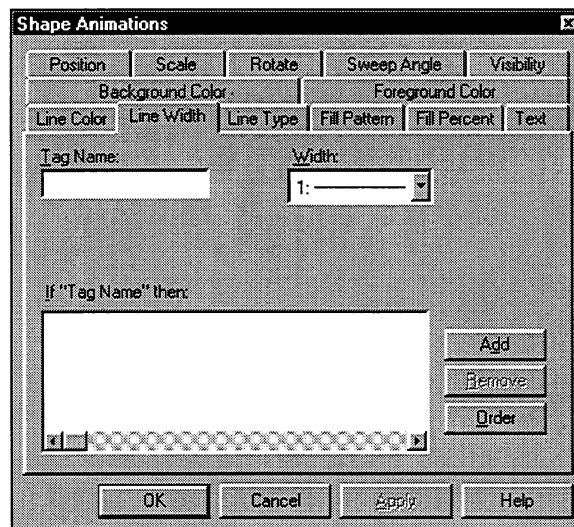

Figure 7-2. Line Width Animation Page

4. In the Tag Name text box, type the name of the tag to which you want to link the animation.

5. Select a line width from the Width drop-down list box.

6. Click Add to add the animation to the list box.

7. Click OK or press ENTER to apply the animation.

7-5

159

Line Type

If you apply a line type animation to a shape, the shape's line type will change during run-time when the attached tag is true (or non-zero). Refer to Chapter 3, *Configuring Tags*, for information on how tags are evaluated

To animate a shape's line type...

1. Select the shape or group of shapes whose line type you want to animate.

2. Select the Animations command on the Edit menu or the Animations button to open the Shape Animations form.

3. Choose the Line Type tab to access the Line Type animation page, as shown in Figure 7-3.
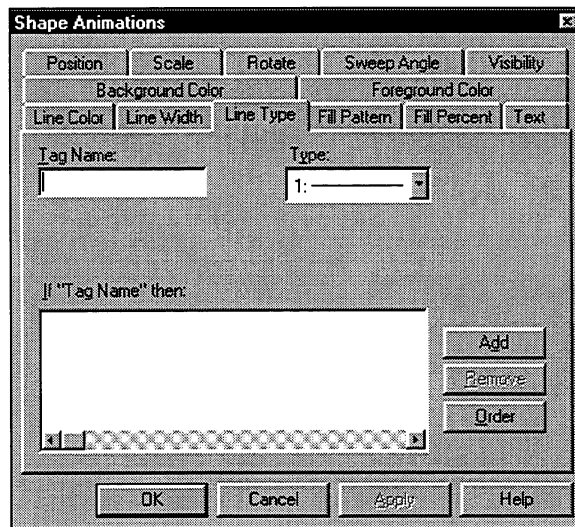
Figure 7-3. Line Type Animation Page

4. In the Tag Name text box, type the name of the tag to which you want to link the animation.

5. Select a line type from the Type drop-down list box.

6. Click Add to add the animation to the list box.

7. Click OK or press ENTER to apply the animation.

7-6

160

Fill Pattern

If you apply a fill pattern animation to a shape, the shape's fill pattern will change during run-time when the attached tag is true (or non-zero). Refer to Chapter 3, *Configuring Tags*, for information on how tags are evaluated. move to top of section

To animate a shape's fill pattern...

1. Select the shape or group of shapes whose fill pattern you want to animate.

2. Select the Animations command on the Edit menu or the Animations button to open the Shape Animations form.

3. Choose the Fill Pattern tab to access the Fill Pattern animation page, as shown in Figure 7-4.
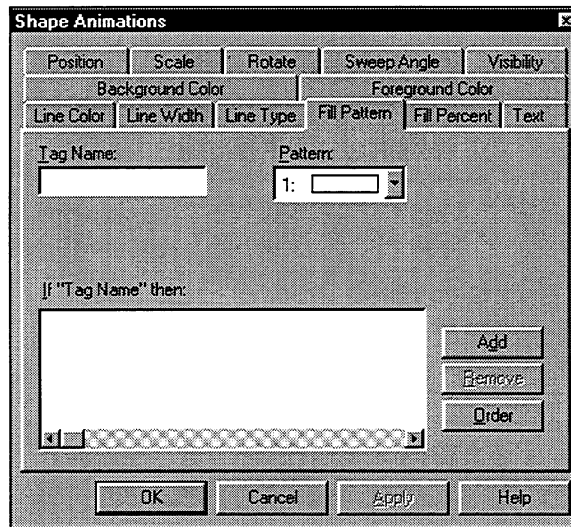
Figure 7-4. Fill Pattern Animation Page

4. In the Tag Name text box, type the name of the tag to which you want to link the animation.

7-7

5. Select a fill pattern from the Pattern text box. If you select pattern 1, the shape will contain a solid foreground color. If you select 2, the shape will contain a solid background color. If you select 3 through 32, the shape will contain a pattern of foreground and background colors, which are set in the Shape Properties form (refer to the section *Applying Shape Properties* in Chapter 6 for more information on setting shape colors).

6. Click Add to add the animation to the list box.

7. Click OK or press ENTER to apply the animation.

Text

To animate text, you must select the Animated Type option on the Text properties page. For more information on specifying text properties, refer to the *Creating Text Boxes* section in Chapter 6.

If you apply a text animation to a text box, the message will display during run-time when the attached tag is true (or non-zero). Refer to Chapter 3, *Configuring Tags*, for information on how tags are evaluated.

To animate text...

1. Select the text box whose text you want to animate.

2. Select the Animations command on the Edit menu or the Animations button to open the Shape Animations form.

3. Select the Text tab to access the Text animation page, as shown in Figure 7-5.

7-8
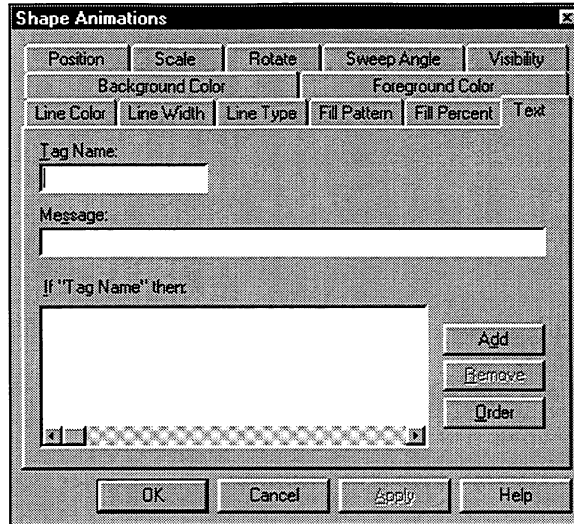
Figure 7-5. Text Animation

4. In the Tag Name text box, type the name of the tag to which you want to link the animation.

5. Type the message you want to display.

Technical Note

Although you can type in all the ASCII characters on the development system, the run-time engine will only display ASCII characters from 20h (32 decimal) to 7Eh (126 decimal).

On the 3100 engine, you are able to display up to 40 characters in 8 and 12 point type; 20 characters in 24 point type; and 10 characters in 48 point type. On the 3200 and 3300, you are able to display 80 characters in 8 and 12 point type; 40 characters in 24 point type; and 20 characters in 48 point type.

6. Click Add to add the animation to the list box.

7. Click OK or press ENTER to apply the animation.

7-9

Visibility

If you apply a visibility animation to a shape, during run-time the animated shape will be invisible when the attached tag is false (zero) and visible when the attached tag is true (non-zero). If you select the blink option, the shape will blink when the attached tag is true (or non-zero) and will not blink (but it will be visible) when the tag is false (zero). Refer to Chapter 3, *Configuring Tags*, for information on how tags are evaluated.

To make a shape blink or change its visibility...

1. Select the shape or group of shapes that you want to make blink or whose visibility you want to change.

2. Choose the Animations command on the Edit menu to open the Shape Animations form.

3. Click on the Visibility tab to access the Visibility animation page, as shown in Figure 7-6.
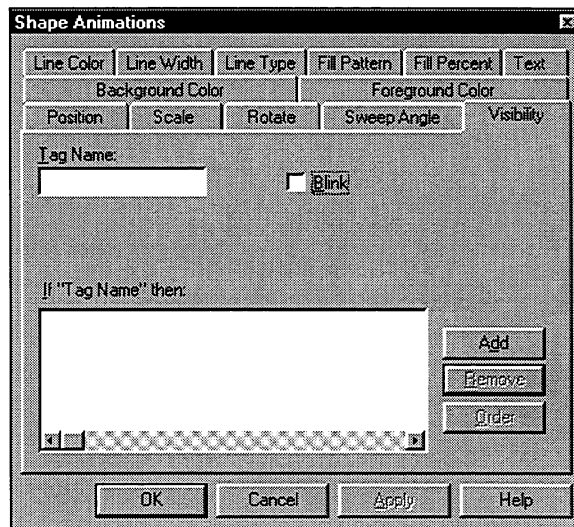

Figure 7-6. Visibility Animation Page

4. In the Tag Name text box, type the name of the tag to which you want to link the animation.

5. To change the shape's visibility, click Add to add the animation to the list box.

To make the shape blink, select the Blink option, and then click Add. The shape will blink every second.

6. Click OK or press ENTER to apply the animation.

Applying Spatial Animations

Spatial animations cause a shape, or group of shapes, to change location or orientation. When you apply more than one spatial animation of the same type to a shape or group of shapes, they are combined (except for fill percent animations).

For example, if you apply an animation that rotates a shape 5° and then apply another animation that rotates the same shape 10°, the shape will rotate 15°.

You cannot apply certain spatial animations to all shapes. Table 7-3 defines which spatial animations apply to which shapes.

Caution
Do not apply a spatial animation to a group that includes a shape to which the animation does not apply. If you do, that shape will behave unpredictably during run-time.

Table 7-3. Spatial Animations

Shape	Fill %	Sweep Angle	Position	Scale	Rotate
Line			x	x	x
Polyline			x	x	x
Square	x		x	x	x
Rectangle	x		x	x	x
Polygon	x		x	x	x
Circle	x		x	x	
Ellipse	x		x	x	
Pie	x	x	x	x	
Arc		x	x	x	
Text/Data Display			x		x
Touch zone					

Shape	Fill %	Sweep Angle	Position	Scale	Rotate
Data entry					
Bitmap			x		x

Fill Percent

If you apply a fill percent animation to a shape, during run-time the shape will fill incrementally from the minimum fill percentage when the attached tag is less than or equal to the minimum data point value. It will continue to fill until it reaches the maximum fill percentage when the attached tag is greater than or equal to the maximum data point value.

Fill Percent animations do not combine. Instead, when you apply more than one fill percent animation to a shape, the last animation in the list will be applied to the shape; all others will be ignored.

To animate a shape's fill percent...

1. Select the shape or group of shapes whose fill percent you want to animate.

2. Select the Animations command on the Edit menu or the Animations button to open the Shape Animations form.

3. Select the Fill Percent tab to access the Fill Percent animation page, as shown in Figure 7-7.

7-12
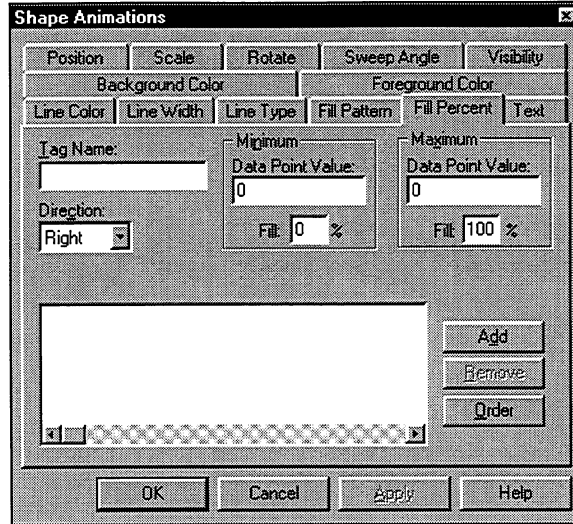
Figure 7-7. Fill Percent Animation Page

4. Type the name of the tag to which you want to link the animation in the Tag Name text box.

5. In the Direction drop-down list box, choose the direction in which you want to the shape to fill: Right, Left, Up, or Down. The default is Right.

6. Type a minimum data point value in the Minimum Data Point Value text box.

7. Specify a percentage from 0 to 100 in the Minimum Fill text box. This sets the percentage of the shape that will be filled when the attached tag is less than or equal to the minimum data point value.

    A fill percent applied to a pie may behave differently than you expect. This is because a fill percent animation applied to a pie is based on the size of the bounding rectangle, not the size of the pie.

    Figure 7-8 illustrates this. It shows how a fill percent of 60% is applied to two different pies that have the same size bounding rectangle.

7-13

100%

60%

0%
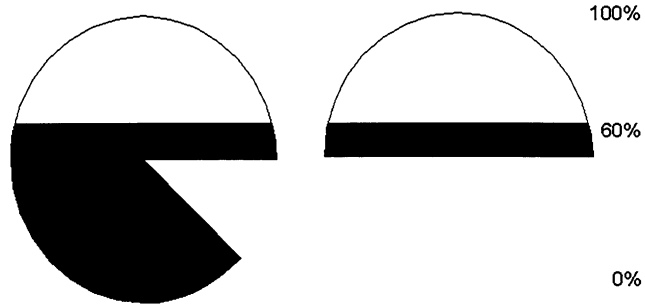
Figure 7-8. Fill Percent Example

8. Type a maximum value in the Maximum Data Point Value text box.

9. Specify a percentage from 0 to 100 in the Maximum Fill text box. This sets the percentage of the shape that will be filled when the attached tag is greater than or equal to the maximum data point value.

   For example, if you set this value to 75%, 75% of the shape will be filled when the attached tag is greater than or equal to the maximum data point value.

10. Click Add to add the animation to the list box.

11. Click OK or press ENTER to apply the animation.

Sweep Angle

If you apply a sweep angle animation to a shape, during run-time, the shape will sweep incrementally from the minimum angle when the attached tag is less than or equal to the minimum data point value. It will continue to sweep until it reaches the maximum angle when the attached tag is greater than or equal to the maximum data point value.

To apply a sweep angle animation...

1. Select the shape or group of shapes to which you want to apply a sweep angle animation.

2. Choose the Animations command on the Edit menu to open the Shape Animations form.

3. Click on the Sweep Angle tab to access the Sweep Angle animation page, as shown in Figure 7-9.

7-14
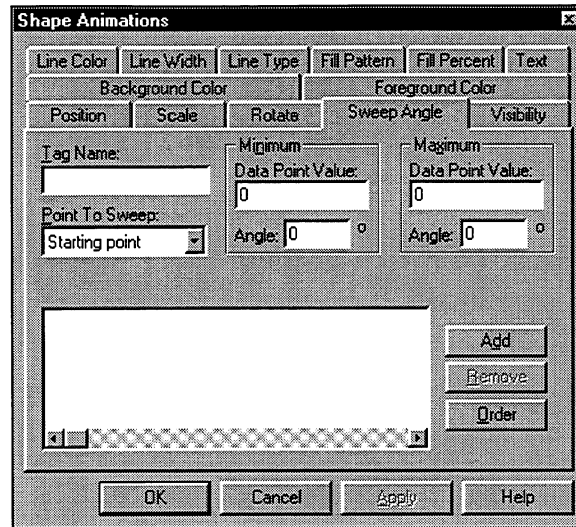
Figure 7-9. Sweep Angle Animation Page

4. Type the name of the tag to which you want to link the animation in the Tag Name text box.

5. In the Point to Sweep drop-down list box, choose Starting point or Ending point. This is the edge of the pie or arc that will change its angle.

   Starting point is the first edge set when drawing the arc or pie. Ending point is the last edge set.

6. Type the minimum data point value in the Minimum Data Point Value text box.

7. Specify a number from -32768 to +32767 in the Minimum Angle text box. This sets the offset from the shape's original angle–either from the starting or ending point (refer to Step 5)–at which the shape will sweep when the attached tag is less than or equal to the minimum data point value.

   For example, suppose you specify starting point as the point to sweep and -12° in the Minimum Angle text box. The shape will sweep -12° from its original starting point when the value of the attached tag is less than or equal to the minimum data point value.

8. Type the maximum data point value in the Maximum Data Point Value text box.

7-15

9. Specify a number from -32768 to +32767 in the Maximum Angle text box. This sets the offset from the shape's original angle–either from the starting or ending point (refer to Step 5)–at which the shape will sweep when the attached tag is greater than or equal to the maximum data point value.

   For example, suppose you specify starting point as the point to sweep and 250° in the Maximum Angle text box. The shape will sweep 250° from its original starting point when the attached tag is greater than or equal to the maximum data point value.

10. Click Add to add the animation to the list box.

11. Click OK or press ENTER to apply the animation.

Position

If you apply a position animation to a shape, during run-time the shape will move incrementally from the minimum X and Y offsets when the attached tag is less than or equal to the minimum data point value. It will continue to move across the screen until it reaches the maximum X and Y offsets when the attached tag is greater than or equal to the maximum data point value.

To change a shape's position...

1. Select the shape or group of shapes whose position you want to change.

2. Select the Animations command on the Edit menu or the Animations button to open the Shape Animations form.

3. Select the Position tab to access the Position animation page, as shown in Figure 7-10.

7-16

170
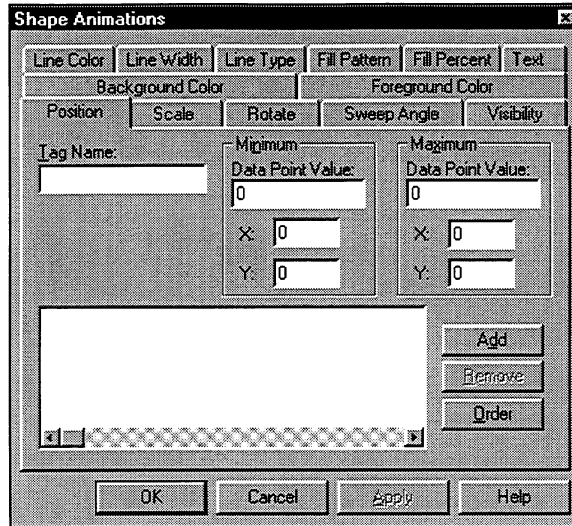
Figure 7-10. Position Animation Page

4. Type the name of the tag to which you want to link the animation in the Tag Name text box.

5. Type the minimum data point value in the Minimum Data Point Value text box.

6. Specify a number from -32768 to +32767 in the Minimum X and Y text boxes. This sets the offset from the shape's original location at which the shape will be when the attached tag is less than or equal to the minimum data point value.

   These numbers are relative, not absolute. For example, if the shape is originally drawn at X=114 and Y=168, and you specify -32 as the minimum X and Y, the shape will be located at X=82, Y=136 when the attached tag is less than or equal to the minimum data point value.

Technical Note

If you apply a position animation to a group of shapes, the offset applies to the X and Y coordinates of the group, not the individual shapes.

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7. Type the maximum data point value in the Maximum Data Point Value text box.

7-17

171

8. Specify a number from -32768 to +32767 in the Maximum X and Y text boxes. This sets the offset from the shape's original location at which the shape will be when the attached tag greater than or equal to the maximum data point value.

These numbers are relative, not absolute. For example, if the shape is originally drawn at X=114 and Y=168, and you specify 50 as the maximum X and Y, the shape will be located at X=164, Y=218 when the attached tag is greater than or equal to the maximum data point value.

Technical Note

If you apply a position animation to a group of shapes, the offset applies to the X and Y coordinates of the group, not the individual shapes.

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9. Click Add to add the animation to the list box.

10. Click OK or press ENTER to apply the animation.

Scale

If you apply a scale animation to a shape, during run-time the shape will scale incrementally from the minimum X and Y percentages when the attached tag is less than or equal to the minimum data point value. The shape will continue to scale until it reaches the maximum X and Y percentages when the attached tag is greater than or equal to the maximum data point value.

Technical Note

Although scale animations are combined when applied to the same shape, a shape will never scale greater than its original size. For example, if you scale a shape 50%, then scale it 75%, it will not scale to 125% of its original size. Instead, the shape will scale to 50% of its original size, and then it will scale to 75% of the 50% size.

To scale a shape...

1. Select the shape or group of shapes that you want to scale.

2. Select the Animations command on the Edit menu or the Animations button to open the Shape Animations form.

3. Select the Scale tab to access the Scale animation page, as shown in Figure 7-11.
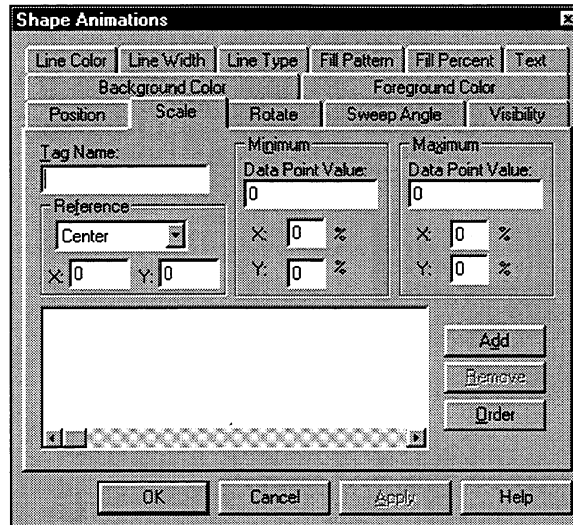
Figure 7-11. Scale Animation Page

4. Type the name of the tag to which you want to link the animation in the Tag Name text box.

5. In the Reference drop-down list box, choose the point around which you want the shape to grow and shrink: Top Left, Top Right, Center, Bottom Left, Bottom Right, or Custom (Center is the default).

   If you select Custom, you must also specify a number from -32768 to +32767 in the X and Y text boxes. This is an absolute point, around which the shape grows or shrinks.

Technical Note

If you apply a scale animation to a group of shapes, the reference point is in relation to the group, not the individual shapes.

Figure 7-12 provides an example of how a different reference point can affect the way a shape displays during run-time. In this example, the rectangles on the left indicate how they were drawn on the development

7-19

173

system. Both rectangles have the same scale settings: minimum X and Y are 0% and maximum X and Y are 50%. The only difference is the reference point. The top rectangle's reference is Top Right; the bottom rectangle's reference is Bottom Left. The rectangles on the right (with the thicker outline) indicate how the rectangles will look after the scale animation has reached 50% during run-time. The dotted lines around the left rectangles indicate the size and location of the original rectangles.
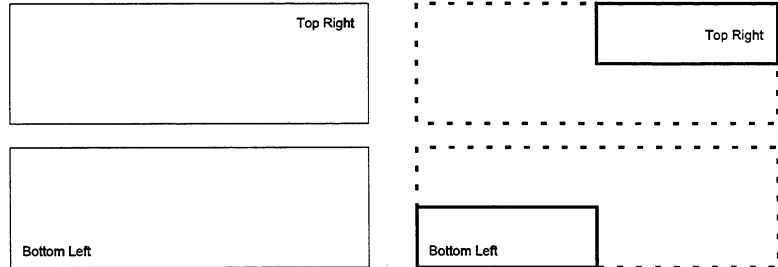
Figure 7-12. Scale Example with Different Reference Points

6. Type the minimum data point value in the Minimum Data Point Value text box.

7. Specify a percentage from 0 to 100 in the Minimum X and Y text boxes. This determines the shape's size, as a percentage of its original size, when the attached tag is less than or equal to the minimum data point value.

   For example, if you specify 10% as the minimum X and Y, the shape will be 10% of its original size when the attached tag is less than or equal to the minimum data point value.

8. Type the maximum data point value in the Maximum Data Point Value text box.

9. Specify a percentage from 0 to 100 in the Maximum X and Y text boxes. This determines the shape's size, as a percentage of its original size, when the attached tag is greater than or equal to the maximum data point value.

   For example, if you specify 75% for the maximum X and Y, the shape will be 75% of its original size when the attached tag is greater than or equal to the maximum data point value.

10. Click Add to add the animation to the list box.

11. Click OK or press ENTER to apply the animation.

7-20

174

Rotate

If you apply a Rotate animation to a shape, during run-time the shape will rotate incrementally from the minimum angle when the attached tag is equal to the minimum data point value until it reaches the maximum angle when the attached tag is equal to the maximum data point value. The tag will remain at the minimum angle if the data point value is less than the minimum, and it will remain at the maximum angle if the data point value is greater than the maximum.

Technical Note

When you apply a rotate animation to a bitmap, data display, or static text shape, it will only affect its position, not its orientation.

To rotate a shape...

1. Select the shape or group of shapes that you want to rotate.

2. Choose the Animations command on the Edit menu to open the Shape Animations form.

3. Click on the Rotate tab to access the Rotate animation page, as shown in Figure 7-13.
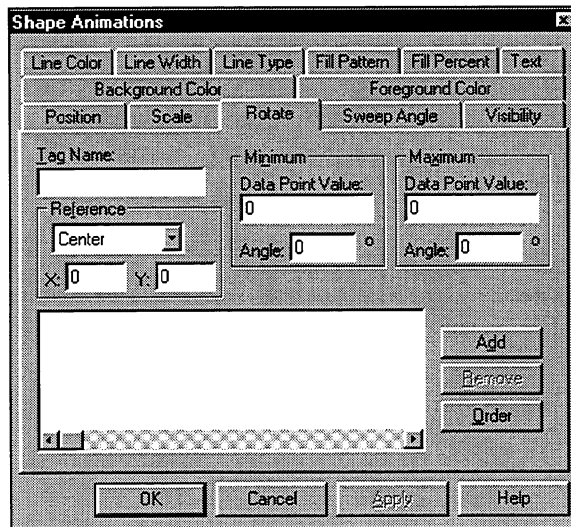
Figure 7-13. Rotate Animation Page

4. Type the name of the tag to which you want to link the animation in the Tag Name text box.

5. In the Reference drop-down list box, choose the point around which you want the shape to rotate: Top Left, Top Right, Center, Bottom Left, Bottom Right, or Custom (Center is the default).

    If you select Custom, you must also specify a number from -32768 to +32767 in the X and Y text boxes. This is an absolute point, around which the shape rotates.

Technical Note

If you apply a rotate animation to a group of shapes, the reference point is in relation to the group, not the individual shapes.

Figure 7-14 provides an example of how a different reference point can affect the way a shape displays during run-time. In this example, the rectangle with the thick border indicates how the rectangle was drawn on the development system. The rectangle is set to a 0° minimum angle and a 50° maximum angle. The gray rectangle indicates how the rectangle will look after the rotate animation has reached 50° when the reference is set to Top Left. The white rectangle indicates how the same rectangle will look when the reference is set to Center.
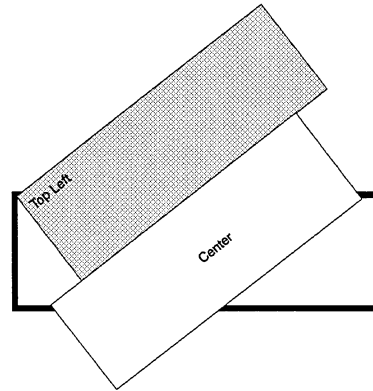
Figure 7-14. Rotate Example with Different Reference Points

6. Type the minimum data point value in the Minimum Data Point Value text box.

7. Specify a number from -32768 to +32767 in the Minimum Angle text box. This sets the offset from the shape's original angle at which the shape will rotate when the attached tag is less than or equal to the minimum data point value.

   For example, if you enter 10° in the Minimum Angle text box, the shape will rotate 10° in a counterclockwise direction from its original position when the attached tag is less than or equal to the minimum data point value.

Technical Note

Positive angles rotate counterclockwise. Negative angles rotate clockwise.

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8. Type the maximum data point value in the Maximum Data Point Value text box.

9. Specify a number from -32768 to +32767 in the Maximum Angle text box. This sets the offset from the shape's original angle at which the shape will rotate when the attached tag is greater than or equal to the maximum data point value.

   For example, if you enter 250° in the Maximum Angle text box, the shape will rotate 250° in a counterclockwise direction from its original position when the attached tag is greater than or equal to the maximum data point value.

10. Click Add to add the animation to the list box.

11. Click OK or press ENTER to apply the animation.

Technical Note

A shape's fill pattern will *not* rotate.

7-23

177

Ordering Animations

Every animation page has an Order button, which accesses the Animations Ordering dialog box, as shown in Figure 7-15.
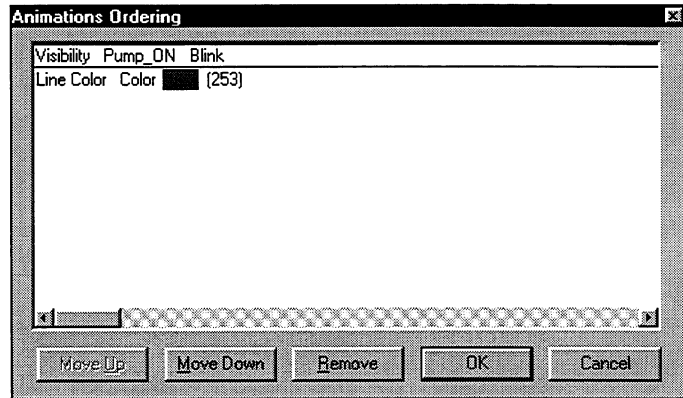
Figure 7-15. Animations Ordering Dialog Box

You can select multiple items in this dialog box. The Move Up button allows you to move selected animations up in the list; Move Down allows you to move them down; and Remove deletes selected animations.

Ordering Non-spatial Animations

If you apply more than one non-spatial animation of the same type to a shape, the last one that evaluates to true (non-zero) will occur. If you apply more than one non-spatial animation of different types to a shape, they will all occur when they evaluate to true (non-zero) because they are mutually exclusive. However, you might not always be able to "see" an animation.

For example, if you apply an animation that changes a shape's fill pattern to solid background (pattern 1)and you apply an animation to the same shape that animates the foreground color, you will not see the foreground color animation take place (although it does) because foreground color does not apply when the pattern is a solid background.

7-24

Ordering Spatial Animations

The order of spatial animations that can be combined (scale, position, and rotate) may have a pronounced effect on how a shape behaves during runtime. For example, a shape may behave one way if you apply a scale animation and then a position animation and it may behave another way if you apply a position animation and then a scale animation. It depends on the animation parameters that are set.

Technical Note

Because the rotate animation does not apply to all shapes, it is *always* applied to a shape after all scale and position animations are applied. However, rotate animations retain their order among themselves.

7-25

179

Chapter 8 – Using Symbols and Templates

Working with Symbols

Symbols allow you to create and save predefined shapes, along with their associated event/actions and animations, which can then be inserted in multiple applications. SoftScreen comes with symbol libraries–which include such things as push buttons, switches, and pilot lights.

Refer to Chapter 4 for examples of using symbols in an application.

Customizing the Symbol Palette

The Symbol Palette is a user-configurable toolbar that comes configured with predefined symbols. As you create symbols, you can add them to the Symbol Palette.

To add symbols to the Symbol Palette...

1. Select the Customize Symbol Palette command on the Options menu. The Customize Symbol Palette dialog box displays as shown in Figure 8-1.
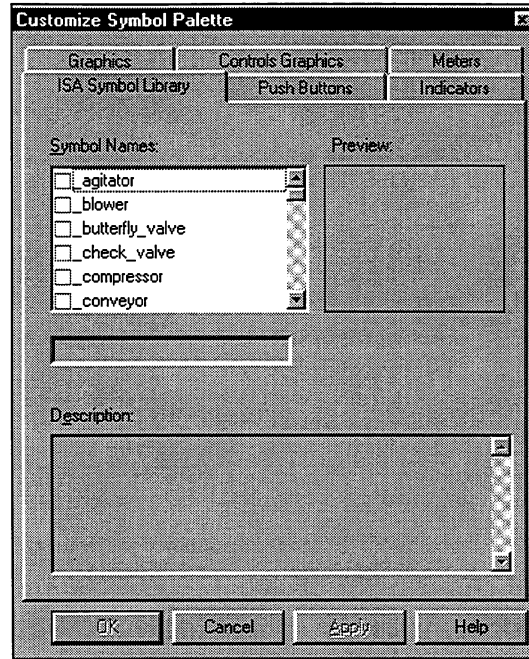
Figure 8-1. Customize Symbol Palette Dialog Box

2. Select a symbol group, click on the checkboxes of the symbols you want to add to the palette, and then click OK. The symbols are then added to the Symbol Palette, which you can open using the Symbol Palette command on the View menu.

Inserting Symbols

In your applications, you can insert graphic symbols and constant, string, and expression symbols that you create, as well as predefined symbols that come with *SoftScreen*.

To insert graphic symbols using the symbol palette...

1. Open the screen on which you want to insert a symbol.

2. Select the Symbol Palette command on the View menu to open the Symbol Palette, shown in Figure 8-2.

8-2
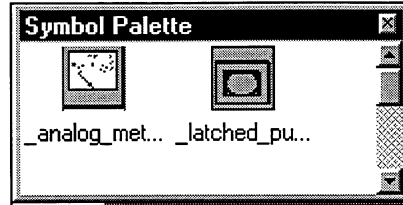
Figure 8-2. Symbol Palette Window

3. Click on the symbol, and, while holding down the left mouse button, drag it over the screen, then release the mouse button.

To insert graphic symbols...

1. Open the screen on which you want to insert a symbol.

2. Select the Insert Symbol command on the Symbol menu in the Graphic Editor or click on the Insert Symbol button. The Insert Symbol dialog box opens, as shown in Figure 8-3.
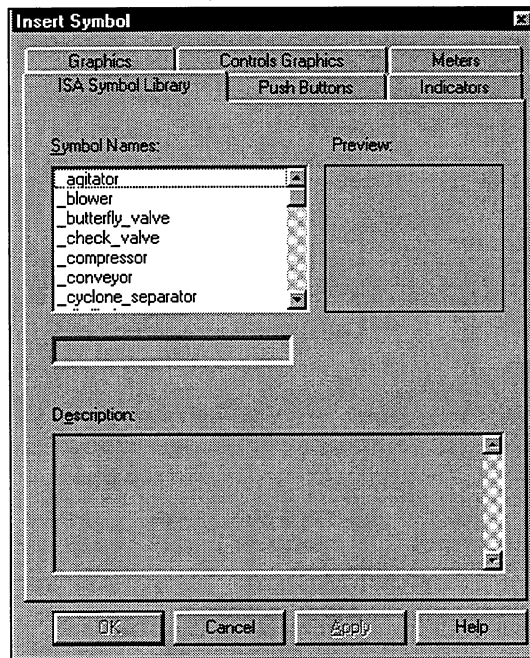
Figure 8-3. Insert Symbol Dialog Box

8-3

183

This dialog box will only display graphic symbols and graphic symbol groups.

The following are some guidelines you must follow when inserting a symbol.

- Data entry shapes and touch zones cannot be inserted on recipe or alarm screens.

- Data entry shapes cannot be inserted if a data entry with the same name already exists in the application.

- Data entry shapes cannot be inserted on the Master Template.

- Data points, including touch zones, cannot be inserted on a screen if a data point, or touch zone, with the same name, but a different value or different type, already exists in the application.

- Touch zones cannot be inserted in an application that is not configured for a target workstation with a touch screen.

- If a group of shapes contains a touch zone and a touch zone cannot be inserted on a screen (because the target engine isn't configured for a touch screen or a touch zone with the same name already exists in the application), the group of shapes will not be inserted.

3. Click on the tab of the group that contains the symbol you want to insert. A list of the symbols in the selected group appear in the Symbol Names list box.

4. Click on the name of the symbol you want to insert. A preview of the symbol appears in the Preview box. A description, if the symbol has one, appears in the Description text box.

Technical Note

Due to sizing constraints, some small symbol details may not be visible in the Preview box.

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5. To insert the symbol, click OK or press ENTER. The symbol is inserted in the same location in which it was it was created. If you try to insert a symbol that is not allowed to be inserted (see Step 2), you will receive a message that tells why the symbol was not inserted.

8-4

6. If the symbol references unresolved tags, the Resolve Tag Names dialog box opens, as shown in Figure 8-4. Unresolved tags are tags that reference a device data point. They are considered unresolved because device data points are not saved with the symbol.
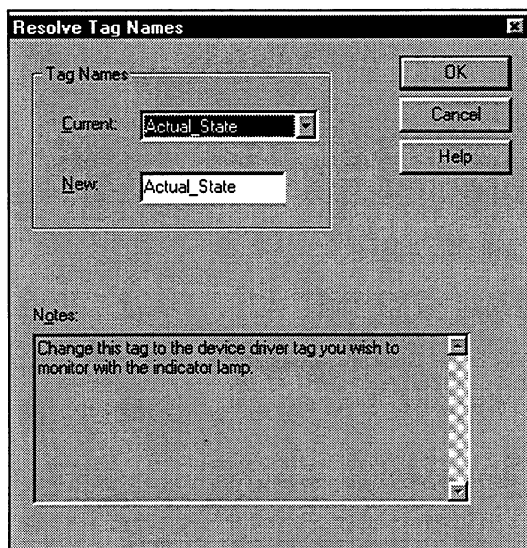
Figure 8-4. Resolve Tag Names Dialog Box

This dialog box allows you to rename unresolved tags assigned to a symbol. You must define a tag to duplicate what the tag attached to the symbol does, or rename the tag and tie it to the appropriate data points.

7. To rename a tag, select it from the Current drop-down list box, and then type a unique name in the New text box. If you need to rename a touch zone to avoid a conflict, select it from the Current drop-down list and type a unique touch zone name in the New text box.

8. After you have finished renaming tags, click OK or press ENTER to accept the new tag names.

9. If you insert a symbol that incorporates data points with the same name, of the same type (expressions, constants, strings, recipes, alarms, etc.), but different values than the ones currently defined in your application, the Data Point Conflict dialog box will display, as shown in Figure 8-5.

8-5
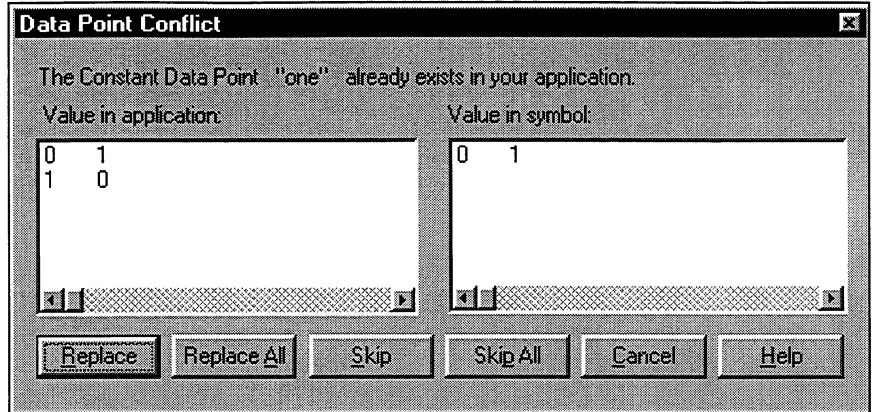
Figure 8-5. Data Point Conflict Dialog Box

This dialog box indicates the value of the data point in the application and in the symbol, and allows you to choose whether to replace or keep the existing value. Table 8-1 describes the choices in this dialog box.

Table 8-1. Data Point Conflict Dialog Box Options

Button	Description
Replace	Replaces the data point value in the application when it is in conflict with a data point value in the symbol. If there is more than one data point in conflict, data points will continue to appear in the dialog box after you press Replace until you've replaced, or skipped, them all.
Replace All	Replaces the data point values in the application when they are in conflict with data point values in the symbol. If you select this option, you will be unable to view all conflicting data points before you replace them.
Skip	Keeps the data point value in the application when it is in conflict with a data point value in the symbol. If there is more than one data point in conflict, data points will continue to appear in the dialog box after you press Skip until you've skipped, or replaced, them all.
Skip All	Keeps the data point values in the application when they are in conflict with data point values in the symbol. If you select this option, you will be unable to view all conflicting data points before you skip them.
Cancel	Cancels symbol insertion.

8-6

To insert constant, string, or expression symbols...

1. Open the constant, string, or expression data editor in which you want to insert a symbol.

2. Select the Insert Symbol command on the Symbol menu.

3. Click on the symbol you want to insert.

4. Click OK or press ENTER to insert the symbol.

Creating Symbols

You can create graphic symbols, as well as constant, string, and expression symbols.

To create a graphic symbol...

1. Create a shape or shapes in the graphic editor.

2. Apply the necessary properties and animations.

3. Select the shape(s).

4. Select the Create Symbol command from the Symbol menu or click on the Create Symbol button. The Create Symbol dialog box opens, as shown in Figure 8-6.
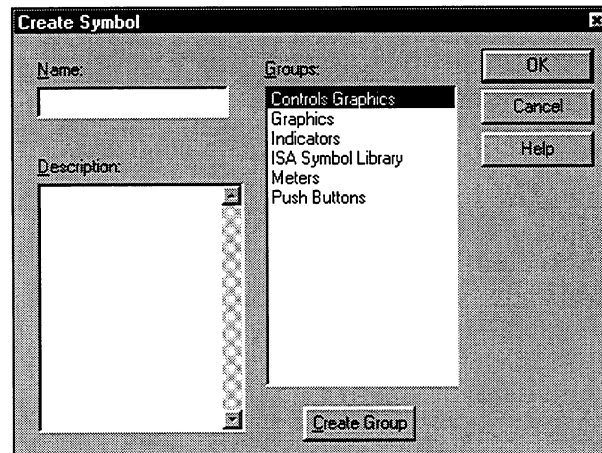
Figure 8-6. Create Symbol Dialog Box

8-7

187

5. Type a unique symbol name in the Name text box. This name is used to identify the symbol.

Caution

The names of symbols shipped with *SoftScreen* begin with an under-score. To avoid overwriting symbols, do not begin symbol or group names with an underscore.

---

6. In the Groups list box, select the name of the group in which you want to place the symbol.

   or

   If you want to create a new symbol group, click on the Create Group button, type the name of a new group in the Group Name text box, and then click OK.

7. Type a description of the symbol in the Description text box. Use this feature to describe the symbol's functions and purpose. A good descrip-tion should include what the symbol does, how it works, and where it can be used.

8. Click OK or press ENTER. If there are no unresolved tags associated with the symbol, it is added to the symbol library along with any associ-ated animations, properties, and event/actions.

   Unresolved tags are tags that reference a device data point. They are considered unresolved because device data points are not saved along with the symbol. Therefore, when you insert a symbol that includes tags that reference a device data point, you must define a tag to duplicate what the tag attached to the symbol does, or rename the tag and tie it to the appropriate data points.

9. If unresolved tags are associated with the symbol, the Set Tag Name Notes dialog box opens, as shown in Figure 8-7.

8-8
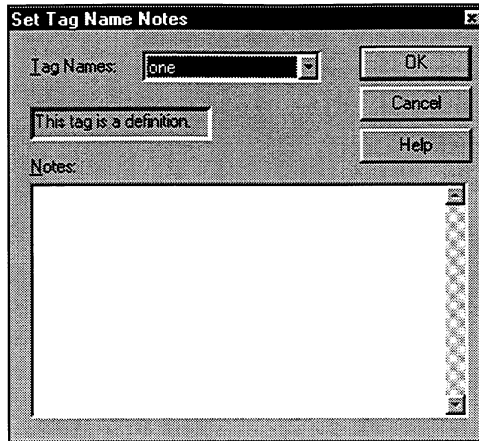
Figure 8-7. Set Tag Name Notes dialog box

This dialog box allows you to describe the tags assigned to a symbol. This is important because symbols are saved with tags, but device data points are not saved. When you insert a symbol that includes tags, the default tag is used (which is no longer attached to a data point). The description, if filled out properly, allows you to remember what the tag controls in the symbol.

So you must configure data points in your application to duplicate the actions of the tags assigned to the symbol, or you must rename the tags and ensure they reference the appropriate data points in the application in which the symbol is inserted.

10. Click OK or press ENTER to save changes to the tags and add the symbol to the symbol library. All associated animations, properties, and event/actions are saved along with the symbol.

To create a constant, string, or expression symbol...

1. Open the constant, string, or expression data editor.

2. Select the constants, strings, or expressions you want to save as a symbol. You can select as many as you like.

3. Select the Create Symbol command on the Symbol menu or click the Create Symbol button. The Create Symbol menu opens, as shown in Figure 8-8.

8-9

189
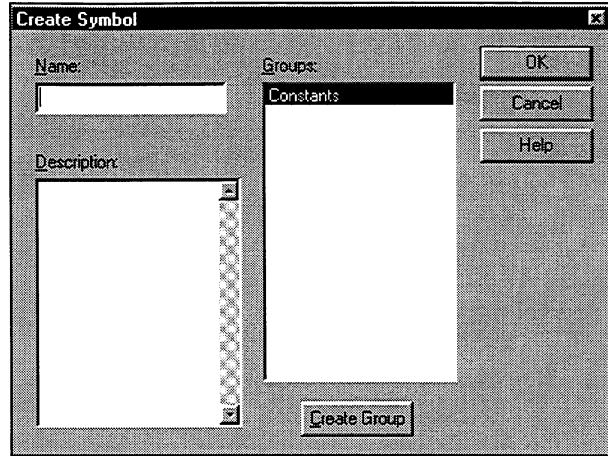
Figure 8-8. Create Symbol Dialog Box for Constants

Only those groups containing the same type of symbols will appear in the Groups box. For example, if you are creating a constant symbol, only constant symbol groups will appear in the Create Symbol dialog box. Any graphic, string, or expression symbol groups you have created will not be visible.

4. Type a unique symbol name in the Name text box. This name is used to identify the symbol.

Caution

The names of symbols shipped with *SoftScreen* begin with an under-score. To avoid overwriting symbols, do not begin symbol or group names with an underscore.

---

5. In the Groups list box, select the name of the group in which you want to place the symbol.

    or

    If you want to create a new symbol group, click on the Create Group button, type the name of a new group in the Group Name text box, and then click OK.

8-10

190

6. Type a description of the symbol in the Description text box. Use this feature to describe the symbol's functions and purpose. A good description should include what the symbol does, how it works, and where it can be used.

7. Click OK or press ENTER. The Set Tag Name Notes dialog box displays, as shown in Figure 8-9.
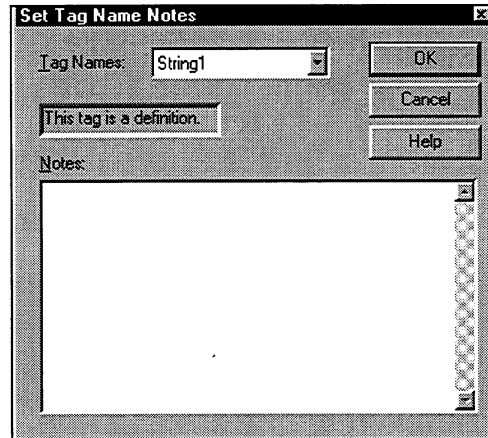
Figure 8-9. Set Tag Name Notes Dialog Box

8. Use this dialog box to provide a description of the tag name attached to the symbol.

9. Click OK to save the symbol along with the tag name description.

To change properties of a shape within a symbol...

1. Ungroup the symbol and select the shape whose properties you want to change.

2. Make the changes and then regroup after your are finished.

Deleting Symbols and Symbol Groups

SoftScreen allows you to delete symbols and symbol groups.

8-11

191

Caution

If you delete a symbol, you cannot use the Undo command to retrieve it.

To delete a symbol...

1. Select the Delete Symbols command on the Symbol menu in the Graphic Editor or click on the Delete Symbols button. The Delete Symbol dialog box opens, as shown in Figure 8-10.
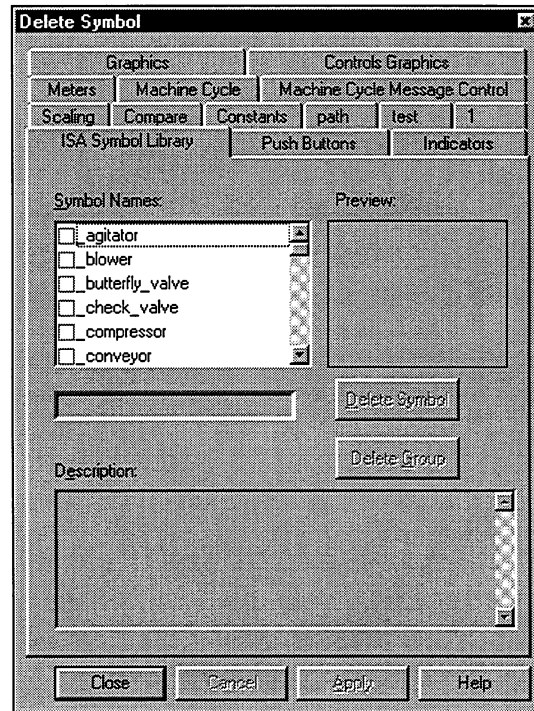
Figure 8-10. Delete Symbol Dialog Box

2. Click on the tab that identifies the symbol group in which the symbols you want to delete are saved.

3. In the Symbol Names list box, click in the checkbox of the symbols you want to delete.

8-12

4. Click the Delete Symbol button. A message box displays, asking if you still want to delete the symbols. Click Yes if you want to delete the symbol(s), No if you do not. (Deleting symbols cannot be undone.)

5. If you want to delete other symbols, select the symbol group and repeat steps 3 through 5.

6. Click Close when you finish deleting symbols.

To delete a symbol group...

1. Select the Delete Symbols command on the Symbol menu in the Graphic Editor or click on the Delete Symbols button. The Delete Symbol dialog box opens, as shown in Figure 8-11.
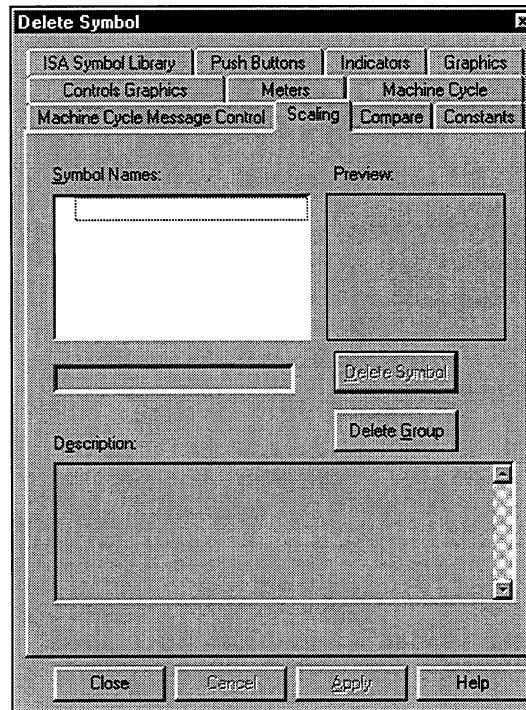
Figure 8-11. Delete Symbol Dialog Box

2. Click on the tab that identifies the symbol group that you want to delete. You must delete all symbols in the symbol group before you can delete the group. Refer to the previous section for information on how to delete symbols.

8-13

3. Once you have deleted all symbols in the group, click the Delete Group button to delete the symbol group. When you delete a symbol group, the tab is removed from the dialog box.

Technical Note

If you delete the last group, the dialog box automatically closes.

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4. Repeat steps 2 and 3 to delete additional symbol groups.

5. Click Close when you have finished deleting symbol groups.

Working with Templates

Templates allow you to create and save predefined screens, alarms, recipes, strings, expressions, and constants, which can then be inserted in other applications. SoftScreen comes with default templates for screens, alarms, and recipes.

Refer to Chapter 4 for examples of using templates in an application.

Creating New Screen, Recipe, and Alarm Templates

In this section, templates refer to a screen, recipe or alarm object. From the Application Navigator you can create new templates for screens, recipes or alarms by using the default template. This is a convenient way to create a starting point for a new screen, recipe or alarm.

1. From the Application Navigator, select Screens, Recipes or Alarms from either the Graphic or Data drop-down list box.

2. Type a new name in either the Graphic or Data text box and press ENTER.

3. Select the Create Template command from the Symbol menu. The Create Template dialog box opens, as shown in Figure 8-12.

8-14
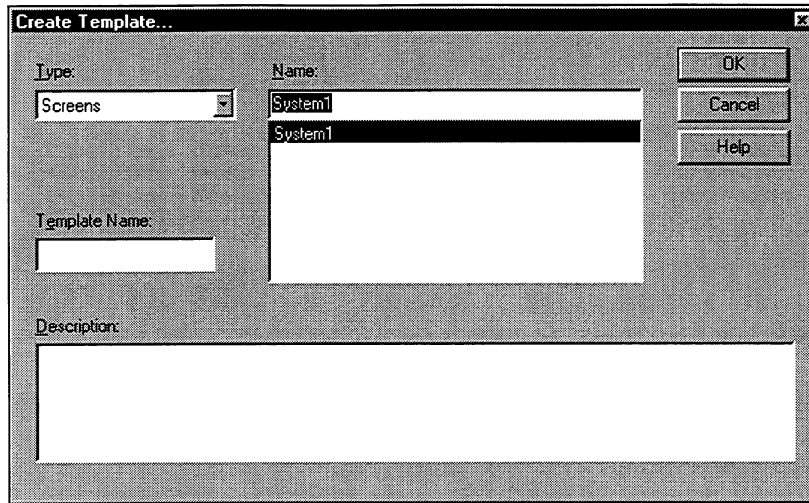
Figure 8-12. Create Template From Dialog Box

6. Click on the Name you want to create as a template (so it appears in the Name text box).

7. Type a unique name in the Template Name text box.

8. Type a description of the template in the Description text box. Use this feature to describe what the screen looks like.

9. Click OK or press ENTER to save the template.

Creating New Objects from Templates

You can create a new object from any existing template.

To create an object from the Graphic Editor tool...

1. Select the Graphic Editor command on the Tools menu or the Graphic Editor button on the Application Toolbar. The Select Graphic dialog box opens, as shown in Figure 8-13.

8-15
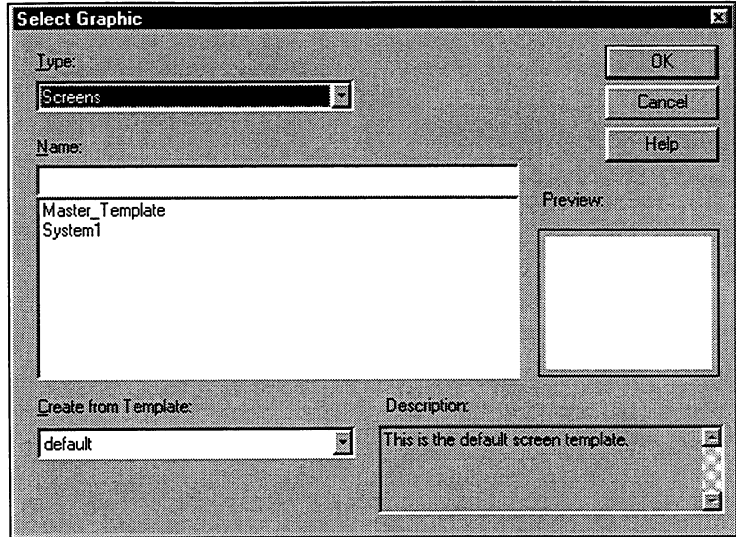
Figure 8-13. Select Graphic Dialog Box

2. Type a unique name in the Name text box. using up to 32 alphanumeric characters, as well as underscores and colons. The name *must* begin with a letter or a colon.

3. You may select an existing template from the Create from Template drop-down list box to create a new object or

   Select None from the Create from Template drop-down list box to create a new object without using any template.

Deleting Templates

Technical Note

If you delete a symbol, you cannot use the Undo command to retrieve it.

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1. Select the Delete Template command from the Symbols menu. The Delete Template dialog box opens, as shown in Figure 8-14.
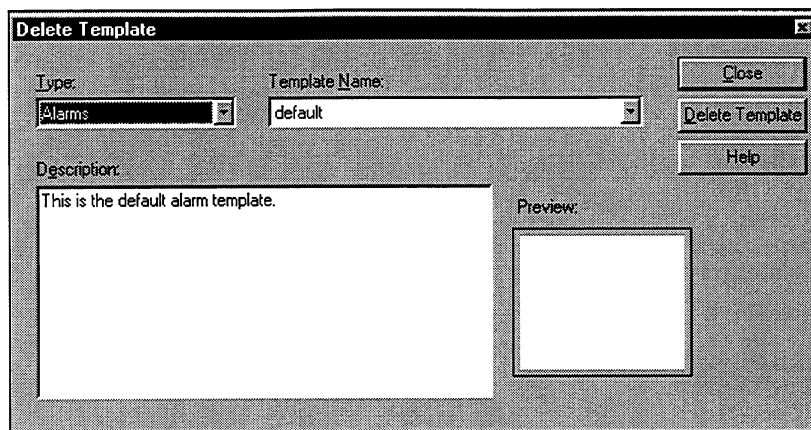
Figure 8-14. Delete Template Dialog Box

2. Choose the template you want to delete from the Template Name list box.

3. Click the Delete Template button. A message box displays asking if you still want to delete the template. Click Yes if you want to delete the template, No if you do not. (Deleting templates cannot be undone.)

SoftScreen Symbol Libraries

This section defines the symbols provided with *SoftScreen*. These symbols can be inserted on any screen, recipe, or alarm, unless noted otherwise.

Symbol libraries provide over 150 ready-to-use objects. They are grouped by function and can be inserted onto a Graphic Editor screen. When inserted, many of the symbols can be dynamically linked to real-time data. SoftScreen will prompt you for the tag name you wish to use when the symbol is inserted.

8-17
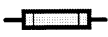
```
                         Technical Note

   In previous SoftScreen versions, the Selectors group included 3D sym-
   bols. Because these symbols were determined to be too memory inten-
   sive, the symbols and group were removed.
```

Control Graphics Group

Table 8-2. Control Graphic Symbols
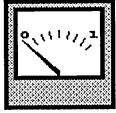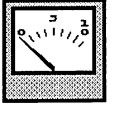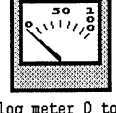
Control Graphics Symbol	Description
_and_logic_gate	Symbol for an AND logic function
_coil	.Electrical symbol for a coil
_contact_NC_horz	Electrical symbol for a normally closed contact with the connections at the sides
_contact_NC_vert	Electrical symbol for a normally closed contact with the connections on the top and bottom
_contact_NO_vert	Electrical symbol for a normally open contact with the connections at the top and bottom
_flow_switch	Electrical symbol for a flow switch
_foot_switch	Electrical symbol for a foot switch

8-18

Control Graphics Symbol	Description
—▭— _fuse	Electrical symbol for a fuse
⏚ _ground	Electrical symbol for a ground connection
_limit_switch_NC	Electrical symbol for a normally closed limit switch
_limit_switch_NO	Electrical symbol for a normally open limit switch
_liquid_level_switch	Electrical symbol for a liquid level switch
_momentary_mush_hd_NC_PB	Electrical symbol for a normally closed momentary contact mushroom head push button
_momentary_mush_hd_NO_PB	Electrical symbol for a normally open momentary contact mushroom head push button
_momentary_NC_PB	Electrical symbol for a normally closed momentary contact single circuit push button
_momentary_NO_PB	Electrical symbol for a normally open momentary contact single pole push button
_or_logic_gate	Symbol for an OR logic gate
_pilot_light	Electrical symbol for a pilot light

8-19

199

Control Graphics Symbol	Description
_pilot_light_push_to_test	Electrical symbol for a push to test pilot light
_single_break_switch	Electrical symbol for a single pole break switch
_temperature_actuated_switch	Electrical symbol for a temperature actuated switch
_thermal_overload_heater	Electrical symbol for a thermal overload heater
_time_switch_de-energized	Electrical symbol for a de-energized timer switch
_time_switch_energized	Electrical symbol for an energized timer switch
_two_position_contact_sw	Electrical symbol for a two-position contact switch
_vacuum_switch	Electrical symbol for a vacuum switch

8-20

Meters Group

Table 8-3. Meter Symbols

Meter Symbol	Description
_analog_meter_0_to_1	This analog meter symbol has a scale from 0 to 1. To use this symbol, insert it on a graphic screen. Rename the Needle_value tag to the device driver tag you wish to monitor.
_analog_meter_0_to_10	This analog meter symbol has a scale from 0 to 10. To use this symbol, insert it on a graphic screen. Rename the Needle_value tag to the device driver tag you wish to monitor.
_analog_meter_0_to_100	This analog meter symbol has a scale from 0 to 100. To use this symbol, insert it on a graphic screen. Rename the Needle_value tag to the device driver tag you wish to monitor.

Graphics Group
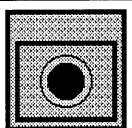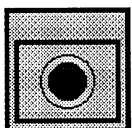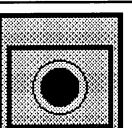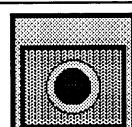
Table 8-4. Graphic Symbols

Graphic Symbol	Description
_alarm_circle_in	This symbol displays when the associated value goes into alarm. To use this symbol, insert it on an alarm screen. Then configure alarm settings in the data editor.
_alarm_circle_in_and_out	This symbol displays when the associated value goes into and out of alarm. To use this symbol, insert it on an alarm screen. Then configure alarm settings in the data editor.
_alarm_circle_out	This symbol displays when the associated value goes out of alarm. To use this symbol, insert it on an alarm screen. Then configure alarm settings in the data editor.
_recipe_failed	This symbol displays when the associated recipe has failed. To use this symbol, insert it on a recipe screen. Then configure recipe settings in the data editor.

8-21

201
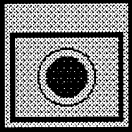
Graphic Symbol	Description
_recipe_posted	This symbol displays when the associated recipe has been posted. To use this symbol, insert it on a recipe screen. Then configure recipe settings in the data editor.

Indicators Group

Table 8-5. Indicator symbols

Indicator Symbol	Description
_pilot_light_blue	This blue pilot light changes color shading and intensity when its tag is 1 or greater, or true. To use this symbol, insert it on a graphic screen. Rename the On_State tag to the device driver tag you wish to monitor. Using the data editor, you can add a keypad or touch zone event/action to the screen to assign a new value to the device driver tag.
_pilot_light_green	This green pilot light changes color shading and intensity when its tag is 1 or greater, or true. To use this symbol, insert it on a graphic screen. Rename the On_State tag to the device driver tag you wish to monitor. Using the data editor, you can add a keypad or touch zone event/action to the screen to assign a new value to the device driver tag.
_pilot_light_red	This red pilot light changes color shading and intensity when its tag is 1 or greater, or true. To use this symbol, insert it on a graphic screen. Rename the On_State tag to the device driver tag you wish to monitor. Using the data editor, you can add a keypad or touch zone event/action to the screen to assign a new value to the device driver tag.
_pilot_light_red_green	This normally red pilot light changes to green when its tag is 1 or greater, or true. To use this symbol, insert it on a graphic screen. Re-name the On_State tag to the device driver tag you wish to monitor. Using the data editor, you can add a keypad or touch zone event/action to the screen to assign a new value to the device driver tag.

8-22

202
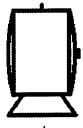
Indicator Symbol	Description
_pilot_light_yellow	This yellow pilot light changes color shading and intensity when its tag is 1 or greater, or true. To use this symbol, insert it on a graphic screen. Rename the On_State tag to the device driver tag you wish to monitor. Using the data editor, you can add a keypad or touch zone event/action to the screen to assign a new value to the device driver tag.

ISA Symbol Library Group

Table 8-6. ISA symbols

ISA Symbol	Description
_agitator	An agitator
_blower	A blower
_butterfly_valve	A butterfly valve
_check_valve	A check valve
_compressor	A compressor
_conveyor	A conveyor

8-23

ISA Symbol	Description
_cyclone_separator	A cyclone separator
_distillation_tower	A distillation tower
_down_arrow	A downward-pointing arrow
_heat_exchanger	A heat exchanger
_heat_furnace	A heat furnace
_horz_valve_w_actuator	A horizontal valve with an actuator
_horz_valve_w_manual_actuator	A horizontal valve with a manual actuator
_horz_valve_w_throttling_actuator	A horizontal valve with a throttling actuator
_inline_mixer	An inline mixer

8-24

ISA Symbol	Description
◀ _left_arrow	A left-pointing arrow
_liquid_filter	A liquid filter
_motor	A motor
_pressure_storage_vessel	A pressure storage vessel
_pump	A pump
_reactor	A reactor
_relief_valve	A relief valve
▶ _right_arrow	A right-pointing arrow
_rotary_feeder	A rotary feeder

8-25

ISA Symbol	Description
_rotary_kiln	A rotary kiln
_screw_conveyor	A screw conveyor
_storage_bin	A storage bin
_transformer	A transformer
_turbine	A turbine
_up_arrow	An upward-pointing arrow
_vacuum	A vacuum
_vert_valve_w_actuator	A vertical valve with an actuator

8-26

206

ISA Symbol	Description
_vert_valve_w_manual_actuator	A vertical valve with a manual actuator
_vert_valve_w_throttling_actuator	A vertical valve with a throttling actuator
_vessel	A vessel
_weight_hopper	A weight hopper

Push Buttons Group

The push button symbols are available only if you have selected a target with a touch screen.

Table 8-7. Push Button Symbols

Push button Symbol	Description
_latched_pbtn_rnd_w_ind	This push button with a round actuator is latched "on" with a touch press, verified with an indicator lamp, and released with a separate tag. To use this symbol, insert it on a graphic screen. Rename the On_State tag to the device driver tag you wish to control. Rename the Actual_State tag to the device driver tag you wish to monitor with the indicator lamp. Rename the Release_Bit tag to the device driver tag you will use to unlatch the button. Add keypad controls by adding key press event/actions for these tags in the data editor for the screen.

8-27

Push button Symbol	Description
_latched_pushbutton_square	This latched push button with a square button is latched "on" with a touch press and released with a separate tag. To use this symbol, insert it on a graphic screen. Rename the On_State tag to the device driver tag you wish to control. Rename the Release_Bit tag to the device driver tag you will use to unlatch the button. Add keypad controls by adding key press event/actions for these tags in the data editor for the screen.
_maintained_pushbutton_square	A single touch press will push "in" the square button on this maintained push button. A second touch press will release it. To use this symbol, insert it on a graphic screen. Rename the On_State tag to the device driver tag you wish to control. Add keypad control by entering a key press event/action for each TZ1 event/action in the data editor for the screen.
_momentary_pushbutton_square	This momentary push button with a square button is selected and released with a single touch press and release. To use this symbol, insert it on a graphic screen. Rename the On_State tag to the device driver tag you wish to control. Add keypad control by entering key press and key release event/actions for each TZ1 touch press and touch release event/action in the data editor for the screen.

Constants Group

The following symbols can be inserted on the Constants form.

The _true_false symbol contains constants for true and false, as shown in Figure 8-15.

8-28

208
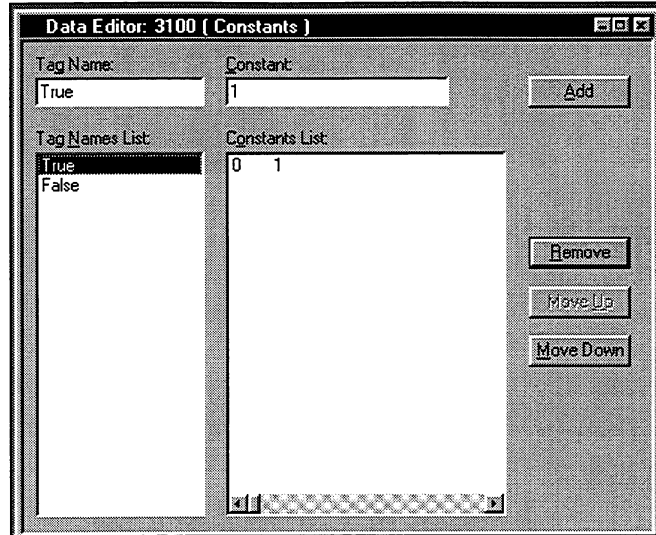
Figure 8-15. _true_false Constants Symbol

The _zero_ten symbol contains constants zero through ten, as shown in Figure 8-16.
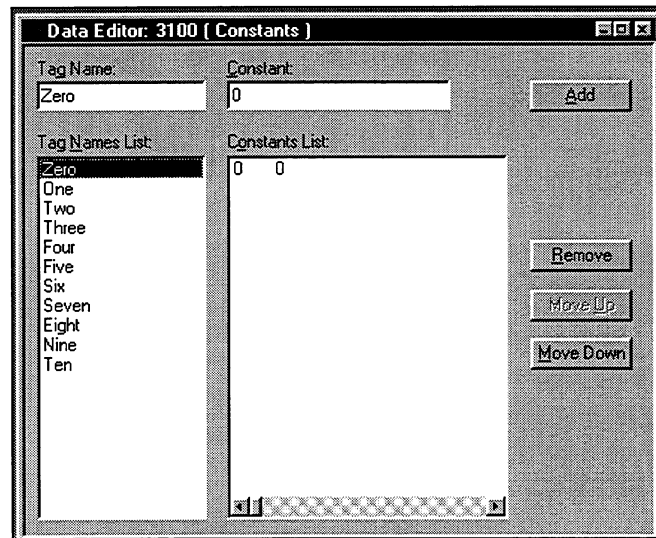
Figure 8-16. _zero_ten Constants Symbol

8-29

209

Machine Cycle Group

This group includes the _machine_cycle_message string, which provides messages used for a machine control cycle that can be inserted on the Strings form.
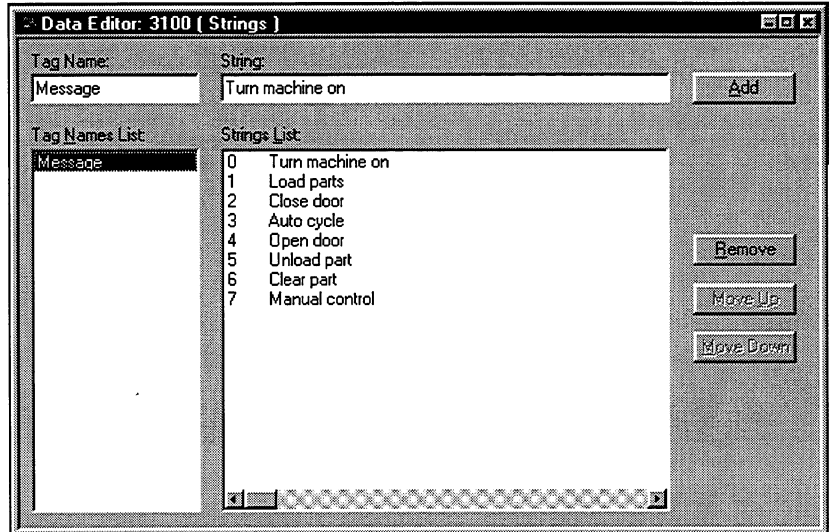
Figure 8-17. _machine_cycle_message String Inserted on the Strings Form

Expression Groups

The following symbol groups include symbols that can be inserted on the Expressions form.

Machine Cycle Message Control Group

This group contains the _message_control expressions, which retrieves messages from the machine cycle message symbol.

8-30

210
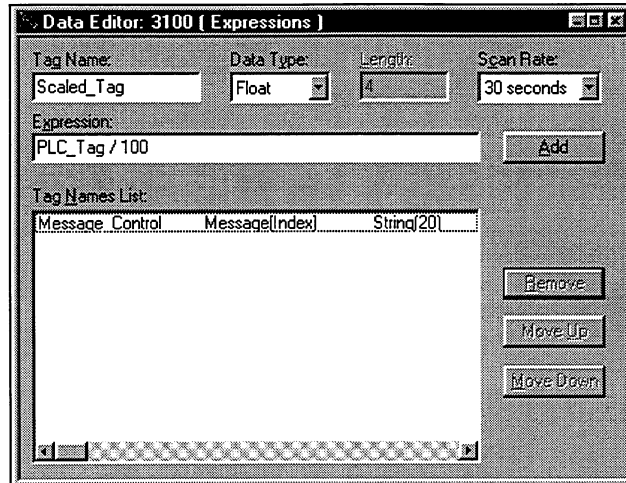
Figure 8-18. _message_control Expression Inserted on the Expressions Form

Scaling Group

This group contains the _scale_by_100 expression, which scales a datapoint by dividing it by 100.
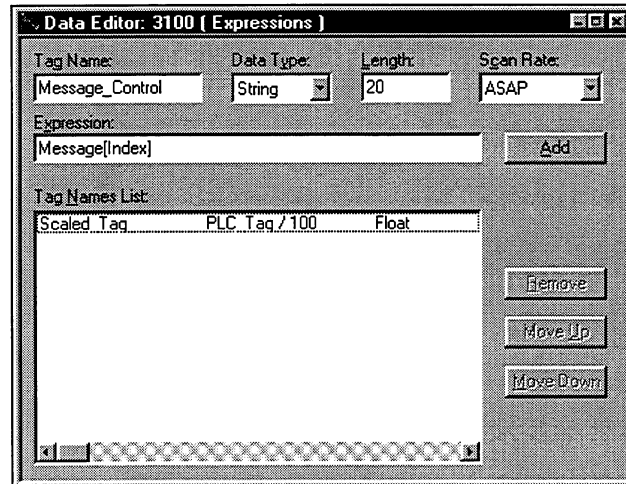
Figure 8-19. _scale_by_100 Expression Inserted on the Expressions Form

8-31

Compare Group

This group includes the _is_greater_than_100 expression, which checks for a datapoint value to be greater than 100.
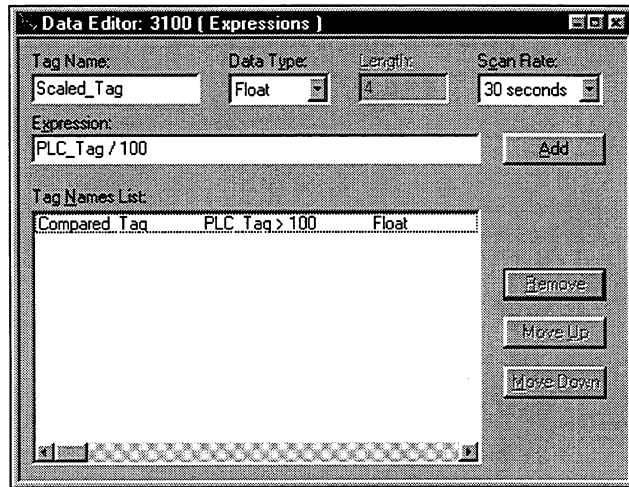
Figure 8-20. _is_greater_than_100 Expression Inserted on Expressions Form

Chapter 9 – Configuring Recipes

This chapter describes how to configure recipes. Recipes are a list of assignments from one tag to another. Recipes are loaded (read and then sent to the PLC) through an event/action. Because recipes provide a way to change many PLC values at one time, special error detection is provided. Part of each recipe configuration includes parameters for when the recipe has been posted successfully and when there is a failure. These parameters include shapes to display and posted/failed assignments.

Recipes consist of a data element (recipe settings) and an optional graphical element (recipe shapes). Recipe settings are specified in the Data Editor. Recipe shapes are configured in the Graphic Editor.

Technical Note

When a recipe is loaded, the run-time engine places it in an internal queue. When the current recipe has completed, the next recipe in the queue is loaded.

The queue holds up to 100 recipes. If a recipe is requested when the queue is full, it will not be queued. When this occurs, the following alarm message is displayed on screen and logged in the alarm summary:

```
"Recipe Queue Exceeded"
```

Creating a New Recipe

You can create new recipes by selecting the Data Editor command on the Tools menu or using the Application Navigator form, shown in Figure 9-1.

9-1
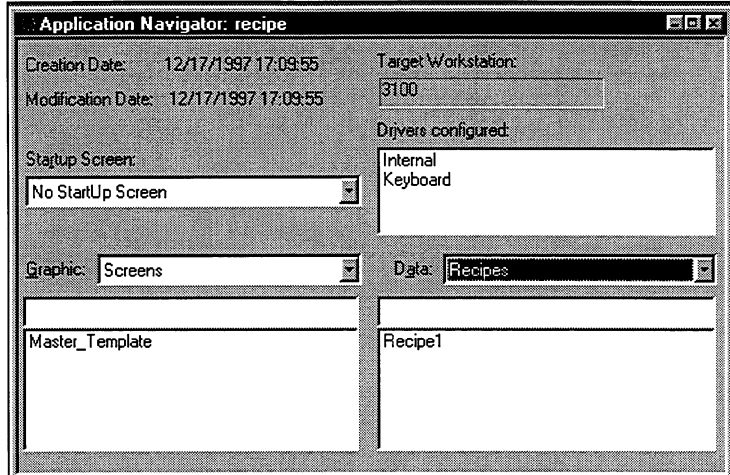
Figure 9-1. Application Navigator Form

To create a new recipe from the Application Navigator form...

1. Select Recipes from the Data drop-down list box.

2. Type a unique recipe name in the Data text box. See Chapter 3 for information on creating tag names.

   If you have created a default screen template, this screen will incorporate all elements of that template.

3. Press ENTER. The Recipe Editor form opens, with the name of the new recipe in its title bar.

To create a new recipe using the Data Editor command...

1. Select the Data Editor command on the Tools menu or the Data Editor button. The Select Data Form dialog box opens, as shown in Figure 9-2.

9-2
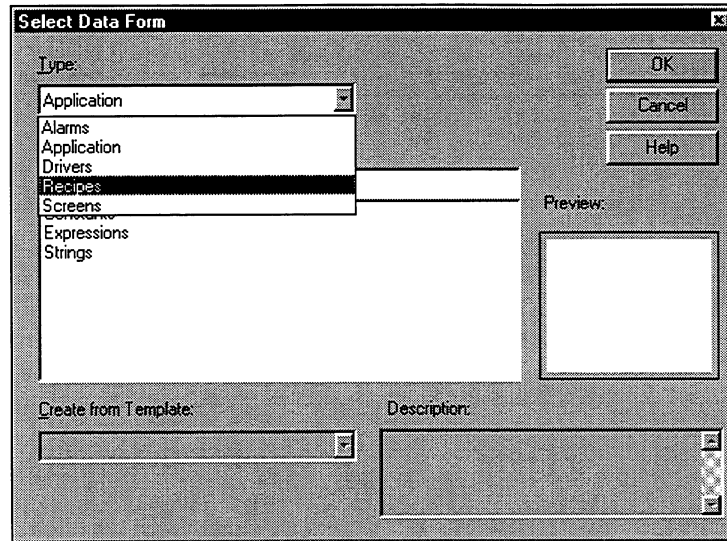
Figure 9-2. Select Data Form Dialog Box

2. Select Recipes from the Type drop-down list box.

3. Type a unique recipe name in the Name text box. See Chapter 3 for information on creating tag names.

4. If you want to create this recipe based on an existing screen template, select the template from the Create from Template drop-down list. Refer to Chapter 8 for more information on templates. The Preview window displays the elements on the selected template, and the Description box provides a description of the template, if there is one.

5. Press ENTER to open the Recipe Editor form, shown in Figure 9-3.

9-3
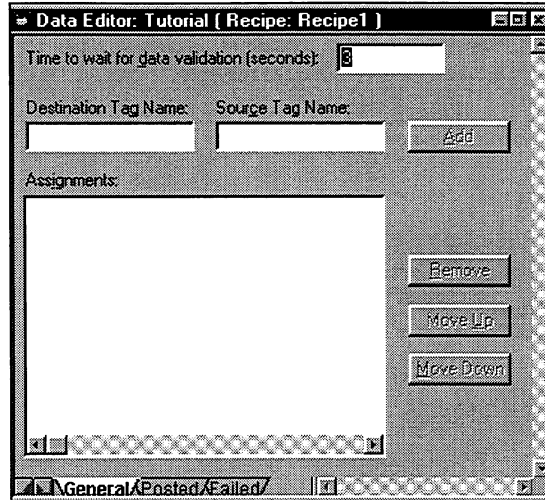
Figure 9-3. Recipe Editor Form

6. Specify the amount of time, from 0 to 4294967 seconds, to wait for data validation. The default is 3.

7. Type a name in the Destination Tag Name text box. The value of the source tag will be assigned to this tag.

8. Type a name in the Source Tag Name text box. The value of this tag will be assigned to the Destination tag.

9. Click Add to add the assignment to the Assignments list box.

You have now specified a recipe. If you want to configure posted and failed assignments, you must configure these on the associated pages.

Posted and failed assignments are based on the status of the recipe. If the recipe is posted, the posted assignment is loaded. If the recipe fails, the failed assignment is loaded.

9-4

216

Technical Note
When a recipe has been successfully posted it means that the run-time engine has ensured that the addresses read from/written to contain valid values. It then "posts" the recipe. When a recipe is successfully posted it does not mean that the values were written from the recipe source to the recipe destination. When a recipe fails, it means that the run-time engine was unable to validate the values at the addresses being read from/written to, so the recipe is not "posted."

To specify a posted assignment...

1. Select the Posted tab on the bottom of the Recipe Editor form to access the Posted Assignment page, as shown in Figure 9-4.
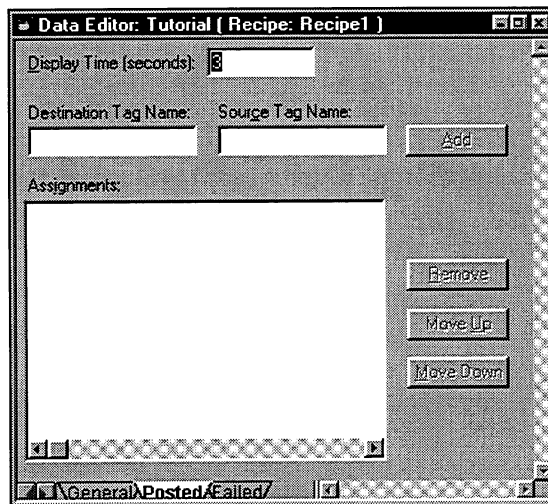
Figure 9-4. Posted Assignment Page

2. Specify a display time. The range is 0 to 4294967 seconds (the default is 3). This is the amount of time the associated recipe shape will display on the target workstation during run-time when the recipe is posted. If no recipe shape is created, this value has no meaning during run-time.

3. Type a name in the Destination Tag Name text box. The source tag value will be assigned to the Destination tag if the recipe is posted.

4. Type a name in the Source Tag Name text box. The value of this tag will be assigned to the Destination tag if the recipe is posted.

9-5

217

5.   Click Add to add the assignment to the Assignments list box.

These assignments will occur if the recipe is posted.

To specify a failed assignment...

1.   Select the Failed tab on the bottom of the Recipe Editor form to access the Failed Assignment page, as shown in Figure 9-5.
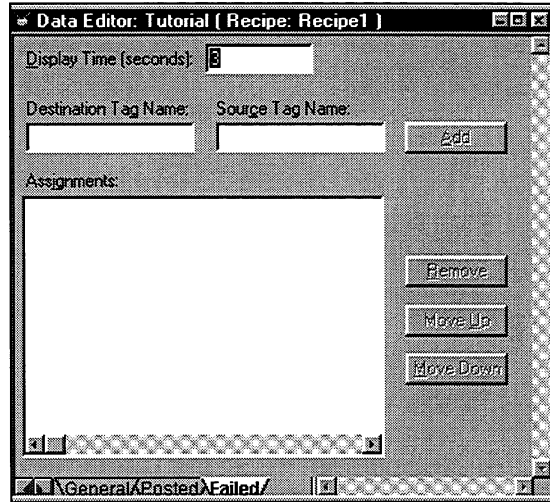
Figure 9-5. Failed Assignment Page

2.   Specify a display time. The range is 0 to 4294967 seconds (the default is 3). This is the amount of time the associated recipe shape will display on the target workstation during run-time if the recipe fails. If no recipe shape is created, this value has no meaning during run-time.

3.   Type a name in the Destination Tag Name text box. The source tag value will be assigned to this tag if the recipe fails.

4.   Type a name in the Source Tag Name text box. The value of this tag will be assigned to the Destination tag if the recipe fails.

5.   Click Add to add the assignment to the Assignments list box.

These assignments will occur if the recipe fails.

9-6

Creating Recipe Shapes

You must create a recipe shape if you want a visible indicator on screen during run-time that a recipe was posted or failed. Recipe shapes are created in the Graphic Editor.

To create a recipe shape...

1. Select Recipes from the Graphic drop-down list in the Application Navigator form.

2. If you have already configured a recipe in the Data Editor, double-click on the recipe name in the Graphic list box.

   or

   If you have yet to configure a recipe in the Data Editor, type a unique name in the associated text box, then click OK. If you have created a default screen template, this screen will incorporate all elements of that template.

3. Draw a shape. Refer to Chapter 6, *Creating Screens*, for information on drawing shapes.

4. Choose the Selection tool on the Drawing Palette.

5. Double-click on the shape to access the Shape Properties dialog box, as shown in Figure 9-6.
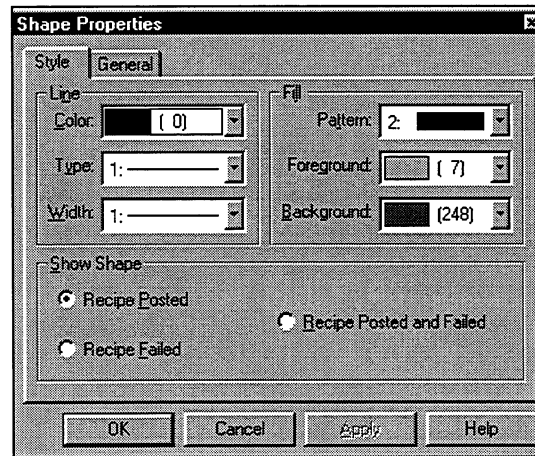
Figure 9-6. Recipe Shape Properties Dialog Box

6. Select a Show Shape option. Table 9-1 defines these options.

9-7

Table 9-1. Show Shape Options

Option	Definition
Recipe Posted	Displays when the recipe is posted (this is the default setting)
Recipe Failed	Displays when the recipe fails
Recipe Posted and Failed	Displays when the recipe is posted *and* displays when the recipe fails

If you configure it as "recipe posted," the shape will display during run-time for the amount of time specified on the Posted assignment page. If it is configured as "recipe failed," the shape will display during run-time for the amount of time specified on the Failed assignment page.

7. Click OK or press ENTER to accept the settings in this dialog box.

8. Repeat steps 3 through 6 to create additional recipe shapes.

Recipe shapes will display during run-time when the associated recipe is posted or failed.

Once you have configured a recipe, you must assign an event/action that loads it during run-time. Refer to Chapter 11 for information on assigning event/actions.

Copying and Pasting Recipes

To copy and paste recipes...

1. From the Application Navigator, select Recipes from the Graphic list box.

2. Select the recipe you want to copy, and then select Copy from the Edit menu.

3. Open the application where you want to place the recipe.

4. In the Application Navigator, select the Paste command on the Edit menu. The Change Paste Names dialog box appears, as shown in Figure 9-7.

9-8
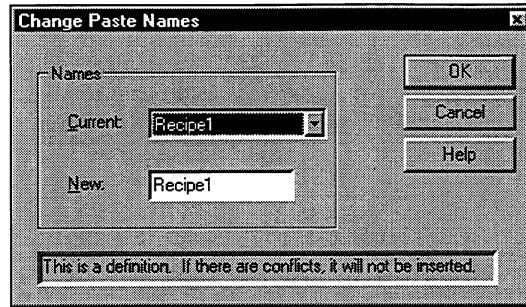
Figure 9-7. Change Paste Names Dialog Box

5. To avoid a conflict with a tag name in the new application, type a new recipe name in the New text box.

6. Click OK. The recipe graphic screen has been added to your application with the name you specified in the New text box.

9-9

221

Chapter 10 – Setting Alarms

This chapter describes how to set alarms. Alarms signal that an analog value has gone below or exceeded defined limits, or a discrete value has been turned on or off.

Alarms consist of a data element (alarm settings) and an optional graphical element (alarm shape). Alarm settings are specified in the Data Editor. Alarm shapes are configured in the Graphic Editor. Every displayable alarm must have its own shape, unless the Master Alarm Shape has been enabled.

Technical Note

See Chapter 5 for Alarm Priority Configuration, Master Alarm Shape Configuration, and Alarm Display Window Configuration.

Creating a New Alarm

You can create new alarms by selecting the Data Editor command on the Tools menu or using the Application Navigator form, shown in Figure 10-1.

10-1
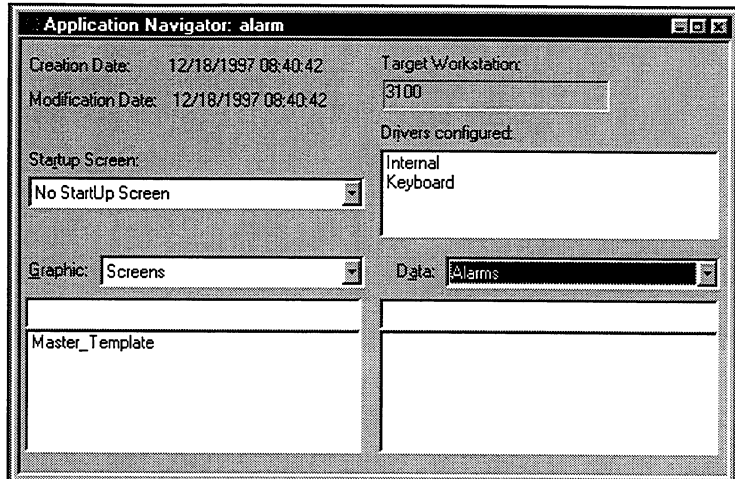
Figure 10-1. Application Navigator Form

To create a new alarm from the Application Navigator form...

1. Select Alarms from the Data drop-down list box.

2. Type a unique alarm name in the Data text box. See Chapter 3 for information on creating tag names. If you have created a default screen template, this screen will incorporate all elements of that template.

3. Press ENTER. The Alarm Editor form opens, with the name of the new alarm in its title bar.

To create a new alarm using the Data Editor command...

1. Select the Data Editor command on the Tools menu or the Data Editor button. The Select Data Form dialog box opens, as shown in Figure 10-2.

10-2
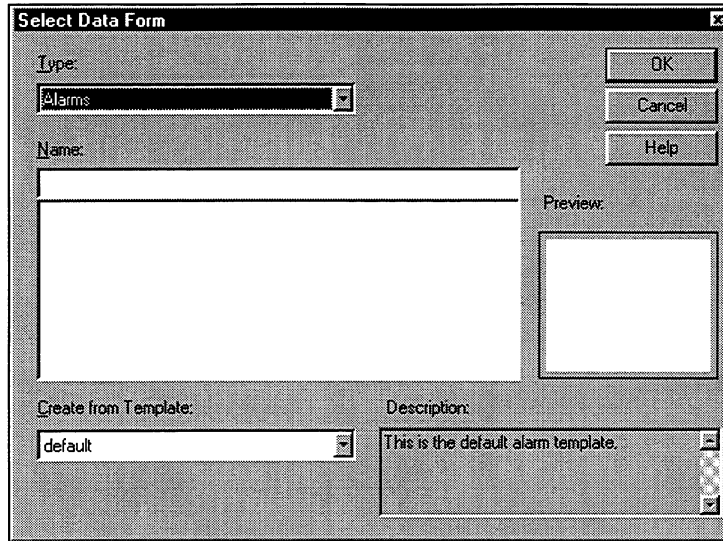
Figure 10-2. Select Data Form Dialog Box

2. Select Alarms from the Type drop-down list box.

3. Type a unique alarm name in the Name text box. See Chapter 3 for information on creating tag names.

4. If you want to create this screen based on an existing screen template, select the template from the Create from Template drop-down list. Refer to Chapter 8 for more information on templates. The Preview window displays the elements on the selected template, and the Description box provides a description of the template, if there is one.

5. Press ENTER to open the Alarm Editor form, shown in Figure 10-3.

10-3
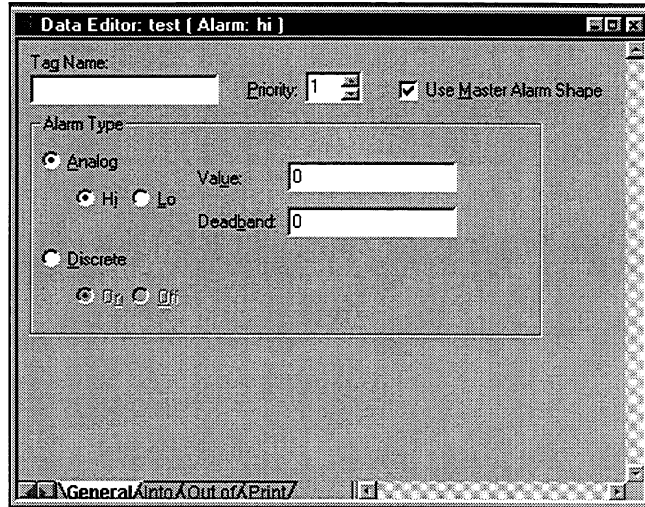
Figure 10-3. Alarm Editor Form

Once you have created an alarm and the Alarm Editor form is displayed on your screen, you can specify analog and discrete alarms.

Specifying Analog Alarms

To specify an analog alarm...

1. In the Alarm Editor form, type a unique tag name in the Tag Name text box. You *must* specify a tag name or you will receive an error when you generate the application.

2. Select a priority level.

3. If you want to use Master Alarm Shape, check the box. (See Chapter 5, "Master Alarm Shape Configuration" for more information.)

4. Select Analog as the Alarm Type.

5. Choose Hi or Lo and specify a value. If you select Hi, the alarm will occur when the value of the attached tag rises above the specified value. If you select Lo, the alarm will occur when the value of the attached tag drops below the specified value.

10-4

6. Specify a Deadband. The deadband sets the value that the attached tag must be equal to or greater than before the alarm will be reset if a Hi alarm is specified. If a Lo alarm is specified, the deadband sets the value that the attached tag must be equal to or less than before the alarm will be reset.

   For example, if you specify 45 as the Hi alarm value and 5 as the deadband, the value of the attached tag must be equal to or less than 40 to reset the alarm. If you specify 50 as the Lo alarm value and 5 as the deadband, the value of the attached tag must be equal to or greater than 55 to reset the alarm.

Specifying Discrete Alarms

To specify a discrete alarm...

1. In the Alarm Editor form, type a unique name in the Tag Name text box. You *must* specify a tag name or you will receive an error when you generate the application.

2. Select Discrete as the Alarm Type.

3. Select a priority level.

4. Next, specify when the alarm will occur: when the value of the tag transitions from 0 to non-zero (on) or non-zero to 0 (off).

Technical Note

A non-zero value is any value equal to or greater than 1. A value of 0 is any value less than 1, including negative numbers.

Once you have specified an alarm, you can configure Into and Out of alarm settings if you want the alarm to be logged during run-time in the alarm summary. You can also trigger an action when a value goes into or out of alarm.

Into alarm settings occur when the value of the attached tag goes into alarm. Out of alarm settings occur when the value of the attached tag goes out of alarm.

Specifying Into and Out of Alarm Settings

Once you have configured an alarm, you can specify settings based on the value going into or out of alarm.

To specify Into Alarm settings...

1. Select the Into tab on the bottom of the Alarm form to access the Into alarm page, as shown in Figure 10-4.
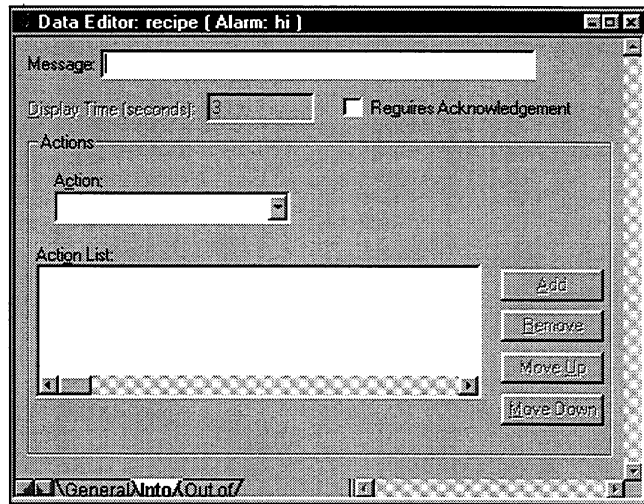
Figure 10-4. Into Alarm Page

2. Type a message in the Message text box. This message identifies the alarm in the alarm summary, which can be displayed during run-time. You can also display this message during run-time if you create an animated text box that is configured to display when the attached value goes into alarm.

10-6

228

Technical Note
You must specify a message or configure an associated alarm shape to log the alarm in the alarm summary when the attached value goes into alarm.

3. Specify a time in the Display Time text box. This is the amount of time you want the associated alarm shape to display when the value goes into alarm. If there is no alarm shape associated with this alarm, this value has no meaning. If "Use Master Alarm Shape" is checked, the time reflects the Master Shape Display time.

4. Check Requires Acknowledgment if you want the alarm to have to be acknowledged. Then you must specify an event/action to acknowledge the alarm (refer to Chapter 11). If the alarm requires acknowledgment, the into alarm shape will display until the alarm is acknowledged. If you specify an acknowledgment, but do not create an alarm shape, the alarm will not have to be acknowledged during run-time.

5. Choose an action from the Action drop-down list box if you want to trigger an action when the attached value goes into alarm. Refer to the Assigning Actions section, below, for more information on actions.

6. Click Add to add the action to the Actions list box.

To specify Out of Alarm settings...

Select the Out of tab on the Alarm Editor form. Then follow steps 1 through 6 described above for the *Into Alarm* section. The dialog box will look the same as the one shown in Figure 10-4.

10-7

Assigning Actions

You can assign actions to alarms that will occur when the alarm is triggered. Table 10-1 defines the actions you can configure.

Table 10-1. Action Descriptions

Action	Description	User Input during Run-time
Acknowledge alarm	Do not specify this action in the Alarm Editor. Use event/actions to acknowledge alarms (see Chapter 11).	N/A
Assignment	Assigns the value of the source tag to the destination tag	N/A
Change password level	Changes the password level of the run-time engine	Type the new password level in the dialog box.
Enable data entry	Allows you to enter data into data entry shapes	Type data into the data entry shapes.
Go to alarm summary	Displays the alarm summary, in which all alarms are logged	N/A
Go to previous screen	Returns to the previous screen	N/A
Go to screen	Displays the specified screen	N/A
Load recipe	Loads the specified recipe	N/A
Scroll Up	Scrolls alarm display (one alarm at a time) up	N/A
Scroll Down	Scrolls alarm display (one alarm at a time) down	N/A

For example, you may want to assign a 1 to register 30 to indicate that an alarm has occurred. Or you may want to go to another screen to allow you to correct the problem that caused the value to go into alarm.

Assigning Multiple Actions

An alarm can trigger multiple actions. However, there are several rules that must be followed when you configure multiple actions for an alarm:

You can configure the following actions in any order:

10-8

- Assignment
- Load Recipe
- Ack Alarm

You can configure only one of the following actions for an alarm. These actions can be preceded or followed by the actions above.

- Change password
- Enable data entry

You can configure one of the following actions for an alarm. These actions can be preceded, but not followed, by any of the actions listed above.

- Go to screen
- Go to Previous Screen
- Go to Alarm Summary

Creating Alarm Shapes

Every displayable alarm must have its own shape. Alarm shapes are necessary if you want a visible indicator of an alarm on screen during run-time. If you do not create an alarm shape, there will be no on-screen display associated with an alarm. However, all alarms are logged in the alarm summary, and/or alarm display window during run-time provided a message is configured. You can access the alarm summary during run-time by configuring an event/action. (Refer to Chapter 14, *Using the Run-time Engine*, for more information on the alarm summary.)

Technical Note

If "Use Master Alarm Shape" is enabled, there is no need to create an alarm shape. Refer to Chapter 14, "Master Alarm Shape."

To create an alarm shape...

1. Select Alarms from the Graphic drop-down list in the Application Navigator form.

2. If you have already configured an alarm in the Data Editor, double-click on the alarm name in the Graphic list box.

10-9

or

If you have yet to configure an alarm in the Data Editor, type a unique name in the associated text box to open the Alarm Editor. If you have created a default screen template, this screen will incorporate all elements of that template.

3. Draw a shape or shapes. Refer to Chapter 6, *Creating Screens*, for information on creating shapes.

4. Create a text box if you want to display a message when an alarm occurs during run-time. Select Animated Text as the Type option. Then click OK or press ENTER.

Technical Note

Do not configure any text animations for this shape, as they will not be performed.

The message configured for this alarm will be displayed in this text box when the alarm occurs, as shown in Figure 10-5. If it is an "into alarm" message, it will display for the amount of time specified on the Into alarm page. If it is an "out of alarm" message, it will display for the amount of time specified on the Out of alarm page.

Figure 10-5. Alarm Text Example

Refer to the previous section, *Configuring Alarm Settings*, for information on specifying a message.

5. Choose the Selection tool on the Drawing Palette.

6. Double-click on the shape to access the Shape Properties dialog box, as shown in Figure 10-6.

10-10
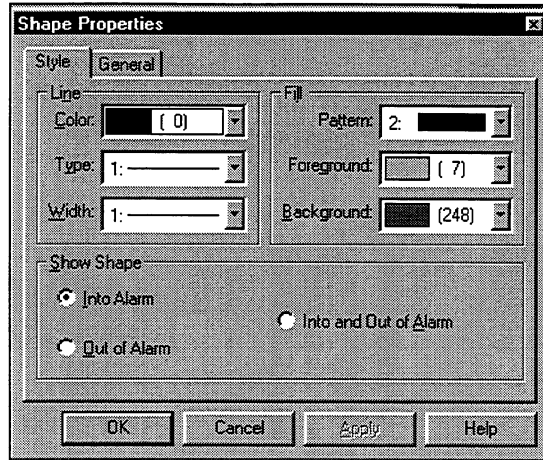
Figure 10-6. Alarm Shape Properties Dialog Box

7. Select a Show Shape option. Table 10-2 defines these options.

Table 10-2. Show Shape Options

Option	Definition
Into Alarm	Displays when a value goes into alarm
Out of Alarm	Displays when a value goes out of alarm
Into and Out of Alarm	Displays when a value goes into alarm *and* displays when a value goes out of alarm

If you configure an "into alarm" shape, it will display during runtime for the amount of time specified on the Into alarm page. If you configure an "out of alarm" shape, it will display during run-time for the amount of time specified on the Out of alarm page.

An example of an alarm shape without text is shown in Figure 10-7.

Figure 10-7. Alarm Shape without Text Example

An example of an alarm shape with text is shown in Figure 10-8.

10-11

Figure 10-8. Alarm Shape with Text Example

8. Click OK or press ENTER to accept the settings in this dialog box.

9. Repeat steps 3 through 7 to create additional alarm shapes.

These shapes will display during run-time when the attached value goes into or out of alarm.

Copying and Pasting Alarms

To copy and paste an alarm graphic screen...

1. From the Application Navigator, select Alarms from the Graphic drop-down list box.

2. Highlight the name of the alarm you want to copy, then select the Copy command on the Edit menu.

3. Open the application in which you want to copy the alarm.

4. In the Application Navigator, select the Paste command on the Edit menu. The Change Paste Names dialog box appears, as shown in Figure 10-9.
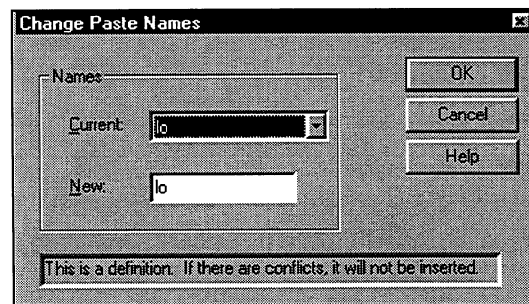
Figure 10-9. Change Paste Names Dialog Box

5. To avoid a conflict with a tag name in the new application, type a new alarm name in the New text box.

10-12

6. Click OK. The alarm graphic screen has been added to your application with the name you specified in the New text box.

10-13

Chapter 11 – Assigning Event/Actions

Event/actions are powerful and flexible events which occur during run-time, triggering specific actions.

For instance, you can configure a key press (event) to go to another screen in your application (action) during run-time. Or alarms can be acknowledged (action) when the attached tag is true (event).

Technical Note

Event/actions are assigned to a particular screen and can only occur when that screen is visible during run-time. The exceptions are event/actions configured in the Master Template. You can specify whether these are local to the Master Template or application wide.

Defining Events

Events are what cause actions to occur. The run-time engine evaluates events approximately every quarter second.

Technical Note

Refer to Chapter 3, *Configuring Tags*, for information on how tags are evaluated.

Table 11-1 defines the events you can configure.

Table 11-1. Event Descriptions

Event	Definition	User Input during Run-time	Trigger Type*
Condition becomes true	Action occurs when the condition of the attached tag goes from false (zero) to true (non-zero)	N/A	Edge
Condition is true	Action occurs when the condition of the attached tag is true (non-zero). *Note: You may want to use the Condition becomes true event instead of the Condition is true event. This event may cause the action to occur more often than necessary, and, as a result, degrade performance.*	N/A	State
Condition becomes false	Action occurs when the condition of the attached tag goes from true (non-zero) to false (zero).	N/A	Edge
Condition is false	Action occurs when the condition of the attached tag is false (zero). *Note: You may want to use the Condition becomes false event instead of this the Condition is false event. This event may cause the action to occur more often than necessary, and, as a result, degrade performance.*	N/A	State
Key press	Action occurs when the configured key is pressed. Function keys F11-F16 are accessed using SHIFT + F1-F6. *Note: This event is in no way associated with the keyboard driver configurations. Event Actions will not occur anytime the Alarm Summary, Data Entry or Password Entry are in use.* Warning: Target workstations (serial numbers xxxxxx-4H7 and above) will not recognize multiple keys pressed at the same time.	Press the configured key.	Edge
Key release	Action occurs when the configured key is released. Function keys F11-F16 are accessed using SHIFT + F1-F6. *Note: This event is in no way associated with the keyboard driver configurations. Event Actions will not occur anytime the Alarm Summary, Data Entry or Password Entry are in use.*	Release the configured key.	Edge
Periodic timeout	Action occurs *every* time the specified amount of time (in msecs) elapses during run-time. These times are accurate to approximately a quarter second. This period begins when the screen is first displayed.	N/A	Edge
Time	Action occurs at the time specified in hour:minute format (hh:mm)	N/A	Edge
Timeout	Action occurs once when the specified amount of time (in msecs) elapses during run-time. These times are accurate to approximately a quarter second. The timer starts when the screen is first displayed.	N/A	Edge
Touch zone press	Action occurs when specified touch zone is pressed	Press the configured touch zone.	Edge

11-2

238

Event	Definition	User Input during Run-time	Trigger Type*
Touch zone release	Action occurs when specified touch zone is released	Release the configured touch zone.	Edge

*Technical Note

An action associated with an edge-triggered event takes place only once when the event occurs. For example, a key press only triggers the action once. The action does not continuously occur as long as the key is pressed.

An action associated with a state-triggered event occurs as long as the event condition remains true.

Defining Actions

Actions are what occur when the configured event takes place. Table 11-2 defines the actions you can configure.

Table 11-2. Action Descriptions

Action	Description	User Input during Run-time
Acknowledge alarm	Acknowledges the currently displayed alarm *Note: While in Alarm Summary, you can also perform this action during run-time by pressing a touch button that displays at the bottom of the alarm summary screen (if you have a target workstation that incorporates a touch screen), or by pressing the function key that is located below this touch button.*	N/A
Alarm window scroll to top	Shows the top of the alarm display window on the screen	N/A
Alarm Window Scroll Up	Scrolls alarm display (one alarm at a time) up	N/A
Alarm Window Scroll Down	Scrolls alarm display (one alarm at a time) down	N/A
Assignment	Assigns the value of the source tag to the destination tag	N/A
Change password level	Changes the security level of the run-time engine	Type the password associated with the new level in the password text box.

11-3

239

Action	Description	User Input during Run-time
Enable data entry	Allows you to enter data into data entry shapes. You can only specify this as a local event, not a global one. *Note: Refer to Chapter 6 for more information on data entry shapes.*	Type data into the data entry shapes.
Go to alarm summary	Displays the alarm summary screen	N/A
Go to previous screen	Returns to the screen that was previously displayed	N/A
Go to screen	Displays the specified screen	N/A
Load recipe	Loads the specified recipe	N/A
Print alarm log	Prints the information contained in the alarm summary. *Note: While in the Alarm Summary, you can also perform this action during run-time by pressing a touch button that displays at the bottom of the alarm summary screen (if you have a target workstation that incorporates a touch screen), or by pressing the function key that is located below this touch button.*	N/A
Print current screen	Prints the contents of the current screen.	N/A
Prepare for download	Shuts the engine down so the bootloader can begin execution. *Note: It is highly recommended that this action be password protected since it stops the engine execution (regardless of what is occurring).*	N/A

Configuring an Event/Action

To configure an event/action...

1. Select Screens from the Data drop-down list box in the Application Navigator. In the associated list box, double-click on the name of the screen for which you want to configure event/actions.

    or

    Select the Data Editor command on the Tools menu to open the Select Data Form dialog box.

2. Select Screen as the Type.

3. In the Name list box, double-click on the name of the screen for which you want to configure event/actions.

    The Event/Actions form opens, as shown in Figure 11-1.

11-4
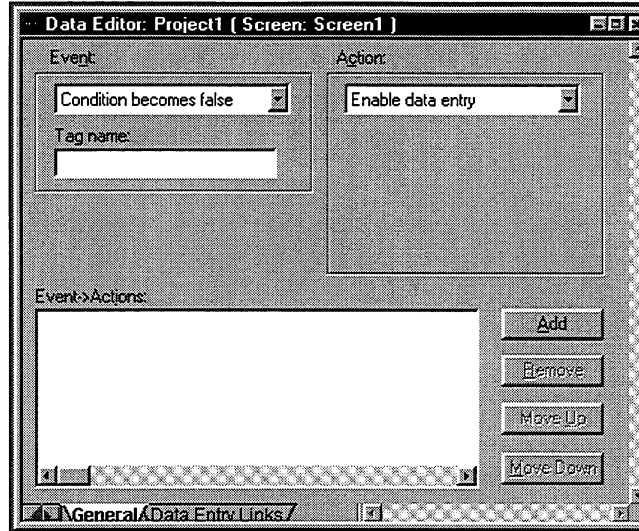
Figure 11-1. Event/Actions form

4. In the Event drop-down list box, select the event that will trigger the action. Refer to Table 11-1 for event descriptions.

    You must provide additional information for each event, as described in Table 11-3.

Table 11-3. Event Information

Event	Additional Information Needed
Condition becomes true	Tag name
Condition is true	Tag name
Condition becomes false	Tag name
Condition is false	Tag name
Key press/release	Key to press or release
Period timeout, Timeout	Time period (in msecs)
Time	Time in 24-hour format (hh:mm)
Touch zone press/release	Name of touch zone to press or release (as defined on General Properties page of Shape Properties form for each touch zone)

11-5

5. Specify an action. Refer to Table 11-2 for action descriptions. Some actions require additional information, as defined in Table 11-4.

Table 11-4. Action Information

Action	Additional Information Needed
Assignment	Source and destination tag names
Go to screen	Screen name
Load recipe	Recipe name

6. If you configure an event/action for the Master Template, specify whether the scope is Application wide or specific to the Master Template. If you specify Application, the event/action will take place when any screen is visible. If you specify Master Template, the event/action will take place only when the Master Template is visible (this would only occur if you configure the Master Template as the application's startup screen).

7. Once you provide all the necessary information, click Add to add the event/action to the Event/Actions list box.

During run-time, the action will occur when the configured event takes place.

The Move Up and Move Down buttons in this form allow you to change the order of selected event/actions in the list. This is important because the order of event/actions can have an impact on what occurs during run-time.

For example, if several event/actions evaluate true at the same time during run-time, then they are performed in the order in which they appear in the Event/Action list box. However, if an action changes the screen (on local event/actions only), then any event/actions configured for the original screen will not be performed.

For example, the following actions configured for screen_1 are each to occur after five seconds has elapsed.:

1. Write 20 to #30.

2. Go to screen "MAINT."

3. Load recipe "STARTUP."

The Load Recipe action will not take place because you exited screen_1.

11-6

```
┌─────────────────────────────────────────────────────────┐
│                    Technical Note                        │
│                                                          │
│  Event/Actions specific to each screen can be configured │
│  in the Data Editor. These tools allow you to control    │
│  your application from any screen. Event/actions         │
│  configured on the master template can be config-        │
│  ured globally or locally.                               │
└─────────────────────────────────────────────────────────┘
```

Configuring Multiple Actions

You can configure an event that triggers multiple actions. However, there are several rules that must be followed when you configure multiple actions.

You can configure the following actions in any order:

- Assignment
- Load Recipe
- Ack Alarm

You can configure only one of the following actions for a single event. These actions can be preceded or followed by the actions in rule 1.

- Change password
- Enable data entry

You can configure one of the following actions for a single event. These actions can be preceded, but should not be followed, by any of the actions listed in the rules above.

- Go to screen
- Go to Previous Screen
- Go to Alarm Summary
- Go to top of alarm display

11-7

Chapter 12 – Generating & Downloading Applications

Once you have configured an application, you must generate it before you can download it to the run-time engine. Generating allows *SoftScreen* to "translate" the application into a form the run-time engine can understand.

Once you have successfully generated an application, you can download it to the run-time engine.

Generating an Application

To generate an application...

1. Select the Generate command on the Tools menu or click the Generate button.

Technical Note

You will get an error message if you have not specified a startup screen in the Application Navigator. Specify a startup screen, and then regenerate.

You will also receive an error message if you do not specify a unique tag name for an alarm. Specify a tag name, and then regenerate.

---

2. If there are unresolved references in the application, a message states this. Unresolved references refer to undefined tags, and forward and circular references. You cannot download an application until you have corrected all unresolved references.

3. Click OK and the Generate window will display.

4. To print the listing in the Generate window, select the Print command on the File menu or press the Print button.

12-1

5. Select Cross Reference from the Tools menu to obtain a listing of unde-
   fined tags.

6. Choose the Tag Names Listed option and a list of all tags used in your
   application appears in the Referenced Tag Names form, as shown in
   Figure 12-1.
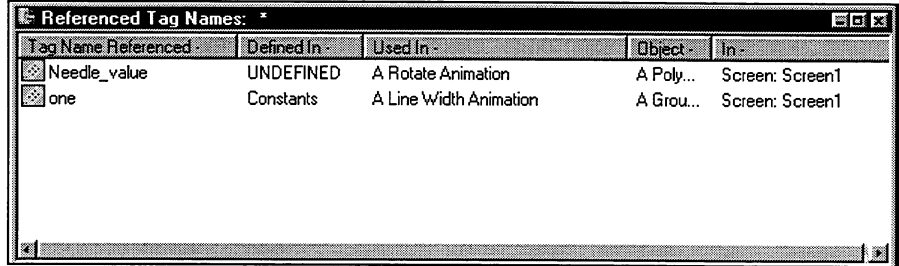
Figure 12-1. Referenced Tag Names Form

Table 12-1 defines the fields in the Referenced Tag Names form.

Table 12-1. Fields in the Referenced Tag Names Form

Field	Definition
Tag Name Referenced	Displays the tag name
Defined In	Specifies where the tag is defined or undefined
Used In	Indicates where the tag is used: in an animation, event, action, or expression
Object	Specifies the shape (if the tag is used in an animation)
In	Specifies if the tag is in a screen, recipe, or alarm

7. Locate the undefined tags. Undefined tags must be defined in the Data
   Editor in one of six places:

   • PLC driver

   • Internal driver

   • Keyboard driver

   • Constants

   • Expressions

   • Strings

12-2

246

8. Once all unresolved references are resolved, generate the application again.

   You may receive a message that states that "Possible memory problems were detected." This message indicates one of two things:

   - Flash usage by the application is greater than or equal to the Flash available for the application or

   - RAM usage by the application is greater than or equal to the RAM available for the application

9. Click OK, and the Successful Generation message displays.

10. Click OK again. The Memory Analysis window displays, as shown in Figure 12-2.

```
Project1:2                                              [-][□][×]

  --- Workstation memory analysis ---
Total flash: 1024K
Flash available for application: 485K
Flash usage by application: 1K    .

Total RAM: 512K
RAM available for application: 380K
Maximum RAM usage by application: 109K
    Master Template: 1K
    Largest screen: Screen1 1K
No recipes
No PrintScreens

Please refer to your user's manual for information
on how to use these estimates.
```

Figure 12-2. Memory Analysis Window

To determine where the memory problem is, compare the Flash usage by the application to the Flash available for the application and RAM usage by the application and the RAM available for the application.

Once you determine the problem, make changes to the application to correct it. For more information on the memory analysis tool, refer to Chapter 13.

11. Once all problems have been corrected, regenerate the application. You will receive a Successful Generation message. Click OK.

You are now ready to download the application. If you have not done so already, connect the development system to the target workstation. Refer to Chapter 2 for cabling information.

12-3

Downloading an Application

To download an application...

1. Select the Download command on the Tools menu or click on the Download button to access the File Download dialog box, as shown in Figure 12-3.
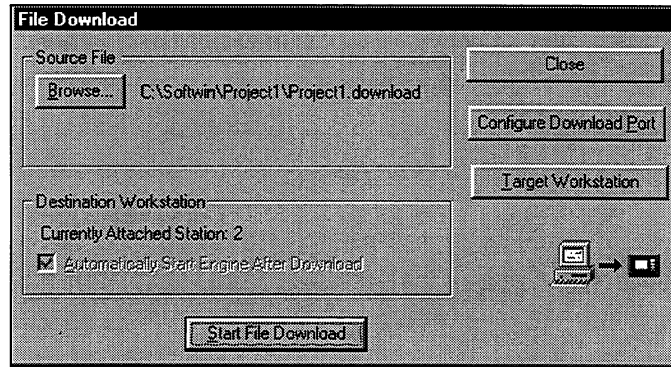
Figure 12-3. File Download Dialog Box

2. Select the Target Workstation button to change the target workstation address or verify the link between a target workstation and the development system workstation. This opens the Target Workstation Address dialog box, as shown in Figure 12-4.
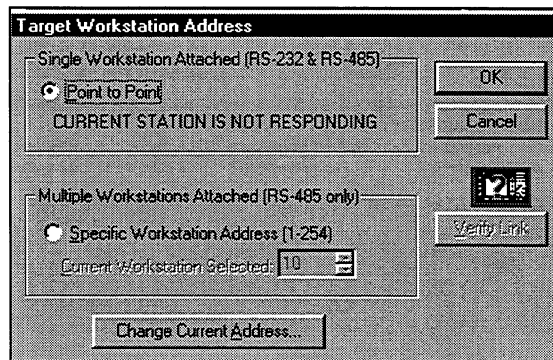
Figure 12-4. Target Workstation Address Dialog Box

12-4

248

If you receive an error that says the COM port you have selected cannot be opened, it may be because

- The port is in use

- Another version of Download is open, causing a conflict

Resolve these problems, then close and re-open the File Download dialog box.

3. Select Point to Point if there is only one target workstation.

4. If more than one workstation is attached, select the Specific Workstation Address button, then specify the address of the workstation to which you want to communicate, from 1 to 254. Choose the Verify Link button to verify that the run-time engine is attached to the station you have specified. If it is attached, a message indicates this. If the station does not exist, you will be asked to choose another address.

5. Select the Change Current Address button if you want to renumber the station address of the workstation to which you are communicating. This opens the Change Current Address dialog box, as shown in Figure 12-5.
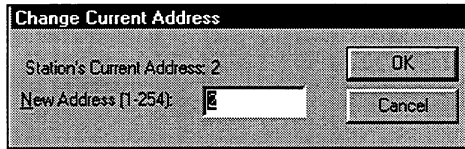
Figure 12-5. Change Current Address Dialog Box

6. Specify a new number, from 1 to 254, in the New Address text box, then click OK.

7. Click on the Configure Serial Port button to open the Configure Download Port dialog box, as shown in Figure 12-6.
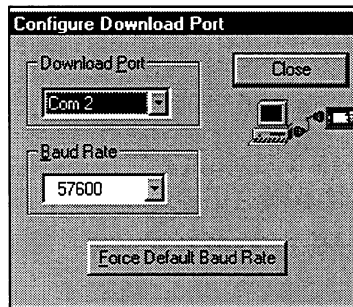
Figure 12-6. Configure Download Port Dialog Box

12-5

8. Select a Download Port. Choices are COM 1, COM 2, COM 3, or COM 4. The default is COM 1.

9. Select a baud rate. If you want to set all attached workstations to the default baud rate (57600), select the Force Default Baud Rate button.

> ## Technical Note
>
> Some PCs may have problems communicating at baud rates higher than 9600. If you have trouble downloading an application, select a slower baud rate.

10. Click Close once you have changed the download port settings.

    The *app_name*.download file associated with the current application will be specified in the File Download dialog box. If you want to download another application, select the Browse button, then double-click on the desired application's .download file.

11. Click on the Start File Download button.

    If the connection between the development system workstation and the target workstation is working properly, you will see the message "Shutting down drivers, please wait..." on the engine.

> ## Technical Note
>
> Some drivers may take a long time to shut down or may not respond. If it appears that the engine is not responding, cycle the target workstation's power. You may want to configure the "Prepare for Download" action for drivers with this problem. Refer to Chapter 11 for more information on actions.

    Once the workstation is ready for you to download, a green OK splash screen will appear.

    After a successful download, a list of the files downloaded will display in the Successful download window on the development system. At the same time, the application's start-up screen will appear on the run-time engine.

12. Click OK to close the Successful download window.

    If the files are not successfully downloaded, a failure message will appear in the dialog box. If you receive a failure message, try downloading the appli-

12-6

cation again. If it does not successfully download this time, cycle the target workstation's power.

Using the Download Utility

The Download utility that comes with *SoftScreen* handles downloading applications in Windows 95/NT, as well as configuring applications so they can be downloaded from MS-DOS. It is incorporated as part of the *Soft-Screen Development System*, but you can use it as a separate utility if you want to view the files associated with the engine.

To access the *SoftScreen* Download utility...

Double-click on the SoftScreen Download utility icon or the download.exe file to access the SoftScreen Download window, as shown in Figure 12-7.
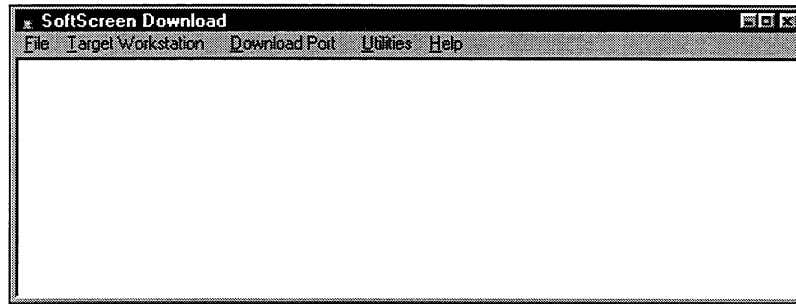
Figure 12-7. SoftScreen Download Window

If you want to download an application, select the Download command from the File menu. Once the File Download dialog box is open, follow the instructions in the *Downloading an Application* section earlier in this chapter.

Hold Station

Select the Hold Station command on the Target Workstation menu to stop execution of the application and drivers on the run-time engine. You must stop the run-time engine before listing memory.

12-7

Start Station

Select the Start Station command on the Target Workstation menu after you have halted application and driver execution with the Hold Station command. Once you select this command, application and driver execution will resume.

List Memory

To display and print a listing of the target workstation's memory...

1. Select the List Memory command on the Target Workstation menu.

    You will receive a message that states that the workstation's power must be cycled, which will halt execution of the current application and drivers on the run-time engine. If you want to do this, click Yes to start the Bootloader.

    The Target Workstation Memory List dialog box lists all the files in the target workstation's memory, and their size, version number (or date), and type. Use this dialog box to determine if you have the latest version of engine files.

Application memory used and free
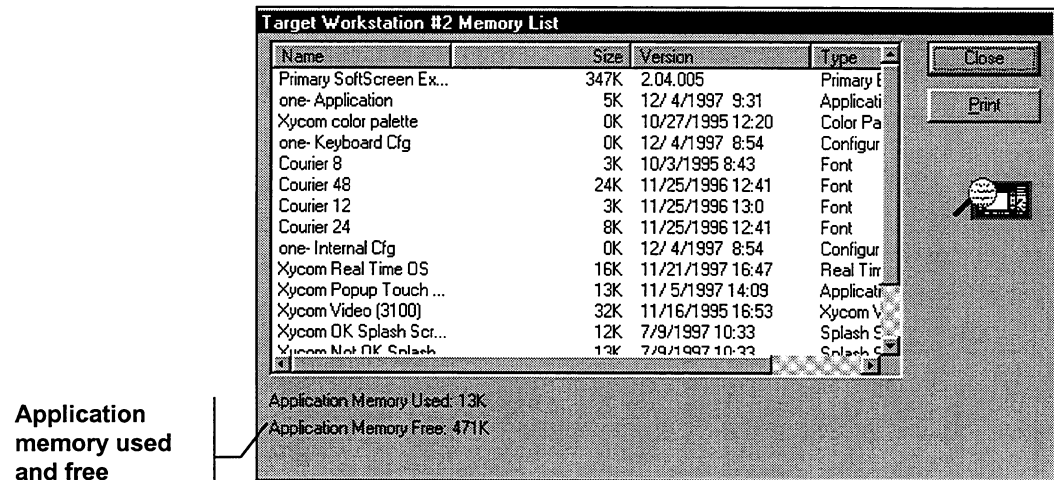
Figure 12-8. Target Workstation Memory List Dialog Box

2. Click the Print button to print this memory listing.

3. Click Close when you are ready to close this dialog box.

12-8

Screen Contrast

To adjust screen contrast...

1. Select the Screen Contrast command on the Target Workstation menu to open the Adjust Target Workstation Contrast dialog box, as shown in Figure 12-9.
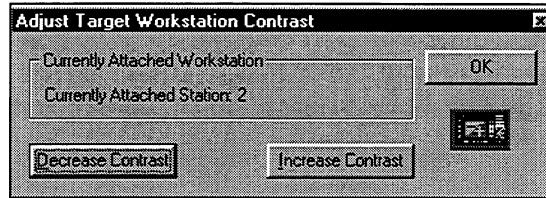
Figure 12-9. Adjust Target Workstation Contrast Dialog Box

2. Click on the Decrease Contrast button to decrease contrast on the target workstation's screen.

3. Click on the Increase Contrast button to increase contrast on the target workstation's screen.

4. Click OK when you have finished adjusting the contrast.

Time/Date

To synchronize time and date with system time...

1. Select the Time/Date command on the Target Workstation menu to open the Workstation Time/Date dialog box, as shown in Figure 12-10.
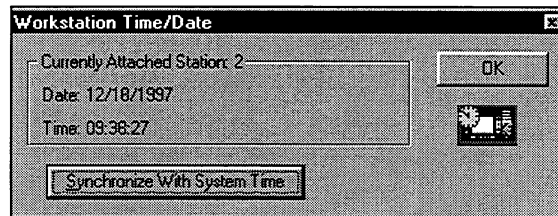
Figure 12-10. Workstation Time/Date Dialog Box

2. Click on the Synchronize With System Time button to synchronize all target workstations' date and time with Windows 95/NT system time.

3. Click OK to close the dialog box.

12-9

Technical Note
If you do not close the Download window, a conflict will occur when you try to download an application using *SoftScreen*'s Download command.

Creating and Using the DOS Download Utility

SoftScreen provides the ability to download applications from MS-DOS. It does this through the DOS Download utility.

Creating a DOS Download Disk

The DOS Download disk configures and saves all the files necessary to download an application from MS-DOS. To create this disk,

1. Double-click on the SoftScreen Download utility icon to access the SoftScreen Download window, as shown in Figure 12-11.
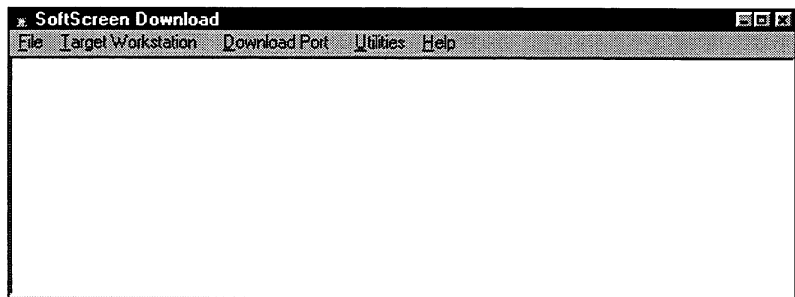
Figure 12-11. SoftScreen Download Window

2. Select the Create DOS Download Disk command on the Utilities menu to access the dialog box shown in Figure 12-12.

12-10
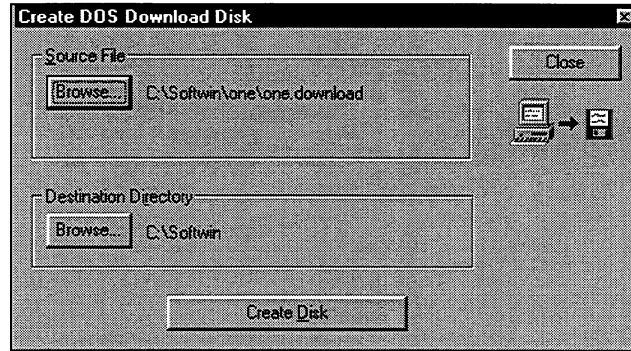
Figure 12-12. Create DOS Download Disk Dialog Box

3. Select the source file for which you want to create the DOS download disk. If the file you want does not appear in the Source File box, select the Browse button to locate the appropriate file.

4. Select the Destination Directory to which you want the file saved. If the destination directory you want does not appear in the Destination Directory box, click on the Browse button to select the appropriate directory. This can be a directory on your hard drive or you can save directly to a floppy disk. If you save to your hard drive, you will need to copy the files to a floppy disk.

5. If you want to create a subdirectory in which to save the download files, click on the Add Subdirectory button.

6. Add the name of the subdirectory you want to create in the New Subdirectory text box, then click OK.

7. Click OK once you have chosen a destination directory.

8. Click the Create Disk button. A completed message displays after the application is saved to the destination directory you specified.

9. Click OK.

10. You can create another DOS download disk at this time, or click Close to end the procedure.

Once you have created a DOS download disk, you can use it to download from DOS.

12-11

255

Using the DOS Download Utility

Once you have created the DOS download disk, insert it in the system from which you want to download the application. You can download from the floppy disk or you can copy the files onto the system's hard drive.

You can perform some of the same functions in DOS download that you do in the SoftScreen Development System for Windows Download. Table 12-2 lists the valid commands and parameters to perform these functions.

Table 12-2. Syntax and Commands

Syntax (these commands are not case sensitive)	Command
-B *baud_rate*	Sets the host computers baud rate to 9600, 57600, or 119200K.
-C *com_port*	Uses 1 for COM1 or 2 for COM2; COM3 and COM4 are not supported.
-I *station_id*	Sets the station ID to which you want to talk. Valid IDs are 1-254 or 255 for point to point.
-? or no parameters	Displays valid commands and command syntax.
-DEFAULT_BAUD	Resets all attached workstation(s) to 57600 baud.
-GET_DATE	Reads the date and time from the Focal Point engine.
-LIST_ITEMS	Lists the items in the engine's memory. This command will stop execution of the current application and drivers on the run-time engine. After the memory listing is complete, use the -START_EXEC command to restart the run-time engine.
-PING	Checks to see if a station is responding.
-SET_DATE	Sets the engine's time and date to match DOS's time and date.
-SET-BAUD *baud*	Sets the workstation's baud rate to 9600, 57600, or 119200K.
-SET_ADDR *addr*	Sets the engine's address. Valid addresses are 1-254.
-START_EXEC	Starts execution of the run-time engine.
APPNAME.LST	Downloads the application files to the run-time engine. *APPNAME* is the name of your application.

To use the DOS download commands, type "download" and the appropriate command at the C: prompt (or the A: prompt if your DOS download files are on floppy).

12-12

256

Following are some DOS download command examples. They assume that the download files are saved in the softwin directory on drive C.

- To download an application to the run-time engine, type the following:

    ```
    C:\softwin\download appname.lst
    ```

    Press ENTER and the utility downloads the necessary files to the run-time engine. The startup screen for the downloaded application should appear on the target workstation screen.

- To read the engine's date and time, type the following:
    ```
    C:\softwin\download -get_date
    ```

    Press ENTER, and you will receive an on-screen response similar to the following:

    ```
    Slave station's Date 6/30/1997, Time 10:44:46
    ```

- To change the address of the target workstation, type the following:

    ```
    C:\softwin\download -set_addr 3
    ```

    Press ENTER, and you will receive the following on-screen response indicating that the station address has been set to 3:

    ```
    Command (SET_ADDR) completed successfully.
    ```

12-13

Chapter 13 – Analyzing an Application's Memory Usage

The SoftScreen Development System for Windows allows you to create applications of varying sizes. However, you must be careful to ensure that an application you create on the development system does not exceed the boundaries imposed by memory restrictions on the target workstation.

Calculating an Application's Memory Requirements

Target workstations have two types of memory: Flash and RAM. When you download an application, it is stored in Flash memory.

As the application executes, the run-time engine transfers screens, as needed, into RAM, along with the tags required by screens, alarms, recipes, expressions, and event/actions.

It is possible to create an application that will download to the target workstation, but will not execute once downloaded. That is because an application may fit in the target workstation's Flash memory, but require more RAM than is available.

Determining the Impact of Application Elements

Application size is determined by examining engine RAM usage; size of the Master Template, the two largest screens, and the largest recipe; and the RAM usage of print screen functions.

Once you've downloaded an application to the target workstation, a portion of RAM will *always* be occupied by engine functions and the Master Template (everything on the Master Template is considered global, and therefore is active at all times).

RAM usage by the other application elements–screens, recipes, and print screen functions–occurs only when the specific element is active. Also, when switching between screens, part of the screen being replaced remains

in RAM for a short time. That is because when the run-time engine loads a new screen into memory, it removes everything related to the previous screen except for its data points. The data points are scanned, and, if not used by the new screen, they are removed.

Screens

Screen size is based on the number of objects and tags placed on the screen. An application's ability to fit within available RAM is directly related to screen size.

Technical Note

A screen object is a symbol, line, circle, etc. that is displayed on the screen during run time. Some symbols are made up of many different objects (objects within objects) which affects the total amount of memory used.

During run time, objects are broken down into their basic components. Therefore, simply grouping objects will not reduce the screen's RAM requirement.

If an application has too many objects on a screen to execute on the target workstation, create a bitmap that incorporates the screen's static objects, then import it into SoftScreen. You can then place active objects–such as data displays, data entry points, and animated objects–on top of the bitmap to complete the screen. As bitmaps are stored in Flash, you will decrease the application's RAM requirement, which may allow an application with large RAM requirements to execute.

Alarms

Alarms are global functions within SoftScreen. An alarm is always being scanned no matter what screen is active, thus requiring RAM. Therefore, the number of alarms has a significant impact on application size in terms of RAM usage.

Recipes

Although recipes only require RAM when they are active, they are important because, once activated, they can have a large impact on the target workstation's RAM. In fact, it is possible to have an application that is able to execute until a recipe is activated. Activating the recipe could subsequently use enough RAM to exceed the RAM available.
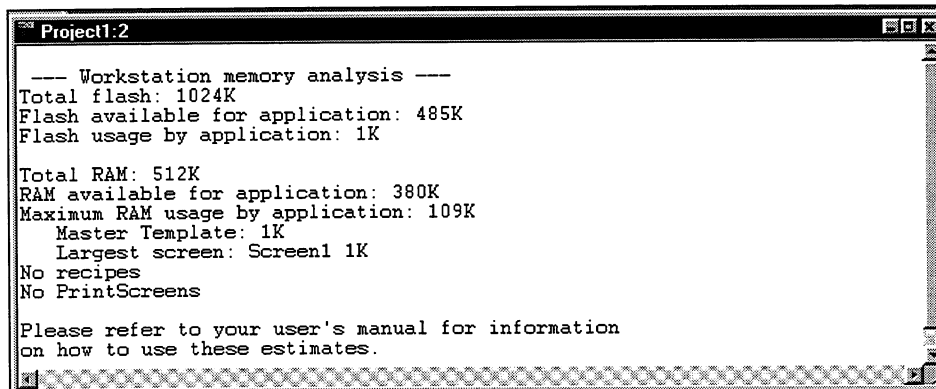
Analyzing an Application's Memory Usage

SoftScreen provides a tool to help you analyze the memory usage of an application. Before using this tool, you should have successfully generated the application. Generate will also do a memory analysis. A message box will appear if a problem occurs during generate. Refer to Chapter 12 for more information on generating an application.

To analyze an application's memory usage,

1. Select the Memory Analysis command on the Tools menu.

2. If the analysis is successfully completed you will receive a Successful Analysis message. Press OK to continue. A window similar to the one in Figure 13-1 will display.

   If the memory analysis is unsuccessful, refer to Step 3.

```
Project1:2

--- Workstation memory analysis ---
Total flash: 1024K
Flash available for application: 485K
Flash usage by application: 1K

Total RAM: 512K
RAM available for application: 380K
Maximum RAM usage by application: 109K
    Master Template: 1K
    Largest screen: Screen1 1K
No recipes
No PrintScreens

Please refer to your user's manual for information
on how to use these estimates.
```

Figure 13-1. Memory Analysis Window

This window provides the following information (in Kbytes) about the target workstation:

- Total Flash

- Flash available for the application

- Flash usage by the application

- Total RAM

- RAM available for the application

- Maximum RAM usage by the application

- Size of the master template

- Size of the largest screen

- Size of the second largest screen (if there is one)

- Size of the largest recipe

- RAM usage by print screen functions (if there are any)

You should be able to download the application to the target workstation if the Flash usage by the application is less than the Flash available for the application.

Once downloaded, the application should execute if maximum RAM usage by the application is less than the RAM available for the application.

3. If the memory analysis is unsuccessful, you will receive the following message:
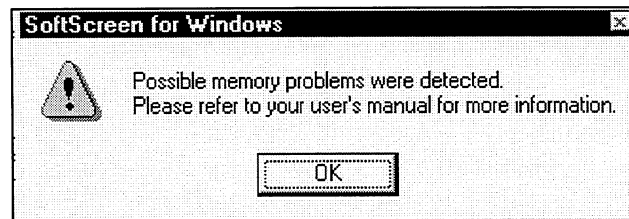
Figure 13-2. Memory Problems Message

4. Press OK and refer to the Memory Analysis window to determine whether it is a Flash or RAM memory problem.

5. Resolve the memory problem, then analyze the application again.

13-4

Application Examples

Table 13-1 describes a typical application that will run on a target workstation. Table 13-2 and Table 13-3 provide application examples to help you determine if your application will run on the target workstation.

Table 13-1. Typical Application Size

Elements	3100	3200/3300
Screens	30 (with 20 objects)	60 (with 40 objects)
Event/Actions	125 (up to 10 per screen)	250
Constants	25	50
Expressions	25	50
Recipes	5 (with 15 assignments)	10
PLC Tags	200	400
Internal Tags	50	75
Alarms	75	150

Table 13-2. 3100 Applications

Elements	Application that Will Fit	Application that Will Be Too Large
Screens	59 (two largest screens have 15 and 20 objects)	12 (two largest screens have 150 and 200 objects)
Event/Actions	241 (two largest screens have 15 and 21 event/actions)	101 (two largest screens have 12 and 14 event/actions)
Constants	23	15
Expressions	121	113
Recipes	7	0
PLC Tags	427	357
Internal Tags	93	18
Alarms	45	60

13-5

The application in the second column of Table 13-2 has more screens, event/actions, constants, expressions, PLC tags, and internal tags than the application in the third column. Both applications will fit in the target workstation's Flash memory (which means you will be able to download them), but the larger application will exceed available RAM (which means it will not execute).

Table 13-3. 3200/3300 Applications

Elements	Application that Will Fit	Application that Will Be Too Large
Screens	12 (two largest screens have 150 and 200 objects)	3 (two largest have 57 and 100 objects)
Event/Actions	101 (two largest screens have 12 and 14 event/actions)	7
Constants	15	2
Expressions	113	0
Recipes	0	0
PLC Tags	357	1584
Internal Tags	18	1
Alarms	60	1584

If you need additional help in determining an application's size, contact the Application Engineering Department at 1-800-AT-XYCOM.

13-6

Chapter 14 – Using the Run-time Engine

This chapter discusses the functions you can perform on the run-time engine once you have downloaded an application.

> ## Technical Note
>
> When you press a key or a touch zone configured to go to another screen, SoftScreen erases the key and touch zone buffers.

Entering Data

Data entry shapes allow you to enter data during run-time. If an application contains data entry shapes, an event must be configured to enable data entry (for example, a key press or a timeout). It is recommended that you specify the I-bar key to enable data entry.

When the configured data entry event occurs, a block-shaped cursor will appear at the first data entry shape on the screen.

To enable the Pop-Up keypad...

If the pop-up keypad for data entry is enabled and the engine has a touch screen, you must press the screen on top of the data entry to enable the pop-up keypad, which will then appear on the screen. Once enabled, you may enter data from the touch screen.

To enter data...

1. Type a floating point value or a string (data entry shapes are configured for either a float or string value) in the data entry shape.

> ## Technical Note
>
> Although you can type in all the ASCII characters on the development system, the run-time engine will only display ASCII characters from 20h (32 decimal) to 7Eh (126 decimal).

Technical Note

You can enter values using scientific notation.

Use the backspace key if you want to delete digits or characters in the data entry shape. Press ESC if you want to abort the data entry before it is sent to the attached tag.

Technical Note

While in alarm summary, user-defined event actions tied to key press and key release will not function. The state of the keys for a screen will be reset to 0 when the alarm summary is activated.

Technical Note

You can enter data using the keypad, an external PC-compatible keyboard or touch screen.

---

2. If more than one data entry shape is configured, press an arrow key or use the touch screen to move the cursor to the next data entry shape. Once you press the arrow key, the data in the current field will be written to the attached tag.

Technical Note

When the pop-up touch pad is active, the arrow keys will not function.

If the data entry shapes have retained their default links, you will be able to move between the shapes in the order in which they were placed on the screen. If data entry link settings were changed in the development system (refer to the *Creating Data Entry Shapes* section in Chapter 6 for more information), the order in which you can move between shapes will be based on those settings.

14-2

Technical Note

If you press an arrow key that is not linked to another data entry shape, the cursor will not move to another shape. Instead, the data in the current shape will be written to the attached tag, and the data entry field will be cleared and ready for another entry.

---

3. Press ENTER when you have finished entering data. This will write the data in the last data entry shape to the attached tag.

Using Function Keys

Function keys F1 through F10 correspond to function keys F1 through F10 on the 3000 target workstation keypad, as well as to function keys F1 through F10 on a PC-compatible keyboard. Function keys F11 through F20 are accessed by selecting SHIFT + F1 through F10.

Changing the Security Level

The default security level of the run-time engine is 0, the lowest level of security. At this level, you can access any screens that have not been configured with a security level.

Technical Note

When entering data, event actions tied to key press and key release will not function. The state of the keys for a screen will be reset to 0 when the alarm summary is activated.

Technical Note

When you enter a password associated with a security level, you are changing the security level of the run-time engine.

14-3

To enter a password...

1. When the password text box appears, type in a password. This password must be attached to a security level that is the same as, or greater than, the security level of the screen you want to access.

    If you make a mistake, use the BACKSPACE key to erase the password, and then retype it.

2. Press ENTER.

Technical Note

Once you press enter, the password text box disappears. It will reappear only if there is an event configured that allows you to change the security level.

The security level of the run-time engine is reset to the one attached to the password you entered. You can now access any screens with security levels less than or equal to the current security level. If you enter an incorrect password, the current screen will continue to display.

For example, when you first start the run-time engine, it is set to security level 0. If a "Go to Screen" action attempts to open a screen set to level 10, a password text box will be provided. You must enter a password that is set for security level 10 or above to open the screen. If you enter the password for level 15, then the run-time engine's new security level will be 15. This means that any screens set to security levels from 0-15 can be opened without providing a password.

Technical Note

Zero is the default security level on the run-time engine. If you enter 0 in the password box during run-time, the security level of the run-time engine will be reset to 0.

14-4

Queuing Recipes

When a recipe is loaded, the run-time engine places it in an internal queue. When the current recipe has completed, the next recipe in the queue is loaded.

The queue will hold up to 100 recipes. If a recipe request is received when the queue already contains 100 recipes, the recipe will not be queued. When this occurs, the following alarm message is displayed on screen and logged in the alarm summary:

```
"Recipe Queue Exceeded"
```

Alarm Priorities

There are 16 alarm priorities with a choice of up to 16 corresponding colors for each priority. When an alarm is sent to the Alarm Summary, or Alarm Display Window (if enabled), the alarm is displayed in its configured priority color. If an alarm is tied to a custom shape, it will be displayed in the custom shape's configured priority color.

Master Alarm Shape

Master alarms are alarms that come from drivers or alarms that are configured to use the master alarm shape. These alarms are displayed if you have configured the alarm to use the master alarm shape and/or configured the alarm for a custom shape(s) as well. When the alarm display window is disabled, the master alarm shape appears at the bottom of the screen and when enabled, appears just above the alarm display window.

Technical Note

Shapes from the Master Alarm screen can be displayed on any screen you are editing. The shapes are not editable but are shown for positional information.

14-5

Alarm Display Window

The Alarm Display window gives a scrollable view of the active alarm(s) in the engine. The view includes the message, displayed in configured color, accompanied by a date and time for the configured alarms. The number of alarms, that can be viewed at one time in this window, can be from 2 to 12 for the 3100 target workstation, and from 1 to 24 for 3200/3300 target workstations. The depth of the Alarm Display window is configurable (refer to Chapter 5, Table 5-4). You can move up or down in the Alarm window by assigning the actions to the alarms for "Scroll Up" or "Scroll Down."

Using the Alarm Summary

The alarm summary is a screen that displays a log of the configured alarms that occurred in the current application. An event/action is configured in the development system (see Chapter 11) that opens the alarm summary during run-time, allowing you to view the alarm log.

Technical Note

While in alarm summary, event actions tied to key press and key release will not function. The state of the keys for a screen will be reset to 0 when the alarm summary is activated

---

Information in the Alarm Summary

The alarm summary displays the following information:

- Message associated with the alarm ("Boiler Temperature Returned to Normal")

- Value at which the alarm was triggered ("1500")

- Time and date when the alarm occurred ("18:18:53; 02/18/95")

- Choice of color/priority level for each alarm

- State of acknowledgment. If an alarm requires an acknowledgment, and it has not yet been acknowledged, a W (for waiting) appears at the end of the log entry. If the alarm has been acknowledged, an A appears at the

14-6

end of the log entry (an event/action must be configured to acknowledge an alarm).

- An "*" at the end of the line signifies that the alarm is active. No asterisk indicates that the alarm is inactive.

Once the number of configured alarms has been reached, and a new alarm occurs, an alarm is deleted from the alarm summary to make room for the new alarm. The order in which the alarms are scanned to find the one to delete is as follows:

1. The oldest inactive alarm that is not waiting for an acknowledgment (either the alarm doesn't require an acknowledgment or it has already been acknowledged).

2. The oldest active alarm that is not waiting for an acknowledgment (either the alarm doesn't require an acknowledgment or it has already been acknowledged).

3. The oldest inactive alarm that is waiting for an acknowledgment.

4. The oldest active alarm that is waiting for an acknowledgment.

Navigating in the Alarm Summary

You can move around in the alarm summary using the keyboard keys, alarm summary touch buttons, and function keys located directly below the touch zone labels.

14-7

Using Keyboard Keys

Key	Description
Up Arrow	Moves up one line in the alarm log
Down Arrow	Moves down one line in the alarm log
Page Up	Returns to the previous page
Page Down	Moves to the next page
Home	Moves to the beginning of the alarm log
End	Moves to the end of the alarm log
Esc	Exits the alarm summary

Using Alarm Summary Touch Buttons and Function Keys

If the target workstation for which you are configuring an application incorporates a touch screen, ten touch buttons (four of the six keys on 3100 target workstations and ten on the 3200 target workstation) will display at the bottom of the Alarm Summary screen and perform the following functions:

Table 14-1. Alarm Summary Touch Buttons

Touch Button	Description
Print	Prints the alarms displayed in the alarm summary (The Print touch zone does not appear on the 3100, as the 3100 does not have printing capabilities.)
Ack	Acknowledges the highlighted alarm
Del	Deletes the highlighted alarm
Up	Moves up one line in the alarm log
Down	Moves down one line in the alarm log
PgUp	Returns to the previous page
PgDwn	Moves to the next page
Home	Moves to the beginning of the alarm log
End	Moves to the end of the alarm log
Esc	Exits the alarm summary

14-8

If your target workstation doesn't have a touch screen, the Alarm Summary buttons will still display on the bottom of your screen. The function keys located below these buttons will perform the same functions when pressed.

Deleting Alarms

If you want to delete an alarm before the run-time engine does, use the up and down arrow keys to highlight the log entry you want to delete. Then press the DEL key.

Technical Note

You cannot delete an alarm that is waiting to be acknowledged. You must acknowledge it first, then delete it.

Any alarm with an "*" is active and cannot be deleted.

Acknowledging Alarms

To acknowledge an alarm while in the alarm summary, highlight the alarm and press the Ack key. This will cause the alarm acknowledgment action.

Exiting the Alarm Summary

Press the ESC key to close the alarm summary screen.

Calculating the Number of Data Points

Each driver has a list of data points that it must scan. At any time, the number of driver data points can be calculated by combining data points used in

- Alarms
- Current screens and the Master Template
- The current recipe request (if a recipe has been requested)

14-9

Exporting and Importing Data Points

This section provides details on how to export Comma Separated Variable (CSV) files from the Development System and the steps for importing CSV files into the Development System.

To export files...

1. Press the Export button.

2. A dialog box comes up for you to pick the file name you want to export.

3. Each data point is output to the chosen file.

4. Once the export is complete, you may edit the data points with an editor that supports the CSV format..

To import files...

1. Press the Import button.

2. Double-click on the file name from the dialog box (default extension is .CSV).

3. Verification process of the fields in the data point begins. If the data point is illegal, processing will automatically terminate.

If a tag name is in use on this device, a dialog box comes up and asks if you want to replace the tag. The dialog box choices are: *Yes, Yes to All*, and *No* (default is *Yes*). If you choose *No*, the process is terminated.

If the tag is valid, it is added to the data point list.

Updating Data Points

Most driver data points have an associated update rate. The driver will only update a data point after its scheduled update time has elapsed. The exception to this rule occurs when the user changes screens or issues a recipe request. When either of these situations occur, the drivers update all of their data points for the new screen or recipe. This ensures that all data points for the new screen or recipe are updated. Once this update has been completed, the drivers revert to the configured update rate for each data point.

14-10

Deleting Data Points

Each screen, alarm, and recipe in an application has a list of scanned data points associated with it. The engine builds a scan table with screen, alarm, and recipe data points. When a new screen is selected, the old screen data points are removed from the scan table and the new screen data points are added to the scan table.

Because data points cannot be deleted while they are being read, a delay may occur when you change screens or issue recipe requests. This could be the result of a PLC that is communicating very slowly, or, if a PLC is not connected, the process of reading the data point may take as long as the timeout configured for the PLC.

Understanding Error Codes

The run-time engine returns error codes associated with data display objects, as defined in Table 14-2.

Table 14-2. Data Display Error Codes

Code	Definition
!!!!	This is a permanent numerical error that the run-time engine cannot resolve. For instance, you may have specified a PLC data point value as an IEEE floating point and the attached PLC does not specify values in this format.
???	This indicates a temporary error. For example, the tag has not been read yet or there is a communication error.
****	This indicates the display fields are not large enough to display the number. For example, if you set the data display shape to display 2 left digits and 2 right digits (##.##), and the PLC returns a value of 117.333, you will see **.** on the run-time engine screen.

14-11

Appendix A – Using Windows 95/NT

This appendix provides information on using the Windows 95/NT Operating System with *SoftScreen*. For more detailed information, refer to your Windows 95/NT documentation.

Keyboard and Mouse Conventions

Table A-1 defines the keyboard conventions used throughout the *SoftScreen* manual.

Table A-1. Keyboard Conventions

Keyboard Convention	What It References
KEY+KEY	A key combination. To execute a key combination, press and hold the first key indicated while you press the second key indicated.
KEY,KEY	A key sequence. In a key sequence, you press and release the first key, then press and release the second key.
Shortcut keys	Keyboard shortcuts. These make it possible to access most menus and commands in *SoftScreen* without having to use your mouse. Keyboard shortcuts usually require that keys be used in combinations such as CTRL+S.

Table A-2 defines the mouse conventions used throughout this manual.

Table A-2. Mouse Conventions

Mouse Convention	What It Refers To
Mouse button	The primary mouse button. On a mouse with multiple buttons, the left mouse button is considered the primary button. If you have configured your mouse differently, use the button you have designated as primary to execute most mouse commands. Occasionally, the secondary button may be used to execute commands. The secondary button will be referred to as "the right mouse button."
Point	Position the tip of the mouse pointer over whatever you want to point to on the screen.
Click	Quickly press and release the primary mouse button one time. Occasionally you may be asked to "double click" the mouse button. To do this, press and release the primary mouse button two times in rapid succession.
Drag	Point, press, and hold down the primary mouse button as you move the mouse. This command is frequently used to select multiple items on the screen.

Windows 95/NT Features

This section defines Windows 95/NT features you will encounter when using *SoftScreen*.

Windows

When you start *SoftScreen*, the *SoftScreen* main window opens. This provides the menu options allowing you to create or open an application.

There are also windows associated with each of the tools within *SoftScreen*. These windows contain the menus and menu commands associated with the

A-2

tool you select. For instance, when you create or open an application, the Application Navigator window displays on your computer screen. When you open the Graphic Editor, the Graphic Editor window displays on your computer screen.

Menus

Menus display a list of commands from which you can select. Click on a menu command to select it.

Commands

Menus consist of drop-down lists of commands. There are several different types of menu commands, which are identified by certain features, as described in Table A-3.

Table A-3. Menu Command Features

Command Feature	Definition
Grayed text	Means the command is currently unavailable
Ellipsis (...)	Accesses a dialog box. You must provide more information in the dialog box before the command can be executed.
Arrow (▶)	Accesses a submenu with more menu commands
Check mark (✓)	Turns a feature on and off. A check mark indicates the feature is selected. When selected, the command performs an action immediately.

When a command has a keyboard shortcut, it appears to the right of the menu name. For example, the keyboard shortcut for the Open command is CTRL+O.

Dialog Boxes and Forms

To access a dialog box, click on a menu command followed by an ellipsis (...). Dialog boxes are used when more information is needed to complete a

A-3

command. When a dialog box is active, you cannot perform any other function in *SoftScreen* until you exit it.

Forms generally access pages on which you must provide more information. When forms are active, you can move among other *SoftScreen* elements.

Dialog boxes and forms contain a combination of buttons, check boxes, list boxes, radio buttons, and text boxes, as described in Table A-4.

Table A-4. Dialog Box and Forms Features

Windows Feature	Description
Buttons	Initiate actions. Click on a button or press ALT+ the underlined letter in the name of the button to perform its associated action.
Check boxes	Turn on or off options. All, a few, or none of the check boxes may be selected at one time. When a check box is selected, an X appears. Click on a check box to select or deselect an option.
List boxes	Display a list of choices. You can choose one list item in single-selection list boxes; you can choose several or all list items in multiple-selection list boxes.
Radio buttons	Provide a related list of options. Radio buttons are mutually exclusive; only one can be selected at a time. A filled button indicates an option is selected. Another option must be selected to deselect the current option.
Text boxes	Accept user-entered information.

The Window Menu

The Window menu is common to all *SoftScreen* tools. The commands on this menu are described in Table A-5.

A-4

280

Table A-5. Window Menu Commands

Command	Definition
New Window	Allows you to open a new window in the current tool
Cascade	Arranges windows so they overlap, with their title bars visible. This makes it easy to select any open window. To switch between cascaded windows, click on the window you want to view. This will bring the selected window to the forefront.
Tile Horizontally	Arranges open windows from the top edge of the screen to the bottom edge of the screen, so that all are visible and none overlap
Tile Vertically	Arranges open windows side by side, so that all are visible and none overlap
Arrange Icons	Arranges icons in a row, so that none overlap
List of Open Windows	Appears at the bottom of the Window menu. The windows are numbered in the order in which they were opened (when you close a window, the list is renumbered). The list holds up to 9 open windows. If more than 9 are open, the More Windows command opens the Select Window dialog box, which accesses all the open windows. A check mark indicates the active window.

A-5

Appendix B – Configuring Toolbars

You can create and customize up to 10 toolbars in *SoftScreen*. SoftScreen ships with five default toolbars: Application, Data, Draw, Screen, and Standard. You can also create five custom toolbars.

SoftScreen also allows you to change the visibility, position, and orientation of all toolbars.

Using Toolbar Buttons

Toolbar buttons allow you to access *SoftScreen* functions with the click of a button. This section describes the toolbar buttons available in *SoftScreen* and what features of the software they access.

When you place your cursor on any of the buttons, without pushing them, you will receive a tool tip, as well as a description of the button on the status bar. Tool tips provide a one- or two-word description of the button, helping you to identify its function.

Application Toolbar

The Application toolbar provides the following buttons. Some of these buttons are available only when the Application Navigator is active.

Button	Description
🔘	Application Navigator
🔘	Graphic Editor
🔘	Data Editor
🔘	Configure Engine. This button is only available when Application Navigator is active.
🔘	Cross Reference

B-1

Button	Description
	Generate
	Download
	Drivers. This button is only available when the Application Navigator is active.
	Tag Browser

Data Toolbar

The Data Toolbar provides the following buttons:

Button	Description
	Insert Symbol. This button is available only when you are able to insert symbols.
	Create Symbol. This button is available only when a symbol is selected.
	Passwords. This button is available only when the Application Navigator is active.
	Shape Properties. This button is available only when the Graphic Editor is active and a shape is selected.
	Animations. This button is available only when the Graphic Editor is active and a shape is selected.

Drawing Palette

The Drawing Palette is active only when the Graphic Editor is active. This toolbar provides the following buttons.

Button	Description
	Selection
	Ellipse
	Line

B-2

Button	Description
	Pie
	Polyline
	Arc
	Square
	Text Box
	Rectangle
	Touch Zone. This button is available only if you have a target workstation that is configured with a touch screen.
	Polygon
	Data Entry
	Circle
	Bitmap

B-3

Screen Toolbar

The Screen Toolbar provides the following buttons:

Button	Description
	Select All
	Flip Vertical
	Grid
	Align
	Visibility
	Group
	Zoom In
	Ungroup
	Zoom Out
	Bring to Front
	Zoom Selected
	Send to Back
	Zoom to Window
	Bring Forward
	Rotate
	Push Backward
	Flip Horizontal

B-4

286

Standard Toolbar

The Standard Toolbar provides the following buttons:

Button	Description
	New Application
	Paste
	Open
	Undo
	Close
	Delete
	Exit
	Print
	Save Application
	Help Topics
	Cut
	Using Help
	Copy
	About SoftScreen

Viewing Toolbars

You can show or hide toolbars, depending on your needs in the current application.

To show or hide toolbars...

1. Select the Toolbars command on the View menu. The Toolbars dialog box opens, as shown in Figure BB-11.

B-5

287
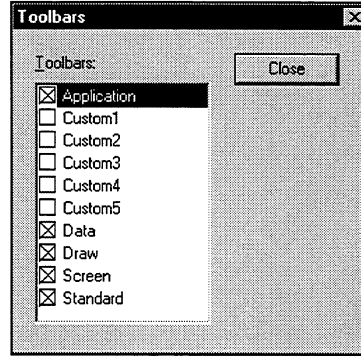
Figure B-1. Toolbars Dialog Box

2. Click on the toolbars you want to show or hide. An x appears in the checkbox when a toolbar is displayed.

3. Click on Close or press ENTER to return to the development system screen.

Adding and Deleting Toolbar Buttons

SoftScreen allows you to choose which buttons you want to include on your toolbars. The buttons are active in the tool in which they can be used and grayed if they cannot be used in the current tool. For instance, the Draw toolbar buttons (line, circle, square, etc.) are active in the Screen Editor, but grayed in the other tools.

To add and delete toolbar buttons...

1. Select the Customize Toolbars command on the Options menu. The Customize Toolbars form opens, as shown in Figure BB-22.

B-6
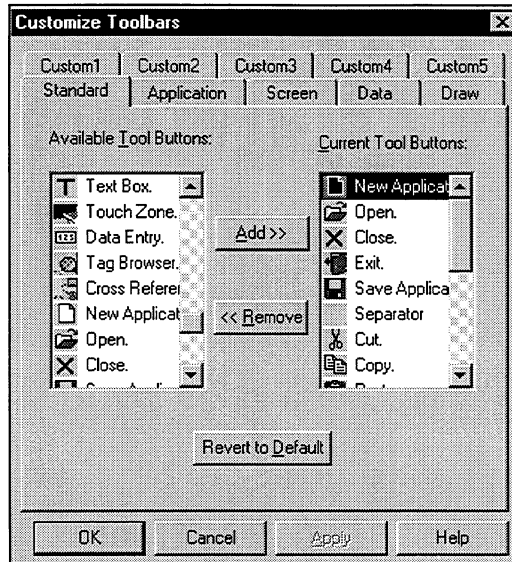
Figure B-2. Customize Toolbars Form

2. Click on the tab with the name of the toolbar you want to reconfigure. For instance, if you want to reconfigure the Draw toolbar, click on the Draw tab at the top of the form. The page associated with this toolbar opens.

    The Current Tool Buttons box lists the buttons currently on the selected toolbar. The Available Tool Buttons box lists the buttons you can add to the selected toolbar.

Technical Note

The buttons in the Available Tool Buttons box remain the same; the buttons in the Current Tool Buttons box vary depending on the toolbar selected. However, all toolbars have a separator button available. This button separates groups of common buttons (for example, cut, copy, and paste) from other buttons on the toolbar. You may use the separator button on a toolbar as many times as you want.

---

3. To remove a button currently on the toolbar, click on the name of the button in the Current Tool Buttons box, then click on the Remove button. The selected button is removed from the Current Tool Buttons box.

B-7

4. To add a button to the toolbar, click on the name of the button in the Available Tool Buttons box, then click on the Add button. The selected button is added to the Current Tool buttons box.

Technical Note

A new button is always added above the button highlighted in the Current Tool Buttons list box.

---

5. Click on the Revert to Default button if you want to revert to the toolbar's default settings. You can use this feature even after you have accepted the changes and exited the form.

6. If you want to see how the toolbar looks before configuring another toolbar or before exiting the Customize Toolbars form, click on the Apply button. This applies the changes you have made to the toolbar. (You may have to move the Customize Toolbars form to a new location in your application window to view the toolbar.)

   If you select the Apply button, you cannot cancel out of this form. The Cancel button is dimmed and the OK button changes to a Close button.

7. Press ENTER to accept changes to the toolbar.

Positioning Toolbars in the Application Window

There are several ways you can position toolbars in the application window. You can "dock" them on the top, bottom, or sides of the application window, or you can "float" them anywhere in the application window. You can also change their orientation, from vertical to horizontal or horizontal to vertical.

Docking Toolbars

To dock toolbars in the application window...

1. Click on the toolbar you want to dock and drag it to the side, top, or bottom of the application window until it turns into an outline box. You will not be able to move the toolbar unless you click on the gray area surrounding the buttons, not on the buttons.

B-8

> ## Technical Note
>
> If you place a horizontal toolbar against the side of the application window, it will change its orientation from horizontal to vertical. However, it will retain its orientation if you press CTRL while moving it.

2. Release the mouse button to dock the toolbar in its new position.

Floating Toolbars

To float toolbars in the application window...

1. Click on the toolbar that you want to move, and drag it anywhere within the application window. You will not be able to move the toolbar unless you click on the gray area surrounding the buttons, not on the buttons.

2. Release the mouse button once you have found the ideal location. A window, with a title bar, appears around the toolbar.

Changing Toolbar Orientation

To change the orientation of a toolbar (from horizontal to vertical or vertical to horizontal), press SHIFT while clicking on the toolbar window. This changes the toolbar to its new orientation.

B-9

Index

A

actions
    acknowledge alarm, 11-3
    assignment, 11-3
    change password level, 11-3
    enable data entry, 11-4
    go to alarm summary, 11-4
    load recipe, 11-4
    triggered by an alarm, 10-8
    triggered by an event, 11-3
    undoing, 6-11
addressing
    data points, 3-2
    internal register, 3-5
    system clock, 3-5
    system performance variables, 3-7
    testing and debugging variables, 3-6
alarm display, 5-9
Alarm Display Window, 5-9, 14-6
alarm priorities, 5-7, 14-5
alarm shapes, example, 10-10, 10-11, 10-12
alarm summary, 5-9
    alarm status, 14-6
    configuring event/action to go to, 11-4
    deleting alarms, 14-6
    exiting, 14-9
    viewing, 14-6
alarms
    acknowledging, 14-6
    actions, specifying, 4-40, 10-7
    alarm shapes, creating, 10-9
    analog, 10-4
    configuring, 5-7
    creating, 4-39

alarms (*continued*)
    definition, 5-1, 10-1
    deleting, 14-6
    discrete, 10-5
    into alarm settings, 10-6
    logging, 14-6
    out of alarm settings, 10-7
    printing during run-time, 5-10
    shape properties, 10-11
aligning shapes, 6-40
analog alarms, 10-4
animated text boxes, 6-20
animating shapes, 4-27
animations
    background color, 7-3
    fill pattern, 7-7
    fill percent, 4-30, 7-12
    foreground color, 4-28, 7-3
    line color, 7-3
    line type, 7-6
    Line Width, 7-5
    non-spatial, 7-1
    ordering, 7-24
    position, 4-34, 7-16
    rotate, 4-32, 7-21
    scale, 7-18
    spatial, 7-1, 7-11
    sweep angle, 4-34, 7-14
    text, 7-8
    visibility, 4-29, 7-10
applications
    analyzing memory usage, 13-3
    calculating memory requirements, 13-1
    closing, 4-42, 5-15
    converting, 2-2, 5-13

Index-1

293

A *(continued)*

applications *(continued)*
    creating, 5-2
    downloading, 4-23
    generating, 4-20, 4-42, 12-1
    layering, 5-1
    maximizing, 4-1
    minimizing, 4-1
    renaming, 5-4
    saving, 4-4, 5-3, 6-47
arcs, drawing, 6-18
assigning event/actions, 4-16
assignments, recipe
    failed, 9-6
    posted, 9-5

B

background color
    animating, 7-4
    specifying, 6-34
backup copies, making, 2-1
baud rate, setting for download, 12-6
bitmaps
    importing, 6-30
    inserting, 4-5, 6-30
    limitations, 6-30
    target workstation, 6-37
bounding box, using to select shapes, 6-43
buttons, A-4

C

character limitations
    engine, 6-20
    expressions, 3-16
    tag names, 3-1
check boxes, A-4
circles, drawing, 6-17
circular reference in expressions, 3-21

closing
    applications, 4-42, 5-15
    SoftScreen, 4-42
COM port errors, 4-25, 12-5
configuring
    Alarm Display Window, 5-9
    alarms, 5-7
    constants, 3-11
    data display shapes, 4-37
    data entry shapes, 4-37
    download port, 12-5
    drivers, 5-12
    keypad for event/actions, 4-17
    master alarms, 5-8
    run-time engine, 5-6
    tags, 4-11
    touch zones, 4-18
constants
    configuring, 3-11
    form, 3-12
    indexing, 3-18
    symbols, 8-28
contrast adjustment, 3-8
control graphic symbols, 8-18
conventions
    dialog boxes, A-3
    Windows, A-2
converting
    applications, 5-13
    customized SoftScreen symbols, 2-3
copying
    applications, 5-3
    screens, 6-6
    shapes, 6-46
    text, 4-1
creating
    applications, 5-2
    screen templates, 8-14
    screens, 6-1
    symbols, 8-7
cross reference tool, 3-23

Index-2

Index-3

Index-9