

Control **S**ystem **S**upervisor

Building Control Interface Software for Microsoft Windows

I n s t r u c t i o n M a n u a l

Table of Contents

Chapter One - Installation And Setup	
1.1 System Requirements.....	1-1
1.2 Setting Up Microsoft Windows To Run CSS.....	1-1
1.3 Installing CSS On Your Hard Drive.....	1-1
1.4 Removing CSS From Your Hard Drive.....	1-2
1.5 Program Authorization.....	1-2
Chapter Two - Tutorial: Getting Started	
2.1 Running CSS.....	2-1
2.2 Logging In To CSS.....	2-1
2.3 Main Menu Screen.....	2-2
2.4 Configuring The Communications Ports In CSS.....	2-2
2.5 Using Folders.....	2-3
2.6 Creating A New Controller.....	2-4
2.7 Configuring A Controller.....	2-4
2.8 Connecting With A Controller.....	2-6
Chapter Three - Tutorial: Graphic Displays	
3.1 Creating A Graphic Display.....	3-1
3.2 Editing A Graphic Display.....	3-2
3.3 Creating Control Points.....	3-4
3.4 Editing Control Points.....	3-5
3.5 Editing Components.....	3-5
3.6 Viewing A Graphic Display.....	3-6
3.7 Closing A Graphic Display.....	3-6
Chapter Four - Tutorial: Schedules	
4.1 Creating A Schedule.....	4-1
4.2 Modifying Schedules.....	4-2
Chapter Five - Tutorial: History Charts	
5.1 Creating A History Chart.....	5-1
5.2 View A History Chart.....	5-1
Chapter Six - Tutorial: Custom Reports	
6.1 Creating a Custom Report.....	6-1
6.2 Editing a Report.....	6-2
6.3 Editing Components.....	6-4
6.4 Calculations on Reports.....	6-5
6.5 Viewing a Report.....	6-5
6.6 Closing a Report.....	6-5
Chapter Seven - Script Files	
7.1 Script File Overview.....	7-1
7.2 Script File Commands.....	7.2
Chapter Eight - Tutorial: Other Features	
8.1 System Setup: General.....	8-1
8.2 System Setup: Communications.....	8-2
8.3 System Setup: Tools.....	8-3
8.4 Alarm Viewing.....	8-4
8.5 User Editing.....	8-5
8.6 Backup Controller's Memory.....	8-5
8.7 Restore Controller's Memory.....	8-6
8.8 Event Scheduling.....	8-6
8.9 Event Editing.....	8-7
8.10 Variable Watch.....	8-8
Chapter Nine - Technical Information	
9.1 Alarm Setup In Controller.....	9-1
9.2 Infinity Alarm Programming.....	9-1
9.3 AC256 Alarm Programming.....	9-2
9.4 Designing Displays.....	9-2
9.5 Display Diagnostics.....	9-3
9.6 Modem Setup.....	9-4
9.7 Directories And Filenames.....	9-4

9.8 Technical Support.....9-6

Chapter One - Installation and Setup

This chapter will guide you through installing and setting up Control System Supervisor (CSS) to operate properly on your computer.

1.1 System Requirements

The first thing you should do is verify that your computer is capable of running CSS. Almost any computer that will run Windows may be used with Control System Supervisor.

NOTE: CSS is not currently compatible with Windows NT.

Minimum System Requirements:

- 386 or faster IBM compatible computer
- 4 megabytes of RAM
- VGA video card and VGA color monitor
- 40 megabyte or larger hard disk
- Mouse or other windows compatible pointing device
- 1.44 megabyte 3 1/2" disk drive
- Microsoft Windows 3.1 or Windows95
- One or more communications ports (Comports)

Recommended Minimum System:

- 486DX or Pentium computer with VESA or PCI local bus
- 8 megabytes of RAM
- SuperVGA local bus video card and SuperVGA color monitor (for 256 Color or High Color mode)
- 100 megabyte or larger hard disk
- Mouse or other windows compatible pointing device
- 1.44 megabyte 3 1/2" disk drive
- Microsoft Windows 3.1 or Windows95

A SuperVGA card configured for 'High Color' or 'True Color' mode is highly recommended.

1.2 Setting up Microsoft Windows to Run CSS

The only setting in Windows required for CSS is that at least one communications port must be set up in the Windows Control Panel. All of the communications ports that you wish to use in CSS must also be set up in Control Panel. The exact setting used are not important, but Windows must know the ports exist.

CSS is compatible with any standard VGA resolution and color depth supported by Windows. However, a resolution of at least 800 by 600 and a color depth of greater than 256 ('High Color' or 'True Color' mode) are highly recommended.

1.3 Installing CSS on Your Hard Drive

To install CSS, insert diskette #1 in drive A: and proceed according to the following:

Windows 3.1 users:

- Select 'Run' from the 'File' menu.
- Type 'A:Setup' in then 'Command Line' field.
- Click the 'OK' button.

Windows 95 users:

- Select 'Run' from the 'Start' menu on the Windows task bar.
- Type 'A:Setup' in the 'Open' field.
- Click the 'OK' button.

The installation program will prompt you for a drive and directory to install TO. It is recommended that you install to the C:\CSS (or D:\CSS) directory if this is the first time you have installed CSS on this computer.

CSS will be copied to your hard drive automatically. When asked if you wish to create a program group (Win31) or add CSS to the 'Start' menu (Win95), choose 'Yes'

You will then be asked if you wish to move the program authorization on to your hard drive. This is required for CSS to operate properly without disk #1 in the drive. Selecting 'Yes' will move the authorization to your hard drive and enable CSS to operate. See 'Program Authorization' for more information.

1.4 Removing CSS from Your Hard Drive

Windows 3.1 users:

- Double click the left mouse button on the 'Un-install Control System Supervisor' icon in the 'Control System Supervisor' program group.

Windows 95 users:

- Double click the 'Add/Remove Programs' icon in 'Control Panel'. Select 'Control System Supervisor' and click the 'Add/Remove' button.

Selecting 'Automatic' un-installation will not delete any files that you have created in CSS. Because of this, the actual \CSS directory may not be deleted. Use File Manager or Explorer to delete the \CSS directory.

Selecting 'Custom' un-installation will let you manually select which files to delete.

1.5 Program Authorization

CSS requires that an 'authorization' file be present on at least one disk drive of the computer CSS is running on. Normally, when you install CSS the authorization will be copied to your hard drive. If CSS does not find the authorization file on the hard drive, it will check the diskette drives starting with drive A:. If it is not found on any of your disk drives, CSS will not run.

Your original diskette comes with 1 'install' of the authorization. In other words, you can install the authorization on one computer only. You can install CSS on multiple computers but only install the authorization on one of them. You can then carry the original diskette to any computer that CSS is installed on and insert it in the diskette drive to enable CSS to operate. You DO NOT need the original diskette to run CSS on the computer the authorization was installed on. If desired, more 'installs' may be purchased so you don't need to carry the original diskette around with you. Contact your Andover dealer for pricing and availability.

If you wish to move the authorization from diskette to hard drive or from hard drive to diskette, insert the original diskette in drive A: and run:

'A:Winmove A: C:' to move from diskette to hard drive, or

'A:Winmove C: A:' to move from hard drive to diskette.

You can determine how many 'installs' remain on your original diskette by running:

'A:Winmove A: C: /C'.

If you are running any type of disk defragmenting program such as 'Norton Utilities', make sure it is set to not move 'hidden' files, otherwise the authorization may be lost.

If the authorization is somehow lost, CSS can be re-authorized by typing in a special authorization code. Contact your Andover dealer for more details.

Chapter Two - Tutorial: Getting Started

2.1 Running CSS

Windows 3.1 users:

- Double click the left mouse button on the 'Control System Supervisor' icon in the 'Control System Supervisor' program group.
- If you would like CSS to run every time Windows 3.1 is loaded, make a copy of the 'Control System Supervisor' icon and place it in the 'Startup' program group. Refer to your Windows documentation for details on how to do this.

Windows 95 users:

- Select 'Programs' from the 'Start' menu, then select 'Control system Supervisor'.
- If you would like CSS to run every time Windows 95 is loaded, open the 'Startup' folder and create a shortcut to CSS. Refer to your Windows documentation for details on how to do this.

2.2 Logging In to CSS

At the log in screen (figure 2.1) type your 'username', press [Tab], then type your password and press [Enter]. The default username is 'CSS' and the default password is also 'CSS'. You should change this as soon as possible to avoid unauthorized access to CSS (see 'System Setup').



Figure Chapter Two .1 Login Screen

⇒ Tip! You can have CSS automatically log in for you every time CSS is executed. See 'System Setup' for more information.

2.3 Main Menu Screen

Once you have logged in to CSS you will see the 'Main Menu' screen (figure 2.2). The main menu is displayed when you are logged in to CSS. The dark area between the Main Menu and the 'Status Bar' is where all graphic displays, schedules, history charts, etc. will appear when in use, but for now it is empty.

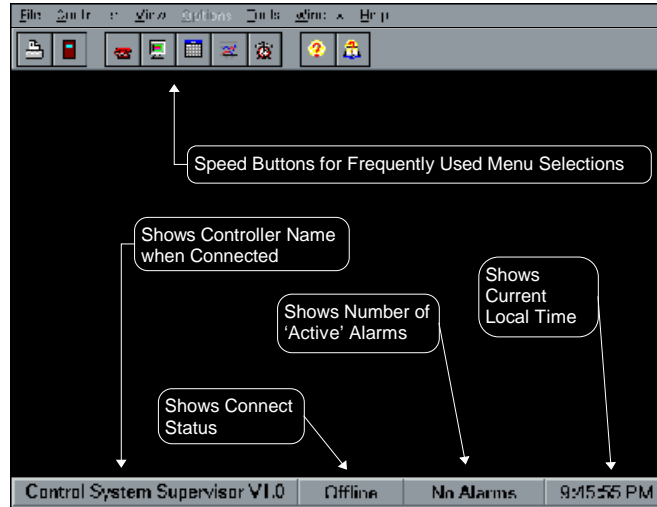
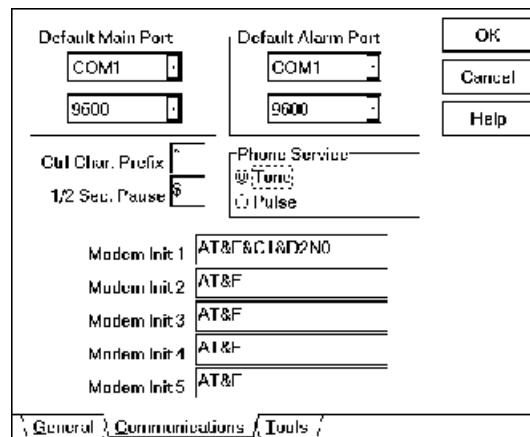


Figure Chapter Two .2 Main Menu Screen

⇒ Tip! You can have CSS automatically connect with a controller and open a graphic display every time CSS is executed. See 'System Setup' for more information.

2.4 Configuring the Communications Ports in CSS

You need to let CSS know which communications ports (Comports) to use before you can connect with a controller. From the main menu select 'File|Setup|System' (the | is used to separate menu selections, in other words, select 'File' then select 'Setup' then 'System').



Click on this 'Tab' to show the communications page.

Figure Chapter Two .3 Communications Setup

For now you can ignore most of these options. Make sure the 'Default Main Port' and 'Default Alarm Port' are set properly. The main port is the port you will use most often to connect to a controller. The alarm port is a secondary port that will be monitored for alarm messages called in from other controllers. Alarms will be received on both the Main and Alarm ports. The main port and alarm port may both be set to the same physical comport if you do not want to monitor alarms from controllers other than the one to which you are currently connected.

'Phone Service' must also be set properly if you will be using a modem to connect to controllers.

2.5 Using Folders

'Folder' is a term used to refer to the window that contains a list of items such as controllers, displays or schedules. Folders are used often in Control System Supervisor. A working knowledge of how to use folders is very important.

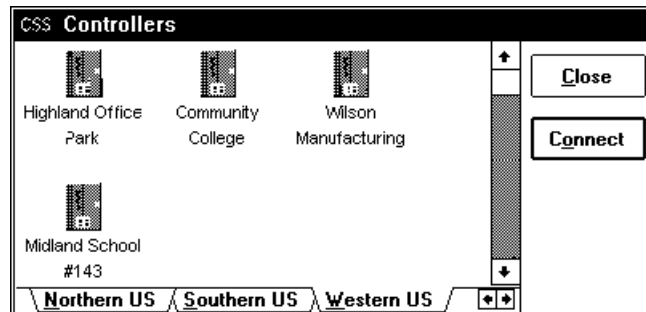


Figure Chapter Two .4 Sample Folder

The upper portion of the folder contains an icon and/or a description of each of the items in the folder. The bottom portion contains a row of tabs. Each of these tabs will display a different group of items when clicked. You may have as many tabs as you wish. Use these tabs to group the items in some logical order. You could group controllers by state, group graphic displays by the floor of the building they represent, etc. Planning ahead on how you want to group items is a good idea that will save you time and make the system easier to use.

Selecting Items

To select an item, simply click on it once to highlight it. You may then click one of the buttons on the right side. Double clicking an item is the same as selecting it and pressing the default button on the right. If there are more items than will fit in the folder window, a scroll bar will appear to the right of the items. Click anywhere on this scroll bar to scroll through the items. You may also make the folder larger by clicking and dragging the lower right corner of the folder. This will allow you to see more items at one time.

Editing Items

To add or edit an item, select it and press the right mouse button. A menu will appear with the following options:

- Edit** - Display the edit dialog box specific to this item.
- Change Icon** - Change the icon that represents this item.
- Create New** - Create a new item.
- Cut** - Delete the selected item and place it in the clipboard.
- Copy** - Copy the selected item to the clipboard.
- Paste/Insert** - Paste the item currently in the clipboard.
- List View** - Hide the icons and show a simple list of items.

Copying Items

It may be easier at times to make copies of existing items and change the copies rather than create whole new items. To do this, select the item you wish to copy, click the right mouse button and select 'Copy' from the pop up menu. The selected item is now in the 'clipboard'. You may now change to a different tab and click the right mouse button again. Select 'Paste/Insert' from the pop up menu and you have a copy of the original item that you may change as desired.

Sorting Items

You can change the position of an item in a folder by holding down the <Alt> key and left clicking in the folder. The item will be moved from its original position to the mouse cursor location. To sort items with the keyboard, hold down the <Alt> key while moving the item with the arrow keys.

Selecting Tabs

To select a different group of items, click on the tab that describes the group you wish to work with. If there are more tabs than will fit in the folder window, two small arrows will appear just to the right of the tabs. Click these arrows to scroll through the tabs. You may also make the folder larger by clicking and dragging the lower right corner of the folder. This will allow you to see more tabs at one time.

Editing Tabs

To add or edit a tab, select it and press the right mouse button. A menu will appear with the following options:

Rename - Change the name of the selected tab.

Create New - Create a new tab.

Delete - Delete the selected tab.

⇒ Tip! The name given to a tab may contain an '&' to make the next letter underlined. For example, '&Western US' will appear on the tab as Western US. You may then press 'W' to switch to that tab rather than clicking it.

2.6 Creating a New Controller

Before you can connect with a controller you must 'create' it in CSS. Click on the telephone button at the top of the screen, or select 'Controller|Connect' from the main menu. The controllers 'folder' will be displayed. Click the right mouse button anywhere in the blank area in the middle of the folder and select 'Create New' from the menu that will appear.

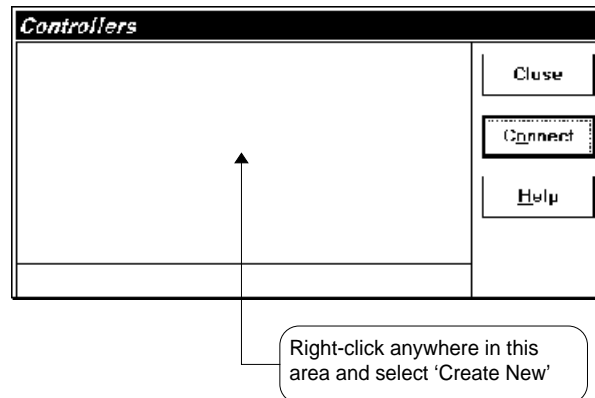


Figure Chapter Two .5 Controllers Folder

After selecting 'Create New' you will be prompted for the type of controller you want to create. Select the controller type and click 'OK'. For this tutorial, we will be creating an Andover Infinity controller, but you may choose any type and click the 'Help' button for information specific to that controller type.

2.7 Configuring a Controller

This is the Controller Edit Dialog (figure 2.6). Here is where you will enter the information necessary for CSS to log on to and operate with this controller. It is important that all fields have the correct information entered into them.

- 'Username' and 'Password' should be the same as you normally use to log on to this controller. It should have a high enough access to allow for backup and reload of the controller's memory.
- 'Controllers Name' should be the actual name given to the controller when it was installed.
- 'Disk Directory' and 'Alarm ID' can be any 1-8 characters you wish.
- **IMPORTANT!** 'Max Response Delay' must have a correct value. Click 'Help' button for more details.

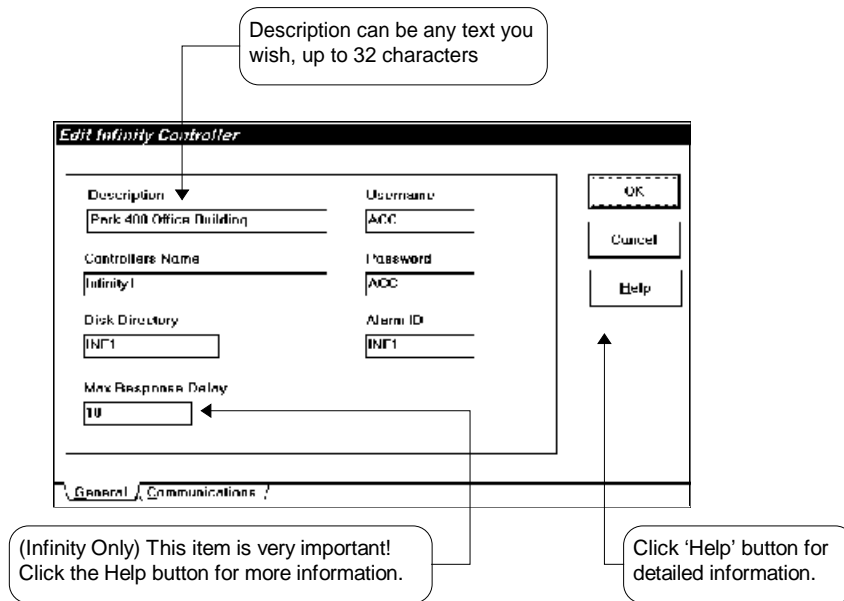


Figure Chapter Two .6 Controller Edit Dialog

Next, you need to supply CSS with the information necessary to connect with this controller (figure 2.7).

- Set 'Connect Type' to 'Direct' if controller is directly connected to the computer with a cable.
- For 'Modem Init. String', click the 'down arrow' to the left of the edit box and select the first string in the list.
- 'Pre-Logon' and 'Post-Logon' should be empty unless the controller is wired through a 'smart' serial switching device.
- For direct connections, 'Connect String' and 'Disconnect String' should be empty unless the controller is wired through a 'smart' serial switching device.
- Leave 'Suppress Logoff' unchecked.

Click the 'OK' button when finished entering this controller's information.

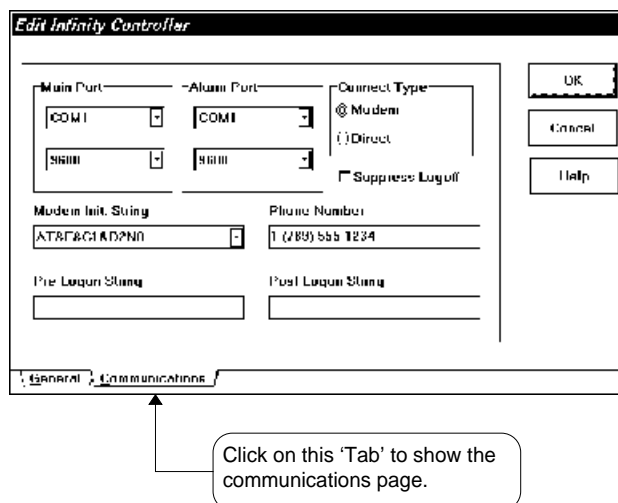
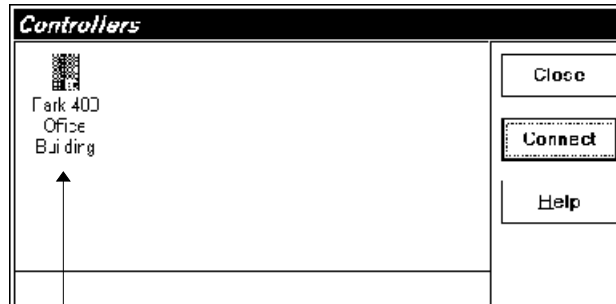


Figure Chapter Two .7 Controller Communications Dialog

2.8 Connecting with a Controller

To connect with a controller, simply click the left mouse button on the desired controller's icon, then click the 'Connect' button. CSS will attempt to connect with this controller. If all the information provided for this controller is correct, you should now be connected. The status bar at the bottom of the screen will display the controller's description and show 'Online'.



If you need to change this controller's configuration, click the right mouse button on this icon and select 'Edit'.

Figure Chapter Two .8 Controllers Folder

⇒ Tip! You can also 'double click' the left mouse button on the controller's icon instead of clicking the 'Connect' button.

Chapter Three - Tutorial: Graphic Displays

3.1 Creating a Graphic Display

A graphic display is basically a real-time report. It can display temperatures and setpoints on the screen as text, or using a variety of meters and gauges. Equipment can also be controlled with several types of switches and potentiometers.

Once connected with a controller, select 'Display' from the 'View' menu and the 'Displays' folder will appear. Click the right mouse button anywhere in the blank area in the middle of the folder and select 'Create New' from the menu that will be displayed.

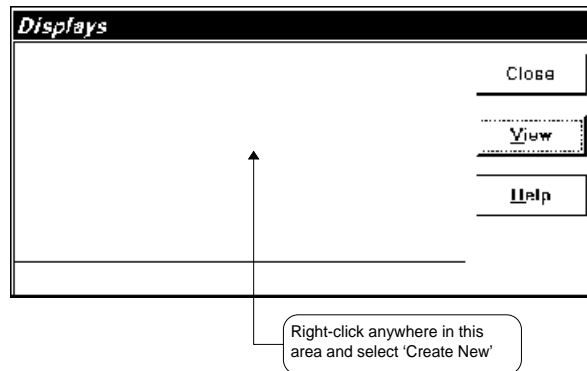


Figure Chapter Three .1 Displays Folder

You will be asked to enter a description and a filename. The description is any text you want to appear under the icon in the 'Displays' folder. The filename can be any 1-8 character string you choose. Click the 'Help' button for more information.

For this example, we will give the display a description of 'First Floor' and the filename 'FLOOR1' (you may use a different description and filename if you wish).

3.2 Editing a Graphic Display

With the 'Displays' folder open, click on the display you wish to edit and then click the 'View' button. A screen similar to figure 3.2 will appear. This is our new display (it is empty until we add something to it).

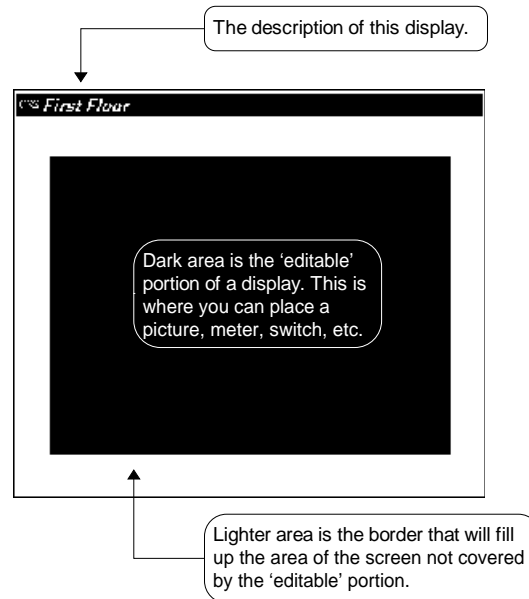


Figure Chapter Three .2 Empty Graphic Display

You probably want to edit the display and add something to it so it will be more useful. Select 'Edit Mode' from the 'Options' menu. The display is now in 'Edit Mode' and the description at the top will change to 'Editing: First Floor'. Notice also that the 'Options' menu has changed to include some new selections.

If you would like to add a bitmap (picture) to this display, copy it into the \CSS\BITMAP directory. All pictures used in CSS must be in standard Windows .BMP format and have a .BMP extension. The paint program that comes with Windows will create .BMP files, as well as convert .PCX files to .BMP.

Once the .BMP file has been placed in the \CSS\BITMAP directory, select 'Configure...' from the 'Options' menu. Click on the 'BMPFile' entry and then click the '+' button. Select the picture you want to place on this display. The picture will always be centered in the 'editable' area of the display.

Now let's add a 'component' to the display. Any meter, gauge, switch, etc. that you can add to a display is referred to as a 'component'. CSS comes with many pre-defined components. In this example we will place the average temperature reading for the first floor on the display. To see the components and choose one to use for the first floor's average temperature, select 'View Components' from the 'Options' menu.

The components will be displayed in the 'Components' folder.

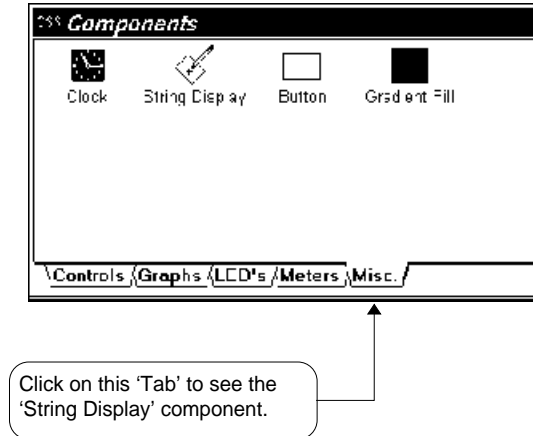


Figure Chapter Three .3 Components Folder

For this example, choose the 'String Display' component because it is the easiest to use. Click the left mouse button on it (it should now be highlighted) and then click on the displays 'editable' area at the approximate location that you want to place this temperature reading.

This component is now a part of the display. You should see a blue square with eight red 'handles' around it and 'Value=' written inside. The handles indicate that this is the 'selected' component.

As you move the mouse cursor over the components handles you will see the mouse cursor changing its shape. If you place the cursor over one of these handles and hold the left mouse button down you will be able to re-size the component as you move the mouse around the display. You can also press and hold the left mouse button anywhere else on the component and move the component itself around the display.

⇒ Tip! You can hold down the <Ctrl> key and click to select multiple components. They can then be moved around, cut, deleted, etc. at the same time.

The component is actually working now, but we have not yet told it what controller variable (input, output, etc.) to show. Go ahead and close the components folder now to get it out of your way by selecting 'View Components' again from the 'Options' menu.

Make sure the component is selected (has the eight red handles around it) then click and hold the right mouse button down on top of the component. This will show a menu of options (consult the help file for a description of these options). Select 'Control Point'.

⇒ Tip! Most of these menu selections also have keystrokes to activate them. This can make editing many components much easier. The keystrokes are listed on the right side of the menu itself.

3.3 Creating Control Points

A control point is any variable, input, output, flag, etc. in the controller that you want CSS to use on a display. Any control point you want to show on a display MUST be created in the 'Control Points' folder.

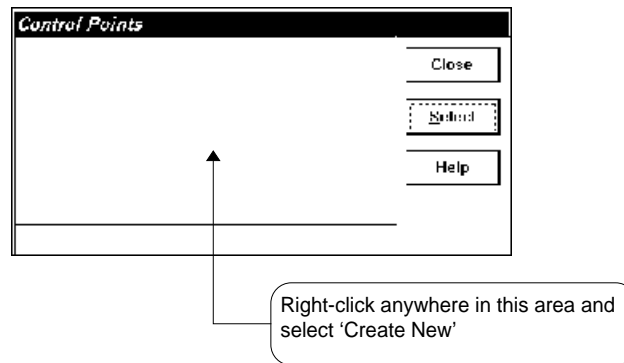


Figure Chapter Three .4 Control Points Folder

When creating a new control point, it is important to select the correct point 'type'. The following is a list of types and a few examples.

- **Digital** - Digital output (fan or chiller), or a digital input (air flow sensor or remote override switch).
- **Analog** - Analog output (rooftop control unit or vane), or an analog input (temperature or humidity sensor).
- **Tri-State** - Any tri-state output with valid states of ON, OFF and -ON.
- **Variable** - A 'V' variable (AC256) or numeric variable (Infinity).
- **Flag** - An ON/OFF variable.
- **Time** - A CSS specific time variable for use with custom schedules. Not the same as a controller TimeDate variable.
- **Date** - A CSS specific date variable for use with custom schedules. Not the same as a controller TimeDate variable.
- **String** - An Infinity string variable.

For our example of the first floor average temperature, select 'Analog' as the point type.

3.4 Editing Control Points

Here you will give CSS the information necessary to access the control point. The information includes:

- **Point Name** - The actual name of the point in the controller. For Infinity, the point name may also contain a controller name (for example, Infinity2 OutsideAir).
- **Point Type** - See Creating Control Points (above) for more information.
- **Units** - Set this to the engineering units of the point (Degrees, Volts, etc..) This is optional.
- **Toggles** - These two options control whether this point may be modified and disabled from a display. The user currently logged in to CSS would also have to have a password level that allows point modifying.

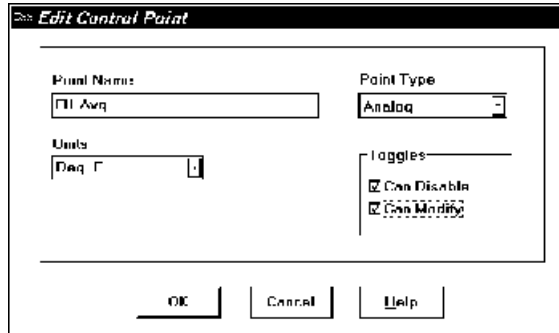


Figure Chapter Three .5 Control Point Edit Dialog

In our example the point is named 'F11.Avg' but you should supply the name of a valid temperature input on this controller. Check the 'Can Disable' and 'Can Modify' boxes if you want to be able to modify this input from a display.

Click the 'OK' button to save this control point to disk. You can now click this point's icon and then click the 'Select' button of the Control Points folder. The display should begin to show the current temperature on the screen, although you probably want to make the component show something more useful than 'Value=73.2'.

3.5 Editing Components

To edit the appearance and behavior of a component, select it by clicking the left mouse button anywhere on the component. It will then have eight red sizing 'handles' around it. Click and hold the right mouse button over the component and a menu will appear. Select 'Edit...' or press <Ctrl>-E and you will see a dialog box similar to figure 3.6.

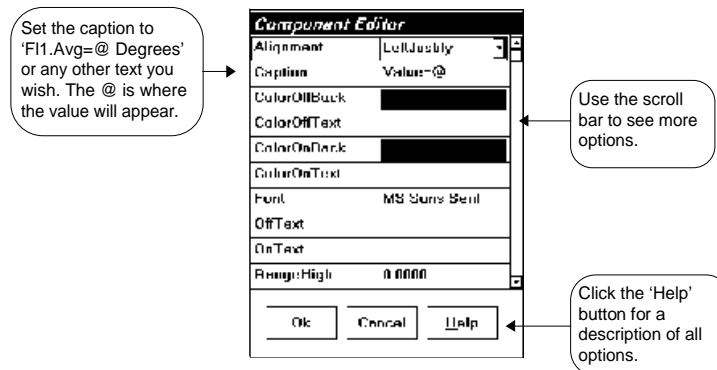


Figure Chapter Three .6 Component Editor

Change the caption to read 'First Floor Temperature is @ Degrees' or any text you wish this component to show. Place an '@' where you want the actual value read from the controller to be inserted into the text. Feel free to change the color, alignment or any other options you wish to try. You can always click the 'Cancel' button to abort all of the changes you have made. Click 'OK' to save the changes to this component.

After changing the caption of this component, it may not be large enough to display all the text. You can grab one of the component sizing handles and move the mouse around until it has the appearance you want.

Once you are satisfied with a component's appearance, you may want to click the right mouse button on it and select 'Save as Component'. This will add it to the components folder, saving the size, color and behavior. You can then easily place it on other displays by selecting it from the components folder just like one of the pre-defined components. You should probably not save every component you design because eventually you will have so many that it would be difficult to find the one you want.

3.6 Viewing a Graphic Display

To view a display, select 'Display' from the 'View' menu and a 'Displays' folder similar to figure 3.7 will appear. Highlight the display you wish to view and click the 'View' button. You may also double click the left mouse button on the icon of the display you wish to view.

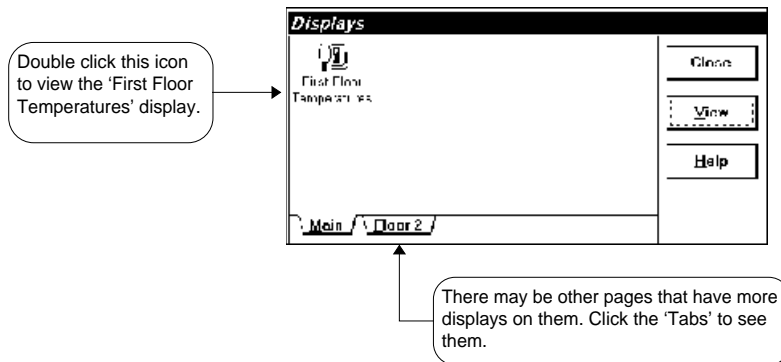


Figure Chapter Three .7 Displays Folder

Some displays may contain components that can be manipulated with the mouse. These components might include switches, potentiometers or text strings.

Switches may be changed by clicking on them, while potentiometers can be changed by clicking and dragging the left mouse button on them. If, while dragging the mouse, you decide that you do not want to change the value, you can move the mouse off of the component and it will revert back the value it had previously.

If modifications are allowed to this component you may click the right mouse button on it to allow you to enable/disable the control point, modify the points value, or get information on the point. Your system administrator has control over what may be modified.

⇒ Note! Modifying a control point does NOT automatically disable it.

3.7 Closing a Graphic Display

When you are finished viewing a display it can be closed by selecting 'Close' from the 'Window' menu. A display may also be closed by double clicking the left mouse button on the Windows 'Control Menu' at the top left of the display.

Displays should always be closed when you are finished viewing them because having unnecessary displays open will slow the update of all other displays.

Chapter Four - Tutorial: Schedules

4.1 Creating a Schedule

A schedule is a convenient way to control equipment ON/OFF times. CSS displays a grid of times and dates that you can modify and CSS will automatically update the programming in the controller. The schedules operate in the controller by way of a pre-defined program that is loaded into the controllers memory. This program will set a controller variable to a specific value based on the time of day (1,2,3 or 4 depending on which ON/OFF pair the current time falls within, or 0 if it does not fall within any ON/OFF pair). The controller programming can then reference this variable to control equipment.

Once connected with a controller, select 'Schedule' from the 'View' menu and the 'Schedules' folder will be appear. Click the right mouse button anywhere in the blank area in the middle of the folder and select 'Create New' from the menu that appears.

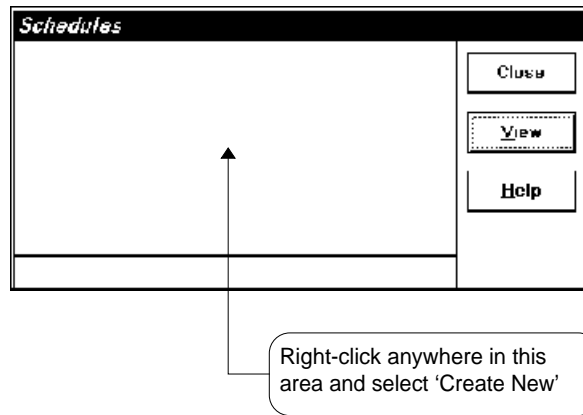


Figure Chapter Four .1 Empty Schedules Folder

Select the type of schedule you would like to use and click the 'OK' button.

⇒ NOTE! This chapter does not cover 'Custom Schedules'. They are actually graphic displays that are stored in the Schedules folder. See the chapter on Graphic Displays for more information.

Next, you will have to supply some details on how you want the schedule to be stored in the controller. The information needed varies widely between different controller types. Click the 'Help' button on the 'Edit Schedule' form for details specific to the type of controller you are working with.

4.2 Modifying Schedules

To view or modify a schedule, select 'Schedule' from the 'View' menu and a 'Schedules' folder similar to figure 4.2 will appear. Highlight the schedule you wish to view and click the 'View' button. You may also double click the left mouse button on the icon of the schedule you wish to view.

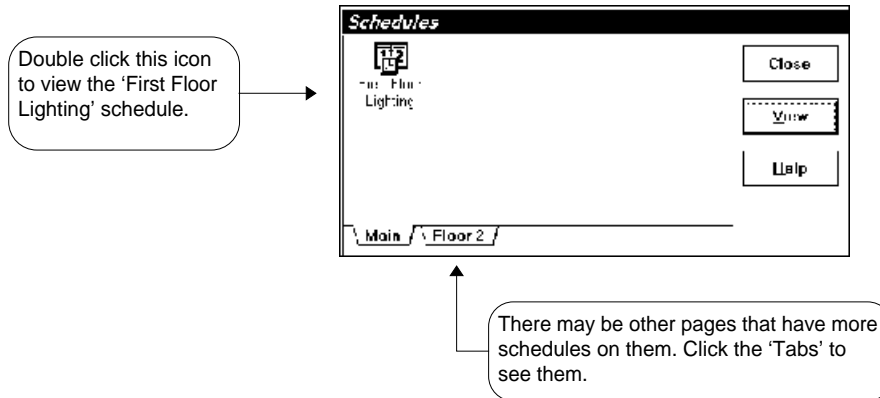


Figure Chapter Four .2 Schedules Folder

Clicking the view button will display a schedule form similar to figure 4.3. Click the left mouse button on the time or date you want to modify and then simply type the new value. You may also use the arrow keys to move around the grid. After you have made all the changes that you want to make, click to 'OK' button to save the changes and optionally load the changes into the controller. Click the 'Cancel' button to abort all the changes you have made.

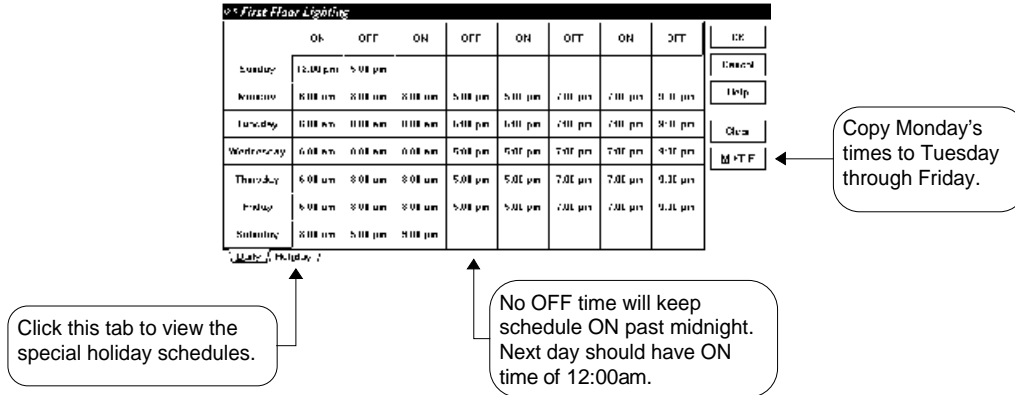


Figure Chapter Four .3 Schedule Edit Screen

Below are some important facts to keep in mind when modifying schedules.

- Times may be entered as am/pm or military times (2200 or 10:00pm), but will always be displayed as am/pm times.
- Press the 'backspace' key then [Enter] to clear a time or date.
- For times, schedule will be ON as soon as the minute changes to the ON time and OFF when the time changes to the OFF time.
- Holidays become active at midnight on the 'Begin' date and remain active through 11:59pm on the 'End' date.
- To keep schedule ON continuously past midnight (e.g. 10:00pm until 2:00am), enter 10:00pm for the ON time and no OFF time. Set the next day to 12:00am ON time and 2:00am OFF time.
- ON/OFF pairs do not have to be entered in chronological order. You can use three pairs for normal scheduling and the forth pair to enter special times.
- The schedule MUST be loaded into the controller for the changes to take effect.

Chapter Five - Tutorial: History Charts

5.1 Creating a History Chart

A history chart displays past values of control points in an easy to understand graphical format. This allows you to quickly determine how well your system is operating, fine tune the controllers programming and display energy usage and savings.

Once connected with a controller, select 'Schedule' from the 'View' menu and the 'Schedules' folder will be appear. Click the right mouse button anywhere in the blank area in the middle of the folder and select 'Create New' from the menu that appears.

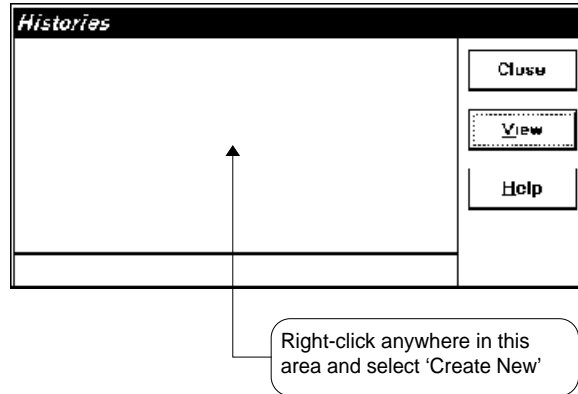


Figure Chapter Five .1 Empty Histories Folder

Next, you will have to supply some details on what type of data you want to display on the chart and how you want it to appear. The information needed varies widely between different controller types. Click the 'Help' button on the 'Edit History' form for details specific to the type of controller you are working with.

5.2 View a History Chart

To view a history chart, select 'History' from the 'View' menu and a 'Histories' folder similar to figure 5.2 will appear. Highlight the history you wish to view and click the 'View' button. You may also double click the left mouse button on the icon of the chart you wish to view.

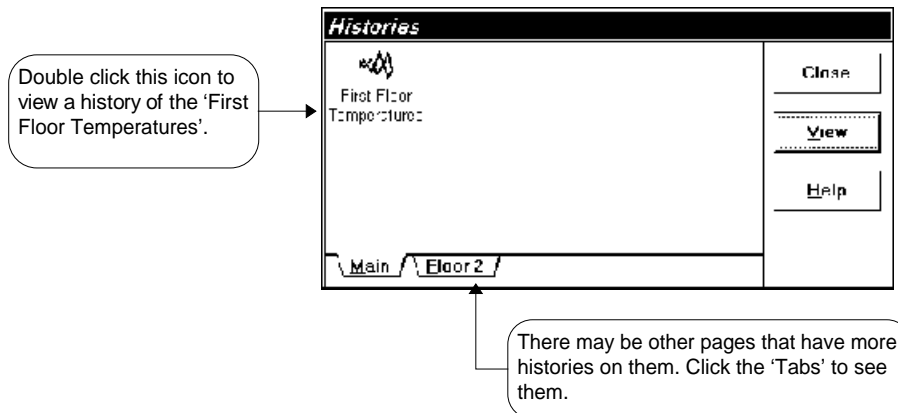


Figure Chapter Five .2 Histories Folder

Almost all aspects of a chart's appearance can be changed. The row of buttons along the top of the chart allow changing the type of chart (2D, 3D, line, bar, etc.). Once you are satisfied with the chart's appearance, click the 'OK' button to save the chart. Close the window through the Windows 'Control Menu' in the upper left (or press <alt>-F4) to cancel the changes. Please note that canceling changes will not affect the data itself, only the appearance of the chart.

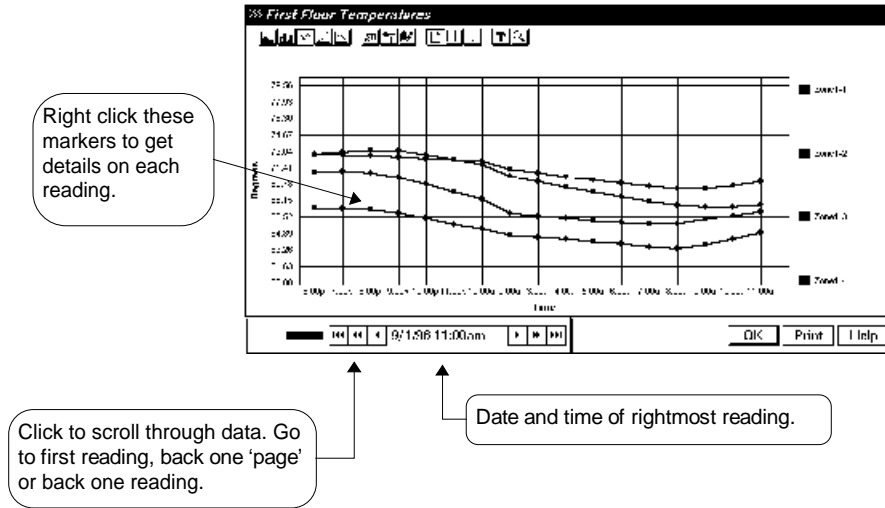


Figure Chapter Five .3 History Chart - 2D Lines

The history data may also be viewed in a tabular format. This is useful for easily determining the exact values of the data. Clicking the 'OK' button when the data is displayed in tabular format will cause the chart to default to tabular format every time the chart is viewed.

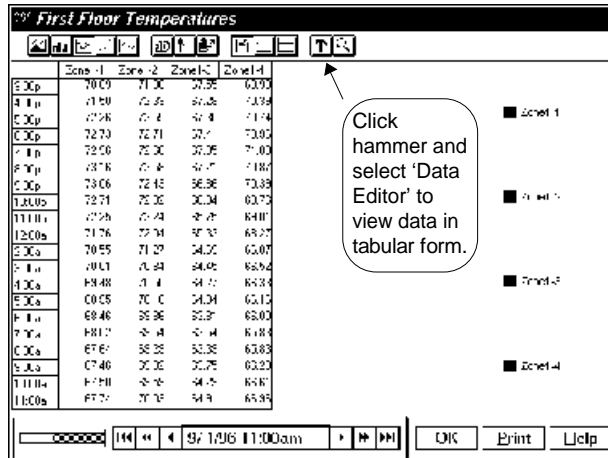
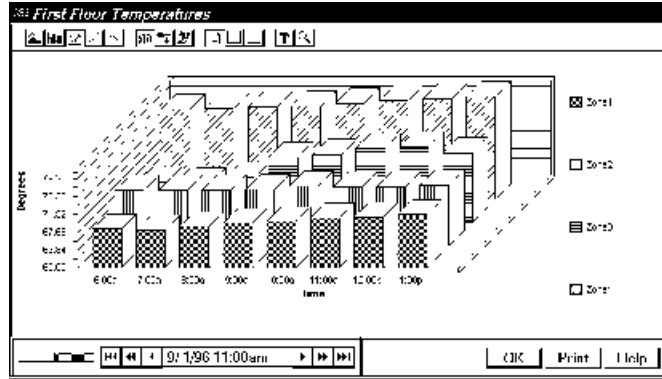


Figure Chapter Five .4 History Data - Tabular Format

Note that the bottom-most reading in tabular format corresponds to the right-most (or most recent) reading on graphical charts.

A variety of chart types can be used to display virtually any type of data. Click the 'Help' button for more details. Any user can change the appearance of the chart, but the changes will only be saved if their password level allows display/schedule/history editing.

Click these buttons to change the appearance of the chart. Line or bar, 2D or 3D, angles and scale.



Type a date and time to view the reading nearest that time.

Figure Chapter Five .5 History Chart - 3D Bars

Chapter Six - Tutorial: Custom Reports

6.1 Creating a Custom Report

Reports are very similar to graphic displays with a few exceptions:

- A report cannot be sized. The entire report will be scaled to fit a single page on your particular printer.
- The control point values are read only once, when the report is first opened.
- Reports can be automatically printed.
- Not all of the graphic display components are available with reports.
- The 'String' component can have a field name, and a calculation that can modify the value displayed.

Once connected with a controller, select 'Report' from the 'View' menu and the 'Reports' folder will appear. Click the right mouse button anywhere in the blank area in the middle of the folder and select 'Create New' from the menu that will be displayed.

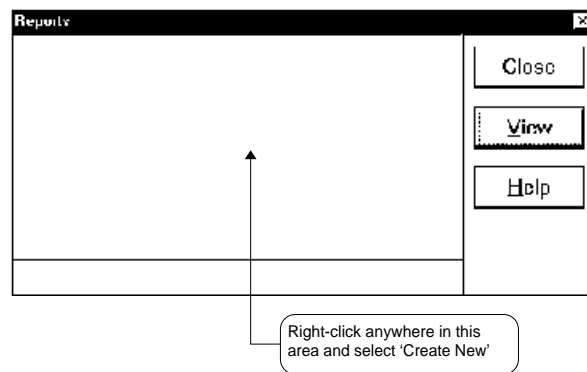


Figure Chapter Six .1 Reports Folder

You will be asked to enter a description and a filename. The description is any text you want to appear under the icon in the 'Reports' folder. The filename can be any 1-8 character string you choose. Click the 'Help' button for more information.

For this example, we will give the report a description of 'First Floor Temperatures' and the filename 'FLOOR1' (you may use a different description and filename if you wish).

6.2 Editing a Report

With the 'Reports' folder open, click on the report you wish to edit and then click the 'View' button. A screen similar to figure 6.2 will appear. This is our new report (it is empty until we add something to it).

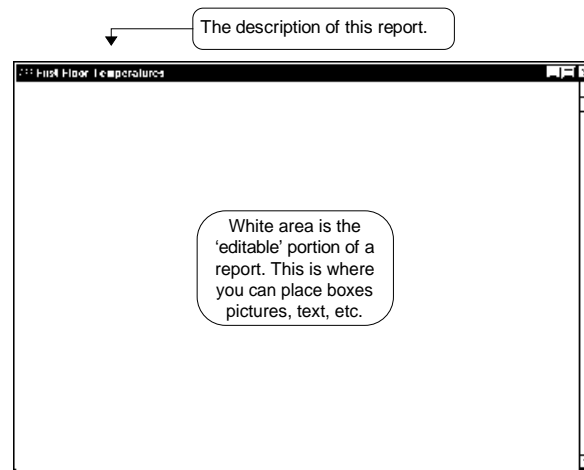


Figure Chapter Six .2 Empty Report

You will probably want to edit the report and add something to it so it will be more useful. Select 'Edit Mode' from the 'Options' menu. The report is now in 'Edit Mode' and the description at the top will change to 'Editing: First Floor Temperatures'. Notice also that the 'Options' menu has changed to include some new selections.

Now let's add a 'component' to the report. Any box, line, picture or text string that you can add to a report is referred to as a 'component'. CSS comes with several pre-defined components. In this example we will place the temperature readings for the first floor on the report. To see the components and choose one to use for the first floor's temperature, select 'View Components' from the 'Options' menu.

The components will be displayed in the 'Components' folder.

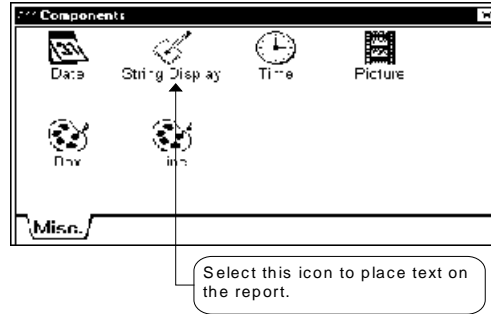


Figure Chapter Six .3 Components Folder

For this example, choose the 'String Display' component. Click the left mouse button on it (it should now be highlighted) and then click on the reports 'editable' area at the approximate location that you want to place this temperature reading.

Select the control point that represents one of the first floor zone temperatures. For this example we will assume the point is called 'TEMP1.1'. See chapter 3 for information on adding control points to CSS.

This component is now a part of the report. You should see a blue square with eight red 'handles' around it and 'Value=' written inside. The handles indicate that this is the 'selected' component.

As you move the mouse cursor over the components handles you will see the mouse cursor changing its shape. If you place the cursor over one of these handles and hold the left mouse button down you will be able to re-size the component as you move the mouse around the report. You can also press and hold the left mouse button anywhere else on the component and move the component itself around the report.

⇒ Tip! You can hold down the <Ctrl> key and click to select multiple components. They can then be moved around, cut, deleted, etc. at the same time.

6.3 Editing Components

To edit the appearance and behavior of a component, select it by clicking the left mouse button anywhere on the component. It will then have eight red sizing 'handles' around it. Click and hold the right mouse button over the component and a menu will appear. Select 'Edit...' or press <Ctrl>-E and you will see a dialog box similar to figure 6.4.

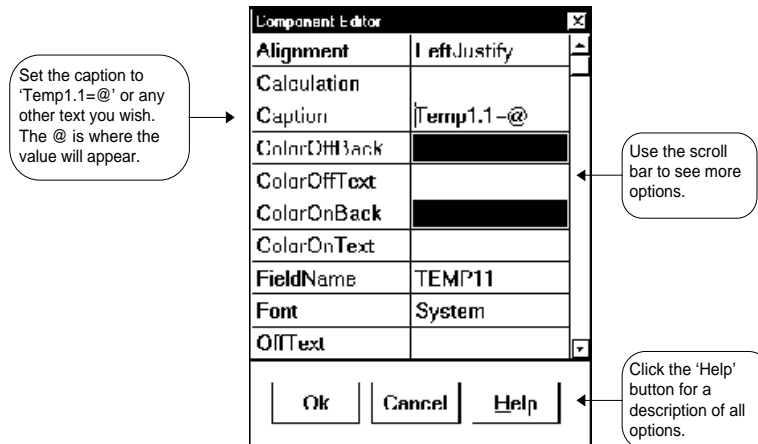


Figure Chapter Six .4 Component Editor

Change the caption to read 'Temp1.1=@ ' or any text you wish this component to show. Place an '@' where you want the actual value read from the controller to be inserted into the text. Feel free to change the color, alignment or any other options you wish to try. You can always click the 'Cancel' button to abort all of the changes you have made. For this example, set the 'Field Name' to 'TEMP11'. You can normally use any field name you wish. Click 'OK' to save the changes to this component.

After changing the caption of this component, it may not be large enough to display all the text. You can grab one of the components sizing handles and move the mouse around until it has the appearance you want.

Once you are satisfied with a component's appearance, you may want to click the right mouse button on it and select 'Save as Component'. This will add it to the components folder, saving the size, color and behavior. You can then easily place it on other reports by selecting it from the components folder just like one of the pre-defined components. You should probably not save every component you design because eventually you will have so many that it would be difficult to find the one you want.

Repeat the above steps for as many zone temperatures as there are on the first floor. For this example we will assume two sensors, named 'TEMP1.1' and 'TEMP1.2', with the 'Field Name' set to 'TEMP11' and 'TEMP12'.

When you have placed all the zone sensor readings as desired, place another string component on the display and when prompted for a control point, press the close button without selecting a point. We will use this string as a calculated field, so we don't need it to reference any control point.

Change the caption of this new string to read 'Floor 1 Average=@ ' or any text you wish this component to show. To complete this example, set the 'Calculation' field to '(TEMP11+TEMP12) / 2'. This tells the component to add the values of the fields 'TEMP11' and 'TEMP12' together, then divide the result by 2 to obtain the average first floor temperature.

6.4 Calculations on Reports

A calculation can be used to modify the value displayed for the control point. Use +, -, * and / in any order you wish but multiplication and division are always evaluated before addition and subtraction. Enclose sections of the calculation in parenthesis to force another order of evaluation.

Example: $10+10 / 2$ equals 15, but
 $(10 + 10) / 2$ equals 10

Several built-in variables are available:

\$LONGDATE	Displays the current date (Saturday, February 08 1997)
\$SHORTDATE	Displays the current date (2/08/97)
\$LONGTIME	Displays the current time (12:30pm)
\$SHORTTIME	Displays the current time (12:30)
\$LONGDOW	Displays the current day of week (Saturday)
\$SHORTDOW	Displays the current day of week (Sat)
\$LONGMONTH	Displays the current month (February)
\$SHORTMONTH	Displays the current month (Feb)
\$LONGYEAR	Displays the current year (1997)
\$SHORTYEAR	Displays the current year (97)
\$MONTH	Displays the current month (01-12)
\$DAY	Displays the current day (01-31)
\$HOUR	Displays the current hour (00-23)
\$MINUTE	Displays the current minute (00-59)
\$SECOND	Displays the current second (00-59)

These variable cannot be embedded in a calculation. They must be the ONLY text in the calculation field. Current date and time are read from the computer CSS is currently running on, not from the controller.

6.5 Viewing a Report

To view a report, select 'Report' from the 'View' menu and a 'Reports' folder similar to figure 6.5 will appear. Highlight the report you wish to view and click the 'View' button. You may also double click the left mouse button on the icon of the report you wish to view.

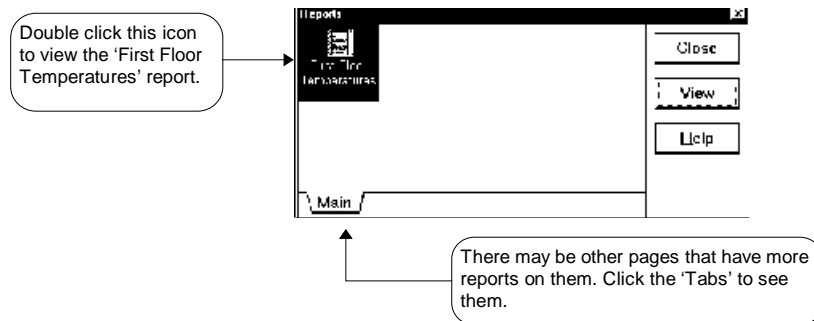


Figure Chapter Six .5 Reports Folder

Reports can be printed automatically using the Event Scheduler, pressing the 'Print' button while a report is being viewed, a user defined button on a graphic display, or through a script file by using the 'CSSPrintReport' command.

6.6 Closing a Report

When you are finished viewing a report it can be closed by selecting 'Close' from the 'Window' menu. A report may also be closed by double clicking the left mouse button on the Windows 'Control Menu' at the top left of the report. Reports should always be closed when you are finished viewing them.

Chapter Seven - Script Files

7.1 Script File Overview

Script files are small programs that you can write to automate certain tasks and extended the functionality of CSS. The script files implemented in CSS are Microsoft Visual Basic for Applications (VBA) V3.0 compatible. VBA is the same language that is used in many Microsoft products such as MS Access. A separate help file (SaxBasic.Hlp) is included that explains all of the VBA commands available for use.

Several good books about VBA are available that will help you to learn how to write elaborate VBA scripts. You may even already have documentation for VBA in your MS Access or MS Excel manuals. Most of the scripts you will need to write in CSS are generally going to be very simple, but if you do decide you need a book about VBA make sure to look for a book on Visual Basic for Applications, not Visual Basic the program. There are a few example scripts in the \CSS\SCRIPT directory for you to use or modify as necessary.

Script files may be executed in several different ways:

- Selected from the menu - Select "Execute Script" from the "Tools" menu.
- From a Graphic display - A button on a graphic display may be set to execute a script file.
- As a scheduled event - Set a script to execute hourly, daily, monthly, etc.
- On reception of an alarm - An incoming alarm may trigger a script file to execute.

All script files must be placed in the \CSS\SCRIPT directory.

Edit the file 'SHELL.BAS' in the \CSS\SCRIPT directory for an empty program into which you can start adding commands.

7.2 Script File Commands

All CSS specific commands are prefixed with 'CSS'. These commands may be freely mixed with the built-in VBA commands.

CSSAutoModeOn <no parameters>

Prohibits CSS from displaying dialog boxes that require user input. This command should be used when executing a script file while the computer will be unattended. Otherwise the script file may be paused for hours waiting for someone to press a key. Be aware that if CSS needs to ask the user a question (such as "Abort Changes?") because it was left in some type of editing mode, the answer will always default to NO.

CSSAutoModeOff <no parameters>

Enables CSS to display dialog boxes that require user input. See CSSAutoModeOn. This is the default mode.

CSSBackup "Data to Backup", "Path and Filename"

Save a controllers memory to disk. "Data to Backup" follows the same rules as specified in Event Editing. "Path and Filename" can be any valid Windows filename (e.g. "C:\CSS\BACKUP\BACKUP.PRG").

Returns TRUE if the backup was completely successful. CSS must already be connected for this command to work properly.

Example:

If CSSBackup "1 2 3 4 5 V M C", "C:\CSS\BACKUP.PRG" then Debug.Print "Backup Successful"

CSSCaptionSet "Text for Caption"

Sets the caption at the top of the main CSS window to the text specified. This is useful for informing the user what as to what action is taking place, or for debugging a script file. You may set the caption as often as you like.

CSSCollectHistory "Filename"

Collects and stores the historical data for the history chart specified by "Filename". This is the name supplied in the "Filename" entry of the history edit dialog box. Do not include the filenames extension.

Returns TRUE if the history collection was completely successful. CSS must already be connected for this command to work properly.

Example:

If CSSCollectHistory "FANHIST" then Debug.Print "History Collection Successful"

CSSComCaptureFile "Filename" , <Overwrite Flag>

Opens a file that all further input from the controller will be copied into. "Filename" is any valid Windows path and filename. "Overwrite Flag" should be 1 to overwrite the existing file, or 0 (zero) to append to the end of the existing file.

Example:

```
'capture and print a report
CSSComCaptureFile "\CSS\CHREPORT.TXT",1 'save in \CSS\CHREPORT.TXT, overwrite file if present
CSSComTransmit "CHREPORT^M" 'request the chiller report
CSSComWaitString "R>" , 30 'wait up to 30 secs for the R> prompt to be received
CSSComCaptureOff 'R> received so must be end of report
CSSPrinterSet "HP LaserJet on LPT1:" 'set printer to use
CSSPrinterFontSize 10 'set printer font size to 10
CSSPrintFile "\CSS\CHREPORT.TXT" 'print the entire file on the printer
```

CSSComCaptureOff

Turns the capturing of incoming data from the controller off.

CSSComFindString "String to Find"

<Advanced Users>

Find a string on the "virtual terminal" screen. CSS maintains an copy of the last 200 lines sent to it by the controller. This is called the virtual terminal. The number returned by this command is the line number that the given string is most recently found on. The actual value of the line number is not especially meaningful by itself, it should be supplied to the CSSGetLine command to retrieve a particular line.

Example:

```
CSSComTransmit "Print CHWS^M" 'request value of CHWS input
CSSComWaitString "R>" , 10 'wait up to 10 secs for the R> prompt to be received
L=CSSFindString "CHWS" 'get most recently received line that contains "CHWS"
A$=CSSGetLine(L) 'get that line
Debug.Print A$ 'A$ should now contain "CHWS = 45.65"
```

See Also: CSSGetPointValue, CSSGetLine

CSSComGetLine <Numeric Value (0-200)>

<Advanced Users>

Returns the line from the "Virtual Terminal" screen (see ComFindString) specified by <numeric value>.

CSSComTransmit "String to Transmit"

Transmit a string of characters out the currently active communication port (i.e. to the controller if connected). Note that the special characters in the "Communications" section of "System Setup" are supported (\$ for 1/2 second pause and ^ for a control character).

Example:

CSSComTransmit "Print History All^M" ^M is a carriage return

CSSComTransmitChar <Numeric Value (0-255)>

Transmit a single character out the currently active communication port (i.e. to the controller if connected).

Example:

CSSComTransmitChar 27 '27 is the ASCII code for the Escape key

CSSComWaitString "String to Wait for" , "Seconds to Wait (0-28800)"

Pauses execution of the script file until the "String to Wait for" has been received from the controller, or until "Seconds to Wait" seconds as elapsed. Returns TRUE if the "string to Wait for" was received within the allotted time.

Example:

```
CSSCaptureFile "\CSS\CHREPORT.TXT",1      'save in \CSS\CHREPORT.TXT, overwrite file if present
CSSComTransmit "CHREPORT^M"              'request the chiller report from controller
If CSSComWaitString "R>" , 30 then Debug.Print "Report Received"
CSSComCaptureOff                          'Close capture file
```

CSSComWaitStringTM "String to Wait for" , "Seconds to Wait (0-28800)", "COM Timeout (0-28800)"

Pauses execution of the script file until the "String to Wait for" has been received from the controller, or until "Seconds to Wait" seconds have elapsed, or until "COM Timeout" seconds have elapsed with no communications received from the controller. Returns TRUE if the "string to Wait for" was received within the allotted time.

Example:

```
CSSCaptureFile "\CSS\CHREPORT.TXT",1      'save in \CSS\CHREPORT.TXT, overwrite file if present
CSSComTransmit "CHREPORT^M"              'request the chiller report from controller
If CSSComWaitStringTM "R>" , 30,5 then Debug.Print "Report Received"
CSSComCaptureOff                          'Close capture file
```

CSSConnect "Disk Directory Name"

Connects with the controller specified by "Disk Directory Name". This is the name supplied in the "Disk Directory" entry of the controller edit dialog box. Do not include the .CTL extension.

Example:

```
CSSConnect "TESTINF"
CSSConnect A$
```

See Also: CSSDisconnect, CSSCtrlConnected, CSSCtrlName, CSSCtrlPath, CSSOfflineEdit

CSSConvertHistory <History Filename, Text Filename, BeginDate, EndDate>

Converts historical data from a CSS history chart to ASCII data for export into other Windows programs. "History Filename" is the filename specified for the history chart in the "Edit Histories" dialog box. "Text Filename" is then file path and name in which you want the ASCII data to be stored. "BeginDate" and "EndDate" are VBA "Date" variables containing the range of the data you wish to convert. All data from the "Begin Date" up to but not including the "End Date" will be converted. This command returns TRUE if the data was successfully converted, otherwise it returns FALSE.

Note: CSS must be connected with a controller (or in Offline Edit mode) before using this command.

Example:

```
'Convert the last 7 days of historical data from the chart "HstChrt1" and
'store it in the file "C:\CSS\MYDATA.TXT"
```

```
CSSOfflineEdit "INF1"                    'select the controller "INF1" for OFFLINE EDIT mode
CSSConvertHistory("HstChrt1","C:\CSS\MYDATA.TXT", Now-7,Now)
CSSDisconnect
```

"Now" returns the current time and date, "Now-7" returns the the current time, seven days ago

'You can also use the "DateSerial" VBA command to use specific dates:

```
'CSSConvertHistory("HstChrt1","C:\CSS\HistTest.Txt",DateSerial(1996,7,29),DateSerial(1996,9,7))
```

The format of the converted data file is:

```
Line 1:      Description of the chart
Line 2:      Units Description
Line 3-10:   Point names of the data
```

The remainder of the file is the converted data in the format:

```
mm/dd/yyyy hh:mm <value1> <value2> <value3> <value4> <value5> <value6> <value7> <value8>
```

Data is always stored in the text file with the most recent reading at the end of the file.

CSSCtrlConnected <no parameters>

Returns TRUE is CSS is currently connected to a controller. Can be used to determine if the previous CSSConnect command was successful.

Example:
If CSSCtrlConnected then CSSDisconnect

CSSCtrlName <no parameters>

Returns the name (description) of the controller CSS is currently connected to, or "" (empty string) if not connected.

Example:
Debug.Print "Currently Connected to: " & CSSCtrlName

CSSCtrlPath <no parameters>

Returns the path of the controller CSS is currently connected to, or "" (empty string) if not connected. The returned path will already contain an ending backslash (\).

Example:
Debug.Print "Path to Controller is: " & CSSCtrlPath
CSSBackup "ALL" , CSSCtrlPath & "BACKUP\BACKUP.PRG"

CSSDisconnect

Disconnects from the current controller.

Example:
CSSDisconnect

See Also: CSSConnect, CSSCtrlConnected, CSSCtrlName, CSSCtrlPath, CSSOfflineEdit

CSSFormsCascade <no parameters>

Cascades (arranges and overlaps) all displays, schedules and history charts currently open within CSS.

CSSFormsClose <no parameters>

Closes all displays, schedules and history charts currently open within CSS.

CSSFormsTileHorz <no parameters>

Horizontally tiles (arranges to fit on screen) all displays, schedules and history charts currently open within CSS.

CSSFormsTileVert <no parameters>

Vertically tiles (arranges to fit on screen) all displays, schedules and history charts currently open within CSS.

CSSGetPointValue "Point Name"

Retrieves the value of the given controller input, output or variable. The value is returned as a string.

Example:

```
A$=CSSGetPointValue "ZONETEMP1" 'get the value of input "ZONETEMP1"  
V=CSng(A$) 'convert A$ to a single precision number  
if (V < 65.0) OR (V>85.0) then Debug.Print("ZONETEMP1 is Out of Range.")
```

CSSOfflineEdit "Disk Directory Name"

Connects with the controller specified by "Disk Directory Name" in OFFLINE EDIT mode. This is the name supplied in the "Disk Directory" entry of the controller edit dialog box. Do not include the .CTL extension.

Example:
CSSOfflineEdit "INF1"

See Also: CSSCtrlConnected, CSSCtrlName, CSSCtrlPath

CSSPrintFile "Filename"

Prints the entire file specified by "Filename" to the currently selected printer.

Example:
CSSPrintFile "C:\CSS\REPORT.TXT"

CSSPrinterFontSize <Numeric Value>

Sets the font size for the currently selected printer. Note: it is not possible to set the font type with this version of CSS. It may be possible with a future version. Try changing the printers default font in the Windows printer setup.

Example:

```
CSSPrinterFontSize 10
```

CSSPrinterSet "Printer Name"

Sets the specified printer to be the currently selected printer. "Printer Name" should be typed exactly as it appears in the list of printer maintained by Windows.

Example:

```
CSSPrinterSet "HP LaserJet Series II on LPT1:"
```

CSSPrintReport "Filename"

Prints the report specified by "Filename". "Filename" is the name contained in the "Filename" entry of the "Report Edit" dialog box.

CSSUserLevel <no parameters>

Returns the CSS password level of the current user or -1 if no user is logged in to CSS.

Example:

```
If CSSUserLevel=1 then Debug.Print "Function not available at your password level."
```

CSSViewDisplay "Filename"

Opens the graphic display specified by "Filename". "Filename" is the name contained in the "Filename" entry of the "Display Edit" dialog box.

CSSViewHistory "Filename"

Opens the history chart specified by "Filename". "Filename" is the name contained in the "Filename" entry of the "History Edit" dialog box.

CSSViewReport "Filename"

Opens the report specified by "Filename". "Filename" is the name contained in the "Filename" entry of the "Report Edit" dialog box.

See Also: CSSPrintReport

CSSViewSchedule "Filename"

Opens the schedule specified by "Filename". "Filename" is the name contained in the "Filename" entry of the "Schedule Edit" dialog box.

Chapter Eight - Tutorial: Other Features

8.1 System Setup: General

General Setup contains options that affect the appearance and operation of CSS. You can access these options through the FILE|SETUP|SYSTEM menu.

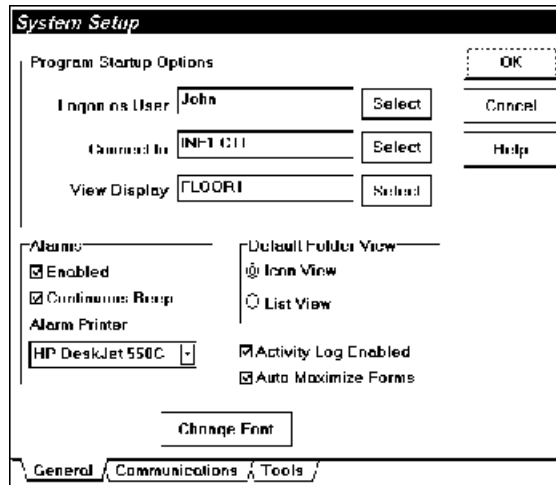


Figure 8.1 System Setup - General

Logon as User - Specify a user name to automatically log in as that user each time CSS is executed. The opening password screen will be bypassed.

Connect To - Specify a controller to automatically logon to each time CSS is executed. A startup user must also be specified.

View Display - Specify a display to automatically load each time CSS is executed. A startup user and controller must also be specified.

Alarms: Enabled - Check this box if you want alarms to be enabled. You will normally want to leave this checked.

Alarms: Continuous Beep - Check this box if you want CSS to beep (or play a standard Windows sound effect) every second after an alarm is received. The sound will continue until you view the alarm report. Leave it unchecked to have CSS beep only once for each alarm received.

Alarms: Alarm Printer - The printer on which you want to print alarms.

Default Folder View - Select the appearance you want folders to have as a default. You can always change the folder's appearance while viewing it by clicking the right mouse button and selecting 'List View'.

Activity Log Enabled - Check this box if you want all user activity to be logged in monthly log files. Every important action taken by a user will be recorded in this file. The log files are stored in the \CSS\LOG directory.

Auto Maximize Forms - Check this box if you want forms (displays, schedules and history charts) to automatically be maximized, that is, to fill the entire screen.

Change Font - Allows you to change the font used throughout CSS. This is supplied mainly for low resolution video modes or certain video cards that may have nonstandard resolutions. If you notice text in any forms being chopped off, changing the font may solve the problem.

8.2 System Setup: Communications

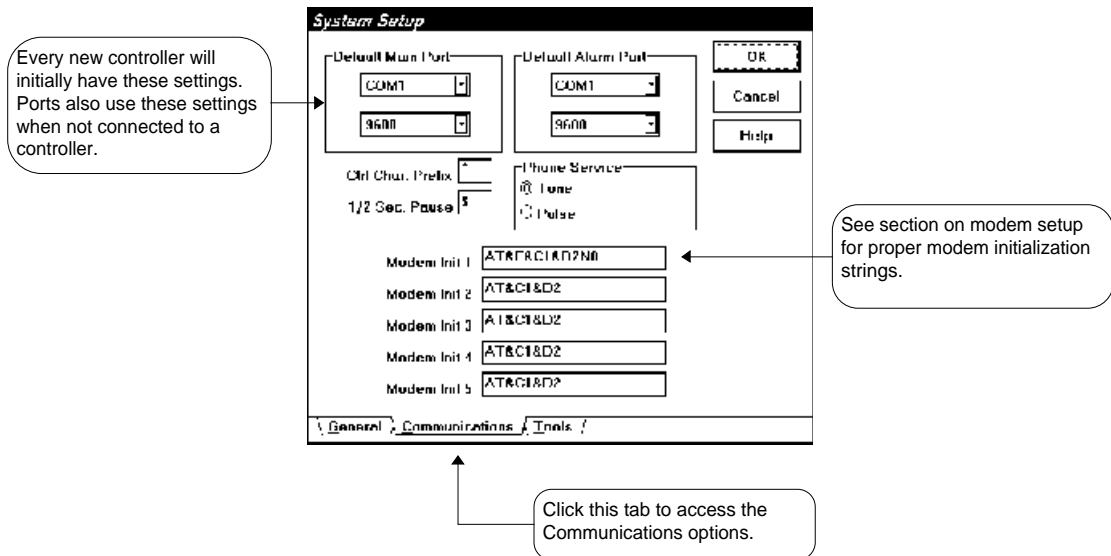


Figure 8.2 System Setup - Communications

Default Main Port - The default COM port and baud rate that will be used to communicate with controllers. Each controller can be configured separately. This is the default setting it will have when it is created.

Default Alarm Port - The default COM port and baud rate used to receive alarms. This may be set the same as the main port, or be a secondary port attached to a modem for reception of alarms from remote sites. Each controller can be configured separately. This is the default setting it will have when it is created. Alarms will be received from the main port as well as the alarm port.

Ctrl Char. Prefix (Control Character Prefix) - A symbol used in connect strings, disconnect strings, etc. that will force the following letter to be transmitted as a control character. I.E. ^M will transmit a Control-M or carriage return (ASCII 13). This should not normally be changed.

1/2 Sec. Pause - A symbol used in connect strings, disconnect strings, etc. that will cause a 1/2 second delay in transmission. This should not normally be changed.

Phone Service - Select the type of phone service active in your building.

Modem Inits - The strings used to initialize the modem before dialing. Each controller can have its own modem initialization string. This is just a convenient place to enter the most common ones you may need.

8.3 System Setup: Tools

'Tools' are a list of executable programs that are accessible through the 'Tools' menu. A few of these tools must be included in the list (Terminal mode, Text Editor, Paint Program), but the actual program executed by them may be changed. For example, Text Editor defaults to 'NOTEPAD.EXE' but may be changed to 'WINWORD.EXE' although you cannot remove text editor from the list of tools.

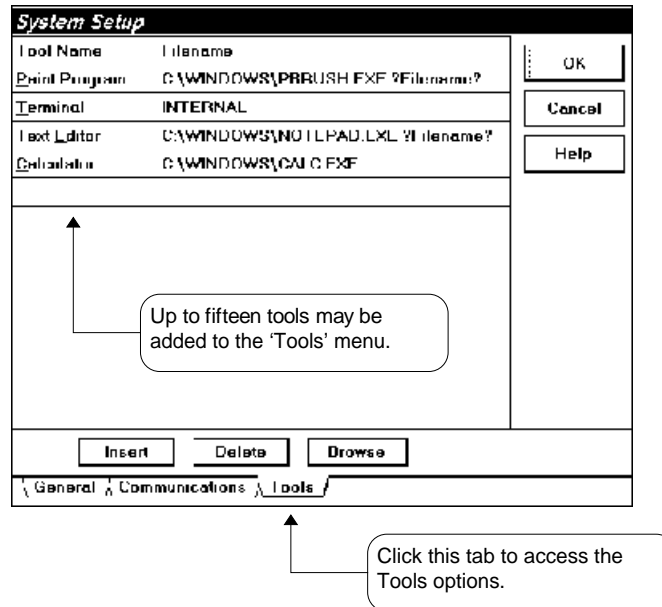


Figure 8.3 System Setup - Tools

Insert Button - Allows you to insert or add a new tool.

Delete Button - Deletes the currently selected tool.

Browse Button - Displays a dialog box that allows you to select which program you want this tool to execute. Any .EXE, .COM, or .BAT file may be selected. Script files may be included by selecting the .BAS file from the \SCRIPT directory.

8.4 Alarm Viewing

Alarms are messages sent from controllers (and occasionally generated by CSS itself) that warn you of situations that need attention. Select 'Alarms' from the 'View' to display a form similar to figure 8.4.

Date	Time	Message	Ack. By	Comment
6/13/96	8:06am	Chilled Water Supply Temperature is Too High (CHWS-70.71)		
6/13/96	8:06am	Fan 5 Did Not Start (Fan5-ON, Flow5-OFF)	CSS	Replaced Flow Switch
6/11/96	10:48pm	Zone 6 Temperature is Out of Range (Zone6-56.81)	CSS	Found problem in controller panel
6/11/96	10:48pm	Fan 2 Did Not Start (Fan2-ON, Flow2-OFF)		
6/11/96	10:40pm	Zone 6 Temperature is Out of Range (Zone6-60.03)		
6/11/96	10:40pm	Chilled Water Supply Temperature is Too High (CHWS-70.11)	CSS	Sensor apparently bad, ordered
6/11/96	10:40pm	Restricted Area 4 Accessed (Sensor4-OPEN)		

Alarms are stored by month. Click here to view a different month.

Up to 100 alarms can be displayed in upper window. Click arrows to see next/previous set of 100.

The highlighted alarm will be fully displayed in this area.

Figure 8.4 Alarm Viewer

Viewing Alarms - The upper section of the alarm report contains up to 100 of the most recent alarms.

Click on the scroll bar to the right of the alarms to move through the current set of alarms. If there are more than 100 alarms for the selected month, you may click one of the arrow buttons at the bottom left of the alarm report to see the next/previous set of 100 alarms. The view mode may be changed between 'All' alarms, 'Active Only' (unacknowledged) alarms and 'Search' which allows displaying only those alarms that contain certain words or phrases. To view alarms from a previous month, select the month from the list just above the 'Active Only' check box. The full text of an alarm will be displayed in the lower portion of the alarm report when it is selected (see below).

Selecting Alarms - To select an alarm, click the left mouse button on it in the upper portion of the screen.

You may click and drag the mouse while holding down the left mouse button to select any number of contiguous alarms.

Acknowledging Alarms - Clicking the 'Ack.' button will allow you to attach a comment to the selected alarms.

You may wish the comment to explain why the alarms happened and/or how the problem was corrected. Once an alarm is acknowledged, it is no longer considered active. A comment is not required to acknowledge the alarm. The alarm is then stamped with the current date and time. The user that acknowledges it is also recorded.

Deleting Alarms - Clicking the 'Delete' button will permanently remove the selected alarms from the alarm report.

You will be asked if you are sure you want to delete them before they are actually deleted. It is not possible to restore an alarm once it has been deleted.

Printing Alarms - Click the 'Print' button to print the alarms to the printer.

You will have the option of printing all alarms on record for the currently selected month, or printing only the currently selected alarms.

8.5 User Editing

A 'User' is someone you want to have access to CSS. Up to 1024 users may be entered into the system. Select 'FILE|SETUP|USERS' to display a form similar to figure 8.5. You must have level 3 access to edit users.

Personal Information	Custom User Access
Name John	<input checked="" type="checkbox"/> Change Setpoints
CSS Password CSS	<input checked="" type="checkbox"/> Change Schedules
Controller Password	<input checked="" type="checkbox"/> Terminal Mode
Access Level	<input checked="" type="checkbox"/> Backup Controller
<input type="radio"/> Level 0 - No Access	<input checked="" type="checkbox"/> Retain Controller
<input type="radio"/> Level 1 - User	<input checked="" type="checkbox"/> Acknowledge Alarms
<input checked="" type="radio"/> Level 2 - Programmer	<input type="checkbox"/> Exit Program
<input type="radio"/> Level 3 - Administrator	<input checked="" type="checkbox"/> Connect/Disconnect
	<input checked="" type="checkbox"/> Edit System Setup
	<input checked="" type="checkbox"/> Edit Displays/Sched.

OK Cancel Help

Figure 8.5 Edit User Form

Name - The name this user will type at the opening screen to gain access to CSS.

CSS Password - The password this user will type at the opening screen to gain access to CSS.

Controller Password - The password that will be used to log on to controllers when this person is using CSS. Leave blank if you want CSS to use the controllers default password.

Access Level - The level of access you want this user to have. Only level 3 users will be able to edit users. **Make sure you always have at least one user with level 3 access!**

Custom User Access - Each user can be granted or denied access to most functions of CSS. Check each action you want this user to be able to perform.

8.6 Backup Controller's Memory

Select 'CONTROLLER|BACKUP MEMORY' to save all of the controller's programs and other data to disk. The backup process is fully automated once you have supplied the following information:

AC256 - Enter the 'domain' you want to backup and click the 'OK' button. Domain 0 (zero) is the main controller. Only one domain may be entered at one time. Next enter the 'drums' you want to backup. You will usually just click the 'OK' button to backup 'ALL', but individual drums (E.G. '1 2 3 C M') may also be specified. Any number of drums may be backed up at one time.

Infinity - Enter any valid data that you want backed up. You will usually just click the 'OK' button to backup 'ALL', but individual objects and programs may also be backed up.

CSS will suggest a filename based on the type of data you are backing up and the current date. You are free to change the filename or just click the 'OK' button to use the default filename.

8.7 Restore Controller's Memory

Select 'CONTROLLER|RESTORE MEMORY' to reload all of the controller's programs and other data from disk. The restore process is fully automated once you have selected the file that you want to restore. CSS does not do any special preparation of the controller before restoring its memory (like setting of options or controller com ports). You must make sure that you do this before selecting 'Restore Memory'.

8.8 Event Scheduling

Events cause CSS to perform certain actions at regular intervals without the need for user intervention. CSS can manage up to 100 events and can occur as frequently as every hour. Select 'FILE|SETUP|EVENTS' to display a form similar to figure 8.6.

Description	Event Type	Enb	Last Run
Park 400 History Collection	Collect History	Yes	Never
Park 400 Memory Backup	Backup Memory	Yes	Never

Figure 8.6 Schedule Events Form

Description - Describes the event. This can be any text you wish.

Event Type - Indicates what action will take place, history collection, memory backup, report printing or script file execution. Other event types may be added in future version of CSS.

Enb (Enabled) - 'Yes' if the event is enabled to execute.

Last Run - The date of the last execution of the event.

Add Button - Allows you to add a new event.

Edit button - Edit the currently selected event.

Delete Button - Deletes the currently selected event.

8.9 Event Editing

The event editor form allows a variety of scheduling options. Most commonly, you will want to perform controller memory backups at least once per month and history collections once per day.

The screenshot shows the 'Event Editor' window with the following fields and values:

- Event Type:** Collect History (dropdown menu), Enabled
- Description:** Park 400 History Collection
- Controller:** INF1.CTL (text box), Select button
- History File:** FLOOR1-FLOOR2 (text box), Select button
- Starting Time:** 9/1/96 12:00am (text box)
- Ending Time:** / / (text box), Endless
- Frequency:** Months: 0 (spin box), Days: 1 (spin box), Hours: 0 (spin box)

Buttons on the right side: OK, Cancel, Help.

A callout box on the right contains the text: "Multiple history collections or report printouts may be performed with one event. Click the 'Select' button and choose a different icon and it will be added to the list."

Figure 8.7 Event Editor Form

Description - Describes the event. This can be any text you wish.

Event Type - Indicates what action will take place, history collection, memory backup, report printing or script file execution. Other event types may be added in future version of CSS.

Enabled - Check this box to enable the event. NOTE: If the Start Date has already passed and you enable the event, it will be executed at the top of the next minute (when the minute changes).

Controller - The controller you wish to connect with before executing this event.

Parameter (backup event only) - Enter any parameters to the backup command here, such as 'All' or 'Site'. For AC256 controllers, a domain may be specified using a colon 1:ALL for domain #1 or 23:ALL for domain #23. The filename used for the backup will be AUTOxxxx, where xxxx is the current month and day. The file will be placed in the individual controllers \BACKUP directory.

History File (history collection event only) - Indicates the history charts for which data should be collected.

Start Time - The date and time you wish to start executing this event.

End Time - The date and time to stop executing this event.

Endless - Check this box to execute this event at the specified interval until you disable it.

Frequency - Sets how often you want this event to execute. If you have a start date of 01/13/96 and set the frequency to 1 month, the event will execute on the 13th of every month. If the days are set to more days than there are in a given month, the event will occur on the 1st day of the following month. Setting the frequency to zero will cause the event to be executed one time only and then disabled.

8.10 Variable Watch

Variable watch allows you to view a list of control points and their current values. The current values update at regular intervals. Variable Watch is useful for debugging and fine tuning controller programming.

The screenshot shows a window titled "Variable Watch" with a table of control points and their values at three different times. The table has columns for "Controller Point", "Current", and three time-based columns. Below the table are buttons for "Add", "Edit", "Delete", "Save", "Load", "Cmd", and "Timing". A callout box points to the "Save" button, stating: "Any list of control points may be saved to disk for quick access at a later time." Another callout box points to the "Timing" button, stating: "Click the 'Timing' button to change how often the values are scrolled to the right. This example is scrolling every ten seconds." There are also "OK", "Cancel", and "Help" buttons on the right side of the table.

Controller Point	Current	12:50:52	12:50:42	12:50:32
Zone1	61.95	60.00	62.74	65.01
Zone2	88.51	88.32	86.66	88.92
Zone3	111.64	111.51	111.14	111.111
Zone4	66.49	66.73	73.66	71.77

Figure 8.8 Variable Watch form

Add Button - Add a new control point to the list.

Edit Button - Change a control point on the list.

Delete Button - Delete the control point from the list.

Save Button - Save the current list of control points to a disk file for quick access at a later time.

Load Button - Load a previously saved list of control points.

Cmd Button (Controller Command) - Issue a command to the controller. Useful for disabling or modifying points, running controller programs, etc..

Timing Button - Change the interval at which the control points update and the current values are scrolled.

Chapter Nine - Technical Information

9.1 Alarm Setup in Controller

NOTE: Alarms will NOT be received when you are using terminal mode.

Alarms must be generated by the controller. Usually this is done in the controllers programming. (See Infinity Alarm Programming or AC256 Alarm Programming) When the controller detects an alarm condition, it should display a message that contains the following codes:

{A#TEXT<SCRIPT>^ID^[>DATE }

Where:

- {** = start of message marker
- A or a** = Lowercase 'a' will not cause the alarm box on the status line to flash or increment the number of alarms. Use this if you only wish to print something to the printer, but don't want to make anyone think there is an alarm. 'M' and 'm' are still supported for compatibility with Monitor but are treated as 'A' or 'a'.
- #** = destination of message
 - 0 = none
 - 1 = printer
 - 2 = disk file (add to alarm report)
 - 3 = printer and disk file
 - 4 = printer (included for compatibility with Monitor, use 1 instead)
 - 5 = printer (included for compatibility with Monitor, use 1 instead)
 - 6 = printer and disk file (included for compatibility with Monitor, use 3 instead)
 - 7 = printer and disk file (included for compatibility with Monitor, use 3 instead)
- TEXT** = the actual text of the message
- <SCRIPT>** = the name of a script file to run (optional). Up to eight characters. Do not include the .BAS extension.
- ^ID^** = an up to eight character "alarm ID" of the controller that generated the alarm (optional)
- [>DATE** = the date and time of the message (optional). Ignored, included for compatibility with Monitor.
- }** = end of message marker

This example will send an alarm to the printer:

```
{A1Zone 1 Temperature is Out of Range (78.5 Deg.f)}
```

This example will print the alarm on the printer and store it in the alarm file of the controller that has the Alarm ID of "CTL1":

```
{A3Airhandler #1 has Exceeded 300 Hours of Runtime^CTL1^}
```

The maximum length of an entire alarm message is 170 characters. The actual text of the message may be no longer than 120 characters. CSS will split the text of the message into two lines of 60 characters each.

9.2 Infinity Alarm Programming

NOTE: A program must be loaded into the controller for Alarms to operate as described in this section. Connect to the controller and select 'Load Controller Programs' from the 'Controller|More' menu. You will only need to do this once for each controller.

Programming alarms for the Infinity controller presents a few problems:

If the controller simply prints the message to the screen, CSS will see the alarm up to 8 more times as the alarm message scrolls off the top of the screen.

If the alarm message is displayed on the status bar, CSS will see the alarm every time the screen redraw (<Ctrl>-Z) command is used (as is done occasionally by CSS itself).

If a com port is opened in "raw" mode and the messages are printed, it can cause problems with any displays that are being viewed, history collections, etc.

The simplest (but not ideal) solution is to create a string variable in the controller named "CSSAlarmMsg" (any name will work) and place a program similar to the following in the controller:

```
Line Checking
  If Length(CSSAlarmMsg) > 0 then
    Print "{:;CSSAlarmMsg;}" to Comm3 StatusBar
    CSSAlarmMsg=""
    Goto Clearing
  Endif

Line Clearing
  Print "" to Comm3 StatusBar
  Goto Checking
```

Any program may then set CSSAlarmMsg = "A2Zone Temperature is Out of Range" and the alarm will be displayed on the status bar and erased on the next controller scan automatically. If this program is set at the end of the firing order, CSSAlarmMessage will only contain a string for a maximum of one scan.

using this method, any program that prints on the status bar would have to check to make sure an alarm wasn't active before printing:

```
If Length(CSSAlarmMsg) = 0 then Print "YourInformation" to Comm3 StatusBar
```

If you aren't concerned about getting an occasional duplicate alarm message, you could simply:

```
Print "|123A2Zone Temperature is Out of Range|125" to Comm3 StatusBar
```

(the |123 and |125 are equivalent to the '{' and '}' characters. See Alarm Setup in Controller)

9.3 AC256 Alarm Programming

Alarm programming in the AC256 is very straightforward. Simply store an alarm in a message line and display it from within a drum program at the appropriate time:

```
Drum M
  M200 = {A2Zone Temperature is Out of Range, Zone1 = "Zone1"}

Drum 301
  Display 200
```

9.4 Designing Displays

At any time while viewing a display, you may select "Edit Mode" from the "Options" menu. This will allow you to edit the display in any way you wish. The display will continue to update normally while in edit mode. This allows you to see exactly what affect your changes will have. Keep in mind that you may have several displays open at one time but switching to edit mode affects only the currently active display. You may activate edit mode on multiple displays and copy components between them.

Once the display is in edit mode, the options menu will change to contain the following:

- View Mode** - Quit edit mode.
- Save** - Write your changes to disk.
- Configure** - Allows you to specify the background picture, size the display, etc.
- Edit Picture** - Execute the drawing program specified in System Setup.
- View Components** - View the "Components" folder. This allows you to add components to the display.

If this is a new display it will initially be empty. The first thing you may want to do is select "Configure" from the "Options" menu and specify a .BMP file to use as a background picture (all user supplied bitmaps must be placed in the \CSS\BITMAP directory) or the background color if no background picture will be used.

Placing Components

Before placing components on the display you must first select "View Components" from the "Options" menu. A "floating" folder will appear that contains all of the available components. You may move this folder anywhere on the screen and it will stay on the screen until you close it or until you quit edit mode.

To place a component on the display, select it in the component folder and click anywhere on the display. The component will then appear on the display. If the component requires a control point the "Control Points" folder will appear. Select which point you wish this component to reference.

NOTE: The only limit on the number of components that may be place on an individual display is the size of the .DIS file. It has a limit of about 65,000 bytes. This equates to roughly 200 string components (the smallest component) or about 100 circular meters (the largest). You should not normally have to worry about this limitation. If it does become a problem, split the data you are trying to present between multiple displays and use a button component to switch between them.

Moving and Sizing Components

Once the component has been placed it becomes the "selected" component. You can easily see which component is selected because it will have 8 red "handles" around its edges. If you left click on one of these handles and drag the mouse while holding the left mouse button down the component will grow larger or smaller depending on the direction you move the mouse. If you left click anywhere else on the component and drag the mouse, the entire component will move. You can at any time select another component by clicking on it with the left mouse button. You can also select multiple components by holding down the <Ctrl> key and left clicking on another component. Some functions will not be available while multiple controls are selected.

Editing Components

Once a component is selected, clicking the right mouse button will bring up the following menu:

- Control Point** - Change the control point referenced by this component.
- Edit** - Edit the appearance and behavior of the selected component
- Save as Component** - Save this component to the components folder.
- Align to Grid** - Align this component to the screen grid.
- Bring to Front** - Move this component in front of all other components.
- Send to Back** - Move this component behind all other components.
- Align** - Align the selected components on the screen or to each other.
- Size** - Change the size of the selected components relative to each other.
- Delete** - Delete the selected components from the display.
- Cut** - Delete the selected components from the display and copy them to the clipboard.
- Copy** - Copy the selected components to the clipboard.
- Paste** - Paste the components currently in the clipboard onto the display.
- Select All** - Select all the components on the display.
- Grid: Snap to Grid** - Enable or disable grid alignment.
- Grid: Grid Spacing** - Specify spacing of the grid.

Once the component has the appearance and behavior that you desire, you may want to select the "Save as Component" option. This will allow you to place this modified component on any other display without having to edit it again.

9.5 Display Diagnostics

Debug Mode

Debug mode displays a terminal window over the top of any displays, schedules or history windows that are currently open. All communication between CSS and the controller is displayed in this terminal. You can click the mouse in the terminal and type commands to the controller, but be careful because CSS will continue to communicate even while you type. To activate Debug Mode, select 'About' from the 'Help' menu. If your password level allows terminal mode access, there will be a 'Debug Mode' check box. Check the box and close the 'About' window.

Display Diagnostics

<Infinity Only>

When updating graphic displays, CSS will ask the controller for as many points per scan as the controller will accept. Unfortunately, if any one of the points CSS asks for is not valid, the Infinity will not return ANY of the values. This means if there is one component on a display that has a nonexistent point assigned to it, it can cause several of the components to not update correctly, or not update at all.

If CSS recognizes this happening, it will display an error message alerting you to the problem. However, CSS cannot detect which point is invalid. The easiest way for you to find the offending point is to put the display in 'Edit' mode, then select 'Diagnostic' from the Options menu. This will force CSS to temporarily ask the controller for the point values individually. Then activate 'Debug Mode' (see above). Now you can watch the communications between CSS and the controller while it is happening. You should be able to see which points the controller is rejecting and correct the problem.

9.6 Modem Setup

The only required setting for a modem used with CSS is AT&C1 (Carrier Detect only when connected). however, it is suggested that the modem also be given the setting AT&D2 (hang up modem on DTR drop) to assist in hanging up.

So the minimum recommended modem initialization is **AT&C1&D2**.

Some high speed modems (9600 Baud and higher) may require ATN0 (ATN 'zero') also. This will force the modem to always connect at the speed that CSS is set to. If this parameter is not used and you call a controller that has a 9600 baud modem attached but is set to communicate at 2400 baud, the modems will still connect at 9600, making communication with the controller impossible.

The modem initialization would now be **AT&C1&D2N0**.

The optimum settings for most high speed modems would be **AT&F&C1&D2N0**.

It has been reported that some modems may hang-up when switching to terminal mode (caused by DTR dropping for a few milliseconds). If this is happening, you may need to use AT&D0 instead of AT&D2. Some modems are apparently more sensitive to DTR dropping than others. You may also check to see if your modem has an 'S' register that specifies how long DTR must be dropped to hang up and raise that value.

9.7 Directories and Filenames

Directory Structure

The following directory structure is used in CSS:
(it is assumed the program was installed in the default \CSS directory)

- \CSS** - Main directory. Contains CSS.EXE, help files, etc.
- \ALARM** - Alarms received when not connected to a controller.
- \BITMAP** - Bitmaps (pictures) used in all user designed displays.
- \CMP** - Display components.
- \ICON** - All icons used in folders. You may add new icons or modify these as you wish. However, CSS does expect some of them to be present so it is best not to delete any of them.
- \LOG** - Monthly activity log files. Log files may be viewed with any text editor.
- \SCRIPT** - All supplied and user written script files.

For each controller added to the "Controllers" folder, a directory with a ".CTL" extension will be created within the \CSS directory. For example, if you added a controller and specified the directory as "TEST" in the controller edit dialog box, the following directories would be created:

- \CSS\TEST.CTL** - Main directory for a controller.
- \CSS\TEST.CTL\ALARM** - Alarms received when connected to this controller.
- \CSS\TEST.CTL\BACKUP** - Files containing the controllers memory backups.
- \CSS\TEST.CTL\DISPLAY** - User designed displays for this controller.
- \CSS\TEST.CTL\HISTORY** - History data files.
- \CSS\TEST.CTL\REPORTS** - Custom report files.
- \CSS\TEST.CTL\SCHEDULE** - Schedule data files.

Each controller will have its own directory. When a controller is deleted from the "Controllers" folder, its directory is actually just renamed to "\CSS\TEST.DEL". This will prevent CSS from seeing it as a controller. If you wish to reinstall the controller into the "Controllers" folder, rename the directory back to "\CSS\TEST.CTL" using file manager. If you are sure you want to totally delete this controller from your hard disk, the directory must be deleted manually using file manager.

Moving Controllers

A separate directory for each controller also simplifies moving a controller to a different computer. To move an entire controller to a different computer, simply backup the entire "\CSS\TEST.CTL" directory (along with all of its sub-directories) and restore it to the other computers "\CSS" directory. The only other files you may need to copy would be any .BMP files used by this controller that are in the "\CSS\BITMAP" directory.

Filename Extensions

All files used in CSS have a default extension. You should **never** supply an extension when asked to type a filename. All filenames should be 1-8 characters (0-9 or A-Z). Windows 95 long filenames are not supported.

The following is a list of many of the extensions used in CSS and their purpose. Most of these are simple text files that may be loaded into a text editor and modified manually. This makes certain things easier to do, such as changing the font of all of the components on a display. **Entering invalid information into one of these files manually can cause unpredictable results!** Make certain you have a backup of a file before you modify it.

- .ALM** - Alarms received from controllers. Not user editable.
- .CMP** - Display components.
- .CPR** - Custom report components
- .DIS** - User designed displays.
- .HST** - History configuration file.
- .HSF** - History graph settings file. Contains the settings of a history graph (2D/3D, colors, chart type, etc.).
Not user editable.
- .INI** - Text file that holds information about certain items, such as controllers "CTL.INI" or users "USERS.INI".
- .SCH** - Schedule configuration and time/date values.
- .PRG** - Controller memory backup file.
- .WAT** - Variable watch configuration files.

9.8 Technical Support

If you are having problems getting CSS to communicate with a controller make sure that:

- The desired communication ports (Comports) exist and are set up properly in Windows Control Panel.
- You have specified the proper comport and baud rate in the Controllers folder.
- The cable from the computer to the modem/controller is wired correctly.

If you are sure this is all correct, read the section on Debug Mode.

If you are still unable to communicate or are having other problems, contact your **Andover dealer** or:

Custom Software Engineering
1463 Countryside Drive
Indianapolis, IN 46231
(317) 247-4819 Voice (technical support hours are 9am to 1pm EST)
(317) 247-1009 FAX/BBS