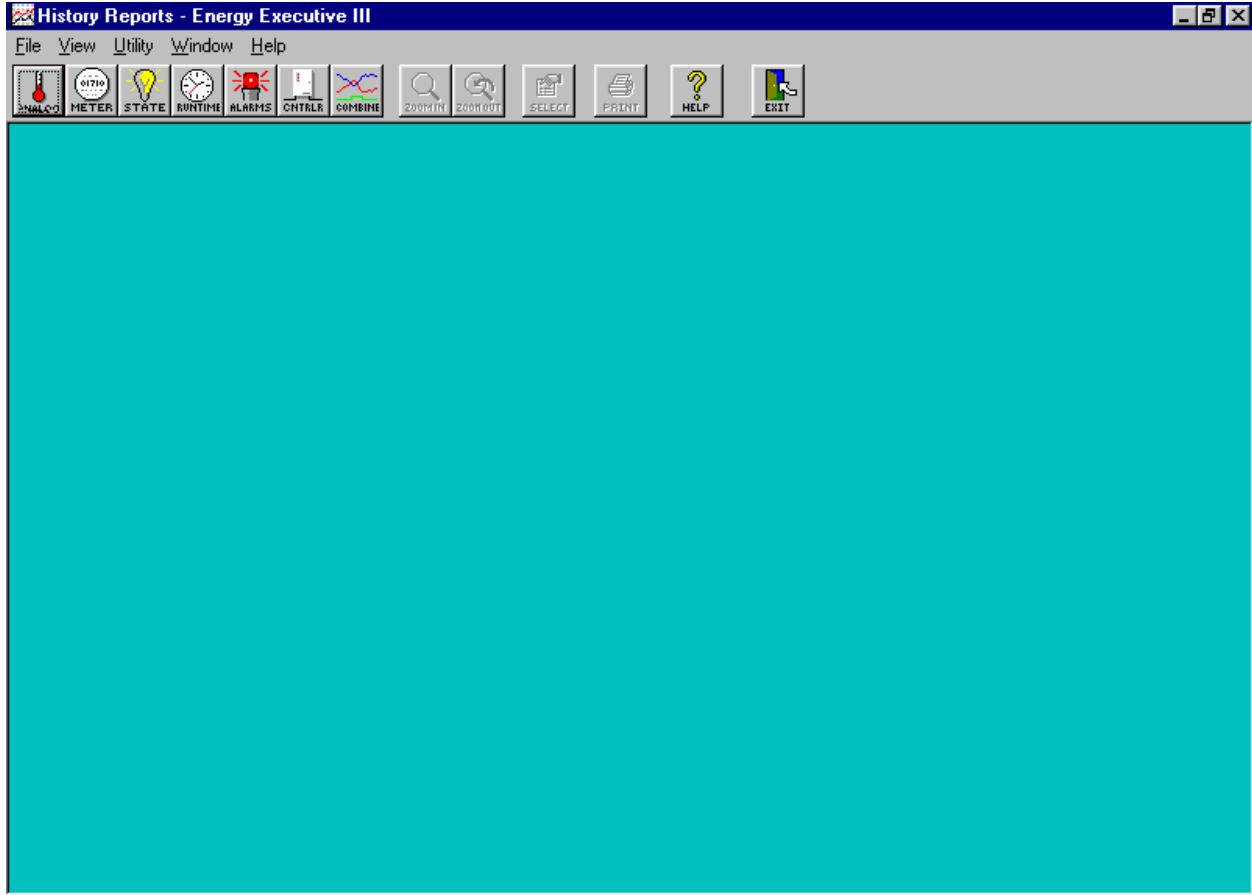


The History Reviewer

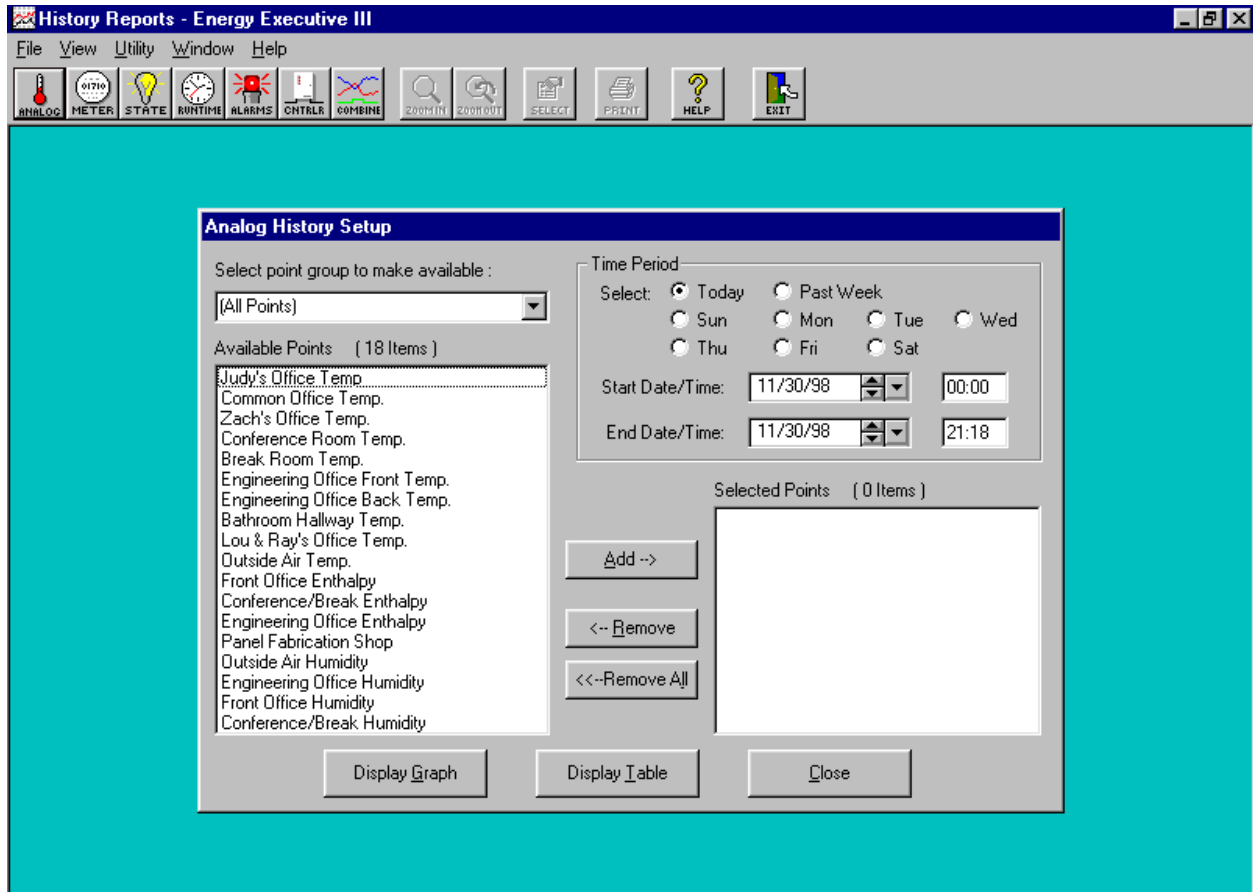
Loading the History Reviewer produces the following window:



The first seven toolbar icons, beginning from left to right, invoke routines that are used to review historical data kept in disk files. Resting the mouse cursor on any one of them without clicking will cause a balloon description for that icon to appear. To execute one of the options, click on the toolbar icon. They are described in order in the following sections. Other icons on the toolbar are used for special purposes within a particular history review session.

1. Analog History

This section is used to review analog history on file. The program automatically tracks the values of all configured analog points and records average values every fifteen minutes. When you select this icon, the following display will appear:

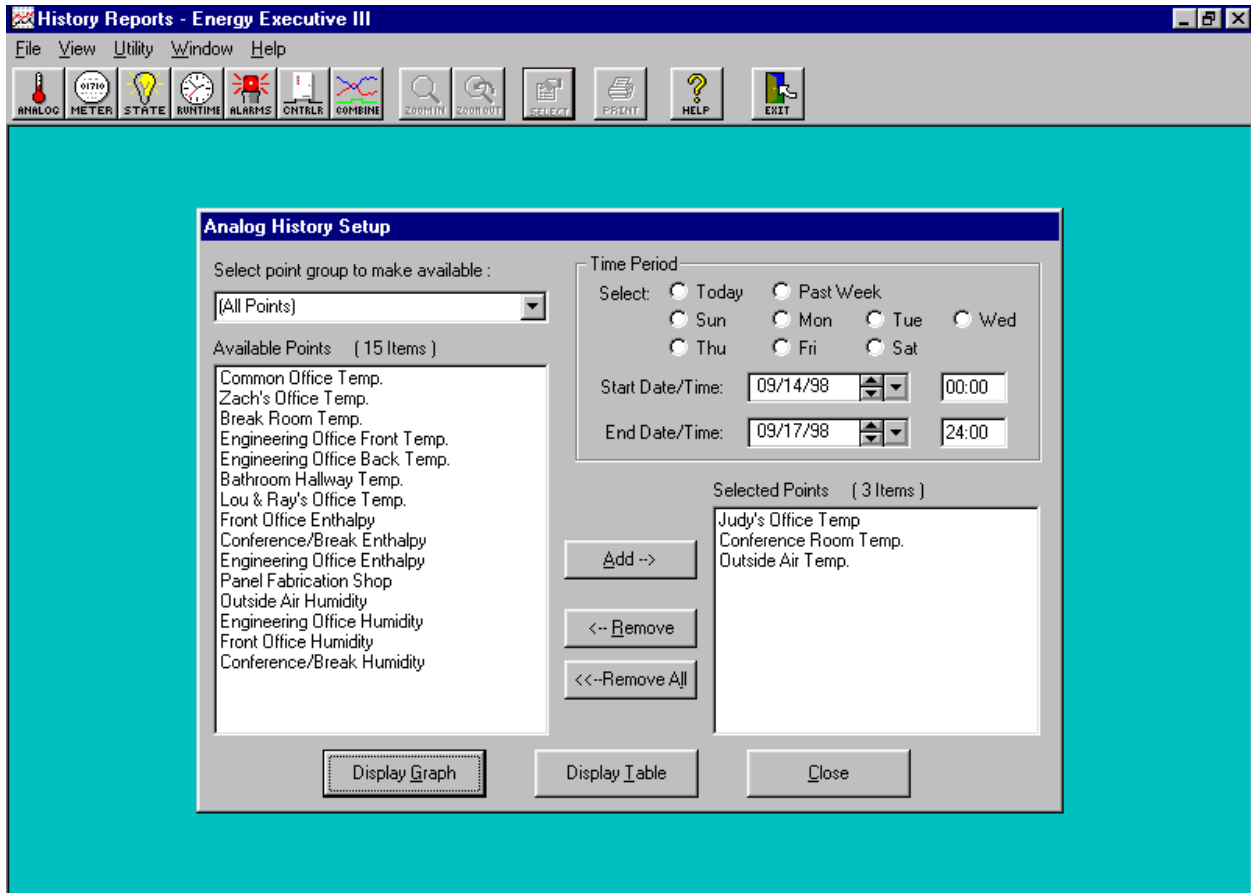


At this point the user can:

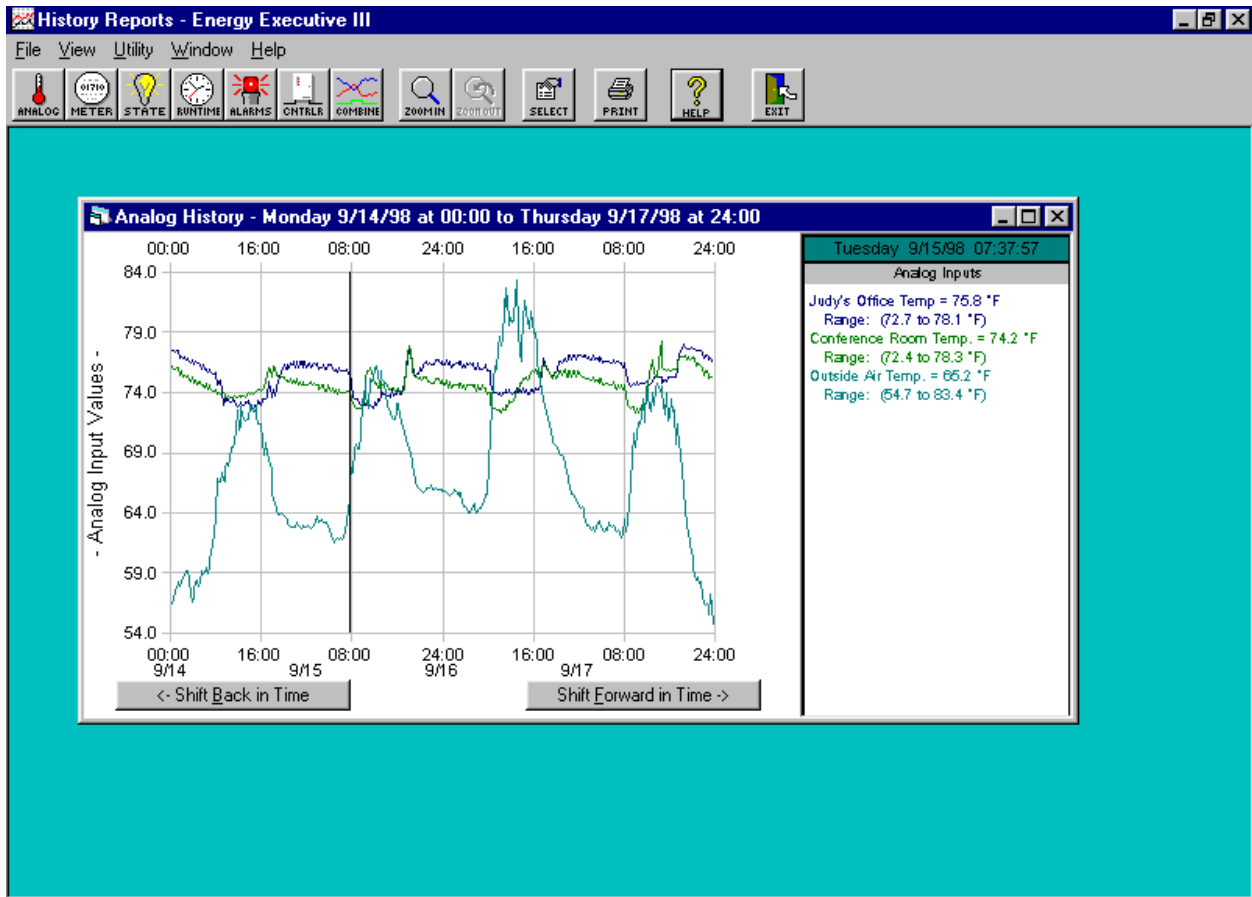
1. Select a Point Group from which to select analog points. Do so by using the drop down list box in the upper left of the form. (Point Group configuration is done in either the System Configuration Editor or the Parameter Editor.)
2. Add or remove points to review by highlighting the point name in the Available Points list box (to add) or in the Selected Points box (to remove) and then clicking on the Add, Remove or Remove All button.
3. Select a time period to review. This can be done in a number of ways:
 - 3.1. Select "Today", "Past Week" or a particular day in the last week using the radio buttons in the top of the "Time Period" box.
 - 3.2. Selecting a "Start Date/Time" and an "End Date/Time". Dates can be entered into the date boxes, incremented or decreased with the arrow buttons or selected using the drop down calendar control.

3.3. Times are entered in military time (24 hour clock).

Once these parameters are selected the user can display the data in either graphical or tabular format using the buttons on the bottom of the form. For example, the input screen for selecting the analog history for three temperatures; Judy's Office Temp, Conference Room Temp and Outside Air Temp, for the period of September 14 at Midnight through September 17 at Midnight would look like this:



Selecting a graphical representation of this data by clicking the “Display Graph” button would look like this:



Note that all three temperatures are displayed on the same graph. The values on the x and y axis' are scaled accordingly.

The legend on the right side of the form shows the values for the selected points at the time represented by the vertical time-selection line in the middle of the graph. This line can be moved throughout the time period on the screen by selecting it with a mouse click and dragging it to any desired point in the graph. The time-selection line can be “dropped” by a subsequent mouse click. While the time-selection line is in the “drag” mode it is a dotted line; when it is dropped, it is a solid line.

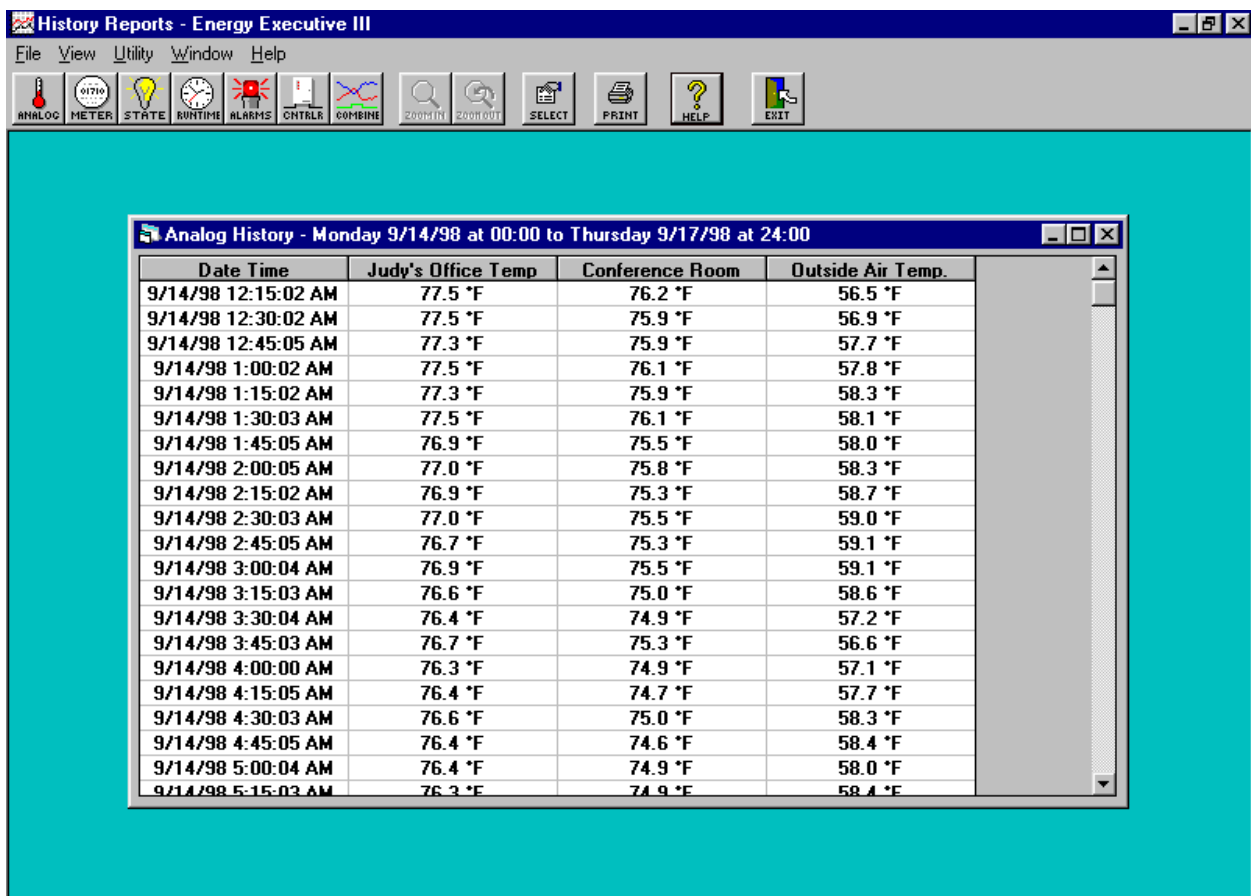
The user can “Shift Back in Time” or “Shift Forward in Time” with the respective buttons on the bottom of the form. The shift will always be in an increment consistent with the amount of time shown on the graph.

Use the “Zoom In/Out” feature to select smaller sections of time. To Zoom In, click on the “Zoom In” icon on the tool bar that will be highlighted when available. The cursor will turn into a cross hair. Place the cross hair on the graph at the point where you wish to start the zoom.

Hold the left mouse button down and drag the cross hair to the point where you wish to end the zoom and release the left mouse button. When the mouse button is released, the graph will zoom in on the selected period. To Zoom Out again simply select the “Zoom Out” icon on the tool bar.

Use the “Print” icon from the toolbar to print the graph. Use the “Select” icon from the toolbar to go back to the Analog History Setup Screen to select a different time period or a different set of points to review.

Selecting a tabular representation of the data from the Analog History Setup Screen would look like this:



The tabular display is self-explanatory. The headings define the columns and you can use the scroll bar on the right of the form to move around through the selected data. As with the graphical display, use the “Print” icon from the toolbar to print the table and use the “Select”

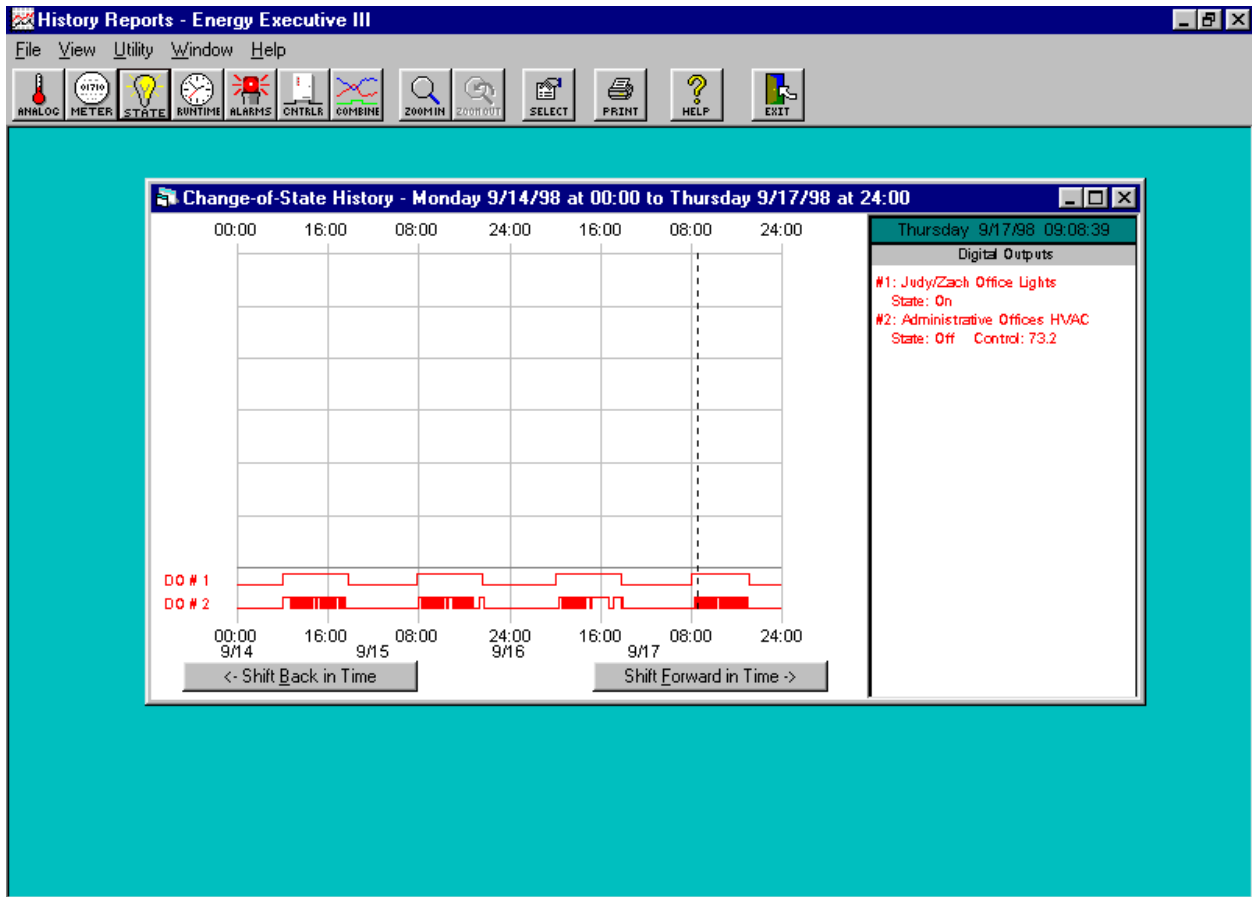
icon from the toolbar to go back to the Analog History Setup Screen to select a different time period or a different set of points to review.

2. Meter History

Reviewing Meter History is accomplished in exactly the same fashion as reviewing Analog History (as described in the previous sections) except the points from which to choose are meter points rather than analog points.

3. Change of State History

The setup screen for reviewing Change of State History is used in exactly the same fashion as the setup screen for reviewing Analog History as described in the previous section except the points from which to choose are control points rather than analog points. However, the graph of this data is somewhat different. For example, if one were to select the change of state history for two control points; Judy/Zach Office Lights and Administrative Offices HVAC, for the period of September 14 at Midnight through September 17 at Midnight, and request a graph of the data, it would look like this:



Note that the graphical depiction of the state of the control point is a step in the line; raised step="ON", low flat line="OFF".

The time-selection line, Zoom In, Select and Print features work as described above in the Analog History review section.

4. Runtime History

The setup screen for reviewing Runtime History is used in exactly the same fashion as the setup screen for reviewing Change of State History (as described in previous sections). Runtimes are accumulated for all control points in the system. Once points and report times are selected the Display Table button produces the following display:

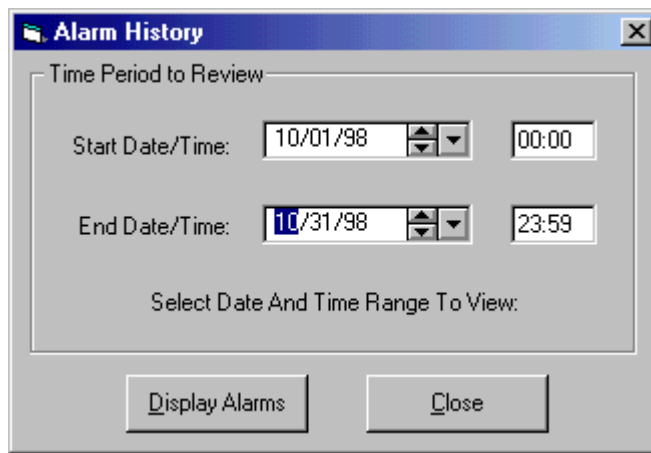
Accumulated times are listed in hours and minutes. For example, 169:40 means one hundred sixty-nine hours and forty minutes.

The left side of the screen lists the control point descriptions. To the right of the descriptions, runtimes for the selected period are displayed. The display has one column for Scheduled runtimes (runtime accumulated during scheduled hours), one column for Unscheduled runtimes (runtime accumulated outside of scheduled hours) and one column for the total runtime for the point.

The last line on the table contains total runtimes in each category for all points on the table.

5. Alarm History

Selecting the Alarm History icon produces following display:



Similar to other history reviewing routines, at this point the user can select a time period for which to review alarm history. When selecting a "Start Date/Time" and an "End Date/Time", dates can be entered into the date boxes, incremented or decreased with the arrow buttons or selected using the drop down calendar control. Times are entered in military time (24 hour clock). In the example shown above, the user has chosen to review all alarms for the month of October, 1998, from midnight on the 1st through midnight on the 31st.

Once you have selected the time period, click on the Display Alarms button to review a display similar to the following:

Date Time	Point Name	Description
10/30/98 4:11:18 PM	Engineering Office Front Temp.	Invalid Analog Input Alarm (-916.1 °F)
10/30/98 4:13:52 PM	Judy's Office Temp	High Analog Input Alarm (84.6 °F)
10/30/98 4:15:47 PM	Engineering Office Front Temp.	Analog Input Alarm Cleared
10/30/98 4:16:30 PM	Judy's Office Temp	Analog Input Alarm Cleared
10/31/98 4:50:38 AM	Panel Fabrication Shop	Low Analog Input Alarm (59.9 °F)
10/31/98 6:03:14 AM	Zach's Office Temp.	Low Analog Input Alarm (60. °F)
10/31/98 8:32:01 AM	Lou & Ray's Office Temp.	Low Analog Input Alarm (59.9 °F)
10/31/98 9:59:48 AM	Panel Fabrication Shop	Analog Input Alarm Cleared
10/31/98 11:39:27 AM	Zach's Office Temp.	Analog Input Alarm Cleared
10/31/98 12:00:44 PM	Lou & Ray's Office Temp.	Analog Input Alarm Cleared

Each alarm event is listed in chronological order and indicates the date and time the alarm occurred (or cleared), the point name that produced the alarm and the description of the alarm.

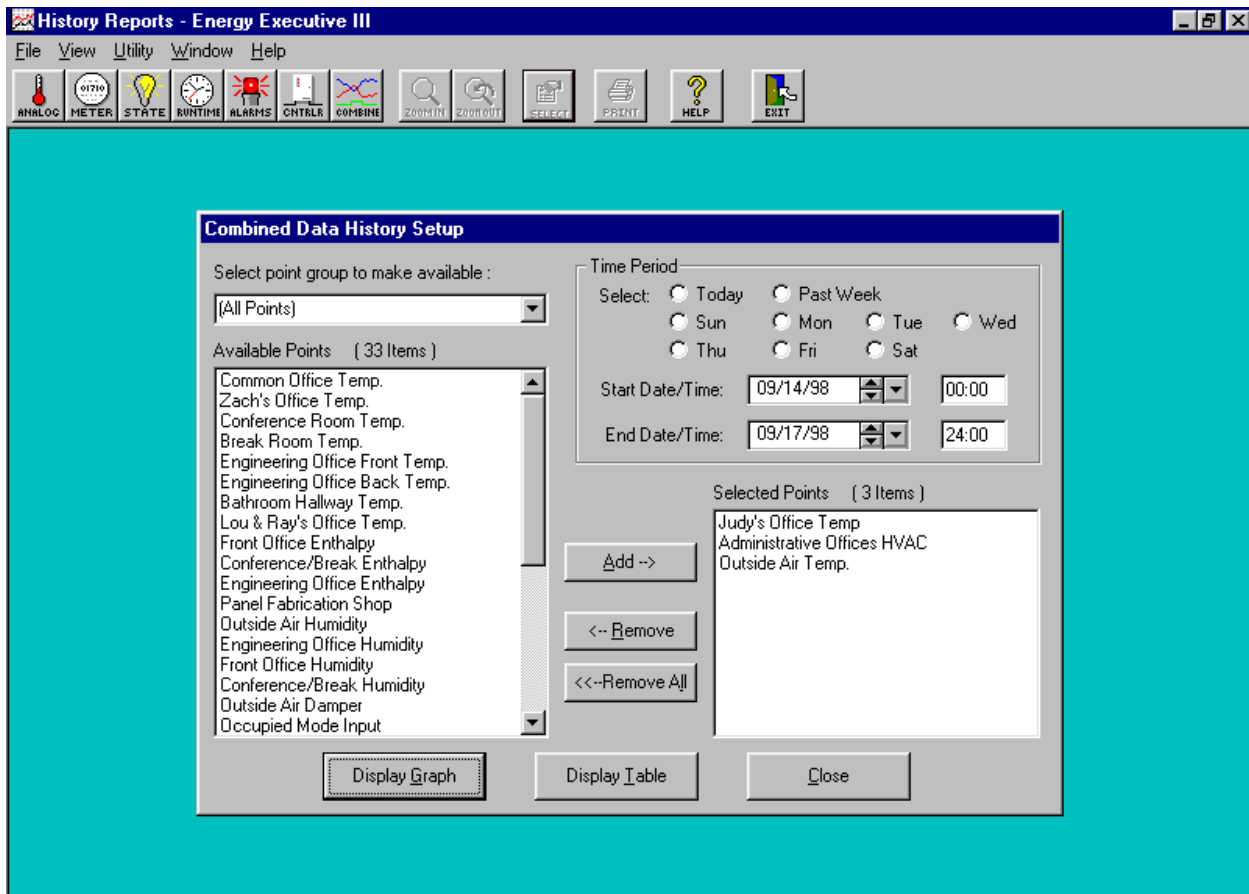
6. Controller History

(This feature to be added)

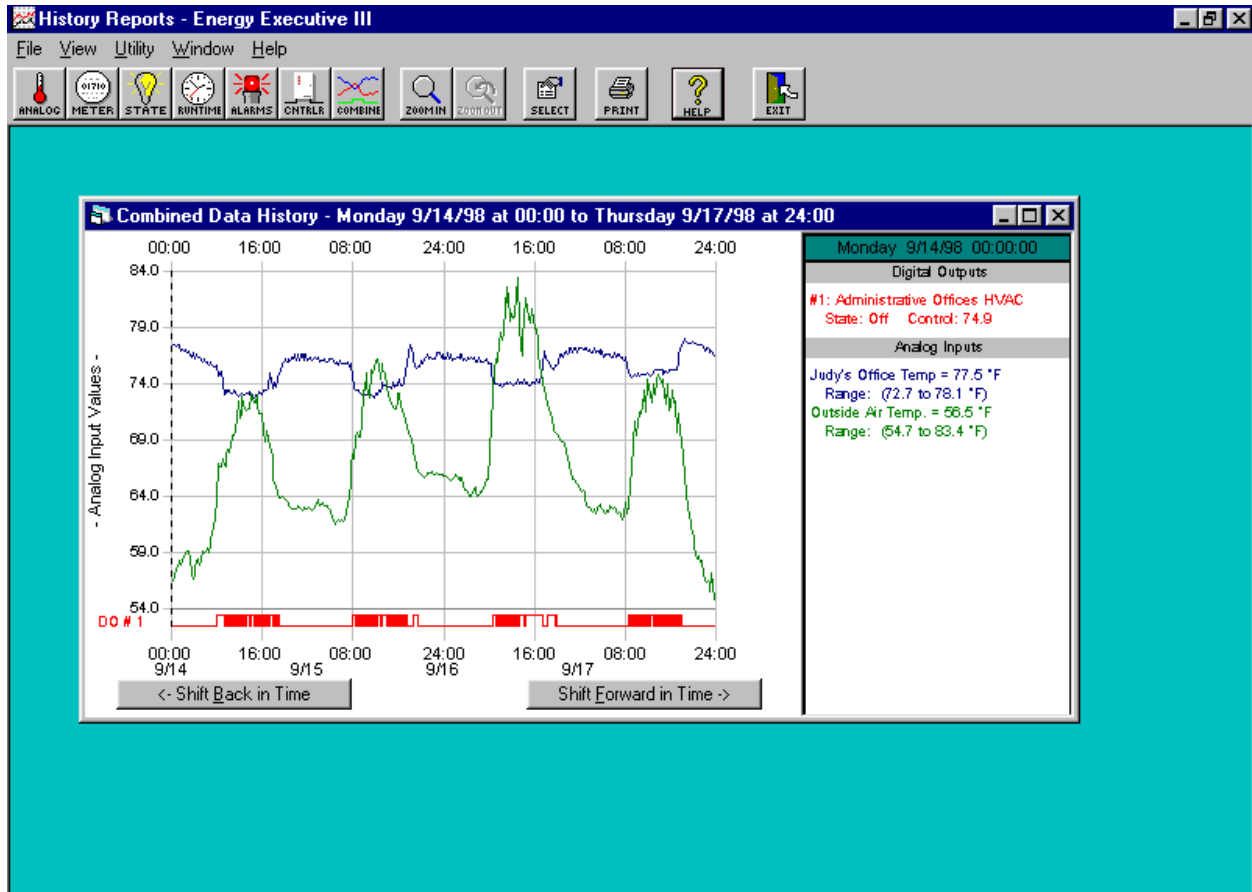
7. Combined History

This section of the History Reviewer allows the user to review data of different types on one screen or graph. For example, it may be of use to plot a graph of the outside air temperature, a particular space temperature and the change of state of the HVAC equipment that is controlling that space temperature. This would help in determining if the equipment is operating properly with regard to both time-of-day scheduling and temperature control.

The setup screen for reviewing Combined History is used in exactly the same fashion as the setup screen for reviewing several other histories (as described in previous sections). Consider the following example:



Here the user has elected to review the operation of the Administrative Offices HVAC control point along with the space temperature from Judy's Office (in the administration area) and the Outside Air Temperature. The resultant graph looks like this:



The graph shows that over this time period the outside air temperature climbed during the day and dropped at night; Judy's space temperature drifted up during unoccupied hours and dropped during occupied hours that corresponded to the running of the HVAC equipment. All seems to be working well in this cooling mode.

The time-selection line, Zoom In, Select and Print features work as described above in the Analog History review section. Also, as with other histories of this nature, data can be displayed in tabular fashion as well.