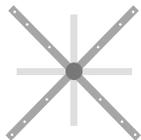
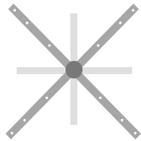
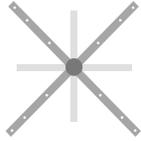
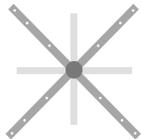


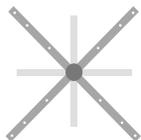
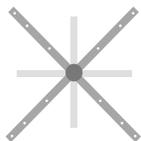
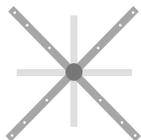
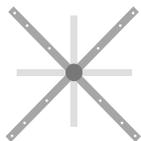
ENVIRO-TEC[®]
ENGINEERING FOR EXCELLENCE



INSIDE WDDCMON



User's Guide for the
ENVIRO-TEC[®] DDC Control System
Windows[®] Based Software



Stock ID: WDDCMON

August, 1997

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Largo, FL

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Getting Started

Minimum Hardware Requirements

Before installing the DDC Monitor program, you will need at least 10 Megabytes of available disk space, and the following minimum hardware requirements should be met:

MINIMUM Hardware Requirements:

- 80486DX 33 MHz (80486DX 66 MHz suggested)
- 8 megabytes of RAM
- VGA Color Monitor
- 1 Available Serial port
- Mouse or any pointing device supported by Windows
- Windows 3.1, Windows for Workgroups 3.11, or Windows 95

Installing the DDC Monitor Software

To install the DDC monitor, place the installation disk into a 3.5" floppy drive on your computer. Select **Run** from the Program Manager **File** menu as shown in the following figure. You will be prompted to enter a file name; type "A:\SETUP" (if you are installing from the B drive, type "B:\SETUP") and press ENTER.



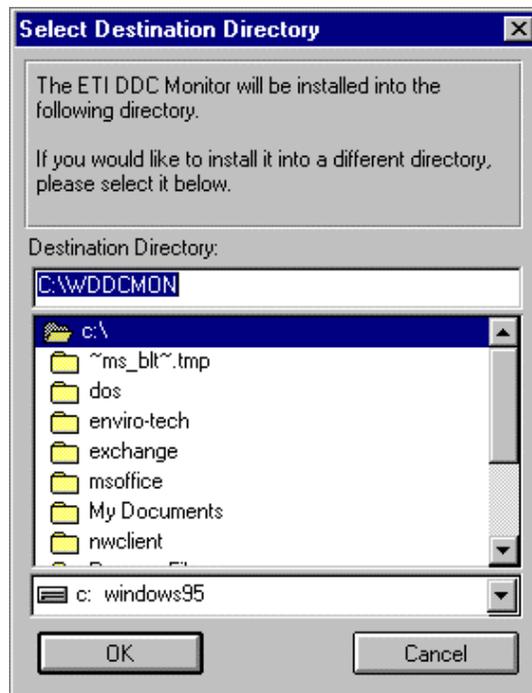
Selecting RUN from the Program Manager

The SETUP program will begin to lead you through the installation process.



Setup Program

You will be asked to choose a directory in which you would like the program installed. The default "C:\WDDCMON" is suggested. A different location can be chosen by either entering a new name or by selecting an existing directory from the list. If the chosen directory does not already exist, it will be created automatically. Press **OK** to continue.



Selecting a Destination Directory for Program Files

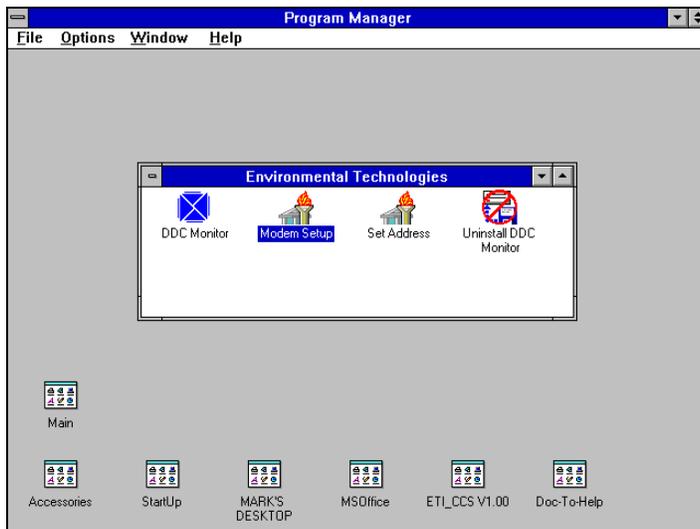
Next you will be asked if you want to backup any files overwritten during the installation process. For first time installations, press **No** to skip this step. If you are upgrading to a newer version, press **Yes** and the installation program will prompt you to select a backup directory.

The installation program will begin copying the program files to your computer. This operation can be stopped by pressing **Cancel** at any time. When all program files have been installed, you will be asked if you would like icons added to your Program Manager. Select **YES** and the screen shown on the following page will be displayed prompting you to choose a Program Group for the icons. If you are installing under Windows 95 you will be asked if you want shortcuts added to the start menu and, in this case, you will not be prompted to select a Program Group.



Selecting a Program Group for Icons

The default Program Group, “Environmental Technologies”, is suggested. A different group can be chosen by either entering a name or selecting an existing group from the list. Press “OK” and the icons will be installed. The installation is now complete.



Icons installed in the Windows Program Manager

Uninstalling the DDC Monitor Software

The DDC Monitor Program comes with built in uninstall capabilities. The installation can be reversed by running the “Uninstall DDC Monitor” program. All programs and system modifications (except directories) made during the installation process will be removed. To run the Uninstall program, double click on the “Uninstall DDC Monitor” Icon in the DDC Monitor Program Group. Afterwards, you can remove any remaining directories using the Windows File Manager.

Communications Setup

Direct Connect Communications

Equipment Needed

A direct connection can be used only in situations where it is possible to physically connect a computer and one of the DDC network controllers using a cable. To establish a direct connection with a DDC system using the Windows DDC Monitor Software, the following equipment is required:

1. An IBM compatible computer with a copy of Windows DDC Monitor software installed.
2. An ETINT1 interface cable included in the ETCOMPAC communication package. This cable has a 9 pin female D-Connector (DB9F) on one end and a 6-pin male Quick-Connect jack with transmit and receive lights on the other end.
3. A QW6N 6 foot communication cable included in the ETCOMPAC communication package. This cable has a 6 pin female Quick-Connect plug on each end.

Setting up Communications

1. Insert the ETINT1 cable's 9 pin female connector into the computer's serial communication port.
2. Insert one end of the QW6N cable into the free end of the ETINT1 cable.
3. Plug the free end of the QW6N cable into the 6 pin communication port on any system controller (SCU, BTC, Zone, or Operators Panel).

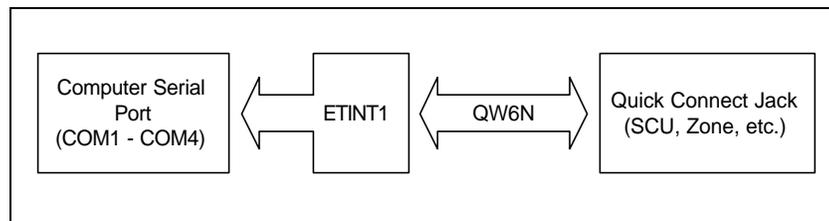


Figure 1. Direct Connect Cable Configuration

Remote Modem Communications

A modem can be used to establish a connection with a DDC system in situations where it is not possible to directly connect a computer and one of the network controllers. To establish a remote connection using the Windows DDC Monitor Software. The equipment needed and steps required to setup communications are listed in the following sections.

Equipment Needed

Remote (DDC side) Equipment

1. An ETINT1 interface cable (described in preceding section).
2. A QW6N interface cable (described in preceding section).
3. An ETNULL1 cable. This is a 9 pin male (DB9M) to 25 pin male (DB25M) null modem cable.
4. An External Hayes Compatible Modem capable of 2400 baud connections.
5. Any additional cables and connectors that might be needed to connect the PC, Modem, and phone line (modem cable, gender changers, phone line extension, etc.).

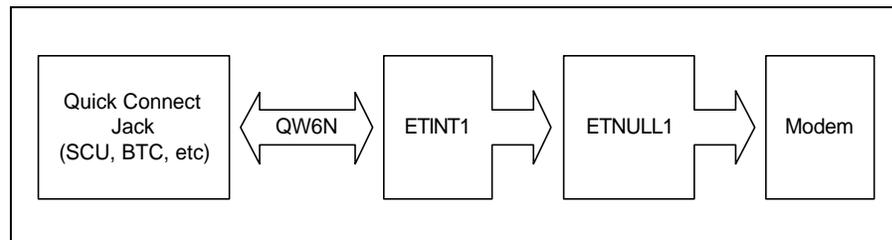
Local (PC side) Equipment

1. A Hayes Compatible Modem capable of 2400 baud connections.
2. An IBM PC compatible computer with at least one available serial port. The port cannot be using a shared interrupt or have any other hardware conflicts with other devices on the computer.
3. Any additional cables and connectors that might be needed to connect the PC, Modem, and phone line (modem cable, gender changers, phone line, etc.).

Setting up Communications

Remote (DDC side) Setup

1. Configure the External modem using the Modem Setup program described elsewhere in this manual.
2. Plug one end of the QW6N interface cable into any quick connect jack on the DDC system. These 6 pin male jacks are located on every SCU, BTC, Zone Controller, Operator's Panel, and Thermostat.
3. Plug the free end of the QW6N interface cable into the Quick Connect jack on the ETINT1.
4. Plug the 9 pin (DB9F) connector on the ETINT1 cable into the 9 pin (DB9M) connector on the ETNULL1 modem cable.
5. Plug the 25 pin end of the ETNULL1 into the External Hayes Compatible Modem. Most modems have a 25 pin (DB25F) connector. If yours does not, you will need to purchase a "converter" with a 25 pin female (DB25F) on one end and the appropriate modem connector on the other end.
6. Finally, connect the modem to a phone line using the appropriate telephone cable which is usually included with the modem.



Remote Communications DDC Cable Setup

Local (PC side) Setup

Follow the installation instructions included with your Modem describing how to connect the Modem to a PC. Note the Serial Port number (i.e. COM1) used for communications to this Modem.

Before attempting to use the modem with the DDC Network, test it using the communications software included with it or by using the Windows terminal program. If it does not work, consult the troubleshooting section of the modem installation manual or contact the manufacturer.

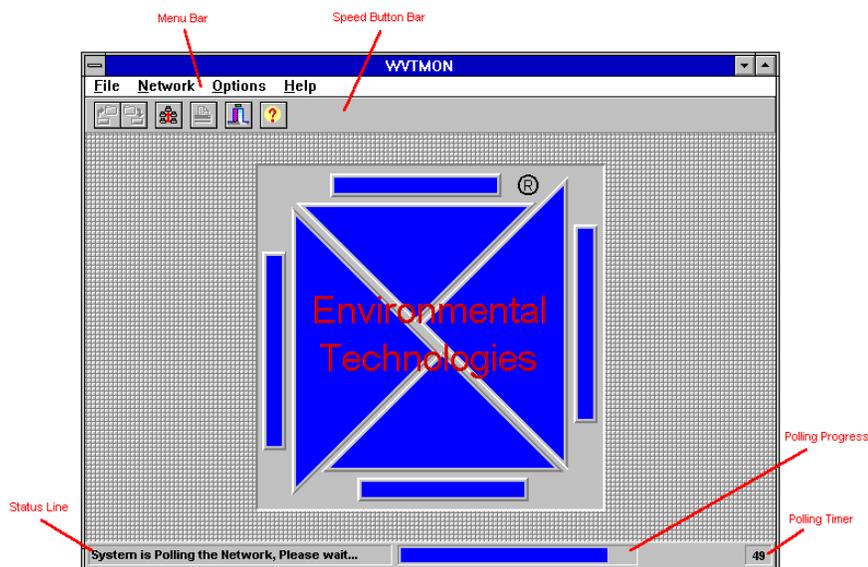
The DDC Monitor Program

Starting the Program

This program uses a large number of standard and custom Windows controls including Buttons, Edit Boxes, Check Boxes, Drop Down Lists, and Tabs for Multipage Dialog Boxes. If you are a new Windows user it may help review your Windows manual before using this program. There is also a good tutorial included with most versions of Windows.

To run the Windows DDC Monitor, double click on the DDC Monitor Icon in the DDC Monitor Program Group. The main program screen will be displayed. If no user action is taken within a few seconds, the “Connect to Network” dialog box will open automatically. After the program has been properly configured, this allows the user to quickly establish a network connection by simply running the program and pressing ENTER when the “Connect to Network” dialog appears.

The Main Screen



DDC Monitor Main Screen

Menu Bar

File Menu

Close - Closes the active controller window.

Load Configuration - Loads a controller configuration from a file.

Save Configuration - Saves a controller configuration to a file.

Print - Prints the current screen.

Print Setup - Selects and configures the printer used by this program.

Exit - Closes and open windows and exits the program.

Network Menu

Connect to Network - Opens the “Connect to Network” dialog.

Lock Controls - Locks and Unlocks the controls on a controller configuration screen.

Options Menu

Program - Opens the “Program Options” dialog.

Communication Stats - Opens the “Communication Stats” dialog. This dialog box displays the number of communication attempts, failures, and percent failures. Properly installed systems with good communications should have less than 1% errors.

Help Menu

Contents - Opens the Help File contents page.

Search for Help On - Opens the Help File search engine dialog.

About - Opens a dialog that displays version and copyright information about the program.

Speed Button Bar

Buttons used a shortcuts for menu commands. The following buttons, listed from left to right, are available.

Load Configuration Button - Shortcut for the *Load Configuration* command on the *File* Menu.

Save Configuration Button - Shortcut for the *Save Configuration* command on the *File* Menu.

Connect to Network Button - Shortcut for the *Connect to Network* command on the *Network* Menu.

Print Button - Shortcut for the *Print* command on the *File* Menu.

Exit Button - Shortcut for the *Exit* command on the *File* Menu.

Help Button - Shortcut for the *Search for Help On* command on the *Help* Menu.

Status Bar

Displays the following program status information.

Status Line - Displays program status during lengthy operations.

Polling Progress Bar - In addition to displaying information in the Status Line, this bar will be displayed to indicate the progress of the current polling cycle.

Polling Timer - Used to indicate the amount of time, in seconds, before the next polling cycle. The polling cycle starts when this timer reaches approximately 55 seconds.

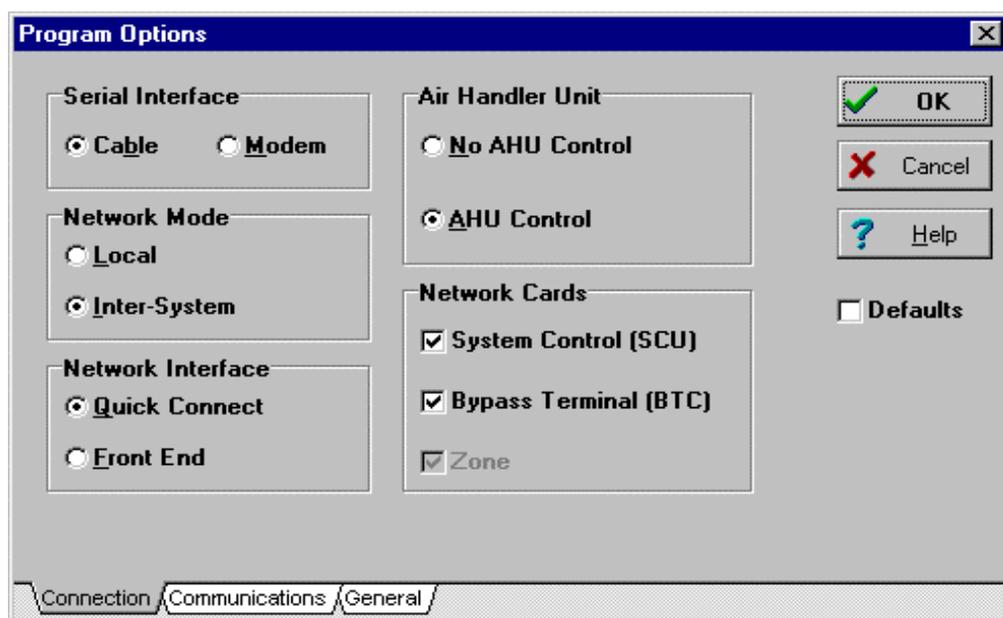
Program Options

Opening the Program Options Dialog

Before logging on to DDC system, program options must be set. These options tell the program how to establish a connection to the DDC network. If the **Connect to Network Dialog** is open, press **Cancel**. Select **Program** from the **Options** menu to open the **Program Options Dialog**. The three pages of options, connection, communication, and general, are available. Individual pages can be selected by pressing the appropriate tab located near the bottom of the dialog box.

Connection Options

To access the Connection Options page, select the “Connection” tab located near the bottom of the Program Options dialog box. The following screen will be displayed.



Connection Options

Serial Interface

The program has the ability to communicate with the DDC network using a Quick-Connect cable plugged directly into a network controller or by using a modem to call a remote system.

Cable - A Quick-Connect is used for network communications.

Modem - A modem is used for network communications.

Network Interface

Two different cable configurations can be used to interface with the DDC network. The standard Quick-Connect cable plugs into one of the 6 pin female connectors on an SCU, BTC, Zone Controller, Thermostat, or Operators Panel. There is an optional connector (ETRS) which allows a Quick-Connect cable to be plugged into the communications bus on a zone controller. This is known as a front end connection.

Quick Connect - The computer is connected to the network (2400 baud) using a Quick Connect cable.

Front End - The computer is connected to the network (9600 baud) using a Front End cable.

Network Mode

There are two different network communication modes available. In Local mode, the program can only communicate with the system into which the Network Interface cable is plugged. If the cable is plugged into zone 105, only the controllers with system address 100 will be visible: SCU #100, BTC #165, and Zones #101 - #164. In Inter-System mode, any controller connected to the network can be accessed. Normally, Inter-System mode should be used. However, Local Mode does provide one very important advantage. Several computers, each using Local Mode to monitor a different system, can be connected to the network simultaneously. This is possible because communication packets are not passed between systems in Local Mode. In Inter-System mode, packets are passed between systems. Errors will occur if more than one computer is connected to the network in Inter-System mode due to packet collisions.

Local - Set the network mode to Local (single system).

Inter-System - Set the network mode to Inter-System.

Network Cards

In order to establish a network connection, the software must search for a Network Card (controller). This is done by searching for an SCU. If an SCU cannot be found, it will search for a BTC. Finally, if a BTC cannot be found, it will begin searching for a zone controller. Response time can be greatly improved by selecting only the available controllers and thus avoiding unnecessary searches.

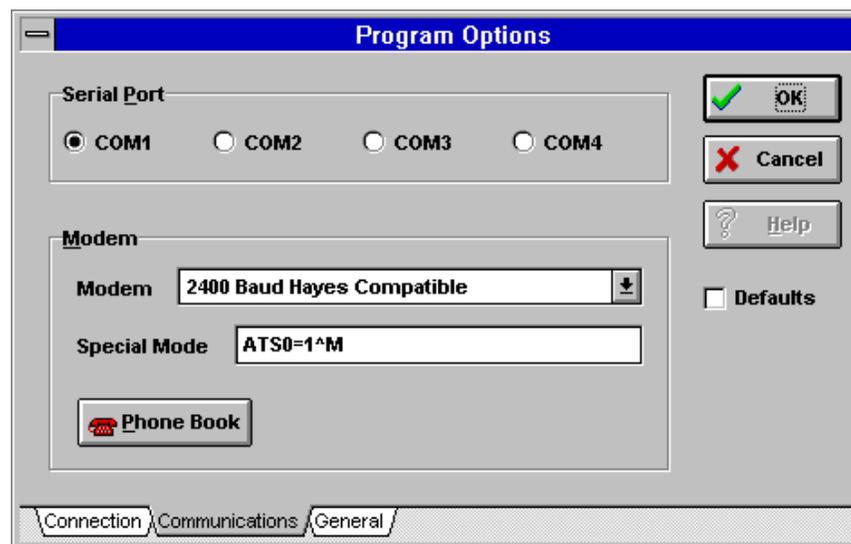
System Control - The network has at least 1 System Control Unit.

Bypass Terminal - The network has at least 1 Bypass Terminal Controller.

Zone - The network has at least 1 Zone Controller.

Communication Options

To access the Communications page, select the “Communications” tab located near the bottom of the Program Options dialog box. The following screen will be displayed.



Communication Options

Serial Port

Select the computer serial port used for DDC network communications. The selected serial port must be unused by any other device. It must also be setup properly in the computer CMOS configuration and in the Windows communication port settings. It is especially important to set the serial port address and interrupt correctly. There must also be no conflict with any other device. The standard IBM compatible PC can have up to 4 communication ports, but by default COM1 and COM2 share interrupts with COM3 and COM4. If you have a serial mouse on COM1 and try to use COM3 for this program it will probably not work because, by default, they share the same interrupt.

Modem

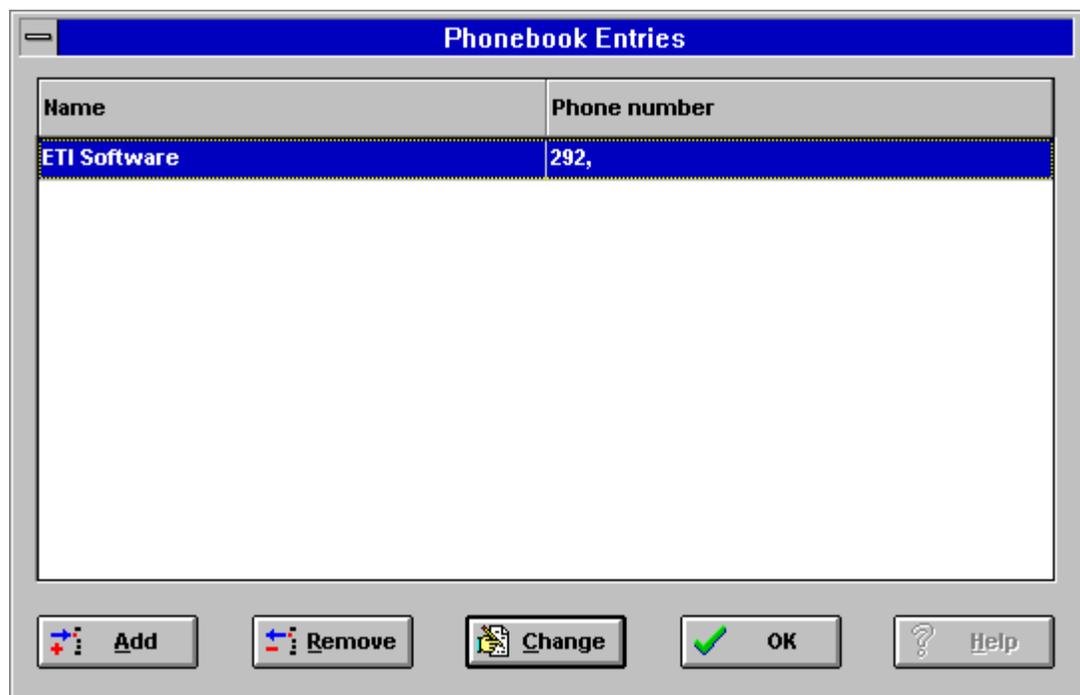
Modem - Select the modem used for remote connections. If the modem being used does not exist, select the closest match; preferably the same manufacturer and product line. If the selected modem does not work properly, a new Modem can be added to the database using the Modem Setup program described elsewhere in this manual.

Special Mode (Read Only) - The ETVT special mode command. Currently, the DDC system can connect only at 2400 baud using a remote modem connection. The remote modem must also be set to answer incoming phone calls. This command, defined in the modem database, is used to set the modem to communicate at only 2400 baud and automatically answer incoming calls.

Phone Book Button - Opens the **Phonebook Entries Dialog** described in the following section.

Phonebook

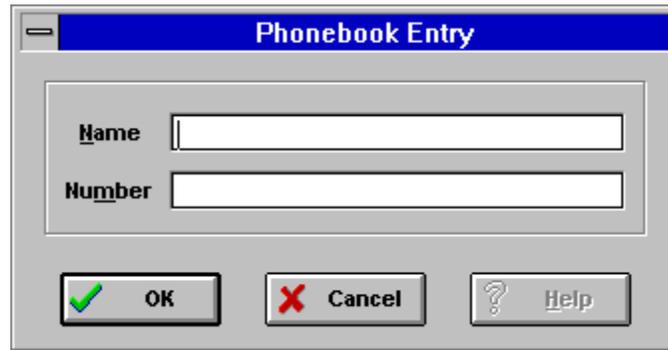
The phonebook contains a list of phone numbers used to call remote DDC systems. To access the phone directory, open the **Program Options Dialog**, select the communications page and press the **Phonebook** button. The **Phonebook Entries Dialog** will be displayed.



Phonebook Entries Dialog

Adding an New Phonebook Entry

To add an new Phonebook entry, Press the **Add** button. The **Phonebook Entry Dialog** shown in following figure will be displayed. Enter a Name and Number. Press **OK** to add the new entry to the phonebook database.



Phonebook Entry Dialog

Name - The name used to identify the new location. It will be used whenever a number needs to be selected.

Number - The phone number used to call this location. This value can contain phone numbers, extensions, calling card information, etc. by using “special” characters listed in the following table. For example, if 9 is required to get an outside line, the number is (813) 541-3531, and the extension is 999, then enter “9W1-813-541-3531,999” (without the quotes).

Character	Description
T	Touch tone dialing
P	Pulse Dialing
W	Wait for a dialtone before continuing.
,	Pause
!	Flash Hook
-	Ignored

Deleting a Phonebook Entry

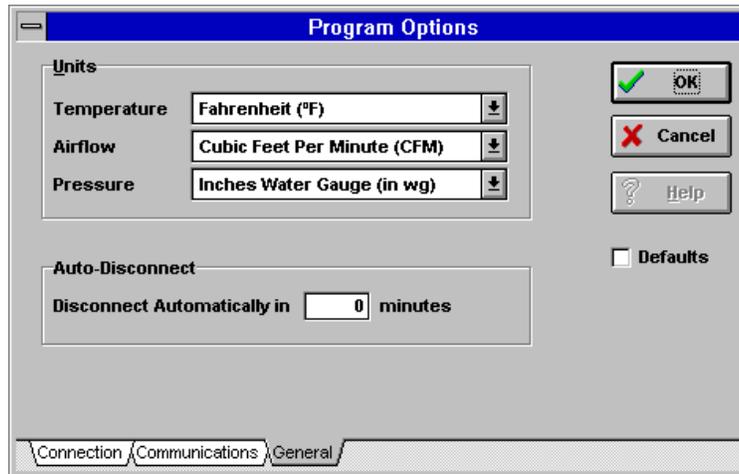
To remove a phone number from the database, select the entry you want to delete from the list and press the **Remove** button. When prompted to confirm the deletion, press **Yes** to remove the entry from the database.

Changing a Phonebook Entry

To change an existing phone number, select the entry you want to change from the list and press the **Change** button. The **Phonebook Entry Dialog** box will appear. Change the name and number as desired and press **OK** to update the database.

General Program Options

To access the General options page, click the “General” tab located near the bottom of the dialog box. The following screen will be displayed.



General Options

Units

The DDC monitor has the ability to display Temperature, Air Flow, and Pressure in different measurement units. The following units are available:

Temperature - Display temperature in Fahrenheit (°F) or Centigrade (°C).

Air Flow - Display air flow in Cubic Feet Minute (CFM), Liters Per Second (L/S), or Cubic Meters Per Hour (CMH).

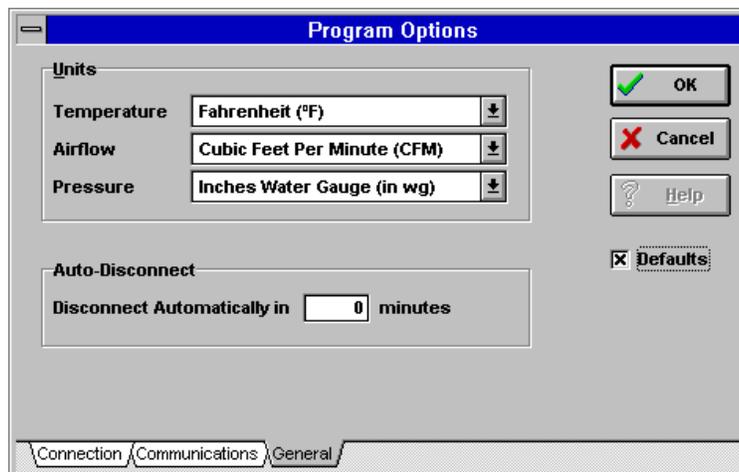
Pressure - Display pressure in Inches of Water Gauge (in w.g) or Pascal (Pa).

Auto-Disconnect

This feature allows the user to select the time, in minutes, used for automatic network log off. If there has been no user input (key presses, mouse clicks, etc.) for the specified time, the program will automatically disconnect from the DDC network. Entering 0 disables the auto-disconnect feature.

Saving the Default Options

Check the **Defaults** checkbox as shown below to save the current program options. If the options are saved, they will become the default program options which are loaded each time the program is run. If the options are not saved, they will be active only during the current session.

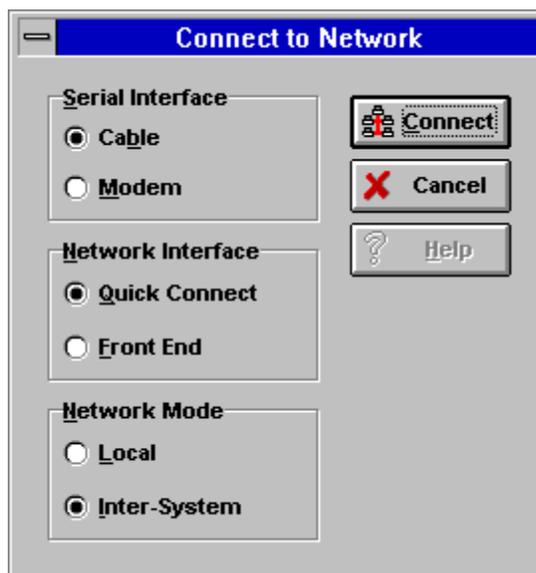


Setting Default Program Options

The Network Monitor

Connecting to the DDC Network

Before attempting to connect with the DDC network, make sure all cables are properly configured and the program options have been set. If the **Connect to Network Dialog** is already open, press the **Connect** button. If it is not already open, choose **Connect** from the **Network** menu first.

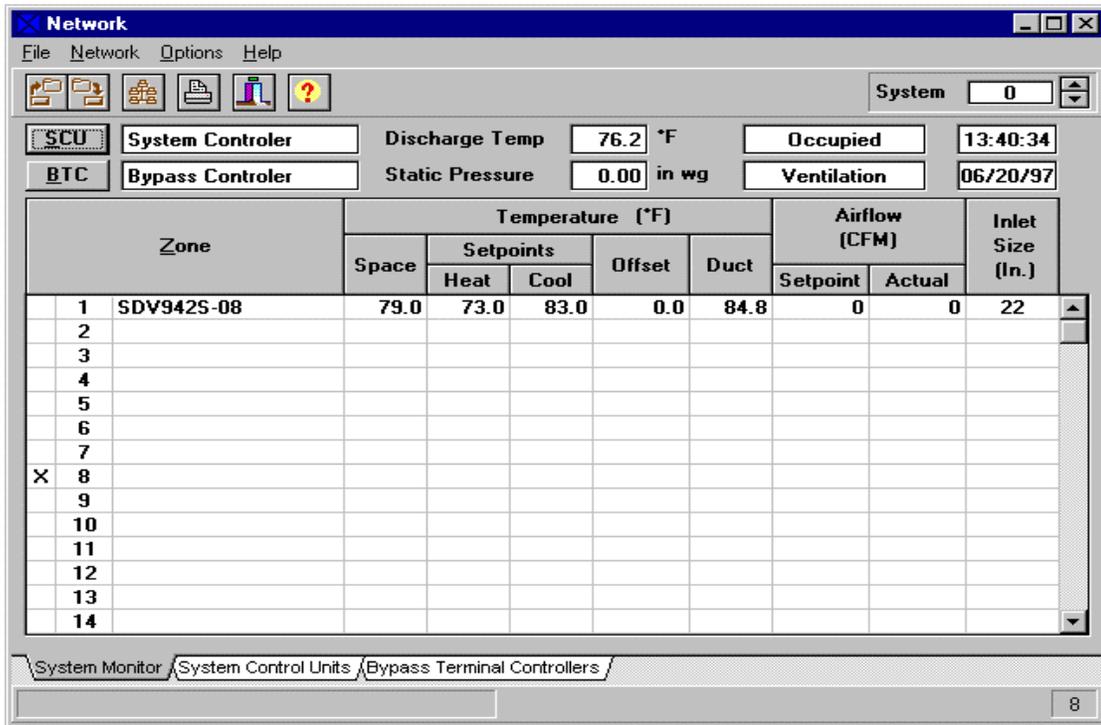


Connect to Network Dialog

The program will begin searching for a network controller based on the network cards selected in the program options. After a card has been found, the program will synchronize itself with the network polling cycle. This process can take up to 20 seconds so please be patient. The search and synchronize status can be monitored by watching the status bar at the bottom of the screen. When a connection to the network has been established the Network Monitor Screen will be displayed.

The Network Monitor Screen

The Network Monitor screen displays operational status information from the selected system. The information from the SCU and BTC may or may not be displayed depending upon the network cards selected in program options. The information displayed on this page is updated continuously and can only be changed using one of the SCU, BTC, or Zone configuration screens described later in this manual.



Network Monitor Screen

System Address

This value displays the system address of the selected system. The address can be changed using the up and down arrows located just to the right of this value. If the connection was not established in Inter-System mode, the address cannot be changed.

System Control Unit (SCU)

Information from the SCU on the selected system.

Identifier - The 16 character alpha-numeric identifier assigned to the SCU.

Occupied Mode - The current occupied mode: occupied or unoccupied.

Time - The current time from the battery backed real time clock.

Date - The current date from the battery backed real time clock.

***Control Mode** - The current control mode: Heating, Cooling, Ventilation, or Standby.

***Discharge Temperature** - The current AHU discharge temperature.

* Only Appear if AHU is selected in program options.

Bypass Terminal Controller (BTC)

Information from the BTC on the selected system.

Identifier - The 16 character alpha-numeric identifier assigned to the SCU.

Static Pressure - The actual static pressure being measured.

Zone Controller Grid

Information from the zone(s) on the selected system. This grid contains 64 rows, one for each possible zone. If a zone is unavailable or not responding, the information will be left blank.

Zone - Displays the zone number and 16 character identified. An “X” will appear at the left of this field when the information from the zone is being updated.

Space Temp - Current room temperature.

Heating Setpoint - Current heating setpoint

Cooling Setpoint - Current cooling setpoint.

Temp Offset - The difference between the space temperature and the heating or cooling setpoint. If the space temperature is below the heating setpoint, the offset will be the *HeatingSetpoint - SpaceTemp* displayed as a negative number in blue. If the space temperature is above the cooling setpoint, the offset will be the *SpaceTemp - CoolingSetpoint* displayed as a positive number in red. If the space temperature is within the heating and cooling setpoints the offset will be zero.

Airflow Actual - Current VAV terminal airflow.

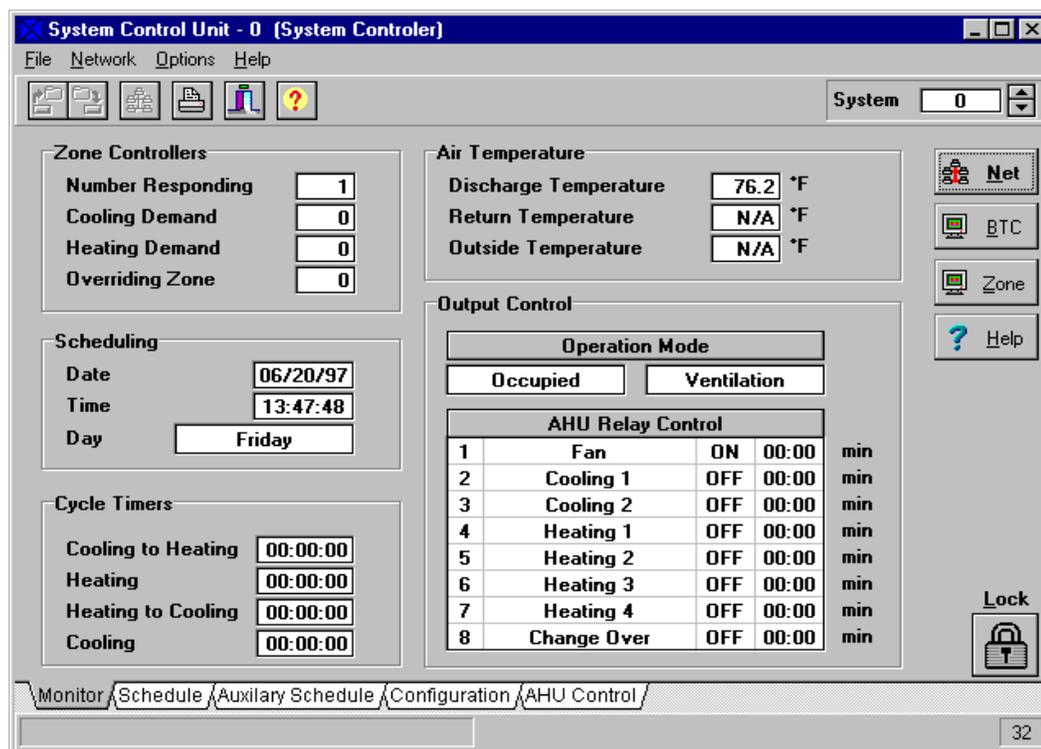
Airflow Setpoint - Airflow setpoint.

Duct Temp - Current duct temperature measured by the zone controller.

The System Control Unit

Monitor Screen

The Monitor screen displays the current operational state of the System Control Unit. The information displayed on this screen is updated continuously and cannot be changed. Any setpoint or parameter changes must be made using the configuration screens discussed in later sections.



SCU Monitor Screen

Zone Controllers

This fields in this group contain VAV terminal communication and voting information. This information is calculated by the SCU once after each polling cycle.

Number Responding - The number of VAV terminal controllers currently responding to the System Control Unit.

Cooling Demand - Cooling demand level recorded during the last polling cycle. It is the sum of the cooling demand levels from all zones on this system.

Heating Demand - Heating demand level recorded during the last polling cycle. It is the sum of the heating demand levels from all zones on this system.

Overriding Zone - Unit address of the last zone, encountered during the last polling cycle, on which the unoccupied override button has been pushed.

Scheduling

The time and date from the battery backed real time clock and the schedule day being used to control occupied status.

Date - Current date in day/month/year (dd/mm/yy) format.

Time - Current time in hour/minutes/seconds (hh:mm:ss) format.

Day - Current schedule day. One of the following values will be displayed:

Sunday ... Saturday: The SCU occupied/unoccupied mode is being control by the normal weekday Occupied Schedule times.

Holiday: The SCU occupied/unoccupied mode is being control by the holiday Occupied Schedule times because the date falls within one of the periods defined in the Holiday Schedule.

Zone Override: The SCU is in occupied mode because one or more zones are in override.

External Override: The SCU is in occupied mode because the External Override input (Outside Air Temperature) has been shorted.

Cycle Timers (only appears if AHU selected in program options)

Mode of operation timer information.

Cooling to Heating - Ventilation cycle time remaining during the change from cooling to heating.

Heating - Heating cycle time remaining until a mode change decision is made.

Heating to Cooling - Ventilation cycle time remaining during the change from heating to cooling.

Cooling - Cooling cycle time remaining until a mode change decision is made.

Air Temperature (only appears if AHU selected in program options)

System temperature information.

Discharge Temperature - Air handler unit discharge temperature.

Return Temperature - (Optional) Air handler unit return air temperature.

Outside Temperature - (Optional) Outside air temperature.

Output Control

System mode and SCU output status.

Operating Mode

Current System Control Unit mode information.

Top Row - The occupied mode: Occupied or Unoccupied.

Bottom Row - The control mode: Cooling, Heating, Ventilation, or Standby.

Contact Closure Status

This grid displays information pertaining to the SCU output relays.

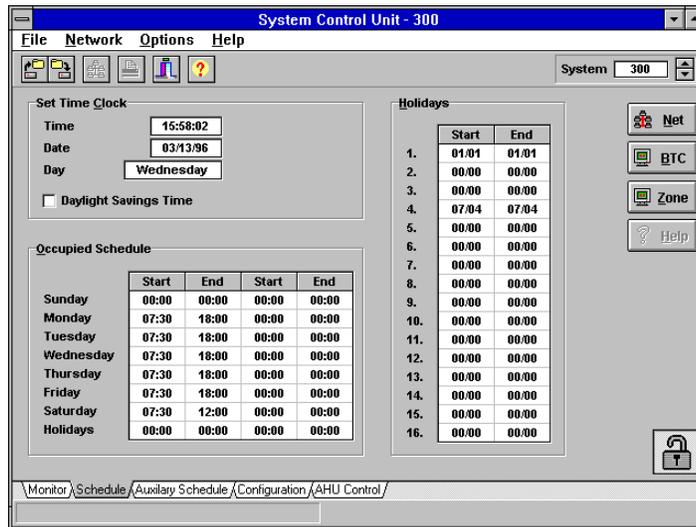
Left Column - Displays output relay assignments.

Center Column - Displays output relay status: On or Off.

Right Column - Displays output relay Anti-Cycle timer.

Schedule Screen

The Schedule screen is used to configure daily occupied and holiday period scheduling. Time of day, date, day of week and daylight saving time compensation can also be set from this screen. To access the SCU "Schedule" screen, select the "Schedule" tab located near the bottom of any System Control Unit screen. The following screen shown will be displayed.



SCU Schedule Screen

Unlocking the Controls

Before any can be made to the information displayed on any of the configuration screens, you must first "unlock" the controls by clicking on the Padlock button located in the lower right hand corner of the screen. If there is a system password, you will be prompted to enter it correctly before the controls will be unlocked and changes can be made.

Set Time Clock

Information from the battery backed real time clock on the System Control Unit.

Time - Display and set the current time using in hour:minutes:seconds (hh:mm:ss) format. Seconds are ignored when the clock is set.

Date - Display and set the current date using mm/dd/yy format.

Day - (Read Only) This value cannot be changed. It will be updated automatically when the date is changed.

Daylight Savings - When set, the internal calendar will automatically compensate for seasonal changes into and out of daylight saving time.

Occupied Schedule

Daily system occupied times. The first 7 rows, Sunday through Saturday, are used for normal weekly occupied mode scheduling. The last row, Holidays, is used for occupied scheduling when the date falls within one of the 16 periods defined in the Holiday Schedule (see the following section).

Start ... End - (columns 1 and 2) The first daily occupied period in hour:minute (hh:mm) format. If no occupied period is desired, enter "00:00" for both values.

Start ... End - (columns 3 and 4) A second daily occupied period in hour:minute (hh:mm) format. If no occupied period is desired, enter "00:00" for both values.

Holidays Schedule

Holiday period scheduling. This schedule is used to define up to 16 different holiday periods throughout the year. During these periods, the occupied mode scheduling will be controlled by the Holiday times defined in the Occupied Schedule (see the preceding section).

Start - The start date of the selected holiday period in day/month (dd/mm) format.

End - The end date of the selected holiday period in day/month (dd/mm) format.

Enter “00/00” for the start and end dates to disable a holiday period.

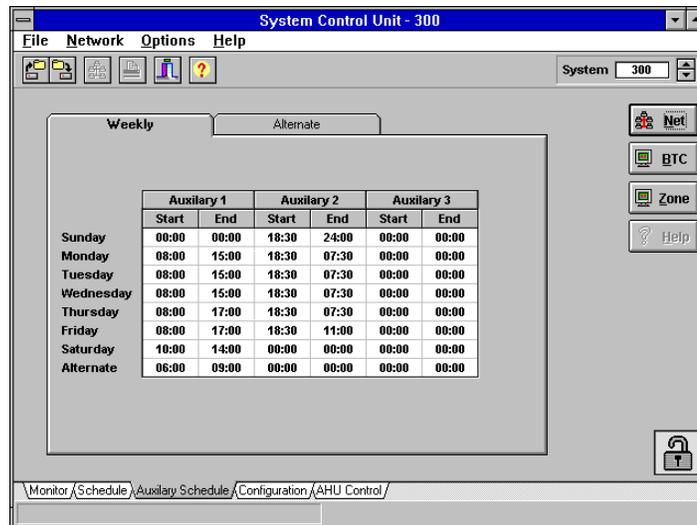
Auxiliary Schedule Screen

The Auxiliary Schedule screen is used to configure the daily operation of the auxiliary output relays. The auxiliary output relays can be used to control any external device that responds to a dry contact closure. Environmental Technologies does not accept any responsibility for the operation of any external devices controlled by the auxiliary output relays.

To access the Auxiliary Schedule screen select the “Auxiliary Schedule” tab located near the bottom of any System Control Unit screen. Two different pages: Weekly and Alternate are available. Individual pages can be selected using the “Weekly” and “Alternate” tabs located near the top of the Auxiliary Schedule screen.

Weekly Schedule

Auxiliary Relay Scheduling configuration. Rows 1 through 7 (Sunday through Saturday) contain the start and end times used for normal, daily, auxiliary output scheduling. Row 8 (Alternate) contains the start and end times used for relay output scheduling during the periods defined in the Alternate Schedule. To access the Weekly schedule select the “Weekly” tab located near the top of the Auxiliary Schedule screen.



SCU Auxiliary/Weekly Schedule

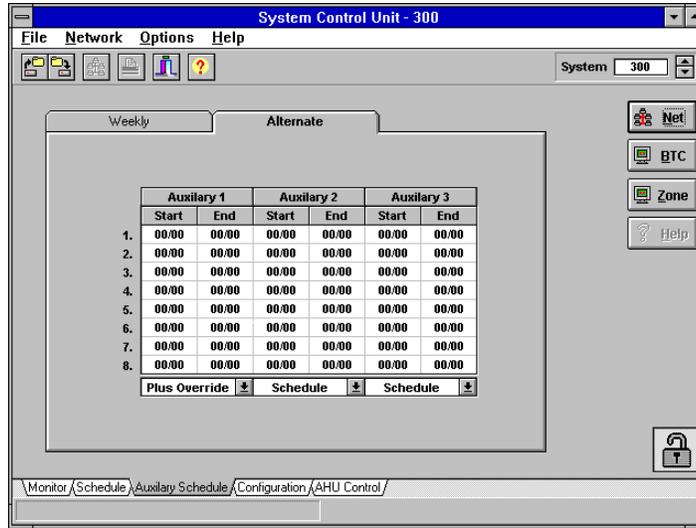
Aux1: Start ... End - (columns 1 and 2) The start and end times used to schedule “on time” for Auxiliary Output Relay 1 in hour:minute (hh:mm) format. If no “on time” is desired, enter "00:00" for both values.

Aux2: Start ... End - (columns 3 and 4) The start and end times used to schedule “on time” for Auxiliary Output Relay 2 in hour:minute (hh:mm) format. If no “on time” is desired, enter "00:00" for both values.

Aux3: Start ... End - (columns 5 and 6) The start and end times used to schedule “on time” for Auxiliary Output Relay 3 in hour:minute (hh:mm) format. If no “on time” is desired, enter "00:00" for both values.

Alternate Schedule

Alternate Relay Scheduling Grid. This Schedule is used to configure up to 8 different periods throughout the year. During these periods, Relay Output Scheduling will be based on the Alternate times defined in the Weekly Schedule. To access the Alternate Days schedule select the Alternate tab located near the top of the Auxiliary Schedule screen.



SCU Auxiliary/Alternate Schedule

Alternate Days

Aux1: Start ... End - (columns 1 and 2) The start and end dates in month/day (mm/dd) format used to define up to 8 different Alternate Scheduling periods for Auxiliary Output Relay 1. Enter "00:00" for both values to disable the period.

Aux2: Start ... End - (columns 3 and 4) The start and end dates in month/day (mm/dd) format used to define up to 8 different Alternate Scheduling periods for Auxiliary Output Relay 2. Enter "00:00" for both values to disable the period.

Aux3: Start ... End - (columns 5 and 6) The start and end dates in month/day (mm/dd) format used to define up to 8 different Alternate Scheduling periods for Auxiliary Output Relay 3. Enter "00:00" for both values to disable the period.

Output Control

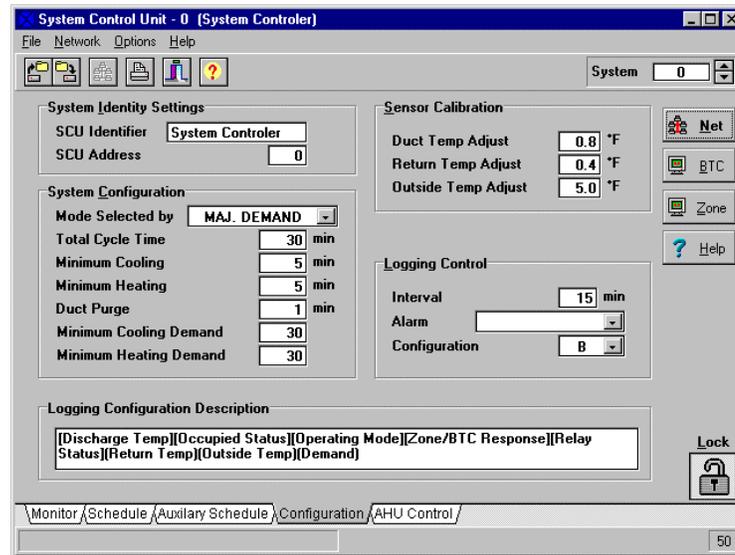
These selections are used to further define how the Auxiliary Output Relays are controlled.

Schedule - The auxiliary output relay will be on only during scheduled times.

Plus Override - The auxiliary output relay will be on during scheduled times and during any user initiated unoccupied override time.

Configuration Screen

The Configuration Settings screen, shown below, is used to configure internal operation parameters. To access the Configuration Screen, select the “Configuration” tab located near the bottom of any System Control Unit screen.



SCU Configuration Screen

System Identity Settings

Controller address and identification.

SCU Identifier - A 16 character alpha-numeric name used to identify this controller. This is the identifier displayed on the Network Monitor screen next to the “SCU” button.

SCU Address - The network address used to communicate with this controller. System Control Unit addresses must be multiples of 100 between 0 and 9900 i.e. 0, 100, 200, ... , 9900. Even after the addresses has been changed, the controller will still be responding to the old address until a “Normal” command is issued or the controller is reset.

System Configuration

SCU control mode and timing functions.

Mode Selected By - Determines how the System Control Unit decides the its control mode: Heating, Cooling, Ventilation, etc.

Majority Vote: When the current cycle timer (see the Monitor screen) counts down to 0, the controller will review the results of the last polling cycle. The next control mode is based on these results as follows:

1. If there are no heating or cooling votes present, the controller will assume that all of the VAV terminal temperature setpoints are satisfied and switch to the ventilation mode.
2. If the number of cooling votes is greater than or equal to the number of heating votes and at least one zone has met the minimum number of cooling votes required, the SCU will go into cooling mode.
3. If the number of heating votes is greater that the number of cooling votes and at least one zone has met the minimum number of heating votes required, the SCU will go into heating mode.

Time Cycling: This option applies the percentage of cooling and heating demand to a fixed time cycle. After the current total cycle timers (both heating and cooling cycle timers) count down to 0, the controller reviews the results of the last polling cycle. The percentage of heating and cooling votes are used to calculate Heating and Cooling time based on the following rules. NOTE: If at any time the sum of the duct purge, heating and/or cooling times exceed the total cycle time, the minimum heating and cooling times will be used.

1. If there are no heating or cooling votes present, the system will assume all Zones are satisfied and go into ventilation mode.
2. If there are heating votes but no cooling votes the SCU will go into heating mode. The heating time will be the Total Cycle Time minus any necessary duct purge time if a cooling to heating mode change is taking place. If the heating time is less than the Minimum Heating Time, the Minimum Heating Time will be used.
3. If there are cooling votes but no heating votes the SCU will go into cooling mode. The cooling time will be the Total Cycle Time minus any necessary duct purge time if a heating to cooling mode change is taking place. If the cooling time is less than the Minimum Cooling Time, the Minimum Cooling Time will be used.
4. If there are heating votes and cooling votes the SCU will go into heating mode, purge the duct, and then go into cooling mode. The Total Cycle Time will be adjusted by subtracting one duct purge time.
5. The heating and cooling times are then calculated by applying the percentage of heating and cooling votes to the adjusted Total Cycle Time. If either of the heating or cooling times are less than the Minimum Heating or Cooling, the respective Minimum Time will be used.

When the heating and cooling cycles are both finished, the entire process will be repeated.

Total Cycle Time - Defines the Total Cycle duration. This is a combination of Cooling, Heating, and Duct Purge times. Used only when “Time Cycling” mode is selected.

Minimum Cooling - The minimum cooling cycle time allowed.

Minimum Heating - The minimum heating cycle time allowed.

Duct Purge - The ventilation time required to purge the ducts between cooling and heating modes.

Minimum Cooling Votes - The threshold number of votes that must be issued by at least one zone before the SCU will go into cooling mode.

Minimum Heating Votes - The threshold number of votes that must be issued by at least one zone before the SCU will go into heating mode.

Sensor Calibration

Temperature sensor calibration adjustments.

Duct Temp Adjustment - Air handler discharge temperature sensor calibration adjustment. Used to adjust the duct temperature reading to match a calibrated device.

Return Temp Adjustment - Air handler return temperature sensor (optional) calibration adjustment. Used to adjust the return temperature reading to match a calibrated device.

Outside Temp Adjust - Outside air temperature sensor (optional) calibration adjustment. Used to adjust the outside temperature reading to match a calibrated device.

Logging Control

Logging and Trending setup.

Interval - Sets the number of minutes between recorded logging information

Alarm - Indicates any error or alarm conditions that occurred during a logging session. One of the following values will be displayed.

No Alarm: No errors have occurred.

Memory Error: The program encountered an error while trying to store information in the on board EEPROM memory.

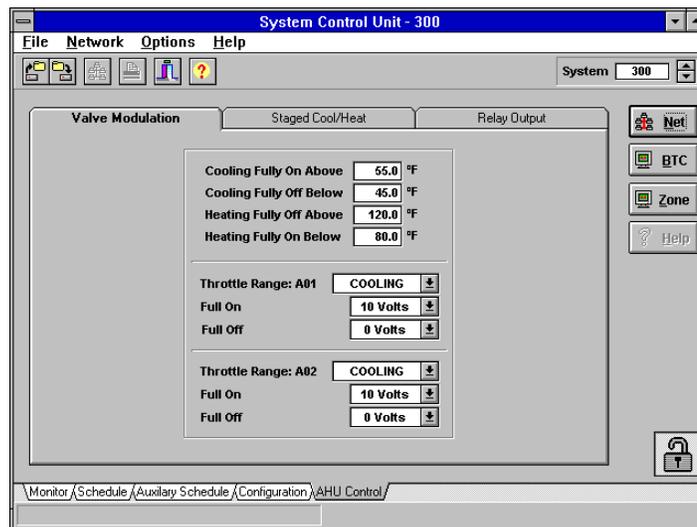
Configuration - Selects one of the pre-defined logging configurations. The configuration determines the information recorded and available for later analysis.

AHU Control Screen

The AHU Control screen is used to configure the parameters used for Air Handling Unit control. To access the AHU Controls screen, select the “AHU Controls” tab located near the bottom of any System Control Unit Screen. Three different pages of AHU control information are available: Valve Modulation, Relay Output, and Cool/Heat Stage control. Individual pages can be selected using the appropriate tab located near the top of the AHU controls screen.

Valve Modulation Control

Modulating valve control on SCUA4A2 and SCULT4 only. To access the Valve Modulation Control page select the “Valve Modulation” tab located near the top of the AHU Control screen.



SCU AHU Valve Modulation Control Screen

Cooling Fully On Above - Sets the chilled water valve output to the “full on” voltage when the air handler discharge temperature is greater than or equal to this value and system is in cooling mode.

Cooling Fully Off Below - Sets the chilled water valve output to the “full off” voltage when the air handler discharge temperature is less than or equal to this value and system is in cooling mode.

Heating Fully Off Above - Sets the hot water valve output to the “full off” voltage when the air handler discharge temperature is greater than or equal to this value and the system is in heating mode.

Heating Fully On Below - Sets the hot water valve output to the “full on” voltage when the air handler discharge temperature is less than or equal to this value and the system is in heating mode.

AO1: Assignment - Analog Output 1 assignment. May be set to either a Cooling or Heating valve output.

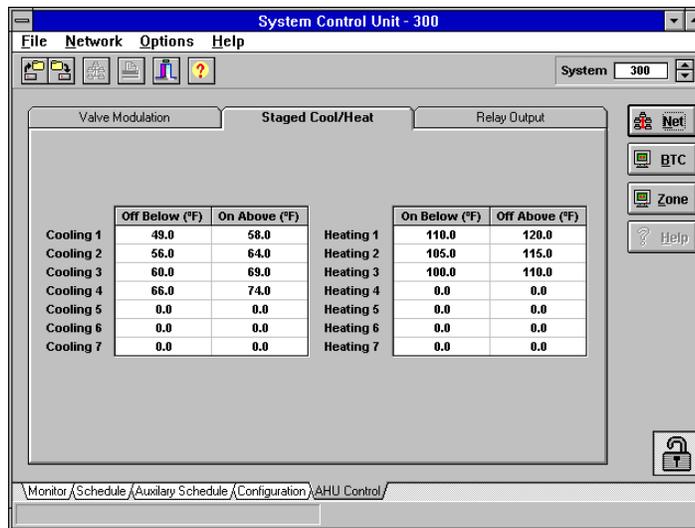
AO1: Full On and Full Off - (AO1 Throttling Range) Configures the analog output 1 voltage range to match the throttling range of the modulating valve controlled by A01.

AO2: Assignment - Analog Output 2 assignment. May be set to either a Cooling or Heating valve output.

AO2: Full On and Full Off - (AO2 Throttling Range) Configures the analog output 2 voltage range to match the throttling range of the modulating valve controlled by A01.

Staged Cooling and Heating Control

Discharge temperature control of the cooling and heating stages. To access the Staged Cool/Heat page, select the “Staged Cool/Heat” tab located near the top of the AHU Control screen.



SCU AHU Staged Cooling/Heating Control Screen

Cooling Stages

“Turn On” and “Turn Off” temperatures used to control cooling stages 1 through 7.

Off Below Column - Sets the “turn off” discharge temperature for cooling stages 1 through 7.

On Above Column - Sets the “turn on” discharge temperature for cooling stages 1 through 7.

Heating Stages

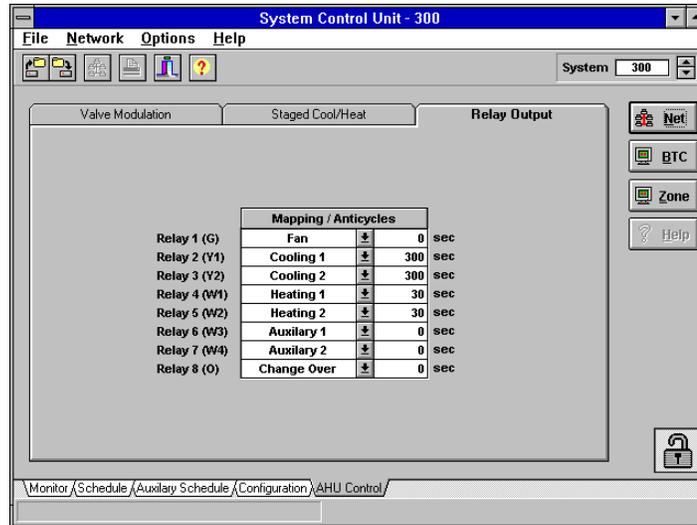
“Turn On” and “Turn Off” temperatures used to control heating stages 1 through 7.

On Below Column - Sets the “turn on” discharge temperature for heating stages 1 through 7.

Off Above Column - Sets the “turn off” discharge temperature for heating stages 1 through 7.

Relay Output Mapping / Anticycles

Output relay and anticycle configuration. To access the Relay Output Mapping/Anticycle Control select the Relay Output tab located near the top of the AHU Control Screen.



SCU AHU Relay Output Control Screen

Mapping Column

Assigns a function to the relay. Any one of 19 different functions described below may be assigned to each relay.

Fan: Air handler unit fan control.

Changeover: Water source heat pump changeover valve control. Relay is active in cooling mode.

Cooling 1 ... Cooling 7: Control of cooling stages 1 through 7.

Heating 1 ... Heating 7: Control of heating stages 1 through 7.

Auxiliary 1 ... Auxiliary 3: Control of up to 3 auxiliary contacts.

Anticycles Column

Sets the time assigned for each output relay individually as required. Anticycle time is the amount of time a relay will be held inactive after it has received an off command from the controller. The primary purpose of this function is to prevent the short cycling of equipment (i.e. compressors) being controlled by the relay.

Control Commands

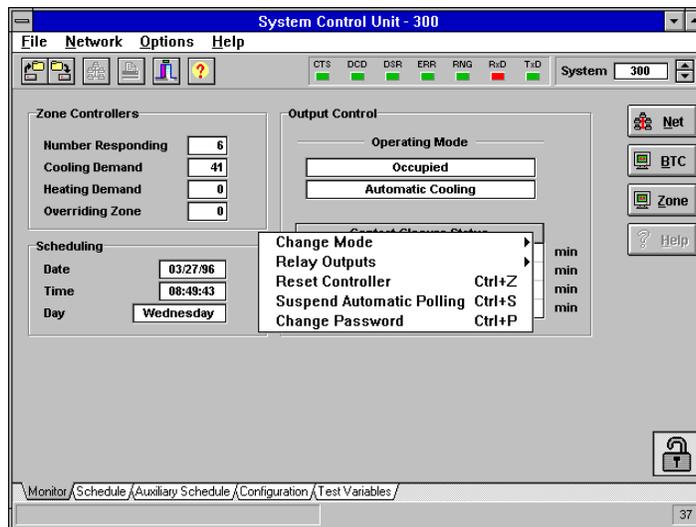
Keyboard Commands

The keyboard commands listed in the following table are available on any System Control Unit screen. The list does not contain the keyboard shortcuts for menu commands described in the next section.

Keyboard Command	Function	Special Conditions
F6	Suspend Polling Cycle	Controller must be unlocked
F7	Resume Polling Cycle	Controller must be unlocked
F8	Decrement System Address	Does not work in Local Mode
F9	Increment System Address	Does not work in Local Mode
Ctrl-F8	Decrement System Address (10X)	Does not work in Local Mode
Ctrl-F9	Increment System Address (10X)	Does not work in Local Mode
F10	Open Popup Menu	
Page Up	Cycles forward through all SCU screens.	Will not work if a configuration control has the input focus.
Page Down	Cycles backwards through all SCU screens.	Will not work if a configuration control has the input focus.
Ctrl-C	Clear and Reset all information.	

Popup Menu Commands

The SCU popup menu shown in the following figure can be activated by pressing F10 or right-clicking on any System Control Unit screen. Most of these commands are used mainly for testing and debugging purposes, but may prove useful in other situations.



SCU Command Menu

Change Mode

SCU Control Mode commands.

Toggle Mode - Cycles through control modes in the following order: Cooling, Heating, Fan Override or Automatic.

Normal - Return this SCU to Normal mode and activate the new network address if it has been changed. After the SCU network address has been changed, the old address will still be used until this command is issued or the controller is reset.

Normal (All Units) - Issue the Normal command to all SCU's.

Relay Outputs

Output Relay Control Commands.

Engage Relay 1 ... 8 - Turns on the respective Relay Output

Disengage All - Turns off all Relay Outputs (1 to 8).

Reset Controller

This selection issues a software reset command to this system control unit. Sometimes, it may be necessary to reset the controller in order to resume normal operations. For example, the controller can become "locked up" due to voltage spikes on the power supply or communication lines. This solution might be easier than removing power from the system, especially when dealing with a remote location via modem.

Suspend Automatic Polling

Suspends the polling cycle until it is either re-enabled or the network connection is ended. It is useful when making many modifications to the controller configuration. By suspending the polling cycle, the 8 second delay that occurs once each minute can be avoided. **NOTE: During the polling cycle, the SCU gathers control information from zones with the same system address. When automatic polling is suspended, the SCU will not be receiving this information and thus will not change the control mode based on heating or cooling demand from the zones.**

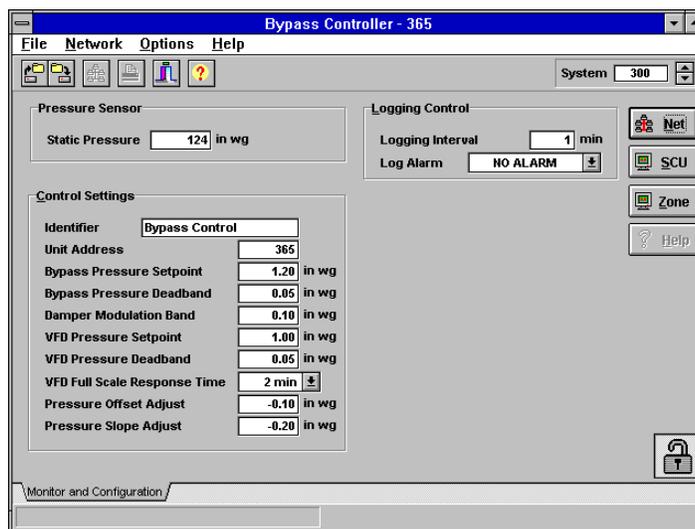
Change Password

The DDC network can accept a password for security purposes. When a password has been set, the system can still be monitored, but its configuration cannot be changed without knowing the password. **NOTE: Be sure to remember this password, if it is forgotten, you will be unable to get back into and modify the system configuration.**

The Bypass Terminal Controller

Monitor and Configuration Settings Screen

The Bypass Terminal Controller screen is used to configure the static pressure control parameters. This screen also provides real time monitoring of the static pressure on the selected system. To open the BTC monitor screen press the “BTU” button located in the upper left hand corner of the Network Monitor Screen.



BTC Monitor Screen

Unlocking the Controls

Before any changes can be made to the information displayed on any of the configuration screens, you must first “unlock” the controls by clicking on the Padlock button located in the lower right hand corner of the screen. If there is a system password, you will be prompted to enter it correctly before the controls will be unlocked and changes can be made.

Pressure Sensor

Static Pressure - (Read Only) Real time system duct static pressure.

Control Settings

Static pressure control parameters.

Identifier - A 16 character alpha-numeric name used to identify BTC. This identifier appears on the DDC Network Monitor Screen next to the “BTC” button.

Unit Address - The Network address used to communicate with the controller. The system address can change, but the unit address must always be 65. Valid BTC addresses are: 65, 165, 265, ..., 9965.

Bypass Pressure Setpoint - The duct static pressure setpoint used to control duct pressure on this system.

Bypass Pressure Deadband - The control range above and below the pressure setpoint where the controller is satisfied with the actual static pressure. For example, with a pressure setpoint of 1.25 in. wg. and a deadband of 0.02 in. wg., the controller would be satisfied with an actual static pressure range between 1.23 in. wg. and 1.27 in.wg.

Damper Modulation Band - The DDC system uses a damper actuator control method called "pulse width modulation". Pulse width modulation uses the difference between the actual static pressure and the pressure setpoint to control the damper. As the static pressure becomes closer to the setpoint value, the output pulses that control the damper become shorter. This value sets the maximum allowable output pulse length.

VFD (Variable Frequency Drive) Pressure Setpoint - Desired system duct static pressure setpoint when controlled by a 0 - 10 VDC modulating output to a VFD.

VFD (Variable Frequency Drive) Pressure Deadband - A control range above and below the pressure setpoint where the controller is satisfied with the actual static pressure. For example, with a pressure setpoint of 1.25 in. wg. and a deadband of 0.02 in. wg., the controller would be satisfied with an actual static pressure ranging between 1.23 in. wg. and 1.27 in. wg.

Pressure Offset Adjust - Used to calibrate the starting point of the static pressure curve. It is the software equivalent of an electronic zero adjustment.

Pressure Slope Adjust - Used to calibrate the slope of the static pressure curve. It is the software equivalent of an electronic gain adjustment.

VFD Full Scale Response Time - Used when the modulating 0 - 10 VDC output controls the frequency drive or inlet vanes on an air handler fan. This value sets the shortest period of time in which the controller will allow the output signal to ramp from 0 VDC to 10 VDC.

Logging Control

Logging and trending program configuration.

Interval - Sets the number of minutes between recorded logging information

Alarm - Indicates any error or alarm conditions that occurred during a logging session. One of the following values will be displayed.

No Alarm: No errors have occurred.

Memory Error: The program encountered an error while trying to store information in the on board EEPROM memory.

Control Commands

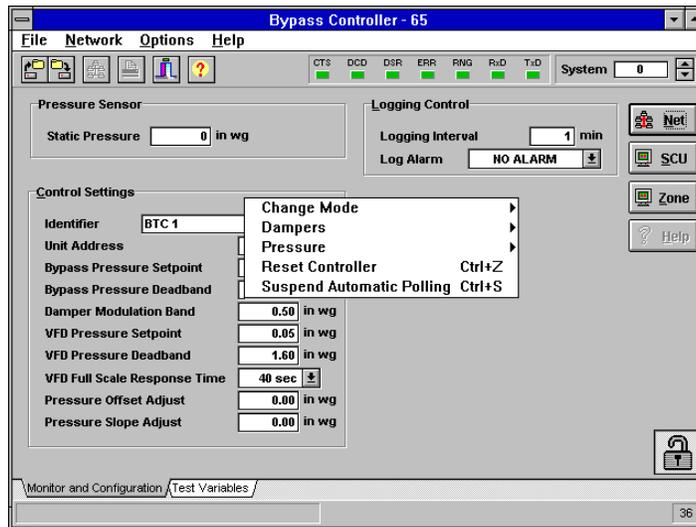
Keyboard Commands

The following keyboard commands, listed in , are available from any Bypass Terminal Controller screen. The list does not contain the keyboard shortcuts for menu commands described in the next section.

Keyboard Command	Function	Special Conditions
F6	Suspend Polling Cycle	Controller must be unlocked
F7	Resume Polling Cycle	Controller must be unlocked
F8	Decrement System Address	Does not work in Local Mode
F9	Increment System Address	Does not work in Local Mode
Ctrl-F8	Decrement System Address (10X)	Does not work in Local Mode
Ctrl-F9	Increment System Address (10X)	Does not work in Local Mode
F10	Open Popup Menu	
Page Up	Cycles forward through all SCU screens.	Will not work if a configuration control has the input focus.
Page Down	Cycles backwards through all SCU screens.	Will not work if a configuration control has the input focus.
Ctrl-C	Clear and Reset all information.	

Popup Menu Commands

The BTC popup menu, shown below, can be activated By pressing F10 or right-clicking on any Bypass Terminal Controller screen. Most popup menu commands are used mainly for testing and debugging, but may prove useful in other situations.



BTC Command Menu

Change Mode

BTC Control Mode commands.

Normal - Return this BTC to Normal mode and activate the new network address if it has been changed. After the BTC network address has been changed, the old address will still be used until this command is issued or the controller is reset.

Normal (All Units) - Issue the Normal command to all BTC's.

Dampers

Open 1, 2&3 Off, Vfd 25% - Turns on the open damper 1 output, Turns off the open and close outputs for dampers 2 and 3, and sets the variable frequency drive output to 25% of full scale; approximately 2.5 Volts.

Close 1, 2&3 Off, Vfd 33% - Turns on the close damper 1 output, Turns off the open and close outputs for dampers 2 and 3, and sets the variable frequency drive output to 33% of full scale; approximately 3.3 Volts.

Open 2, 2&3 Off, Vfd 50% - Turns on the open damper 2 output, Turns off the open and close outputs for dampers 1 and 3, and sets the variable frequency drive output to 50% of full scale; approximately 5 Volts.

Close 2, 2&3 Off, Vfd 60% - Turns on the close damper 2 output, Turns off the open and close outputs for dampers 1 and 3, and sets the variable frequency drive output to 66% of full scale; approximately 6.7 Volts.

Open 3, 1&2 Off, Vfd 75% - Turns on the open damper 3 output, Turns off the open and close outputs for dampers 1 and 2, and sets the variable frequency drive output to 75% of full scale; approximately 7.5 Volts.

Close 3, 2&3 Off, Vfd 100% - Turns on the close damper 3 output, Turns off the open and close outputs for dampers 1 and 2, and sets the variable frequency drive output to 100% of full scale; approximately 10 Volts.

All Outputs Off, Vfd 0% - Turns off all open and close damper outputs and sets the variable frequency drive output to minimum; approximately 0 Volts.

Close All Dampers - Turns on all close damper outputs.

Pressure

Offset - Sets BTC offset adjust for minimum calibrated pressure.

Slope - Sets BTC slope adjust for maximum calibrated pressure.

Reset Controller

This selection issues a software reset command to this system control unit. Sometimes, it may be necessary to reset the controller in order to resume normal operations. For example, the controller can become “locked up” due to voltage spikes on the power supply or communication lines. This solution might be easier than removing power from the system, especially when dealing with a remote location via modem.

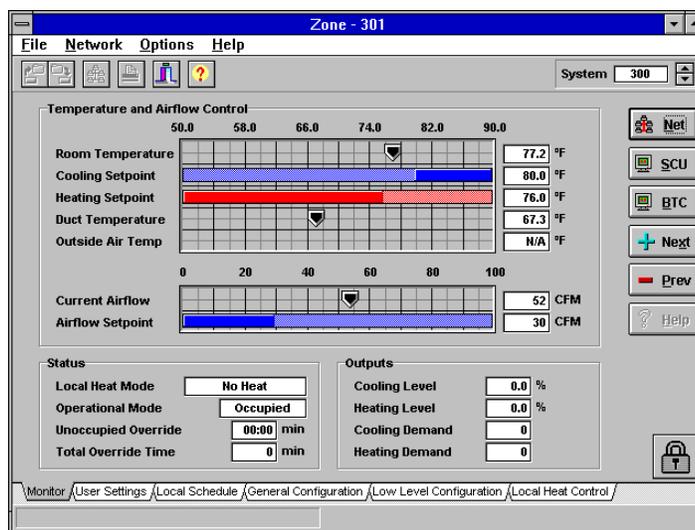
Suspend Automatic Polling

Suspends the polling cycle until it is either re-enabled or the network connection is ended. It is useful when making many modifications to the controller configuration. By suspending the polling cycle, the 8 second delay that occurs once each minute can be avoided. **NOTE: During the polling cycle, the SCU gathers control information from zones with the same system address. When automatic polling is suspended, the SCU will not be receiving this information and thus will not change the control mode based on heating or cooling demand from the zones.**

The Zone Controller

Monitor Screen

The Zone Monitor, shown below, displays the current operational status of a VAV terminal controller. The information on this screen is updated continuously and cannot be modified. Any setpoint or parameter changes must be made using the configuration screens discussed in the following sections. To access the Zone Monitor, double click on the desired zone in the Network Monitor Screen or highlight the zone and press ENTER. The following information is available.



Zone Monitor Screen

Temperature Control

Room Temperature - The current thermostat temperature

Cooling Setpoint - The cooling setpoint.

Heating Setpoint - The heating setpoint

Duct Temperature - The current inlet duct temperature.

Outside Air Temp - If the optional outside air temperature sensor is being used, its temperature will be displayed here.

Airflow Control

Current Airflow - Actual primary airflow through the VAV terminal.

Airflow Setpoint - The current airflow setpoint. This value is determined by the PID control algorithm based on current temperature demand.

Status

Current mode and timer status.

Local Heat Mode - The current heat control status.

Operational Mode - The current mode status: Occupied, Unoccupied or Override.

Unoccupied Override - The time remaining until the zone controller switches from unoccupied override mode back to unoccupied mode. This timer is activated when the system is in the unoccupied mode and the thermostat "On" button is pushed.

Total Override Time - The total amount of time that this zone terminal has been in unoccupied override mode. This information is generally used to charge tenants for excess energy usage. The time in the register can be reset to zero using the "Reset Override Timers" command.

Outputs

Current PID algorithm output status.

Cooling Level - Percentage of cooling required. This is determined by the PID algorithm based on temperature demand in the current occupied or unoccupied cooling mode.

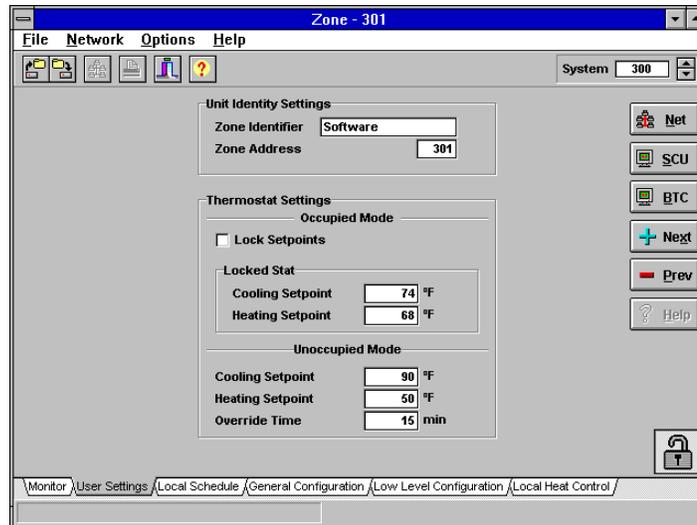
Heating Level - Percentage of heating required. This is determined by the PID algorithm based on temperature demand in the current occupied or unoccupied heating mode.

Cooling Demand - The cooling demand level being sent to the SCU during a polling cycle. This number is determined by applying the cooling level (percentage) to the total cooling demand level assigned to this terminal.

Heating Demand - The heating demand level being sent to the SCU during a polling cycle. This number is determined by applying the heating level (percentage) to the total heating demand level assigned to this terminal.

User Settings Screen

The User Settings screen is used to set zone identifier, address and temperature setpoints. To access the Users Settings screen, select the "User Settings" tab located near the bottom of any Zone Controller screen.



Zone User Settings Screen

Unlocking the Controls

Before any can be made to the information displayed on any of the configuration screens, you must first "unlock" the controls by clicking on the Padlock button located in the lower right hand corner of the screen. If there is a system password, you will be prompted to enter it correctly before the controls will be unlocked and changes can be made.

Unit Identity Settings

VAV zone terminal name and address.

Identifier - A 16 character alpha-numeric name used to identify BTC. This is the identifier that appears on the Network Monitor Screen.

Unit Address - The address used to communicate with this controller. Valid zone addresses range from 1 to 64 or each system: 1...64, 101...164, 201...264, ... , 9901...9964.

Thermostat Settings

Occupied Mode

Lock Setpoints - Selecting this option locks the cooling and heating setpoints. The setpoints can still be changed at the thermostat, but the internal setpoints used by the controller will not be affected.

Locked Stats - The cooling and heating setpoints used if Lock Setpoints is selected.

Unoccupied Mode

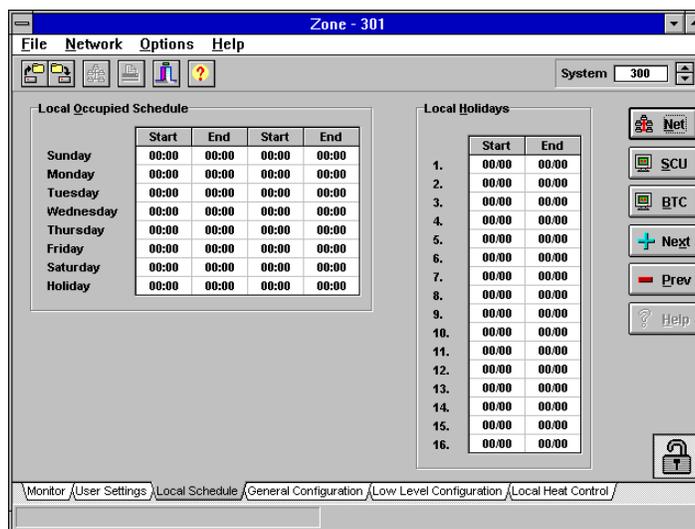
Cooling Setpoint - The cooling setpoint used when the system is in unoccupied mode.

Heating Setpoint - The heating setpoint used when the system is in unoccupied mode.

Override Time - The amount of time that the zone terminal will put the system into unoccupied override when the thermostat “On” button is pressed. The real time counter can be seen on the Monitor screen.

Local Schedule Screen

The Auxiliary Schedule screen is used to configuration the independent zone occupied schedules. To access the Local Schedule select the “Local Schedule” tab located near the bottom of any Zone Controller screen.



Zone Schedule Screen

Local Occupied Schedule

Daily system occupied times. The first 7 rows (Sunday through Saturday) are used for normal weekly occupied mode scheduling. The last row (Holidays) is used for occupied scheduling when the date falls within one of the 16 periods defined in the Local Holidays Schedule (see the following section).

Start ... End - (columns 1 and 2) The first daily occupied period in hour:minute (hh:mm) format. If no occupied period is desired, enter "00:00" for both values.

Start ... End - (columns 3 and 4) A second daily occupied period in hour:minute (hh:mm) format. If no occupied period is desired, enter "00:00" for both values.

Local Holidays

Local Holiday period scheduling. This schedule is used to define up to 16 different holiday periods throughout the year. During these periods, the occupied mode scheduling will be controlled by the Holiday times defined in the Local Occupied Schedule (see the preceding section).

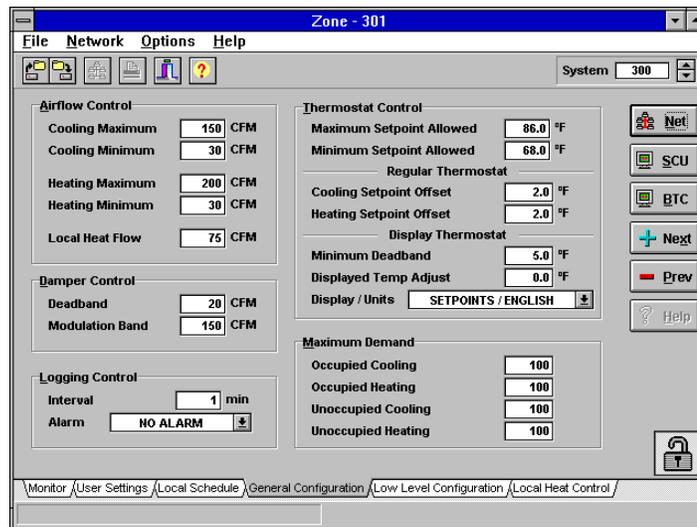
Start - The start date of the selected holiday period in day/month (dd/mm) format.

End - The end date of the selected holiday period in day/month (dd/mm) format.

Enter "00/00" for both the start and end dates to disable a holiday period.

General Configuration Screen

The General Configuration screen is used to configure VAV terminal limit control parameters. To access the General Configuration screen select the "General Configuration" tab located near the bottom of any Zone controller screen.



Zone General Configuration Settings Screen

Airflow Control

Individual mode specified CFM setpoint limits.

Cooling Maximum - Maximum allowable airflow setpoint for cooling mode.

Cooling Minimum - Minimum allowable airflow setpoint for cooling mode.

Heating Maximum - Maximum allowable airflow setpoint for heating mode.

Heating Minimum - Minimum allowable airflow setpoint for heating mode.

Local Heat Flow - Used only on a VAV zone terminal that is equipped with local heating capability. When the zone is demanding heat and the primary inlet air temperature is lower than the heating setpoint, the local heat flow value will become the airflow setpoint.

Damper Control

Deadband - A control range above and below the airflow setpoint where the controller is satisfied with the actual airflow. For example, with a setpoint of 327 CFM and a deadband of 40 CFM, the controller would be satisfied with an actual CFM ranging between 287 CFM and 367 CFM. See the following table for recommended deadband settings per terminal size.

Modulation Band - The controller uses a damper actuator control method called "pulse width modulation. The output pulses used to control the damper become shorter as the actual value becomes closer to the setpoint. This value sets the longest allowable output pulse. See the following table for recommended modulation band settings per terminal size.

Terminal Size	Maximum Airflow (CFM)	Minimum Airflow (CFM)	Deadband Airflow (CFM)	Modulation Band
4	35	225	25	100
5	55	350	30	150
6	65	550	40	175
8	120	1000	50	200
10	195	1600	60	300
12	280	2300	70	350
14	400	3100	75	400
16	550	4100	100	500

Note Maximum and Minimum CFM's listed are recommended absolute VAV terminal limits. These values will probably not reflect the design CFM flows on a specific installation.

Logging Control

Logging and Trending program configuration.

Interval - Sets the number of minutes between recorded logging information

Alarm - Indicates any error or alarm conditions that occurred during a logging session. One of the following values will be displayed.

No Alarm: No errors have occurred.

Memory Error: The program encountered an error while trying to store information in the on board EEPROM memory.

Thermostat Control

Thermostat setpoint range limitations.

Maximum Setpoint Allowed - Maximum cooling setpoint that the controller will recognize regardless of actual thermostat setting.

Minimum Setpoint Allowed - Minimum heating setpoint that the controller will recognize regardless of actual thermostat setting.

Regular Thermostat

Cooling Setpoint Offset - The number of degrees, above the thumbwheel setpoint, used as the controller cooling setpoint.

Heating Setpoint Offset - The number of degrees, below the thumbwheel setpoint, used as the controller heating setpoint.

Display Thermostat (ETDIS)

Minimum Deadband - The minimum allowable deadband between cooling and heating setpoint on the display thermostat. If the heating setpoint is set closer to the cooling setpoint than this deadband, this value will be subtracted from the cooling setpoint to establish a new heating setpoint. Recommended deadband is 3 or 4 degrees.

Displayed Temp Adjust - Used to adjust the room temperature displayed on the thermostat.

Display units - Configures the information displayed on the thermostat. The following choices are available:

1. Display setpoints in English Units.
2. Display setpoints in Metric Units.
3. Display room temperature in Metric Units.
4. Display room temperature in English Units.

Maximum Demand

Mode or terminal priority capability. Each VAV zone can be assigned an operating priority relative to other zone terminals on the same system. This is accomplished by assigning a maximum demand level to each of the 4 operating modes. Terminal controller with a higher maximum demand will have a higher ability to influence SCU mode changes.

Occupied Cooling - The maximum cooling demand used in the occupied mode.

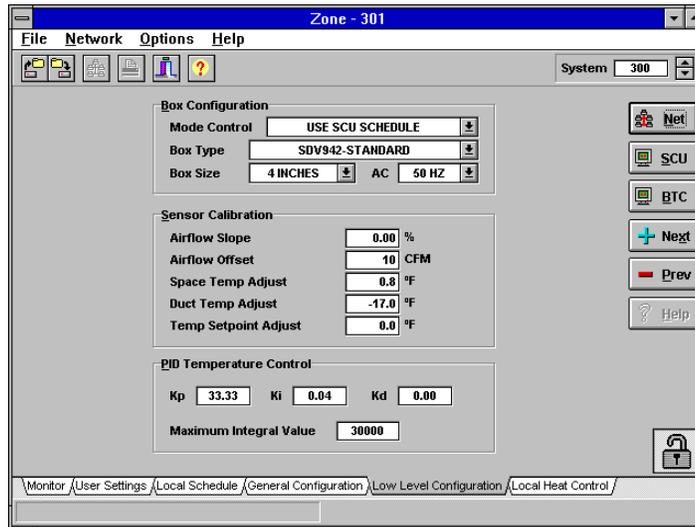
Occupied Heating - The maximum heating demand used in the occupied mode.

Unoccupied Cooling - The maximum cooling demand used in the unoccupied mode.

Unoccupied Heating - The maximum heating demand used in the unoccupied mode.

Low Level Configuration Screen

The Low Level Configuration screen allows adjustment of parameters that control VAV terminal inputs and outputs. To access the Low Level Configuration screen, select the Low Level Configuration tab located near the bottom of any Zone screen.



Zone Low Level Configuration Screen

Box Configuration

VAV terminal type and control settings.

Mode Control - This configuration determines how scheduling will be controlled. The following choices are available:

Use SCU Scheduling: The zone controller will switch between occupied and unoccupied modes in using the System Control Unit occupied schedule.

Stat ON/OFF Timer: The zone controller will respond only to the thermostat "ON" button. The controller will remain in the occupied mode after the "ON" button is pressed for the amount of time programmed into the "Override Timer" option (see the User Settings screen).

Stat ON/OFF Switch: The zone controller will switch between it's occupied and unoccupied setpoints when time the thermostat "ON" button is pressed.

Box Type - Defines the VAV terminal type including any local heat capability. The following selections are available.

SDV942 Standard: A single duct terminal with no local heat capability using the ETDD0 controller board.

SDV945 No Local Reheat: A single duct terminal with no local heat capability using the ETDD2F controller board. This controller is already equipped to control local heat if the necessary equipment is added at a later date.

SDV945 Staged Heat: A single duct terminal with 1, 2 or 3 stages of local electric heat.

SDV945 Tri-State Heat: A single duct terminal with a floating point hot water valve.

SDV945 Proportional Heat: A single duct terminal with a modulating, proportional hot water valve or SCR controlled electric heat.

FVV945 No Local Reheat: A parallel, variable volume, fan powered terminal with no local heat capability using the ETDD2F controller board. This controller is already equipped to control local heat if the necessary equipment is added at a later date.

FVV945 Staged Heat: A parallel, variable volume, fan powered terminal with 1 or 2 stages of local electric heat.

FVV945 Tri-State Heat: A parallel, variable volume, fan powered terminal with a floating point type hot water valve.

FVV945 Proportional Heat: A parallel, variable volume, fan powered terminal with a modulating, proportional hot water valve or SCR controlled electric heat.

FCV945 No Local Reheat: A series, constant volume, fan powered terminal with no local heat capability using the ETDD2F controller board. This controller is already equipped to control local heat if the necessary equipment is added at a later date.

FCV945 Staged Heat: A series, constant volume, fan powered terminal with 1 or 2 stages of local electric heat.

FCV945 Tri-State Heat: A series, constant volume, fan powered terminal with a floating point hot water valve.

FVV945 Proportional Heat: A series, constant volume, fan powered terminal with a modulating, proportional hot water valve or SCR controlled electric heat.

Box Size - The VAV terminal inlet size. This is one of the most critical parameters for a pressure independent controller. The box size determines how the controller will convert the flow transducer information into actual airflow.

Box AC Current Frequency - This controller power supply frequency: 50Hz and 60Hz.

Sensor Calibration

Analog input signal calibration.

Airflow Slope - This calibration parameter is the equivalent to an electronic gain adjustment. The unit of slope is percent (%) and refers to the slope of the airflow curve for the VAV zone terminal box size. The actual airflow reading will be multiplied by this value.

Airflow Offset - This calibration parameter is the equivalent to an electronic zero adjustment. This value will added to the actual airflow reading.

Space Temp Adjust - This calibration parameter is used adjust the displayed space temperature.

Duct Temp Adjust - This calibration parameter adjusts the displayed duct temperature.

Temp Setpoint Adjust - Used only by the ETTS regular thermostat. This calibration parameter adjusts the displayed cooling and heating setpoints to ensure that the dial setpoint matches the displayed values.

PID Temperature Control

PID (Proportional, Integral and Derivative) control parameters. **Adjustment of these values is not advised.**

Kp - The proportional parameter of the PID algorithm. The proportional part of algorithm monitors the difference between the actual space temperature and the setpoint. This difference is called the error or offset.

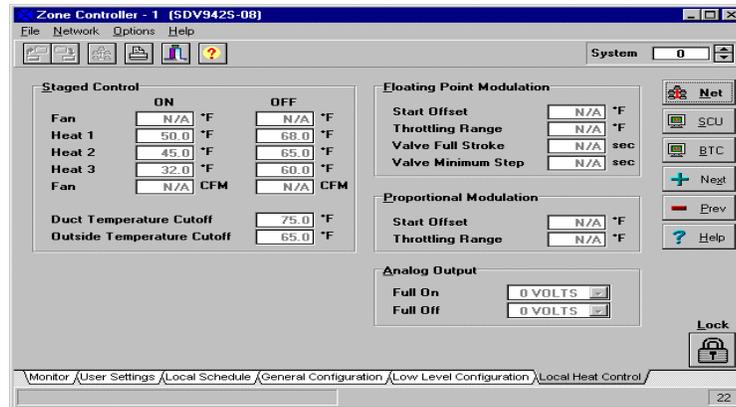
Ki - The integral parameter of the PID algorithm. The integral part of the algorithm monitors the offset (Kp) over time and generates an accumulated offset. This accumulated offset is called the "integral sum" and is updated over 30 second time periods.

Kd - The derivative parameter of the PID algorithm. The derivative monitors the rate at which the offset (Kp) is changing.

Maximum Integral Value - This value sets the integral limit or ceiling that the PID algorithm will accept.

Local Heat Control Screen

The Local Heat Control screen is used to adjust parameters that control local heat. To access the Local Heat Control screen, select the Low Level Configuration tab located near the bottom of the any Zone Controller screen.



Zone Local Heat Screen

Staged Control

On Column - The number of degrees below heating setpoint that the specified output will become energized.

Off Column - The number of degrees below heating setpoint that the specified output will become de-energized.

Fan - Used in conjunction with FVV945 box types. Designates the turn on and turn off space temperature for the zone terminal fan motor.

Heat 1 - Used in conjunction with any Staged Heat box type. Designates the turn on and turn off space temperature for the first stage of local heat.

Heat 2 - Used in conjunction with any Staged Heat box type. Designates the turn on and turn off space temperature for the second stage of local heat.

Heat 3 - (Special order only) Used in conjunction with any Staged Heat box type. Designates the turn on and turn off space temperature for the second stage of local heat.

Fan - (Optional) Used in conjunction with the FVV945 box types. Designates the turn on and turn off primary airflow for the zone terminal fan motor. Most design specifications call for the parallel fan powered terminal to energize the fan on temperature demand. However, there are some design specifications that call for the parallel fan powered terminal to energize the fan based on primary airflow. This parameter is used in those situations.

Duct Temp Cut-off - Used with any local heat capable zone terminal. Designates the inlet duct temperature limit above which local heat should not be energized.

Outside Temp Cutoff - Used with any local heat capable zone terminal. Designates the outside temperature limit above which local heat should not be energized.

Floating Point Modulation

Tri-State local heat control parameters.

Start Offset - The number of degrees below heating setpoint at which the floating point hot water valve will begin to open.

Throttling Range - The number of degrees below the Start Offset at which the floating point hot water valve will be fully open.

Valve Full Stroke - The travel time, in seconds, between the fully closed and fully on the floating point hot water valve.

Valve Min Step - The minimum amount of time that the floating point hot water valve open or close output can be energized.

Proportional Modulation

Proportional local heat control.

Start Offset - The number of degrees below heating setpoint that either the modulating hot water valve will begin to open or the SCR will begin to energize the electric heat.

Throttling Range - This parameter designates the number of below the Start Offset that either the modulating hot water valve will be fully open or the SCR will turn the electric heat fully on.

Analog Output

Proportional local heat control.

Full On - The DC voltage at which the modulating hot water valve will be fully open or the SCR will turn the electric heat fully on.

Full Off - The at which the modulating hot water valve will be fully closed or the SCR will turn the electric heat fully off.

Control Commands

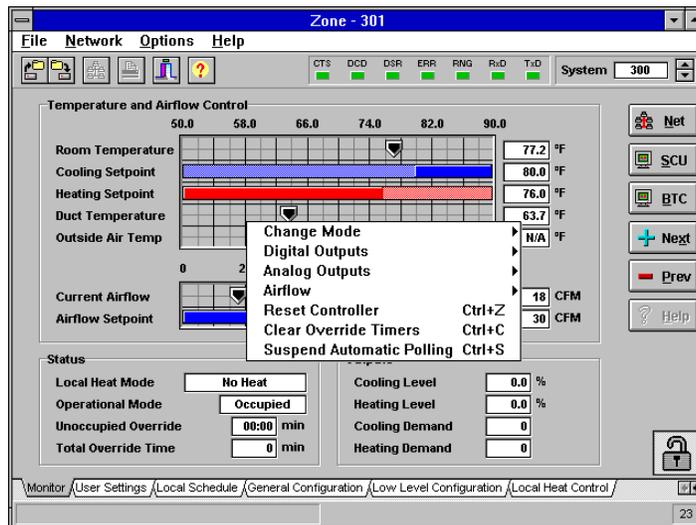
Keyboard Commands

The following keyboard commands are available from any Zone Controller screen. The list does not contain the keyboard shortcuts for menu commands described in the next section.

Keyboard Command	Function	Special Conditions
F6	Suspend Polling Cycle	Controller must be unlocked
F7	Resume Polling Cycle	Controller must be unlocked
F8	Decrement System Address	Does not work in Local Mode
F9	Increment System Address	Does not work in Local Mode
Ctrl-F8	Decrement System Address (10X)	Does not work in Local Mode
Ctrl-F9	Increment System Address (10X)	Does not work in Local Mode
F10	Open Popup Menu	
Page Up	Cycles forward through all SCU screens.	Will not work if a configuration control has the input focus.
Page Down	Cycles backwards through all SCU screens.	Will not work if a configuration control has the input focus.
Ctrl-C	Clear and Reset all information.	

Popup Menu Commands

The Zone Controller popup menu, shown below, can be activated By pressing F10 or right-clicking on any Zone Controller screen. These commands are used mainly for testing, but may prove useful in other situations.



Zone Controller Command Menu

Change Mode

Occupied - Puts the controller in occupied mode.

Unoccupied - Puts the controller in unoccupied mode.

Normal - Return this Zone controller to Normal mode and activate the new network address if it has been changed. After the Zone controller network address has been changed, the old address will still be used until this command is issued or the controller is reset.

Normal All Units - Sends the “Normal” command to all zone controllers.

Digital Outputs

Open Damper - Turns the open damper output on and sets the analog output to setpoint “off”. All other outputs are turned off.

Close Damper - Turns the close damper output on and sets the analog output to setpoint “off”. All other outputs are turned off.

Fan On - Turns the fan output on and sets the analog output to setpoint “off”. All other outputs are turned off.

1st Stage Heat On - Turns the first stage heat output on and sets the analog output to 1/3 setpoint “on”. All other outputs are turned off.

2nd Stage Heat On - Turns the second stage heat output on and sets the analog output to 2/3 setpoint “on”. All other outputs are turned off.

3rd Stage Heat On - Turns the third stage heat output on and sets the analog output to setpoint “on”. All other outputs are turned off.

Turn All Outputs Off - Turns all digital outputs off and sets the analog output to setpoint “off”.

Analog Outputs

Set to Minimum - Sets the analog output to maximum; approximately 10 Volts.

Set to Maximum - Sets the analog output to minimum; approximately 0 Volts.

Airflow

Set to Minimum - Set controller to minimum cool airflow for offset calibration.

Set to Maximum - Set controller to maximum cool airflow for slope calibration.

Set All to Minimum - Sends the “Set to Minimum” command to all zone controllers.

Set All to Maximum - Sends the “Set to Maximum” command to all zone controllers.

Reset Controller

This selection issues a software reset command to this system control unit. Sometimes, it may be necessary to reset the controller in order to resume normal operations. For example, the controller can become “locked up” due to voltage spikes on the power supply or communication lines. This solution might be easier than removing power from the system, especially when dealing with a remote location via modem.

Clear Override Timers

Clears all override timer registers. This information is generally used to charge tenants for excess energy usage.

Suspend Automatic Polling

Suspends the polling cycle until it is either re-enabled or the network connection is ended. It is useful when making many modifications to the controller configuration. By suspending the polling cycle, the 8 second delay that occurs once each minute can be avoided. **NOTE: During the polling cycle, the SCU gathers control information from zones with the same system address. When automatic polling is suspended, the SCU will not be receiving this information and thus will not change the control mode based on heating or cooling demand from the zones.**

Controller Configurations

Overview

The DDC Monitoring program has the ability to save and restore controller configurations. The configurations are stored in binary files with the following extensions:

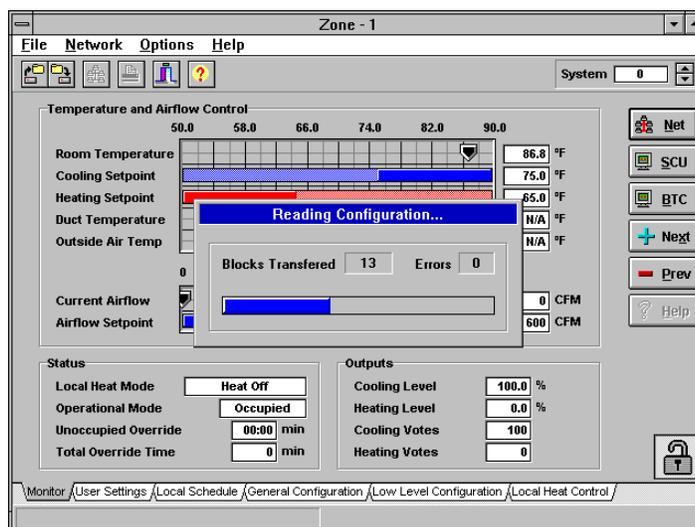
Configuration File Extensions

Controller	Extension
System Control Unit	.SCU
Bypass Terminal Controller	.BTC
Zone Controller	.ZNE

These files contain address, password, calibration, and setpoint information. Currently, the configuration from each controller must be stored individually. Future versions may allow an entire system to be saved and restored.

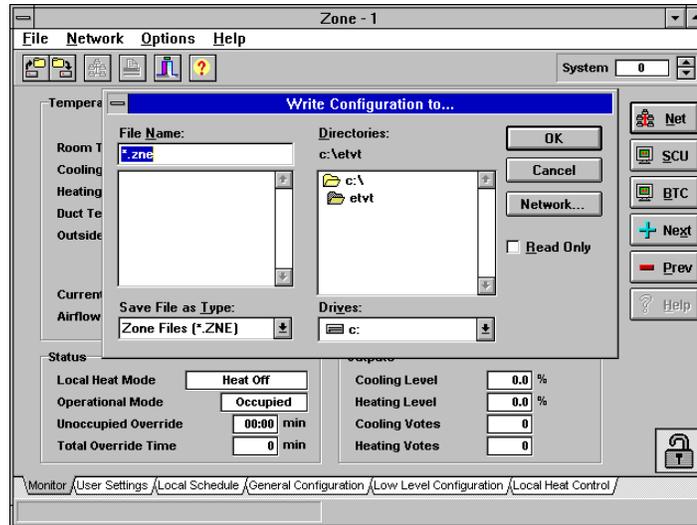
Saving Configurations

Configurations can only be saved while one of the Monitor or Configurations screens for the desired controller is active. For example, if you want to save information from Zone 210, open the Monitor screen for that Zone by double clicking on it in the Network Monitor zone grid. To save the configuration, unlock the controls, and choose **Save Configurations** from the **File** menu. The following screen will be displayed as the program reads information from the controller.



Read Information from a Controller

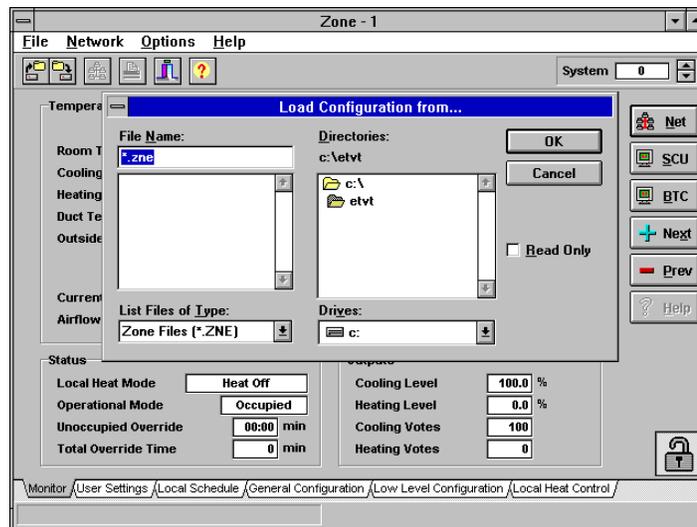
When the entire configuration has been read successfully, you will be prompted to choose a file as shown below. Select an existing file or enter a new file name. Press **OK** to save the configuration.



Selecting a File to Write

Loading Configurations

Configurations can only be loaded while one of the Monitor or Configurations screens for the desired controller is active. For example, if you want to load information into Zone 210, open the Monitor screen for that Zone by double clicking on it in the Network Monitor zone grid. To load the configuration, unlock the controls, and choose **Load Configurations** from the **File** menu. You will be prompted to select a configuration file to load.



Selecting a file to Read

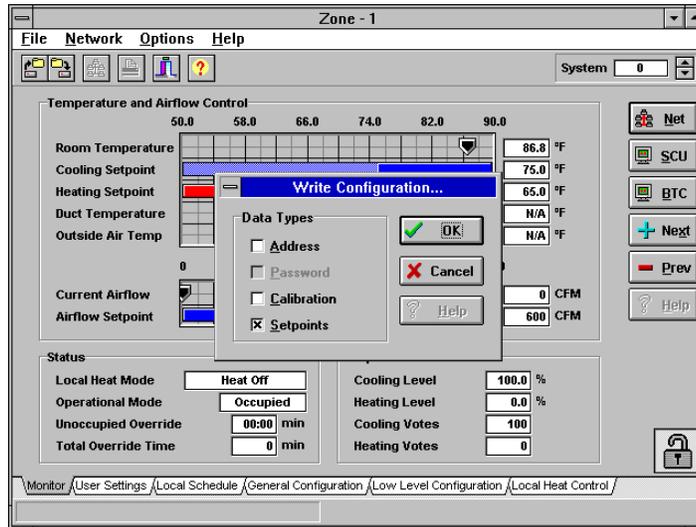
Choose a file and press **OK**. You will be prompted to select the types of information to load into the controller. The following types are available:

Address - The network address used to communicate with this controller. If loaded, the new address will not take affect until the controller is reset or a “Normal Mode” command is issued.

Password - This choice is only available on the SCU. If selected, the password will be changed. Unless you are absolutely sure that you know the password in the configuration this option should not be selected. If a password that you do not know is loaded, you will not be able to get back into the system to make further changes.

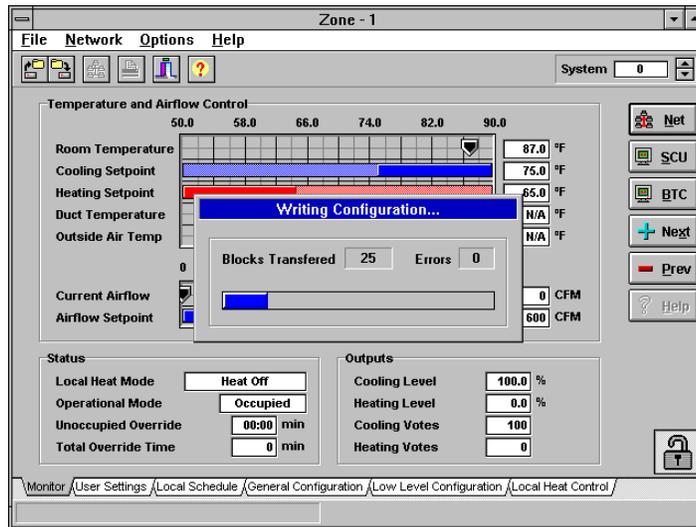
Calibration - The values used to adjust or calibrate the sensors connected to a particular controller. These values should only be loaded into the same controller from which they were saved. If the calibration values are loaded into a different controller, there could be substantial errors in sensor readings.

Setpoints - All other user configurable parameters used by the controller including: heating cooling, and airflow setpoints, heating and cooling control, schedules, etc.



Selecting the types of Information to Load.

Select the desired information, press **OK**. The program will write the information to the controller as shown in the following figure.



Writing Information to a Controller

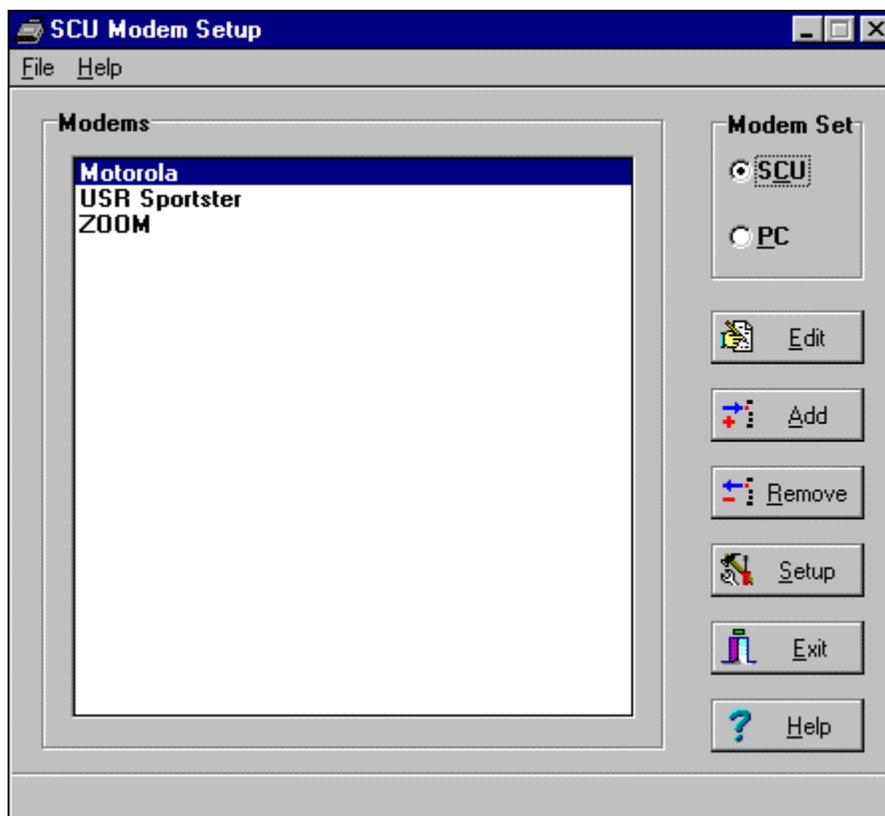
The Modem Setup Program

Starting the Program

The Modem Setup Utility program gives you the ability to add, edit, and delete modem configurations from the DDC modem database. It can also be used to prepare a modem for use with remote DDC Network connections. To run the program, double click on the Modem Setup Icon in the DDC Monitor Program group. The main program screen will be displayed.

A modem used on the DDC side of the connection is not under any form of computer control. For this reason, it must be configured properly prior to use. To set up a modem connected to your System Controller, Select "SCU" from the "Modem Set" radio box located in the upper right hand corner of the screen and connect the modem to your computer for configuration.

To set up a modem connected to your computer, Select "PC" from the "Modem Set" radio box located in the upper right hand corner of the screen.



Modem Setup Main Screen

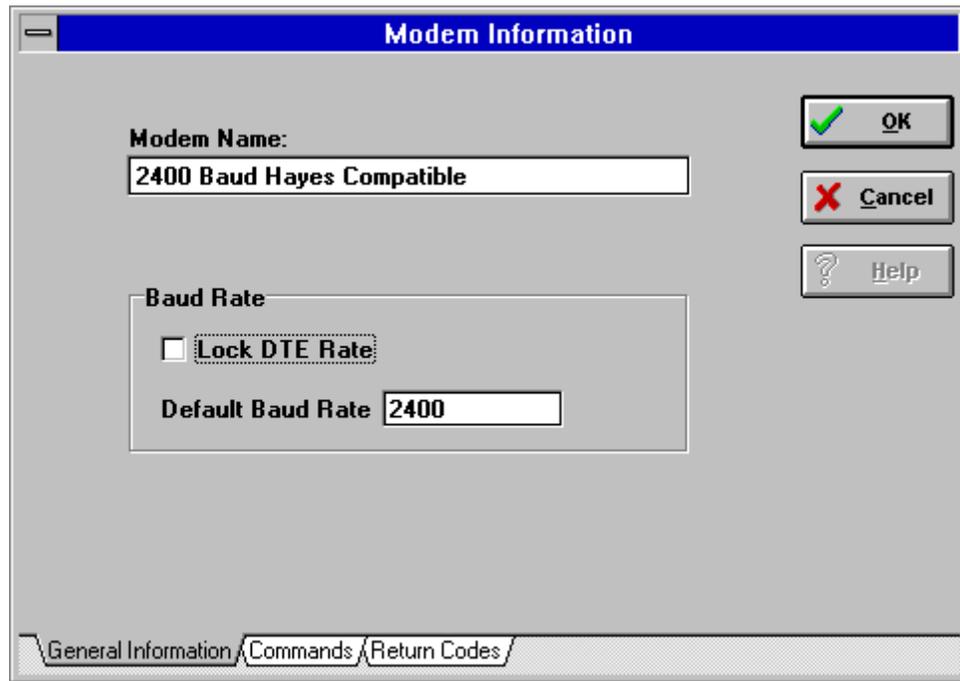
The Modem Database

Modem Information

The Modem Information dialog must be used to modify an entry in the modem database. This dialog will be opened when adding a new modem, or editing an existing modem. Three pages of information are available: General Information, Commands, and Result Codes.

General Information

To access the **General Information** page of the **Modem Information** dialog box, select the “General Information” tab. The following information is available.



The screenshot shows a dialog box titled "Modem Information" with a blue header bar. The main area is light gray and contains the following elements:

- Modem Name:** A text box containing "2400 Baud Hayes Compatible".
- Baud Rate:** A section containing a checkbox labeled "Lock DTE Rate" (which is unchecked) and a text box labeled "Default Baud Rate" containing "2400".
- Buttons:** Three buttons are located on the right side: "OK" (with a green checkmark icon), "Cancel" (with a red X icon), and "Help" (with a question mark icon).
- Tabbed Interface:** At the bottom, there are three tabs: "General Information" (which is selected and highlighted), "Commands", and "Return Codes".

Modem General Information Dialog

Modem Name - The name used to identify this modem entry in the database.

Lock DTE Rate - Some modems automatically change the modem-computer speed (DTE baud rate) to match the speed of the modem-modem connection. If the modem changes its DTE speed and the computer does not, the two will be unable to communicate. The same problem occurs if the computer changes its speed, but the modem does not. Selecting option synchronizes the modem and computer by telling the computer NOT to adjust its speed when a connection is established.

Baud Rate - The default baud rate used by the modem.

Commands

To access the **Commands** page of the **Modem Information** dialog box, select the “Commands” tab. The following information is available.

Modem Configuration Dialog

Initialize - The command string used to initialize the modem. By default, use “ATZ^M” which is a standard Hayes initialize command.

Configure - The command string used to configure modem for operation. Consult your modem manual for the suggested optimum configuration string. This entry may need to be set by “trial and error” especially when trying to communicate with modems from different manufactures. Please note that you must include the following:

1. Reset to factory configuration.
2. DTE rate follows connection rate.
3. DTR always on (Override).
4. Connection speed = 2400
5. No flow control.
6. Answer on first ring. (for remote modem only)

ETVT Mode - Currently, the DDC Network can only communicate at 2400 baud. Modems connected to DDC systems for remote connections must be set to answer incoming calls. This command string should set the modem to answer incoming calls on the first ring, usually “ATS0=1”, and to connect only at 2400 baud. Consult your modem manual for the proper commands. Be sure to put a “^M” sequence at the end of the command.

Dial - The command string used to tell modem to start dialing (dialing prefix command). By default, use “ATD” which is a standard Hayes dial command. It will be followed by the phone number and the dial suffix listed below.

Dial Suffix - The command string used to indicate end of dialing string. By default, use “^M”.

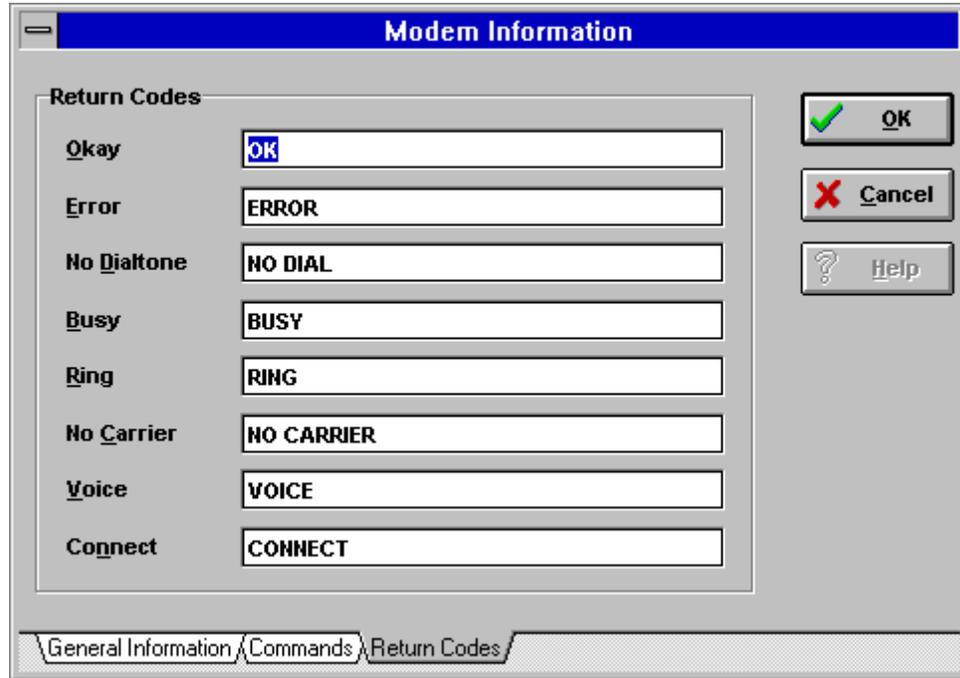
Cancel - The command string used to cancel a dialing operation in progress.

Answer - The command string used to answer an incoming call.

Hangup - The command string used to tell modem to hang up. By default, use “ATH” which is a standard Hayes hangup command.

Return Codes

To access the Return Codes page of the Modem Information dialog, select the “Return Codes” tab. The following information is available.



Modem Result Codes Dialog

Okay - This response is returned by the modem in an “Okay” condition. It indicates that the last command has been successfully executed.

Error - Response sent back from modem in an “Error” condition. It indicates that an error occurred during the last command.

No Dialtone - This response is returned when the modem attempts to Dial, but does not detect a dialtone.

Busy - This response is returned when the modem detects a busy signal during a Dial attempt.

Ring - This response is returned when the modem detects the phone ringing signal during an incoming or outgoing call.

No Carrier - Response sent back from modem in a “No Carrier” condition. This response will be returned when the modem is unable to establish a connection or when a connection is lost.

Voice - This response is returned when the modem detects that a person, instead of a modem, answered during a dial attempt.

Connect - Response sent back from modem after a connection with another modem has been established.

Editing a Modem

Select a Modem from the list and press the **Edit** button. The **Modem Information** dialog box will be displayed. Make the appropriate changes and press **OK**. You will be prompted to confirm. Select **Yes** to update the database.

Adding a New Modem

To Add a new modem to the database, press the **Add** button. The **Modem Information** dialog will be opened with a new modem entry; all information will be blank. Using the descriptions under “Modem Information” fill in all fields. When finished, press the **OK** button. You will be prompted to confirm. Select **Yes** to add the new modem to the database.

Removing a Modem

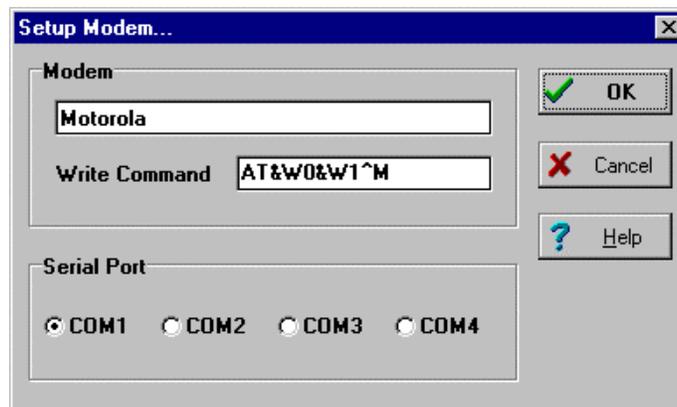
To remove a Modem from the database, highlight the modem name and press the **Remove** button. You will be prompted to confirm. Select **Yes** to remove the modem from the database.

Preparing a Modem for SCU Connection

A modem can be used to establish a remote connection to a DDC Network. This gives the operator the ability to call, monitor, and configure a DDC systems from a location where a physical connection is not possible. The modem used on the DDC side of the connection is not under any form of computer control. For this reason, it must be configured properly prior to use. To set up a Remote modem connected to your System Controller, Select "SCU" from the "Modem Set" radio box located in the upper right hand corner of the screen and connect the modem to your computer for configuration.

The Setup Modem Dialog

To prepare a modem for remote operation, select an entry from the modem list and press the **Setup** button. The **Setup Modem** dialog box will be displayed.



Setup Modem Dialog

Modem - Information for the modem about to be configured.

Name - (Read Only) The name of the database entry used to configure the modem. This value can only be changed by selecting a different modem from the main screen before the **Setup** button is pressed.

Write command - Command string used to save the modem configuration to non-volatile memory. The “AT&W0” is the standard Hayes command used to write the modem configuration to non-volatile memory. If your modem requires a different command, this command should be changed accordingly.

Serial Port - The computer serial port which is connected to the modem. The selected port must be configured properly in the computer CMOS configuration and in the Windows control panel or device manager.

Configuring the Modem

When all of the information in the **Setup Modem** dialog box has been properly set, press **OK** to configure the modem. Pressing **Cancel** will close the dialog box without configuring the modem.

The Set Address Program

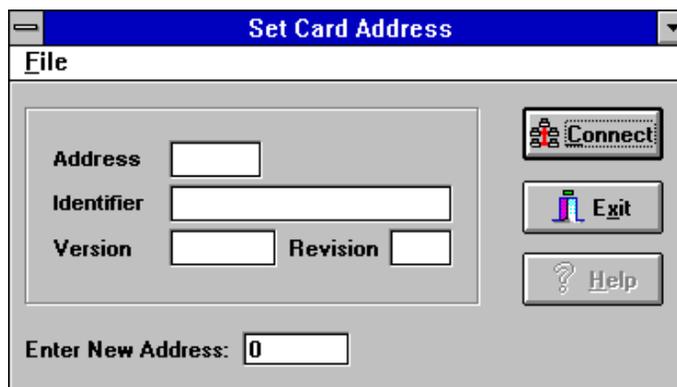
Overview

The Environmental Technologies DDC (ETVT II) system uses a communications protocol known as ETIquette II. It is a simple read/write protocol used to transfer data between a Computer, SCU, BTC and Zone controllers. When a DDC controller leaves the factory, it will be configured with a default network address. However, for proper network operation, each controller must be given a unique network address. The Set Address program can be used to easily change the network address of any DDC controller before, or after, it has been connected to the network.

Using the Program

Starting the Program

To run the Set Address program, double click on the Set Address Icon in the DDC Monitor Program Group. The main screen will be displayed.



Set Address Main Screen

Address - (Read Only) The current network address being used by this controller.

Identifier - (Read Only) A 16 character name used to identify this controller.

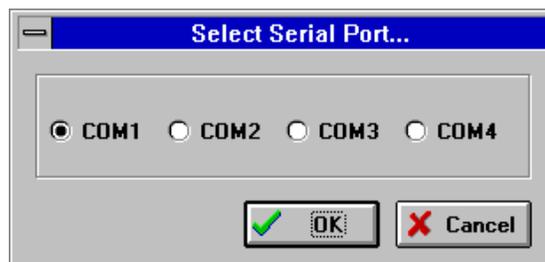
Version - (Read Only) The current firmware (EPROM Software) version

Revision - (Read Only) The current firmware revision.

New Address - The place to enter the new address for this controller.

Establishing a Connection

Connect the computer to a DDC controller using an ETI Quick-Connect cable. The 6-pin end of the cable must be plugged directly into the controller being addressed. Click the **Connect** button to open the **Serial Port** dialog box shown below. Select the computer serial port used for network communications and press **OK**.



Serial Port Dialog Box

The program will begin communicating with the connected controller within a few seconds.

Changing the Network Address

To change the controller address, enter a new address in the “Enter New Address” box and press ENTER. The address must be valid or it will not be accepted by the controller. The following table lists the range of valid addresses for each controller type.

Controller	Valid Addresses
System Control Unit (SCU)	0, 100, 200, ..., 9900
Bypass Terminal Controller (BTC)	65, 165, 265, ..., 9965
Zone Controller	(1...64), (101...164), ..., (9901...9964)

If a valid address has been entered, the new address should appear in the Address field within a few seconds.

Connecting to a Different Controller

The controller continuously sends read commands to the controller. If it does not receive a response within a predetermined amount of time, it will clear the information on the screen. When it receives a response, the displayed information is updated. Because the program never stops trying to read this information, it is not necessary to close or stop the program when switching to a different controller.

LOGGING AND TRENDING PROGRAM SUPPLEMENT

To run the ETLog program connected to a DDC system(SCU/Zone/BTC) requires a command line option indicating which serial communications port is to be used. If no serial communications port number is used in a command line option then ETLog will operate in it's DDC non-communication mode. To indicate comport just insert the number "ETLog 1" for com1. To Connect via modem append m to the command line "ETLog 1 m".

The ETLog program is made up of 4 basic screens. The 1st screen is for setting up how the logging program is to operate. There are, at present, 2 boxes in this first screen. (As seen in figure 1.1)

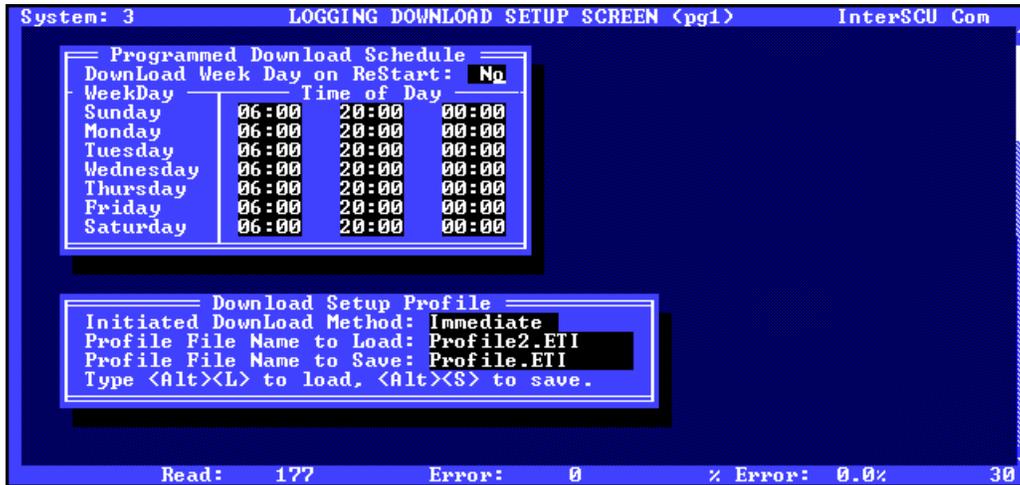


Figure 1.1

The first box in this screen is for programming times at which a PC running ETLog will automatically download all recorded operating parameters from previously chosen controllers (picked in another screen). Any single controller can only record up to 896 entries before it starts rewriting over its first entries. In order to obtain a continuous record of operating parameters over a long period of time, it becomes necessary to download from the controller within a limited amount of time since its last previous download: i.e. within: 896 minutes (~14 hrs.) @ 1 min. intervals of logging parameters, or ~28 hrs. @ 2 min. intervals of logging parameters, or ~42 hrs. @ 3 min. intervals of logging parameters, etc. (Controller logging interval times are set using WDDCMON.) To be able to download at these programmed times means of course that a PC will have to be dedicated to continuously running the ETLog program over the desired lengthy stretch of time. Because power failures or other mishaps can take place over long periods of time, it is also possible in this box to allow an automatic download to occur when the ETLog program is restarted by adding to your startup options. Because a PC will need to be left running the ETLog program continuously connected to the DDC system if in programmed mode, there is a special setback operating mode that the ETLog program goes into after running 10 minutes without having a key pressed. This operating mode clears the screen and stops communication with the DDC system until either a scheduled download is to take place or a key is pressed. At which time communication is reinitialized. (Warning, this setback mode will not operate properly if the PC has an energy saving mode enabled; i.e., Lap Top computers, newer computers with energy savings modes.)

The 2nd box allows saving to PC disk and loading from PC disk the ETLog programs configuration; i.e.: which controllers that have been chosen for download and all configuration data entered into the ETLog program. This box also contains a mode setting that will determine if the ETLog program will download controllers that are chosen in the next 2 screen immediately, or if it will download them based on the schedule box above which has just been previously described.

If a configuration profile with the special name of "Profile.ETI" has previously been saved to disk, and is in the same directory as the ETLog program, then when the ETLog program is started it will automatically load this saved configuration profile from the PC disk and operate according to the loaded configuration.



Figure 2.1

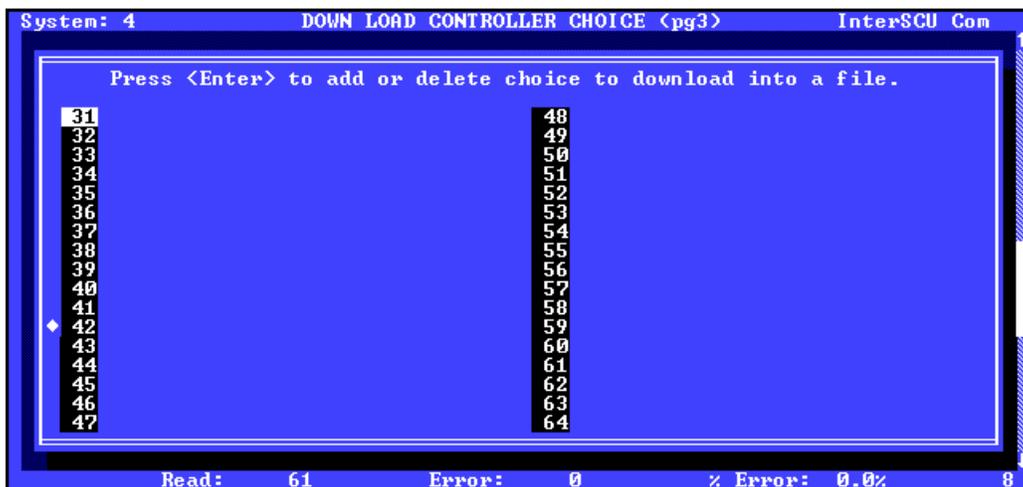


Figure 2.2

The next 2 screens (figures 2.1 and 2.2) display what controllers exist and allow choosing controllers to download for either doing an immediate downloading or for having the controller download at a programmed time. Controllers on this screen that exist will show up as having their identifiers displayed when the diamond shaped line indicator moves past each controller address/type location. As in the monitor program, respective system addresses (Top left hand corner in figure 2.1) can be changed by pressing <F9> or <F10> Keys. By pressing the <Enter> key while a controller number or type is highlighted will mark the controller (seen in figure 2.3) for an immediate download or for a programmed time in which the controller will be downloaded, depending on which mode of operation has been previously chosen in the first screens "DownLoad Setup Profile" box.(figure 1.1) If a controller is marked, then a "DownLoad" statement will appear by the place were the controllers identifier label is. (As seen in figure 2.3) If a download is attempted and the controller is of a logging and trending type, an "(LT)" will appear beside the word "DownLoad". When a controller is actually in the process of being downloaded, a statement will be flashed at the top of any of the ETLog screens indicating which controller address is in the process of being download. (Also seen in figure 2.3) Pressing the <Enter> key again while a controller number or type is highlighted and marked will remove the "DownLoad" statement mark, even if the controller is in the process of being downloaded.



Figure 2.3

The last screen contains ETLog parameters for generating a text file report of logged controller data. When ETLog does a download it either creates a binary file which stores a controller's logged operating parameters or it appends this data to an already existing binary file for a controller. Binary files are a much more efficient method of storing large amounts of data, but they usually need to be converted into some other format before they can be read. The simplest and most common format which can be imported into any word processor or spreadsheet is a text file. This last screen allows the user to choose what times and operating controller parameters that they would like to convert into a text file from a continuous binary file record. Reports will be generated based on all controllers marked with the "DownLoad" label in the previous 2 screens therefore operating parameters for individual controllers can be chosen for report generation.

The first box on this last screen (Figure 3.1) allows you to choose the section of time the user would like to see along with the name that the user chooses it will be saved as. The second box allows choosing which operating parameters will be put into a table with respect to the type of controller.

Because the logged data has already been downloaded into a binary file onto the PC, the ETLog program and text file report generator contained in it can be used without being connected to the DDC system. This means that downloads can be made at the site or via modem and some time later reports can be generated individual controllers on a remote unconnected PC.

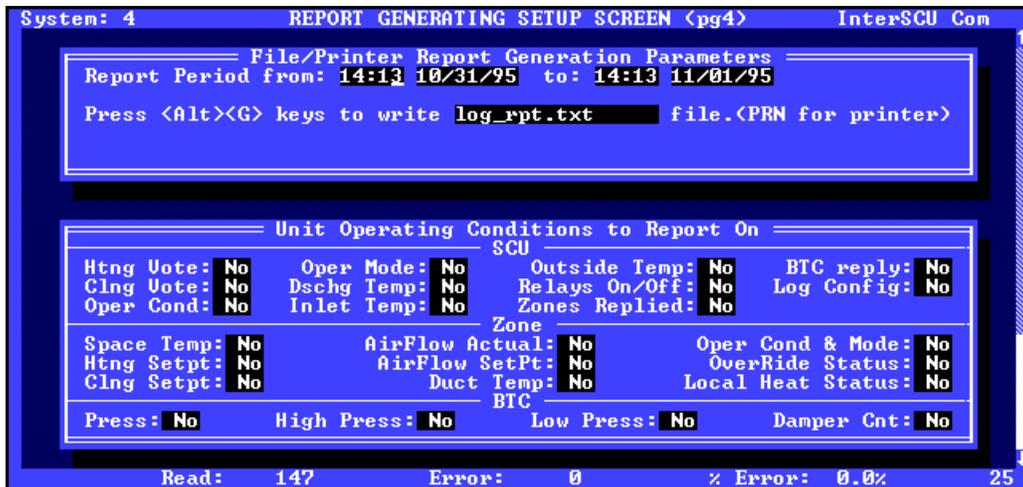


Figure 3.1