ROBERTS GORDON

RG ROBERTS GORDON®

UltraVac™

Controls for Modulating CORAYVAC® Infrared Heating Systems

Software Installation & Operation Manual

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can result in death, injury or property damage. Read the Installation, Operation and Service Manual thoroughly before installing or servicing this equipment.

Installation must be done by a contractor qualified in the installation and service of gas-fired heating equipment or your gas supplier.

C **(UL®)** US **LISTED**

Installer

Please take the time to read and understand these instructions prior to any installation.
Installer must give a copy of this manual to the owner.

Owner

Keep this manual in a safe place in order to provide your serviceman with necessary information.

P/N 10081600NA   Rev D   10/11

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TABLE OF FIGURES

SECTION 1: INTRODUCTION

1.1 General Information

The ROBERTS GORDON® ULTRAVAC™ Controller is designed for multi-stage control of heating. This controller is a microprocessor based control package designed for modulating control of CORAYVAC® heaters based on outdoor temperatures. The CORAYVAC® system input modulates continuously (not staged) between 60% and 100% of designed system input. Input modulation is controlled by varying both air and gas flow rates through the burners.

Multi-function electronic air sensors display zone air temperature, provide zone occupancy override feature and provide user-defined limited zone setpoint adjustment. The ROBERTS GORDON® ULTRAVAC™ is also available with BACnet® interface capabilities, allowing your CORAYVAC® system with ULTRAVAC™ Controls to interface with other BACnet® building management control platforms.

1.2 System Software

System status and settings are viewed from a PC (not supplied) running ROBERTS GORDON® ULTRAVAC™ Software. The software for the ROBERTS GORDON® ULTRAVAC™ Controller is supplied on CD ROM. This includes:

- URV Software: A setup.exe for installation ULTRAVAC™ Controller and Manuals.
- BACnet® Software: A ruinet.exe for installation ULTRAVAC™ BACnet® Controller and Manuals.

The software keeps the user informed of system function by displaying features such as:

- Current room temperature for each zone (°F or °C).
- Current outdoor air temperature (°F or °C).
- Setpoint Temperatures (°F or °C) - for each occupied zone.
- Setback Setpoint Temperature (°F or °C) - Unoccupied periods automatically maintain setback temperature.
- Time Schedule - 7-day scheduling screen for each individual zone, four available occupied time periods per zone.
- Holiday Schedule - Holiday scheduling screen for each individual zone.
- Modulating 0-10Vdc output signal for modulating pump speed.
- Heat Power ON/OFF Indication (For Each Individual Zone)
- Safety Switch Position
- Pump Power ON/OFF Indication
- Pump Speed

1.3 Communications Bus Wiring

- RS-485 communications allowing for system control and status viewing from an on-site PC.
- Modem communication package allowing for system control and status viewing from an on-site. Systems utilizing the optional modem offer pager notification and messaging for customized systems alarms.

1.4 PC Requirements

ROBERTS GORDON® ULTRAVAC™ Software requires a PC (not supplied) running Windows® 95 or higher, with a Pentium® class processor and at least 64k of RAM.

1.5 Safety

Your Safety is Important to Us!
Read this manual carefully before installation, operation, or service of this equipment. Installation, service and annual inspection of controller must be done by an electrician qualified in the installation and service of control systems for heating equipment.
Installation Code and Annual Inspections: All Installations of ROBERTS GORDON® products must be performed by a contractor qualified in the installation and service of gas-fired heating equipment and conform to all requirements of all applicable governmental authorities pertaining to the installation and operation of the equipment.
For optimum performance and safety, Roberts-Gordon recommends that a qualified contractor annually inspect your ROBERTS GORDON® products and perform service where necessary, using only ROBERTS GORDON® replacement parts. Also, know and maintain heater clearances to combustibles, see heater Installation, Operation and Service manual for further details. If you require additional manuals, contact your ROBERTS GORDON® independent distributor or Roberts-Gordon at (716) 852-4400 or (800) 828-7450 in the U.S. or at www.rg-inc.com.

SECTION 2: GETTING STARTED

2.1 Communication Methods

ROBERTS GORDON® ULTRAVAC™ is shipped with PC software that allows the user to monitor and communicate to the ROBERTS GORDON® ULTRAVAC™ controllers in the building. The PC can be connected to the controllers by various methods.

2.1.1 Modem (Included with Central Controller)
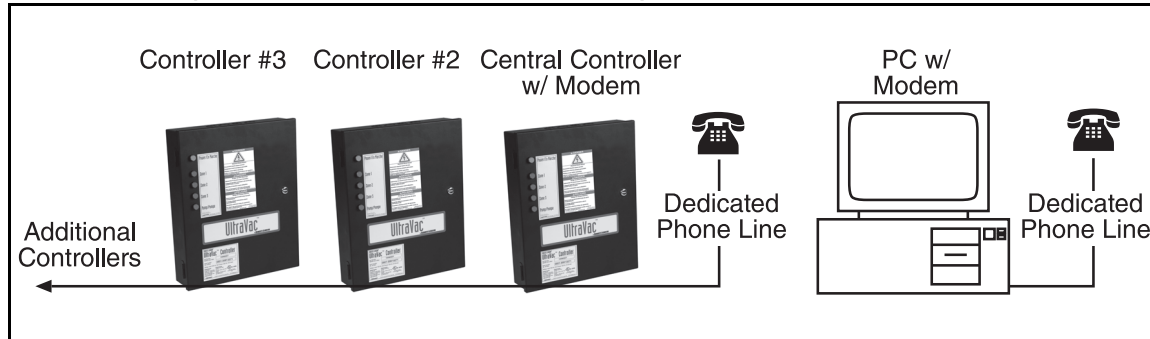
The PC with a modem can dial directly into the central controller (controller #1) with the modem chip (P/N 10080142) installed on the central control board. If more than one controller is installed in the building, additional modems are not needed. The PC will be able to communicate to all the controllers. The RS-485 communications terminals on all the controllers are wired in series with the central controller so that all controllers can send information through the central controller to the PC.

2.1.2 RS-485 Converter (Optional with Central Controller)
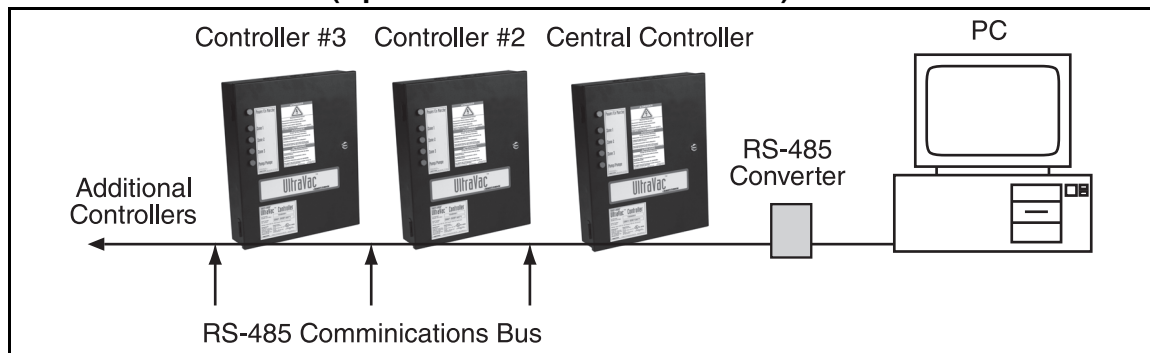
The PC can communicate to the central controller with the optional RS-485 converter (P/N 10080430) wired to the central controller and plugged into the PC 9-pin serial port. If more than one controller is installed in the building, the PC will be able to communicate to all the controllers. The RS-485 communications terminals on all the controllers are wired in series with the central controller so that all controllers can send information through the central controller to the PC.

2.1.3 Direct Connect (Included with Central Controller)

Any Controller   PC

Less than 50' (15 m). Use direct connect cable package supplied with
central controller. Plug RJ-11 plug directly into control board.
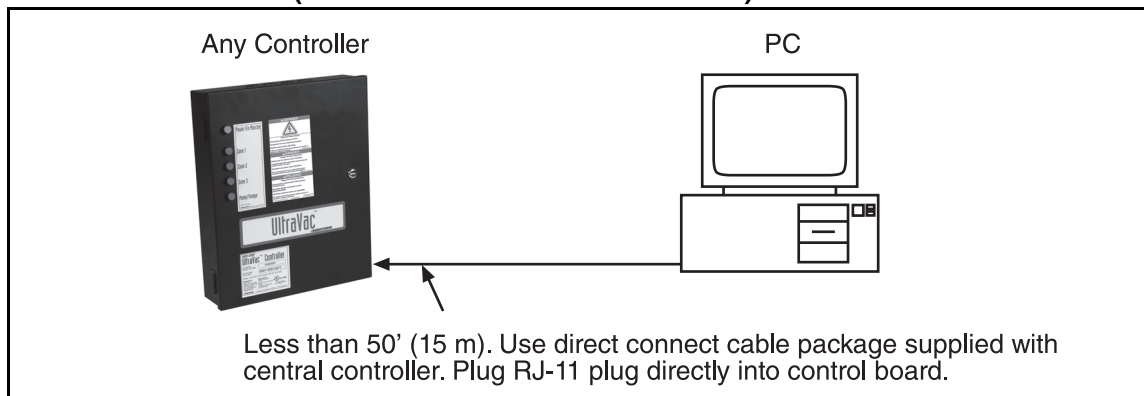
This method is only used when the PC is in close proximity [within 50' (15 m)] of a
controller, or for troubleshooting at the controller using a laptop PC. A standard 4-wire
phone cable is run between the PC and the controller. The phone cable plugs directly into
the controller's direct connect port. The other end of the phone cable plugs into a 9 pin
serial port adapter and the adapter plugs into one of the PCs 9-pin serial ports. One direct
connect cable package (P/N 10080410) consisting of a 9 pin adapter and 7' (2 m) phone
cable is supplied with the ROBERTS GORDON® ULTRAVAC™ central controller package.

2.1.4 TCP/IP (LAN) Communication Module (Optional with Central Controller)

Controller #3   Controller #2

Central Controller
w/ TCP/IP (LAN)
Communication
Module   Server   PC

                                                              PC

Additional
Controllers

                                                              PC

RS-485 Comminications Bus   Ethernet Cable
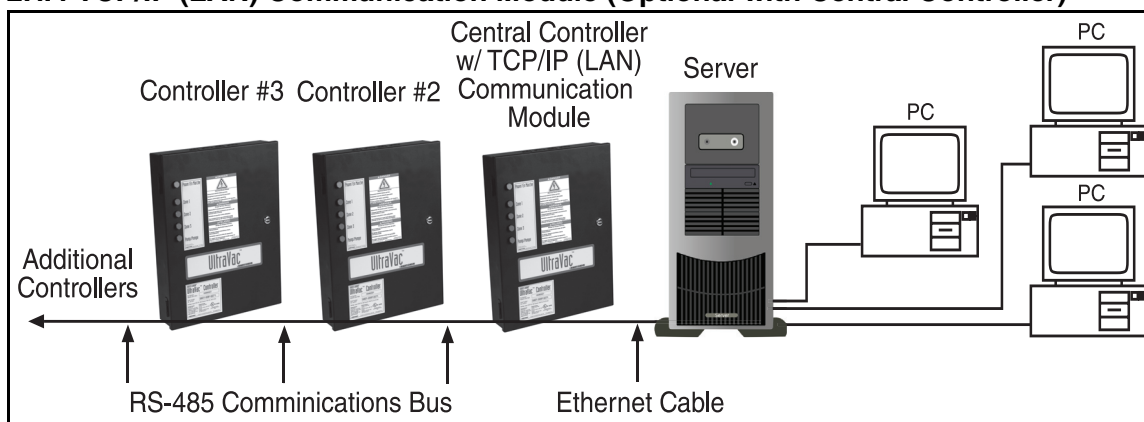
Multiple PCs can communicate to the central controller with the optional TCP/IP (LAN)
communication module installed at the central controller. If more than one controller is
installed in the building, the PCs (one at a time) will be able to communicate to all the con-
trollers. The RS-485 communications terminals on all the controllers are wired in series
with the central controller so that all controllers can send information through the central
controller to the PC.

Any PCs desired for communication to the ULTRAVAC™ controllers must have the
ULTRAVAC™ software installed.

The TCP/IP (LAN) communication module requires an initial set up and programming
operation. Contact your system administrator for assistance. See *Section 12* and *Section
13* for details.

2.1.5 Direct Connect PC with ULTRAVAC™ BACnet® Controller
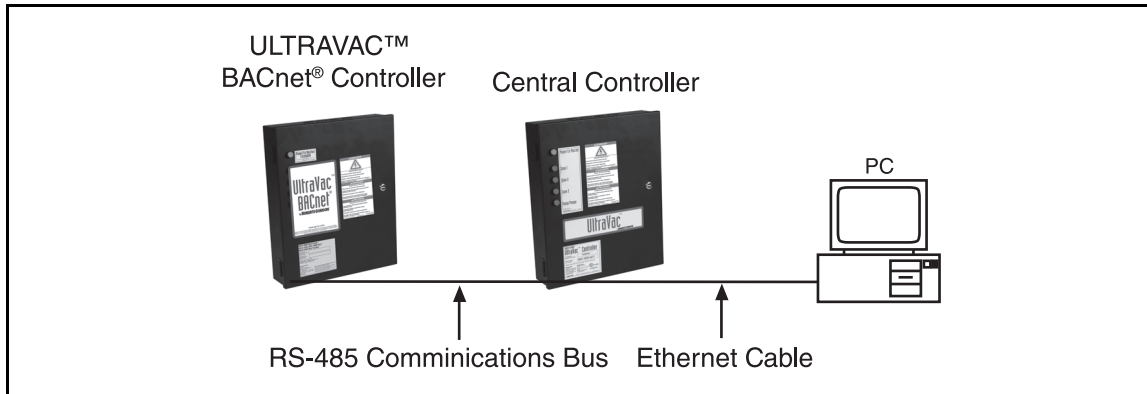
The PC can be connected to the ULTRAVAC™ BACnet® Controller by using a standard ethernet cable.

2.2 Installing ROBERTS GORDON® ULTRAVAC™ Software

Insert the ULTRAVAC™ Software CD into the CD drive of the PC. If software does not load automatically, click on the "My Computer" icon. Double click on your CD drive. Double click on the Setup.exe file. Follow the on-screen directions. When the installation is complete, a black "RG" icon titled "UltraVac" will appear on your desktop.

If using a TCP/IP (LAN) communication module, skip to *Section 12* and *Section 13* before preceding to *Section 2.3*.

FIGURE 1: Software Connect Window

2.3 Software "Connect" Window

Double click on the UltraVac icon on the desktop. The software will open and the "Connect" window will appear.

If the job only has ONE controller, the default job file (UltraVac DEMO) can be used as the job file, but rather than using the default file, it is recommended to create a new project specific job file.

To use default job name, double click on the file "UltraVac DEMO" in the white box underneath the "Setup String" drop down. "UltraVac DEMO" will appear in the "System Name" box. *See Page 7, Section 2.3.2*.

If the job has MORE THAN ONE controller installed, or to create a new job file for a single controller job, *See Page 37, Section 9.1*.

2.3.1 Direct Port and Modem Port

Using the drop downs for "direct port" and "modem port", select the PC port number that will be used for the RS-485 Converter, Direct Connect adapter or Modem. If connection is made via the TCP/IP (LAN) communication module, the "direct port" and "modem port" dropdowns are not used. The "direct port" drop down is used for selecting the ports for either the RS-485 Converter or the Direct Connect plug to the PC. If the PC port number is not known, start by selecting port #1 from the appropriate drop down. If a connection

can not be made, double click on the "Hang-up" button and select the next port number.

2.3.2 Direct Connect Button

If connecting via Direct Connect or RS-485 Converter, select the port number from the "Direct Port" drop down. Select the baud rate from the baud rate drop down or overwrite the existing number. Use **19200 baud for direct connect**, use **57600 baud for RS-485 connection.** Click on the "Direct Connect" button.

If the connection is unsuccessful, check the wiring connections or double-click the "Hang-up" button and select a new port number on the "Direct Port" drop down. Upon successful connection, "Connected to TMS150" will appear in the "Connection Status" panel as shown *on Page 6, Figure 1*.

Click Exit.

2.3.3 Modem Connect Button

If connecting via modem, select the port number from the "Modem Port" drop down. Select the modem type that is used in the PC from the "Modem Type" drop down. Upon selection, the "Setup String" will be automatically selected. Select the appropriate baud rate for the PC modem type from the "Baud Rate" drop down, if the modem baud rate is higher than 2400 baud, select 2400. Type the phone number of the phone line connected to controller #1 in the "Phone #" field. Click "Modem Connect."

NOTE: Phone number format is "xxx-xxx-xxxx". Remove area code for local calls.

If the connection is unsuccessful, check wiring connections or double-click the "hang-up" button and select a new port number on the "Modem Port" drop down.

Upon successful connection, "Connected to TMS150" will appear in the "Connection Status" window as shown *on Page 6, Figure 1*.

Click Exit.

2.3.4 Internet Connect Button

If connecting via TCP/IP (LAN) Communication Module, complete *Section 12* and *Section 13* before attempting to connect.

Type the module's IP address in the "IP address" field. **Select 57600 baud** in the "Baudrate" dropdown. Click on the "Internet Connect" button.

If the connection is unsuccessful, check wiring connections, entered IP address and entered port number (in the "Port Field", not the "Direct Port" drop down). *See Page 54, Section 13.5*. Upon successful connection, "Connected to TMS150" will appear in the "Connection Status" window as shown *on Page 6, Figure 1*.
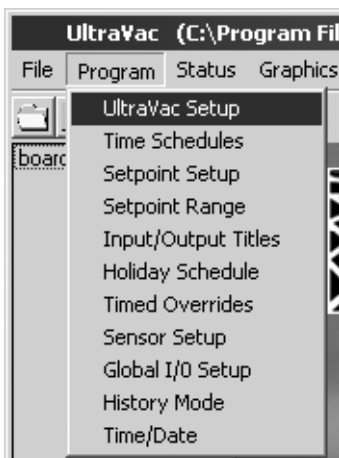
Click exit.

SECTION 3: PROGRAM MENU

3.1 ROBERTS GORDON® ULTRAVAC™ Setup Screen

On the menu bar, click on "Program."
On the drop down menu, click on "UltraVac Setup."

FIGURE 2: ROBERTS GORDON® ULTRAVAC™ Setup
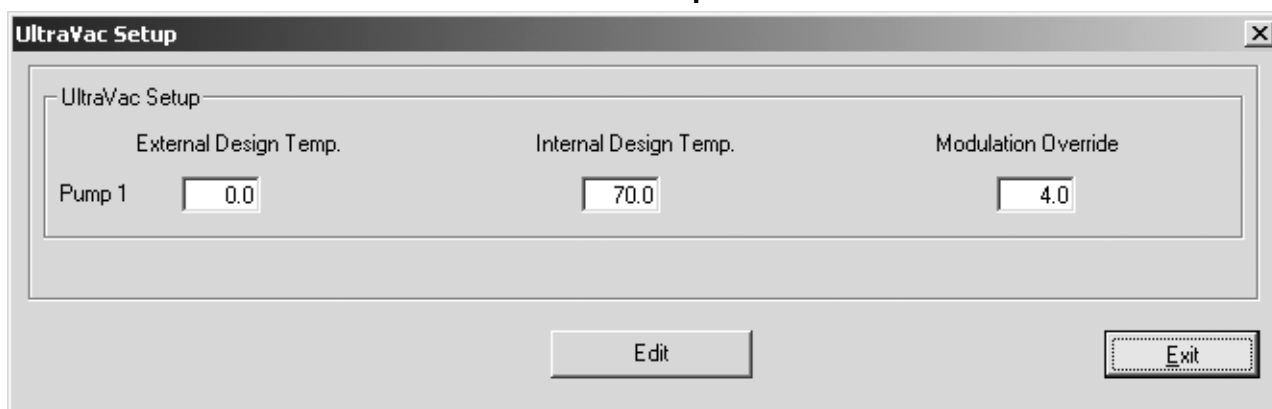
Click on the "Edit" button.

Enter the "External Design Temperature" and "Internal Design Temperature." These values were used to calculate the heat loss of the building during the design of the ROBERTS GORDON® ULTRAVAC™ heating system. For optimal performance of the ROBERTS GORDON® ULTRAVAC™ system, contact your local distributor or designing engineer for the correct External and Internal Design temperatures.

Enter the "Modulation Override." This is the number of degrees below the temperature setpoint at which the heating system will increase heat output to 100% to recover from a rapid heat loss in the heating zone. To allow the system to modulate between 60% output and 100% output correctly, do not select a number less than 2°F. Generally a value of 3°F or 4°F will allow quick enough response to rapid building heat loss without increasing system output to 100% if the zone temperature dips 1°F or 2°F below the setpoint.

Click on the "Send to Controller" button to send the design temperature and modulation override values to the controller. Click on the green "Exit" button. **While the controller is communicating with the PC, the green "Exit" button will become a red "Updating" button. You must wait until the button is green before clicking "Exit".**

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File Program Status Graphics

UltraVac Setup
Time Schedules
Setpoint Setup
Setpoint Range
Input/Output Titles
Holiday Schedule
Timed Overrides
Sensor Setup
Global I/0 Setup
History Mode
Time/Date
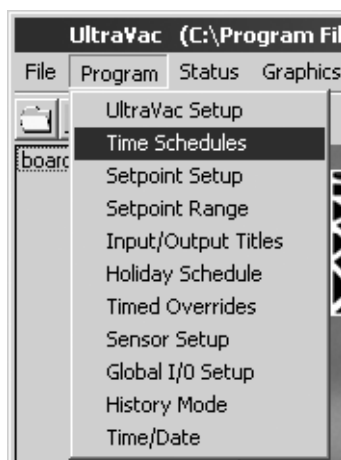
3.2 Time Schedules

Each heating zone has four available "occupied" time periods. An occupied period is a time period in which the zone will be satisfying an "occupied" temperature setpoint. If no occupied periods are scheduled, the zone will be satisfying a "setback" temperature setpoint.

On the menu bar, click on "Program." On the drop down menu, click on "Time Schedules". Click on the "Edit" button.

FIGURE 3: Time Schedules

In the "Enter Schedules" panel, type in any desired occupied time periods, use the 24 hour clock (i.e. 1:15pm = 1315). Twelve different schedules can be entered.

In the "Output in Process" panel, click on the Heating Zone desired. In the "Special Schedules" panel, type in the schedule number(s) (located in the "Enter Schedules" panel) that apply to the needed schedules for each day of the week for the selected zones. Use two digit numbers, i.e. enter "01" for schedule #1. The first scheduled "occupied" period of each day should be entered into period 1. Additional schedules for that day should be entered in periods 2-4 in the order in which they occur during the day. For any unused periods, enter "00." Every day does not need to have schedules entered.
The zone will maintain the setback temperature until a scheduled period occurs.
Remember to set schedules for all heating zones by clicking on other zones in the "Output in Process" area.

Click the "Enabled" box to activate the schedule times. If the "Enabled" box is not checked, the zone will only satisfy setback temperatures, occupied times will not be activated.

For unused heating zones, select the zone in the "Output in Process" panel. Set all time schedules (1-4) for Monday - Sunday to "00".

After Scheduling all the heating zones, click on the "Send to Controller" button.

Click on the green "Exit" button.

Example: (*See Page 9, Figure 3*) Monday-Friday workers occupy Zone 1 from 9 am to 6 pm and 9 am to 12 pm on Saturday. On Thursday nights, an additional shift works from 8 pm to 12 am.
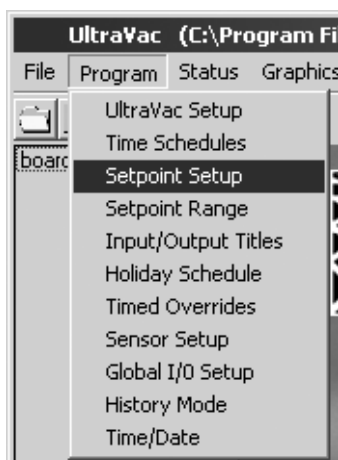
3.3 Setpoint Setup

On the menu bar, click on "Program." On the drop down menu, click on "Setpoint Setup." Click the "Edit" button.

FIGURE 4: Setpoint Setup

In the "Output in Process" panel, click on the Heating Zone desired. The Sensor Input will be automatically selected. In the "Setpoint Occupied" field, the software will display the current setpoint. Due to the ability of the sensor slide bar to adjust within a setpoint range, **no single occupied setpoint is input into the software**. The setpoint cannot be input in the "Setpoint Occupied" box, it is only displayed. The allowable range is set by following the steps *on Page 18, Section 3.8 and Page 13, Section 3.4*. The program checks setpoint range (*See Page 13, Section 3.4*) and the occupied setpoint adjustment Low and High (*See Page 18, Section 3.8*) and will calculate the desired setpoint based on the zone sensor's slide bar position.

In the "Setpoint Offset" area, enter the "On-Below" and "Off-Above" values. "On-Below" is the number of degrees below the setpoint at which the heat will turn on. "Off-Above" is the number of degrees above the setpoint at which the heat will turn off. For example, if the setpoint is 65° and the "On-Below" is set at 1.0 and the "Off-Above" is set at 2.0, the heat will turn on at 64° and stay on until the temperature reaches 67°. Do not set both values at 0.0, this will result in short cycles and will result in increased electricity usage from the vacuum pump turning on and off frequently. Generally a span of 2° or 3° keeps a tight tolerance on the zone temperature without causing short heating cycles.

In the "Night Setback" panel, enter the setback temperature setpoint in the "Heating" field. The setback setpoint is the temperature that will be maintained in the heating zone during a non-occupied or setback period. The setback temperature setpoint is generally 5°-10° lower than the occupied temperature setpoint.

In the "Control Mode" panel, click on "Heating". If "Disable" is chosen, the set points will be ignored and the heaters will turn on and off by time schedules only.

After assigning setpoints for all the heating zones, click on the "Send to Controller" button. Click on the green "Exit" button.

3.4 Setpoint Range

On the menu bar, click on "Program." On the drop down menu, click on "Setpoint Range." Click the "Edit" button.
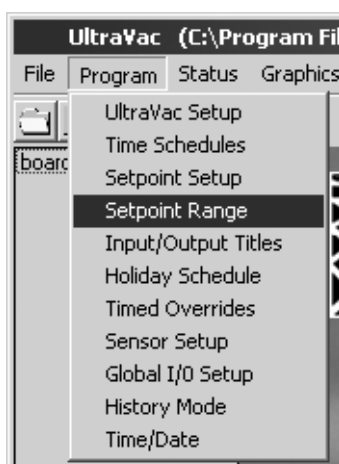
FIGURE 5: Setpoint Range
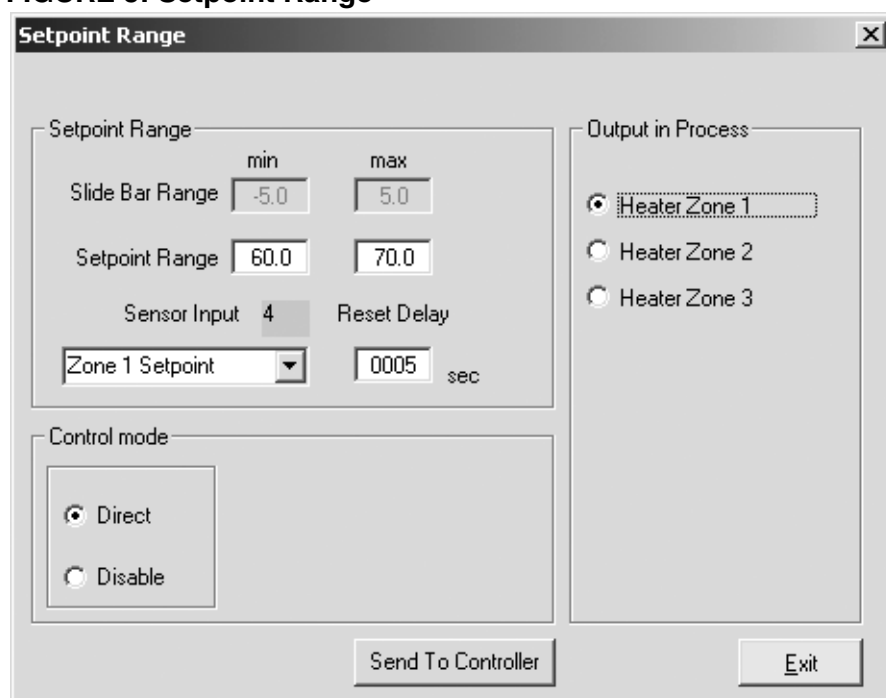
In the "Output in Process" panel, click on the Heating Zone desired.

The "Slide Bar Range Min/Max" fields, will be set according to the values input in the Zone Setpoint adjustment "Low" and "High" boxes on the "Sensor Setup" screen. *See Page 18, Section 3.8.*

In the "Setpoint Range Min/Max" fields, type in the actual temperatures that the sensor can be adjusted to when using the slide bar. For example, if the desired occupied setpoint is 65º and +/- 5.0 was used for the "Slide Bar Range", then the "Setpoint Range Min" will be 60.0 and the "Setpoint Range Max" will be 70.0.

The "Sensor Input" should automatically be selected by the computer when the Desired Heating Zone was selected from the "Output in Process" panel. If the setting was accidentally changed, select the following settings with the "Sensor Input " drop down:

For Heating Zone 1: Select Input 4, "Zone 1 Setpoint"
For Heating Zone 2: Select Input 5, "Zone 2 Setpoint"
For Heating Zone 3: Select Input 6, "Zone 3 Setpoint"

"Reset Delay" should be set to 0005 sec. In the "Control Mode" panel, be sure "Direct" is selected, otherwise the setpoint feature will not function properly. After assigning ranges

for all the heating zones, click on the "Send to Controller" button. Click on the green "Exit" button.
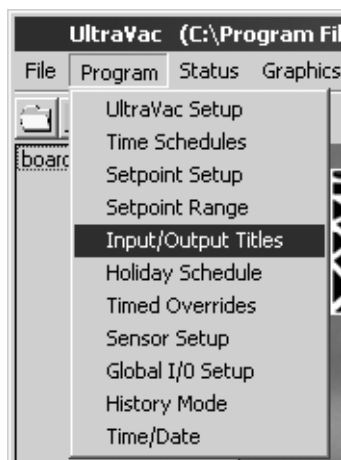
3.5 Input/Output Titles

On the menu bar, click on "Program." On the drop down menu, click on "Input/Output Titles."

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board

- UltraVac Setup
- Time Schedules
- Setpoint Setup
- Setpoint Range
- Input/Output Titles
- Holiday Schedule
- Timed Overrides
- Sensor Setup
- Global I/0 Setup
- History Mode
- Time/Date

FIGURE 6: Input/Output Titles

Input / Output Titles

Digital Outputs

Output 1 Stock Room
Output 2 Loading Dock
Output 3
Output 4
Output 5
Output 6
Output 7
Output 8 Vacuum Pump Enable

Temperature Inputs

Input 1 Stock Room Temperature
Input 2 Loading Dock Temperatu
Input 3
Input 4 Zone 1 Setpoint
Input 5 Zone 2 Setpoint
Input 6
Input 7 BMS Override
Input 8 Outdoor Air Temperature

Digital Inputs

Input 1 Stock Room Override
Input 2 Dock Override
Input 3
Input 4 Pressure Switch Status

Analog Outputs

Output 1 Vacuum Pump Speed
Output 2
Output 3
Output 4

Send To Controller   Exit

All Input and Output titles are preset. By clicking the "Edit" button, any of the titles may be edited. If you are not using all three zones, you may delete unnecessary titles as shown *on Page 14, Figure 6*.

Digital Outputs:

Output 1-3: Power Outputs to Burners in Zone 1-3.
Output 4-7: Not Used.

Output 8: Power Output to Pump Enable Relay in VFD Enclosure.

Temperature Inputs:

Input 1-3: Sensed Temperature in Zones 1-3.
Input 4-6: Setpoint for Zones 1-3 (Title *Only* used on "Setpoint Range" Screen)
Input 7: Building Management System Override Input.
Input 8: Sensed Outdoor Temperature.

Digital Inputs:

Input 1-3: Setpoint Override Button for Zones 1-3.
Input 4: Pressure Switch at Pump.

Analog Outputs:

Output 1: 0-10 V Signal to VFD.
Output 2-4: Not Used.

After editing titles, click on the "Send to Controller" button.

Click on the green "Exit" button.
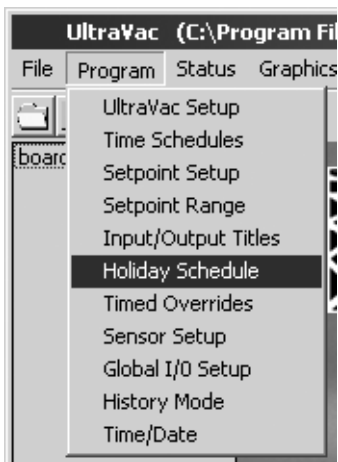
3.6 Holiday Schedule

On the menu bar, click on "Program." On the drop down menu, click on "Holiday Schedule." Click the "Edit" button.

FIGURE 7: Holiday Schedules
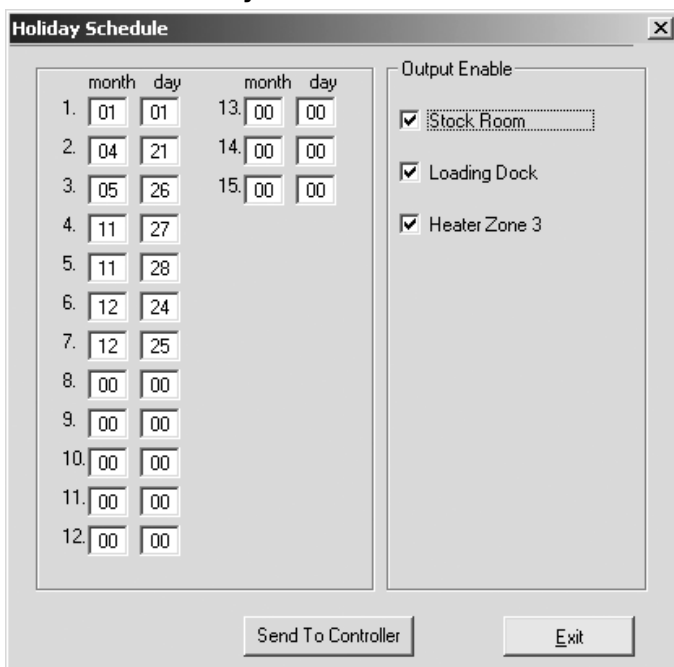
Fifteen holidays may be programmed. During a holiday, the heating system will ignore regularly scheduled "occupied" setpoints and will maintain the setback setpoint for the entire day.

In the "Output Enable" panel, click on the zones that will observe the holidays. Notice that any customized titles as entered on the Input/Output Titles Screen (*See Page 14, Section 3.5*) are now shown in the Output Enable panel.
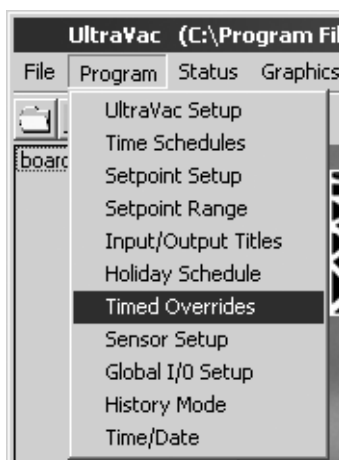
3.7 Timed Overrides

Each zone sensor has an override button. By pressing the button during a "setback" or "unoccupied" scheduled time, the zone will switch on to achieve the "occupied" temperature setpoint. On this screen, the duration of time that the override command is active is programmed. Pressing a zone sensor's override button during an occupied period will have no effect.

On the menu bar, click on "Program." On the drop down menu, click on "Timed Overrides." Click the "Edit" button.

FIGURE 8: Timed Overrides
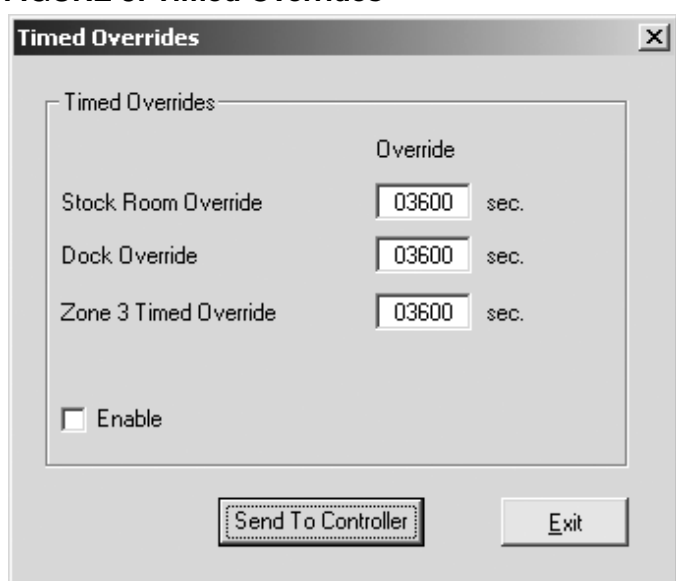
In the appropriate field, enter the desired duration of time (in seconds) for the override period. To enable the overrides, check the Enable box. The overrides may be disabled by un-checking the "Enable" box. When overrides are disabled, the override button on the zone temperature sensors will have no function.

After entering timed overrides, click on the "Send to Controller" button.

Click on the green "Exit" button.

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File | Program | Status | Graphics

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- UltraVac Setup
- Time Schedules
- Setpoint Setup
- Setpoint Range
- Input/Output Titles
- Holiday Schedule
- Timed Overrides
- Sensor Setup
- Global I/0 Setup
- History Mode
- Time/Date
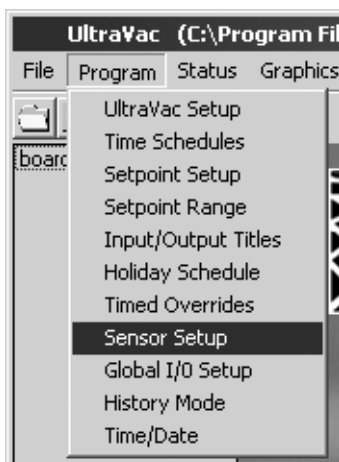
3.8 Sensor Setup

On the menu bar, click on "Program." On the drop down menu, click on "Sensor Setup." Click the "Edit" button.

FIGURE 9: Sensor Setup

Sensor Setup						
Sensor Type Setup				Sensor		
	Type	Low	High	Units	Decimal	
Zone 1 Air Temperature	Thermistor	00	00	F	000.0	
Zone 2 Air Temperature	Thermistor	00	00	F	000.0	
Zone 3 Air Temperature	Thermistor	00	00	F	000.0	
Zone 1 Setpoint	0-10k/0-5vdc	-50	50	Deg	000.0	
Zone 2 Setpoint	0-10k/0-5vdc	-50	50	Deg	000.0	
Zone 3 Setpoint	0-10k/0-5vdc	-50	50	Deg	000.0	
BMS Override	Thermistor	00	00		000.0	
Outdoor Air Temperature	Thermistor	00	00	F	000.0	

☐ Celsius

Edit   Exit

If celsius zone sensors (P/N 10081502) are being used, be sure that there is a check mark in the "Celsius" box.

For Zone 1, 2 and 3 Air Temperature, BMS Override and Outdoor Air Temperature use the following settings:
Type= Thermistor; Low=00; High=00

For Zone 1, 2, and 3 Setpoint (Occupied Setpoint Adjustment) use the following settings: Type= 0-10k/0-5vdc.

The setpoint adjustment is made by using the slide bar on the zone sensor. For Low and High, enter the number of degrees for the setpoint adjustment. NOTE: Do not type in a decimal point. For example, if the desired slide bar adjustment from setpoint is to be +/-5º, then Low = "-50" and High = "50". The program will recognize a decimal point one place to the left of the number entered. For example, a 5° setpoint adjustment should be typed "50", which will be recognized by the program as "5.0".

To disable the sensor slide bar, set Low = 00 and High = 00.

Temperature units of measure (Units): Type in C, F or Deg in the "units" boxes if you wish for the unit of measure to appear next to the corresponding temperature display on the "board status" screen. The boxes may also be left blank. Since BMS override does not have a unit of measure, leave this "units" box blank.

Decimal place: For all rows, leave 000.0 in the "decimal" boxes. After completing the sensor setup, click on the "Send to Controller" button. Click on the green "Exit" button.
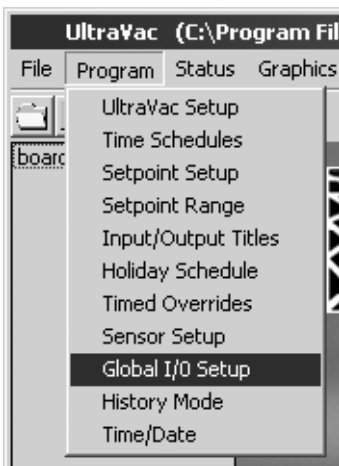
3.9 Global I/O Setup

On the menu bar, click on "Program." On the drop down menu, click on "Global I/O Setup." Click the "Edit" button.

FIGURE 10: Global Setup

Check mark the "Enable Global Communications" box, this will allow the central controller to access data from the satellite controllers.

Check mark the "Enable Global OAT" box, this will send the outside air temperature reading from the central controller to all satellite controllers.

NOTE: IF only one controller is being used, the "Enable Global Communications" and "Enable Global OAT" boxes can be either checked or unchecked with no difference in controller function.

In the "Board Count" field, enter the total number of controllers (central controller and all satellite controllers) on the network that are connected in the RS-485 communication chain. Click on the "Send to Controller" button. Click on the green "Exit" button.
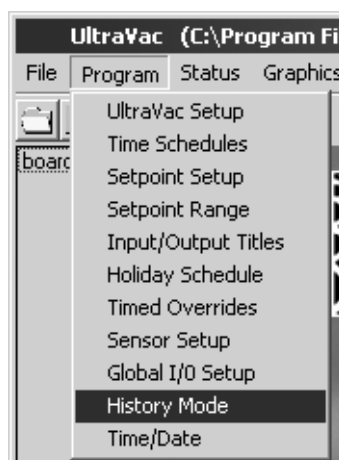
3.10 History Mode

History mode allows data logging for the controller's inputs and outputs. A history log can be kept of any or all of the controller's inputs or outputs for a period of up to 92 days, logging is recorded every 15, 30 or 60 minutes. Logging input/output signals can help gauge system usage and measured temperatures. Note that the more inputs/outputs that are logged, as well as the frequency and duration of the history period, will affect the amount of data recorded.

On the menu bar, click on "Program." On the drop down menu, click on "History Mode."

FIGURE 11: History Mode
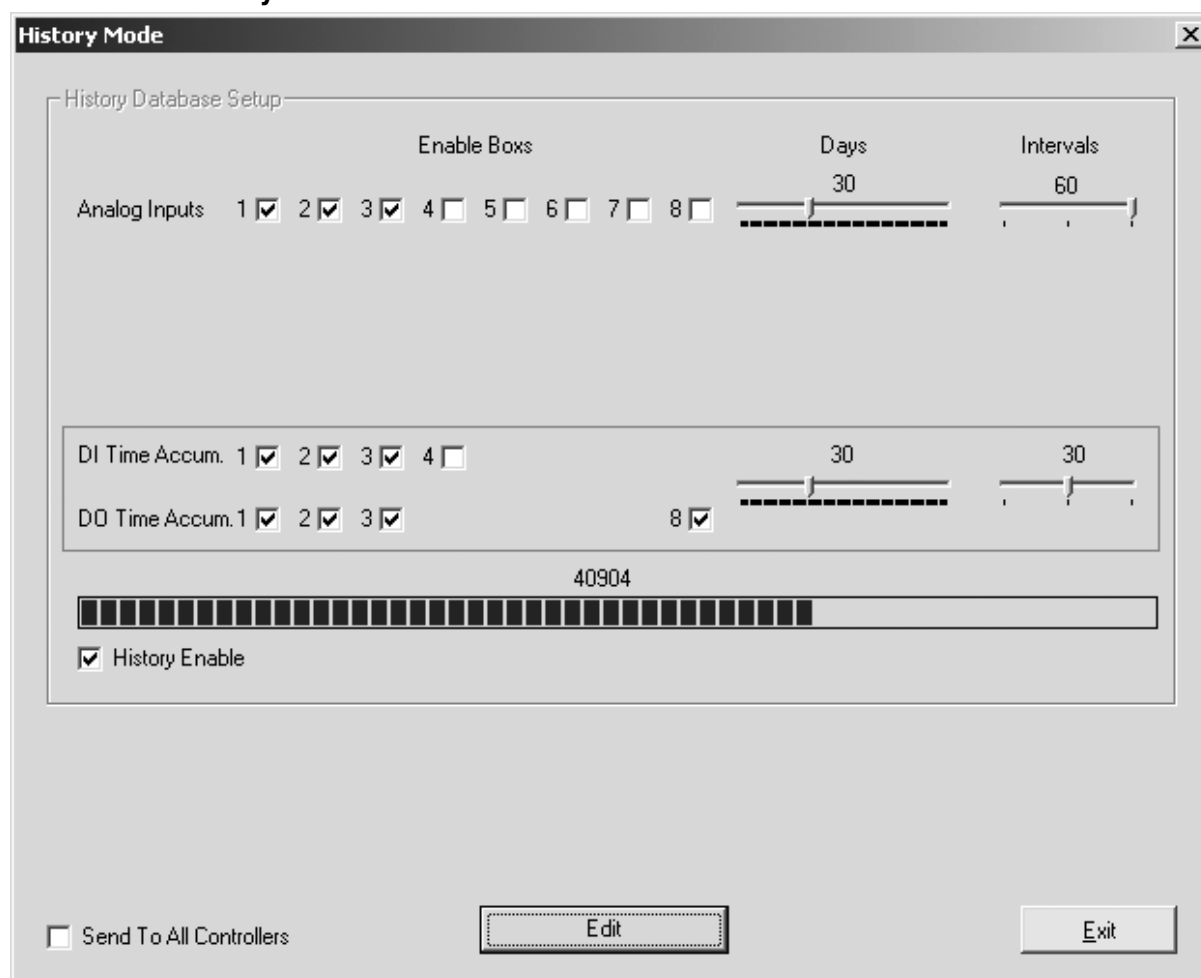
Click the "Edit" button.

Click on the input/output boxes that you wish to log.

Analog inputs:
1-3 are zone temperatures for zones 1-3.
4-6 are sensor slide bar positions for zones 1-3.
7 is BMS Enable
8 is outside air temperature.

DI Time Accum(ulated):
Digital Inputs 1-3 are overrides for zone sensors 1-3. Digital input 4 is for the pump pres-

sure switch.

DO Time Accum(ulated):
Digital Outputs 1-3 are for the burner power signal for zones 1-3. 8 is for the vacuum pump power signal.

Adjust the "Days" slide bar to set the number of days of the history period.

Adjust the "Interval" slide bar to set the number of minutes between each reading.

Check mark the "History Enable" box to activate the data logging feature.

After entering all history criteria, click on the "Send to Controller" button.

Click on the green "Exit" button.

Note that each controller does not have enough memory to record every input/output for the entire 92 day period. Watch the blue memory bar on the screen to determine if the history log is too big for the controller's memory. If the text above the bar reads "out of range," reduce the number of inputs/outputs that are monitored, reduce the number of days in the history period or increase the interval between logging times.

3.11 Time/Date
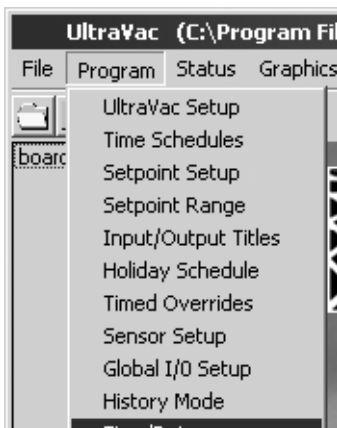
On the menu bar, click on "Program." On the drop down menu, click on "Time/Date." Click the "Edit" button.

FIGURE 12: Time/Date
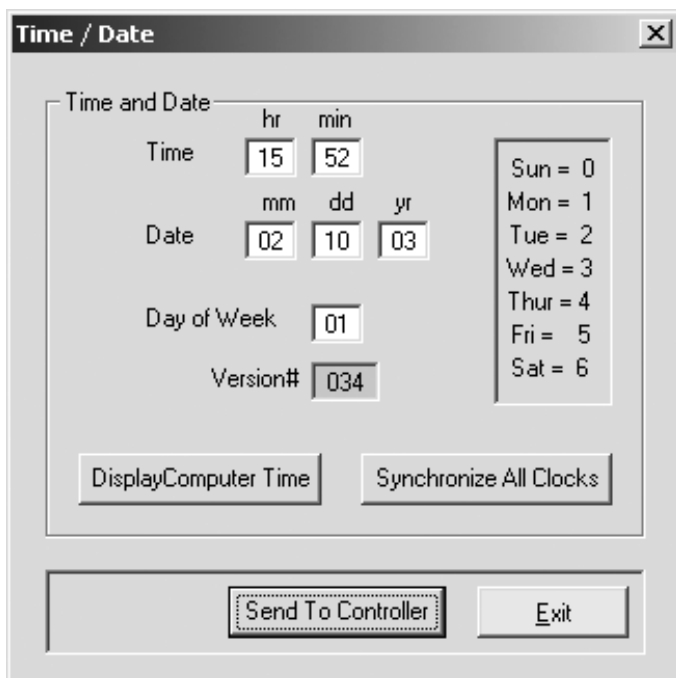
Type in the time, date and day of the week or click the "Display Computer Time" button to enter the same time that is kept by the PC. If there is more than one controller, click the "Synchronize all Clocks" button.

After entering the time/date, click on the "Send to Controller" button. Click on the green "Exit" button.

SECTION 4: STATUS MENU

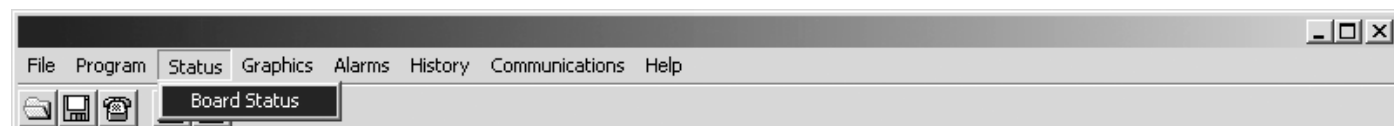### 4.1 Board Status

The board status screen displays all current ROBERTS GORDON® ULTRAVAC™ heating system settings and temperatures. This may be the screen that is most frequently viewed by the user to gather current system conditions.

On the menu bar, click on "Status." On the drop down menu, click on "Board Status."

FIGURE 13: Board Status

Universal Inputs panel displays zone and outside air temperatures.

Setpoints panel displays the occupied setpoint and setback setpoint in each zone. "Slide Bar Position" values indicate how many degrees off of midpoint that the slide bar on the zone sensor is set at.

Digital Output Status panel shows whether power is on to the vacuum pump and burner zones. Text beside the zone status boxes indicate whether the zone is satisfying the occupied setpoint or the setback setpoint.

Digital Input Status panel shows the pressure switch and BMS enable status.

Analog Output Status shows the vacuum pump speed and status. The speed of the vacuum pump also indicates the percentage input rate of the burners that are on.

Check mark the Auto-Update box to continuously update current controller readings.

Click on the green "Exit" button.

SECTION 5: GRAPHICS MENU
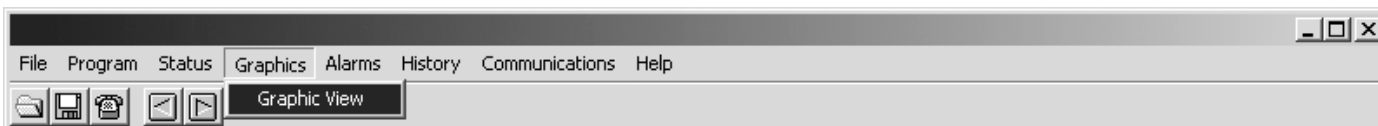
As an alternate method of viewing the ROBERTS GORDON® ULTRAVAC™ system status, the information from the Board Status screen (*See Page 23, Section 4*) can be arranged on a drawing or picture of the area being monitored.

A Windows® Metafile (.wmf) can be assigned to a button on the graphics screen and the user can customize the status data to be viewed in conjunction with the drawing or picture. Data boxes showing zone temperature, setpoints, zone On/Off status etc. can be placed on the screen. Up to 33 different.wmf files can be accessed by the graphics feature for each job file. **To use the Graphics feature, the drawing or picture to be used must be in Windows® Metafile (.wmf) format.** For proper viewing of the entire Graphics Screen, your monitor must be at least set at 1024 x 768 pixels. After setting up the graphic screen, if the graphic displayed appears distorted, contact your local Roberts-Gordon distributor for assistance.
On the menu bar, click on "Graphics". Click on "Graphic View."

5.1 Programming Mode
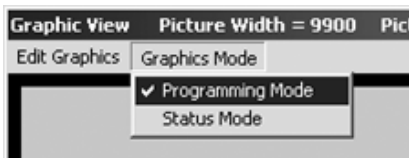
Click on the "Graphics Mode" drop down. Click on "Programming Mode."
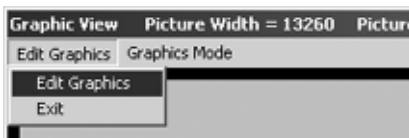
Click on the "Edit Graphics" drop down. Click on "Edit Graphics."

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FIGURE 14: Graphics Edit Box Type Drop Down
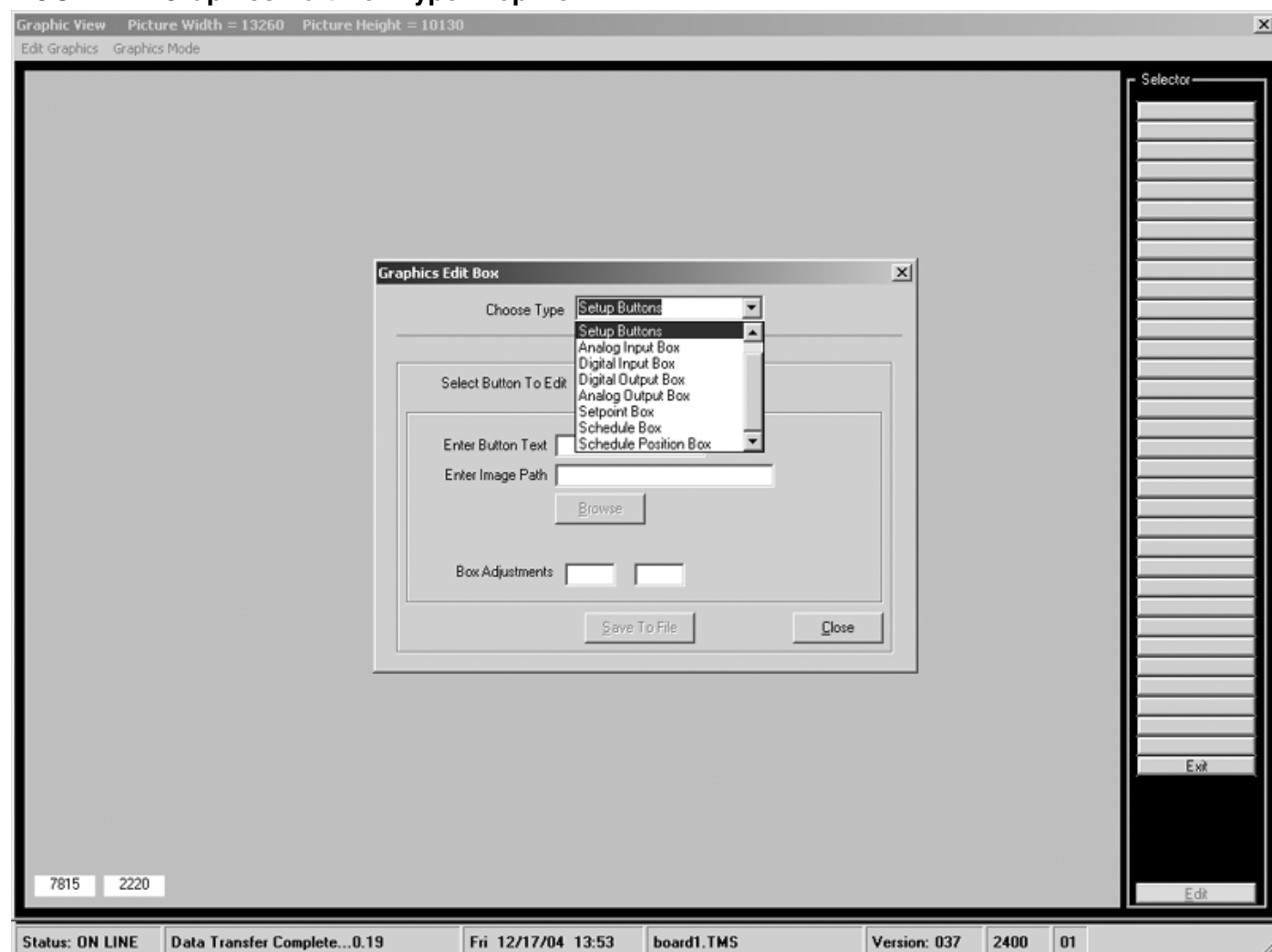
Click on the "Choose Type" drop down. A list of types of boxes and buttons appears that allow for the creation of a custom status screen.

Setup Buttons: Buttons are displayed on the right side of the screen in the "Selector" panel. Each button represents a different graphic screen. A different Windows® Metafile (.wmf) can be assigned to each button. Up to 33 screen buttons can be created. This feature customizes the title of the button as well as assigning the Windows® Metafile to be displayed when the button is clicked.

Analog Input Box: Creates a data label that displays the status of any of the control panel's eight analog inputs. Inputs 1-3 show zone temperatures; inputs 4-6 show zone sensor slide bar positions; input 7 shows BMS enable On/Off; input 8 shows outdoor air temperature.

Digital Input Box: Creates a data label that displays the status of any of the four digital inputs. Inputs 1-3 show zone sensor override button status; input 4 shows pressure switch status.

Digital Output Box: Creates a data label that displays the status of any of the digital outputs. Only digital outputs 1-3 and 8 are used. Outputs 1-3 show zone On/Off status; output 8 shows vacuum pump On/Off status.

Analog Output Box: Creates a data label that displays the 0-10V value generated by the control panel for speed control of the vacuum pump. Only output 1 is used. 0V will indicate minimum pump speed and 60% burner firing rate, 10V will indicate maximum pump speed and 100% burner firing rate.

Setpoint Box: Creates a data label that displays the occupied setpoint for any zone.

Schedule Box: Creates a data label that displays the BEGIN or END time of a time schedule.

Schedule Position Box: Not Used.

5.1.1 Setup Buttons

On the "Choose Type" drop down, click on "Setup Buttons."

FIGURE 15: Graphics Setup Buttons
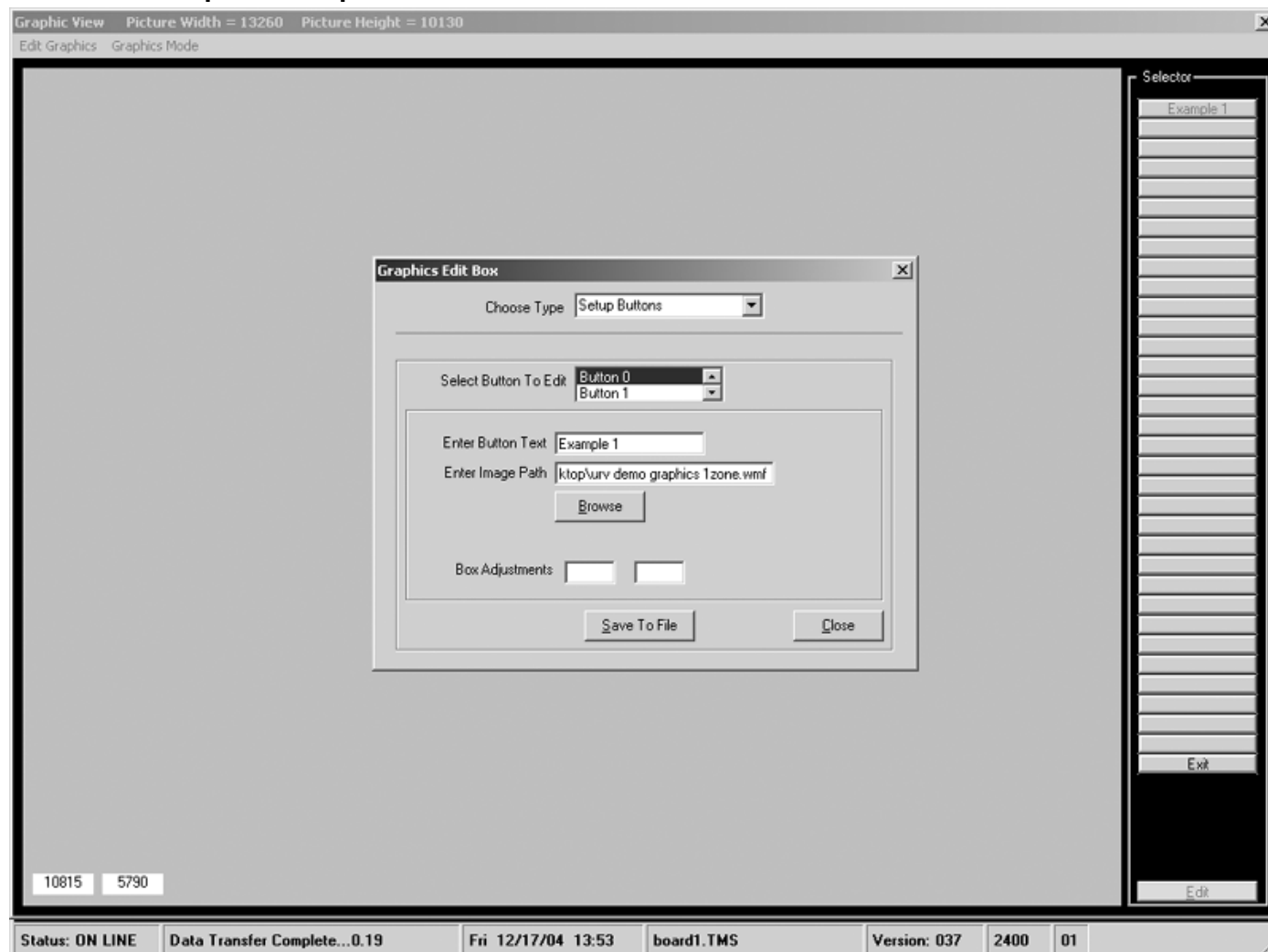
In the "Select Button to Edit" field, click on the button to be customized (button 0 is the top button in the "Selector" panel; button 33 is the button just above the "Exit" button).

Type the title to appear on the button in the 'Enter Button Text" field.

Click "Browse" to locate the Windows® Metafile that will be displayed when the button is clicked. Select the file and click "Open", the file path will be displayed in the "Enter Image Path" field.

Click "Save to File" then click "Close". In the "Selector" panel, click "Exit."

Re-enter the graphics screen and click on the customized button to display the back-ground graphic.

FIGURE 16: Graphic Example
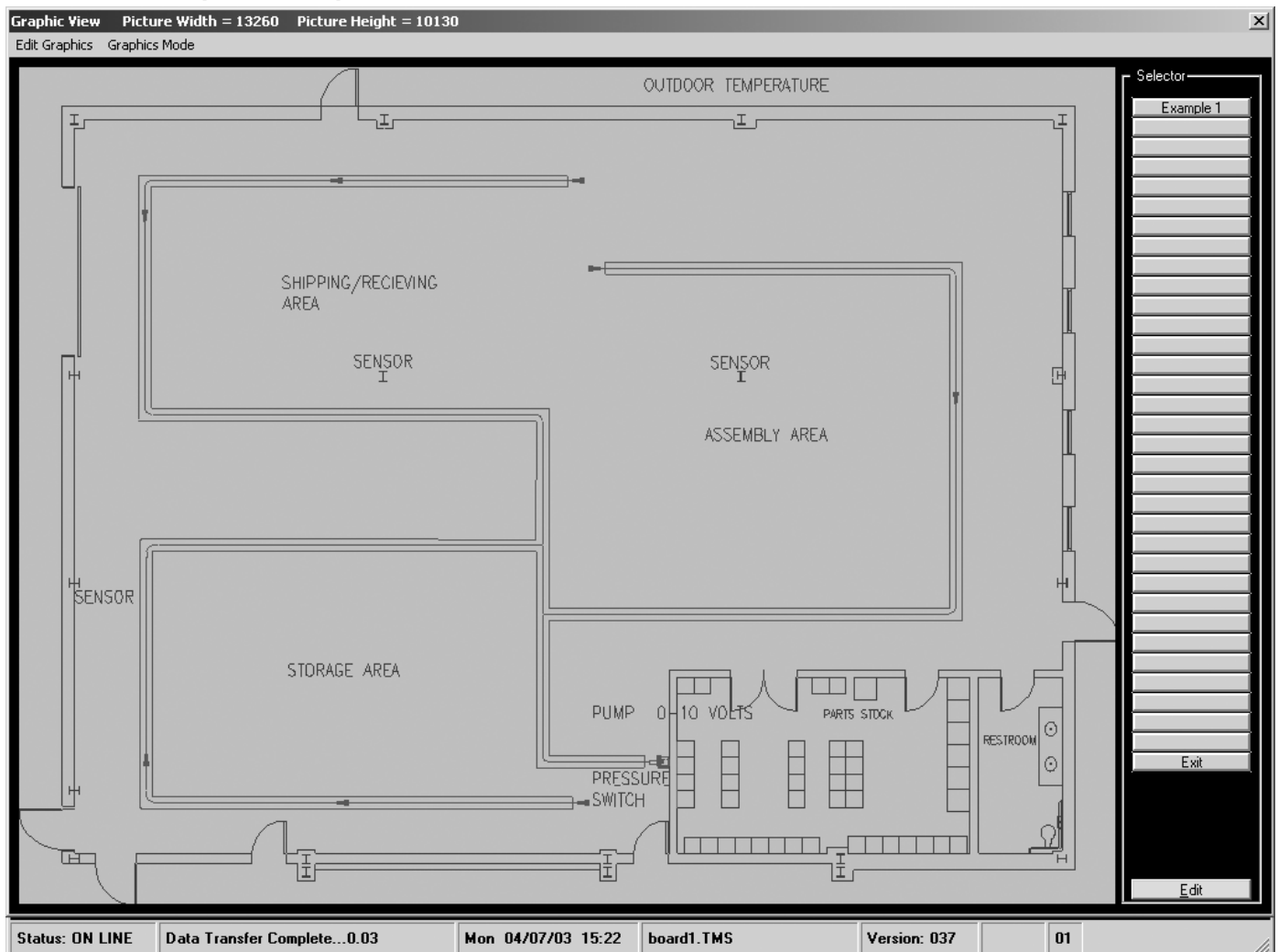
Repeat *Page 26, Section 5.1.1* to create more graphic setup buttons as desired. Each different graphic setup button can display a separate graphic file.

Proceed to *Page 28, Section 5.1.2* to create data labels for this graphic.

5.1.2 Analog Input Label

On the "Choose Type" drop down, click on "Analog Input Box".

FIGURE 17: Graphics Analog Input Box
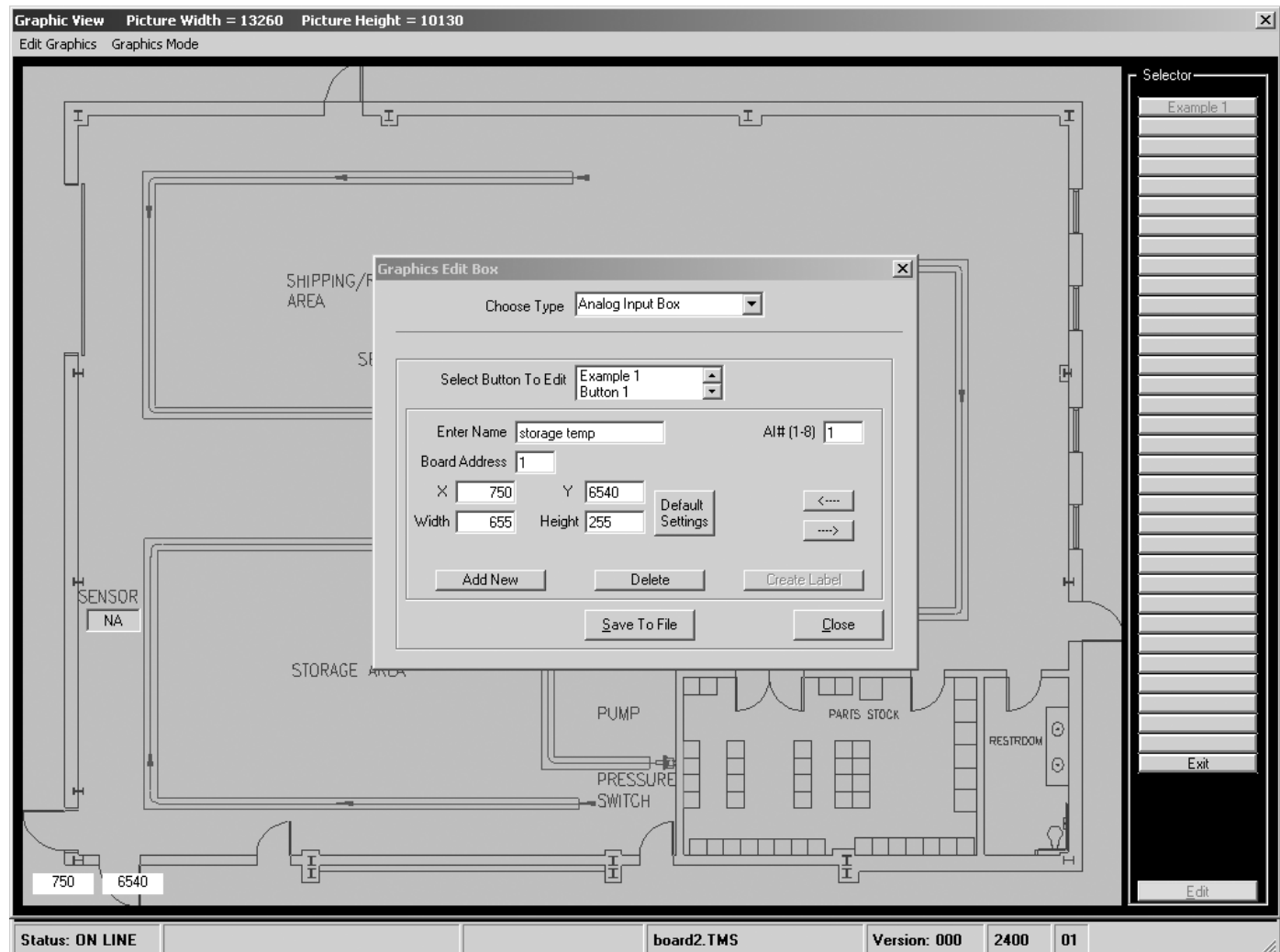
Since the analog input label will be placed on top of the Windows® Metafile graphic, choose the graphic on which the label should appear by clicking on the appropriate selection in the "Select Button to Edit" field. Click "Add New."

In the "AI# (1-8)" field, enter the analog input to be displayed (*See Page 24, Section 5.1* for details about the analog inputs).

Title the name of the label in the "Enter Name" field. This name will not be displayed on the screen, but the name is used to create a file name associated with this label.

In the "Board Address" field, enter the number of the board from which the data is to be retrieved. The board number corresponds to the position of the dip switches on the control board (see the ROBERTS GORDON® ULTRAVAC™ Installation, Operation and Service Manual (P/N 10081601NA) for details about the dip switch settings).

Enter the X and Y position where the label will be placed on the screen. When the cursor is moved across the screen, the X and Y position of the cursor is shown in the bottom left corner of the screen. Move the cursor to the desired location of the label on the screen and enter the coordinates in the X and Y fields.

The width and height of the label can be customized, however, they are not required to be changed from the default settings.

Click "Create Label." The box will appear on the screen at the location of the X and Y

coordinates.

If the label has not been placed in the exact location desired, place the cursor over any part of the picture, **except the open window or the data label that was just created**. Left click and hold, the cursor will grab the data label. While holding, drag the data label to the desired position and release.

To create more Analog Input labels, click on the desired button in the "Select Button to Edit" box, then click "Add New" and enter the required settings. Repeat process until all the desired analog inputs labels have been created.

5.1.3 Digital Output Label

On the "Choose Type" drop down, click on "Digital Input Box".

Setup is similar to Analog Input Label, *See Page 28, Section 5.1.2* for details.

See Page 24, Section 5.1 for details about the digital inputs.

5.1.4 Digital Output Label

On the "Choose Type" drop down, click on "Digital Output Box".

Setup is similar to Analog Input Label, *See Page 28, Section 5.1.2* for details.

See Page 24, Section 5.1 for details about the digital outputs.

In the "DO# (1-8)" field, only digital outputs #1-3 and #8 are used.

5.1.5 Analog Output Label

On the "Choose Type" drop down, click on "Analog Output Box".

Setup is similar to Analog Input Label, *See Page 28, Section 5.1.2* for details.

See Page 24, Section 5.1 for details about the analog outputs.

In the "AO# (1-4)" field, only analog output #1 is used.

5.1.6 Setpoint Label

On the "Choose Type" drop down, click on "Setpoint Box".

Setup is similar to Analog Input Label, *See Page 28, Section 5.1.2* for details.

In the "OSP (1-8)" field, only setpoints (OSP) 1-3 are used.

5.1.7 Schedule Label

On the "Choose Type" drop down, click on "Schedule Box".

Setup is similar to Analog Input Label, *See Page 28, Section 5.1.2* for details.

In the "Schedule# (0-23)" field, enter the appropriate number that corresponds to the "On" or "Off" time that is to be displayed. *See Page 9, Figure 3*, observe the "On" and "Off" times in the "Enter Schedules" panel. If #0 is entered in the "Schedule# (0-23)" field, the box created will display the "On" time for schedule 1; #1 will display the "Off" time for schedule 1 and so on. If #23 is entered in the "Schedule# (0-23)" field, the box created will display the "Off" time for schedule 12.

5.1.8 Schedule Position Label

The "Schedule Position Box" option is not used.
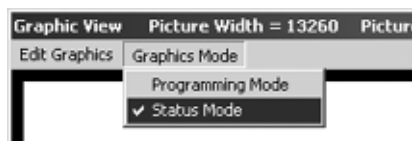
5.2 Status Mode

After programming all graphics as described *on Page 26, Section 5.1.1 through Page 29, Section 5.1.7*, click on the "Graphics Mode" drop down. Click on "Status Mode."

FIGURE 18: Graphic Example with Data Boxes
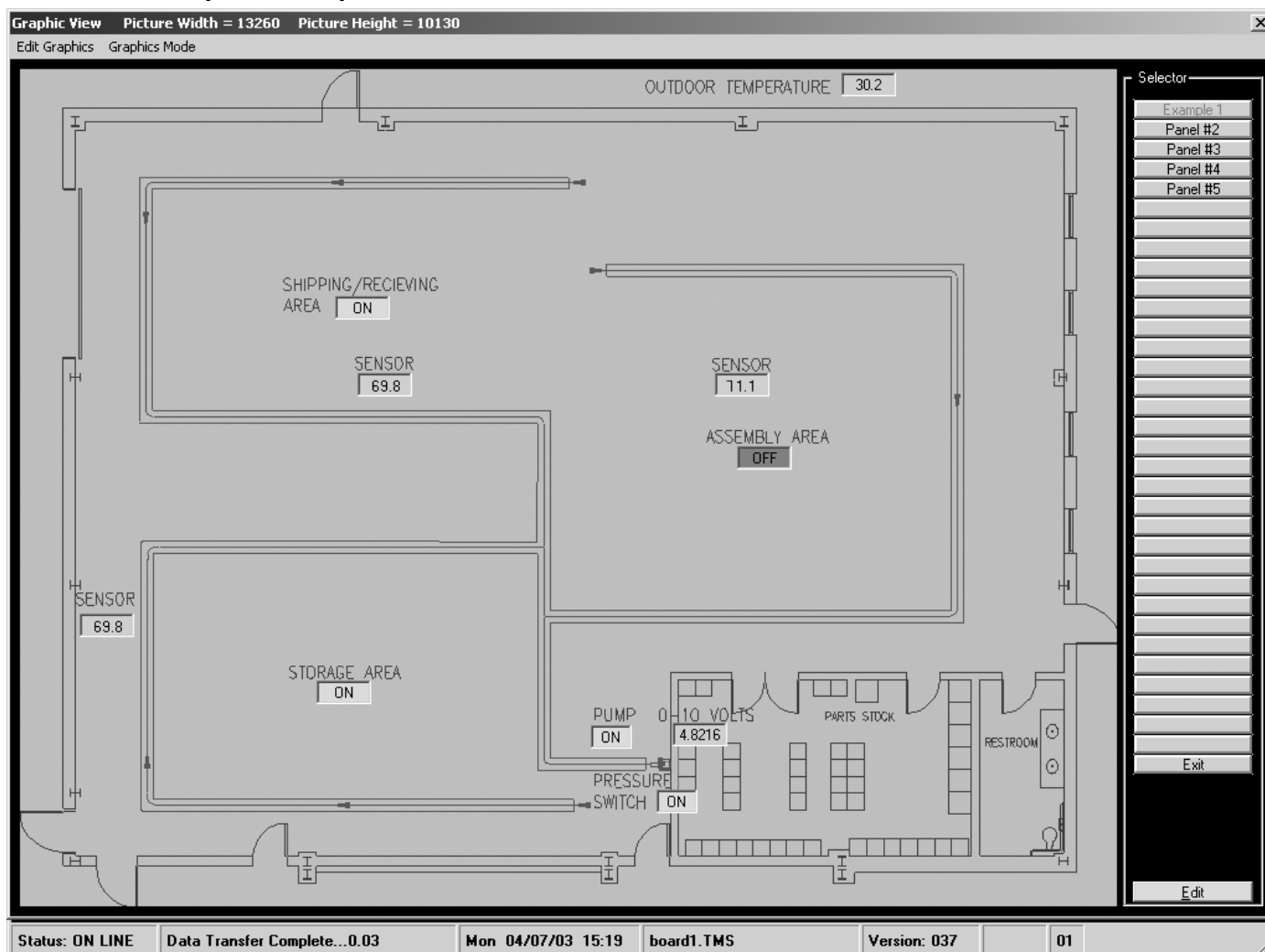
The data labels will update and display current status values. Whenever viewing system status on the "Graphics View" screen, be sure that "Status Mode" is selected so that data labels are continually updated.

If data labels are not updating, exit Graphics. On the tool bar, click on "Status", then click on "Board Status". When the "Board Status" window opens, be sure that the "Auto - Update" box in the lower left corner of the window is checked.

SECTION 6: ALARMS MENU
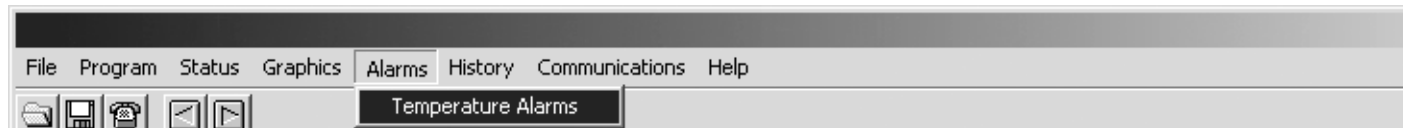
6.1 Temperature Alarms

Any input temperature can be set to generate an alarm that will be sent to any pager phone number along with an alarm message. **Pager notification and messaging can only be used if the central controller has the optional modem installed.** Alarms can be created for zone temperatures that are either above or below a desired setpoint. Up to eight custom alarms can be created.

On the menu bar, click on "Alarms." On the drop down menu, click on "Temperature Alarms."

Click the "Edit" button.

From the drop down, select the sensor input to be monitored. Generally, the only monitored inputs will be zone temperature inputs.

FIGURE 19: Alarm Selection
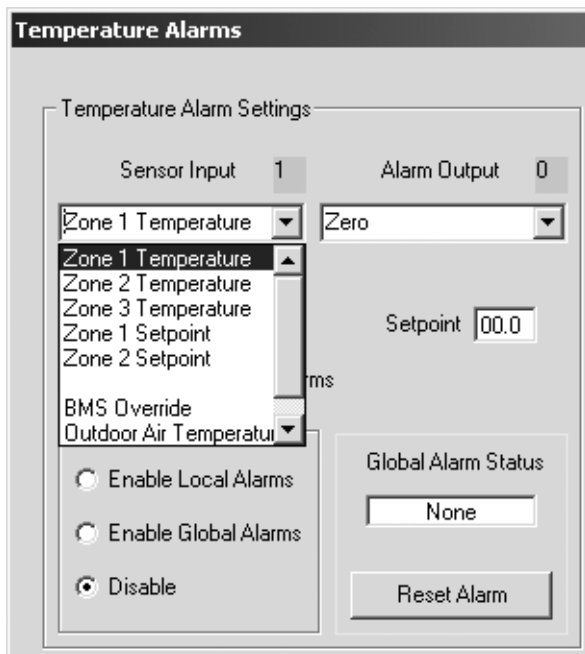
FIGURE 20: Temperature Alarms

Select alarm number in the "Alarm in Process" panel, the alarm condition beneath the "Sensor Input" drop down, and setpoint in the "Temperature Alarm Settings" panel.

Click on "Enable Global Alarms" in the "Alarms Enable" panel. "Enable Local Alarms" will enable alarms for the controller that you are currently accessing. "Disable" will inactivate the alarm feature.

If the pager dial out feature is desired, enter the required dial out settings, pager message and check the "Alarm Dialout Enable" box.

Click on the "Send to Controller" button.

Click on the green "Exit" button.

If alarm condition occurs, the "Global Alarm Status" box will indicate that an alarm has occurred. After the condition has been cleared, click "Edit" and "Reset Alarm" then "Send to Controller".

DISCLAIMER: The ROBERTS GORDON® ULTRAVAC™ features an alarm capability in the event the temperature drops below a specified setpoint. This feature is designed to alert the user of a situation where the heating system is unable to offset building heat loss. The alarm should not be relied upon to safeguard against heat deficiency. The alarm is for convenience purposes only. In no event shall Roberts-Gordon be responsible for any damage due to any failure.

SECTION 7: HISTORY MENU
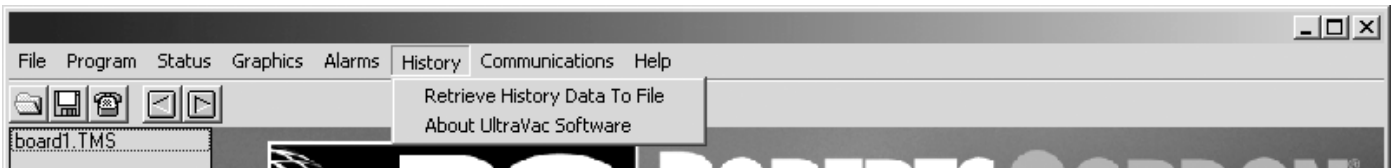
7.1 Retrieve History Data to File

On the menu bar, click on "History." On the drop down menu, click on "Retrieve History Data to File."

FIGURE 21: History - Retrieve Data to File
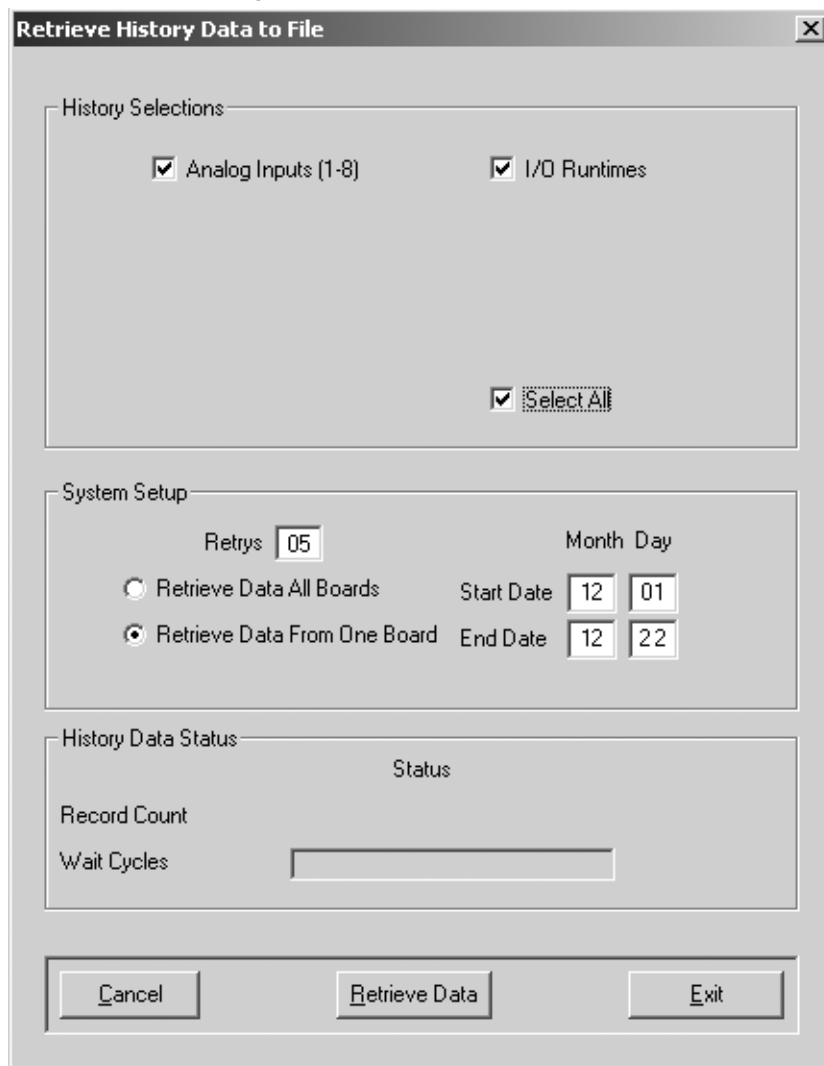
In the "History Selections" panel, select the data to be retrieved. *See Page 21, Section 3.10* for an explanation of the selections.

In the "System Setup" panel, select the start and end dates for the data to be retrieved. Select whether the data is to be collected from one controller or all controllers.

Click the "Retrieve Data" button.

FIGURE 22: History - Data File Name
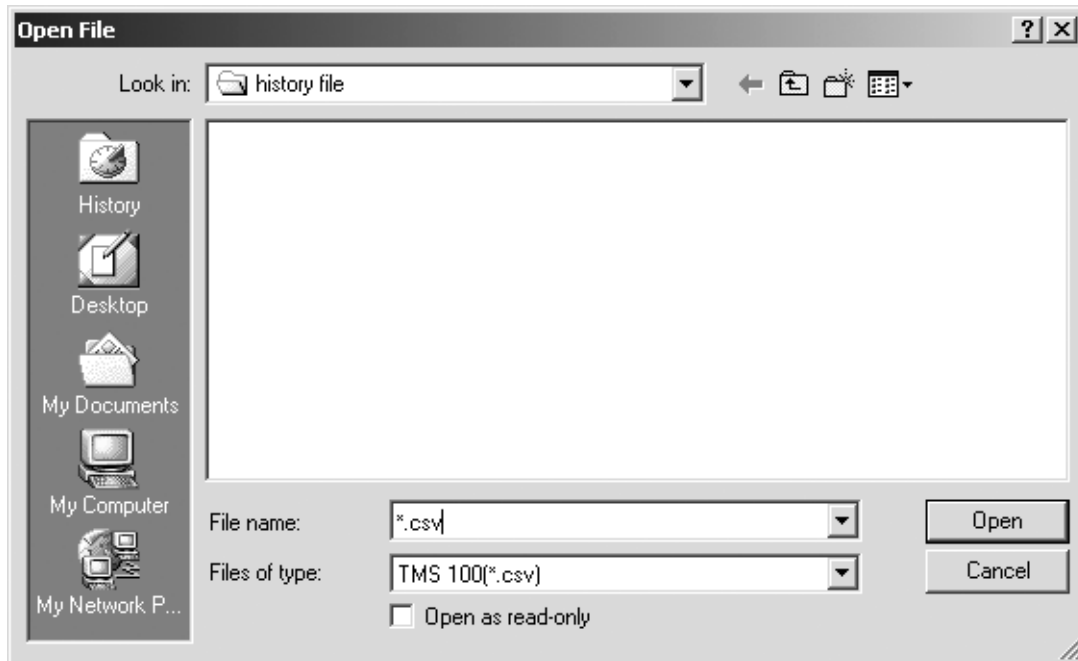
Select a file name and address and a Microsoft® Excel (.csv) file will be saved with the name and file location of your choice.

SECTION 8: COMMUNICATIONS MENU
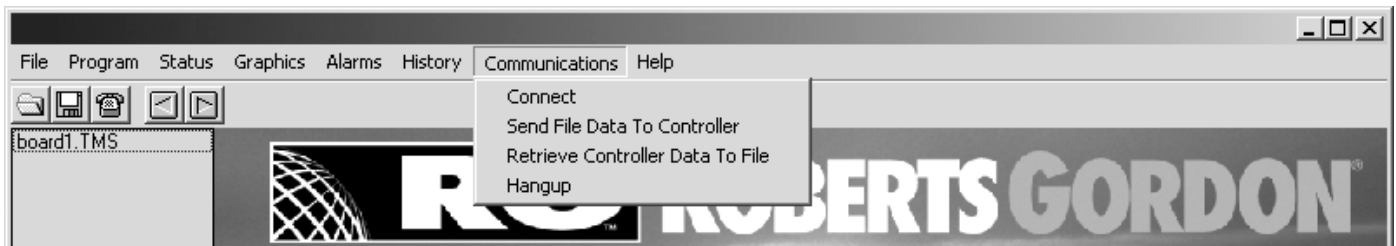
8.1 Connect

See Page 18, Section 3.8.

8.2 Send File Data to Controller

To send a new board file to the controller, open the desired file from the "File" drop down menu on the menu bar. After the file is open, connect to the desired board. Once connected, click on "Communications" on the menu bar, then click on "Send File to Controller" from the drop down menu.

FIGURE 23: Send File to Controller
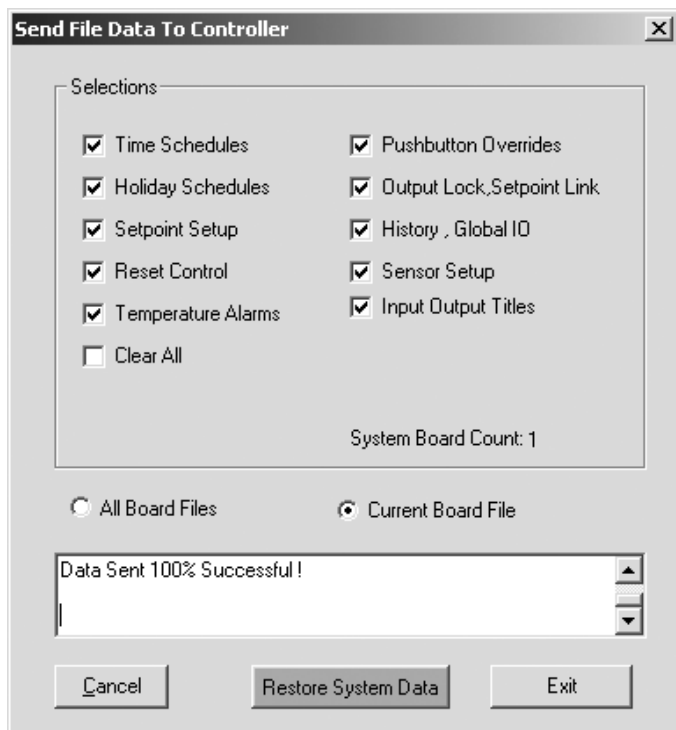
If the job file has multiple board files and you wish to send all the board files, click on "All Board Files". If only the current board file is required to be sent to the controller, click on "Current Board File".

Click on desired selections and then click the "Restore System Data" button.

8.3 Retrieve Controller Data to File

A controller's on board stored settings can be downloaded into an open board file. To create a file from existing board data, open "Edit Job" from the "File" drop down menu on the menu bar. Add a new board file.

On the menu bar, click on "Communications." On the drop down menu, click on "Retrieve Controller Data to File."

Click on desired selections and then click the "Retrieve Data" button.

8.4 Hang-up

Before exiting ROBERTS GORDON® ULTRAVAC™ Software or shutting down the computer, be sure to terminate communications from the controller by using the hang-up feature. Hang-up disconnects communication with the controller(s).

The controller cannot communicate with two PCs' at the same time. For example, a PC cannot direct connect to a controller while another PC is connected via modem.

FIGURE 24: Hang-Up
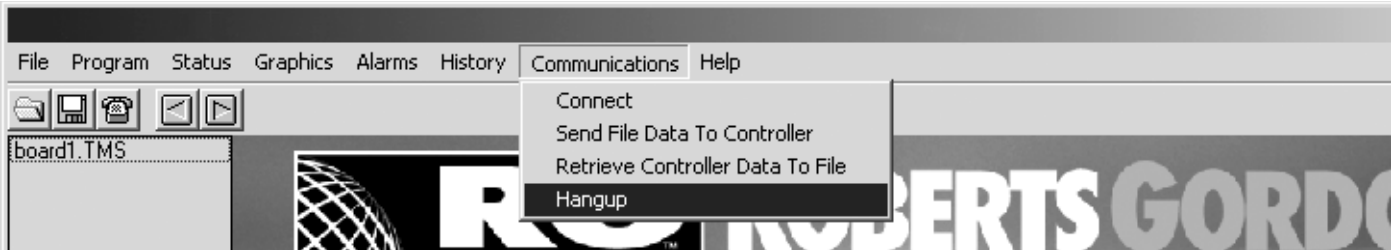
On the menu bar, click on "Communications."

On the drop down menu, click on "Hang-up" to disconnect communication to the controller.

If the software is turned off without hanging up, the connection will be terminated, even though the "Hang-Up" feature was not selected.

SECTION 9: FILE MENU
FIGURE 25: File Drop Down Menu
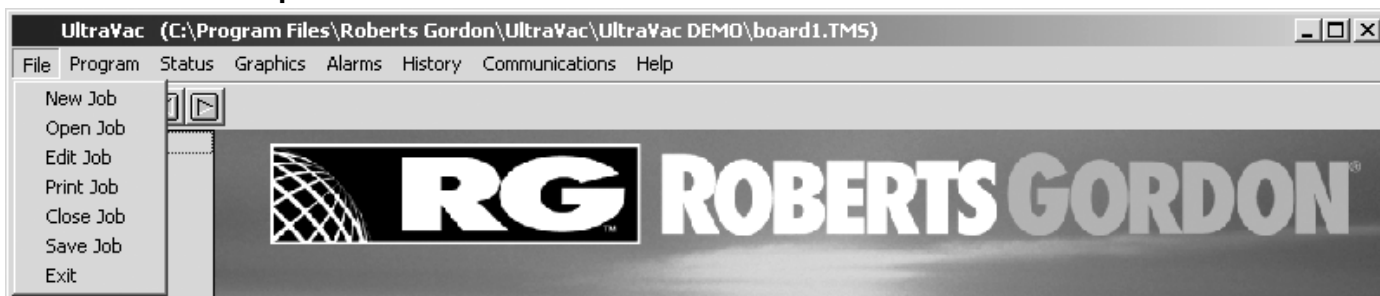
9.1 New Job

If multiple buildings (jobs) are to be accessed, a job file must be created for each location. On the menu bar, click on "File". On the file drop down menu, click "New Job".
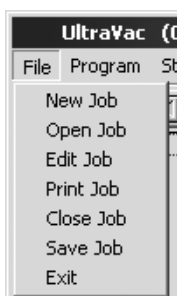
FIGURE 26: New Job System Setup

Click on the "Add New Job" button. Enter system(job) name, phone number (if using modem communications method), number of controllers, IP address and IP port (if using TCP/IP module communication method) in the appropriate fields. If phone number, IP address or IP port are needed but not known, the information may be entered later on the "connect" screen.

Generally, jobs with multiple controllers will share the majority of the programmed options with few changes from board file to board file. Since this usually holds true, enter "1" in the "How many boards are connected?" box. After programming one board file, the pro-grammed board file can be copied so that programming time can be minimized. Copying board files is detailed *on Page 40, Section 10.1*.

If you do not want to copy settings from the first board file to the rest of the board files, in the "how many boards are connected?" box, enter the total number of controllers on the

job. In this case, multiple board files will automatically be created and each controller and board file will have to be programmed separately.

Click the "Save" button. Click "Exit". A job file will be created in the C:\Program Files\Roberts Gordon\UltraVac" folder, ("C" being your PC's hard drive.) The file already contains the number of board files that were specified in the "How Many Boards are Connected" box.

Close the ULTRAVAC™ software program, then reopen it. This will refresh the software with the new job name and board files that were just created.

As shown *on Page 6, Section 2.3*, double click on the correct job name and connect to the central controller.

Program the central controller (board1.TMS) as shown in *Section 3*.

After fully programming settings for the central controller (board1.TMS), *See Page 40, Section 10.1* for programming other (satellite) board files.

9.2 Open Job

To access a different job file, click on "Open Job". Double click on the job name, then double click on the board file name for the controller to be accessed. The "Connect" window will open. *See Page 6, Section 2.3* for correct instructions.

9.3 Edit Job

After creating a new job (*see page 37, section 9.1*) the job file can be edited to accommodate changes. On the menu bar, click on "File". On the drop down menu, click on "Edit Job".

FIGURE 27: Edit Job
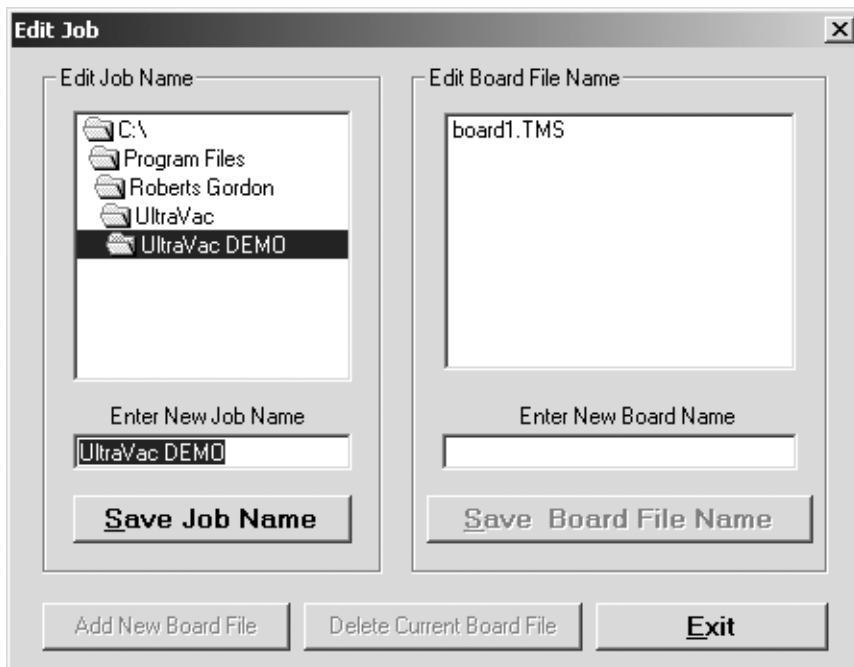
If any new jobs were created as shown *on Page 37, Section 9.1*, the new job names will appear in the "Edit Job Name" panel under the "Ultravac" folder. In *Figure 27*, no new jobs were created so only the factory programmed default job name appears. The default job name is "UltraVac Demo". To customize the job name, click on the "UltraVac Demo" file in the "Edit New Job Name" panel. Click in the yellow text box under "Enter New Job Name" and edit the name. Click on the "Save Job Name" button to save the new name.

9.3.1 Add New Board Files

Do not add new board files if you are copying board files as described *on Page 37, Section 9.1* **and** *on Page 40, Section 10.1*. If the job has multiple controllers, and you wish to program each controller separately instead of copying board files, additional board files must be added (one board file for each controller). To add a board file, click on "board1.TMS" in the "Edit Board File Name" panel. Click on the "Add New Board File" button.

FIGURE 28: Add New Board File
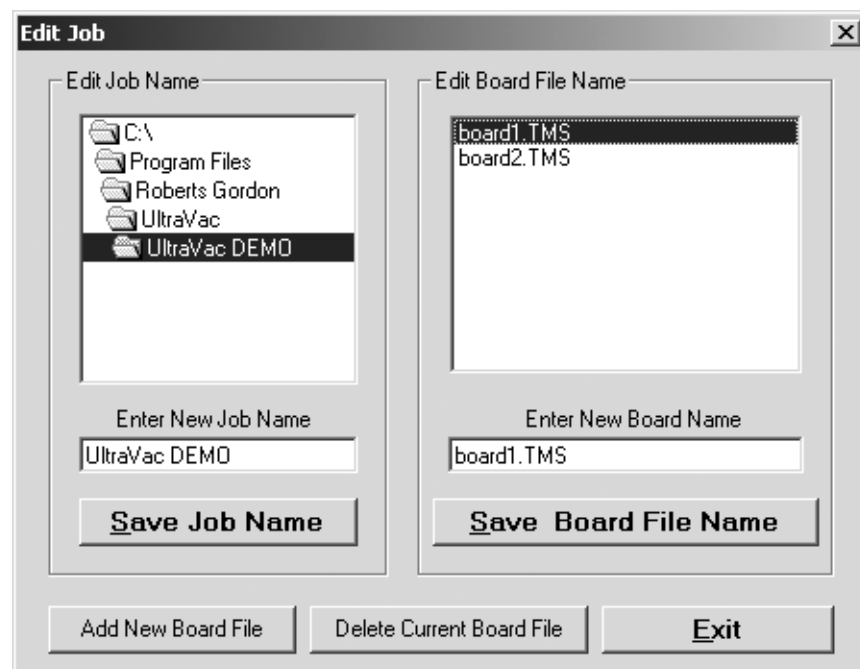
New file name "board2.TMS" will appear in the "Edit Board File Name" panel. To add additional board files, repeat *Section 9.3.1*.

Add board files until the number of files matches the number of controllers on the network that are connected in the RS-485 communications chain. The number in the board file name will correspond to the controller "address" which is set by the board identification dip switch on the controller (see the ROBERTS GORDON® ULTRAVAC™ Installation, Operation and Service Manual P/N 10081601NA for details.)

The new board files will have default programming and will have to be programmed individually while "connected" to the corresponding controller. To copy existing programmed board files, *see page 40, section 10.1*.

9.3.2 Delete Board File

To delete a board file, click on the file name in the "Edit Board File Name" panel, then click on the "Delete Current Board File" button.

9.3.3 Edit Board File Name

To edit a board file name, click on the file name in the "Edit Board File Name" panel, then edit the file name in the "Enter New Board Name" field. You must keep the number suffix and ".tms" extension. Only edit the part of the file name before the number suffix. i.e. edit only "board". The number suffix and ".tms" extension are critical for board addressing purposes.

9.4 Delete Job

To delete a job file, exit ULTRAVAC™ Software. On the PC's desktop, double-click on "My Computer". Navigate to C:\Program Files\Roberts Gordon\Ultravac; all job files should appear as folders. Delete the folder of the unneeded job file.

SECTION 10: MULTIPLE CONTROLLERS

10.1 Copying board1.TMS Board File for Jobs with Multiple Controllers

As mentioned *on Page 37, Section 9.1*, for most jobs that have multiple controllers, each of the controllers usually will need identical settings (internal and external design temperature, time schedules, setpoints, setpoint ranges, holiday schedules, etc.). Since this is usually the case, the easiest way to program multiple controllers is to first program the central controller and then copy the board file (board1.TMS) to make board files for the remaining controllers.

After programming of the central controller, ensure that all of the settings that you have programmed into the PC are sent to the controller by turning to *Page 35, Section 8.2* and following the instructions to send the file data to the current board file.

All of the settings programmed in the PC for the central controller are saved on the PC in a file called "board1.TMS". To save time, verify that the central controller is COMPLETELY programmed before "board1.TMS" is copied to make additional board files.

Exit from the ULTRAVAC™ Software.

A board file must be created for each controller on the job. The dip switch setting on the controller circuit board and the board file name will dictate which board file applies to each controller. For instance, the controller with the dip switches set for address 2 will use a board file named "board2.TMS", a controller addressed as 3 will use a file called "board3.TMS", and so on. Refer to the ROBERTS GORDON® ULTRAVAC™ Installation Manual (P/N 10081601) for controller dip switch setting details.

Copy "board1.TMS" to create additional board files by:

1. Navigate to C:/Program Files/Roberts Gordon/Ultravac.   If you have successfully created a new job as detailed *on Page 37, Section 9.1*, there will be a folder with the same name as the job that was created.

2. Open the folder. The folder will contain one file named "board1.TMS".

3. Right-click on the file and select "Copy" from the dropdown.

4. Right-click in the open area in the window and select "Paste" from the dropdown.

5. Repeat the process until the number of files on the screen equals the number of controllers on the job.

6. Right-click one of the copied files and rename it "board2.TMS". The file name is case sensitive and MUST use this exact naming convention. No extra or alternate characters or spaces may be added to the file name.

7. Repeat the file re-naming process until each file is renamed. The number of files must equal the number of controllers on the job. There must not be any gaps in the sequential numbering convention of the file names. For instance if there are 4 controllers on the job, there must be a board1.TMS, board2.TMS, board3.TMS and board4.TMS file.

 Exit from the current window and open the UltraVac Software by double-clicking on the black Roberts-Gordon UltraVac™ icon. When the "Connect" window appears, the job name that was created will appear in the white field on the right side of the window. Click on the job name and all of the file names that were created and re-named for all of the controllers will appear in the grey field on the left of the screen. Connect to the controllers, *see page 6, section 2.3*.

Close the "Connect" window and notice "Status: ON LINE" in the lower right of the screen. This means that a connection is made to the controller network. Click on one of the board

file names in the grey panel on left of the screen. This will highlight the file name which indicates that the next selection made on the tool bar at the top of the screen will apply to the controller using that file name.

FIGURE 29: Selecting Board 2 File
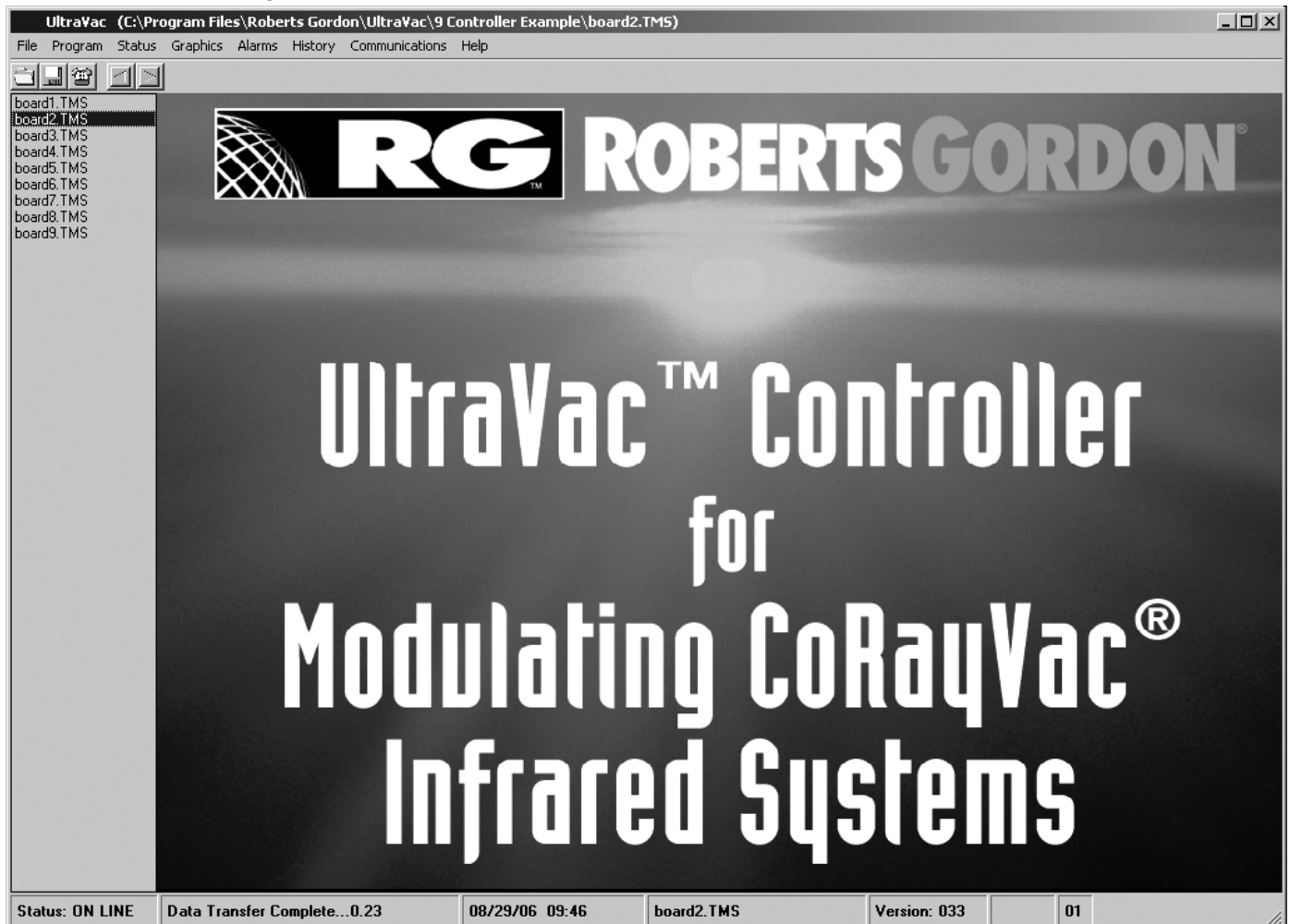
For instance, if board2.TMS is highlighted and then Status/Board Status is selected from the tool bar, then the status screen for controller 2 will appear.

10.1.1 Edit Satellite Board File Settings

If any board files require different settings from the copied "board1.TMS" file, click on the appropriate board file in the bar on the left side of the screen, the board file bar is shown in *Figure 29*. Edit settings as necessary, refer to *Section 3 through 7*.

One setting that MUST be changed on all board files except the "board1.TMS" file is the outside air temperature sensor setup. *See Page 42, Section 10.2* **for details.**

10.2 Outside Air Temperature Setup for Satellite Controllers

For jobs with more than one controller, the central controller (controller #1) will be using an outside air sensor. The remaining controllers will share the outside air temperature signal with the central controller. **For all satellite controllers (every controller except controller #1), the outside air sensor setup screen must be altered.** Click on board 2.TMS on the left of the screen.

Verify that the PC is online with the controller, check the lower left corner of the screen for "Status: ONLINE". Select "Sensor Setup" from the "Program" drop down menu. Click the "Edit" button. Change the "Outdoor Air Temperature" type to "virtual" from the "Type" drop down menu.

FIGURE 30: Satellite Controller Outside Air Sensor Setup
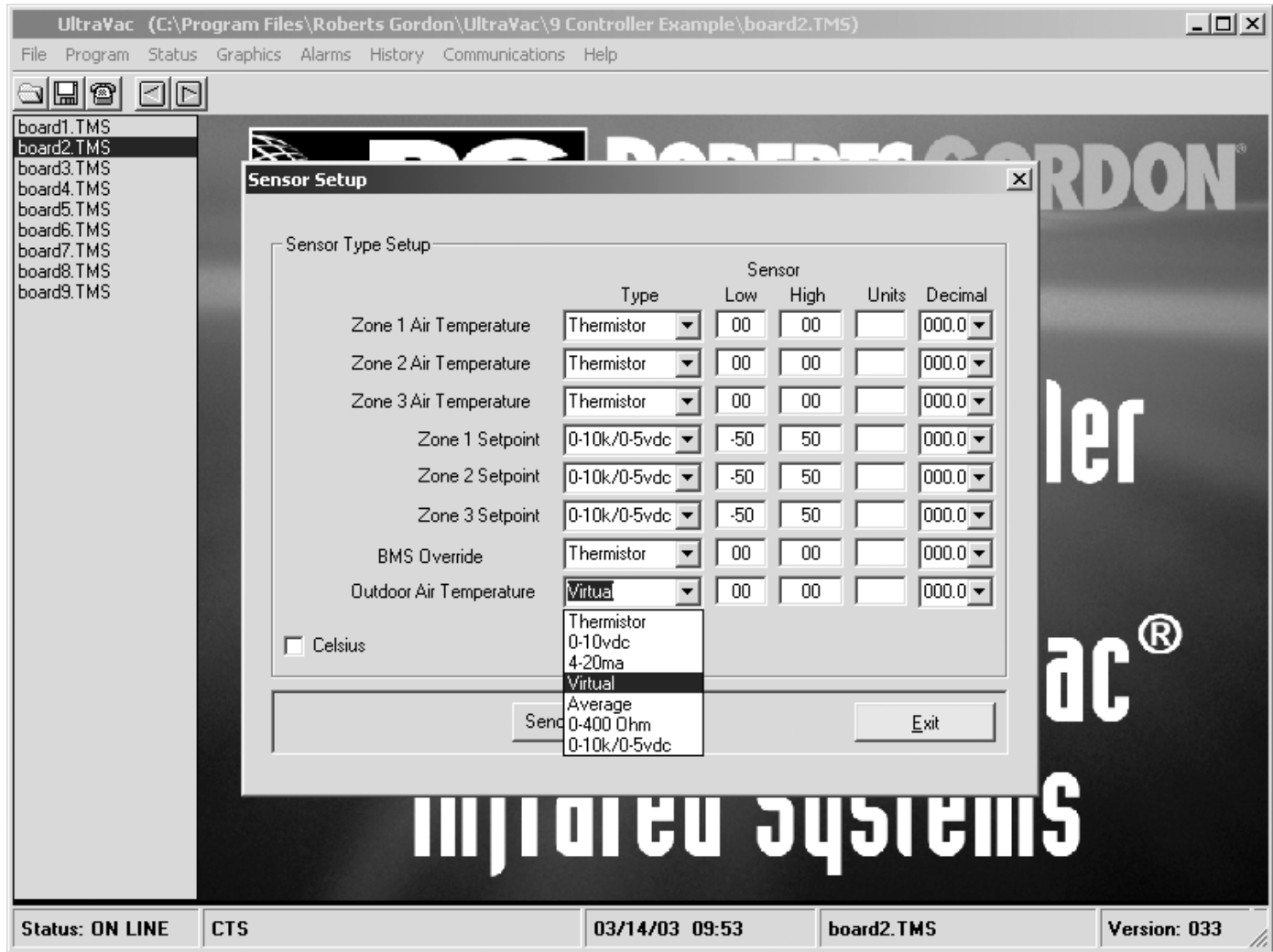
Click the "Send to Controller" button. Click the green "Exit" button. If the board1.TMS file has been copied to board2.TMS, make any other changes to customize board 2, i.e.: input/output titles, setpoints, time schedules, etc. Repeat this procedure for all board files except for "board1.TMS".

SECTION 11: MANUAL ON/OFF SCREEN

Manually overriding the controller power output function can be a useful tool. The "Manual ON/OFF" screen is typically used during the equipment installation process for initial system commissioning.

FIGURE 31: ON/OFF Screen

To access the "Manual ON/OFF" screen, the ULTRAVAC™ software background screen must be visible with no other windows open. Press the "Alt + M" keys on the keyboard.
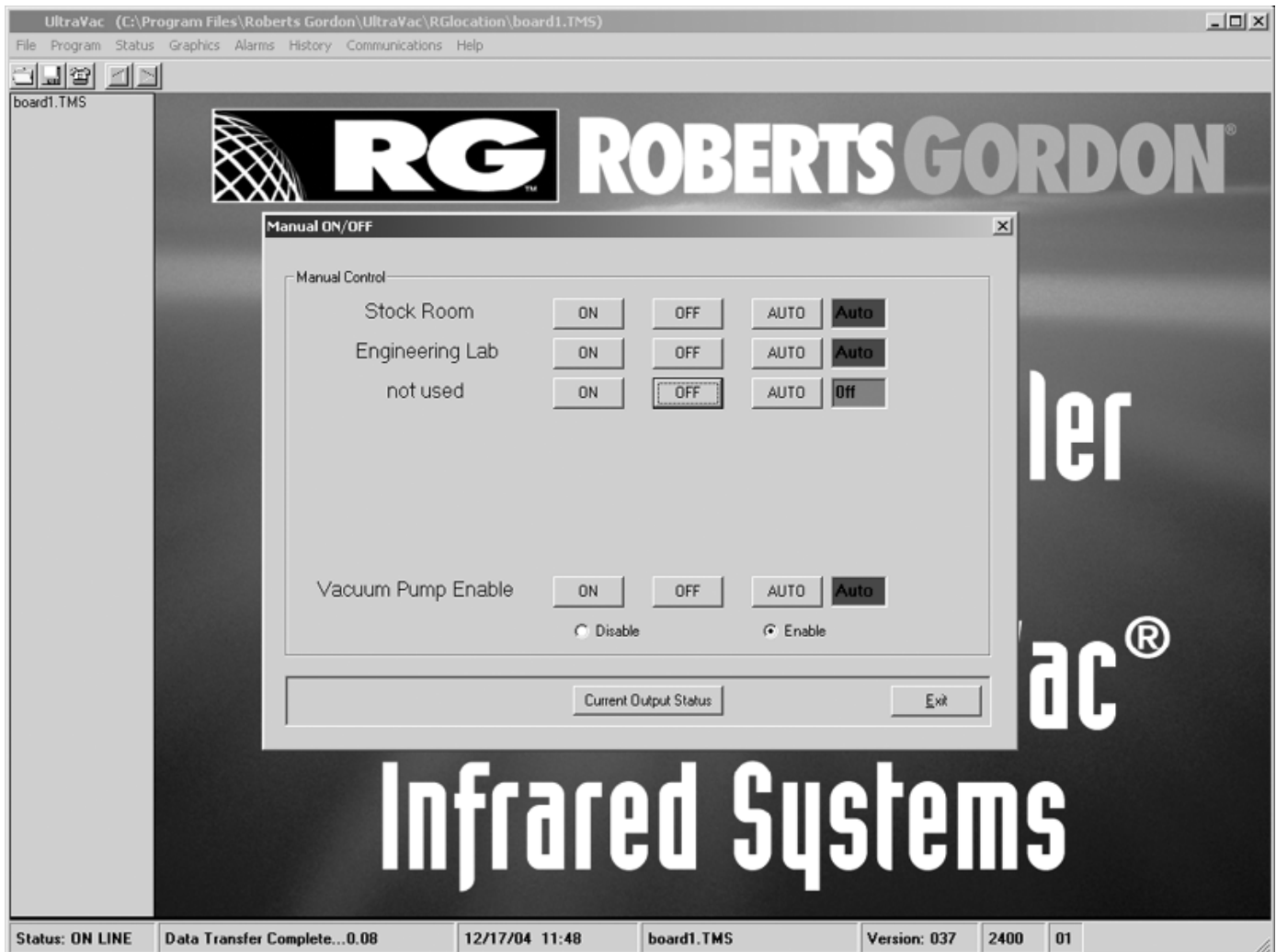
The "Manual ON/OFF" screen displays the power output status for power relays 1-3 and 8 on the controller's relay board. The current status of each zone or pump relay is displayed in the four colored fields on the right side of the screen. Notice that zone titles will be displayed as programmed on the "Input/Output Titles" screen. *See Page 14, Section 3.5.*

Status:

AUTO: Power output will be turned on and off according to controller's programmed settings.

ON: Power output will remain on regardless of controller's programmed settings or temperature setpoints.

OFF: Power output will remain off regardless of controller's programmed settings or temperature setpoints.

To change current power output status of a zone or pump, click on desired button. To turn "ON" burners, it is important to first turn "ON" the vacuum pump. Then turn "ON" the desired zone relay(s). This will allow the pump to create vacuum within the heating system

before attempting to light the burners. Clicking the "ON" button for zone power will not change status to "ON" unless the pump status is "ON" and the pressure switch has closed. When manual control is no longer desired, return vacuum pump power setting and zone power settings back to "AUTO". Set zone power for any unused zones to "OFF". Click "Exit" to close "Manual ON/OFF" screen.

Clicking the "Disable" feature will return all power settings to "AUTO".

SECTION 12: TCP\IP (LAN) COMMUNICATION MODULE INSTALLATION

The TCP/IP (LAN) Communication Module is an optional communication device that is included with every ULTRAVAC™ Central Controller with TCP/IP (LAN) Communication Module (P/N URVCCL). **If a TCP/IP (LAN) Communication Module is not supplied, skip this section.**
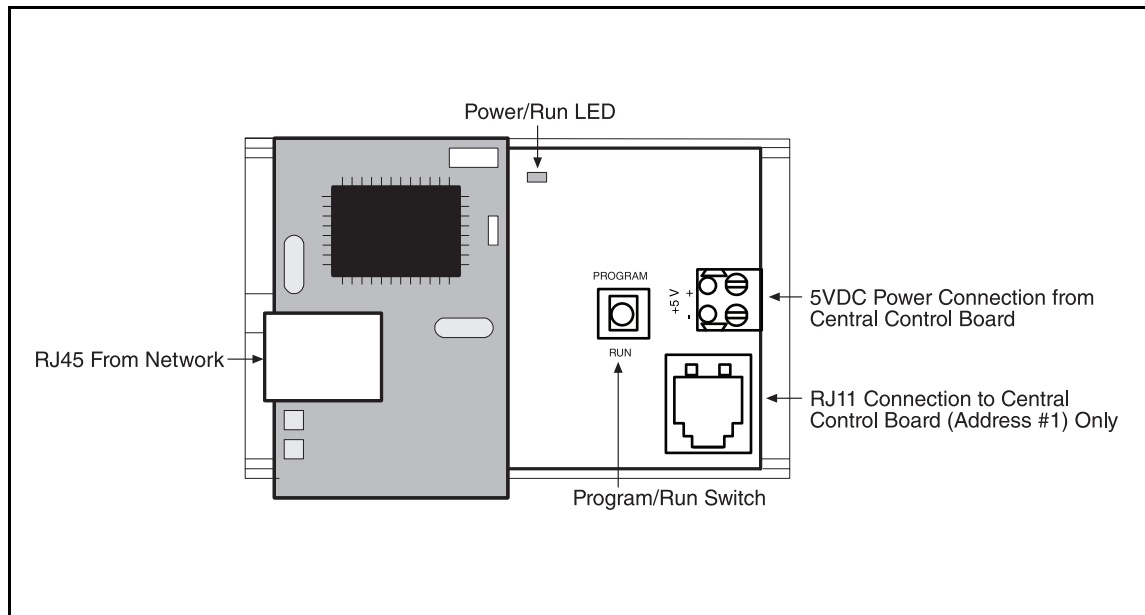
This section describes the proper procedure for installation of the TCP/IP (LAN) Communication Module. The device performs RS232 to TCP/IP conversion for connection of the ULTRAVAC™ Controller through a network connection. This controller will interface with network systems using TCP/IP protocol.

The TCP/IP (LAN) Communication Module is shipped complete with mounting rail for easy mounting. Please follow these instructions carefully to insure proper operation of the TCP/IP (LAN) Communication Module.

12.1 Module Details

Figure 32 shows the layout of the TCP/IP (LAN) Communication Module. The module contains one (1) RJ11 jack for RS232 communications with the central controller (address #1) and one (1) RJ45 ethernet communications jack for connection to a network.

FIGURE 32: TCP/IP Communication Module Details

Power/Run LED

RJ45 From Network

PROGRAM

+5 V

RUN

5VDC Power Connection from Central Control Board

RJ11 Connection to Central Control Board (Address #1) Only

Program/Run Switch

12.1.1 Power / Run LED:

This is a red indicator light, and flashes when power is applied to the module and the unit is in the RUN mode. The LED flashes slow when module is in the RUN mode.The LED burns steady when in the PROGRAM mode.

12.1.2 Program Switch:

This is a 2 position toggle switch which controls the program/run function of the controller. Move fully *TOWARDS* "*PROGRAM*" for the PROGRAM mode, and fully *TOWARDS* "*RUN*" for RUN mode.

12.2 TCP/IP Communication Module

The module must be powered from the central control board, (address #1). Before making power connections, verify that the power switch on the ULTRAVAC™ Controller relay board is in the OFF position. The connection is made with a 1 pair, 18 gauge cable to the 5 Vdc power terminals on the control board. *See Figure 33*.

FIGURE 33: Power Connection to Central Control Board

IMPORTANT! INCORRECT WIRING WILL RESULT IN PRODUCT DAMAGE! TCP/IP module power wires (black=5 V- / red= 5 V+) must be connected to the central control board and TCP/IP module as shown. Turn off the power switch on the ULTRAVAC™ relay board before making wire connections. Verify 5 V power wire connections before turning on the power switch on the ULTRAVAC™ relay board.

Description	Part Number
TCP/IP Communication Module	10080440K

12.3 Network Communications Connection

This controller will interface with network systems using TCP/IP protocols. The TCP/IP Communication Module connects to the network system as shown *on Page 56, Figure 36* and requires information from the network administrator for addressing and connection (*See Page 48, Section 13*).

NOTE: The module MUST be connected to the central control board (address #1) for proper system operation.

SECTION 13: TCP/IP (LAN) COMMUNICATION MODULE

The system is programmed through the "Isetup.exe" software program, and connects to the module with the direct connect cable package (P/N 10080410) included with the central controller.

To access the TCP/IP setup program, the ULTRAVAC™ Software must already be installed on the PC, *See Page 6, Section 2.2*. The TCP/IP setup program is found in c:\Program Files\Roberts Gordon\Ultravac.

Double click the icon labeled "Isetup.exe" and the ISETUP opening screen will appear.

This is the opening setup screen for the TCP/IP Communication Module, which has no data in the "Current Settings" portion of the screen. However, data may appear in the "Default Settings" boxes if used in previous connections.

13.1 Set the Software Communications Parameters

Make sure that the Comm Port setting is correct for your computer, and that the baud rate is set to 2400 (default), as shown above. Click the down arrow or type in the Comm Port box to select the proper comm port number for your computer.

If communications are not able to be established as indicated *on Page 50, Section 13.3*, the comm number selected may be incorrect, try the next comm port number.

13.2 Set the System Type

The setup software is designed to work with several different products. Check the box labeled "TCP IP Enable" above the "CONNECT" button of the opening screen, shown below.

13.3 Connect to the TCP/IP Communication Module

To connect to the module, make sure the module's power wires are connected to wire terminals and program switch is in the "PROGRAM" position. *See Page 46, Figure 33*. Connect the direct connect cable between the module's RJ11 and into the PC as shown *on Page 50, Figure 34*.

FIGURE 34: 9 Pin Adapter for PC
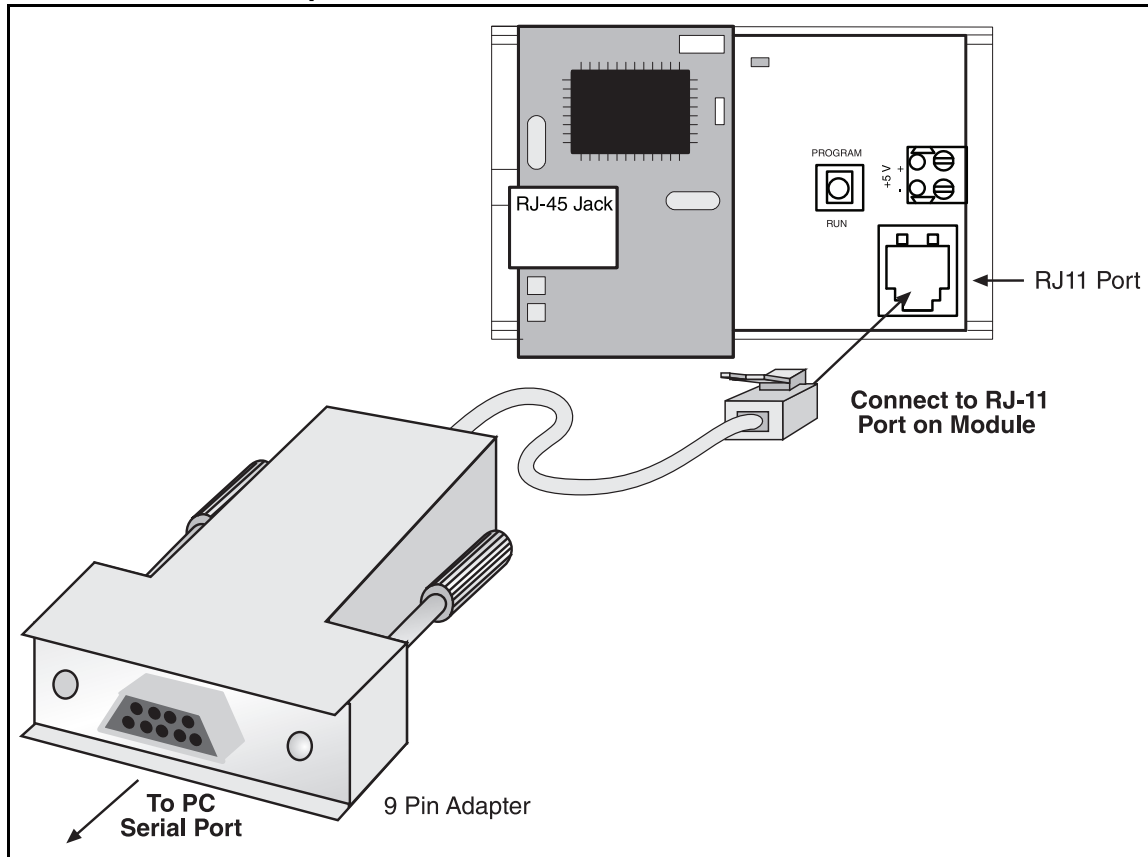
Verify that the program switch is set to the "PROGRAM" position as shown in *Figure 34*. The red Power/Run LED will turn on constant, not blinking.

The module must be set up to respond to the IP address assigned by the network administrator. The setup is performed with the module in the PROGRAM mode.

Click the "Connect" button near the bottom of the screen. The software will establish communications with the module, and the screen will indicate a successful connection by displaying "Comm Port Open" in the status box at the bottom of the screen as shown below. If communications are not established successfully, the comm port number at the top of the window may be incorrect, try changing the comm port number and clicking the connect button.

No data will appear in the "Current Settings" portion of the screen. You may see the program default data in the "Default Settings" portion if this is not the initial setup of the board. You are now ready to retrieve any existing settings from the module.

13.4 Retrieve the Existing TCP/IP Module Settings

The system will retrieve the existing TCP/IP settings, if any, and display the Mac Address of the module.

THE NEXT STEP MUST BE FOLLOWED CAREFULLY!

　　　1. While still connected to the module, toggle the program switch on the module to "RUN" then back to "PROGRAM"　(*See Page 52, Figure 35*).

FIGURE 35: Toggle the Program Switch
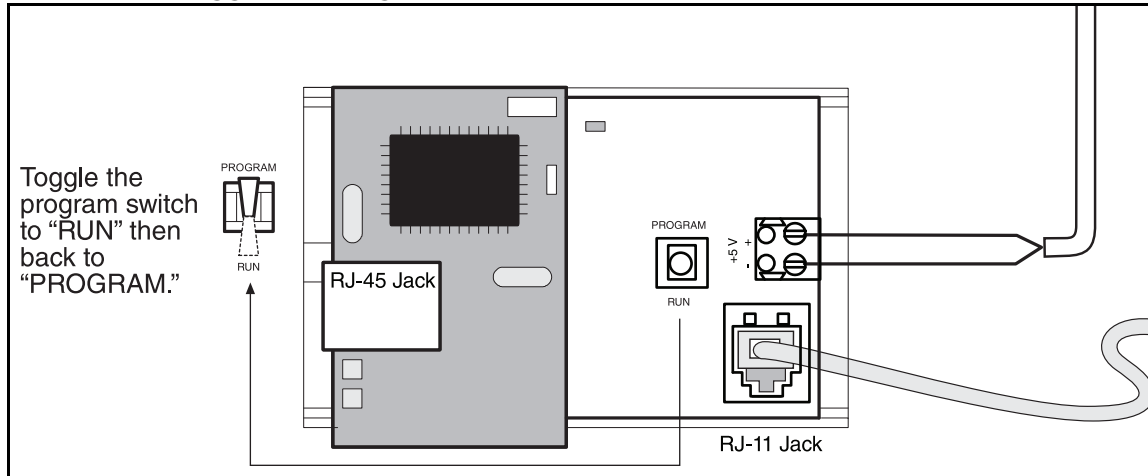
The system will retrieve the existing TCP/IP settings, if any, and display the Mac Address of the module. A pop-up message box when the retrieval is complete.
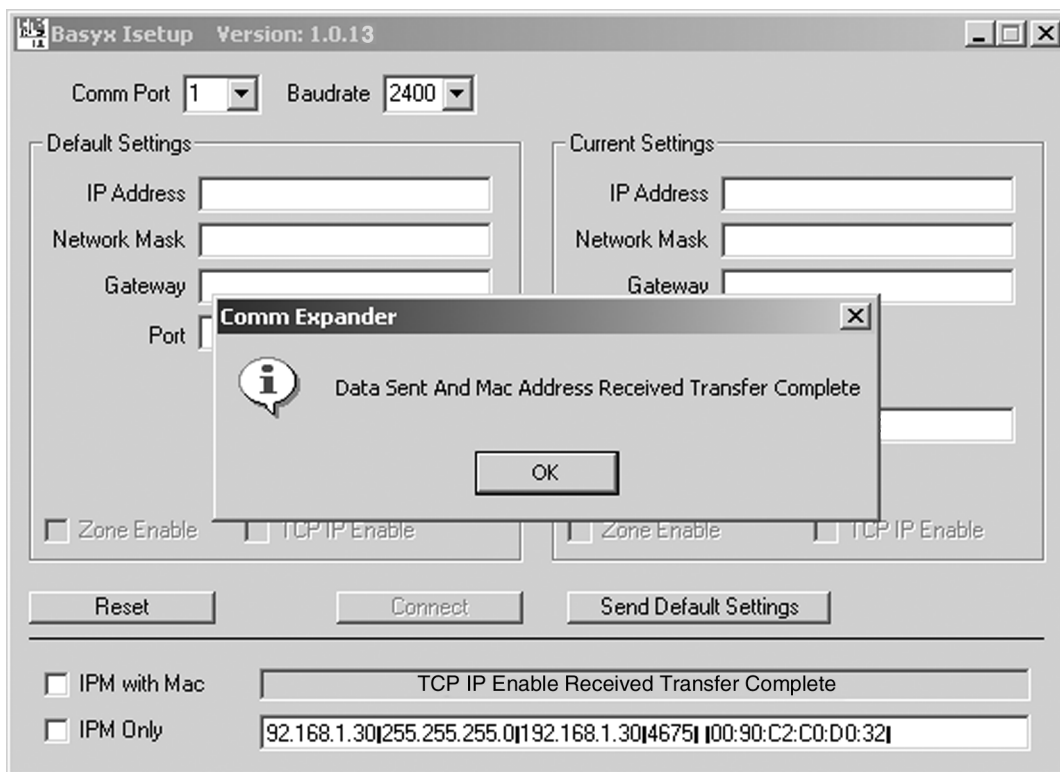
Click on "OK" to acknowledge and close the message box.

The system will now display the retrieved settings in the "Current Settings" portion of the screen.

13.5 Enter the New TCP/IP Communication Module Settings

If your network requires it, the Mac Address for the module will be displayed at the bottom of the "Current Settings" portion of the screen. Provide your system administrator with this address for completion of the network setup.

For TCP/IP connection, you must change the TCP/IP address to match the static TCP/IP address which is **provided by your system or network administrator.**

To change the settings, place the cursor in the IP Address bar in the "Default Settings" portion of the screen.

Enter the proper information as required for your network connection (using the TAB key to move between entries):

- IP Address   This must be a **static IP address** through your network.
- Network Mask   See your network administrator.
- Gateway   See your network administrator.
- Port   This is a software port and is typically 4675 (as shown). See your network administrator if you question this port address.
- Zone   Set to "1".
- Port baud   Set to 19200.
- TCP IP enable   Check this box. No checks should appear in any other boxes (Zone enable, IPM with Mac, IPM only).

Enter your network administrator's settings into the fields in the "Default Settings" panel. The system screen should typically appear as follows at this point: (numbers in the fields on the "Current Settings" and "Default Settings" may vary depending on the settings entered from your network administrator).

13.6 Download the New Module Settings

Verify that the entered information is correct and click on the "Send Default Settings" button at the bottom of the screen to download the new settings to the module. Once the download is completed, the screen will again display the pop-up message box with "Data Sent And Mac Address Received Transfer Complete".
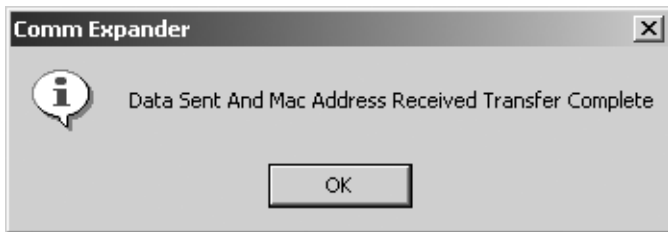
Click on "OK" to acknowledge and close the message box, and notice the status box at the bottom of the screen also indicates that the transfer is complete. The system will now display the new settings in the "Current Settings" portion of the screen as shown: (numbers in the fields on the "Current Settings" and "Default Settings" of the screen may vary depending on the settings entered from your network administrator).
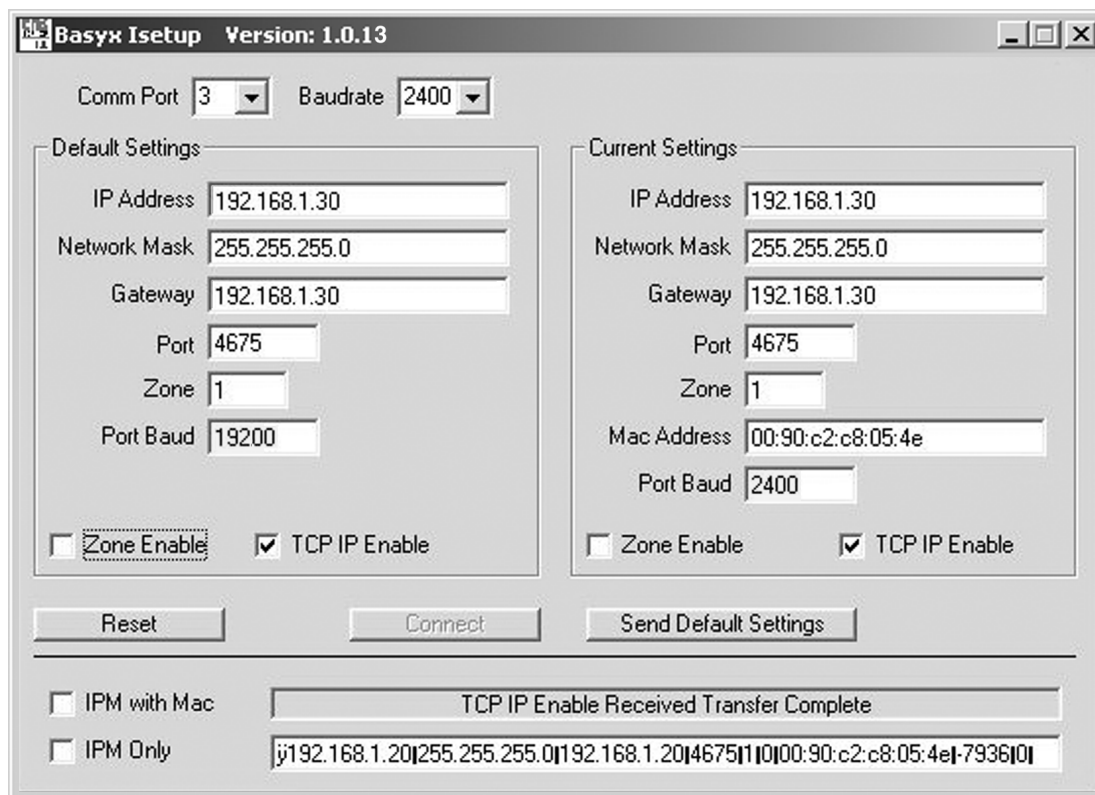
This completes the software setup of the TCP/IP Communication Module.

13.7 Completing the Installation

1. Verify that the current settings are correct and that the LED on the IPM is flashing.

2. Connect the module to the central control board (address #1). The connection is made with a standard 4 conductor telephone cord (included with the module). The telephone cord is plugged into the RJ11 port on the module, and connects to the control board's RJ11 connector marked "DIRECT RS232".

3. Place the program switch in the RUN mode and close the Isetup program on your PC. *See Page 52, Figure 35*.

4. Connect ethernet cable into RJ45 jack on the module.

5. Run/CPU light should flash slow.

6. Return to *Page 6, Section 2.3 Software "Connect" Window*.

FIGURE 36: Communication Port Connections

⚠ **CAUTION**

Do not plug the telephone cord into the RJ11 port on the control board marked "PHONE".

This port is reserved for the system modem.

Serious damage may occur to the on-board modem or module if connected to the PHONE port.

DIRECT
Central Control Board
(Address #1) Only

Standard 4 conductor telephone cord (included)

To Network Router

RJ-45 Jack

Ethernet Cable

PROGRAM

+5 V

RUN

(Power Wire Not Shown)

SECTION 14: BACNET® CONTROLLER PROGRAMMING

Each BACnet® Controller is custom programmed before it is shipped. The custom pro-gram allows the controller to interface with all of the ULTRAVAC™ controllers installed at the jobsite. The total number of ULTRAVAC™ controllers (including the central controller and all satellite controllers, but not including the BACnet® Controller), the job name and location are submitted to Roberts-Gordon LLC upon placing the order for the BACnet® Controller. This information should be submitted on the BACnet® Controller order form. *See Page 58, Figure 37* for order form.

FIGURE 37: BACnet® Order Form

ROBERTS GORDON®

Please complete this form and submit with your order for the ROBERTS GORDON® ULTRAVAC™ BACnet® Control (P/N URVBNC).

RG Rep Name: _____   **Rep PO #:** _____

Job Name: _____

Job Location: _____

Total Number of ULTRAVAC™ Controllers: _____
(Not including BACnet® Control)

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Installation Code and Annual Inspections:
All installation and service of ROBERTS GORDON® equipment must be performed by a contractor qualified in the installation and service of equipment sold and supplied by Roberts-Gordon LLC and conform to all requirements set forth in the ROBERTS GORDON® manuals and all applicable governmental authorities pertaining to the installation, service and operation of the equipment. To help facilitate optimum performance and safety, Roberts-Gordon LLC recommends that a qualified contractor conduct, at a minimum, annual inspections of your ROBERTS GORDON® equipment and perform service where necessary, using only replacement parts sold and supplied by Roberts-Gordon LLC.
Further Information: Applications, engineering and detailed guidance on systems design, installation and equipment performance is available through ROBERTS GORDON® representatives. Please contact us for any further information you may require, including the Installation, Operation and Service Manual.
These products are not for residential use.

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ROBERTS GORDON®

Please complete this form and submit with your order for the ROBERTS GORDON® ULTRAVAC™ BACnet® Control (P/N URVBNC).

RG Rep Name: _____   **Rep PO #:** _____

Job Name: _____

Job Location: _____

Total Number of ULTRAVAC™ Controllers: _____
(Not including BACnet® Control)

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Further Information: Applications, engineering and detailed guidance on systems design, installation and equipment performance is available through ROBERTS GORDON® representatives. Please contact us for any further information you may require, including the Installation, Operation and Service Manual.
These products are not for residential use.

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Each BACnet® controller is supplied with a printed report called a Points List. The Points List lists all of the programmed data addresses. The information from the Points List must be communicated to the controls manager for use in configuring the third party building controls software. This documentation is intended for the contractor to leave with the controls manager or end user upon commissioning of the ULTRAVAC™ system. Refer to the BACnet® Controller User Manual for onsite programming instructions.

14.1 PC Requirements

The PC used for programming must have:

1. Hardware

Ethernet network - a TCP/IP enabled PC with a network card is required. The network card must support 10Mbit/s Ethernet.

2. Software

Programming must run one of the following operating systems:
DOS, Windows 95 (SR2 upwards), Windows 98, 2000, NT, XP

14.2 Communication Method

The PC can be connected to the BACnet® Controller by:

Ethernet Port

The Ethernet port can be used for configuration and troubleshooting, as well as for Protocols that require an Ethernet connection. Use standard Ethernet cables fo this connection.

14.3 Installation and Setup

1. Re-address existing boards.

    a. Since the BACnet® Controller takes address 1, all the existing boards must be re-addressed. Start re-addressing the existing boards beginning with address 2. Address 1 becomes address 2, address 2 becomes address 3, address 3 becomes address 4, etc.

    b. Set Media Access Control address (dip switch).

    c. Plug Ethernet cable to the BACnet® Controller.

    d. Turn on a BACnet® Controller.

2. Connect to the FieldServer.

    a. Turn on a PC and connection to the FieldServer Using RUI (Ruinet) software.

    b. Select Start|Programs|FieldServer Utilities, use arrow keys alone or in conjunction with control key to change to other tiers. *See Page 60, Figure 38*.

FIGURE 38: Field Server Information
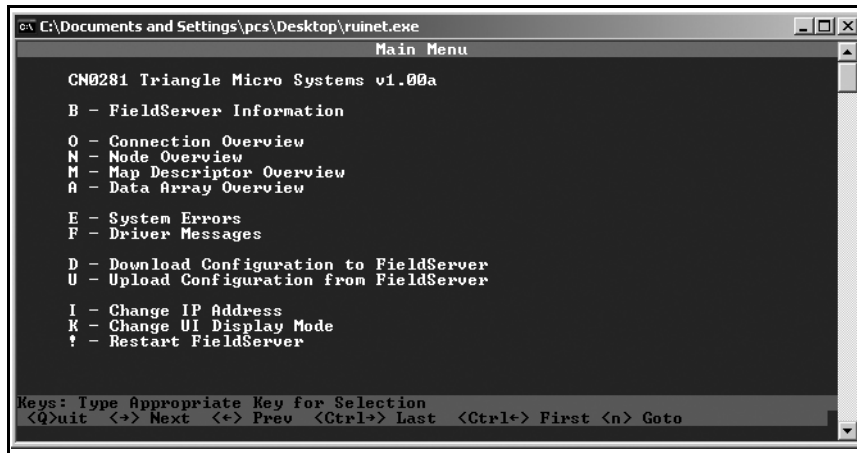
3. Change IP address.

    a. From the main menu, press "1" to enter the edit IP Address settings menu. *See Page 60, Figure 39*.

FIGURE 39: Change IP Address
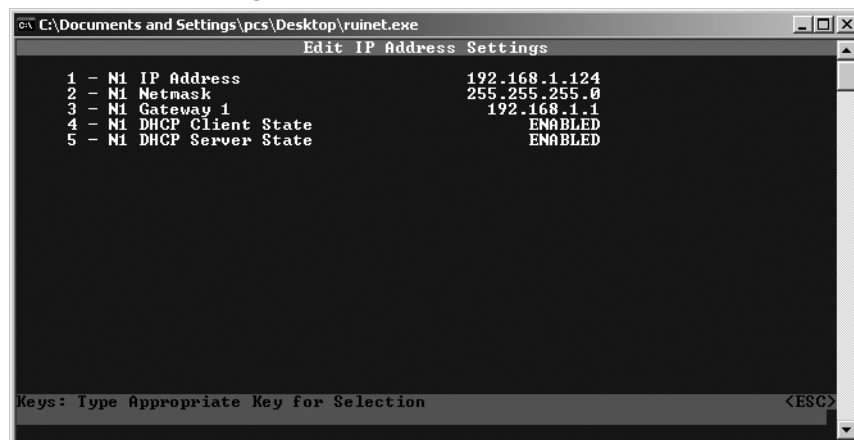
    b. Press "1" to modify the IP address of the N1.

    c. Type in a new IP address such as 192.168.0.35 and press <Enter>. If necessary, press "2" or "3" and change the Netmask or Gateway 1.

    d. Restart the FieldServer. Ruinet will display the main interactive menu again after FieldServer has restarted.

SECTION 15: TROUBLESHOOTING

15.1 Unable to Connect

Check continuity of the communication wire. Check for proper twisting and/or grounding of shield wires. See the ROBERTS GORDON® ULTRAVAC™ Installation, Operation and Service Manual (P/N 10081601NA) external wiring diagrams for details.

If connecting via modem, *See Page 3, Section 2.1.1* and *See Page 7, Section 2.3.3*. Verify that phone line is operational and connected to the central controller. See the ROBERTS GORDON® ULTRAVAC™ Installation, Operation and Service Manual (P/N 10081601NA) external wiring diagrams for details. Verify that the modem chip is installed on the central controller. See the ROBERTS GORDON® ULTRAVAC™ Installation, Operation and Service Manual (P/N 10081601NA) communications section.

If connecting via RS-485 converter, *See Page 3, Section 2.1.2* and *See Page 7, Section 2.3.2*. Verify that the RS-485 converter is plugged in. Verify the RS-485/PC connection wiring in the ROBERTS GORDON® ULTRAVAC™ Installation, Operation and Service Manual (P/N 10081601NA). If connecting via direct connect, *See Page 4, Section 2.1.3* and *See Page 7, Section 2.3.2*. Verify a secure connection between 9 pin connector and PC; 7' cable and 9 pin connector; 7' cable and controller.

15.2 Sensor Temperatures

Zone temperature or outdoor temperature reads "ON" or reads a very high temperature on the status screen. Check the analog input for the sensor temperature input (analog inputs 1-3 for zone sensors, analog input 8 for outdoor sensor). Reverse the wires at the input that has the incorrect reading. On the sensor setup screen, verify "type" is set to "thermistor". *See Page 18, Section 3.8*.

15.3 Zone Status On/Off

Zone 3 status displays "ON", even though there are only 1 or 2 zones installed: Close all windows in the software and access the manual on/off screen, (Alt + M). Click the "OFF" button for any unused zones. All other zones and vacuum pump must be set to "Auto".

15.4 Graphics Distorted

Verify that the file is in **Windows**® Metafile (.wmf) format, *See Page 24, Section 5*. ROBERTS GORDON® ULTRAVAC™ Software accepts "Windows®" Metafiles better than generic metafiles (.wmf). Generally, AutoCAD® can export **generic** metafiles that can be imported into a vector graphics drawing program such as Adobe® Illustrator® or Macromedia® Freehand®, then re-exported as a **Windows**® Metafile.

15.5 Temperature Alarms Reset

If an alarm condition occurs and the "Alarm Reset" button is clicked, then the alarm activates again. The alarm condition must first be eliminated before an alarm reset will work. *See Page 31, Section 6.1*.

15.6 Setting Changes Not Saved

If settings have been changed on any screen and have not been saved, the next time the screen is accessed: verify that the "Edit" button is clicked first; edit the settings; then click "Send to Controller"; then wait for the red "Updating" button to change to a green "Exit" button twice before clicking on the "Exit" button.

15.7 Current Conditions Are Not Updating

While viewing the board status screen or the graphics view screen, the incoming data from the controller can be seen updating in the lower left portion of the screen, next to "Status: ONLINE." If data is not updating, go to the "Board Status" screen and check mark the "Auto-Update" box. If the box is checked and the data is still not updating, close the software and re-connect and/or press the reset button on the control board. See the ROBERTS GORDON® ULTRAVAC™ Installation, Operation and Service Manual (P/N 10081601NA) for reset button details.

15.8 BACnet® Controller

If the BACnet® controller does not connect to a field server, see the Utility User Manual Ruinet Appendix A, troubleshooting section.

15.9 Burner or Pump Operation

See the ROBERTS GORDON® ULTRAVAC™ Installation, Operation and Service Manual (P/N 10081601NA) troubleshooting section.

SECTION 16: THE ROBERTS GORDON® ULTRAVAC™ LICENSE AGREEMENT

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Use of the Software is subject to the terms of this End User License Agreement. By selecting YES and installing the Software, you accept and are bound by all the terms and conditions of the Agreement. If you do not agree with any term, condition or restriction as set forth by the Agreement, select NO, exit setup and return the Software to Roberts- Gordon LLC.

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2.   Software demonstrations are provided for the sole use of prospective purchasers. Installation of software is allowed for demonstration of the system and product information purposes only. The Software is intended solely to support the sale of ROBERTS GORDON® products and equipment. It is not intended for your personal use nor are you authorized to use same in such a manner as would be injurious to Roberts-Gordon's interests.

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