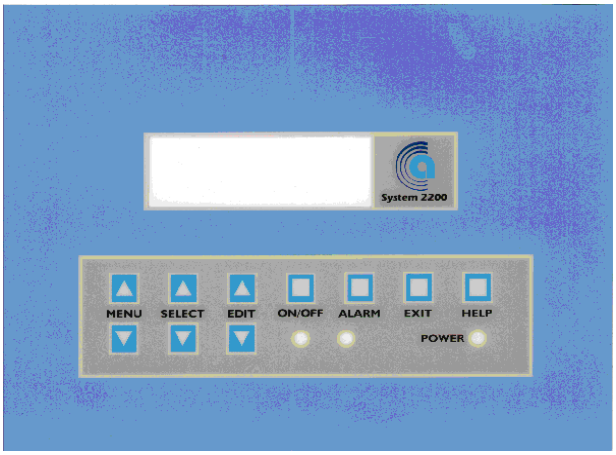

Compu-Aire
System 2200 xs
Programmable Controller

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ABOUT SYSTEM 2200xs

The ***System 2200 xs*** is a new programmable controller designed specifically to provide the functions of the System 2200 controllers for single circuit air conditioning systems. The ***System 2200 xs*** controller is made up of 16-bit 24Mhz microprocessor and up to 2 Mbyte flash memory to ensure the high performance in terms of processing speed and memory space. The control software and parameters are permanently (even in case of power failure) stored in the Flash memory. The ***System 2200 xs*** controller is equipped with a set of terminals used to connect the board to the controlled devices (ie: valves, compressors, fans).. The ***System 2200 xs*** can be linked to a supervisory/telemaintenance system via serial line through the RS485 communication protocol.

System 2200 xs also includes a microprocessor-based user terminal complete with display, keypad and led indicators allowing you to easily set the main control parameters (set-points, bands, alarm thresholds) and carry out the main working operations (on/off, displaying controlled variables, printouts). (for ***System 2200 xs*** without built in display)

The basic sequence of operation is:
· start the fan on demand for cooling, heating, humidifying or dehumidifying or operate continuously
· start the compressor on with programmed delays, to meet demand for cooling
· sequence the heaters on in stages with programmed delays, to meet demand for heating
· activate the humidifier as needed when the humidity falls below the set point
· activate dehumidification by means of cooling to reduce the humidity level when it rises above the set point. If the temperature falls below the temperature set point, heating is brought on at the same time to maintain temperature.
· monitor the sensors, compressor and heaters for failure. On a sensor failure, the applicable systems are disabled. On a compressor failure by low or high pressure, the compressor is locked out. On a heater failure the heaters are locked out, but automatically reset.

In addition to the basic sequence of operation, optional features are available:
· a discharge air temperature sensor to prevent overheating or cooling of the air stream
· an outside air temperature sensor for automatic temperature adjustment or economizer action
· a freecooling temperature sensor for water cooled systems
· hot gas bypass either by solenoid or by modulating electronic valve
· redundant system operation of two or more units with automatic crossover and compensation
· networking to a central command computer, or to an existing building automation system

The ***System 2200 xs*** is truly one of the most powerful and flexible controllers available on HVAC units today.

Front panel view of *System 2200 xs* controller with remote Display/Keypad:

The ***System 2200 xs*** consists of a microprocessor controller located in the electrical panel of the Compu-aire unit, and the front panel mounted keypad/display microprocessor unit shown at left. In this manual, "controller" means the microprocessor board, "keypad" or "display" refers to the panel mounted unit shown at left.

The keypad/display provides a backlit, supertwist LCD screen having 4 rows of 20 characters. There are also three LEDs to indicate Power, On/Off status, and Alarms (red).

To enter set points and other parameters, the ***System 2200*** has 10 buttons arranged on a touchpad. Six of the buttons are arranged in pairs to permit easy access to the menus or specifric items.

In this manual, individual displays will be referred to as "screens", areas on each screen where you may change values will be referred to as "fields".

Functions of the buttons in COMPU-AIRE standard application programs:

The first set of buttons, labeled MENU, control access to the screens. Pressing the down button takes you to the next screen in the loop. Pressing the up button takes you to the previous screen in the loop. On reaching the last screen in the loop, you will roll over to the beginning of the loop again.

The next set of buttons to the right, labeled SELECT, control access to each line or item of a screen. Pressing the down button takes you to the next line or field in the currently displayed screen. Pressing the up button takes you to the previous line or field in the currently displayed screen. On reaching the last field in the screen, you will roll over to the first field again.

The next set of buttons to the right, labeled EDIT allow you to modify the value of a field on the currently displayed screen. Press the up button to increase the value or to toggle it if it is an on/off type. Press the down button to decrease the value or to toggle it if it is an on/off type. To lock in a value, press any button EXCEPT the EXIT button. Pressing the EXIT button returns the value of the field to the starting point, and takes you to the opening screen in the program.

The ON/OFF button controls unit operation. Pressing this button toggle the unit operation on or off. The LED immediately below the button is lit only when the unit is on.

The ALARM button is used to silence the alarm horn and view the alarm screens. When an alarm sounds, the LED directly under the ALARM button will glow red, and an audible horn will sound. The first press of the ALARM button silences the alarm. Each press of the ALARM button then brings up each alarm screen in turn. To reset the microprocessor from any alarm message, resolve the cause of alarm, reset the safety switch for manual reset alarms and press ALARM button followed by EXIT button for each alarm message on the screen.

The EXIT button is used to exit from a loop of screens and return to the main display screen of the program. Pressing this button also reverses any change to the current field you are in.

The HELP button takes you to helpful screens that instruct you on how to operate this program or on any special features.

The POWER LED will glow amber whenever there is power to the keypad/display unit. This does not necessarily indicate power to the unit or the controller board.

All Compu-Aire programs are arranged in a "tree" format, using loops of screens and menus to access all parts of the program.

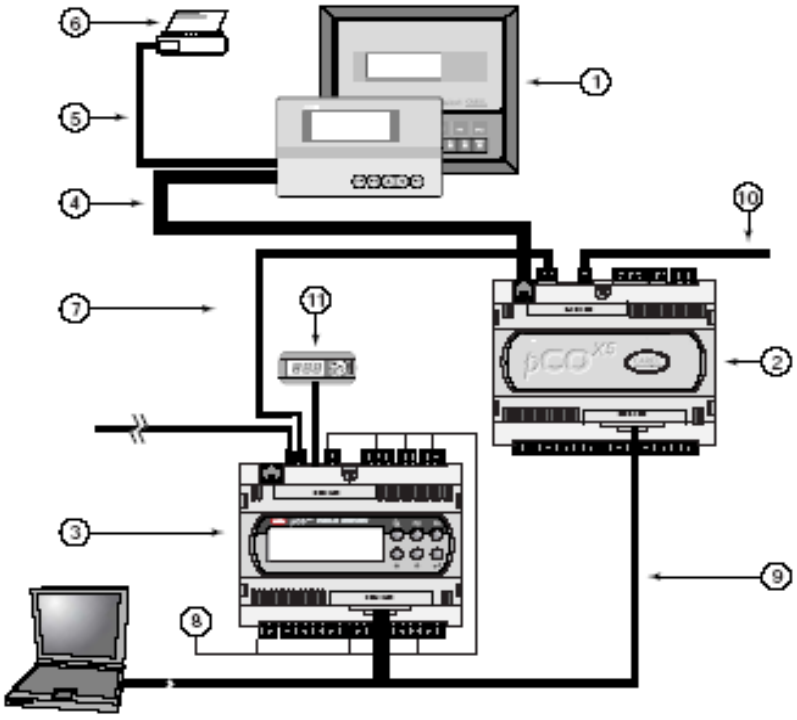
Built-In Display:

Some System 2200 xs controllers are provided with Built-In Dislpay. It provides the same programming features like remote display but uses the different keypad.

Press Prg key to enter in programming mode. Prg key will provide access to the Programming Level screens including System

On/Off. The Enter key functions like Select key and provide you access to different lines on the same screen. The up and down aero keys functions like Menu up and down. The Bell key is the Alarm key and Esc key is similar to Exit button on standard keypad display.

How to turn on unit: Press Prg key and go to the Set points menu. Press Enter and go to SYSTEM, press aero Up or Down to change the SYSTEM to ON position. Unit will be turned on after the set time delay. Change the SYSTEM to OFF position to turn the unit off.



One possible set of hardware is as follows:
1. user terminal with keypad, display and signal LEDs;
2. System 2200xs Controller (pCO xs);
3. pCOxs LCD built-in;
4. connection cable between the terminal and pCOxs;
5. connection cable between the terminal and serial printer (supplied by others);
6. serial printer (supplied by others);
7. AWG20/22 cable for pLAN connection between a series of pCOxs boards;
8. connection terminal kit;

9. connection to supervisor systems.
10. tLAN or MP-Bus network connection;
11. PST terminal.

OPERATING THE *SYSTEM 2200 xs*

Whenever power is first turned on to the ***System 2200***, the version screen is the first displayed:

```
   U00  COMPU-AIRE
  SYSTEM 2200X CONTROL
   DISPLAY=BUILT-IN
V5.xx   DATE:00/00/00
```

This screen shows the version number of the software, type of Display Built-In or Remote and the date the software was created. This is the first screen in the first loop of screens.

Pressing MENU down (aero down for Built-In) will take you to the next screen in the loop which is the main screen. This is where the EXIT(Esc) button will always take you as well.

```
U00  ROOM/RETURN AIR
TEMPERATURE: 000.0¯F
HUMIDITY   : 000.0%
   SYSTEM STATUS
```

This screen displays the current temperature and humidity. The bottom line shows the mode of operation; System Off, Active system or Stand by system.

The following screens will be in the main display loop if the sensors that they display are activated at the factory.

```
U00 OPTIONAL SENSORS
DISCHARGE  : 000.0¯F
COIL TEMP  : 000.0¯F
```

```
U00 OPTIONAL SENSORS
OUTSIDE TMP: 000.0¯F
OUTSIDE HUM: 000.0
```

```
U00 OPTIONAL SENSORS
WATER IN :   000.0
WATER OUT:   000.0
```

Pressing the ON/OFF button toggles the mode status and turns the unit on or off. Or follow the How To Turn On Unit for Built-In display.

VIEWING SYSTEM STATUS

In the main screen loop, there are the following two screens. A quick way to get here is to press EXIT and then MENU down until these screens display.

```
U00 SYSTEMS STATUS

FAN: ON                 Indicate the status of supply fan
DEHUM Demand: 100%      Indicate the % of Dehumidification demand.
```

```
U00 SYSTEMS STATUS
Cooling:1     100%      Shows how many stages of cooling are on if any.
Heating stages:1 2      Shows how many stages of heating are on if any.
```

```
U00  7/01/06 10:10      Shows actual day,date and time per the internal clock.
Mode: MON UNOCC         Shows clock mode.
Override mode> OFF      Toggling this field to ON overrides any night setback.
Override time>060min    Enter override time in minutes.
```

SYSTEM CONTROL MENUS

In the main screen loop, as you continue to press MENU down, you will arrive at three menus giving you a variety of choices. To select any choice, press SELECT up or down. When the cursor is at the end of the line showing the area you want, press EDIT up or down and you will then move to that area in the program.

```
U00 SETPOINTS.....>     Goes to setpoint screens, and alarm setpoint screens.
TIME CLOCK SETUP..>     Goes to time clock setup, night/day setback control.
PRINTER SETUP.....>     Goes to printer setup, if your System 2200 has this.
EQUIP RUN HOURS...>     Goes to screens showing equipment run time hours.
```

The SYSTEM SETUP menu provides access to different modes of operations. Select default AUTO mode for normal operation of the unit. Manual On/Off control can be selected to test different modes of operation.

The CONTROL SETUP menu provides access to select the type of controls. The demand will be calculated based on Proportional (P) or Proportional plus Integral (P+I) type of controlling method.

The SENSOR CALIBRATION menu provides access to calibrate sensors. Find out the difference of actual values vs unit reading and enter the difference to calibrate the sensor. Enter the difference by pressing EDIT UP if the unit sensor is reading lower value than the calibrated meter reading. Enter the difference with negative (-) value by pressing EDIT DOWN if the unit reading is higher than the calibrated sensor.

```
U00 SYSTEMS SETUP.>
CONTROL SETUP.....>
SENSOR CALIBRATION>
ALARM HISTORY.....>
```

Goes to Auto or Manual On Off control of modes.
Goes to type of control P or P+I with time.
Goes to sensor calibration screens.
Goes to screens showing the history of the alarms.

The ALARM RELAY is programmed for remote alarm feature if used. Selecting on or off mode under column R2 enables or disables that alarm for remote monitoring systems. Selecting on or off under column SW enables or disables the switch over feature in case of respective alarm condition.

```
U00
ALARM RELAY.......>
SUPERVISOR SETUP..>
FACTORY SETUP.....>
```

To program alarm relay 2.
To program communication parameters
To program unit configurations and parameters at the factory. (Level 3 setup, password protected)

PASSWORDS

Many areas of the program are protected by password. There are three levels of password. Level 1 is for the operator who needs to change setpoints. Level 2 is for maintenance personnel who need access to other areas. Level 3 is reserved for factory personnel and controls all configuration setups. Contact Factory to set up these user level passwords.

When you try to enter an area protected by password, you see the following screen:

```
U00
  ENTER
  PASSWORD> 0000
PRESS MENU DOWN
```

Use the EDIT up and down buttons to enter the proper password. The wrong password will show the response at left. The proper password takes you to the screens you wants.

ENTERING CONTROL SETPOINTS

From the first menu, select CONTROL SETPOINTS and press the EDIT up or down button. You will then see these screens in order:

```
U00  ROOM SETPOINTS
Temperature >068.0 F
Humidity    >045.0 %
```

These are the system control setpoints.

```
U00 DISCHARGE LIMIT
    High >120.0 F
    Low  >045.0 F
    Band >005.0 F
```

These are the discharge temperature limit setpoints. These are only used when there is a discharge air temperature sensor installed in the unit. These setpoints prevent overheating or cooling of the air.

```
U00   COIL SETPOINTS
 Freeze protection
Setpoint    >034.0 F
Band        >001.0 F
```

If your system has a coil temperature sensor, you may enter the freeze protection setpoints in this screen.

```
U00  ECONOMIZER
  Water temperature
Setpoint    >050.0 F
Hysteresis  >005.0 F
```

If your system has free cooling option Energymizer units), enter those setpoints to enable free cooling at these parameters.

```
U00  ECONOMIZER
 DISCHARGE TEMP
SETPOINT    >000.0¯F
HYSTERESIS  >000.0¯F
```

```
U00 OA SETPOINTS
  AIR ECONOMIZER
Setpoint    >055.0 F
Hysteresis  >004.0 F
```

If your system is operating with economizer control, enter the economizer setpoints and hysteresis here.

```
U00   ROOM ALARMS
      TEMP    HUM
HIGH> 000.0 F 000.0%
LOW > 000.0 F 000.0%
```

In this screen enter the room temperature and humidity alarm setpoints. If room temperature goes above or below either setpoint, an alarm sounds for indication. (This alarm will not shut the unit down)

SETTING THE REAL TIME CLOCK

From the first menu, select TIME CLOCK SETUP and press the EDIT up or down button. If your ***System 2200 xs*** has a real time clock board installed, you may enter night/day setback modes, and the alarms will also be date/time stamped as to when they occur.

```
U00 REAL TIME CLOCK

SET> 00:00  00/00/00
```

The first screen in the loop allows you to set the real time clock, which is battery backed for 10 years.

```
U00
  ENABLE NIGHT
  SETBACK>OFF
NIGHT MIN ON >000S
```

Set to ON if you wish to use night setback mode. Enter the minimum on time for night setback mode.

If OFF, the system will run continuously.

```
U00 NIGHT SETBACK
TEMP>OFF     HUM>OFF
HIGH>000.0¯F >000.0%
LOW >000.0¯F >000.0%
```

Set to ON if you wish night setback to operate
Enter the high and low activation points. When
the room is within these setpoints, the unit is off.

NOTE: always set your alarm setpoints wider than your night setback setpoints or you will have alarms to deal with every morning.

```
U00 SETBACK  MON>NO
TUE>NO       WED>NO
THU>NO       FRI>NO
SAT>YES      SUN>YES
```

In this screen you select the days of the week when night setback is to be in effect. Any day with NO selected will run continuously for the full 24 hours until the next night setback selected day.

```
U00 OCC    MON>01:30
TUE>13:00  WED>00:00
THU>00:00  FRI>00:00
SAT>00:00  SUN>00:00
```

Enter occupied mode start times for each day of the week (international time). Example, mode starts on Monday at 1:30 a.m. On Tuesday it starts at 1:00 p.m. and on Wednsday through Sunday it starts at midnight.

```
U00 UNOCC  MON>14:00
TUE>00:00  WED>00:00
THU>00:00  FRI>00:00
SAT>00:00  SUN>00:00
```

Enter the unoccupied mode start times.

Example: Monday occupied mode starts at 1:30 a.m. and the unoccupied mode starts at 2:00 p.m.

CONTROLLING THE PRINTER

If your ***System 2200*** xs has the optional RS232 printer serial port, you may connect a standard serial printer to this port for data printouts. The printer must be configured for 1200 Baud, 8 bits, No parity, 2 stop bits. See the technical manual for more detail.

From the menus, select PRINTER SETUP and press the EDIT up or down button. You will then see the following screen:

```
 U00 PRINTER   >OFF
PRINT CYCLE   >00MIN
MANUAL PRINT  >OFF
PRINT ON ALARM>OFF
```

Set to ON to activate timed cycle printing.
Enter the minutes between each printout.
Set to ON for force one manual printout.
Set to ON if you want the printer to print all data every time there is an alarm.

MONITORING EQUIPMENT RUN HOURS

From the menus, select EQUIP RUN HOURS and press the EDIT up or down button. You will then see the following screen:

```
U00 FAN      > 00000
RUN HUMIDIFY > 00000
HRS
```

In these screens are displayed the actual run hours for each item in the system.

```
U00 COMP 1    > 00000
RUN COMP 2    > 00000
HRS
```

```
U00 HEAT 1    > 00000
RUN HEAT 2    > 00000
HRS
```

ENABLING SYSTEMS & MANUAL CONTROL

From the menus, select SYSTEMS SETUP and press the EDIT up or down button. You will then see the following screens:

```
 U00 MANUAL CONTROL
1 FAN > AUTO 00 MIN
2 COMP> AUTO 00 MIN
3 HEAT1> AUTO 00 MIN
```

In these screens you may set any component of the ***System 2200 xs*** to manual ON or OFF or AUTO modes. When set to ON, the component runs continuously. OFF means the component is off permanently. AUTO allows the component to run as needed automatically.

```
   MANUAL CONTROL
4 BYPASS> AUTO 00 MIN
5 HUMID> AUTO 00 MIN
```

WARNING: It is not wise to leave any component in the ON mode for longer than a manual test.
If a modulating humidifier is present, you may enter a value for its output to force a manual test.

```
U00 ANALOG OUTPUTS
A1: OFF       >000%
A2: OFF       >000%
```

If an analog output is select in configuration, then manual control of the device will appear. Enter the % output desired for manual testing.

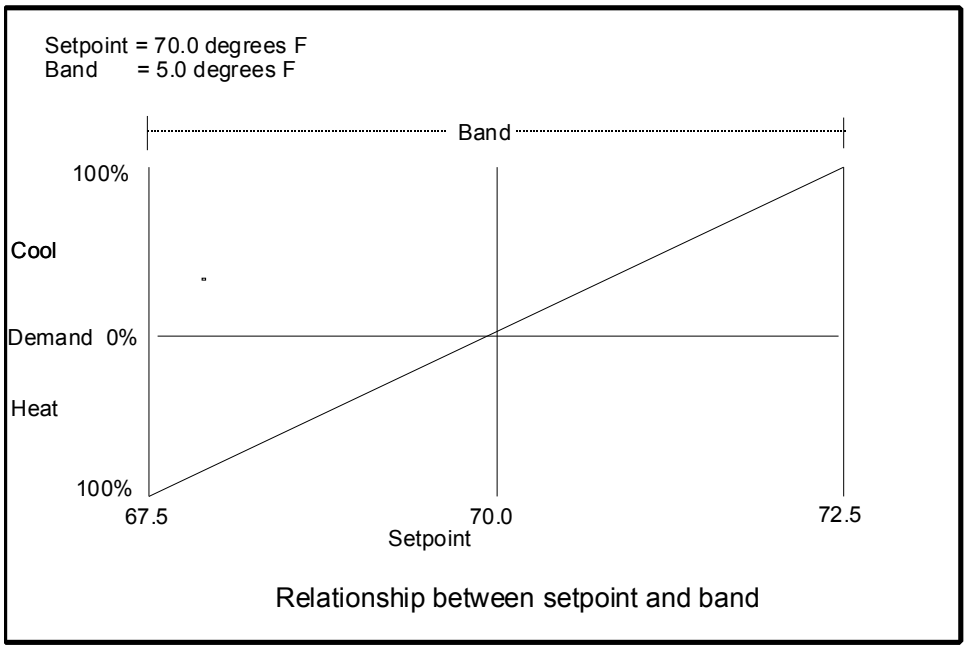
SETTING CONTROL BANDS & TYPE OF CONTROL

From the menus, select CONTROL SETUP and press the EDIT up or down button. You will then see the following screens:

```
U00 ROOM  CONTROL
     TYPE INT BAND
TEMP>P    000 00.0 F
HUM >P    000 00.0%
```

Enter control type. When P+I is chosen, you are also asked for the integration time in seconds. Enter the bandwidths for control. The band is split in half so that for example, at 70F, with a band of 5,control is within the range of 67.5 and 72.5. The humidity band

should always be twice the band set for temperature. Controller calculates the demand based on P or P+I controlling method.



Relationship between setpoint and band

CALIBRATING SENSORS

From the menus, select SENSOR CALIBRATION and press the EDIT up or down button. You will then see the following screens:

```
U00    SENSOR CAL
ROOM TEMP > 000.0 F
ROOM HUMID> 000.0 %
DISCH TEMP>-002.0 F
```

These screens allow you to enter an offset to any sensor reading, allowing you to calibrate the sensors from the controller.
For example, the discharge air temperature sensor has an offset of -2F. If the incoming reading is 60, it will display and control as 58.

```
U00  SENSOR CAL

OA TEMPERA> 000.0 F
OA HUMIDIT> 000.0 %
```

```
U00  SENSOR CAL
COIL TEMP > 000.0 F
WATER IN  > 000.0 F
WATER OUT > 000.0 F
```

```
U00      X1> 0.0 Vdc
B7 CAL   X2> 0.0 Vdc
         Y1> 000.0
         Y2> 000.0
```

In the user sensors, calibration is more involved. You must range the sensor by selecting its input voltage range x1 to x2 (0-1Vdc or .2-1Vdc for 4-20mA) and then selecting the display range y1 to y2. Usually the factory will enter these values.

```
U00      X1> 0.0 Vdc
B8 CAL   X2> 0.0 Vdc
         Y1> 000.0
         Y2> 000.0
```

VIEWING THE ALARM HISTORY

From the menus, select ALARM HISTORY and press the EDIT up or down button. You will then see the following screens if the unit has a Time Clock option available.

```
U00 24 HOUR MIN/MAX
       MIN     MAX
TEMP: 000.0°F 000.0
HUM : 000.0%  000.0%
```

This screen displays the minimum and maximum temperature and humidity of the system. The values will be reset to actual room values at 1:01 am everyday, if a clock board is installed.

```
U00  ALARM LIST 00

 DATE: 00/00
 TIME: 00:00
```

The alarm list holds the last 25 alarms. The time and date is recorded each time an alarm sounds. Use the DOWN menu key to display the active alarms. Use the UP/DOWN edit key to view the ten alarms.

```
U00  ALARM LIST 00
 HIGH TEMP
 HIGH HUM
 AIRFLOW LOSS
```

One or more of the following screens will be visiable for each alarm occurances.

```
U00 ALARM LIST 00
 CONDENSATE AL
 SMOKE AL
 FILTER AL
```

```
U00 ALARM LIST 00
 C1 LO PRES
```

```
U00 ALARM LIST 00
 HI-LIMIT HEAT
 WATER LOSS
 SENSOR FAILURE
```

```
U00 ALARM LIST 00
 STAND-BY PUMP ON
 DISCHARGE COOL AL
 DISCHARGE HEAT AL
```

SETTING THE REMOTE ALARM RELAYS

The ***System 2200xs*** has two relays that may be assigned as remote alarm indicators. The first relay is activated on any alarm that also sounds the horn. To control the second alarm relay, from the menus, select REMOTE ALARM RELAY and press the EDIT up or down button. You will then see the following screens:

```
U00 ALARM RELAY 2
TEMP >OFF AIRFL>OFF
HUM  >OFF SMOKE>OFF
COMPS>OFF
```

To activate remote alarm relay #2, set to ON.

```
U00 ALARM RELAY 2
TEMP >OFF AIRFL>OFF
HUM  >OFF SMOKE>OFF
COMPS>OFF
```

Set each alarm to ON which you want to activate alarm relay #2 when this alarm occurs.

SETTING USER PASSWORDS

The ***System 2200xs*** also allows you to enter two levels of passwords to prevent unauthorized tampering with setpoints and parameters. To reach this control screen, contract factory.

```
  CHANGE PASSWORD
  LEVEL 1>0000
  LEVEL 2>0000
```

Enter the various level passwords and don't forget them.

NOTE: Level 3 password is set at the factory and is generally not handed out.

SETTING UP THE SYSTEM FOR A SUPERVISOR COMPUTER OR MODEM

If your ***System 2200xs*** is to be connected to a computer or modem for remote control and supervision, you need to identify each unit on the network by assigning a unit identification number. To reach this control screen, select SUPERVISOR SETUP and press the EDIT up or down button.

```
U00   COMMUNICATIONS
 UNIT IDENT> 001
 BAUD RATE>  19200
 PROTOCOL>   LOCAL
```

Enter this unit's identification number (1-32)

Enter the communications BAUD rate (1200 - 19200)
NOTE: All units on one network must have the same baud rate.

Select the appropriate communication protocol.

FACTORY SETUPS & SYSTEM CONFIGURATION

The following screens are reserved for factory personnel and are only accessible under the Level 3 password. These parameters are set at the factory and no field modification shall be made without consulting technical support at the factory. They are accessed by selecting FACTORY SETUP from menus and pressing EDIT up or down to select.

The following screens tell ***System 2200xs*** which sensors and devices are connected to the system.

```
U00 INSTALLED SENSOR
ROOM TEMPERATURE>ON
ROOM HUMIDITY   >ON
DISCHARGE TEMP  >OFF
```

Activate which sensors are connected to the system. Turning off sensors deactivates their control loops and alarms.

```
U00 INSTALLED SENSOR
DISCHARGE HUM>OFF
```

```
U00 DIGITAL INPUTS
AIRFLOW SWITCH> ON
SMOKE DETECTOR> OFF
HIGH HEAT SWITCH>OFF
```

Enable or disable which digital input devices are connected in your system. Set to ON if the device is present.

```
U00 DIGITAL INPUTS
C1 LOW PRESSURE> ON
C1 HIGH PRESSURE>ON
WATER OVERFLOW> OFF
```

```
AIRFLOW SWITCH
ALARM IF> CLOSED
CURRENTLY> OPEN
ALARM DELAY> 002 SEC
```

Press HELP key from DIGITAL INPUT screen to go to the programming configuration of Digital inputs.

```
COMP 1 LOW PRESS
ALARM IF> CLOSE
CURRENTLY>OPEN
ALARM DELAY> 002 SEC
```

```
COMP 1 HI PRESS
ALARM IF> CLOSE
CURRENTLY>OPEN
ALARM DELAY> 010 SEC
```

```
U00 DIGITAL OUTPUTS
DO 3> HEAT 1
DO 4> BYPASS 1
DO 5> HUMIDIFIER
```

```
U00 Y1> OFF     DIR
Y1>02.0 Y2>10.0 Vdc
    Y2> OFF     DIR
Y1>02.0 Y2>10.0 Vdc
```

ANALOG Output1 can be COOL,HEAT,HUM,ECONO or NONE. The output can be direct or reverse acting and scaled. Output 2 can be "HEAT","COOL","ECON","HUM" or "ALARM 2"

```
U00 START DELAY>030S
FAN OPERATION  >CONT
FAN SPEED > HIGH
MIN ON>030S OFF>030S
```

Enter the system delay on initial startup.
Set fan to AUTO (demand) or Continous operation.
Enter the minimum ON time for the fan.
Enter the minimum OFF time for the fan.

```
U00 DISCHARGE ALARMS
COOL> 00.2¯F >000sec
HEAT> 00.2¯F >000sec
```

```
U00 COOLING> COMPS
```

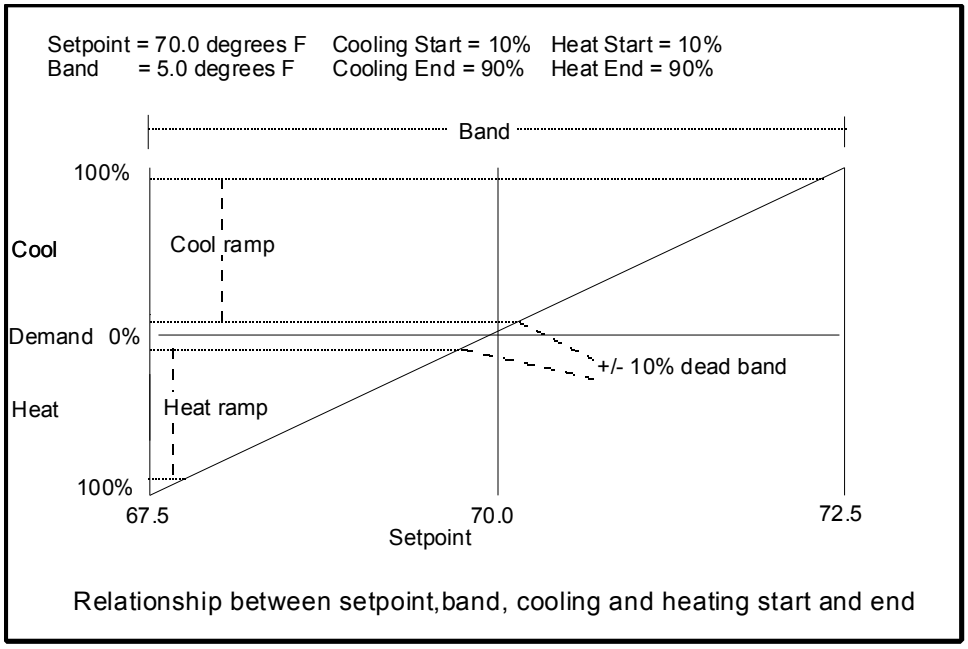
Select whether COM0P or CW/COMP.

```
 LP BYPASS > 003 MIN
```

Enter the Low Pressure switch bypass time if Applicable.

```
U00  COOLING STAGES
COOLING HYSTER  >019
COOLING 1 START >050
COOLING 2 START >100
```

Enter the compressor start points and hysteresis. For example: compressor 1 will start at 19% of the ramp and shut off when the demand drops to 1% of the ramp. System 2200xs is programmed for only 1 stage cooling.



Relationship between setpoint,band, cooling and heating start and end

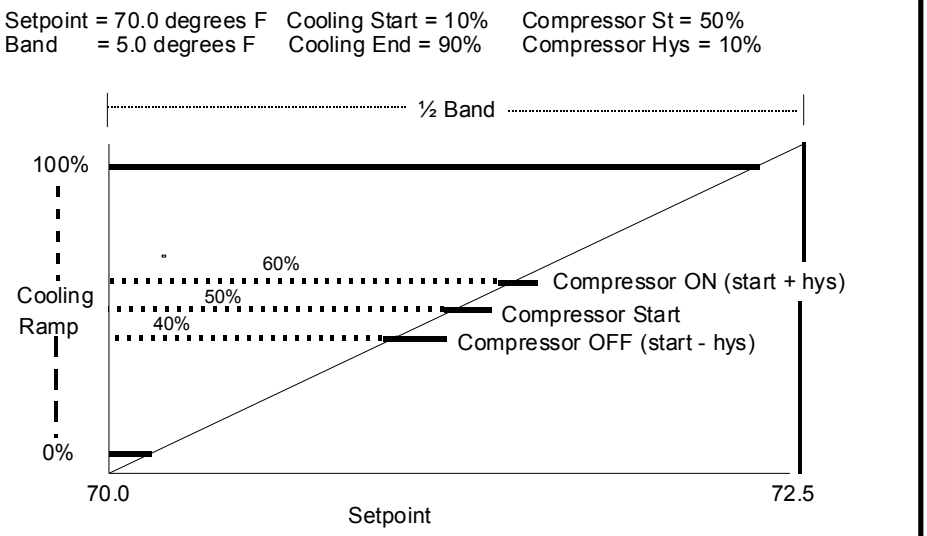
```
U00 COMPRESSOR SETUP
     TBC>
MIN ON>120 OFF>120
ROTATE>000 ECONO>0FF
```

Enter the Minimum ON and OFF time for compressor.

ROTATE is not applicable for System 2200xs.
Select ECONO mode from OFF,CW,EM or AIR Option.

```
U00 LOW PRESSURE
LP RETRYS> 005/HR
```

Select number of retry for low pressure failure to lock the compressor out.



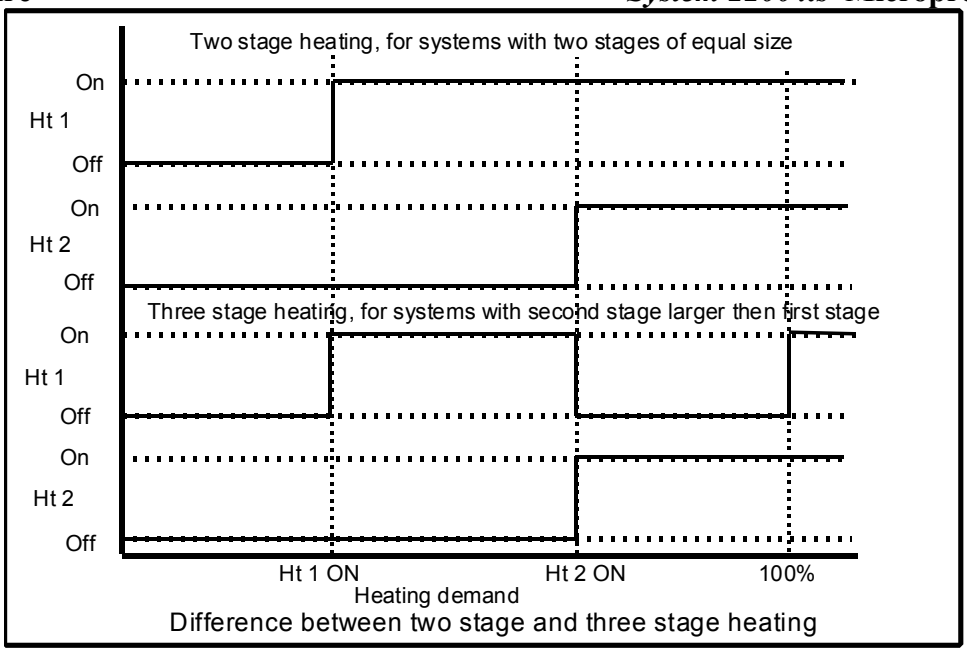
Relationship between cooling ramp and compressor start and hys.

```
U00 HEATING >STAGE
    NUMBER  >2
```

Select HEATING STAGES for heating method.
Enter the number of heaters in the system

```
U00   HEATER SETUP
STAGE RP>OFF TYPE>2S
STAGE DELAY> 000 sec
MIN ON> 000  OFF>000
```

Set to ON if you have one heater with modulation and other heaters ON/OFF. Enter 2 stage or 3 stage if there are two unequal size heaters. Enter the delay between heater stages.



Difference between two stage and three stage heating

```
U00  HEATING STAGES
HEATING HYS    >012%
ST 1>012%  ST 2>048%
ST 3>100%  ST 4>100%
```

Enter the heater start points and hysteresis.

```
U00    HUMIDIFIER
HUM ST>010 HYS > 009
DEHUMIDIFY COMP2>OFF
HT/HUM LOCK OUT > ON
```

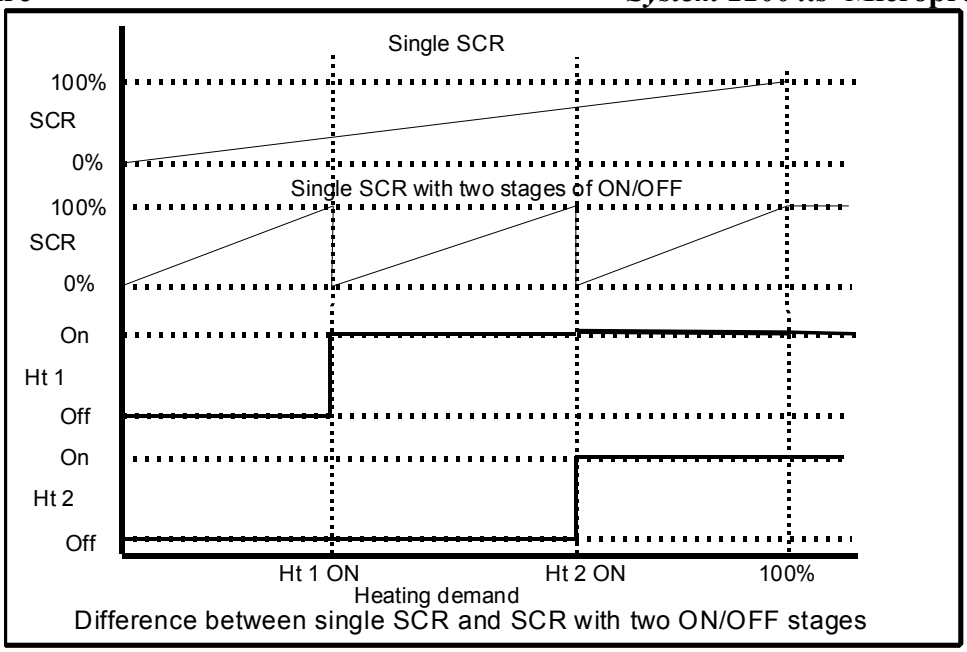
Enter the Humidifier start points and hysteresis.

Select HT/HUM LOCK OUT to ON for interlocking the Electric Heat and Humidifier to be operating at the Same time.

NOTE: THIS FEATURE WILL LOCK THE ELECTRIC HEATER OUT UNTILL THE HUMIDITY IS WITHIN THE CONTROLLED RANGE. IF UNIT DO NOT CALL FOR HEATING, CHECK THE SYSTEM STATUS AND MAKE SURE IT IS NOT IN DUHUMIDIFICATION MODE.

```
U00 DISPLAY SETUP
Display>Old
```

This screen shall be selected to Display> Old while using System 2200xs controller with remote Dislpay.



Difference between single SCR and SCR with two ON/OFF stages

U00 HUMIDIFIER DRAIN AUTO DRAIN >OFF DRAIN CYCLE>0024 HRS DRAIN TIME >0120 SEC	If your unit has an infra-red humidifier, you may set the unit to automatically drain the reservoir. Set to ON for auto draining. Enter drain cycle time. Enter drain duration.
U00 DISPLAY>FAHRENHEIT SHUT DOWN FAN ON AIRFLOW LOSS> NO	Set to FAHRENHEIT or CELCIUS. If you change this setting, you must then reenter all setpoints and bands in the proper unit. Set to YES if you want the fan to shut down on an air flow loss alarm.
U01 Network setup Total Units> 02 Stamdby Units>01 U1 Sensor only> NO	The Network setup menu is only available on UO1(MASTER UNIT) when 'pLAN communication is available.
U01 Network assist Cool>NO Band>02.0 F Heat>NO Band>02.0 F	
U01 Network assist Deh>NO Band>05.0% Hum>NO Band>05.0%	
U01 Network setup Time rotate>Yes Rotation>007day	

```
Time>09.00
```

ALARMS

When an alarm occurs in the ***System 2200 xs,*** the Alarm LED will glow red, and a horn will sound. After a few seconds, the LCD display will begin scrolling through the alarms as well as the normal displays. Pressing the ALARM button will first silence the horn, and then take you to the alarm screens loop.

Pressing the ALARM button again will scroll you through the alarm screens that are active and, after leaving the alarm screens loop, will clear the alarm and reset it. When more than one alarms need to be reset, select the alarm to be reset by pressing ALARM button and press EXIT button to reset it. The Alarm LED will be turned off after all alarms are reset. If alarms still exist, the Alarm LED will relight and the horn will sound again.

```
U00   * ALARM *
     00:00 00/00
    AIRFLOW LOSS
     SYSTEM OFF
```

Time and date alarm occurred.

System turns off only if selected to do so in the factory setup section.

```
U00   * ALARM *
     00:00 00/00
  HEATER OVERHEAT
     HEATER OFF
```

```
U00   * ALARM *
     00:00 00/00
     SMOKE ALARM
     SYSTEM OFF
```

Smoke alarm always shuts down the system.

```
U00   * ALARM *
     00:00 00/00
  C1 LOW  PRESSURE
  COMPRESSOR OFF
```

With compressor alarms, once they clear, the compressor will come back on line automatically.

```
 U00  * ALARM *
     00:00 00/00
  C1 HIGH  PRESSURE
  COMPRESSOR OFF
```

NOTE: There is a manual high pressure reset on the refrigerant lines.

```
U00   * ALARM *
  00:00  00/00
  COMPRESSOR 1
  SHORT CYCLE
```

```
 U00   * ALARM *
    00:00 00/00
```

```
  CONDENSATE OVERFLOW
    CHECK DRAIN
```

```
U00   * ALARM *
    00:00 00/00
 HIGH TEMPERATURE
       ROOM
```

```
U00   * ALARM *
    00:00 00/00
 LOW TEMPERATURE
       ROOM
```

```
U00   * ALARM *
    00:00 00/00
  HIGH HUMIDITY
       ROOM
```

```
U00   * ALARM *
    00:00 00/00
   LOW HUMIDITY
       ROOM
```

```
U00   * ALARM *
ROOM TEMPERATUR:FAIL
ROOM HUMIDITY  :OK
OA TEMPERATURE :OK
```

If a sensor fails, it is indicated as FAIL, otherwise OK indicates the sensor is fine.

```
U00   * ALARM *
FREECOOL TEMPER:OK
DISCH TEMPERATU:OK
ROOM PRESSURE  :OK
```

```
U00   * ALARM *
    00:00  00/00
    FILTER DIRTY
```

```
U00   * ALARM *
   00:00  00/00
   DISCHARGE AIR
   HEATING ALARM
```

```
U00   * ALARM *
  00:00  00/00
  DISCHARGE AIR
  COOLING ALARM
```

```
U00   * ALARM *
```

```
    00:00  00/00

 FAN MOTOR OVERLOAD
```

```
U00   * ALARM *
   00:00  00/00
 WATER FLOW LOSS
 COMPRESSORS OFF
```

This alarm only operates on water cooled units.

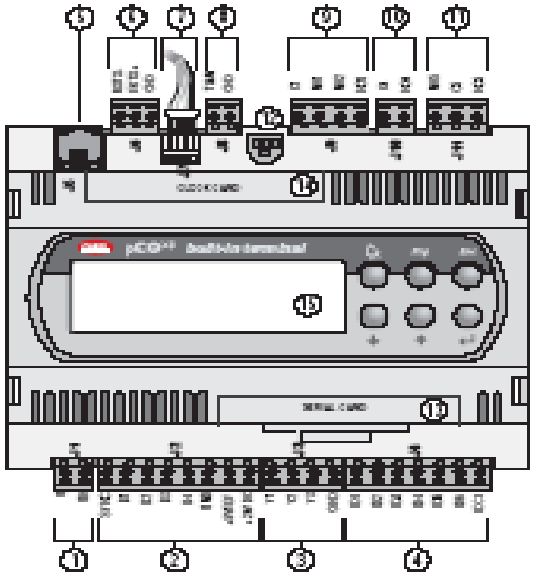
```
U00   * ALARM *
   00:00  00/00
MAIN PUMP FAILURE
STAND BY PUMP ON
```

```
U00   * ALARM *
  NO MORE ALARMS
```

Last alarm screen.

TECHNICAL INFORMATION

SYSTEM 2200xs Controller



The ***System 2200*** main board is the core of the unit and will operate stand-alone without the need for the terminal unit. The main board is where all sensors and controlled devices are connected. The main parts are:

1 Power supply connector [G (+), G0 (-)] 24Vac or 20/60Vdc;
2 Phase cutting and analogue inputs (24 Vac): NTC, 0/1V, 0/5V, 0/20mA, 4/20mA, +5Vref for power supply to 5V ratiometric probes and +24Vdc power supply to active probes;
3 0/10V analogue outputs and PWM phase-cutting output;
4 Free contact digital inputs;
5 Connector for all the pCO series standard terminals and for downloading the application software;*
6 pLAN connector;
7 tLAN terminal connector;
8 tLAN network connector or MP-Bus;
9 Relay digital outputs with shared common;
10 Relay/SSR digital output;
11 Alarm relay digital output with changeover/SSR contact;
12 Yellow power supply LED and 3 pCOXS status LEDs;

13 Cover for inserting the serial card:
- RS485 for supervisor
- RS232 for modem interface
- Gateway (protocol converter)
14 Cover for inserting the clock card;
15 Built-In terminal.

CONNECTIONS OF INPUT/OUTPUTS

Connector	Signals	Description	Software Use
J1-1	G	Power supply 24Vac 50/60 Hz	
J1-2	G0	Power supply reference 0Vac ground	
J2-1	SYNC	Synchronicity input for phase cutting (G0 ground)	
J2-2	B1	Universal analog input 1	Room/R.A. Humidity 0-1Vdc
J2-3	B2	Universal analog input 2	Discharge Air Humidity 0-1Vdc
J2-4	B3	Universal analog input 3	Room/R.A. Temperature NTC
J2-5	B4	Universal analog input 4	Discharge Air Temperature NTC
J2-6	GND	Analog input reference	
J2-7	+5REF	Power supply for 0/5V ratiometric probe	
J2-8	+24VDC	Power supply for active probe, 24Vdc	
J3-1	Y1	Analog output No. 1 0/10Vdc	Cool/Heat/Hum/Econo or none
J3-2	Y2	Analog output No. 2 0/10Vdc	Cool/Heat/Hum/Econo or none
J3-3	Y3	Analog output No. 3 PWM (for phase cutting speed controller)	Fan Speed
J3-4	GND	Ground for analog output	
J4-1	ID1	Digital input No. 1	Air flow loss alarm
J4-2	ID2	Digital input No. 2	Smoke detector alarm
J4-3	ID3	Digital input No. 3	Heater over heat alarm
J4-4	ID4	Digital input No. 4	Compressor 1 low pressure alarm
J4-5	ID5	Digital input No. 5	Compressor 1 high pressure alarm
J4-6	ID6	Digital input No. 6	Condensate overflow alarm/Remote start/stop control

Connector	Signals	Description	Software Use
J4-7	IDC1	Common for digital input for 1 to6	
J5		6-Way telephone connector for connection to the display/user terminal	6 wire, RJ11 telephone connection for display/user terminal
J6-1	TX-	RX-/TX- connector for RS485 connection to the pLAN network	
J6-2	TX+	RX+/TX+ connector for RS485 connection to the pLAN network	
J6-3	GND	Reference for RS485 connection to the p-LAN network	
J7		tLAN terminal connector	
J8-1	TLAN	tLAN connector	
J8-2	GND	Reference for tLAN connector	
J9-1	C1	Common for relays: 1,2,3	
J9-2	NO1	Normally-open contact, relay no. 1	
J9-3	NO2	Normally-open contact, relay no. 2	
J9-4	NO3	Normally-open contact, relay no. 3	
J10-1	C4	Common for relay: 4	
J10-2	NO4	Normally-open contact, relay no. 4	
J11-1	NO5	Normally-open contact, relay no. 5	
J11-2	C5	Common for relay: 5	
J11-3	NC5	Normally-closed contact relay no.5	

Connecting Inputs

DIGITAL INPUTS

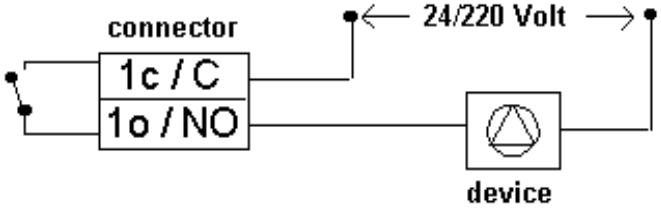
The digital inputs are designed to work with 24 Vac or 24 Vdc. However, when using dc voltage input, the common must come into the actual digital input port, and must also be the same as the connection to the G0 terminal.

ANALOG INPUTS

There are four possible analog inputs. B1 and B2 are universal analogue inputs that are configured for 0/1Vdc signal. B3 and B4 are reserved as resistance type NTC temperature sensor inputs. There is no polarity to the NTC sensors.

Connecting Outputs

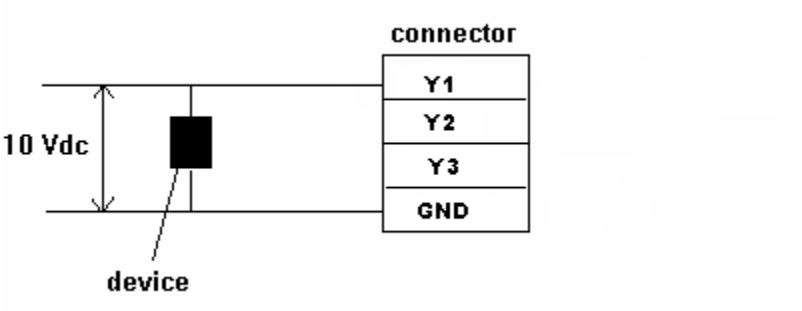
DIGITAL OUTPUTS



The 5 relay outputs are each capable of handling up to 10 Amps at 250 Vac. To power a device connect one side of the power supply to the device, and the other side must then be connected through the relay on the control board as shown.

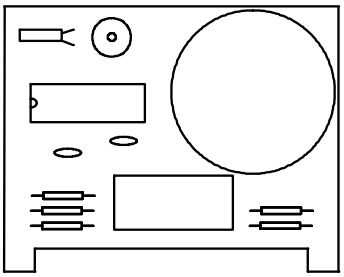
ANALOG OUTPUTS

The analog outputs are 0-10 Vdc modulating.



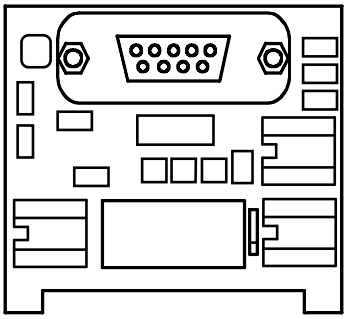
Mounting Optional Boards

REAL TIME CLOCK BOARD



The real time clock board is plugged into the slot for clock card in SYSTEM 2200xs control board. This board is necessary if date/time operations are to be performed. The clock board is powered by a 10 year Lithium battery. CAUTION: NEVER plug-in or remove the real time clock board when the control board is powered.

RS485 SERIAL NETWORK CARD



The RS485 serial board is used to connect the Supervisor system to a modem or computer. This card is plugged into the slot for a serial card on the SYSTEM 2200xs control board. This card provides the optical isolation of the controller from to the RS485 serial network. Maximum baudrate is 19200 baud. CAUTION: NEVER plug-in or remove the RS485 serial board when the control board is powered.

LISTING OF PROGRAMMABLE PARAMETERS

Parameter/Description	Default Setting	Lower/Upper Limits	Unit of Measure
Room temperature set point	72	50/90	°F or °C selectable
Room temperature band	5	0/99	%
Room humidity set point	50	35/85	%RH
Room humidity band	10	0/99	%
Room hi/lo temperature alarm	80/60	50/120	°F or °C selectable
Room hi/lo humidity alarm	65/35	0/100	%RH
Enable night setback	OFF	On/Off	
Night minimum on	300	0-999	seconds
Night setback hi/lo temp	90/55	50/120	°F or °C selectable
Night setback hi/lo humidity	65/35	0/100	%RH
Occupied/unoccupied times	6/18:00	0/24:00/59	Hours/minutes
Temperature control type	Proportional	Prop/Prop + Integral	
Humidity control	Proportional	Prop/Prop + Integral	
Supervisor unit ident	1	1/32	
Supervisor baud rate	1200	300/9600	Baud