

# ***MODCOM II***

## ***A COMMUNICATING MODULATING CONTROL SYSTEM***

**Vote Based Auto Changeover VAV**

**Installation and Applications Manual**



## **MODCOM II**

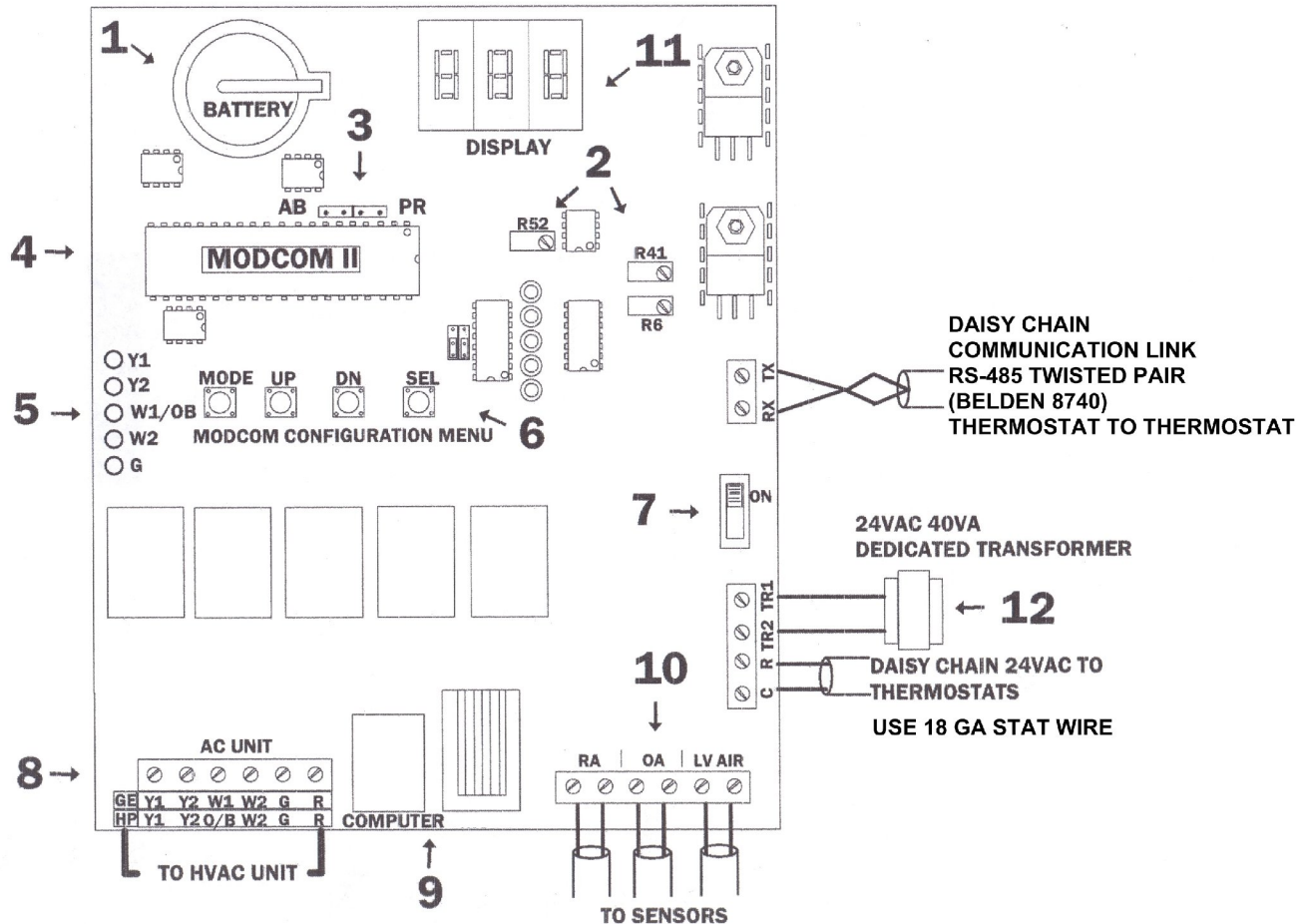
### **QUICK START INSTALLATION**

Follow these Quick steps for a successful job

If you need additional information, please read the MODCOM II Manual

1. Install the **MODCOM II** Controller in a location easily accessible to a network data cable, if you are using the Zonex Systems ISERVER Network device, or within 10 feet of computer for direct connect application.  
NOTE: Regardless of installation intended for TCIP connection, it is recommended to first set up and configure a new system with a direct connected computer (laptop or desktop), and verify operation.
2. Install an Independent 40 VA transformer, and connect to the TR1 and TR2 terminals on the **MODCOM II** Controller. Complete the Voltage Polarity Check for Transformer found on Page 16 of the **MODCOM II** Installation Manual.
3. Install the LAT sensors for Supply Air (SA), Return Air (RA), and Outside Air (OA); and wire back to the **MODCOM II** Controller. The SA sensor should be mounted in the supply air plenum prior to the bypass takeoff.
4. Install Dampers and Bypass Dampers.
5. Install all thermostat sub-bases.
6. Wire R & C Terminals from the **MODCOM II** Controller, using 18 GA thermostat wire, to the **first sub-base – only**.
7. Wire RX & TX Terminals from the **MODCOM II** Controller, using Belden 8740 twisted pair wire, to the **first thermostat sub-base – only**.
8. Plug 1 ModStat into that sub-base.
9. Address that thermostat to #1 - see thermostat instruction sheet (Addressing).
10. You will now confirm communication with the first thermostat. Press and hold the “UP” button located on the Configuration Menu, and turn on the **MODCOM II** Controller. Continue holding the “UP” button for 20 seconds. The Display will indicate the number of thermostats currently in the system; the number 01 appears on the Display. This indicates you are communicating with the first thermostat.
11. If you do not see the #1 and a “0” is displayed, check the address first. Confirm the address is #01 on the stat; then check wires for R & C polarity and RX TX for correct connections.
12. If #1 is displayed on the **MODCOM II** Controller, then daisy chain wires from Stat 01 to the next stat, and address it as #2; then repeat the “UP” Button - ON – Off switch operation and confirm the #2 shows up on the display indicating the system is now communicating with 2 thermostats.
13. Continue to add stats, and confirm communication by repeating the OFF - “UP” - ON switch operation until all stats are wired and the total number of thermostats on your job shows up on the display on the **MODCOM II** Controller.
14. When all thermostats report to the **MODCOM II** Controller, go to any stat and make a Cool Call. Look at the **MODCOM II** Controller and confirm Y1 (yellow LED) and G (green LED) lights are on.
15. Turn off the Cool Call to be sure Y1 and G turn off at the **MODCOM II** Controller.
16. Repeat with Heat Call for W1 (red LED).
17. Turn off Heat Call to be sure W1 turns off at the **MODCOM II** Controller.
18. Wire the **MODCOM II** Controller to the A/C unit.
19. Damper wiring – connect RO, RC, MC wires from each thermostat to its damper with 18 GA thermostat wire.
20. Proceed to computer startup.

## MODCOM II COMMAND CENTER



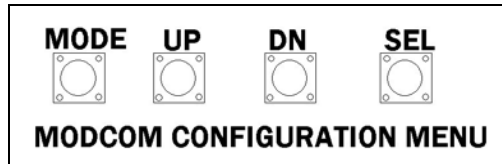
### LEGEND

- |   |   |
|---|---|
| <b>1</b> Date and Time Backup Battery   | <b>8</b> Wiring to HVAC Unit Terminals  |
| <b>2</b> Sensor Calibration<br>Outside Air (OA) – Pot R41<br>Supply Air Temp (LV Air) – Pot R52<br>Return Air Temp – Pot R6 | <b>9</b> 1 RJ-11 Connection and 1 USB Connection<br>Computer – Direct Connect<br>Modem or optional TCIP Device          |
| <b>3</b> AB and PR Jumpers – Priority and Air Balance   | <b>10</b> Sensor Terminals:<br>RA – Return Air<br>OA – Outside Air<br>LV Air – Leaving Air                              |
| <b>4</b> Main Control Chip  | <b>11</b> Configuration Menu Display  |
| <b>5</b> Status LEDs – Y1, Y2, W1 and O/B, W2, G  | <b>12</b> One 24V Transformer is utilized to power all zone dampers in the system. Size Transformer for 2 VA per damper |
| <b>6</b> <b>ModCom</b> Configuration Menu   |   |
| <b>7</b> On/Off Power Switch  |   |

The ModCom board is factory set for G/E mode. For HP mode configuration, refer to Page 13.

## CONFIGURING THE MODCOM II SYSTEM

The **ModCom** has a three-digit LED display to enhance and set up operations, which is controlled from the **ModCom** Configuration Menu below. During manual operation, Leaving Air temperature is displayed every 10 seconds. It also displays your system configuration and updates to the **ModCom** System.



### **MODCOM II** QUICK START COMMISSIONING COMPUTER STARTUP

1. Connect the **MODCOM II** Controller to computer via Network Connection or Direct Connect. See System Startup Procedure on Page 38.  
NOTE: Regardless of installation intended for TCIP connection, it is recommended to first set up and configure a new system with a direct connected computer (laptop or desktop), and verify operation.
2. When the computer is connected to the **MODCOM II** Controller, go to the SYSTEMS Tab and set the number of stats to reflect the number of stats on the system. Click on the radio button for stats; use the pull down menu and select the number of stats on the system. Click on SEND SETTINGS at the bottom of the page. See Page 42, Fig. 11.
3. Go to the REVIEW Tab and verify communications with ModStats.
4. If Zeroes ("0") are present on the REVIEW Tab, verify the addressing of the thermostat(s) and check the communications wire and its polarity. (NOTE: If all thermostats report ZERO ("0") and addresses are set, verify RX TX polarity. If this is correct, reverse R&C at the **MODCOM II** Controller to the thermostats; and review.)
5. Go to Page 45 for advanced information on setting the set points, schedules, and vacations.

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## ZONE DAMPERS

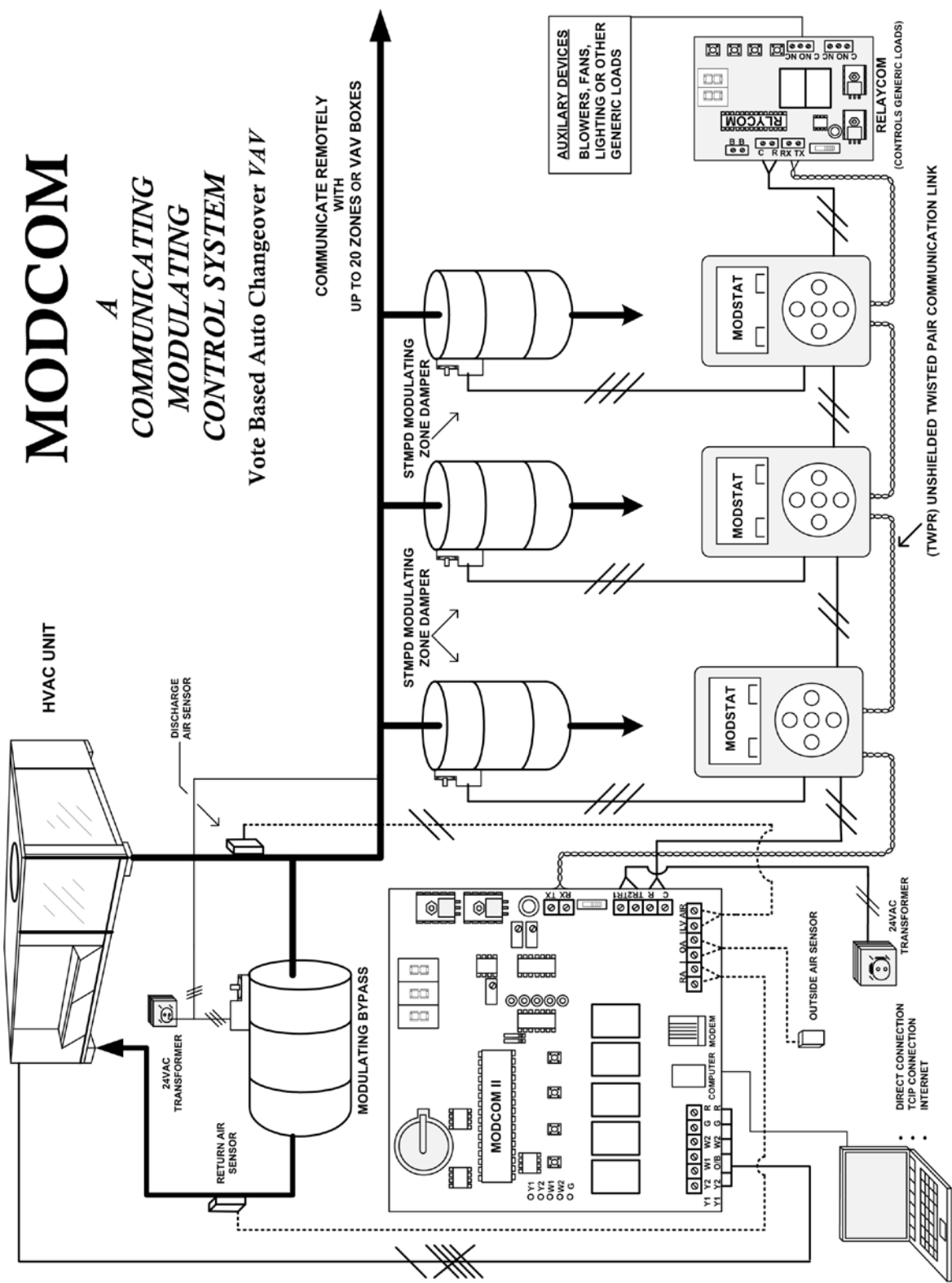
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All RX communication wires must be connected to the RX terminals. All TX communication wires must be connected to the TX terminals. The RX and TX wires should never intersect

# COMPONENT SELECTION GUIDE

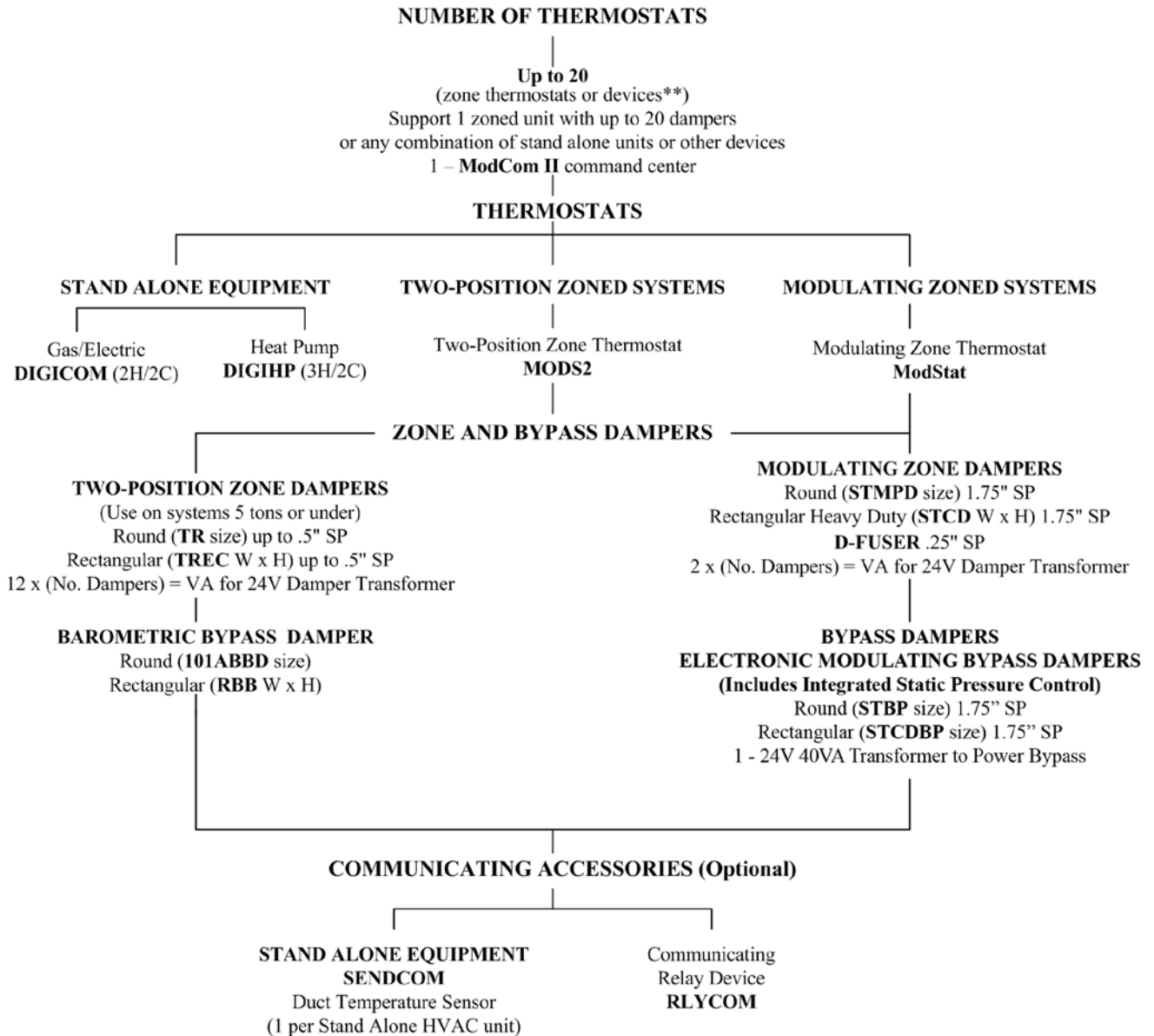
## *ModCom II*

**Digital control of one HVAC unit with modulating or 2-position zone dampers  
with multiple stand alone HVAC units and up to 20 auxiliary devices.\*\***

### **ModCom II SYSTEM**

#### **ModCom II – COMMAND CENTER\***

Includes: Controller, software, TCIP network device, cables, and 3 LAT Sensors  
Also includes: onboard staging and digital capacity control

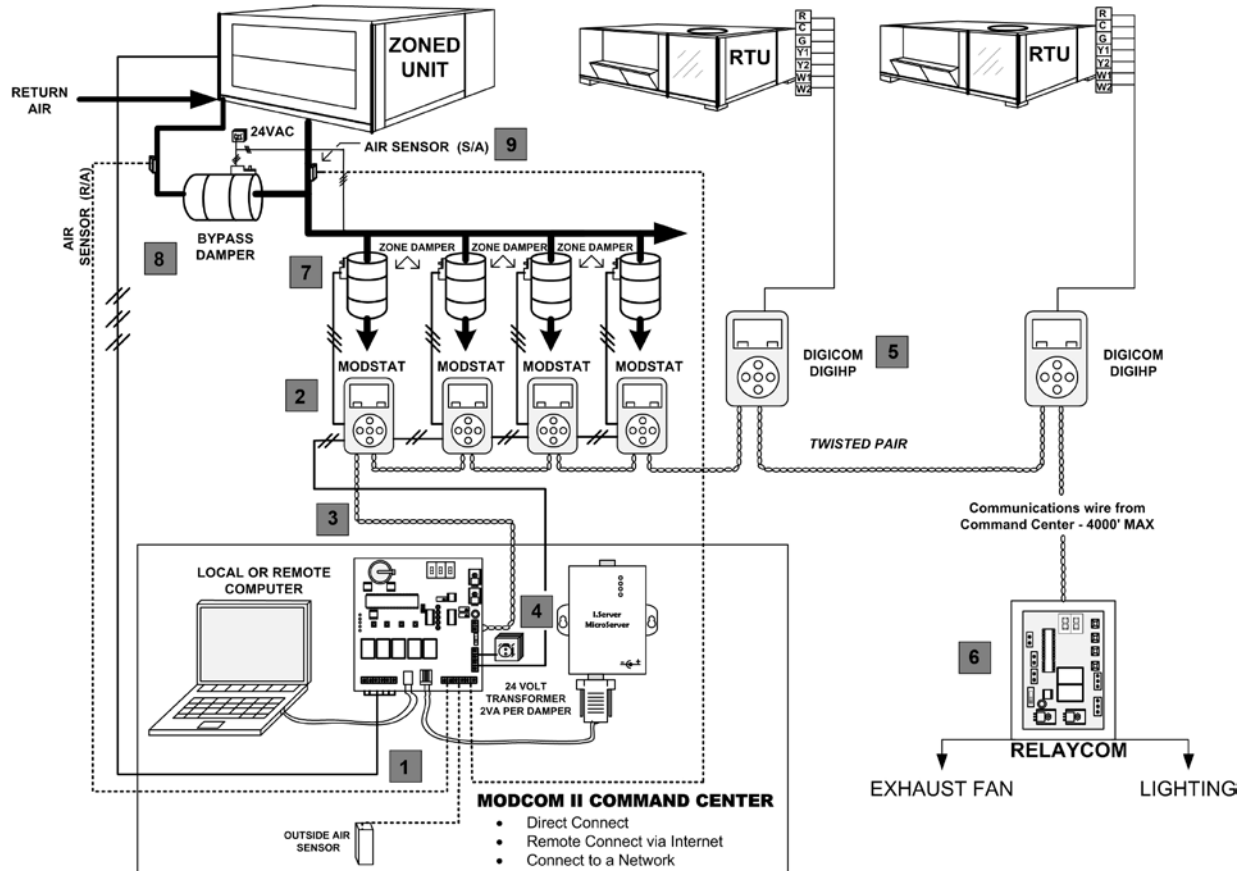


\*If additional **ModCom II** controllers are utilized with multiple zoned units, order Part #MODCIP Command Center, with TCIP but without software.

\*\*Devices include Part #: **ModStat, DIGICOM, DIGIHP, MODS2, and RLYCOM.**

## MODCOM II CONCEPT DRAWING

The **ModCom** System is a Windows-based DDC, modulating zone control and thermal management system. The universal **ModCom** controls both GE and HP units with onboard capacity control. The **ModCom** Command Center can support 20 thermostats, which control fully modulating dampers, stand-alone HVAC equipment and auxiliary equipment, such as exhaust fans, lighting, and other on/off devices, which can be controlled via the **ModCom** Windows-based scheduling programs.



### MODCOM II SYSTEM COMPONENTS

- 1 **ModCom** Command Center
- 2 **ModStat** – Modulating thermostat
- 3 Two-wire twisted pair communication wire (**use unshielded Belden 8740**)
- 4 Transformer to power all zone dampers, 2VA per modulating damper
- 5 **DIGICOM** or **DIGIHP** thermostat to control stand-alone HVAC equipment
- 6 **RLYCOM** – control and schedule lights, ventilation, etc.
- 7 Zone dampers – fully modulating
- 8 Modulating bypass with Integrated Pressure Control
- 9 LAT – Supply, Return, Outside Air sensors

**Optional:** **SENDCOM** sensor can be utilized to report RA/SA from stand-alone HVAC equipment.



## DESCRIPTION

The **ModCom** Command Center provides a central source for communication and control of up to 20 modulating zones on a single HVAC system. The **ModCom** universal controller is designed to control both GE and HP systems. The Command Center polls the **ModStat** thermostats every 60 seconds and selects heat or cool operation. The onboard Capacity Control stages 2H/2C GE or 3H/2C HP based on time and supply air temperature.

All scheduling and monitoring is accomplished through the use of the Windows-based **ModCom** software, accessible by a direct connect computer or TCIP Network device. The Command Center provides each thermostat with two heat and two cool set points with up to four events per day.

The Command Center requires a 24vac power input and has available inputs for display of mixed air temperature, outdoor air, and leaving air temperatures. LED indicators provide status of the HVAC system.

## MODCOM II SEQUENCE OF OPERATION

### SYSTEM OVERVIEW

**ModCom** is a DDC system for automating a single zoned unit, stand-alone HVAC units and mechanical devices. The **ModCom** controller is designed to control both Gas Electric and Heat Pump systems. **ModCom** has integrated capacity control: 2-stage heat and cool when configured for Gas Electric and 3-stage heat when configured for Heat Pump.

The **ModCom** Command Center provides a central source for communication and control of up to 20 modulating zones on a single HVAC system. When heating or cooling calls are sent to the **ModCom** Command Center by the **ModStats**, the Command Center will treat these calls as votes to determine mode of operation. The system also provides the contractor with a number of features to tailor the system to your specific application. All these features are initiated at the **ModCom** controller, saving the contractor time running around the building. These features include:

- Prioritizing each thermostat with 1, 2 or 3 votes to accelerate changeover.
- Opposing call feature, allowing the system to identify and satisfy rogue or maverick calls.
- Air balance tool to automatically open all zone dampers and energize the fan to speed your time air balancing the system.
- Set default system set points with the touch of a button.
- Display RA/SA temperatures and establish heating and cooling cut-out set points at ground level.
- Auto Changeover

All these features are accomplished from the **ModCom's** Configuration Menu (see Page 11).

One unit with up to 20 modulating zone dampers is a perfect application for **ModCom**. If additional thermostats are available (i.e., all 20 are not assigned to zone dampers), the additional thermostats may be utilized to control stand-alone rooftop units with a **DIGICOM / DIGIHP** thermostat or other communicating devices to control generic loads, such as exhaust fans or signage.

**ModCom** is expandable with the addition of a second **ModCom** controller with TCIP device. Multiple **ModCom** Command Centers could each control 20 zone dampers, controlling a larger system of up to 80, 100 or more zones.

All scheduling and monitoring is accomplished through the use of the Windows-based **ModCom** software, accessible by a local computer or internet connection.

The **ModCom** controller can be field configured for Gas Electric or Heat Pump applications. **The controller is set at the factory for Gas Electric operation.** Heat Pump operation is easily configured on the **ModCom** Configuration Menu (see Page 11). The Command Center will poll the **ModStats** once every minute to check for heat and cool demand. When a heat or cool call is recognized by the **ModCom** controller, then Y1 or W1 will energize and the status will be sent to the **ModStats**. The **ModStats** will then control damper operation. The system will change heat and cool modes based on the majority demand from the **ModStats**.

## OPERATION

### COOL CALLS

#### Gas/Electric Cool Mode

When the **ModCom** controller initiates a call for cool, Y1 and G energize, and the status is then sent to the **ModStats**. The **ModStats** that are calling for cooling will then open the dampers. Based on how far from set point the zones are, **ModStats** will modulate the dampers. After four minutes of run time, the **ModCom** controller will check the leaving air temperature. If the supply air temperature is more than the cut-out temperature plus 12 degrees, then Y2 will energize ( $45 + 12 = 57$ ). Y1 and Y2 will remain running until the call is satisfied or Leaving Air temperature reaches cut-out. If Leaving Air temperature reaches cut-out, Y1 and Y2 will de-energize. After 4 minutes, if the leaving air temperature has risen above the cut-out, Y1 will re-energize. When all cool calls are satisfied, the **ModCom** controller will de-energize the Y1 and Y2 outputs and initiate a four-minute purge. During this time, the controller will not allow any calls.

#### Heat Pump Cool Mode “O”

The Heat Pump “O” configuration controls the cooling operation the same as the Gas Electric configuration. The only difference is that the **ModCom** controller also energizes the reversing valve output O/B for cooling.

When the cool calls are satisfied, the reversing valve output on O/B remains energized until the **ModCom** controller changes to heating operation.

#### Heat Pump Cool Mode “B”

Cool operation in the “B” configuration is the same as “O,” except the reversing valve circuit is not energized.

Set up “B” or “O” Heat Pump operation at the **ModCom** Configuration Menu on the controller.

### HEAT CALLS

#### Gas/Electric Heat Mode

When the **ModCom** controller initiates a call for heat, W1 will energize; and the status is then sent to the **ModStats**. The **ModStats** that are calling for heat will then open the dampers. Based on how far from set point the zones are, the **ModStats** will modulate the dampers. After four minutes of run time, the **ModCom** controller will check leaving air temperature. If the leaving air temperature is less than leaving air cut-out temperature minus 20 degrees ( $145 - 20 = 125$ ), then W2 will energize. If the leaving air temperature is more than the cut-out minus 20 degrees, then W2 will remain off and W1 will provide heat. When W1 and W2 are energized, they will remain energized until all calls are satisfied or high limit cut-out has been reached. If Leaving Air temperature reaches high limit cut-out, W1 and W2 will de-energize. After 4 minutes, if Leaving Air temperature has dropped below high limit cut-out, W1 will re-energize. When all heat calls are satisfied, the controller will de-energize; and the system will go into a 4-minute purge. No calls will be allowed during this time.

### **Heat Pump Heat Mode “O”**

When the **ModCom** controller initiates a call for heat, Y1 and G will energize, and the status is then sent to the **ModStats**. The **ModStats** that are calling for heat will then open the dampers. After four minutes of run time, the **ModCom** controller will check the leaving air temperature. If the leaving air temperature is less than leaving air cut-out minus 20 degrees ( $120 - 20 = 100$ ), then Y2 will energize. After four minutes the controller will check the leaving air temperature again. If the leaving air temperature is less than 88 degrees, then W2 electric strip heat will energize. If the leaving air is more than the cut-out minus 20 degrees, then Y2 will remain off and Y1 will provide heat. If the leaving air temperature reaches the high limit cut-out, Y1, Y2 and W2 will de-energize. After 4 minutes, if leaving air has lowered below cut-out and there is still a call for heat, Y1 will re-energize. When all heat calls are satisfied, the controller will de-energize and the system will go into a four-minute purge. No calls will be allowed during this time.

### **Heat Pump Heat Mode “B”**

Heat operation in the “B” configuration is the same as “O,” except the reversing valve circuit is energized in heat mode. After a call for heat is satisfied, the reversing valve will remain energized until an opposing call is made.

### **CHANGEOVER**

If the system is running in one mode and the majority of calls changes to the other mode, a timer will start. The Command Center will give the current operating mode another 4 minutes to try to satisfy the zone(s). It will then go into the purge cycle before switching modes to the majority.

### **PURGE MODE**

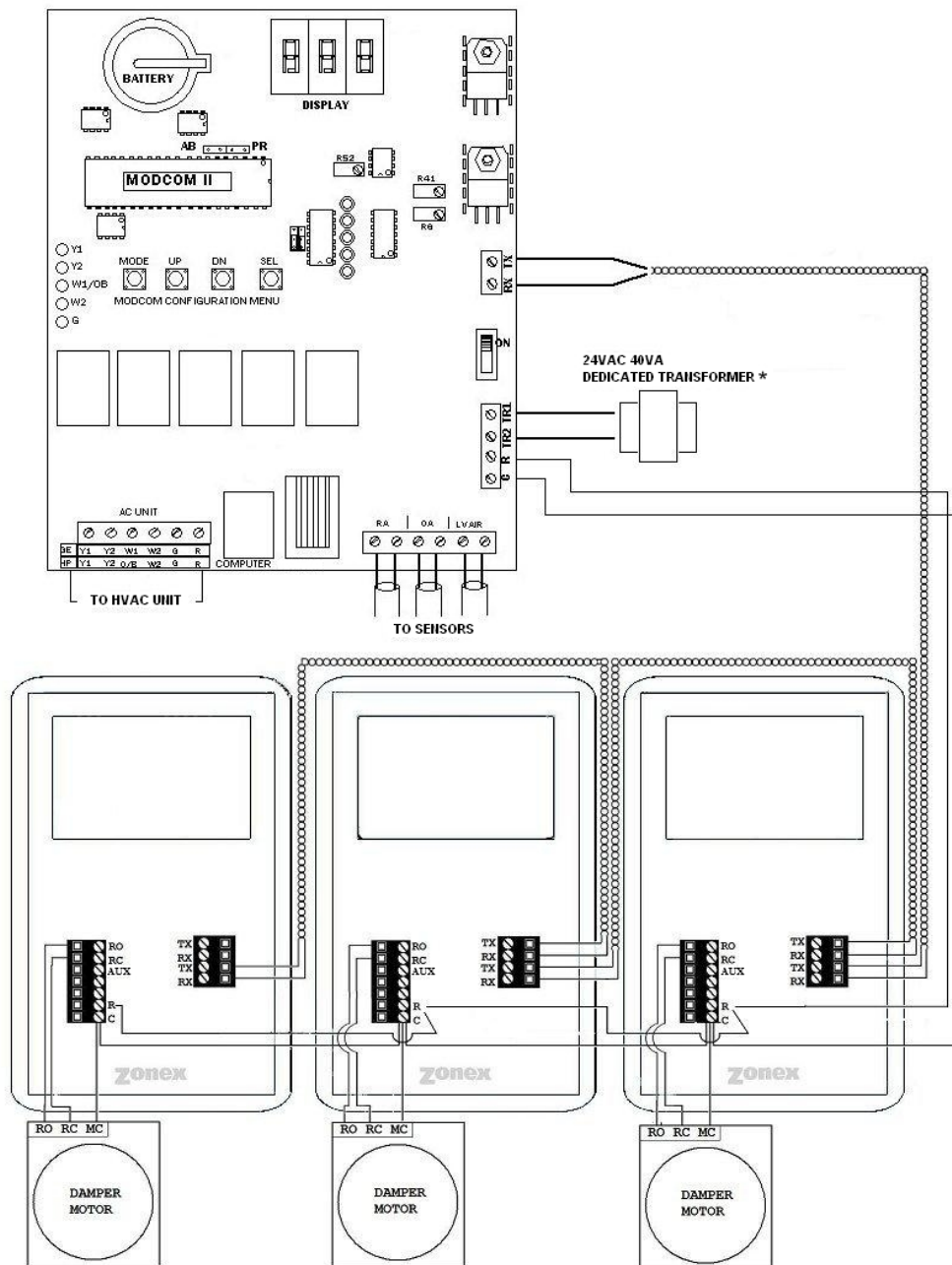
When a heat or cool call is satisfied or before changing modes, the Command Center will go into a 4-minute purge cycle. The call for heat or cool will be removed, and the dampers will motor closed.

### **VENTILATION**

When no zones are calling for heat or cool, the dampers will open 50%. This permits ventilation in all zones, if the blower fan is on continuously.

**NOTE:** The RA and LV AIR sensors (Part # LAT) must be installed for unit operation. A shorted sensor or wiring will display low temperature, and an open sensor or wiring will display high temperature.

## MODCOM II MODULATING DAMPER INSTALLATION WIRING OVERVIEW

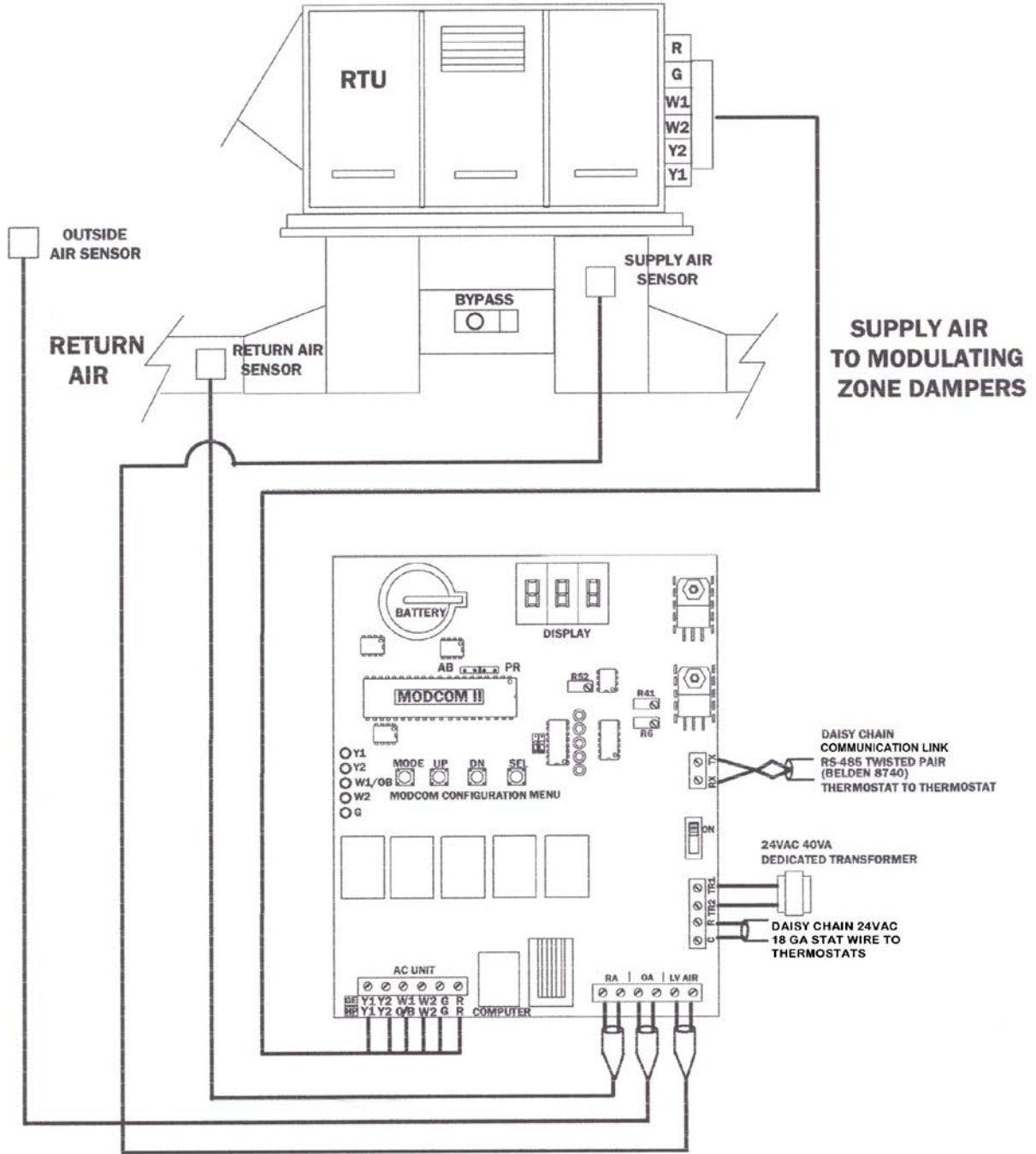


- Wiring must comply with the National Electric Code and local codes.
- Use **Belden 8740** unshielded twisted pair wire for communication wire.
- Observe polarity between TX and RX terminals.
- Communication wire maximum is 4,000 ft. from the Command Center to the farthest **ModStat** or device.
- Keep splices to a minimum. Solder or use a terminal strip for all splices.
- Keep communication wire and power wire separate.
- Power wiring from the **ModCom** controller is daisy chained from stat to stat in the system.

**\*This transformer is used for isolation.**

**Do not connect any other wire or devices other than those shown.**

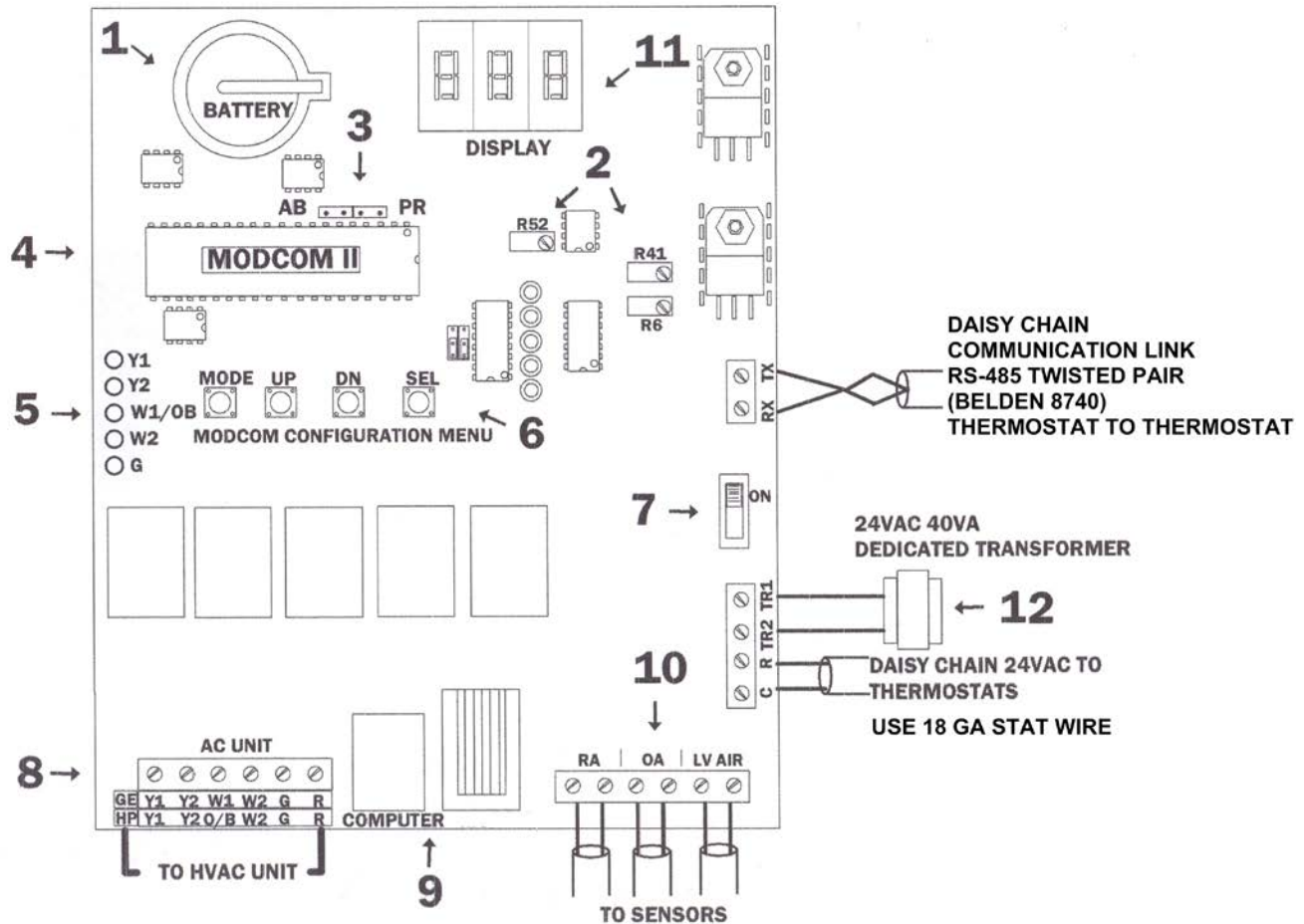
## MODCOM II COMMAND CENTER TO UNIT WIRING DIAGRAM



- Minimum 18 AWG thermostat wire. For RA, OA and LV air sensors.
- Y2 and W2 are not used for gas/electric single stage units. Y2 is not used for heat pump single stage unit.
- Keep sensor wires and power wires separate.
- Part # LAT for all sensors

NOTE: Shorted sensor wiring or sensors cause a low temperature reading. Open sensor wiring or sensors cause a high temperature reading.

## MODCOM II COMMAND CENTER



### LEGEND

- |  |   |
|--|---|
| <p><b>1</b> Date and Time Backup Battery</p> <p><b>2</b> Sensor Calibration<br/>Outside Air (OA) – Pot R41<br/>Supply Air Temp (LV Air) – Pot R52<br/>Return Air Temp – Pot R6</p> <p><b>3</b> AB and PR Jumpers – Priority and Air Balance</p> <p><b>4</b> Main Control Chip</p> <p><b>5</b> Status LEDs – Y1, Y2, W1 and O/B, W2, G</p> <p><b>6</b> <b>ModCom</b> Configuration Menu</p> <p><b>7</b> On/Off Power Switch</p> | <p><b>8</b> Wiring to HVAC Unit Terminals</p> <p><b>9</b> 1 RJ-11 Connection and 1 USB Connection<br/>Computer – Direct Connect<br/>Modem or optional TCIP Device</p> <p><b>10</b> Sensor Terminals:<br/>RA – Return Air<br/>OA – Outside Air<br/>LV Air – Leaving Air</p> <p><b>11</b> Configuration Menu Display</p> <p><b>12</b> One 24V Transformer is utilized to power all zone dampers in the system. Size Transformer for 2 VA per damper</p> |
|--|---|

The ModCom board is factory set for G/E mode. For HP mode configuration, refer to Page 13.

## **MODCOM II INSTALLATION INSTRUCTIONS**

### **ModCom II Command Center**

1. Install the **ModCom** on a wall or mounting board in a dry interior space where the temperatures will be between 32° and 125° non-condensing.
2. If the installation calls for an on-site computer to be directly connected to the Command Center, the computer must be located within 10' of the **ModCom** controller.
3. If the installation calls for use of the TCIP network connection, the location should be easily accessible to the network data cable.
4. When the job is to be set up for TCIP / Internet access, you must provide a 120vac outlet for the TCIP power supply.
5. Install a 24vac 40va dedicated transformer for the Command Center communication loop only, and check polarity before applying the transformer wire to "TR1" and "TR2". Refer to the Voltage Polarity Check Diagram on Page 16.
6. Install the RA (return) LV AIR (supply) sensors (LAT). The LV AIR (supply) sensor must be installed in the supply duct or plenum **ahead of the bypass take-off**. This sensor provides a temperature input to the Command Center to control Heat and Cool staging and temperature cut-out.
7. The RA (return) sensor is to be mounted into the return duct.
8. When SA and RA sensors are installed, energize the **ModCom II** controller; and verify SA and RA readings. To verify readings, simultaneously hold the **UP** and **DN** buttons on the Configuration Menu to display RETURN AIR, then LEAVING AIR temperatures. Return air temperature will flash on the display, followed by Supply Air (leaving air temperature) from the unit.
9. The OA (Outside Air) sensor is mounted outside of the building out of direct sunlight.
10. The twisted pair communication wire (**Unshielded Belden 8740**) is to be daisy chained to each communicating device, which is controlled by the specific Command Center. When multiple Command Centers are used, each Command Center is to have a dedicated communication loop. The communication loop is polarity sensitive on RX and TX. Wire nuts are never to be used on the communication wire. When making connections, use screw type terminal strips or solder.
11. Verify the configuration of the system. The **MODCOM II** controller can be configured for Gas Electric or Heat Pump mode. The controller is set for Gas Electric operation from the factory and can be field configured for Heat Pump.

NOTE: For systems with potential electrical interference, such as larger transformers, VFDs, etc., use shielded twisted pair (**Belden 8450**) for the communication loop.

When the **MODCOM II** controller has been installed and has been configured for operation, go to Page 17 and begin the ModStat installation.

To perform startup procedures, refer to the QUICK START INSTALLATION guide found in the front of the **MODCOM II** Installation Manual.

## CONFIGURATION MENU

### CONFIGURING THE MODCOM II SYSTEM

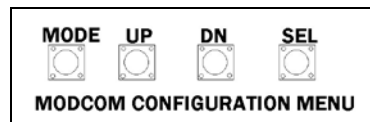
#### Gas Electric Mode

1. The **ModCom** is shipped from the factory configured for Gas/Electric operation.
2. The LO CUT-OUT is factory set at 45°, and the HI CUT-OUT is set for 145°. If a change is required, this can be accomplished with the control board. For LO, Press the **DN** button and hold. A "C" will appear on the display board followed by the LO CUT-OUT temperature. To raise the setting, press the **UP** button; to lower it, continue to press the **DN** button. When the desired limit is found, release the button. To reset the HI CUT-OUT, press and hold the **UP** button; and an "H" will appear followed by the HI CUT-OUT temperature. To lower the setting, press the **DN** button; to raise it, continue to press the **UP** button until desired limit is reached; then release the button.
3. To configure fan operation, see **ModCom II** Configuration Menu (see Page 12).
4. Connect the 24-volt HVAC control wires to the output terminals on the AC terminal strip.

#### Heat Pump Mode

1. The **ModCom** controller can be configured for Heat Pump operation through the configuration menu. The **ModCom** controller is shipped from the factory as a GAS ELECTRIC controller and will need to be reconfigured for Heat Pump operation.
2. When reconfiguration has occurred, the installer will need to verify the LO CUT-OUT limit of 45° and the HI CUT-OUT of 125°. If a change is required, this can be accomplished with the control board. For LO, press the **DN** button and hold. A "C" will appear on the display board, followed by the LO CUT-OUT temperature. To raise it, press the **UP** button; to lower it, continue to press the **DN** button. When the desired limit is found, release the button. To reset the HI CUT-OUT, press and hold the **UP** button, and an "H" will appear followed by the HI CUT-OUT temperature. To lower the setting, press the **DN** button. To raise it, continue to press the **UP** button until the desired limit is reached; then release the button.
3. The default program for HEAT PUMP operation is for the reversing valve to be in the "O" mode, energizing in Cooling. If the desired application is using a "B" mode unit, energizing reversing valve in heating, then the controller must be configured for this application. Refer to page 13 of the Installation Manual.
4. Connect the 24-volt HVAC control wires to the output terminals on the AC terminal strip.

The **ModCom** has a three-digit LED display to enhance and set up operations, which is controlled from the **ModCom** Configuration Menu below. During manual operation, Leaving Air temperature is displayed every 10 seconds. It also displays your system configuration and updates to the **ModCom** System.



The following features are established using the **ModCom II** Configuration Menu:

- Fan– AUTO or ON
- Operating Mode – G/E or HP (G/E mode from factory)
- Capacity Control cut-out set points
- Priority thermostat votes
- Review RA/SA
- Air Balance Tool
- Default thermostat set point programming
- Opposing Call Changeover Timer
- Configure 2<sup>nd</sup> stage cut-in time



Stand-alone push button functions include the following:

- Display RETURN followed by LEAVING AIR temperatures
- Display Capacity Control COOL CUT-OUT temperature
- Display Capacity Control HEAT CUT-OUT temperature
- Display Second Stage ON DELAY
- Show OPPOSING CALL DELAY

### Configuration Functions

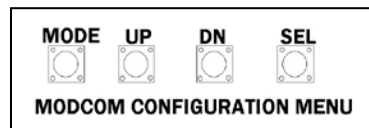
- Mode 1 configures Gas Electric or Heat Pump operation.
  - Mode 2 configures FAN AUTO or FAN ON.
  - Mode 3 configures “O” or “B” Heat Pump operation.
  - Mode 4 configures fan for Gas Electric or Electric Electric operation.
1. Press and hold the **MODE** button until the function you wish to configure shows on the display.
  2. Press **SEL** and release **MODE** to select the mode to be configured.
  3. The Display will show two zeroes or a zero and a one (00 or 01).
  4. The *MODE Functions Table* shows the configured value for 00 or 01.
  5. Press **MODE** to return to normal operation.

### Mode Functions

- Mode 1      00 = GE   01 = HP
- Mode 2      00 = FAN AUTO   01 = Fan ON
- Mode 3      00 = “O” MODE   01 = “B” MODE
- Mode 4      00 = OFF   01 = ON

The **ModCom** controller is shipped in a G/E mode with Fan in AUTO mode. If your job is G/E with AUTO FAN, no change to this Configuration Menu is required.

To change a configuration if 00 is displayed, press the **UP** button to change the display to 01 or **DN** to display 00. Then hold the **MODE** button until the numbers start to scroll. When the **MODE** button is released, the change is confirmed.



### G/E and HP Configuration

**ModCom** is factory set in the G/E mode. To modify:

- Press **MODE** - 01 is Displayed
- Press **SEL** – Display 00 GE is selected
- Press **UP** – While pressing UP, 01 will be displayed for HP
- Press and hold **MODE** for 3 seconds – While 01 is displayed, press **MODE** again for HP to be configured

### Fan Configuration for ON and AUTO Mode

- Press **MODE** – Hold until 02 is displayed
- Press **SEL** and release **MODE** button – Display 00 indicates FAN AUTO
- Press **MODE** – FAN AUTO is configured
- To confirm FAN AUTO operation, press **MODE** and hold while 02 is displayed. Press **SEL**, and release **MODE** button to review – Display 00 confirms FAN AUTO operation
- Press **UP** – Display 01
- Press **MODE**; hold until 02 is displayed; release – FAN ON is configured
- To confirm FAN ON operation, press **MODE** and hold while 02 is displayed. Press **SEL**, and release **MODE** button to review – Display 01 confirms FAN ON operation

### Configuring the O/B Operation for the Heat Pump Mode

- Press **MODE** – Hold until 03 is displayed
- Press **SEL** – 00 is displayed
- Press **MODE** – “O” is then energized in cooling
- Press **UP** – While making your selection, 01 is displayed
- Press **MODE** – “B” is energized in heating

### Electric Fan Configuration

- Press **MODE** – Hold until 04 is displayed
- Press **SEL** – 00 is displayed
- Press **MODE** – No EE is configured
- Press **UP** – 01 is displayed
- Press **MODE** – EE is configured

### Gas Electric Capacity Control – Cool and Heat Cut-out Temperature Adjustment

The factory setting for the Cool and Heat cut-out temperatures is 45 degrees / 145 degrees. This can easily be changed with the following procedure:

1. **Cool Cut-Out temperature** – Press the **DN** button. “C” will be displayed; then the cut-out temperature.
2. **LOWER** – Press the **DN** button. After the “C” is displayed, continue to hold the **DN** button until the desired temperature is displayed; then release.  
Note: The controller will not change the Cool cut-out lower than 40°.
3. **RAISE** – Press the **DN** button. After “C” is displayed, continue holding the **DN** button and simultaneously press the **UP** button. Hold both buttons until the desired temperature reading is displayed; then release.
4. Press the **DN** button to verify the new cool cut-out temperature.
5. **Heat Cut-Out temperature** – Press and hold the **UP** button; after the “H” is displayed, raise the heat cut-out set point to desired level. To lower the displayed temperature, press **UP** to display it; then release and immediately press the **DN** button.

## ADVANCED MODCOM II CONFIGURATION

### 2<sup>nd</sup> Stage Heat and Cool Cut-In Configuration

The **ModCom** controller is set up at the factory to stage Y2 and W2 cut-in operation based on a 3-minute time delay and supply air temperature. This is done at the Configuration Menu. The cut-in delay is factory set at 03 (3 min). The cut-in temperatures are fixed in the controller program at 57° and higher for Y2 and 120° and lower for W2. The Y2 and W2 cut-in delay sequence can be field adjusted (see below). The time delay is fully adjustable from 3 to 20 minutes.

### Adjust 2<sup>nd</sup> Stage Cut-In Time Delay

1. Hold the **SEL** and **DN** buttons to show SECOND STAGE ON DELAY.
2. To increase the DELAY, hold **SEL** and **DN**, then press **UP** (all 3 buttons simultaneously); then release **SEL** to scroll up.
3. To decrease the DELAY, hold **SEL** and **DN** buttons; release **SEL** button, and continue to press **DN** button. Minimum delay is 3 minutes.
4. Hold **SEL** and **DN** buttons to verify your revised time delay.

### Opposing Call Changeover

The **ModCom** controllers are configured at the factory for Opposing Call Changeover with a time delay setting of 10 minutes. With this configuration, any number of thermostats can make a like active call (heat or cool). During this time, if a single thermostat makes an opposite call, a timer is started at the next poll. This timer starts a time delay operation to allow the initial calling thermostats to satisfy. If the initial active thermostats do not completely satisfy after 10 minutes, the dampers all close; and the controller drops out the HVAC inputs and goes into a 4-minute purge cycle. When the purge cycle times out, the opposing thermostat call is

initiated; and the appropriate HVAC outputs are energized, and the supply damper modulates open. The thermostat with the opposing call must now satisfy before the **ModCom** controller will recognize any of the initially calling thermostats.

The Opposing Call timer is factory adjusted for 10 minutes. However, the delay time can be field adjusted from 5 to 30 minutes or disabled.

To modify the opposing call time delay:

1. Hold **SEL** and **UP** buttons to show OPPOSING CALL DELAY.
2. To increase the DELAY, release **SEL**.
3. To decrease the DELAY, hold **SEL**, **UP** and **DN** simultaneously; then release the **SEL** and **UP** buttons.

### Disable Oppose Call Feature

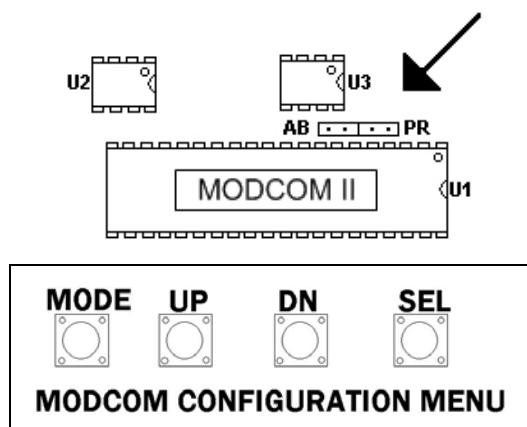
The Opposing Call feature can be disabled by performing the steps above and then releasing the **UP** button when the display indicates 32. With this feature disabled, the **ModCom** controller will operate changeover by majority vote from the zone thermostats.

### Priority Active Heat and Cool Call Operation

The **ModCom** controllers may be configured in the field for majority vote changeover but also to assign multiple votes for selected thermostats to enhance the changeover operation for special requirements. Each thermostat represents one vote for heat or cool operation. A majority of active calls will determine which mode the controller will operate in. With the Priority feature, any thermostat may be assigned one, two or three votes to allow it to have priority to bring a mode changeover more quickly. To keep proper overall temperature control, this priority vote change should be limited to as few zones as possible.

### Priority

Turn off power to the **ModCom** board. A jumper must be installed to connect the two **PR** pins found above the large Micro Controller on the **ModCom** board. After the jumper is installed, turn on the power. The controller is now in a programming mode awaiting your next instructions.



In normal operation each damper thermostat in a system can make one vote for cooling or heating. These votes are tallied, and the majority determines cooling or heating operation.

Priority or extra votes can be added to any thermostat.

When the PR jumper is in place, the following push button and display sequences can be used:

1. Hold the **SEL** button to choose the thermostat to prioritize. The display will scroll through every thermostat number in the system. Be certain you know the thermostat number you want to add or delete Priority. When that stat number is displayed, press the **DN** button and release **SEL**.

2. Press the **DN** button to raise or lower votes for the selected thermostat. The display will show 00, then 01, then 02, and then repeat.
3. Release the **DN** button at 00 for one vote. Release the **DN** button at 01 for two votes. Release the **DN** button at 02 for three votes.
4. Press the **UP** button to review Priority. The display will show each thermostat number followed by the number of votes assigned to that thermostat. All thermostats in the system will be displayed.

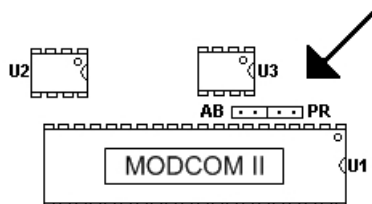
#### To Remove Priority:

1. Press and hold the **UP** and **DN** buttons as the display scrolls through all thermostat numbers to return all thermostats to one vote. Turn off power to the **ModCom** board. Return jumper to 1 pin; then turn power on to resume normal operation.

➔ **WARNING: The PR jumper must be removed to return the system to normal operation. Turn off power on controller, return jumper to 1 pin; then turn power on to resume normal operation.**

#### Air Balance – Force Dampers Open

When performing an air balance on the supply air outlets, the **ModCom** controller provides a unique feature to simplify this procedure. The **ModCom** controller will place all thermostats in a cool call, which will open the dampers 100% and bring on the system blower.



1. Turn off power to the **ModCom** board.
2. A jumper must be installed to connect the two **AB** pins found above the large Micro Controller on the **ModCom** board.
3. After the jumper is installed, turn on the power. The system is now in programming mode, awaiting your next instructions.
4. Hold **SEL** and **UP** buttons to set all stats to 58°, block cooling and start fan. Then initiate your air balance.

**WARNING: Remove AB jumper to restart normal operation. Turn power off and return jumper to 1 pin; then turn power on to resume normal operation.**

#### Default Thermostat Set Point Programming

Global default set points can be established from the **ModCom** controller.

The following procedure will provide a 75C and 70H occupied set point along with Unoccupied 58H and 85C set point for every thermostat in the system. This handy feature minimizes visits to the thermostats. To establish these default set points:

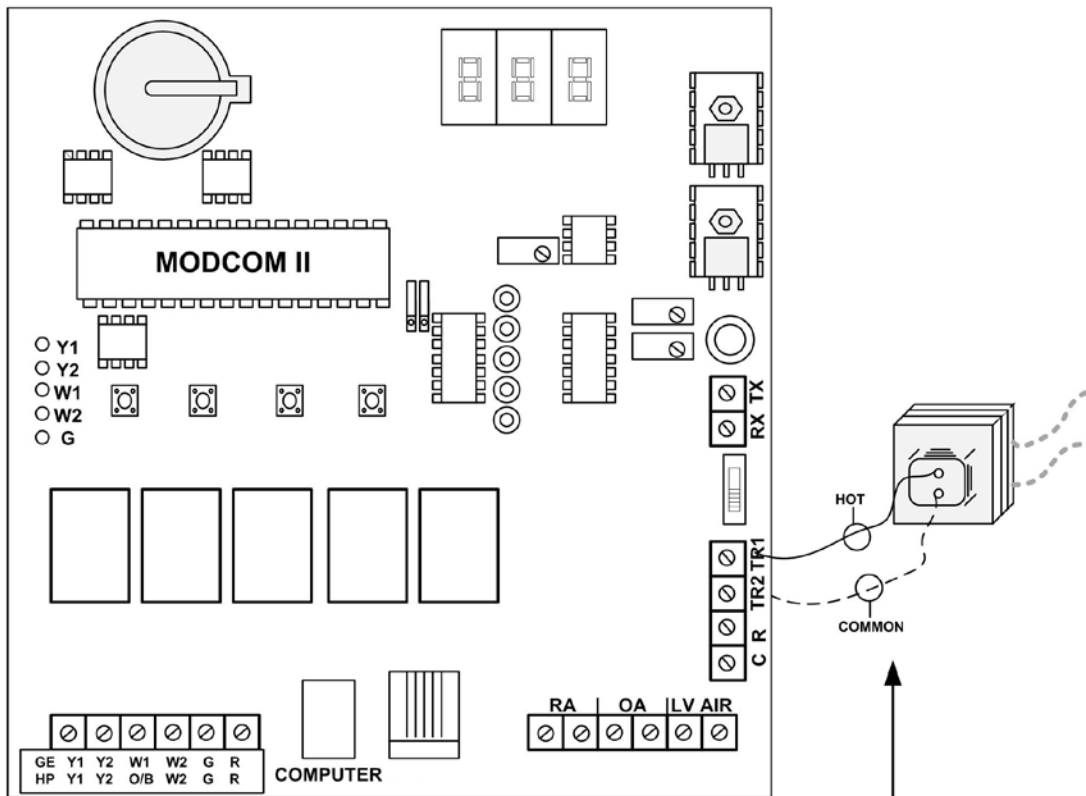
1. Turn off power to the **ModCom** controller. A jumper must be installed to connect the two **AB** pins found above the large Micro Controller on the **ModCom** board. After the jumper is installed, turn power on; system is now in a programming mode awaiting your next instructions.
2. Hold **SEL** and **DN** to set all thermostats to defaults (70, 75, 58 and 85).

**WARNING: Remove AB jumper to return to normal operation. Turn power off, return jumper to 1 pin; then turn power on to resume normal operation.**

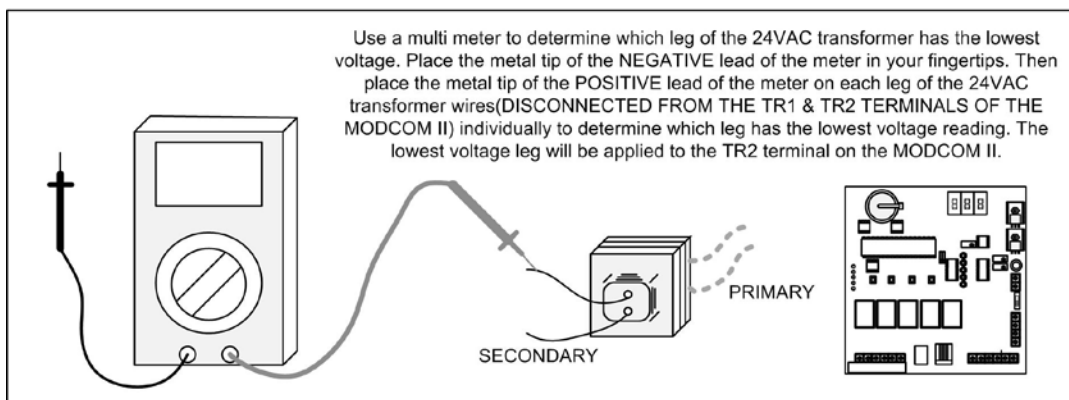
#### Display RA/SA Temperatures

Hold the **UP** and **DN** buttons simultaneously to display RETURN AIR, then LEAVING AIR temperatures. Return Air temperature will flash on the display followed by Supply Air (leaving air temperature) from the unit.

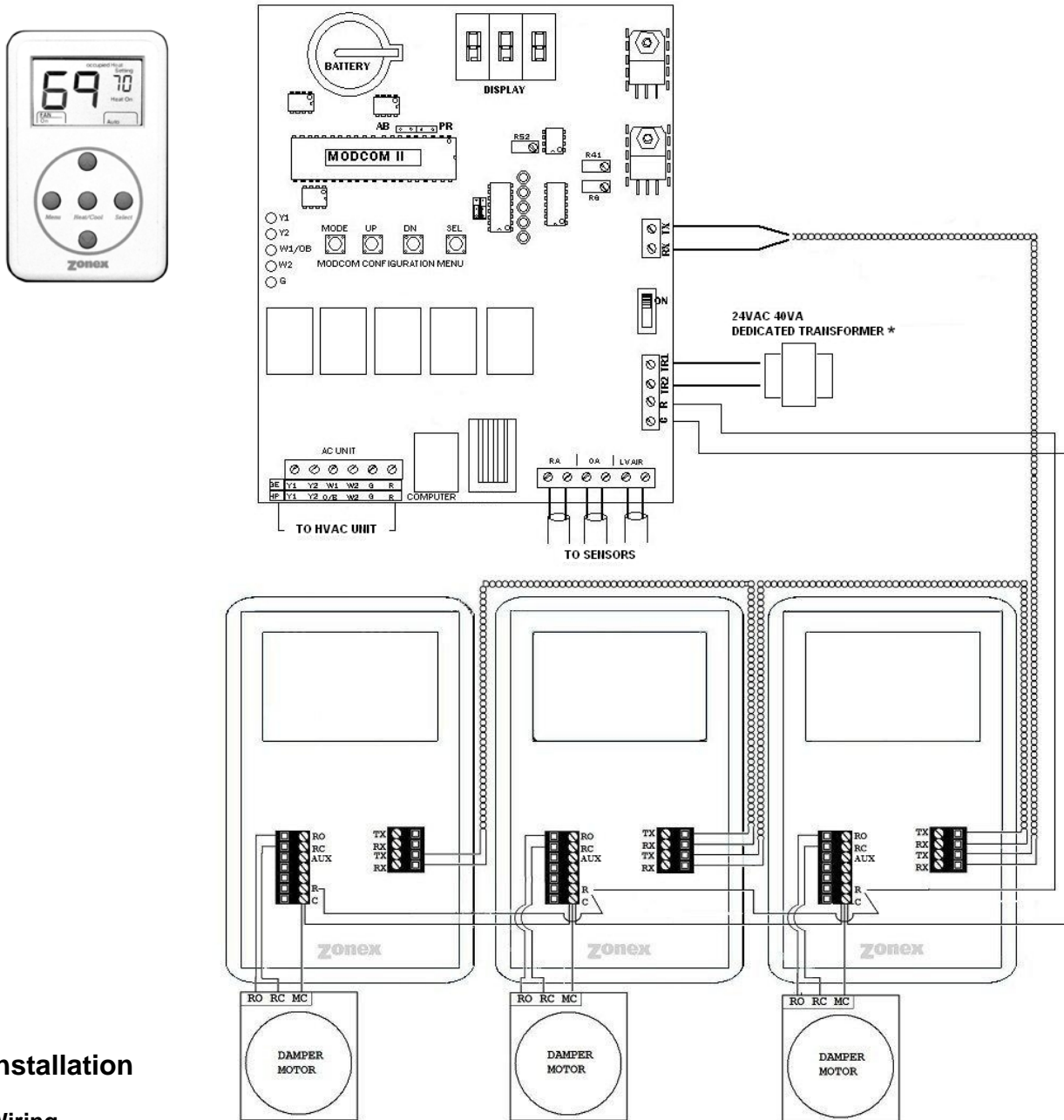
## MODCOM II VOLTAGE POLARITY CHECK



Before installing the 24VAC to the TR1 and TR2 terminals verify which leg is the lowest voltage and apply the lowest voltage leg to the TR2 terminal.



## MODSTAT (ZONE THERMOSTAT)



### Installation

#### Wiring

All 24-volt and communication wiring connections are made to terminal blocks on the thermostat sub-base. The communication terminal block (RX TX/RX TX) is designed as a junction for two sets of 22 ga. solid copper, twisted pair communications cable. The cable should be daisy chained from thermostat to thermostat (**use Belden 8740 unshielded twisted pair**).

1. Install the thermostat sub-base on an interior wall away from direct sunlight, supply air currents, or any heat generating source. Mounting screws and anchors are provided. The sub-base may be installed on a vertical 2x4 electrical box.
2. Connect the control power wires from the **ModStat's** R & C, to the **ModCom**. Verify R & C polarity is the same on each thermostat. **Use 18 ga. thermostat wire**.

3. On the **ModStat**, connect the damper output wires from C-MC, RC and RO to the actuator motor terminals.
4. Connect the RX TX communication wires on the right hand terminal block; there are 2 sets of RX TX terminals to make the daisy chain wiring easier.

**NOTE: The communication wire must be Belden 8740 unshielded twisted pair.**

## CONFIGURATION

### Addressing

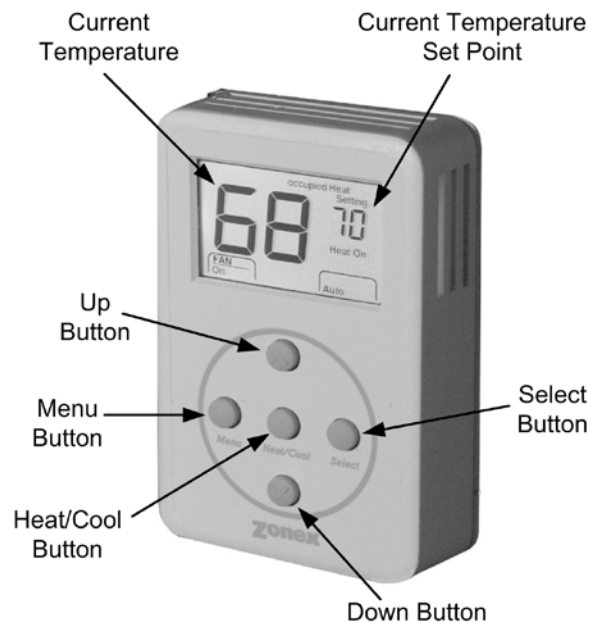
Each thermostat must have a unique address from 1–20 for the **ModCom** controller to identify and communicate with each stat.

1. Press and hold the **MENU** button until you see the system mode display on the lower right begin to change modes; then press and hold the **HEAT/COOL** button with the **MENU** button.
2. When the display shows “Address,” release the **MENU** and **HEAT/COOL** buttons, and press the **UP** or **DN** button until the correct address is displayed in the upper right of the display.
3. After setting the address, the thermostat will automatically go back to normal operation; and the set point temperature will replace the address number just programmed.

### Display Temperature Calibration

Thermostats are calibrated at the factory and should require no further adjustment. However, the display space temperature may be field calibrated by the following procedure:

1. Press and hold the **HEAT/COOL** and **SELECT** buttons together; then press and release the **UP** button to increase the display temperature by one degree.
2. To lower the temperature display, press the **DN** button once after pressing the **HEAT/COOL** and **SELECT** buttons. This makes a 1 degree change. If additional calibration is required, repeat this step.



### Adjusting Set Points

The Heat or Cool set points can be displayed by pressing the **HEAT/COOL** button; the set point will be indicated on the upper right of the display.

**Heat** - If "Heat Setting" is displayed on the top right of the display, simply press the **UP** or **DN** button to change the heat set point. If "Cool Setting" is displayed and you want to change the Heat set point, press the **HEAT/COOL** button twice to change from "Cool Setting" to "Heat Setting". Then press the **UP** or **DN** button to change the set point.

**Cool** - If "Cool Setting" is displayed on the top right of the display, simply press the **UP** or **DN** button to change the cool set point. If "Heat Setting" is displayed and you want to change the Cool set point, press the **HEAT/COOL** button twice to change from "Heat Setting" to "Cool Setting". Then press the **UP** or **DN** button to change the set point.

## Changing Mode

The thermostats are auto changeover, but specific modes may be selected. Auto mode is the default.

**Heat only** – Press and hold the **MENU** button and note the mode display begin to change. Press the **SEL** button when Heat is displayed.

**Emergency Heat** – Press and hold the **MENU** button and note the mode display begin to change. Press the **SEL** button when Emg is displayed.

**Cool only** – Press and hold the **MENU** button and note the mode display begin to change. Press the **SEL** button when Cool is displayed.

**System Off** – Press and hold the **MENU** button and note the mode display begin to change. Press the **SEL** button when Off is displayed.

**Auto mode** – Press and release the **MENU** button.

**Override** - When the thermostat displays "Unoccupied" (top of display), a 2-hour temporary override may be initiated by pressing the **OVERRIDE/SEL** button. When additional override time is required, press the **OVERRIDE/SEL** button again.

**Reheat** - The **ModStat** can be field configured for reheat operation, including Fan Powered Boxes. To set the **ModStat** for Reheat, press and hold the **HEAT/COOL** and **SEL** buttons together, and then press the **MENU** button; release all three buttons and the ° symbol will appear next to the heat and cool set point temperature display.

**NOTE:** An air proving switch must be wired into the AUX output to protect the electric heating devices.

## GENERAL OPERATION

**Ventilation** – No active Heat or Cool calls.

With no active calls, the **ModStat** will open the damper to 50% for ventilation.

**Cool Call** – The **ModStat** will send a signal for demand cooling when the space temperature exceeds the cool set point temperature by 1° . The thermostat will end the active call when the space temperature meets the cool set point.

**Heat Call** – The **ModStat** will send a signal for demand heating when the space temperature drops 1° below the heat set point temperature. If the temperature drops 2° below the heat set point temperature, the AUX output will energize for auxiliary heat. The thermostat will end the active call when the space temperature meets the heat set point.

When configured for Reheat, if the space temperature drops below the heat set point, the **ModStat** will modulate the damper to 40% open. When the temperature drops one more degree, the AUX terminal energizes the duct heat strip. The heat call will terminate when the space temperature reaches the heat set

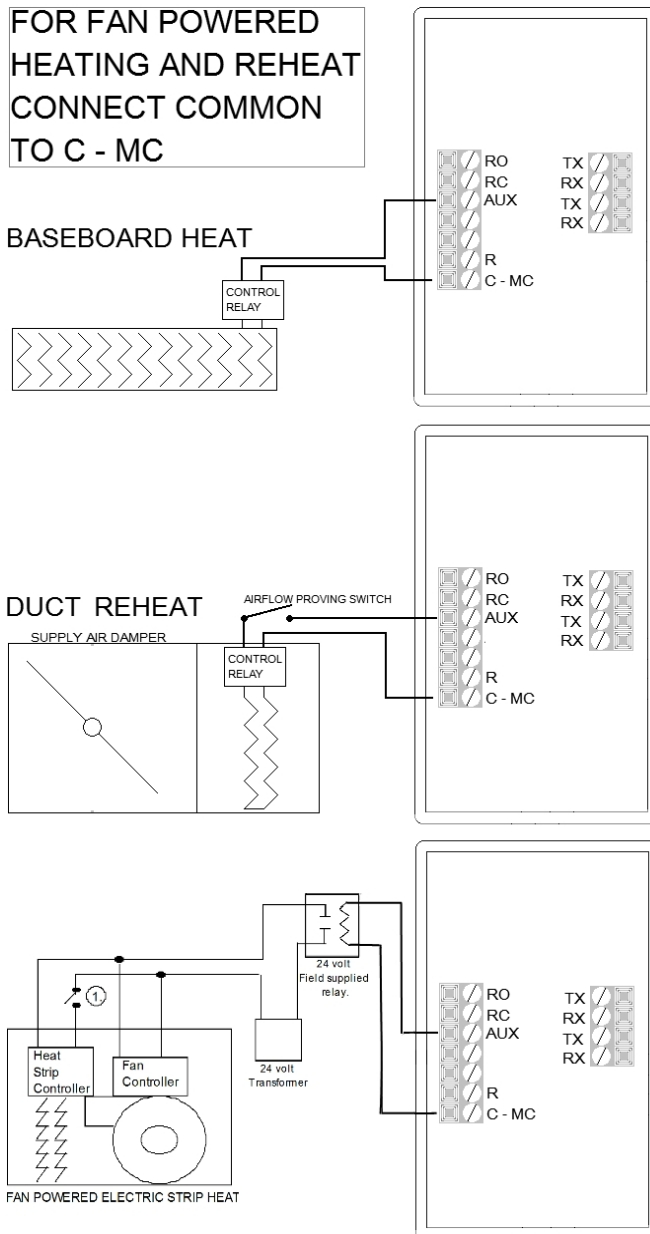


point temperature. The “AUX” output will de-energize, and the damper will modulate closed. If the system goes into the ventilation mode, the damper will then modulate open.

**Reheat** – The **ModStat** can be field configured for reheat operation, including Fan Powered Boxes. To set the ModStat for Reheat, press and hold the Heat/Cool and Select buttons together, and then press the Menu button. Release all three buttons, and the ° symbol will appear next to the heat and cool setpoint temperature display.

**NOTE:** An air proving switch must be wired into the AUX output to protect the electric heating devices.

## SUPPLEMENTAL HEAT APPLICATIONS



Note 1: Sail switch or pressure switch should be used to prove fan operation.

**NOTE:** A larger transformer may be needed to power fan relay and/or heat strip relay.

## MODSTAT



## SUBBASE

### ModStat Terminal Designations

**TX** – Data transmit {twisted pair}

**RX** – Data receive

**AUX** – Reheat/AUX Heat Fan

**RO** – Run Open, damper

**RC** – Run Closed, damper {18 ga. stat wire}

**R** – 24vac power input

**C-MC** – 24vac power common

# DIGICOM / DIGIHP THERMOSTATS

## DESCRIPTION

The Zonex Systems **DIGICOM** (2H, 2C) and **DIGIHP** (3H, 2C) are microprocessor based, auto changeover, stand-alone thermostats used to control stand alone units with no dampers in the system. The DIGICOM is the Gas Electric version and has two-stage heat / cool outputs with selectable fan operation. The DIGIHP Heat Pump thermostats have two-stage cool and three-stage heat outputs with selectable fan. The DIGICOM and DIGIHP thermostats have a large, easy-to-read LCD display with a distinctive grey backlight. The display backlight is continuously illuminated in the Occupied mode and goes off in the Unoccupied mode.



The DIGICOM and DIGIHP are very easy to configure through the system program or to make manual adjustments using the buttons located on the front cover.

These thermostats feature an onboard thermistor for precise temperature measurement. In the event of power loss, the Heat and Cool setpoints are stored in a non-volatile memory, without the need for battery backup.

The space ambient temperature is continually displayed with large, easy-to-read numbers. The DIGICOM temperature display range is 45° to 95° F., and the DIGIHP temperature display range is 55° to 95° F. Fan Mode, Heat or Cool setpoints and operation modes are all indicated on the display.

Programmed setpoints can be manually adjusted at the thermostat or electronically locked through the system program to provide limited manual setpoint adjustment. Two-hour override is provided for after-hours temporary operation with a touch of a button.

## INSTALLATION

### Thermostat and terminal base

1. The thermostat is to be installed on the interior wall, away from drafts, supply air currents and direct sunlight or any heat generating source.
2. To remove the thermostat cover, grasp the cover at the top and pull straight off; do not pivot the cover from the base.
3. Install the thermostat terminal base to the wall using the provided anchors and screws. The thermostat can also be mounted on a 2x4 electrical box using two #6-32" screws.

### Wiring

The Zonex Systems DIGICOM and DIGIHP thermostats have been specifically designed to make wall mounting and wire connections very easy. The thermostat terminal base has two separate terminal blocks: the left side terminal block is for the 24vac control circuits, and the right side terminal block is for the RX TX communication circuits. There are two sets of RX TX terminals on the base to make daisy chain wiring from device to device straightforward and simple.

## Wiring (Continued)

1. Use minimum 18-gauge AWG thermostat wire for the 24vac control circuits. The load on these circuits must not exceed 1 amp. The voltage range on R and C must not exceed 28vac. Check Polarity before applying the transformer wire to R and C. Refer to the Polarity Check diagram on Page 24.
2. Connect the communication wires to the RX TX terminals. There are 2 sets of RX TX terminals for “daisy chain” installation of this circuit. The communication wire specification is twisted pair (**Belden 8740**) or shielded twisted pair wire (**Belden 8450**).

NOTE: When using shielded twisted pair wire (**Belden 8450**), just connect the shield conductors together, as there is no electrical connection on the thermostat base terminals. The shield will be landed on the **ModCom** controller on the G or TR2 terminal.

### DIGICOM

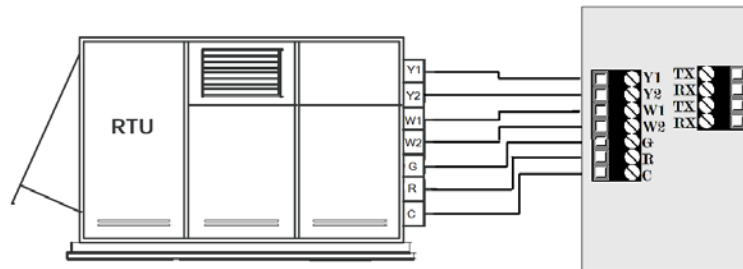


Fig. 1

### DIGIHP

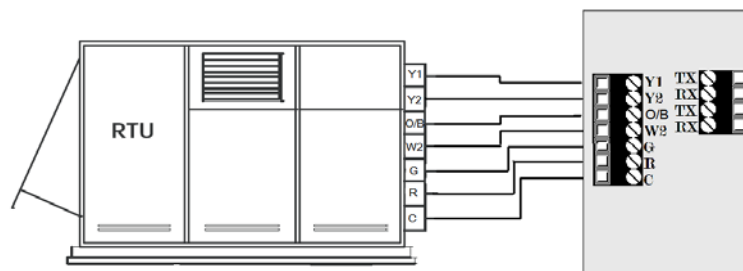


Fig. 2

### Blower Fan Relay

For electrical heat applications, which require a fan output on a call for heat, see Fig. 3.

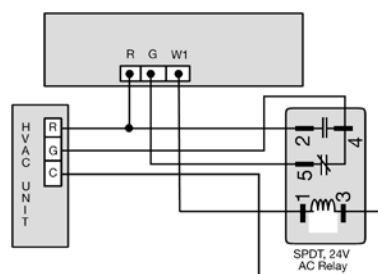


Fig. 3

## Configuration

1. Set the unique address for each thermostat from 01 to 20.
2. Press and hold the **Menu** button until you see the system mode display on the lower right begin to scroll and change modes; then press and hold the **Heat/Cool** button with the **Menu** button.
3. When the display shows “address” and the setpoint temperature changes to the address number, press the **UP** or **DN** button to raise or lower the number.

## MANUAL ADJUSTMENTS

### Heat and Cool Setpoint Display

Press the **Heat/Cool** button to display the Heat or Cool setpoint temperatures.

### Temperature Setpoints

#### COOL Setpoint

1. Press the **Heat/Cool** button to display the Cool setpoint on the upper right.
2. Press the **UP** or **DN** buttons to change the Cool setpoint.

#### HEAT Setpoint

1. Press the **Heat/Cool** button to display the Heat setpoint on the upper right.
2. Press the **UP** or **DN** buttons to change the Heat setpoint temperature.



#### FAN Mode

To change the FAN operation to AUTO or On, press the **UP** and **DN** buttons together once to toggle fan operation.

#### HVAC System Mode

To select Heat, Cool, Auto, Emergency Heat (HP only) or OFF, press and hold the **Menu** button; and when the desired mode is displayed, press and hold the **Select** button; then release both to confirm mode.

#### Override

When the system is in the Unoccupied mode, the thermostat provides a 2-hour override for after-hours system operation. To select the 2-hour override, press the **Select** button and note “Override” indicated on the display, along with the backlight coming on. When additional override is required, press the **Select** button again.

#### Calibration

When re-calibration is required, press and hold the **Heat/Cool** and **Select** buttons simultaneously (the screen will flash). Then press the **UP** button once to increase temperature 1° , or press the **DN** button once to decrease the temperature 1° . If additional calibration is required, repeat this step.

#### Reversing Valve Mode – Heating

**DIGIHP** (O&B) is factory set at “O” and can be field configured for “B” reversing valve operation. For “B” mode reversing valve (reversing valve energized in the heat mode), press and hold the **Heat/Cool** and **Select** buttons; then press and release the **Menu** button once. Release the **Heat/Cool** and **Select** buttons. The ° symbol next to the set point display should disappear. (To set from “B” to “O”, reverse the procedure.)

## THERMOSTAT OPERATION

### Display

The grey display backlight is constantly illuminated in the Occupied mode. The display backlight goes off when in the Unoccupied mode. When in the Unoccupied mode, if any button is pressed, the backlight will illuminate for 5 seconds. If the thermostat is placed in the override mode, the backlight will illuminate until the 2 hours times out. To terminate override, press the **Select** button again.

**COOL – DIGICOM / DIGIHP:** The thermostat will make a Y1 cool call when the space temperature rises 1° above the cool setpoint. Y2 will energize when the space temperature rises 2° above the cool setpoint. When the room temperature is less than 2° above the cool setpoint, Y2 de-energizes. Y1 de-energizes at setpoint. O or B is energized for the reversing valve circuit, depending on configuration. The G circuit is energized for fan.

**HEAT – DIGICOM:** The thermostat will make a W1 heat call when the space temperature is 1 degree below the heat setpoint. W2 will energize when the space temperature is 2 degrees below the heat setpoint. When the room temperature rises to within 2 degrees of the heat setpoint, W2 de-energizes. W1 de-energizes at setpoint.

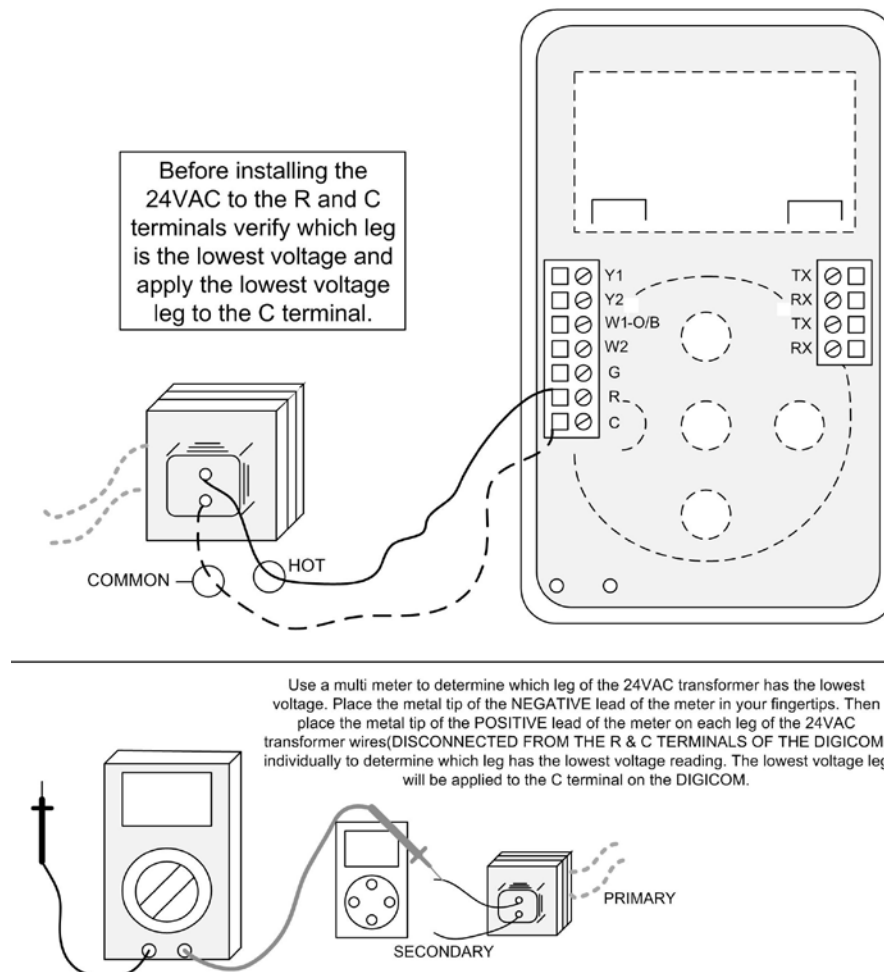
**NOTE:** The “G” fan circuit on the DIGICOM thermostat is not energized in the Heat mode unless the fan is set for ON operation.

**HEAT – DIGIHP:** The thermostat will make a Y1 heat call when the space temperature is 1 degree below the heat setpoint. Y2 will energize when the space temperature is 2 degrees below the heat setpoint. E (aux heat) will energize when the space temperature is 3 degrees below setpoint. When the room temperature rises to within 2 degrees of the heat setpoint, E (aux heat) de-energizes. When the room temperature rises to within 1 degree, Y2 de-energizes. Y1 de-energizes at setpoint.

**Emergency Heat – DIGIHP:** When Emergency Heat is selected on the DIGIHP thermostat on a call for heat, there is an output signal on “E” for backup heat and “G” for the fan. The compressor circuits “Y1” and “Y2” are locked out during heat calls until Auto, Heat or Cool mode is selected. The thermostat display will indicate when Emergency Heat has been selected.

**DIGICOM – FAN** operation for electric heat applications: A pilot relay may be required to energize the fan for heat operation on electric heat applications. This relay is a 24vac coil – SPST and is field supplied. The coil is energized from W1 and C from the **DIGICOM** thermostat terminal base.

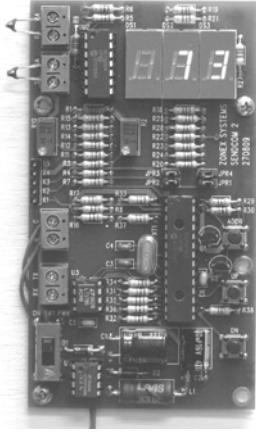
#### VOLTAGE POLARITY CHECK ON DIGICOM / DIGIHP



# SENDCOM

## Communicating Duct Temperature Sensor

### Installation Instructions



#### **Description**

The **SENDCOM** is a microprocessor based, communicating air temperature sensor for stand alone HVAC systems. Each stand alone HVAC system requires a SENDCOM to display the Supply and Return temperature for that particular system. The SENDCOM is designed to be installed on the supply duct with the remote Return Air sensor installed on the return duct or plenum. The SENDCOM uses a unique address number corresponding to the thermostat controlling the HVAC system but does not take up an address point on the Command Center.

#### **Mounting Instructions**

Mount the SENDCOM device in an interior location with the provided sheet metal screws. Drill a 1/4" hole in the supply trunk, before the bypass damper take-off. Insert the Supply Air temperature sensor (LAT) into the 1/4" hole and secure the mounting base with the provided sheet metal screws.

Drill a 1/4" hole in the Return duct upstream of the bypass take-off, and mount the Return Air sensor (LAT) the same way the Supply sensor was installed. See *Fig 1*

#### **Wiring**

Use standard 18 AWG thermostat wire for the 24vac R & C connections. Thermostat wire may also be used to extend the 9' air sensor leads. The LAT sensors do not require a shield to be connected.

Use twisted pair or shielded twisted pair communication wire for the RX TX connections. **NOTE:** The RX TX communication wire is not to be run with any ac voltage wiring in conduit or strapped to the outside of conduit. If there is a potential for electrical interference, use shielded twisted pair communication wire (Belden 8450).

The RX and TX terminals can be tied into the communication bus at any location within the communication circuit.

Multiple SENDCOM installations can have their RX TX bus daisy chained together and terminated at any RX TX location within the link. This can be at any DIGICOM thermostat or at the Command Center.

The SENDCOM requires 24 – 28vac, which can be provided by a dedicated transformer or the HVAC system control transformer. See *Fig 2*

Check polarity before applying the transformer wire to R & C. (Refer to the Polarity Check Diagram on Page 29).

Connect the Return and Supply air sensors (LAT) to the SENDCOM RA and SA terminals. No shield is required. See *Fig 2*

#### **Addressing**

Each SENDCOM must be addressed to the corresponding stand alone thermostat. Determine the thermostat address to which the SENDCOM is applied and add 70 to that address. Press and hold the **ADR** button, and then press the **UP** or **DN** button to raise or lower the displayed address number. See *Fig 3*

## Temperature Display and Calibration

When the SENDCOM is powered up, the Supply air temperature is displayed. To display the Return air temperature, press and hold the **UP** and **DN** buttons. For temperature display on the computer, see Page 44, Fig. 17.

The SENDCOM comes from the factory fully calibrated. Should field calibration be required, adjust the **R2** potentiometer for Supply air. For return air calibration, press and hold the **UP** and **DN** buttons and adjust the **R10** potentiometer until the correct Return air temperature is displayed. Release the **UP** and **DN** buttons. Calibration is complete.

Fig. 1

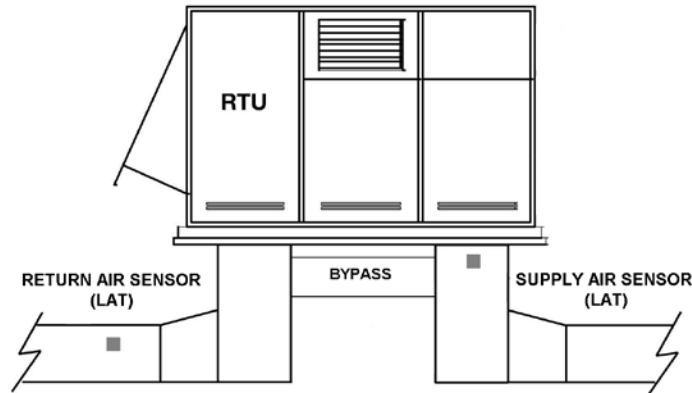
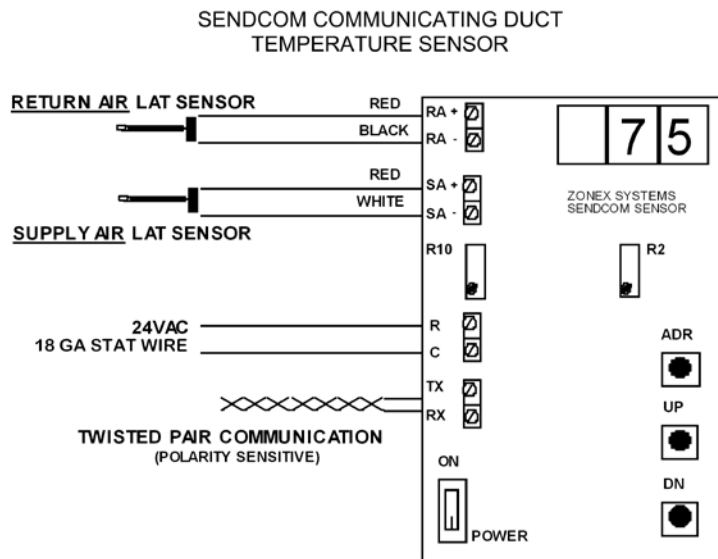


Fig. 2



## Terminal Functions

TX- Data transmit	RA - Return Sensor input
RX- Data receive	RA - Return Sensor common
C - 24vac power common	SA - Supply Sensor input
R - 24vac power input	SA - Supply Sensor common

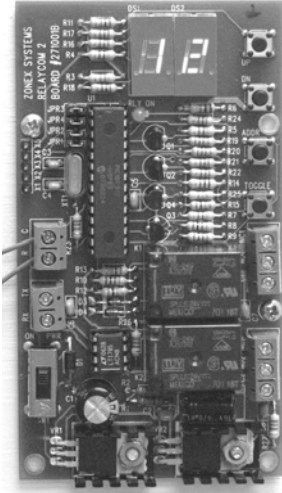
Thermostat Address	SENDCOM	
	Tens	Ones
1	7	1
2	7	2
3	7	3
4	7	4
5	7	5
6	7	6
7	7	7
8	7	8
9	7	9
10	8	0
11	8	1
12	8	2
13	8	3
14	8	4
15	8	5
16	8	6
17	8	7
18	8	8
19	8	9
20	9	0

Fig. 3

# RLYCOM

## Communicating Relay Module

### Installation Instructions



#### Description

The Zonex Systems RLYCOM is a communicating relay module, which provides programmed ON and OFF schedules for auxiliary devices such as blowers, fans, lighting, etc. As with the communicating thermostats, the **ModCom** Schedule program provides up to 4 Occupied – Unoccupied events per day for each RLYCOM, including vacation days. The control status of the RLYCOM is displayed on the Review screen of the **ModCom** program.

The RLYCOM consists of 2 SPDT relays for controlling 24vac circuits. Power for the RLYCOM is provided by any 24vac source except from the **ModCom**.

The RLYCOM requires a unique address from 01 to 20. Communication is through the RS-485 twisted pair or shielded twisted pair control wire.

#### Installation

1. Mount the RLYCOM in a dry, protected atmosphere, not subject to the elements.
2. The RLYCOM can be powered by any dedicated 24vac source except from the **ModCom**. The 24vac is connected to "R"&"C". Check the polarity before applying the transformer wire to R & C. (Refer to the Polarity Check Diagram on Page 29.)
3. Connect the communications wires to RX & TX. The communication wire must be run separately from any other ac voltage, and note the polarity.
4. Connect the output wires to the SPDT relays as required.
5. The RLYCOM must have a unique address from 01 to 20.
6. Set the address for the RLYCOM by pressing the ADDR button and then the UP or DN buttons. The LED display will indicate the address number selected.
7. The relay outputs may be energized manually by pressing the TOGGLE button. The display will change to 00, then the address number. Press the TOGGLE again and the display will revert to normal, address only. Red LED illuminated is Occupied (energized) mode.
8. Verify communication from the Review screen on the **ModCom** program.

#### Operation

When the RLYCOM is in the Occupied mode, the on-board relays are energized. In the Unoccupied mode, the relays are de-energized. The mode status is displayed on the Review screen of the **ModCom** program, and on the RLYCOM circuit board. On the **ModCom** program, the RLYCOM is displayed with a row of "0"s. The Occupied mode is displayed with a RED "0" in the Unoccupied Heat column. The Unoccupied mode is displayed with a BLUE "0" in the Unoccupied Cool column. The mode is also displayed on the RLYCOM circuit board with the RED PWR LED. When the LED is illuminated, the device is in the Occupied mode. When the LED is OFF, the device is in the Unoccupied mode. The mode can be changed manually at the RLYCOM by pressing the TOGGLE button. The mode can also be changed from the **ModCom** program on the System tab.

NOTE: The SPDT relay outputs are pilot duty dry contacts rated for a maximum load of 2 amps on 24vac circuits only. Additional pilot relays may be required for proper circuit control.



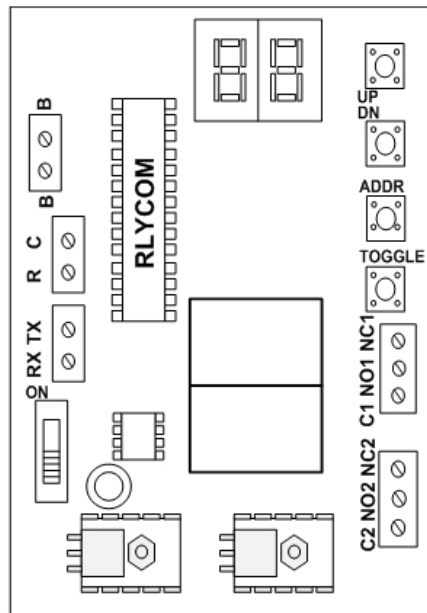
## Ordering Information

<u>Part No.</u>	<u>Description</u>
-----------------	--------------------

<b>RLYCOM</b>	Communicating relay module
---------------	----------------------------

**Note:** Each **RLYCOM** will reduce by (1) the quantity of thermostats available from the Command Center.

## Terminal Functions



R - 24vac power  
C - 24vac common  
TX - Data transmit  
RX - Data receive  
C2 - K2 relay common terminal  
NO2 - K2 normally open terminal  
NC2 - K2 normally closed terminal  
C1 - K1 common terminal  
NO1 - K1 normally open terminal  
NC1 - K1 normally closed terminal  
TOGGLE - Manual mode test  
ON - Power Switch

## Technical Data

### **Electrical**

**Supply Voltage:** 24vac

**Power Consumption:** 4 VA maximum

**Input:** 24vac

**Output:** 2 – SPDT dry contacts, 2A @ 24vac

**Communication:** RS-485

**Comm link maximum length:** 4,000 ft.

### **General**

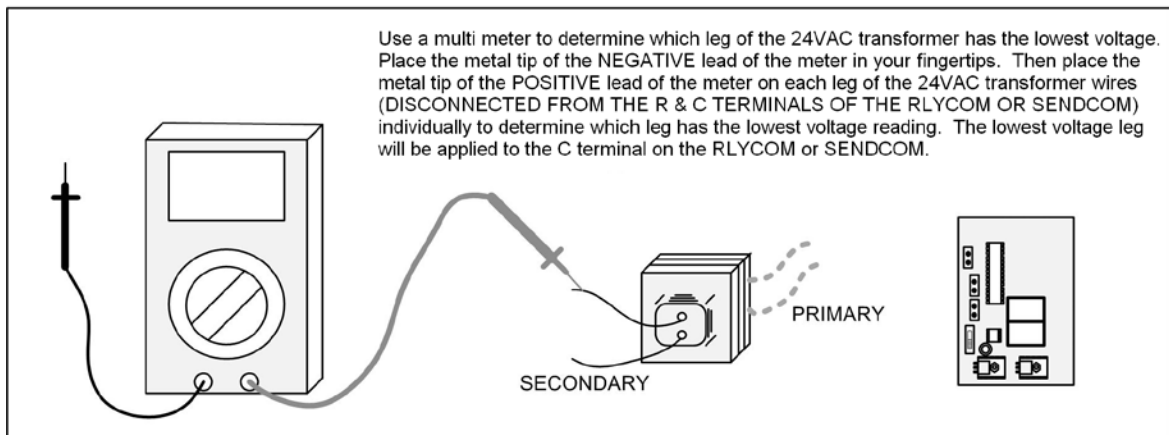
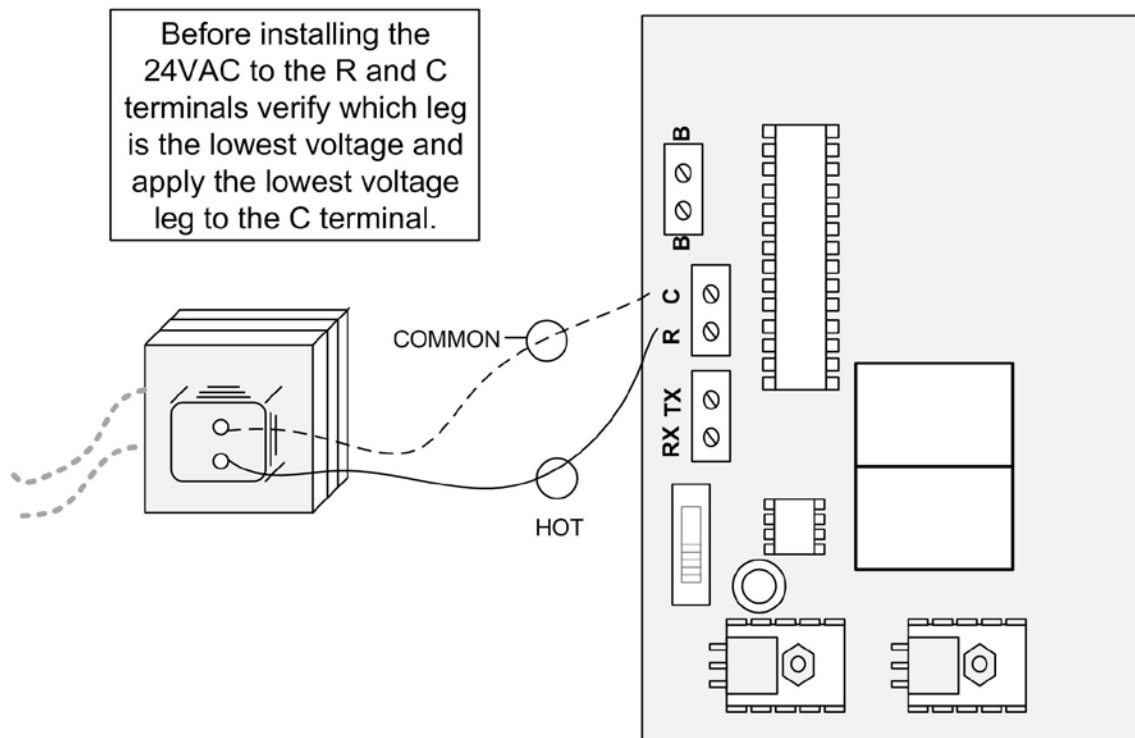
**Operating temperature:** 35° to 130° F (2° to 54° C)

**Operating humidity:** 5% to 95% non-condensing

**Storage temperature:** 0° to 150° F (-18° to 66° C)

**Galvanized Metal Enclosure** 4½" H x 5" W x 1½" D

## VOLTAGE POLARITY CHECK ON RLYCOM AND SENDCOM



## ZONE DAMPERS

Zonex Systems zone dampers are used in cooling/heating systems to provide room by room zone control. The damper is provided with a factory mounted actuator. Each zone damper is controlled by a zone thermostat. More than one damper can be controlled by one zone thermostat. Use this table to determine which zone dampers to use.

DAMPER MODEL	MAXIMUM DIFFERENTIAL PRESSURE	MAXIMUM SYSTEM SIZE	MAXIMUM DUCT SIZE
<b>STMPD</b> Round Med. Pressure	1.75"	Any Size	18"
<b>STMRTD</b> Rect. Med. Pressure	1"	7.5 Tons	24"W x 20"H
<b>STCD</b> Rect. Heavy Duty	1.75"	Any Size	48"W x 48"H
<b>D-FUSER</b>	0.1"	Any Size	10"

Maximum Differential Pressure refers to the maximum static pressure drop in inches of water column between the input (upstream) of the zone damper and the output (downstream) when the damper is closed.

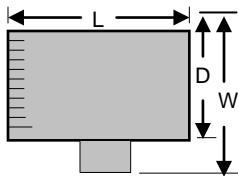
### ROUND MEDIUM PRESSURE ZONE DAMPERS

Zonex Systems round medium pressure zone dampers are recommended for systems with a maximum differential static pressure up to 1.75". This modulating power open/power close damper is manufactured from 20-22 gauge galvanized steel with rolled-in stiffening beads for superior rigidity. Mechanical minimum and maximum set stops are provided and are easily adjustable. The damper is elliptical, which allows the airflow to be tracked linearly. The damper pipe is furnished with one crimped end and one straight end for easy installation. Do not install damper in an inverted position. A hat section supports a reversing 24vac, 60Hz, 2 VA motor. A magnetic clutch allows for continuous power to the motor and longer motor life. Motor drive time from full open to full close is 90 seconds.



**MEDIUM PRESSURE (STMPD)**

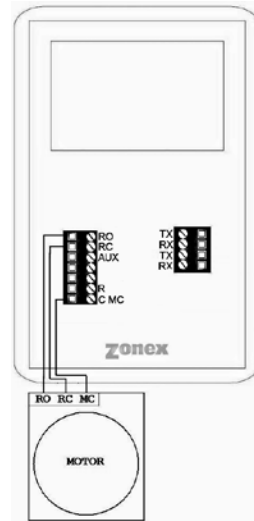
### ROUND MEDIUM PRESSURE DAMPER PART NUMBERS AND SIZES



#### ROUND DIMENSIONAL DATA

PART #	SIZE	D	L	W
STMPD06	6	6"	10"	9"
STMPD08	8	8"	10"	11"
STMPD10	10	10"	12"	13"
STMPD12	12	12"	14"	15"
STMPD14	14	14"	16"	17"
STMPD16	16	16"	18"	19"
STMPD18	18	18"	20"	21"

#### MODSTAT



**DAMPER TO  
MODSTAT  
WIRING**

### TYPICAL ROUND CAPACITIES

These air quantities were derived from a duct sizing chart 0.1" friction loss per 100' of duct. All CFMs listed are approximate. For accurate selection, use duct sizing table or device.

DUCT DIAMETER	NOMINAL CFM	DUCT VELOCITY FPM	DAMPER $\Delta P$ " WC
6"	110	540	.014
8"	250	700	.015
10"	410	750	.015
12"	660	850	.022
14"	1000	925	.035
16"	1450	1070	.036
18"	2000	1100	.036

## RECTANGULAR ZONE DAMPERS

The rectangular zone dampers are available in either medium pressure or heavy duty. For systems under 7.5 tons, use medium pressure dampers. For systems 7.5 tons or over, use heavy duty dampers. Motor drive time open and close is 90 seconds.

### RECTANGULAR MEDIUM PRESSURE ZONE DAMPERS (STMRTD)

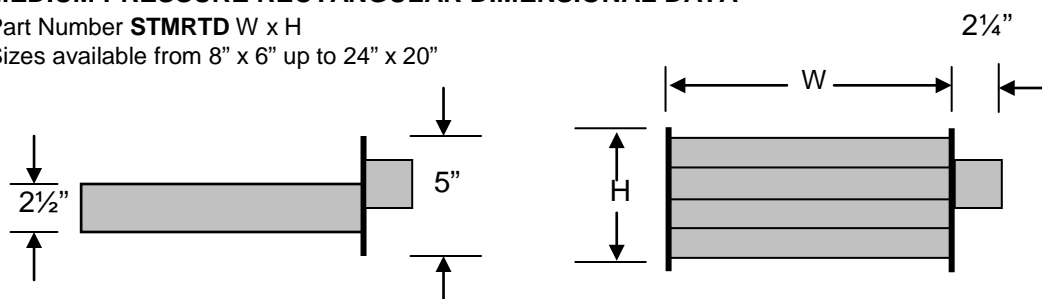
Zonex Systems rectangular medium pressure dampers are recommended for systems under 7.5 tons with a maximum differential static pressure of 1". These are fully modulating, power open, power close dampers. They are constructed from heavy duty aluminum and stainless steel. The damper is an opposed blade type that slips into a 3¼-inch wide cutout in the existing duct and attaches with screws via a duct mounting plate. The duct mounting plate is 5 inches wide. A hat section supports a reversing 24vac, 60Hz, 2 VA motor. A magnetic clutch allows for continuous power to the motor and longer motor life. Two set screws connect the motor to the damper shaft, allowing quick motor replacement if necessary. Motor drive time from full open to full close is 90 seconds.



### MEDIUM PRESSURE RECTANGULAR DIMENSIONAL DATA

Part Number **STMRTD** W x H

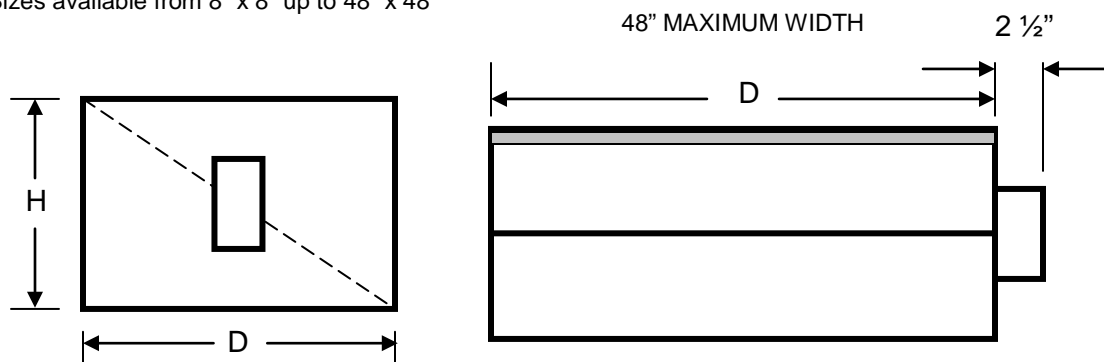
Sizes available from 8" x 6" up to 24" x 20"



### HEAVY DUTY RECTANGULAR DIMENSIONAL DATA

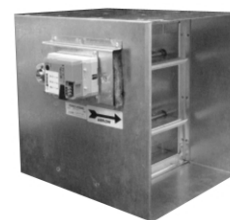
Part Number **STCD** W x H

Sizes available from 8" x 8" up to 48" x 48"



### RECTANGULAR HEAVY DUTY ZONE DAMPERS (STCD)

Zonex Systems rectangular heavy duty dampers are recommended for systems 7.5 tons or larger with a maximum differential static pressure of 1.75". These are fully modulating, power open / power close dampers made of 20 gauge "snaplock" steel frame with S & Drive duct connections. Allow a 16" gap in the duct for the damper. Formed steel blade stops incorporate a gasket for quiet operation and improved structural rigidity. Rectangular dampers under 10" in height incorporate a single blade design. Dampers 10" or over use opposed blade design. A full stall motor, drawing 2 VA, drives the motor from full open to full close in 90 seconds.



## RECTANGULAR DAMPER SELECTION

Rectangular Damper Capacities\*

		WIDTH IN INCHES												
HEIGHT IN INCHES		8	10	12	14	16	18	20	22	24	26	28	30	32
	8	300	400	500	610	710	820	925	1050	1175	1250	1400	1500	1600
	10	400	540	680	825	975	1125	1300	1400	1590	1750	1975	2100	2175
	12	500	680	850	1000	1200	1400	1600	1850	2000	2300	2550	2700	2850
	14	610	825	1000	1250	1500	1750	2000	2250	2500	2900	3150	3425	3625
	16	710	975	1200	1500	1800	2100	2450	2700	3000	3600	3950	4200	4425
	18	820	1125	1400	1750	2100	2500	2850	3080	3600	4400	4600	4950	5100
	20	925	1300	1600	2000	2450	2850	3400	3775	4000	4800	5500	5700	6000
	22	1050	1400	1850	2250	2700	3080	3775	4300	4800	5100	6000	6350	6800
	24	1175	1590	2000	2500	3000	3600	4000	4800	5400	6100	7000	7150	7600
	26	1250	1750	2300	2900	3600	4400	4800	5100	6100	6700	7800	8400	8900
	28	1400	1975	2550	3150	3950	4600	5500	6000	7000	7800	8400	9150	10000
	30	1500	2100	2700	3425	4200	4950	5700	6350	7150	8400	9150	10000	11000
	32	1600	2175	2850	3625	4425	5100	6000	6800	7600	8900	10000	11000	11250

\* These air quantities were derived from duct sizing chart .1" friction loss per 100' of duct.

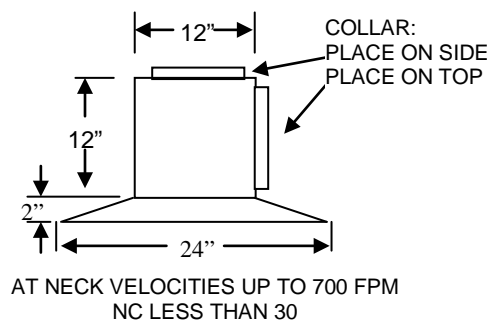
All CFMs listed are approximate.

For accurate selection use duct sizing table or device.

## D-FUSER ZONE DAMPER



Zonex Systems D-Fuser is a combination zone damper and diffuser. It mounts in a standard 2' x 2' T-bar ceiling opening, providing for simple installation and easy maintenance access. The D-Fuser is a cone shaped fluidic nozzle with a platen that modulates up and down to control air flow. As the platen moves up, the air volume is reduced; but the air velocity and throw remain constant. This keeps the air hugging the ceiling, which maximizes room air mixing and minimizes the "waterfall" effect. The D-Fuser is a fully modulating power open / power close damper using a 24vac 60Hz 2 VA motor. Motor drive time from full open to full close is 90 seconds. The D-Fuser connects to round duct either on the side or top. Collars are available for 6", 7", 8", 9" and 10" duct.



6"	Neck Vel	400	500	600	700	800	900
	ΔP	0.011	0.016	0.023	0.035	0.04	0.055
	CFM	80	98	120	135	157	176
	Throw 50 FPM	4'	4'	5'	6'	6'	7'
8"	Neck Vel	400	500	600	700	800	900
	ΔP	0.019	0.03	0.045	0.056	0.041	0.093
	CFM	140	170	207	247	280	315
	Throw 50 PM	5'	6'	7'	8'	9'	10'
10"	Neck Vel	400	500	600	700	800	900
	ΔP	0.029	0.045	0.066	0.09	0.12	0.146
	CFM	218	273	330	382	438	497
	Throw 50 FPM	6'	8'	9'	10'	11'	12'

## SIZING ZONE DAMPERS

If the ductwork already exists, simply size the damper to fit the ductwork. For new systems or retrofit jobs:

- Determine CFM from heat gain or loss calculations.
- Select damper size using either the round capacities chart, the rectangular capacities chart or by using a duct sizing table or calculator.
- Select a Zonex Systems damper to fit the duct size selected for that zone.

Make sure your zone dampers match the type specified in the table showing Maximum Differential Pressure.

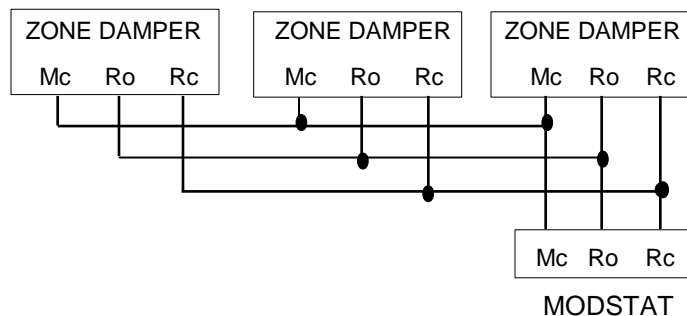
## INSTALLATION NOTES

- Do not exceed 700 FPM in a register/diffuser branch duct.
- If a damper is installed within 3 feet of a register/diffuser, install sound attenuating flex duct between damper and outlet.
- Zone dampers should be preceded by 2' – 4' of straight pipe where possible.
- In attic installations and high humidity areas, the Zonex Systems damper should be insulated along with the ductwork. The hat section on the round damper is delivered with insulation between the hat section and pipe. Therefore, insulation should be applied to the round pipe and be butted against the hat section (do not insulate the motor). The motor generates enough heat so that no condensation will develop on it.
- Remember to allow a 16" gap in the duct for heavy duty rectangular dampers.
- Medium pressure rectangular dampers slide into a 3¼" wide cutout in the side of the preexisting ductwork.
- Minimum open and close positioning is field adjustable on the actuator. The damper is shipped from the factory to close 100%.

NOTE: Dampers should not be installed with motor upside down in the 6:00 position.

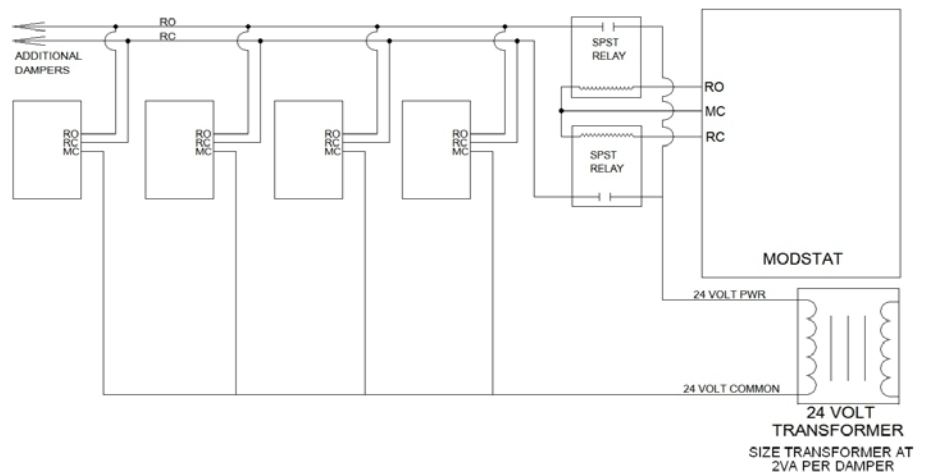
## SLAVING UP TO THREE ZONE DAMPERS

Up to three dampers can be directly controlled by one thermostat. To wire two to three zone dampers to one thermostat, use the following diagram shown. Remember to size the damper power transformer for the total number of zone dampers. Each actuator draws 2 VA.



## SLAVING MORE THAN THREE ZONE DAMPERS

Use the following diagram when a thermostat will be controlling more than three zone dampers. Use an additional 24V transformer sized at 2VA per damper to power the slaved dampers.

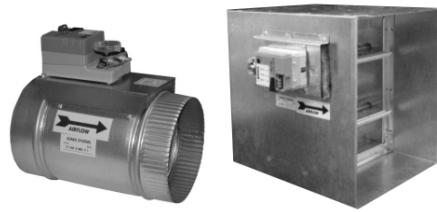


# BYPASS DAMPERS – ELECTRONIC

## ELECTRONIC BYPASS DAMPERS

Bypass dampers are used to provide constant air delivery through the air handling unit. This is done by bypassing excess air from the supply duct back to the return duct. As a zone is satisfied, its zone damper closes. When this happens, the bypass damper opens just enough to bypass the excess air. This will control static pressure and noise at the diffusers.

The Electronic Bypass Damper is used on any size system over 5 tons. The damper can be round (**STBP**) or rectangular (**STCDBP**) with integrated static pressure control; and multiple dampers can be slaved together.



## SIZING ELECTRONIC BYPASS DAMPERS

The bypass damper is to be sized for the total system CFM @ 1500 FPM. System CFM should be calculated at 400 CFM per ton.

**Example:** A 5-ton system is rated at 2000 CFM ( $5 \times 400 = 2000$ ). When calculated at 1500 FPM, the bypass damper should be 16". Never undersize the bypass damper.

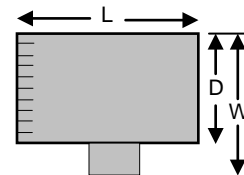
## ROUND BYPASS SELECTION TABLE

Diameter	CFM	PART #	SIZE	D	L	W
8"	560	STBP08	8	8"	10"	11"
10"	900	STBP10	10	10"	12"	13"
12"	1250	STBP12	12	12"	14"	15"
14"	1700	STBP14	14	14"	16"	17"
16"	2200	STBP16	16	16"	18"	19"
18"	2600	STBP18	18	18"	20"	21"

## ROUND BYPASS DAMPER SELECTION

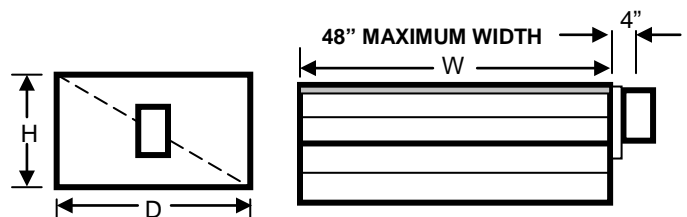
The Zonex Systems **STBP** damper is used for round bypass applications. When you know the bypass CFM requirements, use the ROUND BYPASS SELECTION TABLE to confirm the round damper size.

NOTE: Multiple round dampers can be slaved from one static pressure control to provide the correct capacity. One large rectangular bypass damper may be used instead of multiple round dampers. See below.



## RECTANGULAR BYPASS DAMPER SELECTION

The Zonex Systems **STCDBP WxH** damper is used for rectangular bypass applications. These dampers are also sized for the total system CFM rated at 1500 FPM. Multiple dampers can be slaved from a single static pressure control.



**RECTANGULAR BYPASS DAMPERS**  
SELECT FROM 8 x 8 thru 48 x 48

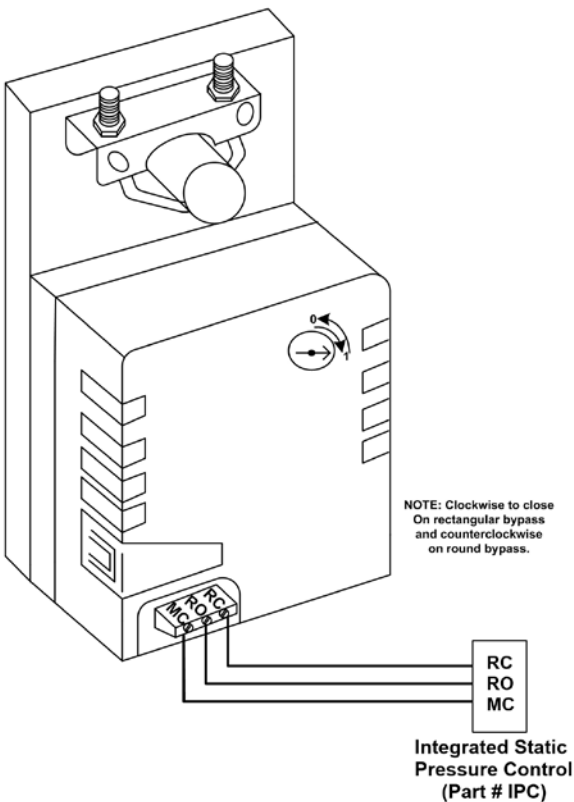
## RECTANGULAR BYPASS SELECTION TABLE

		WIDTH IN INCHES														
		8	10	12	14	16	18	20	22	24	28	32	36	40	44	48
HEIGHT IN INCHES	8	667	833	1000	1167	1333	1500	1667	1833	2000	2333	2667	3000	3333	3667	4000
	10	833	1042	1250	1458	1667	1875	2083	2292	2500	2917	3333	3750	4167	4583	5000
	12	1000	1250	1500	1750	2000	2250	2500	2750	3000	3500	4000	4500	5000	5500	6000
	14	1167	1458	1750	2042	2333	2625	2917	3208	3500	4083	4667	5250	5833	6417	7000
	16	1333	1667	2000	2333	2667	3000	3333	3667	4000	4667	5333	6000	6667	7333	8000
	18	1500	1875	2250	2625	3000	3375	3750	4125	4500	5250	6000	6750	7500	8250	9000
	20	1667	2083	2500	2917	3333	3750	4167	4583	5000	5833	6667	7500	8333	9167	10000
	22	1833	2292	2750	3208	3667	4125	4583	5042	5500	6417	7333	8250	9167	10083	11000
	24	2000	2500	3000	3500	4000	4500	5000	5500	6000	7000	8000	9000	10000	11000	12000
	28	2333	2917	3500	4083	4667	5250	5833	6417	7000	8167	9333	10500	11667	12833	14000
	32	2667	3333	4000	4667	5333	6000	6667	7333	8000	9333	10667	12000	13333	14667	16000
	36	3000	3750	4500	5250	6000	6750	7500	8250	9000	10500	12000	13500	15000	16500	18000
	40	3333	4167	5000	5833	6667	7500	8333	9167	10000	11667	13333	15000	16667	18333	20000
	44	3667	4583	5500	6417	7333	8250	9167	10083	11000	12833	14667	16500	18333	20167	22000
	48	4000	5000	6000	7000	8000	9000	10000	11000	12000	14000	16000	18000	20000	22000	24000

Bypass air in CFM. Calculated at 1500 FPM.

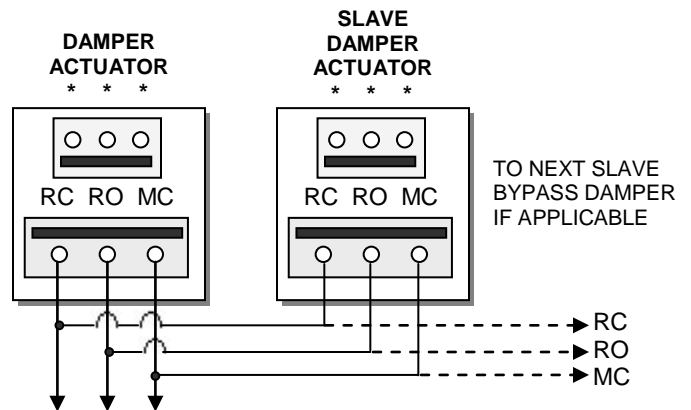
Formula used:  $B = W \times H / 144 \times 1500$ , where B = Bypass air in CFM, W = damper width in inches, H = damper height in inches, 144 = 144 sq. inches per sq. ft., 1500 = 1500 FPM.

### ROUND AND RECTANGULAR BYPASS DAMPER MOTORS



### SLAVING BYPASS DAMPERS

Use only one Pressure Sensor when slaving two or more Bypass Dampers together. Connect the Pressure Sensor to one damper as described above. Connect the slave dampers in parallel as shown. Up to 4 dampers can be slaved to one Sensor. The slaved dampers will self-synchronize each time the dampers reach full open or full close.



To Static Pressure Control, as shown on the Bypass Wiring Diagram on the next page.



## BYPASS DAMPER with INTEGRATED PRESSURE CONTROL (Part # STBP or STCDBP)

Bypass Damper with Integrated Pressure Control is used to control bypass operations. The bypass damper modulates to maintain static pressure as zone dampers open and close. The bypass system reduces air noise from the supply registers caused by excessive air velocity. If the system is configured for intermittent fan mode and the system satisfies, there will be a 3-minute delay to allow for system purge, after which the bypass damper will open to 25%, preventing noisy rush of air through supply registers when fan starts up on a call for heat or cool. If the system is configured for fan continuous operation, the **STBP** (Round) or **STCDBP** (Rectangular) Electronic Bypass will monitor static pressure continuously, providing constant control of system static.

### INTEGRATED PRESSURE CONTROL DESCRIPTION

- A. Supply air tube
- B. 24vac R and C
- C. Damper Terminal RO, RC, MC
- D. LED lights
- E. Adjustable Potentiometer
- F. TP1 Test Point

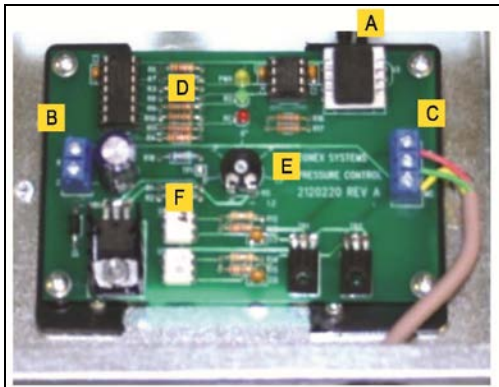
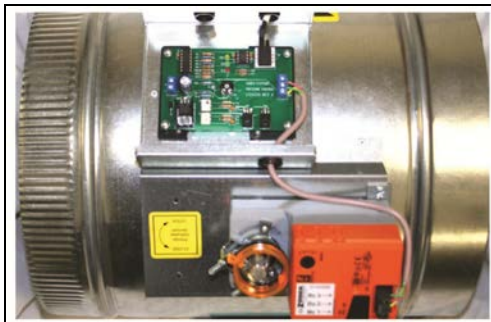


Fig. 1

### BYPASS DAMPER INSTALLATION



1. Verify the bypass damper is sized properly to the system and not undersized. (Bypass damper sizing is recommended for 100% of system CFM.)
2. Bypass damper and controller are powered by a dedicated 24vac 40VA transformer.
3. Do not install the bypass damper outside.
4. Locate the Integrated Pressure Control (IPC) and air tube on the bypass damper.

5. Drill 1/4" hole into the side of the supply duct 2' after the bypass and before the 1<sup>st</sup> supply take-off. Mount pressure supporting block over 1/4" hole, align hole in block with hole in duct. Use provided sheet metal screws.
6. Install air tube into supply air duct by slipping supplied plastic tubing into holes in support block and duct. Slip tube 3" into the duct. Pickup tubing fits snugly into provided hole.
7. Connect pressure tube from static air pickup to Integrated Pressure Control.

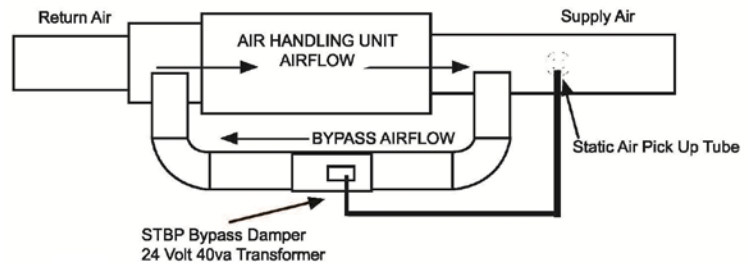


Fig. 2

### BYPASS DAMPER WITH INTEGRATED BYPASS CONTROL SETUP

1. Run all supply dampers to the full open position and have blower motor running at 100% fan speed. (See Note #1)
2. Manually close the bypass damper by pressing in the release lever on the motor side of the actuator. With the release lever pressed, rotate the damper actuator collar to close the damper and release the lever to lock the damper closed.
3. **Quick Set Option:** Turn the potentiometer on the damper control board to the full left position and slowly rotate RIGHT, until the "RC" RED LED turns on. Now rotate LEFT just slightly, until RC LED turns off. The **IPC** is ready for operation.

"RC" RED LED means damper closing.

"RO" GREEN LED means damper opening.

4. **Static Pressure Option:** The Integrated Pressure Control Board can be field configured for specified static pressure using a multi meter and the static pressure – voltage chart. (*Exhibit A*). This chart shows voltage (DC) to inches of W.C. (static pressure) relationship. Use a multi meter set on VDC and place the leads on the “C” terminal and “TP1” (test point one) next to the potentiometer. The Voltage reading translates to inches of W.C.

**Static Pressure Voltage Chart**

Static Pressure	TP1	Static Pressure	TP1
INCH W.C.	Voltage (DC)	INCH W.C.	Voltage (DC)
0.1	1.49	0.5	2.22
0.15	1.62	0.55	2.27
0.2	1.69	0.6	2.42
0.25	1.81	0.65	2.48
0.3	1.85	0.7	2.6
0.35	1.91	0.75	2.68
0.4	1.94	0.8	2.81
0.45	2.06		

**Exhibit A**

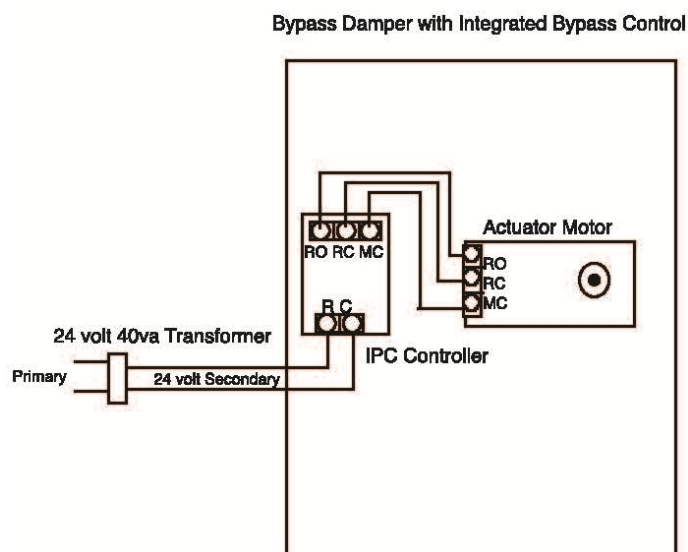
**Note # 1:** To open all dampers, it may be necessary to remove Y outputs to unit on the zone control board and to make full cool calls on all thermostats. This will modulate dampers fully open and lock out compressor.

On Zonex Systems **GEN II** and **ModCom II**, use air balance modes for simplified bypass setup.

## BYPASS CHECKOUT FOR STATIC PRESSURE CONTROLLER

1. Make cool call at the zone thermostat of the smallest zone.
2. Verify all zone dampers are closed except for calling zone.
3. Verify noise at zone registers is not excessive. Adjust the Integrated Pressure Control LEFT to lower noise (airflow) or RIGHT to increase airflow until too noisy.

## BYPASS DAMPER WIRING DIAGRAM WITH INTEGRATED BYPASS CONTROL



# SYSTEM STARTUP PROCEDURE

## Installing Zonex Systems Software

1. Place Systems Software Master CD in the CD drive.
2. Click on **My Computer**.
3. Click on the CD drive; i.e., "C" or "D" or "E."
4. Double click on the **ModCom.exe** file.
5. Click on **OK** to start the Installation Wizard.
6. Please answer the questions as the Installation Wizard is loading.
7. When the Wizard has completed the loading process, confirm the Zonex icon is located on the Desktop:

NOTE: A second icon with our trending or Zonex charts icon will also reside on your Desktop.



## ModCom USB Driver Installation for Windows XP and Vista

1. Connect USB cable to computer and USB plug on **ModCom**.
2. Start with **ModCom** program closed, and switch on the **ModCom** with on/off switch. Verify **ModCom** is on by the power LED. "Found new hardware" wizard should appear on computer screen.
3. Insert the Driver CD into the CD drive on computer, and follow the installation wizard prompts to install.
  - A. Can Windows connect to Windows Update to search for software? Select "**YES, this time only**"
  - B. "This Wizard helps you install software for: **ModCom**. What do you want the wizard to do?" Select "**Install the software automatically**"
  - C. When the message, "**ModCom has not passed Windows logo testing...**" Click "**Continue Anyway**"
  - D. When the wizard has finished installing the software for the **ModCom**, the message "**Completing the Found New Hardware Wizard**" will appear.
4. Remove the Driver CD from computer.
5. Proceed to **Assigning COM Port Instructions**, below.

## USB Driver Installation for Windows 8, 7

1. With the **ModCom** in the OFF position, connect the USB cable to the **ModCom** board and USB port on the computer. Turn on the **ModCom**. The message, "**New Hardware Found**" will appear, followed by "**Device Driver software was not successfully installed.**"
2. Click on the **Start** menu and select **Control Panel**. Then select **Hardware and Sounds**. Locate and click on **Device Manager**. Select **Other Devices**, and locate the **ModCom** listing and note the COM Port assigned. Right click on **ModCom** and then on **Properties**.
3. Insert the USB Driver CD into the computer drive and note which drive is being used.

4. Under the **General** Tab for properties, click on **Update Drivers**; select "**Browse My Computer for Driver Software.**"
5. Select the Drive which has the CD installed; and click on **Next**. A warning may appear; click on "**Install the software anyway.**"
6. After installation, a message will appear, stating "**Windows has successfully updated driver.**"
7. Remove the Driver CD from computer.
8. Proceed to **Assigning COM Port Instructions**, below.

## Assigning COM Port Instructions for Windows 8, 7, XP and Vista

1. From the computer desktop, right click on **MY COMPUTER**.
2. Select **PROPERTIES**.
3. Select **Hardware** on **System Properties** page.
4. Select **Device Manager**.
5. On **Device Manager** page, find **COM & LPT** ports and expand by clicking on the + next to **COM & LPT**.
6. **ModCom** should be listed with COM1, 2, 3 or 4.
7. If the COM assignment is higher than 4, you must manually change it to an open COM1, 2, 3 or 4.
8. Reboot computer.
9. Once computer has restarted, select the **ModCom** Icon on display; and click on **Connect Now**.
10. Select **COM1, 2, 3 or 4** from connection settings window.
11. When **Connection Successful** window appears, click **OK**.

Continue with system setup and configuration steps in the ModCom Installation Manual.

## Connecting to the System

**Direct Connect** – Computer connected directly to a single **ModCom**.

NOTE: It is recommended to first set up and configure a new system with a direct connected computer (laptop or desktop), and verify operation.

## Set Up ModCom

1. With the **ModCom** switched OFF and the **ModCom** program closed, connect the 15' USB cable to computer and USB plug on the **ModCom**.
2. Switch the **ModCom** ON, and then bring up the **ModCom** system program on the computer.
3. Remove the insulating tag from the backup battery on the **ModCom**.
4. With all components wired, addressed and powered up, perform the Common Ground Phasing procedure. See below.

# SYSTEM STARTUP PROCEDURE

## Common Ground Phasing Procedure

1. With the **ModStats** powered up, set voltmeter to the AC scale.
2. Separate the thermostat circuit board and cover from the terminal base.
3. Place one meter probe on the RX terminal and the other probe on the R terminal – note the voltage reading.
4. Keeping one probe on RX, place the other meter probe on terminal C and note the voltage reading.
5. The lowest voltage reading must be on the RX to C terminals.
6. If the low voltage reading is measured on RX to R, reverse the R and C wires on the thermostat terminal base.
7. If erratic voltages are read, contact Technical Support.

## Program Screens

The Zonex software provides 6 tabbed screens for System status and configuration:

<b>Welcome Tab</b>	Use to connect to the system.
<b>Review Tab</b>	Display total number of thermostats and devices, along with current space and heat/cool setpoint temperatures.
<b>Schedule Tab</b>	Assign Occupied and Unoccupied events for each thermostat and <b>RLYCOM</b> in the system.
<b>Set Temp Tab</b>	Enter Occupied and Unoccupied, Heat and Cool temperatures remotely for selected thermostats.
<b>System Tab</b>	To access or set the Day, Date, and Time – display Outside air on all systems, Mixed air (return) and Leaving air (supply) temperatures on <b>ModCom</b> SYSTEMS TAB – Number of thermostats and devices ( <b>RLYCOM</b> ) – Override for Occupied / Unoccupied modes – Enter names or tags for thermostats and other devices – Thermostat lock feature – temperature warning alert and temperature trending.
<b>Vacation Tab</b>	Assign up to 20 vacation/holiday events for each thermostat and <b>RLYCOM</b>

# SYSTEM STARTUP PROCEDURE

## Accessing the Systems

### WELCOME Screen – Fig. 1

Double click on the Zonex icon to open the program's WELCOME screen (see Fig. 1).

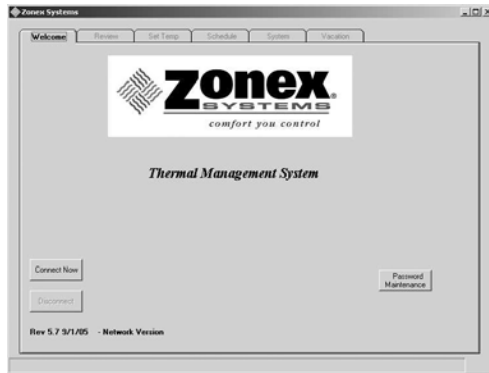


Fig. 1

### Setting a Password (Optional)

If a password is required, it may be entered now or at a later time. If you do not require a password and do not need to add or modify a device, proceed to **Connecting to the Zonex System** section below.

1. Click on the **Password Maintenance** button on the lower right side of the WELCOME screen (see Fig. 2).



Fig. 2

2. Enter your new password. The password must not exceed 30 characters and spaces.
3. Re-enter your password in the **Verify** box.
4. Click on **OK** to store the password.  
NOTE: Your password should be retained elsewhere. If it is lost, the program will have to be re-installed and all information re-entered.

## Adding, Modifying or Deleting Records

To add or change a project name, phone number or IP address:

1. Add a record:
  - A. Click on the **Connect Now** button from the WELCOME screen.
  - B. Verify that the **Connection Settings** window appears (see Fig. 3).

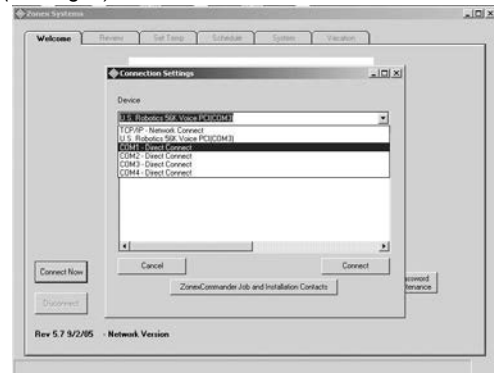


Fig. 3

- C. Click on **Commander Job** and **Installation Contacts** button.
- D. Verify that the **Contacts** window appears (see Fig. 4).



Fig. 4

- E. Click on **Records**.
- F. Click on **ADD** (see Fig. 5); and enter new project name, phone number for the dedicated phone line to this job or IP address and port number, if applicable. Multiple facilities may be accessed from this software.

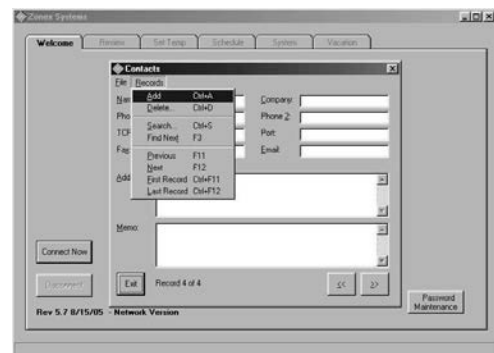


Fig. 5

- G. Click on **File**; then click on **Save**.
- H. Click on **Exit** to return to the WELCOME Tab.

# SYSTEM STARTUP PROCEDURE

2. Modify an existing record:
  - A. Click on the **Connect Now** button from the WELCOME screen.
  - B. Verify that the **Connection Settings** window appears.
  - C. Click on **ModCom Job and Installation Contacts** button.
  - D. Verify that the **Contacts** window appears (see Fig. 4).
  - E. Use the **Scroll** buttons (<< or >>) at the bottom right of the **Contacts** screen to locate the record to be modified.
  - F. Click inside the field to be changed, and revise data.
  - G. Click on **File**; then click on **Save**.
  - H. Click on **Exit** to return to the WELCOME Tab.
3. Delete a record:
  - A. Click on the **Connect Now** button from the WELCOME screen.
  - B. Verify that the **Connection Settings** window appears.
  - C. Click on the **ModCom Job and Installation Contacts** button.
  - D. Verify that the **Contacts** window appears (see Fig. 4).
  - E. Use the **Scroll** buttons (<< or >>) at the bottom right of the **Contacts** screen to locate the record to be deleted.
  - F. Click on **Records**.
  - G. Click on **Delete**.
  - H. Click on **File**; then click on **Save**.
  - I. Click on **Exit** to return to the WELCOME Tab.

3. Click on the appropriate COM port, modem or Internet selection.
4. Click on the **Connect** button (see arrow in Fig. 7). The screen then displays: **Please wait while system is loading** (see Fig. 8). The connection should complete within 30 seconds and is verified when the **Connection Successful** window appears.

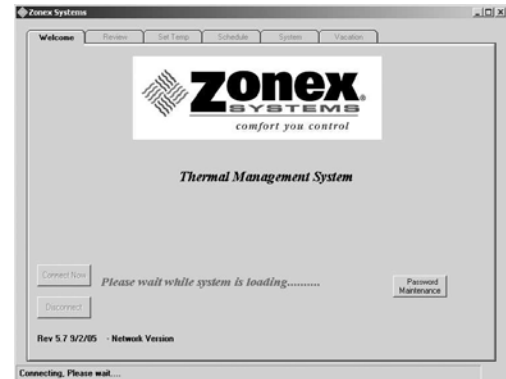


Fig. 8

## Connecting to the Zonex Systems

1. Click on the **Connect Now** button from the WELCOME screen (see Fig. 6).

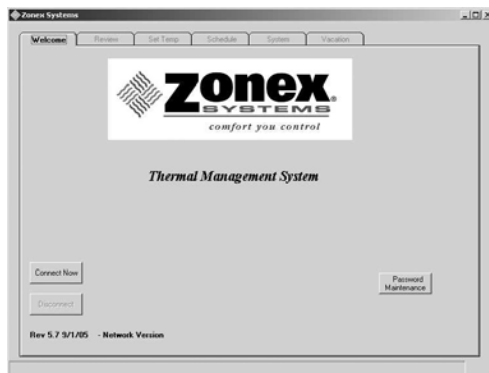


Fig. 6

2. Verify that the **Connection Settings** window appears (see Fig. 7).

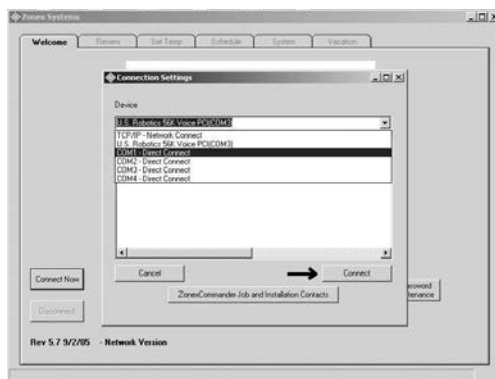


Fig. 7

5. Click on **OK** in the **Connection Successful** window (see Fig. 9).

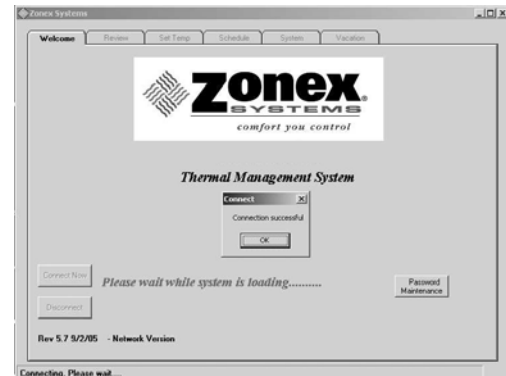


Fig. 9



For International systems equipped with Celsius thermostats, you may now select a Celsius temperature display by clicking the box labeled "Click here for Celsius." If you are not using Celsius thermostats, please ignore this step. Each time you enter the program, this step must be initiated to display Celsius Temperatures.

# SYSTEM STARTUP PROCEDURE

## Setup and Configuration

### SYSTEM Screen – Fig. 10

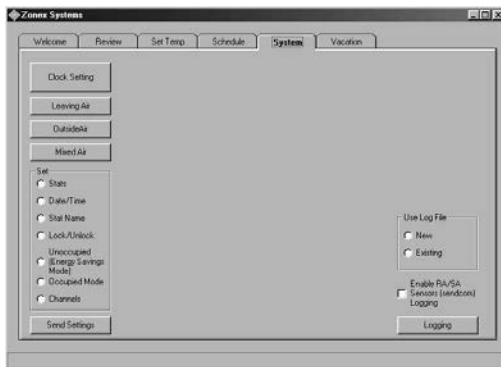


Fig. 10

## Stats

1. Click on the **SYSTEMS** Tab, and click on the radio button next to **Stats** (see Fig. 11).



Fig. 11

2. Select the total number of system devices (up to 20 thermostats and **RLYCOMs** on the **ModCom** communication bus).
3. The program is equipped with a **System Alarm Deviation** function, or System warning alert (see Fig. 11), which allows the user to establish out of range temperature criteria from 3-10°. Whenever a thermostat exceeds the selected deviation from its heating or cooling setpoints, the current temperature will be highlighted in Yellow on the REVIEW Screen. If this feature is not required, select **00** to disable the alert; otherwise, select the temperature deviation. To generate E-mail alerts, please contact Zonex at (800) 228-2966.
4. Click on **Send Settings** to place this information into memory.

## Date/Time

1. Click on the **Date/Time** radio button (see Fig. 12), and a calendar will appear on the upper right of the screen.

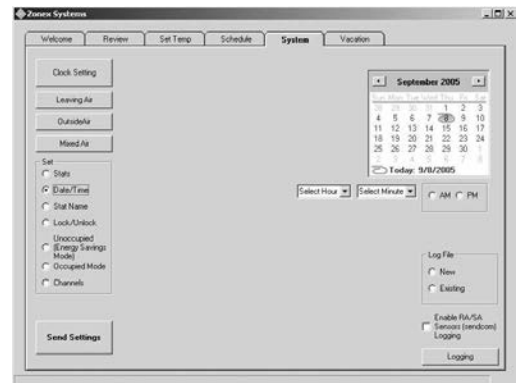


Fig. 12

2. Click on the **right or left arrow** next to the month and year to select the current month, or click on today's date.
3. Click on **current day** to highlight in gray.
4. Click on the **Select Hour** and **Select Minute** down arrow buttons to select time.
5. Click on the **AM** or **PM** radio button.
6. Click on **Send Settings** to place this information into memory.
7. Verify setting by clicking on the **Clock Setting** button on the top left of the screen.

# SYSTEM STARTUP PROCEDURE

## Stat Name

1. Click on the **Stat Name** radio button (see Fig. 13), and enter individual thermostat names, **RLYCOM** or **SENDCOM** designations. Do not exceed 20 characters and spaces on each entry.

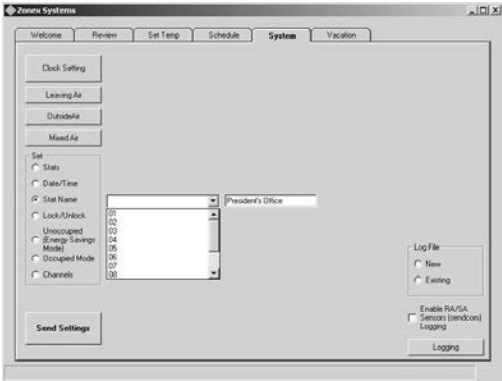


Fig. 13

2. Click on **Send Settings** after typing each address to place it into memory. Confirm that entries have been saved by clicking on the REVIEW Tab; then return to the SYSTEMS Tab to continue labeling the thermostats.

## Occupied Mode

1. Click on the **Occupied Mode** radio button (see Fig. 14).

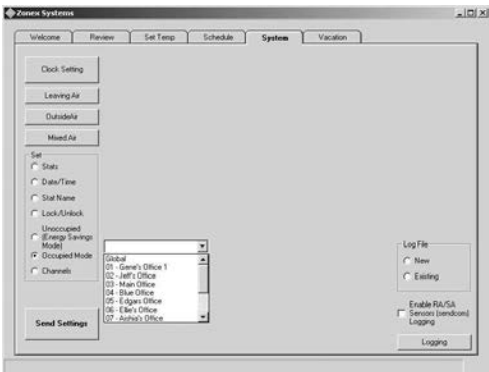


Fig. 14

2. Select **Global**, and click on Send Settings. This is to ensure all devices are in the **Occupied Mode** for the startup. Settings can be changed to **Unoccupied Mode** after initial setup.

## Lock/Unlock Thermostats

1. Click on the **Lock/Unlock** radio button to lock or unlock thermostats remotely (see Fig. 15).

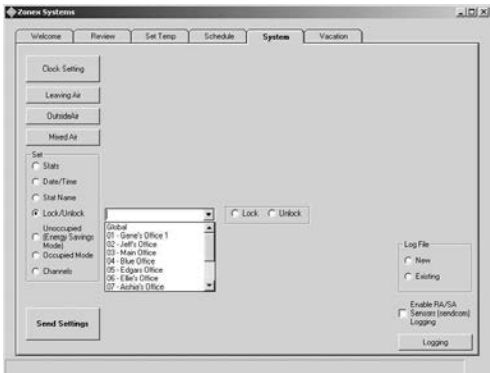


Fig. 15

2. Select the thermostat from the drop down menu, or click on **Global** to lock or unlock all thermostats, or select an individual address to lock.
3. Click on **Send Settings** to place this information into memory.
4. Confirm your lock/unlock request by returning to the REVIEW Tab. If the thermostat number you selected is Red, it is locked; if it is Black, it is unlocked. If necessary, repeat the sequence above to change to desired setting.

## Reviewing System Data

### SYSTEM Screen – Fig. 16

1. Click on the REVIEW Tab at the top of the screen to verify thermostat, **RLYCOM** and **SENDCOM** communications (see Fig. 16).

Thermostat Name	Current Room Temp	Occupied Setpoints		Unoccupied Setpoints	
		Heat	Cool	Heat	Cool
1 Gen's Office 1	73	65	74	58	68
2 Jeff's Office	72	67	72	58	63
3 Main Office	72	65	73	58	63
4 Blue Office	71	65	76	58	63
5 Edgar's Office	73	65	72	58	63
6 Ben's Office	74	65	75	58	63
7 Ashley's Office	74	65	74	58	63
8 Charon's Office	72	67	73	58	63
9 Conference Room	73	65	74	58	63
10 North Theater	73	66	81	58	63
11 South Theater	74	65	88	58	63
12 Jeff RLYCOM	0	0	0	0	0

Fig. 16

2. Verify that the number of thermostats and devices (upper left of screen) is correct.
3. Occupied and Unoccupied temperature setpoints and space temperatures should be displayed in each address row.

NOTE: If any thermostat shows "0" across the row, there is no communication with that thermostat. See the Troubleshooting section.



# SYSTEM STARTUP PROCEDURE

4. **RLYCOM** devices, if utilized, control generic loads and will be displayed with a **Red "0"** when energized and a **Blue "0"** when off.
  - A. A **Red "0"** should appear in the **Unoccupied Heat** column, which indicates the **RLYCOM** is energized. (During setup, all devices were set to Occupied mode.)
  - B. A **Blue "0"** in the **Unoccupied Cool** column indicates the **RLYCOM** is either off or de-energized.
  - C. If all of the **RLYCOM** "0's" are **Black**, the device is not communicating. See Troubleshooting section.

5. To test the **RLYCOM** operation and communications, switch to the **Unoccupied Mode** and verify the result, as follows:

- A. Note the address number of the **RLYCOM** to be tested.
- B. Click on the **SYSTEM** Tab, and click on the **Unoccupied Mode** radio button.
- C. When the address window appears, select the address assigned to the **RLYCOM** being tested.
- D. Click on **Send Settings**.
- E. Return to the **REVIEW** Tab, and verify the **RLYCOM** has changed to a **Blue "0"** in the **Unoccupied** column. The power light on the **RLYCOM** should be off.
- F. After testing, you may wish to adjust the mode back to the original setting.

6. **SENDCOM** communications are used to display RA/SA temperatures from stand-alone units.

- A. Place the cursor directly over a **Current Room Temperature** thermostat number with a **SENDCOM** attached, and double click on it (see Fig. 17).

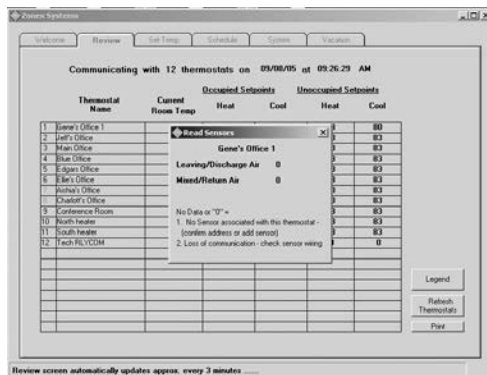


Fig. 17

- B. The **Read Sensors** window will appear, displaying Discharge and Return Air temperatures. If a single "0" is displayed for both sensors, or if the temperature appears to be incorrect, see the Troubleshooting section.

7. For multiple **ModComs**, repeat the above steps in this section for each **ModCom**.

## Additional Information Displayed on the REVIEW Screen

1. Click on the thermostat number to confirm that the thermostat is in the **Occupied** or **Unoccupied** mode (see Fig. 18).

This feature is not available with a **RLYCOM**. Its status is indicated by **Red "0"** for either **ON** or **HOT** (Occupied) and a **Blue "0"** (for **OFF** or **de-energized**).



Fig. 18

2. Click on a thermostat name to display Schedules after they have been entered (see Fig. 19).

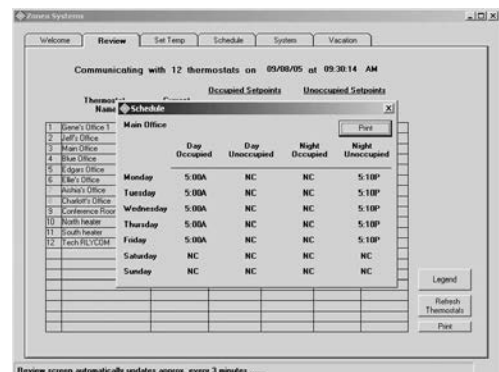


Fig. 19

3. Click on the **Legend** button for an explanation of activities displayed on the REVIEW Screen (see Fig. 20).

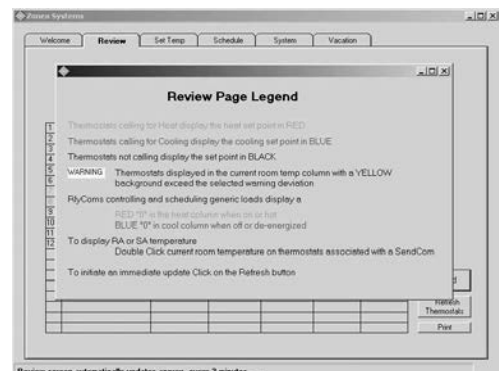


Fig. 20

# SYSTEM STARTUP PROCEDURE

- The REVIEW Screen is dynamic and automatically updates every three minutes. To initiate an immediate update, click on the **Refresh Thermostat** button.
- To print a copy of the REVIEW Screen, which displays all current temperature data, as well as a date and time stamp, click on the **Print** button.

## Thermostat Management

### SET TEMP Screen – Fig. 21

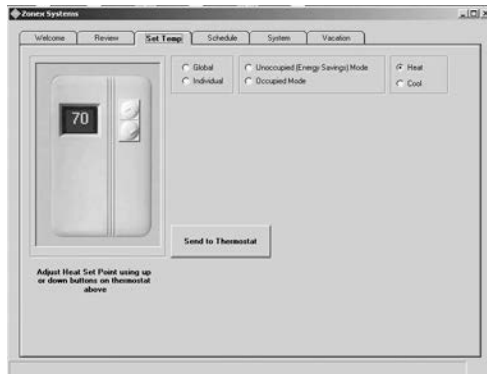


Fig. 21

Everything the on-site user can perform at the thermostat can be performed remotely on the SET TEMP screen. The SET TEMP screen displays a thermostat feature, which allows the Heat and Cool setpoints to be changed on individual or all (global) thermostats, for either Occupied or Unoccupied modes.

- Click on the SET TEMP Tab.
- To change temperature setpoints on all thermostats, click on the **Global** radio button (see Fig. 22).

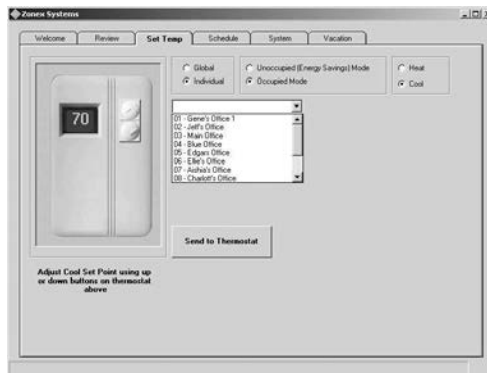


Fig. 22

- To change an individual thermostat, click on the **Individual** radio button.

NOTE: When the Individual radio button is selected, a window will appear with a **down arrow** button:

- Click on the **down arrow** button to display thermostat address numbers and names, and click on an address.

- After selecting the desired address, the current Occupied and Unoccupied temperature setpoints for that thermostat will be displayed (see Fig. 23).

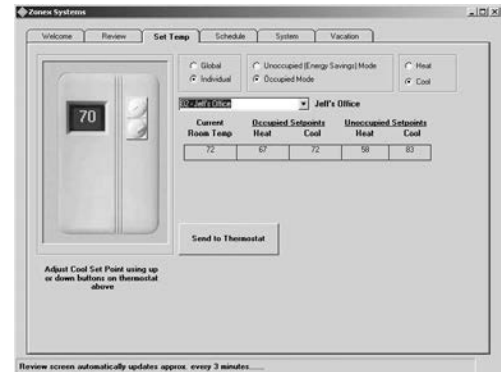


Fig. 23

- After the **Individual** or **Global** radio button has been selected, click on either the **Occupied** or **Unoccupied** mode radio button.
- Click on either the **Heat** or **Cool** radio button.
- To change the temperature, click on the **Up** or **Down** buttons on the thermostat until the desired temperature is displayed.
- Click on the **Send to Thermostat** button to place information into memory.
- After adjusting setpoints, click on the REVIEW Tab to confirm entries have been saved. If a change did not occur, repeat the sequence above.

## Scheduling the System

### SCHEDULE Screens – Fig. 24

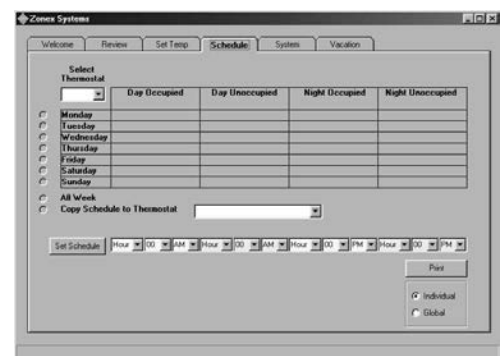


Fig. 24

The ModCom software provides up to four scheduled events each day, for each thermostat. To assign **Occupied** and **Unoccupied** schedules:

- Click on the SCHEDULE Tab.
- Under **Select Thermostat** at the top left of the screen, click on the **down arrow** button; and select a thermostat from the drop down menu.

# SYSTEM STARTUP PROCEDURE

3. Event times can be entered separately for each day or for the entire week. Click on the **All Week** radio button. This allows a complete schedule to be assigned to one thermostat for every day of the week. (If, after the week's schedule has been set, you would like to change one day, see No. 6 below for instructions.)

4. To enter the time schedules on the selected thermostat or **RLYCOM** address, use the **down arrow** buttons in each **Hour**, **Minute** and **AM** or **PM** field to make your selections.

You must make an entry into each time event. If there is no difference in time between the **Occupied** and **Unoccupied** modes, select **NC** ("No Change") in the appropriate fields.

**EXAMPLE: Thermostat 01 will be in the Occupied mode from 6:30 AM until 5:00 PM –**

- A. Under **Day Occupied** select **6** in the hour field, **30** in the minute field, and then **AM**.
  - B. Under **Day Unoccupied** select **NC** in the hour field (this denotes "No Change").
  - C. Under **Night Occupied** select **NC** in the hour field (this denotes "No Change").
  - D. Under **Night Unoccupied** select **5** in the hour field, **00** in the minute field, and then **PM**.
  - E. Click on **Set Schedule** to program the schedule into memory.
  - F. Repeat this process for each thermostat and **RLYCOM** address.
5. To copy the same schedule to another thermostat or **RLYCOM**:
- A. Click on the **Copy Schedule to Thermostat** radio button, and select the destination thermostat address.
  - B. Click on **Set Schedule** to copy the schedule to the destination thermostat.
6. Thermostats and **RLYCOMs** can have individual schedules for every day of the week. To assign a schedule for one day:
- A. Select the thermostat or **RLYCOM** address from the pull down menu under **Select Thermostat**.
  - B. Click on the radio button next to the day of the week to be scheduled. Schedule each day individually. After each day's schedule is entered, click on the **Set Schedule** button.

7. The schedules can be printed from the **SCHEDULE** screen:
- A. Click on either the **Individual** or **Global** radio button below the **Print** button. The **Global** selection will print the schedules for all thermostats and **RLYCOMs**, and the **Individual** selection will print a copy of the **SCHEDULE** screen displayed.
  - B. Click on **Print**. It is recommended that this information be printed following the start-up of the system.
8. The Individual schedules can also be viewed on the **REVIEW** screen:
- A. Click on the **REVIEW** Tab.
  - B. Click on the thermostat name (see Fig. 19).

## Vacation Scheduling

**VACATION Screen – Fig. 25**

**Fig. 25**

The vacation schedule provides 20 separate Unoccupied events for up to 30 days. This feature is designed to maximize your energy savings by placing the thermostat(s) into a 24-hr Unoccupied mode for 1 to 30 days.

### To set an event:

1. Click on the **VACATION** Tab at the top of the screen, and verify all thermostat and **RLYCOM** addresses are listed under the column, **Thermostats below on Vacation Schedule** (see Fig. 26).
2. To enter an **Unoccupied** day event, click on the down arrow button in the field showing the event numbers ["Select 1-20"]. Begin by selecting 1 for the first event.

**Fig. 26**

3. Select **Month**, **Day**, and **Duration** of the event by using the **down arrow** buttons in the appropriate fields.
4. Click on **Set Vacation Schedule**.
5. Verify that the event **Month**, **Day** and **Duration** appear in the list on the left side of the screen.
6. Repeat steps 1 – 4 to set each vacation date using the next available event number.

# SYSTEM STARTUP PROCEDURE

## To clear an event:

1. Click on the down arrow button in the event number ["Select 1-20] field, and select the event number.
2. Click on the **down arrow** button in the **Month** field.
3. Click on **Clear**.
4. Click on **Set Vacation Schedule**.

## To override an event, if you have signage or other units that will operate during a vacation period:

1. In the **Thermostats below on Vacation Schedule** column, click on each thermostat address that you wish to override. Notice that when you click on an address, it moves to the **Override Vacation Schedule** column (see Fig. 27).



Fig. 27

2. Click on **Confirm Override**.

## To print the Vacation event schedule:

1. Click on the **Print** button.

# TREND AND DATA LOGGING OPERATION

**System Requirements:** Windows 2000, XP with SP2 or Vista are required to trend log. Not compatible with Windows 95 or 98.

## Activating Trend Logging Data

SYSTEMS Screen – Fig. 28



Fig. 28

## Trending Thermostat Data

Historical data must be developed in order to trend thermostat information.

1. Click on the **SYSTEM** Tab.
2. Underneath **Use Log File**, in the lower right corner of the **SYSTEM** screen, click on the **New** radio button to open a new trend log.
3. Click on the **Logging** button.
4. If you have **SENDCOM** Sensors in your system:
  - A. Click on the box labeled **Enable RA/SA Sensors (SENDCOM) Logging**. This will open another box, which lists all thermostats in your system (see Fig. 29).
  - B. Click on thermostats with **SENDCOM** Sensors to move them to the right column for inclusion in the trending data.

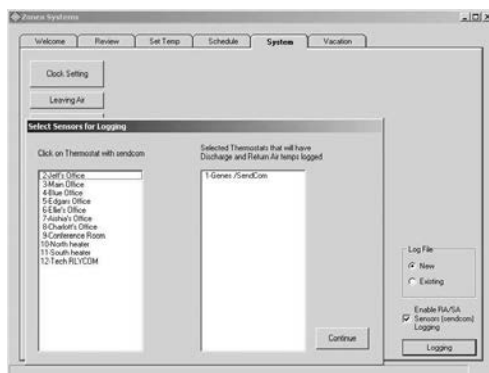


Fig. 29

5. The program must be named and then saved onto your C drive (see Fig. 30). For example, we saved a file named **Log Zones in C:\Program Files\Zonex Systems**.

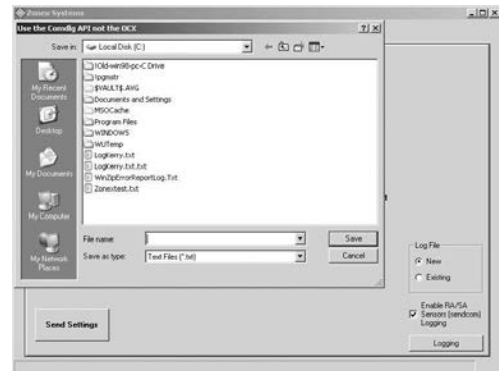


Fig. 30

6. After the logging commences, you may minimize the Zonex program in order to use other computer functions; but **do not turn off the computer or trending program during data collection**. This will cause the logging function to cease. Typically, 2-3 days of logging information polled at 20-minute intervals provides you with sufficient data to establish a trend.

## Displaying Trending Data

Trending data is displayed in a separate Zonex program called **Zonex Trends** (see Fig. 31). This program was initially loaded with the Zonex Software. A **Zonex Trends** icon should reside on your Desktop.



Fig. 31

1. Click on the **Zonex Trends** icon.
2. Click on the **Select Log** file, and retrieve the saved data file. (Using our example above, we would select C:\Program Files\Zone Systems; then click on **Log Zones**).

## TREND AND DATA LOGGING OPERATION

- When the file is retrieved, use the **drop down box** to select your installation name, thermostat number, and date and time range; then click the **Continue** button (see Fig. 32). Multiple buildings can be accessed via the trending program, and files can be saved under various names.

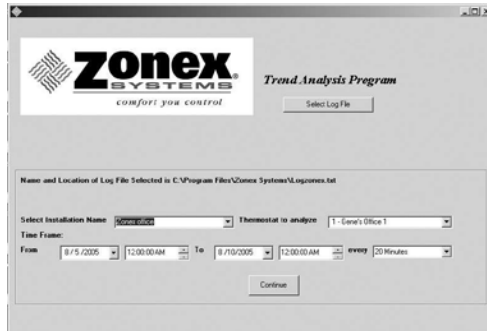


Fig. 32

- The data logging program logs data on every thermostat in your system every 20 minutes. Use the **pull down box** to select the thermostat you want to analyze.
- A calendar resides in the trending software package (see Fig.33). Enter the From/To date and time range you want to review.

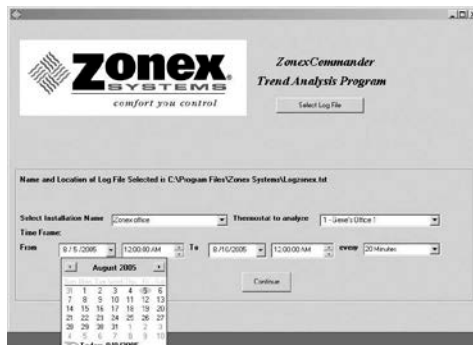


Fig. 33

- You also have the option of viewing the saved data every 20 minutes or hourly; select one option.
- Click on the **Continue** button. The trending program will provide you with a Trend Analysis Chart reflecting the temperatures of the desired thermostat vs. the heating and cooling setpoints during the trending period.

- The chart displays temperatures from 40-100° in 2° increments on the Y axis, and dates and times are displayed on the X axis (see Fig. 34).

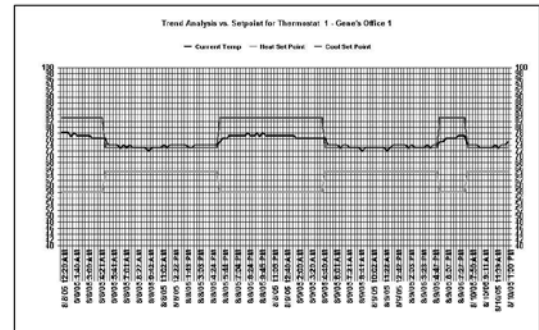


Fig. 34

- Different presentations may be prepared by selecting options listed in the **Chart Type** drop down box. The initial chart is displayed as a 2d line.
- A correlation exists between the number of data points and the rows of data displayed. Reducing the number of rows allows you to zoom in on the data.
- To print the Trending Chart, click on the **Print** button; or save it in your computer as a bitmap (.bmp), which can be e-mailed easily.
- To generate additional data for other thermostats in the system, click on the **X** button located at the top of the page to return to Page 1 of the Trending program. Then select another thermostat you wish to analyze by using the **drop down** arrow, and the data will be retrieved quickly.
- After the data is collected, if you would like to trend Return and Supply air from each unit:
  - If you are using **SENDCOM** Sensors in your system, click on the **Discharge/Return Air Temps** button on the graphing page associated with that thermostat.
  - If you are using **SENDCOM** sensors with stand-alone equipment, that information will follow its thermostat number.
- Temperature points on the trend lines can be highlighted by double clicking on any of the lines (additional data points will appear). By clicking inside each small box, the temperature at the data point will be displayed at the bottom of the graph with its value at that point. Data points will be displayed for any **SENDCOM** assigned to that specific thermostat number.

# TROUBLESHOOTING COMMON PROBLEMS

## ModCom Will Not Connect

### Direct Connect

1. **System will not connect; error message, "Error on operation. Please try again."**
  - A. Verify **MODCOM II** Command Center is energized
  - B. Verify that the USB cable is installed between the **MODCOM II** Controller and the computer.
  - C. Verify the correct COM port is assigned to the computer
  - D. Close all running programs except the **MODCOM II**. Uninstall USB Driver; reinstall following USB Installation procedures on Page 37 of Installation and Applications Manual.
2. **System will not connect; error message, "Invalid port number. Please try again."**
  - A. Verify the correct COM port is assigned on the computer.
  - B. Change COM port assignment in Computer Device Manager to port 1-4.

### Network Connection

1. **System won't connect on the network, "System Timed Out."**
  - A. Verify the network cable is installed to the Network ISERVER Device.
  - B. Check cable from the ISERVER to the MODCOM II Controller.
  - C. Verify the ISERVER Network device is powered and energized.
  - D. Check the IP Address being used to connect.
  - E. Check the configuration of the ISERVER and verify the baud rate of 4800.

## Communicating Devices Not Responding

### ModStat, DIGICOM and DIGIHP

1. When trying to read the thermostats, the REVIEW screen shows "0" for temperature.
  - A. Verify device is powered up.
  - B. Verify device has the correct address.
  - C. Verify communication wire is in correct polarity on terminals RX & TX.
  - D. Verify communication wire is properly connected from **ModStat/DIGICOM/DIGIHP** thermostats to Command Center with no disconnected or broken connections. Wire nuts are not to be used.
  - E. Check polarity of R & C to the thermostats (Common Ground Phasing).

### SENDCOM

1. **SENDCOM** reporting "0" on Read Sensors window.
  - A. Verify device is powered up.
  - B. Verify device has the correct address. For corresponding thermostat address, add 70.
  - C. Verify communication wire is in correct polarity on terminals RX & TX.
  - D. Verify communication wire is properly connected from the **SENDCOM(s)** to the communication link with no disconnected or broken connections. Wire nuts are not to be used.
  - E. Verify C/F jumper position.
  - F. Verify the R & C polarity (Common Ground Phasing).

### RLYCOM

1. **RLYCOM** indicates all black zeroes ("0") on REVIEW screen and does not switch from computer schedule.
  - A. Verify device is powered up.
  - B. Verify device has the correct address (01 to 20).
  - C. Verify communication wire is in correct polarity on terminals RX & TX.
  - D. Verify communication wire is properly connected from the **RLYCOM(s)** to the communication link, with no disconnected or broken connections. Wire nuts are not to be used.
  - E. Check polarity of R & C (Common Ground Phasing).

## Programming and System Setup Problems

1. Thermostat names disappear after entering.
  - A. When entering thermostat names or ID, do not exceed 20 characters, including spaces.
  - B. After entering each name or ID, click on **Send Settings** button.
2. Cannot manually change address or set points on the thermostats.
  - A. Thermostat is electronically locked.
  - B. Thermostat can only be unlocked from the computer on the SYSTEM screen.
3. Thermostat display is blank.
  - A. Verify thermostat 24 volt power, verify 24-28vac measured from "R" to "C" on circuit board.
4. System goes into Unoccupied during the day.
  - A. Go to the SYSTEM screen and verify that the Day, Date and Time are correct.
  - B. Verify Occupied and Unoccupied times are correct from the SCHEDULE screen.
  - C. Verify Vacation schedule entries.

# OPERATING SCHEDULE

For additional questions on programming and technical support, please call Zonex Systems at (800) 228-2966, M-F 6:30 AM-5:00 PM PST.

DAY	ADR	NAME	DAY OCC		DAY UNOCC		NIGHT OCC		NIGHT UNOCC	
			H	C	H	C	H	C	H	C
MON										
TUES										
WED										
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# ***MODCOM II***

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June 2014