

CommStat 4[™] Telecom HVAC Controller

The CommStat 4 is an HVAC controller designed specifically for controlling two redundant air conditioners, heat pumps and air conditioners with two stage compressors in a telecommunications shelter or enclosure. In addition to the control of the air conditioners or heat pumps, the CommStat 4 has seven outputs for remote alarms or notification. The CommStat 4 uses RS-485 communications via a RJ11 communication jack. It is capable of interfacing with a secondary control board which can interpret Marvair's communication protocol and provide Internet connectivity. Note: the end user must provide the interface board and the Graphical User Interface (GUI) software to gain access via the Internet.

The CommStat 4 is factory programmed with standard industry set points, but can be configured on site. Settings are retained indefinitely in the event of a power loss.



CONTROL UP TO SIX AIR CONDITIONERS OR HEAT PUMPS IN A SHELTER

The CommStat 4 has the capability to be daisy chained with up to two additional CommStat 4 controllers for controlling up to six air conditioners or heat pumps in a shelter. When two or three CommStat 4 controllers are daisy chained together, one of the controllers is the Master and controls all connected CommStat 4 controllers. Any settings to the Master unit immediately take effect on the Slave units. The interface for the daisy chain is an RJ11 connector.

EASE OF CONTROL AND CONFIGURATION

A large, backlit LCD display shows the status of the system and provides a convenient user interface. Status LEDs indicate Heat, Cool, Power and the Lead Unit. When a fault is detected, an alarm LED flashes and the LCD screen displays the fault. If multiple faults are detected, the display will scroll the faults across the screen.

The CommStat 4 is easily configured with four buttons. A Comfort button changes the temperature in the shelter for 90 minutes. After 90 minutes, the temperature reverts back to the programmed set points. A lead swap button alternates the lead and lag unit, allowing service techs to quickly check the operation of each unit.

For security, the keypad can be locked out to prevent unwanted changes to the set points. English, Spanish or French is selectable as the language shown on the display. °F or °C is selectable.

RoHS COMPLIANT

The CommStat 4 controller contains no hazardous materials and is RoHS compliant.

Specification/Features

Thermostat

- Cooling Set Point: 65°F through 95°F (18°C through 35°C) in 1° increments.
- Heating Set Point: 50°F through 80°F (10°C through 27°C) in 1° increments.

Differential

- ON-OFF Differential of Stage One: 2°F through 5°F (1° through 3°C) in 1° increments.
- ON-OFF Differential of Stage Two: 2°F through 5°F (1° through 3°C) in 1° increments. The 2nd stage differential is referenced to the 1st stage differential and the outputs will stage off as each stage's differential is satisfied.
- Changeover Differential between cooling and heating: Minimum of 4°F (2°C).
- 3rd stage heating Differential: 0°F through 7°F (0°C through 4°C) in 1° increments

Control Voltage

- The CommStat 4 is powered by a nominal 24 VAC and has a backup power supply of 24VDC or 48VDC applied constantly. Should AC power be lost, the display, user interface and the alarm outputs remain functional. System outputs (Y, G, W, O and the Mixed Air Relay) will not be functional when 24 VAC is not present. If the control voltage is not present, the Low Voltage Loss alarm relay is energized.

Operating Range: -40°F through 150°F (-40°C through 66°C)

Minimum Voltage: 18 VAC

Maximum Voltage: 30 VAC

Ease of Installation

- Wiring connection insensitive to phasing of the units.
- Easy terminal connections for thermostat wire.
- Remote temperature sensors insure accurate temperature readings in the shelter.
- Easy attachment to the wall.

Lead/Lag Operation

- User selectable changeover from ½ to 7 days in ½ day increments. If the lead unit loses power, the lag unit automatically becomes the lead unit with all the set points of the lead unit. A lead swap button alternates the lead and lag unit, allowing service techs to easily check the operation of each unit.

Alarms

Dry contacts can be used for remote alarm or notification. Relays can be wired Normally Open (NO) or Normally Closed (NC). Most alarm relays can be reset by turning the CommStat 4 OFF and then ON OR the UP and DOWN buttons are held simultane-

ously for 4 seconds. Alarms can be reset provided there is no longer an input from the smoke detector. All alarms are functional when 24 VAC is applied to the board. If 24 VAC is not present, no alarms will be displayed unless DC power is present. If DC power is supplied to the board, the display is operational.

- High (Line) Voltage - activated if line voltage is not present. The CommStat 4 requires a line voltage of 230VAC input from each air conditioner or heat pump to monitor for the presence of line voltage. If line voltage is not present, the High Voltage Loss alarm relay is energized.
- Low (Control) Voltage - activated if control voltage is not present.
- Lockout - activated if any air conditioner or heat pump is off due to either high or low refrigerant pressure lockout. If all the air conditioners or heat pumps are locked out, the Mixed Air Relay (MAR) will be activated on each of the air conditioners or heat pumps. This air conditioner or heat pump will go into the Ventilation mode, provided there is a call for cooling. If desired, the lockout alarm can be disabled by the user in the Configuration Set-up.
- Low Building Temperature Alarm - Activated if the temperature in the building drops to the selected temperature. If the low building temperature alarm is activated, the LCD displays, "Low Building Temperature".
- First Stage High Building Temperature Warning - If the set point temperature is reached, the display will show, "First Stage High Building Temperature" on the LCD display.
- Second Stage High Building Temperature Alarm - If the set point temperature is reached, the display will show, "Second Stage High Building Temperature" on the LCD display and all outputs are turned off with the exception of the Mixed Air Relay (MAR) and the Air Mover Relay (AMR). If the air conditioner(s) or heat pump(s) on the shelter have economizer(s) and DC inverter(s), the economizer(s) will open, and the indoor blower(s) will be energized (Emergency Ventilation Mode).
- Smoke Alarm - the contacts will be energized when the smoke detector inputs receive a signal from an external detector. All air conditioners or heat pumps are immediately shut down. A physical reset is required to clear the alarm in the manual mode. If auto reset has been selected, the alarm will reset after the user specified time (3-10 minutes).
- AUX1 and AUX2 - Two auxiliary dry contact outputs that can be energized based upon AUX1 and AUX2 inputs.

CommStat 4 Lead/Lag Controller Inputs

1. Input Power

The R and C terminals are the input power terminals for each respective air conditioner or heat pump.

2. Modem Connection

The modem connection is used for remote communication and remote programming of the CommStat 4. It has the capability of providing shelter temperatures, mode of operation, as well as remote diagnosis. All configuration settings can be viewed and changed remotely.

3. Control Voltage (24 VAC)

The CommStat 4 is powered by 24 VAC and has a back up power supply of 24 or 48 VDC applied constantly. Should AC power be lost, the display, user interface and alarm outputs of the CommStat 4 will still be functional. However, the system outputs of the CommStat 4 (Y, G, W, O, and MAR) will not be functional when 24 VAC is not present.

4. Line Voltage

The CommStat 4 uses line voltage of 230VAC input from each unit air conditioner to monitor for the presence of line voltage. If a line voltage loss is not present, the CommStat 4 will energize the High Voltage Loss Alarm relay.

5. Temperature Sensors

The CommStat 4 uses remote temperature sensor(s) to measure the temperature in the shelter and determine when the system is calling for heating or cooling. Up to three sensors can be connected to each CommStat 4. There are two options for the sensors. If **No** (the default setting) is selected and multiple sensors are being used, the temperatures will be averaged. If **Yes** is selected and multiple sensors are being used, the sensor with the highest reading will be used for cooling operation and the one with the lowest reading will be used for heating. When multiple sensors are being used and there is a temperature differential greater than or equal to 5°F (4°C) between the sensors, the CommStat 4 lead/lag controller will energize the indoor blowers (G) on all connected units.

Screen #20 in the Configuration Mode allows the user to determine how the temperature sensors will be configured.

6. Smoke Detector

The smoke detector input terminals determine when there is a signal from an external smoke detector. They can be configured for either a **Normally Open** (N.O.) or **Normally Closed** (N.C.) smoke signal in Configuration screen # 18. During a smoke fault condition, all AC units will be turned off.

The smoke alarm relay reset has two selections -**Manual** (default) and **Auto**. If **Manual** is selected, a physical reset of the fault is required by holding the Up and Down buttons for 4 seconds. Cycling power will not reset a smoke fault if **Manual** is selected.

If **Auto** is selected the alarm will reset after an adjustable time delay of 3-10 minutes.

Screen #17 in the Configuration Mode allows the user to determine how the smoke alarm relay reset will be configured.

7. Hydrogen Detector

The hydrogen detector input terminals will determine when there is a 24 VAC signal from an external hydrogen detector. The CommStat 4 will switch the lead unit to Emergency Ventilation mode (ComPac II air conditioners or Classic heat pumps with economizers only) when high hydrogen levels are detected. It will switch back to normal air conditioning mode once the hydrogen levels are acceptable and the 24 VAC signal is removed from the hydrogen detector input terminals.

8. Generator Relay

The generator input will monitor for a 24 VAC signal which will be used to determine when the CommStat 4 is operating on generator power. When 24 VAC is recognized at the generator relay input, the CommStat 4 controller will only operate the units selected by the user in screen # 16 of the Configuration Menu. The options are:

- a. to run only the lead unit (default),
- b. the lead unit and one lag unit,
- c. the lead unit and two lag units, or
- d. the lead unit and three lag units.

9. Economizer Mode Status Monitoring

The 2 terminal is monitored for a 24 VAC signal. When the 2 terminal has 24 VAC present, mechanical cooling will be energized and the cooling LED will be lit. When 24 VAC is not present at the 2 terminal, the unit will be in economizer mode and this status will be annunciated on the LCD display. Economizer mode is defined as a call for cooling (24VAC output at Y and O) with no 24VAC signal at the 2 terminal. Mechanical cooling is defined as a call for cooling (24VAC output at Y and O) while there is a 24VAC signal at the 2 terminal.

CommStat 4 Lead/Lag Controller Inputs (cont'd)

10. Lockout Relay (LOR)

The CommStat 4 has a lockout relay input (LOR) and will provide a Normally Open (NO) or Normally Closed (NC) output in accordance to this input. This feature is enabled in the Configuration Mode, screen #10 by either selection **On** (default) or **Off**. If **On** is selected, the control will turn the output off, energize the lockout relay output (NO or NC), and annunciate which unit is locked out on the LCD display. If all the units are locked out, the mixed air relay will be activated on each unit to provide emergency ventilation, provided there is a call for cooling.

Cycling power will not reset the Lockout fault. A physical reset of the fault will be required by pressing the Up and Down buttons for 4 seconds.

11. AUX1-IN/AUX2

The CommStat 4 has the option for two, dry contact, auxiliary outputs that will energize based on the AUX1 and AUX2 inputs. Each AUX input can be configured to look for a normally open (NO) or normally closed (NC) signal in Configuration Mode, screens # 21 and # 22. Each screen will allow the user the option of **NO**, **NC**, or **OFF** to disable the feature.

AUX1 and AUX2 are independent from the operation of the board and the air conditioners or heat pumps.

CommStat 4 Lead/Lag Controller Outputs

1. Y or 1

The Y or 1 output energizes the compressor when the economizer is not selected. Upon a call for cooling, the Y (1) and O terminals are energized. On a call for 1st stage heating, the Y(1) output will be energized. There is a minimum compressor time off delay of 3 minutes for the lead unit and 4 minutes for the lag unit. A minimum compressor run time is preset at three minutes by the controller.

2. G or 3

The G or 3 output terminal energizes the indoor fan during either heating or cooling.

3. W or 4

The W or 4 output terminal energizes the electric heat.

4. O (Heat Pumps) or Y2 (Air Conditioners with 2 Stage Compressors)

The O output terminal energizes the reversing valve on heat pumps. The valve is energized on a call for cooling. If staged air conditioners are selected in Configuration screen #25, the O output becomes the second stage cooling output, Y2.

5. Lockout Alarm

When enabled in screen #10 of the Configuration Menu, the CommStat 4 monitors the Lockout Relay (LOR) input for a contact closure. If there is a contact closure between the LOR terminals, the control will turn off all outputs, energize the NO or NC contacts, and display which unit is locked out on the LCD display. The default setting in the configuration is "On". If all of the connected units are locked out, the Mixed Air Relay (MAR) will be activated on each of the connected units and the units will go into Emergency Ventilation mode. Cycling power will reset the Lockout Alarm.

6. Low (Control) Voltage Loss Alarm

The low voltage loss alarm relay provides a dry contact closure if control voltage is not present.

7. High (Line) Voltage Loss Alarm

The high voltage loss alarm relay will provide a dry contact closure if line voltage is not present.

8. Low Building Temperature Alarm

The Low Building Temperature Alarm has an adjustable temperature range of 30°F thru 65°F (-1°C thru 19°C) that may be adjusted in screen #8 of the configuration menu. If the temperature drops to this setting, all outputs will be turned off and the LCD display will annunciate Low Building Temperature. There is a 2°F (1°C) differential for this alarm to reset.

9. First Stage High Building Temperature Warning

The set point temperature is adjustable from 70°F thru 140°F (21°C thru 60°C). If this set point is reached, the control will display a First Stage High Building Temperature warning on the LCD display. The default setting for this is 85°F (29°C). There is a 2°F (1°C) differential for this alarm to reset. The first stage high temperature warning temperature is adjustable in screen #6 of the Configuration Menu.

10. Second Stage High Building Temperature Alarm

This set point is adjustable from 75°F thru 145°F (24°C thru 63°C). If this set point is reached, all outputs are turned off with the exception of the Mixed Air Relay (MAR) and Air Mover Relay (AMR), and the control will display a Second Stage High Building Temperature alarm on the LCD display. The economizers (if air conditioners or heat pumps with economizers are installed) will run in the emergency mode and the indoor blower will be energized with a DC inverter (if an inverter is present). There is a 2°F (1°C) differential

CommStat 4 Lead/Lag Controller Outputs (cont'd)

for this alarm to reset. The temperature for the second stage high temperature alarm can be selected in screen #7 of the Configuration Menu.

11. Smoke alarm

The smoke alarm is energized when the smoke detector inputs sense a smoke fault condition. All outputs are off and the smoke alarm relay is energized during a smoke fault. This is a dry contact output that can be configured for NO or NC (default) operation in setting #18 of the configuration menu.

The smoke alarm has two selections -**Manual** (default) and **Auto**. If **Manual** is selected, a physical reset of the fault is required by holding the **Up** and **Down** buttons for 4 seconds. Cycling power will not reset a smoke fault if **Manual** is selected.

If **Auto** is selected the alarm will reset after an adjustable time delay of 3-10 minutes. Screen #17 in the Configuration Mode allows the user to determine how the smoke alarm relay reset will be configured.

12. Mixed Air Relay (MAR)

The MAR output is energized by the CommStat 4 when the second stage high temperature alarm has been activated. This is referred to as the Emergency Ventilation Mode.

13. DC Air Mover Relay (AMR)

The DC Air Mover Relay has a dry contact output and is energized in the Emergency Ventilation Mode.

14. AUX1 and AUX2

The CommStat 4 has the option for two, dry contact, auxiliary outputs that are energized based on the AUX1 and AUX2 inputs. Each AUX input can be configured to look for a normally open (NO) or normally closed (NC) signal in configuration screens #21 and #22. Each configuration screen allows the user the option of **NO**, **NC**, or **OFF** (default) to disable the feature. The AUX1 and AUX2 outputs provide a NO, NC, and COM terminal.

Important Safety Precautions



ALWAYS TURN OFF POWER AT THE MAIN POWER SUPPLY BEFORE INSTALLING, CLEANING, OR REMOVING THERMOSTAT.

- This thermostat is for 24 VAC applications only; do not use on voltages over 30 VAC
- Do not short across terminals of system control to test operation; this will damage your thermostat and void your warranty
- All wiring must conform to local and national electrical and building codes
- Use this thermostat only as described in this manual

To Install CommStat 4 Telecom Controller



WARNING

ELECTRICAL SHOCK HAZARD

TURN OFF POWER AT THE MAIN SERVICE PANEL BY REMOVING THE FUSE OR SWITCHING THE APPROPRIATE CIRCUIT BREAKER TO THE OFF POSITION BEFORE REMOVING THE EXISTING THERMOSTAT.

IMPORTANT

CommStat 4 installation must conform to local and national building and electrical codes and ordinances.

Note: Mount the CommStat 4 about five feet above the floor. Do not mount the CommStat 4 on an outside wall, in direct sunlight, behind a door, or in an area affected by a vent or duct.

1. Turn off power to the heating and cooling system by removing the fuse or switching off the appropriate circuit breaker.
2. Put controller against the wall where you plan to mount it (Be sure wires will feed through the wire opening in the base of the CommStat 4).
3. Mark the placement of the mounting holes.
4. Using a drill bit, drill holes in the places you have marked for mounting.
5. Align CommStat 4 with mounting holes and feed the control wires through wire opening.
6. Use screws to mount CommStat 4 to wall.
7. Insert stripped, labeled wires in matching wire terminals. See Wiring Diagrams. CAUTION!: Be sure exposed portion of wires do not touch other wires.
8. Gently tug wire to be sure of proper connection. Double check that each wire is connected to the proper terminal.
9. Seal hole for wires behind CommStat 4 with non-flammable insulation or putty.
10. Replace cover on CommStat 4.
11. Turn on power to the system at the main service panel.
12. Test CommStat 4 operation as described in "Testing the CommStat 4".

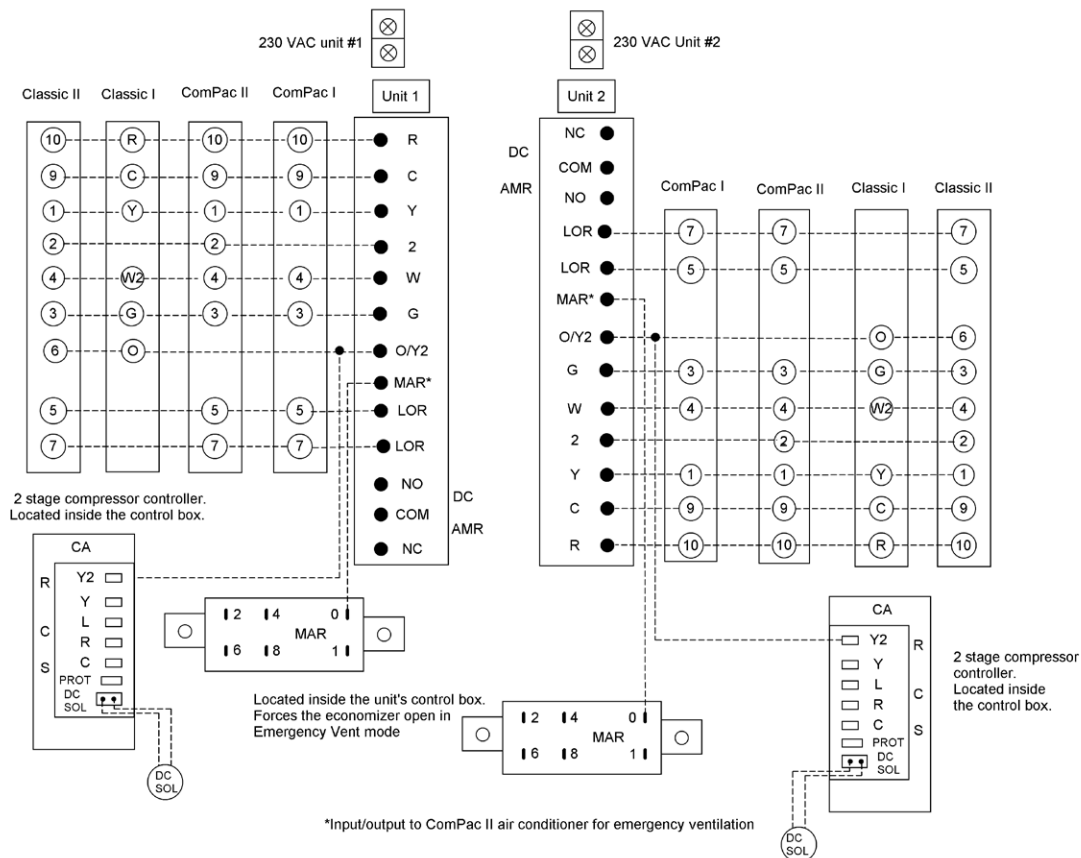
Remote Sensor Installation

1. Remove cover from remote sensor(s) housing.
2. Select an appropriate location for mounting the remote sensor(s).
3. Mount remote sensor(s) unit using hardware provided.
4. Install two wires between remote sensor(s) and CommStat 4 (use shielded cable that is adequately grounded).
 - Wire 1 should run between the S1 terminal on the CommStat 4 and the S1 terminal on the remote sensor
 - Wire 2 should run between the S2 terminal on the CommStat 4 and the S2 terminal on the remote sensor

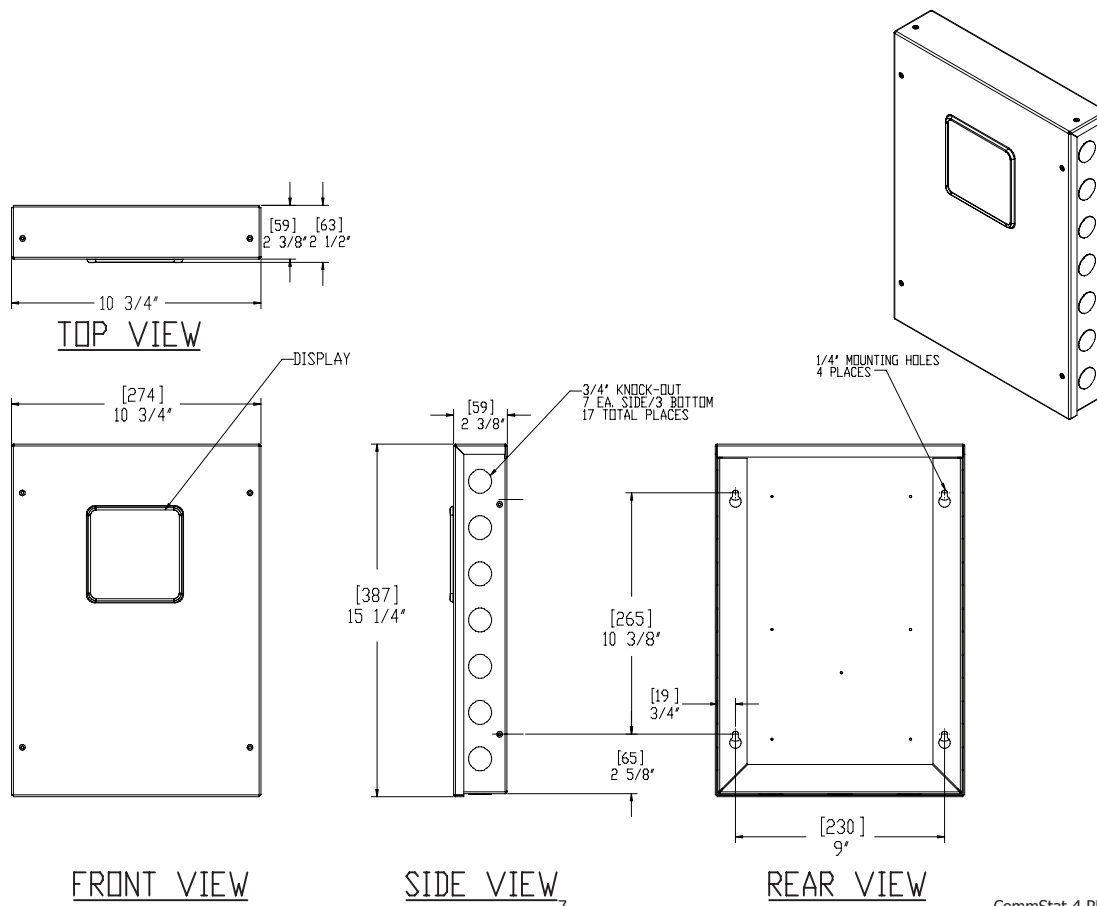
Optional Accessories

- Remote Sensor (P/N 50189)
- Expansion Cable (P/N 80515) To be used when multiple CommStat 4 controllers are installed in a Master/Slave configuration.

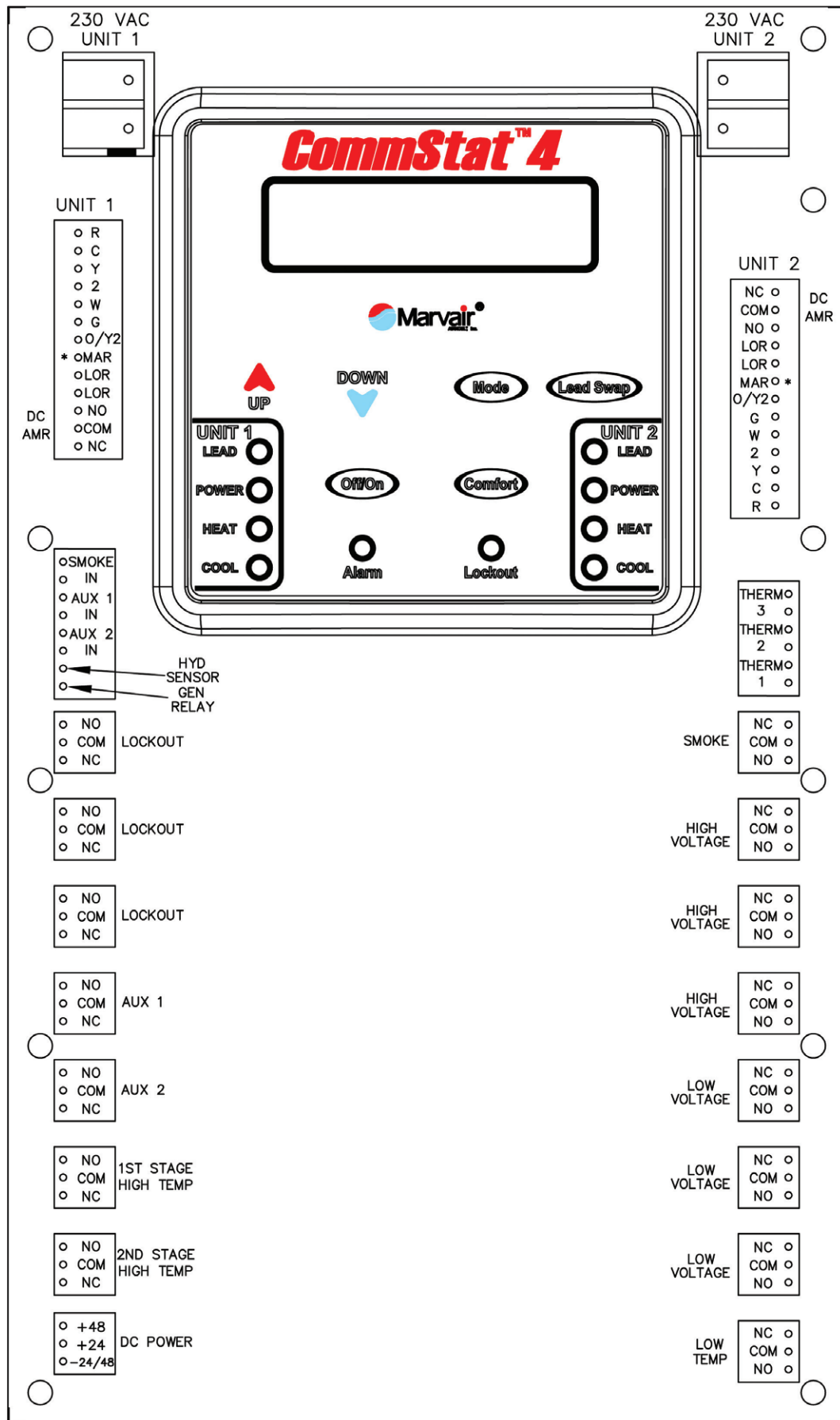
Thermostat and Line Voltage Connections Schematic



Dimensional Data



Alarm Connections Schematic



Operating the CommStat 4 Telecom Controller

The CommStat 4 is controlled with buttons as described below.

On/Off Button

The **On/Off** button turns the CommStat 4 on or off. If the system is running in the cooling or heating cycle when this button is pressed, all outputs will turn off. It also clears unit lockouts and reset alarms as long as all faults have cleared. To clear alarms and reset alarms, push and hold the **On/Off** button for 5 seconds.

Comfort Button

The **Comfort** button enables comfort mode operation. Pushing the **Comfort** button twice while in normal operating mode allows the user access to adjust the cooling and heating temperature settings for Comfort mode. The CommStat 4 will revert to normal operation after 90 minutes in the Comfort mode. It can also be removed from Comfort mode manually by pressing the **Comfort** button once.

The Comfort mode allows the service tech to be comfortable while working in the shelter. By reverting back to the desired set points after 90 minutes, energy costs can be minimized if the tech forgets to reset the temperature.

Up Button

The **Up** button is only functional when in the Configuration mode or when used in conjunction with the **Down** or **Mode** buttons in the normal operating mode. It is primarily used to set values while configuring the controller. Simultaneously pressing the **Up** and **Down** buttons for 4 seconds, while in normal operation, will reset the alarm relays, and status LEDs with the exception of the lockout alarm which requires the power to be cycled at the AC units. Simultaneously pressing the **Up** and **Mode** buttons for 4 seconds, while in normal operation, changes all settings to the default values.

Down Button

The **Down** button is only functional when in the Configuration mode or when used in conjunction with the **Up** button in the normal operating mode. It is primarily used to set values while in the configuration mode. Simultaneously pressing the **Up** and **Down** buttons for 4 seconds, while in normal operation, will reset the alarm relays, and status LEDs with the exception of the lockout alarm which requires the power to be cycled at the AC units.

Mode Button

The **Mode** button is only functional in normal operating mode. Pushing the **Mode** button for 4 seconds in the normal operating mode will activate the CommStat 4 Configuration mode. The settings can be adjusted using the **Up** or **Down** buttons. The Mode button is mashed to accept the values and advance to the next setting. Pressing the **Mode** and **Up** buttons simultaneously for 4 seconds, while in normal operation, will change all settings to the default values.

Fault History Storage

The CommStat 4 has a fault history storage feature that stores the last 10 faults that were registered. The fault history is accessed by holding the **Comfort** button for 5 seconds. Scroll through the fault history by pressing the **Up** and **Down** buttons. To return to the normal operating screen and keep the faults stored in memory, press the **Comfort** button once. To clear the fault memory, hold the **Comfort** button for 5 seconds while on the fault viewing screen. This will clear the fault history and return to the normal operating screen.

Lead Swap Button

Hold down to alternate the Lead and Lag units. Functional only when in the Normal or Comfort operating mode and both units are functional.

Lag Unit Economizer Operation

When the lead unit is in the Economizer mode, the lag or second stage unit, will only operate in the mechanical cooling mode. The CommStat 4 will not allow the lag unit to operate in the economizer mode. The CommStat 4 provides a 24 vac signal to terminal 2 on the lag unit through an internal relay to bypass the enthalpy controller and operate in the mechanical cooling mode until second stage cooling set point is reached

CommStat 4 Lead/Lag Controller Configuration Screens

To enter the Configuration Mode:

1. Make sure that the CommStat 4 is in the normal operating mode.
2. Push the Mode button for 4 seconds.
3. Press the Up and Down buttons to change the set points.
4. Press the Mode button to accept the settings and advance to the next screen.

To change all settings to the default values, press the Mode and Up buttons simultaneously for 4 seconds while in normal operation.

To exit configuration mode, do not touch any of the buttons for 5 seconds.

Screen Number	Description	Default
1	Keypad Lockout Select OFF to disable lockout or a 3 digit number to enable lockout.	OFF
2	°F or °C	°F
3	Lead/Lag air conditioner changeover. 0.5 to 7 days in ½ day increments	7 days
4	Cooling set point. 65°F thru 95°F (18°C thru 35°C) in 1° increments.	75°F (24°C)
5	Heat set point. 50°F thru 80°F (10°C thru 27°C) in 1° increments	68°F (20°C)
6	First stage high temperature warning set point. 70°F thru 140°F (21°C thru 60°C) in 1° increments	85°F (29°C)
7	Second stage high temperature alarm set point. 75°F thru 145°F (24°C thru 63°C) in 1° increments.	90°F (32°C)
8	Low building temperature alarm set point. 32°F thru 65°F (0°C thru 18°C) in 1° increments	55°F (13°C)
9	Continuous indoor blower on all air conditioners Select ON or OFF	OFF
10	Alarms 0=No alarm output. Screen does not display High voltage fail. 1=No alarm output. High voltage input required. 2=Alarm output. Screen does not display High voltage fail. 3=Alarm output. High voltage input required.	3
11	Anti-short cycle timer. 0 = no delay or 3-10 minutes in 1 minute increments	0
12	Differential for 3rd stage htg. 0°F thru 7°F (0°C thru 4°C) in 1° increments	2°F (1°C)
13	1st stage temperature differential 2°F thru 5°F (1°C thru 3°C) in 1° increments. This setting only affects the turning on of the system. The turn off differential is fixed at 1°F/C.	3°F (2°C)
14	2nd stage temperature differential 2°F thru 5°F (1°C thru 3°C) in 1° increments. This differential is in reference to the 1st stage differential and the outputs are staged off each stage's differential is satisfied.	3°F (2°C)
15	Cooling blower off time delay. 0-90 seconds in 1 second increments	90 seconds
16	Operational units on generator power 1= Lead unit only 2= Lead unit & one lag unit 3= Lead unit and two lag units 4= Lead unit and three lag units	1
17	Smoke alarm relay reset Automatic after 3-10 minutes or Manual.	Manual
18	Smoke detector contacts Normally Open or Normally Closed. When configured for N.O., an open circuit between the smoke terminals will be considered a smoke fault. When configured for N.C., a closed circuit between the smoke input terminals will be considered a smoke fault.	Normally Closed
19	Economizer Configuration Yes = ComPac II unit with economizer No= ComPac I unit without economizer If "No" is selected, the emergency ventilation function does not operate.	No
20	Remote temperature Sensor(s). If No (the default) is selected and multiple sensors are being used, the temperatures will be averaged. If multiple sensors are being used and Yes is selected, the sensor with the highest temperature reading will be used to control the units when in the cooling mode. In heating, the sensor with the lowest reading will be used to control the units.	No
21	AUX 1 dry contact output. Selection are: NO = Output will be energized when there is no contact closure between the AUX1-IN terminals. NC = Output will be energized when there is contact closure between the AUX1-IN terminals OFF=Disabled	Off

Screen Number	Description	Default
22	AUX 2 dry contact output. Selection are: NO=Output will be energized when there is no contact closure between the AUX2-IN terminals. NC= Output will be energized when there is contact closure between the AUX2-IN terminals OFF=Disabled	Off
23	Excessive compressor operation. Select between 5-10 cycles per two hour period or "No" to disable. When set between 5-10 cycles and the compressor cycles more than the set point, the first stage differential will increase by 2°F (1°C).	No
24	Language Select either English, French or Spanish	English
25	Select either 1-stage air conditioner, 2-stage air conditioner or heat pump. 1= 1-stage air conditioner 2 = 2-stage air conditioner No = Heat pump If the CommStat 4 Controller is configured for 2-stage air conditioner, the CommStat 4 Controller only functions as a master, stand alone unit. It can not be used as a slave unit.	1
26	Master/Slave setting. When connected to another CommStat 4, the user selects whether this unit is the Master (Yes) or Slave (No).	Yes
27	Differential setting between the 3rd and 4th stages when the CommStat 4 is being used in a Master/Slave application. This screen only appears if No is selected in screen #25.	3°F (2°C)

Testing the CommStat 4 Thermostat Controller

Check-Out of Cooling Cycle

Due the wide range of configurations, the following instructions are limited to checking the operation of the cooling and heating modes. If alarm or fault conditions are displayed, recheck all field wiring and the configuration screens.

Important: Be sure that the crankcase heater (if used) has been energized for at least 24 hours before starting the unit(s). Double-check all electrical connections before applying power. ComPac® air conditioners with scroll compressors running on 3Ø power must be checked for proper rotation during the initial start-up. Please refer to ComPac Installation & Operation manual for determining if the 3Ø compressors are rotating correctly. Incorrect rotation can damage the compressor and is not covered by the warranty

Procedure:

1. In the Configuration screen No. 4, set the cooling set point temperature to a point higher than the ambient temperature. In the Configuration screen No. 5, set the heating set point temperature to a temperature that is lower than the ambient.
2. Set the time delay in the ComPac® I or ComPac® II A/C control box to three minutes. On ComPac II air conditioners with the economizer, check the changeover setting of the H205A or dry bulb sensor and reset it if needed. (See ComPac air conditioner Installation & Operation manual).
3. Using configuration screen No. 4, slowly lower the thermostat's cooling set point temperature until the switch closes. The indoor fan should operate. Once the indoor fan turns on, allow approximately three minutes for the compressor to start. Note that the outdoor fan may not come on immediately, because it is cycled by refrigerant pressures.

NOTE: (ComPac® II A/C only). To check the system operation under different ambient conditions, the air temperature and enthalpy sensors must be "tricked". When outdoor ambient conditions are higher than the control setting, a component cooler aerosol may be sprayed directly into the enthalpy sensor to simulate low enthalpy conditions, causing the economizer damper to open. Alternately, when outdoor conditions are lower than the set point, a source of heat such as a hair dryer can be directed on the air temperature sensor to simulate warmer conditions, which will bring on mechanical cooling and start the compressor.

4. To stop cooling, slowly raise the thermostat cooling set point to a temperature higher than the ambient. Follow the same procedure for additional units.

NOTE: The fan purge allows the indoor fan to run for approximately 90 seconds after the compressor is off. This operation provides a small improvement in system rated efficiency.



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Procedure:

1. In the Configuration screen No. 4, set the cooling set point temperature to a point higher than the ambient temperature. In the Configuration screen No. 5, set the heating set point temperature to a temperature that is lower than the ambient.
2. Set the time delay in the ComPac® I or ComPac® II A/C control box to three minutes. On ComPac II air conditioners with the economizer, check the changeover setting of the H205A or dry bulb sensor and reset it if needed. (See ComPac air conditioner Installation & Operation manual).
3. Using configuration screen No. 4, slowly lower the thermostat's cooling set point temperature until the switch closes. The indoor fan should operate. Once the indoor fan turns on, allow approximately three minutes for the compressor to start. Note that the outdoor fan may not come on immediately, because it is cycled by refrigerant pressures.

NOTE: (ComPac® II A/C only). To check the system operation under different ambient conditions, the air temperature and enthalpy sensors must be "tricked". When outdoor ambient conditions are higher than the control setting, a component cooler aerosol may be sprayed directly into the enthalpy sensor to simulate low enthalpy conditions, causing the economizer damper to open. Alternately, when outdoor conditions are lower than the set point, a source of heat such as a hair dryer can be directed on the air temperature sensor to simulate warmer conditions, which will bring on mechanical cooling and start the compressor.

4. To stop cooling, slowly raise the thermostat cooling set point to a temperature higher than the ambient. Follow the same procedure for additional units.

NOTE: The fan purge allows the indoor fan to run for approximately 90 seconds after the compressor is off. This operation provides a small improvement in system rated efficiency.

Check-Out of Heating Cycle

Procedure: (Applies only to units with resistance elements)

1. Using Configuration screen No. 5, raise the heating set point temperature to a setting which is higher than the ambient temperature. The fan and electric heat should immediately cycle on.
2. Move the system switch to the "OFF" position. All functions should stop.

NOTE: (ComPac® II A/C with economizer only) The damper blade should remain closed during the heating cycle (unless the minimum position potentiometer has been set for constant ventilation A fully counterclockwise position corresponds to full closure of the damper. See ComPac Installation & Operation manual for details.

As part of the Marvair® continuous improvement program, specifications are subject to change without notice.