SmartZonePLUS Equipment Staging

COOLING – Air Conditioning and Heat Pump

- First stage cooling occurs any time there is a call for cooling or a changeover from heating to cooling. Y1 and G are energized. In heat pump cooling mode O/B may also be energized.
- After 8 minutes of initial run time in first stage, the ELC (Electronic Limit Control) will initiate Y2 if the supply air temp is not lower than 10 degrees above the Low Temp Cut-Out temperature.
- Once second stage is initiated and after a 3 minute minimum run time, if the supply air temp goes below 4 degrees above the Low Temp Cut-Out, Y2 is de-energized and only Y1 and G are energized.
- This scenario is repeated as dictated by the supply air temp.

Special Case: *ZONE1 Thermostat with Y2 Connected:*

- The ZONE1 thermostat with a 2ND stage call will force 2nd stage operation by energizing Y2 on the equipment terminal, ignoring the time and temperature strategy described above.
- During any ZONE1 thermostat 2nd stage call, the ELC's second stage cut-out is ignored but the LOW Limit cut-out temperature will still de-energize Y1 and Y2.

Special Case: *DIP switch #5 in the '20%+Zone1' position:*

- Unless a minimum of 20% of all zones in the system are calling, the ELC's second stage cut-in will be ignored.
- The ZONE1 thermostat with a 2ND stage call can force the equipment to go to 2nd stage operation, ignoring the 20% minimum described above.

HEATING – Gas, Electric and Fuel Oil

- First stage occurs anytime there is a call for heating or a changeover from cooling to heating. W1/EH and G are energized if using electric heat. If using gas heat, G will be energized 90 seconds after W1/EH.
- After 8 minutes of initial run time in first stage, the ELC will initiate W2/OB if the supply air temp has not risen above 25 degrees below the High Temp Cut-Out temperature. 110 Deg F (Default)
- Once second stage is initiated, if the supply air temp rises above 10 degrees below the High Temp Cut-Out, W2/OB is de-energized an only W1 and G are energized. 125 Deg F (Default)
- This scenario is repeated as dictated by the supply air temp.

Special Case: *ZONE1 Thermostat with W2 Connected:*

- A ZONE1 thermostat with a 2ND stage call will force the equipment to go to 2nd stage operation, ignoring the timing described above.
- During an ZONE1 thermostat 2nd stage call, the ELC's second stage cut-out is ignored but the HI Limit cut-out temperature will still de-energize W1 and W2.

Special Case: *DIP switch #5 in the '20%+Zone1' position:*

- Unless a minimum of 20% of all zones in the system are calling, the ELC's second stage cut-in and cut-out will be ignored.
- The ZONE1 thermostat with a 2ND stage call can force the equipment to go to 2nd stage operation, ignoring the 20% minimum described above.

HEATING - Heat Pump

- First stage occurs anytime there is a call for heating or a changeover from cooling to heating. Y1 and G are energized. If the DIP switch set to B, then B will also be energized.
- After 4 minutes of initial run time in first stage, the ELC will initiate Y2 if supply air temp has not risen above 15 degrees below the High Temp Cut-Out temperature. 105 Deg F (Default)
- Once second stage is initiated, if the supply air temp rises above 5 degrees below the High Temp Cut-Out, Y2 is de-energized and only Y1 and G are energized. 115 Deg F (Default)
- This scenario is repeated as dictated by the supply air temp.

ELECTRIC AUXILIARY /EMERGENCY HEAT

- Auxiliary Heat - After 6 minutes of initial run time, if the supply air temp drops below 90 degrees, W1/EH will be energized.
- If the supply air temp rises above 100 degrees W1/EH will be de-energized and only Y1, Y2 and G will be energized. (See Note 1, Note 2 and Note 3 below)
- This scenario is repeated as dictated by the supply air temp.

FOSSIL FUEL (DUAL FUEL) AUX./EMERGENCY HEAT

- Auxiliary Heat - After 6 minutes of initial run time, if the supply air temp drops below 90 degrees, W1/EH will be energized. This will remove Y1 and Y2 and energize W1/EH only. G will be continuously energized during staging to auxiliary heat. (See Note 1, Note 2 and Note 3 below)
- Only the W1/EH and G will remain energized for the remainder of the heating cycle.
- This scenario is repeated as dictated by the supply air temp.

EMERGENCY HEAT

- Emergency Heat can only be initiated through a heat pump thermostat in the ZONE1 thermostat position.
- If this thermostat is placed in Em. Heat, the **SmartZone*PLUS*™** system is locked into emergency heat. No compressor will run and only heating calls will be recognized.
- Only the W1/EH and G will remain energized for the remainder of the heating cycle.
- Remove the Em. Heat call at ZONE1 stat and make a call for a mode other than Em. Heat from ZONE1 stat in order to unlock the board and take system out of emergency heat.

Note 1: *When the Outdoor Air Temperature Sensor is installed, the Heat Pump Compressor will not energize in the heating mode if the Outdoor Air temperature is below the OA TEMP LO TEMP Balance Point Cutout. (See PUSH BUTTONS & DISPLAY inside)*

Note 2: *When the Outdoor Air Temperature Sensor is installed, the Auxiliary Heat will not energize if the Outdoor Air temperature is above the OA HI TEMP Balance Point Cutout. (See PUSH BUTTONS & DISPLAY inside)*

Note 3: *Failure to install an outdoor temperature sensor will cause the Fresh Air temperature cutout settings and the Heat Pump Balance Point cutout settings to be ignored.*

OTHER REFERENCES:
SmartZone**PLUS** MC Spec Sheet
SmartZone**PLUS** E1/E4 Quick-Reference Guide
SmartZone System Manual

ecojay

Quick-Reference Guide

SmartZone**PLUS**™ Main Controller (MC)

Commercial & Residential HVAC
Expandable Zoning System up to 33 Zones

- **EXPANDABLE TO 33 ZONES**
- **ELECTRONIC LIMIT CONTROL™(ELC)**
- **BUILT-IN FRESH AIR CONTROLLER**
- **ECONOMY MODE**
- **GAS/ELECTRIC & HEAT PUMP & DUAL FUEL**
- **5-YEAR LIMITED WARRANTY**

MC Main Controller (Equipment Controller)
E1 & E4 Zone Expansion Boards

SmartZone*PLUS* introduces a residential and light commercial HVAC zoning control system with the flexibility to incrementally expand from two (2) zones up to 33 zones on a single forced-air system. Each **SmartZone*PLUS*** system utilizes a single Main Control module (ZONE1) to manage communications of the individual one-zone (E1) and four-zone (E4) expansion modules, and perform control functions of the HVAC equipment.

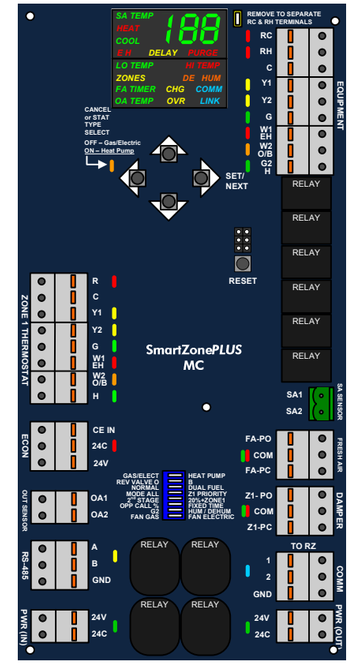
Easy Operation

- Standard Gas/Electric and Heat Pump Thermostats
- Built-In Adjustable Fresh Air Damper Control from 0 to 60 Minutes per Hour with Outdoor Air High & Low Limits
- Multiple Intelligent Staging Options, based on Supply Air Temperature, Time or Zone-1 Staging
- Dynamic Automatic Changeover for Maximum Comfort
- Optional Outdoor Temperature Sensor allows Control of Heat Pump via Balance Points and Temperature Thresholds for Fresh Air Control
- Two-Color LEDs for Each Damper Position

Flexible Installation

- MC Controller Handles Heat Pump (including Dual Fuel) & Conventional Gas-Electric Systems
- Supports up to 2-Stage Cooling Equipment, and 3-Stage Heating, including Emergency Heat
- Simple Pushbutton and Dipswitch Configuration
- Quick-Connect Screw-less Terminals
- Innovative Enclosure Design with Multiple Wiring & Mounting options, both Local and Remote
- Pushbutton ELC™ for Adjustable Temperature Cut-Outs

SmartZone*PLUS* Main Control Board (MC)



SmartZonePLUS-MC
INCLUDES: Supply Air Temperature Sensor and Clear Cover Plastic Enclosure

Simple Service

- Color-Coded Diagnostic LEDs for Each Thermostat Call
- Full Text Display Allows Viewing of Complete System Status at the ZONE1 Panel
- System Communications Diagnostics for Easy Troubleshooting

Convenient Customer Features

- Customer Never Needs to Use the Control Panel
- Selectable Zone-1 Priority for More Customer Control
- Enable Emergency Heat from Zone-1 Heat Pump Thermostat
- Constant Supply Air Monitoring ELC ensures Customer Safety
- Zone-Specific Ventilation Mode; Energize Fan from any Thermostat
- Integrates with most Home Automation Systems
- Superior 5-Year Limited Factory Warranty

SmartZonePLUS
Main Controller (MC)
Quick-Reference

Download SmartZonePLUS System Manual at
www.ecojay.com

PUSH BUTTONS & DISPLAY

NORMAL OPERATION		SETUP MENU	
Below the display indicators an installer or user might see during normal operation are listed and described. For further detail, refer to the **SmartZone*PLUS*** System Manual *at ECOJAY.com*		**Right Button Press**	To start the setup process, press the right arrow button. The numbers in the column to the left indicate the # of button presses needed to see the setting indicated below. All settings can be adjusted with the up and down pushbuttons. THE SET/NEXT BUTTON MUST BE PRESSED TO SAVE ANY CHANGES.
SA TEMP		**1**	***ZONES + COOL***
Temperature displayed by MC is the Supply Air Temp			Number of Zones calling for Cool mode displayed by MC
OA TEMP		**2**	***ZONES + HEAT***
Temperature displayed by MC is the Outdoor Air Temp (if "--" displayed then NO outdoor sensor installed)			Number of Zones calling for Heat mode displayed by MC
COMM LINK		**3**	***ZONES***
Communications Link established with at least one E1/E4			Total Number of Zones connected and communicating to MC
HEAT		**4**	***CHG OVR***
System is running in Heat mode			Time in minutes before system will begin PURGE to switch modes ("--" will be displayed if no calls present)
COOL		**5**	***LO TEMP (FLASHING)***
System is running in Cool mode			Low Temperature Limit displayed by MC
E H		**6**	***HI TEMP (FLASHING)***
System is running in Emergency Heat mode (only for Heat Pump and only if Zone 1 Thermostat is calling for Emer.Heat)			High Temperature Limit displayed by MC
DELAY		**7**	***DE HUM or HUM***
System is on 3 minute time delay because all calls have been satisfied			Humidification or DeHumidification Mode can be selected by pressing the up or down pushbuttons
PURGE + HEAT		**8**	***FA TIMER (FLASHING)***
The system is purging from Heat mode and will start-up in Cool mode after 3 minutes			Time (Minutes per Hour) the Fresh Air Damper will be opened (Must be set to zero "0" if no Fresh Air Damper installed)
PURGE + COOL		**9**	***FA TIMER + OA TEMP + LO TEMP***
The system is purging from Cool mode and will start-up in Heat mode after 3 minutes			Low Outdoor Temperature Limit to prevent FA Damper from opening when Outdoor Temp is **below** this setting (will be ignored when no OA Sensor installed)
DE HUM or HUM		**10**	***FA TIMER + OA TEMP + HI TEMP***
The system is running in DeHumidification or Humidification mode (only if Zone 1 Thermostat is calling)			High Outdoor Temperature Limit to prevent FA Damper from opening when Outdoor Temp is **above** this setting (will be ignored when no OA Sensor installed)
HI TEMP		**11**	***OA TEMP + LO TEMP***
The system has cut-out on a High Temp Limit at the Supply Air Sensor (Equipment fan should still be running and system will start back up after 3 minute minimum off time when Supply Temp has dropped within range)			Low Balance Point Setting – On Heat Pump equipment this setting prevents the compressor from running **below** this set temperature
LO TEMP		**12**	***OA TEMP + HI TEMP***
The system has cut-out on a Low Temp Limit at the Supply Air Sensor (Equipment fan should still be running and system will start back up after 3 minute minimum off time when Supply Temp has dropped within range)			High Balance Point Setting – On Heat Pump equipment this setting prevents the auxiliary heat from running **above** this set temperature
FA TIMER		**13**	***SA TEMP***
Fresh Air Damper is open			Displays supply air temperature

THERMOSTAT WIRING

- *USE 18 GAUGE Solid Conductor Wire*
- ZONE 1 Thermostat Input on the ZONE1 can be used to control staging of the equipment in both Heating and Cooling with the use of a multi-stage thermostat.
- In the case of a HEAT PUMP System with Emergency Heat, ZONE 1 Thermostat is the only thermostat with the ability to control Emergency Heat.

ZONE 1 THERMOSTAT WIRING TABLE

EQUIPMENT	COLOR (TYPICAL)	ZONE1
24VAC (HOT)	RED	R
24VAC (COMMON)	-- no standard	C
COMPRESSOR (STAGE 1)	YELLOW	Y1
COMPRESSOR (STAGE 2)	-- no standard	Y2 (OPTIONAL)
FAN	GREEN	G
HEAT (STAGE 1) or EMERGENCY HEAT	WHITE	W1-EH
HEAT (STAGE 2) or REVERSING VALVE	ORANGE	W2-O/B (OPTIONAL)
HUMIDIFY or DEHUMIDIFY	-- no standard	H (OPTIONAL)

ECONOMY MODE SWITCH (SYSTEM WIDE)

(OPTIONAL) A CONNECTION CAN BE MADE BETWEEN 24V OUT and CE INPUT to put the entire SmartZonePLUS System (ALL ADD1s and ADD4s connected to this ZONE1) in ECONOMY MODE. This means the ZONE1 board will not make calls to the equipment unless the ZONE 1 Thermostat makes a call. All other zones besides ZONE 1 will be ignored, however the ADD1 and ADD4 dampers will still open and close as needed.
APPLICATION: *A simple timer could be used to put the entire system into economy mode after hours.*

OPEN = *NORMAL*

CLOSED = *SYSTEM WIDE ECONOMY*

OUTDOOR SENSOR (OAS)

(OPTIONAL) This optional accessory (SOLD SEPARATLY) is for informational purposes unless the system is set to HEAT PUMP and DUAL FUEL (DIP SWITCHES 1 and 3 to the right). In the case of DUAL FUEL & HEAT PUMP, the OUTDOOR SENSOR will allow for HIGH and LOW Compressor cutout temperatures to be set in the menu. (HIGH and LOW Balance Points)
The OUTDOOR SENSOR can also be used to control temperature limits for FRESH AIR Damper operation.

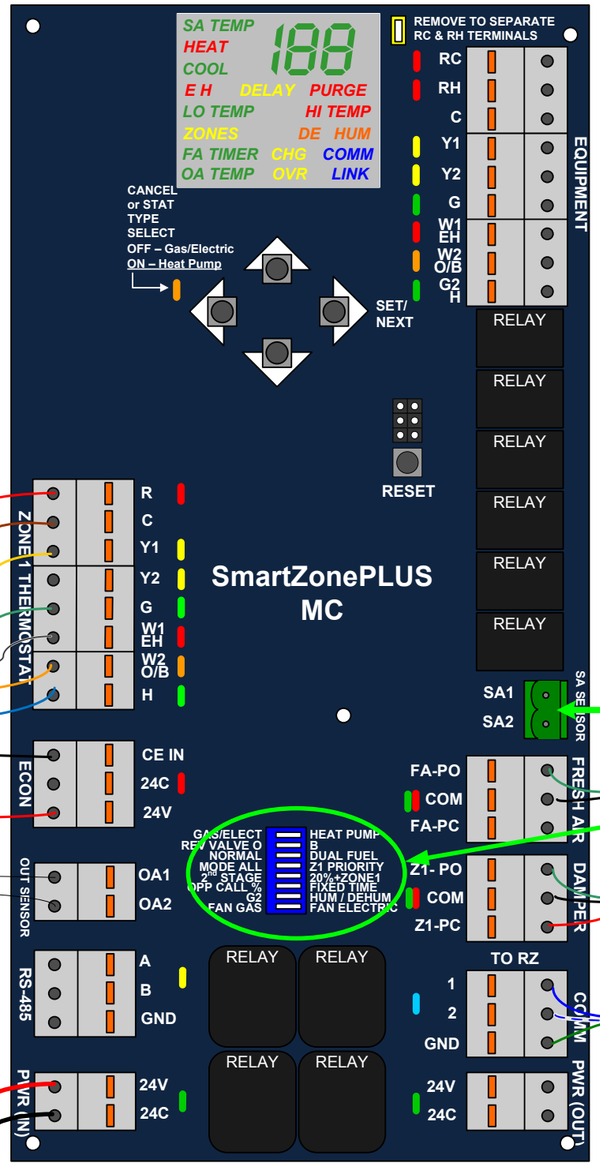
OUTDOOR AIR TEMPERATURE SENSOR

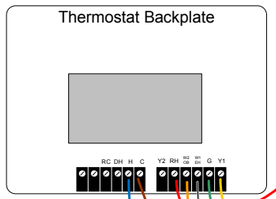
POWER (24 VAC)

SmartZonePLUS System MUST BE POWERED WITH AN INDEPENDENT, **FUSED** TRANSFORMER. The size of this transformer(s) will be determined with the TABLE below.
NOTE: Multiple transformers can be used to power the SmartZonePLUS system as long as correct polarity is maintained on both primary and secondary of every transformer

TRANSFORMER SIZING TABLE

SmartZonePLUS Device	Power Requirement
EC1 Equipment Controller	14 VA
RZ1 1-Zone Expander	10 VA
RZ4 4-Zone Expander	14 VA
TSZ-2 TrueTouch Thermostat	3 VA
SZD Spring Return Damper	10 VA
POC Round POC Damper	3 VA





PC CONNECTION

RS-485 to USB Custom Cable & PC Software (FUTURE AVAILABILITY)

24 VAC Transformer

FUSE MUST BE SIZED FOR TRANSFORMER

EQUIPMENT WIRING

USE 18 GAUGE Solid Conductor Wire

NOT ALL TERMINALS ARE NECESSARY FOR ALL EQUIPMENT, PLEASE CHECK WITH EQUIPMENT MANUFACTURER FOR CORRECT WIRING.
NOTE: *The MC EQUIPMENT Terminal should be wired to the HVAC Equipment just like single thermostat normally would be.*

ZONE1 EQUIPMENT WIRING TABLE

EQUIPMENT	COLOR (TYPICAL)	MC
24VAC (HOT) FROM COOL TRANSFORMER	RED	RC
24VAC (HOT) FROM HEAT TRANSFORMER	RED	RH
24VAC (COMMON)	-- no standard	C
COMPRESSOR (STAGE 1)	YELLOW	Y1
COMPRESSOR (STAGE 2)	-- no standard	Y2 (OPTIONAL)
FAN	GREEN	G
HEAT (STAGE 1) or EMERGENCY HEAT	WHITE	W1-EH
HEAT (STAGE 2) or REVERSING VALVE)	ORANGE	W2-O/B (OPTIONAL)
HIGH SPEED FAN, HUMIDIFY or DEHUMIDIFY	-- no standard	G2-H (OPTIONAL)

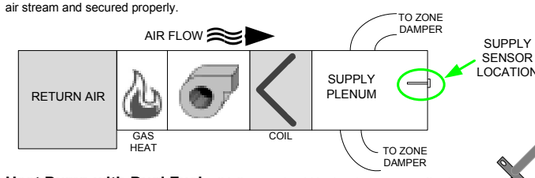
SUPPLY AIR SENSOR (SAS)

Sensor Wiring
Using the provided *GREEN* connector (Factory Connected to Sensor Wire) plug the SA Sensor connector into the SmartZone*PLUS* MC.

NOTE: *WITHOUT THIS SENSOR, THE* SmartZonePLUS *Controller Board will operate in* ***1st Stage ONLY****. All dampers will OPEN, only Zone 1 will be able to make calls and only first stage equipment will be energized.*

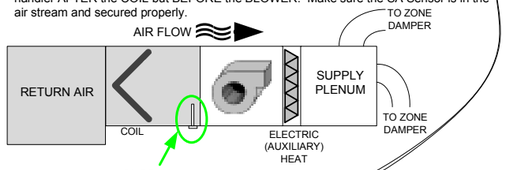
Sensor Placement (Location)

Gas/Electric – SA Sensor should be located in Supply Air Plenum where it will sense AVERAGE air temperature within the plenum. The most ideal placement for the SA Sensor will be 2 to 4 feet beyond the evaporator. Make sure the SA Sensor is in the air stream and secured properly.

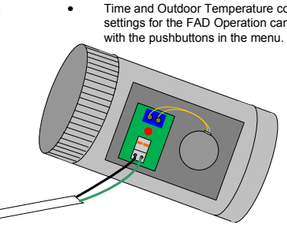


Heat Pump with Dual Fuel – SA Sensor should be located same as Gas/ Electric as described above.

Heat Pump (Standard) – The SA Sensor is placed inside the cabinet of the air handler AFTER the COIL but BEFORE the BLOWER. Make sure the SA Sensor is in the air stream and secured properly.



SUPPLY AIR TEMPERATURE SENSOR



FRESH AIR DAMPER

- 2-Wire or 3-Wire Dampers
- Use 18 GAUGE Solid 2 or 3 Conductor wire.
- Wiring show below is for POWER OPEN, SPRING CLOSE Damper.
- Time and Outdoor Temperature control settings for the FAD Operation can be set with the pushbuttons in the menu.

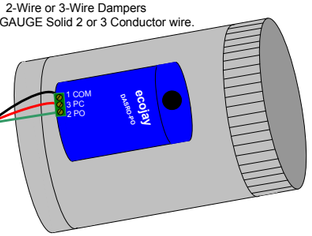
DIP SWITCHES

Additional information can be found in **SmartZonePLUS** System Manual

DIP #1	**GAS/ELECT**	Gas/Electric or Electric/Electric Equipment (Default)
	HEAT PUMP	Heat Pump Equipment ONLY
DIP #2	**REV VALVE O**	Reversing valve is energized in COOLING (Default)
	B	Reversing valve is energized in HEATING
DIP #3	**NORMAL**	Operates electric auxiliary heat with compressor. (Default)
	DUAL FUEL	Operates gas auxiliary heat with NO compressor. USE IN HEAT PUMP MODE ONLY
DIP #4	**MODE ALL**	Normal Opposing Call Changeover is active. (Default)
	Z1 PRIORITY	Opposing Call is Locked Out until Zone 1 is satisfied.
DIP #5	**2ND STAGE**	2nd Stage energized using ELC, or Zone 1 can initiate 2nd Stage. (Default)
	20% + ZONE1	2nd Stage energized using ELC with Minimum of 20% of zones calling, or Zone 1 can initiate 2nd Stage
DIP #6	**OPP CALL %**	Dynamic Opposing Call Time (Default) (SEE OPP CALL TABLE)
	FIXED TIME	Opposing Call time is fixed at 15 minutes.
DIP #7	**G2**	Energize G2 Output on equipment ONLY if 20% or more of the total zones calling for the mode currently running
	HUM / DE HUM	Chose HUM or DE HUM in the button setup menu (Zone 1 Thermostat controls Humidity)
DIP #8	**FAN GAS**	Fan energized 45 seconds after any heat call (Factory Default)
	FAN ELECTRIC	Fan energized immediately with any heat call

ZONE DAMPER

2-Wire or 3-Wire Dampers
Use 18 GAUGE Solid 2 or 3 Conductor wire.



Blue = 1
White w/ Blue = 2
Green = GND

Communication to E1/E4 Zone Expanders

COMMUNICATIONS (COMM)

FOR CONNECTION TO ADDITIONAL ZONES
COMM LINK WIRE REQUIREMENTS: UP TO 1000 Feet per System
Cat5 (Category 5) Wire: 8 Conductor (4 Twisted Pairs) Solid
(Only 2 Pairs used for COMM)

SmartZonePLUS Operation

RC/RH JUMPER

The *RC/RH Jumper* is Factory Installed on the ***SmartZonePLUS***™ MC Main Control Board. If the system being used requires separate Heat and Cool Transformers, REMOVE this jumper [JP2] at the top right of the board.

Note: *In the case of a Heat-Pump System, this jumper ALWAYS needs to be installed.*

EMERGENCY HEAT LOCK

When the MC thermostat has been set to Emergency Heat (EH), the compressor will not be energized until the system has been taken out of EH mode.

- ONLY the MC thermostat can set the equipment into Emergency Heat mode.
- The MC thermostat must be making a call for EH to set the heat pump equipment into EH mode.
- Once the MC has been set into EH by the MC thermostat, it is locked in EH mode and will not allow any compressor calls until it has been un-locked
- Any cooling calls from thermostats other than the MC thermostat will be **ignored** while in EH lock mode. Any heating calls from thermostats other than the MC will be treated as EH calls while in EH lock mode.
- To un-lock EH mode, a call must be made from the MC thermostat for COOL or HEAT.

Note: *EC1 Thermostat must not only be switched out of EH mode but ALSO must MAKE a call for another mode (either Heat-Pump Heat or Cool). If no call is made from the MC thermostat then the MC will remain in EH lock until the MC thermostat does make a call no matter what the other zones are calling for.*

DUAL FUEL APPLICATIONS

Note 1: *A DUAL FUEL KIT IS NOT REQUIRED and HEAT PUMP THERMOSTATS ARE NOT REQUIRED. However, use a Heat Pump stat on the MC (ZONE 1) Thermostat terminal only to control EMERGENCY HEAT.*

Note 2: *Always install the heat pump evaporator downstream of the furnace. This prevents condensation in the heat exchanger during the cooling mode.*

1. The HIGH Temperature Cut-Out for the gas furnace in a dual fuel application can only be identified and adjusted when the **# 1 dipswitch is in the GAS/ELECT** position. MAKE SURE TO SET THIS dipswitch BACK to HEAT PUMP after making this setting change otherwise the equipment will run in GAS/ELECT mode.
2. The HIGH Temperature Cut-Out for the heat pump in a dual fuel application can only be identified and adjusted when the **# 1 dipswitch is in the HEAT PUMP** position.
3. The LOW Temperature Cut-Out for the **HEAT PUMP** in a dual fuel application is the same as described earlier (LOW Temperature Cut-Out).

TIME DELAY

(Shown on the display as a solid yellow DELAY)
After all calls have been satisfied and the equipment is de-energized, all dampers open and a 3-minute **Time Delay** will be completed before new thermostat calls will be processed . This is designed to protect the equipment from re-starting for 3-minutes after it has stopped running. During the 3-minute **Time Delay**, the **SmartZonePLUS™** MC will not energize the fan. However, the fan may continue to run if the equipment being used has a built in "off-time-delay."

ECONOMY MODE

The **SmartZone*PLUS***™ Economy/Comfort Mode feature can reduce HVAC equipment run time compared to the default individual zone control operation. This is accomplished by restricting selected zones from making calls to the equipment. Two individual methods of economy mode help tailor the **SmartZone*PLUS***™ system to the needs of the project

System Wide Economy Control - At this level of Economy/Comfort Mode, only the MC Zone 1 thermostat can energize heating and cooling calls to the equipment. All other zone(s) making a call for the same mode that is also energized on the MC Zone 1 thermostat will open their damper(s). Each zone will close its damper(s) when the zone thermostat is satisfied. All zone dampers will open when all zone thermostats are satisfied. Economy/Comfort Mode at the System Control level can be activated by connecting a jumper wire to the CE IN and 24V connectors on the MC Controller ECON terminal block.

Single Zone Thermostat Economy/Comfort Control - Selected individual zones can be restricted from making direct calls to the HVAC equipment yet open their damper(s) if making a call for the same mode that is also energized on the equipment. Each zone configured for this economy mode will close its damper(s) when its zone thermostat is satisfied. All zone dampers will open when the current HVAC equipment mode de-energizes. Economy/Comfort Mode can be configured for an individual zone (except for the MC Controller Zone 1) by connecting a jumper wire to the 'R' and 'EC' connectors on the corresponding zone thermostat terminal block.

HUMIDIFY / DE-HUMIDIFY

SmartZonePLUS™ Humidity Control requires the use of a humidistat on Zone 1 of the MC Controller.

Humidification – SmartZonePLUS™ MC will energize the G2/H equipment circuit when it has an active heating call to the equipment and 'H' is energized on the Zone 1 thermostat.

Dehumidification – SmartZonePLUS™ MC will de-energize the G2/H equipment circuit when no calls are energized in the system except the MC Zone 1 thermostat. 'DH' on the Zone 1 thermostat must also be de-energized.

G2 (MULTI-SPEED FAN)

The **G2** terminal on the MC Controller Equipment terminal block is used with a variable-speed fan. Connect the G2, DS, BK, ODD or DHUM terminal on the HVAC equipment to this terminal. When 20% or more of the total zones are calling for the same mode that is currently energized, **G2** will be energized. This applies to HEAT, COOL and FAN modes. To activate this feature set dipswitch #7 on the MC Controller to the left, or **G2** position.

PURGE

The Purge Mode is a three-minute time period that allows the blower to continue to operate ('G' is energized) during Opposing Call Changeover. During the Purge, no heating or cooling equipment will be energized. Purge mode is designed to prevent cooling or heating from operating for three minutes so that HVAC system pressures and temperatures can equalize. During the three-minute Purge Mode, zone(s) calling for the opposite mode will have damper(s) closed. All other dampers (associated with non-calling zone(s) and last zone(s) being satisfied) will remain open during Purge Mode.

OTHER REFERENCES:
SmartZonePLUS-E1/E4 Spec Sheet
SmartZonePLUS-MC Quick-Reference Guide
SmartZone System Manual

ecojay

Quick-Reference Guide

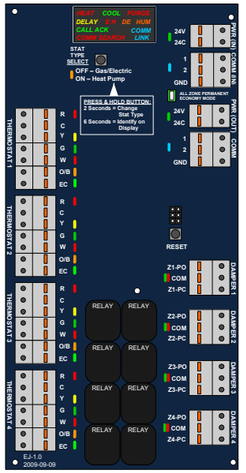
SmartZone**PLUS**™ – Expander Boards (E1/E4)

Commercial & Residential HVAC
Expandable Zoning System up to 33 Zones

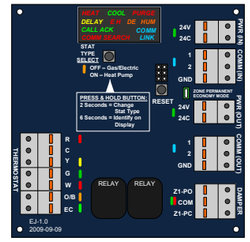
- **EXPANDABLE TO 33 ZONES**
- **FULL TEXT SYSTEM STATUS DISPLAY**
- **CENTRALIZED OR DISTRIBUTED INSTALL**
- **ECONOMY MODE**
- **GAS/ELECTRIC & HEAT PUMP THERMOSTATS**
- **5-YEAR LIMITED WARRANTY**

MC Main Controller (Equipment Controller)
E1 & E4 Zone Expansion Boards

SmartZone*PLUS* introduces a residential and light commercial HVAC zoning control system with the flexibility to incrementally expand from two (2) zones up to 33 zones from a single forced-air system. Each **SmartZone*PLUS*** system utilizes a single Electronic Control Module (MC) to manage communications of the individual one-zone (E1) and four-zone (E4) expansion modules, and perform control functions of the HVAC equipment.



SmartZone*PLUS*-E4



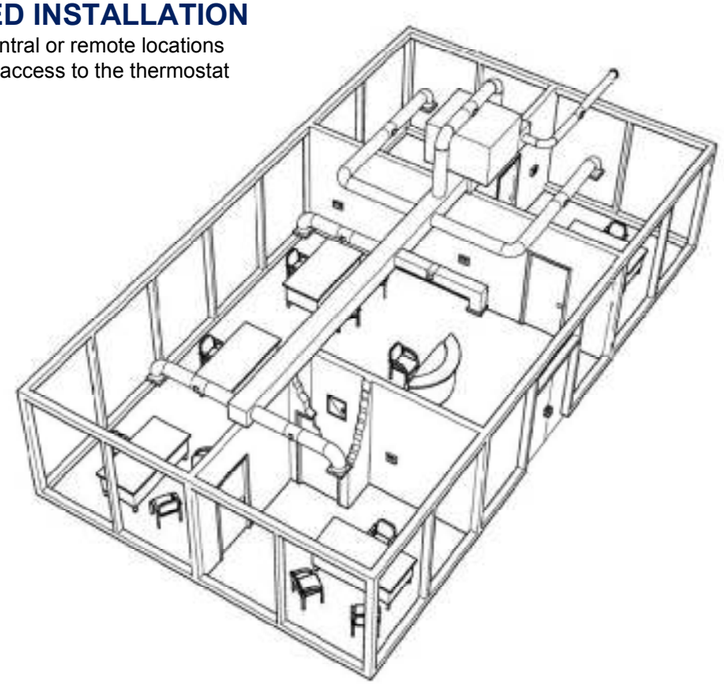
SmartZone*PLUS*-E1

E1 & E4 INCLUDE:
Clear Cover Plastic Enclosure

DISTRIBUTED or CENTRALIZED INSTALLATION

The E1/E4 Expanders can be installed in a central or remote locations from the MC and HVAC Equipment for easier access to the thermostat and damper locations (up to 3000 feet away).

DISTRIBUTED with **Damper-Mount Option**.
Conserves money on labor and wire when single E1 boards are mounted on the damper above the zone that is being served. Power and communications is normally daisy-chained from one damper to the next.



SmartZonePLUS-E1/E4 Quick-Reference

Download full SmartZone*PLUS System Manual* at www.ecojay.com

INITIALIZING E1/E4

1. After the E1/E4 expander has been connected to the MC COMM Port, and all the wiring has been verified.
2. Power the E1/E4 Expanders by applying 24VAC to the PWR (IN) connector.
3. The ***COMM SEARCH*** light should be ON solid.
4. Press the "STAT TYPE SELECT" button once and the ***COMM LINK*** indicator on the display should come ON.
5. This means the MC is communicating with E1/E4. IF the COMM SEARCH starts flashing, power off and re-check wiring.

PUSH BUTTONS AND DISPLAY

Equipment Indicators
HEAT = Equipment is Heating
COOL = Equipment is Cooling
PURGE = Equipment is in Purge Mode
DELAY = Equipment is in Delay Mode
EH = Equipment is in Emergency Heat
(DE) HUM = Equipment is Humidifying or DeHumidifying

Remote Zone Indicators
CALL ACK = MC has acknowledged the call(s) from this E1/E4 expander(s).
COMM SEARCH (SOLID) = Press the STAT TYPE SELECT Button to LINK the E1/E4 to the MC only after connecting all COMM LINK Wiring.
COMM SEARCH (FLASHING) = Communications has been lost to the MC most likely caused by a broken or crossed COMM LINK Wire. CHECK ALL COMM LINK WIRING.
COMM LINK = Indicates that a LINK has been established with the MC and is working properly

Stat Type LED
ON = HEAT PUMP Thermostat
OFF = GAS/ELECTRIC Thermostat

Stat Type Select Button
Press and hold 2 seconds to:
Change from HEAT PUMP to GAS/ELECTRIC. LED will turn OFF
OR
Change from GAS/ELECTRIC to HEAT PUMP. LED will turn ON.

Reset Button
Press to reset board.

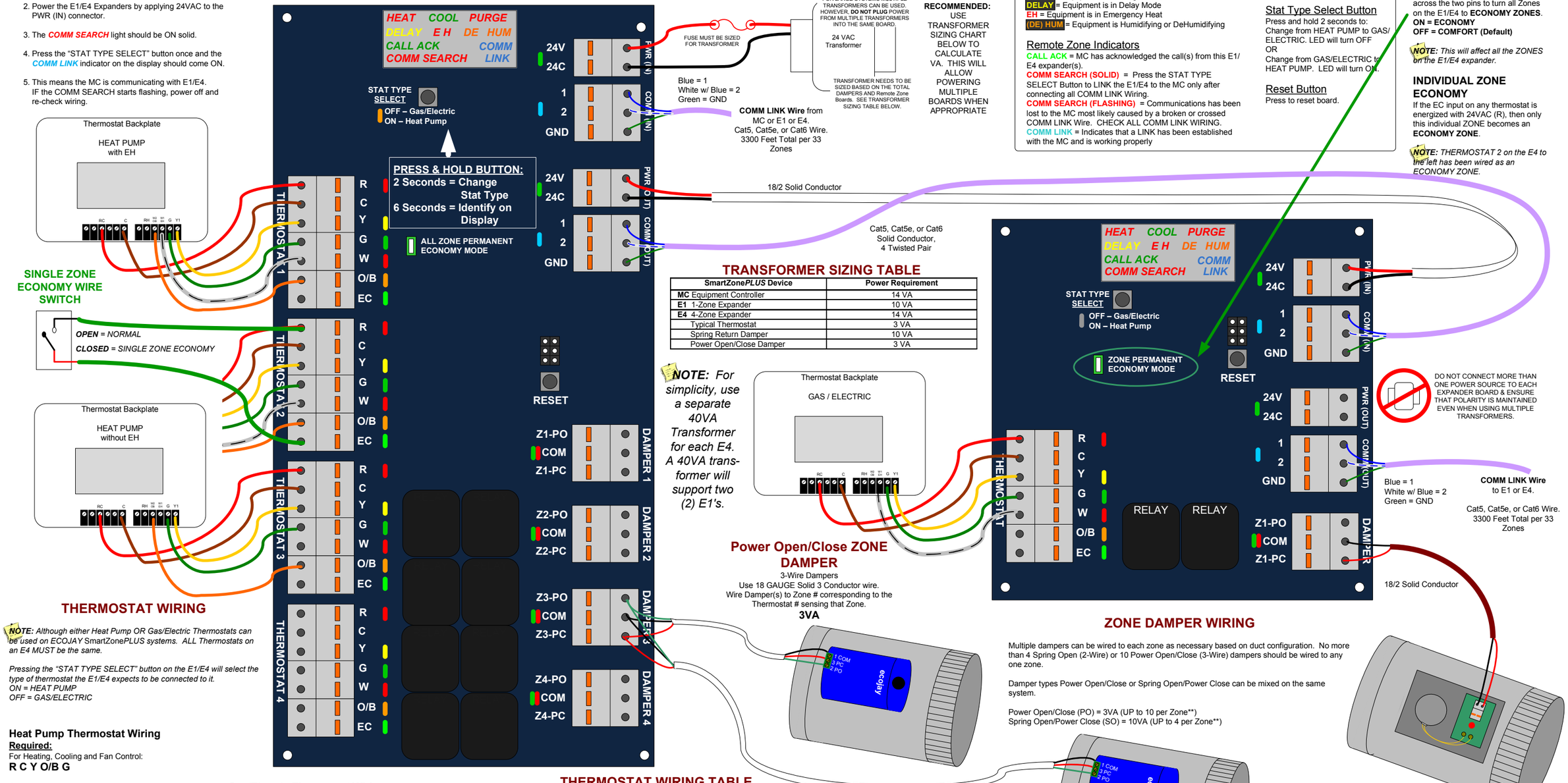
ECONOMY MODE

ZONE PERMANENT ECONOMY MODE JUMPER
This **BLACK** jumper should be placed across the two pins to turn all Zones on the E1/E4 to **ECONOMY ZONES**.
ON = ECONOMY
OFF = COMFORT (Default)

NOTE: *This will affect all the ZONES on the E1/E4 expander.*

INDIVIDUAL ZONE ECONOMY
If the EC input on any thermostat is energized with 24VAC (R), then only this individual ZONE becomes an **ECONOMY ZONE**.

NOTE: *THERMOSTAT 2 on the E4 to the left has been wired as an ECONOMY ZONE.*



TRANSFORMER SIZING TABLE

SmartZone*PLUS* Device	Power Requirement
MC Equipment Controller	14 VA
E1 1-Zone Expander	10 VA
E4 4-Zone Expander	14 VA
Typical Thermostat	3 VA
Spring Return Damper	10 VA
Power Open/Close Damper	3 VA

NOTE: *For simplicity, use a separate 40VA Transformer for each E4. A 40VA trans-former will support two (2) E1's.*

Power Open/Close ZONE DAMPER

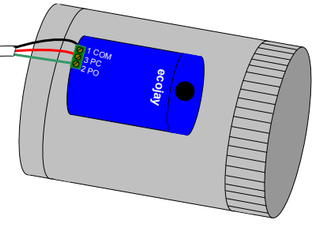
3-Wire Dampers
Use 18 GAUGE Solid 3 Conductor wire.
Wire Damper(s) to Zone # corresponding to the Thermostat # sensing that Zone.
3VA

ZONE DAMPER WIRING

Multiple dampers can be wired to each zone as necessary based on duct configuration. No more than 4 Spring Open (2-Wire) or 10 Power Open/Close (3-Wire) dampers should be wired to any one zone.

Damper types Power Open/Close or Spring Open/Power Close can be mixed on the same system.

Power Open/Close (PO) = 3VA (UP to 10 per Zone**)
Spring Open/Power Close (SO) = 10VA (UP to 4 per Zone**)



Spring Open/Power Close ZONE DAMPER

2-Wire Dampers
Use 18 GAUGE Solid 2 Conductor wire.
10VA

THERMOSTAT WIRING

NOTE: *Although either Heat Pump OR Gas/Electric Thermostats can be used on ECOJAY SmartZonePLUS systems. ALL Thermostats on an E4 MUST be the same.*

Pressing the "STAT TYPE SELECT" button on the E1/E4 will select the type of thermostat the E1/E4 expects to be connected to it.
ON = HEAT PUMP
OFF = GAS/ELECTRIC

Heat Pump Thermostat Wiring
Required:
For Heating, Cooling and Fan Control:
R C Y O/B G

Optional:
To open the damper when Emergency Heat call from each Zone Thermostat is made (see note below)
W
To make each ZONE an **ECONOMY**-ZONE*
EC

NOTE: ONLY Zone 1 on the MC can initiate an Emergency Heat Call so it is not always necessary to connect the W Terminal on the E1/E4 expander.

Gas/Electric Thermostat Wiring
Required:
For Heating, Cooling and Fan Control:
R C W Y G

Optional:
To make each ZONE an **ECONOMY**-ZONE*.
EC

Not Used:
Only for use in Heat Pump Thermostat install.
O/B

THERMOSTAT WIRING TABLE

SmartZone*PLUS* E1/E4 Expanders	Gas/Elect HEAT ONLY	Gas/Elect COOL ONLY	Gas/Elect HEAT & COOL	Gas/Elect NO FAN	Heat Pump
R (24VAC)	X	X	X	X	X
C (24VAC COMMON)	X	X	X	X	X
Y (COMPRESSOR)	--	X	X	X	X
G (FAN)	X	X	X	--	X
O/B (REVERSING VALVE)	--	--	--	--	X
W (FURNACE)	X	--	X	X	OPTIONAL
EC (ECONOMY)	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL