Strato Automation

Product Description



I/O: 5 UI's, 3 AO's & 7 BO's

Temp & Humidity

BACnet MSTP: *B-BC BTL Certification (Pending)*

Applications:

- Room and/or discharge air control application
- Staging only or full proportional built-in vernier control with up to 6 on/off stages
- 0-10 Vdc, 10 Vdc pulsed or 24 Vac pulsed control of single stage modulating output or the vernier stage
- Supports external 0-10 Vdc control from a BMS system if local control is not needed
- Local interface for user setpoint control & configuration. Configuration can also be made through BACnet

OPEN STAT

Model Information

Model	Temp, RH%	BACnet MSTP
OS537H-EH	X	X

Contents

Symbol Definitions **3**

Installation **4**

Overview **5**

Connectors 5

Simple Reheat Applications **6**

Wiring 6

Select Your Equipment 6

Simple pulsed 3-32VDC SSR 7

Simple pulsed 24VAC SSR 8

Simple 0-10VDC SCR 9

Optional Remote Inputs / Network Options 10

Control Curves 11

Multistages Heating Applications **12**

Wiring 12

Select Your Equipment 12

Simple 1 to 6 On-Off Stages 13

1 to 6 Stages with pulsed 3-32DC SSR Vernier 14

1 to 6 Stages with pulsed 24VAC SSR Vernier 15

1 to 6 Stages with 0-10VDC SCR Vernier 16

Optional Remote Inputs / Network Options 17

Control Curves 18

Setup **20**

Setup Menu 20

BACnet Objects **23**

Physical Inputs and Outputs 23

Analog Values (AV) 24

Binary Values (BV) 25

Multi-State Values (MSV) 26

Loop(s) 28

Network **29**

MS/TP Wiring 29

RS-485 Network Guidelines BW Controllers 29

Grounding Guidelines When Using Separate Transformers 30

Specifications **32**

End User Operation Guide **33**

Symbol Definitions

The symbols defined below are used throughout this document to highlight information that requires particular attention.



ATTENTION: This information requires special consideration.



TIP: Identifies advice or hints to help the user perform certain tasks.



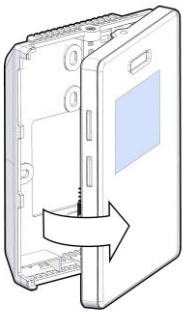
WARNING: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, equipment damage, or data loss. It may also be used to alert against unsafe practices.



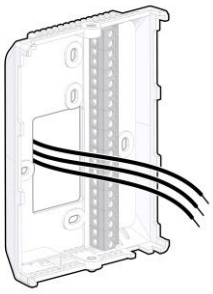
CAUTION: Indicates a situation where users must observe precautions for handling electrostatic-sensitive devices

Installation

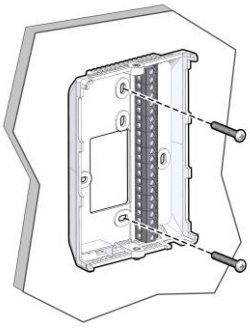
1. After unpacking your OS537, gently pull away from the base using the left side of the front cover.



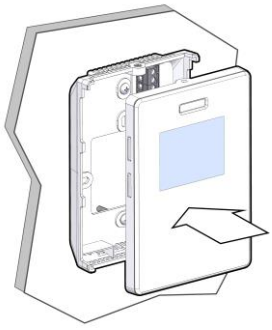
2. Pull the wires through the hole in the base.



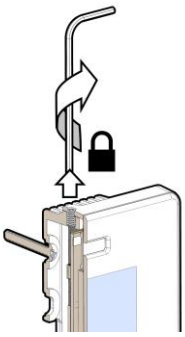
3. Use 2 screws to attach the base to the wall.



4. Connect the wires to the terminals. Refer to the documentation for the proper connections. Then, gently push the front cover straight on to the base.



5. Optionally use the lock screws on top and bottom to secure the cover. Use a 1/16" Allen key and turn counterclockwise until flat with cover.



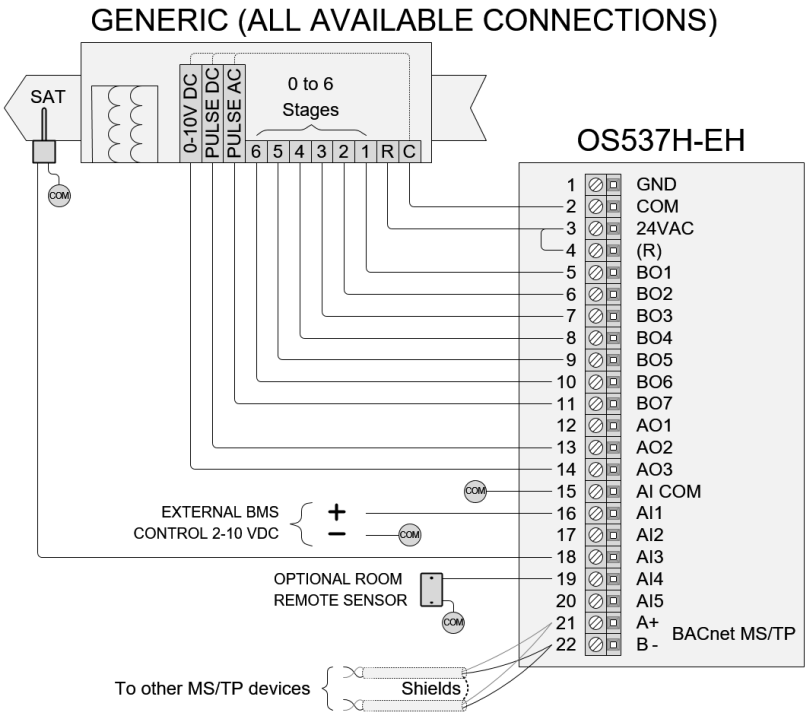
Electronic controls are static sensitive devices; discharge yourself properly before manipulating and installing the device.

Short circuits or incorrect wiring may permanently damage the controller. Double-check your wiring before applying power.

If a control failure could lead to personal injury and/or property loss, the installer must add safety devices and/or alarm systems to protect against failures.

Overview

CONNECTORS



Add a 24VAC transformer when the equipment does not supply the power.

For details on grounding within control panels, NFPA 79 and UL508A provide the required details.

Simple Reheat Applications

Wiring

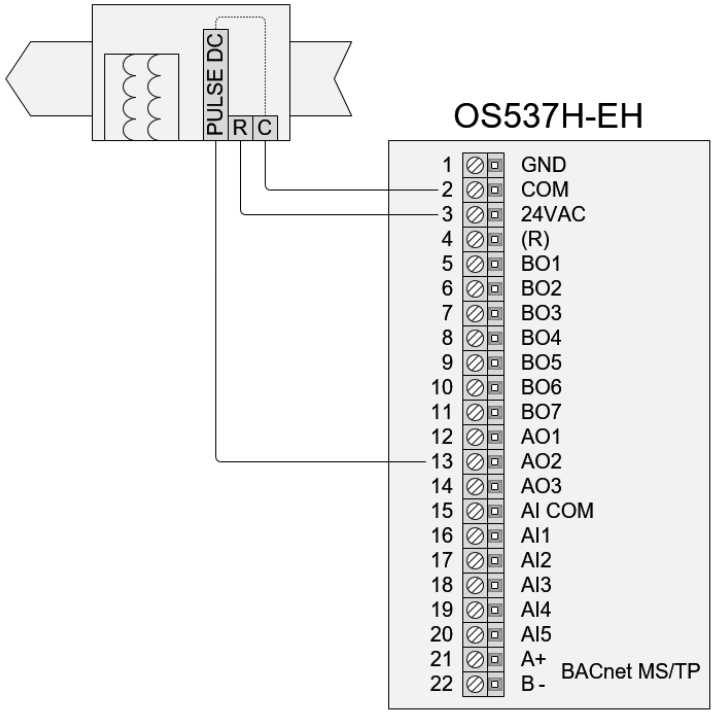
Select Your Equipment

PULSE DC	Simple 3-32VDC SSR
PULSE AC	Simple 24VAC SSR
0-10V DC	Simple 0-10VDC SCR
Options	Optional Remote Inputs / Network Options

Connector	I/O id	BACnet Name		PULSE DC	PULSE AC	0-10V DC	Options
1	GND						
2	COM			C	C	C	C
3	24V			R	R	R	R
4	(R)				R		
5	BO1	BO_1					
6	BO2	BO_2					
7	BO3	BO_3					
8	BO4	BO_4					
9	BO5	BO_5					
10	BO6	BO_6					
11	BO7	BO_7			Pulsed 24VAC		
12	AO1	AO_1					
13	AO2	AO_2		Pulsed 10VDC			
14	AO3	AO_3				Modulated 0-10VDC	
15	AI COM						
16	AI1	AI_1					EXT BMS 2-10VDC
17	AI2	AI_2					
18	AI3	AI_3					Supply Air Sensor
19	AI4	AI_4					Remote Room Sensor
20	AI5	AI_5					
21	A+ MS/TP						BACnet
22	B- MS/TP						BACnet

Simple Reheat Applications – Wiring

Simple pulsed 3-32VDC SSR



Add a 24VAC transformer when the equipment does not supply the power.

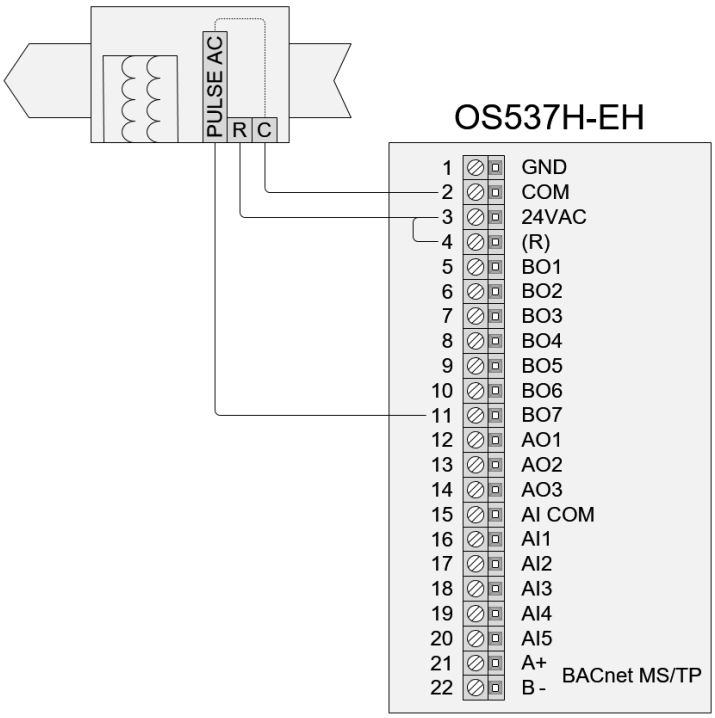
Sequence of operation

On a call for heating: The AO2 output will pulse 0V and 10VDC in a proportional duty cycle that increase progressively from 0% to 100% as the temperature drop. A control loop object will readjust the output over time period to maintain the temperature setpoint.

OBJECT INSTANCE	OBJECT NAME	DESCRIPTION	DEFAULT VALUE
AV-1	RoomSetp	Room temperature setpoint	70°F
AV-14	RoomPB	Adjust room heating prop band	5°F
LOOP-2	PidRoomT	Room temp heating control loop	0 to 100%

Simple Reheat Applications – Wiring

Simple pulsed 24VAC SSR



Add a 24VAC transformer when the equipment does not supply the power.

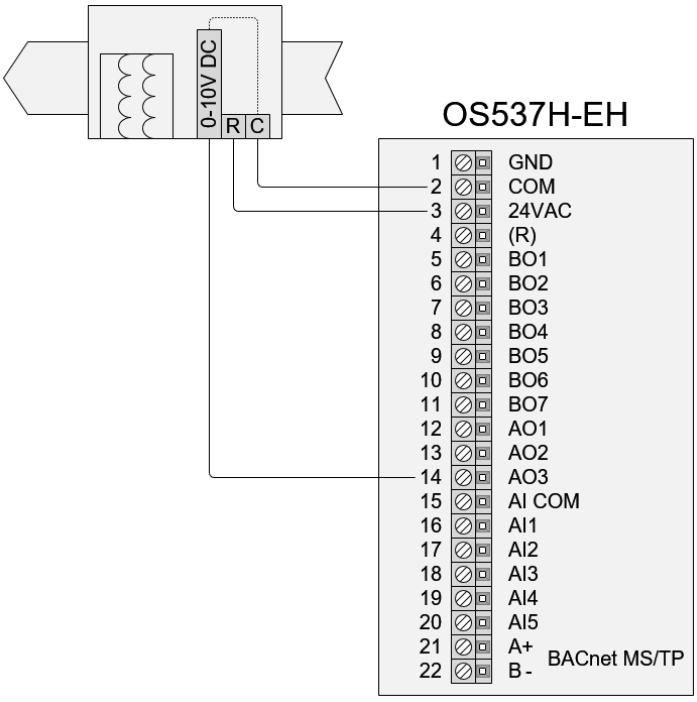
Sequence of operation

On a call for heating: The BO7 output will pulse 0V and 24VAC in a proportional duty cycle that increase progressively from 0% to 100% as the temperature drop. A control loop object will readjust the output over time period to maintain the temperature setpoint.

OBJECT INSTANCE	OBJECT NAME	DESCRIPTION	DEFAULT VALUE
AV-1	RoomSetp	Room temperature setpoint	70°F
AV-14	RoomPB	Adjust room heating prop band	5°F
LOOP-2	PidRoomT	Room temp heating control loop	0 to 100%

Simple Reheat Applications – Wiring

Simple 0-10VDC SCR



Add a 24VAC transformer when the equipment does not supply the power.

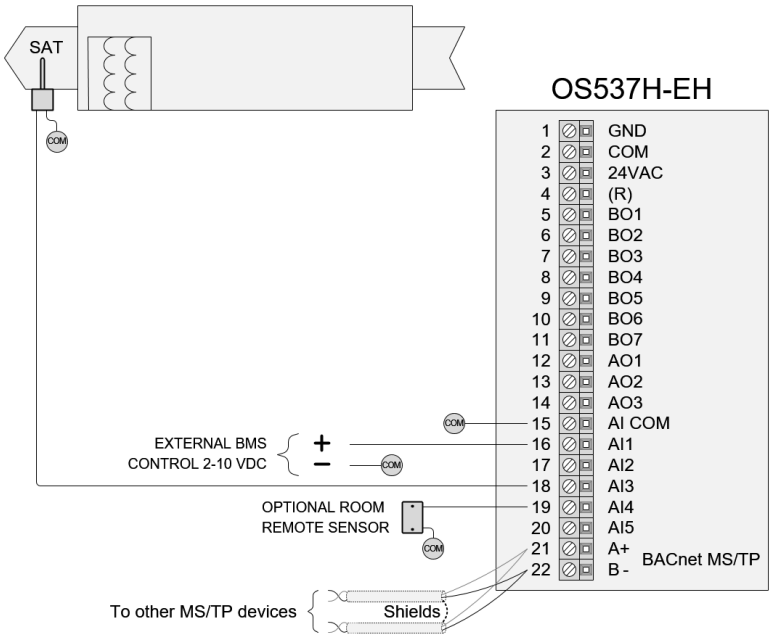
Sequence of operation

On a call for heating: The AO3 output will increase from 0V up to 10VDC progressively from 0% to 100% as the temperature drop. A control loop object will readjust the output over a time period to maintain the temperature setpoint.

OBJECT INSTANCE	OBJECT NAME	DESCRIPTION	DEFAULT VALUE
AV-1	RoomSetp	Room temperature setpoint	70°F
AV-14	RoomPB	Adjust room heating prop band	5°F
LOOP-2	PidRoomT	Room temp heating control loop	0 to 100%

Simple Reheat Applications – Wiring

Optional Remote Inputs / Network Options



Sequence of operation

External BMS Control: 2 to 10VDC external signal will modulate object AV101 Htg_Dem for 0 to 100%. So, this will directly control the outputs and vernier sequences as selected in the Quick Setup menus.

OBJECT INSTANCE	OBJECT NAME	DESCRIPTION	VALUE
MSV-3	CtrlTyp	Control type	ExtBMS

SAT Control: Select MSV-3 "CtrlTyp" to "Supply" for supply only control; so, RoomSetp will be ignored and supply temperature will be displayed to "Supp_SP" setting. If adjustment is made with **+** or **-** buttons, the supply setpoint will be adjusted. Select MSV-3 CtrlTyp to "Dual" for dual setpoints control; so, "RoomSetp" will control the room temperature. If supply temperature fall below supply setpoint "Supp_SP" then the LOOP-6 will maintain the minimum supply temperature.

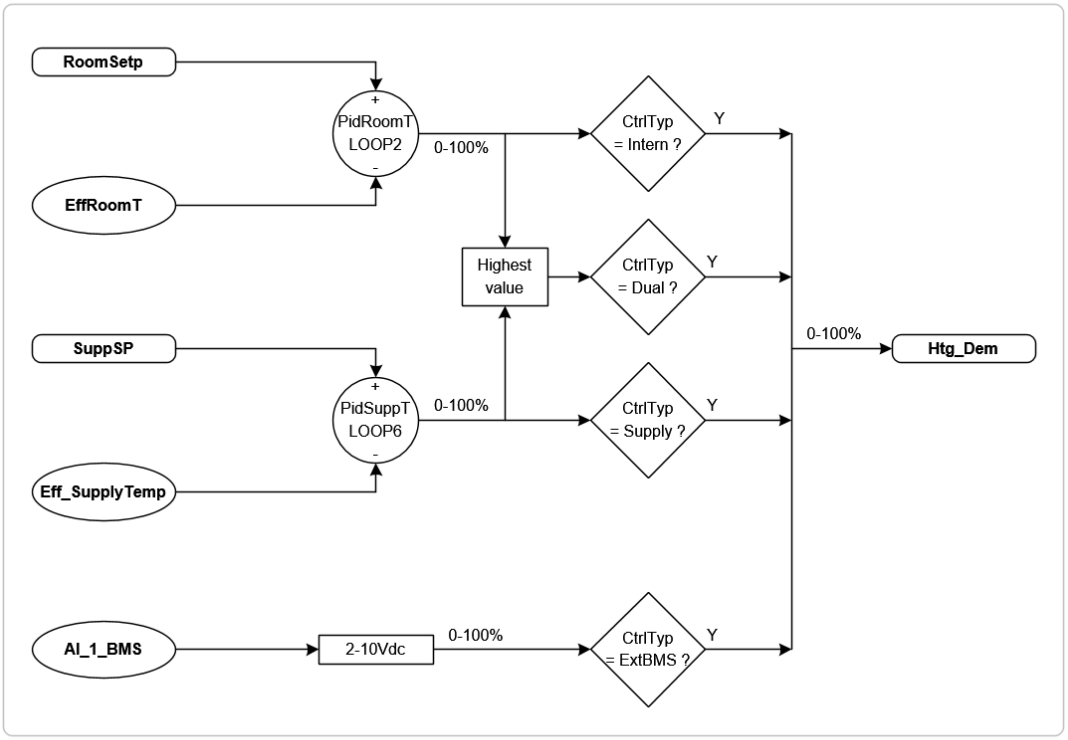
OBJECT INSTANCE	OBJECT NAME	DESCRIPTION	VALUE
AV-1	RoomSetp	Room temperature setpoint	Desired room setpoint
AV-2	Supp_SP	Supply temperature setpoint	Desired minimum supply setpoint
MSV-3	CtrlTyp	Control type	Supply Dual
LOOP-6	PIDSuppT	Supply temp control loop	0 to 100%

Room Remote Sensor: When a 10K thermistor is detected on AI4 input, it replaces automatically the internal temperature reading. Default is type 3. A type 2 can be selected with MSV-5 CFGSens.

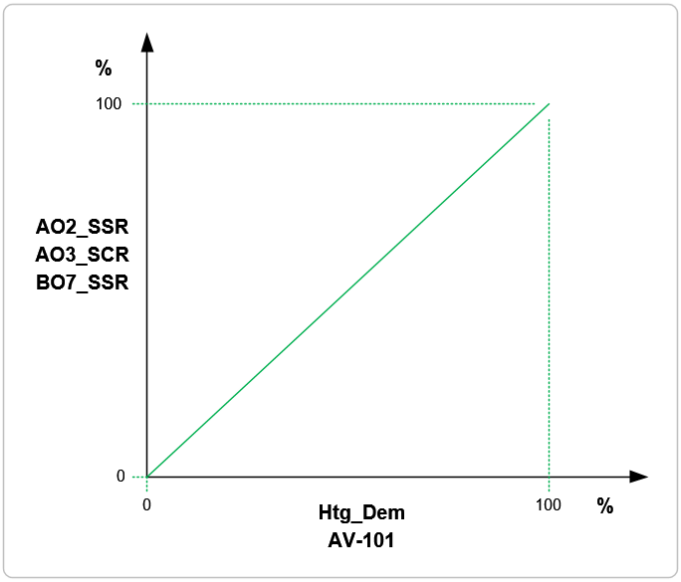
Simple Reheat Applications – Wiring

Control Curves

Control Flowchart



Outputs



Multistages Heating Applications

WIRING

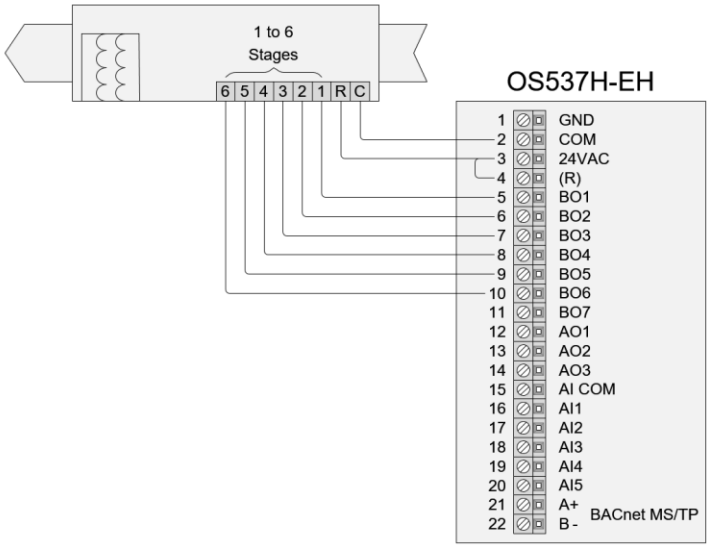
Select Your Equipment

On-Off Simple 1 to 6 On-Off Stages
Vernier DC SSR 1 to 6 Stages with 3-32DC SSR Vernier
Vernier AC SSR 1 to 6 Stages with 24VAC SSR Vernier
Vernier SCR 1 to 6 Stages with 0-10VDC SCR Vernier
Options Optional Remote Inputs / Network Options

Connector	I/O id	BACnet Name	On-Off	PULSE DC	PULSE AC	0-10V DC	Options
1	GND						
2	COM		C	C	C	C	C
3	24V		R	R	R	R	R
4	(R)		R	R	R	R	
5	BO1	BO_1	Stage 1	Stage 1	Stage 1	Stage 1	
6	BO2	BO_2	Stage 2	Stage 2	Stage 2	Stage 2	
7	BO3	BO_3	Stage 3	Stage 3	Stage 3	Stage 3	
8	BO4	BO_4	Stage 4	Stage 4	Stage 4	Stage 4	
9	BO5	BO_5	Stage 5	Stage 5	Stage 5	Stage 5	
10	BO6	BO_6	Stage 6	Stage 6	Stage 6	Stage 6	
11	BO7	BO_7			Pulsed 24VAC		
12	AO1	AO_1					
13	AO2	AO_2		Pulsed 10VDC			
14	AO3	AO_3				Modulated 0-10VDC	
15	AI COM						
16	AI1	AI_1					EXT BMS 2-10VDC
17	AI2	AI_2					
18	AI3	AI_3					Supply Air Sensor
19	AI4	AI_4					Remote Room Sensor
20	AI5	AI_5					
21	A+ MS/TP						BACnet
22	B- MS/TP						BACnet

Multistages Heating Applications – Wiring

Simple 1 to 6 On-Off Stages



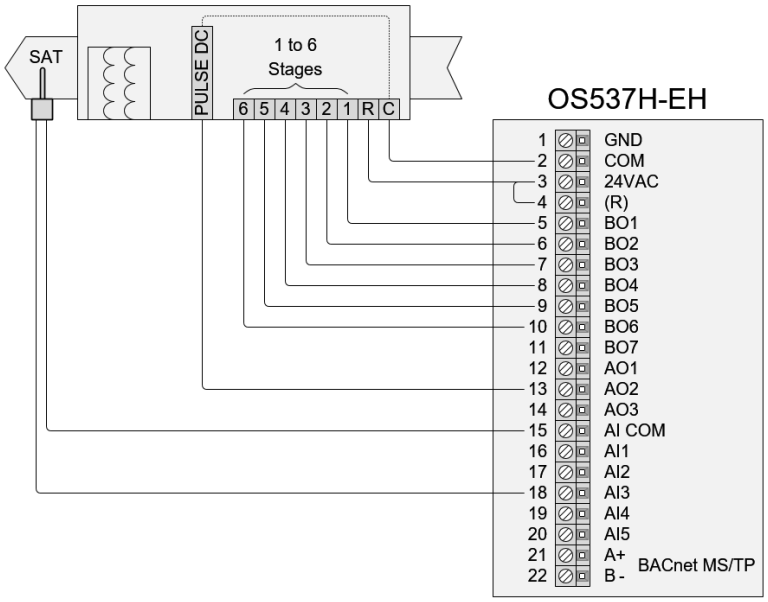
Add a 24VAC transformer when the equipment does not supply the power.

Sequence of operation: Use MSV-1 Stg_Qty to select 1 to 6 stages.
MSV-4 S_Logic set to "LIFO" means "Last In - First Out"; so, it will modulate stages from 1 to 6 and back from 6 to 1.
MSV-4 S_Logic set to "FIFO" means "First In - First Out"; so, it will modulate by sequencing the number of stages and will release in priority the first that was energized.

OBJECT INSTANCE	OBJECT NAME	DESCRIPTION	DEFAULT VALUE	VALUE
MSV-1	Stg_Qty	Select number of stages	0	1 Stage 2 Stage 3 Stage 4 Stage 5 Stage 6 Stage
MSV-2	V_Ratio	Select vernier ratio	200%	200%
MSV-4	S_Logic	Control stages logic	LIFO	LIFO FIFO

Multistages Heating Applications – Wiring

1 to 6 Stages with pulsed 3-32DC SSR Vernier



Add a 24VAC transformer when the equipment does not supply the power.

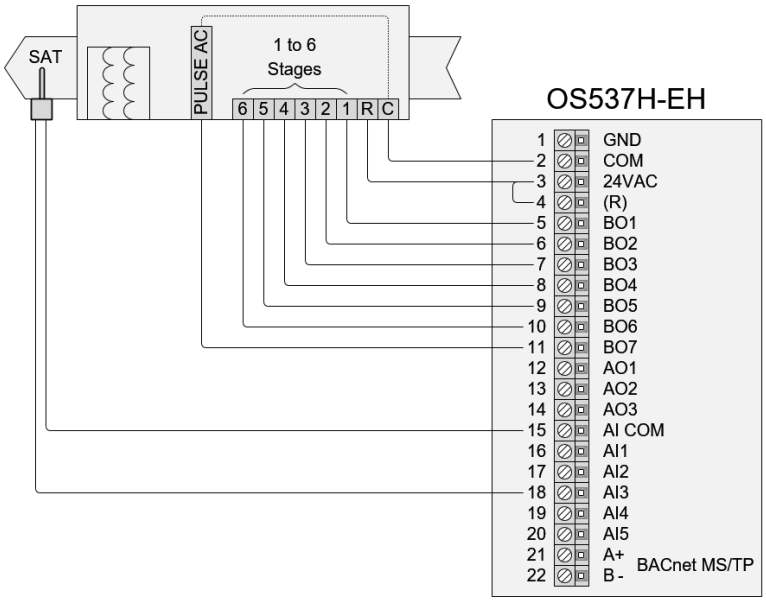
Sequence of operation

On a call for heating: The AO2 output will pulse 0V and 10VDC in a proportional duty cycle that increase progressively from 0% to 100% as the temperature drop. When temperature continue to drop, a new stage will be added and AO2 will drop to 0% (if vernier ratio is 100%) or to 50% (if vernier ratio is 200%). Control loop objects will readjust the outputs over time period to maintain the temperature setpoints.

OBJECT INSTANCE	OBJECT NAME	DESCRIPTION	VALUE
AV-1	RoomSetp	Room temperature setpoint	Desired room setpoint
AV-2	Supp_SP	Supply temperature setpoint	Desired minimum supply setpoint
AV-14	RoomPB	Adjust room heating prop band	5°F
LOOP-2	PidRoomT	Room temp heating control loop	0 to 100%
LOOP-6	PIDSuppT	Supply temp control loop	0 to 100%
MSV-1	Stg_Qty	Select number of stages	1 Stage 2 Stage 3 Stage 4 Stage 5 Stage 6 Stage
MSV-2	V_Ratio	Select vernier ratio	100% 200%
MSV-4	S_Logic	Control stages logic	LIFO FIFO

Multistages Heating Applications – Wiring

1 to 6 Stages with pulsed 24VAC SSR Vernier



Add a 24VAC transformer when the equipment does not supply the power

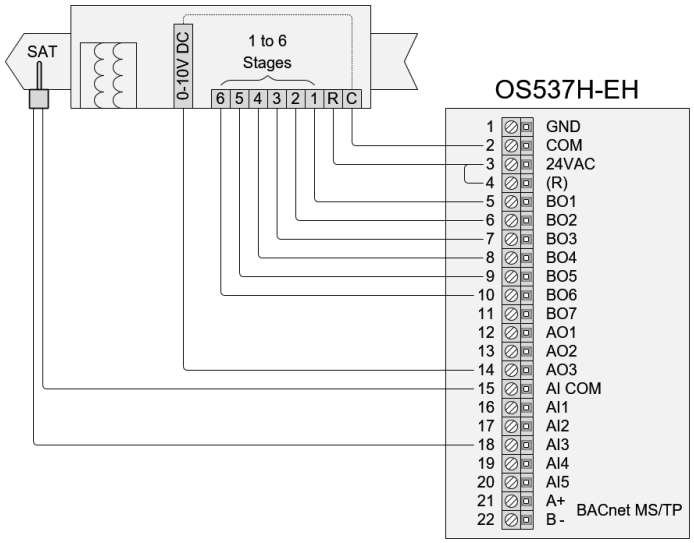
Sequence of operation

On a call for heating: The BO7 output will pulse 0V and 24VAC in a proportional duty cycle that increase progressively from 0% to 100% as the temperature drop. When temperature continue to drop, a new stage will be added and BO7 will drop to 0% (if vernier ratio is 100%) or to 50% (if vernier ratio is 200%). Control loop objects will readjust the outputs over time period to maintain the temperature setpoints.

OBJECT INSTANCE	OBJECT NAME	DESCRIPTION	VALUE
AV-1	RoomSetp	Room temperature setpoint	Desired room setpoint
AV-2	Supp_SP	Supply temperature setpoint	Desired minimum supply setpoint
AV-14	RoomPB	Adjust room heating prop band	5°F
LOOP-2	PidRoomT	Room temp heating control loop	0 to 100%
LOOP-6	PIDSuppT	Supply temp control loop	0 to 100%
MSV-1	Stg_Qty	Select number of stages	1 Stage 2 Stage 3 Stage 4 Stage 5 Stage 6 Stage
MSV-2	V_Ratio	Select vernier ratio	100% 200%
MSV-4	S_Logic	Control stages logic	LIFO FIFO

Multistages Heating Applications – Wiring

1 to 6 Stages with 0-10VDC SCR Vernier



Add a 24VAC transformer when the equipment does not supply the power

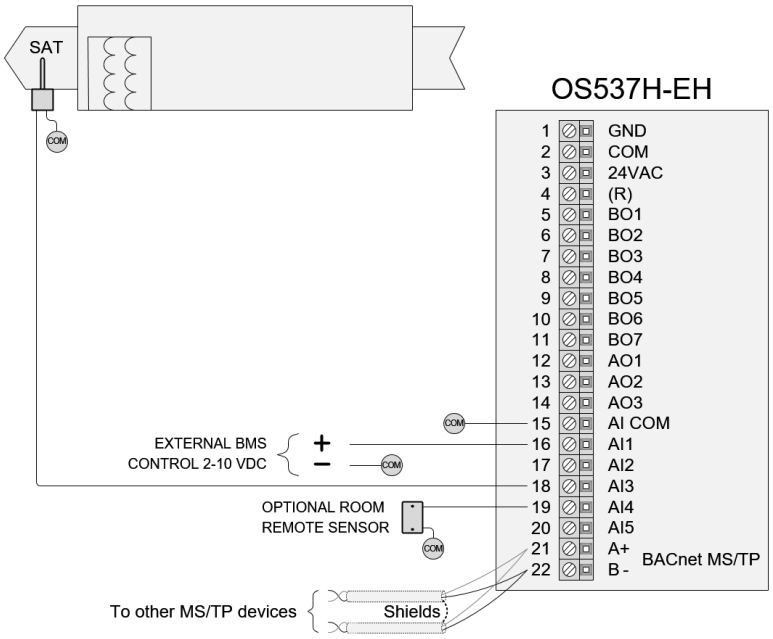
Sequence of operation

On a call for heating: The AO3 output will increase from 0V up to 10VDC progressively from 0% to 100% as the temperature drop. When temperature continue to drop, a new stage will be added and AO3 will drop to 0% (if vernier ratio is 100%) or to 50% (if vernier ratio is 200%). Control loop objects will readjust the outputs over time period to maintain the temperature setpoints.

OBJECT INSTANCE	OBJECT NAME	DESCRIPTION	VALUE
AV-1	RoomSetp	Room temperature setpoint	Desired room setpoint
AV-2	Supp_SP	Supply temperature setpoint	Desired minimum supply setpoint
AV-14	RoomPB	Adjust room heating prop band	5°F
LOOP-2	PidRoomT	Room temp heating control loop	0 to 100%
LOOP-6	PIDSuppT	Supply temp control loop	0 to 100%
MSV-1	Stg_Qty	Select number of stages	1 Stage 2 Stage 3 Stage 4 Stage 5 Stage 6 Stage
MSV-2	V_Ratio	Select vernier ratio	100% 200%
MSV-4	S_Logic	Control stages logic	LIFO FIFO

Multistages Heating Applications – Wiring

Optional Remote Inputs / Network Options



Sequence of operation

External BMS Control: 2 to 10VDC external signal will modulate object AV101 Htg_Dem for 0 to 100%. So, this will directly control the outputs and vernier sequences as selected in the Quick Setup menus.

OBJECT INSTANCE	OBJECT NAME	DESCRIPTION	VALUE
MSV-3	CtrlTyp	Control type	ExtBMS

SAT Control: Select MSV-3 "CtrlTyp" to "Supply" for supply only control; so, RoomSetp will be ignored and supply temperature will be displayed to "Supp_SP" setting. If adjustment is made with **+** or **-** buttons, the supply setpoint will be adjusted.
Select MSV-3 CtrlTyp to "Dual" for dual setpoints control; so, "RoomSetp" will control the room temperature. If supply temperature fall below supply setpoint "Supp_SP" then the LOOP-6 will maintain the minimum supply temperature.

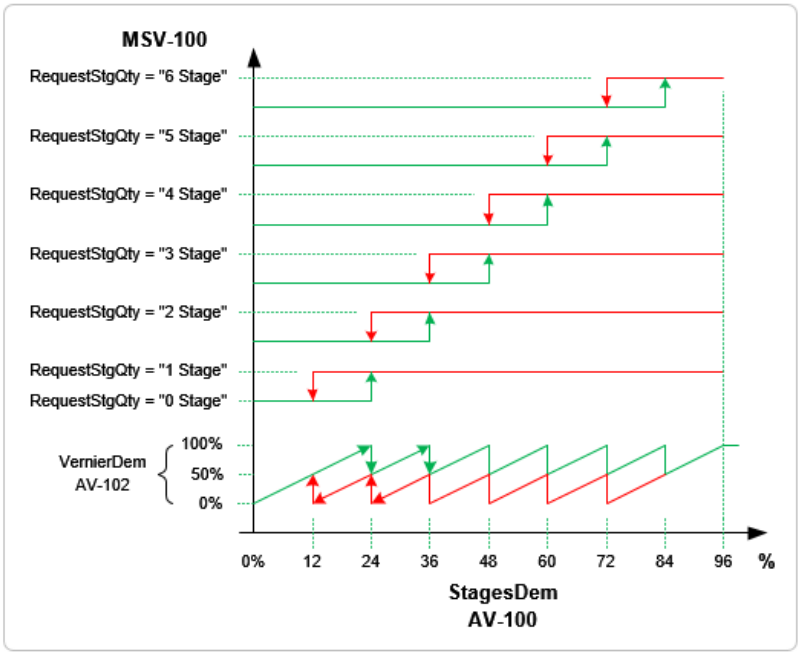
OBJECT INSTANCE	OBJECT NAME	DESCRIPTION	VALUE
AV-1	RoomSetp	Room temperature setpoint	Desired room setpoint
AV-2	Supp_SP	Supply temperature setpoint	Desired minimum supply setpoint
MSV-3	CtrlTyp	Control type	Supply Dual
LOOP-6	PIDSuppT	Supply temp control loop	0 to 100%

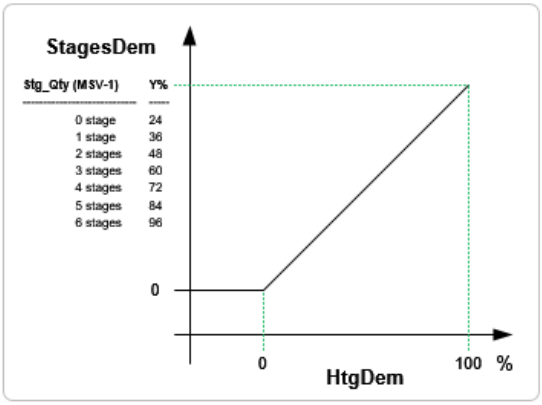
Room Remote Sensor: When a 10K thermistor is detected on AI4 input, it replaces automatically the internal temperature reading. A type 2 can be selected with MSV-5 CFGSens.

Multistages Heating Applications – Wiring

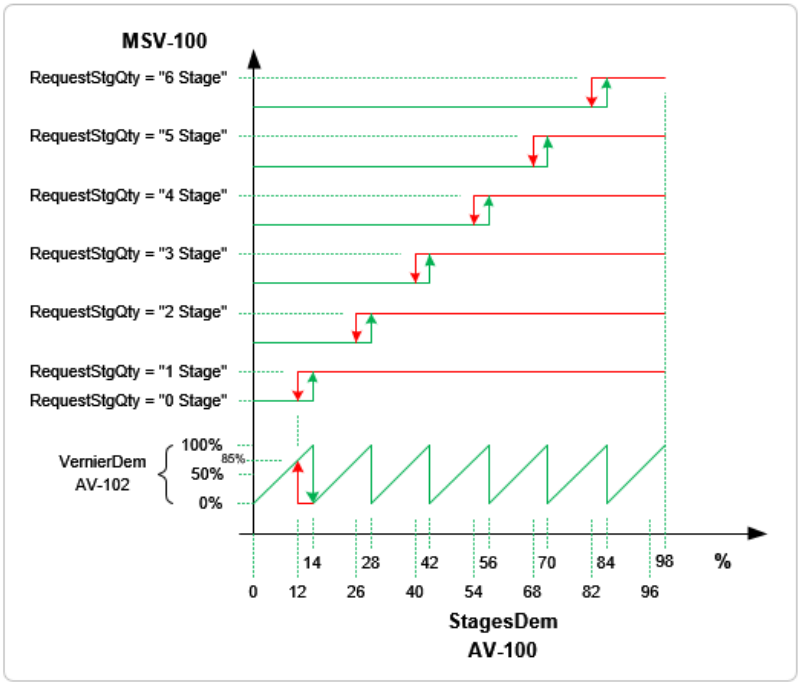
Control Curves

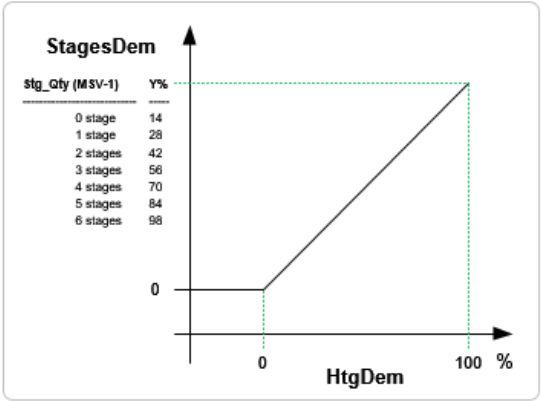
Vernier Ratio = 200%





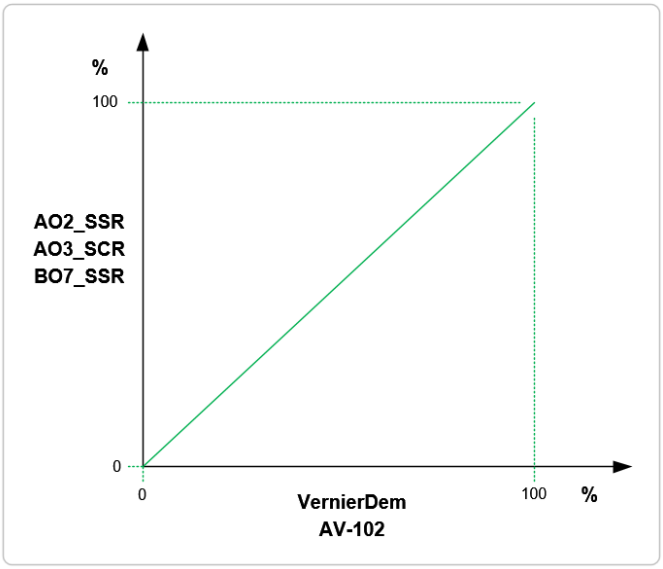
Vernier Ratio = 100%



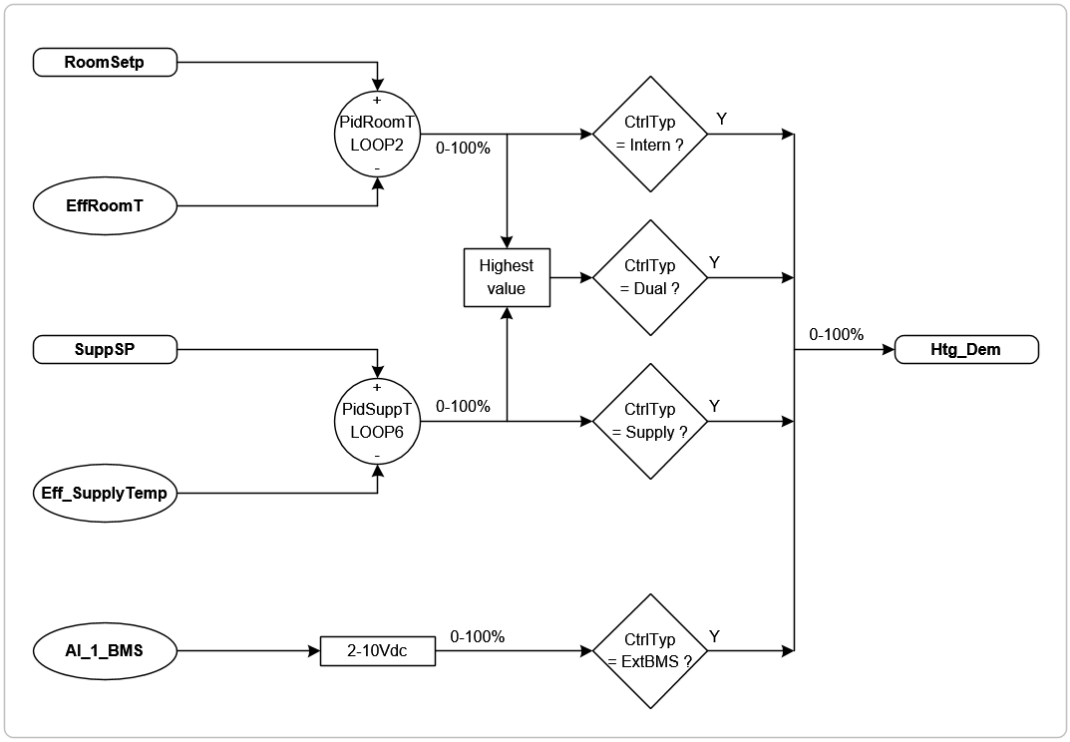


Multistages Heating Applications – Wiring

Proportional Outputs



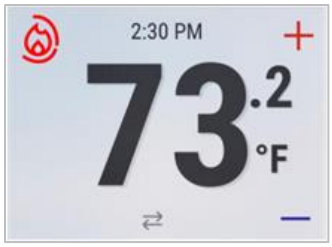
Control Flowchart



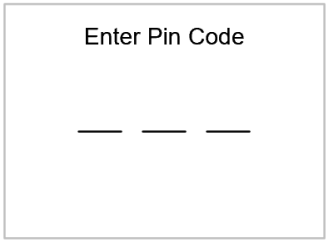
Setup

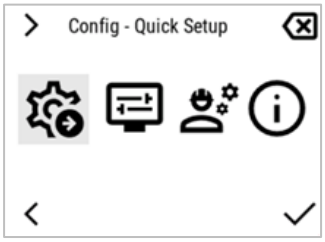
SETUP MENU

1. Access the Setup Menu by holding the two left buttons.



2. Press these PIN keys in sequence: The top left button twice and the top right button once

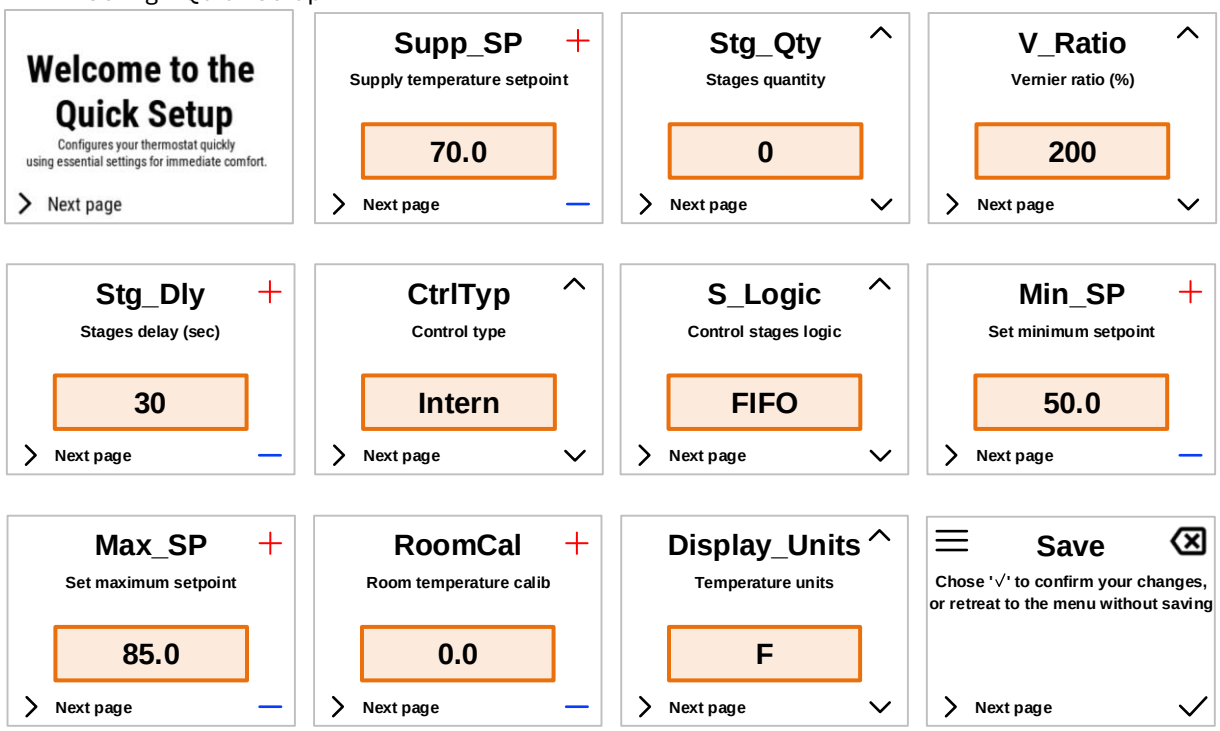




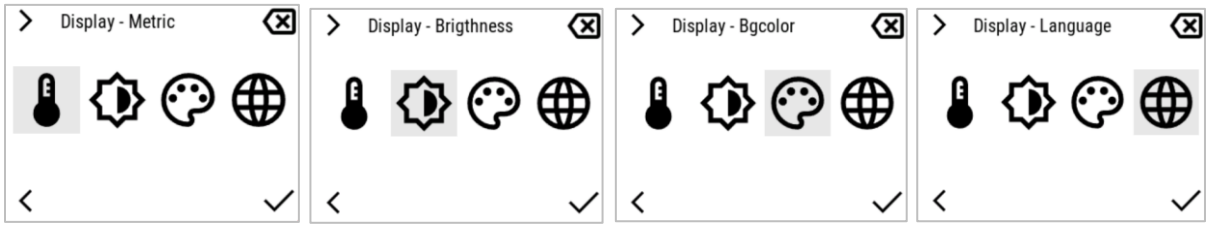
	Config - Quick Setup
	Display Configuration
	MSTP Communication Configuration
	Display Additional Information About The Thermostat
	Scroll Menu Choices
	Select
	Exit Menu

Setup Menu

3. Config – Quick Setup

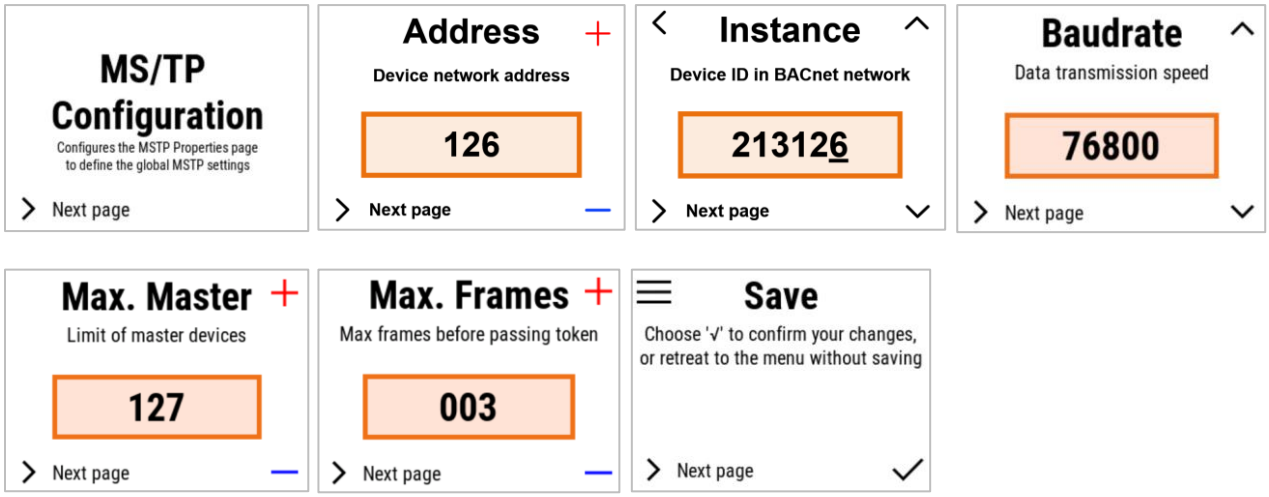


4. Config Display

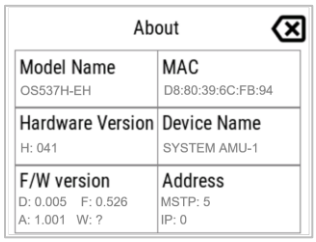


Setup Menu

5. Config - MSTP Config



6. Config – About



BACnet Objects

PHYSICAL INPUTS AND OUTPUTS

OBJECT INSTANCE	OBJECT NAME	DESCRIPTION	DEFAULT VALUE	TAGS	RANGE
BO-1	BO_1_Stg1	Stage 1 output	Off	Status	Dependent on MSV-1 Stg_Qty
BO-2	BO_2_Stg2	Stage 2 output	Off	Status	Dependent on MSV-1 Stg_Qty
BO-3	BO_3_Stg3	Stage 3 output	Off	Status	Dependent on MSV-1 Stg_Qty
BO-4	BO_4_Stg4	Stage 4 output	Off	Status	Dependent on MSV-1 Stg_Qty
BO-5	BO_5_Stg5	Stage 5 output	Off	Status	Dependent on MSV-1 Stg_Qty
BO-6	BO_6_Stg6	Stage 6 output	Off	Status	Dependent on MSV-1 Stg_Qty
AO-1	AO1	Unused	0%	Status	
AO-2	AO_2_SSR	Vernier SSR 0/10Vdc 2sec pulses output	0%	Status	
AO-3	AO_3_SCR	Vernier SCR 0 to 10Vdc analog output	0%	Status	
AO-7	BO_7_SSR	Vernier SSR 24Vac 2sec pulses output	0%	Status	
AI-1	AI_1_BMS	External BMS input signal 2-10Vdc	0%	Status	
AI-2	AI_2	Unused		Status	
AI-3	AI_3_Supply	Supply temperature sensor		Status	0-180°F
AI-4	AI_4_RemRoom	Remote room temperature sensor		Status	32-122°F
AI-5	AI_5	Unused		Status	
AI-6	RoomT	Internal room room temperature sensor		Status	32-122°F
AI-7	RoomRH	Room humidity		Status	5-90%

Objects tagged as Status represent objects or properties typically meant to be displayed on graphics for various required visualizations.

BACnet Objects

ANALOG VALUES (AV)

OBJECT INSTANCE	OBJECT NAME	DESCRIPTION	TAGS	DEFAULT VALUE	RANGE
AV-1	RoomSetp	Room temperature setpoint	User	70°F	50-120°F
AV-2	Supp_SP	Supply temperature setpoint	Cfg	70°F	50-120°F
AV-3	Stg_Dly	Interstage / On / Off min. time delays	Cfg	30 Sec	0-120 Sec
AV-4	Min_SP	Set minimum setpoint	Cfg	50°F	32-150°F
AV-5	Max_SP	Set maximum setpoint	Cfg	85°F	32-150°F
AV-14	RoomPB	Adjust room heating prop band	Cfg	5°F	1-10°F
AV-15	SupplyPB	Adjust supply heating prop band	Cfg	40°F	10-60°F
AV-16	RoomCal	Room temperature calib	Cfg	0°F	-5 to +5°F
AV-17	SuppCal	Supply temperature calib	Cfg	0°F	-5 to +5°F
AV-100	StagesDem	Calculated stages demand (internal use)	Status	30%	50-120°F
AV-101	Htg_Dem	Heating demand (internal use)	Status	0%	0-100%
AV-102	VernierDem	Calc vernier demand (internal use)	Status	0%	0-100%
AV-110	Eff_SuppTemp	Supply temperature (Calibrated)	Status	---	---
AV-111	EffRoomT	Effective temp for ctrl (Calibrated)	Status	---	---
AV-200	guiMainDisplay	AV Display on the Gui	Status	---	---
AV-201	guiSetPtDisplay	SetPoint Display on the Gui	User	---	---

Please note that objects tagged as:

- **Cfg:** represents configuration properties of the device that are typically only set once during commissioning and start-up.
- **User:** represents properties or objects that users of the controller typically manipulate.
- **Status:** represent objects or properties typically meant to be displayed on graphics for various required visualizations.
- **Cmd:** represent objects that can be controlled directly by other BACnet external processes.

BACnet Objects

BINARY VALUES (BV)

OBJECT INSTANCE	OBJECT NAME	DESCRIPTION	TAGS	DEFAULT VALUE	INACTIVE / ACTIVE TEXT
BV-1	StgDem1	Stage 1 demand (no delay)	Status	Off	Off / On
BV-2	StgDem2	Stage 2 demand (no delay)	Status	Off	Off / On
BV-3	StgDem3	Stage 3 demand (no delay)	Status	Off	Off / On
BV-4	StgDem4	Stage 4 demand (no delay)	Status	Off	Off / On
BV-5	StgDem5	Stage 5 demand (no delay)	Status	Off	Off / On
BV-6	StgDem6	Stage 6 demand (no delay)	Status	Off	Off / On
BV-21	Stage1	Stage 1 status (with delays)	Status	Off	Off / On
BV-22	Stage2	Stage 2 status (with delays)	Status	Off	Off / On
BV-23	Stage3	Stage 3 status (with delays)	Status	Off	Off / On
BV-24	Stage4	Stage 4 status (with delays)	Status	Off	Off / On
BV-25	Stage5	Stage 5 status (with delays)	Status	Off	Off / On
BV-26	Stage6	Stage 6 status (with delays)	Status	Off	Off / On

Please note that objects tagged as:

- **Cfg:** represents configuration properties of the device that are typically only set once during commissioning and start-up.
- **User:** represents properties or objects that users of the controller typically manipulate.
- **Status:** represent objects or properties typically meant to be displayed on graphics for various required visualizations.
- **Cmd:** represent objects that can be controlled directly by other BACnet external processes.

BACnet Objects

MULTI-STATE VALUES (MSV)

OBJECT INSTANCE	OBJECT NAME	DESCRIPTION	TAGS	DEFAULT VALUE	STATE TEXTS
MSV-1	Stg_Qty	Select number of stages	Cfg	0	0 Stage 1 Stage 2 Stage 3 Stage 4 Stage 5 Stage 6 Stage
MSV-2	V_Ratio	Select vernier ratio	Cfg	200%	100% 200%
MSV-3	CtrlTyp	Control type	Cfg	Intern	Intern Supply Dual ExtBMS
MSV-4	S_Logic	Control stages logic	Cfg	LIFO	LIFO FIFO
MSV-5	CFGSens	Remote thermistor 10K	Cfg	Type 3	Type 3 Type 2
MSV-100	RequestStgQty	Stages request to On	Status	---	0 Stage 1 Stage 2 Stage 3 Stage 4 Stage 5 Stage 6 Stage
MSV-101	EffStgQty	Effective stages quantity to On	Status	---	0 Stage 1 Stage 2 Stage 3 Stage 4 Stage 5 Stage 6 Stage
MSV-102	NextFI	Next stage In	Status	---	Stage 1 Stage 2 Stage 3 Stage 4 Stage 5 Stage 6
MSV-103	NextFO	Next stage Out	Status	---	Stage 1 Stage 2 Stage 3 Stage 4 Stage 5 Stage 6
MSV-200	Brightness	Brightness Control	Cfg	Med	Low Med-Low Med
MSV-201	BgColor	Background Color	Cfg	White	White Orange Blue Green Red

BACnet Objects

OBJECT INSTANCE	OBJECT NAME	DESCRIPTION	TAGS	DEFAULT VALUE	STATE TEXTS
MSV-202	LockTemp	Main Display	Cfg	Temp	Temp Setpoint Nothing
MSV-203	Language	Language selection	Cfg	English	English French
MSV-204	Display_Units	Temperature displayed units	Cfg	F	C F

Please note that objects tagged as:

- **Cfg:** represents configuration properties of the device that are typically only set once during commissioning and start-up.
- **User:** represents properties or objects that users of the controller typically manipulate.
- **Status:** represent objects or properties typically meant to be displayed on graphics for various required visualizations.
- **Cmd:** represent objects that can be controlled directly by other BACnet external processes.

BACnet Objects

LOOP(S)

OBJECT INSTANCE	OBJECT NAME	DESCRIPTION	TAGS	DEFAULT VALUE	RANGE
LOOP-2	PIDRoomT	Room temp heating control loop	Status	---	0-100%
LOOP-6	PIDSuppT	Supply temp control loop	Status	---	0-100%

Network

MS/TP Wiring

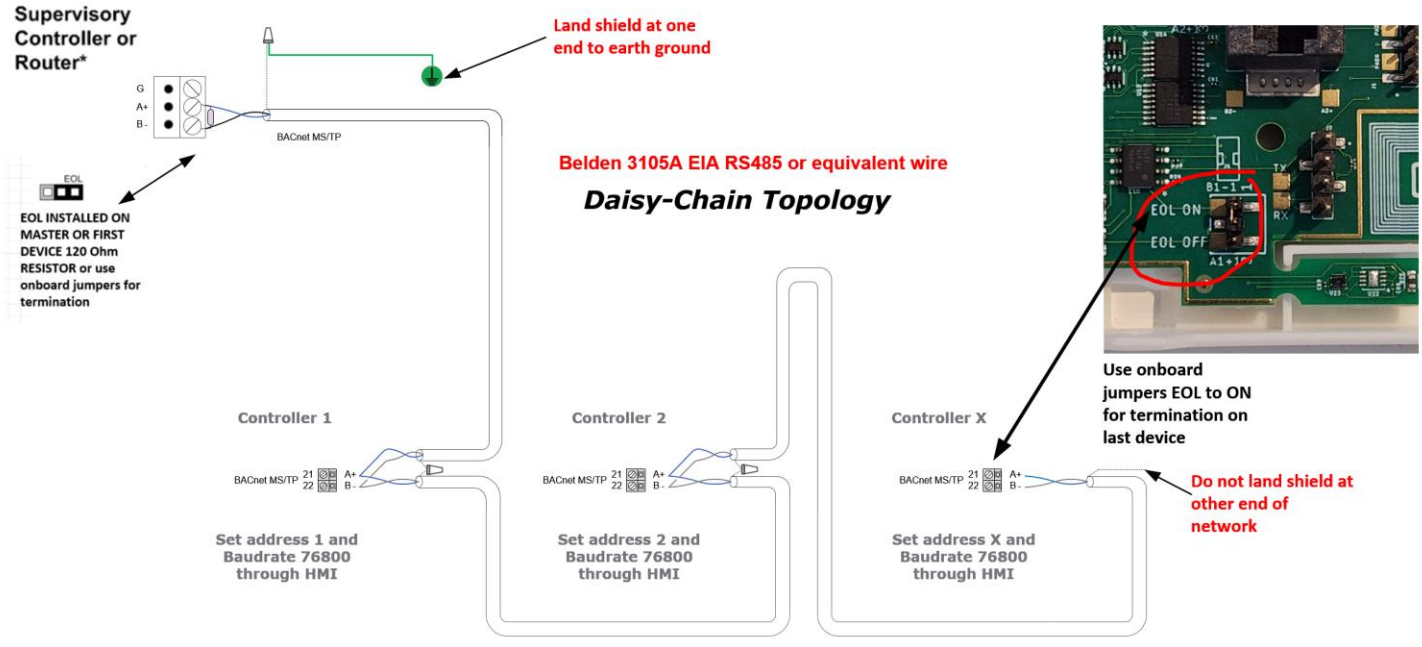
RS-485 Network Guidelines BW Controllers

The best way to ensure a robust and reliable RS-485 network is to build it around a daisy-chain configuration.

Connecting a multidrop 485 network.

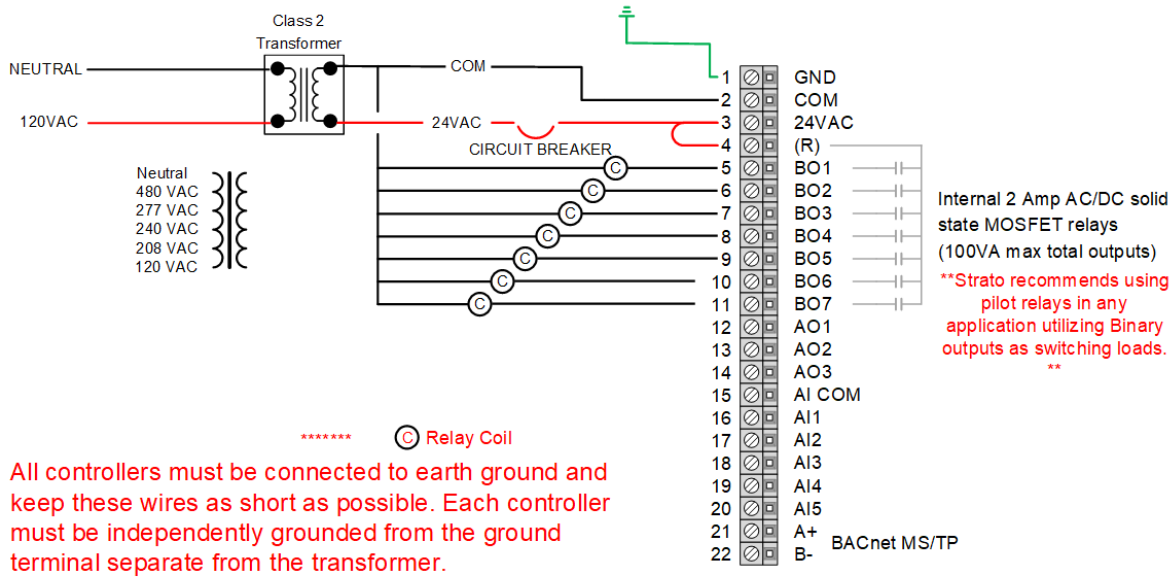
The EIA RS-485 Specification labels the data wires "A" and "B", but many manufacturers label their wires "+" and "-". In our experience, the "+" wire should be connected to the "A" line, and the "-" wire should be connected to the "B" line. Reversing the polarity will not damage a 485 device but will not communicate. That being said, the rest is easy: always connect "+" to "+", and "-" to "-".

Do not forget the Signal Ground. *While a differential signal does not require a signal ground to communicate, the ground wire serves an important purpose. Over hundreds of thousands of feet, there can be significant differences in the voltage level of "ground". The function of the signal ground wire is to tie the signal ground of each node to one common ground. If the ground voltage rises above 3 VAC, data will be lost, and the port itself will often be damaged. However, if the differences in signal grounds are too great, further attention is necessary.*



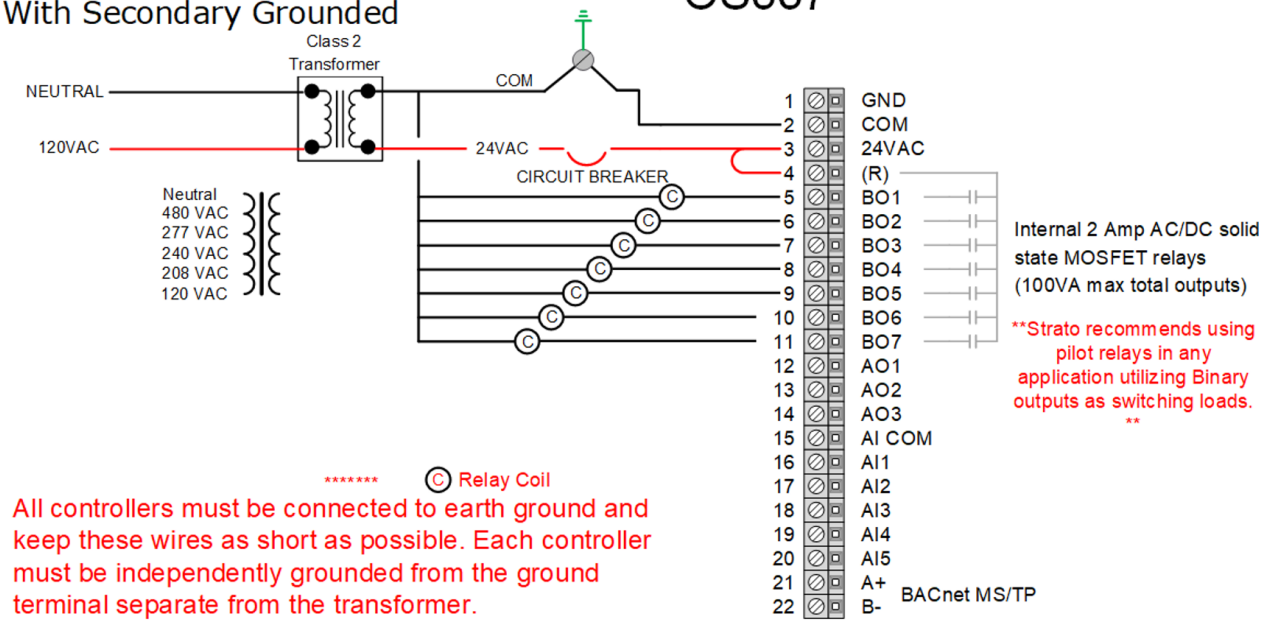
Grounding Guidelines When Using Separate Transformers

Single Or Multiple Voltage AC Transformer OS537



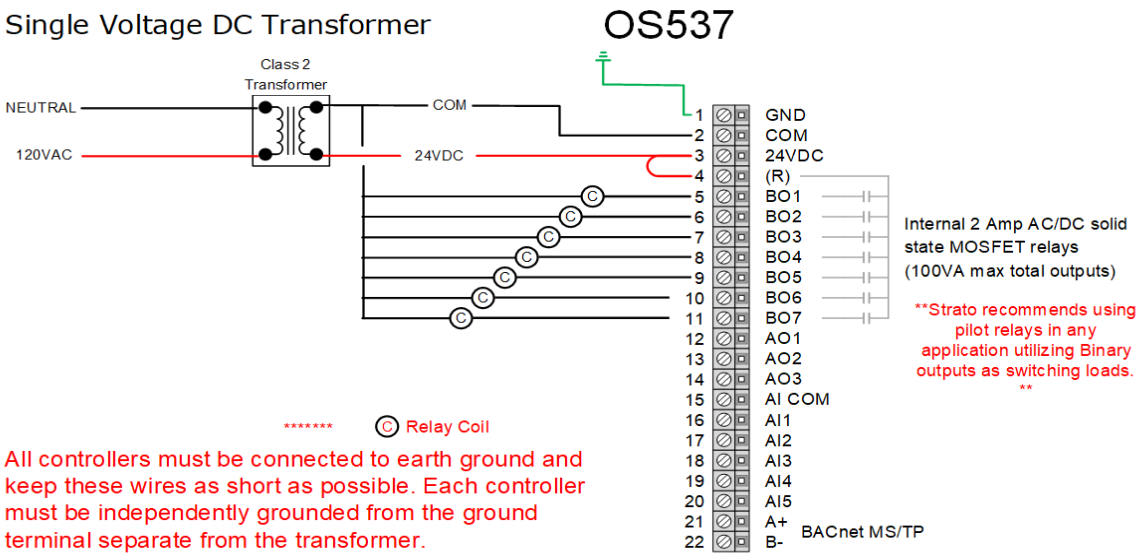
All controllers must be connected to earth ground and keep these wires as short as possible. Each controller must be independently grounded from the ground terminal separate from the transformer.

Single Or Multiple Voltage AC Transformer With Secondary Grounded OS537



All controllers must be connected to earth ground and keep these wires as short as possible. Each controller must be independently grounded from the ground terminal separate from the transformer.

Network



All controllers must be connected to earth ground and keep these wires as short as possible. Each controller must be independently grounded from the ground terminal separate from the transformer.

Specifications

OS537H-EH

OPENSTAT Electric Heat

BACnet MS/TP Controller

Strato Automation

OPENSTAT

Description

- Configurable wall or panel mount controller for electric duct heater applications
- Native BACnet MSTP enabled and ready with BTL certified as a B-ASC
- Room and or discharge air control application
- Staging only or full proportional built in vernier control with up to 6 on/off stages
- 0-10 Vdc, 10 Vdc pulsed or 24 Vac pulsed control of single stage modulating output or the vernier stage
- Supports external 0-10 Vdc control from a BMS system if local control is not needed
- Local interface for user setpoint control & configuration. Configuration can also be made through BACnet
- 15 I/O: 5 UI, 3 AO, 7 BO
- Temp, RH% *Standard*
- BACnet MS/TP: *B-BC BTL Certification (Pending)*



Model	Temp, RH%	BACnet MSTP
OS537H-EH	X	X

Application

The OS537 controller is designed to facilitate the control and management of custom electric resistive duct heater equipment typically used in the HVAC industry. It allows powerful solutions that can be configured according to any project needs. It features a very flexible I/O set capable of meeting electric heaters applications such as modulating small zone heaters, large staged heater systems, room and or discharge air control for central system control or make up air systems.

Technical Specifications

Power supply:
- 24 VAC/VDC ± 15%; Class 2

Current Consumption:
- 1.5 VA controller only
- 100 VA Max including BO's 2A max each

Communication Protocols:
- BACnet MS/TP half-wave device
- Baud 9600, 19200, 38400, 76800 Bps (76800 default) RS485 transceiver is a ¼ load device
- Mini USB2 MS/TP network access
- BTL listed: B-BC, BACnet Building Controller

Hardware
- Microprocessor: STM32 (ARM Cortex™ M33) 32 bits
- CPU Speed: 250 MHz
- Memory: 2 Mbytes non-volatile Flash
- RAM: 640 KB SRAM
- Real-time clock (RTC): Built-in capacitor (one-week backup)

Configuration
- Configurable using the local buttons, writing to the BACnet configuration objects or Strato Software tools.

Inputs:
5 Universal Inputs (AI/BI)
- Thermistor 10KΩ (type 2 or 3)
- Dry contact, 500 ms minimum (On-Off)
- Voltage 0 - 10 Vdc (Input impedance of 100 K Ω)
- Current 0-20 / 4-20 mA (Input impedance of 162 Ω)
- Resolution: 12 Bits (4096 segments)

Outputs:
7 Binary Outputs
- MOSFET Solid State Relays, Isolated
- Zero cross-fired
- 10 to 30VAC, 2.0A max

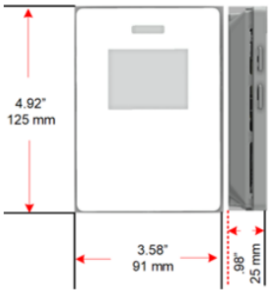
3 Analog Outputs
- Voltage 0 - 10 VDC linear

Humidity & Temperature Sensors
Sensirion™ SHT40
±1.8 RH @ 25-75% RH overall +/- 3%
±0.2 °C @ 0 °C to 60 °C

Mechanical:
- Dimensions: W 3.58"(91 mm) x H 4.92"(125 mm) x D 0.98"(25 mm)
- Stocking temperature: -30 °C to 50 °C / -22 °F to 122 °F
- Operating conditions: 0 °C to 50 °C / ...°F to 113 °F 10% to 90% H.R. without condensation
- Mounting type: Standard 2" x 4" electrical junction box
- Enclosure: White color, PCABS material UL94VO

Warranty: 1 Year

Certifications:
- UL 916 Energy Management Equipment
- BTL listed: B-BC, BACnet Building Controller



OS537H-EH - Spec *sheet - Aug 2024 rev 0.docx*

Designed and assembled in CANADA

End User Operation Guide



Increase Temperature Setpoint

Decrease Temperature Setpoint

Normal display:

	System Status: *No Heating* / *Heating*
	BACnet MSTP communication is connected.