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CC200 RELATIVE HUMIDITY AND DEW POINT (CC200-SM-RH-DP)

REV(REV 20.1.6+)

CRIOSU CONTROLS

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## Introduction

A relative humidity/dew point sensor may be assigned to a zone. The relative humidity sensor is attached to an RS485 network and is powered by a 12vDC supply.



## Module Requirements

### *Module Configuration*

<input type="text" value="8 Zones"/>	<input type="checkbox"/> Digital Input Functions (CC200-SM-IF)
<input type="checkbox"/> Relay Config (CC200-SM-RC)	<input type="checkbox"/> Zone Differential (CC200-SM-DIFF)
<input type="checkbox"/> Relay Config Ext (CC200-SM-RCE)	<input type="checkbox"/> DHW Priority (CC200-SM-DHW-P)
<input type="checkbox"/> Relay Timers & Cycling (CC200-SM-RTC)	<input checked="" type="checkbox"/> Relative Humidity (CC200-SM-RH-DP)
<input type="checkbox"/> Cooling (CC200-SM-CL)	
<input type="checkbox"/> PV (CC200-SM-PV)	
<input type="checkbox"/> PV Adv (CC200-SM-PV_ADV)	
<input type="checkbox"/> VRF (CC200-SM-VRF)	
<input type="checkbox"/> Modbus Slave (CC200-SM-MBS)	
<input type="checkbox"/> Alarms (CC200-SM-ALM)	

Configuration Code: 139595932101216957540087



Help



Exit

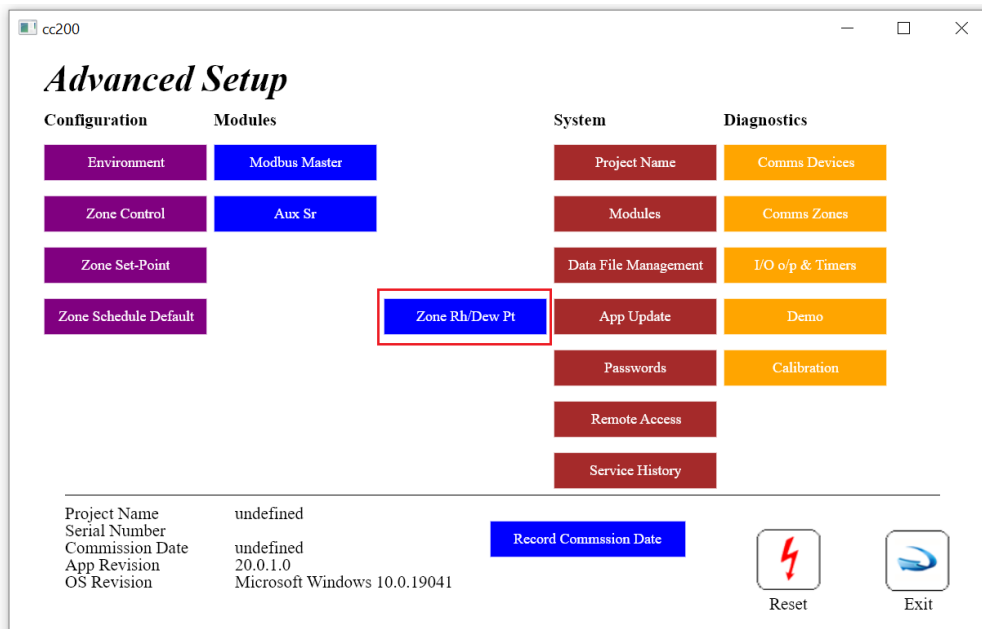
## User Display of Relative Humidity and Dew Point

The relative humidity and dew point are displayed in the Zone Set-Point screen.



## Setup of Zone Relative Humidity and Dew Point

Press "Zone Relative Humidity" to view Setup screen



## Zone Relative Humidity Setup Screen.

Zn	Name	Relative Humidity Sensor				Dew Point Sensor			
		En	SP	RH	T	Addr	En	DewPt	T
1	Zone 1	<input checked="" type="checkbox"/>	0	61°C	20°C	0	<input checked="" type="checkbox"/>	35°C	20°C
2	Zone 2	<input type="checkbox"/>	0	?	?	0	<input type="checkbox"/>	?	?
3	Zone 3	<input type="checkbox"/>	0	?	?	0	<input type="checkbox"/>	?	?
4	Zone 4	<input type="checkbox"/>	0	?	?	0	<input type="checkbox"/>	?	?

**Modbus Master**    *The Relative Humidity and DewPt Probe Sensors are setup as the Modbus Master devices.*

Zones 1 - 4    Zones 5 - 8    Zone 9    Exit

### Relative Humidity Sensor

En	Enables RH Enables communication to the sensor and display of RH in the Zone Set-point Screen.
SP	Setpoint. This value is used in the Relay Configuration to control the relay output state.  If RH < T = Relay Off If RH => T = Relay ON
Rh	Relative Humidity
T	Temperature at probe

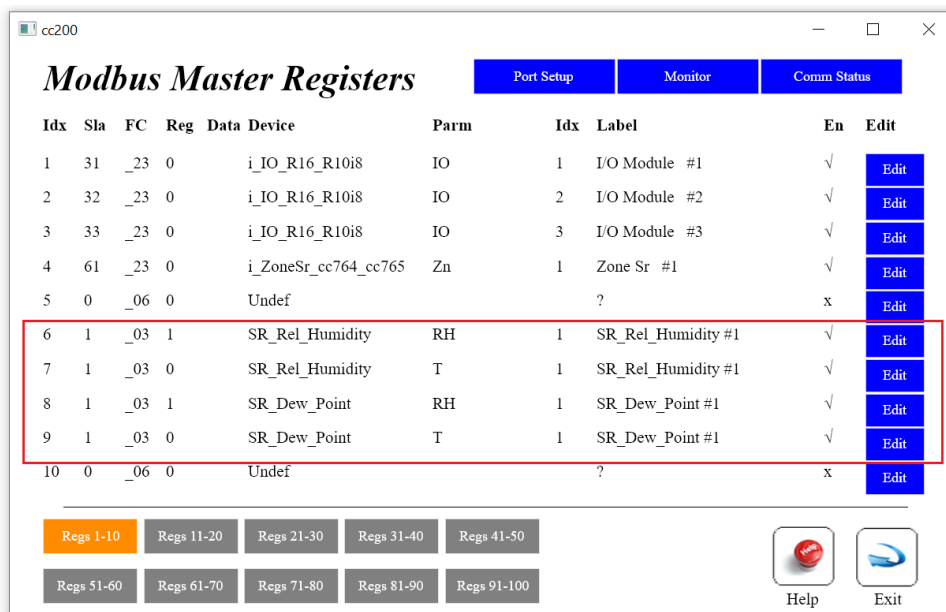
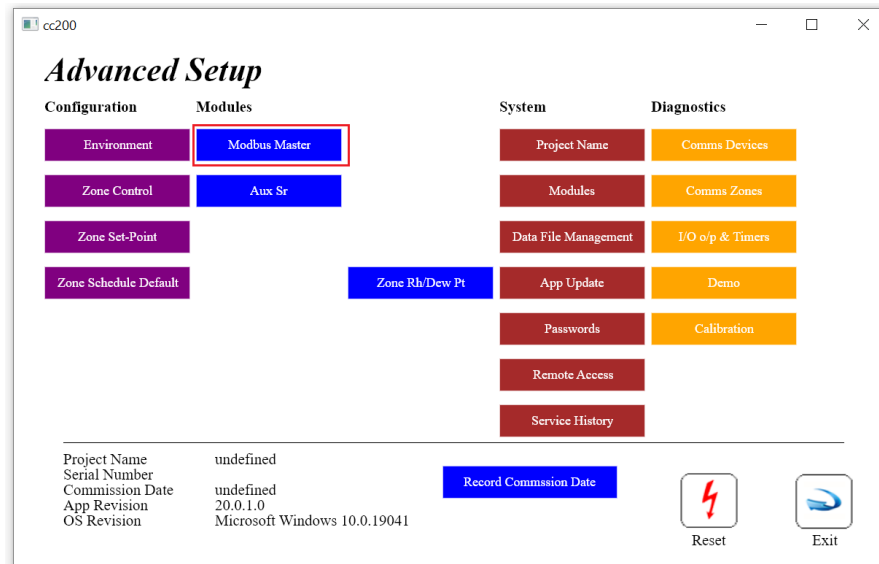
### Dew Point Sensor

En	Enables Dew Point Enables communication to the sensor and display of Dewpoint in the Zone Set-point Screen.
DewPT	Calculated Due Point [Based on Probe Temp & Probe RH ]  <i>Note: Calculated Due Point is based on Probe Temp &amp; Probe RH (Not Room Temp)]</i>
T	Temperature at probe

Press the “**Modbus Master**” button to view the Modbus setup and monitoring.

## Setup of Modbus Registers for Zone Relative Humidity and Dew Point

Press “Modbus Master” in the Advanced Setup Screen.



Modbus registers are created automatically when in the "Quick Setup" screen or when enabled in the "Zone RH / Dew Point" screen.

Press "Edit" to modify a register.

The Zone number is automatically set when the register is created and should not be changed. The probe Slave Address may need to be changed.

Probe Modbus Slave Address


Zone Number

cc200

## Modbus Master Register Edit

<b>Slv Addr</b>	1	<b>Device</b>	SR_Rel_Humidity
<b>FC</b>	_03	<b>Idx</b>	1
<b>Reg Addr</b>	1	<b>Parm</b>	RH
<input checked="" type="checkbox"/> <b>Enable</b>		<b>Label</b>	SR_Rel_Humidity #1

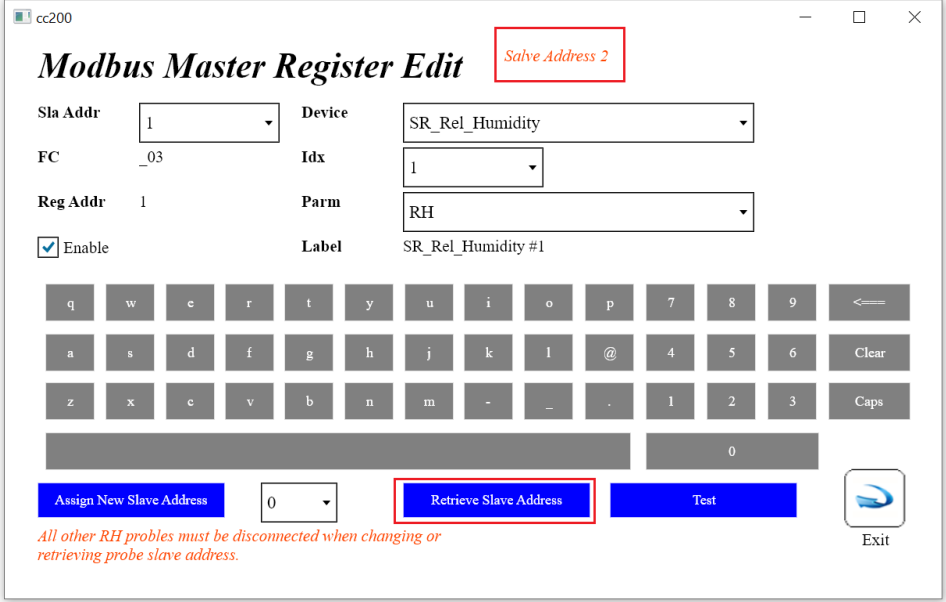
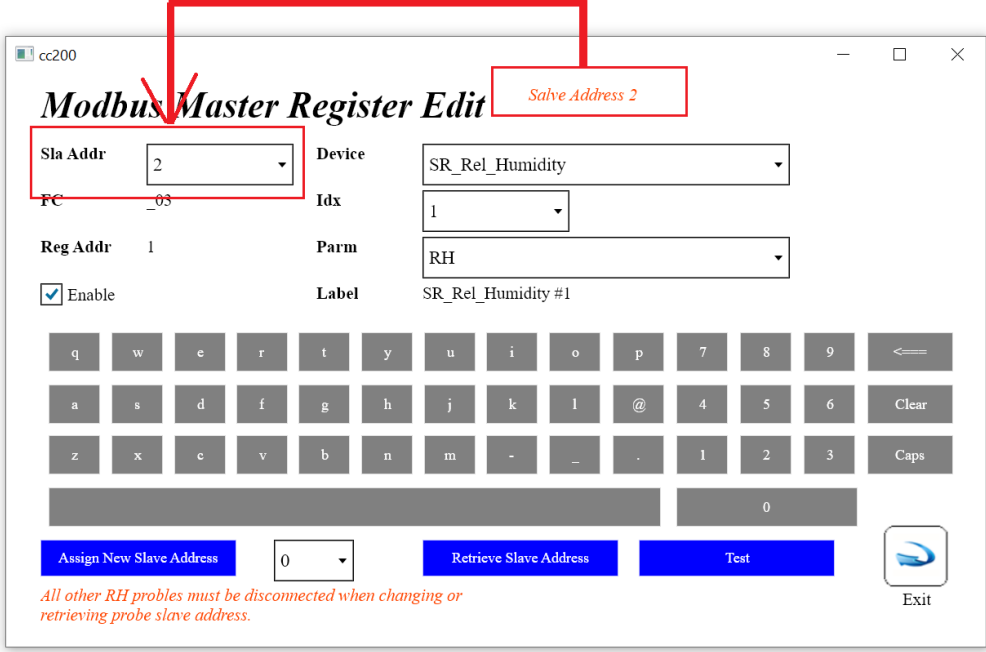
q	w	e	r	t	y	u	i	o	p	7	8	9	←
a	s	d	f	g	h	j	k	l	@	4	5	6	Clear
z	x	c	v	b	n	m	-	_	.	1	2	3	Caps
												0	

**Assign New Slave Address** 0 **Retrieve Slave Address** **Test**  **Exit**

*All other RH probes must be disconnected when changing or retrieving probe slave address.*

## Changing the Modbus Slave Address

**ONLY ONE PROBE CAN BE POWERED WHEN CHANGING A PROBE SLAVE ADDRESS**

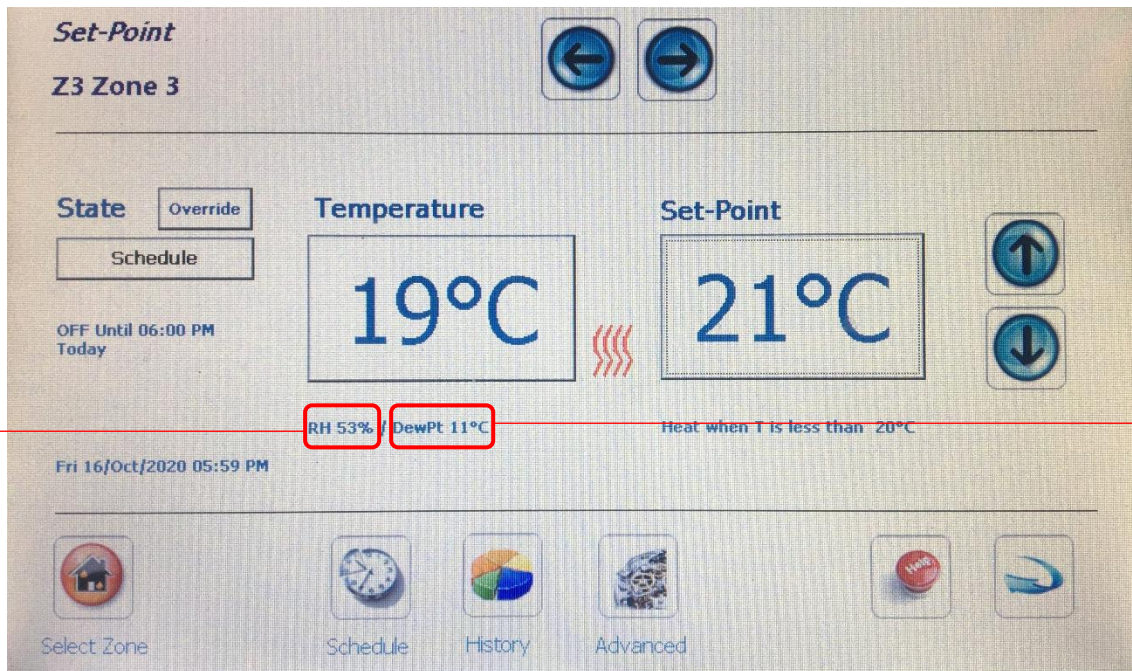
Steps	Description
1	<p>Find the Current Probe slave Address by pressing “Retrieve Slave Address”</p>  <p>The screenshot shows the 'Modbus Master Register Edit' window. The 'Sla Addr' field is set to '1'. The 'Device' dropdown is 'SR_Rel_Humidity'. The 'Idx' dropdown is '1'. The 'Parm' dropdown is 'RH'. The 'Label' is 'SR_Rel_Humidity #1'. The 'Retrieve Slave Address' button is highlighted with a red box. A red box also highlights the 'Salve Address 2' label. Below the keyboard, there is a note: 'All other RH probes must be disconnected when changing or retrieving probe slave address.'</p>
2	<p>Set the “Sla Addr” (Modbus Slave Address) to the Retrieved Slave Address.</p>  <p>The screenshot shows the 'Modbus Master Register Edit' window. The 'Sla Addr' field is now set to '2'. A red arrow points from the 'Retrieve Slave Address' button in the previous screenshot to this field. The 'Salve Address 2' label is highlighted with a red box. The 'Device' dropdown is 'SR_Rel_Humidity'. The 'Idx' dropdown is '1'. The 'Parm' dropdown is 'RH'. The 'Label' is 'SR_Rel_Humidity #1'. Below the keyboard, there is a note: 'All other RH probes must be disconnected when changing or retrieving probe slave address.'</p>





“SP” can be used to set the flag when the relative humidity exceeds the SP. This flag is accessible in the Relay Configuration Module

### User Screen



### Relative Humidity

Relative Humidity will be display if **Rel Hum “En Disp”** check box is checked in engineering screen below

### Due Point

Due Point will be display if **Dew Point “En Disp”** check box is checked in engineering screen below  
*Note: Calculated Due Point is Based on Probe Temp & Probe RH (Not Room Temp)*

### Comment: We DON'T recommend displaying the Due Point Temp

The temperature at which the DP is reach will not correspond with room temp, because the Room temp is measured at room sensor, whereas DP temp is measured wherever the DP Probe is located)

### *Image from Engineering Screen*



## Step 4: Monitoring

The screenshot displays the Modbus Master Monitor interface. The main window shows a log of communication between a master and a slave. The log entries are as follows:

```
XMT>> [4/16/2019 1:29:59 PM] 2,3,0,1,0,1,213,249,
RCV<< [4/16/2019 1:30:00 PM] 2,3,2,24,89,54,126,
XMT>> [4/16/2019 1:30:00 PM] 2,3,0,1,0,1,213,249,
RCV<< [4/16/2019 1:30:01 PM] 2,3,2,24,87,183,186,
XMT>> [4/16/2019 1:30:02 PM] 2,3,0,1,0,1,213,249,
RCV<< [4/16/2019 1:30:02 PM] 2,3,2,24,82,119,185,
XMT>> [4/16/2019 1:30:03 PM] 2,3,0,1,0,1,213,249,
RCV<< [4/16/2019 1:30:03 PM] 2,3,2,24,83,182,121,
XMT>> [4/16/2019 1:30:04 PM] 2,3,0,1,0,1,213,249,
RCV<< [4/16/2019 1:30:04 PM] 2,3,2,24,79,183,176,
XMT>> [4/16/2019 1:30:05 PM] 2,3,0,1,0,1,213,249,
RCV<< [4/16/2019 1:30:05 PM] 2,3,2,24,88,247,190,
XMT>> [4/16/2019 1:30:06 PM] 2,3,0,1,0,1,213,249,
RCV<< [4/16/2019 1:30:06 PM] 2,3,2,24,82,119,185,
XMT>> [4/16/2019 1:30:07 PM] 2,3,0,1,0,1,213,249,
RCV<< [4/16/2019 1:30:07 PM] 2,3,2,24,79,183,176,
```

Annotations with red lines point to specific parts of the log:

- Relative Humidity Slave Address (1-32) points to the first three bytes (2,3,0) of the XMT lines.
- Function Code (always 3) points to the fourth byte (1) of the XMT lines.
- Start Address (001) points to the fifth byte (0) of the XMT lines.
- Points to Read points to the sixth byte (1) of the XMT lines.
- CRC points to the last two bytes (213,249) of the XMT lines.

On the right side of the interface, there are control buttons: "Clear", "Pause" (with an unchecked checkbox), "Format: Decimal" (with a checked checkbox), and "Retart All Tokens". At the bottom right, there are two circular icons: a red "stop" button and a blue refresh button.

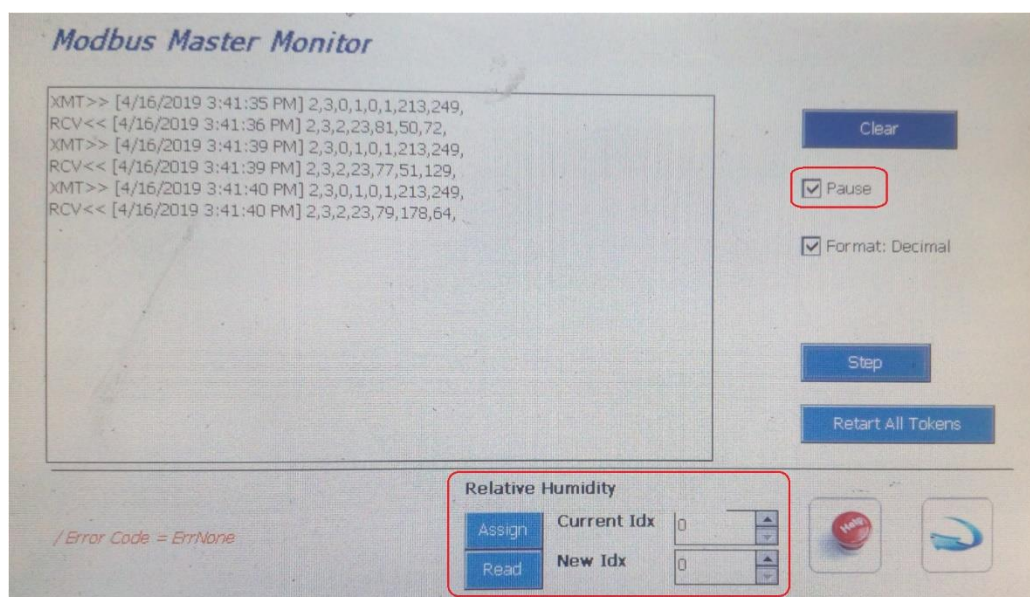
At the bottom left, the text */Error Code = ErrNone* is displayed. A red line from the "CRC" label at the bottom points to the last two bytes (2,3) of the final RCV line.

At the bottom, additional annotations with red lines point to the final RCV line:

- Relative Humidity points to the last two bytes (79,183) of the RCV line.
- Byte Count points to the third byte (2) of the RCV line.
- Function Code (always 3) points to the fourth byte (2) of the RCV line.
- Relative Humidity Slave Address (1-32) points to the first three bytes (2,3,2) of the RCV line.

## Modbus Addressing & Monitor of Relative Humidity Sensor

Check “**Pause**” in the Monitor Window to view relative humidity controls visible.



To Assign an address to a Relative Humidity Sensor

**Sensors MUST be addressed ONE AT A TIME.**

Step	Description
1	Set “Current Idx” to the address of the Sensor.  <b>The default address of new Relative Humidity sensors is “1”</b>
2	Set “New Idx” to the NEW address.
3	Press Assign

Note: New Probe released from factory have a default address of #1

To read a specific Relative Humidity Sensor

Step	Description
1	Set “Current Idx” to the address of the Sensor.
2	Press Read

## Relay Config Setup

A relay can be configured to be Active / Enable / Overridden by any Zone where its Relative Humidity has gone above the threshold or Dew Point Reached

#	Activation .....	Ena	Ovr
1	z:C 1	-----	z:RH 1
2	-----	-----	DewPt 1
3	-----	-----	-----
4	-----	-----	-----
5	-----	-----	-----
6	-----	-----	-----

Example:

Zone 1 Relative Humidity has exceeded its SP Threshold or Dew point reached – Override Zone Cooling

### Relative Humidity Section

Relay Active By Following

If  $RH \geq T$  = Relay ON

If  $RH < T$  = Relay Off

[If RH is equal or above the SP (SP is Threshold value T)]

[If RH is below the SP (SP is Threshold value T)]

### Dew Point Section

Relay ON

Relay OFF

When  $RH \geq 95\%$  (For safety this threshold is set at 95%)

When  $RH < 95\%$

## PV Advanced Setup

**PV #1** Init Ht

<table border="1" style="width: 100%; text-align: center;"> <tr><td>x./PV #1</td><td>x./PV #9</td></tr> <tr><td>x./PV #2</td><td>x./PV #10</td></tr> <tr><td>x./PV #3</td><td>x./PV #11</td></tr> <tr><td>x./PV #4</td><td>x./PV #12</td></tr> <tr><td>x./PV #5</td><td>x./PV #13</td></tr> <tr><td>x./PV #6</td><td>x./PV #14</td></tr> <tr><td>x./PV #7</td><td>x./PV #15</td></tr> <tr><td>x./PV #8</td><td>x./PV #16</td></tr> </table>	x./PV #1	x./PV #9	x./PV #2	x./PV #10	x./PV #3	x./PV #11	x./PV #4	x./PV #12	x./PV #5	x./PV #13	x./PV #6	x./PV #14	x./PV #7	x./PV #15	x./PV #8	x./PV #16	<p><b>Flow</b></p> <p>Max 17</p> <p>Min 12</p> <p>Type SP + DB</p>	<p><b>Output</b></p> <p>Max 10</p> <p>Min 0</p> <p>Type SP + DB + F3</p>	<p><i>Calc: 0°C Flow: 0°C DAC: 0 Primary</i></p> <p>D.Max 255</p> <p>D.Min 0</p> <p>Flow-Src Aux Sensor</p> <p>Idx Sr1 Flow_Temp</p> <p>Ref-Src Hottest Zone (dt)</p>
x./PV #1	x./PV #9																		
x./PV #2	x./PV #10																		
x./PV #3	x./PV #11																		
x./PV #4	x./PV #12																		
x./PV #5	x./PV #13																		
x./PV #6	x./PV #14																		
x./PV #7	x./PV #15																		
x./PV #8	x./PV #16																		
<p>Reference <i>Zone # 1 T : ErrNoZoneCooling</i></p>																			
<p>Interval(s) 20</p> <p>Switch No Switch</p>	<table style="width: 100%;"> <tr> <td><input type="checkbox"/> Enable Cutoff Hi</td> <td><input checked="" type="checkbox"/> Enable Flow</td> </tr> <tr> <td><input type="checkbox"/> Enable Cutoff Lo</td> <td><input type="checkbox"/> Enable Dec Pt</td> </tr> <tr> <td><input type="checkbox"/> Emulate</td> <td><input checked="" type="checkbox"/> Enable RH Override</td> </tr> <tr> <td><input type="checkbox"/> Cal</td> <td><input checked="" type="checkbox"/> Enable Dew Pt Override</td> </tr> <tr> <td><input type="checkbox"/> Nt Low Limit</td> <td><input checked="" type="checkbox"/> Reverse DAC for Cold Water</td> </tr> </table>			<input type="checkbox"/> Enable Cutoff Hi	<input checked="" type="checkbox"/> Enable Flow	<input type="checkbox"/> Enable Cutoff Lo	<input type="checkbox"/> Enable Dec Pt	<input type="checkbox"/> Emulate	<input checked="" type="checkbox"/> Enable RH Override	<input type="checkbox"/> Cal	<input checked="" type="checkbox"/> Enable Dew Pt Override	<input type="checkbox"/> Nt Low Limit	<input checked="" type="checkbox"/> Reverse DAC for Cold Water						
<input type="checkbox"/> Enable Cutoff Hi	<input checked="" type="checkbox"/> Enable Flow																		
<input type="checkbox"/> Enable Cutoff Lo	<input type="checkbox"/> Enable Dec Pt																		
<input type="checkbox"/> Emulate	<input checked="" type="checkbox"/> Enable RH Override																		
<input type="checkbox"/> Cal	<input checked="" type="checkbox"/> Enable Dew Pt Override																		
<input type="checkbox"/> Nt Low Limit	<input checked="" type="checkbox"/> Reverse DAC for Cold Water																		

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### Override PV output (Move to 0v)

Enable RH Override

Enable Dew Pt Override

If  $RH \geq T$

DP Reached (When  $RH \geq 95\%$ )

## Cable Wiring

Color	Description
Red	Power (12vDC)
Green	Ground
Yellow	“A”
Blue	“B”

### Relative Humidity / Due Point - RS484 -USB Interface Wiring

