Advanced SmartAire M and PowerAire M Controller Guide

Tate's SmartAire and PowerAire M units are factory configured for optimal performance in a typical data center environment. The installation of these units in most data center space will result in ideal performance without any user intervention.

Some sites however have differing requirements, and the application of SmartAire and PowerAire M units may not be ideal based on a number of site conditions. These requirements have prompted Tate to publish an advanced guide to the SmartAire and PowerAire M controllers which will allow the expert user more precise control over the functionality of Tate's product.

This document is intended to be only a guide to the operation of the embedded controller. The user takes full responsibility when adjusting the default parameters set in all PowerAire and SmartAire M units when they leave our factory. Adjusts to these parameters may result in undesirable operation of the units, as well as decrease the life expectancy of the units themselves. It is suggest that only those users with a high level of experience in control methodology attempt to make these changes without direct consultation with Tate's data center product management team.

Please feel free to contact Tate with any questions regarding this operations guide.

Please Help Us Improve This Guide

We would be very interested to hear any comments you might have on this new guide. We are particularly interested in learning of omissions or subjects that are unclear. Please call, fax, or e-mail and direct your comments to Technical Service. Thank you very much for your assistance.
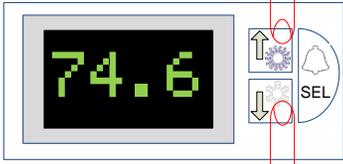Phone: (410) 799-4200
Fax: (410) 799-4207
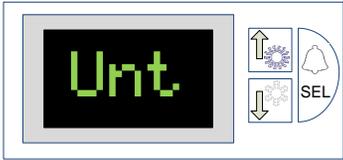E-Mail: TateInfo@Tateaccessfloors.com

74.6

Default Home Screen

To enter Advanced Programming Mode

74.6

Press and Hold Up and Down Simultaneously for 5 Seconds

Unt

Unit Selection Prompt

To change Unit Type

Unt

Unit Type Current Setting

To change Unit Type

dPr   or   **FaN**

Press up or down to change unit type

Press SEL to store the setting

noS

Number of Installed Sensors

To Change the number of sensors

noS

To change the number of sensors

Continue on next page

1 or **2** or **3** or **4**

Default value is 3. Press SEL to store the setting
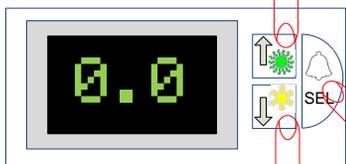
Default value is 3. Press SEL to store the setting

StP
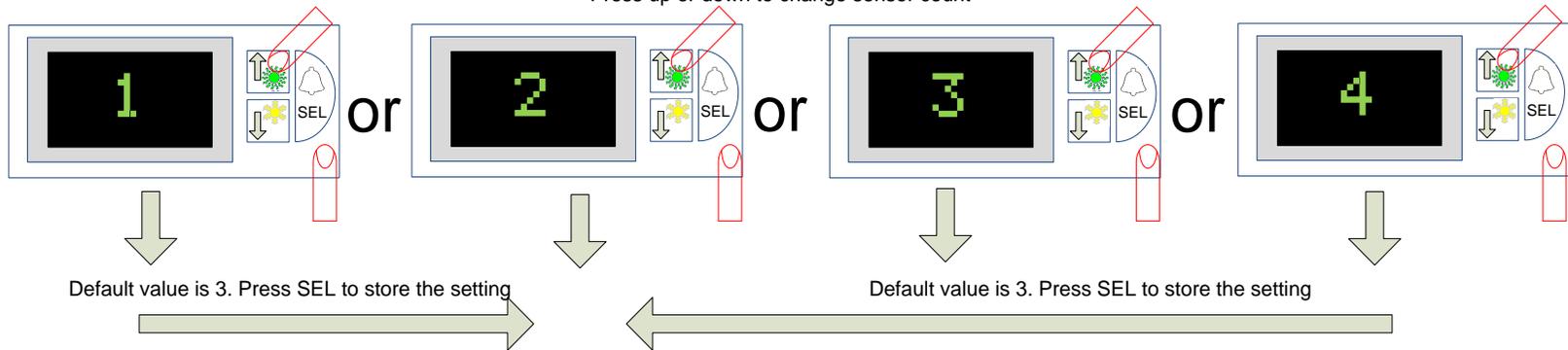
Start Point Configuration Prompt

To change the Start Point Value

1.5

Start Point Current Setting

To change the Start Point Value

0.0

Start Point Configuration Adjustment

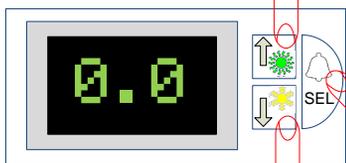Default value is 1.5. Adjust the value from 0.0 to 10.0 (represents percentage) press SEL to save setting

LO

Low Point Configuration Prompt

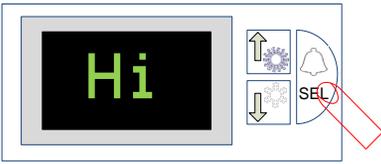This value will set the minimum fan speed or damper position that the unit will adjust to

0.0

Low Point Current Setting

To change the minimum fan speed or damper position

0.0

Start Point Configuration Adjustment

Default value is 0.0. Adjust the value from 0.0 to Hi setting (represents percentage) press SEL to save setting – Continue on next page
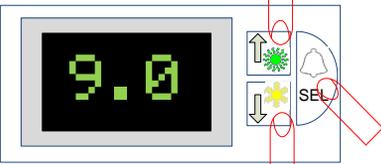
High Point Configuration Prompt

Hi

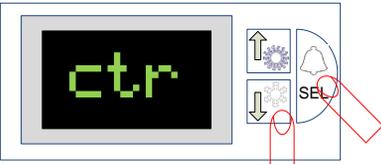To change the maximum fan speed or damper opening setting

High Point Current Setting

10.0

To change the Start Point Value

High Point Configuration Adjustment

9.0

Default value is 10.0. Adjust the value from the Lo setting to 10.0 (represents percentage) press SEL to save setting

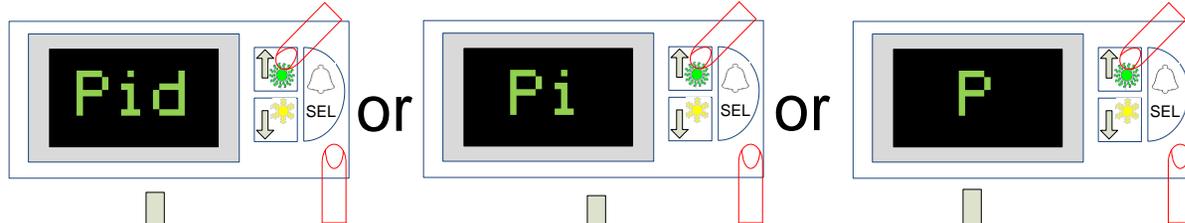## Controller Type Configuration Prompt

ctr

This value will allow you to chose the controller type, the options are Proportional, Proportional-Integral, and Proportional, Integral and Differential

Controller Type Current Setting

Pid

Adjust the controller to the type desired

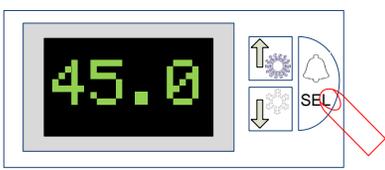## Controller Type Adjustment

Pid or **Pi** or **P**

Default value is PID. Press SEL to store the setting

Proportional Term Configuration Prompt

Pb

This term is the proportional gain constant, and take the value of 1/Pb, a larger Pb will slow the speed of reaction to temperature change – Continue on Next Page
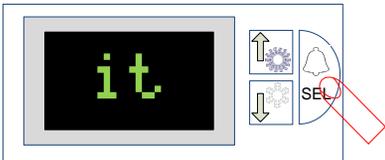
Proportional Term Current Setting

The default Pb value is 45, if the unit seems too slow in responding in your environment, decrease the value to achieve a quicker response
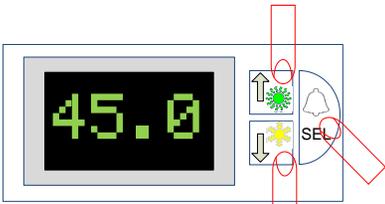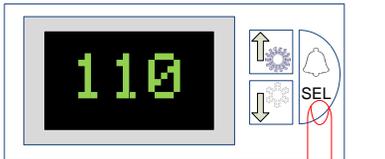
Proportional Term Setting Adjustment

Default value is 45.0. Adjust the Proportional term as required, higher numbers reduce the effect of the proportional term, lower values increase the effect. Press SEL to save the value

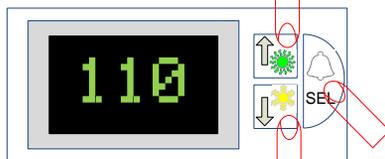# Integral Term Configuration Prompt

This value allows the user to adjust the integral term of the PI or PID loop. Note that the I terms is only displayed if the controller type is set to PI or PID
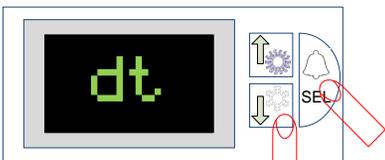
Integral Term Current Setting

This value adjusts the effect of the integral term of the PI or PID controller, this value examines the current difference in the set point, as well as historic error, to determine the change in set point. Increasing this value increases the time the controller examines older data, decreasing it shortens the window of data examined
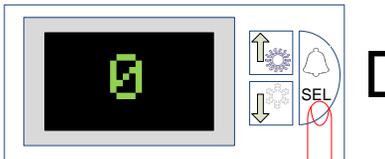
Integral Term Setting Adjustment

Default value is 110. Adjust the integral term as required, higher numbers increase the effect of the integral term, lower values decrease the effect. Press SEL to save the value

# Derivative Term Configuration Prompt

This value allows the user to adjust the derivative term of the PID loop. Note that the D terms is only displayed if the controller type is set to PID

Derivative Term Current Setting

This value adjusts the effect of the derivative term of the PID controller, this value examines the rate of change in the historic temperature values. The faster the temperature is changing, the more effect the derivative term will have on the fan speed or damper setting. The higher the value of derivative term constant, the slower the reaction of the unit will become, but a lower level of steady state error and less overshoot will be realized.
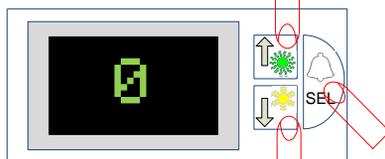
Derivative Term Setting Adjustment

Default value is 0. Adjust the derivative term as required, higher numbers increase the effect of the derivative term, lower values decrease the effect. Press SEL to save the value – Continue on the following page
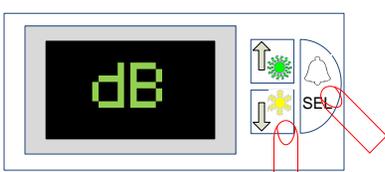
Dead Band Value Configuration Prompt

This value allows the user to adjust the dead band of the temperature values before any action is taken by the controller to adjust the settings. This dead band is +/- the current temperature setpoint
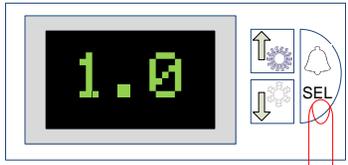
Dead Band Value Current Setting

This value represents the current dead band of the controller where no action will be taken by the control system to either increase or decrease fan speed or damper position.
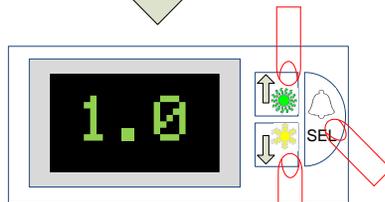
Dead Band Setting Adjustment

Default value is 1.0. Increasing the dead band will result in fewer input changes to the system, and will likely result in a higher level of SmartAire or PowerAire control stability. Lower values will result in tighter control over the output temperature, but will result in more frequent changes in fan speed or damper position. Press SEL to store the new value.
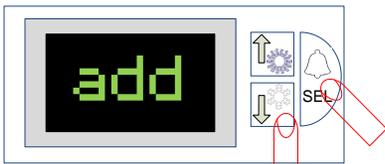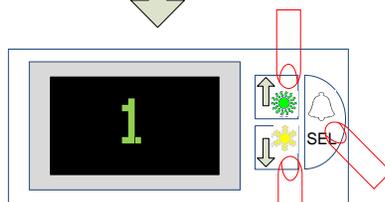
Address Configuration Prompt

This value allows the user to adjust the address of the unit when connecting the unit to a BMS interface via a serial link between units.

Address Current Setting

This value assigns the unit an address on the Carel I/O bus when units are linked serially together to a master unit equipped with a BMS interface card.
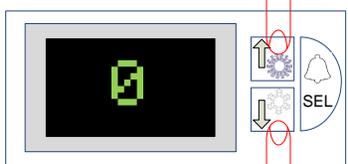
Address Setting Adjustment

Default value is 1, units should be assigned in order, with the unit equipped with the BMS card assigned the address value of 1, with each unit in the chain being assigned the next higher number.
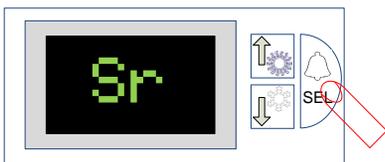
Software Revision Level

This prompt will display the current software revision number

Software Revision

This is a read only value.

Once all values are set, press and hold the up and down buttons simultaneously and you will be return to the current high temperature display home screen, and all values will be saved