



# Aprilaire WiFi Thermostat Module Application Guide

## Description

This module provides two-way control of Aprilaire WiFi Thermostats 8810, 8820, 8830, and 8840. It allows adjustment of heat and cool set points, system modes, and fan status. Real-time feedback of current temperature, humidity, mode selection and fan status.

## Supported Processors

Any 2-series with an Ethernet card or 3-series processor is supported.

Compatibility			Processor Requirements	
				

## **Module Application**

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This module allows two-way TCP/IP communication with Aprilaire thermostats 8810, 8820, 8830, 8840.

The module utilizes direct sockets to communicate with the Aprilaire WiFi thermostat. ControlWorks recommends using a static IP address or making a DHCP reservation to ensure the module can communicate with the thermostat.

Please refer to the thermostat manual for setting up an IP address. At this time there is no way to view the current Ethernet setup of a thermostat from the thermostat itself.

### **Humidity**

The thermostat allows two modes of humidification: Auto and Manual. When in Auto Mode, the thermostat allows you to adjust the humidity in 7 stepped increments. In Manual Mode the thermostat allows the percentage to be directly set. In a typical scenario users are allowed access to humidification in Manual mode only.

See the thermostats owner's manual for a detailed description, and functionality of Auto and Manual Humidity control.

# Signal and Parameter Descriptions

Bracketed signals such as "[signal\_name]" are optional signals

## DIGITAL INPUTS

reboot_finished .....	Latch this signal high after startup is complete. See demo program for example. Once latched high, the module will attempt to establish a connection with the thermostat and query the thermostats current setup and values. Subsequent value changes made on the thermostat are reported to Creston unsolicited.
[heat_sp+].....	Pulse to raise the current heat setpoint. If temp scale is C, the thermostat will increment by .5 degrees, if the temp scale is F the thermostat will increment by 1 degree.
[heat_sp-].....	Pulse to lower the current heat setpoint. If temp scale is C, the thermostat will decrement by .5 degrees, if the temp scale is F the thermostat will decrement by 1 degree.
[cool_sp+] .....	Pulse to raise the current cool setpoint. If temp scale is C, the thermostat will increment by .5 degrees, if the temp scale is F the thermostat will increment by 1 degree.
[cool_sp-] .....	Pulse to lower the current cool setpoint. If temp scale is C, the thermostat will decrement by .5 degrees, if the temp scale is F the thermostat will decrement by 1 degree.
[humidity_sp+].....	Pulse to raise the current humidity setpoint <b>For Auto Mode</b> by 1 level. <b>For Manual Mode</b> by 1 percent.
[humidity_sp-].....	Pulse to lower the current humidity setpoint <b>For Auto Mode</b> by 1 level. <b>For Manual Mode</b> by 1 percent.
[mode_off].....	Pulse to set the thermostat system mode to off.
[mode_heat] .....	Pulse to set the thermostat system mode to heat only. Cool set point inputs are ignored.
[mode_cool] .....	Pulse to set the thermostat system to cool only. Heat set point inputs are ignored.
[mode_eheat].....	Pulse to set the thermostat system to e-heat only.
[mode_auto] .....	Pulse to set the thermostat system to auto mode. Both heat and cool set points are used in this mode.
[fan_on] .....	Pulse to set the fan to on.
[fan_auto].....	Pulse to set the fan to auto (running only in heat or cool calls.)
[fan_circ].....	Pulse to set the fan to circulation mode.
[sync_thermostat_time].....	Pulse to send the current processor time and date to the thermostat.
[reset_thermostat] .....	Puling this input will reset the Thermostat. The action will behave the same as power cycling the thermostat.

## **ANALOG INPUTS**

[heat\_setpoint\_set] ..... initialize to set the heat setpoint.  
**For Celsius Temperature Scale**  
The input range is 40d to 320d in halves of a degree (i.e 45 = 4.5°C and 320d = 32.0°C.) Values should be sent in .5 of a degree (i.e. 210d, 215d, 220d, etc.) If the tenths value is not a 5 or 0, the tenths will be rounded to the nearest half degree.  
**For Fahrenheit Temperature Scale**  
The input range is 390d to 900d (i.e 390d = 39.0°F and 900d = 90.0°F.). The thermostat only accepts whole degree increments and the tenths value should be left at 0d, i.e. 680, 690 etc. If a tenths value other than 0 is received, the tenth will be rounded to the nearest whole degree.  
Do not RAMP the input. Typically this input is used with an INIT or an AINC symbol.

[cool\_setpoint\_set] ..... initialize to set the cool setpoint.  
**For Celsius Temperature Scale**  
The input range is 100d to 370d in halves of a degree (i.e 105 = 10.5°C and 320d = 32.0°C.) Values should be sent in .5 of a degree (i.e. 210d, 215d, 220d, etc.) If the tenths value is not a 5 or 0, the tenths will be rounded to the nearest half degree.  
**For Fahrenheit Temperature Scale**  
The input range is 500d to 990d (i.e 650d = 65.0°F and 900d = 90.0°F.). The thermostat only accepts whole degree increments and the tenths value should be left at 0d, i.e. 680, 690 etc. If a tenths value other than 0 is received, the tenth will be rounded to the nearest whole degree.  
Do not RAMP the input. Typically this input is used with an INIT or an AINC symbol.

[humidity\_setpoint\_set] ..... initialize to set the humidification level  
**For Auto Mode**[humidification\_auto\_fb]  
The input range is 0d-7d. 0d turning humidification off.  
**For Manual Mode**[humidification\_manual\_fb]  
The input range is 0d-100d. 0d turns humidification off.

## **SERIAL INPUTS**

This module does not utilize any serial inputs.

## **DIGITAL OUTPUTS**

[mode_off_fb]	high when the current system mode is off.
[mode_heat_fb]	high when the current system mode is heat.
[mode_cool_fb]	high when the current system mode is cool.
[mode_eheat_fb]	high when the current system mode is eheat.
[mode_auto_fb]	high when the current system mode is in auto.
[fan_on_fb]	high when the fan mode is on.
[fan_auto_fb]	high when the fan mode is auto.
[fan_circ_fb]	high when the fan is set to circulation mode.
[temp_scale_c_fb]	High when the temperature scale is Celsius.
[temp_scale_f_fb]	High when the temperature scale is Fahrenheit.
[humidification_none_fb]	High when the thermostat humidification mode is set to no humidifier.
[humidification_auto_fb]	High when the humidification mode is set to auto. Refer to the Thermostat owner's manual for full description of Auto/manual mode.
[humidification_manual_fb]	High when the humidification mode is set to manual. Refer to the Thermostat owner's manual for full description of Auto/manual mode.
[thermostat_mode_heat_only_fb]	high when the thermostat is capable of being set to heat only mode.
[thermostat_mode_cool_only_fb]	high when the thermostat is capable of being set to cool only mode.
[thermostat_mode_heat_cool_fb]	high when the thermostat can be set to heat or cool mode.
[thermostat_mode_heat_eheat_cool_fb]	high when the thermostat can be set to heat, eheat, or cool mode.
[thermostat_mode_heat_cool_auto_fb]	high when the thermostat can be set to heat, cool, or auto mode.
[thermostat_mode_heat_eheat_cool_auto]	high when the thermostat can be set to heat, eheat, cool, or auto modes.
[thermostat_connected]	High when the module is connected to a thermostat.

## **ANALOG OUTPUTS**

[current_temperature] .....	reports the current regulation temperature of the controlling sensor. Temperatures are reported in tenths of a degree. If the scale is C, the output range is -400d to 400d, if F -400d to 1040d.
[current_humidity] .....	reports the current regulation humidity of all connected sensors in percent.
[outdoor_temperature] .....	reports the current temperature for the outdoor sensor. Temperatures are reported in tenths of a degree. If the scale is C, the output range is -400d to 550d, if F -400d to 1310d.
[heat_setpoint] .....	<b>For Celsius Temperature Scale</b> The output range is 40d to 320d in halves of a degree (i.e 45 = 4.5°C and 320d = 32.0°C.)  <b>For Fahrenheit Temperature Scale</b> The output range is 390d to 900d (i.e 390d = 39.0°F and 900d = 90.0°F.)
[cool_setpoint] .....	<b>For Celsius Temperature Scale</b> The output range is 100d to 370d in halves of a degree (i.e 105 = 10.5°C and 320d = 32.0°C.)  <b>For Fahrenheit Temperature Scale</b> The output range is 500d to 990d (i.e 650d = 65.0°F and 900d = 90.0°F.).
[humidity_setpoint] .....	reports the current humidity setpoint. <b>For Auto Mode</b> [ <a href="#">humidification_auto_fb</a> ] The output range is 0d-7d. 0d turning humidification off.  <b>For Manual Mode</b> [ <a href="#">humidification_manual_fb</a> ] The output range is 0d-100d. 0d turns humidification off.

## **SERIAL OUTPUTS**

This module does not utilize any serial outputs.

## **PARAMETERS**

Thermostat IP Address.....Enter the IP address of the thermostat.

## Support

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This module is supported by ControlWorks Consulting, LLC. Should you need support for this module please email [support@controlworks.com](mailto:support@controlworks.com) or call us at 440-449-1100. ControlWorks normal office hours are 9 AM to 5 PM Eastern, Monday through Friday, excluding holidays.

Before calling for support, please ensure that you have loaded and tested operation using the included demonstration program and touchpanel(s) to ensure that you understand the correct operation of the module. It may be difficult for ControlWorks to provide support until the demonstration program is loaded.

Updates, when available, are automatically distributed via Email notification to the address entered when the module was purchased. In addition, updates may be obtained using your username and password at <https://www.controlworks.com/Customers/Login.aspx>.

## Distribution Package Contents

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The distribution package for this module should include:

Aprilaire WiFi Thermostat (ControlWorks) v1.1.umc.....  
.....Crestron User Module  
Aprilaire WiFi Thermostat Engine (ControlWorks) v1.1.usp  
.....SIMPL+ file used within the control module  
Aprilaire WiFi Thermostat Engine (ControlWorks) v1.1.ush  
.....SIMPL+ header file  
Aprilaire WiFi Thermostat (ControlWorks) TSW1050 v1.1.vtp  
.....Demo touchpanel for TSW-1050  
Aprilaire WiFi Thermostat (ControlWorks) v1.1.smw .....  
.....Demo program for AV3 processor

## Revision History

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V1.1 [caleb@controlworks.com](mailto:caleb@controlworks.com) 2018.03.21

-Fix for compatibility issues with 8840.

V1.0 [bob@controlworks.com](mailto:bob@controlworks.com) 2016.03.11

-initial release

## Development Environment

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This module version was developed on the following hardware and software. Different versions of hardware or software may or may not operate properly. If you have questions, please contact us.

<b>Manufacturer Hardware</b>	<b>Software Version</b>
8810	1.12
<b>Crestron Hardware</b>	<b>Firmware Version</b>
Crestron AV3 Processor	v1.503.3318.24705
<b>Software</b>	<b>Software Version</b>
Crestron SIMPL Windows	4.09.04.01
Crestron Vision Tools Pro-e	6.1.07.02
Crestron Database	66.00.002.00
Crestron Symbol Library	508

# ControlWorks Consulting, LLC Module License Agreement

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## Definitions:

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## Provision of Support

We provide limited levels of technical support only for the most recent version of the Module as determined by Us. We do not provide support for previous version of the module, modifications to the module not made by Us, to persons who have not purchased the module from Us. In addition, we may decline to provide support if the Demo Program has not been utilized. We may withdraw a module from sale and discontinue providing support at any time and for any reason, including, for example, if the equipment for which the Module is written is discontinued or substantially modified. The remainder of your rights and obligations pursuant to this license will not be affected should ControlWorks discontinue support for a module.

## Modification of Software

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