



DOMOSAPIENS EXTENDED DRIVER FOR APRILAIRE WI-FI THERMOSTATS S86WMUPR / 8810 / 8820 / 8830 / 8840

This driver enables you to control an Aprilaire Wi-Fi thermostat from Control4, including the ***NEW*** S86WMUPR.

IMPORTANT: OS 2.7 or later is required for this driver to work properly.

BEFORE YOU BEGIN...

- It is recommended that you ensure your thermostat is at the most recent firmware level, as there may be some issues (communications, Celsius outdoor temperature, etc.) with older firmware levels. For the new **S86WMUPR** thermostat, it will normally be updated automatically when it has access to the Internet (the minimum firmware level is 1.3.4). For the older 8810/8820/8830/8840 thermostats, if you have issues, you may need to contact Aprilaire for an update.
- It is recommended to specify a static IP address for each thermostat. You may use a MAC-based address reservation.
- Read the **IMPORTANT INFORMATION** below on Outdoor Temperature.
- This driver records all thermostat Alerts, Service reminders and Temperature Events (when used) in the History Agent under "Comfort", "HVAC". These items are accessible in Composer.

INSTRUCTIONS

1. ***NEW*** For the **S86WMUPR** thermostat, it is **important** that the following options be selected in the Installer System Settings:

- Programmable: Non programmable (otherwise, this will conflict with Control4 scheduling)
- Connection Type: Automation System
- Outdoor Temperature Data Provided From: Automation

NOTE: the thermostat's Vacation and Away Hold modes are replaced by Control4 Presets with 'Hold Mode' (see the discussion at the end of the **USING PRESETS AND SCHEDULE** section).

2. Install and configure all wired and wireless sensors connected to the thermostat. For the S86WMUPR, installing the Indoor Wireless Sensors (up to eight) may be tricky. It is recommended that you install them one by one, taking note of the identity (as in: IN60270D) and location of each as you go. As there may be only one Outdoor Wireless Sensor, this should not be an issue.

3. Install the thermostat driver and connect it to the thermostat using the thermostat's IP address. Rename it as necessary. Repeat for each additional thermostat in your project.
4. It may take up to three minutes for the driver to read all information from its thermostat.
5. For each thermostat, install, rename, AND MANUALLY CONNECT (to the "APRILAIRE_WIFI" binding) one instance of the **Sensor and Support Module** driver (the companion driver) for each individual sensor you wish to monitor, including Wired, Wireless and Support Module sensors. Such sensor needs to be configured in Installer Settings and physically present. Refer to the documentation for the **Sensor and Support Module** driver.
6. For each **Sensor and Support Module** driver, specify its type by selecting from the dropdown list of Available Sensors (use the Action 'Refresh Available Sensors' as appropriate).
7. If your project has more than one thermostat, it is advisable to designate one of the thermostats as "Master" using the property "Accept Broadcasts".
8. By default, the driver will be in Fahrenheit mode. If desired, select Celsius under Properties. You may set this once for a thermostat and broadcast this (using an Action) to all other Aprilaire Wi-Fi Extended drivers in your project.
9. For each driver, connect the "TEMPERATURE" and "TEMPERATURE_CONTROL" Room Control bindings as appropriate for your project.
10. When you are done, Refresh Navigators.

PROPERTIES

- **Activation Status** displays the current driverCentral license activation.
- **Automatic Updates** turns Auto Update by driverCentral On or Off.
- **Driver Version** displays the version of this driver.
- **Debug Mode** turns Debug Mode On or Off (with output to the Lua Output window).
- **Debug Duration in Minutes** sets the duration of Debug On.
- **Driver Information** displays various status messages about the driver.
- **Thermostat Available via Wi-Fi** displays the status of the Wi-Fi connection with the thermostat. It should be Yes once you make the connection.
- **Disable Thermostat Internal Schedule** allows you to ignore the thermostat's internal scheduling and use Control4's presets and schedule instead. This is recommended for most installations.
- **Control Scope** allows you to specify the purpose of this thermostat. This will be displayed on the thermostat itself and is particularly useful when you put several thermostats in a central location.

- **Accept Broadcasts** allows you, if you have more than one Aprilaire Wi-Fi thermostats in your project, to define a “Master” thermostat or, for a regular thermostat, to block Preset activations, as well as Presets and Schedule broadcasts initiated from a “Master” thermostat driver. It is normally useful and productive to be able to broadcast to all thermostats from a ‘Master’ thermostat, but there may be special cases where you do not want this to be the case for a given recipient thermostat. To avoid conflicts, it is recommended that there be only one “Master” thermostat in a project. Even if a “Master” thermostat has a small number of features installed (such as no Humidifier, for example), you may request that all the available Preset fields be available when entering Presets. This would allow you to create presets with any options required by other thermostats in the project. Rest assured: if a thermostat receives a Preset containing items it does not support, it will simply ignore these items and no harm will be done.
- **Temperature Events** allows you to specify if events are used and what will be the baseline temperature: either the current active setpoint or a fixed value.
- **Temperature Event x Delta** allows you to specify up to four deltas where an event will be triggered if the actual control (room) temperature is too far (higher or lower) from the baseline specified in the Temperature Events property. The deltas may range from -20 to +20 and should be specified in the thermostat’s current scale. Example: 6 will trigger the event when the room temperature exceeds the baseline by 6 degrees or more. Only the highest delta (positive or negative) will be triggered. You may specify up to 4 Events, in any order and set an Event to 0 to disable it.

Informational Properties for the thermostat currently connected to the driver:

- **Thermostat Model** displays the model of the thermostat.
- **Configuration Overview** displays the various modes and IAQ configured in the thermostat. To modify this, use the thermostat’s Installer Setup (with Safety & Installation Instructions).
- **Wired Sensors** displays the sensors currently configured in the thermostat. See the documentation tab for the Module and Sensor driver for a description of the acronyms used. To modify this, use the thermostat’s Installer Setup.
- ***NEW* Wireless Sensors** (S86WMUPR only) displays the wireless sensors (Z10ODT and up to eight Z10IDT) currently configured in the thermostat. See the documentation tab for the Module and Sensor driver for a description of the acronyms used. To modify this, use the thermostat’s Installer Setup.
- **Wired Support Module x** (8820/8830/8840 only) displays the Support Modules connected to the thermostat. To modify this, use the thermostat’s Installer Setup and adjust the DIP switches properly in each Support Module.
- **Current Hold Mode** displays the thermostat’s current Hold Mode.
- **Hardware and Firmware Revisions** displays the thermostat’s current hardware firmware and supported protocol levels (may be used for diagnostics purposes).
- **Outdoor Temperature** displays the current Outdoor Temperature from the designated source (see below) which is broadcasted to the thermostat. The thermostat will display a rounded Outdoor Temperature which may be different from this value.

IMPORTANT INFORMATION ON OUTDOOR TEMPERATURE:

The Outdoor Temperature is used for three purposes: it is displayed on the Navigator interface, it is displayed on the physical thermostat itself and for some thermostat models, it is used to control the Humidifier when set to Humidify+ (needs to be configured in Installer options as Humidifier Mode Auto).

For each thermostat, the Outdoor Temperature is available from one of three sources (in order of precedence):

1. A physically installed Outdoor Temperature sensor connected either to the thermostat's own Outdoor Temperature connection (typical) **OR** to any other temperature sensor connection, even on a Support Module **OR** an Aprilaire Z10ODT Wireless Outdoor Sensor (S86WMUPR thermostat only) **OR** an Aprilaire 8056 Wireless Outdoor Temperature Sensor (8830 and 8840 thermostats only). In ALL CASES, you need to set that sensor's 'Use as Outdoor Temperature' property to 'Yes'. **It is strongly recommended to have this property set to 'Yes' no more than once in the project.** The Sensor Report and the Aprilaire Topology Report will show this information.
2. Another thermostat connected to this thermostat's Outdoor Temperature ****Input**** TEMPERATURE_VALUE connection. This may be used in a project to propagate a given Outdoor Temperature managed by one thermostat to all other thermostats. Be careful to avoid circular references, as these are not detected by the driver. In this mode, decimals are not available for Celsius.
3. A properly installed and configured **Weather Station** driver, available in Composer's online driver database under Manufacturer "Control4" (this updated driver is newly available from Control4 since the Weather Underground service is no longer provided). Often, it is not possible to install a reliable Outdoor Temperature sensor, and this becomes a viable alternative. It is best to install the Weather Station driver first before adding any thermostat to the project.

In all cases, remember to set the thermostat's 'Outdoor Sensor' Installer Setting to '**Automation**' as this allows the driver to fully manage the Outdoor Temperature. Each thermostat driver has a property showing its Outdoor Temperature as well as the source (the actual sensor – such as 'WOT' for Wired Outdoor Temperature, 'TEMPERATURE_VALUE' for another thermostat or 'VAR' for the Weather Station driver).

USING PRESETS AND SCHEDULE, INCLUDING FLEX MODE

The Wi-Fi thermostats support an internal program schedule. Similarly, the new Control4 Navigator interface supports Presets and a Schedule. It is advisable to use one **OR** the other, but **not both**, as this would create conflicts. Use the driver's property to disable the thermostat's internal schedule.

To implement Control4 scheduling, the first thing you need to do is it enter **2 or more presets** in one thermostat (preferably the Master thermostat) using the Control4 Navigator interface. Once this is done, you will be able to add one or more schedule entries. The driver will then take care of managing the thermostat according to this schedule. The thermostat's local scheduling facility is therefore not used.

This driver supports the new **FLEX** mode for presets and schedule. This concept allows you to define an additional level of presets for major categories, such as seasons or home/away modes. To use **FLEX** mode, which is entirely optional, follow the following steps:

1. Determine on paper the various Modes you need for the house/project: For example:
 - a. Summer
 - b. Summer Away
 - c. Winter
 - d. Winter Away

2. Determine on paper the preset states you need: For example:
 - a. Morning
 - b. Day
 - c. Evening
 - d. Night

3. For each combination, create a real preset in the UI. The format is FLEXMode:PresetState (**the colon is the key element here**). Each preset can contain whatever items are pertinent for the preset (for example 'Heat', 'Setpoint' and 'Humidifier'). You may altogether skip presets which are not needed. Also, a preset may be 'rich' as thermostats will simply ignore whatever does not apply to their specific configuration. For example:
 - a. Summer:Morning
 - b. Summer:Day
 - c. Summer:Evening
 - d. Summer:Night
 - e. Summer Away:Morning (you have decided the others are not needed)
 - f. Winter:Morning
 - g. Winter:Day
 - h. Winter:Evening
 - i. Winter:Night
 - j. Winter Away:Morning (you have decided the others are not needed)

4. You may still create special presets with no FLEX Mode. For example:
 - a. My Folks (they like the temperature to be higher)

5. When you create all these presets, the driver will detect the **FLEX** modes you are using and will automatically create special presets named "FLEX:PresetState". For example:
 - a. FLEX:Morning
 - b. FLEX:Day
 - c. FLEX:Evening
 - d. FLEX:Night

6. The driver also creates a new control under Extras called 'Select FLEX Mode' which will allow the user to select one of the defined FLEX modes. For example:
 - a. Summer
 - b. Summer Away
 - c. Winter
 - d. WinterAway
 - e. None (this option is always there)

7. (***NEW***) At this point, you may use the Action 'Sort Presets', as the FLEX presets are interspersed with the presets you have created. Sorting the presets will simplify the user's task. **CAUTION:** in newer versions of the Control4 OS, this causes the current schedule to be deleted.

8. Optionally, you create a Schedule by using primarily the FLEX:... presets created automatically by the driver.
9. This may all be broadcasted to other thermostats at this time (Presets and Schedule)
10. When the schedule is active, the driver simply receives commands to activate a given preset at the appropriate time. If the preset name to be activated contains 'FLEX:...', then the driver simply substitutes the FLEX mode previously selected by the user to determine the actual preset name. For example:
 - a. The user has previously activated FLEX mode 'Winter'
 - b. The schedule calls for preset FLEX:Morning to be activated at 6:30am.
 - c. It is 6:30am
 - d. The driver receives a command to activate preset 'FLEX:Morning'. It does the substitution and activates the preset 'Winter:Morning' if it exists. If not, the driver will look for a preset simply called 'Morning' and run it if it exists. If not, the previously-activated preset (if any) simply remains active. This is why, in our example, you only need a Morning preset for the Away modes.
11. For manual operation (outside of the schedule), it is also possible to select a FLEX: preset and the driver will do the right substitution. You may also select any specific preset (such as Winter:Morning) which will be applied immediately, unless Hold is currently Permanent. In this case, the requested preset will be 'remembered' and will be applied when Hold mode is removed. See below for a discussion on Hold mode.

Once you have set one thermostat this way (likely the "Master" thermostat), you have two options:

1. Repeat the same steps for each other thermostat,
- Or**
2. Use the Master thermostat's Extras tab to:
 - i. Broadcast the presets just entered to all the other thermostats (unless they block this individually) and
 - ii. Optionally broadcast the schedule as well (unless they block this individually).

Since a schedule simply activates a preset **by name** at a given time, presets may have the same name on different thermostats but may contain different setpoint values, for example. Furthermore, it is possible to prevent a thermostat from receiving broadcasted presets/schedule if it needs to be different. This approach gives the user a lot of flexibility while minimizing the amount of information which needs to be entered. It is possible to create a set of presets and a schedule on the Master thermostat, ensure that all other thermostats will accept the broadcast, actually broadcast the initial set of presets and schedule and then, "lock" out some of the other thermostats where you would like to make local changes and not risk that they be overwritten by future broadcasts from the Master thermostat.

Using the Extras tab, you may also cause a Master thermostat's currently active preset and **FLEX** mode to be also activated on all thermostats. This can be useful, for example, if you have a Summer and a Winter preset. You simply activate it on the Master thermostat and then use the Extras tab to cause it to be

activated on all other thermostats (unless they block this individually). This requires, of course, that you have previously created or broadcasted the presets to all thermostats (this does not require a Schedule).

A Hold Mode is available when using Presets and Schedule. When Hold is set to “Permanent”, all Presets changes (manually, by Schedule or by Programming) are ignored except if a Preset specifically contains a “Hold Mode” “Off” command. When Hold is set to Off manually or by Programming, the most recently requested (but ignored) Preset is activated. Presets may also contain a “Hold Mode” “Permanent” command which causes Hold to be set to “Permanent” after the Preset is activated in the thermostat.

PROGRAMMING

The following *Actions* are provided:

- **Print Status Report** prints a summary report about all the driver’s main functions. This is useful for troubleshooting.
- **Print Sensor Report** prints a detailed report of all sensor drivers connected to THIS thermostat. This is useful when setting up your project.
- **Print Aprilaire Wi-Fi- Project Topology** prints a detailed report of all Aprilaire Wi-Fi Thermostat and Sensor drivers in your project, as well as unassigned Sensor drivers. This is useful when setting up your project.
- **Print Debug Log** prints the most recent 100 debug messages, even if Debug Mode was Off. This is useful for troubleshooting.
- **Reset (Power Cycle) this Thermostat** send a Reset command to the thermostat.
- **Synchronize this Thermostat** requests all information from the thermostat. This should normally not be required but may be used if an informational issue is suspected. This function may also be performed from the Extras tab.
- **Set Time and Date on all Wi-Fi Thermostats** causes all Wi-Fi thermostat drivers in the project to send the current time and date to their connected thermostat. This is useful when setting up your project.
- **Set Scale on all Wi-Fi Thermostats** causes this driver’s Scale to be set in all Wi-Fi and Sensor drivers in your project. This is useful when setting up your project.

The following *Device Specific Commands* are provided:

- **Set Fresh Air** allows you to control the Fresh Air IAQ function (S86WMUPR/8830/8840 only). This may also be accomplished in the Extras tab.
- **Set Air Cleaning** allows you to control the Air Cleaning IAQ function (all except 8810). This may also be accomplished in the Extras tab.
- **Clear Service Reminders** allows you to reset a specific Service Reminder. This may also be accomplished in the Extras tab.

- **Manage Alerts** allows you to set the limits which will cause a temperature or humidity alert to be generated. Events are triggered when such an Alert is detected (as well as others) and when all Alerts are resolved.
- **Send Message to Thermostat** (all except S86WMUPR) allows you to set one of three permanent messages on the thermostat. These alternate with Permanent Message 1 which is specified in the 'Control Scope' property. You may also set a temporary message which overlays all others until it is cleared.
- **Clear Message on Thermostat** (all except S86WMUPR) allows you to clear a previously displayed message.
- **Set Backlight** allows you to specify the thermostat's backlighting mode and level.

The following additional Variables are provided:

THERMOSTAT_MODEL	-- "S86WMUPR", "8810", "8820", "8830", "8840"
FRESH_AIR_MODE	-- "OFF", "AUTO", "AUTO3H", "AUTO24H"
AIR_CLEANING_MODE	-- "OFF", "CONSTANT", "AUTO", "AUTO3H", "AUTO24H"
THERMOSTAT_ERROR	-- 0 to 8 - see below for definitions 0: No Error 1: E1 - Built-in Temp sensor open 2: E2 - Built-in Temp sensor short 3: E3 - Non-volatile memory access error (except 8840) 4: E4 - reserved 5: E5 - ECM communication lost (except 8810/8820) 6: E6 - Remote Temp sensor open (except 8810) 7: E7 - Remote Temp sensor short (except 8810) 8: E8 - Support Module Temp lost
HEATING_EQUIPMENT_STATUS	-- 0 to 14 - see below for definitions 0: Not active (Idle) 1: Equipment Wait (Wait) 2: Stage 1 (On) 3: Stage 1 and 2 (On) 4: Stage 1, 2 and 3 (On) 5: Comp 1 (On) 6: Comp 1 and 2 (On) 7: Aux Heat 1 (On) 8: Aux Heat 2 (On) 9: Comp 1, Elec Heat 1 (On) 10: Comp 1, Elec Heat 2 (On) 11: Comp 1 and 2, Elec Heat 1 (On) 12: Comp 1 and 2, Elec Heat 2 (On) 13: Elec Heat 1 (On) 14: Elec Heat 2 (On)
COOLING_EQUIPMENT_STATUS	-- 0 to 6 - see below for definitions 0: Not active (Idle)

	<ul style="list-style-type: none"> 1: Equipment Wait (Wait) 2: Stage 1 (On) 3: Stage 1 and 2 (On) 4: Stage 1, 2 and 3 (On) 5: Comp 1 (On) 6: Comp 1 and 2 (On)
PROGRESSIVE_RECOVERY_ACTIVE	-- T/F (true/false)
DEHUMIDIFICATION_STATUS	<ul style="list-style-type: none"> -- 0 to 4 - see below for definitions 0: Not active (Idle) 1: Equipment Wait (Idle) 2: Whole Home Active (On) 3: Overcooling to dehumidify (On) 4: Off (Off)
HUMIDIFICATION_STATUS	<ul style="list-style-type: none"> -- 0 to 3 - see below for definitions 0: Not active (Idle) 1: Equipment Wait (Idle) 2: Active (On) 3: Off (Off)
FRESH_AIR_STATUS	<ul style="list-style-type: none"> -- 0 to 6 - see below for definitions 0: Not active (Idle) 1: Equipment Wait (Idle) 2: Active (On) 3: High Temperature Lockout (Idle) 4: Low Temperature Lockout (Idle) 5: High RH Lockout (Idle) 6: Off (Off)
AIR_CLEANING_STATUS	<ul style="list-style-type: none"> -- 0 to 3 - see below for definitions 0: Not active (Idle) 1: Equipment Wait (Idle) 2: Active (On) 3: Off (Off)
SERVICE_HVAC_ACTIVE	-- T/F
SERVICE_HVAC_TIME_ELAPSED	-- 0 to 100%
SERVICE_AIRFILTER_ACTIVE	-- T/F
SERVICE_AIRFILTER_TIME_ELAPSED	-- 0 to 100%
SERVICE_WATERPANEL_ACTIVE	-- T/F
SERVICE_WATERPANEL_TIME_ELAPSED	-- 0 to 100%
SERVICE_DEHUM_ACTIVE	-- T/F
SERVICE_DEHUM_TIME_ELAPSED	-- 0 to 100%
SERVICE_FRESHAIR_ACTIVE	-- T/F
SERVICE_FRESHAIR_TIME_ELAPSED	-- 0 to 100%
INDOOR_TEMP_ALERT_STATUS	-- "NONE", "HIGH", "LOW"
INDOOR_HUM_ALERT_STATUS	-- "NONE", "HIGH", "LOW"
SERVICE_ALERT_STATUS	-- "NONE", "ALERT"
HEAT_PUMP_FAULT_ALERT_STATUS	-- "NONE", "ALERT"

BUILTIN_SENSOR_FAULT_ALERT_STATUS	-- "NONE", "ALERT"
REMOTE_SENSOR_FAULT_ALERT_STATUS	-- "NONE", "ALERT"
REMOTE_TEMP_SENSOR_FAULT_ALERT_STATUS	-- "NONE", "ALERT"
REMOTE_HUM_SENSOR_FAULT_ALERT_STATUS	-- "NONE", "ALERT"
3WIRE_COMM_FAULT_ALERT_STATUS	-- "NONE", "ALERT"
WIRELESS_SENSOR_ALERT_STATUS	-- "NONE", "ECMERROR", "WSERROR", "LOWBATT"
BUILTIN_TEMPERATURE_C	
BUILTIN_TEMPERATURE_F	
BUILTIN_TEMPERATURE_STATUS	-- "NORMAL", "LOW", "HIGH", "OPEN", "SHORT"
BUILTIN_HUMIDITY	
BUILTIN_HUMIDITY_STATUS	-- "NORMAL", "ABSENT", "ERROR"
WIRED_REMOTE_TEMPERATURE_C	
WIRED_REMOTE_TEMPERATURE_F	
WIRED_REMOTE_TEMPERATURE_STATUS	-- "NORMAL", "LOW", "HIGH", "OPEN", "SHORT"
WIRED_OUTDOOR_TEMPERATURE_C	
WIRED_OUTDOOR_TEMPERATURE_F	
WIRED_OUTDOOR_TEMPERATURE_STATUS	-- "NORMAL", "LOW", "HIGH", "OPEN", "SHORT"
RETURN_AIR_TEMPERATURE_C	
RETURN_AIR_TEMPERATURE_F	
RETURN_AIR_TEMPERATURE_STATUS	-- "NORMAL", "LOW", "HIGH", "OPEN", "SHORT"
LEAVING_AIR_TEMPERATURE_C	
LEAVING_AIR_TEMPERATURE_F	
LEAVING_AIR_TEMPERATURE_STATUS	-- "NORMAL", "LOW", "HIGH", "OPEN", "SHORT"
WIRELESS_OUTDOOR_TEMPERATURE_C	
WIRELESS_OUTDOOR_TEMPERATURE_F	
WIRELESS_OUTDOOR_TEMPERATURE_STATUS	-- "NORMAL", "LOW", "HIGH", "OPEN", "SHORT"
WIRELESS_OUTDOOR_HUMIDITY	
WIRELESS_OUTDOOR_HUMIDITY_STATUS	-- "NORMAL", "ABSENT", "ERROR"
SUPPORT_MODULE_1_SENSOR_1_STATUS	-- "NORMAL", "ABSENT", "ERROR"
SUPPORT_MODULE_1_SENSOR_2_STATUS	-- "NORMAL", "ABSENT", "ERROR"
SUPPORT_MODULE_2_SENSOR_1_STATUS	-- "NORMAL", "ABSENT", "ERROR"
SUPPORT_MODULE_2_SENSOR_2_STATUS	-- "NORMAL", "ABSENT", "ERROR"
SUPPORT_MODULE_3_SENSOR_1_STATUS	-- "NORMAL", "ABSENT", "ERROR"
SUPPORT_MODULE_3_SENSOR_2_STATUS	-- "NORMAL", "ABSENT", "ERROR"
SUPPORT_MODULE_4_SENSOR_1_STATUS	-- "NORMAL", "ABSENT", "ERROR"
SUPPORT_MODULE_4_SENSOR_2_STATUS	-- "NORMAL", "ABSENT", "ERROR"

SUPPORT

For support on this driver please go to <https://help.drivercentral.io/>. Give a detailed description of the problem and also include the version number of the driver and the version of Control4 OS that you are using.

AUTO UPDATE

This driver is updated with fixes and new features from time to time. To ensure your project uses the latest version, set the Automatic Updates property of the driver to On.

CHANGELOG

10.0.0	November 7, 2018	Initial Release
10.2.0	February 19, 2019	Improved handling of Fahrenheit Outdoor Temperature with new Weather Station driver
11.0.0	May 3, 2019	Infrastructure update, issues fixed
12.0.0	November 16, 2023	Added support for new S86WMUPR thermostat and its sensors