

## Appendix 4

### Weather

Using weather data in your automation solution can have many benefits. Without weather data, your home automation happens regardless of environmental conditions. Some things you can use weather data for are:

- Don't run sprinkler systems when too hot or too windy
- Retract awnings when too windy
- When very hot or very cold adjust the thermostat setpoint to be a bit higher or a bit lower. In doing this you trade off a bit of comfort for what can be substantial energy savings
- Close remote-control skylights when it's raining
- Adjust indoor lighting to make the house appear warmer when it's cold and cooler when it's hot. Your perception of the temperature varies with many environmental factors
- Is the current temperature over 80?
- Has the temperature in the past 4 hours been over 70?
- Will the current wind speed in the next 2 hours be over 10 mph?
- Has it rained more than about 1 inch in the last 4 hours?

This appendix describes how to work with weather data and covers these topics:

- Configuring HCA to use Dark Sky as a weather provider
- The Visual Programmer weather test element
- Weather program triggers
- Additional support for Dark Sky

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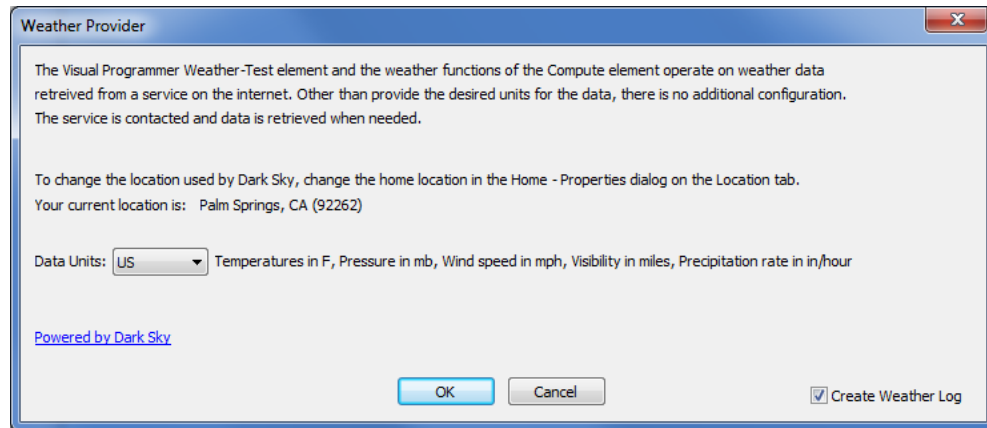
### Weather Provider

HCA gets weather data from an online service called DarkSky ([www.DarkSky.net](http://www.DarkSky.net))

The new weather provider, available to all HCA users with no additional cost and little configuration, is an internet-based system.

There is little configuration needed for the weather provider as it uses the location established in your design (*Design* ribbon category, *Home Configuration* panel, *Properties* button and then the *Location* tab)

You can change the units used for weather data in the dialog opened from the *Interfaces* ribbon category, *Weather* panel, *Provider Setup* button.



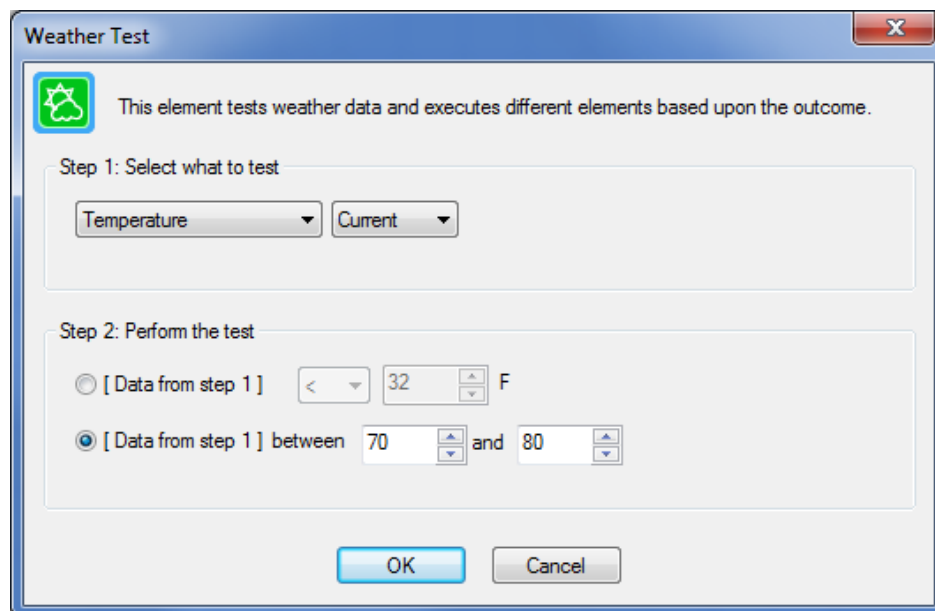
Dark Sky provides weather data in the following units based upon the *Data Units* selection.

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## Visual Programmer

The simplest method of working with weather data is to use the Weather-Test element. This element gets current, historical, or forecast weather data and tests the retrieved value against the value provided.

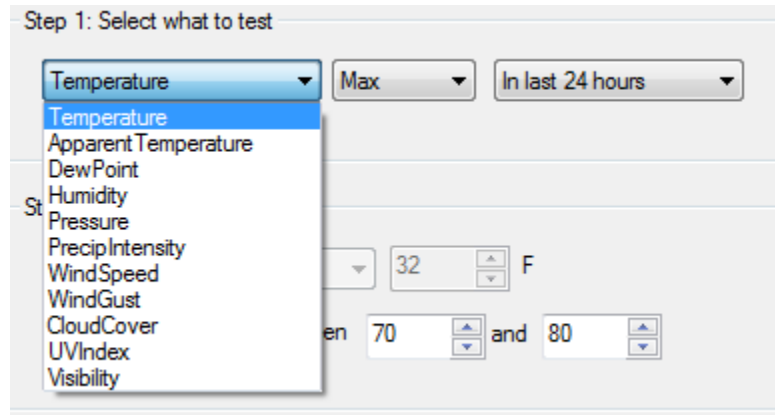
For example, this tests the current temperature being between 70 and 80.



The possible weather items to test chosen from this list:

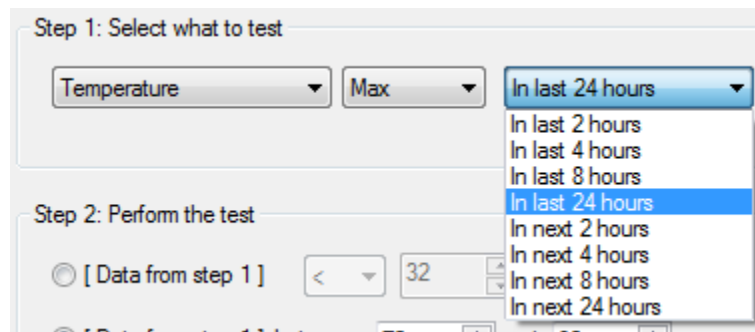
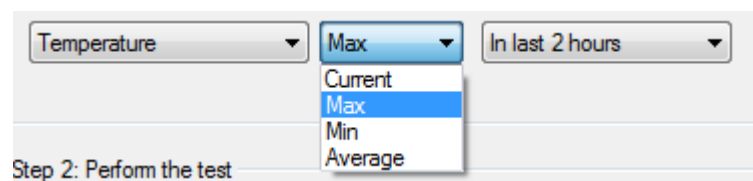
- Temperature
- Apparent Temperature. This considers temperature, humidity, and wind speed. Sometimes called the “feels like” temperature.
- Dew point
- Humidity
- Barometric Pressure

- Wind speed
- Wind gust
- Cloud cover as a percentage of the sky occluded by clouds (100% is totally overcast)
- UV Index. Just a number. Higher numbers mean use more sunscreen.
- Visibility. Distance that can be seen. Capped at 10 miles.



**Tip:** You can experiment with the values of cloud cover, visibility, and UV index and see how they correlate at your location with how bright or dark it is then use that to determine how/if lighting should be controlled.

In addition to testing for current conditions, you can also use the Weather-Test element to check for historical and future conditions and aggregate that data to determine the maximum, minimum, or average over the selected time period.



Like other Test elements, execution continues following the path marked *Yes* if the test is true, otherwise execution follows the *No* path.

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## Weather Triggers

In addition to the weather-test element, you can also add weather triggers to programs. These are evaluated periodically, and the program starts if the test passes. Like all program triggers, these are added using the program triggers tab. For example:

Trigger Type: Weather Condition Change

Start the program on this trigger:

CloudCover > 80 %

Step 1: Select what to test

CloudCover Current

Step 2: Perform the test

[ Data from step 1 ] > 80 %

[ Data from step 1 ] between 0 and 0

This dialog looks a lot like the properties for the visual programmer *weather* element described above. As described in the User Guide *Programs* chapter, HCA evaluates all weather triggers periodically and when the condition evaluates to Yes, the program starts. Before the program can start again, the weather condition must evaluate to No and then to Yes again. For more information on how these kinds of triggers are evaluated and programs started see the User Guide *Programs* chapter.

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## Weather Data and the Compute and Compute Test elements

In addition to examining weather data with the Visual Programmer *Weather-Test* element and with weather triggers, there are also functions that can be used in expressions in the Compute, Compute Test, and in expression placeholders in elements that work with text strings. Refer to the User Guide expressions chapter for information on the `_WeatherGet` function.

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## Dark Sky

In addition to these facilities that expose only part of what Dark Sky provides, programs can also use the `_DarkSky` function to retrieve any data available from Dark Sky. To use it you first must become conversant in the JSON data that Dark Sky uses. The best way to do that is to read their documentation available at:

<https://darksky.net/dev/docs>

This topic is covered in detail in technical note number 123 available from the support web site.