

WeatherWatcher ACP



This is a minimum equipment list:

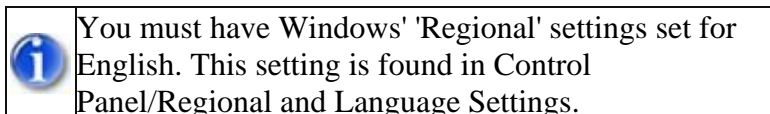
Software

- [Astronomers Control Panel \(V4 or >\)](#)
- [Ambient Virtual Weather Station](#) (Pro or Internet editions)
- [ASCOM platform v4.1 or higher](#)

Hardware

- Weather Station compatible with Ambient VWS software
- [Boltwood Sky Sensor](#) (**Clarity v 1.56 or higher required**)

WeatherWatcher will work without the Boltwood Sky Sensor but it is highly recommended.



Introduction to the Weather Aware Observatory

There will be times in our astronomy careers when want to do unattended imaging. With the choices of software packages these days it is very easy to do. Until a few years ago the only device to protect the observatory from rain events was a rain detector. Of course this means that it had to rain before the observatory was closed. Closing the observatory can be a very slow process and rain falls on the expensive observatory equipment before the dome can be closed.

This problem was solved with WeatherWatcher ACP, by using an off the shelf weather system such as the Davis Vantage Pro2 or similar weather station and the Boltwood Cloud Detector. WeatherWatcher ACP is able to collect vital weather and sky condition information then apply user programmable algorithms to create an automated, weather aware 'brain' for your observatory.

The weather stations provide basic information so the observatory user can set the following weather parameters for local weather conditions.

Humidity - At my location in the Pacific I know that when humidity reaches 85% a few things will be true. Seeing conditions will be poor, clouds will be present and there is a good possibility that it will rain.

Wind - If the wind exceeds the usable limit of the dome the dome will shut. In my case it is 30 MPH so I set 25MPH to 35MPH as my wind limits.

Temperature - We all know that on very hot nights the camera may not cool down well enough to get a clean image so we can set the temperature limit we think works best. The combination of high temperature and high humidity is another waste of imaging time.

The Boltwood Cloud Sensor measures the amount of cloud cover by comparing the temperature of the sky to the ambient ground level temperature. The sky temperature is determined by measuring the amount of radiation in the 8 to 14 micron infrared band. A large difference indicates clear skies, whereas a small difference indicates dense, low-level clouds. This allows the sensor to continuously monitor the clarity of the skies, and to trigger appropriate alerts on your computer. The user sets the parameters relative to his or her location by simply watching the sky to see at what temperature it is clear and what temperature it gets cloudy and of course very cloudy. The parameters are selectable in both the WeatherWatcher setup and on the Boltwood software interface.

Here are some recommendations for those who use WeatherWatcher: In many geographic locations you can anticipate weather such as cold fronts and other storms heading your way. If you know that only scattered clouds are heading your way you can use the check box in the WeatherWatcher program to ignore clouds only, but your observatory will still close for unanticipated wet conditions or many other user settable parameter. So, a few scattered clouds during the night will not cause a loss of an entire night of remote imaging.

In places where there is topography driven weather you must watch the forecast closer and leave the ‘Clouds Only – Safe’ checkbox unchecked. This is where the WeatherWatcher really excels. If it gets cloudy and the forecast calls for a chance of precipitation the observatory will simply close when any of the parameters are exceeded.

Some of you may wonder why both a weather station and the Boltwood systems are desired (but not necessary). To take full advantage of the power of WeatherWatcher the weather station senses rain and other parameters while the Boltwood has an early warning system sensing clouds and bad conditions before it rains. Moreover, the Boltwood’s rain sensor is very sensitive and will indicate wetness before most weather stations can.

Networking WeatherWatcher ACP

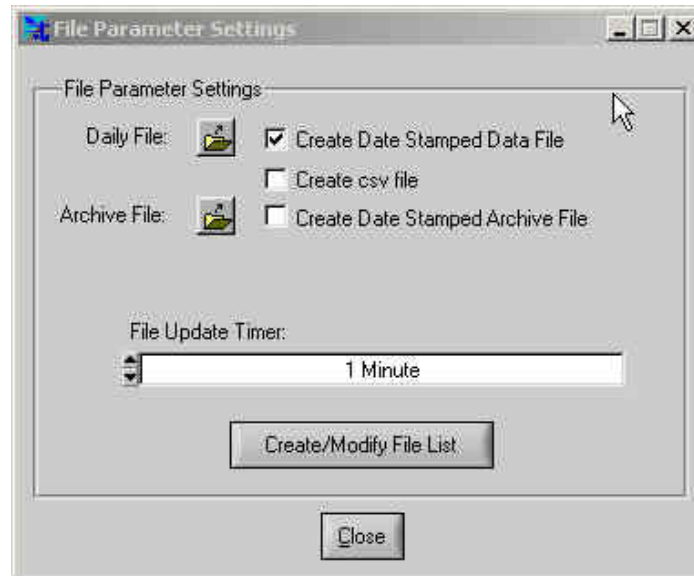
We have built in the ability to setup the WeatherWatcher ACP on the observatory computer or use a networked “Weather Computer” to run several observatories. That means if you have more than one observatory on site you will only need one weather station and one Boltwood Sky Sensor to provide information to each WeatherWatcher ACP equipped observatory. This of course means that all of your computers are able to communicate over a local network.

To setup the networked data only a few steps are required (WeatherWatcher is looking for two paths):

To create the working file for the Boltwood Systems, click on the ‘Data’ button on the Boltwood program, this will take you to a directory where you create a file named “Claritylog.txt”(or any other allowable Windows convention with a ‘.txt’ extension). Once the file is created simply find the same path and file on the network Weather Computer.

Setup for the Virtual Weather System Software

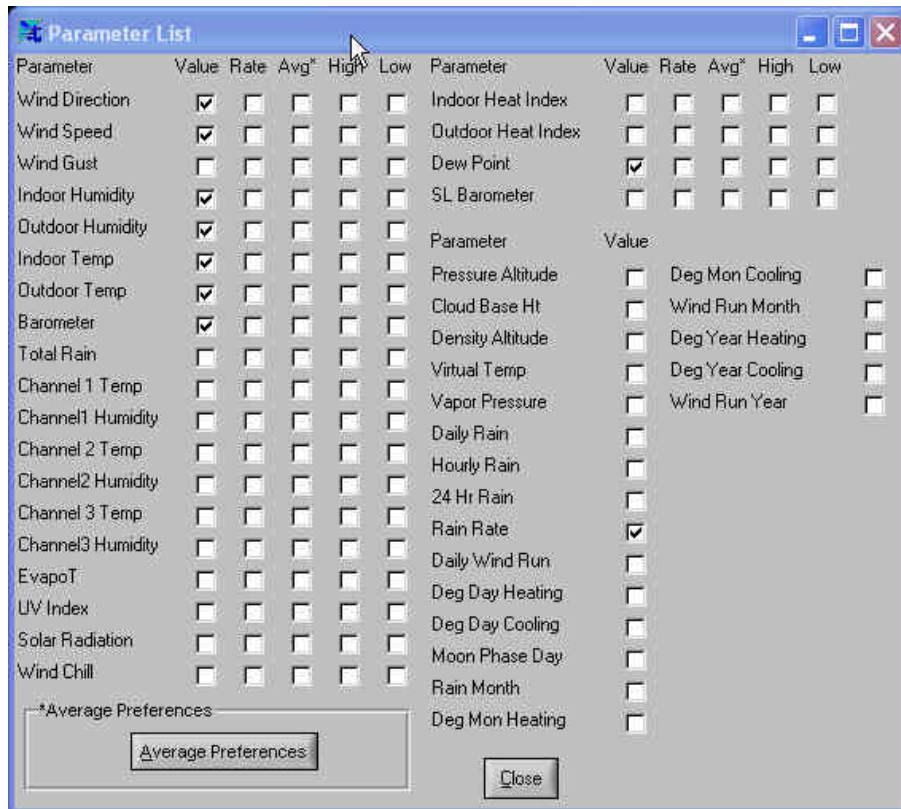
Select 'Settings' the 'File Settings' from VWS' main menu.



"File Update Timer" should be set for a one minute interval or less to adequately update WeatherWatcher of weather changes.

You need to set up Virtual Weather Station (VWS) so the 'Settings/File Settings/Create/Modify File List' menu has the following values checked (only these as shown below):

- Wind direction
- Wind Speed
- Indoor Humidity
- Outdoor Humidity
- Indoor Temp
- Outdoor Temp
- Barometer
- Dew point
- Rain Rate



Setup

Hardware Present

- Weather Station
- Boltwood Sky Sensor
- Roll off Roof

Sky Temperatures

Guided : To

Unguided : To

Weather Parameters

Humidity (%):

Temperature:

Wind Speed:

Data Updating

Update results every Seconds

Clarity Installed Locally

Wind Speed Units

- MPH
- KPH
- KNTS

Baro. Press. Units

- Millibars
- In.Hg

Misc

- Clouds Only = SAFE
- Log Errors
- White Text

File Locations


(double click the text input areas to open a file chooser box)

Get Sky Temperature from :

Get Weather Station Data from:

Save Result to :

OK Default

	<p>To select the location of the weather data files uncheck the checkboxes next to the file boxes in the 'File Location fram. Double click inside the field then navigate to the files. Once completed recheck the boxes as needed for the hardware present.</p>
	<p>Wind speed limits offer 2 inputs. The lower limit is set for winds that enter directly in to a dome slot; the upper limit is the wind speed maximum for blowing from opposite the dome slot. WeatherWatcher will then automatically compute excessive wind speeds for different directions in relation to the dome's current slot position.</p>

	Roll-off roof observatories should enter the same value for both the upper and lower limits.
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Hardware Present:

Check the appropriate hardware you have present. You should now be able to access the weather data.

Sky Temperature:

Set the upper and lower limits for the sky temperatures that suite your guiding needs.

Weather Parameters:


Set these to match your local conditions to trigger the seeing condition determinations that are displayed on the main screen.

Data Uploading:

The interval is in seconds, of how often weather data is retrieved. Check the “Clarity is Installed Locally” if WeatherWatcher ACP is running on the same machine as the Boltwood Clarity software.

MISC.:

The 'Clouds Only = SAFE' check box will allow you to override the unsafe safe trigger if no rain is present. So, with this box checked no actions to close the dome/roof or park the telescope will occur based on cloudy conditions only.

	The 'Limit Parameters' and 'Sky Temperature' fields must be inputted in the same units (Metric, US) as your weather station is set to report its data.
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