

Wireless Weather Station from AcuRite

All of us are concerned about the weather. We talk about it all the time. Our radios and TVs are tuned to channels that report up to date forecasts. We plan activities around those forecasts. I do have a weather app in my menu bar which gives fairly accurate data. I also use the Weather Channel. However, the information for those is gathered from sensors at a Toronto Airport and we live many kilometres away, down by the lake. It is very apparent that the temperature and the wind are not the same at both locations. I want data from my backyard with the convenience of not having to go outside to read it. AcuRite sells an extensive range of weather stations. I was able to obtain a combination temperature, humidity and clock wireless weather station (#01099) from them for this review.

To start with, I would like to explain a couple of weather terms, that being percent humidity and the Humidex Scale. The amount of water in the air is variable. 50% humidity at one temperature does not contain the same amount of water as 50% humidity at another. 50% humidity means that the air contains half as much water vapour in it as it would if it were saturated with water vapour at this temperature. As the temperature of the air rises, the capacity for the air to hold onto gaseous water increases. This is why dew forms overnight. During the day, water is able to be absorbed by the air at the higher temperature. As the air cools during the night it eventually reaches the saturation point. If it dips below that, the dew point, then the excess water vapour is deposited on the surrounding surfaces. The air will probably not feel what we call humid at the low temperature, even though it is at 100% humidity, because there is very little water vapour in it at the lower temperature.

The Humidex Scale, a Canadian invention, is a combination of outdoor temperature and humidity which will indicate how we will feel if we go outside. Water requires heat in order to evaporate from a surface. We sweat in order to produce water on the surface of our skin. As this water evaporates, it takes heat from our bodies and consequently cools us down. The more saturated the air is with water, the harder it is for the water to evaporate from our skin. It is like the water in the air is pushing the water that is trying to escape back onto our skin. A dry heat is never as oppressive as humid air. This is because our sweat cooling system is working just like it is supposed to. Enter the Humidex Scale which combines the air temperature and the percent humidity to indicate how the air will feel to us. The more humidity in the air, the less our sweat will evaporate, and the hotter we will get. The Heat Stress Index Scale works in conjunction with the Humidex scale and uses the adjusted temperatures to indicate the degree of caution. Knowing the outside temperature and the percent humidity allows us to monitor and apply caution to avoid the possible dangers of sunstroke, muscle cramps and heat exhaustion from exposure. Any weather station needs to include the outside percent humidity.



How useful and easy to use is the AcuRite Weather Station? Setting it up is a snap. First, insert three AA batteries into the back of the monitor and two more into the remote outside sensor. Place the remote sensor within 100 m of the main unit. This outside sensor is water resistant, not waterproof, and so should be located as much as possible in an area protected from the elements. A shady area is recommended for accurate readings. I have put mine under the eaves of my garage. The monitor can be mounted on a wall or placed on any flat surface. The main unit will need some initial calibrations. There is a 'set' button on the right side which will walk you through the various options. The clock and calendar must be manually set as well as the temperature and pressure units. Since this unit will work in the US as well as Canada, you should set the temperature to be in °C and the pressure to be in hPa (hectoPascals) which are the common units here.

This particular model displays, on an easy to read LCD screen, the inside and outside temperature and humidity. There is an atomic clock and calendar. The feature I was most interested in was the future forecaster. You may wonder why the weather channels always include what the pressure is doing (rising or falling) but that is a wonderful predictor of future weather. Air is mainly composed of the gases nitrogen and oxygen. There is a variable amount of other gases such as carbon dioxide and water vapour. Air pressure is caused by these molecules colliding with a surface. The heavier the molecule, the more force it hits with. It happens that water vapour is the lightest of all these gases. The more water vapour in the air, the lower the pressure. Thus as air pressure rises, we can expect clearer skies. The lowest pressures recorded on the Earth are found in the eyes of hurricanes. The more the pressure drops, the greater the possibility of precipitation.

Over a period of time, it's possible to use the observations collected from a sensor in your own backyard to generate a localized short-term weather forecast. When you first start up your weather station it goes into the future forecast learning mode which lasts fourteen days. There is an indicator showing its progress. In this learning mode, the weather station takes 4,000 readings at 12-minute increments to calculate a running average of your barometric pressure. An algorithm compares the running average to the average pressure of the earth (1013 hPa) to generate a corrected pressure for your exact location. According to AcuRite, the pressure accuracy increases with each new reading over the Learning Mode time period. After 14 days, the Learning Mode icon disappears from the weather station screen. At this point, the self-calibrated pressure is reasonably accurate (although the algorithm continues to run; 4,000 readings = 33.33 days) and the weather forecaster is ready for localized weather prediction. An icon shows up on the screen indicating the present forecast (see <http://www.acurite.com/acurite-icons#pressure-chart> for a complete summary of the icons shown as well as some further explanation of the science involved). You can also act as your own meteorologist since the weather station displays the pressure for the previous 12 hours in a graph form. You can quickly see if the pressure is rising, falling or holding steady. Because the AcuRite system uses the altitude as well as the pressure changes, in conjunction with the percent humidity, you are getting the most accurate prediction anyone could hope for, and it is pin pointed to your own yard. It is perfectly suited for Canadian weather. The remote temperature



sensor is good for -50°C to 70°C . A signal detector icon indicates how strong the connection is between the two devices. Using this will help you find the best place to put each of the two gadgets. It has daily min/max values for outdoor temperature and humidity, for those who like to lament about the weather when they talk about how bad summer or winter has been. There is a convenient backlight which permits viewing the readouts even in the dark. Push the button down on the top and you get a two second light. The only change I would like to see is a decimal point added to temperatures. I want to see 17.2°C displayed rather than simply 17°C . I like that extra degree of precision, even if my body can't really tell the difference between the two.

Our monitor is looked at often during the day; at least ten times. It is one of those gadgets that you think why would we need it since the information is available from so many sources? But those sources are not as accurate as the info from your own yard. By keeping the inside monitor in an area with a large volume of traffic, it is constantly being used. Weather Stations from AcuRite can be purchased on-line or from various local retailers such as Lowes. This particular unit, the #01099, which displays the indoor/outdoor humidity and temperature as well as the outside pressure, sells for about \$60. But there are many types to choose from and I am sure there is one that will fit your needs as well as your pocketbook. Go to <http://www.acurite.com/> and have a look at their wide range of products.

Get the most up to date weather info you can from your own backyard . . . get an AcuRite Weather Station.

Submitted by Marcel Dufresne

