Smart Irrigation Controllers– *Using Water More Efficiently*

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photos provided by Smith Turf & Irrigation

Smart Controllers, intelligent controllers, ET controllers, central computer systems – whatever you want to call them, they are the most efficient innovation in irrigation systems and you need to know about them. It's time to demystify and simplify what a smart controlled irrigation system is.

Typically speaking, smart controllers are irrigation clocks that do more than just turn the water on and off. They are irrigation devices that automatically control the watering schedule for changes in plant requirements throughout the year. In simpler terms, it applies water to the plants when it is needed most and reduces the amount applied when water is needed less. The goal of smart controllers is to save time, to save water and to save energy which will in turn save you money on your water bill. Though smart controllers are typically used commercially, more and more homeowners are looking for cost effective ways to preserve their landscaping and smart controllers are the perfect answer to many irrigation dilemmas.

Historically

Originally developed for use on golf courses and large park systems that typically used huge amounts of water, most large system smart controllers are operated from a computer in an office rather than on site. Some of these systems have features such as on site weather analysis, flow rate monitors, automatic shutoff and leak detection, freeze protection, soil monitors and more. All of this may seem like overkill, but suppose there is a system that uses 120 gallons of water per minute and the valve gets stuck on overnight before it is detected. In ten hours this will waste over 72,000 gallons of water! Or imagine Disney World that has over 50,000 sprinkler heads. If that system is not properly monitored it could cost thousands of dollars in wasted water on a daily basis.

Why in Residential Landscaping

In most parts of the country, if one wants a beautiful lush lawn or a successful landscape, then a supplemental irrigation system of some sort is a necessity. In the past this meant a person with a hose with a sprinkler attached to it. As labor rates went up and the American dream of homeownership spread, this led to the development of automatic irrigation clocks that turned the water off and on automatically. This was great until water became scarcer and more expensive. Two thirds of all residential water use occurs outdoors and a substantial amount of this water is wasted. The reason for this is that the typical traditional irrigation clock does not take into account weather changes and the homeowner doesn't have the time or knowledge to constantly adjust the clock for these conditions.

The way a smart controller works is by tracking the "evapotranspiration" or ET rate. ET rates are the rate at which water evaporates from the soil and transpires from the leaves of plants. The higher the ET rate the more water is needed, the lower the rate the less water is needed. Some typical examples in the lowcountry: in January when it's cloudy, cold and rainy the ET rate may be zero and the system will not water at all. In May it is typically windy and sunny and the system may water more than usual due to very high ET rates that month, but the next month in June we may have lots of afternoon showers and the rate will be lower. Of course, sometimes the opposite may be true in all of these situations. The smart controller takes the guesswork out of the programming of the irrigation clock for you.

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The typical homeowner model smart controller will distribute water based on ET rates calculated in several different ways: 1) on site data; 2) off site data; 3) historical data; 4) or a combination of any of these data.

On Site Data: ET rates are calculated by information gathered on site by a weather station, which may consist of any or all of the following sensors: rain sensor, anemometer, thermometer, soil moisture sensor, solar sensor and rain gauge. These sensors will communicate with the on site controller via wired or wireless systems to relate the site specific conditions. This is the most accurate since it is gathering data from that specific site, but is also a little more expensive depending on the complexity of the system.

Off Site Data: ET rates are communicated to the controller via wireless technology from a weather station or stations in the vicinity. This information is passed on a daily basis to give the controller an update every 24 hours. There is a monthly charge for this data, but it is usually not very expensive.

Historical Data: Historical weather and water data for your area is used to determine what amount of water is required. Typically it only resets the time monthly. While the historical data is not perfect, it still gives significant water savings for most users. You will periodically need to manually override the automatic controller settings, especially if you have unusually hot weather for the month. To set up the controller on some models you simply enter your zip code and it accesses the historic data from its memory. On others you have to initially key in the historic data from the user's manual or a website. Due to the lower cost of this type of smart controller, often it will give you the best financial return on your investment. This is especially true for a small residential irrigation system.

Combination of Data: Historical data is used to determine an initial watering time, but then it further adjusts the time based on a sensor. Typically a temperature and/or rain sensor is used. If the daily high temperature is lower, it reduces the watering time. If it rains it will stop the watering. This gives more accuracy than the historic data alone will.

With all smart controllers there is an initial shake down period of a few months when the controller will need weekly adjustments. During this time you fine tune the controller to your actual conditions. After that the controller takes care of the adjustments.

Smart controllers can be a big help not only for water efficiency, but for the overall health of the plants. They give the plant more water when needed and reduce the amount of water applied when not needed. This leads to a landscape that will thrive for years to come rather than just surviving. LCH