



Smart controllers & their many benefits

**What makes an irrigation controller “smart”?
What is the purpose of “smart” controllers versus
traditional irrigation-controller clocks?**

Smart controllers seek to simplify and streamline the process of irrigation scheduling, which is the task of knowing when to water, how much and how long.

Most irrigation professionals talk in terms of putting on “an inch of water.” But irrigation controllers talk in minutes, not inches. And therein lies the big mystery: how to translate inches to minutes?

Traditional controllers and irrigators bridge this gap by knowing how much water their sprinkler system can apply in one hour — this is the precipitation rate (inches per hour). Either the system is audited with catch-cans and the data analyzed, or the manufacturer’s sprinkler nozzle precipitation rate is used.

That takes care of how long to water. If the system can apply a ½ inch per hour, and the lawn requires ¾ inch, then the system needs to run for 90 minutes.

But how did we know we needed ¾ inch of water? That involves weather — temperature, sunlight, wind and what’s called evapotranspiration. ET is how much water the lawn has used in a period. Sounds complicated.

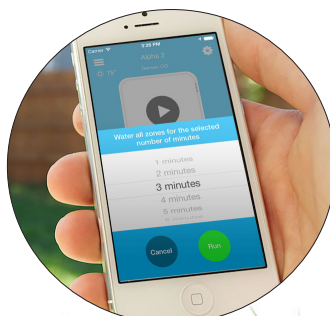
Knowing how dry the soil is helps, too. Overwatering keeps the soil wet, and sometimes even saturated. That means no oxygen for plant roots, which is not healthy for plants anymore than it would be for you.

Smart controllers have been designed to do much of this work for you. Two types of smart controllers try to make life easier for the irrigator.

One type uses weather data and that complicated ET factor to track how much water the turf has used. Then it takes into account rainfall, plant type, soil type, site exposure (sunny, partially shaded, flat or sloped), and what type of sprinklers are installed (spray or rotor). It may even ask directly for precipitation rate.

Behind the scenes, the controller uses either its own attached sensor array or is enabled to communicate with other online sources of weather data. The controller comes up with run-times for the controller, all without your intervention beyond the initial setup.

Some smart controllers are soil-moisture based and use a soil-moisture sensor embedded in the turf to trigger irrigations. Usually only one sensor is used, and all zones are dependent on that one zone’s data. Information needed for these controllers includes the soil type, site information and plant type.



Soil type plays a key role

Soil type is very important, as the internal algorithms need that information to correctly set the upper and lower boundaries for plant available water. A hint: the lower boundary is called the plant permanent wilting point, and once below that, plant death occurs. (That's why it's called the "permanent" wilting point). The "irrigate now" boundary is usually set halfway between.

A soil-moisture based smart controller triggers an irrigation when the lower boundary set point is reached and waters until the upper boundary is reached. The intermediate value is called the "managed allowable depletion" (MAD) and its typical turf value is 50 percent. These limits are different for each soil type.

If you don't know your soil type, you can try one of the soil-texture tests — the "feel" test, or the "mason jar" test. More information about those tests is available at [www.culter.colorado.edu/~kittel/SoilChar\(&RibbonTest\)_handout.pdf](http://www.culter.colorado.edu/~kittel/SoilChar(&RibbonTest)_handout.pdf). You can also use the web-based app at www.extension.colostate.edu/docs/lisa/soil-type.pdf to track soil texture.

Set-up and management of irrigation systems are also critical

It all sounds very easy and takes out all the guesswork of when, how much, and how long to irrigate. What could go wrong? Smart controllers do represent giant advances in irrigation management — if set up and managed correctly. However, many controllers come with default settings that keep turf lush and green, protect the controller manufacturer and really don't conserve water. You could use too much water without proper set up and adjustment.

How can you tell if a smart controller is operating in the interest of water conservation, as well as keeping your lawn healthy? One way is to compare the smart controller's irrigation frequency and run-times with an independent source. These tools or services will help you get the best results with your smart controller. Once correctly set up, it will be a "genius" controller.

Programs are available to assist in your 'smart' irrigation efforts

Lawn Irrigation Self Audit (LISA)

LISA is a toolkit to help homeowners water their lawns more effectively and efficiently. It is designed to measure water application rates for your lawn. LISA will go through a series of steps and present you with an irrigation schedule based on information similar to what you would give a smart controller.

You will have intervals between irrigations, how long to run your sprinklers, and in cases for clay-type soils, information for cycle-and-soak. Cycle-and-soak means to divide the total run-time into segments — cycle the irrigation for a short period, and let it soak for a longer period. Repeat this as needed to get the total needed run-time. It prevents runoff, allows time for water to soak into tight soils such as clays, and promotes deeper rooting because of increased water-infiltration depth.

LISA does this calculation for you, and gives you monthly irrigation scheduling run-times from May through October.

This program is available at www.extension.colostate.edu/topic-areas/yard-garden/lawn-irrigation-self-audit-lisa/.

Resource Central

Also be sure to check your eligibility for home irrigation audits by Resource Central's outdoor sprinkler consultations. If your water provider is on the list, your community participates in the program and the service is free.

The trained personnel can help you understand your irrigation system and how to run it efficiently. You will receive the results of your audit, recommendations for irrigation system improvements, and irrigation schedules, leaving your smart controller set up with the information it needs.

This program is available at www.resourcecentral.org/slow-the-flow-2/outdoor-sprinkler-consultation/.

