

# TIME IT RIGHT WITH IRRIGATION CONTROLLERS

Automatic irrigation systems are terrific — as long as you are in control of your controller.

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Irrigation controllers (also called “clocks” or “timers”) are at the heart of an automatic irrigation system and are often the component least understood by the homeowner. Controllers only do what they are programmed to do. If they aren’t programmed correctly they can cause a beautiful landscape to suffer from poor watering.

Irrigation systems are usually installed with a new landscape. If the system is professionally installed, the controller will most likely be programmed for the homeowner. For new landscapes, the schedule is usually every few days. If the controller isn’t re-programmed within a few months to accommodate establishing plants, the landscape will be watered excessively causing high water or electric bills and possible plant death from root rot.

Controllers can be intimidating at first glance - so many buttons and choices! But they do nothing more than tell irrigation valves how long and how often to open. Even though there are different brands and types, most controllers operate in the same way. There are electromechanical controllers that use gears, pins and dials to set a watering schedule, solid-state controllers that are like small computers and hybrid controllers that combine the best features of electromechanical and solid-state computers.

Hybrid controllers are the most popular choice because even though they are sophisticated, they are easy to program. Electromechanical controllers are not commonly found in stores, but the new owner of an older home may find one as part of an inherited irrigation system. Solid-state controllers are the most versatile of the three types of controllers; they are a good choice for users who want state of the art technology and advanced water management. A new breed of solid-state controllers called “Smart Controllers” are now on the market. Smart Controllers receive a signal from a weather station and determine the watering schedule based on weather factors. No manual scheduling is needed.

How does a controller work? The controller tells the valves (also called stations or zones) when (frequency) to open. The controller pictured uses “Schedules” and “Start Times” to do that. It also tells the

valves how long (duration) to stay open. On this controller “Value Run Times” performs that function.

Sometimes more is better. In this case, the more valves/stations on the irrigation system and the more programs on a controller, the more precise the watering schedule can be.

When learning about an irrigation controller, read the manual! If the controller manual is lost, contact the manufacturer either via a website or call an irrigation supply store for a replacement. Once a manual is obtained put it where it can be easily accessed.

## EXAMPLE

Let’s go through an example to learn how to program a controller. The Smiths have a small lawn, a vegetable garden, high water use shrubs, low water shrubs and low water trees. For watering flexibility, the Smiths bought a controller with six stations. It has a maximum watering frequency interval of 31 days and three programs. They want to schedule the controller for the hot spring months. Before programming, the Smiths need to answer some questions:

### Does it matter how the plants are watered - drip or sprinkler?

Yes. Sprinkler nozzles deliver more water at a faster rate than drip emitters. Drip emitters have an output of gallons or liters per hour (gph or lph). Sprinkler nozzles have an output of gallons per minute (gpm). The Smiths want to sprinkle irrigate the lawn. They want to drip irrigate the garden with 1 gph emitters. They want to use 2 gph emitters on the high and low water use shrubs, and low water use trees.

### How Often (Frequency) Do The Plants Need To Be Watered?

The Smiths asked their Cooperative Extension office about watering frequencies. They were advised to put a 2-3 inch mulch layer of bark, gravel, or for their vegetable garden alfalfa hay, on top of the soil around their plants to reduce evaporation and watering frequency. The Smiths learned that during the hot season their mulched garden will need water every three days. The high water use shrubs with bark mulch will also

need water every three days. The Smiths were also advised that their gravel mulched low water shrubs will need water every two weeks. The gravel mulched low water trees will need water every month. The Smiths know that weather and plant water needs vary seasonally. Therefore each season they will need to re-program the frequency of watering. The Smiths can also access watering guidelines on the Water Wise website listed below.

### For how long (duration) do the plants need water?

The Smiths know that water should penetrate to the root zone depth at each watering. Grass, vegetable and flower roots grow to approximately one foot deep, shrub roots to approximately two feet, and tree roots to approximately three feet deep. They also know that once they learn how long it takes for their watering system to water to those depths, they won't need to seasonally re-program the duration of the watering, only the frequency. The Smiths did a soil probe test ([www.ag.arizona.edu/cochise/waterwise/soilprobe](http://www.ag.arizona.edu/cochise/waterwise/soilprobe)) and found that in one hour in their sandy-loam soil, 1 gph emitters wet the soil to a depth of one foot, and the 2 gph emitters wet the soil to a depth of two feet.

### Which plants on what station?

The Smiths know it is best to have similar plants on the same irrigation valve and not to mix drip with sprinklers. Because each plant type is different and requires different watering frequencies and durations, each gets its own station/valve. The garden will be on valve 1, high water shrubs on valve 2, turf on valve 3, low water shrubs on valve 4, and low water trees on valve 5, and valve 6 is available for future use.

### Which stations on what program?

The Smith's controller has three Programs: A, B and C. This is great because they can schedule each program to water at different frequencies. Program A will control valves 1, 2 and 3; Program B will control valve 4 and Program C will control valve 5.

### How to program the controller?

Now that the Smiths have their landscape water needs categorized, they can schedule their hybrid controller. They go out to their controller

and with their manual, program in the current date and time. They are now ready to enter the information for their watering schedule.

The Smiths know that a Program determines the frequency of watering. They move the Program switch on the controller to Program A.

The Smiths now schedule the days of watering for the hot season for their high water plants. They decide they want to water on Saturday and Thursday. They also want to water in the early morning when the air is cool and still. But they want to be able to see their system function, so the Smiths set the watering to start when they get up at 6 a.m. They schedule both of those choices into the controller on Schedule and Start Times.

Now they select how long (duration) they want each valve to water. From their soil test they know that the 1 gph emitters for the garden need to be on for one hour. Using Valve Run Time they set valve 1 to run for one hour. They know that the 2 gph emitters for the high water shrubs will deliver water to a depth of 2 feet in an hour so they also set the run time for valve 2 for one hour. The Smiths also did a "catch can" test for their lawn sprinklers ([www.ag.arizona.edu/cochise/waterwise/wateringturf](http://www.ag.arizona.edu/cochise/waterwise/wateringturf)) and found out that the lawn sprinklers should be on for 30 minutes, so they set valve 3 for 30 minutes.

Because the low water shrubs and trees have different watering frequencies, each needs to be on a different Program. The Smiths move the Program switch to B and repeat the process for the low water shrubs making sure to schedule the frequency for every two weeks. They repeat the process for the trees on Program C with a frequency of every 30 days.

Finally, the Smiths write down their spring watering schedule and valve locations, put it inside their controller cover, and are glad to have conquered their controller and their irrigation system.

For more information on irrigation, contact your local Cooperative Extension office and visit the Water Wise website at [www.ag.arizona.edu/cochise/waterwise](http://www.ag.arizona.edu/cochise/waterwise).

| VALVE NO.   | VALVE RUN TIMES |           |           | VALVE LOCATION          |
|-------------|-----------------|-----------|-----------|-------------------------|
|             | A PROGRAM       | B PROGRAM | C PROGRAM |                         |
| 1           | 1 hour          |           |           | Veg Garden              |
| 2           | 1 hour          |           |           | High Water Shrubs       |
| 3           | 30 min          |           |           | Turf                    |
| 4           |                 | 1 hour    |           | Low Water Shrubs        |
| 5           |                 |           | 1.5 hours | Low Water Trees         |
| 6           | X               | X         | X         | X                       |
| START TIMES |                 |           |           | WATERING DAY (SCHEDULE) |
| PROGRAM     | 1ST             | 2ND       | 3RD       |                         |
| A           | 6 am            | X         | X         | Sat, Th                 |
| B           | 6 am            | X         | X         | Every 14 days           |
| C           | 6 am            | X         | X         | Every 30 days           |