



Control Freaks

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Ahh, the remote control.

Gone are the days when television watchers had to drag themselves off the sofa to change the channel. And now with VCRs and high-tech digital products that can be set to record programs while the user is otherwise engaged, no one has to worry about missing their favorite shows. Even kitchen appliances are getting in on the action with ovens that will refrigerate a roast from 8 a.m. until 3 p.m., start cooking it at 375 degrees and have everything perfectly basted when the family gets home from work.

If only it could slice and serve, too.

In the face of widespread laziness, consumers are becoming more technology savvy and manufacturers are developing bigger and better automated systems for just about everything. But the irrigation industry is ahead of the curve, having developed automatic irrigation controllers as early as the 1950s. And unlike television remotes that require the user to stick around to change the channel, irrigation controllers are, for the most part, set-it-and-forget-it products that will effectively water landscapes and leave contractors and customers with time to spare.

LIKE CLOCKWORK. On large residential or commercial properties, an irrigation system can have dozens of spray heads and rotors installed to cover the entire area. But who has the time to manually turn each head on and off? Frankly, no one, which is why that job is left to the irrigation controller. Moreover, controllers are designed to accept data relating to a series of on/off signals. The resulting program, usually covering desired run times for each day of the week, lets the controller activate the irrigation system at predetermined times and intervals.

"Irrigation controllers offer an automatic means to control water application in a landscape," says Jeff Kremicki, residential/commercial product manager, Hunter Industries, San Marcos, Calif. "They offer convenience and water-efficient application if programmed properly."

Kremicki explains that programming controllers is easy and similar between manufacturers' brands. "First, the contractor determines what the landscape needs as far as water," he notes. "Then, they choose a valve to program and tell that valve its start and run time information. From there, you program the number of days you want that start and run time to occur and the controller will follow that program automatically."

Installation is equally straightforward, requiring knowledge of low-voltage wiring. "When you design an irrigation system, everything gets wired back to the controller," explains Rod Dick, contractor controllers product manager, Rain Bird, San Diego, Calif. "The controller is generally mounted on the side of a building or in the garage – some fixed location that can easily access all the valves. For each valve, you

bring a wire back to the controller and, with the system plugged in, the contractor can set the watering program for each valve."

Aside from occasionally adjusting the watering schedule, irrigation controllers are mostly maintenance-free after installation. "Controllers will last for years," Kremicki says. "You do have to be careful with electronics – making sure everything is installed properly, waterproofed and protected – but for the most part controllers don't require regular maintenance and should be able to run from 10 to 15 years without a problem."

Dick comments that, in general, controllers range in cost from \$75 to \$400, with the prices reflecting different controller types and available features. "Basic mechanical controllers with internal gear operation and no LCD components are generally the least expensive, followed by electromechanical controllers, which are the most popular type," he says. "With electromechanical models, there is a bit more cost involved because of the electronics and the LCD screen that lets the user see the different stations that are being updated. Modular models are usually the most expensive but are extremely convenient because they can be expanded as the irrigation system grows."

FEATURE PRESENTATION. Unlike irrigation components like sprays and rotors, selecting the type of controller to use is less dependent upon size than upon the features contractors need in their designs. "If you have a 20-zone site, a 12-zone controller isn't going to work for you," remarks Brodie Bruner, vice president of sales and marketing, Weathermatic, Garland, Texas. "It's like buying a truck to haul something that's a certain size. You already know what size bed you need, so you start looking at features like fuel efficiency and four-wheel drive." As a rule, Bruner notes that controllers that accommodate more zones have more features because they're being used to control more areas.

Most contractors look for products that will solve common watering problems they see in their clients' landscapes – primarily, overwatering. "Part of the problem when you have residential and commercial customers adjusting their own controllers is that they tend to make the timing uniform," comments Bob Dobson, president, Middletown Sprinkler Co., Port Monmouth, N.J. "Also, a lot of contractors may not want to bother coming back out to adjust the system as the weather changes, so in April they input a schedule that will suffice for July and August and they're putting down five times more water in the spring than is necessary."

The excess water applied to landscapes in these situations can drown plants and create waste situations where water runs off the property, unused. However, there are several features available on controllers that can ease this problem, as well as some that make operation even simpler.

Soil moisture and rain sensors are the prime solutions to overwatering. "On most controllers, you can add moisture or rain sensors that will detect the amount of water available to the soil," Dick says. Rain sensors, which are either placed in the landscape and wired to the controller or mounted wirelessly on the customer's roof, collect water and keep controllers from operating irrigation systems in rainy conditions. Similarly, soil moisture sensors are buried in the ground and collect soil moisture data, disabling the controller when the landscape is already wet. Products like these can run from \$50 to \$100.

"There are also controllers with water budgeting features that allow you to cut back the percentage of water applied at different times of year without changing the basic program," Dick adds. "We're seeing sensors and water budgeting become more popular as more people are becoming aware of the costs related to wasted water."

Dobson uses both sensors and water budgeting on irrigation systems he installs. "We've put rain sensors on every system we've ever installed," he says. "But one of the things we also look for is a controller that has a capability of bypassing the rain sensor. If we had ¼ inch of rain yesterday, there may be enough

moisture in the rain sensor to keep the system from turning on. However, if the customer is scheduled to receive a fertilizer treatment that needs to be watered in, or if crews need to service the system, you can throw the bypass switch to allow the system to come on again."

In terms of water budgeting, Dobson finds that "seasonal adjust" features let his clients adjust their watering schedules as needed, without disturbing the programs he originally scheduled. "We tell our customers that if they need more water, dial the program up to 120 percent, and as the season starts to cool off, dial it back to 75 percent. Doing that will just multiply the existing time setting by the percentage they choose. On most controllers, you can go up 150 to 200 percent. So, if we've programmed a 40-minute run time and the customer chooses to run it at 150 percent, that zone will run for 60 minutes."

Another feature manufacturers are seeing become more popular is modularity. "This is one of the features we've seen really take off from a controller design standpoint," Kremicki says. "Modularity offers the contractor several things, and one of them is expandability because the contractor can customize the controller to the site."

Kremicki explains that modular controllers allow contractors to increase an irrigation system in size without purchasing an entirely new controller. For instance, if a contractor installs a six-valve irrigation system on a client's front yard, he can use a six-station controller to run one wire back to the controller from each valve. But what if the client decides to have the contractor install irrigation in the back yard the following year? With the front yard already using all six stations, the contractor would need to purchase a second controller to handle the back yard.

Modular controllers, however, allow contractors to install additional stations on existing controllers to expand irrigation systems. Depending on the number of stations, expansion modules range in cost from \$40 for three stations to \$100 for eight stations.

"Contractors are all looking for controllers with the intelligence to know how much it needs to water so it doesn't water too little or too much," Bruner comments. He cites controller features like flow sensors and weather-based irrigation intelligence to fulfill these wishes (*see Irrigation Innovations, starting below, for more information*).

Kremicki also notes "non-volatile" memory as a helpful programming feature. Though all controllers are equipped with surge protection, should a power outage occur altogether, non-volatile memory retains controllers' preset programs and saves the contractor from having to reprogram.

"One of the questions we ask when we add features is, 'What can we add to make this controller easier to operate?'" Kremicki explains. "Because of that thinking in the industry, it's very easy to troubleshoot a controller now." For instance, some controllers on the market can be set up to alert contractors when a problem occurs in the system. If a spray head breaks, for instance, flow sensors could tell the controller to shut down the system and send a pager alert to the contractor noting the valve or head causing the problem. From there, the contractor can go to the site, fix the head and, by using hand-held controls available on some models, reset the controller from the field when the problem is cleared up.

IRRIGATION INNOVATIONS. With the number of advanced features available, it's hard to believe that irrigation controller manufacturers could think of ways to make their products even better. But they have.

One of the biggest advancements in controller technology and water management is the development of ET-based controllers.

"'ET' stands for evapotranspiration and that's a recognized and accepted standard for determining how much water is used by a landscape," explains Chris Spain, president, **HydroPoint**, Petaluma, Calif. "The

numbers identify specifically how much water has evaporated and how much is being transpired by the plant itself. The problem with basic ET data is that you need a specialized weather station to acquire the data and not very many people want to install a weather station in their back yard."

To make ET more accessible, companies like **HydroPoint** take weather data from several thousand weather stations throughout the United States and wirelessly transfer region-specific information to controllers throughout the country. In many ways, the system is similar to the way data is transmitted to computers for GPS vehicle tracking. For contractors like Dobson who don't subscribe to such services (wireless transfer fees can start at about \$4 per month), historical ET data also is useful.

"Part of what we do with our clients after the irrigation system has been installed is create a detailed watering schedule for them based on the type of plants and soil they have and 30-year historical ET data," Dobson says. "The ET rates are available online and through other sources and we use that information to determine how much watering needs to occur at certain times of the year and for certain plant groups. Our driest month has an average ET rating of about 7 inches, which means that during that period the irrigation system has to replenish 7 inches of water transpired by the plant. At the same time, each plant type has a crop coefficient that indicates whether that particular plant needs more or less water than what the ET rating suggests. We look at all that information and calculate the precipitation rates of all our spray heads to determine the run times to dial into the controllers."

Spain notes that automated ET-based irrigation systems do Dobson's math automatically and adjusts the controller's settings on a daily basis as new ET information comes in. "One of the first things we do, instead of having the contractor estimate how much to irrigate or come up with a schedule, is have the controller ask a series of questions about the landscape they're irrigating – what kind of plants are in a certain zone? What's the slope? What's the soil type?," Spain says. "They're easy-to-answer questions and we certify contractors so they're trained on how to install the system, but it's really a simple process."

Jim Laiche also sees ET-based systems becoming more popular in the future. "What we're doing with this new technology is taking out the human element – the person who would have to make the changes on a monthly, weekly or seasonal basis," explains the commercial business development manager, Toro, Richmond, Va. "ET systems are going to make those changes automatically on a daily basis, which results in very precise manipulation of the irrigation controller."

Though ET-based irrigation controllers are more expensive than those without integrated ET technology, the more precise irrigation it affords realizes a quick cost savings for the customers.

"The ET systems can cost about \$500 for a 12-station controller, but when you factor in the total cost of ownership, the cost to the end user is actually lowered and most users see a return on their investment within a year," Spain says. "If you look at the cost of wasting water or the risks to your landscape when you go on vacation – such as the controller not intelligently adding more water when there's a heat wave – not to mention the environmental and societal costs of introducing polluted run-off into our water supplies, ET-based controllers are actually extraordinarily economical."

Across the industry, most contractors and manufacturers agree that water is becoming a more tenuous resource that must be used sparingly. With such strides being made in irrigation controllers – the brains behind irrigation systems – contractors can easily and economically heighten the efficiency of their landscape watering practices.