

Controllers merge technology and resources

The evolution of irrigation system controls that began 20 years ago has been astounding, especially considering that lots of you used to drag hoses and manually open valves or punch heads into quick-coupler systems, and then checking your watch.

Gone are the days of pins and dials used to ballpark irrigation programs. "The advent of solid-state electronics finally enabled folks to schedule sprinkler sets precisely and reliably," says Dave Davis, an irrigation consultant in Crestline, CA, and president of the American Society of Irrigation Consultants.

Which brings us to the technology of today. What would the ultimate irrigation control system look like? "In the best of all worlds, an irrigation manager would have access from anywhere to technology capable of simple tasks, like manual starts and rain overrides all the way to downloading automated irrigation programs based on real-time, weather inputs from on-site weather stations or service providers," says Norm Bartlett, ASIC executive director. "The state-of-the-art system would be capable of running multiple irrigation sets for individual sprinklers to make adjustments for various exposures, slopes infiltration rates or soil types, or getting away from timed irrigation schedules altogether and programming irrigation sets based on need as measured by ET devices or moisture sensors.

"The ultimate control system is programmed with hydraulic data and water source information. It learns flow rates for individual zones or sprinklers, and schedules the watering window to the shortest runtime or maximum pump efficiency. These control systems also manipulate master valves, control valves and isolation valves and can automatically bypass a zone or de-active the entire system when there is a swing in flow, and alert the water manager via a pager, cell phone or e-mail.

"Central control systems now are mobile," Bartlett says. "Anywhere you can take a laptop and access the Internet, you can update irrigation programming."

Take it a step further, and the water manager can program applications of customized element and nutrient blends through individual heads or zones to address plant, soil and water quality imbalances as they arise.

Control system communications challenges? Take your choice of hardware, trunked radio, radio, cell phone, radio remote control, or combinations therein.

"There's some remarkable technology out there," says Davis. "It's evolving so fast that there aren't many water delivery system problems that can't be addressed by available technology. I think that's the key to really effective controller selection—you have to know your site like you know your own home—its limitations and opportunities. Then you select the controller with the optimum features and capabilities based on all available products, not single product lines."

Consider the following parameters:

Soil/Plant/Water Relationships

Know your water quality, soil type and quality (throughout the site), and the diversity and health needs of your turfgrass and other plant material.

Climate/Exposures

Research annual precipitation, seasonal fluctuation, maximum ET days, average temperatures, as well as specific zones that are exposed to elevation, sun, wind, pedestrian and vehicle traffic, and so forth.

Resources, Natural/Human

Be aware of existing and potential water resources and quantities available; your annual and monthly irrigation consumption; power and energy options and requirements; and also your human resources; how large and capable your crews are; full-timers versus seasonal, and so forth.

Watering Windows

This incorporates a lot of detailed info on flow rates, available and dynamic pressure, pumping capabilities, scheduled games and events, cultural practices and the like.

Administrative Demands

Recent, current and projected budgets; how much protection they expect or demand regarding potential liability issues; their expectations of system reliability and turf appearance; and so forth

System Performance

Determine your needs in terms of system longevity; water application precision; system flexibility and safeguards; ongoing maintenance demands; and so forth. Also consider potential future needs.

Your fundamental controller capabilities should include:

Independent Programs, which enable the turfgrass manager to group stations into hydrozones, irrigating each hydrozone at different intervals and durations, according to plant needs.

Solid-State Operation that gives operators very precise station cycling (to the minute). This feature is especially useful on sites that have irrigation systems with high precipitation rates.

Water Budget Features that permit weather-related schedule changes. Consider control systems that offer budgeting to a single percent, rather than 10- or 25% increments.

Multiple Start-Time Capabilities, which are important in preventing runoff and liability issues, particularly on sites with severe slopes, clay-based soils or high precipitation rates.

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Rain Delay Programs that can automatically reactivate the control system after the programmed number of days.

Electrical and Flow Diagnostic/Alert Functions, which can be invaluable on larger sites, as they warn operators of faulty or interrupted wiring or a breach in the system.

It's been established that a monstrous reservoir of evolving system technology is available to you, so take the time to investigate local dealers and distributors. Ask about training, programming, warranties and callbacks—these are essential services with today's advancing controller technology. In addition, inquire about the following:

Design/installation features

- What is the life expectancy of the controller?
- What safety features are included or available as part of the control system?
- What are the options for future upgrades?
- Does the control system meet all applicable local codes?
- What about lightning and other power surge protection issues?
- What water-conservation features are available?

Specific design/operating parameters

- Does the system provide rain override capabilities?
- What about rain sensor, wind sensor or moisture sensor capabilities?

- What is the recommended programming for the controller?
- What are the specific programming capabilities of the system?
- How (and how long) are programs saved in the event of a power outage?
- Are their customer "support groups" with whom the operator(s) can consult (and console)?
- How does the control system link and communicate with other system components (pump controls, weather stations, moisture sensors, etc.)?

Warranties

- Who, if anyone, provides start-up and adjustment services?
- What are the warranties on individual components of the control system, and control system design performance?
- Are the providers (manufacturers and distributors) financially capable of standing behind the warranties?
- What is the availability of replacement parts?
- We've always had irrigation control technology at our fingertips - but now those fingertips are dancing across a computer keyword, not wrapping around a cold, dripping sprinkler in the dead of night.

This article was contributed by the American Society of Irrigation Consultants (ASIC), www.asic.org. ■

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