



Is Your Irrigation System Ready For Tomorrow's Challenges

BY **STUART HACKWELL**

INCREASED EMPHASIS ON WATER CONSERVATION, REGULATION, AND QUALITY MEANS GOLF COURSE OPERATORS SHOULD EXPECT A GREATER FOCUS ON IRRIGATION WATER CONSUMPTION.

Modern, state-of-the-art, irrigation systems have valuable features available to help address future issues.

If a course is upgrading their system or purchasing a new one, the right golf irrigation decisions made today will enable the course to be ready to meet future challenges. An irrigation system is one of the largest single investments that will be made for most golf courses. Irrigation systems for an 18-hole facility can easily cost between \$1 and \$3 million depending upon the geographic location of the golf course and the sophistication of the irrigation system.

In today's economy some golf course operators are making irrigation product decisions based on the difference in price of a few thousand dollars on a multi-million dollar system. In some cases they end up purchasing systems that use old technology. It may be cheaper initially but the older technology is not ready to address future challenges afforded by newer, state-of-the-art irrigation technology.

OLD TECHNOLOGY: ONE-WAY COMMUNICATION

Irrigation control systems that use old one-way communication technology are still available. Control systems with one-way communication are generally less expensive to purchase but greatly limit future flexibility. One-way communication between the central control computer and the field devices means the central control computer sends out instructions to the field, but there is no feedback available from the field. It's a one-way download of information. A control system that uses "paging technology" is one example of older one-way communication technology.

Some users have considered an irrigation control system as a big on/off switch. For these users, the limitations associated with one-way communication were an acceptable consequence. The increased emphasis on dynamically adaptable and highly efficient irrigation water management means that

the time for one-way communication in the golf irrigation industry has come and gone.

STATE-OF-THE-ART TECHNOLOGY: TWO-WAY COMMUNICATION

State-of-the-art irrigation control systems today incorporate two-way communication between the central control computer and the field devices. In addition to receiving information from the computer, two-way communication enables the field satellites or decoders, depending upon your irrigation system, to feed key information back to the central control computer.

This feedback can include simple information like sprinkler operation, but more importantly provides the user with a sophisticated two-way communication "network" to incorporate sensors and other technology into the control system.

In tomorrow's world, sensors and other devices capable of sending information back to the central control computer are expected to play a larger role optimizing irrigation system performance. The irrigation system will be much more than a start/stop mechanism for sprinkler operation.

Incorporating two-way communication technology between the central control computer and the field is the key to success. Ensuring the irrigation control system has two-way communication means the golf course will be prepared to incorporate sensors and other technology in the future.

Managing rainfall: Imagine having a series of rain gauges around the golf course that automatically relays rainfall information to the central control computer via the two-way communication path. The system automatically responds to incoming rainfall information from each part of the course: pausing and re-starting the irrigation system and adjusting sprinkler run times based on rainfall activity.

Receiving rainfall information from an automated rain gauge in the middle of the night has little value unless the central control software immediately takes action based on thresholds established by the user. This technology is available today using two-way communication. A number of golf courses have implemented the technology with great success, saving large amounts of water. It is an indication of future potential

as golf course superintendents more actively use sensors.

Pump station communication: Communication between the pump station and the central control computer enables the irrigation system to operate more efficiently. Many golf course superintendents will artificially limit system capacity to prevent the pump station from shutting down on low pressure.

A buffer of 10-20 percent is common and the pump station only operates at 80-90 percent of its design capacity. With modern technology and communication between the pump station and the central control computer this buffer can be eliminated.

Using this communication the central control software turns sprinklers on and off based on actual pump station capacity not theoretical values saved in the computer. This ensures that the pump station operates at peak capacity with minimal risk of low-pressure shutdown.

Operating the pump station at peak capacity saves energy, resulting in lower operating costs. It reduces the overall irrigation cycle time (also known as, water window), which helps to improve playability.

Reacting to rainfall activity and managing pump station flow are two good examples of the benefits associated with two-way communication in an irrigation system. Other sensors quickly gaining in popularity include soil moisture and salinity sensors. These sensors will be incorporated into a dynamically managed irrigation control system if the user has the right control system technology.

Choosing the latest irrigation technology incorporating two-way communication will enable the user to be prepared for future water challenges in the golf industry. Budget constraints should be balanced with the need to be prepared for the future.

The small incremental cost to purchase an irrigation system with modern technology like two-way communication will be repaid many times over in reduced consumption of water, cost of water and energy. **BR**

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