



Irrigation&Drainage By Paul Gannett

Reducing water use with remote weather stations

REMOTE WEATHER STATIONS provide an ideal platform for turf managers looking to reduce irrigation costs and water use. Equipped with soil moisture sensors, they can be used to automate irrigation based on soil moisture, or allow you to monitor soil moisture and optimize irrigation schedules. Typically web-enabled software provides the remote access to data from any web browser as well as the ability to remotely change system settings.

There are two ways to use this technology: one, use soil moisture readings to automatically turn on irrigation when soil moisture levels get low and two, monitor a timer-based irrigation system. In the latter case, you use the soil moisture data to verify that the desired range is being obtained and then adjust the irrigation schedule as needed.

In the first case, system alarms are configured to activate the

irrigation system when the soil moisture goes below the desired minimum, and to turn the system off when the soil moisture nears saturation. The set points depend on the soil type. Multiple soil moisture sensors can be deployed to get a better profile of soil moisture, and trigger irrigation if any area is too dry. A text-message notification can also be sent when irrigation is turned on. This way you can go out to the site and do a visual inspection to verify that all the sprinkler heads are in fact working.

The other approach is use the remote weather station to verify that the soil moisture is staying within the optimal range for the turf. If not, the irrigation frequency or duration can be increased or decreased as needed. Also, if a pressure sensor is included in the system, alarms can be set up to send a text message any time the pumps turn on.

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A rain sensor can be added since it's often important to know how much rain fell at each site, since rainfall can vary widely over an area. This sensor can also be used to verify irrigation amounts if it is deployed in the irrigated area (if using a sprinkler-based system.) You also can add a second pressure sensor to your station to monitor filter clogging. This is done by connecting a pressure sensor to the lines on either side of a filter. When there is a large pressure drop across the filter, it means the filter needs to be cleaned.

Remote weather stations can save you time and money by boosting monitoring efficiency in three ways:

Reducing the cost of maintaining a weather station. After initial system deployment in the field, many things can happen. No matter how well-built and durable the hardware and sensors, rodents chew through cables; birds nest in rain

gauges; and lightning and vandals strike. What's more, different seasons may require you to change logging intervals or set an alarm weeks or months after you deploy your station.

The truth is, many users check on their weather stations, if possible. Data is just too valuable to risk losing it. These units allow you to log on to the Internet to ensure that things are running smoothly and make adjustments. If a problem is detected, you can make a field visit to fix the problem.

Reduce the cost of retrieving data. Visiting the field to retrieve data requires money and time. There may also be instances where you will need to do more than just download your data; field sampling or qualitative observations may be best done under certain environmental conditions, and it is good to know that you are not wasting time visiting a field site under suboptimal conditions.

Downloading your data remotely also means that there's no need to worry about taking a laptop computer out into the field. And since your data is available over the Internet, you can share it with colleagues from your office.

Reduce the costs associated with losing data. Remote communications lets you know if something is wrong as soon as you check your data on the Internet, or you can even set up sensor and system alarms that immediately notify you by email or text message when something goes wrong. It may even be possible to fix the problem from your desk. This reduces the chances of losing your data due to some type of system error. ■

Paul Gannett is with Onset Computer Corporation, www.onsetcomp.com, which offers the HOBO U30 remote monitoring system that incorporates either built-in GSM cellular or Wi-Fi communication.

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