

SWAT Recommended Supplemental Requirements for Inclusion of “Add-on¹” Type Smart Irrigation Control Devices Designed to Work with Common Controllers from Multiple Manufacturers

Background

There are two general classes of smart controls for use in the residential/light commercial sector that are independent of any classification by sensing capability employed. First, there are stand-alone devices in which smart control is an integrated capability of a single controlling device (i.e. the irrigation controller). Alternatively, smart control can be accomplished by using an “add-on¹” type of device that modifies an existing automated irrigation system with an irrigation controller to a smart system with the addition of the device, when both devices are appropriately programmed.

In a common application, the add-on¹ configuration involves installing the smart control device to the common and/or control wires for the valves and then programming the non-smart irrigation controller to a summer peak irrigation demand schedule. Smart control proceeds as the smart add-on¹ type device decreases irrigation from that peak point as the environmental parameter(s) sensed indicate and dictate, according to the device’s logic, in order to assure scheduling of irrigation through-out the year is accomplished efficiently. The device interrupts the otherwise standing irrigation controller’s program. There may be other non-peak reduction based approaches to using add-ons¹ that are valid as well.

Issue

While SWAT tests add-on¹ type climatological and soil moisture sensor-based smart control devices, efficiency specification agencies sometimes mandate that only specific tested *combinations* of product selections qualify for a specification. This typically occurs when it is the combination that is deemed necessary for efficient operation (or any operation) to occur. A current example is that of high-efficiency toilets (HETs) in which only tested combinations of the toilet and tank qualify as WaterSense labeled as certified by the EPA.

In this particular situation, EPA had initially indicated that the agency considers add-on¹ type smart controller configurations to be in the same class as the above example. In this perspective, theoretically only a specific combination of irrigation controller and add-on¹ type smart product would be considered to meet the certification requirement. Thus every combination of controller and add-on¹ found at properties applying for an efficiency specification would have had to go through SWAT-style testing.

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In subsequent discussions, the EPA has come to understand that there is a great deal of practical commonality in most installed configurations of add-ons¹ and indicated its willingness to consider a compromise position in which the following considerations were assured:

- Declared characteristics that irrigation controllers need to have to work properly with an add-on¹ type smart control device.
- That SWAT tests each add-on¹ type device with a specified minimum number of different controllers representative of the majority of the marketplace.

Valid results from testing with the minimum number of controllers would be considered to assure smart control capability so long as the installed irrigation controller had the specified features.

Proposal and Suggested Language

An add-on¹ type smart control device shall be considered to satisfy the specification when:

1. The standard irrigation controller used with the add-on¹ type device:
 - A. Is a typical 24VAC irrigation controller.
 - B. Has at least two programs.
 - C. Has one or more common wires into which the installation of an add-on can be practically accommodated.
2. The add-on¹ will have the capability, at a minimum, to be installed as an interrupt type device on the common and/or control wires for the controller.
3. The add-on¹ will have completed an initial SWAT test.
4. The add-on¹ will be capable of providing quality operation with the irrigation controllers a manufacturer declares are compatible with the add-on as evidenced by SWAT testing with a minimum of four common irrigation controllers in addition to the original test. The selection of controllers from the declared compatibility list will be designed to provide for market representation, diversity in programming capabilities and diversity of controller manufacturers (at a minimum, four different manufacturers are required). Selection of these will be by the lab conducting the test. The test employed will otherwise match the SWAT testing protocol currently in use.

While the actions presented here will evaluate the add-on device's ability to interrupt the controller per the installation configuration alluded to in item 1 (above), if the add-on¹ has

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dedicated ready outputs to use additional ports on a controller for its intended operation (such as rain or soil moisture interrupt), the lab will monitor and report results for these during the test as well.

Exclusions

The recommendation is designed to provide guidance for reasonably assuring common SWAT tested add-ons¹ will work with the vast majority of common irrigation controllers. There are however a small minority of irrigation control system configurations for the residential and light commercial market that this recommendation cannot reasonably cover. Some of these are listed below.

1. Systems where valves are controlled wirelessly.
2. Systems where valves are not actuated by the specified voltage.
3. Systems that do not operate using a common wire that can be interrupted.
4. Systems where the valves communicate back to the controller in a manner that will be inhibited by the add-on.

It should be noted that there is nothing, conceptually at least, that would exclude future “parallel” add-on supplemental requirement systems like the one recommended here from being developed. It must be understood however that at this time it is unreasonable to expect that this particular recommendation can, for example, guarantee that because an add-on could successfully manage even four different manufactures’ wireless systems, it could then be considered valid for all wireless systems.

Approval and Posting

Approval of a completed test (by both SWAT and the add-on manufacturer) and posting of results will be accomplished in a manner similar as to that for existing SWAT qualified control technologies. The IA will, however, clarify which types of devices are add-ons¹ and which have completed the above supplemental testing. Neither the lab nor SWAT will be responsible for evaluating any other installations or for manufacturers’ claims of compatibility between add-on¹ devices and specific irrigation controllers.

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