

## WaterSense® Draft Specification for Weather-Based Irrigation Controllers

### 1.0 Scope and Objective

This specification establishes the criteria for weather-based irrigation controllers labeled under the U.S. Environmental Protection Agency's (EPA's) WaterSense program. It applies to both stand-alone and add-on controllers (collectively referred to in this specification as controllers) that utilize current climatological data and some form of evapotranspiration (ET) data as a basis for scheduling irrigation. This specification applies to controllers that calculate real-time crop evapotranspiration (ET<sub>c</sub>) based on reference evapotranspiration (ET<sub>o</sub>) by:

- Using onsite sensor(s) to calculate ET<sub>o</sub>;
- Using onsite sensor(s) to modify historical ET<sub>o</sub>;
- Receiving weather data from a real-time remote source to calculate ET<sub>o</sub>; or
- Receiving direct ET<sub>o</sub> data from a remote source.

This specification is designed to ensure the controller has the ability to provide adequate and efficient irrigation while minimizing potential runoff.

This specification applies to residential or light commercial products with 16 or fewer stations that are designed and sold for use at homes and similar scale light commercial and institutional properties.

### 2.0 Summary of Criteria

Controllers must meet criteria in the following areas, as applicable:

- Irrigation adequacy shall be greater than or equal to 80 percent and irrigation excess shall be less than or equal to 5 percent, as specified in Section 3.0.
- The controller must conform to the supplementary feature requirements specified in Section 4.0.

### 3.0 Performance Criteria

The controller shall be tested in accordance with the Smart Water Application Technologies™ test protocol for climatologically based controllers (Draft 8, September 2008) with the additional requirement listed in Section 3.1, and shall meet the criteria in Sections 3.2 and 3.3.

- 3.1 Minimum Runtimes – All runtimes (irrigation cycles) that occur during the test period must be greater than three minutes in duration.
- 3.2 Irrigation adequacy, as defined in the SWAT protocol, shall be greater than or equal to 80 percent.

- 3.3 Irrigation excess, as defined in the SWAT protocol, shall be less than or equal to 5 percent.

#### **4.0 Supplementary Feature Requirements**

The controller shall meet the following supplementary feature requirements:

- 4.1. Non-Volatile Memory – The controller shall include a storage device or mechanism to preserve the contents of the irrigation program and settings when the power source is lost and no backup battery is available.
- 4.2. High-Performing Irrigation Controller – If the controller loses the real-time weather input or signal, the controller shall default to a high-performing conservation controller with the features outlined below.
- 4.2.1. Multiple programming capabilities – The controller shall be capable of storing a minimum of three different programs to allow for separate schedules for zones with differing landscape needs.
- 4.2.2. Multiple start times (cycling, cycle/soak, stackable start times) – The controller shall be capable of a minimum of three different start times to allow for multiple irrigation cycles per day on the same zone for areas prone to runoff.
- 4.2.3. Variable runtimes – The controller shall be capable of varying runtimes, for example three minutes to a minimum of one hour.
- 4.2.4. Variable scheduling – The controller shall be capable of interval scheduling (up to a minimum of 14 days) to allow for watering on even day scheduling, odd day scheduling, calendar day scheduling, and interval scheduling.
- 4.2.5. Diagnostic circuitry – The controller shall have some mechanism for informing the user when the signal is lost and the controller is not operating in weather-based mode.
- 4.2.6. Percent adjust (water budget) feature – The controller shall include a “percent up/down adjust” feature (or “water budget” feature) such as a button or dial that permits the user to increase or decrease the runtimes or application rates for each zone by a prescribed amount or percent, by means of one adjustment without modifying the settings for that individual zone.
- 4.3. Zone-by-Zone Control – The controller shall have the capability to implement runtimes specific for each zone (station) at a minimum using the following attributes:
- 4.3.1. Plant type, crop coefficient values, and/or depth of root zone
- 4.3.2. Soil type
- 4.3.3. Slope

- 4.3.4. Sprinkler type and/or precipitation rate
- 4.3.5. Cycle/soak (either manually programmed into the controller or through automatic calculations)
- 4.4. Ability to Comply With Potential Utility Drought Restrictions – When operating in ET mode, the controller shall have the following capabilities in order to comply with potential utility drought restrictions:
  - 4.4.1. Assigned day of week scheduling – Ability to operate on any prescribed day of the week schedule (for example, Monday-Wednesday-Friday, or Tuesday-Thursday-Saturday, or Tuesday-Friday, etc.).
  - 4.4.2. Skip-day interval scheduling – Ability to operate on an every-other-day or every-third day schedule. Alternatively, the controller could operate on a skip interval between 0 and 30 days.
  - 4.4.3. Even/odd scheduling accommodating a day exclusion – This feature allows the exclusion of a mow day or if a jurisdiction prohibits a specific day for all users.
  - 4.4.4. Minimum of three start times per program within a 24-hour period.
  - 4.4.5. Ability to set irrigation runtimes to avoid a prohibited time of day – For example, irrigation will not occur between 9 a.m. and 9 p.m.
  - 4.4.6. Complete shutoff capability for total elimination of outdoor irrigation.
  - 4.4.7. Percent adjust (water budget) feature – The controller shall include a “percent up/down adjust” feature (or “water budget” feature) such as a button or dial that permits the user to increase or decrease the runtimes or application rates for each zone by a prescribed amount or percent, by means of one adjustment without modifying the settings for that individual zone.
- 4.5. Rain Management – The controller shall be equipped to interface with a rain device.
  - 4.5.1. The controller shall provide an appropriate “simple” terminal connection to allow a rain device to be connected during or after initial installation of the controller; i.e., retrofittable.
  - 4.5.2. The controller shall recognize a rain device once it is connected.
  - 4.5.3. The controller shall have the capability to stop and/or prevent an irrigation cycle from occurring when a “wet” signal is received from the rain device.
  - 4.5.4. The controller shall prevent all irrigation cycles from occurring until the rain device provides a “dry” signal.

- 4.5.5. The controller shall provide some form of visual display to indicate when the rain device has suspended irrigation.

## **5.0 Effective Date**

This specification is effective on TBD.

## **6.0 Future Specification Revisions**

EPA reserves the right to revise this specification should technological and/or market changes affect its usefulness to consumers, industry, or the environment. Revisions to the specification would be made following discussions with industry partners and other interested stakeholders.

## **6.0 Definitions**

Definitions within the Smart Water Application Technologies (SWAT) test protocol for climatologically based controllers (Draft 8, September 2008) are included by reference.

**Add-on controller** – A product that modifies an existing system equipped with a standard clock timer controller to use current climatological data as a basis for controlling the irrigation schedule. For purposes of this specification, add-on controllers are defined as those that communicate with the standard controller through a common wire connection.

**Stand-alone controller** – A product in which weather-based control is an integrated capability. This includes a single controlling device (i.e., the irrigation controller) or the combination of an irrigation controller and plug-in device (i.e., a device manufactured for a specific irrigation controller or brand of controllers) when certified and sold together.

## APPENDIX A: Informative Annex for WaterSense Labeling

The following requirements must be met for products to earn the WaterSense label.

### 1.0 WaterSense Partnership

The manufacturer<sup>1</sup> of the product must have a signed partnership agreement in place with EPA.

### 2.0 Conformity Assessment

Conformance to this specification must be certified by a licensed certifying body (LCB) accredited in accordance with the WaterSense product certification system.

### 3.0 Testing Add-On Controllers

Add-on controllers shall be tested with at least one standard irrigation controller chosen by the LCB.

### 4.0 Product Set-up

The LCB must set up and program the controllers for testing to the specification requirements. Manufacturers may submit to the LCB product set-up instructions and settings.

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<sup>1</sup> Manufacturer, as defined in the WaterSense Program Guidelines, means: “Any organization that produces a product for market that might be eligible to meet WaterSense criteria for efficiency and performance. Manufacturers may also produce ‘private label’ products that are sold under the brand name of a separate organization, which is treated as a separate partner/application from the original product manufacturer.” In the case of private labeling, the private labeling organization that ultimately brands the product for sale must have a signed WaterSense partnership agreement in place with EPA.