

# This presentation premiered at WaterSmart Innovations

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# SMART WATER APPLICATION TECHNOLOGIES 2013 UPDATE



Brian E. Vinchesi, Chairman,  
Irrigation Association  
Smart Water Application  
Technology Committee and  
Standards and Codes Committee

# WHAT IS SWAT?

- SWAT is a coalition of water purveyors, equipment manufacturers, and irrigation practitioners with shared interests in the Smart Water Application Technologies (SWAT) initiative.
- SWAT is an Initiative of the IA Board of Directors
- Mission: to encourage outdoor irrigation efficiency and water conservation through the use of smart water application technologies.



Join the effort to maximize outdoor irrigation efficiency through the use of "Smart" Water Application Technologies™

Smart Water Application Technologies, or SWAT, is a national partnership initiative of water purveyors and irrigation industry representatives created to promote landscape water use efficiency through the application of state-of-the-art irrigation technologies. This website will help you discover how "smart" irrigation technologies are changing the face of landscape irrigation and the benefits of taking part in promoting efficient water use.



#### Landscape Contractors

Find out how "smart" irrigation technologies can help you grow your business and improve client satisfaction.  
[learn more](#)

#### Manufacturers

Join the "smart" irrigation technologies revolution by supporting Smart Water Application Technologies efforts.  
[learn more](#)

#### New Home Developers

Learn how "smart" irrigation technologies add value and maximize limited water resources to help meet growing water demands.  
[learn more](#)

#### Water Purveyors

#### Irrigation Designers and Specifiers

#### Irrigation Distributors

# SWAT HISTORY



- Since 2002
- Meets Every Year at the Irrigation Show (11/6 - 11/7) - Austin
- Other meetings as necessary
  - February 2003 – Smart Controllers
  - April 2007 – Rain Sensors
  - January 2008 – Soil Moisture Sensors

# STRUCTURE

- **Technology Working Group**
  - Testing Protocols
  - Reports
- **Promotions Working Group**
  - Marketing & Promotions
  - Initiatives
    - Education
  - Fundraising
- **Executive Committee**
  - Oversight
  - Communication with EPA, IA Board and other groups

# PROMOTIONS (PWG)

## Chair

- Carlos Michelin – San Diego County Water Authority
- Water Purveyor Members
  - William Granger – Sacramento Water, California
  - Laurie D' Audney – City of Fort Collins, Colorado
  - JoEllen Jacoby – City of San Diego
  - Kathy Nguyen – Cobb County Water System, Georgia
  - Mark Guthrie – Tacoma Public Utilities
  - Margaret Hunter – New Jersey American Water
  - Pam Pavela – Western Municipal Water District
  - Texas/Southwest – Vacant
- SWAT participation is voluntary!



# PROMOTIONS (PWG)

## Chair

- Carlos Michelin – San Diego County Water Authority
- Industry Members
  - Randy Montgomery (Manufacturer) – Rain Bird, Arizona
  - Brent Mecham (Association) – Irrigation Association, Virginia
  - Danny Motylewski (Manufacturer) – Hunter, California
  - Ivy Munion (Association) – ASIC, California
  - Christine Hawkins (Distributor) – California
  - Robert Reaves (Distributor) – Davis Pipe & Supply, Oklahoma
  - David Silva (Association) - CLCA
- SWAT participation is voluntary!

# TECHNOLOGY (TWG)

- **Chair**

- Doug MacDonald – Aqua Engineering

- **Members**

- Kent Sovocool- SNWA
  - James White – Ewing
  - Gary Grabow- North Carolina State University
  - Ed Norum – Center for Irrigation Technology
  - Diganta Adhikari – Center for Irrigation Technology
  - Kelly Kopp – Utah State University
  - Michael Dukes – University of Florida
  - Vacant – Water Purveyor
- SWAT participation is voluntary!



# EXECUTIVE COMMITTEE

## Chair

- Brian E, Vinchesi, Irrigation Consulting

## • Members

- Brent Mecham – Irrigation Association
- Dr. David Zoldoske – Center for Irrigation Technology
- Dr. Michael Dukes – University of Florida
- Carlos Michelin – San Diego County Water Authority
- Doug MacDonald – Aqua Engineering
- Kent Sovocool - SNWA

# SWAT PROTOCOLS

- Follows the International Standards Organization (ISO) process except for voting.
- Developed by the IA, stakeholders and independent testing groups
  - Each draft receives a 90 day review
  - All comments reviewed by the technical committee
  - Changes made by the entity leading the protocol development
  - Last draft (minor issues) receives a 30 day review
- Intend to have major review of protocols every three years
- Environmental Responsive controllers going through the ASABE standards process (Weather based and soil moisture)



# COMMENTING

- Notice of comment period being open is posted on website, emailed, announced in E-times and press released
- Comments only through website:  
[www.swatirrigation.org](http://www.swatirrigation.org)
- All comments are posted and may identify who made the comment
- Reminders are sent to email list
- After technical committee review, decisions on comments are posted

## Rain Sensors – 2nd Draft Testing Protocol

Date: 9-29-2009

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No.	Sec.	Comment or Observation	Accept or Reject	N/A or Question	Explanation
		lamps to be used, dry-out period definitions, etc. The two sub-sections should be consistent.			
6	N/A	If the testing agency purchases the rain sensors from a random irrigation dealer, then must the rain sensor be on the market before being tested. Will manufactures be able to use the SWAT rain sensor protocol to beta test rain sensors? Will they have to retest so the testing agency can randomly purchase rain sensors?		Question	Only devices that are commercially available are to be SWAT tested. While a manufacturer could decide to do beta testing on a product outside of the SWAT testing system using the same protocol (and even lab, if desired), results for such a beta test are not acceptable for SWAT and the manufacturer would have to submit for testing (or retesting) as normal. The current version of the protocol is silent on how the lab actually must acquire the sensors.
7	N/A	I believe that the automatic rain sensors are of critical importance especially in locations like southern California where we are in the third year of drought and saving every drop of water counts. The largest yearly cost the Association has is the cost of water. And sensors like these can make a big difference in helping us not to over water. We would like to do a recycled water irrigation system for the complex in cooperation with our local water district. The idea that I would like to recommend to you is to develop the ability to integrate these sensors into recycled water irrigation systems. That would really help bring about major savings and make irrigation water be used as efficiently as possible.		N/A	Thank you for your insights and your interest in seeing rain sensors subjected to performance testing.
8	2.2	Under 2.2 Problem Statement and Project Need, the first sentence that references Florida Statute 373.62 rain sensor installation, this language has just recently been revised and is effective July 1, 2009. Senate bill 494 has been signed and the new language is as follows: "Any person who purchases and installs an automatic landscape irrigation system must properly install, maintain, and operate technology that inhibits or interrupts operation of the system during periods of sufficient moisture." So owners are not limited to rain sensors, other technology can be used as well.	Accept		Removed specific language in Section 2.2.
9	N/A	The SWAT Rainfall Shutoff Device test should prove to be a valuable, much needed performance gauge and we appreciate the proactive approach on increasing public awareness with this first step protocol.	Accept		Thank you for your insights and your interest in seeing rain sensors subjected to performance testing
10	3.3	The ability of the rainfall simulator to maintain 95% distribution uniformity over the 20 week test and between tests is a concern to us. Will the distribution uniformity across the testing area be validated periodically		Question	Yes, the uniformity will be periodically validated. The rainfall simulator has been measured to have uniformity similar to natural rain events in the 90-95% range

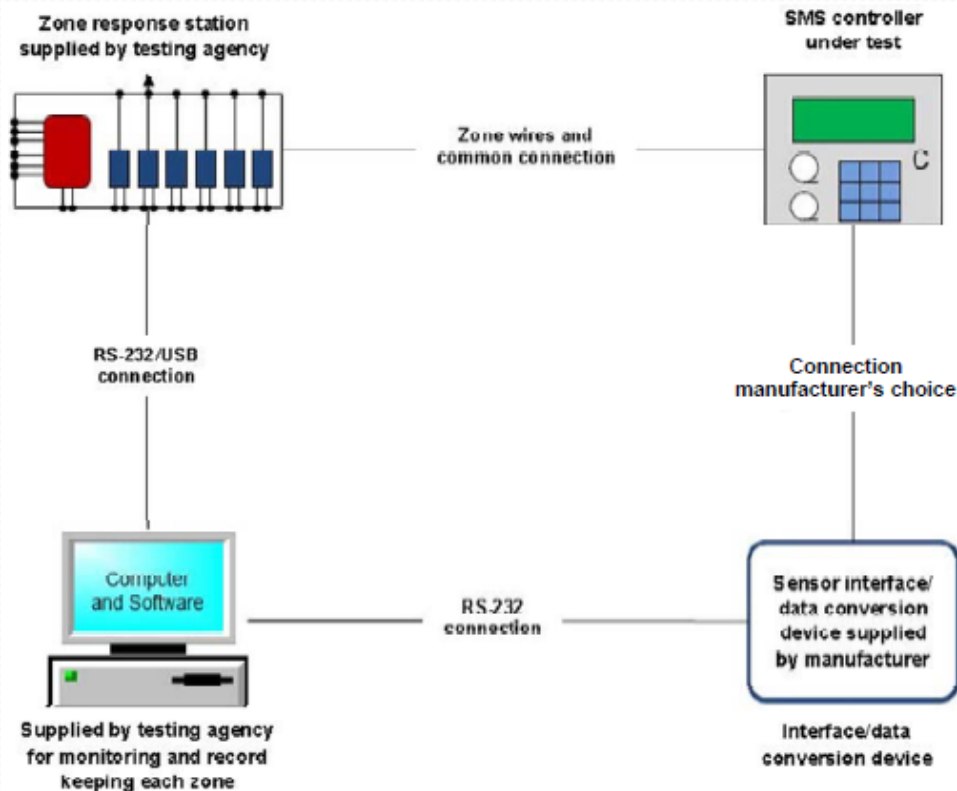
# CLIMATE BASED CONTROLLERS

- Draft 8 is the Testing Protocol
- Residential and Small Commercial Controllers
- Results: 35 Controllers tested and posted (17 manufacturers)
- Status: Basis for EPA WaterSense Climatological Based Controller Labeling
- 174 Controller Series Labeled representing 10 manufacturers
- ASABE Committee formed to develop it into a testing standard.





# SOIL MOISTURE SENSORS



- Version 3.0 is the Testing Protocol (combination of phase I and phase 2)
- Results: 9 Sensors Tested and Posted (7 manufacturers)
- Status: Testing
- ASABE Committee formed to develop it into a testing standard
- Lead: Center for Irrigation Technology
- EPA Developing Labeling Specification

# RAIN SENSORS



- Version 3.0 is the Testing Protocol
- Equipment Functionality
- Results: 2 Sensors Posted (1 manufacturer)
- Status: Testing
- Lead: University of Florida



# RAIN SENSORS



**Irrigation**  
ASSOCIATION™

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[www.irrigation.org](http://www.irrigation.org)

## Smart Water Application Technologies™ (SWAT™) Performance Summary

Testing Agency:	University of Florida	<a href="http://abe.ufl.edu/mdukes/">http://abe.ufl.edu/mdukes/</a>
Testing Period:	January 2010 to May 2011	
Product Type:	Immediate response rainfall shutoff device	
Product Make and Model:	Hunter Wireless Rain-Click™	
Product Description:	Rain sensing device that interrupts irrigation system operation with minimal rainfall	

### SWAT Protocol\*: Rainfall Shutoff Devices 3<sup>rd</sup> Draft Testing Protocol (October 2009)

This protocol provides a standard procedure for evaluating the performance and reliability of rainfall shutoff devices, with respect to the rainfall depth before rainfall shutoff devices switch to interrupt mode, and the accuracy, precision, and variability of their set points. Tests are performed by attaching eight rainfall shutoff devices of a specific brand to a datalogger and placed under a rain simulator. Each sensor is tested 8 times for each threshold setting. Results indicate the ability for the device to reliably bypass irrigation during rainfall events that meet or exceed the set threshold.

\*All SWAT protocols may be viewed at <http://www.irrigation.org/swat/>

### SWAT Performance Report: Hunter Wireless Rain-Click™ Sensor

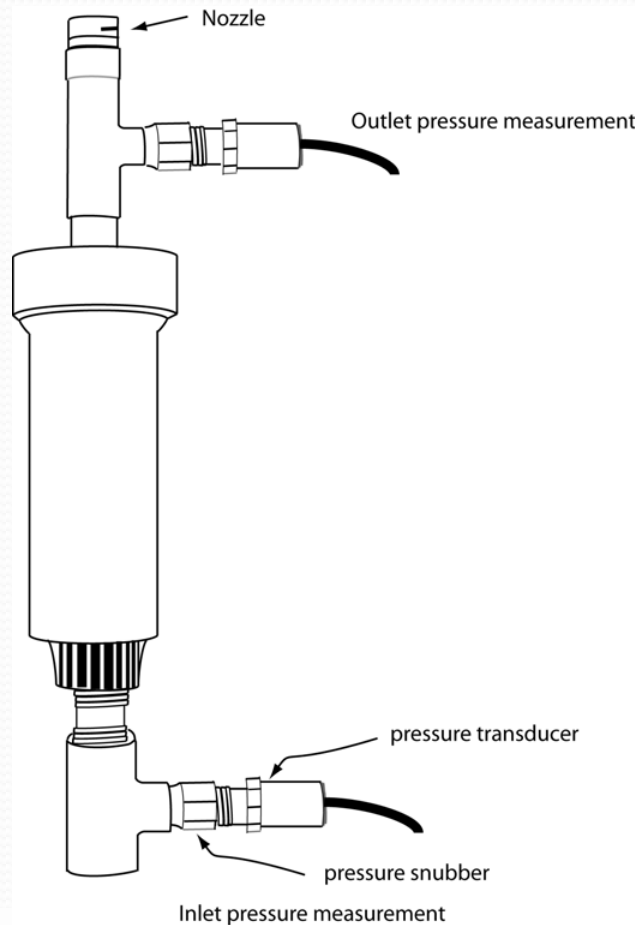
Set Points	Immediate response sensor does not have adjustable set points	
Average Rainfall Intensity (inches per hour)	1.26	
Average Depth of Rainfall before shutoff (inches)	0.02	
Average time to switch off based on rainfall intensity	61.3 seconds	
Variability between sensors--Coefficient of Variation (%)	20.5	
Accuracy(%)	Average	Not applicable for immediate response sensors
	Standard Deviation	n/a
Rainfall Events Not Detected (64 total tests performed)	1	
Shutoff in the Absence of Rainfall (64 total tests performed)	0	

### Manufacturer's Product Specifications and Features

[www.hunterindustries.com](http://www.hunterindustries.com)

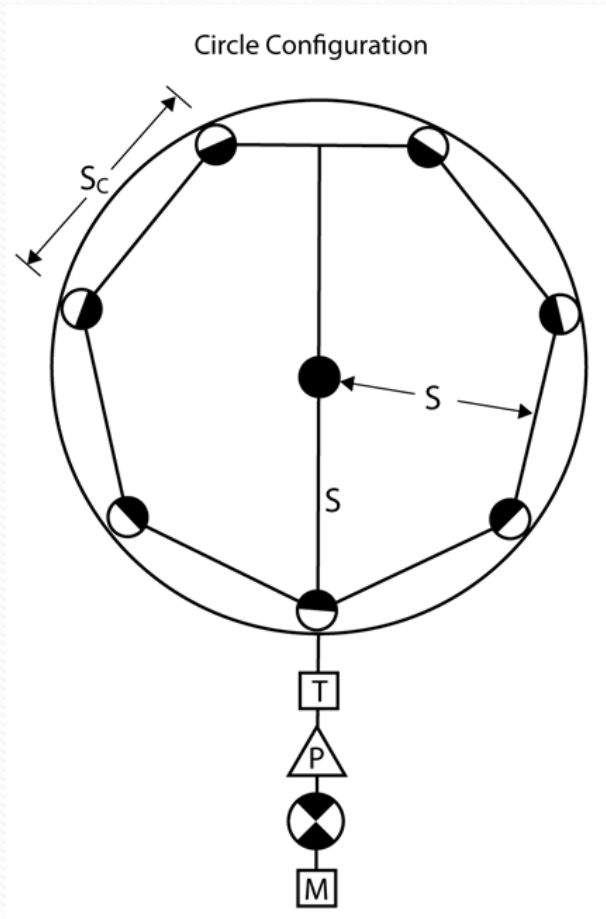
Technology Used	Electrical Specification	Reset Time	Additional Information
Hygroscopic discs	Receiver 22-28 VAC 100mA from transformer	Quick Response unit 4 hours maximum under dry conditions for reset	Receiver includes built-in bypass switch.
<b>Models:</b>	UL listed	3 days maximum under dry conditions for total rainfall compensation unit	Works with all standard controllers.
• WR-Click Wireless Rain Click	Low power radio frequency using 433.92 MHz band	Adjustable vent ring to adjust reset delay	10-year battery life (replaceable)
• WRF-Click Wireless Rain/Freeze-Click	Transmitting range up to 800 feet line of sight		No required maintenance
	Wiring: normally closed or normally open		Optional gutter mount included

# PRESSURE REGULATING SPRINKLERS



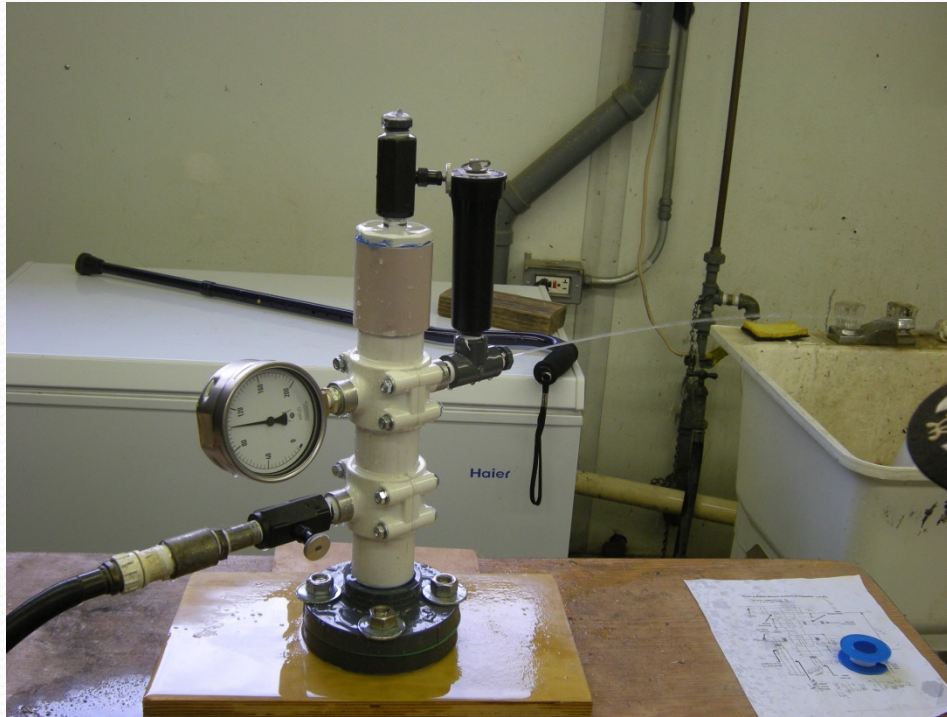
- Version 3.0 is the Testing Protocol
- Equipment Functionality
- Results: None
- Status: Testing
- Lead: North Carolina State University
- Testing: Center for Irrigation Technology

# HIGH UNIFORMITY SPRINKLER NOZZLES



- Version 2.0
- Equipment Functionality
- Results: None
- Status: Public  
Comment period closes on October 10<sup>th</sup> – reviewing comments – 30 day review
- Lead: Utah State University

# SPRINKLER HEAD CHECK VALVES



- Version 2.1
- Equipment Functionality
- Results: None
- Status: Public  
Comment period closed on May 7<sup>th</sup> – comments reviewed – 30 day review soon
- Lead: Center for Irrigation Technology

# STANDARDS

- Currently there are a number of standards being developed for various irrigation products by:
  - International Code Council (ICC)
    - Sprinklers
    - Controls (UL - Hold)
    - Rain Sensors (Moving to ASABE)
  - American Society of Agricultural and Biological Engineers
    - Landscape Water Use – out for public comment
    - Environmentally Responsive Controller Testing
    - Soil Moisture Sensors
    - Landscape Irrigation Auditing

# SWAT TOOLS FOR WATER PROVIDERS

- **Marketing toolkit**

- Smart controller statement stuffers
- Homeowner smart controller direct mail package, self-mailer and jumbo postcard
- Contractor smart controller self-mailer and jumbo postcard

- **Customizable web template**

- Web pages to promote smart technologies
- Website resources – [www.swatirrigation.org](http://www.swatirrigation.org)



# WATERSMART

- **WaterSmart Innovations – Last 6 Years**
  - SWAT Updates
  - Poster Sessions
  - SWAT History Timeline
  - Get Swatted Campaign
  - SWAT Roundtable Discussions
    - Educational Initiatives
      - Introduced Survey in 2011
      - Showed Results in 2012
    - Standard Updates



# WATERSMART 2013

- **Strategic Planning**

- On Monday SWAT had a half day long strategic planning session facilitated by Jill Hoyenga – Eugene Water and Electric Board

- **Goals**

- Is SWAT still relevant?
- Is the mission of SWAT different today than it was in 2002?
- How does SWAT and EPA WaterSense labeling fit?
- What are the role and objectives of SWAT?
- TWG and PWG alignment.
- Where does SWAT need to be in the next 10 years?
- 90 Day working plan.

# LEARNING MORE

- To participate in the SWAT working groups and task teams, contact Brent Mecham or I.  
([bvinchesi@irrigationconsulting.com](mailto:bvinchesi@irrigationconsulting.com))  
([brent@irrigation.org](mailto:brent@irrigation.org))
- To receive periodic SWAT email updates on technical and/or marketing efforts, sign-up at [www.irrigation.org/swat](http://www.irrigation.org/swat).
- Keep an eye on our website: [www.swatirrigation.org](http://www.swatirrigation.org)
- To contribute to SWAT, contact the Irrigation Association at 703-536-7080.

# QUESTIONS



[www.swatirrigation.org](http://www.swatirrigation.org)