

# Smartfield™

*Growing a Greener Future*



## **SmartCrop® Sensors Installation Guide**

Only Smartfield™ trained and certified installers are authorized to install and maintain equipment.

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This guide is frequently updated to reflect changes in the product. The latest version can always be found at <http://www.smartfield.com/>

## Instructions to the User

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operations with non-approved equipment or unshielded cables are likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

## Table of Contents

	Page
<b>Introduction</b>	<b>2</b>
<b>Guidebook Conventions</b>	<b>3</b>
<b>Important Safety Precautions</b>	<b>3</b>
<b>Contents/Tools Needed</b>	<b>3</b>
<b>Installation</b>	<b>3</b>
<b>Warranty</b>	<b>4</b>

## Introduction

Congratulations, you have just purchased the SmartCrop® Sensors, one of the most advanced irrigation management tools available.

### Listen to your crop..... It's talking to you

Your crop is telling you when it is experiencing heat stress and needs water. The SmartCrop® Sensor is smart technology that uses infrared (IR) temperature sensing technology coupled with patented USDA algorithms and methodology to determine when your crop is experiencing heat stress brought on by lack of water. SmartCrop® Sensor provides growers a simple "IRRIGATE / DON'T IRRIGATE" signal that can be seen on the web or even on your cell phone. In addition to irrigation signals, the SmartCrop® Sensors provide temperature and other environmental data via the CropInsight.com web site.

### SmartCrop® Sensor

The SmartCrop® Sensor is a long plastic tube that contains the electronics used to measure, collate, and transmit crop canopy data. At the heart of the Sensor is an industrial infrared (IR) temperature-sensing device that measures the actual temperature of the crop canopy.

### How it works




This temperature data is collected and processed by a microprocessor in the SmartCrop® Sensor. At 15-minute intervals, the microprocessor turns on the radio transmitter and sends the latest set of temperature data directly to the Base Station. The Base Station collects the crop canopy data from each Sensor. Using the crop canopy temperatures from each Sensor, along with other localized environmental measurements, the web server determines if the crop is in stress or not. This decision process is performed every 15 minutes throughout the day.

The CropInsight™ web site keeps track of how much stress is accumulating in the crop and will signal for irrigation when a minimum stress time has been reached. This stress time, along with other crop factors is easily programmed into the web site during setup and these factors can be changed remotely during the growing session.






## Guidebook Conventions

To highlight the most important points – we have used a set of simple icons, which draw attention to key information and settings.

### Key:

	The Check Icon indicates a setting that we recommend you use or enable.
	The Info Icon highlights important facts and information about SmartCrop® Sensors, to help you make better use of the product.
	The Hazard Icon highlights areas where potential problems can arise

## Important Safety Precautions

	<b>Warning:</b> Before installing this product, read and follow all warning notices and instructions, which are included. Failure to follow safety warnings and instructions can result in severe injury or property damage.
	Only Smartfield™ trained and certified installers are authorized to install and maintain equipment; non-certified installations void equipment warranty.
	<b>Important:</b> DO NOT begin installation until all utility lines have been located and marked by your local utility company. Digging without knowing the location of utility lines can result in a damaged system, injury or death.
	This manual contains important information about the installation, operation and safe use of this product. This information should be given to the owner and / or operator of this equipment.
	<b>CAUTION:</b> To comply with FCC RF exposure compliance requirements, a separation distance of 20 cm must be maintained between the antenna of this device and all persons.

### Contents - Box 1

SmartCrop® Sensor  
Two (2) "AA" batteries  
1 Mounting bracket assembly

### Contents - Pallet

One (1) six foot (6') inside pole

### Contents - Box 2

One (1) spade  
Two (2) ¾ x ½ bolts  
Two (2) ¾ lock nuts

## Tools & Materials Needed but Not Included

¾ inch open wrench	Post level
¾ inch deep socket wrench	Post driver
Phillips screwdriver	Post driver cap
Dyke pliers	GPS locator device

## Installation


- Assembling the spade pole
  - Get 6' inside pole
  - Bolt spade into holes 10 & 11 from the bottom with two (2) ¾ x ½ bolts and two (2) ¾ locknuts.
- Driving post
  - Select placement of sensors. Sensors should be placed on an inside row and at an accessible location. For best results, make sure the sensor is not placed on a hill or low spot.
  - Holding the 6' inside pole with the spade of the post to face north. Place the driver cap on the top of the post to prevent warping; drive the pole into the ground until the spade is completely underground. Note: Using the post level, make sure the post is level and plumb; a slight slant in this could effect the rain gauge and rain measurements.

### 3. Sensor battery install

- Gently twist the lid counterclockwise of the Field Sensor tube to remove the inside panel.
- Install "AA" batteries into the battery holder. **Note:** There will be a series of flashing lights on the back of the panel when batteries are inserted.
- Insert the panel back into the sensor tube and twist clockwise to close.



**Figure 1:** Inside panel of sensor showing where to install "AA" batteries.

	Be careful not to drop the sensor, expose the sensor to water or touch any of the panel components.
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### 4. Mounting bracket assembly:

- Snap the sensor into the mounting bracket assembly and snap the bracket closed.




**Figure 2:** Showing the sensor snapped into the mounting bracket assembly with the white stripe facing up.



**Figure 3:** Drain hole pointing down and on the bottom.

### 5. Setting the Sensor height

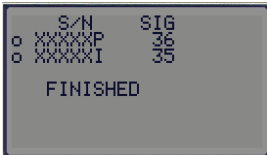
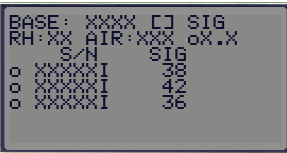
- Place the steel bracket on the post. Adjust the height of the sensor by moving bracket up and down on the post and secure by twisting the black knob. Note: The orientation of the SmartCrop Sensor should be placed at a 45° angle.
- The Field Sensor reads a 1:1 ratio to plant; i.e.: 1 foot away = 1 foot circular read area – adjust height accordingly.
- The height of the sensor will need to be adjusted throughout the growing season in order to get correct readings.

	Using a GPS device, record the location (coordinates) of the Sensor(s). Type these coordinates in CropInsight Field Notes section for easy location of the sensors.
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## Learning SmartCrop® Sensor to the Base Station

- At the Base Station, verify that the Sensor serial numbers are appearing on the Base Station display screen.
  - If so, scroll down using the "Down" arrow and highlight the first serial number and press the "Enter" button. The radial button to the left side of the serial number will become a solid radial button. **Note:** Repeat for all sensor serial numbers then proceed to Step 2 below. **Note:** Record sensor serial numbers for CropInsight.com setup.
  - If not, check sensor battery pack, base station antennae and sensor / base station distance; then continue with Learning SmartCrop® Sensor to the Base Station – Step "a".

7. Scroll down using the “Down” arrow and highlight “Finished” and press “Enter” once, scroll down on the second screen and select “Finished” again, and press “Enter” to go back to home screen.



**Figure 4:** Base Station – serial number: xxxxl. “Finished” located at the bottom of the display.

### Smartfield One (1) Year Limited Warranty

Smartfield’s warranty obligations for these hardware products are limited to the terms set forth below: Smartfield, Inc. (“Smartfield”) warrants SmartCrop®, SmartRate™, SmartRate™ PRO, SmartWeather™, PivotScout™, PivotScout™PRO, SmartProfile™, and other Smartfield-branded hardware products against defects in materials and workmanship under normal use for a period of ONE (1) YEAR from the date of retail purchase by the original end-user purchaser (“Warranty Period”). If a hardware defect arises and a valid claim is received within the Warranty Period, at its option and to the extent permitted by law, Smartfield will either (1) repair the hardware defect at no charge, using new or refurbished replacement parts, (2) exchange the product with a product that is new or which has been manufactured from new or serviceable used parts and is at least functionally equivalent to the original product, or (3) refund the purchase price of the product. Smartfield may request that you replace defective parts with new or refurbished user-installable parts that Smartfield provides in fulfillment of its warranty obligation. A replacement product or part, including a user-installable part that has been installed in accordance with instructions provided by Smartfield, assumes the remaining warranty of the original product or ninety (90) days from the date of replacement or repair, whichever provides longer coverage for you. When a product or part is exchanged, any replacement item becomes your property and the replaced item becomes Smartfield’s property. Parts provided by Smartfield in fulfillment of its warranty obligation must be used in products for which warranty service is claimed. When a refund is given, the product for which the refund is provided must be returned to Smartfield and becomes Smartfield’s property.

### EXCLUSIONS AND LIMITATIONS

This Limited Warranty applies only to hardware products manufactured by or for Smartfield that can be identified by the “Smartfield” trademark or “SmartCrop” trademark, trade name, or logo affixed to them. The Limited Warranty does not apply to any non-Smartfield hardware products or any software, even if packaged or sold with Smartfield hardware. Manufacturers, suppliers, or publishers, other than Smartfield, may provide their own warranties to the end user purchaser, but Smartfield, in so far as permitted by law, provides their products “as is”. Software distributed by Smartfield with or without the Smartfield or SmartCrop brand name (including, but not limited to system software) is not covered under this Limited Warranty. Refer to the licensing agreement accompanying the software for details of your rights with respect to its use. Smartfield does not warrant that the operation of the product will be uninterrupted or error-free. Smartfield is not responsible for damage arising from failure to follow instructions relating to the product’s use.

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### OBTAINING WARRANTY SERVICE

Please access and review the online help resources referred to in the documentation accompanying this hardware product before requesting warranty service. If the product is still not functioning properly after making use of these resources, please contact the Smartfield representatives using the information provided in the documentation. When contacting Smartfield via telephone, other charges may apply depending on your location. When calling, a Smartfield representative will help determine whether your product requires service and, if it does, will inform you how Smartfield will provide it. You must assist in diagnosing issues with your product and follow Smartfield’s warranty processes.

Smartfield may restrict service to the fifty states of the United States of America and the District of Columbia, and provide warranty service (i) at a Smartfield repair service location, (ii) by sending you prepaid way bills (and if you no longer have the original packaging, Smartfield may send you packaging material) to enable you to ship the product to Smartfield’s repair service location for service, or (iii) by sending you new or refurbished customer-installable replacement product or parts to enable you to service or exchange your own product (“DIY Service”). Upon receipt of the replacement product or part, the original product or part becomes the property of Smartfield and you agree to follow instructions, including, if required, arranging the return of original product or part to Smartfield in a timely manner. When providing DIY Service requiring the return of the original product or part, Smartfield may require a credit card authorization as security for the retail price of the replacement product or part and applicable shipping costs. If you follow instructions, Smartfield will cancel the credit card authorization, so you will not be charged for the product or part and shipping costs. If you fail to return the replaced product or part as instructed, Smartfield will charge the credit card for the authorized amount.

Service options, parts availability and response times may vary. Service options are subject to change at any time. In accordance with applicable law, Smartfield may require that you furnish proof of purchase details and/or comply with registration requirements before receiving warranty service. Please refer to the accompanying documentation for more details on this and other matters on obtaining warranty service.

If your product is capable of storing software programs, data and other information, you should protect its contents against possible operational failures. Before you deliver your product for warranty service it is your responsibility to keep a separate backup copy of the contents and disable any security passwords. THE CONTENTS OF YOUR PRODUCT WILL BE DELETED AND THE STORAGE MEDIA REFORMATTED IN THE COURSE OF WARRANTY SERVICE. Your product will be returned to you configured as originally purchased, subject to applicable updates. You will be responsible for reinstalling all other software programs, data and passwords. Recovery and reinstallation of software programs and user data are not covered under this Limited Warranty.

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