

# Smartfield™

*Growing a Greener Future*

Image of Vertical Sensor  
goes here.

## **Vertical Sensor 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 is 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.

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## Introduction

Congratulations, you have just purchased the Smartfield Vertical Sensor, 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.

## Vertical Sensor

The Vertical 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. With the Vertical Sensor, Growers can use the same technology for their tall crops.

## 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

|   |   |
|---|---|
|  | Only Smartfield™ trained and certified installers are authorized to install and maintain equipment; non-certified installations void equipment warranty.  |
|  | Important: 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.                                   |
|  | Warning: 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.           |
|  | CAUTION: 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

One (1) metal post  
One (1) Vertical Sensor  
One (1) Spring assembly bracket  
One (1) 6 foot outside post  
One (1) Sensor PVC extender  
One (1) ½ inch x  
One (1) U-bolt assemblies  
Two (2) Snap lock pins  
One (1) User Guide  
One (1) Warranty Information  
One (1) Spade  
Two (2) ½ inch – 13x1 inch bolts and nuts  
One (1) 4-arm knob

## Tools Needed

Post Driver  
Post Level  
GPS Locator Device

## Installation

1. Assemble spade pole
  - a. Get 6" inside pole
  - b. Bolt spade into holes 10 & 11 from the bottom with two (2) ¾ x ½ bolts and two (2) ¾ locknuts.
2. Installing "AA" batteries:
  - a. While holding the Vertical Sensor, slightly push the battery clip farther into the sensor to release the metal hook from the inner plastic lip and then gently pull it out. **Note:** The battery clip will only come out far enough to install the batteries.



**Figure 1:** Inside battery clip of a Vertical Sensor showing where to install "AA" batteries.

- b. Install two "AA" batteries and gently reinsert battery clip. **Note:** Make sure the metal hook is grabbed and secured by the inner plastic lip.

## 3. Attaching Vertical Sensor to bracket:

- a. Apply Teflon tape or thread sealant to the male threads of the Vertical Sensor and the extension pole (if applicable).
- b. Twist the Vertical Sensor into the spring assembly bracket until tightly secured. **Note:** Make sure the sensor eye is oriented parallel to the springs and away from the mounting holes.



**Figure 2:** The Vertical Sensor attached to the spring assembly bracket. **Note:** Vertical orientation of the sensor should be 30° relative to the pole.

## 4. Mounting the spring assembly bracket:

- a. Place the spring assembly bracket with attached Vertical Sensor at the preferred height on the post. **Note:** Vertical Sensor should be approximately one foot (1') from the crop.
- b. Secure the bracket into place by using the bolt and twisting the black knob. **Note:** Depending on height of system at time of install:
  - i. If mounting the bracket onto the INSIDE post, slide and secure the bolt into the TOP hole.
  - ii. If mounting the bracket onto the OUTSIDE post, slide and secure the bolt into the BOTTOM hole.

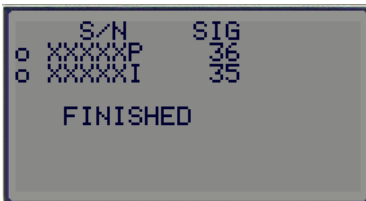
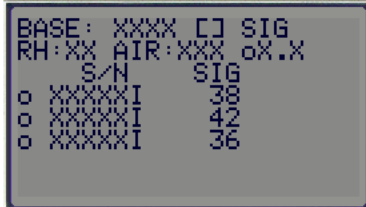


**Figure 3:** Placement of bracket depends on metal post – inside or outside.

## Installation

5. Storing the PVC Extender (if needed)
  - a. Choose a location to store the Vertical Sensor PVC Extender along the metal post to use at a future time. Note: Unless the PVC Extender is attached, make sure the Field Sensor will not hit the pivot. The PVC Extender needs to be installed if the crop is more than 5-foot tall.
  - b. Place the extender flush with the open channel of the post.
  - c. Place the U-bolt around the extender at preferred height on post. Slide metal plate onto bolt and tighten nuts to secure extender to post.
6. Verify Communication:
  - a. Verify the Vertical Sensor serial numbers are appearing on the Base Station screen.
  - b. Scroll and select each serial number. Then scroll and press “Finish” twice to go back to home screen.

**Figure 4:** Base Station – top screen. Serial number: xxxxl



**Figure 5:** Base Station – bottom screen.



**Be careful not to drop the sensor, expose the sensor to water or touch any of the panel components.**

## 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.

This warranty

does not apply: (a) to damage caused by use with non-Smartfield products; (b) to damage caused by accident, abuse, misuse, flood, fire, earthquake or other external causes; (c) to damage caused by operating the product outside the permitted or intended uses described by Smartfield;

(d) to damage caused by service (including upgrades and expansions) performed by anyone who is not a representative of Smartfield; (e) to a product or part that has been modified to alter functionality or capability without the written permission of Smartfield; (f) to consumable parts, such as batteries, unless damage has occurred due

to a defect in materials or workmanship; (g) to cosmetic damage, including but not limited to scratches, dents and broken plastic on ports; or (h) if any Smartfield serial number has been removed or defaced.

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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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