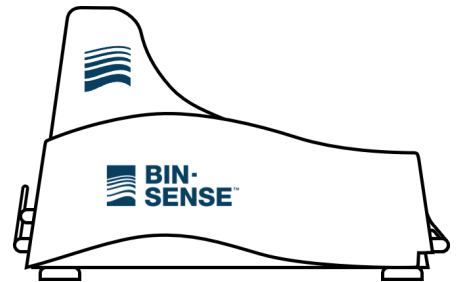
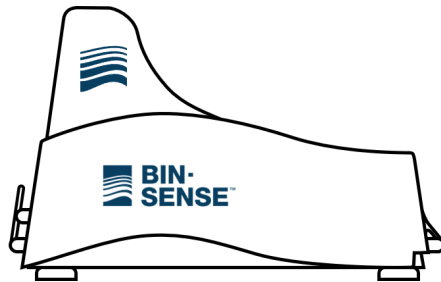
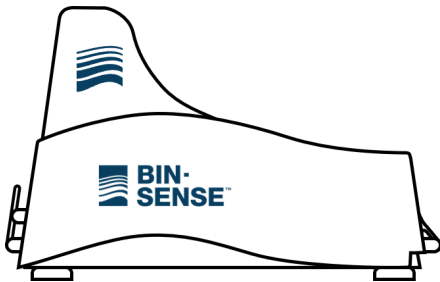
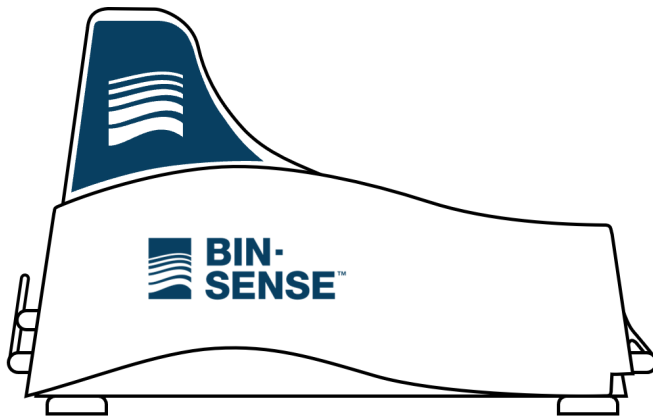




# LIVE SYSTEM

## STARTUP MANUAL





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## CUSTOMER SUPPORT

For warranty service, please contact your local dealer.

For product support, troubleshooting, or additional questions with your Bin-Sense™ device, please contact your local dealer ([www.binsense.com/locate-a-dealer](http://www.binsense.com/locate-a-dealer)) or Calian Agriculture at:



**[support.agriculture@calian.com](mailto:support.agriculture@calian.com)**



**1.833.570.7979**



**[www.binsense.com](http://www.binsense.com)**

## **BIN-SENSE LIVE CERTIFICATIONS**

### **FCC ID MASTER UNIT: 2AUTY-106103MU-V06**

- Contains FCC ID: XPY1EIQ24NN; IC: 8595A-1EIQ24NN

### **FCC ID REMOTE UNIT: 2AUTY-106103RU-V06**

This device complies with part 15 of the FCC Rules.

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly Approved by Calian Agriculture Ltd. could void the user's authority to operate the equipment.

***CAUTION: This equipment has been tested and found to comply with the limits for a class a digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.***

***WARNING: RADIO-FREQUENCY RADIATION EXPOSURE RISK. THIS EQUIPMENT COMPLIES WITH RADIATION EXPOSURE LIMITS PRESCRIBED FOR AN UNCONTROLLED ENVIRONMENT FOR FIXED AND MOBILE USE CONDITIONS. THIS EQUIPMENT SHOULD BE INSTALLED AND OPERATED WITH A MINIMUM DISTANCE OF 20 CM BETWEEN THE RADIATOR AND THE BODY OF THE USER OR NEARBY PERSONS. THIS TRANSMITTER MUST NOT BE CO-LOCATED OR OPERATING IN CONJUNCTION WITH ANY OTHER ANTENNA OR TRANSMITTER EXCEPT AS AUTHORIZED IN THE CERTIFICATION OF THE PRODUCT.***



## **MANUFACTURER'S WARRANTY**

### **CALIAN AGRICULTURE LIMITED TWO-YEAR WARRANTY**

Calian Agriculture Ltd. (Calian) warrants that for a period of two (2) years from the date of original purchase, this product will be free from defects in material and workmanship. Calian, at its option, will repair or replace this product or any component of the product found to be defective during this warranty period. Replacement will be made with a new or re-manufactured product or component. No warranty is provided for batteries.

### **WHAT THIS WARRANTY DOES NOT COVER**

This warranty does not cover normal wear of parts or any damage resulting from any of the following: negligent use or misuse of the product; damage in transport, natural disaster, improper installation or use, improper abuse or improper handling. This warranty is limited to only those manufacturing defects that were caused or allowed by Calian.

### **HOW TO OBTAIN WARRANTY SERVICE**

Please contact the local dealer you purchased the product from. For additional support, please contact Calian Agriculture at 1.833.570.7979 or visit [www.binsense.com](http://www.binsense.com)

### **CONTACT US**

For support questions, troubleshooting, or help with your Bin-Sense device, please contact your local dealer for more information and assistance, or Calian Agriculture at [support.agriculture@calian.com](mailto:support.agriculture@calian.com) or 1.833.570.7979.

## **SAFETY**

**READ AND FOLLOW ALL INSTRUCTIONS.**

**SAVE THESE INSTRUCTIONS.**

Use the Bin-Sense device for its intended use only, as described in this manual. Do not use attachments not recommended by the manufacturer.

## **STANDARDS**

This manual will use the following standard safety terms and conventions to indicate conditions:

***WARNING: INDICATES A HAZARDOUS SITUATION RESULTING IN SERIOUS INJURY OR DEATH.***

***CAUTION: Indicates a hazardous situation which, if not avoided, could result in moderate injury and/or property damage.***

**Note: Indicates an important message not related to personal injury or property damage.**

## OVERVIEW

The Bin-Sense Live system consists of a Master unit and one or more Remote unit(s). Remote units (installed on each grain bin), read temperature and moisture data via sensing cables. The grain condition data is then wirelessly transmitted to the Master unit. The Master unit is also installed on a grain bin and reads the temperature and moisture sensing cables on that bin. The Master unit wirelessly collects the readings from the Remote units on the site and then sends all the readings to the Bin-Sense servers via a cellular network connection.

This guide will discuss how to connect the Master and Remote units and begin reporting data to the Bin-Sense website and Mobile App.

## SYSTEM SET UP

### CREATING ASSOCIATIONS

Bin-Sense Master and Remote units must be associated on the Bin-Sense Website or Mobile App. Only trained, authorized dealers can perform associations and can reference instructional videos available on the Callan Agriculture YouTube channel.

Once a site map including each grain bin is created on the Bin-Sense website, the associations process assigns the serial number of the Master or Remote unit(s) installed on the physical bin to the virtual bin on the Bin-Sense website and Mobile App. Associations also tell the system which Remote units will be connected to a specific Master unit.

It is best to perform associations before installing any devices on the bins. After associations are complete, dealers can print a site map which allows for easy identification of the serial numbers of the Master and Remote unit(s) associated to each bin.

### MASTER UNIT FIRST CALL-IN

Once a site is associated, the list of Remote unit(s) associated to the Master unit must be sent to the Master unit via a cellular network call-in. During this call-in, the Bin-Sense servers will send the Master unit the serial numbers of all the Remote units to connect to and send a command to scan for those Remote units.

1. Power on the Master unit as described in the Master unit manual.
2. Once the Master unit diagnostic LED stops blinking, press and hold the scan button for six seconds. The LED should turn green and then after a few seconds turn pale blue and then go back to green.
3. The modem status LED will begin blinking. The modem status LED and diagnostic LED will both turn off once the call-in is complete.

Once the first call-in is complete, the Master unit is loaded with the serial numbers of its Remote units and is ready to connect to Remote units.

4. Disconnect the power and restart the Master unit into normal mode to begin connecting to Remote units.



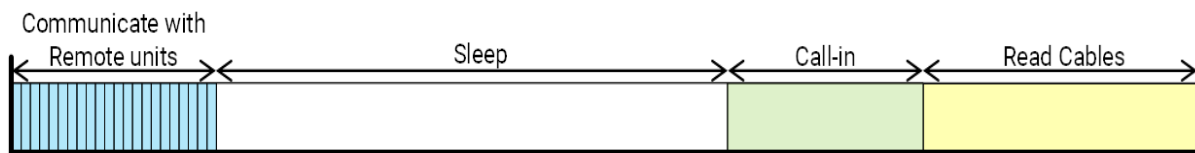
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## OPERATION

### MASTER UNIT OPERATION

Master units operate on a repeating 68-minute cycle. In each cycle, the Master unit will read its own cables, communicate with each Remote unit, and call-in to the Bin-Sense servers. When not performing one of these tasks, the Master unit will go into a low power sleep mode to preserve battery life.

Master units communicate with Remote units one at a time and communicate with Remote units in the same order every cycle.



### REMOTE UNIT OPERATION

When a Remote unit is first powered on, it will read the attached cables, then perform the diagnostic LED blinking pattern and listen for a wireless signal from a Master unit. This uses a large amount of battery power if solar power is not available, so it is best to minimize the amount of time that the Remote unit is powered on and not connected to a Master unit.

Once a Remote unit has communicated with a Master unit, it will enter a low-power sleep state to preserve battery life. After 68 minutes, the Remote unit will wake up and send sensor cable readings to the Master unit. This cycle repeats every 68 minutes.

If a Remote unit is unable to communicate with the Master unit for six consecutive cycles, it will start the LED blinking pattern again and listen for Master units.

### MASTER UNIT MODES

When a Master unit is powered up, it can enter **normal mode** or **listener mode** depending on whether there are Remote units associated.

#### NORMAL MODE

When starting up in normal mode, the Master unit will read the attached cables, perform the diagnostic LED blinking pattern, and then start the normal operating cycle by communicating with Remote units.

## LISTENER MODE

Listener mode allows a Master unit to reconnect to a running Bin-Sense Live site if the Master unit power is interrupted. A Master unit will start up listener mode when it has Remote units associated and was previously operating normally.

In listener mode, the diagnostic LED will blink green once per second and the Master unit will listen for wireless signals from Remote units still running on the site. If the Master unit detects a Remote unit while in listener mode, it will enter normal mode at the appropriate place in the operating cycle. If no Remote units are detected in one hour, the Master unit will enter normal mode.

## FORCING A UNIT TO START IN NORMAL MODE

Follow the steps below if a Master unit is starting up in listener mode and you want it to enter normal mode.

1. Power off the Master unit by disconnecting the Master unit battery and solar panels.
2. With the power off, press and hold the scan button.
3. Continue to hold the scan button and reconnect the Master unit battery. The diagnostic LED will light up solid green.
4. Wait five seconds, then release the scan button. The diagnostic LED will begin flashing rapid green.
5. Press and release the scan button. The Master unit will enter normal mode.
6. Reconnect the solar panels.

## MASTER UNIT SCANNING

To preserve battery life, Master units will only attempt to connect to new Remote units for 10 hours. To extend the time Master units attempt to connect to Remote units, authorized dealers can send the Master unit a scan command from the Bin-Sense website or Mobile App. Bin-Sense customers can also send scan commands from the Bin-Sense website or Mobile App by using the “**Find My Remotes**” button. Sending a scan command will cause the Master unit to attempt to connect to any previously non-communicating Remote units for the next 10 hours.

## STARTING AND CONNECTING MASTER AND REMOTE UNITS

When starting up a Bin-Sense Live site and connecting Remote units to the Master unit, it is important to minimize the time Remote units spend waiting to connect to the Master unit to maximize battery life.

The most efficient, but often least practical method, is to power on all the Remote units at roughly the same time and then power on the Master unit (in normal mode) as soon as possible after all the Remote units are powered on. Since the Master unit starts connecting to Remote units shortly after powering on, Remote units spend very little time waiting for the Master unit. This is effective on small sites where all the Remote units are close together and easily accessible, but does not work well on larger sites or when each bin must be climbed to access the Remote units. This method also works well if all the batteries on a site have died and it will take less than 68 minutes to climb all the bins and install new batteries.

On most large sites, the best method is to first install and power on the Master unit (in normal mode) and then power on each Remote unit as it is installed. Every 68 minutes, when the Master begins communication with

Remote units, it will connect to any new Remote units powered on in the last 68 minutes. It is important to make sure the Master unit has been sent scan commands to keep looking for new Remote units. This method works well on large sites that require numerous man-hours to install the Bin-Sense Live system as each Master unit and Remote unit must only be handled once during the installation process, and Remote units connect to the Master unit within 68 minutes of being powered on.

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