



# Installation Manual

## iBOS® Plus 6 Series



October 2019  
Version 1.5



# Table of Contents

## iBOS® Plus 6 Series

1. Introduction .....	3
1.1 System Overview.....	3
1.2 Instruction Manual Organization.....	3
1.3 Contact Information .....	4
1.4 Installation Outline .....	4
2. System Components .....	5
2.1 Individual Components.....	5
3. Planning / Specifying Job .....	8
3.1 Pools .....	8
3.2 Chargers in each Pool .....	8
3.3 Control Box .....	8
3.4 Data Cable Requirements .....	8
3.5 Installation and Commissioning Services.....	9
4. Pre-Installation .....	10
4.1 Checklist .....	10
4.2 Control Box Dimensions.....	10
4.3 Data Connection Availability.....	11
4.4 Power Availability.....	11
4.5 Useful Tools .....	12
5. System Installation.....	13
5.1 Control Box Installation.....	13
5.1.1 Mounting the Control Box: .....	13
5.2 Installing the Battery Backup (Recommended).....	13
5.3 Sentinel™ Wiring and Charger Mounting.....	13
5.3.1 Sentinel Wiring: .....	13
5.3.2 Mount to Charger (or secure location as desired): .....	14
5.3.3 Sentinel™ LEDs: .....	14
5.3.4 Repeat steps 5.3.1 through 5.3.3 for the remainder of batteries & chargers in the pool.....	15
5.4 Battery Charger and Battery Bay Labels.....	15
6. System Configuration and Settings .....	16
6.1 Language Setting.....	16
6.2 Date and Time Setting.....	17
6.3 Configuring Pools and Chargers .....	20
6.4 Configuring Internet Connections.....	24
6.5 Password Settings .....	29
6.6 Display Pools .....	30
6.7 Volume Adjustment.....	30
6.8 Sentinel Outputs .....	30
6.9 Message Length .....	31
6.10 Linked Pools .....	31
6.11 Home Screen Display.....	32
6.12 Running System Dark.....	32
7. Final Inspection and Testing.....	33
7.1 Sentinels™ .....	33
7.1.1 Status .....	33
7.1.2 Quarantine.....	34
7.1.3 Sentinel List.....	36
7.1.4 System Information .....	37
7.2 Shouter.....	37
7.3 Check Data Upload to Web.....	38
Appendix A: Data Cable Reference Diagram (RJ12, 6-wire).....	41
Appendix B – Internet Connection Requirements.....	41

# 1. Introduction

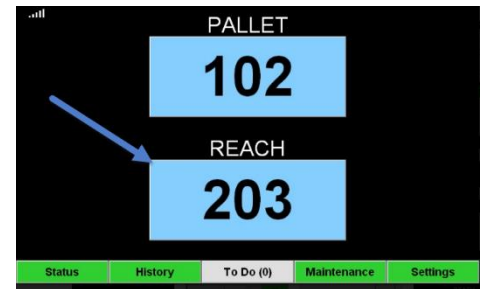
## 1.1 System Overview

The purpose of this manual is to relay all necessary information regarding the installation of the iBOS® Plus 6 Series battery room management system. Once installed, this system will help streamline the process of selecting batteries and provide valuable management information on the batteries and chargers.

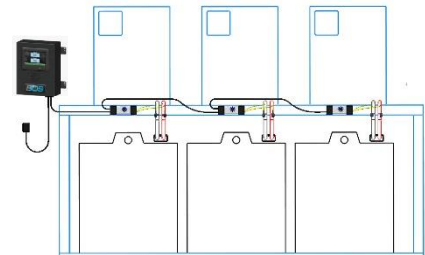
A fully installed system will have a monitoring device mounted on each charger. This monitoring device is referred to as a Sentinel™. The Sentinel's™ primary function is to detect when the charger finishes charging and send this information to the Control Box. The Control Box is wired to all Sentinels™ and uses information received from these Sentinels™ to keep track of all charged batteries. Sentinels™/chargers are grouped into units called "Pools". Each Pool is dedicated to a specific type/size of battery in the facility. The Control Box's other function is to inform the operator of which battery to pick to ensure maximum efficiency. This information is relayed through a display mounted on the control box, a "Shouter" that announces messages to the operator, and colored LEDs mounted on the Sentinels™.

The procedure for the operator is as follows:

- 1) Operator looks at the display for the pool that corresponds to the specific battery type he/she is seeking:
  - a. The display will tell the operator which battery to take: An example message would be "REACH - 203".
- 2) Operator follows the message displayed on the Control Box's iDisplay™ or the Sentinel's™ flashing blue light to the charger specified and selects the battery.



The Control Box is also capable of sending data to a website to generate management reports. These reports contain information necessary for keeping the battery selection process running smoothly and can be used to predict when drift in process is due to too many or not enough batteries, malfunctioning chargers, and operators following instructions improperly.



## 1.2 Instruction Manual Organization

- Section 1 - System Overview. Introduction and overview of the iBOS® Plus 6 Series System and outline of this installation manual.
- Section 2 - System Components. Various parts of the system are documented / pictured to assist in familiarizing the installer and operator with the iBOS® Plus 6 Series System.
- Section 3 - Planning/Specifying the Job. Installation planning and strategies are highlighted.
- Section 4 - Pre-Installation. On-Site preparation steps are listed to ensure a smooth installation.
- Section 5 - Installing System Components. Hardware installation is highlighted to aid in the mounting and wiring of the Control Box and Sentinels.
- Section 6 - System Configuration. Instructions to naming the pools and chargers with the Control Box as well as correct wiring verifications are captured.

- Section 7 - Final Inspection and Testing. A final checklist for the installer is included.
- Section 8 - Operating System Overview. Settings Screen anatomy, Maintenance Mode options, and Status Screen are highlighted.
- Section 9 - Operating Instructions. Operator instructions are listed and pictured.
- Section 10 - Appendix. Additional references are listed and pictured.

## 1.3 Contact Information

Philadelphia Scientific LLC  
 207 Progress Drive  
 Montgomeryville, PA 18936  
 USA  
 Phone: 215-616-0390  
 Fax: 215-616-0500  
 Email: Info@phlsci.com

Philadelphia Scientific UK Ltd.  
 Atlas Mill  
 Bolton BL14LB  
 United Kingdom  
 Phone: +44 (0) 1204-467777  
 Fax: +44 (0) 1204-493300  
 Email: Info@ps-europe.net

Philadelphia Scientific-  
 Asia/Pacific  
 2/17 Norman Street  
 NSW, 2225  
 Australia  
 Phone: +61 2 8004-2447  
 Fax: +61 2 9012-0383  
 Email: Info@phlsci.com.au

## 1.4 Installation Outline

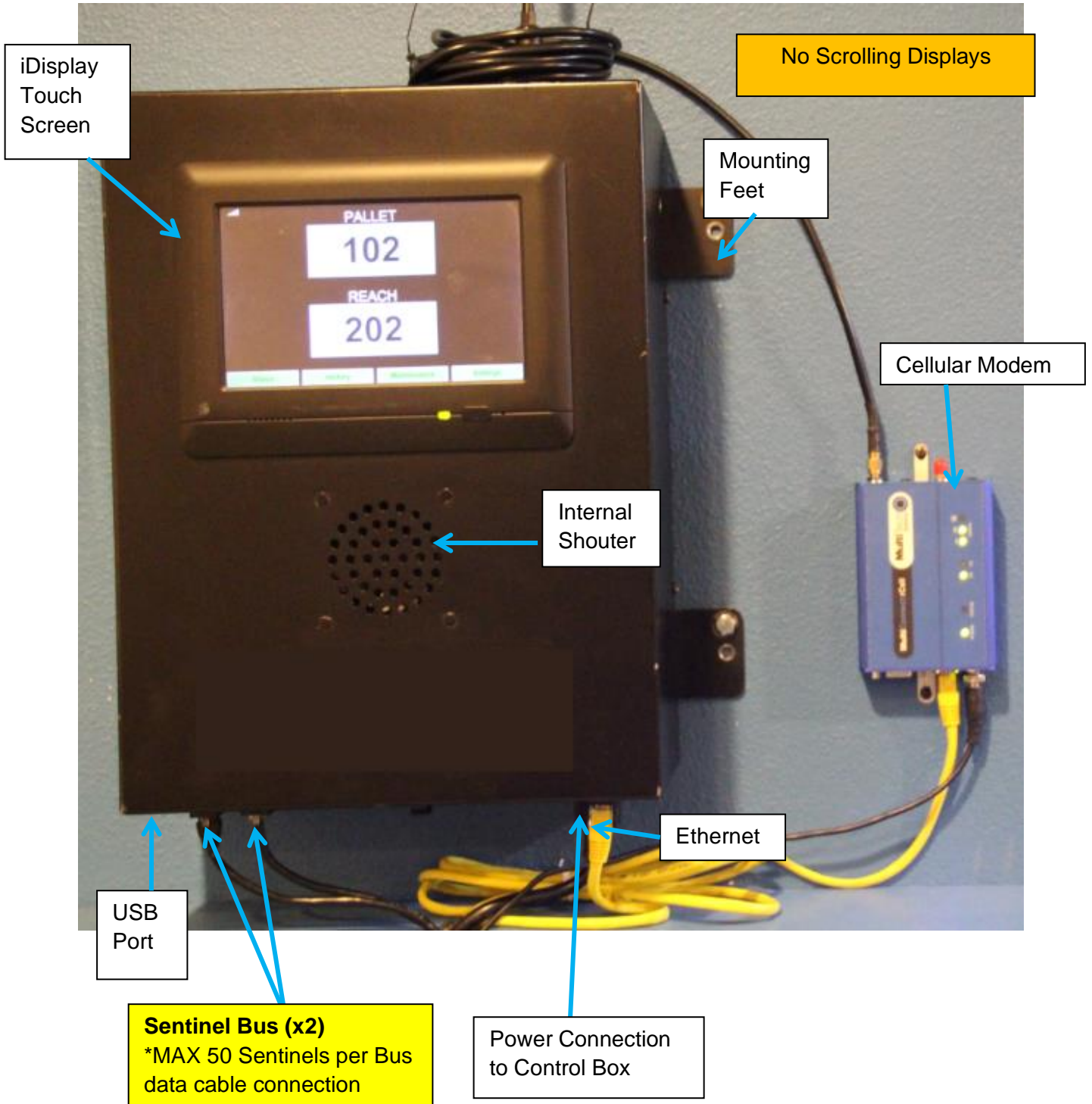
On-Site Installation can be divided into three stages:

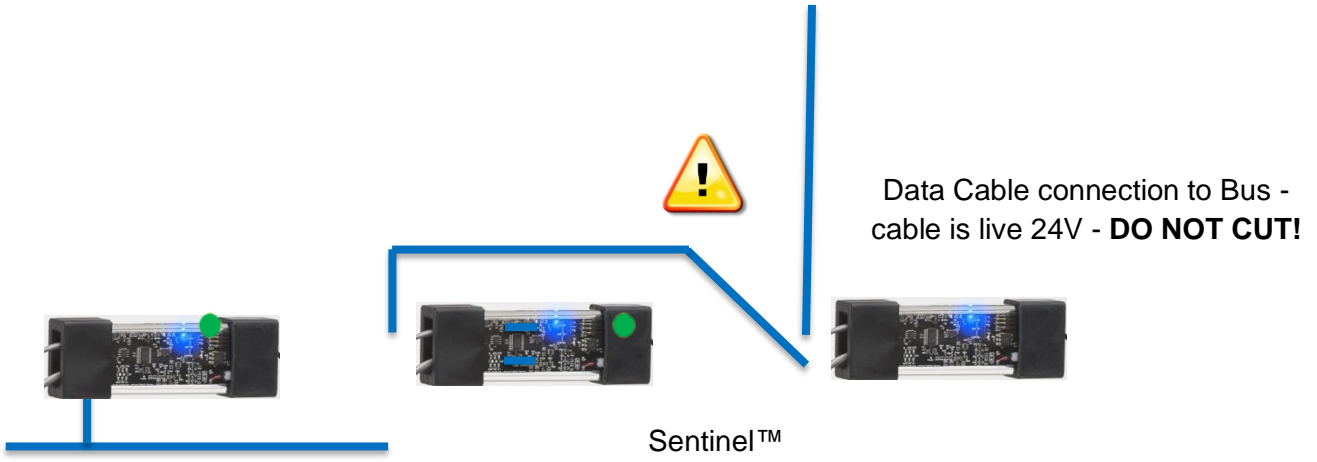
- 1) Control Box and Peripheral Installation
  - a. Control Box
  - b. Ethernet Connection/Wireless Cellular Modem (Optional)
- 2) Sentinel Wiring Connections
  - a. Wiring from Sentinel to Sentinel
  - b. Wiring to the Control Box
  - c. Mount to Chargers
  - d. Labeling the Chargers/Battery Bays
- 3) Charger Configuration/Final Testing
  - a. Configure Pools
  - b. Configure Chargers
  - c. Testing Upload Capability
  - d. Operator Training

## 2. System Components

### 2.1 Individual Components



#### Control Box - 100 Sentinels Max





<p><b>Sentinel™</b></p>	
<p>BOS-SU6003</p>	

**Optional Accessories:**

<p><b>25' (7.6 m) Data Cable and Coupler</b> BOS-143</p>	
<p><b>100' (30.5 m) Data Cable and Coupler</b> BOS-161</p>	
<p><b>Custom Data Cable Kit</b> BOS-159</p>	
<p><b>UPS Backup and Surge Protector</b> BOS-150</p>	

## 3. Planning / Specifying Job

### 3.1 Pools

Batteries in a facility should be grouped by type in a unit called a “Pool” to utilize the iBOS® battery organizing system. An example of this organization would be to consider all of the Reach truck batteries in a facility that use the same type of batteries, in voltage and size, (e.g., 18-125-15) to be one pool and all of the Pallet Jack batteries to be in another pool.

As a basic rule of organizing batteries, there will always be at least one pool per type of battery in the facility. There are some scenarios where it would be preferable to have more than one pool per type of battery. An example of this circumstance would be if the facility had two battery changers per one type of battery. An example organization in this circumstance would be to have two separate pools: one per the battery changer on the right and one per the battery changer on the left. The iBOS® Plus 6 Series has a max of 9 pools.

**\*Note:** The Pool names must be 13 characters or less.

### 3.2 Chargers in each Pool

One Sentinel™ is needed per charger. Chargers in a given pool all have the same voltage. Sentinels™ are universal and can be used for any voltage between 12V to 80V.

### 3.3 Control Box

The Control Box is used to relay battery selecting information to the operator as well as control the process. The mounted location is critical for the operator to view the next battery and shortest distance to first Sentinel™ for each bus.

Some guidelines for mounting the Control Box include:

- Mount in a visible area, free of obstructions.
- Keep the component away from water sources such as emergency showers and sinks.
- The Control Box requires a 100 - 240V power source.
- Be aware of the substrate that the component is being mounted to. Use appropriate anchors as necessary to support the Control Box (15 lbs. (6.8 kg)).

### 3.4 Data Cable Requirements

Data Cables are required to be run from the Control Box to the first Sentinel in a pool as well as from Sentinel™ to Sentinel™ for the rest of the chargers in the pool in a daisy chain method for a max of 50 Sentinels™ per Bus. The iBOS® Plus 6 Series System has 2 Buses with a system max of 100 Sentinels.

- 7' (2.1 m) Data Cables (supplied with each Sentinel™)
- 25' (7.6 m) Data Cables (must be ordered) BOS-143
- 100' (30.5 m) Data Cable (must be ordered) BOS-161
- Custom Cable Kit (must be ordered) BOS-159

You need to purchase enough cable to reach the first Sentinel™ for **each Bus** you are using. Two examples of Bus cabling are shown in the picture below:

**Bus 1:** 50' (15.2 m) of cable needed even though it was only 10 ft. from the Control Box to the first Sentinel™.

**Bus 2:** 100' (30.5 m) of cable needed as it was located on the other side of the aisle to the first Sentinel™.



### 3.5 Installation and Commissioning Services

The iBOS® Plus 6 Series System is designed to not require commissioning by Philadelphia Scientific®, but if assistance is required, it is offered by request. Installation videos are also available online.



Contact Philadelphia Scientific® to receive assistance.

Phone: 215-616-0390 and ask for Customer Service

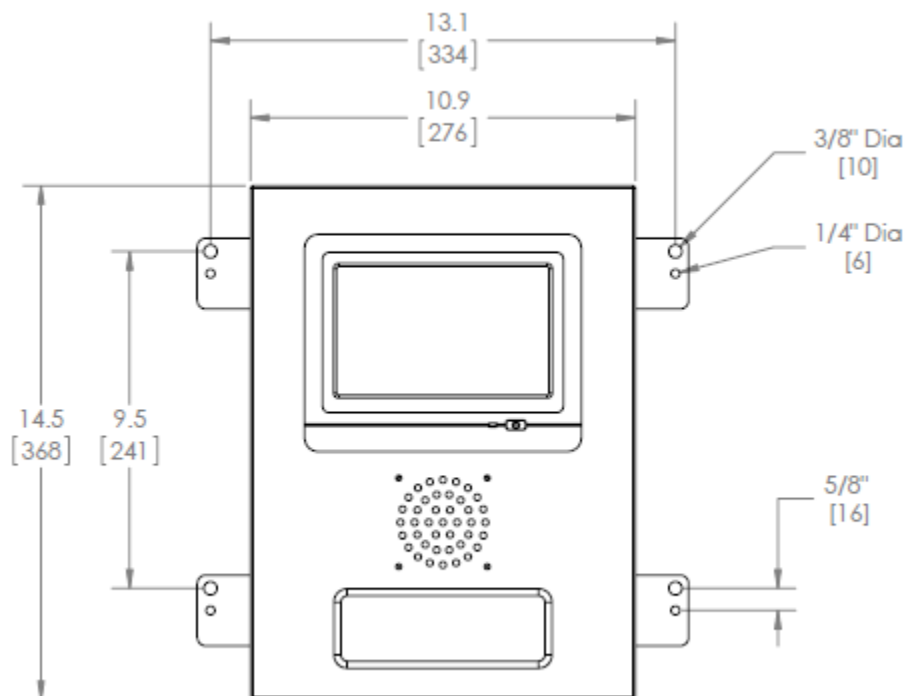
## 4. Pre-Installation

### 4.1 Checklist

Task	Status
Plan for location of Control Box: <ul style="list-style-type: none"><li>• Power for Control Box</li><li>• Near chargers</li><li>• Plan for data cable run to the 1<sup>st</sup> Sentinel™ in each bus</li></ul>	<input type="checkbox"/>
Gather all required tools and equipment: <ul style="list-style-type: none"><li>• Ladders and/or Scissor Lifts.</li><li>• Power Tools – for mounting Control Box, etc.</li><li>• Hand Tools – wire cutters, Phillips-head screwdriver.</li><li>• Extension cords for temporary power.</li><li>• Anchors for mounting components based on mounting wall.</li></ul>	<input type="checkbox"/>
Review <ul style="list-style-type: none"><li>• UPS Battery Backup System for the Control Box (Optional).</li></ul>	<input type="checkbox"/>

### 4.2 Control Box Dimensions

Be sure that there is adequate clearance around the control box to connect cables. (Power, Ethernet, etc.)



## 4.3 Data Connection Availability

To give the iBOS® Plus 6 Series the ability to gather data and generate reports, the customer must provide a means for the iBOS® Plus 6 Series system to connect to the internet. All communication is initiated by the Control Box. The ability to remotely initiate a communication session from the outside is not enabled. See Appendix B – Internet Connection Requirements for details.

## 4.4 Power Availability

iBOS® Plus 6 Series Component Power Requirements		
Component:	Voltage:	Amperage:
Control Box	100-240 VAC	1.3 A
Cellular Modem	100-240 VAC	0.6 A

### Layout planning restrictions to consider:

- Extension cords can be used temporarily but Surge Protection is highly recommended for the Control Box.

## 4.5 Useful Tools



**Drill**

For mounting  
Control Box



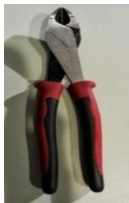
**Level**

For mounting  
Control Box



**Anchors**

Suitable for the mounting  
surface present



**Wire  
Snips**

For installing  
Sentinels



**Drill  
Extensions**

Optional -  
could be useful

## 5. System Installation

### 5.1 Control Box Installation

#### 5.1.1 Mounting the Control Box:

- Level the Control Box.
- Secure the Control Box with four or more screws as needed.

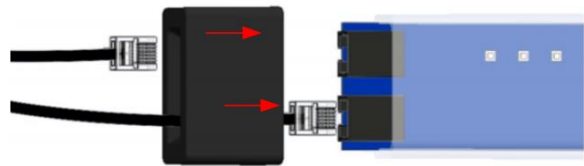
### 5.2 Installing the Battery Backup (Recommended)

- Ensure the battery is connected inside.
- Connect the Control Box's power cord to an outlet on the 'Battery Backup' side of the Battery Backup.

### 5.3 Sentinel™ Wiring and Charger Mounting

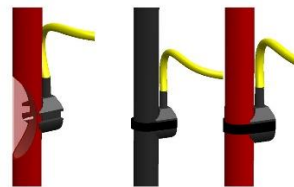
#### 5.3.1 Sentinel Wiring:

- Remove the Sentinel™, Data Cable, and Mounting Tool (wire-ties) from the box.
- Remove the slotted end cap from the Sentinel™ and connect the Data Cable from the previous Sentinel™ (for all the Sentinels™ after the first in a pool) as well as a second Data Cable through the slotted end cap to either of the ports (independent of order).

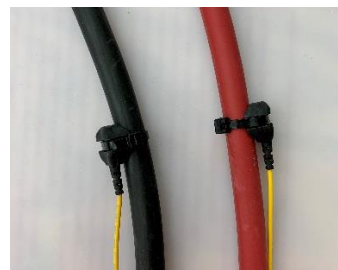


Plug into either socket

- Squeeze the end cap to open the slot and allow easier insertion of data cables.
- Remove the tubing from the ends of the Flexi-Tap.
- Connect one Flexi-Tap to a positive cable and one Flexi-Tap to a negative cable. Keeping the pin centered on the cable, push the cable fully to the bottom of the recess of the Flexi-Tap.
- Ensure the pins of the Flexi-Tap fully penetrate the charger cables and secure with a wire-tie.
- Slide the end cap back onto the Sentinel™.



Flexi-Tap Installation Diagram



### 5.3.2 Mount to Charger (or secure location as desired):

- Mount the Sentinel™ directly to the charger using wire-ties (preferred) in a visible, stable area.
- Secure the upstream data cable to the wire-tie as shown for strain relief.



Correct Strain Relief Technique

### 5.3.3 Sentinel™ LEDs:

- **Green LED = Communication Status:**  
A solid green light indicates a good connection to the Controller. All Sentinels™ should have a solid green light. Upon initial connection, the green light will flash fast, then slower, before settling at solid green. If the green light remains flashing fast, check the wire connection to the Sentinel™.



- **Amber LED = Charging Status:**  
When the amber light is on, the battery is connected. If the amber light does not turn on, check the Flexi-Tap connections to ensure that the pins have fully penetrated the cables.



- **Blue LED = Next Battery to Pick:**  
A slow, blue flashing light indicated the next battery to pick in that pool. If you do not want to use the blue light as a pick light indicator, it can be turned off in the settings panel.



**5.3.4 Repeat steps 5.3.1 through 5.3.3 for the remainder of batteries & chargers in the pool.**

## 5.4 Battery Charger and Battery Bay Labels

The iBOS® Plus 6 Series System communicates with the operator by referencing a charger number. It is always important to keep the charger numbering system organized to maintain the smooth process of selecting a battery. When setting up the charger numbering system in the facility it is recommended to follow a 3 digit format where the first digit references the pool and the second and third digit reference the battery number in that pool.

- If the customer already has numbers that they are accustomed to using, they can be used if they are no longer than 6 characters. It is recommended that a Pool reference letter be used to differentiate between Pools.

Pallet	Reach
101	201
102	202
103	203

Example of 3-digit organization

Pallet	Reach
P1	R1
P2	R2
P3	R3

Example of reference letter organization



Clearly labeled battery using 3-digit organization

## 6. System Configuration and Settings

Click “Settings” and you will see these headings, from which you can set the following:

Settings			
Language	EN	Not Set	Settings Passcode
Date & Time	2013-08-06 14:49	Not Set	Maint Mode Passcode
Pools & Chargers	0 Pools 0 Chargers	0 Total Sentinels Assigned 0 of which are Non-Reporting	Sentinel List
Internet	FIXED		System Information

Navigation: Left Arrow, Up Arrow, Down Arrow. Page: 1/2


Click the down arrow to get to the 2nd Settings screen

Settings			
Display Pools	1 through 9		Sentinel Outputs
Volume	Good Pick Volume = 3 Mispick Volume = 3	Long	Message Length
Communication Test		Pair 1 = 0 + 0 Pair 2 = 0 + 0 Pair 3 = 0 + 0 Pair 4 = 0 + 0	Link Pools
Quarantine			

Navigation: Left Arrow, Up Arrow, Down Arrow. Page: 2/2

### 6.1 Language Setting

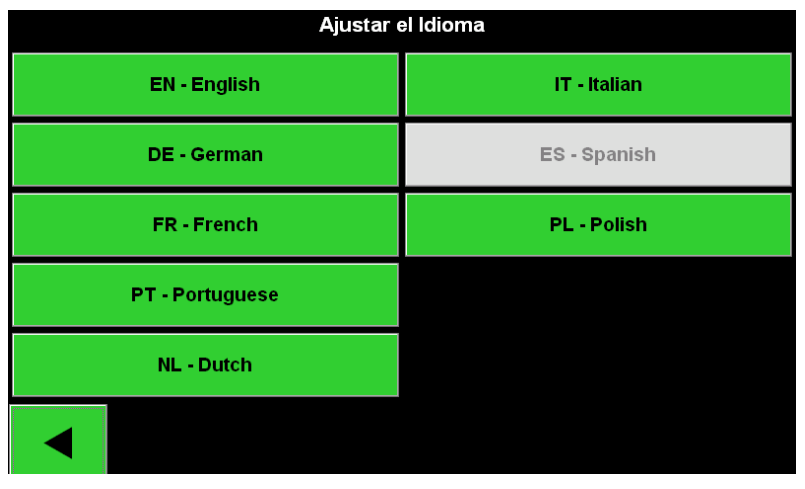
Set a **Language**. The language in white becomes the system language and will change the audio message and text on screens.

Set Language	
EN - English	IT - Italian
DE - German	ES - Spanish 
FR - French	PL - Polish
PT - Portuguese	
NL - Dutch	

Navigation: Left Arrow

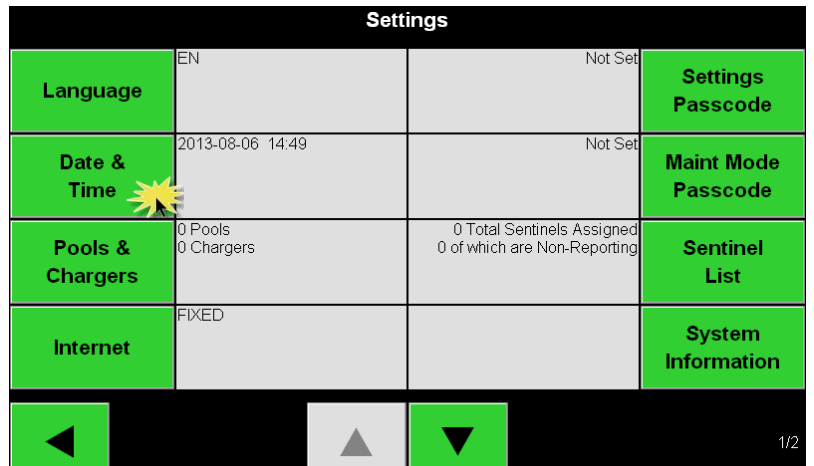


Note: When you change language all system settings also change to that language.

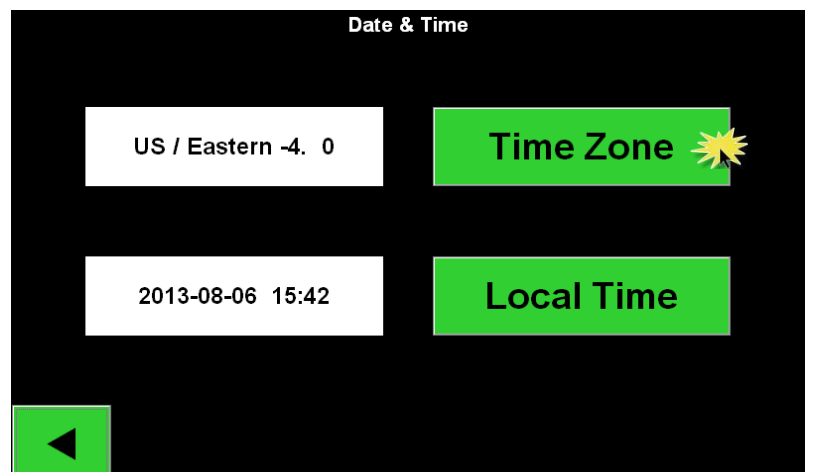


## 6.2 Date and Time Setting

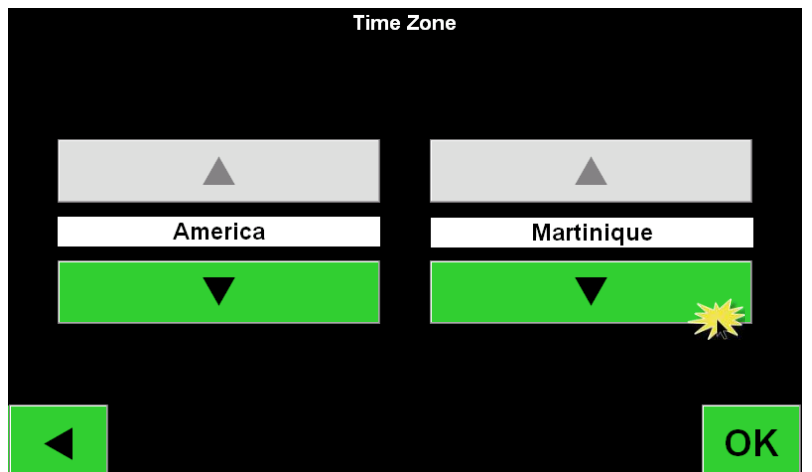
The system time is controlled by this feature. This should be checked to ensure the location time is correct. The default is set at the factory for EST. (-4GMT)



The system is currently set to EST Time Zone.

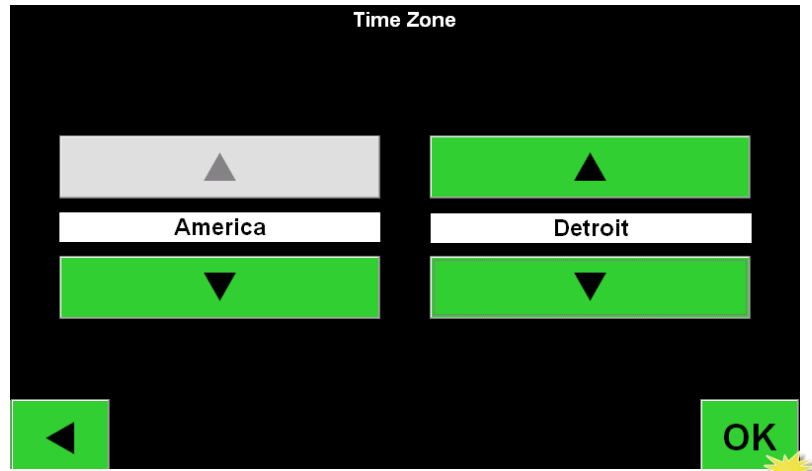


Select your local time zone.

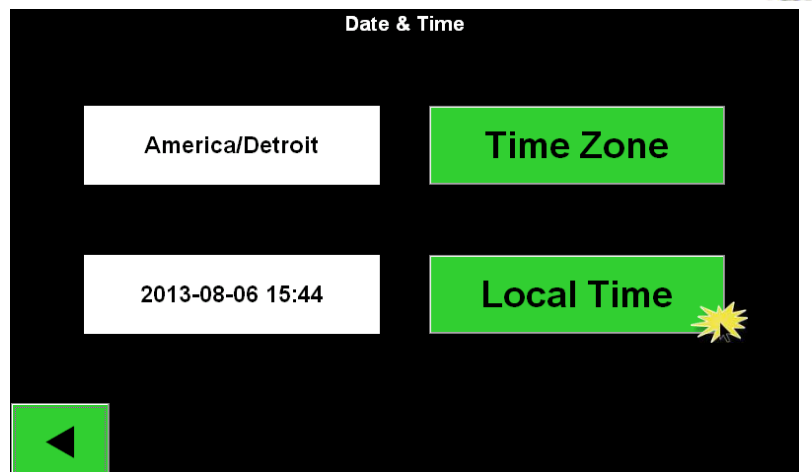


Then click ok.

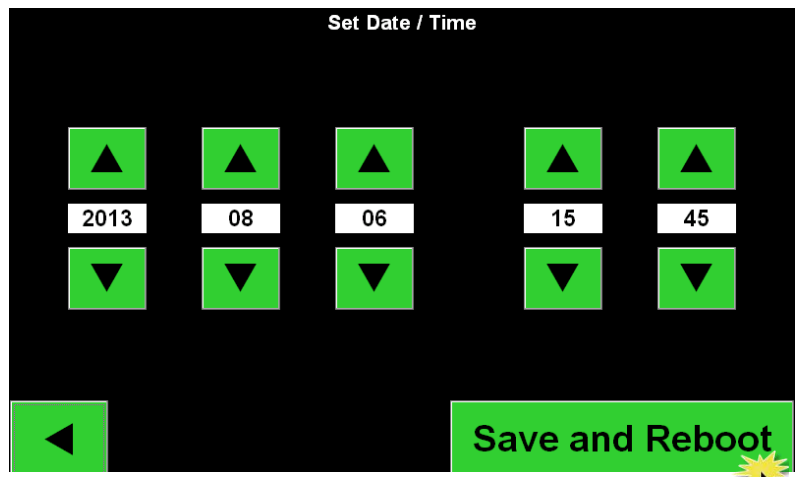
This will take you back to the time/date.



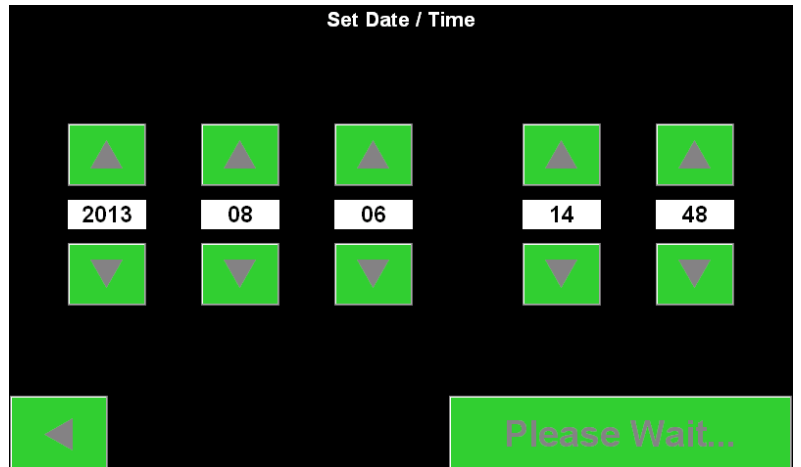
Set Local Time/Date



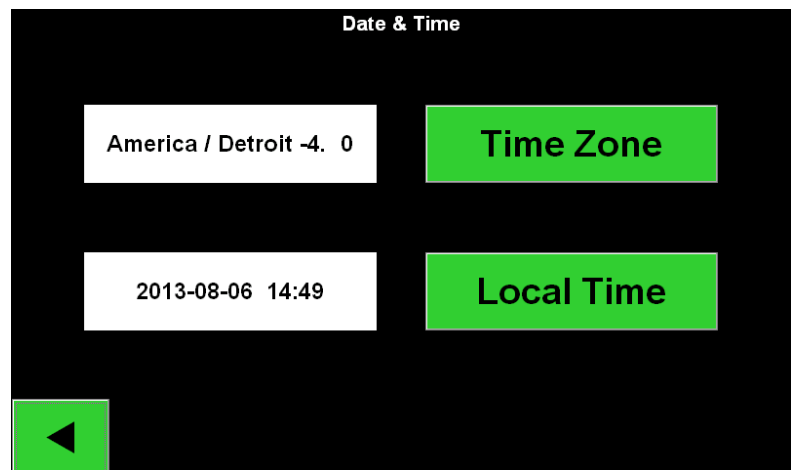
Adjust as needed, and then click “Save and Reboot”.



During system reboot, the touch screen will become temporarily grey and inoperable. Please wait for system to complete the time/date change.



Time/Date is now reset.



## 6.3 Configuring Pools and Chargers

After the chargers are connected and labeled, they must be configured at the Control Box. The steps to follow to correctly configure pools and chargers are outlined below. (Default password is: "919191")

<p>To configure the chargers, click "Settings" on the Home screen.</p>	
<p>Enter Default Password "919191" then click OK.</p>	
<p>Click the "Pools and Chargers" key.</p>	

Click on the first blank Pool key.

Set Up Pools & Chargers			
Pool #	Pool Name	Voltage	Charger Count
1		Set V	Add Charger (0)
2		Set V	Add Charger (0)
3		Set V	Add Charger (0)
4		Set V	Add Charger (0)
5		Set V	Add Charger (0)

Navigation buttons: Left arrow, Up arrow, Down arrow

Type in the name of the pool and click "OK."

Set Pool Name

PALLET

1	2	3	4	5	6	7	8	9	0
Q	W	E	R	T	Y	U	I	O	P
A	S	D	F	G	H	J	K	L	
Z	X	C	V	B	N	M	space	<<<	

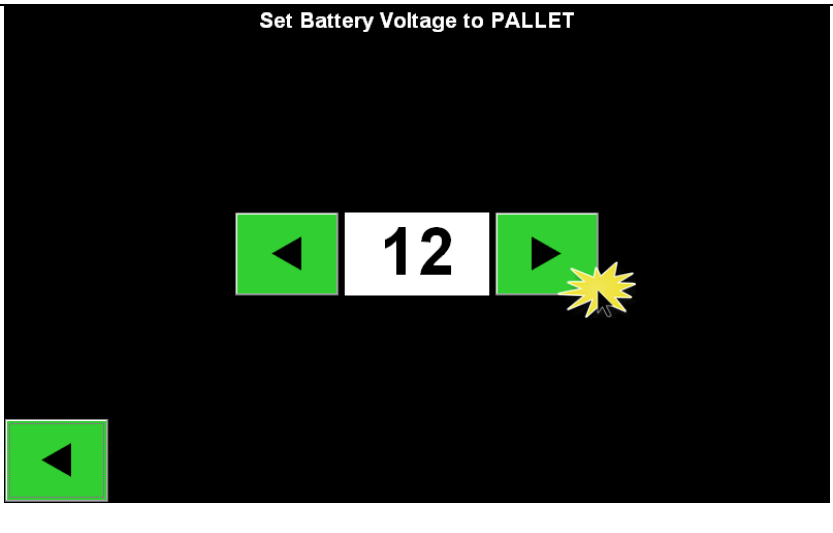
Navigation buttons: Left arrow, OK

Notice the Pool name is now set up. Click on the "Set V" button that corresponds to the pool's voltage.

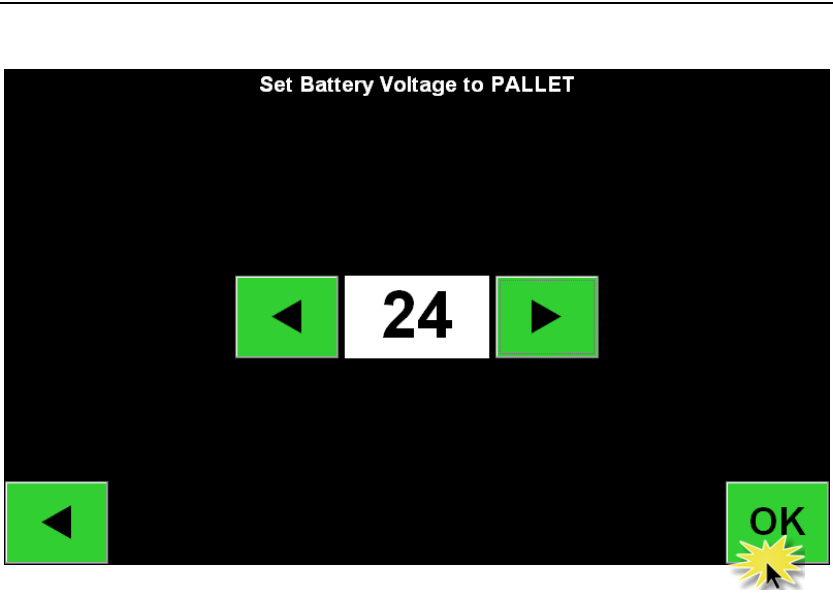
Set Up Pools & Chargers			
Pool #	Pool Name	Voltage	Charger Count
1	PALLET	Set V	Add Charger (0)
2		Set V	Add Charger (0)
3		Set V	Add Charger (0)
4		Set V	Add Charger (0)
5		Set V	Add Charger (0)

Navigation buttons: Left arrow, Up arrow, Down arrow

Click on arrow until you reach the correct pool voltage.



Click "OK".



The Voltage "24" now appears for the pool.

Now that we have named the pool and set the pool voltage we can add chargers to the pool.

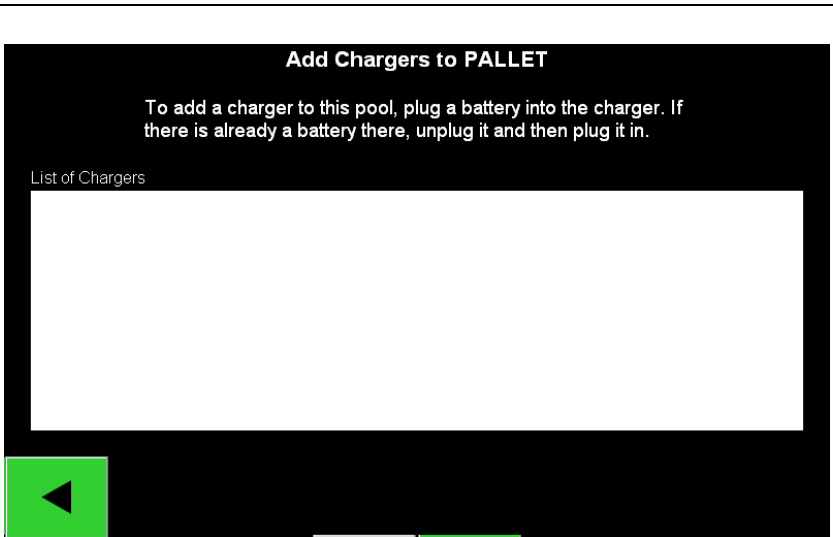
Click on Add Charger.

Note: (0) shows no chargers are assigned to this pool, yet.

Set Up Pools & Chargers			
Pool #	Pool Name	Voltage	Charger Count
1	PALLET	24	Add Charger (0)
2		Set V	Add Charger (0)
3		Set V	Add Charger (0)
4		Set V	Add Charger (0)
5		Set V	Add Charger (0)

When you click on the Add Charger button, the Add Charger to Pool window will appear. You are now in the Wizard mode.

Next, go to the charger you want to add, note the charger number, then disconnect and reconnect the charger. When you reconnect, the next screen will appear.



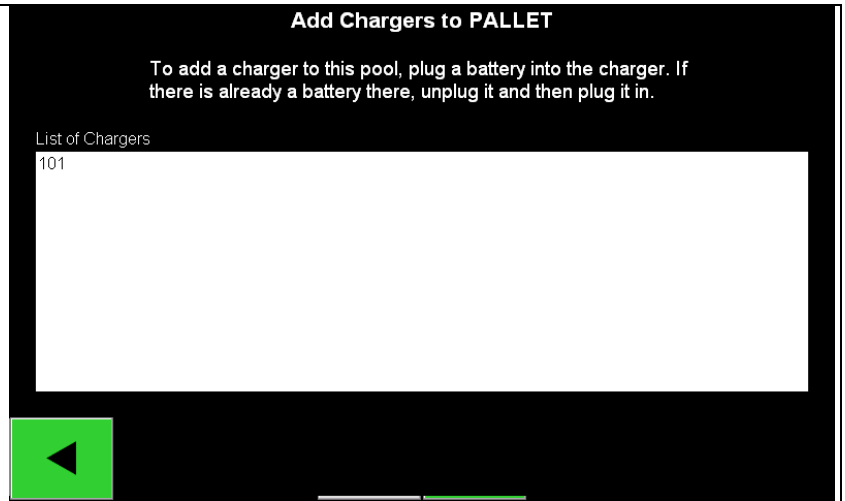
This screen will pop up when iBOS® detects the connected battery.



Entered the desired ID number and click "OK."



Repeat steps for the remainder of the batteries and chargers in the pool.



Set up additional pools and chargers in the same method.

Set Up Pools & Chargers			
Pool #	Pool Name	Voltage	Charger Count
1	PALLET	24	Add Charger (1)
2		Set V	Add Charger (0)
3		Set V	Add Charger (0)
4		Set V	Add Charger (0)
5		Set V	Add Charger (0)

Navigation buttons: Green left arrow, Gray up arrow, Green down arrow.

## 6.4 Configuring Internet Connections

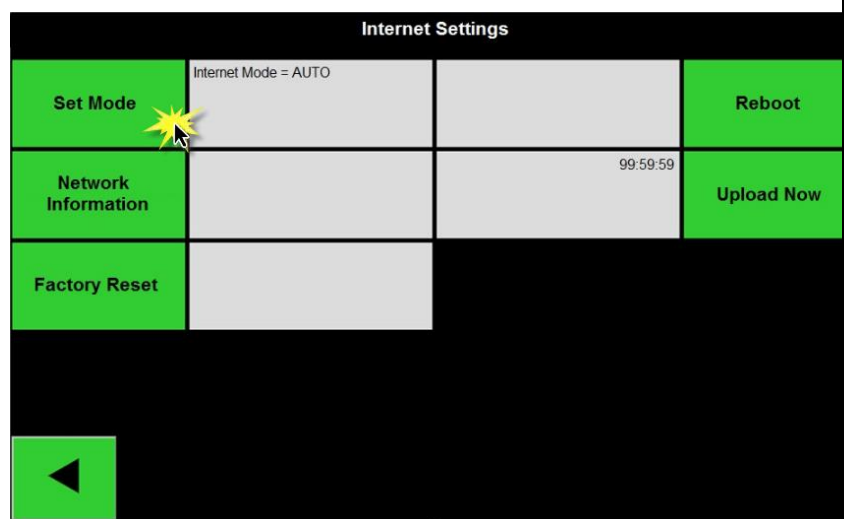
Select the Internet button.

Settings			
Language	EN	Not Set	Settings Passcode
Date & Time	2013-08-06 14:49	Not Set	Maint Mode Passcode
Pools & Chargers	0 Pools 0 Chargers	0 Total Sentinels Assigned 0 of which are Non-Reporting	Sentinel List
Internet	FIXED		System Information

Navigation buttons: Green left arrow, Gray up arrow, Green down arrow.



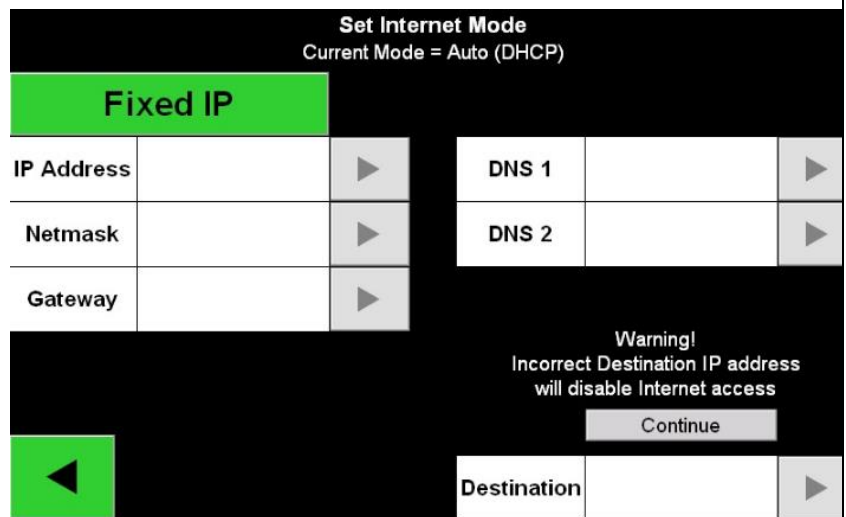
Select Set Mode.



There are 2 options to set up the internet connection.

You can set up:

- **Automatic** (Dynamic) Use this setting with cell modem option.
- **Fixed IP** (Static IP) The address numbers need to be given to the installer from the site's network administrator.

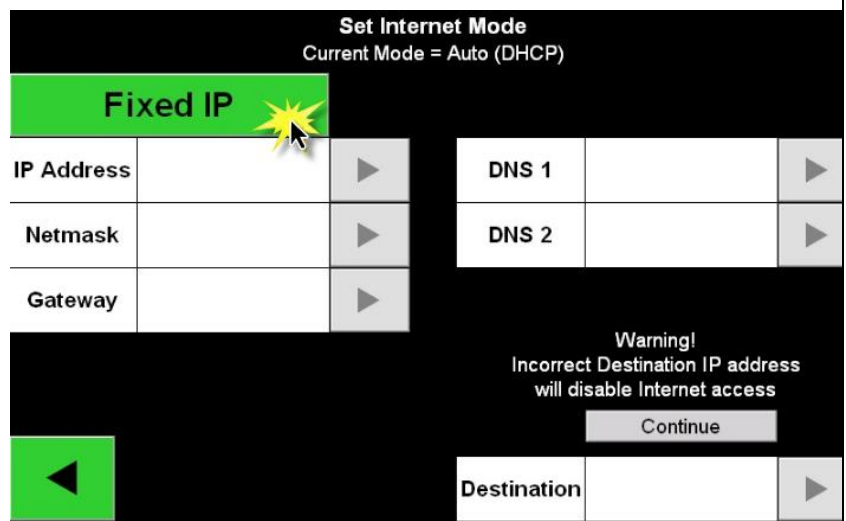


The screen to right shows Automatic and is the factory default.

If connecting through a corporate local network, get the assigned

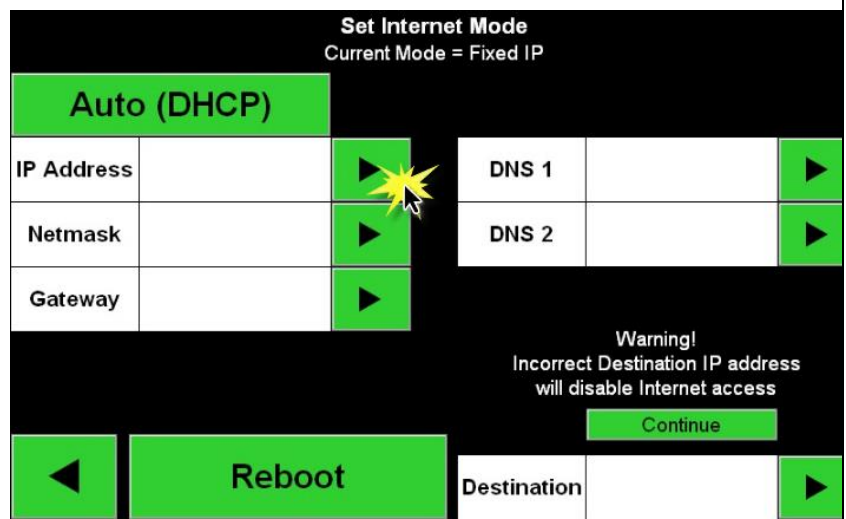
- IP address
- Netmask
- Gateway

from the IT Dept., then press Fixed IP.



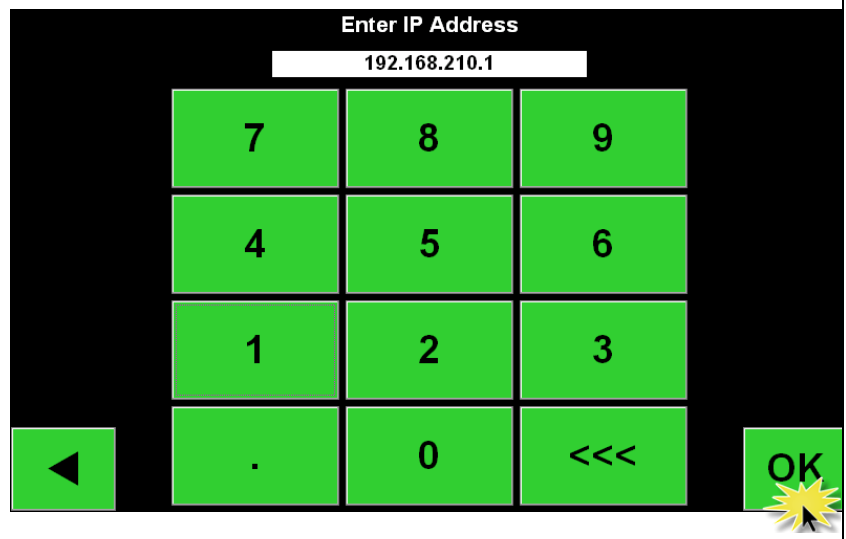
The green arrows will illuminate to the right allowing you to enter the data into each address.

Press the green arrow to the right of IP Address.



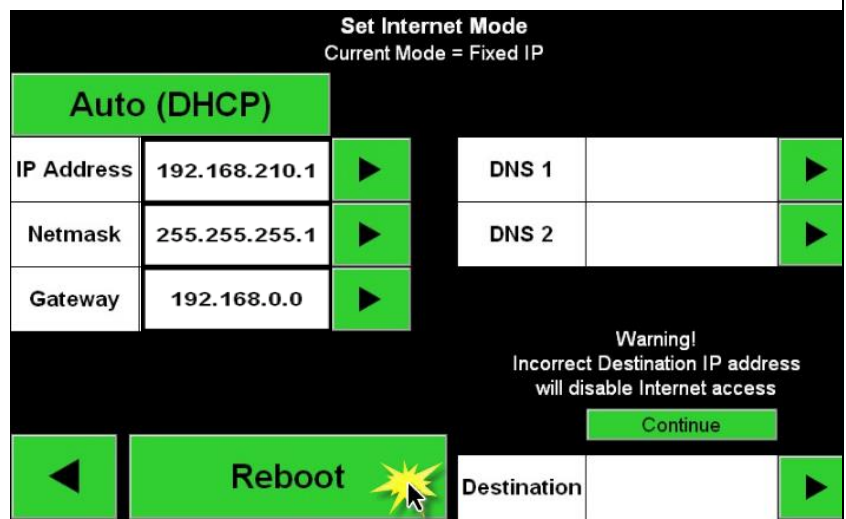
Enter numbers into IP address and click ok.

Do this also for both the Netmask and Gateway.



When data is entered click on the Reboot button to save the setting. The Control Box will reboot. Please wait for the Control Box to reboot. It will return to the Settings screen when complete.

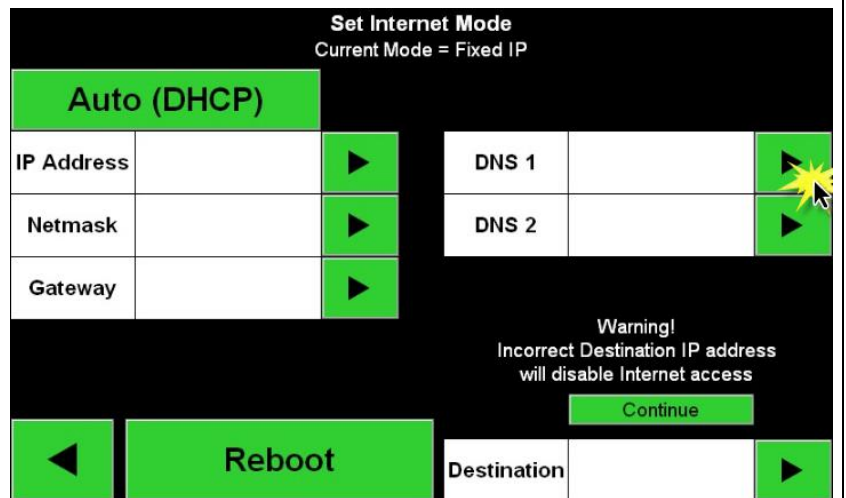
Ensure that the Ethernet cable is connected to the appropriate live port. The Control Box will establish communications with the network at this time.



***DNS settings should only be used by an experienced network administrator.***

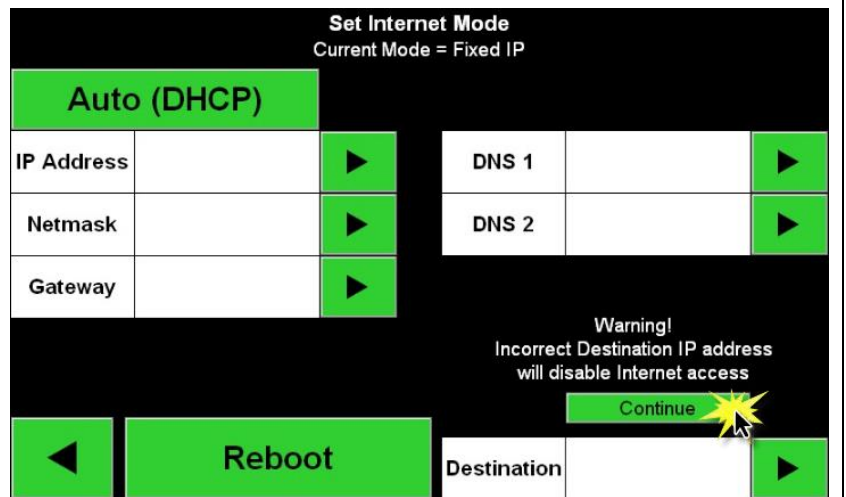
To set the DNS addresses, press the arrow to the right of DNS 1 or 2, enter the address, and press OK.

Press Reboot when complete.

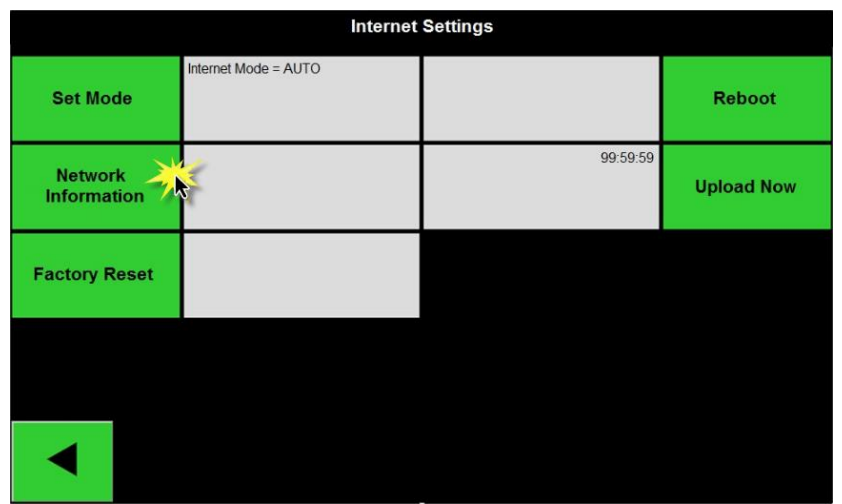


***Destination IP address settings should only be used by an experienced network administrator.***

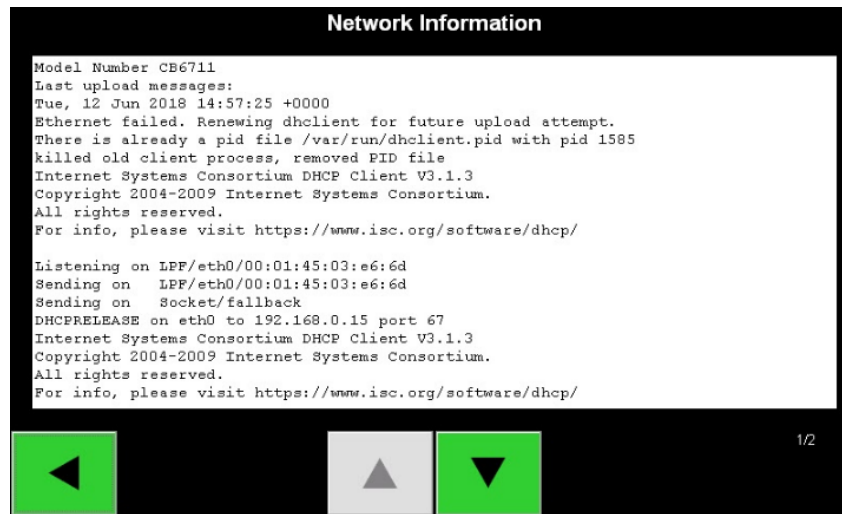
To set the Destination IP address, press Continue and the arrow to the right of Destination. Enter the address, press OK, and press Reboot.



Press Network Information to see upload details.



A Network Information screen will appear.

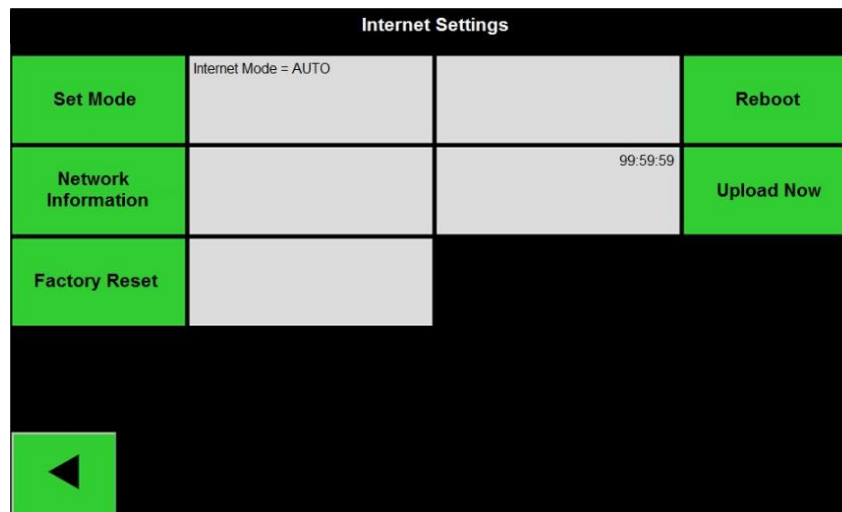


Other option on the Internet Settings Screen:

Press Reboot to restart the Control Box. This is a “soft” reboot that does not power down the Sentinels.

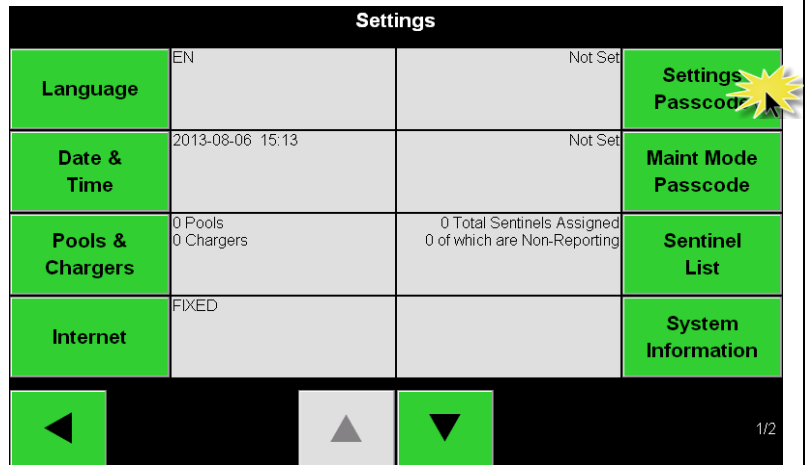
Press Upload Now to send the most recent data to iBOSworld.com.

Pressing Factory Reset will reset the Internet Settings to factory default settings.



## 6.5 Password Settings

To set a new system password, you may do so by clicking the “Settings” tab, then click “Settings Passcode” and enter your number.



The default passcode is 919191. If you would like to remove it during install leave it blank and then click ok.

It's recommended to reinstall the password before leaving the site.

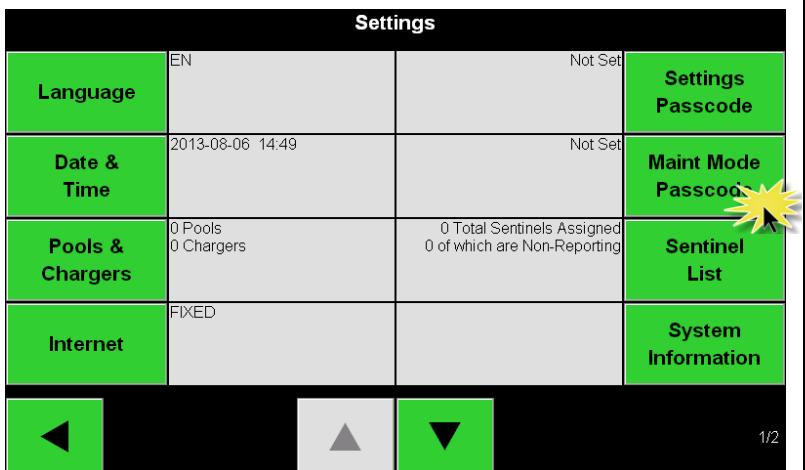
**Password Recovery** – the password can be recovered from Philadelphia Scientific® if lost by contacting us with the system Control Box serial number.



The Maintenance Mode Passcode is set in the same way.

The default passcode is 11111. If you would like to remove it during install leave it blank and then click ok.

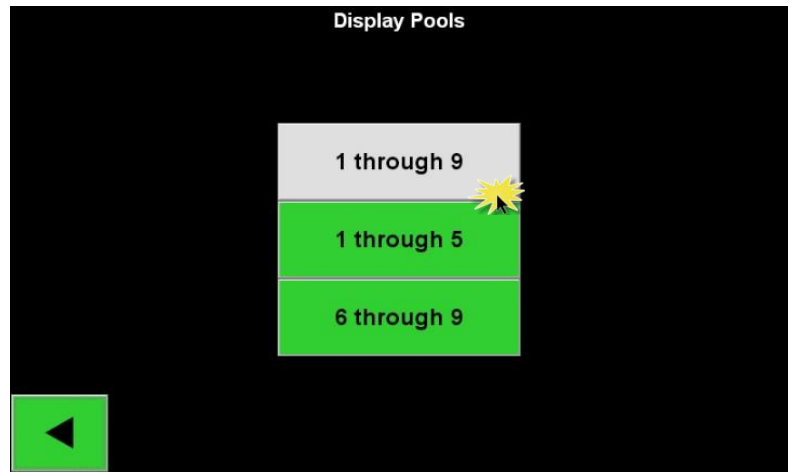
It's recommended to reinstall the password before leaving the site.



## 6.6 Display Pools

The touchscreen display can be set to display Pools 1-5, 6-9, or 1-9.

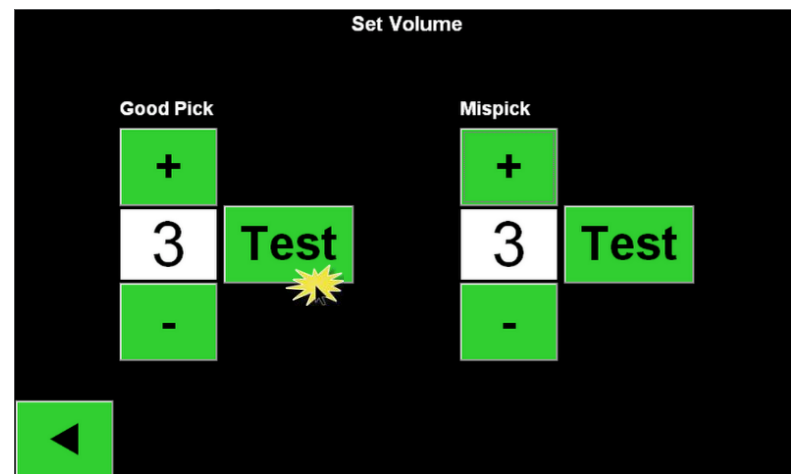
Typically, the control box is set to display Pools 1-9. This setting is generally only used with a combination of a iBOS® Pro 6 Series control box and Wireless Displays.



## 6.7 Volume Adjustment

To set the system volume, press Volume and adjust up to 5 for max volume. To turn volume off adjust to zero. The good pick and the bad pick are independent settings.

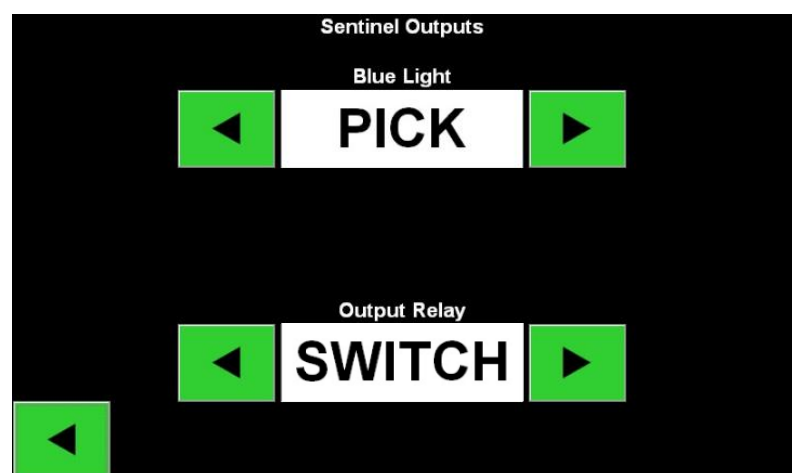
The test button will sound the alarm once.



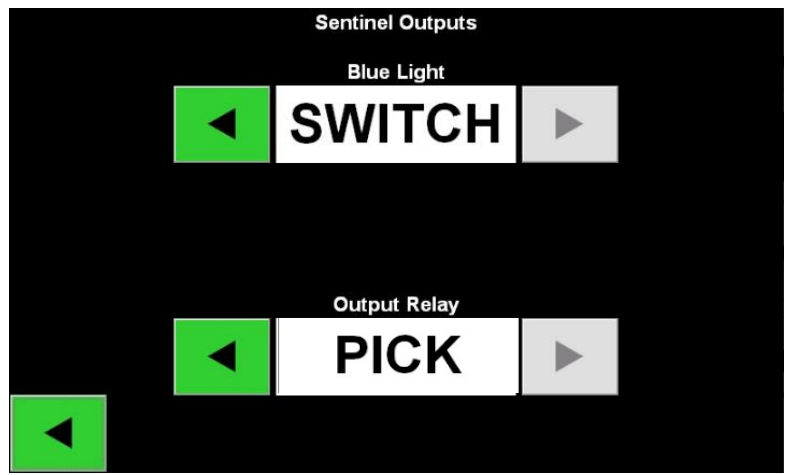
## 6.8 Sentinel Outputs

The Sentinel Outputs screen controls the function of the blue LED and the output relay on the Sentinel.

The blue light can be used as the pick light, the charger switch light, or turned off. An additional light can be attached to the output relay and can be used in the same way.

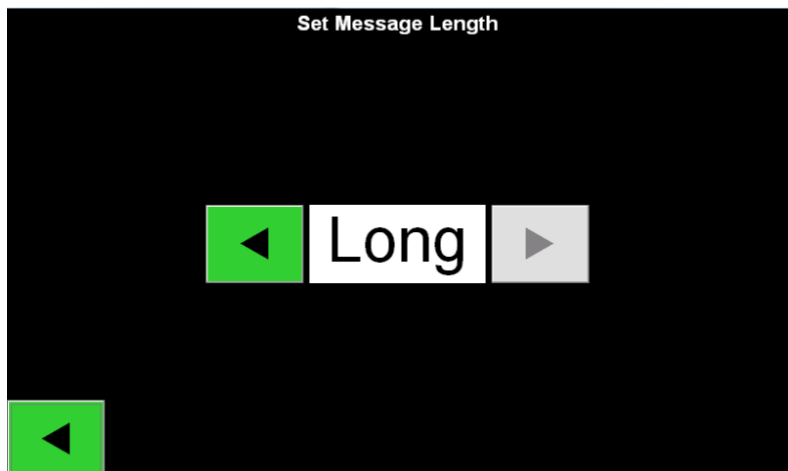


To change the function of the blue LED or output relay, use the arrows to scroll until you have reached the desired function.



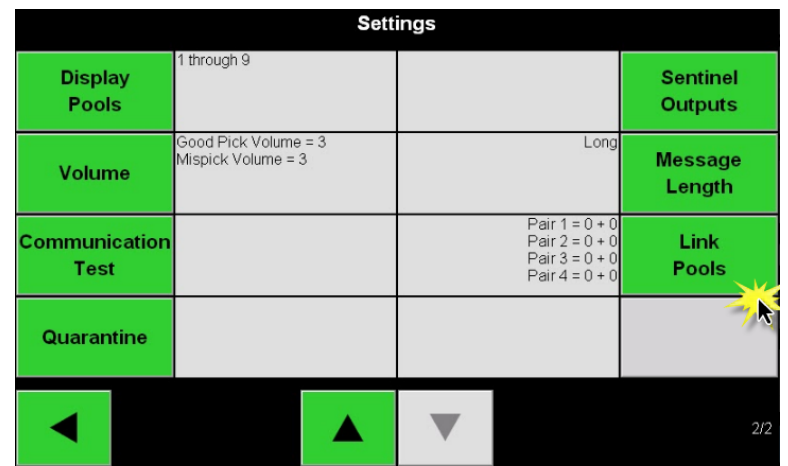
## 6.9 Message Length

This setting is only used with a combination of a iBOS® Pro 6 Series control box and Scrolling Displays.



## 6.10 Linked Pools

This setting is usually used with a combination of a iBOS® Pro 6 Series control box and two battery extractors.



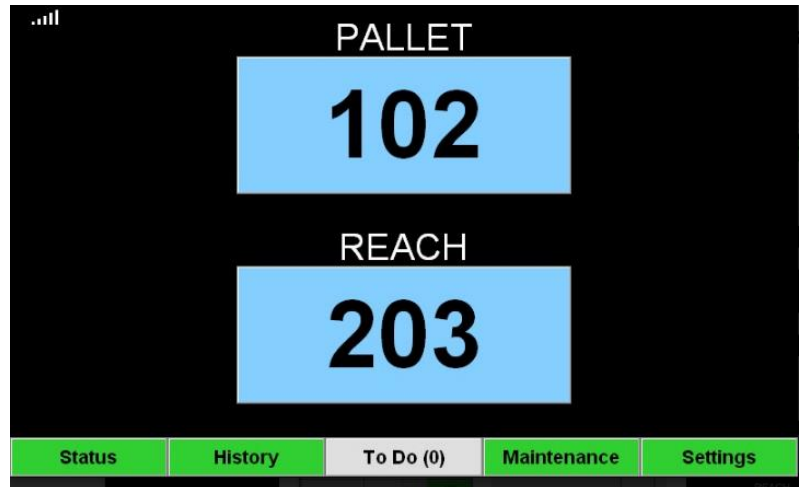
## 6.11 Home Screen Display

The home screen will automatically display up to 9 pools as you create new pools by naming them.

The upper left bars indicate if the display is communicating with the controller. Note this is shown on both wired and wireless versions.

The (blue) boxes show the next battery to take for each of the pools.

This screen is intended to remain on top during operation.



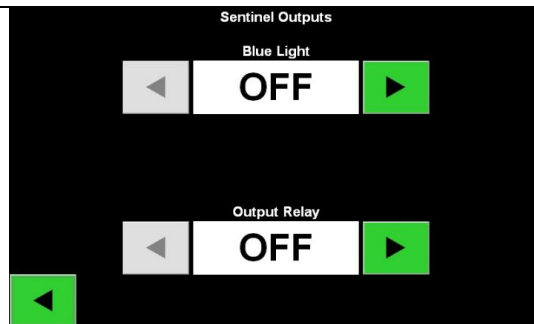
## 6.12 Running System Dark

To quantify the benefits of the iBOS® System, it is suggested that you begin with a benchmark period of two weeks where the system “runs dark.” This means that the system is gathering information but there is no battery selection guidance provided. This way you can tell what is *really* happening in your battery room, so you can compare the raw data with the improved performance once the system is giving commands.

**Here’s how to set the unit for benchmark mode:**

Turn both Sentinel Outputs off:

Using the Settings screen on the Control Box, scroll down to the second page and select “Sentinel Outputs.” Turn the Sentinel Outputs to “OFF”.



Turn off the iDisplay by pressing the power button on the front of the Control Box. This will also turn off the sound.



When you are ready to go live with the system, simply reverse the above steps.



# 7. Final Inspection and Testing


## 7.1 Sentinels™

### 7.1.1 Status

If you have successfully run the installation wizard for all of the Sentinels™, then the green LED is solid on each Sentinel™.



If you want to double check the connection, you can disconnect a battery from a charger and then watch the system status screen. You should see the charger ID. If you don't see the pool and charger ID you expected, then the system may be misconfigured.

Status							
Pool Name	Next Battery on Charger	Batteries Available	Charging	Connected Not Charging	No Battery Connected	Quarantine	Unknown
PALLET	---	0	0	3	1	0	0
REACH 	---	0	0	0	3	0	0

Time Since Last Upload: 01.20.11  
 Serial Number: 4503e6af  
 2013-08-14 09:33

The charger ID will move from column to column as the status changes.

Note: a 10-charger pool you should see all 10 charger IDs.

Available = Charged and ready to use.

The top of the queue is 102 and this charger ID will be the Next Battery on the Scrolling Display or on home screen.

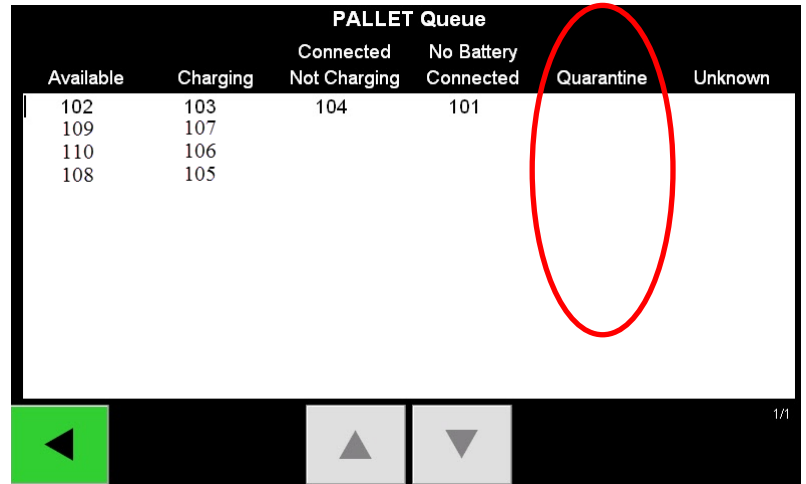
PALLET Queue					
Available	Charging	Connected Not Charging	No Battery Connected	Quarantine	Unknown
102	103	104	101		
109	107				
110	106				
108	105				

1/1

## 7.1.2 Quarantine

The Quarantine column shows the quantity of chargers that have not started or have not completed the charge of a battery that has been connected to it for 24 hours. The system quarantines the battery by taking it out of the queue, and if the issue is not resolved within 72 hours, the battery is returned to the queue.

72 hours is the default factory setting.



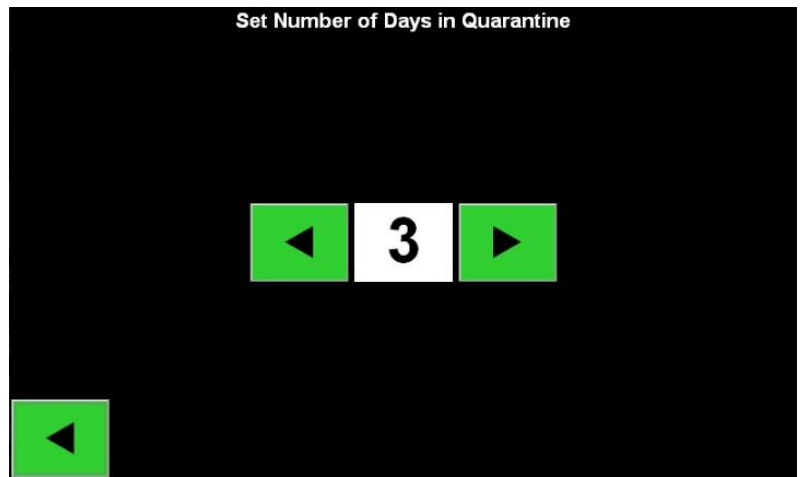
Available	Charging	Connected Not Charging	No Battery Connected	Quarantine	Unknown
102	103	104	101		
109	107				
110	106				
108	105				

- If any charger ID's are listed in the column marked "Quarantine", check to see if the charger indicates a fault.
- Confirm that the amber LED is illuminated on the Sentinel™, and that a battery is connected.
- If the display and all indicator lights on the charger are blank, check to see if there is power to the charger.
- If the charger is functioning properly, check the voltage of the battery as some chargers will not recognize an over discharged battery.
- To remove the battery from Quarantine, disconnect and reconnect the battery.

To change the number of days that a battery is in Quarantine, press Quarantine under the Settings screen.



Scroll to the desired number of days in Quarantine by pressing the arrows on the screen.



### 7.1.3 Sentinel List

Check the Unassigned Sentinel™ list on the touch screen.



This is a very useful screen. You'll be able to see the serial numbers of the unassigned Sentinels™.

When the system is fully configured all Sentinels™ will be assigned.

Press the green arrow at the end of a Sentinel row to see the Sentinel Edit screen.



To find an unassigned Sentinel or determine if a Sentinel has been assigned properly, press Blue On. This will turn the blue LED on the Sentinel on. Press Blue Off when finished.

A Sentinel can be moved to a different Pool by scrolling through Pool ID.

The charger number can be changed by pressing Charger ID.

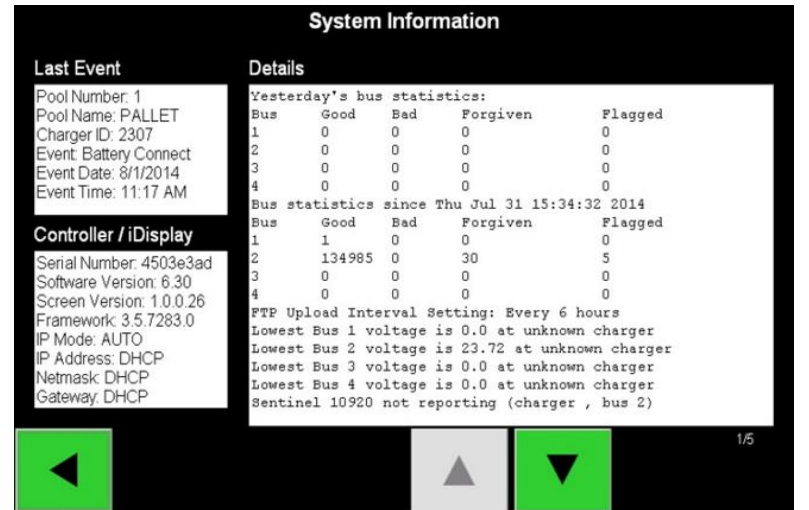


## 7.1.4 System Information

When the system is installed, you can look at the System Info screen to check that your lowest voltage on any bus is above the 19 Volt limit.



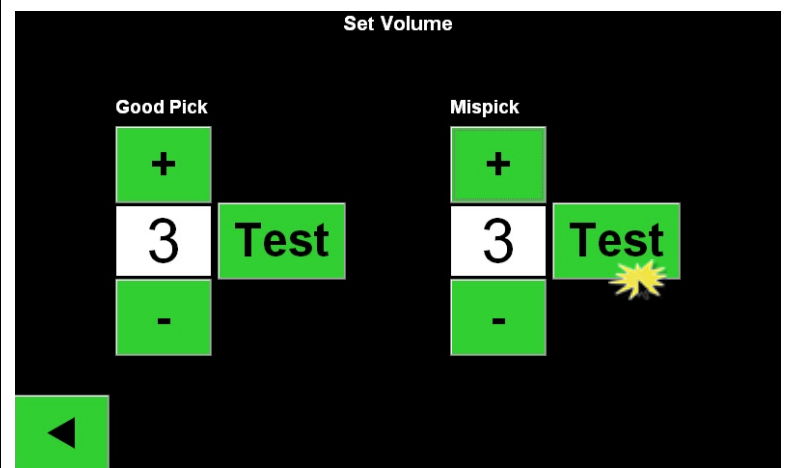
The limiting factor is 19 Volts min voltage on the last Sentinel™ on a bus.



## 7.2 Shouter

To test the shouter, unplug any battery other than the battery indicated on the Scrolling Display. You should hear the shouter say, “Stop! You have selected the wrong battery...”

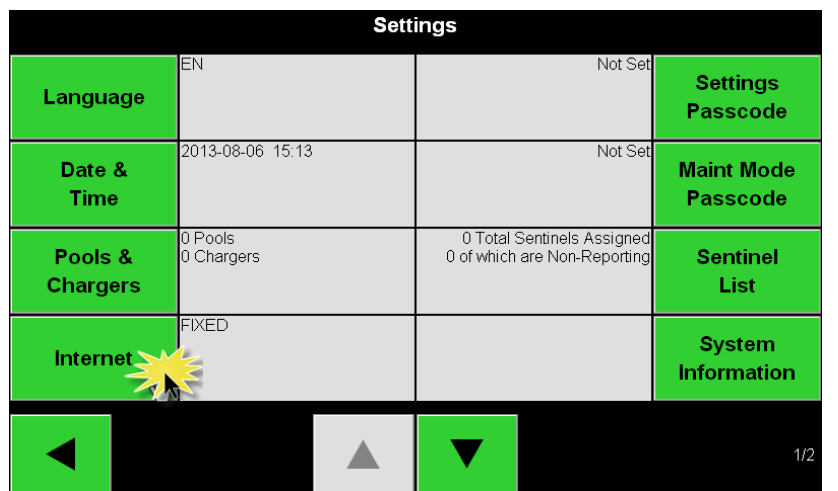
Alternatively, you can just use the set volume setting to test the shouter. Press the Test button.



## 7.3 Check Data Upload to Web

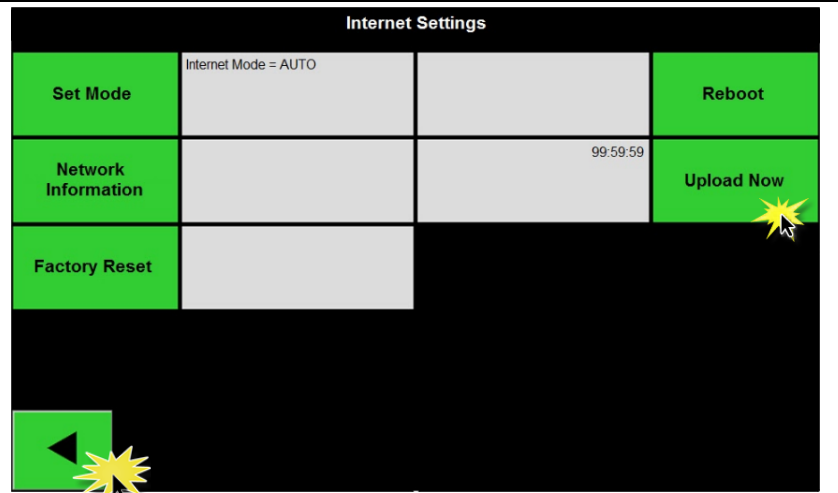
After you have connected the Control Box to a cellular modem or Ethernet port, reboot the Control Box. To do this, go to “Settings,” “Internet,” and “Reboot.” You are now ready to do a data upload test.

Click on the “Settings” screen (default factory password is 919191) and select the “Internet” button.



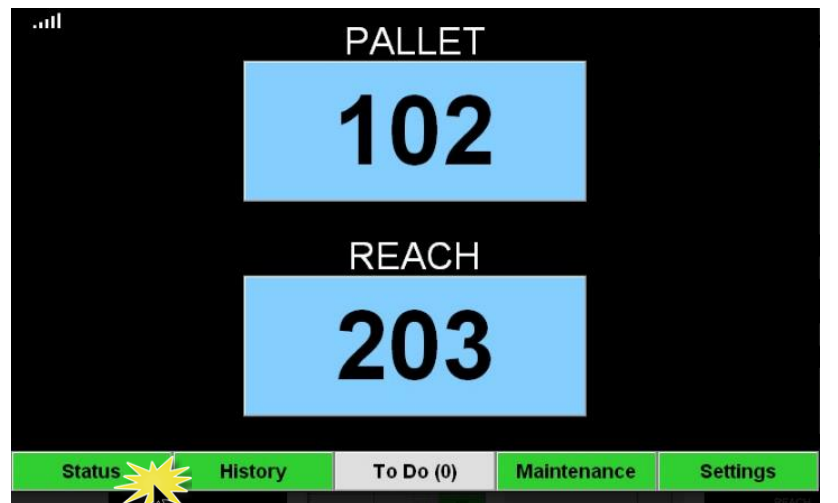
Select the “Upload Now” button.

Exit out of this screen using the back-arrow button.



This will take you back to the home screen. Then click the “Status” key. Screen automatically adjusts to named pools.

Also note, the upper left symbol displays the level of communication with Control Box.



Wait 5 minutes, then check the “Time Since Last Upload” on the bottom left corner of the status screen.

Status							
Pool Name	Next Battery on Charger	Batteries Available	Charging	Connected Not Charging	No Battery Connected	Quarantine	Unknown
<b>PALLET</b>	---	0	0	1	3	0	0

◀

Time Since Last Upload  
 99:59:59

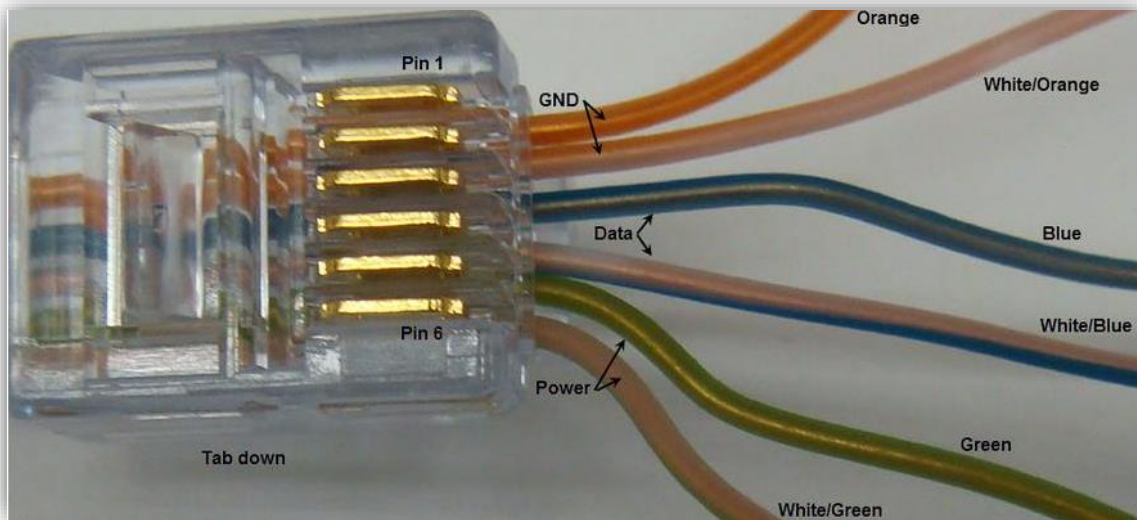
Serial Number  
 4503e6af

2013-08-07  
 11:23

Task	Status
Make sure all Sentinels™ are displaying a solid green light.	<input type="checkbox"/>
Make sure all Sentinels™ are assigned and reporting via the “Sentinel List” under “Settings” on the home screen.	<input type="checkbox"/>
Test the Shouter(s) for “Correct” and “Incorrect” battery pick sounds from the menu. Test this by clicking “Settings” then “Volume.” Also select desired volume at this time.	<input type="checkbox"/>
Test the upload capabilities of the iBOS® System via the Internet.	<input type="checkbox"/>
If the passwords were disabled during installation, reset the Maintenance default password to “11111” and the Settings default password to “919191”. Or set passwords of your own choosing.	<input type="checkbox"/>
Check that the date and time are set correctly.	<input type="checkbox"/>
Check that all chargers are labeled by Pool (101, etc.)	<input type="checkbox"/>
Check Charger Settings to make sure “Cool Down” setting and “Delay Equalization Charge” are set to “Off.”	<input type="checkbox"/>



## Appendix A: Data Cable Reference Diagram (RJ12, 6-wire)



## Appendix B – Internet Connection Requirements

This appendix is provided to present all the information that an IT department would need in order to connect an iBOS® system to the iBOSworld website. The iBOS® system is used in the battery room to provide rotation of battery usage to maximize the useful life of the battery and to give management information about the optimum number of batteries and chargers needed and also if all of the chargers are working properly.

**Description of hardware:** The iBOS® system is installed in the battery room of the distribution center. There is a sensor connected to each of the chargers and they are all wired to a central Control Box. The Control Box monitors the charger activity, displays messages on a Scrolling Display for the battery room operators, and collects data on the activities in the battery room. The Control Box has a Pentium® computer running Linux™ inside it. The Linux is an embedded Ubuntu GNU/Linux®. The Control Box is equipped with Ethernet for uploads to the web.

**Description of data:** The data collected is: which chargers are being picked from, the number of fully charged batteries available at any time, and the times when an operator picks a battery other than the one they should. The data is stored in a proprietary comma delimited format and transmitted via FTP to a server on the internet maintained by Philadelphia Scientific, LLC. The size of the data files is dependent on the size of the installation and the activity level. For example, a typical 20 charger site that pulls a battery from each charger every day would generate about 4k of data per day. In addition, the configuration file for the Control Box is uploaded to the server whenever it is changed. This helps us do remote technical support by being able to see how the box is configured and provides a backup of the configuration information in case hardware needs to be replaced.

## Connecting to the Internet

### Method 1 – Ethernet

**Option A:** DHCP Dynamic Host Configuration Protocol (DHCP) is an automatic configuration protocol used on IP networks. This setting allows for the easiest connection to the web. The Control Box will be

assigned an IP address for the network on boot up. The installer will configure the Control Box to Ethernet auto mode.

**Option B:** To connect the Control Box to a corporate network, the Control Box is typically configured with a fixed IP address. The IT department needs to allocate an IP address and provide that information to the installer. Two-way data flow is necessary to enable software updates and establish confirmation for file uploads. The installer will then configure the Control Box to Ethernet mode and configure the IP address of the Control Box. The IT department then needs to configure the firewall to allow the information to get to the server. Our server's address is [www.ibosworlddata.com](http://www.ibosworlddata.com). We only need SFTP on Port 22 enabled. If the IT department limits access to the Internet, our server's address may need to be set for DNS server access. We use the standard Google global Domain Name System (DNS) to resolve the URL for uploads. (IP: 8.8.8.8 and 8.8.4.4.) DNS addresses can be changed via the Internet button on the Settings screen. Also, all communication is initiated by the Control Box. We are not enabling an ability to remotely initiate a communication session from the outside. When we use the Ethernet method we generally set the upload frequency to once per hour.

## **Method 2 – Cellular Modem**

Connect and turn on cellular modem then boot the Control Box. An IP address will be assigned through DHCP during the boot up process. NOTE: Our system comes configured for Verizon as its carrier. AT&T configuration is available by special order. Call Philadelphia Scientific® at 215-616-0390 and ask for Customer Service.

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