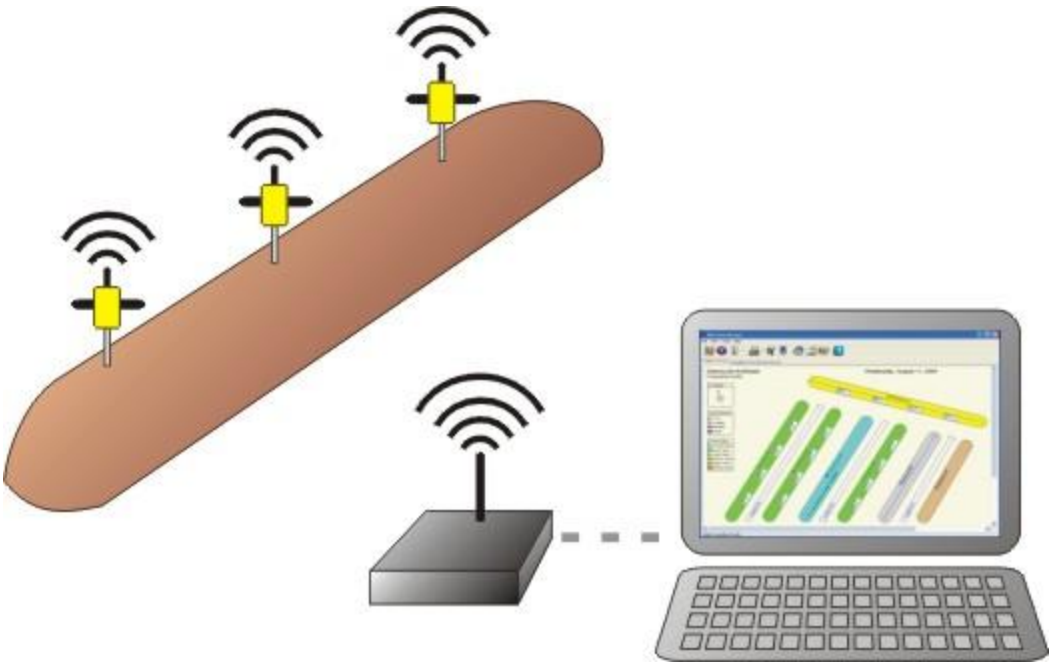
# Windrow Manager

User Guide Addendum

# Wireless Probe System



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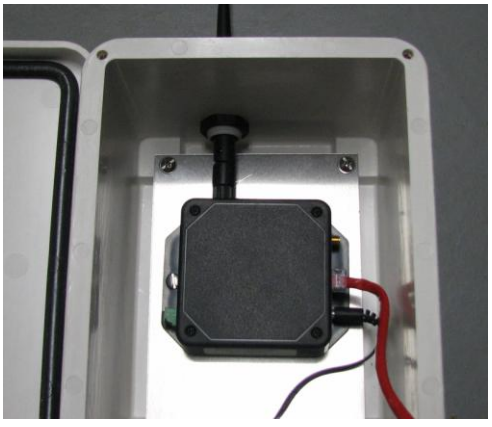
## Introduction


The wireless probe system for windrow Manager includes several components and software features. The wireless base station collects all wireless sensor data and stores up to 15,000 records internally. Each wireless probe can contain one or more transmitters (one for each sensor on the probe) that send the current sensor value to the base station every few seconds. A wireless repeater can be used to extend the range between the base station and the probes.

For assistance with the wireless probe system, please call 1-800-610-7291 or email: support@compostingtechnology.com.

## Installing the Equipment

If possible, the wireless equipment should be installed in a location that will provide optimal performance for the wireless system. In general, this means that the base station and any repeaters should be located as high as practically possible, away from any large electromagnetic sources such as motors or generators. The base station and repeater(s) can be located indoors, but performance may be degraded depending on the building's design and construction.



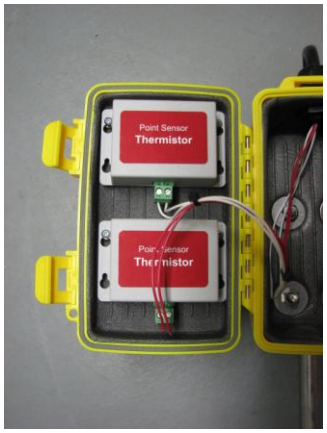
The signal range for the 418 MHz signal from the probes to the base station or repeater is approximately 600 ft. without any obstructions.

The base station or repeater should be located as close as possible to the area where the probes will be used, and above any obstructions that might decrease the signal range. The repeater receives the communications from the 418 MHz probes and relays it to the base station via a 900 MHz transmission. The repeater has a transmission range of up to 7 miles with the included antenna. Of course local features such as hills and buildings may decrease the effective range.

The base station and repeater require a DC power source, which can be provided via the included AC adapter. The base station requires a CAT5 cable connected to a local network that includes the PC Win7/8) running Windrow Manager, or connected in cross-over mode directly to the PC.

## Wireless Probes


The probes are each equipped with wireless transmitter/sensor(s) for each thermistor, etc. located on the probe. The wireless transmitter(s) are located inside a weatherproof box at the top of the probe stem and are easily accessible for repair or maintenance. To replace a transmitter, simply disconnect the sensor wires, loosen the retaining screws and lift the sensor out of its position.




If only a battery change is required, the transmitter cover can be removed be squeezing in on the sides of the cover and gently lifting the cover up off of the transmitter. Be extremely careful when removing and replacing the cover because there is an antenna located directly under the cover, which should not be damaged.

When replacing the battery on multiple sensors it is recommended that only one cover be removed at a time to avoid mixing up the covers. Each cover is marked with the transmitter's unique serial number, and if the cover is placed on the wrong transmitter it will no longer correctly identify the sensor.

The 418 MHz transmitter/sensors have an approximately 600 ft. range without any obstructions. For best results, the receiver or repeater should be placed as near as possible to the area where the probes will be used, and above any obstacles that could reduce the signal range.

# Network Configuration

*Before setting up the wireless probe system, the Windrow Manager software must be installed and configured and a facility layout created (see Windrow Manager User's Guide).*

The first step in setting up the wireless system is to establish the communication link between the PC running Windrow Manager and the base station itself. Communication between the PC and base station is via Ethernet. They can either be both connected to the same local network (LAN) or they can be connected directly using a network crossover cable. The default network settings for the base station are as follows:

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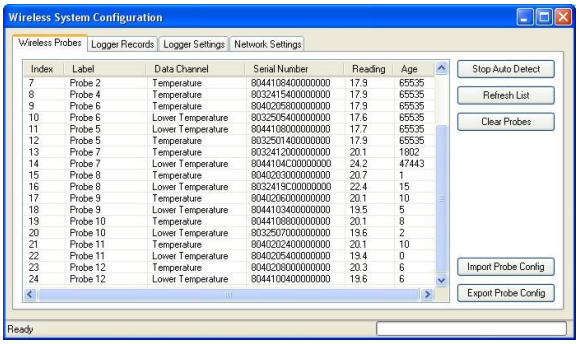
| Network IP (static): | 192.168.1.55 |
| Subnet Mask: | 255.255.255.0 |
| Network Port: | 1000 |
| | |

These settings can be changed through the Network Settings tab of the Wireless System Configuration dialog. A change in the PC's network settings might need to be done to ensure a connection. In the Networks and Sharing Center, for the network that the base station is on, follow Connections > Properties > Internet Protocol Version 4. Here, check “Use the Following IP Address” where the IP address is 192.168.1.xxx where xxx is any number 0-255 but not 55, as that is assigned to the base station, if it has its default IP address. The Subnet Mask should be the same as the one above. Once the Ethernet connection has been established, you can access the base station's configuration by clicking Tools and then Wireless System Configuration in the Windrow Manager main menu.

# Wireless Probe Setup

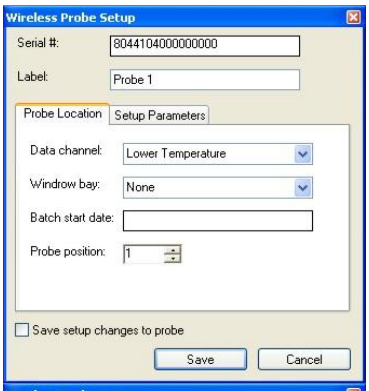



The first tab in the Wireless System Configuration dialog shows the list of wireless sensors that are registered with the base station. Each sensor has a unique serial number as well as an associated label and data channel that are used by Windrow Manager to map data from the sensors to windrow batches that are being monitored. The auto detect feature can be used to add new sensors to the list. Clear Probes causes all sensors to be removed from the registration list and will require that all sensors be re-detected and set up again.

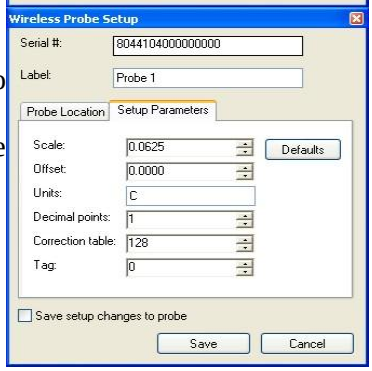
To connect a probe, make sure the base station is on, as is the transmitter, by opening the gray enclosure, opening the access to the batteries and toggling the on/off switch to on. Replace the battery access door. There should be a black service button on the transmitter. Pressing it twice with a ten second gap will sync the probe to the base station.

Hitting “Refresh List” should cause the probe data to appear on screen. If not, press the transmitter service button once more, wait ten seconds then press it again, and refresh the list again. If you choose to, numbering the probes as they appear on screen will allow you to keep better track of them.

To view or configure a sensor, double click the sensor in the list. This will show the sensor setup dialog. This dialog allows you to set the sensor's label, data channel and setup parameters. It also shows the sensor's associated windrow batch information. If multiple sensors are located on the same probe, each of these sensors should use the same label and the data channel should be used to differentiate between the sensors on that probe.

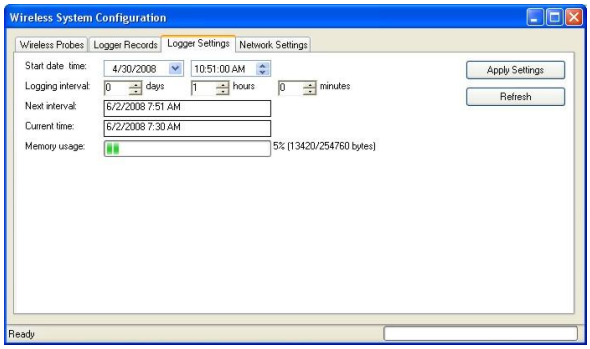



On the Setup Parameters tab, there are a number of variables used by the base station to properly convert the raw sensor readings into usable data. These fields should always be set to the default values, which can be done by clicking the Defaults button. To save the parameters and label to the base station, check the “Save setup changes to probe” checkbox and then click the Save button.




# Logger Settings

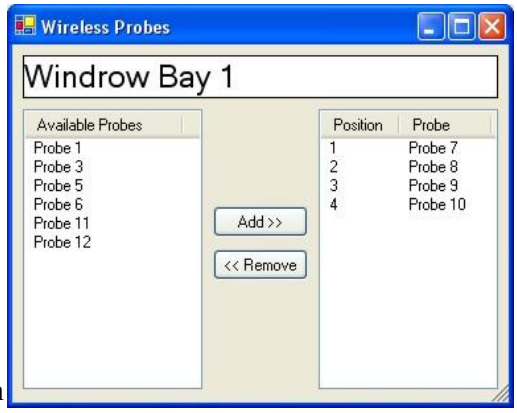
The Logger Settings tab of the Wireless System Configuration dialog allows you to view and configure the data logging setting for the base station. To change the logging interval and timing, set the number of days, hours and minutes between data records. Then select the date and time of the first record to be stored using the new configuration. Finally, click the Apply Settings button to save the new logger settings to the base station.




This tab also displays the current clock time on the base station (updated when the dialog is opened, or when the Refresh button is clicked), the next scheduled data record and the current memory usage on the base station.

The Logger Records tab of the Wireless System Configuration dialog can be used to view the contents of the data log on the base station and also to clear the contents of the data log.

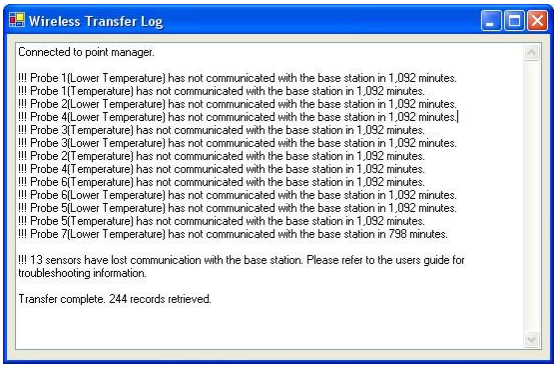
## Assigning Wireless Probes




Before the data collected by the wireless system can be used by Windrow Manager, wireless probes must be assigned to their respective windrows and their location in the windrow defined. This is done by clicking on a windrow in the facility layout or list view to bring up the windrow information. Then click the Wireless Probes button to open the Wireless Probes dialog. The list on the left side of the dialog shows all the probes in the system that are not currently assigned to active windrow batches. To assign a probe to the selected batch, select the probe in the list and click Add. To un-assign a probe from the selected batch, select the probe in the list on the right side of the dialog and click Remove. The order of the probes in the selected batch can be changed by selecting a probe and right-clicking to bring up the Change Position menu. Click Up or Down in the Change Position menu to reassign the position of the selected probe.

## Retrieving Wireless Data

Data records are stored on the base station at the intervals specified in the logger settings. As long as the base station is turned on it will continue to receive wireless data from the probes and log it internally. This does not require the PC to be turned on or Windrow Manager software to be running. When you are ready to retrieve the data that has been stored on the base station, click Tools and then Retrieve Wireless Data in the Windrow manager main menu. A dialog will appear showing the status and progress of the transfer operation.




After all the data has been transferred from the base station to Windrow Manager on the PC, the log records will be deleted from the base station. This is done to ensure that there is always room for more data on the base station and to keep data transfer times to a minimum.

Finally, the Wireless Transfer Log window will appear with a summary of the transfer. Any errors in the transfer process will be displayed along with information to help troubleshoot the problem. If there has been no recent communication from a sensor that is registered with the base station, or if a sensor value is outside the expected range, an error will appear in the log for that sensor. See the troubleshooting section for more information on troubleshooting errors with the base station and probes.

# Troubleshooting

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| The sensor has lost communication with the base station. | Check that the probe is within the signal area for the wireless receiver. The 900 MHz receiver has about 600 ft. range without any obstructions. Different types of obstructions will decrease the signal range to varying degrees, with a cumulative effect from multiple obstructions. Try placing the probe near the receiver to see if that corrects the problem. If the distance between the probe and receiver is to great, a relay can be bought to extend the wireless range of the receiver.<br><br>Check that the sensor is turned on. Activate the sensor by pressing down on the center of the label on the front of the sensor.<br><br>The battery on the sensor may be too low. Try changing the battery. |
| The sensor is giving an invalid reading. | Open the probe head and check that all wire connections are correct and secure.<br><br>Disconnect sensor wires and test with a multimeter for open or short circuit. A reading of 0K Ohms across the sensor wires indicates a short circuit in the sensor wiring or thermistor assembly. An open circuit reading indicates a break in the sensor wiring or thermistor assembly. The probe may need to be returned to the manufacturer for repair or replacement. |
| Connection to wireless base station failed or Lost connection to wireless base station. | Check that the base station is powered on and connected to the local network or to the PC via cross-over cable.<br><br>Check that the PC is connected to the local network or to the base station via cross-over cable.<br><br>Check the network settings on the PC and the base station to ensure that they can communicate with the current settings.<br><br>Make sure the network settings are correct on the PC. Under the Network and Sharing Center, follow Connections > Properties > Internet Protocol Version 4, and make sure that the IP address is 192.168.1.xxx where xxx is 0-255 and not 55 if the base station has its default settings. The Subnet Mask should be 255.255.255.0.<br><br>To reset the wireless base station to the default IP, unplug it from the power source. Press and hold the service button. While still holding the button, plug power source back in, and wait 10 seconds or until |

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| | the red PWR light begins blinking. The IP address of the wireless base station should now be 192.168.1.55<br>NOTE: This method resets the wireless base station to factory defaults. Use only when all other options have been exhausted. |