# Bella Ag Technical Specifications and Install Guide for 3.0 System

## System Components

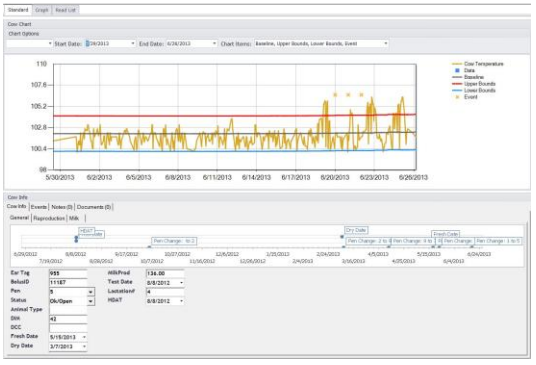
### Gateway



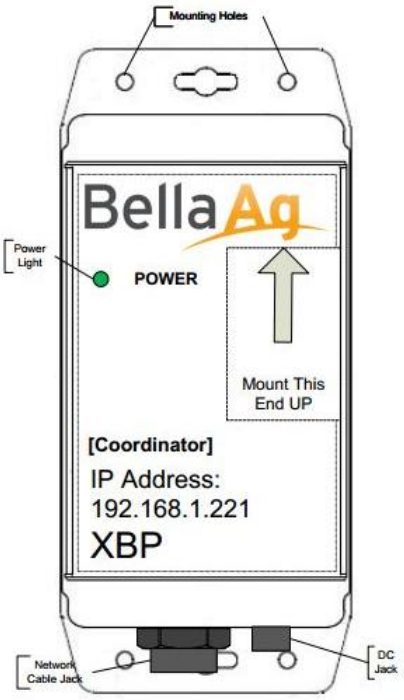
### Collector

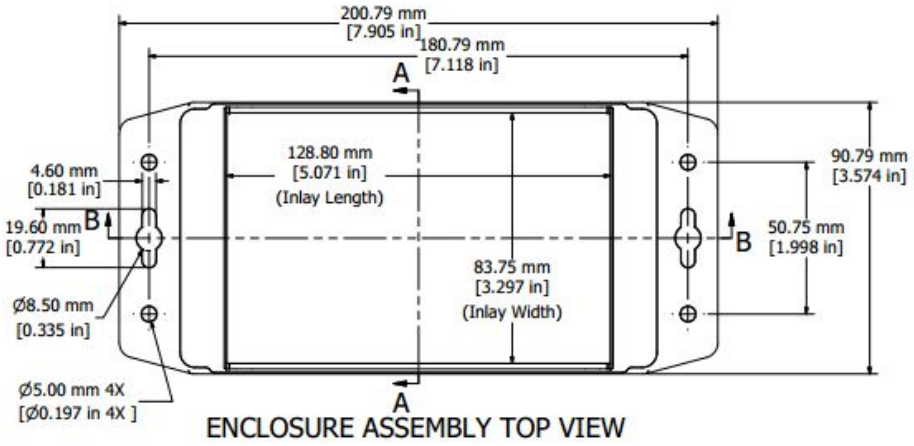

### Bolus


### Software

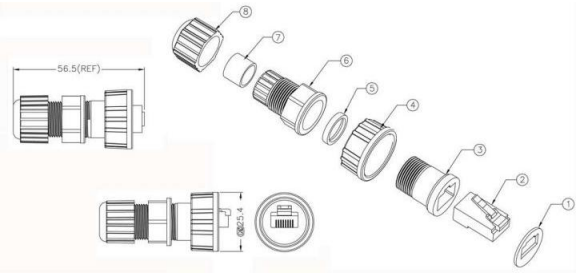


# Coordinator Specifications




## Coordinator Physical Dimensions



## Included Cat5 Connector and DC Power Supply

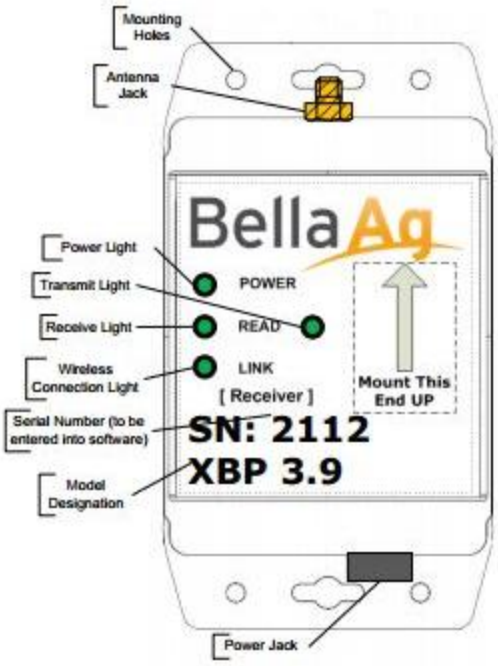
## Cat5 Cable NOT Included

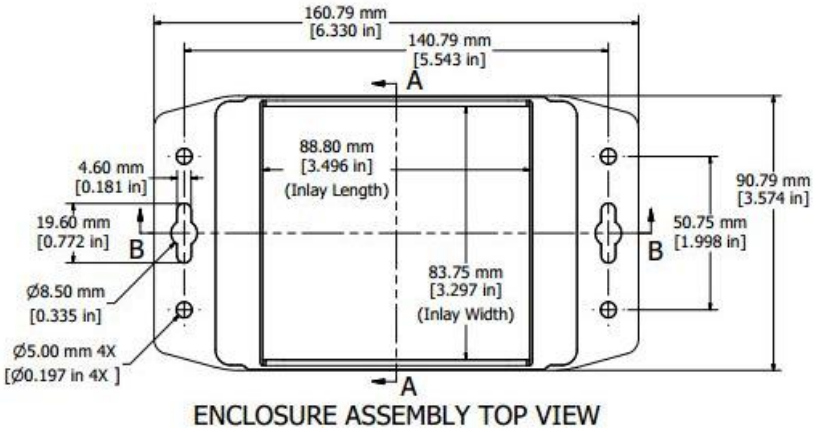
**Coordinator comes supplied with a Waterproof Modular Cat5 connector used to terminate the network cable at the coordinator location, and an approved DC Power Supply. Network cable is not included with the coordinator. The coordinator is intended to be wall mounted in a vertical orientation, preferably with direct line-of-sight to the colllector locations.**

BellaAg

# Collector Specifications

## Collector Layout and Description




ENCLOSURE ASSEMBLY TOP VIEW

## Collector Housing Physical Dimensions

## Included Power Supply and Omnidirectional Antenna

**Collectors come in two different versions based on which frequency they operate in, 900MHz for North America, and 800MHz for Europe and the UK. The frequency your collector uses can easily be identified by the "Model Designation" located below the Serial Number on the front of the collector. Models marked as "3.9" indicate a 900MHz system, while models marked "3.8" indicate an 800MHz system.**

**Always verify that the model designation number matches the frequency approved for your geographic region.**

**Collectors come supplied with an approved DC power supply and omni-directional antenna. The Collector is intended to be mounted in a vertical orientation facing toward the coordinator or dongle gateway location.**


BellaAg

# Coordinator and Collector Components

## Coordinator and Collector Enclosure Key Features

- **Designed for harsh industrial environments or outdoor applications (security, outdoor wireless, controls etc. etc.)**
- **Designed for wall mounting - interior is secure as lid screws are behind the lid. Can be made more secure if wall mounted with security screws (tamper resistant screws).**
- **Polycarbonate (material carries a UL flammability rating of UL94 V0 @ 3mm) - Recommended for outdoor use.**
- **Color is a light gray (RAL 7035) to help keep heat absorption down.**
- **Gasketed lid with two piece "tongue & groove" construction provides protection against ingress of oil, dust and water.**
- **Gasket is one piece using high temperature U.L. listed - silicone rubber gasket material.**
- **Designed to meet IP 67 & NEMA 4, 4X, 12 & 13 ratings.**
- **UL 508 listed (File # E65324).**
- **Flanged lid is secured with self captivating - M4 stainless steel machine screws (included), threaded into integral stainless steel bushings (for repetitive assembly & disassembly). All stainless steel hardware to avoid corrosion caused by dissimilar metals.**
- **Flanged lid screws are self captivating.**

# Coordinator and Collector Components

## Coordinator to Collector Wireless Communication Specifications

| Performance | |
|---|---|
| RF Data Rate | 250 Kbps |
| Indoor/Urban Range | 300f ft. (90 m) |
| Outdoor/RF Line-of-Sight Range | 5000 ft. (1500 m) |
| Transmit Power | 10mW (+10dBm) |
| Receiver Sensitivity (1% PER) | 102 dBm |
| **Features** | |
| Frequency Band | 2.4 GHz |
| Interference Immunity | DSSS (Direct Sequence Spread Spectrum) |
| Serial Data Rate | 1200 bps - Mbps |
| Antenna Configuration | Polarized Wire Whip |
| Operating Temperature | 40 C to +85 C, 0-95% humidity non-condensing |
| **Networking and Security** | |
| Encryption | 128-bit AES |
| ID's and Channels | PAN ID, 64-bit IEEE MAC, 15 Channels |
| **Power Requirements** | |
| Supply Voltage | 2.7 - 3.6VDC |
| Transmit Current | 250 mA |
| Receive Current | 47 mA |
| **Regulatory Approvals** | |
| FCC, IC (North America) | Yes |
| ETSI (Europe) | Yes |
| C-TICK (Australia) | Yes |
| TELEC (Japan) | Yes |

**The embedded wireless communication radios* have a watchdog feature that will force them to reestablish the link between the coordinator and collector in the event that the power fails and returns, eliminating the need to manually reset either device.**

* Wireless communication component contains FCC ID: MCQ-PROS2B IC: 1846A PRO-S2B

BellaAg

# Coordinator and Collector Power Supply Specifications

**SERIES:** 6 W WALL PLUG | **DESCRIPTION:** SWITCHING POWER SUPPLY

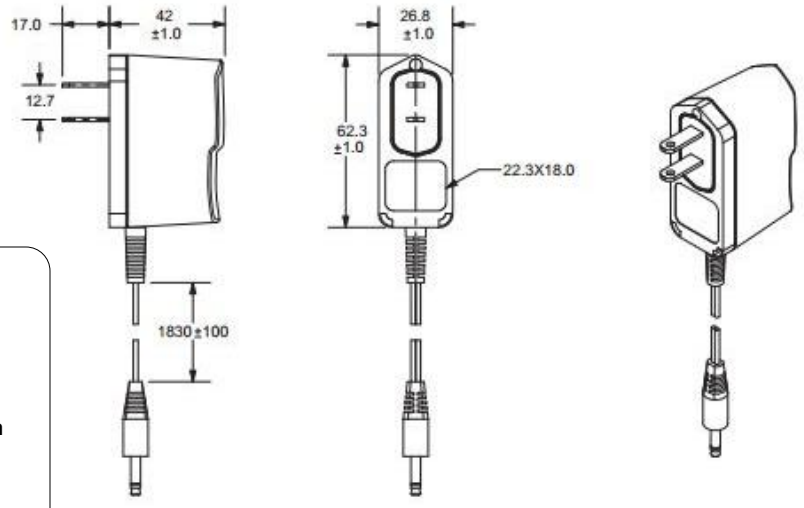
**FEATURES**

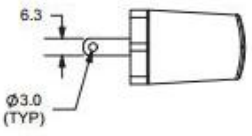
- Up to 6 W power
- Compact size
- Single output from 3~24 V
- Overload, over voltage, and short circuit protections
- 100~132 Vac input voltage
- meets EISA / efficiency level IV regulations
- custom designs available

| MODEL | output voltage nominal (Vdc) | output current max (A) | output power max (W) | ripple and noise[1] max (mVp-p) | efficiency level |
|---|---|---|---|---|---|
| EPS030100 | 3 | 1 | 3 | 100 | IV |
| EPS033100 | 3.3 | 1 | 3.3 | 100 | IV |
| EPS045100 | 4.5 | 1 | 4.5 | 100 | V |
| EPS050100 | 5 | 1 | 5 | 100 | V |
| EPS060100 | 6 | 1 | 6 | 100 | V |
| EPS090066 | 9 | 0.66 | 6 | 100 | V |
| EPS120050 | 12 | 0.5 | 6 | 150 | V |
| EPS150040 | 15 | 0.4 | 6 | 150 | V |
| EPS180033 | 18 | 0.33 | 6 | 180 | V |
| EPS240025 | 24 | 0.25 | 6 | 240 | IV |

Notes: 1. At full load, 100 ~ 132 Vac input, 20 MHz bandwidth oscilloscope, each output terminated with 10 µF aluminum electrolytic and 0.1 µF ceramic capacitors.

## MECHANICAL DRAWING




Units: mm

Tolerance:
X.X ±0.5mm
X.XX ±0.03mm

NOTE 1: THIS POWER UNIT IS INTENDED TO BE CORRECTLY ORIENTED IN A VERTICAL OR FLOOR MOUNT POSITION.

**These power supplies are included in North American orders only. For systems installed outside of North America contact a Bella Ag representative for help in obtaining a suitable power supply.**

Bella Ag

# Coordinator and Collector Power Supply Specifications

## INPUT

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| voltage | | 100 | | 132 | Vac |
| frequency | | 47 | | 63 | Hz |
| input current | | | | 1 | A |
| inrush current | 120 Vac, inrush lasts no longer than 0.5 ms before settling to steady state current | | | 40 | A |
| no load power consumption | | | | 0.5 | W |

## OUTPUT

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| line regulation | | | ±1 | | % |
| load regulation | | | ±5 | | % |
| temperature coefficient | 0 ~ 40°C, full load, after initial 1 hour warm-up | | ±0.02 | | %/°C |
| start-up time | time needed to reach regulation | | | 3 | s |
| hold-up time | at 115 Vac, full load | 10 | | | ms |

## PROTECTIONS

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| over voltage protection | clamped by internal protection zener | | | | |
| overload protection | Fold-back current limiting starts at 105 ~ 160% of the rated output current. Auto-recovery. Long term exposure to overload condition may reduce product reliability. | | | | |
| short circuit protection | Continuous, auto-recovery upon removal of short | | | | |

## SAFETY & COMPLIANCE

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| isolation voltage | input to output at 10 mA for 1 minute | | | 3,000 | Vac |
| isolation resistance | input to output at 500 Vdc | 100 | | | MΩ |
| safety approvals | UL/cUL 1310 | | | | |
| EMI standard | FCC part 15 class B | | | | |
| leakage current | at 120 Vac | | | 0.5 | mA |
| class 2 power supply | yes | | | | |
| MTBF | at 25°C, per MIL-HDBK-217E | 240,000 | | | hours |
| RoHS compliant | yes | | | | |

## ENVIRONMENTAL

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| operating temperature | | 0 | | 40 | °C |
| storage temperature | | -10 | | 70 | °C |
| operating humidity | | 20 | | 80 | % |
| storage humidity | | 10 | | 90 | % |

# Software/System Requirements

## Minimum Software/System Requirements

- **Dual Core Processor, 2.0 GHz**
- **2 GB RAM**
- **500 MHz Dedicated Video Memory**
- **5 GB Hard Disk Space**
- **Windows Vista© Home/Windows 7© Home, 32 bit OS**
- **1 LAN port configured for 192.168.1.1 subnet for Network Coordinator, or 1 USB 2.0 port or better for Dongle Gateway**

## Recommended Software/System Requirements

- **Quad Core Processor, 2.0+ GHz**
- **8+ GB RAM**
- **1+ GHz Dedicated Video Memory**
- **5 GB Hard Disk Space**
- **Preferably not Solid State Hard Drive**
- **Windows 7© Professional or better, 64 bit OS**
- **1 LAN port configured for 192.168.1.1 subnet for Network Coordinator, or 1 USB 2.0 port or better for Dongle Gateway**

BellaAg

# Collector Location Guidelines

**Because the boluses store animal temperature information only one collector is usually needed to obtain the data. By mounting the collector in the holding area, every animal in the milking herd can be accessed on a regular basis as the animals enter the parlor to milk. If more frequent downloads are desired, or if information from animals not in the milking herd is needed, additional collectors can be mounted in areas where the animals are housed.**

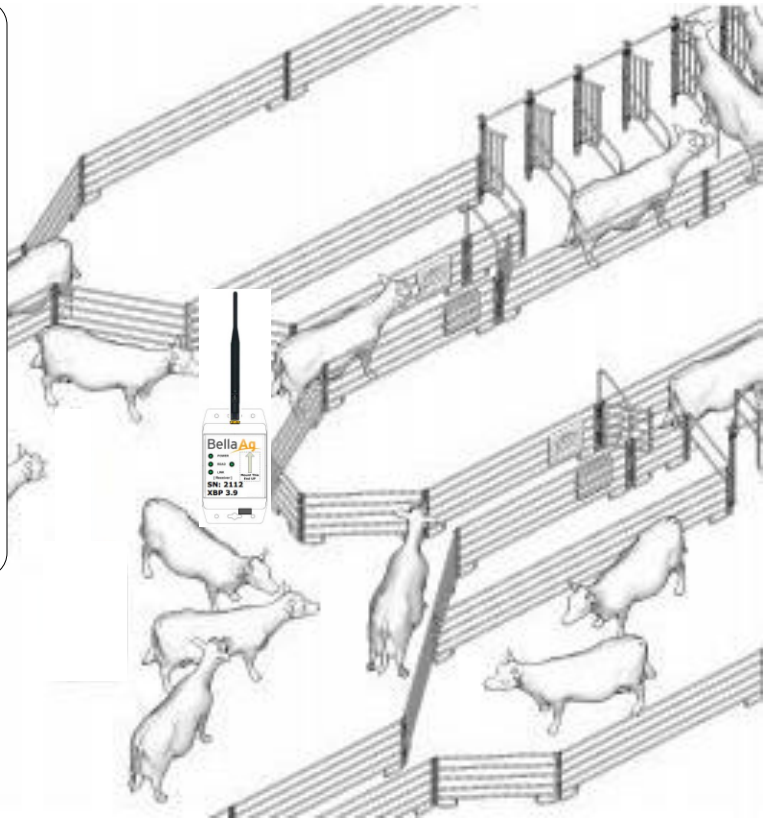
**Ideal placement can be challenging in the dairy environment but following these simple guidelines will result in satisfactory performance overall:**

- **Collectors should be mounted over 8ft. (2.5 meters) from the ground but not higher than 12ft. (4 meters) from the ground, ideal mounting height should be near 10ft. (3 meters) from the ground**
- **Collectors should be located directly over the area that the animals travel through and near the center of a holding area or travel lane**
- **The omni-directional antenna should be mounted vertically, or perpendicular to the ground, and is adjustable allowing you to configure it so that it is pointing either directly up or down above the area the animals will move through**
- **The omni-directional antenna cannot be mounted against any metal surface and should be kept at least 6 inches away from any metal as well as any electrical wiring**
- **The Collector will require an appropriate 110V AC outlet nearby to provide power. Systems outside of North America will normally be sent with an appropriate power supply for the region**
- **When mounting the collector in a Tie Stall environment, the collector should be located in the middle of the barn to allow communication to boluses on either side**
- **Tie stall barns typically have lower ceilings and the collector should be mounted flush to the ceiling and the antenna should be turned 90 degrees and point straight down**

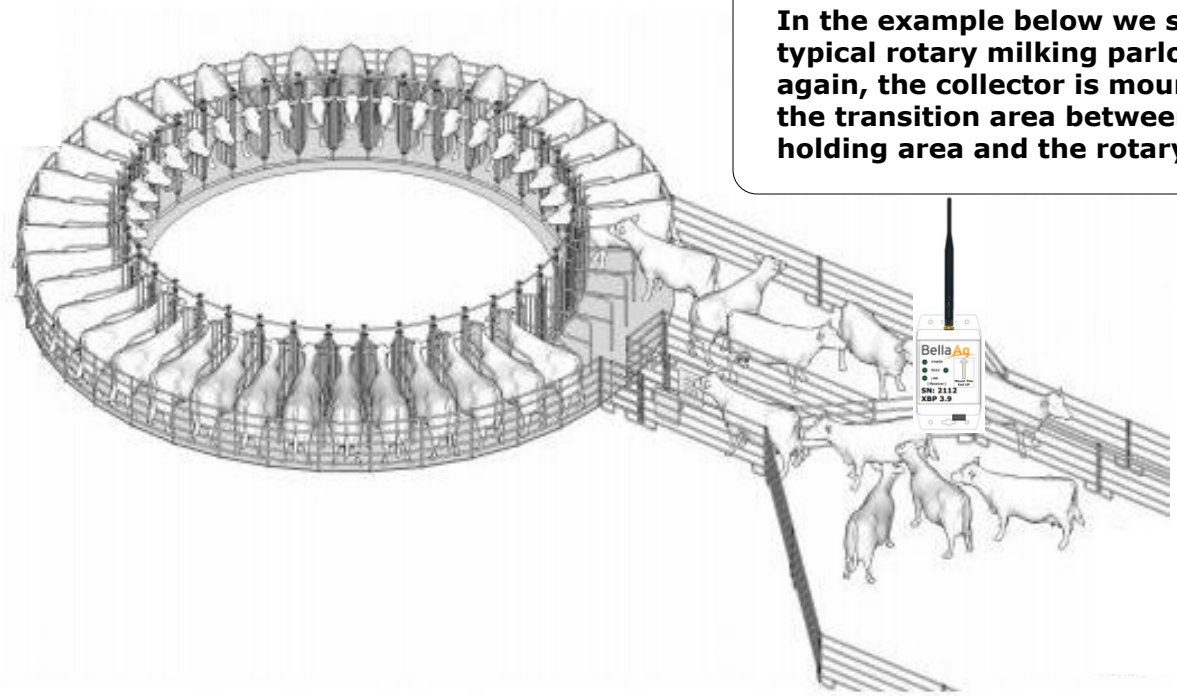
BellaAg

# Collector Mounting Examples

**In the example to the right we see a typical double parallel milking parlor. Your collector should be mounted near the front of the holding pen in the transition area before the animals enter the parlor. The included omni-directional whip antenna should be mounted so that it is pointing either straight up or straight down, and should be a minimum of 6 inches from any metal objects or AC electrical wiring. The collector and antenna should be positioned so that they are a minimum of 8 ft from the ground and no more than 12 ft from the ground.**




**In the example below we see a typical rotary milking parlor. Once again, the collector is mounted in the transition area between the holding area and the rotary.**




BellaAg

# Bolus Specifications

**The Bella Ag 3.0 system uses bi-directional communication between the bolus and the collector to transfer temperature information from the animal to the software. To do this, the bolus has a user configurable sample rate which defines how often the bolus take a temperature sample, and a user defined minimum sample threshold which defines how many samples should be stored before the bolus begins trying to communicate with a collector. Until the minimum sample threshold has been reached the bolus will wake up, take a temperature sample, store it in memory, and go back to sleep. Once the minimum sample threshold has been reached the bolus will begin searching for a collector to download its' information to. Once it is within sufficient range of a collector the two initiate the download transferring the stored data, clearing the bolus' memory, programming the bolus with any changes to the sample rate or minimum sample threshold, and setting it back to sample mode.**

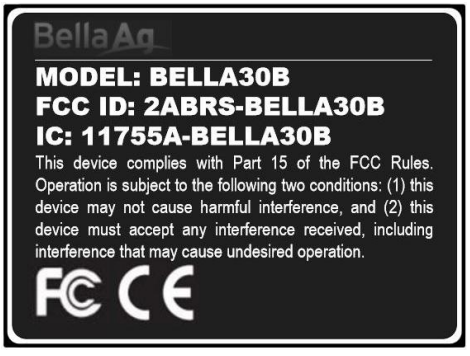
**The boluses and collectors operate in different frequencies depending on the destination country's regulatory limitations. Because of this there are two basic models, one that operates in the 800MHz band and one that operates in the 900MHz band. Since different countries have different regulatory limits we've optimized the design of these components to allow us the greatest range and signal strength permitted in these different regions.**

**The effective range of the system is determined to a large extent by the model being used. The 800MHz system has an effective range of roughly 100ft. (35 meters) from the collector. The 900MHz system has an effective range of 50ft. (16 meters) from the collector. Consult a Bella Ag representative to learn which model can be used in your country.***

- **User configurable sample rates and download rates allow you tune the system for your dairy**
- **3 year battery life at factory settings****
- **Built in noise rejection with 16 channels automatically selects the ideal channel with the least interference**
- **Temperature accuracy to 0.01 degree Fahrenheit*****
- **High strength magnet for protection against hardware disease**
- **Smooth, rounded, medical grade polypropylene housing to protect against animal injury during bolusing and to prevent injury to the animals' stomach lining should the bolus attach to an existing hardware magnet**

**REGULATORY NOTICE TO USERS:**

**Because we have two system versions operating in two different frequencies, the user should always double check that units they've received are the correct version for their region. The two models can be easily identified by the number of digits encoded in each bolus's unique identification number. Units with a seven digit identification number are 900MHz, while units with eight digits are 800MHz .**

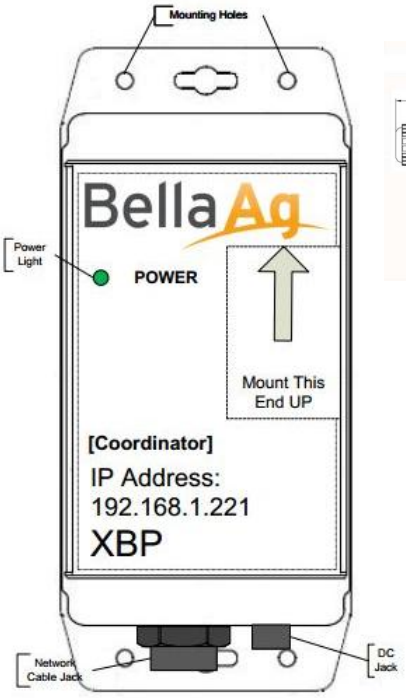


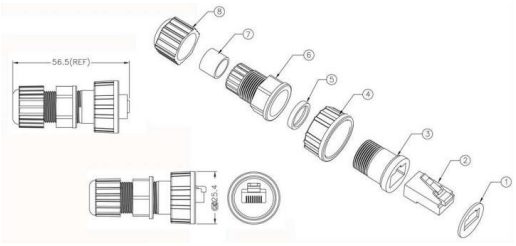

*** These are ideal ranges measured from the side of an animal, actual range may vary depending animal activity and location with relation to the collector**
**** Altering the number of downloads per day can negatively effect battery life. No warrantees either expressed or implied are made concerning the lifespan of boluses if sample rates or download rates have been changed. Consult a Bella Ag representative before making changes to these settings.**
***** The accuracy of temperature readings obtained from the animal and the data presented in Bella Ag software programs may appear to differ depending on the portion of the software program being viewed.**

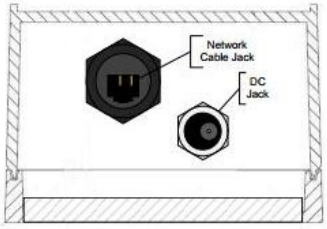
Bella Ag

# System Setup
# Step 1: Connecting the Network Coordinator

**The Coordinator connects to any network router or your PCs LAN port using a standard network cable. The Coordinator's IP address is printed on the front of the box.**






**It should be located within 300 ft. of your PC and should have clear line of sight to the locations where Readers will be mounted. The range of the wireless link between the Coordinator and a Collector is 1500 ft. with no obstructions in between. Objects such as walls, metal, foliage, and other buildings will reduce the effective range. Every attempt should be made to mount the Coordinator in a location where there are no obstructions between it and the Collectors. Mount the Coordinator vertically against a wall or post with the front of the device facing toward the Collector locations to ensure proper internal wireless antenna alignment and good communication with Collectors. The Coordinator comes with an approved power supply included.**

BellaAg

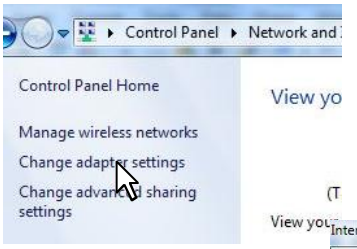
# System Setup
# Step 1 Continued: Changing the Network Coordinator IP Address

**The Network Coordinator comes with a preset IP address of 192.168.1.221 and a subnet mask of 255.255.255.0. On most networks these settings are fine but if you have a large network or have had an IT consultant set up a local network you may need to change the settings on the Coordinator to allow it to run on the network correctly.**

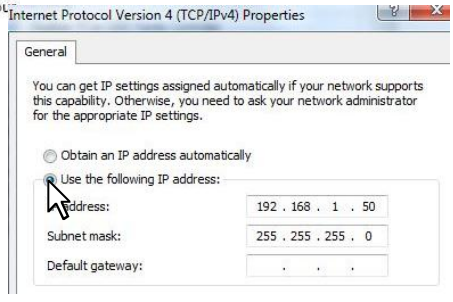
**To change the network settings you'll need to power the Coordinator on, connect the network cable to it on one end, and then connect the network cable to a laptop on the other end. You'll need to turn off your wireless to eliminate network confusion. Then you'll have to set your LAN settings for your laptop ethernet port to the "192" subnet. To do this click the start icon in the lower left of your desktop, then click "Control Panel" in the list to the right. In the Control Panel click "Network and Internet". Under "Network and Sharing Center" click "View network status and tasks".**

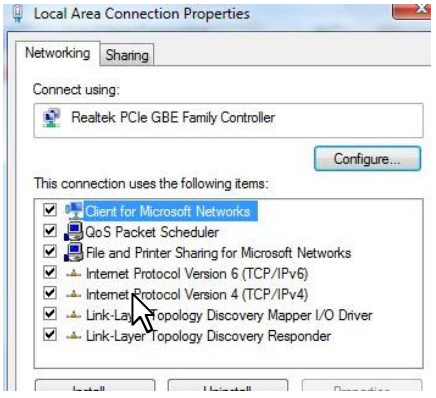


**Then click "Change adapter settings" in the list to the left. In the group below double click "Local Area Connection", then double click "Internet Protocol Version 4 (TCP/IPv4)" in the list. Finally, click the button next to "Use the following IP address" and enter the IP address and Subnet mask shown below.**





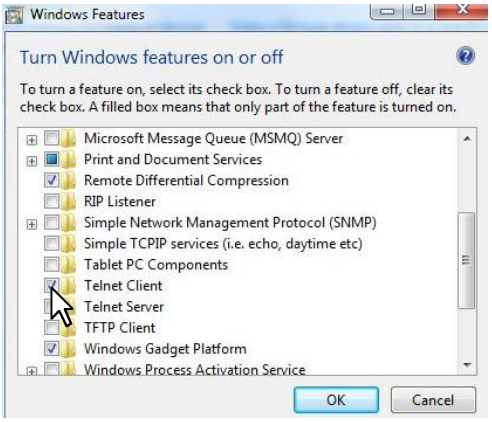


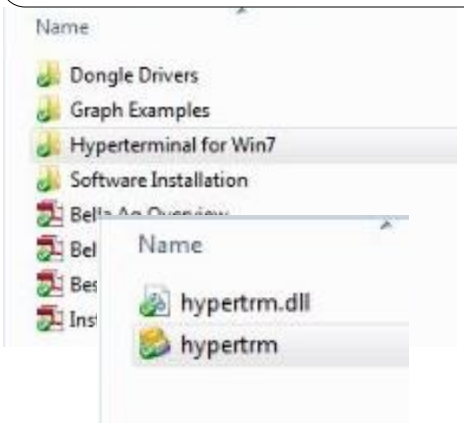

BellaAg

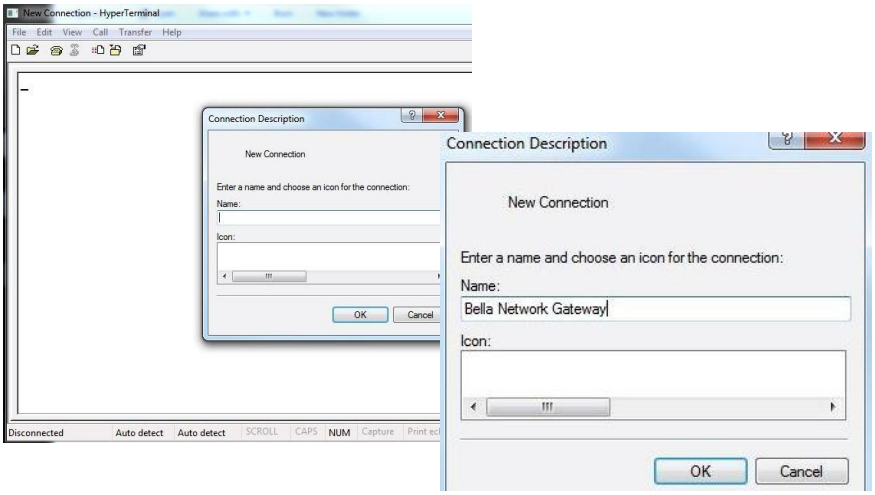
# System Setup
# Step 1 Continued: Changing the Network Coordinator IP Address

**Inside the box you received you'll find a USB drive loaded with resources to help you set the system up and learn how to use the system, as well as some utilities for configuring the system. One of those utilities is Microsoft™ Hyperterminal program. We've included this program on the USB drive because it no longer is a native part of Windows© operating system. We'll use this utility to change the IP address of the coordinator. The first step is to activate "Telnet client" by opening the Control Panel again, clicking "Programs", then clicking "Turn Windows features on or off". Scroll down the list of features until you locate "Telnet Client" and check the box next to it, then click "OK" to turn it on.**

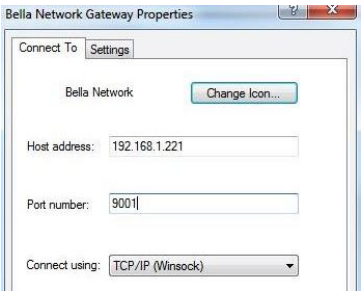

**Now open your USB drive and locate the folder labeled "Hyperterminal for Win7". Copy this folder and paste it to your desktop. Then open it and double click the "hypertrm" icon. Set up a new connection named "Bella Network Gateway" then click "OK".**



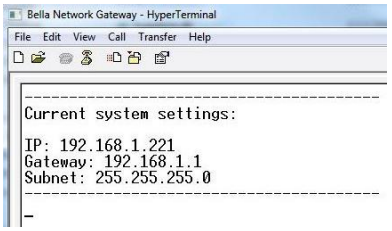



# System Setup
# Step 1 Continued: Changing the Network Coordinator IP Address

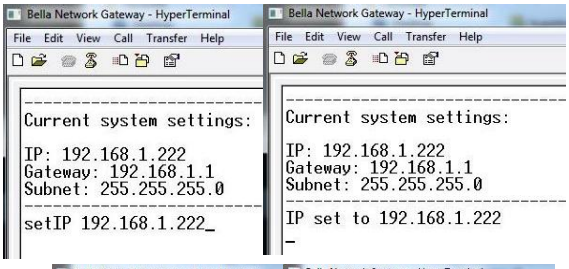
**Now select "Connect using: TCP/IP (Winsock), enter the IP address of the Coordinator after "Host address", and 9001 after "Port Number". Then click "OK". This will start a session to the Coordinator.**

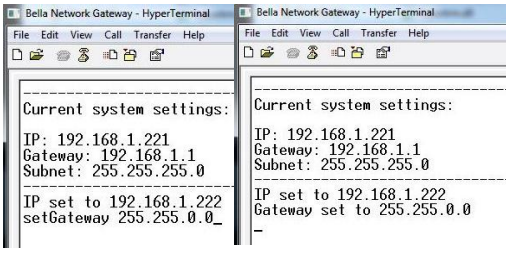


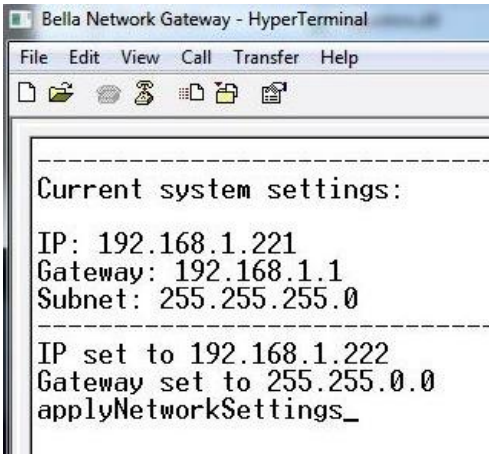

**In the terminal window type "settings" and hit Enter. This will list the current IP settings for the Coordinator.**


**Now type "setIP" followed by the new IP address for the Coordinator and hit Enter to change the IP address. Type "setGateway" followed by the IP address of your network router and hit Enter to save the IP address of the router. You can type the command "setSubnet" followed by your network subnet and hit Enter to save the subnet setting. When you've entered these three items type the command "applyNetworkSettings" and hit Enter to commit these changes.**




**Most networks won't need these settings changed but you can hand these instructions to an IT consultant or call a Bella Ag representative to help you make the necessary changes.**

Bella Ag

# System Setup
# Step 1 Continued: Connecting a Dongle Gateway

**The Dongle Gateway connects to any USB port on your laptop or PC. You will need to install the dongle drivers for it to work correctly. The drivers should download automatically if you're connected to the internet. The driver files are also located on our website and can be downloaded there.**


**The Dongle Gateway is a perfect solution for smaller facilities where the PC or laptop is located within 150ft. of the Collector. The dongle housing is approximately 2 inches by 2 inches and can be mounted on a wall or window using the included 15ft. USB extension cable. A high gain antenna may also be included and should be attached to the antenna jack on the opposite side of the housing from the USB plug. This antenna can be identified by its length. It is approximately half the length of the antennas used by the collectors. The dongle gateway runs on the power supplied by your USB port so it requires no additional power supply.**

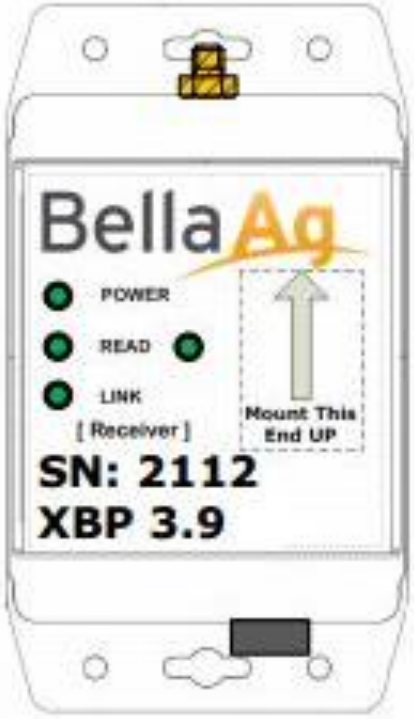
**In the picture to the right you can see the difference between the Omni-Directional Antenna attached to the collector, and the external antenna attached to the Dongle Coordinator.**


BellaAg

# Step 2: Collector Mounting

**Standard Reader Hardware Kit**

**1 9V .66amp Power Supply**
**1 Collector**
**1 Omni-Directional Antenna**



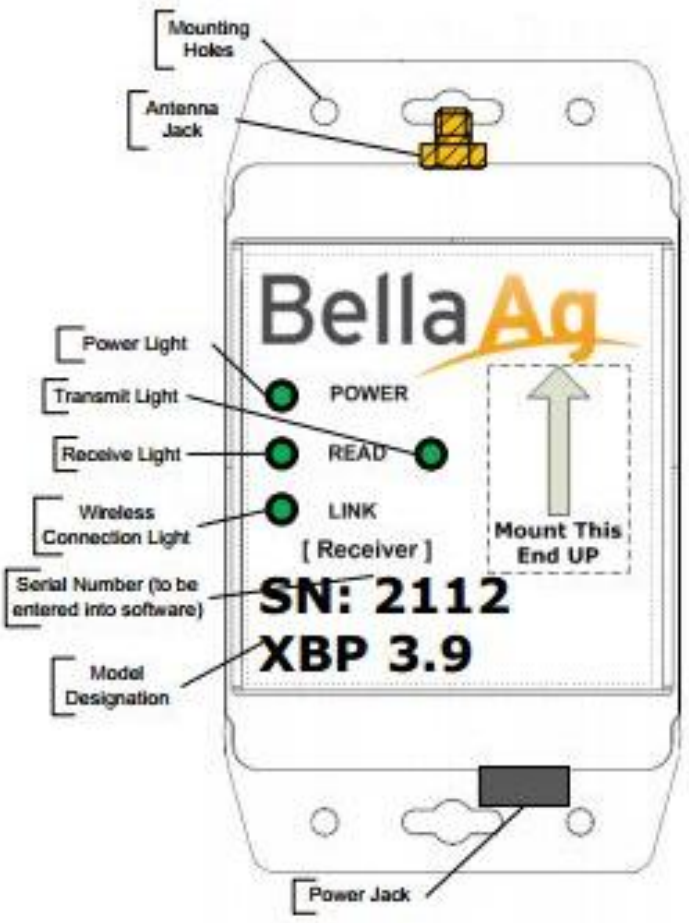

- **Collector should be positioned so that it faces toward the coordinator or dongle gateway location**
- **Appropriate screws should be used to attach it using the existing mounting holes**
- **If mounting to a pole, high grade plastic ties can be used***
- **Attach the antenna by threading the antenna connector onto the antenna jack on the top of the collector housing**
- **Have a suitable outlet installed near the collector location by a licensed electrician or locate an existing outlet nearby**
- **The included power supply may be extended up to 100ft. with the use of two strand low voltage cable****

*** Ensure that the antenna is as far as possible from any metal objects**
**** Consult a licensed electrician before adding or modifying any electrical wiring**

BellaAg

# Step 3: Activating the Collector

1. Mount Collector in desired location (see pg. 9, "Collector Location Guidelines".
2. Connect included Power Supply to standard 110VAC outlet. Power Supply can be extended if necessary with 28 gauge 2 strand low voltage wire.
3. Plug Power Supply into DC power jack located on the bottom of the Collector housing.
4. Verify LED function on front panel. "Power" LED should be on solid, "Read" LEDs should be off and should only blink when receiving a data packet from a Bolus, "Link" LED should be on solid.
5. Establish wireless connection. When the Collector connects to the Coordinator the "Link" LED will begin flashing. If the Coordinator is powered on and the Collector will not link, unplug and plug in the DC power cable 4 to 6 times in rapid succession. Then leave it plugged in and within 10 seconds the "Link" LED should begin to flash.
6. Attach the antenna.




The wireless link between the Collector and the Coordinator is made using an internal closed network radio. These radios will only connect to each other and operate outside the range of other wireless products. The radios in the Collectors are programmed with a watchdog timer that will automatically re-link to the Coordinator once the Coordinator is powered up again in the event of a power outage.

BellaAg

# Step 4: Administer Boluses and Record Ear Tag/Bolus Numbers


**Boluses are administered just like any other stomach magnet or pill. Record the animals ear tag, or management ID number, and the unique serial number printed on the outside of each Bolus. These two numbers will need to be entered into the Software when you're finished.**

**The Bolus uses a miniature radio transceiver operating in either the 800MHz frequency range or the 900MHz frequency range depending on where you live to transmit an encoded unique bolus serial number and stored data payload of temperature readings. Power consumption is extremely low registering about 2 nanoamps when asleep and less than 1 milliamp for 200 milliseconds when awake. The electronic components are potted in an FDA approved medical grade epoxy, and cast inside a chemically inert medical grade polypropylene housing. Each component is subjected to optical verification and function tests at the manufacturing facility throughout the assembly process, and tested for proper radio function characteristics before shipping.**



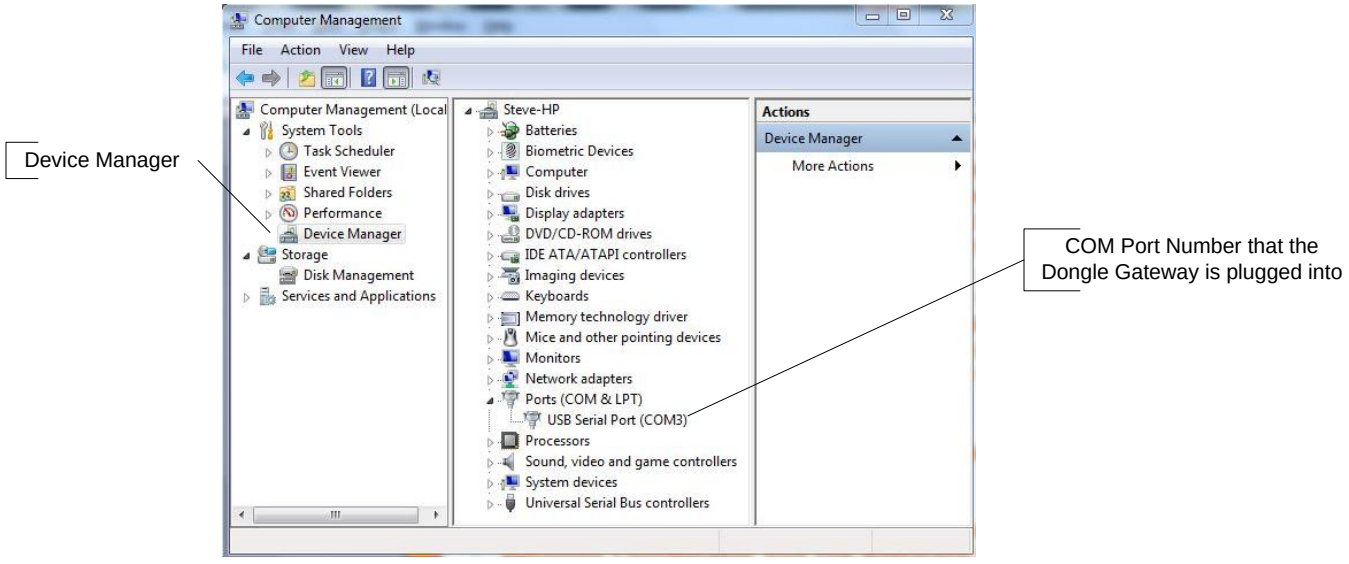
BellaAg

# Step 5: Install and Configure Bella Ag Software

**1. To download the software, open a browser and navigate to http://www.bellaag.com/BellaSoft/publish.htm Install Bella Ag Dairy software by double clicking the Windows Installer file you downloaded. Click through the installer screens until you see the message "Software Successfully Installed!" Each installation begins with a 60 day trial at the end of which you will be prompted to purchase a 1 year license. Contact a Bella Ag representative for assistance with software activation at our toll free number, 1 (877) 224-2790.**

**2. To download the reader service, opwn a browser and navigate to http://bellaag.com/BellaSoft/BellaAgRS30_Install.msi Install Bella Ag Reader Service by double clicking the Windows Installer file you downloaded. This installs the background service that connects to the Coordinator.**

**3. Enter Coordinator and Collector information into the software. This can be found in the "Admin" screen under "General", "Readers". You need to enter the serial numbers for each Collector, the IP Address and port 9001 for the Coordinator, and select "Wireless Node" or "Coordinator" from the "Reader Type" dropdown. You can also write a brief description of each Collector's location for clarification later on if you have more than one. If using a dongle gateway, you'll need to know the COM port the dongle is using. You should've seen the port number during the driver install but if you didn't you can find the port number by opening the "Start" menu, right click "Computer", select "Manage", then select "Device Manager" from the list in the upper right. In Device Manager, click "Ports" to expand the list that will show you which COM port is used by the Dongle.**



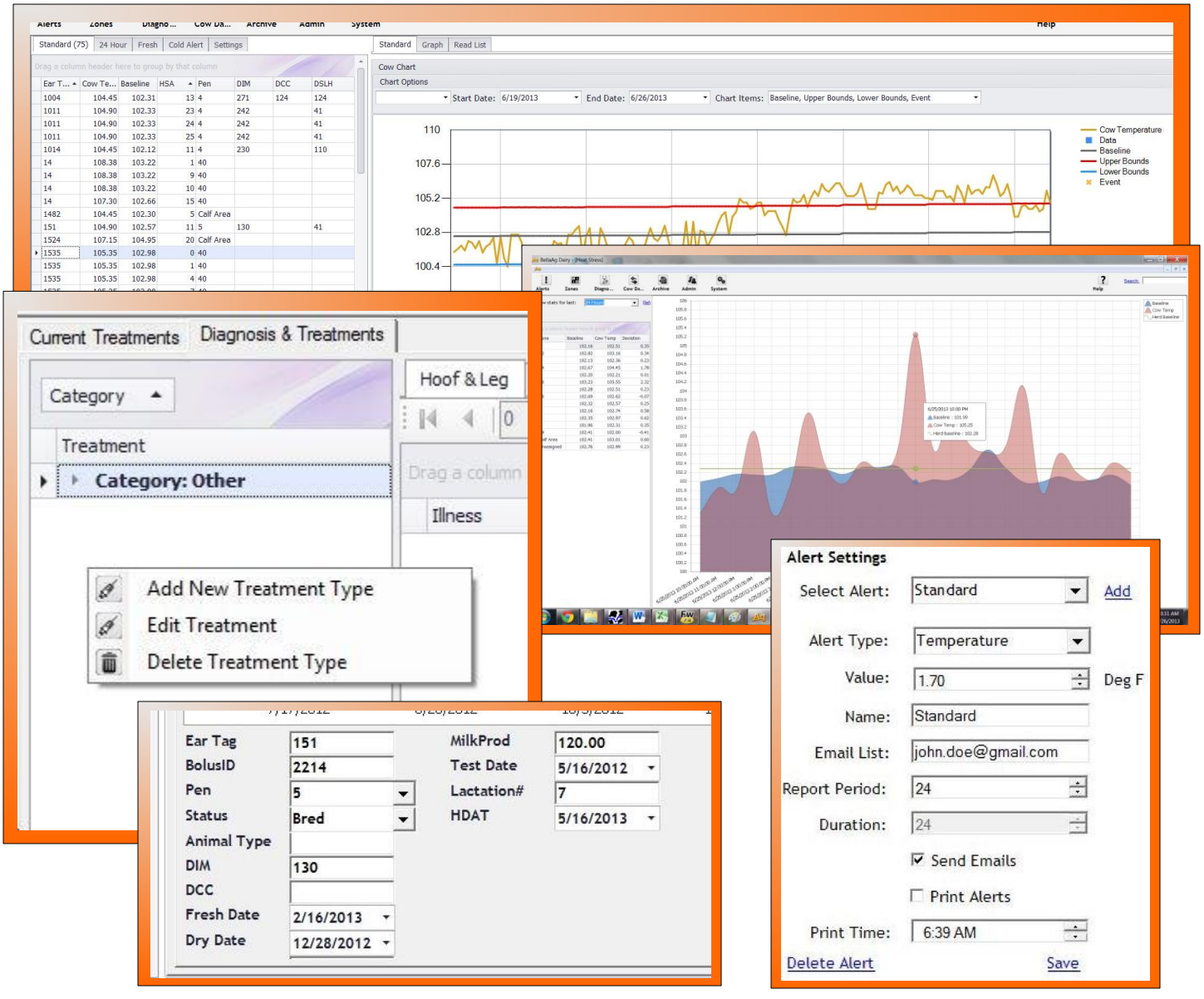

**4. Record Ear Tag numbers and Bolus Numbers in the Bolus Admin screen.**

**5. Restart Bella Ag Reader Service to initialize connection between Coordinator and the Software's database. This can be found by right clicking "My Computer" in the Start menu, and selecting "Manage". Then double click "Services and Applications", double click "Services", then select "Bella Ag Reader Service" from the list on the right. Click "Restart Service" to the left of the list.**

**Alternatively you can restart your PC as this will automatically restart the service.**

# Step 6: Start Viewing Graphs and Generating Alerts

**Once the temperature information starts coming into the software it will be displayed on a graph so that you can easily see what each animals' temperature has been since the last download. The software will automatically generate Alerts for animals that have passed their high temperature threshold, but you can build custom alerts to watch for different thresholds. Refer to the Bella Ag Software Manual for more detailed information on use and customization.**



# Regulatory Considerations Regarding Bella Ag Collectors

**Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. To comply with FCC/IC RF exposure requirements for mobile transmitting devices, this transmitter should only be used or installed at locations where there is at least 20cm separation distance between the antenna and all persons, and must not be co-located or operating in conjunction with any other antenna or transmitter.**

**Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and it's gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This radio transmitter (IC: 11755A-BELLA30C) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.**

**This device has been designed to operate with the antenna(s) listed below, and having a maximum gain of +2dBi. Antennas not included in this list or having a gain greater than +2dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.**

## List of all Antennas Acceptable for use with the Transmitter

**LS Research LLC Manufacturer Part Number 001-0002**

**This Device complies with Industry Canada License-exempt RSS standard(s). Operation is subject to the following two conditions: 1) this device may not cause interference, and 2) this device must accept any interference, including interference that may cause undesired operation of the device.**

# Considérations Réglementaires Concernant Bella Ag Collectors

**Les modifications non expressément approuvés par la partie responsable de la conformité annuler l'autorité de l'utilisateur à faire fonctionner l'équipement. Pour se conformer aux règlements de la FCC/IC exposition aux RF pour mobile appareils de transmission, cet émetteur ne doit être utilisé ou installé dans des endroits où il y a au moins 20cm distance de séparation entre l'antenne et de toutes les personnes, et ne doit pas être placé ou utilisé en conjonction avec toute autre antenne ou émetteur.**

**Sous règlements d'Industrie Canada, cet émetteur radio peut uniquement fonctionner en utilisant l'antenne d'un type et un maximum (ou moindre) gain approuvé pour l'émetteur par Industrie Canada. Afin de réduire les interférences radio potentielles pour les autres utilisateurs, le type d'antenne et de gain doivent être choisis de telle sorte que la puissance isotrope rayonnée équivalente n'est plus que nécessaire pour une communication réussie. Cet émetteur radio (IC : 11755A-BELLA30C) a été approuvée par Industrie Canada pour fonctionner avec l'antenne types énumérés ci-dessous avec le maximum admissible gain et impédance d'antenne requise pour chaque type d'antenne indiqué. Types d'antenne non inclus dans cette liste, qui ont un gain supérieur au gain maximum indiqué pour ce type, il est strictement interdit d'utiliser avec cet appareil.**

**Cet appareil a été conçu pour fonctionner avec l'antenne(s) listé(s) ci-dessous, et dont le gain maximal est de 2dBi. Les antennes non incluses dans cette liste ou qui ont un gain supérieur à 2dBi sont strictement interdits pour une utilisation avec ce terminal. L'impédance d'antenne requise est de 50 ohms.**

## Liste de Toutes les Antennes Acceptable pour une Utilisation avec L'émetteur

**LS Research LLC Manufacturer Part Number 001-0002**

**Cet appareil est conforme aux normes Industry Canada exemptes de licence RSS standard(s). Son fonctionnement est soumis aux deux conditions suivantes : 1) cet appareil ne doit pas provoquer d'interférences et (2) cet appareil doit accepter toute interférence, y compris les interférences susceptibles de provoquer un fonctionnement indésirable.**

DESIGNED & ASSEMBLED IN U.S.A.

LEAD FREE Pb RoHS COMPLIANT

Bella Ag