



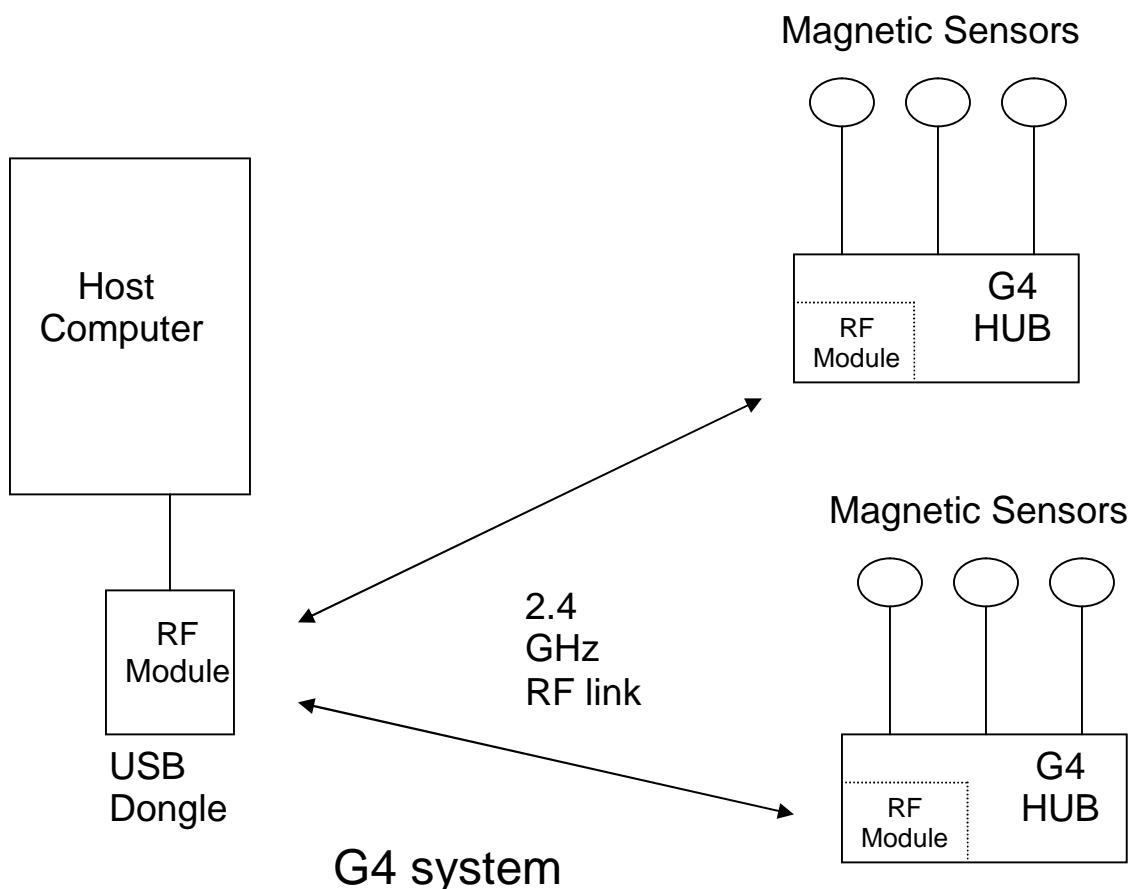
# G<sup>4</sup> Radio Installation Manual

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## Introduction

The G4 radio link is a 2.4 GHz Spread Spectrum system consisting of one or more data collecting HUB devices that each have their own RF transceiver module and a common USB dongle radio module that attaches to a host computer. The user can use Polhemus provided software to operate the system or develop their own custom software applications using Polhemus provided SDK for Windows or LINUX. A simple block diagram of the system is shown below.



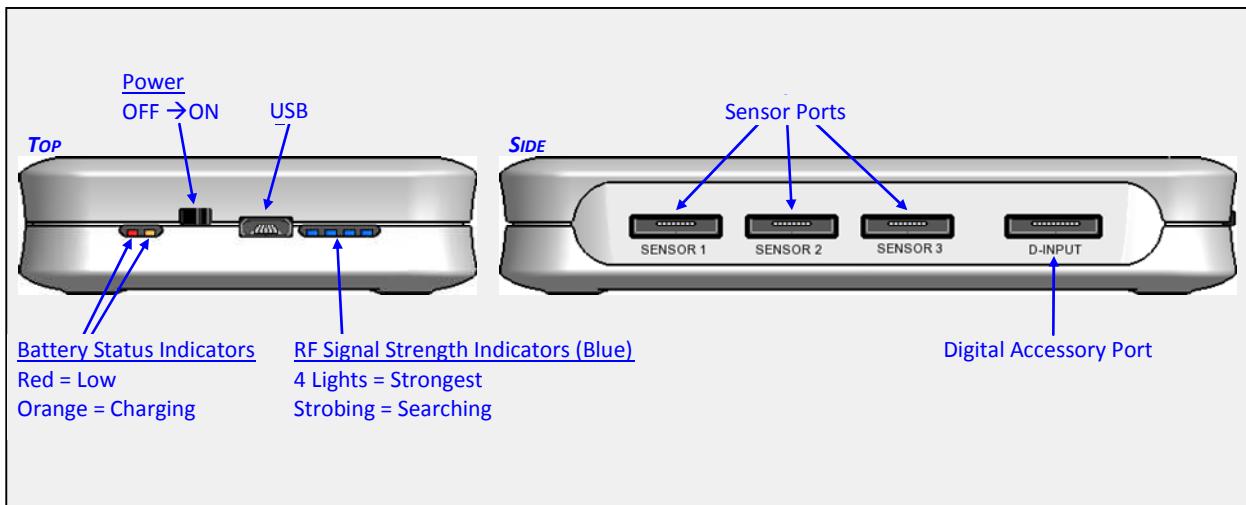
The user is required to do a one time set-up to associate the USB dongle with the HUB devices. Once that is done the system connects automatically and there is no need for user intervention to operate the RF system.

## Preparing the system

To prepare the system you will need the Hub or Hubs, the USB dongle and a USB cable (provided with the system). You must also have a host computer available with the configuration software provided on the CD that came with the G4 system loaded on the host computer. When you place the CD in the host computer the installation program will automatically run. Follow the instructions to load all the required software components.



The diagram below shows the connection ports, switch and LED indicators on the Hub. All that is required for the RF setup is a USB cable. There is no need to have any sensors plugged in for the initial setup. The battery in the hub is charged via the USB cable so allow at least 30 minutes of charging time to ensure you can complete the set-up and test the system before needing to charge the battery again. The G4 Hub had 3 sensor ports for connecting magnetic sensing devices. It has a digital I/O port that is user configurable for up to 8 separate digital inputs. A USB connection is used for charging the Hub battery and configuring the HUB. It can also be used in areas of heavy RF interference to bypass the RF link and send the data directly to the USB port. Four blue indicators are used to display the RF signal strength.



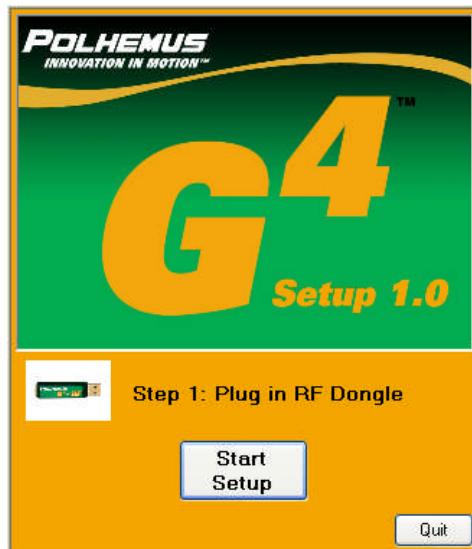
The next sections will describe how to set up the radio system. Polhemus has provided configuration software that walks the user through the set up process step by step. Two software versions are available: one for Windows™ and one for LINUX™.

## Windows Setup

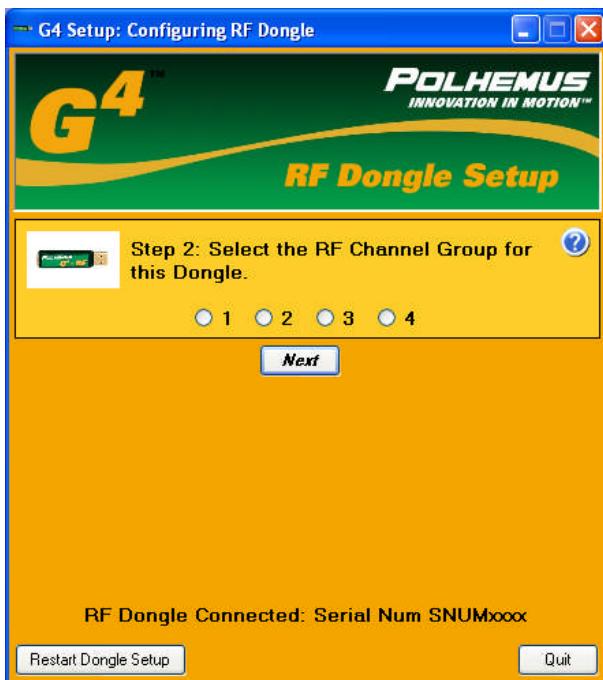
Install the G4 host software from the CD provided with the system. After installation click on the G4 configuration icon located on the desk top.



The following screen will appear:



Plug in the RF dongle to an available USB port on the host computer. The found new hardware ICON will appear and a request for you to load the USB driver. Click the button that loads the drivers automatically. Press the Start Setup button. The following screen will appear. Note in this screen example a generic serial number is shown. The factory serial number will be shown on an actual setup.



You have your choice of one of four RF channel groups. This allows the user to attempt different RF channels in case of interference. In this case channel 1 is chosen.

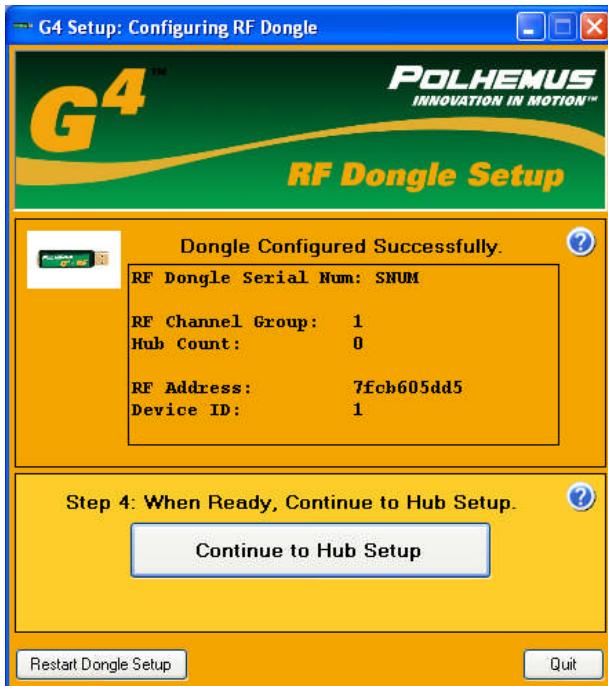


Click on the next button. The follow screen appears



Press “Program Dongle Configuration Now”

The following screen will appear



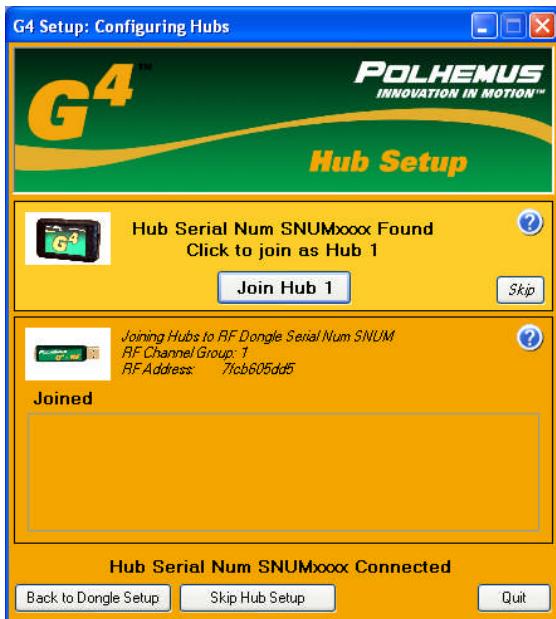
A random RF address will be generated that will provide a unique identifier to the USB Dongle.

The next step is to associate the Hubs to the RF dongle. Up to 255 hubs can be associated to a dongle. Click on the “Continue to Hub Setup” button. The following screen will appear.



Using the USB cable provided with the system plug one end into the G4 Hub and the other end a USB port on the Host computer. Turn the HUB on by sliding the power switch on the side.

The hub will be discovered by the host computer and the following screen will appear. Again a generic serial number is shown in this example instead of the factory serial number.



Press the Join Hub 1 button. The following screen will appear.



You can now click on the More Hubs button to continue joining more hubs to the RF dongle or click on Finished. If you join more hubs, disconnect the first hub from the host computers USB port and plug in the next hub and join it. You will get a screen similar to the one below.



Every time you join a hub it will appear in the lower window. Once you have joined all the hubs click the finished button. You will get the following window.



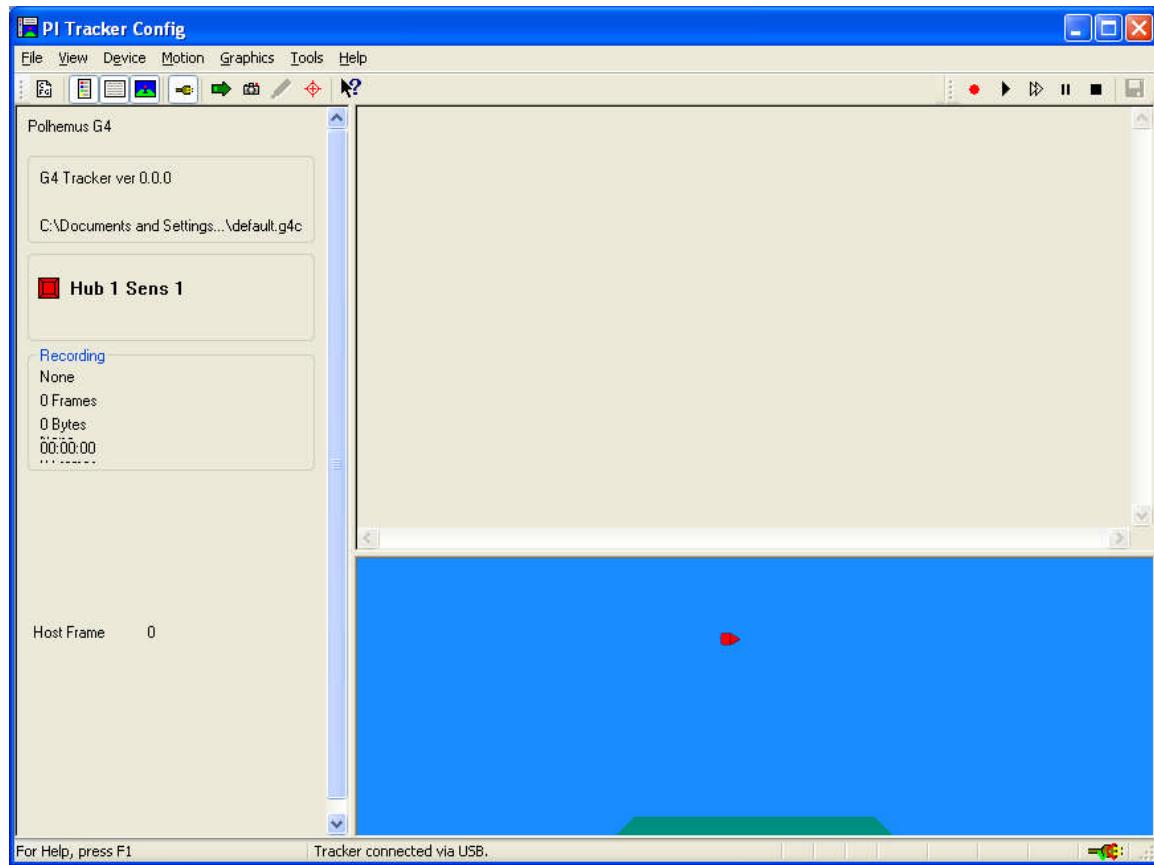
In the above example two Hubs have been joined. You can now disconnect the USB cable and turn off the HUB. Insert the RF Dongle back into the host computer and click “Update Dongle Configuration Now” to update the dongle with the Hub information.

Now the system is ready to test. Plug one of the Polhemus sensors provided in the system. Ensure the Dongle is connected to a USB port on the host computer. Power on the G4 hub by turning on the power switch. The Blue LED indicators will blink several times and then go solid. The more indicators lit, the higher the signal strength. Once the system finishes this initialization, click on the PImgr link on the host computer Desktop.



PImgr.lnk

The following screen will appear showing the number of active Hubs and the number of sensors active on each hub. The system is operational now and the PIMgr software can be used to collect data or the user can commence writing their own software using the Polhemus provided SDK.



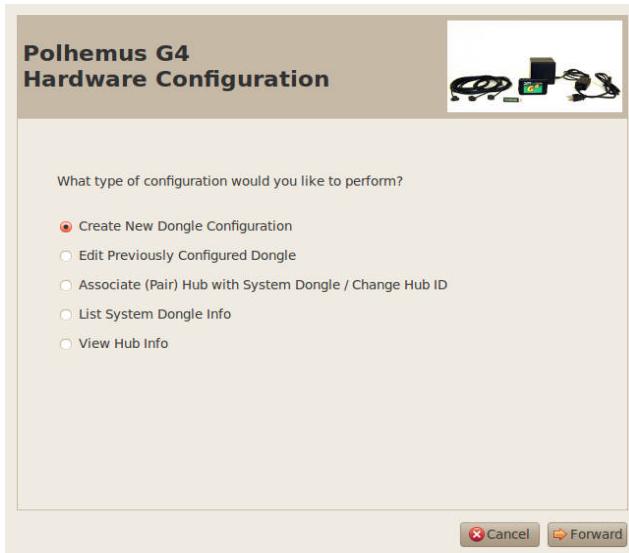
## LINUX Setup

The RF configuration program is self explanatory and walks you through the set-up of the G4 radio system. This section will give the user guidance on how that program functions.

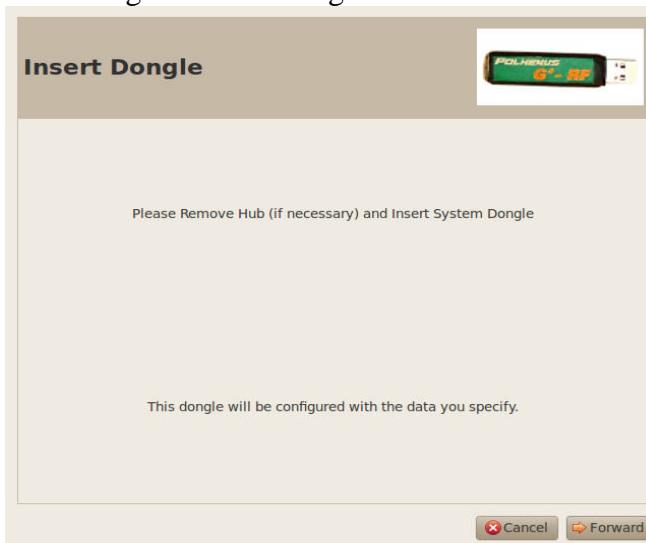
Start by clicking on the RF configuration program Icon



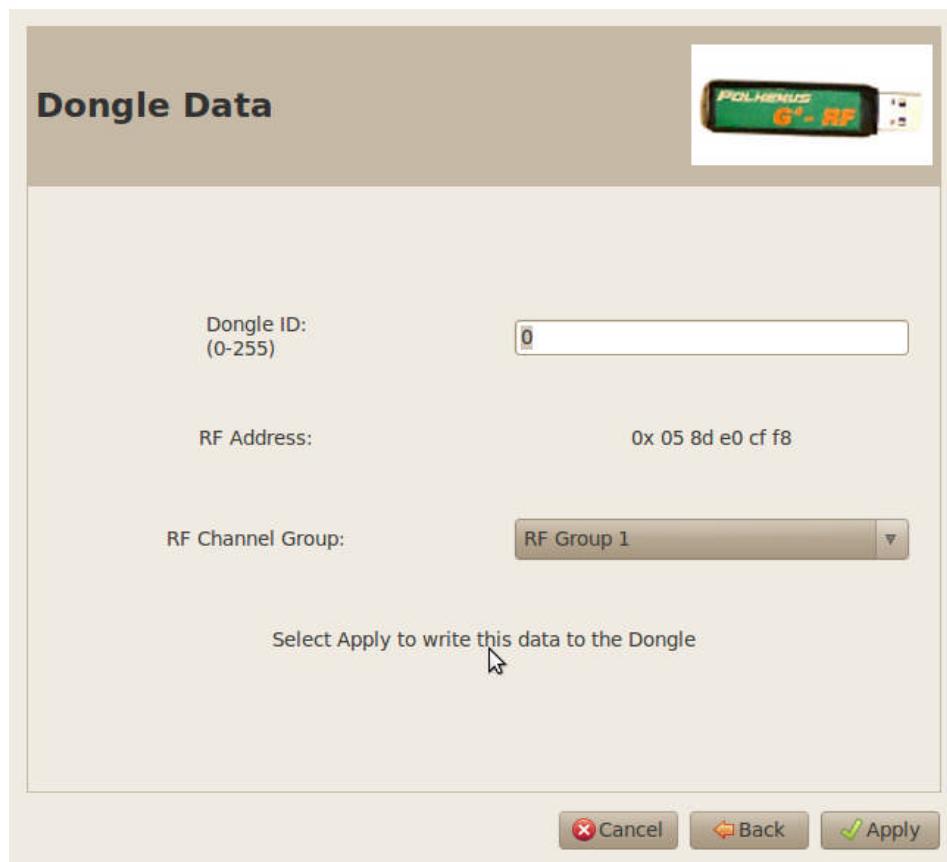
You will get the following window:



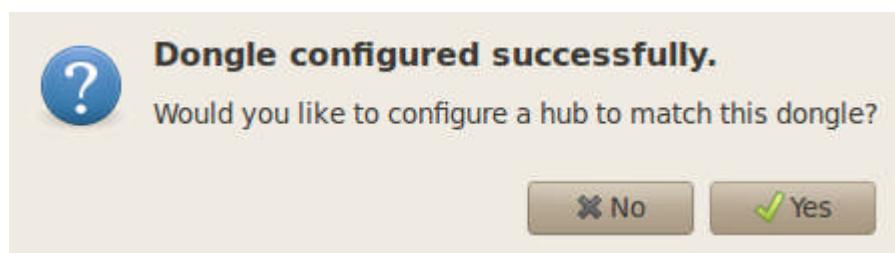
Click the “Create New Dongle Configuration” button and then click “Forward”  
You will get the following window:



Follow the instructions on the screen and then click forward to the next screen:



At this point you can give the Hub a unique ID number. Data from this Dongle will be labeled with this ID. A random RF address is created for this dongle to uniquely identify it when the dongle is associated to a hub. Finally one of four RF groups can be selected. This allows the user to shift frequency band in the case of interference. When done making the desired selections click the apply button. You will then get the following window:



Press Yes to receive the following Window:



Follow the instructions on the screen and the click Forward to get the following screen:



Provide an ID for the Hub. Since multiple Hubs can be associate to the same RF dongle this ID will uniquely identify the data. After choosing an ID click apply.

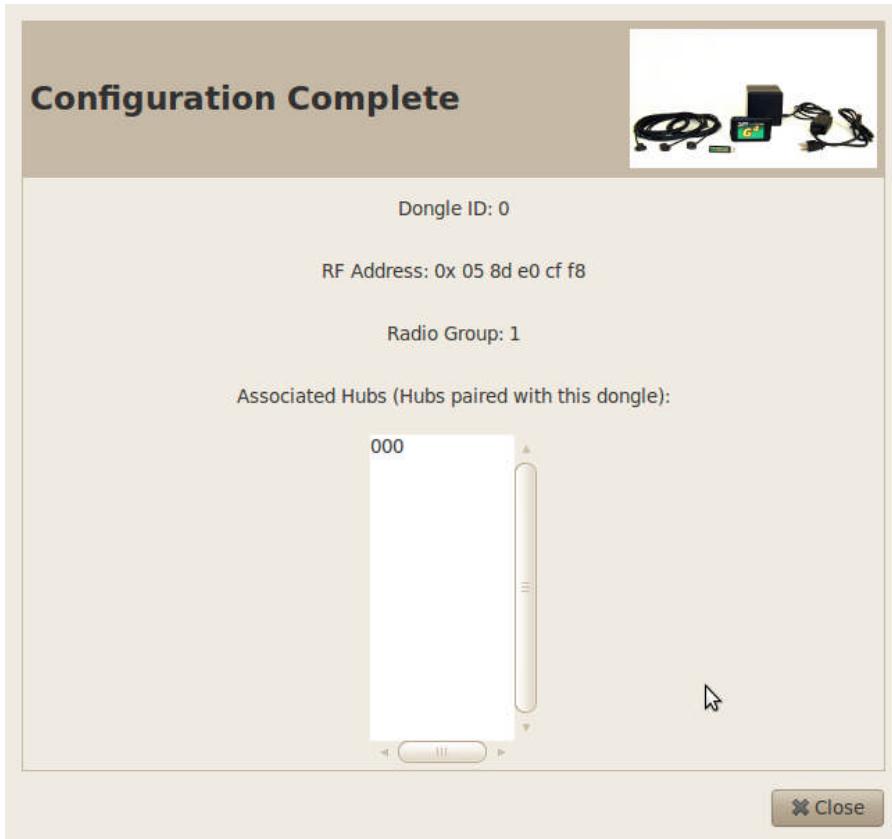
You will get the following Window.



Click yes if you have more Hubs to configure. Be sure to give each Hub a unique ID number. When done configuring all the Hubs, click no. You will get the following Window:



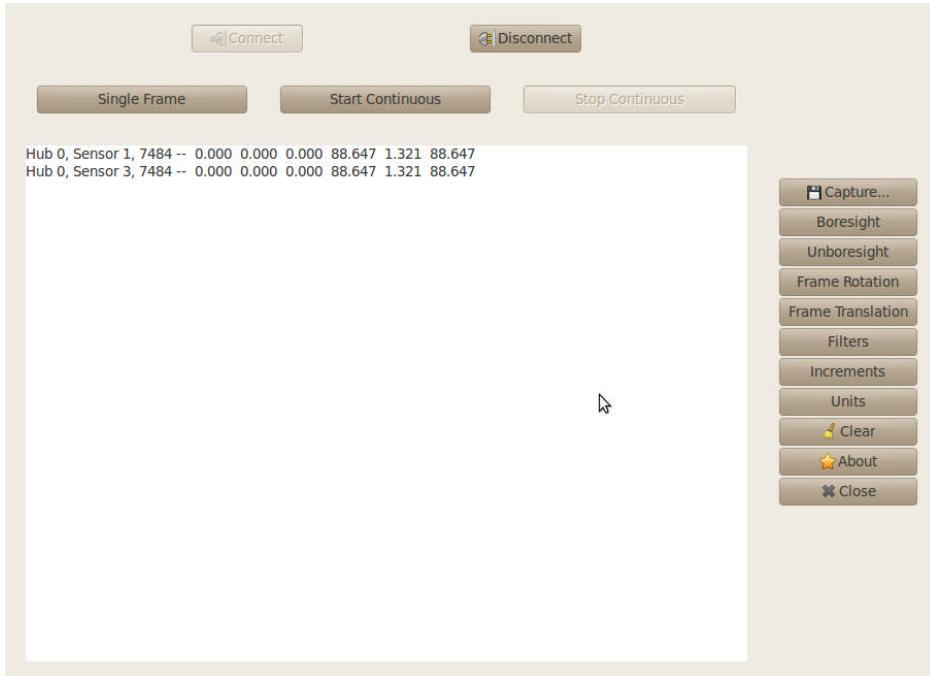
This next step updates the user HUB configuration in the RF dongle. Follow the instructions on the screen and click forward. The setup is now complete and you will get the following screen:



The system is now ready for testing. Plug the USB dongle into the Host computer. Connect 1 to 3 sensors to each HUB to be tested. Turn on the HUB devices. The Blue LED indicators will blink and then go solid. If the signal is weak as indicated by the blue LED array, try using a USB extension cable to move the RF dongle away from the host computer. Next start the G\$ terminal application provided by Polhemus. You will get a screen like the one below.



Press the connect button to connect the Hub to the host computer. Once connected the connect button will shade and the disconnect button will be highlighted. You can now press the “Single Frame” button and data will be displayed like shown below: In this example only one Hub is present with 2 sensors connected. At this point this system is set-up and functional.



## Regulatory Information

**Caution:** Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

RF Dongle



FCC ID YJUG4USB01  
IC: 9183A-G4USB01  
Polhemus G4 RF Dongle

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation



FCC ID YJUG4HUB01  
IC: 9183A-G4HUB01  
Polhemus G4 Hub

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

