

# DataHub: FAQs/Troubleshooting

## The Power of Twelve The Convenience of One

### On the Ward's DataHub....



= Select key



= On/Off and ESC key



= Scroll key

## communication with other devices

1. [How do I pair my DataHub with a \*\*Windows\*\* computer?](#)
2. [How do I pair my DataHub with an Apple Macintosh \(\*\*Mac\*\*\) computer?](#)
3. [How do I pair the DataHub with the \*\*iPad\*\*?](#)
4. [I do not see the DataHub listed in the \*\*iPad Bluetooth\*\* device list. How do I fix that?](#)
5. [How do I pair the DataHub with an \*\*Android\*\* tablet?](#)
6. [Can the DataHub communicate with a \*\*Toshiba\*\* computer?](#)
7. [I'm having trouble linking communications between the DataHub and the \*\*Bluetooth wireless channel\*\*. Why, and how do I fix it?](#)
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## communication with other devices

### 1. How do I pair my DataHub with a Windows computer?

Before connecting the DataHub to the computer for the first time, you will need to pair these two devices:

- a. Turn on the DataHub. Make sure the DataHub is not showing the sleep icon. If it is showing the sleep icon, press any button to leave the sleep mode.

#### On the computer:

- b. Open the DataHub software.
- c. Right-click the Bluetooth icon located on the status bar at the bottom right corner of the screen.
- d. From the new pop-up menu, select "Find more DataHubs and sensors".
- e. The computer will open the "add a device" dialog box and start searching for the Bluetooth device.
- f. Your DataHub will be displayed as "DataHub-xxxx", where "xxxx" are the last four digits of the DataHub serial number sticker.
- g. Select this DataHub device and click "Next".

#### On the DataHub:

- h. Press and hold the SCROLL key to put the DataHub in pairing mode.
- i. The DataHub will produce a long "beep" while its screen shows "BT pairing".
- j. Select the second option: "Enter the device pairing code" and press "Next".
- k. In the next dialog box enter "1234" as the pairing code and press "Next".
- l. Wait for the computer to finish the pairing process. At the end of this process you should hear the prompt "Your device is ready to use."

#### On the computer:

- m. Right click the Bluetooth icon on the status bar. Choose the DataHub you've just paired and click on it.
- n. The computer will connect to the DataHub and turn the Bluetooth icon blue.



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## communication with other devices

### 2. How do I pair my DataHub with an Apple Macintosh (Mac) computer?

#### a. On the DataHub:

Turn on the DataHub. Make sure the DataHub is not showing the sleep icon. If it is showing the sleep icon, press any button to leave the sleep mode.

#### On the computer:

- b. Open the Bluetooth menu from the Mac menu and select "Set Up Bluetooth Device".
- c. A dialog box will open. Your DataHub will be displayed as "DataHub-xxxx", where "xxxx" are the last four digits of the DataHub serial number sticker. Select this device and press "Next".
- d. The Mac will try a quick default attempt to pair the two devices. This attempt will not succeed, as DataHub requires a pairing code.
- e. Press the "Passcode options" button and select the option "Use a specific passcode". Enter the passcode "1234", **but do not press "OK" yet.**

#### On the DataHub:

- f. Press and hold the SCROLL key to put the DataHub in pairing mode. The DataHub will produce a long "beep" while its screen shows "BT pairing".

#### On the computer:

- g. Double click on the DataHub application icon. Control-click (this is a right-click version on a Mac) on the Bluetooth icon located at the bottom right corner of the screen.
- h. Choose the DataHub you've just paired and click on it. The computer will connect to the DataHub and turn the Bluetooth icon blue.



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### communication with other devices

#### 3. How do I pair the DataHub with the iPad?

##### On the DataHub:

- a. Turn on the DataHub. Make sure the DataHub is not showing the sleep icon. If it is showing the sleep icon, press any button to leave the sleep mode.

##### On the iPad:


- b. Tap this icon  to access the iPad settings.
- c. Open Bluetooth and make sure the iPad Bluetooth setting is on.
- d. Wait to see the DataHub on the iPad's list of Bluetooth devices.

If the iPad doesn't show the DataHub on the list of devices, press the "Power off" key on the iPad, then turn the iPad back on, and wait for it to reboot. At this point you should see the DataHub on the iPad's list of Bluetooth devices. If you do not see this, press the scan button to find Bluetooth devices.

##### On the DataHub:

- e. Once you see the DataHub on the iPad's list of Bluetooth devices, press and hold the Scroll key on the Data Hub to put the DataHub in Pairing mode. The DataHub will produce a long "beep" while its screen shows "BT pairing".

##### On the iPad:

- f. From the devices list, click the "DataHub-xxxx", where the "xxxx" are the last four digits on the DataHub serial number sticker.
- g. The iPad will ask for a PIN code. Enter "1234" and click Pair.
- h. The iPad will show DataHub-xxxx connected.
- i. Tap this icon  to open the DataHub software and start using and communicating with the DataHub.

#### 4. I do not see the DataHub listed in the iPad Bluetooth device list. How do I fix that?

This can usually be fixed by turning off the iPad (press the "Power off" key), and then turning it back on. When the iPad has rebooted, you should see the DataHub listed in the Bluetooth device list.



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#### 5. How do I pair the DataHub with an Android tablet?

##### On the DataHub:

- a. Turn on the DataHub. Make sure the DataHub is not showing the sleep icon. If it is showing the sleep icon, press any button to leave the sleep mode.

##### On the tablet:

- b. Go to Settings and select "Bluetooth".
- c. Make sure the Bluetooth radio is ON, then turn on "Search for Devices".
- d. From the tablet's devices list, tap on the "DataHub-xxxx" tab, where the "xxxx" are the last four digits on the DataHub serial number sticker (found on the back cover of the DataHub device).

##### On the DataHub:

- e. Press and hold the Scroll key to put the DataHub in pairing mode. The DataHub will produce a long "beep" while its screen shows "BT pairing".

##### On the tablet:

- f. The tablet will open the "Bluetooth pairing request" dialog box and display "Type the device's required PIN".
- g. Enter the pairing code "1234" and tap "OK".
- h. When the pairing process is complete, the DataHub will appear on the tablet's "paired devices" list.
- i. Open the DataHub application on the tablet.
- j. Tap on the options icon in the top Action Bar (rightmost, 3 vertical dots).
- k. Tap on "Connect DataHub" and select the name of the DataHub you would like to connect to (e.g. DataHub-1052).
- l. The app name will change to "DataHub (DataHub-xxxx)" to indicate connection.

#### 6. Can the DataHub communicate with a Toshiba computer?

The DataHub can communicate wirelessly via Bluetooth on all computers except Toshiba computers. Toshiba computer users can communicate with the DataHub via USB connection.



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## communication with other devices

### 7. I'm having trouble linking communications between the DataHub and the Bluetooth wireless channel. Why, and how do I fix it?

This may occur for one of the following reasons:

**The DataHub is in data logging mode (with the RUN icon displayed) .**

**To fix:** Stop logging to enable Bluetooth communication. Do this by clicking the hand icon on the DataHub software on whatever type of device (computer or tablet) you are using.

**The Bluetooth is disabled, so no icon shows on the DataHub display:**

**To fix:** From the DataHub configuration menu , select Bluetooth  and set its status to enable.

**The USB cable connecting the DataHub and computer has disabled the Bluetooth module.**

**To fix:** Disconnect the USB cable between the computer and the DataHub to enable Bluetooth operation.

**The DataHub Bluetooth was not paired with the computer.**

**To fix:** Please refer to section 3.3.3.2 of the user guide for instructions on pairing.

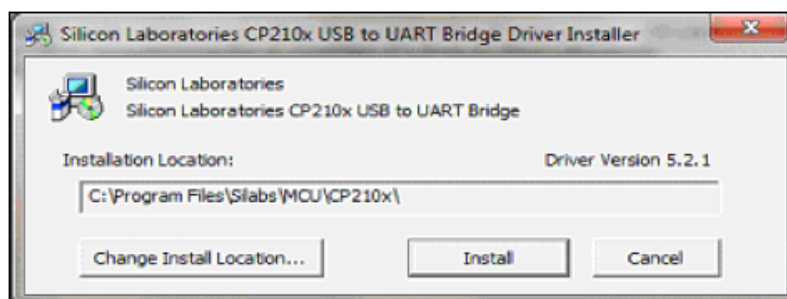
### 8. I'm having trouble linking communications between the DataHub and the USB port. How do I fix it?

First, make sure that the DataHub is not in data logging mode.

Second, make sure that the USB communication cable is connected between the DataHub and the computer.

Make sure that the SiLab 5.2.1 driver was installed as part of the software installation. If not, please run the DataHub installation software.

Make sure that on the screen (see below) you select the INSTALL option for the USB driver. (Note: This screen will look slightly different if you are using a Macintosh-based computer with your DataHub.)



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### communication with other devices

#### 9. For Windows users only: A warning “Wrong USB driver” appears when connecting the DataHub using a USB cable. Why, and what should I do about it?

This warning will appear if DataHub detects that Windows automatically updated the driver to version 6, which is not stable. In order to restore the appropriate driver (version 5.2.1), follow these steps:

- Open “Device manager” from Window’s control panel and expand “Ports (COM & LPT)”. See Figure A, below.

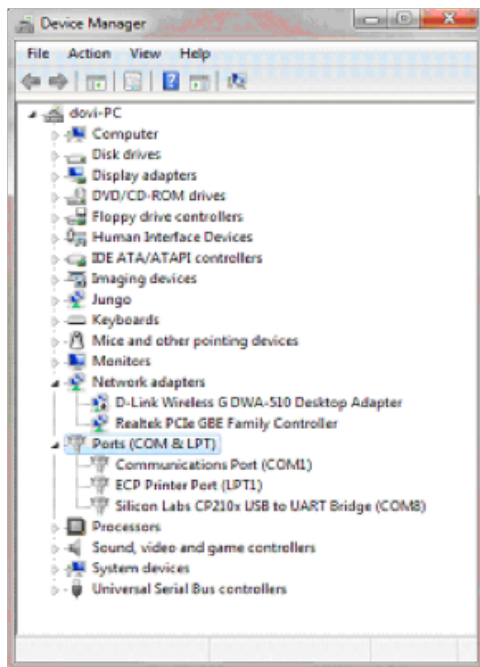


Figure A

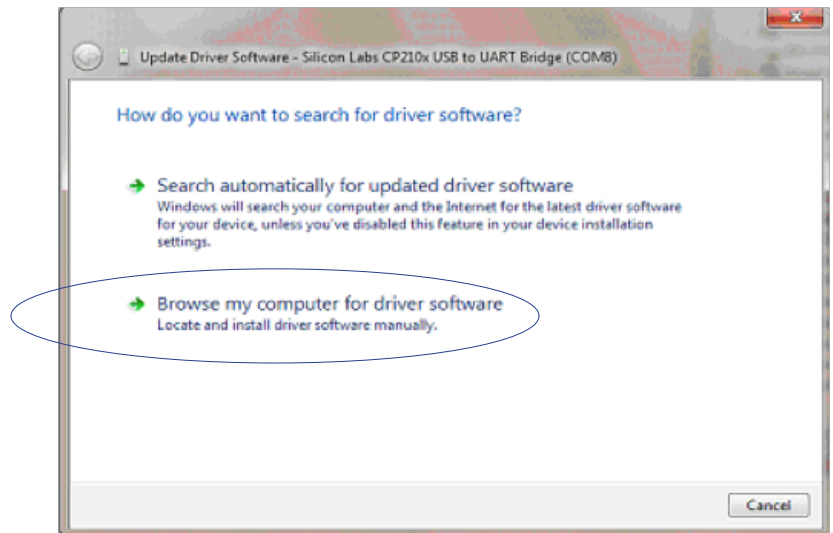


Figure B

- Right click on the line “Silicon Labs CP210x USB to UART Bridge (COM11)” and click on “Update driver software”. (See Figure B, above.)
- Select “Browse my computer for driver software”. (See Figure B.)
- Click “Let me pick from a list of device drivers on my computer”. (See Figure C.)

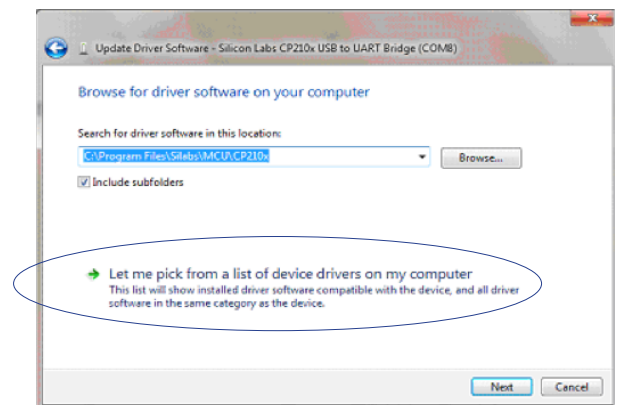


Figure C

(continued on next page)



# DataHub: FAQs/Troubleshooting

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### communication with other devices

9. (continued from previous page) **For Windows users only: A warning “Wrong USB driver” appears when connecting the DataHub using a USB cable. Why, and what should I do about it?**
- e. Select the line with version 5.2.1.0, and click “Next”. (See Figure D.)

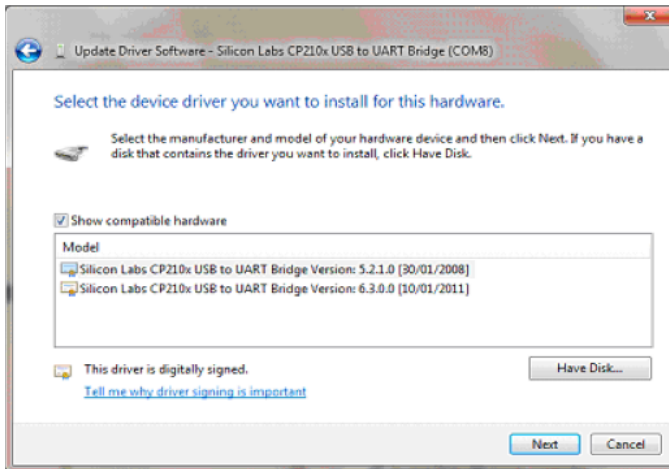


Figure D

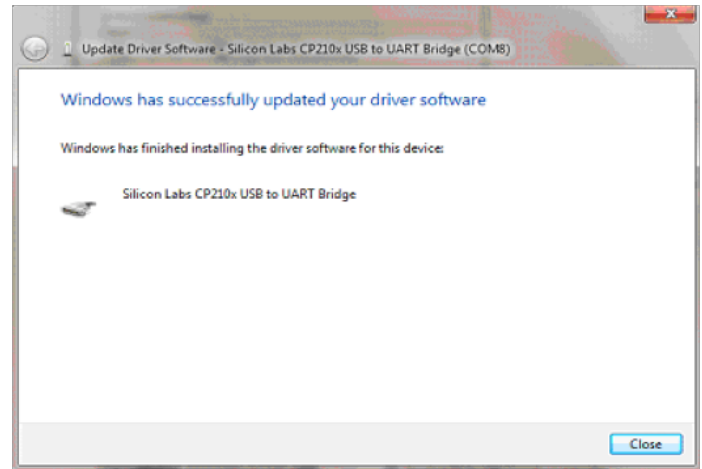


Figure E

- f. At this point, you should see a window indicating that your driver software has been successfully updated and installed. (See Figure E.)




# DataHub: FAQs/Troubleshooting

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### general questions

#### 1. I'm using the DataHub for the first time but can't get the GPS to work. Why, and how do I fix this?




The GPS needs to sync to three or more satellites in order to provide accurate global positioning coordinates. When the DataHub is first used, the GPS is in a "cold start" mode and it might take it 20 to 30 minutes to sync. Once it has synced you'll see three arcs above the small GPS antenna icon on the DataHub LCD. 

After the GPS syncs for the first time it will remember the sync data of the specific satellites, even when the DataHub is turned off. This assures a fast sync (up to one minute) for all future recordings when the GPS is used.

#### 2. Why can't I select a sample rate higher than 10/sec?

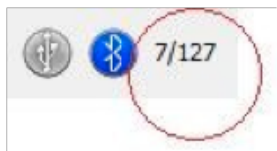
Some of the DataHub sensors can record data at a maximum sampling rate of 10/sec or 1/sec. Selecting one or more of these sensors for data recording will limit the sampling rate to the lowest rate allowed by the slowest sampled sensor. For a complete table of maximum sampling rates per sensor please refer to section "2.7 Built-in Sensors" of the manual.

#### 3. Why isn't the DataHub entering sleep mode after 10 minutes?

Sleep mode is enabled only when both GPS and Bluetooth modes are disabled. Please make sure that the DataHub display doesn't show either of the following icons:  or . If one or both icons appear on the display, use the configuration menu  to disable GPS and Bluetooth modes.

#### 4. My logger memory is full. How do I erase saved experiments?

The Information and Control bar is located in the bottom right corner of the DataHub screen. This bar shows the connection status (either USB or Bluetooth, as indicated by the first two icons) and the amount of available memory for the DataHub. In the example shown below, the memory indicator shows that only seven memory units out of a total of 127 memory units have been used.



To erase saved experiments, (right-click on a Windows PC), (tap on an iPad), or (option-click on a Mac) on the memory indicator to open the memory pop-up menu. Using this menu, you can choose to delete the last experiment from the DataHub, or clear all the experiments from the DataHub.



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### general questions

#### 5. I am unable to measure a heart beat with the ear-clip.

Make sure that you've attached the ear-clip correctly and that you are at rest, as motion will affect readings. The ear-clip should be attached to the soft section of the ear-lobe (an earring hole may interrupt the operation of this sensor). You may also attach the sensor to the index finger or to the soft skin between the index finger and the thumb.

The ear-clip has an IR light source on one side of the clip and a light detector on the other side. Blood flowing through the body changes the skin IR transparency which is measured by this sensor.

When starting a measurement with the DataHub, adjust the sensitivity of the ear-clip sensor to suit your needs and personal preferences. If, in the first five seconds of the measurement, no clear pulses are observed, the DataHub will increase the IR emitted intensity and look for pulses for an additional five seconds. If no clear pulses are measured, the DataHub will increase again the intensity of the IR to maximum intensity. At this stage, no pulse means that the sensor is not properly attached to the ear, or the ear-clip detector is exposed to ambient light (for instance, from an ear piercing). If this occurs, re-attach or re-position the earclip so that no ambient light passes through it.

After a pulse is detected the DataHub will count 16 pulses and then will start to display the heart rate in BPM. For each pulse the DataHub will produce a short beeping sound.

#### 6. Are there differences in how the temperature sensors on DataHub models can or should be used?

Yes. There are different kinds of temperature sensors on various Data Hub models.

**External temperature sensors, thermocouple sensors, and/or infrared sensors** can be found on all DataHub models. If you require an immediate reading of the surrounding temperature, you can use the external temperature, thermocouple or infra-red sensors on the DataHub models.

**An ambient temperature sensor** can be found on the General Science DataHub model and the DataHub Environmental Science model. The ambient temperature sensor is ideal for measuring temperature over a long period of time, for example in measuring the changes in temperature over a 24 hour period.

- On the General Science model, the ambient temperature sensor is located inside the DataHub. This means that it takes about 20 minutes to stabilize. Because this sensor takes a little longer to read the "real" surrounding temperature, it is best suited for long recordings like day and night temperature changes.
- On the Environmental Science DataHub model, the ambient temperature sensor is located in the humidity chamber protruding from the DataHub, allowing it to respond to temperature changes more quickly and accurately.




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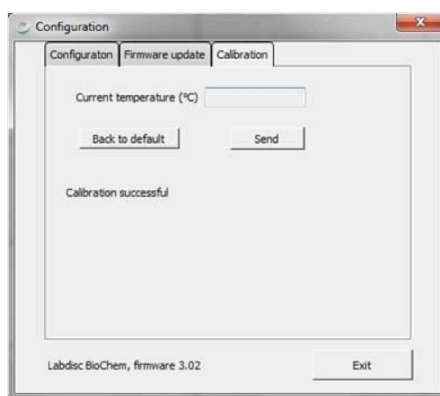
## The Power of Twelve The Convenience of One

### general questions

#### 7. How do I calibrate the DataHub Ambient Temperature sensor?

The DataHub software allows the calibration of ambient temperature. Please follow the steps below for ambient temperature calibration:

- Make sure the ambient temperature is stable. The DataHub should be located in a constant temperature environment for at least 20 minutes.
- Connect the DataHub to the computer and open the DataHub software.
- Click the Configuration icon.  DataHub will open the Configuration dialog box shown below.



- Click on the Calibration tab.
- Type in the actual ambient temperature and press "send".

#### 8. How do I calibrate the DataHub Dissolved Oxygen sensor?

- Place 100 mL DI water into a 150 mL beaker. Bubble air through the water while stirring for 20 minutes. This will saturate the water with air/oxygen and create a 100% DO calibration standard. To prevent air entrapment (from the bubbles) on the DO electrode membrane surface, use an electrode holder that keeps the electrode at a 20° angle.
- To calibrate the reading for 100% saturated oxygen, press and hold the DataHub DO<sub>2</sub> key for 3 seconds until you hear a long beep sound. The data logger should show 8.25 mg/L which represents water saturated oxygen in room temperature of 25°C.

If the water temperature is not 25°C, then place the DataHub temperature sensor probe in the water near the DO electrode. Pressing and holding the data logger DO<sub>2</sub> key will show the mg/L value correlated with the water's actual temperature at 100% oxygen saturation.



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### general questions

#### 9. How do I calibrate the DataHub pH sensor?

The pH sensor is factory calibrated and under normal conditions does not require any calibration. Follow the steps below should you wish to re-calibrate this sensor.

- Insert the DataHub pH electrode into a 7.0 pH buffer.
- Wait for the DataHub pH reading to stabilize.
- Press and hold the pH key for 3 seconds, until you hear a long beep.
- The DataHub pH sensor is now calibrated and will show a reading between 6.95 pH to 7.05 pH.
- If your readings in future sessions appear to be abnormal, repeat this calibration process.

#### 10. What should I do when the solution inside the pH storage bottle runs out?

The soaking solution (storage solution) contains 50% of pH 4 buffer and 50% of 4M KCl. You can prepare this solution yourself using these same proportions of pH 4 buffer and 4M KCl.

#### 11. How do I calibrate the DataHub Colorimeter sensor?

- Fill a clean cuvette with DI water.
- Insert the cuvette into the DataHub cuvette chamber.
- Make sure the DataHub displays one of the colorimeter readings (blue, red or green).
- Press and hold the colorimeter key for three seconds, until you hear a long beep.
- The DataHub Colorimeter sensor is now calibrated; however, the colorimeter calibration is not saved after the DataHub is turned off. You will need to recalibrate the sensor the next time you turn it back on.

#### 12. What is the approximate wavelength of the lights for the colorimeter?

The peak sensitivity wavelengths of the Datahub Colorimeter sensor are:

Red - 620 nm    Green - 550 nm    Blue - 470 nm

#### 13. How do I calibrate the DataHub Turbidity sensor?

- Fill a clean cuvette with 100 NTU turbidity standard.
- Insert the cuvette into the DataHub cuvette chamber.
- Make sure the DataHub displays the turbidity reading.
- Press and hold the turbidity key for three seconds, until you hear a long beep.
- The DataHub Turbidity sensor is calibrated; however, the turbidity calibration is not saved after the DataHub is turned off. You will need to recalibrate the sensor the next time you turn it back on.



# DataHub: FAQs/Troubleshooting

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### 14. If needed, how do I update DataHub firmware?

Firmware is a code used by the internal micro-computer of the DataHub. The latest firmware updates will be posted on the Ward's DataHub website. New firmware releases include bug fixing and additional features.

To update the DataHub firmware:


- Make sure that the DataHub battery is charged, or connect the DataHub to the charger.
- Use the USB cable to connect the DataHub to the computer.
- Run the DataHub software.
- Make sure the bottom right USB icon has turned blue.  If it stays gray, left click on the USB icon.
- From the DataHub toolbar, click the Configuration icon.
- In the opened dialog box, click the second tab, "Firmware update".
- Enter the password (default password = 1234) and press OK.
- When you see the screen shown below (Figure F), click "Open File" and select the new firmware file "Firmware version x.xx. HEX"
- Select the "burn" button. (See Figure G, below.)



Figure F

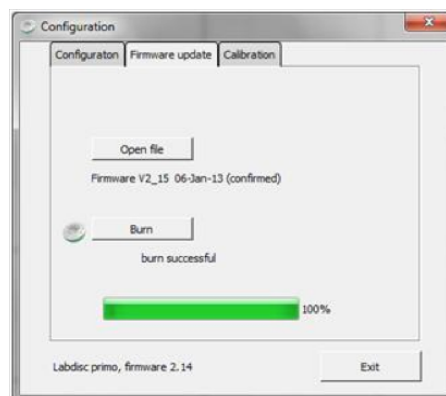


Figure G

- "Burning" the new firmware may take a few minutes. During this time the DataHub will start beeping and flashing its LCD display, while the green progress bar shows the percentage of code being flashed into the DataHub micro-computer memory. Do not turn off or disconnect the DataHub USB cable during this process.
- After burning and verification is complete, the dialog box will show "burn successful". The DataHub is now updated with the latest firmware and can be disconnected from the computer.

