BlueDAQ for Pocket PC
User Guide

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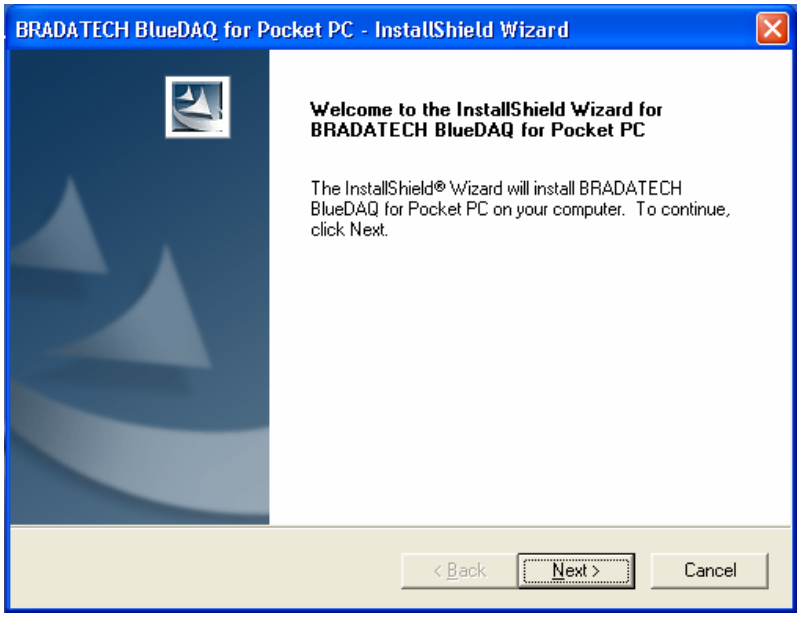
Hardware Specifications

	BlueBOX / SerialBOX (5Volt Box)	BlueBOX / SerialBOX (10Volt Box)
Sample Resolution	10-bit	10-bit
Accuracy	±4.9mV	±9.8mV
Inputs	4 Analog Inputs (0-5V) 2 Digital Inputs (0 or 5V)	4 Analog Inputs (0-10V) 2 Digital Inputs (0 or 5V)
Sample Rate	240 samples/sec (single Channel mode) 60 samples/sec (4 Channel mode)	240 samples/sec (single Channel mode) 60 samples/sec (4 Channel mode)
Interface	Bluetooth (BlueBOX) RS-232 (SerialBOX)	Bluetooth (BlueBOX) RS-232 (SerialBOX)
Range	100 M (300 ft) BlueBOX N/A (SerialBOX)	100 M (300 ft) BlueBOX N/A (SerialBOX)
Analog Input Impedance	>300 kΩ	>200 kΩ
Power Supply	9-15VDC	9-15VDC
Consumption	50mA (BlueBOX) 10mA (SerialBOX)	50mA (BlueBOX) 10mA (SerialBOX)
9V Battery Duration	12-15 hrs continuous use (BlueBOX) 50-60 hrs continuous use (SerialBOX)	12-15 hrs continuous use (BlueBOX) 50-60 hrs continuous use (SerialBOX)
Size	77x66x28mm (BlueBOX) 80x66x28mm (SerialBOX)	77x66x28mm (BlueBOX) 80x66x28mm (SerialBOX)

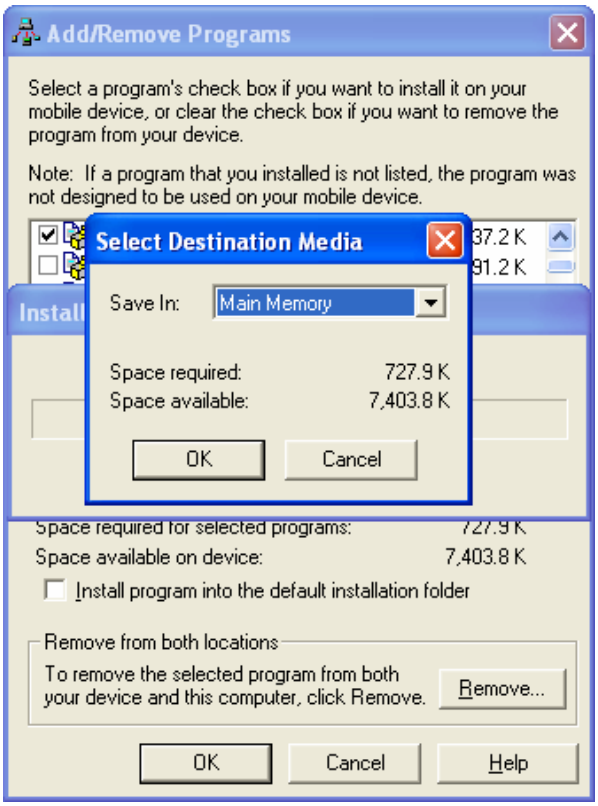
	BlueBOX 2 / SerialBOX 2 (5Volt Box)	BlueBOX 2 / SerialBOX 2 (10Volt Box)
Sample Resolution	12-bit	12-bit
Accuracy	±1.2mV	±2.4mV
Inputs	4 Analog Inputs (0-5V) 1 Digital Input (0 or 5V)	4 Analog Inputs (0-10V) 1 Digital Input (0 or 5V)
Sample Rate	240 samples/sec (single Channel mode) 60 samples/sec (4 Channel mode)	240 samples/sec (single Channel mode) 60 samples/sec (4 Channel mode)
Interface	Bluetooth (BlueBOX2) RS-232 (SerialBOX2)	Bluetooth (BlueBOX2) RS-232 (SerialBOX2)
Range	100 M (300 ft) BlueBOX2 N/A (SerialBOX2)	100 M (300 ft) BlueBOX2 N/A (SerialBOX2)
Analog Input Impedance	>300 kΩ	>200 kΩ
Power Supply	9-15VDC	9-15VDC
Consumption	50mA (BlueBOX2) 10mA (SerialBOX2)	50mA (BlueBOX2) 10mA (SerialBOX2)
9V Battery Duration	12-15 hrs continuous use (BlueBOX2) 50-60 hrs continuous use (SerialBOX2)	12-15 hrs continuous use (BlueBOX2) 50-60 hrs continuous use (SerialBOX2)
Size	77x66x28mm (BlueBOX2) 80x66x28mm (SerialBOX2)	77x66x28mm (BlueBOX2) 80x66x28mm (SerialBOX2)

Installing Software

Launch the **BlueDAQ.exe** program on your workstation running ActiveSync to install the cab files required for the BlueDAQ installation to your Pocket PC. Follow the onscreen instructions.

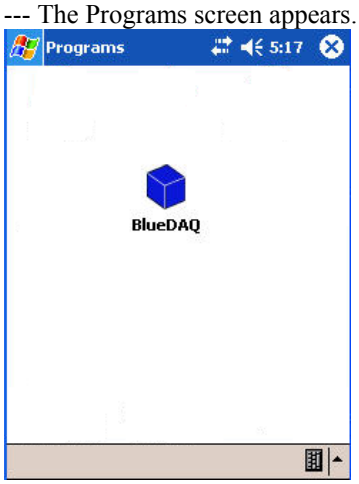


Install to the default directory *Program Files\BlueDAQ* by selecting *Main Memory* or select an available *storage card*.



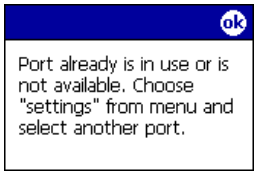
Using BlueDAQ

1. Connect your Pocket PC with the SerialBOX using a serial cable and apply power to the 9-15VDC pin and connect the Gnd pin. If you are using our BlueBOX and your Pocket PC device has Bluetooth capabilities, simply apply power to the 9-15VDC pin and connect the Gnd pin.

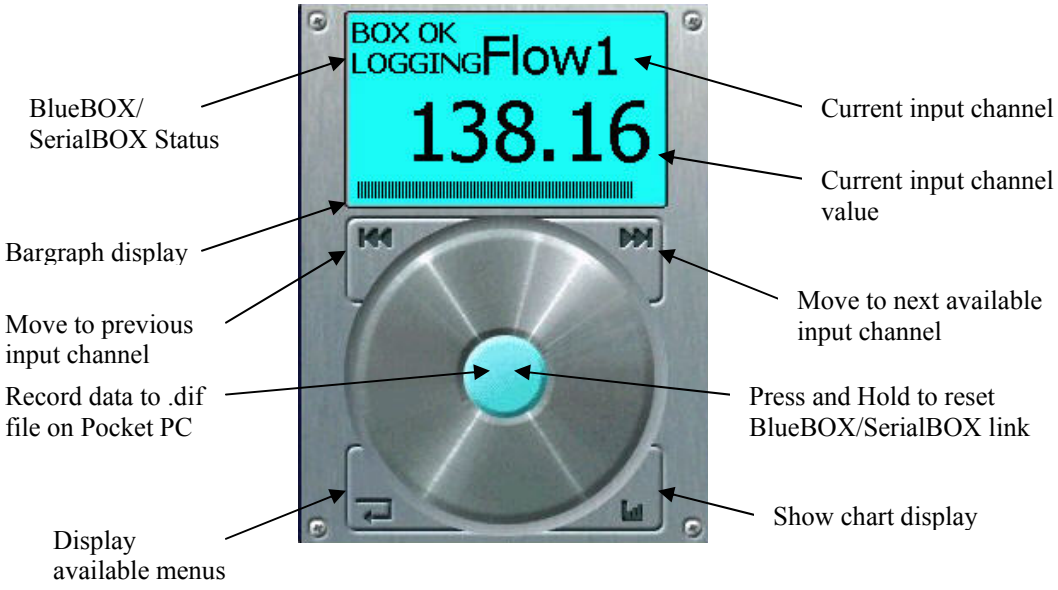
2. {Click}  on the toolbar and {select}  .
--- The Programs screen appears. ---


3. {Click}  to launch the BlueDAQ software.
--- The faceplate screen appears. ---

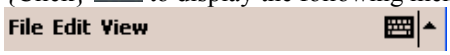

Proceed to the next section C*onfiguring your BlueDAQ for Pocket PC Software* if you receive the following message.



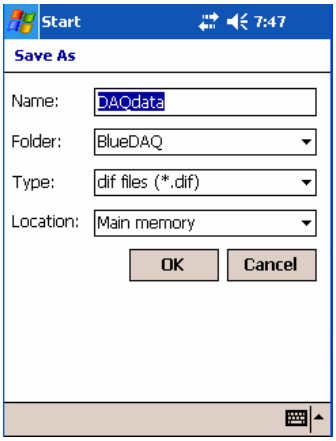
4. The faceplate controls are described below.



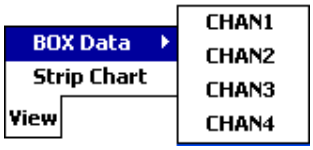
5. {Click}  to display the following menu items.



The File menu provides the ability to modify the current log file name.

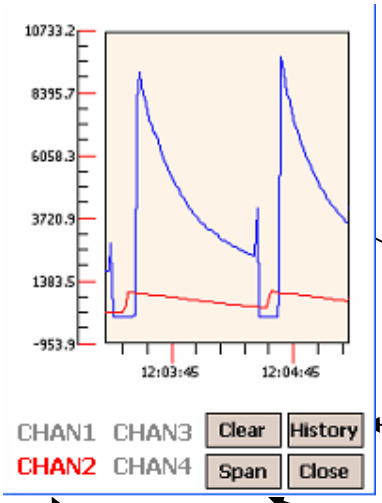


The View menu provides the ability to select available input channels.



Accessing Historical Charts

1. {Click}  on the main faceplate screen.
   --- The chart screen appears. ---



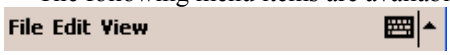
2. The chart updates at a one second interval, but this sampling rate can be changed to a greater value if your Pocket PC device has difficulty with refreshing the chart (especially when more input channels are enabled in the settings).

3. When the sample rate is modified, sampled data is averaged for that time period. For example, if the chart's sample rate is set to 5 seconds and sampling on all inputs is enabled, a total of 5 x 60 samples/sec (from BlueBOX/SerialBOX) = 300 values are averaged for each point on the chart. This is done for each input channel displayed on the chart.

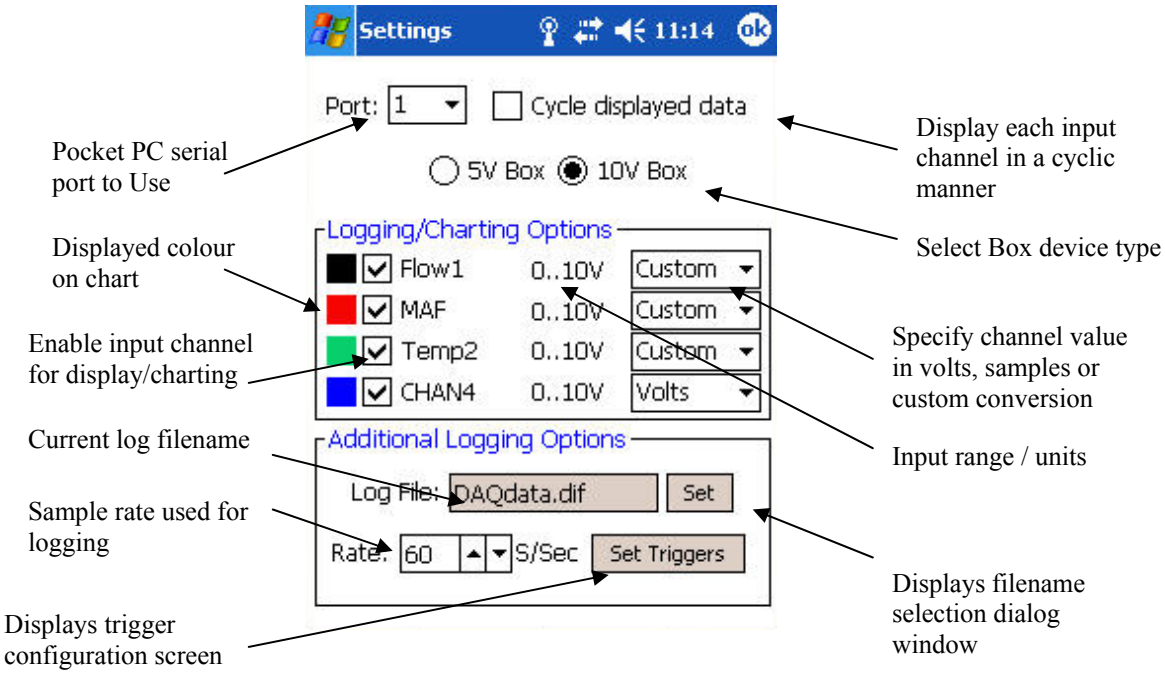
The chart stores 2000 points, therefore a sample rate of 1 second will provide historical data for 33.3 minutes. A sample rate of 5 seconds will provide historical data for 167 minutes.

Chart data is discarded when BlueDAQ closes. If you would like to have sampled data stored to a .dif file, refer to the C*onfiguring your BlueDAQ Software* section which explains the logging process.

Configuring your BlueDAQ Software

1. {Click}  on the main faceplate screen to display the menus.
   --- The following menu items are available to the user. ---
   

2. {Click} Edit, then Settings...
   --- The settings screen appears. ---

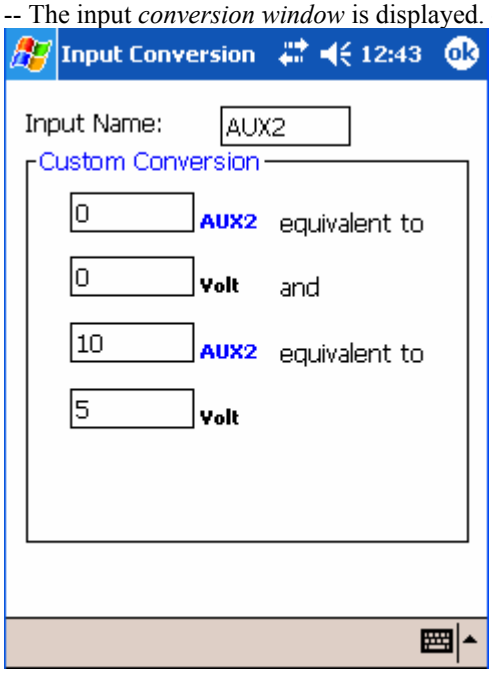


3. {Click} any of the colour boxes on the left of the checkboxes.
   --- The colour palette is displayed. ---

4. {Click} the colour you would like to use when charting the input channel.
   --- The colour palette is closed. ---

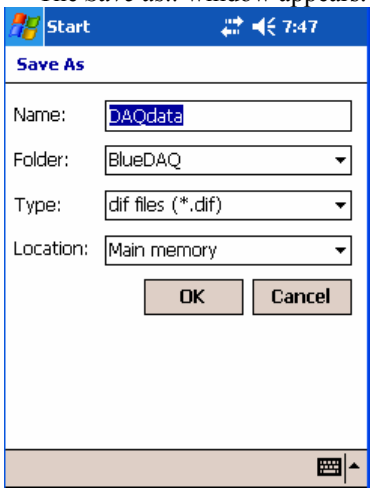
5. {Select} the input channel type by {clicking} the appropriate dropdown list beside the channel.

6. {Select} Custom if you require a custom conversion for the channel.
-- The input *conversion window* is displayed. ---

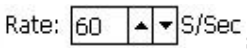


7. {Enter} the appropriate information for converting the raw input value to the required units and {click} ok

8. To modify the log filename for Pocket PC data logging, {click} Set.
--- The *Save as..* window appears. ---



Fill-in the required filename information and {click} OK to save or Cancel to discard the changes.

9. The 

setting will allow adjustments to the number of samples/second logged to the .dif file. The BlueBOX/SerialBOX devices have a maximum sample rate of 240 samples/second total. This means enabling one input provides a maximum sample rate of 240 samples/second and enabling all four inputs provides a maximum sample rate of 60 samples/second for each channel. This is due to the 4800 baud rate of the BlueBOX/SerialBOX. The sample rate can also be reduced to minimize the space used by the .dif file if high sample rates are not needed and you wish to log data for multiple hours.

The sample rate can be adjusted to 1, 5, 10, 15, 20, 30, 60, 120 and 240 samples/second. We only allow sample rates which are multiples of 5 and are factors of 240 (divide evenly into 240) to avoid gaps in the logs.

10. {Click} 

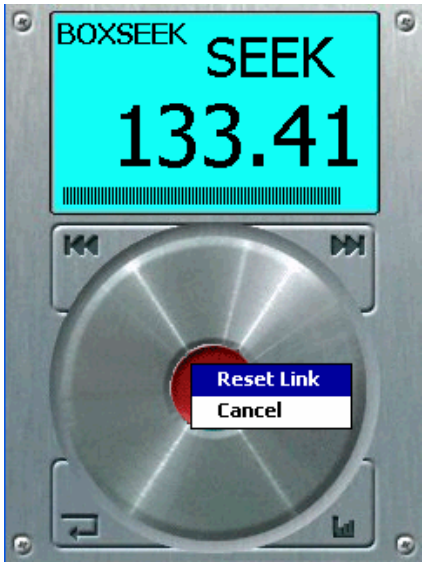
to save the BlueDAQ software settings.

Resetting the Communication Link

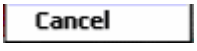
You can reset communications with your BlueBOX/SerialBOX using BlueDAQ for Pocket PC if the device no longer responds with the software.

Press and Hold the BlueDAQ record button on the main faceplate for **2 seconds** to display the hardware control menu.

The refreshing of the display and charts is paused while the hardware control menu is displayed. Select a command quickly to avoid losing data and causing gaps in your log file.

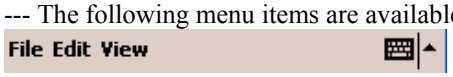


1. {Select} 

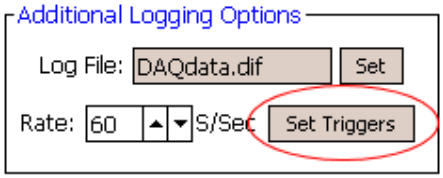
to reset the BlueBOX/SerialBOX connection if it is no longer active.
2. {Select} 

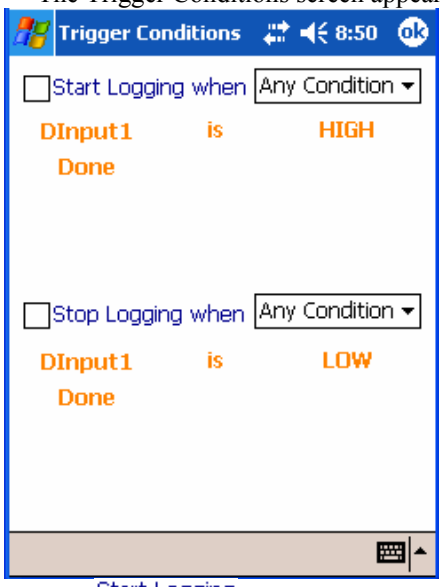
to cancel the control menu.

Using Triggers with your BlueDAQ Software

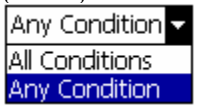
1. {Click}  on the main faceplate screen to display the menus.
   --- The following menu items are available to the user. ---
   

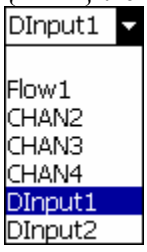
2. {Click} **Edit**, then **Settings...**.
   --- The settings screen appears. ---

3. {Click} Set Triggers in the additional logging options section.
   

   --- The Trigger Conditions screen appears. ---
   

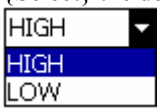
4. {Click} Start Logging and ensure the checkmark appears to enable the start logging trigger. To disable the trigger, {clear} the checkbox.

5. {Select} the desired field condition from the list.
   

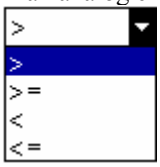
6. {Fill-in} the first line of the condition by selecting the input channel.
   

The four (4) input channels are available for setting the start and/or stop triggers. **Two (2) digital input channels are available on the BlueBOX/SerialBOX** 10-bit units and **one (1) digital input channel on the BlueBOX2/SerialBOX2** 12-bit units. These are designed as on/off state inputs which OFF being defined as 0 Volts and ON being defined as 5V (for the 5V Box) and 10V (for the 10V Box).

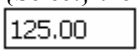
7. {Select} the desired state for the input trigger.



8. If an analog channel is selected as an input for the trigger, a list of available operators is presented.



9. {Select} the appropriate operator and {fill-in} the desired value in the textbox to the right.

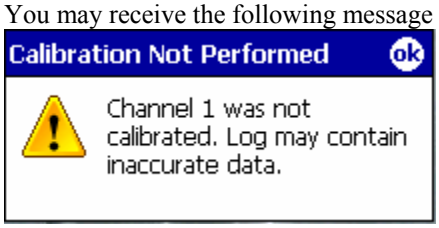


To add additional lines, {click} the Done keyword and select an input from the displayed list. Up to four (4) input triggers can be specified for each of the start and stop triggers. To use less than the allowed four (4) input triggers, {Select} the "Blank" input so that the Done keyword is displayed and the remaining trigger lines are cleared.

Triggers are generally used to prevent filling the log file with unimportant or "garbage" data. By setting the appropriate start and stop triggers, your log file will contain only valid data based on your data collection needs.

Calibrating your BlueBOX/SerialBOX Device using BlueDAQ

You may receive the following message



if you attempt to log data without performing the input channel calibration procedure first. Follow the instructions below in order to calibrate the BlueBOX/SerialBOX input channels using our included calibration cable.

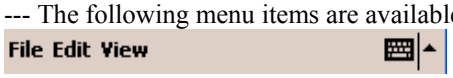
Use our included calibration cable only for performing the calibration sequence described below. Do not use it to connect power supplies or input signals to the BlueBOX/SerialBOX.

1. {Connect} the included calibration cable to the BlueBOX/SerialBOX device as shown below.
   --- BlueBOX connection shown, SerialBOX will connect the same way ---

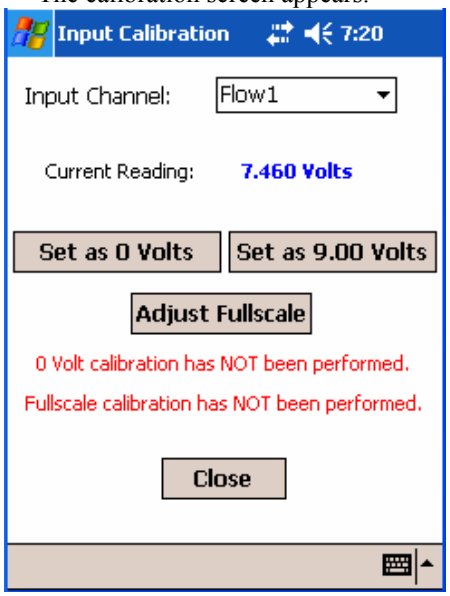
2. {Connect} a fresh 9 Volt battery to the calibration cable's battery connector.

3. {Launch} the BlueDAQ software and ensure it connects successfully to your BlueBOX/SerialBOX device.

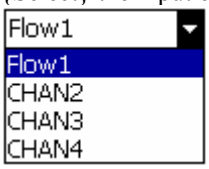
4. {Click}  on the main faceplate screen to display the menus.
   --- The following menu items are available to the user. ---



5. {Click} Edit, then Calibrate...
   --- The calibration screen appears. ---

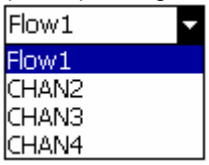


6. {Select} the input channel you wish to perform the zero calibration from the drop down list.

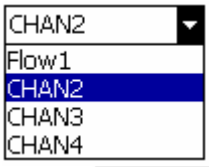


7. {Connect} the **BLACK** wire from the calibration cable to the input selected above.
8. {Click} Set as 0 Volts
9. {Repeat} steps 5 through 7 until all inputs' zero values have been set.

10. {Select} the input channel you wish to perform the full-scale calibration from the drop down list.



11. {Connect} the **RED** wire from the calibration cable to the input selected above.
12. {Measure} the input voltage (where **RED** wire is connected) with a voltmeter.
13. {Click} Adjust Fullscale and {enter} the voltage measured in step 12.
14. {Click} OK to save your full-scale measurement.
15. {Click} Set as 9.00 Volts
16. {Select} the next input channel you wish to perform the full-scale calibration from the drop down list.



17. {Click} Set as 9.00 Volts
18. {Repeat} steps 16 and 17 until all inputs' full-scale values have been calibrated.

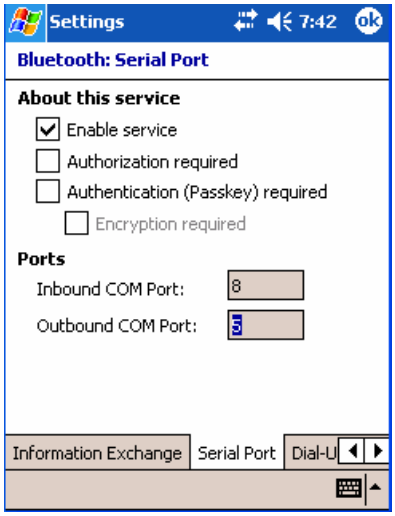
19. {Click} [Close] to save your calibration settings.
20. {Close} the BlueDAQ software and disconnect the calibration cable.
21. Your BlueBOX/SerialBOX is ready for field use.

The [Set as 9.00 Volts] button text may be different if your full-scale value is not exactly 9 volts. The full-scale value will be set to 5 volts by default if you have purchased our 5V range box. The measurement of the voltage in step 12 above needs to be performed only for the first input. Subsequent inputs will use the same full-scale value for calibration.

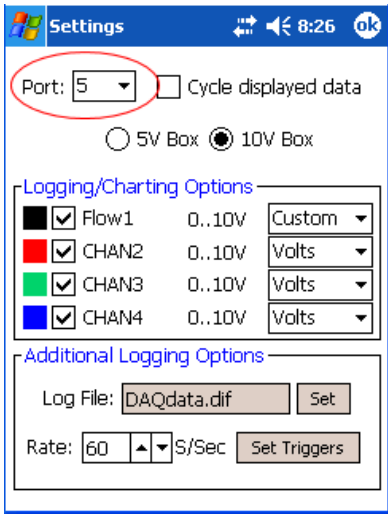
Calibration data is saved in the BluDaqPrefs.xml file located on your Pocket PC's *Program Files\BlueDAQ* directory. You may want to copy this file in another folder for safe keeping once you have performed the calibration sequence above in case you need to someday re-install your BlueDAQ software.

Using the BlueBOX with your BlueDAQ Software

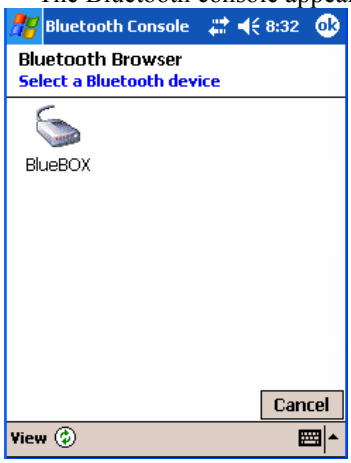
1. {Select} the *Bluetooth Manager* from your Pocket PC. {Select} *Settings, System* panel and locate the *Serial Port* tab.



2. Take note of the *Outgoing COM Port* value.
3. {Launch} BlueDAQ and call-up the *Settings* window.
4. {Select} the port number list and set the port to the same as the *Outgoing COM Port* value above.



5. {Click}  to save changes.
--- The Bluetooth console appears and displays the available devices. ---



6. {Click} the  device.

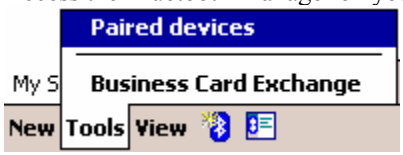
If another instance of the Bluetooth console appears a second time, select  again. This is normal behaviour when using the virtual serial port of the Bluetooth device service included with Pocket PC 2002 and Windows Mobile 2003. Follow the next set of instructions if you wish to bypass the prompting for Bluetooth devices.

Automatically Connect to a Paired Bluetooth Device (without Prompt)

The following method was used to pair a Bluetooth device using an HP iPaq Pocket PC device and Windows Mobile 2003. Pairing on other devices may be different. Follow the manufacturer's specifications on pairing Bluetooth devices.

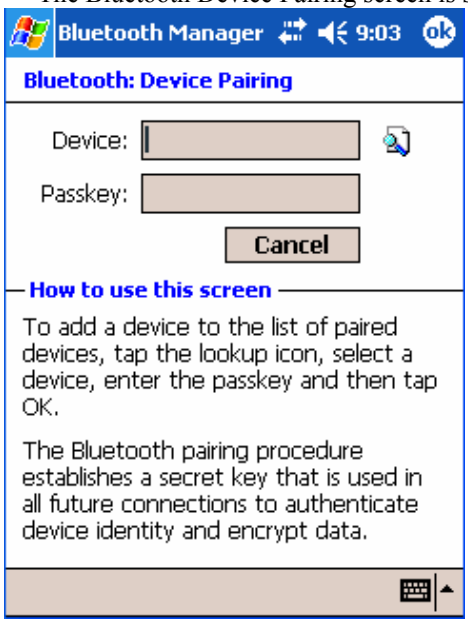
1. {Connect} power to your BlueBOX device.

2. Access the Bluetooth Manager on your Pocket PC device. {Click} *Tools*.



{Select} *Paired Devices*.
--- The *Add/Remove* display is shown. ---

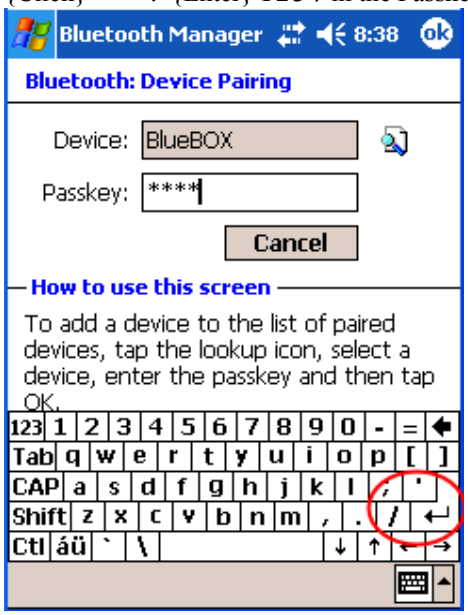
3. {Click} *Add*.
--- The Bluetooth Device Pairing screen is shown. ---



4. {Click} to browse available devices and wait for the BlueBOX device to appear. Refresh if necessary.

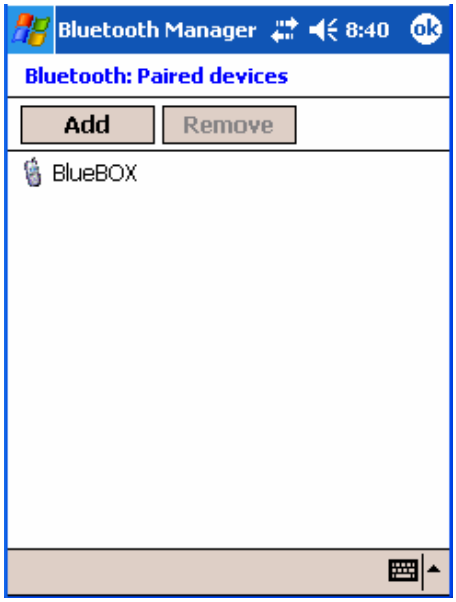
5. {Click} 

. {Enter} *1234* in the Passkey field. {Click} the carriage return *(CR)* key to accept.



6. The 

device will appear in the list of paired devices if it was successfully paired with the BlueBOX device.



7. {Click} 

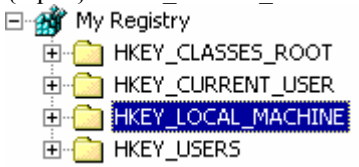
to close.

The following page describes adding a registry key to your Pocket PC settings to prevent the Bluetooth console from appearing each time you connect using Bluetooth. The Bluetooth Manager will now use the paired device created in the previous step if you perform the next registry modification.

Performing the following modifications to the registry on your Pocket PC requires the use of a registry editing tool found on many Internet sites. You must be knowledgeable in performing this change since making an incorrect modification or deleting keys in the registry may cause your Pocket PC to malfunction.

BRADATECH is not responsible for malfunctions caused by improperly performing the registry modifications shown below. We have included this information without warranty.

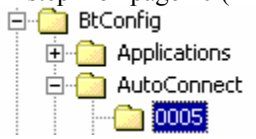
1. {Open} *HKEY_LOCAL_MACHINE*



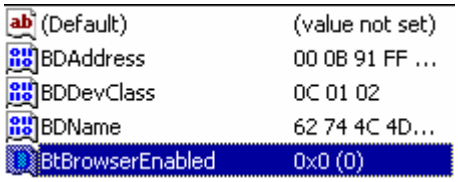
2. {Open} *Software*

3. {Open} *Widcomm* and *BtConfig*

4. {Open} *AutoConnect* and search for the same port number as the *Outgoing COM Port* value found in step 2 on page 10 (in our case, port 5 was used).



5. {Browse} the available settings under this key and {create} a new DWORD value called **BtBrowserEnabled.** Set its value to **0**.



6. {Save} your changes.

7. {Launch} the BlueDAQ software and confirm that you do not get prompted for a Bluetooth device and you automatically connect to the BlueBOX unit.