K5 Test Utility Program User Guide

Project Name: K5

Project Code: TBD

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revision	*Date (dd/mm/yyyy)*	*Description*
1.0	21/01/2015	First emission of the document

1 Table of Contents

2 K5TUP Revision Comments

SW Release Version

1.00 (March 10, 2014)

First Release.

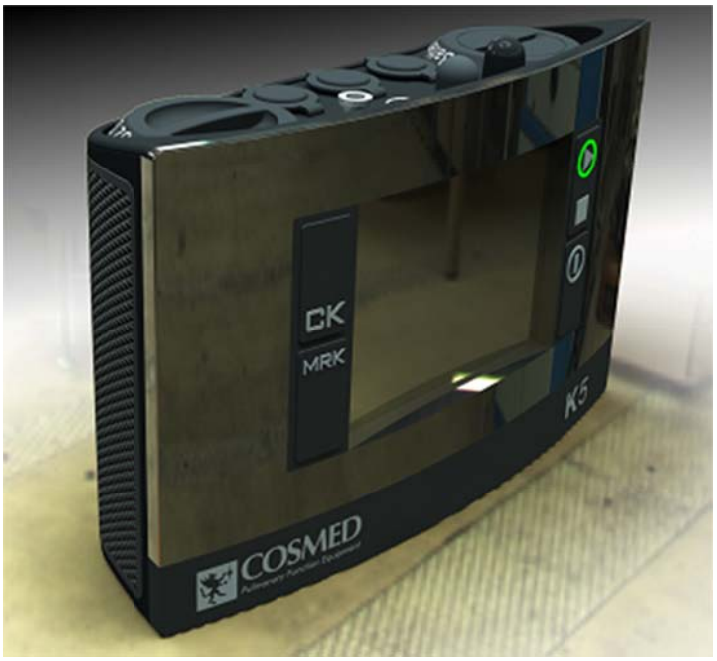
3 Scope of Document

The K5 Test Utility Program (K5TUP) is a C# application tool that enable users to test the following K5's subsystems

- CO2 Analyzer
- GPS Receiver
- Bluetooth Module
- ANT Module

The K5TUP can help the K5 Manufacturer during post board assembly testing, allowing a quick functional check for both the USB signal infrastructure of the K5 Digital Board and the forementioned hardware modules. It also enable module firmware upgrade when combined with external tools. The K5TUP works without the direct intervention of the target CPU.

This document is a User Guide for K5TUP.



K5 Test Utiliy Program - User Guide

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4 Before starting

1. Check that all the following items are present

Code	Description
C04162-01-04	K5 Portable Unit
C04118-01-30	K5 Power Supply
C02890-01-05	CO2 Analyzer
C04117-01-12	K5 USB cable
NA	Bluetooth USB Dongle Parani (Option)
A-661-200-071	ANT HR Elastic Belt IDT (Option)

2. Connect the K5 Unit to the external Power Supply module
3. Connect the K5 Unit to the PC with the USB cable
4. Ensure the K5DB on-board SW1 DIP Switches #1..4 are set to OFF-OFF-OFF-OFF
5. Ensure the K5DB on-board SW2 DIP Switch #4 is set to ON
   This state will prevent the kernel from booting and turn on GPS and CO2 modules
6. Power on the K5 Unit

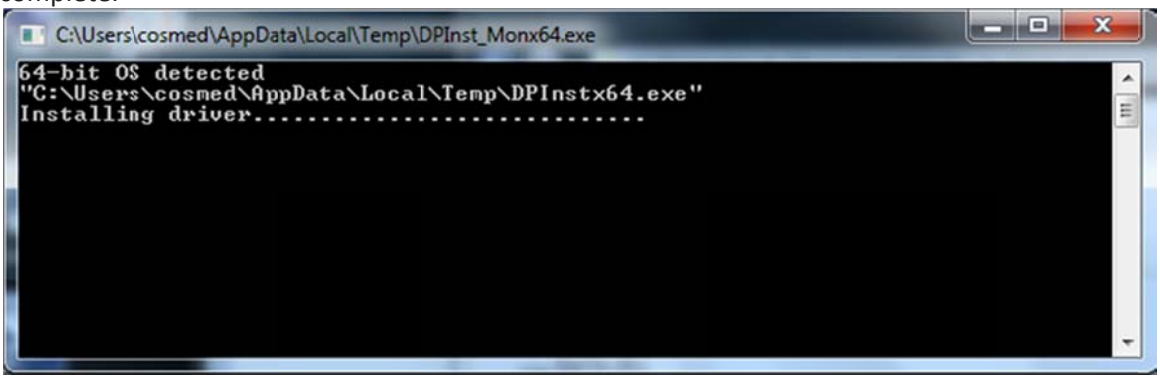
Now U-Boot is running.

5 Install the FTDI's CDM drivers

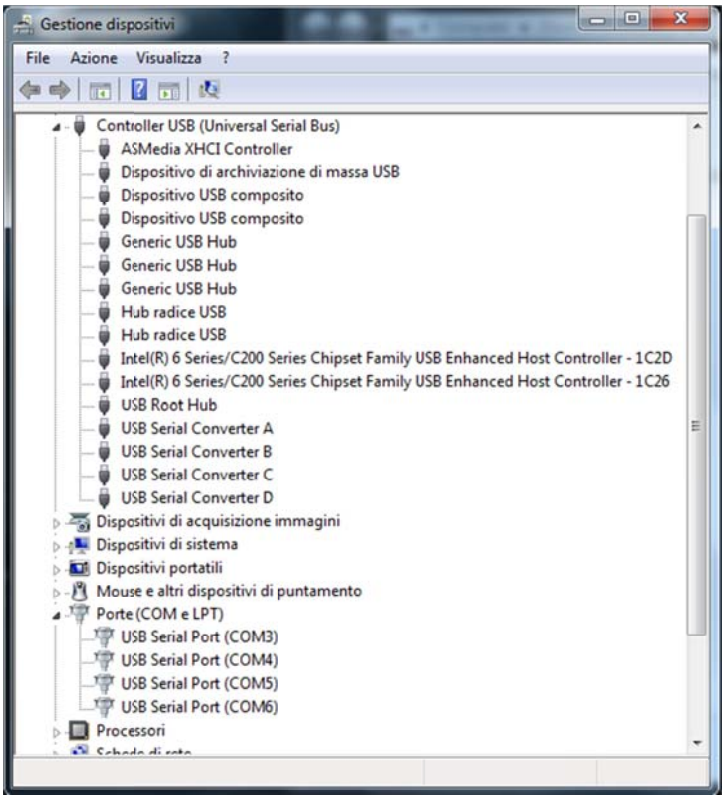
K5DB uses a FT4232 device from FTDI.
FTDI's CDM drivers provide both D2XX and VCP functionality through a single driver package.
On making a new release the files will be posted on FTDI's web site

http://www.ftdichip.com/FTDrivers.htm

Browse the D2XX_driver\ folder and double click the installation file **CDM20824_Setup.exe** and wait it to complete.



When K5 is powered-up and the USB cable is connected to the PC the FTDI drivers recognize the FT4232, and create four virtual serial ports (VCP) as visible from the Windows Control Panel



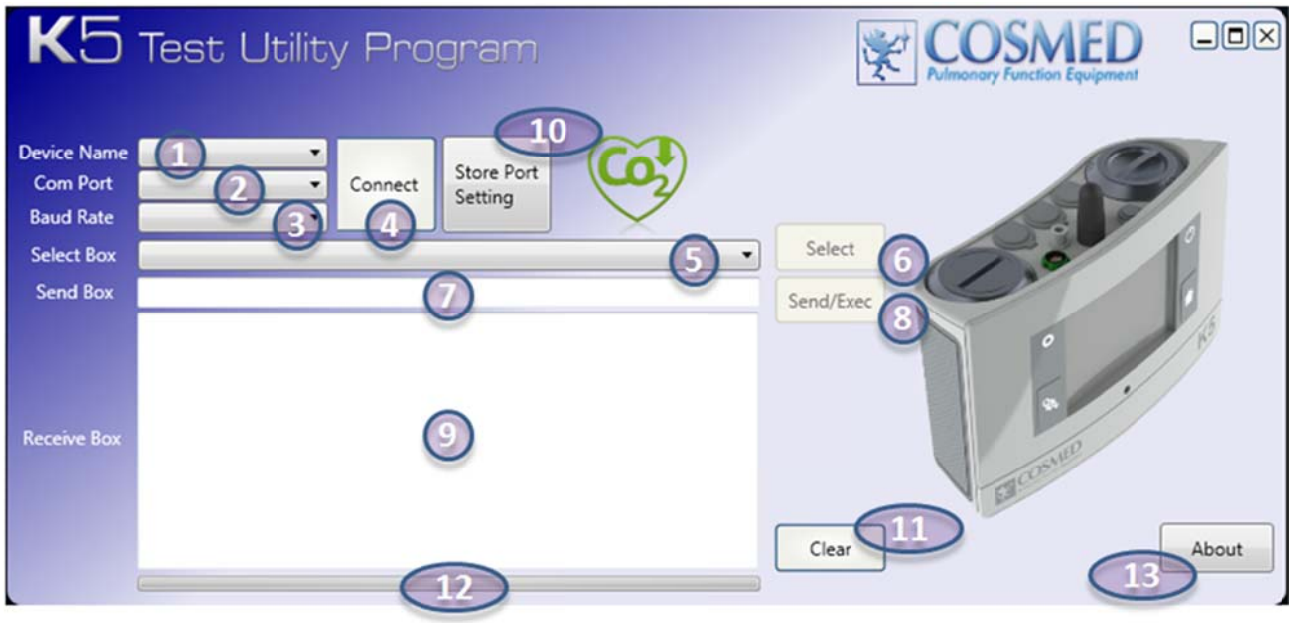
According to the following Table the CO2 Analyzer is mapped to the first USB Serial Converter (A). This mapping depends on hardware and is fixed. As shown in the Control Panel the COM number 4 has been associated with it. This mapping depends on how the PC is populated and can be changed by hand.

USB Serial Converter	Device (fixed mapping)	COM# (session dependent mapping)
A	CO2 Analyzer	4
B	GPS Receiver	5
C	Bluetooth Module	6
D	ANT Module	7

6 Running K5TUP

When starting K5TUP.exe, the following dialog box alerts the user to ensure the hardware setup is correct

Press **OK**. The main panel of the application looks like this



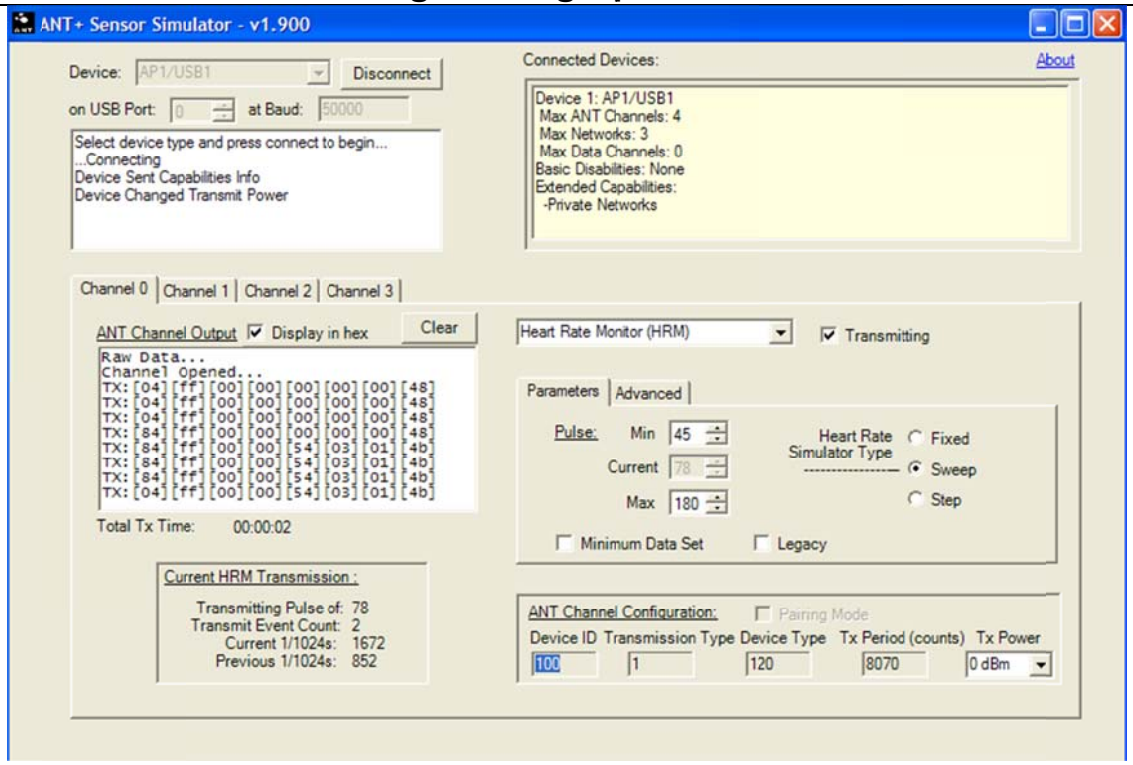
1. Use the **Device Name** drop-down menu to select which device you would like to communicate with
2. To select the communication port, click the **Com Ports** box and select the proper item, according to the table mentioned above or by guess
3. The **Baud Rate** box lets the user select one of several speed choices the current device can support
4. By clicking on the **Connect** button, K5TUP attempts to open the communication port
5. A number of predefined commands (or sequence of commands) are available to through the **Select Box** drop-down list..
6. ..from which the user canselect one by clicking the **Select** button
7. The command will appear into the **Send Box**, into which the user can also type directly a command string
8. Send the selected command to the device by clicking on the **Send/Exec** button

9. The device's output can be read in the **Receive Box**.
10. When the program starts a configuration file **C:\K5TUPInfo.xml** is created with the default program settings. At any given time the user can store to this file the COM port settings associated to the current device by clicking on the **Store Port Settings** button. These new settings will be displayed to the user as default values
11. The **Clear** button will clear the Receive Box
12. When executing complex command sequences a progresso toolbar is a visual feedback to the user.
13. The **About** button gives some informations about the K5TUP utility

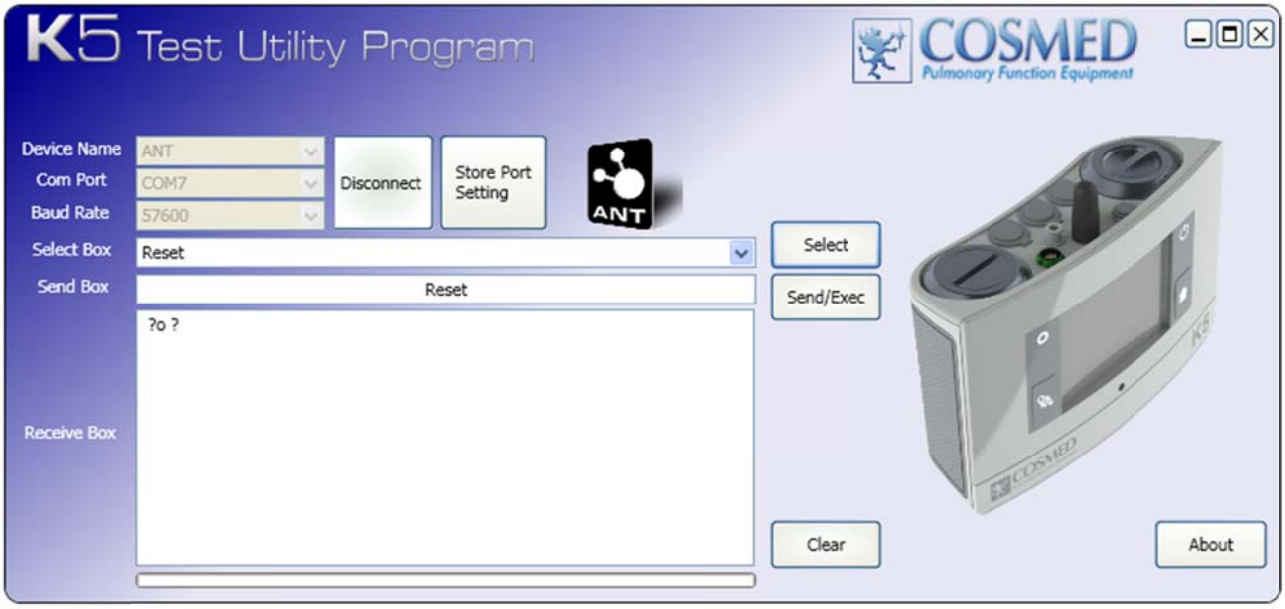
7 ANTC Module Test

This test is a semi-functional and covers the ANTC7 module

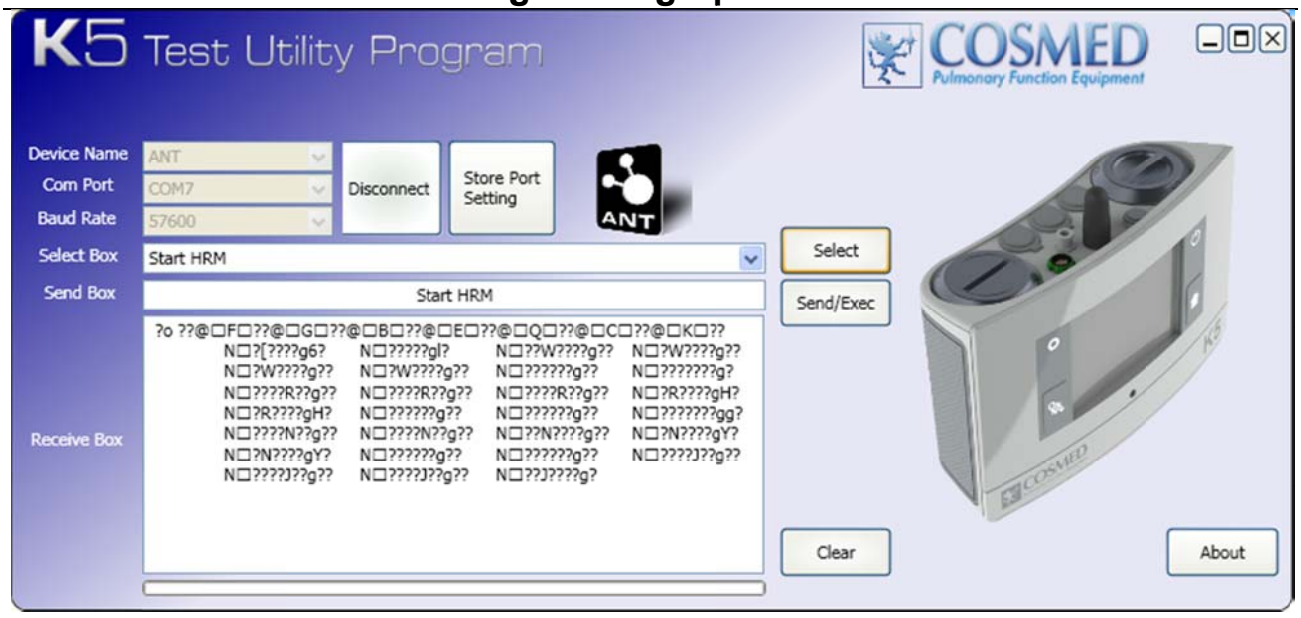
1. Connect the K5 Unit to the PC with the USB cable and power on the unit
2. Insert the ANT Stick USB to a PC USB port
3. On host PC run the AP1 Simulator program
4. Configure and activate a HR channel



5. Start the K5TUP
6. Select ***ANT*** as device and the appropriate communication port settings
7. Click on **Connect** button
8. Select the ***Reset*** command sequence in the **Select Box** drop-down menu and send it to the device. The Receive Box will display the following charachters (current version doesn't support ANT message decoding)



9. Select the ***Start HRM*** command sequence in the **Select Box** drop-down menu and send it to the device. The Receive Box will display the progress of the command sequence
10. The test is PASSED if a short message string is periodically received from the ANT Stick (current version doesn't support ANT message decoding)

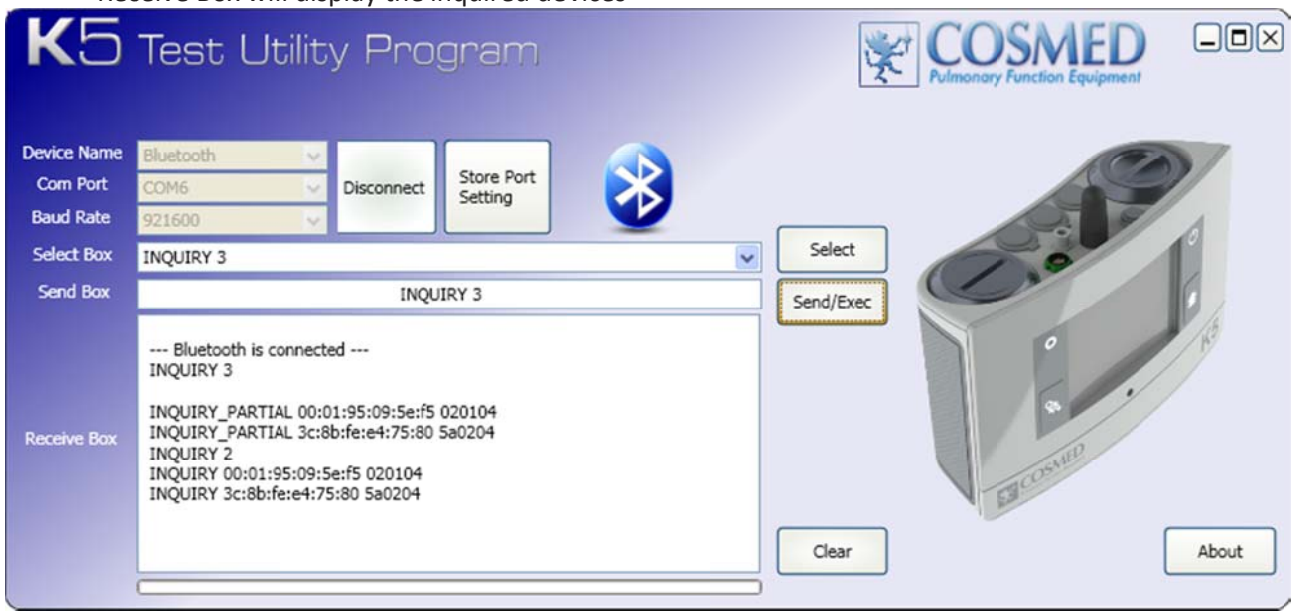


11. Select the ***Stop HRM*** command sequence in the Select Box drop-down menu and send it to the device
12. Click on **Disconnect** button

8 Bluetooth Module Test

This test is a semi-functional and covers the Bluetooth module

1. Start the K5TUP
2. Select ***Bluetooth*** as device and the appropriate communication port settings
3. Click on **Connect** button
4. Select the ***Inquiry*** command in the **Select Box** drop-down menu and send it to the device. The Receive Box will display the inquired devices

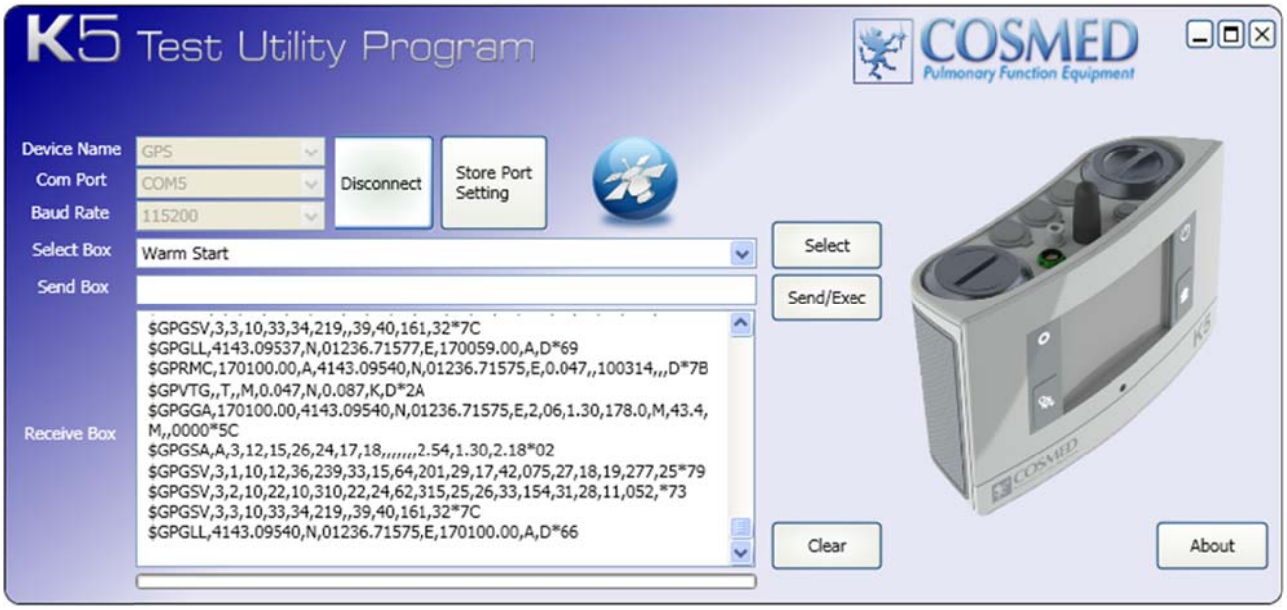


5. Click on Disconnect button

9 GPS Receiver Test

This test is a semi-functional and covers the GPS Receiver

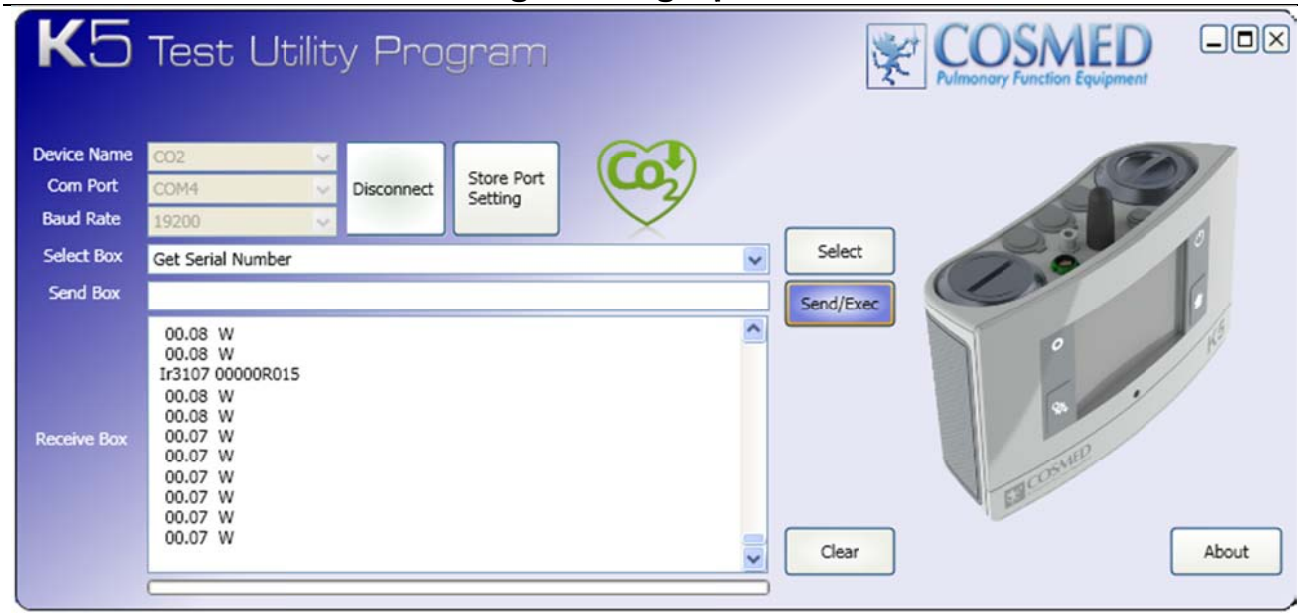
1. Start the K5TUP
2. Select ***GPS*** as device and the appropriate communication port settings
3. Click on **Connect** button
4. The Receive Box starts displaying GPS messages
5. Select the ***Warm Start*** command in the **Select Box** drop-down menu and send it to the device. The Receive Box will display



6. Click on Disconnect button

10 CO2 Analyzer Test

This test is a semi-functional and covers the CO2 Analyzer
TODO



11 Appendix - Connecting K5 to a Bluetooth USB Dongle

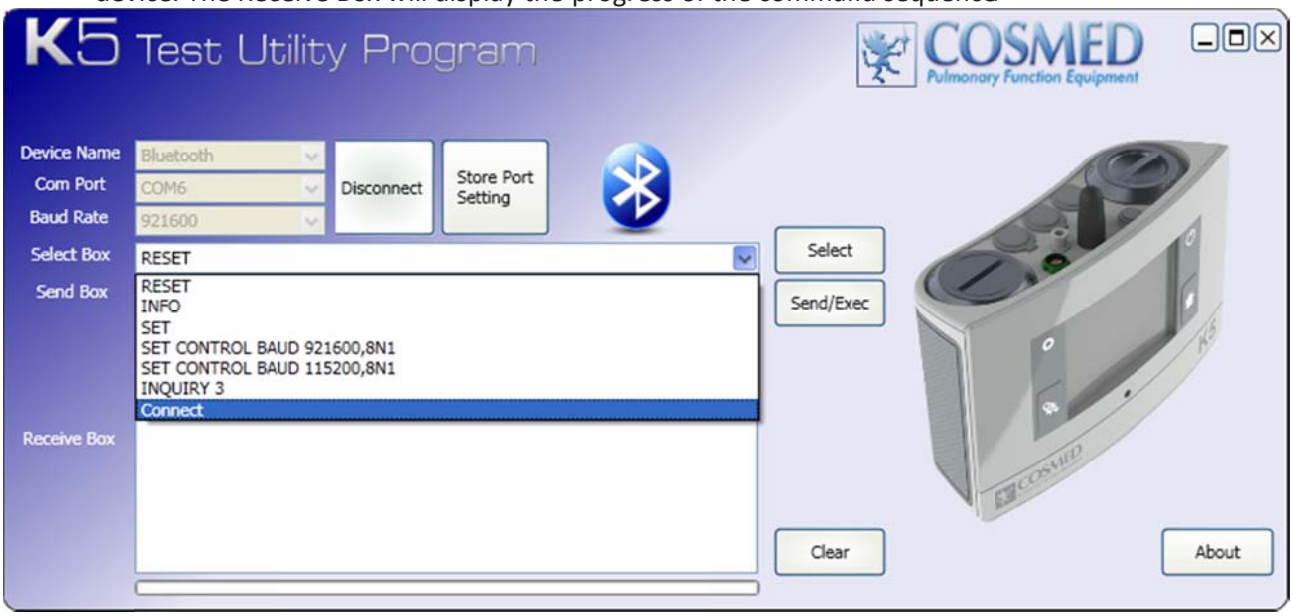
In this section we describe how to use K5TUP to establish a SPP Bluetooth link with a USB Dongle connected to PC. In this case the K5 Unit is the device initiating the call.

1. Connect the K5 Unit to the PC with the USB cable and power on the unit
2. Insert the Bluetooth Dongle to a PC USB port
3. Ensure that the ***btRuAddr*** and ***btPasskey*** tags in the configuration file ***C:\K5TUPInfo.xml*** matche the Bluetooth address and passkey of the Dongle

```
<?xml version="1.0" encoding="utf-8"?>
<K5TUPInfo xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
 <DeviceName>
  <string>CO2</string>
  <string>GPS</string>
  <string>Bluetooth</string>
  <string>ANT</string>
 </DeviceName>
 <ComPort>
  <string>COM4</string>
  <string>COM5</string>
  <string>COM6</string>
  <string>COM7</string>
 </ComPort>
 <BaudRateIdx>
  <int>0</int>
  <int>0</int>
  <int>1</int>
  <int>0</int>
```

```
</BaudRateIdx>
<btRuAddr>00:01:95:09:5e:f5</btRuAddr>
<btPasskey>1234</btPasskey>
</K5TUPInfo>
```

4. Start the K5TUP
5. Select ***Bluetooth*** as device and the appropriate communication port settings
6. Click on **Connect** button
7. Select the ***Connect*** command sequence in the **Select Box** drop-down menu and send it to the device. The Receive Box will display the progress of the command sequence



8. On the remote PC the Bluetooth icon in the taskbar will notify you a request of connection. Accept by inserting the passkey
9. Upon successfull connection the **Receive Box** text ends with “OK” and on the PC side is possible to open a terminal emulator and send/receive data