

BluePort XP

User Guide

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1. Bluetooth Introduction

Bluetooth wireless technology is a short-range radio technology. Bluetooth wireless technology makes it possible to transmit signals over short distances between computers and other devices and thereby simplify communication and synchronization between devices.

The protocol operates in the license-free ISM band at 2.45 GHz. In order to avoid interfering with other protocols which use the 2.45 GHz band, the Bluetooth protocol divides the band into 79 channels and changes channels up to 1600 times per second. Implementations with version 1.2 reach speeds of 723.1 kbit/s.

2. Preparation

Before you use this product, you should be aware of certain industry specifications and standards for Bluetooth and RS232 Interface Specifications. For help with RS232, see the RS232 User Guide.

The BluePort XP is **NOT** a Plug-and-Play device. When used in pairs, these devices consist of a radio link that connects two different RS232 devices. Therefore, you should understand basic radio transmission principals and more importantly, the methods and practices used to connect RS232 devices. Since each BluePort XP has a Bluetooth radio and an RS232 interface, you must configure the Bluetooth radio so that it properly links to another Bluetooth device, and you must configure the RS232 interface to match the device attached to it.

Several examples are provided to aid in setup and configuration.

If you are connecting a pair of BluePort XP radios as a cable replacement, see the XP Quick Start Guide.

3. BluePort XP

BluePort XP is a totally wireless and portable Class 1 Bluetooth serial adapter. With its integrated Power Pack, you can create wireless connections anywhere, anytime, and stay connected for up to 32 hours on a single charge! **BluePort XP** enables wireless connections to most legacy serial ports and supports bi-directional RS-232 signaling at a rate of up to 232.4Kbps. The transmit range can be up to 330' (100m), depending upon environmental considerations.

Features & Benefits

- Wireless cable replacement: use to replace cables or where cabling is not possible or practical
- Low power consumption (50ma connected, 10ma waiting)
- External antenna (SMA jack and ANT) to maximize range
- On board jumpers to switch from DTE/DCE and disable flow control so you don't have to make cables!
- Integral LION Battery (1.1AH), built in charger, status LEDs.

BluePort XP can be charged from any 5VDC power source (including USB ports), and can run for hundreds of hours in standby mode, and up to 32 hours continuously connected and transferring data.

BluePort XP uses the standard Bluetooth Serial Port profile and is compatible with all clients running under Windows™, Windows™, **Apple**™, PocketPC™, and other platforms, including many cellphones.

There are three ways to utilize BluePort XP's capabilities:

1. Direct to a Bluetooth client: the client creates a SPP connection to the unit and uses a virtual COM style interface. Data is sent and received on the client exactly as if a serial cable was connected to a real COM port on the client.
2. Use a pair of **BluePort XP's** for true cable replacement.
3. Access point mode, **BluePort XP** connects via Bluetooth into a **BlueLine** access point, which can then be accessed from any client over a LAN or the Internet. The **Blueport XP** serial port appears as a telnet port on **BlueLine** and network applications can open up a socket interface to the port.

4. Introduction

The BluePort XP is a Class1 Bluetooth radio modem operating on 2.4GHz RF. The modules are Bluetooth version [1.2 compliant](#). Two BluePort XP devices can be configured to make a wireless RS232 cable replacement or extender.



This section provides the setup and operation of the BluePort XP modules and describes the *command mode* protocol used to control and configure BluePort XP Serial Modules. The protocol is similar to the industry standard Hayes AT protocol used in telephone modems due to the fact that both types of devices are connection oriented. Appropriate commands have been provided to make the module perform the two core actions of a Bluetooth device, which is make/break connections and Inquiry. Additional commands are also provided to perform ancillary functions. The serial devices can be configured, commanded, and controlled through simple ASCII strings through the BluePort XP's hardware serial UART or over a remote Bluetooth RF connection.

*NOTE: If you are new to Bluetooth devices or RS232 communications, see the [RS232 User Guide](#), and the [XP Quick Start Guide](#). If you are having problems with the setup and configuration, read these sections for more details. **Please read these sections before calling for technical support.***

The BluePort XP has an RS-232 DB-9 Male connector. BluePort XP is a Class1 Bluetooth device with high power transceiver (100meters/330 feet). Actual range may vary due to environment or type of client device used to connect to BluePort XP.

4.1 BluePort XP Features

- Flexible RS-232, with available baud rates from 1200 to 232.4kbps, and non-standard values.
 - Baud Rates other than 9600 or 115200 are selected in command mode.
 - Switch selectable baud rates of 9600 and 115200bps.
 - Parity Even, Odd, or None, 7/8 Data Bits, 1 Stop Bit.
 - Hardware flow control via RTS, CTS. NO Modem control signals.
 - Settings can be easily changed via local serial port connection.
 - High Power (Class 1, 20dB TX, 330', 100m) Bluetooth™ radio
 - Serial Port Profile used for direct connect to Bluetooth clients.
 - 3 LEDs, Transmit/Received data, Power/Connection Status, and battery/charger.
 - Low power operation, (1ma standby, 50ma connected)
 - Optional USB power charging cable, right-angle and higher gain antennas
-

4.2 Overview

The following drawings show the top and bottom views of the BluePort XP. The bottom view shows the jumpers near the DB9 RS232 connector.

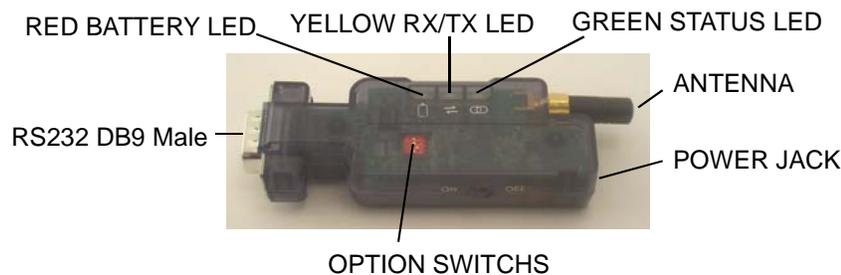


Figure 1 - BluePort XP Top View

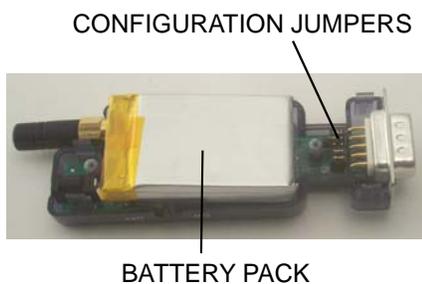


Figure 2 - BluePort XP Bottom View with case removed

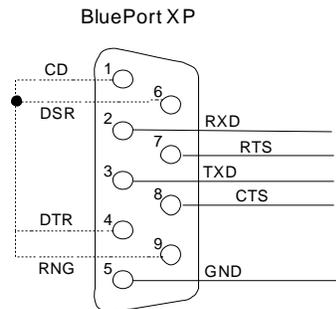
4.2.1 RS232 Physical Port Description

The pin names and descriptions are shown in the following table. Please note that many signal pins are tied to other pins. For example, DTR is tied to DSR and DCD. When DTR goes high, it forces a high signal to Carrier Detect (DCD) and Data Set Ready (DSR).

Pin	Description	Source
1 - DCD	Carrier Detect Tied to 4, 6, 9	
2 - RX	Receive Data	Attached Device (In)
3 - TX	Transmit Data	Host Device (Out)
4 - DTR	Data Terminal Ready Tied to 1, 6, 9	
5 - GND	Ground	
6 - DSR	Data Set Ready Tied to 1, 4, 9	
7 - RTS	Request to Send	Host Device (Out)
8 - CTS	Clear to Send	Attached Device (In)
9 - RNG	Ring Tied to 1, 4, 6	Attached Device (In)

Table 1 - RS232 DB9 Male Pin Descriptions

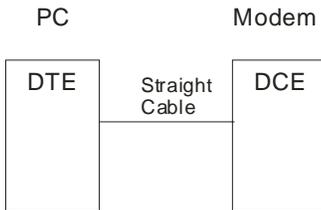
The BluePort XP does not use all the 9-pin cable signals. However, it has some internal jumpers that take care of the missing signals. This simplifies the connection to a BluePort XP. The drawing below shows the input and output signals and the pins that are internally jumpered.



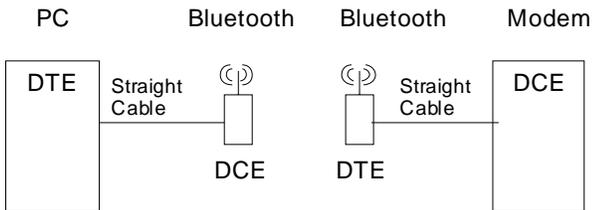
4.2.2 Typical Application

A typical connection between a Computer (DTE) and a Modem (DCE) is shown below. The cable between them is a **straight** cable. A straight cable means that pin 2 on one side goes to pin 2 on the other side. The pins are connected straight through from one side to the other. Generally, a straight cable uses all 9 wires and connects all RS232 signals as shown in *Table 1 - RS232 DB9 Male Pin Descriptions*.

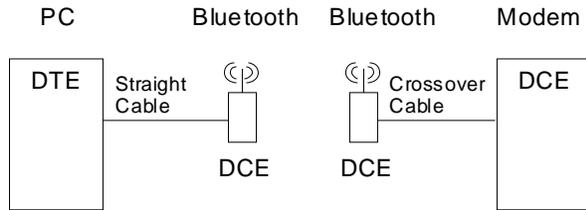
Note: the term Modem is for reference only. The BluePort XP does not support Modems.



A BluePort XP wireless radio set will allow you to remove the straight cable and replace it with a wireless BluePort XP connection. The connection looks something like the drawing below. Please note that the BluePort XP does NOT use all the signals from the PC or the Modem. The BluePort XP uses only RX, TX, RTS and CTS.



An important point to consider in the drawing is that the BluePort XP connected to the Modem (DCE) has been configured as a DTE device. This is done so that the signals from the Modem to the BluePort XP will match. You can also match the signals by using a Modem crossover or Null Modem cable as shown below.



In the above diagram both BluePort XP devices are configured as DCE devices. The Crossover (Null Modem) cable will match up the signals between the Modem and the BluePort XP.

Rule of Thumb: If your device plugs into the computer serial port with a straight cable and works normally, the device is wired as DCE.

Check your cable wiring to determine if you are using a straight or crossover cable. A straight cable requires one of the BluePort XP devices, the one connected to your device, to be configured as DTE. The other option is to use a crossover cable and configure both BluePort XP devices as DCE.

The BluePort XP's DB9 (Male) Serial Connector *usually* comes configured as a DTE device according to the factory settings as shown in Table 1 - RS232 DB9 Male Pin Descriptions. Jumpers are available inside the case to change the pin configuration of the BluePort XP (see section **Error! Reference source not found.** for more information on how to access and modify the jumpers).

4.2.3 Power Requirements

The BluePort XP's Power Jack accepts 4VDC – 9VDC. The center pin of the power jack is for the input power (typically +5V), while the outer cylinder should be connected to ground. The requirements can be met with the supplied 5VDC, 300ma wall plug adapters.

To charge the battery, insert the power adapter and set the slide switch ON. The RED LED comes on SOLID while charging the battery, then turns off when charging is complete. A BLINKING RED LED indicates low battery condition. Battery life between charges depends on use, but you should get at least 24 hours of continuous use between charges.

There is a USB charging cable available.

4.2.4 Status LEDs

The BluePort XP comes equipped with three status LEDs. The Green LED provides Bluetooth Device status, while the Yellow LED provides status of the transmit/receive lines. The Red LED provides battery status.

The Bluetooth Device status is indicated by the Green LED as shown in Table 2 - Status LEDs.

Table 2 - Status LEDs

BluePort XP Device Status	Green LED Blink Rate
Configuring	Fast, 10 times per second
Boot up, Remote Configurable	2 times per second
Discoverable/Idle	1 time per second
Connected	On Solid

The Yellow LED shows the physical state of the TX and RX data pins, pulse stretched for improved visibility. The Yellow LED blinks when data is **transmitted** or **received** on pins 2 and 3 of the serial port. The Yellow LED works using a physical hardware connection, and does not depend on software from the BluePort XP to make it operational.

If the RED LED is blinking, the battery is low and needs charging. When a charger is connected, the RED LED will glow solid and turn off when charge is complete.

4.3 BluePort XP Configuration Switches

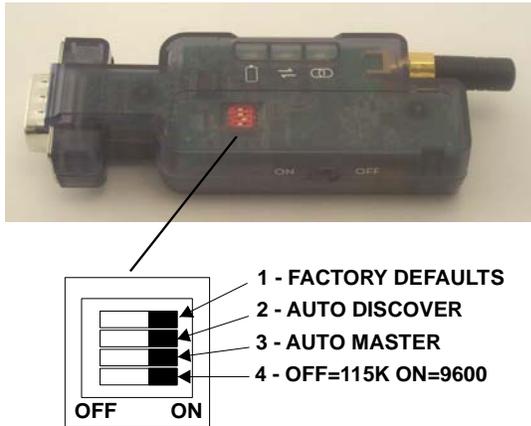


Figure 3 - Configuration Switches

For RS232 cable extender mode of operation, set one unit to Slave and the other unit to Auto Master.

1- **FACTORY DEFAULTS**- Set this switch **ON**, power up the unit, and toggle the switch from ON to OFF 2 times to return the unit to factory settings.

2-**AUTO DISCOVER MODE** – In Slave mode, this will set a special class of device which is used by a remote BluePort XP Master to auto connect. IF Switch 3 also ON, the device performs a search, store, and connect to a remote slave which has switch 2 ON.

3- **AUTO MASTER MODE**- BluePort XP will act as master and auto-connect to a stored remote address. You first set the BluePort XP address of the device to connect to using the SR command or have BluePort XP auto discover and connect by setting this switch AND Switch 2 ON.

4- **DEFAULT BAUD RATE** – OFF = 115K (factory setting), ON = 9600. You can set a different baud rate by software configuration.

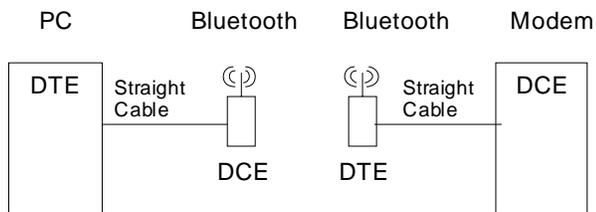
*This is the Baud Rate of YOUR device. Other baud rates are available using the command mode.

4.4 Cable Replacement Example

This section shows how to set up two units as a wireless cable replacement or cable extender. This example assumes that one end of the cable is attached to a PC and the other to a compatible RS232 device, such as a Modem, remote sensor, etc. Remember that the BluePort XP does not fully support modems. The term Modem is just used for reference.

Since there is no way to determine what kind of compatible device you are using, you will have to verify the cable and the pin connections are correct. In some cases, you will need a crossover cable or may have to fabricate a custom cable in order to get the proper connections between your device and the BluePort XP radios. See the *Guide to RS232* at the end of the manual.

For this example, the PC side of the cable and radio connection will be referenced as the MASTER (PC). The device connected to the PC will be referenced as the SLAVE (Modem). The PC is a DTE device, so the BluePort XP radio attached to it must be a DCE device. The Modem is a DCE device, so the BluePort XP radio attached to it must be a DTE device. Use the following drawing as a reference.



The cables used in these examples are straight cables, meaning that pin 2 goes straight through to pin 2 on the other end.

4.4.1 Configuration Procedures

1. Assign one of the BluePort XP radios as the MASTER and set the switches as shown below. The settings are for 115K. Put Switch 4 in the ON position for 9600. This is the baud rate of the com port on your PC. The baud rate must be the same on BOTH BluePort XP devices.
2. The Master device will be setup as a DCE device and should be connected to the PC side of the connection.

MASTER:

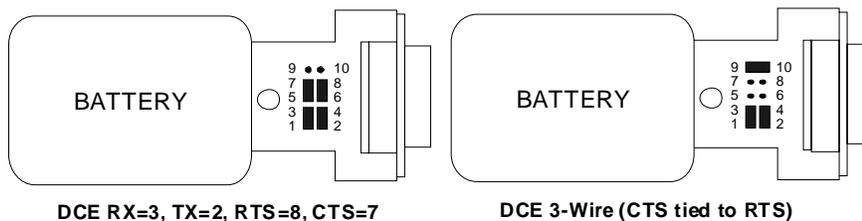
Switch 4 = OFF = 115K

Switch 3 = ON = Auto Master ON

Switch 2 = ON = Auto Discover ON

Switch 1 = OFF = Factory Defaults OFF

Set the internal jumpers as shown below. If your device does not use flow control signals RTS and CTS, set the jumpers as shown on the right. If you are not sure, use the drawing on the right.



Connect the MASTER unit to the PC with a straight cable..

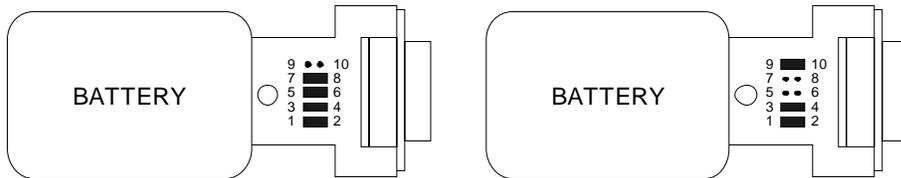
- Assign one of the BluePort XP radios as the SLAVE and set the switches as shown below. The settings are for 115K. Put Switch 4 in the ON position for 9600.

SLAVE:

- Switch 4 = OFF = 115K
- Switch 3 = OFF = Auto Master Off
- Switch 2 = ON = Auto Discover ON
- Switch 1 = OFF = Factory Defaults OFF

Set the internal jumpers as shown below. Slave devices connected to a PC are generally configured as DCE so the BluePort XP connected to your slave device should look like a PC or a DTE device. The drawings below show DTE jumper settings.

If you are not using flow control signals RTS and CTS, set the jumpers as shown in the drawing on the right. If you are not sure, use the drawing on the right.



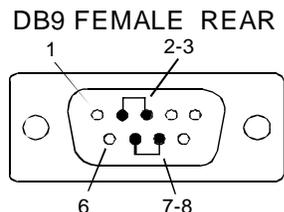
DTE Factory Default, RX=2, TX=3, RTS=7, CTS=8 **DTE 3-Wire (CTS tied to RTS)**

Connect the SLAVE unit to the slave device with a straight cable..

- Power up both devices.
- The MASTER finds and stores the SLAVE address and auto connects. The **GREEN** LED on both units will flash and within a short time should be on **solid**. The solid LED indicates the units are properly linked.
- Verify data flow by observing the **YELLOW** LED. Flashing indicates data flow, both transmit and receive. The above configuration is for 115K Baud. Both units should flash the Yellow LED as data is sent from one side to the other.

4.4.2 Link Test

Note: You can verify communications by connecting one BluePort XP to your PC and connecting a Loop-back adapter to the other BluePort XP. The BluePort XP not connected to the PC can be configured as DCE or DTE. The loop-back adapter will take any received characters and send them back. The loop-back adapter connects transmit and receive lines together and the RTS/CTS lines together. You can make an adapter by using a DB9 Female connector and adding a wire between pins 2 and 3. If you are using RTS and CTS signals, also add a wire from pin 7 to 8.

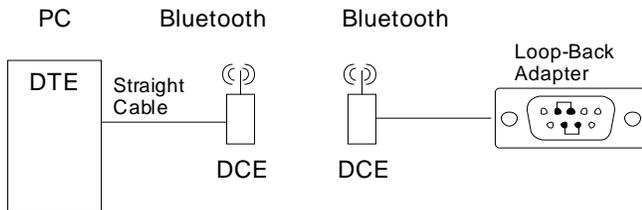


LOOP BACK ADAPTER

Use a program like Hyperterminal to connect to the serial port of one of the BluePort XP radios, then you will see a character displayed on the screen each time you send a character. See *Hyperterminal Setup* on page 4-12 for instructions.

Note: make sure Local Echo is turned OFF, otherwise you will get two characters. Also, turn OFF any Auto functions like Auto Baud.

First make sure the units are linked by observing the steady GREEN LED on both units. When you type a character on the PC side, the yellow LED on the BluePort XP attached to it will blink. If the other BluePort XP is configured properly, the yellow LED on it should also blink, indicating data is being received and transmitted. Typing a character in Hyperterminal will send the character out the PC serial port to the attached BluePort XP, through the radio link to the other BluePort XP, loop around from the receive line to the transmit line and come back to the PC.



4.4.3 Hyperterminal Setup

1. Start Hyperterminal and enter a name for the connection. When the **Connect To** dialog box appears, select a COM port (example COM2) from the **Connect Using** list box and click OK.
2. Ignore the COMx Properties for now and click OK. The status bar at the bottom of the screen may indicate Auto Detect. Click the **Disconnect** icon.
3. Click on the **Properties** icon, select the **Connect To** tab and click the **Configure** button below the selected COM port. Set to 9600, 8, None (parity), 1 None (Flow Control). Verify the settings and click OK.
4. Select the **Settings** tab. Change the Emulation from Auto detect to VT100. The status line at the bottom of the Hyperterminal window should show **VT100** and **9600 8-N-1**.
5. Click the **Call** icon to complete the setup.

4.5 Making a Connection

Blueport XP shows up under Service discovery as “BluePort-zpdq” where the zpdq is the last 2 bytes of the Bluetooth address. To connect to the BluePort XP, browse for services and you should see: “SPP on BluePort-zpdq”. Default baudrate is 115200, no parity, 8 bits, 1 stop. Blueport XP uses Serial Port Profile and can be connected to as a Virtual COM port on PCs, Palms, PocketPCs, or other clients.

NOTE: Only one client can connect to BluePort XP at a time, and there is a limit of 7 total devices in a Bluetooth Piconet network.

If authentication is not required, generally you can simply connect to the Blueport XP by clicking on the service shown by your client. If authentication is required, the default passkey of “1234”, or the passkey that has been configured should be entered.

4.6 Firmware Configuration

Parameters, such as the Bluetooth Name, Class of Device and Serial Port settings can be viewed and configured. This can be done locally through the serial port UART or from a remote Bluetooth RF link. To access configuration, the BluePort XP must be in command mode by issuing (\$\$\$). While in command mode BluePort XP will accept ASCII bytes as commands.

4.6.1 From Local Serial Port

Connect a cable from a PC or from an ASCII terminal to the BluePort XP. Communication settings of your program should match the stored settings. Once you change these parameters, they will be stored permanently.

Note: If the BluePort XP is jumpered as a DCE device, then use a straight thru cable. If jumpered as a DTE device, then use a cross-over or NULL Modem cable between the BluePort XP and your PC.

Default baudrate is 115200 (switch 4=OFF), no parity, 8 bits, 1 stop.

Local configuration works at any time the device does NOT have a Bluetooth connection, and also works under certain conditions when the device is connected. If the device is in configuration mode and a connection occurs, the device will exit configuration mode, and data will pass back and forth from the remote device.

- Run your favorite terminal emulator, HyperTerminal or other program.
- Cycle power to the BluePort XP.
- [Type \\$\\$\\$ on your screen \(3 dollar signs\)](#).
- You should see the characters **CMD** returned to you.

This will verify that your cable and settings are correct. Valid commands will return an AOK. Errors in format will return ERR, and unrecognized commands will return a ?. Type “h”<cr> to see a list of commands, and “d”<cr> to see a summary of current settings.

To exit command mode, type “---“<cr>. (three minus or dash signs).

4.6.2 Remote via Bluetooth

In some case it is very useful to be able to perform configuration remotely over a Bluetooth connection. The **BluePort XP** has this capability. To utilize it, connect to the device over Bluetooth and using a remote terminal emulator, perform the same steps as you would for local configuration. When finished configuring be sure to either reset the device or send the “---” command, which will exit configuration mode and allow data to pass normally.

NOTE: The BluePort XP firmware implements a configuration timer window, which defaults to 60 seconds after power up. The device will ignore configuration attempts after this timer expires, and data will flow back and forth in normal mode. The timer can be set to any value from 0 (disable remote configuration) to 0xFF hex, which allows continuous (no timeout) configuration.

WARNING: Configuration (local or remote) is NEVER enabled when the device is in auto-mode.

VALUE (decimal)	DESCRIPTION
0	No remote config, No local config when connected
1-252	Time in seconds from powerup to allow config
253	Continuous config LOCAL only
254	Continuous config, REMOTE only
255	Continuous config, both LOCAL and REMOTE

The unit must be in configuration mode to remotely configure it via Bluetooth.

- Set the Auto Master and Auto Switches to OFF.
- Set the Baud Rate Switch to 115K

or 9600 and make sure HyperTerminal is also set to the same baud rate.

- Set the Factory Defaults switch to ON and cycle the power.
- Toggle the Factory Default switch from ON to OFF 2 times.
- The Green LED should be blinking at 2 times per second.

Make a connection via Bluetooth. Type \$\$\$ on your screen (3 dollar signs). You should see CMD returned to you. This will verify that your cable and settings are correct. Valid commands will return an AOK. Errors in format will return ERR, and unrecognized commands will return a ?. Type “h”<cr> to see a list of commands, and “d”<cr> to see a summary of current settings.

To exit command mode, type “---”<cr>. (three minus signs).

4.6.3 Security Issues, Pin Codes and Link Keys

If A> Blueport, or B> the remote device has authentication enabled, the following process occurs: The first time a connection is made, a “passkey” is used. This is a series of numbers or characters, “1234” is the default for the Blueport. Once this is entered, the remote Bluetooth device and the Blueport compare their passkeys and if they match, a link key is generated, which is stored by the Blueport. Upon subsequent connections, the devices will first compare link keys and if they are correct, no pin code will have to be re-entered. If the remote device is a PC or PDA, a prompt is generally made to the user to enter this pincode. To remove the stored link key on the remote device, generally you “unpair” with the Blueport. To remove the link key on the Blueport, you can change the Pin Code. This will remove any previously stored link keys from the blueport, forcing a new Pin Code exchange process to occur upon subsequent connection attempts.

4.6.4 Modes of Operation

There are several modes of operation.

1. Manual Mode. In this mode, the Blueport makes connections when a Connect Command “C”, is received. This command can also contain the Bluetooth address of the remote device. If no device is specified, then the store remote address is used. The connection can be broken if the special break character or string is sent (use the SO command to set the break character) **This is a low speed connect mode.**
2. Trigger Mode. In this mode, the Blueport makes connections automatically when a character is received on the serial port. The connection will continue as long as characters are received on either end. There is a configurable timeout (which is set using the ST command) which will cause a disconnect after XX (from 1 to 254) seconds of inactivity. **This is a low speed connect mode.**
3. Auto Mode. In this mode, the Blueport makes connections automatically on powerup, and re-connects when connection is lost. This mode can also be enabled by setting Dip Switch #2. This is the high speed connect mode, and cannot be broken by software break characters.

Low Speed Connect Mode NOTE: in Manual and Trigger mode, the Blueport is making a LOW speed connection, that is, data is being processed by the Blueport before being sent over the air. Because the Blueport is looking for break or config character(s), the latency will increase and data rate will be decreased in these modes. Thus it is recommended that for data rates above 57.6K these modes not be used.

NOTE 1: You can enter command mode locally over the serial port at any time when not connected. Once a connection is made, you can only enter command mode if the config timer has not expired. To enable continuous configuration, set the config timer to 255. Also, if the device is in Auto Master mode3, you will NOT be able to enter command mode.

NOTE 2: You can only enter command mode remotely over Bluetooth if you have made a connection and sent the \$\$\$ within the “config timer” window after powerup. The default config timer expires 60 seconds after power up. Once the timer has expired, any data sent to the device will pass unmodified and unrecognized by the command interpreter. The timer can be modified by command.

4.6.5 Common Problems and Questions

Problem: My Bluetooth client can see the Blueport and its serial service, but I can't connect.

Solution: This is most likely caused by a security setting on your client. If a pincode is required, the default is "1234". Some clients have these settings off by default, others have them on. To check and disable security: From your PC desktop, click My Bluetooth Places, go to the Bluetooth Device configuration (or Advanced Configuration) drop down menu, click on the client applications tab, Select the Bluetooth serial port application name, and click on the properties button, if "secure connection", or "authentication", or "encryption" is checked, uncheck it.

Question: How do I change the clients COM port?

Answer: Widcomm stack, (and others) allows you to connect to BluePort using a "Virtual COM" port mapper. The software installs with a default COM port, usually COM3, COM4, or COM5. To change this setting: From your PC desktop, click My Bluetooth Places, go to the Bluetooth Device configuration (or Advanced Configuration) drop down menu, click on the client applications tab, Select the Bluetooth serial port application name, and click on the properties button, then you can change the com port.

Question: How do I connect to more than one BluePort from the same client at the same time?

Answer: Bluetooth allows 7 devices at a time in a piconet. Widcomm stack allows you to create multiple instances of serial port profile and connect to multiple Blueports at the same time. To do this: From your PC desktop, click My Bluetooth Places, goto the Bluetooth Device configuration (or Advanced Configuration) drop down menu, click on the client applications tab, Select the Bluetooth serial port application name, and click on the ADD COM port button, then you can add another Bluetooth serial port and assign it to another virtual com port (such as COM9).

Problem: Connections can be made but during data transfer, no characters flow, or bytes are dropped.

Solution: Check to see if your flow control signals are properly connected, and enabled in the serial software you are using. A common mistake is to connect during the boot config timer window, in this case, all characters will be ignored until a \$\$\$ is seen, and no characters are forwarded to the remote device. If remote configuration is enabled, the best way to ensure the device is not waiting for configuration is to issue "---<cr>" at the beginning of a connection and before any user data is sent.

Question: How do I use hardware flow control?

Answer: It is not enough to simply disable flow control in your communications software, the Blueport expects to use hardware flow control. Install the jumper on 9 and 10, or short pins 7 and 8 (RTS,CTS) of your cable to permanently enable the flow control.

5. BluePort XP Command Reference

5.1 Command Summary

SET COMMANDS are stored in flash and only take effect AFTER reboot

Example: SU,96 sets UART Baudrate to 9600
 SN,myname sets Bluetooth name to “myname”
 SA,1 enables secure authentication and encryption
 SP,secret sets security pincode to “secret”
 SF,1 restores all values to factory defaults

CMD	VALUE	TYPE	DEFAULT	DESCRIPTION
SA	0,1	dec	0	Enable Authentication
SE	0,1	dec	0	Enable encryption
SF	1	dec		Reset to Factory Defaults
SL	E,O,N	char	N	Parity, Even, Odd, or None
SM	0,1,2,3	dec	0	Mode (0=slav, 1=mstr, 2=trigr,3=auto mstr)
SN	string	1-16 char	Blueport-x	Bluetooth Name
SO	string	1-8 char	NOT SET	Status string or break character(s)
SP	string	1-16 char	1234	Security Pin Code
SR	string	12 chars	NOT SET	Remote Address (123456789ABCDEF)
ST	word	seconds	60	Config Timer(0=no config, 255=always on)
SU	string	2-4 char	115K	Baudrate:1200,2400,4800,9600,19.2,38.4, 57.6,115k,230k,460k)
SX	0,1	dec	0x1F00	Bonding (locks to a single remote address)
S7	0,1	dec	0	Enable 7 Data Bits

CMD	DESCRIPTION
D	Basic Settings
E	Extended Settings
G<X>	A single setting matching the commands above
GB	Bluetooth Address of this device
&	I/O Ports (shows the value of the switches)
V	Firmware Revision

CMD	VAL1	VAL2	DESCRIPTION
C	<addr>		Connect to Remote Address(in Master Mode only)
H			Help, Show list of commands
I	<time>	<COD>	Inquiry Scan, time= xx seconds ,optional COD filter
R	1		Reboot device immediate
U	<rate>	<E,O,N>	Temporary UART Change, immediate, not stored

5.2 Command Reference

The commands are all single or 2 character commands, generally comma delimited. Commands and hex input data can be upper or lower case. Text data, such as Bluetooth name, and pin code, are case sensitive. Commands fall into general categories:

Set COMMANDS - store information permanently and take effect after power cycle or software reset.

Display COMMANDS -retrieve the permanently stored information for display to the user.

Action COMMANDS – perform action such as inquiry, connect, etc.

Set COMMANDS

- SA,<1,0>** Authentication. 1 to enable, 0 to disable. This will force authentication when any remote device attempts to connect. Regardless of this setting, if a remote device forces authentication, this device will respond with the stored pin code. Once a remote device has exchanged pin codes with this device, a link key will be stored for future use. Up to 8 keys are automatically and permanently (in flash) stored in the device, in a first in, first out fashion.
- SE,<1,0>** Encryption 1 to enable, 0 to disable
- SF,1** Set Factory Defaults.
- SL,<E,O,N>** Parity. Can be Even, Odd or None. Only the first character is needed.
Example : “*SL,E*” sets the parity to Even
- S7,1** Enables 7 bit data mode
- SM,<3,2,1,0>** Mode (0 = slave, 1 = master,2=trigger, 3 = auto)
Example: “*SM,1*” sets the mode to Master
- SN,<name>** Friendly Name of the device, 16 characters maximum.
Example: “*SN,MyDevice*”
- SO,<text>** Extended Status String, 8 character maximum. Setting this string to from 1 to 8 characters will enable status messages to be sent to the local serial port. Two status messages are sent, when a Bluetooth connection is established, the string ”<text> CONNECT” will be sent. Upon a Disconnect, the string <text> DISCONNECT will be sent. This parameter is useful, for example, when connected to a printer. The printer can examine an escape sequence and if the <text> is set to ESC%, the printer can parse the ESC%CONNECT and ESC%DISCONNECT messages without interfering with normal print jobs. In Trigger or Master modes, the first character of this string is used as the BREAK connection character.
Example : “*SE,ESC%*”
- SP,<text>** Security Pin Code, 16 character maximum
Example : “*SP,secretcode*”
- SR,<adr>** Remote Address. 12 hex digits, (6 bytes) no spaces or chars between.
Example : “*SR,00A053112233*”
NOTE: 2 special characters can be used here:
“**SR,Z**” will erase any stored address.
“**SR,I**” will write the last address seen by using the Inquiry command.
This can be helpful when you just have 1 other device in range and want to quickly store and connect to it.
- ST,<num>** Config Timer, # of seconds (range= 0 to 255 decimal,, default = 60 decimal) to allow remote configuration over Bluetooth after power up in Slave Mode. In all Master

modes, the remote config timer is set to 0 (no remote configuration). In Trigger Master Mode, this Timer is used as an Idle timer to Break the connection after the timer expires with no characters being received.

Example : “*ST,0*” disables remote configuration

Example : “*ST,255*” enables remote configuration forever

SU,<rate> Baudrate, { 1200, 2400, 4800, 9600, 19.2, 38.4, 57.6, 115K, 230K, 460K, 921K }, only the first 2 characters are needed.
Example : “*SU,96*” sets the baudrate to 9600 baud.

SX,<1,0> Bonding enabled, creates a single stored connection pair with a remote device.

Display COMMANDS

D Display basic settings. Address, Name, UART Settings, Security, Pin code, Bonding, Remote Address. This command is an easy way to check the configuration.

E Display extended settings. Service Name, Service Class, Device Class, Config Timer, Link Timer, Status, Link Keys, DeBug Mode.

G<X> Display stored settings . These commands correspond to the SET commands above. (See below for exceptions)
Example: “GS” will return 1 or 0 depending on the value of security.
Example: “GP” will return the pin code.

GB Returns the Bluetooth Address of the device. Example: 00A0961D97D6.

G& Return a hex byte containing the value of the PIO Pins

V Return the software release version.
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Action COMMANDS

\$\$\$ Enter command mode. Characters are PASSED until this exact sequence is seen. If any bytes are seen before these chars, or after these chars, in a 1 second window, command mode will not be entered and these bytes will be passed on to other side.

--- Exit command mode. “END” will be displayed. If connected over BT, data will now pass in both directions.

C{,<address>} connect. The device will attempt to connect to the remote stored BT address, or an optional address can be entered directly.

I<,time>,<cod> performs an inquiry scan. Default time is 10 seconds, maximum is 48. <cod> is optional class of device, 0 or no entry looks for all device classes. A maximum of 9 devices will be returned. As devices are found, they are displayed in the format below:

<bt address>, <bt name>, <cod>
00A053000123,MySerialPort,72010C

- H** Will print out a list of **Help** commands and their basic syntax.
- R,1** Forces a complete reboot of the device (similar to a power cycle)
- & -** Returns the value of the switches on BluePort XP, or value of PIO3,4,6,7 on other modules.
- U,<rate>,<E,O,N>** Temporary UART Change, will change the serial parameters immediately, but not store them. Command will return “AOK” at current settings, then switch to new.
Example: “U,9600,E” Sets baudrate to 9600, parity even.

5.3 Factory Default Power up Settings

- Bluetooth Service Profile = Serial Port Profile (SPP)
- Mode = 0 Slave
- Baud Rate = 115200bps, Parity=None, Data bits = 8 bits(fixed), Stop bits 1 (fixed).
- Power Mode = Auto low power discoverable mode.
- **Name of Device (local name) = BluePort XP-XXXX last 2 bytes of BT address**
- Service Name = SPP
- Service Class=0000 (undefined service type)
- Major & Minor Class Of Device (COD) = 0x1F00 (unknown device type)
- Authentication Disabled
- Encryption disabled
- Discovery Enabled (0x0200 = window, fixed interval of 0x800= 1.28 Seconds)
- Connection Enabled (0x0200 = window, fixed interval of 0x800= 1.28 Seconds)
- Bonding Disabled (0)
- Config Timer=60 seconds
- SNIFF mode disabled
- Default PIN = “1234”

Note: Switch 1, Set ON at power up time and then toggled 3 times will change all settings above back to their factory values (except the Device name). Device will reboot immediately upon detection of this mode.