

## BlueWAVE Serial Terminal

Bluetooth™ Serial Terminal with SMD Antenna

Part Number: BW\_ST\_C1\_IA



### Overview

The BlueWAVE PCB Serial Terminal provides a fully compliant wireless Bluetooth™ Class 1 Master and Slave function via a simple UART or RS232 interface.

BlueWAVE PCB Serial Terminal is aimed at OEM's and systems integrators planning to deploy a point-to-point or point-to-multipoint Bluetooth™ solution into their product range. By choosing the BlueWAVE PCB Serial Terminal, we offer the opportunity to remove R&D costs, reduce time to market and eliminate development risk.

The BlueWAVE PCB Serial Terminal will provide instant wireless connectivity to any device supporting either a UART or RS232 interface. The BlueWAVE PCB Serial is compatible with all other device supporting Bluetooth™ SPP such as iPAQ™, Palm™, Laptops with integrated Bluetooth™, USB adaptors and cell phones etc.

### Bluetooth™ Serial Port Profile

BlueWAVE Serial Terminal instantly provides either a Bluetooth™ slave or master connection fully supporting the Serial Port Profile

### Features

- Fully Bluetooth™ Class 1 v1.1 SPP compatible
- Wireless range of over 100m (330ft)
- Integrates with RS232 or UART systems.
- Small footprint
- Platform independent
- Supports baud rates from 2400 – 115200 baud
- Configurable Digital I/O
- Various low power sleep modes
- SMA Antenna connection for direct antenna connection or coax

### Important Note for existing customers

The BlueWAVE Terminal is a direct replacement for both the BlueWAVE OEM DCE and the BlueWAVE OEM DTE product. No design change is required.



### How it works

The BlueWAVE PCB Serial Terminal encapsulates all of the Bluetooth™ protocols on a single chip, providing a simple serial interface to the host, therefore removing any need for software drivers or experience in developing wireless technology

### General Specification

Supply Voltage (VCC)	3.5V – 16V DC
Carrier Frequency	2400MHz to 2483.5MHz (USA, Europe)
Modulation Method	GFSK, 1Mbps, 0.5BT Gaussian
Transmission Power	Class 1 (max 20dBm)
Hopping	1600 hops/sec, 1MHz channel
Receiving Signal Range	-84 to -20dBm
Receiver IF Frequency	1.5MHz centre frequency
Output Interface	UART (3.3v), EIA 232 (5V)
Operating Temperature	-20 ~ 75 degrees
Storage Temperature	-40 ~ 85 degrees
Humidity	95% non-condensing
Compliant	Bluetooth™ Specification v1.1
Baud Rate	1200 - 115200baud
Operating Range	100m (328 ft)
Dimensions	40 x 30 x 5 (mm)
Antenna	Internal SMD GigaAnt Rufa Ceramic Antenna

### Power Consumption Specifications (Class 1 figures)

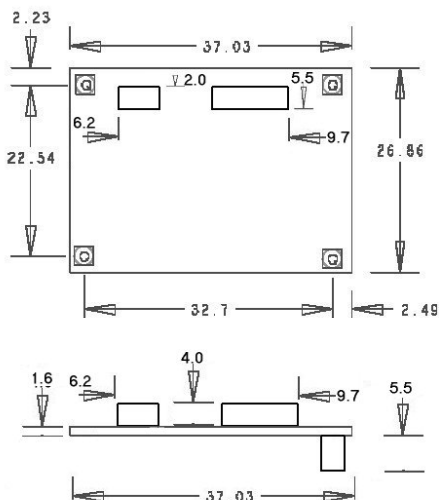
Average Current Consumption at 7.5V		
Temperature = 20 Degrees Centigrade		
Mode	Avg	Unit
Standby – idle	4	mA
Discovery	10	mA
Connected	37	mA
Sleep (AT+BWZ)	2.5	mA

### Connector A – Interface Connector

(12 way Dual row 0.05" micro header- FTSH series)

NO	PIN NAME
1	VCC (3.5v-16V DC)
2	DIO A
3	RS232 RTS (out)
4	RS232 CTS (in)
5	RS232 RxD
6	RS232 TxD
7	UART RxD
8	UART TxD
9	UART RTS (out)
10	UART CTS (in)
11	DIO B
12	GND (0v)

### Mechanical Drawing



### Serial Interface Configuration Commands (Settings are persistent through power cycles)

Command	Function
ATE1	Turn local echo on
ATE0	Turn local echo off
AT+BWB=n	Set baud rate to 1200 – 115200 baud
AT+BWD=n	Set Data Bits to 7 or 8
AT+BWP=n	Set Parity to None, Odd or Even
AT+BWS=n	Set Stop Bits to 1 or 2

### Information Commands

Command	Function
ATI3	Display the BlueWAVE Model
ATI6	Display the firmware version
ATI8	Display the date of software build
ATI9	Display the country of manufacture

### Bluetooth™ Common Commands (Master/Slave and Wireless Cable modes)

Command	Function
+++	Three '+' characters separated by 100ms or more. Enter COMMAND mode and exit DATA mode
AT+BWE	Exit COMMAND mode – return to DATA mode
ATI0	Display the current Bluetooth connection status
AT+BWX	Disconnect. The current Bluetooth™ connection will be disconnected
AT+BWN=nnnn	Set Bluetooth™ PIN to nnnn.
AT+BWN=0	Turn PIN authentication off
AT+BWN=?	Display the current PIN
AT+BWM=xxxx	Set the Bluetooth™ unit 'friendly name'.
AT+BWM=?	Display the current 'friendly name'.
AT+BWA=?	Return the Bluetooth address of this device.
AT+BWC=?	Return the address of the remote device that this unit is connected to.
AT+BWZ	Allow the unit to go into sleep mode.
AT+RESET	Reset the unit. This will reboot the device and return to DATA mode.

### Bluetooth™ Slave Mode Commands

AT+BWL[=nn]	Listen for an incoming connection. The optional value indicates the timeout for the listen. <b>Unit is present to listen.</b>
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### Bluetooth™ Master Mode Commands

AT+BWI[=nn]	Perform a Bluetooth inquiry. The optional value represents the timeout for the inquiry in seconds.
AT+BWC=11:22:33:44:55:66[,nnnn]	Connect to remote slave device with optional PIN code. If PIN code not specified then no authentication is used. (Master mode)
AT+BWPT=nn	Set the timeout for a pair operation. The value represents the timeout for the pairing in seconds.
AT+BWCT=nn	Set the timeout for a connect operation. The value represents the timeout for connecting in seconds.

### Bluetooth™ Wireless Cable Commands

AT+BWAC=11:22:33:44:55:66[,nnnn]	Autoconnect to remote slave device with optional PIN code. If PIN code not specified then no authentication is used. The unit will retry connections when the connection is dropped and at power up. (WC master mode).
AT+BWAL[=nn]	Autolisten. Listen for an incoming connection. The unit will resume listening when the connection is dropped and at power up. (WC slave mode). The optional value indicates the timeout for the listen.

### Digital IO Control

Command	Function
AT+BWDIO=n	0 = (default) No function 1 = Connect and reset 2 = Pass through IO over the air. 3 = Configurable outputs
AT+BWDIOA=n	0 = Set DIOA to high (1) or low (0). 1 = Set Low (0). Only valid if BWIO=3
AT+BWDIOB=n	0 = Set DIOB to high (1) 1 = Set low (0). Only valid if BWIO=3



### How do I evaluate this module?

Wireless Futures offer a BlueWAVE Development kit for this module.



### What does the Development kit contain?

The BlueWAVE™ Development kit is a full resource that allows an engineer to evaluate the benefits and features of the BlueWAVE Bluetooth™ technology, quickly, simply and safe in the knowledge that it is backed by world-class support from Wireless Futures.

The aim of the BlueWAVE Development kit is to provide the engineer with a one-stop development platform required to deploy Bluetooth™ UART or RS232 technology. Each kit contains the following:-

- BlueWAVE Serial Terminal Module
- Ribbon Cable and FTSH Connector assembly
- 9 Way D type connector
- Technical Integration Guide
- Technical Support from Wireless Futures



### Why do I need an Development kit ?

- The easiest route to Bluetooth™ UART/RS232 connectivity
- Benefit from complete technical support from the experts throughout the development.
- Flexible design and easy to integrate to existing hardware/software.
- Remove all risk and technical uncertainty.
- Designed and built by one of the leading Wireless Technology organisations

Over 350 satisfied OEM customers adopting BlueWAVE across the world.



### Customer Promise

We are so confident that you will be delighted with our development kits and technical support that we will offer a **money back guarantee** should you not be happy with the product.



## FAQs

### Q. Does the BlueWAVE Serial Terminal conform to any Bluetooth™ profiles?

A. Yes, the BlueWAVE Serial Terminal conforms to the serial port profile.

### Q. What is the actual range of the device?

A. The device uses Bluetooth class 1. The range will depend on the other Bluetooth™ device that it is connected to. It will also depend on the physical environment ie) obstructive walls and the type of walls the signal will need to go through and on the antenna that is fitted. Assuming it is connected to a class 1 device then the range should be between 50 and 250 meters.

### Q. How do I connect the BlueWAVE Serial Terminal to another Bluetooth™ device such as an PC/PDA?

A. The BlueWAVE Serial Terminal will connect to any Bluetooth™ enabled device supporting SPP. This can be in MASTER mode, where the terminal initiates the connection, or SLAVE mode, where the remote device initiates the connection. The method of connection will vary depending on the remote device. However, generally the other device will perform a four-stage process.

#### Slave Mode

- 1) The remote device will “discover” other Bluetooth devices. The BlueWAVE device will appear as “BlueWAVE”.
- 2) The remote device will need to pair with the BlueWAVE. The pin number is then entered.
- 3) The remote device will connect to the serial port service of the BlueWAVE Serial Terminal.
- 4) A virtual communications port will then generally be created and the application can then talk over this port to the BlueWAVE Serial Terminal.

#### Master Mode

- 1) The BlueWAVE terminal will “discover” other Bluetooth devices.
- 2) The BlueWAVE terminal will need to pair with the other device with the pin number.
- 3) The BlueWAVE terminal will connect to the serial port service of the other device.
- 4) The BlueWAVE terminal will pass through all data to/from the other device.

### Q. How does the design license work?

A. We are able to license the software and board design in order that it can be fully integrated into the customer’s main board. This can reduce manufacturing costs dramatically for the customer for larger quantities. Please contact our sales office for more information.

### Q. How can I order in quantity?

A. Wireless Futures are able to handle orders of any quantity. Please contact the sales office to discuss your requirements and we will consider the best ordering volume and frequency



## About Wireless Futures

Wireless Futures design, manufacture and integrate innovative, practical and easy to implement wireless solutions. These solutions provide our customers a fast track to either incorporate wireless technology within their current products, or to simply design a new product range with built-in wireless technology.

By leveraging our expertise in wireless technologies we are able to offer products and services to our customers to enable cost effective, rapid time to market wireless solutions.



Wireless Futures have over 350 OEM customers across the world from the UK, Europe, North America and the Far East.

The BlueWAVE solution has been successfully deployed across the globe in the following vertical markets:-

- Medical
- Telco
- Defence
- Automotive
- Utility
- Marine
- Many more...

### More Information...

For more information on our products and development kits, please use the following contacts

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