



Wireless Cables Inc.

1414 Soquel Avenue, Suite 212
Santa Cruz, CA 95062

Phone: (408) 850-1884

Fax: (408) 228-0687

Email: sales@aircable.net

Bluetooth Module
AIRcable SMD ACB3C2
USER GUIDE
V1.1

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.



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This device is intended only for OEM integrators under the following conditions:

1) The transmitter module may not be co-located with any other transmitter or antenna. As long as condition above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

The final end product must be labeled in a visible area with the following: "Contains FCC ID: SQCAB3C2".

Manual Information That Must be Included

The users manual for OEM integrators must include the following information in a prominent location " **IMPORTANT NOTE:** To comply with FCC RF exposure compliance requirements, the antenna used not be co-located or operating in conjunction with any other antenna or transmitter.

Example Sticker:

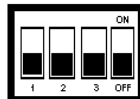
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Model: AIRcable Serial3™

This device complies with part 15
of the FCC Rules and is Bluetooth
certified. CONTAINS FCC ID: SQCAB3C2

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MADE IN CALIFORNIA



Front side switch settings:

UP = 1, DOWN = 0

Baudrate switches 1-3

010: 4800 110: 9600

001: 19.2k 000: 115.2k

101: 38.4k 011: 57.6k

111: 115.2k

Hardware handshake: sw 4



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Description

Wireless Cables Inc. provides various Bluetooth products. They are suitable for customers to exploit them to implement Bluetooth functionality into various electronic devices. The features of Bluetooth module list as below:

Features

Model Name AC3B2
Standard Bluetooth v1.2
Frequency Band 2.4~2.4835GHz unlicensed ISM band
Spread Spectrum FHSS (Frequency Hopping Spread Spectrum)
RF Output Power Class 2 (2.5 dBm)
Integrated Ceramic Antenna
DC power 5V or Lithium battery
I/O Interface
USB Compliant USB V1.2
Overair Baud rate 320kBit/s,
Beeper output
10 PIO, 2 AIO, asynchronous and synchronous serial
Dimension 31 x 14.5 mm



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AIRcable SMD AB3C2V3 Datasheet

The AIRcable SMD

**The Wireless Programmable Micro-Controller (W-PLC)
with the Powerful AIRcable Operating System**

Powerful wireless functions, high security

- Simultaneous master and slave connections
- Allow and control incoming Bluetooth connections
- Make outgoing connections to SPP, FTP and OBEX
- Disable and enable Bluetooth profiles SPP, FTP and OBEX
- Mesh network capable

Wireless Programmable Micro-Controller (W-PLC)

- Runs applications in BASIC on the AIRcable OS
- Easy, wireless software development and deployment
- Data logging functions, up to 48kByte
- Analog, digital, 2-wire and serial sensor interfaces

Single Processor Solution

- Very low hardware cost
- Ultra low power consumption (<50uA with OS running)
- Ideal solution for wireless sensors, smart dust, motes

The **AIRcable SMD** is an intelligent, autonomous, wireless micro-controller with Bluetooth communication capability for applications

running on its AIRcable Operating System. It conforms to Bluetooth V2.0+EDR and supports simultaneous master and slave connection modes, 2 serial port profiles, file transfer client and server, OBEX client and server and an audio channel.

The **AIRcable SMD** can be programmed and configured wirelessly via easy text file transfer.

The **AIRcable SMD** runs applications in BASIC that can be used in products for wireless cable replacement, mesh sensor and control network applications (motes), for reading sensors, logging data, controlling equipment and communicating wirelessly to other devices such as AIRcable devices, cell phones, PDAs, laptops and PCs based on the Bluetooth standard.

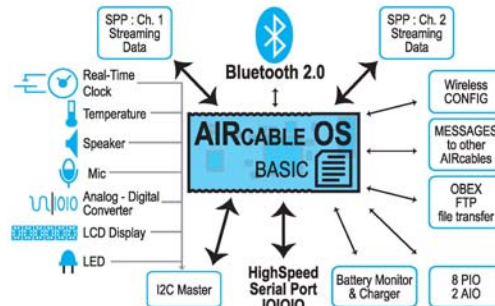
Please visit our web site for details about writing applications for the **AIRcable SMD**. <http://www.aircable.net/smd>



**Actual
Size**

31mm x 14.5mm x 3.5mm

The AIRcable SMD



Benefits of the AIRcable SMD

- Powerful wireless functions, high security
- Single processor solution (one chip plus memory)
- connects to various sensors
- Very low hardware costs
- Ideal solution for "smart dust" or "motes"
- Compatible with all Bluetooth devices
- Easy software development and deployment
- Customizable (with or without file system, max BASIC code size, built-in functions etc.)



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Bluetooth is a registered trademark of the Bluetooth SIG
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Software Specification

BASIC Interpreter	Line numbers: 1-1023 Line length: 32 characters Loop nesting: 6 Subroutines: 8 levels Expressions: -32768 to 32767, 16-bit Variables: 'Z', 'A' - 'Y', variable 'Z' used for debugging String variable: \$0 volatile 80 bytes long String variables: \$1-\$1023, 32 byte length Character size: 8 bit Expression parser recursive, maximum of 5 levels File system: BASIC and config file independent PIN code limit: 15 characters Programmable from other AirNote devices Program load from standard file system	Profiles master and slave mode simultaneously Two SPP profiles for streaming data at the same time OBEX/FTP for file transfer of BASIC and config file FTP server profile OBEX vNote item transfer for messages OBEX vCard business card exchange OBEX server and OBEX client profile up to 4 multiple connections at the same time Security control, pairing and un-pairing functions
Event Handling	PIN code request Incoming SPP connection Outgoing SPP connection success Sensor readings (connection quality, temperature, analog input) Incoming vNote through OBEX Inquiry results SPP control indicator (DTR signal) PIO change event Timer messages	File system access to application BASIC program read/write configuration file wireless file transfer (OBEX), up/downloadable
Interrupt Routines	2 levels: high priority interrupt: stops BASIC program execution low priority: schedules execution	Performance max 250 lines per second standard: 10 lps scheduler resolution: 1s max 160kBit/s streaming data recommended max average: 50kBit/s fastest connect time < 2s FTP file system: 2kpbs
Bluetooth	Bluetooth 2.0 compatible with 802.11b tolerance EDR supported where available	Certifications Bluetooth certified (BQB) FCC and IC module certification CE certified RoHS compliant
Port Access	Parallel IO ports, 8 ports TTL level, 5V tolerant Security overwrite port 2 analog input port (8 bit resolution) UART configurable 1200 to 1382400 baud, parity and stop bits I2C master interface	Radio Device name configurable Bluetooth class configurable Max and default transmit power configurable Scan modes configurable to as low as 100uA power consumption Sniff mode configurable (soon)
Built-in Functions	Powerful high level Bluetooth functions, slave connect, master, send biz card, hardware control, pio input/output, uart, baud rate, sensor, date string operations, hex and ascii conversion, compare, length input and output, on 2 SPP, 1 UART, files and virtual string data logging	Firmware 65000 words code size RTOS for baseband radio
		Customizations additional embedded functions audio profiles (audio gateway, headset, handsfree) networking profiles (TCP) web server LCD 6 digit direct drive or graphic

Hardware Specification

Processor	BlueCore 3 with 64MBit internal flash, 512k EEPROM	Power consumption	50uA sleep, 8mA with connection, 25mA peak, max range peaks up to 70mA
Size	14.5 mm x 31 mm with antenna	Input and Output	8 digital input and output lines (4V TTL, 5V tolerant) 2 analog input lines (0-1.8V) 2 LED current sinks, 4.2V tolerant
Pins	2 rows of 18 pins spaced 1.27 mm SMD pad mounted	Asynchronous serial	1200-1382400 bps, 8 bit, none-odd-even parity, 1 or 2 stop bits
Uart	1200 to 1382400 baud, 3.3V TTL level, 5V tolerant	Radio	raw output power: 5.5dBm input sensitivity: -86dBm range 20-30m
Internal ceramic antenna	5.5dBm transmit power	Sensor Interfaces (optional)	real time clock DS1372 temperature sensor TC54 16bit adc ADS1112 LCD controller PCF8562 other sensors available upon request
Power Supply	5V regulated stand-alone Lithium rechargeable battery, 4.2V, 100-500mAh 3V primary cells	Certifications	Bluetooth certified (BQB) Bluetooth 2.0 Standard (802.11b tolerant) FCC module certification CE certification (pdf)
Battery Charger	90mA Lithium charger requires current protected Lithium rechargeable batteries		



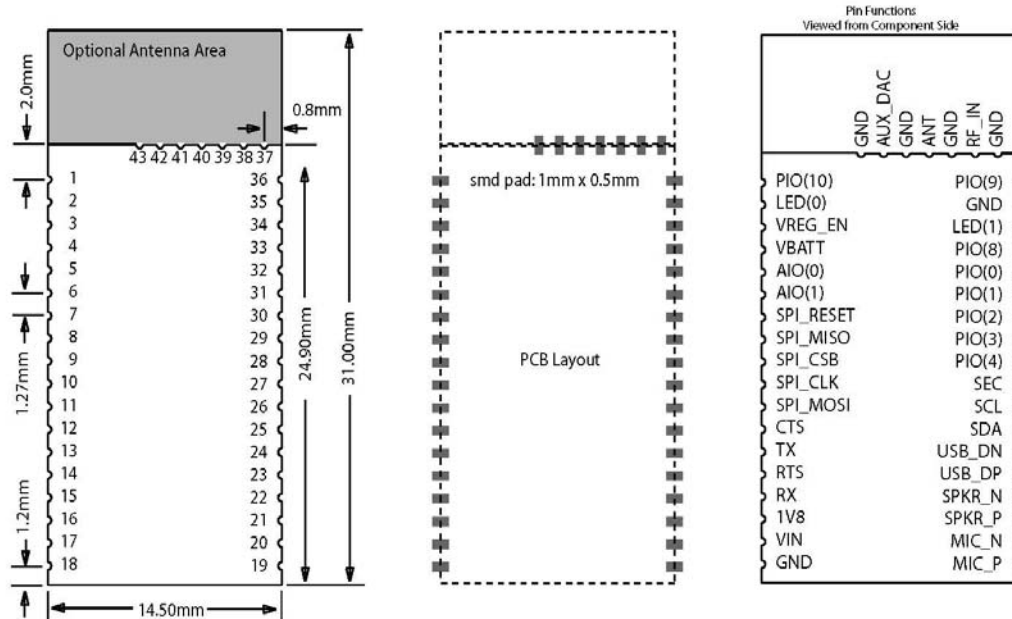
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Terminal Description



1	PIO(10)	I/O	3.3V TTL	general purpose input or output pin defined by the BASIC program
2	LED(0)	O	Supply	Charger LED, current sink, 4.2V tolerant
3	VREG_EN	I	Supply	>2.2V enables the voltage regulator
4	VBATT	I/O	Supply	Lilon or LiPol battery, positive terminal
5	AIO(0)	I	Analog	Analog input 0-1.8V
6	AIO(1)	I	Analog	Analog input 0-1.8V
7	RESET	I	3.3V TTL	Active high reset
8	MISO	I	3.3V TTL	SPI firmware programming
9	CSB	I	3.3V TTL	SPI firmware programming
10	CLK	I	3.3V TTL	SPI firmware programming
11	MOSI	O	3.3V TTL	SPI firmware programming
12	CTS	I	3.3V TTL	Uart clear to send
13	TX	O	3.3V TTL	Uart async serial output
14	RTS	O	3.3V TTL	Uart request to send
15	RX	I	3.3V TTL	Uart async serial input
16	1V8	O	Supply	1.8V power supply output
17	VIN	I	Supply	Battery charger input, 4.5V – 5.75V
18	GND		Supply	Ground



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Terminal Description (cont.)

19	MIC_P	I	Analog	Microphone input plus
20	MIC_N	I	Analog	Microphone input minus
21	SPKR_P	O	Analog	Speaker output plus
22	SPKR_N	O	Analog	Speaker output minus
23	USB_DP	I/O	3.3V TTL	USB data plus
24	USB_DN	I/O	3.3V TTL	USB data minus
25	SDA	I/O	3.3V TTL	I2C master data
26	SCL	O	3.3V TTL	I2C master clock
27	SEC	I	3.3V TTL	Security overwrite
28	PIO(4)	I/O	3.3V TTL	general purpose input or output pin defined by the BASIC program
29	PIO(3)	I/O	3.3V TTL	general purpose input or output pin defined by the BASIC program
30	PIO(2)	I/O	3.3V TTL	general purpose input or output pin defined by the BASIC program
31	PIO(1)	I/O	3.3V TTL	general purpose input or output pin defined by the BASIC program
32	PIO(0)	I/O	3.3V TTL	general purpose input or output pin defined by the BASIC program
33	PIO(8)	I/O	3.3V TTL	general purpose input or output pin defined by the BASIC program
34	LED(1)	O	Supply	LED output, current sink, 4.2V tolerant
35	GND		Supply	Ground
36	PIO(9)	I/O	3.3V TTL	general purpose input or output pin defined by the BASIC program

RF Port Description

For versions of the AIRcable SMD without antenna, only use the antenna port with a 50 Ohm trace to an external antenna. The other ports are designed for use with an external power amplifier. Contact Wireless Cables Inc. for these version.

37	GND		Supply	Ground
38	RF_IN	I	Analog	RF input, for class 1
39	GND		Supply	Ground
40	ANT	I/O	Analog	RF antenna connector
41	GND		Supply	Ground
42	AUX_DAC	O	Analog	PA gain control, for class 1
43	GND		Supply	Ground



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