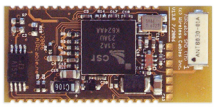
The AIRcable SMD

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



Actual Size

31mm x 14.5mm x 3.5mm

The AIRcable SMD

Powerful wireless functions, high secutiry

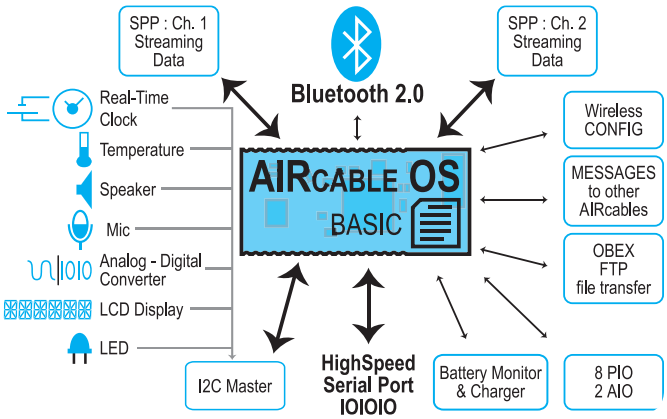
- Simultaneous master and slave connections
- Allow and control incoming Bluetooth connections
- Make outgoing connections to SPP, FTP and OBEX
- Disable and enable Bluetooth profiles SPP, FTP and OBEX
- Mesh network capable

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**

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.)

AIR CABLE
Wireless Cables Inc.
1414 Soquel Avenue, Suite 212, Santa Cruz, CA 95062
T 408.850.1884 ~ F 408.228.0687
sales@aircable.net ~ www.aircable.net

Software Specification

BASIC Interpreter	Line numbers: 1-2047 Line length: 32 characters Loop nesting: 6 Subroutines: 8 levels Expressions: -32768 to 32767, 16-bit Variables: 25, 'A' - 'Y', variable 'Z' used for debugging String variable: $0 volatile 80 bytes long String variables: $1-$2047, 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 AIRmote devices Programm load from standard file system
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
Interrupt Routines	2 levels: high priority interrupt: stops BASIC program execution low priority: schedules execution
Bluetooth	Bluetooth 2.0 compatible with 802.11b tolerance EDR supported where available
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
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

Profiles	master and slave mode simultanously 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
File system	access to application BASIC program read/write configuration file wireless file transfer (OBEX), up/downloadable
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: 1600 bps,
Certifications	Bluetooth certified (BQB) FCC and IC module certification CE certified RoHS compliant
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)
Firmware	48000 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 or 4 with 6MBit internal flash, 512k EEPROM
Size	14.5 mm x 31 mm with antenna
Pins	2 rows of 18 pins spaced 1.27 mm SMD pad mounted
Uart	1200 to 1382400 baud, 3.3V TTL level, 5V tolerant
Internal ceramic antenna	5.5dBm transmit power
Power Supply	5V regulated stand-alone Lithium rechargeable battery, 4.2V, 100-500mAH 3V primary cells
Battery Charger	90-100mA Lithium charger requires current protected Lithium rechargeable batteries

Power consumption	50uA sleep, 11mA with connection, 25mA peek, max range peeks up to 70mA
Input and Output	8 digital input and output lines (3.3V TTL, 5V tolerant) 2 analog input lines (0-1.8V) 2 LED current sinks, 4.2V tolerant
Asynchronous serial	1200-1382400 bps, 8 bit, none-odd-even parity, 1 or 2 stop bits
Radio	raw output power: 5.5dBm input sensitivity: -86dBm range 20m
Sensor Interfaces (optional)	real time clock DS1372 temperature sensor TC54 16bit adc ADS1112 LCD controller PCF8562 other sensors available upon request
Certifications	Bluetooth certified (BQB) Bluetooth 2.0 Standard (802.11b tolerant) FCC module certification CE certification (pdf)

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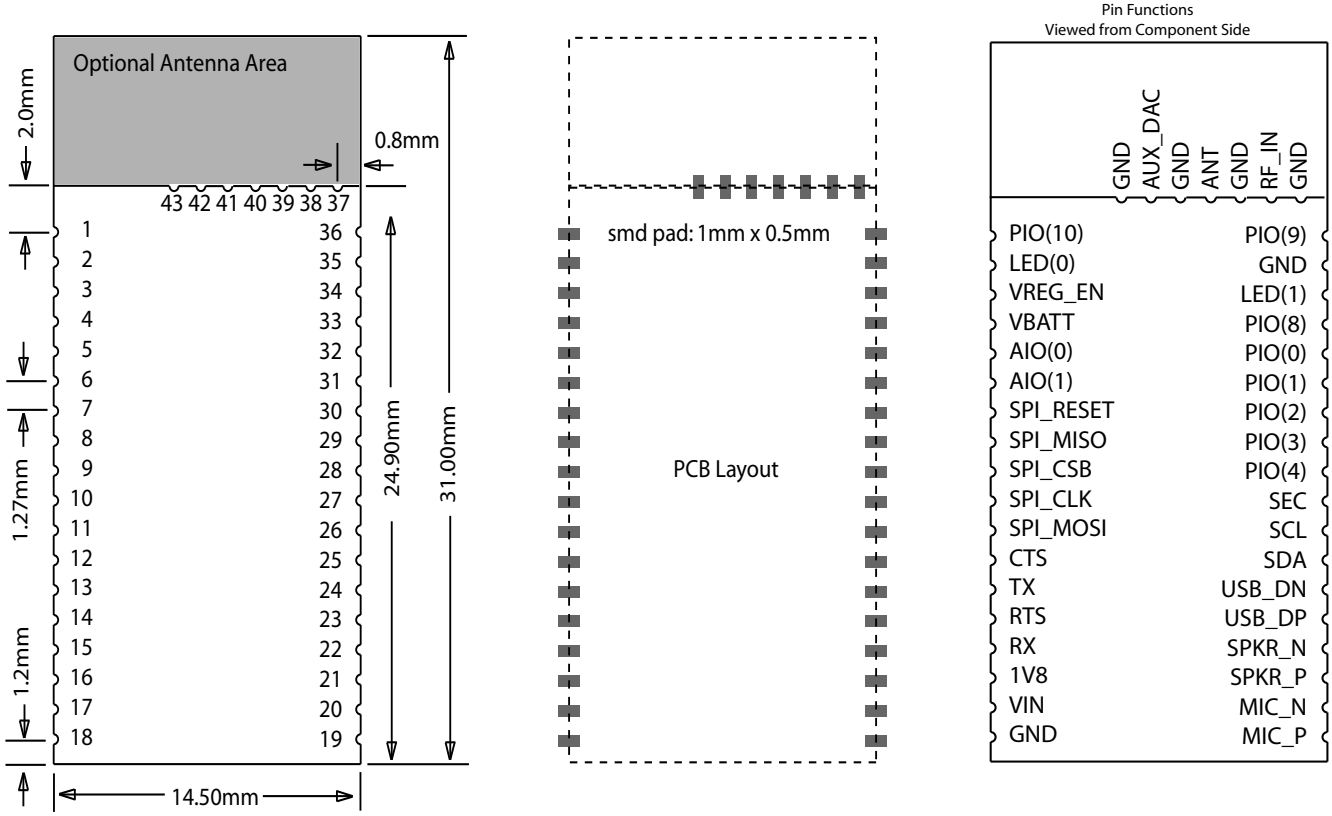
Terminal Description



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	LiIon 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