



USER MANUAL

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Thanks, from AIRcable!

Thank you for purchasing an AIRcable. Your satisfaction is very important to us, so please read this guide before installing your AIRcable modules. We'd appreciate your feedback.

For more information and instructions or for support please visit our website at <http://www.aircable.net/support.html>

Introduction

The AIRcable product is an intelligent Bluetooth adapter for Motorola cell phones that allows automatic connections to other Bluetooth devices as well as supports a user accessible command line interface for configuration. It runs firmware--based onboard Bluetooth connection software and doesn't need to update the phone's firmware. Because the AIRcable is designed to replace physical connections, you can run the same software that would support a physical cable. This AIRcable product is Bluetooth 1.1 certified and is compatible with all other Bluetooth compatible devices.

The AIRcable for Motorola comes pre configured for incoming connections (dial-up). Authentication is enabled which means the user has to type in a PIN code. The PIN code is the 5 digits at the end of the name "AIRcable 12345" when discovering the name of the Bluetooth device.

The AIRcable for Motorola has a connection LED (blue) that shows the status of a connection. The connection LED is on and not blinking (solid) if a connection to another device is active. Otherwise it is blinking or it is off.

The AIRcable Serial supports all modem control signals, including DTR, DSR, RI and DCD. Data flow control is implemented using RTS/CTS handshake. Data mode by default is 115200 baud, 8 bit, no parity, one stop bit.

Configure

When you receive an AIRcable for Motorola, the device is pre configured to run in "service-slave" mode allowing incoming connections. The other modes the AIRcable can run are Cable-Mode, Service-Master mode, and Manual mode. These modes can be used to make connections to various Bluetooth enabled products, such as bar code scanners, access points for network connections, and to use the iDEN phones as a Bluetooth GPS receiver.

All these advanced modes require Java software on the phone to configure the AIRcable and to process data from the connected device.

Advanced Modes

The AIRcable for Motorola can be set into various advanced modes. Use the command line interface available through a Java program running on the phone to change into these modes: Service-Slave mode, Service-Master mode, and Manual mode.

Using the Command Line

The command line interface is available through the serial interface before the AIRcable device is connected. This means that the connection LED must be either blinking or off.

This equipment is also ETS 300 328, ETS 300 826 and C-TICK compliant. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense.

This equipment generates and radiates radio-frequency energy. To comply with FCC RF exposure compliance requirements, the following antenna installation and device operating configurations must be satisfied: (1) Users are not permitted to make changes or modify the system in any way, and (2) connecting external antennas to the card is prohibited. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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 may try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna of the radio or television.
- Increase the distance separating the equipment and the receiver.
- Connect the equipment to an outlet on a different branch circuit than that of the receiver.
- Consult the dealer or an experienced radio/TV technician for help.

The user may find the following booklet helpful: How to Identify and Resolve Radio-TV Interference Problems. This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402

Warranty

Warranty and Limitation of the Use of AIRcable Products
The AIRcable products may be subject to restrictions for import and usage, dependent on the country of use and the regulatory requirements in force.

Any AIRcable product that fails due to defects in workmanship and/or materials will be repaired or replaced to the original purchaser at no charge to the customer, in a reasonable amount of time, provided the recommended installation procedures have been followed- if returned freight prepaid to Wireless Cables Inc. head-quarter.

Damages caused by abuse, misuse, negligence (I.E. hitting objects, improper installation, unauthorized opening, improper power source, power surge, etc) are considered to be avoidable circumstances, or if damaged was caused by lightning, wind, fire, flood, insects, or other natural agent, are not covered by this warranty.

This 1 year warranty gives you specific legal rights, and you may also have other rights which may vary from state to state. This warranty is in lieu of all other warranties, expressed or implied.

The Bluetooth components we use and software are fully qualified and compliant to the Bluetooth Core Specification. AIRcable products have been tested to meet the R&TTE Directive for EU and are CE marked. AIRcable products are approved as a radio frequency device under part 15 of the FCC rules. Restrictions of Use AIRcable products

- The endpoint modules should only be powered by the power supplies included.
- The endpoint modules should be powered down when not in use.
- The endpoint modules should not be opened and modified.
- The system generates electromagnetic interference. If interference is suffered by other electronic equipment, it should be relocated out of the range of radio transmissions.
- Wireless Cables Inc's AIRcable products are not authorized for use in life-support or safety-critical applications.

one at a time. The advantage is that it does not require pairing or bonding with the other end. It is a truly automatic-connect to many other Bluetooth devices. Certainly you can also configure automatic pairing with a PIN number of your choice.

For example, it can connect to Bluetooth bar code scanners without pairing it to a particular one. In this case the Service-Master AIRcable would be configured with the PIN number of the scanner (often "0000") with authentication enabled and it will automatically connect to the first scanner it finds. This is very helpful because you can change the scanner without changing the configuration.

The Bluetooth Service-Master Mode can also be used to connect to a number of AIRcable devices in Service Mode. This is designed for field usage where the AIRcable Service modules are stationary and the AIRcable Master-Service is mobile going from one Service module to another. Again this is an example, adjust to your needs.

- To configure the PIN number that corresponds to the devices you want to connect to, either a fixed 2-5 digit number or an automatically generated 5 digit ID that will be added to the name to identify the AIRcable.
"A P 0000 <CR>"; sets pin number to 0000, require authentication

- To disable authentication if the devices you are connecting to don't require authentication.
"A P D <CR>"

- Switch to mode to "Service-Master Mode"
"A A4<CR>"

Manual Mode

The manual mode is designed to give Bluetooth support to devices that cannot run a full Bluetooth stack. The command line interface is a collection of the simple, most common Bluetooth commands. It allows the discovery of other devices, pairing, inbound slave and outbound master connections, and disconnect by software.

You should understand Bluetooth before you use the manual mode. Please contact us if you have any questions or visit our forums.

Disconnect by Software

Once a connection is established the command line interface is no longer available since all input and output is routed through transparently to the other end.

In this mode it is possible to disconnect a link programmatically. An application can either close the port or should use the DTR line software configuration to disconnect the link.

List of Commands

"H" - Shows status of the AIRcable
 "B" - Print its own BT address: "ADDR: 1A2B3C4D5E6F"
 "O" - Print or set "Class Of Device".
 Example: "OC20104" sets class of device to INFO+MODEM+NET, major PC, minor DESKTOP, see "Bluetooth Assigned Numbers" documentation (*)

"P" - Display PIN number: "PIN: 12345"
 "P12345" - Set PIN number to "12345", and enable authentication. Pin number can be between 2 and 5 digits long.
 "PD" - Disable authentication but keeps the PIN number if another device asks for it. For slave mode only.

"PU" - This command creates a unique 5 digit PIN number and appends it to the name

"E" - Disable encryption mode: "encryption disabled"

"E1" - Example: enable encryption mode.

"N" - Returns the name of the device: "AIRcable"

"NAIRCABLE" - Set name to AIRcable, name has to be exactly 8 characters, fill up with space if required name is shorter.

"I" - Do an inquiry scan for default 11 seconds. The following commands are useful only in manual mode. Upon start it will respond with: "INQUIRING". At the end it will print "OK".

"I90" - Do an inquiry scan for 90 seconds, number must be between 1 and 90 seconds. The result for example looks like: "1A2B3C4D5E6F, class 0xC20104, name AIRtag 12345".

"CS1A2B3C4D5E6F" - Connect as master command. Use authentication as configured. Example: connect to this BT address at port serial. Second letter specifies the port to connect to: S-serial D-dialup L-lan or O-obex. The command responds with "CONNECTING", then "CONNECTED" or "FAILED".

"R1A2B3C4D5E6F" - Manual pair request. This pairs the AIRcable with the partner specified with the address. It uses the PIN number configured. The AIRcable stores the link key it receives to be used in a subsequent connect command. The command responds with "PAIRING" and then "OK" or "FAILED".

"L" - Read the link key that was stored by previous commands.

"L1234567890ABCDEF..." - Set the link key. These are 32 hex numbers.

"D" - Display the services enabled, it is a hex number that is or'd from these services: serial 0x8, dialup 0x4, lan 0x2, obex 0x1.

"DDSDLO" - Set discoverable mode and advertise SPP (serial), DUN (dial-up), LAN, OBEX profiles. First specify if the device should be discoverable "D" or not "U", then select the profiles: S-serial D-dialup L-lan or O-obex: (*)

"DU" - Make device undiscoverable, keep the selected profiles.

"S" - Slave connect command. This is a one time slave command for 11 seconds. After that the devices is in manual mode again. The command responds with "OPEN" and then "CONNECTED" or "FAILED".

"S20" - Start slave connect for 20 seconds. If authentication is enabled the PIN number configured is being used. You can specify up to 90 seconds.

"A" - Display automatic mode (manual=0, master=1, slave=2, service=3, service-master=4)

"A0" - Manual mode

"A1" - Cable-slave mode. The AIRcable becomes discoverable and will be in pairing mode if no pairing information has been stored. Then it will be not discoverable and will allow connections only from the paired partner. In this mode, only the SPP profile is active. After an unsuccessful pairing approach the AIRcable will go into manual mode again.

"A2" - Cable-master mode: do inquiry first, then pairing with the configured PIN number, then connect as master (not discoverable).

"A3" - Service-slave Mode: Use the authentication, profiles, pin number and name configured before. (*)

"A4" - Service-master mode. If authentication is enabled it first discovers a partner, tries to pair with it and makes a connection. If authentication is disabled, it discovers a partner and tries to connect to it. It uses the PIN number configured before.

"U" - UART configuration command. Display the settings in hex: "UART: 0x6". It is an add up of the following: external switches enabled: 6, even parity: 4, odd parity: 2, two stop bits: 1.

"UE2!" - Example 2: Even parity, 2 stop bits, internal baud rate settings.
 "U01E" - Example 3: Odd parity, 1 stop bit, external switches enabled.
 "T" - Display the baud rate of the UART after a connection has been established. "BAUD: 0" means that the external switches determine the baud rate.
 "T472" - Set the baud rate while connected to this value. It is a 3 digit decimal value with leading zeros to this formula: baud * 0.004096. Example: set baud to 115200. (*)
 "K" - AIRcable USB only: command to configure hardware handshake
 "K1" - Disable hardware handshake, this is for poorly written MS applications. Use the dip switches on the AIRcable Serial modules.
 "Z" - Remove pairing information and go into manual mode (*)
 "X0" - Disable debug mode
 "X1" - Switch debug mode on, print status information
 "Y" - Send a "cancel" command to abort any ongoing activity.
 "K" - AIRcable USB has the ability to switch off hardware handshake. Use "K1" to disable hardware handshake and "K0" to enable hardware handshake.
 "F" - Display the sniff max interval: "SNIFF 0x0"
 "F000" - Specify the maximum sniff interval for slave connections. "000" means, sniff is off, "540" is the maximum. The three digits are in hex specifying the number of slots.
 "V" - Display the page scan interval window: PAGESCAN INTV/WIND: 0x800/0x12
 "V08000012" - Set the page scan interval to 0x0800 and the window to 0x0012

Operational Specification

Range: 10m in open office conditions.
 Electrical Requirements: power supply from the phone, 30mA max.

Dimensions

Physical Connectors

External power: Motorola bottom connector (Falcon or Condor).

Environmental Requirements

Operating temperature: -20° to 85°C, Humidity: 5% to 95% non condensing, storage temperature -40° to 95°C.

Regulatory Compliance

The AIRcable device is designed to be compliant with the rules and regulations in locations where they are sold and will be labeled as required. This product is type approved — users are not required to obtain license or authorization before using.

Radio Frequency Interference Requirements

This device complies with part 15 of the FCC rules. Operation is subject to the following 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.

The command line interface is available through the serial interface before the AIRcable device is connected. This means that the connection LED must be either blinking or off.

The serial parameters for the command line interface are fixed at:

- 115200 baud
- No parity
- One stop bit
- 8 bit data
- Hardware handshake enabled

Each command starts with an "^A" (control-A or 0x1) character, then follows one of the commands listed below in all capital letters and finishes with a single <CR> (carriage return or 0xd). The command has to be completed within 3 seconds otherwise the received characters are deleted and ignored. All commands respond with an "OK" if they succeed.

Be aware that some commands in some states require the device to reset. They are marked with (*). This process will take a few seconds during which the AIRcable will not respond to any commands. The power light will go out briefly.

Service-Slave Mode

In the Service-Slave Mode, the AIRcable allows other Bluetooth devices to connect to it. This mode can be used to allow a Palm with Bluetooth or a Laptop with Bluetooth support to connect. The main advantage of this mode is that it allows several devices to connect to it as oppose to the previously described point-to-point cable modes.

In order to switch the AIRcable module into "Service-Slave Mode" use the command line interface detailed below. This is just an example, however. Please adjust the commands to fit your need, including your security needs.

- To reset the AIRcable to the manual mode and delete all pairing information. "**^A Z <CR>**"

- To change the name of the device.

"**^A N AIRcable <CR>**"; sets the name to AIRcable. The name has to be exactly 8 characters long. Use spaces to fill the lack of characters if needed.

- To configure the PIN number you need either a fixed 2-5 digit number or an automatically generated 5 digit ID that will be added to the name to uniquely identify multiple AIRcables. Below is an example of each:

"**^A P 1234 <CR>**"; sets pin number to 1234, require authentication.

"**^A PU <CR>**"; generates a unique 5 digit pin number and append it to the name.

"**^A PD <CR>**"; AIRcable allows connection without PIN. It will keep the pin number and the name. Doing this will disable authentication.

- To configure the supported Bluetooth profiles (see details below): "**^A DDS <CR>**"; sets discoverable SPP profile.

- To switch the mode to "Service-Slave Mode" "**^A A3 <CR>**"

Service-Master Mode

The Service-Master Mode is the counter part to the Service-Slave Mode. It can be used as a master to connect to several Bluetooth devices which are in range,