

AirEZY-2411-BT

User Guide

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AirEZY 2411 BT User's Manual

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Chapter 1

Introduction

AirEZY 2411 BT is an 802.11b compliant Station radio with a 10-BaseT interface. The true plug-and-play feature enabled by the 10-BaseT interface separates AirEZY 2411 BT from many other 802.11b-compliant radios. Most other 802.11b radios are based on a PCMCIA interface and require the installation of a driver on the host computer.

The Utility program is needed to pre-configure AirEZY 2411 BT prior to putting the radio in operation and to monitor the communication condition once the radio is in operation. Once configured, the radio runs self-sufficiently without the aid of any driver program in the host computer connected to the radio.

This Utility program therefore is intended to be, in most cases, just a tool for the network operators. An end user simply plugs the pre-configured radio (delivered to him/her from the network operator) into a host computer or a network device equipped with a RJ-45 receptacle and gets connected without ever being exposed to this Utility program.

The Utility program is simple to install and easy to use through its graphic user interface.

Local Area Network (LAN)

Simply put, a LAN is a network that exists in a relatively limited area. A network is two or more computers connected together sharing files and peripheral devices such as printers.

The Wireless LAN Card allows you to interact with other computers without having to run cables normally associated with networks. This lets you move your computer around while staying connected to your network.

There are two ways to use the Wireless LAN Card. One way is to connect directly to one or more Wireless LAN Card equipped computers, forming an Ad Hoc wireless network. The second way is to connect to an Access Point that gives you access to an existing wired LAN, forming an Infrastructure wireless network.

Ad Hoc Network

The Ad Hoc network offers peer-to-peer connections between workstations, allowing communication between computers within range that have an 802.11 DSSS compatible PC card installed.

Infrastructure Network

The infrastructure network uses an access point (or several access points) as a gateway, linking the wireless network to a wired LAN. As a result, portable workstations on your wireless network have access to all of the features of your wired LAN including e-mail, Internet access, network printers and files server.

System Requirements

To use the AirEZY 2411 BT Wireless LAN Card, your computer must meet the following minimum requirements:

Windows® 95 (OSR2)/ 98 (SEC)/ME/2000

16 MB of RAM, additional memory recommended

Ethernet capable computer with RJ-45 port (either built-in or add-on NIC)

Have your Windows 95/98/ME/2000 installation CD-ROM or disks available;

Windows 95/98/ME/2000 may prompt you for them.

If you need to set up the TCP/IP address or the Subnet Mask, refer to

"Appendix C: Setting Up TCP/IP"

Installing the Hardware

The Wireless LAN Card can be connected to your computer's Ethernet port via the included RJ-45 cable. When connecting to a computer, the straight through cable should be used (3 ft long). The longer cross-over cable is used when connecting the Wireless LAN Card to a hub/ switch/ router. This card is capable of pulling power from either an AC wall outlet, or through a battery pack. Make sure that one of these is used to power the unit on before trying to connect to the network.

Chapter 2

Wireless LAN Card Status LEDs

Connect the 10BaseT port (which resembles an over-sized telephone jack) on the back panel of the AirEZY 2411 BT to the 10 BaseT port in the client computer using the 3-ft straight-through UTP cable. Power on the AirEZY 2411 BT, the LEDs on the front panel should exhibit the following patterns:

<i>LED</i>	<i>Color</i>	<i>Light Blinking Pattern</i>
ON	RED	Steady on
RX	GREEN	Steady on
TX	RED	on, when transmitting
LINK	YELLOW	Continuous flickering

The continuously flickering yellow LED indicates that the RF link is successfully established between the server and the client units. If the yellow LED is showing a one long, one short blinking pattern, it is an indication that the 10BaseT port is not properly connected. Check your UTP cable and make sure that the right cable is used, i.e., 7-ft crossover cable for connecting to hub, switch or router, and 3-ft straight-through cable for connecting directly to a server or PC. If the yellow LED is showing a slow on and off blinking pattern, it is an indication that the RF link is not successfully established. You may want to re-position the AirEZY 2411 BT to a different location for better RF reception. You may also want to check if the client unit is configured with the same RF channel and security code as the server unit. If not, change the settings to make them the same as that of the server unit. Please refer to the OTC Security and Diagnostics Software manual (Appendix A) for how to check and change the RF channel and the security code settings. If the yellow LED is showing a one long, two short blinking pattern, it indicates that the client unit's ID is not registered with

the server unit. Please refer to the OTC Security and Diagnostics Software manual (Appendix A) for the procedure for registering the client ID with the server unit. After the client ID being properly registered with the server unit, re-power up the client unit. The client unit should be able to establish the RF link with the server unit now.

Chapter 3

Installing the Wireless LAN Card Utility Software

I. Installation

The installation simply copies the Utility program and its run-time support (components of Visual Basic) onto the host computer and does not alter any setting of the host computer. Simply insert the CD-ROM provided and the installation process will finish with you clicking a few "OK".

II. Using the Utility Program



Connect the radio to the host computer by plugging one end of the supplied UTP cable into the RJ-45 receptacle on the radio and the other end into the RJ-45 receptacle on the computer. Turn on the radio with the supplied 5V adapter. Click "Start", then "Program", move to locate the "AirEZY 2411 BT" group and click on the Utility program icon to launch the Utility program.

There are four tabs inside the Utility graphic interface. The "About" tab displays the version information. The "Link Info", "Station Configuration" and "Encryption" tabs will be

discussed more in the ensuing subsections.

The **OK** and **Cancel** buttons at the bottom of the frame are common to all tabs. Clicking the **OK** button signals the successful completion of the use of the Utility program. The program applies the modifications made to all tabs and exits. Clicking the **Cancel** button exits the program without changing the setting of the radio. The **Refresh** and the **Apply** buttons are available for the "Station Configuration" and the "Encryption" tabs. Clicking the **Refresh** button at any moment causes the program to retrieve and display the most updated configuration information from the radio at that moment. Clicking the **Apply** button updates the radio setting without exiting the program.



III.1 Configure AirEZY 2411 BT

Clicking on the "Station Configuration" tab retrieves and displays the current configuration parameters of the AirEZY 2411 BT radio on this page. With the exception of the "MAC" field,

Fragmentation Threshold: In the presence of hostile RF environment, such as interference, frames longer than this threshold numbers in bytes are divided prior

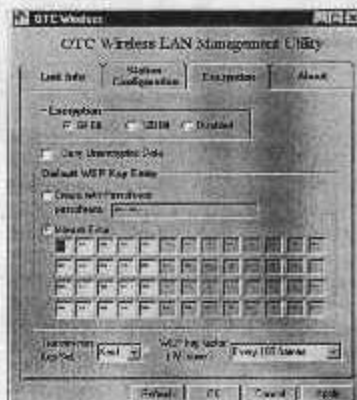
to transmission into one or more fragments equal in length to the fragmentation threshold. The default value is set at 2436 bytes, the maximum 802.11 data frame size, such that no frames are ever fragmented.

RTS Threshold: To minimize the potential packet collision associated with hidden nodes in a wireless network, 802.11 standard has the option to complete a "Request to Send(RTS)" and "Clear to Send(CTS)" two-frame exchange prior to sending the real data. This obviously reduces the throughput of the real data. Since the probability of packet collision increases with size of the packets transmitted, a optimum trade-off between data-throughput and data-integrity may be reached by turning on the two-frame exchange only for data packets exceeding certain size. The number entered in this field is that packet threshold size in Bytes. For example, if "500" is entered, data packets with size less than 500 bytes are transmitted without being preceded by the RTS-CTS exchange and thereby taking a small risk of getting corrupted by packet collisions. If "2346" (the maximum 802.11 data frame size) or a larger number is entered, then every data packet is transmitted without being preceded by the RTS-CTS exchange and thereby maximizing the data throughput.

Channel: This field is modifiable only when the "Ad hoc" type is selected for "Network Type". The Station automatically scans for the right channel to join when operated in the "Infrastructure" mode. In the "Ad hoc" mode, the Station also automatically scans for the right channel to join an existing "ad hoc" Service Set. However, when the Station is the first station to start an ad hoc network, it will stay on the channel selected in this field to wait for other stations to join.

III.2 Set up Encryption

This page allows users to set up the 802.11 Wired Equivalent Privacy (WEP) to protect the content of the data frames from eavesdropping.



Encryption: Encryption reduces data throughput due to the processing overhead. So in applications where security is not a concern, the encryption feature can be disabled. The 64-bit encryption is currently the 802.11 standard. The 128-bit encryption is supported by equipment from a limited number of vendors.

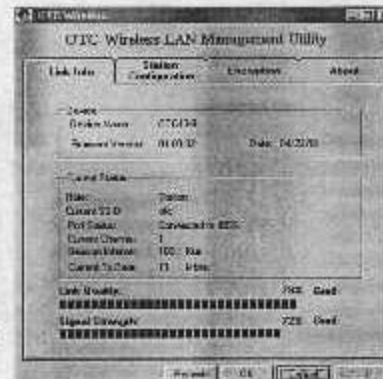
Default WEP Key Entry: AirEZY 2411 BT currently supports only the default WEP key scheme defined in the 802.11 standard, not the mapped key scheme. A set of four keys needs to be created in the default-key scheme. There are two ways of generating the four keys. Choosing "Create with

Transmission Key Sel: (Transmission Key Selection) One of the 4 default keys needs to be selected for transmitting data frames. The radio can de-encrypt received data encrypted in any one of the four default keys, but is use only one of the default keys for transmitting its data.



III.3 Obtain Link Information

This page is used to monitor the condition of a radio engaged in live communication link. Other than displaying the radio configuration, the "Link Quality" and "Signal Strength" are automatically retrieved from the radio and displayed every 2 seconds. "Link Quality" measures the percentage of accurately transmitted data packets, "Signal Strength" directly measures the amount of RF energy received relative to a "maximum" expected for the best condition. The two measures are related, but could differ due to various reasons. In general, as a first step toward maximizing Link Quality, one should try to maximize the Signal Strength by moving the radio around.



Chapter 4

Uninstalling the Wireless LAN Card Software

If you need to uninstall the Wireless LAN Card and application software for any reason, complete the following steps:

1. Close all programs that are currently running.
2. Remove the Wireless LAN Card from the computer.
3. Click the Window **Start** button, point to **Settings** and then click the **Control Panel**.
4. Double click the **Add/Remove Programs** icon.
5. Click the **AirEZY 2411 BT**.

This will uninstall both the PC Card driver as well as the utility program from your computer.

Chapter 5

Troubleshooting

Radio Interference

You may be able to eliminate any interference by trying the following:

- . Reseat the AirEZY 2411 BT Card.
- . Increase the distance between the wireless computers and the device causing the radio interference.
- . Plug the computer equipped with the AirEZY 2411 BT Card into an outlet on a different branch circuit from that used by the affecting device.
- . Consult the dealer or an experienced radio technician for help.
- . Keep the computer with the AirEZY 2411 BT Card away from the microwave oven and large metal objects.

Card Not Detected

If the Wireless LAN Card is not detected by Windows, try the following:

- . Incorrect SSID. Make sure the SSID is the same for all computers that have a Wireless LAN Card.
- . Changes are not being recognized by your computer. Restart your computer.
- . If in Ad Hoc mode, make sure the **Log on to Windows NT domain** check box is not selected in the **Client for Microsoft Networks Properties** dialog box in the **Network Configuration** tab.
- . Incorrect IP Address or Subnet Mask. Check these settings in the **TCP/IP**

Properties

dialog box in the **Network Configuration** tab.

- . Make sure the channel for the Wireless LAN Card is set to the same channel number as the one for the other Wireless LAN card you are trying to connect to.

Cannot Connect to Another Wireless LAN Card

If you cannot make a connection to another Wireless LAN Card from your computer, it could be due to one of the following reasons:

- . Make sure the LAN Card is properly installed.
- . Make sure the bus slot in your computer is working.
- . Contact your dealer for additional testing if there is a hardware problem with the Wireless LAN Card.

Poor Link Quality

If the Link Quality display stays in the Poor range, it could be due to one of the following reasons:

- . Make sure the Wireless LAN Card and Access Point have no physical connection problems.
- . Make sure the SSID for the Wireless LAN Card is set to "any" or is the same as the Access Point.
- . Make sure the privacy type is the same as that of Access Point. If both are using a Passphrase, make sure it is the same for both computers. Also, make sure the Default Key is the same for both computers.

Cannot Connect to Access Point

If you cannot make a connection to the Access Point, it could be due to one of the following reasons:

- . Radio interference.
- . Distance between Wireless LAN Card and the targeted radio (or the other wireless device) is too far. Decrease the distance between the Wireless LAN Card and Access Point (or another card).

Technical Support

If problems are still not solved, please contact our Technical Support to obtain further assistance.

Call: 1-800-770-6698 in USA

Call: 011-510-490-8288 outside of USA

E-mail: techsupport@otcwireless.com

Appendix A: Limited Warranty

Wireless LAN Hardware

The seller warrants to the end user ("Customer") that this hardware product will be free from defects in workmanship and materials, under normal use and service, for one (1) year from the date of purchase from the seller or its authorized reseller. The seller's sole obligation under this express warranty shall be, at the seller's option and expense, to repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or if neither of the two foregoing options is reasonably available, The seller may, in its sole discretion, refund to the Customer the purchase price paid for the defective product.

All products that are replaced will become the property of the seller. Replacement products may be new or reconditioned.

Wireless LAN Software

The seller warrants to Customer that each software program licensed from it, except as noted below, will perform in substantial conformance to its program specifications, for a period of one (1) year from the date of purchase from the seller or its authorized reseller. The seller warrants the media containing software against failure during the warranty period. No updates are provided. The seller's sole obligation under this express warranty shall be, at the seller's option and expense, to refund the purchase price paid by Customer for any defective software product, or to replace any defective media with software which substantially conforms to applicable seller published specifications. Customer assumes responsibility for the selection of the appropriate application programs and associated reference materials. The seller makes no warranty or representation that its software products will meet Customer's requirements or work in combination with any hardware or software applications products provided by third parties, that the operation of the software products will be uninterrupted or error free, or that all defects in the software products will be corrected. For any third party products listed in the seller software product documentation or specifications as being compatible, the seller will make reasonable efforts to provide compatibility, except where the non-compatibility is caused by a defect in the third party's product or from use of the software product not in accordance with the seller's published specifications or user manual.

FCC Part 15 Declaration of Conformity (DoC)

The following equipment:

Product Name: Wireless PC LAN Card

Model Number: AirEZY 2411 BT WLAN is herewith confirmed to comply with the requirements of FCC Part 15 rules. The 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.

FCC ID: currently unknown

Regulatory Compliance**Appendix B:**

Wireless LAN Card User's Manual

FCC Rules and Regulations - Part 15

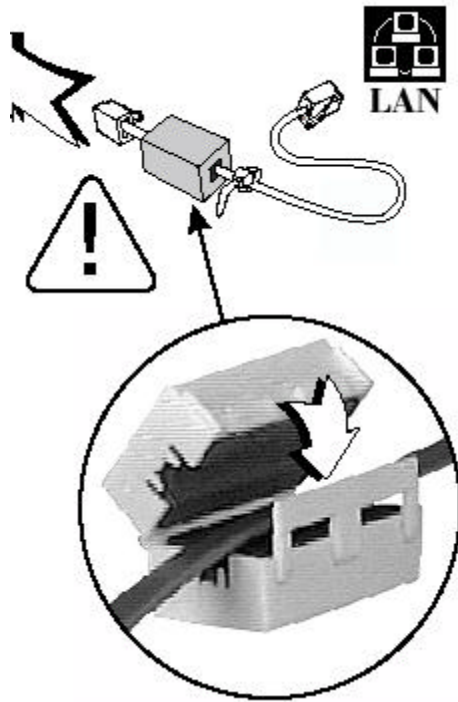
Warning: This device has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the Federal Communications Commissions Rules and Regulations. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated 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. 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 and correct the interference by one or more of the following measures:

- . Relocate your WLAN equipped laptop computer.
- . Increase the separation between the WLAN equipped laptop computer and other electronics.
- . Connect the WLAN equipped laptop computer into an outlet on a circuit different from that of other electronics.
- . Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20cm between the radiator & your body.

Note: To ensure that the product complies with FCC Class B requirements, follow these instruction to install the ferrite bead on your LAN (RJ45) Cable.



Glossary

10BaseT An IEEE standard (802.3) for operating 10 Mbps Ethernet networks (LANs) with twisted pair cabling and a wiring hub.

Access Point An internetworking device that seamlessly connects wired and wireless networks. Access Points combined with a distributed system support the creation of multiple radio cells that enable roaming throughout a facility.

Ad Hoc A network composed solely of stations within mutual communication range of each other (no Access Point connected).

BSS *Basic Service Set*. A set of stations controlled by a single coordination function.

Channel A medium used to pass protocol data units that can be used simultaneously in the same volume of space by other channels of the same physical layer, with an acceptably low frame error ratio due to mutual interference.

Encapsulated An Ethernet address mode that treats the entire Ethernet packet as a whole and places it inside an 802.11 frame along with a new header.

ESS *Extended Service Set*. A set of one or more interconnected Basic Service Sets (BSSs) and integrated Local Area Networks (LANs) can be configured as an Extended Service Set.

Ethernet The most widely used medium access method, which is defined by the IEEE 802.3 standard. Ethernet is normally a shared media LAN; i.e., all the devices on the network segment share total bandwidth. Ethernet networks operate at 10Mbps using CSMA/CD to run over 10BaseT cables.

Gateway A network component that acts as an entrance to another network.

IEEE 802.11 The IEEE 802.xx is a set of specifications for LANs from the Institute of Electrical and Electronic Engineers (IEEE). Most wired networks conform to 802.3, the specification for CSMA/CD-based Ethernet networks or 802.5, the specification for token ring networks. 802.11 defines the standard for wireless LANs encompassing three incompatible (non-interoperable) technologies: Frequency Hopping Spread Spectrum (FHSS), Direct Sequence Spread Spectrum (DSSS), and Infrared. IEEE standards ensure interoperability between systems of the same type.

Infrastructure A wireless network centered about an Access Point. In this environment, the Access Point not only provides communication with the wired network but also mediates wireless network traffic in the immediate neighborhood.

IP *Internet Protocol*. The standard protocol within TCP/IP that defines the basic unit of information passed across an Internet connection by breaking down data messages into packets, routing and transporting the packets over network connections, then reassembling the packets at their destination. IP corresponds to the network layer in the ISO/OSI model.

IP Address An IP address is a 32-bit number that identifies each sender or receiver of information sent across the Internet. An IP address has two parts: the identifier of a particular network on the Internet and an identifier of the particular device (which can be a server or a workstation) within that network.

ISP *Internet Service Provider*. An organization that provides access to the Internet. Small ISPs provide service via modem and ISDN while the larger ones also offer private line hookups (T1, fractional T1, etc.).

LAN *Local Area Network*. A communications network that serves users within a defined geographical area. The benefits include the sharing of Internet access, files, and equipment, such as printers and storage devices. Special network cabling (10BaseT) is often used to connect the PCs together.

NAT *Network Address Translation*. The translation of an Internet Protocol address (IP address) used within one network to a different IP address known within another network. One network is designated the internal network and the other is the external. The internal network then appears as one entity to the outside world.

PCMCIA *Personal Computer Memory Card International Association*. This Association develops standards for PC cards, formerly known as PCMCIA cards. These cards are available in three types, and are about the same length and width as credit cards. However, the different cards range in thickness from 3.3 mm (Type I) to 5.0 mm (Type II) to 10.5 mm (Type III). These cards can be used for various functions, including memory storage, landline modems, and wireless modems.

PS Mode *Power Save Mode*. This mode is recommended for devices where power consumption is a major concern, such as battery-powered devices.

Radio Frequency *RF*, Terms: GHz, MHz, Hz —The international unit for measuring frequency is Hertz (Hz), equivalent to the older unit of cycles per second. One megahertz (MHz) is one Million-Hertz. One gigahertz (GHz) is one Billion-Hertz. The standard U.S. electrical power frequency is 60 Hz, the AM broadcast radio frequency band is 0.55–1.6 MHz, the FM broadcast radio frequency band is 88–108 MHz, and wireless 802.11 LANs operate at 2.4GHz.

SSID *Service Set ID*. A group name shared by every member of a wireless network. Only client PCs with the same SSID are allowed to establish a connection.

Subnet Mask A value that defines whether your computer communicates only within your LAN or communicates outside of your LAN, where it is routed out to the rest of the Internet. A Subnet Mask that has the same first three components (for example, 255.255.255.0) is the routing pattern for a Class C address.

TCP *Transmission Control Protocol*. The standard transport level protocol that provides the full duplex, stream service on which many applications' protocols depend. TCP allows a process on one machine to send a stream of data to a process on another. Software implementing TCP usually resides in the operating system and uses the IP to transmit information across the network.

WEP *Wired Equivalent Privacy*. The optional cryptographic confidentiality algorithm specified by 802.11 used to provide data confidentiality that is

subjectively equivalent to the confidentiality of a wired LAN medium that does not employ cryptographic techniques to enhance privacy.

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