AirTies
wireless networks

54Mbps Wireless Access Point Repeater Bridge

AP-302

User Manual

Manual Overview

This manual guides you through the steps necessary for setting up and configuring the AirTies AP-302 54Mbps 802.11g Wireless Access Point/Repeater/Bridge. Please read this manual carefully before beginning the installation process.

The Warranty does not cover failure or damage as a result of not following the instructions in the manual. AirTies will not be held responsible in such circumstances.

The User Manual is an important resource you can refer to for safe and proper use of your device. Please retain it for future reference.

Safety and Maintenance

- In order to prevent damage to your device, be sure to keep it in its original box during transportation.
- The device must be used solely with its original power adapter. Please note that the adapter is 220V only. Do not use with 110V AC.
- Do not insert a PSTN (phone) plug into the LAN port.
- If you encounter any problems, do not open or disassemble the device. Call AirTies Technical Support.
- In order to prevent electric shock, do not operate the device in wet or damp areas. Do not use the phones connected to the device during lightning storms.
- In the event of a gas leak, do not use the device. Do not turn the device on or off. Do not plug or unplug the power cord.
- Avoid using the device in dusty environments. If dust buildup should occur, use a dry cloth to remove the dust.
- To clean the exterior of the device use a dry cloth. Do not attempt to clean the interior. There are no user serviceable components inside.
- For information regarding the installation and configuration of the device consult the remainder of this manual.
- The average usage life of the device is 7 years as determined by the Authority of Industry and Trade.

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Table Of Contents

1. Introduction

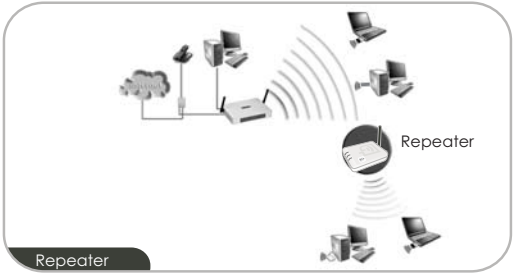
The AirTies AP-302 is an IEEE 802.11b/g compliant, 54 Mbps wireless communication device that can be used as a Wireless Access Point, Repeater, or Bridge.

You can connect the AirTies AP-302 to a wired modem through the Ethernet port to setup a wireless local network and enable your wireless computers to access the Internet.

As a repeater, the AP-302 enables you to extend the coverage area of a wireless network. The AirTies Mesh Technology is what makes this possible.

The AirTies Mesh Technology resolves problems such as loss of wireless signal or limited coverage area often encountered in multiple-story or reinforced concrete buildings. Using the AP-302, the wireless coverage area can be extended to the maximum without sacrificing signal quality. Computers on the network connect to the AP-302 with the strongest signal, and reach the router or the wired network through the AirTies Mesh Network.

The AP-302, used as a bridge, enables wired devices that have an Ethernet interface, such as printers and desktop computers, to be included in a wireless network.



1.1. Main Features

- IEEE 802.11b/g compatible, 54Mbps Wireless Access Point, Repeater, Bridge
- Fully compatible with the widely used 11Mbps 802.11b and 802.11g devices and Centrino laptops
- AirTies Mesh Technology support to extend wireless coverage area across very wide areas or concrete buildings where signal strength problems are common
- Used as a "**Wireless Bridge**", ability to include wired devices with an Ethernet interface in the wireless network
- Advanced wireless security with support for WPA2, WPA,WEP, and 802.1x standards
- Wireless operating ranges of up to 400 meters outdoors and 100 meters indoors
- State of the art chip technologies for best performance
- Automatic detection of straight and cross Ethernet cables with "**Auto MDI/MDIX**"
- Automatic IP address assignment by the DHCP server
- Easy to use Web-based user interface
- Firmware upgrades through the web interface
- 24x7 technical support by the highly trained AirTies Technical Support backed up by the AirTies R&D team

1.2. Minimum System Requirements

- In order to setup and configure your device, you will need a PC that runs any version of Windows, UNIX, Linux, or Mac operating systems and has an Ethernet card or a wireless network adapter.
- The AP-302 does not need to be connected to a PC during normal operation.

1.3. Package Contents

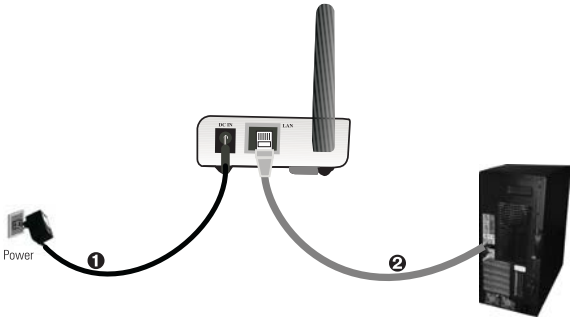
1. AP-302 54Mbps 802.11g Mini Wireless Access Point / Repeater / Bridge
2. Ethernet Cable
3. Power Adapter
4. Easy Setup CD
5. User Manual and Warranty Card

1.4. Top View

LED	Light	State
Power	Green	AP-302 is powered on.
	Off	AP-302 is off.
WLAN	Green	Wireless network is set up and active
	Green flashing	Data exchange over the wireless LAN
	Off	Wireless network not active
LAN	Green	There is a device connected to the LAN port
	Green flashing	Data exchange over the LAN port
	Off	No connection on the LAN port

2. Connecting the Cables

The correct way of connecting the AP-302 is shown in the figure below.



Port	Interface
LAN	10/100 Ethernet port (auto MDI/MDIX); connects to the local network
Power	5V DC; connects to the power adapter

3. Preparing For Installation

The installation settings of the AP-302 must be done from a PC that is directly, not wirelessly, connected to it. However, because the DHCP feature is not enabled in the default factory settings, the AirTies AP-302 cannot assign an IP address to the PC. Therefore, the IP address of the PC has to be assigned manually.

3.1. Assigning a local IP address to a computer that is running WindowsXP

Double-click on the "**Local Area Connection**" icon on the bottom right corner of the WindowsXP desktop. This will bring up the "**Local Area Connection Status**" window.

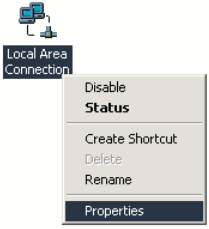
Click on the "**Properties**" button. The "**Local Area Connection Properties**" window will appear.

Select "**Internet Protocol (TCP/IP)**" and click on the "**Properties**" button.

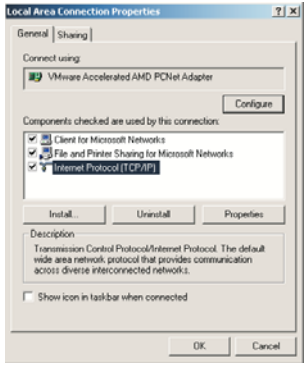
In the "**Internet Protocol (TCP/IP) Properties**" **window that appears, enter 192.168.2.10 in the "IP address**" field and 255.255.255.0 in the "**Subnet mask**" field. The IP address of the AP-302 is 192.168.2.254. Therefore, the IP address of the computer should be in the 192.168.2.x range.

Click "**OK**" to save the values you have entered.

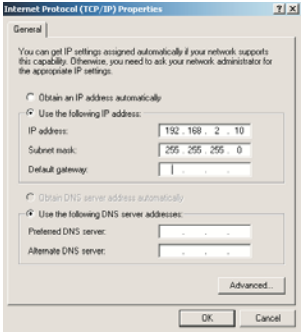
3.2. Assigning a local IP address to a computer that is running Windows98



Right click-on the "**Network Neighborhood**" icon on your desktop and select "**Properties**".



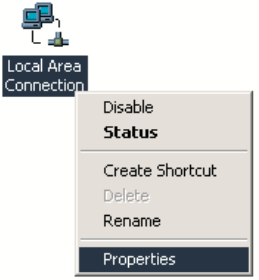
This will take you to the "**Network Connections**" window. Select "**TCP/IP**" and click "**Properties**".



In the "**Internet Protocol (TCP/IP) Properties**" window appears, go to the "**IP Address**" tab. Enter 192.168.2.10 in the "**IP Address**" field and 255.255.255.0 in the "**Subnet Mask**" field. The IP address of the AP-302 is 192.168.2.254. Therefore, the IP address of the computer should be in the 192.168.2.x range.

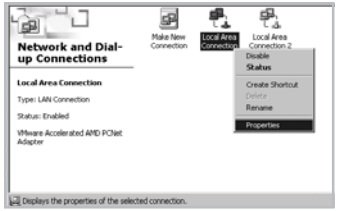
Click "**OK**" to save the values you have entered.

3.3. Assigning a local IP address to a computer that is running Windows2000



Right click on the "**Network Neighborhood**" icon on your desktop and select "Properties".

In the window that appears, right click on the "**Local Area Connection**" icon and select "**Properties**". This will bring up the "**Local Area Connection Properties**" window.



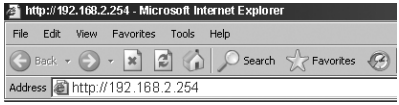
Select "**Internet Protocol (TCP/IP)**" and then click on the "**Properties**" button

In the "**Internet Protocol (TCP/IP) Properties**" window, enter 192.168.2.10 in the "**IP address**" field and 255.255.255.0 in the **"Subnet mask**" field. The IP address of the AP-302 is 192.168.2.254. Therefore, the IP address of the computer should be in the 192.168.2.x range.

Click "**OK**" to save the values you have entered.

4. Installation Settings

AP-302'nin kurulumu için Internet Explorer, Mozilla Firefox, Netscape gibi bir web tarayıcı To setup the AP-302, open a web browser (e.g. Internet Explorer, Mozilla Firefox, or Netscape). In the Address field enter 192.168.2.254, the default IP address of your device, and press Enter. This will launch the web interface of your AirTies AP-302.



You will be prompted for a password to login. Initially, leave this field blank and continue by clicking "**Submit**".

In the screen that appears, the "**Welcome**" screen, a summary of the current network and device settings are displayed.

4.1. IP Settings

You can change the IP address, the Subnet mask and the Gateway address of the AP-302 by going to the "**IP Settings**" submenu under the "**LAN**" menu of the web interface.

You can get the correct values for these fields from your network administrator.

Note: If you change the IP address of the AP-302, you must use the new address next time you want to connect to its web interface.

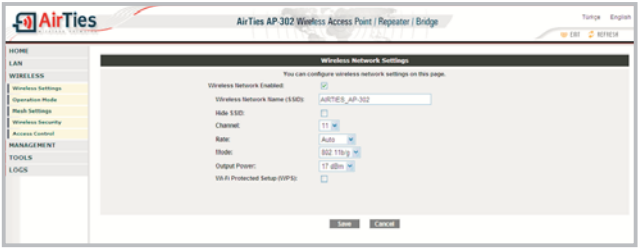
4.2. Wireless Network

Selecting on the "**WIRELESS**" menu of the AP-302 web interface displays all the wireless devices connected to the AP-302. You can block a device's access to the AP-302 by checking the "Block" box to the left of the MAC address of the device.

4.2.1. Wireless Network Settings

To configure your wireless network, go to "**Wireless Settings**" under the "**WIRELESS**" menu of the AP-302 Web interface.

- You can enable wireless function by checking the **Wireless Network Enable** box.
- In the **Wireless Network Name (SSID)** field, you can assign a name to your wireless network and enable the AP-302 to broadcast this name.
- Checking the Hide checkbox will disable the broadcasting of your wireless network name (SSID).
- In the Channel field you can select the broadcast channel number (frequency) of the AP-302.
- The **Data Rate** field gives you the ability to adjust the wireless data rate of the AP-302. However, it is recommended that you leave this field as "**Auto**".
- In the **Mode** field you can select the wireless mode the AP-302 will be operating in.
- **Output Power** field lets you can set the Transmit Power of the AP-302. The lower the transmit power, the smaller your wireless range will be.



4.3. Setting the Operating Mode

The AP-302 is a 3-in-1 device: it can operate as an access point, a repeater, or a bridge. To set the operating mode, go to the "**Operating Mode**" submenu under the "**WIRELESS**" menu. The "**Operating Mode Selection**" screen will come up.

In this window, select the mode that you want the AP-302 to operate in and click "Save".

4.3.1. Configuring the AP-302 as an Access Point

The AP-302 operates as an Access Point by default unless a different mode is selected. Connect the AP-302 to an ADSL router, cable modem or a local area network via its Ethernet port.

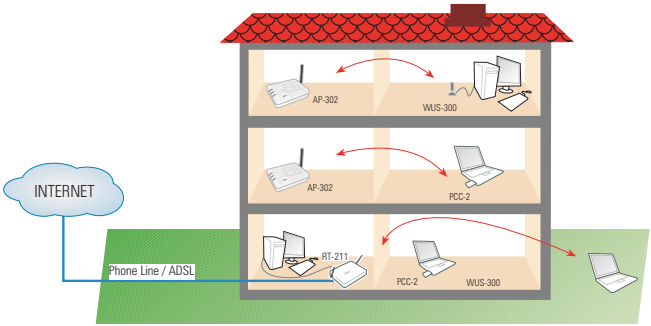
The diagram below is an example where the AP-302 is being used as an access point device.

- Verify that your computer has an IEEE 802.11b or 802.11g compatible Wireless Access Card installed. If not, first install a Wireless Access Card on your computer.
- After making the hardware connections of the AP-302 as explained earlier in this manual, power it on.
- On the computer(s) that will be connected to the AP-302 wirelessly, start the utility program for the Wireless Access Card (e.g. "**Intel Proset**" or "**Wireless Network Connection**" for Windows). Look for wireless networks in range in the "View Wireless Networks" window. Connect to the wireless network whose name (SSID) is "**AIRTIES_AP-302**", the default SSID of the wireless network set up by the AP-302. If you have assigned a different SSID to your wireless network during configuration, connect to the access point with that name.

On your Windows computer, double-click the "**Wireless Network**" icon on the bottom right corner. In the "**Wireless Network Connection Status**" window that appears, click the "**View Wireless Networks**" button. The result will be similar to the one shown below. This example assumes your wireless network has the default SSID "**AIRTIES_AP-302**".

4.3.2. Configuring the AP-302 as a Repeater

To use the AP-302 as a repeater, go to the "**Operating Mode**" submenu under the "**WIRELESS**" menu and select **Mesh** as the operating mode.
The following diagram is an example of the AP-302's use as a repeater.



AirTies Mesh Technology® helps resolve problems such as weak or lost signal, and limited signal range that is commonly seen in concrete buildings.

The Mesh Network consists of a wireless AirTies router and multiple AirTies AP-302 devices. The AP-302s in "mesh" mode communicate with each other and the wireless AirTies router using the Mesh protocol.

The computers connect to the access point closest to them automatically. They reach the AirTies router via the other access points in between. In this manner, wireless coverage area can be expanded significantly.

Select "**MESH**" as the operating mode.

You will be in the "**Mesh Settings**" page. From this point on, **"Mesh Settings**" will also appear as a submenu under the "Wireless Settings" menu of the Web user interface.

On this page, you will find a list of available access points and repeaters the AP-302 can connect to.

Check the box to the left of the access point / repeater you would like the AP-302 to connect to. The access point will appear in the list named "Access Point List". Click "Save" to complete the mesh settings of the AP-302.

Important: The repeaters and the access point that form the Mesh Network must all be operating on the same channel. They should also have a transmit power of at least -70dBm. (In the above example, -49dBm satisfies this requirement).

You need to make the same settings on the access point that will form a Mesh Network with the AP-302. For example, to setup a Mesh Network between an RT-211 and an AP-302, the Mesh settings should be done the same way on both devices. The screenshot below shows the RT-211 Mesh setup screen.

In this window, after you check the "**Enable Bridge/Repeater Connections**" box, check the box to the left of the AP-302 that you have already configured and click "Save". The RT-211 and the AP-302 will now recognize each other. At the point where the wireless signal from the RT-211 weakens, the AP-302 will boost the signal and extend the coverage area.

Note: You can only use WEP encryption in a wireless network with a MESH structure. You can find more information about this in the Wireless Security section.

4.3.3. Configuring the AP-302 as a Bridge

You can include a wired device (e.g. printer) to your wireless network by connecting the device to the LAN port of an AP-302 operating in Bridge mode. The diagram below is an example of the AP-302's use as a bridge (connected to a printer).

To set the bridge mode, go to "**Operating Mode**" submenu under the "**WIRELESS**" menu of the Web interface. Select "**Bridge**" as the operating mode and click "**Save**".

Note: Wireless broadcast is disabled when the AP-302 is in bridge mode. To configure and operate the AP-302 in bridge mode, you need to be directly connected to the AP-302.

When you select "**Bridge**" as the operating mode, the "**Access Point List**" page will come up. At the same time, "**Access Point List**" will appear as a submenu under the "**Wireless Settings**" menu of the web interface.

In this window, you will see a list of all the available wireless access points that the AP-302 bridge can connect to. Check the box next to the access point you would like to connect to and click "**Save**".

4.4. Wireless Security Settings

It is not necessary to configure wireless security to enable wireless communications. However, due to growing importance of data security, it is recommended that you choose a suitable security protocol and configure the AP-302 to use it.

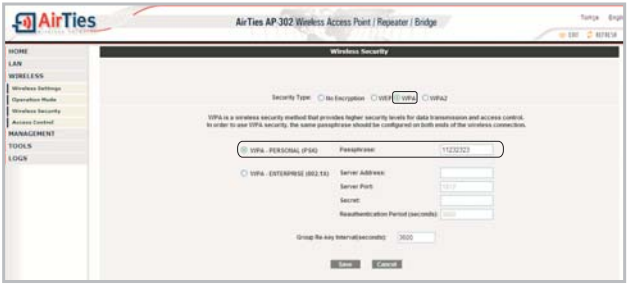
WPA, WPA2 and WEP wireless encryption protocols can be used to encrypt traffic between the wireless terminals and the AP-302. Additionally, MAC address filtering allows only the predefined authorized computers to exchange data with the AirTies AP-302 and blocks access by those that are not authorized. For your wireless network security, it is recommended that both MAC address filtering and one of the wireless encryption protocols WAP, WAP2, or WEP be activated.

4.4.1. WPA Security Settings

Wi-Fi Protected Access (WPA) is one of the latest and most advanced wireless encryption standards and provides you with the highest level of data protection. All AirTies wireless products and the newly introduced 802.11g wireless communication devices support WPA. If you would like to use WPA in your wireless network, all the wireless terminals in your network need to support WPA.

Go to "**Wireless Security**" under the "**WIRELESS**" menu of the AP-302 Web interface.

• To enable WPA encryption, click on the "**WPA**" button in the "**Wireless Security**" screen. Then, click on the "**PSK**" button and enter a network key that is 8 to 63 characters long (use a combination of letters and digits) in the "**Passphrase**" field. Make sure you choose a key that is not easy to guess. Click "Save".



• You must activate WPA and set the same network key in all the wireless devices that will communicate with the AP-302.

4.4.2. WPA2 Security Settings

WPA2 is the latest encryption method defined by the IEEE 802.11i wireless security standard. If you would like to use WPA2 encryption in your wireless network, all the wireless terminals in your network need to support WPA2. If you have a Centrino laptop, in order to use WPA2 encryption you need to download the WPA2 updates for your Windows XP operating system. (www.microsoft.com).

• To enable WPA2 encryption, click on the "**WPA2**" button in the "**Wireless Security**" screen. Then, click on the "**PSK**" button and enter a network key that is 8 to 63 characters long (use a combination of letters and digits) in the "**Passphrase**" field. Make sure you choose a key that is not easy to guess. Click "**Save**".

- You must activate WPA2 and set the same network key in all the wireless devices that will communicate with the AP-302.

4.4.3 WEP Security Settings

AirTies AP-302 supports the Wired Equivalent Privacy (WEP) encryption standard as well. If any of the devices in your wireless network does not support WPA, it is recommended that you choose WEP encryption.

If the AP-302 device is being used in a MESH Network, i.e. communicating with other devices that operate in mesh mode via the MESH protocol, then you can only use WEP encryption.

- Click on the "WEP" button in the "**Wireless Security**" screen.

- Check the Enable WEP Encryption box.
- Depending on the WEP security type you choose, enter a network key in the corresponding field.
  - 64-bit hexadecimal encryption : Enter a key of up to 10 hexadecimal characters (0-9 and A, B, C, D, E, F) e.g. "**4321abcdef**"
  - 64-bit ASCII encryption : Enter a key of up to 5 ASCII characters(all digits and letters) e.g. "**sifre**"
  - 128-bit hexadecimal encryption : Enter a key of up to 26 hexadecimal characters (0-9 and A, B, C, D, E, F) e.g. "**12a34b56c78d90e123456f7890**"
  - 128-bit ASCII encryption : Enter a key of up to 13 ASCII characters (all digits and letters) e.g. "kablosuzsifre"

- You must activate WEP and set the same network key in all the wireless devices that will communicate with the AP-302.

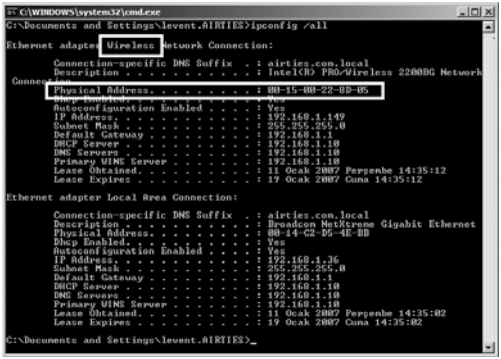
4.5. Access Control

To enable Access Control, go to "**Access Control**" under the "**WIRELESS**" menu of the AP-302 Web interface. In the window that appears, you can enter the MAC addresses of the devices that are permitted to access the AP-302. No device other than those permitted can connect to the AP-302.

To add a new user, enter the MAC Address of the device in the "**Allowed Clients**" field and click the "Add" button. The MAC addresses that you enter will be added to the "**Allowed Clients**" list. To delete a user from the list check the "**Delete**" button next to the MAC Address.

To find out the MAC Address of your computer:

- Click the "**Start**" button on the lower left corner of your Windows desktop.
- Click "**Run**". Type "**cmd**" in the window that opens and hit Enter.
- Enter ipconfig /all in the command line.



The "**Physical Address**" displayed under the "**Wireless Network Connection**" is your computer's MAC address.

4.6. Administration

The default password for accessing the Web-based user interface of the AP-302 is blank. It is recommended that you set a password to avoid unauthorized access to this interface.

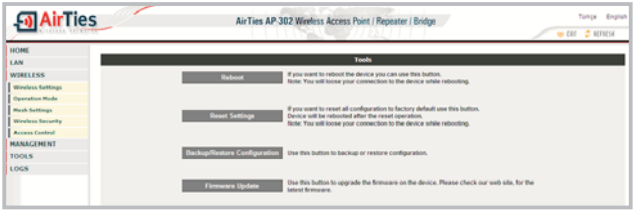
Enter the current password in the "**Current Password**" field. (Leave this field blank for the first use.)

Then enter your new password in the "**New Password**" and "**Confirm New Password**" fields. Click "**Save**".

4.7. Tools

The AP-302 Web interface provides advanced management tools for: Restart, Reset to factory settings, Configuration Backup and Restore, and Firmware update.

Go to the "**TOOLS**" menu of the web interface.



"**Restart**" simply restarts your access point device by powering it off and on. "**Reset to Factory Settings**" erases all your custom settings and returns the device to the default factory settings.
"**Configuration Backup/Restore**" button can be used to backup your device configuration or restore the settings from a previous backup file.
Occasionally, a new firmware is published by AirTies to fulfill customer needs. You can download the latest version of the firmware from www.airties.com. After you download the latest firmware version to your PC, click the "**Firmware Update**" button in "**TOOLS**" window. On the screen titled "**Firmware Update**" click "**Browse**" and select the recently downloaded firmware file. Then, click "**Update**". You can see the version of the firmware that is currently on your AP-302 on the "**Welcome**" screen that appears as soon as you login to the web interface.

4.8. Reset

To reset the AP-302 to the default factory settings, press and hold the reset button at the bottom of the device with the tip of a pencil or similar pointed object for 5 seconds.

Note: When you reset the AP-302, all your custom settings such as passwords and IP addresses will be erased.

5. Technical Specifications

- **Ports:** 1 Ethernet port (10/100, auto MDI/MDIX), 5V DC power in
- **Wireless Transmit Power:** 19dBm EIRP
- **Wireless security:** WPA (802.1x, TKIP, PSK), WPA2 (IEEE802.11i, AES, CCMP), WEP (64/128 bit), MAC filtering, SSID hiding
- **Wireless standards:** Compliant with IEEE 802.11b, 802.11g, 802.11d, 802.11e and 802.11i
- **LEDs:** Power, WLAN, LAN
- **Wireless data rates:** 1, 2, 5.5, 6, 9, 11, 12, 24, 36, 48, 54Mbps (auto speed adjustment)
- **Frequency range:** From ETSI 2400MHz to 2483.5MHz (13 channels, 3 not overlapping)
- **Power:** External 5V power adapter
- **Mounting:** wall or desktop
- **Reset** button to return the device to default factory settings

6. Physical Specifications

- **Dimensions:** 90mm x 70mm x 25mm, special design
- **Weight:** 150 g
- **Power:** 5Volt DC
- **Operating Temperature:** 0°C - 55°C
- **Storage Temperature:** -25°C - 75°C
- **Humidity:** %10 - %90

7. Other Information

Designed By

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AirTies
wireless networks

AirTies Wireless Networks

İTÜ Ayazağa Kampüsü Koru Yolu Arı 2 / A Blok Kat :8 Maslak / İstanbul

Declaration of Conformity

For the following equipment:

54Mbps Wireless Access Point Repeater Bridge

(Product Name)

AP-302

(Model Designation)

is herewith confirmed to comply with the requirements set out in the Council (European parliament) Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility of Radio and Telecom device (1999/5/EC). For the evaluation regarding this Directive, the following standards were applied:

ETSI EN 300 328 v1.7.1:2006
ETSI EN 301 489 -17 v1.2.1:2002
EN 50385:2002
EN 55022:2006
EN 61000-3-2:2000+A2:2005
EN 61000-3-3:1995+A1:2001+A2:2005
EN 55024:1998+A1:2001+A2:2003

CE

The following importer/manufacturer is responsible for this declaration:

(Company Name, Importer)	**AirTies Wireless Networks** (Company Name, Manufacturer) **İTÜ Ayazağa Kampüsü Koru Yolu** **Arı 2 / A Blok Kat :8 Maslak / İstanbul**
(Company Address, Importer)	(Company Address, Manufacturer)
Person responsible for this declaration:	Person responsible for this declaration: **Hakan Koçer**
(Name, Surname, Importer)	(Name, Surname, Manufacturer)
(Position/Title)	**VP of Sales and Marketing** (Position/Title)
(Legal Signature)	(Legal Signature)
(Place) (Date)	**Turkey** **2007/11/05** (Place) (Date)

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