



IP-based
Broadband Wireless Access (BWA) System

EasyWiFi

WiFi Extension
Module for the EasyST Unit

Hardware Installation Guide

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Headquarters:

Airspan Networks Inc.

777 Yamato Road

Suite 105

Boca Raton, FL 33431

USA

Tel: (+1) 561 893 8670

Fax: (+1) 561 893 8671

Main Operations:

Airspan Communications Ltd.

Cambridge House

Oxford Road

Uxbridge

Middlesex

UB8 1UN

United Kingdom

Tel: (+44) 1895 467 100

Web site: www.airspan.com



EasyWiFi

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About this Guide

This chapter describes the purpose, targeted audience, referenced documentation, and typographical conventions of this document.

Purpose



This guide provides a description of the EasyWiFi extension module as well as instructions for installing the module.

Targeted Audience

This guide is intended for the end-user installing the EasyWiFi extension module for the EasyST. This device requires no professional installation.

Typographical Conventions

This guide uses the following typographical conventions:

Convention	Meaning	Example
Bold	Command, menu, icon, button, and field	Click the Next button.
"To" in bold face and at the beginning of a sentence	Introduces a numbered procedure	To download a SW file:
	Warning that provides information that can prevent and avoid bodily or mechanical harm	--
	Note that provides useful information	--

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For service and support for your EasyWiFi, contact your regional Airspan representative or Airspan's Technical Assistance Center (TAC) at:

- **Web site (Support Request Form):**
<http://www.airspan.com/Ultra/ContactForm/airspansupportform.asp>
- **Americas:** (+1)-561-893-8679
- **International:** (+44)-1895-467 467



Introduction

The EasyWiFi extension module allows you to add extra functionality to your EasyST unit:

- WiFi capabilities based on 802.11b and 802.11g
- Four Ethernet LAN switches (10/100BaseT)
- DC power

The EasyST is easily plugged onto the EasyWiFi extension module by means of a 30-pin IDC connector.

The EasyWiFi is powered by an AC/DC adapter that is plugged directly into a standard electrical wall outlet (110/220 VAC). In addition, the adapter's plug prongs can be easily removed, and then replaced to suite electrical sockets of the country in which the unit is being installed.

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Physical Description

This chapter provides a physical description of the EasyWiFi extension module.

2.1. Physical Dimensions

The physical dimensions of the EasyWiFi are listed in the table below:

Table 2-1: EasyWiFi physical dimensions

Parameter	Value
Dimensions (height x width x length)	30 x 125 x 125 mm
Weight	210 grams

2.2. Ports

The EasyWiFi provides various ports on its side panel, as described in the table below:

Table 2-2: Easy WiFi port descriptions

Port	Label	Interface
8-pin RJ-45 (x four)	lan1, lan2, lan3, lan4	10/100BaseT Ethernet LAN
DC power jack	power	6 VDC power (supplied by AC/DC power adapter)
Reset button	reset	Resets configuration settings to factory default
30-pin IDC socket	--	Interfaces with EasyST, providing: <ul style="list-style-type: none">• 802.11 Wi-Fi• LAN switches• DC power (Note: IDC socket accepts flat cables)

Figure 2-1 display the EasyWiFi ports.

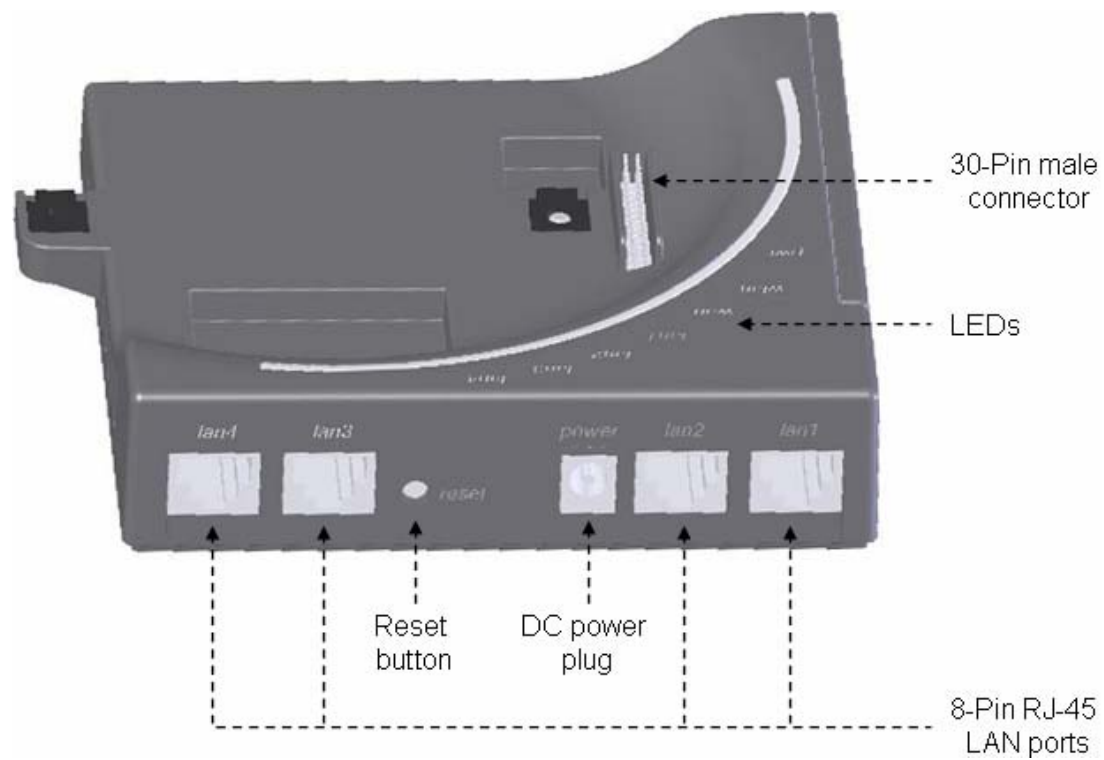


Figure 2-1: EasyWiFi ports (side and top panels)

2.3. WiFi Antenna

The EasyWiFi provides an integral WiFi antenna located on its side panel that can be orientated in the vertical plane, from 0° (i.e. antenna closed) to 180°. Two positions are used: 90° when EasyWiFi mounted horizontally; and 180° when EasyWiFi mounted vertically on a wall.

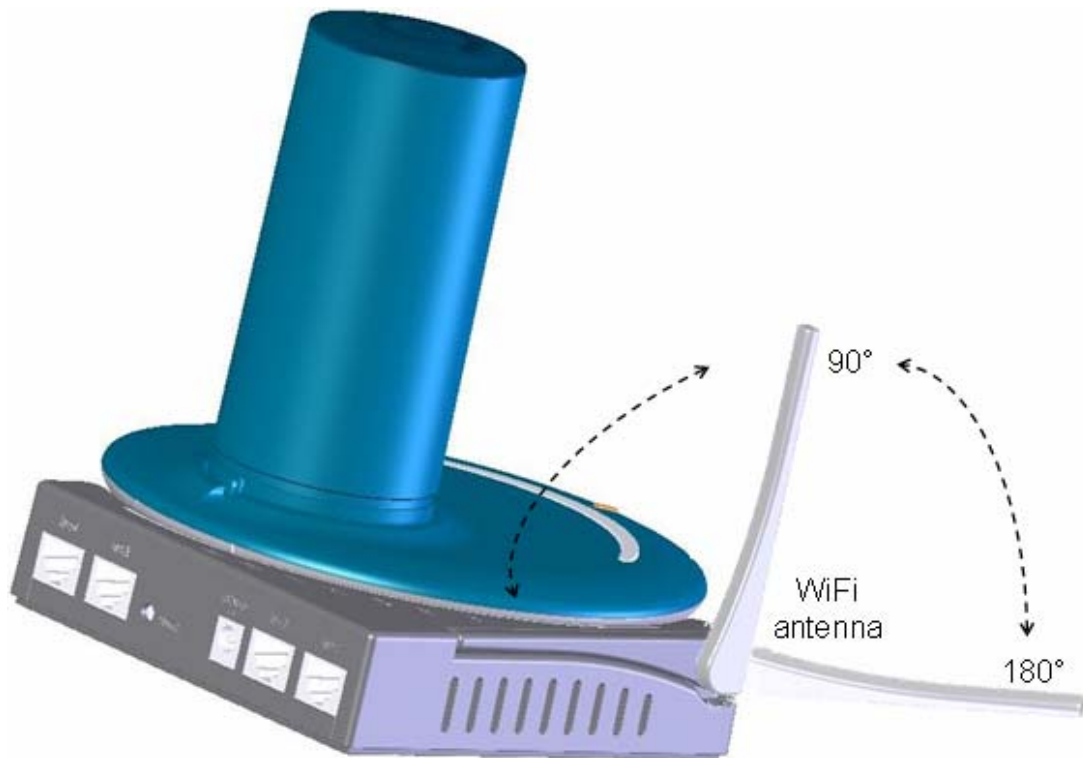


Figure 2-2: EasyWiFi integral WiFi antenna

2.4. Mounting Parts

The EasyWiFi unit provides built-in wall-mounting brackets, desktop-mounting feet, as well as locking latches for mounting (attaching) the EasyST to the EasyWiFi extension module.

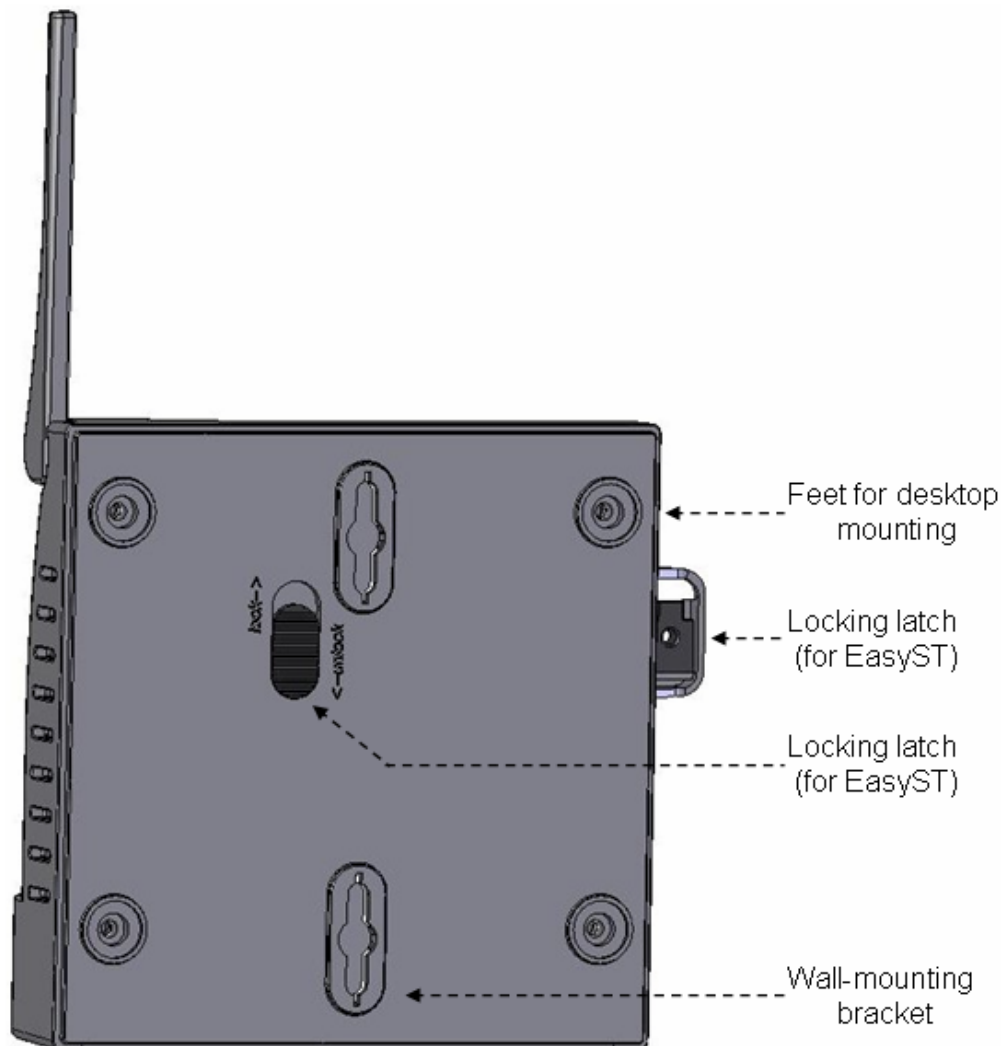


Figure 2-3: EasyWiFi mounting parts (bottom panel)

2.5. LEDs

The EasyWiFi provides LEDs for indicating the status of various operations. These LEDs are located on the top panel for easy viewing, as shown in the figure below:

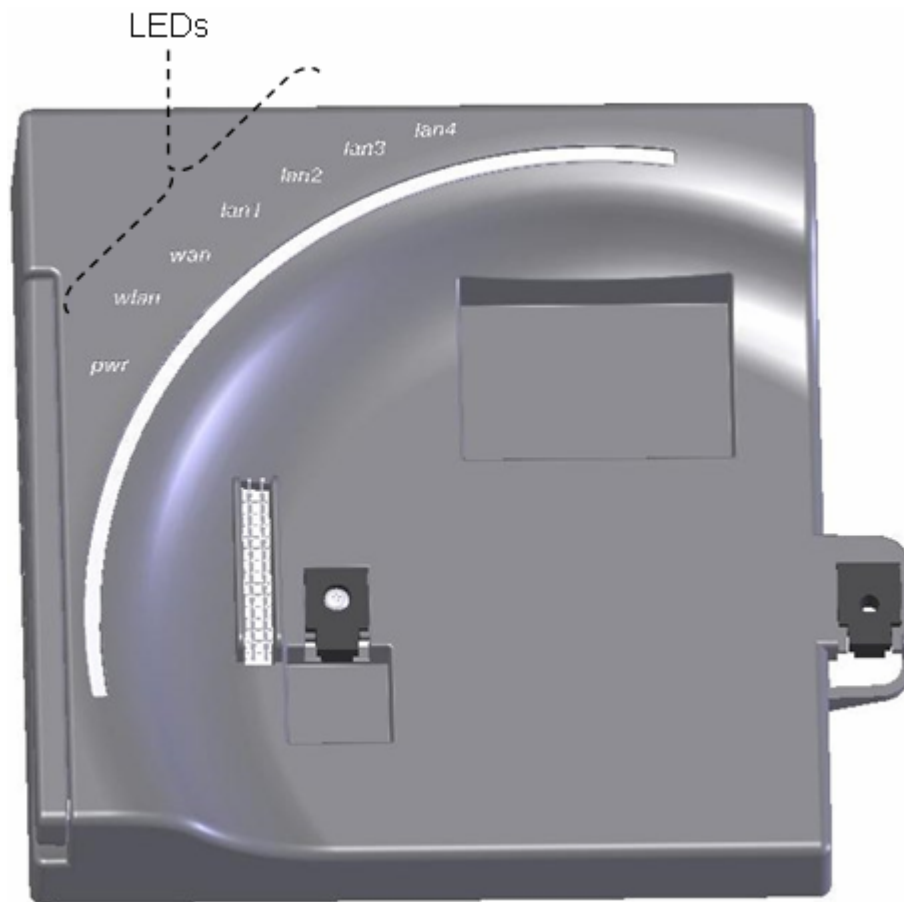


Figure 2-4: EasyWiFi LEDs (top panel)

The EasyWiFi LEDs are described in the table below:

Table 2-3: EasyWiFi LED descriptions

LED	Color	Status	Description
power	Red	On	Unit receiving power
		Flashing	Unit is booting up
		Off	No power
wlan	Green	On	WiFi link with one user or more
		Flashing	Active WiFi link (i.e. data transfer)
		Off	No WiFi link
wan	Green	On	Link (EasyST and EasyWiFi) is active
		Flashing	Activity in 10Mbps - Blinks at 3Hz
			Activity in 100Mbps – Blinks at 12 Hz
		Off	EasyST is not connected
lan1, lan2, lan3, lan4	Green	On	10/100BaseT network device (e.g. PC) is on
		Flashing	Active LAN link (i.e. traffic flow)
		Off	No 10/100BaseT interface connected to port

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Attaching EasyST

The EasyWiFi interfaces with the EasyST by means of a 30-pin connector, located on the EasyWiFi's top panel.

For securing the connection of the EasyST to the EasyWiFi, the EasyWiFi provides two latches that locks and unlocks the EasyST from the EasyWiFi. The latches are located on the EasyWiFi's bottom and side panels.



Figure 3-1: EasyST attached to EasyWiFi

To attach the EasyST to the EasyWiFi:

1. Align the EasyST with the EasyWiFi by aligning the following:
 - EasyST 30-pin female connector with EasyWiFi's 30-pin male connector
 - EasyST RJ-45 port with EasyWiFi RJ-45 port labeled **lan2**
2. Press the EasyST firmly onto the EasyWiFi so that the 30-pin connectors contact and plug into one another.

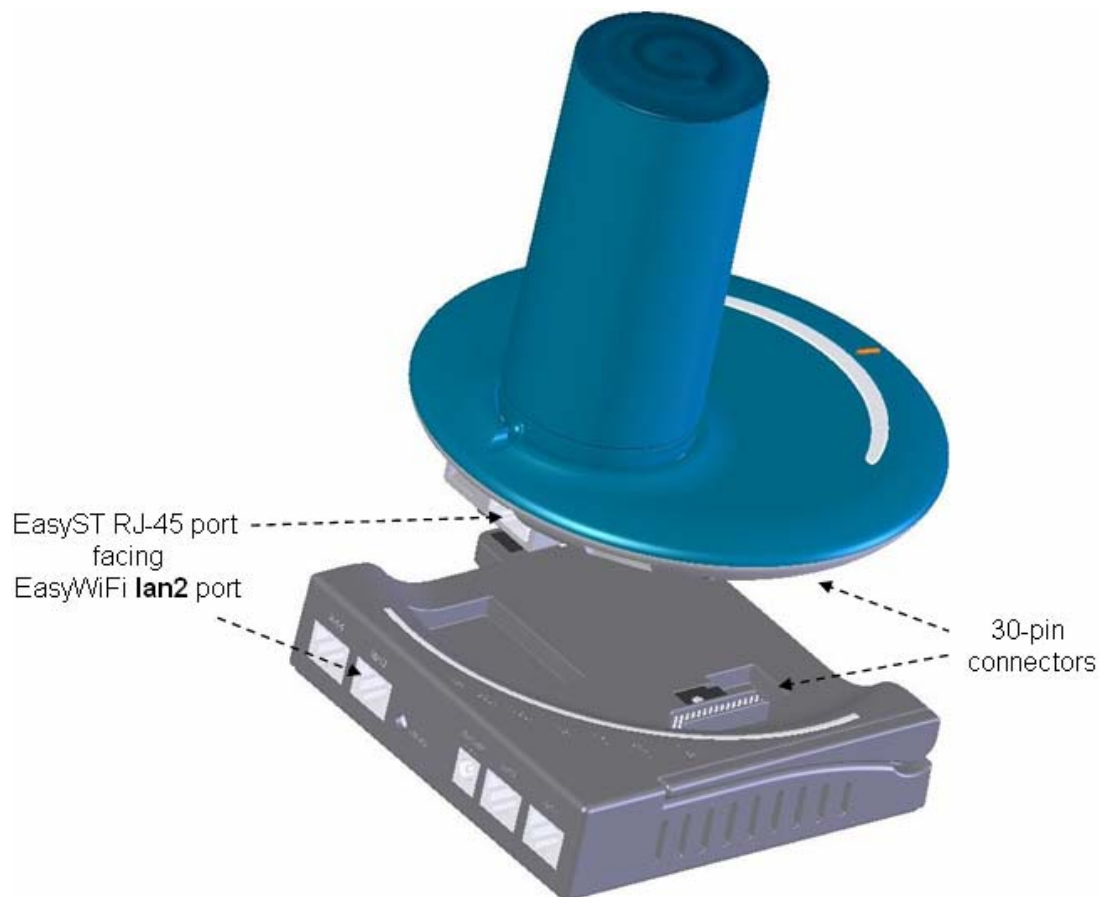


Figure 3-2: Aligning EasyST with EasyWiFi

3. Lock the EasyST to the EasyWiFi using the two latches:
 - a. On the bottom panel, use your thumb to push the latch towards the locking direction (indicated by the "lock" label).
 - b. On the bottom-side panel, use a tool with a pointed edge to move the latch into the EasyST's mounting bracket by inserting the pointed edge into the latch's hole, and then dragging the latch into the EasyST's mounting bracket until it is firmly in place.

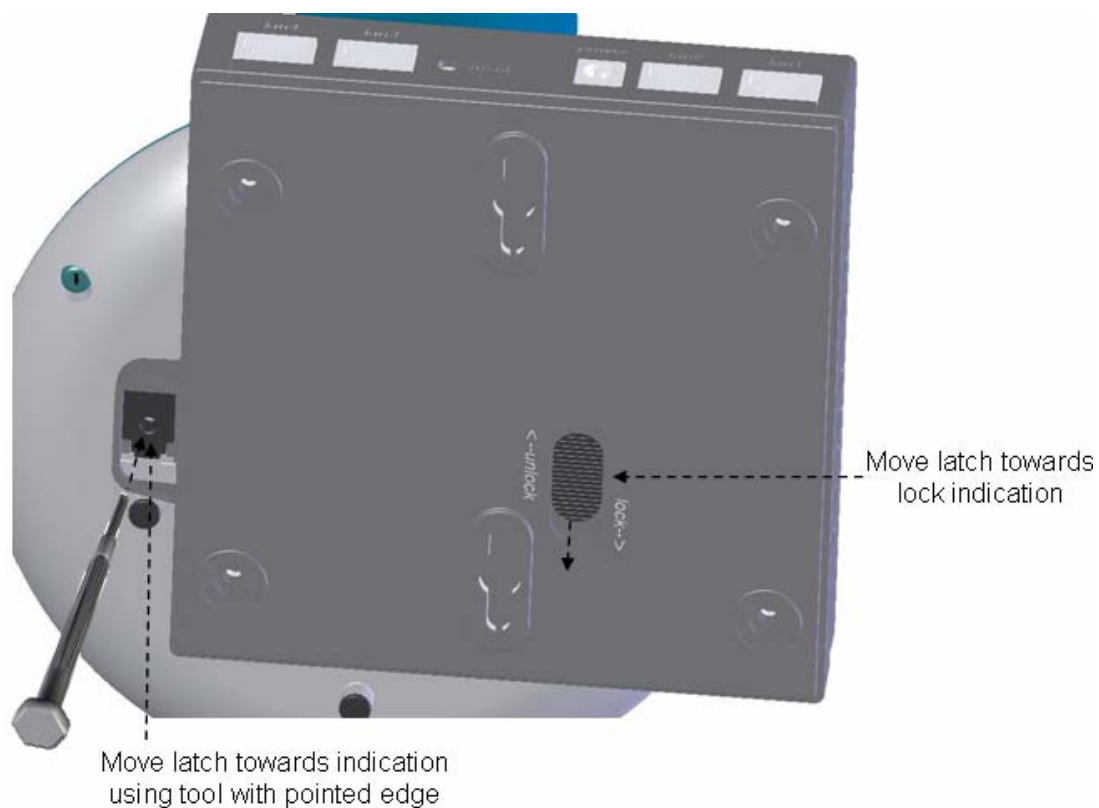


Figure 3-3: EasyWiFi latches (unlock position)

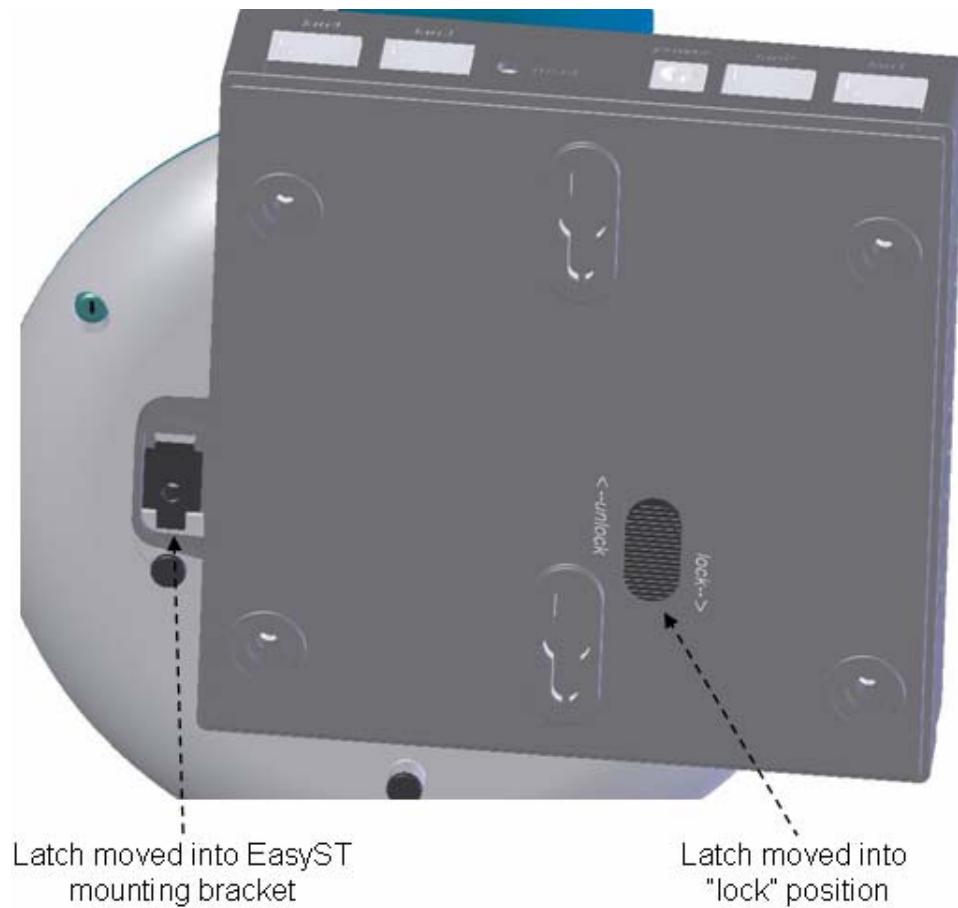


Figure 3-4: EasyWiFi latches (lock position)



Connecting to LAN

EasyWiFi provides four 8-pin RJ-45 ports for 10/100BaseT (Fast Ethernet) interface with the subscriber's network. These LAN ports are located on the back panel and labeled **lan1**, **lan2**, **lan3**, and **lan4**. The LAN ports support Half and Full duplexing mode, Auto-Negotiation, and Auto-MDIX.

The EasyWiFi-to-computer cable setup is listed below:

- **Cable:** straight-through CAT 5 STP Ethernet cable
- **Connector:** 8-pin RJ-45 at both ends
- **Connector pinouts:**

Pin	Function
1	Tx+
2	Tx-
3	Rx+
6	Rx-

To connect EasyWiFi LAN ports to the subscriber's Ethernet network:

1. Plug the Category 5 Ethernet cable into the desired EasyWiFi 8-pin RJ-45 port.
2. Plug the other end of the Category 5 Ethernet cable into your computer's LAN port located at the back of your computer.

The figures below illustrate the EasyWiFi-to-computer cable connection:

Subscriber's computer

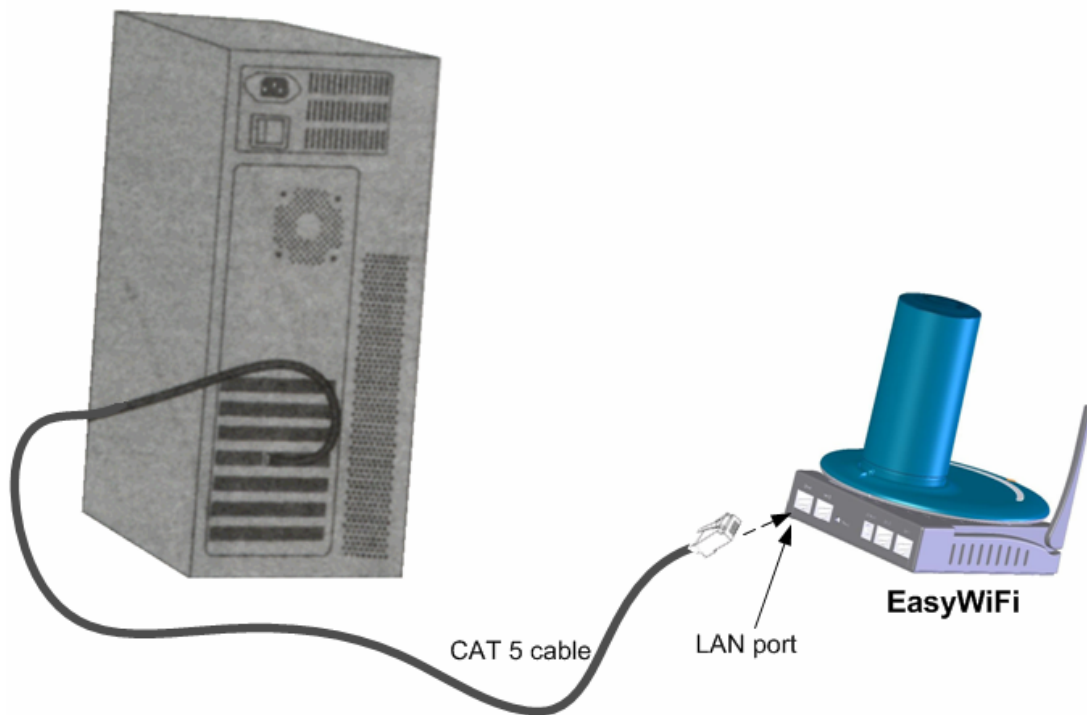


Figure 4-1: Connecting EasyWiFi to subscriber's LAN



Mounting



Warning: The EasyWiFi is an indoor unit and therefore, must be mounted indoors.



Warning: To prevent a fire hazard caused by overheating, do not place the EasyWiFi on a carpeted surface where airflow is restricted.

EasyWiFi is a self-installable indoor unit, requiring no professional installation by a technician.

EasyWiFi must be mounted indoors in a location that provides the following:

- High quality RF reception with the Internet service provider (i.e. base station)
- Accessibility to subscriber's power supply and LAN network with regards to cable lengths
- Strong radio signal strength for the WiFi communication link between EasyWiFi and the subscriber's WiFi computer

EasyWiFi can be mounted in the following ways, depending on the EasyST's antenna configuration:

- **EasyST with clip-on antenna:** mounted horizontally on a desktop
- **EasyST with window-mount external antenna:**
 - Mounted horizontally on a desktop
 - Mounted vertically on a wall

5.1. Desktop Mounting

The EasyWiFi offers quick-and-easy mounting by allowing you to simply place it horizontally on a desktop (as shown in the figure below). The EasyWiFi contains integrated rubber feet (pads) on its bottom panel, providing cushioning as well as insulation from static electricity.

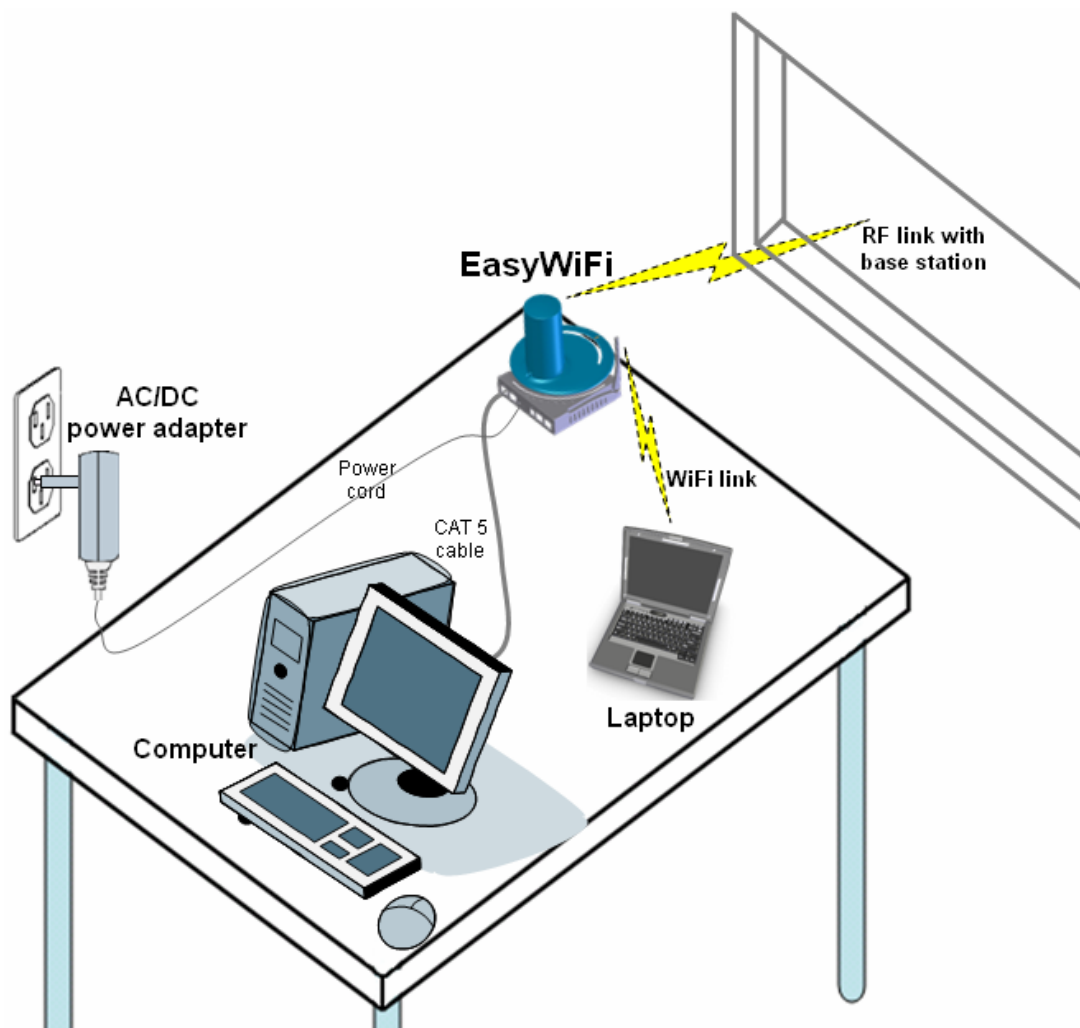


Figure 5-1: Desktop mounting EasyWiFi

5.2. Wall Mounting

When EasyST implements the window-mount, external antenna (i.e. no clip-on antenna), the EasyWiFi can be mounted either on a desk (i.e. desktop mounting) or a wall.

The figure below shows a wall-mounted EasyWiFi. The EasyST is connected to an RF cable that connects to the external antenna (i.e. clip-on antenna is removed). For mounting to a wall, the EasyWiFi provides two mounting hooks molded into its bottom panel, as shown below:

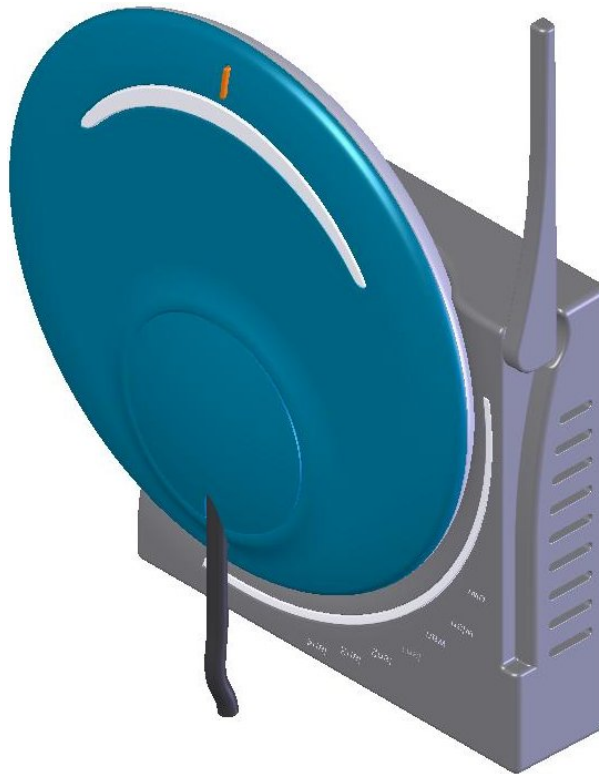


Figure 5-2: Wall-mounted EasyWiFi



Note: The EasyWiFi's WiFi antenna must be fully extended (i.e. 180 degrees) when wall mounted.

To wall mount the EasyWiFi:

1. On the wall, mark the position with a pencil where you want to drill the two holes for the screws onto which the two EasyWiFi mounting hooks will later be guided. The distance between the two wall-mounting hooks (from their centers) is approximately 83 mm (3.27 inches). Ensure that the holes are aligned and level using a spirit level.
2. Drill holes for each hole that you marked in the step above using a no. 6 twist-drill bit.
3. Tap the 6-mm wall anchors (supplied) into each of the drilled holes.

4. Drive the two 0.75-inch screws (supplied) into the wall anchors. Ensure that at least 0.08-inch gap is exposed between the screw head and the wall anchor to allow insertion into the EasyWiFi mounting hooks.
5. Align the screws with the entrance to the two EasyWiFi mounting hooks, and then pull down the EasyWiFi to lock the screws into the mounting hooks.

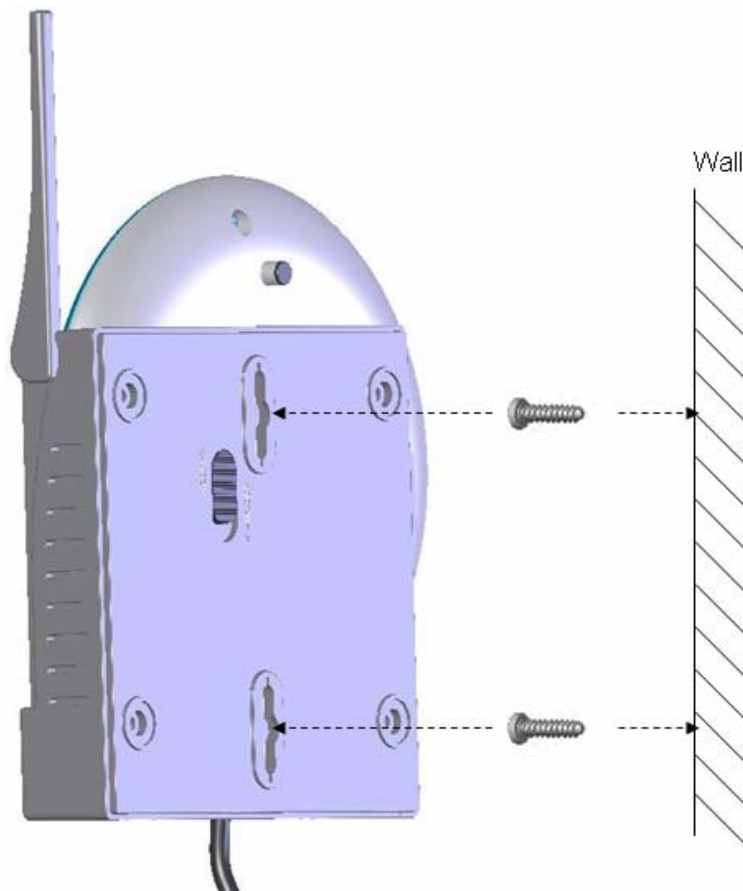


Figure 5-3: Inserting screws into wall mounting hooks

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Connecting Power

EasyWiFi is powered by an AC/DC power supply adapter, supplying 6 VDC and 4 Amperes. The AC/DC adapter is plugged into a standard electrical wall outlet (110/240 VAC; 50/60 Hz).

The power adapter also provides interchangeable prongs (e.g. American vs. European) that can be replaced to suit country electrical standards in which the EasyWiFi is being installed. To view the AC/DC power adapter specifications, see Appendix C, "Power Adapter Specifications".



Note: Any AC/DC power adapter complying with Class 2 and LPS, and safety approved according to national regulations, and that provides rated input of 100-240 V, 50/60 Hz, 0.4 A and output of 6 V, 4 A DC, may be used for powering the EasyWiFi.

6.1. Changing the AC/DC Power Adapter's Prongs

The AC/DC power adapter provides interchangeable prongs to suit electrical wall outlet sockets in the country in which the EasyWiFi is being installed.

To change the plug prongs:

1. Remove the prongs by first moving (with the help of a pen) the **LOCK/OPEN** switch to OPEN position, and then gently sliding the prongs upwards, away from the power cord.
2. Align the desired prongs with the adapter's prong groove, and then slide the prongs onto the adapter in the orientation as shown in the Figure 6-1. Ensure that the prongs reach the end of the prong groove.

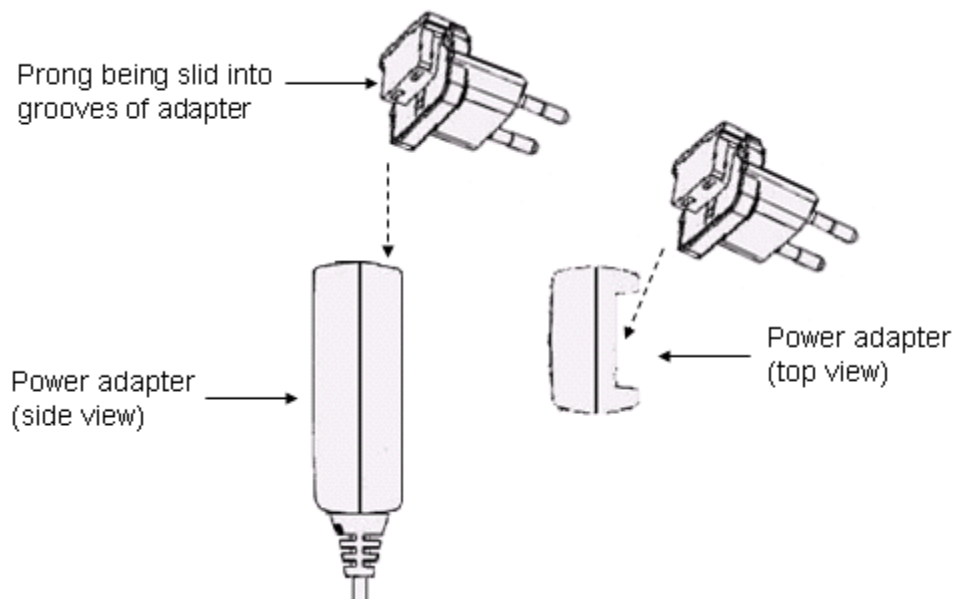


Figure 6-1: Replacing AC/DC power adapter plug prongs

3. Secure the prong in place by moving (with the help of a pen) the **LOCK/OPEN** switch to LOCK position.

6.2. Connecting AC/DC Power Adapter

Once you have attached the plug prongs suitable to your country's electrical wall socket, you are ready to connect the EasyWiFi to the electrical wall outlet.

To connect the EasyWiFi to the power supply:

1. Before plugging the power cord into the electrical wall outlet, plug the AC/DC power adapter's power cable (i.e. DC power jack) into the EasyWiFi's DC power socket (labeled **power**).
2. Plug the prongs of the AC/DC power adapter into the electrical wall outlet.

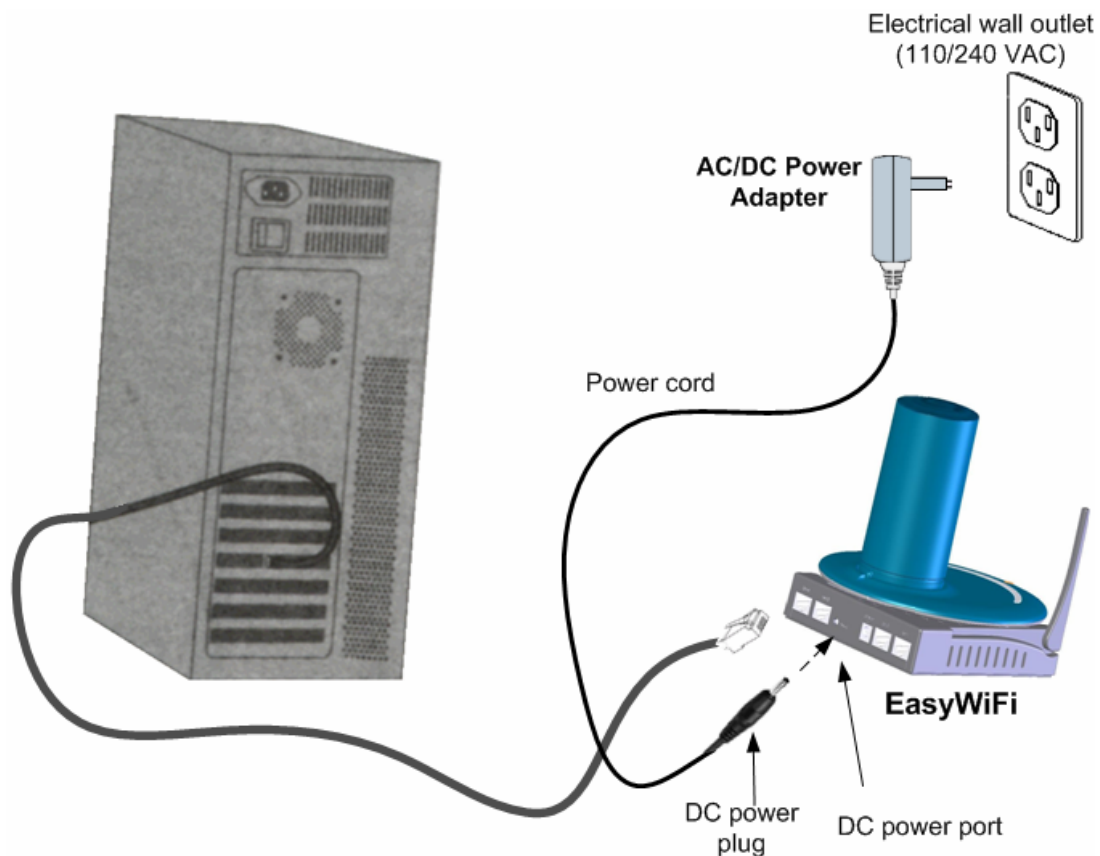


Figure 6-2: Connecting DC power to EasyWiFi

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Resetting EasyWiFi

The EasyWiFi provides a button that enables you to reboot the EasyWiFi as well as reset the EasyWiFi settings to default. This button is located on the EasyWiFi's back panel and labeled **reset**.

To reboot or reset to default the EasyWiFi:

1. Using a tool with a pointed edge, insert the edge into the hole labeled **reset** (located on the back panel next to the DC power jack).

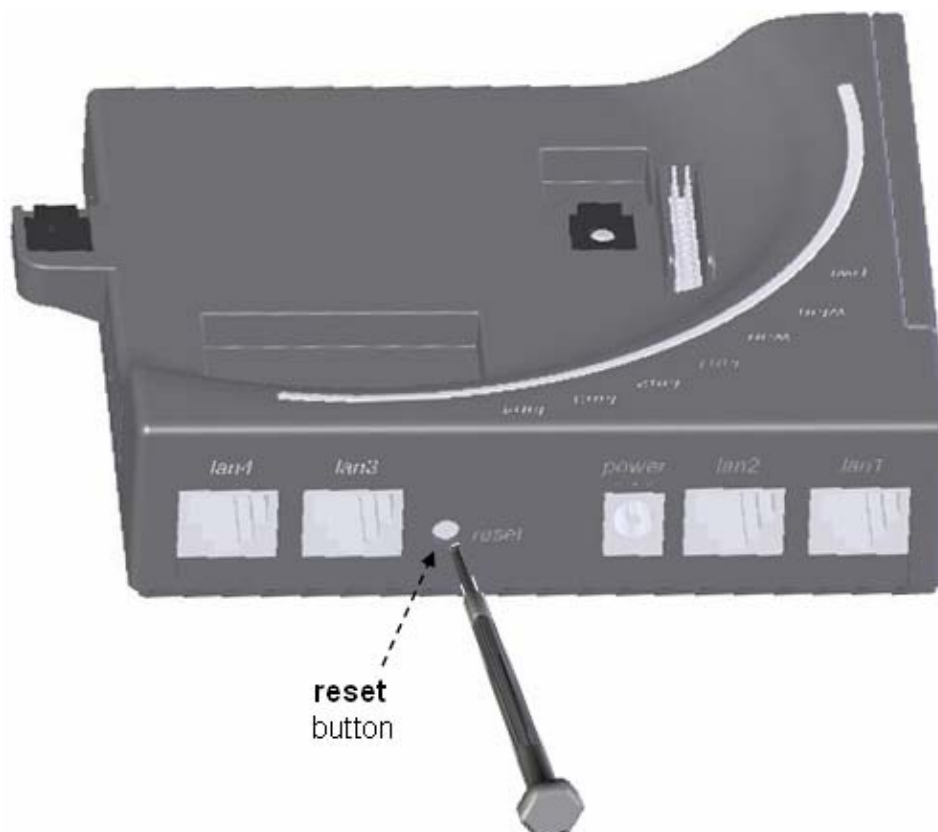
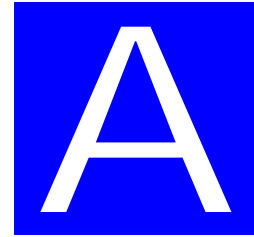


Figure 7-1: Resetting EasyWiFi to default using reset button

2. Push the the tool into the hole until you feel a button being pushed.
 - **To reboot the EasyWiFi:** push the button once and then remove the tool
 - **To reset the EasyWiFi to default settings:** keep the button pressed for at least 7 seconds



FCC Interference Statement

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.

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.

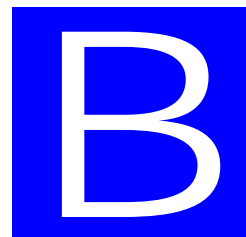
FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IMPORTANT NOTE:

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 20cm between the radiator & your body.

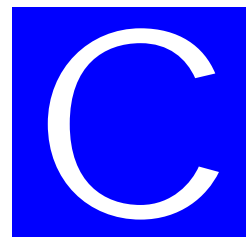
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.



Glossary

BS	Base station
BWA	Broadband wireless access
dB	Decibel
dBm	Power ratio in dB (decibel) of the measured power referenced to one milliwatt
FTP	File Transfer Protocol
GHz	Gigahertz. One GHz represents 1 billion cycles per second
GW	Gateway
HTTP	HyperText Transfer Protocol
Hz	Hertz
IP	Internet protocol
ISP	Internet Service Provider
LAN	Local-Area Network
MAC	The next layer up from the PHY, known as the media access controller
Mbps	Megabits per second (one million bits per second)
MHz	Megahertz (one million cycles per second)
MIB	Management information base
ODU	Outdoor unit associated with an ST
QAM	Quadrature amplitude modulation
QoS	Quality of service, which is used to specify level of data throughput

RF	Radio frequency
Rx	Receive
SNMP	Simple network management protocol
SNR	Signal-to-noise ratio
ST	Subscriber terminal (interchangeable with CPE)
SW	Software
Tx	Transmit
VoIP	Voice over Internet protocol
WiFi	Wireless Fidelity
WiMAX	WiMAX is a wireless industry coalition whose members are organized to advance IEEE 802.16 standards for broadband wireless access (BWA) networks



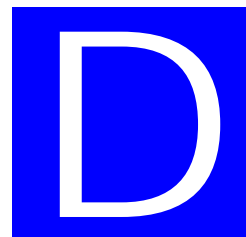
EasyWiFi Specifications

The EasyWiFi specifications are listed in the table below:

Table B-1: EasyWiFi specifications

Parameter		Value
Radio technology	Frequency operation	2412-2472 MHz
	Wireless modulation	<ul style="list-style-type: none">• (IEEE802.11g) Orthogonal Frequency Divisional Multiplexing (OFDM)• (IEEE802.11b) Direct Sequence Spread Spectrum (DSSS)
	WiFi protocols	<ul style="list-style-type: none">• IEEE 802.11b• IEEE 802.11g Japanese Standard ARIB STD-T66
	WiFi antenna	Gain: 1 dBi
	Clients	<ul style="list-style-type: none">• No. of concurrent assigned users: 1,024• No. of concurrent active users: 32
	Tx power max.	19 dBm
Networking	Working modes	Bridge (default) and IP router modes
Interfaces		<ul style="list-style-type: none">• Four 10/100BaseT Ethernet LAN (support Half/Full duplexing, Auto-Negotiation, Auto-MDIX) with subscribers network Radio with EasyST (30-pin IDC connector)• DC power• Default reset button
Compliance	WiFi	<ul style="list-style-type: none">• WiFi certified: FCC Part 15 ClassA; WiFi; WPA, WPA2• 802.11 b/g
	Safety	<ul style="list-style-type: none">• Underwriters Laboratories (UL) 60950 (USA)• IEC 60950 (International)• EN 60950 (ETSI)

Parameter		Value
	Environmental	ETS 300 019 (ETSI)
	EMC	EN 301489 (ETSI) FCC Part 15 Sub Class B
	Radio	<ul style="list-style-type: none"> • FCC Part 15 15.247- 2.4 GHz • EN 300 328 2.4 GHz • TELECOM STD-33/STD-66 (Japan/Telecom)
Management	WiFi/WiMAX	SNMP and Web-based (HTTP)
	SW Upgrade	Via TFTP server (using Web-based tool)
Environmental Conditions	Operating Temperature	0 – 50°C ambient
	Storage temperatures	-20 to +75°C ambient
	Operating Humidity	15 - 90% RH
	Storage Humidity	5 - 95% RH
Mechanical	Ports	<ul style="list-style-type: none"> • WiFi antenna • 4 x 8-pin RJ-45 Ethernet LAN ports (Half/Full duplexing, Auto-Negotiation, Auto-MDIX) • DC power socket • 30-pin IDC connector Button for reset • LEDs for LAN, WAN, WiFi, Power
	Mounting	<ul style="list-style-type: none"> • 2 x wall-mounting brackets • 2 locking clips for attaching EasyST
	Power requirements	<ul style="list-style-type: none"> • Input Voltage / Amperage: 6V/4A • Input Voltage Accuracy: $\pm 3\%$ max. Ripple & Noise: 100mVp-p max <p>Note: supplied by AC/DC adapter from 110/220 VAC outlet</p>
	Dimensions (H x W x L)	30 x 125 x 125 mm
	Weight	210 grams



Power Adapter Specifications

The specifications of the AC/DC power adapter are listed in the table below:

Table C-1: AC/DC power adapter specifications

Parameter		Value
Input	Input voltage	90 to 264 VAC
	Input frequency	47 to 63 Hz
	Input inrush current	<ul style="list-style-type: none">• 30 A at 115 VAC• 60 A at 230 VAC
	Earth leakage	<ul style="list-style-type: none">• 0.4 mA max. @ 115 VAC• 0.8 mA max. @ 230 VAC
Output	Output rating	6V / 4A
	Output voltage accuracy	± 2% max.
	Max. output power	24W
	Line regulation	± 1% max.
	Load regulation (full to half load)	6 ~6.5V
	Transient response (full to half load)	± 1% max. dev. 500 uS recovery
	Temperature coefficient	± 0.04% / °C
	Ripple and noise	100mVp-p max
	Protections	<ul style="list-style-type: none">• Over voltage protection (output voltage 7.5V)• Over power protection• Short circuit protection• Over current protection: 130% ~ 160%
General	Efficiency	70% typical at full load

Parameter		Value
	Hold-up time	5 ms @ 115 VAC full load
	EMI / RFI	VDE and FCC Class B limits
	Dielectric withstand	Input/output: 3000 Vac Input/Ground: 1500 Vac
	Safety meet	UL/CUL UL60950 CE EN55022
	Switching frequency	100 kHz
	Connector for radio	Input: interchangeable prongs Output: DC power jack
	Cable length	1.25 m
	Dimensions	86 × 46 × 33 mm
	Weight	180 g
	MTBF	100,000 hours (MIL-HDBK-217F)
Environmental	Operating temperature	0 to +40°C
	Storage temperature	-20 to +85°C
	Humidity	5 to 95% RH non-condensing
	Vibration	2.4G, 5 to 500 Hz
	Cooling	Free air convection

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Worldwide Headquarters:
Airspan Networks Inc.
777 Yamato Road, Suite 105
Boca Raton, Florida 33431-4408
USA

Tel: +1 561 893 8670
Fax: +1 561 893 8671

Main Operations:
Airspan Communications Ltd.
Cambridge House, Oxford Road,
Uxbridge, Middlesex UB8 1UN
UK

Tel: +44 (0) 1895 467 100
Fax: +44 (0) 1895 467 101

