HiPath Wireless Standalone Access Point, V1.0

User Guide

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Content

1 Welcome

This manual contains instructions for the installation and configuration of the HiPath Wireless Standalone Access Point.

> Please read the following safety instructions and the entire *HiPath Wireless Standalone Access Point Getting Started Guide* before first use. Please also ensure that any children who have access to the HiPath Wireless Standalone Access Point are informed of these safety instructions.

- The HiPath Wireless Standalone Access Point is intended for home and office use.
- Never open the HiPath Wireless Standalone Access Point. If you encounter problems, please contact qualified personnel.
- Only use genuine accessories. The use of any other accessories is dangerous and will void both the warranty and the CE mark.
- Ensure that the HiPath Wireless Standalone Access Point does not come into contact with any liquids including tea, coffee, juice, or soft drinks.

1.1 About this user guide

The Standalone Access Point is a wireless LAN access point using the 802.11 wireless standards (802.11a+b/g) for network communications. Also, the Standalone Access Point bridges network traffic to an Ethernet LAN. The Standalone Access Point is physically connected to a LAN infrastructure. The Standalone Access Point radios can be enabled or disabled in the user interface.

> The Standalone Access Point will operate on the radio bands available in your country. For more information, see Chapter 2, “Regulatory information”.

The *HiPath Wireless Standalone Access Point User Guide* describes how to install, configure, and manage the HiPath Wireless Standalone Access Point.

1.2 Who should use this user guide?

The *HiPath Wireless Standalone Access Point User Guide* is intended for install technicians or others in your organization who are responsible for installing and configuring the Standalone Access Point.

1.3 Chapter descriptions

This user guide contains the following chapters:

- Chapter 1, “Welcome”, describes the target audience, the content of the user guide, and the formatting conventions used in it.
- Chapter 2, “Regulatory information”, provides the regulatory information for the Standalone Access Point.
- Chapter 3, “About the HiPath Wireless Standalone Access Point”, provides an overview of the product and its features and functionality, including creating a cluster.
- Chapter 4, “Installing and configuring the Standalone Access Point”, discusses how to install the Standalone Access Point, how to connect and power the unit, and provides a reference on the LED displays and their significance.
- Chapter 5, “Getting started with a Standalone Access Point”, discusses how to log on to the user interface as well as other procedures, including downloading firmware, changing passwords, and getting help.
- Chapter 6, “Configuring a Standalone Access Point”, provides information on configuring LAN settings, as well as saving and restoring configurations, and upgrading the BootROM.
- Chapter 7, “Troubleshooting the Standalone Access Point”, provides information on rebooting the Standalone Access Point and how to view status information for the Standalone Access Point.
- Chapter 8, “Glossary: Networking terms and abbreviations”, is a glossary of standard industry terms used in this user guide.
- Appendix A, “Appendix: Log codes and messages”, provides a reference list of the codes and messages logged by the Standalone Access Point.
- Appendix B, “Appendix: Supported standards”, provides a reference list of the RFCs that are supported by the Standalone Access Point.

1.4 Related documentation

The following manual contains additional information about the HiPath Wireless Standalone Access Point:

- *HiPath Wireless Standalone Getting Started Guide* provided on the system CD delivered with the Standalone Access Point, describes how to install and configure the HiPath Wireless Standalone Access Point.

1.5 Formatting conventions

The following formatting conventions are used in this guide:

Bold

This font identifies HiPath Wireless Standalone Access Point components, window and dialog box titles, and item names.

Italics

This font identifies references to related documentation.

`Monospace Font`

This font distinguishes text that you should type, or that the computer displays in a message.

ⓘ Notes identify useful information that is not essential, such as reminders, tips, or other ways to perform a task.

⚠ Warnings identify information that is essential. Ignoring a warning can adversely affect the operation of the application.

1.6 Package contents

The HiPath Wireless Standalone Access Point package includes:

- The Standalone Access Point
- The *HiPath Wireless Standalone Access Point Getting Started Guide*
- The Standalone Access Point brackets
- One LAN Ethernet connecting cable

A power supply unit can be ordered separately. (The power supply unit is necessary if PoE is not supported.)

2 Regulatory information

⚠ Warnings identify essential information. Ignoring a warning can lead to problems with the application.

This chapter provides the regulatory information for the Standalone Access Point—AP2630 and AP2640 (AP26XX series).

Configuration of the Standalone Access Point frequencies and power output are controlled by the regional software license and proper selection of the country during initial installation and set-up. Customers are only allowed to select the proper country from their licenced regulatory domain related to that customer's geographic location, thus allowing the proper set-up of Standalone Access Points in accordance with local laws and regulations. The Standalone Access Point must not be operated until properly configured with the correct country setting or it may be in violation of the local laws and regulations.

⚠ Changes or modifications made to the Standalone Access Point which are not expressly approved by Siemens could void the user's authority to operate the equipment.
Only authorized Siemens service personnel are permitted to service the system. Procedures that should be performed only by Siemens personnel are clearly identified in this guide.

2.1 AP2630 Internal Antenna AP, AP2640 External Antenna AP

> Operation in the European Community and rest of the world may be dependant on securing local licenses, certifications, and regulatory approvals.

Optional Approved 3rd Party External Antennas

The AP2640 External Antenna Standalone Access Point can also be used with optional certified external antennas.

Antenna Diversity

There are some limitations for using different antennas and Tx/Rx diversity:

- If **Best** antenna diversity is used for Tx or Rx, then the same antenna model must be used as left and right antennas. In addition, if cables are used to connect external antennas, the cables must be of the same length and similar attenuation. If these rules are not respected, antenna diversity will not function properly and there will be degradation in the link budget in both directions.
- You can choose to install only one antenna provided that both Tx and Rx diversity are configured to use that antenna and only that antenna. You can choose to install one antenna for 11b/g band and one antenna for 11a band, provided that the antenna diversity is configured appropriately on both radios.

2.1.1 United States – FCC Declaration of Conformity Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

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 when the equipment is operated in a residential and business environment. This equipment generates, uses, and radiates radio frequency energy, and if not installed and used in accordance with instructions, may cause harmful interference. However, there is no guarantee that interference will not occur. If this equipment does cause harmful interference, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment or devices.
- Connect the equipment to an outlet other than the receiver's.
- Consult a dealer or an experienced radio/TV technician for suggestions.

This equipment meets the following conformance standards:

USA Conformance Standards

Safety

- UL 60950-1
- UL 2043 Plenum Rated as part of UL 60950-1. Suitable for use in environmental air space in accordance with Section 300.22.C of the National Electrical Code.

EMC

- FCC CFR 47 Part 15, Class B

Radio Transceiver

- FCC ID: REB-APXXX1
- CFR 47 Part 15.247, Subpart C (2.4 GHz)
- CFR 47 Part 15.407, Subpart E (5 GHz)

Other

- IEEE 802.11a (5 Ghz)
- IEEE 802.11b/g (2.4 GHz)
- IEEE 802.3af (PoE)

> The Standalone Access Point must be installed and used in strict accordance with the manufacturer's instructions as described in this guide and the related documentation for the device to which the Standalone Access Point is connected. Any other installation or use of the product violates FCC Part 15 regulations.
>
> Operation of the Standalone Access Point is restricted for indoor use only, specifically in the UNII 5.15 - 5.25 GHz band in accordance with 47 CFR 15.407(e).
>
> This Part 15 radio device operates on a non-interference basis with other devices operating at the same frequency when using antennas provided or other Siemens certified antennas. Any changes or modification to the product not expressly approved by Siemens could void the user's authority to operate this device.

2.1.1.1 FCC RF Radiation Exposure Statement

The Standalone Access Point—AP2630 and AP2640 (AP26XX series) complies with FCC RF radiated exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This device has been tested and has demonstrated compliance when simultaneously operated in the 2.4 GHz and 5 GHz frequency ranges. This device must not be co-located or operated in conjunction with any other antenna or transmitter.

> The radiated output power of the AP26XX Standalone Access Point is far below the FCC radio frequency exposure limits as specified in "Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields" (OET Bullet 65, Supplement C). This equipment should be installed and operated with a minimum distance of 20 centimeters (8 inches) between the radiator and your body or other co-located operating antennas.

2.1.1.2 Optional 3rd Party External Antennas

The AP2640 Standalone Access Point can also be used with optional certified 3rd party antennas. However, in order to comply with the local laws and regulations, an approval may be required by the local regulatory authorities. The following optional antennas have been tested and approved for use with the External Antenna model.

- When using an approved 3rd party external antenna (other than the default), the power must be adjusted according to these tables.
- This device must be professionally installed. The following are the requirements of professional installation:

Equipment marketing

- The device cannot be sold retail to the general public or by mail order. It must be sold to dealers.

Professional installation:

- Installation must be controlled.
- Installed by licensed professionals (equipment sold to dealers who hire installers)
- Installation requires special training (special programming and antenna and cable installations)

Application

- The intended use is generally not for the general public. Instead, it is generally for industry/commercial use.

#	Model	Application	Shape	Gain (dBi)	Frequency (MHz)	Coax Cable Length/Type	Connector Type
Cushcraft							
#1	SR2405135Dxxxxxx	indoor	Directional	5	2400-2500	3 feet / 19AWG CMP(ETL) C(ETL) 9700851	RPSMA
#2	S24493DSxxxxxx	indoor	Omni, 2 inputs	3	2400-2500 4900-5990	3 feet / 19AWG CMP(ETL) C(ETL) 9700851	RPSMA, 2ea.
#3	SL24513Pxxxxxx	indoor	Omni	3	2400-2500 5150-5350	3 feet / 19AWG CMP(ETL) C(ETL) 9700851	RPSMA
#4	S24497Pxxxxxx	indoor	Directional	7	2400-2500 4900-5990	3 feet / 19AWG CMP(ETL) C(ETL) 9700851	RPSMA
Hyperlink Tech							
#5	HG2458CUxxx	indoor	Omni	3	2300-2600 4900-6000	1 foot / 20AWG Coleman Cable 921021	N-female
Maxrad							
#6	MDO24005PTxxxxxx	indoor	Omni, 2 inputs	5.2	2400-2485	3 feet / 19AWG CMP(ETL) C(ETL) 9700851	RPSMA, 2ea.

Table 1 List of FCC approved antennas

The qualification testing and results are based on above described antennas, cable types, lengths, and connector types. Other cable lengths and connector types are also available which are specified by the suffix part of the part numbers (ex. SR2405135Dxxxxxx, where the xxxxxx suffix represents cable length and/or connector type). The antenna feedline used in testing are the mininum cable length. Longer cable may be used with losses greater than or equal to the cables used for testing. The maximum power settings must be adjusted according to these tables.

If one of the following antenna is used, you must select an operating channel (on the **Advanced 802.11b/g** and **Advanced 802.11a** tabs) and the corresponding allowed max power from the values listed in Table 2. DO NOT select a higher power than the value listed in Table 2.

Antenna			**Antenna #1 Cushcraft SR2405135 Dxxxxxx**	**Antenna #2 Cushcraft S24493DSx xxxxx**	**Antenna #3 Cushcraft SL24513Px xxxxx**	**Antenna #4 Cushcraft S24497Pxx xxxx**	**Antenna #5 Hyperlink Tech HG2458CUxx x**	**Antenna #6 Maxrad MDO24005PT xxxxxx**
	Frequency (MHz)	Ch. No.	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)
11b	2412	1	16	18	17	16	17	17
	2417	2	17	17	17	16	17	17
	2422	3	18	18	18	18	18	18
	2427	4	18	18	18	18	18	18
	2432	5	18	18	18	18	18	18
	2437	6	18	18	18	18	18	18
	2442	7	18	18	18	18	18	18
	2447	8	18	18	18	18	18	18
	2452	9	18	18	18	18	18	18
	2457	10	18	18	18	18	18	18
	2462	11	18	18	18	18	18	18

Table 2 FCC Antenna channel-power information

Antenna			**Antenna #1 Cushcraft SR2405135Dxxxxxx**	**Antenna #2 Cushcraft S24493DSxxxxxx**	**Antenna #3 Cushcraft SL24513Pxxxxxx**	**Antenna #4 Cushcraft S24497Pxxxxxx**	**Antenna #5 Hyperlink Tech HG2458CUxxx**	**Antenna #6 Maxrad MDO24005PTxxxxxx**
	Frequency (MHz)	Ch. No.	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)
11g	2412	1	10	13	13	10	12	13
	2417	2	14	15	15	14	15	14
	2422	3	15	16	16	15	16	16
	2427	4	16	18	18	16	17	17
	2432	5	16	18	18	17	18	18
	2437	6	16	18	18	17	18	18
	2442	7	18	18	18	18	18	18
	2447	8	18	18	18	18	18	18
	2452	9	18	18	18	18	18	18
	2457	10	17	17	17	17	17	18
	2462	11	14	14	14	14	14	14

Table 2 FCC Antenna channel-power information

Antenna			**Antenna #1 Cushcraft SR2405135Dxxxxxx**	**Antenna #2 Cushcraft S24493DSxxxxxx**	**Antenna #3 Cushcraft SL24513Pxxxxxx**	**Antenna #4 Cushcraft S24497Pxxxxxx**	**Antenna #5 Hyperlink Tech HG2458CUxxx**	**Antenna #6 Maxrad MDO24005PTxxxxxx**
	Frequency (MHz)	Ch. No.	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)
11a	5180	36	N/S	17	17	17	17	N/S
	5200	40	N/S	17	17	17	17	N/S
	5220	44	N/S	17	17	17	17	N/S
	5240	48	N/S	17	17	17	17	N/S
	5260	52	N/S	18	18	18	18	N/S
	5280	56	N/S	18	18	18	18	N/S
	5300	60	N/S	18	18	18	18	N/S
	5320	64	N/S	18	18	18	18	N/S
	5745	149	N/S	15	N/S	15	15	N/S
	5765	153	N/S	15	N/S	15	15	N/S
	5785	157	N/S	14	N/S	14	14	N/S
	5805	161	N/S	14	N/S	14	14	N/S
	5825	165	N/S	14	N/S	14	14	N/S

Table 2 FCC Antenna channel-power information

> Channels designated as N/S are not supported by the antenna and must not be selected from the **Advanced 802.11b/g** and **Advanced 802.11a** tabs.

> ⚠ For antenna #3 (Cushcraft SL24513Pxxxxxx), do not select the **Auto** channel selection (on the **Advanced 802.11a** tab) for the 11a radio. Instead, only select a channel from the listed supported channels in Table 2.
> Operating on a channel that is NOT supported (N/S) is in violation of the law.

> If you select the **Auto** channel selection (on the **Advanced 802.11b/g** and **Advanced 802.11a** tabs), you must also select the power values listed in Table 3. DO NOT select a higher power than the value listed in Table 3.

Antenna	11a (dBm)	11b/g (dBm)
#1	N/S	10
#2	14	13
#3	17	13
#4	14	10
#5	14	12
#6	N/S	13

Table 3 Auto channel selection

RF Safety Distance

The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with another antenna or transmitter.

2.1.2 Canada - Department of Communications Compliance Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of the Department of Communications.

Cet appareil numerique respecte les limites de bruits radioelectriques applicables aux appareils numeriques de Classe B prescrites dans la norme sur le materiel brouilleur: "Appareils Numeriques," NMB-003 edictee par le ministere des Communications.

This device complies with Part 15 of the FCC Rules and Canadian Standard RSS-210. Operation is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.
- This Class B digital apparatus complies with Canadian ICES-003.
- Operation in the 5150-5250 MHz band is only for indoor usage to reduce potential for harmful interference to co-channel mobile satellite systems.
- The maximum antenna gain permitted for operation in the 5250-5350 MHz band to comply with the e.i.r.p. limit is 4.3 dBi for the internal antenna and 5 dBi for the default external antenna that is shipped with the unit. To comply with the e.i.r.p. limit with the optional external antennas, refer to Table 5.
- The maximum antenna gain permitted for operation in the 5725-5825 MHz band to comply with the e.i.r.p. limit is 4.3 dBi for the internal antenna and 5 dBi for the default external antenna that is shipped with the unit. To comply with the e.i.r.p. limit with the optional external antennas, refer to Table 5.
- Please note that high power radars are allocated as primary users (meaning they have priority) of 5250-5350 MHz and 5650-5850 MHz and these radars could cause interference to LE-LAN devices.

This equipment meets the following conformance standards:

Canada Conformance Standards

Safety

- C22.2 No.60950-1-03
- UL 2043 Plenum Rated as part of UL 60950-1. Suitable for use in environmental air space in accordance with Sections 2-128, 12-010(3) and 12-100 of the Canadian Electrical Code, Part 1, C22.1

EMC

- ICES-003, Class B

Radio Transceiver

- IC: 4702A-APXXXX
- RSS-210 (2.4 GHz and 5GHz)

Other

- IEEE 802.11a (5 GHz)
- IEEE 802.11b/g (2.4 GHz)
- IEEE 802.3af (PoE)

2.1.2.1 Optional 3rd Party External Antennas

The AP2640 Standalone Access Point can also be used with optional certified 3rd party antennas. However, in order to comply with the local laws and regulations, an approval may be required by the local regulatory authorities. The following optional antennas have been tested and approved for use with the External Antenna model.

- When using an approved 3rd party external antenna (other than the default), the power must be adjusted according to these tables.
- This device must be professionally installed. The following are the requirements of professional installation:

Equipment marketing

- The device cannot be sold retail to the general public or by mail order. It must be sold to dealers.

Professional installation:

- Installation must be controlled.
- Installed by licensed professionals (equipment sold to dealers who hire installers)
- Installation requires special training (special programming and antenna and cable installations)

Application

- The intended use is generally not for the general public. Instead, it is generally for industry/commercial use.

#	Model*	Application	Shape	Gain (dBi)	Frequency (MHz)	Coax Cable Length/Type	Connector Type
Cushcraft							
#1	SR2405135Dxxxxxx	indoor	Directional	5	2400-2500	3 feet / 19AWG CMP(ETL) C(ETL) 9700851	RPSMA
#2	S24493DSxxxxxx	indoor	Omni, 2 inputs	3	2400-2500 4900-5990	3 feet / 19AWG CMP(ETL) C(ETL) 9700851	RPSMA, 2ea.
#3	SL24513Pxxxxxx	indoor	Omni	3	2400-2500 5150-5350	3 feet / 19AWG CMP(ETL) C(ETL) 9700851	RPSMA
#4	S24497Pxxxxxx	indoor	Directional	7	2400-2500 4900-5990	3 feet / 19AWG CMP(ETL) C(ETL) 9700851	RPSMA
Hyperlink Tech							
#5	HG2458CUxxx	indoor	Omni	3	2300-2600 4900-6000	1 foot / 20AWG Coleman Cable 921021	N-female
Maxrad							
#6	MDO24005PTxxxxxx	indoor	Omni, 2 inputs	5.2	2400-2485	3 feet / 19AWG CMP(ETL) C(ETL) 9700851	RPSMA, 2ea.

Table 4 List of IC (Industry Canada) approved antennas

ⓘ The qualification testing and results are based on above described antennas, cable types, lengths, and connector types. Other cable lengths and connector types are also available which are specified by the suffix part of the part numbers (ex. SR2405135Dxxxxxx, where the xxxxxx suffix represents cable length and/or connector type). The antenna feedline used in testing are the mininum cable length. Longer cable may be used with losses greater than or equal to the cables used for testing. The maximum power settings must be adjusted according to these tables.

ⓘ If one of the following antenna is used, you must select an operating channel (on the **Advanced 802.11b/g** and **Advanced 802.11a** tabs) and the corresponding allowed max power from the values listed in Table 5. DO NOT select a higher power than the value listed in Table 5.

Antenna			**Antenna #1 Cushcraft** **SR2405135D xxxxxx**	**Antenna #2 Cushcraft** **S24493DSxx xxxx**	**Antenna #3 Cushcraft** **SL24513Pxx xxxx**	**Antenna #4 Cushcraft** **S24497Pxx xxxx**	**Antenna #5 Hyperlink Tech** **HG2458CUxxx**	**Antenna #6 Maxrad** **MDO24005P Txxxxxx**
	Frequency (MHz)	Ch. No.	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)
11b	2412	1	16	18	17	16	17	17
	2417	2	17	17	17	16	17	17
	2422	3	18	18	18	18	18	18
	2427	4	18	18	18	18	18	18
	2432	5	18	18	18	18	18	18
	2437	6	18	18	18	18	18	18
	2442	7	18	18	18	18	18	18
	2447	8	18	18	18	18	18	18
	2452	9	18	18	18	18	18	18
	2457	10	18	18	18	18	18	18
	2462	11	18	18	18	18	18	18

Table 5 IC Antenna channel-power information

Antenna			**Antenna #1 Cushcraft** **SR2405135Dxxxxxx**	**Antenna #2 Cushcraft** **S24493DSxxxxxx**	**Antenna #3 Cushcraft** **SL24513Pxxxxxx**	**Antenna #4 Cushcraft** **S24497Pxxxxxx**	**Antenna #5 Hyperlink Tech** **HG2458CUxxx**	**Antenna #6 Maxrad** **MDO24005PTxxxxxx**
	Frequency (MHz)	Ch. No.	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)
11g	2412	1	10	13	13	10	12	13
	2417	2	14	15	15	14	15	14
	2422	3	15	16	16	15	16	16
	2427	4	16	18	18	16	17	17
	2432	5	16	18	18	17	18	18
	2437	6	16	18	18	17	18	18
	2442	7	18	18	18	18	18	18
	2447	8	18	18	18	18	18	18
	2452	9	18	18	18	18	18	18
	2457	10	17	17	17	17	17	18
	2462	11	14	14	14	14	14	14
11a	5180	36	N/S	17	17	17	17	N/S
	5200	40	N/S	17	17	17	17	N/S
	5220	44	N/S	17	17	17	17	N/S
	5240	48	N/S	17	17	17	17	N/S
	5260	52	N/S	18	18	18	18	N/S
	5280	56	N/S	18	18	18	18	N/S
	5300	60	N/S	18	18	18	18	N/S
	5320	64	N/S	18	18	18	18	N/S
	5745	149	N/S	15	N/S	15	15	N/S
	5765	153	N/S	15	N/S	15	15	N/S
	5785	157	N/S	14	N/S	14	14	N/S
	5805	161	N/S	14	N/S	14	14	N/S
	5825	165	N/S	14	N/S	14	14	N/S

Table 5 IC Antenna channel-power information

Channels designated as N/S are not supported by the antenna and must not be selected from the **Advanced 802.11b/g** and **Advanced 802.11a** tabs.

⚠ For antenna #3 (Cushcraft SL24513Pxxxxxx), do not select the **Auto** channel selection (on the **Advanced 802.11a** tab) for the 11a radio. Instead, only select a channel from the listed supported channels in Table 2.
Operating on a channel that is NOT supported (N/S) is in violation of the law.

If you select the **Auto** channel selection (on the **Advanced 802.11b/g** and **Advanced 802.11a** tabs), you must also select the power values listed in Table 6. DO NOT select a higher power than the value listed in Table 6.

Antenna	11a (dBm)	11b/g (dBm)
#1	N/S	10
#2	14	13
#3	17	13
#4	14	10
#5	14	12
#6	N/S	13

Table 6 Auto channel selection

RF Safety Distance

The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with another antenna or transmitter.

2.1.3 European Community

The Standalone Access Point—AP2630 and AP2640 (AP26XX series) is designed for use in the European Union and other countries with similar regulatory restrictions where the end user or installer is allowed to configure the Standalone Access Point for operation by entry of a country code relative to a specific country. During configuration the software will prompt the user to select a country code. After the country code is selected, the Standalone Access Point will be set up with the proper frequencies and power outputs for that country code.

Although outdoor use may be allowed and may be restricted to certain frequencies and/or may require a license for operation, the Standalone Access Point is intended for indoor use and must be installed in a proper indoor location. Use the installation utility to ensure proper set-up in accordance with all European spectrum usage rules. Contact local Authority for procedure to follow and regulatory information. For more details on legal combinations of frequencies, power levels and antennas, contact Siemens.

Declaration of Conformity with R&TTE Directive of the European Union 1999/5/EC

The following symbol indicates compliance with the Essential Requirements of the R&TTE Directive of the European Union (1999/5/EC).

CE0891ⓘ

> ⚠ The Standalone Access Point is in compliance with the European Directive 2002/95/EC on the restriction of the use of certain hazardous substances (RoHS) in electrical and electronic equipment.

2.1.3.1 Declaration of Conformity in Languages of the European Community

English Hereby, Siemens, declares that this Radio LAN device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Finnish Valmistaja Siemens vakuuttaa täten että Radio LAN device tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.

Dutch Hierbij verklaart Siemens dat het toestel Radio LAN device in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.

Bij deze verklaart Siemens dat deze Radio LAN device voldoet aan de essentiële eisen en aan de overige relevante bepalingen van Richtlijn 1999/5/EC.

French Par la présente Siemens déclare que l'appareil Radio LAN device est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.

Par la présente, Siemens déclare que ce Radio LAN device est conforme aux exigences essentielles et aux autres dispositions de la directive 1999/5/CE qui lui sont applicables.

Swedish Härmed intygar Siemens att denna Radio LAN device står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

Danish Undertegnede Siemens erklærer herved, at følgende udstyr Radio LAN device overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.

German Hiermit erklärt Siemens die Übereinstimmung des "WLAN Wireless Controller bzw. Access Points" mit den grundlegenden Anforderungen und den anderen relevanten Festlegungen der Richtlinie 1999/5/EG.

Greek ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ Siemens ΔΗΛΩΝΕΙ ΟΤΙ Radio LAN device ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.

Icelandic Siemens lysir her med yfir að thessi bunadur, Radio LAN device, uppfyllir allar grunnkrofur, sem gerdar eru i R&TTE tilskipun ESB nr 1999/5/EC.

Italian Con la presente Siemens dichiara che questo Radio LAN device è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.

Spanish Por medio de la presente Siemens declara que el Radio LAN device cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.

Portuguese Siemens declara que este Radio LAN device está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.

Malti Hawnhekk, Siemens, jiddikjara li dan Radio LAN device jikkonforma mal-htigijiet essenzjali u ma provvedimenti ohrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.

New Member States requirements of Declaration of Conformity

Estonian Käesolevaga kinnitab Siemens seadme Radio LAN device vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.

Hungary Alulírott, Siemens nyilatkozom, hogy a Radio LAN device megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.

Slovak Siemens týmto vyhlasuje, že Radio LAN device spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.

Czech Siemens tímto prohlašuje, že tento Radio LAN device je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES."

Slovenian Šiuo Siemens deklaruoja, kad šis Radio LAN device atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.

Latvian Ar šo Siemens deklarē, ka Radio LAN device atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem

Lithuanian Siemens deklaruoja, kad Radio LAN device atitinka 1999/5/EC Direktyvos esminius reikalavimus ir kitas nuostatas".

Polish Niniejszym, Siemens, deklaruję, że Radio LAN device spełnia wymagania zasadnicze oraz stosowne postanowienia zawarte Dyrektywie 1999/5/EC.

European Conformance Standards

Safety

- 73/23/EEC Low Voltage Directive (LVD)
- EN 60950-1

EMC (Emissions / Immunity)

- 89/336/EEC EMC Directive
- EN 55011/CISPR 11, Class B, Group 1 ISM
- EN 55022/CISPR 22, Class B
- EN 55024:1998 Class A, includes IEC/EN 61000-4-2,3,4,5,6,11
- EN 61000-3-2 and -3-3 (Harmonics and Flicker)
- EN 60601-1-2 (EMC immunity for medical equipment)
- EN 50385 (EMF)
- EN/ETSI 301 489-1 & -17

Radio Transceiver

- R&TTE Directive 1999/5/EC
- ETSI/EN 300 328-2 2003-04 (2.4 GHz)
- ETSI/EN 301 893-1 2002-07 (5 GHz)

Other

- IEEE 802.11a (5 Ghz)
- IEEE 802.11b/g (2.4 GHz)
- IEEE 802.3af (PoE)

RoHS

- European Directive 2002/95/EC

2.1.3.2 Optional 3rd Party External Antennas

The AP2640 Standalone Access Point can also be used with optional certified 3rd party antennas. However, in order to comply with the local laws and regulations, an approval may be required by the local regulatory authorities. The following optional antennas have been tested and approved for use with the External Antenna model.

- When using an approved 3rd party external antenna (other than the default), the power must be adjusted according to these tables.
- This device must be professionally installed. The following are the requirements of professional installation:

Equipment marketing

- The device cannot be sold retail to the general public or by mail order. It must be sold to dealers.

Professional installation:

- Installation must be controlled.
- Installed by licensed professionals (equipment sold to dealers who hire installers)
- Installation requires special training (special programming and antenna and cable installations)

Application

- The intended use is generally not for the general public. Instead, it is generally for industry/commercial use.

#	Model	Location	Type	Gain (dBi)	Frequency (MHz)
Huber+Suhner					
#1	SOA 2454/360/7/20/DF	outdoor-capable	Omni	6 8	2400-2500 4900-5875
#2	SPA 2456/75/9/0/DF	outdoor-capable	Planar 2 or 1 inputs	9	2400-2500 5150-5875
#3	SPA 2400/80/9/0/DS	outdoor-capable	Planar 2 inputs	8.5	2300-2500
#4	SWA 0859/360/4/10/V	outdoor-capable	Omni	7	2400-5875
#5	SOA 2400/360/4/0/DS	outdoor-capable	Omni	3.5	2400-2500
#6	SPA 2400/40/14/0/DS	outdoor-capable	Planar 2 inputs	13.5	2400-2500
#7	SWA 2459/360/4/45/V	outdoor-capable	Omni	>4	2400-5875

Table 7 Approved antenna list for Europe

> If one of the following antenna is used, you must select an operating channel (on the **Advanced 802.11b/g** and **Advanced 802.11a** tabs) and the corresponding allowed max power from the values listed in Table 8. DO NOT select a higher power than the value listed in Table 8.

Antenna			Antenna #1 Huber +Suhner SOA 2454/360/7/20/DF	Antenna #2 Huber +Suhner SPA 2456/75/9/0/DF	Antenna #3 Huber +Suhner SPA 2400/80/9/0/DS	Antenna #4 Huber +Suhner SWA 0859/360/4/10/V	Antenna #5 Huber +Suhner SOA 2400/360/4/0/DS	Antenna #6 Huber +Suhner SPA 2400/40/14/0/DS	Antenna #7 Huber +Suhner SWA 2459/360/4/45/V
	Frequency (MHz)	Ch. No.	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)
11b	2412	1	15	14	14	15	15	9	15
	2417	2	15	14	14	15	15	9	15
	2422	3	15	14	14	15	15	9	15
	2427	4	15	14	14	15	15	9	15
	2432	5	15	14	14	15	15	9	15
	2437	6	15	14	14	15	15	9	15
	2442	7	15	14	14	15	15	9	15
	2447	8	15	14	14	15	15	9	15
	2452	9	15	14	14	15	15	9	15
	2457	10	15	14	14	15	15	9	15
	2462	11	15	14	14	15	15	9	15
	2467	12	15	14	14	15	15	9	15
	2472	13	15	14	15	15	15	10	15

Table 8 ETSI Antenna channel-power information

Antenna			Antenna #1 Huber +Suhner SOA 2454/ 360/7/20/ DF	Antenna #2 Huber +Suhner SPA 2456/ 75/9/0/DF	Antenna #3 Huber +Suhner SPA 2400/ 80/9/0/DS	Antenna #4 Huber +Suhner SWA 0859/ 360/4/10/V	Antenna #5 Huber +Suhner SOA 2400/ 360/4/0/DS	Antenna #6 Huber +Suhner SPA 2400/ 40/14/0/DS	Antenna #7 Huber +Suhner SWA 2459/ 360/4/45/V
	Frequency (MHz)	Ch. No.	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)
11g	2412	1	15	13	14	15	15	9	15
	2417	2	15	13	14	15	15	9	15
	2422	3	15	13	14	15	15	9	15
	2427	4	15	13	14	15	15	9	15
	2432	5	15	13	14	15	15	9	15
	2437	6	15	13	14	15	15	9	15
	2442	7	15	14	14	15	15	10	15
	2447	8	15	14	14	15	15	10	15
	2452	9	15	14	14	15	15	10	15
	2457	10	15	14	14	15	15	10	15
	2462	11	15	14	14	15	15	10	15
	2467	12	15	14	14	15	15	10	15
	2472	13	15	13	13	15	15	9	15

Table 8 ETSI Antenna channel-power information

Antenna			Antenna #1 Huber +Suhner SOA 2454/ 360/7/20/ DF	Antenna #2 Huber +Suhner SPA 2456/ 75/9/0/DF	Antenna #3 Huber +Suhner SPA 2400/ 80/9/0/DS	Antenna #4 Huber +Suhner SWA 0859/ 360/4/10/V	Antenna #5 Huber +Suhner SOA 2400/ 360/4/0/DS	Antenna #6 Huber +Suhner SPA 2400/ 40/14/0/DS	Antenna #7 Huber +Suhner SWA 2459/ 360/4/45/V
	Frequency (MHz)	Ch. No.	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)	Power limit (dBm)
11a	5180	36	16	16	N/S	16	N/S	N/S	16
	5200	40	16	16	N/S	16	N/S	N/S	16
	5200	44	16	16	N/S	16	N/S	N/S	16
	5240	48	16	16	N/S	16	N/S	N/S	16
	5260	52	16	16	N/S	16	N/S	N/S	16
	5280	56	16	16	N/S	16	N/S	N/S	16
	5300	60	16	16	N/S	16	N/S	N/S	16
	5320	64	16	16	N/S	16	N/S	N/S	16
	5500	100	20	19	N/S	20	N/S	N/S	20
	5520	104	20	19	N/S	20	N/S	N/S	20
	5540	108	20	19	N/S	20	N/S	N/S	20
	5560	112	20	19	N/S	20	N/S	N/S	20
	5580	116	20	19	N/S	20	N/S	N/S	20
	5600	120	20	19	N/S	20	N/S	N/S	20
	5620	124	20	19	N/S	20	N/S	N/S	20
	5640	128	20	19	N/S	20	N/S	N/S	20
	5660	132	20	19	N/S	20	N/S	N/S	20
	5680	136	20	19	N/S	20	N/S	N/S	20
	5700	140	20	19	N/S	20	N/S	N/S	20

Table 8 ETSI Antenna channel-power information

Channels designated as N/S are not supported by the antenna and must not be selected from the **Advanced 802.11b/g** and **Advanced 802.11a** tabs.

> If you select the **Auto** channel selection (on the **Advanced 802.11b/g** and **Advanced 802.11a** tabs), you must also select the power values listed in Table 9. DO NOT select a higher power than the value listed in Table 9.

Antenna	11a (dBm)	11b/g (dBm)
#1	16	15
#2	16	13
#3	N/S	13
#4	16	15
#5	N/S	15
#6	N/S	9
#7	16	15

Table 9 Auto channel selection

RF Safety Distance

The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with another antenna or transmitter.

2.1.3.3 Conditions of Use in the European Community

The Standalone Access Point—AP2630 and AP2640 (AP26XX series) with Internal and External antennas are designed and intended to be used indoors. Some EU countries allow outdoor operation with limitations and restrictions, which are described in this section. It is the responsibility of the end user to ensure operation in accordance with these rules, frequencies, and transmitter power output. The Standalone Access Point must not be operated until properly configured for the customer’s geographic location.

⚠	The user or installer is responsible to ensure that the Standalone Access Point is operated according to channel limitations, indoor/outdoor restrictions, license requirements, and within power level limits for the current country of operation. A configuration utility has been provided with the Standalone Access Point to allow the end user to check the configuration and make necessary configuration changes to ensure proper operation in accordance with the spectrum usage rules for compliance with the European R&TTE directive 1999/5/EC. The Standalone Access Point with Internal and External antennas are designed to be operated only indoors within all countries of the European Community. Some countries require limited channels of operation. These restrictions are described in this section.

ⓘ	Please follow the instructions in this user guide to properly configure the Standalone Access Point.
	● The Standalone Access Point requires the end user or installer to ensure that they have a valid license prior to operating the Standalone Access Point. The license contains the region and the region exposes the country codes which allow for proper configuration in conformance with European National spectrum usage laws.
	● There is a default group of settings in each Standalone Access Point. There is the ability to change these settings. The user or installer is responsible to ensure that each Standalone Access Point is properly configured.
	● The software within the Standalone Access Point will automatically limit the allowable channels and output power determined by the selected country code. Selecting the incorrect country of operation or identifying the proper antenna used, may result in illegal operation and may cause harmful interference to other systems.
	● This device employs a radar detection feature required for European Community operation in the 5 GHz band. This feature is automatically enabled when the country of operation is correctly configured for any European Community country. The presence of nearby radar operation may result in temporary interruption of operation of this device. The radar detection feature will automatically restart operation on a channel free of radar.
	● The 5 GHz Turbo Mode feature is not enabled for use on the Standalone Access Point.
	● The **Auto** channel setting of the 5 GHz described in this user guide must always remain enabled to ensure that automatic 5 GHz channel selection complies with European requirements.

● The 5150- 5350 MHz band, channels 36, 40, 44, 48, 52, 56, 60, or 64, are restricted to indoor use only.
● The Standalone Access Point with external antenna must be used only with the antennas that are certified by Siemens.
● The 2.4 GHz band, channels 1 - 13, may be used for indoor or outdoor use but there may be some channel restrictions.
● In Italy, the end user must apply for a license from the national spectrum authority to operate outdoors.
● In Belgium, outdoor operation is only permitted using the 2.46 - 2.4835 GHz band: Channel 13.
● In France, outdoor operation is only permitted using the 2.4 - 2.454 GHz band: Channels 1 - 7.

2.1.4 Certifications of Other Countries

The Standalone Access Point—AP2630 and AP2640 (AP26XX series) has been certified for use in the countries listed in the table below. When the Standalone Access Point is configured, the user is prompted to select a country code. Once the correct country code is selected, the Standalone Access Point is set up with the proper frequencies and power outputs for that country code.

> It is the responsibility of the end user to select the proper country code for the country the device will be operated within or run the risk violating local laws and regulations.

Optional 3rd Party External Antennas

The AP2640 Standalone Access Point can also be used with optional certified 3rd party antennas. However, in order to comply with the local laws and regulations, an approval may be required by the local regulatory authorities.

Other Country Specific Compliance Standards, Approvals and Declarations

Australia and New Zealand

- AS/NZS 4288 (Radio via EU standards)
- AS/NZS 60950.1 (Safety)
- AS/NZS 3548 (Emissions via EU standards – ACMA)
- IEEE 802.11a/b/g
- IEEE 802.3af (PoE)
- EN 300 328-2:2003-04 (2.4 GHz)
- EN 301 893-1:2003-08 (5 GHz)
- EN 301 489-17:2002-08 (RLAN)

2.2 Country support list

Spectrum	**11b/g Band 1 2.4-2.472/ 2.4835 GHz**	**11a Band 1 5.15-5.25 GHz**	**11a Band 2 5.25-5.35 GHz**	**11a Band 3 5.47-5.725 GHz**	**11a Band 4 5.725-5.825/ 5.850 GHz**
Channel #	**1-11/13**	**36, 40, 44, 48**	**52, 56, 60, 64**	**100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140**	**149, 153, 157, 161 (165)**
Argentina	11b & g 11 channels	Not supported	4 channels	Not supported	4 channels
Australia	11b & g 13 channels	4 channels	4 channels	Not supported	4 channels
Austria	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Belgium	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Bosnia & Herzegovina	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Brazil	11b & g 13 channels	4 channels	4 channels	11 channels	5 channels
Bulgaria	11b & g l13 channels	4 channels	2 channels	11 channels	Not supported
Canada	11b & g 11 channels	4 channels	4 channels	Not supported	5 channels
Chile	11b & g 13 channels	4 channels	4 channels	Not supported	5 channels
China	11b & g 13 channels	Not supported	Not supported	Not supported	5 channels
Croatia	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Cyprus	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Czech Rep.	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported

Table 10 Country support list

Spectrum	**11b/g Band 1 2.4-2.472/ 2.4835 GHz**	**11a Band 1 5.15-5.25 GHz**	**11a Band 2 5.25-5.35 GHz**	**11a Band 3 5.47-5.725 GHz**	**11a Band 4 5.725-5.825/ 5.850 GHz**
Channel #	**1-11/13**	**36, 40, 44, 48**	**52, 56, 60, 64**	**100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140**	**149, 153, 157, 161 (165)**
Denmark	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Estonia	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Finland	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
France	11b & g 13 channels	4 channels	4 channels	Not supported	Not supported
Germany	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Greece	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Hong Kong	11b & g 13 channels	4 channels	4 channels	Not supported	5 channels
Hungary	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Iceland	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
India	11b & g 13 channels	4 channels	4 channels	Not supported	5 channels
Ireland	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Israel	11b & g 13 channels	4 channels	4 channels	Not supported	Not supported
Italy	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Japan	11b 14 channels 11g 13 channels	4 channels	4 channels	Not supported	Not supported
Korea (South)	11b & g 13 channels	4 channels	4 channels	5 channels	4 channels

Table 10 Country support list

Spectrum	**11b/g Band 1 2.4-2.472/ 2.4835 GHz**	**11a Band 1 5.15-5.25 GHz**	**11a Band 2 5.25-5.35 GHz**	**11a Band 3 5.47-5.725 GHz**	**11a Band 4 5.725-5.825/ 5.850 GHz**
Channel #	**1-11/13**	**36, 40, 44, 48**	**52, 56, 60, 64**	**100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140**	**149, 153, 157, 161 (165)**
Kuwait	11b & g 13 channels	Not supported	Not supported	Not supported	Not supported
Latvia	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Lithuania	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Luxembourg	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Macau	11b & g 13 channels	Not supported	Not supported	Not supported	5 channels
Malaysia	11b & g 13 channels	Not supported	4 channels	Not supported	5 channels
Malta	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Mexico	11b & g 13 channels	4 channels	4 channels	Not supported	Not supported
Netherlands	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
New Zealand	11b & g 13 channels	4 channels	4 channels	Not supported	5 channels
Norway	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Pakistan	11b 13 channels	Not supported	Not supported	Not supported	Not supported
Poland	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Portugal	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Puerto Rico (USA)	11b & g 11 channels	4 channels	4 channels	Not supported	5 channels

Table 10 Country support list

Spectrum	**11b/g Band 1 2.4-2.472/ 2.4835 GHz**	**11a Band 1 5.15-5.25 GHz**	**11a Band 2 5.25-5.35 GHz**	**11a Band 3 5.47-5.725 GHz**	**11a Band 4 5.725-5.825/ 5.850 GHz**
Channel #	**1-11/13**	**36, 40, 44, 48**	**52, 56, 60, 64**	**100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140**	**149, 153, 157, 161 (165)**
Qatar	11b 13 channels	Not supported	Not supported	Not supported	Not supported
Romania	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Russia	11b 13 channels	Not supported	Not supported	Not supported	Not supported
Serbia & Montenegro	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Singapore	11b & g 13 channels	4 channels	4 channels	Not supported	5 channels
Slovakia	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Slovenia	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
South Africa	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Spain	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Sweden	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Switzerland & Liechtenstein	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
Taiwan	11b & g 11 channels	Not supported	3 channels	11 channels	4 channels
Thailand	11b & g 13 channels	Not supported	Not supported	Not supported	Not supported
Turkey	11b & g 13 channels	4 channels	4 channels	Not supported	Not supported

Table 10 Country support list

Spectrum	**11b/g Band 1 2.4-2.472/ 2.4835 GHz**	**11a Band 1 5.15-5.25 GHz**	**11a Band 2 5.25-5.35 GHz**	**11a Band 3 5.47-5.725 GHz**	**11a Band 4 5.725-5.825/ 5.850 GHz**
Channel #	**1-11/13**	**36, 40, 44, 48**	**52, 56, 60, 64**	**100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140**	**149, 153, 157, 161 (165)**
UAE	11b 13 channels	Not supported	Not supported	Not supported	Not supported
UK	11b & g 13 channels	4 channels	4 channels	11 channels	Not supported
USA	11b & g 11 channels	4 channels	4 channels	Not supported	5 channels
Venezuela	11b & g 13 channels	Not supported	Not supported	Not supported	Not supported
Vietnam	11b & g 13 channels	Not supported	Not supported	Not supported	Not supported

Table 10 Country support list

3 About the HiPath Wireless Standalone Access Point

The Standalone Access Point provides high quality and reliable wireless communication. Based on a third generation WLAN topology, the Standalone Access Point makes wireless practical for small and medium-scale enterprises (SME). This solution provides the security and manageability required by enterprises and service providers alike.

The Standalone Access Point is a dual-band access point, with IEEE 802.11a+b/g radios, which implements the following features:

- A standalone access point entry solution for the SME market
- End-to-end solution for wireless real-time IP communication and HiPath integration
- Seamless mobility
- Best-in-class voice quality, multimedia enabled
- Strong SME level security
- Ease of deployment and operation

3.1 Understanding conventional wireless LANs

Wireless communication between two or more computers requires that each computer is equipped with a receiver/transmitter—a WLAN Network Interface Card (NIC)—capable of exchanging digital information over a common radio frequency. This is called an ad hoc configuration. An ad hoc network allows wireless devices to communicate with each other. This is known as an Independent Basic Service Set (IBSS).

An alternative to the ad hoc configuration is the use of an access point. This may be a dedicated hardware router or a computer running special software. Computers and other wireless devices communicate with each other through this access point. The IEEE 802.11 standard defines an access point as a device that allows other wireless devices to communicate with a distribution system. This is known as a Basic Service Set (BSS) or an infrastructure network.

For the wireless devices to communicate with computers on a wired network, the access points must be connected into the wired network, and provide access to the networked computers. This is called bridging. Clearly, there are security issues and management scalability issues in this arrangement.

3.2 Understanding the Standalone Access Point

The Standalone Access Point is a wireless LAN access point. The Standalone Access Point also provides local processing such as encryption. In addition to the Standalone Access Point, the solution provides an optional DHCP Server component, which is standard for enterprise and service provider networks. Standalone Access Points are cost-effective, easy to manage, and easy to deploy.

Here are some advantages the Standalone Access Point offers:

Enhanced security	The Standalone Access Point user interface is secured by user IDs and passwords, as well as forms-based authentication. The Standalone Access Point also allows the user to select no security, WEP security, or WPA-PSK security.
Roaming within the subnet	The Standalone Access Point offers the creation and maintenance of a roaming cluster, ensuring fast handover of mobile clients within the roaming cluster.
Troubleshooting capability	The Standalone Access Point logs system and session activity and provides reports to aid in troubleshooting analysis.

Table 11 Advantages of the Standalone Access Point

3.3 Standalone Access Point and your network

Using the Standalone Access Point requires an understanding of its components and security features.

3.3.1 Standalone Access Point network components

Each wireless device sends IP packets in the IEEE 802.11 standard to the Standalone Access Point. The Standalone Access Point bridges the traffic between the wireless device and the network.

802.11 IP packet transmission

802.11 beacon & probe, wireless device associates with a Standalone Access Point by its SSID

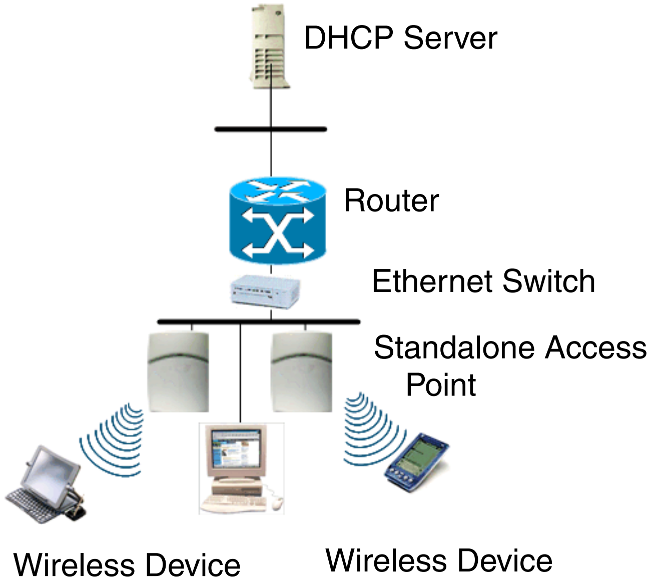


Figure 1 Network traffic flow diagram

For more information on the DHCP Server, refer to the HiPath Wireless documentation.

3.3.2 About network security

The Standalone Access Point provides features and functionality to control network access. These are based on standard wireless network security practices. Current wireless network security methods provide a degree of protection. These methods include an open system that rely on Service Set Identifiers (SSIDs).

The Standalone Access Point supports the following encryption approaches:

- **Wired Equivalent Privacy (WEP)** – A security protocol for wireless local area networks defined in the IEEE 802.11b standard that provides static key management, and WEP 40-bit, 104-bit, and 128-bit ciphers. The WEP protocol provides minimal security.
- **Wi-Fi Protected Access version 1 (WPA v.1)** – A security protocol with Temporal Key Integrity Protocol (TKIP) that provides Pre-shared Master Key management, and a WEP 128-bit cipher. The WPA v.1 protocol provides good security.
- **Wi-Fi Protected Access version 2 (WPA v.2)** – A security protocol with Advanced Encryption Standard (AES) that provides Pre-shared Master Key management, and an AES 128-bit cipher. The WPA v.2 protocol provides the best security. It is highly recommended to use WPA v.2.
- **Media Access Control address(MAC)** – In addition, MAC address filters are used in securing the network. Authentication by MAC address provides a method of access control for a user as it associates with the access point based on the device's MAC address.

3.3.3 About Quality of Service

The Standalone Access Point provides advanced Quality of Service (QoS) management in order to provide better network traffic flow. Such standards include:

- **WMM (Wi-Fi Multimedia)** – Enabled per VNS on the Standalone Access Point. For devices with WMM or 802.1e enabled, the standard provides multimedia enhancements for audio, video, and voice applications. WMM and 802.11e shorten the time between transmitting packets for higher priority traffic.
- **IP ToS (Type of Service) or DSCP (Diffserve Codepoint)** – The ToS/DSCP field in the IP header of a frame is used to indicate the priority and QoS for each frame.
- **802.11e** – If enabled, the Standalone Access Point will accept 802.11e client associations, and will classify and prioritize the downlink traffic for all 802.11e clients. 802.11e clients will also classify and prioritize the uplink traffic.

  When **Priority Override** is enabled, the configured User Priority will determine the transmit queue and the user priority for the wireless QoS packets (WMM or 802.11e) in the downlink direction. The User Priority value is also used to tag the VLAN Priority field for the uplink traffic if the VLAN tagging is enabled for this VNS.

3.4 About clustering

The Standalone Access Point must operate in cluster setup. The purpose of the cluster is to limit the number of access points in it, and to enable roaming. Secure Inter-Access Point Protocol (SIAPP) is used to build cluster information in each access point. All access points in the same roaming cluster must be on the same subnet.

3.4.1 Forming a cluster

A cluster is formed when an access point is connected with one or more additional access points. A cluster is identified by the cluster name, based on the SSID. All Standalone Access Points within the cluster have a common cluster name. An access point can have a state of either Master, Slave, or Register. In a cluster, one access point must be in the Master state. The number of access points in the cluster at any time cannot be larger than ten, including the Master and Slave state access points, and their radios are enabled. The radios are disabled for all Register state access points.

The access point in the Master state broadcasts an update packet periodically, which contains the list of the access points currently registered with the cluster. The first access point listed is the Master, then the first Slave, the second Slave, and so on.

4 Installing and configuring the Standalone Access Point

Prior to using the Standalone Access Point, it must be properly installed and configured.

4.1 Installing a Standalone Access Point

To install the Standalone Access Point:

1. Unpack the Standalone Access Point from its shipment carton, and check that all parts are present. For more information, see *HiPath Wireless Standalone Access Point Getting Started Guide* delivered with the device.
2. Mount the wall bracket, using 3 screws, near the LAN Ethernet cable plug on the wall.

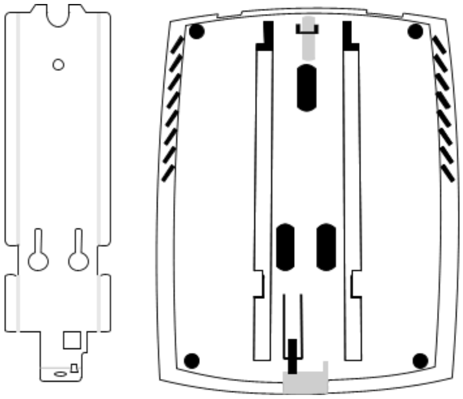


Figure 2 Wall bracket and rearview of Standalone Access Point

3. Press the back of the Standalone Access Point onto the bracket, aligning it with the open notches in the bracket. Then slide it downward until the security spring clip holds it in place.

   To remove the Standalone Access Point, release the spring clip by inserting an Allen key (or other similar tool) into the small hole at the bottom of the bracket. Then slide the case up the bracket and lift off the Standalone Access Point.
4. Insert the plastic spreading rivet through the hole at the bottom of the bracket and into the Standalone Access Point case. Then screw in the plastic screw. This spreads the rivet and locks the case to the bracket. To remove the Standalone Access Point, use a screwdriver to remove the screw.

4.2 Connecting and powering the Standalone Access Point

> ⚠ This device must not be connected to a LAN segment with outdoor wiring. Ensure that all cables are run correctly to avoid strain. Replace the power supply adapter immediately, if it shows any signs of damage.

You can connect the LAN and power up the Standalone Access Points in one of three ways:

- **Power over Ethernet (PoE)** – If your network is already set up with PoE, attach the LAN ethernet cable to the RJ45 ethernet connector at the top of the Standalone Access Point. For this method you can use a regular Ethernet cable.
- **Power over Ethernet: Adding a PoE injector** – If your network is not set up with PoE, you can provide power to the LAN ethernet cable with a PoE injector. The PoE injector must be 802.3af compliant. The PoE injector is not provided with the Standalone Access Point. If you are using a PoE injector, refer to the manufacturer’s documentation for the necessary requirements.
- **Power by AC adaptor** – An AC adaptor for the Standalone Access Point is offered separately. The specifications are:
  - Input: 120-240 VAC
  - Output Voltage: DC +6V, max amps 1.50, max watts 10

  If you are using a direct connection to the Standalone Access Point you must use a cross-over Ethernet cable.

> ⓘ To use an adaptor, install the Standalone Access Point within six feet (two meters) of a wall outlet, attach the adaptor to the Standalone Access Point and then plug the adaptor into the wall outlet.

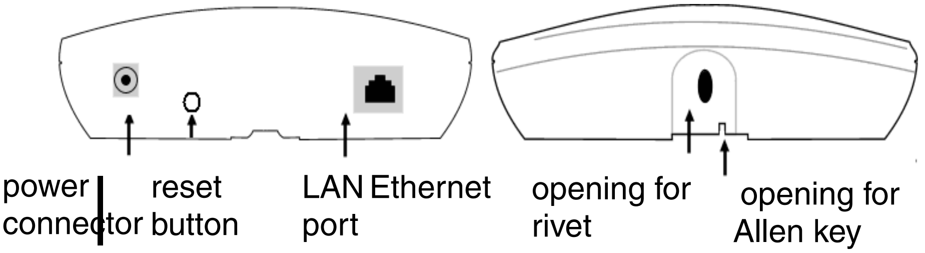


Figure 3 Top and bottom views of Standalone Access Point

4.3 Understanding Standalone Access Point LED status

The description below assumes the software uses a timer and multiple phases to simulate LED "blinking" on all three LEDs. For example, an LED status of "Red" means that the LED is solid-colored "Red", and an LED status of “Off/Green/Off” indicates that the LED is “Off” for the first phase, is “Green” for the second phase, and is “Off” for the third phase.

Left LED Status	Center LED Status	Right LED Status	Access Point Status
Off	Off	Off	Powered-off
Off	Green	Off	Beginning of Power-On-Self-Test (POST) (0.5s)
Off	Off	Off	POST
Off	Red	Off	Failure during POST
Green	Off	Green	Random delay (state shown only after a vulnerable reset)
Green/Off	Off/Green	Green/Off	Vulnerable time interval (the Standalone Access Point resets to factory default if powered-off for three consecutive times during this state). No vulnerable period when Standalone Access Point is resetting to factory defaults.
Green/Off/ Off	Off/ Green/Off	Off/Off/ Green	Resetting to factory defaults announcement (replaces vulnerable period). This pattern is repeated twice to notify the operator when the factory configuration is restored.
Off	Orange (Green + Red)/ Green	Off	Attempting to obtain IP address via DHCP
Off	Off/Green	Off	Obtained IP address, attempting to join the cluster
Green when 802.11b/g enabled Off otherwise	Green	Green when 802.11a enabled Off otherwise	Member of cluster, radios enabled per user settings

Table 12 Standalone Access Point LED status definitions

> Random delays do not occur during normal reboot. Random delay only occurs after vulnerable period power-down.

4.4 Restoring the factory default settings

There are three different methods for restoring the Standalone Access Point factory default settings:

- **Vulnerable time interval** – The Standalone Access Point boot-up sequence includes a vulnerable time interval. During the vulnerable time interval (2 seconds), the LEDs flash in a particular sequence to indicate that the Standalone Access Point is in the vulnerable time interval. For more information, see Table 12 on page 51.

  If you power up the Standalone Access Point and interrupt the power during the vulnerable time interval three consecutive times, the next time the Standalone Access Point reboots, it will restore its factory defaults including the user password and the default IP settings.

  > The restoration of factory default settings does not erase the non-volatile log.

- **Reset button (Hardware)** – Press and hold the **Reset** button on the Standalone Access Point for approximately five seconds. The Standalone Access Point is rebooted and the factory defaults are restored.
- **Restore Factory Defaults (Graphical User Interface)** – Use the **Restore Factory Defaults** button on the **Tools > Configuration** screen to restore the factory defaults via the Standalone Access Point GUI. For more information, see Section 6.4.3, “Restoring the factory default settings”, on page 89.

To restore factory default settings using the vulnerable time interval:

1. Reboot the Standalone Access Point.
2. Depower and power the Standalone Access Point during the vulnerable time interval.
3. Repeat Step 2 twice.

   When the Standalone Access Point reboots for the fourth time, after having its power supply interrupted three consecutive times, it restores its factory default settings.

5 Getting started with a Standalone Access Point

You access the Standalone Access Point through a Web browser.

5.1 About the interface

The Standalone Access Point supports two types of users:

- **Administrator** – The case-sensitive user ID is `admin`. The default password is `admin`.
- **General User** – The case-sensitive user ID is `user`. The default password is `user`.

There are two main states for every user:

- **Logging on** – The user is presented with a form that accepts their ID and password.
- **Logged on** – The user has access to a two-level menu that provides navigation through the entire user interface.

If you are logged in as an Administrator, the top level menu has the following options:

- **Status** – Provides access to the following screens: **Info**, **Logs**, **LAN**, **802.11b/g**, **802.11a**, **Clients**, and **Cluster**.
- **Configuration** – Provides access to the following screens: **LAN** and **Wireless**. The **Wireless** screen provides access to one **Basic** configuration tab and four advanced tabs: **Filters**, **Advanced 802.11b/g**, **Advanced 802.11a**, and **QoS**. In addition, configuration tabs are also available for each individual VNS: **General**, **RF**, **Security**, and **QoS**.
- **Tools** – Provides access to the following screens: **Passwords**, **Configuration**, **Firmware/Language**, and **BootROM**.
- **Help** – Provides access to online help for each user interface screen.
- **Logout** – Logs the current user out of the Standalone Access Point user interface.

If you are logged in as a General User, the top level menu offers the following options:

- **Status** – Provides access to the following screens: **Info**, **Logs**, **LAN**, **802.11b/g**, **802.11a**, **Clients**, and **Cluster**.
- **Help** – Provides access to online help for each user interface screen.
- **Logout** – Logs the current user out of the Standalone Access Point user interface.

5.2 Logging on to the Standalone Access Point

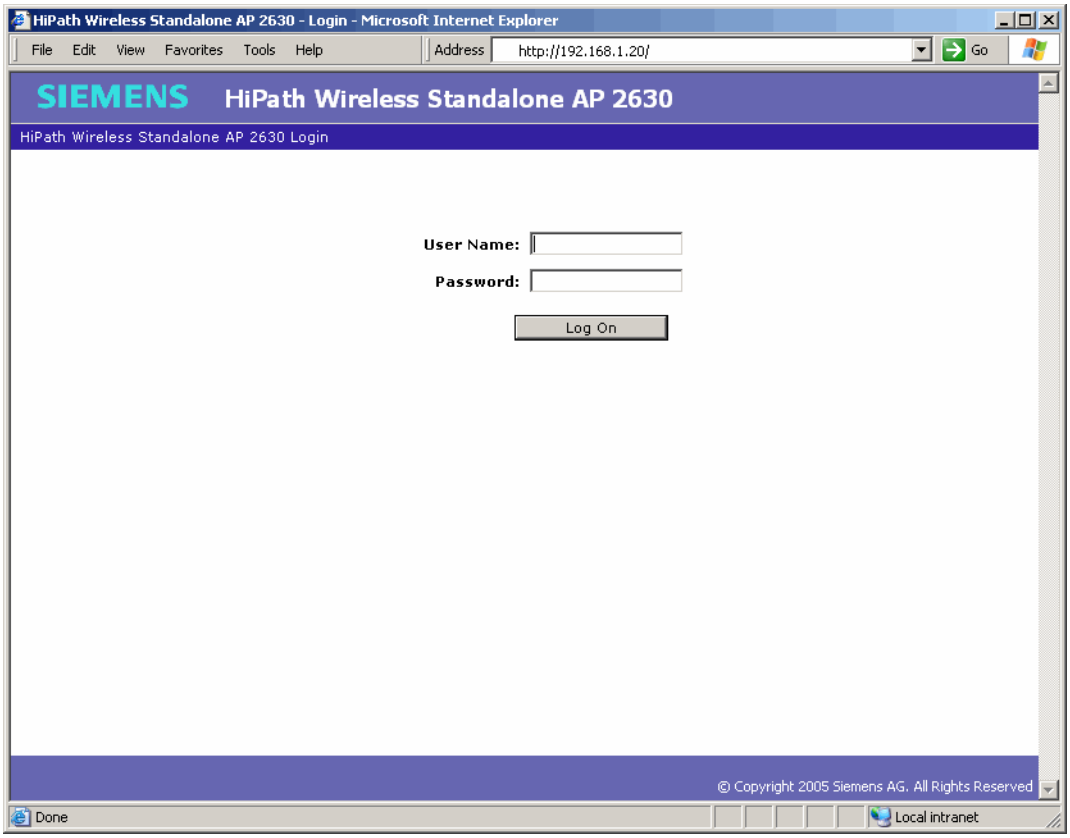
To access the Standalone Access Point, you must log on using a valid user ID and password.

By default, the Standalone Access Point is DHCP enabled. To log on, use the IP address according to your network DHCP IP address assignment. If the Standalone Access Point cannot get an IP address by DHCP, use the default 192.168.1.20 IP address.

To log on to the Standalone Access Point:

1. In a Web browser, type the following:

```
http://192.168.1.20
```



HiPath Wireless Standalone AP 2630 - Login - Microsoft Internet Explorer

File
Edit
View
Favorites
Tools
Help
Address
http://192.168.1.20/
Go
SIEMENS
HiPath Wireless Standalone AP 2630
HiPath Wireless Standalone AP 2630 Login
User Name:
Password:
Log On
© Copyright 2005 Siemens AG. All Rights Reserved
Done
Local intranet

2. In the **User Name** box, type your assigned unique user ID.

3. In the **Password** box, type the password corresponding to your user ID.

> It is strongly recommended that you change your password the first time you log on.

4. Click **Log On**.

> The Web session will time out after 900 seconds (15 minutes) of non-activity.

5.3 Changing passwords

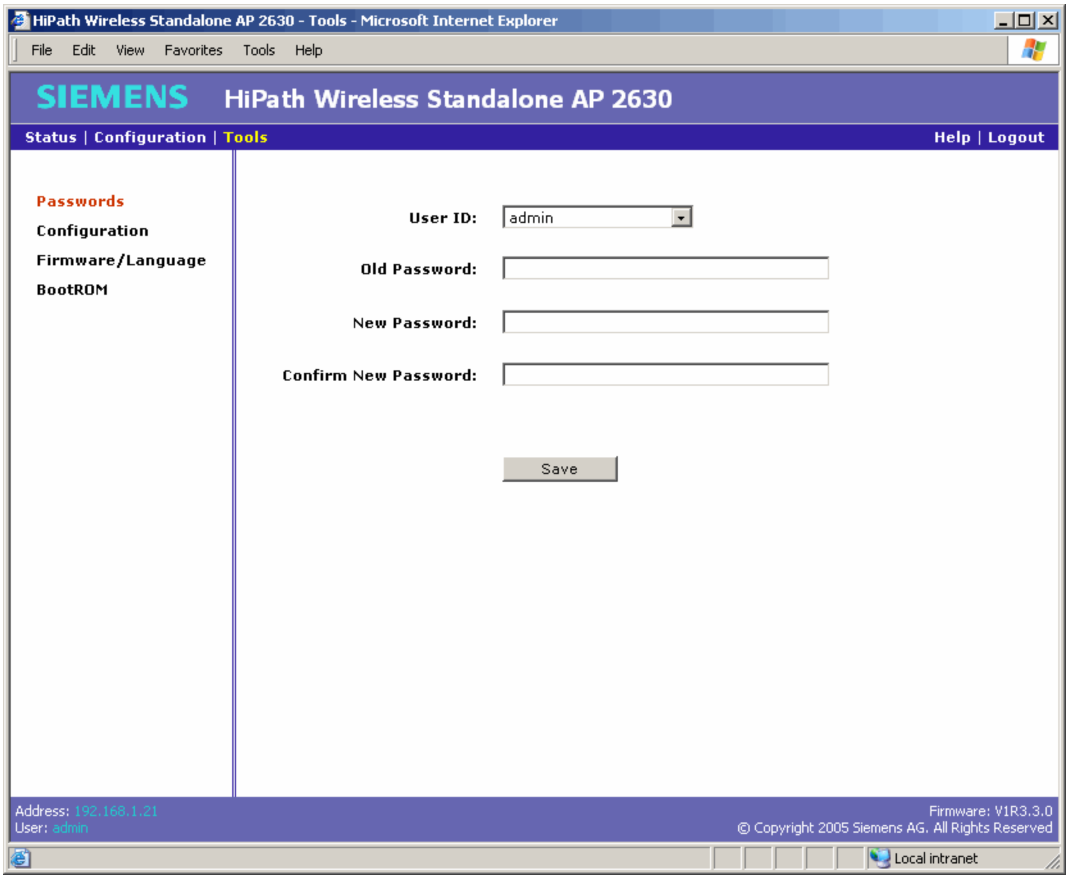
Use the **Passwords** screen to change passwords.

> You must have Administrator access to change a password.

The **User ID** drop-down list allow you to select between an Administrator or a General User. To ensure proper security, the old password for the selected user is required to be entered regardless of which user is logged in and which User ID is selected.

To change a password:

1. On the menu bar, click **Tools**.
2. In the left pane, click **Passwords**.


HiPath Wireless Standalone AP 2630 - Tools - Microsoft Internet Explorer
File Edit View Favorites Tools Help
SIEMENS HiPath Wireless Standalone AP 2630
Status | Configuration | Tools
Help | Logout
Passwords
Configuration
Firmware/Language
BootROM
Save
Local intranet

User ID: admin

Old Password:

New Password:

Confirm New Password:

Address: 192.168.1.21
User: admin

Firmware: V1R3.3.0
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3. From the **User ID** drop-down list, select the user whose password you want to change.
4. In the **Old Password** box, type the password currently in use.

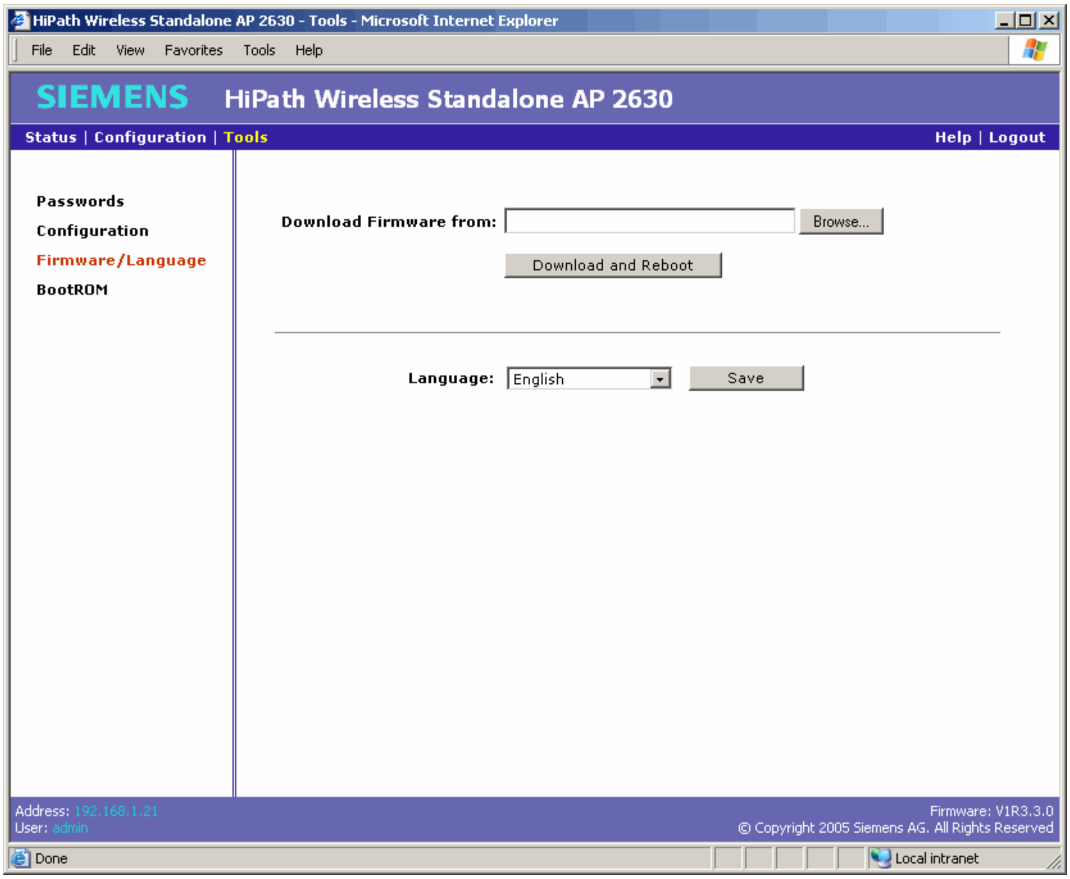
5. In the **New Password** box, type the new password.
6. In the **Confirm New Password** box, re-type the new password.
7. To save your changes, click **Save**.

5.4 Downloading the firmware

Use the **Firmware/Language** screen to download Standalone Access Point firmware.

To download firmware:

1. On the menu bar, click **Tools**.
2. In the left pane, click **Firmware/Language**.



Language: English

Address: 192.168.1.21
User: admin

Firmware: V1R3.3.0
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3. In the **Download Firmware from** section, click **Browse** to navigate to the appropriate file.
4. Select the file to download, and then click **Open** in the **Choose file** dialog box. The directory location is displayed in the **Download Firmware from** box.
5. Click **Download and Reboot**. The selected file is downloaded and the Standalone Access Point is rebooted.

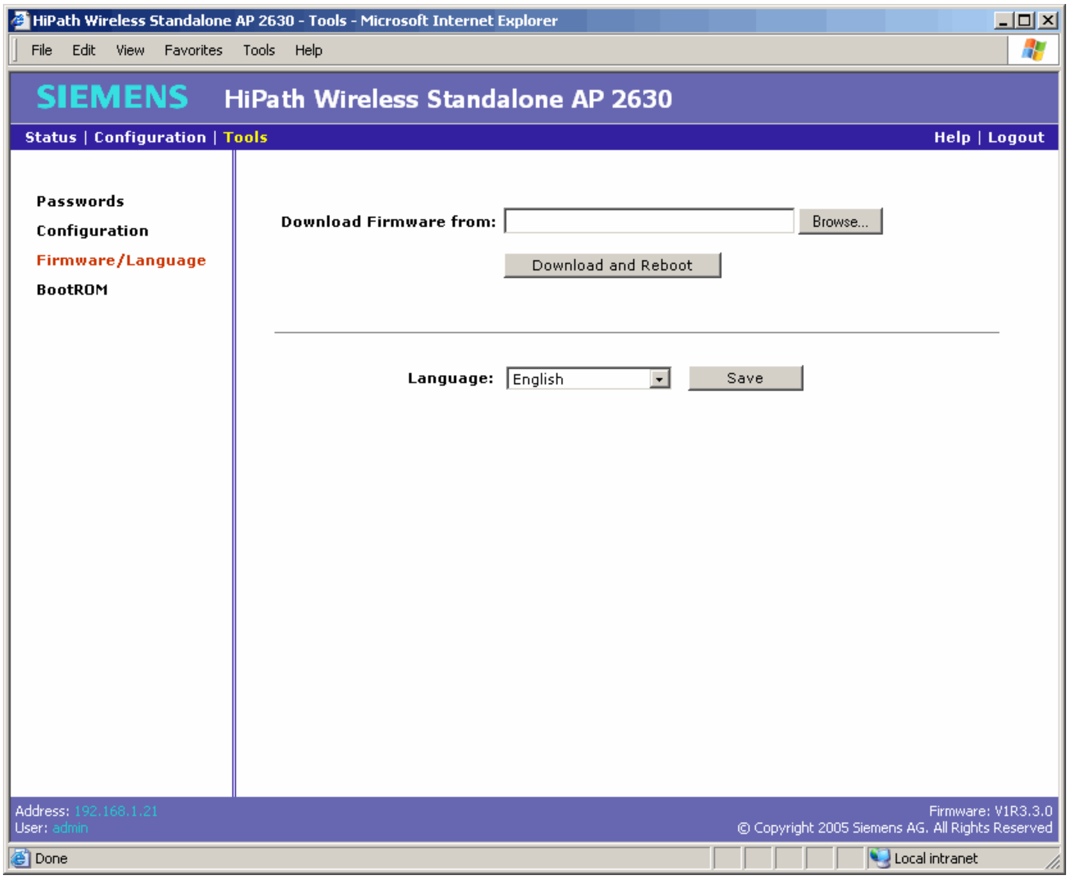
> The Standalone Access Point will automatically reboot using the new downloaded firmware version. For more information, see Section 7.1, “Rebooting”, on page 93.

5.5 Setting the interface language

Use the **Firmware/Language** screen to set the interface language.

To change the interface language setting:

1. On the menu bar, click **Tools**.
2. In the left pane, click **Firmware/Language**.



Download Firmware from:

Language: English

Address: 192.168.1.21
User: admin

Firmware: V1R3.3.0
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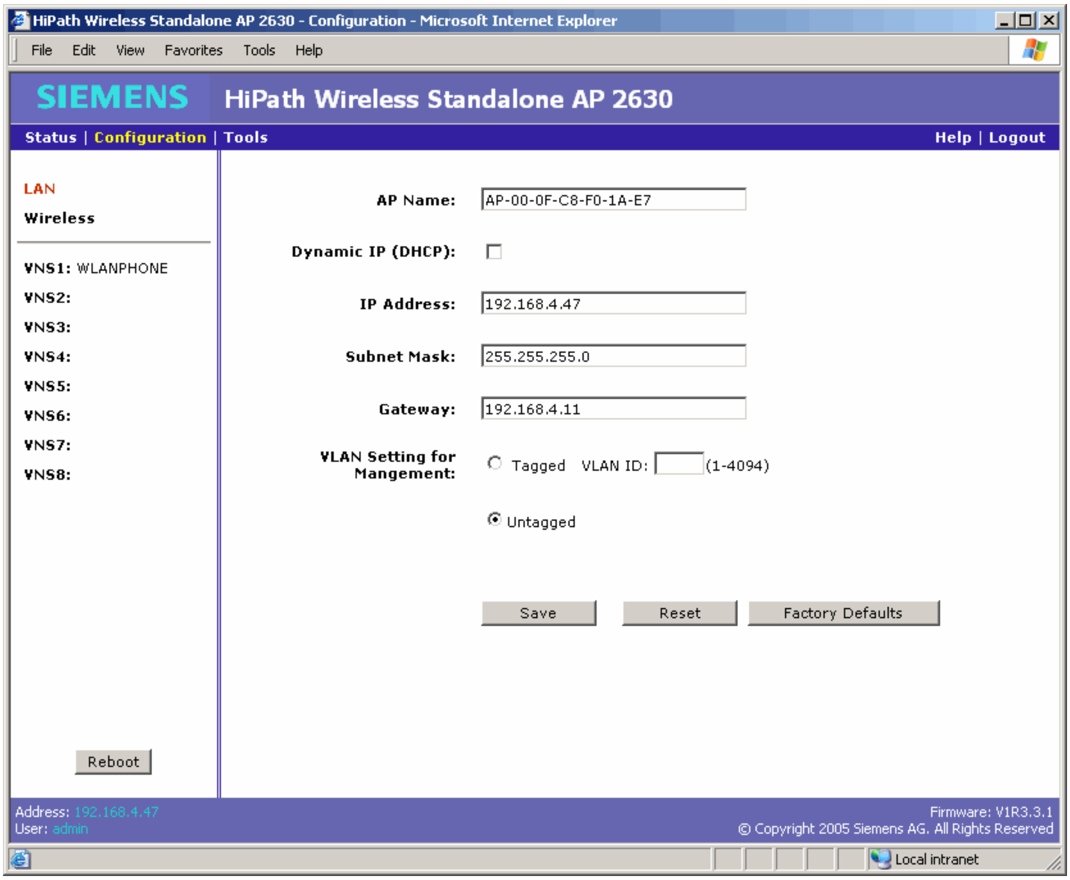
3. From the **Language** drop-down list, select the appropriate language for the user interface. The available language selections are **English** and **German**. The default is **English**.

5.6 Changing the host IP address

Use the **LAN** screen to change the IP address for the Standalone Access Point.

To change the host IP address:

1. On the menu bar, click **Configuration**. The **LAN** screen is displayed.


HiPath Wireless Standalone AP 2630 - Configuration - Microsoft Internet Explorer
File Edit View Favorites Tools Help
SIEMENS
HiPath Wireless Standalone AP 2630
Status | Configuration | Tools
Help | Logout
LAN
Wireless
VNS1: WLANPHONE
VNS2:
VNS3:
VNS4:
VNS5:
VNS6:
VNS7:
VNS8:
Save
Reset
Factory Defaults
Reboot
Local intranet

AP Name: AP-00-0F-C8-F0-1A-E7

Dynamic IP (DHCP): ☐

IP Address: 192.168.4.47

Subnet Mask: 255.255.255.0

Gateway: 192.168.4.11

VLAN Setting for Mangement: ○ Tagged VLAN ID: (1-4094)

● Untagged

Address: 192.168.4.47
User: admin

Firmware: V1R3.3.1
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2. In the **IP Address** box, type the static IP address. The default is **192.168.1.20**.
3. To save your changes, click **Save**.

> The **Reboot** button is available on this screen. For more information, see Section 7.1, “Rebooting”, on page 93.

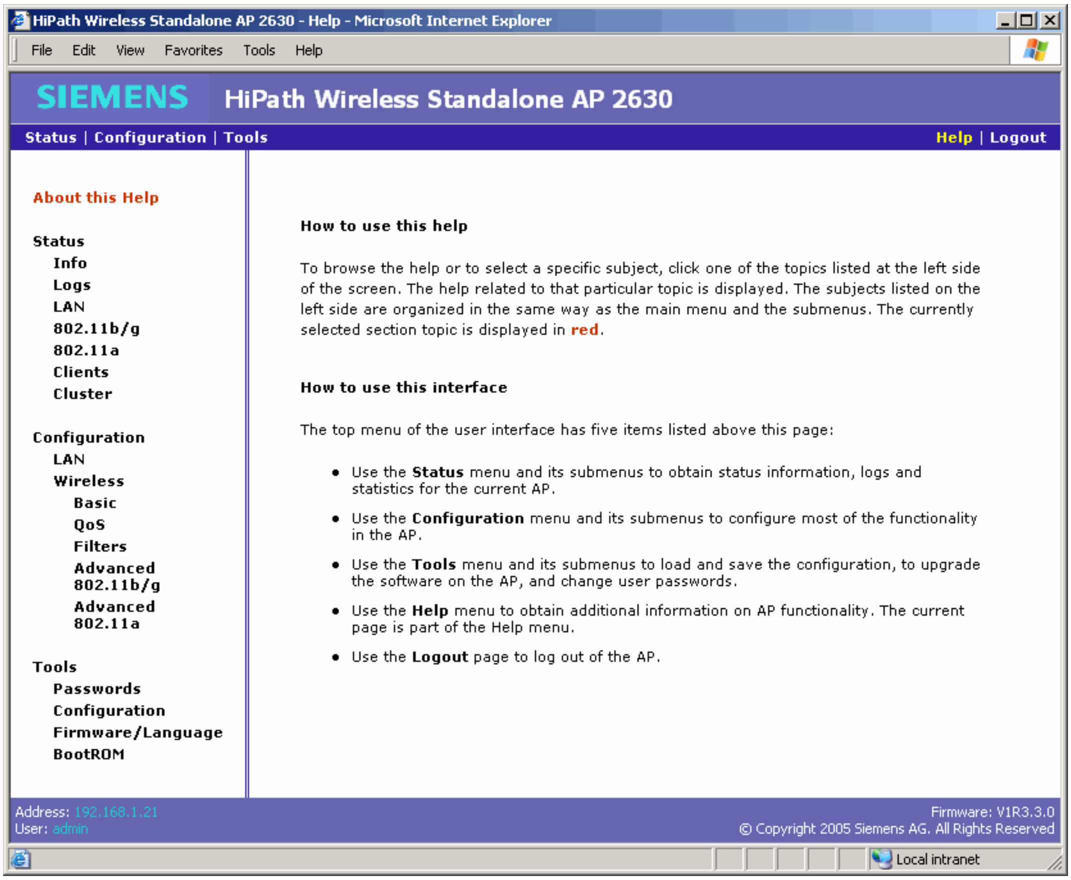
For more details on the LAN settings on this screen, see Section 6.1, “Configuring the LAN settings”, on page 61.

5.7 Accessing help

Use the **Help** menu to access the online help.

To access help:

1. On the menu bar, click **Help**.



How to use this help

To browse the help or to select a specific subject, click one of the topics listed at the left side of the screen. The help related to that particular topic is displayed. The subjects listed on the left side are organized in the same way as the main menu and the submenus. The currently selected section topic is displayed in **red**.

How to use this interface

The top menu of the user interface has five items listed above this page:

- Use the **Status** menu and its submenus to obtain status information, logs and statistics for the current AP.
- Use the **Configuration** menu and its submenus to configure most of the functionality in the AP.
- Use the **Tools** menu and its submenus to load and save the configuration, to upgrade the software on the AP, and change user passwords.
- Use the **Help** menu to obtain additional information on AP functionality. The current page is part of the Help menu.
- Use the **Logout** page to log out of the AP.

Address: 192.168.1.21
User: admin

Firmware: V1R3.3.0
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2. In the left pane, click the appropriate Help topic. The related Help content is displayed.

6 Configuring a Standalone Access Point

⚠ Configuration changes may be delayed up to 60 seconds before being saved into the compact flash. If power interruption occurs during that period, the configuration changes are lost. Configuration changes will also be lost if the power for the Standalone Access Point is reset instead of clicking the **Reboot** button. For more information, see ”Rebooting”, on page 93.

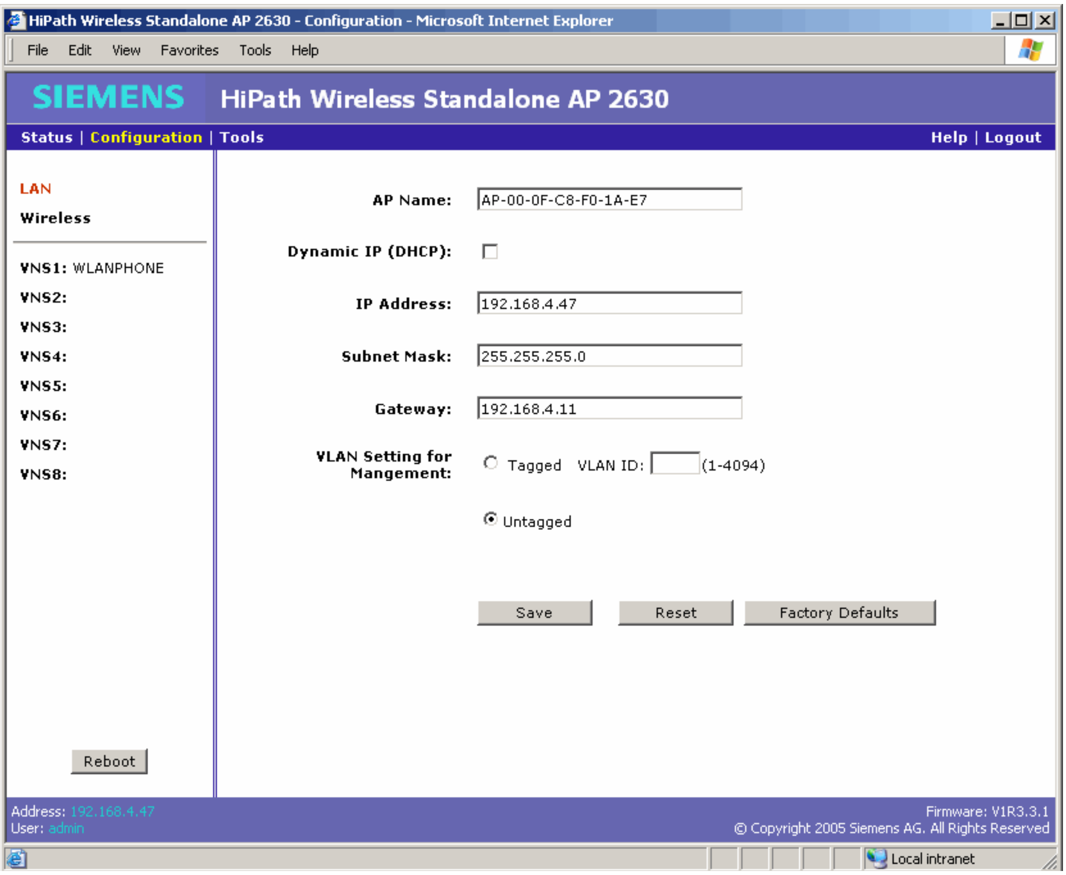
6.1 Configuring the LAN settings

Use the **LAN** screen to view and define the Standalone Access Point LAN configuration, including the following:

- Access point name
- Dynamic or static IP
- Static IP settings
- VLAN Setting for Management

To configure the LAN:

1. On the menu bar, click **Configuration**. The **LAN** screen is displayed.


HiPath Wireless Standalone AP 2630 - Configuration - Microsoft Internet Explorer
File Edit View Favorites Tools Help
SIEMENS
HiPath Wireless Standalone AP 2630
Status | Configuration | Tools
Help | Logout
LAN
Wireless
VNS1: WLANPHONE
VNS2:
VNS3:
VNS4:
VNS5:
VNS6:
VNS7:
VNS8:
Save
Reset
Factory Defaults
Reboot
Local intranet

AP Name: AP-00-0F-C8-F0-1A-E7

Dynamic IP (DHCP): □

IP Address: 192.168.4.47

Subnet Mask: 255.255.255.0

Gateway: 192.168.4.11

VLAN Setting for Mangement: ○ Tagged VLAN ID: (1-4094)

● Untagged

Address: 192.168.4.47
User: admin

Firmware: V1R3.3.1
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2. In the **AP Name** box, type the name for the access point. The default is AP-<MAC address>, where <MAC address> is the MAC address.

3. Do one of the following:

   - To use a static IP address, clear the **Dynamic IP (DHCP)** check box.
   - To use a dynamic IP address, select the **Dynamic IP (DHCP)** check box. The default is enabled.

     To use a static IP address, do the following:

     - In the **IP Address** box, type the static IP address to be used. The default is **192.168.1.20**.
     - In the **Subnet Mask** box, type the subnet mask associated with the static IP address to be used. The default is **255.255.255.0**.
     - In the **Gateway** box, type the gateway associated with the static IP address to be used. The default is **192.168.1.1**.

4. For the VLAN Setting for Management options, do one of the following:
   - **Tagged** – Select to tag all IP management packets for this Standalone Access Point.
     - **VLAN ID** – Type the VLAN ID value you want to use as the tag.
   - **Untagged** – Select for all IP management packets for the Standalone Access Point to be untagged. The default is **Untagged**.

   To enable VLAN, it is recommended that the Standalone Access Point is first connected in an environment where there is no VLAN, enable the VLAN , and then move the Standalone Access Point into an environment where the VLAN is required and reboot the Standalone Access Point. The Standalone Access Point LAN configuration takes effect only after the Standalone Access Point is rebooted and therefore the Standalone Access Point can only be accessed in an environment having the consistent VLAN setting.
5. To save your changes, click **Save**.

> ⓘ Changing either the DHCP, IP, or VLAN settings requires a reboot of the Standalone Access Point. The new settings only take effect after the reboot has completed. Clicking **Save** will not lose the connection, but a reboot may cause a connection loss. During the reboot, a screen will inform the you that:
> **The IP/VLAN setting has been changed. Please login again after the reboot.**

6. To restore the settings displayed in this screen to the most recent saved values, click **Reset**.
7. To restore the factory defaults for the settings on this screen, click **Factory Defaults**.

> ⓘ The **Reboot** button is available on this screen. For more information, see ”Rebooting”, on page 93.

6.2 Configuring the wireless settings

You can configure the Standalone Access Point wireless settings. Configuring the Standalone Access Point wireless settings includes defining the following:

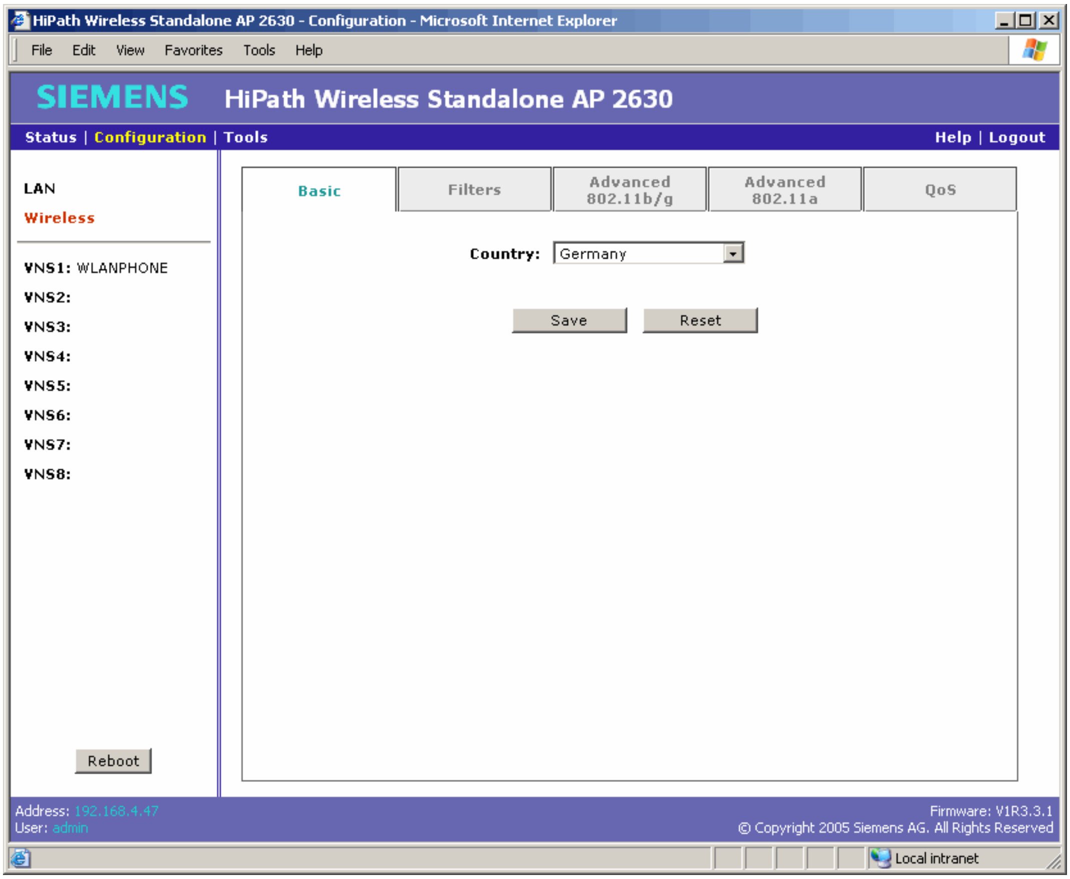
- Basic settings
- Filters configuration
- 802.11b/g radio settings
- 802.11a radio settings
- QoS admission control thresholds

6.2.1 Configuring the wireless basic settings

Use the **Basic** tab to select the country of operation for the Standalone Access Point.

To configure the wireless basic settings:

1. On the menu bar, click **Configuration**.
2. In the left pane, click **Wireless**. The **Basic** tab is displayed.



Country: Germany

HiPath Wireless Standalone AP 2630 - Configuration - Microsoft Internet Explorer
File Edit View Favorites Tools Help
SIEMENS HiPath Wireless Standalone AP 2630
Status | Configuration | Tools
Help | Logout
LAN
Wireless
VNS1: WLANPHONE
VNS2:
VNS3:
VNS4:
VNS5:
VNS6:
VNS7:
VNS8:
Reboot
Basic
Filters
Advanced 802.11b/g
Advanced 802.11a
QoS
Save
Reset
Address: 192.168.4.47
User: admin
Firmware: V1R3.3.1
© Copyright 2005 Siemens AG. All Rights Reserved
Local intranet

3. From the **Country** drop-down list, select the country of operation.

   Selecting the correct country is essential to receiving proper service. In addition, it is illegal to operate with the incorrect country setting.

4. To save your changes, click **Save**.
5. To restore the settings displayed in this screen to the most recent saved values, click **Reset**.

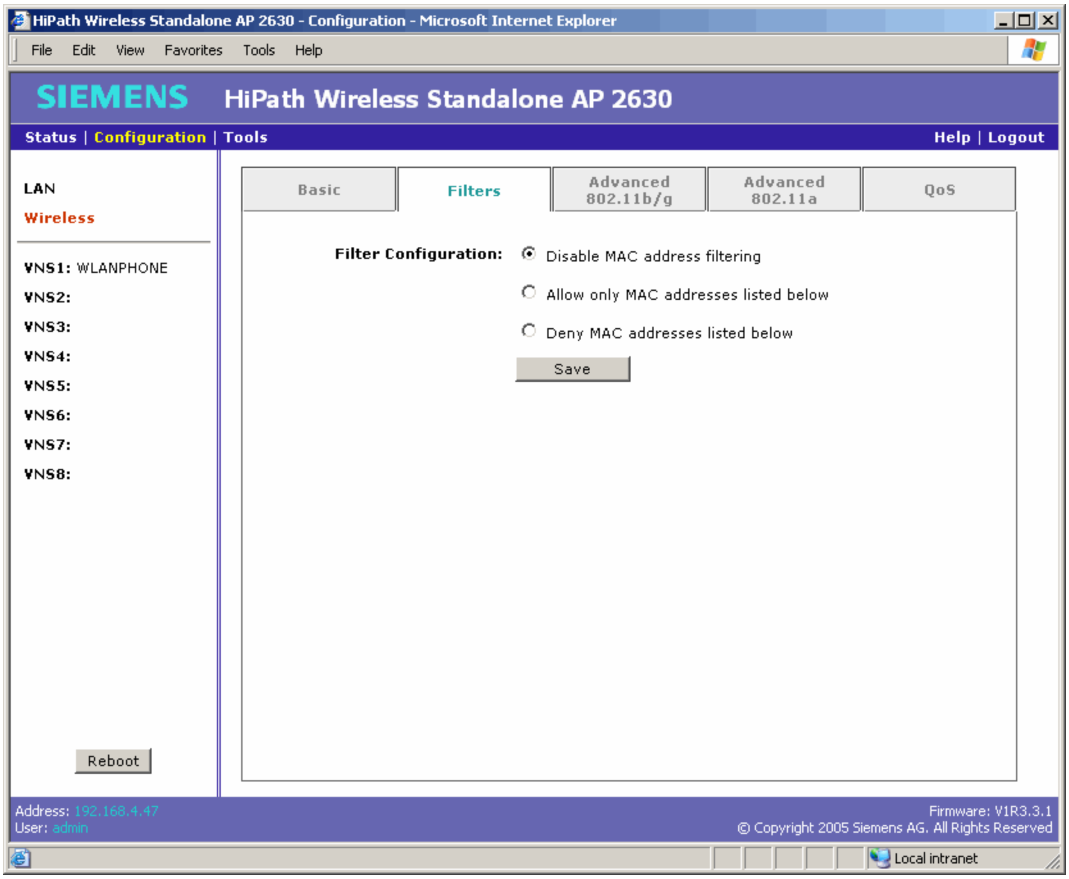
The **Reboot** button is available on this screen. For more information, see ”Rebooting”, on page 93.

6.2.2 Configuring the wireless filter settings

Use the **Filters** tab to configure client filtering based on a MAC address. The default is no MAC address in the list and MAC address filtering is disabled.

To configure the wireless Filter settings:

1. On the menu bar, click **Configuration**.
2. In the left pane, click **Wireless**.
3. Click the **Filters** tab.



Filter Configuration: ● Disable MAC address filtering
○ Allow only MAC addresses listed below
○ Deny MAC addresses listed below

Address: 192.168.4.47
User: admin
Firmware: V1R3.3.1
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4. In the Filter Configuration area, do one of the following:
   - **Disable MAC address filtering** – Select to disable filtering.
   - **Allow only MAC addresses listed below** – Select to allow only those MAC addresses that are listed to connect.
   - **Deny MAC addresses listed below** – Select to deny those MAC addresses that are listed to connect.

> The Allow and Deny filters are mutually exclusive. You can create either a list of MAC addresses to allow or a list of MAC addresses to deny. It is not possible to maintain both lists at the same time.

5. To save your changes, click **Save**.
6. To create either a list of MAC addresses to allow or a list of MAC addresses to deny, type the new MAC address in the **Add MAC Address** box, and then click **Add**. The message **Update successful** is displayed. The new MAC address is displayed in the **MAC Address** list when you click the applicable filter configuration option.

> If necessary, click **Reset Selections** to clear all selected check boxes in the **MAC Address** list.

7. To delete MAC addresses from the list, select the **Select** check box for each of the MAC addresses you want to delete, and then click **Delete Selected Items**. The deleted MAC addresses will be removed from the MAC Address list.
8. To delete all MAC addresses from the list, click **Delete All**. All MAC addresses will be removed from the MAC Address list.

> The **Reboot** button is available on this screen. For more information, see ”Rebooting”, on page 93.

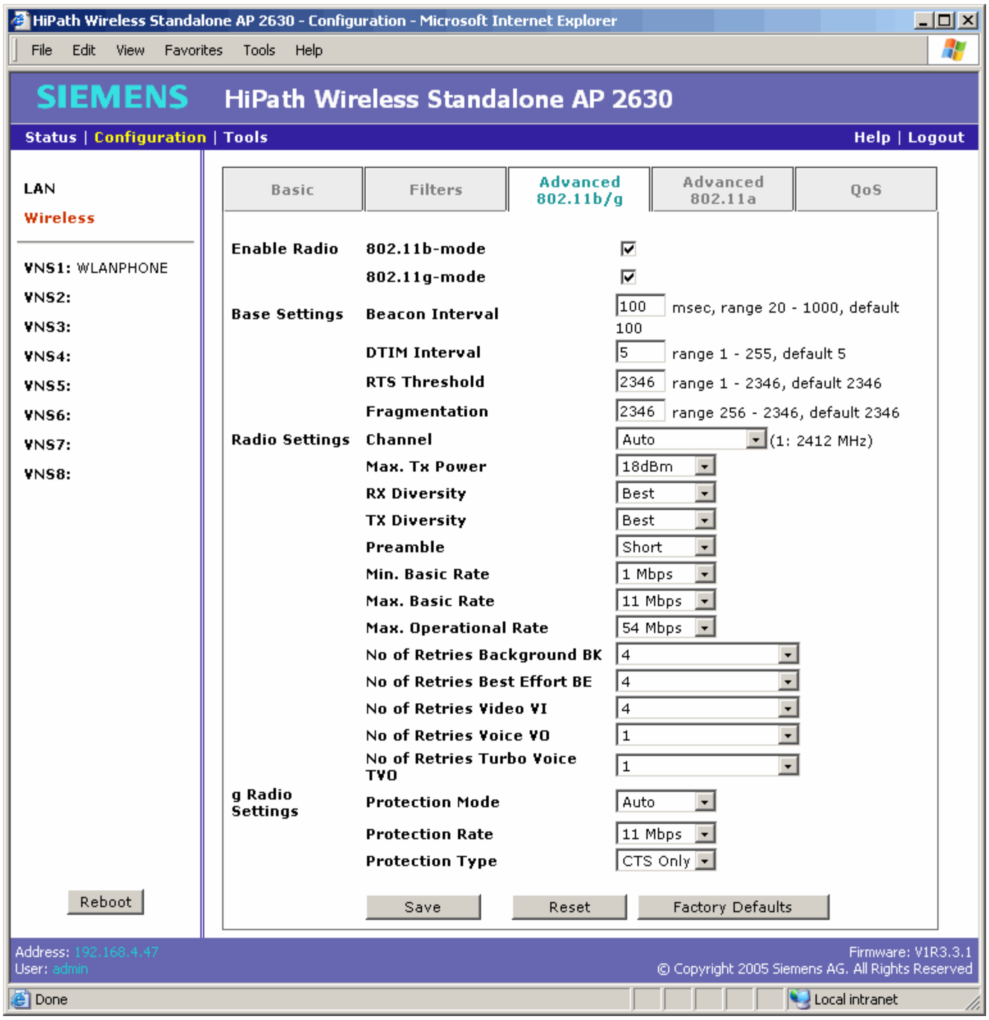
6.2.3 Configuring the advanced 802.11b/g settings

Use the **Advanced 802.11b/g** tab to configure the advanced 802.11b/g radio settings, including the following:

- Enable radio controls
- Base settings
- Radio settings
- g radio settings

To configure the 802.11b/g advanced settings:

1. On the menu bar, click **Configuration**.
2. In the left pane, click **Wireless**.
3. Click the **Advanced 802.11b/g** tab.



Enable Radio	802.11b-mode	☑	
	802.11g-mode	☑	
Base Settings	Beacon Interval	100	msec, range 20 - 1000, default 100
	DTIM Interval	5	range 1 - 255, default 5
	RTS Threshold	2346	range 1 - 2346, default 2346
	Fragmentation	2346	range 256 - 2346, default 2346
Radio Settings	Channel	Auto	(1: 2412 MHz)
	Max. Tx Power	18dBm	
	RX Diversity	Best	
	TX Diversity	Best	
	Preamble	Short	
	Min. Basic Rate	1 Mbps	
	Max. Basic Rate	11 Mbps	
	Max. Operational Rate	54 Mbps	
	No of Retries Background BK	4	
	No of Retries Best Effort BE	4	
	No of Retries Video VI	4	
	No of Retries Voice VO	1	
	No of Retries Turbo Voice TVO	1	
g Radio Settings	Protection Mode	Auto	
	Protection Rate	11 Mbps	
	Protection Type	CTS Only	

4. In the Enable Radio section, do the following:
   - **802.11b** – Select to enable the b/g radio for b-only mode.
   - **802.11g** – Select to enable the b/g radio for g-only mode.
   - To enable the b/g radio for mixed mode, select both the **802.11b** and **802.11g** check boxes.
   - To disable the b/g radio, clear both the **802.11b** and **802.11g** check boxes.
5. In the Base Settings section, do the following:
   - **Beacon Interval** – Type the desired time, in milliseconds, between beacon transmissions. The default is **100 milliseconds**.
   - **DTIM Interval** – Type the desired DTIM (Delivery Traffic Indication Map) period—the number of beacon intervals between two DTIM beacons. To ensure the best client power savings, use a large number. For example, 5. Use a small number to reduce broadcast and multicast delay. The default is **5**.
   - **RTS Threshold** – Type the packet size threshold, in bytes, above which the packet will be preceded by an RTS/CTS (Request to Send/Clear to Send) handshake. The default is **2346**, which means all packets are sent without RTS/CTS. Reduce this value only if necessary.
   - **Fragmentation** – Type the fragment size threshold, in bytes, above which the packets will be fragmented by the Standalone Access Point prior to transmission. The default is **2346**, which means all packets are sent unfragmented. Reduce this value only if necessary.
6. In the Radio Settings section, do the following:
   - **Channel** – Select the wireless channel that the Standalone Access Point will use to communicate with wireless devices. Depending on the regulatory domain (based on country), some channels may be restricted. The **Auto** selection allows the Standalone Access Point to select the appropriate channel automatically. If **Auto** is selected, the current selected channel is displayed next to the **Channel** drop-down list. The default is **Auto**.
   - **Max. Tx Power** – Select the Tx power level for the Standalone Access Point: **8** through **18 dBm**. The default is **18 dBm**.

> ⓘ Reduce the Tx Power setting if two or more neighboring access points are operating on the same channel.

- **RX Diversity** – Select **Best** for the best signal from both antennas, or **Left** or **Right** to choose either of the two diversity antennas. The default and recommended selection is **Best**. If only one antenna is connected, use the corresponding **Left** or **Right** diversity setting. Do not use **Best** if two identical antennas are not used.
- **TX Diversity** – Select **Best** for the best signal from both antennas, or **Left** or **Right** to choose either of the two diversity antennas. The default is **Best**, which maximizes performance for most clients. However, some clients may behave oddly with Tx Diversity set to **Best**. Under those circumstances, it is recommended to use either **Left** or **Right** for Tx Diversity. If only one antenna is connected, use the corresponding **Left** or **Right** diversity setting. Do not use **Best** if two identical antennas are not used.
- **Preamble** – Select **Short** to allow each packet to use less wireless bandwidth, thus increasing overall throughput, or select **Long** to provide better protection. The default is **Short**.
- **Min. Basic Rate** – Select the minimum data rate that must be supported by all stations in a BSS: **1**, **2**, **5.5**, or **11 Mbps** for 11b and 11b+11g modes. Select **1**, **2**, **5.5**, **6**, **11**, **12**, or **24 Mbps** for 11g-only mode. If necessary, the **Max Basic Rate** choices adjust automatically to be higher or equal to the **Min Basic Rate**; the **Max. Operational Rate** choices adjust automatically to be higher or equal to the **Max. Basic Rate**. If both **Min Basic Rate** and **Max Basic Rate** are set to an 11g-specific (OFDM) rate, (for example, **6**, **12**, or **24 Mbps**) all basic rates will be 11g-specific.
- **Max. Basic Rate** – Select the maximum data rate that must be supported by all stations in a BSS: **1**, **2**, **5.5**, or **11 Mbps** for 11b and 11b+11g modes. Select **1**, **2**, **5.5**, **6**, **11**, **12**, or **24 Mbps** for 11g-only mode. If necessary, the **Max. Operational Rate** choices adjust automatically to be higher or equal to the **Max Basic Rate**. If both **Min Basic Rate** and **Max Basic Rate** are set to an 11g-specific (OFDM) rate, (for example, **6**, **12**, or **24 Mbps**) all basic rates will be 11g-specific.
- **Max. Operational Rate** – Select the maximum data rate that clients can operate at while associated with the Standalone Access Point: **1**, **2**, **5.5**, **11 Mbps** for 11b-only mode. Select **1**, **2**, **5.5**, **6**, **9**, **11**, **12**, **18**, **24**, **36**, **48**, or **54 Mbps** for 11b+11g mode and 11g-only mode. If necessary, the **Max Operational Rate** choices adjust automatically to be higher or equal to the **Max. Basic Rate**.
- **No of Retries Background BK** – Select the number of retries for the Background transmission queue. The default is **4**. The recommended setting is **adaptive (multi-rate)**.
- **No of Retries Best Effort BE** – Select the number of retries for the Best Effort transmission queue. The default is **4**. The recommended setting is **adaptive (multi-rate)**.
- **No of Retries Video VI** – Select the number of retries for the Video transmission queue. The default is **4**. The recommended setting is **adaptive (multi-rate)**.

- **No of Retries Voice VO** – Select the number of retries for the Voice transmission queue. The default is **1**. The recommended setting is **adaptive (multi-rate)**.
- **No of Retries Turbo Voice TVO** – Select the number of retries for the Turbo Voice transmission queue. The default is **1**. The recommended setting is **adaptive (multi-rate)**.

7. If the b/g radio 802.11g- mode is enabled, do the following:

   - **Protection Mode** – Select a protection mode: **None**, **Auto**, or **Always**. The default and recommended setting is **Auto**. Select **None** if 11b access points and clients are not expected. Select **Always** if you expect many 11b-only clients.
   - **Protection Rate** – Select a protection rate: **1**, **2**, **5.5**, or **11 Mbps**. The default and recommended setting is **11 Mbps**. Only reduce the rate if there are many 11b clients in the environment or if the deployment has areas with poor coverage. For example, rates lower than 11 Mbps are required to ensure coverage.
   - **Protection Type** – Select a protection type: **CTS Only** or **RTS CTS**. The default and recommended setting is **CTS Only**. Select **RTS CTS** only if an 11b access point that operates on the same channel is detected in the neighborhood, or if there are many 11-only clients in the environment.

> Certain client cards or applications may require modification of the default settings. If so, follow the manufacturer’s instructions.

8. To save your changes, click **Save**.
9. To restore the settings displayed in this screen to the most recent saved values, click **Reset**.
10. To restore the factory defaults for the settings on this screen, click **Factory Defaults**.

> The **Reboot** button is available on this screen. For more information, see ”Rebooting”, on page 93.

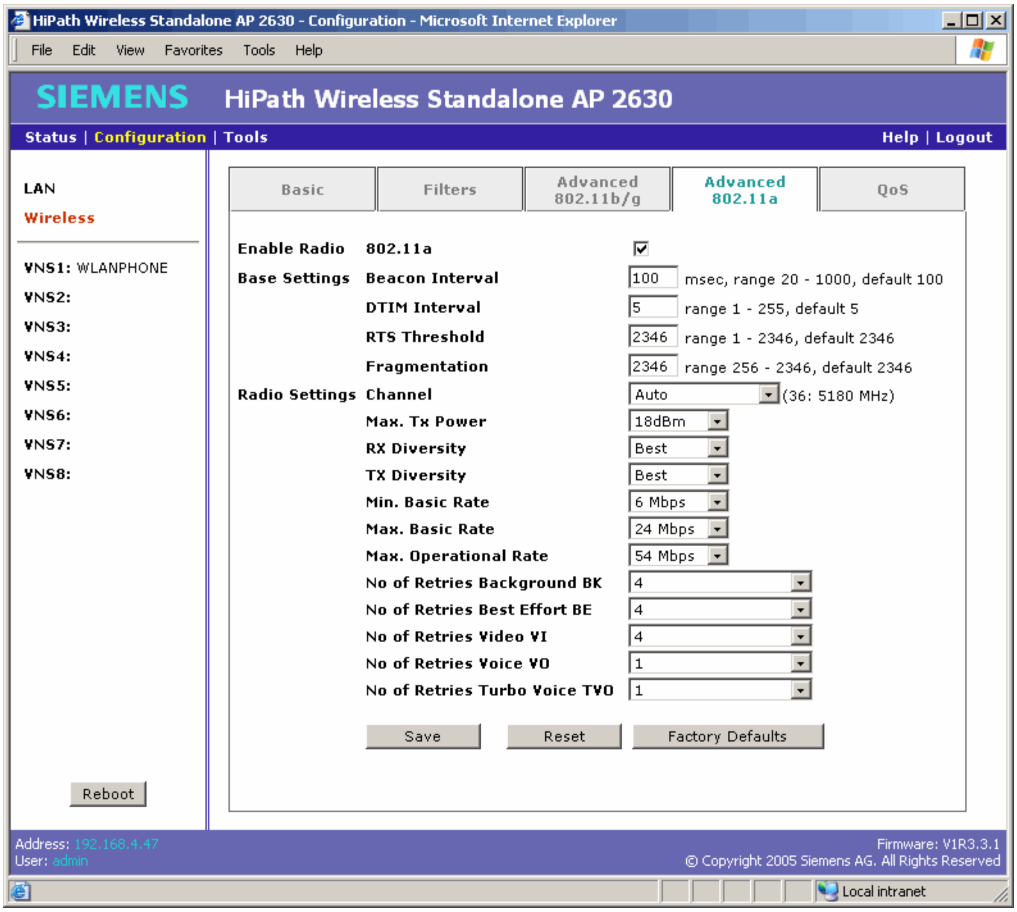
6.2.4 Configuring the advanced 802.11a settings

Use the **Advanced 802.11a** tab to configure the advanced 802.11a settings, including the following:

- Enable radio controls
- Base settings
- Radio settings

To configure the 802.11a advanced settings:

1. On the menu bar, click **Configuration**.
2. In the left pane, click **Wireless**.
3. Click the **Advanced 802.11a** tab.



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VNS6:
VNS7:
VNS8:
Reboot
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Filters
Advanced 802.11b/g
Advanced 802.11a
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Save
Reset
Factory Defaults
Address: 192.168.4.47
User: admin
Firmware: V1R3.3.1
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Local intranet

Enable Radio — 802.11a ☑

Base Settings
- Beacon Interval: 100 msec, range 20 - 1000, default 100
- DTIM Interval: 5 range 1 - 255, default 5
- RTS Threshold: 2346 range 1 - 2346, default 2346
- Fragmentation: 2346 range 256 - 2346, default 2346

Radio Settings
- Channel: Auto (36: 5180 MHz)
- Max. Tx Power: 18dBm
- RX Diversity: Best
- TX Diversity: Best
- Min. Basic Rate: 6 Mbps
- Max. Basic Rate: 24 Mbps
- Max. Operational Rate: 54 Mbps
- No of Retries Background BK: 4
- No of Retries Best Effort BE: 4
- No of Retries Video VI: 4
- No of Retries Voice VO: 1
- No of Retries Turbo Voice TVO: 1

4. In the Enable Radio section, select the **802.11a** check box to enable the radio. Clear the check box to disable the radio. The default is enabled.
5. In the Base Settings section, do the following:

- **Beacon Interval** – Type the desired time, in milliseconds, between beacon transmissions. The default is **100 milliseconds**.
- **DTIM Interval** – Type the desired DTIM (Delivery Traffic Indication Map) period—the number of beacon intervals between two DTIM beacons. To ensure the best client power savings, use a large number. For example, 5. Use a small number to reduce broadcast and multicast delay. The default is **5**.
- **RTS Threshold** – Type the packet size threshold, in bytes, above which the packet will be preceded by an RTS/CTS (Request to Send/Clear to Send) handshake. The default is **2346**, which means all packets are sent without RTS/CTS. Reduce this value only if necessary.
- **Fragmentation** – Type the fragment size threshold, in bytes, above which the packets will be fragmented by the Standalone Access Point prior to transmission. The default is **2346**, which means all packets are sent unfragmented. Reduce this value only if necessary.

6. In the Radio Settings section, do the following:

- **Channel** – Select the wireless channel that the wireless access point will use to communicate with wireless devices. Depending on the regulatory domain (based on country), some channels may be restricted. The default is based on North America. The **Auto** selection allows the Standalone Access Point to select the appropriate channel automatically. If **Auto** is selected, the applicable channel is displayed next to the **Channel** drop-down list. The default is **Auto**.
- **Max. Tx Power** – Select the Tx power level for the Standalone Access Point: **0** through **18 dBm**. The default is **18 dBm**.

> Reduce the Tx Power setting if two or more neighboring access points are operating on the same channel.

- **RX Diversity** – Select **Best** for the best signal from both antennas, or **Left** or **Right** to choose either of the two diversity antennas. The default and recommended selection is **Best**. If only one antenna is connected, use the corresponding **Left** or **Right** diversity setting. Do not use **Best** if two identical antennas are not used.
- **TX Diversity** – Select **Best** for the best signal from both antennas, or **Left** or **Right** to choose either of the two diversity antennas. The default is **Best**, which maximizes performance for most clients. However, some clients may behave oddly with Tx Diversity set to **Best**. Under those circumstances, it is recommended to use either **Left** or **Right** for Tx Diversity. If only one antenna is connected, use the corresponding **Left** or **Right** diversity setting. Do not use **Best** if two identical antennas are not used.

- **Min. Basic Rate** – Select the minimum data rate that must be supported by all stations in a BSS: **6**, **12**, or **24 Mbps**. If necessary, the **Max Basic Rate** choices adjust automatically to be higher or equal to the **Min Basic Rate**; the **Max. Operational Rate** choices adjust automatically to be higher or equal to the **Max. Basic Rate**.
- **Max. Basic Rate** – Select the maximum data rate that must be supported by all stations in a BSS: **6**, **12**, or **24 Mbps**. If necessary, the **Max Basic Rate** choices adjust automatically to be higher or equal to the **Min Basic Rate**. If necessary, the **Max. Operational Rate** choices adjust automatically to be higher or equal to the **Max. Basic Rate**.
- **Max. Operational Rate** – Select the maximum data rate that clients can operate at while associated with the Standalone Access Point: **6, 9, 12, 18, 24**, **36**, **48**, or **54 Mbps**. If necessary, the **Max Operational Rate** choices adjust automatically to be higher or equal to the **Max Basic Rate**.
- **No of Retries Background BK** – Select the number of retries for the Background transmission queue. The default is **4**. The recommended setting is **adaptive (multi-rate)**.
- **No of Retries Best Effort BE** – Select the number of retries for the Best Effort transmission queue. The default is **4**. The recommended setting is **adaptive (multi-rate)**.
- **No of Retries Video VI** – Select the number of retries for the Video transmission queue. The default is **4**. The recommended setting is **adaptive (multi-rate)**.
- **No of Retries Voice VO** – Select the number of retries for the Voice transmission queue. The default is **1**. The recommended setting is **adaptive (multi-rate)**.
- **No of Retries Turbo Voice TVO** – Select the number of retries for the Turbo Voice transmission queue. The default is **1**. The recommended setting is adaptive (multi-rate).

> Certain client cards or applications may require modification of the default settings. If so, follow the manufacturer’s instructions.

7. To save your changes, click **Save**.
8. To restore the settings displayed in this screen to the most recent saved values, click **Reset**.
9. To restore the factory defaults for the settings on this tab, click **Factory Defaults**.

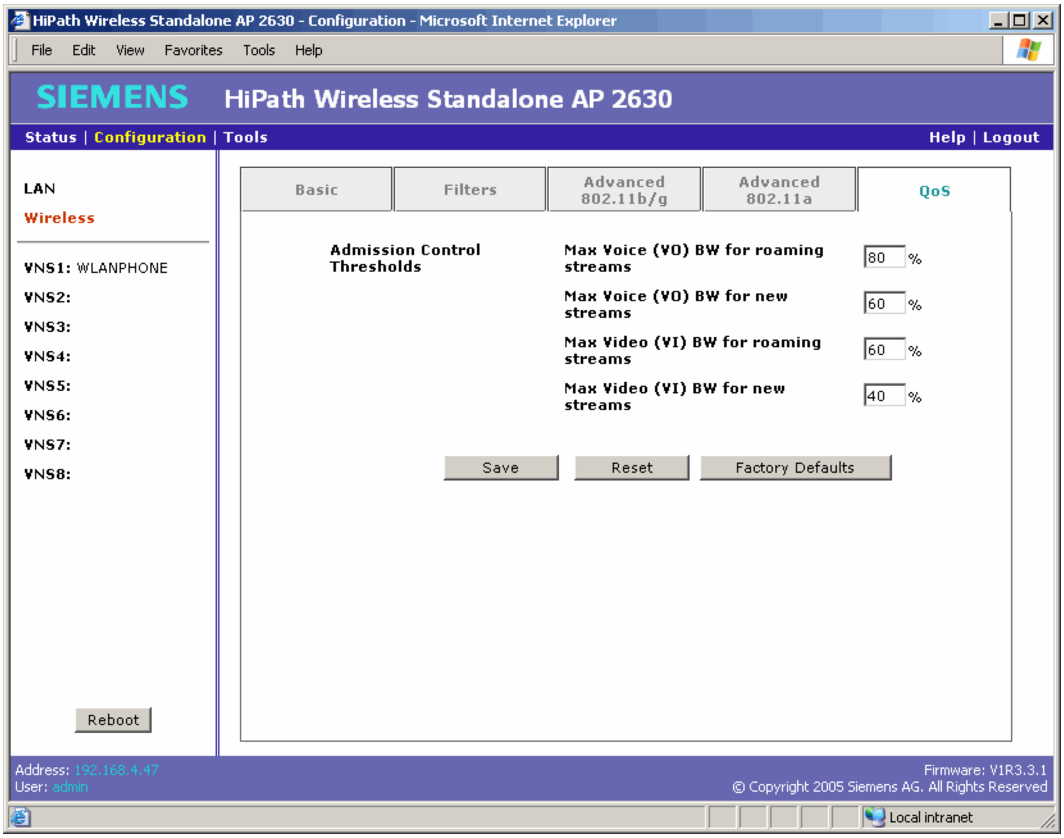
> The **Reboot** button is available on this screen. For more information, see ”Rebooting”, on page 93.

6.2.5 Configuring the wireless Quality of Service (QoS) settings

Use the **QoS** tab to view and define the admission control thresholds. Admission control thresholds protect admitted traffic against overloads, and provide distinct thresholds for VO and VI, and distinct thresholds for roaming and new streams.

To configure the QoS settings:

1. On the menu bar, click **Configuration**.
2. In the left pane, click **Wireless**.
3. Click the **QoS** tab.



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Wireless
VNS1: WLANPHONE
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Admission Control Thresholds

Max Voice (VO) BW for roaming streams	80 %
Max Voice (VO) BW for new streams	60 %
Max Video (VI) BW for roaming streams	60 %
Max Video (VI) BW for new streams	40 %

Address: 192.168.4.47
User: admin
Firmware: V1R3.3.1
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4. Using the **Admission control thresholds** drop-down lists, define the thresholds for the following:

- **Max Voice (VO) BW for roaming streams** – The maximum allowed overall bandwidth on the new Standalone Access Point when a client with an active voice stream requests admission for the voice stream. The default is **80%**.
- **Max Voice (VO) BW for new streams** – The maximum allowed overall bandwidth on the Standalone Access Point when an already associated client requests admission for a new voice stream. The default is **60%**.

- **Max Video (VI) BW for roaming streams** – The maximum allowed overall bandwidth on the Standalone Access Point when a client with an active video stream requests admission for the video stream. The default is **60%**.
- **Max Video (VI) BW for new streams** – The maximum allowed overall bandwidth on an access point when an already associated client requests admission for a new video stream. The default is **40%**.

5. To save your changes, click **Save**.
6. To restore the settings displayed in this screen to the most recent saved values, click **Reset**.
7. To restore the factory defaults for the settings in this tab, click **Factory Defaults**.

> The **Reboot** button is available on this screen. For more information, see ”Rebooting”, on page 93.

6.3 Configuring VNS for the Standalone Access Point

The Standalone Access Point can support up to 8 VNSs. For each VNS the following can be configured:

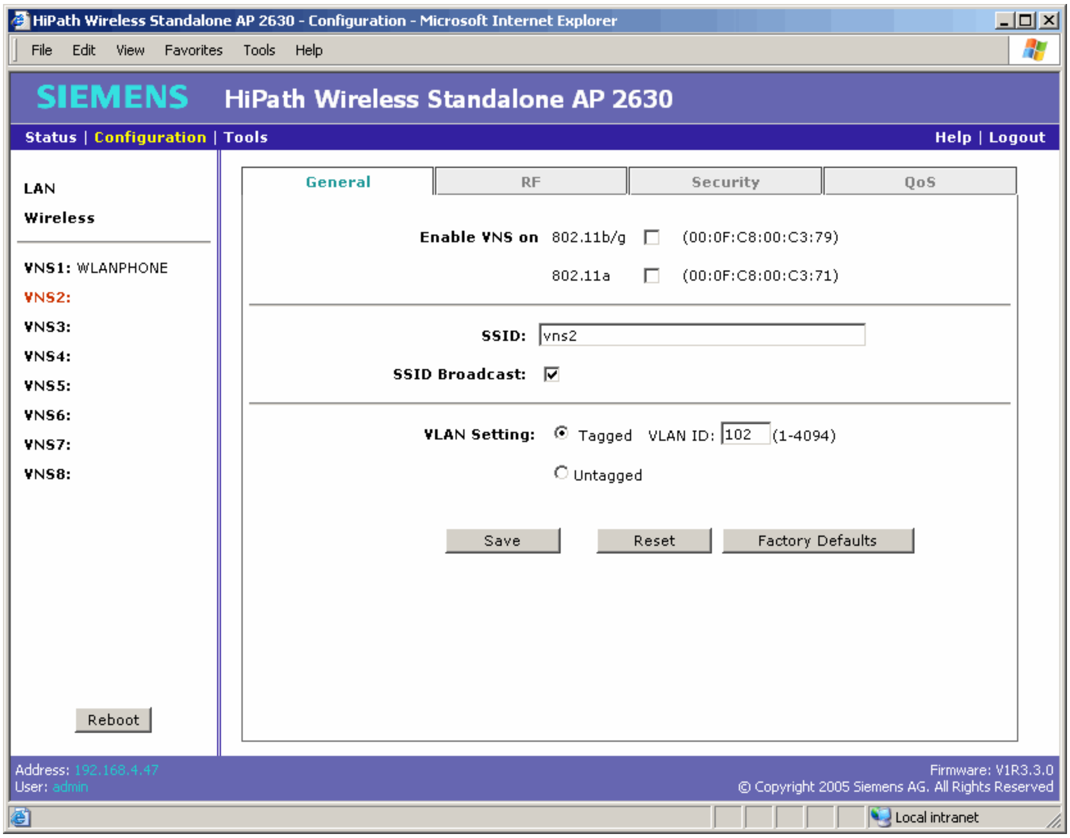
- Radio enabling
- SSID information
- VLAN settings
- Radio frequency
- Security assignment
- Quality of service

6.3.1 Configuring the general VNS configuration

Use the **General** tab to configure the radio, SSID, and VLAN settings for a VNS. By default, the SSID for the first VNS is WLANPHONE and is enabled; all other VNSs are disabled.

To configure the VNS general settings:

1. On the menu bar, click **Configuration**.
2. In the left pane, click the VNS you want to configure. The **General** tab is displayed.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VNS1: WLANPHONE
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VNS6:
VNS7:
VNS8:
General
RF
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Enable VNS on 802.11b/g □ (00:0F:C8:00:C3:79)

802.11a □ (00:0F:C8:00:C3:71)

SSID: vns2

SSID Broadcast: ☑

VLAN Setting: ● Tagged VLAN ID: 102 (1-4094)

○ Untagged

Address: 192.168.4.47
User: admin

Firmware: V1R3.3.0
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3. In the Enable VNS on section, do the following:
   - **802.11b/g** – Select to enable the VNS on 802.11b/g radio.
   - **802.11a** – Select to enable the VNS on 802.11a radio.
4. In the **SSID** box, type the name for the VNS.
5. Do one of the following:
   - To enable SSID broadcasting by the Standalone Access Point, select the **SSID Broadcast** check box. The default is enabled.
   - To disable SSID broadcasting by the Standalone Access Point, clear the **SSID Broadcast** check box.
6. For the VLAN Setting options, do one of the following:
   - **Tagged** – Select to tag all IP packets for this VNS. The default is **Tagged**.
     - **VLAN ID** – Type the VLAN ID value you want to use as the tag.
   - **Untagged** – Select for all IP packets for the VNS to be untagged. The default is **Untagged**.

   By default, the first VNS is **Untagged** and the other VNSs are **Tagged**.

7. To save your changes, click **Save**.
8. To restore the settings displayed in this screen to the most recent saved values, click **Reset**.
9. To restore the factory defaults for the settings on this tab, click **Factory Defaults**.

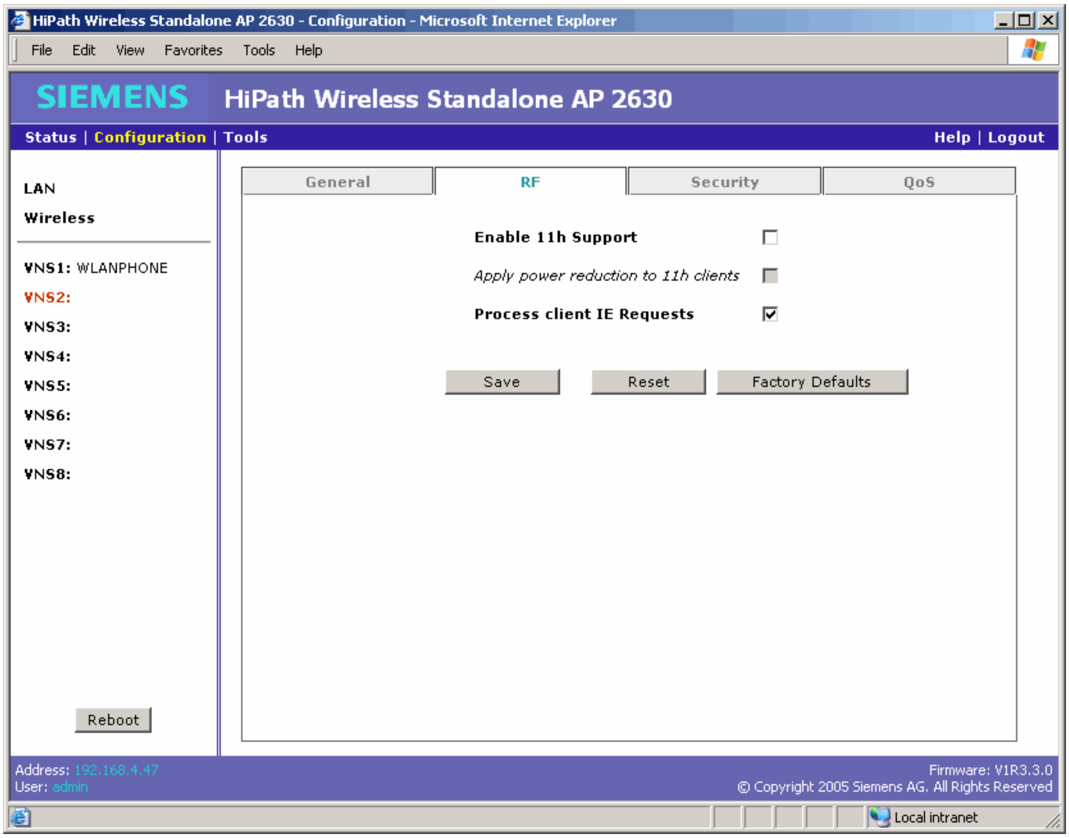
> The **Reboot** button is available on this screen. For more information, see "Rebooting", on page 93.

6.3.2 Configuring VNS radio frequency settings

Use the **RF** tab to configure VNS radio frequency settings.

To configure the VNS radio frequency:

1. On the menu bar, click **Configuration**.
2. In the left pane, click the VNS you want to configure.
3. Click the **RF** tab.



Enable 11h Support ☐

Apply power reduction to 11h clients ☐

Process client IE Requests ☑

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VNS5:
VNS6:
VNS7:
VNS8:
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Address: 192.168.4.47
User: admin
Firmware: V1R3.3.0
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Local intranet

4. Do the following:
   - **Enable 11h Support** – Select to enable 802.11h support for this VNS. The default is disabled. It is recommended to enable this option.
   - **Apply power reduction to 11h clients** – Select to enable the Standalone Access Point to use reduced power (as does the 11h client) for this VNS. The default is disabled. It is recommended to enable this option.
   - **Process client IE Requests** – Select to enable the Standalone Access Point to accept IE requests sent by clients via Probe Request frames and responds by including the requested IE's in the corresponding Probe Response frames for this VNS. The default is enabled. It is recommended to enable this option.
5. To save your changes, click **Save**.
6. To restore the settings displayed in this screen to the most recent saved values, click **Reset**.
7. To restore the factory defaults for the settings on this tab, click **Factory Defaults**.

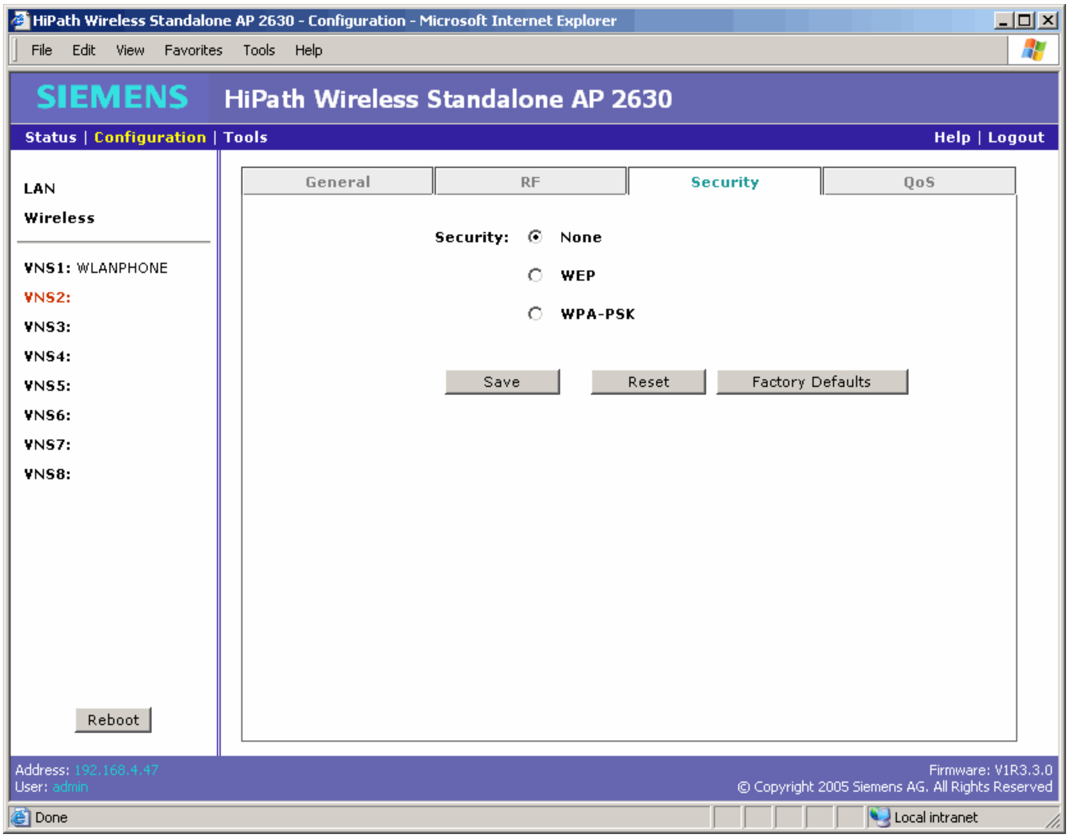
> The **Reboot** button is available on this screen. For more information, see ”Rebooting”, on page 93.

6.3.3 Configuring VNS security settings

Use the **Security** tab to configure VNS security.

To configure VNS security:

1. On the menu bar, click **Configuration**.
2. In the left pane, click the VNS you want to configure.
3. Click the **Security** tab.



Security: ● None
○ WEP
○ WPA-PSK

Address: 192.168.4.47
User: admin

Firmware: V1R3.3.0
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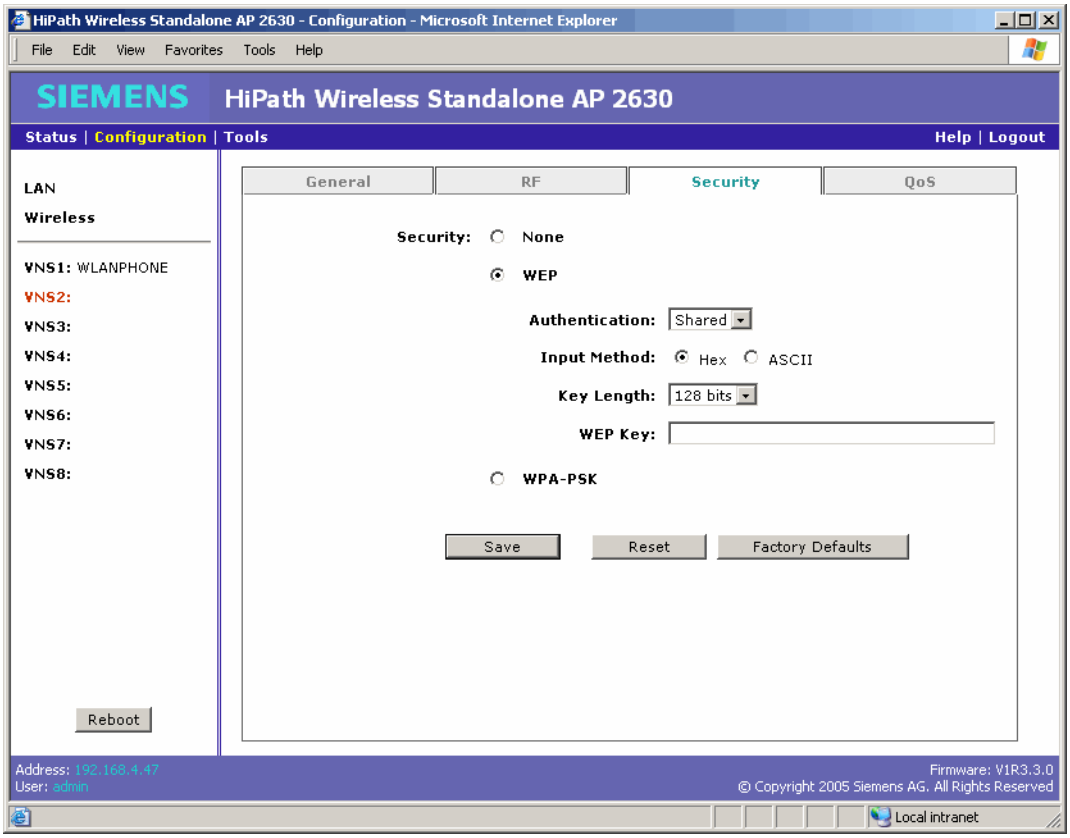
4. To configure VNS security, do one of the following:

- **None** – Select to disable security. The default is **None**.
- **WEP** – Select to enable WEP (Static Wired Equivalent Privacy) as the security protocol for the VNS. WEP security selection allows the configuration of authentication type, input method, key length, and the WEP key.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Security: ○ None

● WEP

Authentication: Shared

Input Method: ● Hex ○ ASCII

Key Length: 128 bits

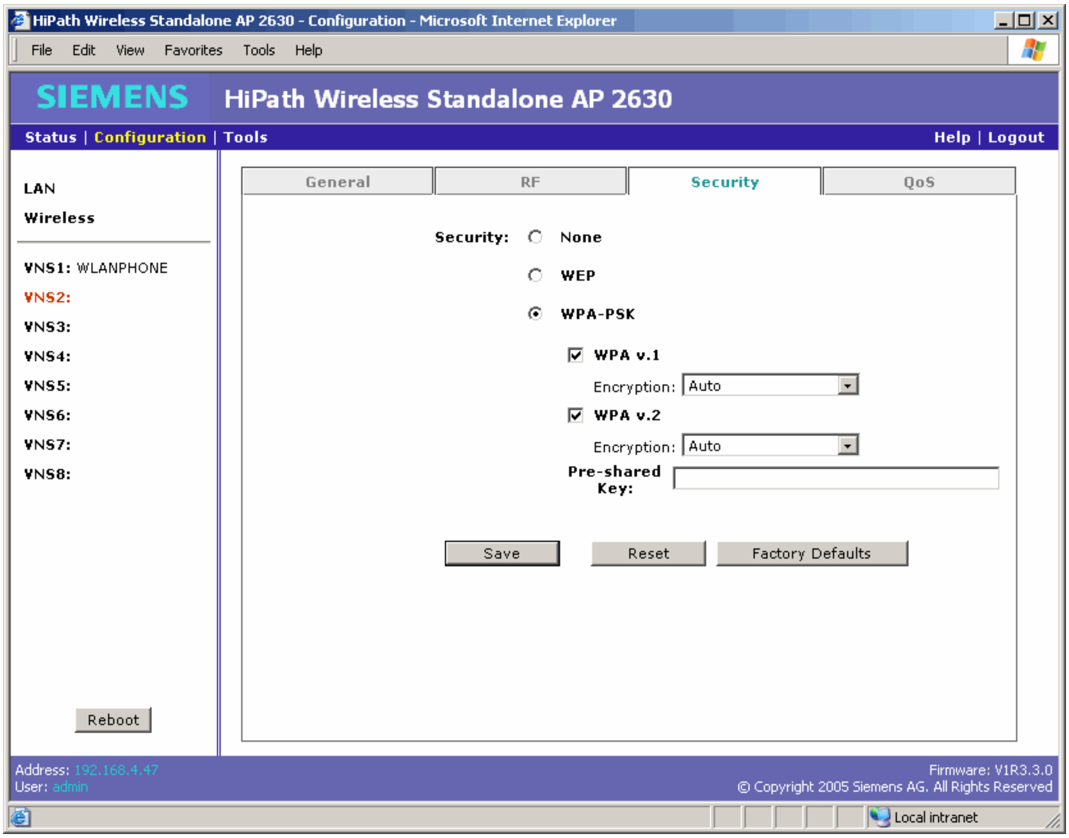
WEP Key:

○ WPA-PSK

- **Authentication** – Select the authentication type to use. The available authentication types are **Open** (no authentication), **Shared** (use the pre-shared key to authenticate), and **Auto** (accept authentication using Open or Shared). The default is **Shared**.
- To define the input method, select **Hex** for a hexidecimal key format or **ASCII** for an ASCII key format. The default is **Hex**.
- **Key Length –** Select the length (bits) for the key. The available key lengths are **40**, **104**, and **128**. The default is **128**.
- **WEP Key** – Type the key. This key is verified for format and length when you save your changes.

- **WPA-PSK** – Select to enable WPA-PSK (Wi-Fi Protected Access Pre-Shared key) as the security protocol for the VNS. WPA-PSK security selection allows the configuration of WPA v.1, WPA v.2, and the pre-shared key. You can select both WPA v.1 and WPA v.2 to allow different clients to associate with WPA v.1 or WPA v.2.

  WPA-PSK adds authentication to enhanced WEP encryption and key management. WPA-PSK mode does not require an authentication server. It is suitable for home or small office.


HiPath Wireless Standalone AP 2630 - Configuration - Microsoft Internet Explorer
File Edit View Favorites Tools Help
SIEMENS
HiPath Wireless Standalone AP 2630
Status | Configuration | Tools
Help | Logout
LAN
Wireless
VNS1: WLANPHONE
VNS2:
VNS3:
VNS4:
VNS5:
VNS6:
VNS7:
VNS8:
Reboot
General
RF
Security
QoS
Save
Reset
Factory Defaults
Local intranet

Security: ○ None
○ WEP
● WPA-PSK
☑ WPA v.1
Encryption: Auto
☑ WPA v.2
Encryption: Auto
Pre-shared Key:

Address: 192.168.4.47
User: admin
Firmware: V1R3.3.0
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- **WPA v.1** – Select to enable the pre-802.11i solution mode. The default is enabled.
- **Encryption** – Select the encryption type **Auto** or **TKIP Only**. The default is **Auto**. If **Auto** is selected, the Standalone Access Point will advertise both TKIP and CCMP (Counter Mode with Cipher Block Chaining Message Authentication Code Protocol) for WPAv1. CCMP is an IEEE 802.11i encryption protocol that uses the encryption cipher AES (Advanced Encryption Standard). If **TKIP Only** is selected, the Standalone Access Point will advertise TKIP as an available encryption protocol for WPAv1. It will not advertise CCMP.
- **WPA v.2** – Select to enable the 802.11i solution mode. The default is enabled.
- **Encryption** – Select the encryption type **Auto** or **AES Only**. The default is **Auto**. If **Auto** is selected, the Standalone Access Point will advertise both TKIP and CCMP (Counter Mode with Cipher Block Chaining Message Authentication Code Protocol) for WPAv2. CCMP is an IEEE 802.11i encryption protocol that uses the encryption cipher AES (Advanced Encryption Standard). If **AES Only** is selected, the Standalone Access Point will advertise AES as an available encryption protocol for WPAv2. It will not advertise TKIP.
- **Pre-shared Key** – Type the ASCII password used to generate the key.

5. To save your changes, click **Save**.

6. To restore the settings displayed in this screen to the most recent saved values, click **Reset**.
7. To restore the factory defaults for the settings on this tab, click **Factory Defaults**.

> The **Reboot** button is available on this screen. For more information, see ”Rebooting”, on page 93.

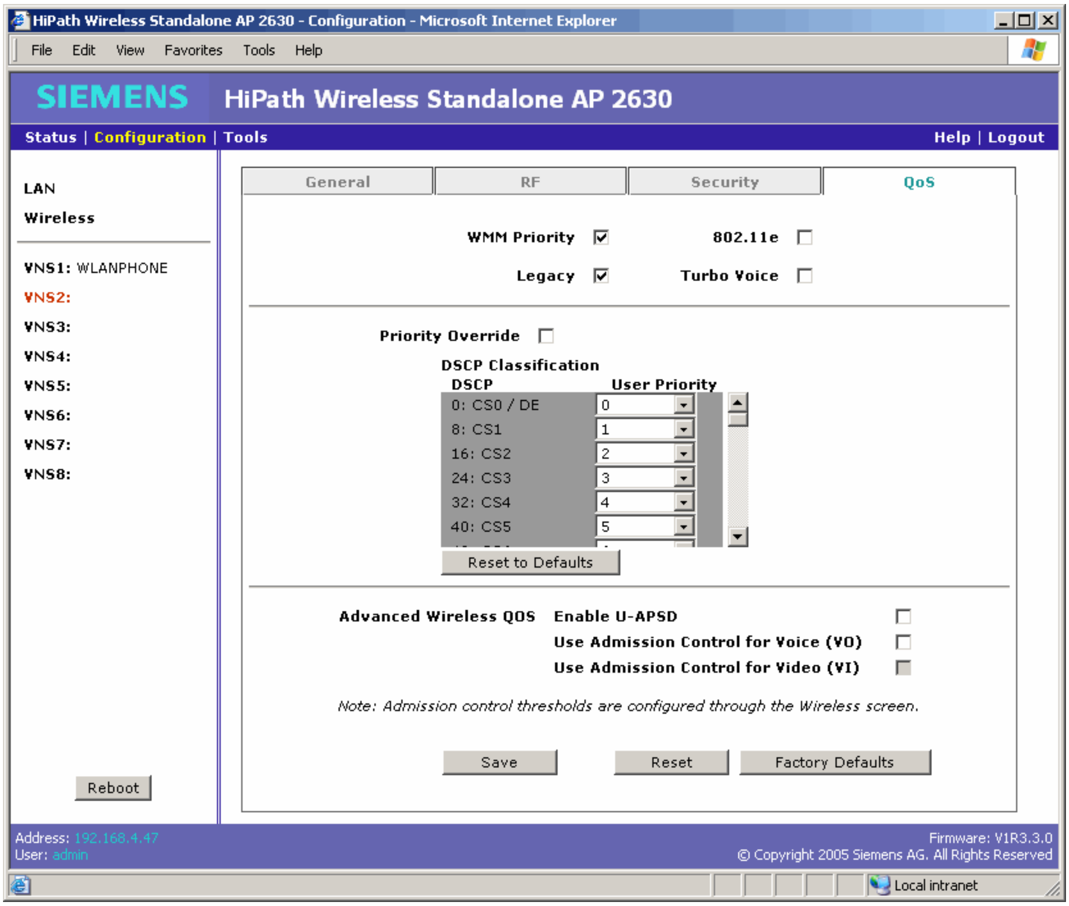
6.3.4 Configuring VNS QoS settings

Use the **Qos** tab to configure VNS QoS settings. The tab provides QoS configuration information, including:

- **WMM Priority** – If enabled, the Standalone Access Point will accept WMM client associations, and will classify and prioritize the downlink traffic for all WMM clients. WMM clients will also classify and prioritize the uplink traffic.
- **802.11e** – If enabled, the Standalone Access Point will accept 802.11e client associations, and will classify and prioritize the downlink traffic for all 802.11e clients. 802.11e clients will also classify and prioritize the uplink traffic. WMM is the pre-802.11e standard established by the WiFi alliance.
- **Legacy** – If enabled, the Standalone Access Point will classify and prioritize the downlink traffic for all clients according to the same rules used for the WMM and 802.11e.
- **Turbo Voice** – If any of the above QoS modes are enabled, the Turbo Voice mode is available. If enabled, all all downlink traffic that is classified to the Voice (VO) AC and belongs to that VNS to be transmitted by the Standalone Access Point via a queue called Turbo Voice (TVO) instead of the normal Voice (VO) queue. When Turbo Voice is enabled together with WMM or 802.11e, the WMM and/or 802.11e clients in that VNS are instructed by the Standalone Access Point to transmit all traffic classified to VO AC with special contention parameters tailored to maximize voice performance and capacity.

To configure VNS QoS:

1. On the menu bar, click **Configuration**.
2. In the left pane, click the VNS you want to configure.
3. Click the **QoS** tab.


HiPath Wireless Standalone AP 2630 - Configuration - Microsoft Internet Explorer
File Edit View Favorites Tools Help
SIEMENS
HiPath Wireless Standalone AP 2630
Status | Configuration | Tools
Help | Logout
LAN
Wireless
VNS1: WLANPHONE
VNS2:
VNS3:
VNS4:
VNS5:
VNS6:
VNS7:
VNS8:
General
RF
Security
QoS
Reset to Defaults
Save
Reset
Factory Defaults
Reboot
Local intranet

WMM Priority ☑ 802.11e ☐

Legacy ☑ Turbo Voice ☐

Priority Override ☐

DSCP Classification

DSCP	User Priority
0: CS0 / DE	0
8: CS1	1
16: CS2	2
24: CS3	3
32: CS4	4
40: CS5	5

Advanced Wireless QOS Enable U-APSD ☐

Use Admission Control for Voice (VO) ☐

Use Admission Control for Video (VI) ☐

Note: Admission control thresholds are configured through the Wireless screen.

Address: 192.168.4.47
User: admin

Firmware: V1R3.3.0
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4. Do the following:

- **WMM Priority** – Select to enable the Standalone Access Point to accept WMM client associations, and classify and prioritize the downlink traffic for all WMM clients. WMM clients will also classify and prioritize the uplink traffic. WMM is part of the 802.11e standard for QoS. If selected, the **Turbo Voice** option is available.

- **Legacy** – Select if your VNS will support legacy devices that do not support WMM or 802.11e for prioritizing voice traffic. If selected, the **Turbo Voice** option is available.

- **802.11e** – Select to enable the Standalone Access Point to accept 802.11e client associations, and classify and prioritize the downlink traffic for all 802.11e clients. The 802.11e clients will also classify and prioritize the uplink traffic. If selected, the **Turbo Voice** option is available.

- **Turbo Voice** – Select to enable all downlink traffic that is classified to the Voice (VO) AC and belongs to that VNS to be transmitted by the Standalone Access Point via a queue called Turbo Voice (TVO) instead of the normal Voice (VO) queue. When Turbo Voice is enabled together with WMM or 802.11e, the WMM and/or 802.11e clients in that VNS are instructed by the Standalone Access Point to transmit all traffic classified to VO AC with special contention parameters tailored to maximize voice performance and capacity. The **Turbo Voice** option is only available if either of the **WMM**, **802.11e**, or **Legacy** options are selected.

5. Do one of the following:

- To define the priority level for the VNS, select the **Priority Override** checkbox. The **User Priority** drop-down list is displayed. From the **User Priority** drop-down list, select the appropriate priority level. You can select one of the eight priority levels:
    - 7, 6 – Voice Traffic.
    - 5, 4 – Video Traffic
    - 3, 0 – Best Effort
    - 2, 1 – Background Traffic
- If you want to assign a priority level to each DSCP marking, clear the **Priority Override** checkbox and define the DSCP service class priorities in the **DSCP Classification** table.

  Use the **DSCP Classification** table to classify downlink traffic by mapping the IP DSCP to the specific User Priority that is defined for each IP DSCP value. However, when Priority Override is enabled, the configured User Priority will be used instead.

  The final User Priority will determine the transmit queue and the user priority for the wireless QoS packets (WMM or 802.11e) in the downlink direction. The User Priority value is also used to tag the VLAN Priority field for the uplink traffic if the VLAN tagging is enabled for this VNS. The Standalone Access Point does not override the DSCP in the IP header of the user packet in either the downlink or the uplink direction.

6. The **Advanced Wireless QoS** options are only displayed if the **WMM Priority** or **802.11e** checkboxes are selected:
   - **Enable U-APSD** – Select to enable the Unscheduled Automatic Power Save Delivery (U-APSD) feature. This feature can be used by mobile devices to efficiently sustain one or more real-time streams while being in power-save mode. This feature works in conjunction with WMM and/or 802.11e, and it is automatically disabled if both WMM and 802.11e are disabled.
   - **Use Global Admission Control for Voice (VO)** – Select to enable admission control for Voice. With admission control, clients are forced to request admission in order to use the high priority access categories in both downlink and uplink direction. Admission control protects admitted traffic against new bandwidth demands.
   - **Use Global Admission Control for Video (VI)** – This feature is only available if admission control is enabled for Voice. Select to enable admission control for Video. With admission control, clients are forced to request admission in order to use the high priority access categories in both downlink and uplink direction. Admission control protects admitted traffic against new bandwidth demands.
7. To save your changes, click **Save**.
8. To restore the settings displayed in this screen to the most recent saved values, click **Reset**.
9. To restore the factory defaults for the settings on this tab, click **Factory Defaults**.

> The **Reboot** button is available on this screen. For more information, see ”Rebooting”, on page 93.

The following table provides detailed information on setting the QoS feature.

Classification				**Mode**
WMM Priority support	**Legacy Priority support**	**WMM or 802.11e client**	**Non-WMM/ Non-802.11e client**	
Disable	Disable	No	No	All the clients will be associated as non-QoS enable. All the Tx frames will be assigned to AC_BE and sent without a IEEE 802.11 QoS control header.
Enable	Disable	Yes	No	The WMM or 802.11e client will be associated as QoS enabled. Each Tx frame will be properly classified and assigned to the appropriate queue. The frame will be sent with QoS control header. For the non-WMM/802.11e client, the Tx frame will not be classified and will be sent via AC_BE without a QoS control field.
Disable	Enable	N/A	Yes	All the clients will be associated as non-QoS enable. Each Tx frame will be properly classified and assigned to the appropriate queue. The frame will be sent without a QoS control header.
Enable	Enable	Yes	Yes	The WMM or 802.11e client will be associated as QoS enabled. Each Tx frame will be properly classified and assigned to the appropriate queue. The frame will be sent with/without a QoS control header depending upon whether the client is associated with QoS enable or not.

Table 13 Setting QoS Classification

6.4 Managing configuration

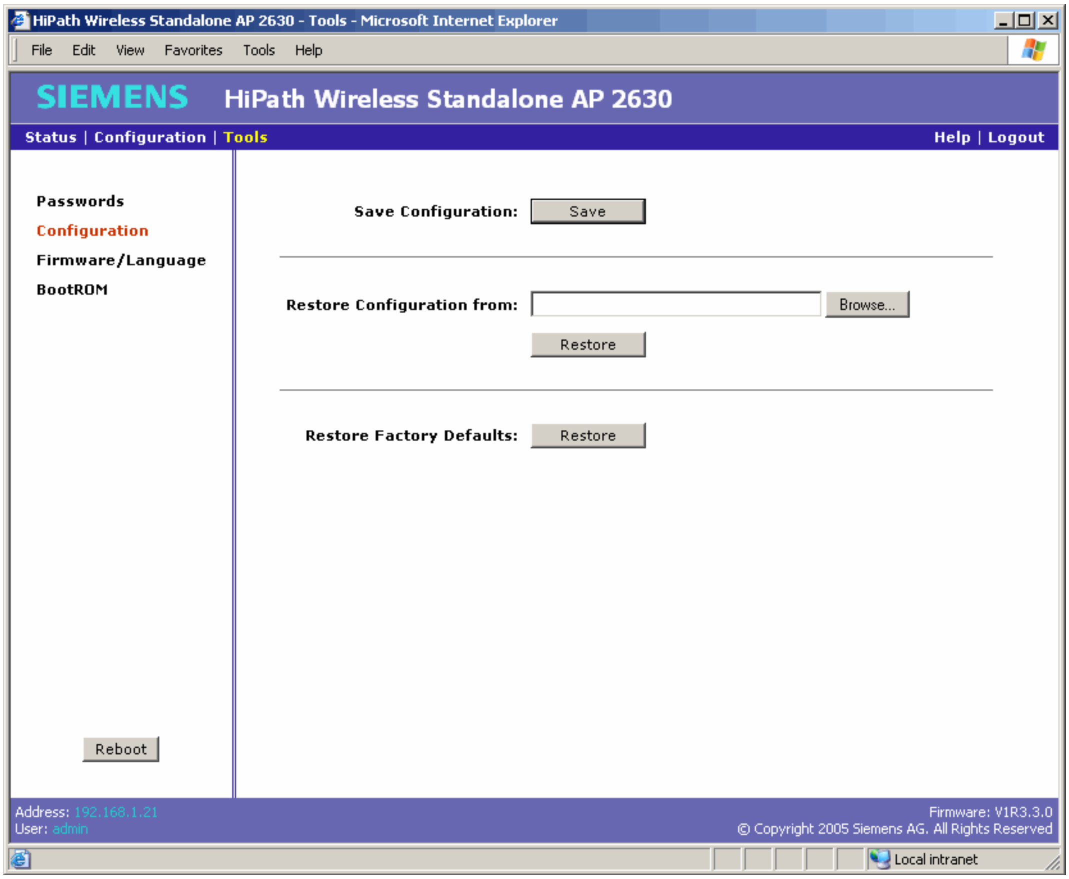
The Standalone Access Point allows you to save Standalone Access Point configurations and then restore them at a later time. You can also restore factory default settings.

6.4.1 Saving a configuration

Use the **Configuration** screen to save a Standalone Access Point configuration to a file.

To save a configuration:

1. On the menu bar, click **Tools**.
2. In the left pane, click **Configuration**.


HiPath Wireless Standalone AP 2630 - Tools - Microsoft Internet Explorer
File Edit View Favorites Tools Help
SIEMENS HiPath Wireless Standalone AP 2630
Status | Configuration | Tools
Help | Logout
Passwords
Configuration
Firmware/Language
BootROM
Reboot
Save Configuration: Save
Restore Configuration from: Browse...
Restore
Restore Factory Defaults: Restore
Local intranet

Address: 192.168.1.21
User: admin
Firmware: V1R3.3.0
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3. To save the current configuration, click **Save** in the **Save Configuration** section. The **File Download** dialog box is displayed.
4. In the **File Download** dialog box, click **Save**.
5. In the **Save As** dialog box, navigate to a directory location.
6. In the **File name** box, type the name for the configuration (.cfg) file.

7. To save the configuration file in the selected directory location, click **Save**.

> The **Reboot** button is available on this screen. For more information, see ”Rebooting”, on page 93.

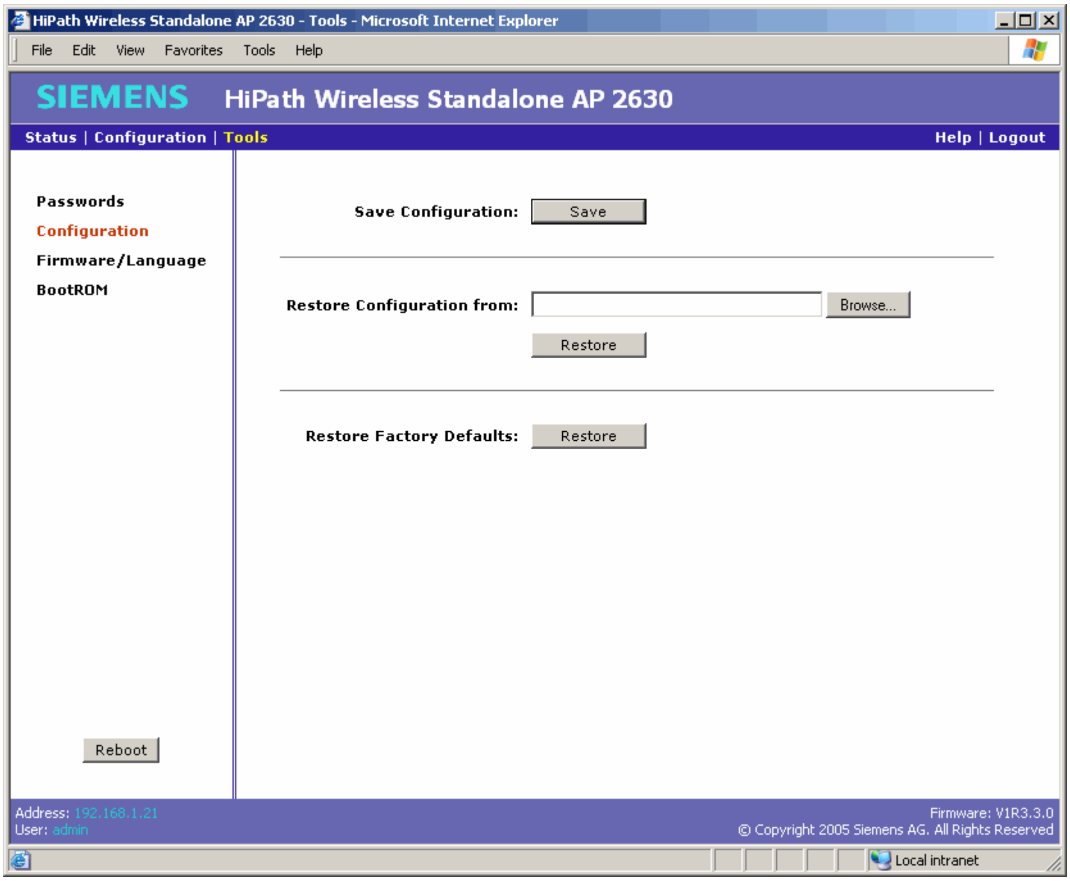
6.4.2 Restoring a configuration

Use the **Configuration** screen to restore a Standalone Access Point configuration from a file.

> When the configuration is restored, the software first resets all configuration parameters to manufacturing default settings. Then the software applies the commands in the specified configuration file.

To restore a configuration:

1. On the menu bar, click **Tools**.
2. In the left pane, click **Configuration**.



HiPath Wireless Standalone AP 2630 - Tools - Microsoft Internet Explorer
File Edit View Favorites Tools Help
SIEMENS HiPath Wireless Standalone AP 2630
Status | Configuration | Tools
Help | Logout
Passwords
Configuration
Firmware/Language
BootROM
Save Configuration:
Save
Restore Configuration from:
Browse...
Restore
Restore Factory Defaults:
Restore
Reboot
Address: 192.168.1.21
User: admin
Firmware: V1R3.3.0
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Local intranet

3. In the **Restore Configuration from** section, click **Browse** to navigate to the appropriate configuration file.
4. Select the file to download, and then click **Open** in the **Choose file** dialog box. The directory location is displayed in the **Restore Configuration from** box.
5. In the **Restore Configuration from** section, click **Restore**.

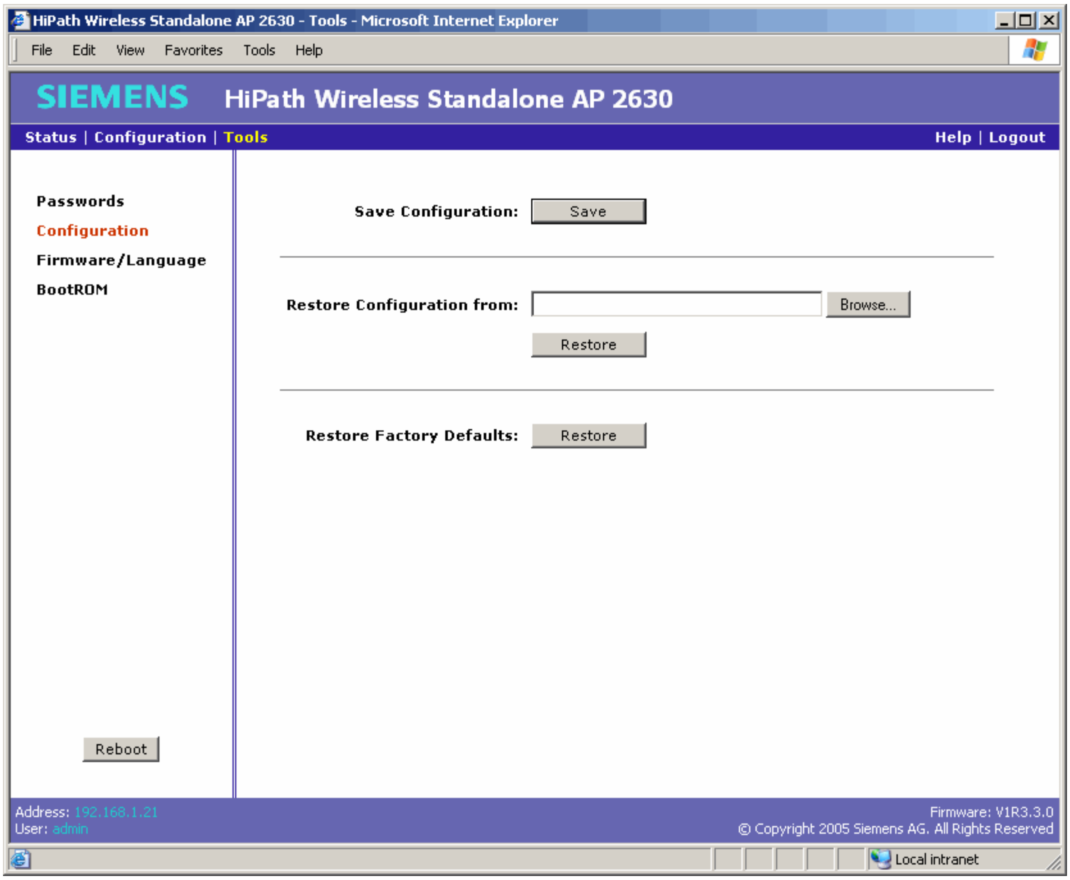
> The Standalone Access Point will automatically **reboot** after restoring a configuration. For more information, see ”Rebooting”, on page 93.

6.4.3 Restoring the factory default settings

Use the **Configuration** screen to restore all Standalone Access Point settings to the factory defaults.

To restore all factory default settings:

1. On the menu bar, click **Tools**.
2. In the left pane, click **Configuration**.


HiPath Wireless Standalone AP 2630 - Tools - Microsoft Internet Explorer
File Edit View Favorites Tools Help
SIEMENS
HiPath Wireless Standalone AP 2630
Status | Configuration | Tools
Help | Logout
Passwords
Configuration
Firmware/Language
BootROM
Reboot
Save Configuration:
Save
Restore Configuration from:
Browse...
Restore
Restore Factory Defaults:
Restore
Local intranet

Address: 192.168.1.21
User: admin

Firmware: V1R3.3.0
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3. In the **Restore Factory Defaults** section, click **Restore**.

> The Standalone Access Point will automatically reboot after restoring all factory default settings. For more information, see ”Rebooting”, on page 93.

6.4.4 Upgrading the BootROM

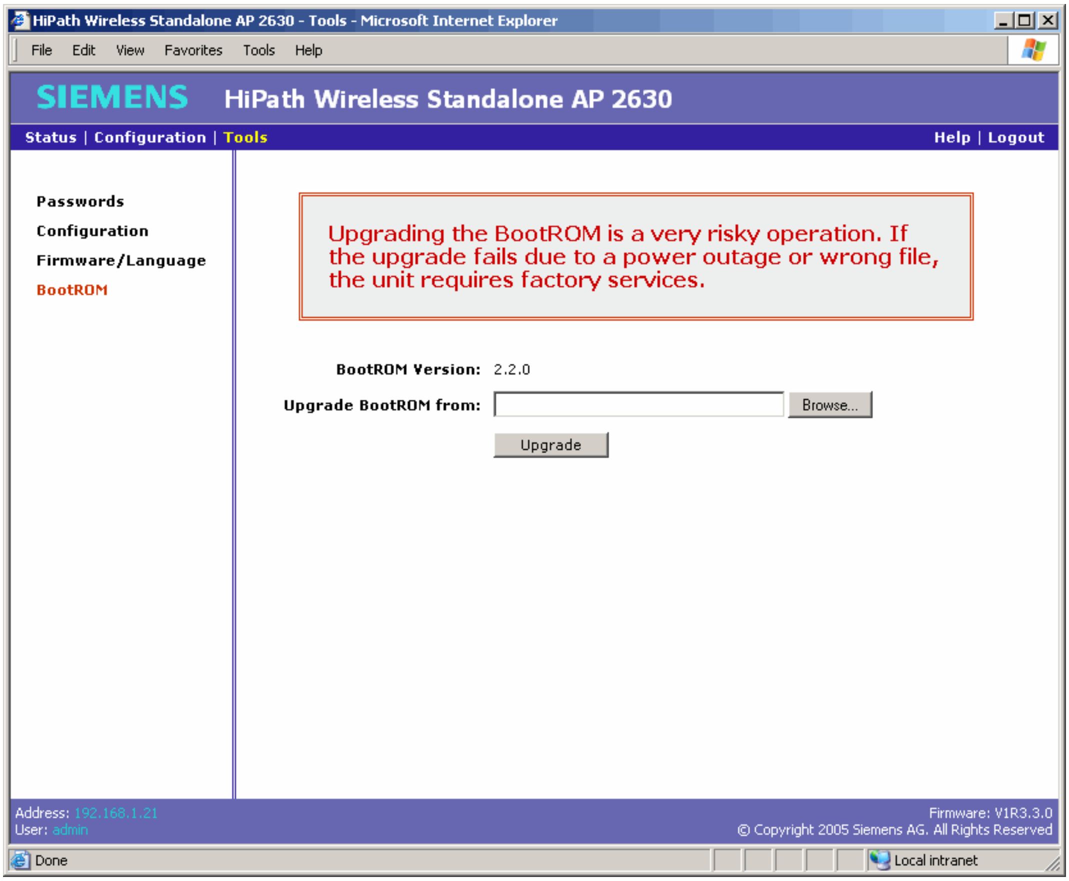
Use the **BootROM** screen to upgrade the BootROM. You can enter or select a path on the host running the Web client from which to download the new BootROM. The new BootROM is installed over the existing BootROM.

> ⚠ Upgrading the BootROM is an extremely dangerous operation. If the upgrade fails for any reason, such as a power outage or an incorrect file, the unit requires factory services.

To upgrade the BootROM:

1. On the menu bar, click **Tools**.

2. In the left pane, click **BootROM**.



HiPath Wireless Standalone AP 2630 - Tools - Microsoft Internet Explorer
File Edit View Favorites Tools Help
SIEMENS
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Status | Configuration | Tools
Help | Logout
Passwords
Configuration
Firmware/Language
BootROM
Browse...
Upgrade
Address: 192.168.1.21
User: admin
Firmware: V1R3.3.0
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Done
Local intranet

Upgrading the BootROM is a very risky operation. If the upgrade fails due to a power outage or wrong file, the unit requires factory services.

BootROM Version: 2.2.0

Upgrade BootROM from:

3. In the **Upgrade BootROM from** section, click **Browse** to navigate to the appropriate file.

4. Select the file to download, and then click **Open** in the **Choose file** dialog box. The directory location is displayed in the **Upgrade BootROM from** box.

5. Click **Upgrade**. The selected file is downloaded.

> The Standalone Access Point will automatically reboot using the new downloaded BootROM version after the new BootROM is downloaded. For more information, see ”Rebooting”, on page 93.

7 Troubleshooting the Standalone Access Point

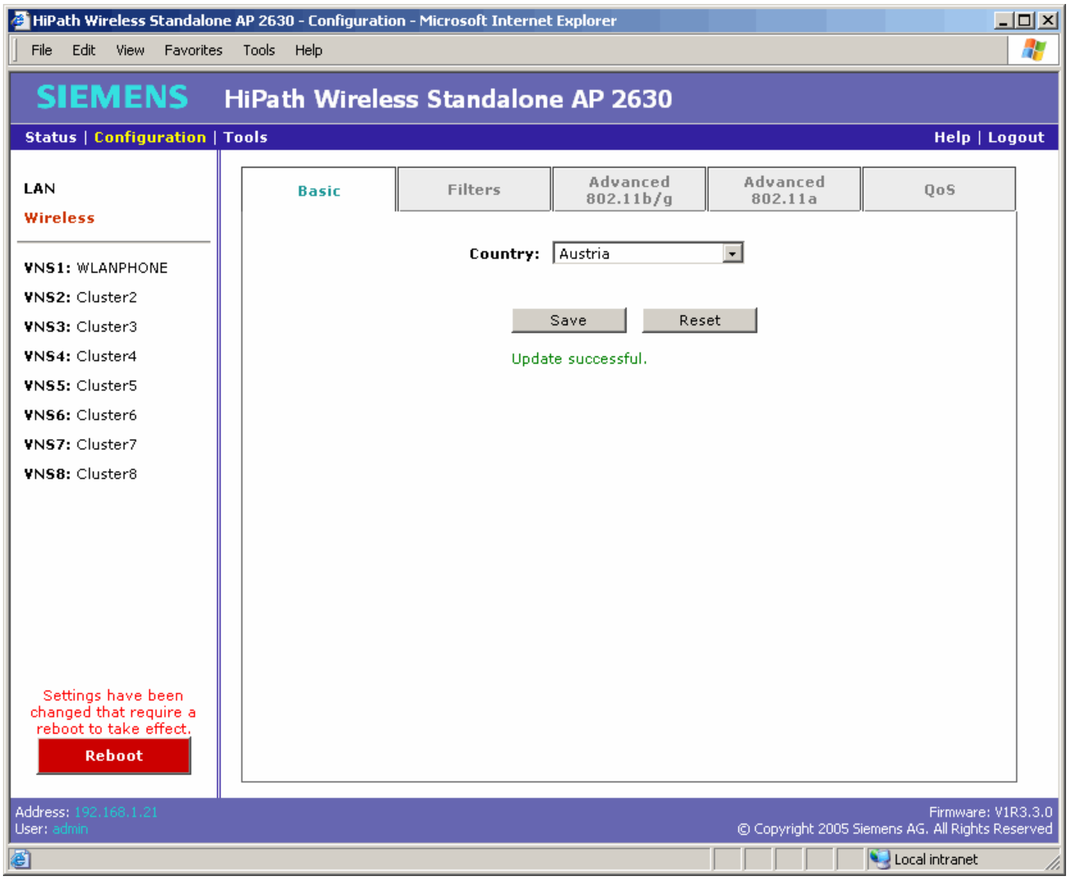
7.1 Rebooting

You can click **Reboot** to restart the Standalone Access Point. Whenever the configuration has been changed and a reboot is required, the **Reboot** button changes from grey to red and displays the following message:

> **Settings have been changed that require a reboot to take effect.**

To reboot the Standalone Access Point:

1. In the left pane, click **Reboot**. The Standalone Access Point is rebooted.



HiPath Wireless Standalone AP 2630 - Configuration - Microsoft Internet Explorer

Country: Austria

Update successful.

Settings have been changed that require a reboot to take effect.

Address: 192.168.1.21
User: admin

Firmware: V1R3.3.0
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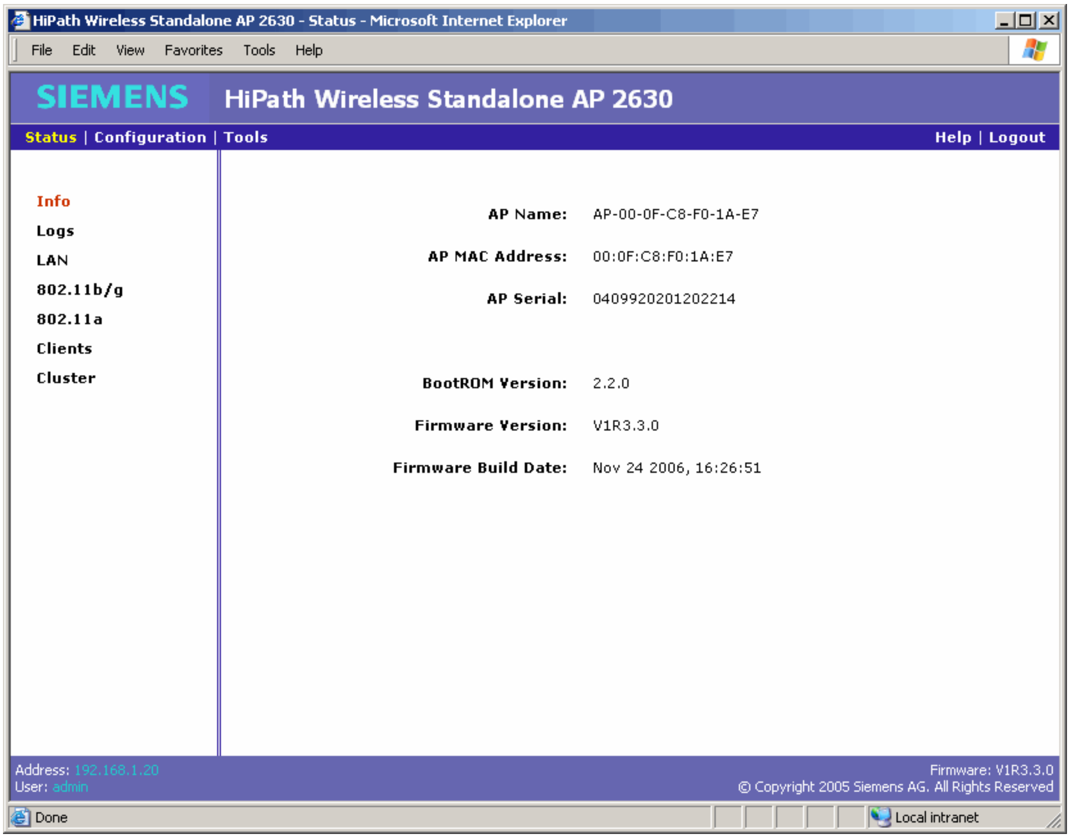
7.2 Viewing status information

Use the **Info** screen to view Standalone Access Point system status information. The screen displays the following:

- Access point name
- Access point MAC address
- Access point serial number
- BootROM version
- Firmware version
- Firmware build date

To view system status information:

On the menu bar, click **Status**. The **Info** screen is displayed.



HiPath Wireless Standalone AP 2630 - Status - Microsoft Internet Explorer
File Edit View Favorites Tools Help
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Status | Configuration | Tools
Help | Logout
Info
Logs
LAN
802.11b/g
802.11a
Clients
Cluster
Done
Local intranet

AP Name: AP-00-0F-C8-F0-1A-E7
AP MAC Address: 00:0F:C8:F0:1A:E7
AP Serial: 0409920201202214

BootROM Version: 2.2.0
Firmware Version: V1R3.3.0
Firmware Build Date: Nov 24 2006, 16:26:51

Address: 192.168.1.20
User: admin

Firmware: V1R3.3.0
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7.3 Viewing log status information

Use the **Logs** screen to view Standalone Access Point log status information. The screen displays the contents of the flash-based log file in an easy-to-read format. Each log entry is displayed on a separate line. You can view the following log status information:

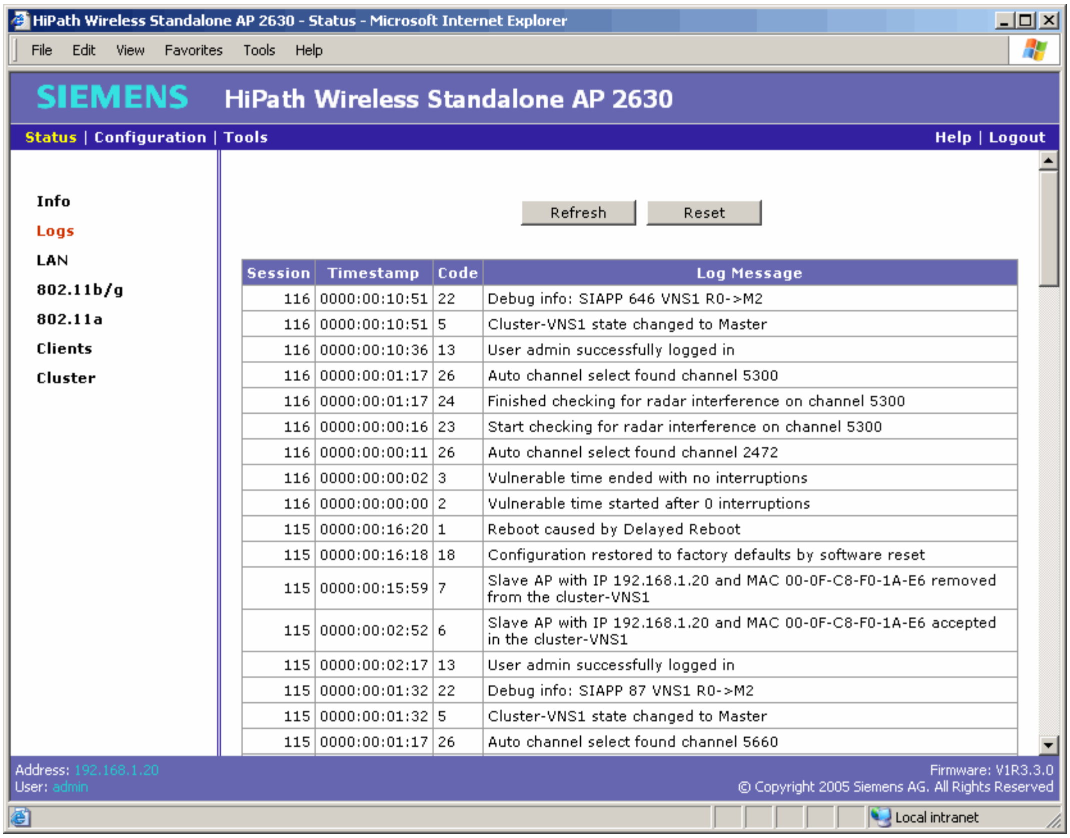
- A unique session number, incremented on every reboot of the Standalone Access Point. This number wraps at 255.
- The timestamp within the session, displayed in days, hours, minutes and seconds since the session started.
- An event code.
- A log message event description containing text and optional parameters. For example, MAC and IP addresses.

> ⓘ The log displays only the last 50 events.

For more information, see Appendix A, “Appendix: Log codes and messages”.

To view log status information:

1. On the menu bar, click **Status**.
2. In the left pane, click **Logs**.


HiPath Wireless Standalone AP 2630 - Status - Microsoft Internet Explorer
File Edit View Favorites Tools Help
SIEMENS
HiPath Wireless Standalone AP 2630
Status | Configuration | Tools
Help | Logout
Info
Logs
LAN
802.11b/g
802.11a
Clients
Cluster
Refresh
Reset
Local intranet

Session	Timestamp	Code	Log Message
116	0000:00:10:51	22	Debug info: SIAPP 646 VNS1 R0->M2
116	0000:00:10:51	5	Cluster-VNS1 state changed to Master
116	0000:00:10:36	13	User admin successfully logged in
116	0000:00:01:17	26	Auto channel select found channel 5300
116	0000:00:01:17	24	Finished checking for radar interference on channel 5300
116	0000:00:00:16	23	Start checking for radar interference on channel 5300
116	0000:00:00:11	26	Auto channel select found channel 2472
116	0000:00:00:02	3	Vulnerable time ended with no interruptions
116	0000:00:00:00	2	Vulnerable time started after 0 interruptions
115	0000:00:16:20	1	Reboot caused by Delayed Reboot
115	0000:00:16:18	18	Configuration restored to factory defaults by software reset
115	0000:00:15:59	7	Slave AP with IP 192.168.1.20 and MAC 00-0F-C8-F0-1A-E6 removed from the cluster-VNS1
115	0000:00:02:52	6	Slave AP with IP 192.168.1.20 and MAC 00-0F-C8-F0-1A-E6 accepted in the cluster-VNS1
115	0000:00:02:17	13	User admin successfully logged in
115	0000:00:01:32	22	Debug info: SIAPP 87 VNS1 R0->M2
115	0000:00:01:32	5	Cluster-VNS1 state changed to Master
115	0000:00:01:17	26	Auto channel select found channel 5660

Address: 192.168.1.20
User: admin

Firmware: V1R3.3.0
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3. To update the log data displayed to the most current data, click **Refresh**.

4. To clear all entries from the log, click **Reset.** This button is disabled for users with read-only privileges.

> Restoring the factory default settings by either hardware or software does not clear the log. Both events are recorded in the log using different codes. For more information, see 3.1"Resetting to factory default settings" on page 15 or 5.2.3"Restoring the factory default settings" on page 41.

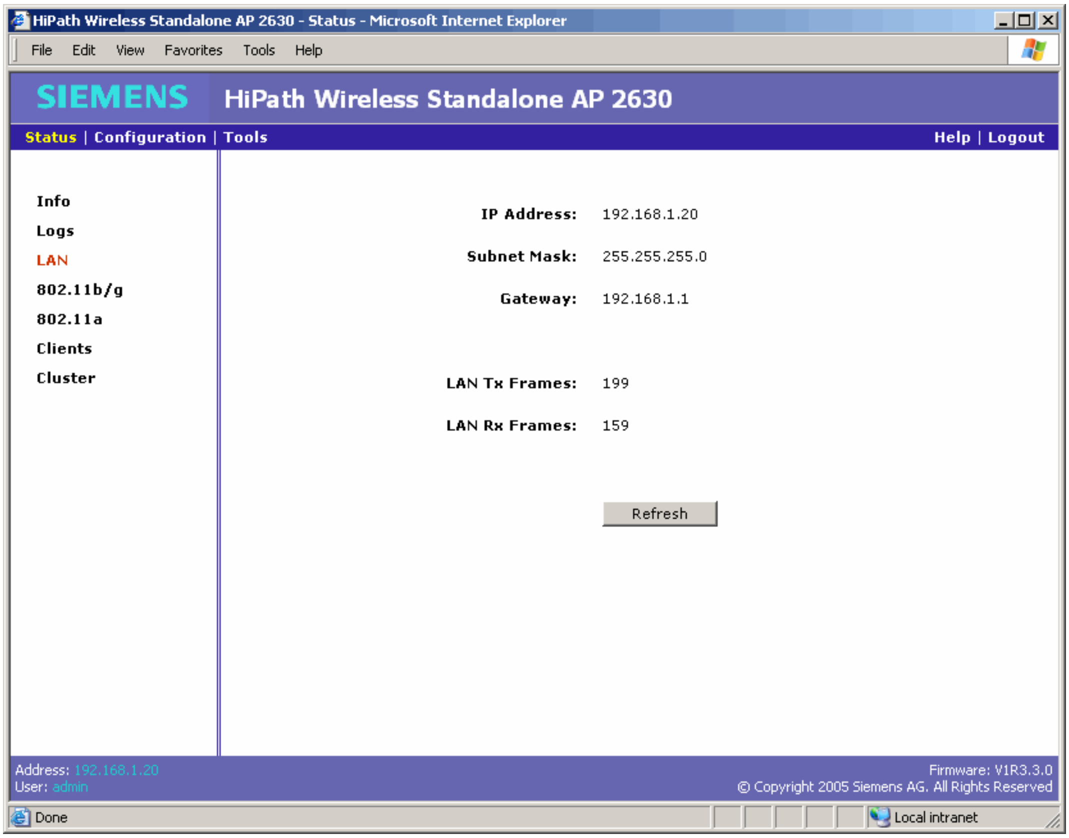
7.4 Viewing LAN status information

Use the **LAN** screen to view Standalone Access Point LAN status information. The screen displays the following:

- IP address
- Subnet mask
- Gateway
- Number of LAN Tx frames
- Number of LAN Rx frames

To view the LAN status information:

1. On the menu bar, click **Status**.
2. In the left pane, click **LAN**.


HiPath Wireless Standalone AP 2630 - Status - Microsoft Internet Explorer
File
Edit
View
Favorites
Tools
Help
SIEMENS
HiPath Wireless Standalone AP 2630
Status | Configuration | Tools
Help | Logout
Info
Logs
LAN
802.11b/g
802.11a
Clients
Cluster
Refresh
Done
Local intranet

IP Address: 192.168.1.20

Subnet Mask: 255.255.255.0

Gateway: 192.168.1.1

LAN Tx Frames: 199

LAN Rx Frames: 159

Address: 192.168.1.20
User: admin

Firmware: V1R3.3.0
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3. To update the LAN data displayed to the most current data, click **Refresh**.

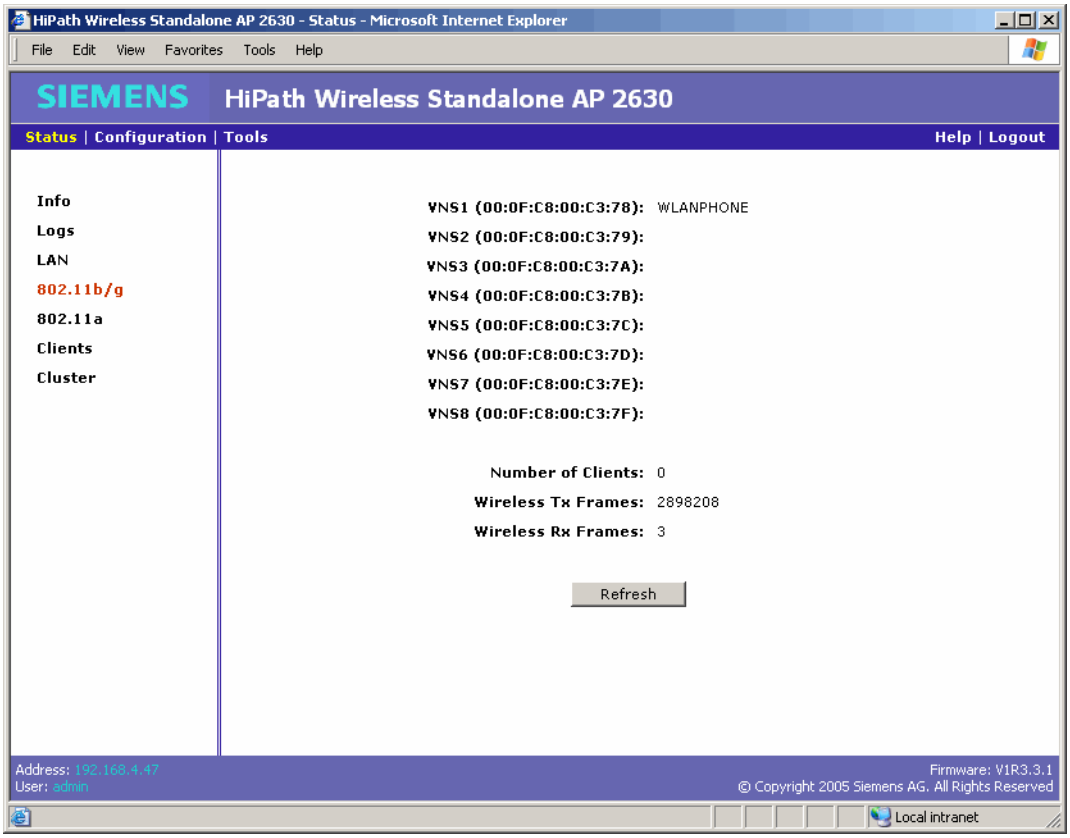
7.5 Viewing 802.11b/g status information

Use the **802.11b/g** screen to view the Standalone Access Point 802.11b/g status information. The screen displays the following:

- Radio status of the VNS. Note that if the Standalone Access Point is not in the cluster, the radio will always be disabled. BSSID – A 48bit identifier used to identify a particular BSS (Basic Service Set) is always displayed. For each enabled VNS, the SSID name is displayed.
- VNS (SSID) name and status
- Number of clients currently associated with this Standalone Access Point on this radio
- Number of wireless Tx frames
- Number of wireless Rx frames

To view the 802.11b/g status information:

1. On the menu bar, click **Status**.
2. In the left pane, click **802.11b/g**.


HiPath Wireless Standalone AP 2630 - Status - Microsoft Internet Explorer
File Edit View Favorites Tools Help
SIEMENS
HiPath Wireless Standalone AP 2630
Status | Configuration | Tools
Help | Logout
Info
Logs
LAN
802.11b/g
802.11a
Clients
Cluster
Refresh
Local intranet

VNS1 (00:0F:C8:00:C3:78): WLANPHONE
VNS2 (00:0F:C8:00:C3:79):
VNS3 (00:0F:C8:00:C3:7A):
VNS4 (00:0F:C8:00:C3:7B):
VNS5 (00:0F:C8:00:C3:7C):
VNS6 (00:0F:C8:00:C3:7D):
VNS7 (00:0F:C8:00:C3:7E):
VNS8 (00:0F:C8:00:C3:7F):

Number of Clients: 0
Wireless Tx Frames: 2898208
Wireless Rx Frames: 3

Address: 192.168.4.47
User: admin
Firmware: V1R3.3.1
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3. To update the data displayed to the most current data, click **Refresh**.

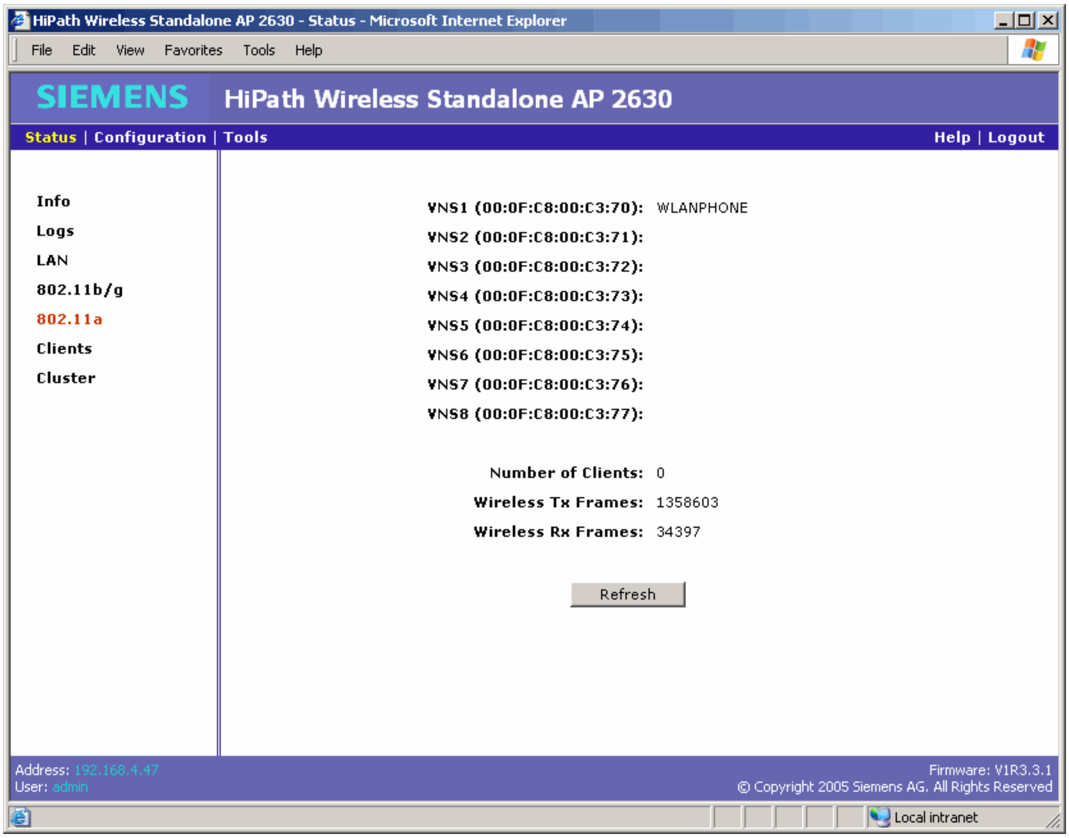
7.6 Viewing 802.11a status information

Use the **802.11a** screen to view the Standalone Access Point 802.11a status information. The screen displays the following:

- Radio status of the VNS. Note that if the Standalone Access Point is not in the cluster, the radio will always be disabled. BSSID – A 48bit identifier used to identify a particular BSS (Basic Service Set) is always displayed. For each enabled VNS, the SSID name is displayed.
- VNS (SSID) name and status
- Number of clients currently associated with this Standalone Access Point on this radio
- Number of wireless Tx frames
- Number of wireless Rx frames

To view the 802.11a status information:

1. On the menu bar, click **Status**.
2. In the left pane, click **802.11a**.


HiPath Wireless Standalone AP 2630 - Status - Microsoft Internet Explorer
File Edit View Favorites Tools Help
SIEMENS
HiPath Wireless Standalone AP 2630
Status | Configuration | Tools
Help | Logout
Info
Logs
LAN
802.11b/g
802.11a
Clients
Cluster
Refresh
Local intranet

VNS1 (00:0F:C8:00:C3:70): WLANPHONE
VNS2 (00:0F:C8:00:C3:71):
VNS3 (00:0F:C8:00:C3:72):
VNS4 (00:0F:C8:00:C3:73):
VNS5 (00:0F:C8:00:C3:74):
VNS6 (00:0F:C8:00:C3:75):
VNS7 (00:0F:C8:00:C3:76):
VNS8 (00:0F:C8:00:C3:77):

Number of Clients: 0
Wireless Tx Frames: 1358603
Wireless Rx Frames: 34397

Address: 192.168.4.47
User: admin
Firmware: V1R3.3.1
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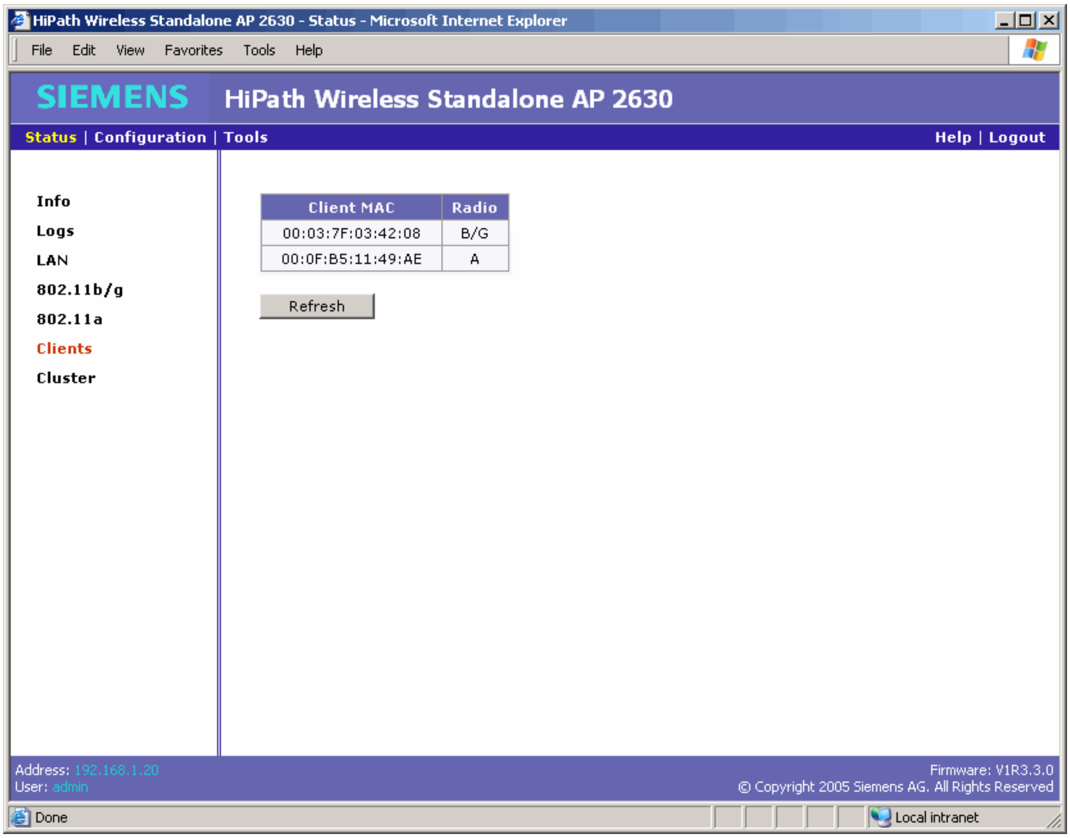
3. To update the data displayed to the most current data, click **Refresh**.

7.7 Viewing the client status information

Use the **Clients** screen to view the Standalone Access Point client status information. The screen displays the MAC address of the client and the radio being used.

To view the client status information:

1. On the menu bar, click **Status**.
2. In the left pane, click **Clients**.



HiPath Wireless Standalone AP 2630 - Status - Microsoft Internet Explorer
File Edit View Favorites Tools Help
SIEMENS
HiPath Wireless Standalone AP 2630
Status | Configuration | Tools
Help | Logout
Info
Logs
LAN
802.11b/g
802.11a
Clients
Cluster
Refresh
Address: 192.168.1.20
User: admin
Firmware: V1R3.3.0
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Done
Local intranet

Client MAC	Radio
00:03:7F:03:42:08	B/G
00:0F:B5:11:49:AE	A

3. To update the client data displayed to the most current data, click **Refresh**.

7.8 Viewing the cluster status information

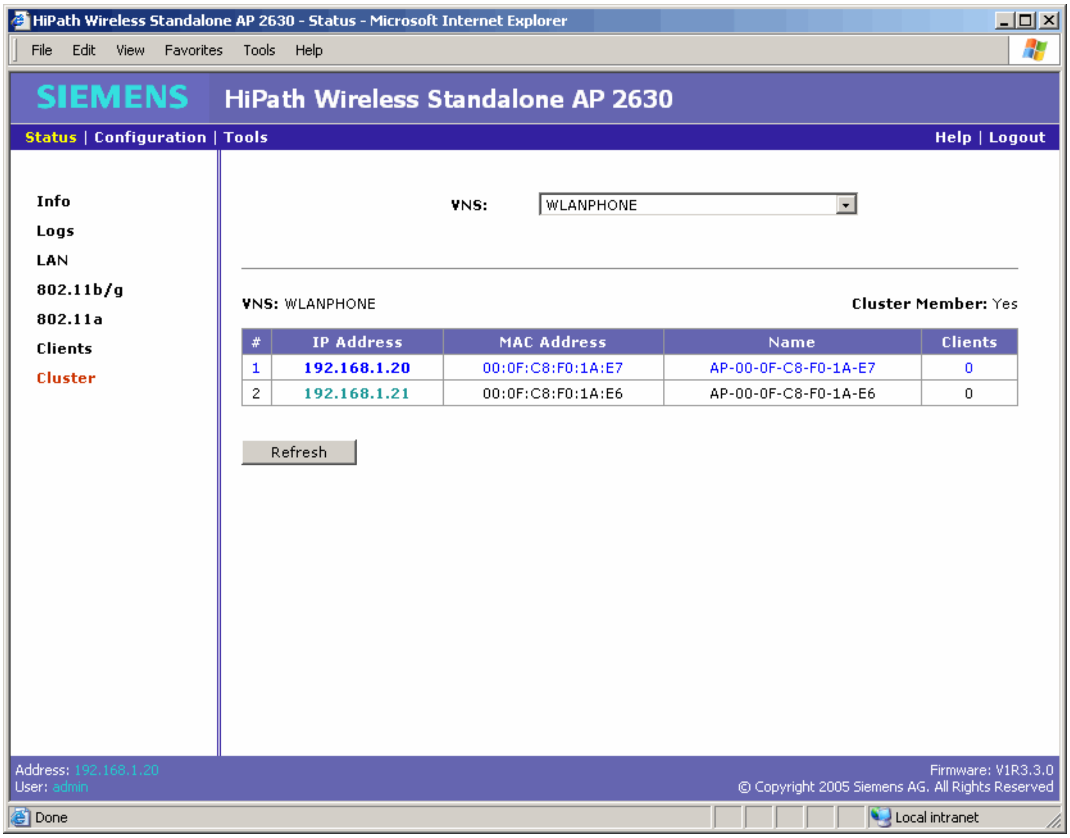
Use the **Cluster** screen to view the Standalone Access Point cluster information. The screen displays the list of Standalone Access Points that are currently registered in the cluster. For each enabled VNS, the SSID name is displayed in the drop-down list. Each Standalone Access Point is displayed showing the following:

- Rank within the cluster
- IP address
- MAC address
- Name
- Number of clients currently associated with the Standalone Access Point

The Standalone Access Points are listed in their ranking order. For more information, see 3.4"About clustering", on page 48. If the current Standalone Access Point is not part of the cluster, the screen lists the cluster without the current Standalone Access Point.

To view the cluster status information:

1. On the menu bar, click **Status**.
2. In the left pane, click **Clusters**.


HiPath Wireless Standalone AP 2630 - Status - Microsoft Internet Explorer
File Edit View Favorites Tools Help
SIEMENS
HiPath Wireless Standalone AP 2630
Status | Configuration | Tools
Help | Logout
Info
Logs
LAN
802.11b/g
802.11a
Clients
Cluster
Refresh
Done
Local intranet

VNS: WLANPHONE

VNS: WLANPHONE   Cluster Member: Yes

#	IP Address	MAC Address	Name	Clients
1	192.168.1.20	00:0F:C8:F0:1A:E7	AP-00-0F-C8-F0-1A-E7	0
2	192.168.1.21	00:0F:C8:F0:1A:E6	AP-00-0F-C8-F0-1A-E6	0

Address: 192.168.1.20
User: admin

Firmware: V1R3.3.0
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3. From the **VNS** drop-down list, click the VNS/SSID you want to view.
4. To update the cluster data displayed to the most current data, click **Refresh**.

8 Glossary: Networking terms and abbreviations

Term	Definition
AAA	Authentication, Authorization and Accounting. A system in IP-based networking to control what computer resources users have access to and to keep track of the activity of users over a network.
AC	Access Class
AC_BE	Access Class - Best Effort
Access Point (AP)	The Standalone Access Point is a wireless LAN access point (IEEE 802.11) provided with unique software that allows it to communicate only with an access point. (A thin access point handles the radio frequency (RF) communication but relies on a controller to handle WLAN elements such as authentication.) The Standalone Access Point also provides local processing such as encryption. The Standalone Access Point is a dual-band access point, with 802.11a+b/g radios.
Ad-hoc mode	An 802.11 networking framework in which devices or stations communicate directly with each other, without the use of an access point (AP). (Compare Infrastructure Mode)
AES	Advanced Encryption Standard (AES) An algorithm for encryption that works at multiple network layers simultaneously. As a block cipher, AES encrypts data in fixed-size blocks of 128 bits. AES was created by the National Institute of Standards and Technology (NIST). AES is a privacy transform for IPSec and Internet Key Exchange (IKE). AES has a variable key length - the algorithm can specify a 128-bit key (the default), a 192-bit key, or a 256-bit key. For the WPA2/802.11i implementation of AES, a 128 bit key length is used. AES encryption includes 4 stages that make up one round. Each round is then iterated 10, 12 or 14 times depending upon the bit-key size. For the WPA2/802.11i implementation of AES, each round is iterated 10 times.
AES-CCMP	AES uses the Counter-Mode/CBC-MAC Protocol (CCMP). CCM is a new mode of operation for a block cipher that enables a single key to be used for both encryption and authentication. The two underlying modes employed in CCM include Counter mode (CTR) that achieves data encryption and Cipher Block Chaining Message Authentication Code (CBC-MAC) to provide data integrity.

Term	Definition
ARP	Address Resolution Protocol. A protocol used to obtain the physical addresses (such as MAC addresses) of hardware units in a network environment. A host obtains such a physical address by broadcasting an ARP request, which contains the IP address of the target hardware unit. If the request finds a unit with that IP address, the unit replies with its physical hardware address.
Association	A connection between a wireless device and an access point.
BSS	Basic Service Set. A wireless topology consisting of one Access Point connected to a wired network and a set of wireless devices. Also called an infrastructure network. *See also* IBSS.
Collision	Two Ethernet packets attempting to use the medium simultaneously. Ethernet is a shared media, so there are rules for sending packets of data to avoid conflicts and protect data integrity. When two nodes at different locations attempt to send data at the same time, a collision will result. Segmenting the network with bridges or switches is one way of reducing collisions in an overcrowded network.
Datagram	A datagram is "a self-contained, independent entity of data carrying sufficient information to be routed from the source to the destination computer without reliance on earlier exchanges between this source and destination computer and the transporting network." (RFC1594). The term has been generally replaced by the term packet. Datagrams or packets are the message units that the Internet Protocol deals with and that the Internet transports.
DHCP	Dynamic Host Configuration Protocol. A protocol for assigning dynamic IP addresses to devices on a network. With dynamic addressing, a device can have a different IP address every time it connects to the network. In some systems, the device's IP address can even change while it is still connected. DHCP also supports a mix of static and dynamic IP addresses. DHCP consists of two components: a protocol for delivering host-specific configuration parameters from a DHCP server to a host and a mechanism for allocation of network addresses to hosts. (IETF RFC1531.) Option 78 specifies the location of one or more SLP Directory Agents. Option 79 specifies the list of scopes that a SLP Agent is configured to use.(RFC2610 - DHCP Options for Service Location Protocol)

Term	Definition
DSSS	Direct-Sequence Spread Spectrum. A transmission technology used in Wireless Local Area Network (WLAN) transmissions where a data signal at the sending station is combined with a higher data rate bit sequence, or chipping code, that divides the user data according to a spreading ratio. The chipping code is a redundant bit pattern for each bit that is transmitted, which increases the signal's resistance to interference. If one or more bits in the pattern are damaged during transmission, the original data can be recovered due to the redundancy of the transmission. (Compare FHSS)
DTIM	Delivery Traffic Indication Message (in 802.11 standard)
EAP-TLS EAP-TTLS	EAP-TLS Extensible Authentication Protocol - Transport Layer Security. A general protocol for authentication that also supports multiple authentication methods, such as token cards, Kerberos, one-time passwords, certificates, public key authentication and smart cards. IEEE 802.1x specifies how EAP should be encapsulated in LAN frames. In wireless communications using EAP, a user requests connection to a WLAN through an access point, which then requests the identity of the user and transmits that identity to an authentication server such as RADIUS. The server asks the access point for proof of identity, which the access point gets from the user and then sends back to the server to complete the authentication. EAP-TLS provides for certificate-based and mutual authentication of the client and the network. It relies on client-side and server-side certificates to perform authentication and can be used to dynamically generate user-based and session-based WEP keys. EAP-TTLS (Tunneled Transport Layer Security) is an extension of EAP-TLS to provide certificate-based, mutual authentication of the client and network through an encrypted tunnel, as well as to generate dynamic, per-user, per-session WEP keys. Unlike EAP-TLS, EAP-TTLS requires only server-side certificates. (*See also* PEAP)
ELA (OPSEC)	Event Logging API (Application Program Interface) for OPSEC, a module in Check Point used to enable third-party applications to log events into the Check Point VPN-1/FireWall-1 management system.
ESS	Extended Service Set (ESS). Several Basic Service Sets (BSSs) can be joined together to form one logical WLAN segment, referred to as an extended service set (ESS). The SSID is used to identify the ESS. (*See* BSS and SSID.)

Term	Definition
FHSS	Frequency-Hopping Spread Spectrum. A transmission technology used in Wireless Local Area Network (WLAN) transmissions where the data signal is modulated with a narrowband carrier signal that "hops" in a random but predictable sequence from frequency to frequency as a function of time over a wide band of frequencies. This technique reduces interference. If synchronized properly, a single logical channel is maintained. (Compare DSSS)
Fit, thin and fat APs	A thin AP architecture uses two components: an access point that is essentially a stripped-down radio and a centralized management controller that handles the other WLAN system functions. Wired network switches are also required. A fit AP, a variation of the thin AP, handles the RF and encryption, while the central management controller, aware of the wireless users' identities and locations, handles secure roaming, quality of service, and user authentication. The central management controller also handles AP configuration and management. A fat (or thick) AP architecture concentrates all the WLAN intelligence in the access point. The AP handles the radio frequency (RF) communication, as well as authenticating users, encrypting communications, secure roaming, WLAN management, and in some cases, network routing.
FTP	File Transfer Protocol
Gateway	In the wireless world, an access point with additional software capabilities such as providing NAT and DHCP. Gateways may also provide VPN support, roaming, firewalls, various levels of security, etc.
GUI	Graphical User Interface
Host	(1) A computer (usually containing data) that is accessed by a user working on a remote terminal, connected by modems and telephone lines. (2) A computer that is connected to a TCP/IP network, including the Internet. Each host has a unique IP address.
HTTP	Hypertext Transfer Protocol is the set of rules for transferring files (text, graphic images, sound, video, and other multimedia files) on the World Wide Web. A Web browser makes use of HTTP. HTTP is an application protocol that runs on top of the TCP/IP suite of protocols. (RFC2616: Hypertext Transfer Protocol -- HTTP/1.1)
IAPP	Inter-Access Point Protocol
IBSS	Independent Basic Service Set. *See* BSS. An IBSS is the 802.11 term for an adhoc network. *See* adhoc network.

Term	Definition
ICMP	Internet Control Message Protocol, an extension to the Internet Protocol (IP) defined by RFC792. ICMP supports packets containing error, control, and informational messages. The PING command, for example, uses ICMP to test an Internet connection.
ICV	ICV (Integrity Check Value) is a 4-byte code appended in standard WEP to the 802.11 message. Enhanced WPA inserts an 8-byte MIC just before the ICV. (*See* WPA and MIC)
IE	Internet Explorer.
IEEE	Institute of Electrical and Electronics Engineers, a technical professional association, involved in standards activities.
IETF	Internet Engineering Task Force, the main standards organization for the Internet.
Infrastructure Mode	An 802.11 networking framework in which devices communicate with each other by first going through an access point (AP). In infrastructure mode, wireless devices can communicate with each other or can communicate with a wired network. (*See* ad-hoc mode and BSS.)
Internet or IP telephony	IP or Internet telephony are communications, such as voice, facsimile, voice-messaging applications, that are transported over the Internet, rather than the public switched telephone network (PSTN). IP telephony is the two-way transmission of audio over a packet-switched IP network (TCP/IP network). An Internet telephone call has two steps: (1) converting the analog voice signal to digital format, (2) translating the signal into Internet protocol (IP) packets for transmission over the Internet. At the receiving end, the steps are reversed. Over the public Internet, voice quality varies considerably. Protocols that support Quality of Service (QoS) are being implemented to improve this.
IP	Internet Protocol is the method or protocol by which data is sent from one computer to another on the Internet. Each computer (host) on the Internet has at least one IP address that uniquely identifies it. Internet Protocol specifies the format of packets, also called datagrams, and the addressing scheme. Most networks combine IP with a higher-level protocol called Transmission Control Protocol (TCP), which establishes a virtual connection between a destination and a source.
Isochronous data	Isochronous data is data (such as voice or video) that requires a constant transmission rate, where data must be delivered within certain time constraints. For example, multimedia streams require an isochronous transport mechanism to ensure that data is delivered as fast as it is displayed and to ensure that the audio is synchronized with the video. Compare: asynchronous processes in which data streams can be broken by random intervals, and synchronous processes, in which data streams can be delivered only at specific intervals.

Term	Definition
ISP	Internet Service Provider.
IV	IV (Initialization Vector), part of the standard WEP encryption mechanism that concatenates a shared secret key with a randomly generated 24-bit initialization vector. WPA with TKIP uses 48-bit IVs, an enhancement that significantly increases the difficulty in cracking the encryption. (*See* WPA and TKIP)
LAN	Local Area Network.
MAC	Media Access Control layer. One of two sublayers that make up the Data Link Layer of the OSI model. The MAC layer is responsible for moving data packets to and from one Network Interface Card (NIC) to another across a shared channel.
MAC address	Media Access Control address. A hardware address that uniquely identifies each node of a network.
MIC	Message Integrity Check or Code (MIC), also called "Michael", is part of WPA and TKIP. The MIC is an additional 8-byte code inserted before the standard 4-byte integrity check value (ICV) that is appended in by standard WEP to the 802.11 message. This greatly increases the difficulty in carrying out forgery attacks. Both integrity check mechanisms are calculated by the receiver and compared against the values sent by the sender in the frame. If the values match, there is assurance that the message has not been tampered with. (*See* WPA, TKIP and ICV).
MTU	Maximum Transmission Unit. The largest packet size, measured in bytes, that a network interface is configured to accept. Any messages larger than the MTU are divided into smaller packets before being sent.
MU	Mobile Unit, a wireless device such as a PC laptop.
multicast, broadcast, unicast	Multicast: transmitting a single message to a select group of recipients. Broadcast: sending a message to everyone connected to a network. Unicast: communication over a network between a single sender and a single receiver.
Netmask	In administering Internet sites, a netmask is a string of 0's and 1's that mask or screen out the network part of an IP address, so that only the host computer part of the address remains. A frequently-used netmask is 255.255.255.0, used for a Class C subnet (one with up to 255 host computers). The ".0" in the "255.255.255.0" netmask allows the specific host computer address to be visible.
NIC	Network Interface Card. An expansion board in a computer that connects the computer to a network.

Term	Definition
NMS	Network Management System. The system responsible for managing a network or a portion of a network. The NMS talks to network management agents, which reside in the managed nodes.
OFDM	Orthogonal frequency division multiplexing, a method of digital modulation in which a signal is split into several narrowband channels at different frequencies. OFDM is similar to conventional frequency division multiplexing (FDM). The difference lies in the way in which the signals are modulated and demodulated. Priority is given to minimizing the interference, or crosstalk, among the channels and symbols comprising the data stream. Less importance is placed on perfecting individual channels. OFDM is used in European digital audio broadcast services. It is also used in wireless local area networks.
OS	Operating system.
OSI	Open System Interconnection. An ISO standard for worldwide communications that defines a networking framework for implementing protocols in seven layers. Control is passed from one layer to the next, starting at the application layer in one station, down through the presentation, session, transport, network, data link layer to the physical layer at the bottom, over the channel to the next station and back up the hierarchy.
OSI Layer 2	At the Data Link layer (OSI Layer 2), data packets are encoded and decoded into bits. The data link layer has two sublayers: ● the Logical Link Control (LLC) layer controls frame synchronization, flow control and error checking ● The Media Access Control (MAC) layer controls how a computer on the network gains access to the data and permission to transmit it.
OSI Layer 3	The Network layer (OSI Layer 3) provides switching and routing technologies, creating logical paths, known as virtual circuits, for transmitting data from node to node. Routing and forwarding are functions of this layer, as well as addressing, internetworking, error handling, congestion control and packet sequencing.
OUI	Organizationally Unique Identifier (used in MAC addressing).

Term	Definition
Packet	The unit of data that is routed between an origin and a destination on the Internet or any other packet-switched network. When any file is sent from one place to another on the Internet, the Transmission Control Protocol (TCP) layer of TCP/IP divides the file into packets. Each packet is separately numbered and includes the Internet address of the destination. The individual packets for a given file may travel different routes through the Internet. When they have all arrived, they are reassembled into the original file (by the TCP layer at the receiving end).
PDU	Protocol Data Unit. A data object exchanged by protocol machines (such as management stations, SMUX peers, and SNMP agents) and consisting of both protocol control information and user data. PDU is sometimes used as a synonym for "packet".
PKI	Public Key Infrastructure
PoE	Power over Ethernet. The Power over Ethernet standard (802.3af) defines how power can be provided to network devices over existing Ethernet connection, eliminating the need for additional external power supplies.
POST	Power On Self Test, a diagnostic testing sequence performed by a computer to determine if its hardware elements are present and powered on. If so, the computer begins its boot sequence.
push-to-talk (PTT)	The push-to-talk (PTT) is feature on wireless telephones that allows them to operate like a walkie-talkie in a group, instead of standard telephone operation. The PTT feature requires that the network be configured to allow multicast traffic. A PTT call is initiated by selecting a channel and pressing the "talk" key on the wireless telephone. All wireless telephones on the same network that are monitoring the channel will hear the transmission. On a PTT call you hold the button to talk and release it to listen.
QoS	Quality of Service. A term for a number of techniques that intelligently match the needs of specific applications to the network resources available, using such technologies as Frame Relay, Asynchronous Transfer Mode (ATM), Ethernet and 802.1 networks, SONET, and IP-routed networks. QoS features provide better network service by supporting dedicated bandwidth, improving loss characteristics, avoiding and managing network congestion, shaping network traffic, setting traffic priorities across the network. Quality-of-Service (QoS): A set of service requirements to be met by the network while transporting a flow. (RFC2386)

Term	Definition
RADIUS	Remote Authentication Dial-In User Service. An authentication and accounting system that checks User Name and Password and authorizes access to a network. The RADIUS specification is maintained by a working group of the IETF (RFC2865 RADIUS, RFC2866 RADIUS Accounting, RFC2868 RADIUS Attributes for Tunnel Protocol Support).
RF	Radio Frequency, a frequency in the electromagnetic spectrum associated with radio wave propagation. When an RF current is supplied to an antenna, an electromagnetic field is created that can propagate through space. These frequencies in the electromagnetic spectrum range from Ultra-low frequency (ULF) -- 0-3 Hz to Extremely high frequency (EHF) -- 30GHz - 300 GHz. The middle ranges are: Low frequency (LF) -- 30 kHz - 300 kHz, Medium frequency (MF) -- 300 kHz - 3 MHz, High frequency (HF) -- 3MHz - 30 MHz, Very high frequency (VHF) -- 30 MHz - 300 MHz, Ultra-high frequency (UHF)-- 300MHz - 3 GHz.
RFC	Request for Comments, a series of notes about the Internet, submitted to the Internet Engineering Task Force (IETF) and designated by an RFC number, that may evolve into an Internet standard. The RFCs are catalogued and maintained on the IETF RFC website: www.ietf.org/rfc.html.
Roaming	In 802.11, roaming occurs when a wireless device (a station) moves from one access point to another (or BSS to another) in the same Extended Service Set (ESS) -identified by its SSID.
RP-SMA	Reverse Polarity-Subminiature version A, a type of connector used with wireless antennas
RSN	Robust Security Network. A new standard within IEEE 802.11 to provide security and privacy mechanisms. The RSN (and related TSN) both specify IEEE 802.1x authentication with Extensible Authentication Protocol (EAP).
RSSI	RSSI received signal strength indication (in 802.11 standard)
RTS / CTS	RTS request to send, CTS clear to send (in 802.11 standard)
Segment	In ethernet networks, a section of a network that is bounded by bridges, routers or switches. Dividing a LAN segment into multiple smaller segments is one of the most common ways of increasing available bandwidth on the LAN.
SIAPP	Siemens Inter-Access Point Protocol

Term	Definition
SSID	Service Set Identifier A 32-character unique identifier attached to the header of packets sent over a Wireless LAN that acts as a password when a wireless device tries to connect to the Basic Service Set (BSS). Several BSSs can be joined together to form one logical WLAN segment, referred to as an extended service set (ESS). The SSID is used to identify the ESS. In 802.11 networks, each access point advertises its presence several times per second by broadcasting beacon frames that carry the ESS name (SSID). Stations discover APs by listening for beacons, or by sending probe frames to search for an access point with a desired SSID. When the station locates an appropriately-named access point, it sends an associate request frame containing the desired SSID. The access point replies with an associate response frame, also containing the SSID. Some APs can be configured to send a zero-length broadcast SSID in beacon frames instead of sending their actual SSID. The access point must return its actual SSID in the probe response.
Subnet mask	(*See* netmask)
Subnets	Portions of networks that share the same common address format. A subnet in a TCP/IP network uses the same first three sets of numbers (such as 198.63.45.xxx), leaving the fourth set to identify devices on the subnet. A subnet can be used to increase the bandwidth on the network by breaking the network up into segments.
SVP	SpectraLink Voice Protocol, a protocol developed by SpectraLink to be implemented on access points in order to facilitate voice prioritization over an 802.11 wireless LAN that will carry voice packets from SpectraLink wireless telephones.
Switch	In networks, a device that filters and forwards packets between LAN segments. Switches operate at the data link layer (layer 2) and sometimes the network layer (layer 3) of the OSI Reference Model and therefore support any packet protocol. LANs that use switches to join segments are called switched LANs or, in the case of Ethernet networks, switched Ethernet LANs.
TCP / IP	Transmission Control Protocol. TCP, together with IP (Internet Protocol), is the basic communication language or protocol of the Internet. Transmission Control Protocol manages the assembling of a message or file into smaller packets that are transmitted over the Internet and received by a TCP layer that reassembles the packets into the original message. Internet Protocol handles the address part of each packet so that it gets to the right destination. TCP/IP uses the client/server model of communication in which a computer user (a client) requests and is provided a service (such as sending a Web page) by another computer (a server) in the network.

Term	Definition
TFTP	Trivial File Transfer Protocol. An Internet software utility for transferring files that is simpler to use than the File Transfer Protocol (FTP) but less capable. It is used where user authentication and directory visibility are not required. TFTP uses the User Datagram Protocol (UDP) rather than the Transmission Control Protocol (TCP). TFTP is described formally in Request for Comments (RFC) 1350.
TKIP	Temporal Key Integrity Protocol (TKIP) is an enhancement to the WEP encryption technique that uses a set of algorithms that rotates the session keys. TKIP's enhanced encryption includes a per-packet key mixing function, a message integrity check (MIC), an extended initialization vector (IV) with sequencing rules, and a re-keying mechanism. The encryption keys are changed (rekeyed) automatically and authenticated between devices after the rekey interval (either a specified period of time, or after a specified number of packets has been transmitted).
ToS / DSCP	ToS (Type of Service) / DSCP (Diffserve Codepoint). The ToS/DSCP field contained in the IP header of a frame is used by applications to indicate the priority and Quality of Service (QoS) for each frame. The level of service is determined by a set of service parameters which provide a three way trade-off between low-delay, high-reliability, and high-throughput. The use of service parameters may increase the cost of service.
TSN	Transition Security Network. A subset of Robust Security Network (RSN), which provides an enhanced security solution for legacy hardware. The Wi-Fi Alliance has adopted a solution called Wireless Protected Access (WPA), based on TSN. RSN and TSN both specify IEEE 802.1x authentication with Extensible Authentication Protocol (EAP).
Tunnelling	Tunnelling (or encapsulation) is a technology that enables one network to send its data via another network's connections. Tunnelling works by encapsulating packets of a network protocol within packets carried by the second network. The receiving device then decapsulates the packets and forwards them in their original format.
UDP	User Datagram Protocol. A connectionless protocol that, like TCP, runs on top of IP networks. Unlike TCP/IP, UDP/IP provides very few error recovery services, offering instead a direct way to send and receive packets over an IP network. It is used primarily for broadcasting messages over a network.

Term	Definition
U-NII	Unlicensed National Information Infrastructure. Designated to provide short-range, high-speed wireless networking communication at low cost, U-NII consists of three frequency bands of 100 MHz each in the 5 GHz band: 5.15-5.25GHz (for indoor use only), 5.25-5.35 GHz and 5.725-5.825GHz. The three frequency bands were set aside by the FCC in 1997 initially to help schools connect to the Internet without the need for hard wiring. U-NII devices do not require licensing.
URL	Uniform Resource Locator. The unique global address of resources or files on the World Wide Web. The URL contains the name of the protocol to be used to access the file resource, the IP address or the domain name of the computer where the resource is located, and a pathname -- a hierarchical description that specifies the location of a file in that computer.
VLAN	Virtual Local Area Network. A network of computers that behave as if they are connected to the same wire when they may be physically located on different segments of a LAN. VLANs are configured through software rather than hardware, which makes them extremely flexible. When a computer is physically moved to another location, it can stay on the same VLAN without any hardware reconfiguration. The standard is defined in IEEE 802.1Q - Virtual LANs, which states that "IEEE 802 Local Area Networks (LANs) of all types may be connected together with Media Access Control (MAC) Bridges, as specified in ISO/IEC 15802-3. This standard defines the operation of Virtual LAN (VLAN) Bridges that permit the definition, operation and administration of Virtual LAN topologies within a Bridged LAN infrastructure."
VoIP	Voice Over Internet Protocol. An internet telephony technique. With VoIP, a voice transmission is cut into multiple packets, takes the most efficient path along the Internet and is reassembled when it reaches the destination.
VPN	Virtual Private Network. A private network that is constructed by using public wires to connect nodes. These systems use encryption and other security mechanisms to ensure that only authorized users can access the network and that the data cannot be intercepted.
WEP	Wired Equivalent Privacy. A security protocol for wireless local area networks (WLANs) defined in the 802.11b standard. WEP aims to provide security by encrypting data over radio waves so that it is protected as it is transmitted from one end point to another.

Term	Definition
Wi-Fi	Wireless fidelity. A term referring to any type of 802.11 network, whether 802.11b, 802.11a, dual-band, etc. Used in reference to the Wi-Fi Alliance, a nonprofit international association formed in 1999 to certify interoperability of wireless Local Area Network products based on IEEE 802.11 specification.
WINS	Windows Internet Naming Service. A system that determines the IP address associated with a particular network computer, called name resolution. WINS supports network client and server computers running Windows and can provide name resolution for other computers with special arrangements. WINS supports dynamic addressing (DHCP) by maintaining a distributed database that is automatically updated with the names of computers currently available and the IP address assigned to each one. DNS is an alternative system for name resolution suitable for network computers with fixed IP addresses.
WLAN	Wireless Local Area Network.
WMM	Wi-Fi Multimedia (WMM), a Wi-Fi Alliance certified standard that provides multimedia enhancements for Wi-Fi networks that improve the user experience for audio, video, and voice applications. This standard is compliant with the IEEE 802.11e Quality of Service (QoS) extensions for 802.11 networks. WMM provides prioritized media access by shortening the time between transmitting packets for higher priority traffic. WMM is based on the Enhanced Distributed Channel Access (EDCA) method.
WPA	Wireless Protected Access, or Wi-Fi Protected Access. Is a security solution adopted by the Wi-Fi Alliance that adds authentication to WEP's basic encryption. For authentication, WPA specifies IEEE 802.1x authentication with Extensible Authentication Protocol (EAP). For encryption, WPA uses the Temporal Key Integrity Protocol (TKIP) mechanism, which shares a starting key between devices, and then changes their encryption key for every packet. Certificate Authentication (CA) can also be used. Also part of the encryption mechanism are 802.1X for dynamic key distribution and Message Integrity Check (MIC) a.k.a. "Michael". WPA requires that all computers and devices have WPA software.
WPA-PSK	Wi-Fi Protected Access with Pre-Shared Key, a special mode of WPA for users without an enterprise authentication server. Instead, for authentication, a Pre-Shared Key is used. The PSK is a shared secret (passphrase) that must be entered in both the wireless access point or router and the WPA clients. This preshared key should be a random sequence of characters at least 20 characters long or hexadecimal digits (numbers 0-9 and letters A-F) at least 24 hexadecimal digits long. After the initial shared secret, the Temporal Key Integrity Protocol (TKIP) handles the encryption and automatic rekeying.

A Appendix: Log codes and messages

Listed below are the log codes and messages provided by the Standalone Access Point.

Event Code (1 byte)	GUI Log Message	Comments
1	Reboot caused by "power loss" / "watchdog timeout" / "software crash" / "Cli Command." / …	Gives out access point reboot reason
2	Vulnerable time started after "2" interruptions	Start of Vulnerable time, with previous power interrupt during 2 consecutive vulnerable time
3	Vulnerable time ended with no interruptions	End of Vulnerable time
4	Configuration restored to factory defaults by hardware reset	
5	Cluster-VNS1 state changed to "Master" / "Slave" / "Registering"	SIAPP major state change
6	Slave AP with IP "10.2.102.10" and MAC "00-0F-C8-F0-1A-E6" accepted in the cluster-VNS1	Master reports new slave accepted
7	Slave AP with IP "10.2.102.10" and MAC "00-0F-C8-F0-1A-E6" removed from the cluste-VNS1	Master reports slave removed
8	Client "00-0F-DD-F0-1A-E6" associated with VNS1 BSSID "00-0F-C8-F0-1A-E8"	
9	Client "00-0F-DD-F0-1A-E6" disassociated from VNS1 BSSID "00-0F-C8-F0-1A-E8"	
10	Client "00-0F-DD-F0-1A-E6" (re)association denied by VNS1 BSSID "00-0F-C8-F0-1A-E8"	
11	Client "00-0F-DD-F0-1A-E6" reassociated with VNS1 BSSID "00-0F-C8-F0-1A-E8" on this AP from BSSID "00-0F-C8-F0-1A-D0"	
12	Client "00-0F-DD-F0-1A-E6" moved from VNS1 BSSID "00-0F-C8-F0-1A-E8" on this AP to BSSID "00-0F-C8-F0-1A-D0"	
13	User "admin" successfully logged in	
14	User "admin" denied log in	

Event Code (1 byte)	GUI Log Message	Comments
15	Password for user "admin" successfully changed	
16	Configuration changed successfully	
17	Configuration downloaded successfully	Bulk configuration downloaded
18	Configuration restored to factory defaults by software reset	
19	Firmware upgraded successfully	
20	BootROM upgraded successfully	
21	Non-volatile log cleared	
22	Debug info: “SIAPP 87 R0->M2”	
23	Start checking for radar interference on channel 5300	
24	Finished checking for radar interference on channel 5300	
25	Radar detected. Switch to auto channel select	
26	Auto channel select found channel 5300	
27	AP crash reaches a limit of 4 times	

Table 14 Log codes and messages

B Appendix: Supported standards

B.1 RFC list

Listed below are the Internet Engineering Task Force (IETF) Request for Comments (RFC) standards supported by the Standalone Access Point.

The Request for Comments, a series of notes about the Internet, is submitted to the Internet Engineering Task Force (IETF) and designated by an RFC number, that may evolve into an Internet standard. The RFCs are catalogued and maintained on the IETF RFC website:www.ietf.org/rfc.html.

RFC Number	Title
RFC 791	IPv4
RFC 1812	Minimum Router Requirements
RFC 793	Transport Control Protocol (TCP)
RFC 768	User Datagram Protocol (UDP)
RFC 792	Internet Control Message Protocol (ICMP)
RFC 826	Address Resolution Protocol (ARP)
RFC 2131	Dynamic Host Configuration Protocol (DHCP)
RFC 1155	Structure and identification of management information for TCP/IP-based Internets.
RFC 959	File Transfer Protocol. (FTP)
RFC 2616	The HyperText Transfer Protocol (HTTP)

Table 15 List of Standalone Access Point supported RFCs

B.2 802.11 standards list

Also supported are the IEEE 802.11 standards listed below:

Standard	Name	Comment
802.11	Wireless LAN MAC and PHY Specifications	
802.11a	Wireless LAN	High Speed Physical Layer in 5 GHz band
802.11b	Wireless LAN	High Speed Physical Layer in 2.4 GHz band
802.11d	802.11 Extensions to Operate in Additional Regulatory Domains	
802.11g	Wireless LAN	Further High Data Rate Extensions in 2.4 GHz band
802.11i	WLAN security and provide better network access control	
802.11e	MAC Enhancements for Quality of Service (future)	
802.3af	DTE Power via MDI (Power over Ethernet)	
802.3	CSMA/CD (Ethernet)	
802.3i	10Base-T	
802.3u	100Base-T	
802.3x	Full Duplex	
802.1d	MAC bridges	

Table 16 List of 802.11 standards supported

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Hofmannstraße 51 • D-81359 München, Germany
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