



## CHAPTER 6

# Cisco Aironet 1240 Series Access Points

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This chapter lists the 1240 series lightweight access point (models: AIR-LAP1242AG-x-K9 and AIR-LAP1242G-x-K9) IEEE 802.11b/g (2.4-GHz) and the IEEE 802.11a (5-GHz) channels and maximum power levels supported by the world's regulatory domains. For additional product hardware information refer to the *Cisco Aironet 1240AG Series Access Point Hardware Installation Guide*.

The following topics are covered in this chapter:

- [Channels and Maximum Power Levels, page 6-2](#)
- [Special Country Restrictions, page 6-7](#)
- [Changing the Lightweight Access Point Output Power, page 6-8](#)

# Channels and Maximum Power Levels

## IEEE 802.11g (2.4-GHz Band)

When shipped from the factory, the AIR-AP1242G-x-K9 (single radio) access points support the channels and maximum power levels listed in [Table 6-1](#) for their regulatory domain.


**Note**

[Table 6-1](#) lists the power levels shipped from the factory. The B columns indicate IEEE 802.11b data rates and the G columns indicate IEEE 802.11g data rates. In the -C, -E, -I, -K, and -S regulatory domains, you must manually adjust power levels depending upon the antenna being used (see [Table 6-4](#)).

**Table 6-1** Channels and Maximum Conducted Power for the 802.11g Radio with up to 10-dBi External Antennas

Channel Id	Center Frequency (MHz)	Maximum Conducted Power Levels (dBm) in the Regulatory Domains					
		-A		-J		-P	
		B	G	B	G	B	G
1	2412	20	17	14	14	14	14
2	2417	20	17	14	14	14	14
3	2422	20	17	14	14	14	14
4	2427	20	17	14	14	14	14
5	2432	20	17	14	14	14	14
6	2437	20	17	14	14	14	14
7	2442	20	17	14	14	14	14
8	2447	20	17	14	14	14	14
9	2452	20	17	14	14	14	14
10	2457	20	17	14	14	14	14
11	2462	20	17	14	14	14	14
12	2467	-	-	14	14	14	14
13	2472	-	-	14	14	14	14
14	2484	-	-	14	-	14	-

## IEEE 802.11g (2.4-GHz Band)

When shipped from the factory, the AIR-LAP1242AG-x-K9 (dual radio) access points support the channels and maximum power levels listed in [Table 6-1](#) for their regulatory domain.


**Note**

[Table 6-2](#) lists the power levels shipped from the factory. The B columns indicate IEEE 802.11b data rates and the G columns indicate IEEE 802.11g data rates. In the -C, -E, -I, -K, and -S regulatory domains, you must manually adjust power levels depending upon the antenna being used (see [Table 6-4](#)).

**Table 6-2** Channels and Maximum Conducted Power for the 802.11b/g Radio with up to 10-dBi External Antennas

Channel Id	Center Freq (MHz)	Maximum Conducted Power Levels (dBm) in the Regulatory Domains																							
		-A		-C		-E		-I		-J		-K		-N		-P		-Q		-R		-S		-T	
		B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G
1	2412	20	17	17	17	17	17	17	17	14	14	17	17	20	17	14	14	14	14	17	17	17	17	20	17
2	2417	20	17	17	17	17	17	17	17	14	14	17	17	20	17	14	14	14	14	17	17	17	17	20	17
3	2422	20	17	17	17	17	17	17	17	14	14	17	17	20	17	14	14	14	14	17	17	17	17	20	17
4	2427	20	17	17	17	17	17	17	17	14	14	17	17	20	17	14	14	14	14	17	17	17	17	20	17
5	2432	20	17	17	17	17	17	17	17	14	14	17	17	20	17	14	14	14	14	17	17	17	17	20	17
6	2437	20	17	17	17	17	17	17	17	14	14	17	17	20	17	14	14	14	14	17	17	17	17	20	17
7	2442	20	17	17	17	17	17	17	17	14	14	17	17	20	17	14	14	14	14	17	17	17	17	20	17
8	2447	20	17	17	17	17	17	17	17	14	14	17	17	20	17	14	14	14	14	17	17	17	17	20	17
9	2452	20	17	17	17	17	17	17	17	14	14	17	17	20	17	14	14	14	14	17	17	17	17	20	17
10	2457	20	17	17	17	17	17	17	17	14	14	17	17	20	17	14	14	14	14	17	17	17	17	20	17
11	2462	20	17	17	17	17	17	17	17	14	14	17	17	20	17	14	14	14	14	17	17	17	17	20	17
12	2467	-	-	17	17	17	17	17	17	14	14	17	17	-	-	14	14	14	14	17	17	17	17	-	-
13	2472	-	-	17	17	17	17	17	17	14	14	17	17	-	-	14	14	14	14	17	17	17	17	-	-
14	2484	-	-	-	-	-	-	-	-	14	-	-	-	-	-	14	-	14	-	-	-	-	-	-	-

## IEEE 802.11a (5-GHz Band)

When shipped from the factory, the AIR-LAP1242AG-x-K9 (dual radio) access points support the channels and maximum power levels listed in [Table 6-3](#) for their regulatory domain.


**Note**

[Table 6-3](#) lists the power levels shipped from the factory. In the –E and –I regulatory domains, you must manually adjust power levels depending upon the antenna being used (see [Table 6-5](#)).

**Table 6-3 Channels and Maximum Conducted Power for IEEE 802.11a Radio with up to 9.5-dBI External Antennas**

Channel ID	Center Freq (MHz)	Maximum Conducted Power Levels (dBm) in the Regulatory Domains												
		–A	–C	–E	–I	–J	–K	–N	–P	–Q	–R	–U	–S	–T
<b>5150 to 5250 MHz</b>														
34	5170	–	–	–	–	11	–	–	–	–	–	–	–	–
36	5180	11	–	17	17	–	15	11	11	11	16	11	14	–
38	5190	–	–	–	–	11	–	–	–	–	–	–	–	–
40	5200	11	–	17	17	–	15	11	11	11	16	11	14	–
42	5210	–	–	–	–	11	–	–	–	–	–	–	–	–
44	5220	11	–	17	17	–	15	11	11	11	16	11	14	–
46	5230	–	–	–	–	11	–	–	–	–	–	–	–	–
48	5240	11	–	17	17	–	15	11	11	11	16	11	14	–
<b>5250 to 5350 MHz</b>														
52	5260	17 <sup>1</sup>	–	17 <sup>2</sup>	17 <sup>1</sup>	–	17 <sup>1</sup>	17 <sup>1</sup>	8 <sup>1</sup>	8 <sup>1</sup>	16	–	11 <sup>1</sup>	–
56	5280	17 <sup>1</sup>	–	17 <sup>1</sup>	17 <sup>1</sup>	–	17 <sup>1</sup>	17 <sup>1</sup>	8 <sup>1</sup>	8 <sup>1</sup>	16	–	11 <sup>1</sup>	11
60	5300	17 <sup>1</sup>	–	17 <sup>1</sup>	17 <sup>1</sup>	–	17 <sup>1</sup>	17 <sup>1</sup>	8 <sup>1</sup>	8 <sup>1</sup>	16	–	11 <sup>1</sup>	11
64	5320	11 <sup>1</sup>	–	17 <sup>1</sup>	17 <sup>1</sup>	–	17 <sup>1</sup>	11 <sup>1</sup>	8 <sup>1</sup>	8 <sup>1</sup>	16	–	11 <sup>1</sup>	11
<b>5450 to 5725 MHz</b>														
100	5500	17 <sup>1</sup>	–	17 <sup>1</sup>	–	–	17 <sup>1</sup>	–	–	15 <sup>1</sup>	–	–	–	17 <sup>1</sup>
104	5520	17 <sup>1</sup>	–	17 <sup>1</sup>	–	–	17 <sup>1</sup>	–	–	15 <sup>1</sup>	–	–	–	17 <sup>1</sup>
108	5540	17 <sup>1</sup>	–	17 <sup>1</sup>	–	–	17 <sup>1</sup>	–	–	15 <sup>1</sup>	–	–	–	17 <sup>1</sup>
112	5560	17 <sup>1</sup>	–	17 <sup>1</sup>	–	–	17 <sup>1</sup>	–	–	15 <sup>1</sup>	–	–	–	17 <sup>1</sup>
116	5580	17 <sup>1</sup>	–	17 <sup>1</sup>	–	–	17 <sup>1</sup>	–	–	15 <sup>1</sup>	–	–	–	17 <sup>1</sup>
120	5600	–	–	17 <sup>1</sup>	–	–	17 <sup>1</sup>	–	–	15 <sup>1</sup>	–	–	–	17 <sup>1</sup>
124	5620	–	–	17 <sup>1</sup>	–	–	17 <sup>1</sup>	–	–	15 <sup>1</sup>	–	–	–	17 <sup>1</sup>
128	5640	–	–	17 <sup>1</sup>	–	–	–	–	–	15 <sup>1</sup>	–	–	–	17 <sup>1</sup>
132	5660	17 <sup>1</sup>	–	17 <sup>1</sup>	–	–	–	–	–	15 <sup>1</sup>	16	–	–	17 <sup>1</sup>
136	5680	17 <sup>1</sup>	–	17 <sup>1</sup>	–	–	–	–	–	15 <sup>1</sup>	16	–	–	17 <sup>1</sup>
140	5700	17 <sup>1</sup>	–	17 <sup>1</sup>	–	–	–	–	–	15 <sup>1</sup>	16	–	–	17 <sup>1</sup>
<b>5725 to 5850 MHz</b>														
149	5745	17	17	–	–	–	17	17	–	–	16	–	17	17
153	5765	17	17	–	–	–	17	17	–	–	16	–	17	17
157	5785	14	17	–	–	–	17	14	–	–	16	–	17	14
161	5805	11	17	–	–	–	17	11	–	–	16	–	17	11
165	5825	–	–	–	–	–	–	–	–	–	–	–	–	–

1. Frequencies require DFS (Uniform spreading not required for the –P regulatory domain).

2. Frequencies require DFS (Uniform spreading not required for the -P regulatory domain).

## Maximum Power Levels in Some Regulatory Domains with External Antennas



### Caution

To avoid exceeding maximum conducted power levels in the China (-C), EMEA (-E), South Korea (-K), Israel (-I), and Singapore (-S) regulatory domains when using an 802.11b/g radio with 2.2- to 10-dBi external antennas, you must manually set the access point output power level as shown in [Table 6-4](#).

**Table 6-4** Maximum Power Levels for the 802.11b/g Radio in the (-C), (-E), (-K), (-I), and (-S) Regulatory Domains

Channel Identifier	Center Frequency (MHz)	Maximum Power Levels (dBm)					
		2.2 dBi Antenna	5.2 dBi Antenna	6.0 dBi Antenna	6.5dBi Antenna	9.0 dBi Antenna	10 dBi Antenna
1	2412	17	14	14	11	11	8
2	2417	17	14	14	11	11	8
3	2422	17	14	14	11	11	8
4	2427	17	14	14	11	11	8
5	2432	17	14	14	11	11	8
6	2437	17	14	14	11	11	8
7	2442	17	14	14	11	11	8
8	2447	17	14	14	11	11	8
9	2452	17	14	14	11	11	8
10	2457	17	14	14	11	11	8
11	2462	17	14	14	11	11	8
12	2467	17	14	14	11	11	8
13	2472	17	14	14	11	11	8
14	2484	-	-	-	-	-	-

**Caution**

To avoid exceeding maximum conducted power levels in the EMEA (-E) and Israel (-I) regulatory domains when using a IEEE 802.11a radio with 6.0- to 9.5-dBi external 5-MHz antennas, you must manually set the access point output power level as shown in [Table 6-5](#).

**Table 6-5 Maximum Power Levels for IEEE 802.11a Radio in the EMEA(-E) and Israel (-I) Regulatory Domains**

Channel Identifier	Center Frequency (MHz)	Maximum Power Levels (dBm)				
		3.5 dBi Antenna	4.5 dBi Antenna	6.0 dBi Antenna	7.0 dBi Antenna	9.5 dBi Antenna
UNII-1 (5150-5250 MHz)						
34	5170	–	–	–	–	–
36	5180	17	17	15	15	11
38	5190	–	–	–	–	–
40	5200	17	17	15	15	11
42	5210	–	–	–	–	–
44	5220	17	17	15	15	11
46	5230	–	–	–	–	–
48	5240	17	17	15	15	11
5250 to 5350 MHz						
52	5260	17	17	15	15	11
56	5280	17	17	15	15	11
60	5300	17	17	15	15	11
64	5320	17	17	15	15	11
5470 to 5725 MHz						
100	5500	17	17	17	17	17
104	5520	17	17	17	17	17
108	5540	17	17	17	17	17
112	5560	17	17	17	17	17
116	5580	17	17	17	17	17
120	5600	17	17	17	17	17
124	5620	17	17	17	17	17
128	5640	17	17	17	17	17
132	5660	17	17	17	17	17
136	5680	17	17	17	17	17
140	5700	17	17	17	17	17
5725 to 5850 MHz						
149	5745	–	–	–	–	–
153	5765	–	–	–	–	–
157	5785	–	–	–	–	–
161	5805	–	–	–	–	–
165	5825	–	–	–	–	–

**Table 6-6** Maximum Power Levels for IEEE 802.11a Radio in the Russia (-R) Regulatory Domain

Channel Identifier	Center Frequency (MHz)	Maximum Power Levels (dBm)				
		3.5 dBi Antenna	4.5 dBi Antenna	6.0 dBi Antenna	7.0 dBi Antenna	9.5 dBi Antenna
UNII-1 (5150-5250 MHz)						
34	5170	–	–	–	–	–
36	5180	16	15	14	13	10
38	5190	–	–	–	–	–
40	5200	16	15	14	13	10
42	5210	–	–	–	–	–
44	5220	16	15	14	13	10
46	5230	–	–	–	–	–
48	5240	16	15	14	13	10
5250 to 5350 MHz						
52	5260	16	15	14	13	10
56	5280	16	15	14	13	10
60	5300	16	15	14	13	10
64	5320	16	15	14	13	10
5470 to 5725 MHz						
100	5500	–	–	–	–	–
104	5520	–	–	–	–	–
108	5540	–	–	–	–	–
112	5560	–	–	–	–	–
116	5580	–	–	–	–	–
120	5600	–	–	–	–	–
124	5620	–	–	–	–	–
128	5640	–	–	–	–	–
132	5660	16	15	14	13	10
136	5680	16	15	14	13	10
140	5700	16	15	14	13	10
5725 to 5850 MHz						
149	5745	16	15	14	13	10
153	5765	16	15	14	13	10
157	5785	16	15	14	13	10
161	5805	16	15	14	13	10
165	5825	–	–	–	–	–

## Special Country Restrictions

Table 6-7 lists special restrictions for wireless operation in some countries.

Table 6-7 Special Country Restrictions for Wireless Operation

Country	Frequency Bands (GHz)	Regulatory Domain	Special Limitation and Restrictions
Japan	5	-J, -P, and -U	Operation limited to indoor only.
South Korea	2.4 and 5	-K	Maximum antenna gain limited to 6 dBi.
Mexico	2.4	-N	End user must limit 2.4 GHz operation to 2450 to 2483.5 MHz and 36 dBm EIRP <sup>1</sup> .
Russian Federation	5	-R	End user must limit 5 GHz operation to 5150-5350 and 5650 to 5725 MHz.
United States	5	-A	Indoor use only from 5150-5250 MHz.

1. EIRP (dBm) = Maximum output power (dBm) + antenna gain (dBi)

## Changing the Lightweight Access Point Output Power

This section provides instructions for changing the 1240 series access point output power to comply with the maximum power limits imposed by special regulatory and country restrictions (see the “[Special Country Restrictions](#)” section on page 6-7). Follow these instructions to change the output power settings using a controller and your browser:



### Note

Administrator privileges may be required in order to change access point settings.



### Note

Regulatory domains are set at the factory and cannot be changed by the user.



### Caution

To meet regulatory restrictions, the access point and the external antenna must be professionally installed. The network administration or other IT professional responsible for installing and configuring the unit is a suitable professional installer. Following installation, access to the unit should be password-protected by the network administrator to maintain regulatory compliance.

The output power on the access points can be changed only using a Cisco controllers (such as the 2600 series or 4400 series), the controllers on a Cisco Wireless Services Module (WiSM), or using Cisco Wireless Control System (WCS).



### Note

See the *Cisco Wireless LAN Controller Configuration Guide* for more details on how to configure your access point using the web-browser interface.

Follow these steps to change the access point's output power to meet local regulations using a controller:

- Step 1** Open your Internet browser. You must use Microsoft Internet Explorer 6.0.2800 or a later release.
- Step 2** Enter **https://IP address** (where *IP address* is the controller's IP address) in the browser address line and press **Enter**. A user login screen appears.
- Step 3** Enter the username and password and press **Enter**. The controller's summary page appears.



**Note** The username and password are case-sensitive.

- Step 4** Click **Wireless > 802.11a Radios** or **802.11b/g Radios** and a list of associated access points displays.
- Step 5** Choose the desired access point and click **Configure**. The radio settings page appears.
- Step 6** Scroll down to the Tx Power Level Assignment field, and click **Custom**.
- Step 7** In the Tx Power Level field, select the appropriate power level setting (1 to 8).

**Custom** indicates that the radio output power is manually controlled by the Tx Power Configuration setting field.

Based on the operating channel, the regulatory domain, and the controller power level setting (1 to 8), the actual transmit power at the access point can be reduced to comply with special regulatory or country restrictions.

Table 6-8 lists the controller power settings and the corresponding output power levels for these two examples:

- 2.4 GHz (802.11b/g) operation in –E regulatory domain:
  - Channel 2 using 11-Mbps data rates with 6-dBi external antenna
- 5 GHz (802.11a) operation:
  - Channel 52 with 6-dBi external antenna

**Table 6-8 Example of Output Power Levels**

Controller Tx Power Settings <sup>1</sup>	Radio Output Power	
	802.11b/g (dBm)	802.11a (dBm)
1 (maximum)	17 <sup>2</sup>	17 <sup>2</sup>
2	14	14
3	11	11
4	8	8
5	5	5
6	2	2
7	-1	-1
8	–	–

1. The Tx Power Level setting of 1 represents the maximum conducted power setting for the access point. Each subsequent controller power level (such as 2, 3, 4, etc.) represents approximately a 3-dBm reduction in transmit power from the previous power level.
2. The maximum output power levels obtained from Table 6-2 and Table 6-3.

**Changing the Lightweight Access Point Output Power**

- For 802.11b/g (see [Table 6-4](#) and [Table 6-8](#)), the manual controller Tx Power Level setting is 2.
- For 802.11a (see [Table 6-5](#) and [Table 6-8](#)), the manual controller Tx Power Level setting is 2.

**Step 8** Click **Apply**.

**Step 9** Close your Internet browser.

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