

Enterasys® Wireless

Outdoor Access Point

Installation Guide

WS-AP3660



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Riesgo Electrico: Solamente personal calificado debe realizar procedimientos de instalacion.

Elektrischer Gefahrenhinweis: Installationen sollten nur durch ausgebildetes und qualifiziertes Personal vorgenommen werden.

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电路模块 (Circuit Modules)	×	○	○	○	○	○
电缆及电缆组件 (Cables & Cable Assemblies)	×	○	○	○	○	○
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About This Guide

The guide describes how to mount and connect cables to the Enterasys Wireless Outdoor Access Point WS-AP3660. In addition, this guide provides information on the product certifications and national approvals for the WS-AP3660.



Note: This guide does not provide information on configuration of the Enterasys Wireless Outdoor APs. For information on how to configure the Enterasys Wireless Outdoor APs, see the *Enterasys Wireless Convergence Software User Guide*.

Who Should Use This Guide



Electrical Hazard: Only qualified personnel should install or service this unit.

Riesgo Electrico: Nada mas personal capacitado debe de instalar o darle servicio a esta unida.

Elektrischer Gefahrenhinweis: Installationen oder Servicearbeiten sollten nur durch ausgebildetes und qualifiziertes Personal vorgenommen werden.

This product should be installed and serviced by a qualified licensed technician, electrician, or electrical maintenance person familiar with its operation and the hazards involved. Proper installation, which includes wiring, mounting, fusing or other over current protection and grounding, can reduce the chance of electric shocks, fires, or explosion in this product or products used within this product.

How to Use This Guide

Read through this guide completely to familiarize yourself with its contents and to gain an understanding of the features and capabilities of the WS-AP3660. A general working knowledge of data communications networks is helpful when setting up this module.

This preface provides an overview of this guide, and a brief summary of each chapter; defines the conventions used in this document; and instructs how to obtain technical support from Enterasys Networks. To locate information about various subjects in this guide, refer to the following table.

For...	Refer to...
An overview of the WS-AP3660 features.	Chapter 1, Introduction
Instructions to mount the WS-AP3660, attach antennas, connect cables, and connect power. Instructions are also included to mount and connect the WS-AP3660 Power Supply.	Chapter 2, Installation
Specifications, environmental requirements, and physical properties of the WS-AP3660 and WS-AP3660 Power Supply.	Appendix A, Specifications
Regulatory certifications and national approvals.	Appendix B, Regulatory Information

Related Documents

The manuals listed below can be obtained from the World Wide Web in Adobe Acrobat Portable Document Format (PDF) at the following site:

<https://extranet.enterasys.com/downloads/>


- *Enterasys Wireless AP External Antenna Site Preparation and Installation Guide*
- *Enterasys Wireless Convergence Software User Guide*


Typographical Conventions


The following typographical conventions and icons are used in this document.


blue type	Indicates a hypertext link. When reading this document online, click the text in blue to go to the referenced figure, table, or section.
------------------	--

Lowercase x	Indicates the general use of an alphanumeric character (for example, 6x1xx, the x's indicate a combination of numbers or letters).
-------------	--

	Note: Calls the reader's attention to any item of information that may be of special importance.
---	---

	Caution: Contains information essential to avoid damage to the equipment. Precaución: Contiene información esencial para prevenir dañar el equipo. Achtung: Verweist auf wichtige Informationen zum Schutz gegen Beschädigungen.
---	---

	Warning: Warns against an action that could result in personal injury or death. Advertencia: Advierte contra una acción que pudiera resultar en lesión corporal o la muerte. Warnhinweis: Warnung vor Handlungen, die zu Verletzung von Personen oder gar Todesfällen führen können!
---	---

	Electrical Hazard: Warns against an action that could result in personal injury or death. Riesgo Electrico: Advierte contra una acción que pudiera resultar en lesión corporal o la muerte debido a un riesgo eléctrico. Elektrischer Gefahrenhinweis: Warnung vor sämtlichen Handlungen, die zu Verletzung von Personen oder Todesfällen – hervorgerufen durch elektrische Spannung – führen können!
---	--

Getting Help

For additional support related to the WS-AP3660 or this document, contact Enterasys Networks using one of the following methods:

World Wide Web	www.enterasys.com/support/
Phone	1-800-872-8440 (toll-free in U.S. and Canada) or 1-978-684-1000 For the Enterasys Networks Support toll-free number in your country: www.enterasys.com/support/
Internet mail	support@enterasys.com To expedite your message, please type [Wireless] in the subject line.

Before contacting Enterasys Networks for technical support, have the following data ready:

- Your Enterasys Networks service contract number
- A description of the failure
- A description of any action(s) already taken to resolve the problem (for example, changing mode switches or rebooting the unit)
- The serial and revision numbers of all involved Enterasys Networks products in the network
- A description of your network environment (such as layout, cable type, other relevant environmental information)
- Network load and frame size at the time of trouble (if known)
- The device history (for example, if you have returned the device before, or if this is a recurring problem)
- Any previous Return Material Authorization (RMA) numbers

Introduction

This chapter provides general information about the Enterasys Wireless Outdoor Access Point WS-AP3660.

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Heater Circuit	1-5

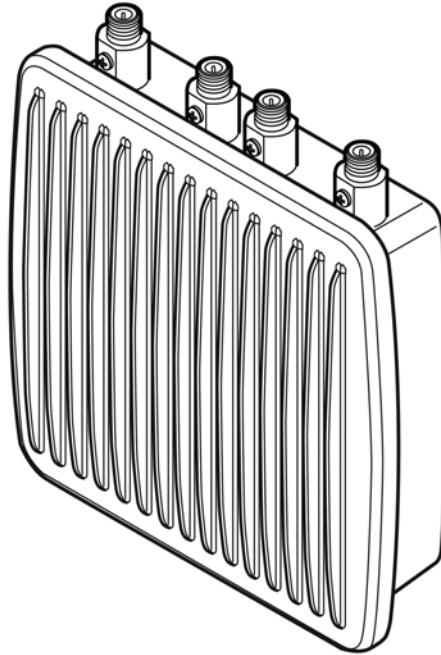
WS-AP3660 Overview

The WS-AP3660 (see [Figure 1-1](#) on page 1-2) enables you to extend your wireless LAN beyond the boundaries of indoor locations. They are resistant to harsh outdoor conditions and extreme temperatures. Using the advanced full mesh wireless distribution feature of the Enterasys wireless LAN, the AP3660 can extend your wireless LAN to outdoor locations without Ethernet cabling. A mounting bracket is available to enable quick and easy mounting of the AP3660 to walls, rails, and poles.

The WS-AP3660 is an 802.11n AP that supports 802.11a/802.11g and 802.11b legacy devices. It is delivered in a rugged enclosure. The WS-AP3660 supports a variety of antennas, providing range and coverage versatility.

The AP3660 interoperates fully with the Enterasys wireless LAN, including support for Enterasys wireless VoWLAN, branch office mode, availability and mobility features.

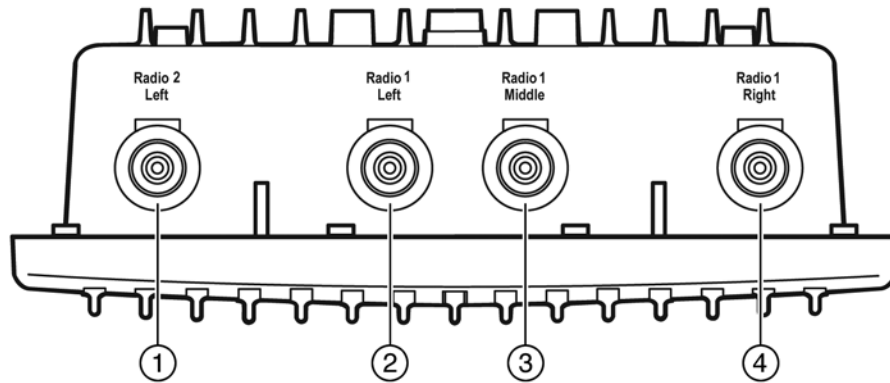
Figure 1-1 WS-AP3660 Front View



Note: The Enterasys Wireless Outdoor APs do not work without the Enterasys Wireless Controller.

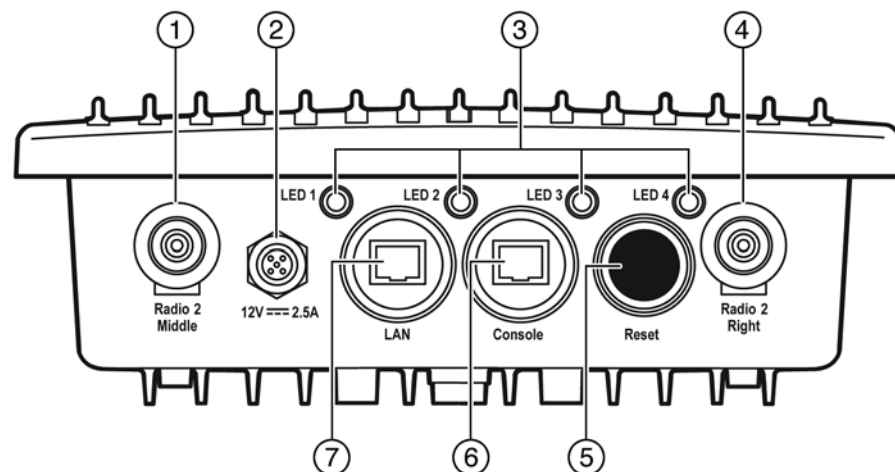
The following views (see [Figure 1-2](#) and [Figure 1-3](#)) illustrate the connections to the WS-AP3660.

Figure 1-2 WS-AP3660 Top View



- | | | | |
|---|------------------------|---|--------------------------|
| 1 | Radio 2 - Left Antenna | 3 | Radio 1 - Middle Antenna |
| 2 | Radio 1 - Left Antenna | 4 | Radio 1 - Right Antenna |
-

Figure 1-3 WS-AP3660 Bottom View



- | | | | |
|---|--------------------------|---|---------------------|
| 1 | Radio 2 - Middle Antenna | 5 | Reset Switch |
| 2 | 12V DC Connector | 6 | Console Port (RJ45) |
| 3 | Status LEDs | 7 | LAN Port (RJ45) |
| 4 | Radio 2 - Right Antenna | | |



Note: The WS-AP3660 provides six external antenna ports. The network administrator determines which antenna port will be used based on the external antenna selected. The WS-AP3660 can also be configured to select the antenna that provides the best possible data transmission (diversity).

WS-AP3660 LED Indicators

The WS-AP3660 provides four LED indicators (see [Figure 1-3](#)). The LEDs provide status information (see [Table 1-1](#) on page 1-4) on the current state of the WS-AP3660. For more information, see the *Enterasys Wireless Controller Convergence Software User Guide*.

Table 1-1 WS-AP3660 LED Status Indicators

LED	Status	Description
1 (Power)	On Green	Indicates the WS-AP3660 is working normally.
	Flashing Green	Indicates: <ul style="list-style-type: none"> • running a self test • loading software program
	On Red	Indicates a CPU or system failure.
2 (Ethernet Link)	On Blue	Indicates a valid 1Gbps Ethernet link.
	On Green	Indicates a valid 100Mbps Ethernet link.
	On Red	Indicates a valid 10Mbps Ethernet link.
3 (Wireless Link)	On Green	Indicates Radio 1 (5GHz) is enabled.
	Flashing Green	Indicates the WS-AP3660 is transmitting or receiving data.
4 (Wireless Link)	On Green	Indicates Radio 2 (2.4GHz) is enabled.
	Flashing Green	Indicates the WS-AP3660 is transmitting or receiving data.

Antennas

The WS-AP3660 includes external antennas for wireless communications. The WS-AP3660 can transmit from multiple antennas at the same time, as defined with MIMO operation, but the antennas must be selected manually based on customer requirements and coverage area. For a list of external antennas, refer to [Appendix B, WS-AP3660 Approved External Antennas](#).

External Antenna Connectors

The WS-AP3660 supports six external antenna connections for both 2.4GHz and 5GHz radios. These antennas offer a variety of options for extending the radio range and shaping the coverage area. For a list of external antennas, refer to [Appendix B, WS-AP3660 Approved External Antennas](#).

Console Port

The WS-AP3660 includes a single console port (see [Figure 1-3](#) on page 1-3). This port is used to connect a console device to the WS-AP3660 through a serial cable. The console device can be a PC or workstation running a VT-100 terminal adapter emulator, or a VT-100 terminal.

LAN Port

The WS-AP3660 has one 10/100/1000BaseT RJ45 LAN port (see [Figure 1-3](#) on page 1-3) that can be attached directly to a 10/100/1000BaseT LAN segment. This segment must conform to the IEEE 802.3 or 802.3u specifications.

The WS-AP3660 appears as an Ethernet node and performs a bridging function by moving packets from the wired LAN to remote workstations on the wireless infrastructure.



Note: The LAN port also supports power over Ethernet (PoE) based on the IEEE 802.3at standard. Refer to “[Power Connections](#)” on page 2-11, for information on supplying power to the WS-AP3660 network port from a network device, such as a switch, that provides Power over Ethernet (PoE).

Reset Switch

The WS-AP3660 provides a Reset Switch (see [Figure 1-3](#) on page 1-3) to reset or restore factory default configurations. If you hold down the button for less than 5 seconds, the WS-AP3660 performs a hardware reset. If you hold the button down for 5 seconds or more, any configuration changes are removed, and the factory default configuration are restored to the WS-AP3660.

Audible Buzzer

The WS-AP3660 includes an audible buzzer used for aligning an antenna with a remote AP. The volume of the buzzer changes based on signal strength and the position of the antenna. The sound (beep) is followed by a pause where the pause is shorter for higher signal strength and longer for a weak signal.



Note: For more information on how to position the WS-AP3660 antennas using the audible buzzer, refer to the *Enterasys Wireless AP External Antenna Site Preparation and Installation Guide*. This document is available in Adobe Acrobat Portable Document Format (PDF) at the following site: <https://extranet.enterasys.com/downloads/>



Warning: The Enterasys Wireless Outdoor AP buzzer volume reaches volumes between 80 and 90 db. Sustained exposure above 90 db may result in hearing loss.

Temperature Sensor

The WS-AP3660 includes an internal temperature sensor for monitoring the temperature of the PCB. If the WS-AP3660 temperature changes (either too low or too high), an alert is generated and written to the log file for the AP. The sensor monitors the AP internal temperature, and creates the alert when the temperature enters either zone. For more information on the operating temperatures of the WS-AP3660, refer to [Appendix A, Specifications](#).

- A low alarm zone is when the internal temperature is less than 5 degrees above the heater circuit system on temperature (see [Heater Circuit](#) below). In this zone the temperature is too close to powering off the unit.
- A high alarm is when the temperature rises above 60 Degrees C. In this zone, the CPU may overheat and stop operating.



Warning: Do not operate the WS-AP3660 with the Temperature Sensor disconnected as this may cause the unit to fail prematurely.

Heater Circuit

The WS-AP3660 provides a heater and thermostat circuit which automatically engages/disengages when the internal PCB temperature reaches between -40 to 0C. The heater maintains a constant operating temperature for optimal performance and reliability.

2

Installation

This chapter provides installation instructions for the Enterasys Wireless Outdoor Access Point WS-AP3660 and the optional WS-AP3660 Power Supply.

For information about...	Refer to page...
Package Contents	2-1
Separately Ordered Components	2-2
WS-AP3660 Installation Procedures	2-3
WS-AP3660 Power Supply Installation Procedures	2-11

Package Contents

The WS-AP3660 package includes components necessary for installation.

Unpacking the WS-AP3660

Unpack the WS-AP3660 as follows:

1. Open the box and remove the packing material protecting the WS-AP3660.
2. Verify that the contents of the carton contains the items listed in [Table 2-1](#).

Table 2-1 WS-AP3660 Supplied Components

Quantity	Item
1	WS-AP3660 wireless outdoor access point
1	Wall mounting bracket
1	Spacer
4	M6 screws
4	M6 flat washers
4	M6 spring washers
1	Ground screw
6	Terminator caps
1	Console port cap
2	Stainless steel tie back straps (pole diameters up to 4 inches)

Table 2-1 WS-AP3660 Supplied Components (Continued)

Quantity	Item
1	Waterproof cable gland adapter assembly
1	Enterasys Wireless Outdoor AP Quick Reference

3. Perform a visual inspection of the WS-AP3660 for any signs of physical damage. Contact Enterasys Networks if there are any signs of damage. Refer to [“Getting Help”](#) on page xi for details.

Unpacking the WS-AP3660 Power Supply

Unpack the WS-AP3660 Power Supply as follows:

1. Open the box and remove the packing material protecting the power supply.
2. Verify that the contents of the carton contains the items listed in [Table 2-2](#).

Table 2-2 WS-AP3660 Power Supply Components

Quantity	Item
1	WS-PS3660-MR power supply
1	Wall mounting bracket
1	Spacer
4	M5 screws
4	M5 flat washers
4	M5 spring washers
1	Ground screw
2	Stainless steel tie back straps (pole diameters up to 4 inches)
1	DC to DC cable
1	Waterproof AC connector (power cord not supplied)
1	Enterasys Wireless Outdoor AP Power Supply Quick Reference

3. Perform a visual inspection of the power supply for any signs of physical damage. Contact Enterasys Networks if there are any signs of damage. Refer to [“Getting Help”](#) on page xi for details.

Separately Ordered Components

The following list of accessories are available for the Enterasys Wireless Outdoor Access Point WS-AP3660. For ordering information, contact your Enterasys sales representative.

- Antennas. The following antennas can be used with the WS-AP3660:
 - WS-AO-2S10360 — Outdoor, 2.4GHz, 10 dBi, Omni Baton (FCC Domain only)
 - WS-AO-DT05120 — Outdoor, 2.3 - 2.7/4.9 - 6.1GHz, Triple-feed, 5dBi, 120 deg, Sector
 - WS-AO-5D16060 — Outdoor, 5.15 to 5.875GHz, Dual-polarization, 16dBi, 60 deg, Sector
 - WS-AO-5D23009 — Outdoor, 5.15 to 5.875GHz, Dual-polarization, 23dBi, 9 deg, Panel

- WS-AIO-2S18018 – Indoor/Outdoor, 2.3 - 2.5GHz, 18dBi, 18 deg, Panel
- WS-AO-DS05360 – Outdoor, 2.4 - 2.5/5.15 to 5.875GHz, 5dBI, Omni, Baton
- WS-AO-5S10360 – Outdoor, 5GHz, 10dBi, Omni, Baton (FCC Domain only)
- WS-AO-DT05120-1 – Outdoor, 2.3 - 2.7/4.9 - 6.1GHz, Triple-feed, 5dBI, 120 deg, Sector
- WS-ANT21 – Outdoor, 2.3 - 2.4/5.1 - 5.8GHz, Omni, Baton
- WS-AO-DX13025 – Outdoor, 2.4 - 2.5/5.1- 5.9 GHz, Six-feed, 12.5/11.5dBI, 27/30 deg, Panel

Refer to “[WS-AP3660 Approved External Antennas](#)” on page B-10 and the *Enterasys Wireless AP External Antenna Site Preparation and Installation Guide* for more information about these antennas. This document is available at: <https://extranet.enterasys.com/downloads/>.

- Power Supply. The following power supply is required for use with the WS-AP3660:
 - WS-PS3660-MR
- Power over Ethernet (PoE) Injector. The following 802.3at PoE injector is recommended for use with the WS-AP3660:
 - PD-9001GR-ENT (this is an indoor PoE injector)
- Terminator cap. This part is listed as a spare item as the WS-AP3660 is shipped with six terminator caps. If you are not attaching six antennas to the WS-AP3660, you must use a terminator cap on the antenna connector not being used.
 - WS-CAB-RPNTerm – Terminator, Reverse Polarity, Type-N Plug, 50 OHM, 1W
- Cables to connect the lightning protectors on the enclosure to the antennas. All cables listed below have Reverse Polarity Type-N plugs at both ends.



Note: New cable part numbers are listed first. Previous equivalent cable part numbers follow in parentheses.

- WS-CAB-L200C20 (RBTES-L200-C20F) – 20 foot LMR200 cable
- WS-CAB-L400C06F (RBTES-L400-C06F) – 6 foot LMR400 cable
- WS-CAB-L400C50F (RBTES-L400-C50F) – 50 foot LMR400 cable
- WS-CAB-L400C75F (RBTES-L400-C75F) – 75 foot LMR400 cable
- WS-CAB-L600C25F (RBTES-L600-C25F) – 25 foot LMR600 cable
- WS-CAB-L600C50F (RBTES-L600-C50F) – 50 foot LMR600 cable

WS-AP3660 Installation Procedures



Electrical Hazard: This product should be installed and serviced by a qualified licensed technician, electrician, or electrical maintenance person familiar with its operation and the hazards involved.

These procedures describes how to attach the mounting bracket to the WS-AP3660, how to mount the WS-AP3660 outside (either a wall or pole), and how to attach the relevant cables.

Attaching the Mounting Bracket

To attach the mounting bracket to the WS-AP3660:

1. Determine the desired orientation (vertical or horizontal) of the mounting bracket (see [Figure 2-1](#) on page 2-4).
2. Attach the mounting bracket and spacer to the WS-AP3660 using four M6 screws, four spring washers, and four flat washers (see [Figure 2-2](#) on page 2-4).

Figure 2-1 Mounting Bracket and Spacer Orientation

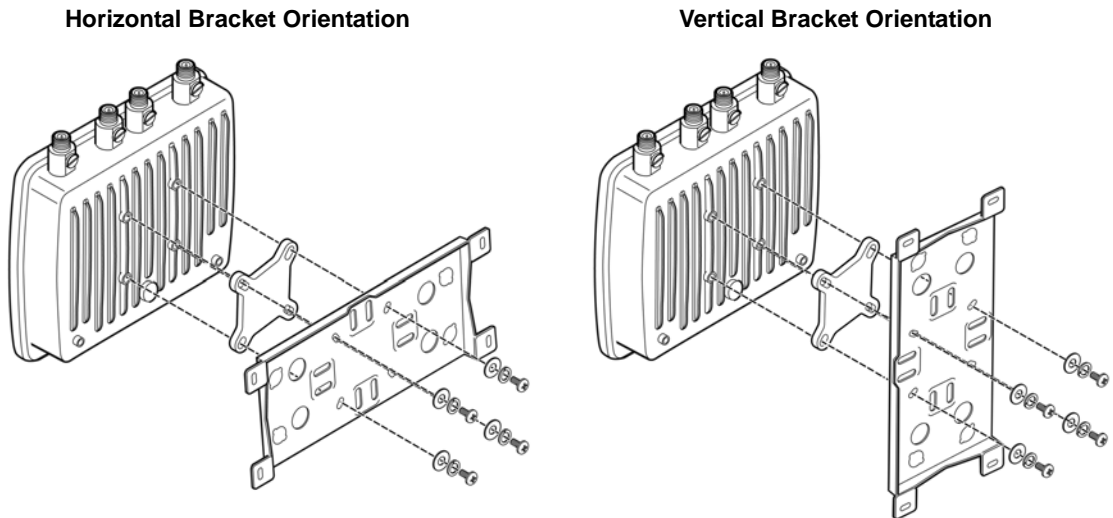
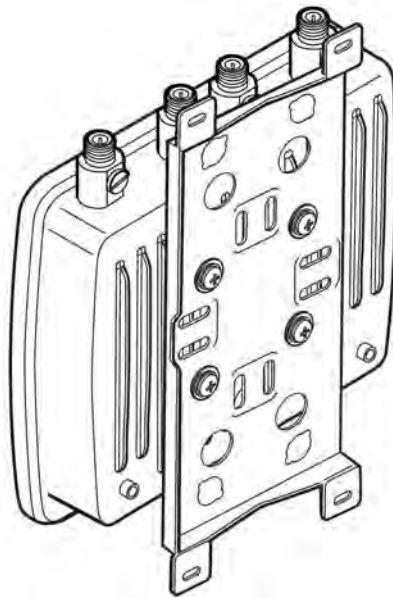


Figure 2-2 Completed Bracket Installation



Mounting the WS-AP3660 to a Wall

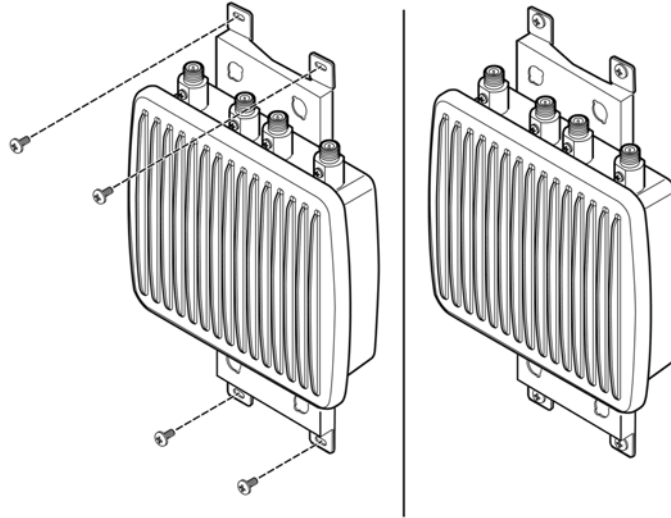
To attach the WS-AP3660 to a wall:

1. Place the WS-AP3660 (with mounting bracket) firmly against the wall surface.
2. Secure the WS-AP3660 to the wall with four screws (see [Figure 2-3](#) on page 2-5).



Note: Screws for attaching the WS-AP3660 to a wall are not supplied with the product. The type and length of the screws will depend on the wall type and thickness.

Figure 2-3 Mounting the WS-AP3660 to a Wall

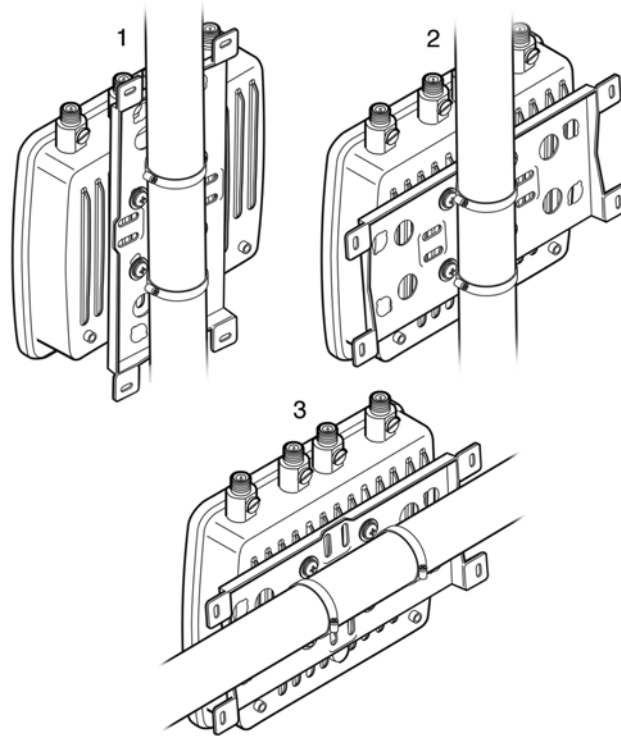


Mounting the WS-AP3660 to a Pole

To fit the mounting plate to a pole:

1. Determine the desired mounting orientation of the WS-AP3660 (see [Figure 2-4](#)).

Figure 2-4 WS-AP3660 Pole Mount Options

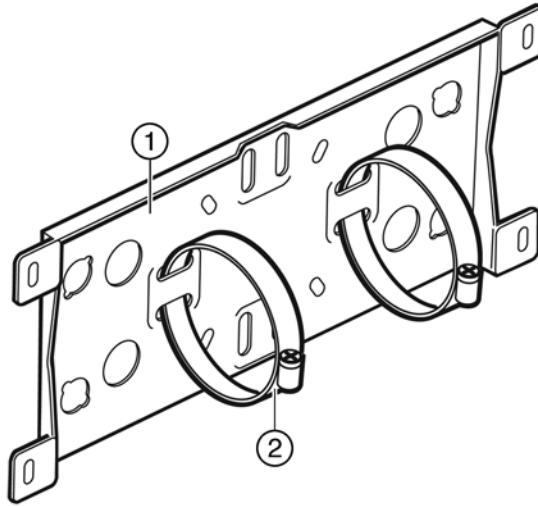


- 1 Vertical bracket on vertical pole
- 2 Horizontal bracket on vertical pole

- 3 Horizontal bracket on horizontal pole

2. Feed the supplied stainless steel tie back straps through the openings in the mounting bracket (see [Figure 2-5](#)).

Figure 2-5 Attaching Straps to the Mounting Bracket



- | | |
|--|-------------------------------|
| 1 Mounting bracket (horizontal position) | 2 Stainless steel straps (X2) |
|--|-------------------------------|

3. Feed the free end of the strap around the pole.
4. Tighten the tensioning screw to adapt the strap to the diameter of the pole.

Attaching Antennas



Notes: The total number of required antennas and associated port locations on the WS-AP3660 is dependant on the coverage area and the type of antennas selected.

To attach external antennas to the WS-AP3660:

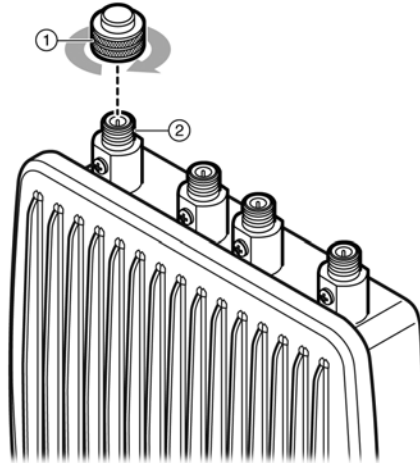
1. Connect an LMR cable (with Reverse Polarity Type-N plugs on both ends) to an antenna connector on the WS-AP3660 (see [Figure 1-2](#) on page 1-2 and [Figure 1-3](#) on page 1-3).



Note: The following antennas do not require an LMR cable and can be directly connected to the WS-AP3660: WS-AO-DT05120-1 and WS-ANT21. See “[Separately Ordered Components](#)” on page 2-2, for a complete list of available antennas and cables.

2. Connect the antenna to the LMR cable.
3. Place a terminator cap on any antenna connector(s) that will not be used (see [Figure 2-6](#) on page 2-8).

Figure 2-6 Installing Terminator Caps



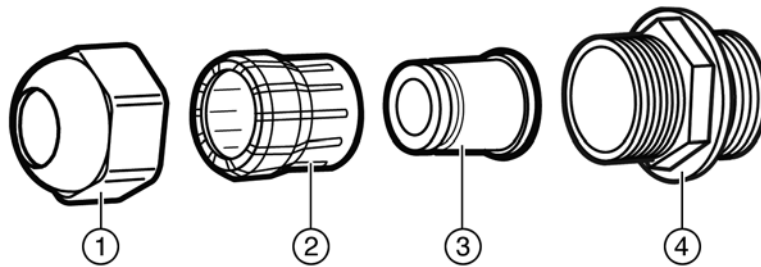
1 Terminator cap

2 Antenna connector

LAN/Console Connections (with Cable Gland Adapter Assembly)

The WS-AP3660 has both a LAN and a Console port. Refer to [Figure 1-3](#) on page 1-3 for the location of these ports. Before connecting an RJ45 cable (not provided) to either port, a waterproof cable gland adapter assembly must be installed onto the cable (see [Figure 2-7](#)).

Figure 2-7 RJ45 Cable Gland Adapter Assembly



1 Sealing nut

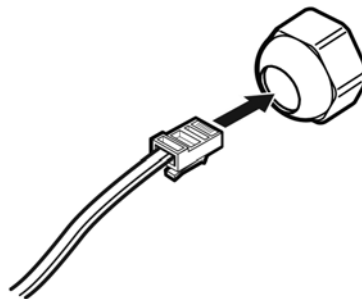
2 Claw

3 Seal

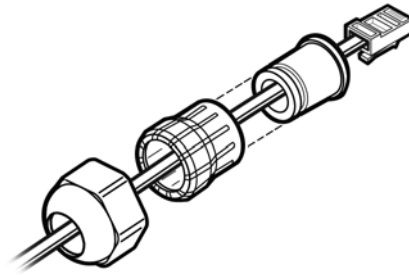
4 Main body

Install the cable gland adapter assembly as follows:

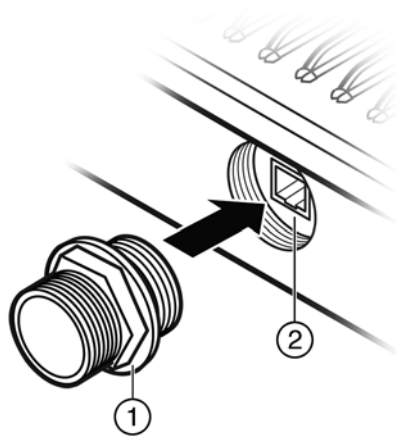
1. Insert the RJ45 cable onto the sealing nut.



- Slide the claw and seal onto the RJ45 cable.



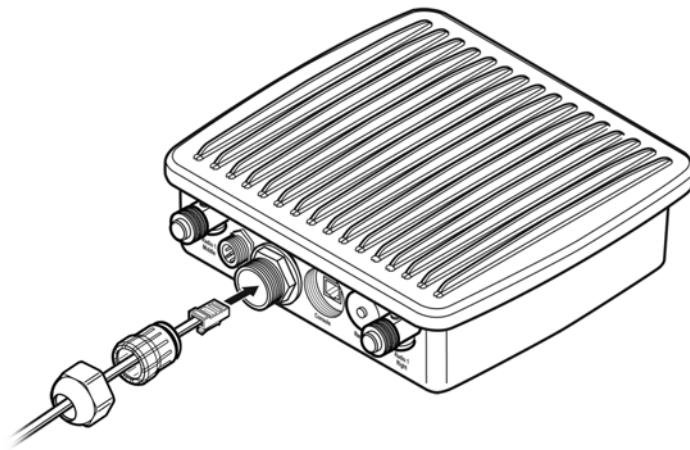
- Screw the main body into the LAN or Console port of the WS-AP3660.



1 Main body

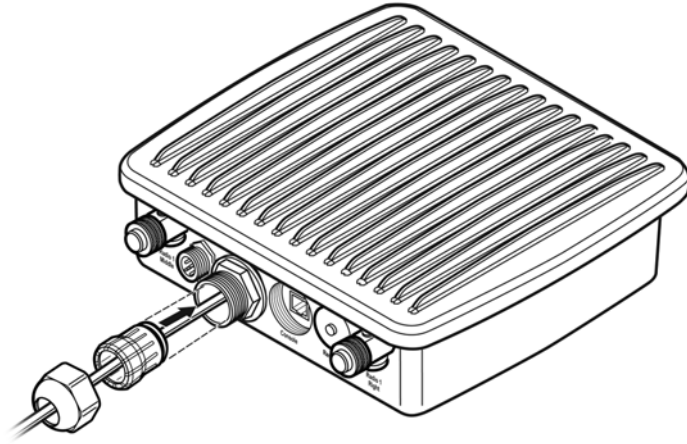
2 LAN or Console port

- Plug the RJ45 cable into the LAN or Console port.

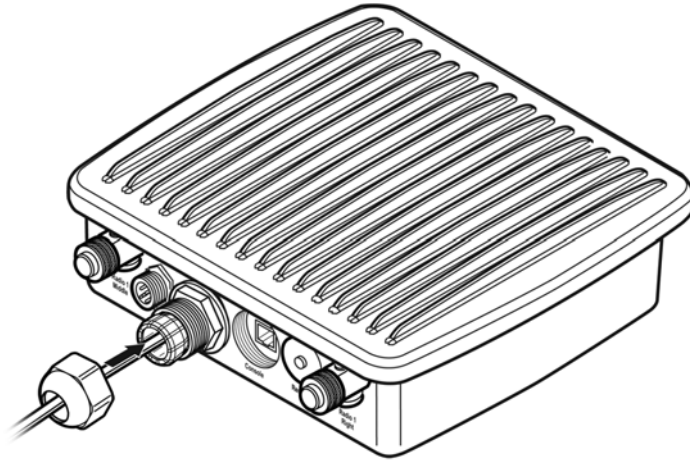


Caution: Do not run the network cable through the cable conduit connector used for connecting the power cables. You must connect the network cable and power cables through separate connectors.

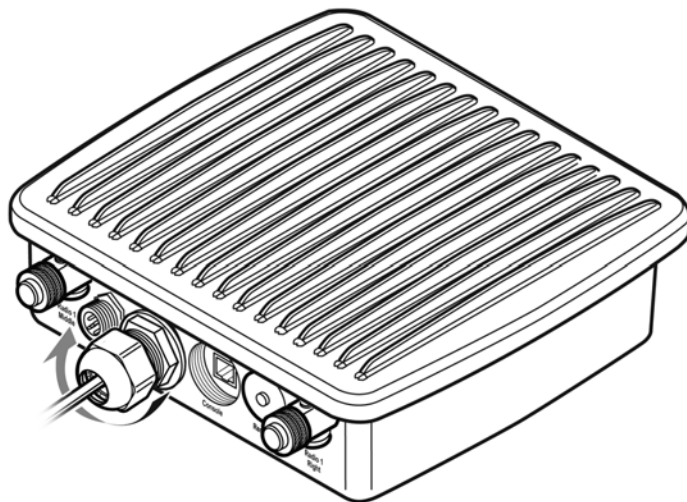
5. Slide the seal and claw into the main body.



6. Secure the seal nut onto the main body.



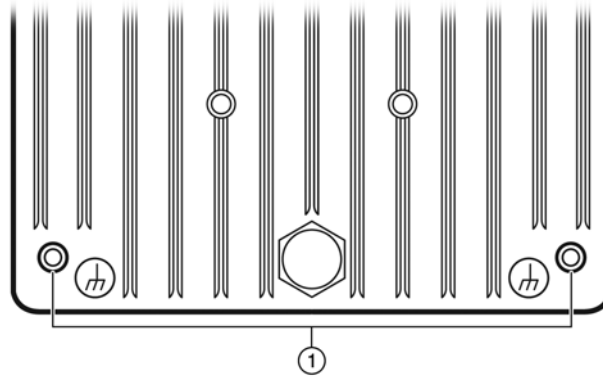
7. Tighten the assembly by hand.



Ground Connection

1. The ground connection for the WS-AP3660 is located on the rear of the device. Attach a ground to earth cable to one of two grounding terminals using one ground screw (see [Figure 2-8](#)).

Figure 2-8 WS-AP3660 Grounding Terminals



1 Grounding terminals (2)

Power Connections

The WS-AP3660 can be powered in one of the following ways:

- Power over Ethernet (PoE)

Power is provided to the LAN port of the WS-AP3660 with a PoE injector. The PoE injector must be 802.3at compliant and is not provided with the WS-AP3660.



Note: The RJ45 connector used for providing PoE to the WS-AP3660 must be contained within a waterproof adapter assembly before being installed. For more information, see [“LAN/Console Connections \(with Cable Gland Adapter Assembly\)”](#) on page 2-8.

- Power by external power supply

An external 12VDC power supply (WS-PS3660-MR) can be purchased to power the WS-AP3660. For more information on the installation process, see [WS-AP3660 Power Supply Installation Procedures](#) below.

WS-AP3660 Power Supply Installation Procedures



Electrical Hazard: This product should be installed and serviced by a qualified licensed technician, electrician, or electrical maintenance person familiar with its operation and the hazards involved.

These procedures describe how to attach the mounting bracket to the WS-AP3660 Power Supply, how to mount the power supply outside (either a wall or pole), and how to attach the relevant cables.

Attaching the Mounting Bracket

To attach the mounting bracket to the WS-AP3660 Power Supply:

1. Determine the desired orientation (vertical or horizontal) of the mounting bracket (see [Figure 2-9](#)). In the horizontal position, two power supplies can be attached to one bracket.
2. Attach the mounting bracket and spacer to the power supply using four M5 screws, four spring washers, and four flat washers (see [Figure 2-10](#)).

Figure 2-9 Mounting Bracket and Spacer Orientation

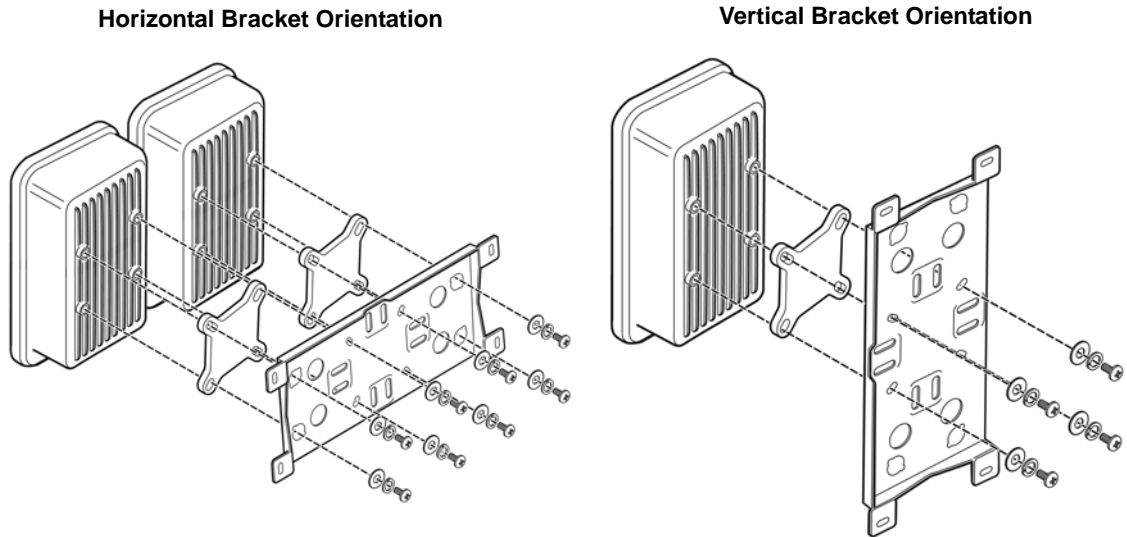
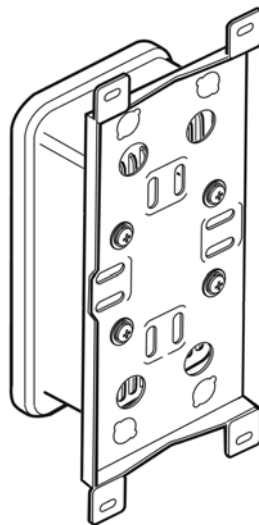


Figure 2-10 Completed Bracket Installation



Mounting the Power Supply to a Wall

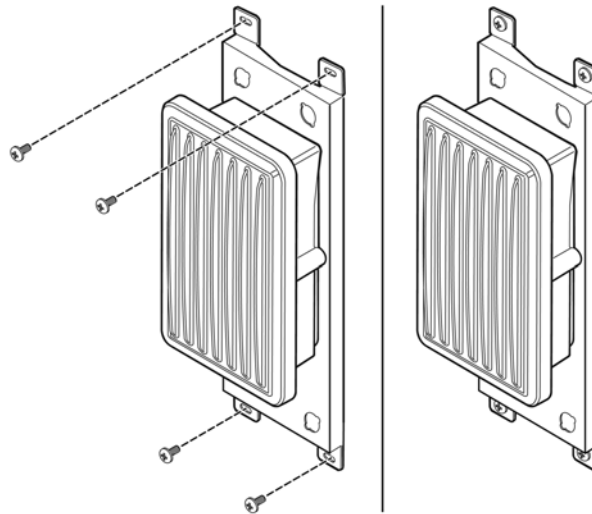
To attach the power supply to a wall:

1. Place the power supply firmly against the wall surface.
2. Position the mounting bracket so the mounting holes are aligned with wall studs.
3. Secure the power supply to the wall with four screws (see [Figure 2-11](#)).



Note: Screws for attaching the power supply to a wall are not supplied with the product. The type and length of the screws will depend on the wall type and thickness.

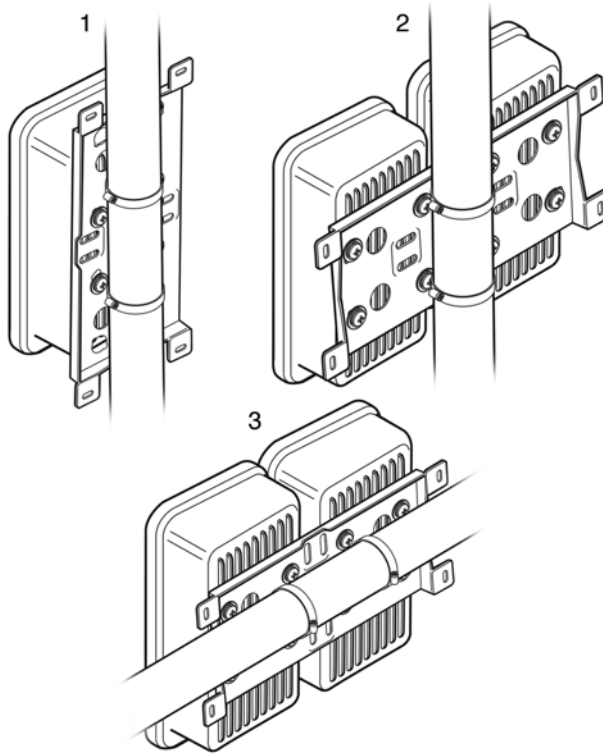
Figure 2-11 Mounting the Power Supply to a Wall



Mounting the Power Supply to a Pole

To mount the power supply to a pole:

1. Determine the desired mounting orientation of the power supply (see [Figure 2-12](#) on page 2-14).

Figure 2-12 Power Supply Pole Mount Options

- | | |
|---|--|
| <p>1 Vertical bracket on vertical pole</p> <p>2 Horizontal bracket on vertical pole</p> | <p>3 Horizontal bracket on horizontal pole</p> |
|---|--|

2. Feed the supplied stainless steel tie back straps through the openings in the mounting bracket (see [Figure 2-5](#) on page 2-7).
3. Feed the free end of the strap around the pole.
4. Tighten the tensioning screw to adapt the strap to the diameter of the pole.



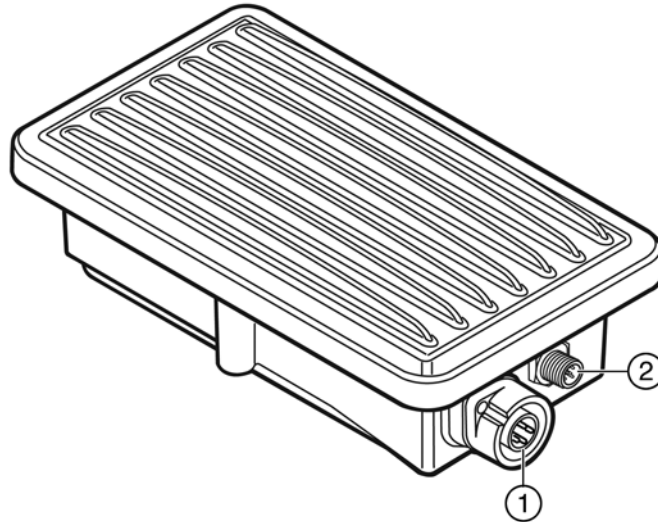
Note: The maximum distance between the WS-AP3660 and Power Supply is 1 meter (see [Figure 2-14](#) on page 2-15).

Connecting the DC Power Supply to the WS-AP3660

To connect the power supply to the WS-AP3660:

1. Locate the DC to DC cable (provided with the power supply).
2. Insert one end of the DC to DC cable into the DC connector port on the WS-AP3660 (see [Figure 1-3](#) on page 1-3 for the location of the DC connector).
3. Screw on and hand tighten the knurled knob securely.
4. Insert one end of the DC to DC cable into the DC connector on the bottom of the WS-AP3660 Power Supply (see [Figure 2-13](#) on page 2-15).

Figure 2-13 WS-AP3660 Power Supply Connections



1 AC Power Receptacle

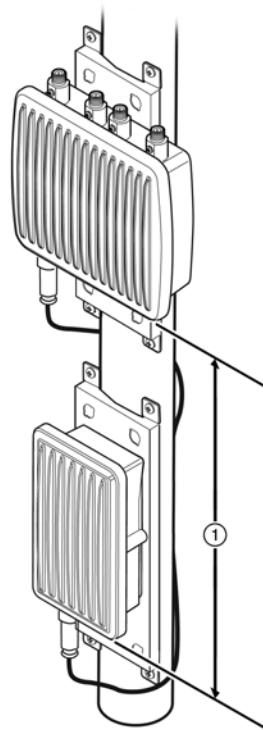
2 DC Connector



Note: The DC to DC cable forms a drip loop that allows water to safely drip away from the connections to both the WS-AP3660 and Power Supply (see [Figure 2-14](#) on page 2-15).

5. Screw on and hand tighten the knurled knob securely.

Figure 2-14 Power Supply Connections with Drip Loop

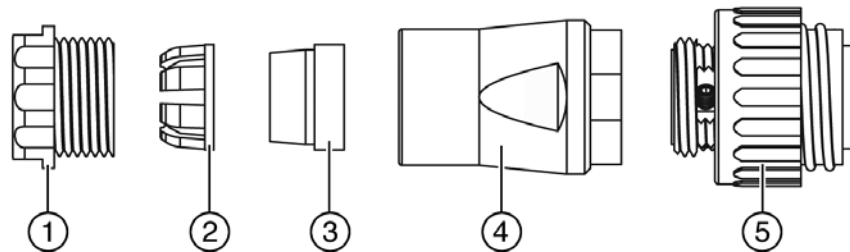


1 1 meter (maximum distance between units)

Connecting the Power Supply to AC Power

The WS-AP3660 Power Supply provides a power receptacle for connecting the unit to an external AC power source. The power supply is shipped with a waterproof AC connector assembly (see [Figure 2-15](#)), but a power cord is not provided. Before connecting the power supply to AC power, the AC connector assembly must be installed onto the power cord.

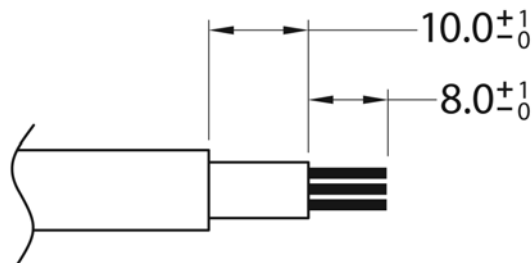
Figure 2-15 WS-AP3660 Power Supply AC Connector Assembly



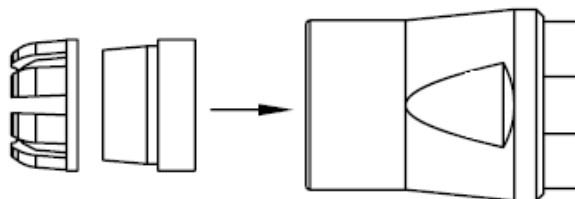
- | | | |
|---------------|--------|--------------------|
| 1 Sealing nut | 3 Seal | 5 Housing assembly |
| 2 Clamp ring | 4 Body | |

Install the waterproof connector assembly as follows:

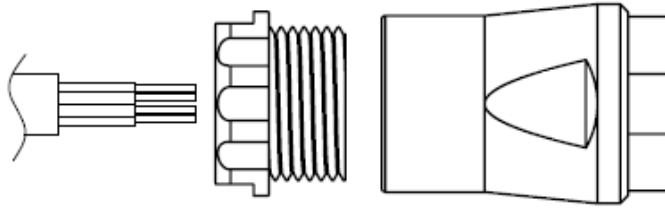
1. Strip the power cord sheath.



2. Insert the clamp ring and seal into the body.

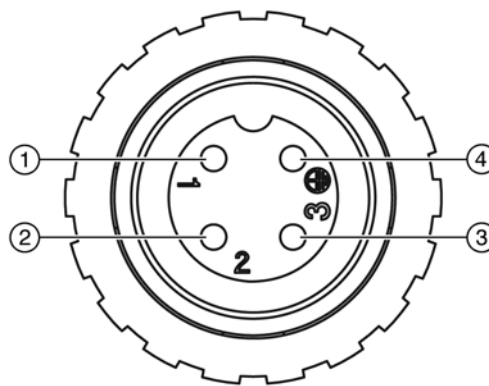


3. Insert the sheathed cable through the sealing nut, clamp ring, seal, and body.



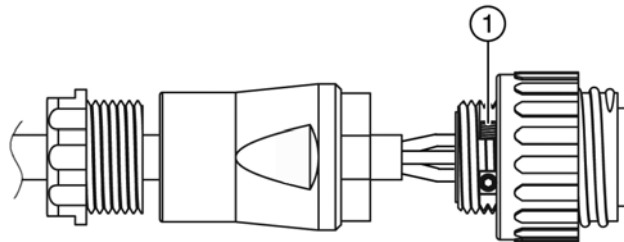
4. Insert the cable conductors into the housing assembly using the pin out diagram shown in [Figure 2-16](#).

Figure 2-16 Power Cable Pin Out Diagram



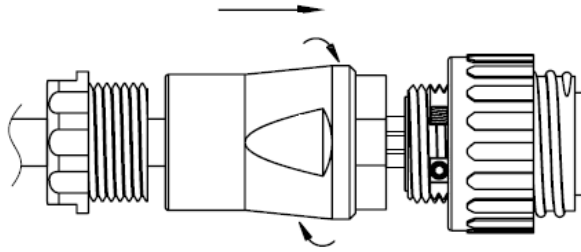
- | | |
|---------------------------|--------------------------|
| 1 Pin 1 - Hot | 3 Pin 3 - Neutral |
| 2 Pin 2 - Not used | 4 Pin 4 - Ground |

5. Secure the wires by tightening the single lock nut with a 1.5 mm (Hex) driver.

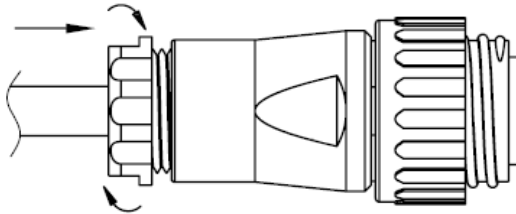


- 1** Lock nut

- Screw the body into the housing assembly and tighten.



- Screw the sealing nut into the body and tighten.



- Insert the assembled AC connector into the AC power receptacle on the power supply (see [Figure 2-13](#) on page 2-15).
- Screw on and hand tighten the knurled knob securely.
- Insert the plug into the AC power source.



Electrical Hazard: The connection to the AC power source should be made by a properly trained and licensed electrician in accordance with local codes and regulations.

This completes the installation of the WS-AP3660.



Specifications

This appendix lists the specifications for the Enterasys Wireless Outdoor Access Point WS-AP3660 and the WS-AP3660 Power Supply.

Table A-1 Specifications for the WS-AP3660

Item	Specification
Enclosure material	Metal enclosure IP67 rated
Power source	802.3at compliant PoE PD 12V DC input
Power consumption	< 40W (Max.)
Outside dimensions (max)	9.8 x 10.23 inches 250 x 260 mm
Antenna	6x RP-N Jack antenna connectors; 2.4GHz x 3, 5GHz x 3, 6x antenna terminator caps
Uplink Interface	GbE Ethernet x1 with PoE
Buzzer	Sound level: >80 dB; <90 dB Pause interval: 0.25 to approximately 2 seconds
RoHS compliant	Yes
Radio Configuration	IEEE 802.11a/b/g/n, 2.4/5GHz dual-band; Dual-radio, 3x3 MIMO
Water/Dust Proof Ratings	NEMA Type 4
Operating temperature	-40° C to +60° C (includes solar load testing)
Heater power	24 Watts (PoE deployment)
Heater set point temperature	System ON = 0° C Heater OFF = 9° C

Table A-2 Specifications for the WS-AP3660 Power Supply

Item	Specification
Enclosure material	Metal enclosure IP67 rated
AC Input	90 to 264V
DC output	12V
Outside dimensions (max)	8.5 x 4.8 inches 215 x 122 mm
RoHS compliant	Yes
Water/Dust Proof Ratings	NEMA Type 4
Operating temperature	-40° C to +60° C (includes solar load testing)

Regulatory Information



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

This appendix provides regulatory information for the WS-AP3660.



Notes: Specific AP models are only identified in this appendix where it is necessary to do so.



Warning: Changes or modifications made to the WS-AP3660s which are not expressly approved by Enterasys could void the user's authority to operate the equipment.

Only authorized Enterasys service personnel are permitted to service the system. Procedures that should be performed only by Enterasys personnel are clearly identified in this guide.



Note: The WS-AP3660s are 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.

WS-AP3660

The following regulatory information applies to the WS-AP3660.

WS-AP3660 External Antenna AP

Approved external antennas

The WS-AP3660 must only be used with certified external antennas. Any unused antenna ports must be terminated.

For a list of approved external antennas, see "[WS-AP3660 Approved External Antennas](#)" on page B-10.

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 transmitting 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.

USA Conformance Standards

This equipment meets the following conformance standards:

Safety

- UL 60950-1

EMC

- FCC CFR 47 Part 15, Class B

Radio transceiver

- 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 802.11n (WS-AP3660)
- IEEE 802.3af (PoE)



Warning: The WS-AP3660s must be installed and used in strict accordance with the manufacturer's instructions as described in this guide and related documentation for the device to which the WS-AP3660 is connected. Any other installation or use of the product violates FCC Part 15 regulations.

This Part 15 radio device operates on a non-interference basis with other devices operating at the same frequency when using the antennas provided or other Enterasys-certified antennas. Any changes or modifications to the product not expressly approved by Enterasys could void the user's authority to operate this device.

For the product available in the USA market, only channels 1 to 11 can be operated. Selection of other channels in the 2.4 GHz band is not possible.

FCC RF Radiation Exposure Statement

The WS-AP3660 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 WS-AP3660 is below the FCC radio frequency exposure limits as specified in “Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields” (OET Bulletin 65, Supplement C). This equipment should be installed and operated with a minimum distance of 25 cm between the radiator and your body or other co-located operating antennas.

External Antennas

The external antennas used with the WS-AP3660 must be approved and certified before use. However, in order to comply with the local laws and regulations, an approval may be required by the local regulatory authorities.

For a list of approved external antennas, see “[WS-AP3660 Approved External Antennas](#)” on page B-10.

RF safety distance

The antennas used for this transmitter must be installed to provide a separation distance of at least 25 cm from all persons and must not be co-located or operating in conjunction with another antenna or transmitter.

Professional Installation Notice

To comply with FCC part 15 rules in the United States, the system must be professionally installed to ensure compliance with the Part 15 certification. It is the responsibility of the operator and professional installer to ensure that only certified systems are deployed in the United States. The use of the system in any other combination (such as co-located antennas transmitting the same information) is expressly forbidden.

Canada

Industry Canada 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 Industry Canada.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur: “Appareils Numériques,” NMB-003 édictée par le Industrie Canada.

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.
- Please note that high power radars are allocated as primary users (meaning they have priority) and can cause interference in the 5250-5350 MHz and 5470-5725 MHz bands of LE-LAN devices.
- For the product available in the Canadian market, only channels 1 to 11 can be operated. Selection of other channels in the 2.4 GHz band is not possible.

Canada Conformance Standards

This equipment meets the following conformance standards:

Safety

- C22.2 No.60950-1-03

EMC

- ICES-003, Class B

Radio transceiver

- RSS-210 (2.4 GHz and 5GHz)

Other

- IEEE 802.11a (5 GHz)
- IEEE 802.11b/g (2.4 GHz)
- IEEE 802.11n (WS-AP3660)
- IEEE 802.3af (PoE)

External Antennas

The external antennas used with the WS-AP3660 must be approved and certified before use. However, in order to comply with the local laws and regulations, an approval may be required by the local regulatory authorities.

For a list of approved external antennas, see [“WS-AP3660 Approved External Antennas”](#) on page B-10.

RF Safety Distance

The antennas used for this transmitter must be installed to provide a separation distance of at least 25 cm from all persons and must not be co-located or operating in conjunction with another antenna or transmitter.

European Community

The WS-AP3660s are 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 WS-AP3660 for operation by entry of a country code relative to a specific country. After the country code is selected, the WS-AP3660 will use the proper frequencies and power outputs for that country code.

The WS-AP3660 is intended for outdoor use and must be installed in a proper outdoor location. Contact local Authority for procedure to follow and regulatory information. For more details on legal combinations of frequencies, power levels and antennas, contact Enterasys.

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).



Declaration of Conformity in Languages of the European Community

English	Hereby, Enterasys, declares that this Radio LAN device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Finnish	Valmistaja Enterasys 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 Enterasys 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 Enterasys 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 Enterasys 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, Enterasys 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 Enterasys 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 Enterasys erklærer herved, at følgende udstyr Radio LAN device overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
German	Hiermit erklärt Enterasys 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 Enterasys ΔΗΛΩΝΕΙ ΟΤΙ Radio LAN device ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/EK.
Icelandic	Enterasys lýsir her með yfir að thessi bunadur, Radio LAN device, uppfyllir allar grunnkröfur, sem gerðar eru í R&TTE tilskipun ESB nr 1999/5/EC.
Italian	Con la presente Enterasys 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 Enterasys 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	Enterasys declara que este Radio LAN device está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Malti	Hawnhekk, Enterasys, jiddikjara li dan Radio LAN device jikkonforma mal-htigijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Direttiva 1999/5/EC.

New Member States Requirements of Declaration of Conformity

Estonian	Käesolevaga kinnitab Enterasys seadme Radio LAN device vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
Hungary	Alulírott, Enterasys nyilatkozom, hogy a Radio LAN device megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.
Slovak	Enterasys týmto vyhlasuje, že Radio LAN device spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
Czech	Enterasys tímto prohlašuje, že tento Radio LAN device je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES."

Slovenian	Šiuo Enterasys deklaruoja, kad šis Radio LAN device atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
Latvian	Ar šo Enterasys deklarē, ka Radio LAN device atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem
Lithuanian	Enterasys deklaruoja, kad Radio LAN device atitinka 1999/5/EC Direktyvos esminius reikalavimus ir kitas nuostatas".
Polish	Niniejszym, Enterasys, deklaruję, że Radio LAN device spełnia wymagania zasadnicze oraz stosowne postanowienia zawarte Dyrektywie 1999/5/EC.

European Conformance Standards

This equipment meets the following conformance standards:

Safety

- 2006/95/EC Low Voltage Directive (LVD)
- IEC/EN 60950-1 + National Deviations

EMC (Emissions / Immunity)

- 2004/108/EC EMC Directive
- EN 55011/CISPR 11, Class B, Group 1 ISM
- EN 55022/CISPR 22, Class B
- EN 55024/CISPR 24, 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)
- ETSI/EN 301 489-1 & -17

Radio transceiver

- R&TTE Directive 1999/5/EC
- ETSI/EN 300 328 (2.4 GHz)
- ETSI/EN 301 893 (5 GHz)

Other

- IEEE 802.11a (5 GHz)
- IEEE 802.11b/g (2.4 GHz)
- IEEE 802.11n (WS-AP3660)
- IEEE 802.3af (PoE)

RoHS

- European Directive 2002/95/EC

External Antennas

The external antennas used with the WS-AP3660 must be approved and certified before use. However, in order to comply with the local laws and regulations, an approval may be required by the local regulatory authorities.

For a list of approved external antennas, see “[WS-AP3660 Approved External Antennas](#)” on page B-10.

RF safety distance

The antennas used for this transmitter must be installed to provide a separation distance of at least 25 cm from all persons and must not be co-located or operating in conjunction with another antenna or transmitter.

Conditions of use in the European Community

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 WS-AP3660 must not be operated until properly configured for the customer’s geographic location.



Caution: The user or installer is responsible to ensure that the WS-AP3660 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 Wireless AP 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.



Caution: Please follow the instructions in this user guide to properly configure the WS-AP3660.

- Each Wireless AP is configured with a default group of settings. There is the ability to change these settings. The user or installer is responsible to ensure that each WS-AP3660 is properly configured.
- The software within the Wireless AP will automatically limit the allowable channels and output power determined by the selected country code. Selecting the incorrect country of operation or misidentifying the antenna being 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 WS-AP3660s.
- The 5150- 5350 MHz band, channels 36, 40, 44, 48, 52, 56, 60, or 64, are restricted to indoor use only.
- The external antenna APs must only use antennas that are certified by Enterasys.
- The 2.4 GHz band, channels 1 - 13, may be used for indoor or outdoor use but there may be some channel restrictions.
- In Greece and Italy, the end user must apply for a license from the national spectrum authority to operate outdoors.
- In France, outdoor operation is not permitted using the 2.4 - 2.454 GHz band.

European Spectrum Usage Rules

The AP configured with approved internal or external antennas can be used for indoor and outdoor transmissions throughout the European community as displayed in [Table B-1](#). Some restrictions apply in Belgium, France, Greece, and Italy.

Table B-1 European Spectrum Usage Rules

Country	5.15-5.25 (GHz) Channels: 36,40,44,48	5.25-5.35 (GHz) Channels: 52,56,60,64	5.47-5.725 (GHz) Channels: 100,104,108,112,116, 132,136,140	2.4-2.4835 (GHz) Channels: 1 to 13 (Except Where Noted)
Austria	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Belgium	Indoor only	Indoor only	Indoor or outdoor *	Indoor or outdoor
Bulgaria	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Croatia	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Cyprus	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Czech Rep.	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Denmark	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Estonia	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Finland	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
France	Indoor only	Indoor only	Indoor or outdoor	Indoor only
Germany	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Greece	Indoor only	Indoor only	Indoor (Outdoor w/License)	Indoor (Outdoor w/license)
Hungary	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Iceland	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Ireland	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Italy	Indoor only	Indoor only	Indoor or outdoor	Indoor (Outdoor w/license)
Latvia	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Liechtenstein	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Lithuania	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Luxembourg	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Malta	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Netherlands	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Norway	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Poland	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Portugal	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Romania	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Slovak Rep.	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Slovenia	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Spain	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor

Table B-1 European Spectrum Usage Rules (continued)

Country	5.15-5.25 (GHz) Channels: 36,40,44,48	5.25-5.35 (GHz) Channels: 52,56,60,64	5.47-5.725 (GHz) Channels: 100,104,108,112,116, 132,136,140	2.4-2.4835 (GHz) Channels: 1 to 13 (Except Where Noted)
Sweden	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Switzerland	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
Turkey	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor
U.K	Indoor only	Indoor only	Indoor or outdoor	Indoor or outdoor



Note: * Belgium requires notifying the spectrum agency if deploying > 300 meter wireless links in outdoor public areas.

Certifications of Other Countries

The WS-AP3660s have been certified for use in various other countries. Once the correct country code is selected, the Wireless AP automatically uses 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.

Approved External Antennas

The external antenna WS-AP3660s can also be used with certified external antennas. However, in order to comply with the local laws and regulations, an approval may be required by the local regulatory authorities.

For a list of approved external antennas, see “[WS-AP3660 Approved External Antennas](#)” on page B-10.

Other Country Specific Compliance Standards, Approvals and Declarations

- IEC 60950-1 CB Scheme + National Deviations
- AS/NZS 60950.1 (Safety)
- AS/NZS 3548 (Emissions via EU standards – ACMA)
- AS/NZS 4288 (Radio via EU standards)
- EN 300 328 (2.4 GHz)
- EN 301 893 (5 GHz)
- EN 301 489-1 & -17 (RLAN)
- IEEE 802.11a (5 GHz)
- IEEE 802.11b/g (2.4 GHz)
- IEEE 802.11n (AP3630, WS-AP3660)
- IEEE 802.3af (PoE)

WS-AP3660 Approved External Antennas

The WS-AP3660 external antenna APs can be used with certified external antennas. However, in order to comply with the local laws and regulations, an approval may be required by the local regulatory authorities. The optional antennas listed in [Table B-2](#) have been tested and approved for use with the external antenna models.

This device has been designed to operate with the optional antennas listed below, and having a maximum gain of 23 dB. Antennas not included in this list or having a gain greater than 23 dB are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p) is not more than that required for successful communication.

Table B-2 List of Approved Antennas - WS-AP3660

Model	Application	Shape	Gain (dBi)	Frequency (MHz)	Connector Type
WS-AO-DS05360	outdoor	omni baton	5	2400-2500 5150 - 5875	1 x Reverse Type-N Jack on 12" pigtail
WS-AO-2S10360	outdoor	omni baton	10	2400	1 x Reverse Type-N Jack
WS-AO-DT05120	outdoor	120 deg, sector, triple-feed, MIMO	5	2300-2700 4900 - 6100	3 x Reverse Type-N Jack
WS-AO-5S10360	outdoor	omni baton	10	5000	1 x Reverse Type-N Jack
WS-AO-5D16060	outdoor	60 degree, sector, dual polarization	16	5150-5875	2 x Reverse Type-N Jacks
WS-AO-5D23009	outdoor	9 degree, panel, dual polarization, point-to-point	23	5150-5875	2 x Reverse Type-N Jacks
WS-AIO-2S18018	indoor/outdoor	18 degree, panel	18	2300-2500	1 x Reverse Type-N Jack
WS-AO-DT05120-1	outdoor	120 deg, sector, triple-feed	5	2300-2700 4900 - 6100	3 x Reverse Type-N Plugs on 12" pigtail
WS-ANT21	outdoor	omni baton	5	2300-2400 5150 - 5875	1 x Reverse Type-N Plug
WS-AO-DX13025	outdoor	panel	12.5 11.5	2400-2500 5100 - 5900	6 x Reverse Type-N Plugs

RF Safety Distance

The antennas used for this transmitter must be installed to provide a separation distance of at least 25 cm from all persons and must not be co-located or operating in conjunction with another antenna or transmitter.