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Wireless Mesh Network

# Wireless Access Point 7220

## Hardware Installation Guide

Product release code Draft 01.00 March 2004 Distribution Number

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“About this document”

“Installing the Wireless AP7220”



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Wireless Mesh Network

# Wireless Access Point 7220

## Hardware Installation Guide

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## Regulatory Statements

This device is designed for installation and use in the USA and Canada. For operation in other countries, please consult Nortel Networks for alternate product models.

This device contains one RLAN radio operating in the 2.4 GHz band and one RLAN radio operating in the 5 GHz bands.

### Regulatory statements pursuant to CFR 47 Part 15 for the United States

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The installation and operation of this device shall be in strict compliance with the manufacturer's instructions for its installation and use. Any changes in the installation, or modification of the device or of its optional accessories that are not expressly approved by the manufacturer and the party responsible for compliance could void the user's authority to operate the device.

Only those optional accessories listed in the operating manual shall be used with this device. The use of any other accessories (including antennas) will void the warranty and the user's authority to operate the device.

The manufacturer is not responsible for interference to other radio systems caused by the use of this device or by any unauthorised modification to the device or its associated antennas. The manufacturer assumes no liability for any damage or violation of regulations arising from the use of the device.

This device is designed to be installed by professionals trained in its installation and who are responsible for compliance with the relevant regulations.

This device is designed for installation in fixed locations only.

This device is not designed for direct connection to the public switched telephone network.

**NOTE:** The use of external RF amplifiers with this device is not permitted by the regulations of the FCC.

This unit is not a consumer product and requires professional network planning and installation. As such, this device is limited for use with approved antennas only.

**NOTE:** the use of non-approved antennas, tampering with, or deviating from the approved deployment configurations is strictly prohibited and could result in FCC/IC regulatory violations.

## Regulatory statements pursuant to RSS-210/CNR-210 for Canada

**AVIS:** Le texte en français est au-dessus

Operation (of this device) is subject to the following two conditions: (1) this device may not cause interference and (2) this device must accept any interference, including interference that may cause undesired operation of the device. To reduce the potential of radio interference to other users, the antenna type and its gain should be chosen so that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.

This Class B digital apparatus meets all the requirements of the Canadian Interference Causing Equipment Standard 003 (ICES-003).

**NOTE:** The use of external RF amplifiers with this device is strictly forbidden by the regulations of Industry Canada.

This device has been designed to operate with an optional external 5GHz antenna having a maximum gain of 23.6 dBi. Operation with antennas having a higher gain is strictly prohibited by the regulations of Industry Canada. The required antenna impedance is 50 ohms.

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not create an RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website [www.hc-sc.gc.ca/rpb](http://www.hc-sc.gc.ca/rpb).

This unit is not a consumer product and requires professional network planning and installation. As such, this device is limited for use with approved antennas only.

**NOTE:** the use of non-approved antennas, tampering with, or deviating from the approved deployment configurations is strictly prohibited and could result in FCC/IC regulatory violations.

L'utilisation de ce dispositif est autorisée seulement aux conditions suivantes : (1) il ne doit pas produire de brouillage et (2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

Afin de réduire le risque d'interférence aux autres utilisateurs, le type d'antenne et son gain doivent être choisis de façon à ce que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne soit pas supérieure au niveau requis pour obtenir une communication satisfaisante.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de la class B prescrites dans la norme sur le matériel brouilleur " Appareils Numériques " (NMB-003) édictée par le ministère des Communications du Canada

**ATTENTION:** L'utilisation d'amplificateurs RF externes avec les dispositifs de faible puissance est strictement interdite.

Ce dispositif a été conçu pour fonctionner avec une antenne optionnel de 5GHz ayant un gain maximal de 23.6 dB. Une antenne ayant un gain plus élevé est strictement interdite par les règlements d'Industrie Canada. L'impédance d'antenne requise est 50 ohms.

L'installateur du présent matériel radio doit s'assurer que l'antenne est située ou pointée de manière à ce que cette dernière n'émette pas de champs radioélectriques supérieurs aux limites spécifiées par Santé Canada pour le grand public; consulter le Code de sécurité 6, disponible sur le site Web de Santé Canada, à l'adresse suivante: [www.hc-sc.gc.ca/rpb](http://www.hc-sc.gc.ca/rpb).

Cet appareil est seulement pour usage commercial et requiert une installation professionnelle certifiée. L'usage de cet appareil est limité aux antennes certifiées stipulées par le fabricant.

**ATTENTION:** L'usage d'antennes autres que stipulées par le fabricant est prohibé et peut résulter en une violation des critères d'approbation FCC et Industrie Canada pour lequel cet appareil est homologué.

**General Installation Considerations**

This device has been evaluated and found to be compliant to the requirements addressing RF exposure from radio frequency devices for an uncontrolled environment. The RF emissions of this device are below the FCC limits. However, it is nevertheless generally advisable that radio transmitting equipment should always be installed and used in a manner so as to minimise exposure during normal operation.

When installed in indoor or outdoor locations using approved antennas, the product shall be installed in a fixed location with a minimum separation of 20 cm from all persons during normal use and shall not be used with any accessories not listed as approved in this manual.

When installed in outdoor locations using approved external 5 GHz antennas, the product shall be installed in a fixed location with a minimum separation of 30 cm from all persons during normal use and shall not be used with any accessories not listed as approved in this manual.

# Publication history

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## March 2004

Wireless AP7220 Hardware Installation Guide, Draft 1.00.



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# About this document

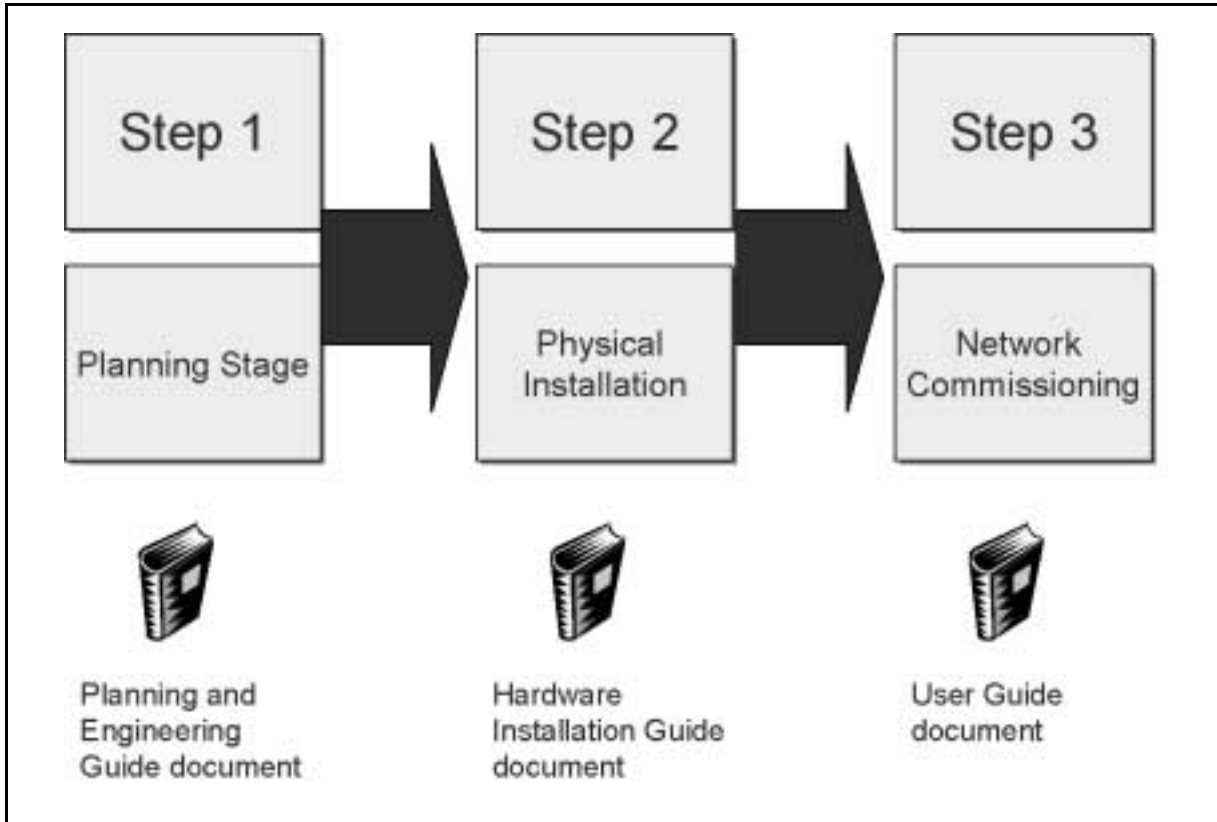
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## **Audience**

This Hardware Installation Guide is intended for professional deployment and is directed at professional installation personnel such as electricians, trained network installers and field technicians responsible for the physical installation and deployment of the Nortel Networks Wireless Access Point (AP7220).

## Related documents

This Hardware Installation Guide provides the instructions for the second major step in the commissioning of a Wireless Mesh Network. The three steps in the overall commissioning activity are shown in the figure below:



For complete information about installing, configuring, monitoring, and managing the AP7220 in a Wireless Mesh Network, refer to the following documents:

- WMN Planning and Engineering Guide document
- WMN User Guide (Network Commissioning)

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# Installing the Wireless AP7220

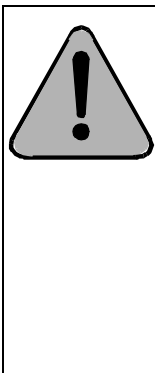
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This chapter provides an overview of the steps required to perform a physical installation of the AP7220 (Wireless Access Point 7220). It also outlines the pre-requisite steps that should already have been completed at the planning and engineering phase. For complete information about installing, configuring, monitoring, and managing the AP7220 in a Wireless Mesh Network, refer to “Related documents” on page 1-xii.

Before attempting installation, you should read through this entire section carefully.

## Limitations and Restrictions

Observe the following warnings and safety guidelines when installing the AP7220:

	<p><b>WARNING: THE AP7220 IS A SEALED DEVICE INTENDED FOR PROFESSIONAL INSTALLATION BY A QUALIFIED INSTALLER FOR INDUSTRIAL/COMMERCIAL USE. THERE ARE NO USER-SERVICEABLE COMPONENTS INSIDE.</b></p> <p><b>TO AVOID ELECTRICAL SHOCK OR BODILY INJURY DO NOT TAMPER WITH OR ATTEMPT TO OPEN THIS DEVICE.</b></p>
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## Safety Guidelines

Use the following safety guidelines to ensure your own personal safety and to help protect your AP7220 unit from potential damage:

- The AP7220 is safety-certified as a free-standing unit and as a component for use indoors or outdoors when installed using certified components according to the instructions and observing the limitations detailed in this manual.

- The installed product must be installed in compliance with all local safety codes. The manufacturer disclaims all warranties and liability in connection with installation methods not described in this manual and/or installations that do not comply with local safety codes and regulations.

## **AP7220 Standard Package**

The AP7220 base unit includes integrated 5 GHz antennas.

If you have purchased the NTE300AA package it includes the following items (see Figure 1-1):

- Wireless Access Point with attached power cable and integrated 2.4 GHz antennas
- 3/4 inch “T” type electrical junction box
- Installation guide (this booklet)

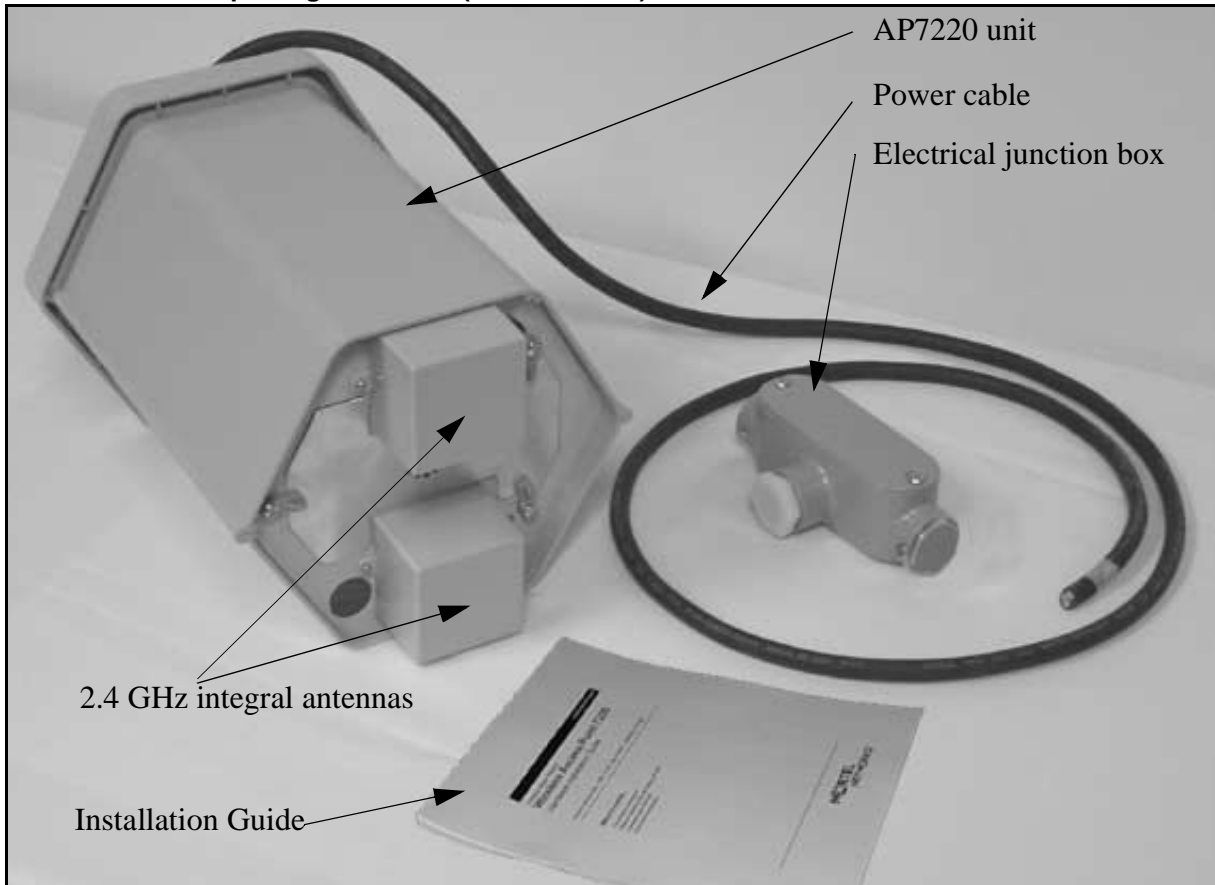
If you have purchased the NTE300BB package it includes the following items (see Figure 1-2):

- Wireless Access Point with attached power cable
- 3/4 inch “T” type electrical junction box
- Installation guide (this booklet)
- Two co-linear 2.4 GHz antennas
- Two antenna protective weatherproofing boots

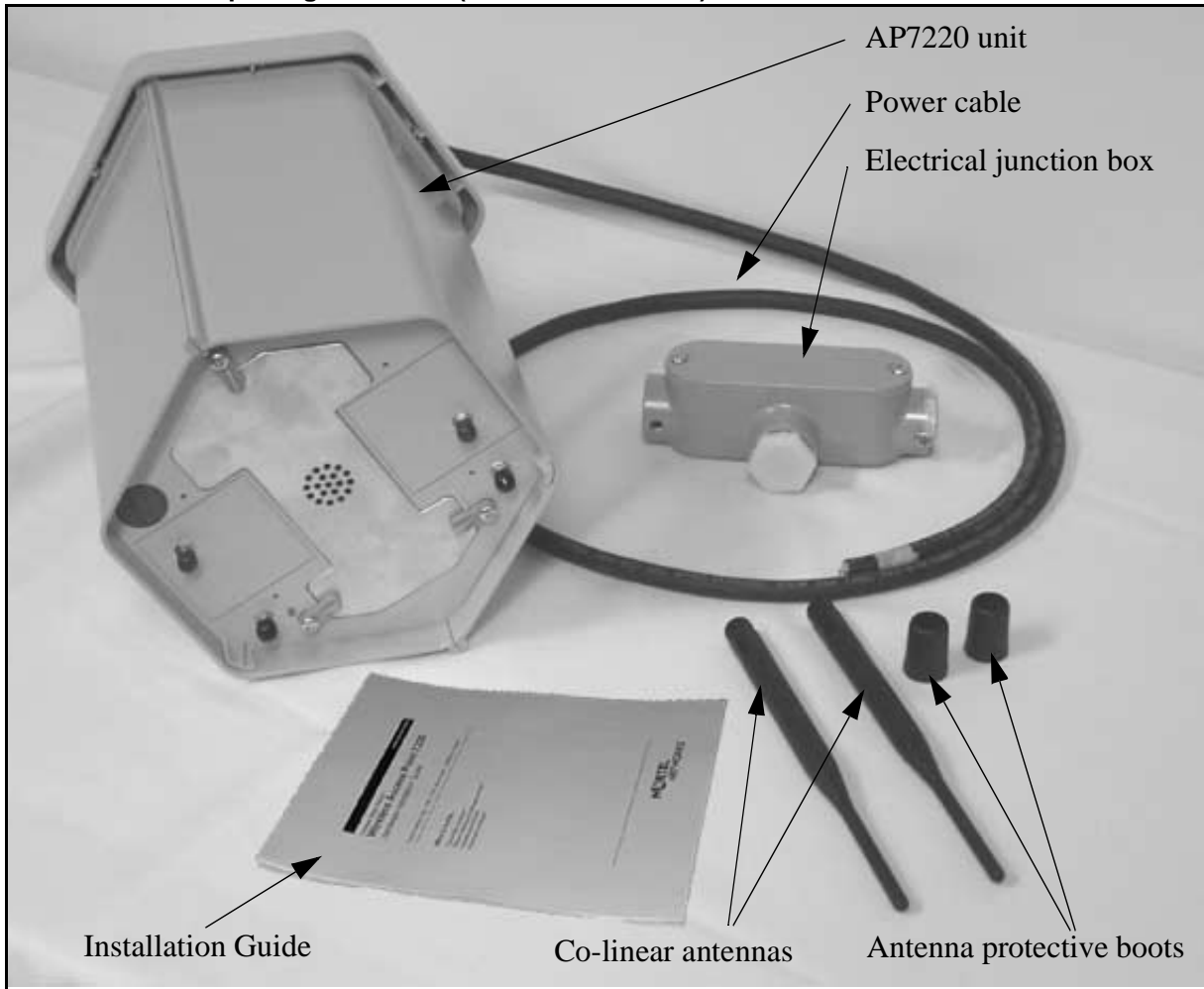
The standard package contents for package NTE300AA and NTE300BB are shown in Figure 1-1 and Figure 1-2 (items mentioned may not be exactly as shown).



**Figure 1-1**  
**AP7220 Standard package contents (PIFA antenna) - NTE300AA**



**Figure 1-2**  
**AP7220 Standard package contents (co-linear antennas) - NTE300BB**



## Optional Accessories

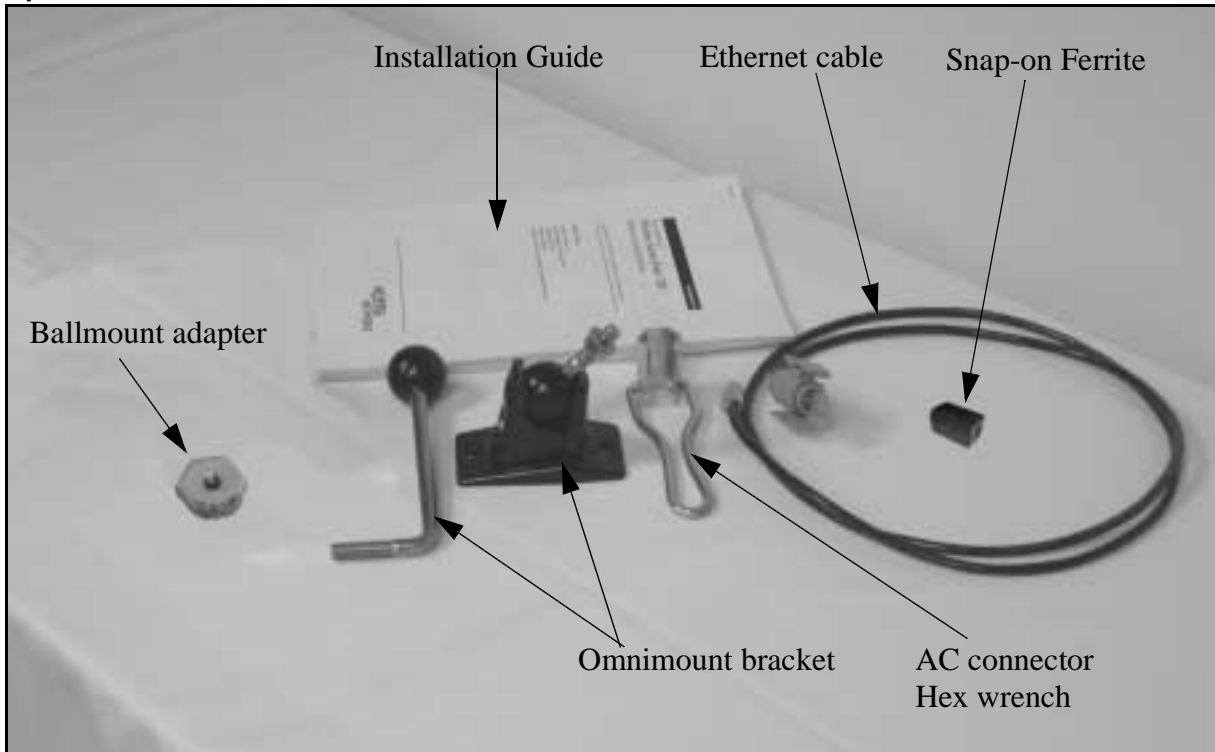
The following optional accessories are also available for ordering:

- Omnimount\* vertical and side mounting hardware bracket and Ball mount adapter
- Ethernet cables for indoor or outdoor options:
  - 25-metre connectorized CAT5 cable (indoor) or CAT5 outdoor-rated cable
  - 50-metre connectorized CAT5 cable (indoor) or CAT5 outdoor-rated cable
  - 100-metre connectorized CAT5 cable (indoor) or CAT5 outdoor-rated cable
- Snap-On Ferrite to be attached to Ethernet Cable upon installation (Steward, p/n: 28A2025-0A0 - Nortel CPC code: A0643364).
- AC Connector Hex wrench tool - for tightening AC power cable plug (Phoenix-Contact model QSS 19 order number 1670895)
- Approved external 5 GHz antennas:
  - 13 dBi Huber+Suhner\* SPA5600140/14/0/V Planar Antenna
  - 18 dBi Andrew Corporation\* #FPA5250D06-N
  - 23.6 dBi Andrew Corporation\* #FPA5250D12-N (**Note:** Restricted to outdoor use only)
- Printed Hardware Installation Guide (this manual)

**Note:** The standard package includes parts suitable for the majority of installations. Additional site specific accessories may be required prior to installation.

The optional accessories are shown in Figure 1-3.

**Figure 1-3**  
**Optional accessories**



## Installation Overview

Before installing the unit, review the “Limitations and Restrictions” and “Safety Guidelines” at the start of this chapter.

Installation involves the following tasks:

- Review “Installation Pre-requisites”
- Review “Physical Installation Requirements”
- Review “Installation Scenarios and Flowchart”

These tasks are described briefly below.

### Installation Pre-requisites

The AP7220 is intended for installation as part of a Wireless Mesh Network. Before the AP7220 unit is installed and powered up, ensure that the procedures described in the Planning and Engineering Guide have been performed.

### Physical Installation Requirements

The AP7220 unit is designed to be installed vertically with the baseplate facing down (in indoor or outdoor locations).

When installing the unit in an indoor location with approved antennas, choose a location that provides a minimum separation of 20 cm from all persons during normal operation.

When installing the unit in an outdoor location with approved antennas, choose a location that provides a minimum separation of 30 cm from all persons during normal operation.

Choose a location that minimizes the possibility of vandalism or accidental harm to the unit.

Choose a location that has line of sight with neighboring units.

Record the serial number and the location of each AP7220 unit. These records may be used for subsequent network management and maintenance.

### **Supplying Available Power**

The AP7220 may be conveniently powered from sources available at the location of the installation. A continuous supply of power is required for continuous operation of the unit. Power can be supplied to the AP7220 from the following sources:

#### **Mains AC Source**

The AP7220 can be powered from AC supplies in the range 100V-240V and 45Hz-65Hz.

#### **90V to 350V DC Source**

The AP7220 can be powered by a DC input ranging from 90V to 350V.

### **Installation Scenarios and Flowchart**

AP7220 mounting methods are determined by the characteristics of the location at which the AP7220 is to be installed.

The AP7220 unit is always installed vertically with the baseplate facing down. It can be installed using:

- side mounting methods
- vertical mounting methods

Using a side mounting method, the AP7220 can be installed:

- on the side of a post (such as a lamp post)
- on the side of a building

Using a vertical mounting method the AP7220 can be installed:

- below a curved post (such as a lamp post)
- below a ceiling

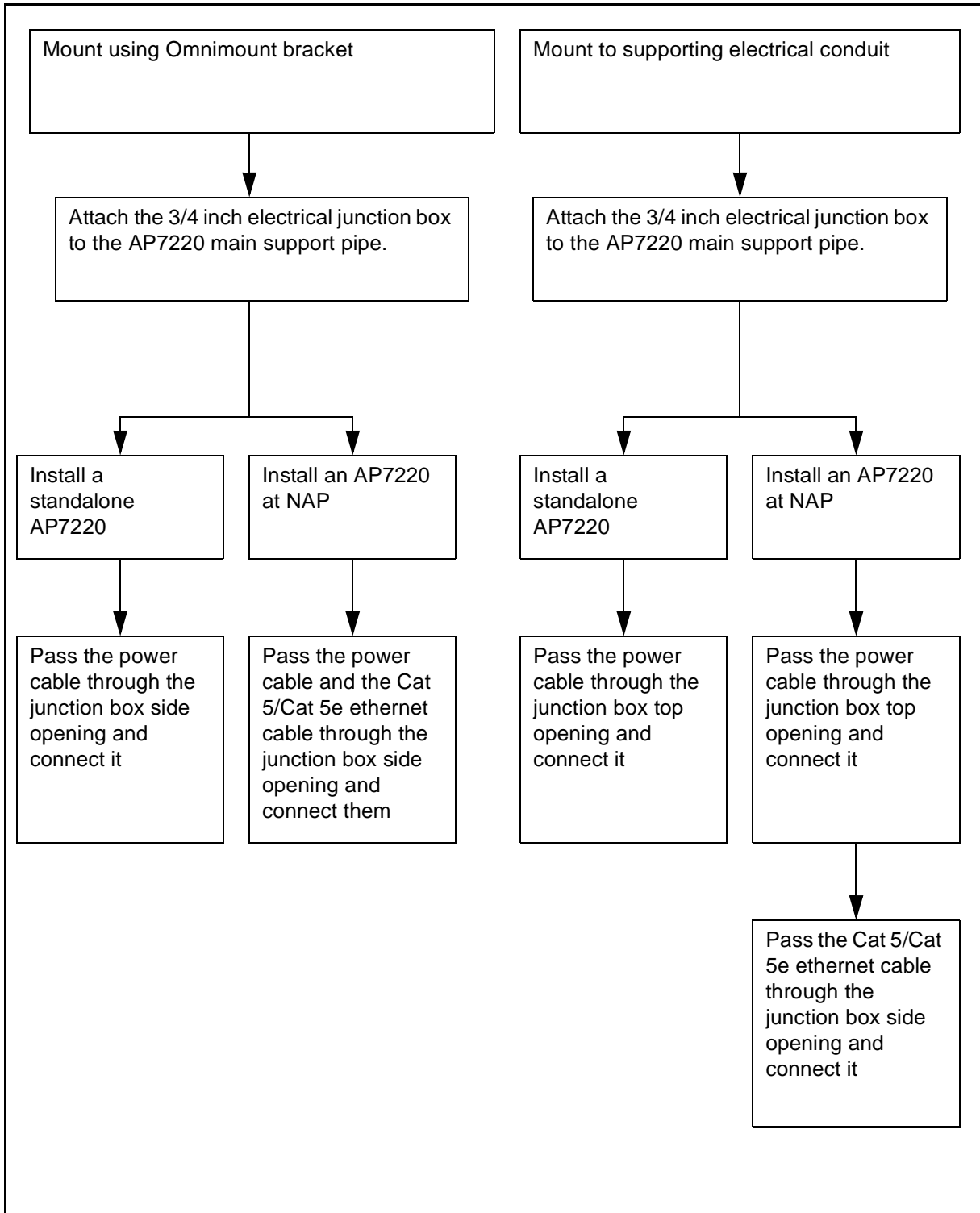
The flowchart shown at the end of this section details the sequence in which the AP7220 installation is to be performed. Use the flowchart to determine which procedures and tasks should be performed for your particular installation scenario.

The installation scenarios described in this manual are as follows:

- Standalone AP7220 mounted using Omnimount bracket
- AP7220 at NAP mounted using Omnimount bracket
- Standalone AP7220 mounted directly to supporting electrical conduit
- AP7220 at NAP mounted directly to supporting electrical conduit

The flowchart below consolidates the scenarios listed above into two basic installation scenarios based on mounting methods.

**Figure 1-4**  
**Installation Flowchart**



An example installation is shown in the following illustration:

**Figure 1-5**  
**AP7220 mounted directly to supporting electrical conduit**







Wireless Mesh Network  
**Wireless Access Point 7220**  
Hardware Installation Guide

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