AB-MAX® Access Point Installation and Maintenance Guide

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1 Preface

AB-MAX™ System technology enables high-speed, broadband Internet access for fast data transmission, full streaming video, real-time video conferencing, and web surfing. Axxcelera Broadband's wireless point-to-multipoint (AB-MAX) solutions for fixed networks enables our customers to easily leap-over existing infrastructure, making the initial investment significantly lower than that required for *wired* alternatives.

AB-MAX System's low-cost, wireless infrastructure means that a complete network can be installed *in days or weeks*, instead of the typical months or years. Since AB-MAX architecture is highly scalable, our customers' wireless network can grow as quickly as does their business in either or both bandwidth or geographic coverage needs.

The main tasks covered in this manual are those associated with the physical installation and cabling of Customer Premise Equipment (CPEs) and Access Points. Definitions of all the terms and abbreviations used in this manual can be found in the *Glossary* at the end of this manual.

1.1 Who Should Read This Manual

This guide is aimed at qualified AB-MAX system installers. Installers should have experience in radio equipment installations and aspects of hardware and software networks.

1.2 Conventions Used

This manual uses the following text formatting conventions:

- **Bold Text** indicates a specific module, field, window, or button.
- I*talic Text* highlights the name of other documents or references.
- Text in angle brackets indicates individual keystrokes. For example, <**Return**>.
- `Fixed width text` identifies a specific file or directory.

Text within boxes indicates helpful tips and hints.

1.3 Related Documentation

For more information, refer to one or more of the following documents:

- *AB-MAX Configuration & User Manual* – Covers AB-MAX components, architectures, configuration, and troubleshooting
- *AB-MAX Troubleshooting and Diagnostics* – Describes configuration, operational, and diagnostic capabilities of the radios.
- *AB-MAX Software Release Notes* – Describes updates and changes to the latest software and known product issues.

1.4 Technical Support

Axxcelera provides technical support to assist with any problems or to answer questions about Axxcelera AB-MAX solutions. The technical support staff is factory trained and equipped to resolve questions about Axxcelera products.

Telephone: +1 (804) 864-4222

Email: tech.support@axxcelera.com

Web site: www.axxcelera.com

1.5 Sales

You may contact the Sales Department for more information:

Telephone: +1 (408) 894-0160

Fax: +1 (408) 894-9831

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2 AB-MAX Product Overview

2.1 AB-MAX System

The Axxcelera Broadband AB-MAX System is a broadband, fixed, wireless access network for Internet, data, video, and voice applications. AB-MAX can enhance or replace existing networks, wired or wireless, or be used to develop new networks. The AB-MAX System offers:

- IEEE 802.16d / WiMAX air-link protocol (IEEE 802.16-2004)
- Point-to-Multipoint (PMP) Wireless Access Network
- End-to-End Connectivity
- Spectrum Efficiency per Offered Load
- Powerful, Flexible Elements.

2.2 AB-MAX Topology

The AB-MAX network consists of wireless data network cells similar in topology to the cellular phone networks. AB-MAX networks are designed for rapid and easy deployment, and constructed from a number of Base Stations deployed in a conventional cellular pattern. Deployment can vary from a number of small island sites to complete coverage of a chosen geographical area.

2.3 System Components

The AB-MAX System is comprised of the following major components:

- **Customer Premise Equipment (CPE)** – Located at customer premises and provides Ethernet connectivity.
- **Access Point (AP)** – The Access Point is the cornerstone component of the Base Station. The AP is the interface between the Service Provider's terrestrial network and the wireless fabric.

2.3.1 AB-MAX System Architecture

Figure 2-1 and Figure 2-2 show an AB-MAX System's typical deployment and network architecture.
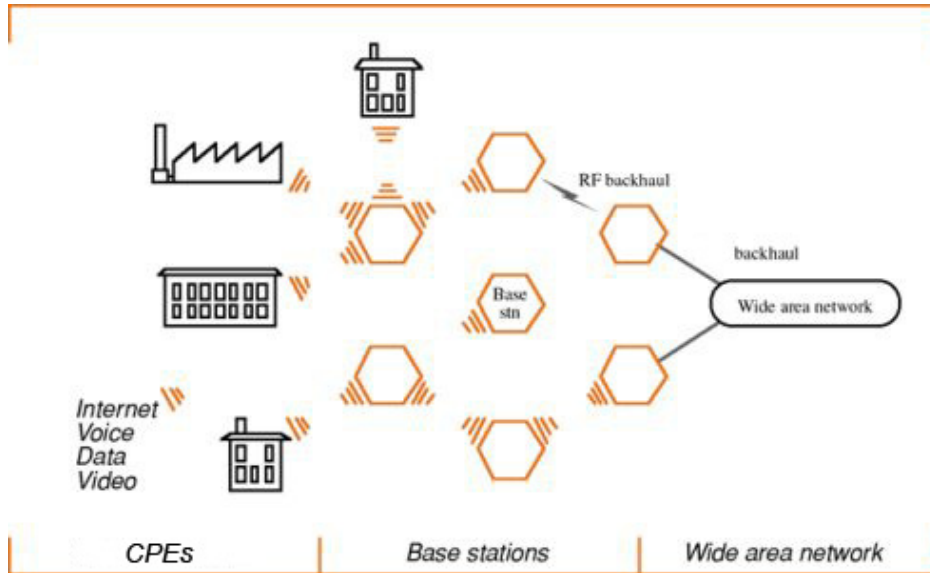

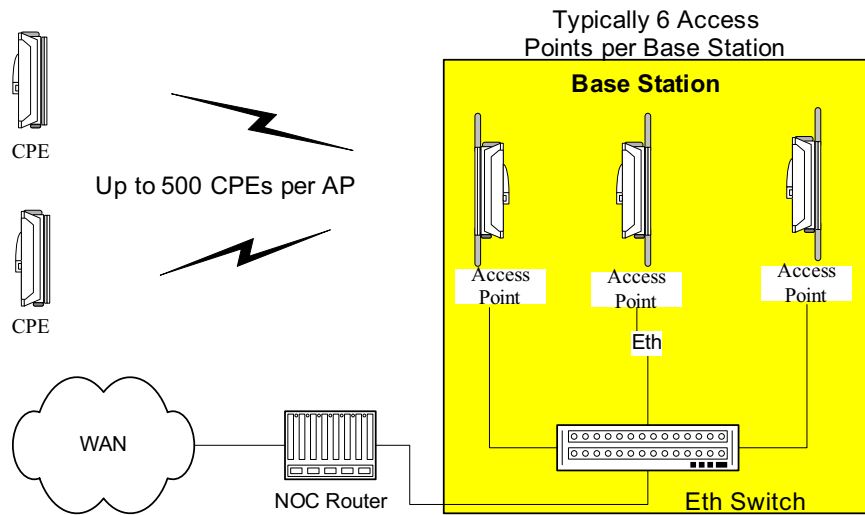Figure 2-1   AB-MAX Typical Deployment

Figure 2-2 AB-MAX Typical Network Architecture

2.3.2 Base Station Function

The Base Station enables wireless communications between the Customer Premise Equipment and the Wide Area Network (WAN). Base Station elements may include:

• Access Point

• Switch

- Termination Point and Lightning Arrestor

- 48 VDC Power Supply

- Uninterruptible Power Supply (UPS) (optional).
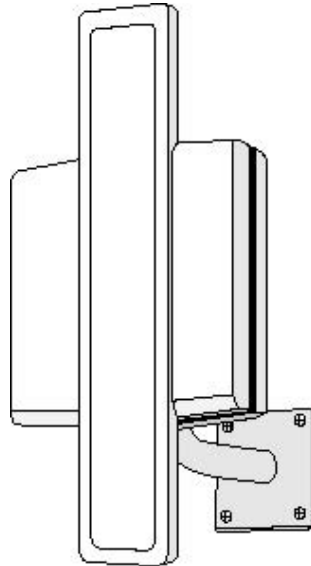
2.3.2.1 Access Points

Figure 2-3 Outdoor Access Point and Mounting Pole

A Base Station can have six Access Points (for 360-degree coverage) or more (for coverage overlap). Each AP consists of an outdoor transceiver (which contains the antenna and associated electronics that transmit and receive broadband wireless signals to and from Customer Premise Equipment) and an indoor wallbox.

2.3.2.2 OPTIONAL: GPS Antenna

A GPS antenna may be connected to each co-located AB-MAX Access Point to allow them to synchronize their RF transmissions. Although not required for basic system operation, use of the "network synchronization" feature allows Access Points that use the same frequency channel to more harmoniously co-exist.

2.3.3 Customer Premise Equipment Function

The Customer Premise Equipment is an integrated device that mounts externally at the customer site. This device provides Ethernet communications via the WiMAX wireless connection with the Base Station. Customer Premise Equipment elements may include:

- Internal Wallbox

- Cabling

- Switch, hub or router

3 Pre-Installation

3.1 Compliance Alert

The CE Marking with alert symbol (see below) appears on the Access Point assembly. The alert symbol indicates operation on frequency bands that are not harmonized throughout the European community.

Figure 3-1: Compliance Alert Label

Note: This equipment operates in the 5 - 6 GHz frequency range, which is not harmonized throughout the community.

Member states must be notified, in accordance with Article 6.4 of the R&TTE Directive 99/5/EC, before this equipment can be sold or put into service. Contact Axxcelera Customer Support for an up-to-date listing of Member State Notifications.See "Technical Support" on page 6.

3.2 Safety Precautions

PLEASE READ THESE SAFETY PRECAUTIONS!

3.2.1 RF Energy Health Hazard

Please pay attention to the following warnings:

When servicing equipment and selecting a location for the ABMAX antennas, it is important to note that a minimum distance of 38 cm (15 inches) is required between personnel and ABMAX antennas to comply with a radio-frequency exposure limit of 1.0mW/cm2.

Professional installation required. The radio equipment described in this guide uses radio frequency transmitters. Although the power level is low, the concentrated energy from a directional antenna may pose a health hazard. ABMAX integrated antennas are 16dBi.

3.2.2 Connection Sequence Caution

Arcing may occur when connecting the outdoor Ethernet cable to either the Access Point or the NIA should the power be connected to the NIA. Arcing may irrevocably damage the NIA or the Access Point. To prevent any chance of damage from occurring, verify that the power is disconnected from the NIA before attempting to connect the interconnecting cable to either the Access Point or NIA.

3.2.3 Protection from Lightning

Article 810 of the US National Electric Department of Energy Handbook 1996 specifies that radio and television lead-in cables must have adequate surge protection at or near the point of entry to the building. The code specifies that any shielded cable from an external antenna must have the shield directly connected to a 10 AWG wire that connects to the building ground electrode.

3.2.4 FCC Notice, USA

The AB-MAX units comply 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 device is specifically designed to be used under Part 15 of the FCC Rules and Regulations. Any unauthorized modification or changes to this device without the express approval of Axxcelera Broadband may void the user's authority to operate this device. Furthermore, this device is intended to be used only when installed in accordance with the instructions outlined in this manual. Failure to comply with these instructions may also void the user's authority to operate this device and/or the manufacturer's warranty.

3.3 Skills Required

The AB-MAX Product Installation procedures require some construction-related experience using both power and hand tools. Answer the following questions to determine whether you have the skills to attempt the installation.

1) Are you comfortable working at heights?

The installation may require you to climb a ladder and work at heights depending on where you need to install your outdoor transceiver. Keep in mind, you will also carry tools and equipment with you to the installation site.

2) Have you ever installed an RJ-45 connector to an Ethernet cable?

This is required to connect the outdoor transceiver and the wallbox.

3) Have you run telephone cable, wired a telephone jack, or connected telephone wire connections to a punch down block?

4) Have you ever installed expansion shields into brick or masonry walls?

This requires drilling holes in masonry using masonry drill bits.

5) Have you ever wired an electrical outlet?

6)   Although you won't wire an outlet, you will be required to run ground wires and clamp them to an earth grounding rod or a cold water pipe.

If you can perform all the above tasks, then you should be able to install the AB-MAX System. If you are unsure of your ability to perform these tasks, contact a more qualified installer.

3.4 Information Needed From Your Service Provider

Your service provider should have supplied you with the following information. Please contact your service provider before commencing installation, if you do not have all of this information:

• Locations of any local Access Points, which you should be able to connect to.

• The IP address of the radio being installed.

• An IP address and subnet mask needed to configure a Test PC. This is so you can check to see if your CPE is working, align your outdoor transceiver correctly, and confirm that you can connect to your service provider.

3.5 Required Tools and Equipment

This section lists all the extra tools and equipment mentioned in this guide that you will need to perform the installation. None of the items listed in Table 3-1 are supplied with the kit, so make sure you gather everything you need before you start. Use the table below to check exactly what you will need (this will depend on where you are going to install the outdoor transceiver).

Tools Required	Extra Equipment Required
Compass	¼ inch grounding rod
Area map with an accurate direction legend showing magnetic north	Grounding clamp
Phillips-head screwdriver	Grounding wire
Flat-head screwdriver	Roll of UTP CAT 5 cable
Hammer or mallet	#6 wood screws
Power drill	Cable clip
1/8 inch drill bit	Anchor sleeves
¼ inch masonry drill bit	RJ-45 connectors (plastic bodied)
3/16 inch, 4mm hex (Allen) wrench	Ethernet Hub (10BaseT)
Bubble level or plumb line	
Adjustable wrench	
Wire snake (if routing cable through interior walls)	
Crimping tool (must be specifically matched for the RJ-45 connector used)	

Tools Required	Extra Equipment Required
Wire stripper	
Small wire cutters	
Punch down tool	

Table 3-1   Required Tools and Extra Equipment

3.6 Access Point Packing List

Table 3-2 lists the main components (Figure 3-1) of an Access Point.

Item	Quantity	Notes
Outdoor transceiver	1	See item 1 in Figure 4-2
Mounting pole	1	See item 2 in Figure 4-2
Pole clamp	1	See item 3 in Figure 4-2
M6 washer	2	See item 4 in Figure 4-2
M3 x M10 machine thread screws	2	See item 5 in Figure 4-2
Indoor wallbox	1	White wallbox
Power supply and cord	1	

Table 3-2 AP Components
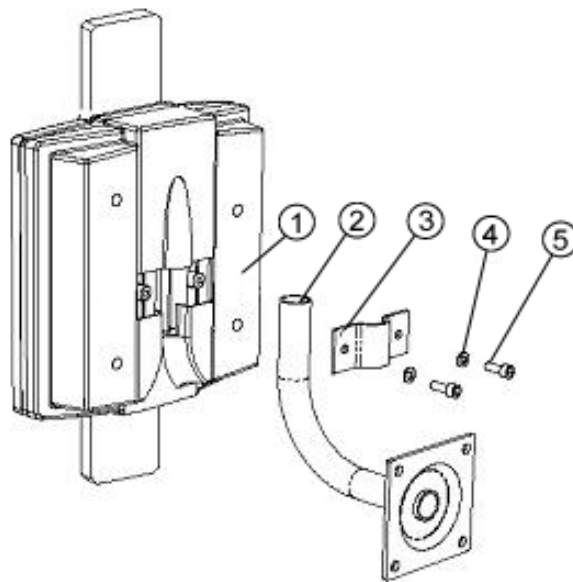
Figure 3-1 Outdoor Access Point Components

4 Installing the Mounting Poles

First install the mounting poles, on which you will mount the outdoor transceivers.

Bear in mind the direction in which the transceivers will point.

Attention! The mounting pole must be mounted in a vertical position. Failure to do so may result in improper alignment of the outdoor transceiver. If you need to tilt the transceiver down to avoid self-interference in a cellular-style deployment, you should use an (optional) tilt bracket.

Warning! The mounting pole must be grounded. See Section Grounding the System .

4.1 Installing On an Antenna Mast

1) Position the mounting pole on the antenna mast.

2) Insert the U-bolts around the mast (Figure 4-2) and through the holes in the mounting pole. Install a washer and nut to each side of the threaded U-bolt and hand tighten. Repeat this step for the second U-bolt.

3) Tighten nuts equally until mounting pole is secure and cannot rotate.
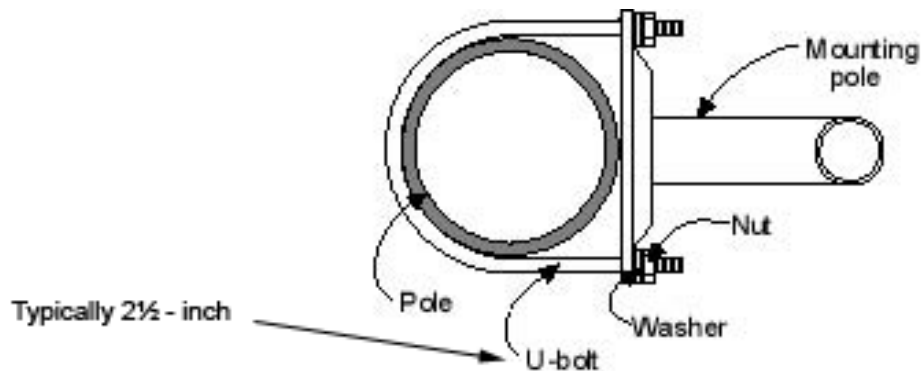

Figure 4-2 Mounting Pole Installed on Pole or Antenna Mast

4.2 Installing On Brick or Masonry

1) Place the mounting plate against the wall (Figure 4-3:). Use a level or plumb line to set the mounting pole perpendicular to the ground.

2) Mark the hole locations.

3) Set the pole aside.

4) Drill ¼ inch holes at the marked locations. Drill the holes approximately ½ inch deep.

5) Insert the expansion shields into the drilled holes and tap them home.

6)   Align the mounting pole with the drilled holes and fix with the lag bolts.
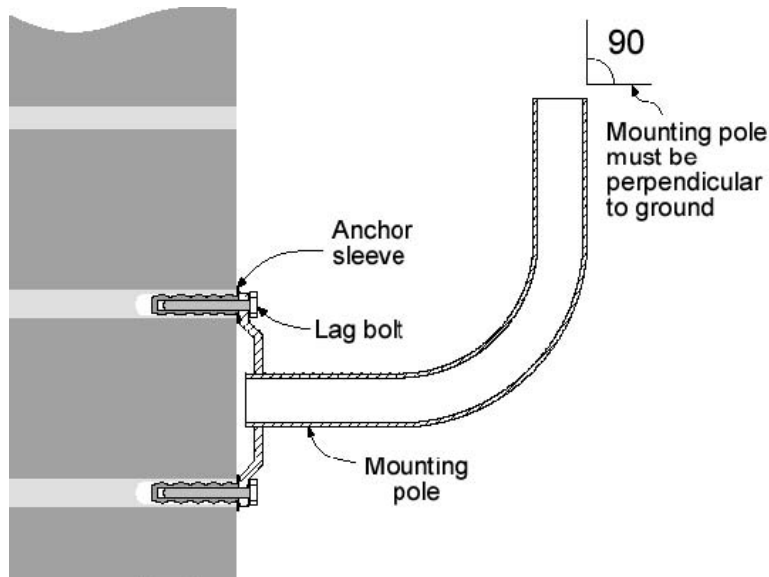

Figure 4-3: Mounting Pole Installation

4.3 Installing On a Wall with Wood Siding

1)   Place the mounting plate against the wall.

2)   Using a level, be sure that the mounting pole is perpendicular to the ground. You may need to use spacers, as shown in Figure 4-4.

3)   Mark the hole locations for the drilled hole locations. Remove the mounting pole and set aside.

4)   Drill 1/8-inch holes in the places marked.

5)   Use #10 or #12 wood screws to secure the mounting pole to the wall and tighten.
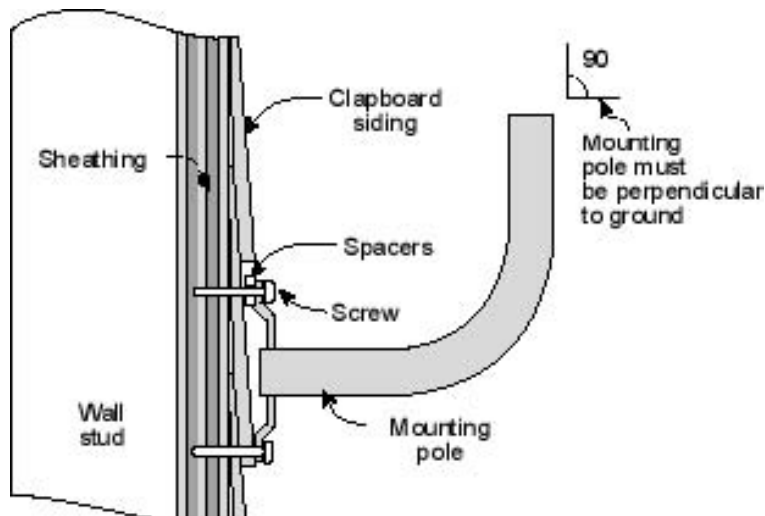

Figure 4-4 Mounting Pole on Clapboard Siding

5 Radio Installation

5.1 Before You Start

This section lists the information needed to install an AP.

5.2 Information Required

Before you perform the installation, a site survey should have been performed by the service provider. From this, you will need to know:

• Number of APs to install

• Where the outdoor transceivers will be mounted (antenna mast, pole or building)

• Heights at which the outdoor transceivers will be mounted.

• Transceiver directional information (azimuth and elevation).

• Whether or not GPS antennas need to be installed.

You may be installing as many as six APs (or even more) on a mast or pole, giving 360 degree coverage in 60 degree sectors, as shown in Figure 5-1.

Figure 5-1 Diagram of Six Access Points for 360 degree Coverage

5.3 Installing the Equipment

This section explains how to install an AP transceiver onto a variety of surfaces, connect them to the indoor wallbox, and ground the system. The most likely scenario is to install six transceivers on a single tower or mast 60 degrees apart.

5.3.1 Mounting the Outdoor Access Points

Now that you have installed the mounting pole, you are ready to install the Access Points onto the mounting poles. Reference Figure 5-2 through Figure 5-5.
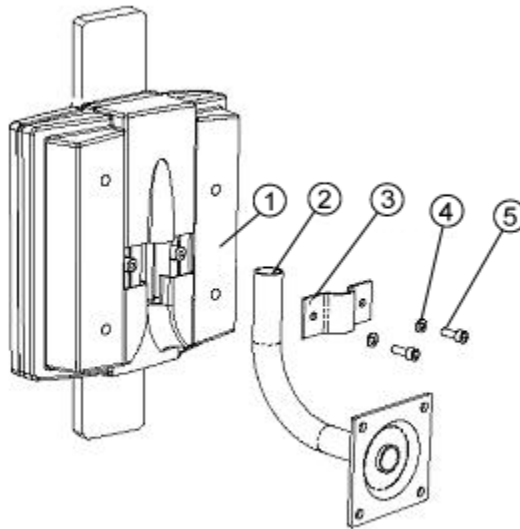
Figure 5-2 Mounting Parts for an Outdoor Access Point

1)   Place the outdoor Access Point on the mounting pole.

2)   Align the pole clamp with the mounting holes.

3)   Insert the mounting screws and hand tighten.

4)   Rotate the outdoor Access Point so it is pointing in the correct direction.
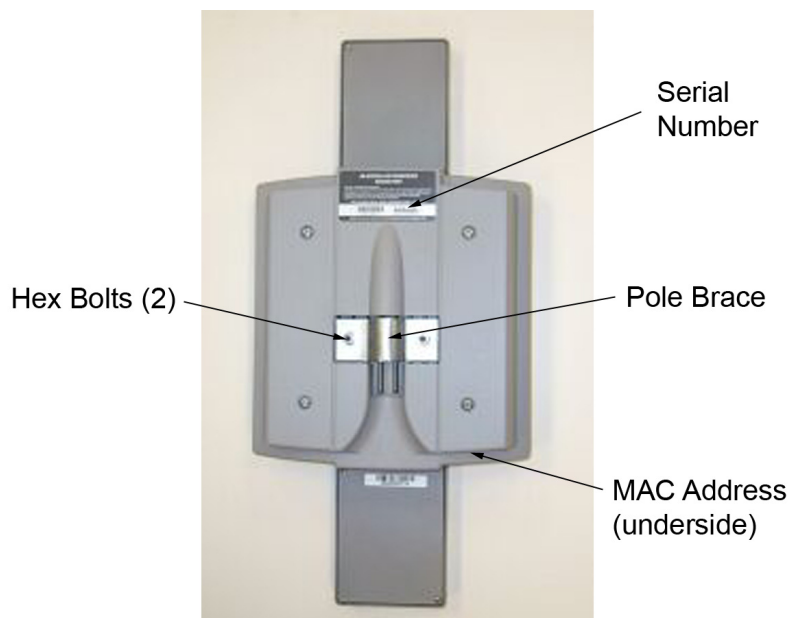
5)   Tighten the mounting screws.
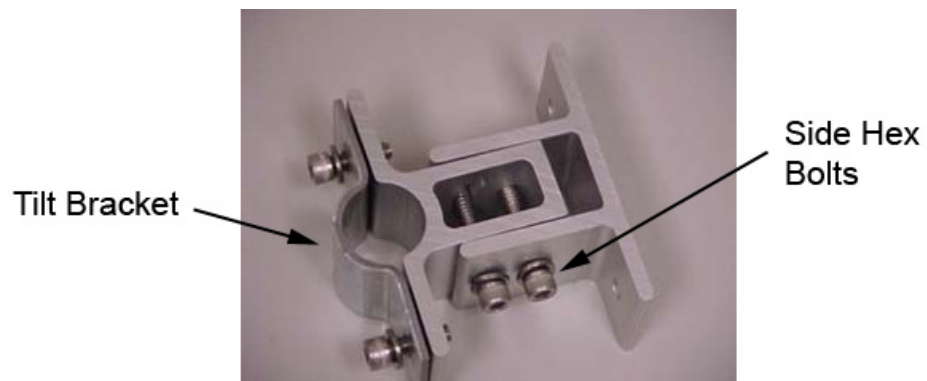
Figure 5-3 Access Point Rear View

Figure 5-4 Tilt Bracket

Figure 5-5 Access Point with Mounted Tilt Bracket

5.3.1.1 OPTIONAL: Installing the GPS Antenna

Consult the manufacturer of the GPS antenna for installation specifics. Connect the GPS antenna cable lead to the GPS antenna port of the AB-MAX AP.

6 Installing the Interconnect Cables

For each interconnect cable, you will need to perform the following steps.

6.1 A Note On Cabling

Attention! Most of the cabling used in the AB-MAX System is CAT5. You will need to be aware of the following limits on CAT5 cable lengths:

1. The interconnect cable from the indoor wallbox to an outdoor transceiver must be less than 100 meters. This is due to DC resistance loss over the distance of the cable run.

2. The combined length of Ethernet interconnect cable (from the radio to the switch) must be less than 100 meters.

6.2 Route the Cables

Now that you have installed the Access Point and indoor wallbox, you are ready to route the interconnect cable.

1)   Select where the cable will enter the building from the outside Once you have chosen the route, determine the length of cable required. Allow three extra feet on each end to allow for strain relief as well as any bends and turns.

2)   Install the cable, leaving the ends free and ready to fit the RJ-45 connector (transceiver end), and install to the indoor wallbox.

3)   Remember to form a drip loop on the exterior of the building where the cable enters the penetration. This will help prevent water from entering.

6.3 Install the Interconnect Cables (Transceiver End)

1) Remove the grommet and clamping plate from the outdoor transceiver by removing the two screws.
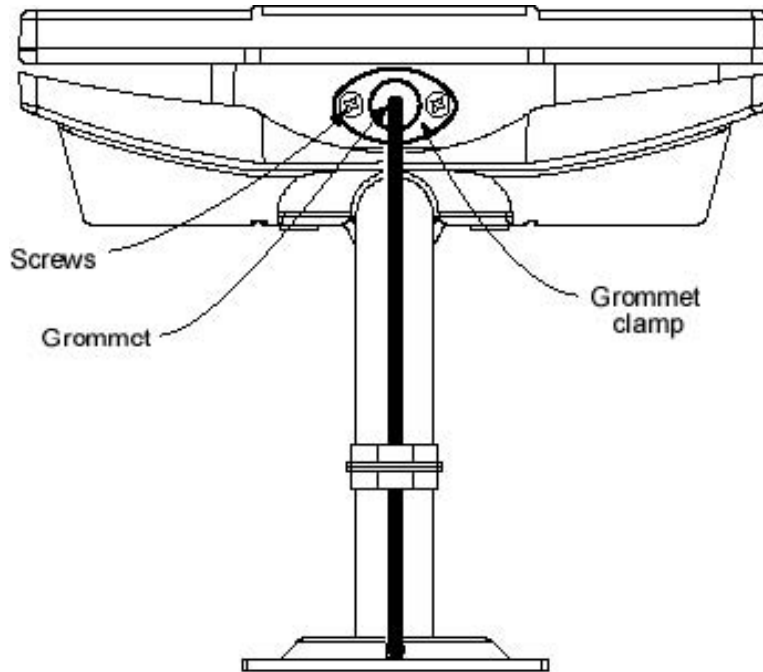

Figure 6-1: Grommet Location - Underside of Access Point

Note: The Grommet is made of a special conductive material used to complete the ground between the Access Point and wallbox.

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2) Insert the cable end through the grommet clamping plate (Figure 6-1:)

3) Insert the cable end through the grommet. The tapered end of the grommet should be opposite the cable end.

4) Strip 1/2 inch of insulation off the cable end. Trim the wire ends flat as shown in Figure 6-2.
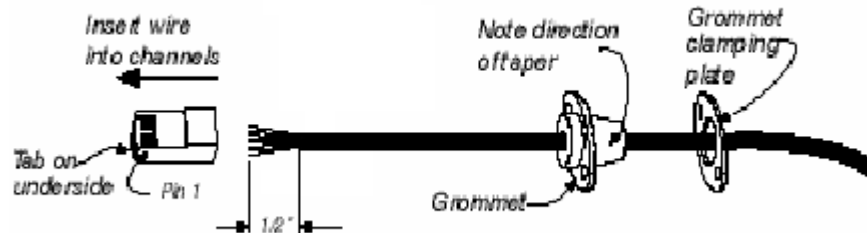

Figure 6-2 Outdoor Transceiver End of the Interconnect Cable with Cable Preparation

5) Separate the twisted pair wires and align by color code in the order listed in Table 6-1.

Pin	Color Code
1	White / Orange
2	Orange
3	White / Green
4	Blue
5	White / Blue
6	Green
7	White / Brown
8	Brown

Table 6-1 Cable Legend for Interconnect Cable

6) Using pin 1 as a reference, insert the individual wires into the channels of the RJ-45 connector. Each wire should penetrate the channels until flush with the connector end.

7) When all wires are inserted into the channels in their correct order, use the crimping tool to permanently crimp the wires to the connector.

Attention! Carefully read the instructions for the crimping tool you are using. Use the correct crimping tool for the RJ-45 connector you are using. Incorrect installation of the RJ-45 connector may result in a bad connection between the outdoor transceiver and wallbox.

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8) Insert the RJ-45 connector into the receptacle located underneath the outdoor AP. Make sure that the connector tab engages the slot in the receptacle.

9) Slide the grommet up the cable and press it into the bottom of the outdoor AP.

10) Slide the grommet clamp up the cable and align the holes with the mounting holes on the bottom of the outdoor transceiver.

11) Insert the two screws in the mounting holes and tighten until the grommet has a slight bulge. Be sure to tighten both screws equally so that the grommet is seated correctly.

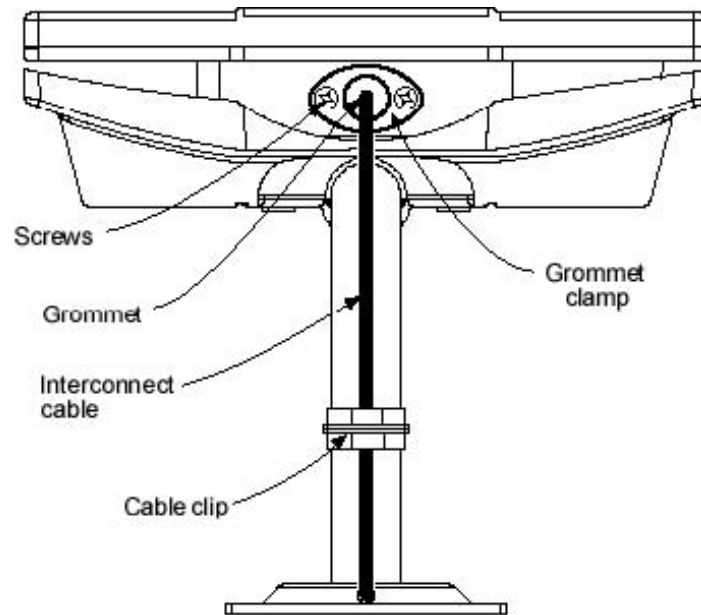**12)** Secure the interconnect cable to the mounting pole with the cable clip as shown in Figure 6-3.

Figure 6-3 Interconnect Cable Installation to Outdoor Access Point - Bottom View

6.4 Mark the Access Point Cables

Attention! Step 1 is important, and will enable the network installer to configure the system easily.

Mark the cable with a permanent label and make a note so that the network installer knows which outdoor AP transceiver is connected to which wallbox.

7 Grounding the System

The AB-MAX System must be properly grounded in order to protect it and the structure it is installed on from lightning damage. This requires:

1) Grounding all the outdoor transceivers as shown in Figure 7-1.

2) Grounding the CAT5 cable to the wallbox as shown in Figure 7-2.

7.1 Grounding the Outdoor Radio

1) Place the grounding rod so as to allow for the shortest possible path from the grounding cable to the outdoor Access Points.

2) Drive the grounding rod into the ground at least eight inches from the ground surface.

3) Attach a grounding clamp to the grounding rod. You will use this clamp to attach grounding wires for both the outdoor transceiver and indoor wallbox, reference Figure 7-1.
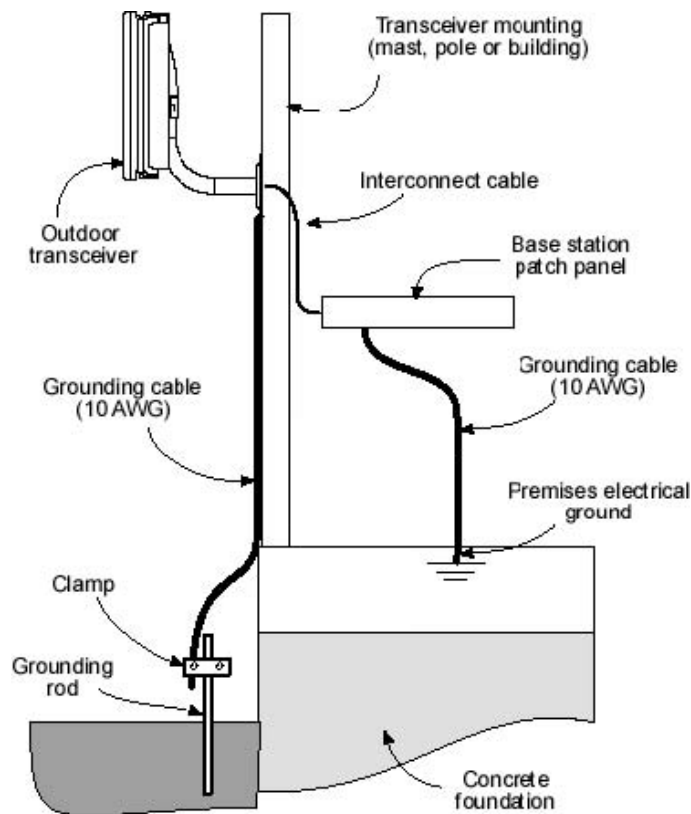

Figure 7-1 Ground Connections to Access Point Transceiver

Attention! The grounding wire should be long enough to reach from the mounting pole to the grounding rod with 3 to 6 extra feet allowed for strain relief.

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4) Connect a ground lug to one end of the grounding wire.

5)   Remove one of the lower mounting screws of the mounting pole. Insert a screw through the grounding lug terminal and re-install it to the mounting pole.

6)   Attach the grounding wire to the clamp on the grounding rod, reference Figure 7-2. If necessary, use wire staples to secure the grounding wire to the outside wall.
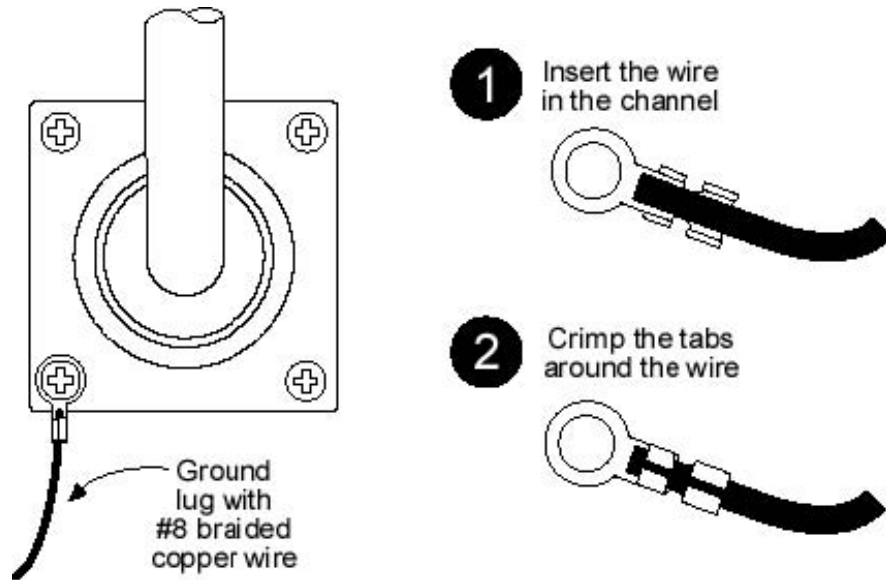

Figure 7-2 Mounting Pole with Ground Lug

7)   Install a grounding wire from the wallbox to the grounding rod.

8 Installing the NIA/Power Adapter Hookup

Install the ABMAX Access Point's NIA/Power Adapter as follows:

1)   Remove the new NIA/Power Adapter from the installation kit.

2)   Flip the NIA over and use a Philips screw driver to remove the screw in Figure 8-1:

Figure 8-1: Remove access cover screw

Note: The NIA does not have a captive screw. Take care to retain this screw (Figure 8-2) when opening the access cover on the adapter.

Figure 8-2 NIA access cover and non-captive screw

3) Using a shielded RJ-45 plug, terminate (attach plug) to the outdoor CPE Cat-5 cable per the manufacturer's recommended specifications for plug attachment. (Recommended manufacturer: AMP P/N 5-569552).

4) Insert the RJ-45 plug from the outdoor CPE into the RJ-45 receptacle inside the NIA (Figure 8-3).

Figure 8-3 Connect the CPE (outdoor unit)

5) Lay the CAT-5 cable so it passes through the opening into the case between the NIA and the cover. Replace and tighten the screw (Figure 8-4) to secure the access cover to the NIA.

Figure 8-4 Reassemble the NIA

8.1 Attaching to the Wall (optional)
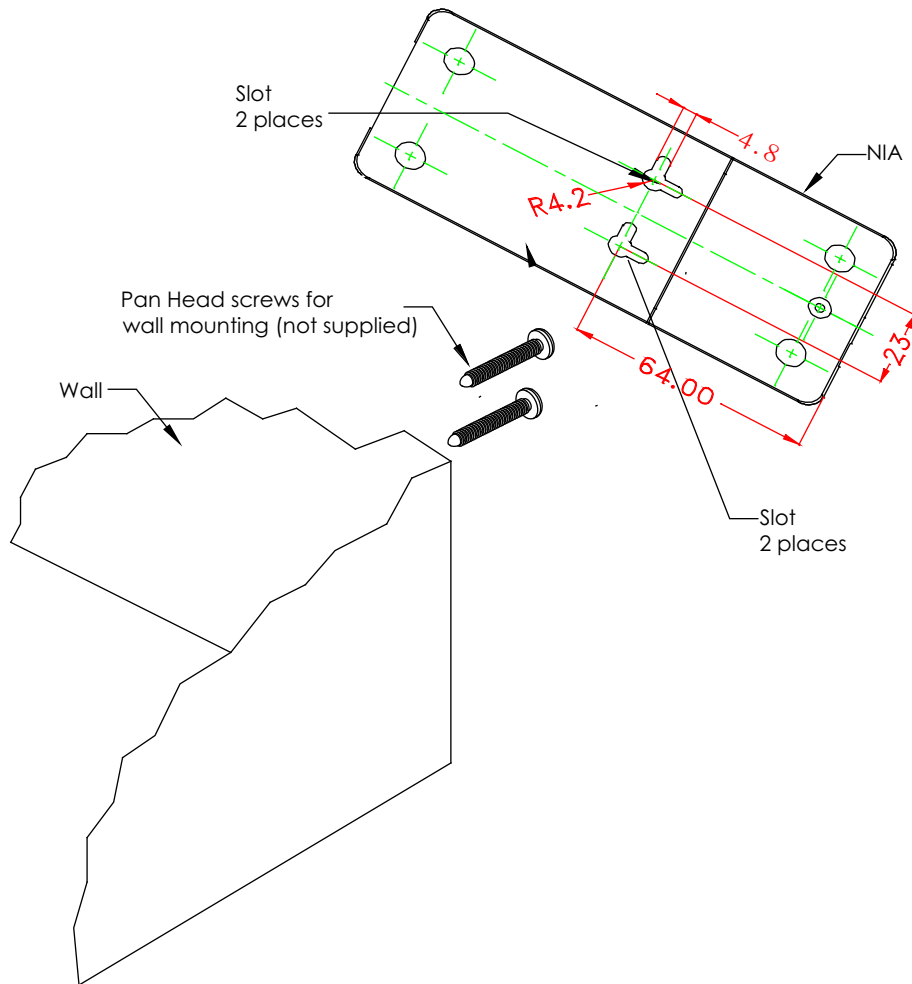

Figure 8-5 Attaching to the wall

1) If the unit is to be wall mounted, mark two hole locations on an appropriate wall 23 mm (0.94 in.) apart.

2) Using the previously marked holes, screw two M4 pan head screws into the wall, leaving 3.18 mm (1/8 in.) minimum clearance between the head of the screw and the wall.

3) Position the NIA so that openings on the back line up with the screw heads.

4) Slide the NIA slots over the screw heads adjusting the exposed screw heads in or out for appropriate tightness.

8.2 Hooking up the NIA/Power Adapter

It is extremely important to connect the AC power to the NIA as the last step. Connecting AC power prematurely can damage the CPE and lead to faulty behavior.

Note: The NIA/Power Adapter does not come with cables or power cord. Service provider must provide their own cables and power cord.

1) Insert one end of an RJ-45 to RJ-45 Ethernet cable assembly to the external RJ-45 jack on the outside of the NIA and the other end to the customer's computer (Figure 8-6).
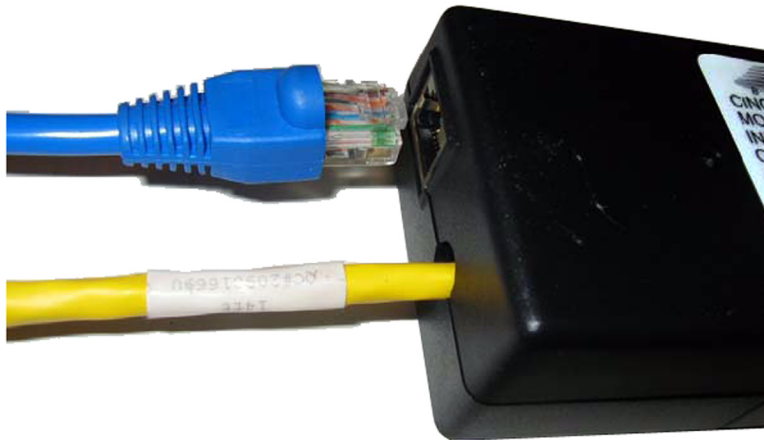

Figure 8-6 Connect customer computer or network device

Note: Customer equipment requiring Ethernet connectivity may not be located more than 100 m (328 ft) from the CPE.

2) Check to see that the connection to the CPE is in place.

3) Connect the two-wire power cord to the NIA. The power cord uses an IEC320-C7 type connector (Figure 8-7 and Figure 8-8) Then insert the power cord connector from the NIA into the nearest wall outlet.
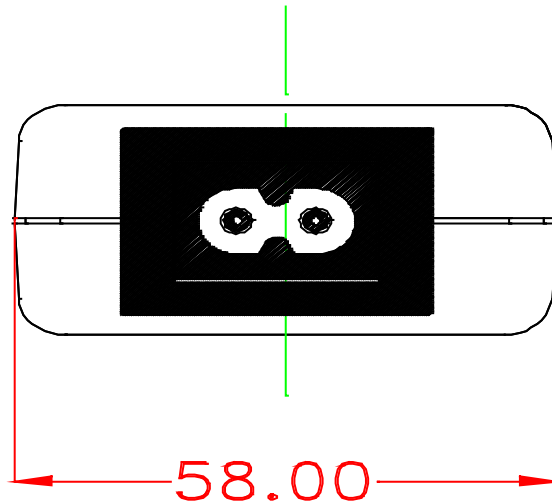

Figure 8-7 Connect the power cord

Figure 8-8 Diagram of NIA's IEC320-C7 type connector

Note: It is extremely important to connect the AC power to the NIA as the last step. Connecting AC power prematurely can damage the CPE and lead to faulty behavior.

4) The completed setup is shown in Figure 8-9. After verifying all connections to the NIA, connect the power cord to the wall and complete the process of setting up of the CPE.

To computer or
other network device*

From CPE*

To power source*

*Cables and power cord are not included with the NIA/Power Adapter

Figure 8-9 NIA setup is complete

9.0 Configuring the ABMAX Access Point Base Station

9.1 Configure the Access Point with an IP identity

Use the following steps to configure each Access Point:

Follow this procedure to configure the Access Point using the Access Point browser-based setup screens.

1) If the installer laptop is not running, power on and wait for the installer laptop to complete initialization to the desktop.

2) Set the PC IP address to be on the same network as the Access Point.

Note: Suggested to use config IP **10.1.1.2**, netmask **255.255.255.0**.

---

3) To run the Access Point setup operation, open an internet browser and type the following default address in the browser **Address** field:

10.1.1.254

4) When the connection login popup appears, type the following in the user name/password fields:

User Name: **admin**

Password: **admin**

5) When the **Access Point Status** screen appears, (Figure 9-1), click on **AP Setup** from the screen menu.
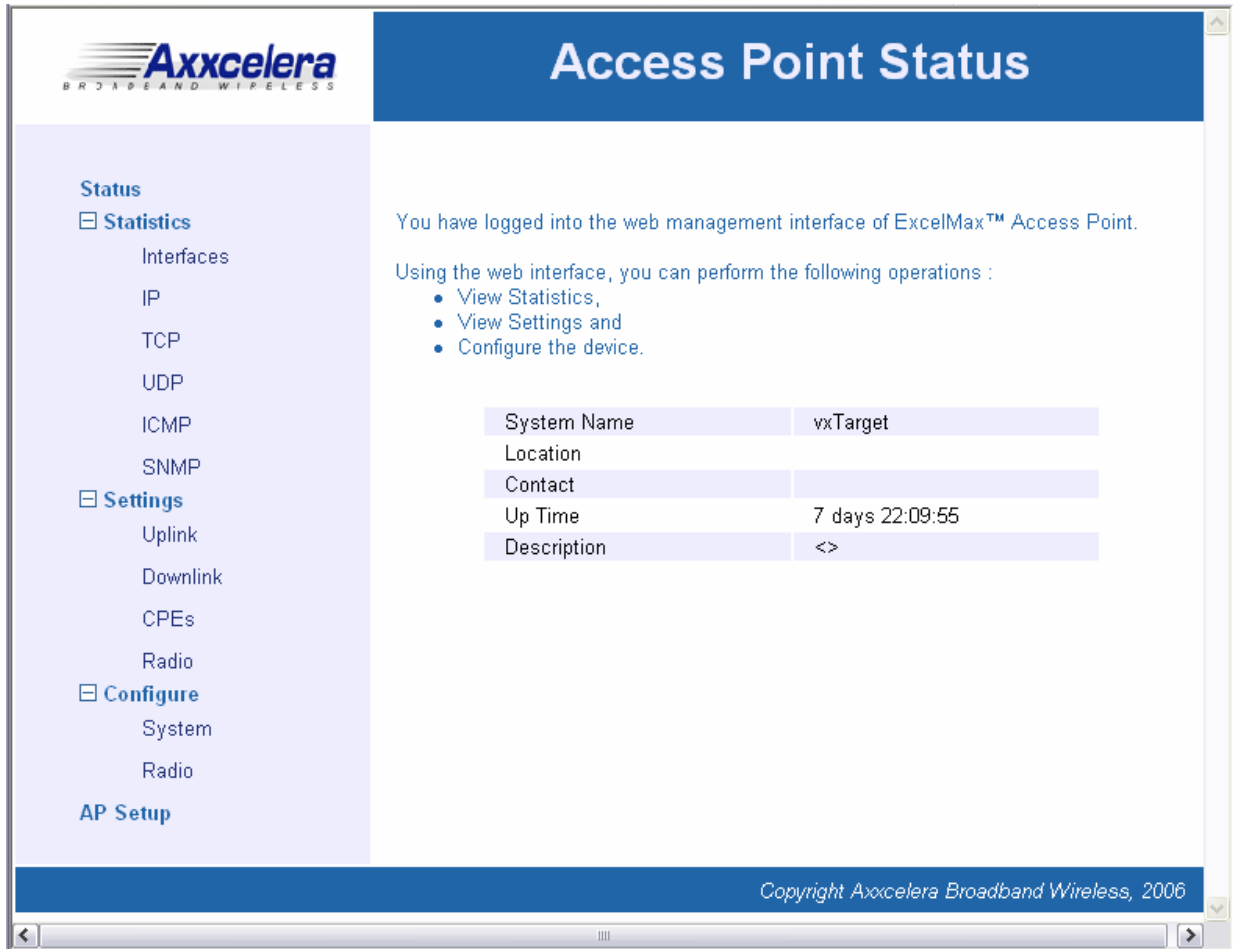

Figure 9-1 Access Point Status screen

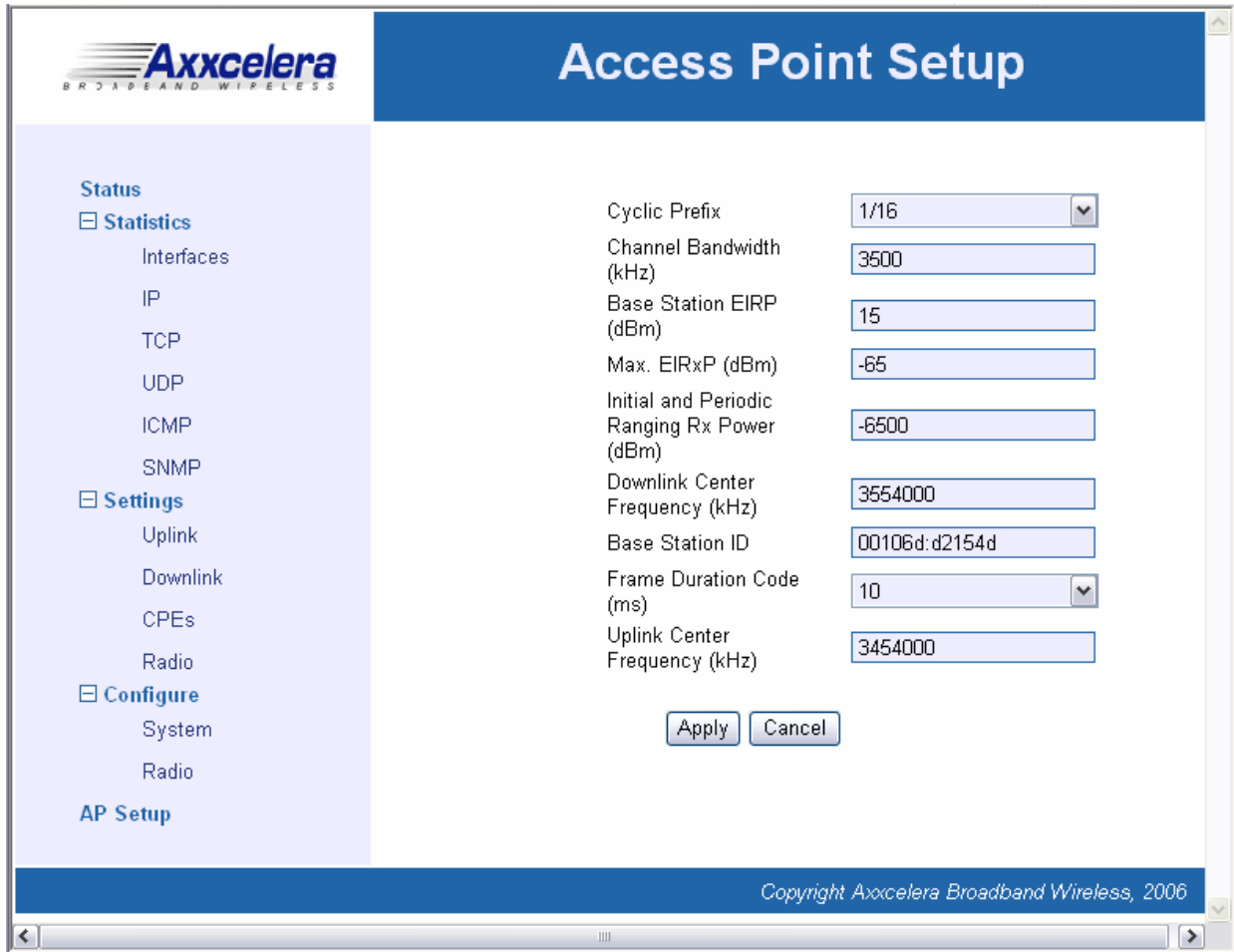**6)** When the **Access Point Setup** screen appears (Figure 9-2), enter the desired parameters.

Figure 9-2 Access Point Setup screen

7) Click **Apply** to complete the Access Point setup.

Appendix A: Glossary of Terms and Abbreviations

A.1 Terms and Definitions

Term	Definition
Access Point	An Access Point (AP) is a component of a Base Station (BS) that contains the antenna used to communicate with a Customer Premise Equipment (CPE).
Antenna	A device for transmitting and/or receiving radio waves.
Asynchronous	A data transmission method in which data may be sent at irregular intervals (without reference to clock signals).
Available Bit Rate (ABR)	Service that provides rate-based flow control and is aimed at data traffic such as file transfer and e-mail.
Azimuth	The angle along the horizon usually referenced to north.
Bandwidth	The data carrying capacity of a communications channel, measured in Hertz as the difference between the highest and lowest frequencies of the channel.
Base Station	The Base Station is the part of the AB-MAX System that sends signals to and receives signals from the Customer Premise Equipment (CPEs) to enable communication with the WAN.
Baud	A measure of data transmission speed. The baud rate denotes the number of symbols per second.
Bit Error Rate	The Bit Error Rate (BER) is the fraction of transmitted bits that are received in error.
Constant Bit Rate (CBR)	Service that operates on a connection basis and offers consistent delay predictability; used for applications such as circuit emulation, voice, and video.
DS1	A data transmission rate of 1.544 Mbps, also referred to as a T-1.
DS3	A data transmission rate of 45 Mbps
Element Management System	The Element Management System (EMS), located on a workstation at an appropriate point in the network, allows you to configure, control, and monitor all components of the AB-MAX System.
MIB	Management information base allows external management system access.
Multiplexer	A multiplexer is device or system capable of combining elementary streams into one aggregate transport stream.
Network	A network is an interconnection of computer systems, terminals, or data communications facilities.
OC3	A data transmission rate of 155 Mbps
Packet	A packet is a sequence of data, with associated control information, that is switched and transmitted as a whole.

Term	Definition
Packet Switching	Packet switching is the data transmission method that divides messages into standard-sized packets for greater efficiency of routing and transport through a network.
Parsing	Parsing is the process of analyzing a data stream and breaking it down into more easily processed components.
Point-to-Point	A single communication circuit connecting two locations.
Point-to-Multipoint	A communications circuit connecting one location to many locations.
Radio Frequency	Radio frequency (RF) is a portion of the electromagnetic spectrum in the frequency range of 100 kHz to 20 GHz.
Customer Premise Equipment	The Customer Premise Equipment (CPE) is the part of the AB-MAX System that is installed at the customer premises and provides communication with the Base Station (BS).
Synchronous	A data transmission method in which data transfer is at a fixed rate. The transmitter and receiver are both controlled by clock pulses.
TCP/IP	Transmission Control Protocol/Internet Protocol, a layered set of protocols that allows sharing of applications among PCs, hosts, or workstations in a high-speed communications environment. The suite of protocols is designed to allow communication between networks regardless of the technologies implemented in each network.
TDD	Time Division Duplex, the transmission method where a single channel is used to alternately carry data in each direction of a link.
Time-Division Multiplexing	A form of multiplexing used with digital signals. A device scans individual channels in rotation, takes bits from each channel, transmits the bits in a string (according to a predetermined sequence), and repeats the process.
Transmitter	A transmitter is an electronic device, consisting of oscillator, modulator, and other circuits, that produce a radio or television electromagnetic wave signal for radiation into the atmosphere by an antenna.
Unspecified Bit Rate	Service that operates on a connection basis and allows for raw cell or best effort transport by the network. In this service, cells are transported by the network whenever bandwidth is available and traffic is presented by the user. Data using UBR service is more apt to be discarded during peak traffic times in deference to data using other classes of service.
Uninterruptible Power Supply	An optional BS element used to provide power in the event of an AC power failure.

A.2 Acronyms/Abbreviations

The following is a list of acronyms and abbreviations associated with the AB-MAX System, some of which may appear in this guide.

Acronym	Definition
AFC	Automatic Frequency Control
AGC	Automatic Gain Control
AP	Access Point
ARP	Address Resolution Protocol
ARQ	Automatic Repeat Request
BER	Bit Error Rate
BS	Base Station
CBR	Constant Bit Rate
CNR	Carrier To Noise Ratio
CPE	Customer Premise Equipment
dB	Decibel
dBm	Decibel relative to 1mW
DES	Data Encryption Standard
DHCP	Dynamic Host Configuration Protocol
EIRP	Effective Isotropic Radiated Power
EMS	Element Management System
FCC	Federal Communications Commission
GHz	Gigahertz
GUI	Graphical User Interface
IP	Internet Protocol
Kbps	kilobits per second
LAN	Local Area Network
LOS	Line of Sight
MAC	Media Access Control
Mbps	Megabits per second
MIB	Management Information Base
NOC	Network Operations Center

Acronym	Definition
PTMP	Point to Multipoint
QOS	Quality of Service
RF	Radio Frequency
RSSI	Receiver Signal Strength Indication
SNMP	Simple Network Management Protocol
SNR	Signal to Noise Ratio
TCP/IP	Transmission Control Protocol/Internet Protocol
TDD	Time Division Duplex
TDMA	Time Division Multiple Access

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