W5networks™

AP Installation Guide

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W5 Networks, Inc., 48389 Fremont Boulevard, Fremont, California 94538, USA

Regulatory Information

FCC Class B Statement

This device complies with Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in commercial installation.

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

FCC RF Safety Requirement

The radiated output power is far below the FCC radio frequency exposure limits.

1. Shielded cabled, if any, must be used in order to comply with the emission limits.
2. Any change or modification not expressly approved by the grantee of the equipment authorized could void the user authority to operate the equipment.
3. This device must be fixed-mounted on indoor permanent structures with a separation distance of at least 100 cm from all persons.

FCC Warning

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 commercial 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 the 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

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Chapter 1
Pre-Installation Procedures

Introduction

The W5 Access Point contains Flash memory to store vxWorks boot parameters. These parameters control how the AP boots up and can be configured using the vxWorks bootloader configuration menu.

The W5 Access Point uses the network to boot itself, downloading both a HW FPGA bit file and a vxWorks FW image file over the network using the FTP protocol. As a result, booting up a W5 Access Point will require an existing FTP server to be set up, configured, and loaded with the appropriate HW FPGA bitfile and vxWorks FW image file.

Because you must have access to the unit's serial port for configuration, it is recommended that you complete the AP's configuration before mounting the unit to the wall.

After configuring your unit, or if no configuration changes are required, proceed to **AP Installation** on page 8.

Configuring the FTP Server

The setup and configuration of the FTP server is beyond the scope of this document. Once the FTP server has been configured and is running properly, make sure to load both the HW FPGA bit file and the vxWorks FW image file into the FTP server's home directory. Make a note of the filename used for the vxWorks FW image. This filename will need to be configured into the W5 Access Point bootloader. The HW FPGA bitfile must be named **ap_top_virtex5.bit**.

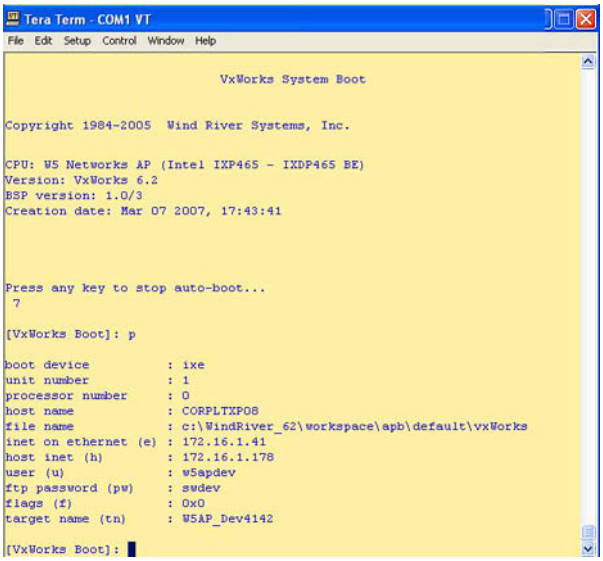
Configuring the W5 Access Point Bootloader

The W5 Access Point bootloader can be configured after entering the bootloader command line console. To do this, follow these steps:

1. Connect one end of a serial cable to the AP's serial port.
2. Connect the other end of the serial cable used above to the serial port of a computer.
3. On the computer, open a serial application program such as Teraterm or Window's HyperTerminal.
4. Configure the serial terminal with the following settings:
    a. Baud rate: 115200
    b. Data: 8 bit
    c. Parity: None
    d. Stop: 1 bit

e. Flow control: None

5. Keep the serial terminal window in view as you proceed to the next step.
6. Power up the AP.
7. When the AP begins to power up, text will be displayed on the terminal window. As soon as text begins to appear, press the **ENTER** button repeatedly until the following is displayed: **[VxWorks Boot]:**.
8. Type **p** to see the current configuration. The screen will display the following



Note: *The image above is for example purposes only. The parameter values of your unit may differ from those shown above.*

9. Type **c** to change the current configuration, field by field.
10. The fields of interest are listed below. For all other fields, press **ENTER** to skip:
    a. host name: <set to the host name of your FTP server>
    b. file name: <set to the vxWorks FW image file name on the FTP server>
    c. inet on Ethernet (e): <type **.** (period) to clear this field if using DHCP; otherwise, enter the IP address to be assigned to the AP. Make sure to include the subnet mask. Ex: 172.16.1.99:ffffff00. This uses an IP address of 172.16.1.99 and a subnet mask of 0xFFFFFF00, or 255.255.255.0>
    d. host inet (h): <set to the IP address of the FTP server. The subnet mask is not required here; the IP address alone is sufficient.>
    e. user (u): <set to the username needed to log into the FTP server>
    f. ftp password (pw): <set to the password associated with the FTP username entered above. Note: if password is left blank, RSH will be used by the Access Point to download both the VxWorks FW image and the HW FPGA bit file. >

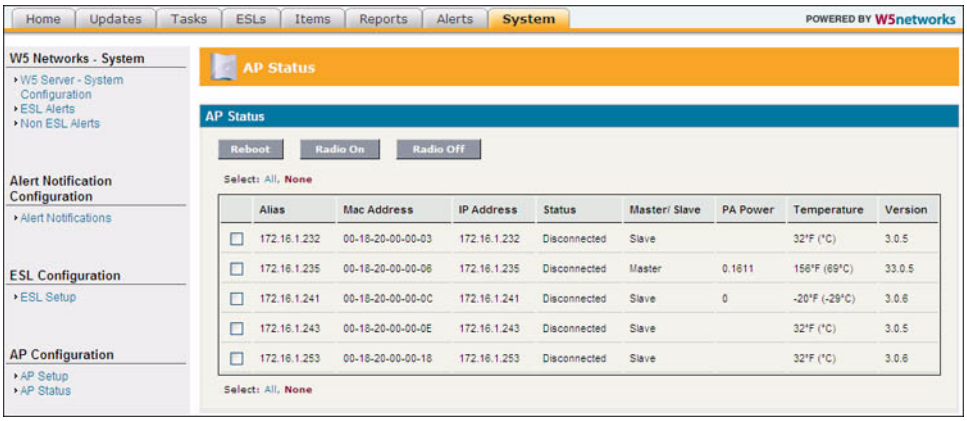
g. flags (f): <This field sets the Boot flag setting. For quick auto-boot (no countdown), set this flag to 0x08. To use DHCP to get the boot parameters, set this flag to 0x40. To use DHCP and quick auto-boot, set this flag to 0x48. For all available boot options, type **?** at the **[vxWorks Boot]:** prompt for more information.>

11. When the **[VxWorks Boot]:** prompt is displayed again, type **p** to verify your changes to the bootloader configuration file. If satisfied, type @ to reboot the AP. Otherwise, type **c** to reconfigure the settings.

Upgrading AP Software

To upgrade AP software:

1. Get the latest released AP VxWorks FW image file and, if necessary, the latest HW FPGA bit file from W5 Networks.
2. Replace the existing vxWorks FW image file with the new file. Replace the existing HW FPGA bit file with the new file, making sure the bit file is named ap_top_virtex5.bit. If you would like to save the old vxWorks FW image file and the HW FPGA bit file, rename them with different filenames.
3. Login to the *W5networks ESL Server* as an administrator.
4. Click on the **System** tab, then on the **AP Status** link in the navigation window (left column). The following screen will be displayed.



5. Place a check mark next to the APs you would like to upgrade, and click **Reboot**.
6. Once the APs have rebooted, view the Version column on the AP Status page to verify that the version number correct.

Chapter 2
AP Installation

Kit Contents

Before you begin installation, verify that you have received the following items.

Wall Mounting Plate	W5 Access Point

Note: *The W5 access point is a self-contained unit with fully integrated antennas and no user replaceable parts or components.*

Additional Items Required

1. PoE Power Midspan (IEEE 802.3at Pre-standard) with:
   a. 30 W output power from each port
   b. Power delivered through Data (1/2 and 3/6) or Spare pairs (4/5 and 7/8)
2. Access to Ethernet cables:
   a. CAT-5 or better
   b. Two Ethernet cables per AP with either:
      - Power and data on both cables, or;
      - Power and data on the port 1 cable and power only on the port 2 cable

See Figure 1 below for PoE midspan and Ethernet configuration options.

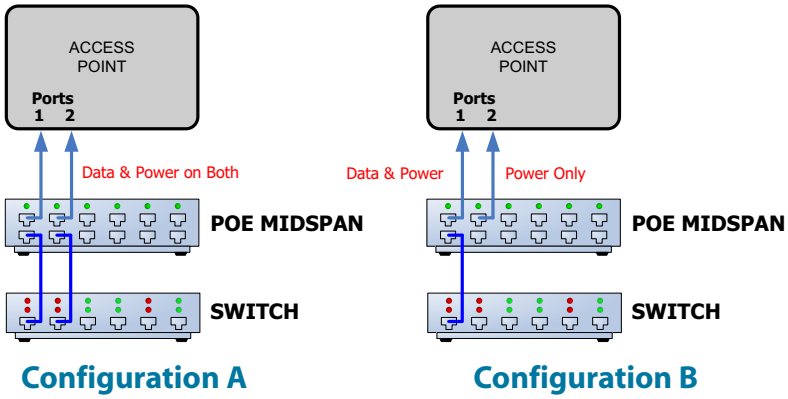


Figure 1. PoE Midspan Configuration Options

Hardware Installation

1. **Select Location.**
   a. Identify a wall that has a clear line of sight to the area of coverage.
   b. Run a pair of Ethernet cables from the PoE midspan to this location with enough slack to connect to the AP.
2. **Install the Mounting Plate on the Wall.**
   • Using appropriate screws or fasteners, install the mounting plate on the wall.

Figure 2. Mounting Plate Installation

3. **Install the AP to the Wall Mounting Plate.**
   a. Orient the AP with the connector side up, and find the keyhole slots on the back of the case.

Figure 3. Keyhole Locations

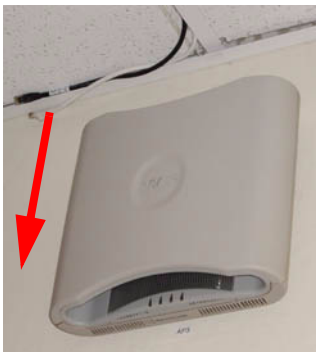
b. Align the top keyhole slot with the top shoulder bolt of the mounting plate, and then slide the top shoulder bolt through the hole **(Step 3c)**.

c. With the top shoulder bolt in place, align the bottom keyhole slot with the bottom shoulder bolt. Slide the bolt in when aligned.

d. With both shoulder bolts in place, gently slide the AP down to secure and lock the bolts in place **(Step 3d)**. Make sure the AP is properly seated.

Step 3b

Step 3c



Step 3d

Figure 4. AP Mounting

4. Connect the Ethernet Cables

Figure 1 on page 9 illustrates how to connect the Ethernet cables to the AP. In the following example, Configuration B is used. Two labeled views of the AP ports are displayed in Figure 5 below.

a. Connect the cable with **data and power** to Port 1.

b. Connect the cable with **power only** to Port 2.

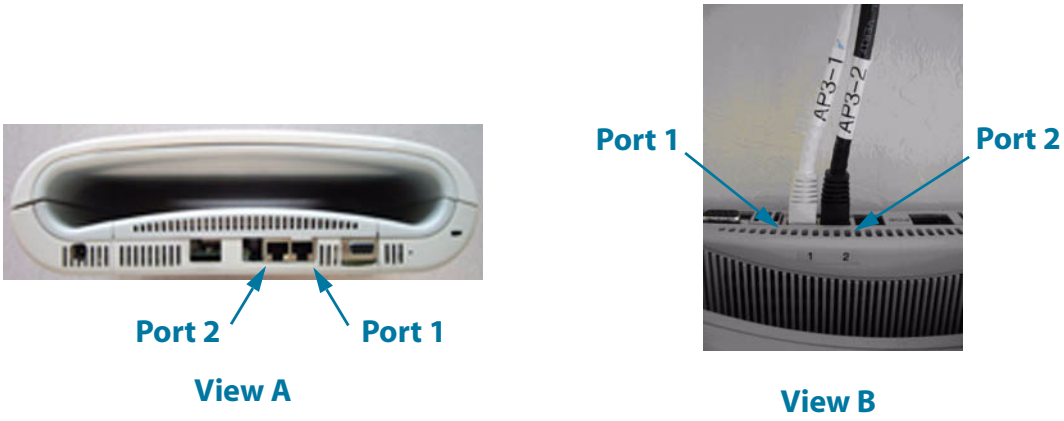


Figure 5. Ethernet Cable

c. Once these connections are made, two LEDs will turn green. The solid green LED indicate that power to the AP is active, while the flashing green LED indicates ethernet activity.