Introduction
The AP 7181 is a wireless broadband data system that uses mesh networking technology to support wide-area broadband data coverage. The system offers both 2.4 GHz 802.11b/g/n and 5.x GHz 802.11n Wi-Fi client access with 2.4 GHz 802.11 b/g/n and 5.x GHz 802.11a/n meshing. The dual-band system supports industry standard client devices and features easily deployed fixed infrastructure nodes.

The AP 7181 is also designed to meet the needs of large outdoor networks. The network can be configured and managed for optimal performance using the WiNG management UI.

Document Conventions
The following graphical alerts are used in this document to indicate notable situations.

<table>
<thead>
<tr>
<th>Alert</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Checkmark]</td>
<td><strong>NOTE</strong> Tips, hints, or special requirements that you should take note of.</td>
</tr>
<tr>
<td>![Exclamation]</td>
<td><strong>CAUTION</strong> Care is required. Disregarding a caution can result in data loss or equipment malfunction.</td>
</tr>
<tr>
<td>![Lightning Bolt]</td>
<td><strong>WARNING!</strong> Indicates a condition or procedure that could result in personal injury or equipment damage.</td>
</tr>
</tbody>
</table>

Package Contents
The AP 7181 ships with the following:

- AP 7181 Access Point (assembled with mounting yoke attached)
- Power cable
- Optional accessories (in a separate box inside the AP 7181 shipping container)
- AP 7181 Access Point Installation Guide (*this document*)
Hardware Installation

An AP 7181 Access Point installation includes mounting the Access Point, connecting the Access Point to the network, and applying power. Installation procedures vary for different environments.

Precautions

Before installing an AP 7181 Access Point, verify the following:

- Become familiar with grounding requirements
- The grounding cable for an AP 7181 must be a #8 gauge (10 mm) wire cross section and use a ring lug that will fit the M5 grounding screw on the bottom of the unit
- Verify the environment has a continuous temperature range between -40° C to 55° C

AP 7181 Access Points must be installed by trained professionals familiar with RF planning and regulatory limits defined by the regulatory bodies of the country where the devices are being deployed. All common precautions for grounding and Electrostatic Discharge (ESD) protection should be observed during deployment and installation. AP 7181 Access Points are designed to be installed outdoors and must be installed such that no harmful interference results from device operation.

CAUTION

All device wiring must comply with the National Electric code (NEC) or regulations and procedures defined by the regulatory bodies of the country or region where the devices are being deployed. All local building and structure codes must be observed.

WARNING!

Strictly observe the following safety precautions during the AP 7181 installation procedure.

- Installations must be performed by professionals who are properly trained and certified,
- Avoid contact with overhead power lines,
- Take precautions to avoid injury from falling tools and equipment. Crews should wear hard hats in and around the installation work site.
- Be aware of vehicular traffic in and around the installation work site.
- Do not hold any component containing a radio such that the antenna is very close to or touching any exposed parts of the body, especially the face or eyes, while transmitting.
- Do not operate a portable transmitter near unshielded blasting caps or in an environment where explosives are present unless the transmitter is especially certified for such use.
Deployment Guidelines

Observe the following recommended guidelines to help ensure a successful network deployment:

- Mounting height for network devices should not exceed 30 to 35 feet. Mounting height should vary to accommodate the topography of the deployment area, foliage, and other obstructions.
- Devices can be deployed using either the Bottom Mount Installation or the Top Mount Installation procedure.
- Point-to-Point (PTP (Slave)) or Point-to-Multipoint (PMP (SM)) nodes providing backhaul should be oriented to point away from AP 7181 antenna panels.
- Custom stand-off brackets should be used as required to provide adequate pole separation in an effort to minimize reflective received power.
- Line of Sight (LoS) guidelines should be given special consideration whenever devices are not installed in a straight line, such as deploying devices on alternating sides of a roadway.
- Ensure all root nodes are deployed with LoS to the wireless backhaul cluster points.

Installation Methodology

Consideration of the order in which units are installed when deploying an AP 7181 wireless network can ensure a more stable and functional network. The PTP backhaul layer should be deployed first. Next, deploy all nodes for the PMP Access Point distribution layer. Next, deploy root node nodes along with PMP Subscriber Modules (SMs) such that backhaul and network connectivity can be verified or corrected. Finally, deploy all Mesh Point wireless nodes in order of the least to most hops (1 hop nodes first, followed by 2 hop nodes, etc.).

Grounding Requirements

The grounding cable for an AP 7181 must be a #8 gauge (10 mm) wire cross section and use a ring lug that fits the M5 grounding screw on the bottom of the unit.

**CAUTION**

It is required all root and portal nodes be adequately grounded. In addition, all root nodes and portals using the Ethernet port or attached devices (e.g. a camera) must not only be grounded, but they should also include surge suppression for network reliability. This is particularly important for network configurations with a public safety component.
Ethernet and Lightning Protection

When installing an AP 7181 root node with a direct connection between the shielded CAT-5E Ethernet and the wired network, lightning protection should be used on all shielded CAT-5E Ethernet connections.

NOTE
Lightning damage is **not** covered under the conditions of a standard product warranty. When installed correctly, LPUs provide the best protection from the harmful effects of lightning. Observe all regional and national codes that apply to grounding for lightning protection.
**Grounding Hardware and Connections**

The grounding cable for an AP 7181 must be a #8 gauge (10 mm) wire cross section and use a ring lug that fits the M5 grounding screw on the bottom of the unit (see *Grounding Hardware and Connections*).

The grounding screw is shown below in green:

When connecting the grounding cable to the unit, tighten the grounding screw from 21.9 - 29.2 inch pounds (lbf-in).
Access points mounted on a metallic pole should be grounded as shown in the following figure:

**Figure 1: Grounding an AP 7181 Mounted on a Metallic Pole**

- **Blue Line:** Ethernet – Shielded CAT-5E must be used
- **Green Line:** Ground – Minimum 8 AWG Grounding Cable

**Legend:**
- **Bond from AP 7181 External Grounding Screw to Metallic Pole Using Appropriate Hardware**
- **Lightning Protection Unit**
Access points mounted on a nonmetallic pole should be grounded as shown in the following figure:

When grounding a unit installed on a non-metallic pole, a ground conductor and rod is required. This requirement should be factored into the project deployment costs, particularly if the equipment must be installed by a utility company.

When grounding a unit installed on a wooden pole, a ground conductor and rod is required. This requirement should be factored into the project deployment costs, particularly if the equipment must be installed by a utility company.
Minimum Installation Requirements

The minimum requirements for installing an AP 7181:

- AP 7181 Access Point
- Power cable (flying leads)
- Standard Ethernet cable
- Yoke (attached)
- 22 mm socket and driver to remove port caps
- #6 metric Allen wrench to remove the yoke

Access Point Placement

Typically, roadways in the deployment area become main arteries for the wireless mesh network. Roadways can provide LoS coverage over large distances between root nodes and non root APs.

Site Surveys

A site survey is recommended prior to installing an Access Point. A thorough site survey must include a visit to the customer site to identify the characteristics of the coverage area, including availability of electrical distribution for power sources and the location of existing network infrastructure. The site survey should also include preliminary WLAN measurements to identify candidate AP locations.

When scheduling a visit to conduct a site survey, request access to wiring closets, adjacent floors, and other locations that may require special permission.

Root Node Placement

When planning for root node placement:

- Identify Root node wireless backhaul technology (Point-to-Point (PTP), Point-to-Multipoint (PMP))
- Identify Ethernet or fiber optic backhaul
- Identify Root node locations
- Obtain all required permits and/or lease agreements
- Verify that power is available at each potential node deployment location
- Give careful consideration to the fact that Root nodes with a wireless backhaul usually backhaul traffic to a cluster point (i.e. PMP Canopy)
- Wireless backhaul clusters can be on towers, rooftops, etc.
- Ensure that all Root nodes are deployed with LoS to cluster points

When installing an AP 7181 root node that has its Shielded CAT-5E Ethernet directly connected to the wired network, lightning protection should be used on all Shielded CAT-5E Ethernet connections. An outdoor rated Lightning Protection Unit kit such as the HyperLink AL-CAT6HPJW Lightning Protector should be used.
**Non Root Node Placement**

The same guidelines as Root nodes apply to Non Root nodes with the exception of a backhaul requirement. The placement of Non Root nodes will depend heavily on the RF network design. Consider the guidelines for optimizing wireless network performance when identifying potential mounting sites.

In addition, consider the following when planning for Non Root node placement:

- **Light Poles, Utility Poles, or Traffic Poles**
  - Obtain all required supplemental agreements from local governments and utilities.
  - Obtain a generic mounting agreement that is not specify specific poles, since installation locations may need to be modified during deployment.
  - Plan for AC power usage of 84 watts average, 126 watts peak.
  - The AP 7181 is rated for wind loading of up to 160 miles per hour and 30 pounds per square foot.
  - Ensure that proper grounding can be established.
  - The grounding cable for an AP 7181 must be a #8 gauge (10 mm) wire cross section and use a ring lug that will fit the M5 grounding screw on the bottom of the unit.

- **Rooftops and Towers**
  - May require lease agreements.
  - Identify Access Point locations based on optimal communication with the Root nodes.
  - Non root node placement will be dependent on asset availability, terrain, etc.
  - Ensure that nodes are placed at the same height.
  - Build the network outward from each root node, from least to greatest number of hops.

As with Root node nodes, it should be noted it is incumbent upon the customer to obtain the required pole attachment agreements for devices to be installed on traffic / utility poles. Obtaining the agreements can be a lengthy process, so ample lead time must be allowed.

The potential pole locations should be logged with GPS to obtain accurate coordinates. Also log any identifying numbers on the pole so this information can be provided to the appropriate utility agency. Alternate mounting locations should also be identified in the event that your initial request is denied.

Specialized brackets may be required for attaching devices to decorative light poles and these brackets may have to be custom fabricated. In this case, allow enough lead time for ordering the proper equipment.

Also consider any requirements to coordinate requests with multiple utility agencies within the same community. Verify light pole selections have power available continuously and the power source is within the operational range of the device being connected.
**Mounting Locations**

To avoid distortion of the RF pattern, device locations should be chosen such that the AP 7181 ADvanced Element Panel Technology (ADEPT) antenna panels are at least 30 inches from any nearby metal poles and not co-located or operating in conjunction with any other antenna or transmitter. The antenna panels must also have a separation distance of at least 2 meters from anyone who may come into proximity of the AP 7181.

**Device Deployment Height**

AP 7181 nodes are typically mounted at a height of 30 to 35 feet. Ensure neighboring nodes are mounted at or near the same device height.

Excessive height should be avoided since this may result in increased congestion and interference in dense RF environments. This is especially true for the 2.4 GHz band.

Nodes deployed with too great a difference in height or too close to each other may not mesh properly.

Always consider these general guidelines for device deployment height:

- Maintain a typical deployment height of 30 to 35 feet
- For optimum performance, ensure that devices are oriented to have LoS to all neighboring devices
- Locate root nodes which support Wireless Backhaul so that they have LoS to Backhaul clusters or PTP locations, such as towers

**Antenna Options**

The AP 7181 features an integrated *ADvanced Element Panel Technology* (ADEPT) antenna system designed to take full advantage of the 802.11n radios. No other antennas are supported.

**Power Options**

Details of the power sourcing equipment for the AP 7181 should be handled by a professional installer. The requirements for deploying the system are:

- Over current protection device with a maximum rating of 20 Amps.
- AP 7181 AC Model - 100-240 VAC input capable of sourcing 180 watts.
- AP 7181 DC Model - Nominal 48 volt power source (41-58 VDC) capable of sourcing 150 watts and battery floating voltage should not exceed 60 VDC
**Power Cables**

Flying lead power cables are available based on the country of operation.

<table>
<thead>
<tr>
<th>Four Wire AC Right Angle Power Cable</th>
<th>Black (Line)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(North America and International)</td>
<td>White (Neutral)</td>
</tr>
<tr>
<td></td>
<td>Red (Unused)</td>
</tr>
<tr>
<td></td>
<td>Green/Yellow (Ground)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Three Wire AC Power Cable</th>
<th>Brown (Line)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(International)</td>
<td>Blue (Neutral)</td>
</tr>
<tr>
<td></td>
<td>Green/Yellow (Ground)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Two Wire DC Power Cable</th>
<th>Black (Negative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(North America and International)</td>
<td>Red (Positive)</td>
</tr>
</tbody>
</table>

**CAUTION**  Never plug a power cable wired to a power source for an AC unit into a DC unit.

If the units will be plugged directly into an electrical wall outlet, power plug adapters are available for North America, Europe, and Australia.

**CAUTION**  Do not use the connector on the power cables for interrupting current. Never actively plug or unplug the connector while the cable is energized.
**Mounting an AP 7181**

The AP 7181 Access Point is designed for outdoor installations. All hardware installations should be performed by a professional installer.

Devices can be deployed using either the *Bottom Mount Installation* or the *Top Mount Installation* procedure.

**Pole Mounted Installations**

The optional wall gooseneck can also be used with the pole adapter for pole mounting.

![Pole adapter and gooseneck](image)

The wall gooseneck dimensions are 10x12x6 inches and it weighs 4 pounds. The pole adapter dimensions are 4x2.62x7 inches and it weighs 3 pounds.

The gooseneck attaches to the yoke, which can be attached to the top or the bottom of the AP 7181. Secure the gooseneck and adapter to the pole with the threaded portion pointing either up or down using band clamps.

If using a bottom mount, drill a 1/2 inch diameter hole at the lowest point on the bend to allow water to drain from the gooseneck.

**Installing an AP 7181**

The following guidelines and procedures should be observed when installing an AP 7181 Access Point.

The following is a list of the minimal tool set required to install an AP 7181 device:

- 24 mm socket and driver - for cable gland
- 22 mm socket and driver - for GE1 and GE2 port caps
- 19 mm socket and driver - for console port cap
- 21 mm socket and driver - for set screw
- 8 mm socket and driver - for grounding screw
- 6 mm Allen wrench bit - for mounting bracket (yoke)
- T27 Torx bit - for the radome antenna panels and sun shields
- Torque screwdriver - for the radome antenna panels and sun shields
- Torque wrench
- Adjustable wrench
- Standard level
- Anti-seize lubricant

You may also need a Phillips screw driver and a 2.5 mm Allen wrench.

**AP 7181 Connections and Ports**

The power cable, grounding connections, power indicator light, Ethernet ports, and LED status panel on the bottom the AP 7181 are shown in the figure below:

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**NOTE** The grounding cable for an AP 7181 must be a #8 gauge (10 mm) wire cross section and use a ring lug that will fit the M5 grounding screw on the bottom of the unit.
The two pin DC power connector (phase-in) is shown below. All other connections, ports, and the LED status panel are the same.

The horizontal (HP) and vertical (VP) connectors for the antenna cables are located on the top of the AP 7181.

All radome antenna panel cables are labeled as HP or VP. Attach each cable to the corresponding connector when performing a remote panel installation or any other procedure which requires attaching antenna cables to the connectors.

**NOTE** The connectors on the AP 7181 are *Ingress Protection 67* (IP67) rated. No additional weatherproofing precautions are required.
There are six LEDs on the AP 7181 which can be viewed through the light pipes on the bottom of the unit. The LEDs have the following display characteristics and functionality:

<table>
<thead>
<tr>
<th>LED 1</th>
<th>LED 2</th>
<th>LED 3</th>
<th>LED 4 - 5 GHz</th>
<th>LED 5 - 2.4 GHz</th>
<th>LED 6</th>
</tr>
</thead>
</table>

*WARNING!* When disconnecting the antenna cables from the unit or removing an antenna panel and replacing it with a blank panel, terminators MUST be placed on the unused horizontal and vertical connectors on the top of the unit. The terminators on the AP 7181 are Ingress Protection 68 (IP68) rated. No additional weatherproofing precautions are required.
Removing the AP 7181 Kit from the Shipping Carton

**CAUTION**  Never lift an AP 7181 using the radome antenna panels or other plastic parts. Always lift the unit by the yoke or metal antenna rings.

**WARNING!**  An AP 7181 unit weighs 39 pounds. Use all appropriate cautions when lifting and consider a two man lift when necessary.

1. Open the shipping carton and remove the packaging material on the top of the Access Point.
2. Remove the accessories box from the shipping carton. In the accessories box, locate the following items:
   - Weatherproof Ethernet port adaptor (cable gland) (part number: HKLN4486A)
   - Waterproof Console Port Adapter (part number: HKLN4485A)
   - Power Cable (part number: 30009307001, 30009308001, or 30009315002)
   - Sun Shields with Captive Screws (part number: HKLN4446A)
   - Yoke (Mounting Bracket) (part number: HKLN4484A)
   - Set Screw for Yoke (part of the complete AP 7181 kit)

3. Open the plastic bag covering the unit.
4. Roll the plastic bag to the bottom of the shipping carton. Using the yoke or antenna ring, carefully remove the unit from the box. This method prevents damage to the antenna assembly.

**NOTE** Only one set screw is included with each AP 7181 kit. If a second set screw is required, purchase an M14x2.0, 20mm stainless steel Hexagonal screw.
Staging the AP 7181 Prior to Installation

**WARNING!** An AP 7181 Access Point weighs 39 pounds. Use all appropriate cautions when lifting and consider a two man lift when necessary.

1. Place the Access Point on a solid surface with the yoke facing up.

**CAUTION** Never lift an AP 7181 using the radome antenna panels or other plastic parts. Always lift the unit by the yoke or metal antenna rings.

2. Using the 6mm Allen wrench, loosen the Allen head bolts to remove the yoke.

3. To gain access to the Ethernet and or console ports you will need to remove the protective caps. A 22 mm socket is required to remove the Ethernet port caps covering Gigabit Ethernet ports GE1 and GE2. A 19 mm socket is required to remove the console port cap (if required).
4. Using the 22 mm socket, remove the port caps for Gigabit Ethernet GE1 and GE2.

5. Remove the cap on the cable gland as shown below.

6. Carefully hand tighten the gland into Gigabit port GE1. Once the gland is snug, use a 24 mm socket to finish tightening the gland.
If the node is configured as a **Mesh Point Root** node (Mesh Point Root nodes have a direct wired Ethernet connection to the core network or an Ethernet connection to a wireless backhaul), a cable gland is required for Gigabit Ethernet port GE1.

![Mesh Point Root](image)

If the **Mesh Point Root** node has an external device attached (e.g. surveillance camera), an additional cable gland is required for Gigabit Ethernet port GE2 (make sure the WAN port GE2 has been configured to permit an attached external device during the configuration process).

![Mesh Point Root](image)

**NOTE** The AP 7181 supports 802.af compliant *Power over Ethernet* (PoE) on Ethernet port GE1, and can provide power to an external PoE capable device such as a surveillance camera. PoE is auto sensing and is enabled when the AP 7181 senses a PoE capable device.
If the device being staged is a **Mesh Point** node (no wired connection to the core network) and no external device is going to be attached then no cable glands are required.

If the Mesh Point node is going to have an external device attached (e.g. surveillance camera), a cable gland is required for Gigabit Ethernet port GE1.
7. Repeat the process if a second cable gland is required.

8. Attach an Ethernet cable to Gigabit Ethernet port GE2 (used with an external laptop for configuring the unit). You also need to terminate the flying lead power cable with the proper plug (for the country of operation) so the unit can be powered for configuration. After preparing the power cable, attach the cable to the power port. Notice the power connector is keyed. Next configure the unit. Refer to *Basic Access Point Configuration* for initial configuration of the AP 7181 Access Point.
9. Once the Access Point is configured, if the GE2 port is used to attach an external device to the AP7181, reattach the port cap. If the GE2 port is used to attach and external device, attach the cable gland to the GE2 port.

10. Reattach the yoke.

11. Return the unit to the shipping carton for transport to the installation site. Due to the nature of the electronic components and antenna array, using the shipping carton is the most secure method for transport.
Field Installation

**CAUTION** Observe the following precautions to avoid damage to the unit during installation:

- Only trained and qualified personnel should install this equipment
- Only a licensed electrician should install power cable / energize circuits
- All device wiring must follow the *National Electric Code* (NEC) or wiring requirements in the country of installation. All location building and structure codes must be observed
- Ensure that the power source for the AP 7181 is de-energized prior to installation

**WARNING!** Observe the following safety precautions to avoid personal injury during installation:

- Avoid exposure to high voltage power sources
- Avoid contact with overhead power lines
- Avoid falling tools or equipment
- Be aware of vehicular traffic in the vicinity of the work area

**WARNING!** When disconnecting antenna cables from the unit or removing an antenna panel and replacing it with a blank panel, terminators MUST be placed on the unused connectors on the top of the unit. The terminators for the AP 7181 are *Ingress Protection 68* (IP68) rated. No additional weatherproofing precautions are required.

**Bottom Mount Installation**

The pole mount adapter (Part Number RLN6197A) will accommodate a banding strap up to 1¼ inch width. Banding straps and the banding tool are not included when ordering the pole mount adapter. The banding straps recommended for the pole mount adapter are 3/4 inch 201 Stainless Steel BAND-IT BAND (www.band-it-index.com) or better. Two bands are required for each mounting kit.
The pole mount adapter can be mounted to poles 3 inches to 15 inches in diameter and has a load rating of 75 lbs.

1. Attach the pole mount adapter (or other mounting bracket hardware) to the mounting asset and ensure that the mounting bracket is level.

2. Secure the gooseneck to the pole mount adapter using the 4 hex head bolts (3/8”x16”x1”) included with pole mount adapter (Part Number RLN6197A).

3. Grasp the yoke and carefully remove the unit from the shipping carton.

4. Place the unit on a solid surface with the yoke facing up.

5. Remove the yoke and the Allen socket head screws from the bottom of the Access Point.

NOTE: If using a bottom mount, drill a 1/2 inch diameter hole at the lowest point on the bend to allow water to drain from the gooseneck.

NOTE: It is recommended to apply a small tube of anti-seize lubricant to the threads of the gooseneck to prevent corrosion and seizing. This will facilitate the mounting process and assure easier disassembly if the unit needs to be serviced.
6. Attach the yoke to the gooseneck by rotating the device counter clockwise for a minimum of four turns.

7. Ensure the yoke and the mounting bracket are level.

8. Loosely attach the Allen socket head screws to the unit. Leave the screws loose enough to attach the yoke.

**WARNING!** Carefully align the yoke with the mounting bracket to avoid cross threading.
9. Carefully lift the unit into position. Align the key slots for the yoke with the Allen socket head screws and slide the yoke to the final position.

10. Torque the Allen socket head screws to between 108.7 and 145.0 Inch Pounds (lbf-in).

WARNING! An AP 7181 Access Point weighs 39 pounds. Use all appropriate cautions when lifting and consider a two man lift when necessary.

CAUTION Ensure the Allen socket hex screws are tight and in the locked position before releasing the full weight of the Access Point.
11. The set screw can now be inserted to increase stability. Tighten the set screw from 214.2 - 250.0 inch pounds (lbf-in).

![Set Screw]

**NOTE** Only one set screw is included with each AP 7181 kit. If a second set screw is required, purchase an M14x2.0, 20mm stainless steel Hexagonal screw.

12. If the AP 7181 is a Mesh Point Root node or a Mesh Point node with an external device (e.g. surveillance camera), perform the required Ethernet cabling.

   The Ethernet cable gland is optimized for cables of diameter 0.39 - 0.55 inches. Smaller diameter cables can achieve a watertight seal if the cable gland is properly tightened during installation. It is recommended that an outdoor UV rated shielded cable is used in AP 7181 deployments. Examples are:

   - Superior Essex 04-001-55
   - Best-Tronics BT-0562

   In most cases, Ethernet cable is custom cut to length. After preparing the Ethernet cable and attaching shielded RJ-45 end connectors, feed the cable through the cable gland cap and rubber insert as shown below.

![Ethernet Cable through Gland]

13. Insert the data cable through cable gland (i.e. the cable gland on Gigabit Ethernet port GE1).
   a. Connect the RJ45 Ethernet cable to the Ethernet port.
   b. Hand tighten the cap for the cable gland.
c. Using an adjustable wrench, tighten the cable grip until it fits snugly around the Ethernet cable.

d. Repeat the process for additional Ethernet connections if required.

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**CAUTION** Observe the following precautions to avoid damage to the unit during installation:

- Only trained and qualified personnel should install this equipment
- Only a licensed electrician should install power cable / energize circuits
- All device wiring must follow the *National Electric Code* (NEC) or wiring requirements in the country of installation. All location building and structure codes must be observed
- Ensure the power source for the AP 7181 is de-energized prior to installation

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**WARNING!** Observe the following safety precautions to avoid personal injury during installation:

- Avoid exposure to high voltage power sources
- Avoid contact with overhead power lines
- Avoid falling tools or equipment
• Be aware of vehicular traffic in the vicinity of the work area

The power cable included with the AP 7181 is a flying lead cable. Most installations require the installer to install an additional power cable.

The AP 7181 flying lead power cables are 12 feet long. The installer should splice the power cable to the AP 7181 flying lead cable in accordance to the NEC or wiring requirements in the country of operation. Only outdoor rated power cable should be used.

⚠️ **CAUTION** AC versions of the AP 7181 require an input voltage of 100-240 VAC. DC versions require an input voltage of 41-58 VDC.

14. Once the power cable has been prepared, connect the power cable to the unit.

15. The grounding cable for an AP 7181 must be a #8 gauge (10 mm) wire cross section and use a ring lug that fits the M5 grounding screw on the bottom of the unit.
The grounding screw is shown below in green. When connecting the grounding cable to the unit, tighten the grounding screw from 21.9 - 29.2 inch pounds (lbf-in).

16. Secure and conceal the cables using UV resistant tie wraps. Tie wraps should be used to secure the cables along the gooseneck.

17. If desired, attach the sun shields to the top/bottom using the captive screws. If attaching the sun shields to the bottom of the unit, first remove the knock out discs in the center to fit the sun shields around the yoke. Tighten the captive screws to from 39.9 - 53.1 inch pounds (lbf-in).

18. Once the physical installation is complete, the circuit powering the AP 7181 can be energized. Verify the green power LED is illuminated and the unit is powered on.
Top Mount Installation

1. Grasp the yoke and carefully remove the unit from the shipping carton.
2. Place the unit on a solid surface with the yoke facing up.
3. Remove the yoke and the Allen socket head screws from the bottom of the unit.

The pole mount adapter (Part Number RLN6197A) will accommodate a banding strap up to 1¼ inch width. Banding straps and the banding tool are not included when ordering the pole mount adapter.

The pole mount adapter can be mounted to poles from 3 inches to 15 inches in diameter and has a load rating of 75 lbs.

4. Attach the pole mount adapter (or other mounting bracket hardware) to the mounting asset and ensure the mounting bracket is level.
5. Secure the gooseneck to the pole mount adapter using the 4 hex head bolts (3/8"x16"x1") included with pole mount adapter (Part Number RLN6197A).

NOTE Apply a small tube of anti-seize lubricant to the threads of the gooseneck to prevent corrosion and seizing. This will facilitate the mounting process and assure easier disassembly if the unit needs to be serviced.

6. Attach the yoke to the gooseneck by rotating the device counter clockwise for a minimum of four turns.

WARNING! Carefully align the yoke with the mounting bracket to avoid cross threading.
7. Ensure the yoke and the mounting bracket are level.
8. Loosely attach the Allen socket head screws to the top of the unit. Leave the screws loose enough to attach the yoke.

**WARNING!** An AP 7181 unit weighs 39 pounds. Use all appropriate cautions when lifting and consider a two man lift when necessary.

9. Carefully lift the unit into position. Align the key slots for the yoke with the Allen socket head screws and slide the yoke to the final position.

**CAUTION** Ensure that the Allen socket hex screws are tight and in the locked position before releasing the full weight of the unit.

10. Torque the Allen socket head screws from 108.7 - 145.0 inch pounds (lbf-in).
11. The set screw can now be inserted to increase stability. Using a 21mm socket with torque wrench, tighten the set screw from 214.2 - 250.0 inch pounds (lbf-in).

![Set Screw](image1.jpg)

**NOTE** Only one set screw is included with each AP 7181 kit. If a second set screw is required, purchase an M14x2.0, 20mm stainless steel hexagonal screw.

12. If the AP 7181 you are mounting is a Mesh Point Root node or a Mesh Point node with an external device (e.g. surveillance camera), perform the required Ethernet cabling.

The Ethernet cable gland is optimized for cables of diameter .39 - .55 inches. Smaller diameter cables can achieve a watertight seal if the cable gland is properly tightened during installation. It is recommended that an outdoor UV rated, shielded cable is used in AP 7181 deployments. Some examples are:

- Superior Essex 04-001-55
- Best-Tronics BT-0562

In most cases, Ethernet cable is custom cut to length. After preparing the Ethernet cable and attaching shielded RJ-45 end connectors feed the cable through the cable gland cap and rubber insert as shown below.

![Ethernet Cable](image2.jpg)
13. Insert the data cable through cable gland (i.e. the cable gland on Gigabit Ethernet port GE1).
   a. Connect the RJ45 Ethernet cable to the Ethernet port.
   b. Hand tighten the cap for the cable gland.
   c. Using an adjustable wrench, tighten the cable grip until it fits snugly around the Ethernet cable.
   d. Repeat the process for additional Ethernet connections if required.

**CAUTION** Observe the following precautions to avoid damage to the unit during installation:

- Only trained and qualified personnel should install this equipment
- Only a licensed electrician should install power cable / energize circuits
- All device wiring must follow the *National Electric Code* (NEC) or wiring requirements in the country of installation. All location building and structure codes must be observed
- Ensure that the power source for the AP 7181 is de-energized prior to installation

**WARNING!** Observe the following safety precautions to avoid personal injury during installation:

- Avoid exposure to high voltage power sources
- Avoid contact with overhead power lines
• Avoid falling tools or equipment
• Be aware of vehicular traffic in the vicinity of the work area

The power cable included with the AP 7181 is a flying lead cable. Most installations will require the installer to install an additional power cable.

The AP 7181 flying lead power cables are 12 feet long. The installer should splice the power cable to the AP 7181 flying lead cable in accordance to the National Electric Code (NEC) or wiring requirements in the country of operation. Only an outdoor rated power cable should be used.

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**CAUTION**  AC versions of the AP 7181 require an input voltage of 100-240 VAC. DC versions require an input voltage of 41-58 VDC.

14. Connect the power cable to the unit once the power cable has been prepared.
15. The grounding cable for an AP 7181 must be a #8 gauge (10 mm) wire cross section and use a ring lug that fits the M5 grounding screw on the bottom of the unit. The grounding screw is shown below in green. When connecting the grounding cable to the unit, tighten the grounding screw from 21.9 - 29.2 inch pounds (lbf-in).

16. Secure and conceal the cables using UV resistant tie wraps. Tie wraps should also be used to secure the cables along the gooseneck.

17. If desired, attach the sun shields to the top / bottom using the captive screws. If attaching the sun shields to the bottom of the unit, first remove the knock out discs in the center to fit the sun shields around the yoke. Tighten the captive screws from 39.9 - 53.1 inch pounds (lbf-in).

Once the physical installation is complete, the circuit powering the AP 7181 can be energized. Verify the green power LED is illuminated and the unit is powered on.
Remote Panel Antenna Installation

When choosing an optimal deployment location, it may be necessary to mount a device so one of the antenna panels may be obstructed. For example, traffic light poles can completely obscure one of the panels in the AP 7181 antenna array. The remote panel antenna kit can be used to address this use case.

In addition to the standard hardware, the following items are also required for installing a remote panel antenna:

- Antenna extension cables (6 or 10 feet)
- ADEPT panel remote mounting bracket
- Terminators for the horizontal (HP) and vertical (VP) antenna connections on the top of the unit.

**NOTE**

The terminators for the AP 7181 are *Ingress Protection 68 (IP68)* rated. No additional weatherproofing precautions are required.

**NOTE**

In addition to the required tools, you will need a cordless drill and a 3.6 mm bit to drill the hole for the set screw on the ADEPT panel remote mounting bracket.
When the remote panel antenna installation is used, a blank antenna panel should be attached to cover the side of the device facing the obstruction. Using a blank antenna panel protects the interior of the AP 7181.

Blank antenna panels can also be used when a device is installed directly against a wall or the side of a building. See *Installing the Blank Antenna Panel*.

**WARNING!** Terminators MUST be placed on the unused horizontal and vertical connectors on the top of the unit when disconnecting the antenna cables from the unit or removing an antenna panel and replacing it with a blank panel. The terminators on the AP 7181 are *Ingress Protection 68* (IP68) rated. No additional weatherproofing precautions are required.
Preparing the AP 7181 for Remote Panel Antenna Installation

To prepare the AP 7181 for installation using the remote panel antenna:

1. Remove the screws for one of the four radome antenna panels.

2. Grasp the lower part (barrel) of the antenna cable connector and carefully detach the antenna cables from the connectors on the device. Remove the radome antenna panel.
3. Attach the extension cable for the remote antenna panel to the Access Point.

4. Carefully route the extension cable inside the antenna rings on the Access Point.
5. Using the four screws provided, attach a blank antenna panel to the unit to cover the side of the Access Point where the functional antenna panel was removed. Adjust the panel to the desired position. Tighten the screws to 60 inch pounds (lbf-in).

6. Return the unit to the shipping carton for transportation to the installation site.

7. Collect the radome panel removed from the unit, all other hardware, and tools required for the installation.
Installing the Remote Panel Antenna

To complete the installation of the remote panel antenna at the site:

1. At the installation site, install the AP 7181 using the appropriate Field Installation procedure.

   **WARNING! DO NOT** apply power to the unit until the remote panel installation procedure is complete.

2. Assemble the ADEPT panel remote mounting bracket using the instruction sheet supplied with the hardware.
3. Test fit the mounting bracket at the installation site, positioning the bracket so that when the remote panel antenna is attached, it will be oriented to support LOS communication with other devices.
4. Tighten the nuts on the mounting bracket so that the support arm remains in the desired position.
5. Use a cordless drill and a 3.6 mm bit, drill a hole for the set screw on the mounting bracket.
6. Insert and tighten the M4.8 set screw for the mounting bracket.
7. Using the supplied clamps, attach the remote mount antenna panel to the mounting bracket.

8. Complete the installation of the mounting bracket using the appropriate method for the installation requirements.

9. Attach the extension cable from the AP 7181 to the connectors on the remote mount antenna panel.

10. Secure the cables to the mounting bracket using UV resistant tie wraps.

11. After the remote panel installation is complete, apply power to the AP 7181. Verify the green power LED is illuminated and the unit is powered on.

**CAUTION** To comply with wind loading requirements, when adjusting the remote mount antenna panel on the mounting bracket, ensure that the mounting bracket does not extend past the top of the antenna panel.

**NOTE** The connectors on the AP 7181 are Ingress Protection 67 (IP67) rated. No additional weatherproofing precautions are required.

**NOTE** Both 6 foot and 10 foot extension cables are available. The extension cables can be configured in a daisy chain if additional length is required.
Installing the Blank Antenna Panel

In addition to remote panel antenna installations, blank antenna panels can also be used if the unit is going to be placed directly against a wall or building. The radome antenna should be removed and the blank panel should be attached to the side of the unit that will be facing an obstruction.

**WARNING!** Terminators MUST be placed on the unused horizontal and vertical connectors on the top of the unit when disconnecting the antenna cables from the unit or removing an antenna panel and replacing it with a blank panel. The terminators on the AP 7181 are Ingress Protection 68 (IP68) rated. No additional weatherproofing precautions are required.
To install a blank antenna panel:

1. Remove the screws for one of the four radome antenna panels.

2. Grasp the lower part (barrel) of the antenna cable connector and carefully detach the antenna cables from the connectors on the Access Point. Remove the radome antenna panel.
3. Attach the terminators to the antenna cable connectors.

**NOTE** The terminators for the AP 7181 are *Ingress Protection 68* (IP68) rated. No additional weatherproofing precautions are required.

4. Using the four screws provided, attach a blank antenna panel to the unit to cover the side of the device where the functional antenna panel was removed. Adjust the panel to the desired position. Tighten the screws to 60 inch pounds (lbf-in).
Basic Access Point Configuration

Once the Access Point is installed and powered on, complete the following steps to get the device up and running and access management functions:

1. Attach an Ethernet cable from the Access Point to a controller with an 802.3af compatible power source or use the PWR6-14000-148R power supply to supply power to the AP 7181 (once fully cabled).

   If your host system is a DHCP server, an IP address is automatically assigned to the AP 7181 and can be used for device connection. However, if a DHCP server is not available, you’ll need to derive the IP address from the AP MAC address. Using this method, the last two bytes of the MAC address become the last two octets of the IP address. For example:

   MAC address - 00:C0:23:00:F0:0A
   Zero-Config IP address - 169.254.240.10

   To derive the Access Point’s IP address using its MAC address:

   a. Open the Windows calculator be selecting Start > All Programs > Accessories > Calculator. This menu path may vary slightly depending on your version of Windows.
   b. With the Calculator displayed, select View > Scientific. Select the Hex radio button.
   c. Enter a hex byte of the Access Point’s MAC address. For example, F0.
   d. Select the Dec radio button. The calculator converts F0 into 240. Repeat this process for the last Access Point MAC address octet.

2. Point the Web browser to the Access Point’s IP address. The following login screen displays.
3. Enter the default username admin in the Username field.
4. Enter the default password admin123 in the Password field.
5. Click the Login button to load the management interface.

**NOTE** When logging in for the first time, you’re prompted to change the password to enhance device security in subsequent logins.

**NOTE** If you get disconnected when running the wizard, you can connect again with the Access Point’s actual IP address (once obtained) and resume the wizard.

6. If this is the first time the management interface has been accessed, the Initial Setup Wizard automatically displays.

**Function Highlight**

- Access Point Types: Virtual Controller AP, Standalone AP, or Dependent AP
- Networking Mode: Bridge or Router Operation
- LAN Configuration
- Radio Configuration
- VLAN Configuration
- Wireless LAN Setup
- Location, Country Code, Time Zone, Date and Time
- Summary and Save/Commit

**Choose One Type to Setup the Access Point**

- Typical Setup (Recommended)
  - The wizard uses as many default parameters as possible to simplify the configuration process.

- Advanced Setup
  - With this selection, you may configure the access point’s LAN, WAN, Radio Mapping, Radius Server, VLAN, etc.
The Introduction screen displays the various actions that can be performed using the wizard under the Function Highlight field.

Use the Choose One type to Setup the Access Point field options to select the type of wizard to run. The Typical Setup is the recommended wizard. This wizard uses the default parameters for most of the configuration parameters and sets up a working network with the least amount of manual configuration.

The Advanced Setup wizard is for administrators who prefer more control over the different configuration parameters. A few more configuration screens are available for customization when the Advanced Setup wizard is used.

The first page of the Initial Setup Wizard displays the Navigation Panel and Function Highlights for the configuration activities comprising the Access Point’s initial setup. This page also displays options to select the typical or advanced mode for the wizard.

The Navigation Panel for the Typical Setup Wizard displays the basic configuration options.

A green checkmark to the left of an item in the Navigation Panel defines the task as having its minimum required configuration set correctly. A red X defines a task as still requiring at least one parameter be defined correctly.
7. Select **Save/Commit** within each page to save the updates made to that page's configuration. Select **Next** to proceed to the next page listed in the Navigation Panel without saving your updates.

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**NOTE** While you can navigate to any page in the navigation panel, you cannot complete the Initial AP Setup Wizard until each task in the Navigation Panel has a green checkmark.

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For the purposes of this guide, use the **Typical Setup (Recommended)** option to simplify the process of getting the Access Point up and running quickly with a minimum number of changes to the Access Point's default configuration.

For information on using the Access Point's Advanced Setup option, refer to the *WiNG Access Point System Reference Guide* to familiarize yourself with the feature set supported by the WiNG operating system. The guide is available at [www.zebra.com/support](http://www.zebra.com/support).

To configure the Access Point using the Typical Setup Wizard:

8. Select **Typical Setup** from the **Choose One type to Setup the Access Point** field on the Initial Setup Wizard.

9. The Typical Setup Wizard displays the **Access Point Settings** screen to define the Access Point's Standalone versus Virtual Controller AP functionality. This screen also enables selection of the country of operation for the Access Point.

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### Access Point Type Selection

- **Virtual Controller AP** - When more than one access point is deployed, a single access point can function as a Virtual Controller AP and manage Dependent mode access points. The Virtual Controller AP can adopt and configure other like APs in a 24-cell deployment.

- **Standalone AP** - Select this option to deploy this access point as an autonomous “fat” access point. A standalone AP isn’t managed by a Virtual Controller AP, or adopted by a controller.

---

- **Country**  
  - Choose a Country Code
10. Select an **Access Point Type** from the following options:

- **Virtual Controller AP** - When more than one Access Point is deployed, a single Access Point can function as a Virtual Controller AP. Up to 24 Access Points can be connected to, and managed by, a single Virtual Controller AP of the same Access Point model. These connected Access Points must be the same model as the Virtual Controller AP.

- **Standalone AP** - Select this option to deploy this Access Point as an autonomous fat Access Point. A Standalone AP isn’t managed by a Virtual Controller AP, or adopted by a controller.

**NOTE** If wanting to adopt the Access Point to a controller or service platform, use the controller or service platform’s resident UI to connect to the Access Point, provision its configuration and administrate the Access Point’s configuration.

**NOTE** If designating the Access Point as a Standalone AP, it’s recommends the Access Point’s UI be used exclusively to define its device configuration, and not the CLI. The CLI provides the ability to define more than one profile and the UI does not. Consequently, the two interfaces cannot be used collectively to manage profiles without an administrator encountering problems.

11. Select the **Country Code** of the country where the Access Point is deployed. Selecting a proper country is a critical task while configuring the Access Point, as it defines the correct channels of operation and ensures compliance to the regulations of the selected country. This field is only available for the Typical Setup Wizard.

12. Select **Next** to set the Access Point’s network mode.
13. The Typical Setup Wizard displays the **Network Topology** screen to define how the Access Point handles network traffic.

"Network Topology"

- **Router Mode** - the access point routes traffic between the wireless network and the Internet or corporate network (WAN).

![Network Topology Diagram](image)

- **Bridge Mode** - In Bridge Mode, the access point depends on an external router for routing LAN and WAN traffic. Routing is generally used on one device, whereas bridging is typically used in a larger density network. Select Bridge Mode when deploying this access point with numerous peer APs supporting clients on both the 2.4 and 5GHz radio bands.

![Bridge Mode Diagram](image)

14. Select an Access Point Mode from the available options.

- **Router Mode** - In Router Mode, the Access Point routes traffic between the local network (LAN) and the Internet or external network (WAN). Router mode is recommended in a deployment supported by just a single Access Point.

- **Bridge Mode** - In Bridge Mode, the Access Point depends on an external router for routing LAN and WAN traffic. Routing is generally used on one device, whereas bridging is typically used in a larger density network. Select Bridge Mode when deploying this Access Point with numerous peer Access Points supporting clients on both the 2.4GHz and 5GHz radio bands.

**NOTE** When Bridge Mode is selected, WAN configuration cannot be performed and the Typical Setup Wizard does not display the WAN configuration screen.
15. Select **Next**. The Typical Setup Wizard displays the **LAN Configuration** screen to set the Access Point’s LAN interface configuration.

**LAN Configuration**

Please configure interface settings for LAN (Y/LAN 1) which will be used by wireless clients

- **Use DHCP**
  - Select the checkbox to enable an automatic network address configuration using the Access Point’s DHCP server.

- **Static IP Address/Subnet**
  - Enter an IP Address and a subnet for the Access Point’s LAN interface. If **Use DHCP** is selected, this field is not available. When selecting this option, define the following **DHCP Server** and **Domain Name Server (DNS)** resources, as those fields will become enabled on the bottom portion of the screen.
    - **Use on-board DHCP server to assign IP addresses to wireless clients**
    - **Range**
      - Enter a starting and ending IP Address range for client assignments on the LAN interface. Avoid assigning IP addresses from x.x.x.1 - x.x.x.10 and x.x.x.255, as they are often reserved for standard network services. This is a required parameter.
    - **Default Gateway**
      - Define a default gateway address for use with the default gateway. This is a required parameter.

16. Set the following DHCP and Static IP Address/Subnet information for the LAN interface:

- **Use DHCP** - Select the checkbox to enable an automatic network address configuration using the Access Point’s DHCP server.

- **Static IP Address/Subnet** - Enter an IP Address and a subnet for the Access Point’s LAN interface. If **Use DHCP** is selected, this field is not available. When selecting this option, define the following **DHCP Server and Domain Name Server (DNS)** resources, as those fields will become enabled on the bottom portion of the screen.

- **Use on-board DHCP server to assign IP addresses to wireless clients** - Select the checkbox to enable the Access Point’s DHCP server to provide IP and DNS information to clients on the LAN interface.

- **Range** - Enter a starting and ending IP Address range for client assignments on the LAN interface. Avoid assigning IP addresses from x.x.x.1 - x.x.x.10 and x.x.x.255, as they are often reserved for standard network services. This is a required parameter.

- **Default Gateway** - Define a default gateway address for use with the default gateway. This is a required parameter.
• **DNS Forwarding** - Select this option to allow a DNS server to translate domain names into IP addresses. If this option is not selected, a primary and secondary DNS resource must be specified. DNS forwarding is useful when a request for a domain name is made but the DNS server, responsible for converting the name into its corresponding IP address, cannot locate the matching IP address.

• **Primary DNS** - Enter an IP Address for the main Domain Name Server providing DNS services for the Access Point’s LAN interface.

• **Secondary DNS** - Enter an IP Address for the backup Domain Name Server providing DNS services for the Access Point’s LAN interface.

17. Select **Next**. The Typical Setup Wizard displays the **Wireless LAN Setup** screen to set the Access Point's Wireless LAN interface configuration.

```
WLAN 1 Configuration

SSID  WA_01
WLAN Type  No Authentication and No Encryption

18. Set the following WLAN1 Configuration parameters

• **SSID** - Configure the SSID for the WLAN.

• **WLAN Type** - Configure the encryption and authentication to use with this WLAN.
  
  • **No Authentication and No Encryption** - Configures a network without any authentication. This option also configures the network without encryption. This means that any data transmitted through the network is in plain text. Any device between end points can see the information transmitted. This is the least secure of all network configurations.

  • **Captive Portal Authentication and No Encryption** - Configures a network that uses a RADIUS server to authenticate users before allowing them on to the network. Once on the network, no encryption is used for the data being transmitted through the network. Select this option to use a Web page (either internally or externally hosted) to authenticate users before access is granted to the network.

  • **PSK authentication, WPA2 encryption** - Configures a network that uses PSK authentication and WPA2 encryption. Select this option to implement a pre-shared key that must be correctly shared between the Access Point and requesting clients using this WLAN.
19. Select **Next**. The Typical Setup Wizard displays the **RADIUS Server Configuration** screen if required. Otherwise, the **Typical Setup Wizard** displays the **Summary and Commit** screen.

20. Use the **Radius Server Configuration** screen to configure the users for the onboard RADIUS server. Use the screen to add, modify and remove RADIUS users.

Some WLANs require authentication using the on-board RADIUS server. User accounts must be added for all users that should be authorized by the server.

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21. Select **Add User** to display the dialog to enter user information to add to the RADIUS server user database.

![Add User dialog](image)

22. Enter the following user information:
   - **Username** - Provide a user name used to authenticate the user.
   - **Password** - Provide a password used to authenticate the user.
   - **Confirm Password** - Confirm the password by entering the same password as entered in the Password field.
   - **Description** - Provide a description to identify the user created in the RADIUS server database.

23. To create the entry in the RADIUS server database and add another user, select **Create**. To create the entry in the RADIUS server database and close the Add User dialog, select **Create & Close**.

24. Select **Modify User** on the RADIUS Server Configuration screen to modify information for an existing user from the RADIUS database. Highlight the user entry then select **Modify User**.

### NOTE

The **Username** cannot be modified with this dialog.

25. Select **Delete User** on the RADIUS Server Configuration screen to remove information for an existing user from the RADIUS database. Highlight the user entry and select **Delete User**.

26. Select **Confirm** on the dialog displayed. The entry for the user is removed from the RADIUS database.

27. To dismiss the dialog without adding, modifying or removing entries in the RADIUS server database, select **Cancel**.
28. Select **Next**. The Typical Setup Wizard displays the **Summary and Commit** screen to summarize the screens (pages) and settings updated using the Typical Setup Wizard.

### Access Point Type Page

- **Access Point Type**: Standalone AP

### Networking Mode Page

- **Networking Mode**: Router Mode

### LAN Configuration Page

- **LAN Configuration Type**: Static IP Address/Subnet
- **VLAN ID for the LAN Interface**: 1
- **Static IP Address/Subnet**: 192.168.13.23/24

### vWAN Configuration Page

- **vWAN Configuration Type**: Use DHCP
- **Port to External**: GE1 Port

### WLANS Configuration

No user intervention or additional settings are required. It's an additional means of validating the Access Point's updated configuration before it's deployed. However, if a screen displays settings not intended as part of the initial configuration, then any screen can be selected again from within the Navigation Panel and its settings modified accordingly.

29. If the configuration displays as intended, select **Save/Commit** to implement these settings to the Access Point's configuration. If additional changes are warranted based on the summary, either select the target page from the **Navigational Panel**, or use the **Back** and **Next** buttons to scroll to the target screen.
Regulatory Information

This guide applies to the following model number: AP 7181

Zebra devices are designed to be compliant with rules and regulations in locations they are sold and will be labeled as required.

Local language translations are available at the following Website: www.zebra.com/support

Any changes or modifications to Zebra equipment, not expressly approved by Zebra could void the user’s authority to operate the equipment.

Zebra devices are professionally installed, the Radio Frequency Output Power will not exceed the maximum allowable limit for the country of operation.

Health and Safety Recommendations

The Federal Communications Commission (FCC) with its action in ET Docket 96-8 has adopted a safety standard for human exposure to radio frequency (RF) electromagnetic energy emitted by FCC certified equipment. Zebra Technologies products meet the uncontrolled environmental limits found in OET-65 and ANSI C95.1, 1991. Proper operation of this radio will result in user exposure that is substantially below the FCC recommended limits.

Warnings for the Use of Wireless Devices

Please observe all warning notices with regard to the usage of wireless devices.

Potentially Hazardous Atmospheres

You are reminded of the need to observe restrictions on the use of radio devices in fuel depots, chemical plants etc. and areas where the air contains chemicals or particles (such as grain, dust, or metal powders).

Reducing RF Exposure—Use Properly

Only operate the device in accordance with the instructions supplied.

Power Supply

Use only the approved power supply output rated at 84 watts average, 126 watts peak. Use of alternative power supply will invalidate any approval given to this device and may be dangerous.

FCC Regulatory Information

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.

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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
- Do not touch or move the antenna(s) while the unit is transmitting or receiving.
- Do not hold any component containing a radio such that the antenna is very close to or touching any exposed parts of the body, especially the face or eyes, while transmitting.
- Do not operate a portable transmitter near unshielded blasting caps or in an explosive environment unless it is a type especially qualified for such use.
- Do not operate the radio or attempt to transmit data unless the antenna is connected; otherwise, the radio may be damaged.

**RF Exposure**

This equipment complies with the FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The antennas used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be located or operating in conjunction with any other antenna or transmitter.

To comply with FCC RF exposure compliance requirements, a separation distance of at least 33.9cm must be maintained between the user and antenna.

**Intentional and Unintentional Radiators**

Changes or modifications not expressly approved could void the user’s authority to operate the equipment.

**Canada Requirements**

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme ICES-003 du Canada.

For AC powered units use only the approved internal power supply rated at 48V output. Typical power is 84 watts average and 126 watts peak. Use of alternative power supply will invalidate any approval given to this device and may be dangerous.

**Statement of Compliance**

Zebra hereby declares that this device is in compliance with all the applicable Directives, 2004/108/EC, 2006/95/EC. A Declaration of Conformity may be obtained from www.zebra.com/doc.
This is a Class B product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.
**Waste Electrical and Electronic WEEE**

**English:** For EU Customers: All products at the end of their life must be returned to Zebra for recycling. For information on how to return product, please go to: [www.zebra.com/weee](http://www.zebra.com/weee).

**Français:** Clients de l'Union Européenne: Tous les produits en fin de cycle de vie doivent être retournés à Zebra pour recyclage. Pour de plus amples informations sur le retour de produits, consultez : [www.zebra.com/weee](http://www.zebra.com/weee).

**Español:** Para clientes en la Unión Europea: todos los productos deberán entregarse a Zebra al final de su ciclo de vida para que sean reciclados. Si desea más información sobre cómo devolver un producto, visite: [www.zebra.com/weee](http://www.zebra.com/weee).

**Български:** За клиенти от ЕС: След края на полезния им живот всички продукти трябва да се връщат на Zebra за рециклиране. За информация относно връщането на продукти, моля отидете на адрес: [www.zebra.com/weee](http://www.zebra.com/weee).


**Italiano:** per i clienti dell'UE: tutti i prodotti che sono giunti al termine del rispettivo ciclo di vita devono essere restituiti a Zebra al fine di consentire il riciclaggio. Per informazioni sulle modalità di restituzione, visitare il seguente sito Web: [www.zebra.com/weee](http://www.zebra.com/weee).

**Português:** Para clientes da UE: todos os produtos no fim de vida devem ser devolvidos à Zebra para reciclagem. Para obter informações sobre como devolver o produto, visite: [www.zebra.com/weee](http://www.zebra.com/weee).

**Nederlands:** Voor klanten in de EU: alle producten dienen aan het einde van hun levensduur naar Zebra te worden teruggestuurd voor recycling. Raadpleeg [www.zebra.com/weee](http://www.zebra.com/weee) voor meer informatie over het terugzenden van producten.

**Polski:** Klientom z obszaru Unii Europejskiej: Produkty wycofane z eksploatacji należą do firmy Zebra w celu ich utylizacji. Informacje na temat zwrotu produktów znajdzie się na stronie internetowej [www.zebra.com/weee](http://www.zebra.com/weee).

**Čeština:** Pro zákazníky z EU: Všechny produkty jsou nutné po skončení jejich životnosti vrátit společnosti Zebra k recyklaci. Informace o způsobu vrácení produktu najdete na webové stránce: [www.zebra.com/weee](http://www.zebra.com/weee).

**Eesti:** EL klientidele: kõik tooted tuleb nende eluea lõppes tagastada taaskasutamise eesmärgil Zebra’ile. Lisainfot saate toote tagastamise kohta külalische palun aadressil: [www.zebra.com/weee](http://www.zebra.com/weee).

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EEE Yönetmeliğine Uygundur
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Customer Support Web Sites

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Manuals

www.zebra.com/support
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