The Aruba IAP-277 is an environmentally hardened, outdoor rated, dual-radio IEEE 802.11ac wireless access point. This access point use MIMO (Multiple-in, Multiple-out) technology and other high-throughput mode techniques to deliver high-performance, 802.11ac 2.4 GHz and 5 GHz functionality while simultaneously supporting existing 802.11a/b/g/n wireless services.

**IAP-277 Operations**

- Wireless transceiver
- Wireless access point (IEEE 802.11 a/b/g/n/ac)
- Wireless air monitor (IEEE 802.11 a/b/g/n/ac)
- Protocol-independent networking functionality
- Compatibility with IEEE 802.3at PoE

**Guide Overview**

- “IAP-277 Hardware Overview” on page 3 provides a detailed hardware overview of the IAP-277.
- “Before You Begin” on page 5 provides key questions to ask and items to consider when deploying an outdoor wireless network.
- “Installing the AP” on page 7 describes the multi-step process for a successful installation and deployment of the IAP-277.
- “Safety and Regulatory Compliance” on page 16 provides an overview of safety and regulatory compliance information.

**Package Contents**

- IAP-277 Access Point
- Cable Glands x2
- USB Console Cable
- Copper Lug x1
- M4 x 6 Screw x1
- Aruba Instant Quick Start Guide
- Installation Guide (this document)

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**NOTE**

The weatherproof caps for Ethernet, Console, and power interfaces are connected to the AP, not loose in the package.

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**NOTE**

Mounting kits for use with the AP-270 Series access points are sold separately. Contact your Aruba sales representative for details.
Inform your supplier if there are any incorrect, missing, or damaged parts. If possible, retain the carton, including the original packing materials. Use these materials to repack and return the unit to the supplier if needed.
IAP-277 Hardware Overview

Figure 1 IAP-277 Front View

Figure 2 IAP-277 Rear View

LED
The IAP-277 is equipped with one LED that indicates the system status of the AP.

Table 1 IAP-277 LED Meanings during Boot Up

<table>
<thead>
<tr>
<th>LED</th>
<th>Color/State</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>System LED</td>
<td>Off</td>
<td>No power to AP</td>
</tr>
<tr>
<td></td>
<td>Red</td>
<td>Initial power-up</td>
</tr>
<tr>
<td></td>
<td>Green - Flashing</td>
<td>AP booting</td>
</tr>
<tr>
<td></td>
<td>Green - Steady</td>
<td>AP ready and 1000Mbps Ethernet link established. The LED turns off after 1200 seconds</td>
</tr>
<tr>
<td></td>
<td>Green - Yellow, 6 seconds period</td>
<td>AP ready and 10/100Mbps Ethernet link established. The LED turns off after 1200 seconds</td>
</tr>
</tbody>
</table>
Table 2  *IAP-277 LED Meanings during Operation*

<table>
<thead>
<tr>
<th>LED</th>
<th>Color/State</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>System LED</td>
<td>Solid Red</td>
<td>General fault</td>
</tr>
<tr>
<td></td>
<td>One blink off every 3 seconds</td>
<td>Radio 0 fault (5 GHz)</td>
</tr>
<tr>
<td></td>
<td>Two quick blink off 0.5 seconds</td>
<td>Radio 1 fault (2.4GHz)</td>
</tr>
</tbody>
</table>

**USB Console Port**

The USB Micro-B console port allows you to connect the AP to a terminal or a laptop for direct local management. Use the included USB console cable to connect the AP. You can download the necessary driver for USB-UART adapter from support.arubanetworks.com under the **Tools & Resources** tab.

Use the following setting to access the terminal:

**Table 3  Console Settings**

<table>
<thead>
<tr>
<th>Baud Rate</th>
<th>Data Bits</th>
<th>Parity</th>
<th>Stop Bits</th>
<th>Flow Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>9600</td>
<td>8</td>
<td>None</td>
<td>1</td>
<td>None</td>
</tr>
</tbody>
</table>

**Ethernet Ports**

IAP-277 is equipped with two 10/100/1000Base-T (RJ-45) Gigabit Ethernet ports (WAN and LAN port) for wired network connectivity. The WAN port supports 802.3at Power over Ethernet (PoE), accepting 48 VDC (nominal) as a standard defined Powered Device (PD) from a Power Sourcing Equipment (PSE) such as a PoE midspan injector.

These ports have RJ-45 female connectors with the pin-outs shown in **Figure 3**.

**Figure 3  Gigabit Ethernet Port Pin-Out**

![Gigabit Ethernet Port Pin-Out](image)

**Reset Button**

The reset button can be used to return the AP to factory default settings. To reset the AP:

1. Power off the AP.
2. Press and hold the reset button using a small, narrow object, such as a paperclip.
3. Power-on the AP without releasing the reset button. The system LED will flash within 5 seconds.
4. Release the reset button.

The system LED will flash again within 15 seconds indicating that the reset is completed. The AP will now continue to boot with the factory default settings.
AC Power Interface
The IAP-277 is capable of AC power in the range of 100 - 240 VAC. The power cord or power connector kit is sold separately.

Grounding Point
Always remember to protect the AP by installing grounding lines. The ground connection must be complete before connecting power to the AP enclosure.

Figure 4  IAP-277 Top View

Figure 5  IAP-277 Bottom View

Before You Begin
This device must be professionally installed and serviced by a trained Aruba Certified Mobility Professional (ACMP) or similar Aruba-certified technician. Aruba access points are classified as radio transmission devices, and are subject to government regulations of the host country. The network administrator(s) is/are responsible for ensuring that configuration and operation of this equipment is in compliance with their country's regulations. For complete list of approved channels in your country, refer to the Aruba Domain Regulatory Table at arubanetworks.com.
Outdoor Planning and Deployment Considerations

Prior to deploying an outdoor wireless network, the environment must be evaluated to plan for a successful Aruba WLAN deployment. Successfully evaluating the environment enables the proper selection of Aruba routers and antennas and assists in the determination of their placement for optimal RF coverage. This process is considered WLAN or RF planning and Aruba's system engineers can assist in the outdoor planning process.

For **WLAN systems being installed outdoors in the USA**, the following requirements must be met.

1. Systems must be **professionally installed** by a qualified engineer familiar with WLAN, including Aruba trained partners and resellers.
2. Operation in the 5600-5650-MHz band is prohibited.
3. When within 35 km distance of a TDWR, the center frequency of the WLAN must be separated from the TDWR center frequency by 30 MHz.
   a. If the radar is operating from 5600-5610 MHz, disable the use of channel 116 (5580 MHz).
   b. If the radar is operating from 5630-5650 MHz, disable the use of channel 132 (5660 MHz).

For TWDR locations in the US please refer to [www.wispa.org/tdwr-locations-and-frequencies](http://www.wispa.org/tdwr-locations-and-frequencies).
Identifying Specific Installation Locations

You can mount the IAP-277 access point on a wall or pole. Use the AP placement map generated by Aruba’s RF Plan software application to determine the proper installation location(s). Each location should be as close as possible to the center of the intended coverage area and should be free from obstructions or obvious sources of interference. These RF absorbers/reflectors/interference sources will impact RF propagation and should have been accounted for during the planning phase and adjusted for in RF plan.

Identifying Known RF Absorbers/Reflectors/Interference Sources

Identifying known RF absorbers, reflectors, and interference sources while in the field during the installation phase is critical. Make sure that these sources are taken into consideration when you attach an AP to its fixed location. Examples of sources that degrade RF performance include:

- Cement and brick
- Objects that contain water
- Metal
- Microwave ovens
- Wireless phones and headsets

Installing the AP

Service to all Aruba products should be performed by trained service personnel only.

Using the AP-270-MNT-H1 Mounting Kit

The IAP-277 access point can be installed on a wall or attached to a pole by using AP-270-MNT-H1 mounting kit.

The IAP-277 access point does not ship with any mounting kit. The AP-270-MNT-H1 mounting kit is available as accessories and must be ordered separately.

For details on AP-270-MNT-H1, please refer to the AP-270-MNT-H1 Installation Guide.

Mounting the IAP-277 Access Point to a Wall

1. Use the mounting template provided in the AP-270-MNT-H1 mounting kit package to mark the four mounting points on the wall.
2. Use a drill to create four holes on the four markings you created in the previous step.
3. Insert an anchor bolt into each drilled hole. Anchor bolts are not included in the mounting kit package.
4. Place the mounting bracket over the anchor bolts and press the bracket against the wall.
5. Place the washers and nut onto the bolt's threaded end and tighten the nut until the mounting bracket is firmly attached to the wall as shown in Figure 6.
6. Use the M10x30 screw (with washer) and M10 nut included in the package to attach the mounting holder to the mounting bracket as shown in Figure 7.

**Figure 6  Attaching the Mounting Bracket to a wall**

**Figure 7  Attaching the Mounting Holder to the Mounting Bracket**

7. Slide the holder of the AP into the opening of the mounting holder and use two M6x20 screws included in the package to fix the AP to the mounting holder as shown in Figure 8.
The inclination of the AP (mounted to the mounting holder) can be adjusted up to +/-45 degrees by inserting the M6x20 screw (included in the package) into the different holes on the mounting holder.

8. Use the cable tie to fasten the cables on the bracket.

**Mounting the AP to a Pole**

1. Begin by attaching the mounting bracket to the pole as shown in Figure 10.
   a. Pass a hose clamp through the two slots on the mounting bracket, attach the mounting bracket to the pole and tighten the clamp using a screw driver to twist its screw head.
   b. Use another hose clamp through the other two slots on the mounting bracket and tighten the clamp.

The hose clamps provided with the AP have an optimal pole diameter range of 4” to 6” (100 to 150mm). Outside of that, longer or shorter clamps may be required.
2. Use the M10x30 screw (with washer) and M10 nut included in the package to attach the mounting holder to the mounting bracket as shown in Figure 11.

3. Slide the holder of the AP into the opening of the mounting holder and use two M6x20 screws included in the package to fix the AP to the mounting holder as shown in Figure 12.
The inclination of the AP (mounted to the mounting holder) can be adjusted up to +/-45 degrees by inserting the M6x20 screw (included in the package) into the different holes on the mounting holder.

4. Use the cable tie to fasten the cables on the bracket.

**Grounding the AP**

The grounding must be completed before powering up the AP. The grounding wire should be #8 AWG.

1. Peel the cover of one end of the grounding wire and place the bare grounding wire into the included copper lug, and press firmly with the crimping pliers.

2. Fasten the copper lug to the grounding hole on the AP with the included M4 x6 screw as shown in Figure 14.
Connecting the Ethernet Cable

To connect the Ethernet cable to the AP, perform the following steps using the cable glands that ships with your AP.

1. Slide the sealing nut over the cable (without the RJ45 connector attached to the end).
2. Slide the clamping ring over the cable.
3. Using a crimping tool, attach the shielded RJ45 connector to the end of the cable.
4. Remove the weatherproof cap on the Ethernet port.
5. Insert the RJ45 connector to the Ethernet port.
6. Screw the clamping ring onto the Ethernet port.
7. Screw the sealing nut onto the clamping ring.

**WARNING**

Failure to use the included Ethernet cable glands can lead to connectivity and POE issues.

The cable is not included and must be purchased separately. Purchase a suitable UV-resistant, outdoor rated, CAT 5E or better RJ45 cable for use with the AP.

**NOTE**

The seals inside the clamping ring by factory default is applicable for cables with 5-8.5 mm diameter. In the cable gland kit, another seals is provided for use with the cables with 7-10 mm diameter.
Connecting the Power Cable

Installation and service of Aruba products should be performed by Professional Installers in a manner that is consistent with the electrical code in force in the jurisdiction of deployment. In many countries this will require a licensed electrician to perform this operation. In Japan, this is a Certified Electrician by Ministry of Economy, Trade, and Industry.

The IAP-277 access point does not ship with any power cables. These are available as accessories and should be ordered separately.

The IAP-277 access point offers two ways to connect the unit to AC power. Two power cord variants are offered and a connector kit that allows the customer to assemble their own cable if the standard offering does not meet deployment needs.

The applicable SKUs for these options are:

**Table 4** SKUs for Powering Options

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC-OD-AC-P-NA</td>
<td>Weatherproof AC power cable(5m), North America version</td>
</tr>
<tr>
<td>PC-OD-AC-P-INT</td>
<td>Weatherproof AC power cable(5m), International (EU) version</td>
</tr>
<tr>
<td>CKIT-OD-AC-P</td>
<td>Weatherproof connector kit for AC power interface</td>
</tr>
</tbody>
</table>

The difference between the NA and INTL part variants is the color coding of the conductors.

- The North American cable uses Black (Hot), White (Neutral), and Green (Ground).
- The INTL part follows the international schema of Brown (Hot), Blue (Neutral) and Yellow/Green (Ground)

Please only use included or Aruba specified cables, power cords, AC power supplies and batteries. The power cord should not be used with other electric equipment than what is specified by Aruba

**Best Practice for Outdoor Connection to AC Mains**

In all circumstances and with any outdoor infrastructure the recommended practice is to connect to AC mains in an order grade weather protected junction box. This needs to be implemented by a qualified resource in a manner that is consistent with the electrical code in force in the jurisdiction of deployment. In many countries this will require a licensed electrician to perform this operation.

In Japan, this would is a Certified Electrician by Ministry of Economy, Trade and Industry.

The use of plugs with infrastructure equipment is suitable only for temporary installs where nuisance tripping of GFI plugs is considered tolerable. Should it be desired to attach a plug to the cable assemblies then the installer is expected to follow all directions provided with the plug end in a fashion consistent with local electrical code.
Use of the CKIT-OD-AC-P

Assembly instructions for this part are shipped with the part. All instructions must be followed to ensure proper assembly of the connector onto the cable.

The required specifications for third party cable used with the CKIT solution are as follows:

- AC power cable specifications (when using AC connector kit and custom cable): minimum voltage/current rating 250V/1A, diameter 6-12mm, rated for outdoor use and UV exposure.

AC Power Cable Connector PIN OUT

**Figure 16** AC power cable connector

Connecting the Power Cable to the AP

1. Remove the weatherproof cap on the power interface.
2. Insert the power cable connector into the power interface and hand-fasten the locknut.

Verifying Post-Installation Connectivity

The integrated LEDs on the AP can be used to verify that the AP is receiving power and initializing successfully (see Table 1 and Table 2). Refer to the *ArubaOS Quick Start Guide* for further details on verifying post-installation network connectivity.
Product Specifications

Mechanical:
- Device Dimensions (HxWxD): 10.6 inches x 9 inches x 9.4 inches (27cm x 23cm x 24cm)
- Weight: 4.4 lbs/2.0 kg

Electrical
- Ethernet
  - 2 x 10/100/1000Base-T auto-sensing Ethernet RJ-45 Interfaces
  - MDI/MDX
  - Power over Ethernet (IEEE 802.3at compliant), 48VDC/0.6A
- Power
  - 100-240 VAC 50/60 Hz from external AC power source
  - POE support on WAN port: 802.3at-compliant POE sourcing devices

Environmental
- Operating
  - Temperature: -40°C to 65°C (-40°F to 150°F)
  - Humidity: 5% to 95% non-condensing
- Storage
  - Temperature: -40°C to 70°C (-40°F to 158°F)

For additional specifications on this product, please refer to the data sheet. The data sheet can be found at www.arubanetworks.com.
Safety and Regulatory Compliance

Aruba Networks provides a multi-language document that contains country-specific restrictions and additional safety and regulatory information for all Aruba access points. This document can be viewed or downloaded from the following location: www.arubanetworks.com/safety_addendum

Regulatory Model Name
The regulatory model name of IAP-277 is APEX0102.

FCC
This device is electronically labeled. To view the FCC ID:
1. Log into the controller WebUI

Aruba access points must be installed by a professional installer. The professional installer is responsible for ensuring that grounding is available and it meets applicable local and national electrical codes.

CAUTION

RF Radiation Exposure Statement: This equipment complies with FCC RF radiation exposure limits. This equipment should be installed and operated with a minimum distance of 9.84 inches (25 cm) between the radiator and your body for 2.4 GHz and 5 GHz operations. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

CAUTION

RF Radiation Exposure Statement: When operated in the 5.15 to 5.25 GHz frequency range, this device is restricted to indoor use to reduce the potential for harmful interference with co-channel Mobile Satellite Systems.

CAUTION

FCC Class B Part 15
This device complies with Part 15 of the Federal Communications Commission (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.

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

CAUTION

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. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instructions, may cause interference harmful to radio communications.

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

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

**EU Regulatory Conformance**


**Proper Disposal of Aruba Equipment**

For the most current information about Global Environmental Compliance and Aruba products, see our website at www.arubanetworks.com.

**Waste of Electrical and Electronic Equipment**

Aruba products at end of life are subject to separate collection and treatment in the EU Member States, Norway, and Switzerland and therefore are marked with the symbol shown at the left (crossed-out wheelie bin). The treatment applied at end of life of these products in these countries shall comply with the applicable national laws of countries implementing Directive 2002/96EC on Waste of Electrical and Electronic Equipment (WEEE).

**European Union RoHS**

Aruba products also comply with the EU Restriction of Hazardous Substances Directive 2011/65/EC (RoHS). EU RoHS restricts the use of specific hazardous materials in the manufacture of electrical and electronic equipment. Specifically, restricted materials under the RoHS Directive are Lead (including Solder used in printed circuit assemblies), Cadmium, Mercury, Hexavalent Chromium, and Bromine. Some Aruba products are subject to the exemptions listed in RoHS Directive Annex 7 (Lead in solder used in printed circuit assemblies). Products and packaging will be marked with the “RoHS” label shown at the left indicating conformance to this Directive.

**China RoHS**

Aruba products also comply with China environmental declaration requirements and are labeled with the “EFUP 10” label shown at the left.
Canadian Statement

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This device complies with Industry Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Canadian Caution

This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Gain of antenna: 7.4dBi for 2.4G band; 9.1dBi for 5G band;
Type of antenna: directional;
Impedance of antenna: 50ohm

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) a été approuvé par Industrie Canada pour fonctionner avec les types d’antenne énumérés ci-dessous et ayant un gain admissible maximal et l’impédance requise pour chaque type d’antenne. Les types d’antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l’exploitation de l’émetteur.

Gain d’antenne: 7.4dBi pour 2.4G band; 9.1dBi pour 5G band;
Type d’antenne: 50 ohm, directionnel.
# Contacting Aruba Networks

## Web Site Support

<table>
<thead>
<tr>
<th>Service</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Site</td>
<td><a href="http://www.arubanetworks.com">http://www.arubanetworks.com</a></td>
</tr>
<tr>
<td>Support Site</td>
<td><a href="https://support.arubanetworks.com">https://support.arubanetworks.com</a></td>
</tr>
<tr>
<td>Software Licensing Site</td>
<td><a href="https://licensing.arubanetworks.com/login.php">https://licensing.arubanetworks.com/login.php</a></td>
</tr>
<tr>
<td>Wireless Security Incident Response Team (WSIRT)</td>
<td><a href="http://www.arubanetworks.com/support/wsirt.php">http://www.arubanetworks.com/support/wsirt.php</a></td>
</tr>
</tbody>
</table>

## Support Emails

- Americas, APAC and EMEA: support@arubanetworks.com
- WSIRT Email: sirt@arubanetworks.com

## Telephone Support

<table>
<thead>
<tr>
<th>Support</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aruba Corporate</td>
<td>+1 (408) 227-4500</td>
</tr>
<tr>
<td>FAX</td>
<td>+1 (408) 227-4550</td>
</tr>
<tr>
<td>United States Support</td>
<td>800-WI-FI-LAN (800-943-4526)</td>
</tr>
<tr>
<td>Universal Free Phone Service Number (UIFN):</td>
<td>+800-4WIFI-LAN (+800-49434-526)</td>
</tr>
<tr>
<td>Australia, Canada, China, France, Germany,</td>
<td></td>
</tr>
<tr>
<td>Hong Kong, Ireland, Israel, Japan, Korea,</td>
<td></td>
</tr>
<tr>
<td>Singapore, South Africa, Taiwan, and the UK.</td>
<td></td>
</tr>
<tr>
<td>All Other Countries</td>
<td>+1 (408) 754-1200</td>
</tr>
</tbody>
</table>

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