

INSTALLATION GUIDE



AP10020i Wireless Access Point

Model Number: AP12I360

Release Number: 1.0

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Safety Warnings

The AP1002Oi Wireless Access Point installation must be performed by certified technicians only and in compliance with all local/state/federal safety requirements. All warnings and information in this manual should be read and understood before proceeding with installation. Any noncompliance by the user voids the warranty of the product.



General Safety

You can be killed or injured if performing antenna installation near electrical power lines. Carefully read and follow all instructions in this guide. Ensure that there are no high voltage or electrical fields nearby.



Working Aloft Warning

When working on tower or roof, individuals must wear safety belts. Tools must be tied to the individual using them. Workers below must wear safety helmets.



Lightning Activity Warning

Make sure not to connect or disconnect cables during periods of lightning activity. A surge protective device should be installed to prevent potential damage from very high surges, for instance, the peak surges caused by lightning.



Explosive Device Proximity Warning

Do not operate network devices close to explosive merchandise or in explosive environments, for example, in the vicinity of a gas station.



Antenna Placement Warning

Do not install any antenna near overhead power lines or other electric light, or where the antenna can come into contact with such circuits.



Grounding Warning

Protect your AP1002Oi Wireless Access Point by installation of grounding lines. The ground connection must be complete before connecting power to the AP1002Oi Wireless Access Point enclosure. The requirement of grounding is to make sure the resistance is less than 5 ohm between the ground termination point to grounding tier.



Power Installation Warning

The installation of the power switch must be performed by a certified technician. The power switch is not supplied with the AP1002Oi Wireless Access Point. The power cord must be assembled by a certified technician, and the final assembly must comply with related requirements.

Chapter 1 : Overview

This document provides information and procedures required to install and configure the AP1002Oi Wireless Access Point (model number AP12I360) into a WLAN installation and is intended for certified system installers, system administrators, and network operators.

The WLAN system is designed for high density deployments. It comprises of the following main components:

- AP1002Oi Wireless Access Point (AP)
- AC1K Access Controller (AC)
- Wireless Management System (WMS)

Dependencies

The installation and configuration of AP1002Oi Wireless Access Point depends on the following components:

- Access Controller
- Wireless Management System
- DHCP Server

AP1002 Oi Package Contents

The AP1002Oi package consists of the following items:

- One AP1002Oi Wireless Access Point
- One AP1002Oi wall mounting bracket
- AP1002Oi 9/16" narrow T-rail mounting clip
- AP1002Oi 15/16" wide T-rail mounting clip



The installation technician is responsible for procuring wall/ceiling anchors, mounting screws, and safety systems, as required by the local/state/federal authorities governing the installation of the AP1002Oi Wireless Access Point.

Additional Item

The following item is to be purchased separately:

- AC1K Access Controller

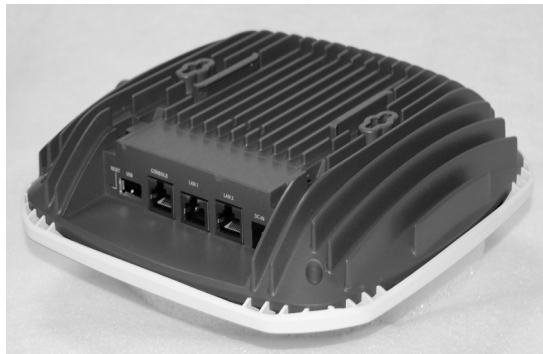
Item Identification

The following figures show top and bottom view of the AP1002Oi Wireless Access Point.

Figure 1: AP1002Oi Wireless Access Point - Top View



Figure 2: AP1002Oi Wireless Access Point - Bottom View



Related Documentation

- AP1004NRe Installation Guide(DOC-000003-000)
- AP1004WRe Installation Guide(DOC-000004-000)
- AP1002We Installation Guide (DOC-000005-000)
- AC1K Access Controller Installation Guide - DOC-000007-000
- Wireless LAN Management System User Guide -DOC-000008-000
- Wireless LAN Management System Quick Start Guide - DOC-0000??-000

Chapter 2 : Installing AP1002Oi

This section provides information and procedures required to install the AP1002Oi Wireless Access Point using various methods.



- The AP1002Oi Wireless Access Point installation must be performed by certified technicians only and in compliance with all local/state/federal safety requirements and building codes.
- Proper grounding and surge protectors may be required in outdoor installations.

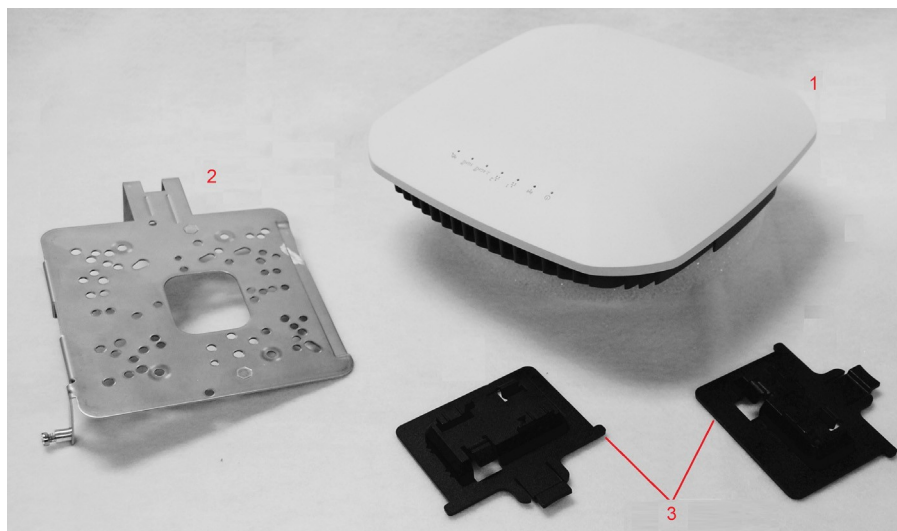


The network coverage depends on the location and position of the AP1002Oi Wireless Access Point.

Installing AP1002 Oi Using T- Rail Mounting Clips

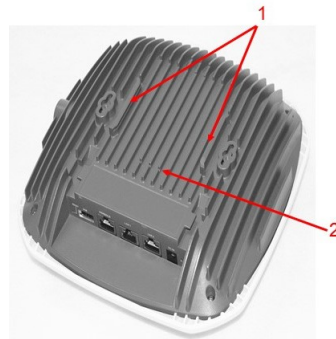
Perform this procedure to install the AP1002Oi Wireless Access Point using T-rail mounting clips.

1. Verify the contents of the AP1002Oi Wireless Access Point package.



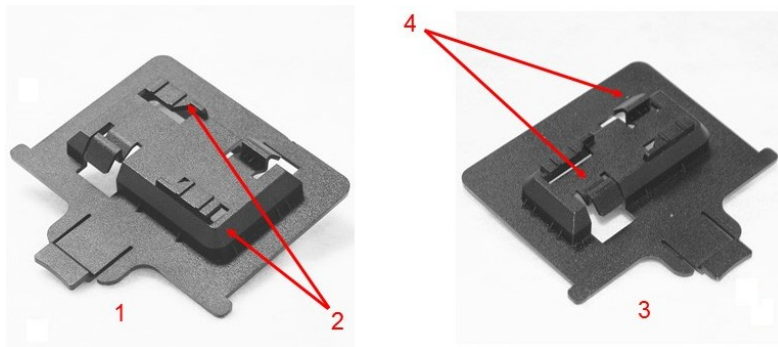
1	AP1002Oi Wireless Access Point
2	Mounting bracket
3	T-rail mounting clips

The AP1002Oi Wireless Access Point has two sets of mounting slides at the bottom of the chassis for attaching the plastic T-rail mounting clips, and a locking catch, to secure the AP1002Oi in the T-rail mounting clip.



1	Side rails
2	Locking catch

2. Select the appropriate T-rail mounting clip that fits the T-rail.



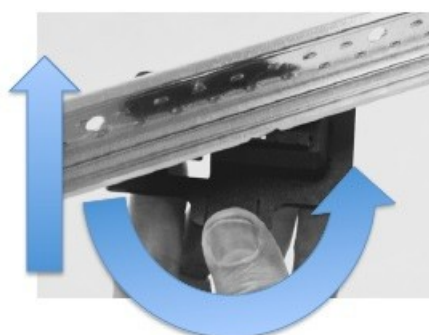
1	15/16" wide T-rail mounting clip
2	Finger tabs
3	9/16" narrow T-rail mounting clip
4	Locks

3. Perform the following steps to install the T-rail mounting clip to the T-Rail.

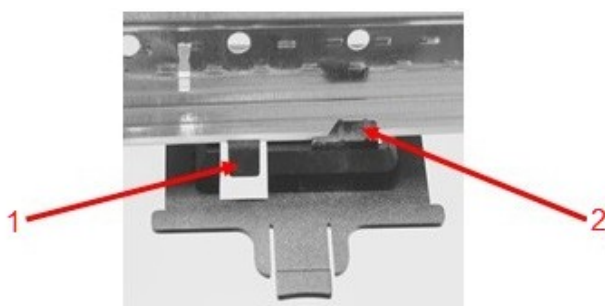
a. Slightly rotate the mounting clip so that the tabs clear the edge of the T-Rail.



b. Twist and push the mounting clip up on the T-rail so that the tabs catch the edge of the T-rail.

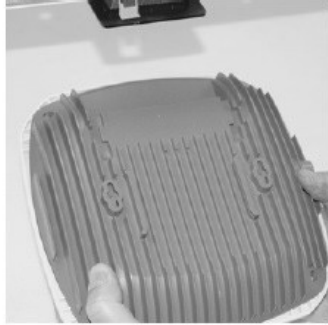


c. Ensure that the mounting clip is locked on the T-rail.

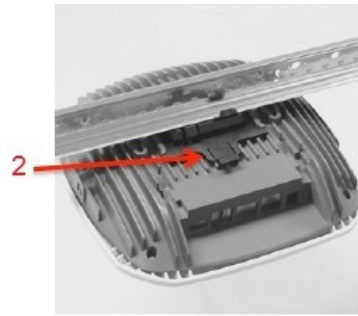
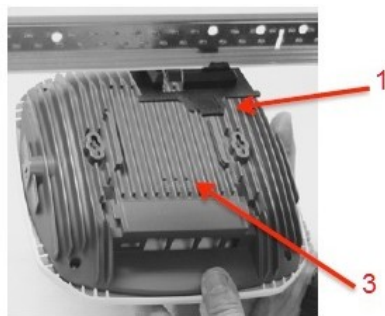


1	Mounting bracket locked to T-rail
2	Finger tab secured to T-rail edge

4. Slide the AP1002Oi Wireless Access Point on the T-rail mounting clip.



5. Push the AP1002Oi Wireless Access Point until the tab on the mounting clip engages with the catch on the AP1002Oi.



1	Tab
2	Latched
3	Catch

6. Verify the AP1002Oi Wireless Access Point is properly latched to the mounting bracket and the mounting bracket is locked to the T-rail.



AP1002 Oi Installation Using Wall Mounting Bracket

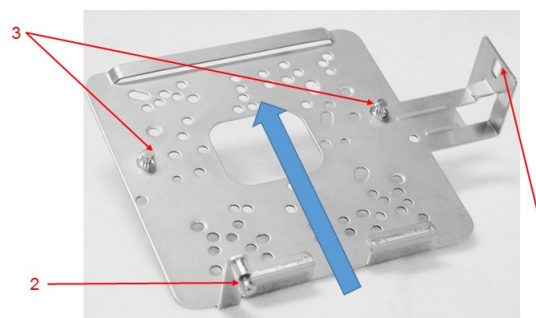
AP1002Oi Wireless Access Point has two sets of mounting eyelets at the bottom of the chassis that fits into the stand-offs on the wall mounting bracket. The mounting bracket also has a thumb screw that secures Access Point to the bracket, and a Kensington lock slot to secure the Access Point and the bracket to the surroundings.

Figure 3: AP1002Oi Parts



1	Eyelets
2	Security Screw
3	Kensington Lock

Figure 4: AP1002Oi Mounting Bracket Parts

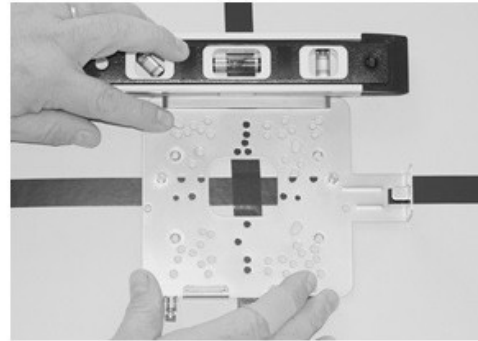
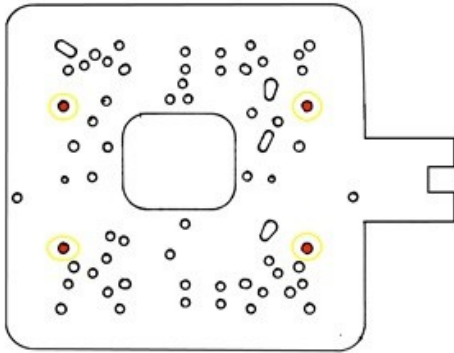


1	Kensington Lock Slot
2	Thumb Screw
3	Mounting Stand-offs

Installing AP1002O i on a Hollow Wall or Ceiling

Perform this procedure to install the AP1002Oi Wireless Access Point on a hollow wall or ceiling.

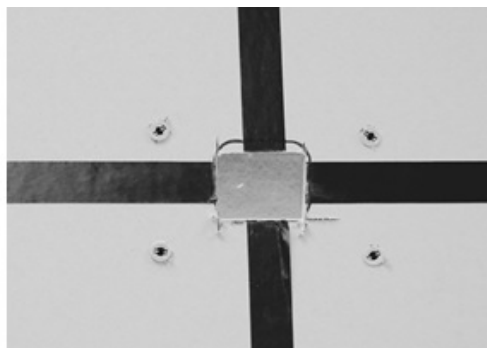
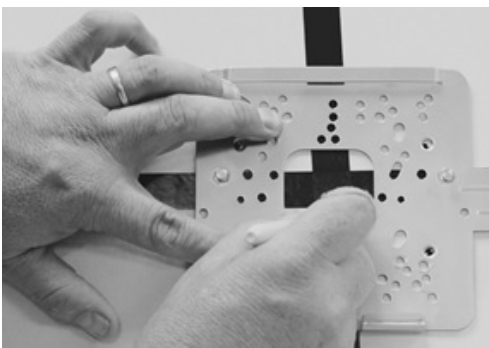
1. Locate and use the four mounting holes on the mounting bracket to secure the bracket.



2. Locate the mounting position on the wall or ceiling. Ensure that the surface is leveled or aligned. The LEDs are at the top of the Access Point and the thumb security screw is located at the bottom.
3. Mark the positions of the holes on the surface and drill holes for the manufacturer's recommended hollow wall anchors.



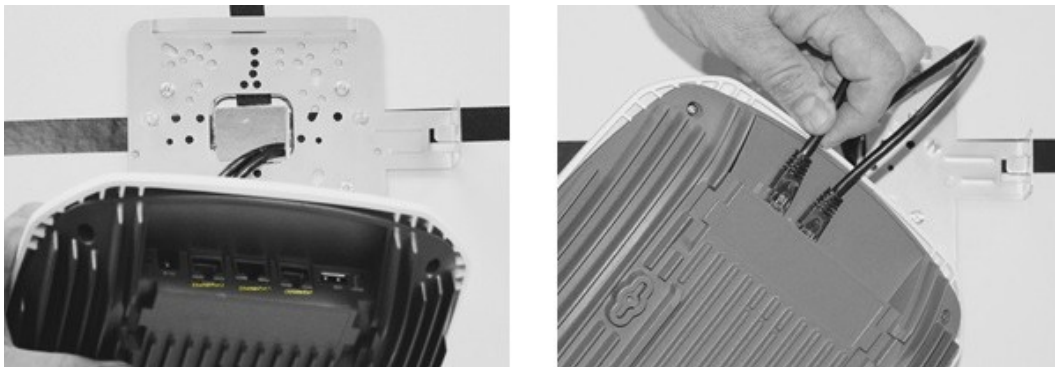
4. Using the mounting bracket mark the surface in the center for installing the cables and cut it open.



5. Install the hollow wall anchors and secure the mounting bracket to the surface using the screws.



6. Insert the cables through the center opening on the bracket.



7. Locate the two LAN Ports at the bottom of the AP1002Oi and connect the Ethernet cables:

- LAN Port 1 supports 2.5G-NBaseT, 1000 BaseT, and 100 BaseTx
- LAN Port 2 supports 1000BaseT, 100BaseTx, and 10BaseT
- Both ports support 802.11af and 802.11atPower

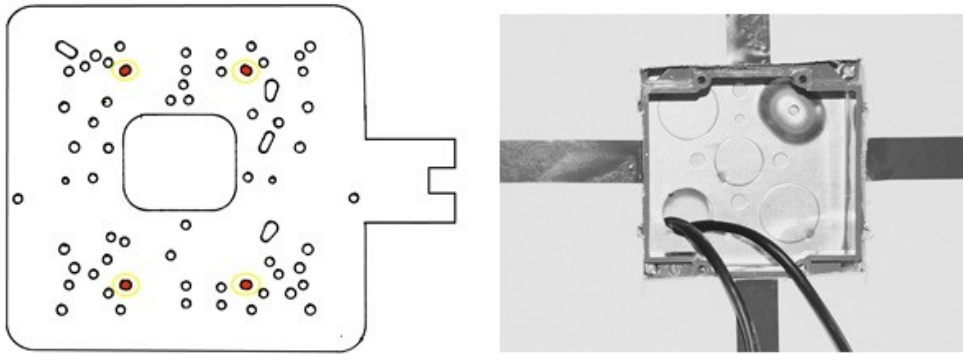
8. Using the security thumb screw attach the AP1002Oi to the mounting bracket.



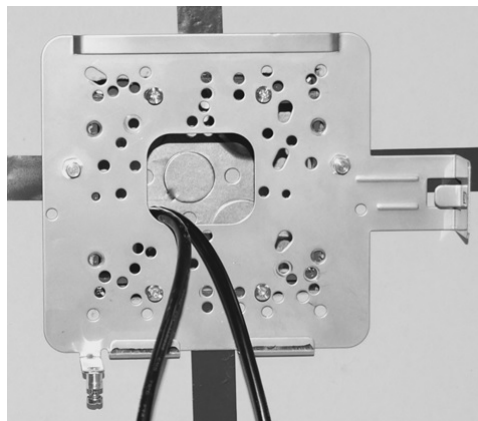
Installing AP1002O i Using 2 - Gang Junction or Quad Box

The AP1002Oi has a set of four holes that align with a standard quad box mounting pattern. Perform this procedure to install the AP1002Oi using a 2-Gang junction or a quad box.

1. Locate the four mounting holes on the mounting bracket that align with the mounting holes on the quad box.



2. Secure the mounting bracket to the quad box using the screws.

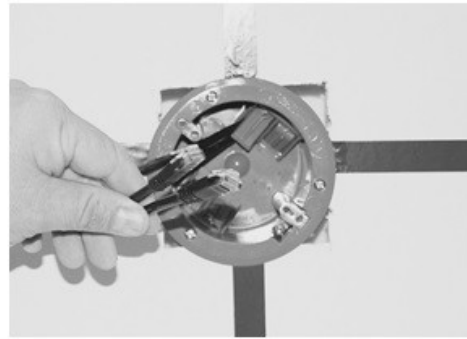
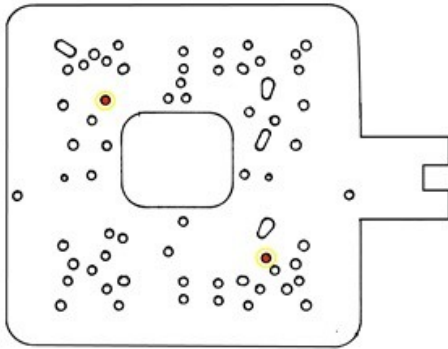


3. Insert the cables through the center opening on the bracket.
4. Locate the two LAN Ports at the bottom of the AP1002Oi and connect the Ethernet cables:
 - LAN Port 1 supports 2.5G-NBaseT, 1000 BaseT, and 100 BaseTx
 - LAN Port 2 supports 1000BaseT, 100BaseTx, and 10BaseT
 - Both ports support 802.11af and 802.11atPower
5. Using the security thumb screw attach the AP1002Oi to the mounting bracket.

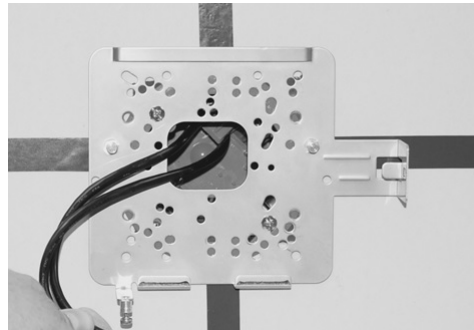
Installing AP1002O i Using a Ceiling Box

The AP1002Oi has a set of two holes that align with a standard ceiling box screw pattern. Perform this procedure to install the AP1002Oi using a ceiling box.

1. Locate the two mounting holes on the mounting bracket that align with the mounting holes on the ceiling box.



2. Secure the mounting bracket to the ceiling box using the screws.

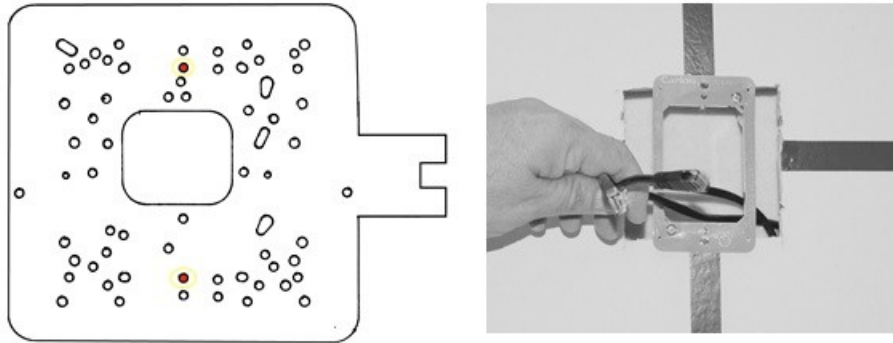


3. Insert the cables through the center opening on the bracket.
4. Locate the two LAN Ports at the bottom of the AP1002Oi and connect the Ethernet cables:
 - LAN Port 1 supports 2.5G-NBaseT, 1000 BaseT, and 100 BaseTx
 - LAN Port 2 supports 1000BaseT, 100BaseTx, and 10BaseT
 - Both ports support 802.11af and 802.11atPower
5. Using the security thumb screw attach the AP1002Oi to the mounting bracket.

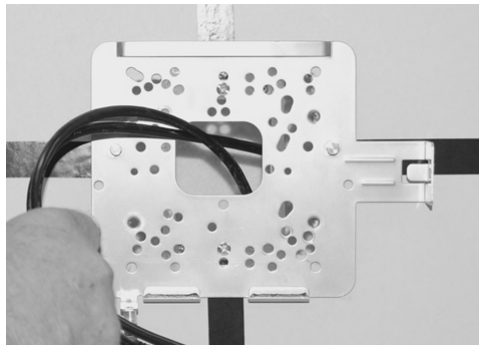
Installing AP1002O i Using a Single- Gang Junction or Duplex Box

The AP1002Oi has a set of two holes that align with a standard duplex box mounting pattern. Perform this procedure to install the AP1002Oi using a duplex-box.

1. Locate the two mounting holes on the mounting bracket that align with the mounting holes on the duplex-box.



2. Secure the mounting bracket to the duplex-box using the screws.



3. Insert the cables through the center opening on the bracket.
4. Locate the two LAN Ports at the bottom of the AP1002Oi and connect the Ethernet cables:
 - LAN Port 1 supports 2.5G-NBaseT, 1000 BaseT, and 100 BaseTx
 - LAN Port 2 supports 1000BaseT, 100BaseTx, and 10BaseT
 - Both the ports support 802.11af and 802.11at Power
5. Using the security thumb screw attach the AP1002Oi to the mounting bracket.

Chapter 3 : Configuring AP1002Oi

This section provides information and procedures required to configure the AP1002Oi Wireless Access Point.

Logging into WMS

The user can log into the management console by following the below procedure.

1. Log into WMS URL, <http://<AC IP address>> using the following credentials:

- Username:admin@admin.com
- Password:admin

Configuring AP1002Oi

Perform this procedure to configure the AP1002Oi Wireless Access Point.

1. Configure the POE+ ports as access ports with untagged PVID.

The PoE+ source must identify itself as PoE+ capable using the 2-event classification method. For more information on configuring the AP1002Oi Wireless Access Points that are connected to POE+ sources that support a discovery protocol, see [Configuring AP1002Oi to Work with Discovery Protocol](#).

2. Connect the AP1002Oi Wireless Access Point to a POE+ source.

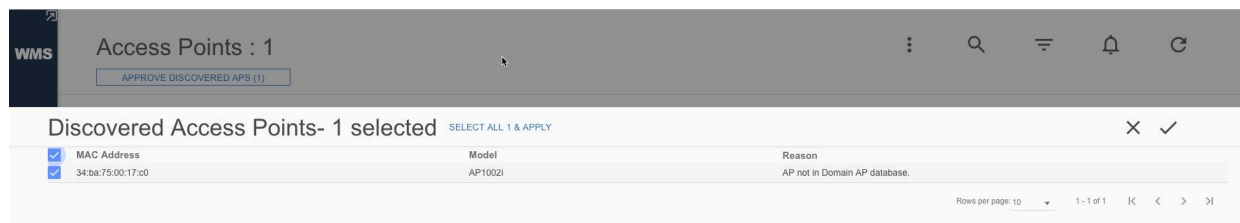
Once powered up, AP1002Oi Wireless Access Point requests the DHCP server for an IP address. This process may take up to 90 seconds.

3. Verify if the AP1002Oi was assigned an IP address by reviewing the DHCP logs or status in the WMS **Access Points** page. Along with the IP address, the AP1002Oi receives the IP address of the AC1K Access Controller and establishes a connection with it.

4. Is **AP MAC Authentication** option under **Settings > ACCESS CONTROLLER** enabled?

- If yes, proceed to the next step to approve and promote the discovered Access Points to the running state.
- If no, the Access Point displays in the running state automatically. Proceed to step 7.

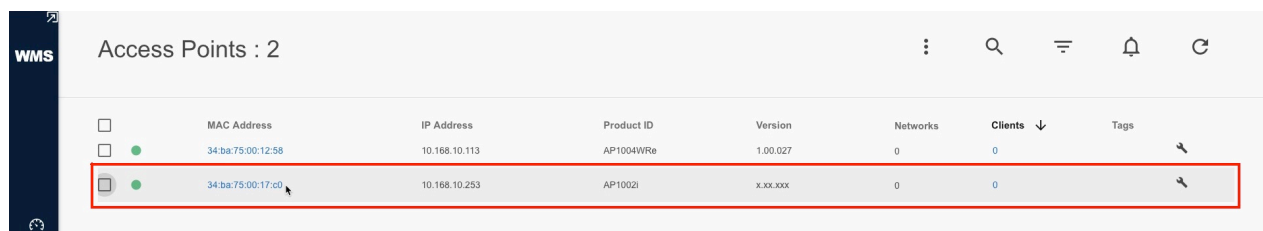
5. From the WMS navigation pane, select **Access Points > APPROVE DISCOVERED APs**.



6. Select the check boxes of the required Access Point(s) and click **Done** to promote them to the running state.

7. During the discovery phase of the AP1002Oi, the AC1K Access Controller verifies the country code of setting of the AP1002Oi against the country code locked into the AC1K Access Controller Software before allowing the AP1002Oi to join the network.

- If the country codes registered in the AP1002Oi non-volatile memory and country code locked in to the AC1K Access Controller software match, the AP1002Oi is allowed to join the network.
- If the country code registered in the AP1002Oi non-volatile memory doesn't match the locked country code in the AC1K Access Controller software, the AP1002Oi is quarantined and not allowed to join the network. When the Access Point is quarantined, the transmitters on the radio modules in the Access Point are disabled and the Access Point is moved to the discovered state.
- If the country code in the AP1002Oi non-volatile memory is in the default state, the AC1K Access Controller will register the country code locked to the AC1K Access Controller software into the AP1002Oi Access Point¹ and allows the AP1002Oi to join the network.



¹ Per FCC and IC regulations, any country code selection features are disabled for products marketed to the US/Canada

Configuring AP 1002Oi to Work with Discovery Protocol

In some cases, a POE+ Ethernet switch requires a Discovery Protocol such as LLDP and CDP to request additional power above the 15.4 W PoE PSE limit. In such cases, the POE+ PSE source must be configured to override the Discovery Protocol and force the PoE+ PSE source to provide at least 22.5 W of PoE+ power.

Perform this procedure to configure the Access Point to work with Discovery Protocol.



Use extreme caution. This is a manual mode of operation. There is no action taken by the AP1002Oi, if PoE+ power is interrupted. Even a single port losing PoE+ power may result in an overload on the port.

1. In the WMS **Access Point** menu, set the **Forced POE+ Power** selection to flag the AP1002Oi Wireless Access Point to ignore the POE+ status.

The AP1002Oi Wireless Access Point automatically resets when the new **Forced POE+ Power** selection configuration is saved. All the AP1002Oi hardware resources are available after rebooting the AP1002Oi.

Regulatory Declarations

This section provides the Regulatory Declarations for the AP1002Oi Wireless Access Point, Model Number: AP12I360.

HW Versions:

Main Board: 7016A1223004 V1.0
2.4G PCB: 7016A1224004 V1.0
5G PCB: 7016A1225004 V1.0
FCCID: 2AGMRAP12I360
IC: 21218-AP12I360

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

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

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 device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

Important Note:

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Important Note:

Country Code selection feature are disabled for products marketed to the US/CANADA.

Important Note:

For 2.4 GHz 802.11bgn products available in the US/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.

Important Note:

Operation in the 5.15-5.25 GHz band limited to indoor use only.

Important Note:**FCC Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 28 cm between the radiator & your body.

IC Statement:

This device complies with Industry Canada license-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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This radio transmitter (AP1002Oi/IC:21218-AP12I360) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain 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.

Le présent émetteur radio (AP1002Oi/IC:21218-AP12I360) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal 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.

Internal Antenna P/N 5100A2139300 (Max Gain @2.4-2.5 GHz 3.98 dBi)
(Max Gain @5.15-5.85 GHz 5.84 dBi)

Dynamic Frequency Selection (DFS) for devices operating in the bands 5250- 5350 MHz, 5470-5600 MHz and 5650-5725 MHz.

Sélection dynamique de fréquences (DFS) pour les dispositifs fonctionnant dans les bandes 5250-5350 MHz, 5470-5600 MHz et 5650-5725 MHz.

The maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit.

le gain maximal d'antenne permis pour les dispositifs utilisant les bandes 5250-5350 MHz et 5470-5725 MHz doit se conformer à la limite de p.i.r.e.

The maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate.

le gain maximal d'antenne permis (pour les dispositifs utilisant la bande 5725-5850 MHz) doit se conformer à la limite de p.i.r.e. spécifiée pour l'exploitation point à point et non point à point, selon le cas.

Operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

La bande 5150-5 250 MHz est réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.

Users are advised that high-power radars are allocated as primary users (i.e. priority users) of the bands

5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

Les utilisateurs êtes avisés que les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5 250-5 350 MHz et 5 650-5 850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

Important Note:

IC Radiation Exposure Statement:

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 32 cm between the radiator & your body.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 32 cm de distance entre la source de rayonnement et votre corps.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

Japan Statement:

5GHz band 1 and band 2: Indoor use only

“電波法により 5.15-5.35GHz 帯は屋内使用に限ります”

(5GHz band 1 and 2, indoor use only.)

VCCI Statement:

この装置は、クラス B 情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。

取扱説明書に従って正しい取り扱いをして下さい。

VCCI-B

Appendix: General Specifications

This section provides general specifications of the AP1002Oi Wireless Access Point.

Mechanical Specifications

The following table provides mechanical specifications of the AP1002Oi Wireless Access Point.

Table 9: Mechanical Specifications

Height	Width	Depth	Weight
210 mm (8.3 inch)	210 mm (8.3 inch)	35 mm (1.4 inch)	~700 g (1.5 lbs)

Operational Requirements

The following table provides operational requirements of the AP1002Oi Wireless Access Point.

Table 10: Operational Requirements

Condition	Input Power Requirement	Max Power Consumption
POE+ Power Requirements	42.5 - 56 Vdc, 600 mA, 25.5W	25.5 Watts Max (1.45 BTU/Minute)
DC Power Requirements	12 Vdc, 3000 mA, 36W	25.5 Watts Max (2.05 BTU/Minute)

Environmental Requirements

The following table provides environmental requirements of the AP1002Oi Wireless Access Point.

Table 11: Environmental Requirements

Condition	Requirement
Operating Temperature	0 °C to 45 °C (-32 °F to 113°F)
Storage temperature	-40 °C to 70 °C (-40 °F to 158 °F)
Humidity (non-condensing)	5% to 90% (operating and non-operating)
Maximum elevation	<ul style="list-style-type: none">Operating: Sea level 45 °C (113 °F) 4,206 m (13,800 ft) at ?? °C (?? °F)Non-operating: 12,500 m (40,000 ft) at -65 °C (-149 °F)

Reliability

The following table provides reliability specifications of the AP1002Oi Wireless Access Point.

Table 12: Reliability Specifications

Condition	Descriptions
Mean Time Between Failures (MTBF)	401,314 hours
Mean Time to Repair (MTTR)	30 minutes

Statement of Conditions

In the interest of improving internal design, operation function, and/or reliability, Tembo Systems, Inc. reserves the right to make changes to products described in this document without notice. Tembo Systems, Inc. does not assume any liability that may occur due to the use or application of the product(s) described herein.

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