

Narrow-Beam Stadium Antenna, 8-port, Tri-band Wi-Fi 6E with GNSS (IW-ANT-PNL25613-R=)

This chapter contains the following sections:

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- Technical Specifications, on page 3
- Mechanical Drawings, on page 4
- Radiation Patterns, on page 6
- Installation Options, on page 8

Overview

The Narrow-Beam Stadium Antenna (IW-ANT-PNL25613-R=) is an 8-port tri-band directional panel antenna supporting three 4x4 MIMO Wi-Fi 6E radios. The antenna features a narrow, symmetric beamwidth at 5 and 6 GHz, providing extended distance coverage. It is designed to comply with the FCC's 21 dBm EIRP skyward limit across the UNII-1, UNII-5, and UNII-7 bands.

This antenna is designed for overhead mounting at large public venues such as stadiums and other environments such as outdoor campus coverage, warehouses, and industrial sites.

Integrated high-rejection coexistence filters and a passive, L1 GNSS antenna enable concurrent 5–GHz and 6–GHz radio operation and AFC location reporting, respectively. The radome is IP67, UV-stabilized, and UL 94 V-0 rated.

Figure 1: Antenna Front View

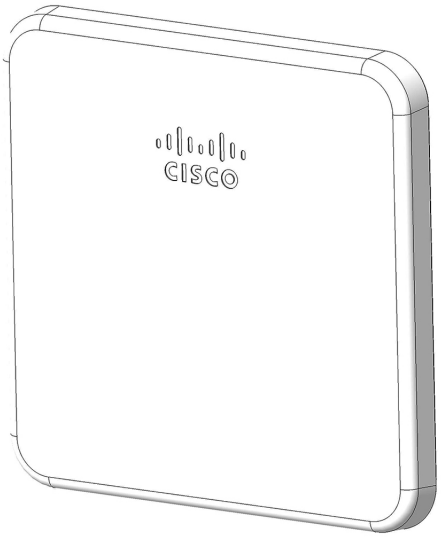
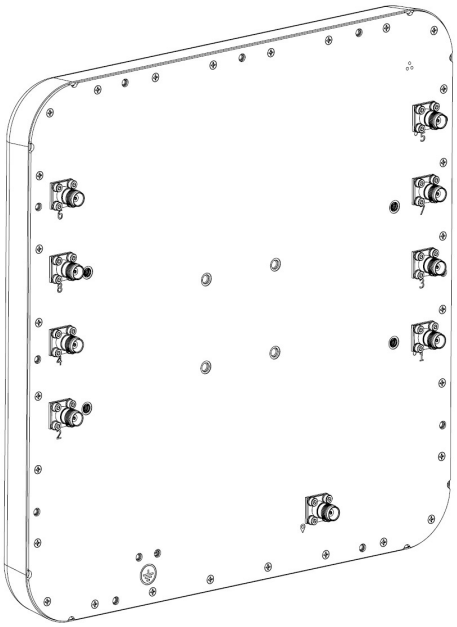


Figure 2: Antenna Back View



Features include the following:

- Supports 4x4 MIMO over 2.4 GHz, 5 GHz, and 6 GHz radio bands
- High-isolation between 5 GHz and 6 GHz ports enables concurrent radio operation
- Integrated GNSS antenna covers L1 GPS bands for AFC location reporting
- Compatible with Catalyst IW9167E Heavy Duty Access Point

Note The antenna cannot be field replaced in IW9167E-x-STA2 AP.

- IP66/67 rated
- UV-stabilized, UL 94 V-0 rated radome
- The antenna supports Self-Identification (SIA) on ports 1 and 5

Technical Specifications

The following table lists the specifications for the antenna:

Table 1: Technical Specifications Catalyst IW9167EH-x-STA2 Bundle

Specification	Description
Frequency	2400-2482 MHz (Ports 1–4) 5170-5835 MHz (Ports 1–4) 5925-6875 MHz (Ports 5–8)
Polarization	±45° dual slant
VSWR	2:1 maximum
Port-to-Port Isolation	20 dB minimum between ports of same band
Port-to-Port Isolation, 5 to 6 GHz	55 dB minimum
Peak Gain	2.4 GHz—7 dBi 5 GHz—13 dBi 6 GHz—13 dBi
3-dB Azimuth Beamwidth	2.4 GHz—75 degrees typical 5 GHz—35 degrees typical 6 GHz—35 degrees typical
3-dB Elevation Beamwidth	2.4 GHz—50 degrees typical 5 GHz—25 degrees typical 6 GHz—25 degrees typical
Dimensions (excluding connectors)	14.5 in x 14.5 in x 1.26 in 368mm x 368 mm x 32.1mm
Weight	Antenna—4.8 lb (2.2 kg)

Specification	Description
Connector	RP-TNC, jack
Operating temperature	-40 to +70°C
Flammability rating	UL 94 V-0
IP rating	IP66 and IP67

Table 2: GNSS Specifications

Specification	Catalyst IW9167EH-x-STA2 Bundle Values
Frequency	1164-1215 MHz 1559-1610 MHz
Polarization	Mixed
VSWR	2:1 maximum
Maximum Gain	4 dBi
GNSS Connector	TNC, jack

Mechanical Drawings

The following images show the antenna dimensions:

Figure 3: Front view

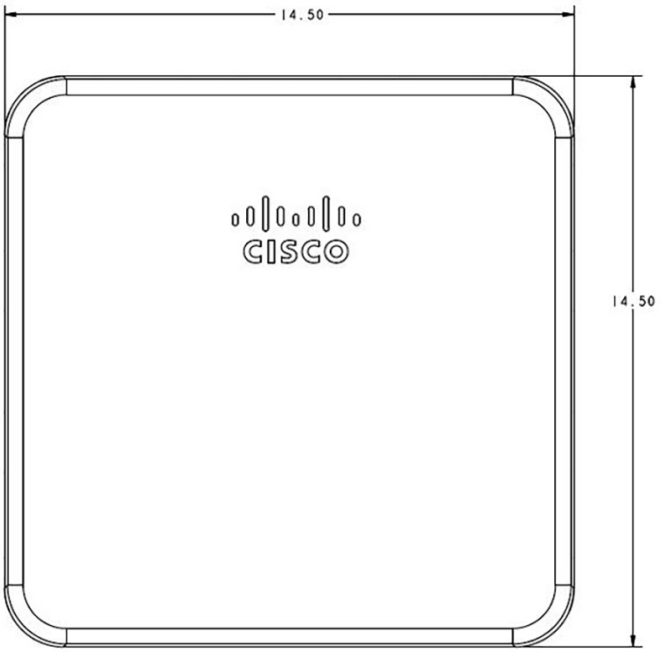


Figure 4: Side view

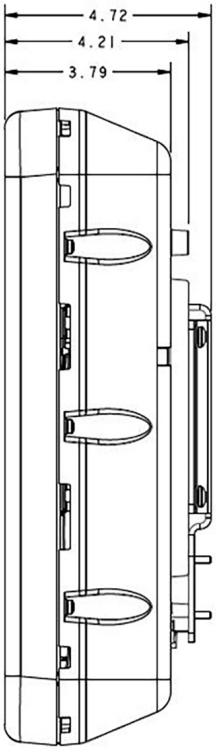
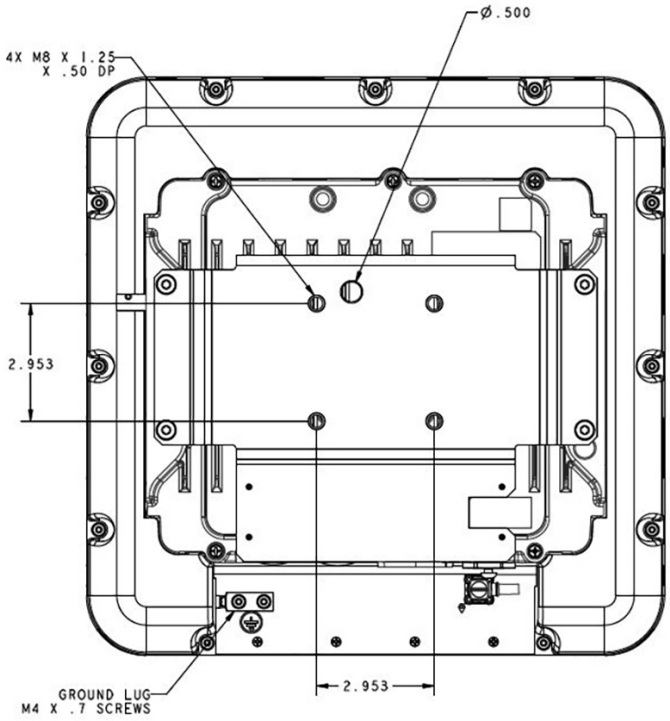


Figure 5: Rear view



Radiation Patterns

Table 3: Radiation Patterns

Figure 6: 2.4-GHz Azimuth

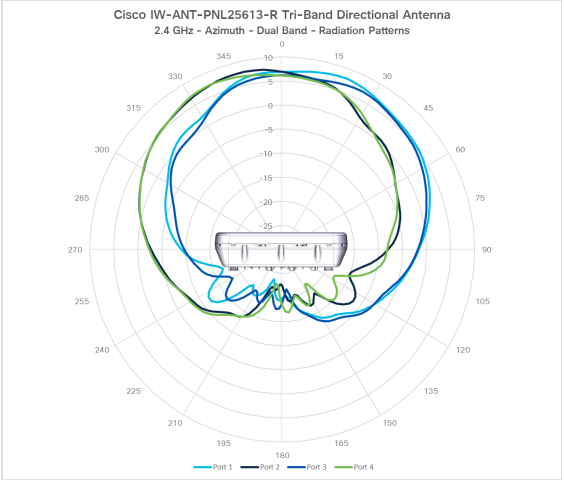


Figure 7: 2.4-GHz Elevation

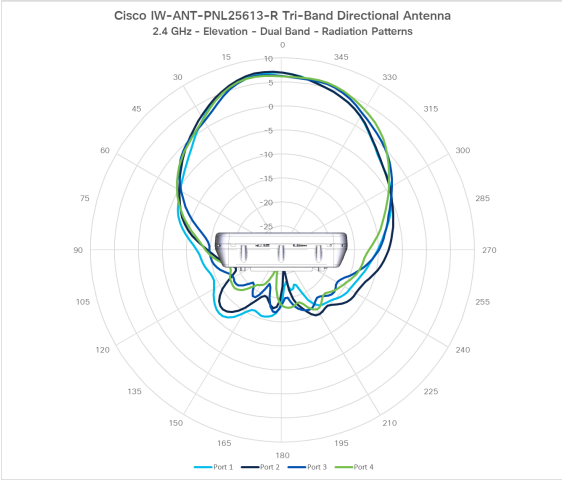


Figure 8: 5-GHz Azimuth

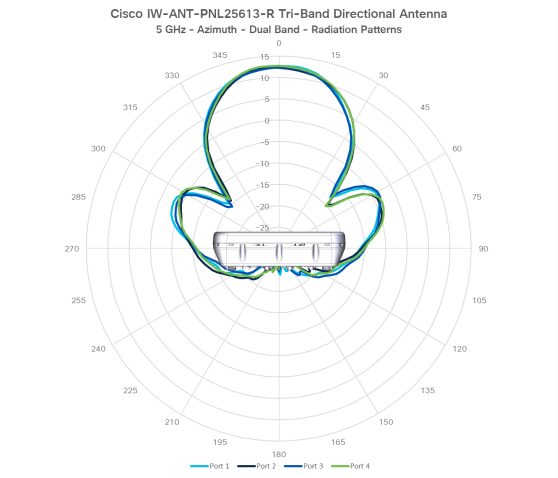


Figure 9: 5-GHz Elevation

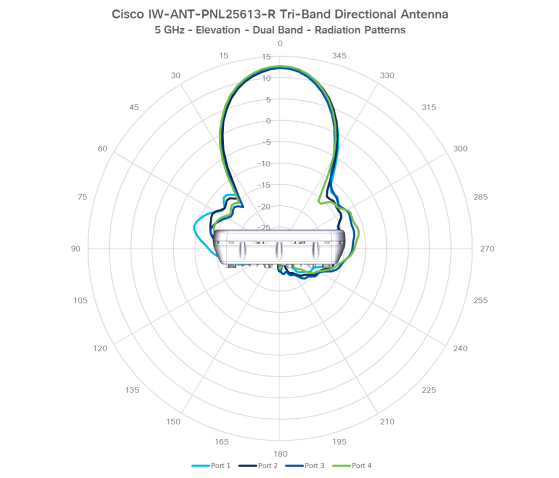


Figure 10: 6-GHz Azimuth

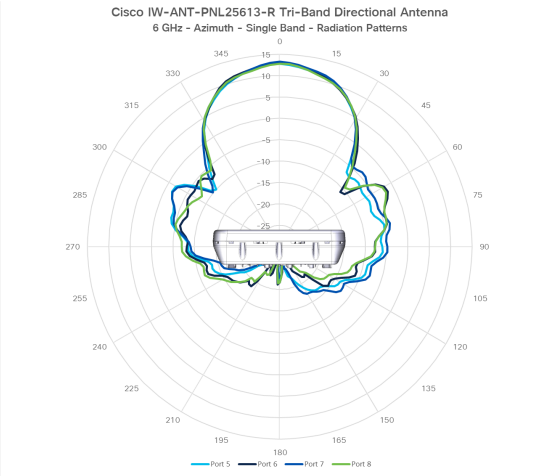


Figure 11: 6-GHz Elevation

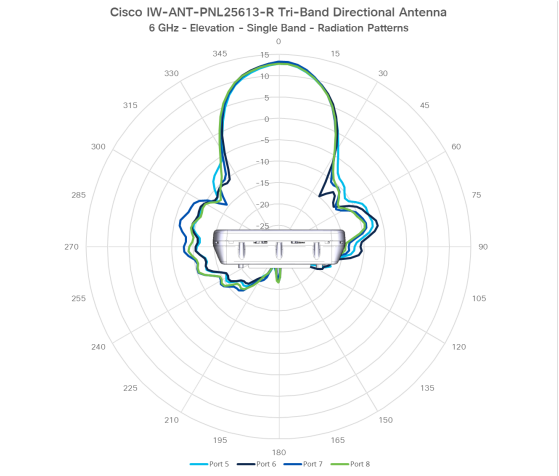


Figure 12: GNSS Elevation, XY plane

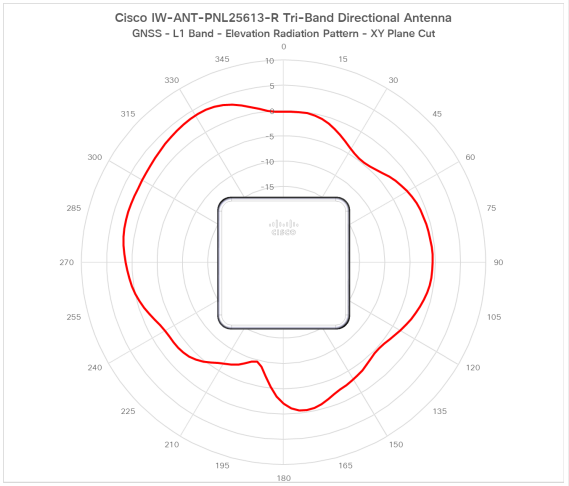
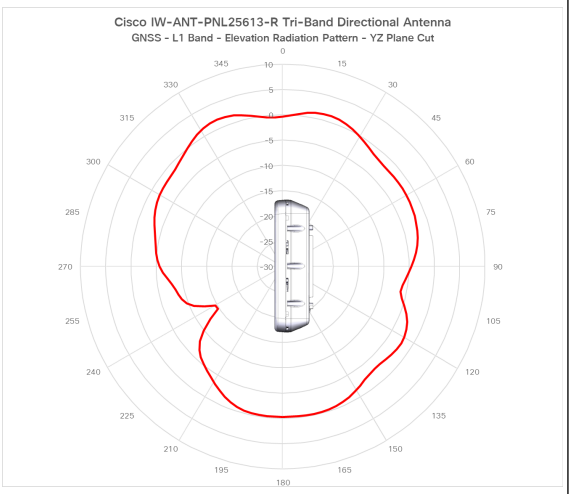


Figure 13: GNSS Elevation, YZ plane



Installation Options

The IW-ANT-PNL25613-R= tri-band antenna can be wall or pole mounted using the supported mounting kits.

Cisco PID	Description
IW-ACC-BRK1=	Pole/Wall mount articulating bracket with pan and tilt capability.
AIR-MNT-ART1=	Pivoted Pole/Wall mounting bracket for both vertical and horizontal mounting.

Mount using AIR-MNT-ART1= Bracket Kit

The pivoting mounting kit AIR-MNT-ART1= contains a pivoting mounting bracket for both wall and pole mounting the antenna. The antenna with this kit can be mounted to the ceiling in a horizontal plane.

Note When mounted outdoors, elevation shall only be adjusted such that the antenna is aimed level with or below the horizon to ensure regulatory compliance.

Caution The mounting surface, attaching screws, and optional wall anchors must support a 50 lb (22.7 kg) static weight.

Table 4: Materials for Mounting AP to a Wall with AIR-MNT-ART1= Kit

Materials Needed	Supplied in the Kit?
Ground lug and screws (Optional, size is M4 thread with 0.63" pitch)	No
Pivoting mount kit and hardware	Yes
(4) M6 x 12-mm Screws	Yes
Two stainless steel band clamps (adjustable 2 to 5 inch (51 to 127 mm)	Yes Provided but required for pole/mast mount only.
90.0 mm M8 screw	Yes
M8 Flat washer	Yes
M8 Spring washer	Yes
Four wall mounting screws (M6 max size)	No
#6 AWG ground wire (Optional)	No
Shielded outdoor-rated Ethernet (CAT5e or better) cable	No
Grounding block (Optional)	No
Grounding rod (Optional)	No
13-mm box-end wrench or socket set	No
10-mm box-end wrench	No

Pivoting Bracket Specifications

This kit supports adjusting the antenna position along its vertical plane.

Figure 14: Pivoting Wall Mounting Bracket Dimensions

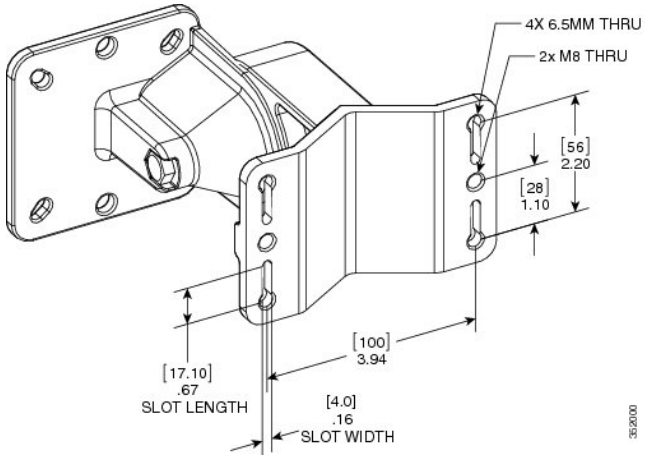
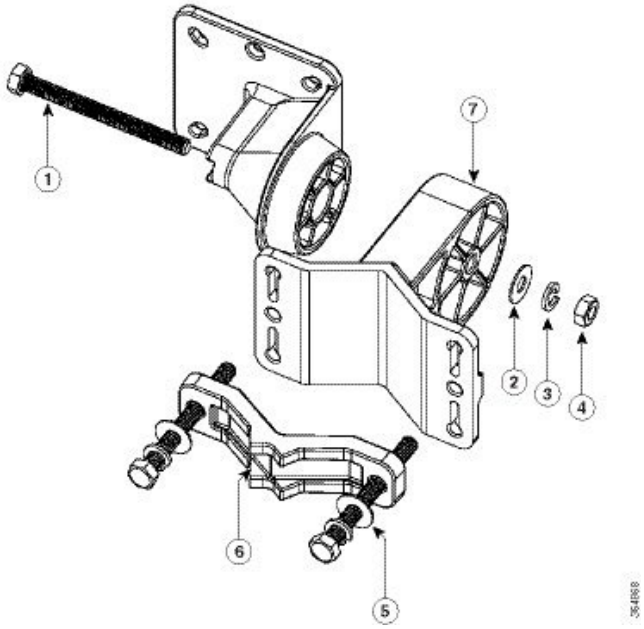
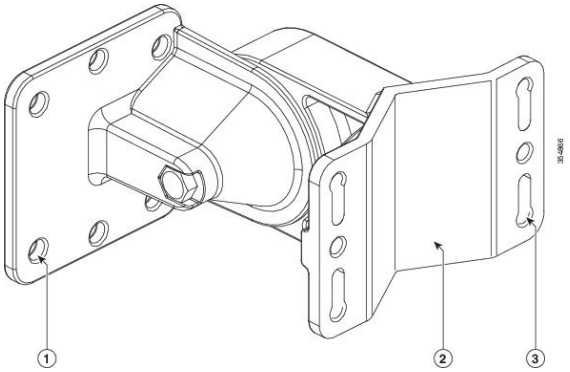


Figure 15: Exploded View of the Pivoting Mounting Kit



1	90.0 mm M8 screw	5	80.0 mm M8 screw with washer and spring washer for fastening the pole-mount screw clamp to the pivoting bracket base plate.
2	M8 washer	6	Pole-mount screw clamp
3	M8 spring washer	7	Pivoting bracket base plate
4	M8 nut		

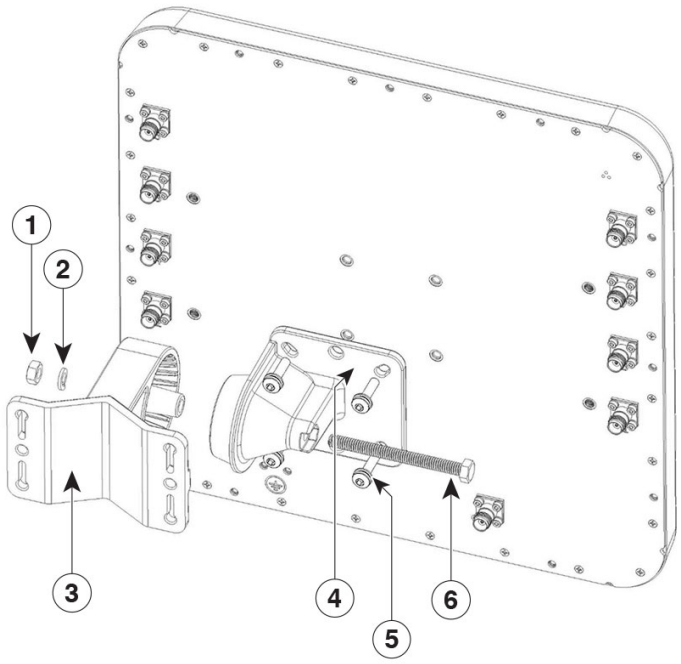
Figure 16: Pivoting Wall Mounting Bracket



1	One of four bolt holes for fastening to the back of the antenna. This is the antenna-plate end of the bracket and is fastened to the back of the antenna.
2	Wall-plate end of the bracket. This plate is fastened to the wall.
3	Screw holes for wall mounting. These screw holes can also be used as slots for steel band clamps in pole-mount installations.

Mounting to a Wall or Ceiling using AIR-MNT-ART1= Bracket

Figure 17: Visualization of Antenna Fastened to the Pivoting Wall Mounting Kit



Item #	Mounting Bracket Kit	Quantity	Tightening Values
1	M8 Nut	1	
2	M8 Flat, spring Washer	3	—
3	Wall-plate end of the bracket. This plate is fastened to the wall. Hardware not supplied (M6 max size)	1	—
4	This is the antenna-plate end of the bracket and is fastened to the back of the antenna.	1	—
5	M6 x 12mm Long screws	4	4.5+/- .5 Nm
6	90.0 mm M8 screw	1	25 +/- 1 Nm

Before you begin

Note Using this mount to wall mount the antenna, azimuth adjustment (side-to-side) is not possible. Alternatevly, for azimuth adjustment use the IW-ACC-BRK1=.

Procedure

Step 1 Disassemble the pivot kit, if not already disassembled.

Step 2 Use the mounting bracket's wall-plate end as a template to mark four screw hole locations on the mounting surface. See Figure 16: Pivoting Wall Mounting Bracket , on page 11 for the mounting bracket screw hole locations (screw holes of maximum 6 mm). See Figure 14: Pivoting Wall Mounting Bracket Dimensions, on page 10 for the dimensions of the pivoting mounting bracket.

Step 3 Use four screws and, if required, wall anchors to attach the mounting bracket's wall-plate end to the mounting surface. These screws and anchors are to be sourced independently.

Note

- You can use an exterior-grade plywood backboard to mount the antenna to stucco, cement, or drywall.
- The mounting surface, attaching screws, and wall anchors must support a 50-lb (22.7 kg) static weight. It is important to use proper anchoring for the mount surface to support the static load.

Step 4 Align the antenna-plate end of the bracket with the screw holes in the antenna's back.

Step 5 Fasten the bracket plate to the antenna by using four M6 x12 mm bolts and a 10–mm box or socket wrench. Tighten the bolts to 40 lbf-in (4.5 Nm) of torque.

Step 6 Using the 90 mm M8 long screw and the hardware supplied with the pivoting bracket, bolt the antenna and bracket plate to the wall plate mounted on the wall. See Figure 16: Pivoting Wall Mounting Bracket , on page 11 for this assembly. Do not fully tighten the assembly.

Note
The antenna should be mounted with the ground lug on the lower side of the antenna.

Step 7 Pivot the antenna as required, and then fully tighten the 90 mm M8 long screw using a 13–mm wrench.

Step 8 Proceed attaching the antennas signal cables, grounding the antenna.

Mounting to a Pole using AIR-MNT-ART1= Bracket

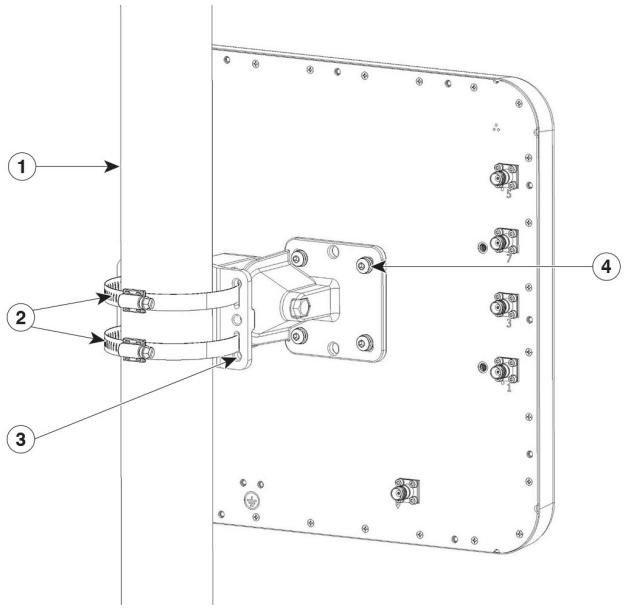
The articulating mounting kit AIR-MNT-ART1= contains a pivoting mounting bracket for both wall and pole mounting. This kit can be used to install the antenna on a pole or mast. It supports metal, wood, or fiberglass poles from 2 to 5 inch (51 to 127mm) in diameter.

The AIR-MNT-ART1= articulating mounting kit allows for adjusting the antenna position by pivoting the antenna along its vertical plane.

Note The pole or mast must be rigid enough to hold the weight of an antenna along with the associated forces produced by wind loads. In addition, the mast must be structurally strong enough to withstand the clamping force of the hose clamps.

Note When mounted outdoors, elevation shall only be adjusted such that the antenna is aimed level with or below the horizon to ensure regulatory compliance.

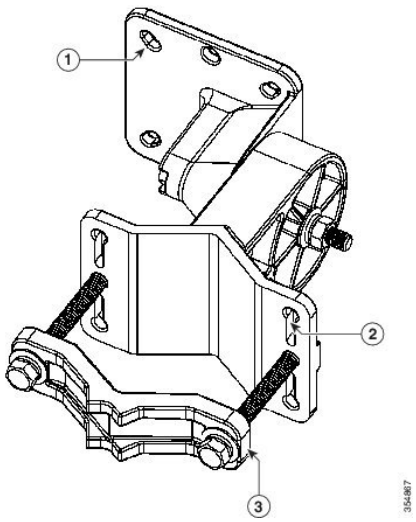
Figure 18: Pole Mounted Antenna Using the Pivoting Mounting Bracket



1	Pole	3	Slots for band clamps

2	Steel band clamps	4	One of four mounting holes for mounting the AP to the bracket

Figure 19: Pivoting Mounting Kit with Pole Mount Clamp



1	One of four mounting holes for the AP. This is the AP-plate end of the bracket and is fastened to the back of the AP	3	Pole mount screw clamp. It can fit poles having a diameter of up to 2 to 3 inches (50 to 76 mm)
2	One of four slots for band clamps. This is the pivot bracket base plate and is fastened to the pole. Pole mount installation using band clamps are shown in Figure 18: Pole Mounted Antenna Using the Pivoting Mounting Bracket, on page 13.		

Procedure

Step 1 Select a mounting location on the pole to mount the antenna. You can attach the antenna to any pole with a diameter of 2 to 5 inch (51 to 127mm).

Step 2 Disassemble the pivot kit, if not already disassembled.

Step 3 Fasten the pivot bracket base plate to the pole using either one set of the adjustable band clamps or the screw clamp (the screw clamp can be used only on poles that are 2 to 3 inch (50 to 76 mm) in diameter).

Step 4 Position the pivot bracket base plate and clamp(s) on the pole. Tighten only enough to hold the bracket base plate in place to prevent it from sliding along the pole but still pivot on the pole. Fully tighten only after the antenna is mounted and positioned.

Step 5 Align the antenna-plate end of the bracket with the screw holes in the antenna's back.

Step 6 Fasten the bracket plate to the antenna by using four M6 x12–mm bolts and a 10–mm box or socket wrench. Tighten the bolts to 40–lbf-in (4.5 Nm) of torque.

Step 7 Using the 90 mm M8 long screw and the hardware supplied with the pivoting bracket, bolt the antenna and bracket plate to the base plate mounted on the pole. Do not fully tighten the assembly.

Note
The antenna should be mounted with the grounding lug on the lower side of the antenna.

Step 8 Pivot and position the antenna as required, and then fully tighten the 90 mm M8 long screw using a 13–mm wrench and then tighten the clamps on the pole.

Note
Use caution when tightening the 80 mm bolts on the pole-mount screw clamp. Ensure the clamp face remains parallel to the bracket base plate while tightening the bolts. Tighten the M8 x 80 mm bolts to 52 to 61 lbf-in (5.9 to 6.9 Nm) of torque.

Caution
Misalignment and over-torquing can result in breaking the screw clamp.

Step 9 Connect the ground cable and then the antenna cables to the antenna.

Antenna cables are connected to the Catalyst IW9167E antenna ports with the same number or symbol as identified on the antenna.

Mount using IW-ACC-BRK1= Bracket Kit

The pivoting mounting kit IW-ACC-BRK1= contains a pivoting mounting bracket supporting both wall and pole mounting the antenna. The antenna can be mounted to the ceiling in a horizontal plane.

The bracket supports metal, wood, or fiberglass poles from 2 to 5 inch (51 to 127mm) in diameter.

Note When mounted outdoors, elevation shall only be adjusted such that the antenna is aimed level with or below the horizon to ensure regulatory compliance.

Table 5: Materials for Wall or Pole Mounting the AP with IW-ACC-BRK1= Kit

Materials Needed	Supplied in the Kit?
Ground lug and screws (Optional, size is M4 with 0.63" pitch)	No
Pivoting mount kit and hardware	Yes
Adapter Bracket	Yes
M6 x 12-mm Hex-head Bolts	Yes
Pole clamp	Yes
M8 Flat washers	Yes

Materials Needed	Supplied in the Kit?
M8 spring washers	Yes
M6 Flat washers	Yes
M6 spring washers	Yes
Four wall mounting screws (M6 max)	No
#6 AWG ground wire (Optional)	No
Shielded outdoor-rated Ethernet (CAT5e or better) cable	No
Grounding block (Optional)	No
Grounding rod (Optional)	No
13-mm box-end wrench or socket set	No
10-mm box-end wrench	No
T30 Torx Socket or Driver	No

Articulation Range

This articulation kit allows for adjusting the position of the antenna by pivoting the antenna along its vertical and horizontal plane.

Figure 20: Close-Up View of the Azimuth and Elevation-Adjustment Pivots

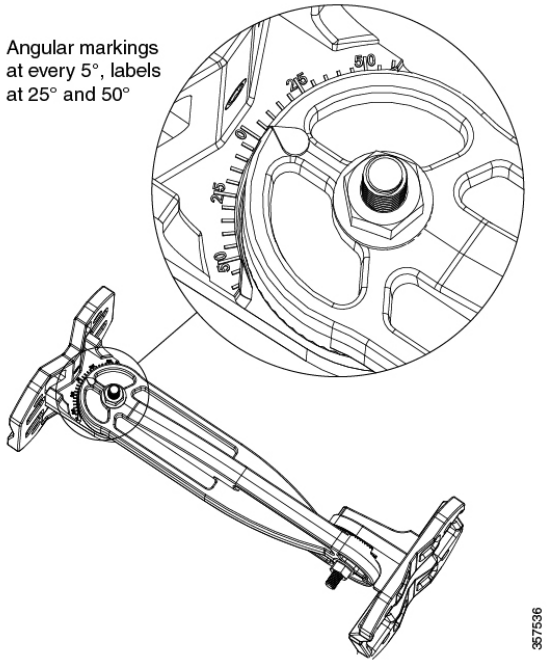


Figure 21: Azimuth Adjustment

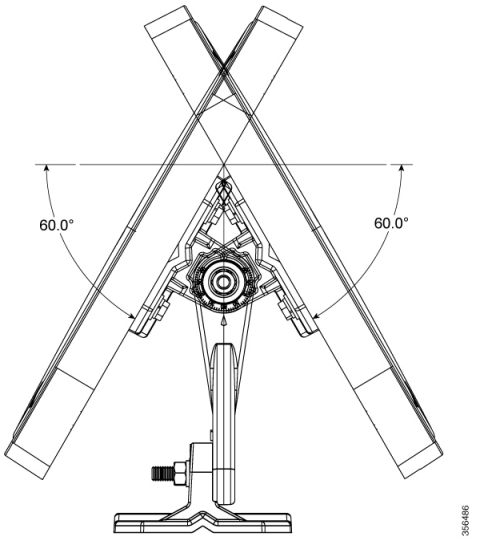
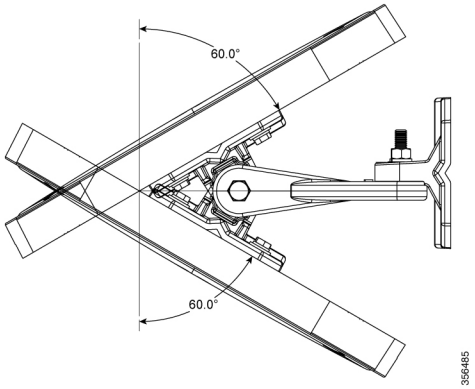


Figure 22: Elevation Adjustment

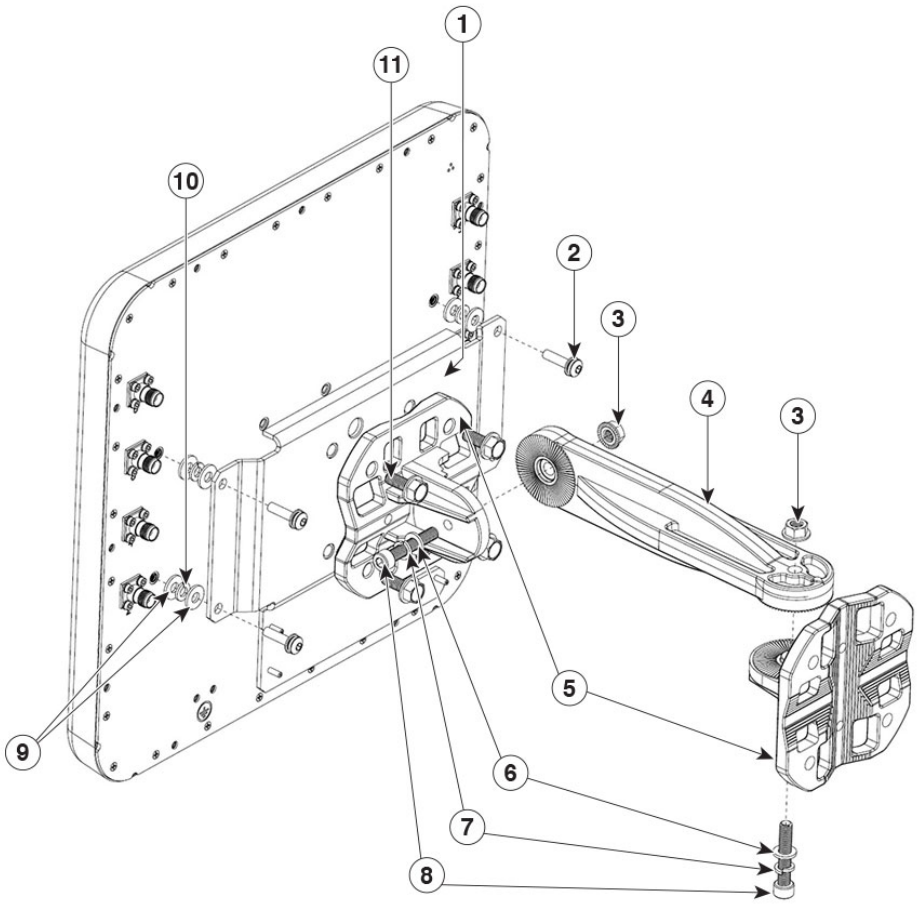


Mounting on a Wall or Ceiling Using IW-ACC-BRK1= Bracket

The articulating mounting kit IW-ACC-BRK1= contains a pivoting mounting bracket for both wall and pole mounting.

Caution The mounting surface, attaching screws, and optional wall anchors to support a 50 lb (22.7 kg) static weight.

Figure 23: Exploded View of Antenna and Bracket Hardware Assembly



Item #	Mounting Bracket Kit	Quantity	Tightening Values
1	Adapter plate	1	—
2	M6 torx screw	4	4.5 +/- .5 Nm
3	M8 nut	2	25.0 +/- 1.0 Nm
4	Mounting arm	1	—
5	Mounting flange	2	—
6	M8 Flat washer	2	—
7	M8 Spring washer	2	—
8	M8 Bolt	2	—
9	M6 Flat washer	8	—
10	M6 Spring washer	4	—

Item #	Mounting Bracket Kit	Quantity	Tightening Values
11	M8 x20 Bolt	4	8 +/-.5 Nm

Procedure

Step 1 Determine the mounting location for the antenna.

Step 2 Attach one of the mount flange to a wall or ceiling using four M8 bolts or similar fastner through the holes in the bracket.

Note
The mounting kit does not include the M8 fastners for securing the bracket to the mounting surface.

Step 3 Attach adapter plate to the antenna with M6 torx screws.

Place the M6 flat washers and the spring washer between the adapter plate and the antenna. Using a T30 torx socket or driver, tighten the M6 torx screws to 4.5 +/-.5 Nm torque.

Step 4 Attach the other mount flange to the back of the adapter plate.

Use the four M8 bolts through the holes in the bracket. Tighten the bolts to 8 +/-.5 Nm Nm torque.

Step 5 Assemble the mounting arm to the flanges.

Use a wrench to tighten all screws and nuts. See Figure 23: Exploded View of Antenna and Bracket Hardware Assembly, on page 18.

Step 6 Orient the antenna as required.

Use a wrench to loosen or tighten the fasteners at the azimuth and elevation- adjustment pivots.

Note
Ensure that the antenna cable exits from the lower side of the antenna.

Step 7 Adjust the azimuth (side-to-side position) and elevation (up-and-down position) of the antenna.

Loosen the adjustment pivot nuts slightly to allow for adjustment. Use the azimuth and elevation markings on the articulating mounting arm and the flange brackets as a guide. See Figure 20: Close-Up View of the Azimuth and Elevation-Adjustment Pivots, on page 16. You may adjust the azimuth angle up to ±60 degrees, see Figure 21: Azimuth Adjustment, on page 17, and elevation up to ±60 degrees see Figure 22: Elevation Adjustment, on page 17.

Step 8 After adjusting the antenna position, tighten the pivot nuts.

Tighten all nuts at the pivot points to 25.0 +/- 1.0 Nm torque.

Step 9 Connect the ground cable and then the antenna cables to the antenna.

Antenna cables are connected to the Catalyst IW9167E antenna ports with the same number or symbol as identified on the antenna.

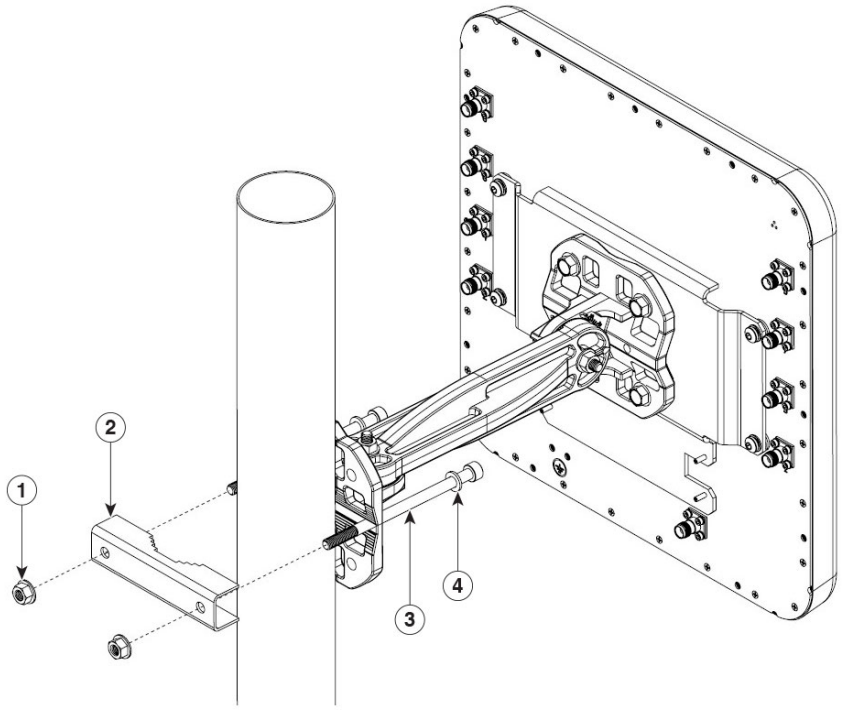
Mounting on a Pole or Mast Using IW-ACC-BRK1= Bracket

The articulating mounting kit IW-ACC-BRK1= contains a pivoting mounting bracket for both wall and pole mounting.

Note The pole or mast must be rigid enough to hold the weight of an antenna along with the associated forces produced by wind loads. In addition, the mast must be structurally strong enough to withstand the clamping force of the hose clamps.

Note When mounted outdoors, elevation shall only be adjusted such that the antenna is aimed level with or below the horizon to ensure regulatory compliance.

Figure 24: Antenna Bracket Hose Clamp Assembly for Pole Mounting



Item #	Mounting Bracket Kit	Quantity	Tightening Values
1	M8 Nut	2	25.0 +/- 1.0 Nm
2	Pole clamp	1	—
3	M8 Bolt 140 Lg	2	—
4	M8 Flat washer	2	—

Procedure

Step 1 Determine the mounting location for the antenna on the pole or mast.

Step 2 Position and mount the mounting flange bracket onto the pole or mast using the pole clamp provided in the kit.

Tighten the M8 bolts until the flange is fully secure on the pole or mast. Ensure to tighten each nut manually so the clamp is parrallel to the flange.

Step 3 Attach the adapter plate to the antenna.

Place the M6 flat washers and the spring washer between the adapter plate and the antenna. Tighten the M6 torx screws using a T30 torx socket or driver with 4.5 +/-.5 Nm torque.

Step 4 Attach the other mounting flange through the holes in the bracket to the back of the adapter plate using four M8 bolts.

Tighten the bolts to 8 +/-.5 Nm torque.

Step 5 Assemble the mounting arm to the flanges.

Use a wrench to tighten all bolts and nuts. Ensure that the antenna cannot rotate about the mast.

Step 6 Adjust the azimuth (side-to-side position) and the antenna's elevation (up-and-down position).

Loosen the adjustment pivot nuts slightly to allow for adjustment.

You can use the azimuth and elevation markings on the articulating mounting arm and the flange brackets as a guide. See Figure 20: Close-Up View of the Azimuth and Elevation-Adjustment Pivots, on page 16. You can adjust the azimuth angle up to ±60 degrees, see Figure 21: Azimuth Adjustment, on page 17, and elevation up to ±60 degrees see Figure 22: Elevation Adjustment, on page 17.

Step 7 After adjusting the antenna position, tighten all nuts at the pivot points to 25.0 +/- 1.0 Nm torque.

Caution
Misalignment and over-torquing can result in breaking the screw clamp.

Step 8 Connect the ground cable and then the antenna cables to the antenna.

Antenna cables are connected to the Catalyst IW9167E antenna ports with the same number or symbol as identified on the antenna.