

# Cisco Unified Wireless Network

*Access Point installation  
guidelines and mechanicals  
1040, 1140, 1260, 3500 Series*

*Fred Niehaus (fredn@cisco.com)*

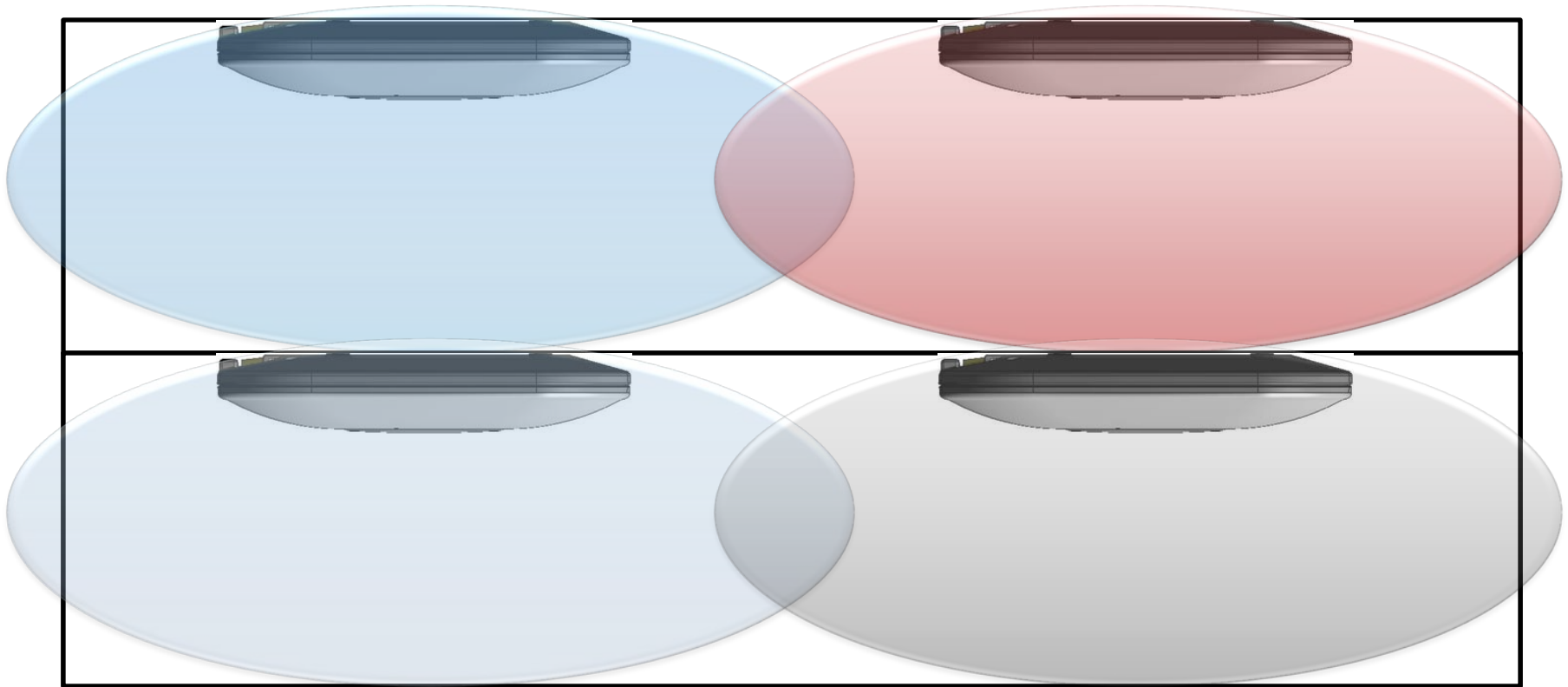


**NOTE: \*NEW\*** URL for help with Cisco  
Access Point mounting options

**[www.cisco.com/go/bracket](http://www.cisco.com/go/bracket)**

# Internal antenna version Access Points

*Designed for Horizontal Mounting*



- **Internal antenna versions of Access Points work best when mounted horizontally on the ceiling as the antenna coverage pattern radiates down and outward in a 360 degree pattern**

# Mounting Access Points



**Access Points can be mounted several different ways.**

- **Above the ceiling tiles or grid work**
- **In the actual ceiling tiles**
- **Below the ceiling tiles**
- **Third Party Ceiling Enclosures**
- **Wall & Electrical Box Mounting**



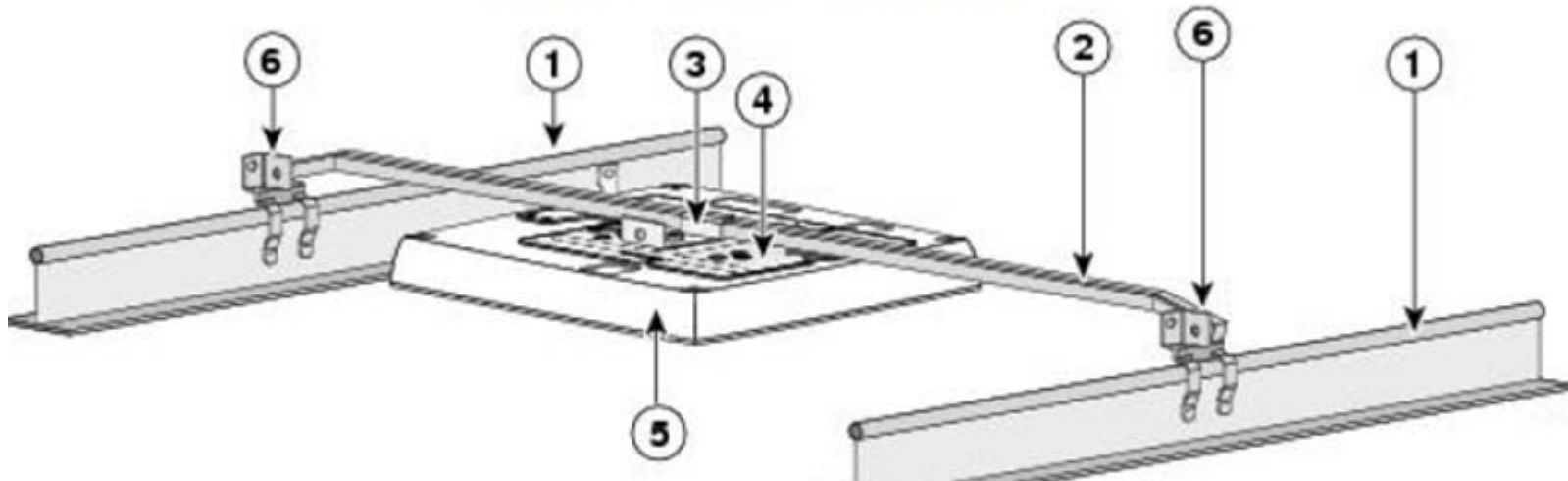
# Mounting Access Points

*Installation above the ceiling tiles*



An optional rail above the tiles may be used

T-Bar Grid Mounting Bracket Parts

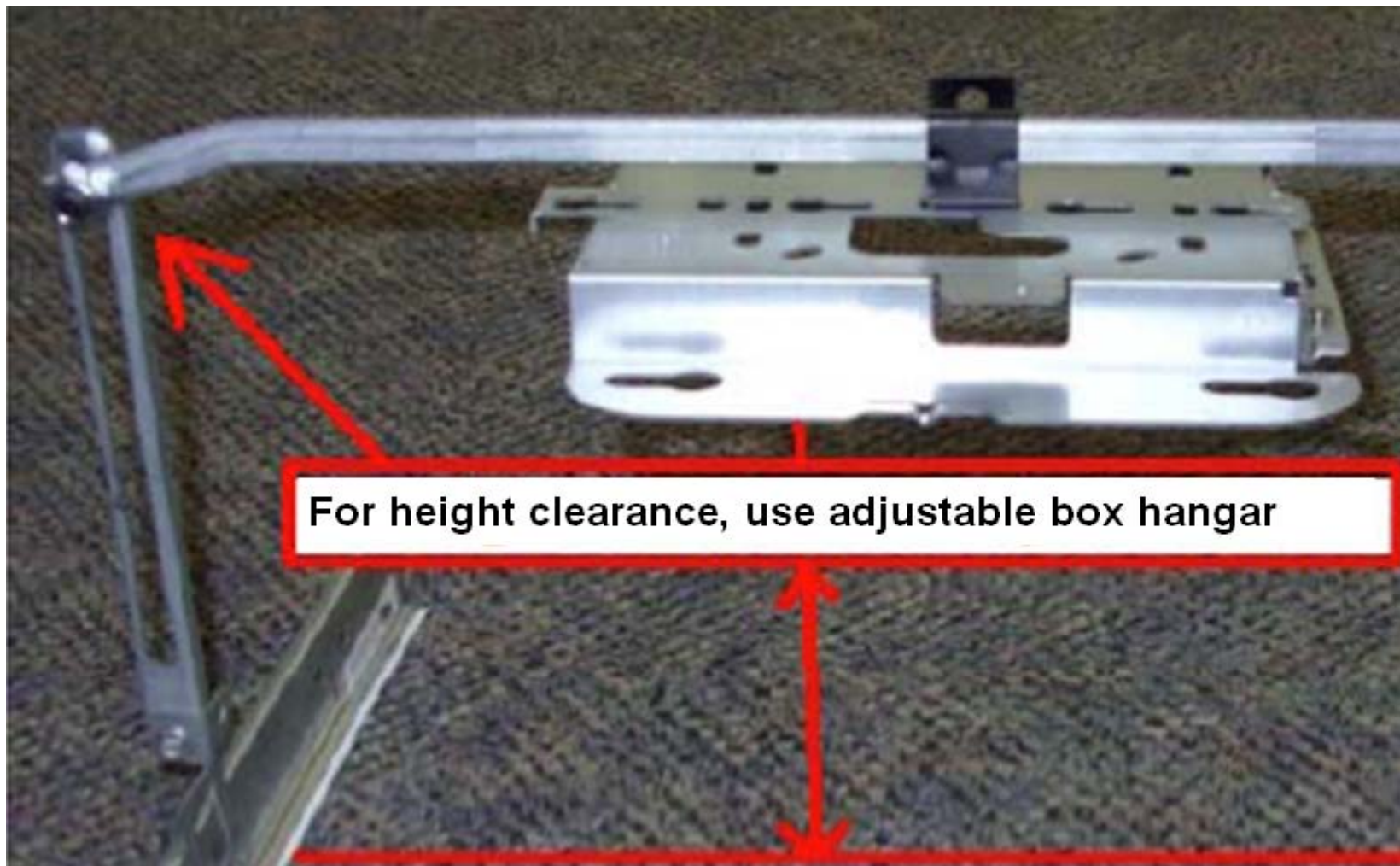


1	Suspended ceiling T-rail	4	<b>Universal Bracket</b>
2	T-bar box hanger	5	Access point
3	Bracket mounting clip	6	T-rail clip

*AP bracket supports this optional T-Bar box hanger item #2 (not supplied)  
Such as Erico Caddy 512a or Cooper B-Line BA50a*

# Mounting Access Points

*Installation above the ceiling tiles*





# Installation above the ceiling tiles

Mount AP close to the tiles and away from objects



**Try to find open ceiling areas away from metal obstructions (use common sense)**

Installing Access Points above the ceiling tiles should be done only when mounting below the ceiling is not an option.

Such mounting methods can be problematic for advanced RF features such as voice and location as they depend on uniform coverage

**Tip: Mount antennas either below ceiling tile or the AP as close to the inside of the tile as possible**

# New In-Tile Access Point Mount

Cisco Part Number **AIR-AP-BRACKET-3=**

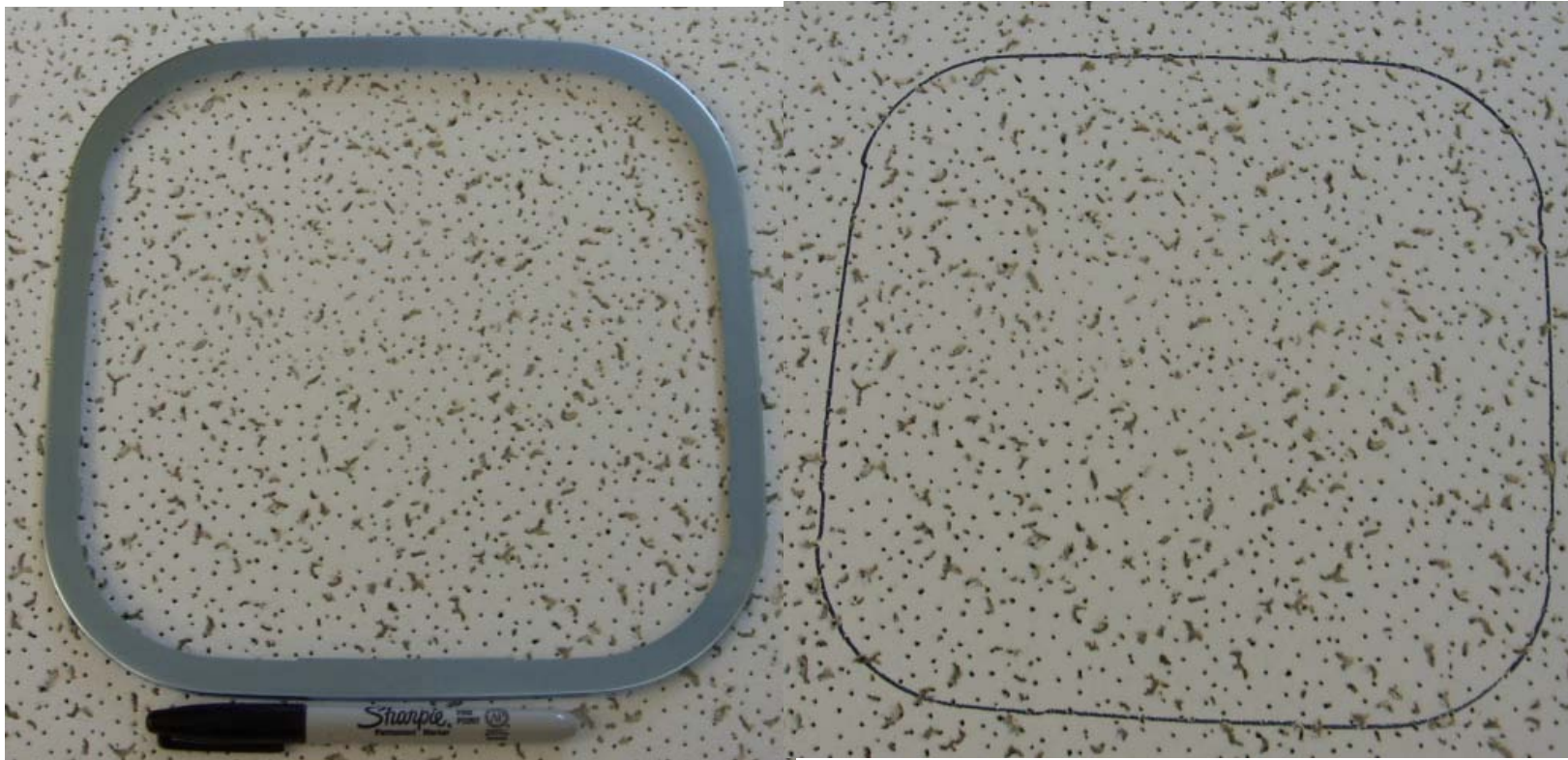


Access Point can be mounted inside the tile using this optional bracket.

Single piece is **AIR-AP-BRACKET-3=**

# New In-Tile Access Point Mount

Cisco Part Number **AIR-AP-BRACKET-3=**



**This can be installed using the ring as a template to draw the circle and then cut the tile with a knife or cutting tool.**



# Access Point mounting

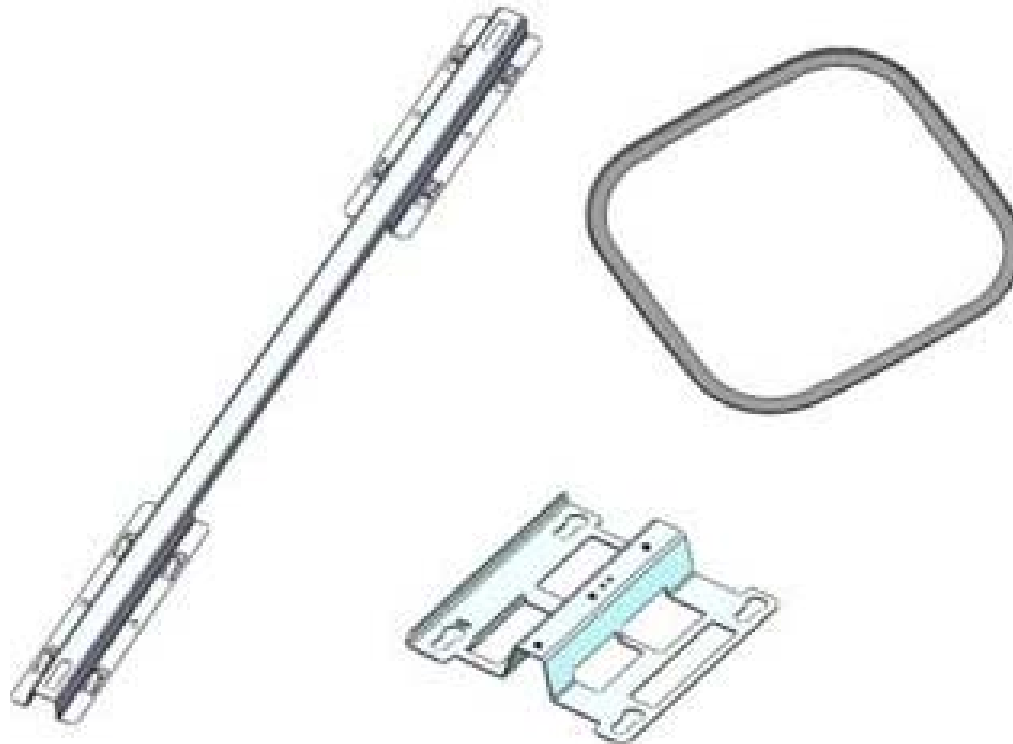
*AP secured with metal strut and adjustable bracket*



*Finished installation puts the Access Point flush into the tile for best overall antenna performance and aesthetics.*

# Access Point mounting

## Components of the AIR-AP-Bracket-3=



*Bracket kit comes with span bracket to transfer load to the T-Rail, Cosmetic bezel and wing bracket that attaches to the rear of the AP.*

# Access Point mounting

## *Security Options*

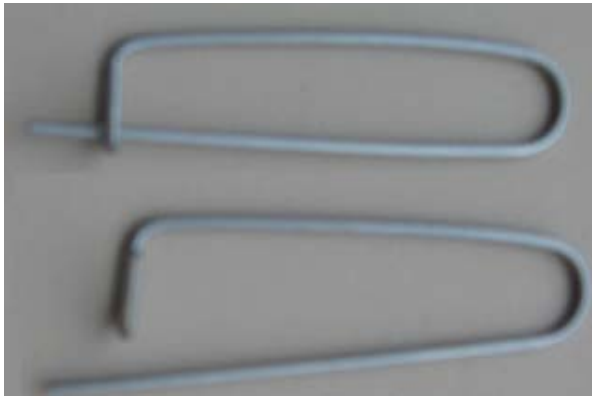


Access Point can be secured using a Kensington style locking cable, or secured in the bracket using a common padlock



# Access Point mounting (cont.)

## Security Options – Continued



If a padlock is not used, a plastic tie or third party wire pin may be used. Pin is available from ...

McMaster-Carr web site: <http://www.mcmaster.com/>  
The McMaster part number is: **90319A120**



# Mounting and understanding ceiling grid hardware



**NOTE: \*NEW\*** URL for help with Cisco  
Access Point mounting options

**[www.cisco.com/go/bracket](http://www.cisco.com/go/bracket)**



# Different types of ceiling tiles

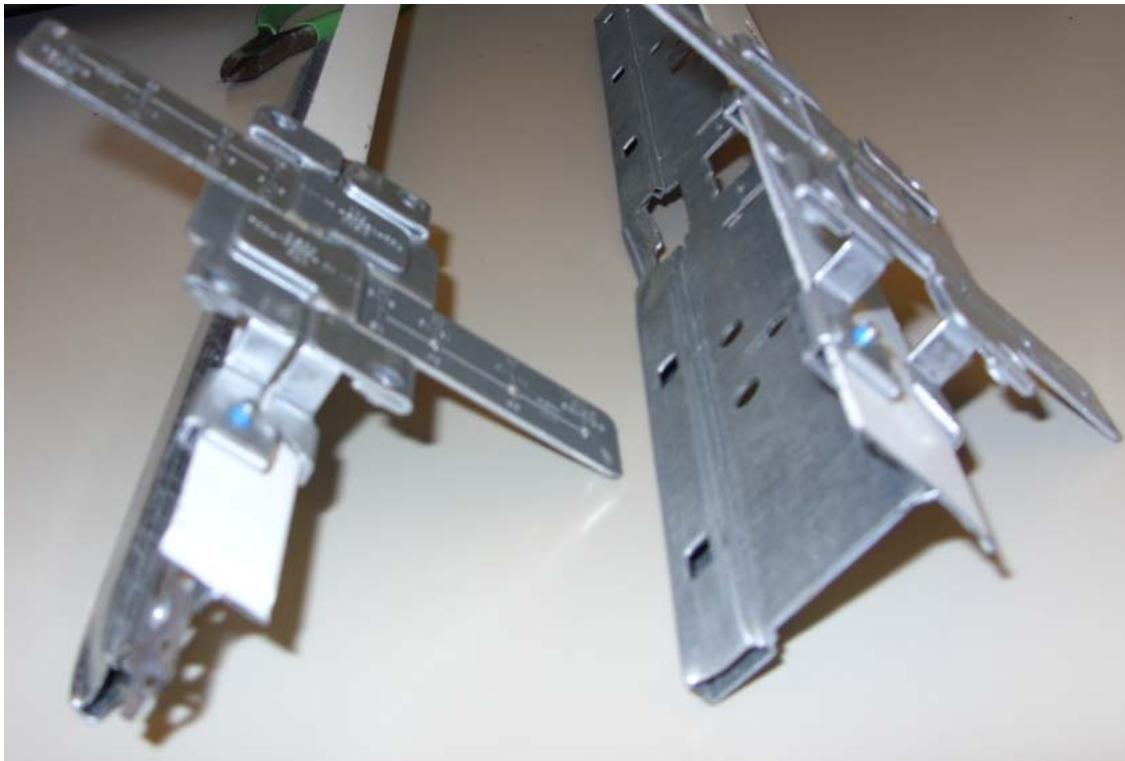
*Understanding recessed tiles and flush tiles*



**Recessed tiles (left) the tile hangs below the rail.  
Flush tiles (right) the tile is flush with the rail**

# Different types of ceiling rails

*The “T”-Rail is the most common ceiling rail*



AIR-AP-T-RAIL-F  
Ceiling Grid Clip (Flush)

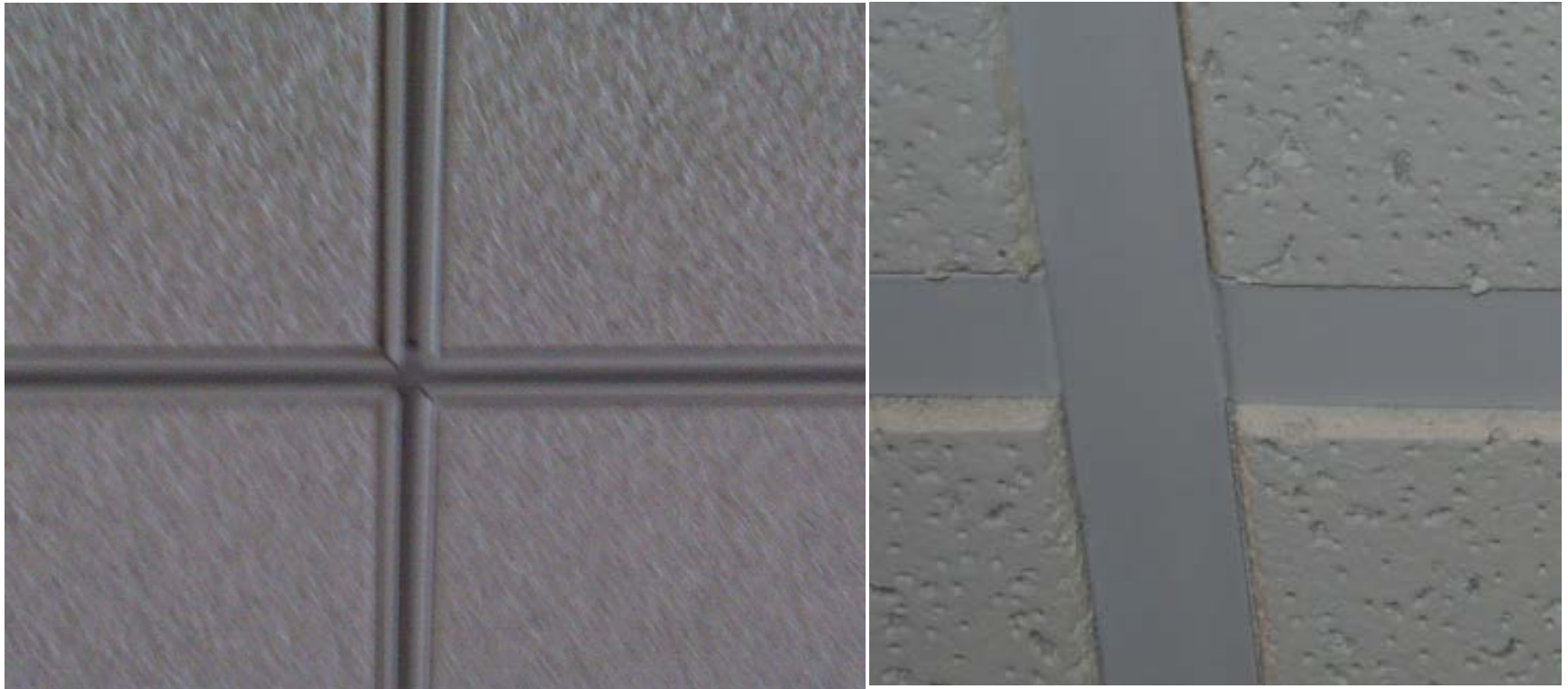


AIR-AP-T-RAIL-R  
Ceiling Grid Clip (Recessed)

**Common ceiling T-Rails come in different widths and we have two heights of T-Rail clips (recessed and Flush) depending on the type of tile used**

# Different types of ceiling rails

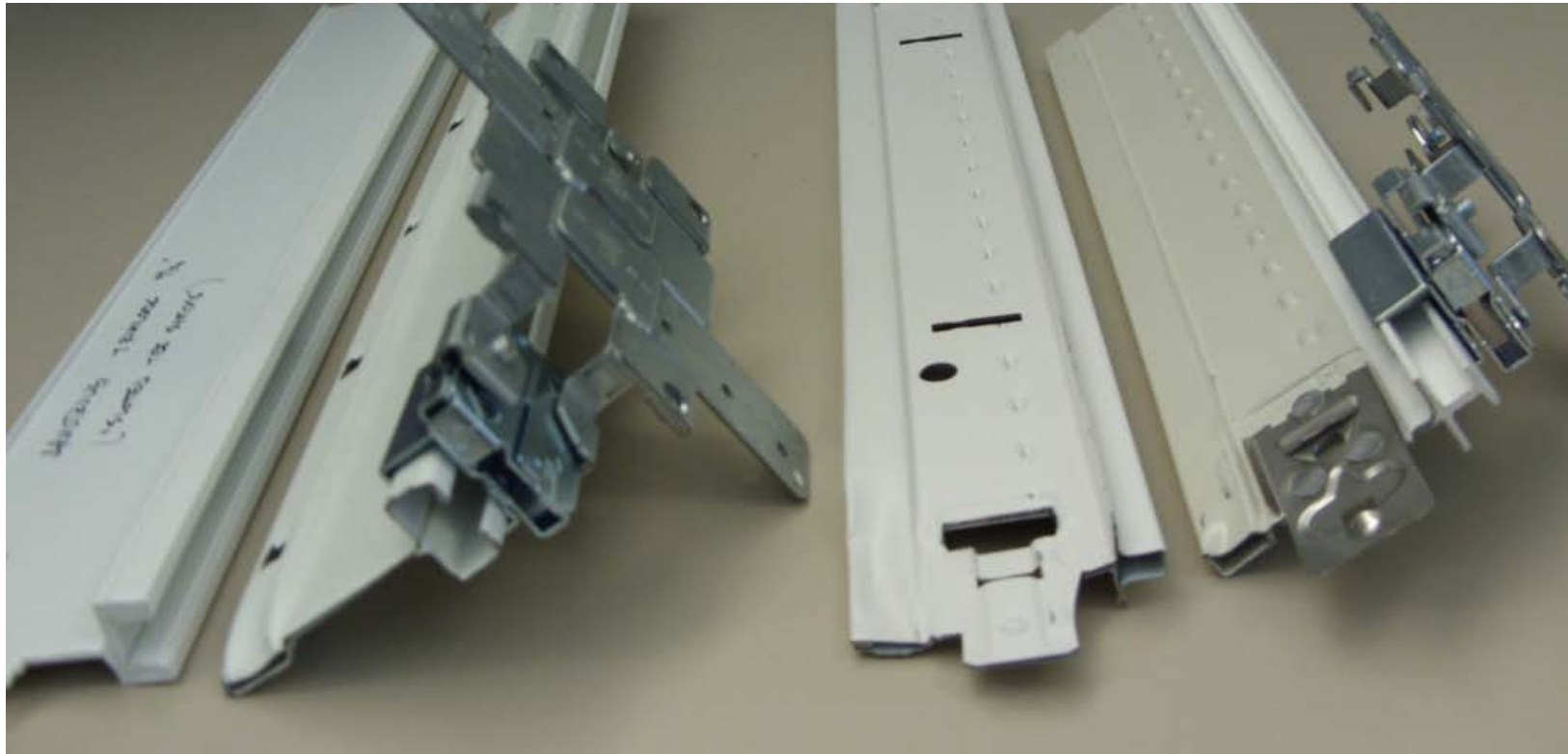
*Channel and beam rail type ceiling rails*



**Channel and Beam rails (left) require special channel adapters – “T” rail the most common (right) does not**

# Different types of ceiling rails

*Channel rails and beam rails require special clips*

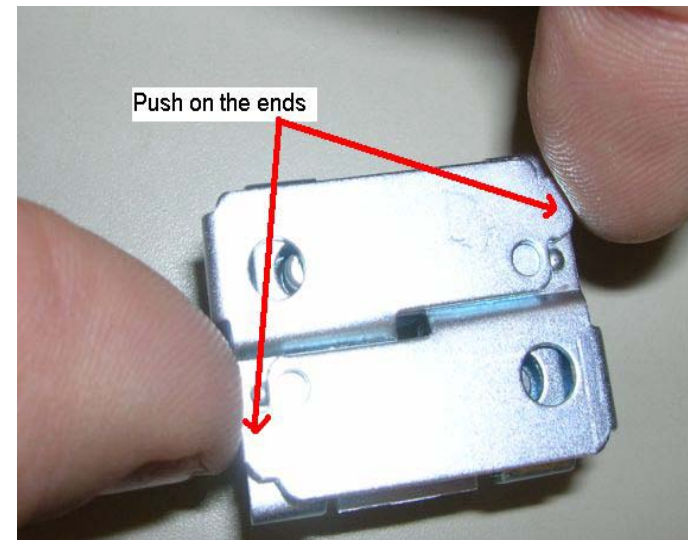
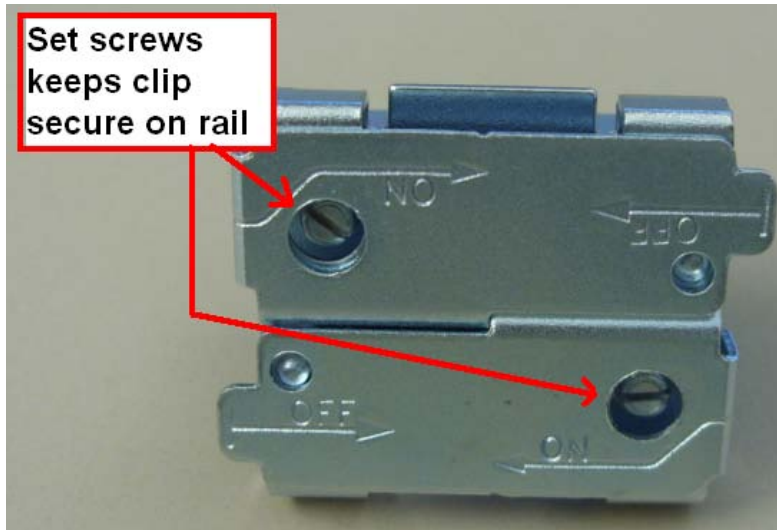


**Channel rails (left) and beam rails (right) require the use of a special ceiling adapter clip to adapt to our T-Rail support clips.**



# Ceiling Adapter Clips

## *Taking the clips apart*



Channel and Beam adapter  
**NEW PART NUMBER**  
**Cisco AIR-CHNL-ADAPTER**  
and it has two clips in the package enough for one Access Point. Old part #  
**AIR-ACC-CLIP-20= (is now deprecated)**



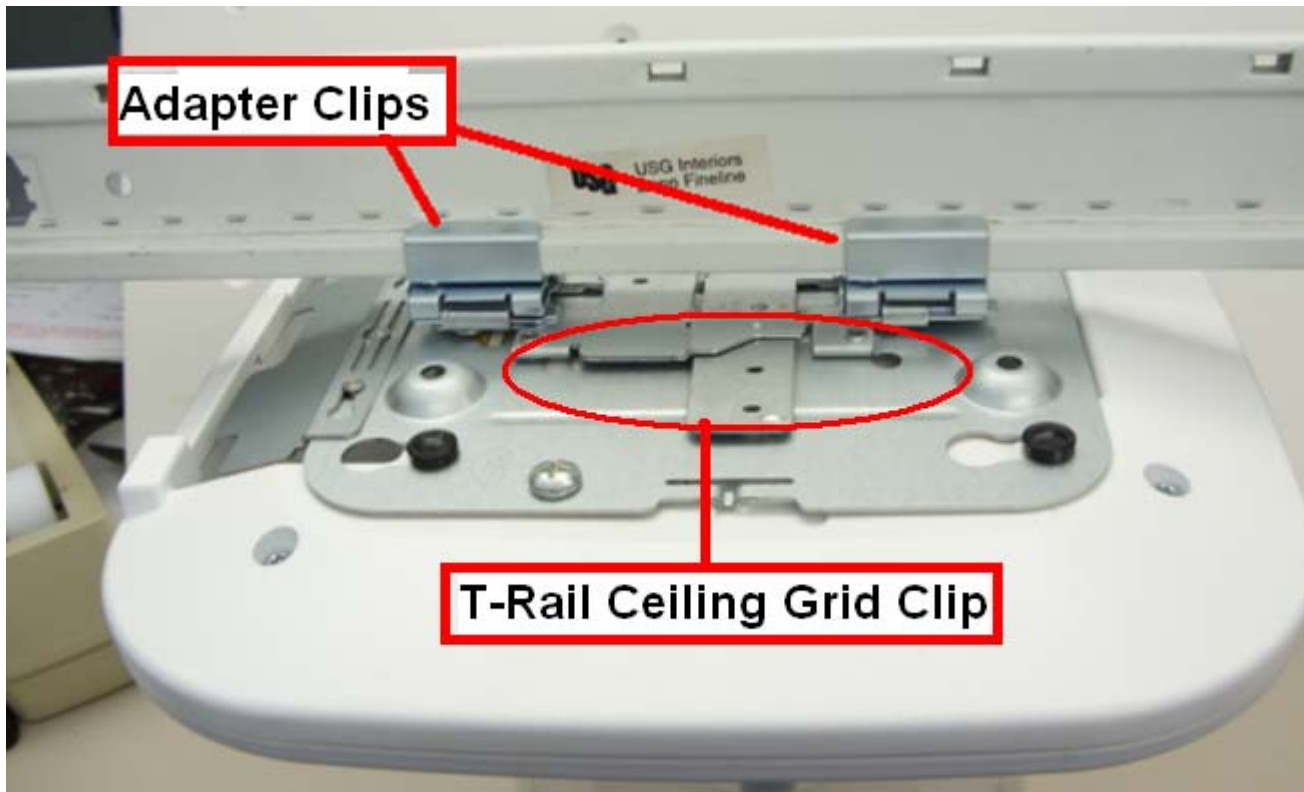
# Ceiling Adapter Clips

*Secure clips to the ceiling channel and beam rails*



# Adapter Clips adapt to Rail

*Attaching to Channel and Beam rails*



Channel and Beam rails require special adapter clips that convert those rails to mate with the T-Rail ceiling grid clips.

Part Number for ceiling clips is **AIR-CHNL-ADAPTER**  
This item (is packaged in 2 pieces) for 1 Access Point  
T-Rail clip is **AIR-AP-T-RAIL-F (Flush) or -R (Recessed)**

**Ceiling rail  
accessories must  
now be specified  
during ordering  
process**



# Reference



**AIR-AP-T-RAIL-R**  
Ceiling Grid Clip (Recessed)

If the tiles are hanging below the rail and there isn't enough clearance this clip is recommended.

If the tiles are flush with the rail  
Then the bracket may hang slightly  
Lower - If so then recommend the  
flush clip



**AIR-AP-T-RAIL-F**  
Ceiling Grid Clip (Flush)

This clip along with the  
Low profile ceiling bracket  
permits a very snug fit against  
Tiles that are flush with rails

# Reference



**AIR-AP-BRACKET-1**  
AP Bracket: Low-Profile

This Bracket provides the best (flush) mount for below ceiling tiles but does not accommodate network / electrical box or wall mounting



**AIR-AP-BRACKET-2**  
AP Bracket: Universal

This bracket will work with electrical boxes, wall mounting and adapts to ceiling installations but not as flush to the tile as the low profile bracket. Works in all environments.



# User Selection – AP Brackets



Affected Platforms: AP1040, AP1140, AP1260, AP3500i, AP3500e

- Starting September 2010, customers ordering above platforms will be able to select AP bracket through the configuration tool
  - AIR-AP-BRACKET-1 (Low-Profile)
  - AIR-AP-BRACKET-2 (Universal)
- Customer can select one of the two, NOT both
- Both options are \$0 at time of configuration
- If nothing is selected, the default selection is AIR-AP-BRACKET-1 (Low-Profile)

# Spares



- Given the differences in ceiling tiles and rails and the different mounting options:
- Starting August 2010, customers can order individual mounting components

Product ID	Description
AIR-AP-T-RAIL-R=	Ceiling Grid Clip – Recessed
AIR-AP-T-RAIL-F=	Ceiling Grid Clip – Flush
AIR-AP-BRACKET-1=	AP Bracket – Low Profile
AIR-AP-BRACKET-2=	AP Bracket – Universal

Note: Accessory clips for channel and beam rails are also available packaged two in a bag (as two clips are used per AP) Part number is **AIR-CHNL-ADAPTER**

# Access Point (wall) Network / Electrical Box mounting



# Network Box and Wall Mounting



**AIR-AP-BRACKET-2**  
AP Bracket: Universal  
(lower right)

Permits Access Point mounting to Wall and Electrical Boxes as the hole patterns are designed to line up and the recessed bracket allows for cable routing.

# AP Placement – Wall Mounting



**AP-1040, 1140 and AP-3500i**

Wall mounting is acceptable for small deployments such as hotspots, kiosks, etc but antenna coverage is better when mounted on ceiling



**AP-1260 and AP-3500e**

Best for enterprise deployments as coverage is more uniform especially for advanced features such as voice and location



# Third Party options (color skins) and locking enclosures from Oberon



# Third Party options to change color.



## Specifications:

- Fabricated from textured ABS plastic
- The skin is virtually transparent to access point radio frequency transmission.
- Attaches to access point with Velcro tabs (included)
- Available in five standard colors: Black, Dark Grey, Light Grey, Tan, Navy Blue
- Custom colors are available on request.

[www.oberonwireless.com](http://www.oberonwireless.com) Phone (814) 867-2312

# Locking Ceiling Enclosures



[www.oberonwireless.com](http://www.oberonwireless.com) Phone (814) 867-2312

# Outdoor NEMA Enclosures



NEMA enclosures  
available from 3<sup>rd</sup> party  
sources such as...

[Oberonwireless.com](http://Oberonwireless.com)  
[Sparcotech.com](http://Sparcotech.com)  
[Extronicswireless.com](http://Extronicswireless.com)  
[Tessco.com](http://Tessco.com)  
[Panduit.com](http://Panduit.com)

## Example Oberon # 1025-00

Many different models are available - Some have  
heating and cooling for wide temperature applications

# AP-1040 Mechanicals



# AP-1040 Series...

*Similar in Physical Design as 1140*



**AP-1040 has recessed sides as it is a 2x2 MIMO**  
**AP-1140 has two extra receive antennas for 3x3 MIMO**



# AP-1040 Series (low cost)

*Similar in Physical Design as 1140*

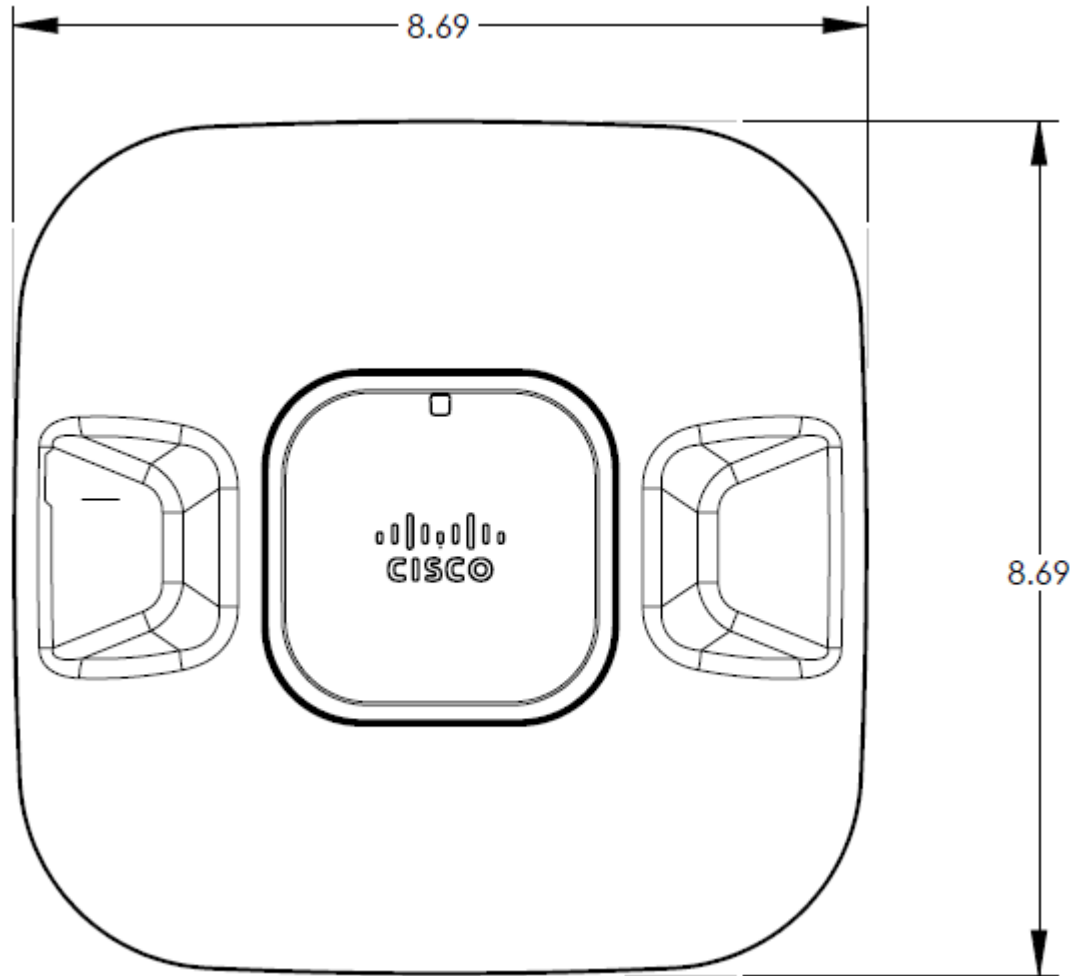


**Lower cost Access Point (no Spectrum Intelligence)**

**(Entry level AP) 2x2 with 2 spatial streams - lower performance.**

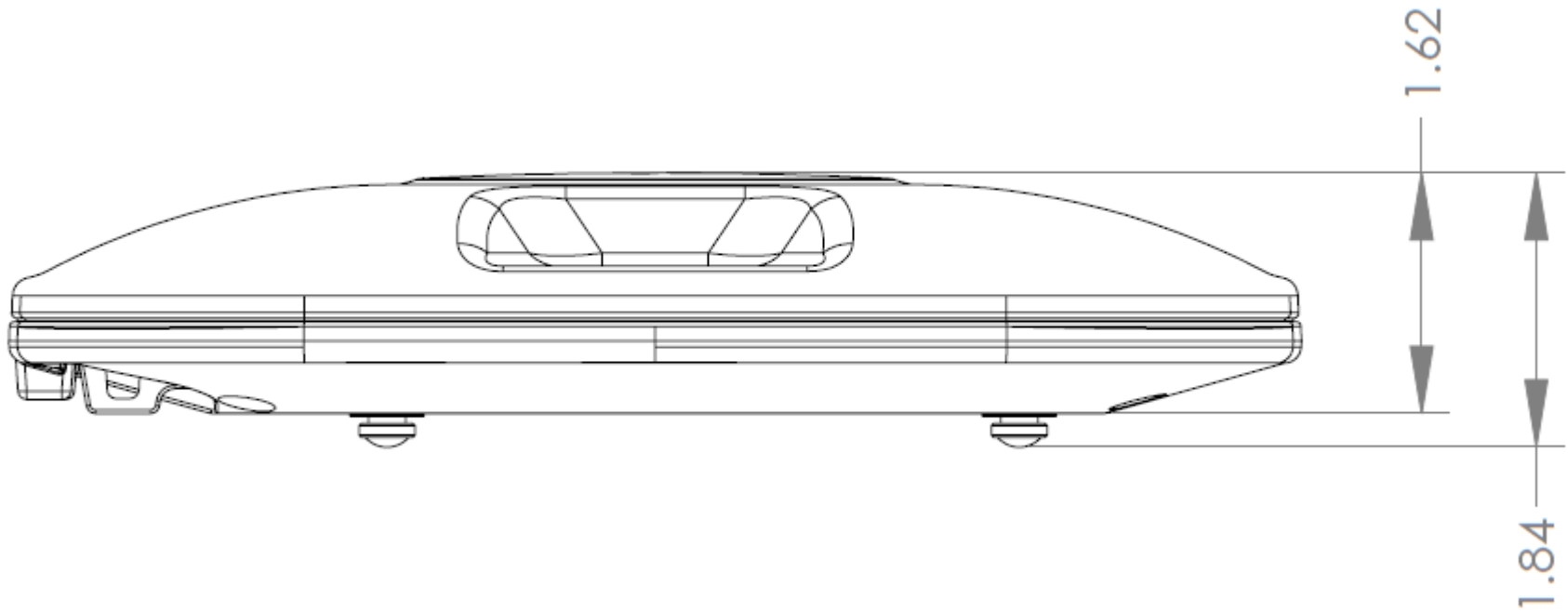
# AP-1040 Series

## Mechanicals



# AP-1040 Series

## *Mechanicals*



# AP Series Mounting Bracket

**AIR-AP-BRACKET-1**



This bracket was originally part of the AP-1140 and had an early part number of AIR-AP1140MNTGKIT=

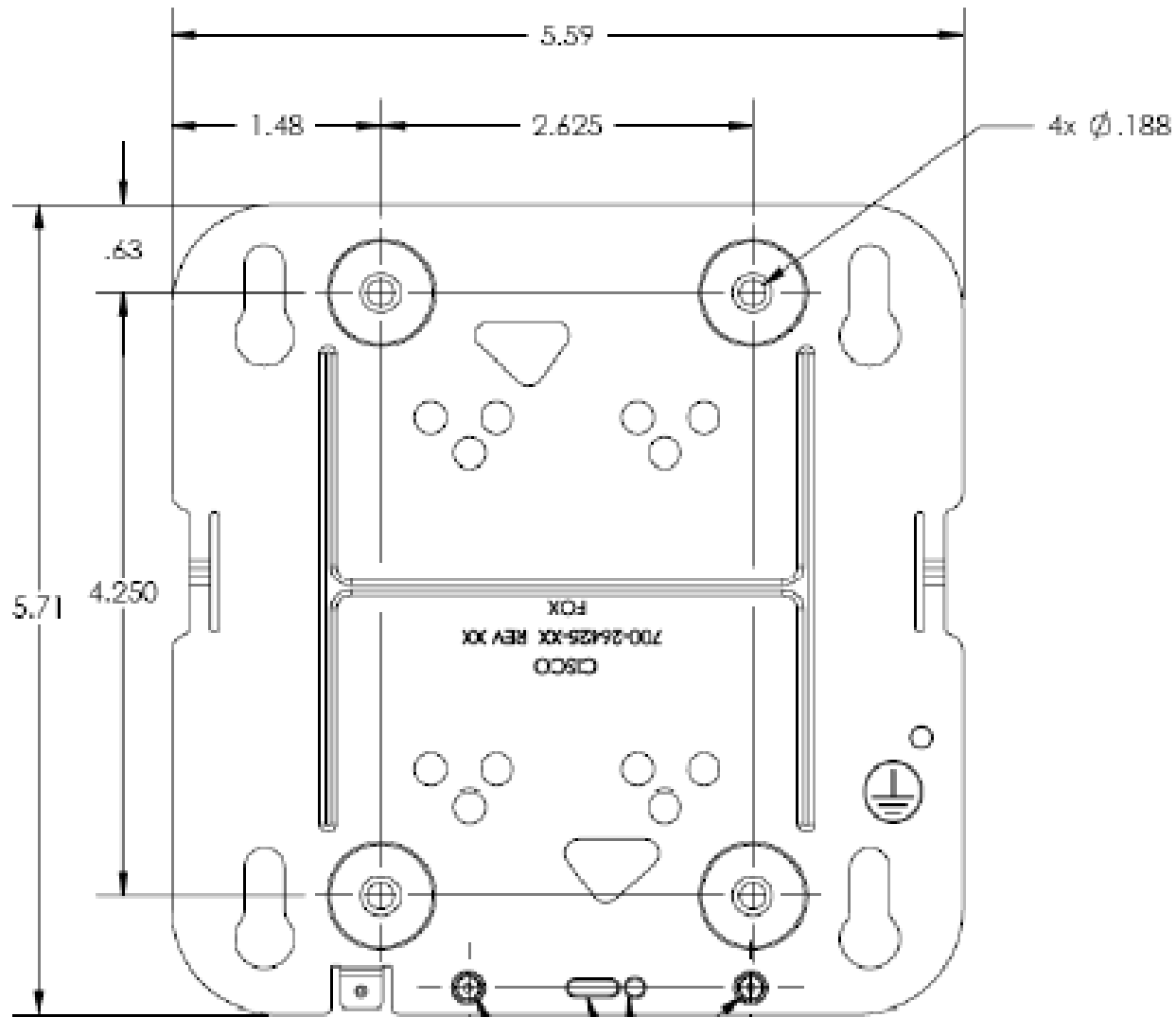
It is best used for low profile ceiling mount applications

Part Number **AIR-AP-BRACKET-1**

Low profile ceiling bracket (mounts flush to ceiling tiles)

# AP Series Mounting Bracket

*AIR-AP-BRACKET-1*



# AP Series Mounting Bracket

**AIR-AP-BRACKET-2**



This is a more “universal” type mounting bracket with lots of holes for mounting to enclosures.

Note: when using it on ceilings the AP is not as flush to the tile.

Part Number **AIR-AP-BRACKET-2**

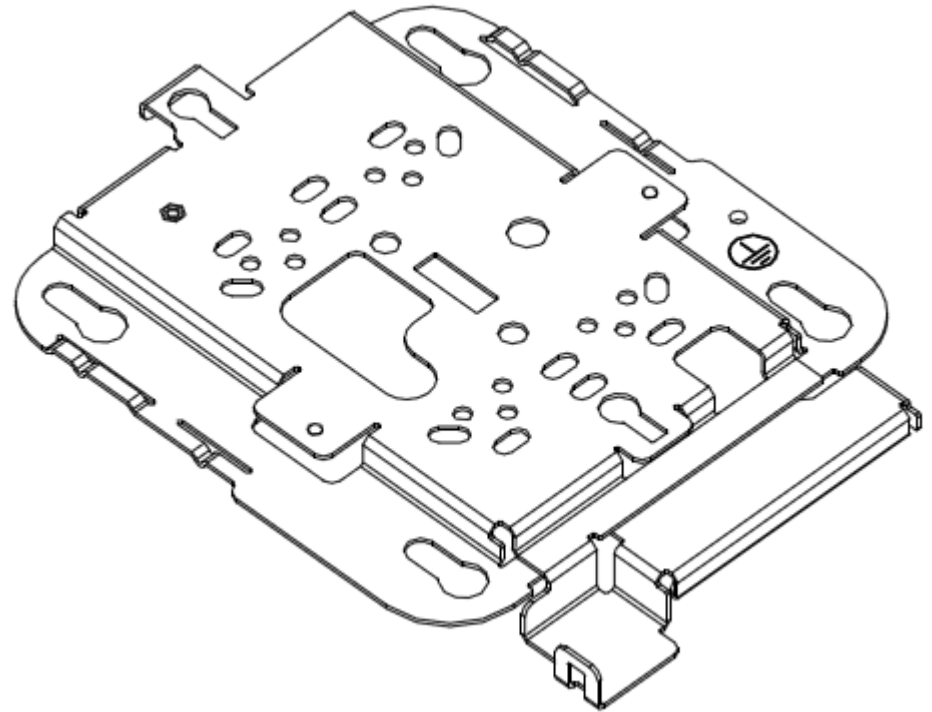
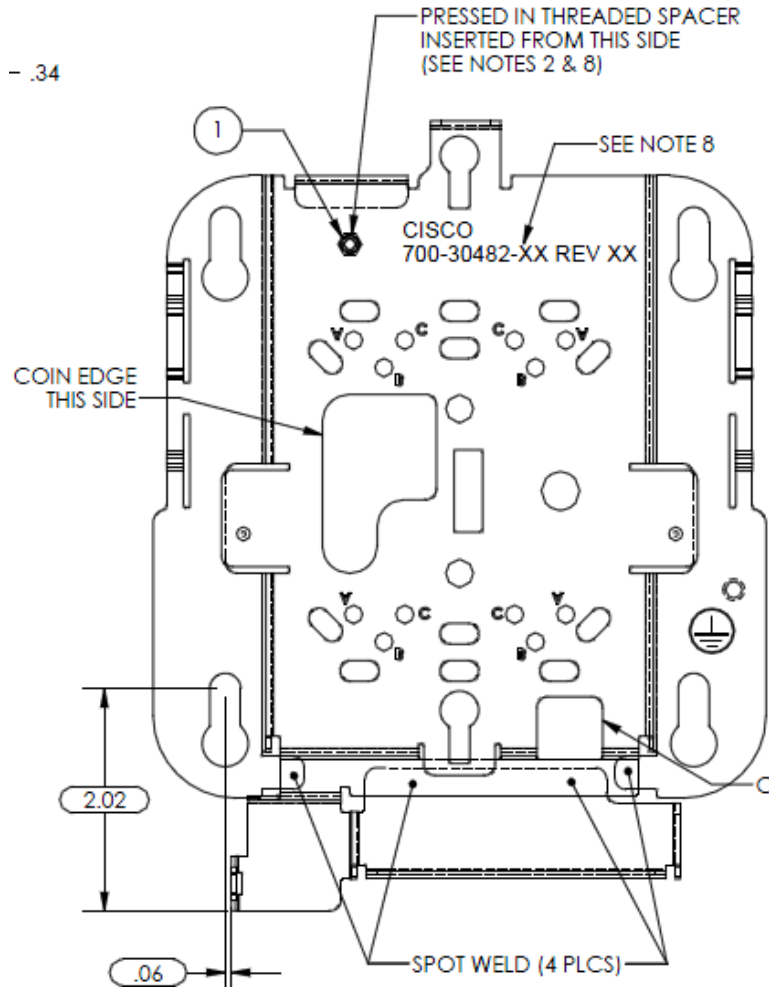
Permits wall, ceiling and network / electrical box mounting





# AP Series Mounting Bracket

## AIR-AP-BRACKET-2



# Power options with Mechanicals



# Power Requirements

*AP-1040, 1140, 3500 and 1260 Access Points*



All of these access Points use 802.3af power, 12 Watts at the Power Source – up to 15.4 Watts at the end of 100 meters of Ethernet cable.

None of these Access Points use Cisco pre-standard power and all of them can be powered by the Cisco Power Injector **AIR-PWRINJ4**

The Cisco Power injector is not a repeater, it simply supplies power so maximum length is still 100 meters.

# Local Power Supply

Cisco Part Number AIR-PWR-A= (older supply)



This is the older power Cisco AP supply while it will work with the AP-1040, it has been replaced by the AIR-PWR-B=



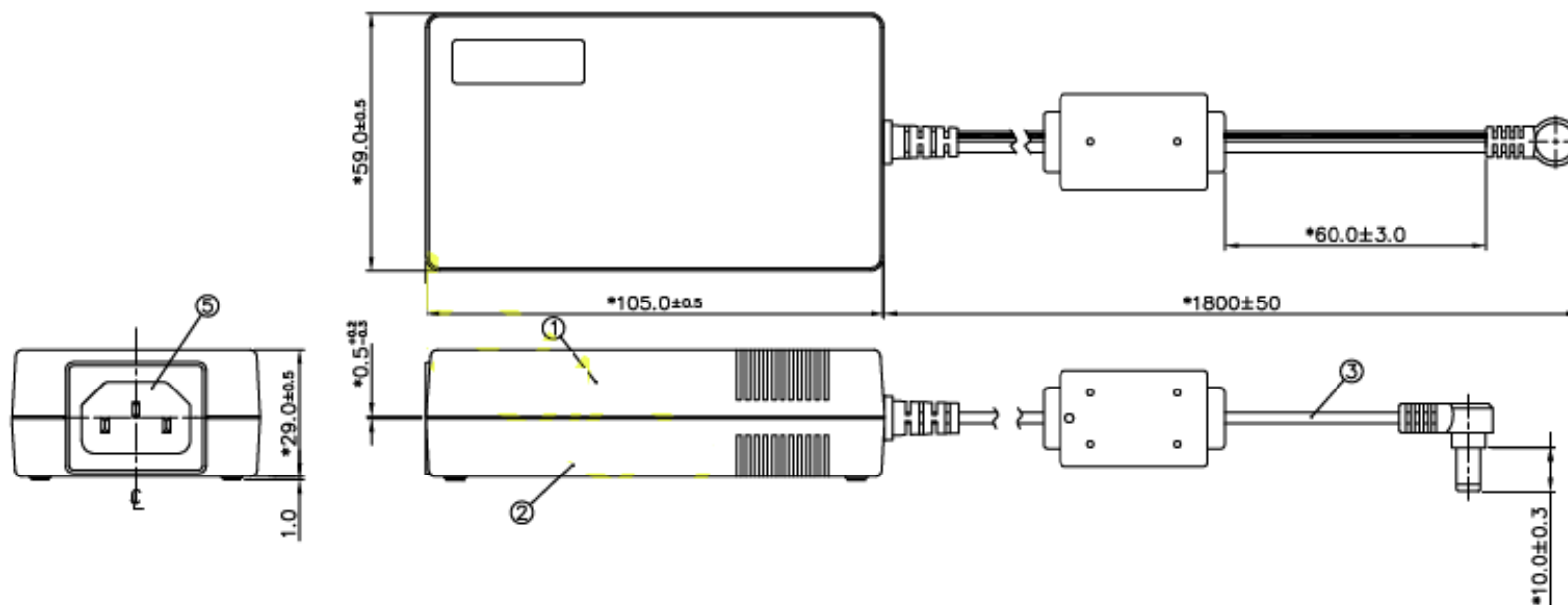
Note: Output power is 48 Volts DC at 380 mA

# Local Power Supply

*AIR-PWR-A= (older model)*



## Mechanical Drawing AIR-PWR-A=





# New local Power Supply

Part Number AIR-PWR-B= (newer supply)



This newer “Energy Star” rated power supply AIR-PWR-B= is identical electrically to the earlier (End of life AIR-PWR=A) that was not Energy Star.



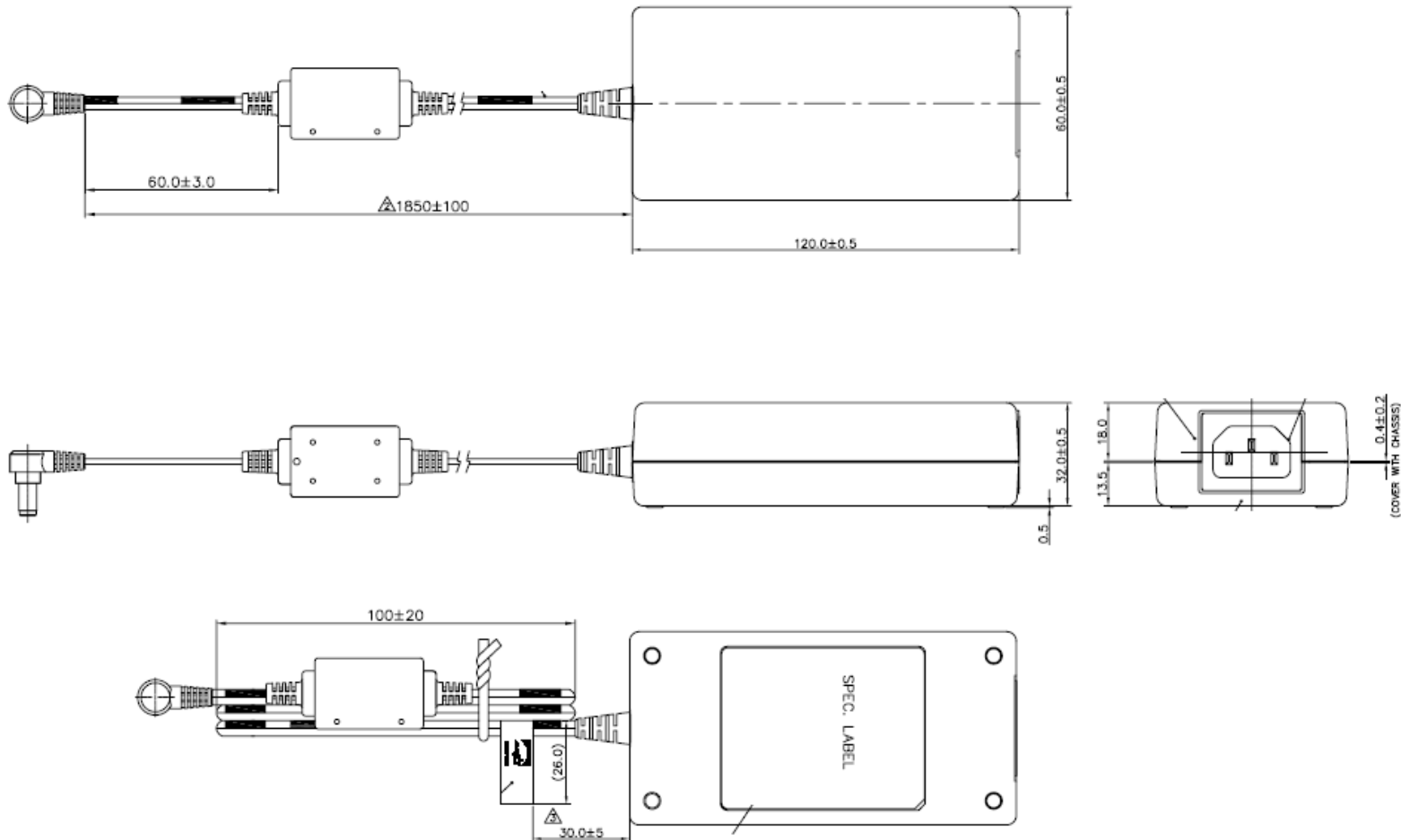
Power Supply output is 48 Volts DC at 380 mA

# Access Point Local Power Supply

Cisco Part Number **AIR-PWR-B=**



## Mechanical Drawing AIR-PWR-B=



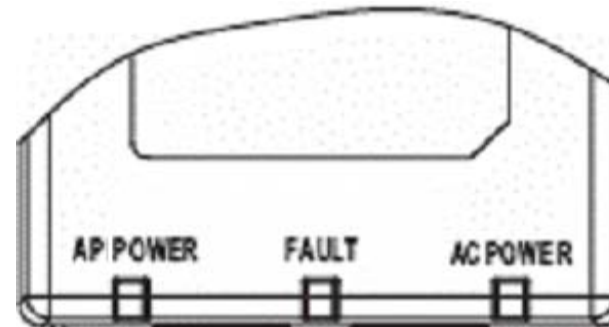
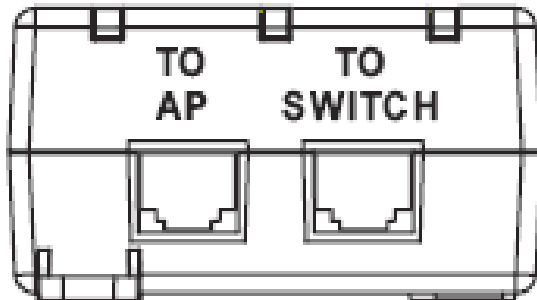
# Cisco PoE Power Injector

Cisco Part Number **AIR-PWRINJ4**



CISCO AIRONET  
POWER INJECTOR  
P/N: AIR - PWRINJ4

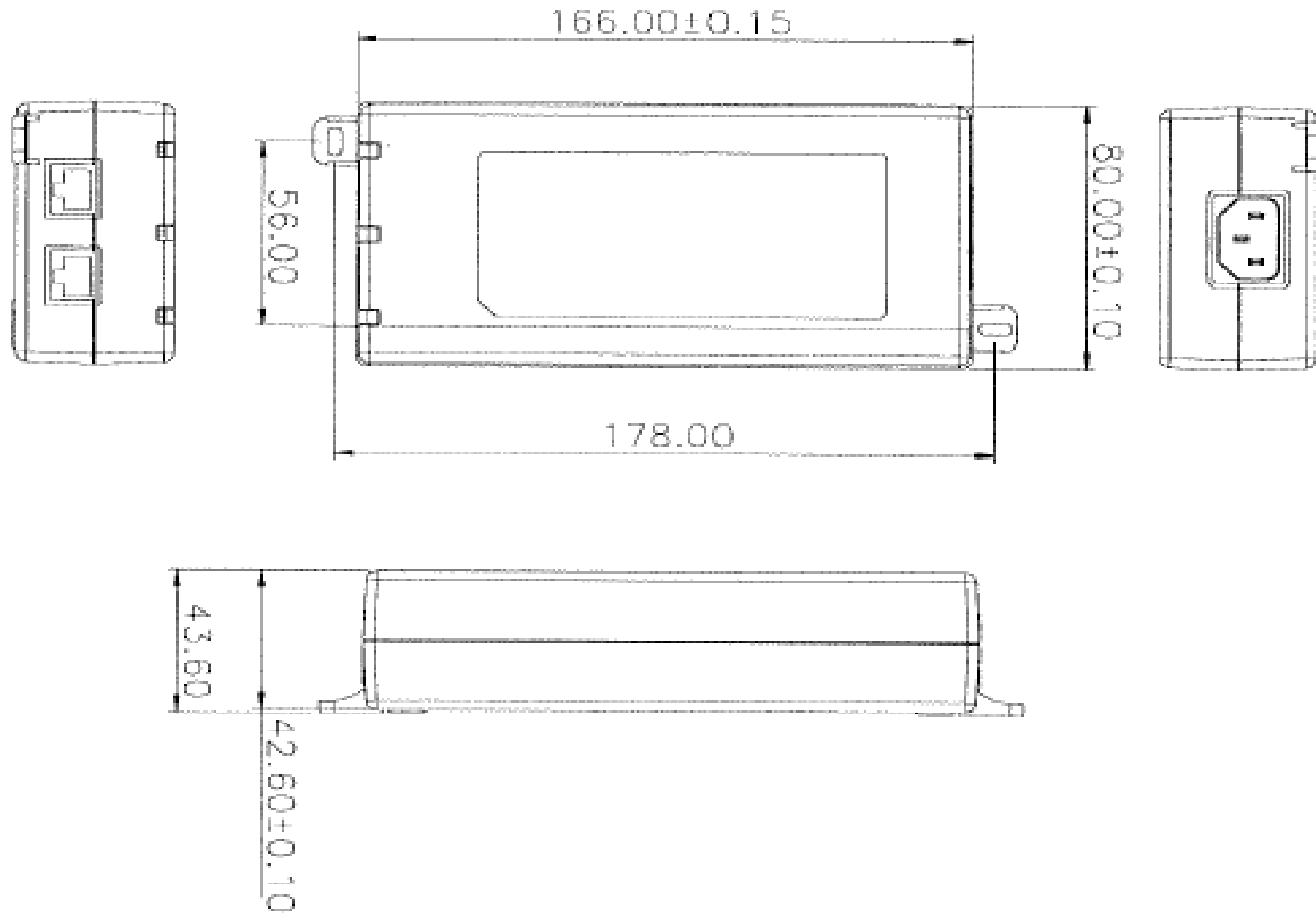
MODEL (型號): POE30U-560(G)-C-R  
INPUT (輸入): 100-240V ~ 0.95A  
50-60Hz  
OUTPUT (輸出): 56V === 0.55A



**Note:** Although the AP-1040 only draws 12.95 Watts, this Power Injector is also capable of providing higher power for the Cisco 1250 Series Access Points. This injector can be used with 1140, 1040, 3500 and 1250 Series Access Points.

# Power Injector

## AIR-PWRINJ4 (Mechanical)



# Power Injector – Voltage Characteristics



## INPUT VOLTAGE AND FREQUENCY

Parameter	Minimum	Nominal	Maximum
Voltage Range	85 VAC	100-120 VAC	132VAC
	170 VAC	200-240 VAC	264VAC
Line Frequency	47Hz	50/60Hz	63Hz

## OUTPUT DC VOLTAGE AND CURRENT

Output Voltage (VDC)	56.0V
Voltage Range*	54V to 57V
Voltage Tolerance	-3.6%, +1.7%
Min. Current (mA)(no load)	15
Max. Current (A)	0.550

# Power Injector AIR-PWRINJ4 (specifications)



## *TEMPERATURE*

Operating: -20 to +55 degree C.

Non-operating: -40 to +85 degree C.

## *HUMIDITY*

Operating: 10% to 90%, non-condensing.

Non-operating: 10% to 95%, non-condensing.

## *THERMAL SHOCK*

Operating: -20 to +55 degree C at 0.5 degree C per minute.

Non-operating: -40 to +85 degree C. with change over time between 2 and 3 minutes.

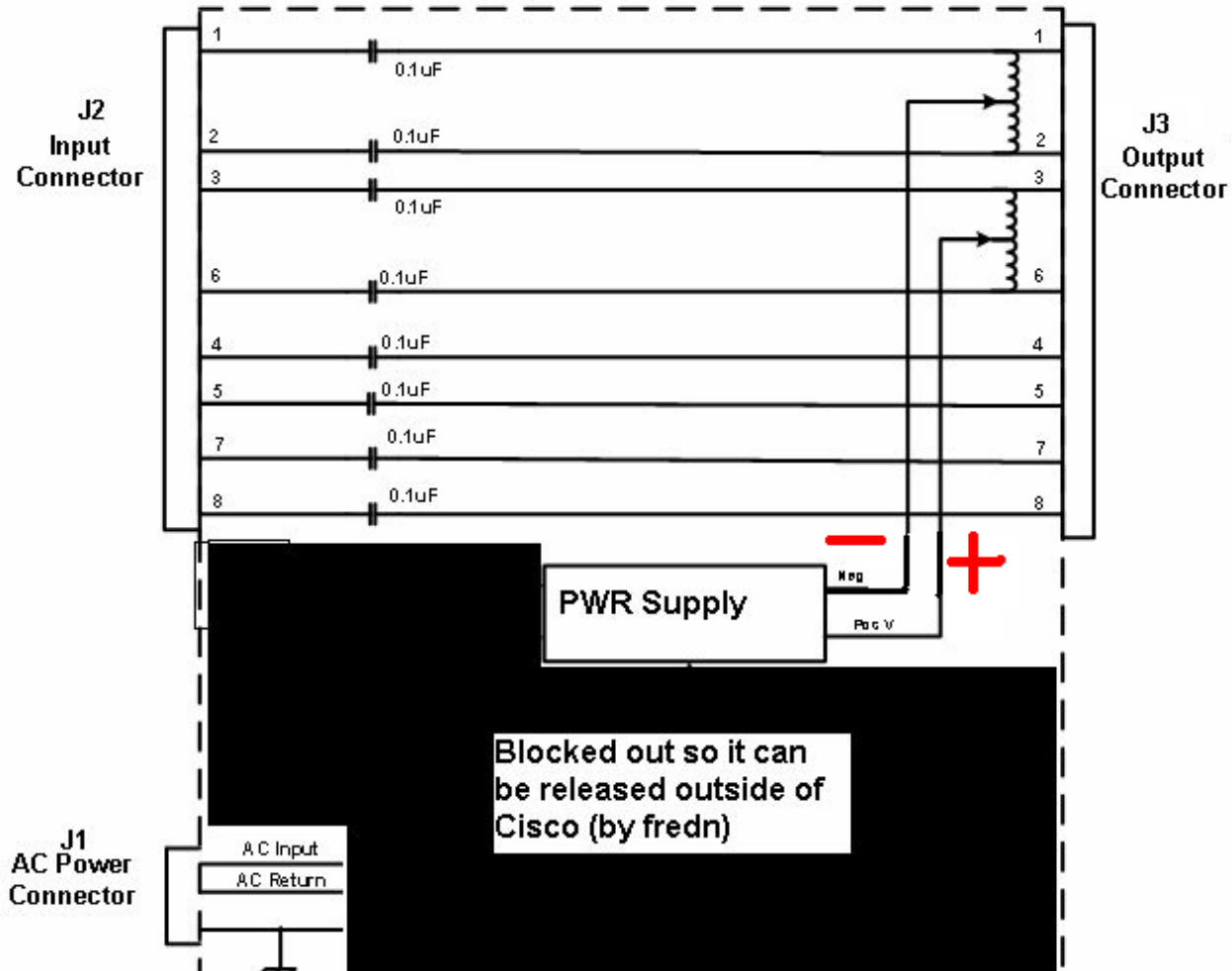


# Power Injector

## AIR-PWRINJ4 (electrical)



### BLOCK DIAGRAM DESCRIPTION



# Not promoted for anything other than AP-1250 AIR-PWR-SPLY1 (used for 1250 Series)






**AP-1250 Power Supply is 56 Volts DC**

This supply will power the other APs in a pinch, but it is overkill and at this time has not been FCC tested for use with the other Aps.

We are looking into certification for those customers who wish to stock only one supply for spares.

When ordering use Cisco Part Number AIR-PWR-SPLY1=

 **DELTA ELECTRONICS, INC.**  
(台达电子工业股份有限公司) (台達電子工業股份有限公司)  
**AC/DC ADAPTER** 电源适配器/交换式电源供应器  
**CISCO P/N : AIR-PWR-SPLY1(341-0211-01) REV : A0\***  
**MODEL** 型号/型号: **EADP-45BB B**  
**INPUT** 输入/输入: **100-240V~1.5A 50-60Hz**  
**OUTPUT** 输出/输出: **56V 0.8A** 



# Aironet 1250 Power Supply

**AIR-PWR-SPLY1**



## Mechanical Drawing AIR-PWR-SPLY1=

