

Portable Product Sheet - Aironet



Last Updated: December 8, 2004

General Information - Application Notes

Access Points are primarily used for In-Building connectivity (Wireless Client to LAN).

Bridges are primarily used for Building-to-Building (LAN to LAN) connectivity.

802.11b equipment is fully interoperable, with the notable exception of 340 series bridges and 350 series bridges not being able to work together.

Access Points/Bridges have no moving parts (such as a fan).

A Bridge can connect to another bridge or wireless clients (or both at same time).

An access point connects only to clients and/or workgroup bridges.

A workgroup bridge can only connect to either an AP or a Bridge in AP mode.

A client adapter cannot connect to a workgroup bridge (WGB doesn't support ad hoc mode).

Range and performance of 802.11b links are not affected by bad weather.

Any RP-TNC equipped AP or Bridge can use any RPC-TNC antenna (however you will generally use AP antennas with AP's and Bridge antennas with Bridges).

350 series equipment is all 100mW, power output selectable for country codes.

ISL can be trunked over the wireless link, but the MTU must be increased from 1500 to 1550.

Default SSID is "tsunami".

When an AP is set to Client mode, its ethernet interface is forced into a blocking state.

Client card communication maxes out at a distance of 1 mile, regardless of antenna hardware used, when communicating with an AP. When doing client-to-bridge-in-AP-mode, Cisco Bridges "break" the 802.11 timing restrictions and allow whatever distance allowable by antennae.

Access Points and Bridges support SNMP management and are manageable via a web browser.

802.11a: 5.0 GHz, 54Mbps, 8 non-overlapping channels, not compatible with 802.11b or g.

802.11b: 2.4 GHz, 11Mbps, 3 non-overlapping channels, compatible with 802.11g.

802.11g: 2.4 GHz, 54Mbps, 3 non-overlapping channels, compatible with 802.11b.

Binary Phase Shift Keying (BPSK) is used at 1 Mbps.

Quaternary Phase Shift Keying (QPSK) is used at 2 Mbps.

Complementary Code Keying (CCK) is used at 5.5 and 11 Mbps.

Orthogonal frequency division multiplexing (OFDM) is used at 6 to 54 Mbps.

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General Information - WEP/Security Notes

WEP = Wireless Equivalent Privacy encryption, available 40bit and 128bit, or no WEP at all.

128bit WEP is restricted to the US and selected countries.

Since WEP is done in hardware, there are no noticeable performance penalty for turning it on.

Last digit denotes encryption level: 0=no encryption, 1=40bit, 2=128bit. "K9" also denotes 128-bit.

Cannot upgrade 0-bit to 40-bit or 128-bit, or 40-bit to 128-bit.

WEP can be configured "down" (i.e. 128-bit configured to use 40-bit), but not "up."

WEP encryption is 128 bit, and is 26 hex characters: (24 bit header- standard) + (26 hex characters= 4 bits x 26 or 104).

When doing dynamic WEP key establishment using LEAP and CSACS, the timeout for key renegotiation is held on the CSACS server. Should an AP/BR lose connection to the CSACS server, it will continue to allow the key to be used indefinitely, until the CSACS connection is restored.

WEP has many publicized issues regarding how "secure" it is, in particular the notion that "sniffing" a wireless LAN for ~15 minutes can result in a WEP key that is hacked. Cisco dynamic WEP establishment using LEAP and CSACS gets around this (so long as strong passwords are used to avoid brute force attacks), so long as the timing is honed for ~10 minutes between key updates. TKIP and MIC can also be implemented to "harden" wireless LAN's.

General Information - Antennas

Requires Radio Line-of-Site more than Visual Line-of-Site. (ensure a clear Fresnel Zone)

Antennas ship with basic hardware to mount them (such as U-bolts), but not the mast itself.

Basic mounting hardware is included with all antennas (except patch, which mount directly to wall).

Keep bridge antenna cables as short as possible (significant effect on range/transmission rate).

Cables are not plenum-rated.

Horizontal polarization is best for transmissions over water, since vertical polarizations exhibit a 180 degree phase shift and result in multipath problems at the far end of the circuit.

General Information - Latencies

1. Receive over Ethernet (~300 usec)
2. Pass to radio, PCMCIA transfer (750ns per word)
3. Over airwaves-based on distance, (but in nano-seconds)
4. Pass to host, PCMCIA transfer (1.1 uS per word)
5. Pass onto Ethernet (~300 usec) - note that this step may not be applicable in NIC situations.

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Access Point Antennas (Page 1 of 2)

AIR-ANT3213

Pillar mount diversity

Description: Indoor, unobtrusive medium range antenna
Mounts to pillars/columns

Gain: 5.2 dBi

Beam Width, Horizontal: 360°, **Vertical:** 75°

Approx. Indoor 1 Mbps Max Range: 497 ft (151.5m)

Approx. Indoor 11 Mbps Max Range: 142 ft (43.3m)

Cable length: 3 ft (~1m)

Dimensions: 10" x 1" (25.4cm x 2.54cm)

Weight: 1 lb. (453.6g)



AIR-ANT1728

High-gain omni ceiling mount

Description: Indoor med range, typically mount to crossbars
of drop ceilings

Gain: 5.2 dBi

Beam Width, Horizontal: 360°, **Vertical:** 75°

Approx. Indoor 1 Mbps Max Range: 497 ft (151.5m)

Approx. Indoor 11Mbps Max Range: 142 ft (43.28m)

Cable length: 3 ft (1m)

Dimensions: 9" x 1" (22.86cm x 2.54cm)

Weight: 4.6 oz. (130.4g)



AIR-ANT3549

Patch wall mount

Description: Indoor, unobtrusive medium range (also used as
bridge antenna)

Gain: 8.5 dBi

Beam Width, Horizontal: 60°, **Vertical:** 55°

Approx. Indoor 1 Mbps Max Range: 700 ft (213.36m)

Approx. Outdoor 1 Mbps Max Range: 2 mi (3.22km)

Approx. Indoor 11Mbps Max Range: 200 ft (60.96m)

Approx. Outdoor 11Mbps Max Range: 3390 ft (1.033km)

Cable length: 3 ft (~1m)

Dimensions: 5" x 5" (12.7cm x 12.7cm)

Weight: 5.3 oz. (150.25g)



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Access Point Antennas (Page 2 of 2)

AIR-ANT1729

Patch wall mount

Description: Indoor, unobtrusive medium range (also used as bridge antenna)

Gain: 6 dBi

Beam Width, Horizontal: 75°, **Vertical:** 65°

Approx. Indoor 1 Mbps Max Range: 542 ft (165.2m)

Approx. Outdoor 1 Mbps Max Range: 1.1 mi (1.77km)

Approx. Indoor 11Mbps Max Range: 155 ft (47.24m)

Approx. Outdoor 11Mbps Max Range: 1900 ft (579m)

Cable length: 3 ft (~1m)

Dimensions: 4" x 5" (10.16cm x 12.7cm)

Weight: 4.9 oz. (138.9g)



AIR-ANT2012

Diversity patch ruggedized mount

Description: Indoor/Outdoor, unobtrusive medium range (also used as bridge antenna)

Gain: 6.5 dBi

Beam Width, Horizontal: 80°, **Vertical:** 55°

Approx. 1 Mbps Max Range: 547 ft (166.7m)

Approx. 11Mbps Max Range: 167 ft (50.9m)

Cable length: 3 ft (~1m)

Dimensions: 4.8" x 6.66" x 0.8" (12.4cm x 17cm x 2.1cm)

Weight: 9.6 oz. (272g)



AIR-ANT5959

Diversity omni ceiling ruggedized

Description: Indoor, unobtrusive medium range (also used as bridge antenna)

Gain: (2) 2dBi omni elements. 2-2.35 dBi gain overall.

Beam Width, Horizontal: 360°, **Vertical:** 80°

Approx. 1 Mbps Max Range: 350 ft (106.68m)

Approx. 11Mbps Max Range: 130 ft (39.62m)

Cable length: 3 ft (~1m)

Dimensions: 5.3" x 2.8" x 0.9" (13.5cm x 7.1cm x 2.3cm)

Weight: 0.3 lb. (136g)



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Bridge Antennas (Page 1 of 2)

AIR-ANT2506

Omnidirectional mast mount

Description: Outdoor short range, pt-to-multipt applications

Gain: 5.2 dBi

Beam Width, Horizontal: 360°, **Vertical:** 75°

Approx. Outdoor 1 Mbps Max Range: 5000 ft (1.524km)

Approx. Outdoor 11Mbps Max Range: 1580 ft (481 m)

Cable length: 3 ft (~1m)

Dimensions: 13" x 1" (33cm x 2.54cm)

Weight: 6 oz. (170.1g)



AIR-ANT24120

High-gain omnidirectional mast

Description: Outdoor med range, pt-to-multipt applications

Gain: 12 dBi

Beam Width, Horizontal: 360°, **Vertical:** 7°

Approx. Outdoor 1 Mbps Max Range: 4.6 mi (7.4km)

Approx. Outdoor 11Mbps Max Range: 1.4 mi (2.25km)

Cable length: 1 ft (~0.3m)

Dimensions: 42" x 1.5" (106cm x 3.8cm)

Weight: 3 lb. (1.36Kg)



AIR-ANT2410Y-R

Yagi Mast Mount

Description: In/Outdoor med range, pt-to-pt applications

Gain: 10 dBi

Beam Width, Horizontal: 47°, **Vertical:** 55°

Approx. Indoor .11b 1 Mbps Max Range: 800 ft (244m)

Approx. Indoor .11b 11Mbps Max Range: 230 ft (70m)

Cable length: 3 ft (~1m)

Dimensions: 7.25 x 5" (18.4 x 12.7cm)

Weight: 8 oz. (~200g)

Created for use with 802.11g (cannot use 1949 with .11g)



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Bridge Antennas (Page 2 of 2)

AIR-ANT1949

Yagi mast mount

Description: Outdoor med range directional connections

Gain: 13.5 dBi

Beam Width, Horizontal: 30°, **Vertical:** 25°

Approx. Outdoor 1 Mbps Max Range: 6.5 mi (10.46km)

Approx. Outdoor 11Mbps Max Range: 2.0 mi (3.22km)

Cable length: 1.5 ft (~0.5m)

Dimensions: 18" x 3" (45.72cm x 7.62cm)

Weight: 1.5 lb. (680.4g)

Mounts to 1.5" (3.81cm) diameter mast (pipe)

Recommend using optional Yagi articulating mount (P/N AIR-ACC2662)



AIR-ANT3338

Solid dish

Description: Outdoor long range directional connections

Gain: 21 dBi

Beam Width, Horizontal: 12.4°, **Vertical:** 12.4°

Approx. Outdoor 1 Mbps Max Range: 25 mi (40.23km)

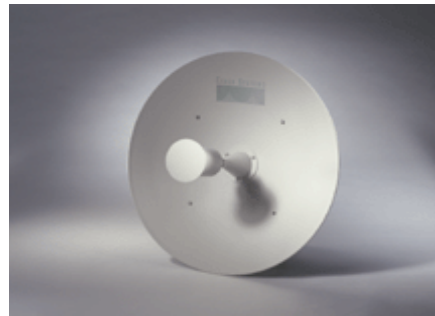
Approx. Outdoor 11Mbps Max Range: 11.5 mi (18.5km)

Cable length: 2 ft (~0.66m)

Dimensions: 24" (61cm) diameter

Weight: 11 lbs. (4.99kg)

Mounts to 1 5/8" to 2 3/8" diameter mast (pipe)



AIR-ANT2414S

Vertically Polarized Sector

Description: Outdoor long range point-to-multipoint apps.

Gain: 14 dBi

Beam Width, Horizontal: 90°, **Vertical:** 8.5°

Approx. Outdoor 1 Mbps Max Range: 6.5 mi (10.5km)

Approx. Outdoor 11Mbps Max Range: 2.0 mi (3.3km)

Cable length: 5 ft (3m)

Dimensions: 36" x 6" (91cm x 15cm)

Weight: 6.5 lbs. (3kg)

Mast Mount



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Client Adapter Antennas and Accessories

These antennas are used to connect to the AIR-LMC3xx wireless client PC card adapters (the PC cards without the integrated antenna). These antennas both have the small MMCX connectors and attach directly to the AIR-LMC3xx PC cards' MMCX connectors.

If you need to attach any of the other antennas to these PC cards, you need a cable to adapt the MMCX connector to the RP-TNC antenna connector - **AIR-420-001625-0500**, 5" (12.7cm) long.

AIR-ANT3351

POS diversity

Gain: 2.2 dBi

Beam Width, Horizontal: 360°, **Vertical:** 75°

1 Mbps Max Range, 30mW: 500 ft (152.4m)

11Mbps Max Range, 30mW: 100 ft (30.48m)

Cable length: 5 ft (1.5m)

Dimensions: 7" x 2" x 8" (17.8cm x 5.1cm x 20.3cm)

Can connect directly to a AIR-LMC3xx PC Card



AIR-ACC1725 (Magnetic Mount Adapter)

This device is similar to AIR-ACC2228, except it has a heavy magnetic base (about 3" (7.62cm) in diameter). The cable is 12" (30.48cm) in length and terminates with RP-TNC connectors on each end. So you attach an RP-TNC style antenna to the mount.

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Antenna Cables

Old Cables (EOS Feb 27, 2002)

These cables are used to connect from the RP-TNC connector to the antenna. Always try to use the shortest cable possible as it has a significant effect on distance and speed. If necessary, keep the bridge as close to antenna as you can - simply making the ethernet cable longer may work, instead.

AIR-420-003346-020	20'(6.1m)	1.3 dBi loss
AIR-420-003346-050	50'(15.24m)	3.4 dBi loss
AIR-420-003346-075	75'(30.48m)	5.0 dBi loss
AIR-420-003346-100	100'(45.72m)	6.7 dBi loss

These cables are Belden 9913 type cables made by Belden Wire and Cable Company. The cables have a typical loss of 6.7 dB per 100'. Basically, a low loss RG-8/U 50 ohm cable.

Cable Specifications

Jacket material: PVC (black)

Diameter of cable (includes jacket): 0.405" (1.0287cm)

Conductor material and diameter: 10 AWG bare copper, 0.108" (0.27432cm)

Insulation material and diameter: Semi-solid polyethylene, 0.286" (0.72644cm)

Suitable for indoor, outdoor, and aerial use

Minimum bending radius: 6" (15.24cm)

Temperature Rating: -40 to 80° C

Max pulling tension: 292 lbs (132.4kg)

New Cables - FCS 12/11/2001

AIR-CAB020LL-R	20'(6.1m)	0.8 dBi loss(est.)
AIR-CAB050LL-R	50'(15.24m)	2.2 dBi loss(est.)
AIR-CAB100LL-R	100'(30.48m)	4.4 dBi loss
AIR-CAB150LL-R	150'(45.72m)	6.6 dBi loss

These cables are replacements for the Belden 9913 type cables made by Belden Wire and Cable Company. These cables have a much lower loss of 4.4 dB per 100' (30.48m) and have much improved shielding for lower loss and less susceptibility to outdoor conditions.

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Cable Accessories (Page 1 of 2)

Console Cables

AIR-ACC5559-072 - 340/350 Series Serial Cable for Console Port Configuration

AIR-CONCAB1200 - 1100/1200 Series Serial Cable for Console Port Configuration

Bulkhead Extender

This cable is used when you want to put a bridge/access point (or even a PCI card) inside an enclosure. This bulkhead connector effectively extends the RP-TNC port from the bridge so that the RP-TNC connector for antenna connection is available on outside surface of enclosure.

AIR-ACC2537-060 - 60" (1.52m) Bulkhead Extender



Cable Assembly

AIR-ACC1622 - TNC raw connector, crimp style, female for 9913 cable

RP-TNC raw connector, straight plug, crimp style, Female. Mates to the connector that is on the AP/BR; used if someone wants to make their own cable. To be used with 9913/LMR400 cabling.

AIR-ACC1623 - TNC straight jack, crimp style, male for 9913 cable

RP-TNC raw connector, straight plug, crimp style, Male. Mates to the connector that is on an antenna. Used if someone wants to make their own cable. To be used with 9913/LMR400 cabling.

AIR-ACC1828 - TNC raw connector, crimp style, female for RG-58 cable

RP-TNC raw connector, straight plug, crimp style, Female. Mates to the connector that is on an antenna. Used if someone wants to make their own cable. To be used with RG-58 cabling. (not recommended cable choice).

AIR-ACC1655 - TNC straight plug, crimp style, male for RG-58 cable

RP-TNC raw connector, straight plug, crimp style, Male. Mates to the connector that is on an AP/BR. Used if someone wants to make their own cable. To be used with RG-58 cabling. (not recommended cable choice).

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Cable Accessories (Page 2 of 2)

MMCX to RP-TNC Cables

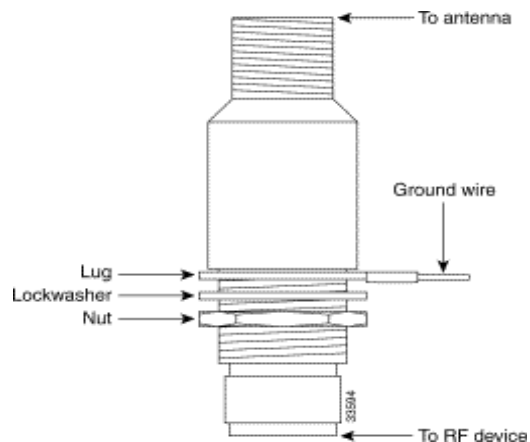
This cable is used to convert the MMCX connector to a RP-TNC connector. One card which has an MMCX connector is the AIR-LMC3xx PC Cards (which have no antenna). You use this cable to allow you to connect any RP-TNC type antenna to the NIC's MMCX connector. (However, you will generally use the antennas in the Client Antennas section of this document for these NIC's).

AIR-420-1625-0500 - MMCX to RP-TNC cable, 5" (12.7cm) length

Lightning Arrestor (For outdoor antennae)

Part number: **AIR-ACC3354**

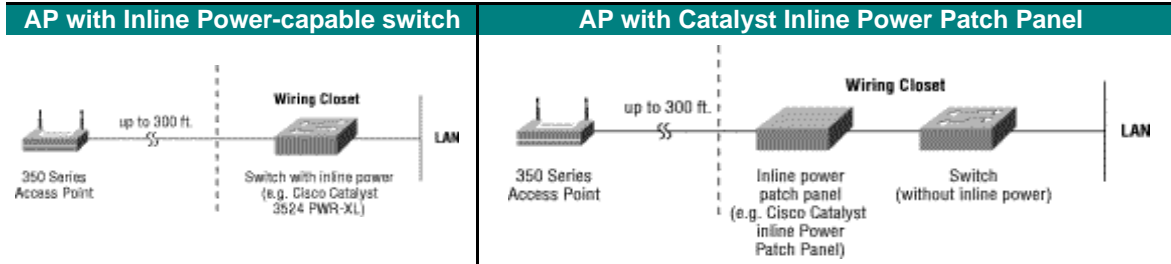
This arrestor is designed to be installed between your outdoor antenna cable and the Cisco Aironet wireless radio device. Actually connect to the bridge's RP-TNC connector, then connect antenna cable to lightning arrestor. The lightning arrestor does not protect against *direct* lightning hits, it merely dissipates static buildup and lessens the likelihood of a direct hit. The most sure way to protect a LAN from lightning spikes is through the use of fiber and transceivers, but this option not only drastically increases cost but also precludes the option of inline power.



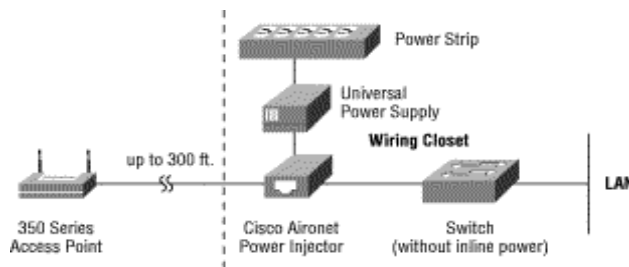
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Inline Power



AP with Power Injector



Power Injectors

Injector	Used With	Current	Ext Pwr Supply
AIR-PWRINJ	350 Series	0.2A In, 0.125A Out	Attached
AIR-PWRINJ2	350 Series, 1100 Series, 1200 Series	0.38A In, 0.35A Out	AIR-PWR-A
AIR-PWRINJ3	350 Series, 1100 Series, 1200 Series	0.38A In, 0.32A Out	AIR-PWR-A
AIR-PWRINJ-FIB	350 Series, 1100 Series, 1200 Series	0.38A In, 0.32A Out	AIR-PWR-A
AIR-PWRINJSYS1200	1200 Series	0.38A In, 0.35A Out	Attached
AIR-PWRINJ-BLR2	1300 Series	0.38A In, 0.35A Out	AIR-PWR-A

AIR-PWRINJ can only be used with 350 series inline-powered devices.

The rest can be used with any inline-powered devices.

AIR-PWRINJ2, 3, and FIB require the wall-transformer power supply that ships with the AP.

AIR-PWRINJ-FIB converts 100BaseFX (2Km max range, MT-RJ multimode fiber interface) for the LAN side (facing the core) to powered 100TX (to the AP). This makes the device able to get data across the fiber link, but would still require a local power supply to power the power injector/AP.

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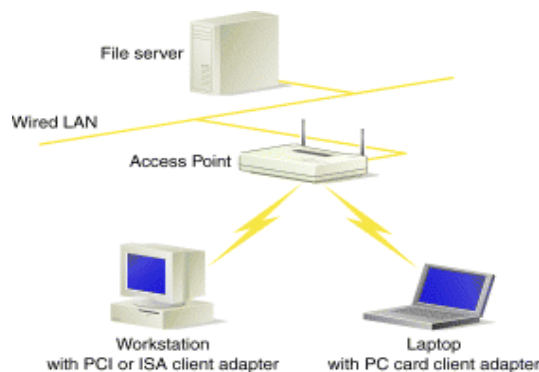
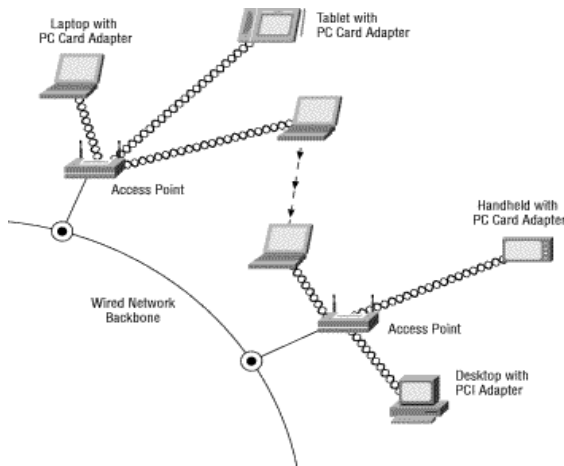
350 Series Access Point

- AIR-AP35xE2C** - 2 integrated antennas
- AIR-AP35xE2R** - 2 RP-TNC connectors
- AIR-AP352E2R-A-K9** - Rugged, 2 RP-TNC, for Americas
- AIR-AP352E2R-E-K9** - Rugged, 2 RP-TNC, for Europe
- AIR-AP352E2R-J-K9** - Rugged, 2 RP-TNC, for Japan
- AIR-AP352E2R-S-K9** - Rugged, 2 RP-TNC, for Singapore



- Connectors:** 10/100 Autosensing RJ-45, RS232 serial(Female), some also have RP-TNC (Male)
- RF Power Output:** 1, 5, 20, 30, 50, or 100 mW (depending on country)
- Environmental:** Standard: 32° to 122°F (0° to 50° C), Rugged -4° to 131°F (-20° to 55° C) (UL2043)
- Humidity:** 10 to 90% (noncondensing)
- Dimensions:** 6.3W x 4.7D x 1.45H in. (16 x 12 x 3.7cm)
- Weight:** Standard: 350g, Rugged: 648g
- Data Rates:** 1, 2, 5.5, and 11 Mbps
- EOS:** AIR-AP35xE2R EOS Nov 30,2001 (Rugged AP replaces AIR-AP35xE2R).
AIR-AP352E2R-S-K9 EOS due to regulatory restrictions being lifted in Singapore/France.
Entire remainder of AP350 line EOS October 31, 2003.

Ships with power injector (AIR-PWRINJ=) and mounting hardware.
Has no power ports - must use inline power.
16MB DRAM, 8MB Flash, IBM PowerPC MIPS 66 CPU at 50MHz.
Rugged AP is **not** waterproof. Use a NEMA waterproof enclosure.
Can run IOS, as of 12.2(13)JA1. Older software is run on a VxWorks operating system.



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350 Series Bridge

AIR-BR350-A-K9 Most of Americas
AIR-BR350-E-K9 Most of Europe
AIR-BR350-J-K9 Japan
AIR-BR350-S-K9 Singapore and France



Connectors: 10/100 Autosensing RJ-45, RS232 serial(Female), some also have RP-TNC (Male).

RF Power Output: 1, 5, 20, 30, 50, or 100 mW (depending on country)

Environmental: -4° to 131°F (-20° to 55° C) (UL2043 plenum rated)

Humidity: 10 to 90% (noncondensing)

Dimensions: 6.7W x 6.25D x 1.31H in. (17.1 x 15.9 x 3.3cm)

Weight: 1.43 lb. (648 g)

Data Rates: 1, 2, 5.5, and 11 Mbps

EOS: AIR-BR350-S-K9 EOS due to regulatory restrictions being lifted in Singapore/France

Ships with power injector (AIR-PWRINJ=), 2.2dBi rubber dipole, and mounting hardware

Has no power ports - must use inline power

Is **not** waterproof. Use a NEMA waterproof enclosure.

Uses a maximum of 10W of power.

Will not interoperate with 340 series bridges

350 Series Workgroup Bridge

AIR-WGB35xC - 1 integrated antenna

AIR-WGB35xR - 1 RP-TNC connector

Connectors: 10baseT RJ-45, RS232 serial(Female), some also have RP-TNC (Male).

RF Power Output: 1, 5, 20, 30, 50, or 100 mW (depending on country)

Environmental: 32° to 122°F (0° to 50° C)

Humidity: 10 to 90% (noncondensing)

Dimensions: 6.3W x 4.7D x 1.45H in. (16 x 12 x 3.7cm)

Weight: 0.772 lb. (350 g)

Data Rates: 1, 2, 5.5, and 11 Mbps

EOS: AIR-BR350-S-K9 EOS due to regulatory restrictions being lifted in Singapore/France.

Ships with AC power supply and mounting bracket.

Uses standard power (**not** inline) - only 350 series product to do so (no power injector).

Connects over wireless to either an Access Point or a Bridge.

Will not connect to another workgroup bridge.

Client adapters cannot connect to a workgroup bridge.

Maximum of 8 ethernet devices behind the workgroup bridge (connect a hub to achieve this).

Workgroup Bridges are, essentially, a way for Ethernet-equipped PC's to gain access to the WLAN.



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1120 Series Access Point

AIR-AP112x-A-K9 Americas
AIR-AP112x-E-K9 ETSI
AIR-AP112x-J-K9 TELEC (Japan)
x = 0B (.11b) or 1G (.11g)

.11g Upgrades

AIR-MP21G-A-K9 Americas
AIR-MP21G-E-K9 ETSI
AIR-MP21G-J-K9 TELEC (Japan)
AIR-MP21G-I-K9 Israel

Connectors: 10/100 Autosensing RJ-45, RS-232 RJ-45 serial(Female)

802.11b RF Power Output: 1, 5, 20, 30, 50, or 100 mW

802.11g RF Power Output: 1, 5, 10, 20, or 30 mW

Environmental: 32° to 104° F (0° to 40° C) (UL2043)

Humidity: 10 to 90% (noncondensing)

Dimensions: 4.1W x 1.5D x 8.1H in. (10.4 x 3.8 x 20.5 cm)

Weight: 10.5 oz. (297g)

Ranges (Typical)	Indoor	Outdoor
.11b, 1Mbps	400 ft (122m)	2000 ft (610m)
.11b, 11Mbps	150 ft (45m)	800 ft (244m)
.11g, 6Mbps	300 ft (91.4m)	1300 ft (396.2m)
.11g, 54Mbps	90 ft (27.4m)	250 ft (76.2m)

802.11b Data Rates: 1, 2, 5.5, and 11 Mbps

802.11g Data Rates: 6, 9, 12, 18, 24, 48, and 54 Mbps

EOS: No

Runs Cisco IOS only (First Aironet product to do so)

Supports up to 16 VLAN's trunked over 802.1q

Supports either .11b or .11g radio, field replaceable. No .11a (never will, does not have cardbus slot)

Ships with power cube and mounting hardware, but no power injector.

Can be powered either inline or locally with power cube.

Supports only a built-in dual diversity 2.2dBi antenna (included) - not any external one.

Plenum-rated plastic casing.

Supports inline power from AIR-PWRINJ2 (not included) or inline power.

Console port is "normal" - the same as on a router (no need for a proprietary Aironet console cable).

Kensington security lock locks down the AP to its mounting bracket.

4.9W power draw (33-57VDC at device)

16MB DRAM, 8MB Flash, IBM PowerPC 282 MIPS CPU at 200MHz.



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1130AG Series Access Point

AIR-AP1131AG-x-K9

Regulatory Domains: (x=Regulatory Domain)

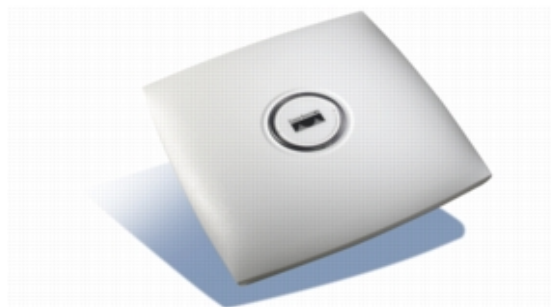
A=FCC (Americas)

C=China

E=ETSI

J=TELEC (Japan)

N=North America (Excluding FCC)



Integrated Antennas:

2.4 GHz Gain-3.0 dBi, Horizontal Bandwidth 360°

5 GHz Gain-4.5 dBi, Horizontal Bandwidth 360°

Connectors: 10/100 Autosensing RJ-45, RS-232 RJ-45 serial(Female)

802.11a RF Power Output: 0.5,1,3,5,10,25,30,50mW

802.11b RF Power Output: 0.5,1,3,5,10,20,30,50mW

802.11g RF Power Output: 0.5,1,3, 5,10,25,30,50,100mW

Environmental: 32° to 104° F (0° to 40° C) (UL2043)

Humidity: 10 to 90% (noncondensing)

Dimensions: 7.5W x 7.5D x 1.3H in. (19.1 x 19.1 x 3.83cm)

Weight: 1.5 lb (0.67kg)

Ranges (Typical)	Indoor	Outdoor
.11a, 6Mbps	325 ft (100m)	650 ft (198m)
.11a, 54Mbps	80 ft (24m)	100 ft (30m)
.11b, 1Mbps	400 ft (122m)	2000 ft (610m)
.11b, 11Mbps	150 ft (45m)	800 ft (244m)
.11g, 6Mbps	400 ft (122m)	900 ft (274m)
.11g, 54Mbps	100 ft (30m)	120 ft (37m)

802.11a Data Rates: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps

802.11b Data Rates: 1, 2, 5.5, and 11 Mbps

802.11g Data Rates: 6, 9, 12, 18, 24, 48, and 54Mbps

EOS: No

Runs Cisco IOS only

Supports up to 16 VLAN's trunked over 802.1q

Ships with power cube and mounting hardware, but no power injector.

Can be powered either inline or locally with power cube.

Plenum-rated plastic casing.

Supports inline power from AIR-PWRINJ3 (not included) or inline power.

The Cisco Aironet Power Injector Media Converter (AIR-PWRINJ-FIB) converts fiber media to Cat5 media and combines the resulting data signal with power for delivery to the AP or bridge.

Console port is "normal" - the same as on a router (no need for a proprietary Aironet console cable).

Kensington security lock locks down the AP to its mounting bracket.

12.2W power draw (36-57VDC at device) 802.3af compliant for PoE.

32MB DRAM, 16MB Flash

Portable Product Sheet - Aironet



1230AG Series Access Point

AIR-AP1232AG-x-K9

Regulatory Domains: (x=Regulatory Domain)

A=FCC (Americas)

C=China

E=ETSI

J=TELEC (Japan)

N=North America (Excluding FCC)

S=Singapore

T=Taiwan

Connectors: 10/100 Autosensing RJ-45, RS-232 RJ-45 serial(Female)

802.11a RF Power Output: 0.5,1,3,5,10,25,30,50mW

802.11g RF Power Output: 1,5,10,20,30,50,100mW

2.4GHz Antennas: Two RP-TNC connectors; 802.11g approved with:AIR-ANT1728, AIR-ANT1729, AIR-AIR-ANT2506, AIR-ANT3213, AIR-ANT3549, AIR-ANT4941, AIR-ANT5959, and AIR-ANT2410Y-R

5GHz Antennas: Two RP-TNC connectors; 802.11a approved with:AIR-ANT5135D-R, AIR-ANT5145V-R, and AIR-ANT5160V-R

Environmental: -4° to 122° F (-20° to 50° C) (UL2043)

Humidity: 10 to 90% (noncondensing)

Dimensions: 6.562W x 7.232D x 1.660H in. (16.67 x 18.37

Weight: 1.725 lb (0.783kg)



Ranges (Typical)	Indoor	Outdoor
.11a, 6Mbps	500 ft (152m)	950 ft (289m)
.11a, 54Mbps	90 ft (27m)	170 ft (54m)
.11g, 6Mbps	300 ft (91m)	650 ft (198m)
.11g, 54Mbps	90 ft (27m)	110 ft (34m)

802.11a Data Rates: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps

802.11b Data Rates: 1, 2, 5.5, and 11 Mbps

802.11g Data Rates: 6, 9, 12, 18, 24, 48, and 54Mbps

EOS: No

Runs Cisco IOS only

Supports up to 16 VLAN's trunked over 802.1q

Ships with power cube and mounting hardware, but no power injector.

Can be powered either inline or locally with power cube.

Plenum-rated plastic casing.

Supports inline power from AIR-PWRINJ3 (not included) or inline power.

The Cisco Aironet Power Injector Media Converter (AIR-PWRINJ-FIB) converts fiber media to Cat5 media and combines the resulting data signal with power for delivery to the AP or bridge.

Console port is "normal" - the same as on a router (no need for a proprietary Aironet console cable).

Kensington security lock locks down the AP to its mounting bracket.

11W power draw 802.3af compliant for PoE.

16MB DRAM, 8MB Flash

Portable Product Sheet - Aironet



1200 Series Access Point

IOS Software APs

AIR-AP1230x-A-K9 FCC (Americas)

AIR-AP1231x-A-K9 FCC (Americas)

x= A (.11a), B (.11b), or G (.11g) y=A (Americas), E (Europe), J (Japan), or T (Taiwan)

Connectors: 10/100 Autosensing RJ-45, RS-232 RJ-45 serial(Female), 2 RP-TNC (Male).

802.11a RF Power Output: 5, 10, 20, 40 mW

802.11b RF Power Output: 1, 5, 20, 30, 50, or 100 mW (depending on country)

802.11g RF Power Output: 1, 5, 10, 20, or 30 mW

Environmental: -4° to 131° F (-20° to 55° C) (UL2043 plenum rated)

Humidity: 10 to 90% (noncondensing)

Dimensions: 6.56W x 7.2D x 1.44H in. (16.67 x 18.28 x 3.66 cm)

Weight: 1.6 lbs (0.73 kg) (empty)

802.11a Data Rates: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps

802.11b Data Rates: 1, 2, 5.5, and 11 Mbps

802.11g Data Rates: 6, 9, 12, 18, 24, 48, and 54Mbps

EOS: No

Ships with power cube and mounting hardware, but no power injector.

Can be powered either inline or locally with power cube.

Cannot be powered by non-802.3af (classic) inline power if *both* radios are installed.

Supports inline power from AIR-PWRINJ2 or (in the future) 802.3af inline power with both radios.

Console port is "normal" - the same as on a router (no need for a proprietary Aironet console cable).

Not to be confused with the pre-Cisco acquisition Aironet 1200 series (pre-802.11b AP).

One internal slot for a mini-PCI 802.11b radio, one "podule" slot for a cardbus 802.11a radio.

802.11a is primarily used for interior high-speed WLAN applications due to decreased range.

Ruggedized, plenum-rated aluminum casing.

Kensington security lock locks down the 802.11a podule and locks the AP to its mounting bracket.

16MB DRAM, 8MB Flash, IBM PowerPC 282 MIPS CPU at 200MHz.

802.11a antenna is fixed to the card, and can be either flat (as a patch) or flipped out (as an omni).



Portable Product Sheet - Aironet



1300 Series Wireless AP/Bridges

Part Numbers: AIR-BR1310G-x-K9 (captured), AIR-BR1310G-x-K9-R (external antennae)

Connectors: (2) F-Type BNC Connectors, (2) RP-TNC connectors (-R model only)

802.11b RF Power Output: 1, 5, 10, 20, 30, 50, 100 mW

802.11g RF Power Output: 1, 5, 10, 20, 30 mW

Environmental: -30° to +55°C (-22° to +131°F), up to 13,800 ft altitude

Humidity: 0 to 100% (non-condensing)

Dimensions (captured): 8in x 8.1in x 3.12in (20.3cm x 20.57cm x 7.87cm)

Weight: 2.5lbs (1.25kg)

802.11b Data Rates: 1, 2, 5.5, and 11 Mbps

802.11g Data Rates: 6, 9, 12, 18, 24, 48, and 54Mbps

EOS: No

Non-R model is an environmentally enclosed unit with 13 dBi, 36° E-plane by 38° H-plane antenna

Must be powered inline by special power injector (included with either type bridge unit)

Inline power provided over a second coaxial cable from the power injector.

Power inj. can "reset" Ethernet timers so the copper can be 100m *and* the coaxial run can be 100m.

Part number includes the bridge unit, mounting hardware, injector, 2 coax cables, and coax sealant.

Bridge distances:

p-t-p 1.3 miles (2km)@54Mbps with captured antenna, 4.5 miles (15km) w/ 21dBi dish antenna

p-mp 1.1 miles (1.8km)@54Mbps with captured antenna, 2.0 miles (3.3km) w/ 14dBi sector antenna.

Access Point distances:

865ft (260m) @54Mbps with captured antenna, 350ft (105m) with 5.2dBi patch antenna.

LED's can be set to display signal strength, useful in deployments to mount antennae properly

Note: The inline power for the 1300 series is similar to the 1400 series example below.



Portable Product Sheet - Aironet



1400 Series Wireless Bridges

Part Numbers: AIR-BR1410A-A-K9 (captured), AIR-BR1410A-A-K9-N (external antennae)

Connectors: (2) F-Type BNC Connectors, (1) N-Type BNC connector (-N model only), (1) RSSI BNC

802.11a RF Power Output: 15, 30, 60, 125, 155, 200, 250 mW

Environmental: -30° to +55°C (-22° to +131°F), up to 13,800 ft altitude

Humidity: 0 to 100% (non-condensing)

Dimensions (captured): 11.4in x 11.4in x 4.2in (29cm x 29cm x 11cm)

Dimensions (external): 11.6in x 11.6in x 3.6in (29cm x 29cm x 9cm)

Weight: 11lbs (~5kg) (captured), 10lbs (~5kg) (external)

802.11a Data Rates: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps

EOS: No

Non-N model is an environmentally enclosed unit with 22.5 dBi, 10° E-plane by 12° H-plane antenna
Must be powered inline by special power injector (included with either type bridge unit)

Inline power provided over a second coaxial cable from the power injector.

Power inj. can "reset" Ethernet timers so the copper can be 100m *and* the coaxial run can be 100m.

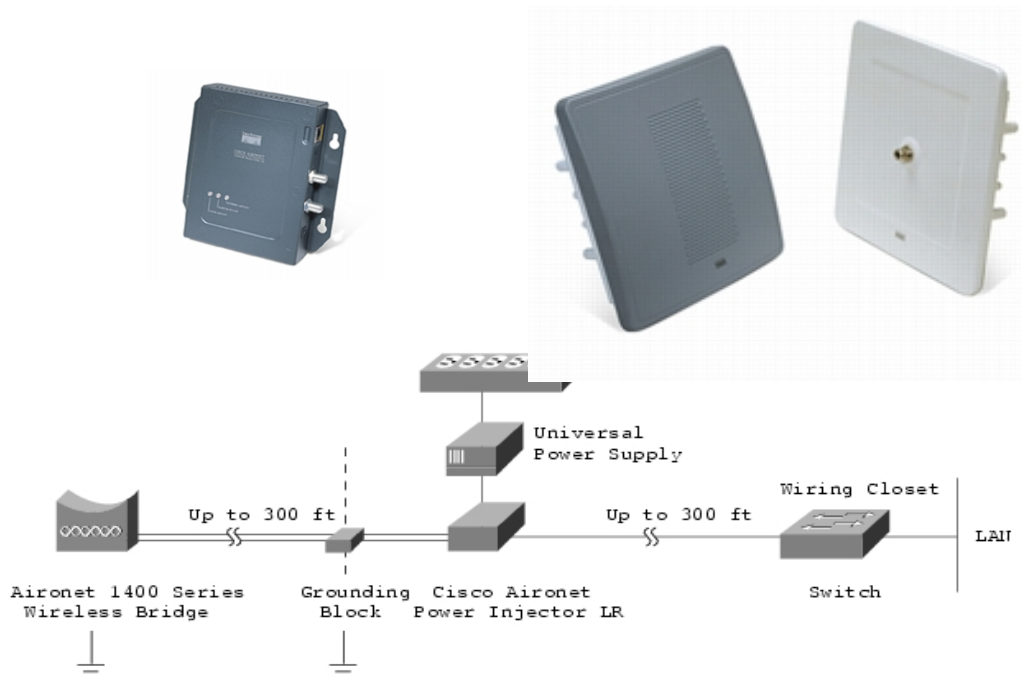
Part number includes the bridge unit, mounting hardware, injector, 2 coax cables, and coax sealant.

7.5 miles (13 km) @54Mbps with captured antenna, 12 miles (19km) with 28dBi parabolic external

Point-to-multipoint limits ranges to 2 miles (3km), or 4 miles (7km) if parabolics used at non-root

LED's can be set to display signal strength, useful in deployments to mount antennae properly

Also has RSSI BNC port for local diagnostics using standard RF gear



Portable Product Sheet - Aironet



PCMCIA Client Adapters

AIR-LMC35x - 802.11b PC Card Adapter (with MMCX connector for AIR-ANT3549 or AIR-ANT3351)

AIR-PCM35x - 802.11b PC Card Adapter (with 2.2 dBi non-removable antenna)

AIR-CB20A-A-K9 - 802.11a PC Card Adapter (with integrated antenna)

AIR-CB21AG-x-K9 (Cardbus)

AIR-PI21AG-x-K9 (Low-profile PCI)

x= **A (Americas)**, **E (Europe)**, **J (Japan)**, **W (World)**

802.11a RF Power Output: 5, 10, 20 mW

802.11b/g RF Power Output: 1, 5, 20, 30, 50, or 100 mW (depending on country)

35x Environmental: -22° to 158°F (-30° to 70° C)

CB20A Environmental: -22° to 158°F (-30° to 70° C)

CB21/PI21 Environmental: 32° to 158°F (0° to 70° C)

Humidity: 10 to 90% (noncondensing)

LMC Dimensions: 2.1 in. (5.4 cm) W x 3.4 in. (8.6 cm) D x 0.2 in. (0.5 cm) H

PCM Dimensions: 2.1 in. (5.4 cm) W x 4.5 in. (11.3 cm) D x 0.2 in. (0.5 cm) H

CB Dimensions: 2.1 in. (5.4 cm) W x 4.5 in. (11.3 cm) L x 0.2 in. (0.5 cm) H

PI Dimensions: 0.7 in. (1.8 cm) W x 4.7 in. (12 cm) L x 3.1 in (7.9 cm) H

Weight: LMC: 1.4 oz. (40 g), PCM: 1.6 oz. (45 g), CB: 1.5 oz. (43 g)

802.11a Data Rates: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps

802.11b Data Rates: 1, 2, 5.5, and 11 Mbps

802.11g Data Rates: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps

EOS: No

350 Series Transmit/Receive/Sleep modes (100mW): 450 mA/250 mA/15 mA

Outdoor 802.11a Maximum Range: 1200ft (365.8m)@6Mbps, 120ft (36.6m)@54Mbps

Indoor 802.11a Maximum Range: 200ft (61m)@6Mbps, 70ft (21.3m)@54Mbps

Outdoor 802.11b/g Maximum Range: 2000ft (610m)@1Mbps, 250ft (76m)@54Mbps

Indoor 802.11b/g Maximum Range: 410ft (124m)@1Mbps, 90ft (27m)@54Mbps



Portable Product Sheet - Aironet



Mini-PCI Client Adapter

For laptop PC's, integrated into motherboards or used as daughtercards.

Connectors: 2 ultra mini SMT U.FL type connectors compatible with Hirose U.FL-R-SMT antenna

Data Rates: 1, 2, 5.5 and 11 Mbps

RF Power Output: 1, 5, 20, 30, 50, 100 mW (depending on country)

Environmental: -22° to 158°F (-30° to 70° C)

Humidity: 10 to 90% (noncondensing)

Dimensions: 2.006W x 2.346D x 0.189H in. (50.952 x 59.588 x 4.801mm)

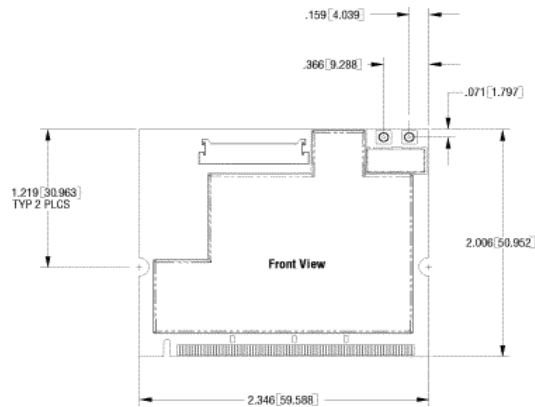
Weight: 0.53 oz, 15 g - Mini PCI Type IIIA

Transmit/Receive/Sleep modes: 570 mA/350 mA/15 mA w/PCI clock off

Indoor Estimated Maximum Range: 130 ft(11 Mbps), 320 ft(1 Mbps)

Outdoor Estimated Maximum Range: 800 ft(11 Mbps) 2,000 ft(1 Mbps)

EOS: April 1, 2003 due to implementation concerns. Now outsourced to Ambit Microsystems.



PCI Client Adapter

AIR-PCI3xx: PCI WLAN Adapter with 1 RP-TNC (Male)

Connectors: 1 RP-TNC (Male)

34x RF Power Output: 1, 5, 15, or 30 mW (depending on country)

35x RF Power Output: 1, 5, 20, 30, 50, or 100 mW (depending on country)

34x Environmental: 32° to 158°F (0° to 70° C)

35x Environmental: -22° to 158°F (-30° to 70° C)

Humidity: 10 to 90% (noncondensing)

Dimensions: 5.8W x 3.2D x 0.5H in. (14.7 x 8.1 x 1.3 cm)

Weight: 4.6 oz. (130 g)

Data Rates: 1, 2, 5.5, and 11 Mbps

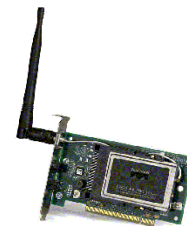
EOS: Entire AIR-PCI34xx series EOS October 27, 2002.

340 Series Transmit/Receive/Sleep modes (30mW): 450 mA/350 mA/~110 mA

350 Series Transmit/Receive/Sleep modes (100mW): 550 mA/350 mA/~115 mA

Ships with 2.2dBi rubber dipole

Old ISA card is EOS (P/N AIR-ISA342) - PCI is the only desktop-internal card.



Portable Product Sheet - Aironet



Client Antenna Receiver Sensitivities

802.11b/g client adapters	-94 dBm @ 1 Mbps
	-91 dBm @ 2 Mbps
	-89 dBm @ 5.5 Mbps
	-85 dBm @ 11 Mbps
802.11a client adapters	-85 dBm @ 6 Mbps
	-84 dBm @ 9 Mbps
	-82 dBm @ 12 Mbps
	-80 dBm @ 18 Mbps
	-77 dBm @ 24 Mbps
	-73 dBm @ 36 Mbps
	-69 dBm @ 48 Mbps
	-68 dBm @ 54 Mbps

Starter Kits

AIR-SSI350-x-K9 - In-Building Starter Kit (EOS October 31, 2003)

QTY	Part Number	Description
2	AIR-AP352E2R-x-K9	350 Series Access Point with 2 RP-TNC Connectors
2	AIR-PCM352	350 Series PC Card Adapter with Integrated Antenna
4	AIR-ANT4941	2.2 dBi Dipole Antenna (Standard Rubber Dipole)
2	AIR-ANT5959	2 dBi Diversity Omni-directional Ceiling Mount Antenna
2	AIR-ANT2012	6.5 dBi Diversity Patch Wall Mount Antenna

The recommended replacement for the above EOS kit is an 1100 or 1200 in place of the AP352... the

AIR-SSB350-x-K9 - Building-to-Building Starter Kit

QTY	Part Number	Description
2	AIR-BR352-x-K9	350 Series Bridge with 2 RP-TNC Connectors
2	AIR-ANT1949	13.5 dBi Yagi Antenna
2	AIR-CAB050LL-R	50 feet low-loss cable
2	AIR-ACC3354	Lightning Arrestor