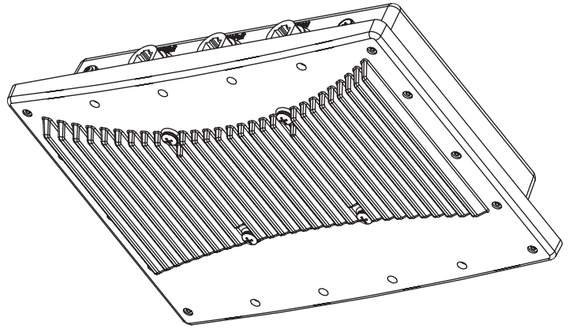
AP-5181 Access Point

Installation Guide



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symbol®
The Enterprise Mobility Company™

To the Installer

This guide is intended for the technician responsible for installing the Symbol AP-5181 model access point. It assumes the technician is familiar with basic Ethernet LAN-based networking and device installation concepts. This guide provides specifications, procedures and guidelines to use during the installation process. This guide does not provide site-specific installation procedures. For detailed site-specific installation procedures, refer to the site-specific documentation derived from site survey and site network analysis.

Verifying Package Contents

Inspect the package contents and report any missing or damaged items to your sales representative.

Service Information

Before using the unit, it must be configured to operate in the facility's network and run your applications. If you have a problem running your unit or using your equipment, contact your facility's Technical or Systems Support. If there is a problem with the equipment, they will contact the Symbol Support Center:

United States	1-800-653-5350 1-631-738-2400	Canada	905-629-7226
United Kingdom	0800 328 2424	Asia/Pacific	+65-6796-9600
Australia	1-800-672-906	Austria/Österreich	1-505-5794-0
Denmark/Danmark	7020-1718	Finland/Suomi	9 5407 580
France	01-40-96-52-21	Germany/Deutschland	6074-49020
Italy/Italia	2-484441	Mexico/México	5-520-1835
Netherlands/Nederland	315-271700	Norway/Norge	+47 2232 4375
South Africa	11-8095311	Spain/España	91 324 40 00 Inside Spain
Sweden/Sverige	84452900		+34 91 324 40 00 Outside Spain
Latin America Sales Support	1-800-347-0178 Inside US +1-954-255-2610 Outside US		
Europe/Mid-East Distributor Operations	Contact local distributor or call +44 118 945 7360		

For the latest version of this guide go to: http://www.symbol.com/manuals/

Safety Information

Before operating any equipment, review this document for any hazards associated with installation and use of the device. Also, review standard practices for preventing accidents.

- Only trained and qualified personnel should install and remove the Power Injector.
- A power cord is not supplied with the device. Use only a correctly rated power cord that's certified, as appropriate, for the country of operation.
- The power cord must be a three-conductor type (two current carrying conductors and one ground conductor) terminated on one end by an IEC 60320 appliance coupler (for Power Injector connection) and on the other end by a plug containing a ground (earth) contact.
- The power cord must be rated for a minimum of 250VAC RMS operation, with a minimum rated current capcity of 5A [or a minimum wire gauge of 18AWG (0.75mm²)].
- The AC wall-socket outlet must be near the Power Injector and easily accessible.
- The Power Injector **Data** and **Data & Power** interfaces are qualified as SELV (Safety Extra-Low Voltage) circuits according to to IEC 60950. These interfaces can only be connected to SELV interfaces on other equipment.

Warnings

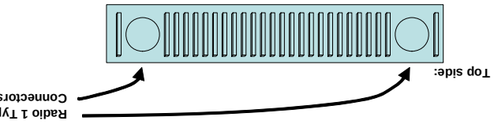
- Read the installation instructions before connecting the Power Injector to a power source.
- Follow basic electricity safety measures whenever connecting the Power Injector to its power source.
- This product relies on on the building installation for short-circuit (over current) protection. Ensure a fuse or circuit breaker no larger than 120 VAC, 3A U.S. (240VAC, 1.5A international) is used on the phase conductor.
- A volatge mismatch can cause equipment damage and could pose a fire hazard. If the voltage indicated on the label is different from the power outlet voltage, do not connect the Power Injector to that particular outlet.
- The Power Injector **Data In** and **Data & Power Out** ports are shielded RJ-45 sockets. Only RJ-45 data connectors should be connected to these sockets.

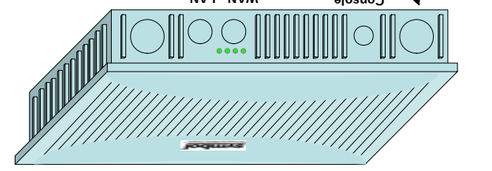
Introduction

The AP-5181 is an Access Point designed for outdoor installation using the existing AP-5131 feature set. The AP-5181 provides a dual-mode simultaneous 802.11a and 802.11g radio solution. There is one mechanical version of the AP-5181containing both 802.11a and 802.11g radios within the access point. The AP-5181 has four external antenna connectors supporting both the 802.11a antennas options and the 802.11g antenna options. All supported external antennas are part of Symbol's existing antenna suite for the 2.4 and 5.2 GHz bands.

Product Description

The AP-5181 design is loosely based on the current AP-5131 core architecture. The AP-5 has 2 Ethernet ports for connecting to the network and receiving 802.3af power (on the AP-5181's LAN port only). The AP-5181's mode of operation is identical to the AP-5131's functionality





Mounting the AP-5181

The AP-5181 access point can be mounted in the following ways using the supplied mounting bracket:

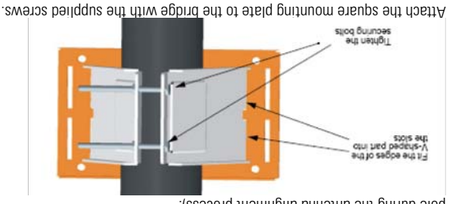
- To a wall
- To a 1.5 - 2 inch diameter pole

The mounting bracket has four parts. One rectangular plate used for pole and wall mounting, one square plate that attaches directly to the AP-5181, and two plates forming an adjustable V-shaped clamp for pole mounting.

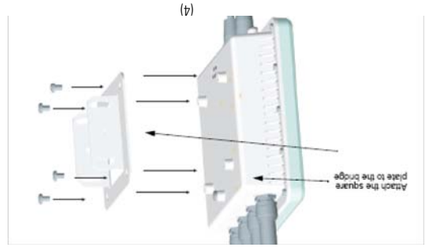
Mounting the AP-5181 on a Pole

Complete the following steps to mount the AP-5181 to a 1.5 to 2 inch diameter steel pole or tube (using the mounting bracket):

1. Fit the edges of the V-shaped clamp parts into the slots on the flat side of the rectangular plate. The inner slots are for the 1.5-inch diameter pole and 181 outer slots for a 2-inch diameter pole.
2. Place the V-shaped bracket clamp parts around the pole and then tighten the nuts just enough to hold the bracket to the pole. (The bracket may need to be rotated around the pole during the antenna alignment process).



3. Attach the square mounting plate to the bridge with the supplied screws.



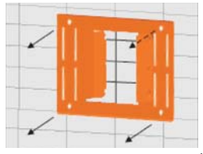
4. Attach the AP-5181 and mounting plate to the bracket already fixed to the pole.
5. Secure the AP-5181 to the pole bracket using the provided nuts.

Note: The AP-5181 tilt angle may need to be adjusted during the antenna alignment process. Verify the antenna polarization angle when installing, ensure the antennas are oriented correctly in respect to the AP-5181's coverage area..

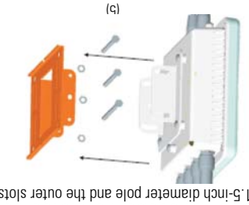
Mounting the AP-5181 on a Wall

Complete the following steps to mount the AP-5181 to a wall using the supplied wall-mounting bracket:

1. Attach the bracket to a wall with flat side flush against the wall (see the illustration below). Position the bracket in the intended location and mark the positions of the four mounting screw holes.



2. Drill four holes in the wall that match the screws and wall plugs.
3. Secure the bracket to the wall.
4. Attach the square mounting plate to the bridge with the supplied screws. Attach the bridge to the plate on the pole.
5. Use the included nuts to secure the wireless bridge to the bracket.Fit the edges of the V-shaped clamp parts into the slots on the flat side of the rectangular plate. The inner slots are for the 1.5-inch diameter pole and the outer slots for a 2-inch diameter pole.



Technical Specifications

Physical Specifications

Width	
Height	
Depth	
Weight	

Environmental Specifications

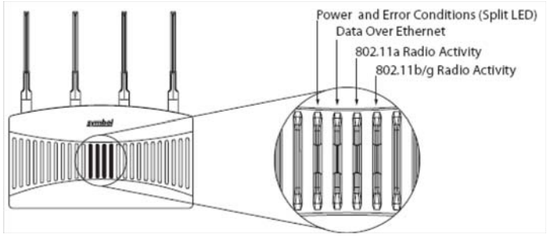
Operating Temperature	0°C to 55°C
Storage Temperature	-40°C to 85°C
Operating Humidity	5% to 95% Non-condensing
Storage Humidity	5% to 95% Non-condensing
Altitude (operating)	8,000 feet/2438 m @28°C
Altitude (storage)	15,000 feet/4572 m @12°C
Electrostatic Discharge	15kV (air) @ 50% rh
Electrostatic Discharge	8kV (contact) @ 50% r
Drop	Bench drop 36 inches to concrete
Wind Blown Rain	40 MPH @ 0.1inch/minute, 15 minutes
Rain/Drip/Spill	IPX5 Spray @ 4L/minute, 10 minutes
Dust	IP6X 20mb vacuum max, 2 hours, stirred dust, .88g/m^3

Electrical Specifications

Operating Voltage	48Vdc (Nom)
Operating Current	200mA (Peak) @ 48Vdc/170mA (Nom) @ 48Vdc

AP-5181 LEDs

The AP-5181 access point has four LEDs matching the functionality of the AP-5131 model access point.



The five LEDs on the top housing of the AP-5181 are clearly visible in table-top, wall and below ceiling installations. The five top housing LEDs have the following display and functionality:

Power Status - Solid **white** indicates the AP-5131 is adequately powered.

Error Conditions - Solid **red** indicates the AP is experiencing a problem requiring attention.

Ethernet Activity - Flashing **white** indicates data transfers and Ethernet activity.

802.11a Activity - Flickering **amber** indicates beacons and data transfers over the radio..

802.11b/g Activity - Flickering **green** indicates beacons and data transfers over the radio.

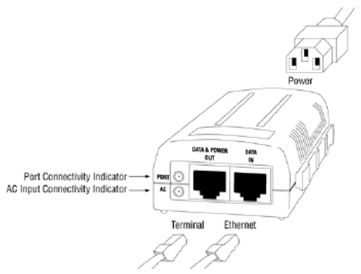
Symbol Power Injector

The access point can receive power either directly form a Symbol 48V AC-DC power supply or via an Ethernet cable connected to the LAN port (using the 802.3af standard).

When users purchase a Symbol WLAN solution, they often need to place access points in obscure locations. In the past, a dedicated power source was required for each access point in addition to the Ethernet infrastructure. This often required an electrical contractor to install power drops at each access point location. An approved power injector solution merges power and Ethernet into one cable, reducing the burden of installation and allows optimal access point placement in respect to the intended radio coverage area.

The Symbol Power Injector is included in certain AP-5131 and AP-5181 kits. The Symbol Power Injector (Part No. AP-PSBIAS-1P2-AFR) is an integrated AC-DC converter and 802.3af power injector which requires 110-220V AC power to combine low-voltage DC with Ethernet data in a single cable connecting to the access point. The access point can only use a Power Injector when connected to the LAN port. The Symbol AP-5131 and AP-5181 Power Supply (Part Numbers 50-24000-050 and AP-PSBIAS-5181-01R respectively) are not included in the kit and must be orderable separately as an accessory.

Caution - The access point supports any standards-based 802.3af compliant power source (including non-Symbol power sources). However, using the wrong solution (including a POE system used on a legacy Symbol access point) could severely damage the access point and void the product warranty.



The power injector has no On/Off power switch. The power injector receives power and is ready for access point device connection and operation as soon as AC power is applied.

Customer Support

Symbol Technologies provides its customers with prompt and accurate customer support. Use the Symbol Support Center as the primary contact for any technical problem, question or support issue involving Symbol products. If the Symbol Customer Support specialists cannot solve a problem, access to all technical disciplines within Symbol becomes available for further assistance and support. Symbol Customer Support responds to calls by email, telephone or fax within the time limits set forth in individual contractual agreements.

When contacting Symbol Customer Support, please provide the following information:

- Serial number of unit
- Model number or product name
- Software type and version number

North American Contacts

Inside North America, contact Symbol at:

For sales and product information:
Symbol Technologies, Inc.
One Symbol Plaza
Holtsville, New York 11742-1300
Telephone: 1-631-738-2400/1-800-SCAN 234
Fax: 1-631-738-5990

For product support and service:
Symbol Global Support Center:
Telephone: 1-800-653-5350, +1-631-738-6213 (Outside North America)
Fax: 631-563-5410
Email: support@symbol.com

Or see the Symbol Web for additional local contact numbers http://www.symbol.com/services/contactsupport

International Contacts

Outside North America, contact Symbol at:
Symbol Technologies, Inc.
Symbol Place
Winnersh Triangle, Berkshire, RG41 5TP
United Kingdom
Telephone: 0800-328-2424 (Inside UK), +44 118 945 7529 (Outside UK)

For other sales offices, use the Symbol Services Web site for contact information
http://www.symbol.com/services/howto/howto_contact_us.html

Web Support sites

Comprehensive On-line support is available at the MySymbolCare Web-site. Registration is free and a variety of services can be linked through this Web-portal.

MySymbolCare - RMA repair requests
http://www.symbol.com/services/msc/msc.html

Symbol Services Homepage
http://www.symbol.com/services/

Symbol Software Updates
http://www.symbol.com/services/downloads/

Symbol Developer Program Web Site
http://devzone.symbol.com/

Additional Information

Obtain additional information by contacting Symbol at:

- 1-800-722-6234, inside North America
- +1-631-738-5200, in/outside North America
- http://www.symbol.com/

Regulatory Information

All Symbol devices are designed to be compliant with rules and regulations in locations they are sold and will be labeled as required. Any changes or modifications to Symbol Technologies equipment, not expressly approved by Symbol Technologies, could void the user's authority to operate the equipment.

Symbol's devices are professionally installed, the Radio Frequency Output Power will not exceed the maximum allowable limit for the country of operation.

Antennas: Use only the supplied or an approved replacement antenna. Unauthorized antennas, modifications, or attachments could cause damage and may violate regulations.

This guide is available in local languages, translations can be downloaded from the following website: http://www.symbol.com/services/manuals/.

Country Approvals

Regulatory markings are applied to the device signifying the radio (s) are approved for use in the following countries: United States, Canada, Australia, Japan and Europe (see notes 1 and 2).

Please refer to the Symbol Declaration of Conformity (DoC) for details of other country markings. This is available at *http://www2.symbol.com/doc/*.

Note 1: For 2.4GHz Products: Europe includes, Austria, Belgium, Czech Republic, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Note 2: The use of 5GHz RLAN's has varying restrictions of use; please refer to the Symbol Declaration of Conformity (DoC) for details.

Operation of the device without regulatory approval is illegal.

Health and Safety Recommendations

Warnings for the use of Wireless Devices

Please observe all warning notices with regard to the usage of wireless devices.

Potentially Hazardous Atmospheres

You are reminded to observe restrictions on the use of radio devices in fuel depots, chemical plants etc. and areas where the air contains chemicals or particles (such as grain, dust, or metal powders) and any other area where you would normally be advised to turn off your vehicle engine.

Safety in Hospitals

Wireless devices transmit radio frequency energy and may affect medical electrical equipment. When installed adjacent to other equipment, it is advised to verify that the adjacent equipment is not adversely affected.

FCC / EU RF Exposure Guidelines

Safety Information

The device complies with Internationally recognized standards covering Specific Absorption Rate (SAR) related to human exposure to electromagnetic fields from radio devices.

Reducing RF Exposure—Use Properly

It is advisable to use the device only in the normal operating position.

Remote and Standalone Antenna Configurations

To comply with FCC RF exposure requirements, antennas that are mounted externally at remote locations or operating near users at stand-alone desktop of similar configurations must operate with a minimum separation distance of 20 cm from all persons.

Power Supply

Use only a Symbol approved power supply (p/n 50-24000-050) output rated 48 Vdc and minimum 0.25 A. The power supply is certified to EN60950-1 with SELV outputs. Use of alternative power supply will invalidate the 60950-1 approval given to this device and may be dangerous.

The AP-5181 can also be powered from a 802.3af compliant power source. Use only a certified and correctly rated device as appropriate for the country of operation.

Wireless Devices - Countries

Country Selection

Select only the country in which you are using the device. Any other selection will make the operation of this device illegal.

Operation in the US

The use on UNII (Unlicensed National Information Infrastructure) Band 1 5150-5250 MHz is restricted to indoor use only, any other use will make the operation of this device illegal.

The available channels for 802.11 b/g operation in the US are Channels 1 to 11. The range of channels is limited by firmware.

Radio Frequency Interference Requirements—FCC

Tested to comply with FCC Standards FOR HOME OR OFFICE USE

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 or more 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.

Radio Transmitters (Part 15)

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.

Radio Frequency Interference Requirements – Canada

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Radio Transmitters

This device complies with RSS 210 of Industry & Science Canada. 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.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that permitted for successful communication.

This device has been designed to operate with the antennas listed in section 3.3.1 of this installation guide, and having a maximum gain of 13.9dBi (2.4GHz) and 13dBi (5GHz). Antennas not included in this list or having a gain greater than 13.9dBi (2.4GHz) and 13dBi (5GHz) are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

Label Marking: The Term "IC:" before the radio certification signifies that Industry Canada technical specifications were met.

CE Marking and European Economic Area (EEA)

The use of 2.4GHz RLAN's, for use through the EEA, have the following restrictions:

- Maximum radiated transmit power of 100 mW EIRP in the frequency range 2.400 -2.4835 GHz.
- France outside usage, the equipment is restricted to 2.400-2.45 GHz frequency range.
- Italy requires a user license for outside usage.

The use of 5GHz RLAN's has varying restrictions for use within the EEA; please refer to the Symbol Declaration of Conformity (DoC) for details at *http://www2.symbol.com/doc/*.

Statement of Compliance

Symbol Technologies, Inc., hereby, declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC. A Declaration of Conformity may be obtained from *http://www2.symbol.com/doc/*.

Other Countries

Mexico - Restrict Frequency Range to: 2.450 - 2.4835 GHz.
Sri Lanka - Restrict Frequency Range to: 2.400 – 2.430 GHz.