

AIRcable Host XR - Professional Antenna Installation Guide

*Rev. C
January 2010*

Summary

This manual covers the installation of optional directional 18dBi patch antennas and optional 9dBi omni-directional rubber duck antennas for use with the AIRcable Host XR, wireless Bluetooth - Computer interface (dongle), containing part number AB5C1.

The use of directional, higher gain antennas is classified by the FCC as a professional installation for a fixed point-to-point application. The use of higher gain omni-directional antennas with more than 6dBi is must also be professionally installed. To be in compliance with FCC requirements, the AIRcable Host XR must be installed only with the approved type of directional patch antenna with a gain of less or equal of 18dBi or with the approved type of omni-directional antenna with a gain of less or equal of 9dBi.

FCC Information

This device complies with Part 15 of FCC Rules and Regulations. Operation is subject to the following two conditions: (1) This device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

This 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 these instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in any 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 correct the interference by one of more of the following measures:

1. Reorient the antenna;
2. Increase the separation between the affected equipment and the unit;
3. Connect the affected equipment to a power outlet on a different circuit from that which the receiver is connected to;
4. Consult the dealer and/or experienced radio/TV technician for help.

FCC ID: SQCAB5C1


IMPORTANT NOTE: Intentional or unintentional changes or modifications must not be made unless under the express consent of the party responsible for compliance. Any such modifications could void the user's authority to operate the equipment and will void the manufacturer's warranty. To comply with FCC RF exposure requirements, the following antenna installation and device operating configurations must be satisfied. The antenna for this unit must be fixed and mounted on outdoor permanent structures with a separation distance of at least 20cm from all persons. Furthermore, it must not be co-

located or operating in conjunction with any other antenna or transmitter.

Warranty Information

All products from Wireless Cables Inc. are warranted from one year from date of purchase. Please see www.aircable.net for complete description of warranty coverage and limitations.

WARNING



IMPORTANT SAFETY PRECAUTIONS:

LIVES MAY BE AT RISK! Carefully observe these instructions and any special instructions that are included with the equipment you are installing.

IMPORTANT: Look over the site before beginning any installation, and anticipate possible hazards, especially these:

CONTACTING POWER LINES CAN BE LETHAL. Make sure no power lines are anywhere where possible contact can be made. Antennas, masts, towers, guy wires or cables may lean or fall and contact these lines. People may be injured or killed if they are touching or holding any part of equipment when it contacts electric lines. Make sure there is **NO** possibility that equipment or personnel can come in contact directly or indirectly with power lines.

Assume all overhead lines are power lines.

The horizontal distance from a tower, mast or antenna to the nearest power line should be at least twice the total length of the mast/antenna combination. This will ensure that the mast will not contact power if it falls either during installation or later.

TO AVOID FALLING, USE SAFE PROCEDURES WHEN WORKING AT HEIGHTS ABOVE GROUND.


- Select equipment locations that will allow safe, simple equipment installation.
- Don't work alone. A friend or co-worker can save your life if an accident happens.
- Use approved non-conducting ladders and other safety equipment. Make sure all equipment is in good repair.
- If a tower or mast begins falling, don't attempt to catch it. Stand back and let it fall.
- If anything such as a wire or mast does come in contact with a power line, **DON'T TOUCH IT OR ATTEMPT TO MOVE IT.** Instead, save your life by calling the power company.
- Don't attempt to erect antennas or towers on windy days.

MAKE SURE ALL TOWERS AND MASTS ARE SECURELY GROUNDED, AND ELECTRICAL CABLES CONNECTED TO ANTENNAS HAVE LIGHTNING ARRESTORS. This will help prevent fire damage or human injury in case of lightning, static build-up, or short circuit within equipment connected to the antenna.

- The base of the antenna mast or tower must be connected directly to the building protective ground or to one or more approved grounding rods, using 1 OAWG ground wire and corrosion-resistant connectors.
- Refer to the National Electrical Code for grounding details.
- Lightning arrestors for antenna feed coaxial cables are available from HyperLink Technologies, Inc.

IF A PERSON COMES IN CONTACT WITH ELECTRICAL POWER, AND CANNOT MOVE:

- **DON'T TOUCH THAT PERSON, OR YOU MAY BE ELECTROCUTED.**
- Use a non-conductive dry board, stick or rope to push or drag them so they no longer are in contact with electrical power.
- Once they are no longer contacting electrical power, administer CPR if you are certified, and make sure that emergency medical aid has been requested.



Connections

The AIRcable Host XR comes equipped with a professional reverse-polarity SMA (RP-SMA) connector for attachment to an external antenna. To attach the directional patch antenna a pig-tail cable from N-Type to RP-SMA must be used according to the specification. Length of the pig-tail must not be shorter than 3 feet with a loss of 0.5 dB. Installer must cover cable-connector with heat shrink tubing to provide weatherproofing of the RF cable connectors.

The following pig-tail cable has been approved by the FCC:

K-LMR200



结构参数: Parameters

项目 Items	材料 materials	直径(mm) diameter
1. 内导体 Inner conductor	裸铜线 Copper Clad AL	1.12
2. 绝缘体 Dielectric	发泡聚乙烯 Froth polyethylene	2.95
3. 外导体 Outer conductor	自粘铝箔+ 镀铜铜线编织 Tinned copper wire braid	3.66
4. 护套 Jacket	PE 聚乙烯 (或其他材料) PE polyethylene	4.95

电性能参数: Performance parameters

电容(pF/m) Capacitance	80.4
阻抗(欧姆) Impedance	50
速率(%) Rate	83
护套耐压(VRMS) Jacket Electric strength	3000
峰值功率 (kw) Peak power	2.5
屏蔽衰减(>dB) Shielded attenuation	90
截止频率(GHz) Cut off frequencies	39

衰减 & 平均功率 Attenuation & Avg.Power

频率 Frequency (MHz)	衰减 Attenuation (dB/100m)	平均功率 Avg.Power (KW)
30	5.8	1.02
50	7.5	0.79
150	13.1	0.45
220	15.9	0.37
450	22.8	0.26
900	32.6	0.18
1500	42.4	0.14
1800	46.6	0.13
2000	49.3	0.12
2500	55.4	0.10
5800	86.5	0.07

Antenna Type

Due to FCC restrictions the professional installer must ensure that only directional patch type antennas of gains with less or equal of 18dBi are used. For these antenna this device does not require manual power limit settings since the maximum output power of the AIRcable Host XR is under 20dBm.

Application

The FCC restricts the use of directional antennas to fixed point-to-point operation. The antenna must be installed on a pole using the supplied mounting hardware per drawing below.

The omni-directional antenna must be used directly connected to the AIRcable Host XR without a cable pig-tail. Screw on the antenna to the antenna port of the device and align the antenna vertically.

Only antennas of that type with gain of less or equal 18dBi (directional) and less or equal 9dBi (omni-directional) are certified by the FCC and allowed to use with the AIRcable Host XR.

Antenna Model

ANT2400D18W

ANT2400Q9P

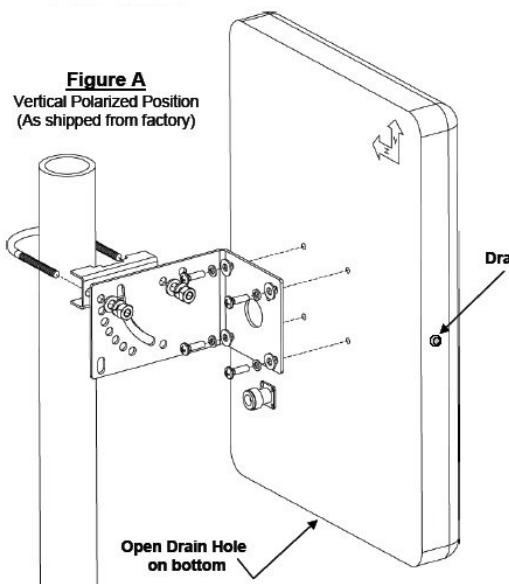
Antenna Gain

18dBi directional

9dBi omni-directional

INSTALLATION INSTRUCTIONS

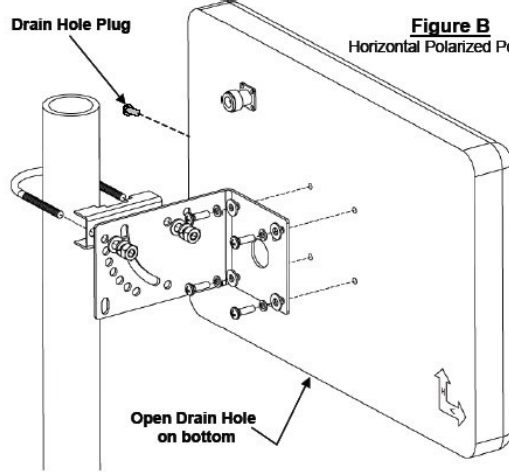
Figure A
Vertical Polarized Position
(As shipped from factory)



Drain Hole Plug

Open Drain Hole on bottom

Figure B
Horizontal Polarized Position



Drain Hole Plug

Open Drain Hole on bottom

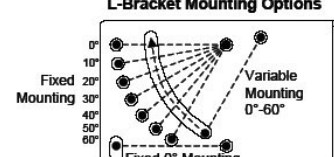
Vertical or Horizontal Polarized Mounting

1. This antenna can be vertical polarized mounted (Figure A) or horizontal polarized mounted (Figure B). It is shipped from the factory in the vertical polarized position.
2. To mount the antenna in the horizontal polarized position, rotate antenna into the position shown in Figure B. Note orientation label on rear of antenna.
3. Remove the drain hole plug from current location and replace into position shown.
4. Attach antenna to L-Bracket using the (4) pan head screws.

Mounting

1. Mount the antenna as shown, ensuring U-Bolt nuts are securely tightened to prevent antenna shift in high wind.
2. The antenna can be mounted in a up or down tilt position from 0-60°. See below for mounting options.

L-Bracket Mounting Options



Fixed Mounting

Variable Mounting 0°-60°

Fixed 0° Mounting

L-Bracket shown for down-tilt mounting. For up-tilt, rotate bracket 180 degrees when attaching to antenna.

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Antenna Alignment

The directional antenna must be aligned for optimal performance. The antenna shall be aimed at the peer and precisely aligned for a maximum signal strength. The AIRcable Host XR provides Relative Signal Strength Indicator through the standard Bluetooth interface.

Please note that the Bluetooth radio adjusts the output power to the situation. A relative zero is a good and solid connection.

The omni-directional rubber-duck antenna must be aligned vertically to give an optimum horizontal radiation pattern.