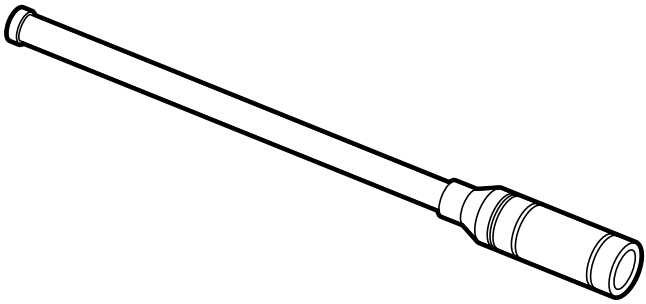
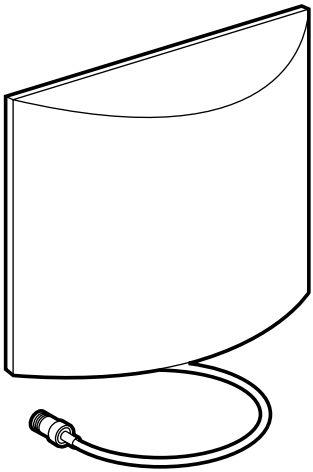
1000 Park Drive • Lawrence, PA 15055-1018 • 724-746-5500 • Fax 724-746-0746

JULY 2004
LW6200A
LW6201A

Pure Networking 2.4-GHz Antennas





CUSTOMER SUPPORT INFORMATION

Order **toll-free** in the U.S.: Call **877-877-BBOX** (outside U.S. call **724-746-5500**)
FREE technical support 24 hours a day, 7 days a week: Call **724-746-5500** or fax **724-746-0746**
Mailing address: **Black Box Corporation**, 1000 Park Drive, Lawrence, PA 15055-1018
Web site: **www.blackbox.com** • E-mail: **info@blackbox.com**

FEDERAL COMMUNICATIONS COMMISSION and INDUSTRY CANADA RADIO FREQUENCY INTERFERENCE STATEMENTS

Class B Digital Device. This equipment has been tested and found to comply with the limits for a Class B computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. However, there is no guarantee that interference will not occur in a particular 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. If this equipment does cause harmful interference to radio or telephone reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one 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 an experienced radio/TV technician for help.

CAUTION

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

To meet FCC requirements, shielded cables and power cords are required to connect this device to a personal computer or other Class B certified device.

This digital apparatus does not exceed the Class B limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

TRADEMARKS USED IN THIS MANUAL

Any trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.

Contents

1. Specifications

1.1 General

Application: LW6200A: Outdoor/indoor (pole);
LW6201A: Outdoor/indoor (wall/pole)

Frequency Range: 2.4000–2.5 GHz

Gain: LW6200A: 8 dBi; LW6201A: 14 dBi

Beam Width: LW6200A: H360, V15; LW6201A: H30, V30

Approximate Range: LW6200A: 0.62 mi. (1 km); LW6201A: 1.86 mi. (3 km)

Impedance: 50 ohms

Survival Wind Speed: 111.8 mi./hr. (180 km/hr.)

Lightning Protection: DC ground

Cable Length: LW6200A: 19.7" (50 cm); LW6201A: 11.8" (30 cm)

Connector: (1) N female

Temperature Tolerance: -40 to +122°F (-40 to +50°C)

Humidity: Up to 100%

Size: LW6200A: 0.7"W x 24.8"L (18 x 63 cm);
LW6201A: 9.4"H x 9.4"W x 2.8"D (23.9 x 23.9 x 7.1 cm)

1.2 Radiation Patterns

Figures 1-1 and 1-2 show the vertical and horizontal radiation patterns for the antennas.

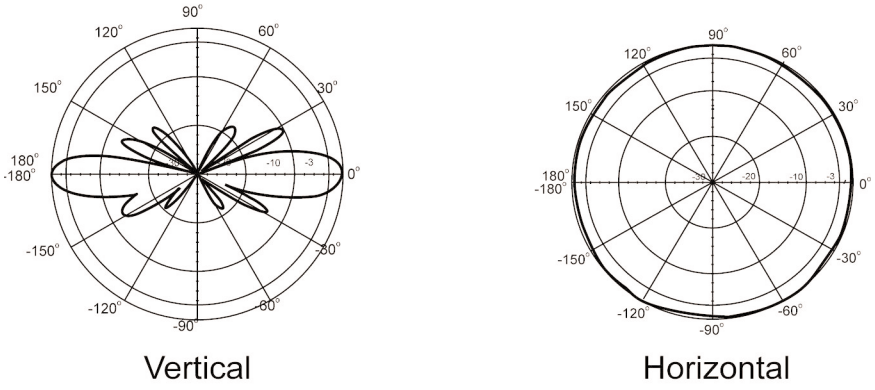


Figure 1-1. LW6200A's radiation pattern.

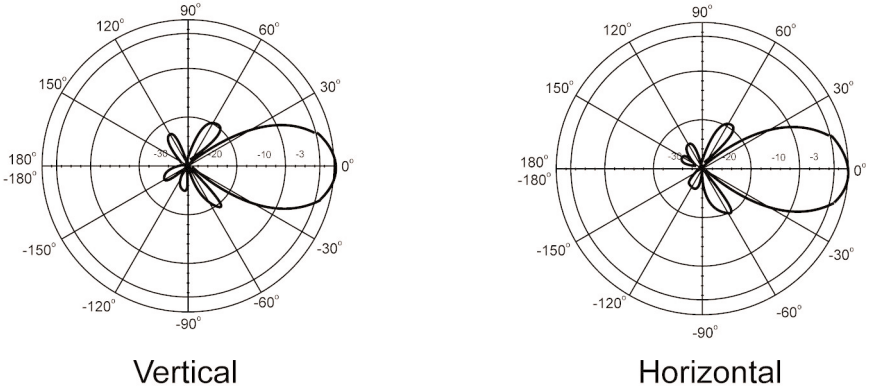


Figure 1-2. LW6201A's radiation pattern.

2. Introduction

2.1 Overview

The Pure Networking 2.4-GHz Antenna is an outdoor/indoor antenna that extends an IEEE 802.11g wireless access point's transmitting and receiving power. With this antenna, your wireless network will have extraordinary transmission distances and a wider coverage range.

Installers can easily and conveniently build a wireless network in a building's interior or exterior. The antenna is completely waterproof, wind resistant, and is made out of corrosion-resistant material to withstand harsh environments.

Two models are available:

- 8-dBi Omnidirectional 2.4-GHz Antenna (LW6200A)
- 13-dBi Directional Panel 2.4-GHz Antenna (LW6201A)

2.2 What's Included

Your package should include the following items. If anything is missing or damaged, contact Black Box at 724-746-5500.

LW6200A:

- (1) Antenna
- (1) Metal tube
- (2) U-shaped screws
- (4) M8 x 110 bolts
- (4) Screw clamps
- (4) ¼ spring washers
- (4) ¼ nuts
- (4) M8 spring washers
- (4) M8 nuts

- (1) N male to N female 1.64-ft. (0.5-m)/0.43-dB transmission loss interconnecting cable
- (1) lightning surge arrestor and static electricity protector/N female to N male
- This users' manual

LW6201A:

- (1) Antenna
- (2) M-shaped metal fixings
- (8) M8 spring washers
- (2) M8 x 12 screws
- (1) steel tube
- (5) M8 washers
- (3) M8 x 110 bolt
- (5) M8 nuts
- (2) M8 x 16 screws
- (4) M6 x 10 screws
- (4) M6 washers
- (1) triangle stand
- (1) half-round metal stand
- (2) tapping screws
- (2) plastic wall tigers
- (1) lightning surge arrestor and static electricity protector/N female to N male
- (1) ring clamp
- (2) screw clamps
- This users' manual

3. Installation

3.1 Guidelines

Observe the following guidelines when you are installing the antenna.

- Avoid placing the antenna behind obstacles. Obstructions such as concrete walls, trees, power lines, and thick metals limit radio signal penetration and reduce throughput and the wireless device's range.
- Mount the antenna vertically. This antenna is vertically polarized. Since it has vertical gain, mount the antenna in a vertical (not leaning) position for optimal performance.
- Use a surge arrestor for the antenna when it's installed outdoors. A surge arrestor can protect your wireless device from high voltage surges caused by the antenna's discharge and transient voltages.
- Do not point the antenna in the direction of people or animals. Mount the antenna to minimize the potential for human or animal contact during normal operation.

3.2 Mounting the Antenna

3.2.1 8-dBi Omnidirectional Antenna

Wallmount configuration

1. Connect the interconnecting cable to the antenna.
2. Put the interconnecting cable into the metal tube and connect the metal tube to the antenna.
3. Clip the two U-shaped screws to the metal tube with two of the screw clamps.
4. With a secure pole between them, connect the other side of the two screw clamps used in step 3 to the remaining two screw clamps using the M8 x 110 bolts, the ¼ spring washers, and the ¼ nuts.
5. Using the M8 spring washers and M8 nuts, attach the screw clamps to a secure pole in the desired position.

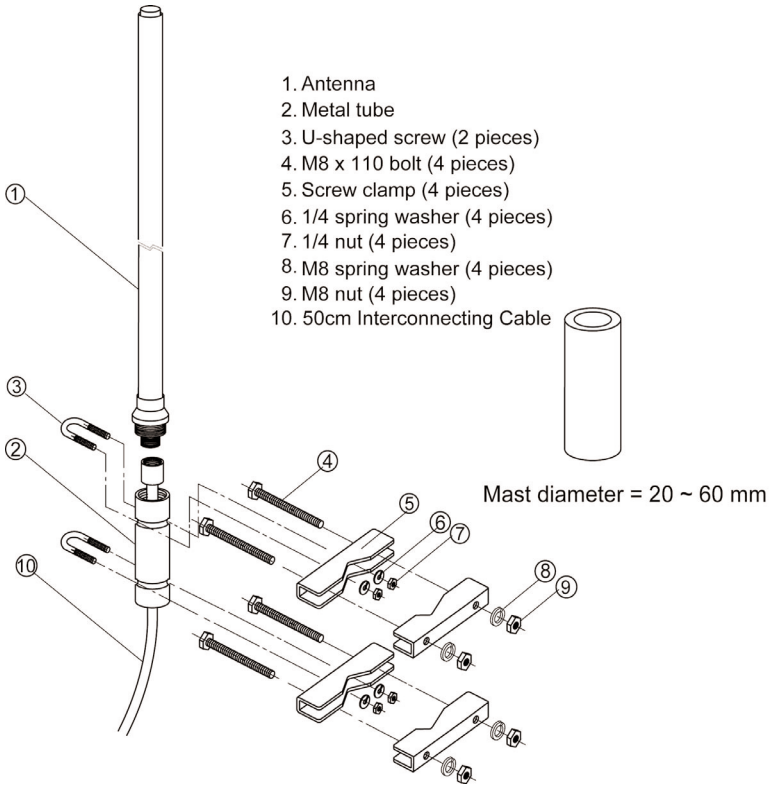


Figure 3-1. Using the included components to install the LW6200A.

3.2.2 14-dBi Directional Panel Antenna

Wallmount configuration

NOTE

You will not need to use all of the included components to install the antenna on the wall.

1. Using one M8 spring washer and one M8 x 12 screw, attach one of the M-shaped metal fixings to the back of the antenna.

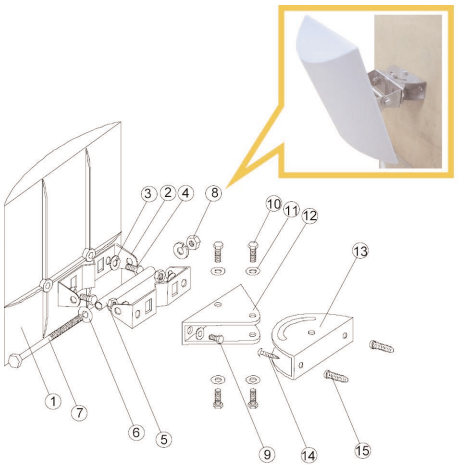
2. Attach the half-round metal stand with the two plastic wall tigers and two tapping screws horizontally in the desired mounting position.

3. Connect the other M-shaped metal fixing and the triangle stand with one M8 x 12 screw and one M8 spring washer.

4. Using the four M6 x 10 screws and four M6 washers, attach the triangle stand to the half-round metal stand. The antenna can be horizontally aligned with this connection.

5. Attach one M8 x 110 bolt to one M-shaped metal fixing using one M8 washer, then slide the steel tube over this bolt. Connect the two M-shaped metal fixings together with the same M8 x 110 bolt, a second M8 washer, and one M8 nut. The antenna can be vertically aligned with this connection.

6. Connect the triangle stand to the M-shaped metal fixings with two M8 x 16 screws.



1. Antenna body
2. M-shaped metal fixing (2 pieces)
3. M8 spring washer (8 pieces)
4. M8 x 12 screw (2 pieces)
5. Steel tube
6. M8 Washer (5 pieces)
7. M8 x 110 bolt (3 pieces)
8. M8 nut (5 pieces)
9. M8 x 16 screw (2 pieces)
10. M6 x 10 screw (4 pieces)
11. M6 washer (4 pieces)
12. Triangle stand
13. Half-round metal stand
14. Tapping screw (2 pieces)
15. Plastic wall tiger (2 pieces)

Figure 3-2. Using the included components to install the LW6201A.

Pole-mount configuration

Using a ring clamp

NOTE

You will not need to use all of the included components to install the antenna on a pole using a ring clamp.

1. Using one M8 spring washer and one M8 x 12 screw, attach one of the M-shaped metal fixings to the back of the antenna.

2. Push the ring clamp through the other M-shaped metal fixing as shown in the diagram.

3. Attach the clamp to a secure pole in the desired position. The diameter of the pole should be less than 2 inches (5.1 cm).

4. Attach one M8 x 110 bolt to one M-shaped metal fixing using one M8 washers, then slide the steel tube over this bolt. Connect the two M-shaped metal fixings together with the same M8 x 110 bolt, a second M8 washer, and one M8 nut. The antenna can be vertically aligned with this connection.

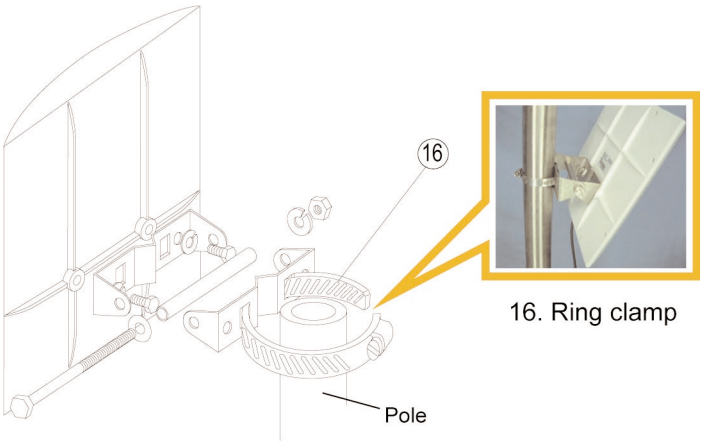


Figure 3-3. 14-dBi Directional Panel Antenna mounted on a pole, secured with a ring clamp.

Using a screw clamp

NOTE

You will not need to use all of the included components to install the antenna on a pole using a screw clamp.

1. Using one M8 spring washer and one M8 x 12 screw, attach one of the M-shaped metal fixings to the back of the antenna.

2. Push the two M8 x 110 bolts through the other M-shaped metal fixing with two M8 washers and both screw clamps.

3. Attach the screw clamps to a secure pole in the desired position.

4. Attach one M8 x 110 bolt to one M-shaped metal fixing using one M8 washers, then slide the steel tube over this bolt. Connect the two M-shaped metal fixings together with the same M8 x 110 bolt, a second M8 washer, and one M8 nut. The antenna can be vertically aligned with this connection.

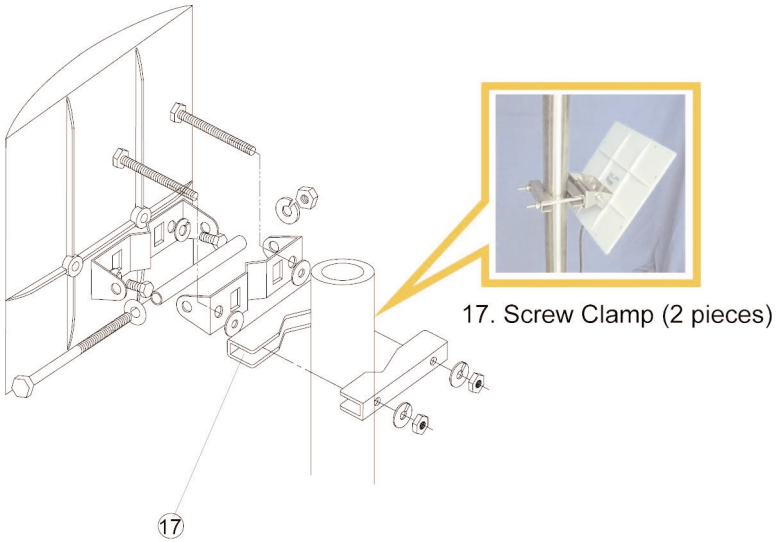


Figure 3-4. 14-dBi Directional Panel Antenna mounted on a pole, secured with a screw clamp.

3.3 Installing the Surge Arrestor

With the surge arrestor attached to the lightning protector of the building, all devices downstream are protected from lightning strikes. Follow the steps below to install the surge arrestor.

1. Connect one end of the surge arrestor (#1 in Figure 3-5) to the antenna.
2. Connect the other end of the surge arrestor (#2) to the extension cable linked to the wireless access point.
3. Connect the building's lightning protector to the surge arrestor (#3).

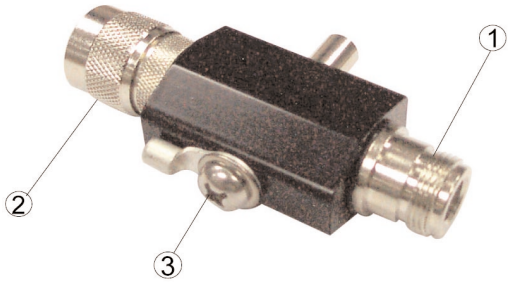


Figure 3-5. The surge arrestor's connections.

3.4 Connecting to the Wireless Access Point

The wireless access point connects to the antenna through an extension cable. To assemble the wireless access point, use the components in the diagram shown below. First, attach the extension cable (#2 in Figure 3-6) to the wireless access point (#1). Then install the surge arrestor (#3) in-line between the extension cable (#2) and the antenna (#4).

Figure 3-6. The wireless access point's system components.

4. Troubleshooting

4.1 Calling Black Box

If you determine that your 2.4-GHz Antenna is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box at 724-746-5500.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem.
- when the problem occurs.
- the components involved in the problem.
- any particular application that, when used, appears to create the problem or make it worse.

4.2 Shipping and Packaging

If you need to transport or ship your 2.4-GHz Antenna:

- Package it carefully. We recommend that you use the original container.
- If you are shipping the 2.4-GHz Antenna for repair, make sure you include everything that came in the original package. Before you ship, contact Black Box to get a Return Authorization (RA) number.