SENAO

SL-2011CD-GP

SL-2011CD-FP

SL-2011CD-DP

Antenna User Guide

Before operating the unit, please read this manual thoroughly, and retain it for future reference.

Manufactured by ISO-9001 Certified Factories

Installing the Antenna

1. Introduction

The Senao access point is designed to perform in a variety of environments. Implementing the antenna system can greatly improve coverage and performance. A good communication can only be achieved with the right antenna. The antenna kits comprise numerous components, including the antenna, connectors, mounting hardware, antenna cabling, and in certain product boxes.

2. Type of Antennas

The Senao access point may be bundled with several different styles of antennas for use in the 2.4GHz range. Each type of antenna will offer different coverage capabilities. As the gain of an antenna increases, there is some tradeoff to its coverage area. Usually high gain antennas offer longer coverage distances, but only in a certain direction. The radiation patterns below show the coverage areas of the styles of omni-directional and uni-directional antennas.

◆Omni-Directional Antennas

An omni-directional antenna is designed to provide a 360-degree radiation pattern. This type of antenna is used when coverage in all directions from the antenna is required.

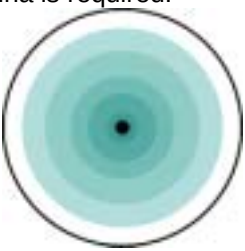


Figure 1-1: Omni-Directional Antenna (top-view)

◆Directional Flat Panel Antennas

Directional antennas have many different styles and shapes. By redirecting this energy, it has the effect of providing more energy in one direction, and less energy in all other directions. As the gain of a directional antenna increases, the angle of radiation usually decreases, providing a greater coverage distance, but with a reduced coverage angle.

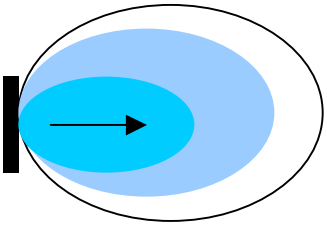


Figure 1-2: Directional Flat Panel Antenna (side view)

3. Antenna placement

The advices below are basic concepts to install an antenna.

- The distance between the antenna and transceiver should be kept to a minimum to reduce signal loss.
- To operate at optimum efficiency, antenna cable should be kept as short as possible.

IMPORTANT NOTE:
FCC RF Radiation Exposure Statement:
This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

4. Installing the 3dBi omni-directional antenna

4-1. Hardware Description

The 3dBi omni-directional antenna is a broadband antenna for the 2.4GHz frequency band featuring an omni-directional pattern with a normal gain of 3dBi. Before you start installing the antenna, verify the following items in the antenna kits or in the product package.

◆ Elements list (Figure 1-3)

Element Description	Quantity	Item
Omni-directional Antenna	1	A
Ferrules	1	B
Nut	2	C
Screw (Long)	3	D
Screw (medium)	2	E
Screw (short)	1	F
Lock-washers	5	G
Bracket	1	H
Cable	1	I
Jack	1	J

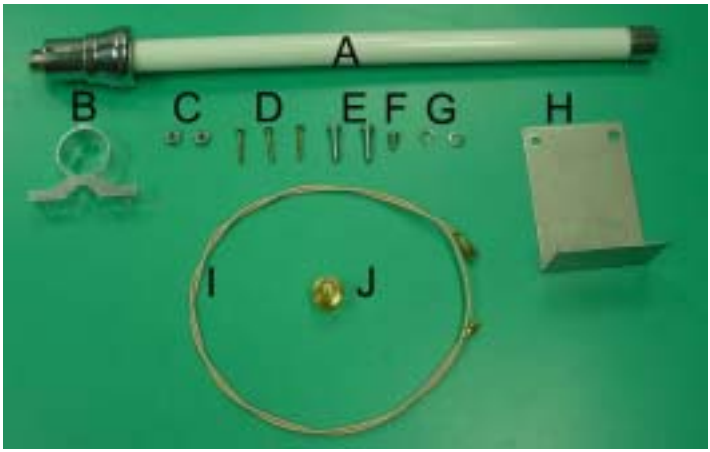


Figure 1-3 Elements list

4-2. Mounting the Omni-directional Antenna

You can mount the 3dBi antenna to a ceiling for indoor use. This antenna uses vertical polarization that is the most common type of polarization for omni-directional antennas.

◆ Mounting to a ceiling

In most cases, these installations require a large coverage area. Experience has shown that an omni-directional antenna mounting at about 6 to 8 meter (20 to 26 feet) will typically provide the best overall coverage. Of course this also depends upon the height of the ceiling, material on the ceiling and ability to locate the antenna at this height. The antenna should be placed in the center of the desired coverage area. An open area will provide the best performance.

To mount the antenna to a ceiling proceed following steps：

1. Position the ferrule (item B in Figure 2-11) to the front of the bracket (item H).
2. Place antenna mounting screws (item F) through the screw hole on the bracket.
3. Use the lock – washers (item G) and nuts (item C) to secure the bracket to the ferrule (item B).
   Use a wrench to tighten the nuts and ensure the ferrule will be fixed

to the front of the bracket.

4. Feed the omni-directional antenna (item A) through the hole of the ferrule (item B)
5. Push the antenna through the ferrule (item B) to the end. Place screw (item E) to tighten the antenna.
   Note：The hole of the antenna should be above the ferrule.(See figure 1-4)
6. Attach the cable (item I) and Jack (item J) to the connector on top of the antenna.
7. Place 3 screws (item D) through the holes to fix the antenna on the ceiling.
8. Attach the other end of the cable (item I) to the access point or the PC card of the access point.

Step 1

Step 2

Step 3

Step 4

Step 5

Step 6

Step 7

Step 8

The hole of the antenna should be above the ferrule

Figure 1-4

5. Installing the 7dBi Flat panel directional antenna

5-1. Hardware Description

The 7dBi flat panel antenna is a broadband antenna for the 2.4GHz frequency band featuring a directional pattern with a normal gain of 7dBi. Before you start installing the antenna, verify the following items in the antenna kits or in the product package.

◆ Elements list (Figure 1-5)

Element Description	Quantity	Item
Flat Panel Antenna	1	A
Panel for Antenna	1	B
Panel for Wall	1	C
Strut	1	D
Nut	2	E
Screw	2	F
Gummed tape	2	G
Cable	1	H

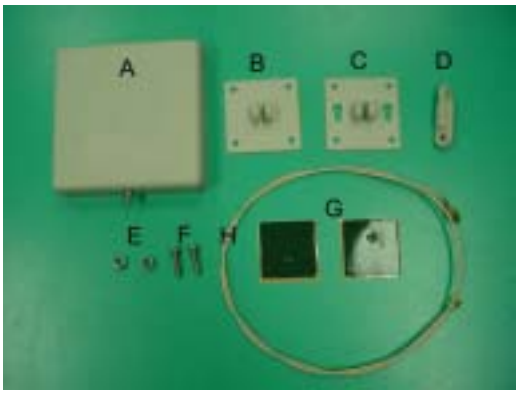


Figure 1-5

5-2. Mounting the Flat panel directional Antenna

You can mount the 7dBi MHz antenna to a wall. Our package has a 180° stand and you can adjust the best angle you want. This antenna uses vertical polarization that is the most common type of polarization for directional antennas.

◆ Assembly the stand

To assembly the stand proceed following steps：

1. Put the strut (item D) through the hole of the panel for antenna (item B) and panel for wall (item C).
2. Place 2 screws (item F) through these two holes.
3. Use two nuts (item E) to secure the panel for antenna (item B) and panel for wall (item C). Complete set picture is in step 3

Step 1

Step 2

Step 3

◆ Mounting to a wall

To mount the antenna to a wall proceed following steps：

1. Stick or screw the stand on the wall.
2. Glue the one-gummed tape in the panel for antenna (item B) and stick the flat panel antenna (item A) together. Make sure that the connector of the flat panel antenna points to the ground.
3. Attach the cable (item H) to the connector on the button of the antenna.
4. Attach the other end of the cable (item H) to access point or the pc card of the access point.

Step 1

Step 2

Step 3

Step 4

Step 5

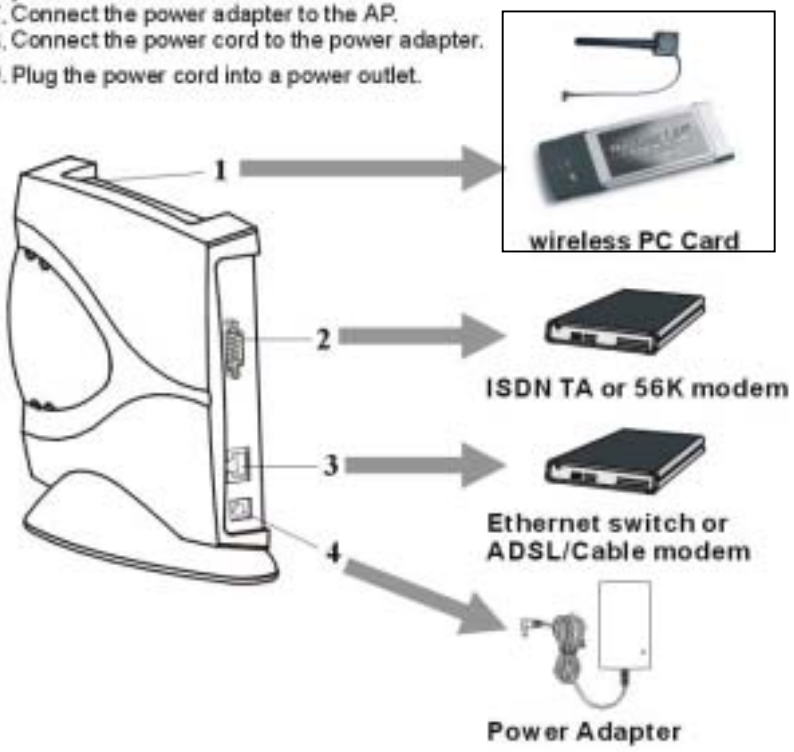
Step 6

6.Installation Wireless PC card with one rubber antenna

Hardware Installation

The AP can be placed on a flat surface or mounted on a wall. For mounting a wall, refer to Wireless Broadband Router & Access Point User Guide in the Installation CD.

1. Use the desktop stand provided to place the AP on a flat surface.
2. Insert the PC Card into the PC Card slot of the AP.
3. Put the rubber antenna into the hole of the antenna bracket
4. Connect the cable of the rubber antenna to the jack of the PC Card
5. Connect the magnet of the antenna bracket to the AP
6. Connect an Ethernet cable from the RJ-45 Ethernet port of the AP to your Ethernet network.
7. Connect the power adapter to the AP.
8. Connect the power cord to the power adapter.
9. Plug the power cord into a power outlet.



Appendix A Specifications

SL-2011CD General

Radio Data Rate	11, 5.5, 2 and 1 Mbps, Auto Fall-Back
Range (open environment)	11 Mbps – 150m 5.5 Mbps – 200m 2 Mbps – 250m 1 Mbps – 400m
Operating Voltage	3.3V/5V
EMC Certifications	FCC Part 15, ETSI 300/328
Compatibility	Fully interoperable with IEEE802.11b compliant products
LED Indicator	RF Link activity

Network Information

Network Architecture	Support ad-hoc, peer-to-peer networks and infrastructure communications to wired Ethernet networks via Access Point
Drivers	Windows 95/98/ME/2000
Access Protocol	CSMA/CA
Roaming	IEEE802.11b compliant
Security	64/128-bit WEP data encryption

Radio

Frequency Band	2.412 – 2.462 GHz
Radio Type	Direct Sequence Spread Spectrum (DSSS)
Modulation	CCK (11, 5.5Mbps) DQPSK (2Mbps) DBPSK (1Mbps)
Operation Channels	11 for North America, 14 for Japan, 13 for Europe, 2 for Spain, 4 for France
RF Output Power	13dBm $\pm$ 2dBm
Antenna	Integrated, with built-in diversity
Sensitivity @FER=0.08	11 Mbps < -83dBm 5.5 Mbps < -86dBm 2 Mbps < -89dBm 1 Mbps < -91dBm

Environmental

Temperature Range	0 to 50 C (operating) -20 to 80 C (storage)
Humidity (non-condensing)	5% to 95% typical

Physical Specifications

Form Factor	PCMCIA Type II PC Card
Dimensions	118(L) mm x 54(W) mm x 7.5(H) mm
Weight	40 g

Specifications 3dBi Omni-directional Antenna

Mechanical		
Size		H 390 mm(15.35 inches)
Weight		370 g (13.05 ounces)
Material		Guide pipe : Aluminum alloy Bracket : Aluminum alloy
Mounting method		Using our antenna kits to mount to a ceiling
Connector		N-Female(reverse)
Electrical		
Frequency		2400-2485 MHz
Polarization		Vertical
VSWR		≦ 2.0 : 1
Gain (dBi)		3
Beamwidth deg.	Horz.	N/A
	Vert.	60°

Specifications 7dBi Flat panel directional Antenna

Mechanical		
Size		H 120 mm(4.72 inches), W 120mm(4.72inches), D 27mm(1.063inches)
Weight		160 g (5.643 ounces)
Material		ABS-PC
Mounting method		Using our antenna kits to mount to a wall
Connector		SMA female(unique)
Electrical		
Frequency		2400-2485 MHz
Polarization		Linear
VSWR		≦ 2.0 : 1
Gain (dBi)		7
Beamwidth deg.	Horz.	60°
	Vert.	60°

Appendix B Regulatory Compliance Information

Radio Frequency Interference Requirements
FCC ID：NI3-SL-2011CD-ANT
CANADA：xxxxxxx

This device complies with Part 15 of FCC Rules and Canada RSS-210. Operation is subject to the following conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Interference Statement

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

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 and Regulation. 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 instruction manual, may cause harmful interference to nearby TV's, VCR's, radio, computers, or other electronic devices. To minimize or prevent such interference, this equipment should not be placed or operated near these devices. If interference is experienced, moving the equipment away from them will often reduce or eliminate the interference.

However, there is no guarantee that interference will not occur in a particular installation. If the 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:

1.Re-orient or relocate the receiving antenna.
2.Increase the separation between the equipment and receiver.
3.Connect the equipment into an outlet on a circuit different from that which the receiver is connected.
4.Consult the dealer or an experienced radio/TV technician for help.