

Professional installation Guide

Product/s covered in this guide: **Device: APEX0100 and APEX0101** is part of the **Aruba's** APEX0100 family, implementing dual radio cards each 3x3 MIMO supporting IEEE 802.11 a/b/g/n/ac operation.

IMPORTANT - Visit Aruba Support web page for the latest information and documentation related to this product.

IMPORTANT – Please read this document before installing and using your product. This device must be installed and used in strict accordance with the manufacturer's instructions. Only approved by the manufacturer power adapters must be used. For replacement, contact your supplier or distributor.

Installation of this product must comply with local regulations and codes. When this product is used with external antenna/s, please refer to the installation documentation provided for the antenna/s. Changes or modifications to the device not approved by the manufacturer of the product could void the user's authority to operate the equipment and will void the warranty of the product. No user serviceable parts; all repairs and service must be handled by a qualified service center. All products using external antennas must be professionally installed, and the transmit power of the system must be adjusted by the professional installer/s to ensure that the system's EIRP is in compliance with the limit specified by the regulatory authority of the country of deployment. During deployment of the system and its initial setup, professional installer must ensure that the allowed EIRP limit is not exceeded (in the Country of exploitation of this equipment).

To achieve this professional installer must use approved and recommended by the Manufacturer antennas,

<i>Model</i>	<i>Type</i>	<i>Gain (dBi)</i>	<i>Frequency Band (MHz)</i>
ANT-3X3-2005	Omni	5	2400-2500
		NA	4900-5900
ANT-3X3-5005	Omni	NA	2400-2500
		5	4900-5875
ANT-2X2-D805	Directional	5	2400-2500
		5	4900-5875
ANT-3X3-5712	Directional	NA	2400-2500
		11.5	4900-6000
ANT-2X2-2314	Directional	14	2400-2500
		NA	4900-5875
ANT-2X2-5314	Directional	NA	2400-2500
		14	4900-6000
ANT-2X2-2714	Directional	14	2400-2483
ANT-3X3-5010	Omni	10	4900-5875
ANT-2X2-D607	Directional	7	2400-2500
		7	4900-5875
ANT-3X3-D608	Directional	8	2400-2500
		8	4900-5900
ANT-3X3-D905	Directional	5	2400-2500
		5	4900-5900

and enter Antenna gain in the software using to setup and manage the product. In additional attenuation between the device and antenna may have to be measured or calculated. The following formula can be used to calculate from EIRP limit related RF power based on selected antennas (antenna gain) and feeder (Coaxial Cable loss):

$$\text{EIRP} = \text{Tx RF Power (dBm)} + G_A (\text{dB}) - F_L (\text{dB});$$

EIRP → limit specific for each Country of deployment

Tx RF Power → RF power measured at RF connector of the unit

G_A → Antenna gain

F_L → Feeder loss (including the connectors' loss)

This device has been designed to operate with antennas listed above and having a maximum gain listed below. Antennas not included in this list or having gain greater than specified below are strictly prohibited for use with this device. The require Antenna Impedance is 50 Ohms.

Attention to user and installation person:

According to §2.1091, §2.1093 and §1.1307(b), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

The power density(S) must less than 1 mW/cm²,

$$S = PG / (4\pi R^2)$$

Where:

S = power density in mW/cm²;

P = transmit power in mW;

G = numeric gain of transmit antenna;

R = distance (cm)

(Which according to user manual for a safety use distance, default 35cm.)

numeric gain = $\text{Log}^{-1}(\text{dB antenna gain}/10)$

The user and installation person should calculated the Power density(S) before using and insure that less than 1 mW/cm².

For example:

Where Product transmit power from 2.4GHz band:

Port 0=50mW, port 1=50mW, port 2=50mW,

The total transmit power= port 0+ port 1+ port 2 = 50mW+50mW+50 mW = 150mW;

Where Product transmit power from 5GHz band:

Port 0=50mW, port 1=50mW, port 2=50mW,

The total transmit power= port 0+ port 1+ port 2 = 50mW+50mW+50 mW = 150mW;

If User's antenna with 14dBi gain max(for 2.4GHz band and 5GHz band),

the numeric gain= $\text{Log}^{-1}(\text{dB antenna gain}/10) = \text{Log}^{-1}(14/10)=25.12\text{dBi}$;

R=35(cm)(Satety warning in User Manual),

S limit=1mW/cm²,

According to the formula:

$$S = PG / (4\pi R^2)$$

For 2.4GHz band:

$$S_1 = 150 * 25.12 / (4 * 3.14 * 35 * 35) = 0.245 < 1\text{mW/cm}^2.$$

For 5GHz band:

$$S_2 = 150 * 25.12 / (4 * 3.14 * 35 * 35) = 0.245 < 1\text{mW/cm}^2.$$

$$S_{(\text{Total})} = S_1 + S_2 = 0.245 + 0.245 = 0.490 < 1\text{mW/cm}^2.$$

So, it compliance to FCC rules.

Antenna Types and Maximum Antenna Gains

<i>Frequency Band</i>	<i>Type</i>	<i>Gain(dBi)</i>
2.4GHz	Omni	5
	Directional	14
5GHz	Omni	10
	Directional	14

Note: Antenna information provided above reflect approved antennas for initial release of the device. For full list of antennas approved/recommended by the Manufacture please visit the Aruba Networks Inc. web site.