

2.4 Labeling

2.4.1 Grounding

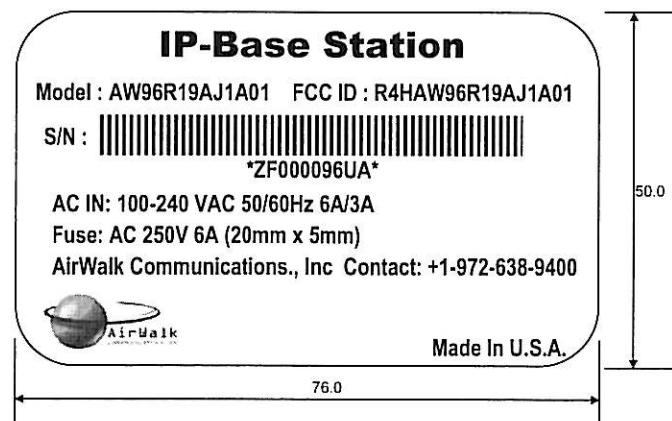
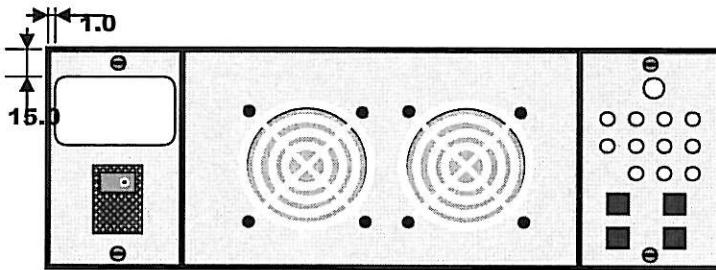
Proper grounding is recommended to ensure good RF performance in addition to personnel safety. Antenna systems should also be suitably grounded for good RF performance.

Grounding connection points on the chassis are identified by this symbol:



2.4.2 Label: Model Identification, FCC Identification, Power

The following label is applied to the OneRAN unit to provide model identification, FCC identification and rated power supply information. Note some units are not equipped with FCC identification and therefore operation of these units in the US is not permitted.



2.5 Regulatory Compliance Information

The FCC regulatory compliance information provided in this section is applicable only to models equipped with an FCC identification number (FCC ID).

2.5.1 Radio Interference (FCC 15.19 Statement)

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.

2.5.2 Unauthorized Modifications (FCC 15.21 Statement)

Persons or parties responsible for operation of this equipment are cautioned that any changes or modifications not expressly approved by AirWalk Communications Incorporated could void the user's authority to operate this equipment.

2.5.3 Digital Device Interference (FCC 15.105 Statement)

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.

2.5.4 RF Exposure (FCC MPC Compliance)

In order to comply with FCC RF Exposure requirements, this device must be installed and operated in such a way that a minimum separation distance of 20 cm is always maintained between the antenna and all persons during normal operations.

3 OneRAN System Introduction

3.1 Overview

The AirWalk OneRAN (CDMA-2000 IP-Base Station) product is unique in the way that it combines both BTS and BSC functionality in one compact platform.

This product is designed for efficiency and optimized to reduce the service providers CAPEX, and OPEX and at the same time, it increases the number of users per assigned spectrum.

It provides higher capacity in less space for today's spectrum hungry data and multi-media applications.

The OneRAN system provides the following advantages:

- Easily adapted to 3FA/Omni structure.
- Supports 2G and 3G CDMA standards [depending on model]
 - TIA/EIA-95, J-STD-008, CDMA2000 (1x); EVDO Rev A
- Supports data service transmission of 1.2 kbps to 144 kbps
- Provides 96 basic channel elements
- Easy repair and support
- Improved reliability
- Provides an 'All-IP' solution
- Provides an effective solution for macro systems, enterprise networks, and hot spots.

3.2 IP- Base Station (BS) System Description

The OneRAN IP-RAN (Internet Protocol Radio Access Network) is comprised of a BSC/RNC & a BTS integrated in a single package. The IP-RAN connects to an MSC soft switch or Call Agent (CA) via an IP connection. The IP-RAN communicates with adjacent IP-RAN units to provide soft handoff capabilities without burdening the soft switch. 1xRTT & EVDO data is supported by an IP network connection to a PDSN. A Base Station Management system provides O&M management of IP-RAN units in a network.

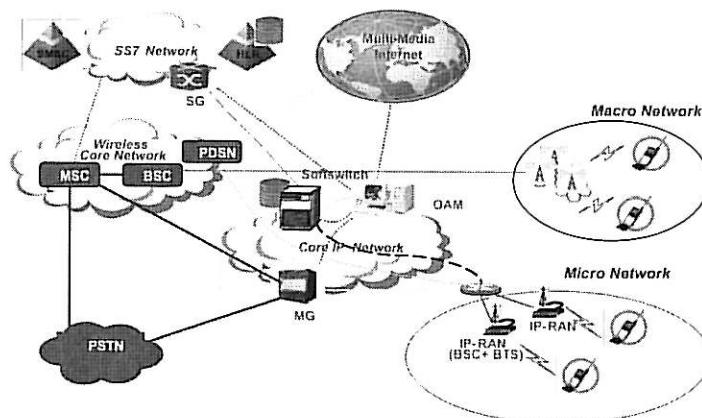


Figure 3-1 Network Diagram

3.3 Hardware Configuration

The IP-BS is a unique modular and stackable combination BSC and BTS platform that is differentiated from other systems. Other systems have separate BTS and BSC platforms which add to cost and complexity. The AirWalk RAN has a structure that combines and arranges the BSC interface with one 1FA/3Sector BTS in a single package.

The main components are (depending on specific model):

- OneRAN (Main Unit)
 - CDPB Module (Common Digital Processing Board), consisting of:
 - CPIB (Channel Processor and IF Interface Board)
 - PCPM (Primary Call Processor Module)
 - GPSR (Global Positioning System Receiver)
 - XCVB Module (RF Transceiver Board)
 - PSA (Power Supply Assembly)
- Sector RU (Remote RF Unit – Slim Series)
 - HPAU (High Power Amplifier Unit)
 - AFEU (Antenna Front End Unit)
 - FANU (Fan Unit)
 - RPSU (Remote RF Power Supply Unit)
 - *Note: A Single Sector RU is used for Omni configurations*
- DC RPSU for RU (Remote RF Unit – Slim Series)
 - DC power distribution unit
 - Includes voltmeter and ammeter
 - Provided for optional DC powered RU system configurations only
- Optional Cabinet Mounting
 - Some units may be mounted in an optional cabinet

3.3.1 Physical Description

- Main Unit
 - Dimension: Max. 482mm[19"] (W) x 457mm[18"] (D) x 178mm[7"] (H)
 - 19" EIA Rack x 4 Rack Units
 - Weight: 18 kg [40 lbs] (3 Sector); 15 kg [33 lbs] (Omni)
- Sector RU [Slim RU Series]
 - Dimension: Max. 482mm[19"] (W) x 457mm[18"] (D) x 88mm[3.5"] (H)
 - 19" EIA Rack x 2 Rack Units
 - Weight: 32 kg [73 lbs]
- DC RPSU [optional for DC powered configurations]
 - Dimension: Max. 482mm[19"] (W) x 457mm[18"] (D) x 44[1.75"] mm (H)
 - 19" EIA Rack x 1 Rack Unit
 - Weight: 3 kg [6.6 lbs]
- Optional Self-Contained Mounting Cabinet (including casters)
 - Dimension: Max. 546mm[21.5"] (W) x 610mm[24"] (D) x 876mm[34.5"] (H)
 - 19" EIA Rack x 16 Rack Units mounting space
 - *Refer to Optional Cabinet Installation Manual*

3.3.2 Typical Configurations

The following shows typical component configurations for common applications. Refer to the model charts for the contents of specific model numbers.

Low/medium power systems including Omni or Sector MicroCell, MiniCell and Pilot Beacon (1mW/50mW/4W)

- OneRAN Main Unit

Omni High Power MacroCell Systems (20W)

- OneRAN Main Unit
- Sector RU
- Optional DC RPSU for DC powered systems

Sector High Power MacroCell Systems (20W)

- OneRAN Main Unit
- 3x Sector RU
- Optional DC RPSU for DC powered systems

3.3.3 Installation Photographs

The following photographs show typical field installations for OneRAN systems:

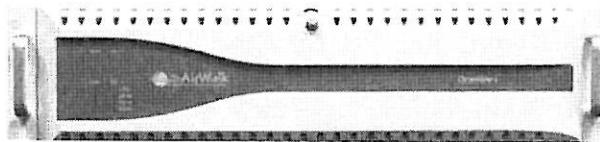


Figure 3-1 – Typical OneRAN (Pico)

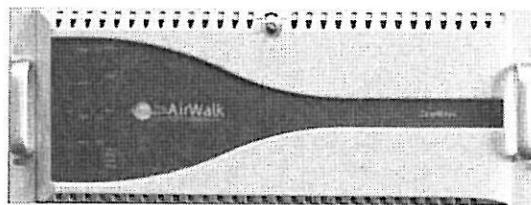


Figure 3-2 – Typical OneRAN Main Unit (Mini)

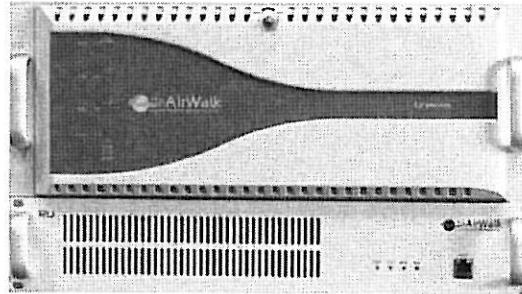


Figure 3-3 – Typical OneRAN with Omni RU

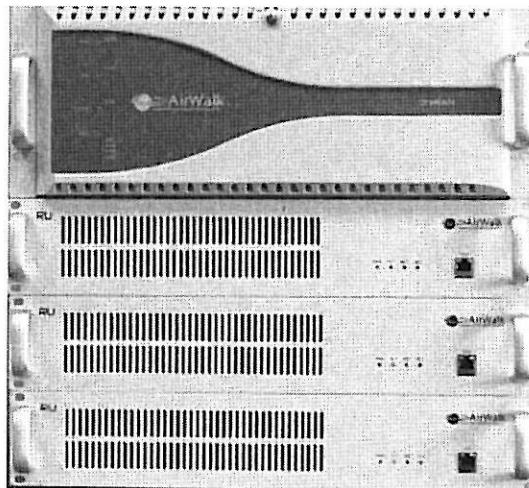


Figure 3-4 – Typical OneRAN & 3 Sector RU

3.4 Block Diagram – OneRAN

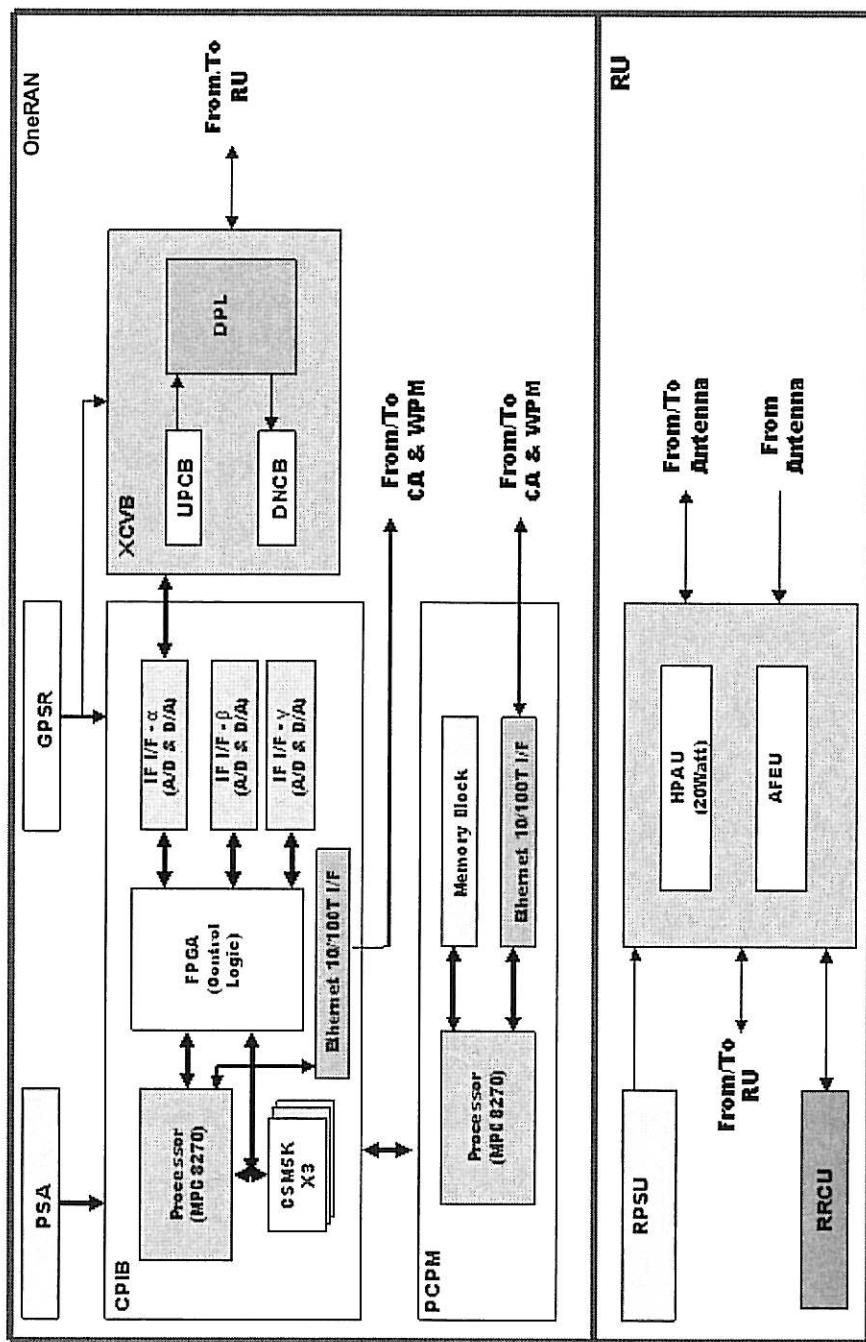


Figure 3-6 IP-BS Hardware Structure

3.5 System Capacities and Specifications

3.5.1 OneRAN Technical Specification

| Item | Capacity and Specification | Remarks |
|---------------------------------|--|---|
| Frequency Band | Up-Link: 2175 ~ 2180 MHz Down-Link: 1985 ~ 1990MHz | Japan PCS Band |
| | Up-Link: 1850 ~ 1910 MHz Down-Link: 1930 ~ 1990 MHz | North American PCS Band |
| | Up-Link: 824 ~ 849 MHz Down-Link: 869 ~ 894 MHz | 800 MHz Cellular Band |
| | <u>A Sub Band</u> Up-Link: 452.5 ~457.475 MHz Down-Link: 462.5 ~ 467.475 MHz | |
| | <u>B Sub Band</u> Up-Link: 452.0 ~456.475 MHz Down-Link: 462.0 ~ 466.475 MHz | 450 MHz Band (incl NMT) |
| Sector/FA | <u>H Sub Band</u> Up-Link: 451.310 ~455.730 MHz Down-Link: 461.310 ~ 465.730 MHz | |
| | 3 Sectors/FA 3FA/Omni | Each OneRAN Unit |
| | 96CE 3FA (64 CE Omni) | IP BTS |
| | Handoff | |
| | Channel pooling | |
| | GPS | One per OneRAN |
| | Installation | 4 Rack Units |
| | Cooling | Front To Rear Flow |
| | IP-Network Interface | |
| | Transmitter output power | Dependent on model; Includes duplexer function |
| RF Interface | 1 Transmit and 1 Receive A RF signal, 1 Receive B RF signal | 2-Branch Receive Diversity |
| | J-STD-008/IS-95-A/IS-95B | |
| | /CDMA2000-1x/EVDO Rev A | Dependent on model |
| Common Air Interface (CAI) | 1.25MHz | |
| | Channel bandwidth | |
| Receiving sensitivity | Less than 1% FER, when the power is under -119dBm | Minimum |
| | | |
| Mechanical Specification | | |
| RF Input and Output Connector | SMA Female (Input/Output) | From/To RU |
| GPS Antenna Connector | TNC Female | Phantom powered |
| AC Power Connector | IEC | |
| BSC/RNC/BTS Ethernet Connectors | RJ-45 | Ethernet Interface |
| RU Control and ENV Connectors | RJ-45 | Serial Interface |
| Dimensions (W x H x D) | 482mm(W) x 457mm(D) x 178mm(H) 19"(W) x 18"(D) x 7"(H) | 4 Rack Units |
| Weight | 18 kg[40#] (3 Sector); 15 kg[33#] (Omni) | OneRAN Main Unit |

Table 3-1 – OneRAN Specifications