

- 3) Install the optional IPC jumper cable on the IP-RAN front panel.
- 4) Install the DC power cable between the PSU/RPSU and the RU amplifier chassis.
- 5) DC Models Only: Install the DC power cable between the RPSU and the IP-RAN main unit.
- 6) Install the RF cables between the IP-RAN main unit and the RU system as illustrated in this manual. Verify all RF cable connections are correct before proceeding.

NOTE: Use only cables provided with the IP-RAN system to ensure proper operation.

### 8.2.3 External System Connections

NOTE: Ensure all external power sources are disconnected prior to making power connections to the IP-RAN system. Remove fuses or lock circuit breakers prior to proceeding.

- 1) Establish external grounding points and install ground strap connections from the IP-RAN main unit and the RU amplifier system to the common site ground points using the ground straps provided with the IP-RAN system. Rack should be equipped with ground bus bars or bonding points that are cabling to a common cell site ground system.
- 2) Connect the external Ethernet backhaul connections. Use category 5 or category 6 cable that is certified for use in 10/100 Ethernet systems.
- 3) Connect the external GPS antenna to the IP-RAN GPS antenna input. Use a suitable RF cable (RG-58 or equivalent) equipped with a TNC connector.
- 4) Connect the external RF antenna systems. Follow site specific cable installation drawings prepared by the RF system/planning engineer for cable type and routing. The IP-RAN unit is equipped with N-type RF connectors. Ensure the individual sector antenna systems are connected to the correct IP-RAN sector antenna connections. Incorrect sector connections may cause operational or coverage problems.
- 5) AC Models Only: Connect the AC line cords for the IP-RAN and the PSU to a dedicated AC power source. Use only the cables provided with the system for continued safe operation.
- 6) DC Models Only: Locate and verify the polarity of the DC power source cables. Slip a 4" length of heat shrink tubing over each DC cable. Connect the cable lugs to the RPSU DC power bus bars using the supplied connector lug bolts. Tighten the bolts firmly to ensure a solid electrical connection. The use of electrical contact grease is acceptable if desired. Slide the heat shrink tubing over the bus bar connection and use a heat gun to secure the connection.

NOTE: Short circuits in high current DC power systems can be dangerous. All exposed DC connections must be protected to prevent accidental short circuits.

- 7) DC Models Only: If required, install an optional +12VDC output cable between the IP-RAN main unit and designated external equipment such as an Ethernet switch. Ensure the connected load does not exceed 3A maximum.

### 8.2.4 Power-up Procedure

NOTE: Verify all connections are correct prior to powering up base station.

- 1) AC Models Only
  - a. Switch on the AC power source.
  - b. Switch on the PSU main power circuit breaker located on the front panel of the PSU power supply unit.
  - c. Use the PSU front panel voltmeter to verify the presence of 27 VDC power.
  - d. Switch on the IP-RAN main unit power switch located on the rear panel power entry point. The switch is located adjacent to the AC cord connection.
- 2) DC Models Only
  - a. Switch on or engage the circuit breakers at the +24/27 DC power source.
  - b. Switch on the RPSU main circuit breaker located on the RPSU front panel.
  - c. Use the RPSU voltmeter to verify the presence of +24/27 VDC and +12 VDC power.
  - d. Switch on the RPSU RU circuit breaker located on the RPSU front panel. Note the increase in current consumption on the RPSU current meter.
  - e. Switch on the IP-RAN main unit (OneRAN) circuit breaker located on the RPSU front panel. Note the increase in current consumption on the RPSU current meter.
- 3) The IP-RAN unit will automatically initiate the startup procedure. Front panel warning indicators will be illuminated during the start up period, however all except the GPSR warning should be extinguished within 1-2 minutes. The GPSR warning will remain lit until the GPS receiver locks on to the GPS satellites. This can take up to 1 hour, depending on the location of the GPS antenna relative to the GPS satellites.
- 4) Verify communication between the IP-RAN main unit and the RU amplifier system by observing the communications indicators on the RU rear panel. The indicators should flash intermittently to indicate communication is occurring.
- 5) Verify the Ethernet backhaul links are communicating by observing the activity indicators on the external Ethernet switch. The activity indicators are typically found on the front panel or adjacent to the connection point on Ethernet switches. The indicators should be flashing intermittently to indicate the presence of IP packet activity.

### 8.2.5 Installation Completion

Completion of the installation requires that all cables be suitably routed and bundled for a neat appearance. All cables should be tie wrapped as needed to ensure cables will not move or be stressed in normal system operation. External cables should be labeled in accordance with the site specific installation drawings prepared by the site planning engineer.

All garbage and installation materials, including wire clippings and tie wrap ends, must be removed from the site prior to completing the installation.

## 8.3 Initial System Configuration

Each IP-RAN system requires configuration of key site specific information prior to operation to allow the system to communicate and contact the controlling base station management system (BSM). Once this initial information is configured the system will automatically download software and configuration information from the BSM. No additional on-site configuration is required after this initial configuration is completed.

The following items must be configured in the base station after installation using the Web Server installation support tool:

- BTS IP Address: A locally valid static IP address (allows IP communications)
- BSC IP Address: A locally valid static IP address (allows IP communications)
- Host BSM IP Address: The IP address of the controlling BSM (to allow initial contact)
- IP-RAN Identity: A unique identifier associated with a BSM site configuration

Additional capabilities are provided in the Web Server Installation Tool to identify sub-net masks and net gateways, and the ability to select optional boot modes.

The required IP addresses and base station identity for a particular site are normally set up in advance by the network control center engineers prior to site deployment. Ensure this information has been provided prior to installation configuration.

### 8.3.1 Web Server Installation Tool Set-up

The Web Server Installation Tool is built into the IP-RAN base station. Connection to the tool requires only a PC equipped with an Ethernet capability and a common browser such as Explorer.

Connection from the PC to the base station is made over the local Ethernet connection at the cell site, usually via the local on site Ethernet switch (Figure 8-1).

Refer to the Web Server Installation Tool document for complete instructions on configuring the PC and browser to access the web server tool. Abbreviated instructions are provided in the remainder of this section for users previously familiar with the Web Server Tool.

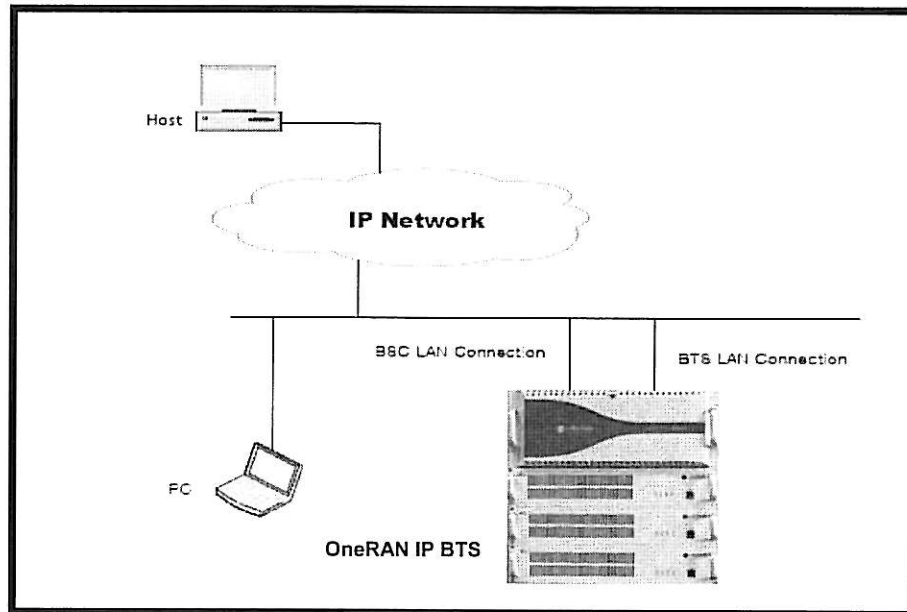


Figure 8-1 – Initial Configuration Using Local Web Server

### 8.3.2 Web Server Connections

Each IP-RAN unit is shipped from the factory with a default private network IP address for the BTS and the BSC, as follows:

BTS: 172.30.255.3

BSC: 172.30.255.1

Use these default addresses to access the BTS and BSC functions for the first time using the PC browser. Enter these IP addresses in the browser address bar to gain access to the BTS or BSC functions.

Once a base station has been configured, the default addresses are no longer valid.

To gain access locally to a base station that has already been configured (running), use either the new IP address (the primary address) or a second address based on the base station ID to make new boot configuration changes. These addresses are as follows:

Primary Address (BTS or BSC): x.x.x.x (For example 10.30.10.250)

BTS Secondary Address (BTS port): 172.30.[bts\_id].3 (eg 172.30.15.3 for bs\_id=15)

BSC Secondary Address (BSC port): 172.30.[bsc\_id].1 (eg 172.30.15.1 for bs\_id=15)

Note that you must know either the base station id or the current IP address to access the web server function when the base station is running.

The Web Server function is also equipped with a security log in to prevent unauthorized access from the local IP network. The following default log-in parameters are used:

Login ID: air

Password: airairair

### 8.3.3 BTS Initial Configuration (default "booting mode")

Connection the PC to the BTS using either the default factory IP address (new systems), or the primary address or secondary address (systems already configured). The following window will appear in the browser:

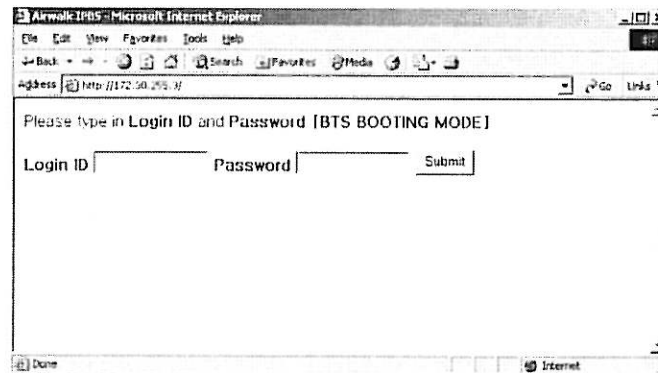


Figure 8-2 – Web Server Login Screen

Enter the default login id and password to gain access to the configuration screen, which will look like this:

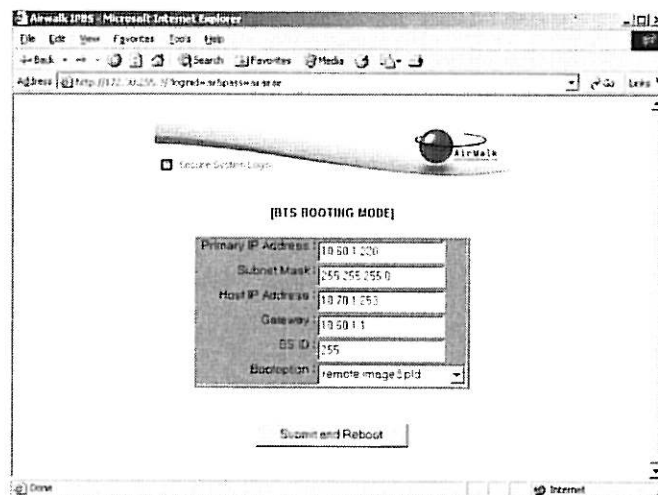


Figure 8-3 – BTS Configuration Screen (default "booting mode")

Enter the require information and click on "Submit and Reboot" to set the parameters. The system will present the following screen, set the configuration parameter and then proceed to reboot. During reboot, the BSM will be contacted and download the full site configuration. The reboot process can be interrupted by clicking on "RECONNECT".

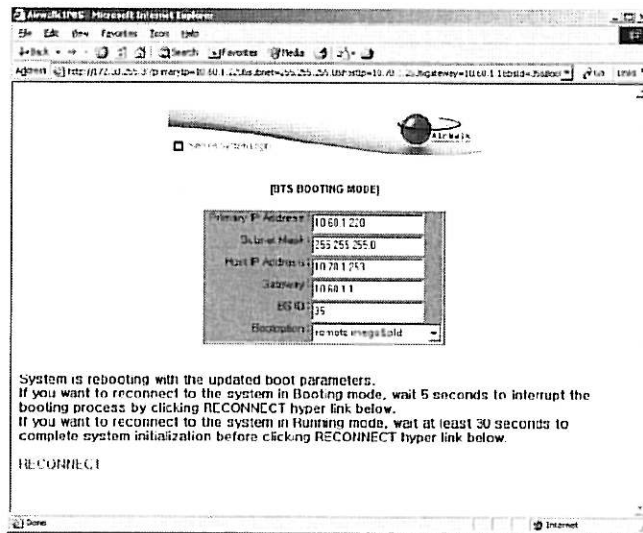


Figure 8-4 – BTS Configuration Screen (default “booting mode”)

### 8.3.4 BSC Initial Configuration (default “booting mode”)

Setting the initial BSC configuration is done using the same process as the BTS, except the PC connection is made to the BSC default IP address rather than the BTS IP address.

### 8.3.5 BTS Re-Configuration (“running mode”)

A BTS equipped with an existing configuration can again be accessed via the Web Server tool to change parameters. The connection to the BTS must be made using either the current primary IP address or the secondary address which is based on the base station id. After connection, the following login screen will appear (indicating “running mode”):

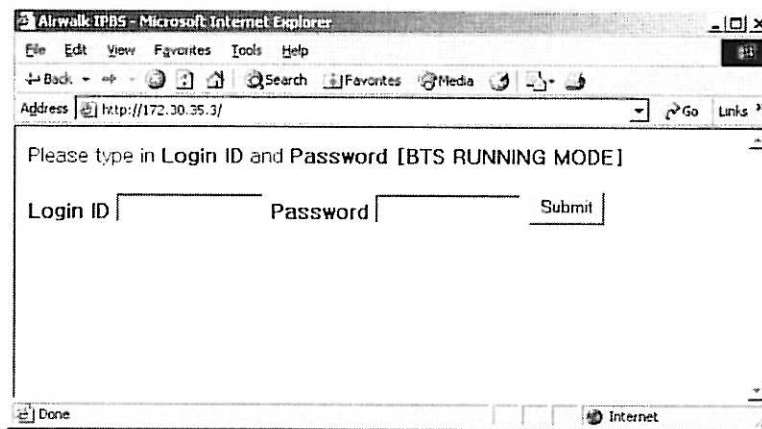
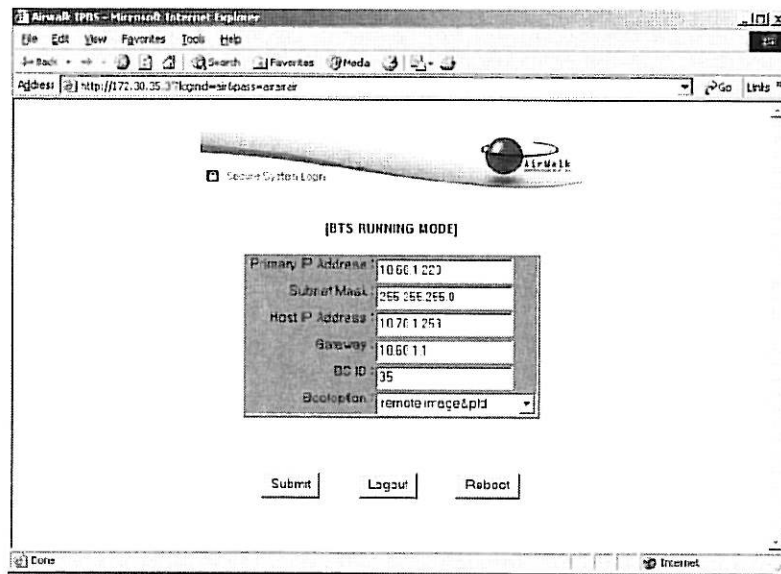


Figure 8-5 – BTS Configuration Screen (“running mode”)

Enter the default login id and password to access the configuration screen:



**Figure 8-6 – BTS Configuration Screen (“running mode”)**

Configuration changes are entered using this screen and accepted by the BTS by clicking on the “Submit” button. However, the new changes will NOT become effective until the IP-RAN unit is rebooted. This can be done by clicking on the “Reboot” button.

Once the IP-RAN unit reboots, it will use the new configuration information to contact the controlling BSM system to download software images and/or configurations, as required or defined in the “bootoptions” setting.

### 8.3.6 BSC Re-Configuration (“running mode”)

Re-configuring a currently configured BSC is done using the same process as reconfiguring the BTS, except the PC connection is made to the BSC primary or secondary IP address rather than the BTS IP addresses.

### 8.3.7 Additional Operation Tests

Additional operational tests may be required by the RF system/planning engineer, the network control centre engineers, or others in order to complete the base site installation.

Such tests could include:

- Power output measurement (PPS or PN3383)
- Alarm function testing
- Test calls using mobile handsets or data terminals
- Drive testing and RF coverage/performance measurement

Refer to the individual test checklists for completion and recording of any additional installation test activities.

## 8.4 Site Clean up and Customer Signoff

The following activities must be undertaken prior to completion of the site installation:

- Disposal of all packing and installation materials, including wire clippings
- Replace all equipment, covers, doors and other site equipment
- Completion of the installation checklist
- Final approval by the relevant customer authority

## 8.5 Recommended Installation Tools and Supplies

- 1) Hand Tools
  - a) Screwdriver set,
  - b) Pliers set,
  - c) Nut Driver set,
  - d) Cutter set,
  - e) Punch Down Tool, or Wire-wrap tool (Site dependent),
  - f) RJ-45 Crimper tool.
- 2) Test Equipment.
  - a) Multi-Meter & Adapter kit,
  - b) PC equipped with Ethernet card and browser
  - c) RF test set (power measurement, or optionally a CDMA test set)
  - d) RF adapters
- 3) Supplies.
  - a) RJ-45 connectors,
  - b) Cat 5 or 6 Cable,
  - c) Cable Tie-wraps
  - d) Rack mounting screws and related rack hardware

## 8.6 Troubleshooting Procedures

The OneRAN Series CDMA IP-RAN system is designed to provide reliable and consistently high performance in all network environments. The installation procedure described in this manual for the IP-RAN is quite straightforward and simple to implement.

Should problems develop during installation, this section is intended to help locate, identify and correct these types of problems. Please follow the suggestions listed below prior to contacting the AirWalk Customer Support Centre. If you are unsure of the procedures described in this section, contact the Installation coordinator immediately for clarification.

### 8.6.1 Before Calling for Assistance

- 1) If difficulty is encountered with a specific component of the IP-RAN, refer back to the Installation Section for that component.