



Alcatel-Lucent CDMA Base Station 8420

Indoor Cabinet Installation Manual

401-703-444
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Alcatel-Lucent - Proprietary

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About this information product

Purpose

This information product (IP) provides instructions for the physical installation of the Alcatel-Lucent CDMA BTS 8420 and AWS 8420 indoor radio cabinets.

The tasks are to be performed after completion of all site preparation tasks, which are covered in *Alcatel-Lucent CDMA Base Station 8420 Indoor Site Preparation Guidelines*, 401-703-443.

Following installation of the indoor 8420 radio cabinet, the next step is to test and integrate it into the network. Procedures for testing and integration may be found in *CDMA Modcell and Base Station Integrated Engineering Handbook (IEH 238)*.

Important! The procedures contained in this IP are based on Alcatel-Lucent standard practices. Prior to beginning an indoor radio cabinet, power cabinet or frame, or battery frame or stand installation, installers should be familiar with these practices. If there is a conflict, standard practices take precedence. However, this IP takes precedence for identification of parts and materials specific to an indoor radio cabinet.

Reason for reissue

This is Issue 4.0 of the *Alcatel-Lucent CDMA Base Station 8420 Indoor Cabinet Installation Manual*, document number 401-703-444. This issue incorporates information available as of November 2007.

In Issue 2, information was added about two new versions of the BTS 8420 radio cabinet -- Filtered version and Low Power version. The previous or original release covered only the Digital Only version. In this release the Filtered, and Low Power versions were added. In addition, Appendix A was added, which covers 3GP24i and EZBFi installation information for the non-integrated version of the BTS 8420 radio cabinet.

In Issue 3, information was added about a new configuration of the Digital Only version the Digital Only version with two Digital Shelves. The weight and power tables as well as the T1/E1 and User Alarm tables were updated. The Universal Hatchplate figures were replaced with updated figures. Also, changes to EZBFI material were made throughout the document.

In Issue 4, information about the EZBFI was removed. (From now on, refer to the *EZBFI Modular Battery System Installation Manual for +24V and -48V*, 401-703-507, when installing and connecting the EZBFI Modular Battery System.) Also, the Z-IDC information was updated. (The Z-IDC is no longer required if the NIU is located within the 10 meter (33 foot) cable length distance from the AWS 8420 or BTS 8420 radio cabinet.) In addition, information was added about the new AWS 8420 indoor radio cabinet.

Intended audience

This IP is intended for use by Alcatel-Lucent installation technicians.

Systems supported

This document applies to Alcatel-Lucent CDMA Base Station 8420 indoor cell sites.

Conventions used

In this IP, all parts are described as they are shipped. Metric parts are specified in metric units. Non-metric parts are specified in non-metric units.

Lengths and other measurements are given in metric units, with non-metric units given as equivalents for use in non-metric markets.

For manufactured parts, the following system of conventions is used:

- Metric sizes of nuts, bolts, flat washers, and lock washers are identified by an uppercase letter M followed immediately by a size in millimeters (example: M10)
- American fractional sizes of nuts, bolts, anchor bolts, and washers are identified by a number followed immediately by a double apostrophe (example: 3/8"). In the case of lengths measured in feet, "2 feet" is used rather than "2'" so that the single apostrophe is not overlooked.

Wire gauges are specified in metric units. Equivalent sizes in the American Wire Gauge (AWG) system are given in the following table.

Important! the measurement in millimeters in the following table is the *cross-sectional area* of the wire.

The following table is from CEI/IEC 60947-1:2004, *Table 1, Standard cross-sections of round copper conductors and approximate relationship between mm² and AWG/kcmil sizes* for reference. Additional wire sizes are included in this information product as appropriate for the topic.

ISO rated cross-sectional area (mm²)	AWG/kcmil size
0.2	24
0.34	22
0.5	20
0.75	18
1	-
1.5	16
2.5	14
4	12
6	10
10	8
16	6
25	4
35	2
-	1
50	0 (1/0)
70	00 (2/0)
95	000 (3/0)
-	0000 (4/0)
120	250 kcmil
150	300 kcmil
185	350 kcmil
-	400 kcmil
240	500 kcmil
300	600 kcmil
NOTE: The dash, when it appears, counts as a size when considering connecting capacity (see 7.1.7.2 in the standard).	

Site preparation checklists

All site preparation activities, as well as adherence to the guidelines, should be verified prior to the installation of the cell site equipment. Various checklists and punchlist sheets have been provided in Appendix A of the site preparation document (see Related documentation) to aid customers and Alcatel-Lucent personnel during a base station site Method of Procedure (MOP) walk-through, prior to the equipment installation. A general list is provided in Chapter 1.

Utilization of the checklists helps ensure a quality installation and provides a base station site history file for later reference. The punchlist is used to track completion of any outstanding site preparation items, and to aid in the project management of installation resources.

Related documentation

Installation personnel must have the appropriate reference material, and all applicable local, regional and national code documentation.

Alcatel-Lucent documents (required)

- *Alcatel-Lucent CDMA Base Station BTS 8420/ AWS 8420 Indoor Site Preparation Guidelines*, 401-703-443
- *Alcatel-Lucent Engineering Rules Document*, ER_0102_0005
- *EZBFi Modular Battery System Installation Manual for +24V and -48V*, 401-703-507
- *Grounding and Lightning Protection Guidelines for Alcatel-Lucent Technologies Network Wireless System Cell Sites*, 401-200-115
- *Alcatel-Lucent CDMA Base Stations System Description*, 401-703-463
- *Alcatel-Lucent CDMA Base Stations Operations, Administration, and Maintenance*, 401-703-407
- *Thermal Probe Multiplexer 210E Control Module J85501X-1*, 157-010-202
- *Supplemental Battery Stand J85504D-1*, 157-003-101

These documents may be ordered by contacting the Alcatel-Lucent Customer Information Center (CIC). Use the telephone numbers listed on the back of the title page of this manual.

A password-protected Web site is available where customers can obtain the most recent information about Mobility products.

That Web site is the documentation downloads area of the Alcatel-Lucent customer support Web site. You can access that site at the following URL:

https://wireless.support.lucent.com/amps/rls_info/rls_doc/index.html

Related training

Safety training in the following areas is required for personnel installing the Alcatel-Lucent CDMA Base Station 8420 and associated equipment:

- Hazard Communication
- Lift Safety
- Hoist Safety
- Lock Out/Tag Out
- Accident/Incident Reporting.

Other related training is for:

- Integration into the cell site
- Operation, Administration, and Maintenance (OA&M) .

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For questions or concerns about this or any other Alcatel-Lucent information products, please contact us at one of the following numbers:

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This information product contains hazard statements for your safety. Hazard statements are given at points where safety consequences to personnel, equipment, and operation may exist. Failure to follow these statements may result in serious consequences.

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To comment on this information product, go to the [Online Comment Form](http://www.lucent-info.com/comments/enus/) (<http://www.lucent-info.com/comments/enus/>) or e-mail your comments to the Comments Hotline (comments@alcatel-lucent.com).

1 Overview of indoor Alcatel-Lucent CDMA Base Station 8420 radio cabinet site installation

Overview

Purpose

The following chapter describes the *Alcatel-Lucent CDMA BTS 8420 and AWS 8420 radio cabinets*. They are referred to in the text as “BTS 8420 radio cabinet,” “AWS 8420 radio cabinet,” or “radio cabinet.” This chapter also describes how they are used in the wireless network and their physical characteristics.

The information in the first part of this chapter familiarizes the installer with the wireless network to which the cabinet will be connected. It also discusses how the radio cabinet will be used as an integral part of that network. Next the physical characteristics of the radio cabinet are discussed: its site requirements, its dimensions and weights, and the location of items and components associated with the cabinet. Finally, the radio cabinet power back-up options are discussed.

Installation procedures

Before starting installation of the cabinet, the installer should become familiar with the safety precautions, warnings, and product conformance statements in [Chapter 2, “Safety”](#).

[Chapter 3, “Tools, materials, and checklist”](#) provides the needed tools and materials for installation and a process checklist. [Chapter 4, “Transport, mount, and ground cabinet”](#) provides instructions for anchoring the cabinet to the floor. These instructions include handling, placement, anchoring, grounding, and cabling of the cabinet. [Chapter 5, “Connecting cables to BTS 8420/AWS 8420 radio cabinet”](#) shows how to connect the radio cabinet to the network -- this includes T1/E1, GPS jumper cable, and user/Power Alarm cables. [Chapter 6, “Power connections”](#) shows how to connect the radio cabinet to the power source. (The power source for an integrated radio cabinet is AC line voltage. The power source for the regular radio cabinet is 24 VDC from an external power source.) [Chapter 8, “Finishing the installation”](#) provides instructions for installing the EZBFi battery back-up cabinet.

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Background information

Overview

Purpose

The following section provides background information on the cabinet, such as the network overview, product overview, and site configurations.

These topics are presented to provide the installer with sufficient background material to better understand the methods and procedures required to install the cabinet.

Installation details

This equipment is intended for installation in restricted access locations where access is controlled or where access can only be gained by service personnel with a key or tool. Access to this equipment is restricted to qualified service personnel only.

Install only in a controlled environment (an area where the humidity is maintained at levels that cannot cause condensation on the equipment, and where contaminating dust is controlled, and steady state temperature is within the range specified in the site preparation guidelines listed below). This equipment has been evaluated for use in an indoor ambient temperature range from 0° C to +40° C (continuous) and -5° C to 50° C (short-term).

The cabinet, frame, or stand must only be mounted on a concrete floor or other noncombustible surface.

For complete details on installation requirements, refer to the following documents:

- *Alcatel-Lucent CDMA Base Station BTS 8420 and AWS 8420 Indoor Site Preparation Guidelines*, 401-703-443

Definitions

The following terms are used when describing an installation site.

Controlled Environment *An indoor location in which temperature, humidity, and ventilation are maintained at specific levels.*

Indoor Site *Installation site in a Controlled Environment, allowing use of indoor cabinets: OneBTS cabinets and Galaxy Power System.*

For more information on indoor site environmental requirements, refer to Alcatel-Lucent CDMA Base Station BTS 8420/AWS 8420 Indoor Site Preparation Guidelines, 401-703-443.

Radio Cabinet *An indoor radio cabinet is the cabinet that houses the CDMA radio*

communication electronics, amplifiers, and filters (if present, depending on the configuration). The radio cabinet contains all of the cell site control electronics, alarms, and T1/E1 facilities interface, as well as the user alarm interface.

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Functional description

Overview

This topic describes relevant product functional information.

General description

The BTS 8420 is a CDMA product intended for indoor applications. It is used with a third party Distributed Antenna System (DAS) that is provided by the customer. The DAS is a self-contained unit that is separate from the BTS 8420/AWS 8420 radio cabinet and connects the BTS 8420/AWS 8420 radio cabinet to the antenna system.

The BTS 8420 provides 1xEV-DO service in the 850 and 1900 MHz bands

The AWS 8420 provides service in the 2100 MHz band only. In the present release, it is a standalone cabinet.

In this release, the BTS 8420 is available in the following versions:

- Digital Only version with one Digital Shelf (no Amplifiers or Filters)
- Digital Only version with two Digital Shelves (no Amplifiers or Filters)
- Filtered version (Digital Shelf + Filters)
- Low Power version (Digital Shelf + Amplifiers + Filters).

In this release, the AWS 8420 is available in the following versions:

- Digital Shelf + Amplifiers + Filters for 3 sectors
- Digital Shelf + Amplifiers + Filters for 6 sectors

Product configurations

The BTS 8420 radio cabinet can be deployed as one of the following:

- *Dual band* -- 850 MHz and 1900 MHz in same cabinet
- *Single band* -- 850 MHz
- *Single band* -- 1900 MHz.

The AWS 8420 can be deployed in the following configurations:

- 2100 MHz with 3 sectors
- 2100 MHz with 6 sectors

Product capabilities

The product capabilities of the BTS 8420 in this release are as follows:

- Indoor, with or without integrated power, +24 VDC
- Up to three sectors.

- *Dual Band*: up to eight 850 MHz carriers and up to eleven 1900 MHz carriers. The combination must not exceed 15.
- *Single Band, 850 MHz*: up to eight carriers (two carriers can be 1xEV-DO).
The minimum configurations are:
 - One carrier -- Voice only (no 1xEV-DO)
 - Two carriers -- one Voice carrier and one 1xEV-DO carrier
- *Single Band, 1900 MHz*: up to 11 carriers (two carriers can be 1xEV-DO)
The minimum configurations are:
 - One carrier -- Voice only (no 1xEV-DO)
 - Two carriers -- one Voice carrier and one 1xEV-DO carrier.
- Up to 12 T1/E1 lines supported when URCs are used in Digital Shelf (SECBs not offered)
- Up to 24 T1/E1 lines supported in Digital Only version with two Digital Shelves (12 T1/E1 lines per Digital Shelf)
- In Digital Only version with two Digital Shelves, user alarms 0-15 go to first (or bottom) Digital Shelf and user alarms 16-31 go to second (or top) Digital Shelf
- In all versions except Digital Only version with two Digital Shelves, user alarms 0 through 31 go to Digital Shelf
- Connection to GPS
- URCs installed in Digital Shelf in the original release
- URC-IIs installed in Digital Shelf in this release and the release preceding this one.

The product capabilities of the AWS 8420 in this release are as follows:

- Indoor, with or without integrated power, +24 VDC
- *Single Band, 2100 MHz*: up to 7 carriers (two carriers can be 1xEV-DO)
The minimum configurations are:
 - One carrier -- Voice only (no 1xEV-DO)
 - Two carriers -- one Voice carrier and one 1xEV-DO carrier.
- Up to 12 T1/E1 lines supported when URCs are used in the Digital Shelf (SECBs not offered)
- User alarms 0 through 31 go to the Digital Shelf
- Connection to GPS
- URC-IIs installed in Digital Shelf in this release.

□

Physical description

Overview

Purpose

This topic provides an overview of the various versions of the BTS 8420 and AWS 8420 radio cabinet.

In the present release, the BTS 8420/AWS 8420 radio cabinet is available only for the indoor environment. It is anchored to the floor.

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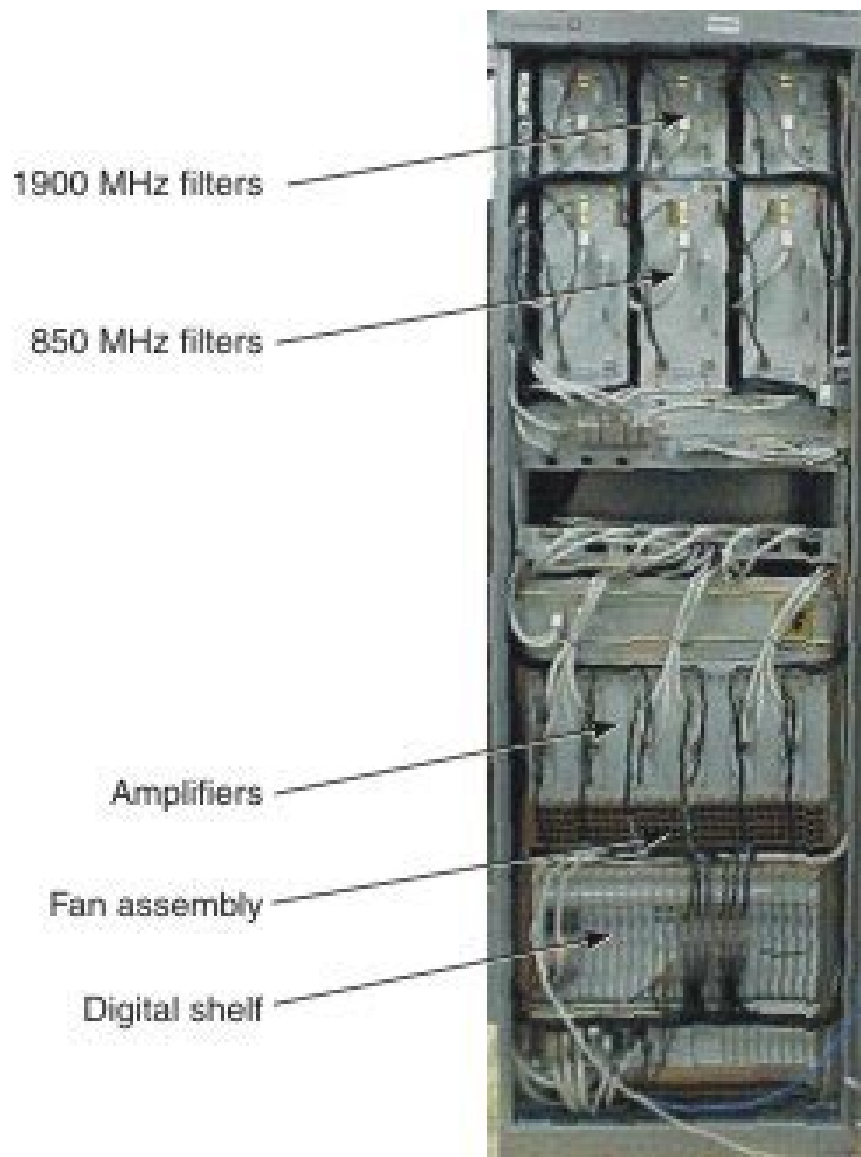
Cabinet information

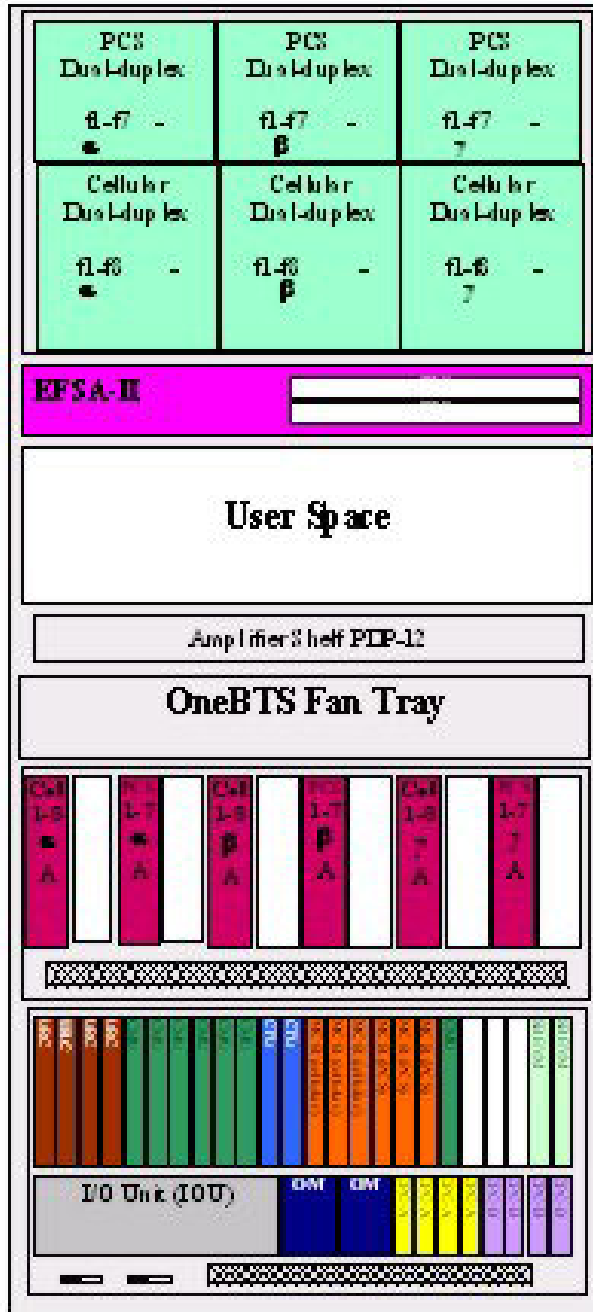
Overview

This topic provides an overview of the various versions of the BTS 8420 and AWS 8420 radio cabinet. The BTS 8420 radio cabinet is available in four configurations: Digital Only version, Digital Only version with two Digital Shelves, Filtered version, and Low Power version. The AWS 8420 radio cabinet is available in two configurations: a three sector and a six sector version.

Filtered version of BTS 8420 radio cabinet

The following two figures display the interior of the Filtered version of the BTS 8420 radio cabinet. It contains one Digital Shelf, amplifiers, and 850 MHz and 1900 MHz filters. The first figure is an actual photo. The second figure is a diagram. The individual components are labeled in the diagram.

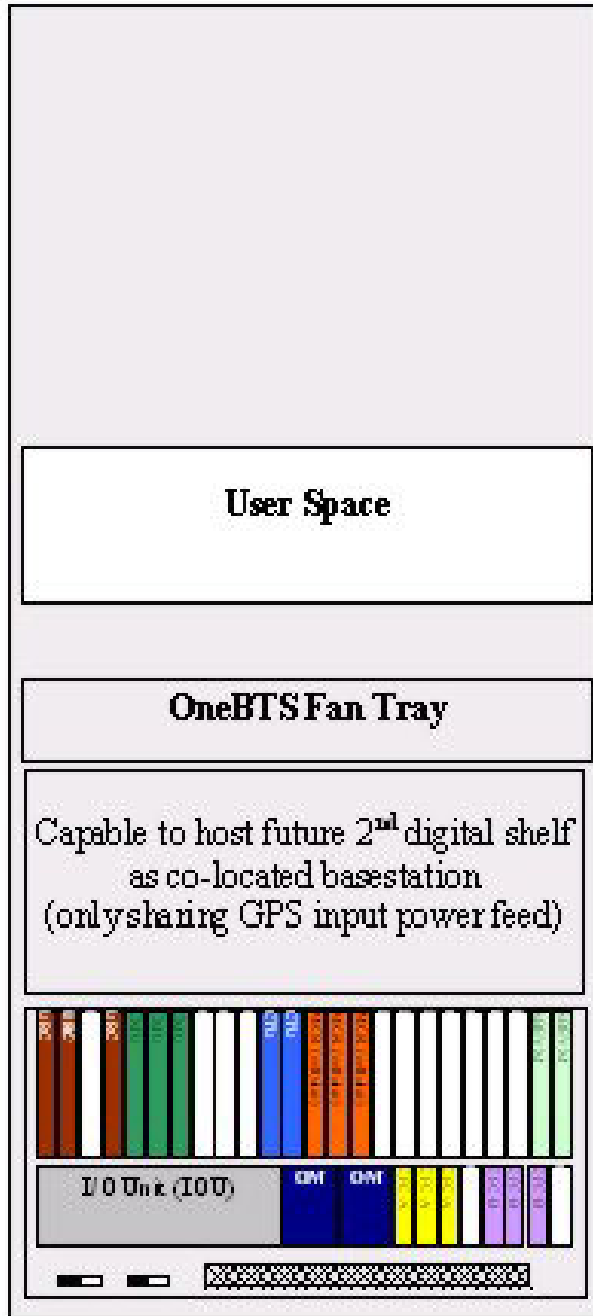




Digital Only version of BTS 8420 radio cabinet

The following figure shows the interior of the Digital Only version of the BTS 8420 radio cabinet. It contains one Digital Shelf. The first figure is an actual photo. The second figure is a diagram. The individual components are labeled in the diagram.

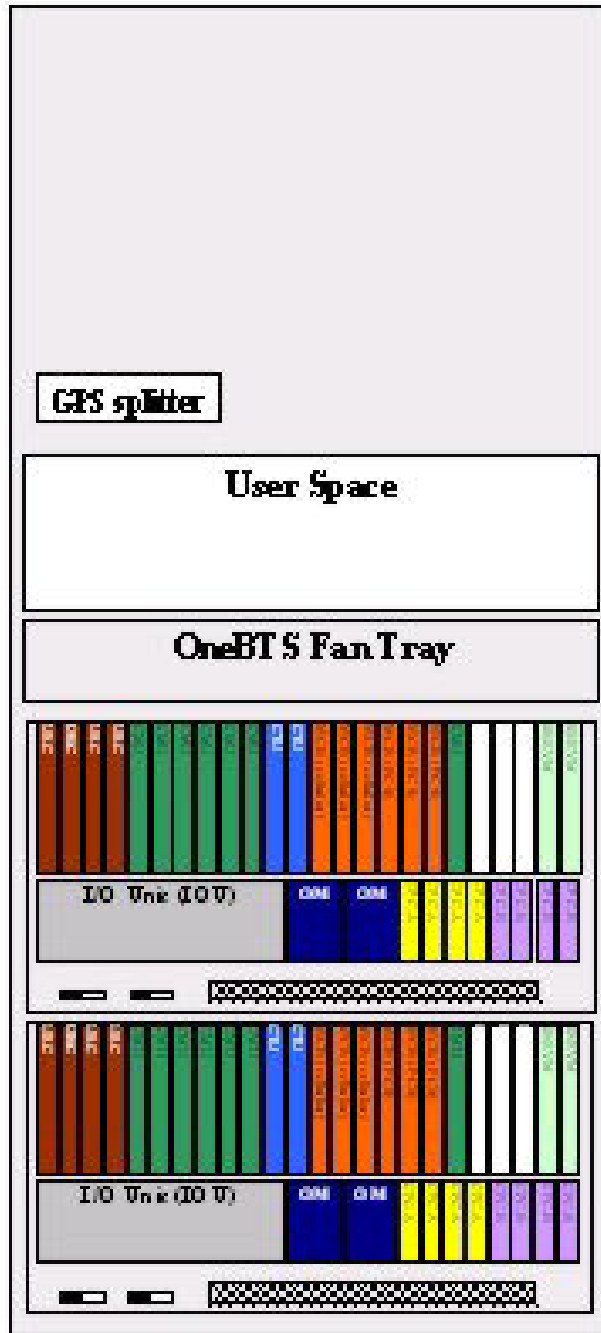




Digital Only version of the BTS 8420 radio cabinet with two Digital Shelves

The figure below shows the interior of the Digital Only version of the BTS 8420 with two Digital Shelves. It is the same as the Digital Only version except there is one additional Digital Shelf. Each Digital Shelf represents a separate cell occurrence. The first figure is an actual photo. The second figure is a diagram. The individual components are labeled in the diagram.





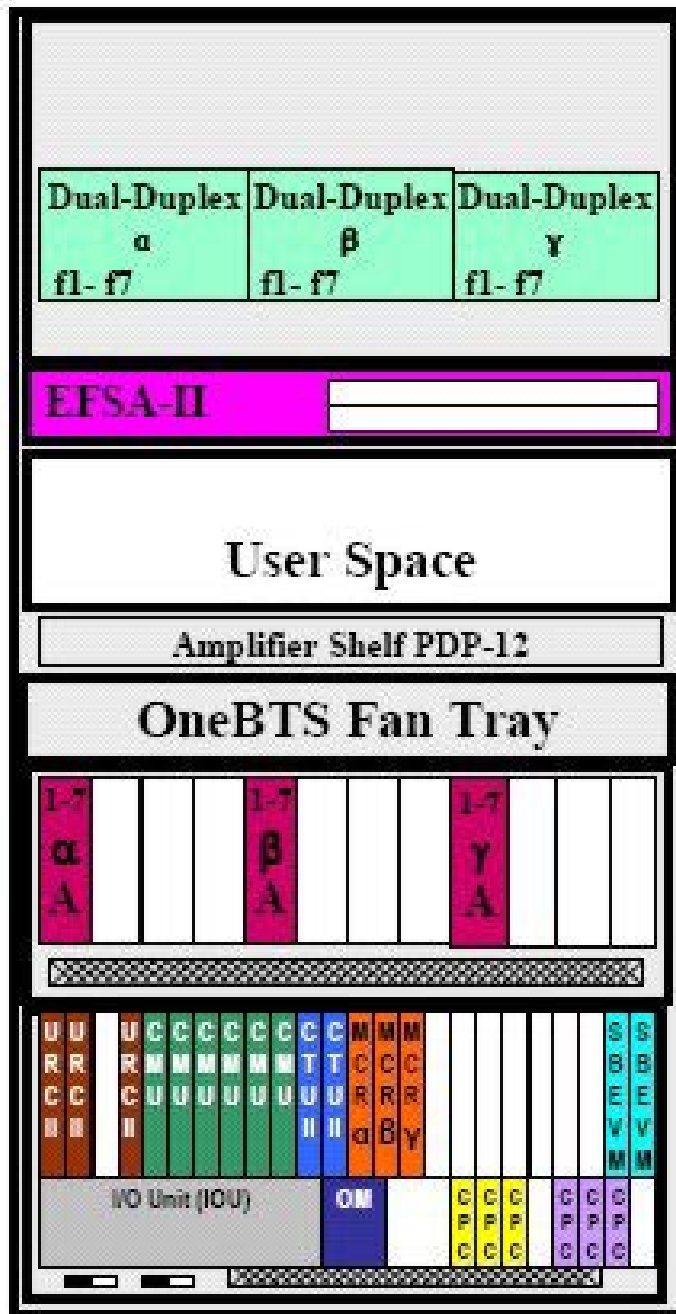
AWS 8420 radio cabinets

The AWS 8420 is available in two versions -- a three sector and a six sector version. Each version consists of the following components:

- Digital Shelf
- Amplifiers
- Filters

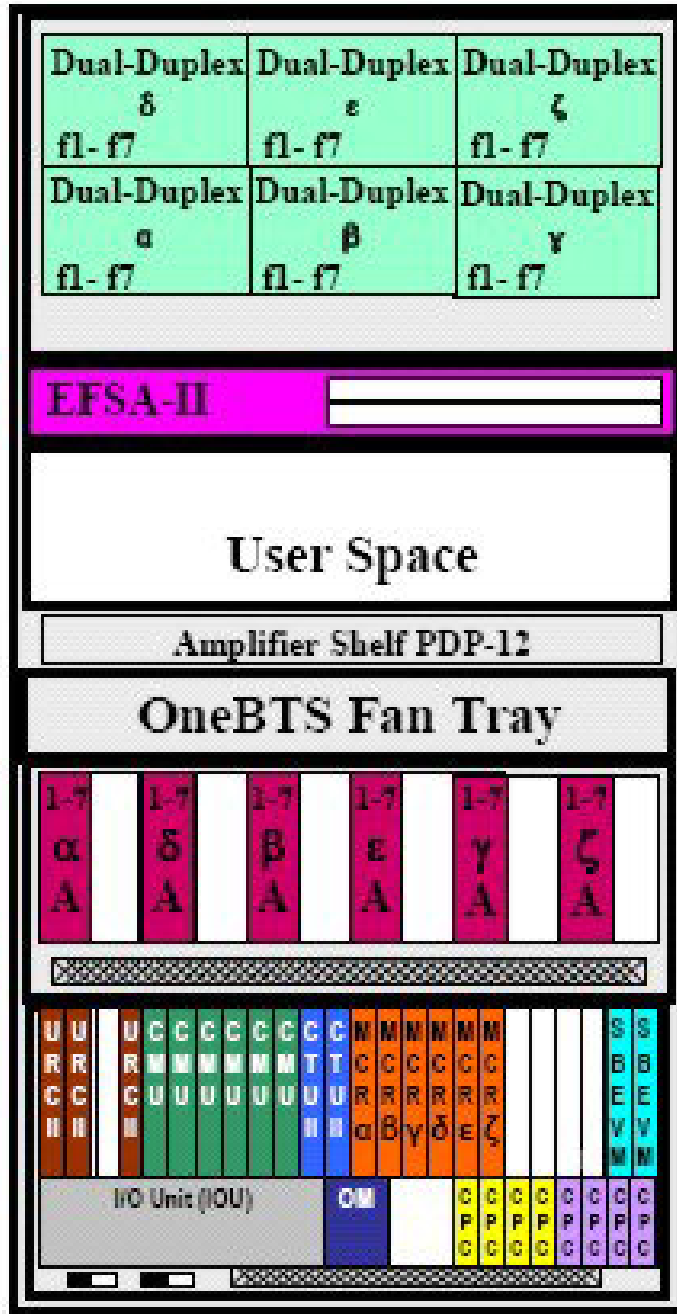
AWS 8420 radio cabinet -- three sector

Shown below is a diagram of the three sector version of the AWS 8420 radio cabinet. It contains amplifiers, six filters and one Digital Shelf.



AWS 8420 radio cabinet -- six sector

Shown below is a diagram of the six sector version of the AWS 8420 radio cabinet. It contains amplifiers, six filters and one Digital Shelf.



Cabinet weights and dimensions

Overview

This topic covers the cabinet weight and dimensions.

Weights and dimensions of BTS 8420/AWS 8420 radio cabinet, battery frame, power shelf, and mounting plate

The following table provides the weights and dimensions for the BTS 8420/AWS 8420 radio cabinet, power shelf, mounting plate, and EZBFi battery frame.

Cabinet	Configuration	Maximum estimated installed weight, kg (lb)	Reference dimensions width x depth x height, mm (inches)
BTS 8420 (850/1900 MHz)	Digital Only Version -- one Digital Shelf	204 (450)	600 x 600 x 1880 (23.6 x 23.6 x 74)
BTS 8420 (850/1900 MHz)	Digital Only Version -- two Digital Shelves	230 (508)	600 x 600 x 1880 (23.6 x 23.6 x 74)
BTS 8420	Filtered Version (Digital Shelf + Filter)	263 (581)	600 x 600 x 1880 (23.6 x 23.6 x 74)
BTS 8420	Low Power Version (Digital Shelf + Filter + Amplifier)	284 (630)	600 x 600 x 1880 (23.6 x 23.6 x 74)
AWS 8420 (2100 MHz)	Low Power Version (Digital Shelf + Filter + Amplifier), 3 sector	284 (630)	600 x 600 x 1880 (23.6 x 23.6 x 74)
AWS 8420 (2100 MHz)	Low Power Version (Digital Shelf + Filter + Amplifier), 6 sector	284 (630)	600 x 600 x 1880 (23.6 x 23.6 x 74)
Mounting plate	Always required	11 (24)	600 x 600 x 3 (23.6 x 23.6 x 0.12)
EZBFi Battery frame	Fully equipped with: (4) battery shelves and (16) 12IR125-LP batteries	817 (1800)	543 x 600 x 1842 (21.4 x 23.6 x 72.5)
Integrated Power Module	BTS 8420/AWS 8420 with integrated power	17 (36)	525 x 406 x 150 (20.7 x 16.0 x 5.9)

Weights of battery, rectifier, and pallet

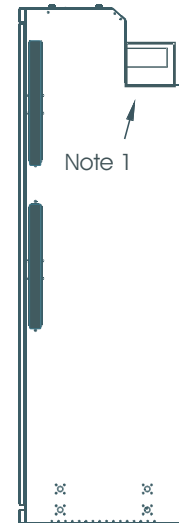
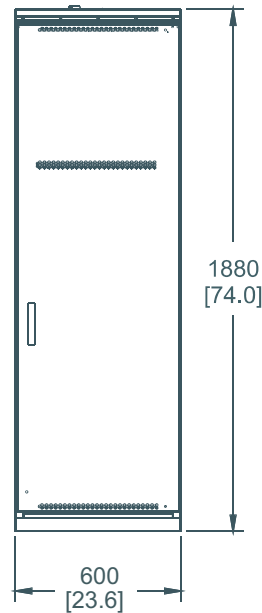
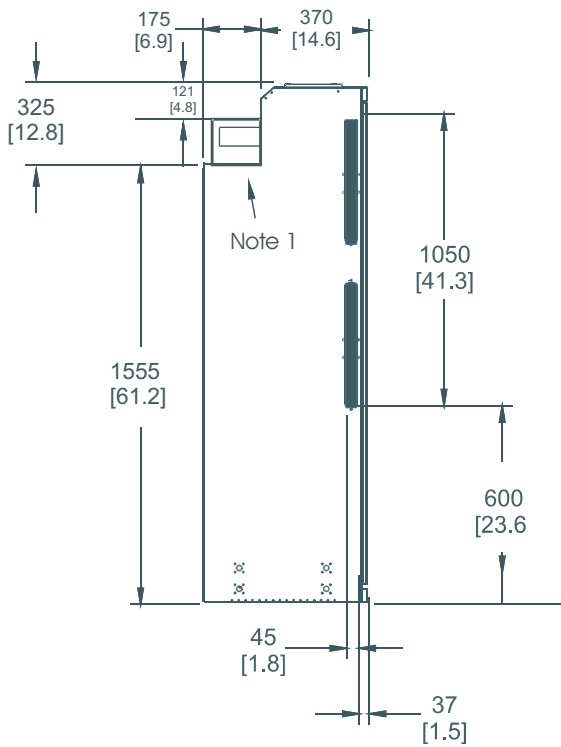
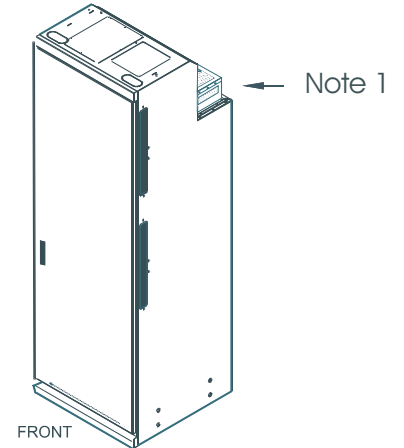
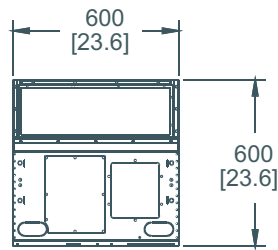
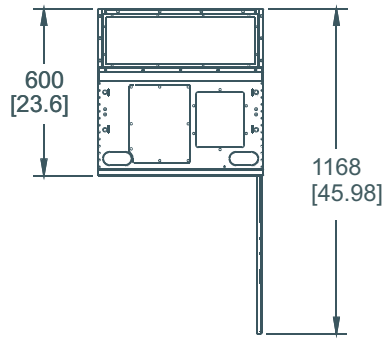
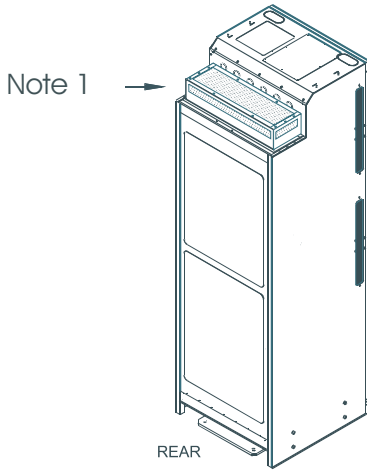
The following table provides approximate weights for batteries, rectifier, and pallet.

Item	Weight, kg (lb)
Battery (L1)	32 (71)
Rectifier KS-24734L1 (1500 W)	3.0 (6.6)
Pallet	30 (65)

Dimensions of BTS 8420/AWS 8420 radio cabinet

The following diagram shows the dimensions of the BTS 8420/AWS 8420 radio cabinet. The integrated power shelf, which mounts on top of the cabinet is not shown. When the Integrated Power Module is added, the height of the cabinet increases by 210 mm (8.27 inches).

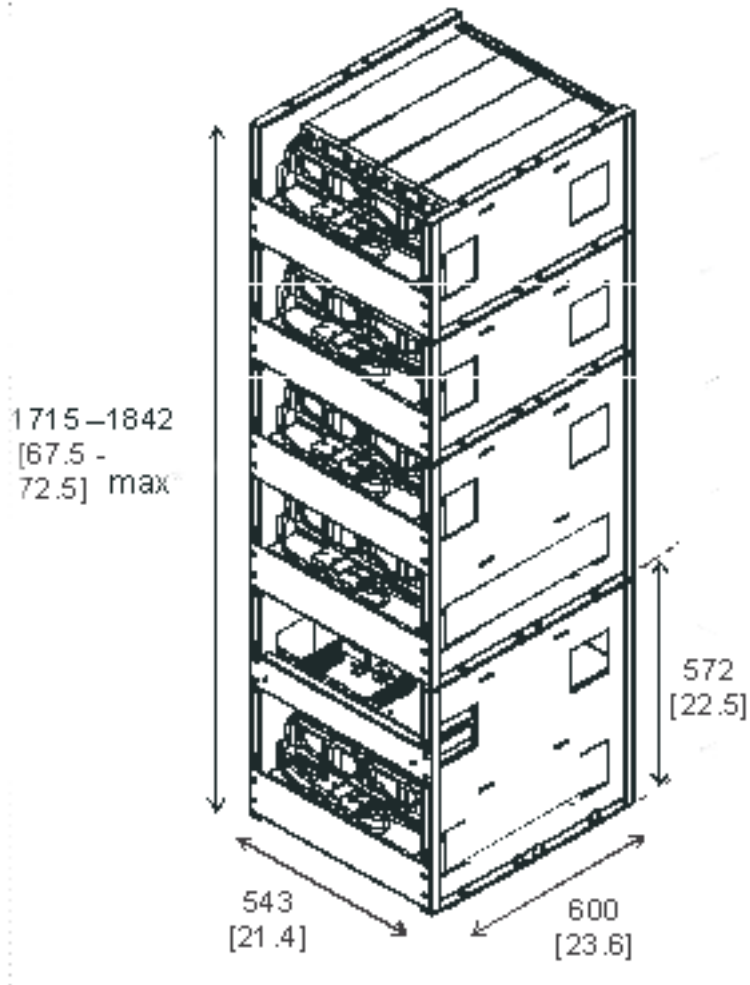
Note 1: Rear filter cover not present on BTS 8420 cabinets



Note 2: The Integrated Power Module (not illustrated) adds 210 mm (8.25 Inches) to the height of the cabinet

Dimensions of EZBFi

The following diagram shows the dimensions of the first and second EZBFi battery cabinet. (Refer to *EZBFi Modular Battery System Installation Manual for +24V and -48V*, 401-703-507, for installation of the EZBFi.)



□

Cabinet components

Overview

This topic covers the components inside the BTS 8420/AWS 8420 radio cabinet.

The basic configuration is implemented in one cabinet.

Hardware components inside Digital Only version of BTS 8420 radio cabinet

The hardware components inside the Digital Only version of BTS 8420 radio cabinet include:

- One fan tray
- One Digital Shelf with circuit packs.

Hardware components inside Digital Only version with two Digital Shelves of BTS 8420 radio cabinet

The hardware components inside the Digital Only version with two Digital Shelves of the BTS 8420 radio cabinet include:

- Two fan trays
- Two Digital Shelves with circuit packs.

Hardware components inside Filtered version of BTS 8420 radio cabinet

The hardware components inside the Low Power version of the BTS 8420 radio cabinet include:

- Amplifiers
- One or two fan trays
- One or two Digital Shelves with circuit packs.

Hardware components inside the Low Power version of BTS 8420 radio cabinet

The hardware components inside the Filtered version of BTS 8420 radio cabinet are:

- 850 MHz and 1900 MHz filters
- Amplifiers
- One or two fan trays
- One or two Digital Shelves with circuit packs.

Hardware components inside the AWS 8420 radio cabinet

The hardware components inside the three sector AWS 8420 radio cabinet are:

- Three 2100 MHz filters
- Three amplifiers

- One fan tray
- One Digital Shelf with circuit packs.

The hardware components inside the six sector AWS 8420 radio cabinet are:

- Six 2100 MHz filters
- Six amplifiers
- One fan tray
- One Digital Shelf with circuit packs.



Physical interfaces

Overview

This topic covers the following physical interface points on the BTS 8420/AWS 8420 radio cabinet: input power, RF, GPS, T1/E1, Power Alarms, user alarms, relay alarms, and cabinet grounding.

Cable interfaces on the BTS 8420/AWS 8420 radio cabinet without integrated power

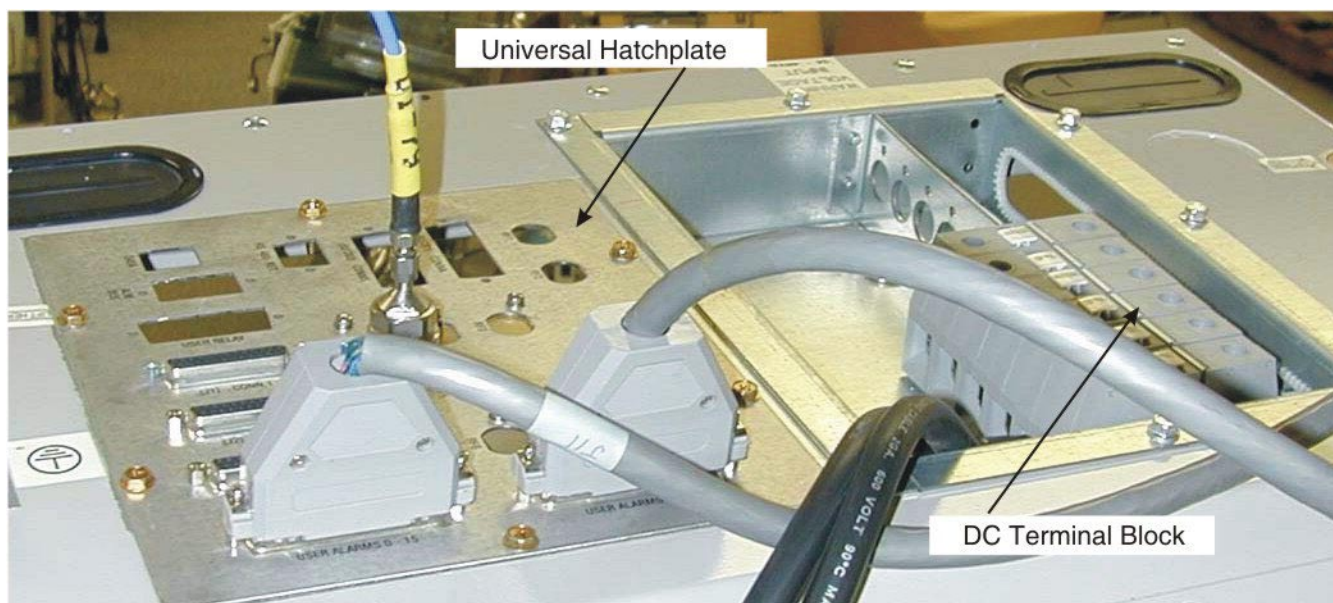
Refer to the following figure. The cable interface points on the Universal Hatchplate (which is located on top of the BTS 8420/AWS 8420 radio cabinet without integrated power) are for the following:

- DC power feeder
- Ground
- T1/E1 lines
- User alarms
- User relay alarms (used to interface T1/E1 lines to Digital Shelf)
- Power alarms
- GPS antenna.

The RF (Rx/Tx) cable interface connectors are located at the top-rear of the BTS 8420/AWS 8420 radio cabinet.

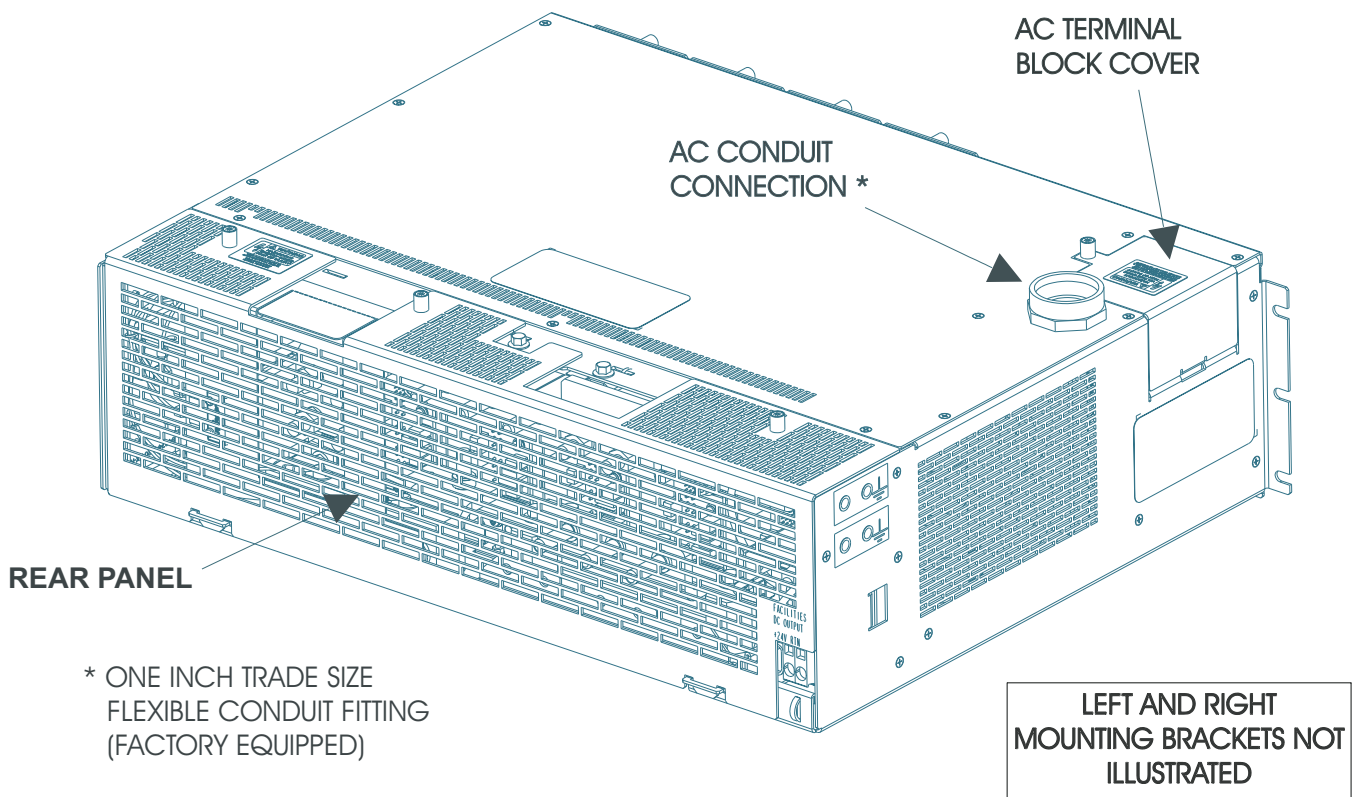
BTS 8420/AWS 8420 radio cabinet without integrated power - external top view

Shown below is the top panel of the BTS 8420/AWS 8420 radio cabinet without integrated power. The Universal Hatchplate (on the left) provides connections to the GPS, T1/E1, and alarm cables. The DC Terminal Block (on the right) provides connections to the DC power feeder cables. Connections for the RF (Rx/Tx) cables are located on the rear panel of the BTS 8420/AWS 8420 radio cabinet.



BTS 8420/AWS 8420 radio cabinet with integrated power

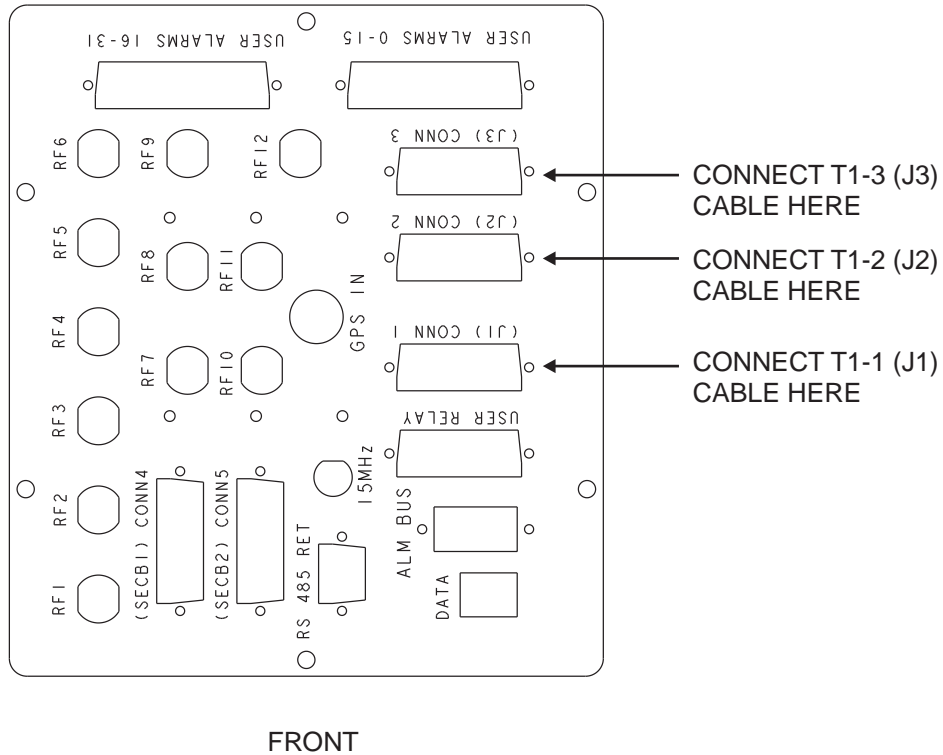
Shown below is the BTS 8420/AWS 8420 radio cabinet with integrated power. The BTS 8420/AWS 8420 radio cabinet with integrated power is equipped with an integrated power module. The integrated power module is mounted on top of the BTS 8420/AWS 8420 radio cabinet and converts AC input power to +24 VDC for the BTS 8420/AWS 8420 radio cabinet. The T1/E1, User Alarm, Power Alarm, User Relay Alarm, and GPS cables are connected directly to the integrated power module. The AC input power is also connected directly to the integrated power module. AC input power is connected to the AC terminal block, underneath the AC terminal block cover, on top of the integrated power module support bracket. The integrated power module is illustrated in the figure below. The RF (Rx/Tx) jumper cables are connected to the BTS 8420/AWS 8420 radio cabinet at the rear panel.



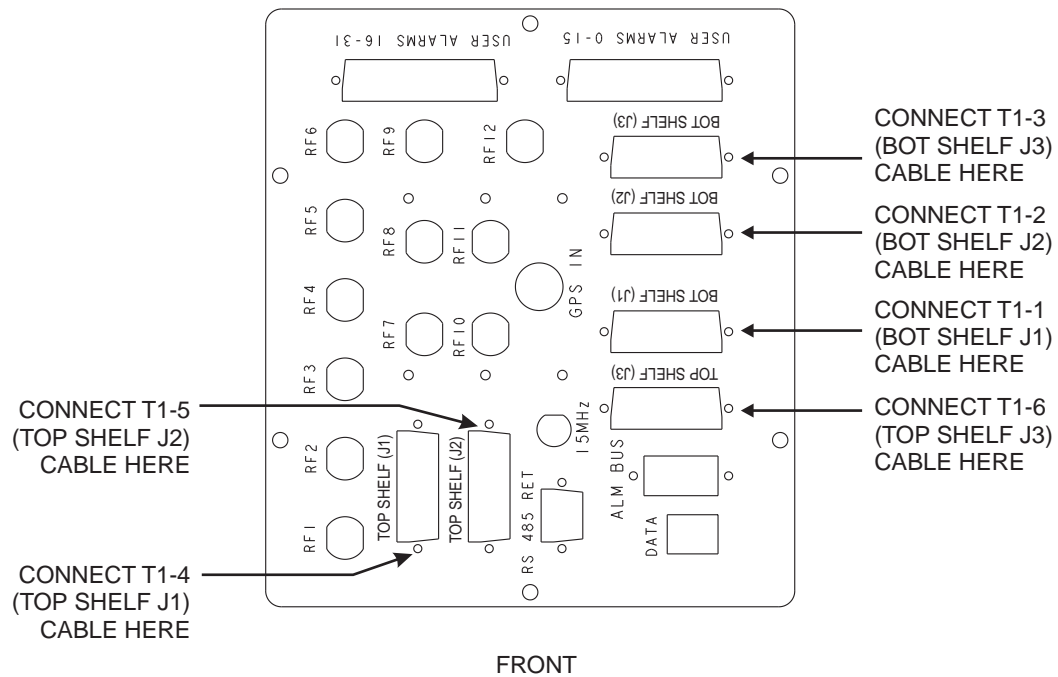
I/O cable termination points on BTS 8420/AWS 8420 radio cabinet without integrated power

The following cables (each containing 8 twisted-wire pairs) are connected to the Universal Hatchplate: T1/E1, User Alarms, Power Alarms, and User Relay Alarms. Each of these cables is terminated with a D-sub connector. The GPS cable is coaxial and is terminated with a coaxial connector. Callouts are shown only for the T1 cables here.

The figure below shows the cable termination points on the Universal Hatchplate located on top of all versions of the BTS 8420 radio cabinet, except the Digital Only version with two Digital Shelves, and is only for configurations without integrated power.



The figure below shows the cable termination points on the Universal Hatchplate located on top of the Digital Only with two Digital Shelves version of the BTS 8420 radio cabinet and is only for configurations without integrated power. Again, only callouts for T1 cable connections are shown here.



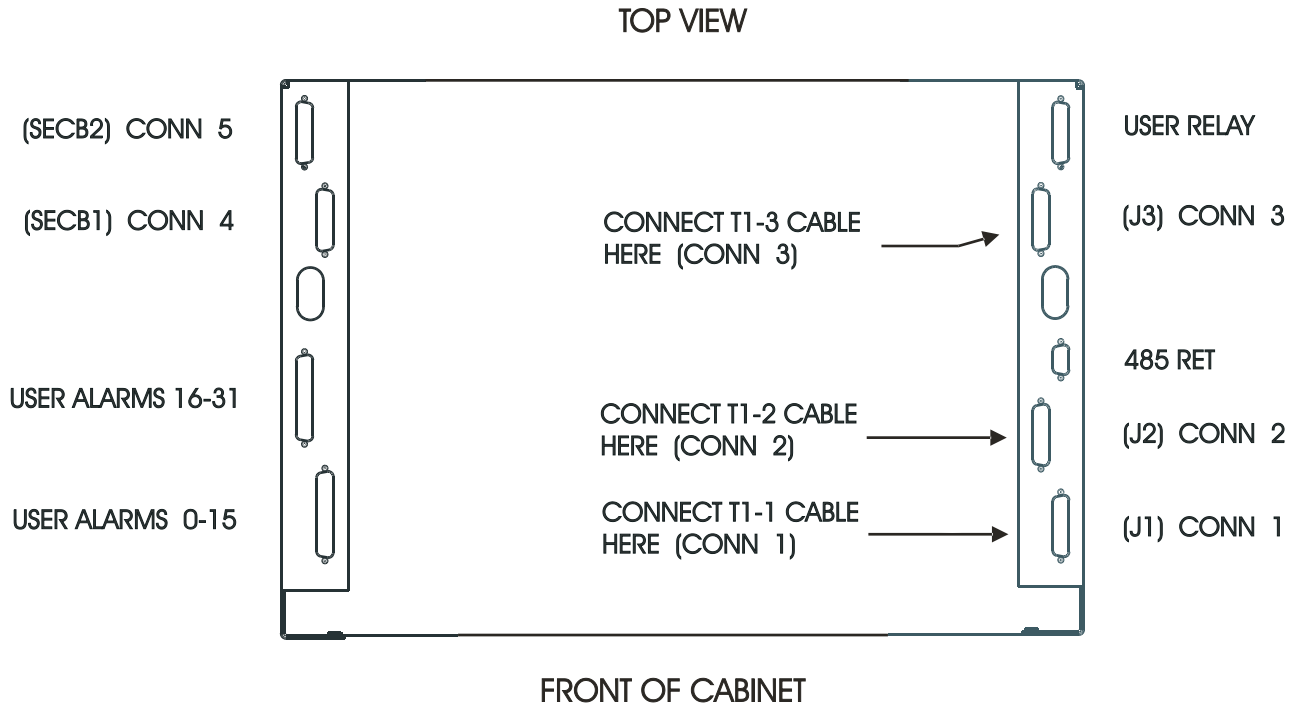
I/O cable termination points on BTS 8420/AWS 8420 radio cabinet with integrated power

The figure below shows the cable termination points on the Integrated Power Module, which is located on top of the BTS 8420/AWS 8420 radio cabinet with integrated power.

The following cables are connected to the top of the Integrated Power Module, at the left and right sides: T1/E1, User Alarm, Power Alarm, and User Relay Alarm. The GPS cable is connected at the rear of the Integrated Power Module.

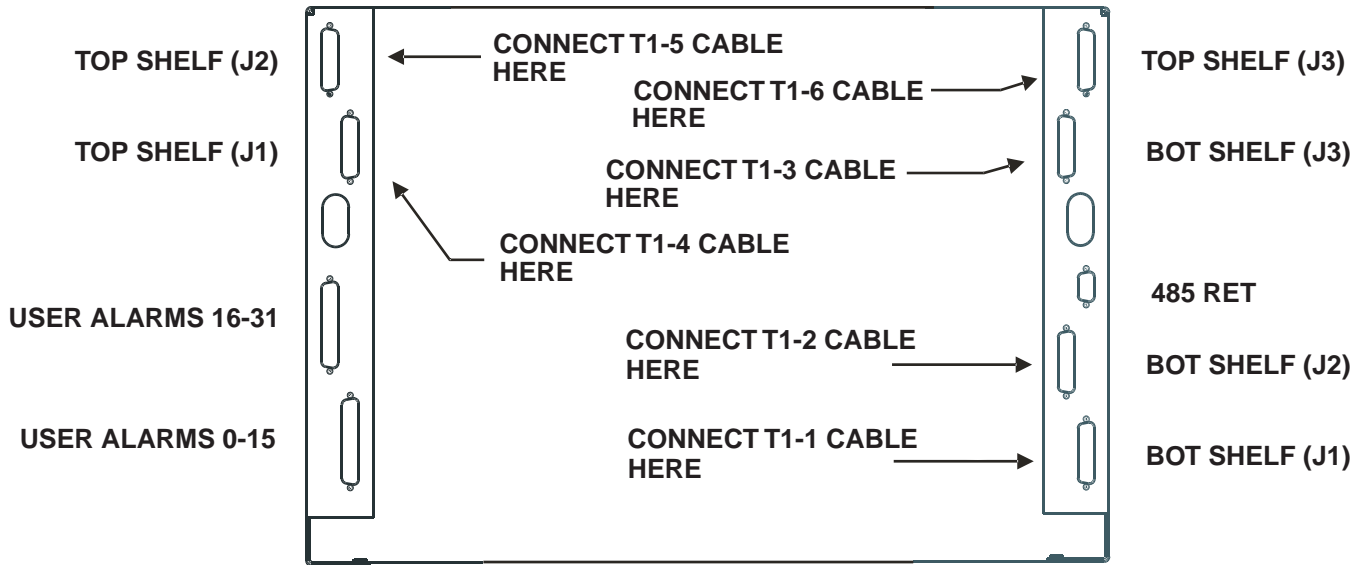
The following cables (each containing 8 twisted-wire pairs) are connected to the Integrated Power Module bracket on top of the Integrated Power Module: T1/E1, User Alarms, Power Alarms, and User Relay Alarms. Each of these cables is terminated with a D-sub connector. The GPS cable is coaxial and is terminated with a coaxial connector. The GPS cable is connected at the rear of the Integrated Power Module. Callouts are shown only for the T1 cables here.

The figure below shows the cable termination points on the Integrated Power Module bracket on top of the Integrated Power Module, located on the BTS 8420 radio cabinet with two Digital Shelves, and is only for configurations with integrated power.



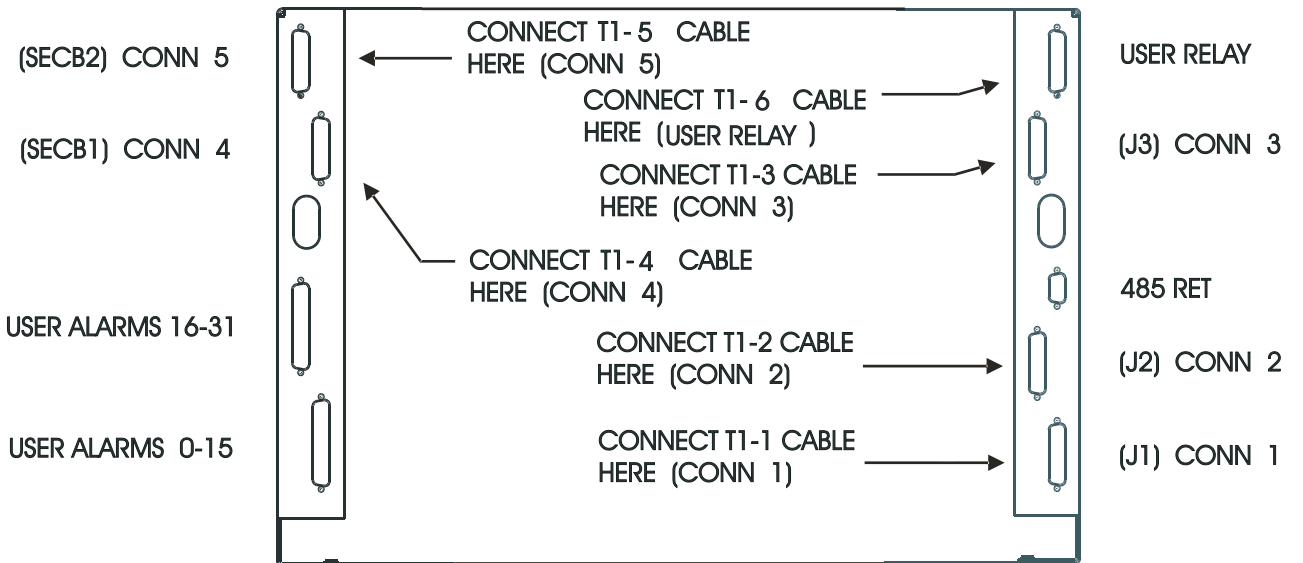
The figure below shows the cable termination points on the Integrated Power Module bracket located on top of the Integrated Power Module and is for the Digital Only with two Digital Shelves version of the BTS 8420/AWS 8420 radio cabinet. It is only for configurations with integrated power. Again, only callouts for T1 cable connections are shown here. The bracket will have labels that match one of the figures below.

TOP VIEW



FRONT OF CABINET

TOP VIEW



FRONT OF CABINET

RF antenna jumper cable connections

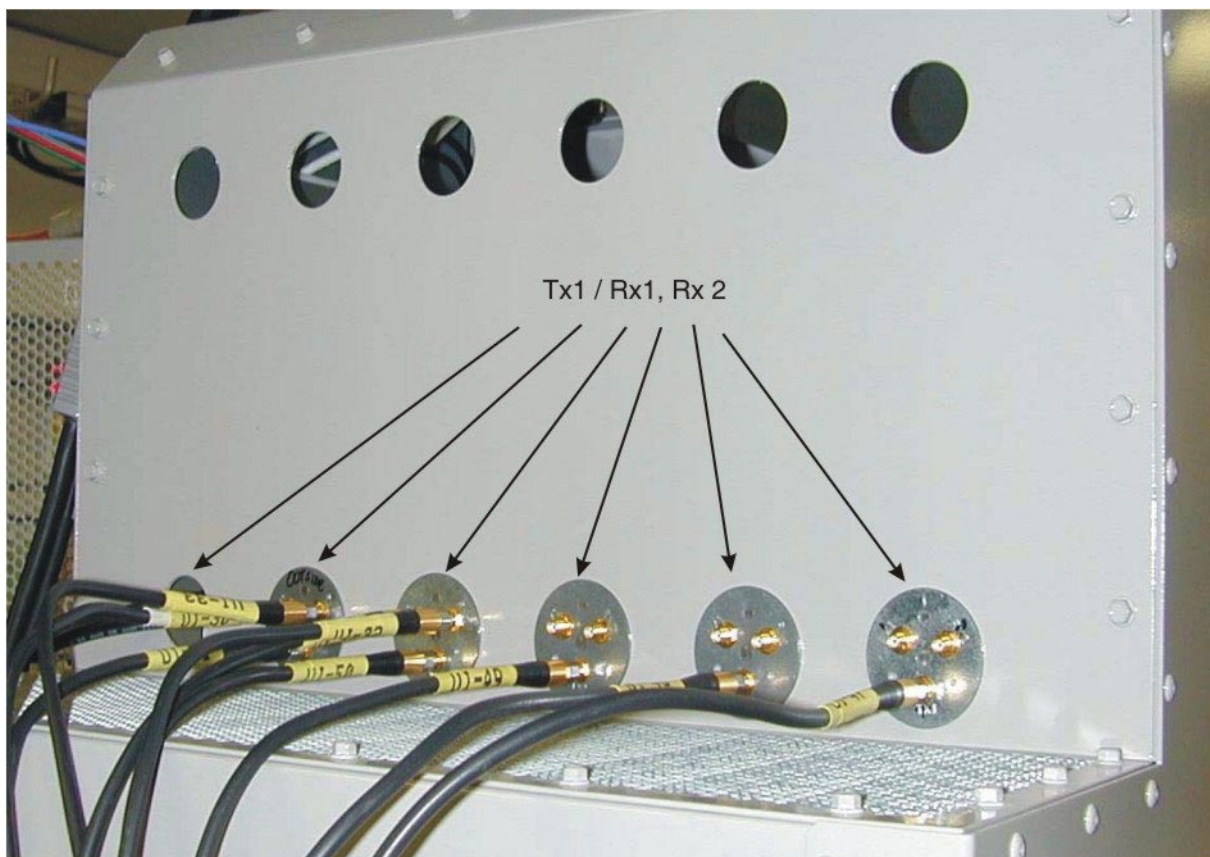
The Digital Shelf contains the equipment that performs the signal processing functions for a three-sector CDMA base station.

The following antenna cables need to be connected to the *Digital Only*, *Filtered*, and *Low Power* versions of the BTS 8420/AWS 8420 radio cabinet:

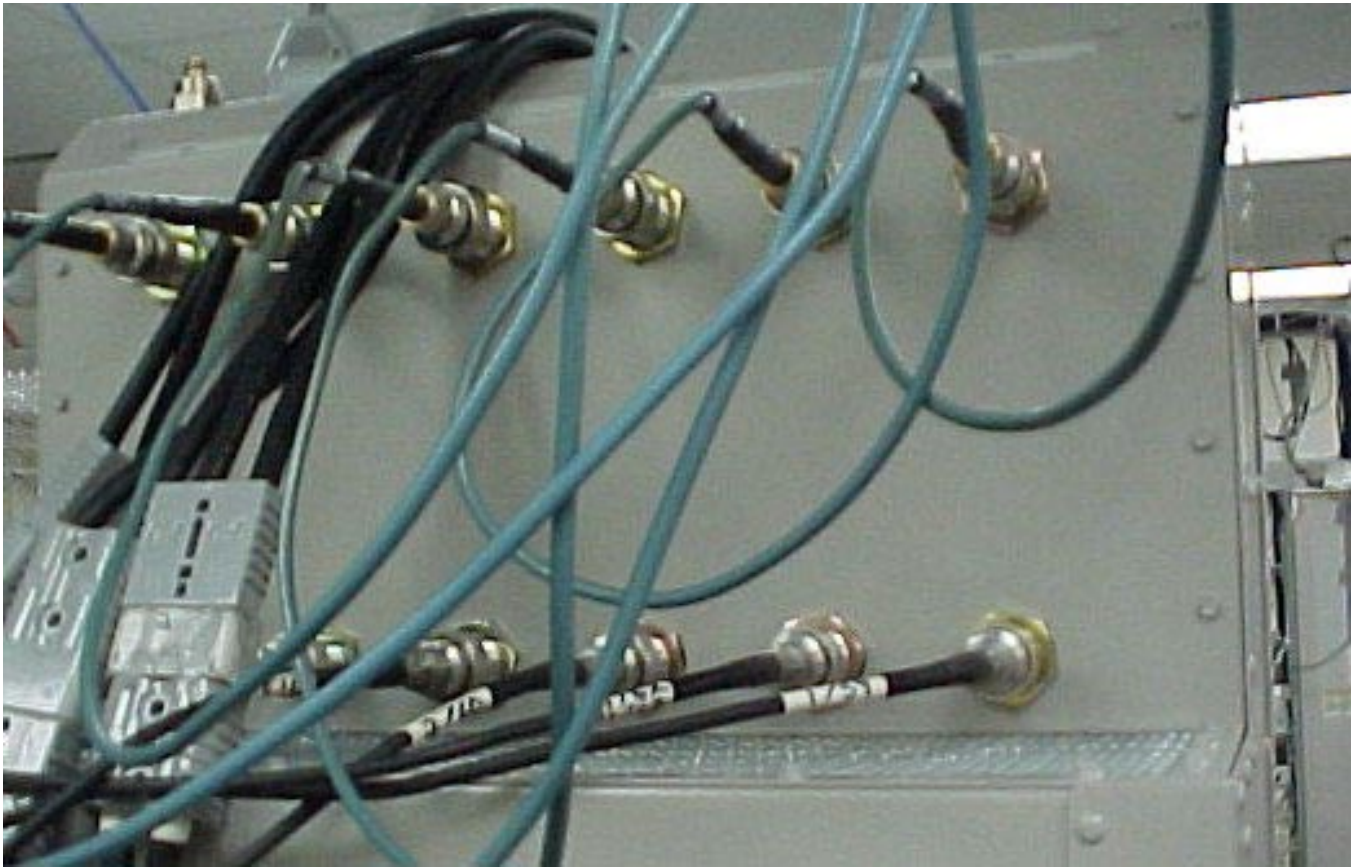
- RF jumper cables (provided by customer).

Customer-provided RF jumper cables are connected from the BTS 8420/AWS 8420 radio cabinet to the customer-provided Distributed Antenna System (DAS). The DAS is external to the BTS 8420/AWS 8420 radio cabinet.

Shown in the figure below are the RF antenna jumper cable interface connectors on the back of the *Digital Only* version with one Digital Shelf. The *Digital Only* version with two Digital Shelves differs from the *Digital Only* version with one Digital Shelf only in the sense that it has a second row of RF antenna jumper cable interface connectors.



Shown in the figure below are the RF antenna jumper cable interface connectors on the rear panel of the *Filtered* and *Low Power* versions equipped with 850 MHz and 1900 MHz filters.



□

Site configurations

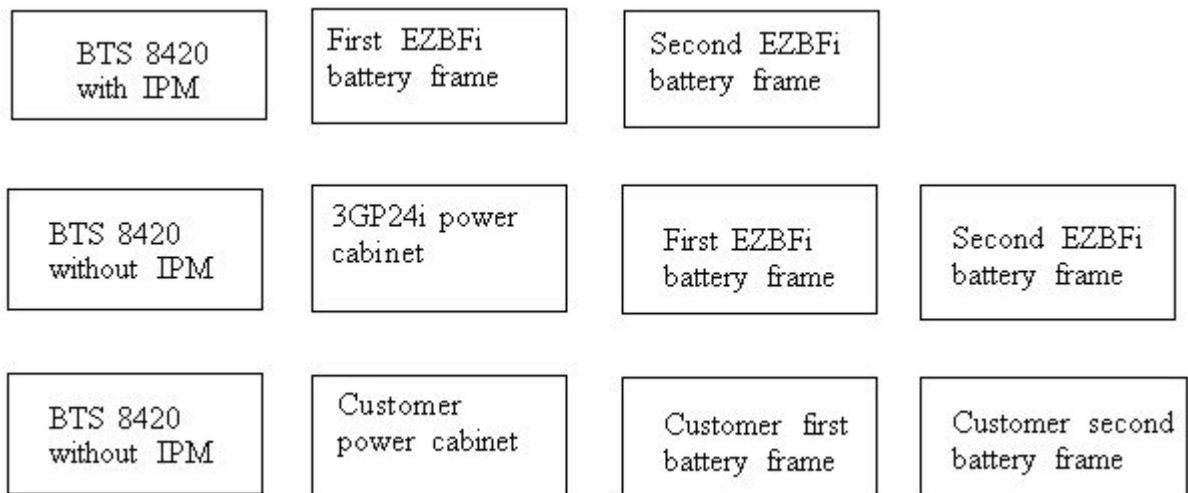
Overview

This topic covers the possible configurations for the BTS 8420 radio cabinet at the site.

Site configurations for BTS 8420/AWS 8420 radio cabinets with and without integrated power

The following diagram (applies to both BTS 8420 and AWS 8420) shows typical site configurations for:

- An indoor BTS 8420/AWS 8420 radio cabinet with integrated power and two EZBFi battery frames
- An indoor BTS 8420/AWS 8420 radio cabinet without integrated power, a 3GP24i power cabinet, and two EZBFi battery frames
- An indoor BTS 8420/AWS 8420 radio cabinet without integrated power, a customer power cabinet, and two customer battery frames



□

Power specifications

Overview

Purpose

This section covers the power specifications for the BTS 8420/AWS 8420 radio cabinet, such as input power, power configurations, and power back-up options.

BTS 8420/AWS 8420 radio cabinets with integrated power

BTS 8420/AWS 8420 radio cabinets with integrated power are equipped with an Integrated Power Module, which converts AC input power to +24 VDC. The Integrated Power Module is mounted on top of the BTS 8420/AWS 8420 radio cabinet.

Rectifier modules inside Integrated Power Module

The Integrated Power Module contains rectifier modules. The rectifier modules convert AC line voltage to +24 VDC. The number of rectifier modules is determined by the number of configured carriers. One additional rectifier module is needed for redundancy or to charge the batteries.

BTS 8420/AWS 8420 radio cabinets without integrated power

The BTS 8420/AWS 8420 radio cabinet without integrated power requires +24 VDC input power. +24 VDC input power can be provided by a Alcatel-Lucent 3GP24i power cabinet or a customer-supplied power source. The DC feeder cables consist of 1/0 AWG wire and are protected with 150 A circuit breakers.

Contents

Input power	1-36
Site power configurations	1-38
Backup power options	1-39



Input power

Overview

The BTS 8420/AWS 8420 radio cabinet is available with or without integrated power. The BTS 8420 radio cabinet without integrated power requires +24 VDC input power. The BTS 8420/AWS 8420 radio cabinet with integrated power requires AC input power.

AC power for BTS 8420/AWS 8420 radio cabinet with integrated power

The Integrated Power Module on the BTS 8420/AWS 8420 radio cabinet with integrated power requires AC input power and converts AC input power into +24 VDC. +24 VDC powers the apparatus inside the BTS 8420 radio cabinet.

AC input power for the BTS 8420/AWS 8420 radio cabinet with integrated power must meet the following requirements:

Characteristic	Supported values	
Number of branch circuits	2	
Input voltage(s), nominal(s)	Domestic	208 VAC, 240 VAC
	International	230 VAC
Frequency, nominal	Domestic	60 Hz
	International	50 Hz
Phases	1	

In a single-phase branch circuit, the AC power cables are designated:

- L1
- L2/N
- GND/PE.

The AC power cables are connected to the AC terminal block on top of the Integrated Power Module.

AC input power requirements for BTS 8420/AWS 8420 radio cabinet with integrated power

The BTS 8420/AWS 8420 radio cabinet with integrated power requires two single-phase branch circuits. AC power is supplied from an external service panel. The service panel is installed during site preparation.

The AC service panel must be rated 100 A for each BTS 8420/AWS 8420 radio cabinet. If additional cabinets or other AC equipment is to be installed at the site, the total power consumption for all site equipment must not exceed the service rating.

The AC power feeders must consist of Class B, stranded, THHN insulated cable.

The following table provides the AC input requirements for a fully-configured system (8 carriers).

AC input requirements for fully-configured system with 100 A service panel			
Type of cabinet	Equipment	Circuit 1	Circuit 2
BTS 8420/AWS 8420 radio cabinet with integrated power	Circuit breaker rating	50 Amp	50 Amp
	L1 wire gauge	8 AWG	8 AWG
	L2 (Neutral) wire gauge	8 AWG	8 AWG
	Ground wire gauge	8 AWG	

Location/color/voltage		Wire size	Function	Circuit
Domestic: 208-240 VAC	International: 230 VAC			
F1 L1 / Black	F1 L1 / Brown	8 AWG	Feeder line 1	Branch circuit 1
F1 L2 / Red	F1 N / Blue	8 AWG		
Ground - Green / Yellow	PE - Green / Yellow	8 AWG	Ground/PE	
F2 L1 / Black	F2 L1 / Brown	8 AWG	Feeder line 2	Branch circuit 2
F2 L2 / Red	F2 N / Blue	8 AWG		

DC input power for BTS 8420/AWS 8420 radio cabinet without integrated power

The BTS 8420/AWS 8420 radio cabinet without integrated power requires +24 VDC input power. 1/0 AWG feeders with 150 A circuit breakers are needed.



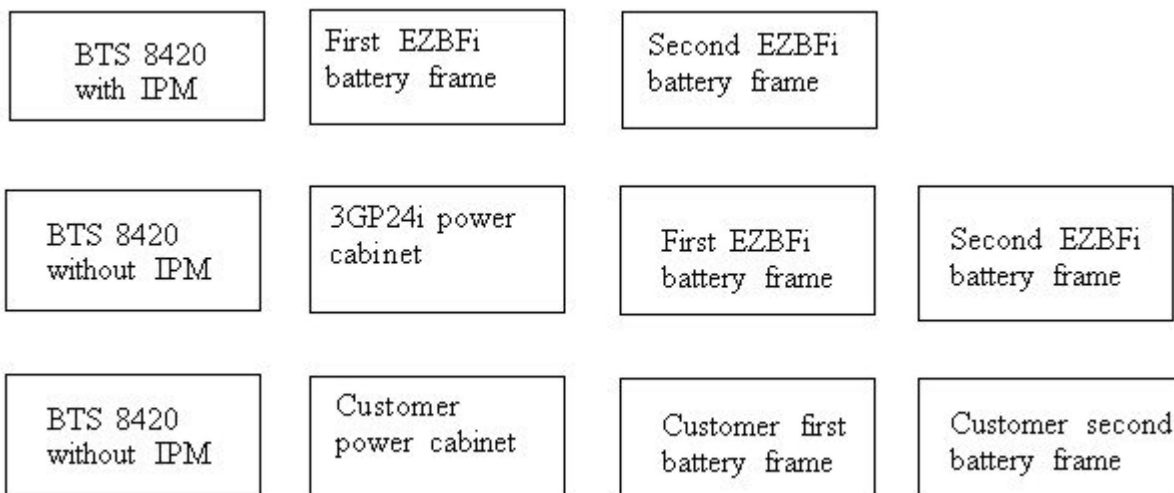
Site power configurations

Power options

There are three power configurations for the BTS 8420/AWS 8420 radio cabinet. They are as follows:

- In the first configuration, the BTS 8420/AWS 8420 radio cabinet with integrated power is connected to a first and second EZBFI battery frame.
- In the second configuration, the BTS 8420/AWS 8420 radio cabinet without integrated power is connected to a 3GP24i power cabinet and a first and second EZBFI battery frame.
- In the third configuration, the BTS 8420/AWS 8420 radio cabinet without integrated power is connected to a customer power cabinet and a first and second customer battery frame.

Shown below are block diagrams for the three power configurations. These power configurations apply to both BTS 8420 and AWS 8420 radio cabinets.



□

Backup power options

Overview

This topic discuss the various battery backup options that are available for the BTS 8420 radio cabinet.

Power options

The following table provides the power options available for the BTS 8420 radio cabinet.

Power options	Details
Integrated power + EZBFi	BTS 8420/AWS 8420 radio cabinet with Integrated Power Module + EZBFi
Non-integrated power	BTS 8420/AWS 8420 radio cabinet without Integrated Power Module + 3GP24i or customer provided power

Battery backup

Battery backup is available to ensure uninterrupted base station operation in the event of a power interruption.

The Alcatel-Lucent EZBFi battery frames and 3GP24i power cabinet are installed next to the BTS 8420/AWS 8420 radio cabinet. The 3GP24i power cabinet provides +24 VDC and contains only the minimum number of batteries that are needed for battery backup. The EZBFi battery cabinet contains additional batteries.

The customer has the option of supplying his own power cabinet and battery frames.

Battery backup requires N+1 rectifiers. Rectifier N+1 is provides redundancy and additional power for charging the batteries.

EZBFi battery frame

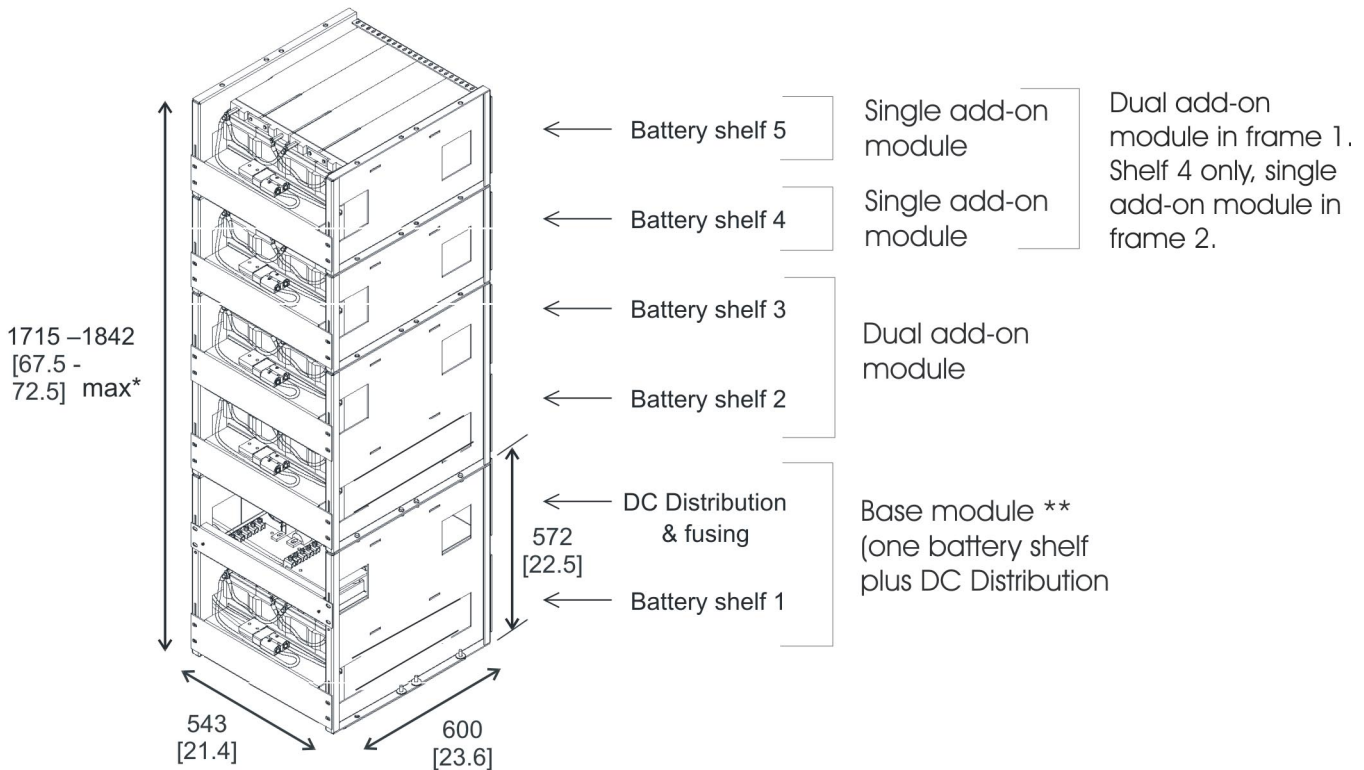
The EZBFi battery frame is the standard backup power configuration for indoor applications.

One or more EZBFi frames can be deployed and installed side-by-side to the right of the BTS 8420 radio cabinet. The EZBFi battery frame is modular in design. The frames can be stacked on top of each other. This gives the service provider the option of installing as much battery back up as is needed.

The procedures for installing and connecting EZBFi battery frames are covered in the *EZBFi Modular Battery System Installation Manual for +24V and -48V*, 401-703-507.

EZBFi battery frames (first and second) standard

The optional EZBFi battery frame provides additional battery backup (up to 20 batteries) to supplement the batteries in a 3GP24i power cabinet. The batteries are charged by the integrated power shelf or 3GP24i power cabinet.



*Maximum height is dependent upon growth path (single vs dual shelf add-on modules)

** The base unit in a second frame is the same as a dual add-on module (two battery shelves)

NOTE: For installation of a second add-on module in Zone 4, a Zone 4 anchoring kit is required.

Battery frame modules

The entire assembly consists of a Battery Base Module and one or two Add-On Battery Modules stacked on top of the Battery Base Module, which is referred to in the text as the “first” or “second” battery frame.

Each battery frame must include a battery base module, consisting of one battery shelf and a DC distribution and fusing panel. The difference between a battery base module and add-on battery modules is that the add-on battery modules do not include a DC distribution and fusing panel. As its name implies, the DC distribution and fusing panel provide the DC distribution buses required for power connection to the cabinet and fusing protection, as well as the Power Alarm interface.

The Battery Base Module contains one battery shelf. Each add-on battery module contains two battery shelves.

L1 100-Ah 12-VDC batteries are used in the EZBFi battery cabinet. The batteries are connected in a series-parallel manner to provide 24 VDC.

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