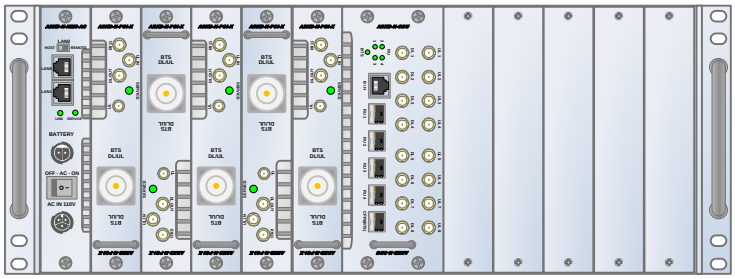
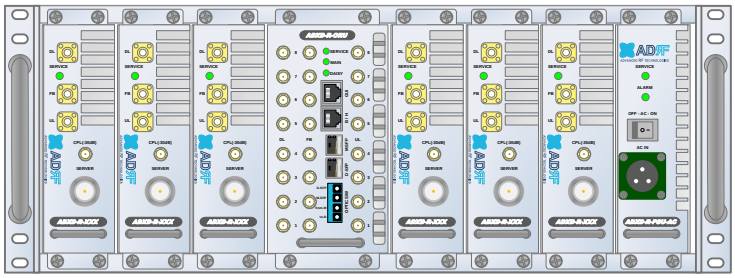
ADXD DAS for MPR User Manual

Version 0.1





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Change List

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Terms and Abbreviations

The following is a list of abbreviations and terms used throughout this document.

Abbreviation/Term	Definition
AGC	Automatic Gain Control
ALC	Automatic Level Control
AROMS	ADRF' Repeater Operation and Management System
BCU	Band Combiner Unit
BTS	Base Transceiver Station
CDMA	Code Division Multiple Access
CHC	Channel combiner
CW	Continuous Wave (un-modulated signal)
DAS	Distributed Antenna System
DL	Downlink
Downlink	The path covered from the Base Transceiver Station (BTS) to the subscribers' service area via the repeater
HE	Head End
HPA	High Power Amplifier
HW	Hardware
IF	Intermediate Frequency
LNA	Low Noise Amplifier
LPR	Low Power Remote Unit
LTE	Long Term Evolution
MPR	Medium Power Remote Unit
MS	Mobile Station
NMS	Network Management System
ODU	Optic Donor Unit which is located in ADXD-HE.
OEU	Optic Expansion Unit
ORU	Optic Remote Unit which is located in ADXD-MPR.
PLL	Phased Locked Loop
POI	Point Of Interface
PSU	Power Supply Unit
RF	Radio Frequency
RU	Remote Unit which is composed of ORU and RMs of plural bands
RM	Remote Module which is assigned per band
SW	Software
UL	Uplink
Uplink	The path covered from the subscribers' service area to the Base Transceiver Station (BTS) via the repeater
VSWR	Voltage Standing Wave Ratio

1. INTRODUCTION

Currently the ADXD supports 600MHz, 700 MHz (Lower A, Lower B, Lower C and Upper C), SMR800/Cellular, PCS, AWS, WCS and BRS band.

1.1 Highlights

- Modular Structure (HE)
  - Supports multi bands service in one body
  - Supports up to 12 slot available for POI, ODU, etc.
- **33dBm or 37dBm of downlink composite output power**
- Requires only single strand of fiber per remote unit
- Supports SNMP v1, v2, v3 (get, set & traps)
- Web-based GUI Interface; No 3rd party GUI software required
- Web-GUI connectivity via DHCP in host mode
- Versatility and Usability: ADXD gives total control to the user. Control parameters such as gain, output power, and alarm threshold can be changed using Web-GUI interface allowing the user to fine tune the system to the given RF environment.

1.2 ADXD DAS Quick View

1.2.1 HE Quick View

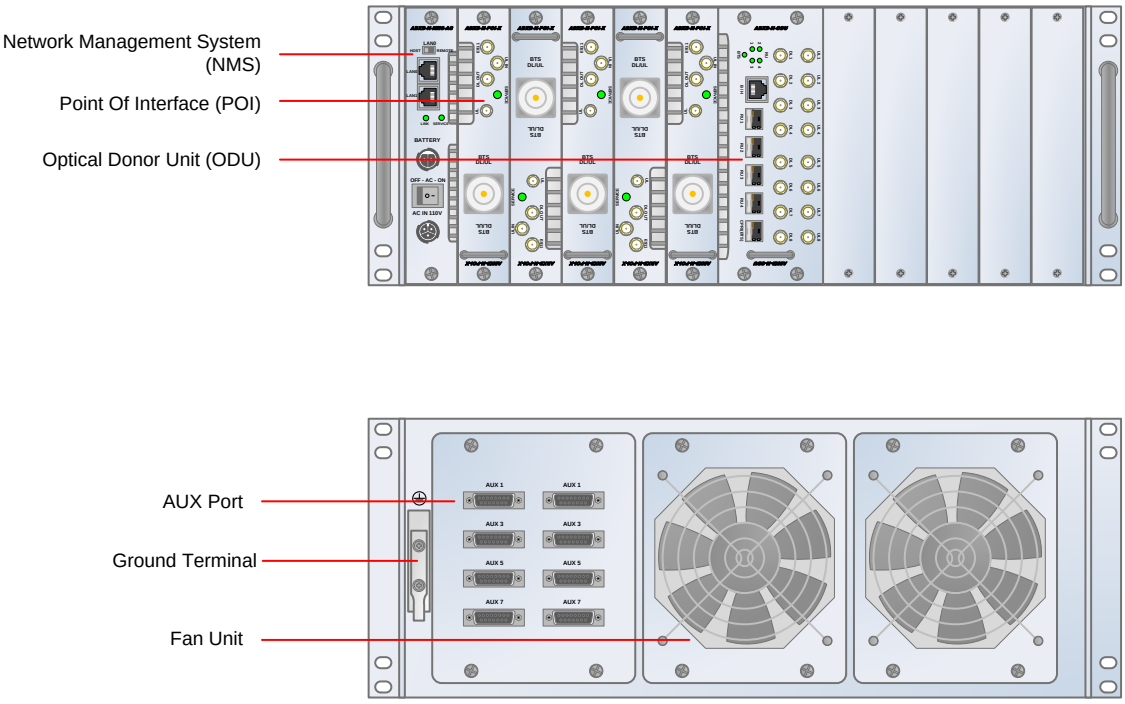


Figure 2-1 ADXD DAS HE Quick View (Front and Rear)

1.2.2 RU Quick View

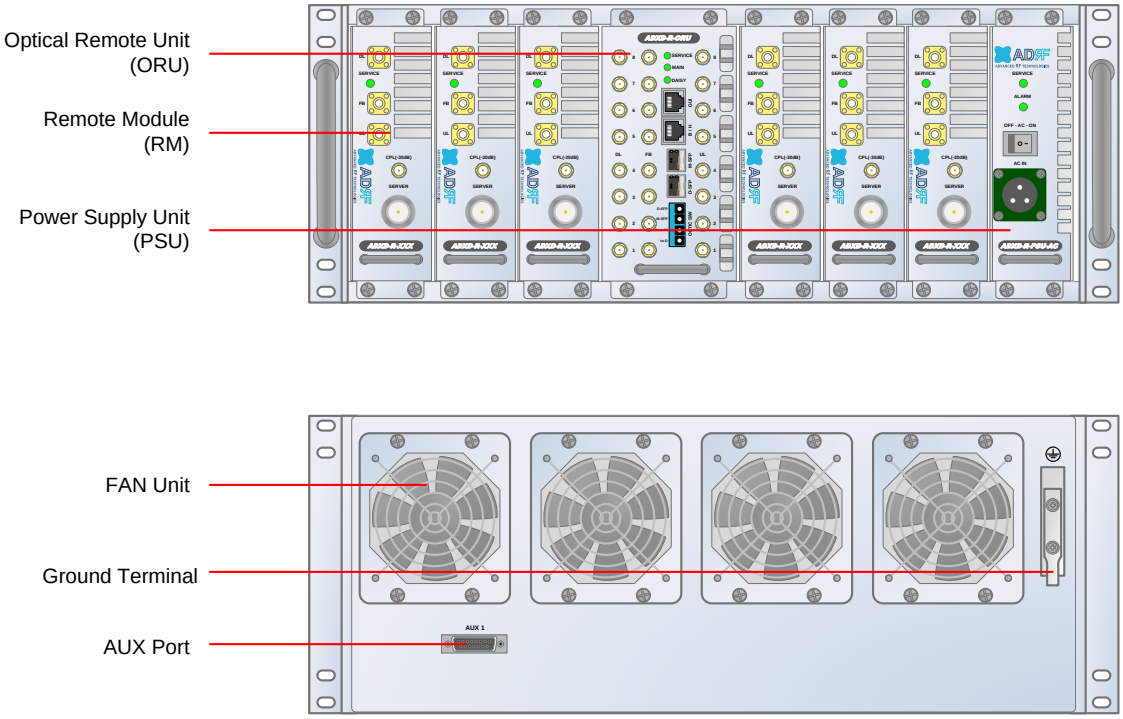


Figure 2-2 ADXD DAS RU Quick View (Front and Rear)

1.3 Warnings and Hazards

WARNING! ELECTRIC SHOCK

Opening the ADXD DAS could result in electric shock and may cause severe injury.

WARNING! EXPOSURE TO RF

Working with the ADXD DAS while in operation, may expose the technician to RF electromagnetic fields that exceed FCC rules for human exposure. Visit the FCC website at www.fcc.gov/oet/rfsafety to learn more about the effects of exposure to RF electromagnetic fields.

RF EXPOSURE & ANTENNA PLACEMENT Guidelines

Actual separation distance is determined upon gain of antenna used.
Please maintain a minimum safe distance of at least C0 cm while operating near the donor and the server antennas.

FCC WARING & ANTENNA INSTALLATION Guidance

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

WARRANTY

Opening or tampering the ADXD DAS will void all warranties.

Lithium Battery: CAUTION. RISK OF EXPLOSION IF BATTERY IS REPLACED BY INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO INSTRUCTIONS.

Ethernet Instructions: This equipment is for indoor use only. All cabling should be limited to inside the building.

FCC Part 15 Class A

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. 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 radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

FCC Part 20

WARNING. THIS is NOT a CONSUMER device. It is designed for installation by FCC LICENSEES and QUALIFIED INSTALLERS. You MUST have an FCC LICENSE or express consent of an FCC Licensee to operate this device. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of $100,000 for each continuing violation.

Laser Safety

Fiber optic ports of the ADXD DAS emit invisible laser radiation at the 1270, 1330nm wavelength window.

To avoid eye injury never look directly into the optical ports, patch cords or optical cables. Do not stare into beam or view directly with optical instruments. Always assume optical output is on.

Only technicians familiar with fiber optic safety practices and procedures should perform optical fiber connections and disconnections of the ADXD DAS and the associated cables.

The ADXD DAS complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to laser notice No.50 (July26. 2001)@IEC 60825-1, Amendment2 (Jan. 2001).

Care of Fiber Optic Connectors

Do not remove the protective covers on the fiber optic connectors until a connection is ready to be made. Do not leave connectors uncovered when not connected.

The tip of the fiber optic connectors should not come into contact with any object or dust.

Refer to the cleaning procedure for information on the cleaning of the fiber tip.

Use of unauthorized antennas, cables, and/or coupling devices not conforming with ERP/EIRP and/or indoor-only restrictions is prohibited.

Home/ personal use are prohibited

Only 50 ohm rated antennas, cables and passive equipment shall be used with this remote. Any equipment attached to this device not meeting this standard may cause degradation and unwanted signals in the bi-directional system. All components connected to this device must operate in the frequency range of this device.

Only 50 ohm rated antennas, cables and passive components operating from 0.6 - 3 GHz shall be used with this device.

RSS-GEN, Sec. 7.1.2 – (transmitters)

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionneravec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada.
Dans le but de réduire les risques de brouillage radioélectrique à l'intention desautres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotroperayonnée quivalente (p.i.r.e.) ne dépassepas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

RSS-GEN, Sec. 7.1.2 – (detachable antennas)

This radio transmitter (identify the device by certification number, or model number if Category II)has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste,ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

RF Radiation Exposure

This equipment complies with RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of c0 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. RF exposure will be addressed at time of installation and the use of higher gain antennas require larger separation distances.

RSS-102 RF Exposure

L'antenne (ou les antennes) doit être installée de façon à maintenir à tout instant une distance

minimum de au moins c0 cm entre la source de radiation (l'antenne) et toute personne physique. Cet appareil ne doit pas être installé ou utilisé en conjonction avec une autre antenne ou émetteur.

2. BLOCK DIAGRAM

2.1 ADXD DAS Block Diagram

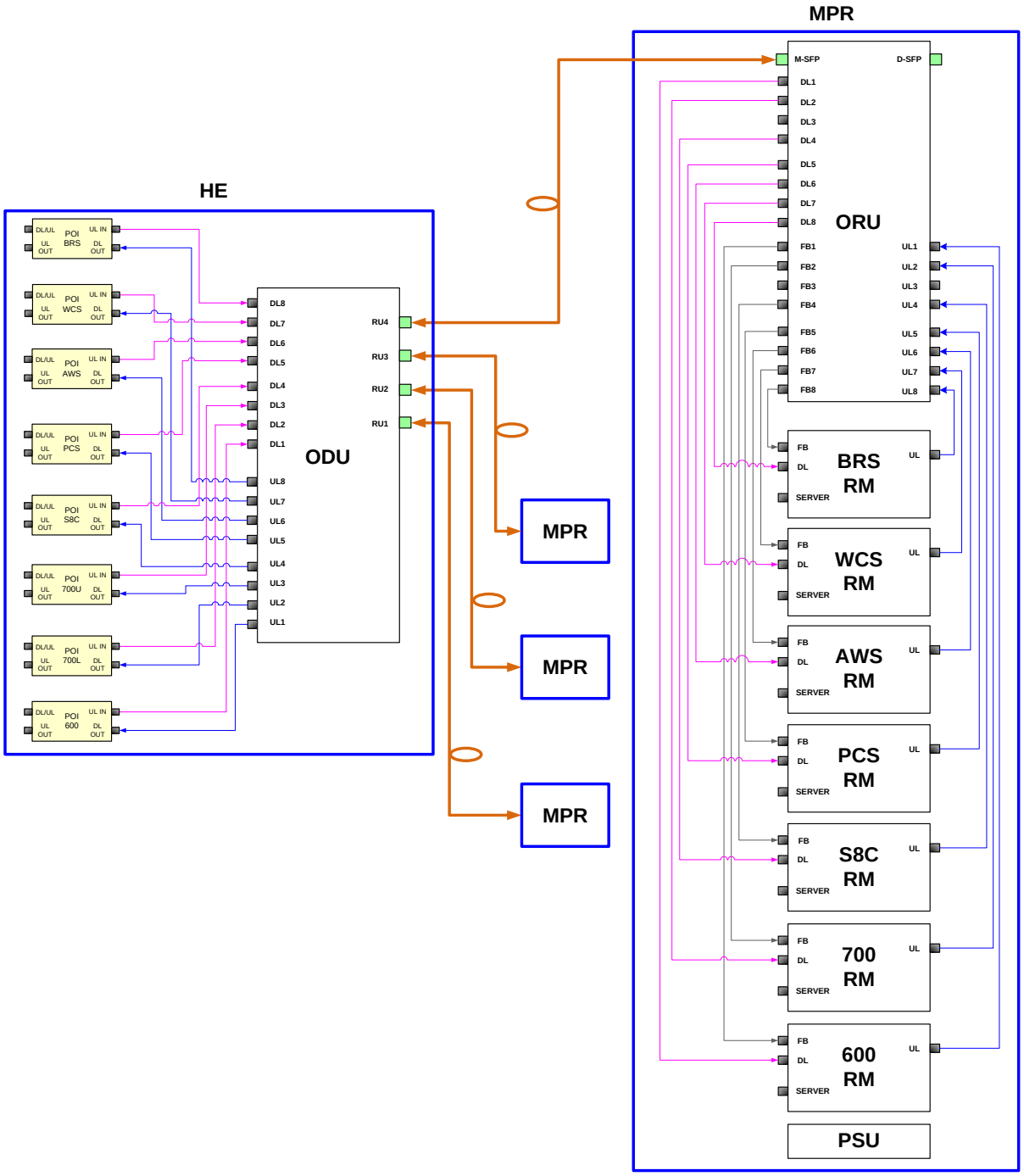


Figure 2-1 ADXD DAS Block Diagram

2.2 ADXD-DAS Scalability

Table 2-1 ADXD-DAS Scalability

Unit		Scalability	Remarks
Supported band		700F, Cellular, SMR800, PCS, AWS, WCS, BRS	
HE	POI	No limitation in 12 slots except NMS	
	NMS	No limitation through NMS daisy chain link (1 per one HE 19” Rack)	
	ODU	No limitation in 12 slots except NMS In case of Aux, No limit in 8 Aux ports	
MPR	RM	8 per one ORU (6 in 19” rack and 2 in R-RACK through AUX port)	One Aux port for R-RACK supporting 2 RMs
	ORU	No limitation through ORU daisy chain link (1 per one MPR 19” Rack)	
	PSU	Capable of supplying power Up to 8 RMs and 1 ORU	

3. ADXD OVERVIEW

3.1 Head End

The head end unit always has to be connected to the Base Station using a direct cabled connection. This system has not been approved for use with a wireless connection via server antenna to the base station.

- Specifications
  - Size: 19.0 x 19.7 x 7inches (482 x 500 x 178 mm)
  - Weight: 71.5lbs @8 POIs, ODU and NMS
  - Power Input: 110/220VAC, -48VDC(optional)

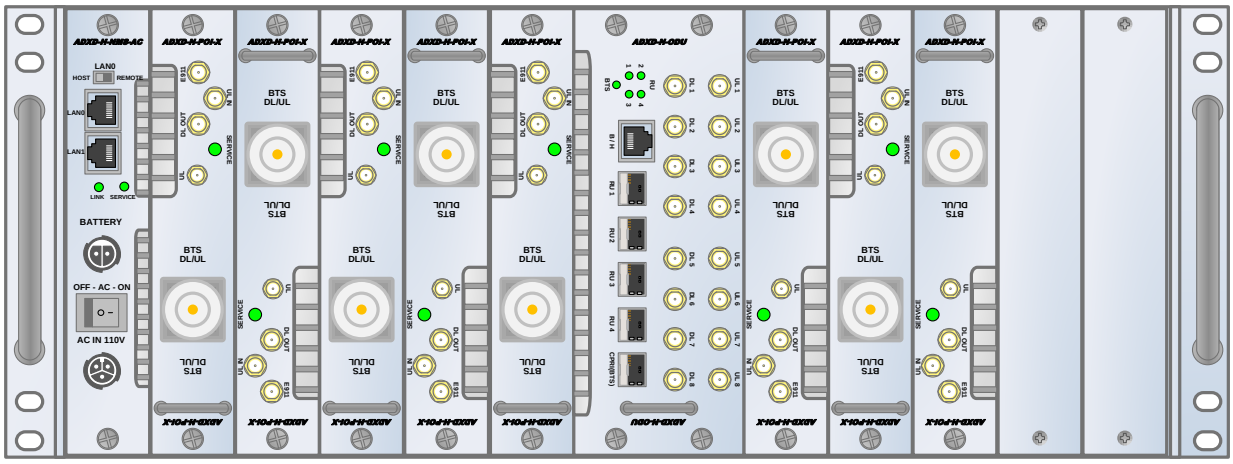


Figure 3-1 Head End Front View

3.1.1 NMS (Network Management System)

- Functions and features
  - Supports SNMP v1, v2, and v3 (get, set & trap) and web-based GUI Interface.
  - Monitors alarms and status
  - Provides control interfaces with all subordinate modules
  - Provides overall DAS structure via the auto tree update function
  - ADXD-H-NMS-AC is for AC type
  - ADXD-H-NMS-DC is for DC type
  - HE's battery backup option is available only in ADXD-H-NMS-AC
- Spec
  - Size: 19.0 x 12.1 x 1.7inches
  - Weight: 3.5lbs

Figure 3-2 ADXD-H-NMS-AC Front View

3.1.1.1 LEDs

NMS has LEDs on the front panel as shown in Figure 3-3.

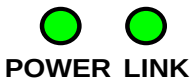


Figure 3-3 NMS LED

Table 3-1 NMS LED Specifications

ADXD DAS-NMS		Specifications
POWER	Solid Green	NMS power is ON
	OFF	NMS power is OFF
LINK	Solid Red	HE Link Fail alarm exists in the system
	Solid Green	No HE Link Fail alarms are present in the system

3.1.1.2 Ethernet Port

The Ethernet port can be used to communicate directly with the ADXD DAS using a RJ-45 crossover cable or can also be used to connect the ADXD DAS to an external modem box.

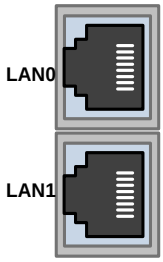


Figure 3-4 Ethernet Port

3.1.1.3 Host/Remote Switch

The Host/Remote Switch allows the user to switch the default Repeater IP, Subnet Mask, and Gateway of the repeater to an alternative setup. These settings can be adjusted by logging into the ADXD DAS in HOST mode and configuring the settings under the Modem Box Setting section under the Install Page of NMS.

Once the settings are set, flipping the switch to the REMOTE position will reboot NMS module with the new alternate settings. *Please note that when the NMS is set to the REMOTE position, DHCP is disabled and the NMS will not automatically assign an IP address to any device that connects directly to the NMS.*

Figure 3-5 Host/Remote Switch

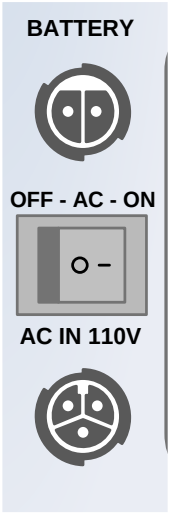
- Host IP: 192.168.63.1 (Fixed IP, unable to modify this IP address)
- Remote IP: 192.168.63.5 (Default IP, but can be modified in Host mode)

3.1.1.4 Power Connection

- For AC type(AC 110V)

  ADXD-H-NMS-AC has two push-lock connectors for battery backup and AC power connection on the front panel.

  You should verify voltage and should turn on the power after power connection necessarily



3.1.1.5 POI (ADXD-H-POI-x)

Figure 3-6 POI front View

- Functions and features
  - Provide RF interface with BTS
  - Each POI has independent gain control and filtering
  - Modular type and hot swappable
  - Supports duplex port and simplex RX port
  - Easily support additional frequency bands by adding a POI
  - Reduces complexity and overall equipment size
- Specifications
  - Size: 1.3 x 17.0 x 6.86 (in)
  - Weight: 6.2 lbs

3.1.2 POIL (ADXD-H-POIL-x)

Figure 3-7 POIL front View

- Functions and features
  - Provide RF interface with BTS
  - Each POIL has independent gain control and filtering
  - Modular type and hot swappable
  - Supports duplex port and simplex RX port
  - Easily support additional frequency bands by adding a POIL
  - Reduces complexity and overall equipment size
- Specifications
  - Size: 1.3 x 17.0 x 6.86 (in)
  - Weight: 5.0 lbs

3.1.2.1 LED

POI has LEDs on the front panel as shown in Figure 3-8.

Figure 3-8 POI LED

Table 3-2 POI LED Specifications

POI		Specifications
Power	Solid Green	POI power is ON and POI/POIL is normal status
	Solid Red	POI power is ON and POI/POIL is hard fail alarm status
	Solid Yellow	POI power is ON and POI/POIL is soft fail alarm status

3.1.2.2 RF Ports

BTS DL/UL, DL OUT, UL IN, E911 Ports (refer to Figure 3-6) are located at the front of the POI

Table 3-3 POI RF port

RF Port	Function
BTS DL/UL	BTS Interface, DL duplexer Input, UL duplexer output
DL OUT	DL output
UL IN	UL input
UL OUT	UL output not passing through duplexer
E911	E911 RF interface

3.1.3 Optic Distribution Unit (ODU, ADXD-H-ODU)

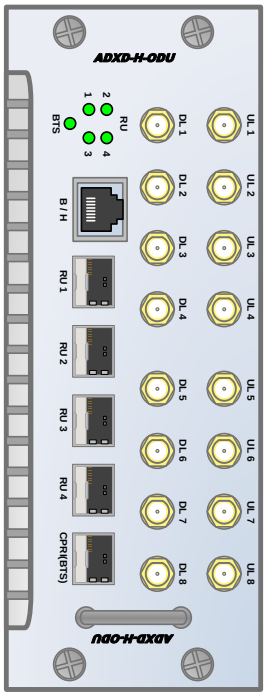


Figure 3-9 ADXD-H-ODU Front view

- Functions & Features
  - Converts signal from RF to digital optic and transports signals up to a maximum of 20Km.
  - One ADXD-H-ODU supports up to 8 bands
  - Has 4 SFP+ ports for RU connections.
- Spec
  - Size: 2.62 x 17.0 x 6.86 (in)
  - Weight: 5.6lbs

3.1.3.1 LED

The ADXD-H-ODU has the following LEDs on the front panel as shown in Figure 3-10.

Figure 3-10 ADXD-H-ODU LED

Table 3-4 ODU LED Specifications

ADXD DAS-Module		Specifications
RU 1 to RU 4	Solid Yellow	RU Link Fail alarm exists
	Solid Green	RU Link is normal

3.1.3.2 RF Ports

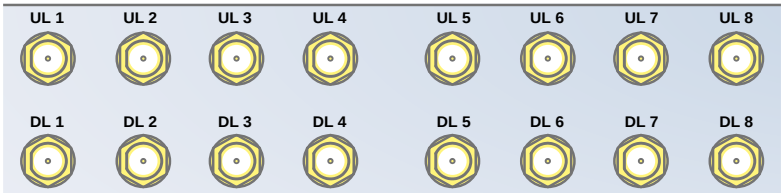


Figure 3-11 ODU RF Ports

3.1.3.2.1 DL / UL

The downlink signal received from specific POI's DL OUT port is transferred to the specific DL port at ODU. The specific UL port connects to specific POI's UL IN port.

3.1.3.3 Optic Ports

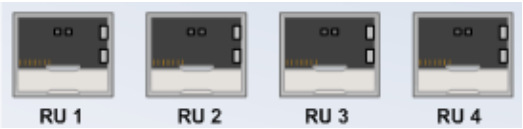


Figure 3-12 ODU Optic Ports

The ADXD-H-ODU has 4 SFP+ ports and can support up to 4 RUs.

3.2 MPR (Medium Power RU)

- A remote unit (single MPR chassis base) is composed of an ORU (Optic Remote Unit), a PSU (Power Supply Unit) and plural band's RM (Remote Module).

- Specifications
  - Size: 19.0 x 15.0 x 7 inches (482 x 380 x 178 mm)
  - Weight: 62.17lbs (28.2 Kg)@4 RM(337F/33S8C/37P/37A), ORU and PSU
  - Power Input: 110VAC(optional) or -48VDC

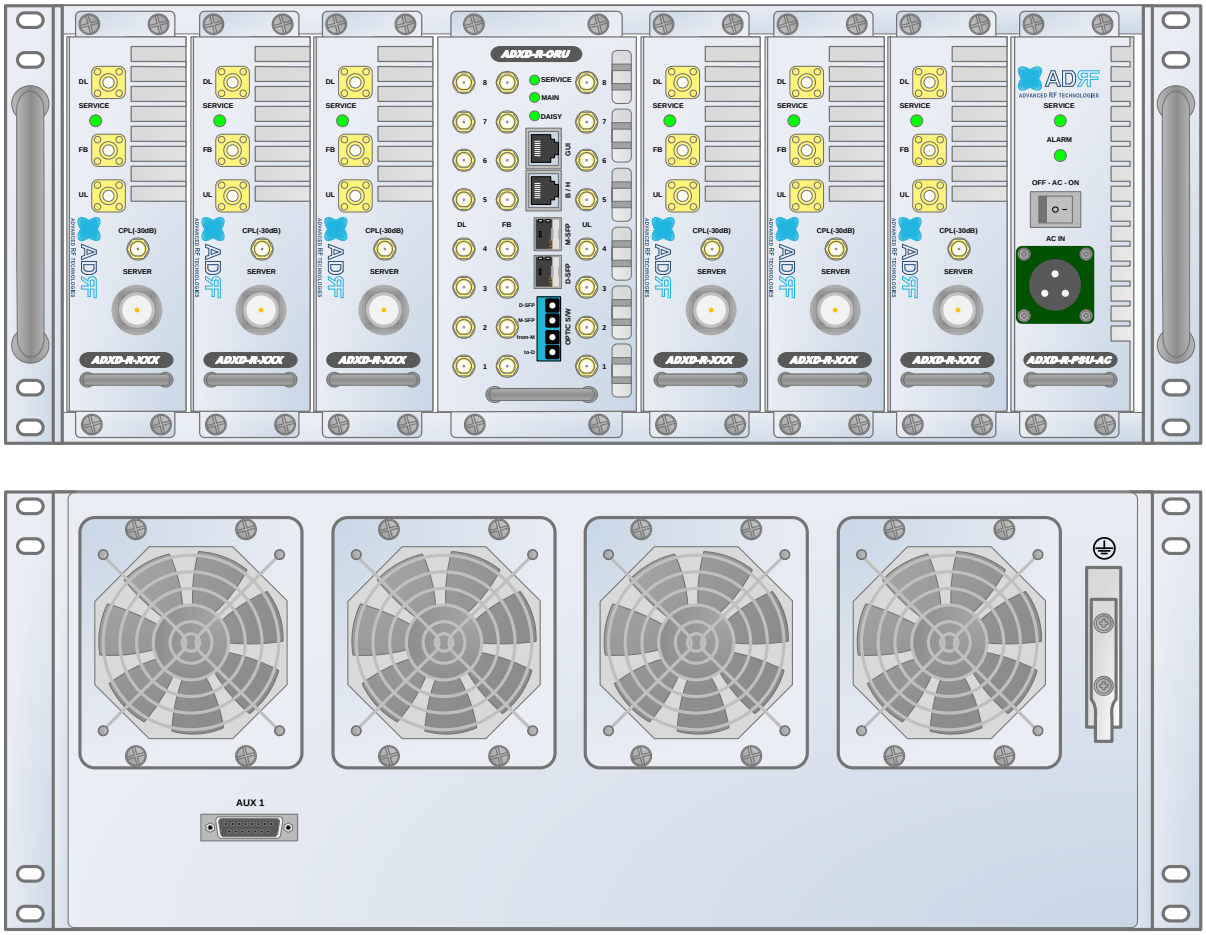


Figure 3-13 ADXD-R Front and Rear View

3.2.1 Remote Module (RM, ADXD-R-xxx)

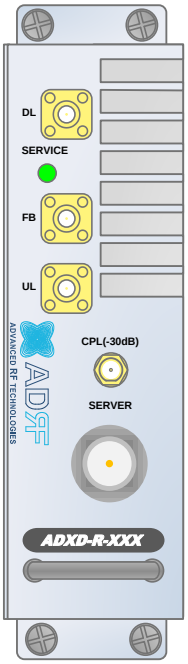


Figure 3-14 ADXD-R-XXX (RM) Front and Rear View

- Spec
  - Size: 1.9 x 17.0 x 6.86 (in)
  - Weight: 8.7 lbs

3.2.1.1 RM ID numbering and RF line connection scheme

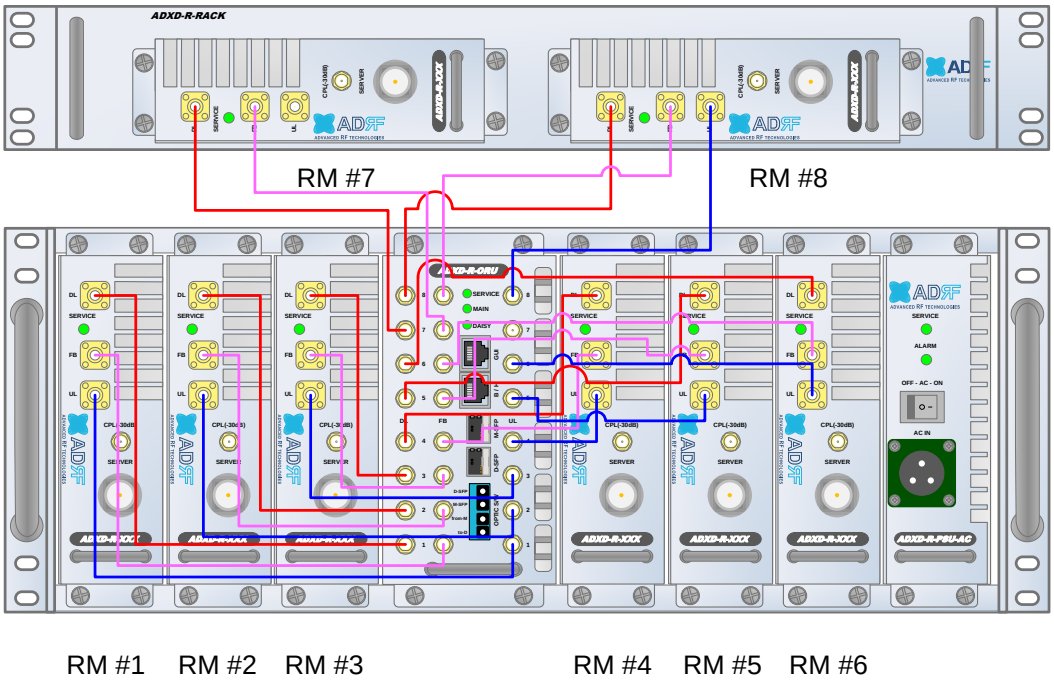


Figure 3-15 RM ID numbering and RF connection between ORU and RM

3.2.1.2 RF port

DL/FB/UL ports of RM connect to ORU's DL port, FB port and UL port in the same ID number equal to for RM ID number.

CPL (-30dB): DL output 30dB coupling

SERVER: DL output, UL input, Server Duplexer port

3.2.1.3 LED

LED color	Status
Green	Normal
Yellow	Soft fail
Red	Hard fail

3.2.2 Optic Remote Unit (ORU, ADXD-R-ORU)

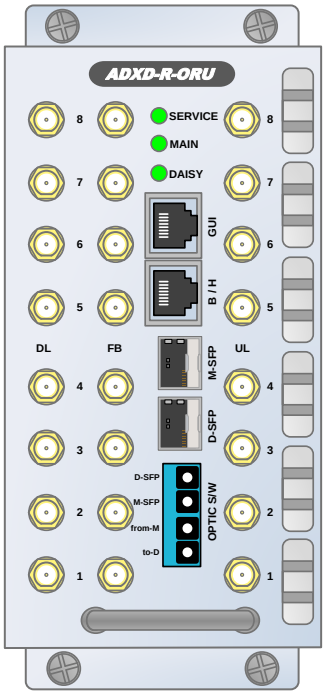


Figure 3-16 ADXD-R-ORU Front and Rear View

- Spec
  - Size: 3.2 x 17.0 x 6.86 (in)
  - Weight: 7.0 lbs

3.2.2.1 Front port

- DL1-DL6: DL port connect to 'DL' of RM (Remote Module) (see 3.2.1.1)
- FB1-FB6: FB port connect to 'FB' of RM (Remote Module) (see 3.2.1.1)
- UL1-UL6: UL port connect to 'UL' of RM (Remote Module) (see 3.2.1.1)
- M-SFP: Optic port connects to HE- ODU
- D-SFP: Optic port connects to another RU for daisy chain

3.2.2.2 LED

LED	LED color	Status
Service	Green	Normal
	Yellow	Soft fail
	Red	Hard fail
Main	Green	Link normal
	Yellow	Lost signal
	Off	SFP empty
Daisy	Green	Link normal
	Yellow	Lost signal
	Off	SFP empty

3.2.3 PSU (ADXD-R-PSU-AC)

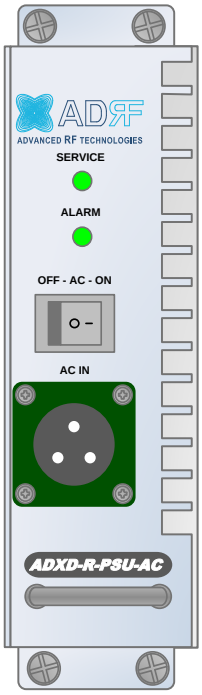


Figure 3-17 ADXD-R-PSU-AC Front and Rear View

- Mechanical Spec
  - Size: 1.9 x 17.0 x 6.86 (in)
  - Weight: 4.5lbs

3.2.3.1 Port

- AC IN port connects to AC 110V/220V

3.2.3.2 LED

LED	LED color	Status
ALARM	Green	Normal
	Yellow	Link fail
SERVICE	Green	Normal
	Yellow	Soft fail
	Red	Hard fail

3.2.3.3 AC Switch

The ADXD-RU is operated at 110V/220V AC.

(WARNING: The AC switch must be set to OFF before cable connection to avoid equipment damage and personal injury.)

(WARNING: To avoid damage, be sure 110V AC for operation of ADXD-RU.)

(CAUTION: DOUBLE POLE/NEUTRAL FUSING.)

The procedure for powering RU

- AC S/W OFF
- AC cable connection
- Optic connection
- RF cable connection
- AC S/W ON

Figure 3-18 ADXD-R-PSU Front and Rear View

4. CABLE CONNECTION

4.1 Head End Connection Diagrams

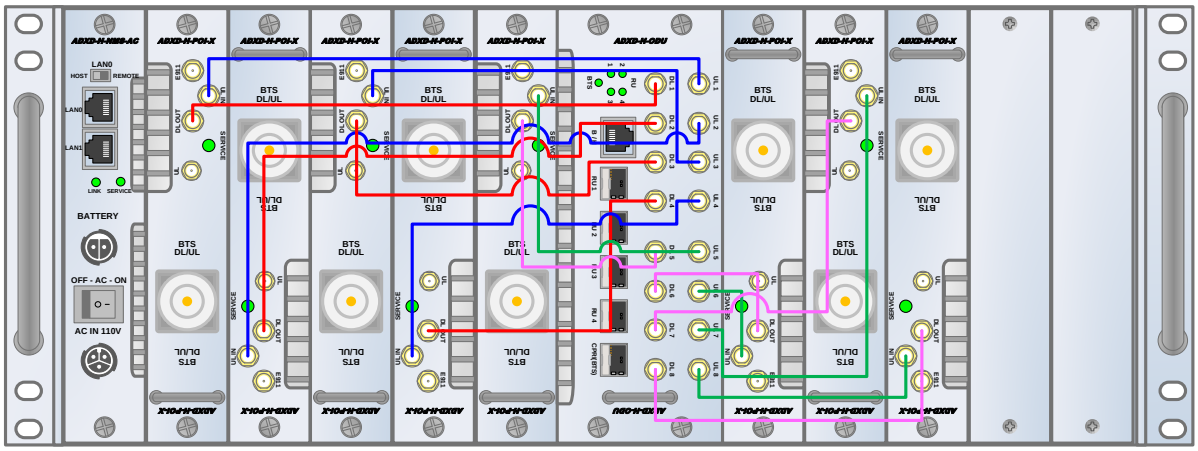


Figure 4-1 HE Cable connection between POIs and ODU

4.2 Remote Unit Connection Diagrams

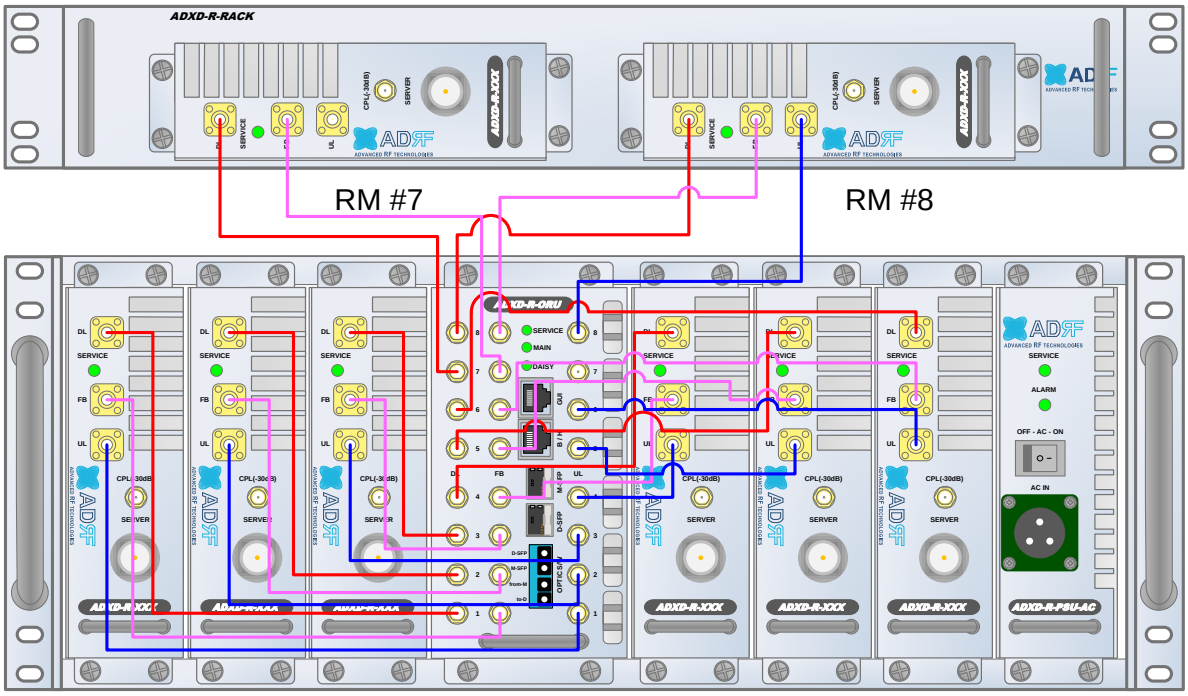


Figure 4-2 ADXD-RU 5ands connection

5. MOUNTING METHOD

5.1 Head End

5.1.1 Rack Mount

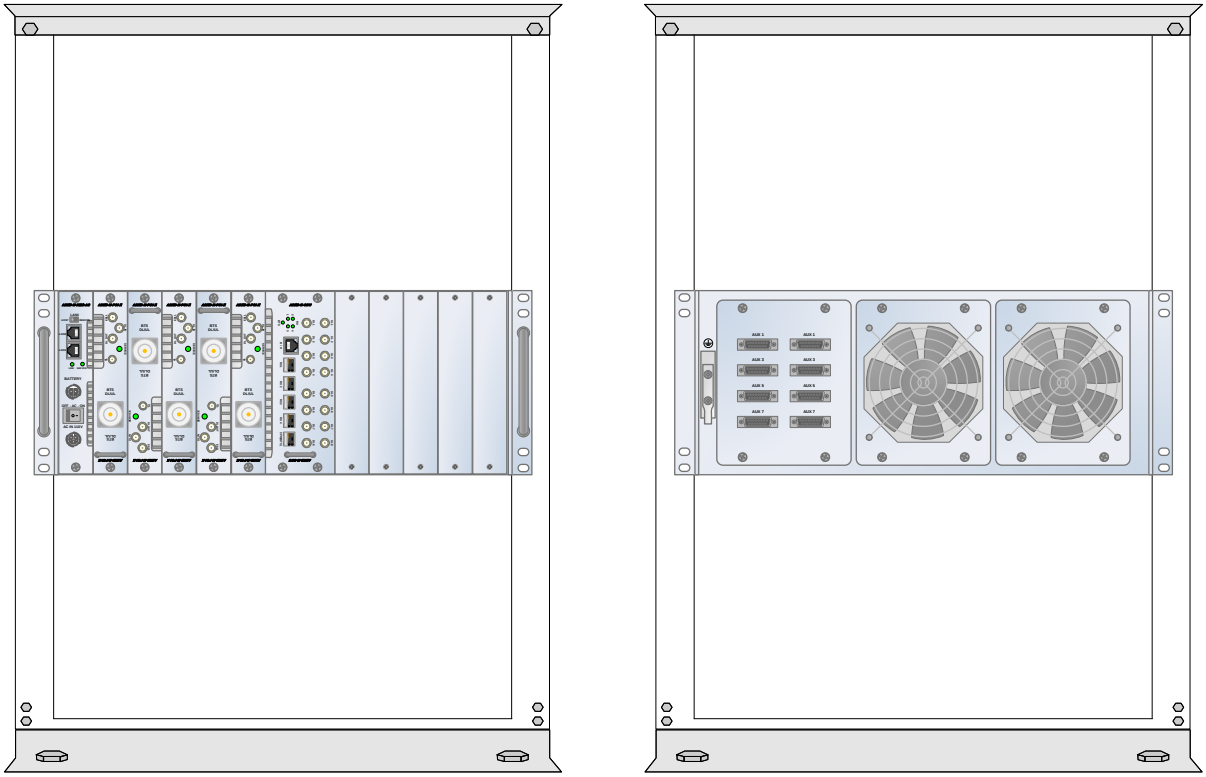


Figure 5-1 HE Rack Mount (Front & Rear view)

5.2 RU

5.2.1 Rack Mount

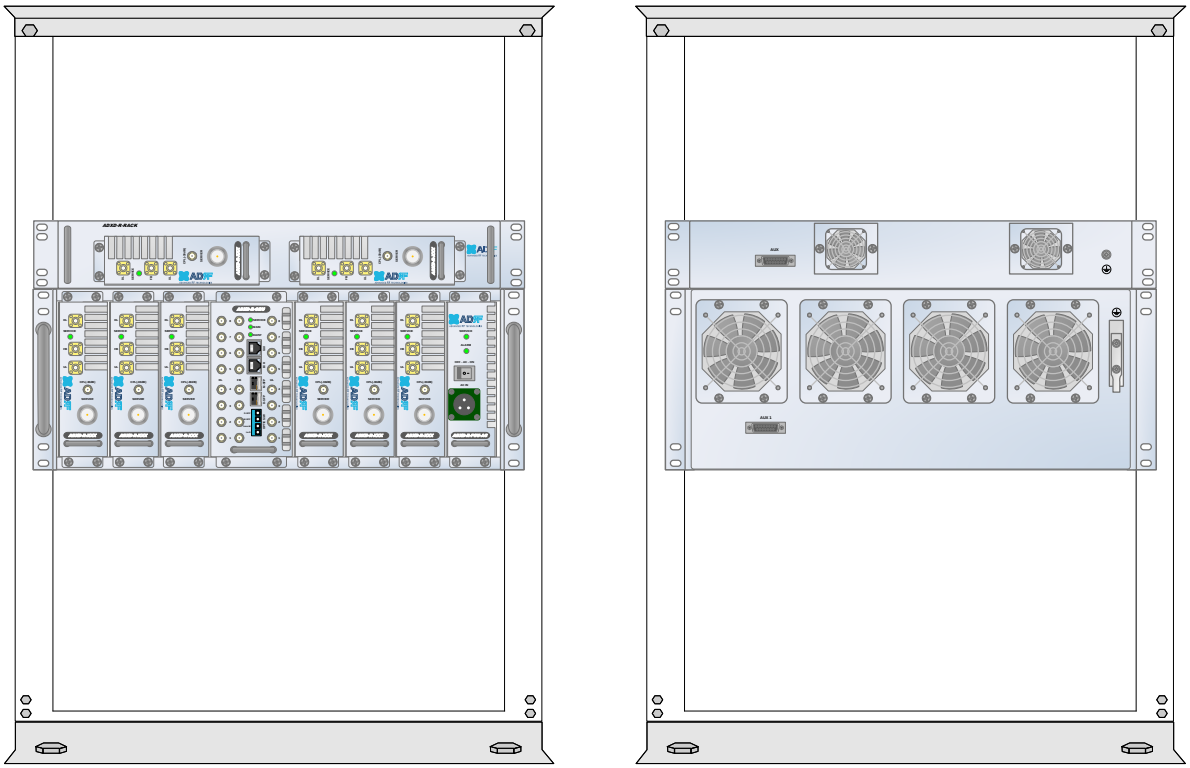


Figure 5-2 RU Rack Mount Front and Rear View

6. INSTALLATION

6.1 Pre-Installation Inspection

Please follow these procedures before installing ADXD RU equipment:

- Verify the number of packages received against the packing list.
- Check all packages for external damage; report any external damage to the shipping carrier. If there is damage, a shipping agent should be present before you unpack and inspect the contents because damage caused during transit is the responsibility of the shipping agent.
- Open and check each package against the packing list. If any items are missing, contact ADRF customer service.
- If damage is discovered at the time of installation, contact the shipping agent.
- Verify the AC voltage with DVM (Volt meter) is 110VAC or 220VAC. Incorrect AC voltage can damage the ADXD equipment.
- This power of this system shall be supplied through wiring installed in a normal building. If powered directly from the mains distribution system, it shall be used additional protection, such as overvoltage protection device.
- Over voltage category(OVC) & Pollution degree(PD)

Over voltage category (OVC)	OVC II
Pollution degree (PD)	PD2

6.2 ADXD DAS Installation Procedure

6.2.1 HE Installation Procedure

CAUTION: ADXD DAS HE should be installed inside building only.

6.2.1.1 Installing a ADXD DAS HE in a rack

The ADXD HE chassis mounts in a standard 19” (483mm) equipment rack. Allow clearance of 3” (76mm) at the front and rear, and 2” (51mm) on both sides for air circulation. No top or bottom clearance is required.

- Consideration:
  - Eight mounting holes are located on 4 corners of ADXD HE to attach it to the 19” rack. The ADXD HE must be securely attached to a rack that can support the weight of the ADX.
- Mount procedure
  - The following steps should be followed while mounting the ADXD HE
  - > Verify that the HE and Mounting holes are in good condition
  - > Set the ADXD DAS HE against the 19”rack and secure the unit with screws
  - > Verify that ADXD HE is securely attached
  - > Connect the GND cable
  - > Connect the RF cable
  - > Connect the Power
  - > Connect the Optic cable

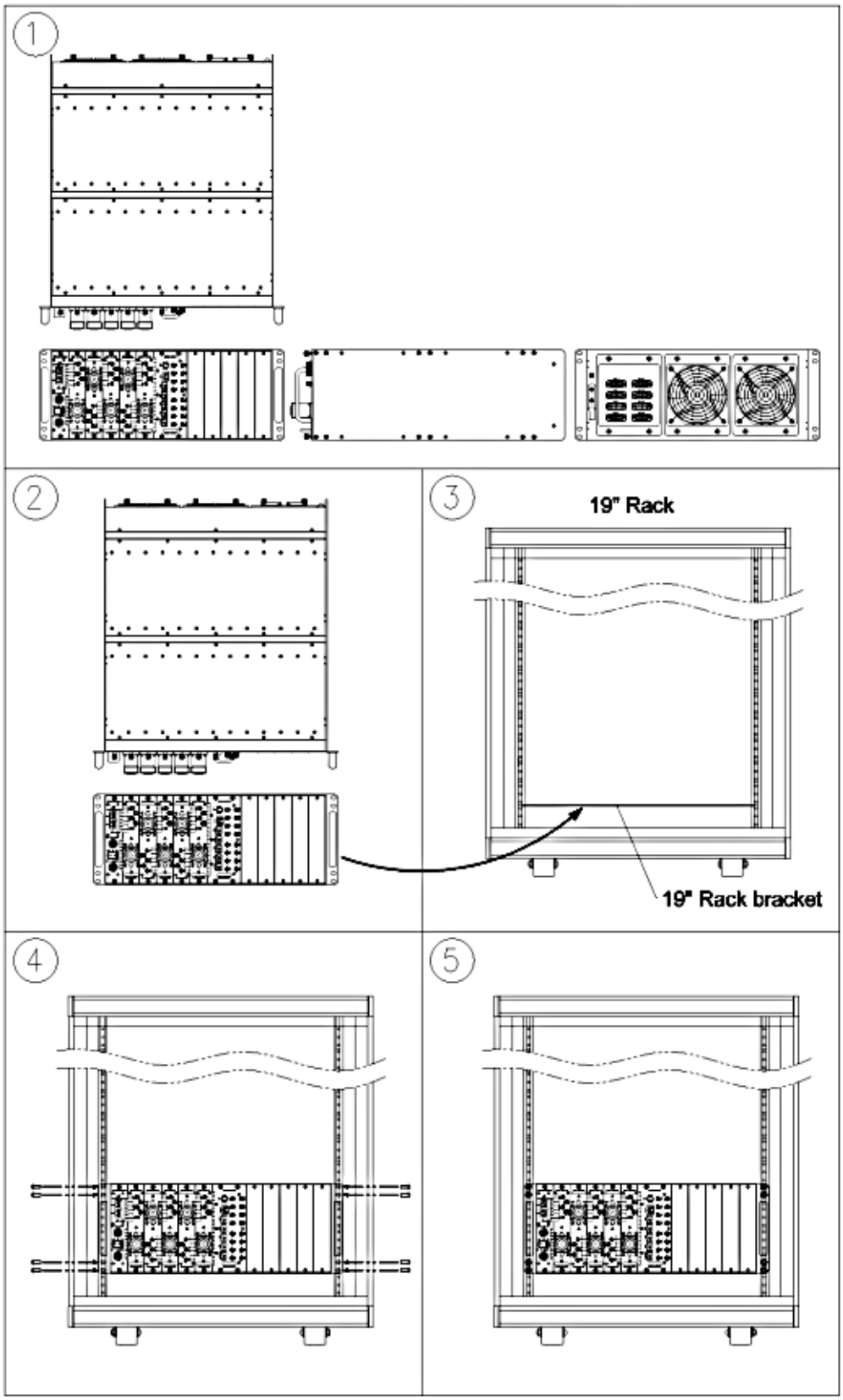


Figure 6-1 HE Installation Procedure

6.2.2 RU Installation Procedure

The ADXD RU chassis mounts in a standard 19” (483mm) equipment rack. Allow clearance of 3” (76mm) at the front and rear, and 2” (51mm) on both sides for air circulation. No top or bottom clearance is required.

- Consideration:
  - Eight mounting holes are located on 4 corners of ADXD RU to attach it to the 19” rack. The ADXD RU must be securely attached to a rack that can support the weight of the ADX.
- Procedure
  - The following steps should be followed while mounting the ADXD RU
  - > Verify that the RU and Mounting holes are in good condition
  - > Set the ADXD DAS RU against the 19”rack and secure the unit with screws
  - > Verify that ADXD RU is securely attached
  - > Connect the GND cable
  - > Connect the RF coaxial cable
  - > Connect the Power
  - > Connect the Optic cable

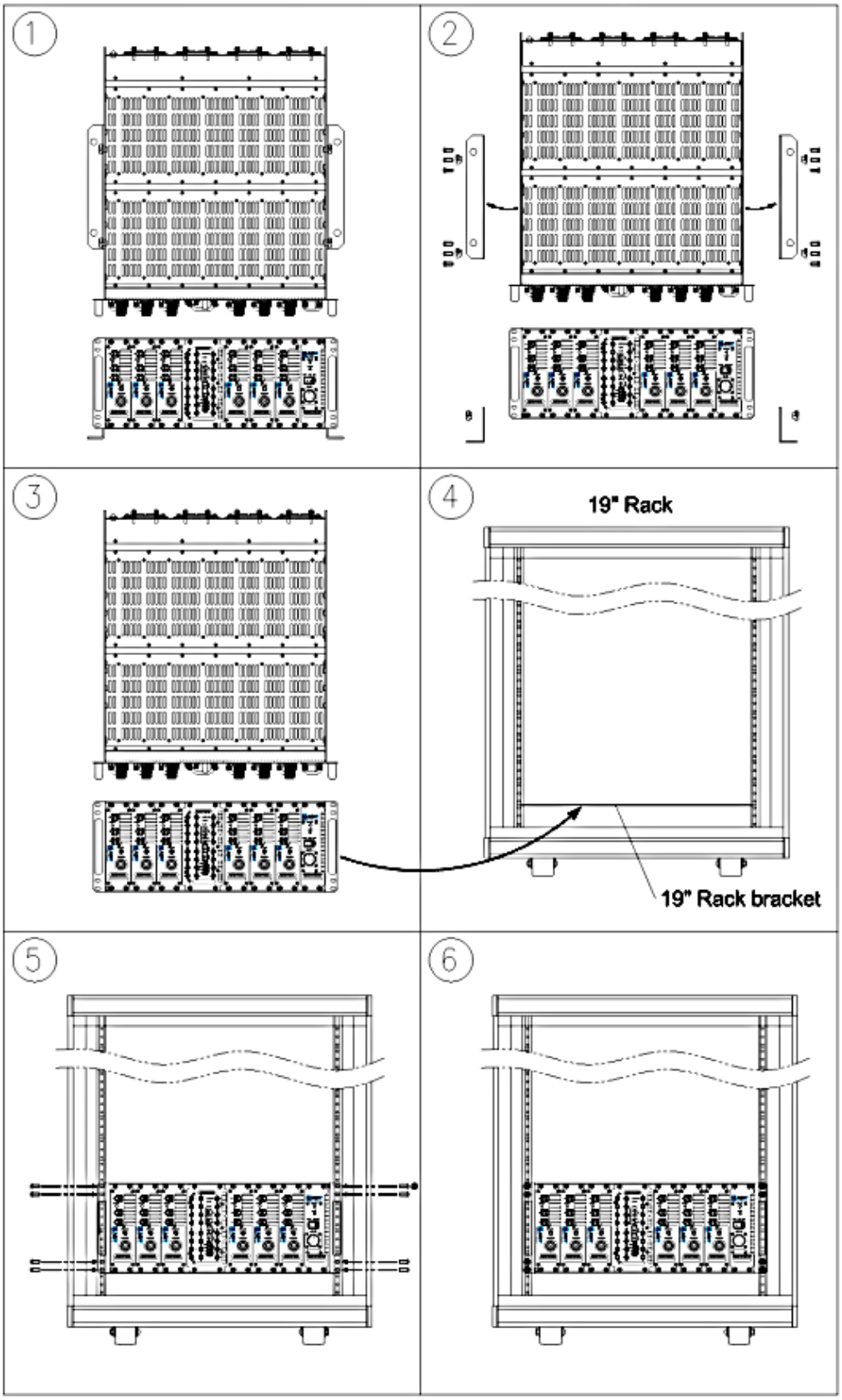


Figure 6-2 RU Installation Procedure

6.2.3 RF coaxial cable and antenna connection

> The coaxial cables are connected to the antenna ports of RUs. Before connection, check the VSWR value of coaxial cable whether it is within specification using Sitemaster..
> At this time, check if the Return loss or VSWR is proper
> The part of antenna connection fasten to port not to be loosed and not to be injected the dusty and insects
> The antenna connected to RU is only serviced in in-building

6.3 Grounding

A ground cable is included in the box. The grounding terminals are located at the rear of the ADXD HE and RU. The grounding cable should be properly connected before powering on the equipment.

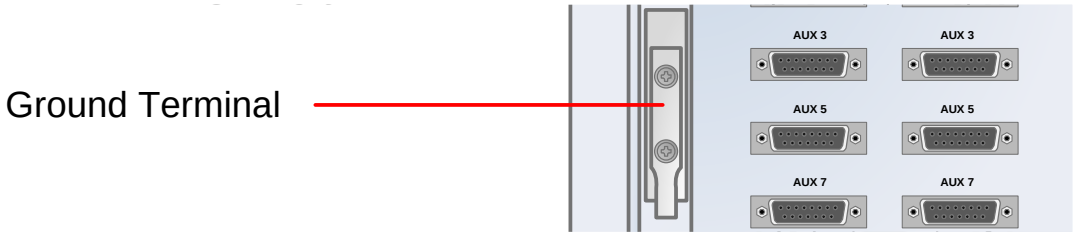


Figure 6-3 HE Ground Cable Connection, Protective Earthing Conductor (HE chassis rear side)

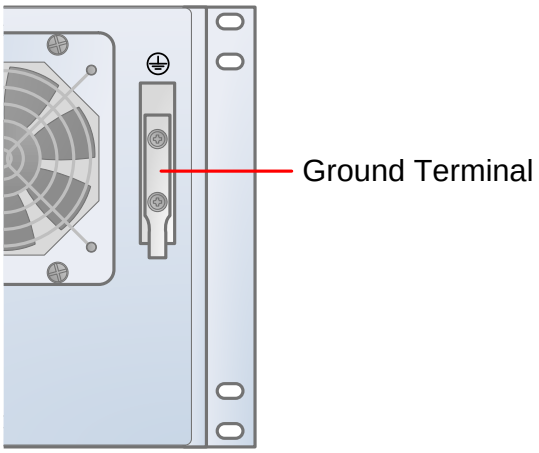


Figure 6-4 RU Ground Cable Connection, Protective Earthing Conductor (RU chassis rear side)

Round terminals located on the side of a 1.25mm^2(16AWG)or more wires Using permanently connected to earth(Protective earthing conductor).

6.4 Optic Port Cleaning

- We recommend cleaning the optic connectors using the proper optical cleaning tools in a dry environment as needed.
- When optic connector are not in use, the port should be covered with a protective dust cap.

7. WEB-GUI

7.1 Web-GUI Setup

The Web-GUI allows the user to communicate with the DAS system either locally or remotely. To connect to the DAS system locally, you will need a laptop with an Ethernet port and a RJ-45 crossover cable. To connect to the DAS system remotely, you will need to have an active internet connection and the ADXD system must have and external modem box connected to the ADX.

7.1.1 DAS system/PC Connection Using Web-GUI

- Verify that your Local Area Connection is set to Obtain an IP address automatically under the Internet Protocol (TCP/IP) properties
  - If you are connecting to the unit remotely (use of a modem), then skip this and next step.
- Connect the RJ-45 crossover cable between the laptop's Ethernet port and the repeater's Ethernet port
- Launch an Internet Browser
- Type the following IP address into the address bar of Microsoft Internet Explorer: http://192.168.63.1
  - If you are connecting to the unit remotely, then type the IP address of the modem to connect to the unit
- The following login screen will appear:

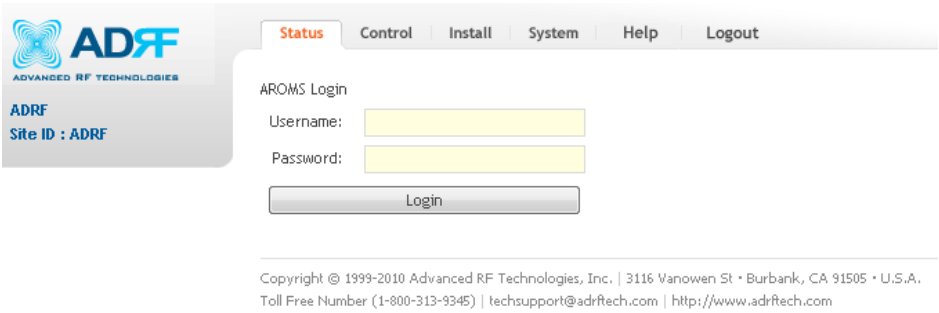


Figure 7-1 Login screen

If you are not the Administrator, please type in your assigned username & password which you should have received from the Administrator.

Table 7-1 Account Information for Login

Account type	Show items	Control Items	Default ID	Default Password
Administrator	all Items	all items	admin	admin
User	restricted items	restricted items	adrf	adrf
Guest	restricted items	read-only	guest	guest

7.2 Administrator/User Mode

7.2.1 Common

7.2.1.1 Navigation Tree

The navigation tree located on the left hand side of the Web-GUI allows the user to switch between the various modules that are connected to the system.

Table 7-2 Navigation tree

Parameters	Description
Expand All	Expands the entire navigation tree
Collapse All	Collapses the entire navigation tree
+	The module has the expandable subordinate modules
–	The branch is currently expanded
	The module has soft fail alarm
	The module has hard fail alarm
	The module has no alarms (normal)
NMS	The selected module will have orange colored text

7.2.1.2 Power Status

Display the power source that is currently being used.

Table 7-3 Power Supply Status

Input Power Status	Display Image
AC	Power
Battery	Battery

7.2.1.3 Commissioning Status

Display whether or not the module has successfully been commissioned.

Table 7-4 Commissioning ICON

Status	Display Image
Commissioned	Commissioned
Not-Commissioned	Not Commissioned

7.2.1.4 Information

ADRF Remote Operation & Management System

Information

Serial Number	SN_NMS
Latitude	N777.777777
Longitude	E777.777777
Firmware	13000F01002X
Web GUI	X0.0.35

Location

ADRF
3116 Vanowen St.
burbank CA 91505

Description

nms_desc.

Technical Support

Phone: 1-800-313-9345
E-mail: techsupport@adrftech.com

Installer Contact Info

Company: ADRF
Installer: Installer
Phone: 800-313-9345
E-mail: techsupport@adrftech.com

Figure 7-2 ADXD DAS General Information

- Information: Displays the serial number, latitude/longitude, firmware version of selected module, and Web GUI version of the NMS.
- Location: Displays the address where the ADXD DAS is installed.
- Description: Displays the description of selected module. The description of each module can be edited from the Install tab. It is recommended to use the location of the module as the description. This description information can be seen when hovering over the device tree in order to easily identify each component.
- Technical Support: Displays ADRF's Technical Support contact information.
- Installer Contact Info: Displays the contact information of the installer.

7.2.2 Status Tab

7.2.2.1 Status – NMS

The NMS Status page provides an overall view of how the system is performing. From the NMS Status page, the user can see what modules are connected to ADXD DAS. In addition, the user can see if any alarms are present in the system and also the commissioning status of each module.

7.2.2.1.1 System Summary

The Summary section provides the user with the number of components physically connected, the number of soft/hard/link fails present in the system, and also the number of commissioned and non-commissioned componnets.

Table 7-5 System Summary Description

Parameters	Description
Connected	Display the number of modules physically connected to ADXD DAS
Soft Fail	Display the number of soft fail present on each module
Hard Fail	Display the number of hard fail present on each module
Link Fail	Display the number of link fail present on each module
Not Commissioned	Display the number of non-commissioned or commission failed module
Commissioned	Display the number of successfully commissioned module

7.2.2.1.2

7.2.2.1.3 HE Alarm Status

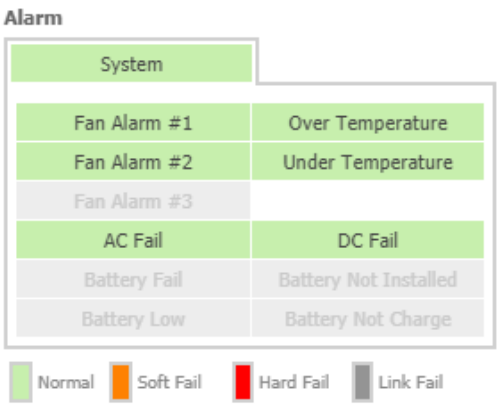
Display the alarm status of each HE component.

7.2.2.1.4 HE Commissioning Status

Display commissioning status of each HE component.

7.2.2.1.5 Alarm

Displays alarm status of the NMS. If an alarm is present in the system, the color of the system alarm tab will change according to the type of failure.



7.2.2.2 Status – POI

7.2.2.2.1 Frequency

Frequency

poiTESTBANDNAME	Downlink	Uplink
PCS	1930.0 ~ 1995.0 (1962.5)	1850.0 ~ 1915.0 (1882.5)

Display the band frequency status of the connected POI

7.2.2.2.2 Power & Attenuation

Power & Atten (POI)

---	Downlink	Uplink
Input	--.-	--.-
Gain[dB]	-2.0	14.0
Atten[dB]	11.0	11.0
Output[dBm]	--.-	--.-

Displays the detected Input, Gain, Attenuation and Output values of the connected POI

7.2.2.3 Status – ODU

7.2.2.3.1 Alarm

Displays alarm status of the ODU. If an alarm is present in the system, the color of the system alarm tab will change according to the type of failure.

7.2.2.3.2 Frequency Plan

Frequency Plan

Port Setting	Carrier	DL Frequency	UL Frequency
700L SISO None	#1	1953.12 ~ 1971.88 (1962.50)	1923.12 ~ 1941.88 (1932.50)
	#2	1956.88 ~ 1968.12 (1962.50)	1926.88 ~ 1938.12 (1932.50)
	#3	1958.12 ~ 1966.88 (1962.50)	1928.12 ~ 1936.88 (1932.50)
	#4	1952.50 ~ 1972.50 (1962.50)	1922.50 ~ 1942.50 (1932.50)
700L SISO None	#5	1954.12 ~ 1972.88 (1963.50)	1924.12 ~ 1942.88 (1933.50)
	#6	1959.12 ~ 1967.88 (1963.50)	1929.12 ~ 1937.88 (1933.50)
	#7	1956.62 ~ 1970.38 (1963.50)	1926.62 ~ 1940.38 (1933.50)
	#8	1961.00 ~ 1966.00 (1963.50)	1931.00 ~ 1936.00 (1933.50)

Displays information about ports, carriers, and frequencies set by ODU by band

7.2.2.4 Status – ORU

7.2.2.4.1 Alarm

Displays alarm status of the ORU. If an alarm is present in the system, the color of the system alarm tab will change according to the type of failure.

7.2.2.4.2 Frequency Plan

Frequency Plan

Port Setting	Carrier	DL Frequency	UL Frequency
700L SISO None	#1	1953.125 ~ 1971.875 (1962.500)	1923.125 ~ 1941.875 (1932.500)
	#2	1956.875 ~ 1968.125 (1962.500)	1926.875 ~ 1938.125 (1932.500)
	#3	1958.125 ~ 1966.875 (1962.500)	1928.125 ~ 1936.875 (1932.500)
	#4	1952.500 ~ 1972.500 (1962.500)	1922.500 ~ 1942.500 (1932.500)
700L SISO None	#5	1954.125 ~ 1972.875 (1963.500)	1924.125 ~ 1942.875 (1933.500)
	#6	1959.125 ~ 1967.875 (1963.500)	1929.125 ~ 1937.875 (1933.500)
	#7	1956.625 ~ 1970.375 (1963.500)	1926.625 ~ 1940.375 (1933.500)
	#8	1961.000 ~ 1966.000 (1963.500)	1931.000 ~ 1936.000 (1933.500)

Displays information about ports, carriers, and frequencies set by ORU by band

7.2.2.5 Status – RM

7.2.2.5.1 Frequency

Frequency

-	Downlink			Uplink		
	Start	Center	End	Start	Center	End
Enable	-	-	-	-	-	-
Enable	-	-	-	-	-	-
Enable	-	-	-	-	-	-
Enable	-	-	-	-	-	-

Display the band frequency status of the connected RM

7.2.2.5.2 Power & Attenuation

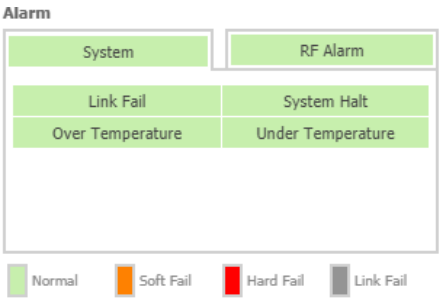
Power & Atten (RM)

---	Downlink	Uplink
Input	--.-	--.-
Gain[dB]	--.-	--.-
Atten[dB]	8.0	0.0
Output[dBm]	--.-	--.-

Displays the detected Input, Gain, Attenuation and Output values of the connected RM

7.2.2.5.3 Alarm

Alarm



Displays the alarm status of the RM. If an alarm is present in the system, the color of the system alarm tab will change according to the type of failure.

7.2.3 Control/Install Tab

7.2.3.1 Control/Install – NMS

7.2.3.1.1 SNMP

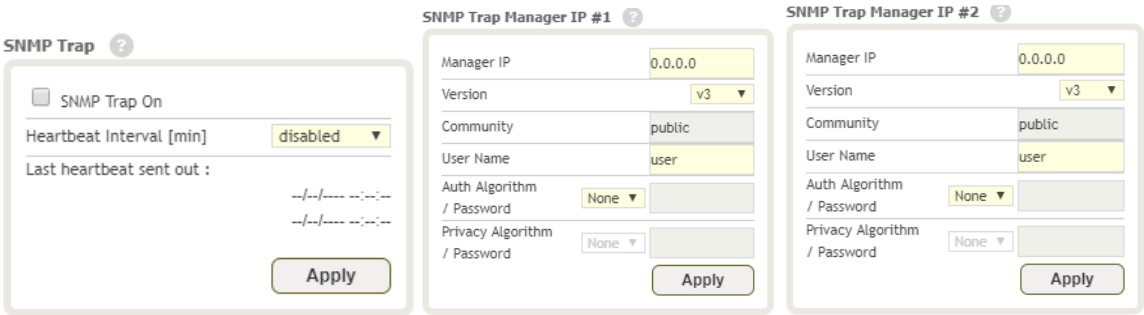


Figure 7-3 SNMP

In the SNMP section, you can configure SNMP Trap operation, Trap Interval, and Trap Manager. The Manager IP field is where the user enters the IP address of the NOC system used to monitor SNMP traps. You can also configure other settings for the Trap.

7.2.3.1.2 Location

This section allows the user to input the latitude and the longitude of the repeater.

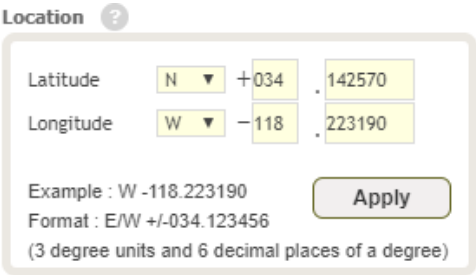


Figure 7-4 Location Setting (Install – NMS)

- Select N or S from the dropdown menu for Latitude
- Select E or W from the dropdown menu for Longitude
- Input the first 3 numbers of the latitude/longitude in the text area after the "+" and before the "."
- Input the last 6 numbers of the latitude/longitude in the text area after the "."

7.2.3.1.3 Remote Ethernet Setting

In this section, you can specify alternate IP, subnet mask, and gateway settings. This setting is enabled after the host / remote switch is set to the remote location and the static setting (Use the following IP Address) is set. the LAN1 setting is also used to configure the daisy chain system.

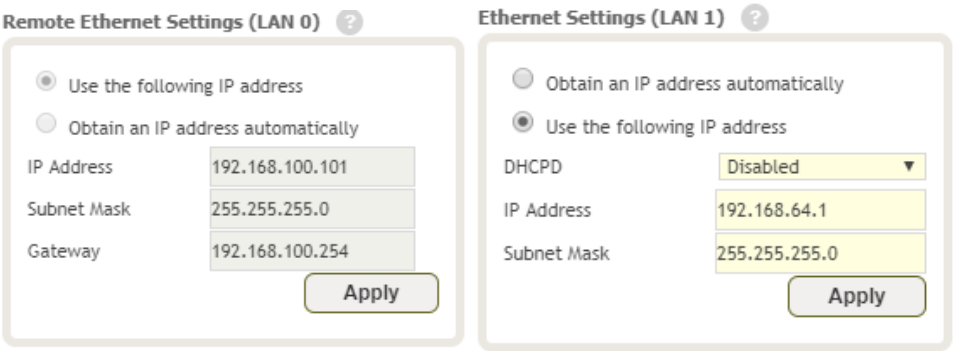


Figure 7-5 Remote Ethernet Settings

7.2.3.1.4 Information

The Information section allows you to specify the Site ID and Description. the Site-ID is the code that is used to identify a particular module.

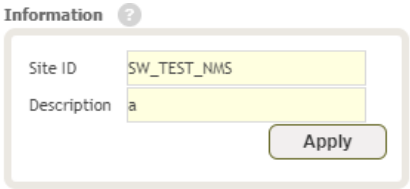


Figure 7-6 Information

7.2.3.1.5 Location Info / Installer Info

This section allows the user to specify the address of the repeater and also the information of the installer.

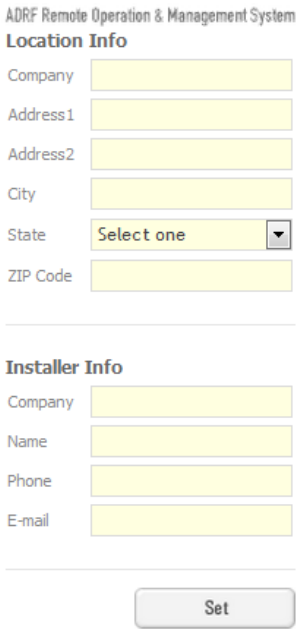


Figure 7-7 Location Info / Installer Info

7.2.3.1.6 Date & Time

This section allows the user to specify the current date and time.

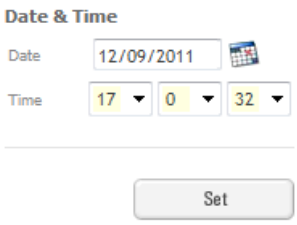


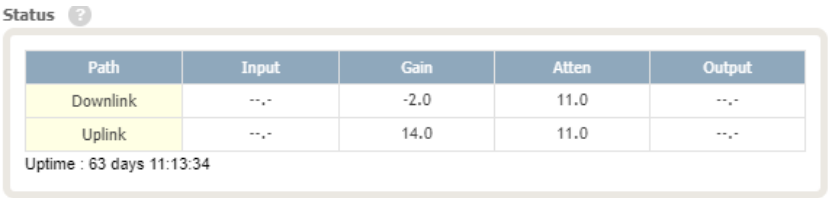
Figure 7-8 Date & Time Setting

7.2.3.1.7 Alarm Test

This is the system alarm test item. It can be set to Off to end the test or set to Soft / Hard / Normal.

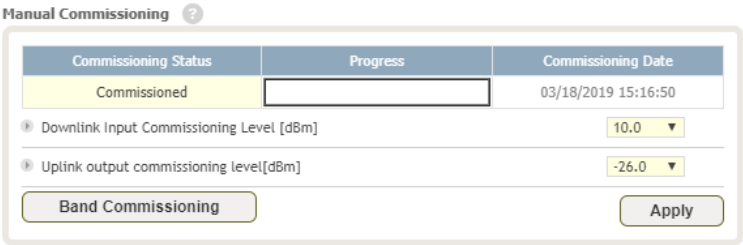
7.2.3.2 Control/Install – POI

7.2.3.2.1 Status



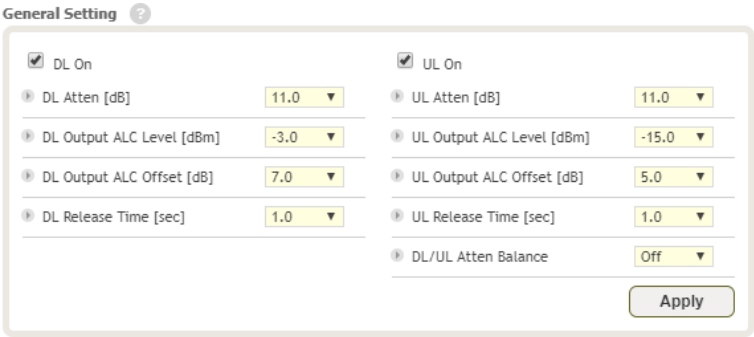
Displays the detected Input, Gain, Attenuation and Output values

7.2.3.2.2 Manual Commissioning

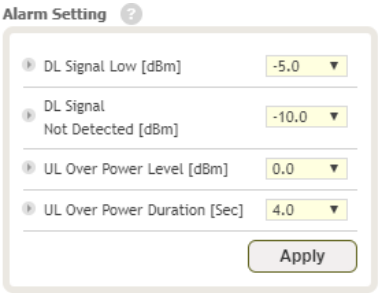


Set up the Commission manually.

7.2.3.2.3 General Setting



7.2.3.2.4 Alarm Setting



Set alarm options.

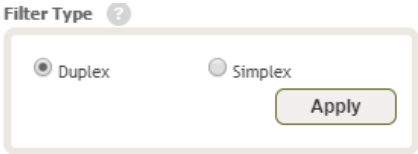
7.2.3.2.5 Information

Set description and Band Name of product.

7.2.3.2.6 SISO/MIMO ID

Set SISO, MIMO options

7.2.3.2.7 Filter Type



Set Filter Type options

7.2.3.3 Control/Install – ODU

7.2.3.3.1 Port Setting

Port Setting

Occupied Resource	80	Remaning Resource	40

number	Band	Sector	MIMO	Description	Occupied Carrier
Port #1	700L	None	SISO	T_PORT1	4
Port #2	700L	None	SISO	T_PORT2	4
Port #3	700L	None	SISO	T_PORT3	4
Port #4	700L	None	SISO	T_PORT4	4
Port #5	700U	None	SISO	T_PORT5	0
Port #6	700U	None	SISO	T_PORT6	4
Port #7	700U	None	SISO	T_PORT7	4
Port #8	700U	None	SISO	T_PORT8	4

Apply

Set Band, Sector, Mimo, Description for each port.

7.2.3.3.2 Frequency Plan Setting

Frequency Plan Setting

Occupied Carrier	28	Remaining Carrier	4

Port #1 | Port #2 | Port #3 | Port #4 | Port #5 | Port #6 | Port #7 | Port #8

Band	700L	Frequency Range	728.00 ~ 746.00
Sector	None	MIMO	SISO

	Center Frequency			Band Width		
Carrier #1	1962.5			CDMA-18.75 MHz		
	Downlink			Uplink		
	Start	Center	End	Start	Center	End
	1953.1	1962.5	1971.9	1923.1	1932.5	1941.9
Carrier #2	1962.5			CDMA-11.25 MHz		
	Downlink			Uplink		
	Start	Center	End	Start	Center	End
	1956.9	1962.5	1968.1	1926.9	1932.5	1938.1
Carrier #3	1962.5			CDMA-8.75 MHz		
	Downlink			Uplink		
	Start	Center	End	Start	Center	End
	1958.1	1962.5	1966.9	1928.1	1932.5	1936.9
Carrier #4	1962.5			CDMA-20.00 MHz		
	Downlink			Uplink		
	Start	Center	End	Start	Center	End
	1952.5	1962.5	1972.5	1922.5	1932.5	1942.5

Apply

Set frequency and bandwidth for each carrier for each port you set.

7.2.3.3.3 Information

Information

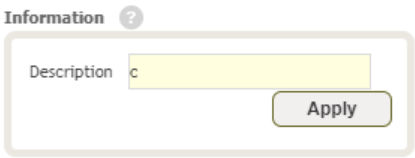
Description b

Apply

Set description of product.

7.2.3.4 Control/Install – ORU

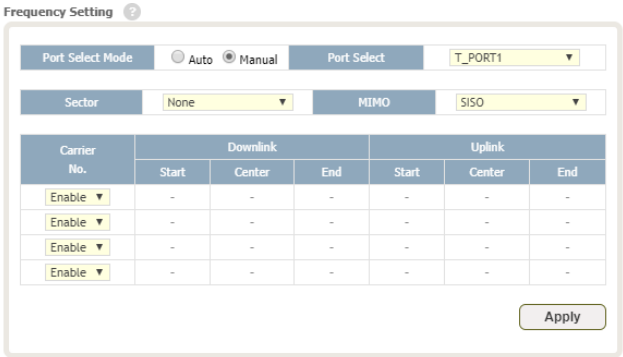
7.2.3.4.1 Information



Set description of product.

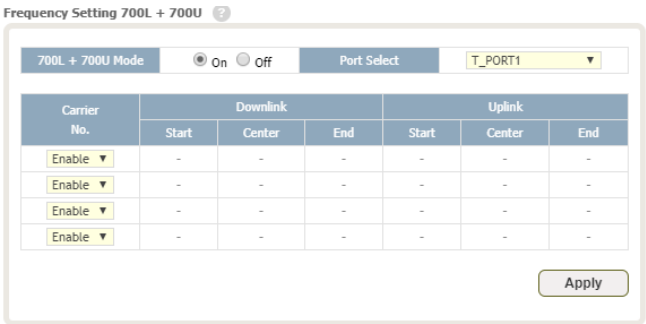
7.2.3.5 Control/Install – RM

7.2.3.5.1 Frequency Setting



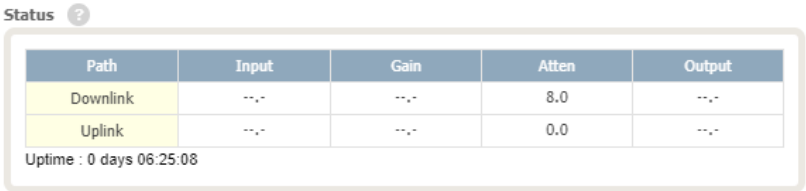
Set Port, Sector, MIMO and Carrier.

7.2.3.5.2 Frequency Setting 700L+700U



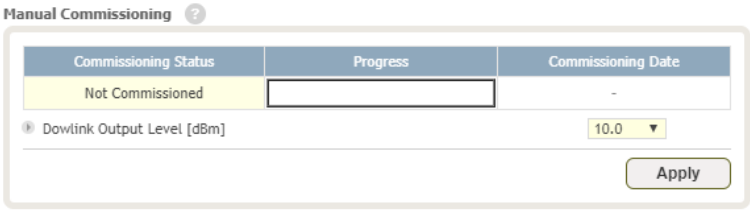
Set Port and Carrier of 700 Band.

7.2.3.5.3 Status



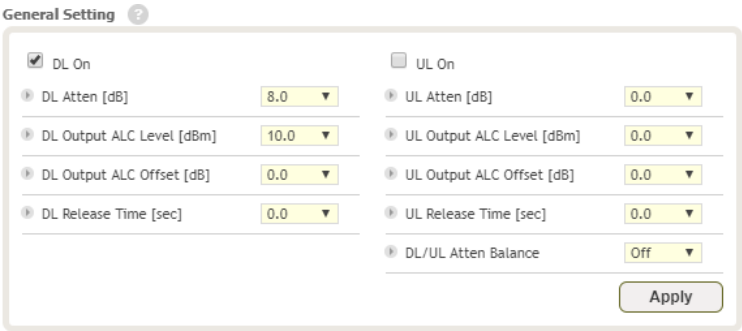
Display the detected level of Input, Gain, Atten and Output level.

7.2.3.5.4 Manual Commissioning



Set up the Commission manually.

7.2.3.5.5 General Setting

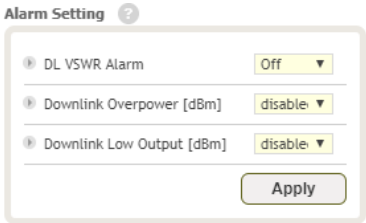


Control and manage general settings.

7.2.3.5.6 Information

Set description and Band Name of product.

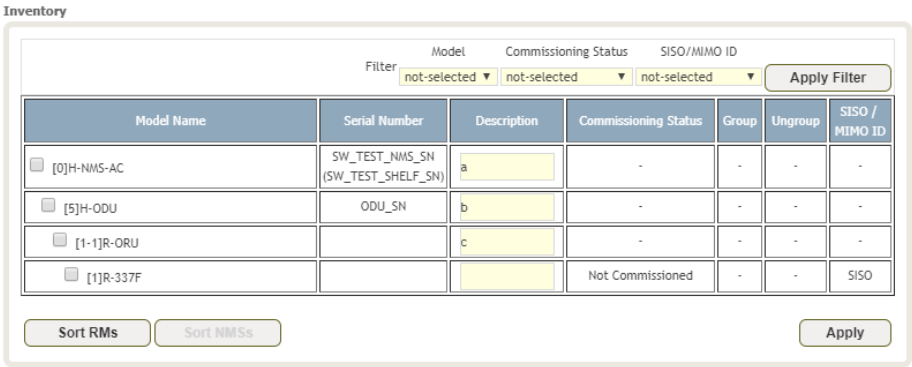
7.2.3.5.7 Alarm Setting



Set alarm options.

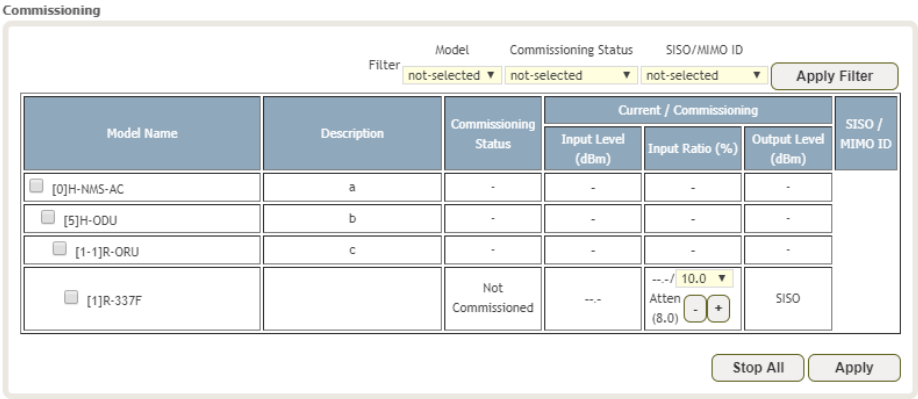
7.2.4 Tools

7.2.4.1 Inventory (NMS, ODU)



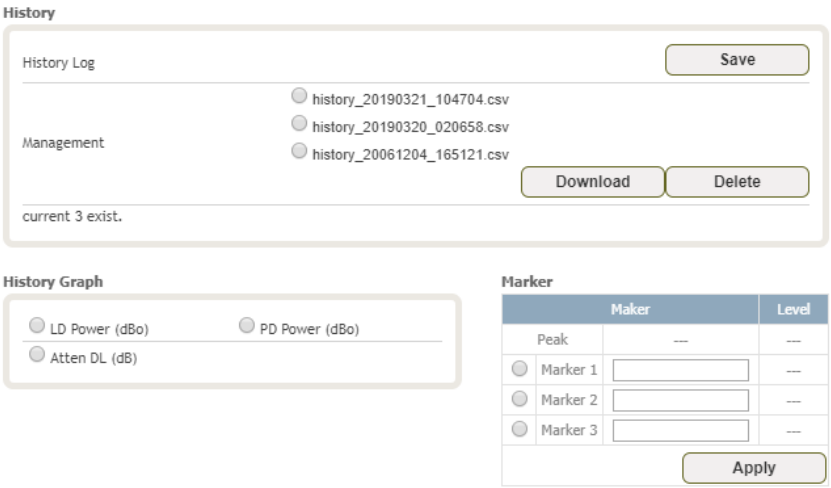
Use the Inventory function for connected products in the system.

7.2.4.2 Commissioning (NMS)



Use the Commissioning function for the connected products of the system.

7.2.4.3 History (NMS, ODU, ORU, RM)



For each item, check the recorded data of the previous values.

7.2.5 System

The System tab allows the user to perform firmware updates, upload closeout packages, view any changes to the system, backup existing configuration, and add/remove user accounts, and change the login credentials of the Administrator.

7.2.5.1 Account

7.2.5.1.1 Account Management (Admin Only)

The Account Management section allows the Administrator to delete any user/guest account. Please note that the Account Management section is only available if you are logged into the system as the Administrator. To delete a user/guest account click on the Account Management link and under the Delete column, click on the delete button.

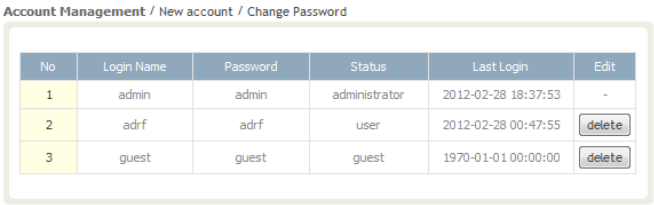


Figure 7-9 Account Management

7.2.5.1.2 New Account (Admin Only)

The New account section allows the Administrator to create a new user/guest account. Please note that the new account section is only available if you are logged into the system as the Administrator. To create a new user/guest account click on the new account link and fill in the fields highlighted in yellow as shown below.

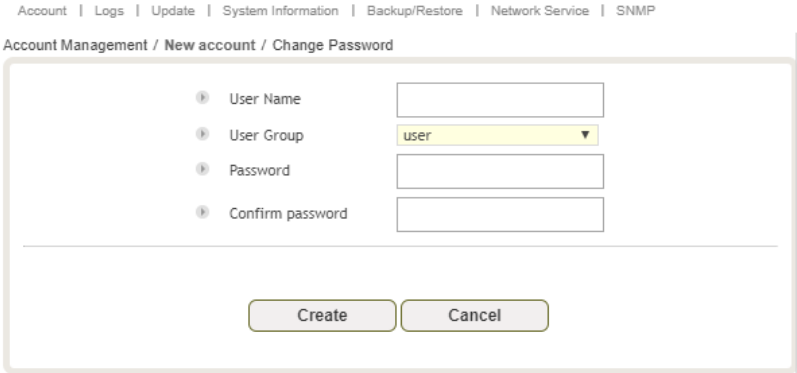


Figure 7-10 New Account

7.2.5.2 Logs

7.2.5.2.1 Event Log

This section displays system events that have taken place. The Event Log displays who has made the changes, the time and date of when the event took place, and what changes were made to the system. The System Log tracks the following events:

- System Initiation
- Alarm Set
- Alarm Clear

7.2.5.2.1 User Log

This section tracks user activity within the system. The User Log displays who has made the changes, the time and date of when the event took place, and what changes were made to the system. The User Log tracks the following items:

- Log in / Log out activity
- Changes to gain/attenuation/output values

- System event generated by user(firmware update, backup/resote, create/delete account)
- DAS Navigation Tree Lock/Unlock
- Description change
- Repeater/installer information change
- Setting date/time

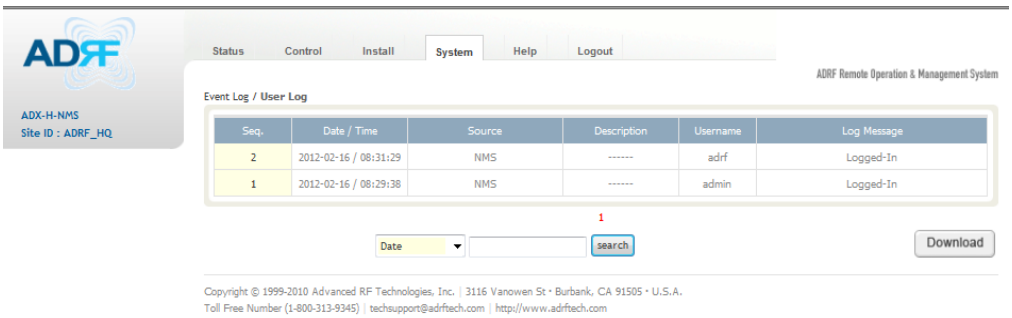


Figure 7-11 User Log

7.2.5.3 Updates

- To perform a firmware update, click on the System: Update tab and the following screen will show up.

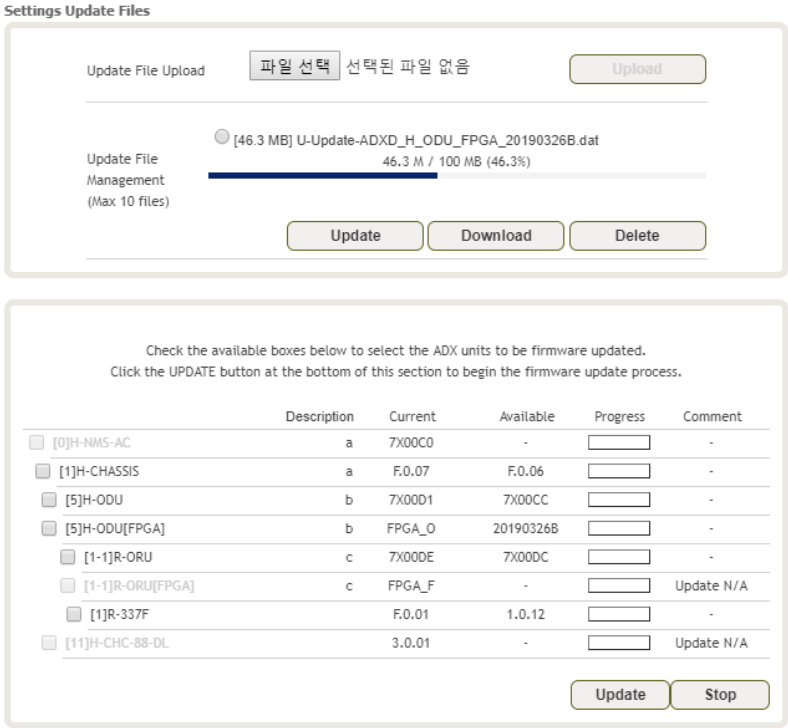
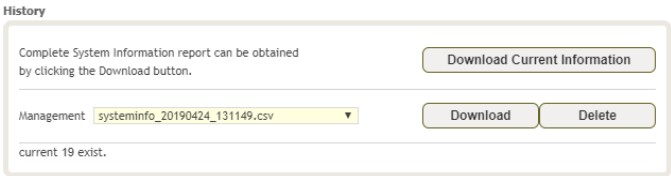


Figure 7-12 System update

- Click on the ‘Browse’ button and locate the firmware file then click the ‘Upload’ button.
- Click on the ‘Update’ button to perform the firmware update.
- Click on the ‘Download’ button to perform the firmware update file download.
- Click on the ‘Delete’ button to perform the firmware update file delete.
- Check the child items that require updates and click the ‘Update’ button.
- Once the firmware update is complete, the following message will appear.

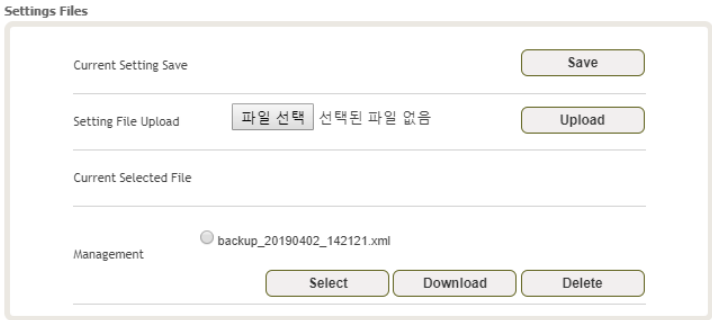
Figure 7-13 Message after System update is complete

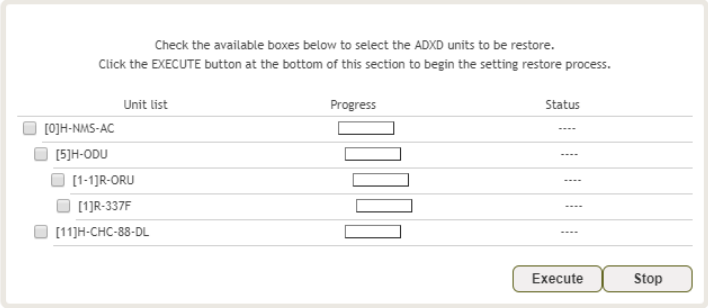
7.2.5.4 System Information



It verifies the information of all devices connected to the system, and manages downloading and deletion of information at present time.

7.2.5.5 Backup/Restore

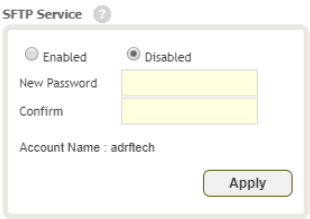




You can backup, save, download, and manage the system information of the current point of view and restore each individual device using the backup file if necessary.

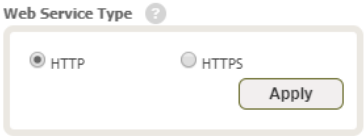
7.2.5.6 Network Service

7.2.5.6.1 SFTP Service



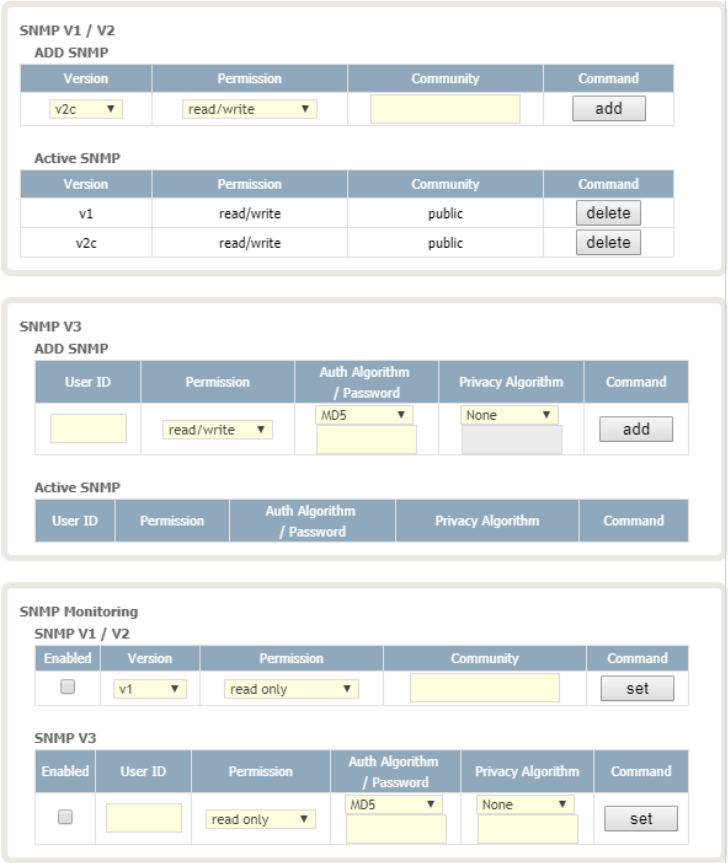
Turn SFTP Service function on and off. The account name is adrftech and the password can be changed..

7.2.5.6.2 Web Serivce Type



Change the Web GUI Service Type to HTTP / HTTPS.

7.2.5.7 SNMP



Manage and add SNMP options.

7.2.6 Help

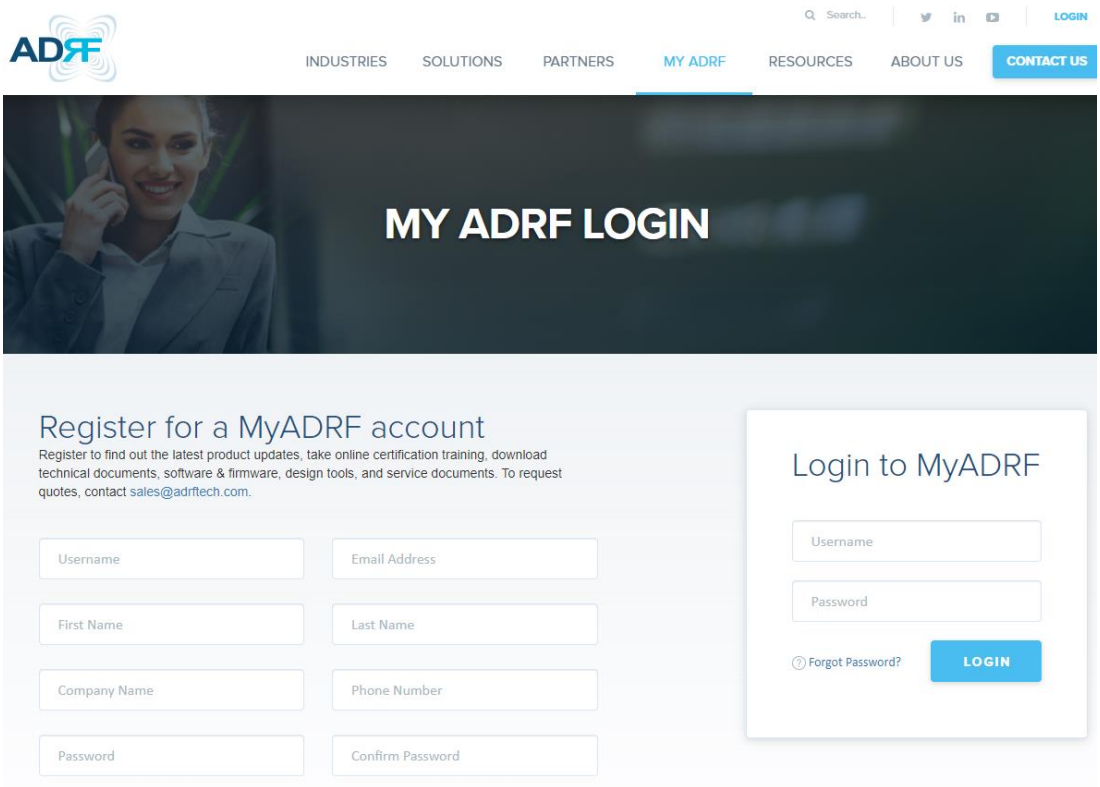


Figure 7-14 Help

If an internet connection is available, clicking on the Help Tab will redirect the user to our Technical Support page.

7.2.7 Logout

Clicking the Logout button will log the current user off the system.

7.3 Guest Mode

When logging into the system as a guest, the guest will only have read-only privileges and will not be able to make any changes to the system.

8. SYSTEM-WIDE SPECIFICATIONS

- 600,700L, 700U, S8C

Parameters		600MHz	700L	700U	S8C	Comment
Frequency	Downlink	617-652MHz	728-746MHz	746-757MHz	862-894MHz	
	Uplink	663-698MHz	698-716MHz	776-787MHz	817-849MHz	
Max BW		35MHz	18MHz	11MHz	32MHz	
DL Input Power Range @ POI		+48~ 0dBm				
System Gain	Downlink	-15~33dB				
	Uplink	-20~10dB				
Maximum Composite Output Power(DL)		33dBm(2Watt)				

- PCS,AWS,WCS,BRS, CBRS

Parameters		PCS	AWS	WCS	BRS		Comment
Frequency	Downlink	1930-1995MHz	2110-2155MHz	2350-2360MHz	2496-2690MHz (196MHz)		
	Uplink	1850-1915MHz	1710-1755MHz	2305-2315MHz			
Max BW		65MHz	45MHz	10MHz	80MHz	80MHz	Max 80MHz Use
Input Power Range @ POI		+48~ 0dBm					
System Gain	Downlink	-11~37dB					
	Uplink	-20~10dB					
Maximum Composite Output Power(DL)		37dBm(5Watt)					
VSWR		≤ 1.5:1					
Optic		10Gbps LC Receptacle Bi-Directional SFP+ Transceiver up to 20Km (up to 384MHz per SFP)					
Spurious		Meet FCC rules, 3GPP TS 36.104, 3GPP2 C.S0010-C					
Dimension (WXDXH)	Head End Chassis	19.0 in x 19.7 in x 7.0 inches (482 x 500 x 178 mm)					
	H-POI	1.3 in x 17.0 in x 6.86 inches (33 x 432 x 174 mm)					

	H-ODU	2.62 in x 17.0 in x 6.86 inches (66.4 x 432 x 174 mm)	
	RU Chassis RU(Remote Unit)	19.0 in x 19.7 in x 7.0 inches (482 x 500 x 178 mm)	
	RM(Remote Module)	1.9 in x 17.0 in x 6.86 inches (48 x 432 x 174 mm)	
	RM-ORU	3.2 in x 17.0 in x 6.86 inches (81 x 432 x 174 mm)	
	RM-PSU	1.9 in x 17.0 in x 6.86 inches (48 x 432 x 174 mm)	
Weight	Head End Chassis	16.3 lbs (7.4kg)	
	H-POI	6.2 lbs (2.8kg)	
	H-ODU	5.6 lbs (2.6kg)	
	RU(Remote Unit) Chassis	14.5 lbs (6.6kg)	
	RM(Remote Module)	8.7 lbs (4.0kg)	
	RM-ORU	7.0 lbs (3.2kg)	
	RM-PSU	4.5 lbs (2.0kg)	
Operating Temperature		-32~122°F(-30~50°C)	
Operating Humidity		5~90%	
Power Supply	Head-End	110/220V, 50-60Hz(optional) with battery backup function	
	RU	110/220V, 50-60Hz , -48V DC(optional)	
Network Management System		Ethernet(RJ45)	
RF connector	POI	7/16 DIN(Female)	
	POIL	4.3-10(Female)	
	RM(Remote Module)	4.3-10(Female)	

9. MECHANICAL DRAWINGS

9.1 HE

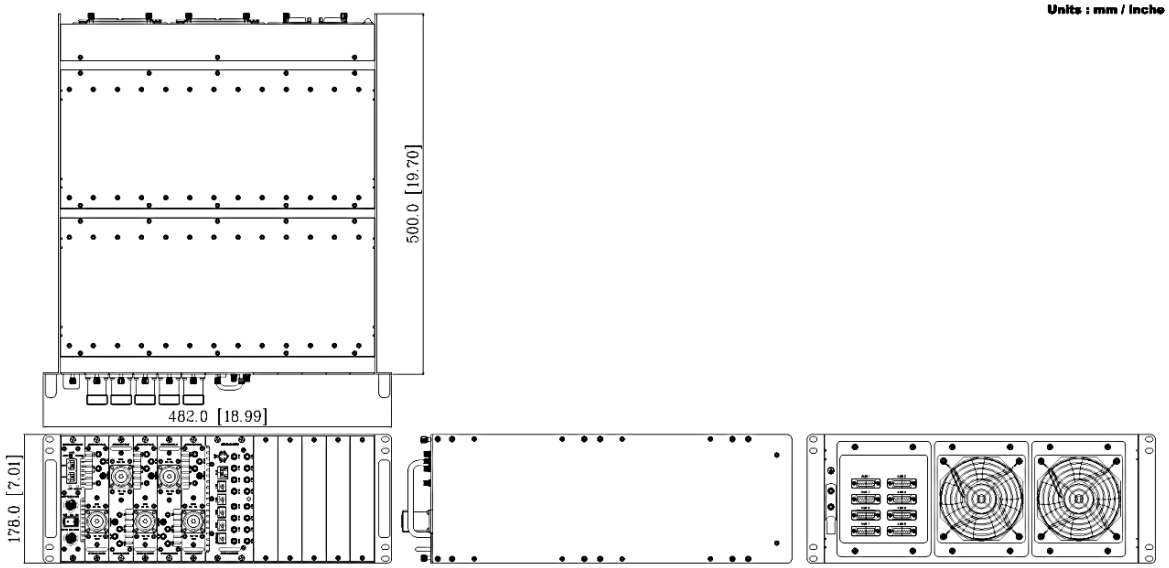


Figure 9-1 HE Drawing

9.2 RU

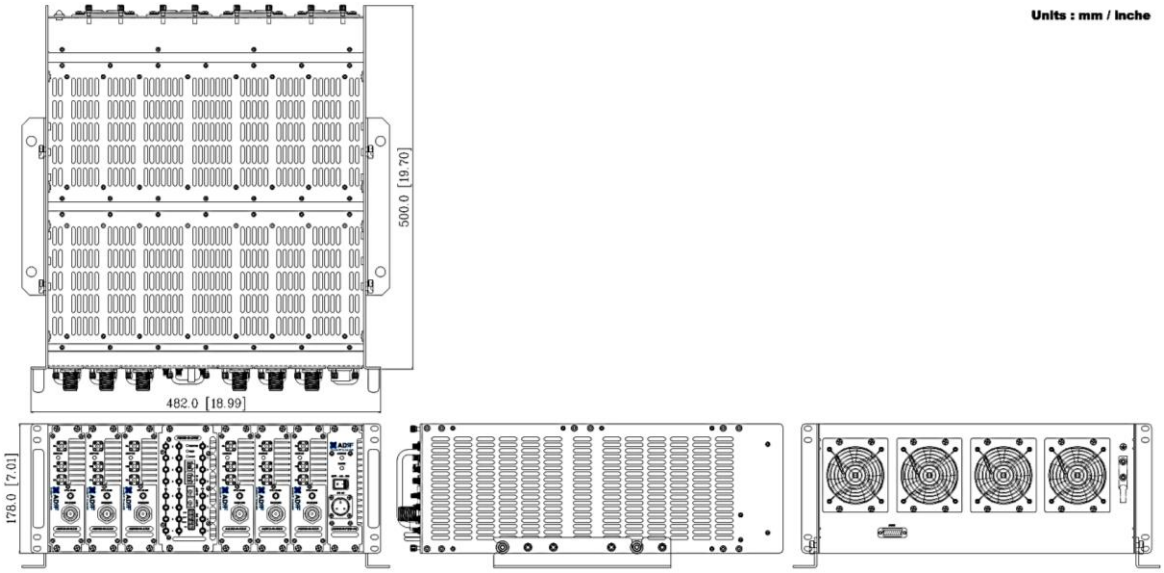


Figure 9-2 RU Drawing