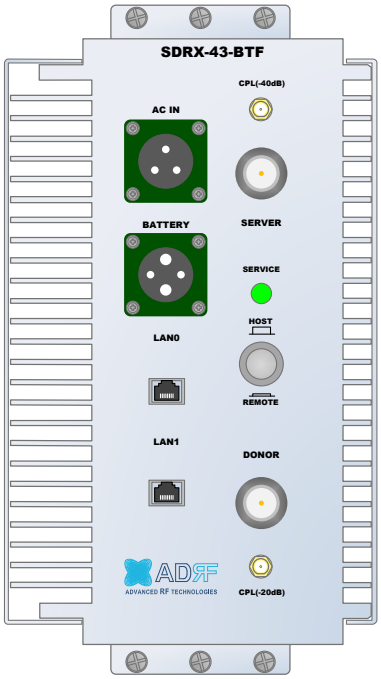
SDRX-43-BTF User's Manual

Version 0.1



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Terms and Abbreviations

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

Abbreviation/Term	Definition
ALC	Automatic Level Control
AROMS	ADRF' Repeater Operation and Management System
BDA	Bi-Directional Amplifier
BTS	Base Transceiver Station
CDMA	Code Division Multiple Access
CFR	Crest Factor Reduction
CP	Cyclic Prefix
CW	Continuous Wave (un-modulated signal)
DAS	Distributed Antenna System
DL	Downlink
HW	Hardware
LNA	Low Noise Amplifier
LTE	Long Term Evolution
MS	Mobile Station
OFDM	Orthogonal Frequency-Division Multiplexing
PSU	Power Supply Unit
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase Shit Keying
RB	Resource Block
RF	Radio Frequency
SQE	Signal Quality Estimate
SW	Software
eUE	LTE User Equipment (LTE Mobile Station)
UL	Uplink
VSWR	Voltage Standing Wave Ratio

1. INTRODUCTION

The SDRX-43-BTF is an over-the-air high power repeater supporting BRS TDD band.

1.1 Highlights

- Channel and bandwidth Selectable
- Digital filtering
- Remote monitoring and control capability using our Web-based GUI
- Configurable network setting in order to interface with 3rd party external modem boxes
- Supports SNMP v1, v2, v3 (get, set & traps)
- Web-GUI connectivity via DHCP
- Supports DHCP; No 3rd party GUI software required

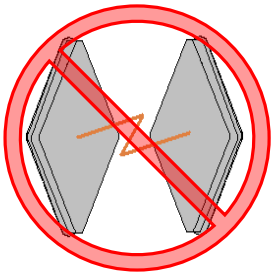
1.2 Warnings and Hazards

WARNING! ELECTRIC SHOCK

Opening the SDRX-43-BTF could result in electric shock and may cause severe injury.

WARNING! EXPOSURE TO RF

Working with the repeater 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.



WARNING! DAMAGE TO REPEATER

Operating the SDRX-43-BTF with antennas in very close proximity facing each other could lead to severe damage to the repeater.

RF EXPOSURE & ANTENNA PLACEMENT Guidelines

Actual separation distance is determined upon gain of antenna used.
Please maintain a minimum safe distance of at least 140cm(Uplink) and 110 cm(DownLink) while operating near the donor and the server antennas. Also, the donor antenna needs to be mounted outdoors on a permanent structure.
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

WARRANTY

Opening or tampering the SDRX-43-BTF 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.

CAUTION

Double Pole/Neutral Fusing.

CAUTION

Circuit Breaker Installation in the Box for Overcurrent Protection
Must install the circuit breaker between the system and main AC source for separation.
Make sure to install the circuit breaker on the place to operate easily.
Circuit breaker is able to operate up to 20A.

◈LABEL WARNING◈

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.

Regulatory Warning Statement

FCC RF Radiation Exposure Statement:
This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 140 cm(Uplink) and 110 cm(DownLink) between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

RSS-131 Warning Statement

The passband gain shall not exceed the nominal gain by more than 1.0 dB. The 20 dB bandwidth shall not exceed the nominal bandwidth that is stated by the manufacturer. Outside of the 20 dB bandwidth, the gain shall not exceed the gain at the 20 dB point.

RSS-GEN Warning Statement

RSS-GEN (6.8 Transmit antenna)
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.
(UL: Panel Antenna / Max. Antenna Gain: 20.4 dBi,
DL: Omni-Directional Antenna / Max. Antenna Gain: 5.3 dBi)

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.
(UL : Antenne du panneau / Gain maximal d'antenne : 20,4 dBi,
DL : Antenne omnidirectionnelle / Gain maximal d'antenne : 5,3 dBi)

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 140 cm(Uplink) and 110 cm(DownLink) 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 may 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 140 cm(Uplink) and 110 cm(DownLink) 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.

WARNING! Hot surface

2. OVERVIEW

2.1 LED

The SDRX-43-BTF has an LED in the Lower left corner as shown in figure below.

Figure 2-1 LED

Table 2-1 RF Module LED Specifications

LED Indicator		Specifications
Service	Green	System is Normal
	Orange	Soft Fail
	Red	Hard Fail

2.2 Host/Remote Switch

Figure 2-2 Host/Remote Switch

The Host/Remote Switch allows the user to switch the default Repeater IP, Subnet Mask, and Gateway of the LOCAL port of the repeater to an alternative setup.

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

- 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)

2.3 Ethernet Port

Figure 2-3 Ethernet Port

- **LAN0** – The Local port can be used to communicate directly with the SDRX-43-BTF using a RJ-45 crossover cable or can also be used to connect the SDRX-43-BTF to an external modem box or the optional internal Digi Transport WR-21.
- **LAN0** and **LAN1** support cascade communication for modem and Web-GUI

2.3.1 AC Power

Figure 2-3 AC Input Port

The SDRX-43-BTF PSU can operate at 110V AC to 220V AC. The user should verify that the AC input voltage is the correct voltage before powering on the SDRX-43-BTF.

2.3.2 Back Up Battery Port

Figure 2-4 Battery Backup Port

The SDRX-43-BTF can be connected to an ADRF-BBU (ADRF Battery Backup) to provide power during a power failure. If an ADRF-BBU is utilized, connect the ADRF-BBU to the SDRX-43-BTF via the external battery port.

(WARNING: The circuit switch on the ADRF-BBU must be set to OFF before connecting the ADRF-BBU to the SDRX-43-BTF to prevent damage to the repeater or the ADRF-BBU and personal injury.)

Note: Please contact ADRF Technical Support for assistance if you are unfamiliar with the installation procedure of our battery box.

2.4 RF Ports

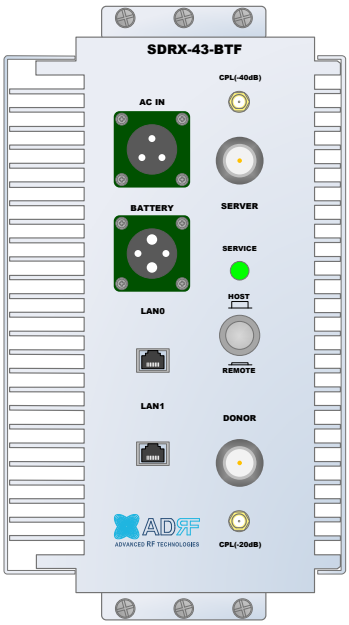


Figure 2-5 RF port

- **DONOR** – 4.3-10 female which is used to connect the donor antenna
- **DONOR_ CPL (20dB)** – SMA female 20 dB coupling port which is used to Modem
- **SERVER_CPL (40dB)** – SMA female 40 dB coupling port which is used to monitor the amplified DL signal
- **SERVER** – 4.3-10 female which is used to connect the server antenna

3. ALARMS

3.1 Message Board Alarms and Notification

Table 3-1 Message Board Alarms and Notification

Parameters	Remark
AC Fail	Power supply is not operating within specs
DC Fail	Power supply is not operating within specs
Fan[1/2] Fail	System has detected an issue with the fan1 and fan2
Temperature	Module is above the normal operating temperature
Current	Power supply is not operating within normal range
System Halt	System is in a shutdown state due to a hard fail alarm
DSP Fault	System has detected an issue with the internal DSP chip
DL Signal not detected	DL signal is below the specified level
DL Signal Low	DL signal is below the specified level
Input Overload	Incoming in-band DL or UL signal is too strong
Out of band Overload	Incoming out-band DL or UL signal is too strong
DL RF Power	Input + gain does not match the output level (above delta of 6 dB)
Overpower	Output level is above the max output levels
VSWR	Power is being reflected back to the repeater
Heartbeat	Heartbeat
Reboot	Reboot
Factory setting	Factory setting
Sync Fail	Sync Signal Not Detect, Sync Fail

4. INSTALLATION

4.1 Installation Procedures

4.1.1 Wall Mount Procedure

- Verify that the SDRX-43-BTF and mounting hole are in good condition
- Place the SDRX-43-BTF mounting template up against the wall and mark of mount holes
- Mount the SDRX-43-BTF to wall use the six (6) mounting hole on the wall mount bracket
- Connect the GND cable
- Connect the Antenna cable
- Connect the Power cable

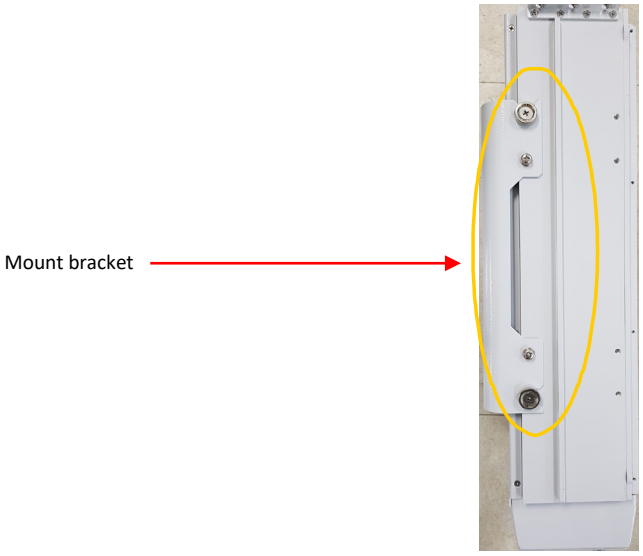


Figure 4-1 Wall Mount

4.2 Grounding

- Install the ground cable that is included in the package at the side of the repeater as show in the figure below.
- The grounding terminal is located at lower right-hand side of the BDA. The grounding cable should be properly connected before powering on the equipment.

Figure 4-2 Ground Cable Connection

- Ground terminals located on the side consisted of a 16mm²(6AWG) and should be permanently connected to earth (Protective earthing conductor).

4.3 Antenna Separation/Isolation

Separation between the antennas is necessary to prevent oscillation. Oscillation occurs when the signal entering the system continually reenters, due to the lack of separation between the donor and server antennas. In other words, the signal is being fed back into the system. This creates a constant amplification of the same signal. As a result, the noise level rises above the signal level.

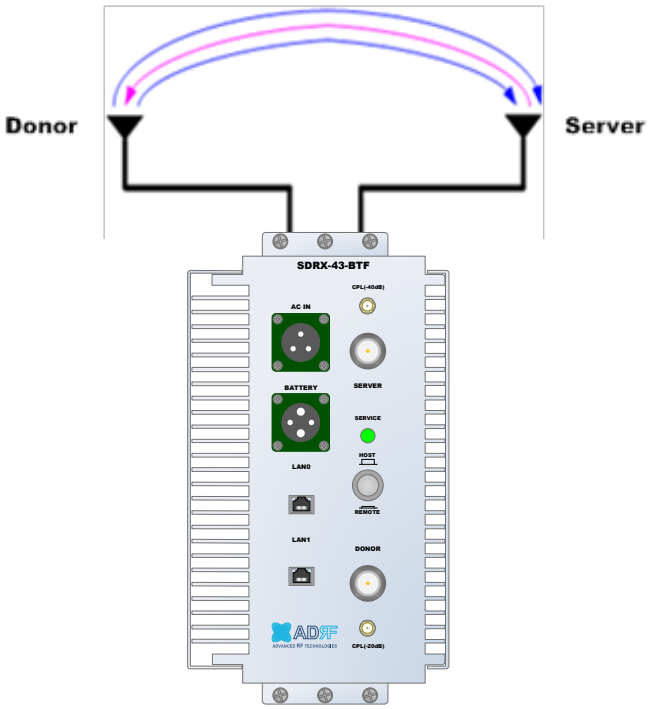


Figure 4-3 RF Repeater Oscillation

To prevent feedback, the donor and server antennas must be separated by an appropriate distance to provide sufficient isolation. Isolation is attained by separating antennas a sufficient distance so that the output of one antenna does not reach the input of the other. This distance is dependent on the gain of the repeater.

The recommended isolation value is 20dB greater than the maximum gain of the repeater. For example, if the gain of the repeater is 50 dB, then an isolation of 70dB or greater is required. In the same manner, because the SDRX-43-BTF has a maximum gain of 95dB in case of SDRX-43-BTF, it requires isolation of at least 115dB.

4.4 Line of Sight

The donor antenna which points towards the BTS typically has a narrow beam antenna pattern. As a result, a slight deviation away from the direction of the BTS can lead to less than optimum results. In addition, obstacles between the repeater and the BTS may impair the repeater from obtaining any BTS signal. As a result, the repeater cannot transmit signal to the coverage area. Therefore, a direct line of sight to the BTS for the donor antenna is vital to the function of a repeater. For the same reason, placing the server antenna in direct line of sight of the coverage area is also necessary.

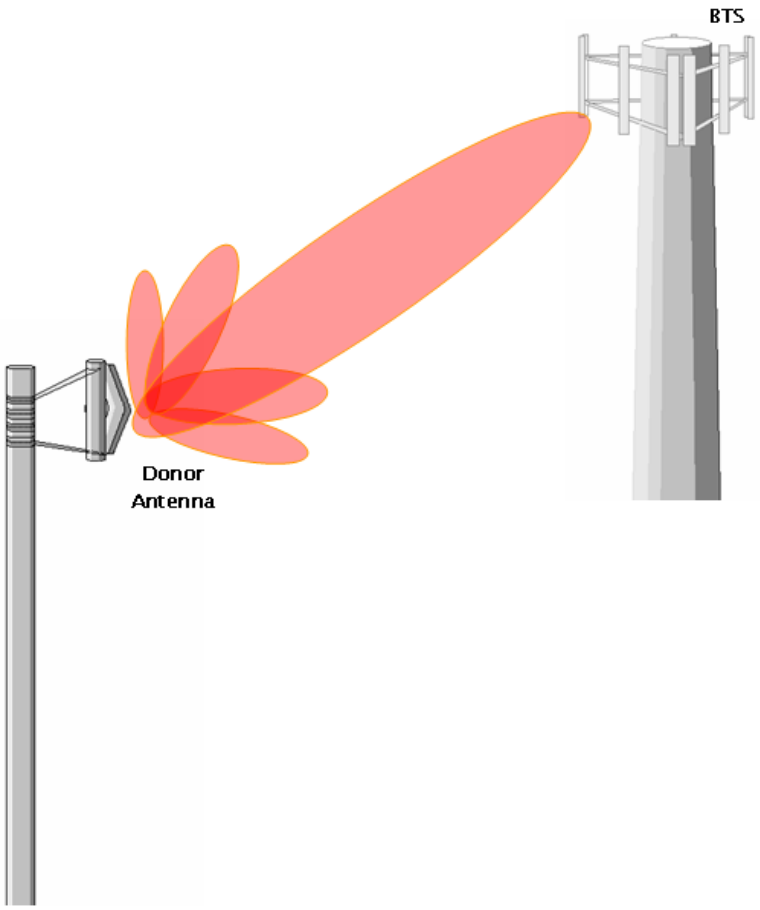


Figure 4-4 Line of Sight to the BTS

5. WEB-GUI SETUP

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

5.1 Repeater/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 steps above.
- 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:

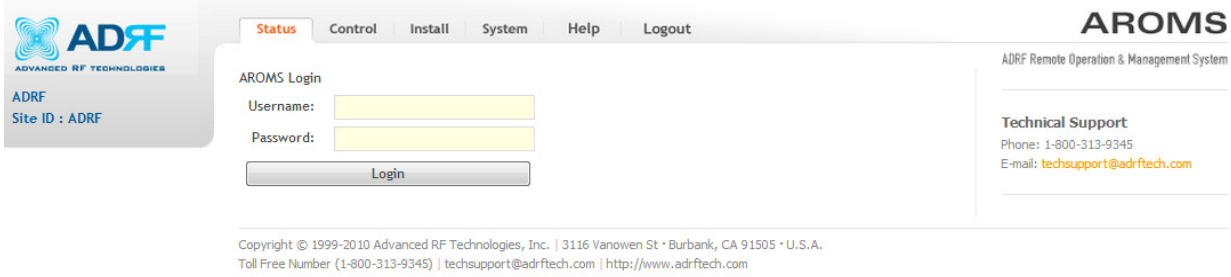


Figure 5-1 Login page

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

The default username and password for the General User is adrf & adrf, respectively.
The default Administrator login is admin & admin, respectively.

5.2 Status Tab

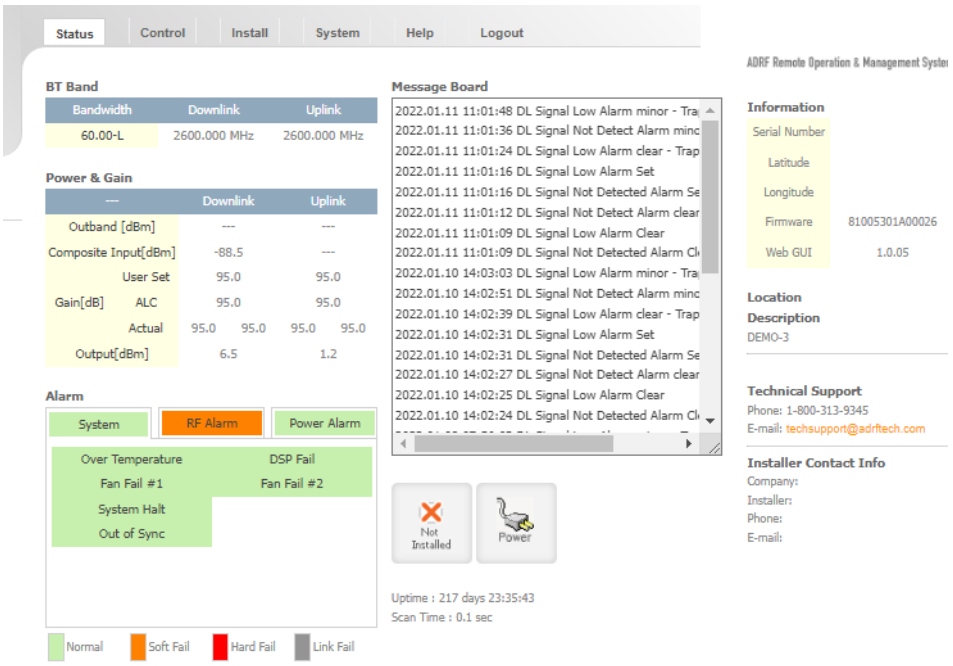


Figure 5-2 Status Tab

5.2.1 Band

BT Band

Bandwidth	Downlink	Uplink
60.00-L	2600.000 MHz	2600.000 MHz

Figure 5-3 Band Display

5.2.2 Power & Gain

This section displays the Input, Gain, and Output for both downlink and uplink.

Power & Gain

---		Downlink		Uplink	
Outband [dBm]		---		---	
Composite Input[dBm]		-88.5		---	
Gain[dB]	User Set	95.0		95.0	
	ALC	95.0		95.0	
	Actual	95.0	95.0	95.0	95.0
Output[dBm]		6.5		1.2	

Figure 5-4 Power & Gain Display

- Input [dBm] – Displays the in-band Downlink/Uplink signal level. The system will display "--.-"when the input level is < -90 dBm.
- Gain [dB]
  - User Set: Displays the amount of gain that user set.
  - ALC: Displays the amount of gain that is attenuated by ALC function.
  - Actual: Displays the actual amount of gain that is currently in use.
- Output [dB] – Displays the Downlink/Uplink output power levels.

5.2.3 Alarm

This section displays the alarm status for System alarms, RF Alarms, and Power alarms. If an alarm is present in the system, then the color of the alarm tab will change according to the type of failure.

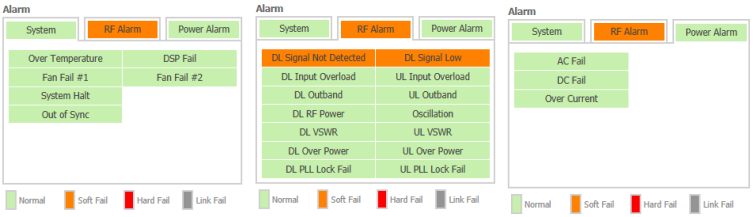


Figure 5-5 Alarm Display

5.2.4 Message Board

Displays the 30 most recent events.

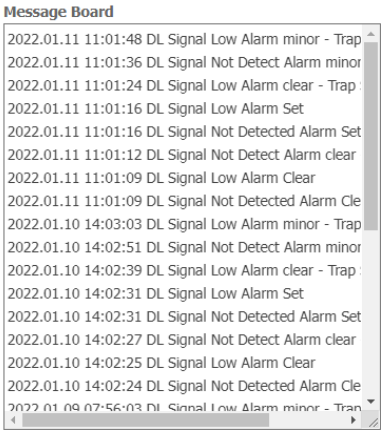


Figure 5-6 Message Board

- **Log File**: Downloads the system Log File (events and alarms) to your computer

5.2.5 Install and Power Status

Figure 5-7 Install and Power Status

- **Installation**: Displays whether or not the installation routine has been run (Not Installed or Installed)
- **Power**: Displays the power source that is currently being used

5.2.6 Repeater Info / Repeater Location / Technical Support / Installer Contact Info

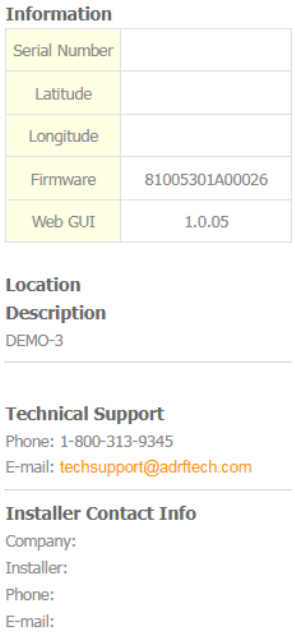


Figure 5-8 Repeater Info / Repeater Location / Technical Support / Installer Contact Info

- **Repeater Info**: Displays the serial number, latitude, longitude, firmware version, Web-GUI version
- **Repeater Location**: Displays the address where the repeater is installed
- **Technical Support**: Displays ADRF's Technical Support contact information
- **Installer Contact Info**: Displays the installer's name, phone and e-mail address

Note: Once successfully logged in, the repeater model name and the site/cascade ID will be displayed on the top of all the windows (except for the Main Window).

5.3 Control Tab

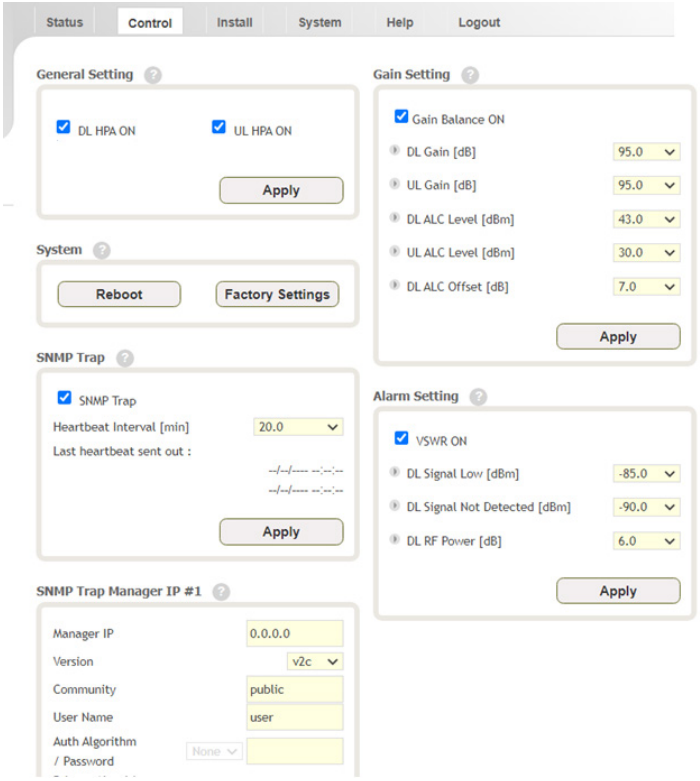


Figure 5-9 Control page

5.3.1 General Setting

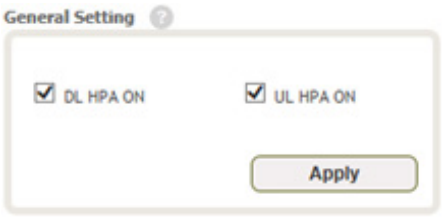


Figure 5-10 General Setting

- **Downlink HPA ON**: Enables or disables the DL HPA (High Power Amplifier)
- **Uplink HPA ON**: Enables or disabled the UL HPA (High Power Amplifier)

To enable any of the settings, click on the checkbox and click the Apply button.

5.3.2 System

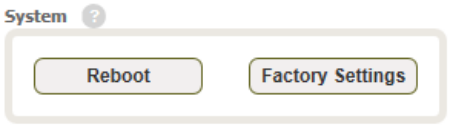


Figure 5-11 System

- **Reboot**: Clicking the reboot button will have the following popup show up:

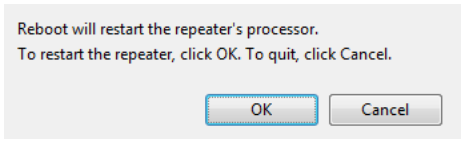


Figure 5-12 Pop-up message when Reboot button is pressed

Click OK to reboot the repeater or click Cancel to exit out

- **Factory Setting**: Resets the repeater to the original factory settings

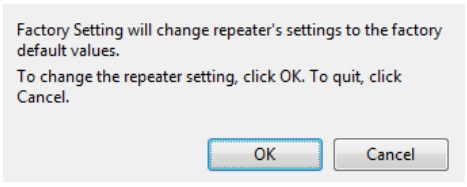


Figure 5-13 Pop-up message when Factory Setting button is pressed

5.3.3 SNMP Trap

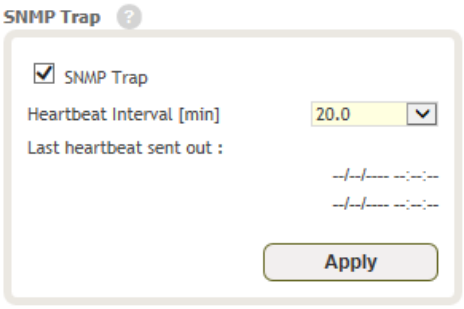


Figure 5-14 SNMP Trap

- SNMP Trap ON – Enables or Disables SNMP traps from being sent out when an alarm is triggered.
- Heartbeat Periodic Time [min] – Specifies the amount time between heartbeats

5.3.4 Gain Control

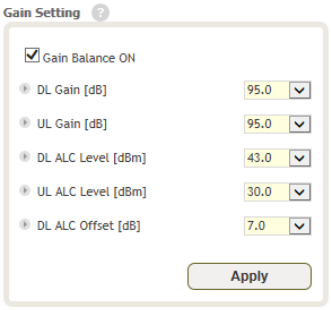


Figure 5-15 Gain Control Setting

- **Downlink Gain/Uplink Gain**: Allows the UL gain to be adjusted manually when ALC is OFF
- **DL Output ALC Level**: Prevents the output power from exceeding the specified value
- **DL Output ALC Offset**: When the incoming signal level increases, the system will not adjust the attenuation levels until the delta reaches the level specified
- **DL /UL Gain Balance ON**: Allows the user to enable or disable the gain balance. When gain balance is enabled, the delta value between the downlink and uplink gains remain constant

5.3.5 Alarm Setting

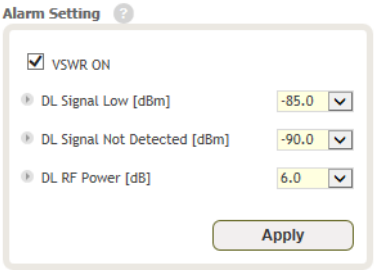


Figure 5-16 Alarm Threshold Setting

- **Downlink Signal Low**: Allows the user to specify how low the signal can be before triggering a "Downlink Signal Low" soft-fail alarm
- **Downlink Signal Not Detected**: Allows the user to specify how low the signal can be before triggering a "Downlink Signal Not Detected" soft-fail alarm
- **Downlink RF Power**: Allows the user to set a maximum deviation value for the downlink RF power
  - For example, if the input signal is -50 dBm and the gain is set to 60 dB, the expected output power should be 10 dBm. If the Downlink RF Power alarm value is set to 6dB, then if the output power is below 4 dBm, then this will trigger a soft-fail alarm
- **VSWR ON**: Allows the user to enable/disable the VSWR alarm check

5.4 Install Tab

5.4.1 Install

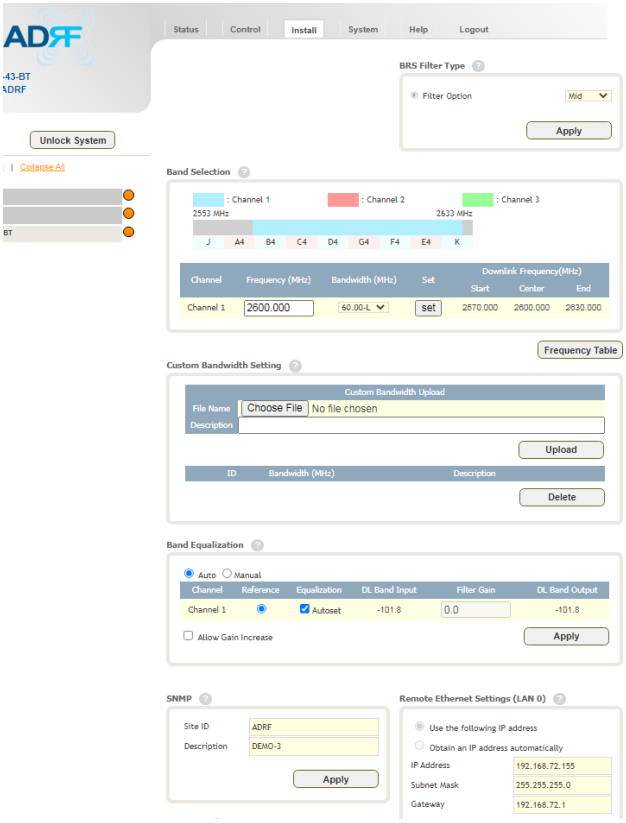


Figure 5-17 Install page

5.4.2 SNMP

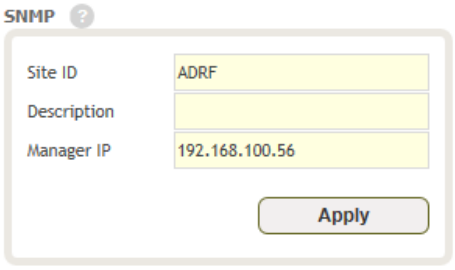


Figure 5-18 SNMP

The SNMP section allows you to specify the Site ID, Description and Manager IP. The Site-ID is the code that is used to identify a particular module. The Description is separate field for user. The Manager IP field is where the user inputs the IP address of the NOC system that is being used to monitor the SNMP traps.

5.4.3 Location

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

Figure 5-19 Location Setting

5.4.4 Remote Ethernet Settings

This section allows the user to specify an alternative Repeater IP, Subnet Mask, and Gateway settings. These settings are enabled when the Host/Remote switch is set to the Remote position.

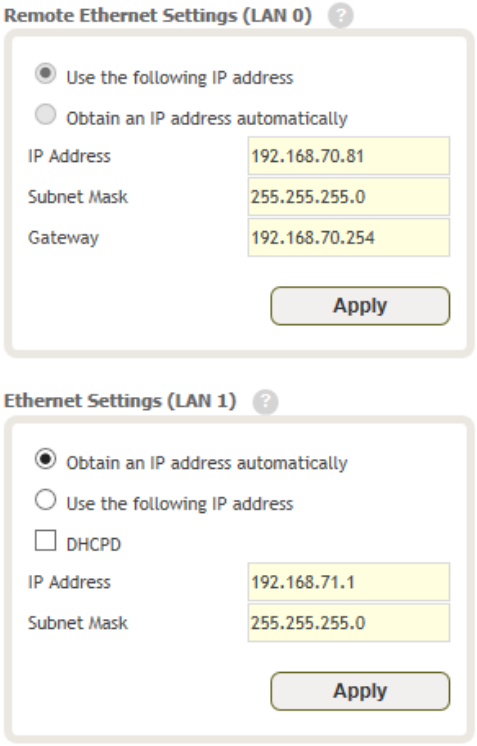


Figure 5-20 Remote Ethernet Settings

5.4.5 Auto Installation

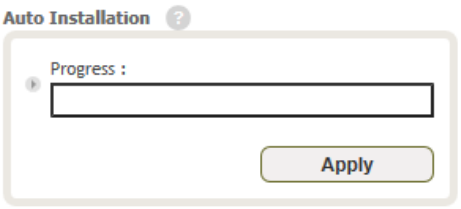


Figure 5-21 Auto Installation

The Auto Installation routine can be run by clicking on the Install button. The Auto Installation routine runs basic system checks to ensure proper functionality.

Repeater Location Info / Repeater Installer Info

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

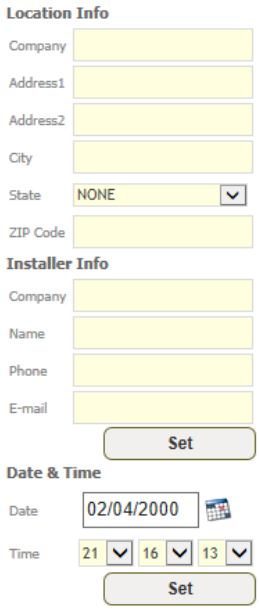


Figure 5-22 Repeater Location Info / Repeater Installer Info

5.4.6 Date & Time

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

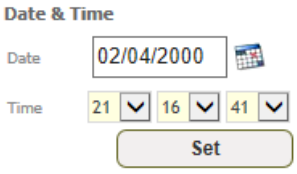


Figure 5-23 Date & Time Setting

5.4.7 Band Selection

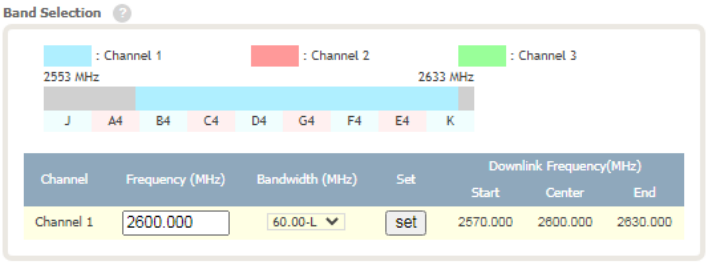


Figure 5-24 Band Selection

Band selection allows the user specify the desired frequncies.

5.5 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.

5.5.1 System: Account

5.5.1.1 System: Account- Account Management

The Account Management section allows the Administrator to delete any user 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 account click on the Account Management link and under the Delete column, click on the delete button.

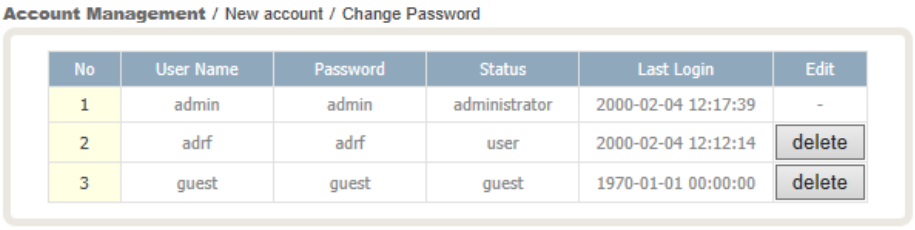


Figure 5-25 System: Account- Account Management

5.5.1.2 System: Account- New Account

The New account section allows the Administrator to create a new user 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 account click on the new account link and fill in the fields highlighted in yellow as shown below.

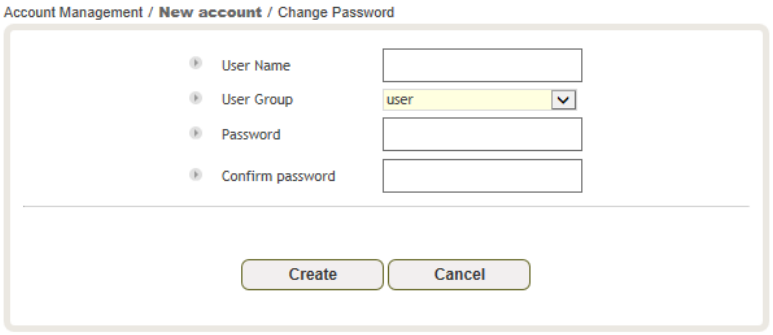


Figure 5-26 System: Account- New Account

5.5.1.3 System: Account- Change Password

The Change Password section allows the current user who is logged into the system to change their login credentials.

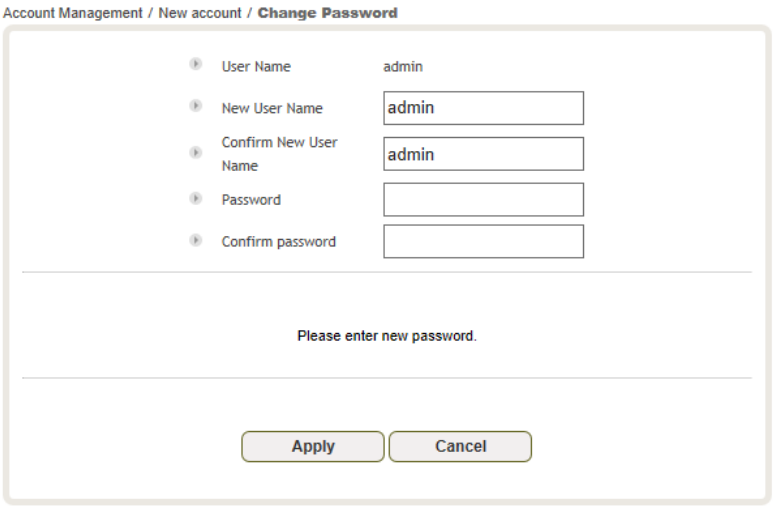


Figure 5-27 System: Account- Change Password

5.5.2 System- Closeout Package

The closeout package section will allow the user to upload documents to the module. The maximum file size for each upload is limited to 10 MB. The total amount of space available for uploading document is 100 MB. Please do not use this section as the primary storage location of your documents. Documents may become unavailable if the system goes down.

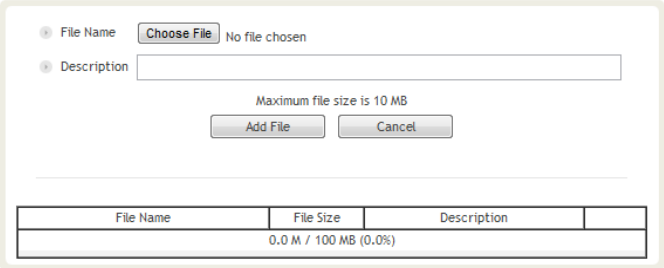


Figure 5-28 System- Closeout Package

To upload documents to the module, click on the "Choose File" or "Browse" button and locate the file that you would like to upload, then enter in a Description of the file being uploaded. Afterwards, click on the "Add File" button to upload the file. Below is what you will see after the file upload. To delete the file, click on the delete button located in the last column.

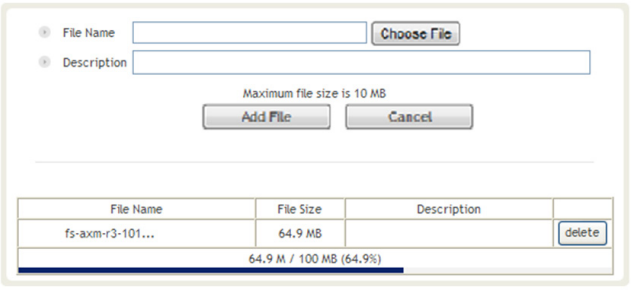
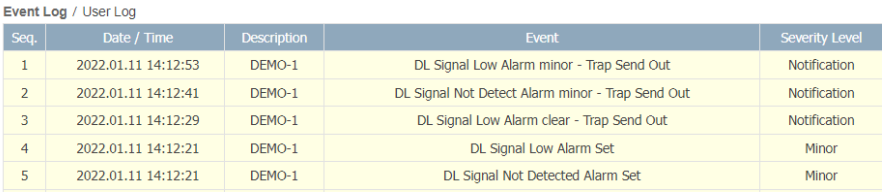


Figure 5-29 System- Closeout Package after the file upload

5.5.3 System- User Log

This section displays system events that have taken place. 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.



Event Log / User Log

Seq.	Date / Time	Description	Event	Severity Level
1	2022.01.11 14:12:53	DEMO-1	DL Signal Low Alarm minor - Trap Send Out	Notification
2	2022.01.11 14:12:41	DEMO-1	DL Signal Not Detect Alarm minor - Trap Send Out	Notification
3	2022.01.11 14:12:29	DEMO-1	DL Signal Low Alarm clear - Trap Send Out	Notification
4	2022.01.11 14:12:21	DEMO-1	DL Signal Low Alarm Set	Minor
5	2022.01.11 14:12:21	DEMO-1	DL Signal Not Detected Alarm Set	Minor

Figure 5-30 System – User Log

5.5.4 System: Update

- To perform a firmware update, click on the System tab and the following screen will appear.

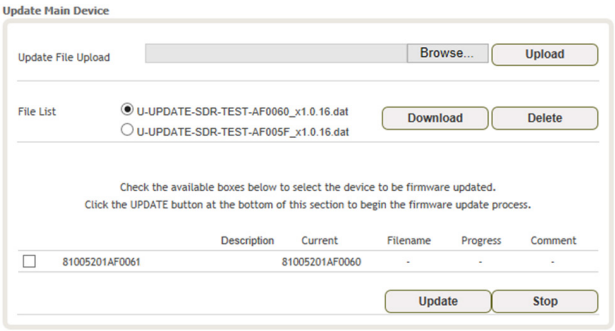


Figure 5-31 System – Update

- Update File Upload
  - Click on the Browse… button and locate the firmware file
  - Click on the Upload button to the firmware file upload.
  - Once the firmware upload is complete, File List will update.
- Update Main Device
  - Select update file on file list.
  - Check the boxes the device to be firmware updated.
  - Click Update button at Update Main Device section
- Update Slave Device
  - Check the available boxes to select the device to be firmware updated.
  - Click update button at Update Slave Devices section to begin the firmware update process.

5.5.5 System- Backup

The backup section allows the user to save the settings of the module.

Click the Save button to perform the backup. To restore the settings to your system, select the file and click the Restore button. To download the file, select it and click the download button. To delete a file, select it and click the Delete button.

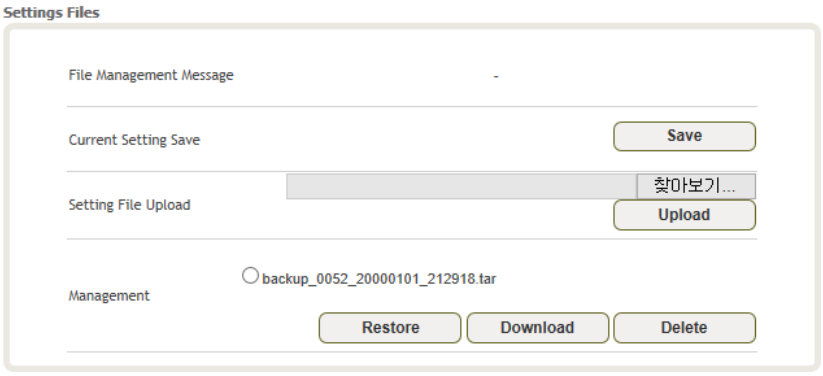


Figure 5-32 System Backup

5.6 Help

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

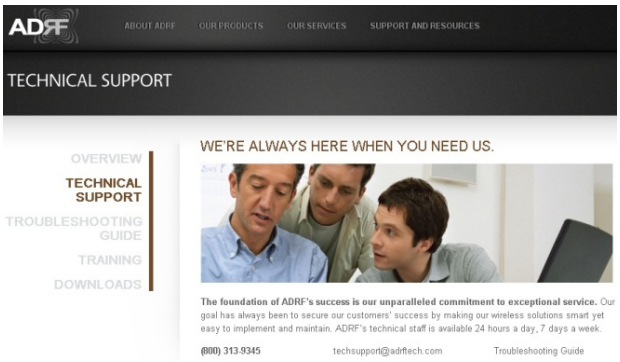


Figure 5-33 Help

5.7 Logout

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

6. MAINTENANCE GUIDE FOR SDRX-43-BTF REPEATER

6.1 Periodic Inspection Checklist

- Check for loose connections between the repeater and antennas. If connections are loose, make sure that all connections are tightly fastened properly.
- Cables and connectors are in good condition.
- Ensure that the repeater brackets are in good. condition and that the repeater is securely fastened

6.2 Preventive Measures for Optimal Operation

6.2.1 Recommendations

- Perform the *Periodic Inspection Checklist* quarterly or semi-annually.

6.2.2 Precautions

- Do not operate the repeater with the antennas in extremely close proximity to one another as this may cause damage to the repeater.
- Do not change the parameters unless instructed to do so by an authorized supervisor.
- Do not move the repeater unless instructed to do so by an authorized supervisor.
- Do not detach any cables to the repeater unless repair of respective components is necessary.

7. WARRANTY AND REPAIR POLICY

7.1 General Warranty

The SDRX-43-BTF carries a Standard Warranty period of two (2) years unless indicated otherwise on the package or in the acknowledgment of the purchase order.

7.2 Limitations of Warranty

Your exclusive remedy for any defective product is limited to the repair or replacement of the defective product. Advanced RF Technologies, Inc. may elect which remedy or combination of remedies to provide in its sole discretion. Advanced RF Technologies, Inc. shall have a reasonable time after determining that a defective product exists to repair or replace the problem unit. Advanced RF Technologies, Inc. warranty applies to repaired or replaced products for the balance of the applicable period of the original warranty or ninety days from the date of shipment of a repaired or replaced product, whichever is longer.

7.3 Limitation of Damages

The liability for any defective product shall in no event exceed the purchase price for the defective product.

7.4 No Consequential Damages

Advanced RF Technologies, Inc. has no liability for general, consequential, incidental or special damages.

7.5 Additional Limitation on Warranty

Advanced RF Technologies, Inc. standard warranty does not cover products which have been received improperly packaged, altered, or physically damaged. For example, broken warranty seal, labels exhibiting tampering, physically abused enclosure, broken pins on connectors, any modifications made without Advanced RF Technologies, Inc. authorization, will void all warranty.

7.6 Return Material Authorization (RMA)

No product may be returned directly to Advanced RF Technologies, Inc. without first getting an approval from Advanced RF Technologies, Inc. If it is determined that the product may be defective, you will be given an RMA number and instructions in how to return the product. An unauthorized return, i.e., one for which an RMA number has not been issued, will be returned to you at your expense. Authorized returns are to be shipped to the address on the RMA in an approved shipping container. You will be given our courier information. It is suggested that the original box and packaging materials should be kept if an occasion arises where a defective product needs to be shipped back to Advanced RF Technologies, Inc. To request an RMA, please call (800) 313-9345 or send an email to techsupport@adrftech.com.

8. SPECIFICATIONS

8.1 Electrical Specifications

Parameters	Specifications	Comments
Frequency	FCC: 2496~2690 MHz ISED: 2500~2690 MHz	
Service Technology	4G LTE/5G NR	
Maximum Composite Output (DL/UL)	+43dBm/+30dBm (Tolerance: ±0.5 dBm)	
Channel Selection Bandwidth per Filter	5/10/15/20/25/30/40/50/60/70/80/ 90/100 MHz	
System Gain	55 - 95dB	
Spurious Emissions	Compliance of FCC Regulations	
Remote Alarm/Network	Web-GUI, SNMP, SNMP-Traps	Through Ethernet connection

8.2 Mechanical Specifications

Parameters	Specifications	Comments
Dimension (W x H x D)	5.71x10.34x17.73 in	
Antenna Connectors	4.3-10(F)	
Interface	Ethernet (RJ45)	
Mounting Type	Wall Mount	
Ground	External Threaded Stud	

8.3 Environmental Specifications

Parameters	Specifications	Comments
Operating Temperature	23°F ~ 122°F (-5°C to +50°C)	-
Operating Humidity	5%~90% RH (Non-condensing)	

8.4 Power Specifications

Parameters	Specifications	Comments
Power Supply	AC 100- 240V	With Battery Backup
Power Consumption	TBD	

9. MECHANICAL DRAWINGS

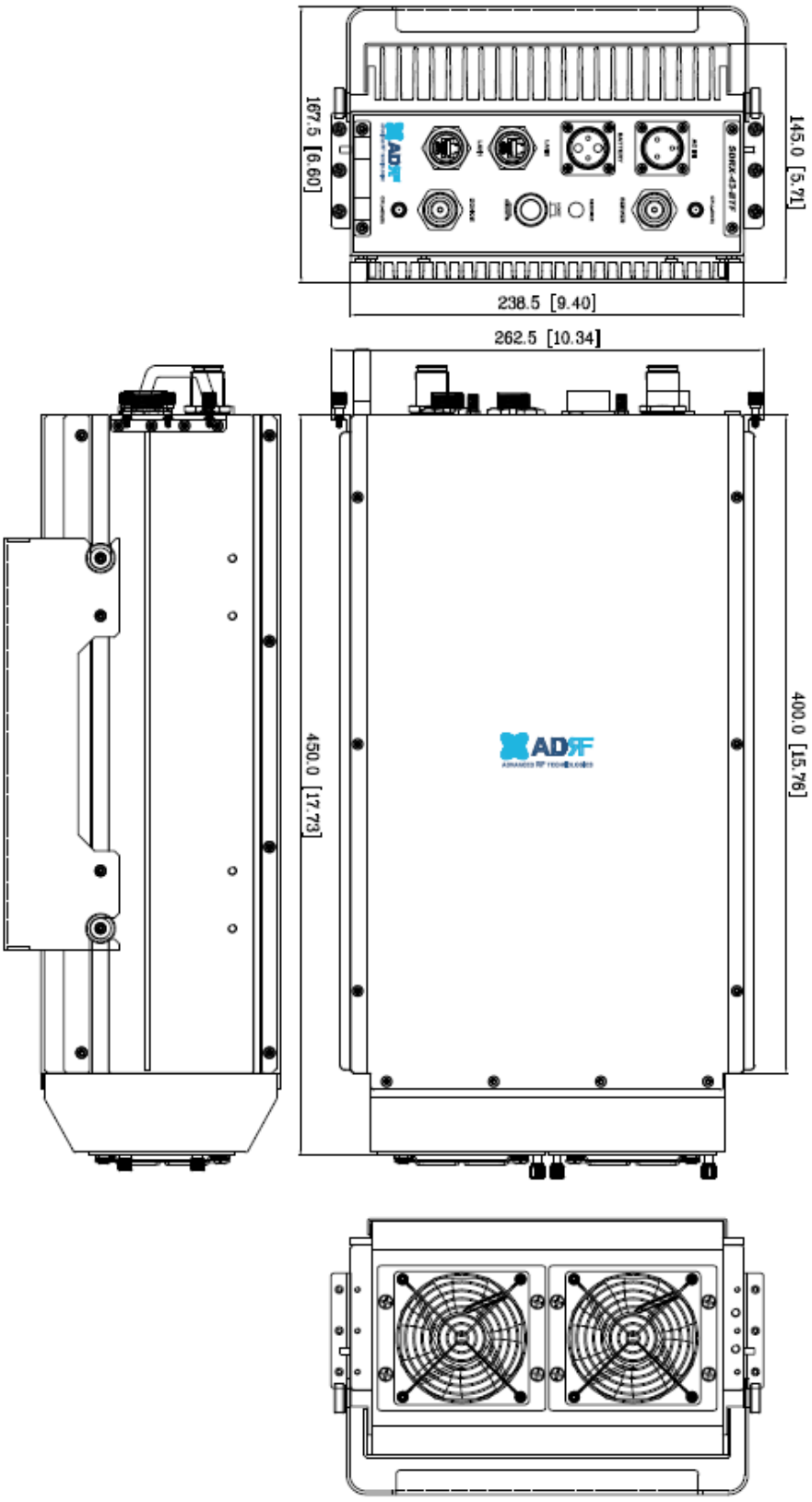


Figure 9-1 Mechanical Drawings

10. APPENDIX

10.1 Shutdown Retry Logic

The function of the built-in shutdown routine is to protect the repeater from any further damage from a hard-fail that the system may be experiencing.

Within 5 seconds of a hard-fail alarm being detected, the repeater will start the shutdown routine. The repeater will shut down by powering of the HPAs (high-powered amplifiers) for 30 seconds.

After 30 seconds have elapsed, the repeater will power on the HPAs and check to see if the hard-fail alarm still exist. If the hard-fail alarm still exists, then the repeater will shut down for 1 minute (double the time of the previous shutdown time).

After 1 minute has elapsed, the repeater will power on the HPAs and check to see if the hard-fail alarm still exist. If the hard-fail alarm still exists, then the repeater will shut down for 2 minutes (double the time of the previous shutdown time).

The shutdown routine will repeat itself a total of 10 times. If the hard-fail alarm still exists after the 10th retry, then the repeater will turn off its HPAs permanently until a reset is performed or factory set is executed.