



PSR-78-9533-NB Installation Manual

VERSION 0.1



3116 West Vanowen St.
Burbank, CA 91505
Tel: 818-840-8131
Fax: 818-840-8138
www.adrftech.com



*Information in this document is subject to change without notice.
Advanced RF Technologies, Inc. 1996-2019.
All rights reserved.*

Please send comments to:

E-Mail: info@adrftech.com

Phone: (818) 840-8131
(800) 313-9345

Fax: (818) 840-8138

Address:

Advanced RF Technologies, Inc.
Attention: Technical Publications Department
3116 Vanowen St.
Burbank, CA 91505
USA
www.adrftech.com

REVISION HISTORY

Version	Author	Descriptions	Date
0.1	ADRF	Initial Release	01/23/2026

CHANGE LIST

Version	Change list	Contents

TABLE OF CONTENTS

1.	Introduction	7
1.1	Highlights	7
1.2	Parts List.....	8
1.3	Quick View	9
1.4	Warnings and Hazards	10
2.	Installation	14
2.1	Wiring Compartment	14
2.2	Wire Terminals.....	15
2.2.1	AC 100-240V Terminal Block	15
3.	Overview	16
3.1	LED	16
3.2	Cable Connection.....	17
3.2.1	AC Power	17
3.2.2	External Alarm	18
3.2.3	RF.....	19
3.2.4	Annunciator	19
3.2.5	Battery Backup Terminal	20
3.2.6	EPO(Emergency Power Off).....	20
3.2.7	Grounding.....	21
4.	Alarms	22
4.1	Message Board Alarms and Notifications.....	22
4.2	External Alarms.....	22
4.2.1	External Alarm Output interface	22
5	Installation	23
5.1	Installation Procedures.....	23
5.1.1	Wall Mount Procedure	23
5.1.2	PSR-ANN-U2 Annunciator Installation.....	24
5.2	Antenna Separation/Isolation.....	26
6.	ADRF-BBu-W1 Installation	28
6.1	Installation Procedures	28

FIGURES

Figure 1-1	PSR-78-9533-NB Repeater Parts List	8
Figure 1-2	PSR-78-9533-NB External Ground Terminal	9
Figure 2-1	Wiring Compartment Cutout Holes.....	14
Figure 2-2	Terminal Wiring Diagram	15
Figure 2-3	AC 100-240V Terminal Block	16
Figure 2-1	LED Panel	16

TABLES

Table 1-1	Parts List	8
Table 2-1	Pre-cut hole size and labels	14
Table 2-2	Terminal Block Definition	16
Table 2-1	LED Specifications.....	16
Table 4-1	Message Board Alarms and Notifications.....	22

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
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
HPA	High Power Amplifier
HW	Hardware
IF	Intermediate Frequency
LNA	Low Noise Amplifier
LTE	Long Term Evolution
MS	Mobile Station
OFDM	Orthogonal Frequency-Division Multiplexing
OFDMA	Orthogonal Frequency-Division Multiple Access
PAR (PAPR)	Peak to Average Power Ratio (Crest Factor)
PLL	Phase Locked Loop
PSU	Power Supply Unit
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase Shift Keying
RB	Resource Block
RF	Radio Frequency
SC-FDMA	Single Carrier-Frequency Division Multiple Access
SQE	Signal Quality Estimate
SW	Software
UE	User Equipment
UL	Uplink
VSWR	Voltage Standing Wave Ratio

1. INTRODUCTION

PSR-78-9533-NB bi-directional amplifiers (BDAs) extend the coverage area of radio communications in buildings and RF shadow environments. These units feature low noise figure and wide dynamic range and are certified to UL 2524.

The PSR-78-9533-NB is a revolutionary digital public safety repeater designed to protect the lives of first responders and building occupants.

The PSR-78-9533-NB is the best-in-class public safety repeater and it is fully compliant with International Fire Code (IFC) and National Fire Protection Association (NFPA).

Product Features

- NFPA 1221 2016 code compliant and FirstNet compliant
- Alarming output to supervised circuits for: antenna, amplifier, power supply, battery, and charger failure
- IP66 compliant enclosure for both indoor and outdoor environments
- Class B wideband repeater designations
- Up to 95dB of gain and up to 33 dBm downlink output power per band and up to 30 dBm uplink output power per band

1.1 Highlights

- UL 2524 Certified
- Supports both 700MHz and 800MHz Public Safety Frequencies in a single repeater
- Supports a total of 2 wide band and up to 128 non-contiguous narrow band channels (700MHz + 800MHz PS)
- Air convection cooling without fans
- Sharp Filter Roll-off performance (Wide: 60dBc @ Filter Bandwidth Edge + 1MHz | Narrow: 55dBc @ Filter Bandwidth Edge + 3 * Filter BW)
- Supports SNMP v1, v2c, v3 (get and set)
- Web-based GUI Interface; No 3rd party GUI software required
- Web-GUI connectivity via DHCP in host mode
- External Alarm Function supporting dry contacts (14 outputs, 1 input)
- Support Emergency Power Off Switch
- EPO

1.2 Parts List

Table 1-1 Parts List

Label	Quantity	Description
A	1	PSR-78-9533-NB
B	1	Wall Mount Bracket
C	1	Mounting Bracket Template
D	1	Alarm Cable
E	1	EPO Cable
F	1	Ethernet Cable (Crossover)
G	5	Cable Gland 1/2inch
H	1	Cable Gland 1inch
I	4	Anchor Bolt

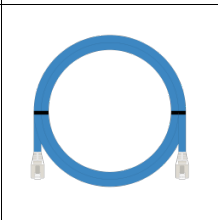
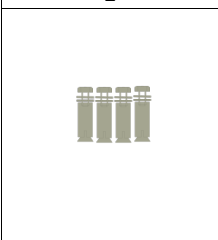
			
A	B	C	D
			
E	F	G	H
			
I			

Figure 1-1 PSR-78-9533-NB Repeater Parts List

1.3 Quick View

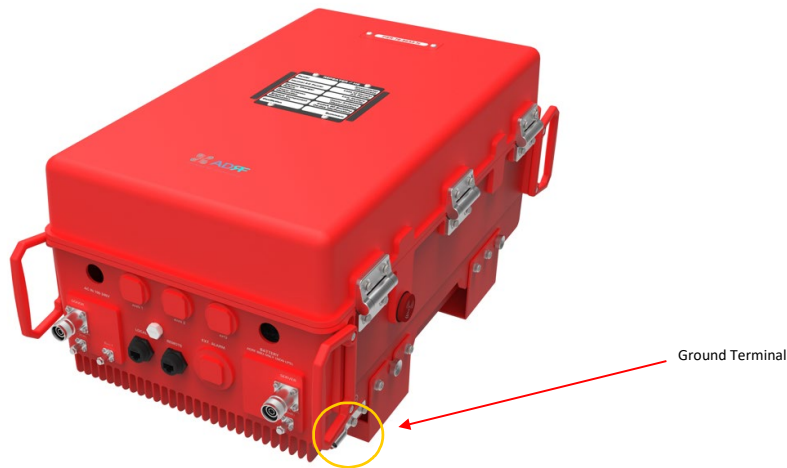


Figure 1-2 PSR-78-9533-NB External Ground Terminal

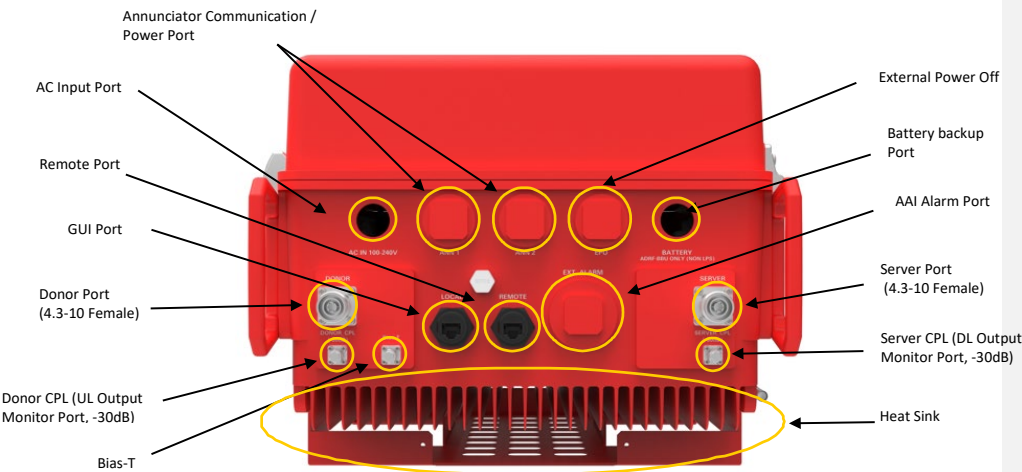


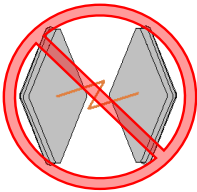
Figure 1-3 PSR-78-9533-NB Quick View (Bottom)

1.4 Warnings and Hazards



WARNING! ELECTRIC SHOCK

Opening the PSR-78-9533-NB could result in electric shock and may cause severe injury.



WARNING! DAMAGE TO REPEATER

Operating the PSR-78-9533-NB 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 70cm while operating near the donor and the server antennas. Also, the donor antenna needs to be mounted outdoors on a permanent structure.

WARRANTY

Opening or tampering the PSR-78-9533-NB will void all warranties.

Lithium Battery

- high or low extreme temperatures that a BATTERY can be subjected to during use, storage or transportation
- low air pressure at high altitude
- replacement of a BATTERY with an incorrect type that can defeat a SAFEGUARD
- disposal of a BATTERY into fire or a hot oven, or mechanically crushing or cutting of a BATTERY, that can result in an EXPLOSION
- leaving a BATTERY in an extremely high temperature surrounding environment that can result in an EXPLOSION or the leakage of flammable liquid or gas
- a BATTERY subjected to extremely low air pressure that may result in an explosion or the leakage of flammable liquid or gas

Operating Ambient Temperature: -40°F to +131°F (-40°C to +55°C)

Ethernet Instructions: This equipment is for indoor use only. All cabling should be limited to inside the building. Ethernet connection can only be used for programming/troubleshooting purposes only and is not to be connected during normal operation.

Preclude indications that Home/ personal use are prohibited.

Equipment is intended for installation in Restricted Access Area

Les matériels sont destinés à être installés dans des EMPLACEMENTS À ACCÈS RESTREINT

Permanently connected equipment

For PERMANENTLY CONNECTED EQUIPMENT the DISCONNECT DEVICE shall be incorporated in the equipment, unless the equipment is accompanied by installation instructions stating that an appropriate DISCONNECT DEVICE shall be provided as part of the building installation. The rated capacity of the circuit breaker to be installed is 20A.

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

FCC Part 15.21

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

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.

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 70 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Part 90 Signal Boosters

THIS IS A 90.219 CLASS B DEVICE

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. You **MUST** register Class B signal Boosters (as defined in 47 CFR 90.219) online at www.fcc.gov/signal-boosters/registration. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of \$100,000 for each continuing violation.

Power Reduction Warning Statement

This 3.5 dB back off is only required when multiple carriers are present in the pass-band.

RF Radiation Exposure

FCC RF Radiation Exposure Statement:

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 70 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.

2. INSTALLATION

2.1 Wiring Compartment

The bottom of the PSR-78-9533-NB is a wiring compartment with pre-cut holes. These holes are designed to be used in conjunction with conduit hubs to prevent water ingress. A total of 6 pre-cut holes are available to use for the various cables that will be needed for the proper operation of the repeater.

To maintain UL 2524 Listed status, unused ports must be properly weather proofed.

Table 2-1 Pre-cut hole size and labels

Silkscreen Label	Location	Diameter
AC 100-240V	BOTTOM	22.2mm (7/8")
ANN1	BOTTOM	22.2mm (7/8")
ANN2	BOTTOM	22.2mm (7/8")
EPO	BOTTOM	22.2mm (7/8")
BATTERY ADRF-BBU ONLY(NON LPS)	BOTTOM	22.2mm (7/8")
EXT. ALARM	BOTTOM	33.0mm (1-3/8")



Figure 2-1 Wiring Compartment Cutout Holes

2.2 Wire Terminals

Non-power limited cables such as the AC power line and the DC battery line shown below in red must be separated by $\frac{1}{4}$ " from power limited cables such as the donor/server, ext. alarm, and annunciator lines shown below in black. To maintain the $\frac{1}{4}$ " spacing, route the annunciator line above the server line as shown in the picture below.

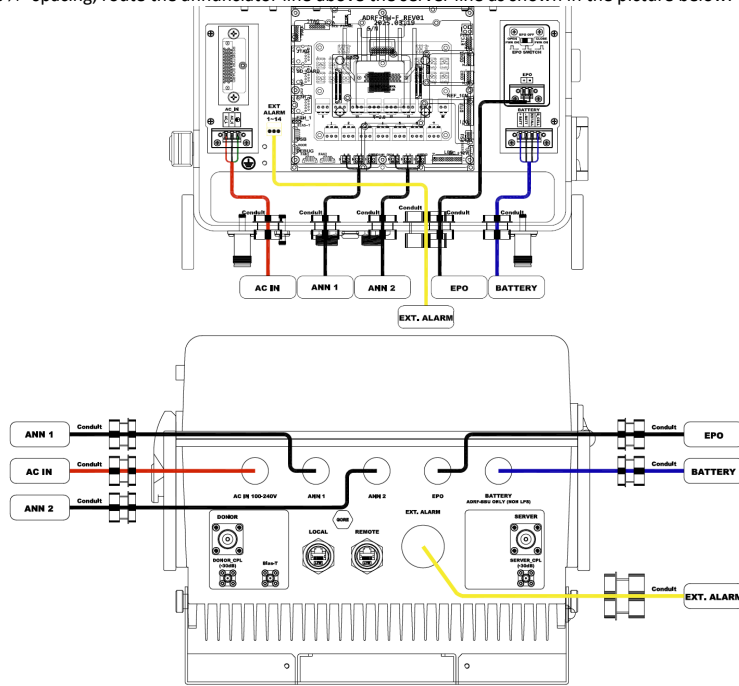


Figure 2-2 Terminal Wiring Diagram

2.2.1 AC 100-240V Terminal Block

The AC 100-240V Terminal Block is located on the left side of the wiring compartment. One side of the terminal block is pre-wired to the PSU and chassis ground. The open terminals must be connected to an AC power source (100-240V AC) via a UL-approved metal conduit and secured in an electrical breaker box on a dedicated circuit. The terminal block supports a wire gauge of 12 AWG. For safety compliance, the protective earthing wire connected to the AC terminal must be a minimum of 12 AWG.

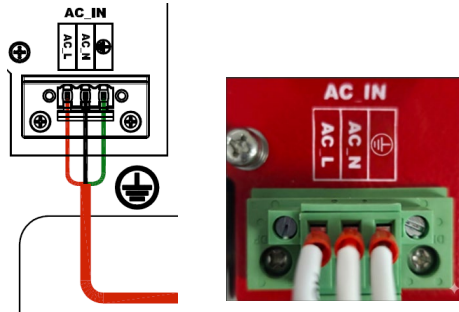


Figure 2-3 AC 100-240V Terminal Block

Table 2-2 Terminal Block Definition

Silkscreen Label	Line Type	Supported AWG
AC_N	Neutral	14AWG ~ 12AWG
AC_L	Line or Hot	14AWG ~ 12AWG
⏏	Ground	14AWG ~ 12AWG

3. OVERVIEW

3.1 LED

PSR-78-9533-NB LED indicator lights are located on the outside of the repeater towards the front. Below the LED indicators is a button that is used to trigger the door open alarm.

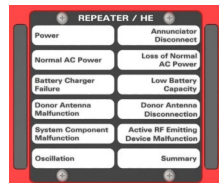


Figure 3-1 LED Panel

Table 3-1 LED Specifications

LED		Visual	Audible
Power			
Annunciator Disconnection			
Normal AC Power	AC-ON	Green (Normal)	Off(Normal)
Loss of Normal AC Power	AC-Fail	Red (Alarm)	ON(Alarm)
Battery Charger Failure	Battery Not Charge	Red (Alarm)	ON(Alarm)
	Low Battery	Red (Alarm)	ON(Alarm)
	Battery Fail	Red (Alarm)	ON(Alarm)
Low Battery Capacity	Low Battery	Red (Alarm)	ON(Alarm)
Donor Antenna Malfunction	Donor Antenna Malfunction	Red (Alarm)	ON(Alarm)
Donor Antenna Disconnection	Donor Antenna Disconnection	Red (Alarm)	ON(Alarm)
System Component Malfunction	Over Temperature hard fail System Halt DL/UL Out of Band Overload hard fail DSP Fail	Red (Alarm)	ON(Alarm)
Active RF Emitting Device Malfunction	DL RF Power soft fail DL/UL Out of Band Overload soft fail	Red (Alarm)	ON(Alarm)

	DL/UL Input Overload soft fail DL/UL Over Power soft fail DL VSWR hard fail DL Oscillation hard fail		
Oscillation	System Oscillation fail	Red (Alarm)	ON(Alarm)
Summary		Red (Alarm)	ON(Alarm)

LED Indicator	Specifications
Solid Green	Normal operation
Solid Yellow	Soft Fail alarm exists in the system
Solid Red	Hard Fail alarm exists in the system

3.2 Cable Connection

3.2.1 AC Power

The AC Terminal is located at the bottom of the wiring compartment on the opposite side of the wiring compartment door. The repeater has a free-voltage range input of 100-240V AC. The AC terminal box can support a max gauge of 12AWG and should be connected to the breaker box on its own circuit.



Figure 3-1 AC Terminal Block

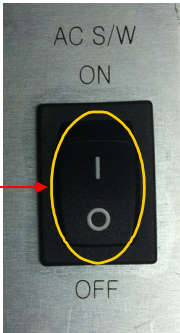


Figure 3-2 AC On/Off Switch

The AC Power on/off switch is on the left-hand side of the PSU which is located inside of the repeater.

3.2.2 External Alarm



Figure 3-3 External Alarm Port

This port should be connected only to the fire alarm control panel.

Table 3-1 External Alarm Port Pin Description

AAI Number	Connector Pin Number	Alarm Description	Selection Pin Description
1	1	Donor antenna malfunction	OPEN
1	2	Donor antenna malfunction	COM
1	3	Donor antenna malfunction	CLOSE
2	1	Active RF device malfunction	OPEN
2	2	Active RF device malfunction	COM
2	3	Active RF device malfunction	CLOSE
3	1	Low battery capacity	OPEN
3	2	Low battery capacity	COM
3	3	Low battery capacity	CLOSE
4	1	System component malfunction	OPEN
4	2	System component malfunction	COM
4	3	System component malfunction	CLOSE
5	1	Normal AC Power	OPEN
5	2	Normal AC Power	COM
5	3	Normal AC Power	CLOSE
6	1	Loss of normal AC Power	OPEN
6	2	Loss of normal AC Power	COM
6	3	Loss of normal AC Power	CLOSE
7	1	Battery charger failure	OPEN
7	2	Battery charger failure	COM
7	3	Battery charger failure	CLOSE
8	1	Donor Antenna Disconnect	OPEN
8	2	Donor Antenna Disconnect	COM
8	3	Donor Antenna Disconnect	CLOSE
9	1	ANN Disconnection	OPEN
9	2	ANN Disconnection	COM
9	3	ANN Disconnection	CLOSE
10	1	Summary Alarm	OPEN
10	2	Summary Alarm	COM
10	3	Summary Alarm	CLOSE
11	1	Oscillation Alarm	OPEN
11	2	Oscillation Alarm	COM
11	3	Oscillation Alarm	CLOSE

12	1	AAI Alarm Spare 1	OPEN
12	2	AAI Alarm Spare 1	COM
12	3	AAI Alarm Spare 1	CLOSE
13	1	AAI Alarm Spare 2	OPEN
13	2	AAI Alarm Spare 2	COM
13	3	AAI Alarm Spare 2	CLOSE
14	1	AAI Alarm Spare 3	OPEN
14	2	AAI Alarm Spare 3	COM
14	3	AAI Alarm Spare 3	CLOSE

3.2.3 RF



Figure 3-4 RF Ports

The RF connections are made via two N-type female connectors. The RF connector labeled “DONOR” must be connected to the antenna pointing towards the base station. The DONOR port can receive both 700 and 800MHz public safety signals. The RF connection labeled “SERVER” must be connected to the antenna facing the area to be covered by the BDA. The repeater has a single SERVER port that supports both 700 and 800MHz public safety signals.

The RF connections must be made using cables with an impedance of 50 ohms.

The separation between the antennas is necessary to prevent oscillation. Oscillation occurs when the signal entering the system continually re-enters, 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.

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.

- **DONOR** – N-type female which is used to connect the donor antenna (700MHz + 800MHz PS)
- **DONOR_CPL (30dB)** – SMA female 30 dB coupling port which is used to monitor the amplified UL signal
- **SERVER_CPL (30dB)** – SMA female 30 dB coupling port which is used to monitor the amplified DL signal
- **SERVER** – N-type female which is used to connect the server antenna (700MHz + 800MHz PS)

3.2.4 Annunciator

The Annunciator port provided power and communication to the PSR-ANN-U2 annunciator box. The PSR-ANN-U2 annunciator box provides a summary status of the repeater via LED indicator lights and an audible alarm.

The default length of the cable that is provided to connect to the PSR-78-9533-NB to the PSR-ANN-U2 is 2m (6.5ft). Additional cable lengths at 10ft, 20ft, and 33ft are available. The maximum distance of the cable between the PSR-78-9533-NB repeater and the PSR-ANN-U2 annunciator is limited to 20m (66ft).

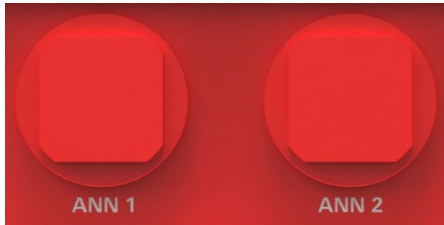


Figure 3-5 Annunciator Conduit Hole

3.2.5 Battery Backup Terminal

This port connects to the ADRF-BBU-W1 (24V battery backup unit) via a dedicated cable provided by the ADRF.



Figure 3-6 Battery Backup Terminal Block

When the ADRF-BBU-W1 is connected to the repeater, the battery switch on the PSU must be switched to the ON position. This will enable the repeater to charge the ADRF-BBU-W1 battery backup unit when AC power is present.



Figure 3-7 Battery Switch

The PSR-78-9533-NB can be connected to an ADRF-BBU-W1 to provide power during a power failure. If an ADRF-BBU-W1 is utilized, connect it to the PSR-78-9533-NB via the external battery port.

(WARNING: The circuit breaker switch on the ADRF-BBU-W1 must be set to OFF before connecting it to the PSR-78-9533-NB to prevent damage to the repeater or the ADRF-BBU-W1 and personal injury.)

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

3.2.6 EPO(Emergency Power Off)

This Terminal Block and switch can be configured to enable or EPO feature, depending on the user's needs. To use EPO, the user must install an external switch and connect it to this port.

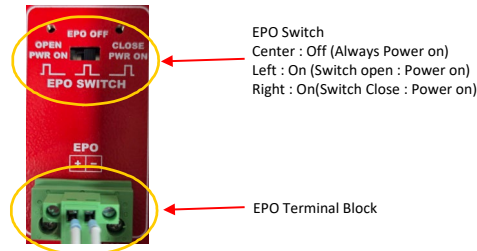


Figure 3-8 EPO Terminal Block

Set the switch to the left or right, depending on the type of switch (normally open or normally closed) connected to the EPO terminal block. (Left: Nominal Open, Right: Nominal Close) When the installed EPO switch is activated, the BDA powers off.

3.2.7 Grounding

The grounding terminal is located at the lower right-hand side of the BDA. A grounding cable should be properly connected before powering on the equipment.



Figure 3-10 Ground Cable Terminal

Ground terminals located on the side of the repeater and can support a ground cable up to 16mm² (6AWG) in diameter and should be permanently connected to a grounding bar.

4. ALARMS

4.1 Message Board Alarms and Notifications

Table 4-1 Message Board Alarms and Notifications

Alarm	Alarm Description	Trigger Condition
AC Fail	AC Input is outside of operating range	The power supply is not operating within specs. (4 seconds)
DC Fail	DC Output is outside of operating range	The power supply is not operating within specs. (4 seconds)
Temperature	The module is above/below the normal operating temperature	The module is above the normal operating temperature. (4 seconds) Over Temperature [Soft: 80~87 C, Hard: Above 87 C]
Current	PSU is providing more than the max current	The power supply is not operating within specs. (4 seconds) Over Current [Hard: Above 20A]
System Halt	The system is in a shutdown state due to a hard fail alarm	The system is in a shutdown state due to a hard fail alarm. (10 cycles)
DSP Fault	The system has detected an issue with the internal DSP	The system has detected an issue with the internal DSP chip. (Cannot communicate with DSP)
OSC	Oscillation detected	Oscillation detected.
DL Signal not detected	DL signal is below the specified level	DL signal is below the specified level. (default: -90dBm, 4 seconds)
DL Signal Low	DL signal is below the specified level	DL signal is below the specified level. (default: -85dBm, 4 seconds)
Input Overload	Incoming in-band DL or UL signal is too strong	Input signal is above the threshold. (4 seconds) (Soft: DL -5dBm/UL -5dBm, Hard: DL +5dBm/UL +5dBm)
Out of band Overload	Incoming out-band DL or UL signal is too strong	Out of band signal is above the threshold. (4 seconds) (Soft: DL -5dBm/UL -5dBm, Hard: DL +5dBm/UL +5dBm)
Synthesizer Lock Fail	There is an issue with the internal PLL	There is an issue with internal PLL. (4 seconds)
DL RF Power	Input + gain does not match the output level (above delta of 6 dB)	Input + gain does not match the output level. (default delta of 6 dB)
Overpower	The output level is above the max output levels	The output level is above the max output levels. AGC On case (Soft: AGC Level + 1~2dB, Hard: AGC Level + >2dB) AGC Off case (Soft: max output level + 1~2dB, Hard: max output level + >2dB)
VSWR	Power is being reflected back to the repeater	Power is being reflected back to the repeater. Threshold = output power - 8dB. For example, if the repeater is outputting 24dBm and detects 16dBm of return power, then the VSWR will be triggered. (Alarm will only trigger when the output power is 15dBm or greater)
Heartbeat	Heartbeat is sent out to the NOC	Heartbeat sent at set interval.
Reboot	Soft reboot performed	Reboot is performed from the Control tab.
Factory setting	Factory default settings restored	Factory setting is set from the Control tab.
Door	Door alarm set/clear	Door alarm set: Door open Door alarm clear: Door close

4.2 External Alarms

The PSR-78-9533-NB supports dry contact alarms and can be connected to a fire alarm control panel. The user can program the repeater to either create an open or closed circuit when an alarm is present in the system.

4.2.1 External Alarm Output interface

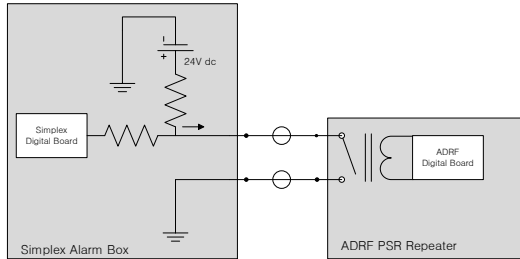


Table 4-2 External Alarm

External Alarm Name	Set Condition	Likely Causes
Donor Antenna Malfunction	- UL Return Power Hard Fail	- Damaged Donor Antenna
Active RF Device Malfunction	- RF Power Soft Fail	- Degrading Amplifier
	- DL Return Power Hard Fail	- Open or Disconnected Server Port
	- DL/UL Over Power Hard Fail	- Oscillation
	- DL/UL Input Overload Hard Fail	- Strong RF Input Signal
Low Battery Capacity (70% depleted)	- Low Battery Soft Fail	- Battery Depleted
System Component Malfunction	- Over Current Hard Fail	- Faulty or Damaged PSU
	- Over Temperature Hard Fail	- Ambient Temperature
	- DSP Hard Fail	- DSP Filter Fault
	- Out-band Overload Hard Fail	- Strong RF Input Signal
Normal AC Power	- AC Normal Set	- Powered by AC Power
Loss of Normal AC Power	- AC Fail Soft Clear	- Powered by DC Power
	- AC Normal Clear	- Powered by AC Power
Battery Charger Failure	- Battery Fail Soft Fail	- Low Battery Charging Voltage
	- Battery Not Connected Soft fail	- Battery Cable Disconnected
	- Battery Not Charge Soft Fail	- Degraded Batteries
Summary Alarm	- Any Active Alarm	- Any Active Alarm Present in the System
Donor Antenna Disconnect	- No DL Signal Detected	- Disconnected Donor Line
Oscillation Alarm	- Oscillation Hard Fail	- Gain Set Too High or Lack of Isolation
Annunciator Disconnect	- Annunciator Disconnect Hard Fail	- Disconnected PSR-ANN-U2

5 INSTALLATION

5.1 Installation Procedures

5.1.1 Wall Mount Procedure

- Verify that the PSR-78-9533-NB and mounting holes are in good condition
- Place the PSR-78-9533-NB mounting bracket template up against the wall and mark off mounting holes
- Drill the appropriate size holes and install the included wall anchors
- Remove the wall mount bracket from the repeater and bolt the wall mount bracket to the wall
- Place the repeater onto the wall mount bracket and secure the bracket to the repeater
- Connect the GND cable

메모 포함[AK1]: 중계기와 Bracket 을 연결하는 Screw 의 사이즈와 제공되는 수량 포함되어야 합니다.

- Connect the Antenna cables
- Connect the Power cable
- M6 Screw x 8EA

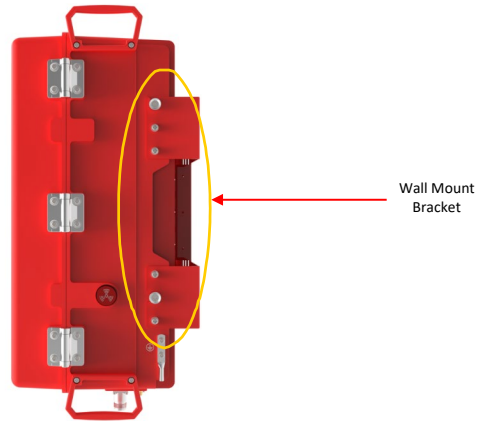


Figure 5-1 Wall Mount

5.1.2 PSR-ANN-U2 Annunciator Installation

The PSR-ANN-U2 annunciator box also be wall mounted separately. Once the PSR-ANN-U2 annunciator box has securely mounted, connect the included power/data cable from the side of the PSR-ANN-U2 box to the port labeled Annunciator on the PSR-78-9533-NB.

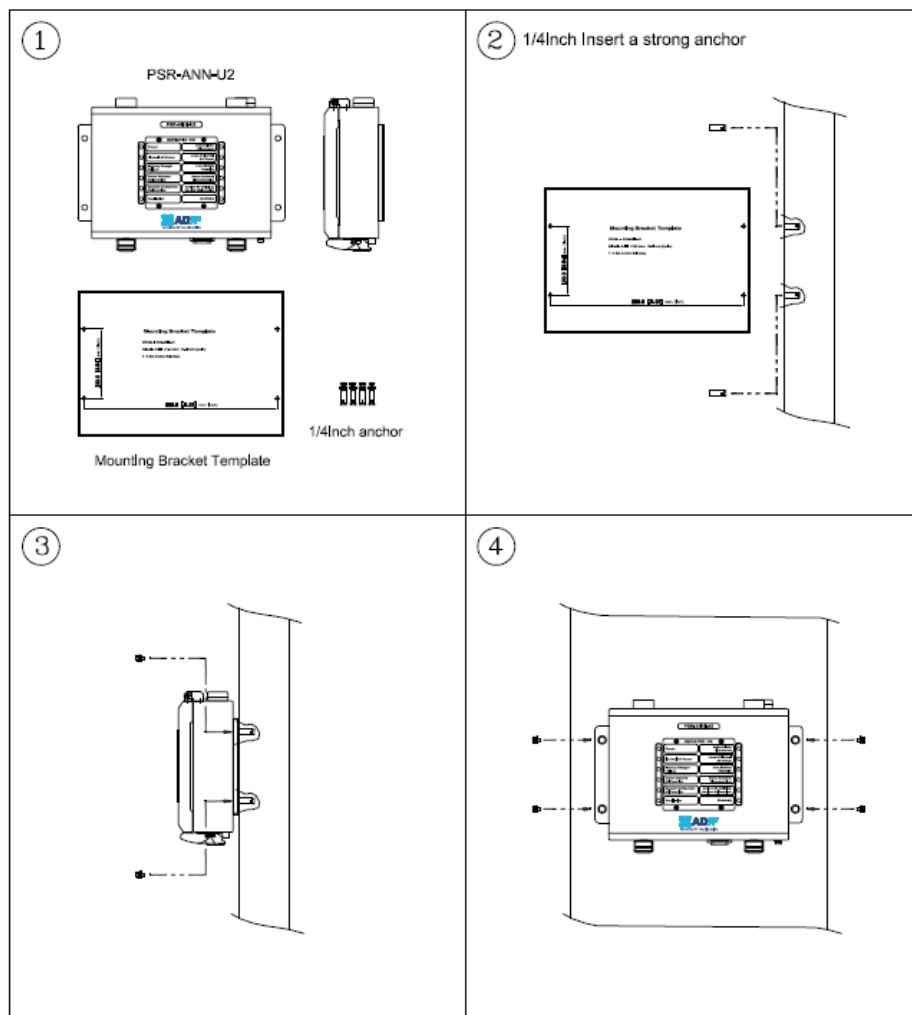


Figure 5-2 PSR-ANN-U2 Wall Mount

5.2 Antenna Separation/Isolation

The separation between the donor and server antennas is necessary to prevent oscillation. Oscillation occurs when the signal entering the system continually re-enters, 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.

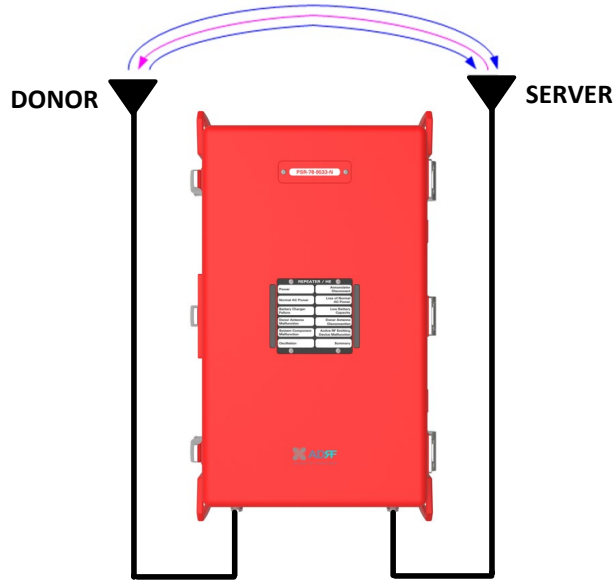


Figure 5-3 RF Repeater Oscillation

To prevent feedback, the donor and server antennas must be separated by an appropriate distance to provide sufficient isolation. Isolation can be attained by separating antennas at 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.

Recommended isolation value is 15dB greater than the user-set gain of the repeater. For example, if the user-set gain of the repeater is 50dB, then isolation of 65dB or greater is required. In the same manner, to utilize the maximum gain of 95dB of the PSR-78-9533-NB, isolation of at least 110dB is required.



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.

DO NOT APPLY AC POWER TO THE BDA UNTIL CABLES ARE CONNECTED TO BOTH PORTS OF THE BDA AND THE ANTENNAS.

1. To mount on a wall. Using appropriate screws and anchors attach the BDA to the wall at the four mounting holes.
2. Ensure that the isolation between the donor antenna and the serving antennas is at least 15 dB greater than the BDA gain.
3. Connect the cable from the donor antenna to the BDA connector labeled "DONOR" and the cable from the serving antennas to the BDA connector labeled "SERVER".
4. Connect the AC power cord to the BDA and turn on the switch at the left of PSU.
5. Installation of the BDA is now complete. Adjust the gain controls to suit the specific signal environment through the GUI on your PC.

6. ADRF-BBU-W1 INSTALLATION

6.1 INSTALLATION PROCEDURES

The ADRF-BBU-W1 battery backup unit houses two 12V batteries that are connected in series to have a nominal voltage of 24VDC. The battery charger is built into the PSU located inside of the PSR-78-9533-NB. When the system is being powered by AC, the PSU will charge the ADRF-BBU-W1 battery backup. When there is a loss of primary power (AC), then repeater will switch over to the secondary power (DC) provided by the battery backup. Once the primary power is restored, the PSR-78-9533-NB will switch back to operating with AC power and will resume charging the battery backup.

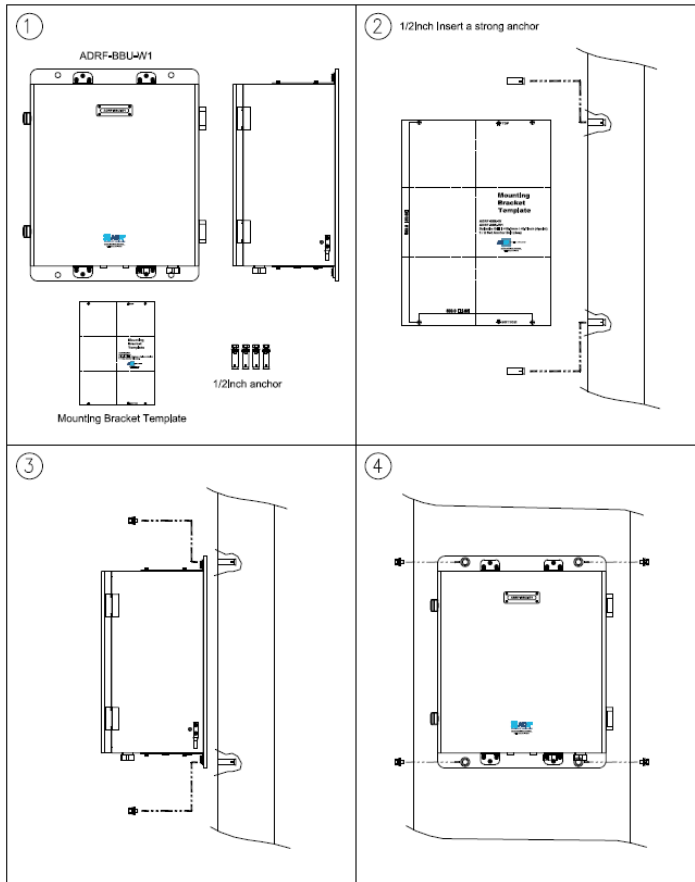
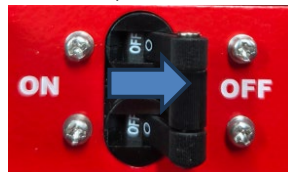


Figure 6-1 ADRF-BBU-W1 Wall Mount

1. Verify that the repeater has been properly grounded.



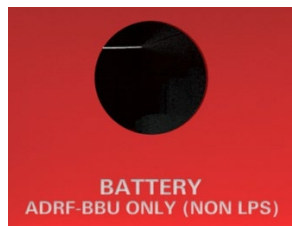
2. Use the included key to unlock the door latches to open the ADRF-BBU-W1.
3. On the ADRF-BBU-W1, set the power switch to the OFF position.



4. On the PSR-78-9533-NB, verify that both **AC** and **BATT** switches have been set to the OFF position.



5. Use the provided battery backup cable from the ADRF-BBU-W1 and connect the wires to the terminal block located inside of the wiring compartment of the PSR-78-9533-NB.



6. Install a conduit hub connector that can support 7/8" onto the PSR-78-9533-NB hole labeled BATTERY and snake the cable through the conduit.



7. Install a conduit hub connector that can support 7/8" onto the ADRF-BBU-W1 hole labeled BATTERY.



8. Open the wiring compartment of the ADRF-BBU-W1 and wire the battery cable to the terminal block.



9. On the PSR-78-9533-NB, wire the AC terminal block to your dedicated circuit breaker



10. On the PSR-78-9533-NB, flip the **POWER** and **BATT** switch to the ON position.



11. On the ADRF-BBU-W1, set the circuit breaker to the ON position

