

SDR Modular Repeater USER MANUAL

Version 0.4





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



Glossary

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
BTS	Base Transceiver Station
CDMA	Code Division Multiple Access
CFE	Compact Front End
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
HPA	High Power Amplifier
HW	Hardware
IF	Intermediate Frequency
LNA	Low Noise Amplifier
LTE	Long Term Evolution
MS	Mobile Station
PLL	Phased Locked Loop
PS	Power Supply
RF	Radio Frequency
SQE	Signal Quality Estimate
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



Released version: 0.4

Information in this document is subject to change without notice. Advanced RF Technologies, Inc. 1996-2011. 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	Description	Date
0.1	Sun Kim	Initial Release	January 18, 2011
0.2	Sun Kim	Revised max gain levels for SMR module	May 10, 2011
0.3	Sun Kim	Revised Band Selection section on the Install Page	July 15, 2011
0.4	Sun Kim	Update illustrations and changes to specifications;	July 19, 2011
		added Closeout Package, User Log, and Backup	
		sections	



TABLE OF CONTENTS

1. SDR REPEATER	6
1.1 Introduction	6
1.1.1 Highlights	6
1.1.2 Parts List	7
1.1.3 Repeater Quick View	1
2. WARNINGS AND HAZARDS	9
3. SDR OVERVIEW	
3.1 Switches & Fault Indicators	11
3.1.1 NMS and Module LED	11
3.1.2 Module LEDs	11
3.1.3 Message Board Alarms and Notification	12
3.2 Switches and Ports	13
3.2.1 Power Switch	13
3.2.2 Back Up Battery Switch & Battery Port	13
3.2.3 Ethernet Port and Host/Remote Switch	14
3.2.4 RF Ports	14
3.5 Installation	15
3.5.1 Wall Mount Procedure	15
3.5.2 Rack Mount Procedure	15
3.5.3 Grounding	1
3.5.4 Antenna Separation/Isolation	17
3.5.5 Line of Sight	18
4. SDR WEB-GUI SETUP	19
4.1 Repeater/PC Connection Using Web-GUI	19
4.2 Status Tab	
4.2.1 Status- NMS	
4.2.2 Status- SMR, PCS, BRS	
4.3 Control Tab	25
4.3.1 Control- NMS	25
4.3.2 Control- SMR, PCS, BRS	
4.4 Install Tab	
4.4.1 Install- NMS	
4.4.2 Install- SMR	
4.4.3 Install- PCS	
4.4.4 Install- BRS	35
4.5 System	
4.5.1 System- Account	
4.5.2 System- Closeout Package	
4.5.3 System- User Log	
4.5.4 System: Update	
4.5.5 System- Backup	



4.6 Help	40
4.7 Logout	40
Clicking the Logout button will log the current user off the system.	40
5. MAINTENANCE GUIDE FOR SDR REPEATER	41
5.1 Periodic Inspection Checklist	41
5.2 Preventive Measures for Optimal Operation	41
5.2.1 Recommendations	41
5.2.2 Precautions	41
6. WARRANTY AND REPAIR POLICY	42
6.1 General Warranty	42
6.2 Limitations of Warranty	42
6.3 Limitation of Damages	42
6.4 No Consequential Damages	42
6.5 Additional Limitation on Warranty	42
6.6 Return Material Authorization (RMA)	42
7. SPECIFICATIONS	43
7.1 Electrical Specifications	43
7.2 Mechanical Specifications	43
7.3 Power Specifications	44
7.4 Environment Specifications	44
7.5 Warranty & Certificates	44
APPENDIX A: MECHANICAL DRAWING	46
APPENDIX B: SHUTDOWN RETRY LOGIC	47



1. SDR Repeater

1.1 Introduction

Four technologies in one body: SDR is an over-the-air repeater system that can incorporate up to four (4) technologies in one body. Current supported technologies are SMR800, SMR900, PCS, and BRS.

1.1.1 Highlights

- Supports up to 4 frequency bands simultaneously
 - Covers the SMR800, SMR900, PCS, and BRS, LTE, Cellular, AWS bands
 - [SDR-S]SMR800- Covers 18 MHz
 - SMR900- Covers 5 MHz
 - [SDR-P]PCS- Covers 65 MHz
 - 3 independent RF PCS channels, each channel supports 1.25 to 18.75 MHz bandwidth
 - [SDR-B] BRS- Covers 30 MHz
 - [SDR-700]LTE- Covers A+B:12MHz , C:11MHz
 - [SDR-C]Cellular- Covers 25MHz
 - [SDR-A] AWS- Cover 45MHz
- Composite Output Power of 24 or 30 dBm
- 30 dB AGC Range @ 0.5 dB Step
- Adjustable AGC Output Power Level
- Adjustable ALC Level
- Band Selectable via Web-GUI
- Can Support up to 3 Non-Contiguous Bands on the PCS module
- · Supports Network Management Monitoring System via SNMP
- Adjustable FA (3 channels)
- Digital filtering
- Incremental Automatic Shutdown/Resumption Time: SDR gradually increases the time span between
 automatic shutdown and resumption before it permanently shuts itself down
- Versatility and Usability: SDR gives total control to the user. Most of the control parameters, e.g., gain, output
 power, alarm threshold, etc. can be changed using the Web-GUI so that the user can adjust the system
 perfectly to the given RF environment
- Web-GUI connectivity via DHCP
- Supports DHCP; No 3rd party GUI software required
- Automated installation



1.1.2 Parts List

Label	Quantity	Description			
A	1	SDR Network Management System (NMS)			
В	Up to 3*	Optional SDR Modules*			
С	1	AC Power Cable			
D	1	Ethernet Cable (Crossover)			
E	1	Documentation CD**			
F	1	Ground Cable			
G	3	Channel Data Cable			
Н	1	Dipole Antenna			
	1	NMS Power Cable			
J	6	Anchor Bolt			

Table 1 – Parts List



* At least 1 module must be present in order to use SDR ** CD includes: User Manual, Quick-Start Guide, and Troubleshooting Guide

Figure A – SDR Repeater Parts List











WARRANTY

Opening or tampering the SDR 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.



3. SDR Overview

3.1 Switches & Fault Indicators

3.1.1 NMS and Module LED



Figure 1: NMS LED

SDR-NMS		Specifications		
Power	Solid Green	NMS power is ON		
	OFF	NMS is powered OFF		
CH-1, CH-2, CH-3,	Solid Green	Module has communication with NMS		
CH-4	Solid Red	Module has a communication failure with NMS		
	OFF	Module is powered OFF		

3.1.2 Module LEDs

SDR has LEDs on the front of the module as shown below in Figure 2.



Figure 1: Module LED

SDR-Module		Specifications			
Power	Solid Green	Module power is ON			
	OFF	Module is powered OFF			
Soft Fail	Solid Yellow	Soft Fail alarm exist in the system			
	OFF	No Soft Fail alarm are present in the system			
Hard Fail	Solid Red	Hard Fail alarm exist in the system			
	OFF	No Hard Fail alarms are present in the system			
RSSI	Input < -85dBm	Zero (0) bar On			
	Input < -75dBm	One (1) bar On			
	Input < -65dBm	Two (2) bars On			
	Input < -55dBm	Three (3) bars On			
	Input < -45dBm	Four (4) bars On			
	Input >= -45dBm	Five (5) bars On			



3.1.3 Message Board Alarms and Notification

Parameters	Remark		
Communication failure	Internal Communication failure		
RMF	Field replaceable module failure		
RESET	Reset alarm		
Heartbeat	Heartbeat		
OSC	Oscillation detected		
UL RSSI fail	Power at coverage port too high		
UL PLL fail	UL Synthesizer failure		
H/W fail	Hardware failure		
S/W fail	Software failure		
UL Emission fail	UL Out-of-band emissions out of spec		
DL RSSI fail	Donor Power too high/low		
ISO fail	Low isolation		
DL PLL fail	DL Synthesizer failure		
DL Spur fail	DL Spurious emissions out of spec		
Interfere	Interferer power exceeded		
Link Fail	Communication error between the module and NMS		
Over Temperature	Module is above the normal operating temperature		
Under Temperature	Module is below the normal operating temperature		
Fan Fail	System has detected an issue with the fan		
System Halt	System is in a shutdown state due to a hard fail alarm		
DL Signal not detected	DL signal is below the specified level		
DL Signal Low	DL signal is below the specified level		
Outband overload	System has detected a strong out of band signal		
Input overload	In-band incoming signal strength is above max input level		
Synthesizer Lock Fail	Issue with internal system amp		
DSP Fault	System has detected an issue with the internal DSP chip		
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		
DL Oscillation Alarm	Oscillation has been detected in the system		
VSWR	Power is being reflected back to the repeater		
AC Fail	Power supply is not operating within specs		
DC Fail	Power supply is not operating within specs		
Over Current	Power supply is not operating within specs		



3.2 Switches and Ports

3.2.1 Power Switch

The AC Power on/off switch is located at the back of each individual module. Each module must be powered on separated. The switch should be powered on after the repeater has been installed properly.



Figure 2: SDR Repeater Power Switch View

3.2.2 Back Up Battery Switch & Battery Port



The SDR module 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 SDR via the external battery port as shown in Figure 4.

(WARNING: The circuit switch on the ADRF-BBU must be set to OFF before connecting the ADRF-BBU to the SDR 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.



3.2.3 Ethernet Port and Host/Remote Switch

Ethernet Port

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

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 adjusting by logging into the repeater in HOST mode and configuring the settings under the Modem Box Setting section on the Install Page (section 4.4). Once the settings are set, flipping 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.*



Figure 4: Ethernet Port and Host/Remote Switch

3.2.4 RF Ports

Module RF Ports

Donor and server antennas can be connected directly to the modules or the optional SDR-CHC (channel combiner) can be used to split or combine signals.





Figure 5: RFU RF port

Optional SDR-CHC

An optional channel combiner can be mounted directly above the SDR. The donor portion of the SDR-CHC can be used to split up a combine donor signal into PCS, BRS, and SMR. The server portion of the SDR-CHC can be used to combine the server signals (PCS, BRS, 2.4 GHz WIFI, and SMR) into the Server Sum port. Please contact <u>sales@adrftech.com</u> if you are interested in purchasing the SDR-CHC.



Figure 6: Donor Combiner RF port



3.5 Installation

- 3.5.1 Wall Mount Procedure
 - Verify that the SDR and mounting hole are in good condition
 - Remove all SDR modules from the system
 - Place the SDR chassis up against the wall so that that module's RF ports face the ceiling
 - Mount the SDR chassis to wall use the six (6) mounting hold on the wall mount bracket
 - Install the SDR modules into the chassis and secure the module by tightening the four (4) hand screws
 - Connect the power and data cables at the bottom on the SDR
 - · Connect the GND cable
 - Connect the Antenna cable
 - Connect the Power cable



- · Verify that the SDR and mounting hole are in good condition
- Remove all SDR modules from the system
- · Install the SDR chassis into the 19" rack mount system
- Screw the SDR chassis into the 19" rack mount system using the eight (8) mounting holes
- Install the SDR modules into the chassis and secure the module by tightening the four (4) hand screws
- · Connect the power and data cables at the back of the SDR
- Connect the GND cable
- Connect the Antenna cable
- Connect the Power cable







3.5.3 Grounding

Install the ground cable that has been included in the package at the back of the repeater as show in the figure below.



Figure 8: Ground Cable Connection



3.5.4 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 9: 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.

A sufficient isolation value is 13 \sim 15 dB greater than the maximum gain of the repeater. For example, if the gain of the repeater is 50 dB, then an isolation of 63 \sim 65 dB or greater is required. In the same manner, because the SDR has a maximum gain of 90 dB in case of SDR-24, it requires an isolation of at least 103 \sim 105 dB.



3.5.5 Line of Sight

The donor antenna which points towards the base station 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 12 - Direct Line of Sight to the BTS



4. SDR 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 internal modem or an Omnibox (ADRF Modem Box) connected to the repeater.

4.1 Repeater/PC Connection Using Web-GUI

- A. 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 A and B.
- B. Connect the RJ-45 crossover cable between the laptop's Ethernet port and the repeater's Ethernet port
- C. Launch an Internet Browser
- D. Type the following IP address into the address bar of Microsoft Internet Explorer: <u>http://192.168.63.1</u>
 If you are connecting to the unit remotely, then type the IP address of the modem to connect to the unit
- E. The following login screen will appear:

	Status Control Install System Help Logout
ADVANCED RF TECHNOLOBIES	AROMS Login
ADRF Site ID : ADRF	Username:
	Password:
	Login
	Copyright © 1999-2010 Advanced RF Technologies, Inc. 3116 Vanowen St • Burbank, CA 91505 • U.S.A.

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 And the Administrator User is admin & admin, respectively



4.2 Status Tab



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 if there are any alarms present on any of the modules.

4.2.1.1 Navigation Bar

NMS
SMR-1
PCS-2
BRS-3
EMPTY

The navigation bar 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.

4.2.1.2 System Summary

	Connected Device	Alarm		Install Status
ALL DE	[1] SDR-30-S8/9	-	Normal	Not installed
	[2] SDR-30-P	-	Soft Fail	Not installed
	[3] SDR-30-B	-	Hard Fail	Not installed
SYSTEM	[4] EMPTY	-	Em	pty

The system summary provide a snapshot of the system is currently performing.

- Connected Device- Displays what modules are connected to the SDR-NMS. Clicking on the buttons in the column will take you to the Status page of that module.
- Alarm- Displays the current alarm status of the individual modules



• Install Status- Displays the installation status of the module

4.2.1.3 Message Board

Displays the system events of all connected modules.

011-01-19 08:34:00	[MCU] Service Ir	nitiated	
011-01-19 07:13:00	[MCU] Service In	nitiated	
			/

4.2.1.4 Repeater Info / Modem Info / Technical Support / Installer Contact Info

Repeater S/N	P-SDR30-110001
Latitude	
Longitude	
Firmware	26100F01003X0038
Web GUI	0.0.21
lodem Info	



Installer Contact Info Company: Installer: Phone: E-mail:

- Repeater Info- Displays the serial number, latitude, longitude, and firmware version of the repeater
- Modem Info- If an internal modem is present, the modem information appears in this section
- Technical Support- Displays ADRF's Technical Support contact information
- Installer Contact Info- Displays the contact information of the installer



4.2.2 Status- SMR, PCS, BRS

DVANGED RF TECHNOLOGIES	EMB Rand				ADRF Remote Opera	tion & Management System
DR-30-58/9	SIMR ballu			Message Board	Repeater Init	,
e ID : ADRF-SMR	Band	Downlink	Uplink	2011-08-12 10:21:27 [BRS-3] Oscillation Shutdowr	Repeater S/N	TEST
	2.50 MHz	853,300 MHz	808.300 MHz	2011-08-12 10:21:27 [BRS-3] Downlink RSSI Alarm 2011-08-12 10:21:13 [BRS-3] Service Initiated	Latitude	
				2011-08-12 10:21:10 [MCU] Service Initiated	Longitude	
				2011-08-12 10:21:01 [PCS-2] Downlink Signal Low 🗏	Eireauara	26100E01002V0062
15	Power & Gain			2011-08-10 11:49:27 [BRS-3] Oscillation Shutdowr	T II TIMATE	20100301003/0005
R-1	SMR	Downlink	Uplink	2011-06-10 11:49:27 [BRS-3] Downink RSST Alarm 2011-08-10 11:49:14 [BRS-3] Service Initiated	Web GUI	X0.0.33
	Terrish [dDes]	-		2011-08-10 11:49:00 [MCU] Service Initiated		
3-2	Tubac [apm]		,-	2011-08-10 11:49:02 [PCS-2] Downlink Signal Low	Modem Info	
łS-3	Gain [dB]			2011-08-10 11:43:47 [BRS-3] Oscillation Shutdown 2014 09 10 11:43:47 [BRS-3] Downlink BSSI Marm	Repeater Loc	ation
РТҮ	Peak Detector			2011-08-10 11:43:33 (BRS-3) Downlink RSs1 Alarm		
	[dBm]	,-	,-	2011-08-10 11:43:09 [PCS-2] Downlink Signal Low		
				2011-08-10 11:43:08 [SMR-1] Service Initiated		
	System	RF Alarm	Power Alarm	2011-08-10 11:43:08 [PCS-2] Downlink Signal Not De	Technical Sup	port
nced RF Technologies, Inc.	System		101101110	2011-08-10 11:43:05 [PC3-2] Service Initiated	Phone: 1-800-313	3-9345
es innovative coverage	Link Fail			2044 00 40 44-00 45 EDC 01 0	E-mail: techsupp	ort@adrftech.com
ders around the world.	Over Temper	ature				
	u t T			Clear Log File		
ss Coverage	Under Temper	acure			Installer Cont	act Info
Never Been So Easy	Fan Fail			Modem 🥎	Company:	
	System Ha	alt		Not Solo Disabled	Phone:	
				Installed	E-mail:	
	Normal 9	Joft Fail Hard	Fail Link Fail			
	Copyright © 1999-2 Toll Free Number (1	010 Advanced RF T -800-313-9345) tec	"echnologies, Inc. 3 chsupport@adrftech.	116 Vanowen St - Burbank, CA 91505 - U.S.A. om http://www.adrRech.com Status- SMR		
	Status Con	ntrol Install	System	Help Logout		AROM
	Status Con PCS Band	ntrol Install	System	Help Logout	ADRF Remote Op Repeater I	AROM: peration & Management Sys

Site ID : ADRF-PCS

NMS	
SMR-1	
PCS-2	
BRS-3	
EMPTY	

Advanced RF Technologies, Inc. supplies innovative coverage solutions to leading wireless service providers around the world.

Wireless Coverage Has Never Been So Easy

PCS Band			Message Board	
Band		Uplink	2011-08-12 10:21:27 [BRS-3] Oscillation Shutdowr	
13.75 MHz	1,936.875 MHz	1,856.875 MHz	2011-08-12 10:21:27 [BRS-3] Downlink RSSI Alarm	
()			2011-06-12 10:21:13 [bKS-3] Service Initiated 2011-08-12 10:21:00 [MCU] Service Initiated	
9444			2011-08-12 10:21:01 [PCS-2] Downlink Signal Low = 2011-08-10 11:49:27 [BRS-3] Oscillation Shutdowr	
Power & Gain			2011-08-10 11:49:27 [BRS-3] Downlink RSSI Alarm 2011-08-10 11:49:27 [BRS-3] Downlink RSSI Alarm 2011-08-10 11:49:14 [BRS-3] Service Initiated	
		Uplink	2011-08-10 11:49:00 [MCU] Service Initiated 2011-08-10 11:49:02 [PCS-2] Downlink Signal Low I	
Input [dBm]		1995	2011-08-10 11:43:47 [BRS-3] Oscillation Shutdowr	
Gain [dB]	90.0	90.0	2011-08-10 11:43:47 [BRS-3] Downlink RSSI Alarm 2011-08-10 11:43:33 [BRS-3] Service Initiated	
Peak Detector [dBm]		1995	2011-08-10 11:43:09 [PCS-2] Downlink Signal Low 2011-08-10 11:43:08 [SMR-1] Service Initiated 2011-08-10 11:43:08 [PCS-2] Downlink Signal Not Dr	
			2011-08-10 11:43:05 [PCS-2] Service Initiated	
System	RF Alarm	Power Alarm	2011-08-10 11:43:00 [MCU] Service Initiated	
Link Fail				
Over Temper	ature		Clear Log File	
Under Tempe	rature		Modem D	
Fan Fai			Not Sisabled	
System H	alt		Installed	

Copyright © 1999-2010 Advanced RF Technologies, Inc. | 3116 Vanowen St. • Burbank, CA 91505 • U.S.A. Toll Free Number (1-800-313-9345) | techsupport@adritech.com | http://www.adritech.com

Status- PCS

Repeater S/N	
Latitude	
Longitude	
Firmware	26100201003X006
Web GUI	X0.0.33
Madam Infa	
Modem Info	
Modem Info Repeater Loc	ation
Modem Info Repeater Loc Technical Sup	ation oport 3-9345

ller Contact Info nya



Copyright @ 1999-2010 Advanced RF Technologies, Inc. | 3116 Vanowen St • Burbank, CA 91505 • U.S.A. Toll Free Number (1-800-313-9345) | techsupport@adritech.com | http://www.adritech.com

Status- BRS

4.2.2.1 Band

This section displays the spectrum and technology that is being used. The band column displays the bandwidth that has been selected. The downlink column displays the center frequency of the selected band. The uplink column displays the center frequency of the selected band.

				PCS Band					
1	5MR Band			Band					
			Uplink	15.00 MHz	1,937.500 MHz	1,857.500 MHz	BRS Band		
	1.00 MHz	852.000 MHz	807.000 MHz		-		Band		
	1.25 MHz	938.000 MHz	899.000 MHz				2.50 MHz	2,512.750 MHz	2,512.750 MHz

4.2.2.2 Power & Gain

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

Power & Gain		
Input [dBm]	,-	,-
Gain [dB]	90.0	90.0
Peak Detector [dBm]	,-	-16.0

4.2.2.3 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.





4.2.2.4 Message Board Displays the 20 most recent events.

Message Board		
2011-01-19 08:34:00 2011-01-19 07:13:00	[MCU] Service [MCU] Service	Initiated Initiated
	Clear	Log File

- o Clear: Clears the content that is currently being displayed on the Message Board
- o Log File: Downloads the system Log File (events and alarms) to your computer

4.2.2.5 Install, Modem, and Power Status



- Installation: Displays whether or not the installation routine has been run (Not Installed or Installed)
 Modem: Displays the status of the modem
 - Disabled- No internal modem is present
 - Not Connected- Internal modem is detected, but no connection to the network has been established
 - · Connected- Internal modem is detected and a connection to the network has been established
- Power: Displays the power source that is currently being used

4.2.2.6 Repeater Info / Modem Info / Repeater Location / Technical Support / Installer Contact Info

- Repeater Info: Displays the serial number, latitude, longitude, firmware version, Web-GUI version
- Modem Info: Displays the internal modem information (ESN, MDN, IP)
- 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).

Repeater Info)
Repeater S/N	P-SDR30-B110001
Latitude	
Longitude	
Firmware	26100101003X0038 3.1.7
Web GUI	0.0.21
1odem Info	
Modem Type	NONE
Repeater Loc	ation
echnical Sup	port

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

Installer Contact Info Company: Installer: Phone: E-mail:



4.3 Control Tab

4.3.1 Control- NMS

	Status Control I	install System Help	Logout		AROMS
ADVANCED RF TECHNOLOGIES					ADRF Remote Operation & Management Syst
SDR-N		r11 SDD-30-S8 0 -	Factory Setting	Reheat	
	distant to the		Factory Octting	Rebot	
		[2] SDR-30-P	Factory Setting	Reboot	
NMS	and the second s	[3] SDR-30-B	Factory Setting	Reboot	
SMR-1	SYSTEM	[4] EMPTY -	Factory Setting	Reboot	
PCS-2	Full System				
BRS-3	Ditur				
EMPTY	Repool	Factory Setting			
Advanced RF Technologies, Inc. supplies innovative coverage					
solutions to leading wireless service					
providers around the world.					
Wireless Coverage Has Never Been So Easy					
	Copyright © 1999-2010 Advan Toll Free Number (1-800-313-93	ced RF Technologies, Inc. 3116 ' 345) techsupport@adrftech.com	Vanowen St • Burbank, CA 9 http://www.adrftech.com	1505 • U.S.A.	
		Cor	ntrol- NMS		

4.3.1.1 Control Summary

	Connected Device			
1000	[1] SDR-30-S8/9	-	Factory Setting	Reboot
NICH III	[2] SDR-30-P	-	Factory Setting	Reboot
Contraction of the second	[3] SDR-30-B	-	Factory Setting	Reboot
SYSTEM	[4] EMPTY	-	Factory Setting	Reboot

This section allows the user to perform factory settings and reboot one module at a time.

4.3.1.2 Full System



This section allows the user to perform a full system reboot or a full system factory settings.



4.3.2 Control- SMR, PCS, BRS

2-30-58/9	General Setting		Manu	al Gain Control		
D : ADRF-SMR	AGC ON Downlink	HPA ON	۲	Downlink Gain [dB]	50.0	•
	🔲 Uplink HP	PA ON		Uplink Gain [dB]	50.0	•
NMS		Apply	۲	Downlink AGC Level [dBm]	30.0	Ŧ
SMR-1			۲	Uplink AGC Level (dBm)	30.0	v
CS-2	5ystem		۲	DL Output ALC Level [dBm]	30.0	-
IMPTY	Reboot	Factory Setting	۲	DL Output ALC Offset [dB]	7.0	-
	Oscillation Check			DL /UL Gain Balance ON	ON	-
vanced RF Technologies, Inc.	Sensitivity	Low 💌			Apply	
plies innovative coverage utions to leading wireless service widers around the world.	Progress : 0%		Alarm	Setting		
eless Coverage	(Check		Downlink Signal Low [dBm]	-85.0	-
as Never Been So Easy				Downlink Signal	-90.0	-
	Heartbeat Time			Develiel: DE Deven (dD)	10	1823
	🗹 Heartbeat ON		-		0.0	
	Periodic Time [min]	20.0 💌	-	VSWR Alarm ON		
		Apply			Apply	
	Alarm Reporting Time					
	Over Current	5 mins 💌				
	Over Temperature	5 mins 💌				
	· VSWR	5 mins 💌				
	RSSI at Donor	5 mins 💌				
	RF Power	5 mins 💌				
		Apply				
	_					

4.3.2.1 General Setting

AGC ON	Downlink HPA ON
	Uplink HPA ON
	Annly

- AGC ON: Enables or disables AGC (Automatic Gain Control) Downlink HPA ON: Enables or disables the DL HPA 0
- 0
- Uplink HPA ON: Enables or disabled the UL HPA 0

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



show up:

4.3.2.2 System

Reboot	Factory Setting	
Reboot: Clicking t	the reboot button will have the follo	wing p
Reboot will restart the To restart the repeater	e repeater's processor. r, click OK. To quit, click Cancel.	

•

Factory Setting: Resets the repeater to the original factory settings

Message fr	om webpage		
?	Factory Setting will cha values. To change the repeate	inge repeater's settings to er setting, click OK. To qu) the factory default it, click Cancel.
		0	Cancel

4.3.2.3 Heartbeat Time Heartbeat Time

Heartbeat ON	
Periodic Time [min]	20.0 💌
	Apply

o Allows the user to enable or disable heartbeats from being sent out and also specify the time interval

4.3.2.4 Alarm Reporting Time

Alarm Reporting Time

•	Over Current	5 mins 💌
•	Over Temperature	5 mins 💌
•	VSWR	5 mins 💌
•	RSSI at Donor	5 mins 💌
•	RF Power	5 mins 💌
		Apply

This section allows the user to specify the reporting time of the following alarms; Over Current, Over Temperature, VSWR, RSSI at Donor, and RF Power. If the alarm is set to 5 mins, then the system will send out an SNMP trap only if the alarm is continually present for a 5 minute period. If the alarm clears within this 5 minute period, then the SNMP trap will not be sent out. When the alarm reporting time is set to 0 min, the SNMP trap will be set out immediately once the alarm is triggered. The alarm should be set to 0 min, only when testing the monitoring function. Otherwise, all alarms should be set to 5 mins for normal operation.



4.3.2.5 Manual Gain Control

Manual Gain Control

💿 Downlink Gain [dB]	50.0 💌
💿 Uplink Gain [dB]	50.0 💌
Downlink AGC Level [dBm]	30.0 👻
 Uplink AGC Level [dBm] 	30.0 👻
DL Output ALC Level [dBm]	30.0 💌
DL Output ALC Offset [dB]	7.0 💌
DL /UL Gain Balance ON	ON 💌
	Apply

- o Downlink Gain: Allows the DL gain to be adjusted manually when AGC is OFF
- o Uplink Gain: Allows the UL gain to be adjusted manually when AGC is OFF
- o Downlink AGC Level: Allows the user to set the DL gain when AGC is enabled
- Uplink AGC Level: Allows the user to set the UL gain when AGC is enabled
- o DL Output ALC Level: Allows the user to set the Max output level when AGC is OFF
- DL Output ALC Offset: The amount of gain that the system has to work with before raising the gains to match the DL Output ALC Level specified
- DL /UL Gain Balance ON: When enabled, the system will keep the delta value between the Downlink and Uplink gain levels

4.3.2.6 Alarm Setting

Al	arm	Set	tin	g

Downlink Signal Low [dBm]	-85.0 💌
Downlink Signal Not Detected [dBm]	-90.0
Downlink RF Power [dB]	6.0 💌
💿 🗹 VSWR Alarm ON	
	Apply

- Downlink Signal Low: Allows the user to specify the how weak the signal can be before triggering a "Downlink Signal Low" soft-fail alarm
- Downlink Signal Not Detected: Allows the user to specify the how weak the signal can be before triggering a "Downlink Signal Not Detected" soft-fail alarm
- o 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
- o VSWR Alarm ON: Allow the user to enable/disable the VSWR alarm check



	Status Control II	nstall System Hel	p Logout		ADRF Remai	e Operation & Management System
ADVANCED RF TECHNOLOGIER		Connected Device	Auto Installation		Repeate	r Location Info
2DK-N	1000	[1] SDR-30-S8/9	- Install		Company	
2	difference	[2] SDR-30-P	- Install		Address1	
		[3] SDP-30-B	- Inetall		Address2	
NMS		[o] and an p	matan		City	
SMR-1	SYSTEM	[4] EMPTY	7 2	Empty	State	Select one
PCS-2					ZIP Code	
BRS-3	Device	Manager IP		Site ID		
EMPTY	[1] SDR-30-58/9	192,168,63,10		ADRE-SMR	Repeate	r Installer Info
	[2] SDR-30-P	192.168.63.10		ADRF-PCS	Company	
	[3] SDR-30-B	192,168,63,10		ADRF-BRS	Name	
Advanced RF Technologies, Inc. supplies innovative coverage	EMPTY			-	Phone	
solutions to leading wireless service providers around the world.	Location		Modem Box Settin		E-mail	
Wireless Coverage	Latitude		Repeater IP	192,168,70,55		Set
Has Never Been So Easy	Longitude		Subnet Mask	255.255.255.0	Data 9. 1	ime
			Gateway	192,168,70,254	Date	08/15/2011
		Set		Set	Date	

Copyright @ 1999-2010 Advanced RF Technologies, Inc. | 3116 Vanowen St • Burbank, CA 91505 • U.S.A, Toll Free Number (1-800-313-9345) | techsupport@adrftech.com | http://www.adrftech.com

4.4.1.1 Install Summary:

The auto installation routine can be run from this page by clicking on the Install button under the Auto Installation column. This section also displays the Manager IP and Site ID for all the connected SDR modules.

	Connected Device	Auto Installation
1000	[1] SDR-30-S8/9	- Install
NICH-I-	[2] SDR-30-P	- Install
Conductor - Conductor	[3] SDR-30-B	- Install
SYSTEM	[4] EMPTY	- Empty

Device	Manager IP	Site ID
[1] SDR-30-58/9	192.168.63.10	ADRF-SMR
[2] SDR-30-P	192.168.63.10	ADRF-PCS
[3] SDR-30-B	192.168.63.10	ADRF-BRS
EMPTY	-	-



4.4.1.2 Location

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

00001011	
Latitude	
Longitude	
	Set

4.4.1.3 Modem Box 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. When the Host/Remote switch is changed, the repeater will reboot and will result in a temporary loss in coverage.

Repeater IP	192,168,63,5
Subnet Mask	255.255.255.0
Gateway	192.168.63.254
,	192.100.03.254

4.4.1.4 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. Repeater Location Info

Company		
Address1		
Address2		
City		
State	Select one	-
ZIP Code		

Repeater Installer Info		
Company		
Name		
Phone		
E-mail		
	Set	

4.4.1.5 Date & Time

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

Date & 1	fime
Date	01/20/2011 📷
Time	3 💌 38 💌 53 💌
	Set



4.4.2 Install- SMR



The SMR Install page allows the user specify the desired frequncies by inputting the Reference Frequency and Bandwidth. The SMR module supports 1 channel on the SMR800 and 1 channel on the SMR900. SMR800 bandwidth selections range from 1.25 to 18 MHz and SMR900 bandwidth selections range from 1.25 to 5 MHz.

4.4.2.1 Install- SMR Band Selection



To specify a frequency, input a DL reference frequency and select either start, center, or stop from the dropdown menu. Select the desired bandwidth from the dropdown menu under the Bandwidth column and then click Set.



Start Frequency:

If a start frequency is specifed, then this will be the beginning frequency of the band selection. Adding the bandwidth value that is selected from the Bandwidth column will give you the end frequency of your band selection.

Center Frequency:

Once a center frequency is specified and a bandwidth is selected, the system will split the bandwidth value in half and then add this to the center frequency to obtain your end frequency and also subtract this value to obtain your start frequency.

Stop Frequency:

If a stop frequency is specified, then this will be the ending frequency of the band selection. Subtracting the bandwidth value that is selected from the Bandwidth column will give you the start frequency of your band selection.

4.4.2.2 Install- SNMP

SNMP	
Site ID	ADRF-SMR
Manager IP	192.168.63.10
	Set

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

4.4.2.3 Install- Auto Installation

Auto	Installation

Install

The Auto Installation routine can be run by clicking on the Install button. The Auto Installation routine runs basic system checks for property functionaility.



4.4.3 Install- PCS

	Status Control Install System	Help Logout	AROMS
ANDED RF TECHNOLOGIES	Band Selection		ADRF Remote Operation & Management System Repeater Location Info
l-30-P		Maria Mar	Company
D: ADRF-PCS	: Channel1 : C 1930 MHz	Channel2 : Channel3 1995 MHz	Address1
			Address2
	A1 A2 A3 D B1 B2	2 B3 E F C3 C4 C5 G	City
P15	1850MHz	1915MHz	State Select one
18-1			ZIP Code
RS-3	Channel Reference Frequency (ndwidth Set Downlink Frequency (MHz) (MHz) Start Center End	
IPTY	Channel1 1,937.500 center 💙 13.	.75 Set 1,930.625 1,937.500 1,944.375	Repeater Installer Info
	Channel2 center V dis	able V Set	Company
			Name
nced RF Technologies,	Channel3 center Y dis	able V Set	Phone
supplies innovative			E-mail
rage solutions to leading ess service providers			
nd the world.	SNMP	Modem Box Settings :	6
less Coverage		Repeater IP 192,168,70,55	Set
s Never Been So Easy	Site ID ADRF-PCS	Subject Mask 255,255,255,0	Data & Time
	Manager IP 192.168.63.10	Gateway 102 168 70 254	Date & Time
	Set	192.100.70.254	Date 0//20/2011
		Set	Time 4 💙 3 💙 13
	Location	Auto Installation	Set
	Latitude N111.11111		
	Longitude E222.22222	Progress	
		(PCS) Install	
	Set		
	Copyright © 1999-2010 Advanced RF Technologies, In	c. 3116 Vanowen St · Burbank, CA 91505 · U.S.A.	

The PCS Install page allows the user specify the desired frequencies by inputting the Reference Frequency and Bandwidth. The PCS module supports up to 3 non-contiguous bands. Bandwidth selection ranges from 1.25 to 18.75 MHz.

4.4.3.1 Install- PCS Band Selection

band Selection	on						
: C 1930 MHz	hannel1		: Channel2		:	Channel3	1995 MHz
A1	A2 A3	D B1	B2 B3	E	F C3	C4 (C5 G
1850MHz							1915MHz
Channel	Reference	Frequency	Bandwidth		Downli	nk Frequency	(MHz)
							(
		. I requeries	(MHz)	Set	Start	Center	End
Channel 1	1,937.500	center 💙	(MHz)	Set Set	Start 1,930.625	Center 1,937.500	End 1,944.375
Channel1 Channel2	1,937.500	center 💌	(MHz) 13.75 disable	Set Set Set	Start 1,930.625 	Center 1,937.500	End 1,944.375
Channel1 Channel2 Channel3	1,937.500 	center 👻 center 👻 center 👻	(MHz) 13.75 disable disable	Set Set Set Set	Start 1,930.625 	Center 1,937.500 	End 1,944.375

To specify a frequency, input a DL reference frequency and select either start, center, or stop from the dropdown menu. Select the desired bandwidth from the dropdown menu under the Bandwidth column and then click Set.



Start Frequency:

If a start frequency is specifed, then this will be the beginning frequency of the band selection. Adding the bandwidth value that is selected from the Bandwidth column will give you the end frequency of your band selection.

Center Frequency:

Once a center frequency is specified and a bandwidth is selected, the system will split the bandwidth value in half and then add this to the center frequency to obtain your end frequency and also subtract this value to obtain your start frequency.

Stop Frequency:

If a stop frequency is specified, then this will be the ending frequency of the band selection. Subtracting the bandwidth value that is selected from the Bandwidth column will give you the start frequency of your band selection.

4.4.3.2 Install- SNMP

SNMP	
Site ID	ADRF-SMR
Manager IP	192.168.63.10
	Set

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

4.4.3.3 Install- Auto Installation

Auto	Installation

D	
Progress	
(SMR)	Install

The Auto Installation routine can be run by clicking on the Install button. The Auto Installation routine runs basic system checks for property functionaility.



4.4.4 Install- BRS

NICED RF TECHNOLOGIES	Band Selection		ADRF Remote Operation & Management System
-30-B	balla Selection		Company
ID : ADRF-BRS	: Channel1		Company
	2502 MHz	2568 MHz	Addressi
	AB	C D	Address2
IMS			City
MR-1	2/24 101-	2/02/01/-	State Select one
5-2	2624 MHZ	2690 MHZ	ZIP Code
-3	E F	H G	
TY			Repeater Installer Info
	Channel Reference Frequency Mul-	th Set Downlink Frequency (MHz)	Company
	Quitz	Start Center Enu	Name
	Channel1 2,518.500 center 30.0	Set 2,503.500 2,518.500 2,533.500	Phone
d RF Technologies, lies innovative			Priorie
solutions to leading			E-mail
service providers the world			
	SNMP	Modem Box Settings :	Set
Coverage ver Been So Fasy	Site ID ADDE RDC	Repeater IP 192.168.70.55	
in been so casy	SITE ID ADRE-BRS	Subnet Mask 255.255.255.0	Date & Time
	Manager IP 192.168.63.10	Gateway 192 168 70 254	Date 07/20/2011
	Set	(Success)	Time 4 ¥ 9 ¥ 24 ¥
		Set	
			Set
	Location	Auto Installation	
	Latitude N111.11111		
	Longitude E222 22222	Progress	
		(BRS) Install	
	Set		

Copyright © 1999-2010 Advanced RF Technologies, Inc. | 3116 Vanowen St · Burbank, CA 91505 · U. Toll Free Number (1-800-313-9345) | techsupport@adrftech.com | http://www.adrftech.com

The BRS Install page allows the user to specify the desired frequncies by inputting the Reference Frequency and Bandwidth. The BRS module supports 1 contiguous bands. Bandwidth selection ranges from 2.5 to 30 MHz.

4.4.4.1 Install- BRS Band Selection Band Selection

: Ch 2502 MHz	nannel1							2568 MHz
A		В		С			D	
2624 MHz								2690 MHz
E		F		н			G	
					_			6
Channel	Reference I	Frequency	Bandwidth			Downli	nk Frequency	(MHz)
			(MHz)			Start	Center	End
Channel 1	2,518.500	center 🗸	30.0 🗸		Set	2,503.500	2,518.500	2,533.500





To specify a frequency, input a DL reference frequency and select either start, center, or stop from the dropdown menu. Select the desired bandwidth from the dropdown menu under the Bandwidth column and then click Set.

Start Frequency:

If a start frequency is specifed, then this will be the beginning frequency of the band selection. Adding the bandwidth value that is selected from the Bandwidth column will give you the end frequency of your band selection.

Center Frequency:

Once a center frequency is specified and a bandwidth is selected, the system will split the bandwidth value in half and then add this to the center frequency to obtain your end frequency and also subtract this value to obtain your start frequency.

Stop Frequency:

If a stop frequency is specified, then this will be the ending frequency of the band selection. Subtracting the bandwidth value that is selected from the Bandwidth column will give you the start frequency of your band selection.

4.4.4.2 Install- SNMP

ADRF-SMR
192.168.63.10
Set

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

4.4.4.3 Install- Auto Installation

Auto Installation	
Progress (SMR)	Install

The Auto Installation routine can be run by clicking on the Install button. The Auto Installation routine runs basic system checks for propery functionaility.

4.5 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.





4.5.1 System- Account

4.5.1.1 System: Account-Account Management

The Account Management section will allow 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.

Update / Account Management / New Account / New Administrator / Modify Login

				Delete
1	admin	admin	administrator	-
2	adrf	adrf	user	delete

4.5.1.2 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.

Status Control Install System He	lp Logout	
Account Management / New account / Administrator /	/ Change Password	
New User Name Password Confirm password		
Please add a new login name and password		
Apply Cancel		

Copyright © 1999-2010 Advanced RF Technologies, Inc. | 3116 Vanowen St • Burbank, CA 31 Toll Free Number (1-800-313-9345) | techsupport@adrftech.com | http://www.adrftech.com

4.5.1.3 System: Account- Administrator

The Administrator section allows the Administrator to create additional Administrator accounts. Please note that the Administrator section is only available if you are logged into the system as the Administrator.

Account Management / New ac	count / Administrator /	Change Password	
8 8 9	New Administrator Password Confirm password		
	Please enter new administ	rator name and password.	
	Apply	Cancel	

Copyright © 1999-2010 Advanced RF Technologies, Inc. | 3116 Vanowen St + Burbank, CA 91505 + U.S.A. Toll Free Number (1-800-313-9345) | techsupport@adrRech.com | http://www.adrRech.com



4.5.1.4 System: Account- Change Password

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

Status Control Install	System Help	D Logout	
Account Management / New account /	′Administrator / Cl	hange Password	
 User N Passwi Confir 	lame a ord [m password [admin	
Please enter new password.			
Apply Cancel			

Copyright © 1999-2010 Advanced RF Technologies, Inc. | 3116 Vanowen St + Burbank, CA 91505 + U.S.A. Toll Free Number (1-800-313-9345) | techsupport@adrRech.com | http://www.adrRech.com

4.5.2 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 5 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.

🕟 File Name	File Name Choose File No file chosen				
Description					
Maximum file size is 5 MB Add File Cancel					
File	Name	File Size	Description		
0.0 M / 100 MB (0.0%)					

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.

File Name Choose File No file chosen					
Description					
Maximum file size is 5 MB Add File Cancel					
File Name	File Size	Description			
test.txt	252 Bytes	testing	delete		
	D.O M / 100 MB (I	0.0 M / 100 MB (0.0%)			



4.5.3 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.

Number	Date	Username	Log Message
1	07/19/2011 20:43:17	admin	Logged-In
2	07/19/2011 19:34:09	admin	Logged-In
3	08/18/2011 13:31:08	adrf	[SMR-1] System Time Change to 7/19/2011 7:19:52
4	08/18/2011 13:21:42	adrf	Logged-In
5	08/18/2011 05:11:57	adrf	Logged-In
6	08/18/2011 01:45:25	admin	[SMR-1] Change Longitude to E222.222222
7	08/18/2011 01:45:25	admin	[SMR-1] Change Latitude to N111.111111
8	08/18/2011 01:43:59	admin	[SMR-1] UL HPA Set On
9	08/18/2011 01:43:59	admin	[SMR-1] DL HPA Set On
10	08/18/2011 01:43:59	admin	[SMR-1] AGC Set On
11	08/18/2011 00:12:06	admin	Logged-In

4.5.4 System: Update

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

	File Name Choose File No file chosen
Click II	narada to undata tha ranaatar firmuara, or olick Cancel to short the undrace
CILICK U	Igraue to update the repeater miniware, or click cancer to abort the upgrad
	Underta Connect
	Update Cancel

- Click on the Choose File... button and locate the firmware file
- Click on the Upload button to perform the firmware update
- Once the firmware update is complete, the following popup message will appear:



4.5.5 System- Backup

is Backun

The backup section allows the user to backup the settings on the module. To perform the backup, click on the Backup button and you will be prompted to save the backup file. To restore the settings to the system, perform an update using this file.

Exports which c update	the current sett an be restored u: function.	tings of this module sing the system
		Backup



4.6 Help

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



4.7 Logout

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



5. Maintenance Guide for SDR Repeater

5.1 Periodic Inspection Checklist

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

5.2 Preventive Measures for Optimal Operation

5.2.1 Recommendations

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

5.2.2 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.



6. Warranty and Repair Policy

6.1 General Warranty

The SDR carries a Standard Warranty period of three (3) years unless indicated otherwise on the package or in the acknowledgment of the purchase order.

6.2 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.

6.3 Limitation of Damages

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

6.4 No Consequential Damages

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

6.5 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.

6.6 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.



7. Specifications

7.1 Electrical Specifications

Parameters		Specifications			
		SDR-S (SMR800/900)		SDR-P (PCS)	SDR-B (BRS)
	DL	SMR800	851~869MHz	- 1930~1995MHz	2502~2690MHz
Frequency		SMR900	935~940MHz		
Range	1.0	SMR800	806~824MHz	1950 1015MUL	
	UL	SMR900	896~901MHz	1000*19100012	
Frequency Erro	r			≤ ±0.05ppm	$\leq \pm 0.02$ ppm
Band Selection		0.25MHz MHz	Step, Max 18	1.25MHz Step Max 18.75 MHz (Non-Contiguous 3ch)	2.5MHz Step Max 30 MHz (Continuous 1ch)
Cain Elatross	Full band	≤ ±1.5dB		≤ ±1.5dB	≤ ±1.5dB
Gain Flatness	Each band	≤±1.5dB		≤ ±1.5dB	≤ ±1.5dB
	Maximum	80dB		90dB	90dB
Coin	Step	0.5dB		0.5dB	0.5dB
Gain	Range	30dB		30dB	30dB
	Tolerance	≤ ±1.0dB		≤ ±1.0dB	≤ ±1.0dB
Composite Out	outnower	24dBm (SDR-24)		24dBm (SDR-24)	24dBm (SDR-24)
		30dBm (SDR-30)		30dBm (SDR-30)	30dBm (SDR-30)
Delay		8us		6us	6us
Roll offs		0.5MHz@	65dBc	1MHz@ 50dBc	1MHz@ 40dBc 3.5MHz@ 80dBc
Noise Figure(U	lplink Only)	6dB@ Max Gain		6dB@ Max Gain	6dB@ Max Gain
VSWR (Input O	nly)	1.5:1		1.5:1	1.5:1
Sync Detection	Level				<-85dBm Typ (Max -90dBm)

Param	eters	Specifications			
T didinotors		SDR-700 (LTE)		SDR-C (CELL)	SDR-A (AWS)
		Upper C	746~757MHz		
	DL	Lower A	728~734MHz	869~894MHz	2110~2155MHz
Frequency		Lower B	734~740MHz		
Range		Upper C	776~787MHz		
L	UL	Lower A	698~704MHz	824~849MHz	1710~1755MHZ
		Lower B	704~710MHz		
Frequency Error ≤ ±0.05ppm		≤ ±0.05ppm	≤ ±0.05ppm		
Band Selection		0.25MHz Sto (Non-Contig	ep, Max 12 MHz uous 2ch)	0.25MHz Step, Max 25 MHz	1.25MHz Step, Max 18.75 MHz (Non-Contiguous 3ch)
Gain Elatross	Full band	$\leq \pm 1.5$ dB		≤ ±1.5dB	≤ ±1.5dB
Gain Flathess	Each band	$\leq \pm 1.5$ dB		≤ ±1.5dB	≤ ±1.5dB
Gain	Maximum	90dB		90dB	90dB
	Step	0.5dB		0.5dB	0.5dB
	Range	30dB		30dB	30dB



	Tolerance	≤ ±1.0dB	≤ ±1.0dB	≤ ±1.0dB
Composite Output power		24dBm (SDR-24)	24dBm (SDR-24)	24dBm (SDR-24)
		30dBm (SDR-30)	30dBm (SDR-30)	30dBm (SDR-30)
Delay		6.5us	7us	6us
Roll offs		1MHz@ 50dBc	0.5MHz@ 30dBc, 1MHz@ 50dBc	1MHz@ 50dBc
Noise Figure(U	lplink Only)	6dB@ Max Gain	6dB@ Max Gain	6dB@ Max Gain
VSWR (Input O	nly)	1.5:1	1.5:1	1.5:1
EVM		≤ 12.5%	≤ 12.5%	≤ 12.5%

7.2 Mechanical Specifications

Paran	neters	Specifications	Remarks
	Module	18.2 x 11.6 x 4.2 in	
Size	NMS	17.0 x 16.7 x 2.3 in	
	Chassis	19.0 x 19.5 x 14 in	
	Module	21 lbs	
Weight	NMS	7 lbs	
	Chassis	26 lbs	
	Input / Output	N Fomalo	
Connector	Sum Port	N I emale	
Туре	Ethernet	RJ45 Female	
	Frame ground	M5 Screw	
Mount type		Wall mount or 19" rack mount	
Security		Physical Cabinet	

7.3 Power Specifications

Parameters	Specifications	Remarks
AC Power	100~120V AC, 60Hz	
DC Power	-40 ~ -60V DC	Ontion
	+20 ~ +30V DC	Option

7.4 Environment Specifications

Parameters	Specifications	Remarks
Operating Temperature	+30 ~ +122°F	
Operating remperature	+0 ~ +50°C	
Relative Humidity	+5 ~ +95%	
Industrial dust	Telcodia GR63-core	

7.5 Warranty & Certificates

Parameters	Specifications	Remarks
MTBF	> 100,000 hours	



	UL 60950	
Cortificator	FCC CFR47 part 24	
Certificates	FCC CFR47 part 15	
	FCC CFR47 part 90	



Appendix A: Mechanical Drawing





Appendix B: 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.

Warning: Exposure to Radio Frequency Radiation The radiated output power of this device is far below the FCC radio frequency exposure limits. Nevertheless, the device should be used in such a manner that the potential for human contact during normal operation is minimized. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna should not be less than 60cm during normal operation. The gain of the antenna is 12 dBi. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IC Warning

This device complies with Industry Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) this device may not cause interference, and

(2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.