

ADX DAS HPR User Manual

Version 0.1



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Table of Contents

1.	Introduction.		14
	1.1 Highlight	S	14
	1.2 Head End	d Parts List	15
	1.2.1 ADX	-H-NMS-PKG Parts List	15
	1.2.2 ADX	-H-BCU Parts List	16
	1.2.3 ADX	-H-RFU Parts List	16
	1.2.4 ADX	-RACK-ODU Parts List	17
	1.2.5 ADX	-H-ODU4-X Parts List	17
	1.2.6 ADX	-H-ODU1-X Parts List	17
	1.3 High Pow	ver Remote Unit Parts List	18
	1.3.1 ADX	-R-xxx46/44.8/43M (HPR) Parts List	18
	1.4 ADX DAS	Quick View	19
	1.4.1 HE C	Quick View	19
	1.4.3 RU 0	Quick View	20
	1.5 Warning	s and Hazards	21
2.	ADX-DAS Con	figuration	24
	2.1 ADX DAS	Topology	24
	2.2 Configura	ation	25
	221 Cing	le hand or multi-hand configuration (1~8 hands)	25
	2.2.1 Sing		23
	2.2.1 Sing 2.3 ADX-DAS	Scalability	25
3.	2.2.1 Sing 2.3 ADX-DAS ADX Overview	scalability	
3.	2.2.1 Sing 2.3 ADX-DAS ADX Overview 3.1 Head End	v Scalability	26 27 27
3.	2.2.1 Sing 2.3 ADX-DAS ADX Overview 3.1 Head End 3.1.1 NMS	scalability	
3.	2.2.1 Sing 2.3 ADX-DAS ADX Overview 3.1 Head End 3.1.1 NMS 3.1.1.1	scalability	26
3.	2.2.1 Sing 2.3 ADX-DAS ADX Overview 3.1 Head End 3.1.1 NMS 3.1.1.1 3.1.1.2	s Scalability	23 26 27 27 27 28 28 28 28 29
3.	2.2.1 Sing 2.3 ADX-DAS ADX Overview 3.1 Head End 3.1.1 NMS 3.1.1.1 3.1.1.2 3.1.1.3	Scalability	23 26 27 27 28 28 28 28 29 29
3.	2.2.1 3 mg 2.3 ADX-DAS ADX Overview 3.1 Head End 3.1.1 NMS 3.1.1.1 3.1.1.2 3.1.1.3 3.1.1.4	Scalability	25 26 27 27 28 28 28 29 29 29 29 29
3.	2.2.1 3mg 2.3 ADX-DAS ADX Overview 3.1 Head End 3.1.1 NMS 3.1.1.1 3.1.1.2 3.1.1.3 3.1.1.4 3.1.2 RFU	s Scalability	23 26 27 27 28 28 28 29 29 29 29 29 29 30
3.	2.2.1 Sing 2.3 ADX-DAS ADX Overview 3.1 Head End 3.1.1 NMS 3.1.1.1 3.1.1.2 3.1.1.3 3.1.1.4 3.1.2 RFU 3.1.2.1	Scalability	23 26 27 27 28 28 28 28 29 29 29 29 29 29 30 30
3.	2.2.1 3mg 2.3 ADX-DAS ADX Overview 3.1 Head End 3.1.1 NMS 3.1.1.1 3.1.1.2 3.1.1.3 3.1.1.4 3.1.2 RFU 3.1.2.1 3.1.2.2	 Scalability 	26
3.	2.2.1 Sing 2.3 ADX-DAS ADX Overview 3.1 Head End 3.1.1 NMS 3.1.1.1 3.1.1.2 3.1.1.3 3.1.1.4 3.1.2 RFU 3.1.2.1 3.1.2.2 3.1.2.3	s Scalability	25 26 27 27 28 28 28 29 29 29 29 29 29 30 30 30 31 31
3.	2.2.1 Sing 2.3 ADX-DAS ADX Overview 3.1 Head End 3.1.1 NMS 3.1.1.1 3.1.1.2 3.1.1.3 3.1.1.4 3.1.2 RFU 3.1.2.1 3.1.2.1 3.1.2.2 3.1.2.3 3.1.3 Char	 Scalability 	29 29 29 29 29 29 29 30 30 31 31 31
3.	2.2.1 Sing 2.3 ADX-DAS ADX Overview 3.1 Head End 3.1.1 NMS 3.1.1.1 3.1.1.2 3.1.1.3 3.1.1.4 3.1.2 RFU 3.1.2.1 3.1.2.2 3.1.2.3 3.1.3 Char 3.1.3.1	 Scalability 	29 29 29 29 29 29 29 30 30 30 31 31 31 31
3.	2.2.1 Sing 2.3 ADX-DAS ADX Overview 3.1 Head End 3.1.1 NMS 3.1.1.1 3.1.1.2 3.1.1.3 3.1.1.4 3.1.2 RFU 3.1.2.1 3.1.2.2 3.1.2.3 3.1.3 Chai 3.1.3.1 3.1.4 Opti	 Scalability Scalability Scalability V Scalability V Scalability V Scalability Scalabili	29 29 29 29 29 29 29 30 30 30 31 31 31 31 31 31 32
3.	2.2.1 Sing 2.3 ADX-DAS ADX Overview 3.1 Head End 3.1.1 NMS 3.1.1.1 3.1.1.2 3.1.1.3 3.1.1.4 3.1.2 RFU 3.1.2.1 3.1.2.2 3.1.2.3 3.1.3 Chan 3.1.3.1 3.1.4 Opti 3.1.4.1	 Scalability Scalability S (Network Management System) LEDs Ethernet Port Host/Remote Switch HE View/RU View Switch (ADX-H-RFU-x) LEDs RF Ports Communication Port nnel Combiner (ADX-H-CHC) RF ports c Unit (ADX-RACK-ODU, ADX-H-ODU4/ADX-H-ODU1) LEDs 	25 26 27 27 28 28 28 29 29 29 29 29 30 30 30 31 31 31 31 31 31 31 32 32
3.	2.2.1 Sing 2.3 ADX-DAS ADX Overview 3.1 Head End 3.1.1 NMS 3.1.1.1 3.1.1.2 3.1.1.3 3.1.1.4 3.1.2 RFU 3.1.2.1 3.1.2.2 3.1.2.3 3.1.3 Chai 3.1.3.1 3.1.4 Opti 3.1.4.1 3.1.4.2	 Scalability 	25 26 27 27 28 28 29 29 29 29 29 29 30 30 30 30 31 31 31 31 31 31 31 31 32 32 32



	3.1.4.4 Communication Port	
	3.1.5 Power Supply Unit (ADX-H-PSU)	
	3.1.5.1 LEDs	
	3.1.5.2 AC Input On/Off Switch, AC Input Po	rt and AC Input Selection Switch34
	3.1.5.3 Battery Backup Port, Battery Install	Port and Battery Backup Switch34
	3.1.6 Optional Band Combiner Unit (ADX-H-BCU	-x)35
	3.1.6.1 LEDs	
	3.1.6.2 RF Ports	
	3.1.6.3 Communication Port	
	3.2 HPR	
	3.2.1 Port	
	3.2.1.1 RF Port	
	3.2.1.1.1 Antenna server port (DIN type)	
	3.2.1.1.2 Extension Filter port (N type)	
	3.2.1.2 Optic port	
	3.2.1.3 GUI, RS 485 port	
	3.2.2 LEDs	
	3.2.3 AC On/Off Switch, AC Port	
	3.2.4 DC On/Off Switch, DC Port	
4.	4. Cable Connection	
	4.1 Head End Connection Diagrams	41
	4.1.1 Front/Rear Head End Connection View wit	h Optional BCU unit41
	4.1.2 Rear Head End Connection View with (4) A	DX-RACK-ODU units42
	4.2 High Power Remote Unit Connection Diagrams	
5.	5. Mounting method	
	5.1 Head End	
	5.1.1 Rack Mount	
	5.1.2 Wall Mount	
	5.2 HPR	
6	6 Installation	40
0.	6.1 Pre-Installation Inspection	46
	6.2 ADX DAS Installation Procedure	
	6.2.1 HE Installation Procedure	
	6.2.1.1 Installing a ADX DAS HE in a rack	
	6.2.1.2 Wall mounting the ADX DAS HE	
	6.2.2 RU Installation Procedure	51
	6.3 Grounding	53
	6.4 Optic Port Cleaning	



7.	Commis	issioning	55
	7.1 Pre	e-Commissioning Check	55
	7.1.1	Verify cable connections	55
	7.1.2	2 Connect to the Web-GUI	55
	7.1.3	B Check Navigation Tree Status	56
	7.1.4	Set Location Info, Installer Info and Date & Time	56
	7.1.5	Verify Navigation Tree Links	56
	7.1.6	BOM Comparison & Check Band Configuration	57
	7.1.7	/ Lock current navigation tree	57
	7.2 Co	mmissioning	58
	7.2.1	Optic Commissioning	58
	7.2	2.1.1 How to compensate the optic loss	58
	7.2.2	HE Commissioning	60
	7.	2.2.1 Composite power	60
	7.2.3	B HPR Commissioning	66
	7.3 DA	AS Install Verification	67
	7.3.1	Setting SNMP & Remote IP	67
	7.3.2	2 Verification through Web based GUI	67
	7.3.3	B UL noise power detection	67
8.	Web-G	UI	68
	8.1 We	eb-GUI Setup	68
	8.1.1	DAS system/PC Connection Using Web-GUI	68
	8.2 Ad	Iministrator/User Mode	69
	8.2.1		69
	8	2.1.1 Navigation tree Lock/Unlock	69
	8.2	2.1.2 Navigation Tree	69
	8.2	2.1.3 Power Status	70
	8.2	2.1.4 Commissioning Status	70
	8.2	2.1.5 Information	70
	8.2.2	2 Status Tab	71
	8.2	2.2.1 Status – NMS	71
	8.2	2.2.2 Status – BCU	74
	8.2	2.2.3 Status – RFU	76
	8.2	2.2.4 Status – ODU	78
	8.2	2.2.5 Status – RU Hub	81
	8.2	2.2.6 Status – Remote module	82
	8.2.3	3 Control Tab	85
	8.2	2.3.1 Control – NMS	85



9.

	8.2.3.2	Control – BCU	86
	8.2.3.3	Control – RFU	87
	8.2.3.4	Control – ODU	91
	8.2.3.5	Control – RH Hub	92
	8.2.3.6	Control – Remote Module (Master or Slave RU)	93
	8.2.4 Insta	II Tab	96
	8.2.4.1	Install – NMS	96
	8.2.4.2	Install – BCU	99
	8.2.4.3	Install – RFU	
	8.2.4.4	Install – ODU	
	8.2.4.5	Install – HPR Hub	
	8.2.4.6	Install – Remote Module (Master or Slave RU)	
	8.2.5 Syste	m	106
	8.2.5.1	System: Account	106
	8.2.5.2	System: Logs	
	8.2.5.3	System: Update	
	8.2.5.4	System: System Information	
	8.2.5.5	System: Backup/Restore	
	8.2.5.6	System: SNMP	112
	8.2.5.7	System: Closeout Package	113
	8.2.6 Help		114
	8.2.7 Logo	ut	114
	8.3 Guest Mo	de	114
9.	System-Wide	Specification (to be connected to HE via Optic line)	
	700LTE/CELL/S	MR800 Specifications	115
	2. PCS/AWS/BI	RS Specifications	116
	3. SMR900 Spe	ecifications	117
	4. WCS Specifi	cations	118
10.	Mechanical Dr	rawing	119



Figures

Figure 1-1 Figure 1-2	ADX DAS HE Quick View	.19
Figure 2-1	ADX DAS Block Diagram (4BANDS) 으르니채간피가 정이되어 이지 않습니	Γŀ
Figure 2-2		24
Figure 2-2	ADX DAS Topology	25
Figure 2-5		.2J
Figure 2-4	ADX DAS 4bands configuration또 뉴민적일파가 영의되어 있지 않습니	-1-
Figure 3-1	ADX H NMC Front View	.27
Figure 3-2		.20
Figure 3-3	NMIS LED	20
Figure 3-5	Host/Remote Switch	29
Figure 3-6	HE View/RIT View Switch	29
Figure 3-7	REL Front & Rear View	30
Figure 3-8	REU LED	30
Figure 3-9	Communication Port (BELI)	.31
Figure 3-10	ADX-H-CHC Front & Rear View	.31
Figure 3-11	ADX-RACK-ODU Front & Rear view	.32
Figure 3-12	ADX-H-ODU4 and ADX-H-ODU1 Installed in ADX-RACK-ODU	.32
Figure 3-13	ADX-RACK-ODU LED	.32
Figure 3-14	ODU RF Ports	32
Figure 3-15	ODU Optic Ports	.33
Figure 3-16	Communication Port (ODU)	.33
Figure 3-17	ADX-H-PSU Front & Rear View	.33
Figure 3-18	HE PSU LED	34
Figure 3-19	HE PSU AC Input On/Off Switch, AC Input Port and AC Input Selection Switch	.34
Figure 3-20	Battery Backup Port, Battery Install Port and Battery Backup Switch	34
Figure 3-21	ADX-H-BCU Front & Rear View	.35
Figure 3-22	BCU LED	35
Figure 3-23	Communication Port (BCU)	.36
Figure 3-24	ADX-HPR Single enclosure (bottom view)	.36
Figure 3-25	Inner Optic port connection	.37
Figure 3-26	Optic connection	.38
Figure 3-27	ADX-HPR 3bands GUI connection (Single enclosure)	.38
Figure 3-28	ADX-HPR 4bands GUI, RS 485 connection (2 enclosures) 오류! 책갈피가 정의되어 있지 않습니	다.
Figure 3-29	HPR LED	39
Figure 3-30	HPR AC Port	39
Figure 3-31	HPR AC Switch	39
Figure 4-1	HE Cable connection (1 ADX-RACK-ODU +1 BCU)	.42
Figure 4-2	HE Cable connection (4 ADX-RACK-ODUs)	.43
Figure 4-3	ADX-HPR 3bands connection (Single enclosure)	.43
Figure 4-4	ADX-HPR 4bands connection (2 enclosures) 오류! 책갈피가 정의되어 있지 않습니	다.
Figure 5-1	HE Rack Mount (Front & Rear view)	.44
Figure 5-2	HE Wall Mount (Top View)	.45
Figure 5-3	HPR Wall Mount	46
Figure 6-1	ADX HE 19" Rack Mount Instructions	.48
Figure 6-2	ADX HE Wall Mount Instructions	.49
Figure 6-3	Wall Mount Instructions for ADX-HE added 10 Unit	.50
Figure 6-4	HPK Wall Wount Instructions	.52



Eiguro 6 E	Ground Cable Connection (HE rear side)	БЭ
Figure 6-5	Ground Cable Connection (HDD dual side)	
Figure 6-0	Ontic Connector Cleaning (left) and Ontic Port Cleaning (right)	
Figure 6-7	SC/ADC Ontio Connector Dust Con	54
Figure 0-8	SC/APC Optic Connector Dust Cap	
Figure 7-1	Logiii wiildow	
Figure 7-2	Navigation tree Lock/Uniock	56
Figure 7-3	Navigation tree	56
Figure 7-4	ODU Install page	58
Figure 7-5	measured optic loss display	58
Figure 7-6	BCU Install Window	64
Figure 7-7	RFU Install Window	65
Figure 7-8	Remote Module Install Window	66
Figure 8-1	Login screen	68
Figure 8-2	Navigation tree Lock/Unlock	69
Figure 8-3	Navigation tree	69
Figure 8-4	ADX DAS General Information	70
Figure 8-5	Status - NMS	71
Figure 8-6	System Summary	71
Figure 8-7	System scan time, HE view/RU view	72
Figure 8-8	HE alarm status	72
Figure 8-9	HE Commissioning status	73
Figure 8-10	Status – BCU	74
Figure 8-11	Status – BCU Band	74
Figure 8-12	Status – BCU Power & Atten	74
Figure 8-13	Status – BCU Power Ratio	75
Figure 8-14	Status – BCU Alarm	75
Figure 8-15	Status – RFU	76
Figure 8-16	Status – RFU Band	76
Figure 8-17	Power & Gain Display (Admin)	76
Figure 8-18	Power & Gain Display (User)	77
Figure 8-19	Status - ODU	
Figure 8-20	Summary (Status – ODU)	
Figure 8-21	BE Status (Status – ODU)	79
Figure 8-22	Ontic Status – ODU)	79
Figure 8-23	Ontic Attenuation (Status – ODU)	80
Figure 8-24	Ontic Path Status (Status – ODU)	80
Figure 8-25	Status - HPR Hub	00
Figure 8-26	BLI Alarm Status (Status - HDR Hub)	01 81
Figure 8-20	RU Commissioning Status (Status - HDR Hub)	01 81
Figure 8-27	Status – Pomoto Modulo	01
Figure 8-28	PCS Pand Information (Status – Pernote Module)	02
Figure 8-29	Power & Gain (Admin)	05
Figure 8-30	Power & Cain (Admin)	05
Figure 0-51	Power & Gain (User)	05
Figure 8-32	Optic Power (Status – Master HPR Only)	64
Figure 8-33		65
Figure 8-34	HE System Deheat & Fastery Satting (Captrol - NIMS)	ðጋ ог
Figure 8-35	TE System Report & Factory Setting (Control - NVIS)	
Figure 8-36	INIVIS SYSTEM REDOUT & FACTORY SETTING (CONTROL – NIVIS)	85
Figure 8-37	Control - BCU	ðb
Figure 8-38	Control – BCU Manual A I I Control	86
Figure 8-39	Control – BCU Reboot/Factory Setting	87
Figure 8-40	Control – BCU Alarm Setting	87
Figure 8-41	Control - KFU	87



Figure 0 42	Constal Setting (Control - REU) (Admin)	00
Figure 8-42	General Setting (Control – RFU) (Authin)	00
Figure 8-45	Deheat & Factory Setting (Control – RFU)	00
Figure 8-44	Rebuil & Factory Setting (Control – RFU)	00
Figure 8-45	UL Noise Detection (Control – RFO)	00
Figure 8-40	OL NOISE DELECTION - PCS Danu	89
Figure 8-47	Manual Attenuator Control Setting (Control – RFU)	89
Figure 8-48	Alarm Threshold Setting (Control – RFU)	90
Figure 8-49		91
Figure 8-50	Optic Attenuation – ODU	91
Figure 8-51	Reboot & factory Setting (Control – ODU)	92
Figure 8-52	Control – HPR Hub	92
Figure 8-53	Reboot & Factory Setting (Control – HPR Hub)	92
Figure 8-54	Control – Remote Module	93
Figure 8-55	General Setting (Control - RU)	93
Figure 8-56	Reboot & factory Setting (Control - RU)	94
Figure 8-57	Optic Setting (Control - RU)	94
Figure 8-58	Manual Atten Control (Control - RU)	94
Figure 8-59	Alarm Setting (Control - RU)	95
Figure 8-60	Install - NMS	96
Figure 8-61	HE Commissioning Status (Install – NMS)	96
Figure 8-62	SNMP (Install – NMS)	97
Figure 8-63	Location Setting (Install – NMS)	97
Figure 8-64	External Modem Box Setting (Install – NMS)	97
Figure 8-65	Description (Install – NMS)	98
Figure 8-66	SNMP Agent False Alarm Test (Install – NMS)	98
Figure 8-67	Location Info / Installer Info (Install – NMS)	98
Figure 8-68	Date & Time Setting (Install – NMS)	99
Figure 8-69	Install – BCU	99
Figure 8-70	Install – BCU Commissioning	.100
Figure 8-71	Install – BCU Description	.100
Figure 8-72	Install - RFU	.101
Figure 8-73	RFU Commissioning (Install – RFU)	.102
Figure 8-74	Description (Install – RFU)	.102
Figure 8-75	Install – ODU	.102
Figure 8-76	Optic control (Control – ODU)	.103
Figure 8-77	Description (Install – ODU)	.103
Figure 8-78	Install-RU Hub	.104
Figure 8-79	RU Commissioning Status (Install-RU Hub)	.104
Figure 8-80	Description (Install-RU Hub)	.104
Figure 8-81	Install-Remote Module	.105
Figure 8-82	RU Output Commissioning (Install-RU)	.105
Figure 8-83	Description (Install-Remote Module)	.106
Figure 8-84	Account Management	.106
Figure 8-85	New Account	.106
Figure 8-86	Change Password	.107
Figure 8-87	Event Log	.107
Figure 8-88	User Log	.108
Figure 8-89	System update	.108
Figure 8-90	Message after System update is complete	.109
Figure 8-91	System Information	.109
Figure 8-92	System Notification	.110
Figure 8-93	Bill of material	.110
Figure 8-94	Setting Backup (Before)	.111
0	U	



Figure 8-95	Setting Backup (After)	111
Figure 8-96	Setting Restore	112
Figure 8-97	SNMP V1/V2	112
Figure 8-98	SNMP V3	113
Figure 8-99	System- Closeout Package	113
Figure 8-100	System- Closeout Package after the file upload	113
Figure 8-101	Help	114
Figure 10-1	HE Drawing	119
Figure 10-2	Master HPR Drawing	120



Tables

Table 1-1	ADX-H-NMS Parts List	15
Table 1-2	ADX-H-BCU Parts List	16
Table 1-3	ADX-H-RFU Parts List	16
Table 1-4	ADX-RACK-ODU Parts List	17
Table 1-5	ADX-H-ODU4 Parts List	17
Table 1-6	ADX-H-ODU1 Parts List	17
Table 1-7	Main HPR Parts List	18
Table 1-8	Extended HPR Parts List 오류! 책갈피가 정의되어 있지 않습!	니다.
Table 2-1	ADX-DAS Scalability	26
Table 3-1	NMS LED Specifications	
Table 3-2	RFU LED Specifications	
Table 3-3	ODU LED Specifications	32
Table 3-4	HE PSULED Specifications	34
Table 3-5	BCULED Specifications	
Table 3-6	Master HPR LED Specifications	39
Table 7-1	Ontic loss compensation table	59
Table 7-2	Back-off value for each technology due to traffic breathing	60
Table 7-2	Input signal conditions @HE BELL downlink input	61
Table 7-3	HE maximum downlink input level without 10dB attenuator	61
Table 7-4	HE downlink input signal conditions after adding 10dB attenuator to HE downlink input part	01 61
Table 7-5	HE maximum downlink input loval after adding 10dB attenuator to HE downlink input port	01 63
	Included and the second terms of the second se	62
Table 7-7	HE maximum downlink input lovel	02
Table 7-8	Terreted maximum input never	02
Table 7-9	Targeted maximum input power	62
Table 7-10	Maximum Output Power per carrier	63
Table 8-1	Account Information for Login	68
Table 8-2	Navigation tree	69
Table 8-3	Power Supply Status	70
Table 8-4		70
Table 8-5	System Summary Description	72
Table 8-6	Description for HE Commissioning status	73
Table 8-7	Description for NMS alarm	73
Table 8-8	RFU Alarm Status	77
Table 8-9	Summary Description	79
Table 8-10	Description for optic path status	80
Table 8-11	Description for HPR Commissioning status	82
Table 8-12	Alarm Status (Status - HPR Hub)	82
Table 8-13	Operating Status (Status – Remote Module)	84
Table 8-14	Description for General Setting	88
Table 8-15	Description for Main Gain Control Setting (Control – RFU)	89
Table 8-16	Description for Alarm Threshold Setting (Control – RFU)	90
Table 8-17	Description for Optic Attenuation (Control – ODU)	92
Table 8-18	Description for General Setting (Control - RU)	93
Table 8-19	Description for Optic Setting (Control - RU)	94
Table 8-20	Description for Manual Atten Control (Control - RU)	95
Table 8-21	Description for HE Commissioning Status (Install – NMS)	96
Table 8-22	Description for Optic control (Control – ODU)	.103
Table 8-23	Description for HPR Commissioning status	.104



Terms and Abbreviations

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

Abbreviation/Term	Definition
AGC	Automatic Gain Control
ALC	Automatic Level Control
AROMS	ADRF' Repeater Operation and Management System
BCU	Band Combiner Unit
BTS	Base Transceiver Station
CDMA	Code Division Multiple Access
СНС	Channel combiner
CW	Continuous Wave (un-modulated signal)
DAS	Distributed Antenna System
DL	Downlink
Downlink	The path covered from the Base Transceiver Station (BTS) to the subscribers' service area via the repeater
HE	Head End
HPA	High Power Amplifier
HW	Hardware
IF	Intermediate Frequency
LNA	Low Noise Amplifier
LTE	Long Term Evolution
MS	Mobile Station
NMS	Network Management System
ODU	Optic Distribution Unit which is located in ADX-RACK-ODU. An ADX-RACK-ODU has two ODUs.
OEU	Optic Expansion Unit
PLL	Phased Locked Loop
PSU	Power Supply Unit
RF	Radio Frequency
RFU	RF Channel Unit
RU	Remote Unit which is composed of master HPR and multiple slaves RU
HPR	High Power RU
Remote Module	generic term for master HPR and Master RU, slave RU
SW	Software
UL	Uplink
Uplink	The path covered from the subscribers' service area to the Base Transceiver Station (BTS) via the repeater
VSWR	Voltage Standing Wave Ratio



1. INTRODUCTION

Up to (8) frequency bands in one body: Currently the ADX supports 700 MHz (Lower A, Lower B, Lower C, and Upper C), 700MHz Public Safety & Upper D support, Cellular, PCS, SMR800/SMR900, AWS, WCS and BRS-TD LTE bands.

	ADX-HPR-7F43, ADX-HPR-C43, ADX-HPR-W, ADX-HPR-P46, ADX-HPR-A46, ADX-HPR-BT46	 메모 [C1]: 표기 방법 검토
		W43->W44.8->W 로 수정
1.1	Highlights	
•	Modular Structure (HE)	
	 Supports multi bands service (700MHz, 700MHz PS, Cell, PCS, AWS, SMR800/SMR900, WCS, BRS-TD LTE, etc.) in one body Supports up to 8 RF units 	
•	Supports optional combining/balancing of multiple carriers' signals via BCU (Band Combiner Unit)	
•	Supports up to a of maximum of 8 High Power Remote Units	 메모 [C2]: 수정
•	Up to <mark>6</mark> Band in HPR enclosure	 메모[H3]·8->6 로 수정
•	46/44.8/43dBm of downlink composite output power	
•	Requires only single strand of fiber per remote unit	
•	Operates with up to 5dBo optical loss (with ADX-H-ODU4, single mode), up to 10dBo optical loss possible(with ADX-H-ODU1, single mode)	
•	Supports SNMP v1, v2, v3 (get, set & traps)	
•	Web-based GUI Interface; No 3rd party GUI software required	
•	Web-GUI connectivity via DHCP in host mode	
•	Versatility and Usability: ADX gives total control to the user. Control parameters such as gain, output power, and alarm threshold can be changed using Web-GUI interface allowing the user to fine tune the system to the given RF environment.	
•	Uplink noise measurement routine	
•	Support RU View mode, refer to section 3.1.1.4	
•	Incremental Automatic Shutdown/Resume Time: ADX gradually increases the time span between automatic shutdown and resume period before it permanently shuts itself down	

• Support ALC function to prevent ADX DAS from input overload or output overpower



1.2 Head End Parts List

1.2.1 ADX-H-NMS-PKG Parts List

Table 1-1 ADX-H-NMS Parts List Label Quantity Description ADX-H-NMS-PKG (Network Management System Package) А ADX-H-NMS 1 1 ADX-H-PSU (AC to DC Supply) ADX-H-CHC (Head End Channel Combiner) 1 AC Power Cord В 1 С 1 RJ-45 Crossover Cable D 1 Ground Cable Documentation CD (User Manual, Quick Start Guide and Troubleshooting Guide) Е 1 F 1 Wall Anchor Bolt Set G 28 SMA terminators н L-mounting Brace 1







1.2.2 ADX-H-BCU Parts List

Table 1-2 ADX-H-BCU Parts List

Label	Quantity	Description
А	1	ADX-H-BCU (Band Combiner Unit)
В	6	N-Type terminators
С	2	NM to NM RF Jumper Cables (3ft)
D	1	Data/Power Cable
E	2	Chassis mounting brace



1.2.3 ADX-H-RFU Parts List

Table 1-3 ADX-H-RFU Parts List

Label	Quantity	Description
А	1	ADX-H-RFU (RF Unit)
В	2	N-Type Terminators
С	2	SMA Male RF Jumper Cables





1.2.4 ADX-RACK-ODU Parts List







1.2.5 ADX-H-ODU4-X Parts List

Table 1-5 ADX-H-ODU4 Parts List

메모 [H4]: -X 추가

메모 [H5]: -X 추가

Label	Quantity	Description
А	1	ADX-H-ODU4 (4-port Optical Unit)
В	2	SMA-M Terminators
С	2	SMA-M to SMA-M RF Jumper Cable (3ft)



1.2.6 ADX-H-ODU1-X Parts List

Table 1-6 ADX-H-ODU1 Parts List

Label	Quantity	Description
А	1	ADX-H-ODU1 (1-port Optical Unit)
В	2	SMA-M Terminators
С	2	SMA-M to SMA-M RF Jumper Cable (3ft)







1.3 High Power Remote Unit Parts List

1.3.1 ADX-R-xxx46/44.8/43M (HPR) Parts List

Table 1-7 HPR Parts List

Label	Quantity	Description
А	1	ADX-R-xxx46/44.8/43M (Main HPR)
В	4	N type-M terminators
С	1	USB Cable
D	1	AC cable
E	1	Ground cable
F	4	Anchor Bolt
G	1	Manual CD
Н	1	Install guide
-	1	Wall mount template



1.4 ADX DAS Quick View

1.4.1 HE Quick View



Figure 1-1 ADX DAS HE Quick View





메모 [C6]: 사진 수정 필요





1.5 Warnings and Hazards



RF EXPOSURE & ANTENNA PLACEMENT Guidelines

Actual separation distance is determined upon gain of antenna used. We recommend that the maximum antenna gain should not be exceed 2 dBi for 698-960 MHz and 3 dBi for 1710-2690 MHz. RF exposure compliance should be addressed at the time of licensing.

Antennas must be installed in accordance with FCC rule. The height of the antenna above average terrain (HAAT) is permitted over 1372m. For different gain antennas refer to the relevant rules.

WARRANTY

Opening or tampering the ADX DAS will void all warranties.

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



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

FCC Part 15 Class A

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

FCC Part 20

WANRNING. 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.

메모 [H8]: 추가 15/5/18

메모 [H9]: 추가 15/5/18



Laser Safety

Fiber optic ports of the ADX DAS emit invisible laser radiation at the 1310, 1550nm wavelength window.

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

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

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

Care of Fiber Optic Connectors

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

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

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

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



2. ADX-DAS CONFIGURATION

2.1 ADX DAS Topology



_ _ _ _

Figure 2-1 ADX DAS Topology

Advanced RF Technologies, Inc.

메모 [C10]: Block Diagram 삭제(15.07.28) _조찬기



2.2 Configuration

2.2.1 Single band or multi-band configuration (1~8 bands)

메모 [C12]: 수정(CK) 700LTE . . . °(... PCS ÷. ÷. 1 0.0 CELL BTS tillet **c** ////// AD ...

메모 [C11]: 수정

Figure 2-2 ADX DAS 6bands Configuration

- HPR is composed of only Main HPR for 17<mark>6</mark> bands configuration In this case, HPR has two ORU. 메모 [H13]: 8->6 으로 수정함.
- _



2.3 ADX-DAS Scalability

			Table 2-1 ADX-DAS Scalability	1
Unit			Scalability	Remarks
S	upporte	ed band	700M, Cellular, AWS, PCS, SMR800/900, PS700, WCS, BRS TD-LTE	
		RFU	Up to 8	up to 6: card type 7 th & 8 th RFU: 19" rack type
		NMS	1	
	Channel Combiner		1	
HE		Optic Unit	Up to 4	
	Band Combiner Unit		Up to 4	To support multiple carriers
	Power Supply Unit (AC or DC)		1	Capable of supplying power to 8 RFUs, 4 BCUs, 4 ODU racks and NMS.
	RU or HPR		Up to 60	
RU or HPR	OEU		Up to 4	
	PSU (RU)	Adaptor type	1 per remote module	
		19" rack mount (AC or DC)	1	Capable of supplying power to <mark>6</mark> Remote Modules

메모 [H14]: 8->6 으로 수정



3. ADX OVERVIEW

3.1 Head End

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

Head end components include:

- ADX-H-NMS (Network Management System)
- ADX-H-CHC (Head End Channel Combiner)
- ADX-H-PSU (Head End Power Supply)
- Up to [4] ADX-H-BCU (Band Combiner Unit)
- Up to [8] ADX-H-RFU-x (RF Unit)
- Up to [4] ADX-RACK-ODU (Optical Unit)
- Specifications
 - Size: 19.0 x 14.6 x 12.2 inches (482 x 370 x 311 mm)
 - Weight: 83.7 lbs (38.0 Kg)@4 RFU, CHC-H, PSU and NMS
 - Power Consumption: 52W@4 RFU, 1 ADX-H-ODU4 and NMS, 28W@1 RFU, 1 ADX-H-ODU4 and NMS
 - Power Input: 110VAC or -48VDC(optional)
 - Supports the ADRF-BBU for external battery backup solution



Figure 3-1 Head End Front View

메모 [Y15]: 추가 15/05/18



3.1.1 NMS (Network Management System)

• Functions and features

- Supports SNMP v1, v2, and v3 (get, set & trap) and web-based GUI Interface.
- Monitors alarms and status
- Provides control interfaces with all subordinate modules
- Provides overall DAS structure via the auto tree update function

• Spec

- Size: 19.0 x 12.1 x 1.7 inches
- Weight: 5.5 lbs



Figure 3-2 ADX-H-NMS Front View

3.1.1.1 LEDs

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





Table 3-1	NMS LED Specifications
	THE SPECIFICATIONS

ADX DAS-NMS		Specifications
Power	Solid Green	NMS power is ON
	OFF	NMS power is OFF
SOFT FAIL-H	Solid Yellow	HE Soft Fail alarm exists in the system
	Solid Green	No HE Soft Fail alarms are present in the system
SOFT FAIL-R	Solid Yellow	RU Soft Fail alarm exists in the system
	Solid Green	No HPR Soft Fail alarms are present in the system
HARD FAIL-H	Solid Red	HE Hard Fail alarm exists in the system
	Solid Green	No HE Hard Fail alarms are present in the system
HARD FAIL-R	Solid Red	RU Hard Fail alarm exists in the system
	Solid Green	No HPR Hard Fail alarms are present in the system
LINK FAIL-H	Solid Yellow	HE Link Fail alarm exists in the system
	Solid Green	No HE Link Fail alarms are present in the system
LINK FAIL-R	Solid Yellow	RU Link Fail alarm exists in the system
	Solid Green	No HPR Link Fail alarms are present in the system



3.1.1.2 Ethernet Port

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





3.1.1.3 Host/Remote Switch

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

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



Figure 3-5 Host/Remote Switch

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

3.1.1.4 HE View/RU View Switch

The HE View/RU View Switch allows the user to disable the periodic monitoring performed by the NMS. In the HE view mode, the NMS monitors the status of all subordinate units connected to NMS but when switched to HPR view the NMS does not monitor the subordinate units. HPR View mode will allow the user to go to a HPR and monitor/control the HE. If the NMS is set to the HE View mode and tries to connect to a HPR to monitor the HE, data collisions between the NMS and HPR may prevent the user from properly monitoring or configuring the HE when at the RU.





3.1.2 RFU (ADX-H-RFU-x)



Figure 3-7 RFU Front & Rear View

- Functions and features
 - Provide RF interface with BTS
 - Each RFU has independent gain control and filtering
 - Modular type and hot swappable
 - Supports duplex port or simplex TX & RX ports
 - Easily support additional frequency bands by adding a single RFU
 - Reduces complexity and overall equipment size
- Specifications
 - Size: 12.8 x 6.2 x 2.8 inches
 - Weight: 7.3 lbs

3.1.2.1 LEDs

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



ADX DAS-Module		Specifications
Power	Solid Green	Module power is ON.
	OFF	Module power is OFF.
Soft Fail	Solid Yellow	Soft Fail alarm exists in the RFU.
	Solid Green	No Soft Fail alarms are present in the RFU.
Hard Fail	Solid Red	Hard Fail alarm exists in the RFU.
	Solid Green	No Hard Fail alarms are present in the RFU.
DL SIG LOW	Solid Yellow	When DL input signal level is lower than the defined threshold
		level. (default threshold value: -5dBm)
	Solid Green	When DL input signal level is upper than the defined threshold
		level.



3.1.2.2 RF Ports

3.1.2.2.1 DL IN/UL OUT & DPX ports

DL IN/UL OUT & DPX Ports (refer to Figure 3-7) are located at the back of RFU and can be connected directly to the BTS. The RFU can support incoming signal strength from 0 to 25dBm.

3.1.2.2.2 DL OUT/UL IN

DL OUT/UL IN Ports (refer to Figure 3-7) are located at the front of the RFU and connect directly to the HE Channel Combiner (ADX-H-CHC).

3.1.2.3 Communication Port

The ADX-H-NMS monitors and controls the RFU via this port. DC Power is also provided to the RFU via this port.



Figure 3-9 Communication Port (RFU)

3.1.3 Channel Combiner (ADX-H-CHC)

ADX ++ CHC						6	
14 20 20 24							

Figure 3-10 ADX-H-CHC Front & Rear View

- Functions & Features
 - Combines DL signals received from each RFU and feeds the combined signals to the ADX-RACK-ODU
 - Combines UL signals received from each HPR and feeds the combined signal to the ADX-H-RFU
 Supports up to 8 RFUs and (4) ADX-RACK-ODU
- Specifications
 - Size: 16.9 x 12.9 x 1.7 inches
 - Weight: 11.0 lbs

3.1.3.1 RF ports

3.1.3.1.1 RF ports at the front panel (DL 1 to DL 8, UL 1 to UL 8)

DL 1(to DL 8) & UL 1(to UL 8) RF ports are connected to DL OUT/UL IN Ports at the front panel of RFU.

- Receive the downlink signal from each RFU
- Split the uplink signal received from ODU to each RFU

3.1.3.1.2 RF ports at the back panel (DL 1 to DL 8, UL 1 to UL 8)

DL 1(to DL 8) & UL 1(to UL 8) RF ports are connected to DL IN/UL OUT Ports at the back panel of ODU.

- Transfer the combined downlink signals to ODU
- Receive the uplink signal from ODU



3.1.4 Optic Unit (ADX-RACK-ODU, ADX-H-ODU4/ADX-H-ODU1)



Figure 3-12 ADX-H-ODU4 and ADX-H-ODU1 Installed in ADX-RACK-ODU

- Functions & Features
 - Converts signal from RF to optic and transports signals up to a maximum of 10Km (optical 5dBo loss including optical connection loss).
 - ADX-H-ODU4-X can supports up to (4) Main HPRs and up to 5dBo optical loss.
 - ADX-H-ODU1-X can supports up to 10dBo optical loss.
 - Minimizes the number of optic fiber cable need by transporting multi band signals over a single strand of fiber using WDM technology.

메모 [H16]: -X 추가	
메모 [H17]: -X 추가	

• Spec

- Size: 19.0 x 12.9 x 1.7 inches (482 x 327 x 44 mm)
- Weight: 13.2 lbs (6.0 kg)

3.1.4.1 LEDs

The ADX-RACK-ODU has the following LEDs on the front panel as shown in Figure 3-13.



Figure 3-13 ADX-RACK-ODU LED

Table 3-3 ODU LED Specifications

ADX DA	S-Module	Specifications
Power	Solid Green	Module power is ON
	OFF	Module power is OFF
LD FAIL	OFF	ODU is not installed
	Solid Yellow	LD Fail alarm exists in the ODU
	Solid Green	No LD Fail alarm is present in the ODU
LINK1 to LINK4	Solid Yellow	PD Fail alarm exists
	Solid Green	No PD Fail alarm is present

3.1.4.2 RF Ports



Figure 3-14 ODU RF Ports



3.1.4.2.1 DL IN/UL OUT

The combined downlink signal received from ADX-H-CHC is transferred to the DL IN 1(or 2) at the back of ODU. The UL OUT port connects any of the ports on back of the ADX-H-CHC labeled UL 1 \sim 8.

3.1.4.2.2 VHF DL/VHF UL

VHF DL/UHF UL ports are used to support Public Safety in the VHF & UHF frequency bands. VHF/UHF signals for Public Safety bypass the ADX-H-CHC and connect directly to the VHF DL/UHF UL ports of the ADX-H-ODU.

3.1.4.3 Optic Ports



Figure 3-15 ODU Optic Ports

The ADX-H-ODU4 has (4) optic ports and can support up to (4) Main HPR's. Likewise, the ADX-H-ODU1 has (1) optic ports and can support up to (1) Main HPR.

3.1.4.4 Communication Port

ADX-H-NMS monitors and controls the ADX-RACK-ODU via this port. DC power is provided from the ADX-H-PSU to the ADX-RACK-ODU via this port.



Figure 3-16 Communication Port (ODU)

3.1.5 Power Supply Unit (ADX-H-PSU)



Figure 3-17 ADX-H-PSU Front & Rear View

- Functions & Features
 - Capable of supporting up to:
 - > (8) ADX-H-RFUs
 - > (4) ADX-H-BCU
 - > (4) ADX-H-ODU
 - > ADX-H-NMS
 - Support the ADRF-BBU for an external battery backup solution
- Specificaitons
 - Size: 16.9 x 13.1 x 1.7 inches
 - Weight: 7.7lbs
 - Power Input: 110V or 220VAC, selectable by switch
- 3.1.5.1 LEDs



ADX-H-PSU has the following LEDs on the front panel as shown in Figure 3-18.



Figure 3-18 HE PSU LED

Table 3-4 HE PSU LED Specifications

ADX D	AS-Module	Specifications
Power	Solid Green	ADX-H-PSU power is ON
	OFF	ADX-H-PSU power is OFF
CHG STS	Solid Yellow	No AC power is available and ADRF-BBU is being used
	Blinking Green	PSU is charging the ADRF-BBU
	Solid Green	ADRF-BBU is completely charged
	OFF	Battery is not connected
LOW BATT	Solid Yellow	Low Battery alarm exist in the PSU
	Solid Green	No Low Battery alarm is present in the PSU
AC FAIL	Solid Yellow	AC Fail alarm exists in the PSU
	Solid Green	No AC Fail alarm is present in the PSU
DC FAIL	Solid Yellow	DC Fail alarm exists in the RFU
	Solid Green	No DC Fail alarms is present in the PSU

3.1.5.2 AC Input On/Off Switch, AC Input Port and AC Input Selection Switch



Figure 3-19 HE PSU AC Input On/Off Switch, AC Input Port and AC Input Selection Switch

The AC Power on/off switch is located at the back panel of HE PSU. The ADX-H-PSU can operate at 110V AC and 220V AC. The user should verify that the AC input voltage switch is set to the correct voltage before powering on the ADX-H-PSU.

3.1.5.3 Battery Backup Port, Battery Install Port and Battery Backup Switch



Figure 3-20 Battery Backup Port, Battery Install Port and Battery Backup Switch

The Battery Switch can be used to provide power to the optional External Backup Battery (ADRF-BBU) (Figure 3-20).

The ADX-H-PSU can be connected to an ADRF-BBU (ADRF Battery Backup Unit) which can provide power during a power outage. If an ADRF-BBU is utilized, connect the ADRF-BBU to the ADX-H-PSU via the external battery backup port as shown in Figure 3-20.



(WARNING: The circuit switch on the ADRF-BBU must be set to the OFF position before connecting the ADRF-BBU to the ADX-H-PSU to prevent damage to the ADX-H-PSU 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.

The Battery Install port is used to let ADX-H-NMS know if an ADRF-BBU is connected to the ADX-H-PSU or not. If an ADRF-BBU is connected without the cable connection to Battery Install port, the ADX-H-NMS will not detect the ADRF-BBU.

The procedure for connecting HE PSU to BBU

- BATT S/W OFF
- Connect ADRF-BBU to HE PSU Battery port and Battery Install port using HE battery cable
- BATT S/W ON

3.1.6 Optional Band Combiner Unit (ADX-H-BCU-x)



Figure 3-21 ADX-H-BCU Front & Rear View

• Functions & Features

_

- Combines and balances up to 3 carriers' signals
- Easily supports multiple carriers' signals by adding a single piece of equipment
- Reduces complexity and expansion costs to support multiple carriers' signals in a single system
- Input range: +5 ~ +25dBm
- Specifications
 - Size: 19.0 x 12.9 x 1.7 inches
 - Weight: 9.9 lbs

3.1.6.1 LEDs

The ADX-H-BCU has the following LEDs on the front panel as shown in Figure 3-22.



Figure 3-22 BCU LED

Table 3-5 BCU LED Specifications

ADX DAS-Module		Specifications
Power	Solid Green	Module power is ON
	OFF	Module power is OFF

Advanced RF Technologies, Inc.

메모 [C18]: BCUH 추가 필요 검토



Soft Fail	Solid Yellow	Soft Fail alarm exist in the RFU			
	Solid Green	No Soft Fail alarms are present in the RFU			

3.1.6.2 RF Ports

3.1.6.2.1 DL IN/UL OUT & DPX ports

DL IN/UL OUT & DPX Ports are located at the back of BCU and connect directly to a BTS.

3.1.6.2.2 DL OUT/UL IN

DL OUT/UL IN Ports are located on the back of ADX-H-BCU and connect directly to the ADX-H-RFU.

3.1.6.3 Communication Port

ADX-H-NMS monitors and controls the ADX-H-BCU via this port. DC Power is provided from ADX-H-PSU to the ADX-H-BCU via this port.



Figure 3-23 Communication Port (BCU)

3.2 HPR

- The High power remote unit is composed of a (1) Main HPR and up to (1) Extended HPR.
- Main HPR and Extended HPR use same enclosure.





3.2.1 Port

3.2.1.1 RF Port

3.2.1.1.1 Antenna server port (DIN type)




3.2.1.1.2 Extension Filter port (N type)

- EX_F1_IN, EX_F1_OUT: extension of additional Filter Port
- EX_F2_IN, EX_F2_OUT: extension of additional Filter Port



3.2.1.2 Optic port



Figure 3-25 Inner Optic port connection





Figure 3-26 Optic connection

3.2.1.3 GUI, RS 485 port

- GUI_A, RS 485_A is for additional band (SISO, MIMO_1)
- GUI_B, RS 485_B is for additional band (MIMO_2)
- GUI connectivity is along with optic line position (See the pictures below of various combinations)



Figure 3-27 ADX-HPR 6bands GUI connection (Single enclosure)

3.2.2 LEDs

HPR has the following LEDs on the front panel as shown in Figure 3-28.





Figure 3-28 HPR LED

Table 3-6 Master HPR LED Specifications

ADX DAS-Module		Specifications
Power	Solid Green	Module power is ON
	OFF	Module power is OFF

3.2.3 AC On/Off Switch, AC Port



Figure 3-29 HPR AC Port



Figure 3-29 HPR AC Switch

The AC Power on/off switch is located on PSU in the enclosure of each ADX-HPR.



The ADX-HPR is operated at the only 110V AC. The socket-outlet shall be installed near the equipment and shall be easily accessible (WARNING: The AC switch must be set to OFF before cable connection to avoid equipment damage and personal injury.) (WARNING: To avoid damage, be sure 110V AC for operation of ADX-HPR.) (CAUTION: DOUBLE POLE/NEUTRAL FUSING.)

The procedure for connecting HPR

- AC S/W OFF
- AC cable connection
- Optic connection
- RF cable connection
- RS 485 connection
- AC S/W ON
- 3.2.4 DC On/Off Switch, DC Port

메모 [C20]: DC 고려 사항 추가



Figure 3-30 HPR DC Port



Figure 3-31 HPR DC Switch

The DC Power on/off switch is located on PSU in the enclosure of each ADX-HPR. The ADX-HPR is operated at the only -48V DC.

The socket-outlet shall be installed near the equipment and shall be easily accessible



(WARNING: The DC switch must be set to OFF before cable connection to avoid equipment damage and personal injury.) (WARNING: To avoid damage, be sure -48V(-36[~]-76V) DC for operation of ADX-HPR. (CAUTION: DOUBLE POLE/NEUTRAL FUSING.)

The procedure for connecting HPR

- DC S/W OFF
- DC cable connection
- Optic connection
- RF cable connection
- RS 485 connection
- DC S/W ON

4. CABLE CONNECTION

4.1 Head End Connection Diagrams

4.1.1 Front/Rear Head End Connection View with Optional BCU unit







Figure 4-1 HE Cable connection (1 ADX-RACK-ODU +1 BCU)







_	RS485
_	Power & Signal
_	RF

Figure 4-2 HE Cable connection (4 ADX-RACK-ODUs)

4.2 High Power Remote Unit Connection Diagrams

- Ethernet cable for RS 485 is crossover type



Figure 4-3 ADX-HPR 6bands connection (Single enclosure)

• WARNING! The RS-485 ports should NEVER be connected to the Enthernet port of laptop or Ethernet Network Equipment. Doing so may cause serious damage to the Remote Modules or network equipments.



- 5. MOUNTING METHOD
- 5.1 Head End
- 5.1.1 Rack Mount





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

• Expandable up to 4 ADX-RACK-ODUs, 4 BCUs and 2 AUX CHs



5.1.2 Wall Mount



Figure 5-2 HE Wall Mount (Top View)

- Expandable up to 3 units (ODU, BCU) or max 3U (132mm)
 - ODU or BCU will be stacked up above basic 19" HE chassis which includes NMS, RFU, PSU and CHC



5.2 HPR

5.2.1 Wall Mount

ADX-HPR is support only wall mount.



Figure 5-3 HPR Wall Mount

6. INSTALLATION

6.1 Pre-Installation Inspection

Please follow these procedures before installing ADX HPR equipment:

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

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



6.2 ADX DAS Installation Procedure

6.2.1 HE Installation Procedure



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

6.2.1.1 Installing a ADX DAS HE in a rack

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

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





Figure 6-1 ADX HE 19" Rack Mount Instructions



6.2.1.2 Wall mounting the ADX DAS HE

If the ADX HE chassis is being mounted to a wall, then allow clearance of at least 17" (430mm) on the top (front side of HE) and 2" (51mm) on the bottom (rear side of HE) and 2" (51mm) on both sides and front for air circulation.

- Mount procedure
 - The following steps should be followed when wall mounting the ADX HE
 - > $\;$ Verify that the HE and Mounting hole are in good condition
 - > Place the ADX HE against the wall and mark of the mounting holes
 - > Drill holes(4holes, 180mm, 50mm depth) in the installation surface and insert the anchor bolts
 - > Bolt the ADX HE to the wall
 - > Make sure the ADX HE is securely attached
 - > Connect the GND cable
 - > Connect the RF cable
 - > Connect the Power
 - > Connect the Optic cable



Figure 6-2 ADX HE Wall Mount Instructions



6.2.1.2.1 Installing added rack type modules into basic HE chassis

Additional modules such as the ADX-RACK-ODU and ADX-H-BCU can be mounted to the Chassis (ADX-H-CHA) using the included mounting brackets that come with the add-on modules.

- A maximum of up to 3 addon modules (ODU, BCU) can be mounted to the chassis
 - ODU or BCU will be stacked up above basic 19" HE chassis which includes NMS, RFU, PSU and CHC



Figure 6-3 Wall Mount Instructions for ADX-HE added 1U Unit



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6.2.2 RU Installation Procedure

Wall mounting the ADX HPR

Mount procedure

- The following steps should be followed while mounting the Remote Module
- > Verify that the HPR and Mounting hole are in good condition
- > Separate the wall mount bracket from the HPR
- > Placed the wall mount bracket against the wall and mark off the mounting holes
- >~ Drill holes(4holes, 18 Φmm) in the installation surface then insert the enclosed anchor bolts
- > Bolt the mounting bracket to the wall
- > Install the HPR to the mounting bracket
- > Fasten the HPR to the mounting bracket using the included screws
- > Verify that the HPR is securely attached
- > Connect the Antenna cable
- > Connect the Power
- > Connect the Optic cable (if applicable)



Figure 6-4 HPR Wall Mount Instructions



6.3 Grounding

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



Figure 6-5 Ground Cable Connection (HE rear side)



Figure 6-6 Ground Cable Connection (HPR dual side)

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



6.4 Optic Port Cleaning

- We recommend cleaning optic connector using a dry optical cleaning swab or tissue in a dry environment as needed. We recommend cleaning the optic connectors only if the expected optic loss is higher than the loss reported in the Web-GUI by 1.5dBo. (Figure 6-7)
- When optic connector are not in use, the port should be covered with a protective dust cap. (Figure 6-8)



Figure 6-7 Optic Connector Cleaning (left) and Optic Port Cleaning (right)



Figure 6-8 SC/APC Optic Connector Dust Cap



7. COMMISSIONING

The commissioning process is composed of the following:

- Pre-Commissioning Check (refer to section 7.1)
- Optic Commissioning (Optic loss compensation) (refer to section 7.2.1)
- HE commissioning (refer to section 7.2.2)
- RU commissioning (refer to section 0)
- Commissioning verification (refer to section 0)

7.1 Pre-Commissioning Check

7.1.1 Verify cable connections

- Before powering up units, check all RF cables, fiber cables, and power cables connections.
- All power LEDs should be lit 1 minute after the components have been turned on.
- Check whether LD & PD LEDs of HE ODU modules are solid GREEN. (PD LED will be lit green when connected to a Master RU).
 - If the PD LED for the link with a connection with to a HPR is OFF, then check the optic cable connection.
 - If the optic cable is good and the PD LED is not lit green, the try another optic port on the ADX-RACK-ODU to see if the other port lights up green.

7.1.2 Connect to the Web-GUI

- Confirm that the NMS Host/Remote switch is set to the Host position
- Confirm that the HE View/RU View switch is set to the HE View position
- Connect the RJ-45 crossover cable from the Ethernet port of NMS to the Ethernet port of laptop
- Launch a standard Internet browser like IE or Google Chrome and type the System Controller's IP address (192.168.63.1) into the addess bar
- On the login screen use the following default login/password to gain access:
 - Username: adrf
 - Password: adrf

ADT	Status Control Install System Help Logout
0.0	AROWS Login
ADRF	Username: adrí
	Password: ••••
	Login
	Copyright © 1999-200 Advanced BF Technologies, Inc. 1116 Varowen St + Burbank, CA 91556 + U.S.A. Toll Free Number (1+00-113-9955) technoport@adrflech.com http://www.adrflech.com
	Figure 7-1 Login window



7.1.3 Check Navigation Tree Status

- Check whether the status of navigation tree is Lock or Unlock.
- The navigation tree should be in the "Unlock" state in when adding or removing active ADX components.



Figure 7-2 Navigation tree Lock/Unlock

When the system is locked:

- Unable to detect any hardware that is added
- Able to detect any link fails (communication errors between NMS and components)
- System should be locked after final commissioning

When the system is unlocked:

- Unable to perform BCU, RFU, or HPR commissioning
- System is continually scanning for new hardware

7.1.4 Set Location Info, Installer Info and Date & Time

- Go to the Install page of NMS
- Enter Location & installer information
- Set current Date & Time

7.1.5 Verify Navigation Tree Links

- Check whether all units connected to HE & HPR are being displayed in the navigation tree.
 - Navigation tree is located on the left side of Web-GUI (Figure 7-3)

NPC			^
* R	FU - 700	0	
• 8	FU - Cell		
* R	FU - PCS		
* B	FU - AWS	0	
- 0	PT - 1	•	
- 1	RU-Hub - 1		
	M-RU - PCS	0	L.
	S-RU - 700	0	1
	S-RU - Cell	0	
,	S-RU - AWS	0	
1	RU-Hub - 2		
	M-RU - PCS	0	
	S-RU - 700		
	S-RU - Cell		
	S-RU - AWS	0	
1	RU-Hub - 3	0	
	M-RU - PCS	0	
		0	

Figure 7-3 Navigation tree

- Check whether link fails exist. Link fails status can be seen on the front panel of NMS module via the Link Fail-H and Link Fail-R LED lights.
 - If LINK-H fail exists, power cycle the HE PSU and check if LINK-H fail is still present and repeat this step up to 3 times or until the alarm clears. If LINK-H fail still exists after 3 power cycles, then contact ADRF Technical support.
 - If LINK-R fail exists, power cycle the ADX-H-ODU module which is connected to the Master HPR with link fail and check to see if the LINK-R fail is still present and repeat this step up to 3 times or until the alarm clears. If LINK-R fail still exists after 3 power cycles, contact ADRF Technical support.



7.1.6 BOM Comparison & Check Band Configuration

- BOM comparison
 - On the System information page in the System menu, the list of all components connected to the ADX-H-NMS should match the ADX Navigation tree. This list can be used to verify BOM generated by designer or installer for all active components. Please note that passive components such as the ADX-H-CHC, ADX-R-CHC, ADX-H-PSU, and the ADX-R-4WS will not show up on this report.
- Check Band Configuration
 - Check whether the band configuration of ADX-H-RFU is identical to the band configuration of the ADX HPR units. Any discrepancies will appear in the System Information report.
 - Check to see if there are multiple remote modules with the same frequency bands within 1 remote unit. This information is displayed on the System Information page in the System menu as notification message.

7.1.7 Lock current navigation tree

- If there are no errors in the process of BOM Comparison & Check Band Configuration, then lock the Navigation Tree by cliking on the "Lock System" button.
 - After locking the Navigation Tree, link fail alarms should not appear. If link fail alarms are present, please check the physical connection of the device with the link fail alarm.
 - The system must first be placed in the "Unlock" state before adding any new devices. Newly added devices will appear in the Navigation Tree when the page is refreshed. Once all new hardware has been added to the Navigation Tree, the tree must be locked before commissioning the system.



7.2 Commissioning

7.2.1 Optic Commissioning

		Control	Instan	System					
	Optic Comm	nissioning							
CH-OFT ID : abcefefe				Common 4	Attenuation	1			
				DL	UL	2			
				5.0 *	5.0 *		Remote U	Jnit	
Lock System			LD Power	PD Power	UL O-ATT	LD Power	PÖ Power	DL ATT	
	Communication	Le Le	1k 1-1		13.0			13.0	
	Consystem	OLi	sk 1-2		13.0			0.0	
1 All Collapse All	Carrorna	OL:	1k 1-3		13.0 -	1		0.0	
	Conversion	OL:	sk 1-4		13.0 .	1	a b 1	0.0	
	-				Apply			Apple	
FU - PCS									
BU - Cell	-					510 			
RFU - Cell				Common /	Attenuation UL	<u>,</u>			
IFU - Cell () ICU - PCS () ICU	-			Common / DL 5,0	Attenuation UL		Renote t	Joit and	
FU - Cell CU - PCS CU - PC - 1 CU			LD Power	Common / DL 5,0 ~ PD Power	Attenuation UL 5.0 -	LD Power	Remote 0 PD Power	DL ATT	
10 - Cell	Central		LD Power	Common / DL 5,0 * PD Power	Attenuation UL 5.0 v UL O-ATT 13.0 v	LD Power	Remote 0 PD Power	DL ATT	
U - Cell U - PCS T-1 RU-Hub - 1	Commu		LD Power	Common / Di, 5,0 * PD Power	Attenuation UL 5.0 7 UL O-ATT 13.0 7 13.0 7	LD Power	Remote C PD Power	DL ATT	
Cell PCS 1 Htub-1	Commission		LD Power 1k 1-5 1k 1-6 1k 1-7	Common / DL 5,0 * PD Power	Attenuation UL 5.0 * UL O-ATT 13.0 * 13.0 *	LD Power	Remote (PD Power	0.0 0.0	
Cell PCS Hub-1	Commu Commu Commu Commu		LD Power 1k 1-5 1k 1-6 1k 1-8	Common J DL 5,0 * PD Power	Attenuation UL 5.0 * UL O-ATT 13.0 * 13.0 * 13.0 *	5.D Power	Remote U PD Power	DL ATT 0.0 0.0 0.0 0.0	

Figure 7-4 ODU Install page

- Navigate to the Install page of ADX-H-ODU (Figure 7-4)
- Compare the values of measured optic loss (LD power PD power) in the Web-GUI with the actual optic loss
 which is typically measured at the time of installation of the fiber.
 - The calculated optic loss is displayed when the mouse pointer is placed over the Status indicator of each link

		LD Power	PD Power	UL ALI	
Commissioning	Link 1-5			13.0	
Commissioning	Link 1-6	0.0		13.0	4
Commissioning	Link 1-7	0.0	4.5	8.0	-
Commissioning	Optic Los	s(DL/UL) :	2.6 / 2.4 dBo	18.0	-
				_	



- If the difference between the measure optic loss and the calculated loss is larger than 1.5dBo, then clean the optic connector and optic port using optical cleaning swab. (refer to section 6.4)
- The following is the definiton of the Status indicator of each link:
 - Green: Indicates that optic loss is less than 5dBo
 - Orange: Indicates that optic loss is greater than 5dBo
 - Gray: No Master HPR is connected to this link.
 - The following is the definition for the background color of the Commissioning button:
 - Green: Indicates that no optic loss compensation is needed.
 - Orange: Indicates that optic loss compensation is needed.
 - Gray: No Master HPR is connected to this link.

7.2.1.1 How to compensate the optic loss



Optic loss compensation should be performed when the color of "Commissioning" button is orange. The "Commissioning" button will turn orange when the difference between the compensated attenuation and the actual compensated attenuation level is greater than 1.5 dB. Optic compensation can be performed by clicking the orange "Commissioning" button.

• The optic loss compensation for uplink and downlink are performed separately.

- The optic loss compensation for downlink will be performed based on the LD level of the ODU and the PD level of the Master RU.
- The optic loss compensation for uplink will be performed based on the LD level of the Master HPR and the PD level of the ODU.
- Optic loss compensation adjusts the attenuation based on Table 7-1 and the calculated optic loss (LD level-PD Level).
 - The calculated optic loss is displayed when a mouse is placed on the circle of each link. (Refer to section 7.2.1.1)
 - Based on the table below, when the calculated optic loss is 1dB, the attenuation will be set to 11dB.
 - The attenuator for downlink optic loss compensation is located at the Master RU.
 - The attenuators for uplink optic loss compensation are located at the ODU.

Table 7-1 Optic loss compensation table

Optic Loss (dBo)	Compensated Attenuation (dB)
0	13
0.5	12
1	11
2	9
3	7
4	5
5	3

Example: Let's say that this ADX-H-ODU had previously been commissioned in a system where the optic loss was 3 dBo. In the previous system, the correct amount of attenuation is 7dB. The ADX-H-ODU was moved to another site and the new system has an optic loss of only 1dBo. At 1dBo of loss, the correct amount of attenuation should be 11 dB. When this system powers on, optic commissioning will need to be performed because the difference between the old attenuation level and the new attenuation level is 4dB which exceeds the 1.5 dB threshold. Once optic commissioning is performed, it will set the attenuation level to 11 dB.



•

7.2.2 HE Commissioning

HE commissioning is composed of HE BCU and HE RFU commissioning. The HE BCU is an optional component and should be used when WPSs' signals are being used in the same frequency band.

7.2.2.1 Composite power

To perform HE commissioning, the user should calculate downlink composite input level and add the proper amount of breath room required for rise in traffic.

- Information that is needed to calculate commissioning levels are:
 - Service frequency band
 - Service technology
 - The number of wireless service provider
 - The number of carriers per technology
 - The number of band sharing same amplifier

7.2.2.1.1 DL Composite Input Level Calculations for HE Commissioning

7.2.2.1.1.1 Single WSP in a frequency band

- Measure the output power of the BTS signal that will be inserted into the RFU using a Spectrum Analyzer.
 - If input signal includes more than one technology, then measure the composite power of each technology.
- Based on Table 7-2, calculate the maximum composite input level by using the following formula:
 - "Output power of BTS of technology being used" + "back-off value" (refer to Table 7-2)
 - If calculated composite HE DL input power exceeds the permitted maximum input range, then
 additional attenuation will need to be added so that the calculated HE DL input power does not
 exceed 25dBm.

Technology	Connected to BTS
CDMA	6~8dB
1xEVDO	6~8dB
WCDMA	8~10dB
HSPA	8~10dB
iDEN	0~3dB
GSM	0~3dB
LTE	8~10dB

Table 7-2 Back-off value for each technology due to traffic breathing

7.2.2.1.1.2 Multiple WSPs in a frequency band

When multiple WSPs exist in a frequency band at the same time, the ADX-H-BCU can be used to combine/divide the signals received from multiple WSPs.

- The ADX-H-BCU can receive up to 3 incoming DL signals. Each incoming signal can be attenuated individually allowing the user to specify power ratios to control the power per carrier.
- The downlink path of BCU has the input range from 0 to 25dBm.
- If the downlink output of BCU exceeds DL output ALC level set by user, ALC function will activate and limit the DL output from exceeding the defined ALC level.
- The DL output of ADX-H-BCU is transferred to the DL input of RFU.
- Measure the output power of the BTS signal that will be inserted into the BCU using a Spectrum Analyzer.
 - If input signal includes more than one technology, then measure the composite power of each technology.
- Based on Table 7-2, calculate the maximum composite input level by using the following formula:
 - "Output power of BTS of technology being used" + "back-off value" (refer to Table 7-2)



- If calculated composite HE DL input power exceeds the permitted maximum input range, then
 additional attenuation will need to be added to the BCU input port so that the calculated HE DL
 input power does not exceed 25dBm.
- The RFU DL input commission level is the combined DL Output ALC Level of the ADX-H-BCU which can be obtained from the Control page of the ADX-H-BCU.
 - The maximum input level of HE RFU will not exceed 10dBm (= 5dBm + 10*log10 (3)) because the maximum output of BCU each path is limited to 5dBm by the ALC function.

7.2.2.1.2 Example of commissioning value calculation

7.2.2.1.2.1 AT&T signal in the PCS band with multiple technologies (without attenuation)

Table 7-3 shows 2 technologies being used by AT&T within the same band which are inputted into the HE RFU.

Table 7-3 Input signal conditions @HE RFU downlink input

WSP	AT	&T	
Technology	GSM WCDMA		
Total input per band	20.0dBm	20.0dBm	
HE Total Input	23.0dBm		

- The downlink input level for each technology should be measured because two technologies (GSM & WCDMA) are being used by AT&T in the PCS band.
 - Total measured input power for GSM is 20dBm and for WCDM is 20dBm.
- The HE DL maximum input level for each technology can be calculated by adding the back-off value per technology due to traffic load change (breathing).
- Estimated Total Max Input per band = Total input per band + back-off value per band for breathing.
- HE DL maximum input level becomes the sum of HE DL maximum input level for each technology.
 - The sum of HE DL maximum input level for each technology is 28dBm (25.0dBm for GSM + 25.0dBm for WCDMA = 28.0dBm) and this value is 3dB (28dBm 25dBm) larger than the maximum DL input of HE RFU.
 - If the calculated HE downlink commissioning value exceeds the maximum DL input of HE RFU, attenuation will need to be added have the calculated HE downlink commissioning level not exceed 25dBm.

Table 7-4 HE maximum downlink input level without 10dB attenuator

WSP	AT&T		
Total input per band	20.0dBm 20.0dBm		
Back off per band for breathing	5.0dB	5.0dB	
Estimated Total Max Input per band	25.0dBm	25.0dBm	
Estimated Total Max Input	28.0dBm		
Available Max Input	25.0dBm		

7.2.2.1.2.2 AT&T signals in the PCS band with multiple technologies (with 10dB of attenuation)

After adding 10dB of attenuation to the system, the input levels per band and HE Total Input can be seen below:

Table 7-5 HE downlink input signal conditions after adding 10dB attenuator to HE downlink input port

WCDMA



Total input per band	10.0dBm	10.0dBm
HE Total Input	13.00	dBm

The RFU can now be commissioned with the 10dB of attenuation by using a DL input commission level of 18dBm.

Table 7-6	HE maximum downlink input level after adding 10dB attenuator to HE downlink input port	
	The maximum domining input level arter adding ious attenuator to the domining input port	

WSP	AT	&т
Total input per band	10.0dBm	10.0dBm
Back off per band for breathing	5.0dB	5.0dB
Estimated Total Max Input per band	15.0dBm	15.0dBm
Estimated Total Max Input	18.0	dBm
Available Max Input	25.0	dBm

7.2.2.1.2.3 Multiple WSPs' signals exist in the PCS band (with power ratio)

Table 7-7 displays all the various incoming DL signals that are entering into the HE PCS BCU. The ADX-H-BCU has total 3 input ports and in the example below each port has been assigned to Sprint, AT&T, and VzW.

Table 7-7	Input signal conditions @HF BCU downlink input
	input signal conditions with beo downlink input

WSP	Sprint- CH1	AT&1	- CH2	VzW- CH3
Technology	CDMA	GSM	WCDMA	CDMA
Total input per band	5.0dBm	10.0dBm	10.0dBm	7.0dBm
BCU Total Input		14.5	dBm	

• Calculate maximum DL input level for each WSP factoring in the back-off values.

Table 7-8 HE maximum downlink input level

WSP	Sprint- CH1	AT&T	- CH2	VZW- CH3
Total input per carrier	5.0dBm	10.0dBm	10.0dBm	7.0dBm
Back off per band for breathing	4.0dB	5.0dB	5.0dB	4.0dB
	0.040	15.0dBm	15.0dBm	11.0dDat
Estimated Total Max input per carrier	9.00Bm	18.0	dBm	11.00Bm

• Based on the calculated maximum DL input level for each port, the user should decide on a target maximum Input power for each BCU port.

- Targeted maximum Input power for each BCU port should not be less than the calculated maximum DL input level for each port and should not exceed the maximum input level, 25dBm.

Table 7-9 Targeted maximum input power

WSP	Sprint- CH1	AT&T- CH2	VZW- CH3
Torgated maximum input neuror	9.0dBm	18.0dBm	11.0dBm
Targeted maximum input power		19.2dBm	
Targeted DL Output Power Ratio set by user	30.0%	20.0%	50.0%

• Calculate the DL maximum output power of BCU based on targeted maximum Input power for each BCU port.

 The highest power ratio that has been set is VZW- CH3 @ 50%. The ADX-H-BCU will apply attenuation to this port to set the maximum output power to 5dBm, therefore 6dB of attenuation will be applied to this port.



- The attenuation and DL output ALC level for the other ports are set based on the formula below to keep the power ratio between BCU ports.
- The maximum output power for the specified path = 10*log10[10^(Max_ALC/10)x(Pwr_Ratio)/ Max Ratio]
 - Max_ALC: DL output ALC level for the path with maximum power ratio = 5dBm
 - . Pwr_Ratio: Targeted DL output power ratio value for the specified path
 - Max_Ratio: maximum power ratio value
- The attenuation for the specified path = The targeted maximum input power for the specified path -> The maximum output power for the specified path
- DL output ALC level = The targeted maximum input power for the specified path The attenuation for the specified path
- The path for AT&T- CH2
 - The maximum output power = $10*\log 10[10^{(5/10)}x20^{(50)}] = 1.02$ dBm
 - . The ATT value = 18.0dBm-1.02dBm=16.98dB → 16.5dB(the control step of used attenuator is 0.5dB)
 - . DL output ALC level = 18dBm - 16.5dB = 1.5dBm
- The path for Sprint- CH1
 - The maximum output power = 10*log10[10^(5/10)x30%/50%] = 2.78dBm
- The ATT value = 9.0dBm-2.78dBm=6.22dB → 6.0dB(the control step of used attenuator is 0.5dB) DL output ALC level = 9.0dBm - 6.0dB = 3.0dBm
- The DL maximum output power of BCU is the sum of maximum output power for each port and this power becomes the HE RFU input commissioning level.
- The maximum input level of HE RFU should be less than 10dBm (= 5dBm + 10*log10 (3)) because the maximum output of BCU per each path doesn't exceed 5dBm by ALC function.

WSP	Sprint	AT&T	vzw	
To control and include include	9.0dBm	18.0dBm	11.0dBm	
raigeted maximum input power	19.2dBm			
Targeted DL Output Power Ratio set by user	30.0%	20.0%	50.0%	
DL maximum output power (ATT control step, 0.5dB is not considered)	2.78dBm	1.02dBm	5.0dBm	
ATT value	6.0dB	16.5dB	6.0dB	
DL output ALC level or	3.0dBm	1.5dBm	5.0dBm	
DL Maximum output power (ATT control step, 0.5dB is considered)	8.2dBm(I	RFU DL Input commission	ing level)	
DL Output Power Ratio considering ATT control step 0.5dB	30.37%	21.50%	48.13%	



7.2.2.1.3 HE BCU Commissioning

When performing BCU commissioning, the user will need to enter the DL input commissioning level and Targeted DL Output Power Ratio for each RF path. Refer to section 7.2.2.1 to calculate DL input commissioning level. If a port is not being used, the DL Input Commissioning Level should be set to "disabled".

7.2.2.1.3.1 HE BCU Commissioning Procedure

• Go to Install page of the BCU on the Web-GUI

	PATH A	PATH B	PATH C
Current DL Input Level [dBm]	0.1	-0.3	1.5
DL Input Commissioning Level [dBm]	0.0 -	0.0 -	0.0 🔻
Targeted DL Output Power ratio[%]	33.3	33.3	33.3
Commissioning Progress			
Previous DL Commissioning Level [dBm]	0.0	0.0	0.0
Last Commissioning Date		00/00/0000	
Last Commissioning Time	[00:00:00	
			Annly
			, shhil

Figure 7-6 BCU Install Window

- Select a DL Input Commissioning Level for each RF path
- DL Input Commissioning Levels range is 0~+25dBm (0.5dB step)
- Enter HE BCU downlink output power ratio for each port
- Press the "Apply" button
- The attenuation value and output ALC level for each DL/UL path will be set automatically based on the HE BCU downlink input commissioning level and downlink output power ratio for each port.
- The BCU will check to see if ALC is active on any of the ports.
 - During the commissioning routine, if ALC is activated, a popup message will appear stating that ALC is running. If this is the case, then there is a chance that the "back-off" value needs to be increase to allow more breathing room.
- The BCU checks to see if the BCU has any alarms.
 - If a soft fail is present, the system will prompt the user whether or not they would like to continue.
 - If hard fail is present, the commissioning process will stop immediately.



7.2.2.1.4 HE RFU commissioning

If a BCU is being used in the system, the BCU should be commissioned before commissioning the HE RFU. For RFU commissioning, the user will need to calculate the DL input commissioning level. Refer to section 7.2.2.1 to for information to determine the DL input commissioning level.

7.2.2.1.4.1 HE RFU commissioning Procedure

• Go to Install page of RFU on the Web-GUI

Current DL Input Level [dBm]	-27.1
DL Input Commissioning Level [dBm]	1.0 -
Commissioning Progress	
Previous DL Commissioning Level [dBm]	1,638.4
ast Commissioning Date	00/00/0000
aust commissioning bate	

Figure 7-7 RFU Install Window

- Enter HE RFU downlink input commissioning level
 - Input range: 0~+25dBm, 0.5dB step
- Press the "Apply" button
- The attenuation levels will be set automatically based on DL Input Commissioning Level that is selected.
- Checks to see if DL input is low.
 - During the commissioning routine, if DL input level is 10dB less than commissioning level, a
 popup message will appear stating that DL input is low. If this is the case, then there is a chance
 that the "back-off" value needs to decrease breathing room.
- Checks to see if ALC is active.
 - During the commissioning routine, if ALC is activated, a popup message will appear stating that ALC is running. If this is the case, then there is a chance that the "back-off" value needs to be increase to allow more breathing room.
- Checks to see if the RFU has any alarms.
 - If a soft fail is present, the system will prompt the user whether or not they would like to continue.
 - If hard fail is present, the commissioning process will stop immediately.
- Commissioning is successfully completed.



7.2.3 HPR Commissioning

HPR composite downlink output level can be determined using simulation tools like iBwave. User should simulate this output level in order to ensure that all service areas have sufficient coverage.

- The simulated composite DL output power value should not exceed the maximum output level of the HPR, which is 46/44.8/43dBm.
- The simulated composite DL output power value would be used as HPR DL commissioning output level. DL attenuation value will be adjusted automatically based on this simulated value HPR commissioning level.

For HPR commissioning, user should enter information on DL output commissioning level. Refer to section 7.2.2.1 to calculate DL output commissioning level.

Go to Install page of Remote Module on the webGUI

Current DL Output Level [dBm]		
DL Output Commissioning Level [dBm]	5.0	•
Commissioning Progress		
Previous DL Commissioning Level [dBm]	1,638.4	
Last Commissioning Date	00/00/0000	
Last Commissioning Time	00:00:00	

Figure 7-8 Remote Module Install Window

- Enter HPR downlink output commissioning level
 - Output range: 5~+46/44.8/43dBm, 0.5dB step
- Press the "Apply" button
- The attenuation level for each DL/UL path will be set automatically based on DL Output Commissioning Level that is entered
- Checks to see if DL output is low.
 - During the commissioning routine, if DL output level is 10dB less than commissioning level, a popup message will appear stating that DL output is low. If this is the case, then there is a chance that the "back-off" value needs to decrease breathing room.
- Checks to see if ALC is is active.
 - During the commissioning routine, if ALC is activated, a popup message will appear stating that ALC is running. If this is the case, then there is a chance that the "back-off" value needs to be increase to allow more breathing room.
- Checks to see if the Sub-RU has any alarms.
 - If a soft fail is present, the system will prompt the user whether or not they would like to continue.
 - If hard fail is present, the commissioning process will stop immediately.
- Commissioning is successfully completed.



7.3 DAS Install Verification

7.3.1 Setting SNMP & Remote IP

- Go to Install page of NMS (refer to section 8.2.4.1.4)
- When external modem box is connected, user should set SNMP & Remote IP information.

7.3.2 Verification through Web based GUI

- Go to System information page of System (refer to section 8.2.5.4.1)
 - Check if Remote Module with same frequency band exist more than one within one HPR.
 - Check if there are any noncommissioned modules in HE or RU.
 - Check if any critical alarms are present.

7.3.3 UL noise power detection

When the UL noise levels is larger than the expected value, ADX DAS has a function that will measure the uplink noise for each HPR and will generates a report with the UL noise levels. This will help the user determine which HPR might be the cause of the elevated UL noise.

- UL noise power measurement can be performed for only one frequency band at a time.
- For more information, refer to section 8.2.3.3.3.



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8. WEB-GUI

8.1 Web-GUI Setup

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

8.1.1 DAS system/PC Connection Using Web-GUI

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

	AROMS Login			
DRF	Username:			
ite ID : ADRF				
	Password:			
		Login		
	C	×		

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Figure 8-1 Login screen

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

Table 8-1 Account Information for Login

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



8.2 Administrator/User Mode

8.2.1 Common

8.2.1.1 Navigation tree Lock/Unlock

When the system is "Locked", a green lock icon will appear above the navigation tree. When the system is locked, new devices cannot be added. Any devices added to the system when the system is "Locked" will not be detected by the NMS. After a system has been commissioned properly, the system should be left in the "Locked" position. To unlock the system, click on the "Unlock System" button to the right of the icon.

When the system is "Unlocked", an orange icon will appear above the navigation tree. When the system is unlocked, new devices added to the system will be automatically detected. Once the new hardware appears in the system tree, then the system can be locked. To lock the system, click on the "Lock System" button to the right of the icon.



Figure 8-2 Navigation tree Lock/Unlock

8.2.1.2 Navigation Tree

1	Unlock	System
Ex	pand All Colla	pse All
1	uks .	0
٠	[1] RFU - Cell	0
٠	[2] RFU - AWS	0
٠	[3] RFU - PCS	0
٠	[4] RFU - AWS	
٠	[5] RFU - 700	0
•	[6] RFU - PCS	0
٠	BCU - 700	0
•	BCU - Cell	•
•	BCU - PCS	
•	BCU - AWS	0
•	[7] RFU - PCS	•
•	[8] RFU - AWS	0
+	OPT - 1	0
+	OPT - 2	0
+	OPT - 3	0
+	OPT - 4	0

Figure 8-3 Navigation tree

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

	Table 8-2 Navigation tree			
Parameters	Description			
Expand All	Expands the entire navigation tree			
Collapse All	Collapses the entire navigation tree			
+	The module has the expandable subordinate modules			
-	The branch is currently expanded			
0	The module has soft fail alarm			
•	The module has hard fail alarm			
•	The module has no alarms (normal)			
NMS	The selected module will have orange colored text			



8.2.1.3 Power Status

Display the power source that is currently being used.

Table 8-3 Power Supply Status

Input Power Status	Display Image		
AC	Power		
Battery	Battery		

8.2.1.4 Commissioning Status

Display whether or not the module has successfully been commissioned.

Table 8-4	Commissioning ICON
1 abie 0-4	COMMISSIONING ICON

Status	Display Image
Commissioned	Commissioned
Not-Commissioned	Not Commissioned

8.2.1.5 Information

Serial Number	SN NHS	
Lathude.	10777.777777	
Longitude	E777.777777	
Fermara	13000F01002x	
Wab GLD	×0.0.95	
ITTE Variation St. Instant. CA 1150 Description rms_desc.		
Itili Varomer SL Instank CA IISI Description rm_desc.	5	
The Vancenier SL Instrument CA 1152 Description rem_desc. Technical Supp	port	
1119 Vanceven SL Increant CA 3150 Description rma_desc. Technical Supp Phone: 1-809-313 E-mail: Incheopo	s port -5345 riPad-fach core	
IIIs Vaccourt St. burbank CA IISE Description rma_desc. Technical Supp Phone: 1-800-333 E-main buchcoppo Installer Contr	s port 2015 riBalritshaum set Info	
1118 Vancourn SL Iburbark CA 1955 Description rem_desc. Technical Supp Phone: 1400-313 E-mail: Inchrouppo Installer Cont. Company: ADIV	s port 5345 riBaldtishaum act Info	
1111 Vancourn SL Increark CA 1935 Description rem_denc Technical Supp Phone: 1-000-313 E-mail: Incheuppo Installer Contr Company: ADIF Installer Installer	s port 5345 riBalcheshaum set Info	

Figure 8-4 ADX DAS General Information

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



8.2.2 Status Tab

8.2.2.1 Status - NMS



Figure 8-5 Status - NMS

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

8.2.2.1.1 System Summary

Summary								
		BCU			Remote Units			
	RIU	DCO		OPT-1	OPT-2	OPT-3	OPT-4	
Connected	8	4	4	32	32	32	32	32
Soft Fail	0	0	0	0	0	0	0	0
Hard Fail	0	0	0	0	0	0	0	0
Link Fail	0	0	0	0	0	0	0	0
Not Commissioned	7	0	0	-	0	12	13	14
Commissioned	1	4	4	-	32	20	19	18

Figure 8-6 System Summary

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



Table 8-5 System Summary Description

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

8.2.2.1.2 HE View / HPR View, System Scan Time

- HE View/RU View
 - Displays whether the NMS is set to HE view or HPR view.
 - Refer to section 3.1.1.4
- System Scan Time
 - Displays the time it takes to scan and update the information of all the modules that are on the navigation tree. This time will increase as more components are added to the system.
 - When Navigation Tree is unlocked, the user should wait at least the "System Scan Time" for the system to detect newly added hardware.



System Scan Time : 41.8 sec



8.2.2.1.3 HE Alarm Status

Display the alarm status of each HE component.

HE Alarm Status						
Normal	🔵 Soft Fail	Hard Fail	Link Fail			
RFU-Cell	RFU-700	BCU-1	OPT-1			
RFU-AWS	RFU-PCS	BCU-2	OPT-2			
RFU-PCS	RFU-PCS	BCU-3	OPT-3			
RFU-AWS	RFU-AWS	BCU-4	OPT-4			

Figure 8-8 HE alarm status


8.2.2.1.4 HE Commissioning Status

Display commissioning status of each HE component.

HE Commissioning Status				
Commissioned		Not Commissioned		
RFU-Cell	RFU-700	BCU-1	OPT-1	
RFU-AWS	RFU-PCS	BCU-2	OPT-2	
RFU-PCS	RFU-PCS	BCU-3	OPT-3	
RFU-AWS	RFU-AWS	BCU-4	OPT-4	

Figure 8-9 HE Commissioning status

Table 8-6 Description for HE Commissioning status

Sta	atus	Display	Description
Installed Status	Physically Installed	RFU-PCS	Text is black
Installeu Status	Physically Not-Installed	RFU CH5	Text is gray
Commissioning Status	Success	0	Green
Commissioning Status	Failed or not commissioned	0	Gray

8.2.2.1.5 Alarm

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

Alarm	Alarm		Description
System Power Alarm	Over Temperature	Hard Fail / Soft Fail	Temperature of NMS is higher than the threshold level for over temperature alarm
Over Temperature Under Temperature	Under Temperature	Soft Fail	Temperature of the NMS is lower than the threshold level for under temperature alarm
System Halt Normal Soft Fail Hard Fail Link Fail	System Halt	Hard Fail	HE system halt
Power Alarm	AC Fail	Soft Fail	AC power is operating outside of its normal range
System Power Alarm	DC Fail	Soft Fail	DC power is operating outside of its normal range
DC Fall Over Current	Over Current	Hard Fail	Total current of HE is higher than the threshold level for over current alarm
Rattery Low Normal Soft Fel Hard Fel Link Fel	Battery Low	Soft Fail	Voltage of battery connected to HE PSU is lower than the defined threshold

Table 8-7 Description for NMS alarm



8.2.2.2 Status – BCU

Site ID : bbbbbbbbb								
1.11	Statistics.	100			PCS Band			
Δ				2	Band	Downink	Uplink	
Unlock System	вс	eu C	ammissioned	Power	65 MHz	1,930.0 MHz - 1,995.0 MHz	1,850.0 MHz 1,915.0 MH	
Expand All Collapse All								
NMS 🔗	Power & Att	en (BCU)		2010 A	Date 1	1010	Partie C	
* [1] BFU-Cell-M2	1			(Carther A)	(Cartlant			
* [2] RFU-PCS	DI commissio	oing Level [d]	Imi	0.0	8.0		7.6	
* [3] RFU-AWS	00 00111000	ting cerei [ee	and		0.0		- A.F.	
• [4] RFU-700	DL Input [dBm]			6.0- E.F.			-97.2	
• [1] BCU-700		-			4.1			
* [2] BCU-Cell 🥥		DL (User S4	rc)	4-5	3.0		2.0	
 [3] BCU-PCS 	Atten [dB]	DL (ALC)		0.0	0.0		0.0	
• [4] BCU-AWS		UL (User Se	et)	4.5	3.5		2.0	
+ [1] OPT	DL Output (dBm)			-5.8	-3.8		-2.5	
+ [2] OPT				0.9				
+ [4] OPT	Douune Datio							
	Power Karoo	PCS		Path A (Carner A)	Path E (Carrier	8)	Path C (Carrier C)	
	Targeted Di	Output Pow	er	33.3 %	33.3 1	6	33.4 %	
	Actual DL	Output Powe	r	21.2%	33.69		45.3%	
			í	Dath A	Er.	6.E	Out C	
The Signal For Success				(Carrier A)	(Car	ner 8)	(Carner C)	
Advanced RF Technologies, Inc. ("ADRF") is an established, leading provider of in-				DL Signal Low DL Input Overloa	DL Sig d DL Input	nal Low COverload D	DL Signal Low DL Input Overlo	
building equipment and services that improve wireless coverage and capacity			1	Normal	Soft Fail	Link Fail	duibled	

ligure 0-10 Status

8.2.2.2.1 Band

Displays the bandwidth and the frequency ranges for DL and UL of the BCU module.

PCS Band		
65 MHz	1,930.0 MHz - 1,995.0 MHz	1,850.0 MHz - 1,915.0 MHz

Figure 8-11 Status – BCU Band

8.2.2.2.2 Power & Atten

Power & Atte	en (BCU)					
DL commissio	ning Level [dBm]	9.0	8.0	7.0		
DI Jos	ut [dBm]	-1.3	-0.3	-0.5		
DE IUÈ	iuc (ubilij	4.1				
	DL (User Set)	4.5	3.5	2.0		
Atten [dB]	Atten [dB] DL (ALC)	0.0	0.0	0.0		
	UL (User Set)	4.5	3.5	2.0		
DL Out	out [dPm]	-5.8	-3.8	-2.5		
DE Output [dBm]			0.9			

Figure 8-12 Status – BCU Power & Atten

• DL Commissioning Level: Displays the commissioning level for each individual RF path. If unit has not been commissioned, "Not Commissioned" will be displayed.



- DL Input: Displays the currently incoming signal strength of each RF path along with the composite DL input power of all 3 RF paths.
- Atten: Displays the attenuation values that the system is currently using which is defined by the power ratios specified by the user.
- *DL Output*: Displays the output value for each RF path along with the composite DL output power of all 3 RF paths. The DL Output level for each RF path will not exceed 5dBm and the composite output power will not exceed 10 dBm.

8.2.2.2.3	Power Ratio
-----------	-------------

Power Ratio					
PCS					
Targeted DL Output Power	33.3 %	33.3 %	33.4 %		
Actual DL Output Power	21.2%	33.6%	45.3%		

Figure 8-13 Status – BCU Power Ratio

- Targeted DL Output Power: Displays desired power ratios specified by the user. If unit has not been commissioned, "Not Commissioned" will be displayed.
- Actual DL Output Power: Displays the currently power ratios that the system is using. These values will fluctuate based on the amount of traffic that is in the system.

8.2.2.2.4 Alarm

Displays the current alarm status of each individual RF path. Parameters for both DL Signal Low and DL Input Overload can be specified from the Control tab.



Figure 8-14 Status – BCU Alarm



8.2.2.3 Status – RFU



Figure 8-15 Status – RFU

8.2.2.3.1 Band

Displays the bandwidth and the frequency ranges for DL and UL of the RFU module.

PCS Band		
	Downlink	Uplink
65 MHz	1,930.0 MHz - 1,995.0 MHz	1,850.0 MHz - 1,915.0 MHz

Figure 8-16 Status – RFU Band

8.2.2.3.2 Power & Gain (Admin/User)

- Admin Mode- Displays the Downlink Input/output, Downlink/Uplink Attenuation, and Uplink Output.
- User Mode- Displays the Downlink Input, Downlink/Uplink Attenuation, and Uplink Output.

Cell	Downlink	Uplink
Input [dBm]	9.9	
ALC Atten [dB]	0.0	0.0
Atten[dB]	10.0	10.0
Output [dBm]	-4.1	-22.4

Figure 8-17 Power & Gain Display (Admin)



Power & Gain (RFU)

Cell	Downlink	Uplink
Input [dBm]		
Atten[dB]	25.0	35.0
Output [dBm]		,-

Figure 8-18 Power & Gain Display (User)

- Input [dBm]: Displays the Downlink RF input level which comes from the ADX-H-BCU or BTS. This value should be between 0 to 25 dBm.
- ALC Atten [dB]: The amount of attenuation that is being used by the system when ALC is active.
- Atten [dB]: The amount of attenuation that has been set manually by the user.
- Output [dBm]: The downlink/uplink output power of the RFU and NOT the output power of the RU.

8.2.2.3.3 Alarm

Displays System, RF, and Power Alarms. If an alarm is present in the system, then the color of the tab will change according to the type of failure.

Alarm		Severity	Description
System	Link Fail	Soft Fail	A component is physically connected, but the NMS is unable to communicate with it.
System RF Alarm Power Karm	Over Temperature	Hard Fail / Soft Fail	The temperature of NMS is higher than the threshold level for over temperature alarm.
Over Temperature Under Temperature	Under Temperature	Soft Fail	The temperature of NMS is lower than the threshold level for under temperature alarm.
System Helt Normal Soft Full Fixed Full Link Full	System Halt	Hard Fail	System will go into a "System Halt" state when a hard fail alarm does not clear after 10 checks. System Halt can only be cleared with a power cycle, reboot, or factory settings.
RF Alarm	DL Signal not detected	Soft Fail	Downlink input signal is lower than the defined threshold by user.
DL Signal not detected DL Signal Low	DL Signal Low	Soft Fail	Downlink input signal is lower than the defined threshold by user.
Input overload Over Power	Input Overload	Hard Fail / Soft Fail	Downlink input signal is higher than the defined threshold.
Normal Soft Fall	Overpower	Hard Fail / Soft Fail	Uplink output signal is higher than the defined threshold by user.
Power Alarm	AC Fail	Soft Fail	AC power is not operating within parameters.
System RF Alarm Power Alarm	DC Fail	Soft Fail	DC power is not operating within parameters.
DC Fail Over Current	Over Current	Hard Fail	Total current of HE is higher than the threshold level for over current alarm.
Normal Soft Fail Hard Fail Link Fail	Battery Low	Soft Fail	Voltage of battery connected to HE PSU is lower than the defined threshold.

Table 8-8 RFU Alarm Status



8.2.2.4 Status - ODU





8.2.2.4.1 Summary

The Summary section displays the number of remote modules that are physically connected, the number of soft/hard/link fail alarms, and the number of Remote Module that have been commissioned and the number of Remote Module that need to be commissioned.

our many								
Connected	4	4	4	4	4	4	4	4
Soft Fail	0	0	0	0	0	0	0	0
Hard Fail	0	0	0	0	0	0	0	0
Link Fail	0	0	0	0	0	0	0	0
Not Commissioned	0	0	0	0	0	0	0	0
Commissioned	4	4	4	4	4	4	4	4

Figure 8-20 Summary (Status – ODU)

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C....



Table 8-9 Summary Description

Parameters	Description
Connected	Displays the number of Remote Module's connected to the ADX-RACK-ODU.
Soft Fail	Displays the total number of soft fail present.
Hard Fail	Displays the number of hard fail present on each module.
Link Fail	Displays the number of link fail present on each module.
Not Commissioned	Displays the number of non-commissioned or commission failed module.
Commissioned	Display the number of successfully commissioned module

8.2.2.4.2 RF Status

Displays the DL input power and the UL output power for each ODU. An ADX-RACK-ODU is composed of 2 ODUs.

	•		
		DE	Ctat

Kr Status		
ODU RF 1 [dBm]	-0.1	0.0
ODU RF 2 [dBm]	0.0	26.3

Figure 8-21 RF Status (Status – ODU)

8.2.2.4.3 Optic Status

Display LD Power and PD Power for each optic path. LD Power is the power that is being sent to the HPR and PD Power is the power that is being received from the RU. Optic Status

Link 1-1 [dBm]		3.0
Link 1-2 [dBm]	1.2	3.5
Link 1-3 [dBm]	1.2	3.6
Link 1-4 [dBm]		3.6
Link 1-5 [dBm]		4.3
Link 1-6 [dBm]	1.2	4.4
Link 1-7 [dBm]	1.2	4.3
Link 1-8 [dBm]		4.6

Figure 8-22 Optic Status (Status – ODU)

8.2.2.4.4 Optic Atten (Admin Only)

The ADX-H-ODU has 3 types of attenuators.

- Downlink Common Attenuator- Displays the common attenuation level on the DL path.
- Uplink Common Attenuator- Displays the common attenuation level on the UL path.
- Uplink Optic Attenuator- Displays the amount of attenuation used at each optical link.



	Uplink					
		Downlink	Upl	ink		Common attenuator
Downlink		Downlink	Common	Link		
Common attenuator	Link 1-1 [dB]			6.5		Uplink
	Link 1-2 [dB]	FO	E O	6.5		Optic attenuator
	Link 1-3 [dB]	5.0	5.0	6.5		
	Link 1-4 [dB]			8.5		
	Link 1-5 [dB]			8.0		
	Link 1-6 [dB]	5.0	5.0	8.0		
	Link 1-7 [dB]	5.0	5.0	8.0		
	Link 1-8 [dB]			8.5		

Figure 8-23 Optic Attenuation (Status – ODU)

8.2.2.4.5 Optic Path Status

Displays the optic status for each optic path

Optic Link Status	
■ Link 1-1 ~ 4 LD	● Link 1-5 ~ 8 LD
Cink 1-1 PD	Link 1-5 PD
Link 1-2 PD	Link 1-6 PD
Cink 1-3 PD	Link 1-7 PD
Cink 1-4 PD	Link 1-8 PD

Figure 8-24 Optic Path Status (Status – ODU)

Table 8-10 Description for optic path status

Status D		Display	Description
	Normal		Green, optic signal being sent to Master HPR is > -5dBm
LD Status	LD fail	\circ	Orange, optic signal being sent to Master HPR is < -5dBm
	Not Connected		Gray, no connection between ODU and Master RU
Normal			Green, optic signal being received from Master HPR is > -10dBm
PD Status	PD fail	0	Orange, optic signal being received from Master HPR is < -10dBm
	Comm Fail or Not Connected		Gray, no connection between ODU and Master RU



8.2.2.5 Status – RU Hub

RU-Hub is not separate module but is integrated into the master RU. The picture of HPR Hub displayed on web based GUI is same as the picture of master RU.

			RU Alarm Stati	45			ADRF Remote Operation	en & Hanagement Sy
ADX-R-RU-Hub			Normal	Soft Fail	Hard Fail	Unk Fal	Serial Number	9000000
ite ID :	10 010 KP		RU-PCS				Lebtude	
	"Internetioner	2	RU-Cel				Longitude	
0		3	RU-AWS				Permuse	1.5.54
Unlock System	RU-Hub	Power	RU-700				and all	
			RU Commission	ning Status			Mich Ortt	80.0.58
Expand All Collapse All			Commissio	ned	Not Com	nissioned	Location	
NMS 🙆 -			RU-PCS					
• [1] RFU - Cell			RU-Cell					
 [2] RFU - AWS 			RU-AWS				Description	
* [3] RFU - PCS 🕥			RLI-700					
* [4] RFU - AWS							2720742200	100
* [5] RFU - 700				Autom		Inclusion Albuma	Technical Supp	ort
• [6] RFU - PCS				SARCELLI		ower Marini	E-mail: technigger	tBad flech.com
• BCU - 700				Link Fall				
BCU - Cell				System Hal	t.			
BCU - PCS							Installer Conta	ict Info
* 171 REU - PCS							Instaler:	
* [8] RFU - AWS							Phone:	
- OPT - 1							E-mail:	
- RU-Hub - 1				Normal So	Pt Fal Hard I	al Link Fal		
• M-RU - PCS 🥥								
* S-RU - Cell 🔘								
• S-RU - AWS 🥥								
1 m max mm								

Figure 8-25 Status - RU Hub

8.2.2.5.1 RU Alarm Status

The HPR Hub can support up to 8 remote modules. The HPR alarm status displays the alarm status of each remote module.

RU Alarm Statu	IS		
Normal	\varTheta Soft Fail	🔴 Hard Fail	C Link Fail
RU-PCS			
RU-Cell			
RU-AWS			
🔘 RU-700			

Figure 8-26 RU Alarm Status (Status - HPR Hub)

8.2.2.5.2 RU Commissioning Status

Display the Commissioning status of each Remote Module.

Not Commissioned

Figure 8-27 RU Commissioning Status (Status - RU Hub)



Table 8-11 Description for RU Commissioning status

Sta	tus	Display	Description
Installed Status	Installed	RU-PCS	Text is black
	Not-Installed	RU-CH7	Text is gray
Commissioning Status	Success	O	Green
	Fail or not yet	0	Gray

8.2.2.5.3 Alarm

Table 8-12 Alarm Status (Status - RU Hub)

	Alarm		Severity	Description
Sys	tem	Link Fail	Soft Fail	Present when a module cannot communicate with the
System	Power Alarm			
Link Fail				
System Halt Normal Soft Fail	System Halt		Hard Fail	System will go into a "System Halt" state when a hard fail alarm does not clear after 10 checks. System Halt can only be cleared with a power cycle, reboot, or factory settings.
Power	Alarm	AC Fail	Soft Fail	AC power is not within parameters.
AC Fail DC Fail		DC Fail	Soft Fail	DC power is not within parameters.
Over Current Battery Low		Over Current	Hard Fail	Total current of HPR is higher than the threshold level for over current alarm
Normal Soft Fail	Hard Fail	Battery Low	Soft Fail	Voltage of battery connected to HPR PSU is lower than the defined threshold

8.2.2.6 Status - Remote module



Figure 8-28 Status – Remote Module



8.2.2.6.1 Band

Display the spectrum that is being used. The band column displays the bandwidth that has been used. The downlink column displays the center frequency of the used downlink band. The uplink column displays the center frequency of the used uplink band.

PCS Band		
		Uplink
65 MHz	1962.5 MHz	1882.5 MHz

Figure 8-29 PCS Band Information (Status – Remote Module)

8.2.2.6.2 Power & Gain (Admin/User)

Display the Downlink output, Downlink/Uplink Attenuation, and Uplink Input/output.

Power & Gain		
PCS		
Input [dBm]		-50.8
ALC Atten [dB]	0.0	0.0
Atten [dB]	6.5	0.0
[M]Output [dBm]	-16.1	-17.8
[H]Output [dBm]	16.8	

Figure 8-30 Power & Gain (Admin)

Power & Gain						
PCS	Downlink	Uplink				
Input [dBm]		,-				
Atten [dB]	9.0	7.5				
Output [dBm]	25.6					

Figure 8-31 Power & Gain (User)

- Admin
- Input [dBm]: Displays the RF input level for Uplink only for the Remote Module.
- ALC Atten [dB]: The amount of attenuation used when ALC is activate.
- Atten [dB]: The amount of attenuation manually set by the user.
- o [M]Output [dBm]: Output power of RF transceiver (1st stage amplification).
- [H]Output [dBm]: Output power of downlink HPA (2nd stage amplification).
- User
- Input [dBm]: Displays the RF input level for Uplink only for the Remote Module.
- Atten [dB]: The amount of attenuation manually set by the user.
- o Output [dBm]: Displays the total composite output power.



8.2.2.6.3 Optic Power (Master-RU Only)

Display the LD Power and PD Power of optic module inside the Master RU.



Figure 8-32 Optic Power (Status – Master HPR only)

8.2.2.6.4 Operating Status

Table 8-13 Operating Status (Status – Remote Module)

Alarm		Severity	Description
System	Link Fail	Soft Fail	No communication with NMS.
System RF Alarm Power Alarm	Over Temperature	Hard Fail / Soft Fail	Temperature is higher than the threshold level for over temperature alarm.
Link Fail Over Temperature	Under Temperature	Soft Fail	Temperature is lower than the threshold level for under temperature alarm.
Under Temperature System Halt ORU LD Fail	System Halt	Hard Fail	System halt on either the Master HPR or Slave RU. System halt occurs when a hard fail alarm fails to clear after 10 checks.
ORU PD Fail	ORU LD Fail	Soft Fail	LD Fail present in the Master RU's optic unit.
Normal Soft Fail Hard Fail Link Fail	ORU PD Fail	Soft Fail	PD Fail present in the Master RU's optic unit.
RF Alarm System RF Alarm Power Alarm	Input Overload	Hard Fail	Uplink input signal is higher than the defined threshold.
Input overload	Over Power	Hard Fail / Soft Fail	Downlink output signal is higher than the defined threshold by user.
Ver Power VSWR	VSWR	Soft Fail	Triggered when power is being reflected back to the system, typically due to a loose connector.
Power Alarm System RF Alarm Power Alarm	AC Fail	Soft Fail	AC power is not operating within parameters.
AC Fail DC Fail	DC Fail	Soft Fail	DC power is not operating within parameters.
Over Current Bettery Low	Over Current	Hard Fail	Total current of HPR is higher than the threshold level for over current alarm.
Normal Soft Fail Hard Fail Link Fail	Battery Low	Soft Fail	Voltage of battery connected to HE PSU is lower than the defined threshold.



8.2.3 Control Tab

8.2.3.1 Control - NMS

ADF	Status	Control	Install	System	Help	Logout	
	Heartbeat 1	lime			HE System		
ADX-H-NMS Site ID : bbbbbbbbbb	SNMP	Trap On			F	leboot	Factory Setting
-	Heartbe	at Interval [min]	1.0	•	NMS		
Expand All Collapse All	Last hea	rtbeat sent out	:		F	leboot	Factory Setting
- NMS			Apply				
* [1] RFU-Cell							
* [2] RFU-PCS							
* [3] RFU-AWS							
* [4] RFU-700							
* [1] BCU-700							



8.2.3.1.1 Heartbeat Time

Allows the user to enable or disable SNMP traps from being sent out and also specify the Heartbeat interval. Time and date stamps of the last 2 heartbeats will be displayed in the "Last heartbeat sent out" section.

1.0
//::
//:
Apply

Figure 8-34 Heartbeat (Control – NMS)

8.2.3.1.2 HE System

Allows the user to perform a HE system reboot or HE full system factory settings

HE S	ystem		
	Reboot	Factory Setting	Ī

Figure 8-35 HE System Reboot & Factory Setting (Control – NMS)

8.2.3.1.3 NMS System

Allows the user to perform a NMS Unit reboot or NMS factory settings

Rehaat	Eactory Setting
Repoor	Tactory Settin



Advanced	RF	Techno	logies,	Inc.
----------	----	--------	---------	------



8.2.3.2 Control – BCU

ADV H RCH R	Manual ATT Control			
Site ID + bbbbbbbbbb	Thundur ATT CONTON			
		PATH A (Carrier A)	PATH B (Carrier B)	PATH C (Carrier C)
Halash Sustan	Downlink [dB]	30.0	30.0	30.0
Unlock System	Uplink [dB]	30.0	30.0	30.0 💌
Expand All Collapse All	DL Output ALC Level	5.0 💌	5.0	5.0
	[dBm]		9.8	
NMS O				(
[1] RFU-Cell-M2				Apply
[2] RFU-PCS				
[3] RFU-AWS	neu		Alexen Cathline	
[4] RFU-700	BCU		Alarm Secong	
[1] BCU-700	Reboot	Factory Setting	Downlink Input O	verload (dBm) 25.0
[2] BCU-Cell				restore feering
			Downlink Signal Le	ow [dBm] -5.0 💌
[4] BLU-AWS				
			U Downank Inp	ut Overload Alarm On
121 ODT			🛞 🗹 [PATH - A] [Downlink Signal Low Alarm Or
[2] OPT				
[2] OPT [3] OPT [4] OPT			C DATH D 10	Secondards Connel Laws Alarma On

메모 [C22]: BCUH 추가 여부 검토

Figure 8-37 Control – BCU

8.2.3.2.1 Manual ATT Control

Manual	ATT	Control

Downlink [dB]	30.0	30.0	30.0
Uplink [dB]	30.0	30.0	30.0
DL Output ALC Level	5.0	5.0	▼ 5.0 ▼
[dBm]		9.8	
			Apply

Figure 8-38 Control – BCU Manual ATT Control

- Downlink: Allows the user to manually adjust the DL attenuation levels for each RF path. Adjusting these settings is not recommended since it will change the power ratios set by the user.
- Uplink: Allows the user to manually adjust the UL attenuation levels for each RF path. Adjusting these settings is not recommended, unless additional attenuation is needed on the UL path.
- *DL Output ALC Level*: Allows the user to manually set the DL Output ALC Levels for each RF path. Adjusting these settings is not recommended since it will change the power ratios set by the user. These settings are automatically set by the system during the BCU commissioning process. This section also displays the composite DL Output ALC Level which is the value that can be used to commission the RFU.



8.2.3.2.2 Reboot / Factory Setting

Allows the user reboot or restore factory settings of the BCU.

Reboot	Factory Setting
--------	-----------------

Figure 8-39 Control – BCU Reboot/Factory Setting



Figure 8-40 Control – BCU Alarm Setting

- Downlink Input Overload: Allows the user to specify the level at which the DL Input Overload alarm is triggered. Values range from 0 dBm to +25 dBm.
- Downlink Signal Low: Allows the user to specify the level at which the DL Signal Low alarm is triggered. Values range from -10 dBm to +20 dBm.
- Downlink Input Overload Alarm On: Allows to user to enable or disable the Input Overload Alarm
- [Path A/B/C] Downlink Signal Low Alarm On: Allows the user to enable or disable the DL Signal Low alarm for each RF path.

ADF	Status Control	Install	System	Help	Logout		
	General Setting		Mar	nual Att	en Control		
ADX-H-RFU-C Site ID :	I Downlink ALC	Uplink ALC		Downlink			
	Downlink On	Uplink On		. Down	link Atten [dE]	10.0	Ŀ
9	1	D Uphra Hinha	Det	. DL Ox	itput ALC Level (dBm)	-4.0	-
Unlock System	5	Apply		DL OA	tput ALC Offset [d8]	5.0	1
Expand All Collapse All		- cance		UpEnk			
- NMS 😜				Uplini	Atten [dE]	10.0	ŀ
• (1) IU - Cell 🔘				. UL D	rtput ALC Level (dBm)	-4.0	6
• [2] REU - AWS						100	-
* (41 BEIL AWS				00.01	stput ALC Offset [db]	3.0	1
+ (51 8FU - 700						Janly	
* [6] RFU - PCS					_	- 49-3	-
• BCU - 700							
+ BCU - Cell	RFU		Ala	rm Setti	ng		
+ BCU - PCS 🔘	(T 1)	1 0 0 0 0 0 0 0 0					
• BCU - AWS 🔘	Rebest	Factory Settin	•	Downlin	nk Signal Low [dBn]	-5.0	
• [7] NFU - PCS 🙆				Downlin	nk Sienal		1
• [8] RFU - AWS 🕥				Not De	tected (dBm)	-10,0	
+ OPT-1 🔘	UL Noise Detection						
+ OPT-2	UL Noise Det	1		Uplink.	Overpower (dBm)	0.0	
+ OPT-3	er inter en	<i>.</i>					
+ OPT 4						Apply	

Figure 8-41 Control - RFU

Advanced RF Technologies, Inc.

8.2.3.3 Control - RFU



8.2.3.3.1 General Setting

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

Downlink ALC	Uplink ALC
Downlink On	Uplink On
	Uplink Noise De

Figure 8-42 General Setting (Control – RFU) (Admin)

eneral Setting	
✓ Downlink ALC	Uplink ALC
Downlink On	Uplink On
	Uplink Noise Det
	Apply

Figure 8-43 General Setting (Control – RFU) (User)

Table 8-14 Description for General Setting

Name	Description	Available Accounts
Downlink ALC	Enables or disables Downlink ALC	Administrator
Uplink ALC	Enables or disables Uplink ALC	Administrator
Downlink ON	Enables or disables the RFU Downlink path	Administrator, User
Uplink ON	Enables or disables the RFU Uplink path	Administrator, User
Uplink Noise Det	Displays if the module is turned on or off due to the UL Noise Detection	Administrator
	Routine	

8.2.3.3.2 Reboot / Factory Setting

Allows the user reboot or restore factory settings of the RFU.



Figure 8-44 Reboot & Factory Setting (Control – RFU)

8.2.3.3.3 Uplink Noise Detection (Admin Only)

UL Noise Detection

UL Noise Det	1
OL NOISE DEL	

Figure 8-45 UL Noise Detection (Control – RFU)



The "UL Noise Det" button will take you to the UL Noise Detection page which will allow you to run the UL Noise Detection routine.

ADF	Status Control	Install System	Help Logout			
ADX-H-RFU-C Site ID :	[Cell] UL Noise Det Progress Base UL Noise Level (All RUs turned off)	Check - dBm			
Unlock System Expand All Collapse All	Number	Model Name	Path	Description	Detected Level	Detected Level - Min Level
- NMS (1] RFU - Cell		Source 💌	search			Download

Figure 8-46 UL Noise Detection - PCS band

The Auto UL noise measurement routine can be run by clicking on the Check button. After all UL noise measurement have been taken, the levels for each UL path will be displayed and along with the difference between minimum detect level and measured detect level.

The user will be able to see which path is generating the elevated UL noise level based on the measured detect level and difference value.

To navigate back to the RFU control page, click on the Control tab again.

8.2.3.3.4 Manual Atten Control

ownlink			
Downlink Atten [dB]	0.0		
DL Output ALC Level [dBm]	0.0	Manual Attan Control	
DL Output ALC Offset [dB]	10.0	Downlink	
plink		Downlink Atten [dB]	25.0 -
Uplink Atten [dB]	0.0	Uplink	
UL Output ALC Level [dBm]	0.0	 Uplink Atten [dB] 	35.0 💌
UL Output ALC Offset [dB]	10.0	UL Output ALC Level [dBm]	-20.0 💌
	Apply		Apply

(Admin)

Figure 8-47 Manual Attenuator Control Setting (Control – RFU)

(User)

Table 8-15 Description for Main Gain Control Setting (Control – RFU)

Name	Description	Range	Step	Available Accounts
Downlink Attenuator	Downlink Attenuator to be adjusted manually	0 ~ 25dB	0.5dB	Administrator, User
Uplink Attenuator	Uplink Attenuator to be adjusted manually	0 ~ 35dB	0.5dB	Administrator, User
DL Output ALC Level	To set the Max output ALC level	-10 ~ 0dBm	0.5dBm	Administrator
UL Output ALC Level	To set the Max output ALC level	-20 ~ 0dBm	0.5dBm	Administrator, User



DL Output ALC Offset	To set the Max output ALC Offset	-10 ~ 0dBm	0.5dBm	Administrator
UL Output ALC Offset	To set the Max output ALC Offset	-20 ~ 0dBm	0.5dBm	Administrator

8.2.3.3.5 Alarm Setting

Downlink Signal Low [dBm]	-5.0 🔻
Downlink Signal Not Detected [dBm]	-10.0 🔻
Uplink Overpower [dBm]	0.0 🔻



Table 8-16 Description for Alarm Threshold Setting (Control – RFU)

Name	Description	Range	Default threshold
Downlink Signal Low	Allows the user to specify the minimum incoming DL input signal level before triggering a "Downlink Signal Low" soft-fail alarm.	-10 ~ 20dBm	-5dBm
Downlink Signal Not Detected	Allows the user to specify the minimum incoming DL input signal level before triggering a "Downlink Signal Not Detected" soft-fail alarm.	-10 ~ 20dBm	-10dBm
Uplink Over Power	Allows the user to specify the how strong the output signal of uplink can be before triggering an "Uplink Over Power" Hard Fail alarm.	-20 ~ 0dBm	0dBm



8.2.3.4 Control - ODU



Figure 8-49 Control – ODU

8.2.3.4.1 Optic Attenuation (Admin Only)



Figure 8-50 Optic Attenuation – ODU



Table 8-17 Description for Optic Attenuation (Control – ODU)

Name	Description	Range	Default threshold
DL/UL common ATT	Allows the user to control overall optic DL/UL path gain.	0 ~ 30dB	5dB
DL ATT	Used to compensate DL optic loss.	0~13dB	13dB
UL ATT	Used to compensate UL optic loss.	0~13dB	13dB

8.2.3.4.2 **Reboot/Factory Setting**

Allow the user to perform ODU reboot or ODU factory settings.

Rehnot	Factory Setting



8.2.3.5 Control – RH Hub

8.2.3.5.1

	ADF	Status Control Install System Help Logout
		RU System
	ADX-DAS-RCU Site ID : adrf	Rebost Factory Setting
	ALCONTRACTORY .	
	Expand All Collapse All	
	- NPIS 🔘	
	• R/U - 700	
	RFU - PCS	
	+ RFU - AWS 🧔	
	- OPT - 1	
	RU-Hub - 2	
	 S-RU - 700 	
	* S-RU - Cell	
	* S-RU - AWS 🔘	
	+ RU-Hub - 3 🔘	
		Figure 8-52 Control – RU Hub
2.3.5.1 Re	boot/Factory Setti	ing
		-
	то регтогт ник ни	ib repoot of HPR Hub factory settings
llows the user		
llows the user	RU S	lystem
llows the user	RU S	System
llows the user	RU S	System
llows the user	RU S	Reboot Factory Setting
llows the user	RUS	Reboot Factory Setting
llows the user	RUS	Reboot Factory Setting
llows the user	RUS	Reboot Factory Setting



8.2.3.6 Control – Remote Module (Master or Slave RU)

(1993)				
	General Setting		Manual Atten Control	
DX-R-P30 te ID :	Downlink ALC	link ALC	Downlink	
	Downlink On	link On	Downlink Atten [dB]	6.5
	Up	link Noise Det	DL Output ALC Level [dBm]	30.0
Unlock System		Apply	DL Output ALC Offset [dB]	5.0 -
xpand All Collapse All			Uplink	
NMS	RU		Uplink Atten [dB]	0.0
[1] RFU - Cell	Reboot Fac	tory Setting	UL Output ALC Level [dBm]	6.0 💌
[3] RFU - PCS	Optic Setting		UL Output ALC Offset [dB]	3.0
[4] RFU - AWS	Deverticely Ocation Address [JdD]	12.0		
[5] RFU - 700	Downank Obric Arren [gp]	12.0		Apply
BCU - 700	PD Power[dBm]	0.6	Alarm Setting	
BCU - Cell	ID Power[dBm]	6.2	-	
BCU - PCS		0.2	Downlink Overpower [dBm]	30.0
BCU - AWS		Apply	VSWR Alarm On	

Figure 8-54 Control – Remote Module

8.2.3.6.1 General Setting (Admin/User)

General Setting	General Setting
Downlink ALC	Downlink ALC
Downlink On Uplink On	Downlink On
Uplink Noise Det	Uplink Noise Det
Apply	Apply
(Admin)	(User)

Figure 8-55 General Setting (Control - RU)

Table 8-18 Description for General Setting (Control - RU)

Name	Description	Available Accounts
Downlink ALC	This setting allows you to enable or disable the downlink ALC function. When ALC is enabled, the downlink output power will not exceed the Downlink Output Level specified in the Manual Atten Control section.	Administrator
Downlink On	This setting allows you to enable or disable the Downlink path. Adv	
Uplink ALC	This setting allows you to enable or disable the uplink ALC function. When ALC is enabled, the Uplink output power will not exceed the Uplink Output Level specified in the Manual Atten Control section.	Administrator
Uplink On	This setting allows you to enable or disable the Uplink path.	Administrator, User



8.2.3.6.2 Reboot/Factory Setting

Allows the user to Reboot or restore Factory Settings on the remote module. $${\rm RU}$$

Dehaat	Eastony Catting
neuuui	Factory Setting

Figure 8-56 Reboot & factory Setting (Control - RU)

8.2.5.6.5 Optic Setting (Only Master RO) (Admin Onl	8.2.3.6.3	Optic Setting (Only Master RU) (Admin Only)
---	-----------	---

12.0 🔻
).6
5.2
pply

Figure 8-57 Optic Setting (Control - RU)

Table 8-19 Description for Optic Setting (Control - RU)

Name	Description	Range	Step	Available Accounts
Downlink Optic Atten	RF attenuator to compensate the optic loss of downlink	0~ 13.0 dB	0.5 dB	Administrator
PD Power	Incoming power level from the ODU			Administrator
LD Power	Outgoing power level to the ODU			Administrator

8.2.3.6.4 Manual Attenuator Control

Manual Atten Control

Downlink		
Downlink Atten [dB]	6.5 💌	Manual Atten Control
DL Output ALC Level [dBm]	30.0 🔻	Downlink
DL Output ALC Offset [dB]	5.0 💌	Downlink Atten [dB]
Uplink		DL Output ALC Level [dBm]
Uplink Atten [dB]	0.0 🔻	DL Output ALC Offset [dB]
IL Output ALC Level [dBm]	6.0 💌	Uplink
UL Output ALC Offset [dB]	3.0 🔻	 Uplink Atten [dB]
	Apply	
(Admin)		(User)

Figure 8-58 Manual Atten Control (Control - RU)



Name	Description	Range	Default	Available Accounts
			threshold	
Downlink Atten	Allows the user to specify how much attenuation to use.	0 ~ 30dB	30dB	Administrator, User
Uplink Atten	Allows the user to specify how much attenuation to use.		25dB	Administrator, User
DL Output ALC Level	The remote module will prevent the downlink output power from exceeding the specified value.	5~43dBm	43dBm	Administrator, User
UL Output ALC Level	The system will prevent the output power to exceed the specified value.	0 ~ 10dBm	5 or 6dBm	Administrator
DL Output ALC Offset	When the incoming signal level increases, the system will not adjust the gain levels until it reaches the ALC Offset Level.	0 ~ 10dB	5dB	Administrator, User
UL Output ALC Offset	When the incoming signal level increases, the system will not adjust the gain levels until it reaches the ALC Offset Level.	0 ~ 10dB	3dB	Administrator

~ ...

Table 8-20 Description for Manual Atten Control (Control - RU)

8.2.3.6.5 Alarm Setting

Downlink Overpower [defined to the second	3m]	30.0	•
💿 🗷 VSWR Alarm On			
		Annly	

Figure 8-59 Alarm Setting (Control - RU)

- DL Over Power Limit: The overpower alarm threshold can be adjusted from 5~43dBm. +2dB from the DL overpower limit will trigger a soft fail and >2dB will trigger a hard fail alarm
- VSWR Alarm ON : Enable or disables the VSWR Alarm.



8.2.4 Install Tab

8.2.4.1 Install – NMS

Commissioned		Not Commiss	ioned	Company	
RFU-Cell	RFU-700	BCU-1	OPT-1	Address 1	
RFU-AWS	RFU-PCS	BCU-2	OPT-2	Address2	
RFU-PCS	RFU-PCS	BCU-3	OPT-3	City	
RFU-AWS	RFU-AWS	BCU-4	OPT-4	State	Select one
NMP		External Modem B	ox Settings	ZIP Code	
Site ID		Repeater IP	192.168.63.5	Installer	Info
Magazer ID 0.00	0	Subnet Mask	255.255.255.0	Company	Ino
Manager IP 0.0.0	.0	Gateway	192.168.63.254	Name	
	Set		Set	Phone	
				E-mail	
ocation		Description		L. 1160	
Latitude	N 🔻 +	Design of the second seco			Set
Longitude	E 🔻 +	Description		Date & T	īme
			Set	Date	01/30/2000
	Set			Time	15 19 13
		SNMP Agent Fak	se Alarm Test		Set

Figure 8-60 Install - NMS

8.2.4.1.1 HE Commissioning Status

Commissioned	Not Commission	red
RFU-PCS	BCU-1	OPT-1
RFU-Cell		
	BCU 4	

Figure 8-61 HE Commissioning Status (Install – NMS)

Table 8-21 Description for HE Commissioning Status (Install – NMS)

Sta	tus	Display	Description
Installed Status	Physically Installed	RFU-PCS	Text is black
Installed Status	Physically Not-Installed	RFU CH5	Text is gray
	Success	\circ	Green
Commissioning Status	Fail or not commissioned	0	Gray

ADFF THE EVENAL FOR EFOCESS

8.2.4.1.2	SNMP

SNMP		
Site ID	adrf	
Manager IP	0.0.00	
		Set

Figure 8-62 SNMP (Install – NMS)

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.

8.2.4.1.3 Location

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

Location		
Latitude	N 🔻 +	
Longitude	E 💌 +	
		Set

Figure 8-63 Location Setting (Install – NMS)

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

8.2.4.1.4 External Modem Box Settings

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

Repeater IP	192.168.70.202
Subnet Mask	255.255.255.0
Gateway	255.255.255.0



8.2.4.1.5 Description



This section allows the user to save the description of NMS.

Description	
Description	desp_rfu_700
	Set

Figure 8-65 Description (Install – NMS)

8.2.4.1.6 SNMP Agent False Alarm Test

This section allows the user to generate both soft and hard fail alarms. After alarms are generated, the NOC can poll the ADX to see if alarms are present. All alarms generated during this test are false alarms.

NMP Agent False Ala	arm Test
Progress	
	Start

Figure 8-66 SNMP Agent False Alarm Test (Install – NMS)

8.2.4.1.7 Location Info / Installer Info

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

Company	
Address1	
Address2	
City	
State	Select one
ZIP Code	
Installer Company	Info
Installer Company Name	Info
Installer Company Name Phone	Info
Installer Company Name Phone E-mail	Info
Installer Company Name Phone E-mail	

Figure 8-67 Location Info / Installer Info (Install – NMS)



8.2.4.1.8 Date & Time

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

Date	12/	09/	2011		###	
Time	17	•	0	•	32	•
		ſ		Se	t	



8.2.4.2 Install – BCU

	BCU Commissioning - P	CS						
Site ID : bbbbbbbbbb			PAT (Carr	PATH A PATH B (Carrier A) (Carrier B)		PATH C (Carrier C)		
0	Current DL Inpu	t Level (dBm)	-1.3		-0.3		-0.5	
Unlock System	DL Input Commissio	ning Level [dBm]	0.0	-	0.0	-	0.0	
	Targeted DL Outpu	t Power ratio[%]	33.3		33.3		33.3	
Expand All Collapse All	Commissionin	g Progress						
NMS C								
[1] RFU-Cell-M2	Previous DL Commissio	ning Level [dBm]	0.0		0.0		0.0	
[2] RFU-PCS	Last Commissioning Date				00/00/0000			
[3] RFU-AWS	Last commissioning bace				0070070000		_	
(4] RFU-700	Last Commissio	ning Time			00:00:00			
[1] BCU-700								
[2] BCU-Cell							Ap	ріу
[3] BCU-PCS								
f [4] BCU-AWS	Description			SISO/I	MIMO Assir	inment		
- [1] OPT	beschption			010071	TATIO POSIS	milenc		
• [2] OPT	BCU RF Lo	cation						
• [3] OPT	Path A	arrier A			2 SISO	MIM	0-1 ©/	WIMO -
F [4] OPT	- adda	Path A Carrier A					Appl	y.
	Path B C	arrier B						
	Path C C	arrier C						

Figure 8-69 Install – BCU



8.2.4.2.1 BCU Commissioning BCU Commissioning - PCS

	PATH A (Carrier A)	PATH B (Carrier B)	PATH C (Carrier C)
Current DL Input Level [dBm]	-1.3	-0.3	-0.5
DL Input Commissioning Level [dBm]	0.0	0.0	0.0
Targeted DL Output Power ratio[%]	33.3	33.3	33.3
Commissioning Progress			
Previous DL Commissioning Level [dBm]	0.0	0.0	0.0
Previous DL Commissioning Level [dBm] Last Commissioning Date	0.0	0.0	0.0
Previous DL Commissioning Level [dBm] Last Commissioning Date Last Commissioning Time	0.0	0.0	0.0

Figure 8-70 Install – BCU Commissioning

- Current DL Input Level:
- DL Input Commissioning Level:
- Targeted DL Output Power Ratio:
- Commissioning Progress:
- Previous DL Commissioning Level:
- Last Commissioning Date:
- Last Commissioning Time:

8.2.4.2.2 Description

Description	
BCU	RF Location
Path A	Carrier A
Path B	Carrier B
Path C	Carrier C
	Set

Figure 8-71 Install – BCU Description

- BCU: This section allows the user to set the description of BCU.
- *Path A/B/C:* Allows the user to specify a name for each RF path. The names of each RF path will appear in the column headers.

8.2.4.3 Install – RFU

ADT	Status Control Install	System Help Logout
63	HE Input Commissioning - Cell	
ADX-H-RFU-C Site ID : bbbbbbbbbb	Current DL Input Level [dBm]	7.9
A	DL Input Commissioning Level [dBm] Commissioning Progress	8.0
Unlock System	Previous DL Commissioning Level [dBm]	8.0
Expand All Collapse All	Last Commissioning Date	09/28/2012
- NMS	Last Commissioning Time	05:42:57
* [1] RFU-Cell * [2] RFU-PCS		Αρρίγ
* [4] RFU-700	Description	SISO/MIMO Assignment
* [2] BCU-Cell	Description PELcoll	
* [4] BCU-AWS	Securitarian KPU-cell	et Apply
+ [1] OPT + [2] OPT		
+ (1) ODT		

Figure 8-72 Install - RFU



8.2.4.3.1 RFU Commissioning

This section allows the user to perform RFU commission. To perform RFU commissioning, select a DL Input Commissioning Level from the dropdown menu and click Apply. The commissioning progress is displayed on the Commissioning Progress bar. Any errors, warnings, and messages will appear via a popup window. Please refer to the ADX Installation Guide to determine the proper RFU commissioning levels.

Current DL Input Level [dBm]	7.9	
DL Input Commissioning Level (dBm)	8.0	
Commissioning Progress		
Previous DL Commissioning Level [dBm]	8.0	
Last Commissioning Date	09/28/2012	
Last Commissioning Time	05:42:57	

Figure 8-73 RFU Commissioning (Install – RFU)

8.2.4.3.2 Description

8.2.4.4 Install – ODU

This section allows the user to set the description of RFU.



Figure 8-74 Description (Install – RFU)



Figure 8-75 Install – ODU

8.2.4.4.1 Optic Commissioning

This section will allow the user to perform any optic compensation if it is necessary. The Commissioning button will turn orange if optic compensation is needed.





Figure 8-76 Optic control (Control – ODU)

Table 8-22 Description for Optic control (Control – ODU)

Display & Control	Description
•	Optic loss is less than 5dBo
\bigcirc	Optic loss is more than 5dBo
0	Not connected to a RU
Commissioning	No optic loss compensation is needed.
Commissioning	Optic loss compensation is needed.
Commissioning	Not connected to a RU

8.2.4.4.2 Description

This section allows the user to save the description of ODU.

Description	OPT	
		Set
	(

Figure 8-77 Description (Install – ODU)

8.2.4.5 Install – HPR Hub

ADA	Status Control	Install System	Help Logout
	RU Commissioning Status		
ADX-R-RU-Hub	Commission ed		Not Commissioned
Site ID :	RU-PCS		
	RU-Cell		
A	RU-AWS		
Ur	Ock System RU-700		
Expand All	Collapse All Description		
- NMS			

Figure 8-78 Install-RU Hub

8.2.4.5.1 RU Commissioning Status

Commission ed	Not Commissioned	
RU-PCS		
RU-Cell		
RU-AWS		
RU-700		

Figure 8-79 RU Commissioning Status (Install-RU Hub)

Table 8-23 Description for HPR Commissioning status

Status		Display	Description
	Physically Installed	RU-PCS	Text is black
Installed Status	Physically Not-Installed	RU-CH7	Text is gray
Commissioning Status	Success	\circ	Green
	Fail or not commissioned	0	Gray

8.2.4.5.2 Description

This section allows the user to save the description of HPR Hub.

Description	ru_hub_desc.
	Set

Figure 8-80 Description (Install-RU Hub)

8.2.4.6 Install – Remote Module (Master or Slave RU)

	Statue	Control	Install	Svetom	Holp	Logout	
	Status	Control	Install	System	нер	Logout	
	RU Commis	sioning - PCS					
ADX-R-P30							
Site ID : bbbbbbbbbb	Current DL	. Output Level [dBm]	16.8			
	DL Output	Commissioning	Level [dBm]	5.0	-		
0	Commission	ning Progress					
Unlock System							
	Previous D	L Commissioning	Level [dBm]	0.0			
Expand All Collapse All	Last Comm	issioning Date		00/00/0000			
				00.00.00			
- NMS 🔵 🔺	Last Comm	issioning Time		00:00:00	0		
* [1] RFU-Cell-M2							
* [2] RFU-PCS				Ap	iply		
* [3] RFU-AWS							
* [4] RFU-700					0100 100000		
* [1] BCU-700	Description	1			5150/MIMO /	Assignment	
* [2] BCU-Cell 🥥							
* [3] BCU-PCS	Descri	ption zzzz			SISO	MIMO - 1	MIMO - 2
* [4] BCU-AWS			9	at			Annly

Figure 8-81 Install-Remote Module

8.2.4.6.1 RU Output Commissioning

This section allows the user to perform HPR commission. To perform HPR commission, select a DL Output Commissioning Level from the dropdown menu and then click Apply. The commissioning progress is displayed on the Commissioning Progress bar. Any errors, warnings, and messages will appear via a popup window.

Current DL Output Level [dBm]	16.9
DL Output Commissioning Level [dBm]	5.0 💌
Commissioning Progress	
Previous DL Commissioning Level [dBm]	5.0
Last Commissioning Date	01/15/2000
Last Commissioning Time	00:41:52

Figure 8-82 RU Output Commissioning (Install-RU)



8.2.4.6.2 Description

This section allows the user to save the description of remote module.

scription		
Description	ru_desc.	
	Set	



8.2.5 System

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

8.2.5.1 System: Account

8.2.5.1.1 System: Account - Account Management (Admin Only)

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

No	Login Name	Password	Status	Last Login	Edit
1	admin	admin	administrator	2012-02-28 18:37:53	-
2	adrf	adrf	user	2012-02-28 00:47:55	delete
3	guest	guest	guest	1970-01-01 00:00:00	delete

Figure 8-84 Account Management

8.2.5.1.2 System: Account - New Account (Admin Only)

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

	Account Name		
	Account Name		
	Account Group	user 👻	
0	Password		
	Confirm password		
	Create	Cancel	

Figure 8-85 New Account



8.2.5.1.3 System: Account - Change Password

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

ount Management / Ne	ew account / Change Pas	sword
	User Name Password	admin
	 Confirm password 	
	Please en	ter new password.
	Арр	Ay Cancel

Figure 8-86 Change Password

8.2.5.2 System: Logs

8.2.5.2.1 System: Logs - Event Log

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

- System Initiation
- Alarm Set
- Alarm Clear

	ADRF Remote Operation & Manag							
MS ADRF HQ	Seq.	Date / Time	Source	Description	Event	Severity Lev		
	1970	2012-02-16 / 08:27:09	OPT-3	12387	PD Path 8 Fail Alarm Set	minor		
	1969	2012-02-16 / 08:27:09	OPT-3	12387	PD Path 7 Fail Alarm Set	minor		
	1968	2012-02-16 / 08:27:08	OPT-3	12387	PD Path 6 Fail Alarm Set	minor		
	1967	2012-02-16 / 08:27:08	OPT-3	12387	PD Path 5 Fail Alarm Set	minor		
	1966	2012-02-16 / 08:27:08	OPT-3	12387	PD Path 4 Fail Alarm Set	minor		
	1965	2012-02-16 / 08:27:07	OPT-3	12387	PD Path 3 Fail Alarm Set	minor		
	1964	2012-02-16 / 08:27:07	OPT-3	12387	PD Path 2 Fail Alarm Set	minor		
	1963	2012-02-16 / 08:27:07	OPT-3	12387	PD Path 1 Fail Alarm Set	minor		
	1962	2012-02-16 / 08:27:06	OPT-2		PD Path 8 Fail Alarm Set	minor		
	1961	2012-02-16 / 08:27:06	OPT-2		PD Path 7 Fail Alarm Set	minor		
	1960	2012-02-16 / 08:27:06	OPT-2		PD Path 6 Fail Alarm Set	minor		
	1959	2012-02-16 / 08:27:05	OPT-2		PD Path 5 Fail Alarm Set	minor		
	1958	2012-02-16 / 08:27:05	OPT-2		PD Path 4 Fail Alarm Set	minor		
	1957	2012-02-16 / 08:27:05	OPT-2		PD Path 3 Fail Alarm Set	minor		
	1956	2012-02-16 / 08:27:04	OPT-2		PD Path 2 Fail Alarm Set	minor		
	1955	2012-02-16 / 08:27:04	OPT-2		PD Path 1 Fail Alarm Set	minor		
	1954	2012-02-16 / 08:27:04	OPT-1	ADRF_HQ_H-ODU	PD Path 8 Fail Alarm Set	minor		
	1953	2012-02-16 / 08:27:03	OPT-1	ADRF_HQ_H-ODU	PD Path 7 Fail Alarm Set	minor		
	1952	2012-02-16 / 08:27:03	OPT-1	ADRF_HQ_H-ODU	PD Path 6 Fail Alarm Set	minor		

Figure 8-87 Event Log



8.2.5.2.2 System: Logs - User Log

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

- Log in / Log out activity
- Changes to gain/attenuation/output values
- System event generated by user(firmware update, backup/resote, create/delete account)
- DAS Navigation Tree Lock/Unlock
- Description change
- Repeater/installer information change
- Setting date/time

						ADRF Remote Operation & Manageme
H-NMS	Event Log / Use	r Log		17		
D : ADRF_HQ	Seq.					
	2	2012-02-16 / 08:31:29	NMS	000000	adıf	Logged-In
	1	2012-02-16 / 08:29:38	NMS	Contractor	admin	Logged-In
				1		
		Date	•	search		Down

Figure 8-88 User Log

8.2.5.3 System: Update

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

	System Up	late				
-H-NMS ID: ADRF HO						
		File	Name			Browse
		Click Upgrade	to update the	e repeater firmw	are, or click C	ancel to abort the upgrade
				Undate	Cancel	
				opulle	Gancer	

Figure 8-89 System update

- Click on the 'Browse' button and locate the firmware file.
- Click on the Update button to perform the firmware update.
- Once the firmware update is complete, the following message will appear.


File Size File uplo Now co Updated Updated	r = 1149078///1149095 iad OK. oying files and reboot. Do not close this page. j Web j Universal Extra files
Updated	đ
Rebooti	ng now
Turn off And cor	this terminal, nnect GUI after 30 seconds
	End Download

Figure 8-90 Message after System update is complete

8.2.5.4 System: System Information

8.2.5.4.1 System: System Information

						ADF	F Remote Operation	& Management Sys
ystem Infoma	tion Check	Che	ck					
tem Infoma	ation							
	Nar	ne				Status		
/eb GUI Vers	sion		X0.0.5	8				
cternal Mode	m Box Setting		192.16	8.63.5 / 255.25	5.255.0 / 192.168	.63.254		
ime			01/30/	2000 15:52:58				
1								
				Firmware Version				Module Statu (DL / UL)
140	ADX-CELL-S- 30R	OPT-4 / RU-Hub-8 / S- RU-Cell		1.5.63		Normal	1.000	On / On
139	ADX-AWS-S- 30R	OPT-4 / RU-Hub-8 / S- RU-AWS		1.5.63		Normal	-	On / On
	ADY-PCS-S-	OPT-4 / RIL-Hub-8 / S-						

138	ADX-PCS-S- 30R	OPT-4 / RU-Hub-8 / S- RU-PCS	1.5.63	Normal	2 <u>000</u>	On / On
137	ADX-700-M- 30R	OPT-4 / RU-Hub-8 / M-RU-700	1.5.63	Normal	0.0000	On / On
136	ADX-CELL-S- 30R	OPT-4 / RU-Hub-7 / S- RU-Cell	1.5.63	Normal	1.000	On / On
135	ADX-PCS-S- 30R	OPT-4 / RU-Hub-7 / S- RU-PCS	1.5.63	Normal		On / On
134	ADX-AWS-S- 30R	OPT-4 / RU-Hub-7 / S- RU-AWS	1.5.63	Normal		On / On

• System Information Check

The System Information Check button will check the ADX configuation and report possible discrepancies.

|--|

• System Information

This section displays the general system information of the ADX DAS.

Web GUI Version	X0.0.49
External Modem Box Setting	192.168.63.44 / 255.255.255.0 / 192.168.63.254
Time	02/16/2012 09:07:35

Figure 8-91 System Information



System Notification

This section is displayed only when the following conditions are present:

- When multiple remote modules with same frequency band exist in a RU.
- When the remote module does not match with the RFU being used.

System Notification

[OPT-1 / RU-Hub-3 / S-RU-PCS] Multiple (PCS) remote units have been detected. [OPT-2 / RU-Hub-2 / S-RU-PCS] Multiple (PCS) remote units have been detected. [OPT-2 / RU-Hub-2 / S-RU-PCS] Multiple (PCS) remote units have been detected.

Figure 8-92 System Notification

BOM

BOM displays all parts that are connected to the ADX-H-NMS. The BOM can be downloaded as a CSV file by clicking the 'Download' button at the bottom right.

						Module Status (DL / UL)
16	ADX-AWS-S- 30R	1.5.5D	3rd chassis(bottom)	Normal		On / Off
15	ADX-AWS-S- 30R	1.5.5D	2nd chassis(top)	Normal		Off / Off
14	ADX-700-5-30R	1.5.5D	***************************************	Normal	-	Off / On
13	ADX-CELL-S- 30R	1.5.5D	abcde	Normal	8.0004	Off / Off
12	ADX-AWS-S- 30R	1.5.5D	1st chassis	Normal	(a nn a	On/ On
11	ADX-700-5-30R	1.5.5D	s-ru-700	Normal	~ -1	On/ On
10	ADX-CELL-S- 30R	1.5.5D	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Normal	- 10 - -1	On/ On
9	ADX-PCS-M- 30R	1.5.5D	******	Normal		On/ On
8	ADX-H-OPT	1.5.1C	12307	Normal		-1-
7	ADX-H-OPT	1.5.1C		Normal	\rightarrow	/
6	ADX-H-OPT	1.5.1C	ADRF_HQ_H-ODU	Normal	2-2	/
5	ADX-H-RFU-A	1.5.52	ADRF_HQ_H-A	Normal	Not Commissioned	Off /
4	ADX-H-RFU-C	1.5.52	ADRF_HQ_H-C	Normal	Not Commissioned	On / On
3	ADX-H-RFU-7	1.5.52	ADRF_HQ_H-7	Normal	Not Commissioned	On/ On
2	ADX-H-RFU-P	1.5.52	ADRF_HQ_H-P	Soft Fail	Commissioned	On / On
1	ADX-H-NMS	13000F01002X1017		Normal	-	-1-

Figure 8-93 Bill of material

8.2.5.5 System: Backup/Restore

Settings Backup	
Click the Backup button to genera file.	ste a backup Backup
Settings Restore	
Fie Na	me Choose File No file chosen
VIM5	
[1] [1]RFU - Cet	
2]RFU - 700	
23RFU - 700 (2) (3)RFU - AWS	
(2)RFU - 700 (2)RFU - AWS (2)RFU - AWS (2)RFU - PCS	
V (2)8FU - 700 V (3)8FU - AW5 V (4)8FU - PCS V Unknown - 5	
238FU - 700 238FU - 700 338FU - AWS 248FU - PCS 249FU - 700 249FU	
[2] [2] [2] [2] [3] [3] [4] [3] [4] [
IV 238FU - 700 IV 138FU - AWS IV 149FU - PCS IV 149FU - FCS IV Unknown - 5 IV Unknown - 11 IV Unknown - 12	
[2] [2] [2] [2] [2] [2] [2] [2] [2]	nisi
V (2)870 - 700 V (3)870 - AWS V (4)870 - 6 V Unitrown - 6 V Unitrown - 11 V Unitrown - 12 V OPT - 1 V 20-1	INDE HUBOITADOC
V (2)PFU - 700 V (3)PFU - AVS V (3)PFU - AVS V (4)PFU - PCS V (4)Anown - 5 V (4)Anown - 5 V (4)Anown - 1 V (4)Anown - 12 V (9)PT - 1 V (4)Anown - 12 V (9)PT - 1 V (4)Anown - 6 V (4)Anown - 6 V (4)Anown - 12	atan 2004 1 10001 1 10001
(2) (2)(470 - 700 (2) (3)(470 - 700 (2) (3)(470 - 705 (2) (10)(470 - 75 (2) (10)(470 - 75 (2) (10)(470 - 75 (2) (10)(470 - 75 (2) (10)(470 - 75) (2) (470 - 76) (2) (470 - 76) (470 - 76) (mid Hubbita
22347U - 700 27 (3347U - 700 27 (3347U - AX5 27 (4347U - AX5 27 (43470 - AS5 27 (43470 - AS 27 (43470 - AS 27 (43470 - AS 27 (43470 - AS 27 (43470 - AS) 27 (434	mis HUBO11400 1909-1909 1909-1900 1909-1900 1909-1900 1909-1900 1909-1000 1000

• Settings Backup

Clicking the Backup will create a temporary backup file stored inside of the ADX. Once the file is created, it will need to be downloaded to a computer. A download button will appear after the backup file has been created. If the ADX is power cycled or rebooted, then the temporary backup file will be lost. We recommend downloading the backup file immediately after it has been created. Click on the Download button to download the backup file.

Exports t which ca function.	he current setting n be restored usin	; of this system g the system restore
		Backup
igure 8	-94 Setting	3ackup (Before
igure 8 tings Bac	-94 Setting	Backup (Before
igure 8 tings Bac Click the file.	-94 Setting :kup Backup button to	Backup (Before generate a backup



Setting Restore



Restore function can be used to restore the saved settings from the backup file. Once the backup file is loaded, the tree in the figure below will appear. Check the boxes of the modules that you would like to restore and then click the "Restore" button at the bottom on this section.

We recommend creating a new backup file if adding or removing modules from the ADX. Discrepancies between the backup file and the existing tree could cause restore errors.

File Name	Browse
NMS	
TIRFU - PCS	ADRF_HQ_H
[2]RFU - 700	ADRF_HQ_H
3]RFU - Cell	ADRF_HQ_H
[4]RFU - AWS	ADRF_HQ_H
V OPT - 1	ADRF_HQ_H-OL
RU-Hub - 1	
M-RU - PCS	<u> </u>
S-RU - Cell	<u> </u>
S-RU - 700	s-ru-7
S-RU - AWS	1st chas
S-RU - Cell	abc
💟 S-RU - 700	<i><i>ŸŸŸŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶ</i></i>
S-RU - AWS	2nd chassis(to
S-RU - AWS	3rd chassis(botto
V OPT - 2	
V OPT - 3	123
Click R	estore to restore the system-setting
	Restore

Figure 8-96 Setting Restore

8.2.5.6 System: SNMP

• SNMP V1/V2

This section allows you to add community strings for SNMP v1 and v2.

Version	Permission	Community	Command
v2c 🔻	read/write 🔻		add
tive SNMP			
tive SNMP Version	Permission	Community	Command
ive SNMP Version	Permission	Community	Command
ve SNMP Version v1	Permission read/write	Community public	Command
tive SNMP Version v1	Permission read/write	Community public	Command





•

SNMP V3

This section allows the user to add accounts for SNMP v3.

			Auth Al <u>c</u> / Pass	gorithm word			
	read/write	•	MD5	-	None	•	add
ive SNMD							

Figure 8-98 SNMP V3

8.2.5.7 System: Closeout Package

The closeout package section will allow the user to upload documents to the ADX-H-NMS. 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.

		Browse
Description		
	Maximum file size is 1	0 MB
	Add File (Cancel
File Name	File Size	Description

Figure 8-99 System- Closeout Package

To upload documents to the module, click on the "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.

Hie Name		Browse			
Description					
	Maximum file size is 10 MB				
	Add File	Cancel			
File Name	Add File	Cancel	1		
File Name	Add File	Cancel Description			

Figure 8-100 System- Closeout Package after the file upload



8.2.6 Help

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



8.2.7 Logout

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

8.3 Guest Mode

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



9. SYSTEM-WIDE SPECIFICATION (TO BE CONNECTED TO HE VIA OPTIC LINE)

700LTE/CELL/SMR800 Specifications.

			700F	CELL	SMR800	Comments		
	Down	ink	Lower ABC	728-746MHz	869-894MHz	851~869MHz	SMR800 is not	
Frequency	Downi	INK	Upper C	746-757MHz			for FCC approval	
Frequency			Lower ABC	698-716MHz		806~824MHz		
	Uplink		Upper C	776-787MHz	824-849MHZ			
Support Band Width	Support Band Width		16+11MHz (Lower ABC + Upper C)		25MHz	18MHz		
DL Input Range			0~25dBm		0~25dBm	0~25dBm		
Cain	Denes	D/L	18~43dB,	18~43dB, 0.5dB step, ATT range: 0~25dB				
Gain	капде	U/L	-5~30dB,	-5~30dB, 0.5dB step, ATT range: 0~35dB				
	Denes	D/L	0~25dB	0~25dB				
Attenuation	капде	U/L	0~35dB					
	Accura	ю	0~15dB: <	0~15dB: < ±0.5dB, 15~35dB: < ±1.0dB, 35dB~: < ±1.5dB				
Gain Flatness			< ±2.0dB < ±2.0dB < ±2.0dB			< ±2.0dB		
Composite Maximun	Composite Maximum Downlink		43dBm±1					
Output Power	Up	olink	-15dBm±1					
Noise Figure @max gain		5.0dB @ Band Center		5.0dB @ Band Center	5.0dB @ Band Center			
VSWR		< 1.5:1						
LTE			Uplink (<					
EVM	EVDO		Uplink (<					
CDMA2		2000	Uplink (<					
Optical Loss			0~10dBo					
System Delay			<2us @0dBo optic loss					
Spurious			FCC, 3GPP TS 36.104, 3GPP2 C.S0010-C					
Operating Temperature		-30~55°C						
Operating Humidity		5-90%						

메모 [H23]: SMR800 의 경우 FCC 인증에서 제외함. (ACP 문제점)



메모 [Y24]: Addition 14/05/12

2. PCS/AWS/BRS Specifications.

				PCS	AWS	BRS	Comments
_	Downlink			1930~1995MHz	2110~2155 MHz		
Frequency U		Uplink		1850~1915MHz	1710~1755 MHz	2496~2690 MHz	
Support Band Width				65MHz	45MHz	194MHz	
DL Input Range				0~25dBm	0~25dBm	+12~37dBm (Medium Mode) -15~12dBm (Low Mode)	
			D/L	21~46dB, 0.5dB step, A			
Gain	Ran	ige	U/L	-5~30dB, 0.5dB step, A			
			D/L	0~25dB			
Attenuation	Ran	ige	U/L	0~35dB			
	Acc	Accuracy		0~15dB: < ±0.5dB, 15~			
Gain Flatness	Gain Flatness			< ±2.0dB	< ±2.0dB	< ±2.0dB	
Composite Maximu	m	Downl	ink	46dBm±1dB			
Output Power Uplink			-15dBm±1dB				
Noise Figure	Noise Figure @max gain		5.0dB @ Band Center	5.0dB @ Band Center	5.0dB @ Band Center		
VSWR		< 1.5:1					
EVM EVDO CDMAX		LTE		Uplink (< 12.5%), down			
		0		Uplink (< 14.75%), dow			
		MA200	0	Uplink (< 14.75%), dow			
Optical Loss				0~10dBo			
System Delay				<2us @0dBo optic loss			
Spurious				FCC, 3GPP TS 36.104, 3			
Operating Temperature				-30~55°C			
Operating Humidity				5-90%			



3. SMR900 Specifications.

			SMR9000+Paging	Comments
_	Downlink		929~942MHz	
Frequency	Uplink		896~903MHz	
Support Band Width			DL:13MHz, UL: 7MHz	
DL Input Range			0~25dBm	
<u> </u>	_	D/L	18~43dB, 0.5dB step, ATT range: 0~25dB	
Gain	Range	U/L	-5~30dB, 0.5dB step, ATT range: 0~40dB	
	_	D/L	0~25dB	
Attenuation	Range	U/L	0~40dB	
	Accuracy	/	0~15dB: < ±0.5dB, 15~35dB: < ±1.0dB, 35dB~: < ±1.5dB	
Gain Flatness			< ±2.0dB	
Composite Maximum	Downlin	k	43dBm±1dB	
Output Power	Uplink		-15dBm±1dB	
Noise Figure	@max g	ain	5.0dB@ Band Center	
VSWR			< 1.5:1	
	LTE		Uplink (< 12.5%), downlink (< 8%)	
EVM	EVDO		Uplink (< 14.75%), downlink (< 12.5%)	
	CDMA2000		Uplink (< 14.75%), downlink (< 14.75%)	
Optical Loss			0~10dBo	
System Delay			<2us @0dBo optic loss	
Spurious			FCC, 3GPP TS 36.104, 3GPP2 C.S0010-C	
Operating Temperature			-30~55°C	
Operating Humidity			5-90%	

메모 [Y25]: Addition 14/05/12

메모 [H26]: 해당 제품의 SPEC 의 경우 향후 추가될 제품의 SPEC 임.



4. WCS Specifications.

			WCS	Comments		
_	Downlink		2305-2315MHz			
Frequency	Uplink		2350-2360MHz			
Support Band Width			10MHz			
DL Input Range			+12~37dBm(Medium) -15~12dBm(Low)			
Cain	Deres	D/L	19.8~44.8dB, 0.5dB step, ATT range: 0~25dB			
Gain	Range	U/L	-5~30dB, 0.5dB step, ATT range: 0~40dB			
	Deve	D/L	0~25dB			
Attenuation	капде	U/L	0~40dB			
	Accurac	су.	0~15dB: < ±0.5dB, 15~35dB: < ±1.0dB, 35dB~: < ±1.5dB			
Gain Flatness			< ±2.0dB			
Composite Maximum	Downlir	nk	44.8dBm±1dB			
Output Power	Uplink		-15dBm±1dB			
Noise Figure	@max g	gain	5.0dB@ Band Center			
VSWR			< 1.5:1			
	LTE EVDO		LTE		Uplink (< 12.5%), downlink (< 8%)	
EVM			Uplink (< 14.75%), downlink (< 12.5%)			
	CDMA2000		Uplink (< 14.75%), downlink (< 14.75%)			
Optical Loss			0~10dBo			
System Delay			<2us @0dBo optic loss			
Spurious			FCC, 3GPP TS 36.104, 3GPP2 C.S0010-C			
Operating Temperature			-30~55°C			
Operating Humidity			5-90%			

메모 [Y27]: Addition 14/05/12

메모 [C28]: 주파수 수정 2015.07.28



메모 [Y29]: Addition 14/05/12

10. MECHANICAL DRAWING





메모 [H30]: 6band 로 모델명

수정필요함

Figure 10-2 HPR Drawing