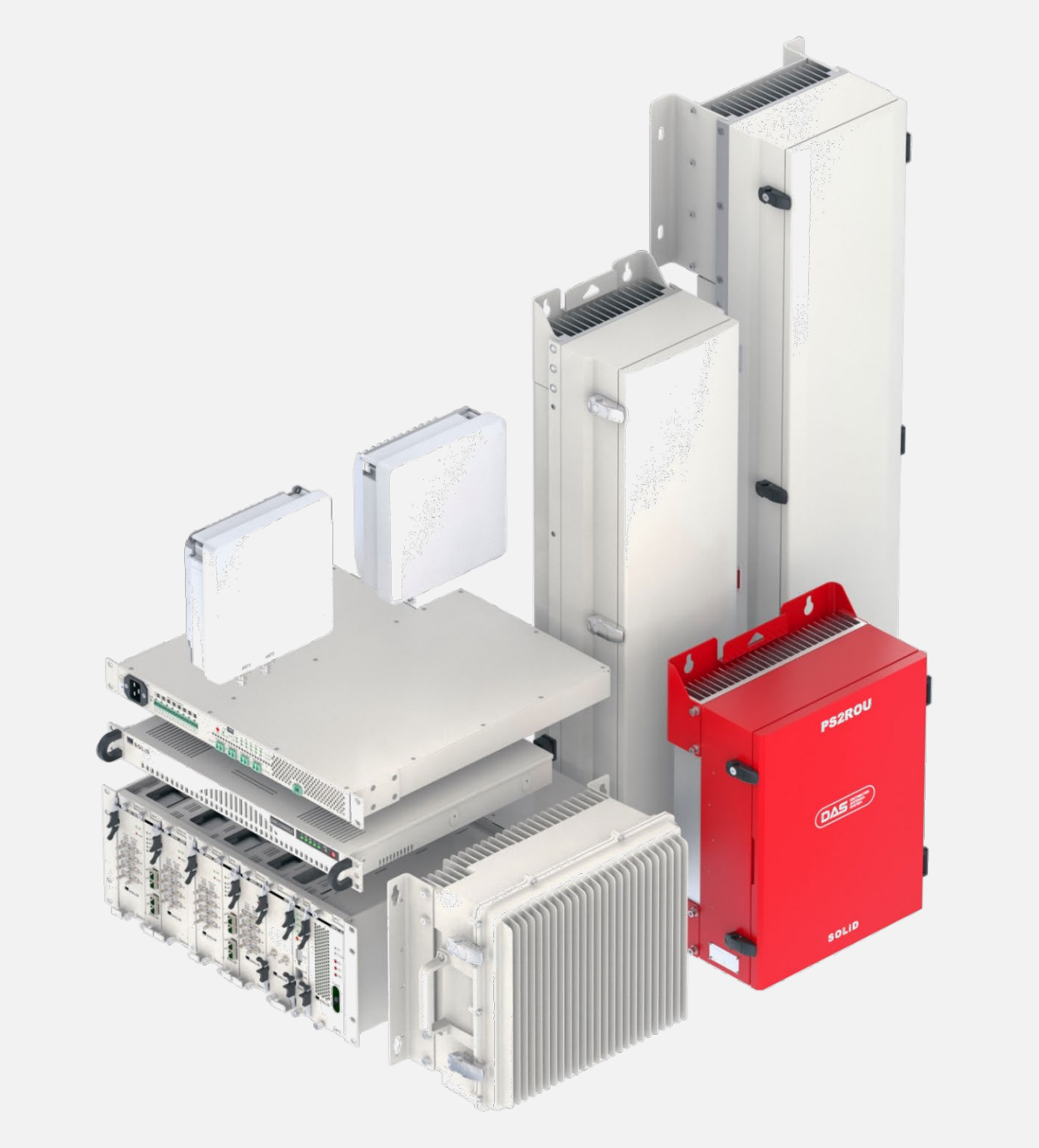
ALLIANCE Multi-Operator DAS

Ordering Guide



Preface

The ALLIANCE DAS user documentation consists of these volumes:

- *iBIU Headend Operations and Install Guide*
- *N2ROU 2W Remote Unit Operations and Install Guide*
- *MROU 5W Remote Unit Operations and Install Guide*
- *HROU 20/40W Remote Unit Operations and Install Guide*
- *MPROU Multi-power Remote Unit Operations and Install Guide*
- *High Power Mid-Band Remote Optic Unit (HROU_4000) Operations and Install Guide*
- *PS2ROU Public Safety 2W Remote Unit Operations and Install Guide*
- *Fiber2Antenna edgeHUB/edgeROU Operations and Install Guide*
- *Add-on Remote (AOR / AOR_2W) Operations and Install Guide*
- *DMS1200 Management System User Guide*
- ***SOLiD Ordering Guide – ALLIANCE DAS (This document)***

All documentation is available for download from the SOLiD Support website.

SOLiD has developed the contents of this guide assuming the reader has completed SOLiD certification. Only SOLiD certified personnel should handle the ALLIANCE DAS equipment. To learn more about SOLiD certification, visit the SOLiD Training and Certification website.

Legal Stuff

Getting Support

To authorize technical support or to establish a return authorization for defective units, you will need the product serial number, which is available from the GUI management software. Contact SOLiD for additional support information:

SOLiD Gear, Inc. Headquarters

800 Klein Road, Suite 200, Plano, TX 75074 Phone: 888.409.9997

Email for support issues: support@solid.com Web site: SOLiD Support

Revision Log

Revision	Issue Date	Section	Changes
V1.0	June 2022	All	Initial release
V1.1	March 2023	All	Updated parts lists and descriptions

Contents

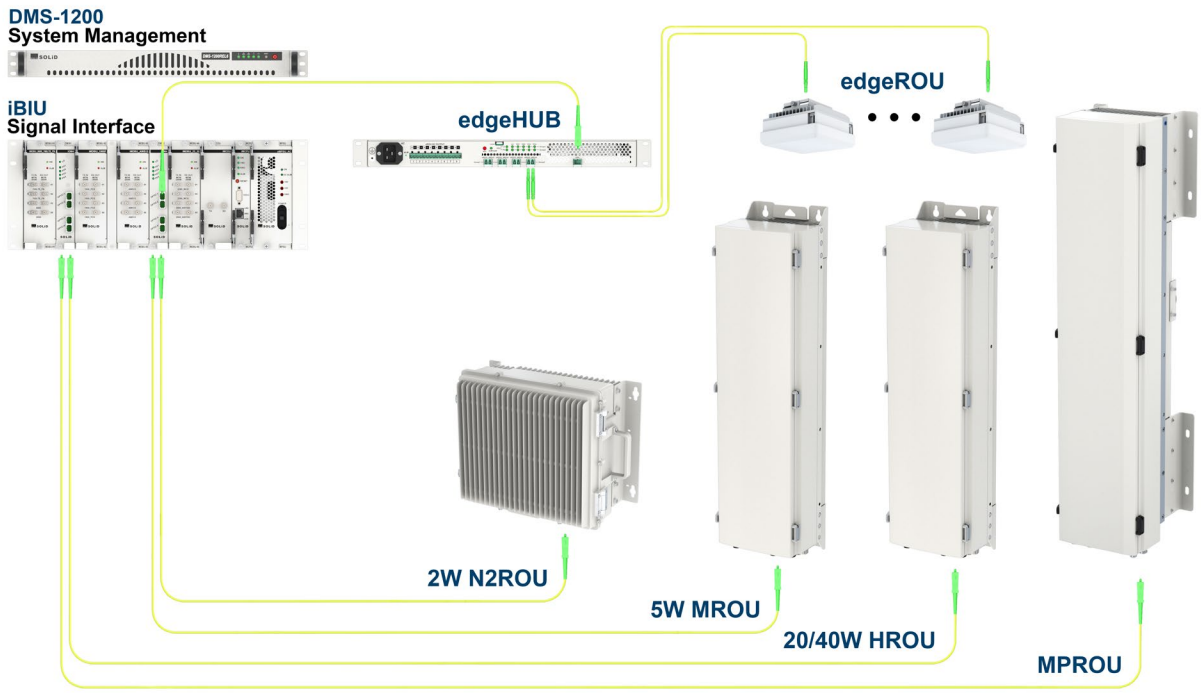
1. ALLIANCE DAS Overview

The ALLIANCE platform is SOLiD's multi-operator, neutral host Distributed Antenna System (DAS) for efficiently delivering wireless RF signals into buildings, campus environments, stadiums, airports, underground transit systems, or any other location that is traditionally difficult to cover with outdoor macro wireless networks.

The following document provides guidance for ordering and configuring ALLIANCE DAS components which include:

- Integrated BTS Interface Unit (iBIU)
- Integrated Optical Distribution Unit (iODU)
- Integrated Optic Expansion Unit (iOEU) (optional fiber MUX to support highly distributed systems)
- Remote Optic Units (ROU) – edgeROU, low-power 2W (N2ROU) and public safety PS2ROU, mid-power 5W (MROU), high-power 20W (HROU) and mid-band HROU_4000, and multi-power MPROU models
- Fiber2Antenna edgeHUB, edgeROU and optional Expansion Power Supply Unit (EPSU)
- Add-on Remote Units (AOR, AOR_2W, and HARU) (optional units to support additional bands)
- DAS Management System (DMS-1200 REL6)

The figure shows a typical system topology with the iBIU, DMS-1200, edgeHUB, and multiple ROUs, including the edgeROU. The figure does not show the Public Safety remote PS2ROU, optional iODU or iOEU, AOR, HARU or EPSU.



2. Integrated Base Station Interface Unit (iBIU)

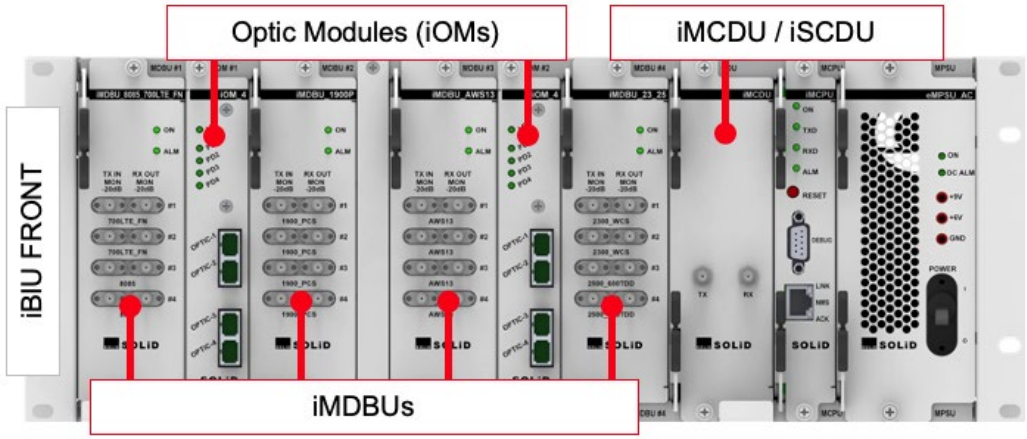
The Integrated Base Station Interface Unit (iBIU) is the central input point for all source signals sent and received over the DAS.

For deployments requiring support for more than 16 services per sector, the DAS headend can support a secondary iBIU that interfaces directly with the main iBIU.

The iBIU supports up to two integrated 4-port or 1-port optic modules (iOMs).

The iBIU can also be configured with any combination of integrated Point of Interface (POIs) modules: high power (20W), low power (100mW), or hybrid (high and low power).

iBIU Configuration Guidelines



1. For each sector, order one main iBIU, either AC or DC power. The unit includes the CPU and power unit.
2. Order one main combiner/divider unit (iMCDU) for each iBIU you ordered in Step 1. If the system will support C-Band (3700~3980MHz) or Auction 110 (3450~3550MHz), order the iMCDU_4000.
3. Select one or two integrated optic modules, either 4-port (iOM_4s) or 1-port (iOM_1s). If you only need one optic module, order a blank plate (iOM_B) to cover the unused slot. If the system will support C-band and/or A110, order the "_4000" versions of the iOM_1 or iOM_4.

iBIU and iOMs Description	Part Numbers
iBIU Chassis, Includes: iMCPU, iMPSU_AC	iBIU_AC
iBIU Chassis, Includes: iMCPU, iMPSU_DC	iBIU_DC
Main Combiner/Divider Unit	iMCDU
Main Combiner/Divider Unit - C-Band (3700~3980MHz) or Auction 110 (3450-3550MHz)	iMCDU_4000
1 Port optical module, use with iBIU, iODU, iOEU, supports 136~2700MHz	iOM_1_2700
4 Port optical module, use with iBIU, iODU, iOEU, supports 136~2700MHz	iOM_4_2700
1 Port optical module, use with iBIU, iODU, iOEU, supports 136~4000MHz	iOM_1_4000
4 Port optical module, use with iBIU, iODU, iOEU, supports 136~4000MHz	iOM_4_4000
Blank optical module, use with iBIU, iODU, iOEU	iOM_B

4. Select iMDBUs to match desired bands and capacity. Bands are identified in the part number. Modules with suffix "_M" are for MIMO applications. Each iBIU can support up to four iMDBUs. Main/secondary configuration (see below) can support up to eight iMDBUs.

   NOTE: iMDBU_7_8_9_V/U (for VHF/UHF frequencies) is only supported in the main iBIU.

5. Order blanks (iBIU_B) for any empty iMDBU slot.

iMDBU Description	Part Numbers
600MHz, 700LTE + FirstNet	iMDBU_600_700LTE_FN
700/800/900VHF/UHF Public Safety and LMR	iMDBU_7_8_9_V/U
800/850MHz, 700LTE + FirstNet	iMDBU_8085_700LTE_FN
1900 MHz with extension for Band 70	iMDBU_1900P_E
2100MHz (AWS 1+3) with extension for Band 70 and AWS-4	iMDBU_AWS13_B66B70
2300 WCS, 2500MHz TDD (Full Band)	iMDBU_23_25_FB
1900 MHz, MIMO	iMDBU_1900P_M
700LTE, SISO & MIMO	iMDBU_700LTE_M
2100MHz (AWS 1+3), MIMO	iMDBU_AWS13_M
3450~3550MHz SISO	iMDBU_345
3450~3550MHz MIMO	iMDBU_345_M
3700~3980MHz SISO	iMDBU_Cband
3700~3980MHz MIMO	iMDBU_Cband_M
iMDBU Blank	iBIU_B

6. Optional: If you have filled all four iMDBU slots in the main iBIU and you still need more service provider inputs, order a second iBIU (iBIU_AC or _DC) to configure as a secondary unit. Order the desired iSCDU combiner divider unit, either 2-way or 4-way, for the secondary unit.

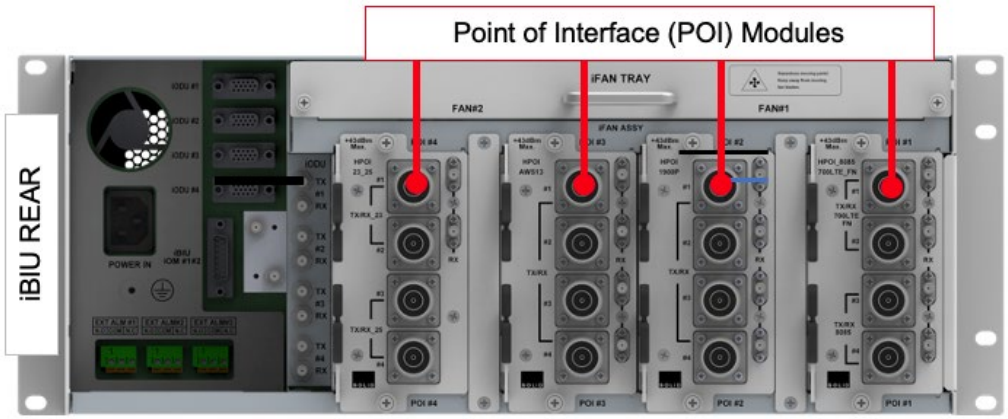
   NOTE: iSCDU_4W1 connects all four iMDBU slots of the secondary iBIU to one main iBIU. iSCDU_2W2 connects two iMDBU slots to one main iBIU and the other two iMDBU slots to a second main iBIU. To support frequencies above 3GHz (C-band and/or A110), order the "_4000" versions of the iSCDUs.

iSCDU Description	Part Numbers
iBIU Chassis, Includes: iMCPU, iMPSU_AC	iBIU_AC
iBIU Chassis, Includes: iMCPU, iMPSU_DC	iBIU_DC
Secondary Combiner/Divider Unit, iSBIU_4W1, 1 sector	iSCDU_4W1
Secondary Combiner/Divider Unit, iSBIU_4W1, Supports 136~4000MHz	iSCDU_4W1_4000
Secondary Combiner/Divider Unit, iSBIU_2W2, 2 sectors	iSCDU_2W2
Secondary Combiner/Divider Unit, iSBIU_2W2, Supports 136~4000MHz	iSCDU_2W2_4000
iBIU Cable Kit, OM Modules in Secondary iSBIU, Data and RF Cables	iODU_CBL_KIT

7. Optional: If you need additional optical ports, the secondary iBIU can support one or two optic modules. Follow the same guidelines as described in Step 3 above. Also order cable kit iODU_CBL_KIT which connects the iOMs in the secondary iBIU to the main iBIU.

8. Order Point of Interface modules (POIs) (for both main and secondary iBIUs) to match carrier equipment input power levels. POI frequency band must match corresponding iMDBU frequency band. (For iMDBU_7_8_9_V/U use LPOI_SPLX_T10_R35.)

   If the system will support C-Band (3700~3980MHz) or Auction 110 (3450~3550MHz), use the "_4000" versions of the LPOI, HPOI, or HLPOI.



POI Description	Part Numbers
Low Power Extender Board, +10dBm max, Simplex only, 136MHz to 2700Mhz	LPOI_EB
Low Power POI (100mW), Simplex, DL Atten 10 dB, UL Atten 35 dB, 136~2700MHz	LPOI_SPLX_T10_R35
Hybrid POI, 600: 20W/100mW, 700LTE+FN: 20W/100mW	HLPOI_600_700LTE_FN
Hybrid POI, 700LTE+FN: 20W & 100mW, 800/850: 20W & 100mW	HLPOI_8085_700LTE_FN
Hybrid POI, 1900MHz, 2 Ports 20W, 2 Ports 100mW	HLPOI_1900P
Hybrid POI, AWS(1+3), 2 Ports 20W, 2 Ports 100mW	HLPOI_AWS13
Hybrid POI, 3550~4000MHz TDD, 2 Ports 20W, 2 Ports 100mW	HLPOI_4000
Low Power POI (100mW), 800MHz Sprint, 850MHz Cellular, 700LTE+FirstNet	LPOI_8085_700LTE_FN
Low Power POI (100mW), 1900MHz PCS	LPOI_1900P
Low Power POI (100mW), 2100MHz (AWS 1+3)	LPOI_AWS13
Low Power POI (100mW), 2300MHz WCS, 2500MHz TDD	LPOI_23_25
Low Power POI Module (100mW), 3550~4000MHz TDD, 4 Ports	LPOI_4000
High Power POI (20W), 800MHz Sprint, 850MHz Cellular, 700LTE+FirstNet	HPOI_8085_700LTE_FN
High Power POI (20W), 1900MHz PCS	HPOI_1900P
High Power POI (20W), 2100MHz (AWS 1+3)	HPOI_AWS13
High Power POI (20W), 2300MHz WCS, 2500MHz TDD	HPOI_23_25
High Power POI Module (20W), 3550~4000MHz TDD, 4 Ports	HPOI_4000

3. Integrated Optical Distribution Unit (iODU)

Each iODU is equipped with one or two integrated optic modules, either 4-port (iOM_4s) or 1-port (iOM_1s). Each sector can support up to four iODUs.

The number of iODUs required will depend on the optical port capacity required for your DAS configuration (dictated by the number of remotes and/or iOEUs in the DAS):

- The main iBIU is typically equipped with one or two iOMs. These iOMs serve as iODU #1 for the system. If more optical capacity is needed, you can order up to three additional iODUs.
- If your system will use a secondary iBIU, it can also be equipped with iOMs.

  (These iOMs in the secondary iBIU serve as iODU #2 for the system.) If more optical capacity is needed, you can order up to two additional iODUs.

iODU Configuration Guidelines

1. Select the number of iODUs depending on your coverage requirements. See guidelines above. iODUs are powered by the iBIU so do not require a power unit.
2. For each iODU, order one or two optic modules, either 4-port (iOM_4s) or 1-port (iOM_1s). If the system will support C-Band (3700~3980MHz) and/or Auction 110 (3450~3550MHz), order the "_4000" versions of the iOM_1 or iOM_4.
3. Order blanks (iOM_B) to fill any empty optic module slots.

iODU and iOM Description	Part Numbers
Optical Distribution Unit Chassis for iOM w/ Fans	iODU
1 Port optical module, use with iBIU, iODU, iOEU, supports 136~2700MHz	iOM_1_2700
4 Port optical module, use with iBIU, iODU, iOEU, supports 136~2700MHz	iOM_4_2700
1 Port optical module, use with iBIU, iODU, iOEU, supports 136~4000MHz	iOM_1_4000
4 Port optical module, use with iBIU, iODU, iOEU, supports 136~4000MHz	iOM_4_4000
Blank optical module, use with iBIU, iODU, iOEU	iOM_B

4. DMS-1200 DAS Management System

The DMS-1200 is SOLiD's DAS management system that provides alarming, diagnostic, and control for the SOLiD ALLIANCE DAS platform, and it provides an enterprise level interface between the DAS and your Network Operations Center (NOC). The DMS-1200 gathers vital system information and alarm data from up to 20 iBIUs and transmits via SNMP to the designated NOC facility for monitoring.

Front Panel

Rear Panel

Configuration Guidelines

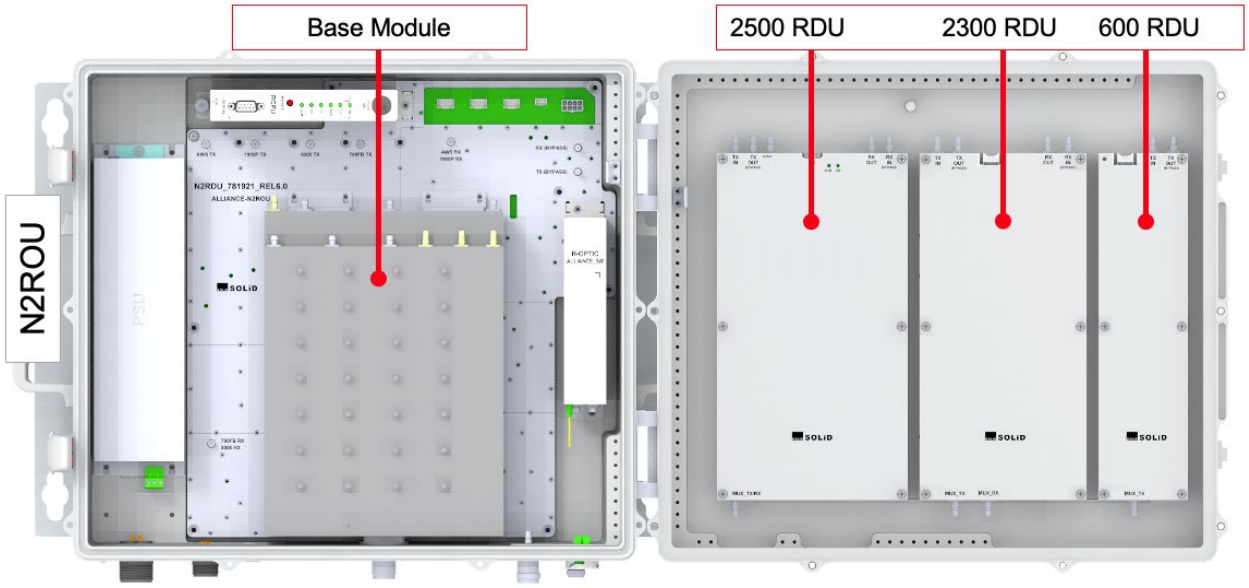
1. Order a DMS-1200 unit. The unit ships with the power cable and (1) straight type 2m CAT6 Ethernet cable.

One DMS-1200 can provide management functions for up to 20 iBIUs. For configurations with multiple iBIUs, use a Gigabit Ethernet switch.

DMS-1200 Description	Part Number
DAS Management System (DMS) for ALLIANCE - For use with Rel. 6	DMS_1200

5. 2W Remote Optic Unit (N2ROU)

This remote unit can support up to seven bands simultaneously. Additionally, the unit can support VHF and UHF bands by connecting the optional Add-on Remote (AOR).



N2ROU Configuration Guidelines

1. Select the N2ROU base model with AC or DC power.

   Base model includes: 7-band multiplexer, CPU, power unit, R-Optic unit, and 4 amplifiers providing 700LTE full band (incl. 700 Band 14), 800 (legacy Sprint) / 850 MHz, 1900 PCS, and 2100 AWS 1+3.

2. Optional: For additional bands, order the corresponding amplifiers (N2RDUs 600, 2300, or 2500).
3. Optional: To support VHF/UHF, order the AOR (AC or DC), the amplifier (PS2RDU_E_VHF_UHF), and cable kit (N2ROU_AOR Kit).
4. Optional: To support an external alarm when an AOR is not used, order the cable kit N2ROU-DRY Kit.

N2ROU Description	Part Numbers
2 WATT Remote Unit, 700/8085/1900/2100, MUX_7B - AC	N2ROU_BASE_7B_AC
2 WATT Remote Unit, 700/8085/1900/2100, MUX_7B - DC	N2ROU_BASE_7B_DC
2 WATT Amplifier Module, 600	N2RDU_600
2 WATT Amplifier Module, 2300	N2RDU_2300
2 WATT Amplifier Module, 2500TDD, 194MHz Contiguous, LTE + NR	N2RDU_2500_FB_TDD_R
Amplifier Module, +24 dBm, VHF/UHF	PS2RDU_E_VHF_UHF
N2ROU AOR Cable Kit	N2ROU_AOR Kit
N2ROU Dry Contact Kit	N2ROU-DRY Kit

6. 2W Public Safety Remote Optic Unit (PS2ROU)

The Public Safety 2W Remote Optic Unit (PS2ROU) can support up to five bands for public safety, paging and 2-way communications. The PS2ROU uses a red-colored enclosure to comply with public safety product requirements.

PS2ROU Configuration Guidelines

1. Select the PS2ROU base model with AC or DC power.

   Base model includes Multiplexer, CPU, power unit (AC or DC), R-Optic unit, and wall mount brackets.

2. Order the corresponding amplifiers for the bands you need: (PS2RDU_800PS_700PS_FN, PS2RDU_900_PA, PS2RDU_E_VHF_UHF).

3. If the remote will support only the PS2RDU_800PS_700PS_FN module, then no blanks are required for empty amplifier slots. For any other scenario, order blanks (ROU_B) for any unused slots.

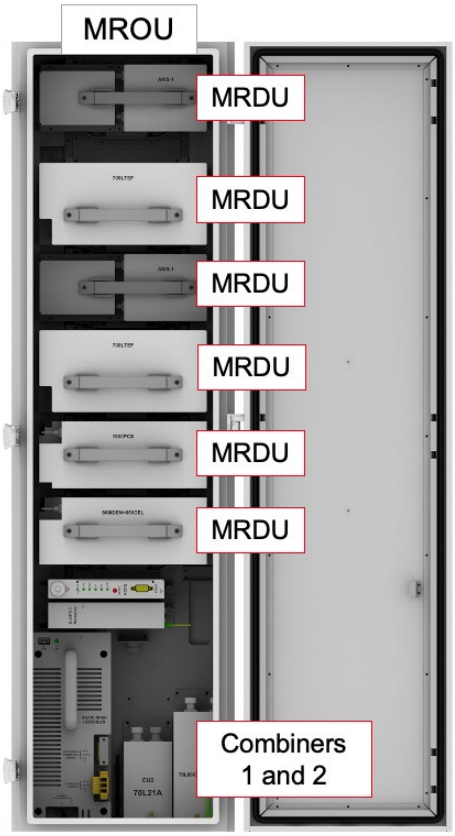
4. Optional: Order the splitter kit (PS2WAY_KIT) if using either the 900MHz or VHF/UHF modules, or if using both modules.

5. Optional: Order the rack mount kit (PS2_BRKT_Rack) for mounting the unit in a standard 19” rack. The unit can be wall mounted without any additional hardware.

PS2ROU Description	Part Numbers
Public Safety Remote Optical Unit Chassis - AC Power	PS2ROU_AC
Public Safety Remote Optical Unit Chassis - DC Power	PS2ROU_DC
Blank Amplifier Module	ROU_B
Amplifier Module, 700PS/800PS including FirstNet	PS2RDU_800PS_700PS_FN
Amplifier Module, 900MHz	PS2RDU_900_PA
Amplifier Module, VHF & UHF	PS2RDU_E_VHF_UHF
Divider Kit, Required with either VHF/UHF or 900MHz Modules	PS2WAY_KIT
Rack Mount Kit	PS2_BRKT_Rack

7. 5W Remote Optic Unit (MROU)

The ALLIANCE Mid-power 5W Remote Optic Unit (MROU) supports up to seven bands simultaneously. The Add-on Remote unit (AOR) can also be connected to support VHF/UHF.



MROU Configuration Guidelines

1. Select the MROU with AC or DC power.

The default MROU includes the power unit (AC or DC), R-Optic unit, CPU, external fan, and CU7 combiner which handles the bands: 600/700LTE+FN, 850IC, PCS, AWS13, 2300, 2500.

MROU Description	Part Numbers
5 WATT Remote Optical Unit - AC Power with MROU_CU7, Fan Included	MROU_C_MF_AC_CU7
5 WATT Remote Optical Unit - DC Power with MROU_CU7, Fan Included	MROU_C_MF_DC_CU7

2. Order amplifiers (MRDUs) according to your band requirements. The unit will hold up to six MRDUs.
3. Order blank module(s) (MROU_B) for empty slots.

MRDUs Description	Part Numbers
Blank Amplifier Module for 5W MROU	MROU_B
5 WATT 600 MHz & 700MHz Amplifier Module (Includes FirstNet)	MRDU_600_700LTE_FN
5 WATT 800MHz & 850MHz Amplifier Module	MRDU_800I_850C
5 WATT 1900MHz Amplifier Module	MRDU_1900P
5 WATT 2100MHz Amplifier Module (AWS1+3)	MRDU_AWS13
5 WATT 2300MHz WCS Amplifier Module	MRDU_2300_WCS
5 WATT 2500 MHz TDD Amplifier Module, 194MHz Contiguous, LTE + NR	MRDU_2500_FB_TDD_R
5 WATT 700MHz Full Band Amp Module; Channel B for MIMO	MRDU_700LTEF_B
5 WATT 1900MHz Amplifier Module; Channel B for MIMO	MRDU_1900P_M
5 WATT AWS Amplifier Module; Channel B for MIMO Applications	MRDU_AWS13_M

4. If necessary: order the appropriate combiner unit based on band requirements. If you do not specify a combiner unit, the default configuration ships with CU7.
5. For MIMO configurations, two combiner units are required. Order the CU1 combiner, then order a second combiner, CU5 or CU6, depending on band requirements.

NOTE: Because of their size, the CU4 and CU7 combiners do not allow for the installation of a second combiner, which is required for MIMO configurations.

MROU Combiner Units Description	Part Numbers
5 WATT Combiner Unit 700LTE, 850IC, 1900P, AWS13 and 2500	MROU_CU1
5 WATT Combiner Unit for 700LTE, 850IC, 1900P, AWS13, 2.5TDD, 2.3 WCS	MROU_CU4
5 WATT Combiner Unit for 2500/2600 & 1900 PCS, use with MIMO configurations	MROU_CU5
5 WATT Combiner Unit for 700/1900/AWS13, use with MIMO configurations	MROU_CU6
5 WATT Combiner Unit, 600/700LTE+FN, 850IC, PCS, AWS13, 2300, 2500	MROU_CU7

6. Optional: To support VHF/UHF, order the AOR, the amplifier (PS2RDU_E_VHF_UHF), and cable kit (CBL_MAOR_ALM).
7. Optional: If connecting an external device, like battery backup system, to the remote and need alarm capabilities, order alarm cable CBL_MAOR_ALM or CBL_MROU_ALM.
8. Optional: If you need to connect a single MRDU directly to its own output on the bulkhead, use the adapter ADP_DIN_N_BH. This adapter can be used with CU1 or CU4, but not CU7 because of its size.
9. Optional: Order the external fan unit if necessary (see note below).

NOTE: The fan comes installed as standard equipment on all new MROU base models (MROU_C_MF_AC_CU7, MROU_C_MF_DC_CU7) as of Q1 2022. For older units, the fan can be ordered separately and added in the field. For all MROUs, the fan is required when using the 2500 TDD full band amplifier (MRDU_2500_FB_TDD_R).

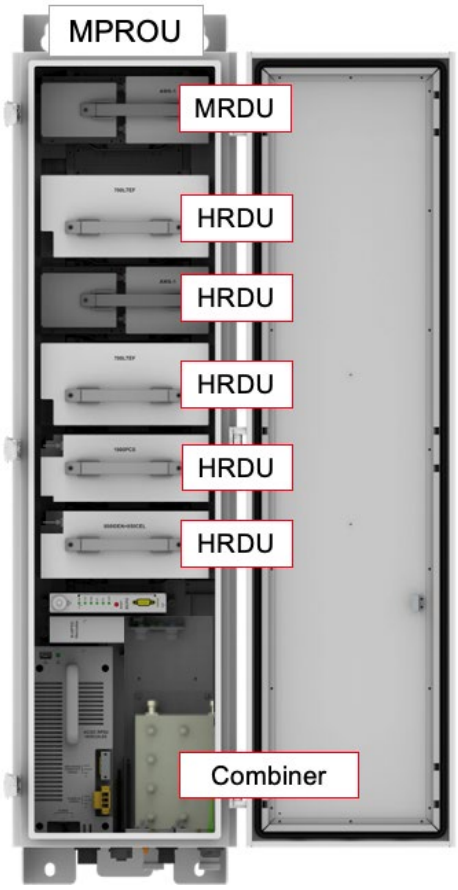
MROU Optional Components Description	Part Numbers
5 WATT Alarm Cable MROU-to-AOR cable with external alarm input pigtail	CBL_MAOR_ALM
5 WATT Alarm Cable MROU cable with external alarm input pigtail	CBL_MROU_ALM
Adapter, DIN Jack to N Jack, Bulkhead	ADP_DIN_N_BH
External Fan-Tray assembly for 5 Watt MROU chassis	MROU_FAN_TRAY

8. Multi-power Remote Optic Unit (MPROU)

The Multi-power Remote Optic Unit (MPROU) can support up to seven commercial bands from 600 to 2700 MHz, delivering either 5W or 20W of output power depending on the band.

The MPROU can be mixed with the other ALLIANCE REL6 remote units – edgeROU, PS2ROU, 2W N2ROU, 5W MROU, and 20W HROU – in a single DAS.

The multi-band combiner unit supports single antenna configurations. A dual fan unit on the back of the chassis dissipates heat.



MPROU Configuration Guidelines

1. Order the MPROU with either AC or DC power. The base chassis includes the R-Optic, default combiner, CPU, rear fan, and power unit.

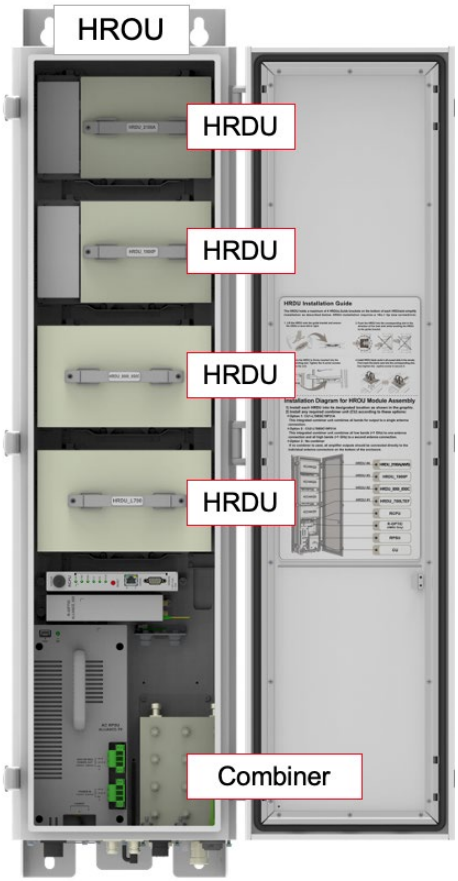
MPROU Description	Part Numbers
Remote Optical Unit Chassis, 6 Bay, Multi-Power, Includes CU - AC	MPROU_C_AC
Remote Optical Unit Chassis, 6 Bay, Multi-Power, Includes CU - DC	MPROU_C_DC

2. Order at least one and up to six amplifiers. Order blank module(s) (HROU_B) for any empty slots. (HROU_B will work in any empty slot including MRDU_600_700LTE_FN.)

NOTE: the MRDU_600_700LTE_FN amplifier supports 5 Watts of output power per band. All other amplifiers support 20W output. The MPROU does not support the 40W HRDU amplifiers.

MRDU and HRDUs Description	Part Numbers
20 WATT Blank Module	HROU_B
5 WATT 600 MHz & 700MHz Amplifier Module (Includes Band 14)	MRDU_600_700LTE_FN
20 WATT 800MHz and 850MHz Module	HRDU_800I_850C
20 WATT 1900MHz Amplifier Module	HRDU_1900P
20 WATT 2100MHz Amplifier Module (AWS1+3)	HRDU_AWS13
20 WATT 2300 MHz WCS Amp Module	HRDU_2300_WCS
20 WATT 2500 MHz TDD Amplifier Module, 194MHz Contiguous, LTE + NR	HRDU_2500_FB_TDD

9. 20W Remote Optic Unit (HROU)



The ALLIANCE High-power 20W Remote Optic Unit (HROU) supports up to eight frequency bands: four in the main unit and four in the High-power 20W Add-on Unit (HARU).

Both 20W (+43 dBm) and 40W (+46 dBm) amplifier modules are available, allowing the operator to deploy a standalone 20W or 40W remote unit or mix 20W / 40W modules in the same chassis.

Built-in combiners support single or dual (high-band/low-band) port antenna configurations. An external combiner is available to combine the HROU/HARU output.

HROU Configuration Guidelines

1. Order the base HROU chassis with either AC or DC power. The base unit includes R-Optic, CPU, fan unit, power unit, but no combiner.
2. Optional: For additional capacity, order add-on unit HARU with AC or DC power. HARU includes RCPU, fan unit, power unit, but no combiner.

HROU Description	Part Numbers
20 WATT Remote Optical Unit Chassis - AC Power – No Combiner	HROU_C_AC
20 WATT Remote Optical Unit Chassis - DC Power – No Combiner	HROU_C_DC
HARU Description	**Part Numbers**
20 WATT Add-on Unit Chassis - AC Power - No Combiner	HARU_C_AC
20 WATT Add-on Unit Chassis - DC Power - No Combiner	HARU_C_DC

3. When ordering the 20W HROU and HARU, the base unit does NOT include a combiner. Make sure to order the correct combiner or bottom plate option as summarized in the following table. The same combiner units are used for both 20W and 40W modules.

HROU / HARU Combiner Units / Bottom Plate Descriptions	Antenna Ports	Part Numbers
1 Antenna port. Combines: 700LTE, 800/850, 1900, AWS13	1	HROU_CU1_AWS13
2 Antenna ports: Port 1: 700LTE, 800/850, Port 2: 1900, AWS13	2	HROU_CU2_AWS13
1 Antenna port. Combines: 800/1900/2500	1	HROU_CU3
1 Antenna port. Combines: 700LTE or 850IC /1900 /AWS13/2500	1	HROU_CU4_AWS13
Bottom Plate w/ 4 Bulkhead DIN connectors. Use with external combiners.	4	HROU_CU5
Bottom Plate w/ 1 Bulkhead DIN connector. Use when 1 HRDU installed.	1	HROU_CU6
Combiner: Ant 1: 2300, 2500 (or 2600). HARU only	1	HROU_CU7
20 WATT Combiner Unit: 1 port, 1900/AWS13/2300/2500	1	HROU_CU8

4. Optional: To combine the output of the HROU and HARU, order ECU1 or ECU2.

HROU / HARU External Combiner Description	Antenna Ports	Part Numbers
External Combiner: HROU 700/850IC/PCS/AWS13 with HARU 2300/2500	1	HROU_ECU1
External Combiner: HROU 600/700/850IC, HARU 1900P/AWS13/2300/2500	1	HROU_ECU2
NOTES: The HROU_ECU2 combiner should only be used if your configuration requires the HRDU_600 module. If the configuration does not include the HRDU_600 module, use HROU_ECU1.		

The following tables show two typical configuration options describing the recommended slot assignments, internal combiners, and external combiners.

Configuration 1	HROU Main Cabinet	HARU Add-on Cabinet
HRDU4 (Top most)	700LTE	Blank Module
HRDU3	800Sprint/850C	Blank Module
HRDU2	1900P (20W or 40W)*	2300
HRDU1 (Bottom most)	2500 or 2100AWS13 (20W or 40W)*	2500
Combiner	HROU_CU1_AWS13	HROU_CU7
NOTES: This configuration would require external combiner HROU_ECU1. *The 40W modules can only be installed in slots 1 or 2.		

Configuration 2	HROU Main Cabinet	HARU Add-on Cabinet
HRDU4 (Top most)	Blank Module	1900P or 2500
HRDU3	600	AWS13 or 2300
HRDU2	700LTE	2300 or 1900P_40*
HRDU1 (Bottom most)	800Sprint/850C	2500 or AWS13_40*
Combiner	HROU_CU5 (4 port bottom plate)	HROU_CU8
NOTES: This configuration would require external combiner HROU_ECU2. The HROU_ECU2 is only used when deploying the HRDU_600 module. *The 40W modules can only be installed in slots 1 or 2.		

5. Order at least one and up to four HRDUs for the main HROU. If using the HARU, order one and up to four HRDUs. Order blank module(s) (HROU_B) for empty slots.

HRDU Description	Part Numbers
20 WATT 600MHz Amplifier Module	HRDU_600
20 WATT 700MHz Amplifier Module (Includes Band 14)	HRDU_700LTE_FN
20 WATT 800MHz (Sprint Only) and 850MHz Module	HRDU_800I_850C
20 WATT 1900MHz Amplifier Module	HRDU_1900P
20 WATT 2100MHz Amplifier Module (AWS1+3)	HRDU_AWS13
20 WATT 2300 MHz WCS Amp Module	HRDU_2300_WCS
20 WATT 2500 MHz TDD Amplifier Module, 194MHz Contiguous, LTE + NR	HRDU_2500_FB_TDD
40 WATT 1900MHz Amplifier Module	HRDU_1900P_40W_A
40 WATT 2100MHz Amplifier Module (AWS1+3)	HRDU_AWS13_40W_A

6. Optional: If connecting an external device to the remote, like battery backup system, and need alarm capabilities, order alarm cable CBL_HROU_ALM.

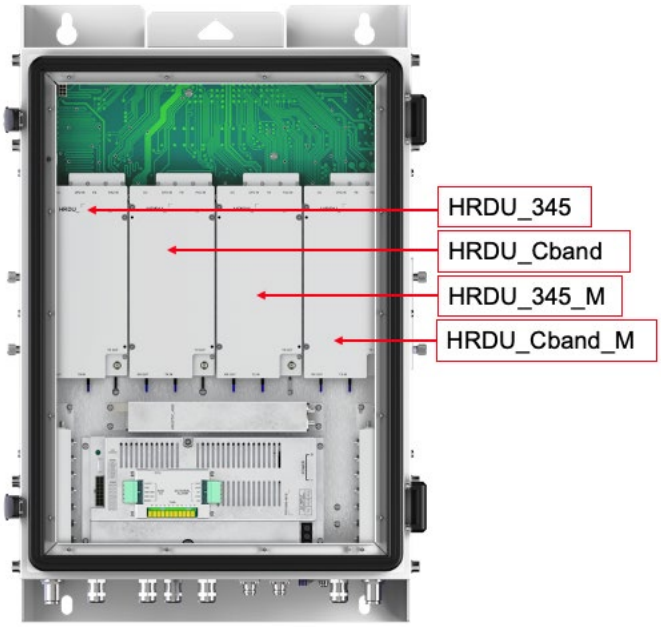
HROU – Optional Components Description	Part Numbers
Alarm Cable with External Alarm Input pigtail and Summary Alarm output pigtail	CBL_HROU_ALM

10. High Power Mid-Band Remote Optic Unit (HROU_4000)

The Mid-Band High-power Remote Optic Unit (HROU) supports C-Band MIMO (3700MHz~3980MHz) and Auction 110 MIMO (3450MHz~3550MHz).

The unit can be equipped with up to four amplifier modules (HRDUs). The C-Band HRDUs deliver 32W of output power, while the Auction 110 HRDUs deliver 20W. The unit supports MIMO configurations within a single chassis.

The built-in combiner units support SISO and 2x2 MIMO antenna configurations.



Mid-Band HROU Configuration Guidelines

1. Order the base HROU chassis with either AC or DC power. The base unit includes the R-Optic, CPU, fan unit, power unit, and two combiners.

HROU_4000	Part Numbers
High Power Mid-Band Remote Chassis, AC Power, Including HROPTIC for C-band	HROU_4000_AC
High Power Mid-Band Remote Chassis, DC Power, Including HROPTIC for C-band	HROU_4000_DC

2. Order at least one and up to four HRDUs for the main HROU. Blank modules are not required for empty slots.

HRDUs	Part Numbers
High Power Amplifier Module, 3700~3980MHz, TDD	HRDU_Cband
High Power Amplifier Module, 3700~3980MHz, TDD, MIMO	HRDU_Cband_M
High Power Amplifier Module, 3450~3550MHz, TDD	HRDU_345
High Power Amplifier Module, 3450~3550MHz, TDD, MIMO	HRDU_345_M

11. Fiber2Antenna edgeHUB and edgeROU

The Fiber2Antenna™ solution is comprised of the edgeHUB and edgeROU remote units, which can be deployed as a standalone system or integrated with other ALLIANCE remotes on a common headend.

The edgeROU is available in several different versions. Each version will support a subset of the available bands. The edgeHUB is available in two versions.

The edgeHUB connects to the optical modules in the headend and transmits/receives optical signals to/from the edgeROUs. The edgeHUB can also provide DC power to the edgeROUs.

edgeHUB Configuration Guidelines

Optical: The edgeHUB has eight optical ports. For edgeROUs that support cascaded configurations (two main units, Lambda 1 and 2), the edgeHUB can provide the optical connection for up to 16 edgeROUs by splitting the optical fiber from each port using the optic coupler (eROU_CASCADE_KIT).

For edgeROU versions that support cascaded main units and add-on units, the edgeHUB can provide an optical connection for 32 edgeROUs: 16 main units and 16 add-ons.

Power: The edgeHUB has eight power terminals which can power up to 16 edgeROUs by splitting the power leads from each terminal. The optional Expansion Power Supply Unit (EPSU) is available to power any edgeROUs that cannot be powered by the edgeHUBs.

For example, if the edgeHUB is providing optical connection for 32 edgeROUs, then 16 of the edgeROUs can be powered by the edgeHUB, but edgeROUs #17~32 would need to be powered by an expansion unit (EPSU). In addition to the EPSU, an external power supply adapter (eROU_PSU_KIT) is available to power a single edgeROU with a nearby AC power outlet if necessary.

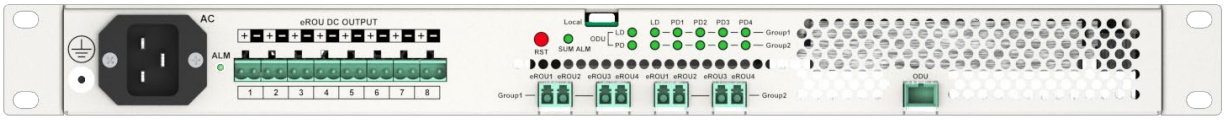
NOTE: For power, the exception is the eROU_40403434 unit, which requires a dedicated power connection to the edgeHUB (so maximum eight eROU_40403434 powered per edgeHUB). The eROU_40403434s can also be powered by an EPSU.

1. Order the edgeHUB(s) required to provide optical connection and DC power for the number of edgeROUs that you will deploy. See configuration guidelines above. A headend with four 4-port iOMs can support up to 16 edgeHUBs.

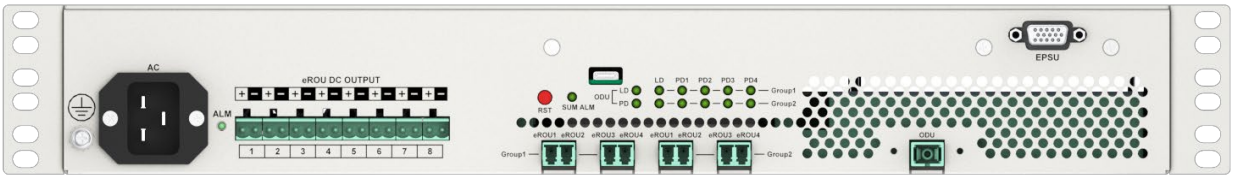
   Select the WDM version (eHUB_SR_WDM_AC or DC) if deploying edgeROUs supporting C-Band (3700~3980MHz) and/or Auction 110 (3450~3550MHz). Add the delay module to the WDM version only if you will be deploying C-Band and/or Auction 110 edgeROUs with High Power Mid-Band remotes (HROU_4000s) on the same sector.

NOTE: The edgeHUB can only connect to iODU #1 or iODU #2 at the headend. The edgeHUB cannot be connected to the iOEU; it cannot be connected to an iOM if that iOM also has an iOEU connected to it. The iBIU typically functions as iODU#1.

edgeHUB R2

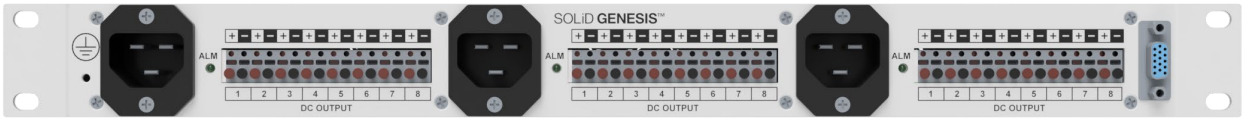


edgeHUB WDM



2. Optional: Order the Expansion Power Supply Unit (EPSU) to power those edgeROUs that cannot be powered by the edgeHUBs (limit of 16 per edgeHUB, except if using the eROU_40403434, see note above).

Expansion Power Supply Unit



The EPSU is a modular unit, holding one to three power supply modules (HOPSUs). HOPSUs are ordered separately from the EPSU chassis. Order one HOPSU (up to three) for each 16 edgeROUs requiring power from the EPSU. A fully configured EPSU (3 HOPSUs) can power up 48 edgeROUs.

Order blank plates (HOPSU_BLK) for any empty HOPSU slots.

edgeHUB / EPSU Description	Part Numbers
Hub Subrack, PSU Included, AC	eHUB_SR_AC_R2
Hub Subrack, PSU Included, DC	eHUB_SR_DC_R2
Hub Subrack, PSU Included, AC, WDM (Does not include optional delay module)	eHUB_SR_WDM_AC
Hub Subrack, PSU Included, DC, WDM (Does not include optional delay module)	eHUB_SR_WDM_DC
edgeHUB Delay Module for C-Band (3700~3980MHz) or Auction 110 (3450~3550MHz), WDM eHUB	eHUB_DM_4000
Expansion PSU Subrack, Supports 3 HOPSU, PSU Purchased Separately	EPSU_SUBRACK
PSU module for HOU, EPSU, and eHUB, AC Input	HOPSU_AC
EPSU Blank Module	HOPSU_BLK

3. Optional: For installations where it is not practical to power the edgeROU from the edgeHUB or EPSU, an external power supply adapter is available (eROU_PSU_KIT). The power adapter uses local AC power and can power a single edgeROU.

External Power Supply Adapter	Part Number
eROU PSU, 2m Cable, Adapter	eROU_PSU_KIT

edgeROU Configuration Guidelines

4. Select the edgeROU version to match your band and deployment requirements. Most models offer external (_X_) or internal (_N_) antenna versions. All configurations require the main unit. Some versions can support an add-on unit (part numbers “eROUa”). The add-on unit cannot be deployed on its own without the main unit.

   For increasing band coverage, a main edgeROU can be cascaded from another main edgeROU and placed in separate locations. When cascading two main units mix the Lambda versions (i.e., pair L1 with L2, L2 with L1) and use the optic coupler (eROU_CASCADE_KIT) to split the optical feed from the eHUB.

Version 1: Main: 700 / PCS / AWS / 2500T – Add-on: 600 / 8085 / WCS

This version offers internal or external antenna models and accepts an add-on unit. The eROUa_682335 add-on unit can only be used with the eROU_7191725 main units.

edgeROU Description – Version 1	Part Numbers
eROU, Main, 700/1900/AWS13/2500, Lambda 1, External Antenna, 2.2-5	eROU_7191725L1_X_R
eROU, Main, 700/1900/AWS13/2500, Lambda 1, Internal Antenna	eROU_7191725L1_N_R
eROU, Main, 700/1900/AWS13/2500, Lambda 2, External Antenna, 2.2-5	eROU_7191725L2_X_R
eROU, Main, 700/1900/AWS13/2500, Lambda 2, Internal Antenna	eROU_7191725L2_N_R
eROU, Add-on, 600/8085/2300, External Antenna, 2.2-5	eROUa_682335_X_R
eROU, Add-on, 600/8085/2300, Internal Antenna	eROUa_682335_N_R

Version 2: Main: PCS / AWS / WCS / 2500T – Main: 600 / 700 / 8085

This version is only available with an external antenna option.

edgeROU Description – Version 2	Part Number
eROU, Main, 1900/AWS13/2300/2500, Lambda 1, External Antenna, 2.2-5. One antenna port.	eROU_17192325L1_X
eROU, Main, 600/700/8085, Lambda 2, External Antenna, 2.2-5. Two antenna ports.	eROU_67835L2_X

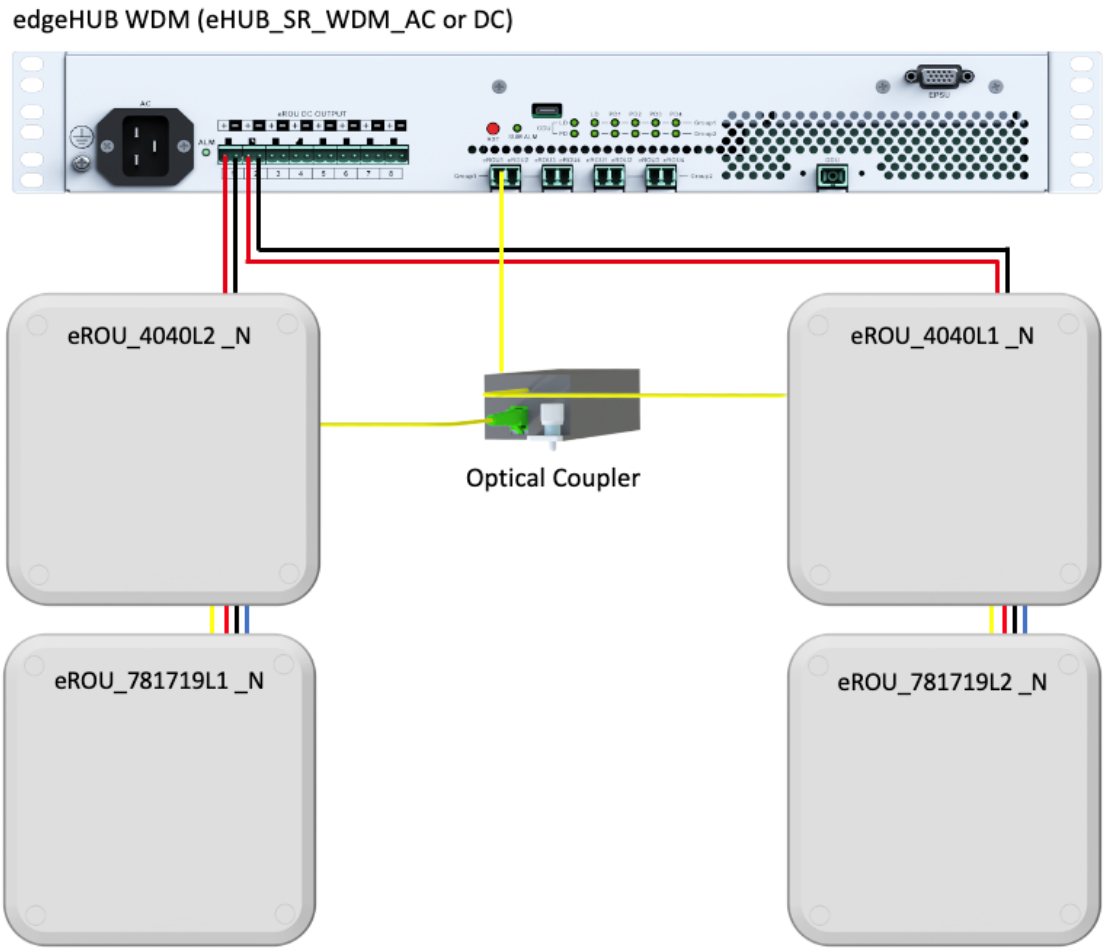
Version 3: Main: 700 / 8085 / PCS / AWS Version

This version offers internal or external antenna models.

edgeROU Description – Version 3	Part Number
eROU, Main, 700/850/1900/AWS13, Lambda 1, External Antenna, 2.2-5	eROU_781719L1_X
eROU, Main, 700/850/1900/AWS13, Lambda 1, Internal Antenna	eROU_781719L1_N
eROU, Main, 700/850/1900/AWS13, Lambda 2, External Antenna, 2.2-5	eROU_781719L2_X
eROU, Main, 700/850/1900/AWS13, Lambda 2, Internal Antenna	eROU_781719L2_N

Version 4: Main: C-Band MIMO (3700~3980 MHz) – Add-on: Auction 110 MIMO (3450~3550 MHz)

The eROU_4040 main unit with the eROUa_3434 add-on can be deployed as a standalone network. Also, the eROU_4040 main unit can be paired with the eROU_781719 main unit. If pairing the eROU_4040 with the eROU_781719, mix the Lambda versions. For example, use eROU_4040L2 with eROU_781719L1. Use eROU_4040L1 with eROU_781719L2. A typical deployment could look like:



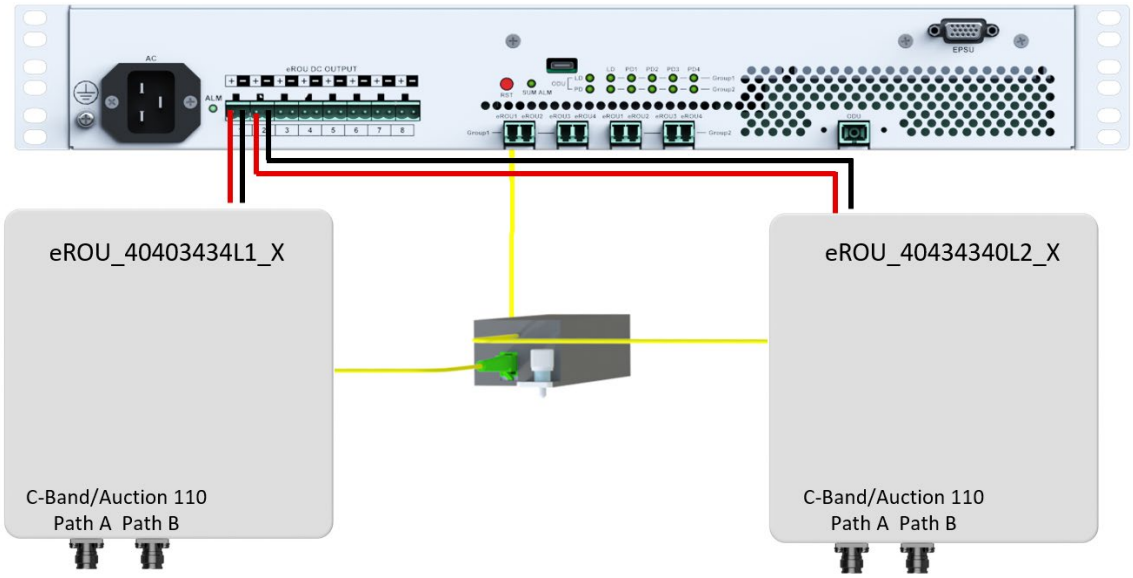
The eROUa_3434 add-on can only be used with the eROU_4040 main unit. This add-on cannot be used if the eROU_4040 is paired with the eROU_781719.

The C-Band MIMO version is available with internal or external antennas and requires the WDM edgeHUB (eHUB_SR_WDM_AC) and a C-Band iMDBU in the iBiU headend.

edgeROU Description – Version 4	Part Numbers
eROU, Main, C-Band (3700~3980MHz) MIMO, Internal Antenna, Lambda 1	eROU_4040L1_N
eROU, Main, C-Band (3700~3980MHz) MIMO, Internal Antenna, Lambda 2	eROU_4040L2_N
eROU, Main, C-Band (3700~3980MHz) MIMO, External Antenna, Lambda 1, 2.2-5	eROU_4040L1_X
eROU, Main, C-Band (3700~3980MHz) MIMO, External Antenna, Lambda 2, 2.2-5	eROU_4040L2_X
eROU, Add-on, 3450~3550MHz MIMO, External Antenna, Lambda 2, 2.2-5	eROUa_3434_X
eROU, Add-on, 3450~3550MHz MIMO, Internal Antenna, Lambda 2	eROUa_3434_N

Version 5: Main: C-Band MIMO (3700~3980 MHz) + Auction 110 MIMO (3450~3550 MHz)

The eROU_40403434 main unit combines C-Band MIMO (3700~3980 MHz) and Auction 110 MIMO (3450~3550 MHz) in a single unit. It can be deployed as a standalone, or for increasing band coverage, can also be cascaded with a second eROU_40403434 unit. Cascading two units requires mixing the Lambda versions (i.e., pair L1 with L2 or L2 with L1) and using the optic coupler (eROU_CASCADE_KIT) to split the optical feed from the edgeHUB WDM.



The eROU_40403434 main unit is offered with internal or external antennas. The edgeHUB WDM version is required, as are the corresponding iMDBUs in the headend that support these bands.

NOTE: The eROU_40403434 unit requires a dedicated power lead from the edgeHUB or the EPSU. See note above.

edgeROU Description – Version 5	Part Numbers
eROU, Main, C-Band and Auction 110 MIMO, Internal Antenna, Lambda 1	eROU_40403434L1_N
eROU, Main, C-Band and Auction 110 MIMO, External Antenna, Lambda 1, 2.2-5	eROU_40403434L1_X
eROU, Main, C-Band and Auction 110 MIMO, Internal Antenna, Lambda 2	eROU_40403434L2_N
eROU, Main, C-Band and Auction 110 MIMO, External Antenna, Lambda 2, 2.2-5	eROU_40403434L2_X

5. Order a mounting kit (wall or ceiling) for each edgeROU.
6. If cascading two main edgeROUs, order the optic coupler kit. (See Step 4 above.)
7. Order a power supply adapter (eROU_PSU_KIT) to power the edgeROUs that cannot be powered from the edgeHUB or EPSU.

edgeROU Accessories Description	Part Numbers
eROU Wall Mount Bracket	eROU_WALL_BKT
eROU Drop Ceiling Mount Bracket	eROU_CEILING_BKT
eROU PSU, 2m Cable, External Power Supply Adapter	eROU_PSU_KIT
Optical Coupler, eROU Cascade	eROU_CASCADE_KIT

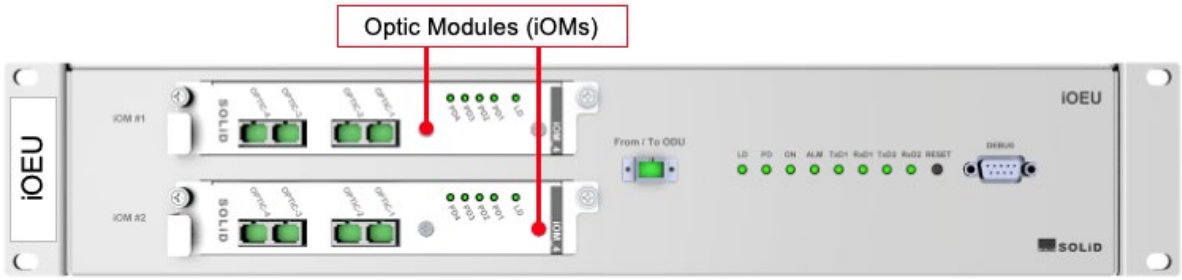
12. Integrated Optic Expansion Unit (iOEU)

The Integrated Optic Expansion Unit (iOEU) is an optional component used primarily in highly distributed systems or systems with limited fiber links available for connecting remote optic units (ROUs).

The iOEU can support up to two optic modules, either 4-port or 1-port versions.

The iOEU connects to a 1-port or 4-port optical module at the headend to transmit/receive optical signaling. If using the 4-port OM, the iOEU must connect to port 4.

iOEU Configuration Guidelines



1. Order one to four iOEUs, either AC or DC power, depending on your deployment and capacity needs. For deployments that support bands above 3GHz (C-Band and/or Auction 110), order the "iOEU_4000" versions.
2. Order 4-port or 1-port optical modules (iOM_4 or iOM_1). If the system is supporting bands above 3GHz, order the "_4000" versions.
3. Order blanks (iOM_B) to fill any empty optical module slots.

iOEU and iOM Description	Part Numbers
Optical Expansion Unit Chassis for iOM, AC	iOEU_AC
Optical Expansion Unit Chassis for iOM, DC	iOEU_DC
Optical Expansion Unit Chassis for iOM_4000, AC	iOEU_4000_AC
Optical Expansion Unit Chassis for iOM_4000, DC	iOEU_4000_DC
1 Port optical module, use with iBIU, iODU, iOEU, supports 136~2700MHz	iOM_1_2700
4 Port optical module, use with iBIU, iODU, iOEU, supports 136~2700MHz	iOM_4_2700
1 Port optical module, use with iBIU, iODU, iOEU, supports 136~4000MHz	iOM_1_4000
4 Port optical module, use with iBIU, iODU, iOEU, supports 136~4000MHz	iOM_4_4000
Blank optical module, use with iBIU, iODU, iOEU	iOM_B

13. Add-on Remote Unit (AOR)

The Add-on Remote (AOR) is an optional unit that is connected to the 2W N2ROU and 5W MROU remote units for supporting VHF+UHF services.

The AOR has its own power supply unit and is connected externally to the main remote with RF jumpers. Alternatively, when connecting to the 5W MROU, for AC powered units, the AOR can be powered from the 5W unit. For all DC-powered configurations, the AOR will require its own power source.

For Public Safety applications, a red cabinet is available.

The AOR also includes 2 SMA connectors for TX / RX paths in deployments where separate antennae are required (typically for VHF and/or UHF support). If a duplexed output is needed, an external duplexer (not provided by SOLiD) is required to combine the simplex ports out of the AOR.

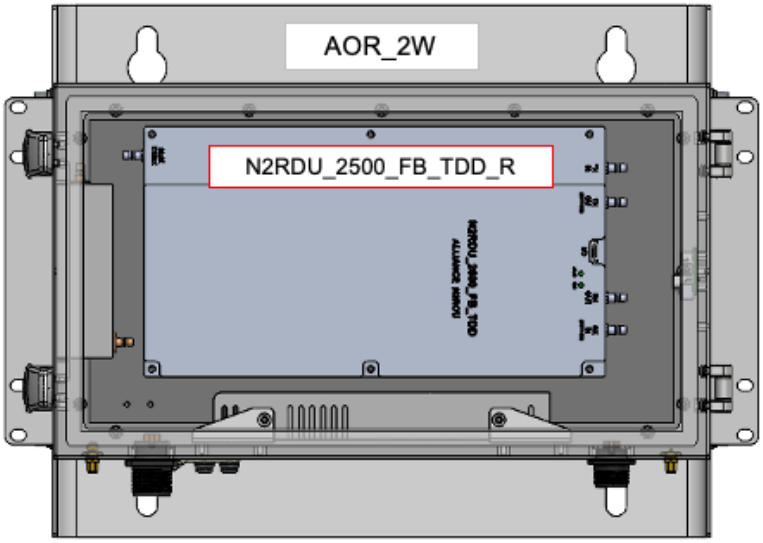
AOR Configuration Guidelines

1. Order the AOR with AC or DC power. All external RF cabling is included. For Public Safety applications, order the red cabinet.
2. Order the VHF & UHF amplifier module (PS2RDU_E_VHF_UHF).
3. Order the cable required to connect the AOR to the main remote, either 2W or 5W.

AOR Description	Part Numbers
Add-on cabinet for ROU - AC Power	ROU_Add-On_AC
Add-on cabinet for ROU - DC Power	ROU_Add-On_DC
Add-on cabinet for ROU - AC Power *Red cabinet for Public Safety application	ROU_Add-On_AC_PS
Add-on cabinet for ROU - DC Power *Red cabinet for Public Safety application	ROU_Add-On_DC_PS
Amplifier Module, VHF & UHF	PS2RDU_E_VHF_UHF
2W N2ROU Alarm Cable Kit N2ROU-to-AOR cable with external alarm input pigtail	N2ROU-AOR_AC
5W MROU Alarm Cable MROU-to-AOR cable with external alarm input pigtail	CBL_MAOR_ALM

14. 2W Add-on Remote Unit (AOR_2W)

The 2W Add-on Remote (AOR_2W) is an optional add-on unit that is connected to the legacy 1W (LROU) or 2W (L2ROU) remote units. The AOR_2W is used exclusively for supporting the 2W 2500MHz Full Band (N2RDU_2500_FB_TDD_R) amplifier. The cabinet has its own power supply unit and is connected externally to the main remote with RF jumpers.



AOR_2W Configuration Guidelines

1. Order the AOR_2W with AC or DC power. All interconnect cables are included.
2. Order the 2W 2500MHz Full Band (N2RDU_2500_FB_TDD_R) amplifier module.

2W AOR Description	Part Numbers
Add on Chassis supporting 2W N2RDU - AC Power	AOR_2W_AC
Add on Chassis supporting 2W N2RDU - DC Power	AOR_2W_DC
2 WATT Amplifier Module, 2500TDD, 194MHz Contiguous, LTE + NR	N2RDU_2500_FB_TDD_R

15. Glossary of Terms

Acronyms and abbreviations used in this manual are shown in the table below.

Abbreviation	Definition
AOR	Add-on Remote. Used with N2ROU and MROU to support UHF/VHF.
AOR_2W	2W Add-on Remote. Used with legacy 1W and 2W remote units to support 2500TDD full band.
CU	Combiner unit
DAS	Distributed Antenna System
DMS-1200	DAS Management System version 1200 for ALLIANCE Release 6 systems
eHUB	edgeHUB
EPSU	Expansion Power Supply Unit
eROU	edgeROU
HARU	High power 20W Add-on Remote Unit
HLPOI	Hybrid POI Module. Combines high and low power inputs in a single POI.
HOPSU	HOU Power Supply Units. Power modules used in the EPSU
HPOI	High power Point of Interface module
HROU	High power Remote Optic Unit (20W and 40W)
iBIU	Integrated Base Station Interface Unit. Can be configured as main or secondary unit.
iOEU	Integrated Optic Expansion Unit. Optional unit used in highly distributed systems.
iODU	Integrated Optical Distribution Unit
iOM	Integrated Optic Module, either 1-port or 4-port versions. Used in iBIU, iODU and iOEU. Connects to R-Optic Module at the headend.
iMCDU	Main Combiner Divider Unit. Used in iBIU when configured as main unit.
iMDBU	Main Drive BTS Unit. Used in iBIU.
iSCDU	Secondary Combiner Divider Unit. Used in iBIU when configured as secondary unit.
LROU*	Legacy 1W Remote Optic Unit. *No longer offered.
L2ROU*	Legacy 2W Remote Optic Unit. *No longer offered.
LPOI	Low power Point of Interface module
MPROU	Multi power Remote Optic Unit.
MROU	Medium power Remote Optic Unit (5W)
N2ROU	Low power Remote Optic Unit (2W)
POI	Point of Interface module. Used in iBIU only. Available in high, low and hybrid high/low
PS2ROU	Public Safety Remote Optic Unit (2W)
PSU (AC or DC)	Power Supply Unit
R-Optic Module	Remote Optic module. Used in remote units. Connects to OMs in iBIU, iODU or OEU.
RDU	Remote Drive Unit amplifier