

# ALLIANCE Multi-Operator DAS

## 20W High-Power Remote Optic Unit (HROU)

### Product Specifications / Parts List



The ALLIANCE Release 6 platform is SOLiD's multi-operator, neutral host Distributed Antenna System (DAS) that efficiently delivers wireless RF signals into any indoor or outdoor location difficult to cover with traditional macro networks.

The High-power Remote Optic Unit (HROU) can support up to four commercial bands, each delivering 20W of output power (or 40W for select bands). An add-on unit (HARU) is supported for additional RF services.

The 20W HROU features:

- Combiners support one, two or four antenna ports
- Mix 20W and 40W amplifiers in the same chassis
- Embedded PIM indicator simplifies system optimization
- Rugged construction: IP66 / NEMA 4 certified
- Up to 8 Bands on one fiber

**Overview**

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

Both 20W (+43 dBm) and 40W (+46 dBm) amplifier modules are available and may be used in the same chassis.

The 20W high-power ROU (HROU) supports up to eight different bands simultaneously: four in the main unit and four in the add-on unit (HARU).

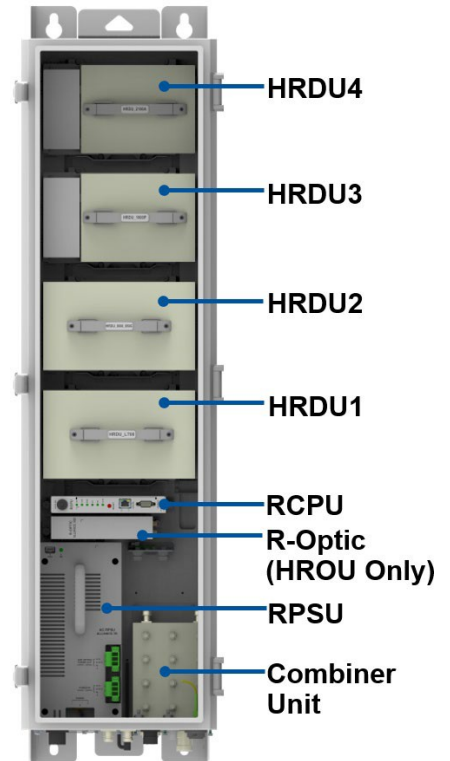
In the downlink signal path, the HROU receives optical signals from the headend and converts them to RF signals in the R-Optic module. The signals move to the Remote Drive Units (RDUs) where they are amplified and filtered to remove out-of-band signals, and then radiated to the antenna port(s).

The process is reversed for the uplink path. When receiving uplink signals through the antenna port(s), the RDU filters the signals, amplifies them, and sends them to the R-Optic where the RF signals are converted to optical, combined, and sent to the headend. The DAS can automatically compensate for optical loss up to a maximum 5 dBo.

To accommodate a variety of applications, the HROU and HARU offer a built-in combiner unit to support one, two and four port antenna configurations. External combiners are available to combine the HROU and HARU outputs.

Both the HROU and HARU enclosures incorporate a rugged, but compact NEMA4 design. Units can be rack or wall mounted, indoors or outdoors, in a vertical orientation. A dual fan unit is attached at the bottom of both enclosures.

With the DMS-1200, the technician can monitor and control the operation of the HROU.



Unit Name	Unit Description
20W High-power Remote Optic Unit (HROU)	Enclosure including RCPU, RPSU_AC or DC, Multiplexer, R-Optic
20W High-power Remote Optic Add-On Unit	An optional add-on enclosure (not shown in figure above), AC or DC power
Remote Power Supply Unit (RPSU)	AC: 100 to 240V; DC: -42 to -56V
Remote Central Processor Unit (RCPU)	Controls and monitors signals for each unit
High-power Remote Drive Unit (HRDU)	Filters and amplifies downlink / uplink signals
Remote Optic Module (R-Optic)	Converts downlink optical signals to RF and uplink RF signals to optical
Combiner Unit	Combines downlink signals and separates uplink signals for each band
Dual Fan Unit	Turns on/off automatically based on operator-defined temperature settings

**Specifications**

RF Parameters		All Bands
Input Power	TX	LPOI: -10 to +20 dBm. HPOI: +15 to +43 dBm each port
	RX	HROU: -50 dBm max
Output Power	TX	+43 dBm for 20W modules; +46 dBm for 40W modules
	RX	All bands -3 dBm ± 0.5 dB (except 2500TDD -23 dBm ± 1 dB)
System Gain	TX	63 dB max for 20W modules and 66 dB max for 40W modules
	RX	All bands 47 dB max (except 27 dB for 2500TDD); 25 dB gain control at remote all bands
Spurious Emissions		Maximum Intermodulation Distortion. TX: ≤ -13 dBm @ 9kHz to 5GHz
Nominal Impedance		50 Ohm
VSWR		1.69:1 typical, 1.80:1 max.
<b>NOTES:</b> TX Input power refers to the DAS headend. TX Output power is measured at the antenna port. TX and RX Output power is ± 0.5dB. Additional gain control available at head end including uplink gain control. See the AOR data sheet for VHF/UHF specifications.		

RF Parameters	600 MHz	700LTE+ Band 14	800/850 Cell	1900PCS	2100AWS	2300WCS	2500TDD (Full Band)
NF UL (typical)	4.5 dB	3.5 dB	2.9 dB	4.0 dB	3.4 dB	5.0 dB	5.2 dB
NF UL (max)	5.0 dB	4.2 dB	3.4 dB	4.5 dB	3.9 dB	5.4 dB	5.8 dB
IIP <sub>3</sub> UL (typical)	-23.5 dBm	-21.2 dBm	-21.4 dBm	-19.8 dBm	-23.2 dBm	-20.3 dBm	-20.8 dBm
IIP <sub>3</sub> UL (max)	-24.0 dBm	-21.7 dBm	-21.9 dBm	-20.3 dBm	-23.7 dBm	-20.8 dBm	-21.3 dBm
EVM DL (typical)	1.6%	1.8%	1.8%	1.9%	1.8%	1.3%	2.0%
EVM DL (max)	2.0%	2.2%	2.2%	2.3%	2.2%	1.6%	2.5%
Ripple DL (typical)	3.0 dB	2.5 dB	3.2 dB	3.2 dB	2.5 dB	1.5 dB	3.5 dB
Ripple DL (max)	4 dB	4 dB	4 dB	4 dB	4 dB	3 dB	5 dB
Downlink	617-652	729-768	862-894	1930-1995	2110-2180	2350-2360	2496-2690
Uplink	663-698	699-716 777-798	817-849	1850-1915	1710-1780	2305-2315	2496-2690
<b>NOTES:</b> NF (noise figure) represents system noise tested with one remote connected. Add 2 dB to NF when using Optic Expansion Unit (OEU or iOEU) or 1-port optic module. EVM performance includes 0.7% error from signal source. NF, IIP <sub>3</sub> and EVM specs are measured with 0 dB attenuation.							

Power Consumption (Max)	600 MHz	700LTE+ Band 14	800/850C	1900 PCS	2100 AWS	2300 WCS	2500TDD (Full Band)
20W HRDU	158W	146W	135W	121W	127W	112W	185W
40W HRDU	N/A	N/A	N/A	203W*	203W*	N/A	N/A
HROU Chassis	RCPU, RPSU, R-Optic = 25W						
<b>NOTES:</b> For total power, add the power consumption of the included HRDUs to the chassis' power consumption.							
*Values for 1900 PCS and 2100 AWS 40W modules refer to DPD versions.							

Optical	Specification
Wavelength	Tx: 1550 nm; Rx: 1310 nm
Loss	4-port optic module: 5 dBo max.; 1-port optic module: 10 dBo max.

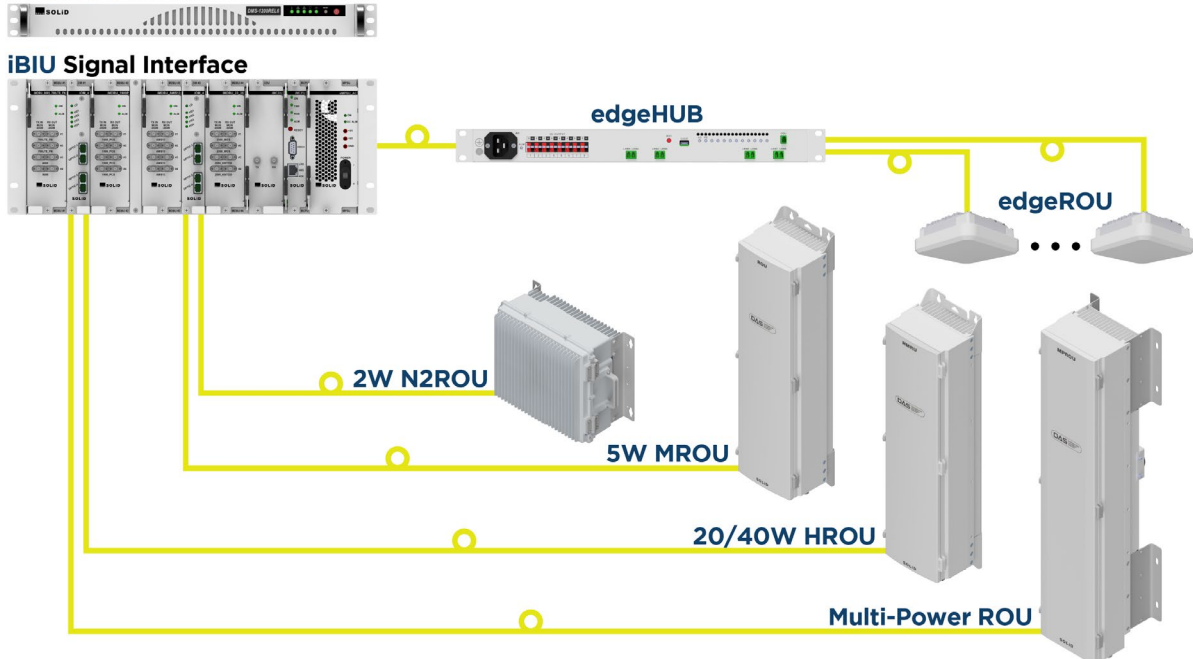
Regulatory	Specification
Type Approval	FCC, IC, FCC Part 15 Subpart B, Class A
Safety	NRTL Certified
FDA/CDRH	This equipment uses a Class 1 LASER according to FDA/CDRH Rules. This product conforms to all applicable standards of 21 CFR Chapter 1, Subchapter J, Part 1040.

Mechanical	Specification
Mounting Type	Wall or rack (fits standard 19" rack with bracket). Vertical mounting only.
Antenna Connectors	7/16" DIN Female
External Alarm Interface	5-Pin connector on bottom panel
Optical Connector	SC / APC, Step Ferrule, Waterproof, Single Mode Fiber. HARU: Not required.
Monitor Port	- 40 dB (±3 dB), SMA female, TX output only, located on combiner unit
Craft Port	Serial interface RS-232 9-pin D-sub male
Power Input	AC: 100 to 240V; DC: -42 to -56V
Dimensions (WxHxD)	12.6 x 45.9 x 10.2 inches (320 x 1165 x 260 mm) including wall mount bracket.
Weight	130 lbs (59 kg) max with 4 HRDUs
MTBF	9.65 Years (fully loaded HROU or HARU)
Ingress Protection	IP66, NEMA 4
Operating Environment	Temp: -13° to 131°F / -25 to +55°C. Humidity: 0% to 90% non-condensing

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**DMS1200 System Management**

**iBIU Signal Interface**



**Parts List**

Part Number	20W HROU / HARU / HRDU / Combiners
HROU_C_AC	20 WATT Remote Optical Unit Chassis - AC Power
HROU_C_DC	20 WATT Remote Optical Unit Chassis - DC Power
HARU_C_AC	20 WATT Add-on Unit Chassis - AC Power -No Combiner
HARU_C_DC	20 WATT Add-on Unit Chassis - DC Power -No Combiner
HROU_B	20 WATT Blank Module
HRDU_600	20 WATT 600MHz Amplifier Module
HRDU_700LTE_FN	20 WATT 700MHz Amplifier Module (Includes Band 14)
HRDU_800I_850C	20 WATT 800MHz (Sprint Only) and 850MHz Module
HRDU_1900P	20 WATT 1900MHz Amplifier Module
HRDU_AWS13	20 WATT 2100MHz Amplifier Module (AWS1+3)
HRDU_2300_WCS	20 WATT 2300 MHz WCS Amp Module
HRDU_2500_60TDD	20 WATT 2500 MHz TDD Amp Module; 60MHz contiguous, LTE
HRDU_2500_FB_TDD	20 WATT 2500 MHz TDD Amplifier Module, 194MHz Contiguous, LTE + NR
HRDU_2600_FDD	20 WATT 2600 MHz FDD Amp Module
HRDU_1900P_40W_A	40 WATT 1900MHz Amplifier Module
HRDU_AWS13_40W_A	40 WATT 2100MHz Amplifier Module (AWS1+3)
HROU_CU1_AWS13	20 WATT Combiner Unit, 1 Antenna port, 700LTE, 800/850, 1900, AWS13
HROU_CU2_AWS13	20 WATT Combiner Unit, 2 Ant. ports, Ant 1: 700LTE, 800/850, Ant 2: 1900, AWS13
HROU_CU3	20 WATT Combiner Unit, 1 Antenna port. Combines 800/1900/2500
HROU_CU4_AWS13	20 WATT Combiner Unit: 1 Antenna port. 700LTE or 850IC /1900 /AWS13/2500
HROU_CU5	20 WATT 4-Port Bottom Plate, includes 4 bulkhead connectors, 7/16 DIN
HROU_CU6	20 WATT 1-Port Bottom Plate, includes 1 bulkhead connector, 7/16 DIN
HROU_CU7	20 WATT Combiner Unit: 1 Antenna port. Combines 2300 WCS & 2500TDD
HROU_CU8	20 WATT Combiner Unit: 1 port, 1900/AWS13/2300/2500
HROU_ECU1	20 WATT External Combiner: HROU 700/850IC/PCS/AWS13 with HARU 2300/2500
HROU_ECU2	20 WATT External Combiner: HROU 600/700/850IC, HARU PCS/AWS13/2300/2500
TR_HROU_FAN	External Fan assembly for Alliance and Alliance-TR 20 Watt Remote Units
<b>NOTES:</b> Combiner units are not included with the HROU or HARU chassis and must be ordered specifically for the band combination and antenna port requirements of the project.	

Additional information is available in the following documents, available from [SOLiD Support](#).

*ALLIANCE REL6 – 20W Remote Unit HROU - Operations & Install Guide*

*SOLiD Data Sheet – ALLIANCE MTBF Specification*



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