



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 remote 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

### 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 50 dB max (except 30 dB for 2500TDD); 25 dB gain control at remote
Spurious Emissions		Maximum Intermodulation Distortion. TX: ≤ -13 dBm @ 9kHz to 5GHz
Nominal Impedance		50 Ohm
System Ripple		< 5 dB
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.		

RF Parameters	700LTE+ FirstNet	800/850 Cell	1900PCS	2100AWS	2300WCS	2500TDD
NF (typical)	4.0 dB	3.5 dB	4.2 dB	3.1 dB	4.1 dB	4.1 dB
NF (max.)	5.0 dB	3.9 dB	4.7 dB	3.6 dB	4.6 dB	4.6 dB
IIP <sub>3</sub> (typical)	-18.0 dB	-18.3 dB	-17.3 dB	-19.6 dB	-17.4 dB	-21.4 dB
IIP <sub>3</sub> (max.)	-18.5 dB	-18.8 dB	-17.8 dB	-20.1 dB	-17.9 dB	-21.9 dB
EVM (typical)	1.8%	1.7%	2.1%	2.0%	1.0%	5.5%
EVM (max.)	2.3%	2.2%	2.6%	2.5%	1.5%	6.0%
Downlink	729-768	862-894	1930-1995	2110-2180	2350-2360	2496.8-2690
Uplink	699-716 777-798	817-849	1850-1915	1710-1780	2305-2315	2496.8-2690
<b>NOTES:</b> For 2500TDD services, the operator sets the sub-band using management software. The EVM performance in this table includes 0.7% error from the signal source.						

Power Consumption (Max)	700LTE+ FirstNet	800/850C	1900PCS	2100 AWS	2300 WCS	2500TDD
20W HRDU	146W	150W	160W	155W	112W	164W
40W HRDU	N/A	N/A	180W	180W	N/A	170W
HROU Chassis	RCPU, RPSU, R-Optic = 25W					
<b>NOTES:</b> For total power, add the power consumption of the included HRDU's to the chassis' power consumption.						

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)
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.
Monitoring Port	SMA Female
Craft Port	Serial interface RS-232 9-pin D-sub Male
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 (worst-case, 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

### Overview

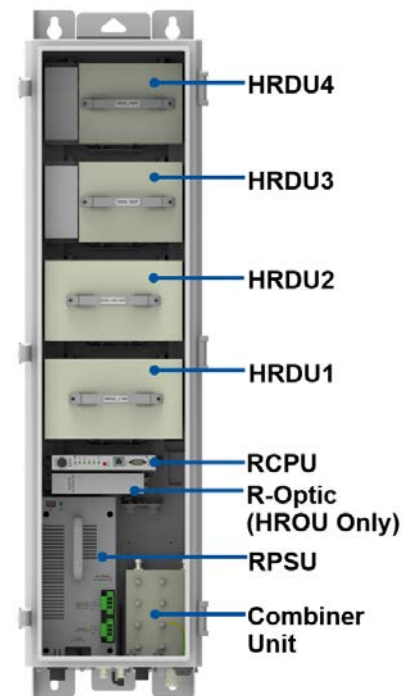
SOLiD's 20W High-power Remote Optic Unit (HROU) can be mixed with 1W, 2W and 5W remotes in a single system all driven by a common head end.

This highly efficient, small footprint unit can support up to eight frequency bands: four in the main unit and four in the High-power Add-on Remote Unit (HARU).

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

Combiner units support one, two and four port antenna configurations. An external combiner is available to combine the HROU and HARU outputs.

Both the HROU and HARU enclosures incorporate a rugged, but compact NEMA 4 design. Units can be rack or wall mounted, indoors or outdoors. A dual fan unit is available for high-temp deployments.



Unit Name	Unit Description
20W High-power Remote Optic Unit (HROU)	Enclosure including R-CPU, 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 (R-CPU)	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 (Optional)	Turns on/off automatically based on operator-defined temperature settings

Higher frequencies are installed toward the bottom of the cabinet closest to the combiner to minimize cable loss. 40W RDU's may only be installed in the two lowest slots of an HROU or HARU.

Slot	HROU Main Cabinet	HARU Add-on Cabinet
HRDU1 (Bottom most)	2500, 2600, or 2100AWS13 (20W or 40W)	2500 or 2600
HRDU2	1900P (20W or 40W)	2300
HRDU3	800Sprint/850C	Future expansion
HRDU4 (Top most)	700LTE	Future expansion

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
<a href="#">HRDU_600</a>	<a href="#">20 WATT 600MHz Amplifier Module</a> *2019Q3
HRDU_700LTEF	20 WATT 700MHz Full Band LTE Module
HRDU_700LTE_FN	20 WATT 700MHz Amplifier Module (Includes FirstNet)
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 bandwidth
HRDU_2600_FDD	20 WATT 2600 MHz FDD Amp Module
HRDU_1900P_40	40 WATT 1900MHz Amplifier Module
HRDU_AWS13_40	40 WATT 2100MHz Amplifier Module (AWS1+3)
<a href="#">HRDU_2500_60TDD_40</a>	<a href="#">40 WATT 2500 MHz TDD Amp Module; 60MHz contiguous bandwidth</a>
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
<a href="#">HROU_CU8</a>	<a href="#">20 WATT Combiner Unit: 1 port, 1900 /AWS13/2300/2500</a> *2019Q3
<a href="#">HROU_CU9</a>	<a href="#">20 WATT Combiner Unit, 1 port, 600/700LTE+FN/800/850</a> *2019Q3
HROU_ECU1	20 WATT External Combiner: HROU 700/850IC/PCS/AWS13 with HARU 2300/2500
<a href="#">HROU_ECU1_600</a>	<a href="#">20 WATT External Combiner: HROU 600/700/850IC, HARU PCS/AWS13/2300/2500</a>
TR_HROU_FAN	External Fan assembly for Alliance and Alliance-TR 20 Watt Remote Units
<b>NOTE: 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.</b>	

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

SOLiD Operations Manual – ALLIANCE DAS REL6; SOLiD Installation Manual – ALLIANCE DAS REL6

SOLiD Data Sheet – ALLIANCE MTBF Specification; SOLiD Application Note - Combiner Options for ALLIANCE 20W HROU



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