



ALLIANCE is a multi-operator DAS solution that offers public safety, 2-way radio and commercial wireless services all from a common head end and delivered over a single fiber.

Modular design means lower operational costs and unparalleled RF performance, cost efficiency and flexibility.

Rugged construction meets the latest fire codes and requirements for harsh environmental conditions.

The 5W Mid-power Remote Optic Unit features:

- Guaranteed RF Power Control
- Support for 7 individual bands on a single fiber
- 4G certified, MIMO capable. One system delivers 150MHz to 3GHz
- NFPA72 compliant / NEMA 4 / UL labeled
- Quality checked and fully bench tested
- Easy install, commissioning and management
- Wall / pole / rack mounting
- Convection cooled. Optional fan unit available

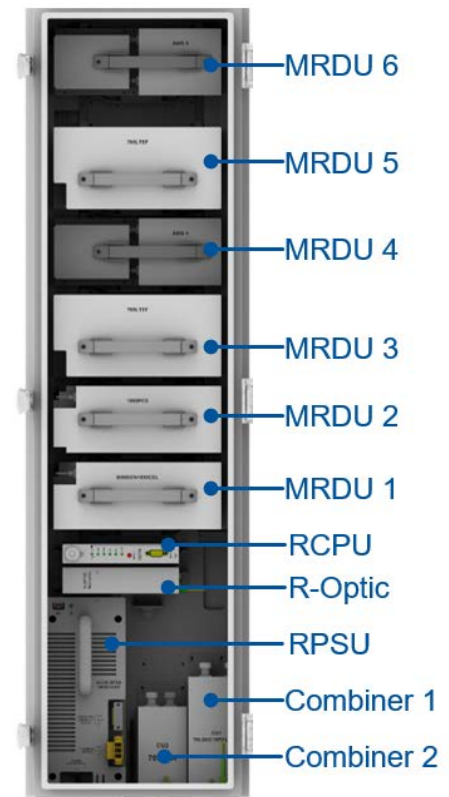
Operation

SOLiD’s 5W Mid-power Remote Optic Unit (MROU) is designed for the ALLIANCE Release 6 DAS and can be mixed with other ALLIANCE remote units (1W, 2W, and 20W) in a single system all driven by a common head end.

The 5W MROU delivers +37dBm of output power per band at the antenna port for all commercial bands. For VHF/UHF Public Safety bands, output power is +24dBm.

This highly efficient, small footprint unit can support up to seven bands simultaneously. An Add-on Remote unit (AOR) can also be connected to support VHF/UHF.

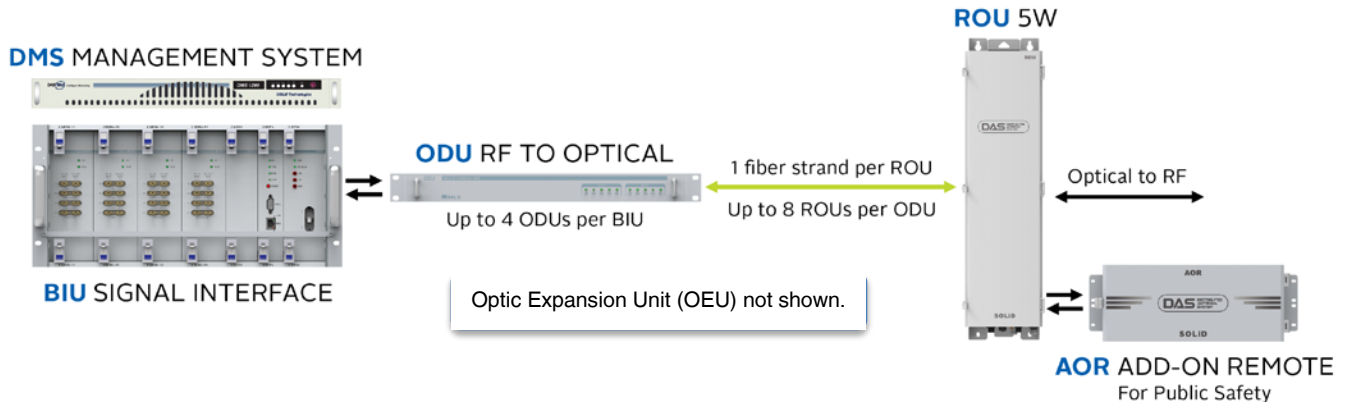
The MROU enclosure incorporates a rugged, but compact NEMA 4 design. The unit can be rack or wall mounted, indoors or outdoors. An external alarm port on the bottom of the enclosure can accept input alarms from connected equipment like battery backup systems.



Unit Name	Description
5W Remote Optic Unit (MROU)	Enclosure including R-CPU, RPSU_AC or DC, Multiplexer, R-Optic
Add-on Remote (AOR)	An optional add-on enclosure (not shown in figure above), AC or DC power. For the 5W MROU, the AOR is only used to support VHF/UHF.
Remote Power Supply Unit (RPSU)	AC: 120V, 50/60Hz. Operating Range: 108 to 132 VAC, 50/60Hz DC: -48 VDC. Operating range: -42 to -56 VDC
Remote Central Processor Unit (R-CPU)	Controls and monitors signal of each unit RS232 port for connecting management PC
Mid-power Remote Drive Unit (MRDU)	Filters and amplifies downlink / uplink signals 5W enclosure supports up to 6 single or dual band RDUs
R-Optic Remote Optic Module (R-Optic)	Converts downlink optical signals to RF and uplink RF signals to optical Compensates for optical loss
Combiner (1 and 2)	Combines TX signals from RDUs and sends to single antenna port Distributes RX signals to RDUs. Second combiner is required for MIMO.
External Fan Unit (Optional)	Turns on/off automatically based on operator-defined temperature settings

For the downlink signal path, the MROU receives optical signals from the ODU (or OEU) and converts them to RF signals in the Remote Optic (R-Optic) module. The signals move to the Remote Drive Units (MRDUs) where they are amplified and filtered to remove out-of-band signals. A multiplexer in the remote unit combines RF signals from multiple RDUs and then delivers them to the antenna port. The process is reversed for the uplink path.

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



Slot Configurations

5W ROU	Recommended Configurations	Notes
MRDU1 (Bottom most)	800Sprint/850C only	
MRDU2	1900P only	
MRDU3	700LTE_A only	
MRDU4	AWS_A only	
MRDU5	700LTE_B or 700PS_800PS or 2500 or 2300	Default cabling for this slot is routed to 2500 port on CU4.
MRDU6 (Top most)	AWS_B or 2300 or 900 or 2500	Default cabling for this slot is routed to 2300 port on CU4.
Add-on Remote (AOR)	VHF/UHF	For the 5W MROU, the AOR is only used to support VHF/UHF

Configuration Notes: Recommended configurations have been tested for thermal and RF performance.
 MRDU_700PS_800PS is the largest module and will only fit in Slot 5.
 MRDU_700LTE_B can only be installed in Slot 3 or Slot 5 due to size.
 MRDU_AWS_B can be installed in any slot.
 MRDU_700_800 can be connected directly to the Antenna port 2. An N-to-DIN adaptor is included with the 700_800 module for this purpose.
 Do not install both the MRDU_700PS_800PS and MRDU_700LTE_FN modules in the 5W chassis due to interference issues.
 Any empty MRDU slots should be covered with blank (MROU_B).

Specifications

Frequency Band	Downlink (Tx)		Uplink (Rx)	
	Freq (MHz)	BW (MHz)	Freq (MHz)	BW (MHz)
700LTE Full Band	729-756	27	699-716 / 777-787	17 / 10
700LTE Full Band+FirstNet	729-768	39	699-716 / 777-798	17 / 21
700PS (Incl. FirstNet)	758-775	17	788-805	17
800PS	851-860	9	806-815	9
800 Sprint / 850C	862-894	32	817-849	32
900 SMR / Paging	929-941	12	896-902	6
1900PCS	1930-1995	65	1850-1915	65
2300WCS	2350-2360	10	2305-2315	10
AWS 1+3	2110-2180	70	1710-1780	70
2500TDD LTE	2497.8-2687.4	LB: 71.2 MB: 37.8 UB: 71.2	2497.8-2687.4	LB: 71.2 MB: 37.8 UB: 71.2
2600 FDD	2620-2690	70	2500-2570MHz	70
VHF	136-174	38	136-174	38
UHF	B1: 380-434 B2: 396-450 B3: 450-512	54 54 62	B1: 380-434 B2: 396-450 B3: 450-512	54 54 62

NOTES:
For 2500 services and UHF, operator can select band using management software.
VHF/UHF services require the Add-On Remote (AOR)

RF Parameters		VHF/UHF	700LTEF	700PS / 800PS	800 Sprint / 850C	900SMR / Paging
Input Power at BIU/eBIU	Tx (BIU)	-15dBm to +10dBm	-20dBm to +10dBm			
	Tx (eBIU)	NA	+15dBm to +43dBm (HPOI) / -10dBm to +20dBm (LPOI)			
	Rx	≤ -54dBm	-50dBm max			
Output Power	Tx	24dBm	37dBm			
	Rx (BIU)	BIU: -4dBm	BIU: 0dBm			
	Rx (eBIU)	NA	eBIU: -3dBm			
System Gain	Tx	39dB	57dB max	60dB max	57dB max	
	Rx	34 to 50dB	30 to 50dB			
Gain Control	Tx	Gain Control Range: For the remote unit TX: 30 dB/step 0.5dB				
System Delay	Tx	< 2μs	< 8μs			
	Rx	< 2μs	< 8μs			
EVM	(Tx %)	NA	2%			
Noise Figure	Rx	7dB Max	6dB max			
VSWR		1.8:1 max at each band In / Out ports				
Spurious	Tx	Spurious Emissions: ≤ -13dBm @ 9kHz to 5GHz				
Nominal Impedance		50 ohm				

NOTES
When operating both 800 Sprint and 850C, output power is 37dBm each band. When operating only one band, output power is 40dBm.
TX system gain for VHF/UHF is 39dB when input power is -15dBm.
eBIU does not support VHF/UHF input at this time.

RF Parameters		1900P	2100 AWS 1+3	2300 WCS	2500TDD	2600FDD
Input Power at BIU/eBIU	Tx (BIU)	-20dBm to +10dBm				
	Tx (eBIU)	+15dBm to +43dBm (HPOI) / -10dBm to +20dBm (LPOI)				
	Rx	-50dBm max				
Output Power	Tx	37dBm	38dBm	37dBm		
	Rx (BIU)	0dBm			-20dBm	
	Rx (eBIU)	-3dBm			-23dBm	
System Gain	Tx	57dB max				
	Rx	30 to 50dB			10 to 30dB	
Gain Control	Tx	Gain Control Range: For the remote unit TX: 30 dB/step 0.5dB				
System Delay	Tx	< 8µs		< 1µs	< 1.5µs	< 1µs
	Rx	< 8µs		< 4µs	< 1.5µs	< 3µs
EVM	(Tx %)	3%		2%	4%	3%
Noise Figure	Rx	6dB max				
VSWR		1.8:1 max at each band In / Out ports				
Spurious	Tx	Spurious Emissions: ≤ -13dBm @ 9kHz to 5GHz				
Nominal Impedance		50 ohm				

NOTES

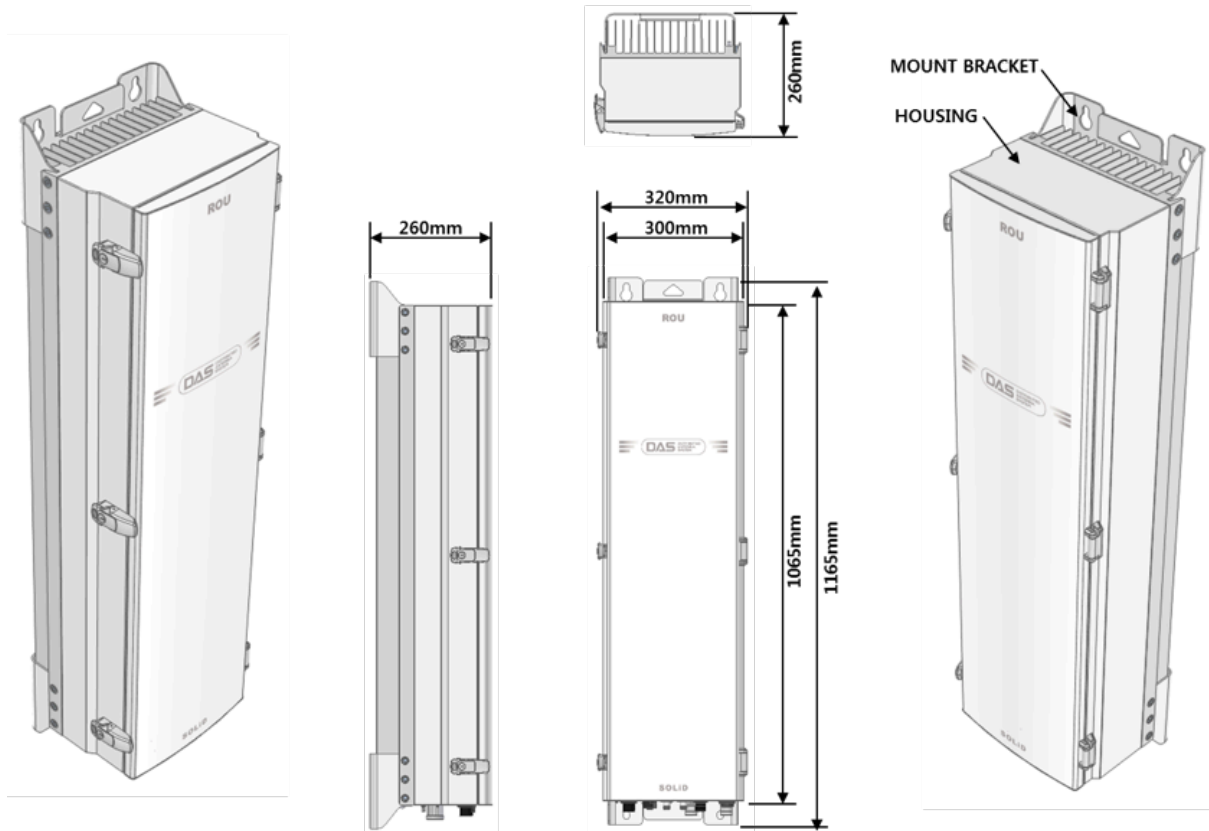
TX Input power refers to the DAS headend.
 TX Output power is measured at the antenna port.
 TX and RX Output power is ± 0.5dB.
 Noise figure represents system noise and tested with one remote connected.
 Add 2dB to Noise figure when using Optic Expansion Unit (OEU) or 1-port Donor Optic Modules (DOUs).
 System delay excludes fiber optic delay.
 Additional gain control available at head end including uplink gain control.

Optical	Specification	
Connector at R-Optic Module	RF	SMA FEMALE / 50ohm SMA PUSH MALE / 50ohm
	Optic	SC / APC (Step Ferrule)
	Power/Signal	D-SUB 3 row 15PIN MALE
Laser Diode / Photo Diode	1550nm (Coaxial Type) / 1310nm	
Optic Loss	Max 5dBo (4-port Donor Optic Module); Max 10dBo (1-port Donor Optic Module)	

Environmental	Specification
Ingress Protection	IP66 Compliant, NEMA 4
Operating Environment	Temp: -13 to 131°F / -25 to +55°C. Humidity: 0% to 90% Non-condensing

Regulatory	Specification
NFPA 72	Code Compliant. Applies to Remote Optic Unit and Add-on Remote only
UL (North America)	UL 60950-1, 2nd Edition CSA C22.2 No. 60950-1-07, 2nd Edition, CSA C22.2 No. 60950-1-03, 1st Edition
FCC (North America)	FCC Part24 Subpart D and Part90 Subpart I FCC Part22 Subpart H and Part 27 Subpart C FCC Part24 Subpart E and Part 27 Subpart C
IC (Canada)	RSS-131 (ISSUE 2), ICES-003
Emissions (North America)	FCC Part15 Subpart B, Class A
MTBF (Telcordia SR-332 Issue 2)	Failure Rate = 11,971 MTBF = 9.54 Years

Mechanical	Specification
Mounting Type	Wall, pole or rack mounting (fits standard 19" rack with optional bracket). Indoor or outdoor mounting
Connectors	Optical Ports: SC-APC (Single Mode Fiber) RF Antenna Port: 7/16 DIN-Female for antenna ports 1 and 2 In / Output Port (to AOR for VHF/UHF): N-Female
Craft Port	Serial interface RS232 9-pin D-sub Male, to connect management PC (on CPU)
Monitoring Port	-40dB (SMA Female) TX Output Only
Power Consumption	475 W Fully loaded (6 MRDUs) covering bands: 700/800/850/1900/2100/2300/2500. Total power consumption will vary depending on band configuration.
Dimensions	12.6" x 45.9" x 10.2" W x H x D (320 x 1165 x 260 mm) includes wall mount bracket
Weight	137 lbs. (62 kg) Fully Loaded



Part Numbers

5W Remote Units	Part Number
5 WATT Remote Optical Unit Chassis - AC Power	MROU_C_M_AC
5 WATT Remote Optical Unit Chassis - DC Power	MROU_C_M_DC
5 WATT 700MHz Amplifier Module (Includes FirstNet)	MRDU_700LTE_FN
5 WATT 700MHz Amplifier Module	MRDU_700LTEF
5 WATT 700MHz Full Band Amp Module; Channel B for MIMO Applications	MRDU_700LTEF_B
5 WATT 700MHz and 800MHz Amplifier Module (Includes FirstNet)	MRDU_700PS_800PS
5 WATT 800MHz & 850MHz Amplifier Module	MRDU_800I_850C
5 WATT 900MHz Amp Module **Allow 8-12 weeks for delivery	MRDU_900I
5 WATT 1900MHz Amplifier Module	MRDU_1900P
5 WATT 1900MHz Amplifier Module; Channel B for MIMO	MRDU_1900P_M
5 WATT 2100MHz Amplifier Module (AWS1+3)	MRDU_AWS13
5 WATT 2100MHz Amp Module; Channel B for MIMO Applications **Will be Replaced by MRDU_AWS13_M	MRDU_AWS_B
5 WATT 2100MHz Amp Module; Channel B for MIMO Applications **Q3 2017	MRDU_AWS13_M
5 WATT 2500 MHz TDD Amp Module; 60MHz contiguous bandwidth	MRDU_2500_60TDD
5 WATT 2500 MHz TDD Amplifier Module; 60MHz contiguous bandwidth. MIMO	MRDU_2500_60TDD_M
5 WATT 2300MHz WCS Amplifier Module	MRDU_2300_WCS
5 WATT 2600MHz FDD Amplifier Module **Q2 2017	MRDU_2600_FDD
Blank Amplifier Module for 5W MROU	MROU_B
5 WATT Combiner Unit, 6-band: 700LTE, 850IC, 1900P, AWS13, 2.5TDD	MROU_CU1
5 WATT Combiner Unit for 700/2100 MHz; Channel B for MIMO Applications	MROU_CU2
5 WATT Combiner Unit for 700PS, 800PS and 900MHz	MROU_CU3
5 WATT Combiner Unit, 7-band, includes 700LTE, 850IC, 1900P, AWS13, 2.5TDD, & 2.3 WCS. This item is to be used for legacy upgrades only.	MROU_CU4
5 WATT Combiner Unit, Dual Band 2500/2600 & 1900 PCS, for MIMO configurations	MROU_CU5
5 WATT Combiner Unit, Tri-Band 700/1900/AWS13, for use with MIMO configurations **Q3 2017	MROU_CU6
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
External Fan-Tray assembly for 5 Watt MROU chassis	MROU_FAN_TRAY



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