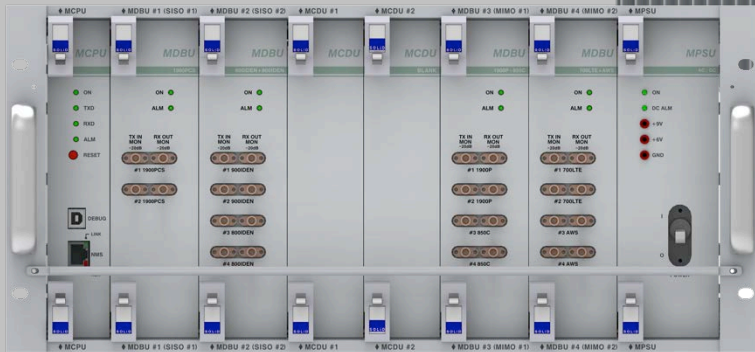## EXPRESS DAS
Specifications / Parts List

SOLiD's EXPRESS DAS is a single-carrier DAS solution engineered to meet the needs of wireless carriers across multiple frequency bands.

EXPRESS delivers agility and simplicity through SISO and MIMO configurations that are easy to design, commission and manage.

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

- *High efficiency with fewer components*
- *Rugged design and convection cooling means no moving parts*
- *4G Certified, MIMO capable*
- *Typically one fiber needed to connect a building*
- *Small footprint, wall or rack mounted remotes*
- *Easy Setup – auto-configuration simplifies commissioning*
- *NFPA 72 Compliant / NEMA 4 Certified*

EXPRESS Single Carrier DAS – Product Specification

Operation

The EXPRESS single-carrier Distributed Antenna System (DAS) efficiently delivers wireless signals into buildings, campus environments, or any locations that are difficult to cover with traditional outdoor macro networks. EXPRESS is designed for cost-effective deployment, rapid commissioning and simplified management of in-building wireless service to meet the needs of a single wireless provider across multiple frequency bands.

For the downlink path, the SOLiD EXPRESS Base Station Interface Unit (BIU) receives simplexed signals from the RF signal source. The input power range for the BIU is -20 dBm to +10 dBm. Variable attenuation is available up to 30 dB is available for both the TX and RX paths.

The BIU independently filters, attenuates and controls each signal and transmits these to the system's Optical Distribution Units (ODU). The ODU converts the RF signals into optical signals and distributes them over fiber cabling to the EXPRESS Main Remote Units, or MRUs, in that sector.

The MRU converts the optical signals back to RF signals and transports them across coaxial cable to the DAS antennae which radiate the wireless signals within the corresponding sector to the user equipment. For the uplink, the signal follows the reverse path using the same equipment.

The MRU comes in both single band and dual-band configurations. Add-on Remote Units (ARUs) can also be connected to the MRUs to provide additional band coverage. In addition, a VHF/UHF Add on Remote (AOR) is available to support the 450MHz UHF and 150MHz VHF bands.

Each EXPRESS BIU consists of up to two MDBUs (SISO chassis) or up to two MDBUs (MIMO chassis) and can support up to nine or 17 discrete inputs per sector, respectively (four per MDBU and one V/UHF combined input on the BIU chassis). Supported bands include VHF, UHF, 700MHz, 800MHz, 850MHz, 900MHz, 1900MHz, 2100MHz, and 2500MHz TDD.

The DAS Management System (DMS-600) is a network management device that provides remote control and monitoring of the DAS through a standard Internet connection.

Topology
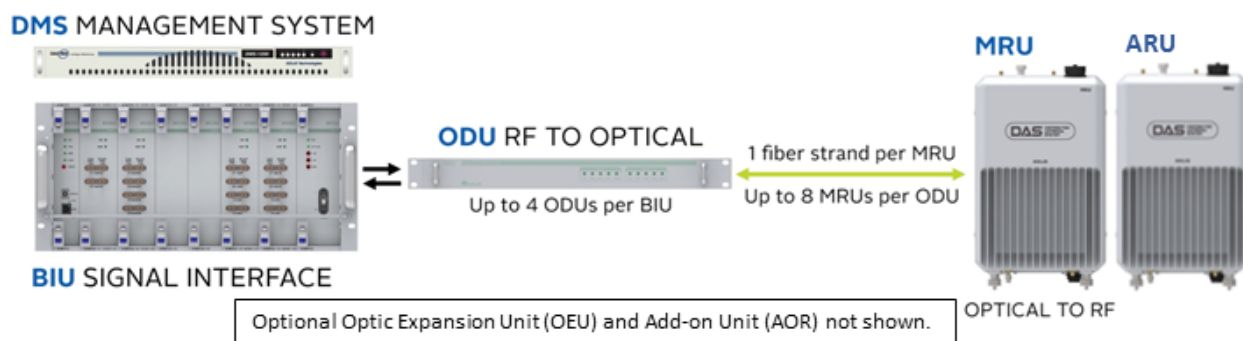
EXPRESS Single Carrier DAS – Product Specification

Band and RF Specifications

Frequency Band	Downlink (Tx)		Uplink (Rx)	
	Frequency (MHz)	Bandwidth (MHz)	Frequency (MHz)	Bandwidth (MHz)
700LTE	729-757	28	699-716 / 777-787	17 / 10
700PS	764-776	12	794-806	12
800 PS + I	851-869	18	806-824	18
850C	869-894	25	824-849	25
900 Paging	929-941	11	896-902	6
1900PCS	1930-1995	65	1850-1915	65
AWS 1	2110-2155	45	1710-1755	45
2500TDD LTE **	Upper Band 2624-2690 Lower Band 2502-2568	UB 66 LB 66	Upper Band 2624-2690 Lower Band 2502-2568	UB 66 LB 66
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
** For 2500 services and UHF, operator can select band using management software.				

Specification										
Supported Services	700PS	700LTE	800PS+I	850C	900I+PA	1900P	AWS-1	2500 TDD	VHF	UHF
System delay	< 3 usec *								< 5 usec *	
	*System delay excludes optic delay.									
VSWR	1.8 Max							1.5 Max	1.8 Max	
	VSWR = Each Band In/Out port									
Ripple	Passband Ripple: 4dBp-p (Each Band)									
Optical	Optical Link Loss: Max 5dBo (At 8km). Optic Wavelength 1310nm/1550nm with WDM									
Connectors	1 N-female (antenna port); 6 SMA-female (RF); 1 SC/APC (optical)									
Fiber Type	Single Mode									
Impedance	Nominal Impedance: 50 ohm									

Downlink									
TX Power MRU/ARU	700PS	700LTE	800	850C	900i+PA	1900P	AWS-1	2500TDD	VHF / UHF
850/1900P+700LTE/AWS	-	24dBm	-	24dBm	-	28dBm	28dBm		
1900+800/900	-	-	25dBm	-	25dBm	30dBm	-		
2500TDD								28dBm	24dBm
1900	-	-	-	-	-	30dBm	-		
850/1900	-	-	-	25dBm	-	30dBm	-		
700PS/800+800/900	21dBm	-	21dBm	-	21dBm	-	-		
Downlink Gain [dB]	41	44	45 (41)	44 (45,41)	45 (41)	48 (50)	48 (50)	48	14 to 39
Downlink Input Power (dBm)	-20dBm to +10								-15 to +10
Gain Control Range	25dB/step 1dB (for ROU)								
Spurious	<-13dBm								

EXPRESS Single Carrier DAS – Product Specification

Uplink									
Category	700PS	700LTE	800PS	850C	900I+PA	1900P	AWS-1	2500 TDD	VHF / UHF
Uplink Output Power	0dBm/Total each band							-20dBm	0dBm
Uplink Input Power	-50dBm Max								
Uplink Gain	30 to 50dB							10 to 30dB	20 to 40dB
Gain Control Range	20dB/step 1dB (at BIU)								
Noise Figure	700PS, 700PS/800+800/900: 12dB Max; 700LTE, 1900+800/900, 850C, 900i+PA, 1900P, AWS: 8dB Max							7dB Max	

Electrical / Environmental / Mechanical

Parameter	BIU	ODU	OEU	MRU/ARU	VHF/UHF AOR
DC Power	Normal: -48 VDC Operating range: -40.8 - -57.6 VDC	-	-	Normal: -48 VDC Operating range: -42 to -56 VDC	
AC Power	-	-	-	Normal Range: 120 VAC 50/60Hz Operating Range: 108 to 132 VAC, 50/60Hz	
Power Consumption	SISO Mode: 192W (Incl. 4 SISO ODUs) MIMO Mode: 312W (Incl. 4 SISO & 4 MIMO ODUs)	30W (Including 2 DOUs)	39W (Including 2 DOUs)	50W max for dual band	93W (Incl. VHF/UHF RDU)
Operating Temp	-10 to +50°C, 14 to 122 F			-10 to +50°C, 14 to 122 F	
Operating Humidity	-			5% to 90% (Non-condensing)	

Component	Size (WxHxD) (inches)	Weight (Lbs)	Power Consumption (W)
BTS Interface Unit Chassis – SISO	19 x 8.75 (5U) x 17.7	40	7.5
MDBUs (dual band models)	11.2 x 2.2 x 8	7	16
Optical Distribution Unit Chassis	19 x 1.75 (1U) x 17.7	6	30 (w/2 DOUs)
Optical Expansion Unit Chassis	19 x 3.5 (2U) x 17.7	14	39 (w/2 DOUs)
4 Port Donor Optic Unit (DOU) for ODU and OEU	11.8 x 6.6 x 1.3	4	15
DOU Blank Card (fits ODU and OEU)	11.8 x 6.6 x 1.3	1	-
Main Remote Units (dual band models)	7.9 x 11.8 (7U) x 5.5	15	50 max
Add-on Remote Units (dual band models)	7.9 x 11.8 (7U) x 5.5	15	40 max
150MHz VHF & 450MHz UHF Amp Module	15 x 2.3 x 5.5		93
VHF/UHF Add-on cabinet for MRU/ARU – AC or DC Power (Includes RDU_150_450)	19 x 7 (4U) x 10.2	25	93

Standards and Certifications

Specification	Description
FCC	This equipment complies with the applicable sections of Title 47 CFR Parts 15, 22, 24 and 90.
ICES-003	This Class A digital apparatus complies with Canadian ICES-003.
UL/CUL	Complies with UL and CUL 1950-1 Standard for safety for information technology equipment, incl. electrical business equipment.
FDA/CDRH	This equipment uses a Class 1 LASER according to FDA/CDRH Rules and conforming to all applicable standards of 21 CFR Chapter 1, Subchapter J, Part 1040.
NFPA 72 Code Compliant	National Fire Alarm Code. Applicable for components that can be installed outdoors (e.g., Remote Optic Units and Add-On Remotes).
NEMA 4	Main Remote Units and Add-On Remote Units meet NEMA 4 enclosure standards to withstand rain, sleet, snow, dust, dirt, splashing water, and hose-directed water. (Applies only to remote units.)

EXPRESS Single Carrier DAS – Product Specification

Part Numbers

BIU (Base Station Interface Unit) Signal Source Inputs	Part Number
BIU - MIMO (Incl. DC/DC PS, MCPU Card, 2 MCDU Cards) (Power supply not incl.)	SC_BIU_MIMO
BIU - SISO (Incl. DC/DC PS, MCPU Card, MCDU Card, 3 Blanks) (Power supply not incl.)	SC_BIU_SISO
700MHz LTE & 2100MHz Input Module for the SC_BIU	SC_MDBU_700LTE_2100
800MHz & 900MHz Input Module for the SC_BIU	SC_MDBU_800_900
850MHz & 1900MHz Input Module for the SC_BIU	SC_MDBU_850_1900
1900MHz Input Module for the SC_BIU	SC_MDBU_1900
2500 MHz TDD Input Module for SC_BIU; Duplexed Input	SC_MDBU_2500_LBUB
700MHz PS & 800MHz PS Input Module for the SC_BIU	SC_MDBU_700PS_800PS
Blank Input Module for the SC_BIU	SC_MDBU_B
EXPRESS Power Supply - 48 VDC / 480 W	SC_RMP_480
ODU/OEU Optical Distribution and Expansion Units	
Blank Optical Module for the ODU	SC_ODU_B / SC_OEU_B
Optical Distribution Unit Chassis	SC_ODU_C
4 Port Optical Module	SC_ODU_OM_4 / SC_OEU_OM_4
OEU Chassis. NOTE: Input Power -48VDC. Power supply not included.	SC_OEU_C
MRU, ARU, and VHF/UHF Add-on Remote	
850 MHz & 1900 MHz Main Remote Unit - AC Power - NEMA	MRU_AC_850_1900_N
850 MHz & 1900 MHz Main Remote Unit - DC Power – NEMA	MRU_DC_850_1900_N
1900 MHz Main Remote Unit - AC Power – NEMA	MRU_AC_1900_N
1900 MHz Main Remote Unit - DC Power – NEMA	MRU_DC_1900_N
2500 MHz Lower and Upper Band Main Remote Unit - AC Power – NEMA	MRU_AC_2500_LBUB
2500 MHz Lower and Upper Band Main Remote Unit - DC Power – NEMA	MRU_DC_2500_LBUB
700MHz LTE & 2100 MHz Add-on Remote Unit - AC Power - NEMA	ARU_AC_700LTE_2100_N
700MHz LTE & 2100 MHz Add-on Remote Unit - DC Power – NEMA	ARU_DC_700LTE_2100_N
800 MHz & 900 MHz Add-on Remote Unit - AC Power – NEMA	ARU_AC_800_900_N
800 MHz & 900 MHz Add-on Remote Unit - DC Power – NEMA	ARU_DC_800_900_N
700 MHz PS & 800 MHz PS Main Remote Unit - AC Power - Red NEMA	MRU_AC_700_800_N_PS
700 MHz PS & 800 MHz PS Main Remote Unit - DC Power - Red NEMA	MRU_DC_700_800_N_PS
150MHz VHF & 450MHz UHF Amplifier Module with AC Add-on Cabinet – NEMA	SC_AC_150_450PS
150MHz VHF & 450MHz UHF Amplifier Module with DC Add-on Cabinet – NEMA	SC_DC_150_450PS
Stacking ROU Wall Mounting Kit (Stacks ARU on top of MRU)	SC_ARU_STK
19" Rack MRU/ARU Chassis (4U Rack Space Requirement)	SC_RM19
Vertical Rack Mount MRU/ARU (9U Rack Space Requirement)	SC_RU_BRK
Public Safety MRU-to-AOR Cable with External Alarm Input pigtail. (For NEMA PS and Cellular MRUs)	CBL_SC_AOR_ALM_PS
Public Safety MRU cable with External Alarm Input (For NEMA PS and Cellular MRUs)	CBL_MRU_ALM_PS
MRU-to-AOR Cable with External Alarm Input pigtail. (For legacy MRUs with non-NEMA connectors)	CBL_SC_AOR_ALM
MRU cable with External Alarm Input pigtail. (For legacy MRUs w/ non-NEMA connectors)	CBL_MRU_ALM
DAS Management System	
DAS Management System (DMS) for EXPRESS	DMS_600
DAS Management System (DMS) for EXPRESS. NOTE: SPRINT use only	DMS_700
DMS Supporting Bracket	SC_DMS_BRK