MobileAccess1000
Datasheet

The MobileAccess**1000** (MA1000) provides enterprise level indoor coverage for a wide range of wireless services over a single broadband infrastructure.

MobileAccess**1000** is a single operator, multi-band system based on combining a number of services, voice and data, and distributing them to each remote location through a common antenna infrastructure.

Wireless RF services are bi-directionally transmitted between the capacity source (BTS/BDA) and remote locations using low loss fiber and broadband coax.

Deployment Options

- **RHU:** Supports two RF services over a common fiber/coax antenna infrastructure.
- **MA1000 TSX:** Supports three RF services over a common fiber/coax antenna.infrastructure
- **MA1000 QSX:** Supports four RF services over a common fiber/coax antenna infrastructure.

Features & Benefits

- **Multi-Service Platform**: Accommodates up to four wireless voice and data services including WLAN, eliminating the need for separate overlay networks. Supported wireless voice and data services and technologies include: TDMA, CDMA, WCDMA, GSM and AWS, and services such as Cellular/PCS, Paging, and iDEN.
- **Modular Design**: With its modular packaging, the MobileAccess**1000** enables new wireless services to be added easily and cost-effectively without disruption to work spaces or existing services.
- **Carrier-class Operation**: Advanced signal handling and management ensures optimal performance for all services involved in a multi-operator environment.
- **Robust Management**: Proactive, centralized end-to-end monitoring and management of MobileAccess**1000** equipment and RF signals.
- **Reduce Operating Expenses:** Multi-operator, multi-service across common infrastructure; support multimode fiber.

Figure 1: Typical Head-End Equipment

Figure 2: Typical Remote-End Equipment

System Architecture

The MobileAccess**1000** solution deployment is comprised of the following elements:

Head End Equipment

Radio Interface Unit (RIU): The RIU conditions the RF Downlink signals from base-transceiver stations (BTS) or bi-directional amplifiers (BDA) provided by the Wireless Service Providers (WSPs), ensuring a constant level of RF before passing them on to the Base Units (BU). RF Uplink signals from subscribers are received from the BU and transported back to the BTS or BDA.

Base Unit (BU): The BU converts the RF Downlink signals received from the RIU to an optical signal for transport on single or multi-mode fiber to the Remote Hub Units (RHU) located at the remote locations. Uplink optical signals from subscribers are received from the RHU and converted back to RF before passing them on to the RIU.

System Controller: The system controller enables remote management and control of all MA1000 elements from a single location. Refer to the System Controller datasheet for more information.

Remote Location Equipment

Quad-Service Package (QSX): The MA1000 QSX offers a simple and cost-effective method for delivering a dedicated single carrier, or four RF service, deployment across a common fiber/coax antenna infrastructure. It supports the same form factor and functionality as a single RHU with two Add-On units.

Tri-Service Package (TSX): The MA1000 TSX offers a simple and cost-effective method for delivering a dedicated single carrier, or three RF service, deployment across a common fiber/coax antenna infrastructure. It supports the same form factor and functionality as a single RHU with an Add-On.

Remote Hub Unit (RHU): he RHU is a service specific module that performs optical to RF conversion on signals received from the BU. The signals are then filtered and amplified for transport across broadband coax to the antenna. Uplink signals from the antenna are then converted to optical signals before being transmitted back to the BU. Each RHU supports up to two services.

Add-On (AO): The Add-On is a single service unit that is coupled with an RHU to support an additional service. The Add-On receives filtered RF signal from the RHU and amplifies it for transport across the broadband coax.

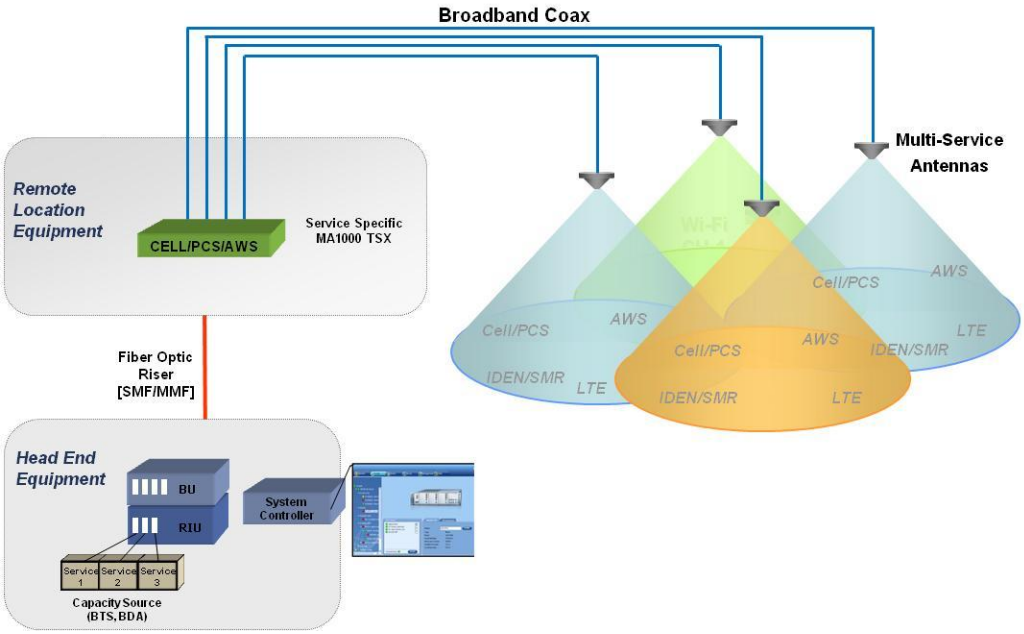

Figure 1: Example MA1000 System Architecture

Supported Services

Services	Frequency Range (MHz)	
	Uplink (UL)	Downlink (DL)
Low Band Services		
700 LTE	698-716 777-787	728-757
CELL	824-849	869-894
Telstra 850M	824-849	869-890
iDEN 800 (SMR 800)	806-824	851-869
GSM	890-915	935-960
E-GSM	880-915	925-960
iDEN 900 (SMR 900)	896-902	929-941
High Band Services		
DCS	1710-1785	1805-1880
PCS	1850-1910	1930-1990
G-PCS	1850-1915	1930-1995
UMTS 2100	1920-1980	2110-2170
AWS	1710-1755	2110-2155

RF Parameters Per Service

MA1000 RF Parameters - Low Band Services										
RF Parameter	**LTE 700 MHz**		**CELL TDMA / CDMA / WCDMA / GSM800**		**SMR 800[6]**		**GSM / E-GSM**		**SMR 900[6]**	
	DL	**UL**	**DL**	**UL**	**DL**	**UL**	**DL**	**UL**	**DL**	**UL**
Max Output Power / Antenna Port										
1 (Composite)	21		20		20		14		20	
2 Carriers	18		17		17		11		17	
4 Carriers	15		14		14		8		14	
8 Carriers			11		11		5		11	
12 Carriers			9		9		3		9	
Mean Gain(dB)[1]	21		20	7	20	7	14	7	20	7
Pin (dBm)[1]	0		0		0		0		0	
Input IP3 (dBm) AGC OFF Min		-10		-5		-5		-5		-5
Input IP3 (dBm) AGC ON Min				5		5		5		5
SFDR[2] (dB)		55		68/69/73		72		68		74
Max Intermod Distortion (dBm)	**		-13*		-13		-36		-13	
Max NF (dB)		20		20		20		16		16
Gain Flatness / Ripple (dB)[3]	+/-1.0[5]		+/-1.5							

* WCDMA compiles with 3GPP TS 25.106 V5.0.0 (2002-03) table 9.4 spectrum emission mask.
**Out of band and spurious emissions compliant with FCC standards.
[1]Factory set mean gain BU-RHU without RIU. May be field adjusted using controller system.
[2]SFDR for CDMA services is calculated in 100KB/sec.
[3]Gain Flatness/Ripple is specified for the non-duplexed port of the system.
[4]Specifications include the 900 MHz UL filter. The output power is limited on the downlink.
[5]Gain Flatness/Ripple at any block of the spectrum.
[6]The SMR 800/900 for Sprint are to be designed, per Sprint guidelines, with composite power levels per antenna port and mean gain values 3dB less than stated.

RF Parameters Per Service *(Continued)*

MA1000 RHU RF Parameters - High Band Services												
MA1000 RHU RF Parameter	**DCS**		**PCS[5] CDMA / WCDMA**		**PCS[5] GSM / TDMA**		**G-PCS[6] CDMA/WCDMA**		**G-PCS[6] GSM/TDMA**		**UMTS and AWS CDMA/WCDMA**	
	DL	**UL**	**DL**	**UL**	**DL**	**UL**	**DL**	**UL**	**DL**	**UL**	**DL**	**UL**
Max Output Power / Antenna Port												
1 (Composite)	16		20		20		20		21		21	
2 Carriers	13		17		17		17		18		18	
4 Carriers	10		14		14		14		15		15	
8 Carriers	7		11		11		11		12		12	
12 Carriers	5		9		9		9		10		10	
Mean Gain(dB)[1]	16	3	20	3	20	3	20		20	3	21	3
Pin (dBm)[1]	0		0		0		0		1		0	
Input IP3 (dBm) AGC OFF Min		-6		-6		-6		-7		-7		-7
Input IP3 (dBm) AGC ON Min		3		3		3						
SFDR[2] (dB)		65		67		70/65		66		64		66
Max Intermod Distortion (dBm)	-30		-13*		-13		-13*		-13		*	
Max NF (dB)		18		18		18						
Gain Flatness / Ripple (dB)[3]	+/-2.0											

* WCDMA compiles with 3GPP TS 25.106 V5.0.0 (2002-03) table 9.4 spectrum emission mask.
[1]Factory set mean gain BU-RHU without RIU. May be field adjusted using controller system.
[2]SFDR for CDMA services is calculated in 100KB/sec.
[3]Gain Flatness/Ripple is specified for the non-duplexed port of the system.
[5]The PCS service RF specifications outlined is relevant only for the MA1000 CELL/PCS RHU, CELL/PCS/700LTE TSX, CELL/PCS/AWS TSX and CELL/PCS/700LTE/AWS QSX
[6]The PCS service RF specifications outlined is relevant only for the MA1000 PCS AO and IDEN/SMR/PCS TSX

System Specifications

Absolute Maximum Rating

Total Input RF Power to BU	10dBm
Power Supply	60VDC

Optical Specifications

Optical Output Power	<3.0mW
Max. Optical Budget	2 dB for fiber + 1 dB for Connectors (assumed) = 3 dB total. 300 m Multi-mode
Optical Loss per Mated-pair Connectors	0.5dB (max)
Optical Connector	SC/APC
Fiber Type	Single-mode: 9/125um Multi-mode: 50/125 um or 62.5/125um (Minimum qualifications with ANSI/TIA/EIA-568-B series, EN50173-1 or ISO/IEC 11801)
Wavelength	1310±10nm
Maximum Distance Between Base Unit and Remote Cabinet	2km

Temperature Specifications

Operating	0°C to +50°C (32°F to 122°F)
Storage	-20°C to 85°C (-4°F to 185°F)

Standards and Approvals

Laser Safety	CDRH 21 CFR 1040.10, 1040.11 (Except for deviations per notice No.50, July 26, 2001) IEC 60825-1, Amendment 2 (January 2001) EN 60825-1
CE	Radio Equipment and Systems EN 301 502 – for GSM / EGSM Frequency Bands EN 300 609 – for DCS Frequency Band EN 301 908 – for UMTS Frequency Band EN 300 328 – for WLAN 802.11b/g 2.4GHz Frequency Band EN 301 893 – for WLAN 802.11a 5GHz Frequency Band EMC EN 301 489
FCC	Radio Equipment and Systems FCC 47 CFR Part 2, 15, 22, 24, 27, 90 EMC FCC 47 CFR Part 15 Subpart B
Safety	EN 60950UL 60950 CAN/CSA-C22.2 No.60950 UL 2043

System Component Specifications

Tri-Service Package (TSX)

Supported Services	Three services per TSX. Refer to the TSX model number for service support.
Ports	Optical Port to BU: One SC/APC
Power	Power Consumption: 79W Max
Physical Characteristics	Dimensions: 27.9 cm x 22.00 cm x 11.4 cm (10.98" x 8.66" x 4.49") Weight: 5.6Kg (12.4 Lb)

Remote Hub Unit

Supported Services	Two services per RHU. Refer to RHU model number for specific service support.
Ports	Optical Port to BU: One SC/APC To Add-On: Two SMA 50Ω connectors (One DL / One UL)
Power	Input Power: 20 to 48V DC Power Consumption: 29W
Physical Characteristics	Dimensions: 27.9 cm x 22.0 cm x 4.5 cm (10.98" x 8.66" x 1.77") Weight: 2.8 Kg (6.2 Lb)

Add-On

Supported Services	Single service per Add-On. Refer to Add-On model number for specific service support.
Ports	To RHU: Two SMA 50Ω connectors (One DL and one UL)
Input Power	Input Power: 25 to 48V DC Power Consumption: 50W
Physical Characteristics	Dimensions: 27.9 cm x 22.0 cm x 6.9 cm (10.98" x 8.66" x 2.71") Weight: 2.8 Kg (6.2 Lb)

Multimode Fiber Qualifications

50/125 or 62.5/125um complying with ANSI/TIA/EIA-568-B series, EN50173-1 or ISO/IEC 11801, may be used up to 300 meters in length assuming the following qualifications:

- Both the Base Unit and Remote Hub must be multimode capable.
- All fiber in a given length of fiber must be of the same core diameter.
- All Bulkhead Adapters must be Single-mode SC/APC (Green) adapters.
- All terminations cross connections or patches must be direct fusion splice or MobileAccess specified patch cords listed below.

900 Micron Patchcord for Splicing, 2 Meters, 2xSC/APC

62.5/125/900	Diamond p/n ENC/1045341	FiberNext p/n OEM-629002-MAN
50/125/900	Diamond p/n ENC/1045340	FiberNext p/n OEM-509002-MAN

Zipcord Patchcord, 4xSC/APC, 50/125/900/2000/4500 Micron

1 Meter	Diamond p/n ENC/1045342	FiberNext p/n OEM-50ZIP1-MAN
3 Meter	Diamond p/n ENC/1045343	FiberNext p/n OEM-50ZIP3-MAN

Zipcord Patchcord, 4xSC/APC, 62.5/125/900/2000/4500 Micron

1 Meter	Diamond p/n ENC/1045344	FiberNext p/n OEM-62ZIP1-MAN
3 Meter	Diamond p/n ENC/1045345	FiberNext p/n OEM-62ZIP3-MAN

Ordering Information

MA1000 QSX

Service Supported	Part Number	Description
CELL/PCS/700 LTE/AWS	1000-C85P19L70A17-A	MA1000 Quad-service package supporting CELL, PCS, 700 MHz LTE and AWS.
	1000M-C85P19L70A17-A	MA1000 Quad-service package supporting CELL, PCS, 700 MHz LTE and AWS with MMF.

MA1000 TSX

Service Supported	Part Number	Description
CELL/PCS/700 LTE	1000-C85P19L70-A	MA1000 TSX tri-service CELL/PCS and 700 MHz LTE.
	1000M-C85P19L70-A	MA1000 TSX tri-service CELL/PCS and 700 MHz LTE with MMF.
CELL/PCS/AWS	1000-C85P19A17-A	MA1000 TSX tri-service CELL/PCS and AWS.
	1000M-C85P19A17-A	MA1000 TSX tri-service CELL/PCS and AWS with MMF.
IDEN/SMR/PCS	1000-IDEN-SMR-G-PCS	MA1000 TSX tri-service iDEN/SMR and PCS with G-Block support.
	1000M-IDEN-SMR-G-PCS	MA1000 TSX tri-service iDEN/SMR and PCS with G-Block support with MMF.
	1000-IDEN-SMR-G-PCSF	MA1000 TSX tri-service iDEN/SMR and PCS with G-Block support and filter to provide additional guard band between iDEN DL and SMR UL.
	1000M-IDEN-SMR-G-PCSF	MA1000 TSX tri-service iDEN/SMR and PCS with G-Block support and filter to provide additional guard band between iDEN DL and SMR UL with MMF.

Ordering Information (Continued)

Remote Hub Units

Part Number	Description
1000-CELL-4E	Single-band CELL, 4 Ports, PCS Add-On Support
1000-PCS-4E	Single-band PCS, 4 Ports, AWS Add-On Support
1000-DCS-4E	Single-band DCS, 4 Ports, UMTS Add-On Support
1000M-DCS	MMF Single-band DCS, 4 Ports, UMTS Add-On Support
1000-CELL-PCS4E-HL	Dual-band CELL/PCS, 4 Ports, AWS Add-On Support
1000M-CELL-PCS4E-HL	MMF Dual-band CELL/PCS, 4 Ports, AWS Add-On Support
1000-CELL-DCS4E	Dual-band CELL/DCS, 4 Ports, UMTS Add-On Support
1000M-GSM-DCS	MMF Dual-band GSM/DCS 4 Ports, UMTS Add-On Support
1000-GSM-DCS4E	Dual-band GSM/DCS, 4 Ports, UMTS Add-On Support
1000-GSMO-DCS4E	Dual-band GSM Orange/DCS, 4 Ports, UMTS Add-On Support
1000M-iDEN-SMR	MMF Dual-band iDEN(SMR800)/SMR900 Paging,4 Ports, PCS Add-On Support
1000-iDEN-SMR4	Dual-band iDEN(SMR800)/SMR900, 4 Ports, PCS Add-On Support
1000-iDEN-SMR4F	Dual-band iDEN(SMR800)/SMR900, 4 Ports with Filter Kit, PCS Add-On Support
1000-SMR-FILTER	Filter Kit for SMR 900

Add-On Modules

Part Number	Description
700LTE-AO-A-SCU	Add-On kit for LTE 700 MHz service for use in upgrade situations with older MA1000 Cell/PCS RHUs (P/N 1000-CELL-PCS4E and 1000M-CELL-PCS). Includes 700 MHz service combiner unit (SCU-700) and applicable accessories for connecting to the Cell/PCS RHU.
700LTE-AO-B-HL	Add-On for LTE 700 MHz service with MA1000 Cell/PCS RHUs (P/N 1000(M)-CELL-PCS4E-HL)
1200-G-PCS-AO	Add-On RHU Supporting a PCS w/G-Block
1200-UMTSE-AO	Add-On RHU - UMTS Service
1200-AWS-AO	Add-On RHU Supporting AWS Service

Power Supply Accessories

Part Number	Description
LPS-48V-66W	Local AC/DC Converter 66W
LPS-48V-100W	Local AC/DC Converter 100W
AK-PWR-CORD-EU	AC Power Cord for 66W and 100W Power Supplies, European Connector
AK-PWR-CORD-UK	AC Power Cord for 66W and 100W Power Supplies, UK Connector

Mounting Brackets Accessories

Part Number	Description
BRKT-1200-STK	Bracket for stacking RHU/Add-On/860 module on top of an Add-On module
BRKT-1RU-SHELF-2K	Shelf for RHU/Add-On/860 or bracket for stacking on MA2000 MRC
BRKT-RHU-800-STK	Bracket for stacking RHU/Add-On/860 module on top of a RHU/860 module *(Note: Not on top of an Add-On)*

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