MobileAccess1000

features and 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 LTE, and services such as Cellular, PCS, AWS Paging, and iDEN
Modular design	With its modular packaging, the MobileAccess1000 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 MobileAccess1000 equipment and RF signals
Reduce operating expenses	Single-operator, multi-service across common infrastructure; support multimode fiber

The MobileAccess1000 (MA1000) provides enterprise level indoor coverage for a wide range of wireless services over a single broadband infrastructure.

MobileAccess1000 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.

Typical Remote-End Equipment: Add-on, Remote Hub Unit | Figure 1

Typical Headend Equipment: System Controller, Base Unit, Radio Interface Unit | Figure 2

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system architecture |

The MobileAccess1000 solution deployment is comprised of the following elements:

Headend 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. RF Uplink signals from subscribers are received from the Base Units 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-mode or multimode fiber to the Remote Hub Units (RHU), which are 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 spec sheet 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, four RF service deployment across a common fiber/coax antenna infrastructure. It consists of a single RHU with two Add-on units mounted on a bracket.

Tri-Service Package (TSX): The MA1000 TSX offers a simple and cost-effective method for delivering a dedicated single carrier, three RF service deployment across a common fiber/coax antenna infrastructure. It consists of a single RHU and an Add-on mounted on a bracket.

Remote Hub Unit (RHU): The 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. Similarly uplink signals from the antenna are converted to optical signals before being transmitted back to the BU. Each RHU supports up to two RF services.

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

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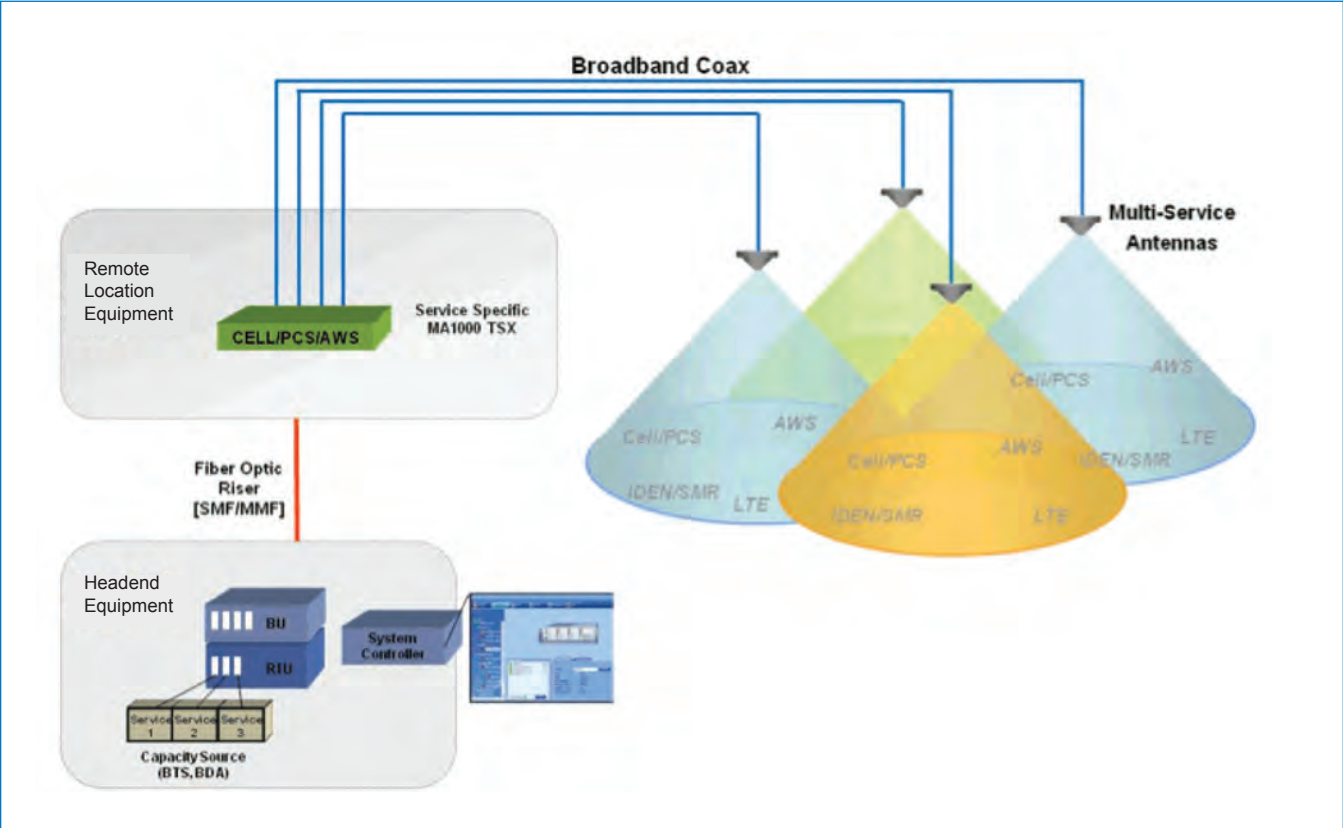
specifications |

Example MA1000 System Architecture | Figure 3

Supported Services	Frequency Range (MHz)	
	Uplink (UL)	Downlink (DL)
Telstra 850M	824-849	869-890
AWS	1710-1755	2110-2155

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MobileAccess1000

specifications | (continued)

RF Parameters Per Service
MA1000 RF Parameters–Low Band Services

LTE 700 MHz		
RF Parameter	DL	UL
Frequency Range (MHz)	728-757	698-716 777-787
Max Output Power Per Antenna Port 1 (Composite)	21	
2 Operators	18	
4 Operators	15	
8 Operators		
12 Operators		
Mean Gain (dB)[1]	21	
Pin (dBm)[1]	0	
Input IP3 (dBm) AGC OFF Min		-10
Input IP3 (dBm) AGC ON Min		
SFDR[2] (dB)		55
Max Intermod Distortion (dBm)	**	
Max NF (dB)		20
Gain Flatness/Ripple (dB)[3]	+/-1.0[5]	

CELL TDMA/CDMA/WCDMA/GSM800		
RF Parameter	DL	UL
Frequency Range (MHz)	869-894	824-849
Max Output Power Per Antenna Port 1 (Composite)	20	
2 Operators	17	
4 Operators	14	
8 Operators	11	
12 Operators	9	
Mean Gain (dB)[1]	20	7
Pin (dBm)[1]	0	
Input IP3 (dBm) AGC OFF Min		-5
Input IP3 (dBm) AGC ON Min		5
SFDR[2] (dB)		68/69/73
Max Intermod Distortion (dBm)	-13*	
Max NF (dB)		20
Gain Flatness/Ripple (dB)[3]	+/-1.5	

SMR 800[6]		
RF Parameter	DL	UL
Frequency Range (MHz)	851-869	806-824
Max Output Power Per Antenna Port 1 (Composite)	20	
2 Operators	17	
4 Operators	14	
8 Operators	11	
12 Operators	9	
Mean Gain (dB)[1]	20	7
Pin (dBm)[1]	0	
Input IP3 (dBm) AGC OFF Min		-5
Input IP3 (dBm) AGC ON Min		5
SFDR[2] (dB)		72
Max Intermod Distortion (dBm)	-13	
Max NF (dB)		20
Gain Flatness/Ripple (dB)[3]	+/-1.5	

GSM/E-GSM		
RF Parameter	DL	UL
Frequency Range (MHz)	935-960 925-960	890-915 880-915
Max Output Power Per Antenna Port 1 (Composite)	14	
2 Operators	11	
4 Operators	8	
8 Operators	5	
12 Operators	3	
Mean Gain (dB)[1]	14	7
Pin (dBm)[1]	0	
Input IP3 (dBm) AGC OFF Min		-5
Input IP3 (dBm) AGC ON Min		5
SFDR[2] (dB)		68
Max Intermod Distortion (dBm)	-36	
Max NF (dB)		16
Gain Flatness/Ripple (dB)[3]	+/-1.5	

* WCDMA complies 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 100 KB/sec.
[3]Gain flatness/ripple is specified for the non-duplexed port of the system.
[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 3 dB less than stated.

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specifications | (continued)

RF Parameters Per Service
MA1000 RF Parameters – Low-Band Services

SMR 900[4]		
RF Parameter	**DL**	**UL**
Frequency Range (MHz)	929-941	896-902
Max Output Power Per Antenna Port 1 (Composite)	20	
2 Operators	17	
4 Operators	14	
8 Operators	11	
12 Operators	9	
Mean Gain (dB)[1]	20	7
Pin (dBm)[1]	0	
Input IP3 (dBm) AGC OFF Min		-5
Input IP3 (dBm) AGC ON Min		5
SFDR[2] (dB)		74
Max Intermod Distortion (dBm)	-13	
Max NF (dB)		16
Gain Flatness/Ripple (dB)[3]	+/-1.5	

[1]Factory set mean gain BU-RHU without RIU. May be field adjusted using controller system.
[2]SFDR for CDMA services is calculated in 100 KB/sec.
[3]Gain flatness/ripple is specified for the non-duplexed port of the system.
[4]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.

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specifications | (continued)

RF Parameters Per Service
MA1000 RF Parameters – High-Band Services

DCS		
RF Parameter	**DL**	**UL**
Frequency Range (MHz)	1805-1880	1710-1785
Max Output Power Per Antenna Port 1 (Composite)	16	
2 Operators	13	
4 Operators	10	
8 Operators	7	
12 Operators	5	
Mean Gain (dB)[1]	16	3
Pin (dBm)[1]	0	
Input IP3 (dBm) AGC OFF Min		-6
Input IP3 (dBm) AGC ON Min		3
SFDR[2] (dB)		65
Max Intermod Distortion (dBm)	-30	
Max NF (dB)		18
Gain Flatness/Ripple (dB)[3]	+/-2.0	

PCS[5] CDMA/WCDMA		
RF Parameter	**DL**	**UL**
Frequency Range (MHz)	1930-1990	1850-1910
Max Output Power Per Antenna Port 1 (Composite)	20	
2 Operators	17	
4 Operators	14	
8 Operators	11	
12 Operators	9	
Mean Gain (dB)[1]	20	3
Pin (dBm)[1]	0	
Input IP3 (dBm) AGC OFF Min		-6
Input IP3 (dBm) AGC ON Min		3
SFDR[2] (dB)		67
Max Intermod Distortion (dBm)	-13*	
Max NF (dB)		18
Gain Flatness/Ripple (dB)[3]	+/-2.0	

PCS[5] GSM/TDMA		
RF Parameter	**DL**	**UL**
Frequency Range (MHz)	1930-1990	1850-1910
Max Output Power Per Antenna Port 1 (Composite)	20	
2 Operators	17	
4 Operators	14	
8 Operators	11	
12 Operators	9	
Mean Gain (dB)[1]	20	3
Pin (dBm)[1]	0	
Input IP3 (dBm) AGC OFF Min		-6
Input IP3 (dBm) AGC ON Min		3
SFDR[2] (dB)		70/65
Max Intermod Distortion (dBm)	-13	
Max NF (dB)		18
Gain Flatness/Ripple (dB)[3]	+/-2.0	

G-PCS[6] CDMA/WCDMA		
RF Parameter	**DL**	**UL**
Frequency Range (MHz)	1930-1995	1850-1915
Max Output Power Per Antenna Port 1 (Composite)	20	
2 Operators	17	
4 Operators	14	
8 Operators	11	
12 Operators	9	
Mean Gain (dB)[1]	20	
Pin (dBm)[1]	0	
Input IP3 (dBm) AGC OFF Min		-7
Input IP3 (dBm) AGC ON Min		
SFDR[2] (dB)		66
Max Intermod Distortion (dBm)	-13*	
Max NF (dB)		
Gain Flatness/Ripple (dB)[3]	+/-1.5	

* WCDMA complies 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 100 KB/sec.
[3] Gain flatness/ripple is specified for the non-duplexed port of the system.
[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 3 dB less than stated.

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specifications | (continued)

RF Parameters Per Service
MA1000 RF Parameters – High-Band Services

G-PCS[4] GSM/TDMA				UMTS and AWS CDMA/WCDMA		
RF Parameter	**DL**	**UL**		**RF Parameter**	**DL**	**UL**
Frequency Range (MHz)	1930-1995	1850-1915		**Frequency Range (MHz)**	2110-2170	1920-1980
Max Output Power Per Antenna Port 1 (Composite)	21			**Max Output Power Per Antenna Port** 1 (Composite)	21	
2 Operators	18			2 Operators	18	
4 Operators	15			4 Operators	15	
8 Operators	12			8 Operators	12	
12 Operators	10			12 Operators	10	
Mean Gain (dB)[1]	20	3		**Mean Gain (dB)[1]**	21	3
Pin (dBm)[1]	1			**Pin (dBm)[1]**	0	
Input IP3 (dBm) AGC OFF Min		-7		**Input IP3 (dBm) AGC OFF Min**		-7
Input IP3 (dBm) AGC ON Min				**Input IP3 (dBm) AGC ON Min**		
SFDR[2] (dB)		64		**SFDR[2] (dB)**		66
Max Intermod Distortion (dBm)	-13			**Max Intermod Distortion (dBm)**	*	
Max NF (dB)				**Max NF (dB)**		
Gain Flatness/Ripple (dB)[3]	+/-2.0			**Gain Flatness/Ripple (dB)[3]**	+/-2.0	

* WCDMA complies 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 100 KB/sec.
[3] Gain flatness/ripple is specified for the non-duplexed port of the system.
[4] The SMR 800/900 for Sprint are to be designed, per Sprint guidelines, with composite power levels per antenna port and mean gain values 3 dB less than stated.

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specifications | (continued)

Absolute Maximum Rating

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

Optical

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

Temperature

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

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specifications | (continued)

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 2.4 GHz frequency band • EN 301 893 – for WLAN 802.11a 5 GHz 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

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component specifications | (continued)

Tri-Service Package (TSX)

Supported Services	Three services per TSX. Refer to the TSX model number for specific service support.
Ports	Optical port to BU: One SC APC
Power	Power consumption: 79 W Max
Physical Characteristics	• Dimensions (H x W x D): mm (in) 114 x 220 x 2779 (4.5 x 8.7 x 11) • Weight: kg (lbs) 5.6 (12.4)

Tri-Service Package (TSX) | Figure 4

Quad-Service Package (QSX)

Supported Services	Four services. Refer to the QSX model number for specific service support.
Ports	Optical port to BU: One SC/APC
Power	Power consumption: 129 W Max
Physical Characteristics	• Dimensions (H x W x D): mm (in) 183 x 220 x 349 (7.2 x 8.7 x13.7) • Weight: kg (lbs) 8.6 (18.6)

Quad-Service Package (QSX) | Figure 5

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component specifications | (continued)

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 48 V DC • Power consumption: 29 W
Physical Characteristics	• Dimensions (H x W x D) mm (in): 45 x 220 x 279 (1.8 x 8.7 x 11) • Weight: kg (lbs) 2.8 (6.2)

Remote Hub Unit | Figure 6

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 48 V DC • Power consumption: 50 W
Physical Characteristics	• Dimensions (H x W x D) mm (in): 69 x 220 x 279 (2.7 x 8.7 x11) • Weight: kg (lbs) 2.8 (6.2)

Add-on | Figure 7

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Multimode Fiber Qualifications |

50/125 or 62.5/125 µm 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 Unit 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 termination cross connections or patches must be direct fusion splice or Corning MobileAccess specified patch cords listed below.

900 µm Patch Cord for Splicing, 2 Meters, 2 x SC 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 Patch Cord, 4 x SC APC, 50/125/900/2000/4500 µm		
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 Patch Cord, 4 x SC APC, 62.5/125/900/2000/4500 µm		
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

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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

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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	1000-SMR-FILTER

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ordering information | (continued)

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 supporting UMTS Service
1200-AWS-AO	Add-on RHU supporting AWS Service

Power Supply Accessories

Part Number	Description
LPS-48V-66W	Local AC/DC Converter 66 W
LPS-48V-100W	Local AC/DC Converter 100 W
AK-PWR-CORD-EU	AC Power Cord for 66 W and 100 W Power Supplies, European Connector
AK-PWR-CORD-UK	AC Power Cord for 66 W and 100 W 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 an RHU/860 module (Note: Not on top of an Add-on)

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notes |

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