

MA 2000 System



MA 2000 Cabinet



MA 2000 Lite



MA 2000 – Multi-Operator Converged In-building Coverage System

MobileAccess™ 2000 converged wireless networks solution provides *full multi-operator in-building coverage*. This includes support for any combination of services in any band range. For example, CELLULAR 800MHz band and GSM 900MHz band.

This scalable solution is based on combining a number of services, voice and data, and distributing them at each remote location through a common antenna infrastructure.

Voice services are bi-directionally transferred between the BTS/BDA side and the remote locations over optic fiber. Data services from 802.11/a/b/g APs may be integrated into the MA 2000 system at the remote sites.

Main features and capabilities

- Support for all current and future technologies
- All services are distributed through a *single* coax and antenna infrastructure
- Each remote cabinet can house up to 20 multi-operator services
- Each MA 2000 Lite can support up to 8 services
- All active components are located in the communication closet/room
- Modular, scalable and future-safe – additional remote units can easily be installed
- Single coax antenna infrastructure prevents RF interferences such as those induced where multiple antenna systems are used to serve multiple services
- Enables fast deployment for corporate enterprises, property owners and WSP's of new services
- Reduces tenant disruption
- Low power required by the system eliminates the need for high power BTS/RBS, reducing operator expenses
- Local and remote monitoring and control capabilities
- Software programmable parameters including output power, AGC (on/off and levels), and system gain
- Real time component setting capabilities for optimal performance

Main elements

The MA 2000 solution is based on the following main elements:

- **MA Remote Units (RUs)** – service specific devices that perform the optic to RF (and vice versa) conversion at the remote locations and interface to the coax and antenna infrastructure at each location. Each RU can support two services. A third service can be added by connecting an Add-on RHU (MA 1200) to the RU.

The RUs are available in two configurations:

- **2000 Cabinets** – This configuration provides future-safe multi-operator coverage for larger sites. It can distribute up to 20 services through internally housed RUs.
- **2000 Lite** – This configuration provides single-operator entry level support for up to 8 services. The RUs are *external*.
- **MA Base Units (BU)** – wideband devices that perform the RF to optic signal conversion (and vice versa) on the BTS/BDA side. Each BU can support up to eight Remote Hub Units through F/O connections.
- **MA 850** – The MA 850 is a wireless LAN module that provides secure and centralized connections for 802.11a/b/g Access Points and distributes the wireless services over the same coax and broadband infrastructure as the voice services.

To provide optimum coverage at all times and monitoring and control of all system elements from a central location MA provides the following devices:

- **MA Radio Interface Units (RIUs)** – The RIUs provide interfaces for up to three BTS/BDA signals, and automatically adjusts the output signal in response to input signal level in order to provide optimal coverage.
- **MA Network Management System (MA NMS)** – enables remote management of all MA 2000 elements from a *single location*. The system consisting of MA 410/430 controllers and advanced intuitive GUI management software.

MA RIUs, BUs and MA 410/430 controllers are concentrated in the communication room, while the RHU, MA 1200 and MA 850 remote units are securely installed (in the shaft or electrical closet) of each remote location.

Figure 1 shows an example of an MA 2000 Cabinet based solution. Five services from two different operators are distributed, where services from Operator A conflict with those from Operator B.

The converted optical signal is routed from the BUs directly to the corresponding RUs in each Cabinet over optic fiber. Each BU supports connections to 8 RUs. Additional BUs are required for connection to more RUs.

Services 1 and 2 are distributed through the foremost RU in each Cabinet. Services 3, 4 and 5 are distributed through the second RU and the MA 1200 unit connected to that RU.

MA 850 converges 802.11a/b/g data services with the voice services to be distributed through a common infrastructure of coax and wideband antennas.

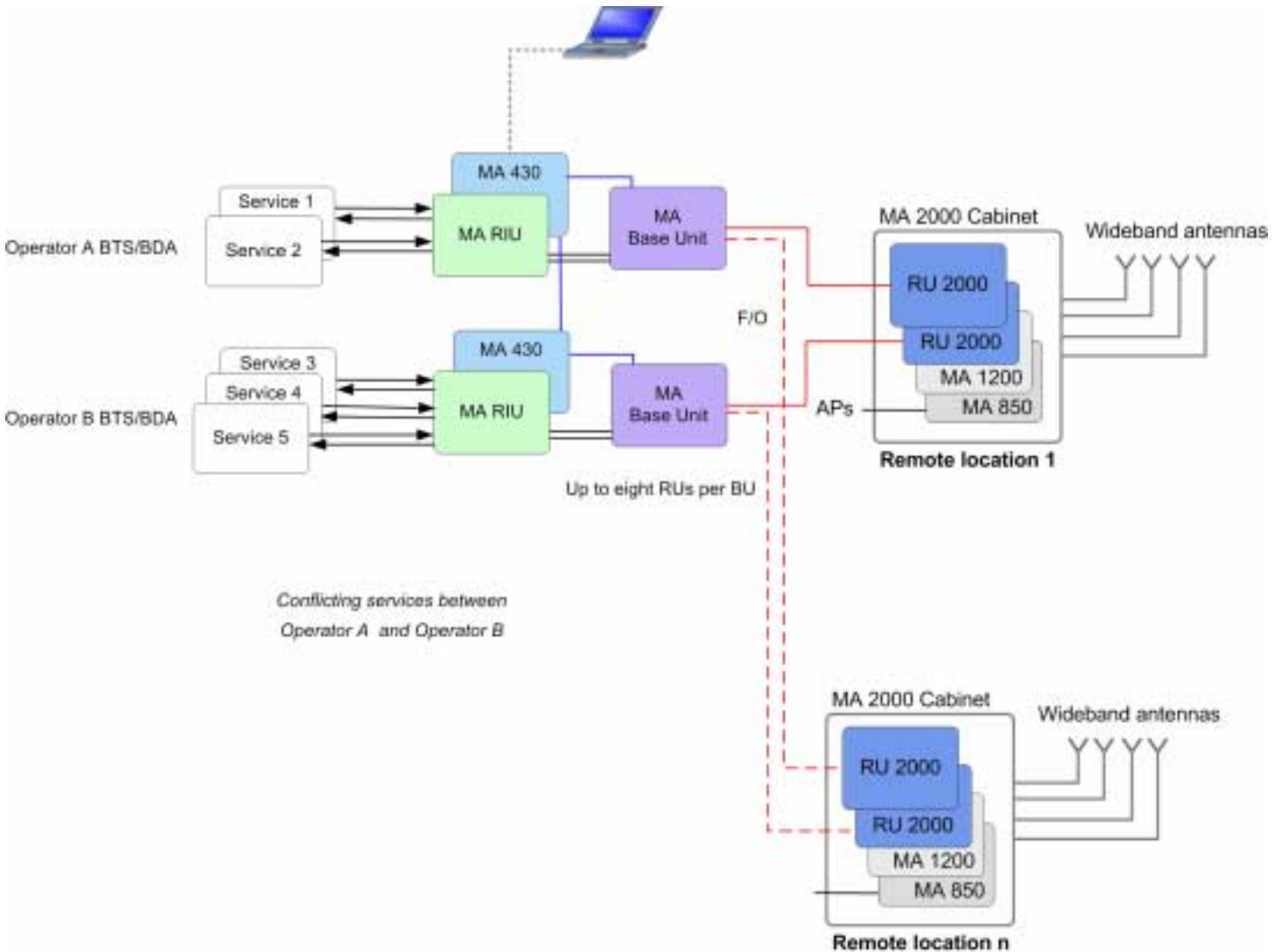


Figure 1. Example of MA 2000 Cabinet Architecture

RF Parameters Low Band										
RU 2000	TDMA 800		CDMA 800		iDEN 800		GSM 900		SMR/PAGE 900	
Max Output Power per antenna port	D	U	D	U	D	U	D	U	D	U
1 (composite)	17		16		14		11		14	
2 carriers	14		14		11		8		11	
4 carriers	11		10		8		5		8	
8 carriers	8		7		5		2		5	
12 carriers	5		4		5		2		3	
Mean Gain(dB) *	17	7	16	7	14	7	11	7	14	7
Pin (dBm)*	0		0		0		0		0	
Input IP3 (dBm) AGC OFF Min		-5		-5		-5		-5		-5
Input IP3 (dBm) AGC ON Min		5		5		5		5		5
SFDR**(dB)		71		67		72		64		71
Max Intermod Distortion (dBm)	-13		-13		-13		-36		-13	
Max NF (dB)		20		20		20		20		20
Gain Flatness (dB)	±2.0									

RF Parameters High Band								
RU 2000	GSM 1800		CDMA 1900		GSM 1900		TDMA 1900	
Max Output Power per antenna port	D	U	D	U	D	U	D	U
1 (comp)	11		16		15		16	
2 carriers	8		10		11		13	
4 carriers	5		7		8		9	
8 carriers	2		4		5		5	
12 carriers	0		2		3		3	
Mean Gain(dB) *	11	3	16	3	15	3	16	3
Pin (dBm) *	0		0		0		0	
Input IP3 (dBm) AGC OFF Min		-6		-6		-6		-6
Input IP3 (dBm) AGC ON Min		3		3		3		3
SFDR**(dB)		64		66		64		70
Max Intermodulation Distortion (dBm)	--30		-13		-13		-13	
Max NF(dB)		20		20		20		20
Gain Flatness (dB)	±2.0		±2.0		±2.0		±2.0	

* Factory set mean gain BU to RHU when RIU is not used. May be field adjusted using system controller.

** SFDR for CDMA services is calculated in 100Kb/sec

RF Parameters per Band

1200 add-on RF parameters per service								
1200 Add-on	CDMA 1900		GSM 1900		TDMA 1900		UMTS	
Max Output Power per antenna port	D	U	D	U	D	U	D	U
1 (composite)	20		21		21		18	
2 carriers	18		18		18		14	
4 carriers	13		15		15		11	
8 carriers	10		12		12		8	
12 carriers	8		10		10		6	
Mean Gain(dB)*	20	3	20	3	20	3	18	3
Pin (dBm)	0		1		1		0	
Max. Intermodulation Distortion [dBm]	-13		-13		-13		***	
Input IP3 (dBm) AGC OFF Min		-7		-7		-7		-7
Input IP3 (dBm) AGC ON Min		3		3		3		3
SFDR (dBm)*	66		64		69		66	
Max Nf (dB)		20		20		20		20
Gain Flatness (dB)	±2.0							

*Factory set mean gain BU-RHU when RIU is not used. May be field adjusted using system controller.

** SFDR for CDMA services is calculated in 100Kb/sec

***UMTS complies with 3GPP TS 25.106 V5.0.0 (2002-03) table 9.4 spectrum emission mask

RF Frequency Range			
Services	Frequency Range		Band Width
	Uplink	Downlink	
CDMA 800	824-849	869-894	1.25MHz
WCDMA 800	824-849	869-894	5MHz
TDMA 800	824-849	869-894	30KHz
GSM 800	824-849	869-894	200KHz
iDEN 800 Nextel	806-824	851-869	25KHz
GSM 900	896-915	935-960	200KHz
iDEN 900 Nextel	896-901	929-941	25KHz
GSM 1800	1710-1785	1805-1880	200KHz
CDMA 1900	1850-1910	1930-1990	1.25MHz
TDMA 1900	1850-1910	1930-1990	30KHz
GSM 1900	1850-1910	1930-1990	200KHz
WCDMA 1900	1850-1910	1930-1990	5MHz
UMTS 2100	1920-1980	2110-2170	5MHz

Supported Services

TDMA 800/1900
 CDMA 800/1800/1900
 GSM 900/1800/1900
 IDEN 800, SMR 900, Paging 900
 WCDMA

Absolute Maximum Rating

Total Input RF Power to BU:	10 dBm
Total Input RF Power to RU:	
Out-of-band	20 dBm
Inband	-10 dBm
Power Supply:	60 VDC

Fiber Optic Specifications

Optical output power	<3.0 mW
Max. Optical budget	2 dB
Optical loss per mated-pair connectors:	0.5dB (max)
Optical Connector	SC/APC
Fiber type	9/125 SM
Wavelength	1310±10nm
Maximum distance between Base Unit and Remote Cabinet	2Km

Power

Supply to Base Units, Remote Unit 2000, RIUs and MA 410/430: 20-48VDC
 Supply to 1200 add-on: 25-48VDC

Consumption:

- 2000 Cabinet	25W
- 2000 Lite	4W
- Base Unit	14W
- Remote Unit 2000	25W
- Add-on MA 1200	50W
- RIU	12W
- MA 410/430	10W

MA 410/430 Remote Management

- Remote SNMP management from a single location
- Client/server management capability over TCP/IP network with enhanced monitoring and control capabilities.

RF Connections

To RF source
 (Base Unit and RIU): N-type Female, 50 ohm
 To antennas: N-type Female, 50 ohm
 Intermodule: SMA Female, 50 ohm

Physical Specification

Dimensions (HxWxD)

2000 Cabinet	355 x 482.6 x 397mm (13.97" x 19" x 15.63")
2000 Lite	442 x 336 x 86.41mm (17.4" x 13.23" x 3.4")
Base Unit	48.26 x 4.44 x 29.97cm (19" x 1U x 11.8")
RIU	48.26 x 13.32 x 29.97cm (19" x 3U x 11.8")
MA 410/430	48.26x4.44x29.97cm (19"x1Ux11.8")

Weight

2000 Cabinet (four modules)	35Kg (77lb)
2000 Lite	5.5Kg (12.1lb)
BU	2.82 Kg (6.2lb)
RIU (3 BTSC)	8.7Kg (19lb)
MA 410/430	2.6Kg (5.8lb)

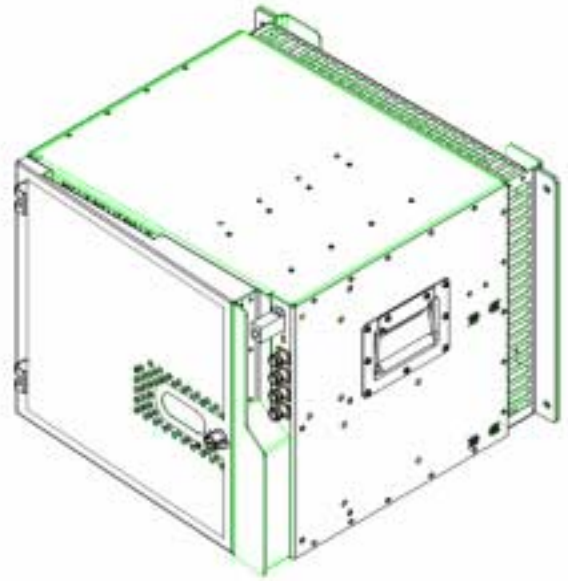
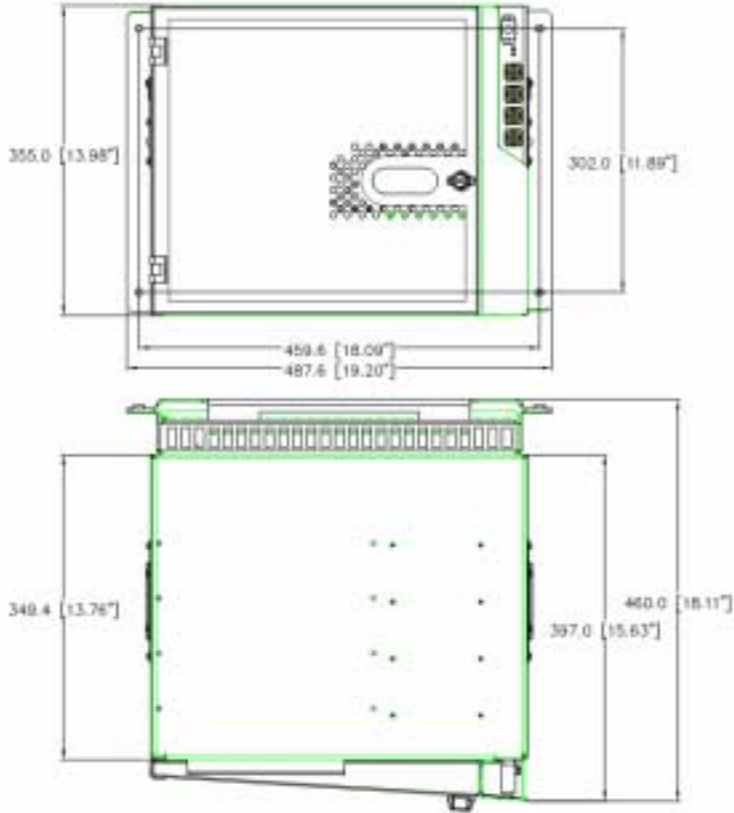
Temperature

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

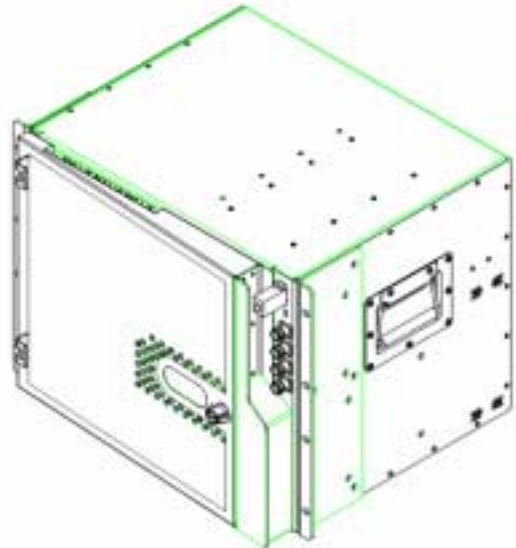
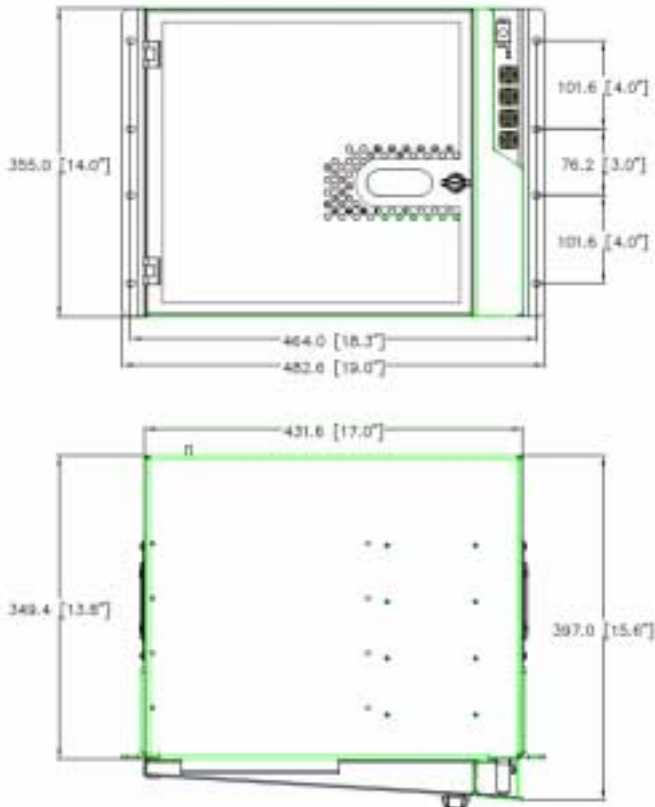
Standards and Approvals

USA – FCC-47CFR, parts 2,15, 22, 24,90
 Canada – IC
 UL 60950

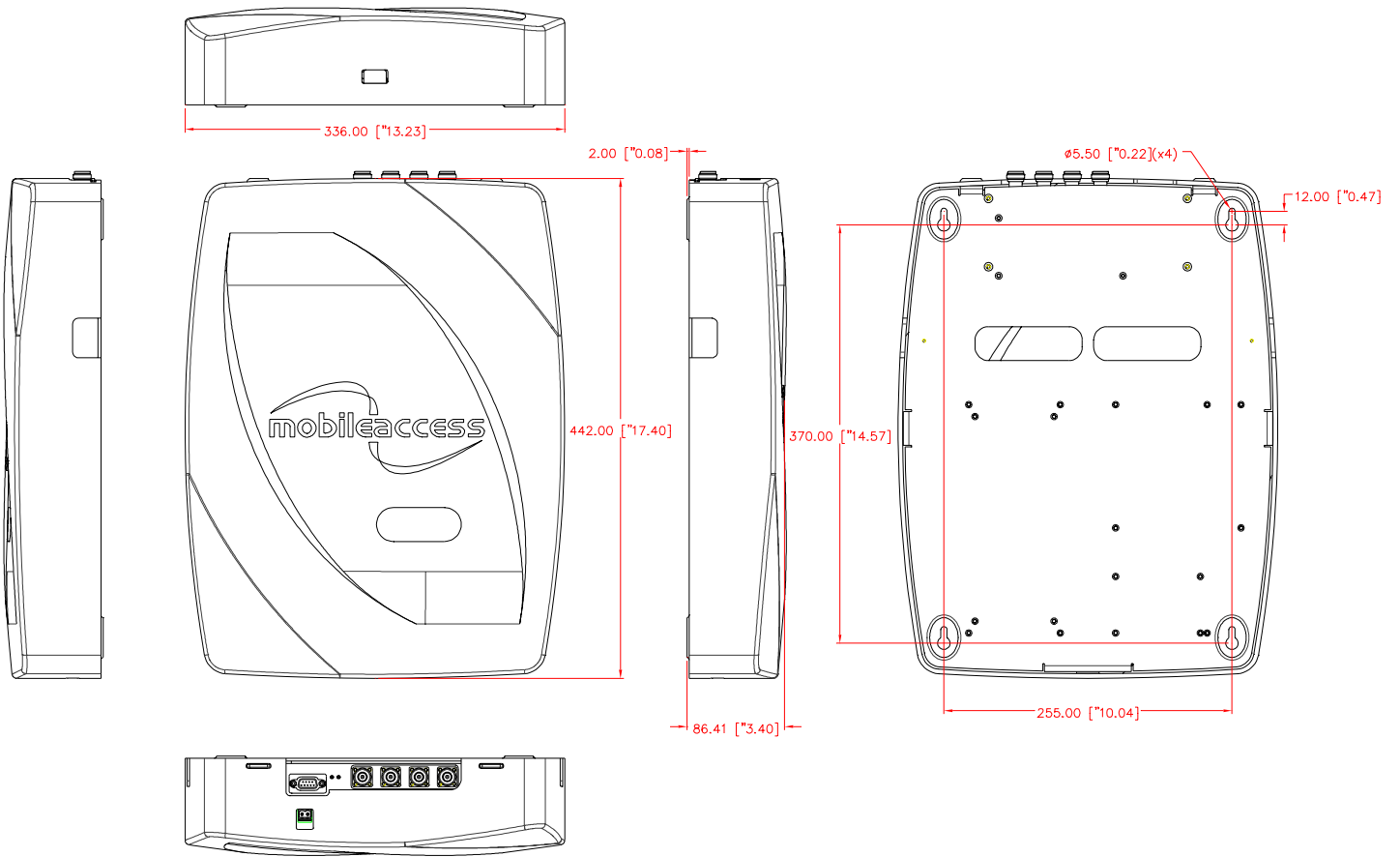
MA 2000 Wallmount



MA 2000 Rackmount



MA 2000 Lite



Enclosures	
RC-RP-2000	- Remote Cabinet, remote powering
RC-LP-2000	- Remote Cabinet, local powering
MINI-ENC-2000	- 2000 enclosure supporting 2 modules
Dual Band RF Modules, add-on ready	
2000-CELL-PCSE	- Dual Band Cell/PCS for cabinet
2000-IDEN-SMR	- Dual Band iDEN/SMR for cabinet Nextel
2000-CELL-DCSE	- Dual Band Cell/DCS for cabinet
2000-GSM-DCSE	- Dual band GSM/DCS for cabinet
2000-GSMO-DCSE	- Dual band GSM Orange/DCS for cabinet
2000-GSM-DCSE-I	- Dual Band Cell/DCS for cabinet Indonesia
2000-CELL-PCSE-I	- Dual Band Cell/PCS for cabinet Indonesia
2000-CELL-PCSE-L	- Dual Band Cell/PCS for Lite
2000-IDEN-SMR -L	- Dual Band iDEN/SMR for Lite Nextel
2000-CELL-DCS-L	- Dual Band Cell/DCS for Lite for Lite
2000-GSMO-DCSE-L	- Dual Band GSM/DCS for Lite
2000-GSM-DCSE-L	- Dual Band GSM Orange/DCS for Lite
2000-GSM-DCSE-IL	- Dual Band Cell/DCS for Lite Indonesia
2000-CELL-PCS-IL	- Dual Band Cell/PCS for Lite Indonesia
MobileAccess 1200 RHUs	
1200-PCS-AO-CB	- Add-on RHU - PCS service for cabinet
1200-UMTS-AO-CB	- Add-on RHU - UMTS service for cabinet
1200-PCS-AO-LT	- Add-on RHU - PCS service for Lite
1200-UMTS-AO-LT	- Add-on RHU - UMTS service for Lite

MobileAccess Universal Base Units	
WB-B8U	Wide Band Base 8 Unit supporting 8 RHUs
WB-B4U	Wide Band Base 4 Unit supporting 4 RHUs

Network Controller	
410	Network Controller – Serial Interface (dial-up)
430	Network Controller –Ethernet/IP Interface

Network Management System	
NMS-SW-SERVER	GUI and server S/W package (one per site)
NMS-SW-MFEE	NMS annual S/W maintenance fee (per 430-CTLR)

MobileAccess Radio Interface Unit (RIU)	
RIU-IM	Radio Interface Unit
RIU-BTSC-CELL	BTS Conditioner for Cellular
RIU-BTSC-IDEN	BTS Conditioner for iDEN
RIU-BTSC-PCS	BTS Conditioner for PCS
RIU-BTSC-SMR	BTS Conditioner for SMR-Paging
RIU-BTSC-GSM	BTS Conditioner for GSM 900MHz
RIU-BTSC-GSM-O	BTS Conditioner for GSM 900MHz for Orange
RIU-BTSC-DCS	BTS Conditioner for DCS 1800MHz
RIU-BTSC-UMTS	BTS Conditioner for UMTS 2100MHz
RIU-BDAC-CELL	BDA Conditioner for Cellular
RIU-BDAC-IDEN	BDA Conditioner for iDEN
RIU-BDAC-PCS	BDA Conditioner for PCS
RIU-BDAC-SMR	BDA Conditioner for SMR-Paging
RIU-BDAC-GSM	BDA Conditioner for GSM 900MHz
RIU-BDAC-GSM-O	BDA Conditioner for GSM 900MHz for Orange
RIU-BDAC-DCS	BDA Conditioner for DCS 1800MHz
RIU-L-ESMR-SMR1	RIU Lite ESMR 800,SMR 900
RIU-L-CELL-PCS1	RIU Lite Cellular 800,PCS 1900

Power Supply	
LPS-48V-40W	Local AC/DC Converter 40W
LPS-48V-100W	Local AC/DC Converter 100W
RPS-200-N-48	Non-redundant 200W 110/220V Wall Mount. <i>Not to be used in North America</i>
RPS-500-R-48	Redundant 500W 110/220V Chassis Mount. <i>Not to be used in North America.</i>
RPS-1000-R-48	Redundant 1000W 110/220V Chassis Mount
RPS-14-50W-48	Remote power supply,14 modules of 50W,48V
RPS-14-100W-48	Remote power supply,14 modules of 100W,48V
RPS-6M-220	Remote power supply enclosure,6 Modules,220v in-48VDC. <i>Not to be used in North America</i>
RPS-600W-220	Remote power supply module 600W/48VDC,220V in <i>Not to be used in North America</i>
RPS-1200W-220	Remote power supply module 1200W/48VDC,220V in <i>Not to be used in North America</i>

MobileAccess Ltd. Vienna, Virginia Tel: +1-703-848-0200

MobileAccess Ltd. Lod, Israel Tel: +972-8-9183888

<http://www.MobileAccess.com>