



## MA 2000 Converged In-building Coverage System

MA 2000 LITE



MA 2000 MRC



**MobileAccess™-2000** series provides enterprise level indoor coverage, of a wide range of multi-operator wireless services over a single broadband infrastructure.

Front-end wireless RF services are routed, over optic fibers, to MA 2000 series hubs that are securely located in remote telecommunication closets at each remote location.

These modular service aggregation platforms precisely combine multiple wireless service signals for simultaneous distribution over a common broadband infrastructure. Two remote service hub models are available:

- **MA-2000 Lite** – provides low-cost, low-risk entry level coverage for two *Remote Units* with or without 1200 Add on units.
- **MA-2000 Cabinet (MRC)** – provides coverage for total of up to five *Remote Units*.

The Voice **Remote Units (RUs)** are service specific modules that perform the optic to RF conversion, filtering and amplification at the remote locations. Each RU can support two services.

### Features

- Multi-service platform that accommodates virtually any mix of wireless voice and data services eliminating the need for separate overlay networks
- Scalable and future-safe – services can be added and removed without affecting existing operators or end-users
- MA-2000 Lite components can be migrated to MA-2000 MRC for increased capacity
- All active components are located in the communication closet/room
- Carrier class operation – MA 2000 advanced signal handling ensures optimal performance for all services within a multi-operator deployment
- Local and remote end-to-end monitoring and control through interface to MA 410/430 controllers
- Conditioning and monitoring of input RF signals at the head-end through interface to MA-RIU

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

- **MA 2000 Lite/MRC** – provide service aggregation and interface support for service specific units.
- **Remote Units (RUs)** – service specific modules that perform the optic to RF (and vice versa) conversion, filtering and amplification at the remote locations. Each RU can support two services.
- **MA 1200 Add-on Units** – Single service unit that can be integrated onto an RU for an additional service.
- **MA Base Units (BUs)** – essential units that perform the RF to optic conversion at the head-end.

Optional elements – for more information see product specific data sheets.

- **BTS/BDA Interface (RIU)** – provides conditioning and remote control of a number of services signals at the head-end. Optimizes coverage.
- **MA 850** – a WiFi AP Switching Hub that enables converging 802.11a/b/g services with cellular services.
- **MA Network Management System (MA NMS)** – enables remote management of all MA 2000 elements from a *single location*.

The figure shows an example of an MA 2000 system supporting five services from two operators. Each service is routed via F/O cables to the corresponding RUs housed in or supported by the hubs. Wi-Fi (802.11a/b/g) data services may be converged with the cellular services at the remote locations by adding a MA850.

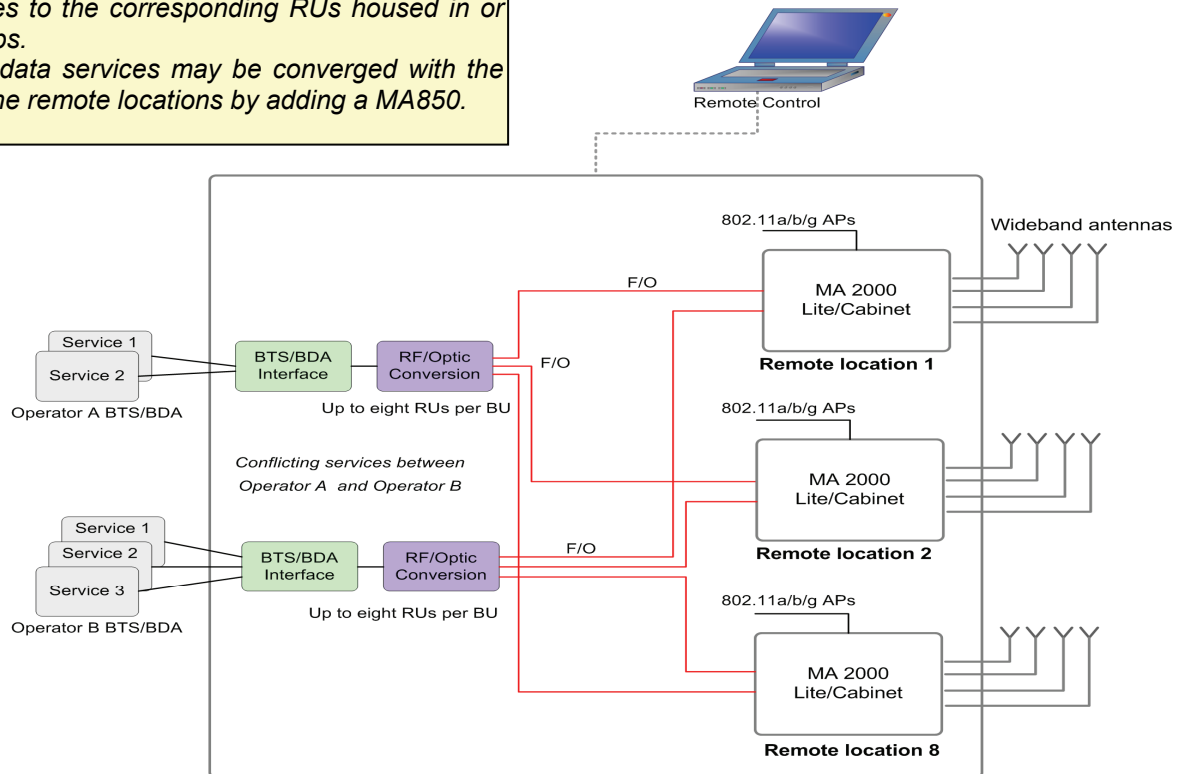


Figure-1 – Example of MA 2000 Architecture

## RF Parameters per Band

RF Parameters Low Band												
RU 2000	CELL TDMA/CDMA /WCDMA		SMR 800		iDEN 800 Sprint		GSM		SMR 900		iDEN 900 Sprint	
	D	U	D	U	D	U	D	U	D	U	D	U
Max output PWR per antenna port												
1 (comp)	16		14		10		12		14		10	
2 carriers	13		11		7		9		11		7	
4 carriers	10		8		4		6		8		4	
8 carriers	7		5		1		3		5		1	
12 carriers	5		3		-1		1		3		-1	
Mean Gain(dB)*	16	7	14	7	10	7	12	7	14	7	10	7
Pin (dBm)*	0		0		0		0		0		0	
Input IP3 (dBm) AGC OFF Min		-5		-5		-5		-5		-5		-5
Input IP3 (dBm) AGC ON Min		5		5		5		5		5		5
SFDR** (dB)		71		72		72		64		71		71
Max Intermod Distortion (dBm)	-13		-13		-13		-36		-13		-13	
Max Nf (dB)		20		20		20		20		20		20
Gain Flatn. (dB)	± 2.0											

RF Parameters High Band						
RU 2000	DCS		PCS CDMA/WCDMA		PCS GSM/TDMA	
	D	U	D	U	D	U
Max output PWR per antenna port						
1 (comp)	14		14		16	
2 carriers	11		11		13	
4 carriers	8		9		10	
8 carriers	5		6		7	
12 carriers	3		4		5	
Mean Gain(dB)*	14	3	14	3	14	3
Pin (dBm)*	0		0		2	
Input IP3 (dBm) AGC OFF Min		-6		-6		-6
Input IP3 (dBm) AGC ON Min		3		3		3
SFDR** (dB)		64		66		64
Max Intermod Distortion (dBm)	-30		-13		-13	
Max Nf (dB)		20		20		20
Gain Flatn. (dB)	± 2.0					

\*Factory set mean gain BU-RHU without RIU. May be field adjusted using system controller.

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

## RF Parameters per Band

1200 ADD-ON	PCS CDMA/WCDMA		PCS GSM/TDMA		UMTS***	
	D	U	D	U	D	U
Max output PWR per antenna port						
1 (comp)	20		21		18	
2 carriers	17		18		14	
4 carriers	14		15		11	
8 carriers	11		12		8	
12 carriers	9		10		6	
Mean Gain(dB)*	20	3	20	3	18	3
Pin (dBm)*	0		1		0	
Input IP3 (dBm) AGC OFF Min		-7		-7		-7
Input IP3 (dBm) AGC ON Min		3				3
SFDR** (dB)	66		64		66	70
Max Intermod Distortion (dBm)	-13		-13		***	
Max Nf (dB)		20		20		20
Gain Flatn. (dB)	± 2.0					

\*Factory set mean gain BU-RHU without RIU. May be field adjusted using system controller.

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

\*\*\* UMTS Compiles with 3GPP TS 25.106 V5.0.0 (2002-03) Table 9.4 spectrum emission mask

### RF Frequency Ranges

Services	Frequency Range	
	Uplink	Downlink
CELL	824-849	869-894
iDEN	806-824	851-869
GSM	890-915	935-960
Telstra 850M	824-849	869-890
SMR	896-902	929-941
DCS	1710-1785	1805-1880
PCS	1850-1910	1930-1990
UMTS 2100	1920-1980	2110-2170

## Absolute Maximum Rating

Total Input RF Power to BU	10dBm
Total Input RF Power to RU	20dBm out-of-band -10dBm in-band
Power Supply VDC	60VDC

## Fiber Optic Specifications

Optical output power	<3.0mW
Max. Optical budget	2 dB for fiber + 1 dB for connectors (assumed) = 3 dB total
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

## 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

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

**NOTE:** This datasheet provides detailed information on the Base Units, MA 2000 Lite/MRC, MA RUs and MA 1200 remote units. Information on MA 850, MA RIU and MA NMS (controller and management application) is provided in the corresponding datasheets.

## MA 2000 MRC Remote Hub



**Figure -2. MA 2000 MRC (local powering model)**

Supported Units	: A total of up to five Remote Units (one being a MA 1200 Add-on module) (not including MA 850 which is installed externally)
RF antenna connections	: Four N-type female antenna connections
Input power	
Local powering	: 230 VAC, 115 VAC (an AC/DC converter is built into the chassis).
Remote powering	: 20 to 48VDC to external connectors on chassis
Power consumption	: 25W
Physical	
Mounting	: Wallmount and rackmount
Dimensions	: 355 x 482.6 x 397mm (13.97" x 19" x 15.63" )
Weight (4 modules)	: ~35Kg (~77 lb)

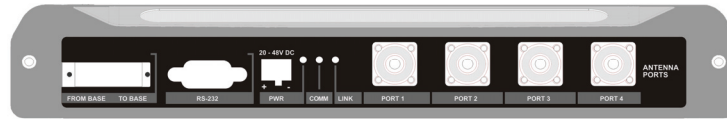
## MA 2000 Lite



**Figure -3. MA 2000 Lite**

Supported Units	: External connections to two Remote Units (MA 1200 Add-ons each unit)
RF antenna connections	: Four N-type female antenna connections
Power consumption	: 3W max (housing only with no remote units)
Physical	
Mounting	: Wallmount
Dimensions	: 442 x 336 x 86.41mm (17.4" x 13.23" x 3.4" )
Weight	: 5.5Kg (12.1lb)

## MA2000 Remote Unit



**Figure -4. MA RU 2000**

Supported services	: Two services corresponding to the model
Power:	
Input power	: 20 to 48V DC
Power consumption	: 29W
RF connections	: To Antenna (via hub) - N-type Female, 50 ohm : To MA 1200 add-on - SMA 50 ohm
Optic connections	: SC/APC optic connections
Remote management	: SNMP, NMS via Base Unit connection to MA 410/430 controller.

## MA 1200 Add-on Specifications



**Figure -5. RHU 1200 Add-on**

Supported services	: Single service corresponding to the model
RF Connections:	: To RHU - SMA 50 ohm
Power:	
Input power	: 25-48VDC
Power consumption	: 50W
Remote management	: SNMP, NMS via RHU connection

## Base Unit Specifications



**Figure -6. Base Unit – 8-port model**

Models:	4-port model, 8-port model (illustrated above)
Supported services:	Wideband device supporting all services supported by MA systems
RF (total Input):	10 dBm max
Power:	
Input power	20 to 48V DC
Power consumption	14W (8-port BU)
RF connections	N-type Female, 50 ohm – interface to RIU or to passive BTS interface N-type Female, 50 ohm – interface to antennas
Optic connections	Four or eight (depending on the model) SC/APC optic connections
Remote management	SNMP, NMS via connection to MA 410/430 controller.
Physical	
Dimensions	48.26x4.44x29.97cm (19"x1Ux11.8")
Weight	2.82Kg (6.2lb)

<b>Remote HUBs</b>	
RC-RP-2000	- Remote Cabinet, remote powering
RC-LP-2000	- Remote Cabinet, local powering
MINI-ENC-2000	- 2000 enclosure supporting 2 modules
<b>Dual Band RF Modules, add-on ready</b>	
<b>2000 Cabinet</b>	
2000-CELL-DCSE	Dual band Cell/DCS 1 port for cabinet, enhanced power
2000-CELL-PCSE	Dual band Cell/PCS 1 port for cabinet, enhanced power
2000-GSMO-DCSE	Dual band GSM Orange/DCS 1port for cabinet, enhanced power
2000-IDEN-SMR	Dual band iDEN/SMR for cabinet
<b>2000 Lite</b>	
2000-CELL-DCSEL	Dual band Cell/DCS 1 port for Lite, enhanced power
2000-CELL-PCSEL	Dual band Cell/PCS 1 port for Lite, enhanced power
2000-GSM-DCSEL	Dual band GSM/DCS 1 port for Lite, enhanced power
2000-GSMO-DCSEL	Dual band GSM Orange/DCS 1 port for Lite, enhanced power
2000-IDEN-SMR-L	Dual band iDEN/SMR for Lite
2000-CELL-DCSLT	Dual band Cell/DCS 1 port for Lite enhanced power for Telstra
2000-GSM-DCSLT	Dual band GSM/DCS 1 port for Lite enhanced power for Telstra
<b>MobileAccess 1200 Add On</b>	
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

<b>MobileAccess Universal Base Units</b>	
WB-B8U	Wide Band Base 8 Unit supporting 8 RHUs
WB-B4U	Wide Band Base 4 Unit supporting 4 RHUs

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

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



<b>MobileAccess Radio Interface Unit (RIU)</b>	
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
RIUL-ESMR-SMR-P1	RIU Lite for iDEN800 ,SMR900 and PCS 1900 supporting 1 BU8
RIU-L-CELL-PCS1	RIU Lite Cellular 800,PCS 1900

<b>Power Supply</b>	
LPS-48V-66W	Local AC/DC Converter 66W
LPS-48V-100W	Local AC/DC Converter 100W

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