

# MobileAccessHX High-Power DAS Remote Unit

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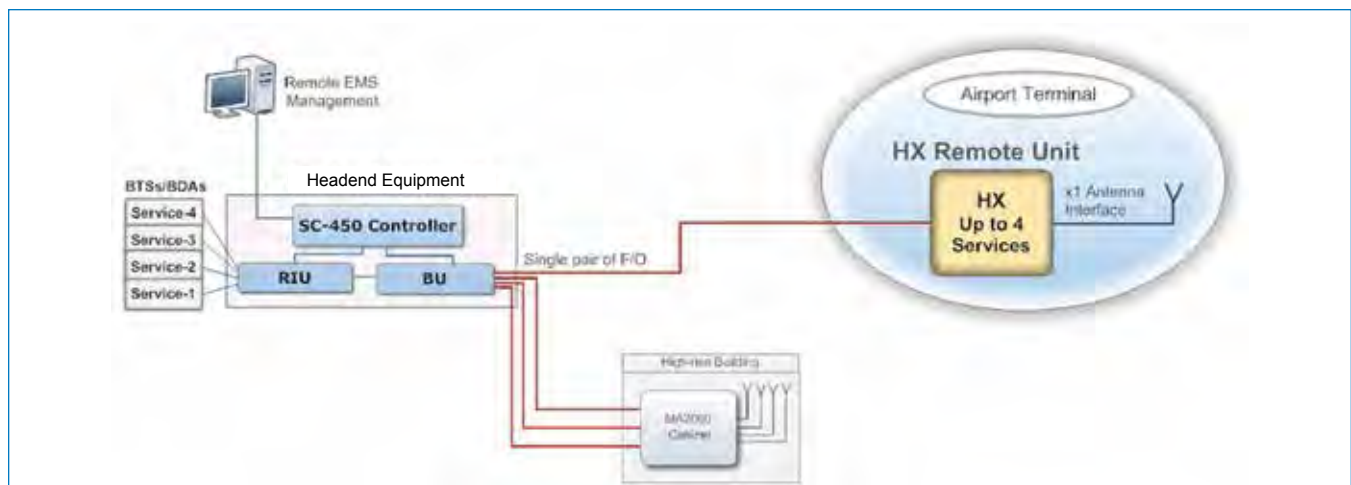
## features and benefits |

<b>Multiservice platform</b>	Accommodates GSM, UMTS, HSPA, LTE, EDGE, EV-DO, AWS and more
	Provides MIMO configuration for LTE700, AWS and UMTS band
<b>Cost-effective high power</b>	Optimizes and reduces the number of antennas required to cover open areas by offering up to 33 dBm (2 W) composite power per frequency band
<b>Indoor models</b>	Support either SISO or MIMO service in a single compact enclosure
<b>Outdoor models</b>	Outdoor enclosures are compliant to IP65/NEMA standard
<b>Operator-grade operation</b>	Advanced signal handling and management ensures operator-grade performance in multi-operator deployments
<b>Design and deployment flexibility</b>	Remote unit supports both SM and MM fiber connections and are available in AC or DC power supply options  Antenna splitting schemes are possible due to the higher power output capability
<b>Backward compatible</b>	Connects to existing MobileAccess1000 or MobileAccess2000 deployment (shares a common headend and EMS in a single deployment)

MobileAccessHX is a high-power, remote solution for the MobileAccess1000 (MA1000) and MobileAccess2000 (MA2000) Distributed Antenna Systems (DAS). It is a fiber-fed, compact and scalable multiservice platform designed to complement the MA1000 and MA2000 while providing complete RF open space coverage for large-scale public venues such as campuses, stadiums, convention centers, hotels, airports and train stations. The solution can be deployed in new sites or alongside existing MA1000 and MA2000 systems, sharing a common headend and element management system (EMS).

MobileAccessHX supports multiple wireless technologies and operator services over a single broadband infrastructure. Using low-loss fiber optic cabling, remote units can cover distances of up to 2 km from the BTS signal sources at the headend.

Alongside MA1000 and MA2000 deployments, MobileAccessHX provides a comprehensive indoor and outdoor coverage solution for varying site requirements, supporting everything from high-rise building and campus topologies to stadiums and airports. HX indoor MIMO takes full advantage of MIMO technology by using spatial multiplexing to deliver higher spectral efficiency and prevent quality degradation while significantly increasing throughput on the same spectrum.



MobileAccessHX – SISO Architecture with an Existing MA2000/MA1000 Sharing a Common Headend | Figure 1

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## system architecture |

MobileAccessHX provides a complete solution consisting of HX remote units at the remote locations and headend elements that are shared with any MobileAccess1000 or MobileAccess2000 system that is either installed or being installed at the site.

In the downlink, at the headend, the BTS or BDA signal is conditioned by the RIU, ensuring a constant RF level. The conditioned signal is then converted by the base unit to an optical signal for transport over single-mode or multimode fiber to the HX remote units, which are located at the remote locations. In the uplink, the process is reversed. The system controller (SC-450) enables local and remote management, as well as controls all MA1000, MA2000 and HX elements from a single, centralized location.

The MobileAccessHX Remote Unit (indoor-SISO/MIMO and outdoor-SISO models) consists of a compact enclosure housing the RF module, power elements and required interfaces. The RF module supports three bands (GSM, DCS and UMTS) and two types of quad bands (Type 1: LTE700, CELL, PCS and AWS or Type 2: CELL, EGSM, DCS and UMTS). All mobile services are combined and distributed through a single antenna port over antennas installed at the remote locations.



Headend: System Controller, Base Unit, RIU | Figure 2



Remote-end Indoor Units: SISO/MIMO | Figure 3



Remote-end: Outdoor | Figure 4

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## specifications |

### Supported Services

Services	Band	Frequency Range (MHz)	
		Uplink (UL)	Downlink (DL)
CDMA/WCDMA**/TDMA/GSM	CELL800	824-849	869-894
CDMA/WCDMA**/TDMA/GSM	PCS1900	1850-1915	1930-1995
WCDMA**/HSPA/LTE	AWS2100	1710-1755	2110-2155
LTE	700MHz	698-716 and 776-787	728-757
GSM/GPRS/WCDMA/HSPA/LTE*	EGSM900	880-915	925-960
GSM/GPRS/WCDMA/HSPA/LTE*	DCS1800	1710-1785	1805-1880
WCDMA/HSPA/LTE*	UMTS2100	1920-1980	2110-2170

\* WCDMA service is based on 3GPP standards, LTE service may be deployed in the future due to frequency re-farming planned by the operators.

\*\* WCDMA service is based on 3GPP2 CDMA2000 standards.

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## specifications | (continued)

### RF Parameters per Service

LTE 700 MHz		
RF Parameter	DL	UL
Frequency Range (MHz)	728-757	698-716 776-787
Maximum Output Power Per Antenna Port		
1 (Composite)	33	
2 Operators	30	
4 Operators	27	
8 Operators		
Mean Gain (dB) <sup>1</sup>	33	11
Pin (dBm) <sup>1</sup>	0	
Input IP3 (dBm) AGC OFF Typical		-10
Maximum Intermod Distortion (dBm)	-13**	
NF (dB) Typical		10
Gain Flatness/Ripple (dB) <sup>2</sup>	+/-1.5 <sup>3</sup>	

CELL TDMA/CDMA/WCDMA 800 MHz		
RF Parameter	DL	UL
Frequency Range (MHz)	869-894	824-849
Maximum Output Power Per Antenna Port		
1 (Composite)	33	
2 Operators	30	
4 Operators	27	
8 Operators	24	
Mean Gain (dB) <sup>1</sup>	33	11
Pin (dBm) <sup>1</sup>	0	
Input IP3 (dBm) AGC OFF Typical		-10
Maximum Intermod Distortion (dBm)	-13**	
NF (dB) Typical		10
Gain Flatness/Ripple (dB) <sup>2</sup>	+/-1.5	

PCS CDMA/WCDMA 1900 MHz		
RF Parameter	DL	UL
Frequency Range (MHz)	1930-1995	1850-1915
Maximum Output Power Per Antenna Port		
1 (Composite)	33	
2 Operators	30	
4 Operators	27	
8 Operators	24	
Mean Gain (dB) <sup>1</sup>	33	11
Pin (dBm) <sup>1</sup>	0	
Input IP3 (dBm) AGC OFF Typical		-10
Maximum Intermod Distortion (dBm)	-13*	
NF (dB) Typical		10
Gain Flatness/Ripple (dB) <sup>2</sup>	+/-2.0	

AWS CDMA/WCDMA 2100 MHz		
RF Parameter	DL	UL
Frequency Range (MHz)	2110-2155	1710-1755
Maximum Output Power Per Antenna Port		
1 (Composite)	33	
2 Operators	30	
4 Operators	27	
8 Operators	24	
Mean Gain (dB) <sup>1</sup>	33	11
Pin (dBm) <sup>1</sup>	0	
Input IP3 (dBm) AGC OFF Typical		-10
Maximum Intermod Distortion (dBm)	-13*	
NF (dB) Typical		10
Gain Flatness/Ripple (dB) <sup>2</sup>	+/-2.0	

\* 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 to FCC.

<sup>1</sup>Factory set mean gain BU-HX without RIU. May be field adjusted using controller system.

<sup>2</sup>Gain flatness/ripple is specified for the non-duplexed port of the system.

<sup>3</sup>Gain flatness/ripple at any block of the spectrum.

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## specifications | (continued)

### RF Parameters per Service

GSM E-GSM 900 MHz		
RF Parameter	DL	UL
Frequency Range (MHz)	925-960	880-915
<b>Maximum Output Power Per Antenna Port</b>		
1 (Composite)	29	
2 Operators	26	
4 Operators	23	
8 Operators	20	
Mean Gain (dB) <sup>1</sup>	29	11
Pin (dBm) <sup>1</sup>	0	
Input IP3 (dBm) AGC OFF Typical		-10
Maximum Intermod Distortion (dBm)	-36*	
NF (dB) Typical		10
Gain Flatness/Ripple (dB) <sup>2</sup>	+/-1.5	

DCS 1800 MHz		
RF Parameter	DL	UL
Frequency Range (MHz)	1805-1880	1710-1785
<b>Maximum Output Power Per Antenna Port</b>		
1 (Composite)	32	
2 Operators	29	
4 Operators	26	
8 Operators	23	
Mean Gain (dB) <sup>1</sup>	32	11
Pin (dBm) <sup>1</sup>	0	
Input IP3 (dBm) AGC OFF Typical		-10
Maximum Intermod Distortion (dBm)	-30*	
NF (dB) Typical		10
Gain Flatness/Ripple (dB) <sup>2</sup>	+/-2.0	

UMTS 2100 MHz		
RF Parameter	DL	UL
Frequency Range (MHz)	2110-2170	1920-1980
<b>Maximum Output Power Per Antenna Port</b>		
1 (Composite)	29	
2 Operators	26	
4 Operators	23	
8 Operators	20	
Mean Gain (dB) <sup>1</sup>	29	11
Pin (dBm) <sup>1</sup>	0	
Input IP3 (dBm) AGC OFF Typical		-10
Maximum Intermod Distortion (dBm)	-13*	
NF (dB) Typical		10
Gain Flatness/Ripple (dB) <sup>2</sup>	+/-2.0	

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

<sup>1</sup>Factory set mean gain BU-HX without RIU. May be field-adjusted using controller system.

<sup>2</sup>Gain flatness/ripple is specified for the non-duplexed port of the system.

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## specifications | (continued)

### Optical

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

### Physical

#### Indoor Remote Unit

<b>Ports</b>	<ul style="list-style-type: none"><li>• One SC APC fiber-optic pair connector</li><li>• One N-Type female 50 Ohm connector for antenna (two connectors for MIMO models)</li><li>• One Power Connector for 110/220 VAC power feed or four power connectors for up to four direct 48 VDC power feeds</li><li>• One D-Type 9-pin RS-232 connector for local craft</li></ul>
<b>Power</b>	<ul style="list-style-type: none"><li>• Local power (AC) or remote DC power feed options: 90-264 VAC or 36-75 V DC</li><li>• Maximum power consumption: 350 W (SISO models), 500 W (MIMO models)</li></ul>

#### Physical Dimensions

<b>Mounting</b>	Wall or rack
<b>Dimensions (H x W x D) in (mm)</b>	13.8 x 16.9 x 14.9 (350 x 429 x 378)
<b>Weight kg (lb)</b>	<ul style="list-style-type: none"><li>• Three Services SISO configuration: 30 (66)</li><li>• Four Services SISO configuration: 32 (71)</li><li>• Two SISO + Two MIMO Services configuration: 42 (92)</li></ul>
<b>Cooling Feature</b>	Active heat dissipation (fan)

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### Physical

#### Outdoor Remote Unit

<b>Ports</b>	<ul style="list-style-type: none"><li>• Two SC APC fiber optic waterproof connectors</li><li>• One N-Type female 50 Ohm connector for antenna</li><li>• One 3-pin power waterproof connector for 110/220 VAC power feed or one 8-pin waterproof power connectors for up to four direct 48 VDC power feeds</li><li>• One 10-pins waterproof connector for local craft</li></ul>
<b>Power</b>	<ul style="list-style-type: none"><li>• Local power (AC) or remote DC power feed options: 90-264 VAC or 36-75 V DC</li><li>• Max power consumption: 340 W</li></ul>
<b>Physical Dimensions</b>	
Mounting	Wall or pole
Dimensions (H x W x D) in (mm)	17.5 x 24.1 x 11.4 (440 x 610 x 290)
Weight kg (lb)	40 (88)
<b>Cooling Feature</b>	Passive heat dissipation (heat sink)

### Environmental

#### Indoor Remote Unit

<b>Temperature</b>	<ul style="list-style-type: none"><li>• Operating: 0° to +50°C (32° to 122°F)</li><li>• Storage: -20° to 85°C (-4° to 185°F)</li></ul>
<b>Humidity</b>	10 to 95 percent, non-condensing

#### Outdoor Remote Unit

<b>Temperature</b>	<ul style="list-style-type: none"><li>• Operating: -30° to +65°C (-22° to 149°F)</li><li>• Storage: -20° to 85°C (-4° to 185°F)</li></ul>
<b>IP65/NEMA Enclosure Protected from Elements and Waterproofing</b>	IP65

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### Standards and Approvals

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<b>Laser Safety</b>	<ul style="list-style-type: none"><li>• CDRH 21 CFR 1040.10, 1040.11 (except for deviations per notice No. 50, July 26, 2001)</li><li>• IEC 60825-1, Amendment 2 (January 2001)</li><li>• EN 60825-1</li></ul>
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#### CE

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Radio Equipment and Systems	<ul style="list-style-type: none"><li>• EN 301 502 – for GSM/EGSM frequency bands</li><li>• EN 300 609 – for DCS frequency band</li><li>• EN 301 908 – for UMTS frequency band</li></ul>
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EMC	EN 301 489
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#### FCC

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Radio Equipment and Systems	<ul style="list-style-type: none"><li>• FCC 47 CFR Part 22 – for CELL frequency band</li><li>• FCC 47 CFR Part 24 – for PCS frequency band</li><li>• FCC 47 CFR Part 27 – for 700 LTE and AWS frequency bands</li></ul>
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EMC	FCC 47 CFR Part 15 Subpart B
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<b>Safety</b>	<ul style="list-style-type: none"><li>• EN 60950; UL 60950</li><li>• CAN/CSA-C22.2 No.60950</li></ul>
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## Indoor Units (SISO and MIMO)

Service Supported	Part Number	Description
<b>CELL/PCS/700LTE/AWS SISO Services</b>	HX-C85P19L70A17-AC-A	MobileAccessHX Quad-service Indoor CELL, PCS, AWS and 700 MHz LTE Solution supporting local AC power, SMF and MMF
	HX-C85P19L70A17-DC-A	MobileAccessHX Quad-service Indoor CELL, PCS, AWS and 700 MHz LTE Solution supporting remote DC power, SMF and MMF
<b>CELL/PCS/700LTE-MIMO/ AWS-MIMO</b>	HX-C85P19L70MA17M-AC-A	MobileAccessHX Quad-service Indoor CELL, PCS, AWS MIMO and 700 MHz LTE MIMO Solution supporting local AC power, SMF and MMF
	HX-C85P19L70MA17M-DC-A	MobileAccessHX Quad-service Indoor CELL, PCS, AWS MIMO and 700 MHz LTE MIMO Solution supporting remote DC power, SMF and MMF
<b>CELL/GSM/DCS/UMTS SISO Services</b>	HX-C85G91D18U21-AC-A	MobileAccessHX Quad-service Indoor CELL, GSM Partner, DCS and UMTS Solution supporting local AC power, SMF and MMF
	HX-C85G91D18U21-DC-A	MobileAccessHX Quad-service Indoor CELL, GSM Partner, DCS and UMTS Solution supporting remote DC power, SMF and MMF
<b>GSM/DCS/UMTS SISO Services</b>	HX-G90D18U21-AC-A	MobileAccessHX Tri-service Indoor GSM, DCS and UMTS Solution supporting local AC power, SMF and MMF
	HX-G90D18U21-DC-A	MobileAccessHX Tri-service Indoor GSM, DCS and UMTS Solution supporting remote DC power, SMF and MMF
<b>GSM/DCS/UMTS MIMO Services</b>	HX-G90MD18U21M-AC-A	MobileAccessHX Tri-service Indoor GSM MIMO, DCS and UMTS MIMO Solution supporting local AC power, SMF and MMF
	HX-G90MD18U21M-DC-A	MobileAccessHX Tri-service Indoor GSM MIMO, DCS and UMTS MIMO Solution supporting remote DC power, SMF and MMF
	HX-G90D18MU21M-AC-A	MobileAccessHX Tri-service Indoor GSM, DCS MIMO and UMTS MIMO Solution supporting local AC power, SMF and MMF
	HX-G90D18MU21M-DC-A	MobileAccessHX Tri-service Indoor GSM, DCS MIMO and UMTS MIMO Solution supporting remote DC power, SMF and MMF

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ordering information | (continued)

## Indoor Units (SISO and MIMO)

Service Supported	Part Number	Description
<b>GSM/DCS/UMTS MIMO Services</b>	HX-G90MD18MU21-AC-A	MobileAccessHX Tri-service Indoor GSM MIMO, DCS MIMO and UMTS Solution supporting local AC power, SMF and MMF
	HX-G90MD18MU21-DC-A	MobileAccessHX Tri-service Indoor GSM MIMO, DCS MIMO and UMTS Solution supporting remote DC power, SMF and MMF

## Outdoor Units (SISO services)

Service Supported	Part Number	Description
<b>CELL/PCS/700LTE/AWS SISO Services</b>	HX-C85P19L70A17-AC-B	MobileAccessHX Quad-service Outdoor CELL, PCS, AWS and 700 MHz LTE Solution supporting local AC power, SMF and MMF
	HX-C85P19L70A17-DC-B	MobileAccessHX Quad-service Outdoor CELL, PCS, AWS and 700 MHz LTE Solution supporting remote DC power, SMF and MMF
<b>CELL/GSM/DCS/UMTS</b>	HX-C85G91D18U21-AC-B	MobileAccessHX Quad-service Outdoor CELL, GSM Partner, DCS and UMTS Solution supporting local AC power, SMF and MMF
	HX-C85G91D18U21-DC-B	MobileAccessHX Quad-service Outdoor CELL, GSM Partner, DCS and UMTS Solution supporting remote DC power, SMF and MMF
<b>GSM/DCS/UMTS</b>	HX-G90D18U21-AC-B	MobileAccessHX Tri-service Outdoor GSM, DCS and UMTS Solution supporting local AC power, SMF and MMF
	HX-G90D18U21-DC-B	MobileAccessHX Tri-service Outdoor GSM, DCS and UMTS Solution supporting remote DC power, SMF and MMF

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## Optical Central Hub (OCH) – HX International Products

Part Number	Description
<b>OCH-HX-4-MMF</b>	Optical Central Hub for SISO services, supporting four SISO HX units, MMF
<b>OCH-HX-4-SMF</b>	Optical Central Hub for SISO services, supporting four SISO HX units, SMF
<b>OCH-HX-8-MMF</b>	Optical Central Hub for SISO or MIMO Services, supporting eight SISO or four MIMO HX units, MMF
<b>OCH-HX-8-SMF</b>	Optical Central Hub for SISO or MIMO Services, supporting eight SISO or four MIMO HX units, SMF

## Accessories

Part Number	Description
<b>AK-HXOD-FP-CAB-AC-5M</b>	HX Outdoor fiber optic and AC Power Cable with industrial connectors, 5 m
<b>AK-HXOD-FP-CAB-AC-50M</b>	HX Outdoor fiber optic and AC Power Cable with industrial connectors, 50 m
<b>AK-HXOD-FP-CAB-AC-100M</b>	HX Outdoor fiber optic and AC Power Cable with industrial connectors, 100 m
<b>AK-HXOD-FP-CAB-AC-200M</b>	HX Outdoor fiber optic and AC Power Cable with industrial connectors, 200 m
<b>AK-HXOD-FP-CAB-DC-5M</b>	HX Outdoor fiber optic and DC Power Cable with industrial connectors, 5 m
<b>AK-HXOD-FP-CAB-DC-50M</b>	HX Outdoor fiber optic and DC Power Cable with industrial connectors, 50 m
<b>AK-HXOD-FP-CAB-DC-100M</b>	HX Outdoor fiber optic and DC Power Cable with industrial connectors, 100 m
<b>AK-HXOD-FP-CAB-DC-200M</b>	HX Outdoor fiber optic and DC Power Cable with industrial connectors, 200 m

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notes |

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