

# MobileAccessHX High-Power DAS Remote Unit

A Corning  
MobileAccess  
Solutions Product

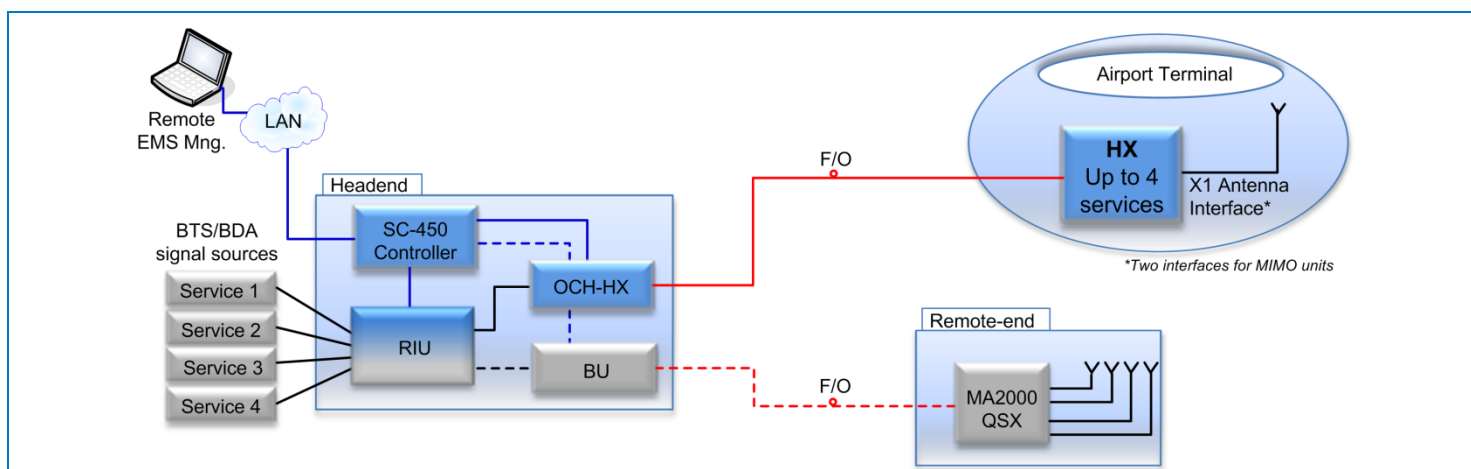
## features and benefits

<b>Multi-service 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 (2W) composite power per frequency band
<b>Indoor models</b>	Supports 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>Backwards compatible</b>	Connects to an 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 multi-service 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 will support 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 buildings 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 preventing the degradation of quality while significantly increasing throughput on the same spectrum.



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

# MobileAccessHX High-Power DAS Remote Unit

A Corning  
MobileAccess  
Solutions Product

## 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 that houses the RF module, power elements and the 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 or UMTS). All mobile services are combined and distributed through a single antenna port over antennas installed at the remote locations.



Headend: System Controller, OCH, RIU

Figure 2



Remote-end Indoor Units: SISO/MIMO

Figure 3



Remote-end Outdoor

Figure 4

# MobileAccessHX High-Power DAS Remote Unit

A Corning  
MobileAccess  
Solutions Product

## specifications

### Supported Services

Services	Frequency Range		
	Band	Uplink (UL)	Downlink (DL)
CDMA / WCDMA** / TDMA / GSM	CELL850	824-849	869-894
CDMA / WCDMA** / TDMA / GSM	PCS1900	1850-1915	1930-1995
WCDMA** / HSPA	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.

# MobileAccessHX High-Power DAS Remote Unit

A Corning  
MobileAccess  
Solutions Product

## specifications (continued)

### RF Parameters per Service

LTE 700 MHz		
RF Parameter	DL	UL
Frequency Range (MHz)	728-757	698-716 776-787
Max 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
Max Intermod Distortion (dBm)	-13**	
NF (dB) Typical		10
Gain Flatness/Ripple (dB) <sup>2</sup>	+/-1.5	

CELL TDMA/CDMA/WCDMA 850 MHz		
RF Parameter	DL	UL
Frequency Range (MHz)	869-894	824-849
Max 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
Max 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
Max 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
Max 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
Max 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
Max 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.

# MobileAccessHX High-Power DAS Remote Unit

A Corning  
MobileAccess  
Solutions Product

## specifications (continued)

### RF Parameters per Service

GSM E-GSM 900 MHz		
RF Parameter	DL	UL
Frequency Range (MHz)	925-960	880-915
Max Output Power Per Antenna Port (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
Max 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
Max Output Power Per Antenna Port (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
Max 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
Max 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
Max 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.

# MobileAccessHX High-Power DAS Remote Unit

A Corning  
MobileAccess  
Solutions Product

## specifications | (continued)

### Optical Specifications

<b>Optical Output Power</b>	< 3.0 mW
<b>Max. Optical Budget</b>	2 dB for fiber + 1 dB for connectors (assumed) = 3 dB total. 300m Multimode
<b>Optical Loss per Mated-pair Connectors</b>	0.5 dB (max)
<b>Optical Connector</b>	Indoor: SC/APC Outdoor: Corning Optitap
<b>Fiber Type</b>	Single-mode: 9/125 $\mu$ m Multimode: 50/125 $\mu$ m or 62.5/125 $\mu$ 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

Ports	<ul style="list-style-type: none"><li>• (1) SC APC Fiber-optic Pair Connector or (2) for MIMO models</li><li>• (1) N-Type female 50<math>\Omega</math> connector for antenna or (2) connectors for MIMO models</li><li>• (1) Power Connector (model dependent):<ul style="list-style-type: none"><li>• AC models: (1) power connector for 90-264V AC power feed</li><li>• DC models: (1) Power Connector for 25-48V DC power feeds</li></ul></li><li>• (1) D-Type 9 pin RS-232 connector (or two for MIMO models) for local craft</li></ul>
Power	<ul style="list-style-type: none"><li>• Local Power (AC) or Remote DC power feed options: 90-264 VAC or 25-48V DC</li><li>• Max Power Consumption: 350 W (SISO models), 500 W (MIMO models)</li></ul>

#### Physical Dimensions

Mounting	Wall and Rack
Dimensions (HxWxD)in (mm)	13.8 x 16.9 x 14.9 (350 x 429 x 378)

# MobileAccessHX High-Power DAS Remote Unit

A Corning  
MobileAccess  
Solutions Product

## specifications | (continued)

### Physical (continued)

#### Indoor Remote Unit (continued)

Weight kg (lb)	<ul style="list-style-type: none"><li>• (3) Services SISO configuration: 30 (66)</li><li>• (4) Services SISO configuration: 32 (71)</li><li>• (2) SISO + (2) MIMO Services Configuration: 42 (92)</li></ul>
<b>Cooling Feature</b>	Active heat dissipation (Fan)

### Physical

#### Outdoor Remote Unit

Ports	<ul style="list-style-type: none"><li>• (1) N-Type female 50Ω connector for antenna</li><li>• (1) 10-pin RS232 waterproof connector for local craft</li><li>• (2) Corning Optitap fiber optic waterproof connectors (1 for UL and 1 for DL)</li><li>• (1) Waterproof power connector – model dependent:<ul style="list-style-type: none"><li>• AC model: 1-20UNEF, plug, 3-pin waterproof, solder for panel, power connector for 100/240 VAC power feed</li><li>• DC model: 1-20UNEF, plug, 8-pin waterproof , solder for panel, power connector for 25-48 VDC power feed</li></ul></li></ul>
Power	<ul style="list-style-type: none"><li>• AC or DC power feed options (model dependent): 100/240 VAC or 25-48V DC</li><li>• Max Power Consumption: 340 W</li></ul>
<b>Physical Dimensions</b>	
Mounting	Wall or Pole
Dimensions (HxWxD) 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)

# MobileAccessHX High-Power DAS Remote Unit

A Corning  
MobileAccess  
Solutions Product

## specifications (continued)

### Environmental Specifications

#### 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 90%, 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: -30° to 85°C (-22° to 185°F)</li></ul>
<b>IP65/NEMA Enclosure Protected from Elements and Waterproofing</b>	IP65

### Standards and Approvals

<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>
---------------------	---

<b>CE</b>	
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 301 893 – for WLAN 802.11a EN 301 908 – for UMTS Frequency Band</li></ul>
EMC	EN 301 489

<b>FCC</b>	
Radio Equipment and Systems	FCC 47 CFR Part 22 – for CELL Frequency Band FCC 47 CFR Part 24 – for PCS Frequency Band FCC 47 CFR Part 27 – for 700 LTE and AWS Frequency Bands
EMC	FCC 47 CFR Part 15 Subpart B

<b>Safety</b>	<ul style="list-style-type: none"><li>EN 60950; UL 60950</li><li>CAN/CSA-C22.2 No.60950</li></ul>
---------------	---



# MobileAccessHX High-Power DAS Remote Unit

A Corning  
MobileAccess  
Solutions Product

## Ordering information

### 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-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
<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

# MobileAccessHX High-Power DAS Remote Unit

A Corning  
MobileAccess  
Solutions Product

## Ordering information (continued)

### 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

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

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