

The logo consists of a solid blue square with the word "CORNING" written in white, uppercase, sans-serif font centered within it.

CORNING

GX 40 W Quad-Band Remote Unit

User Manual

Warranties

Hardware Warranty

Corning Optical Communications LLC (“Corning”) warrants to the original purchaser (“Customer”) that for the duration of the warranty period, one (1) year, commencing on the date of shipment of the Hardware, unless otherwise agreed in writing by Corning (the “Hardware Warranty Period”), the Hardware furnished by Corning shall be free in all material respects from defects in material and workmanship, and shall conform to the applicable portions of the Specifications, as defined below (the “Hardware Warranty”). If notified by Customer of any such defects in material or workmanship or nonconformity with applicable portions of the Specifications within the Hardware Warranty Period, Corning shall promptly, at its own election and expense, repair or replace any such Hardware proven to be defective under the terms of this Hardware Warranty.

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If Customer invokes this Hardware Warranty, it shall notify Corning promptly of the claimed defect.

Customer will allow Corning to inspect the Hardware at Customer’s location, or to return the Hardware to Corning’s closest repair facility. For Hardware returned to Corning’s repair facility, Customer shall be responsible for payment of all transportation and freight costs (including insurance) to Corning’s repair facility, and Corning shall be responsible for all transportation and freight costs (including insurance) incurred in connection with the shipment of such Hardware to other repair facilities of Corning and/or its return to Customer.

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Corning does not warrant any hardware, software or services not provided by Corning.

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Returns

In the event that it is necessary to return any product against above warranty, the following procedure shall be followed:

1. Return authorization is to be received from Corning prior to returning any unit. Advise Corning of the model, Serial number, and discrepancy. The unit may then be forwarded to Corning, transportation prepaid. Devices returned collect or without authorization may not be accepted.
2. Prior to repair, Corning will advise the customer of our test results and any charges for repairing customer-caused problems or out-of-warranty conditions etc.
3. Repaired products are warranted for the balance of the original warranty period, or at least 90 days from date of shipment.

Reporting Defects

The units were inspected before shipment and found to be free of mechanical and electrical defects. Examine the units for any damage that may have been caused in transit. If damage is discovered, file a claim with the freight carrier immediately. Notify Corning as soon as possible in writing.

Note: Keep all packing material until you have completed the inspection

Limitations of Liabilities

Corning's liability on any claim, of any kind, including negligence for any loss or damage arising from, connected with, or resulting from the purchase order, contract, quotation, or from the performance or breach thereof, or from the design, manufacture, sale, delivery, installation, inspection, operation or use of any equipment covered by or furnished under this contact, shall in no case exceed the purchase price of the device which gives rise to the claim.

Except as expressly provided herein, Corning makes no warranty, expressed or implied, with respect to any goods, parts and services provided in connection with this agreement including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Corning shall not be liable for any other damage including, but not limited to, indirect, special or consequential damages arising out

Of or in connection with furnishing of goods, parts and service hereunder, or the performance, use of, or inability to use the: goods, parts and service.

Technical Support Contact

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• FAX: 703-848-0280 • Tech Support Hotline: 800-787-1266 •
www.corning.com/mobileaccess<<http://www.corning.com/mobileaccess>>

Warnings and Admonishments

There may be situations, particularly for workplace environments near high-powered RF sources, where recommended limits for safe exposure of human beings to RF energy could be exceeded. In such cases, restrictive measures or actions may be necessary to ensure the safe use of RF energy.

The equipment has been designed and constructed to prevent, as far as reasonably, practicable danger. Any work activity on or near equipment involving installation, operation or maintenance must be, as far as reasonably, free from danger.

Where there is a risk of damage to electrical systems involving adverse weather, extreme temperatures, wet, corrosive or dirty conditions, flammable or explosive atmospheres, the system must be suitably installed to prevent danger.

Equipment provided for the purpose of protecting individuals from electrical risk must be suitable for the purpose and properly maintained and used. This covers a range of activities including lifting, lowering, pushing, pulling, carrying, moving, holding or restraining an object, animal or person from the equipment. It also covers activities that require the use of force or effort, such as pulling a lever, or operating power tools.

Where some of the abovementioned activities are required, the equipment must be handled with care to avoid being damaged.

Observe standard precautions for handling ESD-sensitive devices. Assume that all solid-state electronic devices are ESD-sensitive. Ensure the use of a grounded wrist strap or equivalent while working with ESD-sensitive devices. Transport, store, and handle ESD-sensitive devices in static-safe environments.

Regulatory Compliance Information



WARNINGS!

- This is **NOT** a **CONSUMER** device. It is designed for installation by **FCC LICENCEES** and **QUALIFIED INSTALLERS**. You **MUST** have an **FCC LICENSE** or express consent of an FCC Licensee to operate this device. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of \$100,000 for each continuing violation.
- **ANTENNAS:** Use only authorized and approved antennas, cables and/or coupling devices! The use of unapproved antennas, cables or coupling devices could cause damage and may be of violation of FCC regulations. The use of unapproved antennas, cables and/or coupling devices is illegal under FCC regulations and may subject the user to fines. See section 2.1.5 of this document.

RF Safety



WARNING! To comply with FCC RF exposure compliance requirements, each individual antenna used for this transmitter must be installed to provide a separation distance greater than 157 cm or more from all persons during normal operation and must not be co-located with any other antenna for meeting RF exposure requirements.

The design of the antenna installation needs to be implemented in such a way so as to ensure RF radiation safety levels and non-environmental pollution during operation.



WARNING! Antenna gain should not exceed 12.5 dBi.



WARNING! Each individual antenna used for this transmitter must be installed to provide a separation distance greater than 400 cm or more from all persons and must not be co-located with any other antenna for meeting RF exposure requirements.



WARNING! The design of the antenna installation needs to be implemented in such a way so as to ensure RF radiation safety levels and non-environmental pollution during operation.

Compliance with RF safety requirements:

- Corning products have no inherent significant RF radiation.
- The RF level on the downlink is very low at the downlink ports. Therefore, there is no dangerous RF radiation when the antenna is not connected.

Laser Safety

Fiber optic ports of the GX system emit invisible laser radiation at the 1310/1550 nm wavelength window. The laser apertures /outputs are the green SC/APC Bulkhead adapters located on the front panel of the equipment.

The product is Class 1/Hazard level 1

External optical power is less than 10mW, Internal optical power is less than 500mW.

To avoid eye injury never look directly into the optical ports, patch cords or optical cables. Do not stare into beam or view directly with optical instruments. Always assume that optical outputs are on.

Only technicians familiar with fiber optic safety practices and procedures should perform optical fiber connections and disconnections of GX devices and the associated cables.

GX has been tested and certified as a “Class 1” Laser product to IEC/EN 60825-1(2007). It also meets the requirements for a Hazard Level 1 laser product to IEC/EN 60825-2: 2004 to the same degree.

GX complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice NO.50 (2007).

The product itself has been tested and certified as a Class 1 Laser product to IEC/EN 60825-1 (2007). It also meets the requirements for a Hazard Level 1 laser product to IEC/EN 60825-2: 2004 to the same degree.

Care of Fiber Optic Connectors

Do not remove the protective covers on the fiber optic connectors until a connection is ready to be made. Do not leave connectors uncovered when not connected.

The tip of the fiber optic connector should not come into contact with any object or dust.

Standards and Certifications

Corning products have met the approvals of the following certifying organizations:

Category	Standards
Safety:	CB: IEC 60950; NRTL: UL 60950; CAN/CSA: C22.2 NO 60950
EMC:	ETSI: EN 301489; FCC: Part 15 subpart B
Radio:	ETSI: EN 301908; EN 301502; EN 300609 FCC: Part 22, 24, 27
ISO:	ISO 9001: 2000 and ISO 13485: 2003

About this Guide

This Installation Guide describes how to perform the physical installation of the GX unit. The installation procedures of other units (e.g. RIU, OCH-GX, SC-450) relevant to the system are detailed in their user manuals (see Additional Relevant Documentation below).

Additional Relevant Documents

The following documents are required if the corresponding units are included in your system.

Document Name
RIU Installation and Configuration Guide
FT350 Installation Guide (includes OCH-GX information)
System Controller User Manual (SC-450 v5.4 and higher)
MA Software Version Update Tool

List of Acronyms

Term	Meaning
BDA	Bi-Directional Amplifier
BTS	Base Transceiver Station
BTSC	Base Transceiver Station Conditioner
BU	Base Unit
DL	Downlink
OCH-GX	(Dedicated GX) Optical Central Hub
RU	Remote (Hub)Unit
RIU	Radio Interface Unit
UL	Uplink

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1 Introduction

GX quad-band remote (“GX”) offers a cost-effective 40 W (46 dBm) high power remote outdoor coverage solution for MA2000 distributed antenna systems (DAS).

GX is a fiber-fed, multi-frequency, multi-operator remote designed to complement the MA2000 lower power, standard remotes. GX can also be installed as a dedicated solution for new sites, providing complete RF coverage options for open indoor, tunnel and adjacent outdoor spaces.

Using low loss fiber optic cabling, GX quad-band remotes can distribute multiple BTS signal sources for LTE700/CELL/ESMR/PCS1900/EAWS2100 to multiple remote locations from 2 to 15 km from the headend to remotes. GX efficiently supports all operator modulations with linear multi-carrier power amplifier (MCPA) up to 40 W.

GX remotes share a common equipment head end and element management system (EMS) with other remotes on the MA1K/MA2K platform.

GX offer high RF power coverage capabilities with compact design for added spaces savings and weather resistant enclosures to fit various site needs.



Figure 1-1. GX Quad-Band Remote Unit

Key Features and Capabilities

- **Multi-Frequency/Multi-Service RF Transport Platform:** Accommodates CDMA, GSM, UMTS, HSPA, LTE, EDGE, EV-DO technologies and more. Four model-dependent bands per enclosure
- **Cost-Effective Higher Power:** Optimizes and reduces the number of antennas required to cover open and outdoor areas by offering 46 dBm composite power per frequency band
- **Operator-Grade Operation:** Advanced signal handling and management ensures operator-grade performance.
- **Unique, space-saving non-obtrusive design:** Blends into the environment and avoids costly tower builds outdoors when covering campus scenarios, parking lots, tunnels and indoor-adjacent outdoor spaces.
- **Designed to withstand harsh environments** - Fully sealed remote unit (RU) enclosure ensures superior performance in harsh environments and worry-free electronics maintenance. Compliant to NEBS OSP Class 4 rated
- **Management and control** – alarm forward to NOC or standard EMS via SNMP, software controlled output power and optical link auto gain control

1.1 System Architecture

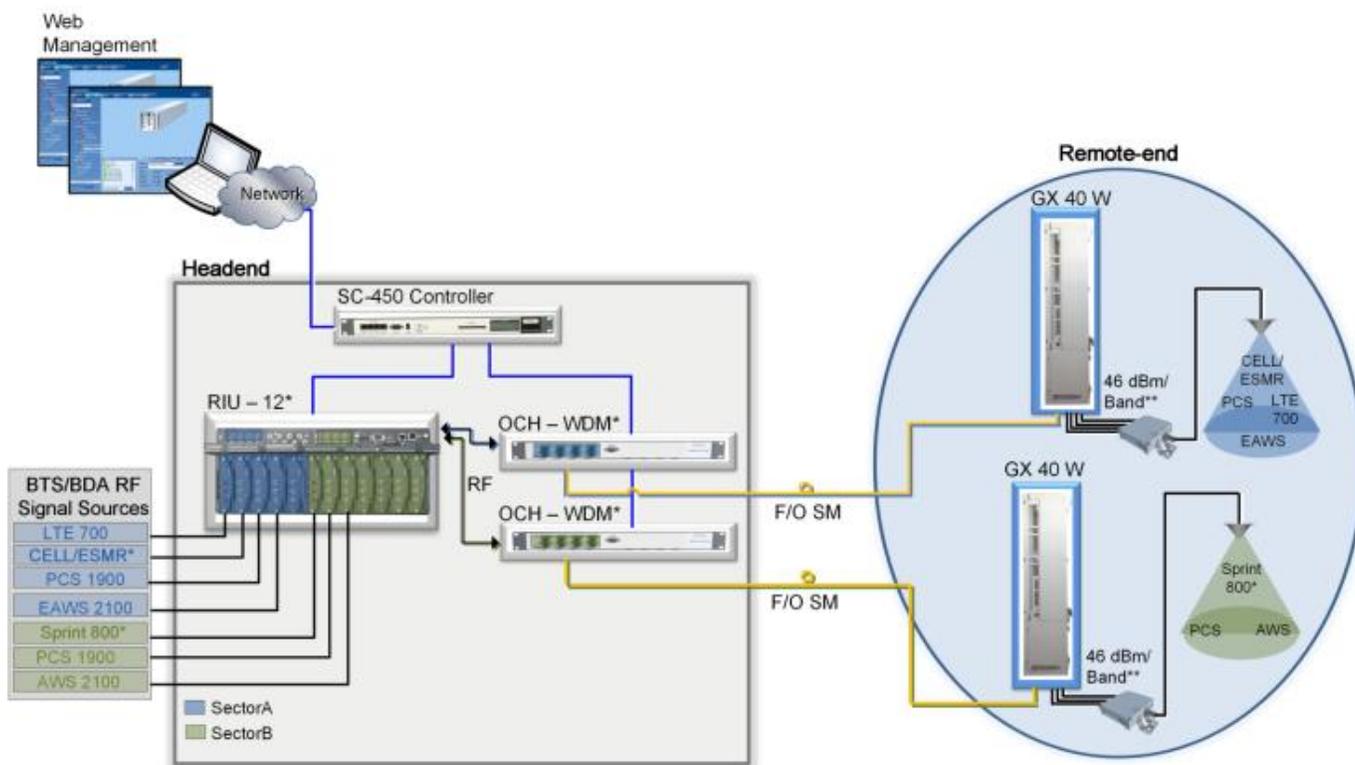
GX provides a complete solution consisting of GX-Quad remote units at the remote locations, and head end elements, which are shared with any existing or new MA1000/MA2000 deployment. GX consists of a uniquely designed, non-obtrusive unit that includes all of the required RF, fiber optic and power interfaces. All mobile services are distributed through service/band dedicated RF connection ports over antennas installed at the remote locations.

IMPORTANT! GX quad-band models GX-E17E85P19L70-40-AC and GX-E17E85P19L70-40-DC do not support coexistence with other GX models. These must be connected to a different RIU or different sector (for RIU-12) and to a different optical module of the OCH. Connecting these GX models to the same RF paths as other GXs may result in a VSWR alarm.

1.1.1 SISO Scenario

Figure 1-2 illustrates a scenario including one GX quad-band remote and one GX tri-band remote. Note that all site elements are managed and controlled via a single SC-450 controller (software version 5.4 and higher) that enables local and remote management, and provides single-source, centralized common headend controls of all installed elements.

For the GX path, at the headend, the BTS or BDA signal is conditioned by the RIU, ensuring a constant RF level. The conditioned RF electrical signal is then converted by the optical central hub (OCH) to an optical signal for transport to/from multiple GX remotes, over low-loss fiber cabling.



*In installations including a GX supporting the CELL band and a GX supporting the Sprint800 band, the CELL and Sprint service signals must be conditioned via two independent sectors in the RIU-12 (i.e., SectorA and SectorB in Figure 2) and routed through dedicated optical modules in the OCH. Note the following:

- Installations with RIU-4 units require a dedicated RIU-4 per GX model
- Either an OCH-4 unit per GX or an OCH-8 (supporting two separate optical modules) is used

**External Combiner Insertion Loss of 1.0 dB

Figure 1-2. GX SISO Architecture

1.1.3 Signal Path

In the downlink path, combined RF signals (from up to four supported services) from the radio interface unit (RIU) are converted into optical signals by the OCH. The optical signals are then transmitted to the GX at the remote site via optical fiber. The signals are filtered and amplified at the GX and transmitted through the service specific output ports to the broadband antennas.

In the uplink path, GX converts the RF signals transmitted from the service antennas into optical signals. The signals are transmitted via optical fiber to the OCH which then converts the optical signals back to RF signals.

The optical DL and UL signal are transmitted in a single optical fiber based on the wavelength division technology (WDM).

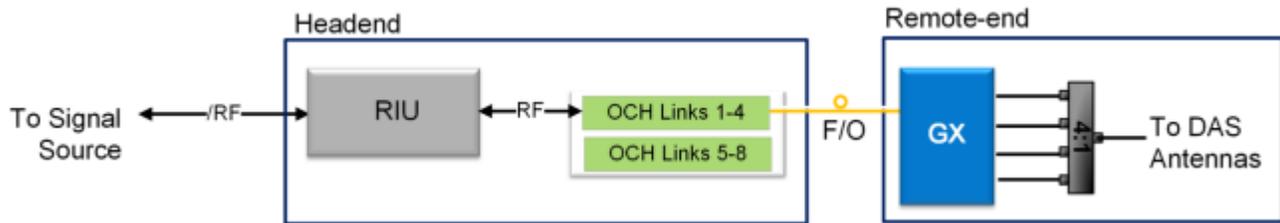


Figure 1-4. GX Functional Block Diagram

1.2 System Monitoring and Management

The GX-Quad Remote Unit is centrally managed via the MobileAccess SC-450 Controller.

Note: The GX Quad-band solution is supported by SC-450 v5.4 and higher.

The GX remote is not connected directly to the controller; it is connected to the OCH-GX element (that is connected to the controller). Thus, the controller monitors views and manages the GX via the OCH-GX, hosting the GX unit.

The following shows the Configuration tab of the selected GX unit. The system configuration and management is described in the SC-450 user manual (v5.4 and higher).

Note: The EAWS band is supported from software version 7.4 and higher.

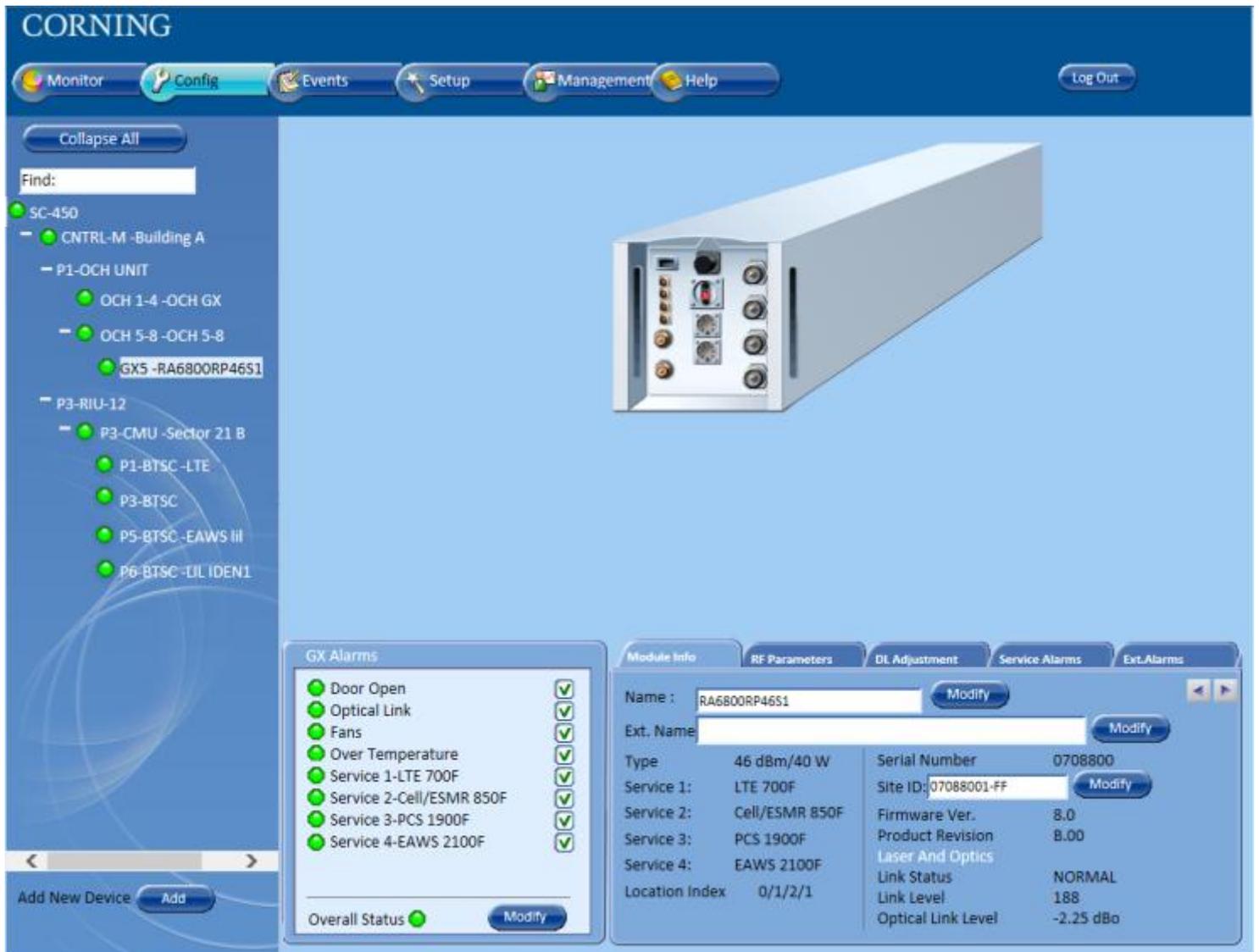


Figure 1-5. Example of GX Quad-Band Remote Configuration Tab (software v7.4)

1.3 GX Quad-Band Remote Interfaces

All of the GX interfaces (except for the power connector) are located externally on the underside of the unit (facing down when unit is mounted). The unit interfaces include the RF, power, optical link and external alarms connections. The power connector is located in a separate side panel.

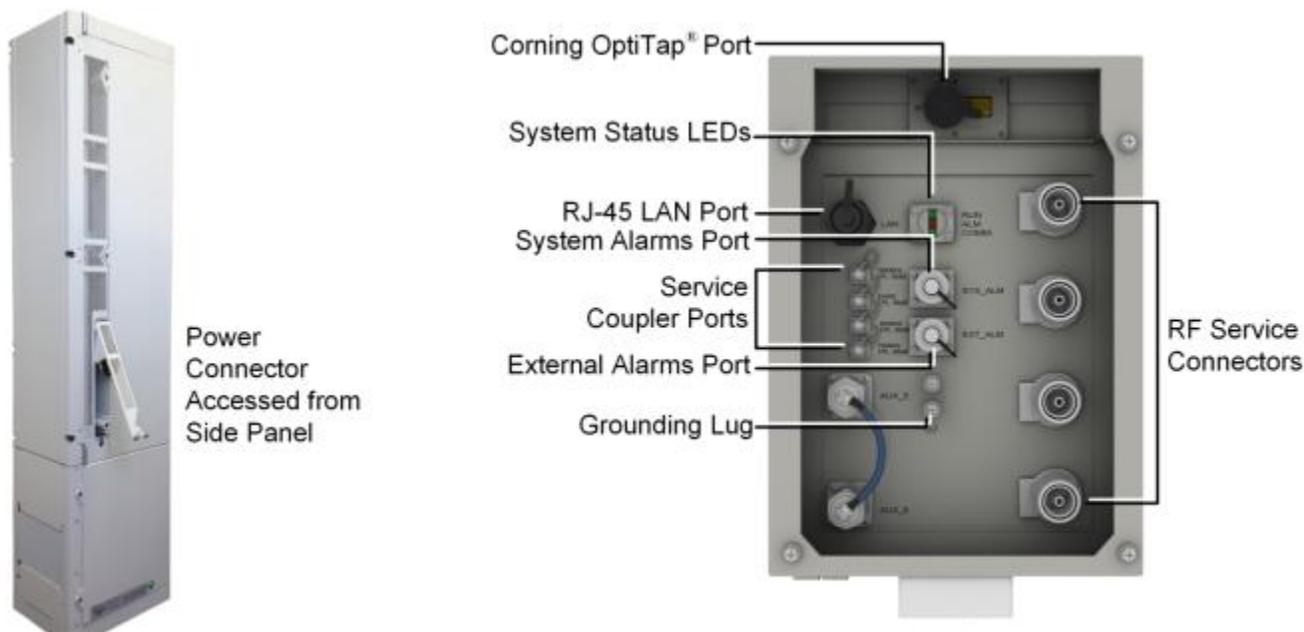


Figure 1-6. Example of GX Quad-Band Remote (AC) Interfaces – Side Panel (Left) and Underside (Right)

Table 1-1 and Table 1-2 provide descriptions of the GX-Quad connectors and LEDs.

Interface	Description
Service Connectors	Service specific RF DIN female connectors to antennas (or external combiner)
OP	Corning OptiTap™ fiber-optic waterproof connector – connects to OCH-GX-XR using Corning OptiTap to SC APC cable (ordered separately). IMPORTANT! OptiTap™ pullout force ranges from a few lbs to 50+ lbs with the dust cap or connector installed. This prevents damages caused to the DAS unit.
Power Connector (side panel)	Power feed option is model dependent: <ul style="list-style-type: none"> Local power feed (AC) option: 100-240 V AC; 47-63 Hz; Remote power feed (DC) option: 40-57 V DC ; Max 37.5A Maximum power consumption: Refer to Appendix A for detailed power specifications
LAN	RJ-45 connector for local connection (i.e., debugging, troubleshooting)
EXT_ALM	External Alarm pin-out connectors supporting four external alarm connections
SYS_ALM	Pin-out connector supporting up to three relay alarms used for connecting the GX-QUAD to a network or modem and relaying the status of the GX alarms
1900MHz CPL -50 dB	Coupler port 1900 MHz 50 dB coupling

Interface	Description
EAWS CPL -50 dB	Coupler port EAWS 50 dB coupling
850 MHz CPL -50 dB	Coupler port 850 MHz 50 dB coupling
700 MHz CPL -50 dB	Coupler port 700 MHz 50 dB coupling
FILTER_ OUT/ FILTER_ IN*	Connections to external filter – only relevant if External Filter (ordered separately) is installed on GX-Quad

Table 1-1. GX Interface Descriptions

LED	Description
RUN	Green – power on
ALM	Off – normal operation Red - fault
COMM.	Rapid flashing green - flashes (rate of flash per second) for the duration of 1 minute upon communication initialization Rapid/No Flash - indicates communication fault

Table 1-2.LED Descriptions

1.4 External Multiplexer (optional)

Note: The external combiner is optional and ordered separately (P/N: AK-GX-ECPL-COMB).

The 4x1 external multiplexer filters and combines the service specific RF signals received from the GX and transmits the converged input signals through a single output port to the broadband service antenna.

The multiplexer includes the following interfaces:

- Four service specific RF input connectors (one is unused and should be terminated using the DIN terminator) – used for connecting to the GX service specific RF connectors
- One output connector – interfaces to the broadband DAS antenna
- One grounding lug
- One QMA coupler port – enables users/field engineers to measure and read signals without interrupting service due to service cable disconnections. The QMA coupling port serves as the coupling measurement port for reading the signal without affecting services on the main stream.

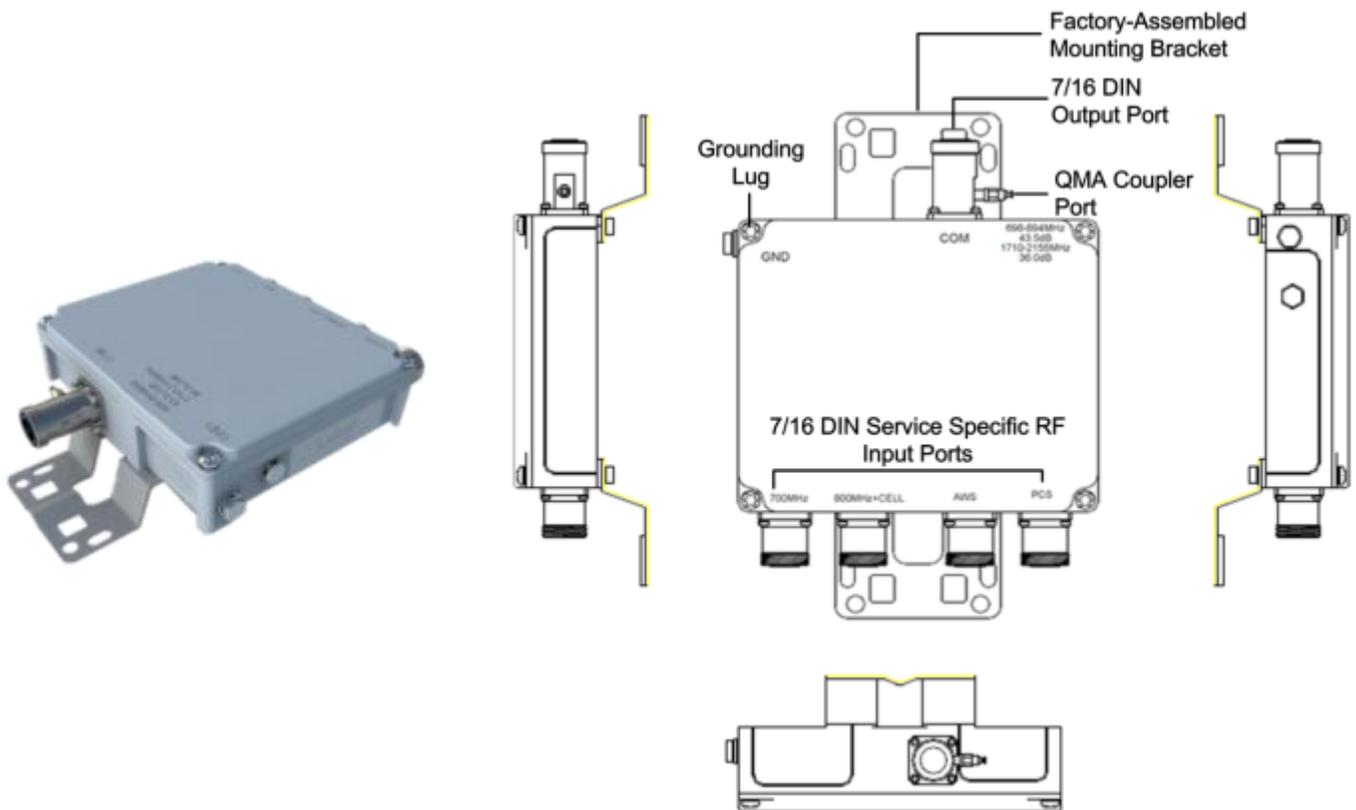


Figure 1-7. GX External Combiner

2 Installation Guidelines

This chapter provides the general guidelines for installing the GX Quad-band Remote Unit and includes information such as site considerations and installation requirements.

2.1 Site Considerations

- The distance between the GX service antenna and the coverage area should correspond to line of sight (LOS) requirements for maximum coverage area.
- The maximum fiber path loss is 6 dB.
- The system delay of the optical system must be taken into consideration when there are neighboring BTS sites overlapping in coverage.
- In the MIMO scenario, two remote units shall use a pair of optic fiber for each one. This ensures to avoid the system delay difference between two units.

2.1.1 Installation Location

Mounting surface shall be capable of supporting the weight of the equipment.

In order to avoid electromagnetic interference, a proper mounting location must be selected to minimize interference from electromagnetic sources such as large electrical equipment.

2.1.2 Environmental

Humidity has an adverse effect on the reliability of the equipment. It is recommended to install the equipment in locations having stable temperature and unrestricted air-flow.

The installation location for the system should be well ventilated. The equipment has been designed to operate at the temperature range and humidity level as stated in the product specifications at temperatures ranging from $-40\sim 70^{\circ}\text{C}$ and a relative humidity of maximum 95%.

2.1.3 Powering

The power supply unit provides power to all modules within the equipment. Depending on the product variant, it is recommended that the PSU operates on a dedicated AC circuit breaker or fused circuit.

2.1.4 Grounding Requirement

Verify that the equipment has been well grounded. This includes GX Quad-band unit, external combiner, antennas and all cables connected to the system. Ensure lightning protection for the antennas is properly grounded.

2.1.5 Cable Routing

Ensure all cables, e.g. power cable, feeder cable, optic fiber, commissioning cable, connecting are properly routed (use drip-loops) and secured so that they are not damaged.

2.1.6 Manual Handling

During transportation and installation, take necessary handling precautions to avoid potential physical injury to the installation personnel and the equipment.

2.2 Installation Requirements

- Working space available for installation and maintenance for each mounting arrangement. Ensure unrestricted airflow.
- Ensure grounding connector is within reach of the ground wire.
- Ensure a power source is within reach of the power cord and the power source has sufficient capacity.
- Where appropriate, ensure unused RF connectors are terminated.
- Do not locate the equipment near large transformers or motors that may cause electromagnetic interference.
- Reduce signal loss in feeder cable by minimizing the length and number of RF connections.
- Ensure the equipment will be operated within the stated environment (refer to datasheet).
- Where appropriate, confirm availability of suitably terminated grade of RF and optical fiber.
- Observe handling of all cables to prevent damage.

2.3 Fiber Optic Rules

ATTENTION!

- Please also refer to the laser safety section in the document preface material.
- Fiber optic cables require proper handling. Do not stretch, puncture, or crush the fiber cable(s) with staples, heavy equipment, doors, etc.
- Always maintain the minimum bending radius specified by the cable manufacturer. The minimum bend radius is usually ten times the cable's outer diameter. In the case of single optical fiber that is not in a cable, the minimum bending radius to be observed is 30 mm.
- Wave division multiplexing (WDM) units require single-mode fiber
- Use minimum splicing/connectors to achieve minimum losses on the fibers.
- Use precaution while installing, bending, or connecting fiber optic cables.
- Use an optical power meter and OTDR for checking the fiber optic cables.
- Make sure the environment is clean while connecting/splicing fiber optic cables.
- All fiber optic connections should be cleaned prior to attaching to termination points using a dry cleaning device (i.e., Cletop or equivalent).
- Fiber connector protective caps should be installed on all non-terminated fibers and removed just before they are terminated.
- Check the fiber optic connections.

3 System Installation

This chapter describes the installation procedure for the GX quad-band remote units. The installation of the system components must be in the following order:

1. External filter installation - only relevant for GX quad-band models supporting CELL band and which are deployed with units supporting 800 MHz band. See section 3.1.
2. GX remote unit installation. See section 3.2.
3. External combiner installation (optional). See section 3.3.

3.1 Installing External Filter (If Required)

External Filter (ordered separately) is required if GX is deployed along with units supporting the 800 MHz Public Safety band. It is recommended to perform this procedure before the GX installation.

The installation procedure requires the following tools (not provided):

- L-shaped size 3 Allen wrench
- T20 Security Torx
- Adjustable wrench (0 ~ 20 mm)

3.1.1 Package Contents

Unpack and inspect the cartons according to the following procedure

1. Open the shipping carton and carefully unpack each unit from the protective packing material.
2. Please verify that the items listed in Table 3-1 are included in your package (image size is not proportional) and check for signs of external damage. If there is any damage, call your Corning service representative.

Item	Quantity	Image
CELL/ESMR MHz Filter; 817 – 849 MHz; N-Type Male	1	
Upper Bracket (for GX Quad-band chassis)	1	
Lower Bracket (for GX Quad-band chassis)	1	
RF Cable - N-Type Female to N-Type Male jumpers; L= 10.62 in (269.74 mm); Used for GX filter connections	2	
Grounding Wire - 6 AWG; L = 78.74 in (2000 mm)	1	
Hexagon Cap Screw, (GB/T5783,M5x10)	2	
Spring Washer (GB/T93,5)	2	
Torx Head Screws Kits (for GX Quad-band chassis), (M4x14)	12	

Table 3-1 External Filter Package Items

3.1.2 Installation Procedure

1. Remove the eight M4 socket cap screws on the GX side panel (adjacent to the RF jumper connections), using an Allen wrench.
2. Remove the pre-connected RF jumper cable on the GX, using an adjustable wrench.

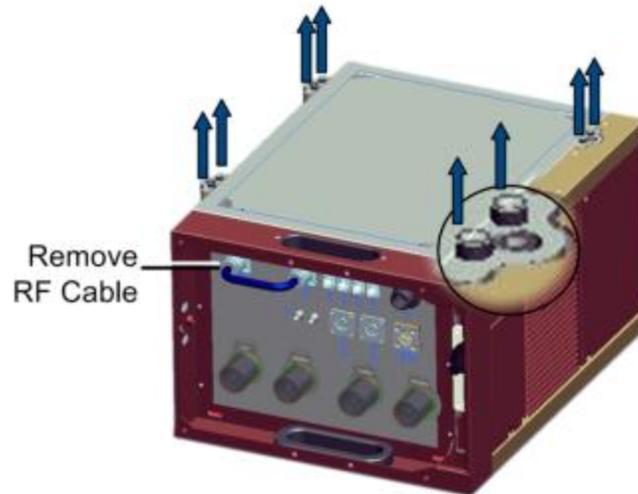


Figure 3-1. Removing GX Panel Screws

3. Fix the upper bracket and lower bracket onto the GX using eight of the provided M4 x 14 Torx Head Screws.

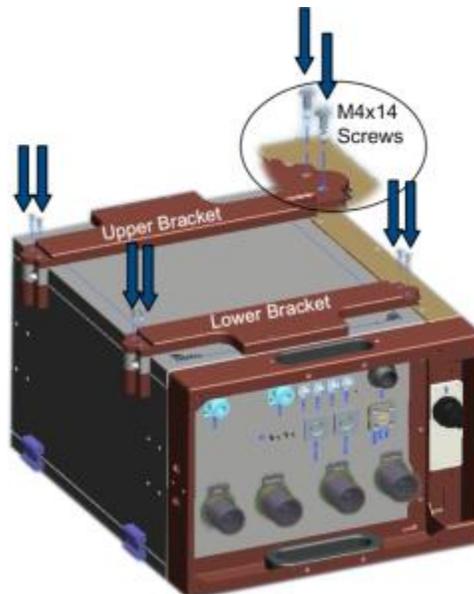


Figure 3-2. Assembling Filter Brackets

- Using the four remaining M4 x 14 Torx Head screws, install the filter onto the brackets using - with the filter RF connector facing downwards.

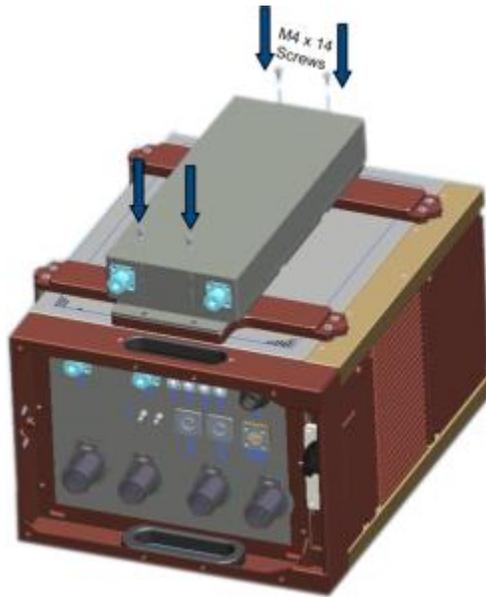


Figure 3-3. Assembling Filter onto Brackets

- Connect the two provided RF cables between the filter and GX. Make sure that the connectors are tightly screwed to prevent water from leaking in.

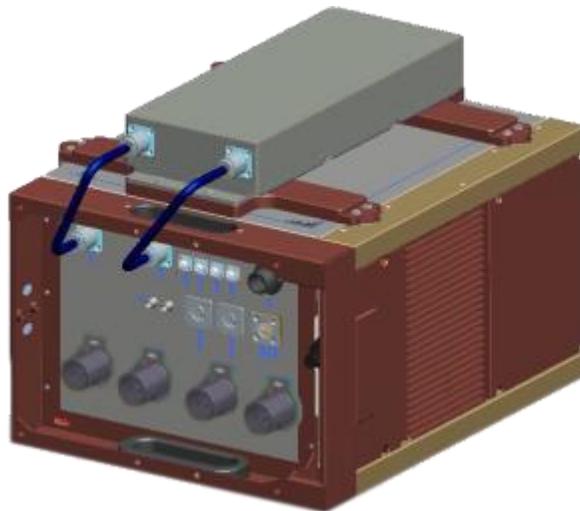


Figure 3-4. RF Cable Connections

6. Connect one side of the grounding wire to filter grounding lug (left side panel) using the two provided M5 x 10 Hexagon Cap Screws and spring washers.
7. Connect the other side of the grounding wire to the building earth.

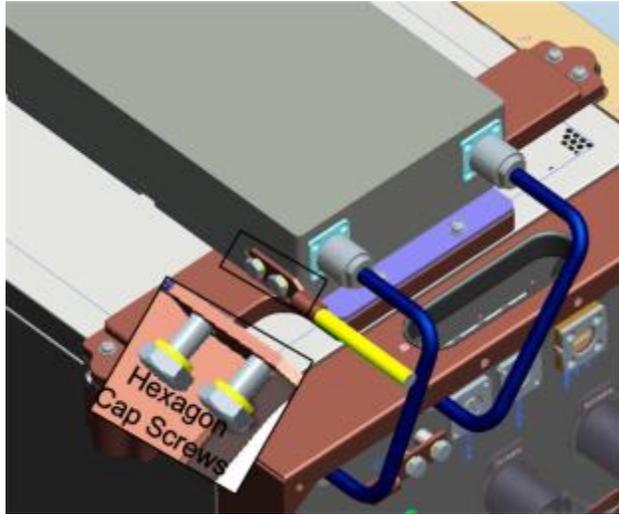


Figure 3-5. Ground Connection

3.2 Installing the GX unit

3.2.1 Selecting Mounting Location

Select the mounting location (wall/pole):

- General surroundings
- Ventilated and easy-to-reach area
- Proximity to the antenna in order to minimize cable loss

For installations with GX external multiplexer - take into consideration that the unit must be mounted adjacent to the GX RF interfaces to facilitate the connections (DIN-DIN cables = 1.2 m).

3.2.2 Unpacking and Inspection

Unpack and inspect the cartons according to the following procedure

1. Open the shipping carton and carefully unpack each unit from the protective packing material.
2. Please verify that the items listed in Table 3-2 are included in your package (image size is not proportional) and check for signs of external damage. If there is any damage, call your Corning service representative.

Item	Quantity	Image
GX Quad-band Remote Unit	1	
Mounting bracket (used for both pole and wall installations)	1	
M8 Nuts, spring washers $\Phi 8$, plain washers $\Phi 8$ (used for securing Remote Unit when hanged on bracket protrusions)	2 (per item)	
Masonry bolt (set) M10x110 – used for wall mount installations	6	
Power Supply Cable (AC) – for AC models	1	

Item	Quantity	Image
Power cable tube gasket (DC) – for DC models	2	
Copper Grounding Wire (2 m)	1	
RJ-45 Ethernet communication cable	1	

Table 3-2. GX Package Items

3.2.3 Additional Required Tools

The following tools are the minimum required when installing the GX remote unit or performing routine maintenance:

- Electric Drill ($\Phi 12$ head for drilling holes for wall mount)
- Spanner (0.31 inch for tightening GX Quad-band M8 nuts)
- For pole mount installations – the GX bracket supports wooden pole mounting via the a dedicated GX accessory kit (ordered separately): AK-GX-QUAD-BRKT-WDPOLE

3.2.4 Mounting

CAUTION!

- Take all necessary precautions when mounting. A minimum of two people is required for installing the GX quad-band remote.
- GX unit weighs:
 - Quad-band remote: 147.7 lb (67 kg)
 - S800 remote: 146.16 lb (66.3 kg)

3.2.4.1 Wall Mount Installation

Note: The instructions provided in this section are for solid brick and concrete walls only.

To mount the unit on the wall

1. Select the wall mount location according to the following criteria:
 - General surroundings
 - Ventilated and easy-to-reach area (for maintenance and on-site inspection)
 - Proximity to the antenna in order to minimize cable loss
 - For installations with GX external multiplexer - take into consideration that the unit must be mounted adjacent to the GX RF interfaces to facilitate the connections (DIN-DIN cables = 1.2 m).

2. Using the mounting bracket top and bottom mounting holes as a guide (refer to Figure 3-6):

- Measure and mark the location for drilling the (supplied) M10 Masonry bolts ($\Phi 12$) in the wall (six per bracket and drill the holes).

Note: The GX quad-band unit is mounted vertically with the connectors facing downwards.

- Using an electric drill with a $\Phi 12$ head, drill the holes for the Masonry bolts

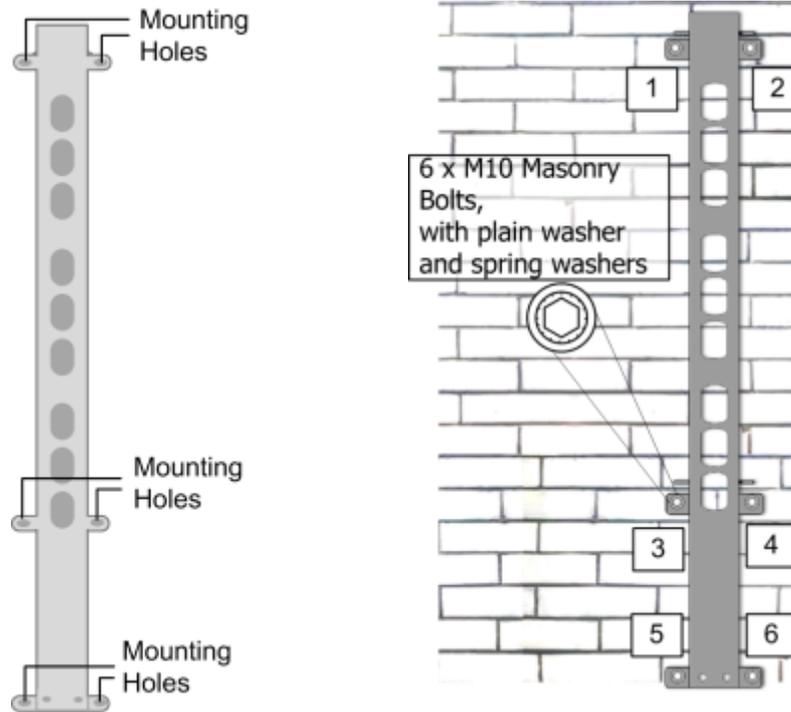


Figure 3-6. GX Mounting Bracket

3. Using six (M10 x 110) Masonry bolts per bracket – secure the mounting brackets to the wall with the protruding pins facing towards you. The GX quad-band will be hung on these. See Figure 3-6.

4. Connectors facing down, carefully fit and hang the GX unit on the Pins (see Figure 3-7) protruding from the top, and middle-bottom parts of the mounting bracket.

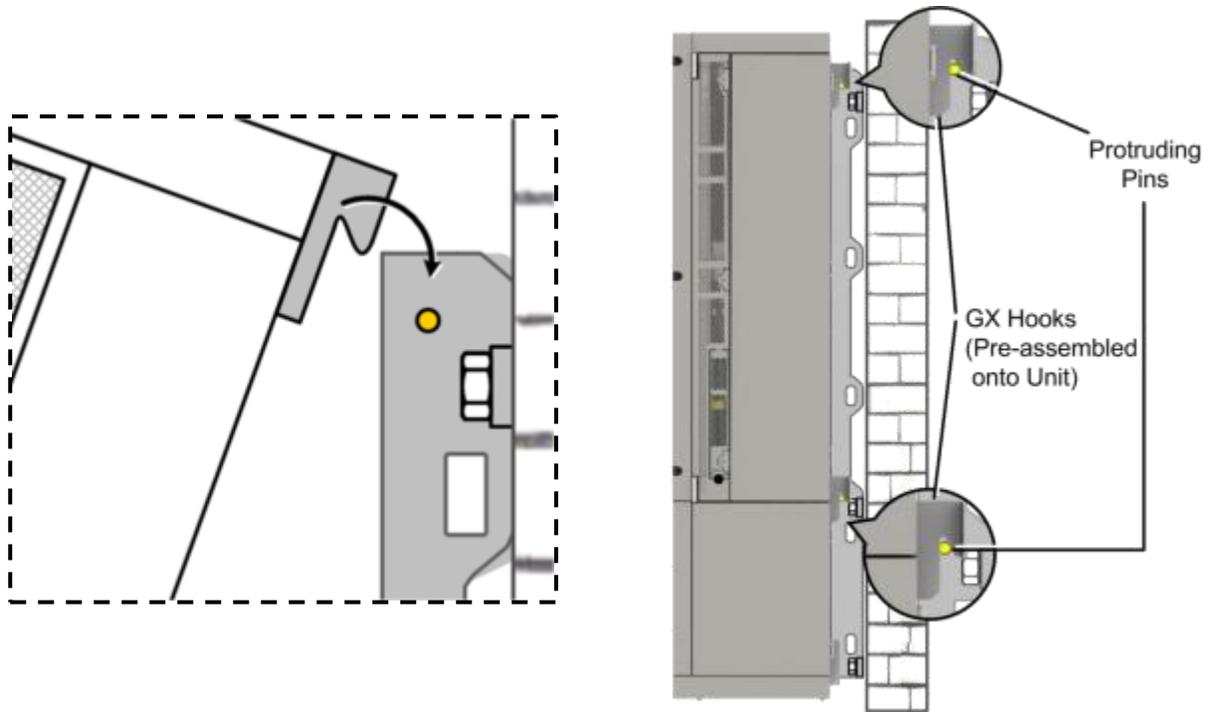


Figure 3-7. Mounting Procedure and Zoom-in of Hung Unit

5. Using a spanner or wrench, tighten the two M8 nuts on the top and bottom of the mounting bracket as shown in Figure 3-8.

Note: It is recommended to use a threadlocker to tightly seal the nuts.



Figure 3-8. Wall Mounted GX – Underside View

6. Check enclosure position and verify that unit is mounted securely to the wall.

3.2.4.2 Pole Mount Installation

Note: Refer to section 3.2.5.2 for wooden pole mount installations.

To mount the unit on a pole (not wooden)

1. Select the appropriate location according to the following criteria:
 - Accessibility
 - Antenna location and distance
 - Proximity to the antenna in order to minimize cable loss
2. Secure the mounting bracket by slipping the five hose clamps (provided) through the mounting bracket and tighten securely. Refer to Figure 3-9.

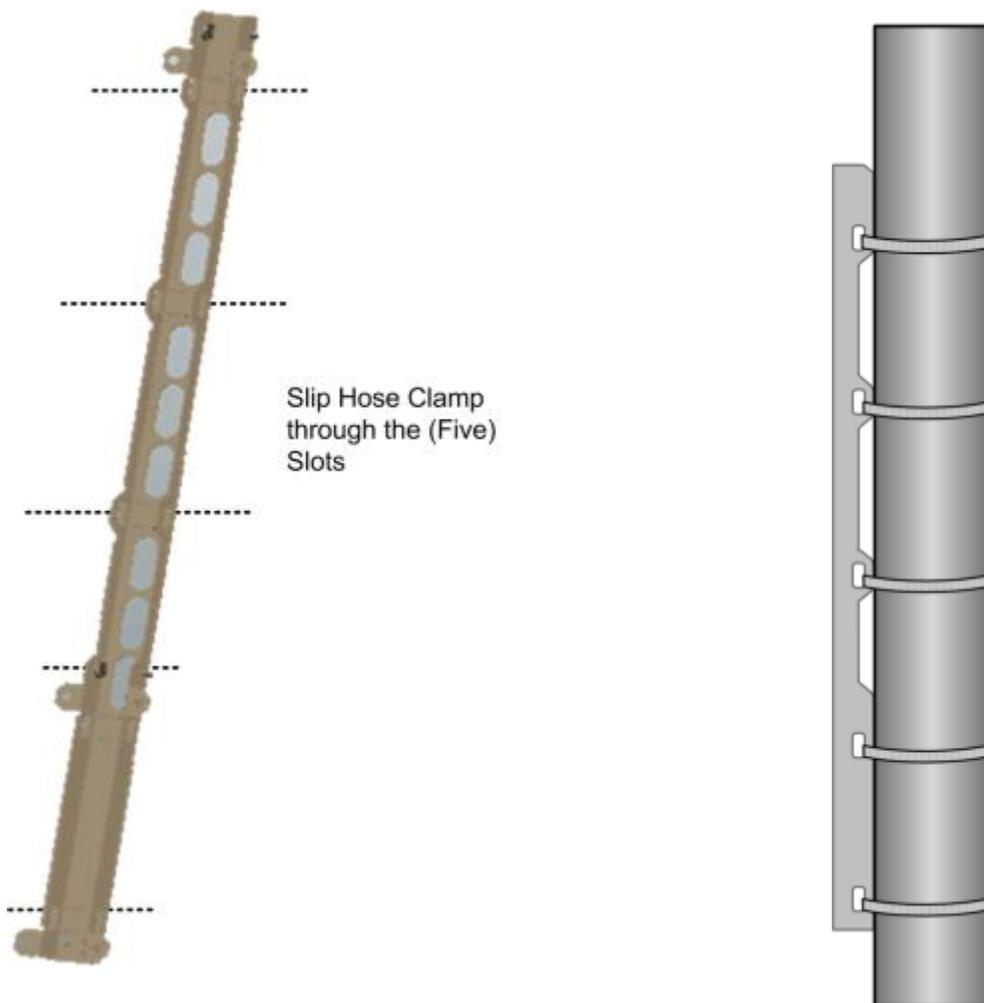


Figure 3-9. Bracket Slots for Hose Clamps (Left) and View of Bracket Mounted on Pole (Right)

3. Connectors facing downwards, hook the GX Quad-band on to the top part of the bracket and then to the bottom. Refer to Figure 3-10.

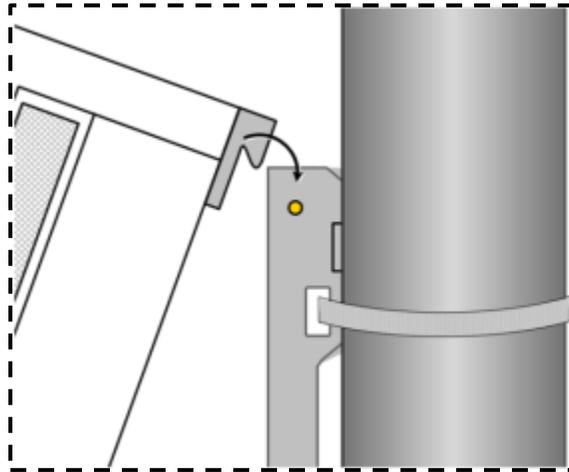


Figure 3-10. Hooking GX to Bracket

4. Using a spanner or wrench, tighten the two M8 nuts on the top and bottom of the mounting bracket as shown in Figure 3-11 and Figure 3-12.

Note: It is recommended to use a threadlocker to tightly seal the nuts.



Figure 3-11. Pole Mounted GX – Underside View

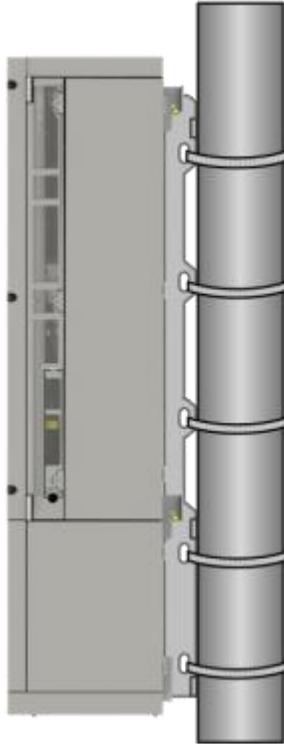


Figure 3-12. Pole Mounted GX Quad-Band Remote

3.2.5 Additional Mounting Options

Additional mounting options are provided with separately ordered accessory kits:

- Indoor wall mount installation (section 3.2.5.1)
- Wooden pole mount installation (section 3.2.5.2)

3.2.5.1 Indoor Wall Mount Installation

This section provides instructions on how to mount the GX Quad-band unit on indoor concrete walls using the AK- AK-GX-QUAD-BRKT-INDOOR accessory kit (ordered separately).

Note the following:

- The AK-GX-QUAD-BRKT-INDOOR accessory kit is designed for installations on concrete walls only.
- The GX unit is mounted with the connectors facing UPWARDS (as opposed to all other installation types).
- Weight: GX (per unit) = ~156.5 lbs (71 kg); Bracket = 28.7 lbs (13 kg)

The accessory kit includes the following items:

Item	Quantity	Image
Top Wall Rack (6 holes)	1	
Bottom Wall Rack (8 holes)	1	
Mounting Ground Support	1	
Sideboard	2	
M6x16 Hex socket head cap screws – required for sideboard assembly	8	
Spring Washer	8	
Plain Washer	8	

Table 3-3. Kit Items for GX Quad Indoor Bracket

Additional required tools:

- Electric Screwdriver with Hex bits
- Electric Drill with a $\Phi 12$ head
- Spanner (0.31 inch for tightening GX M8 nuts)

To mount GX Quad-band unit in indoor installation

1. Determine the installation location so that there is enough free space for proper ventilation and maintenance access.
2. Referring to Figure 3-13, disassemble the GX mat and mounting hooks from the GX by unscrewing the relevant bolts, save those screws for following step.

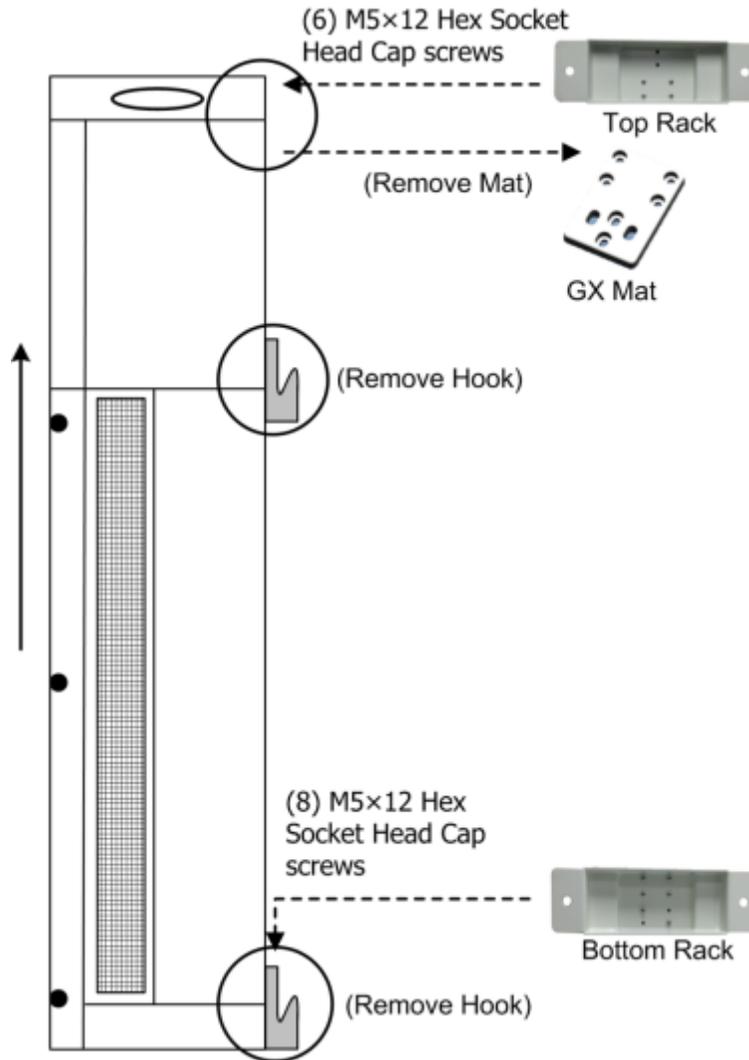


Figure 3-13. Pre-Mounting Procedure

3. Assemble the top wall rack on the GX using six M6x12 hex socket head cap screws.
4. Assemble the bottom wall rack on the GX using eight M6x12 hex socket head cap screws.
5. Place the GX unit on the Mounting Ground Support with the connectors facing upwards.
6. Secure the GX to the mounting ground support with the two sideboards using eight M6x16 hex socket head cap screws.

错误！未找到引用源。 provides an overview of the mounted GX unit.

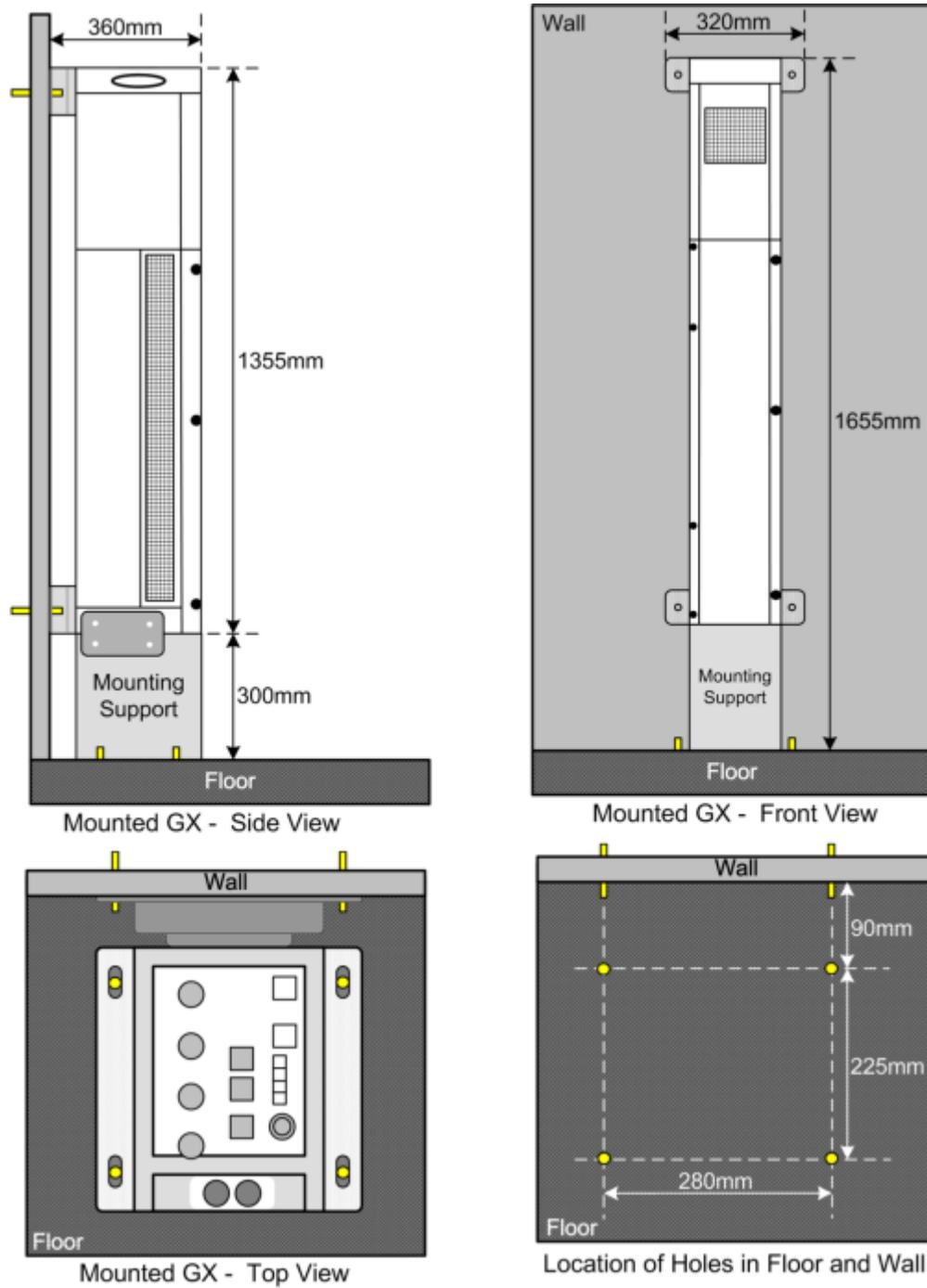


Figure 3-14. Overview of Mounting Procedure

7. Position the GX and Bracket assembly so that the mounting brackets face the wall. Refer to “Side View” (top-left image) and “Front View” (top-right image) shown in Figure 3-14.
8. Using the screw holes as a template, drill the required holes in the floor and wall (drill directly through the screw holes). Refer to “Front View” (top-right image) and “Top View” (bottom-left image) shown in Figure 3-14.
Note: Eight M10 masonry bolts are required (not provided).
9. Insert masonry M10 bolts into drilled holes and tighten. Refer to Figure 3-15.

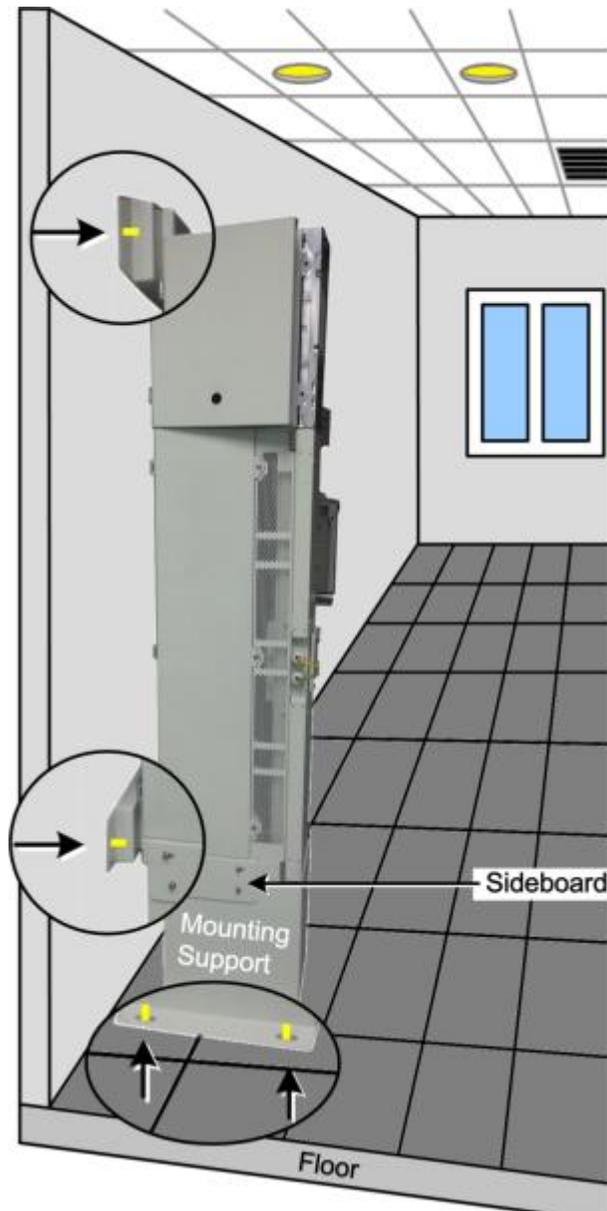


Figure 3-15. Location of Inserted Masonry Bolts

3.2.5.2 Wooden Pole Mount Installation

This section provides instructions on how to mount the GX quad-band unit on wooden poles using the AK-GX-QUAD-BRKT-WDPOLE accessory kit (ordered separately).

Note the following:

- This bracket is designed for installations on wooden poles only.
- Up to two GX units can be mounted on a single bracket. One on each side.
- Two people are required for mounting each GX unit onto the bracket.
- For GX models supporting the CELL band, requiring an external filter (if deployed along with 800 MHz band MA1000/MA2000 units) – install filter before mounting the GX on to the bracket [see GX CELL 850 MHz cavity filter quick installation sheet (CMA-378-AEN) for details].
- The GX unit is mounted onto the pole with the connectors facing downwards.
- Weight: GX (per unit) = ~156.5 lbs (71kg); Bracket = 30.9 lbs (14 kg).

Package Contents

Check your package contents to verify that the items in the packing list are included and that there are no signs of external damage.

Item	Quantity	Image
Pole Bracket Top	1	
Pole Bracket Middle	1	
Pole Bracket Bottom	1	
M6x16 Hex Socket Head Cap Screw (Bracket Assembly)	8	
Spring Washer	8	

Item	Quantity	Image
Plain Washer	8	
5/8" Self-Tapping screws (Wood assembly)	4	

Table 3-4. GX Wooden Pole Mounting Bracket Package Contents

Additional required items (not included)

Item	Quantity	Image
5/8" screws and nuts for wooden pole assembly, screws must meet requirement for related installation environment.	4	
M8x30 screws for GX assembly, included in GX package	2	
Electric Screwdriver with the proper heads	1	-
Electric Drill with appropriate head	1	-
Spanner (0.31 inch for tightening GX M8 nuts)	1	-
Hex key	1	-

Table 3-5. Additional Required Items

Figure 3-16 and Figure 3-17 show an overview of a single mount and dual mount GX installation.

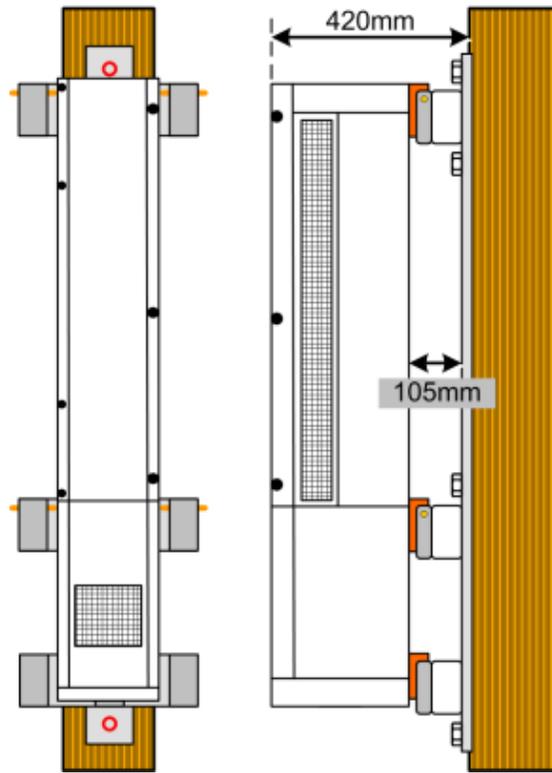


Figure 3-16. Pole Mounted GX – Single Mount

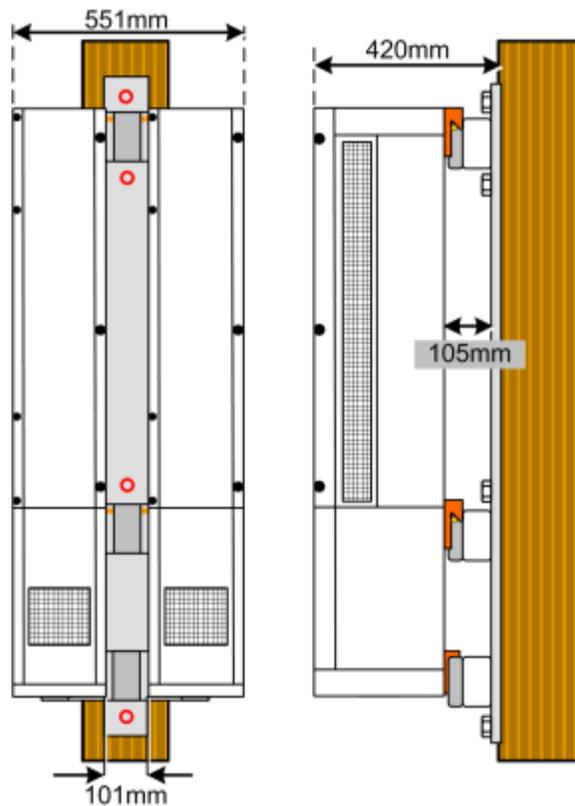


Figure 3-17. Pole Mounted GX – Dual Mount

To mount a GX unit on a wooden pole

1. Using the eight M6×16 hex socket screws and the relevant washers, assemble the three parts of the Pole Bracket as shown in Figure 3-18.

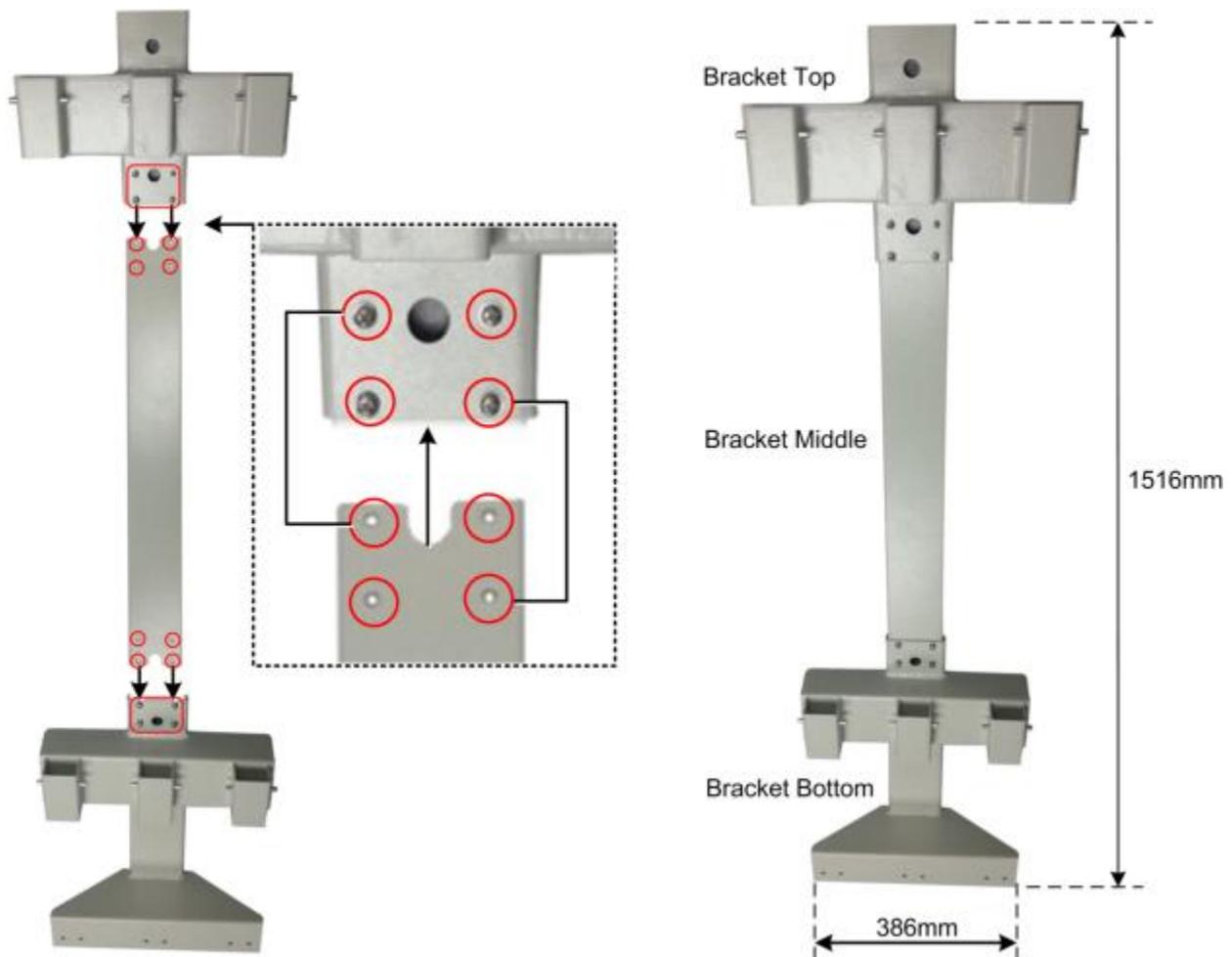


Figure 3-18. Wooden Pole Bracket Assembly

2. Select the appropriate location for the bracket according to the following criteria:

- General surroundings
- Make sure that the bracket is installed high enough to ensure convenient access to the GX connectors located on the underside of the unit when mounted.
- Ventilated and easy-to-reach area
- Proximity to the antenna in order to minimize cable loss

3. Referring to Figure 3-19, mount the wooden pole bracket according to the following steps:

- Drill four holes in the pole according to the distances shown in Figure 3-19.
- Position the bracket onto the wooden pole and screw in the 5/8" screws (provided) into the top and bottom mounting holes.
- Screw in the two additional screws into the remaining middle mounting holes and tighten.

Note: The distance between the bracket bottom screw and the ground must be at least 20 mm.

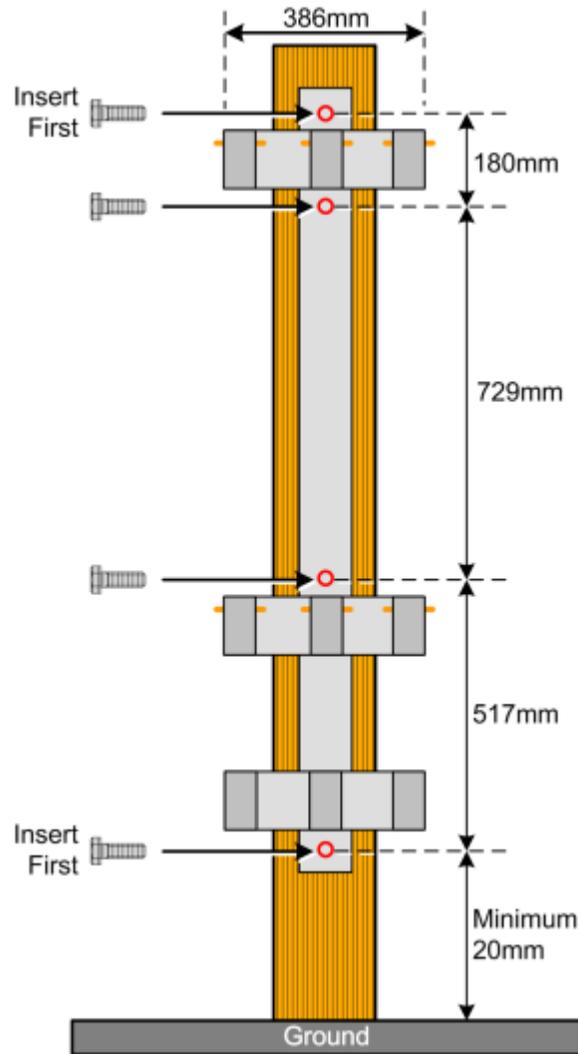


Figure 3-19. Mounting the Bracket

4. Mount the GX unit onto the bracket: - referring Figure 3-20, hang the GX on the pins protruding from the relevant top and center parts (depending on single or dual installation) of the bracket.

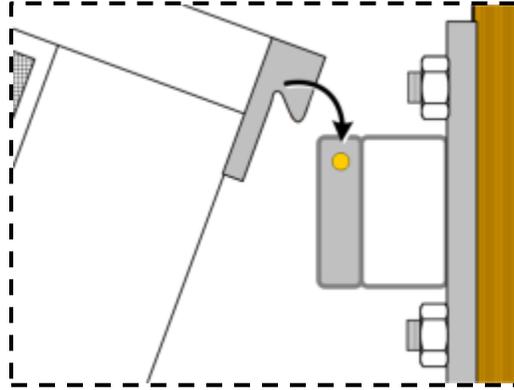


Figure 3-20. Hooking GX onto Bracket

*Note: For Single GX unit installations – unit is mounted onto middle of bracket (Figure 3-21);
For Dual GX unit installations – units are mounted on the sides of the bracket (Figure 3-22).*

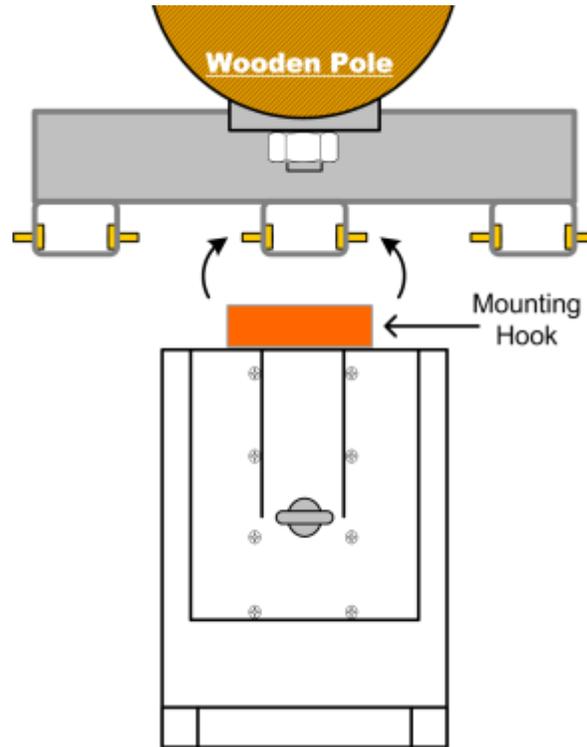


Figure 3-21. Single GX Installation (Mounted in Middle of Bracket) – Top View

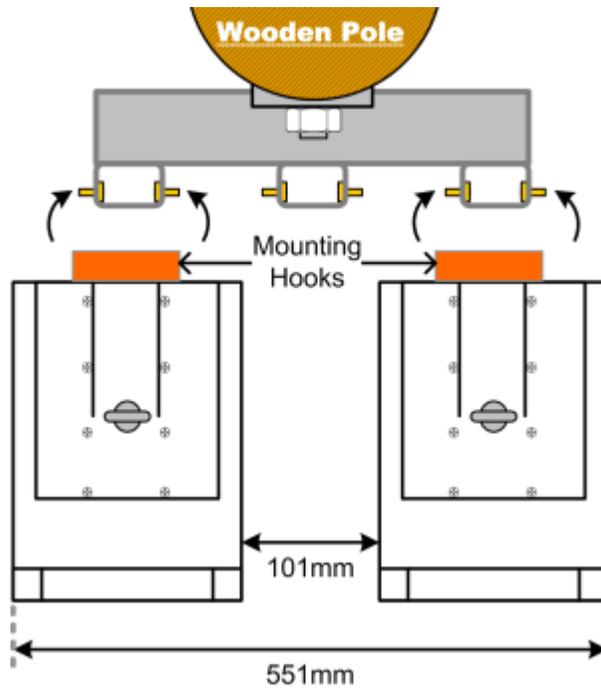


Figure 3-22. Dual GX Installation (One on each Bracket Side) – Top View

5. Insert the two M8 nuts on the bottom of the GX unit (provided with GX) into the appropriate bracket holes and tighten using a spanner or wrench. See Figure 3-23.

Note: It is recommended to use a thread locker to tightly seal the nuts.

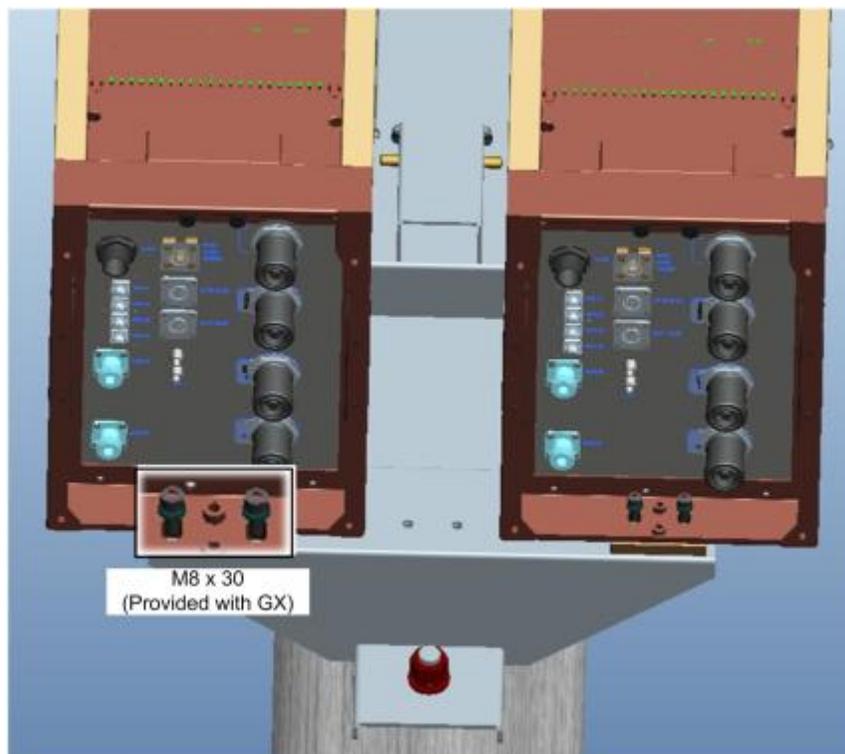


Figure 3-23. Securing GX Bottom to Bracket with M8 Screws

3.3 Installing External Combiner

Note: The external combiner is ordered separately and supports up to four service inputs. The GX remote unit supports 3 services, requiring that the unused combiner input be terminated.

The 4x1 external combiner (AK-GX-FILT-COMB) combines the input signals of the four GX supported bands (e.g. ESMR/CELL, PCS, LTE700 and EAWS) and transmits them through a single output port to the broadband service antenna.

3.3.1 Unpacking and Inspection

1. Open the shipping carton and carefully unpack each unit from the protective packing material.
2. Check your package contents to verify that the items in the packing list are included and that there are no signs of external damage. If there is any damage, call your Corning Optical Communications service representative.

The External Combiner kit includes the following items:

Item	Description	Quantity
External combiner (multiplexer)	4 x 1 service specific quad-band combiner	1
Grounding cable; 3 ft. (~ 1m)	Used for connecting combiner to earth ground	1
Hose clamps	Used for pole mount installations	2
M6 x 16 anchor bolts; Spring washers; Flat washers	Used for wall mount installations	4 (per item)
DIN to DIN cables – super flex; 3 ft. (1.2 m)	Used to connect the GX RF service ports to the external combiner input ports	4
DIN terminator	Used to terminate unused input port (e.g. for installations with GX tri-band units)	1

Table 3-6. External Combiner Kit Contents

3.3.2 Mounting the External Combiner

3.3.2.1 Wall mount

1. Using the combiner bracket mounting holes as a guide mark and drill four holes for the provided M6 bolts
2. Mount combiner on wall using the M6 bolts, spring and flat washers (four of each) provided in the External Combiner Kit.

3.3.2.2 Pole mount

Slip a hose clamp through each end of the factory assembled mounting bracket (see Figure 3-24) and secure to pole by tightening.

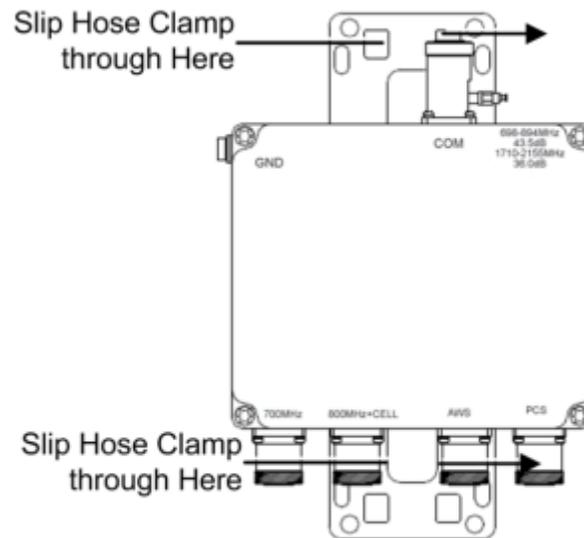


Figure 3-24. Hose Clamp Installation Holes



Figure 3-25. Example of Combiner with Hose

3.4 GX Connections

IMPORTANT – CABLE DRIP LOOPS!

It is highly recommended that every horizontal cable entry to the equipment forms a 'U' before its entry to the equipment. Water on the cable will drip down at the bottom of the loop and will not accumulate at the equipment connectors.

The connections are performed from the underside of the GX unit after it has been mounted.

3.4.1 Grounding Connections



WARNING!

This unit must always be grounded. Consult an appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

DO NOT CONNECT POWER BEFORE GROUNDING!

Note: An internationally acceptable color code of the ground connection wire is green/yellow.

To ground the GX unit:

1. Connect the supplied copper wire (AWG #6) GND cable to the GND connector and the equipment rack or building earth.
2. Ground the GX unit by connecting the provided “earth wire” of the power cord to the ground terminal of the AC supply.

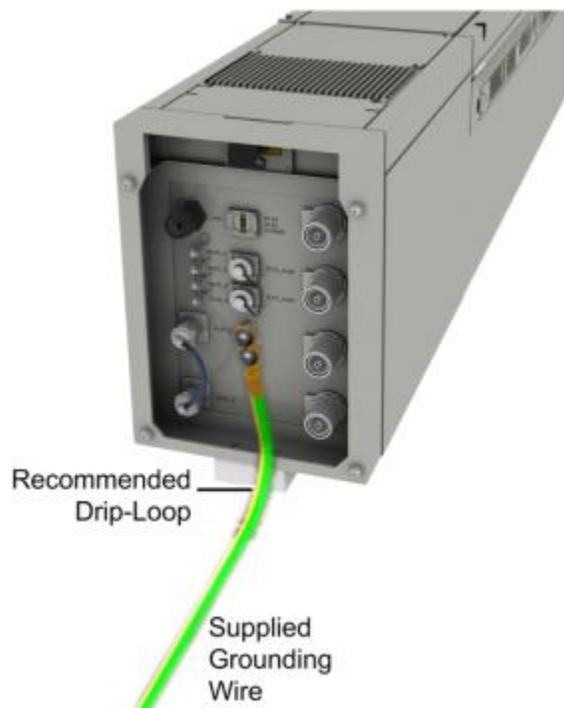


Figure 3-26. GX Grounding Connection

Note: For installations with external combiner (AK-GX-ECPL-COMB) – connect external combiner ground to building ground. See Figure 3-25 for grounding bolt location.

3.4.2 Fiber Connections

IMPORTANT! OptiTap® pullout force ranges from a few lbs to 50+ lbs with the dust cap or connector installed. This prevents damages caused to the DAS unit.

Connect the GX OP OptiTap port to one of the OCH front panel “Link” ports (via F/O patch panel), using an OptiTap cable assembly (ordered separately).

IMPORTANT! GX quad-band models GX-E17E85P19L70-40-AC and GX-E17E85P19L70-40-DC do not support coexistence with other GX models. These must be connected to a different RF path via separate optical module of the OCH. Connecting these GX models to the same RF paths as other GXs may result in a VSWR alarm.

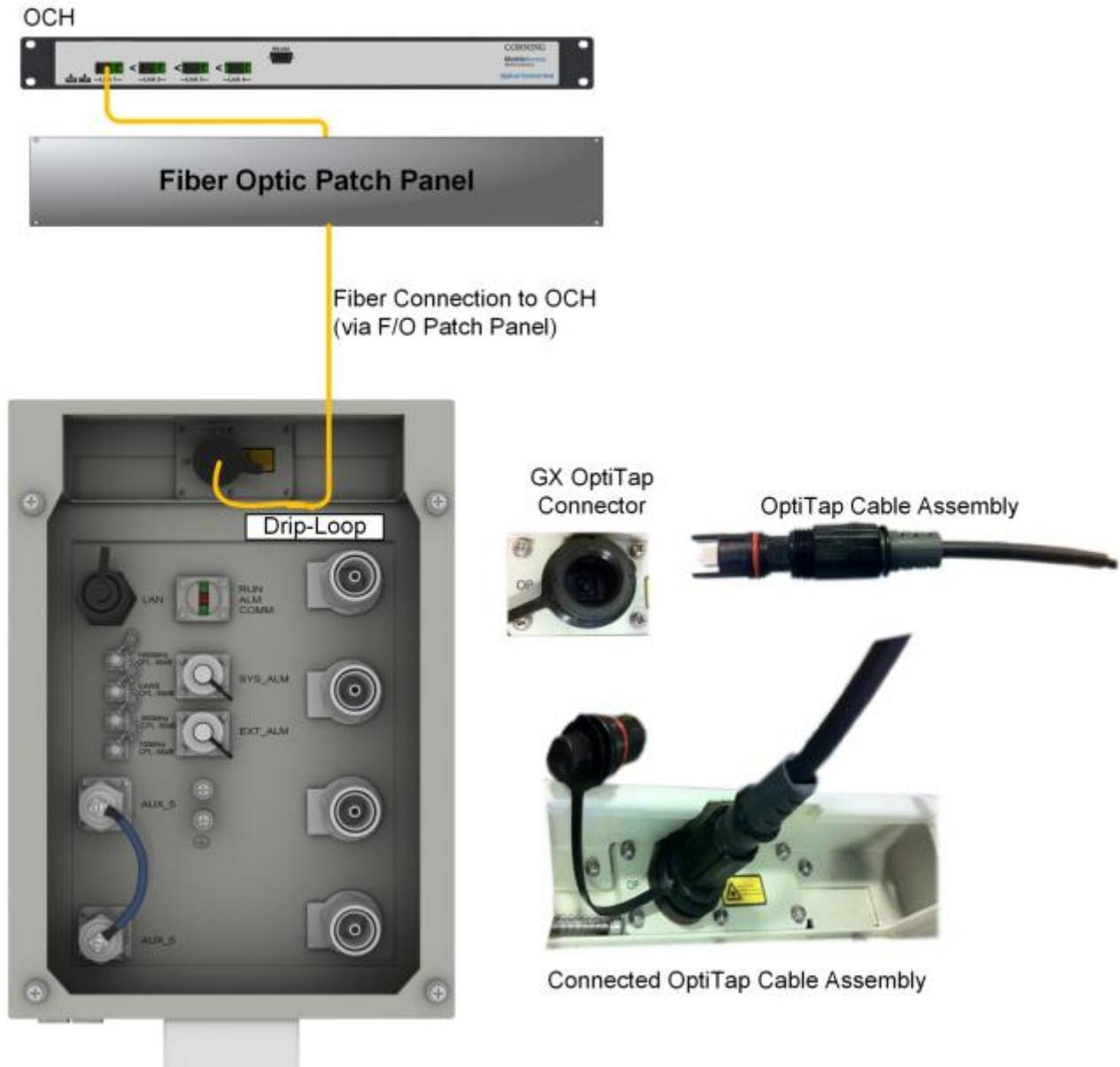


Figure 3-27. GX Fiber Optic Connection

3.4.3 RF Connections

CAUTION! Any open RF port on GX or improper connection between GX RF ports and combiner inputs, will damage GX internal power amplifier after the equipment is powered on. Make sure all connections are performed correctly before powering.

IMPORTANT! GX quad-band models GX-E17E85P19L70-40-AC and GX-E17E85P19L70-40-DC do not support coexistence with other GX models. These must be connected to a separate RF path via a different RIU or different sector (for RIU-12). Connecting these GX models to the same RF paths as other GXs may result in a VSWR alarm.

For direct connections to DAS antennas

1. Using the required coax cables, connect the GX RF ports to the service antennas.
2. Ensure lightning protection for each antenna port.
3. Waterproof all RF ports (recommended drip-loops).
4. Terminate any unused GX and RF ports.

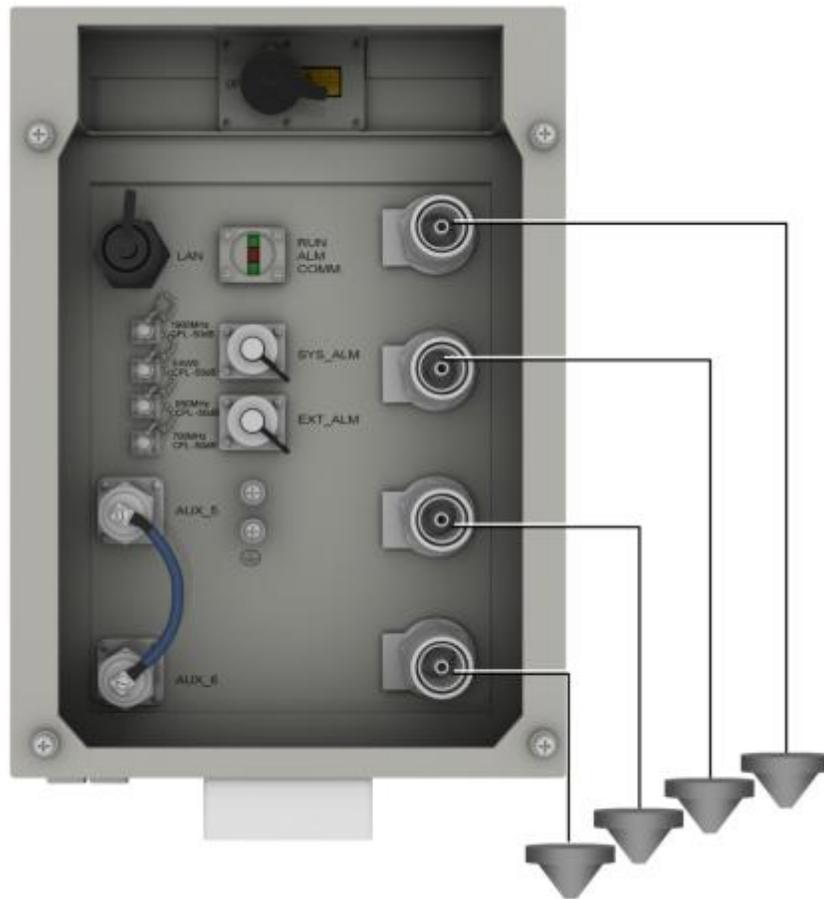


Figure 3-28. GX Direct RF Connection to DAS

For connections via GX External Combiner:

1. Using the DIN cables (provided with external combiner), connect each relevant RF output to the corresponding service connector on the external combiner.
2. Ensure lightning protection for each antenna port.
3. Waterproof all RF ports (recommended drip-loops).
4. Terminate any unused GX and RF ports.
5. Connect external combiner RF output connector to broadband antenna. Refer to Figure 3-29.

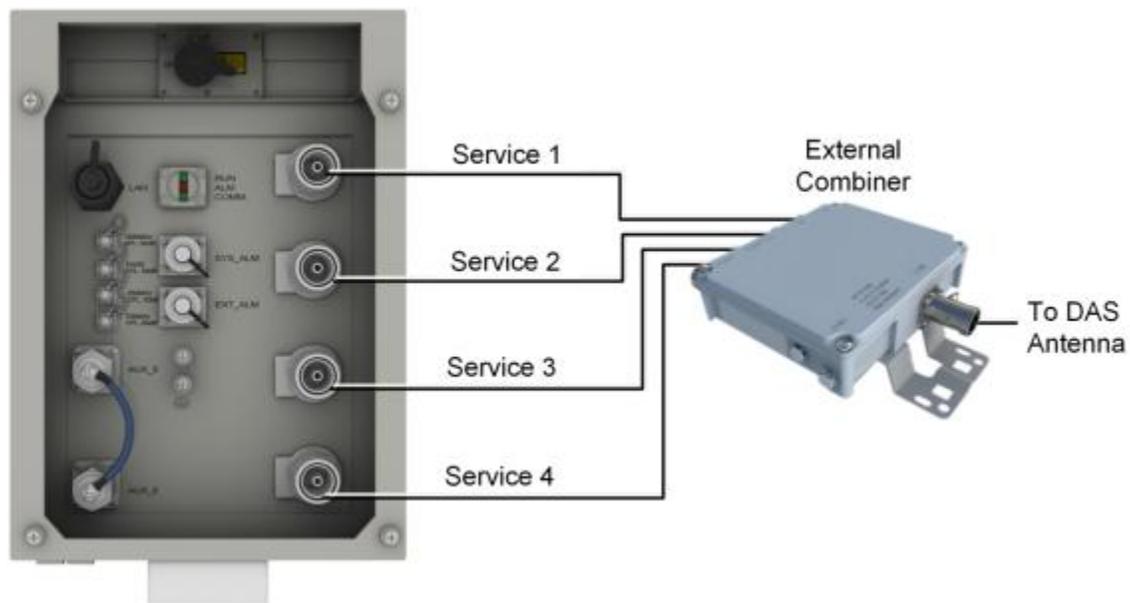


Figure 3-29. GX RF Connections with External Combiner

3.4.4 Power Connections

CAUTION!

Any open RF port on GX or improper connection between GX RF ports and filter input ports will damage GX internal power amplifier after the equipment is powered on. Make sure all connections are performed correctly before powering.

3.4.4.1 AC Models

To connect GX power

1. Unscrew the two screws of the side panel (shown in Figure 3-30) and open to access the power connector.

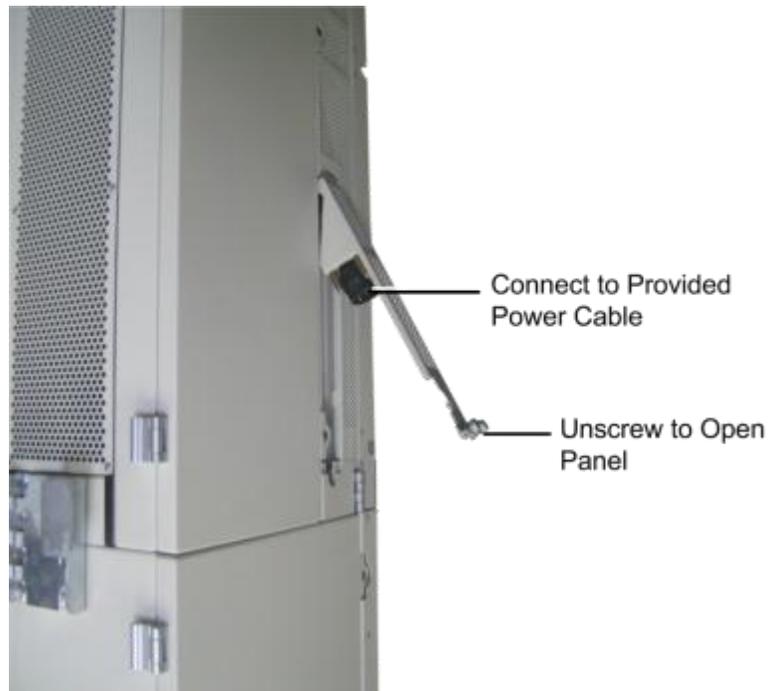


Figure 3-30. GX Power Connector (AC Model)

2. Connect the supplied power cable to the power supply port:
 - Power input: VAC 100-240/47-63 Hz
 - Maximum power consumption:
 - Quad band remote: 1450 W
 - Maximum current consumption: 20 A maximum

3.4.4.2 DC Models

Verify the following before connecting DC power:

- DC power supply is turned off
- DC cable (not provided) meets the following requirements:
 - Supports required voltage and current specifications: 40-57 V DC; Max 37.5A.
 - Cable diameter ranges between 7 and 14 mm
 - Cable lug specs (refer to Figure 3-31 for example of compliant lug) :
 - Hole Size: 1/4 in
 - Hole Spacing: 5/8 in

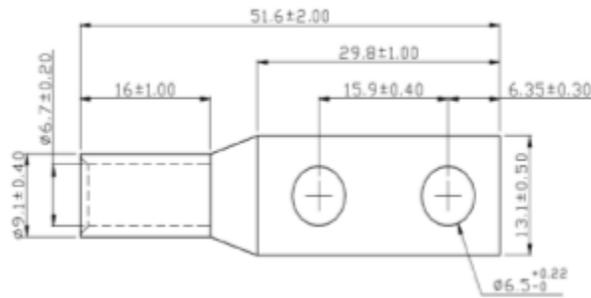


Figure 3-31. Example of Compliant DC Cable Lug

To connect DC power

1. Open DC power chamber panel by loosening four M3 screws, as shown in Figure 3-32.

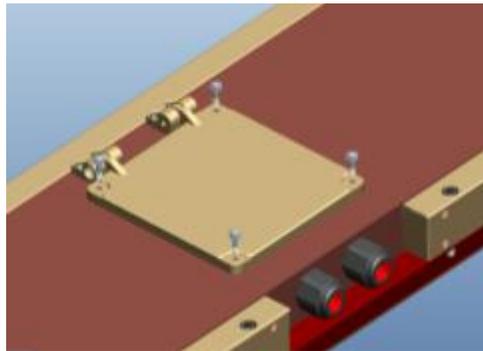


Figure 3-32. Opening DC Chamber Panel

2. Referring to Figure 3-33, remove retaining nut, insert DC power cable through tubing gasket (provided), then carefully route the power cable into the chamber (through hole) and connect the lug to terminal (make sure right DC polar is connected).
3. Tighten retaining nuts.

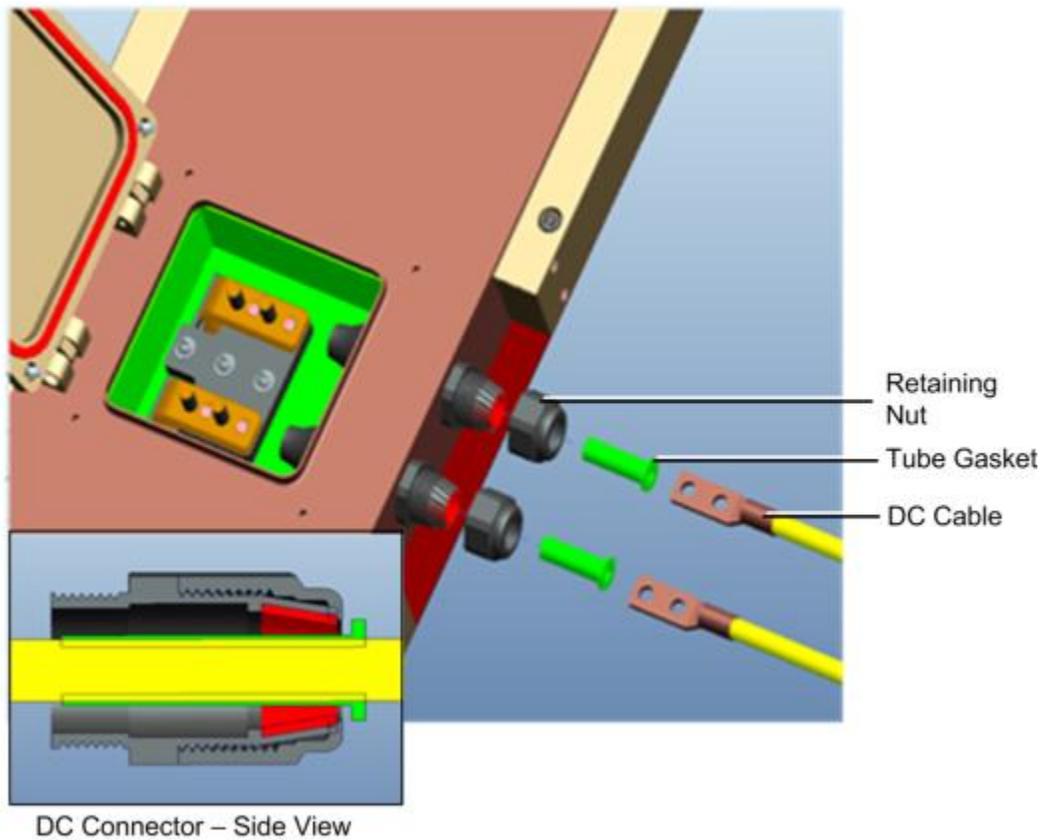


Figure 3-33. Connecting power Cord to Terminal

4. Referring to Figure 3-34, use nut to tighten lug to terminal.

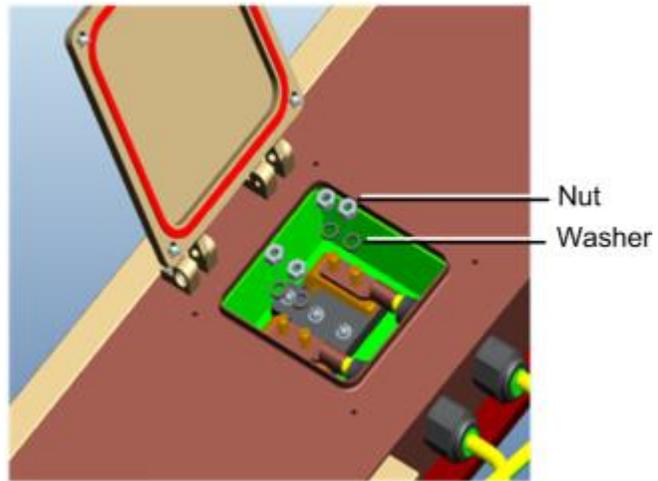


Figure 3-34. Tightening Lug to Terminal

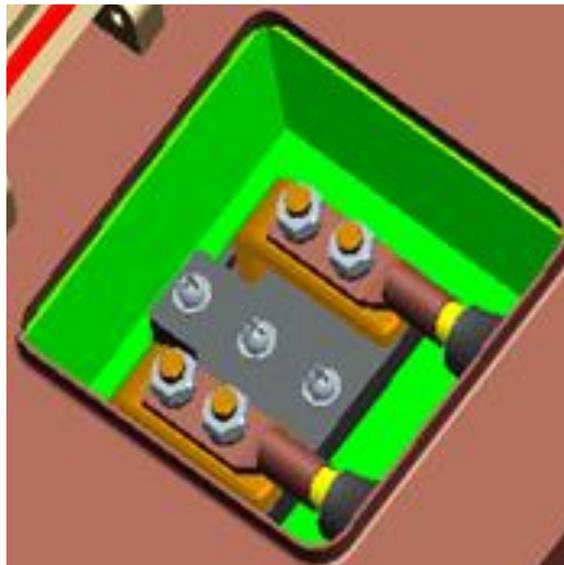


Figure 3-35. Securing Lug and Terminal

5. It is highly recommended to have power cords fixed or tighten with an enclosure type element. Additional holes are left for that purpose. See Figure 3-36.

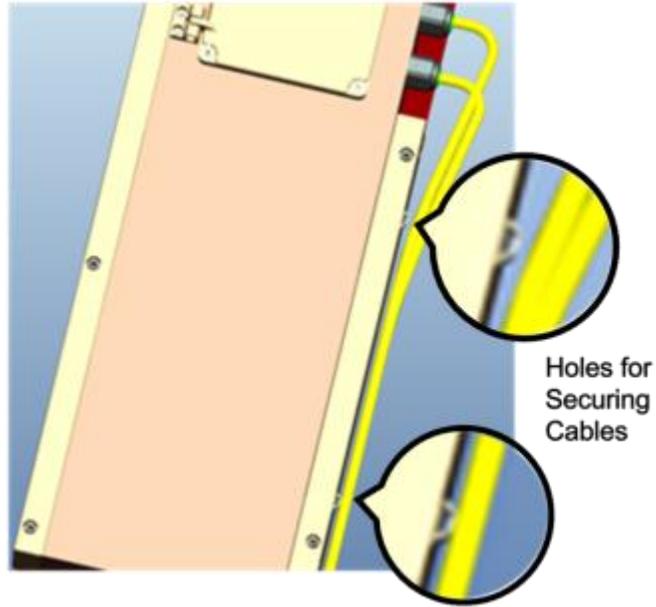
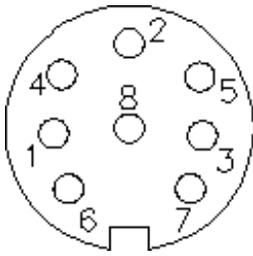


Figure 3-36. Fixed Power Cable

3.4.5 External Alarm Connections

The GX-Quad EXT_ALM port supports up to four dry-contact alarm connections from external sources (incoming outputs). The alarms can be connected any time, before or after the system is powered-on.

Note: After being connected, the External Alarms must be enabled from the Web Management application (see SC-450 user manual – v5.4 and higher).



Pin Number	Description
1	EXT_ALM1
2	EXT_COM1
3	EXT_ALM2
4	EXT_COM2
5	EXT ALM3
6	EXT_COM3
7	EXT ALM4
8	EXT_COM4

Figure 3-37. External Alarm Pin Out Description

3.4.6 System Alarm Pin-Out Description

The GX quad band system alarm pin-out connector supports three relay alarm connections. GX quad band status alarms can be relayed via a network or modem connection.



Pin No.	Description
1	EXT_OPEN
2	EXT_COM
3	EXT_CLOSE

Figure 3-38. System Alarm Pin Out Description

3.5 Verifying Normal Operation

Upon powering up the GX quad-band remote unit:

- Confirm the fans are working after powering.
- Verify normal operation:

LED	Status	Description
RUN	Flashing green:	Flashes green for the duration of a minute upon system initialization
	Off:	System initialized
COMM.	Flashing green:	Flashes (rate of flash per second) for the duration of 1 minute upon communication initialization
	Rapid/no flash:	Indicates communication fault
ALM	Steady red:	Fault
	Off:-	Normal operation



Figure 3-39. GX Status LEDs

4 Appendices

4.1 Appendix A: System Specifications

RF Parameters

Supported Services

Technologies	Frequency Range		
	Service/Band	Uplink	Downlink
CDMA / WCDMA* / GSM /LTE	CELL850 & ESMR	817-849	862-894
LTE	700MHz	698-716 776-787	728-757
CDMA / WCDMA* / GSM /LTE	PCS1900	1850-1915	1930-1995
WCDMA* / HSPA / LTE	EAWS2100	1710-1780	2110-2180

(*)WCDMA service is based on 3GPP standards, LTE service may be deployed in the future due to frequencies re-farming planned by the operators as well

RF Parameters per Service (40 W)

Notice: The Manufacturer's rated output power of this equipment is for single carrier operation. For situations when multiple carrier signals are present, the rating would have to be reduced by 3.5 dB, especially where the output signal is re-radiated and can cause interference to adjacent band users. This power reduction is to be by means of input power or gain reduction and not by an attenuator at the output of the device.

RF Parameters	LTE 700MHz		CELL GSM /WCDMAESMR/CEL L CDMA / WCDMA/ LTE 850 MHz & ESMR		PCS GSM / CDMA / WCDMA / LTE 1900 MHz		EAWS CDMA / WCDMA / LTE 2100 MHz	
	DL	UL	DL	UL	DL	UL	DL	UL
Nominal Bandwidth (MHz)	29	18/11	32	32	65	65	70	70
Mean Output Power (dBm)	46		46		46		46	
Max Output Power (dBm) 1 Carrier (composite)	46		46		46		46	
2 Carriers	43		43		43		43	
4 Carriers	40		40		40		40	
8 Carriers	-		37		37		37	
12 Carriers	-		35		35		35	
24 Carriers	-		32		32		32	
Nominal Passband Gain (dB)	46	50	46	50	46	50	46	50
Mean Gain (dB)¹	46	50	46	50	46	50	46	50
Gain Range (dB)**	30	30	30	30	30	30	30	30
Max Pin (dBm)¹ at AGC Threshold	0	-54	0	-54	0	-54	0	-54
Max Intermod Distortion (dBm)***	-13		-13		-13**		-13	
NF (dB) at Maximum Gain		5		5		5		5
VSWR								
Gain Flatness/Ripple (dB)²								

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

**Default Conditioner (BTSC) UL Gain=+3 dB

*** Out of band and spurious emissions compliant to FCC.

¹ Factory set mean gain OCH-WDM without RIU (OCH GUI set in "Active Mode"). May be field adjusted using controller system.

² Gain Flatness/Ripple is specified for the non-duplexed port of the system.

Coupling Specifications

Frequency (MHz)	Typical Coupling* (dB)
700	-50.0
S800/850	-50.0
1900	-50.0
EAWS	-50.0

*Depending on the band the actual coupling value may slightly vary.

Optical Specifications

Parameters	
Maximum Optical Budget	6.0 dBo
Optical Return Loss	> 50 dB
Optical Loss per Mated-pair Connectors	0.5 dB (maximum)
Optical Connector	Corning OptiTap [®] fiber optic waterproof connector
Optical Automatic Gain Control Range	-2 to -10 dBm
Fiber Type	Single-mode: 9/125 um
Wavelength	1310 nm, 1550 nm + WDM

Physical Specifications

Parameters	
Ports	OptiTap fiber optic waterproof connectors RF DIN Female connectors
Power	AC: VAC 100-240/47-63 Hz Maximum power consumption: 1450 W DC: VDC (-40) to (-57) Maximum power consumption: 1450 W
Physical Characteristics	Weight kg (lbs): 147.7 lb (67 kg)
	Mounting: Wall or pole
	Dimensions (H x W x D): 53.15 x 8.9 x 12.4 in (1350 x 226.06 x 314.96 mm)
Cooling Feature	Active heat dissipation (fan)

Environmental Specifications

Parameters	
Operating Temperature	-40 to +70°C (-40 to +158° F)
Humidity	≤ 95 %
Enclosure	NEBS OSP Class 4 rated (enclosure protected from elements and waterproofing)

4.2 Appendix B: Ordering Information

Note: The information listed below is updated up to the document publishing date. Refer to the GX 40 W quad-band datasheet (CMA-273-AEN) for the most updated ordering information.

GX Quad-Band Remote Units

Service Supported	Part Number	Description
ESMR/CELL/PCS/LTE700/EAWS 40 W	GX-E17E85P19L70-40-AC	GX Quad-Hardware with service CELL/ESMR, PCS, EAWS and 700 MHz LTE solution supporting 40 W output power.
	GX-E17E85P19L70-40-DC	GX Quad-Hardware with service CELL/ESMR, PCS, EAWS and 700 MHz LTE solution supporting 40 W output power, for DC powering.

Optical Central Hub (OCH) - GX International products

Part Number	Description
OCH-4-WDM	Optical central hub for SISO services, supporting (4) SISO Remote units, single-mode fiber (WDM)
OCH-8-WDM	Optical central hub for SISO or MIMO services, supporting (8) SISO or (4) MIMO Remote units, single-mode fiber (WDM)

Accessories

Part Number	Description
AK-GX-ECPL-COMB	GX accessorized 4 to 1 external multiplexer supporting EAWS band
AK-GX-QUAD-PWR-CABLE	GX AC electrical power cable for US GX quad-band remote
AK-GX-ELEC-ADAPT-AC	AC electrical junction adapter IP67 rated
AK-3COUPLER-DINM-DINF	Male DIN-Type to female DIN-Type Coupler with QMA port, three pieces
AK-RIU4-OCH-CABLES	Accessory kit cables for RIU4 to OCH, four QMA to QMA R/A cables 1 m
AK-GX-FILT-850	GX accessories CELL cavity external filter
AK-GX-QUAD-BRKT-INDOOR	GX accessory kit including bracket for wooden pole mounting option
AK-GX-QUAD-BRKT-WDPOLE	GX accessory kit including bracket with ground support for indoor concrete wall mounting option

Corning OptiTap® Cables

Part Number	Description
434401EB4R2005M-P	OptiTap® to SC APC 5 meters
434401EB4R2030M-P	OptiTap to SC APC 30 meters
434401EB4R2100M-P	OptiTap to SC APC 100 meters
434401UB4H3005M-P	Indoor/Outdoor Riser rated 5 meter OptiTap to SCAPC cable
434401UB4H3030M-P	Indoor/Outdoor Riser rated 30 meter OptiTap to SCAPC cable
434401UB4H3100M-P	Indoor/Outdoor Riser rated 100 meter OptiTap to SCAPC cable

Note: The listed OptiTap cables are available on demand within a week of the order. Custom length cables require longer lead times. For more information contact your Corning account manager.

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