Outdoor CDMA Femto Installation Guide

Version 1.0

September 2016

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Revision History

Version	Date	Person	Description
0.1	09/22/2016	Ray Kim	Initial Draft Document
1.0	10/02/2016		Review changes

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1 Introduction

1.1 Proprietary Information Notice

1.2 Purpose

The Conexus World Outdoor CDMA Femto Cells, called the xFemto throughout this document, are compact, easily installable miniature base stations designed to provide improved and enhanced coverage outside of buildings. Typically, the xFemto cells are connected to the public Internet and the operator's network via Cable, DSL, on-premise fiber optic link, satellite modem, or a similar IP backhaul technology. The xFemto offers benefits for both the subscribers and the operators. The subscribers get better voice service coverage and higher data throughput while the operators are able to provide better coverage in spotty coverage areas and are able to off-load traffic from the macro cellular network. In addition, indoor and/or outdoor coverage problems may be resolved by using the xFemto cell.

1.3 Scope

This document describes the installation procedure for the xFemto. The scope of this document covers the description, environmental specifications, equipment location, cabling, and installation followed by trouble shooting steps if required during the installation of the xFemto device.

2 Acronyms

1xEVDO	1x Evolution Data Optimized
1xRTT	1x Real Time Transmission
AAA	Authentication, Authorization and Accounting
AN	Access Network
BSC	Base Station Controller
BTS	Base Station Transceiver Subsystem
DHCP	Dynamic Host Control Protocol
DNS	Domain Name Server
DSCP	Differentiated Services Code Point
FCC	Federal Communications Commission
FSM	Femtocell Station Manager
FQDN	Fully Qualified Domain Name
GPS	Global Positioning System
IKEv2	Internet Key Exchange version 2
IMS	IP Multimedia Subsystem
IOS	Interoperability Specification
ISAKMP	Internet Security Association and Key Management Protocol
IPSec	IP Security
LAN	Local Area Network
LED	Light Emitting Diode
MGW	Media Gateway
O&M	Operation and Maintenance
PCF	Packet Control Function
RF	Radio Frequency
RN	Radio Network
RNC	Radio Network Controller
RTP	Real Time Protocol
SeGW	Security Gateway
SIP	Session Initiation Protocol
UDP	User Datagram Protocol
VPN	Virtual Private Network
WAN	Wide Area Network

3 Safety and Compliance Information

3.1 Statement of Intent

The Conexus World Outdoor CDMA Femtocell is intended for use in a CDMA cellular infrastructure radio access network. The responsible body shall be made aware that, if the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

3.2 Safety Precautions

⚠ Power Sources

Use only power sources that are within the specified limits as designated on the equipment labels. Use of power sources outside the specified limits is hazardous and may cause personal injury or property damage.

⚠ Equipment Location

Equipment is meant for outdoor use only and should be located outside the building. Use of unprotected equipment indoors is hazardous and may cause personal injury or property damage.

3.3 Regulatory Compliance Information

The FCC regulatory compliance information provided in this section is applicable only to models equipped with an FCC Identification Number (FCC ID).

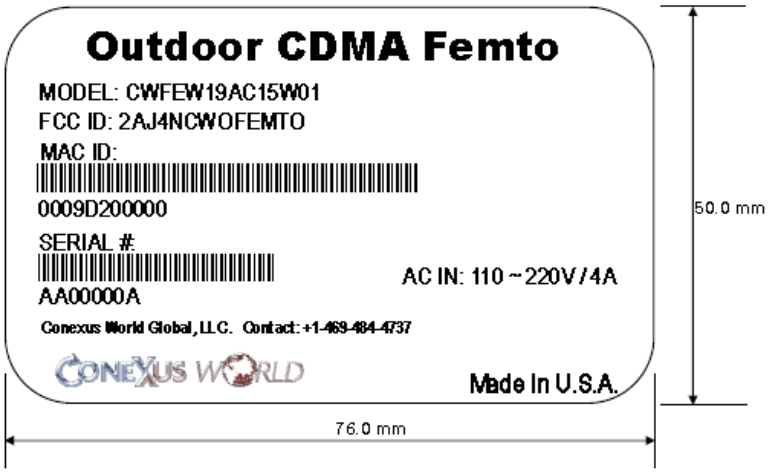


Figure 1. Conexus World Outdoor CDMA Femto FCC Label (SAMPLE)

3.3.1 FCC Radiation Exposure Statement

This equipment complies with FCC's RF radiation exposure limits set forth for an uncontrolled environment under the following conditions:

- This equipment should be installed and operated such that a minimum separation distance of 19 feet (5.8 meters) is maintained between the radiator (antenna) and the user's or nearby person's body at all times.

3.3.2 Radio Interference (FCC 15.19 Statement)

This equipment complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This equipment may not cause harmful interference, and (2) This equipment must accept any interference received, including interference that may cause undesired operation.

3.3.3 Unauthorized Modifications (FCC 15.21 Statement)

Persons or parties responsible for operation of this equipment are cautioned that any changes or modifications not expressly approved by Conexus World Incorporated could void the user's authority to operate this equipment.

3.3.4 Digital Device Interference (FCC 15.105 Statement)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their expense.

4 Device Installation

4.1 Overview

The xFemto is a compact cellular access point, supporting both cdma2000 1xRTT and 1xEVDO Rev. 0/Rev.A subsystems. The combined functionalities of BTS, BSC, and PCF are supported within the cdma2000 1xRTT sub system. Further, the xFemto is capable to interoperate with standard IOS protocols and SIP messages on the back haul network for cdma2000 1xRTT handsets. For the 1xEVDO sub system, the xFemto supports the combined AN and PCF functionalities. The entire communication with the Operator's network goes through a secure IPSec tunnel or other secured IP tunnel. This tunnel originates from the xFemto and terminates at the SeGW or other network counter-part. The xFemto expands 3G cellular services inside and/or outside buildings so mobile users can experience full voice and data service in areas that have inconsistent to none cellular signal. Typical installations include office buildings, warehouses, high rises, convention centers and other in-building hot spots, or highways, small campus and other outdoor hot spots of rural area.

xFemto Advantages:

- **Security:** Secure and reliable connection into the operator's network. The xFemto might use a secure VPN tunnel to access an operator's internal network. The xFemto provides self as well as subscriber authentication to protect against fraud and illegal usage of the device.
- **Scalability:** Scalable to any number of Femto cells within an operator's network with minimal impact to the existing infrastructure. Each xFemto is easily configurable remotely from the operator's network using FSM.
- **Minimizing Interference:** The xFemto comes equipped with internal hardware and algorithms to minimize and mitigate RF interference towards existing networks.
- **Seamless Services Support:** The xFemto services are compatible with any standard-issue CDMA cellular phone or AirCard. The xFemto supports E911 emergency calls. The xFemto also supports feature transparency with the CDMA Macro network.
- **Single Cell or Cluster Configuration Support with Mobility:** The xFemto can be deployed as a single RF cell or as a cluster of Femto cells. Peer-to-Peer soft handoff is supported within the clusters. User mobility with soft handoff and hard handout from the Femtocell to the Macro is also supported.
- **Long Term Performance:** Once the device is installed, there is typically no reason to move, or update the xFemto. This unit requires no regular maintenance.

4.2 Network Diagram

The xFemto may be deployed as a single cell or multiple xFemtos may be deployed as a cluster configuration. The device is IP-based and plugs in directly into an existing IP network within the customer's premises or a Satellite modem.

4.2.1 Single xFemto Deployment

The following is a typical network diagram of a standalone xFemto device deployed within a customer's premise.

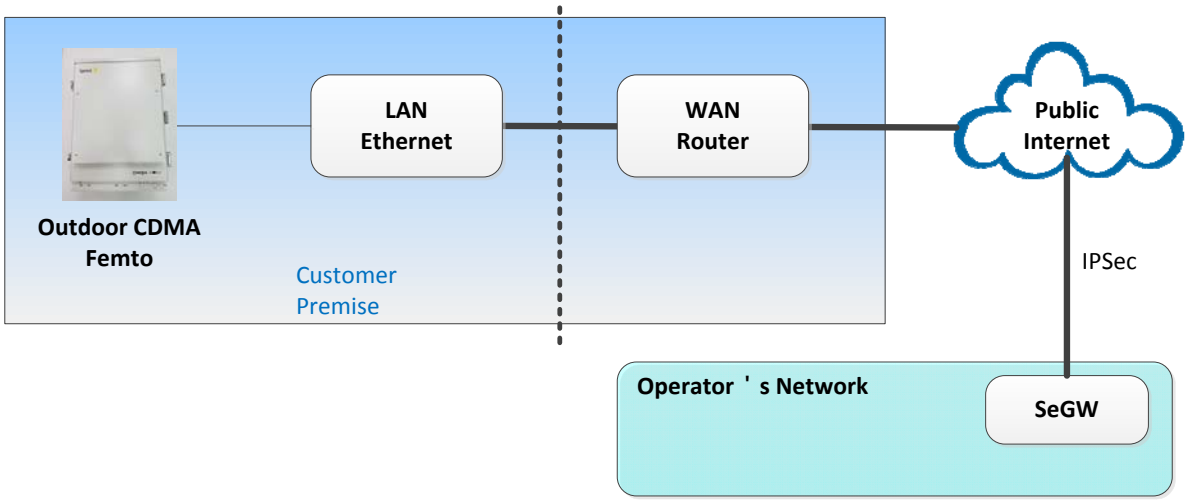


Figure 2. Single xFemto deployment network diagram

4.2.2 Multiple xFemto Deployment

The following is a typical network diagram of multiple xFemto devices deployed in a cluster configuration at a customer's site. In a cluster configuration, it should be ensured that all the xFemtos within the cluster are reachable by each other across the LAN. One way to do this is to place all the devices within the same IP subnet. If different IP subnets are used for a cluster, the routers must be configured accordingly so that all used subnets are reachable by all xFemtos.

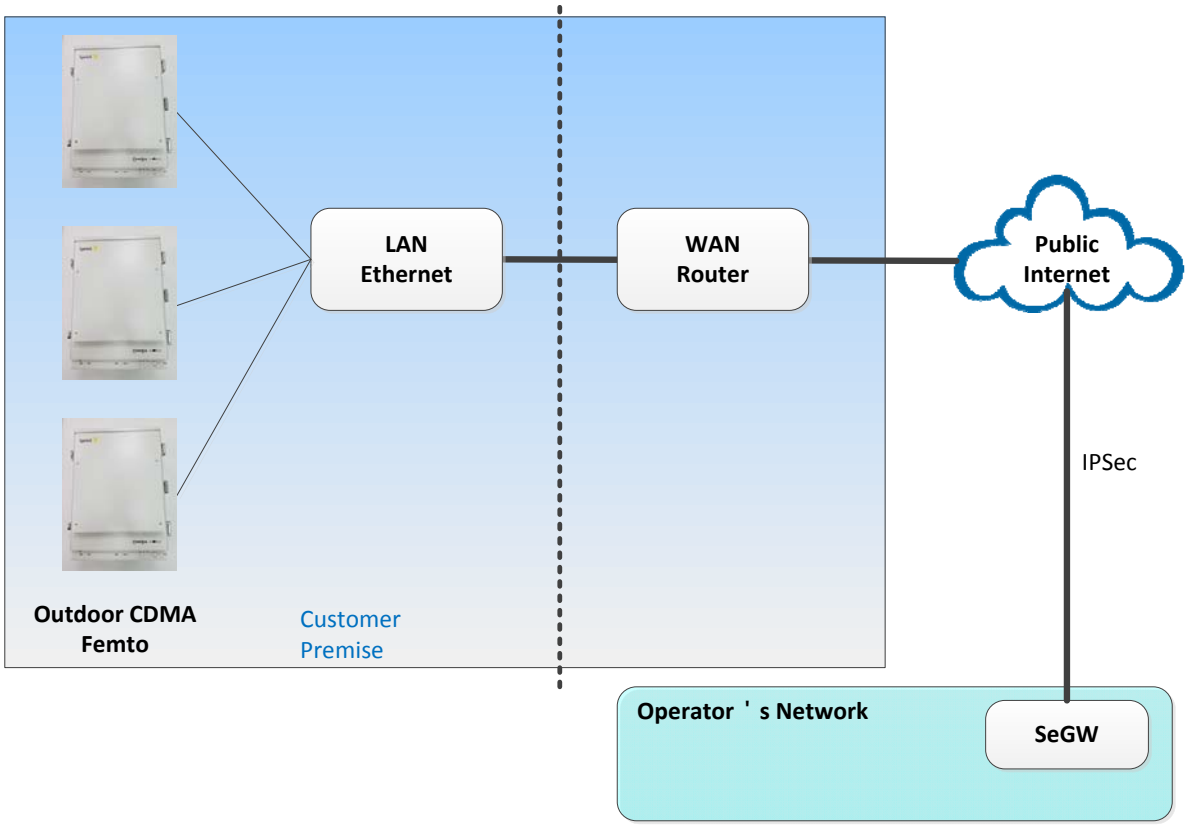


Figure 3. Multiple xFemtos deployed in a Cluster Configuration

4.2.3 Single xFemto Deployment with a Satellite Modem

The following is a typical network diagram of a standalone xFemto deployment with Satellite modem.

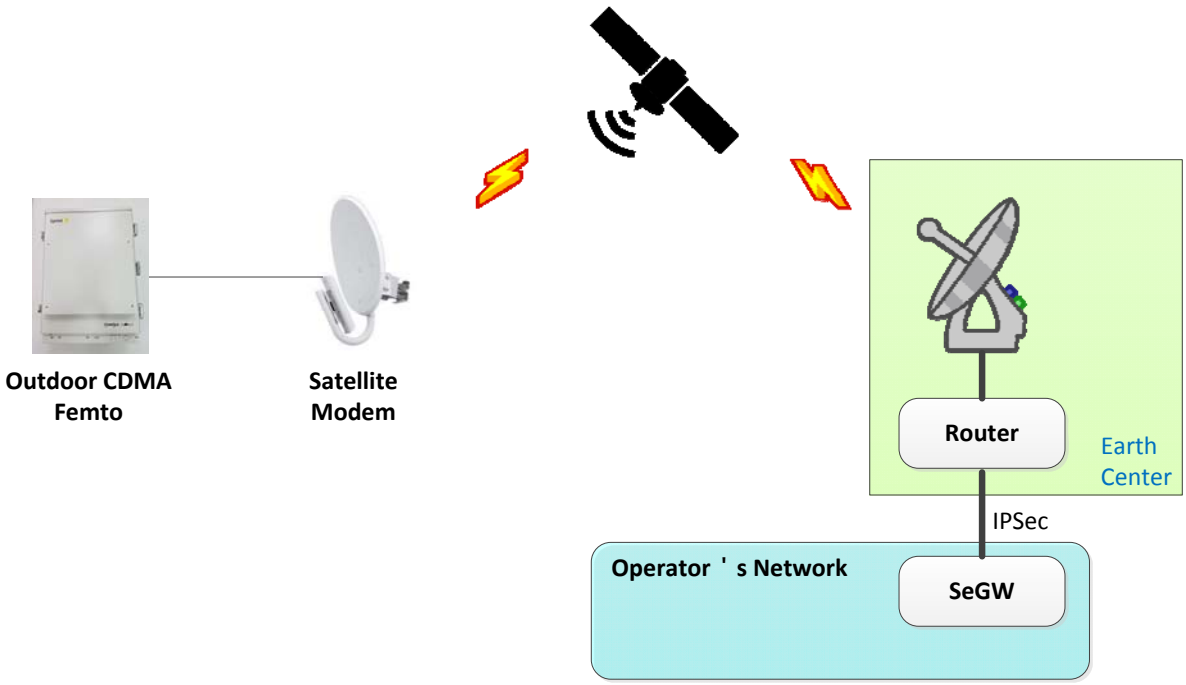


Figure 4. Single xFemto deployment with a Satellite modem network diagram

4.2.4 Multiple xFemto Deployment with one Satellite Modem

The following is a typical network diagram of a cluster configuration of multiple xFemto devices connected to a Satellite modem. In a cluster configuration, it should be ensured that all the xFemtos within the cluster are reachable by each other across the LAN same as in 4.2.2 Multiple xFemto Deployment.

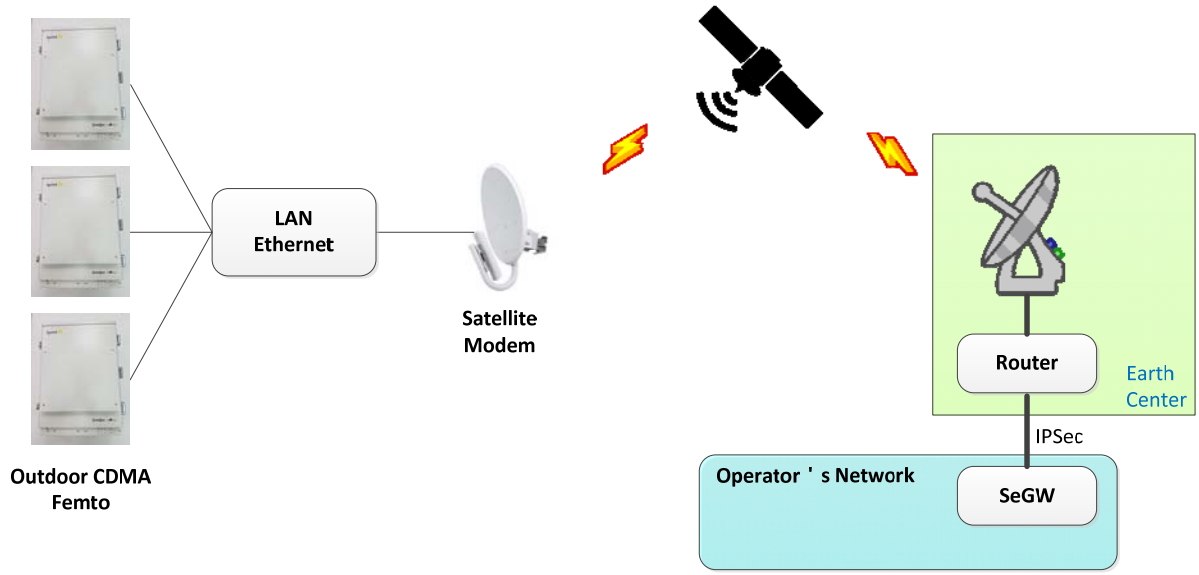


Figure 5. Multiple xFemto deployed within a Cluster Configuration with a Satellite modem

4.2.5 Network Requirements

For optimal xFemto operations, a customer's IP network needs to meet the following bandwidth and capacity requirements:

Service Usage Type	Bandwidth Requirements	Capacity Description
At Maximum Capacity	5 Mbps	29 voice calls and 32 active data users, simultaneously
Idle	20 Kbps	No active users
Voice Traffic Only	60 Kbps per call	29 concurrent calls Maximum
Data Traffic Only	3 Mbps per device (maximum)	32 simultaneous data sessions Maximum
If multiple devices are installed throughout a campus, there will be an increase of IP traffic on the LAN		

Table 1. Network Bandwidth Requirements

LAN Installation Considerations:

- The xFemto device uses standard RJ 45 LAN connection (100BASE-TX Ethernet Switch/Router is recommended).
- The xFemto device supports DHCP as well as static IP addressing schemes. The device is shipped from the factory with DHCP addressing scheme enabled.
- The LAN requires routing to the customer's WAN network to allow the xFemto to connect to the operator's network across the Internet.
- Signaling and traffic for Soft Handoff between cluster members goes across the LAN network.

WAN Installation Considerations:

- The installer must Open UDP Ports 500 and 4500 for ISAKMP signaling between the xFemto and the Security Gateway to support IPSec NAT-Traversal.
- Intrusion Prevention Systems should be properly configured for the device and Security Gateway communication if required.
- Support for DSCP marked IP packets is desired but not required on the customer's IP network.
- For optimal performance of the device, a back haul bandwidth of 5 Mbit/s should be reserved for each xFemto.
- For cluster configuration, each device within the cluster needs its own linear back haul bandwidth. All the devices within a cluster is required to use the same back haul network for optimal performance.

Static IP Addressing Scheme

The xFemto supports static IP addressing for the device. The device is shipped from the factory with DHCP addressing scheme enabled. The USB cable provided should be used to set static IP address for the device (see *Outdoor CDMA Femto - USB Console User Guide* for more information).

When using static IP address addressing scheme, the IP address, Subnet Mask, default Gateway and DNS server information should all be configured on the xFemto using the USB connection.

4.3 Hardware Configuration

The xFemto offers a unique combination of 1xRTT and EV-DO radio and controller in one physical platform which differentiates itself from competing systems. The xFemto is equipped with a Network Listener module which aids the device in sniffing its RF environment to reduce interference to existing Macro networks. The xFemto also has a GPS receiver which is used to validate the position of the device once it becomes operational.

The following table lists the xFemto device specifications:

Outdoor CDMA Femto Specifications		
RADIO	**Technology**	CDMA 1xRTT and 1xEV-DO Rev. A
	Frequency Bands	1900 MHz
	Simultaneous Calls	Up to 29 simultaneous voice calls Up to 32 active data sessions
	Transmit Power	15 W
	Configuration	1 carrier / omni
CONTROLLER	**Handoff**	Soft / Hard
	Integrated	BTS, BSC, RN, RNC, PCF and O&M
INTERFACES	**Core Network Interface**	SIP/IMS RTP/MGW
	PDSN	IP-10/100 Base T Ethernet – (A10, A11)
	AAA+HA	IP-10/100 Base T Ethernet – (A12)
	SeGW	IKEv2
POWER SUPPLY	**AC**	4A maximum / 110~220V AC
ENVIRONMENTAL	**Temperature**	Operating -20°C to 50°C (-4°F to 122°F)
	Humidity	0 to 100% non-condensing
HARDWARE	**Installation**	Wall/Poll mount
	Dimensions (HxWxD)	19.9” x 27” x 11.2”
	Weight	90 lbs
	Cooling	Conductive
	Type	Outdoor

Table 2. xFemto Device Specifications

5 Installation Steps

5.1 Workflow of Installation

The Workflow to install the xFemto is shown in the following diagram:

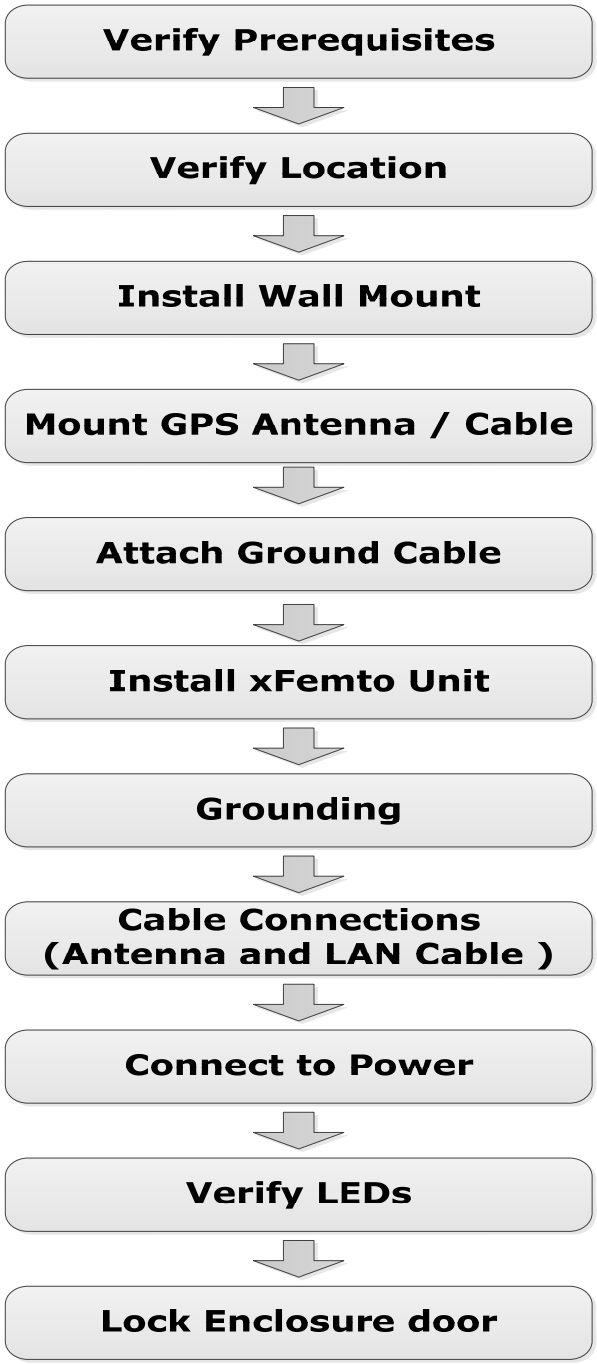
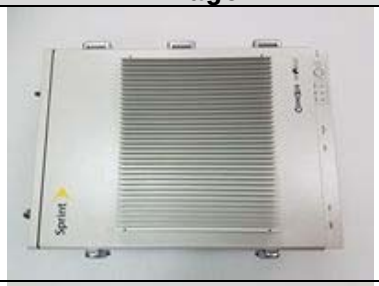


Figure 6. Installation Work Flow

5.2 Verifying Prerequisites

Prior to installation of the xFemto, verify the required tools, parts, and components.

5.2.1 Verify the Parts and Kits

No.	Kit / Part	Part No.	Descriptions	Image
1	Outdoor CDMA Femto (1900 MHz)	CWFEW19AC15W01	• Outdoor CDMA Femto 15W – 1 unit • Dimension: - 18.1" x 27" x 11" • Weight: - 90 lbs	
2	Wall Mounting Kit	S855-002-U03	• Wall mount bracket – 1 unit • M5 x .8 Socket Head Screws – x6 *Note) The mounting kit is attached to the xFemto unit at the factory by default.*	
`3	Sun Shield	S855-002-U07	• Sun shield plate – 1 unit • M4 Pan Head Screws – x4 *Note) The sun shield kit is attached to the xFemto unit at the factory by default.*	
4	Power Cable	PWF-03BFFA-SL7001	• AC Power Cord 3m – 1 EA	
5	GPS Antenna	TW3012	• GPS L1 and SBAS frequency bands, high performance and low noise antenna – 1 EA	

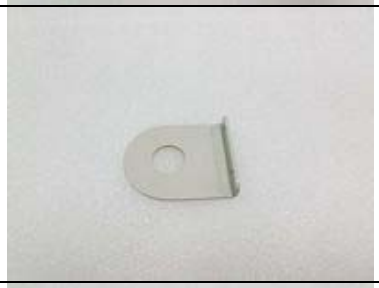
6	GPS Cable	CC58T-3	• RG58C Coaxial Cable, TNC Male / TNC Male, 3 ft – 1 EA	
7	GPS Bracket	S855-002-B06	• GPS Antenna mount – 1 EA	
8	Enclosure Key	N/A	• Enclosure lock keys – 2 EA	
9	Ground wire	6AWG	• AWM 1283 105 °C 600V 1.5m – 1 EA • M6 Pan Head screws – x4	 
10	USB Debug Cable	30-3006-6	• USB 2.0 Male/Male 6ft – 1 EA	

Table 3. xFemto Part and Kit List

5.2.2 Verify Tools

No.	Tool	Purpose
1	5mm Hex Key Allen Wrench	• For securing the xFemto unit to the mounting kit
2	Medium Philips head screw driver	• For mounting the GPS bracket to the xFemto unit – M4 Pan Head screws • Grounding – M6 Pan Head screws
3	Type N Torque Wrench	• For securing N type RF connector
4	1 13/16” Wrench	• For securing the LAN cable conduit

Table 4. Installation Tool List

5.3 Verifying Location

5.3.1 Environmental requirements

The xFemto meets the following Environment Compliance:

No.	Item	Details
1	Operating Temperature	-20°C to 50°C (-4°F to 122°F)
2	Operating Humidity	0 to 100% non-condensing
3	Rain and dust ingress protection	IP66
4	Solar radiation	1120 W/m^2
5	Altitude	TBD

Table 5. xFemto Environmental Requirements

5.3.2 Wall Mount Requirements

The following list defines the xFemto location requirements for Mounting on a wall:

- Flat 25”x32” wall space so a physical clearance of 5” on all sides of the device is observed to ensure efficient operation of the antennas.
- The xFemto unit should be mounted at least 6ft (2m) from the floor.
- A building support beam for mounting support (recommended).
- The GPS antenna must be placed no metal sheeting within 4ft (1.2m) with a clear view of the sky.

5.4 Installing Wall Mount

5.4.1 Wall Mount Kit Dimension

The following image shows the wall mount kit dimension.

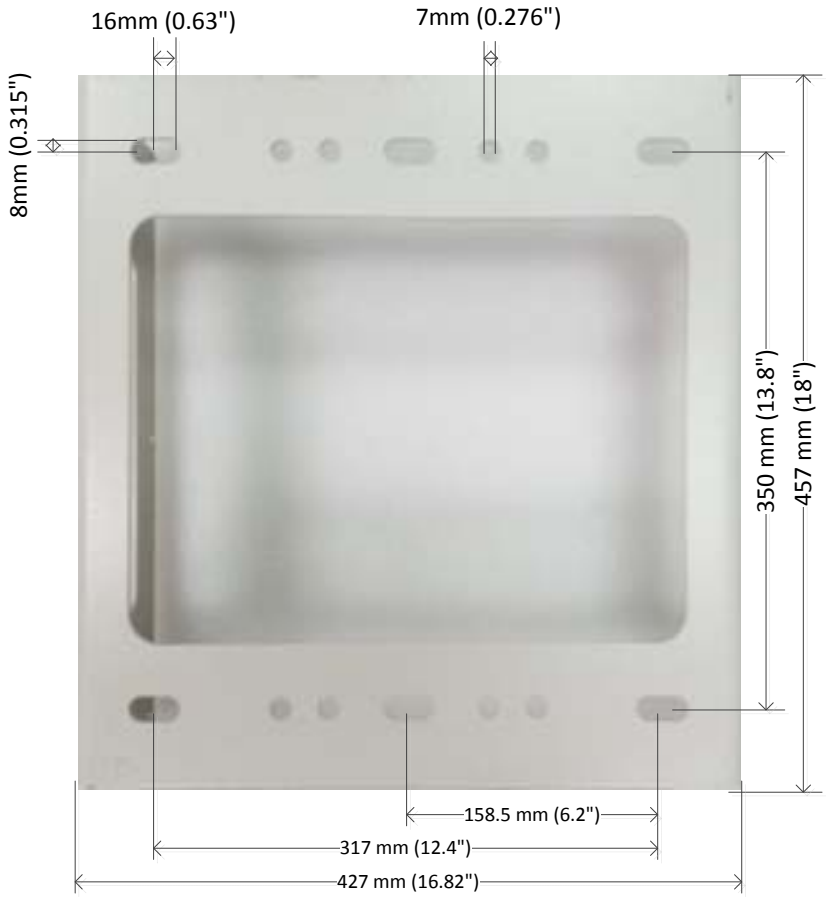


Figure 7. Wall Mount Kit Dimension

5.4.2 Mounting on a Wall

Once the location has been selected, mount the bracket to the wall.

1. Use mounting bracket as a template to determine hole locations. Making 6 holes matching with oval shape holes on the bracket are recommended. Be sure to line holes straight at mounting level.
2. Position the bracket lined up with the holes. Be sure to mount the bracket in the correct orientation. Mount grooves on the bracket should be positioned upward as shown below.

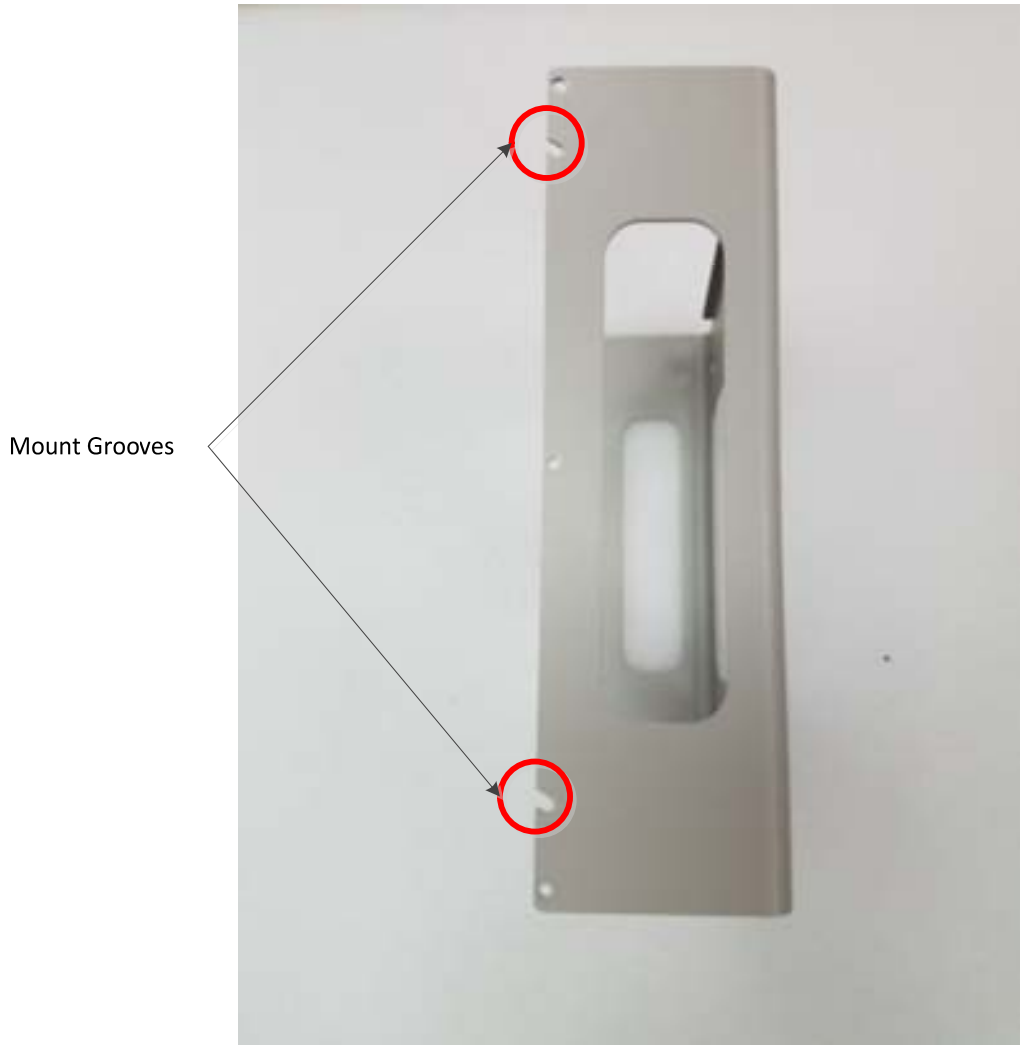


Figure 8. Wall Mount Grooves

3. Attach the bracket to the wall using Lag bolts (x6).

   Note) Lag bolts (x6) are not supplied by Conexus World and are the responsibility of the installer.

5.5 Mounting GPS Antenna/Cable

The GPS Antenna and Cable should be attached to the xFemto unit before installing the unit to the wall mount.

1. Install the GPS bracket to the xFemto unit after unscrewing two M4 screws, which are located on the left side of the xFemto top panel as below.

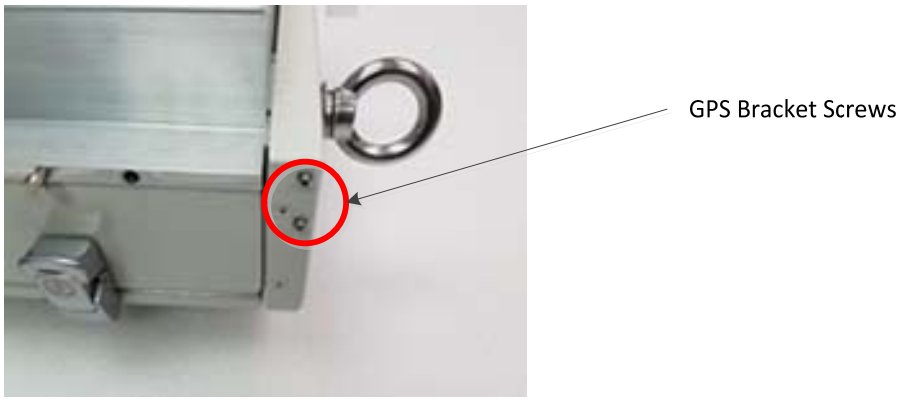


Figure 9. Location of GPS Bracket screws

Figure 10. After mounting the GPS bracket to the xFemto unit

2. Mount the GPS antenna to the GPS bracket as in below picture. Insert the GPS antenna jack into the hole of the GPS bracket after unscrewing the bottom washer of the GPS antenna jack. After that, install the bottom washer and screw to fix the GPS antenna to the bracket.

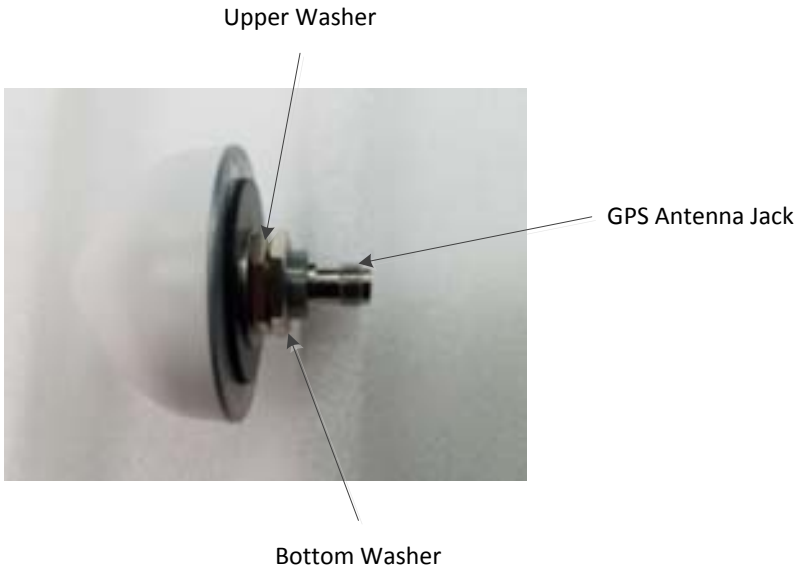


Figure 11. GPS antenna jack and washers

Figure 12. After mounting the GPS antenna to the GPS bracket

3. Unscrew and release two GPS cable clamp screws from the xFemto unit. GPS cable clamp screws are located on the left side of the xFemto unit as below.

Figure 13. GPS Cable Clamp and Screws

4. Place two GPS clamps on the GPS cable as below.

Figure 14. GPS clamps on the cable

5. Connect the GPS cable to the GPS antenna jack.

Figure 15. GPS cable connection to the GPS antenna

6. Attach the top clamp of the cable to the xFemto unit with a M2 screw driver as below.

Figure 16. GPS cable attachment - First

7. Attach the bottom clamp of the cable to the xFemto unit and then tighten the GPS cable as shown below. Do not tighten the cable too much.

Figure 17. GPS cable attachment – Last

8. Connect the other end of the GPS cable to the GPS jack at the xFemto bottom panel as below.

Figure 18. GPS cable connection to the xFemto unit

5.6 Attaching Ground Cable

The ground cable should be attached to the xFemto unit before installing the unit to the wall mount.

1. Grounding holes are located at the right bottom side of the xFemto unit as below.

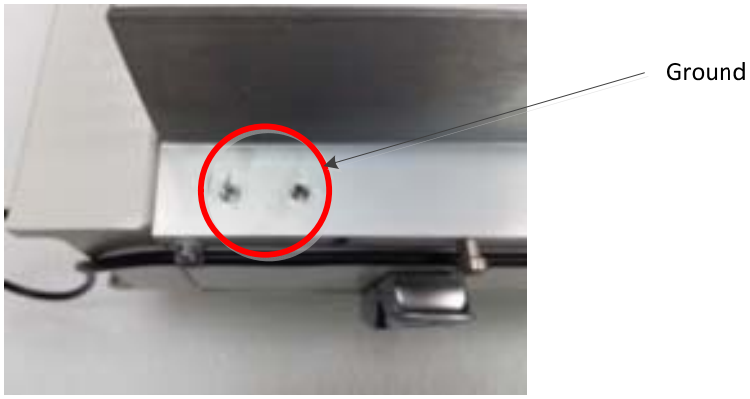


Figure 19. Ground Location

2. Connect the vented end of the ground cable to the ground on the unit with grounding screws fitted with a flat washer and lock washer using M6 pan head screw driver as below.

Figure 20. Ground Cable Attachment to the xFemto

5.7 Installing xFemto Unit

Once the GPS antenna/cable and ground cable are attached to the unit, mount the xFemto unit to the mounting plate.

1. There are 4 mounting pins, 2 pins on the left side of the unit and the other 2 pins on the right side of the unit, to hook the xFemto unit to the mount kit as below.

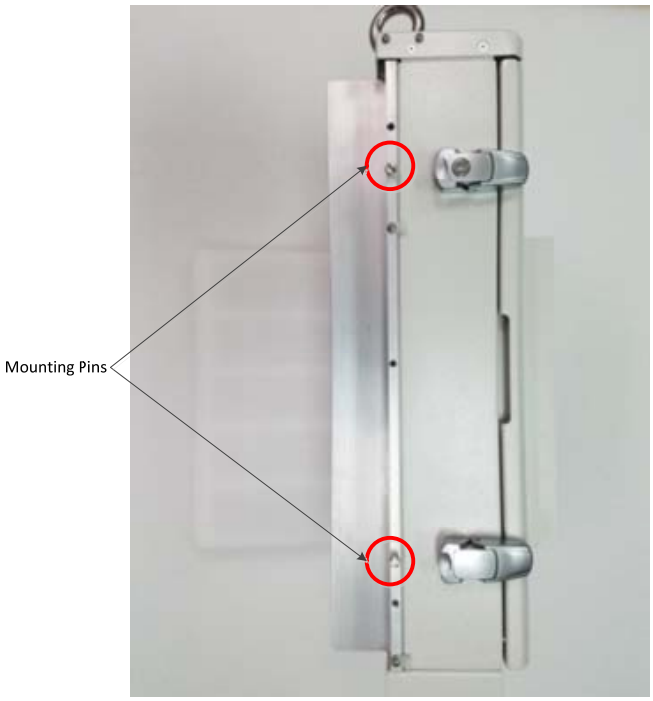


Figure 21. Mounting pins on the left side of the xFemto

2. Lift up the xFemto unit and hook the mounting pins, 2 pins on the left and 2 pins on the right, of the xFemto unit to mounting grooves on the mounting kit as below.

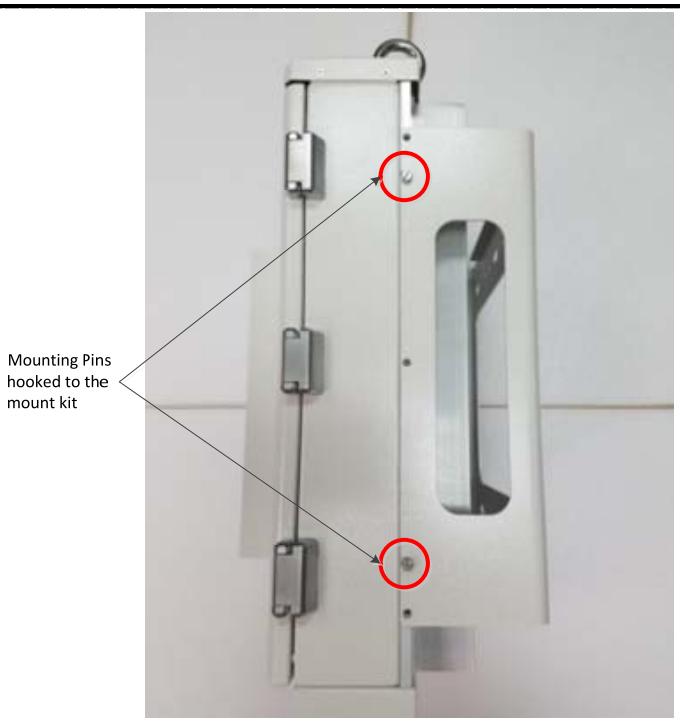


Figure 22. Mounting pins hooked to the mount kit

3. Securing the xFemto unit to the mount kit with M5 socket cap screws (x6) fitted with a flat washer and lock washer using 5mm Hex Key Allen Wrench firmly as below.

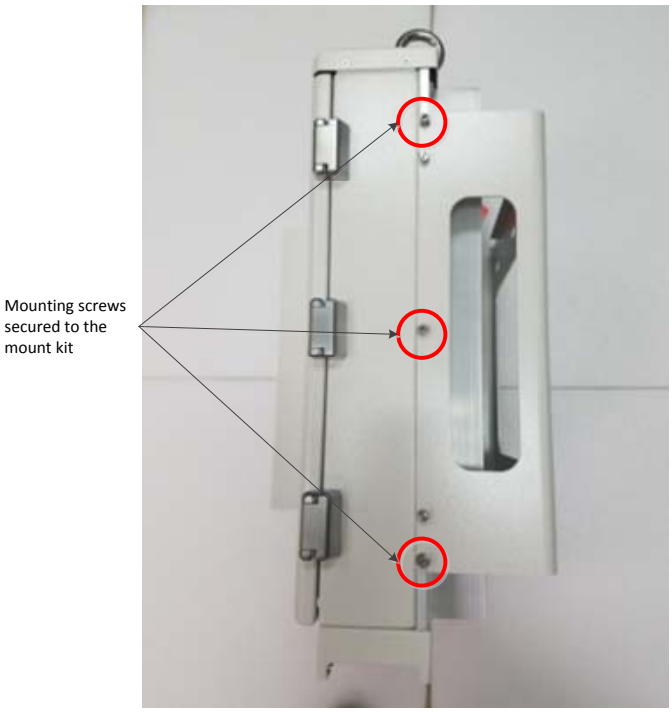


Figure 23. Mounting screws secured to the mount kit

5.8 Grounding

The flat head end of the ground cable as below image should be grounded according to the international or local standards.

Figure 24. Flat end of the ground cable

5.9 Connecting Cables

Once the grounding is completed properly, LAN, RF Antenna, and Power cable should be connected to the xFemto.

5.9.1 Bottom Panel

The following image shows the bottom panel of the xFemto for connecting cables such as GPS, RF antenna, LAN, and Power.

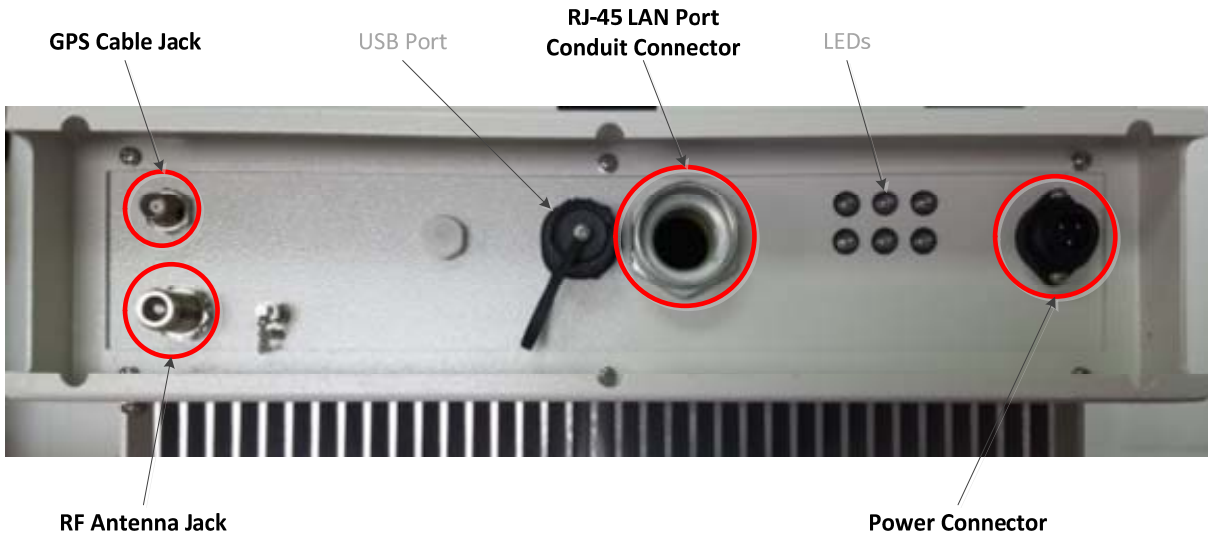


Figure 25. Bottom Panel of the xFemto

5.9.2 Connecting LAN Cable

For security reason, the LAN cable should be run through a flexible or pipe conduit.

Note) The conduit is not supplied by Conexus World and is the responsibility of the installer.

1. Measure and prepare the LAN cable and conduit for connection to the WAN or Satellite modem port.
2. Run the LAN cable in the conduit as below.

Figure 26. LAN cable in conduit

3. Unscrew and release three conduit fitting parts from the xFemto unit for fitting to the conduit as shown the below, which are attached to the xFemto unit at the factory.

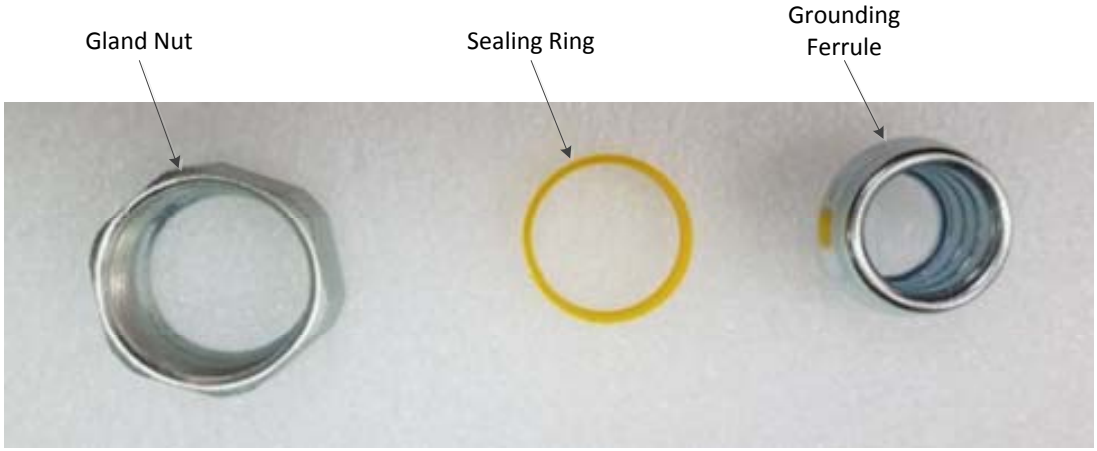


Figure 27. Conduit fitting parts

4. Insert the gland nut to the end of the conduit, which is connected to the xFemto unit, as below.

Figure 28. Gland nut fitted to the conduit

5. Insert the sealing ring to the conduit as below.

Figure 29. Sealing ring fitted to the conduit

6. Insert the grounding ferrule to the conduit as below.

Figure 30. Grounding ferrule fitted to the conduit

7. Connect the conduit to the xFemto unit for connecting the LAN cable as below. Tighten the conduit gland nut with the 1 and 13/16" wrench.

Figure 31. Connecting the conduit to the xFemto

8. Open the xFemto enclosure door and connect the LAN cable as below. Be sure not to bend the LAN cable too much and make sure to prevent the LAN cable from contacting the xFemto RF Amplifier.

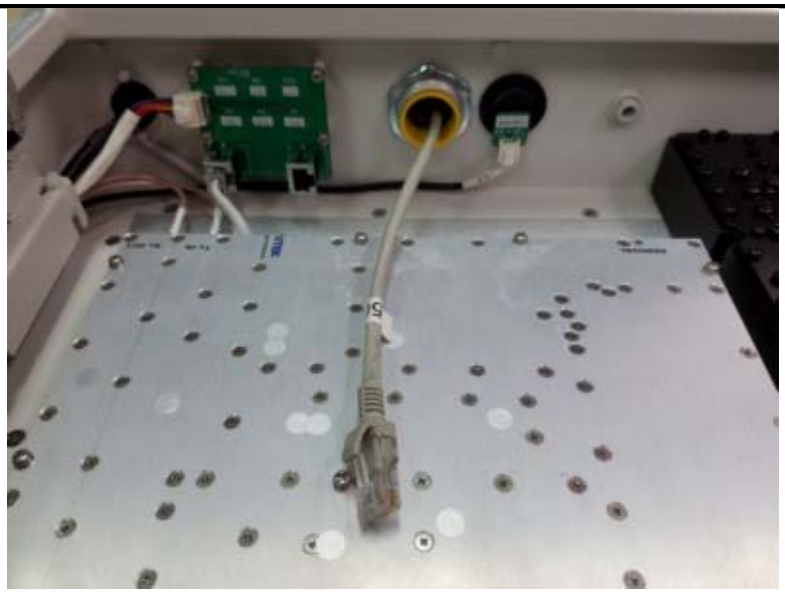


Figure 32. Before connecting the LAN cable to the xFemto

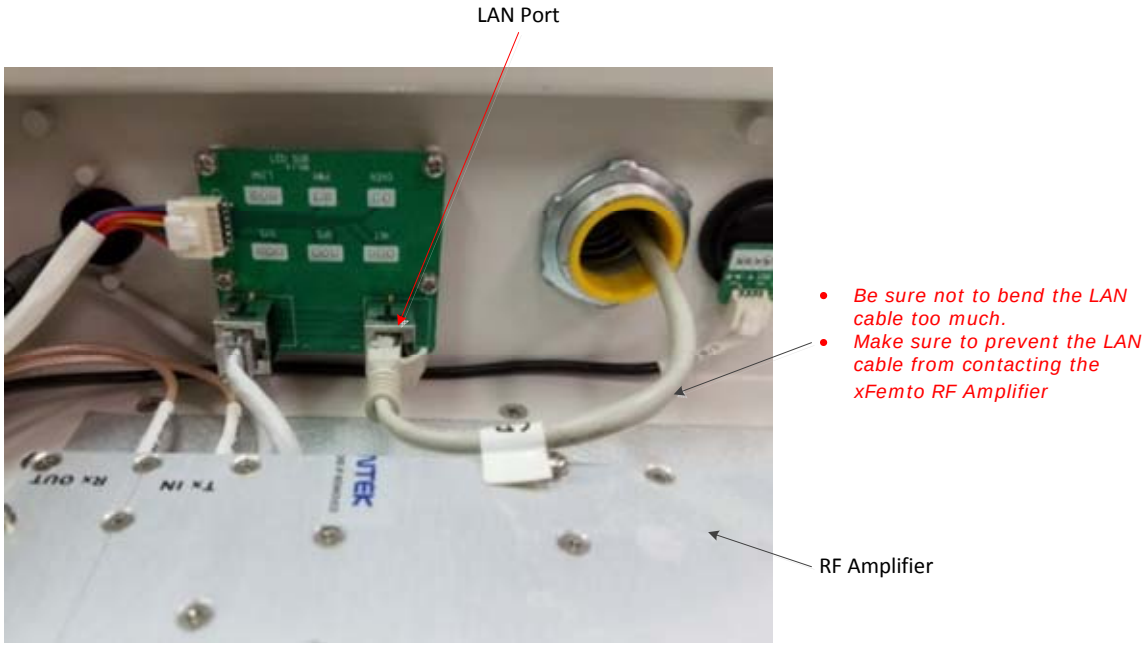


Figure 33 .After connecting the LAN cable to the xFemto

5.9.3 Connecting RF Antenna cable

The RF antenna cable should be connected the RF antenna jack at the bottom panel of the xFemto marked in Figure 25. Be sure to tighten the connection only with the type N torque wrench to avoid over tightening. The other end of the cable shall be connected the external RF antenna, which is not supplied by Conexus World.

5.9.4 Connecting Power Cable

1. Connect the power cable to the power connector located at the bottom panel of the xFemto shown in Figure 25.

5.10 Connecting AC Power

1. Connect the power cable to the AC power source. The xFemto can operated from 110V to 220V.
2. Open the xFemto enclosure door and turn on the main switch by switching to 'ON' position.

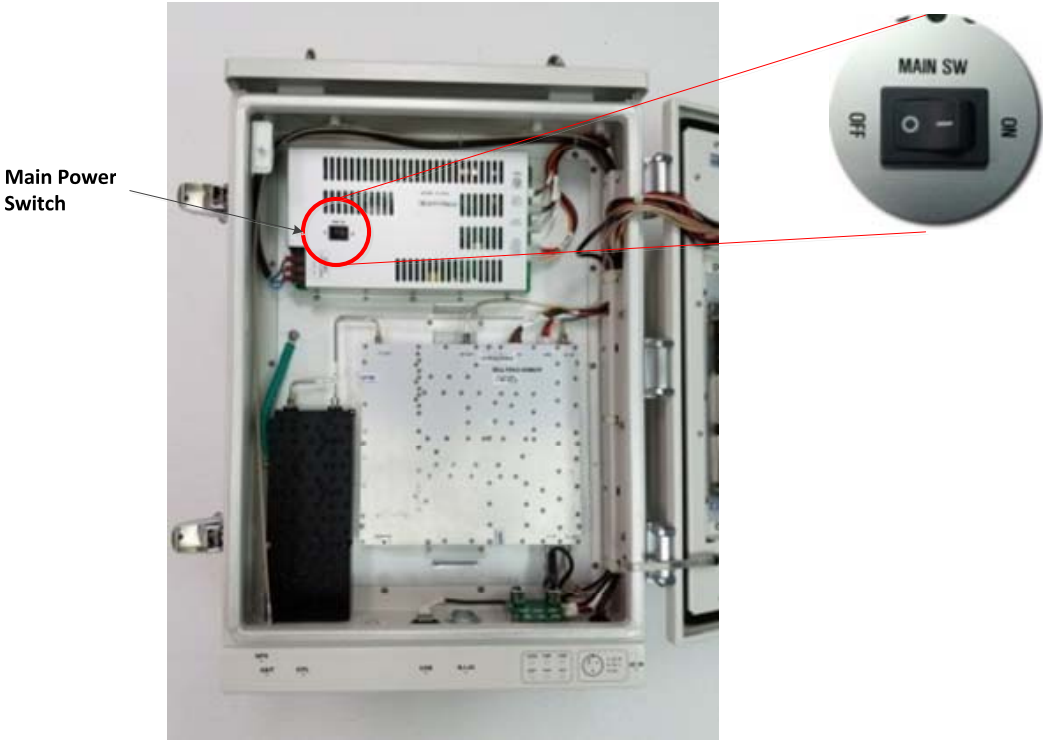


Figure 34. Main Power Switch

5.11 Verifying LED status

5.11.1 Plug and Play Feature

The xFemto works as a plug and play device when installed. The xFemto is shipped from the factory with a factory image as well as factory configuration parameters stored within its non-volatile memory. The xFemto will automatically communicate with the operator's network to download a service image as well as perform various self-authentication and self-configuration steps before turning its RF on to service the mobiles.

When the xFemto is powered on for the first time, it will follow the following steps:

- get an IP address assignment from LAN.
- Initiate an IPSec tunnel establishment with the SeGW for communication through the operator's network.
- Start the communication with the FSM and download the service image.
- Once a new service image has been downloaded from FSM, the xFemto will save this image to its non-volatile memory and then perform a self-reboot.

- After the reboot, the xFemto will setup the IPSec tunnel again with the SeGW, start communication with the FSM and start acquiring a GPS lock.
- It may take any time between 30 to 45 minutes for the xFemto to become operational the first time that it is installed.

5.11.2 LED Status

The xFemto device has six LEDs located on the bottom panel of the xFemto, indicating various operational status of the device. These six LEDs are shown as below.

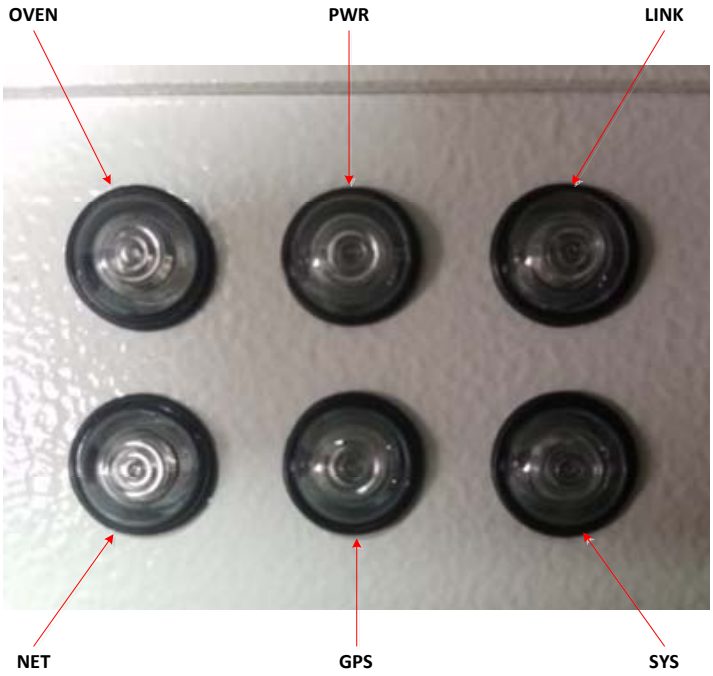


Figure 35. xFemto LEDs

OVEN: Indicates oven status of the device

PWR: Indicates Power status of the device

LNK: Indicates the Ethernet access for the device

NET: Indicates the IP addressing as well as IPSec tunnel status

GPS: Indicates the GPS status of the device

SYS: System status

Make sure five LEDs, excluding 'OVEN' indicator, are "Blue". The 'OVEN' LED shall be turned to 'Blue' temporally only when the system should be heated up because the weather is cold to boot up the system.

After power up, if five LEDs, excluding 'OVEN' LED, turn "Blue", then the device has been configured by the FSM, all systems are ready and the RF on the device has been turned on for services.

The following section describes what steps may be taken if any of these LEDs turn “Red” during the power up of the device:

OVEN: This LED turns “Blue” only when the heater installed in the xFemto is turned on. The heater turns on automatically when the inside of the system’s temperature is below 0°C (32°F) and turns off automatically when the temperature is above 5°C (41°F).

PWR: This LED is always “Blue” indicating that the device is receiving power. If this LED is not illuminated, check the following:

- Ensure that the power cable is plugged into a working wall socket
- Ensure that the power cable is plugged into the xFemto
- Check the main power switch in the xFemto’s enclosure
- If other LEDs are blinking, then it is possible that this LED is broken

LNK: This LED defines the device status regarding Ethernet connectivity to the customer’s LAN network. If the Ethernet cable has been connected to the device and the device is able to access the LAN, then this LED will turn “Blue” and blink to indicate network activity.

This LED will turn “Red” if Ethernet cable is removed or not connected properly on the device.

If this LED is blinking or solid “Red”, check the following:

- Ensure that the Ethernet cable is good.
- Ensure that the LAN Ethernet Switch/Router is working.
- Get help from customer’s IT to resolve any LAN issues.

NET: This LED defines the IP address and IPSec tunnel status of the device. On power up, this LED will be blinking “Red” until an IP address is obtained from the DHCP Server. The LED will be blinking “Blue” while IPSec tunnel is being established and will turn “Red” during the wait time due to a failure in establishing IPSec tunnel with the SeGW.

If this LED is blinking “Red”, check the following:

- The DHCP server is accessible to the device on the LAN.
- Get help from the customer’s IT to resolve any DHCP server issues providing an IP address to the device on the LAN.

If this LED turns “Red”, check the following:

- The device is able to send and receive signaling messages with the SeGW using the WAN.
- The SeGW has been configured with the valid information for this device.
- Ensure that the DNS server information provided by the DHCP server is valid and the DNS server is able to resolve the SeGW FQDN.

GPS: This LED defines the GPS lock status of the device. This LED will turn “Red” if there are not enough tracking satellites visible to the device. It will blink “Blue” when trying to acquire a GPS lock and will turn “Blue” when GPS lock has been achieved.

If this LED turns “Red”, check the following:

- Ensure that the GPS cabling is connected on the device.
- Reposition the GPS antenna to ensure a clear view of sky.

SYS: This LED defines different states of the device. This LED will blink “Blue” when the device is trying to register with the IMS Core. This LED will blink “Red” if the back haul bandwidth is not enough for calls.

5.12 Locking Enclosure Door

For security reason, make sure to close the xFemto enclosure door and secure it with the lock key. The door lock is located the left side of the xFemto as below.

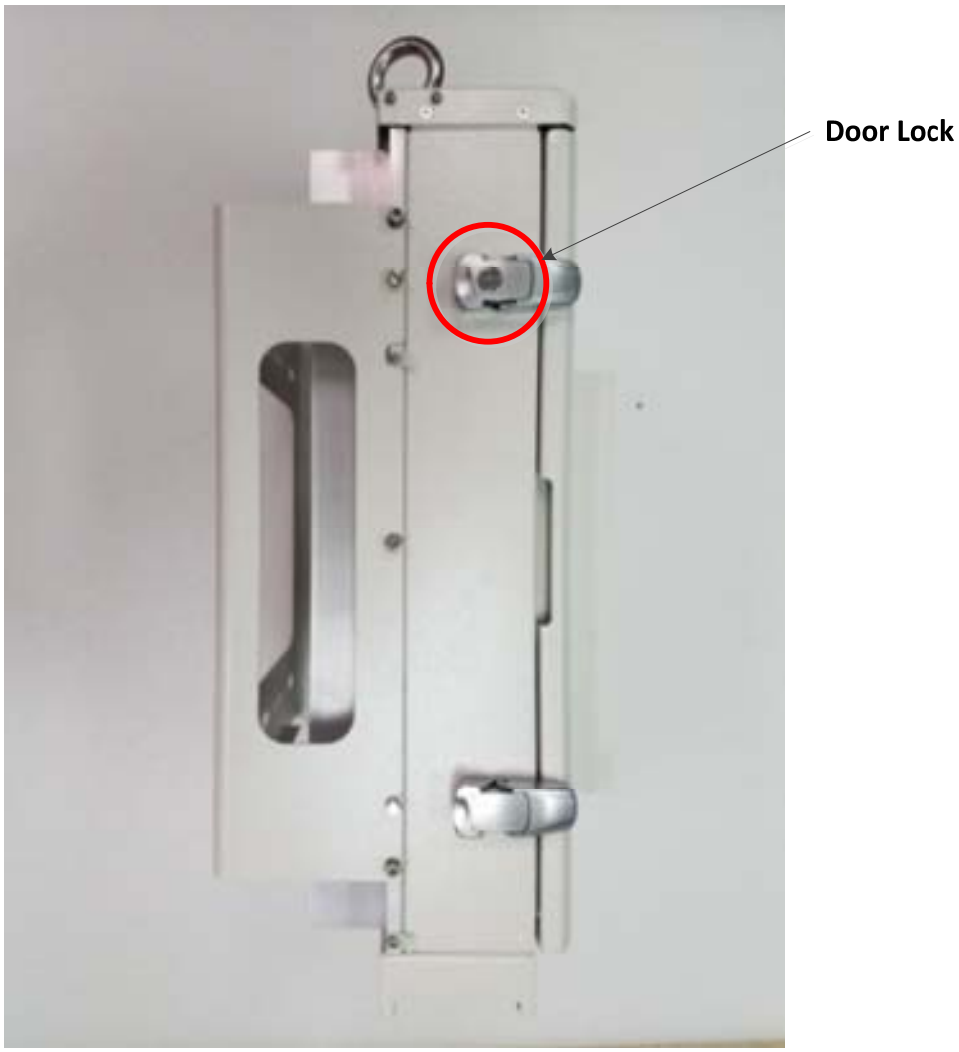


Figure 36. Enclosure Door Lock