GigaPro GPR2032H Installation Guide

About this Guide

This document provides general installation practices for the Calix GigaPro GPR2032H Outdoor ONT.

This document also provides a general description of the products, and guidance for planning, site preparation, power installation, splicing to the outside plant, and basic troubleshooting.

Intended Audiences

This document is intended for use by network planning engineers, outside plant engineers, field support personnel, and craft personnel responsible for installation and maintenance of Calix premises equipment.

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Professional installation is required

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 52cm between the radiator & your body.

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

(1) This device may not cause interference.

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil contient des émetteurs / récepteurs exempts de licence qui sont conformes au (x) RSS (s) exemptés de licence d'Innovation, Sciences et Développement économique Canada. L'opération est soumise aux deux conditions suivantes:

(1) Cet appareil ne doit pas provoquer d'interférences.

(2) Cet appareil doit accepter toute interférence, y compris les interférences susceptibles de provoquer un fonctionnement indésirable de l'appareil.

The operation of this device is prohibited on oil platforms, cars, trains, boats, and aircraft. Operation of transmitters in the 5.925-7.125 GHz band is prohibited for control of or communications with unmanned aircraft systems.

IMPORTANT NOTE:

IC Radiation Exposure Statement:

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 31cm between the radiator & your body.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 31 cm de distance entre la source de rayonnement et votre corps.

Devices shall not be used for control of or communications with unmanned aircraft systems.
Les appareils ne doivent pas être utilisés pour contrôler ou communiquer avec des systèmes d'aéronefs sans pilote.

Operation on oil platforms, automobiles, trains, maritime vessels and aircraft shall be prohibited. L'exploitation sur les plates-formes pétrolières, les automobiles, les trains, les navires maritimes et les aéronefs est interdite.

The antenna height shall be determined by the installer or operator of the standard-power access point or fixed client device, or by automatic means. This information shall be stored internally in the device. Provision of accurate device information is mandatory. La hauteur de l'antenne doit être déterminée par l'installateur ou l'opérateur du point d'accès à puissance standard ou de l'appareil client fixe, ou par des moyens automatiques. Ces informations doivent être stockées en interne dans l'appareil. La fourniture d'informations précises sur l'appareil est obligatoire.

Safety Notices

This document uses the following safety notice conventions.

DANGER! Danger indicates the presence of a hazard that will cause severe personal injury or death if not avoided.

DANGER! Danger indique la présence d'un danger qui entraînera des blessures graves ou la mort s'il n'est pas évité.

WARNING! Warning indicates the presence of a hazard that can cause severe personal injury if not avoided.

ATTENTION! Avertissement indique la présence d'un danger pouvant entraîner des blessures graves s'il n'est pas évité.

CAUTION! Caution indicates the presence of a hazard that can cause minor to moderate personal injury if not avoided.

MISE EN GARDE! Attention indique la présence d'un danger qui peut causer des blessures légères à modérées s'il n'est pas évité.

ALERT! Alert indicates the presence of a hazard that can cause damage to equipment or software, loss of data, or service interruption if not avoided.

ALERTE! L'alerte indique la présence d'un danger susceptible d'endommager l'équipement ou les logiciels, de perdre des données ou d'interrompre le service s'il n'est pas évité.

IMPORTANT SAFETY INSTRUCTIONS

When using your equipment, basic safety precautions must always be followed to reduce the risk of fire, electric shock, and injury to persons, including the following:

- Do not use this product near water. For example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool.
- Use only the power cord indicated in this manual.
- For external power supplies, the external power supply used in this device is to be Class II or a Limited Power Source (LPS) power supply.

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Chapter 1

GigaPro GPR2032H Overview

Calix GigaPro™ Hardened Wi-Fi System (GPR2032H) is a new generation, tri-band, outdoor PoE or local powered Wi-Fi 6E system, ideal for small business and residential applications, bringing high-bandwidth services outdoors to the barn, patio, pool, restaurant patio, and more. It features the latest Wi-Fi 6 and 6E technology, utilizing the full 1.2 GHz channel width of the new 6 GHz spectrum, offering the ultimate Wi-Fi experience. Besides supporting data and video services, this intelligent, high-performance system has both a 2.5 GE LAN and WAN interface, allowing it to support multi-Gigabit throughput for IPTV video and data services.

The GigaPro™ Hardened Wi-Fi System is a tri-band, outdoor PoE or local powered Wi-Fi 6E system that leverages the ultra wide 6 GHz spectrum. Using a 2.5 Gigabit Ethernet interface on both the WAN and LAN allows broadband service providers (BSPs) to provide high bandwidth for the most demanding environments. With integrated power of Ethernet (PoE), the GigaPro™ Hardened Wi-Fi System can be placed in an optimal location; even without power availability. Coupled with the Calix GigaPro™ Managed Switch (GPR8802x), the GigaPro™ Hardened Wi-Fi System can be powered via an Ethernet cable. In addition, the GigaPro™ Hardened Wi-Fi System can also be powered locally (with a traditional power adapter), offering the ultimate location flexibility indoors or outdoors. The GigaPro™ Hardened Wi-Fi System offers wide temperature range support from -30° C to 70° C. It also supports Ingress Protection (IP65) preventing dust and water penetration. For public venues, such as outdoor hotspots or patios, the GigaPro™ Hardened Wi-Fi System provides the ideal Wi-Fi coverage with Wi-Fi 6 and the new generation of Wi-Fi 6E.

The GigaPro™ Hardened Wi-Fi System enables business and residential subscribers to receive Multi-Gigabit broadband data, Internet Protocol (IP) video and services. Using the latest 802.11ax and Wi-Fi 6E technology in the 2.4, 5 and 6 GHz radios, the GigaPro™ Hardened Wi-Fi System incorporates 6x6 streams of Wi-Fi delivery (2x2 @ 2.4 GHz, 2x2 @ 5 GHz and 2x2 @ 6 GHz).

In addition, with multi-user multiple-input and multiple-output (MU-MIMO) and beamforming, the GigaPro™ Hardened Wi-Fi System allows service providers to extend the access network inside or outside small businesses and smart homes, establishing a strategic location for the delivery and control of broadband services.

With Wi-Fi being the de facto wireless data communication technology of choice for consumers, Calix engineered the GigaPro™ Hardened Wi-Fi System for optimal coverage for outdoor areas with simultaneous tri-band 2.4 GHz, 5 GHz and 6 GHz operation and dynamic beamforming in all spectrums. Leveraging the latest Wi-Fi 6 and 6E features, the GigaPro™ Hardened Wi-Fi System provides long range, higher efficiency and less interference compared to earlier generations of Wi-Fi technology.

The GigaPro™ Hardened Wi-Fi System also supports the entire 6 GHz band of 1.2 GHz spectrum, allowing fully uncongested 160 MHz channel offering 1.2 Gbps bandwidth. Also supporting Dynamic Frequency Selection (DFS) channels at 5 GHz to maximize transmission. The GigaPro™ Hardened Wi-Fi System easily delivers HD and UHD (ultra-HD) video and data throughout a subscriber's home in an increasingly video-rich and mobile broadband environment. Ensuring consumers can have ultra-fast Wi-Fi throughout their premises, the GigaPro™ Hardened Wi-Fi System provides the latest generation of redundant Wi-Fi 6 and 6E mesh when connected to any other product in the GigaPro™ Hardened Wi-Fi System portfolio. The GigaPro™ Hardened Wi-Fi System itself can be provisioned as either a residential gateway (RG) or a mesh satellite. With the GigaPro™ Hardened Wi-Fi System as the RG, and another GigaPro™ Hardened Wi-Fi System system as a satellite extender, consumers can truly experience Wi-Fi coverage everywhere.

GPR2032H Hardened Outdoor ONT


Revenue Edge Platform

As part of the Revenue EDGE, the GigaPro™ Hardened Wi-Fi System uses the world's only hardware independent, modular, standards-based, software platform. With the Revenue EDGE, BSPs can use the containerized architecture to quickly deploy new services that leverage a range of pre-integrated value-added solutions (e.g., enhanced parental controls or home network security). This allows BSPs to generate additional recurring revenue or further differentiate their service, while increasing subscriber satisfaction. Once integrated with your business and operations support systems (B/OSSs), adding additional GigaPro™ Hardened Wi-Fi System Wi-Fi systems is simple; taking days instead of weeks.

Use Case - Small Business

Small businesses such as restaurants and cafes are looking to offer outdoor dining experiences. Other businesses such as farms need to provide connectivity to barns, workshops, and other external buildings. The GigaPro™ Hardened Wi-Fi System provides an affordable, managed option for delivering the ultimate high bandwidth Wi-Fi experience, regardless of harsh climates.

The GigaPro™ Hardened Wi-Fi System is also a key component of the Revenue EDGE Small Business solution (coming in Q4 2022), which offers a number of features that will allow BSPs to capitalize on the massive small business opportunity.

Use Case - Outdoor Residential

Many consumers want Wi-Fi coverage for large backyards, lakefront properties, or outdoor workshops. The GigaPro™ Hardened Wi-Fi System provides an affordable, managed option for delivering the ultimate high bandwidth Wi-Fi experience, regardless of harsh climates.

Key Attributes - GigaPro GPR2032H

Key attributes of the hardened GPR2032H include the following:

Home Gateway	Wi-Fi Redundant Mesh
• Layer 2 bridge and Layer 3 routing for High Speed Internet (HSI) data and IPTV video services.	• Self-managed; self configuration, air time fairness
• DHCP server Options	• Dynamic Mesh: load balancing, band/node steering; interference management
• DHCP (IPoE) and PPPoE network connections	• Self-healing: backhaul failover; diagnostics; events
• Network Access Translation (NAT), public to private IP addressing	**Interfaces**
• Configurable IP Address schemes, subnets, static-IP addresses	• 2.5 Gigabit Ethernet WAN interface; single port of multi-rate 100/1000/2500 BASE-T Ethernet, auto-negotiating for residential IPTV and data services
• DNS Server	• 2.5 Gigabit Ethernet (2.5 GE) LAN interface; single port of multi-rate 100/1000/2500 BASE-T Ethernet, auto-negotiating for residential IPTV and data services
• Bridge port assignment and data traffic mappings.	**Traffic Management and Quality of Service (QoS)**
• Port forwarding	• 802.1Q VLANs
• Firewall and security	• 802.1p service prioritization
• Application and website filtering	• Q-in-Q tagging
• Supports multiple data service profiles	• Multiple VLANs
• Selectable forwarding and blocking policies	• DiffServ
• DMZ hostings	• Pre-defined QoS based on service type
• Parental controls, time of day usage	• LAG of GE ports
• Denial of service (DoS) protection	• MAP-T
• MAC Filtering	**IPTV, IGMPv2, future support of IGMPv3**
• Time/Zone support	• IGMP Snooping and Proxy
• Universal Plug-and-Play (UPnP)	• IGMP Fast Leaves
Wi-Fi	**Gateway Management**
• 2.4 GHz, 5 GHz, and 6 GHz simultaneous tri-band	• Calix Support Cloud
• 6x6 streams (2x2 @ 2.4 GHz, 2x2 @ 5 GHz and 2x2 6 GHz)	• TR-069
• 6 GHz (Wi-Fi 6E), 802.11ax compatible	• Local Home Gateway GUI, access provisionable
• 5 GHz 802.11ax (Wi-Fi 6) certified, 802.11a/b/g/n/ac compatible	• Remote WAN side GUI access
• 2.4 GHz 802.11ax (Wi-Fi 6) certified, 802.11b/g/ac compatible	• Default username/password
• WPA/WPA2/WPA3; WEP 64/128 bit encryption	**Power Management**
• PuF (Physical Unclonable Functions)	• AC to 12 VDC power adapter
• WPS push-button	• PoE 802.3BT PD
• DL/UL MU-MIMO with beamforming	**Environmental**
• 1024 QAM; OFDMA; BSS Coloring	• If the GigaPro™ Hardened Wi-Fi System is to be deployed in environments with temperatures below -30° C, it is recommended that the system first be started in a warmer environment and run for 10-15 minutes.
• DCM (Dual Carrier Modulation)	
• TWT (Target Wake Time) for IoT clients	

Agency Listings

FCC WARNING: These devices comply with Part 15 of the FCC Rules and Regulations. Operation is subject to the following conditions.

This device may not cause harmful interference, and, this device must accept any interference received, including interference that may cause undesired operation.

These devices have been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules and Regulations. These limits are designed to provide reasonable protection against harmful interference when this 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 instructions in this guide, may cause harmful interference to radio and television communications.

Hazardous Materials

There are no hazardous materials identified for the GigaPro GPR2032H.

Application Standards

Following is a list of standards that apply to this product:

Standards		
FCC Part 15, Sub Part B, class B	UL 62368-1	EN 300 328
CAN ICES-003 Class B	CSA C22.2 No. 62368-1	EN 301 893
ANSI C63.4	IEC 62368-1	EN 301 489-1
FCC Part 15.247	ITU-T K21	EN 301 489-17
FCC Part 15.203	ITU-T K44	EN 55032 Class B
FCC Part 15.207	EN 62368-1	EN 61000-3-2
FCC Part 15. 209	IC: 4009A-U6HE	EN 61000-3-3
FCC ID: 2ABLKU6HE	EN 62311	EN 50581
RSS 102	CE / RED, RoHS, WEEE, Energy	USB 2.0 Type A
RSS 247	Telcordia GR-63	EN 50564
FCC Part 15.407	Telcordia-GR-1089	CISPR 32 Class B
NEC(National Electrical Code)	Telcordia GR-950	IEEE: 802.3, 802.3AB, 302.3U, 802.11p, 802.11Q
Telcordia GR-909	Telcordia GR-1244	RCM
Telcordia GR-49	Wi Fi 6	Telcordia GR-2890

Wi-Fi Alliance Certified 802.11ax		CISPR-22
Wi-Fi Alliance Certified 802.11ax		

Radiated Emissions

- This Class-B digital device complies with radiated emissions requirements as defined in Canadian ICES-003.

Power Supply

Note: When using the standard power adapter, units will be inoperable after loss of main power.

- The unit must be powered by a listed power adapter or DC power source marked "LPS" (Limited Power Source) and rated output between 12 VDC, 3 A minimum, TMA = 70 ◦ C minimum. If additional help is needed on implementing a power supply, please contact your local Calix service professional.

  The external power supply is with the following rating:

GigaPro GPR2032H

- Input voltage: 12 VDC (nominal)
- External Power Adapter: 12 VDC, 3 A
- PoE 802.3BT PD

DANGER! Using non-approved or incorrect power adapters can result in injury.

DANGER! L'utilisation d'adaptateurs d'alimentation non approuvés ou incorrects peut entraîner des blessures.

Site Preparation

Before you install any BLAST or GigaPro device, you need to consider the routing of the power adapter cord and Ethernet cable(s) if used.

Note: It is critical that you maintain the proper airflow in and around the unit. These devices are designed for surface mounting only. Do not install cabinetry or other building material around the outside of the unit.

Power Cords

In order to complete the installation, a power cords is required:

- Connectorized Power and Signal Cable - A 2-pin barrel connector to the local AC power receptacle (Type A).
- The equipment power supply cord shall be connected to a socket-outlet with earthing connection.

Coaxial Cables

Note that Coaxial cable connections are to be internal connections only. Outdoor connections are not allowed.

Before you Begin

Before starting the installation process, check that the following conditions are met:

- Ensure the site preparation steps are complete based on the model being installed.
- Ensure that all components are on-site or readily available to complete the installation.
- The customer is aware of your planned visit and will provide access to the inside of the home.

Introduction

This document describes the installation of the GigaPro GPR2032H. This device is designed to be placed in a wall mount or pole mount configuration.

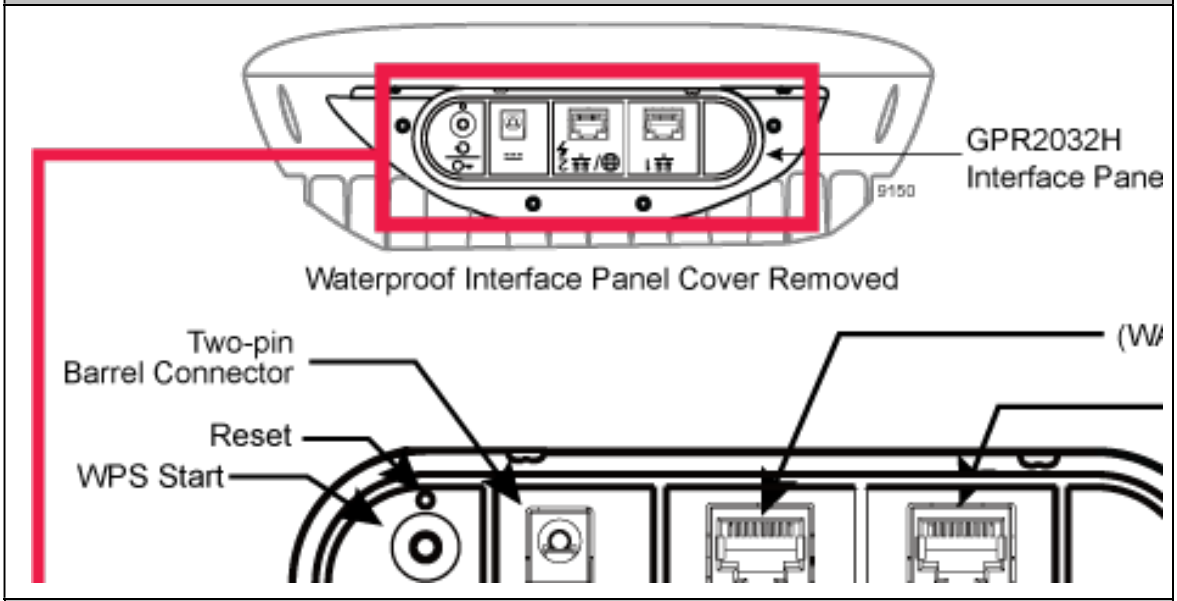
Powering Options

Attach to any 110/220 VAC power outlet using the supplied 12 VDC wall transformer.

Note: For the GigaPro GPR2032H, the power cord configuration must be appropriate for use in the country where the device is being deployed.

Note: Only provided and approved power cords or voltage adapters should be used to connect to this product(s).

Wall Mount or Pole Mount - u6H



Power Supply (2-Pin)

Chapter 2

Installation

Installation Tips

CAUTION! Use of controls or adjustments or performance of procedures other than those specified here may result in hazardous radiation exposure.

MISE EN GARDE! L'utilisation de commandes ou de réglages ou l'exécution de procédures autres que celles spécifiées ici peuvent entraîner une exposition à des rayonnements dangereux.

Follow these tips when installing a GigaPro GPR2032H device:

- For subscribers using data services, all data wiring inside the home must be CAT5 cable or better.
- Make sure subscriber connections are tightened properly.

Check the contents of each box carefully as you receive them. Components may not be located where you might expect them due to certain items being tested immediately before shipment.

About Wi-Fi Placement

Certain building materials are particularly effective at blocking Wi-Fi signals (see table below) and should be taken into consideration when locating the GigaPro GPR2032H. Line of sight is not necessary since MIMO technology takes advantage of reflections in the over-the-air path to carry additional data. However, Calix recommends that when possible, Calix GigaPro's should be placed in a centralized location within the home to yield the best possible results for Wi-Fi coverage.

Building Materials and Their Effect on Wi-Fi Signals	
Material	**Wi-Fi Attenuation**
Wood, Drywall, Particle Board, Tile	Low
Glass	Low

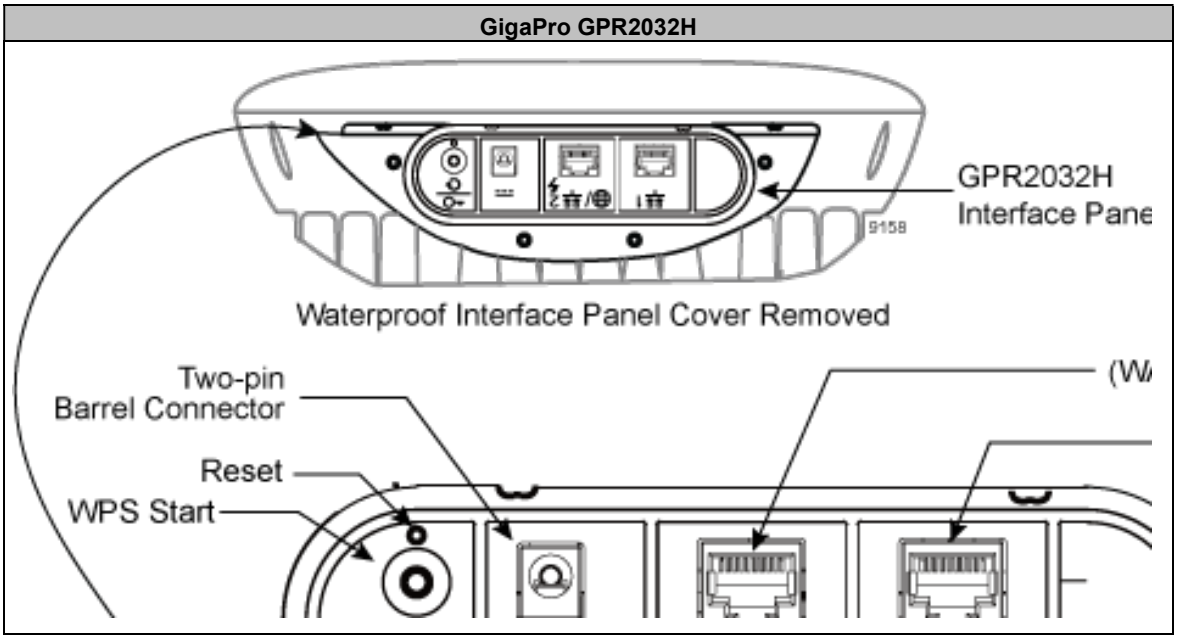
Water	Medium
Bricks, Cinder Block	Medium
Plaster, Stucco	High
Concrete	High
Tinted or Low-E Glass (metalized)	Very High
Metal	Very High
Note: The lower the attenuation, the better the performance.	

Installation Variables

Before installing either device, consider what additional services may be implemented. Various access points are available on the back of the unit which may or may not be used. Prior to determining the unit's final location, you need to account for the following variables:

- Optional: Where will the Ethernet cable(s) be routed?
- What type of building material is used in this facility? Make sure you have the appropriate drills, drill bits and fasteners for routing Ethernet or power cables as they pass through walls and the like.

GigaPro GPR2032H



Unpacking the GigaPro GPR2032H

Each device is shipped individually in its own carton and contains the following:

- (1) GigaPro GPR2032H
- (1) Power Adapter interface cord (wall wart)
- (1) Safety and Regulatory Statements Guide
- (2) Product Identification Labels with Login Credentials

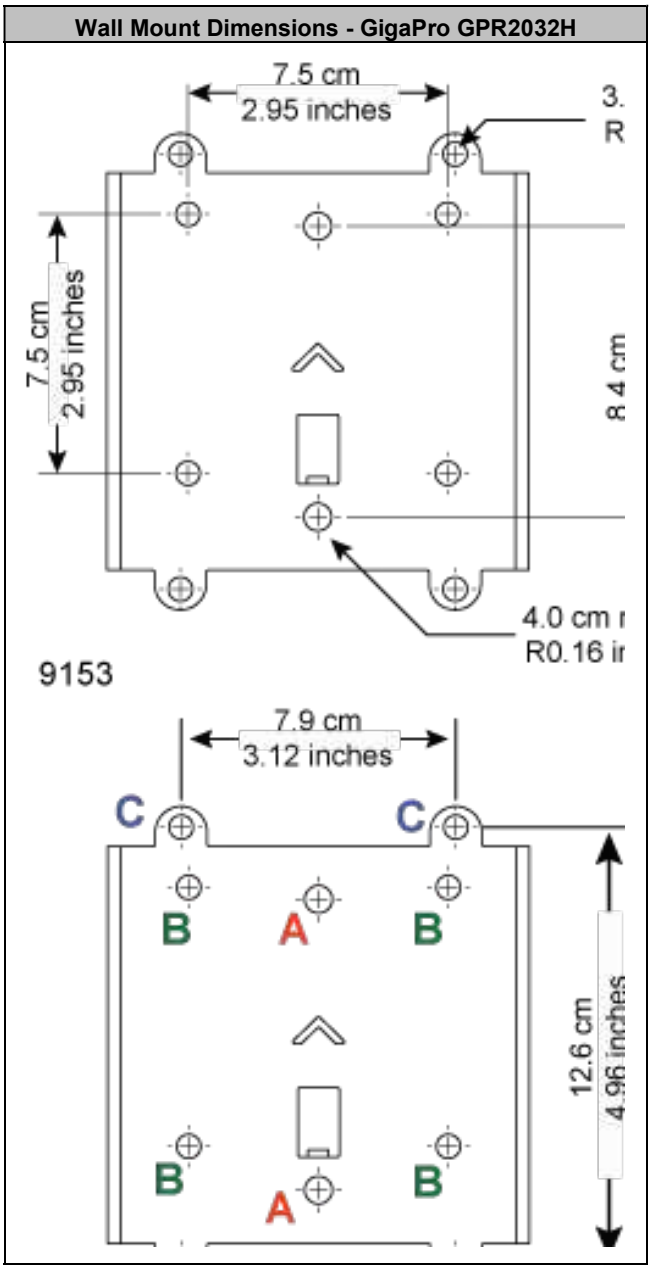
After opening the carton, remove the protective packaging, ensure all components above are present, and prepare for mounting the unit.

Wall-Mounting Dimensions - GPR2032H

Dimensions for tabletop or wall mounting of a GigaPro GPR2032H are included here for reference.

Note: In order to mount the GPR2032H, the purchase of the Wall Mount kit is required.

Wall Mount Dimensions - GigaPro GPR2032H



Additional Considerations

Mounting Bracket attachment points include three options:

- Position A^1 and A^2 are designed to attach to a wall stud behind the bracket.
- Positions B^1 through B^4 are designed to attach to the GPR2032H rear mounting posts

Wall Mount the GPR2032H

The Calix GigaPro GPR2032H can be wall mounted. Keep the following information in mind when considering wall mounting:

- The unit must be installed by skilled person only.
- Locate the unit on the wall in a location that is unlikely to be bumped or jostled.
- The unit must be installed with Interface Cover Attachment facing downwards.
- Make sure that the Ethernet cable[s] (if used) and power supply wiring attached to the unit are secured properly and out of harms way.

Note: Once the GigaPro is connected and turned up, Wi-Fi network parameters are persisted in memory. For this reason, if power is lost to the unit, it will be re-discovered on the network automatically, without operator intervention.

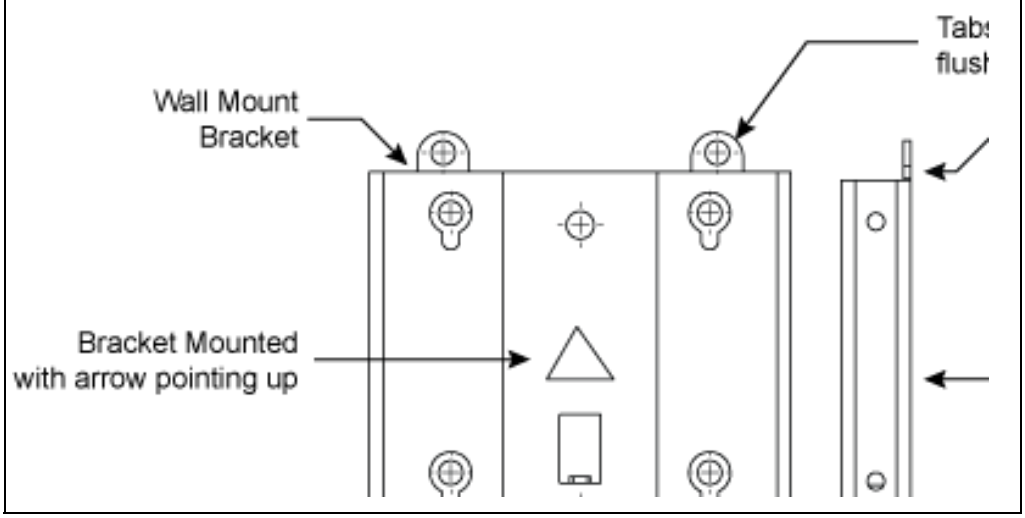
To wall mount the GigaPro GPR2032H

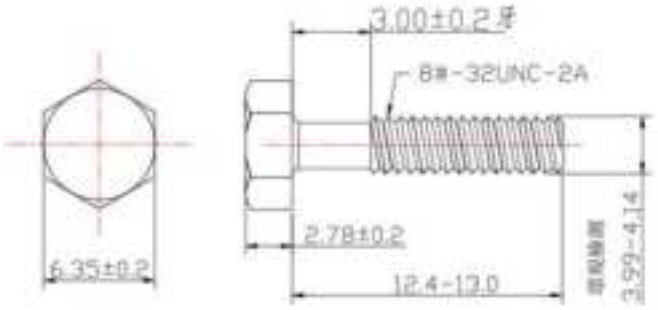
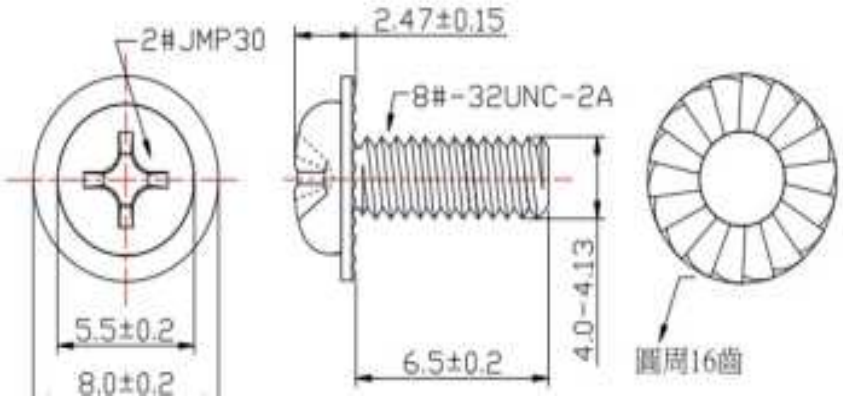
1. Find a suitable location for attaching the unit to the wall. Be mindful of the power source and Ethernet cable requirements when determining a mounting location.
2. Using the template included in the back of this guide, mark the two screw locations on the wall, making sure the device will remain level after mounting.

Note: If attaching to sheet rock or gypsum board, Calix recommends using a wall anchoring system to ensure the bracket is securely attached to the wall.

3. Drill holes in the wall and install appropriate wall anchors if required.
4. Thread the screws into the wall anchors and tighten leaving a gap of about 1/8" between the screw head and the and the back of the unit.

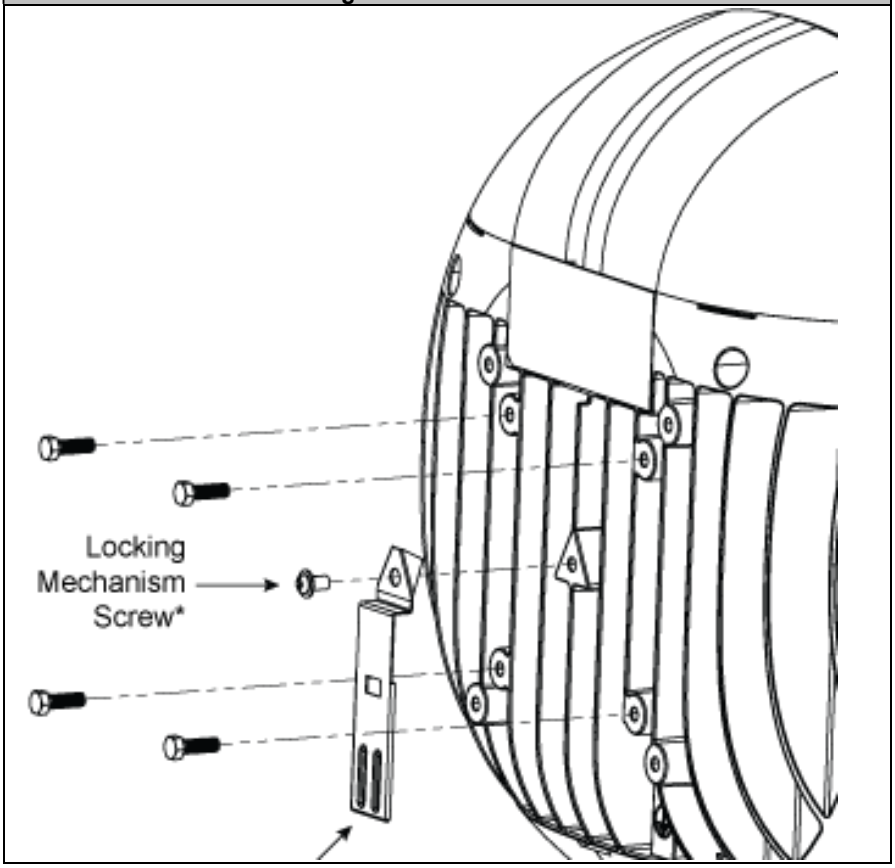
Wall Mount Bracket Details



Screw Length QTY: 4	
Screw Length QTY: 1	

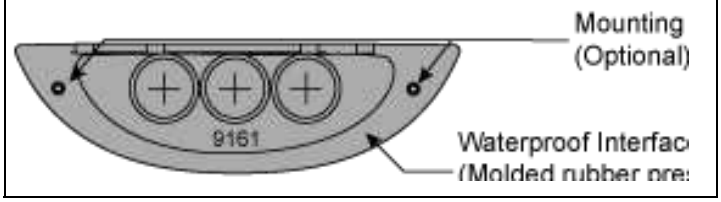
Before attaching the wall mount bracket to the back of the GPR2032H, make sure the locking mechanism is installed as shown below.

Locking Mechanism - GPR2032H

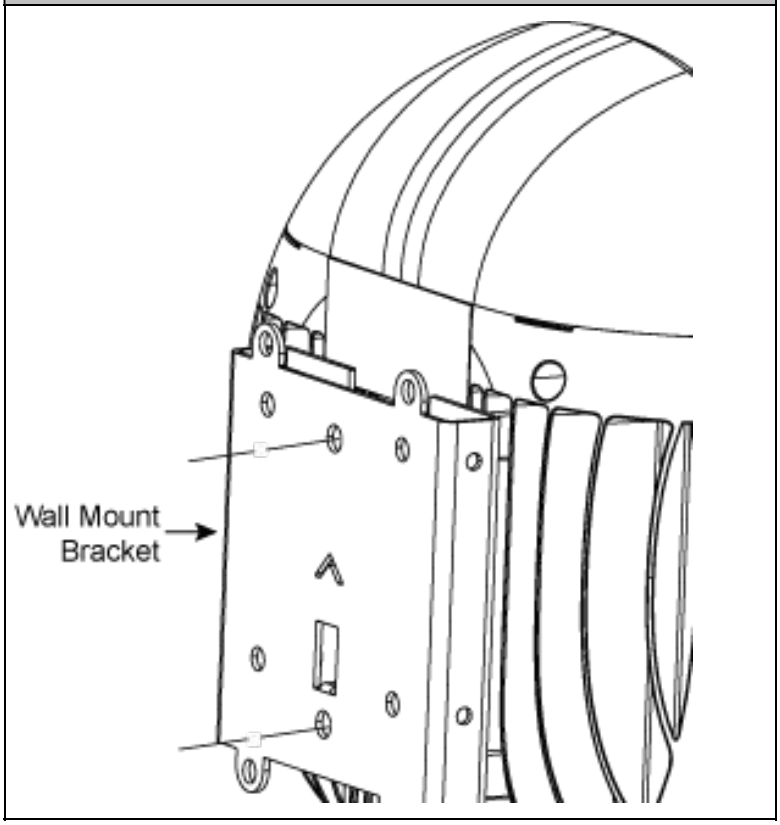


Note: Before attaching the GPR2032H to the bracket, remove the screws securing the interface cover to the GPR2032H.

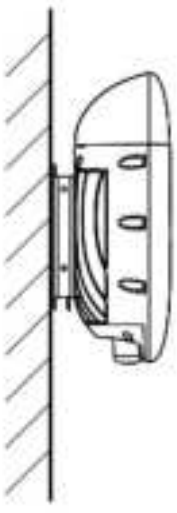
Interface Cover Attachment



Wall Mount Bracket Secured to GPR2032H



Location



Pole Mount the GPR2032H

The Calix GigaPro GPR2032H can be wall mounted. Keep the following information in mind when considering wall mounting:

- The unit must be installed by skilled person only.
- Locate the unit on the Pole in a location that is unlikely to be bumped or jostled.
- The unit must be installed with Interface Cover Attachment facing downwards.
- Make sure that the Ethernet cable[s] (if used) and power supply wiring attached to the unit are secured properly and out of harms way.

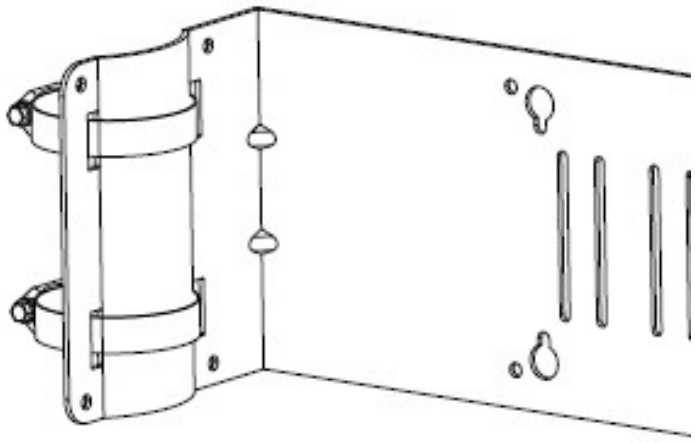
Note: Once the GigaPro is connected and turned up, Wi-Fi network parameters are persisted in memory. For this reason, if power is lost to the unit, it will be re-discovered on the network automatically, without operator intervention.

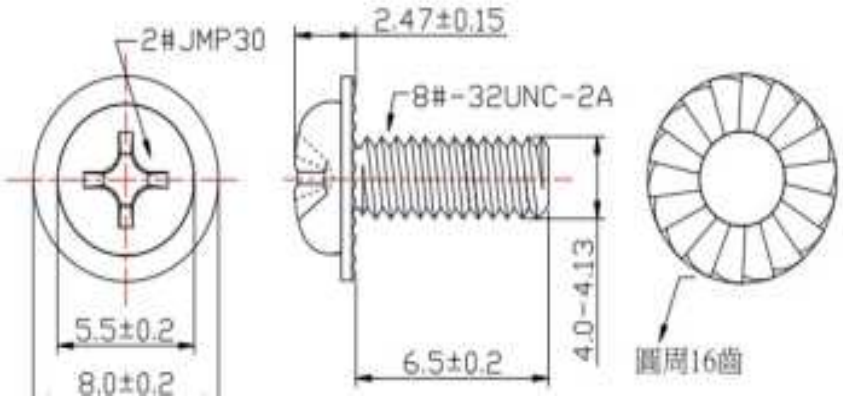
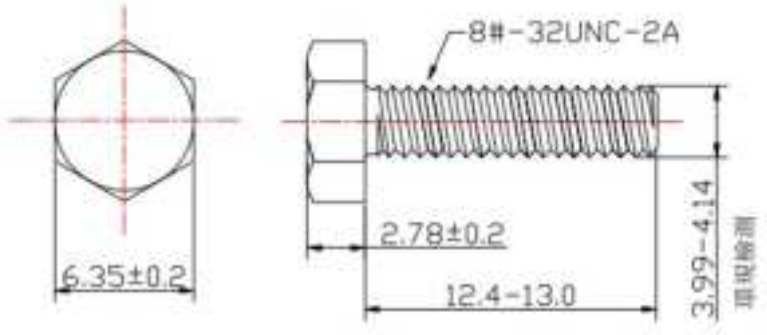
To pole mount the GigaPro GPR2032H

5. Find a suitable location for attaching the unit to the pole. Be mindful of the power source and Ethernet cable requirements when determining a mounting location.
6. Using the template included in the back of this guide, mark the two screw locations on the pole, making sure the device will remain level after mounting.

Note: If attaching to sheet rock or gypsum board, Calix recommends using a wall anchoring system to ensure the bracket is securely attached to the pole.

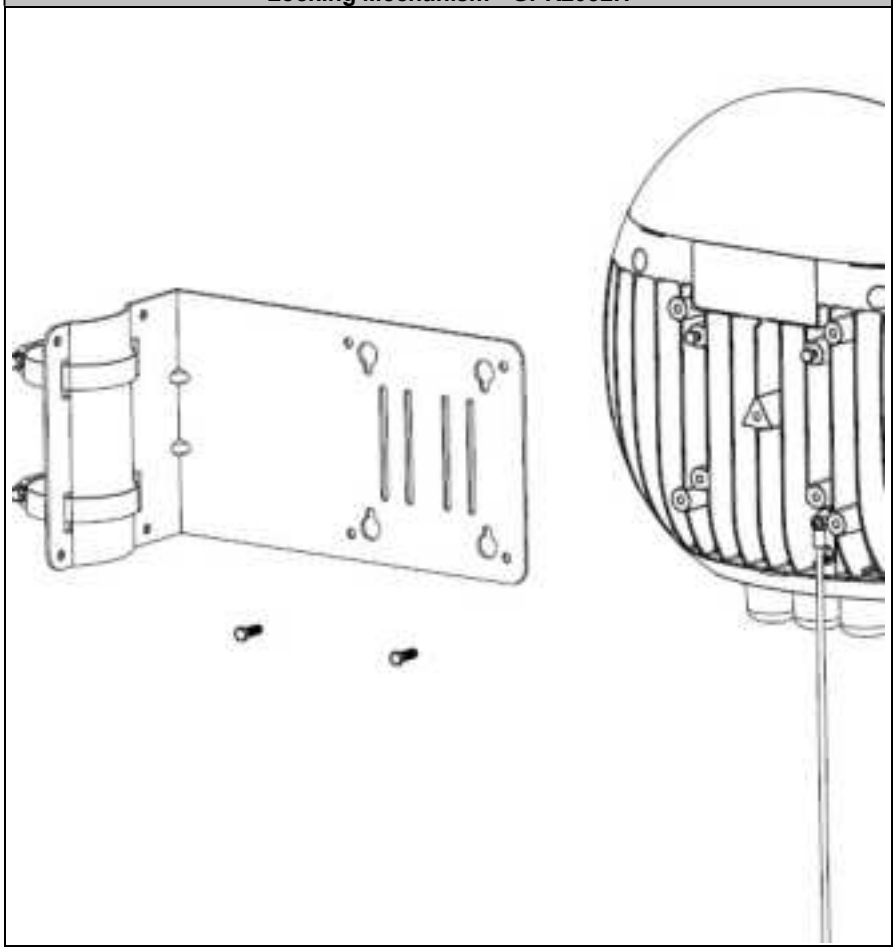
7. Thread the screws into the pole anchors and tighten leaving a gap of about 1/8" between the screw head and the and the back of the unit.

Pole Mount Bracket Details


Screw Length QTY: 1	
Screw Length QTY: 4	

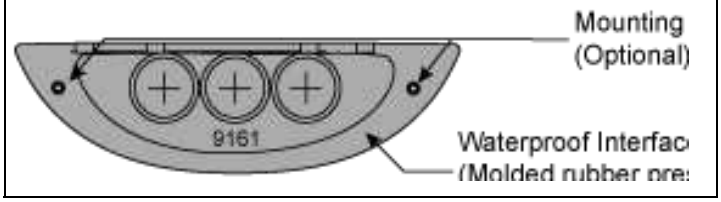
Before attaching the pole mount bracket to the back of the GPR2032H, make sure the locking mechanism is installed as shown below.

Locking Mechanism - GPR2032H

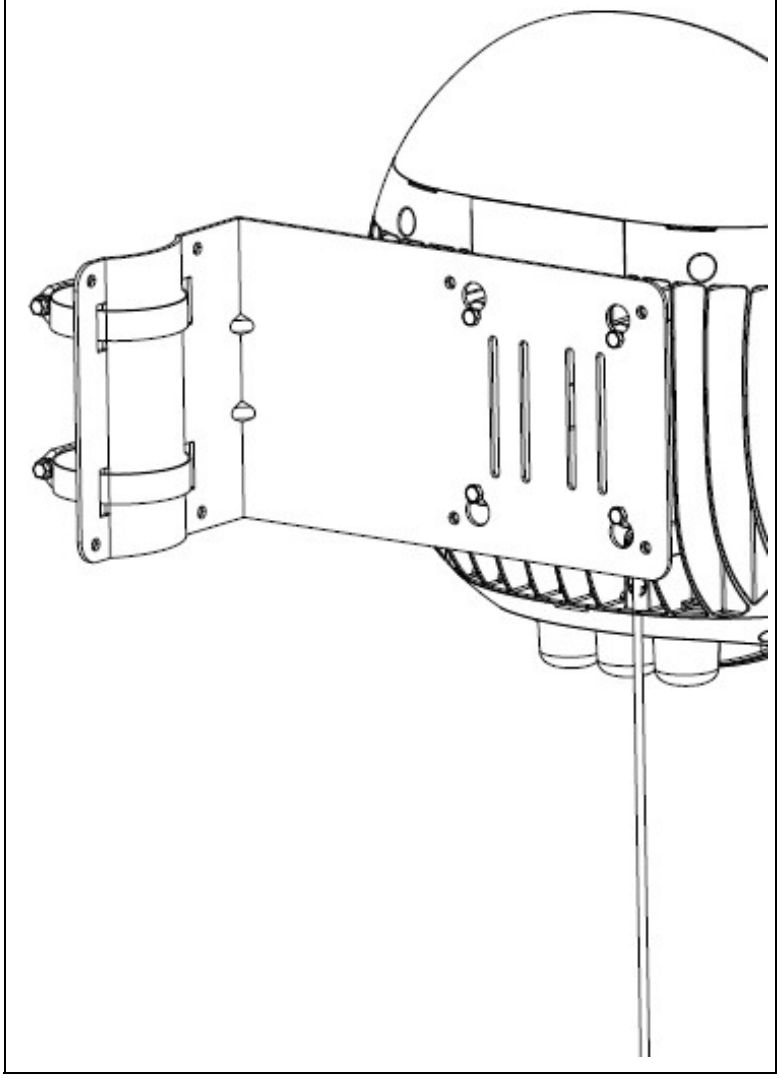


Note: Before attaching the GPR2032H to the bracket, remove the screws securing the interface cover to the GPR2032H.

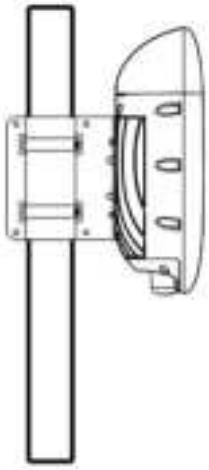
Interface Cover Attachment



Pole Mount Bracket Secured to GPR2032H



Location



Additional Mounting Considerations

The options for mounting a GigaPro GPR2032H system are well documented. From a best practice's standpoint, keep the following in mind:

- Calix recommends mounting the GigaPro as high as practical for Wi-Fi performance reasons. However, this deployment scenario still mandates that an AC power outlet is located within the power cord distance of the Wi-Fi source. If installing in a greenfield environment (initial installation), plan on placing the GPR2032H within 4 feet of the power supply. As an alternative, longer power cords are available to extend the distance between the GigaPro and the power supply.
- Calix also recommends keeping cabling neat and well secured wherever possible. A tidy installation allows for increased safety and an overall neater appearance. Common tools used for this purpose include cable ties and velcro straps for routing cable out of the way. Also, custom made wall plates are often used where the majority of cabling is hidden behind a wall.

Chapter 3

Final Set-up and Testing

Calix EDGE systems support a variety of system reset functions and provide multiple methods for invoking each of these functions, as described in this topic. Calix defines these functions and behaviors as follows:

1. **Basic reset (reboot):** Restarts the unit.
2. **Configuration reset:** Resets the RG configuration settings (those visible to the subscriber/Admin user in the EWI, such as SSIDs, LAN IP scope, etc.) to defaults, but retains operator-configured management settings (those visible only to the Support user in the EWI, such as ACS URL and SPID).
3. **Factory reset:** Resets the router (and any attached mesh satellites) to factory default settings. A factory reset also removes devices from network management systems such as Calix Support Cloud and the Smart Home Admin Dashboard, where applicable.

These reset functions can be used as troubleshooting and/or operations tools for reset/removal scenarios. Hardware-invoked resets behave differently depending on how long the reset button is pressed, as described below.

Function	Where Performed
Basic Reset[1]	Hardware: Press Reset button once for 1 second
	Software: EWI > Utilities > Reboot
Configuration Reset[2]	Hardware: Press and hold Reset button for 15+ seconds
	Software: EWI > Utilities > Restore Defaults
Factory Reset	Hardware: no option
	Software (for support user only): EWI > Support > Tools > Smart Activate > Factory Reset

Note: For operators with cloud based network management systems, remote resets can be invoked as follows:

1 (https://www.calix.com/content/calix/en/site-prod/library-html/software-products/cloud/nm/support/help/index.htm#88688.htm) System Tools > Reboot (https://www.calix.com/content/calix/en/site-prod/libraryhtml/software-products/cloud/nm/support/help/index.htm#88688.htm)

2 System Tools > Factory Reset (https://www.calix.com/content/calix/en/site-prod/libraryhtml/software-products/cloud/nm/support/help/index.htm#88687.htm) (option actually performs just a configuration reset)

The table below provides additional notes for each Reset event:

BLAST u6e/u6me Reset Behavior			
Reset Type	**How Invoked**	**Expected Behavior**	**Notes**
Basic Reset - Hardware	Press Reset button	• Router or satellite reboots • RG configuration and subscriber's custom settings persist	Pressing the Reset button performs a standard power cycle. All configuration information persists. Device goes off-line for 2-3 minutes while it completes the reboot process.
Basic Reset - Software	EWI > Utilities > Reboot	• Router reboots • RG configuration and subscriber's custom settings persist	Subscriber (Admin user) has access to the EWI to invoke a soft reset. All configuration information persists. Device goes off-line for 2-3 minutes while reboot process completes.
Configuration Reset - Hardware	Press and hold Reset button (10+ seconds)	• Router or satellite reboots • RG configuration and subscriber's custom settings reset to defaults • Service provider applied management settings persist	Reset button must be pressed and held until LEDs flash (after about 10 seconds). Device goes off-line while it completes the reboot process. Residential Gateway (RG) configuration settings include all subscriber-configurable information such as login credentials for Admin user, SSIDs, LAN IP scope, etc., all of which reset to defaults.
Configuration Reset - Software	EWI > Utilities > Restore Defaults	• Router reboots • RG configuration and subscriber's custom settings reset to defaults • Service provider applied management settings persist	Subscriber (Admin user) has access to the EWI to invoke a configuration reset. Device goes off-line while it completes the reboot process. Residential Gateway (RG) configuration settings include all subscriber-configurable information such as login credentials for Admin user, SSIDs, LAN IP scope, etc., all of which reset to defaults.
Factory Reset - Software	EWI > Support Menu > Tools > Smart Activate > Factory Reset	• Router reboots • RG configuration settings reset to factory defaults • Service provider applied management settings reset to factory defaults	Function available only to operators via EWI Support user (not available to subscriber/Admin user). Service provider management settings include all information visible on the EWI Support tab, such as login credentials for Support user, TR-69 ACS URL and login credentials, SPID, etc., all of which reset to defaults.

GPR2032 Reset Behavior

The reset button will do a "restore to defaults" when held for 10 seconds which clears everything except what was set by Smart Activate (restores defaults to whatever was set up during installation by the service provider). **Note:** Performing a reset does not remove the default SPID and ACS URL that has been assigned to the system. This is designed intentionally, so that u6 systems cannot be taken out of service by the subscriber if they were to cancel and/or move to another service provider. The SPID and ACS URL are unique for each service provider. Calix EDGE systems support a variety of system reset functions and provide multiple methods for invoking each of these functions, as described in this topic. Calix defines these functions and behaviors as follows: I. Basic reset (reboot): Restarts the router. II. Configuration reset: Resets the RG configuration settings (those visible to the subscriber/Admin user in the EWI, such as SSIDs, LAN IP scope, etc.) to defaults, but retains operator-configured management settings (those visible only to the Support user in the EWI, such as ACS URL and SPID). III. Factory reset: Resets the router (and any attached mesh satellites) to factory default settings. A factory reset also removes devices from network management systems, including Calix Support Cloud and the Smart Home Admin Dashboard, where applicable. These reset functions can be used as troubleshooting and/or operations tools for reset/removal scenarios, whether the device is deployed as a an RG or as a subtended WAP or Satellite (GigaSpire BLAST or GigaMesh). Hardware-invoked resets behave differently depending on how long the reset button is pressed, as described below.	**Where Performed**
Function	
Basic Reset[1]	Hardware: Press Reset button once for 1 second
	Software: EWI > Utilities > Reboot
Configuration Reset[2]	Hardware: Press and hold Reset button for 15+ seconds
	Software: EWI > Utilities > Restore Defaults

Factory Reset	Hardware: no option
	Software (for support user only): EWI > Support > Tools > Smart Activate > Factory Reset

Note: For operators with Calix Support Cloud (CSC), remote resets can be invoked as follows:

[1]System Tools > Reboot

[2]System Tools > Factory Reset (option actually performs just a configuration reset)

The table below provides additional notes for each Reset event:

BLAST Reset Behavior

Reset Type	How Invoked	Expected Behavior	Notes
Basic Reset - Hardware	Press Reset button	▪ Router or satellite reboots ▪ RG configuration and subscriber's custom settings persist	Pressing the Reset button performs a standard power cycle. All configuration information persists. Device goes offline for 2-3 minutes while it completes the reboot process.
Basic Reset - Software	EWI > Utilities > Reboot	▪ Router reboots ▪ RG configuration and subscriber's custom settings persist	Subscriber (Admin user) has access to the EWI to invoke a soft reset. All configuration information persists. Device goes offline for 2-3 minutes while reboot process completes.
Configuration Reset - Hardware	Press and hold Reset button (10+ seconds)	▪ Router or satellite reboots ▪ RG configuration and subscriber's custom settings reset to defaults ▪ Service provider applied management settings persist	Reset button must be pressed and held until LEDs flash (after about 10 seconds). Device goes off-line while it completes the reboot process. RG configuration settings include all subscriber- configurable information such as login credentials for Admin user, SSIDs, LAN IP scope, etc., all of which reset to defaults.
Configuration Reset - Software	EWI > Utilities > Restore Defaults	▪ Router reboots ▪ RG configuration and subscriber's custom settings reset to defaults ▪ Service provider applied management settings persist	Subscriber (Admin user) has access to the EWI to invoke a configuration reset. Device goes offline while it completes the reboot process. RG configuration settings include all subscriber- configurable information such as login credentials for Admin user, SSIDs, LAN IP scope, etc., all of which reset to defaults.
Factory Reset - Software	EWI > Support Menu > Tools > Smart Activate > Factory Reset	▪ Router reboots ▪ RG configuration settings reset to factory defaults ▪ Service provider applied management settings reset to factory defaults	Function available only to operators via EWI Support user (not available to subscriber/Admin user). Service provider management settings include all information visible on the EWI Support tab, such as login credentials for Support user, TR-69 ACS URL and login credentials, SPID, etc., all of which reset to defaults.

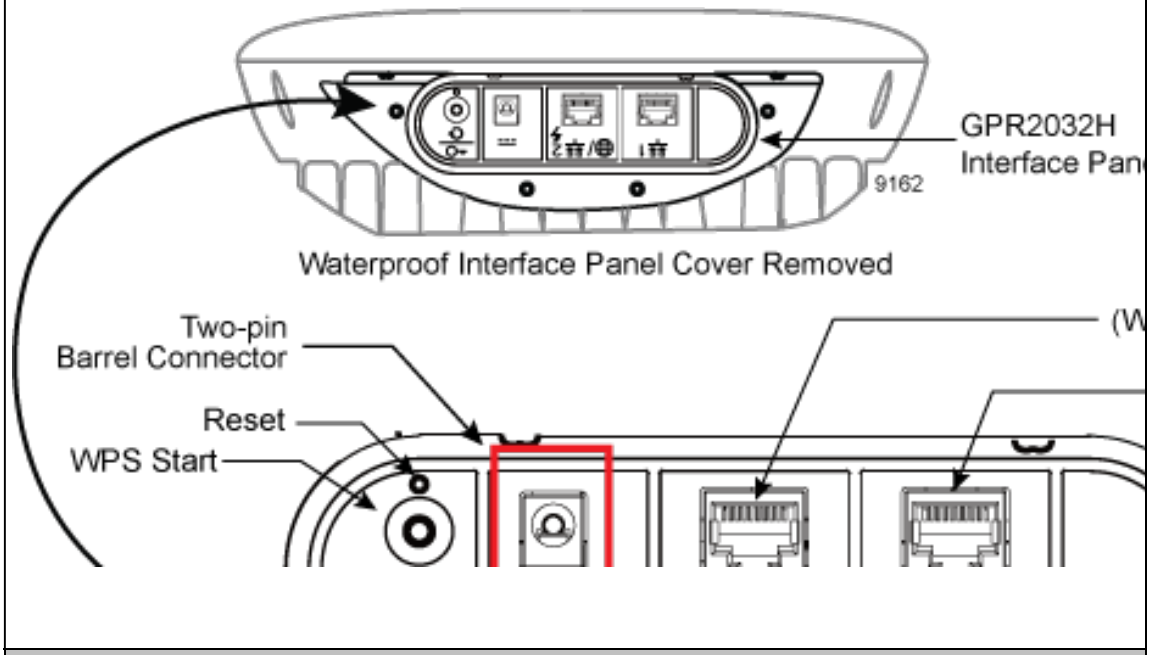
Powering the GigaPro GPR2032H

The information below describes the powering of the GigaPro GPR2032H.

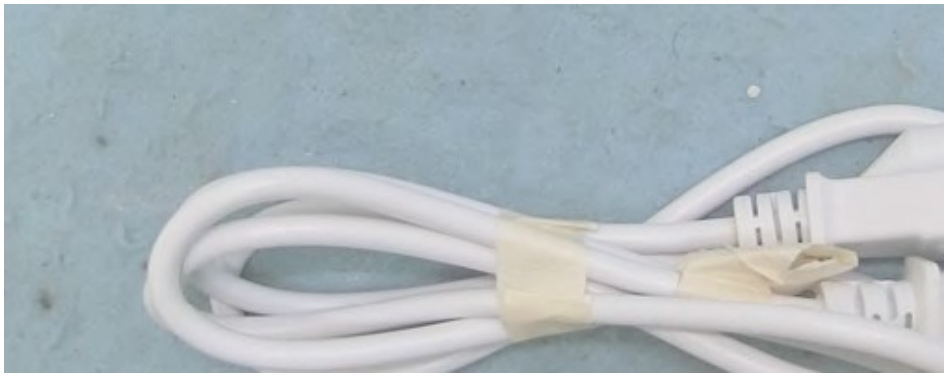
To power up the GPR2032H

1. Locate the 12 VDC Power Adapter.
2. Attach one end (2-pin barrel connector) to the rear of the GigaPro device.
3. Plug the other end into any available 110/220 VAC wall outlet.
4. The GigaPro begins its start-up sequence (Flashing amber LED).

GPR2032H Power Connection



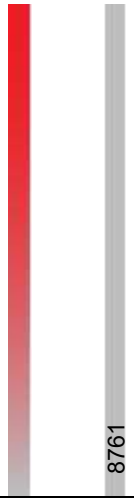
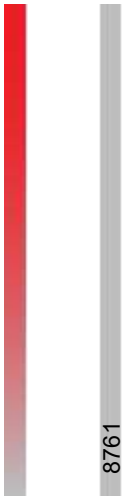
Power Adapter



LED States - Power Off and Boot-up

The LED's located on the corner of the unit provide information on the status and current state of the device. Below, you will find a detailed status of the power-up cycle.

Unit Status		
Power-up Status	**Function**	**LED Status**
Off	Power is off. • The unit has not been turned on or • There is no power to the unit or • The UPS battery has been discharged and there is insufficient power to continue operation. **Note:** LED is off.	
Booting Up, Software Upgrade in Process	Unit is in the boot-up process or service/software is being upgraded. Flashes orange every second assuming software has taken over. **Note:** LED is on.	

Boot-up Failure	Boot-up failed (assuming software has taken over) **Note:** Cycles at 8/10 of a second **Note:** LED is on.	
Connected to Internet	Unit has successfully booted up, local services are up, and connected to the Internet. **Note:** LED is on.	
Service Failure, No Internet	No service, no Internet. **Note:** LED is on. **Notes:** Cycles at 1.6 seconds	

LED States - WPS Functionality

Pressing the WPS button a single time is primary mode, for mobile device connecting to the RG. Pressing WPS button for about 3 seconds is backhaul mode, for satellites connecting to the RG. Pressing WPS button 3 times in 10s is IPTV mode, for IPTV connecting to the RG.

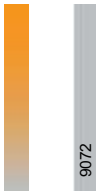
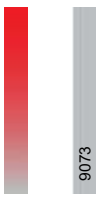
After pressing the button, the WPS feature will stay in pairing mode for 120 seconds.

During this time, other Wi-Fi capable devices can be paired to the Gateways Wi-Fi radios (5 GHz band) by initializing a similar WPS function on the other device or mesh satellite thereby creating an association with the Gateway SSID and the mesh satellite. When the Gateway and the mesh satellite are successfully paired, they will have the same primary SSID (2.4 and 5 GHz).

Sequence of WPS operation

1. Press WPS button a single time (3+ seconds in a 10-second window, according to SW convention).
2. Device Gateway enters pairing mode (up to 120 seconds).
3. If another device is found, the device pairs with the device.
4. If no device is found, the unit will exit pairing mode after 120 second.

Note: WPS LED behavior takes priority even if Alexa is in use during the pairing period.

WPS Status			
Power-up Status	**Function**	**LED Appearance**	**LED Status**
1. Device booting up	Unit is in the process of booting up or service/software is currently being upgraded. LEDs flash every second assuming software can control the LEDs. **Note**: If the device is connected via WIRED or WIRELESS backhaul, ignore pairing and signal strength behavior.	Alternating on/off at 1000 m/sec per cycle	
2. Boot-up Failure	Unit boot-up failed (assume failure occurs after software has taken control of the LEDs)	Alternating on/off at 800 m/sec per cycle	

3. WPS Pressed, Pairing Attempt Started	WPS is enabled upon pressing the WPS a single time. The device will stay in pairing mode for 120 seconds. During this time, other Wi-Fi capable devices can be paired to the Gateway Wi-Fi radios (5.0 GHz band) by initializing a similar WPS function on the other unit or mesh satellite thereby creating an association with the Gateway SSID and the mesh satellite. When the Gateway and the mesh satellite are successfully paired, they will have the same primary SSID (2.4 and 5.0 GHz). WPS LED behavior takes priority even if Alexa is used during the pairing period.	LED bar begins flashing at 500 m/sec intervals and continues for at most 120 seconds.	
4. Gateway Not Found	If no device is found after the initial 120 second time-out, the WPS/Strength LED bar shifts from the blinking green to solid red.	LED bar remains red for another 60 seconds, then reverts to the "No Internet failure status.	

LED States - Mesh Mode

WPS is enabled upon pressing the WPS button a single time. After pressing the button, the GigaPro will stay in pairing mode for 120 seconds.

During this time, other Wi-Fi capable devices can be paired to the Gateway Wi-Fi radios (5 GHz band) by initializing a similar WPS function on the other GPR2032H or GM1020 mesh satellite thereby creating an association with the Gateway SSID and the mesh satellite. When the Gateway and the mesh satellite are successfully paired, they will have the same primary SSID (2.4, 5 GHz, and 6 GHz).

Appendix A

Specifications are included here for your reference.

Dimensions	Remote Management
• Width: 10.75 in (27.3 cm)	• TR-069 remote management
• Height: 3.65 in (9.27 cm)	• TR-098 Internet Gateway Device Data Model
• Depth: 10.75 in (27.3 cm); 10.9 • in (27.69 cm) with cable boots	**Environmental**
• Weight: 4.6 pounds (2.1 kg)	• Operating temperature: Indoor ambient temperature, -30° C* to 70° C (-30° F to 158° F)
WAN Interface	• Operating and storage relative humidity: 10 to 90 % and 5 to 95% non-condensing respectively
• Interface: 2.5 Gigabit Ethernet	• K.21 enhanced lightning support
Interfaces	**Certification and Compliance**
• Wireless: 2x22.4 GHz, 2x25 GHz, and 2x2 6 GHz internal antennas	**Emissions:** • FCC Part 15 Class B • IC ICES-003 Class B • ISPR-22
• LAN Data/IPTV: Single 100/1000/2500 BASE-T Ethernet port, RJ 45 connectors	**Safety:** • UL 62368 and UL 1697 approved
• Power: 2-pin barrel connector	• EEE: 802.3, 802.3AB, 802.3U, 802.11p, 802.11Q
Data	• Wi-Fi Alliance Certified 802.11ax (Wi-Fi 6)
• 2.5 GBT: 328 feet (100 m) CAT6A/7 cable	**Insert Wi-Fi 6 Certified Logo HERE**
• Traffic Management and QoS: • 802.11Q VLAN; 802.11p voice, video, data and management priorities; Q-in-Q tagging	**Insert Wi-Fi 6E Certified Logo HERE**
Wireless	**Powering and Alarms**
• 2.4 GHz 802.11 b/g/n/ac/ax	• PoE 802.3BT PD
• 2x2 UL/DL MU-MIMO	• 2-pin barrel connector

• 5 GHz 802.11 a/n/ac/ax	• Input voltage: 12 V DC (nominal), 10 V DC (min.), 15 VDC (max)
• 2x2 UL/DL MU-MIMO, Explicit high-power, dynamic beamforming	• External Power Adapter (20 ft/6 m): 12 V DC, 3A
• 6 GHz 802.11 ax 2x2	
• 2.4 GHz, 5 GHz and 6 GHz simultaneous	
• DCM, TWT, extended GI	
• Auto channel selecting and interference detection	
• WPS, WPS push button	
• Wi-Fi multimedia (WMM)	* If the GigaPro™ Hardened Wi-Fi System is to be deployed in environments with temperatures below -30° C, it is recommended that the system first be started in a warmer environment and run for 10-15 minutes.

Glossary of Terms

- **Wi-Fi On The Go** – The Calix branded community Wi-Fi service which is based on the Passpoint specification.
- **MyCommunityIQ** – A container which is installed on the Gigaspire and manages the hotspot service. Also, MyCommunityIQ is the name used within Calix Deployment Cloud for configuring the Passpoint service.
- **Passpoint** – An industry-standard solution that enables mobile devices to discover and authenticate to Wi-Fi Hotspots that provide internet access https://www.wi-fi.org/discover-wi-fi/passpoint
- **BSP** – Broadband Service Provider
- **ANQP** – Access Network Query Protocol is a query & response protocol that defines services offered by an AP, typically at a Wi-Fi Hotspot
- **NHQP** – Non-hotspot-client Quality of experience Protection is a policy to ensure non-Hotspot stations do not experience degraded performance due to the presence of Hotspot stations.
- **JSON** – JavaScript Object Notation is a lightweight data-interchange format
- **JWT** – JSON Web Token is a standard used to share information between two parties, typically a client and a server
- **NAI** – Network Address Identifier is a standard way of identifying users who request access to a network, for example, user@realm
- **HSMGR** – Hotspot Manager is a GigaPro process that manages Hotspot services
- **AAMGR** – Advanced Authorization Manager is a GigaPro process that controls and enforces authorization policies.
- **RADIUS** – Remote Authentication Dial-In User Service is a networking protocol that centralizes authentication, authorization, and accounting for users who connect to a network service.
- **Oauth2** – An application framework that enables applications to obtain limited access to user accounts on an HTTP service https://oauth.net/2/