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GigaSpire BLAST GS5229E, GS5229XG Installation Guide

January 2024

Part Number 220-01327 Rev 10

DRAFT - B



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About this Guide

This document provides the installation procedures required for the Calix GigaSpire BLAST (GS5229E/GS5229XG) indoor Wi-Fi AP systems.

The Calix GigaSpire GS5229E and GS5229XG is a new generation, dual-band, PoE or locally powered Wi-Fi 6 RG/Mesh system.

Intended Audience

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

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 27cm between the radiator & your body.

This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license-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.

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 33cm 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 33cm de distance entre la source de rayonnement et votre corps.

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 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.



DANGER! CLASS 1 LASER PRODUCT. INVISIBLE LASER RADIATION MAY BE PRESENT.

Fiber optic radiation can cause severe eye damage or blindness. Do not look into the open end of an optical fiber.

DANGER! PRODUIT LASER DE CLASSE 1. UN RAYONNEMENT LASER INVISIBLE PEUT ÊTRE PRÉSENT. Le rayonnement de la fibre optique peut causer de graves lésions oculaires ou la cécité. Ne regardez pas dans l'extrémité ouverte d'une fibre optique.

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.

Chapter 1

GigaSpire u6t (GS5229E) and u6txg (GS5229XG) ONU Product Overview

This chapter introduces two indoor Wi-Fi access point (AP) system and provides an overview of installation considerations.

Topics Covered

This chapter covers the following topics:

- Introducing the GigaSpire BLAST u6t and u6txg indoor Wi-Fi AP systems
- Product dimensions
- Exploring the access compartment
- Powering options
- Mounting options
- Installation considerations

Introducing the GigaSpire u6t

Overview - GS5229E GigaSpire BLAST u6t

The u6t (GS5229E) is a new generation of Wi-Fi 6 smart home system that offers 10GE WAN and 10GE LAN residential gateway functionality into a single system. It delivers the ultimate indoor Wi-Fi experience. Besides supporting broadband connectivity of data and video services, these intelligent, high-performance systems offers the latest 802.11ax 'Wi-Fi 6' technology. The u6t/u6txg provides switching and routing functions that support 10-Gigabit throughput for IPTV video and data services.

10-Gigabit Subscriber Experience

The GigaSpire BLAST u6t is a premium smart home integrated system that delivers the latest Wi-Fi 6 technology. The GigaSpire BLAST u6t provides integrated 10GE supporting a 10 Gigabit link at the subscriber's premises to provide carrier class WAN. On the LAN side, a single 10 Gigabit Ethernet and four (4) Gigabit Ethernet interfaces are available for subscribers' multi-media devices.

The GigaSpire BLAST u6t enables residential subscribers to receive 10-Gigabit broadband data, Internet Protocol (IP) video, and voice (POTS) services. Using the latest 802.11ax technology in both the 2.4 and 5 GHz spectrum bands, the GigaSpire BLAST u6t incorporates 6x6 streams of Wi-Fi delivery (2x2 @ 2.4 GHz, 4x4 @ 5 GHz). In addition, with multi-user multiple-input and multiple- output (MU-MIMO) and beamforming, the GigaSpire BLAST u6t allows broadband service providers to extend the access network inside the home and establish 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 GigaSpire BLAST u6t for optimal whole-home coverage with simultaneous dual-band 2.4 GHz and 5 GHz operation with dynamic beamforming in both spectrums. Leveraging the latest Wi-Fi 6 features, the GigaSpire BLAST u6t provides long range and higher efficiency compared to earlier generations of Wi-Fi technology.

The GigaSpire BLAST u6t also supports Dynamic Frequency Selection (DFS) channels and can be provisioned to support 160 MHz channel bandwidth at 5 GHz. The GigaSpire BLAST u6t 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 GigaSpire BLAST u6t provides the latest generation of redundant Wi-Fi mesh via the Calix GigaSpire Mesh BLAST u4m (GM1028). With the GigaSpire BLAST u6t as the hub and the GigaSpire BLAST u4m as satellite extenders, consumers will attain the Whole Home/SmartHome experience.

Voice Support: GigaSpire BLAST u6t also provides two voice ports supporting a comprehensive family of voice protocols including SIP and H.248.

Easy to Install, Activate, and Maintain

With the GigaSpire BLAST u6t integrated system, Calix has redefined how to install and activate residential services at a subscriber's premises.

Using the Calix CommandIQ® app, and a phone or laptop, a field technician can install and apply the subscriber's service profile without special equipment or assistance from the central office.

Calix also provides the innovative Calix Service Cloud, which allows the broadband service provider to configure, activate, and upgrade the GigaSpire BLAST u6t from a remote location using in-band management, or TR-069. Extensive troubleshooting capabilities, remote software downloads, and easy-to-use service activation features ensure that services are delivered and maintained without costly truck rolls at time of deployment and/or during hardware upgrades.

Deploying GigaSpire BLAST u6t systems allows broadband service providers to reduce their operational expenses while effectively delivering an unparalleled Gigabit experience to their subscribers.

CALIX EXPERIENCE INNOVATION PLATFORM

All GigaSpire BLAST systems are powered by the Calix Innovation Experience Platform. This container-based platform allows broadband service providers to quickly change and adapt their services to embrace new technologies and offer new, value-added managed services. This approach can generate recurring revenue and increase subscriber satisfaction.

Key Attributes

Home Gateway

- Layer-2 bridge and Layer-3 routing for High Speed Internet (HSI) data and IPTV video services
- DHCP server options
- DHCP (IPoE) and PPPoE network connections
- Network Access Translation (NAT), public to private IP addressing
- Configurable IP address schemes, subnets, static-IP addresses
- DNS server support
- Bridge port assignment and data traffic mappings
- Port forwarding
- Firewall and security
- Application and website filtering
- Selectable forwarding and blocking policies
- DMZ hosting
- Parental controls, time of day usage
- Denial of service (DoS) protection

- MAC filtering
- Time/Zone support
- Universal Plug-and-Play (UPnP)

Wi-Fi

- 2.4 GHz, 5 GHz, simultaneous dual-band
- 2.4 GHz 802.11ax (Wi-Fi 6) certified, 802.11b/g/ac compatible
- 5 GHz 802.11ax (Wi-Fi 6) certified, 802.11a/b/g/n/ac compatible
- 6x6 streams (2x2 @ 2.4 GHz, 4x4 @ 5 GHz)
- WPA/WPA2/WPA3; WEP 64/128 bit encryption
- PuF (Physical Unclonable Functions)
- WPS push-button
- 4x4 DL/UL MU-MIMO, implicit/ explicit high-power, dynamic beamforming
- 1024 QAM; OFDMA; BSS Coloring
- DCM (Dual Carrier Modulation)
- TWT (Target Wake Time) for IoT clients

Wi-Fi Redundant Mesh

- Self Managed: self configuration, Air time fairness
- Dynamic Mesh: load balancing, band/node steering; interference management
- Self Healing: backhaul failover; diagnostics; events

10GE WAN interface - u6t only

- Full 10 Gigabit bandwidth

Gigabit Ethernet (GE) LAN interfaces

- Four (4) ports of multi-rate 10/100/1000 BASE-T Ethernet, auto-negotiating for residential IPTV and data services

10 Gigabit Ethernet (10 GE) LAN/ WAN interface

- Single port of multi-rate 100/1000/2500/5000/10000 BASE-T Ethernet, auto-negotiating for residential IPTV and data services

Two voice lines

- Carrier grade SIP, H.248 (aka Megaco) and MGCP

USB Port

- USB 2.0 - Type A host interface

Supports multiple data service profiles**Traffic Management and Quality of service (QoS)**

- 802.1Q VLANs
- 802.1p service prioritization
- Q-in-Q tagging
- Multiple VLANs
- DiffServ
- Pre-defined QoS on service type
- LAG of GE ports
- MAP-T

IPTV, IGMPv2, future support of IGMPv3

- IGMP Snooping and Proxy
- IGMP Fast Leaves

Gateway Management

- Calix Support Cloud
- TR-069
- Local Home Gateway GUI, access provisionable
- Remote WAN side GUI access
- Default username/password

AC to 12 VDC power adapter

UPS power unit



Introducing the GigaSpire u6txg

GS5229XG Overview

The Calix GigaSpire BLAST u6txg (GS5229XG) is a new generation of Wi-Fi 6 smart home system that integrates ONT and residential gateway functionality into a single system. It supports XGS-PON and Ethernet technology, while providing the ultimate Wi-Fi experience. Besides supporting broadband connectivity of data and video services, this intelligent, high-performance system offers the latest 802.11ax 'Wi-Fi 6' technology. The GigaSpire BLAST u6txg provides switching and routing functions that support 10-Gigabit throughput for IPTV video and data services.

10-GIGABIT SUBSCRIBER EXPERIENCE

The GigaSpire BLAST u6txg is a premium smart home integrated system that delivers the latest Wi-Fi 6 technology. The GigaSpire BLAST u6txg provides integrated XGS-PON supporting a 10 Gigabit link at the subscriber's premises to provide carrier class WAN. On the LAN side, a single 10 Gigabit Ethernet and four (4) Gigabit Ethernet interfaces are available for subscribers' multi-media devices.

The GigaSpire BLAST u6txg enables residential subscribers to receive 10-Gigabit broadband data, Internet Protocol (IP) video, and voice (POTS) services. Using the latest 802.11ax technology in both the 2.4 and 5 GHz spectrum bands, the GigaSpire BLAST u6txg incorporates 6x6 streams of Wi-Fi delivery (2x2 @ 2.4 GHz, 4x4 @ 5 GHz). In addition, with multi-user multiple-input and multiple output (MU-MIMO) and beamforming, the GigaSpire BLAST u6txg allows service providers to extend the access network inside the home and establish 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 GigaSpire BLAST u6txg for optimal whole-home coverage with simultaneous dual-band 2.4 GHz and 5 GHz operation with dynamic beamforming in both spectrums. Leveraging the latest Wi-Fi 6 features, the GigaSpire BLAST u6txg provides long range and higher efficiencies compared to earlier generations of Wi-Fi technology.

The GigaSpire BLAST u6txg also supports Dynamic Frequency Selection (DFS) channels and can be provisioned to support 160 MHz channel bandwidth at 5 GHz. The GigaSpire BLAST u6txg easily delivers HD and UHD (ultra-HD) video and data throughout a subscriber's home within an increasingly video-rich and mobile broadband environment.

Ensuring consumers can have ultra-fast Wi-Fi throughout their premises, the GigaSpire BLAST u6txg provides the latest generation of redundant Wi-Fi mesh via the Calix GigaSpire BLAST u4m (GM1028).

With the GigaSpire BLAST u6txg as the hub, and the GigaSpire BLAST u4m as satellite extenders, subscribers can truly gain the whole home / SmartHome experience.

VOICE SUPPORT: GigaSpire BLAST u6txg also provides two voice ports supporting a comprehensive family of voice protocols such as SIP and H.248.

EASY TO INSTALL, ACTIVATE, AND MAINTAIN

With the GigaSpire BLAST u6txg integrated system, Calix has redefined how to install and activate residential services at a subscriber's premises. Using the Calix CommandIQ® app, and a phone or laptop, a field technician can install and apply the subscriber's service profile without special equipment or assistance from the central office.

Calix also provides the innovative Calix Service Cloud, which allows broadband service providers to configure, activate and upgrade the GigaSpire BLAST u6txg quickly from a remote location using in-band management, or TR-069. Extensive troubleshooting capabilities, remote software download, and easy-to-use service activation features ensure that services are delivered and maintained without costly truck rolls having to be deployed and/or hardware upgrades.

Deploying GigaSpire BLAST u6txg systems allows broadband service providers to reduce their operational expenses while effectively delivering an unparalleled Gigabit experience to their subscribers. PON configuration and management is done via the OMCI protocol.

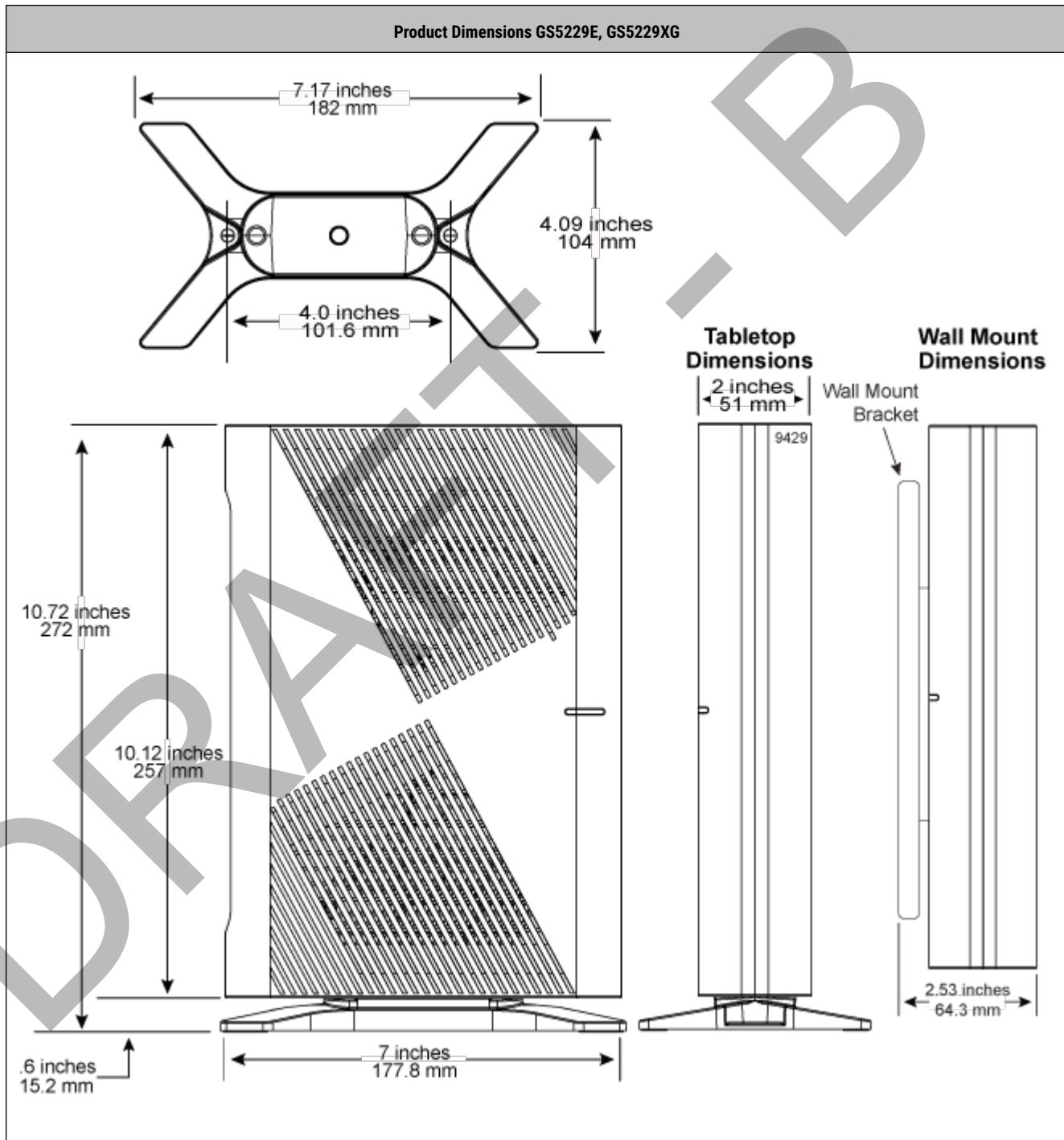
CALIX EXPERIENCE INNOVATION PLATFORM

All GigaSpire BLAST systems are powered by the Calix Innovation Experience Platform. This container-based platform allows broadband service providers to quickly change and adapt their services to embrace new technologies and offer new, value added managed services quickly and easily. This approach can generate recurring revenue streams and increase subscriber satisfaction.



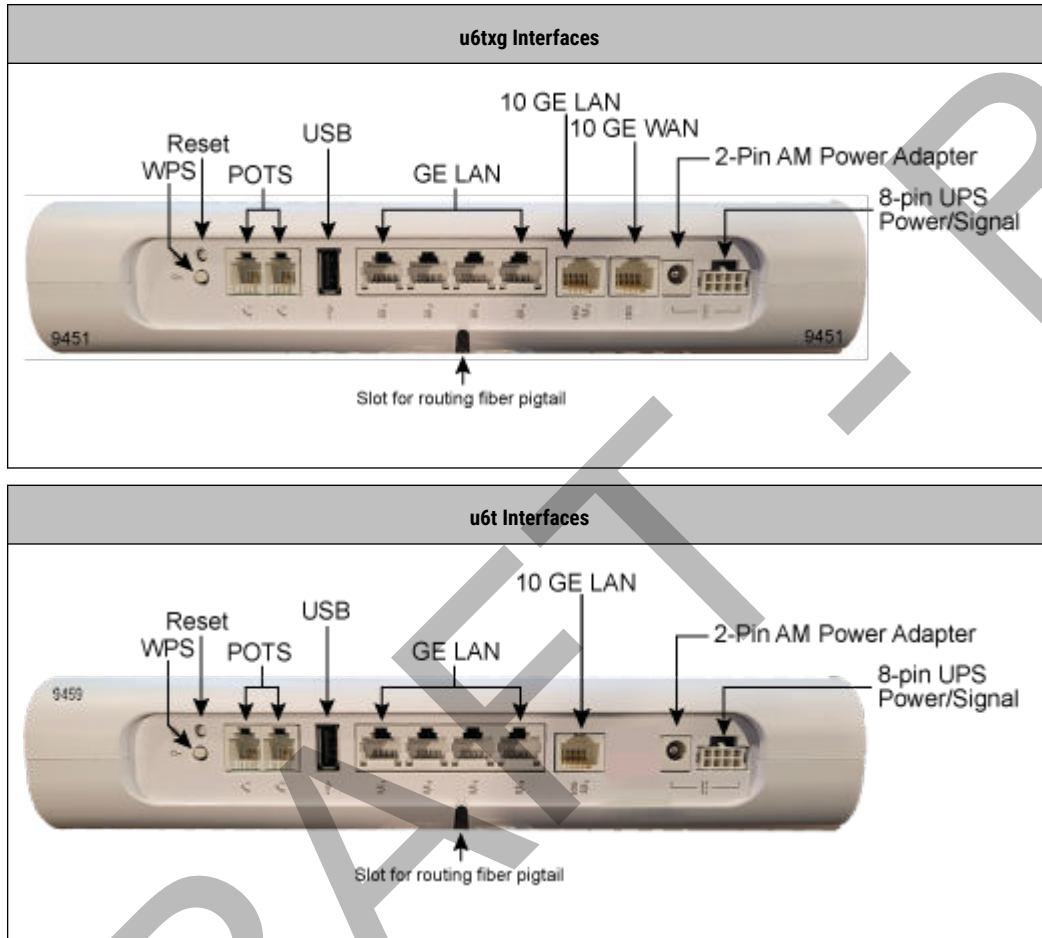
Product Dimensions

The u6t or u6txg ONUs occupy the identical footprint. Dimensions will vary slightly in a wall mount configuration.



Exploring the ONU Interfaces

The u6t/u6txg has interfaces



Powering Options

The GigaSpire BLAST u6t/u6txg system supports two options for power:

- **Local AC power:** You can power the system via a standard AC power outlet using a Calix power adapter cable with wallwart.
- **UPS power:** Power is provided via the 8-pin UPS interface.

Note: These products are intended to be supplied by a UL Listed Power source, which output complies with ES1, PS2/LPS, rated output 12VDC, 3.0A, Tma = 40° C minimum, Altitude 5000m.

Local Power Option

The u6t/u6txg system accepts local power using a Calix-supplied adapter cable that plugs into any standard AC power outlet. The DC end of the adapter cable has a two-pin barrel connector to connect to the ONU system's local power interface.

UPS Power Option

The u6t/u6txg ONUs accept power through the UPS interface. This 8-pin interface connects directly to the UPS and provides power and signalling for various ONU conditions.

Two power cables available

Two different local power cables are available from Calix for the system:

- **100-05789 - Indoor-only** power adapter cable; 12 V, 3A, Type A (2-prong), C-temp rated; 5-foot (150 cm) length.
- **100-0xxxx** - UPS interface cable.

Mounting Options

To maximize Wi-Fi performance, the GigaSpire GS5229E or GS5229XG™ system must be installed in a location and orientation to maximize Wi-Fi radio performance. Calix

- **Wall Mount Orientation** - Use this kit to mount the system on a *flat* vertical surface (wall).
- **Tabletop Orientation** - Use this kit to mount the system on a flat horizontal surface (tabletop, shelf, or the like).

Every installation site has different structural options for mounting. In this case, Calix has designed a stand that allows for both horizontal or vertical deployment. This stand is included in the giftbox of both the u6t and the u6txg ONU.

Calix-supplied hardware

The u6t or u6txg giftbox includes the following components:

Qty	Description
1	Wall-mount/SWE mount/tabletop mount bracket
1	GS5229E or GS5229XG GigaSpire ONU
1	Desiccant pack for absorbing humid or wet environments
1	120 VAC to 12 VDC power adapter
Note: Screws for installing the mounting bracket to the wall are not included. A #8 or #10 screw is compatible with the pre-drilled mounting hole in the bracket.	

User-supplied hardware

Fasteners for mounting the wall mount bracket to the wall.

Installation Considerations

Review the following considerations and guidelines before starting installation activities.

General Guidelines

Follow these general guidelines and practices:

- Read this document completely before starting any installation activities.
- Determine the system powering method to use for your installation, from among two options. See [Powering Options](#) (on page 17) and [Selecting an Installation Location](#) (on page 23) for details and guidance.
- Determine the system mounting method to use for your installation, from among two options. See [Mounting Options](#) (on page 18) and [Selecting an Installation Location](#) (on page 23) for details and guidance.
- Follow standard safety precautions when performing installation tasks.
- Keep all cabling neat and secured for safety and strain relief. Use cable ties, screw clips, and velcro straps for dressing cables as needed.

Network Uplink

The u6t/u6txg system is equipped with a 10GE WAN Ethernet port for uplink connections to the network. Connect the system to the network following these guidelines:

- **RG mode:** Connect to an ONT LAN port for network access using a standard Ethernet data cable (up to 328 feet/100 m long). If the system will use PoE power, connect to a PoE injector's PD port instead.

Note: Calix recommends connecting the u6t/u6txg system to an ONT equipped with a 10GE LAN port to provide maximum uplink bandwidth. Typically, this means using an XGS-PON ONT (many equipped with 10GE LAN ports) or 10GE AE ONT. For example, the Calix GP1101X outdoor ONT is commonly used for this application.

- **Satellite mode:** Use either a wired (Ethernet) or wireless backhaul link to connect to the RG system.

Supported Topologies

The GigaSpire Wi-Fi AP system can operate in either RG mode or satellite mode. Supported deployment topologies depend on the operating mode, as shown below.

User-Supplied items

Bring the following tools and materials to the installation site, as required:

Materials

- Ethernet cables, up to 100 m length
- Mounting screws for wall-mount bracket (2)

Tools

Bring the following tools to the installation site:

- Power drill with drill and driver bits
- Phillips head screwdrivers (#2 head, #1 head)
- Level
- Pencil (to mark bracket and drill hole locations; wall-mount only)

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Installing the GigaSpire u6t and u6txg

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Unpacking the ONU

Each GigaSpire BLAST u6t or u6txg ships in a box that contains the following items:

Qty	Description
1	GS5229E or GS5229XG GigaSpire BLAST with fiber access cover
1	Wall mounting bracket
1	120VAC to 12VDC power adapter
2	Product identification labels (shows default Wi-Fi SSID and RG login info)
1	Safety and Regulatory Statements Guide
Note: Screws for installing the mounting bracket to the wall are not included. A #8 (M4.2), #9 (M4.5), or #10 (M4.8) screw is compatible with the pre-drilled mounting holes in the bracket.	

To unpack the system

1. Open the giftbox housing the u6t or u6txg.
2. Access the mounting bracket by removing the ONU. The bracket is nested underneath the ONU.
3. Remove the voltage adapter located under the separate side panel of the ONU and set aside.
4. Check to ensure all Calix-supplied items are present before proceeding with installation.

Selecting an Installation Location

As per the Installation Considerations topic, consider several factors when selecting an installation location:

- Proximity to the network termination point
 - **Distance from the ONT (RG systems):** All systems operating in RG mode must use a wired Ethernet uplink. The maximum distance from the ONT providing the network termination must be 328 feet / 100 meters (the maximum supported length of Ethernet cables).
 - **Distance from the RG (Satellite systems):** Systems operating in satellite mode can use either a wired (Ethernet) or wireless backhaul link to the RG system. For wired connections, the maximum distance from the RG must be 328 feet / 100 meters (the maximum supported length of Ethernet cables). For wireless connections, the maximum distance from the RG may vary from site to site based on environmental factors that affect signal strength. As general guidance, Calix recommends locating satellites at a distance where they can receive a signal of -60 dBm or better.
- Proximity to power
 - **Distance from AC power outlet (local power option):** The Calix outdoor power adapter cable is 16 feet long. Therefore, unless you use an outdoor rated (and user supplied) power extension cord to extend the reach for power, you must locate the system within 16 feet of an AC power outlet.
- **Mounting type:** The system can be installed on a tabletop or wall/SWE in a vertical orientation. Is there a suitable wall (or tabletop) at the targeted location?
- **Location within targeted Wi-Fi serving area:** Several environmental factors, including proximity to the center of the area. See the section below for additional details to consider.

Consider all factors above before selecting a location and proceeding with the installation.

Wi-Fi AP placement

In a Wi-Fi serving area, direct line-of-sight to the AP is not essential for signal quality, thanks to MIMO technology and an omni-directional antennae array. However, to achieve the best possible Wi-Fi coverage and performance, Calix recommends the following guidance:

- Prioritize a centralized location; the closer the AP system is to the center of the target area, the better.
- Elevate the system as high up as possible; higher elevation helps the signal clear lower/ground-level obstructions.

Some building materials block Wi-Fi signals more than others. See the table below for reference; lower attenuation yields better performance. Consider the materials in surrounding structures when selecting an installation location for the system.

Building Materials: Effect on Wi-Fi Signals	
Material	Wi-Fi Attenuation

▪ Wood, Drywall, Particle Board, Tile ▪ Glass	Low
▪ Bricks, Cinder Block ▪ Water	Medium
▪ Plaster, Stucco ▪ Concrete	High
▪ Metal ▪ Tinted or Low-E Glass (metalized)	Very High



CAUTION! Use of controls or adjustments or performance of procedures other than those specified in this document 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.

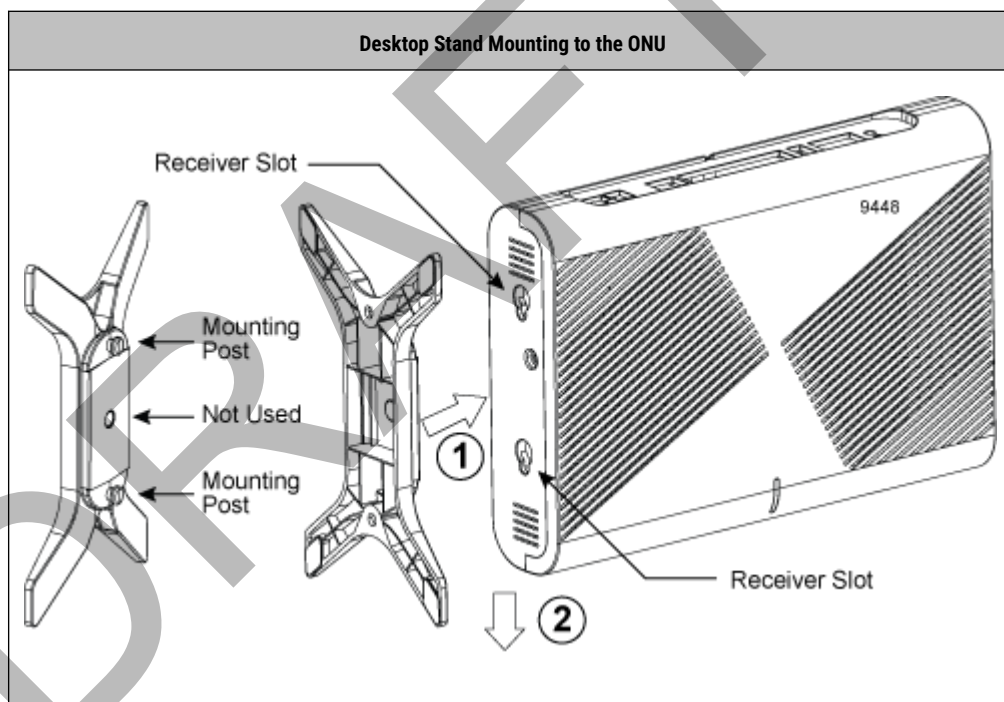
Option 1: Installing the System on a Tabletop

Any Calix GigaSpire BLAST can be mounted flat on a tabletop, in a tower configuration. Four (4) rubberized feet are pre-installed on the bottom of the mounting bracket to provide a non-skid surface when placing the GigaSpire on a table or shelf.

Keep the following information in mind when considering tabletop mounting:

- Due to component placement inside the chassis, do not remove the rubber feet that are installed on the bottom of the unit.
- Locate the GigaSpire on the desktop in a location that is unlikely to be bumped or jostled.
- Make sure that the Ethernet cable (if used) and power supply wiring attached to the GigaSpire are secured properly and out of harms way.

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



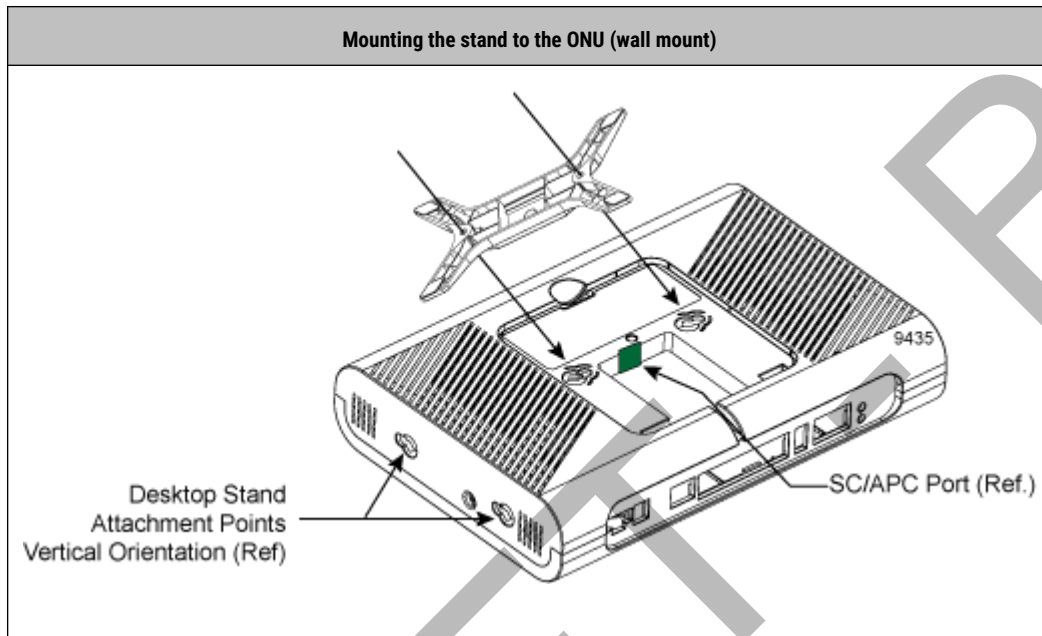
To attach the mounting bracket to the ONU

1. Examine the bracket carefully and ensure the two mounting posts are present.
2. Note the receiver slots on the bottom of the ONU.
3. Place the bracket as shown ensuring the mounting posts are fully inserted into the receiver slots.
4. Once mated, grasp the mounting bracket and slide it down, locking it in place.
5. Choose the intended location and prepare for wiring.

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Option 2: Installing the System on a Wall

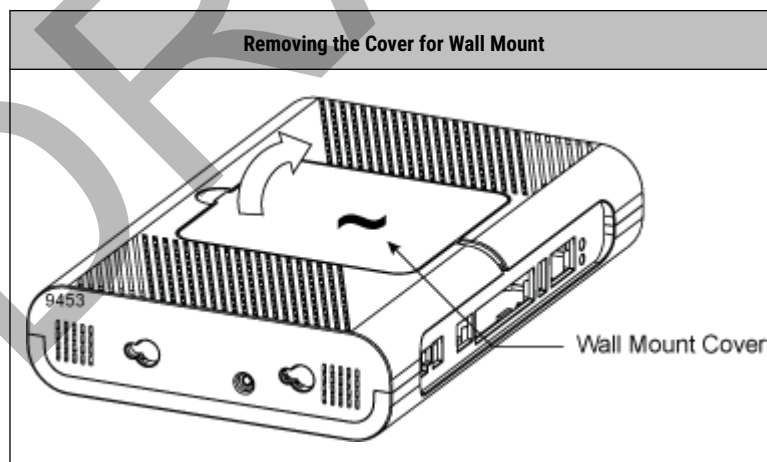
Prior to mounting the unit on a wall



Note: Prior to attaching the mounting bracket to the ONU, Calix recommends installing the fiber pigtail first. Access to this connector is limited once the mounting bracket is in place.

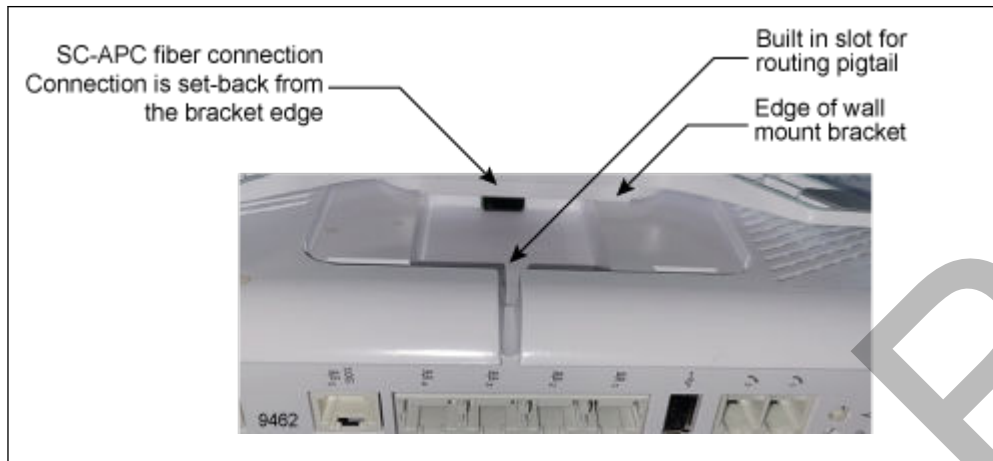
1. Remove the cover on the top of the ONU. Set aside for future use.

Note: In a wall mount configuration, the cover will not be re-installed.



2. Note that the SC-APC connection port is nestled into the bottom of the opening.

SC-APC Connector



3. Remove the protective cover of the fiber port and insert a fiber pigtail until it clicks into place.
4. Route the pigtail out through the slot built into the ONU outer shell and secure as appropriate.
5. Attach the wall mount cover to the mounting slots.

Grounding the Unit

As both ONUs are designed for indoor applications only, the grounding of these units assumes the power source is directly attached to a Ground Fault Interrupter (GFI) circuit.

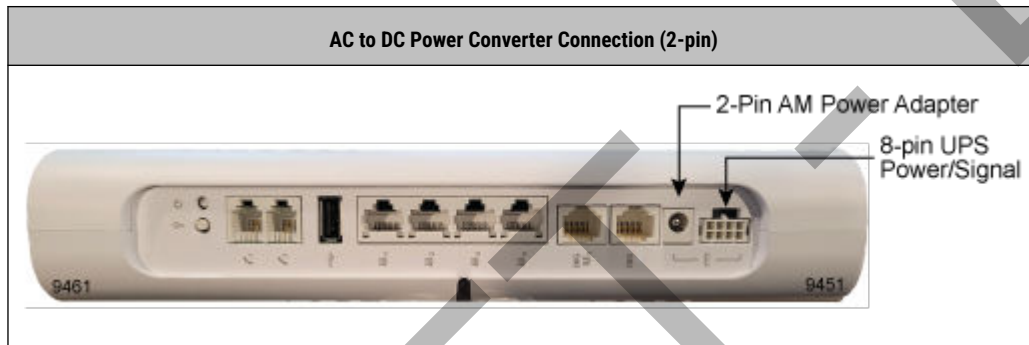
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Installing Power and Network Cables - AC to DC

The information below describes the powering of any GigaSpire BLAST that **does not** include a UPS.

To power up the GigaSpire

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



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(Optional) Installing Power and Network Cables - UPS Power

Prior to putting the GigaSpire into service, the UPS must be mounted to ensure the low voltage power cord that is connected between the UPS and the GigaSpire is long enough to span the distance between the two devices.

Depending on your configuration, power cords of varying lengths may be included:

- The AC power cord that runs from the UPS to the AC wall outlet is 8-feet long. Make sure an AC outlet is available within that distance.
- The power/signal cord that runs from the UPS to the GigaSpire is available in any of the following configurations based on model.

Any GigaSpire BLAST incorporating a UPS (Sold Separately)

- Connectorized Power and Signal Cable - An 8-pin (GigaCenter end) to 8-pin terminal block (UPS end) cable available in 3 foot (1 meter) or 10 foot (3 meters) lengths.
- Connectorized Power and Signal Cable - An 8-pin (GigaCenter end) to dressed and tinned (un-terminated) cable available in 20 foot (6 meter) length.

Mounting the UPS



WARNING! High voltage electrical and pressurized natural gas lines may be present. Make sure you fully understand the locations of these and all other utility connections before drilling through any surface.



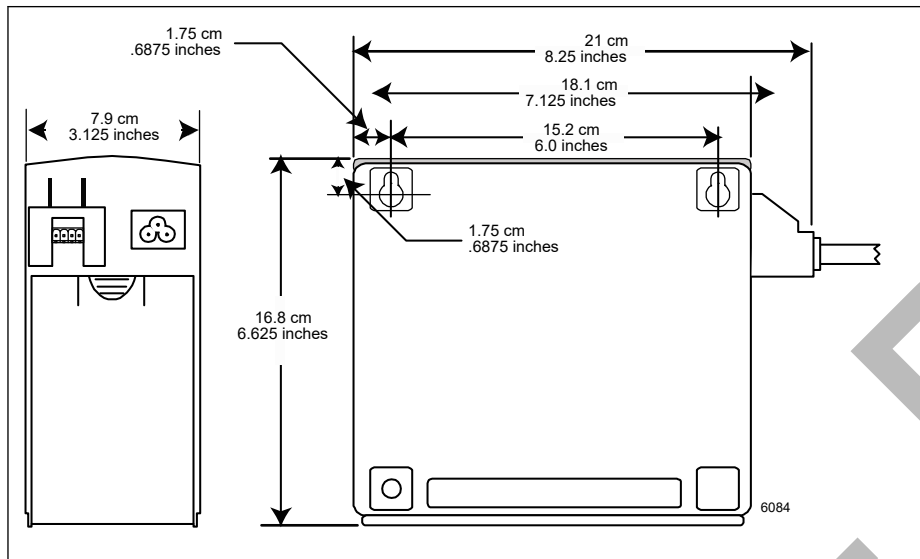
CAUTION! The UPS is designed for indoor installation and must be installed in a location with adequate airflow.

Make sure the UPS is not installed under water pipes which may leak or drip from condensation.

Reference: The UPS must be located less than 50 feet (15.2 meters) from the GigaSpire when using an 18 AWG Type I power cord or less than 70 feet (21.3 meters) from the GigaSpire when using 16 AWG Type II power cord.

1. Unpack the UPS and associated hardware from the carton.
2. Find a suitable location for the UPS and prepare mounting screws per the mounting hole pattern shown below.

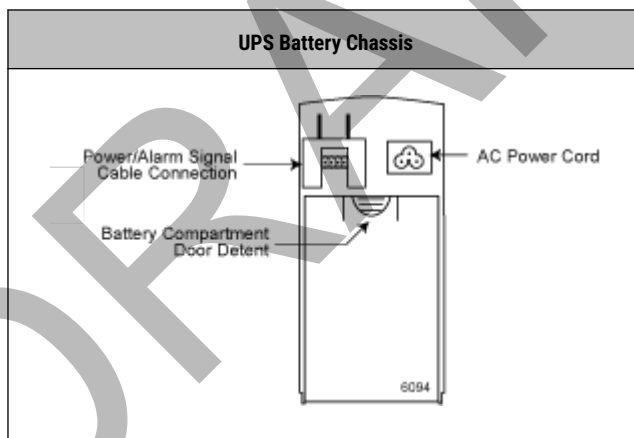
UPS Dimensions



3. Pre-drill mounting holes (to accept an 8-32 pan head screw - not provided) of the appropriate size.

Important: Make sure the material you are mounting the UPS to is of sufficient strength to support its weight of 7.16 pounds (3.25 kgs).

4. Insert a screw into each hole, leaving 3/16-inch (.48 cm) of the screw protruding from the wall.
5. Align the key slots on the top of the UPS with the screws and slide the unit down into place.
6. If the UPS is not snug after test fitting the mounting screws, remove the UPS and tighten the mounting screws slightly to allow for a tighter fit.



7. Unpack the battery and slide it into the UPS housing.
8. Attach the battery leads to the battery (red to red, black to black).
9. Re-install the battery cover.

Connecting to the Internet

The method by which the GigaSpire is deployed will impact the internet connection. With power applied to the GigaSpire BLAST, perform the following steps based on the role the GigaSpire plays in the network.

Connecting to a residential gateway

If the GigaSpire is configured as a Residential Gateway, connect an Ethernet Cable to its WAN port from the WAN modem (ONU, cable modem, or DSL modem).

Note: Before connecting the WAN uplink cable, verify that the system has fully booted up and shows a red flashing LED to ensure proper discovery in the Calix Cloud once it connects to the Internet. In addition, make sure the fiber pigtail is connected to the ONU (u6t only).

Connecting as a Mesh point

If the GigaSpire is configured as a MESH point, connect an Ethernet cable from it's WAN port to another GigaSpire or wirelessly connect the two devices.

Additional Notes

- During boot-up, the network interface may be reset as processes start. If a reset occurs during the discovery phase of check-in to Calix Cloud, the system will show a degraded state in Calix Cloud and may fail to properly run through workflows and upgrade software. If this occurs, execute a basic reset (reboot) on the GigaSpire.
- Once your GigaSpires LED turns BLUE, you are connected to the upstream WAN modem.
- At start-up, GigaSpire Wi-Fi radios are defaulted to on.
- To configure your GigaSpire, connect an Ethernet cable between your PC and the LAN port of your GigaSpire and enter the default IP Address of the device (192.168.1.1) into your browser.
- Wi-Fi radios can be configured using the default settings:
 - SSID: Printed on the product label in the gift box. (CXNKxxxxxxx)
 - Number of radios: 2 (2.4 GHz and 5 GHz)
 - Wi-Fi Protocol supported: 802.11a/b/n/g/ac/ax
 - Credentials: Login and password printed on the product label in the gift box.

Appendix C

Appendix

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System LED Behavior

LED Behavior - RG Mode			
Status	Status	Description - RG Mode	Color
Power Off and Boot-up	Off	Power is OFF The unit has not been turned on, or * There is no power to the unit or * UPS battery has been discharged and can no longer power the unit	 Solid Gray
	Boot-up, SW Upgrade in Progress	* Unit is in the process of being booted up or service/software is being upgraded * Flashing amber every 1 second assuming SW can control the LEDs.	 Off and Amber (1000 msec cycle)
	Boot-up Failure	* Unit boot up failed assuming SW can control the LEDs.	 Off and Red (800 msec cycle)
GigaSpire LED Status	Connected to Internet	Unit has successfully booted up, local services are up and connected to the Internet	 Solid Green
	Service Failure - no Internet	No service, no Internet access	 Solid Red
Mesh Mode			
Mesh	WPS Pressed, pairing attempt has begun	* For Satellite/Mesh mode, upon pressing the WPS button a single time (3+ seconds), WPS is enabled. * The LED bar begins to flash 0.5 second green/off and continues to do so for up to 120 seconds. * If the Gateway has also initialized WPS during this time, the Satellite can be paired to the Gateway Wi-Fi radios (5.0 GHz band) thereby creating an association with the Gateway SSID.	 Off and green (1000 msec)

Mesh	Mesh Complete.	In Service. Connected to Internet	 Solid Green
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System Specifications

Width: 2 in (3.7 inch with stand)

Height: 10.1 in (10.75 inch with stand)

Depth: 7 in

Weight: 2.6 pounds

Interface: 10GE

Wireless: 2.4 GHz 2x2, 5 GHz 4x4 internal antennas

LAN Data/IPTV: Four (4) 10/100/1000 BASE-T Ethernet ports, RJ 45 connectors; Single 100/1000/2500/5000/10000

USB: USB 2.0 Type A

Voice: Two ports supporting

Metaswitch; C15; C20 SIP;

H.248 and MGCP

Power: Single pin and 8-pin

WPS Switch: Push-button actuator

Reset button for factory default

Drop length: 328 feet (100 m) maximum using CAT5/6 cable for GigE

Auto MDI/MDIX crossover for 1000BASE-TX, 100BASE-TX

10GBT: 328 feet (100m) CAT6A/7 cable

Traffic Management and QoS: 802.11Q VLAN; 802.11p voice,

SPECIFICATIONS

Dimensions

WAN Interface

LAN Interfaces

BASE-T Ethernet ports

Data

video, data and management priorities; Q-in-Q tagging

Wireless

2.4 GHz 802.11 b/g/n/ac/ax

2x2 UL/DL MU-MIMO

5 GHz 802.11 a/n/ac/ax

4x4 DL MU-MIMO,

explicit high-power, dynamic beamforming

2.4 GHz, 5 GHz simultaneous

DCM, TWT, extended GI

Auto channel selecting and interference detection

WPS, WPS push button

Wi-Fi multimedia (WMM)

802.11k,802.11v

Supports up to 500 wireless clients

Remote Management

TR-069 remote management

TR-098 Internet Gateway Device Data Model

Environmental

Operating temperature: Indoor ambient temperature, 0° to 40°C

(32° to 104° F)

Operating and storage relative humidity: 10 to 90 % and

5 to 95% non-condensing respectively

Certification and Compliance

Emissions: FCC Part 15 Class B, IC ICES-003 Class B, CISPR-22

Safety: UL 62368 and UL 1697 approved

IEEE: 802.3, 802.3AB, 802.3U, 802.11p, 802.11Q

Wi-Fi Alliance Certified 802.11ax (Wi-Fi 6)

USB-IF Compliance USB 2.0

Powering and Alarms

Single pin and 8-pin

Input voltage: 12 V DC (nominal)

External Power Adapter:

12 V DC, 3A

UPS Power Unit

Speed Performance Testing

Subscribers can run an Ookla-based performance test from within the Calix CommandIQ® mobile app

Calix branded speed test provides 10Gbps DL and 5Gbps UL speed test

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 GigaSpire u6t or u6txg.

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-U4X	EN 61000-3-3
FCC ID: 2ABLKGP1027E 4009A-GPR1027E	EN 62311	EN 50581
RSS 102	CE / RED, RoHS, WEEE, Energy	
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

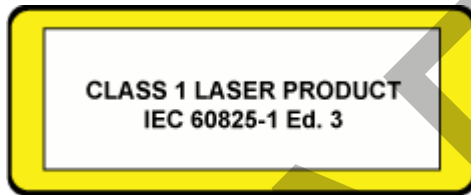
Telcordia GR-909	Telcordia GR-1244	RCM
	Telcordia GR-2890	CISPR-22
Wi-Fi Alliance Certified 802.11ax	 	

Radiated Emissions

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

Product labeling

The following required labeling shows the laser class and IEC standard that defines the laser used in this product.



9457

Laser specifications

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 56, dated May 8, 2019.

Nominal laser wavelength: 1270 nm

Nominal laser wavelength (XGS PON): 1577 nm

Laser Radiation Maximum Output: +9 dBm (7.9 mW)

Pulse Duration: 6.45×10^{-11} s to 6.45×10^{-10} s



DANGER! CLASS 1 LASER PRODUCT. INVISIBLE LASER RADIATION MAY BE PRESENT.

Fiber optic radiation can cause severe eye damage or blindness. Do not look into the open end of an optical fiber.

DANGER! PRODUIT LASER DE CLASSE 1. UN RAYONNEMENT LASER INVISIBLE PEUT ÊTRE PRÉSENT. Le rayonnement de la fibre optique peut causer de graves lésions oculaires ou la cécité. Ne regardez pas dans l'extrémité ouverte d'une fibre optique.

Note: When servicing this product during operation, care must be taken to avoid intrabeam viewing of the laser.

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