



GigaSpire 7u10t.2 (GS4139E), 7u10txg.2 (GS4139XG) Installation Guide

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About this Guide

This document provides the installation practice for the following two models:

- Calix GS4139E GigaSpire 7u10t.2 (10GE Wi-Fi 7 Gateway)
- Calix GS4139XG GigaSpire 7u10txg.2 (XGS Wi-Fi-7 Gateway ONT)

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.

Safety and Regulatory Information

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.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The following restrictions apply to devices classified as 6ID (Low-Power-Indoor Access Points) and 6PP (Subordinate Devices):

- FCC regulations restrict the operation of this device to indoor use only.
- The operation of this device is prohibited on oil platforms, cars, trains, boats, and aircraft, except that operation of this device is permitted in large aircraft while flying above 10,000 feet in the 5.925-6.425 GHz band.
- Transmitters in the 5.925-7.125 GHz band are prohibited from operating to control or communicate with unmanned aircraft systems.

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 within a minimum distance of 20 cm between the radiator & your body.

This device complies with ISSED's licence-exempt RSSs. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d' ISSED applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

Caution:

- (i) any devices capable of operating in the band 5150–5250 MHz shall only be used indoors to reduce the potential for harmful interference to co-channel mobile satellite systems (this requirement does not apply to OEM devices installed in vehicles by vehicle manufacturers)
- (ii) where applicable, antenna type(s), antenna models(s), and worst-case tilt angle(s) necessary to remain compliant with the e.i.r.p. elevation mask requirement set forth in section 7.3.2.4 or 7.3.5.3 shall be clearly indicated.

Avertissement:

Le guide d'utilisation des dispositifs pour réseaux locaux doit inclure des instructions précises sur les restrictions susmentionnées, notamment :

- (i) tout dispositif capable de fonctionner dans la bande de 5150 à 5250 MHz ne doit être utilisé qu'à l'intérieur des bâtiments afin de réduire les risques d'interférences nuisibles avec les systèmes mobiles par satellite à canaux multiples (cette exigence ne s'applique pas aux dispositifs FEO installés dans les véhicules par les constructeurs automobiles)
- (ii) lorsqu'il y a lieu, les types d'antennes (s'il y en a plusieurs), les numéros de modèle de l'antenne et les pires angles d'inclinaison nécessaires pour rester conforme à l'exigence de la p.i.r.e. applicable au masque d'élévation, énoncée à la section 7.3.2.4 ou 7.3.5.3, doivent être clairement indiqués.

Radiation Exposure Statement:

This equipment complies with ISSED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with greater than 26cm between the radiator & your body.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements ISSED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à plus de 26cm entre le radiateur et votre corps.

- Devices shall not be used for control of or communications with unmanned aircraft systems.
- Devices shall not be used on oil platforms.
- Devices shall not be used on aircraft, except for the low-power indoor access points, indoor subordinate devices, low-power client devices, and very low-power devices operating in the 5925-6425 MHz band, that may be used on large aircraft as defined in the Canadian Aviation Regulations, while flying above 3,048 metres (10,000 feet).
- Les dispositifs ne doivent pas être utilisés pour commander des systèmes d'aéronef sans pilote ni pour communiquer avec de tels systèmes;
- Les dispositifs ne doivent pas être utilisés sur les plateformes de forage pétrolier;
- Les dispositifs ne doivent pas être utilisés dans les aéronefs, à l'exception des points d'accès intérieurs de faible puissance, des dispositifs subordonnés intérieurs, des dispositifs clients de faible puissance et des dispositifs de très faible puissance fonctionnant dans la bande de 5 925 à 6 425 MHz, qui peuvent être utilisés dans les gros aéronefs tel qu'il est défini dans le Règlement de l'aviation canadien, et ce, lorsqu'ils volent à une altitude supérieure à 3 048 mètres (10 000 pieds).

Safety Notices

Safety Notice Conventions

This document uses the following safety notice conventions.

Note: Some of the notices below may be excluded from this document based on the incorporated features.



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.

Current Safety Notices



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

Attention! L'utilisation des commandes ou réglages ou l'exécution des procédures autres que celles spécifiées dans les présentes exigences peuvent être la cause d'une exposition à un rayonnement dangereux.

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.

Chapter 1

GigaSpire 7u10t.2 and 7u10txg.2 Products Overview

This chapter introduces the GS4139E 7u10t.2 and GS4139XG 7u10txg.2 tri-band gateway systems and provides an overview of installation planning.

Topics Covered

This chapter covers the following topics:

- *Introducing the GigaSpire 7u10t.2 and 7u10txg.2* (on page [10](#))
- *Product dimensions* (on page [12](#))
- *Exploring the system interfaces* (on page [13](#))
- *Powering options* (on page [14](#))
- *Mounting options* (on page [15](#))
- *Installation considerations* (on page [18](#))

Introducing the GigaSpire 7u10t.2 and 7u10txg.2

The Calix GS4139E GigaSpire 7u10t.2 and 7u10txg.2 systems are the latest generation of Calix Wi-Fi 7 smart home gateways, offering 10 Gbps throughput (10G WAN and 10GE LAN ports) with the latest 802.11be 'Wi-Fi 7' technology.

- The **GS4139E GigaSpire 7u10t.2** is an Ethernet Wi-Fi gateway system for use in residential or small-business applications where a 'two-box model' (separate ONT and RG/Wi-Fi gateway systems) is preferred or required. The 7u10t.2 is equipped with a 10GE WAN uplink port for connecting to an ONT providing a multi-gig broadband services. The 7u10t.2 itself has its own 10GE LAN port to provide multi-gig service throughput on the LAN, plus additional (1) 2.5GE and (2) 1GE ports for connecting client devices on the LAN.
- The **GS4139XG GigaSpire 7u10txg.2** is a combination Wi-Fi gateway plus XGS-PON ONT system for use in residential or small-business applications where a 'one-box model' (combined ONT+RG/Wi-Fi gateway system) is preferred or required. With built-in ONT functionality, the 7u10txg.2 is equipped with a 10G fiber WAN uplink for connecting to XGS-PON networks. The 7u10txg.2 features one 10GE LAN port to provide multi-gig service throughput on the LAN, plus additional (1) 2.5GE LAN and (2) 1GE ports for connecting client devices on the LAN.



Both systems feature tri-band Wi-Fi using the latest 802.11be technology across 10x10 streams (4x4 @ 6 GHz, 4x4 @ 5 GHz, plus 2x2 @ 2.4 GHz), and are also equipped with two POTS ports for telephony services.

Interfaces	7u10t.2	7u10txg.2
Wi-Fi	Tri-band 2x2 (2.4 GHz) plus 4x4 (5 GHz) plus 4x4 (6GHz)	Tri-band 2x2 (2.4 GHz) plus 4x4 (5 GHz) plus 4x4 (6 GHz)
WAN	10 GE	10 GE XGS-PON
LAN	(1) 10 GE, (1) 2.5 GE, and (2) 1 GE	(1) 10 GE, (1) 2.5 GE, and (2) 1 GE
POTS	1	1
USB	1	1

Both systems consume the same footprint and shape for easy deployment planning purposes, and feature a slim-width chassis for installation into structured wiring enclosures commonly seen in higher-density housing (also known as multi-dwelling units, or MDUs).

Refer to the *System Specifications* (on page [50](#)) in the back of this document to learn more about specifications.

Refer to the product data sheets on calix.com for complete details regarding features and specifications.

Product Dimensions

The 7u10t.2 and 7u10txg.2 systems are the same size and occupy an identical physical footprint.

When installed, total dimensions vary slightly between tabletop (foot/bracket attached to the bottom of the ONT) and wall mount or Structured Wiring Enclosure (SWE) where the bracket is attached to the back side of the unit.

Product Dimensions

System Interfaces

The system interfaces for GigaSpire 7u10t.2 and 7u10txg.2 systems are shown below.

7u10t.2 System Interfaces

7u10txg.2 System Interfaces

Powering Options

GigaSpire 7u10t.2 and 7u10txg.2 systems each support two powering options:

- **Local AC power:** Connect to a standard AC power outlet using the Calix-supplied power cable with AC/DC adapter.
- **UPS power:** To provide a battery backup option to maintain power to the system during AC power outages, you can use an Uninterruptible Power Supply (UPS), sold separately (Calix part number 100-05345). Connect DC power from a UPS source via the 8-pin UPS power interface.

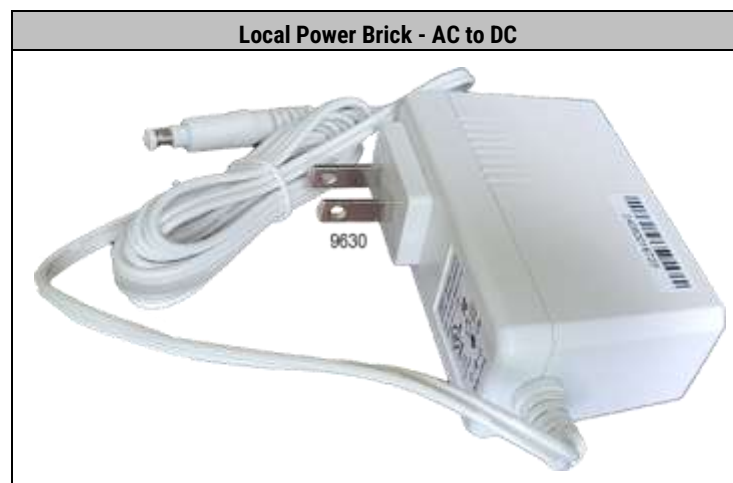
Note: The systems must be supplied by a UL Listed power source compliant with ES1, PS2/LPS, rated output 12VDC, 4.0A, Tma = 40° C minimum, Altitude 5000m.

Local power option

GigaSpire 7u10t.2 and 7u10txg.2 systems accept local AC power using a Calix-supplied AC/DC adapter cable. The DC end of the adapter cable has a two-pin barrel connector to connect to the GigaSpire system. Plug the AC end into any standard AC power outlet.

Spare AC/DC power cables are also available from Calix:

Part Number 100-06218: Power adapter cable, white; 12 V, 4.0A, Type A; 5-foot (150cm) length. C-temp rated (indoor-only).



UPS power option

GigaSpire 7u10t.2 and 7u10txg.2 systems accept DC power from a UPS. Connect the UPS power & signal cable to the system's 8-pin interface for UPS power and signaling.

Use the cable supplied with the UPS to connect its DC power supply to the GigaSpire.

Mounting Options

Both GigaSpire systems each ship with a multi-purpose stand that supports mounting on horizontal or vertical surfaces:

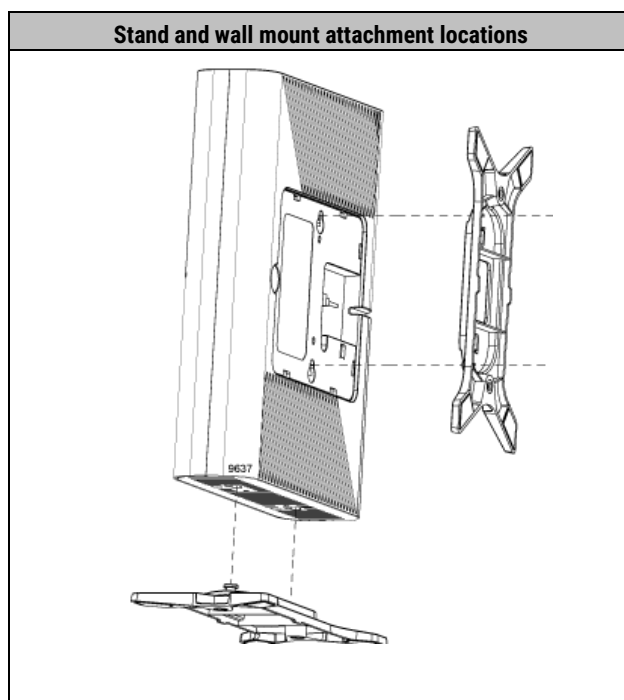
- Horizontal surfaces - For "desktop" orientation –free standing on a flat horizontal surface such as a desktop, shelf, or table– attach the stand to the bottom of the system via its snap-in posts, to serve as a foot.

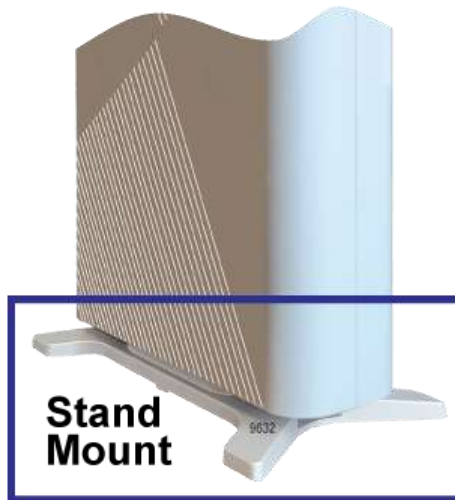
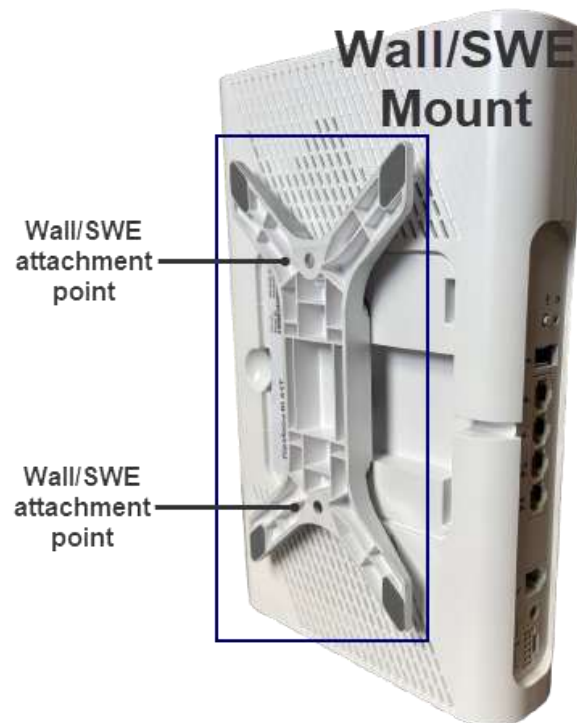
See *Installing the System on a Horizontal Surface* (on page [26](#)) for instructions.

- Vertical surfaces - To mount the system on a vertical surface –a wall, back of a cabinet, or back of a structured wiring enclosure – attach the stand to the side of the system to serve as a mounting bracket. In this configuration, first attach the stand to the vertical surface using (2) mounting screws*, and then attach the system to the stand via its snap-in posts.

See *Installing the System on a Vertical Surface* (on page [28](#)) for instructions.

* - When mounting to a SWE, use the provided "pin and receiver" hardware included in the giftbox.



For horizontal surfaces**For vertical surfaces**

User-supplied hardware

For mounting on a vertical surface only, some user-supplied hardware is required. Specifically, two (2) screws are required to attach the stand (bracket) to the wall* or other vertical surface, but are not included in the kit.

Calix recommends using screws with the following spec: M4 x 8mm x 1-inch long.

* - When mounting to a SWE, use the provided "pin and receiver" hardware included in the giftbox.

Installation Considerations

Review the following guidelines before starting the installation.

Guidelines

Follow these general guidelines and practices:

- Determine which mounting and powering methods to use for each site before beginning the installation. See *Powering Options* (on page [14](#)) and *Mounting Options* (on page [15](#)) for details and guidance.
- Follow all standard safety precautions when performing installation tasks.
- Keep cabling neat and secure for safety and strain relief. Use cable ties and screw clips for dressing long-run cables as needed.

User-supplied items

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

Materials

- WAN link cabling:
 - Ethernet: Cat5e Ethernet cable (for 7u10t.2 system only)
 - XGS-PON: Fiber pigtail, up to 5mm diameter, SC/APC connector (for 7u10txg.2 system only)
- Mounting screws (2) for stand/bracket (wall-mount); spec: #10 (M4.8) x 1-inch length.
- Optional: Fiber splicing equipment

Tools

Bring the following tools to the installation site:

- Level
- Pencil (to mark bracket and drill hole locations; wall-mount)
- Power drill with drill and driver bits (to install mounting screws; wall mount)



Chapter 2

Installing the GigaSpire System

This chapter describes how to install the GigaSpire system at the service location. This process includes guidance for identifying an appropriate installation location, system hardware installation instructions, and cabling instructions.

Topics Covered

This chapter covers the following topics:

- *Unpacking the system* (on page [22](#))
- *Selecting an installation location* (on page [24](#))
- Installing the GigaSpire system at the service location:
 - *Option 1: Installing the system on a horizontal surface (desktop or shelf)* (on page [26](#))
 - *Option 2: Installing the system on a vertical surface (wall, or structured wiring enclosure)* (on page [28](#))
- *Connecting to the network* (on page [35](#))
- *Connecting power* (on page [41](#))
- *Activating the system* (on page [34](#))

Unpacking the System

Each GigaSpire 7u10t.2 and 7u10txg.2 system ships in a box that contains the following items:

Qty	Description
1	GigaSpire system (7u10t.2 or 7u10txg.2)
1	Stand / mounting bracket*
1	Power cable with AC/DC (120VAC to 12VDC) adapter
2	Push-pin and receiver (for SWE mount)
2	Product identification labels (with default Wi-Fi SSID and RG admin user login info)
1	Safety and regulatory statements guide

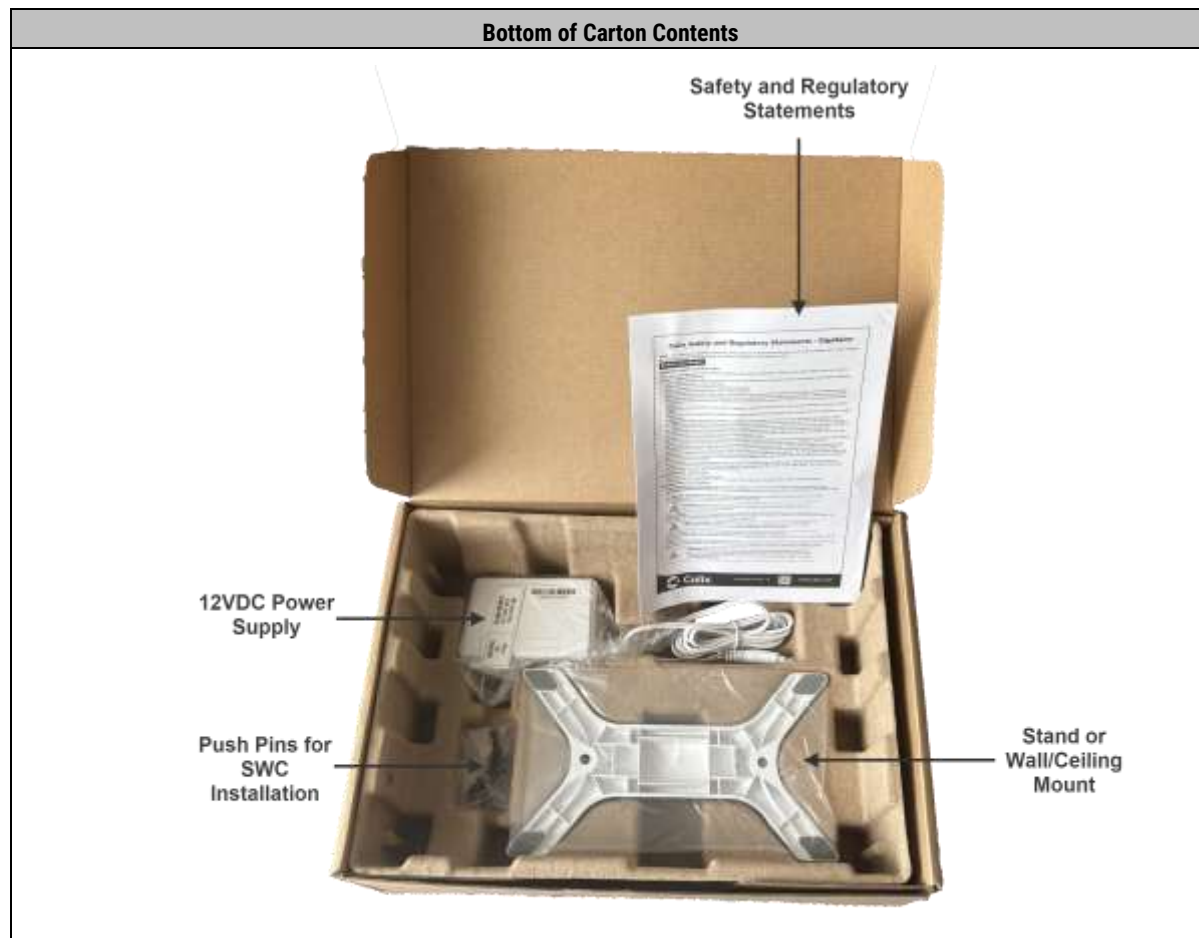
***Note:** Mounting screws are not included. See *Mounting Options* (on page [15](#)) for screw spec recommendation.

To unpack the system

1. Open the box containing the 7u10t.2 or 7u10txg.2 system.
2. Remove the system from the pulp tray, exposing items packed underneath (mounting tray and power adapter).



3. Check to ensure supplied items are present before proceeding:
 - Remove the stand/bracket and set aside for use during installation.
 - Remove the power cable and set aside for use during installation.



Selecting an Installation Location

Consider several factors when selecting an installation location for the system:

- Proximity to power:
 - **AC power:** The supplied power cable is five feet long. You must locate the system within (5 feet) reach of an AC power outlet to use standard AC power.
 - **UPS power:** Distance from a UPS power source depends on cabling options available for the UPS. Locate the system within reach of the 8-pin DC power cable attached to the UPS.
- Proximity to network termination point:
 - **Distance from ONT (7u10t.2 systems only):** The 7u10t.2 system uses a wired Ethernet link to connect to the WAN. The maximum distance to the network termination device (ONT or modem) equals the maximum ethernet cable length of 100 meters (328 feet).
 - **Distance from fiber jack (7u10txg.2 systems only):** The 7u10txg.2 system's ONT WAN interface uses a fiber pigtail to connect to a fiber jack or other indoor local convergence point (where the PON fiber enters the premises). Locate the 7u10txg.2 system near enough to the jack to reach it with your user-supplied fiber pigtail.
- **Mounting type:** Depending on the selected mounting type (horizontal or vertical surface) per site, select a location with a surface that can support that mounting type.
- **Location within serving area:** Environmental factors including centralized location and structural materials can affect Wi-Fi performance. Consider the factors described below.

Wi-Fi AP placement

Direct line-of-sight to the Wi-Fi access point (AP) is not essential for client signal quality, thanks to MIMO technology and an omni-directional antennae array in the AP. 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 serving area, the better.
- Elevate the system as high up as practical; higher elevation helps the Wi-Fi signal clear lower/ground-level obstructions including items such as couches and furniture. For wall mounting, ensure the unit is a minimum of 5 feet (1.5m) away from any obstructions.
- The Calix best practice is to place the Wi-Fi gateway in an open area to enable Wi-Fi signal to broadcast freely with minimal 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.

Effects of Building Materials 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



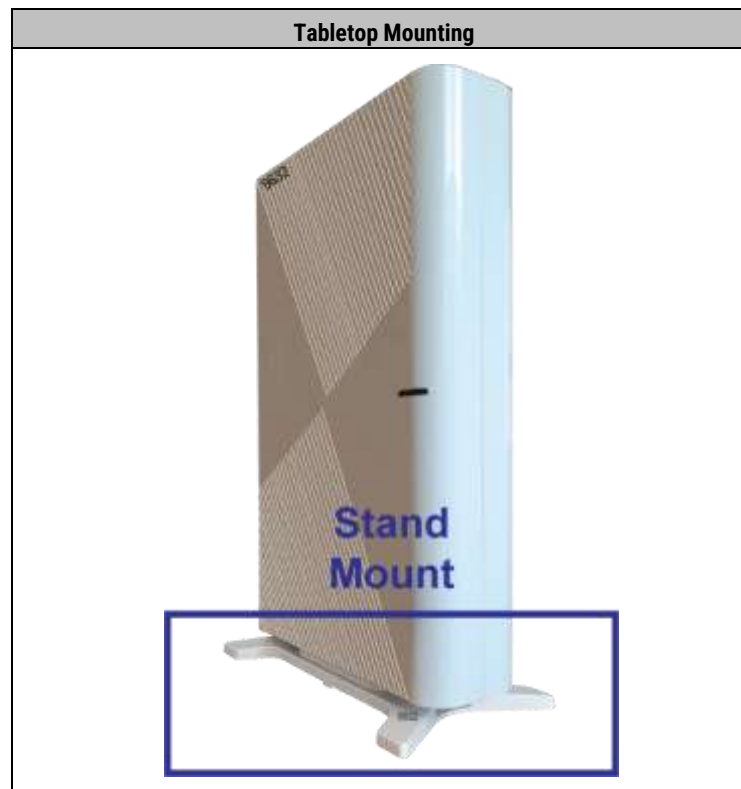
CAUTION! Use of controls or adjustments or performance of procedures other than those specified in this document may result in hazardous radiation exposure.

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 Horizontal Surface

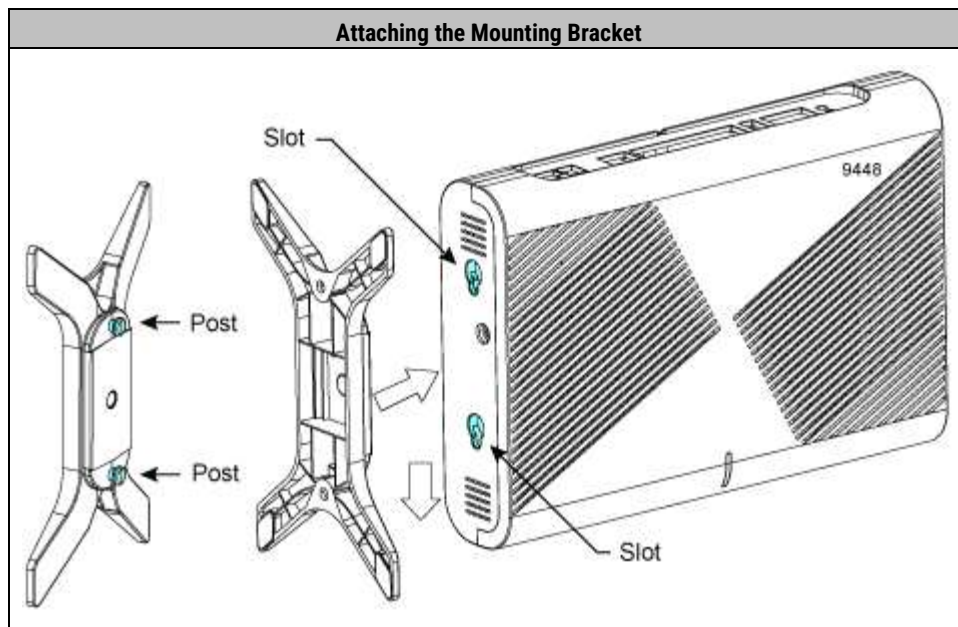
This topic describes how to install GigaSpire 7u10t.2 and 7u10txg.2 systems onto any flat horizontal surface, such as a desktop, shelf, or table.

With a "desktop" arrangement, the system's multi-purpose stand/bracket attaches to the bottom of the unit, serving as a foot for free-standing operation on a horizontal surface. The stand snaps onto the bottom of the system via a pair of mating posts, and has rubber pads underneath to reduce accidental slippage on flat surfaces.



To install the system on a horizontal surface

1. Get the system and its stand/bracket from the ship kit.
2. Attach the stand to the bottom of the system
 - a. Align the stand's (2) posts with the (2) counterpart keyhole slots on the bottom of the system.



- b. Insert the posts into the slots at the wide end of the keyholes.
- c. Slide the stand laterally so the posts fit snugly into the narrow ends of the keyholes.
3. Orient the system upright with its stand at the bottom to serve as a foot.
4. Set the system down on a horizontal surface at its installation location.

Note: Calix recommends locating the system within five feet of an AC power outlet to avoid needing a power extension cord.

Skip to topics *Connecting to the Network* (on page [35](#)) and *Connecting Power* (on page [41](#)) for instructions to connect power and network cables to the system.

Option 2: Installing the System on a Vertical Surface

This topic describes how to install GigaSpire 7u10t.2 and 7u10txg.2 systems onto a flat vertical surface, such as a wall, the back of a cabinet, or inside a structured wiring enclosure (SWE). For simplicity, this topic shall refer to this installation option as simply a wall-mount installation.

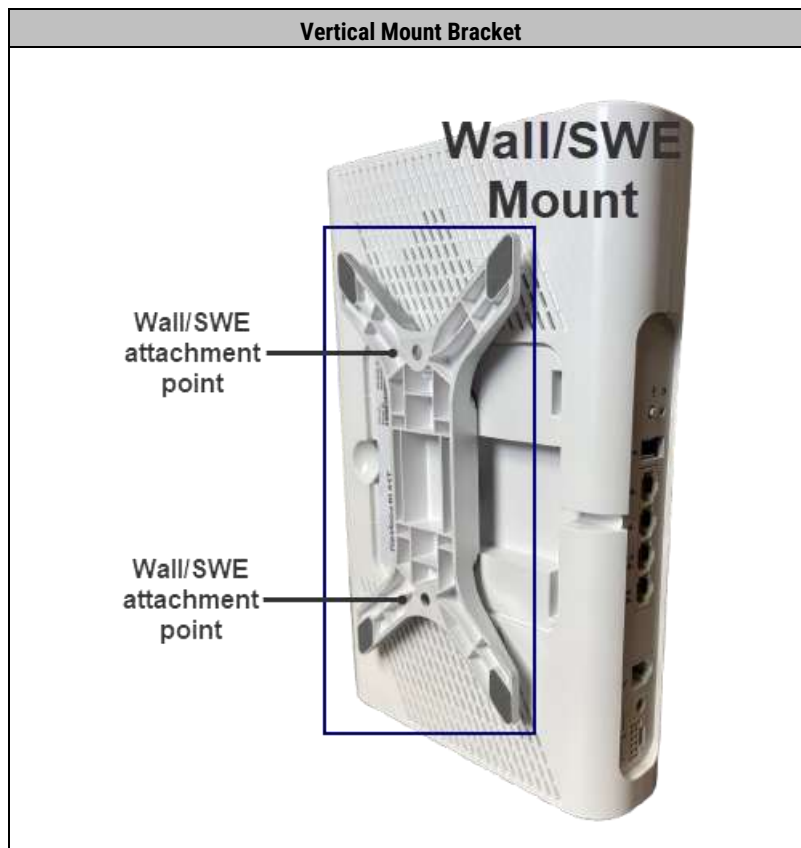
To support wall-mount installations:

- The system's multi-purpose stand attaches to the *side* of the unit to serve as a mounting bracket.
- Two holes in the bracket are designed for attaching the bracket to the wall or SWE.

Note: You must mount the bracket to the wall or SWE prior to attaching the ONT to the bracket.

- A set of two push-pins are included in the giftbox for attaching the mounting bracket to an SWE.

First, attach the mounting bracket to the vertical surface using (2) mounting screws, and then hang the system onto the bracket in snap-on fashion —where slots on the side of the system (located behind a removable cover panel) fit onto counterpart posts on the stand.



Guidelines

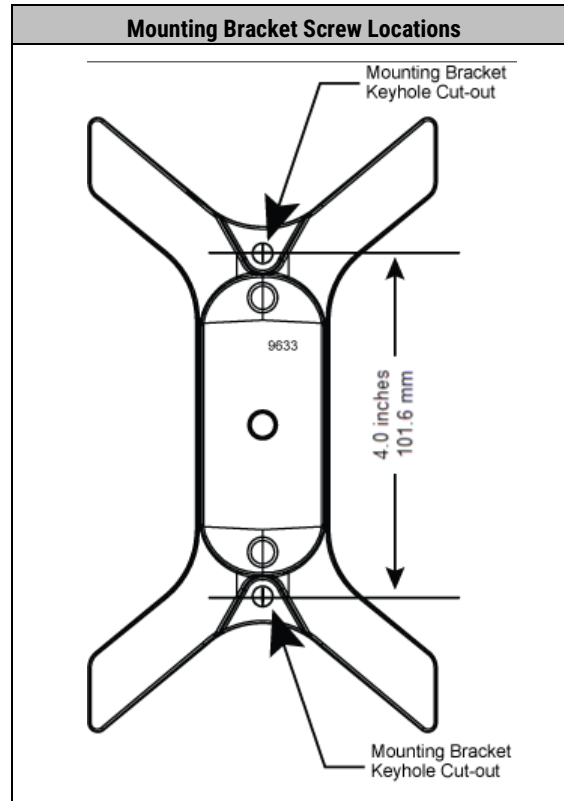
Follow these installation guidelines for wall mount installations:

- User-supplied hardware is required to attach the stand/bracket to a wall or SWE. Mounting screws are not included. See *Mounting Options* (on page [15](#)) for screw specs.
- The wall-mount instructions below assume the drilling is into a stud. If no stud is close enough, use wall anchors of sufficient size and strength instead (not supplied).
- When selecting an installation location, Calix recommends locating the system within five feet of an AC power outlet to avoid needing a power extension cord.
- **Important!** For 7u10txg.2 systems only, Calix recommends connecting the WAN fiber link to the system *before* mounting the system onto the wall bracket, due to its WAN optical port being inaccessible when the system is installed on the bracket. Connect the WAN fiber to the system and then attach the system onto its bracket as described.

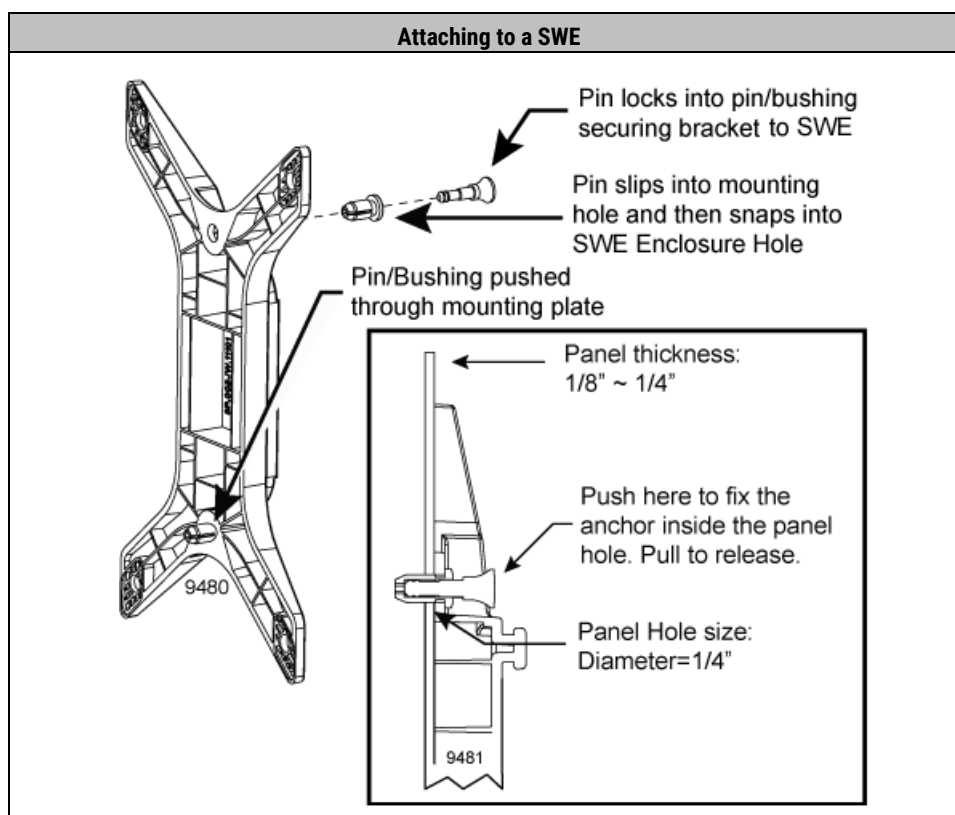
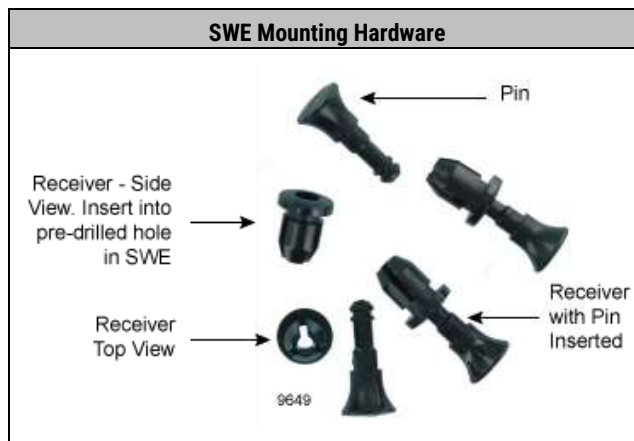
To install the bracket onto a vertical surface (wall)

1. Get the stand/bracket from the ship kit.
2. At the mounting location, mark the position for the bracket on the wall.
 - a. Hold the bracket against the wall at the mounting position.
 - b. Using a pencil, mark the two (2) hole locations to drill for screws.

Note: For structured wiring enclosure (SWE) installations, skip to step 4.



3. Drill two (2) holes into the wall at the marked locations.
4. Hold the bracket against the wall or SWE at the marked location and attach it as follows:
 - Attach to a wall:
 - a. Insert the first mounting screw into the upper of (2) holes in the bracket, and then use a screwdriver to screw it completely into the hole.
DO NOT OVER-TIGHTEN the screw or else risk cracking the plastic bracket.
 - b. Insert the second mounting screw into the lower of (2) holes in the bracket, and then use a screwdriver to screw it completely into the hole.
 - Attach to a SWE rear panel:
 - a. Insert the first pin/bushing into the upper of (2) holes in the bracket and push it all the way through the aligned holes in the SWC rear panel, as shown.

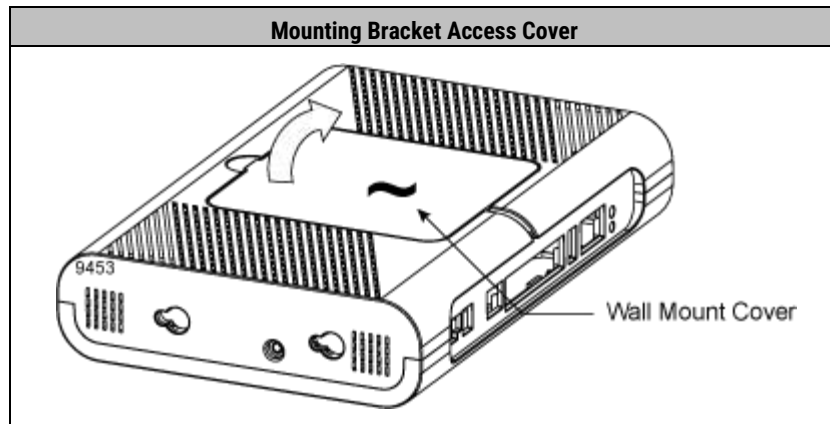


- b. Insert the second pin/bushings into the lower of (2) holes in the bracket and push it all the way through the aligned holes in the SWE rear panel.
5. Once both screws or pin/bushing sets are installed, check the bracket to confirm it is tightly attached to the wall or SWE before proceeding to the next task below.

To install the system onto the mounting bracket

1. Get the 7u10t.2 or 7u10txg.2 system from the ship kit.
2. Remove the cover from the system's side panel to access its interior compartment.

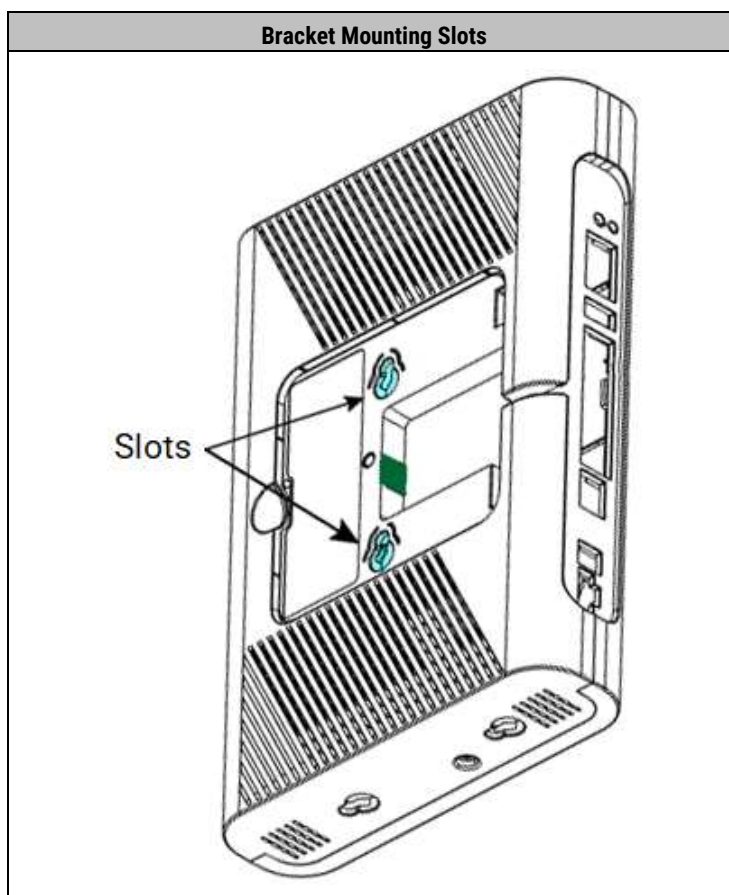
- a. With a finger, press on the tab to release the catch.
- b. Pull on the tab to remove the cover away from the side panel.



- c. Discard the cover, as it will not be used with wall-mount installations.

Note: For 7u10t.2 systems, skip to step 4.

3. **For 7u10txg.2 systems only:** You must connect the WAN fiber link to the system *before* mounting it onto the wall-mount bracket, due to the WAN optical port being inaccessible while the system is installed on the bracket. Go to topic *Connecting the WAN Fiber (7u10txg.2 Only)* (on page [37](#)) for instructions, and then return here to complete the wall-mount installation, as per below.
4. Attach the 7u10t.2 or 7u10txg.2 system to the mounting bracket:
 - a. Align the (2) keyhole slots on the system (located inside the compartment) with the (2) counterpart posts on the bracket.



- b. Hang the system onto the bracket posts at the wide end of the keyholes.
 - c. Slide the system down onto the posts until the posts fit into the narrow ends of the keyholes.
- 5.** For 7u10txg.2 systems only: Check to make sure the WAN fiber exits left cleanly via the slot in the rounded edge of the system body, near the back left side of the mounted unit (when viewed from the front). Make sure the fiber is not pinched.

Proceed to topics *Connecting to the Network* (on page [35](#)) and *Connecting Power* (on page [41](#)) for instructions to connect power and network cables to the system.

Activating the System

Once the system is cabled out, it is ready to activate and connect to the network.

To activate the system

1. If you have not done so already, apply power to the GigaSpire system to initiate activation.
 - For systems using AC power: Plug the power cable's 3-prong connector into an AC power outlet. (Refer to *Connecting AC Power* (on page [42](#)) for instructions.)
 - For systems using a UPS for DC power: Plug the UPS AC power cable's 3-prong connector into an AC power outlet. (Refer to *Connecting UPS Power* (on page [43](#)) (Optional) for instructions.)
2. Observe as the system powers up – and for 7u10txg.2 systems only, as its internal ONT ranges up and gets discovered by the OLT – and then transitions to 'in service' status (green LED).

Next steps

Before completing the installation, verify system startup operation:

- Verify that the system's status LED shows expected 'in service' state (green) before considering the installation complete. Refer to *System LED Behavior* (on page [48](#)) for expected behavior.
- Verify with your back office that the system checked in to Calix Cloud as applicable.
- For gateway system turn-up instructions, refer to the following related user documentation:
 - *EXOS Systems: Service Provider's Guide*
 - *Calix Deployment Cloud Help*

Chapter 3

Connecting to the Network

Connect the GigaSpire 7u10t.2 or 7u10txg.2 system to the wide-area network (WAN). If applicable, also connect any wired services or devices to the gateway.

- Network uplink
 - **Ethernet link (7u10t.2 systems)** - Connect the 7u10t.2 gateway system to the network via a WAN Ethernet link to the broadband service device (ONT or modem). See *Connecting the WAN Ethernet Link (7u10t.2 Only)* (on page [36](#)) for instructions.
 - **XGS-PON fiber link (7u10txg.2 systems)** - Connect the 7u10txg.2 gateway system to the FTTx access network via an XGS-PON WAN fiber link. See *Connecting the WAN Fiber (7u10txg.2 Only)* (on page [37](#)) for instructions.
- Wired LAN-side connections
 - **Data services** - To support data services to wired Ethernet devices on the LAN, connect those client devices to the gateway system. See *Connecting Wired Services Interfaces* (on page [39](#)) for instructions.
 - **Voice services** - To support voice services at the premises, connect the telephone(s) to the gateway system's POTS ports. See *Connecting Wired Services Interfaces* (on page [39](#)) for instructions.

Connecting the WAN Ethernet Link (7u10t.2 Only)

Note: This task applies only to GigaSpire 7u10t.2 (GS5239E) systems. For 7u10txg.2 (GS4139XG) installations, skip this topic.

The GigaSpire 7u10t.2 system is equipped with a 10GE WAN Ethernet port for connecting to the broadband network. Follow these guidelines to connect a 7u10t.2 system to the network:

- **RG mode:** For systems that will operate in gateway (RG) mode, use a standard Ethernet data cable (not supplied) to connect the system's WAN Ethernet port to a LAN Ethernet port on the broadband service device (ONT or modem).

Note: To allow maximum throughput bandwidth to the gateway, Calix recommends connecting to an ONT equipped with a multi-gigabit LAN port. For example, connect to an XGS-PON ONT (most are equipped with a 10GE or 2.5GE LAN port), such as the Calix GP1101X ONT.

- **Satellite mode:** For systems that will operate in mesh satellite mode, you can use either a wired (Ethernet) or wireless backhaul link to connect to the RG system. Follow the instructions below only for systems that will use a wired connection to the gateway.

To connect to the network

1. Bring an Ethernet data cable (not supplied) to the GigaSpire location.
2. Connect the Ethernet cable to the system's WAN Ethernet port —labeled **10G**  (WAN icon)—located on the back of the system.

- insert photo interface port -

1. Connect the Ethernet cable's other end to the upstream device:
 - For gateways, connect the uplink cable to the broadband service device's LAN Ethernet port.
 - For satellites, connect the uplink cable to an available LAN Ethernet port on the gateway system.
2. Dress, tuck, or tie back any cable slack to prevent accidental catching or snags on the cable, as needed.

Connecting the WAN Fiber (7u10txg.2 Only)

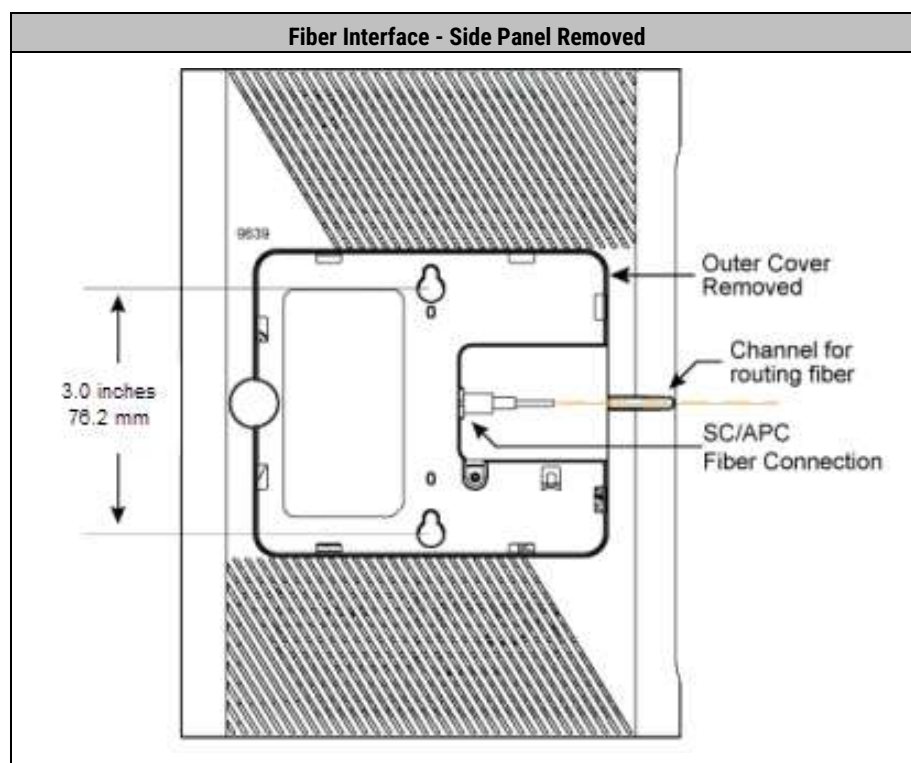
Note: This task applies only to GigaSpire 7u10txg.2 (GS4139XG) systems. For 7u10t.2 (GS4139E) installations, skip this topic.

The GigaSpire 7u10txg.2 system is equipped with an integrated XGS-PON ONT for connecting directly to a PON FTTx network. The 7u10txg.2 WAN optical port uses an SC/APC connector.

Connect the PON service drop fiber to the 7u10txg.2 system's WAN optical port to establish a PON network connection.

To connect the WAN fiber link

1. Route the service drop fiber from its premises entry location to the GigaSpire location.
2. Remove the cover from the 7u10txg.2 system's side panel to access the WAN optical port (located inside the interior compartment).
3. Remove the rubber dust cover from the WAN optical port.
4. Insert the WAN fiber's SC/APC male connector into the 7u10txg.2 system's WAN optical port (SC/APC female connector).



Side panel with cover removed (for access to WAN optical port)

5. Remove any slack in the fiber pigtail and then fit the fiber into the exit notch at the back of the side panel.
6. Based on your selected mounting option for this system, do one of the following to finish this task:
 - For horizontal surface mounts (desktop or shelf): Replace the side panel cover, taking care not to pinch the fiber pigtail in the exit notch.
 - For vertical surface mounts (wall or SWE): Attach the system to its (previously installed) mounting bracket using the keyholes in its side compartment. See topic *Option 2: Installing the System on a Vertical Surface* (on page [28](#)) for instructions.

Connecting Wired Services Interfaces

This section describes how to connect service lines to the system's LAN-side interfaces.

GigaSpire 7u10t.2 and 7u10txg.2 systems are equipped with the following service ports:

- (5) LAN Ethernet ports
 - One (1) 10GE port, RJ-45 interface
 - One (1) 2.5GE port, RJ-45 interface
 - Two (2) GE ports, RJ-45 interfaces
- (1) POTS voice port, copper RJ-11 interface

To provide wired services on the LAN, connect Ethernet cables to the LAN ports as described below.

To connect LAN Ethernet cables

1. Bring an Ethernet data cable to the GigaSpire location.
2. Connect the Ethernet cable to a LAN Ethernet port on the system's rear panel:
 - To support a multi-gig connection to a LAN device, insert the cable's RJ-45 connector into LAN port **4** (10G).
 - To support a gigabit connection to a LAN device, insert the cable's RJ-45 connector into LAN port **1**.
3. If connecting additional LAN devices, repeat steps 1-2 to connect to ports **2-3** as needed.
4. Connect the far end(s) of the Ethernet cable(s) to the LAN device(s) located on premises.

To provide wired voice services, connect a telephone line as described below.

To connect POTS line

1. Route a telephone cable to the GigaSpire location.
2. Insert the phone cable's RJ-11 connector into POTS port **1** on the system's rear panel.
3. Route and connect the far end(s) of the telephone cable to the telephone located on premises.



Chapter 4

Connecting Power

Connect power to the GigaSpire 7u10t.2 or 7u10txg.2 system via one of the following options:

- **AC power:** Use the power cable supplied with the system to connect it to a standard AC power outlet. See *Connecting AC Power* (on page [42](#)) for instructions.
- **UPS power:** If you purchased an Uninterruptible Power Supply (UPS; sold separately) to provide battery backup support, use the UPS to power the system. See *Connecting UPS Power (Optional)* (on page [43](#)) for instructions.

Connecting AC Power

Calix provides an AC power cable (with AD/DC adapter) with each system. Connect the system to AC power as described below.

Note: UPS power connections are discussed in the next topic.

To connect the system to AC power

1. Get the AC power adapter cable from the installation kit.
2. Connect the power cable's device end (2-pin barrel connector) to the GigaSpire's power input jack.

- insert interface photos -

1. Route the cable's other end (3-prong connector) to a nearby AC power outlet and plug into the outlet.

Note: Indoor installations assume that grounding support for the system is provided via the power cable connected to a Ground Fault Circuit Interrupt (GFCI) outlet.

Connecting UPS Power (Optional)

If using an optional Uninterruptible Power Supply (UPS) for battery backup support, the UPS must be located near the GigaSpire system to ensure that its low-voltage power supply cord is long enough to reach the GigaSpire.

Depending on your UPS (sold separately), varying lengths of power cords may be included:

- The AC power cord (used between AC wall outlet and UPS) is 8 feet long. Make sure to locate the UPS within that distance from an AC outlet.
- The DC power/signal cord (used between UPS and GigaSpire) offers up to three lengths based on UPS model.
 - Connectorized power & signal cable: 8-pin (GigaCenter end) to 8-pin terminal block (UPS end) cable; 1 meter (3 foot) or 3 meter (10 foot) lengths.
 - Connectorized power & signal cable: 8-pin (GigaCenter end) to unterminated (UPS end) cable; 6 meter (20 foot) length.

Note: If using your own supplied cable, the UPS must be located less than 50 feet (15.2 meters) from the GigaSpire if using an 18 AWG Type I power cord, or less than 70 feet (21.3 meters) from the GigaSpire if using an 16 AWG Type II power cord.



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



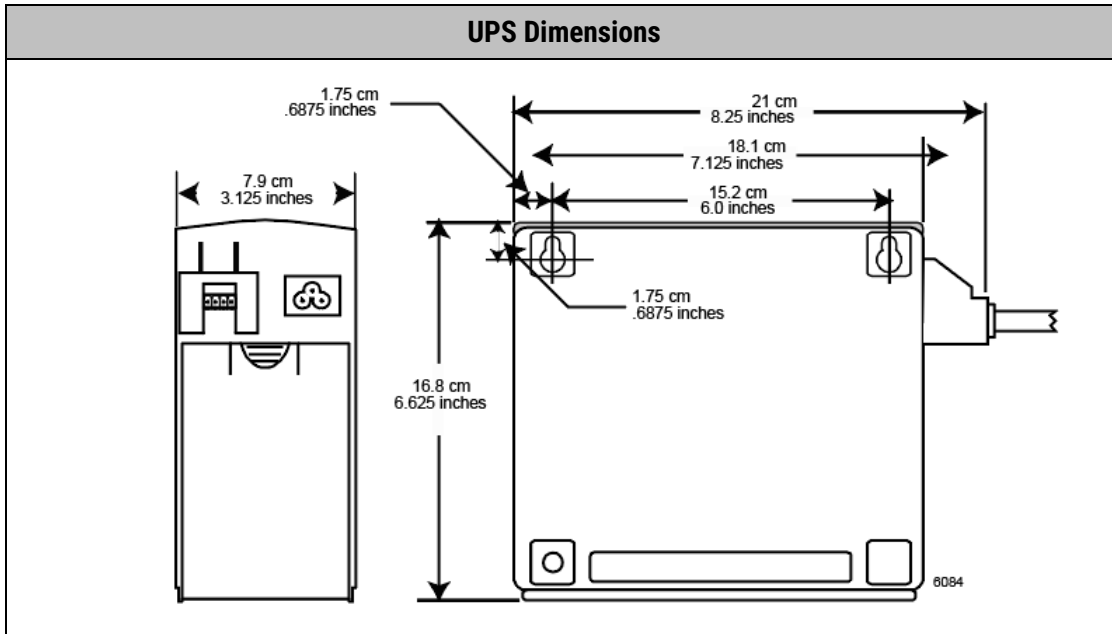
CAUTION! The UPS is designed for indoor installation and must be installed in a location with adequate airflow.

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

Most indoor UPS systems support a wall-mounting option. The procedure below includes instructions to install it with or without using the wall-mount option.

Installing the UPS

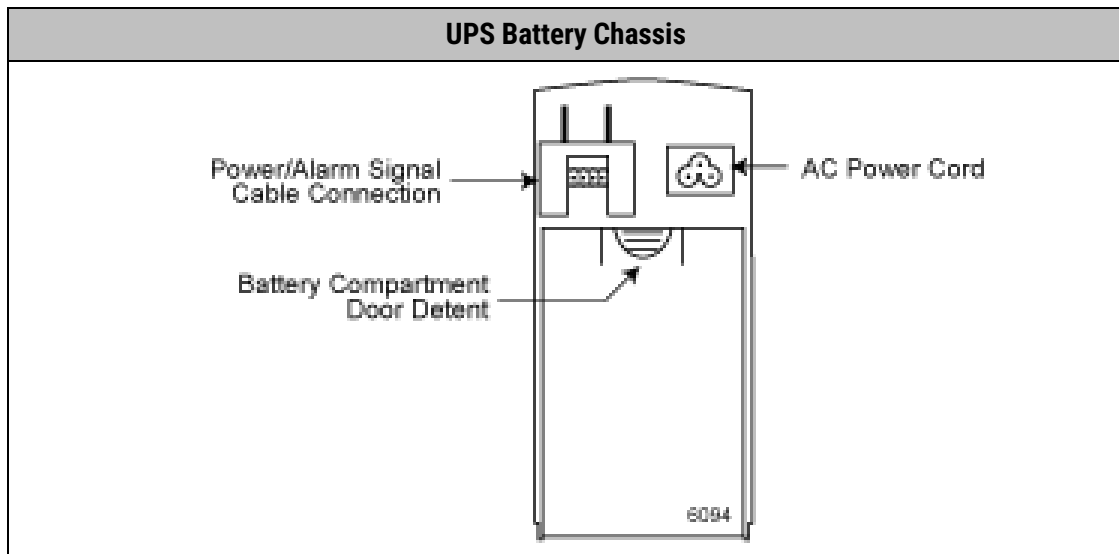
1. Unpack the UPS and associated hardware from the carton.
2. Find a suitable installation location for the UPS and then install it using one of the following options:
 - To mount the UPS onto a wall, proceed to step 3 below.
 - To set a free-standing UPS on a flat surface (floor, shelf, desktop), place the UPS on that surface and then skip to step 4 below.
3. Install two pan-head screws (not included) into a wall on which to hang the UPS:



- a. Pre-drill two mounting holes at appropriate locations per the mounting hole pattern shown above (to accept 8-32 pan-head screws, not provided).

Important: Make sure the material on which you are mounting the UPS is of sufficient strength to support its weight of 7.2 pounds (3.3 kgs).

- b. Insert a screw into each hole, leaving 3/16-inch (.48 cm) of the screw protruding from the wall.
- c. Align the key slots on the top of the UPS with the screws and slide the unit down into place.
- d. 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.



4. Unpack the battery and slide it into the UPS housing.

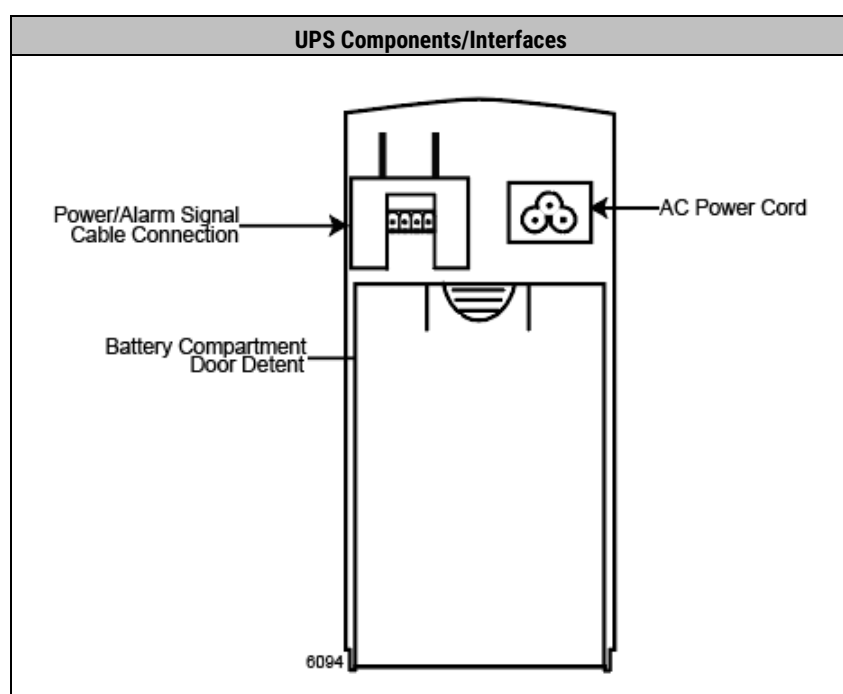
5. Attach the battery leads to the battery (red to red, black to black).

Re-install the battery cover. After the UPS is mounted with battery installed, proceed with connecting power cables:

- Connect the AC power cable to the UPS and then to an AC power outlet.
- Connect the DC power cable cable to the UPS and the to the GigaSpire.

To connect the UPS AC power cable

1. Get the UPS AC power cable from the UPS kit.
2. Connect the AC power cable's female end to the three-pin receptacle on the UPS rear panel.
3. Route the AC power cable's other (male) end to a nearby AC power outlet and plug it in.



To connect the low voltage power cable

1. Get the DC power cable from the UPS kit.
2. On the UPS rear panel, lift the protective housing surrounding the VDC terminal block to expose it for cabling, and then connect the cable's 7-pin connector end to the UPS VDC terminal block.
3. Route the cable's other end to the GigaSpire and connect to the 8-pin DC input connector.



Chapter 5

Appendix

This appendix provides general reference information about the systems.

Topics Covered

This appendix covers the following topics:

- *System LED behavior* (on page [48](#))
- *System specifications* (on page [50](#))
- *Agency listings* (on page [51](#))

System LED Behavior

During boot up, the LEDs go through a sequence as shown below for gateway (RG) and configurations.

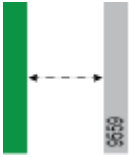
LED Behavior - RG Mode - 7u10t and 7u10txg			
Status	Status	Description - RG Mode	Color
Power Off and Boot-up	Off	Power is OFF The unit has not been turned on, or * There is no power to the unit or * UPS battery has been discharged and can no longer power the unit	 Solid Gray
	Boot-up, SW Upgrade in 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)
In Service	Connected to Internet	System is In Service and connected to Internet.	 Solid Green
Service Failure, no internet	No Internet	• No service, no internet	 Solid Red

The table below includes the various statuses with their corresponding LED pattern (front or side of the unit) for an ONT in mesh mode.

Note: For any Mesh satellite, backhaul pairing can be started by pressing the WPS button for 3 seconds or an equivalent method via a GUI or smartphone application.

WPS is enabled upon pressing the WPS button a single time. After pressing the button, the ONT 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 other ONTs or satellites 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).

LED Behavior - Mesh Satellite Mode - 7u10t only			
Mode	Status	Description - Mesh Mode	Color
Mesh	WPS Pressed, pairing attempt has started	- For Satellite/Mesh mode, upon pressing the WPS button a single time (3+ seconds), WPS is enabled. - The LED bar begins to flash 1 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 GHz band) thereby creating an association with the Gateway SSID.	 Green and Off (500 msec)
	Mesh Connected	Meshing is complete, is in service, and connected to the internet.	 Solid Green
	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 revert to the No Internet failure status. - If pairing is accomplished, LED bar will change to reflect Gateway status.	 Solid Red

System Specifications

Hardware specifications for the GS4139E 7u10t.2 and GS4139XG 7u10txg.2 systems follow:

Dimensions	
Width	2.0 in (5.1 cm); 3.7 in (9.4 cm) with stand
Height	10.1 in (25.7 cm); 10.75 in (27.3 cm) with stand
Depth	7.0 in (17.8 cm)
Weight	2.6 lbs. (1.2 kg)
Power	
AC / DC	Input voltage: 12 VDC (nominal) External Power Adapter (1.5 m): 12 VDC, 4.5 A 1-pin barrel connector UPS power option: 8-pin connector
Network Interfaces	
WAN	GS4139E 10GE system: One (1) 10 GE (100/1000/5000/10000 Base-T) port, RJ-45 GS4139XG system: One (1) XGS-PON ONT fiber interface port, SC/APC
LAN	One (1) 10 GE (100/1000/5000/10000 Base-T) port, RJ-45 Four (4) 2.5 GE (100/1000/2500 Base-T) ports, RJ-45
Voice	One (1) POTS ports, RJ-11
Wireless	• Tri-band internal antennas, 10x10 streams • (2x2 2.4 GHz, 4x4 5 GHz, 4x4 6 GHz, simultaneous) • 2.4 GHz 802.11b/g/n//ax/be • 5 GHz 802.11a/n/ac/ax/be • 6 GHz 802.11a/ax/be • 4x4 UL/DL MU-MIMO, Explicit high-power, dynamic beamforming
Other interfaces	One (1) USB 2.0 Type A One (1) WPS push-button actuator One (1) reset button
Environmental	
Operating temperature	Indoor ambient temperature: 0 to 40 degrees C (32 to 104 degrees 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, ICES-003 Class B, CISPR-22
Safety	UL 62368 and UL 1697 approved

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 7u10t.2 or 7u10txg.2.

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 802.11be	  	

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.



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

Certification:

EN 60825-1:2014+A11:2021

EN 50689:2021



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.