ARRIS

Xfinity TG1682
Telephony Gateway
User's Guide

Get ready to experience the Internet's express lane! Whether you're checking out streaming media, downloading new software, checking your email, or talking with friends on the phone, the Xfinity TG1682 Telephony Gateway brings it all to you faster and more reliably. All while providing toll quality Voice over IP telephone service and both wired and wireless connectivity. It also supports a Lithium-Ion battery backup to provide continued telephone service during power outages.

The Xfinity Telephony Gateway provides four Ethernet connections for use as the hub of your home/office Local Area Network (LAN). The Xfinity Telephony Gateway also provides 802.11a/b/g/n/ac wireless connectivity for enhanced mobility and versatility. In addition, the Xfinity Telephony Gateway provides for up to two separate lines of telephone service and Digital Enhanced Cordless Telecommunications (DECT) funtionality to allow using cordless telphones within the home. The Telephony Gateway also offers integrated MoCA 2.0 home networking providing Internet access and transfer of multimedia content between devices over coaxial cable in the home.

Installation is simple and your cable company will provide assistance to you for any special requirements. The links below provide more detailed instructions.

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Protected under one or more of the following U.S. patents: 7,031,435. Other patents pending.

Release 16 Standard 1.6 November 2014

Safety Requirements

These Telephony Gateways comply with the applicable requirements for performance, construction, labeling, and information when used as outlined below:

CAUTION
Risk of shock

Mains voltages inside this unit. No user serviceable parts inside. Refer service to qualified personnel only!

CAUTION
Potential equipment damage
Potential loss of service

Connecting the Telephony Gateway to existing telephone wiring should only be performed by a professional installer. Physical connections to the previous telephone provider must be removed and the wiring must be checked; there must not be any voltages. Cancellation of telephone service is not adequate. Failure to do so may result in loss of service and/or permanent damage to the Telephony Gateway.

CAUTION
Risk of explosion

Replacing the battery with an incorrect type, heating a battery above 75°C, or incinerating a battery, can cause product failure and a risk of fire or battery explosion. Do not dispose of in fire. Recycle or dispose of used batteries responsibly and in accordance with local ordinances.

- The Telephony Gateway is designed to be connected directly to a telephone.
- Connecting the Telephony Gateway to the home's existing telephone wiring should only be performed by a professional installer.
- Do not use product near water (i.e. wet basement, bathtub, sink or near a swimming pool, etc.), to avoid risk of electrocution.

- Do not use spray cleaners or aerosols on the Telephony Gateway.
- The product shall be cleaned using only a damp, lint-free, cloth. No solvents or cleaning agents shall be used.
- Avoid using and/or connecting the equipment during an electrical storm, to avoid risk of electrocution.
- Do not use the telephone to report a gas leak in the vicinity of the leak.
- Do not locate the equipment within 6 feet (1.9 m) of a flame or ignition source (i.e. heat registers, space heaters, fireplaces, etc.).
- Use only power supply and power cord included with the equipment.
- Equipment should be installed near the power outlet and should be easily accessible.
- The shield of the coaxial cable must be connected to earth (grounded) at the entrance to the building in accordance with applicable national electrical installation codes. In the U.S., this is required by NFPA 70 (National Electrical Code) Article 820. In the European Union and in certain other countries, CATV installation equipotential bonding requirements are specified in IEC 60728-11, *Cable networks for television signals, sound signals and interactive services*, Part 11: Safety. This equipment is intended to be installed in accordance with the requirements of IEC 60728-11 for safe operation.

  If the equipment is to be installed in an area serviced by an IT power line network, as is found in many areas of Norway, special attention should be given that the installation is in accordance with IEC 60728-11, in particular Annex B and Figure B.4.
- In areas of high surge events or poor grounding situations and areas prone to lightning strikes, additional surge protection may be required (i.e. PF11VNT3 from American Power Conversion) on the AC, RF, Ethernet and Phone lines.
- When the Telephony Gateway is connected to a local computer through Ethernet cables, the computer must be properly grounded to the building/residence AC ground network. All plug-in cards within the computer must be properly installed and grounded to the computer frame per the manufacturer's specifications.

- Ensure proper ventillation. Position the Telephony Gateway so that air flows freely around it and the ventillation holes on the unit are not blocked.
- Do not mount the Telephony Gateway on surfaces that are sensitive to heat and/or which may be damaged by the heat generated by the modem, its power supply, or other accessories.

FCC Part 15

This equipment has been tested and found to comply with the requirements for a Class B digital device under Part 15 of the Federal Communications Commission (FCC) rules. These requirements are intended 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 or more 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.

Warning: Changes or modifications to this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

RF Exposure

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 7.9 inches (20cm) between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Getting Started

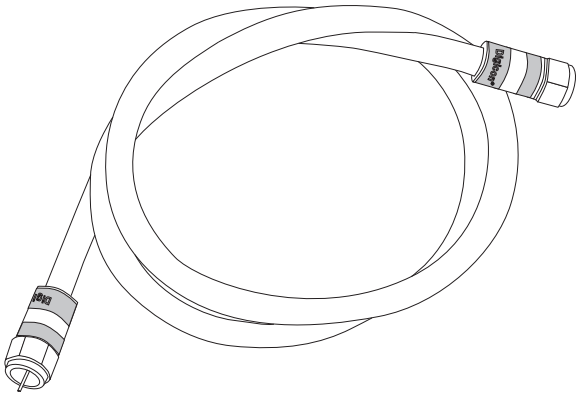
About Your New Telephony Gateway

The Xfinity TG1682 Telephony Gateway is DOCSIS compliant with the following features:

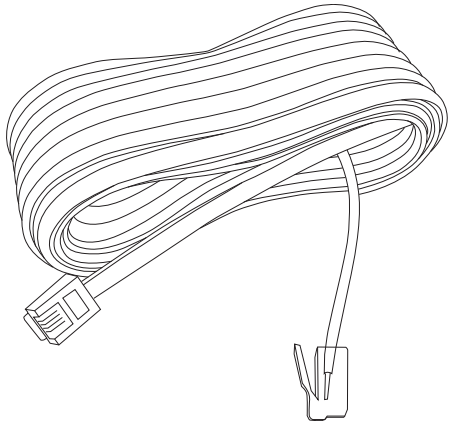
- Speed: much faster than dialup or ISDN service; up to eight times faster than DOCSIS 2.0 cable modems.
- Convenience: supports Ethernet and 802.11a/b/g/n/ac wireless connections; both can be used simultaneously
- Flexibility: provides two independent lines of telephone service as well as high speed data
- Compatibility:
  - Data services: DOCSIS 3.0 compliant and backward-compatible with DOCSIS 2.0 or 1.1; supports tiered data services (if offered by your cable company)
  - Telephony services: PacketCable™ 2.0 compliant
  - DECT support for CAT-iq 2.0 compliant DECT 6.0 hardware with multi line calling capabilities (if offered by your cable company)

The TG1682 provides:

- Wireless 802.11a/b/g/n/ac connectivity
- Four Ethernet ports for connections to non-wireless devices
- Up to two lines of telephone service with Digital Enhanced Cordless Telecommunications (DECT) funtionality
- Integrated MoCA 2.0 home networking
- DOCSIS 3.0 compliant with Li-Ion backup battery
- Two USB host ports (future support for external USB devices)



Coax Cable



Phone Cable

What's in the Box?

Make sure you have the following items before proceeding. Call your cable company for assistance if anything is missing.

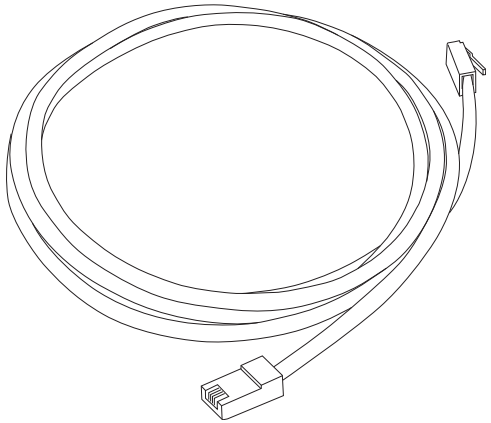
- Telephony Gateway
- Power Cord
- Quick Installation Guide
- End User License Agreement

Items You Need

If you are installing the Telephony Gateway yourself, make sure you have the following items on hand before continuing:

- **Telephony Gateway package**: see What's in the Box? for a list of items in the package.
- **Coaxial cable (coax)**: as shown in the image to the left, this is a round cable with a connector on each end. It is the same kind of wire used to connect to your television for cable TV. You can buy coax from any electronics retailer and many discount stores; make sure it has connectors on both ends. There are two types of connectors, slip-on and screw-on; the screw-on connectors are best for use with your Telephony Gateway. The coax should be long enough to reach from your Telephony Gateway to the nearest cable outlet.

  Note: For best performance, use high-quality RG-6 type coax cable and minimize or eliminate splitters between the cable jack and the Telephony Gateway.
- **Phone Cable**: as shown in the image to the left, this is a standard phone cable with standard phone connectors (RJ11 type) on both ends. You can buy phone cables from any electronics retailer and many discount stores.
- **Splitter (optional)**: provides an extra cable connection by splitting a single outlet into two. You may need a splitter if you have a TV already connected to the cable outlet that you want to use. You can buy a splitter from any electronics retailer and most discount stores; you may also need a short piece of coax cable (with connectors); use it to connect the splitter to the cable outlet and then connect the Telephony Gateway and TV to the splitter.



Ethernet Cable

Note: A splitter effectively cuts the signal in half and sends each half to its two outputs. Using several splitters in a line may deteriorate the quality of your television, telephone, and/or internet connection.

- **Ethernet Cable(s)**: as shown in the image to the left, this is a Category 5e (CAT5e) straight-through cable for connecting computers to the Gateway.
- **Information packet**: your cable company should furnish you with a packet containing information about your service and how to set it up. Read this information carefully. Contact your cable company if you have any questions.

Getting Service

Before trying to use your new Telephony Gateway, contact your local cable company to establish an Internet account and telephone service. When you call, have the following information ready:

- the Telephony Gateway serial number and cable MAC addresses of the unit (printed on the back panel of the Telephony Gateway)
- the model number of the Telephony Gateway (printed on the bottom panel of the Telephony Gateway)

If the Telephony Gateway was provided by your cable company, they already have the required information.

In addition, you should ask your cable company the following questions:

- Do you have any special system requirements or files that I need to download after I am connected?
- When can I start using my Telephony Gateway?
- Do I need a user ID or password to access the Internet or my e-mail?
- Will my phone number(s) change?
- What new calling features will I have and how do I use them?

System Requirements

The Telephony Gateway operates with most computers. The following describes requirements for each operating system; see the documentation for your system for details on enabling and configuring networking.

To use the Telephony Gateway, you need DOCSIS high-speed Internet service from your cable company. Telephone service requires that the cable company has PacketCable support.

Recommended Hardware

The following hardware configuration is recommended. Computers not meeting this configuration can still work with the TG1682, but may not be able to make maximum use of TG1682 throughput.

- CPU: P4, 3GHz or faster
- RAM: 1GB or greater
- Hard drive: 7200 RPM or faster
- Ethernet: Gig-E (1000BaseT)

Windows

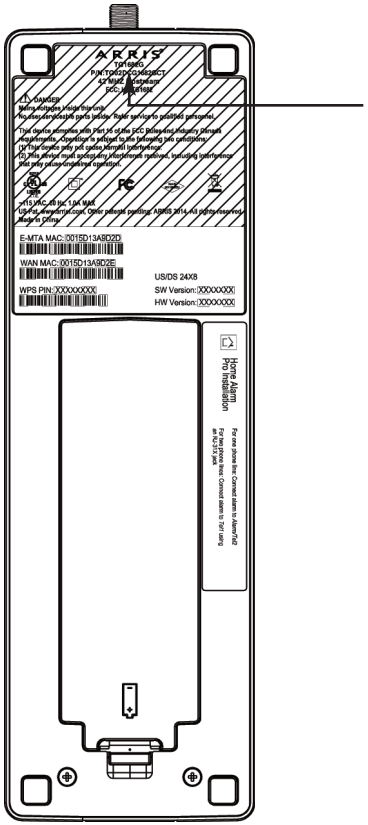
Windows XP, Windows Vista, Windows 7, or Windows 8. A supported Ethernet or wireless LAN connection must be available.

MacOS

System 7.5 to MacOS 9.2 (Open Transport recommended) or MacOS X. A supported Ethernet or wireless LAN connection must be available.

Linux/other Unix

Hardware drivers, TCP/IP, and DHCP must be enabled in the kernel. A supported Ethernet or wireless LAN connection must be available.



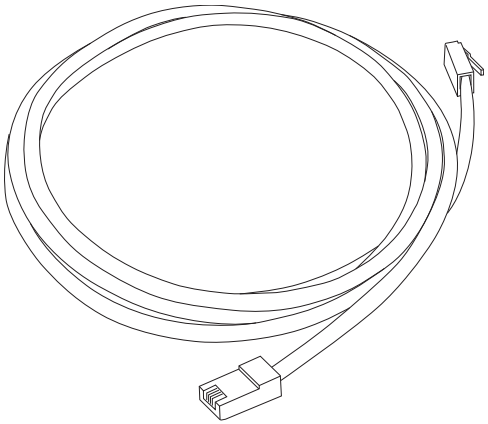
About this Manual

This manual covers the Xfinity TG1682 Telephony Gateway. The model number is on the label affixed to the bottom of the Telephony Gateway. See the image at the left.

What About Security?

Having a high-speed, always-on connection to the Internet requires a certain amount of responsibility to other Internet users—including the need to maintain a reasonably secure system. While no system is 100% secure, you can use the following tips to enhance your system's security:

- Keep the operating system of your computer or laptop updated with the latest security patches. Run the system update utility at least weekly.
- Keep your email program updated with the latest security patches. In addition, avoid opening email containing attachments, or opening files sent through chat rooms, whenever possible.
- Install a virus checker and keep it updated.
- Avoid providing web or file-sharing services over your Telephony Gateway. Besides certain vulnerability problems, most cable companies prohibit running servers on consumer-level accounts and may suspend your account for violating your terms of service.
- Use the cable company's mail servers for sending email.
- Avoid using proxy software unless you are certain that it is not open for abuse by other Internet users (some are shipped open by default). Criminals can take advantage of open proxies to hide their identity when breaking into other computers or sending spam. If you have an open proxy, your cable company may suspend your account to protect the rest of the network.
- If you use the wireless LAN, make sure you enable wireless security on the Telephony Gateway (for the same reasons that you should run only secured proxies). See Configuring Your Wireless Connection.



Ethernet Cable

Ethernet or Wireless?

There are two ways to connect your computer (or other equipment) to the Telephony Gateway. The following will help you decide which is best for you:

Ethernet

Ethernet is a standard method of connecting two or more computers into a Local Area Network (LAN). You can use the Ethernet connection if your computer has built-in Ethernet hardware.

Note: To connect more than four computers to the TG1682 through the Ethernet ports, you need an Ethernet hub (available at computer retailers).

The Telephony Gateway comes with one 4-foot (1.2m) Ethernet cable (the connectors look like wide telephone connectors); you can purchase more cables if necessary at a computer retailer. If you are connecting the Telephony Gateway directly to a computer, or to an Ethernet hub or broadband router with a cross-over switch, ask for Category 5e (CAT5e) straight-through cable. CAT5e cable is required for gigabit Ethernet (Gig-E), not regular CAT5 cable

Wireless

Wireless access lets you connect additional (wireless-capable) devices to Telephony Gateway. The 802.11 wireless LAN standard allows one or more computers to access the TG1682 using a wireless (radio) signal. These connections are in addition to the connections supported via Ethernet.

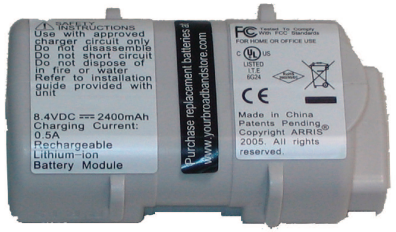
Note: You can use the wireless connection if your computer has a built-in or aftermarket plug-in wireless adapter. To learn more about which wireless hardware works best with your computer, see your computer dealer.

Both

If you have two or more computers, you can use Ethernet for up to four devices and wireless for the others. To connect five or more computers to the Ethernet ports, you will need an Ethernet hub (available at computer retailers.)

Battery Installation and Removal

Basic Backup Battery (black)



Basic Backup Battery (grey)

Extended Backup Battery

The TG1682 Telephony Gateway supports a Lithium-Ion backup battery to provide continued telephone service during power outages. The battery backup is not intended to take the place of AC power.

Note: For safety and regulatory purposes, batteries are shipped outside of the Telephony Gateway and must be installed.

The TG1682 supports the following battery models:

- **Basic backup battery** — provides up to 4 hours of backup time, depending on your Telephony Gateway model and usage. It may be light grey or black.

  Basic Battery Installation and Replacement

- **Extended backup battery** — provides up to 8 hours of backup time, depending on model and usage. It has a strap between the battery guides. This is the standard battery for the TG1682.

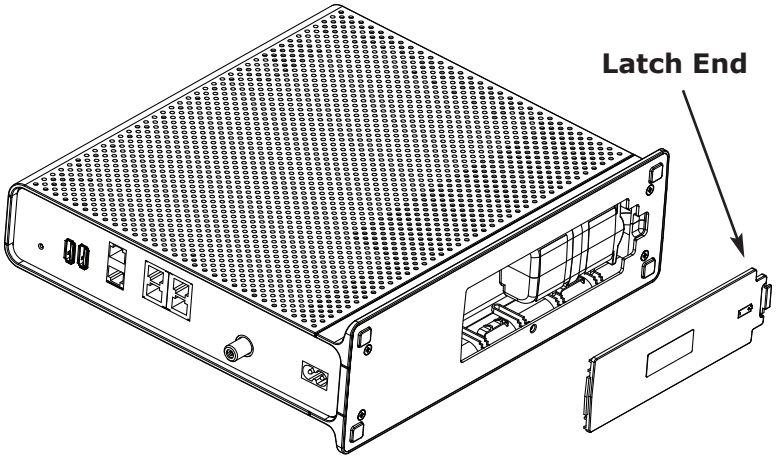
  Extended Battery Installation and Replacement

Your cable company may include a backup battery with your Telephony Gateway. You can order batteries at www.arrsimodemsite.com

Basic Battery Installation and Replacement

This model of the Telephony Gateway supports backup batteries to provide continued telephone service during power outages. The battery backup is not intended to take the place of AC power.

Use this procedure to install and to replace the backup battery.

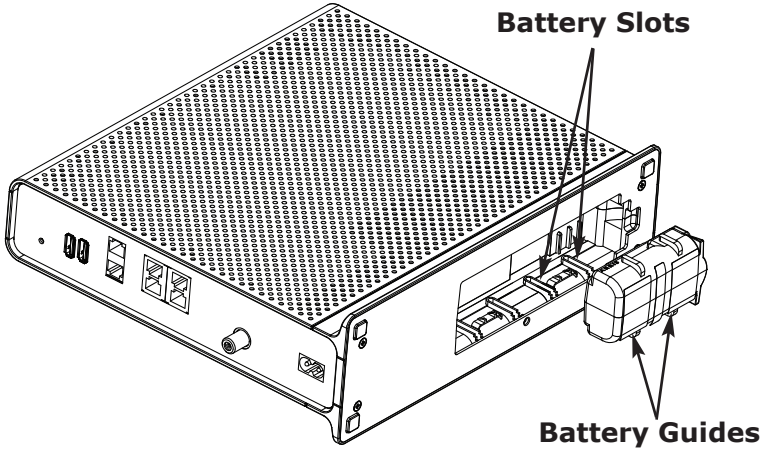


1 Press down and pull back on the latch holding the battery door (on the bottom of the Telephony Gateway). Pull the door toward you. Set the door aside in a safe place.

CAUTION

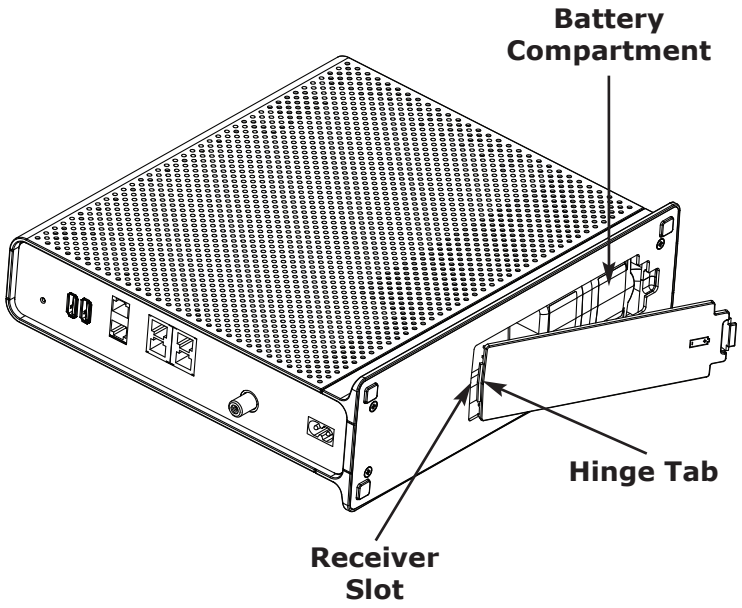
Risk of equipment damage

Improperly inserting the battery may damage the battery connector in the Telephony Gateway. Carefully follow the instructions in the next step to avoid damage.



2 Hold the battery pack so that the guides on the battery align with the slots on the Telephony Gateway and slide the battery into the bay. The diagram on the left shows the proper orientation.

Note: Batteries will not insert completely into the Telephony Gateway if not oriented correctly. The battery should slide into the bay without significant force. Line up the guides on the battery with the slots in the battery bay.

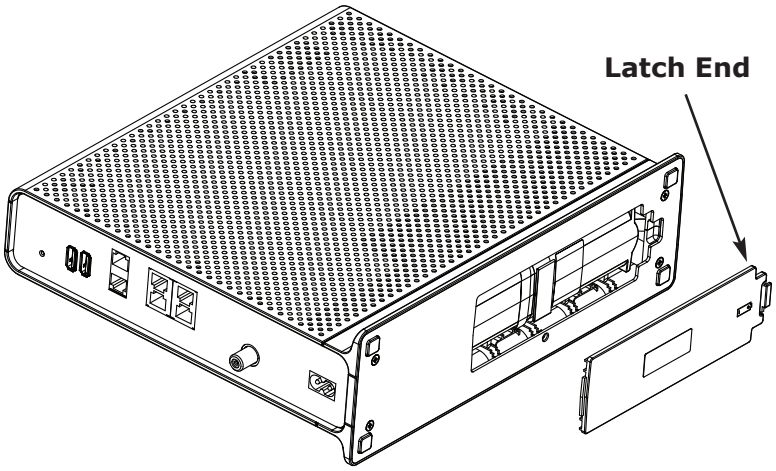


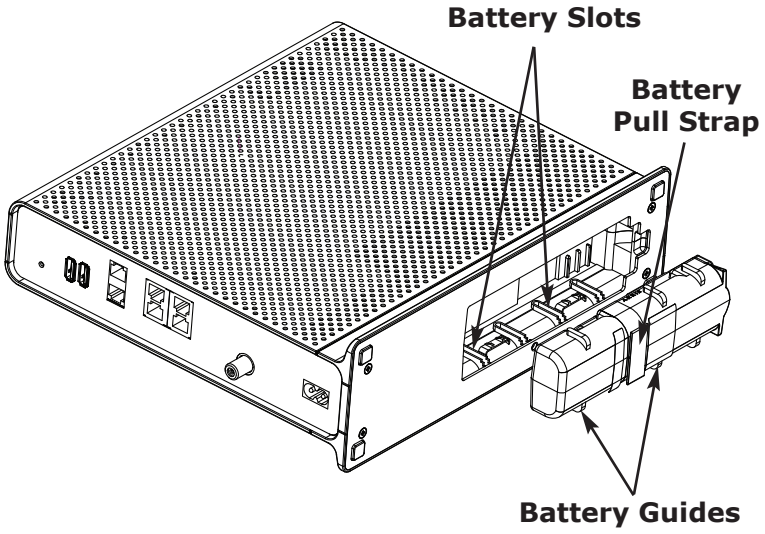
3 Push the battery pack into the bay until it seats into place. **If you are taking the battery out of the Telephony Gateway, position your finger in the battery opening area and use leverage to dislodge the battery while pulling it straight back.**

Note: The Telephony Gateway will not begin operating until you apply AC power.

4 Replace the door. To do so, place the hinge tab of the battery door into the receiver slot inside the Telephony Gateway battery compartment on the opposite end of the battery opening. Rotate the door toward the unit until the latch snaps back into place.

Note: Telephony Gateways use a Lithium-Ion battery pack. Please recycle or dispose of the battery responsibly and in accordance with local ordinances.





Extended Battery Installation and Replacement

Use this procedure to install or replace the backup battery.

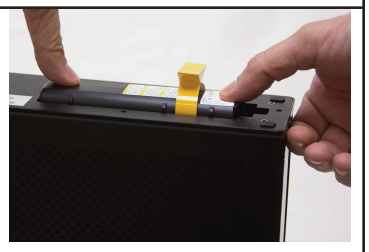
1 Press down and pull back on the latch holding the battery door (on the bottom of the Telephony Gateway). Pull the door toward you. Set the door aside in a safe place.

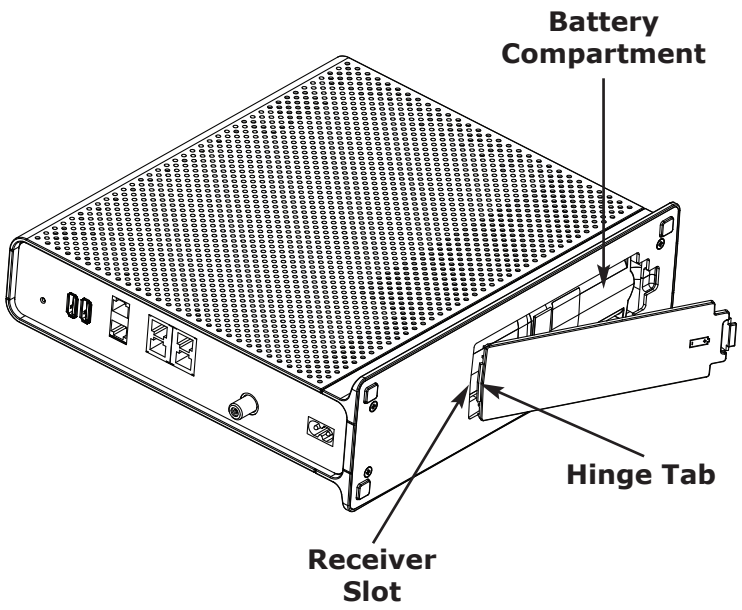
CAUTION
Risk of equipment damage

Improperly inserting the battery may damage the battery connector in the Telephony Gateway. Carefully follow the instructions in the next step to avoid damage.

2 Hold the battery pack so that the guides on the battery align with the slots on the Telephony Gateway and slide the battery into the bay. The diagram on the left shows the proper orientation.

Note: Batteries will not insert completely into the Telephony Gateway if not oriented correctly. The battery should slide into the bay without significant force. Line up the slots in the battery bay with the guides on the battery and apply even pressure on both ends of the battery.

WRONG	WRONG	RIGHT
		



3 Push the battery pack into the bay until it latches into place. **If you are taking the battery out of the Telephony Gateway, use the battery pull strap to dislodge the battery.**

Note: The Telephony Gateway will not begin operating until you apply AC power.

4 Replace the door. To do so, place the tab of the battery door into the slot inside the Telephony Gateway battery compartment. Rotate the door toward the front of the Telephony Gateway until the latch snaps back into place.

Note: Telephony Gateways use a Lithium-Ion battery pack. Please recycle or dispose of the battery responsibly and in accordance with local ordinances.

Installing and Connecting Your Telephony Gateway

Before you start, make sure that:

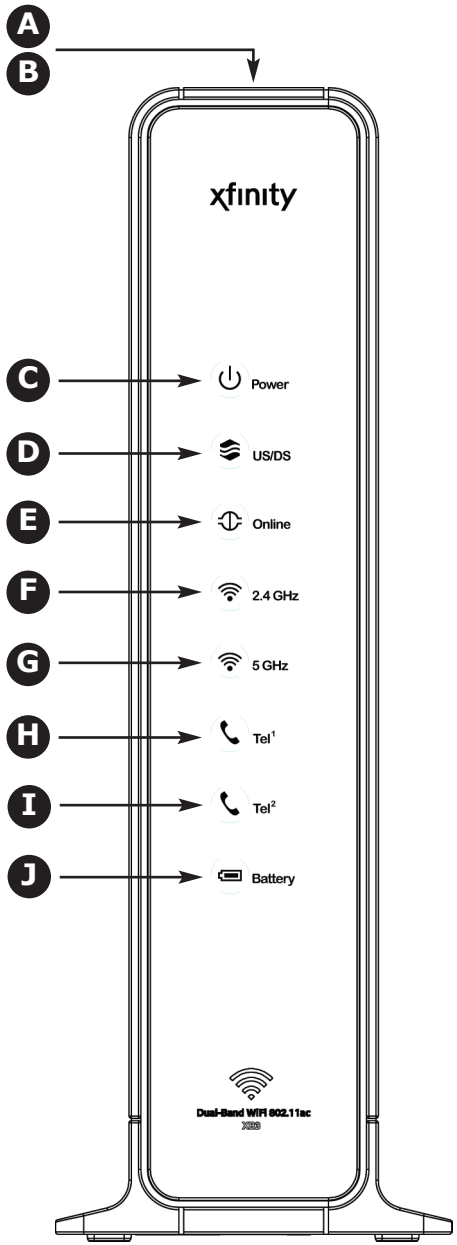
- You have contacted your cable company and verified that they provide data and telephone service using standard DOCSIS technology.
- You have all the items you need.
- Cable, phone, and power outlets are available near the computer. If a cable outlet is not conveniently located, your cable company can install a new one.

If you have ordered service, your cable company should configure the Telephony Gateway automatically. You need only follow the instructions in this section to install and connect the Telephony Gateway.

CAUTION

Risk of equipment damage

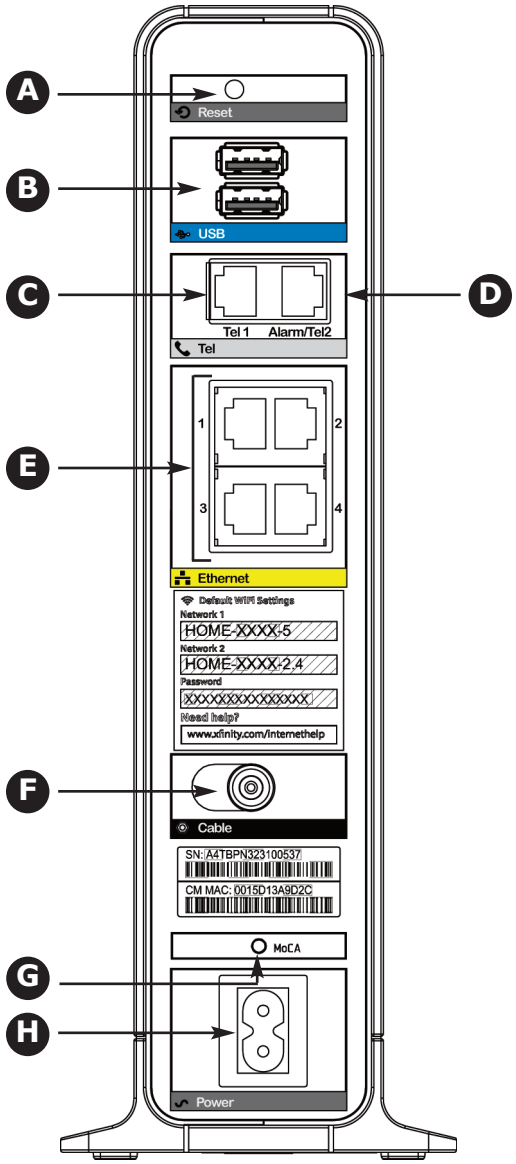
Only qualified installation technicians should connect the Telephony Gateway to house wiring. Incumbent telephone service must be physically disconnected at the outside interface box before making any connections.



Front Panel

The front of the Telephony Gateway has the following indicators:

- **A** **WPS** button with indicator light: indicates Wireless Protected Setup (WPS) is active. (Button with light ring is located on top of unit.)
- **B** **DECT** button with indicator light: Pressing the button pages all the registered handsets. Pressing again cancels paging. Pressing and holding the button for 15 seconds places the unit in registration mode for handset registration. (Button with light ring is located on top of unit.) **Note:** The DECT button only works with CAT-iq 2.0 cordless handsets.
- **C** **Power**: indicates whether AC power is available to the unit.
- **D** **US/DS**: indicates upstream and downstream connectivity.
- **E** **Online**: indicates Internet data transmission status.
- **F** **2.4 GHz**: indicates the status of the 2.4 GHz wireless LAN.
- **G** **5 GHz**: indicates the status of the 5GHz wireless LAN.
- **H** **Tel 1:** indicates the status of telephone line 1.
- **I** **Tel 2**: indicates the status of telephone line 2.
- **J** **Battery**: indicates the battery status.



Rear Panel

The rear of the Telephony Gateway has the following connectors and controls:

- **A** **Reset** button: resets the Telephony Gateway as if you power cycled the unit. Use a pointed non-metallic object to press this button.
- **B** **USB:** USB host connectors - future support for external USB devices
- **C** **Tel 1**: connector for the first phone line.
- **D** **Alarm/Tel 2**: connector for the second phone line or a home alarm connection.
- **E** **Ethernet (1 - 4)**: connectors for use with a computer LAN port.
- **F** **Cable**: connector for the coaxial cable.
- **G** **MoCA**: indicates connectivity between the Telephony Gateway and other home devices connected via the MoCA network.
- **H** **Power**: connector for the power cord.

Selecting an Installation Location

There are a number of factors to consider when choosing a location to install your Telephony Gateway:

- Is an AC outlet available nearby? For best results, the outlet should not be switched and should be close enough to the Telephony Gateway that extension cords are not required.
- Is a cable jack available? For best performance, keep the number of splitters between the jack and cable drop to a minimum. Each splitter attenuates (reduces) the signal available to the Telephony Gateway. A large number of splitters can slow down the Internet connection and even affect your telephone service.
- Can you easily run cables between the Telephony Gateway's location and the phones?
- If you are connecting devices to the Ethernet ports, can you easily run cables between the Telephony Gateway's location and those devices?
- If you want to install the Telephony Gateway on a desktop, is there enough space on either side to keep the vents clear? Blocking the vents may cause overheating.
- How close are your wireless devices? The Telephony Gateway wireless connection range is typically 100–200 feet (30m–65m). A number of factors can affect connection range, as described below.

Desktop mounting instructions

Position the Telephony Gateway so that:

- air flows freely around it
- the back faces the nearest wall
- it will not fall to the floor if bumped or moved
- the side of the unit are not blocked.

Cleaning Instructions

Clean the Telephony Gateway using only a clean, slightly moistened, cloth. Do not use aerosols in the vicinity of the Telephony Gateway.

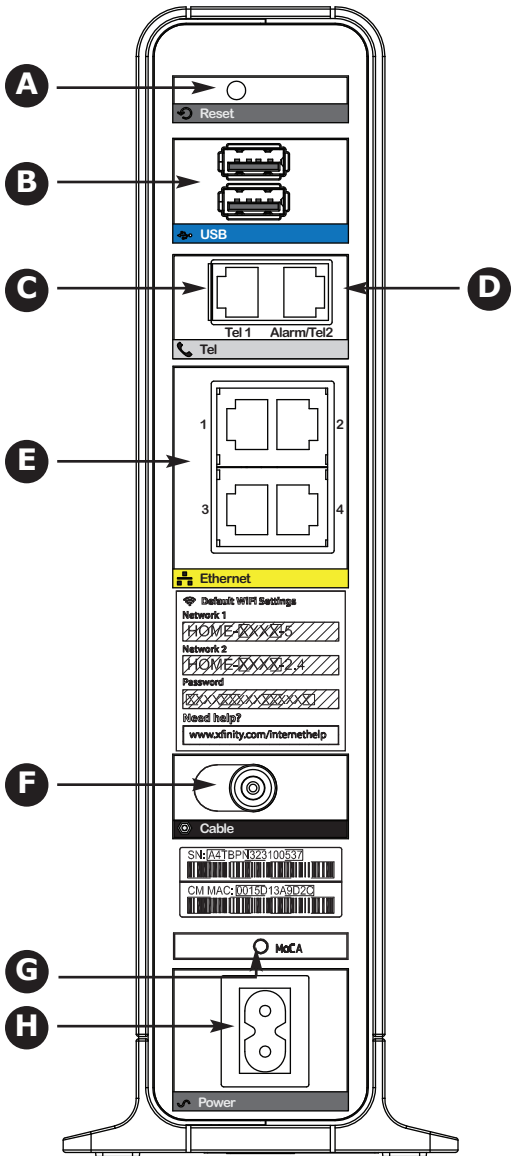
Factors Affecting Wireless Range

A number of factors can affect the usable range for wireless connections.

Increases range:	• Raising the unit above the devices (for example, installing the Telephony Gateway in the upper floor of a multi-story dwelling) • Adding a wireless extender to the network
Decreases range:	• Lowering the unit below the devices (for example, installing the Telephony Gateway in a basement) • Metal or concrete walls between the Telephony Gateway and other devices • Large metal appliances, aquariums, or metal cabinets between the Telephony Gateway and other devices • Interference and RF noise (2.4 GHz wireless phones, microwave ovens, or other wireless networks)

Note: Decreasing the range of your wireless network may be beneficial, as long as the decreased range is sufficient for your needs. By limiting your network's range, you reduce interference with other networks and make it harder for unwanted users to find and connect to your network.

Note: Setting the trasmit power level to High increases the range. Setting it to Medium or Low decreases the range proportionately.



Connecting the Telephony Gateway

WARNING
Risk of injury or equipment damage

Connecting the Telephony Gateway to the home's existing telephone wiring should only be performed by a professional installer. Physical connections to the previous telephone provider must be removed and the wiring must be checked; there must not be any voltage. Cancellation of telephone service is not adequate. Failure to do so may result in loss of service and/or permanent damage to the Telephony Gateway.

1. Connect one end of the coax cable to the cable outlet or splitter, and the other end to the Telephony Gateway's Cable connector (**F**). Tighten the connections by hand, then tighten an additional 1/8 turn with a wrench.

   Note: For best performance, use high-quality coax cable and minimize or eliminate splitters between the cable jack and the Telephony Gateway.

2. Insert the plug from the power cord into the Power connector on the back of the Telephony Gateway (**H**) and insert the power cord into a convenient AC outlet.

   The Power light on the front of the Telephony Gateway lights up, then flashes once (refer to the LED tables shown in Using the Telephony Gateway). See Troubleshooting if the Power light does not turn on.

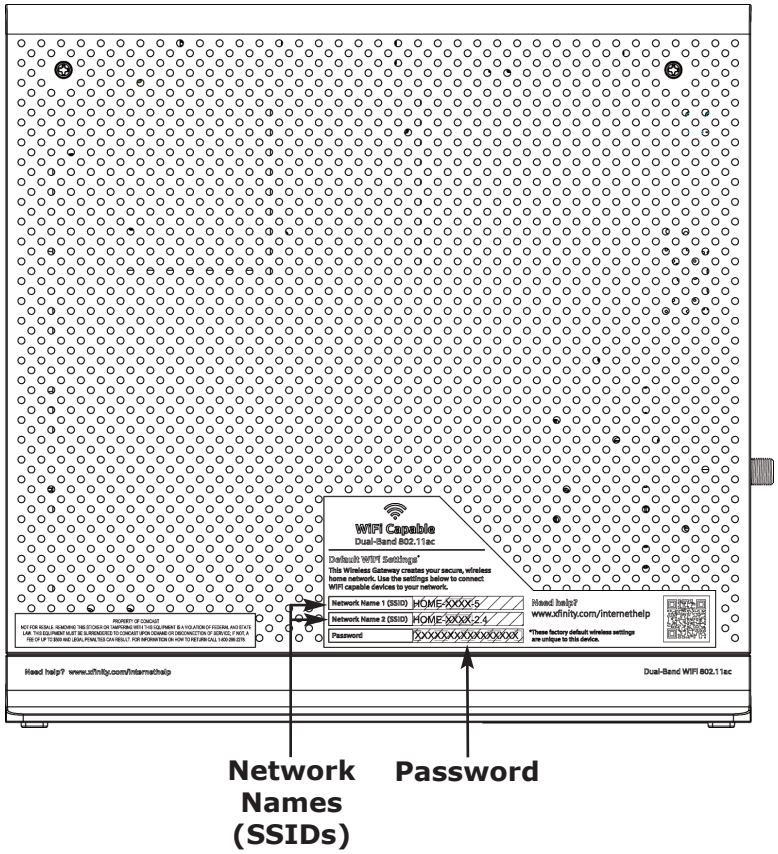
3. Connect one end of the Ethernet cable to any Ethernet port on the back of the Telephony Gateway, (**E**) and the other end to the Ethernet port on a computer, hub, or broadband router.

   Note: If you are connecting to a computer or an Ethernet hub with a crossover switch, use a straight-through cable.

4. Connect one end of the telephone cable to the telephone port on the back of the Telephony Gateway (**C** or **D**). Connect the other end to the telephone.

Home Alarm Connection

The Alarm port (**D**) is for use with an analog home alarm system or for a second phone line. Only a trained professional (Comcast or alarm installer) should use this port.



Configuring Your Wireless Connection

The TG1682 ships with a secure SSID that is unique for every device. Wi-Fi network information is located on the side panel label. If your computer is equipped with a 802.11a/b/g/n/ac wireless LAN card, you may wish to configure the Telephony Gateway's wireless settings.

Note: **At a minimum, you should set a login password and set up wireless security.** Refer to the separate wireless configuration documentation for complete instructions on configuring your wireless connection.

Configuring Your Ethernet Connection

If your computer is equipped with a LAN card providing an Ethernet connection, you may have to configure your computer's TCP/IP settings. The steps that follow will guide you through setting your computer's TCP/IP settings to work with the Telephony Gateway.

Requirements

Make sure you have the following before attempting to configure your Ethernet connection:

- Computer with:
  - one of: Windows XP, Windows Vista, Windows 7, Windows 8, or MacOS X
  - Ethernet interface
- Ethernet cable (supplied)
- IP address, subnet, gateway, and DNS information for installations not using DHCP

How to use this chapter

The following list shows the procedures for modifying the TCP/IP settings on the computer. The procedure is slightly different depending on the operating system that you are using. Please ensure you are using the correct steps for the operating system on your computer. Follow the links below for instructions to configure your Ethernet connection on your operating system.

- TCP/IP Configuration for Windows XP
- TCP/IP Configuration for Windows Vista
- TCP/IP Configuration for Windows 7 or Windows 8
- TCP/IP Configuration for MacOS X

TCP/IP Configuration for Windows XP

Follow these steps to configure the Ethernet interface on a Windows XP operating system.

TCP/IPv6 Note: This procedure shows the configuration of TCP/IPv4. TCP/IPv6 is not installed or enabled by default in Windows XP. If your cable provider requires TCP/IPv6 you must first install and enable it on your Windows XP system. Refer to Microsoft support materials on Windows XP for installation instructions. Once installed and enabled, follow this same configuration example, but select TCP/IPv6 at the appropriate step.

Note: Dialog boxes shown on your computer may differ slightly from those shown in this procedure.

1. From the computer, select **Start > Settings > Control Panel** and double-click **Network Connections** in the Control Panel.

   The Network Connection window displays a list of LAN connections and associated network adapters.

2. Double-click the local area connection to be used for your device's network connection.

   The Local Area Connection Status widow displays.

3. Click **Properties**.
4. Select **TCP/IP** by clicking it one time. Then click **Properties**.
5. Click the **General** tab. Then click **Obtain an IP address automatically** and click **OK**.
6. Click **OK** to accept the new settings, and **OK** again to close the Properties window.
7. You may have to restart your computer in order for your computer to obtain a new IP address from the network.

TCP/IP Configuration for Windows Vista

Follow these steps to configure the Ethernet interface on a Windows Vista operating system.

1 Open the Vista Control Panel.

2 Double-click **Network and Sharing Center** to display the Network and Sharing Center window.

3. Click **Manage Network Connections**. If promted for a connection, choose **Local Area Connection**.

   The Network Connections window displays.

4 Double-click the **Local Area Connection** to open the Properties window.

Note: If Windows requests permission to continue, click **Continue.**

5 Double-click **Internet Protocol Version 4 (TCP/IPv4)** to configure TCP/IPv4.

Note: If your cable provider requires TCP/IP version 6, double-click **Internet Protocol Version 6 (TCP/IPv6)** to configure TCP/IPv6.

The TCP/IP properties window for the version you selected displays.

6. For either TCP/IPv4 or TCP/IPv6, select **Obtain an IP address automatically** and **Obtain DNS server address automatically**, unless instructed otherwise by your cable provider.

7 Click **OK** to accept the new settings and close the Properties window.

TCP/IP Configuration for Windows 7 or Windows 8

Follow these steps to configure the Ethernet interface on a Windows 7 or Windows 8 operating system.

1. Open the Windows Control Panel.
2. Click **Network and Internet**.
3. Click **Network and Sharing Center**.
4. Click **Local Area Connection** to open the Status window.
5. Click **Properties** to open the Properties window.
6. Select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties** to configure TCP/IPv4.

   Note: If your cable provider requires TCP/IP version 6, select **Internet Protocol Version 6 (TCP/IPv6)** and click **Properties** to configure TCP/IPv6.

   The TCP/IP properties window for the version you selected displays.
7. For either TCP/IPv4 or TCP/IPv6, select **Obtain an IP address automatically** and **Obtain DNS server address automatically**, unless instructed otherwise by your cable provider.
8. Click **OK** to accept the new settings and close the Properties window. Then click **Close** to back out of the remaining setup screens.

TCP/IP Configuration for MacOS X

Follow these steps to configure the Ethernet interface on a MacOS X operating system.

1. Open System Preferences, either by choosing System Preferences from the Apple menu or by clicking the System Preferences icon in the dock.
2. Click the **Network** icon.
3. Choose **Automatic** from the Location drop-down menu, and **Built-in Ethernet** from the Show menu.
4. Choose the TCP/IP tab, if necessary.

   If you are using **TCP/IPv4**, go to **step 5**.
   If your cable provider requires **TCP/IPv6**, go to **step 8**.
5. Choose **Using DHCP** from the Configure IPv4 menu.
6. If necessary, click the **Renew DHCP Lease** button.
7. Close the System Properties application.

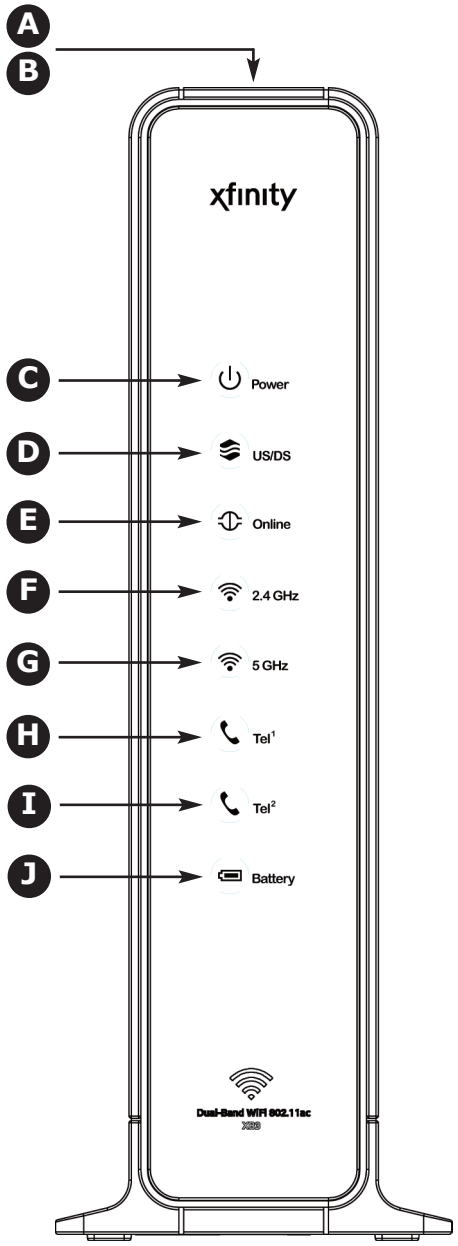
   TCP/IPv4 configuration is completed.
8. If you are using TCP/IPv6, click **Configure IPv6** near the bottom of the previous window.
9. Choose **Automatically** from the Configure IPv6 drop-down menu and click **OK**.
10. Close the System Properties application.

Using the Telephony Gateway

This chapter describes the controls and features available on the Telephony Gateway, and covers basic troubleshooting procedures.

Setting up Your Computer to Use the Telephony Gateway

Follow the instructions in the information packet supplied by your cable company. Contact your cable company if you need help setting up your computer.



Indicator Lights for the TG1682

The Xfinity Telephony Gateway has several LED indicator lights to assist in troubleshooting.

Wiring Problems

If the Telephony Gateway begins flashing all its lights for more than 10 seconds, this indicates a problem with the telephone wiring — the red and green wires may be shorted (touching), or there may be undesired voltage on the lines. If this pattern persists for more than 10 seconds, disconnect the telephone lines from the Telephony Gateway, then call a wiring technician for assistance.

Patterns: Normal Operation (LAN and Telephone)

The following table shows light patterns for the Ethernet, MoCA and wireless LANs, and the telephones, during normal operation.

Mode	Ethernet (rear panel)	2.4 GHz/ 5 GHz WiFi	Tel 1 / Tel 2	MoCA (rear panel)
AC Power	**Green LED On** = Computer with 1 Gbps port connected **Amber LED On** = Computer with 100 Mbps/10 Mbps port connected **Amber/Green LED** Flash = Computer activity Both LEDs Off = Computer not connected	**On** = WiFi Enabled Off = WiFi Disabled Flash = Computer Activity	**On** = On-hook Flash = Off-hook Off = disabled	**On** = MoCA enabled Flash = MoCA network device activity/traffic Off = MoCA disabled
No AC Power	Off	Off	**On** = On-hook Flash = Off-hook Off = disabled	Off
Firmware Upgrade	(normal operation)	(normal operation)	(normal operation)	(normal operation)

Patterns: Normal Operation (WAN and Battery)

The following table shows light patterns during normal operation.

Mode	Power	US/DS	Online	Battery
AC Power Good	**On**	**On** = Connected to the Internet Flash = Not connected to the Internet	**On** = Internet available Off = Internet not available	**On** = Battery good or low Off = Battery missing Flash = Battery bad
No AC Power Battery Installed	Flash	Off	Off	Off = Battery power Flash = Battery bad
No AC Power No Battery	Off	Off	Off	Off
Firmware Upgrade	**On**	Flash	**On**	(normal operation)

Patterns: Startup Sequence

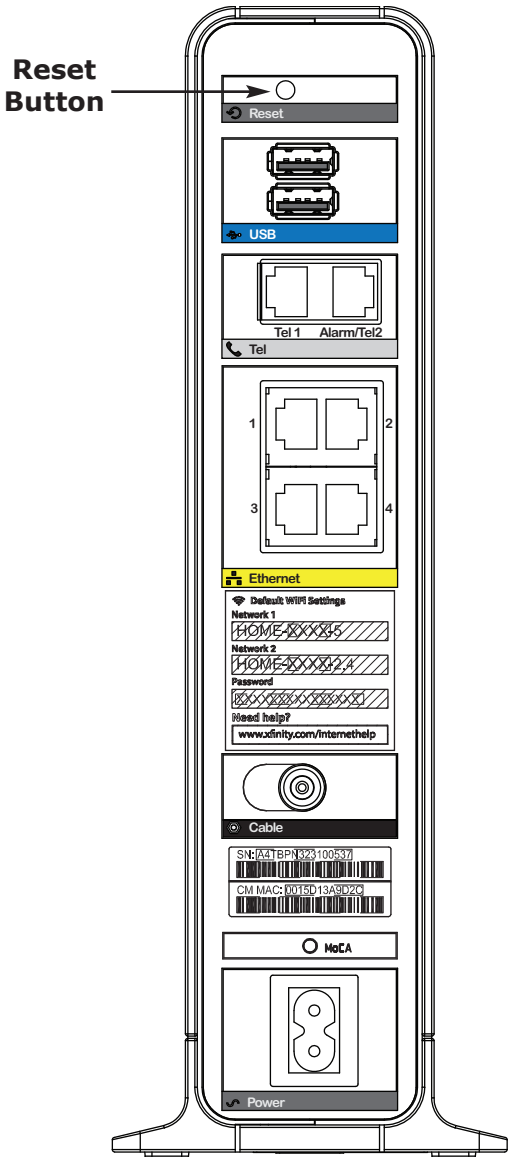
The following table shows the Telephony Gateway light patterns during each phase of the startup sequence. There are two phases of startup; the Telephony phase and the cable modem phase. Both are outlined below.

Power, US/DS, Online	Telephone		Battery	Description
	1	2		
Off	Off	Off	Off	No power to Modem
Flash	Flash	Flash	Flash	Power-on Self Test
"Cable Modem Start Up Sequence" Begins				
On	Flash	Off	Off	Retrieving telephone network information
On	Off	Flash	Off	Retrieving telephone line information
On	Flash	Flash	Off	Activating telephone service
Normal Operation Begins				

Note: The **US/DS** indicator flashes during startup, and turns on when the Telephony Gateway establishes a connection.

Cable Modem Start Up Sequence

US/DS	Online	Description
Slow Flash (1/second)	Off	Downstream acqusition in progress
On (until Upstream acqusition starts)	Off	Downstream acquisition completed
Fast Flash (3/second)	Off	Upstream acquisition completed
On	**Slow** Flash (during acqusition) **On** (when modem IP address obtained)	Upstream acqusition completed, ready for service



Using the Reset Button

Use the **Reset** button, on the back of the Telephony Gateway, to reset the modem and perform initialization as if you power cycled the unit. You may need to reset the Telephony Gateway if you are having problems connecting to the Internet. Using this button will be rare.

Use a pointed **non-metallic** object to press this button. The photo to the left shows the location of the **Reset** button. The **Reset** button is recessed to prevent accidental resets.

The diagram on the left shows the location of the reset button.

Resetting the Router to Factory Defaults

To reset the router to factory defaults, press and hold the **Reset** button on the back of the Telephony Gateway for more than fifteen seconds. This restores the wireless setup configuration and router configuration parameters to the factory defaults. You may need to do this if a misconfiguration has locked out all access.

Booting from Battery

The TG1682 supports a "Boot from Battery" feature that allows the Telephony Gateway to provide voice service without AC power.

To start the TG1682 from its battery, follow these steps:

1. If a battery is already installed in the Telephony Gateway, remove it.
2. Re-insert the battery into the Telephony Gateway (see Battery Installation and Removal for details).
3. Press the **Reset** button; the Power light should turn on immediately.

Troubleshooting

The Telephony Gateway is plugged in, but the Power light is off.

Check all power connections. Is the power cord plugged in firmly at both ends?

If you plugged the power cord into a power strip, make sure the strip is switched on.

Avoid using an outlet controlled by a wall switch, if possible.

Finally, check the fuse or circuit breaker panel.

I'm not getting on the Internet (all connections).

It may take over 30 minutes to establish a connection the first time you power up your Telephony Gateway, especially when many people are online. Always leave your Telephony Gateway plugged into AC power and connected to the cable system.

Check the front panel lights:

- The **Power** and **Online** lights should be on.
- If the **Power** light blinks for more than 30 minutes, call your cable company for assistance.

Check your cable connections. Connectors should be tight. The coax cable should not be pinched, kinked, or bent sharply—any of these can cause a break or short in the cable (you may have to replace the cable). If you have one or more splitters between the Telephony Gateway and CATV outlet, remove the splitters and connect the Telephony Gateway directly to the outlet.

Proceed to the Ethernet or wireless solutions (next page) if necessary.

I'm not getting on the Internet. (Ethernet)

If you are using a hub, is the hub turned on?

Are you using the right type of Ethernet cable? Use a straight-through cable for direct connection to a computer; use a cross-over cable for connection to a hub without a cross-over switch.

Press the **Reset** button on the back of the Telephony Gateway.

A misconfiguration could lock out all access to the Telephony Gateway router. If you think this has happened, see Resetting the Router to Factory Defaults.

I'm not getting on the Internet. (Wireless)

Check the indicator lights (see Using the Telephony Gateway) — the WiFi light should be on.

Does your connection utility discover your wireless LAN? If you turned off "Broadcast SSID" you need to manually enter the name of your wireless LAN in the connection utility.

Change your security mode to "disabled". Enable one of the other security modes as soon as you find the problem.

A misconfiguration could lock out all access to the Telephony Gateway router. If you think this has happened, see Resetting the Router to Factory Defaults.

My wireless Internet connection stops working sometimes.

This is usually caused by interference — two common sources are 2.4GHz "remote" telephones and microwave ovens. If you cannot remove the interfering product, try using a different channel or setting Protected Mode.

I can get on the Internet, but everything is slow.

If the Web site you are visiting is very popular, that site may be having trouble servicing all the requests. If other sites download quickly, wait for a few minutes and try again. Usage during peak hours may also affect the connection speed.

Other communications on the LAN, or interference with wireless connections, may slow down your connection.

I don’t have dial tone when I pick up my phone, why?

In order for telephone service to be functional on the Telephony Gateway, telephone service must have been purchased from the service provider and configured on your Telephony Gateway. The following steps should help in identifying the source of the problem.

1 Is the Power LED lit?

- If not, check to make sure the Telephony Gateway is plugged in and the outlet has power.
- If the LED is lit, go to the next step.

2 Is the Online LED lit?

- If not, check the coax connection at the Telephony Gateway and the wall. Ensure they are connected and tight. If they are and you do not have dial tone, contact your service provider.
- If the Online LED is lit, go to the next step.

3 Is the Telephone (Tel 1 or Tel 2) LED lit?

- If not, phone service has not been set up on that line. Contact your service provider.
- If it is blinking, there is a phone off hook somewhere in the house. Find that phone and hang it up.
- If it is lit, go to the next step.

4 Is the phone plugged directly into the Telephony Gateway?

- Make sure the phone is plugged into the port on the back of the Telephony Gateway labeled “Tel 1” for line 1, and “Alarm/Tel 2” for line 2.
- If so, try a different phone. Make sure the new phone is a working phone.
- If a known good phone is used and you still don’t have dial tone, try a different phone cable. If a new phone and cable do not restore dial tone, call your service provider.

5 Is the Telephony Gateway plugged into a wall outlet?

- If so, unplug the RJ-11 connector at the back of the Telephony Gateway and plug in a known working phone. If you now have dial tone, the problem is with the house wiring. Contact your cable company or a qualified wiring technician to correct the house wiring. If you still do not have dial tone, contact your service provider.

Glossary

The following is a list of common cable and networking terms.

Amp-hour (Ah)

A measure of battery capacity. For example, a 1.0Ah battery can nominally supply one Ampere of current for one hour.

Category 5e (Cat5e)

A high-quality type of cable, used for gigabit Ethernet (1000BaseT) connections. When purchasing Ethernet cables, always look for Category 5e cable.

Coaxial cable (coax)

A thin wire, used to connect your television and Telephony Gateway to the cable TV system. You can buy coax from any electronics retailer and many discount stores.

CPE

Customer Premise Equipment. This is the equipment that is plugged in to the Telephony Gateway; typically a computer or hub.

Cross-over

An Ethernet cable used to connect two hubs (or a hub and a cable modem) together. Also, some Ethernet hubs may have built-in cross-over on one or more ports (which eliminates the need for a cross-over cable).

DHCP

Dynamic Host Configuration Protocol. An IP protocol used to provide an IP address and location of services (such as DNS and TFTP) needed by a device connecting to the network. DHCP allows the cable company to configure your computer's networking software for you.

DNS

Domain Name Service (Server). An IP service that associates a domain name (such as www.example.com) with an IP address.

Downstream

In an HFC network, the direction from the head-end to the subscriber. Some older cable documentation may refer to this as the forward path.

DOCSIS

Data Over Cable System Interface Specification. The interoperability standards used for data communications equipment on an HFC network.

EMTA

Embedded Multimedia Terminal Adapter. An MTA device that is integrated with a cable modem.

Ethernet

A standard method of connecting two or more computers into a Local Area Network (LAN).

EuroDOCSIS

The European version of DOCSIS.

Event

An informational message used for monitoring network status.

F-connector

The type of connector used on coax cable. There are two common types of F-connector, slip-on and screw-on. Use coax with screw-on connectors for connecting your Telephony Gateway.

Firewall

A hardware or software device that prevents unauthorized access to a private network from the Internet. The TG1682 provides a built-in firewall.

Gateway

The device, usually a router, that connects devices on a given IP subnet to other IP subnets.

Headend

The "central office" in an HFC network. The headend houses both video and data equipment. In larger cable networks, a "master" headend often feeds several "remote" headends to provide distributed services.

HTTP

HyperText Transfer Protocol.

Hub

A box with several Ethernet connectors. Ethernet hubs provide a common point of contact for all connected devices.

IP address

A number assigned to your computer by your cable company, used to identify your computer to other systems on the Internet.

ISDN

Integrated Services Digital Network. A digital telephony standard that provides communication speeds about twice as fast as standard dialup.

LAN

Local Area Network. A network that allows computers in a single location (such as a building) to communicate with one another.

LED

Light Emitting Diode. A semi-conductor diode that emits light when current is passed through it.

MAC address

A number that uniquely identifies any device connected to a network. Your cable company uses your Telephony Gateway's MAC address to authorize access to the Internet. The MAC address is printed on a label on the bottom of your Telephony Gateway.

Protocol

A set of rules and formats that determines the communication behavior of network entities at a given layer.

Proxy

A device or program that stands in between a server (for example, a web site) and a client (your browser), providing a way to relieve some of the burden from the server. For example, your cable company may have a web proxy that keeps copies of popular web pages; the proxy can send you those pages instead of fetching them directly from the web site, resulting in faster page loading and less network congestion.

RF

Abbreviation for Radio Frequency. Some literature refers to coax as "RF cable" and the connectors as "RF connectors."

RJ-11

A standard 2-conductor modular connector, commonly used in North America for connecting telephones.

RJ-45

A standard 8-conductor modular connector, commonly used on Ethernet cable. An RJ-45 connector looks like a wide RJ-11 (telephone) connector.

Splitter

A small box with three cable connectors: one input and two outputs. You may need a splitter if you have a TV already connected to the cable outlet that you want to use for your Telephony Gateway. You can buy a splitter from any electronics retailer and most discount stores.

SSID

Service Set IDentifier, a string of text (up to 32 characters long) that uniquely identifies a wireless LAN.

Switched outlet

A power outlet that may be turned on and off using a wall switch. Usually intended for lamps. Avoid plugging your computer or Telephony Gateway into a switched outlet to avoid disruptions.

TCP/IP

Transmission Control Protocol/Internet Protocol. The protocols used to facilitate communications across one or more connected networks.

TDMA

Time Division Multiple Access. A method used by DOCSIS-compliant cable modems for sending upstream data with minimal interference.

Upstream

The path from a subscriber device to the headend. Some older cable documentation may refer to this as the return path or reverse path.

WEP

Wired Equivalent Privacy, a common standard for encrypting data sent over a wireless LAN.

WPA

Wi-fi Protected Access, a standard for encrypting data sent over a wireless LAN. WPA offers improved security over WEP.

Xfinity

TG1682 Telephony Gateway User's Guide

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Release 16 Standard 1.6 November 2014