



# Touchstone DG1680 Data Gateway

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User Guide

Release 16 STANDARD 1.3 March 2015

Touchstone DG1680 Data Gateway User Guide  
Release 16 STANDARD 1.3

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## Overview

### Introduction

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 Touchstone DG1680 Data Gateway brings it all to you faster and more reliably.

The Touchstone DG1680 Data Gateway provides four Ethernet connections for use as the hub of your home/office Local Area Network (LAN). The DG1680 also provides 802.11a/b/g/n/ac wireless connectivity for enhanced mobility and versatility. The Data 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.

## Getting Support

If you need assistance with your ARRIS product please contact your cable company.

For additional technical information and product User Guides please visit the ARRIS Support website at <http://www.arris.com/consumer>.

## Safety Requirements

The ARRIS Data Gateway complies 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!

- Do not use product near water (i.e. wet basement, bathtub, sink or near a swimming pool, etc.), to avoid risk of electrocution.
- The product shall be cleaned using only a damp, lint-free, cloth. No solvents or cleaning agents shall be used.
- Do not use spray cleaners or aerosols on the gateway.
- Avoid using and/or connecting the equipment during an electrical storm, to avoid risk of electrocution.
- 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 the AC power adapter (if provided) 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 Data 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 ventilation. Position the Data Gateway so that air flows freely around it and the ventilation holes on the unit are not blocked.
- Do not mount the Data 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.

## Industry Canada Compliance

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.



## For Mexico

The operation of this equipment is subject to the following two conditions: (1) This equipment or device cannot cause harmful interference and (2) this equipment or device must accept any interference, including interference that may cause some unwanted operation of the equipment.

## Getting Started

### About Your New Data Gateway

The Touchstone DG1680 Data Gateway is DOCSIS compliant with the following features:

- **Speed:** much faster than dialup or ISDN service; up to twenty four 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
- **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)

The DG1680 provides:

- 2.4 GHz radio and 5 GHz radio for wireless 802.11a/b/g/n/ac connectivity
- Four Ethernet ports for connections to non-wireless devices
- Integrated MoCA 2.0 home networking
- DOCSIS 3.0 compliant
- One USB host port (future support for external USB devices)

### What's in the Box

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

- Data Gateway
- Power Cord
- Wireless Connection Configuration Guide
- Ethernet Cable
- End User License Agreement

### Items You Need

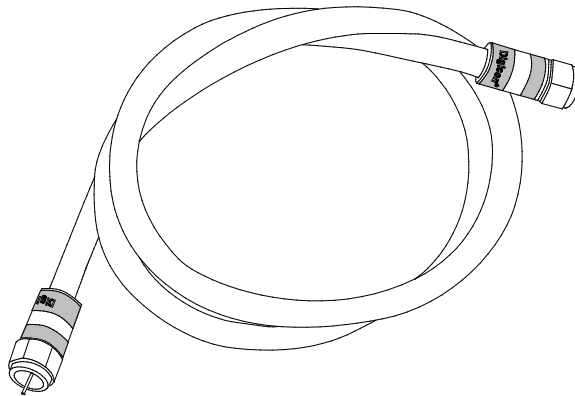
If you are installing the Data Gateway yourself, make sure you have the following items on hand before continuing:

- **Data Gateway package:** see [What's in the Box](#) (page 10) for a list of items in the package.

- **Coaxial cable (coax):** 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 Data Gateway. The coax should be long enough to reach from your Data 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 Data Gateway.



- **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 Data Gateway and TV to the splitter.



**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.

- **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 and contact your cable company if you have any questions.

## Getting Service

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

- the Data Gateway serial number and cable MAC addresses of the unit (printed on the Data Gateway)
- the model number of the Data Gateway (printed on the Data Gateway)

If the Data 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 Data Gateway?
- Do I need a user ID or password to access the Internet or my e-mail?

## System Requirements

The Touchstone Data 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 Data Gateway, you need DOCSIS high-speed Internet service from your cable company.

## Recommended Hardware

The following hardware configuration is recommended. Computers not meeting this configuration can still work with the DG1680, but may not be able to make maximum use of DG1680 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

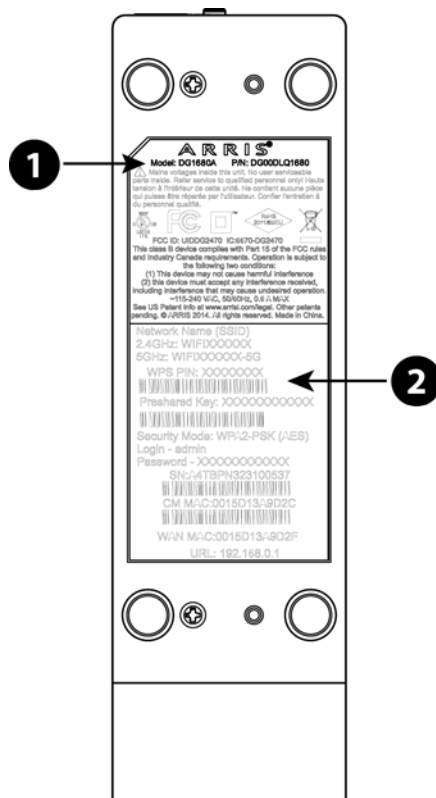
System 7.5 to MacOS 9.2 (Open Transport recommended) or MacOS X. A supported Ethernet or wireless LAN connection must be available.

## 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 Touchstone DG1680 Data Gateway. The model number is on the label affixed to the Data Gateway.



1. Model Number
2. Security Label

## 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 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 Data 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.
- The DG1680 ships with wireless LAN security set by default (for the same reasons that you should run only secured proxies). See the security label on your product for the factory security settings. If you need to modify the default wireless security settings, see *Configuring Your Wireless Connection*.

## Ethernet or Wireless?

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

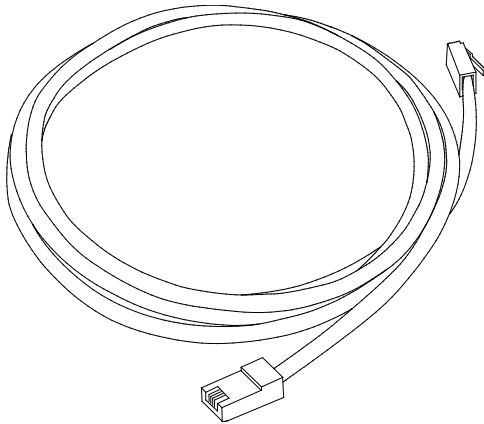
### Ethernet

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 DG1680 through the Ethernet ports, you need an Ethernet hub (available at computer retailers).

The Data Gateway package 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 Data Gateway directly to a computer, or to an Ethernet hub 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 Data Gateway. The 802.11 wireless LAN standard allows one or more computers to access the DG1680 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.)

## Installing and Connecting your Data Gateway

Before you start, make sure that:

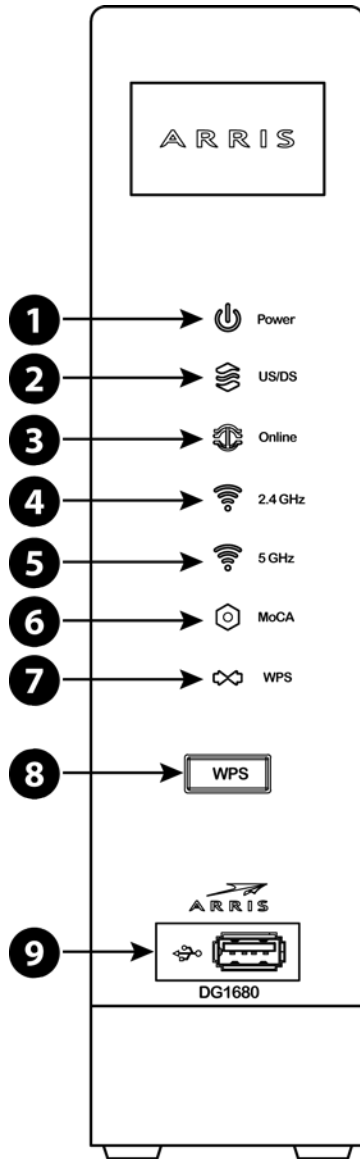
- You have contacted your cable company and verified that they provide data service using standard DOCSIS technology.
- You have all the [Items You Need](#) (page 10).
- Cable and power outlets are available near the computer. If a cable outlet is not conveniently located, your cable company can install a new one.

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



## Front Panel

The front of the Data Gateway has the following indicators.

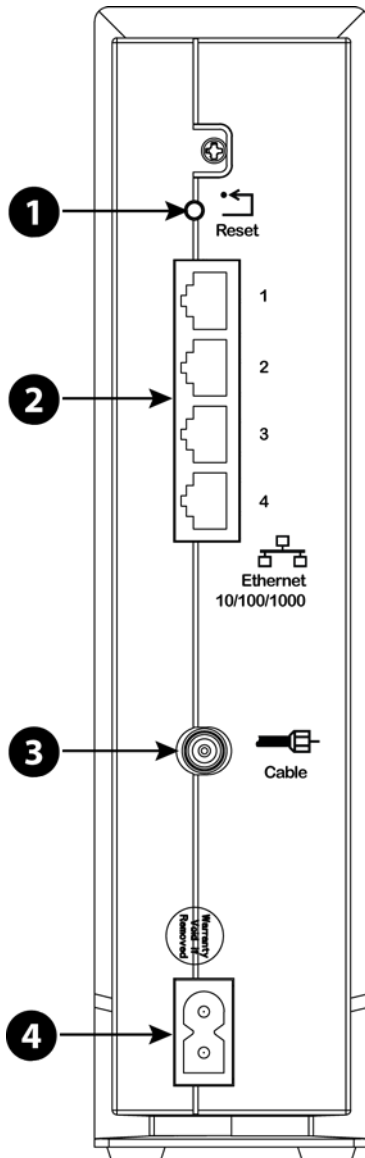


1. **Power:** indicates whether AC power is available to the unit.
2. **US/DS:** indicates upstream/downstream connectivity.
3. **Online:** indicates internet data transmission status.
4. **2.4 GHz:** indicates the status of the 2.4 GHz wireless LAN.
5. **5 GHz:** indicates the status of the 5 GHz wireless LAN.
6. **MoCA:** indicates connectivity between the Data Gateway and other home devices connected via the MoCA network.
7. **WPS:** indicates Wireless Protected Setup (WPS) is active.
8. **WPS Button:** begins associating the Data Gateway with a wireless device.

9. **USB:** USB host connector - future support for external USB devices.

## Rear Panel

The rear of the Data Gateway has the following connectors and controls.



1. **Reset button:** resets the Data Gateway as if you power cycled the unit. Use a pointed non-metallic object to press this button.
2. **Ethernet (1 - 4):** connectors for use with a computer LAN port.
3. **Cable:** connector for the coaxial cable.
4. **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 Data Gateway:

- Is an AC outlet available nearby? For best results, the outlet should not be switched and should be close enough to the Data 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 Data Gateway. A large number of splitters can slow down the Internet connection and even affect your telephone service.
- If you are connecting devices to the Ethernet ports, can you easily run cables between the Data Gateway's location and those devices?
- If you want to install the Data 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 Data 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 Data Gateway so that:

- it stands vertically on its base (Do not lay it flat on its side.)
- air flows freely around it
- the back faces the nearest wall
- it will not fall to the floor if bumped or moved
- the ventilation holes on the sides of the unit are not blocked

### Factors Affecting Wireless Range

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

Increases range	<ul style="list-style-type: none"> <li>■ Raising the unit above the devices (for example, installing the Data Gateway in the upper floor of a multi-story dwelling)</li> <li>■ Adding a wireless extender to the network</li> </ul>
Decreases range	<ul style="list-style-type: none"> <li>■ Lowering the unit below the devices (for example, installing the Data Gateway in a basement)</li> <li>■ Metal or concrete walls between the Data Gateway and other devices</li> <li>■ Large metal appliances, aquariums, or metal cabinets between the Data Gateway and other devices</li> <li>■ Interference and RF noise (2.4 GHz wireless phones, microwave ovens, or other wireless networks)</li> </ul>



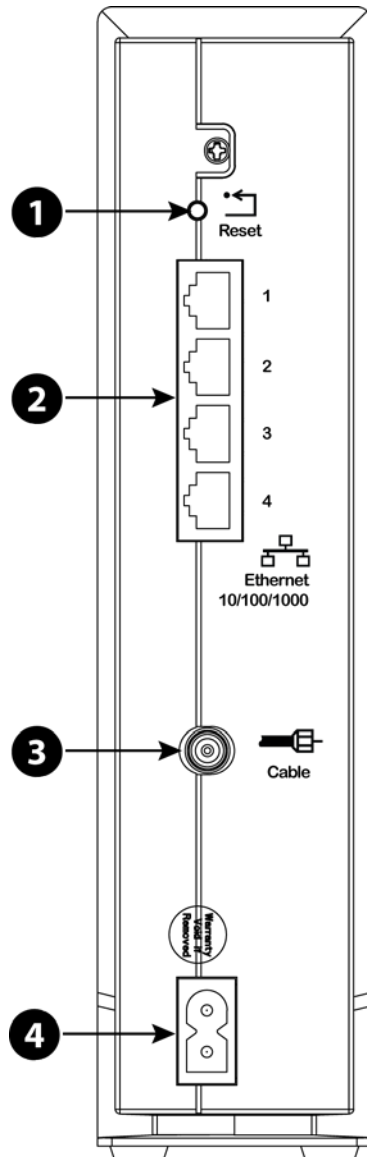
**Note:** Note that decreasing the range of your wireless network may be beneficial, as long as the decreased range is sufficient for your needs. By limiting your network's range, you reduce

interference with other networks and make it harder for unwanted users to find and connect to your network.



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

## Connecting the Data Gateway



1. Connect one end of the coax cable to the cable outlet or splitter, and the other end to the Data Gateway's Cable connector (**3**). 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 Data Gateway. If you are using MoCA for your home

network, MoCA filters must be installed on any legacy client devices. Your cable company will install these filters for you.

2. Insert the plug from the power cord into the Power connector on the back of the Data Gateway (4) and insert the power cord into a convenient AC outlet.

The Power light on the front of the Data Gateway lights up, then flashes once (refer to the LED tables shown in Using the Data Gateway). See [Troubleshooting](#) (page 34) 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 Data Gateway, (2) and the other end to the Ethernet port on a computer, hub, or broadband router.



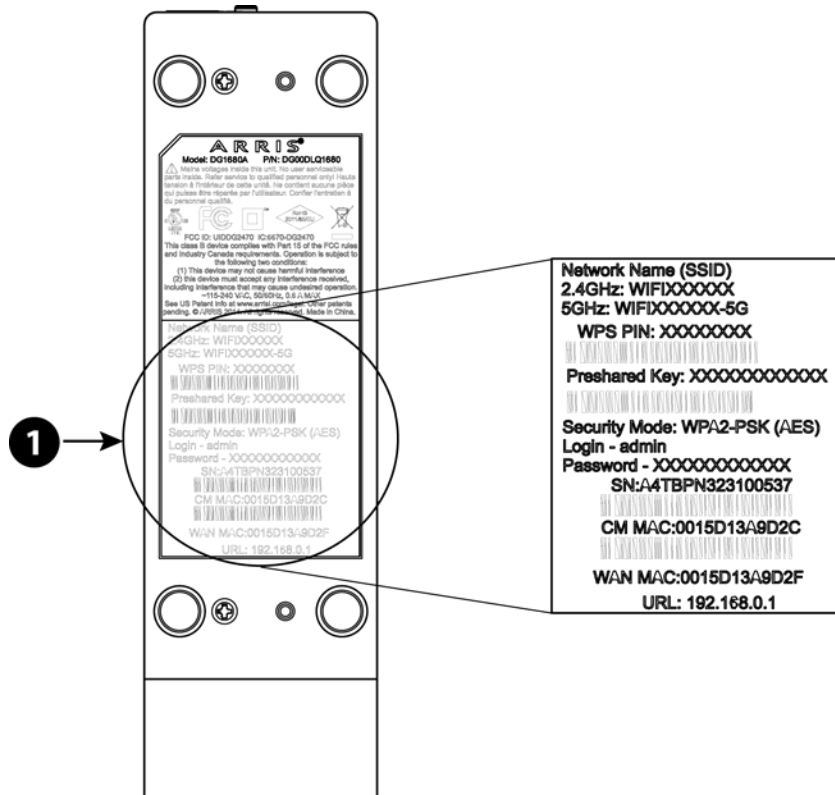
**Note:** If you are connecting to a computer, use the Ethernet cable included in the Data Gateway package.

## Configuring Your Wireless Connection

The DG1680 ships with wireless LAN security set by default. See the security label on your product for the factory security settings.



**Note:** You must set up your computer and other client devices to work with the security settings on the DG1680. Refer to the documentation for your client device for instructions on setting security. On most computer systems you only need to select the network name (SSID) device and enter the encryption key. If your computer or client device supports Wi-Fi Alliance WPS (Wireless Protected Setup), activate WPS on your computer or client device and the DG1680 simultaneously to easily set up your system security.



### 1. Security Label

If you need to modify the Data Gateway's default wireless security settings, or if you want to configure any other wireless LAN settings, refer to the following instructions.

## Accessing the Configuration Interface

Follow these steps to access the configuration interface. You should have already set up the DG1680 as described in [Installing and Connecting your Data Gateway](#) (page 16).

1. If security has been properly set up on your computer to access the wireless LAN on the DG1680, use the connection utility for your operating system to connect to the wireless LAN using its network name (SSID), as shown on the security label.
2. If you cannot access the wireless LAN, you must first establish a wired Ethernet connection between your computer and the DG1680.
3. In your web browser, open the page <http://192.168.0.1/> to access the wireless router setup.

*The Login screen displays.*



**Note:** The default user name is “admin”. The default password is “password”, in lower case letters.

4. Enter the user name and password and click the Apply button to log in.

*The System Basic Setup screen displays.*

5. Use the online help information to set configuration parameters as required.



**Note:** Most configuration parameters that you may want to set can be accessed on the System Basic Setup screen, including the security mode and setting a system password.

## Setting Parental Controls

The Parental Control feature allows you to block specified keywords and web sites from being accessed and also to specify trusted computers in the network. Trusted computers are not affected by the parental control settings.

### Finding the MAC Address of a Computer

In order to set up trusted computers you must first determine the MAC address of those computers.

Use the operating system of your computer to find its MAC address, as follows:

**Windows:** from the Start menu, find and select the [Control Panel](#). Double-click [Network Connections](#) (Windows XP), or [Network & Sharing Center](#) (Windows Vista or Windows 7). Then double-click either “Wireless Network Connection” for a wireless connection, or “Local Area Connection” for an Ethernet connection. Next click the [Details](#) button (Windows Vista or Windows 7), or click the Support tab and then the [Details](#) button (Windows XP). The “Physical Address” line shows the MAC address.

**MacOS X:** open System Preferences and click the Network icon. To find the Ethernet MAC address, select [Built-in Ethernet](#) from the Show drop-down, then click the Ethernet tab. The “Ethernet ID” field shows the MAC address. To find the wireless MAC address, select [Airport](#) from the Show drop-down, then click the Airport tab. The “Airport ID” field shows the MAC address.

**Linux:** open a shell window and type `/sbin/ifconfig` (and press Enter). The wireless interface is eth1 (unless there is no Ethernet adapter, in which case the interface is eth0).

### Making Your Parental Control Settings

Follow these steps to set up your Parental Controls:

1. Access and log into the wireless configuration interface as explained in [Accessing the Configuration Interface](#).
2. Click the [Firewall](#) tab and then click [Parental Controls](#) in the side menu to display the Parental Controls screen.

3. Check the **Enable Parental Controls** checkbox and click the **Apply** button.

The screenshot shows the 'Parental Controls' configuration page. The 'Enable Parental Controls' checkbox is checked. Below it, there are sections for 'Trusted Mac' (with two input fields for MAC addresses), 'Keyword Filtering' (with a table for keywords, days, and times), and 'Web Site Filtering' (with a table for websites, days, and times). Buttons for 'Apply', 'Add', and 'Delete' are visible.

4. Configure any or all of the following parental controls:

#### Trusted MAC Addresses:

Enter the MAC addresses of any “trusted” computers on the network and click the **Apply** button. You can add two trusted computers. Once added, these trusted computers will not be affected by the parental control settings. For example, you may want the computers of the father and mother to be trusted, while the childrens’ computers have parental controls in effect.



**Note:** Refer to the [Finding the MAC Address of a Computer](#) (page 23) for information on determining the MAC address of your computer.

#### Keyword and Web Site Filtering:

You can add a list of keywords and web sites that you want to block. To add a keyword or web site to the list, click the respective **Add** button. To delete a keyword or web site from the list, first click its check box and then click the **Delete** button.

#### Add Keyword Filter Dialog Box

The 'AddKeywordFilter' dialog box contains the following fields and options:

- Keyword:** A text input field with a help icon.
- Day:** A group of checkboxes:  ALL WEEK,  Sun,  Mon,  Tue,  Wed,  Thu,  Fri,  Sat.
- Time:** A group of checkboxes:  ALL DAY, and a time range selector with '00:00' and 'until 00:00' and a help icon.
- Buttons:** 'Cancel' and 'AddKeywordFilter'.



## Add Web Site Filter Dialog Box

The screenshot shows a dialog box titled "AddWebSiteFilter". It has a light gray background and a title bar with the text "AddWebSiteFilter" and a close button. The dialog is divided into three main sections: "Web Site", "Day", and "Time".  
- The "Web Site" section has a text input field and a help icon (?).  
- The "Day" section has an "ALL WEEK" checkbox and seven checkboxes for the days of the week: Sun, Mon, Tue, Wed, Thu, Fri, and Sat. All of these checkboxes are checked.  
- The "Time" section has an "ALL DAY" checkbox and two dropdown menus for time, both set to "00:00", with a help icon (?).  
At the bottom of the dialog are two buttons: "Cancel" and "AddWebSiteFilter".

### Adding a Keyword or Web Site Filter

- Enter the keyword in the Keyword field or web site URL address in the Web Site field.
- Click the checkboxes for the days you want access blocked, or click the All Week checkbox for all week.
- Set the start time and end time during the specified days (24-hour clock). (0:00 until 0:00 indicates all day, or just click the All Day checkbox.)
- Click the [Add Keyword Filter](#) or [Add Web Site Filter](#) button respectively. Then click the [Apply](#) button.

## 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 Data Gateway.

### Requirements

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

- Computer with 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](#) (page 26)
- [TCP/IP Configuration for Windows Vista](#) (page 27)
- [TCP/IP Configuration for Windows 7 or Windows 8](#) (page 27)
- [TCP/IP Configuration for MacOS X](#) (page 28)

### 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.

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 window 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 prompted 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 Data Gateway

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

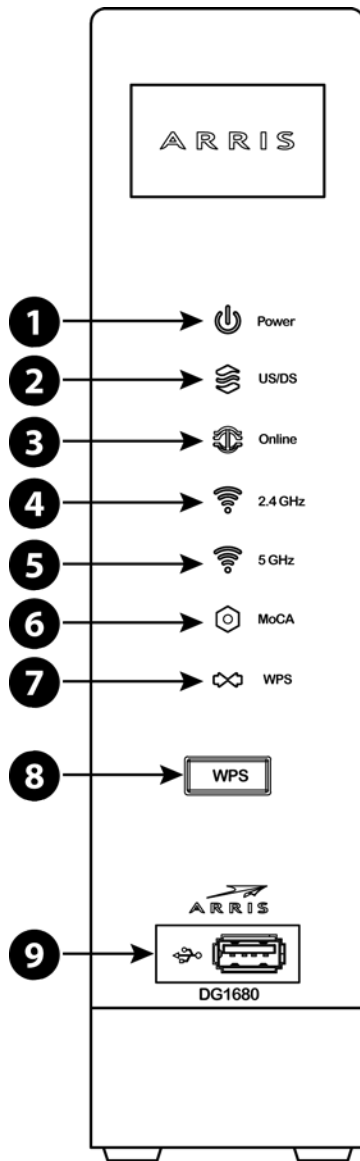
- [Setting up Your Computer to Use the Data Gateway](#) (page 29)
- [Indicator Lights for the DG1680](#) (page 30)
- [Using the Reset Button](#) (page 32)
- [Resetting the Router to Factory Defaults](#) (page 33)

## Setting up Your Computer to Use the Data 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 DG1680

The Data Gateway has LED indicator lights to assist in troubleshooting.



- |                 |               |
|-----------------|---------------|
| 1. Power        | 6. MoCA       |
| 2. US/DS        | 7. WPS        |
| 3. Online       | 8. WPS Button |
| 4. 2.4 GHz WiFi | 9. USB port   |
| 5. 5 GHz Wi-Fi  |               |

### Patterns: Normal Operation (LAN)

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

Mode	Ethernet (LEDs on rear panel connector)	2.4G Wi-Fi / 5G Wi-Fi	MoCA
AC Power	<p><b>Green LED On</b> = Computer with 1Gbps port connected</p> <p><b>Amber LED On</b> = Computer with 100 Mbps/10Mbps port connected</p> <p><b>Amber/Green LED Flash</b> = Computer activity</p> <p><b>Both LEDs Off</b> = Computer not connected</p>	<p><b>On</b> = Wi-Fi enabled</p> <p><b>Flash</b> = Computer activity</p> <p>Off = Wi-Fi disabled</p>	<p><b>On</b> = MoCA enabled and MoCA network device attached</p> <p><b>Flash</b> = MoCA network device activity/traffic</p> <p>Off = MoCA disabled or no MoCA network device attached</p>
No AC Power	Off	Off	Off
Firmware Upgrade	(normal operation)	(normal operation)	(normal operation)

### Patterns: Normal Operation (WAN)

The following table shows light patterns during normal operation.

Mode	Power	US/DS	Online
AC Power Good	<b>On</b>	<p><b>On</b> = Connected to the Internet</p> <p><b>Flash</b> = Not connected to the Internet</p>	<p><b>On</b> = Internet available</p> <p>Off = Internet not available</p>
No AC Power	Off	Off	Off
Firmware Upgrade	<b>On</b>	<b>Flash</b>	<b>On</b>

## Cable Modem Startup Sequence

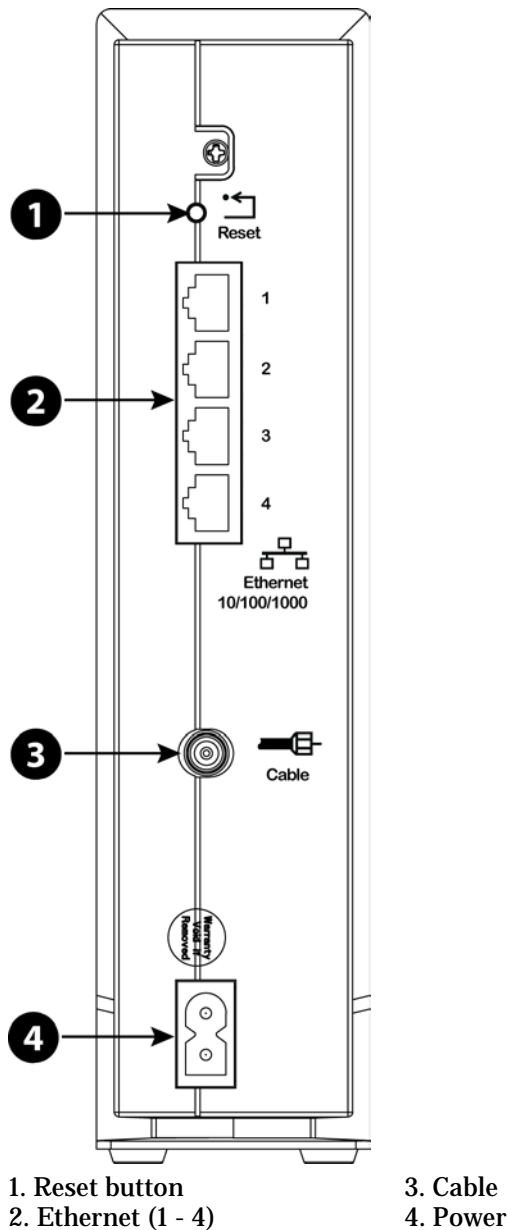
US/DS	Online	Description
<b>Slow Flash</b> (1/second)	Off	Downstream acquisition in progress
<b>On</b> (until Upstream acquisition starts)	Off	Downstream acquisition completed
<b>Fast Flash</b> (3/second)	Off	Upstream acquisition in progress
<b>On</b>	<b>Slow Flash</b> (during acquisition)  <b>On</b>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

## Using the Reset Button

Use the **Reset** button (1), on the back of the Data Gateway, to reset the modem and perform initialization as if you power cycled the unit. You may need to reset the Data 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 **Reset** button is recessed to prevent accidental resets.





## Resetting the Router to Factory Defaults

To reset the router to factory defaults, press and hold the **Reset** button (1) on the back of the Data 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.

## Troubleshooting

### The Data 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 Data Gateway, especially when many people are online. Always leave your Data 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 Data Gateway and CATV outlet, remove the splitters and connect the Data Gateway directly to the outlet.

Proceed to the Ethernet or wireless solutions 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 the supplied cable for direct connection to a computer; use a cross-over cable for connection to a hub.

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

A misconfiguration could lock out all access to the Data Gateway router. If you think this has happened, see [Resetting the Router to Factory Defaults](#) (page 33).

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

Check the indicator lights, see Using the Data Gateway — the Wi-Fi 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 Data Gateway router. If you think this has happened, see [Resetting the Router to Factory Defaults](#) (page 33).

## 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 the connection.

# Glossary

## C

### 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 Data 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 Data 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).

## D

### 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.

## DOCSIS

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

### 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.

## E

### 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

### 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 Data Gateway.

### Firewall

A hardware or software device that prevents unauthorized access to a private network from the Internet. The DG1680 provides a built-in firewall.

## G

### Gateway

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

## H

### 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.

## I

### IP address

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

## L

### 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.

## M

### MAC address

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

## P

### 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.

## R

### RF

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

### 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.

## S

### 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 Data 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 Data Gateway into a switched outlet to avoid disruptions.

#### T

#### 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.

#### U

#### 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.

#### W

#### 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.

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