



Touchstone DG6450 Data Gateway
User Guide, STANDARD Revision 2.0

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Table of contents

CommScope legal statements.....	2
Chapter 1: Safety requirements.....	5
FCC Part 15.....	6
RF Exposure.....	6
Canadian compliance.....	6
RF Exposure.....	7
License exempt.....	7
Chapter 2: Get started.....	8
Introduction.....	8
About your new Data Gateway.....	9
What's in the box.....	9
Items you need.....	9
Contact your service provider.....	10
System requirements.....	10
Recommended hardware.....	11
Windows.....	11
macOS.....	11
Linux/Unix.....	11
About this manual.....	11
What about security?.....	12
Ethernet or wireless?.....	13
Ethernet.....	13
Wireless.....	13
Both.....	14
Get support.....	14
Install and connect your DG6450.....	14
Front panel.....	14
Rear panel.....	15
Choose an installation location.....	16
Connect the Data Gateway.....	18
Configure your wireless connection.....	18
Set parental controls.....	20
Chapter 3: Configure your Ethernet connection.....	24
Requirements.....	24
How to use this section.....	24
Configure TCP/IP for Windows Vista.....	24
Configure TCP/IP for Windows 7, Windows 8, or Windows 10.....	25
Configure TCP/IP for macOS.....	25

Chapter 4: Operate the Data Gateway.....	27
Set up your computer to use the Data Gateway.....	27
Indicator lights for the DG6450.....	27
Internet LED.....	28
WPS LED.....	29
WiFi LED.....	29
Chapter 5: Troubleshooting.....	30
The Data Gateway is plugged in, but the power light is off.....	30
I'm not getting on the Internet (all connections).....	30
I'm not getting on the Internet (Ethernet).....	30
I'm not getting on the Internet (wireless).....	31
My wireless Internet connection stops working sometimes.....	31
I can get on the Internet, but everything is slow.....	31
Appendix A: Glossary.....	32

Safety requirements

The ARRIS Data Gateway complies with the applicable requirements for performance, construction, labeling, and information when used as outlined below:

**CAUTION:**

This device is restricted to indoor use.

- 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 external 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, and Ethernet 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 device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

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

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.



CAUTION:

FCC Caution.

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 19.3 inches (49 cm) between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device is for indoor use only.

Canadian compliance

This Class B digital device complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

RF Exposure

The device meets the exemption from the routine evaluation limits in section 2.5 of RSS 102 and compliance with RSS-102 RF exposure, users can obtain Canadian information on RF exposure and compliance.

Le dispositif rencontre l'exemption des limites courantes d'évaluation dans la section 2.5 de RSS 102 et la conformité à l'exposition de RSS-102 rf, utilisateurs peut obtenir l'information canadienne sur l'exposition et la conformité de rf.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 49 centimeters between the radiator and your body.

Cet émetteur ne doit pas être Co-placé ou ne fonctionnant en même temps qu'aucune autre antenne ou émetteur. Cet équipement devrait être installé et actionné avec une distance minimum de 49 centimètres entre le radiateur et votre corps.

Operation in the band 5150–5350 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

Le dispositif fonctionnant dans la bande 5150-5350 MHz est réservé uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.

For indoor use only.

Pour usage intérieur uniquement.

License exempt

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

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Get started

Introduction

Get ready to experience the Internet's express lane! Whether you're checking out streaming media, downloading new software, or checking your email, the Touchstone DG6450 Data Gateway brings it all to you faster and more reliably.

The Touchstone DG6450 Data Gateway provides two Ethernet connections for use as the hub of your home/office Local Area Network (LAN). The DG6450 also provides 802.11a/b/g/n/ac/ax wireless connectivity for enhanced mobility and versatility.



Installation is simple, and your service provider will help you with any special requirements.

About your new Data Gateway

The TouchstoneDG6450Data Gateway is DOCSIS compliant with the following features:

- Speed: much faster than dialup or ISDN service; up to 24 times faster than DOCSIS 3.0 cable modems.
- Convenience: supports Ethernet and 802.11a/b/g/n/ac/ax wireless connections; both can be used simultaneously
- Compatibility:
 - Data services: DOCSIS 3.1 compliant and backward-compatible with DOCSIS 3.0, 2.0, or 1.1; supports tiered data services (if offered by your service provider)

The DG6450 provides:

- Wireless 802.11a/b/g/n/ac/ax connectivity
- One 2.5GigE Ethernet port and two 1GigE Ethernet ports for connections to non-wireless devices
- DOCSIS 3.1 compliant

What's in the box

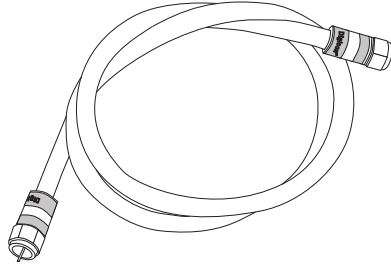
Make sure you have the following items before proceeding. Call your service provider for assistance if anything is missing.

- Data Gateway
- Power cord
- Wireless connection configuration guide
- Ethernet cable
- End User License Agreement

Items you need

Data Gateway package See [What's in the box](#) (page 9) 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.



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: Using several splitters in a line may deteriorate the quality of your internet connection.

Information packet

Your service provider should give you a packet containing information about your service and how to set it up. Read this information carefully and contact your service provider if you have any questions.

Contact your service provider

Before trying to use your new Data Gateway, contact your local service provider to establish an Internet account. 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 service provider, they already have the required information.

In addition, you should ask your service provider 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 DG6450 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 service provider.

Recommended hardware

The following hardware configuration is recommended. Computers not meeting this configuration can still work with the DG6450, but may not be able to make maximum use of DG6450 throughput.

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

Windows

Windows Vista, Windows 7, Windows 8, Windows 10, or Android OS (for mobile devices). A supported Ethernet or wireless LAN connection must be available.

macOS

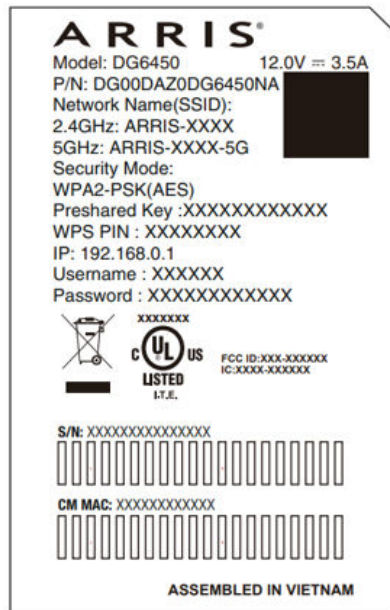
System 7.5 to Mac OS 9.2 (Open Transport recommended), macOS X, or iOS (for mobile devices). A supported Ethernet or wireless LAN connection must be available.

Linux/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 DG6450 Data Gateway. The model number is on the label affixed to the Data Gateway.



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 service providers prohibit running servers on consumer-level accounts and may suspend your account for violating your terms of service.
- Use the service provider'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 service provider may suspend your account to protect the rest of the network.
- The DG6450 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.
- Set up a strong password for both your Wi-Fi access and your web administration login. Change the password regularly, every three months or so.

Ethernet or wireless?

There are two ways to connect your computer (or other equipment) to the Data Gateway.

Ethernet

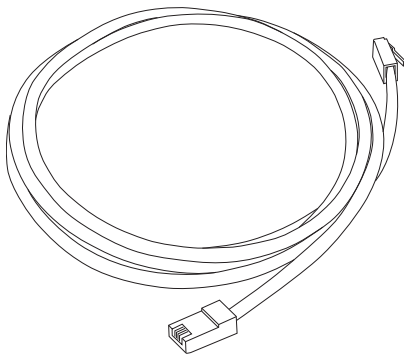
Ethernet is a standard method of connecting two or more computers into a Local Area Network (LAN). You can use the Ethernet connection if your computer has built-in Ethernet hardware.

Ethernet connections are slightly more secure than wireless connections, making it harder for unauthorized users to “eavesdrop” on communications between the router and the connected device. However, Ethernet connections are not as convenient or easy to install as wireless connections.



Note: To connect more than two computers to the DG6450 through the Ethernet ports, you need an Ethernet hub (available at computer retailers).

The Data Gateway package comes with one 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 6 (CAT6) straight-through cable. CAT6 cable is required for best Ethernet performance. Regular CAT5 or CAT5e cable may not allow full-speed Ethernet operation.



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 DG6450 using a wireless (radio) signal. These connections are in addition to the connections supported via Ethernet.

Wireless connections are easier to install than standard Ethernet connections. However, wireless connections are slightly less secure, increasing the chances that unauthorized users could “eavesdrop” on connections between the router and the connected device.



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

Get support

If you need assistance with your ARRIS product please contact your service provider.

For additional technical information and product user guides please visit the ARRIS Support website at <http://www.arris.com/consumers>.

Install and connect your DG6450

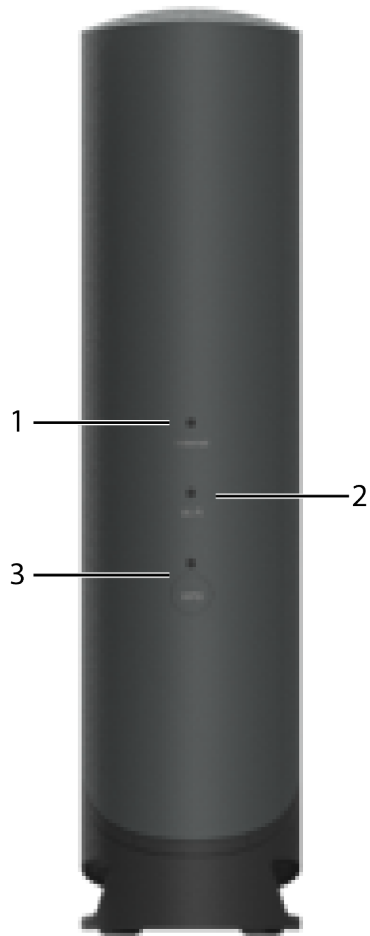
Before you start, make sure that:

- You have all the *Items you need* (page 9).
- Cable and power outlets are available near the computer. If a cable outlet is not conveniently located, your service provider can install a new one.

If you have ordered service, your service provider should configure the DG6450 automatically. You need only follow the instructions in this section to install and connect the DG6450.

Front panel

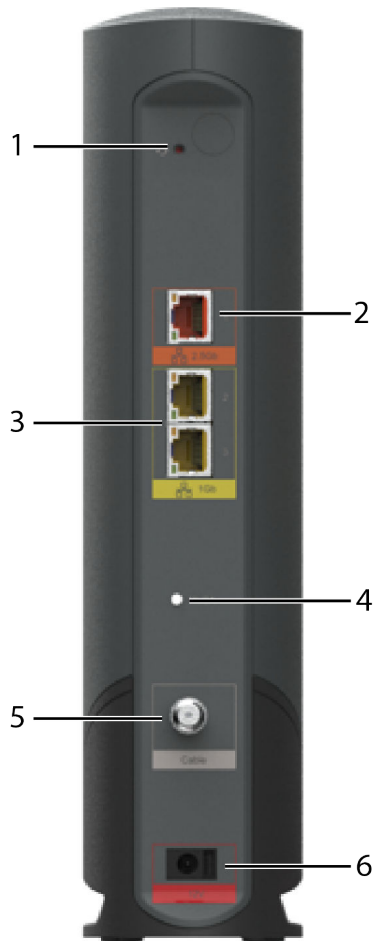
The front of the DG6450 has the following indicators.



1. Internet: Indicates Internet data transmission status.
2. WiFi: indicates the status of the wireless LAN.
3. WPS Button/LED: Begins associating the Data Gateway with a wireless device. The LED indicates that Wireless Protected Setup (WPS) is active.

Rear panel

The rear of the DG6450 has the following connectors and controls.



1. Reset button: Resets the Data Gateway as if you power cycled the device. Use a pointed non-metallic object to press this button.
2. 2.5GigE Ethernet connector: 2.5GigE connector for use with a computer LAN port.
3. 1GigE Ethernet connectors: 1GigE connectors for use with a computer LAN port.
4. MoCA: Indicates connectivity between the Data Gateway and other home devices connected via the MoCA network.
5. Cable: Connector for the coaxial cable.
6. Power: Connector for the power cord.

Choose 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 your Internet connection.

- 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 that affect wireless range

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

Increases range	<ul style="list-style-type: none"> ■ Adding a wireless extender to the network
Decreases range	<ul style="list-style-type: none"> ■ Metal or concrete walls between the Data Gateway and other devices ■ Large metal appliances, aquariums, or metal cabinets between the Data Gateway and other devices ■ Interference and RF noise (2.4 GHz wireless phones, microwave ovens, or other wireless networks)

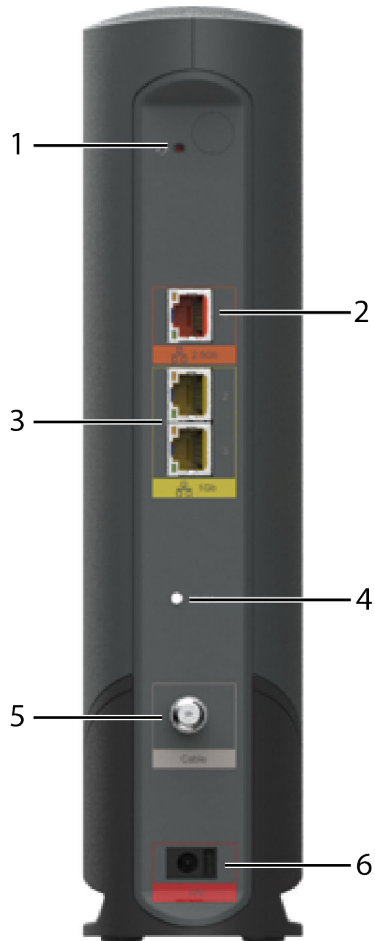


Note: Set the transmit power level to High to increase the range. Set it to Medium or Low to decrease the range proportionately.



Note: You may decide to decrease the range of your wireless network, 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.

Connect 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 (4). 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 service provider 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 (8) and insert the power cord into a convenient AC outlet.
3. Connect one end of the Ethernet cable to any Ethernet port on the back of the Data Gateway, and the other end to the Ethernet port on a computer or other client device.



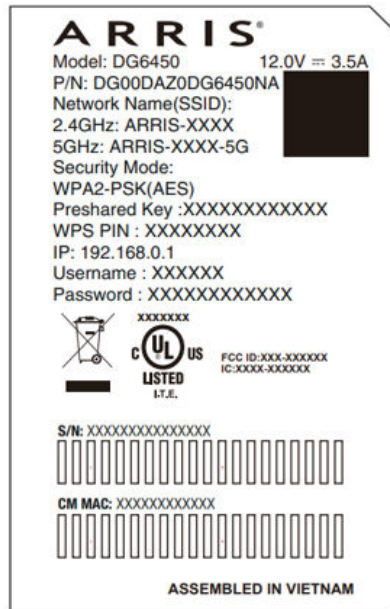
Note: Use the Ethernet cable included in the Data Gateway package.

Configure your wireless connection

The DG6450 ships with wireless LAN security enabled 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 DG6450. 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) 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 DG6450 simultaneously to easily set up your system security.



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.

Access the configuration interface

1. If security has been properly set up on your computer to access the wireless LAN on the DG6450, 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 DG6450.
3. In your web browser, navigate to <http://192.168.0.1/> to access the wireless router setup.

The Login screen appears.



Note: The default user names and passwords for each login type are listed below. All user names and passwords are case-sensitive.

Login type	User name	Password
WiFi/Ethernet	admin	Wi-Fi PWD (from the product label)
MSO	mso	PWOD
Technician	technician	PWOD

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

The System Basic Setup screen appears.



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.

Set parental controls

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

Find the MAC address of a computer

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

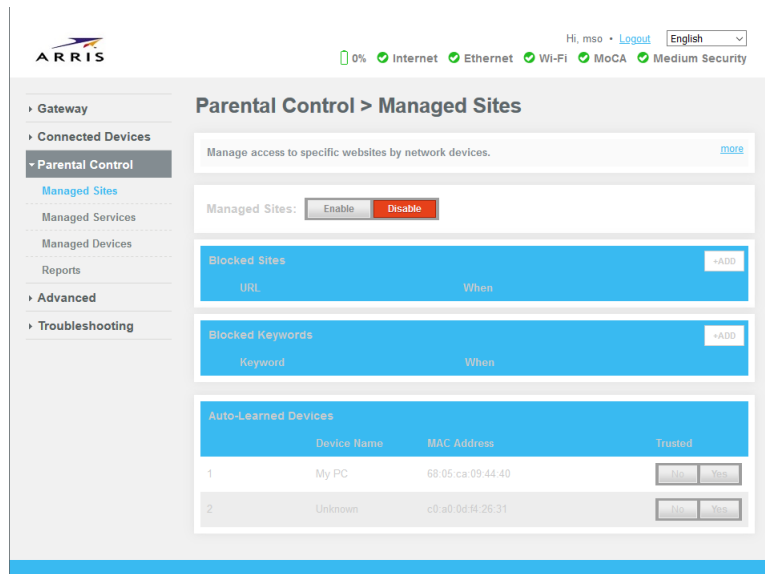
Windows: from the Start menu, select the **Control Panel**. Double-click **Network & Sharing Center**. Then double-click either "Wireless Network Connection" for a wireless connection, or "Local Area Connection" for an Ethernet connection. Next click the **Details** button. The "Physical Address" line shows the MAC address.

macOS: 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.

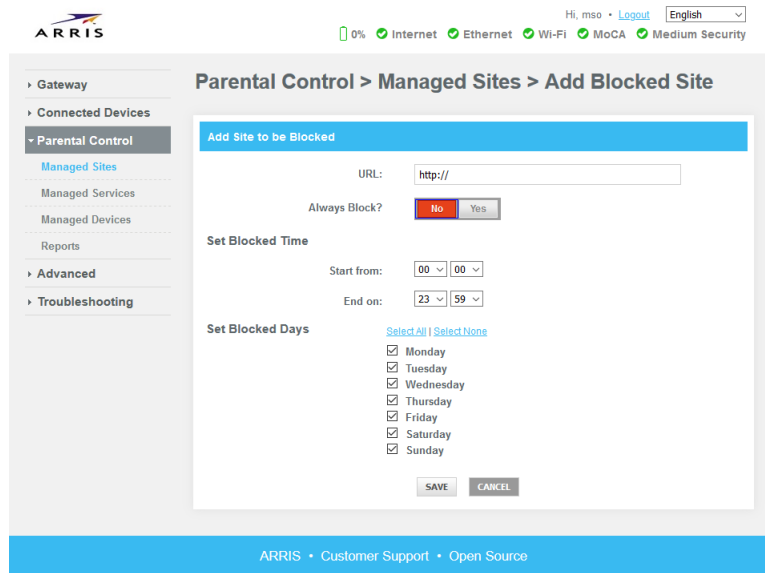
Linux: open a shell window and type `/sbin/ifconfig` (and press **Enter**). The wireless interface is eth1 (unless there is no Ethernet adapter, in which case the interface is eth0).

Set up your parental controls

1. Access and log into the wireless configuration interface as explained in [Access the configuration interface](#) (page 19).
2. Click **Parental Control** in the side menu to display the Parental Control screen.
3. Click **Enable**.



4. Configure any or all of the following parental controls:
 - **Managed Sites:** block sites by URL or by keyword (strings that appear in the URL).
 - **Managed Services:** block access to specific services by port or port range.
 - **Managed Devices:** lists managed devices and lets you block specific devices.
- ▶ **To block sites by URL:**
5. On the **Managed Sites** tab, in the **Blocked Sites** section, click **+Add**.



6. Enter the URL you want to block and when you want to block it.
7. Click **Save**.
- ▶ **To block sites based on a keyword that appears in the string:**
8. On the **Managed Sites** tab, in the **Blocked Keywords** section, click **+Add**.

The screenshot shows the ARRIS Parental Control interface. The breadcrumb trail is "Parental Control > Managed Sites > Add Blocked Keyword". The form is titled "Add Keyword to be Blocked" and includes the following fields and options:

- Keyword:** A text input field.
- Always Block?:** Radio buttons for "No" (selected) and "Yes".
- Set Blocked Time:** Two time pickers for "Start from:" (00:00) and "End on:" (23:59).
- Set Blocked Days:** A list of days from Monday to Sunday, each with a checked checkbox. Links for "Select All" and "Select None" are provided.
- Buttons:** "SAVE" and "CANCEL".

The footer of the interface reads "ARRIS • Customer Support • Open Source".

9. Enter the keyword you want to block (for example, .xxx) and when you want to block it.
10. Click **Save**.
- ▶ **To block services by port or port range:**
11. On the **Managed Services** tab, in the **Blocked Services** section, click **+Add**.

The screenshot shows the ARRIS Parental Control interface. The breadcrumb trail is "Parental Control > Managed Services > Add Blocked Service". The form is titled "Add Service to be Blocked" and includes the following fields and options:

- User Defined Service:** A text input field.
- Protocol:** A dropdown menu with "TCP" selected.
- Start Port:** A text input field.
- End Port:** A text input field.
- Always Block?:** Radio buttons for "No" (selected) and "Yes".
- Set Blocked Time:** Two time pickers for "Start from:" (00:00) and "End on:" (23:59).
- Set Blocked Days:** A list of days from Monday to Sunday, each with a checked checkbox. Links for "Select All" and "Select None" are provided.
- Buttons:** "SAVE" and "CANCEL".

The footer of the interface reads "ARRIS • Customer Support • Open Source".

12. Type a description of the service in the **User Defined Service** field.
13. Choose the protocols that the service uses, and specify the port(s) you want to block.
14. Specify when you want to block this service.
15. Click **Save**.
- ▶ **To block or allow specific devices:**

16. On the **Managed Devices** tab, choose **Allow All** to allow all devices to access the Data Gateway. Then you can add devices that you want to block to the blocked list.



Important: The **Block All** option will block access to the Data Gateway for all devices, including the device that is currently connected to the Data Gateway. We recommend that you do not choose this option because it may cause a loss of connectivity.

17. Click **+Add Blocked Device** to add a device to the blocked list.

The screenshot shows the 'Add Blocked Device' configuration page. The page title is 'Parental Control > Managed Devices > Add Blocked Device'. The main content area is titled 'Add Device to be Blocked' and 'Set Blocked Device'. It features two sections: 'Auto-Learned Devices' and 'Custom Device'. The 'Auto-Learned Devices' section has a table with columns 'Device Name' and 'MAC Address', listing 'My PC' (68:05:ca:09:44:40) and 'Unknown' (c0:a0:0d:f4:26:31). The 'Custom Device' section has a radio button selected for 'Some device' with input fields for 'Device Name' and 'MAC Address' (04:90:AB:83:98:92). Below this is an 'Always Block?' toggle set to 'No'. The 'Set Blocked Time' section has 'Start from' (00:00) and 'End on' (23:59) dropdowns. The 'Set Blocked Days' section has checkboxes for all days of the week (Monday through Sunday), all of which are checked. At the bottom are 'SAVE' and 'CANCEL' buttons. The footer of the page reads 'ARRIS • Customer Support • Open Source'.

18. Enter the name of the device and its MAC address, and specify when you want to block it.
19. Click **Save**.

Configure your Ethernet connection

If your computer has a LAN card that provides an Ethernet connection, you may have to configure your computer's TCP/IP settings. The following steps 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.
- IP address, subnet, gateway, and DNS information for installations not using DHCP.

How to use this section

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.

- [Configure TCP/IP for Windows Vista](#) (page 24)
- [Configure TCP/IP for Windows 7, Windows 8, or Windows 10](#) (page 25)
- [Configure TCP/IP for macOS](#) (page 25)

Configure TCP/IP for Windows Vista

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 appears.
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 service 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 appears.

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

Configure TCP/IP for Windows 7, Windows 8, or Windows 10

1. Click the **Start** menu and type **network and sharing** into the Search box.
2. Select **Network and Sharing Center** when it appears.
3. Click **Change adapter settings** from the left-side menu.
4. Right-click on your local area connection icon and select **Properties** to open the Properties window.
5. Select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties** to configure TCP/IPv4.



Note: If your service 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 appears.

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 service provider.
7. Click **OK** to accept the new settings and close the Properties window. Then click **Close** to back out of the remaining setup screens.

Configure TCP/IP for macOS

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 service 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.

Operate the Data Gateway

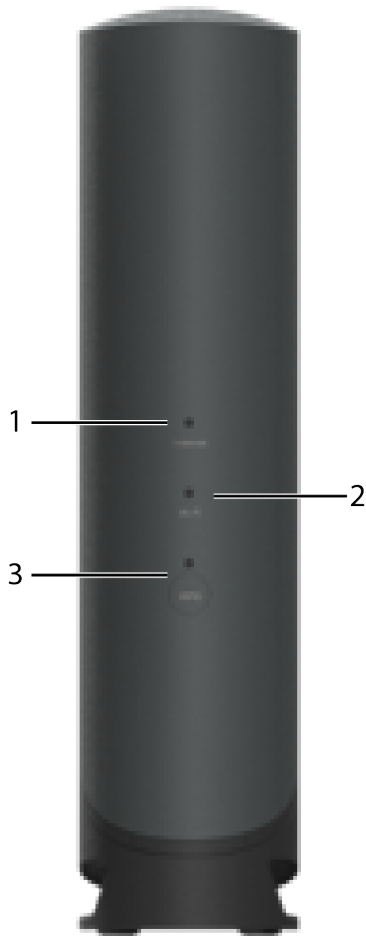
This chapter describes the controls and features available on the Data Gateway, and covers basic troubleshooting procedures.

Set up your computer to use the Data Gateway

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

Indicator lights for the DG6450

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



1. Internet: Indicates Internet data transmission status.
2. WiFi: indicates the status of the wireless LAN.
3. WPS Button/LED: Begins associating the Data Gateway with a wireless device. The LED indicates that Wireless Protected Setup (WPS) is active.

Internet LED

Light patterns for the Internet LED during normal operation

Event	LED Status
Downstream scanning in progress	Red (slow blink)
Upstream ranging in progress	Red (fast blink)
Ranging completed; registration in progress	White (slow blink)
Cable modem was successfully registered	White (steady)
Cable modem failed to register	Red (steady)

WPS LED

Light patterns for the WPS LED during normal operation

Event	LED Status
WiFi switched off	Off
Synchronizing WPS	White (fast blink)

WiFi LED

Light patterns for the WiFi LED during normal operation

Event	LED Status
WiFi switched off	Off
WiFi switched on	White (blinking)
WiFi data is being transmitted	White (blinking)
WiFi disabled due to scheduling	Off

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?



Note: Use only the power adapter and power cord included with the equipment.

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

Make sure that the rear panel power switch is set to the ON position.

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 light should be on. If the light blinks for more than 30 minutes, call your service provider 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.

I'm not getting on the Internet (Ethernet)

If you are using an Ethernet hub, is it 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 an Ethernet hub.

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

I'm not getting on the Internet (wireless)

Check to be sure that the **Wi-Fi** light is 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.

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 website 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

Category 5e (Cat5e)	A high-quality type of cable, used for connections with speeds up to 2.5Gbps (2500Base-T or 2.5GBase-T). When purchasing Ethernet cables, always look for Category 5e cable or higher.
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).
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 service provider 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.
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 Data Gateway.
Firewall	A hardware or software device that prevents unauthorized access to a private network from the Internet. The DG6450 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 service provider, 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 service provider uses your Data Gateway's MAC address to authorize access to the Internet. The MAC address is printed on a label affixed to your Data 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 service provider 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 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.
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.

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