COMMSCOPE®

Touchstone CM9200 Cable Modem

User Guide, STANDARD Revision 1.0

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Safety requirements

The ARRIS Cable Modem 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 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 Cable Modem 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 Cable Modem so that air flows freely around it and the ventilation holes on the unit are not blocked.
- Do not mount the Cable Modem 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.

Get started

Introduction

The Touchstone CM9200 Cable Modem provides high-speed access to the Internet and other online services on your home network. You can use your CM9200 to connect a computer directly to your home or small business LAN through an Ethernet connection.

This guide provides a product overview and instructions for installing and configuring your CM9200 Cable Modem to get it up and running on your home network.

About your new Cable Modem

The Touchstone CM9200 Cable Modem is DOCSIS compliant with the following features:

- DOCSIS speed: more than 4 Gbps over the network

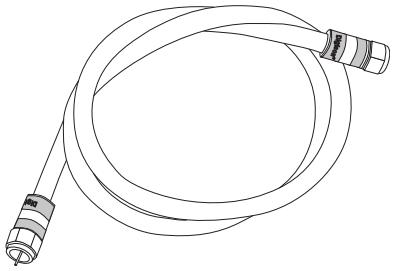
- Convenience: supports an ultra-fast 2.5Gbps Ethernet connection capable of linking with similarly-enabled ultra-fast LAN equipment
- Compatibility:
  - Data services: DOCSIS 3.0 and DOCSIS 3.1 compliant

What's in the box

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

- Cable Modem
- External power adapter
- Ethernet cable
- End user license agreement

Items you need

Cable Modem package	See *What's in the box* (page 8) 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 Cable Modem. The coax should be long enough to reach from your Cable Modem 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 Cable Modem 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 Cable Modem, contact your local service provider to establish an Internet account. When you call, have the following information ready:

- the Cable Modem serial number and cable MAC addresses of the unit (printed on the Cable Modem)
- the model number of the Cable Modem (printed on the Cable Modem)

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

System requirements

The CM9200 Cable Modem 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 Cable Modem, 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 CM9200, but may not be able to make maximum use of CM9200 throughput.

- CPU: P4, 3GHz or faster.
- RAM: 1GB or greater.
- Hard drive: 7200 RPM or faster.
- Ethernet: 2.5Gbps (2500Base-T or 2.5GBase-T).

Windows

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

macOS

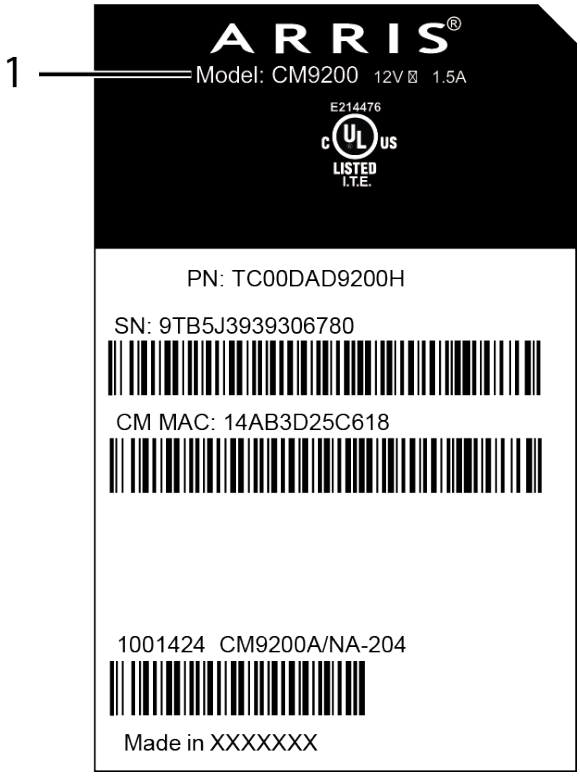
System 7.5 to Mac OS 9.2 (Open Transport recommended), macOS X, or iOS (for mobile devices). A supported Ethernet LAN connection must be available.

Linux/Unix

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

About this manual

This manual covers the Touchstone CM9200 Cable Modem. The model number is on the label affixed to the Cable Modem.



1. Model Number

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 Cable Modem. 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.

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 Cable Modem

Before you start, make sure that:

- You have contacted your service provider and verified that they provide data service using standard DOCSIS technology.
- You have all the *Items you need* (page 8).
- 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 Cable Modem automatically. You need only follow the instructions in this section to install and connect the Cable Modem.

CAUTION:

Risk of equipment damage.

Only qualified installation technicians should connect the Cable Modem to house wiring.

Front panel

The front of the CM9200 has the following indicators.

1. Power: Indicates whether power is available to the device.
2. Internet: Indicates Internet data transmission status.

Rear panel

The rear of the CM9200 has the following connectors and controls.

1. Reset button: Resets the Cable Modem as if you power cycled the device. Use a pointed non-metallic object to press this button.
2. Cable: Connector for the coaxial cable.
3. Ethernet connector: Connector for use with a computer LAN port.
4. 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 Cable Modem:

- Is an AC outlet available nearby? For best results, the outlet should not be switched and should be close enough to the Cable Modem 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 Cable Modem. A large number of splitters can slow down the Internet connection.
- If you are connecting devices to the Ethernet ports, can you easily run cables between the Cable Modem's location and those devices?

- If you want to install the Cable Modem on a desktop, is there enough space on either side to keep the vents clear? Blocking the vents may cause overheating.

CAUTION: Your CM9200 Cable Modem is designed to be installed vertically *only*. Do not lay your CM9200 Cable Modem flat for operation. Doing so may damage internal components.

Desktop mounting instructions

Position the Cable Modem 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

Connect the Cable Modem

1. Connect one end of the coax cable to the cable outlet or splitter, and the other end to the Cable Modem's Cable connector. 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 Cable Modem.

2. Insert the plug from the power cord into the Power connector on the back of the Cable Modem and insert the power cord into a convenient AC outlet.

   Note: Use only the external AC power adapter (if provided) and power cord included with the equipment.

   The Power light on the front of the Cable Modem lights up , then flashes once. See *Troubleshooting* if the Power light does not light up.

3. Connect one end of the Ethernet cable to the Ethernet port on the back of the Cable Modem, and the other end to the Ethernet port on a computer, Ethernet hub, or broadband router.

   Note: If you are connecting to a computer, use the Ethernet cable included in the Cable Modem package.

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 Cable Modem.

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 16)
- *Configure TCP/IP for Windows 7, Windows 8, or Windows 10* (page 17)
- *Configure TCP/IP for macOS* (page 17)

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.

Chapter 5

Operate the Cable Modem

This chapter describes the controls and features available on the Cable Modem, and covers basic troubleshooting procedures.

- *Set up your computer to use the Cable Modem* (page 19)
- *Indicator lights for the CM9200* (page 19)
- *Use the Reset button* (page 21)

Set up your computer to use the Cable Modem

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 CM9200

The Cable Modem has LED indicator lights to assist in troubleshooting.

1. Power: Indicates whether power is available to the device.
2. Internet: Indicates Internet data transmission status.

Patterns: normal operation

When the CM9200 is plugged in, the Power and Online lights will both be on.

Patterns: other operation

Light patterns during other operation

State	Power	Online
Network access denied	Off	Flashing blue and white
Power failure	Off	Off
Firmware downloading	Both lights flash blue in unison	

Cable modem startup sequence

Telephony modem startup sequence

State	Power	Online
Powering up	Flashing	Off
DOCSIS connection in progress	On	Flashing blue and white
Normal operation	On	Solid white = bonded with DOCSIS 3.0 Solid blue = bonded with DOCSIS 3.1

Use the Reset button

Use the **Reset** button on the back of the Cable Modem to reset and initialize the modem as if you had power cycled the unit. You may need to reset the Cable Modem if you are having problems connecting to the Internet. You will not use this button often.

Use a pointed non-metallic object to press this button. The Reset button is recessed to prevent accidental resets.

Note: The rear panel power switch can also be used to power cycle the unit.

1. Reset button: Resets the Cable Modem as if you power cycled the device. Use a pointed non-metallic object to press this button.
2. Cable: Connector for the coaxial cable.
3. Ethernet connector: Connector for use with a computer LAN port.
4. Power: Connector for the power cord.

Troubleshooting

The Cable Modem 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.

Try to plug the power cord into a different outlet. If the outlet is controlled by a wall switch, make sure the switch is on.

Finally, check the fuse or circuit breaker panel.

I'm not getting on the Internet

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

Check the front panel lights:

- The **Power** and **Internet** lights should be on.
- If the **Power** 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 Cable Modem and CATV outlet, remove the splitters and connect the Cable Modem directly to the outlet.

If you are using an Ethernet hub, check to be sure that it is turned on.

Check to be sure that you are 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 Cable Modem.

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.

I'm not getting 2.5 Gbps speeds

Actual achievable throughput for a 2.5 Gbps connection will actually be slightly less than 2.5 Gbps in practice. However, if you're consistently getting speeds that are significantly less than 2.5 Gbps, you can try these steps to try and find the issue.

First, verify that you have subscribed for Gigabit speed services. Contact your service provider to verify your subscription and see which speeds you should be receiving.

In addition, online speed testing utilities often are unable to accurately gauge Gbps speeds. Contact your service provider and ask them to run a speed test for you.

Finally, double-check the NICs between your CM9200 and your client device to be sure that they are capable of speeds up to 2.5 Gbps. These NICs might be creating a bottleneck.

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 Cable Modem 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 Cable Modem; 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 Cable Modem.

Firewall	A hardware or software device that prevents unauthorized access to a private network from the Internet. The CM9200 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 Cable Modem's MAC address to authorize access to the Internet. The MAC address is printed on a label affixed to your Cable Modem.
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 Cable Modem. 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 Cable Modem 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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