CODA-551x DOCSIS Wifi Gateway

User’s Guide

Version 1.1 - 09/2020

hitron

About This User's Guide

Intended Audience

This manual is intended for people who want to configure the CODA-551x's features via its Graphical User Interface (GUI).

How to Use this User's Guide

This manual contains information on each the CODA-551x's GUI screens, and describes how to use its various features.

- Use the Introduction on page 12 to see an overview of the topics covered in this manual.
- Use the Table of Contents (page 6), List of Figures (page 8) and List of Tables (page 10) to quickly find information about a particular GUI screen or topic.
- Use the Index (page 127) to find information on a specific keyword.
- Use the rest of this User's Guide to see in-depth descriptions of the CODA-551x's features.

Related Documentation

- **Quick Installation Guide**: see this for information on getting your CODA-551x up and running right away. It includes information on system requirements, package contents, the installation procedure, and basic troubleshooting tips.
- **Online Help**: each screen in the CODA-551x's Graphical User Interface (GUI) contains additional information about configuring the screen.

Document Conventions

This User’s Guide uses various typographic conventions and styles to indicate content type:

- Bulleted paragraphs are used to list items, and to indicate options.

1. Numbered paragraphs indicate procedural steps.

NOTE: Notes provide additional information on a subject.

Warnings provide information about actions that could harm you or your device.

Product labels, field labels, field choices, etc. are in **bold** type. For example:

Select **UDP** to use the User Datagram Protocol.

A mouse click in the Graphical User Interface (GUI) is denoted by a right angle bracket (>). For example:

Click **Settings** > **Advanced Settings**.

means that you should click **Settings** in the GUI, then **Advanced settings**.

A key stroke is denoted by square brackets and uppercase text. For example:

Press [ENTER] to continue.

Customer Support

For technical assistance or other customer support issues, please consult your Hitron representative.

Default Login Details

The CODA-551x's default IP address and login credentials are as follows. For more information, see Logging in to the CODA-551x on page 19.

Table 1: Default Credentials

IP Address	192.168.0.1
Username	cusadmin
Password	password

NOTE: When you have completed the EasyConnect setup wizard, the default password is replaced with the password you configured for the wireless network.

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1

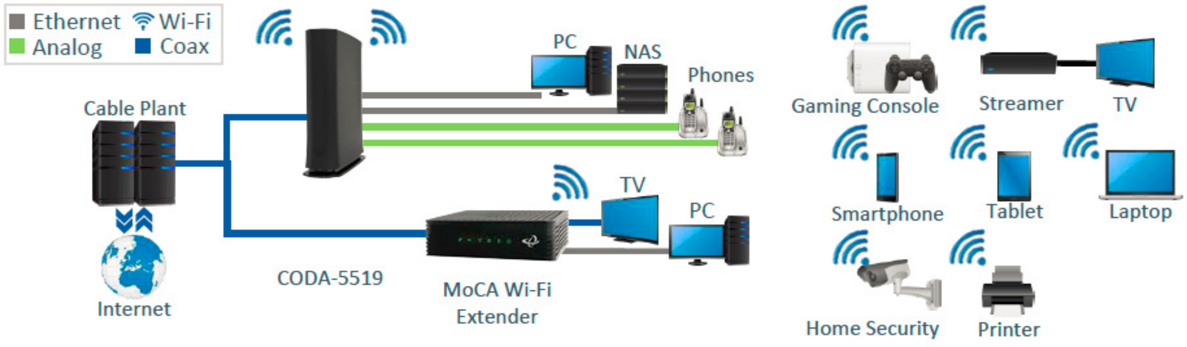
Introduction

This chapter introduces the CODA-551x and its GUI (Graphical User Interface).

1.1 CODA-551x Overview

Your CODA-551x is a DOCSIS cable modem, router and wireless access point that allows you to connect your cabled Ethernet, wireless devices and analog telephones to one another and to the Internet via your building’s cable connection.

Figure 1: Application Overview



For more information on MoCA, see The Multimedia over Coax Alliance on page 37.

1.1.1 Model Differentiation

The models covered by this User’s Guide differ in the following specifics:

- The CODA-551x operates on cable data frequencies of 5 to 85MHz, and 5 to 204MHz (configurable by the operator).

1.1.2 Key Features

The CODA-551x provides:

- DOCSIS 3.1 compliant and DOCSIS 3.1 certified.
- Two Gig-E Ethernet LAN ports.
- One 2.5 Gbps WAN port.
- Wi-Fi 4x4 2.4GHz 802.11ax and 4x4 5GHz 802.11ax dual band MU-MIMO internal antennas.
- 16 SSIDs (8 SSIDs per radio). Individual configuration for each SSID (security, bridging, routing, firewall and Wi-Fi parameters).
- One USB 3.0 host, supporting Network Attached Storage (NAS) functionality.
- Integrated DLNA media server with support for video, audio and image serving
- Extensive operator control via configuration file and SNMP.
- Well-defined LEDs clearly display device and network status.
- TR-069 and HNAP for easy setup and remote management.
- Enhanced management and stability for low total cost of ownership.
- MoCA channel bonding for high performance.
- 2x RJ-11 HD voice ports (CODA-5519).
- External Battery support (CODA-5519).

1.2 Hardware Connections

This section describes the CODA-551x's physical ports and buttons.

Figure 2: Hardware Connections

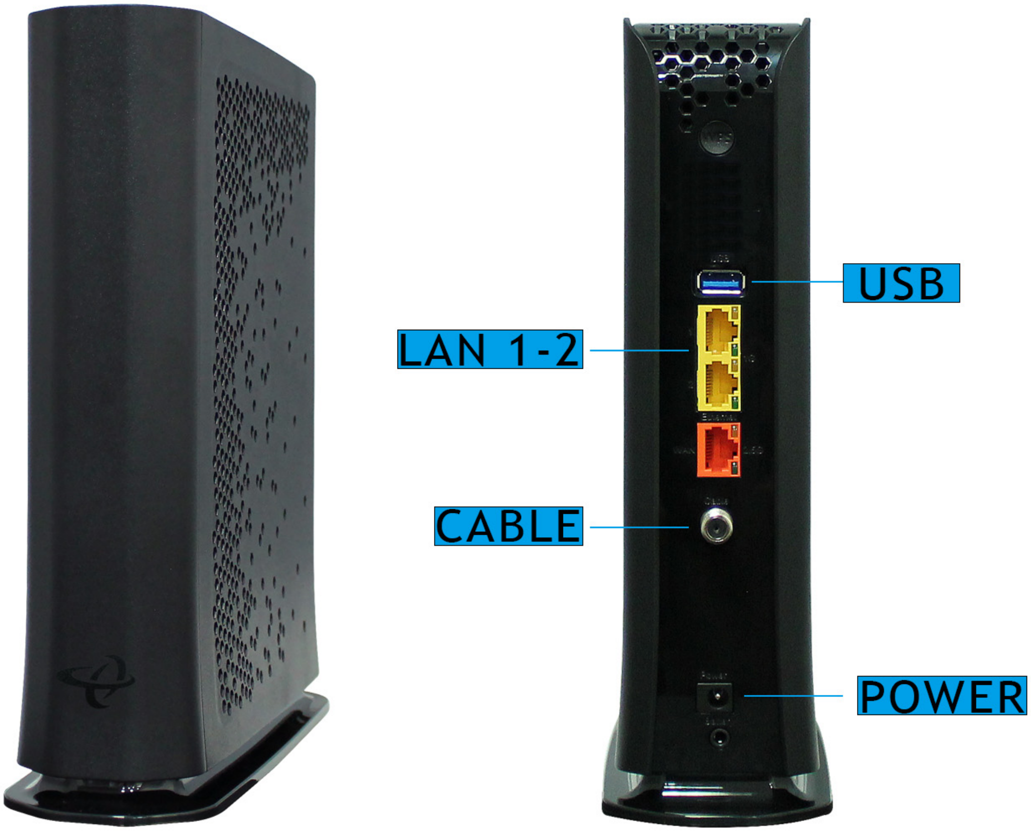


Table 2: Hardware Connections

WPS	Press this button to begin the WiFi Protected Setup (WPS) Push-Button Configuration (PBC) procedure. Press the PBC button on your wireless clients in the coverage area within two minutes to enable them to join the wireless network. The **WPS** LED displays WiFi Protected Setup connection status as follows: - **Blue, blinking**: the WPS connection is processing. - **Blue, steady**: the WPS connection has been successful. - **Off**: WPS is not active. See WPS on page 80 for more information.
USB	Use this port to plug in USB flash disks for mounting and sharing through the LAN interfaces via the Samba protocol (network neighborhood). The CODA-551x supports the following Windows file systems: - FAT16 - FAT32 💣 **USB devices must not drain more than 500mA from the USB port. USB devices requiring more than 500mA should be provided with their own power source(s).**
RESET	Use this button to reboot or reset your CODA-551x to its factory default settings. To reboot the CODA-551x, press the button and hold it for less than five seconds. The CODA-551x restarts, using your existing settings. To reset the CODA-551x, press the button and hold it for five or more seconds. All user-configured settings are deleted, and the CODA-551x restarts using its factory default settings.

Table 2: Hardware Connections

WAN Port	The Wan-port is the uplink port of your device that uses to connect to the wide area network such as Internet or the modem that your ISP has provided.
LAN 1	Use these ports to connect your computers and other network devices, using Category 5 or 6 Ethernet cables with RJ45 connectors. Each **LAN** port's yellow LED glows when the connection on the relevant port's is at 1Gbps, and its green LED glows when the connection is at 10/100Mbps.
LAN 2	
POWER	Use the **POWER** port to connect to the input 100~125VAC, output 12v, 5A power adapter that came with your CODA-551x Figure 3: Power Cable

1.3 LEDs

This section describes the CODA-551x's LEDs (lights).

Table 3: LEDs

COLOR STATUS	**STATE**
Green Slow Blank	Booting
White/Green alternating	Establishing DOCSIS
White Slow Blink	Provsioning

Table 3: LEDs

Solid-White	Online & all enabled-radios active (Steady-state), Device in the Gateway Mode.
Solid-Cyan	Device in the Bridge Mode or all Wi-Fi disabled but device fully online.
Blue Blinking	WPS Sync
Blue Solid (5 seconds)	WPS Paired
Light-Blue	Phone off hook (CODA-5519).
Cyan/White alternating	Software upgrade in progress
Red Blinking	DOCSIS Issue (e.g. ranging issue / no signal).
Red Slow Blink	Provision Issue (e.g. authorized or failed to download configuration file).
Solid-Red	HW Failure

1.4 IP Address Setup

Before you log into the CODA-551x’s GUI, your computer’s IP address must be in the same subnet as the CODA-551x. This allows your computer to communicate with the CODA-551x.

NOTE: See When the CODA-551x is not in routing mode, the service provider assigns an IP address to each computer connected to the CODA-551x directly. The CODA-551x does not perform any routing operations, and traffic flows between the computers and the service provider. on page 58 for background information.

If your computer is configured to get an IP address automatically, or if you are not sure, try to log in to the CODA-551x (see GUI Overview on page 20).

- If the login screen displays, your computer is already configured correctly.
- If the login screen does not display, your computer is not configured correctly. Follow the procedure in Manual IP Address Setup on page 18 and set your computer to get an IP address automatically. Try to log in again. If you cannot log in, follow the manual IP address setup procedure again, and set a specific IP address as shown. Try to log in again.

NOTE: If you still cannot see the login screen, your CODA-551x's IP settings may have been changed from their defaults. If you do not know the CODA-551x's new address, you should return it to its factory defaults. See Resetting the CODA-551x on page 21. Bear in mind that ALL user-configured settings are lost.

1.4.1 Manual IP Address Setup

By default, your CODA-551x's local IP address is **192.168.0.1**. If your CODA-551x is using the default IP address, you should set your computer's IP address to be between **192.168.0.2** and **192.168.0.254**.

Take the following steps to manually set up your computer's IP address to connect to the CODA-551x:

NOTE: This example uses Windows 7; the procedure for your operating system may be different.

1. Click the **Start Orb**, then click **Control Panel**.
2. In the window that displays, double-click **Network And Sharing Center**.
3. In the left-hand panel, click **Change Adapter Settings**.
4. Right-click your network connection (usually **Local Area Connection**) and click **Properties**.
5. In the **Networking** tab's **This connection uses the following items** list, scroll down and select **Internet Protocol (TCP/IPv4)**. Click **Properties**.
6. You can get an IP address automatically, or specify one manually:
    - If your network has an active DHCP server, select **Get an IP address automatically**.
    - If your network does not have an active DHCP server, select **Use the following IP address**. In the **IP address** field, enter a value between **192.168.0.2** and **192.168.0.254** (default). In the **Subnet mask** field, enter **255.255.255.0** (default). In the **Default Gateway** field, enter **192.168.0.1** (default).

NOTE: If your CODA-551x is not using the default IP address, enter an IP address and subnet mask that places your computer in the same subnet as the CODA-551x.

7 Click **OK**. The **Internet Protocol (TCP/IP)** window closes. In the **Local Area Connection Properties** window, click **Close**.

Your computer now obtains an IP address from the CODA-551x, or uses the IP address that you specified, and can communicate with the CODA-551x.

1.5 Logging in to the CODA-551x

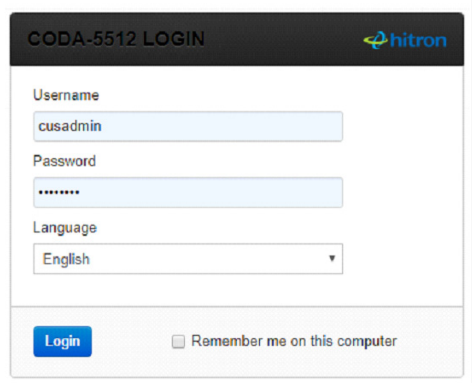
Take the following steps to log into the CODA-551x's GUI.

NOTE: If you did not already complete the EasyConnect setup wizard (see EasyConnect on page 23) you will be prompted to do so before you can log in.

1 Open a browser window.

2 Enter the CODA-551x's IP address (default **192.168.0.1**) in the URL bar. The **Login** screen displays.

Figure 4: Login



CODA-5512 LOGIN

Username

cusadmin

Password

••••••••

Language

English

3 Enter the **Username** and **Password**. The default user name is **cusadmin** and the password is the same as the password you configured for the wireless network in the EasyConnect wizard (see EasyConnect on page 23).

NOTE: The Username and Password are case-sensitive; "password" is not the same as "PASSWORD".

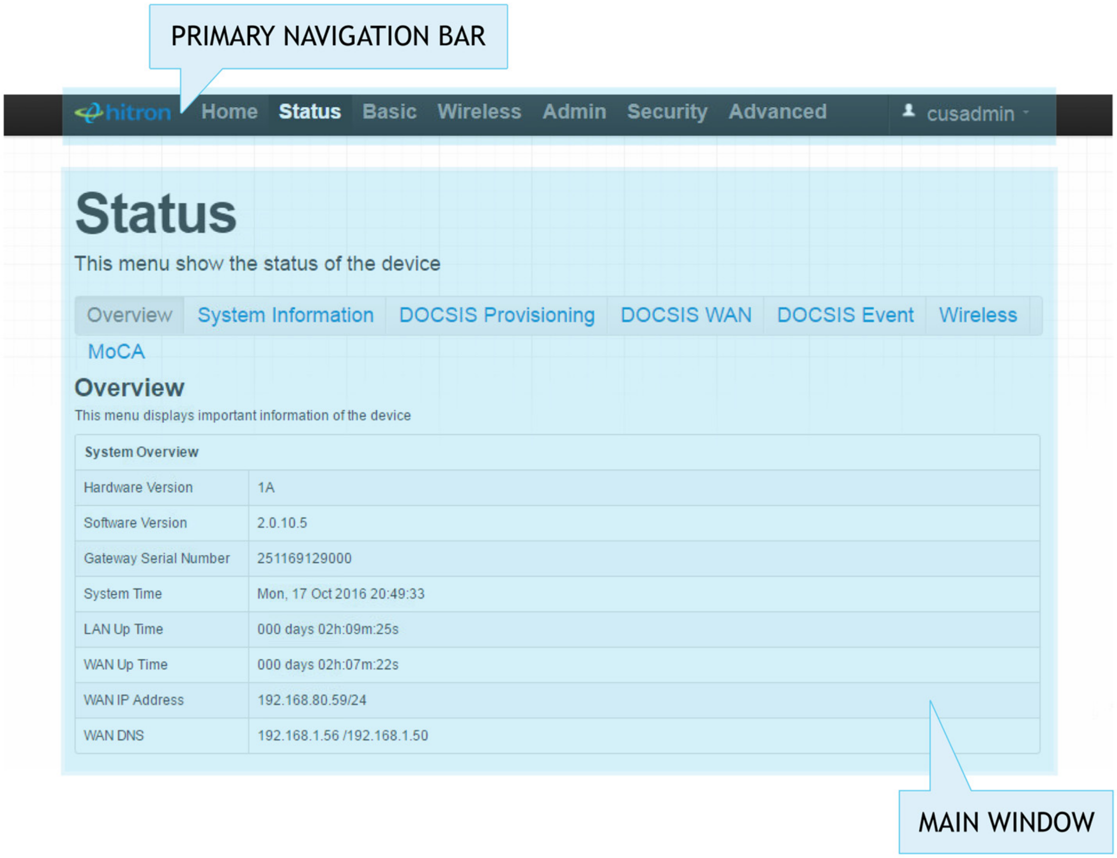
4 If you want to log in without entering the password in future, select **Remember me on this computer**. Only select this on your own, private computer (not public computers, or those easily-accessible by others).

5 Click **Login**. The **Status Overview** screen displays (see The System Information Screen on page 41).

1.6 GUI Overview

This section describes the CODA-551x's GUI.

Figure 5: GUI Overview



Status

This menu show the status of the device

Overview

This menu displays important information of the device

System Overview	
Hardware Version	1A
Software Version	2.0.10.5
Gateway Serial Number	251169129000
System Time	Mon, 17 Oct 2016 20:49:33
LAN Up Time	000 days 02h:09m:25s
WAN Up Time	000 days 02h:07m:22s
WAN IP Address	192.168.80.59/24
WAN DNS	192.168.1.56 /192.168.1.50

Table 4: GUI Overview

Primary Navigation Bar	Use this section to move from one part of the GUI to another.
Main Window	Use this section to read information about your CODA-551x's configuration, and make configuration changes.
Online Help	Use this section to learn more information about the fields in each screen.

1.7 Resetting the CODA-551x

When you reset the CODA-551x to its factory defaults, all user-configured settings are lost, and the CODA-551x is returned to its initial configuration state.

To reset the CODA-551x, press and hold the **RESET** button for ten seconds, or go to the **Admin** > **Device Reset** screen and click **Factory Reset** (see The Admin: USB Storage Screen on page 100). The CODA-551x turns off and on again, using its factory default settings.

NOTE: Depending on your CODA-551x’s previous configuration, you may need to re-configure your computer’s IP settings; see IP Address Setup on page 17.

2

EasyConnect

This chapter describes the screens that display when you first access the CODA-551x, and when you access the CODA-551x after a factory reset (see Resetting the CODA-551x on page 21). It contains the following sections:

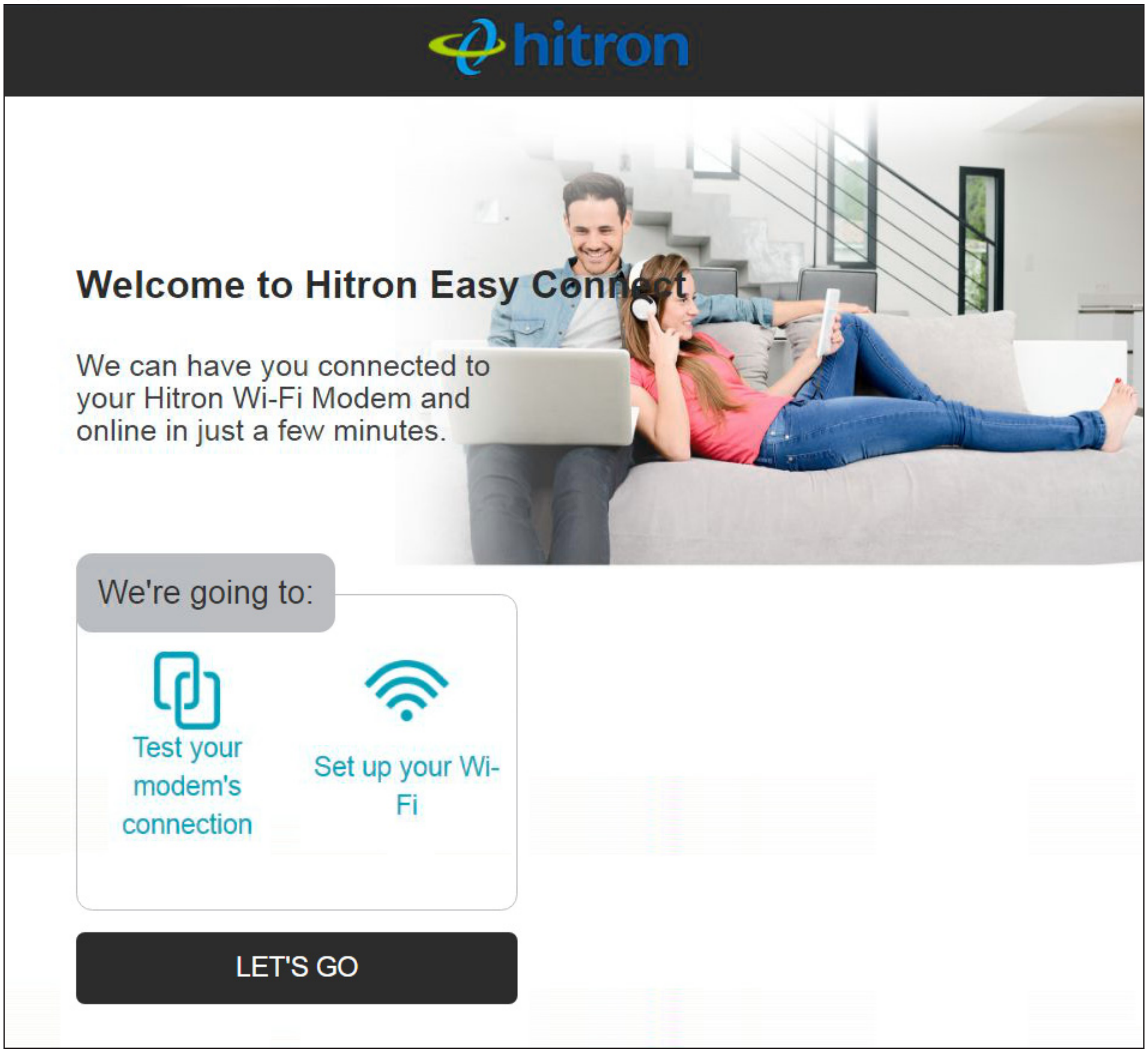
2.1 EasyConnect Overview

EasyConnect is a setup wizard that allows you to rapidly configure the CODA-551x's most important settings, including Internet connection, wireless and password settings.

2.2 EasyConnect: Welcome

This screen displays when you first access the CODA-551x, or immediately after you have performed a factory reset. Click **Let's Go** to proceed to the **Connection** screens (see EasyConnect: Internet Connection on page 24).

Figure 6: The EasyConnect: Welcome Screen



Welcome to Hitron Easy Connect

We can have you connected to your Hitron Wi-Fi Modem and online in just a few minutes.

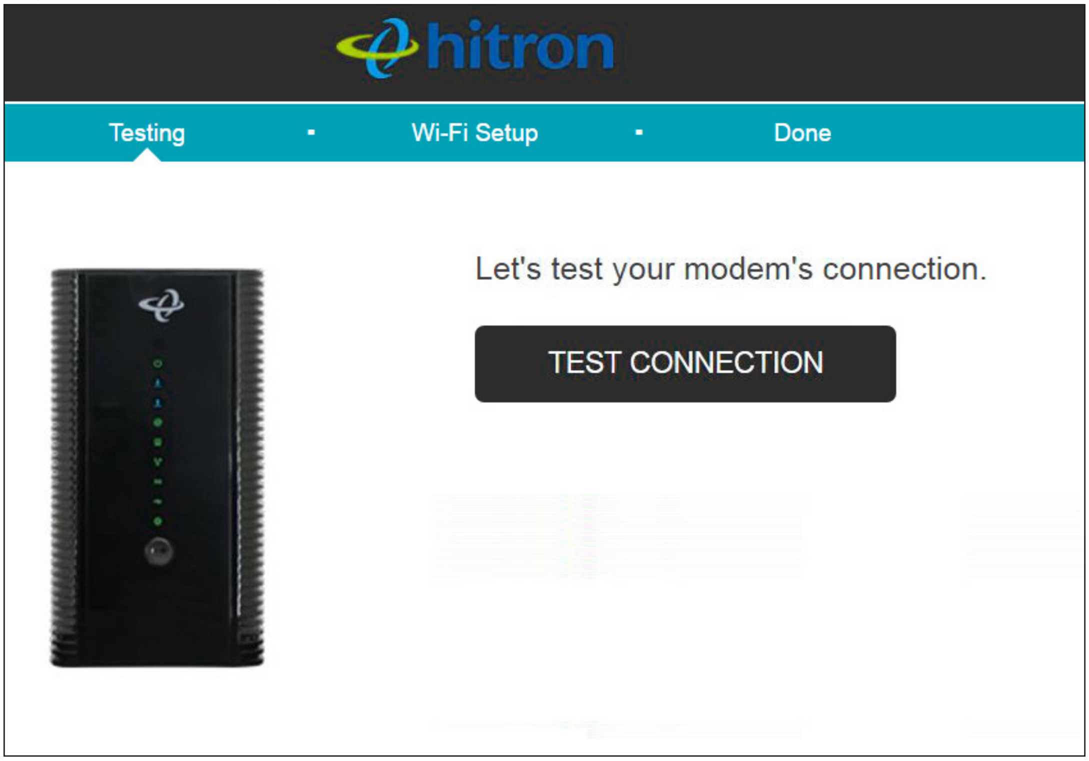
We're going to:

2.3 EasyConnect: Internet Connection

Use these screens to test the CODA-551x's connection to the Internet.

Click **Let's Go** in the EasyConnect **Welcome** screen. The following screen displays.

Figure 7: The EasyConnect: Internet Connection Start Screen

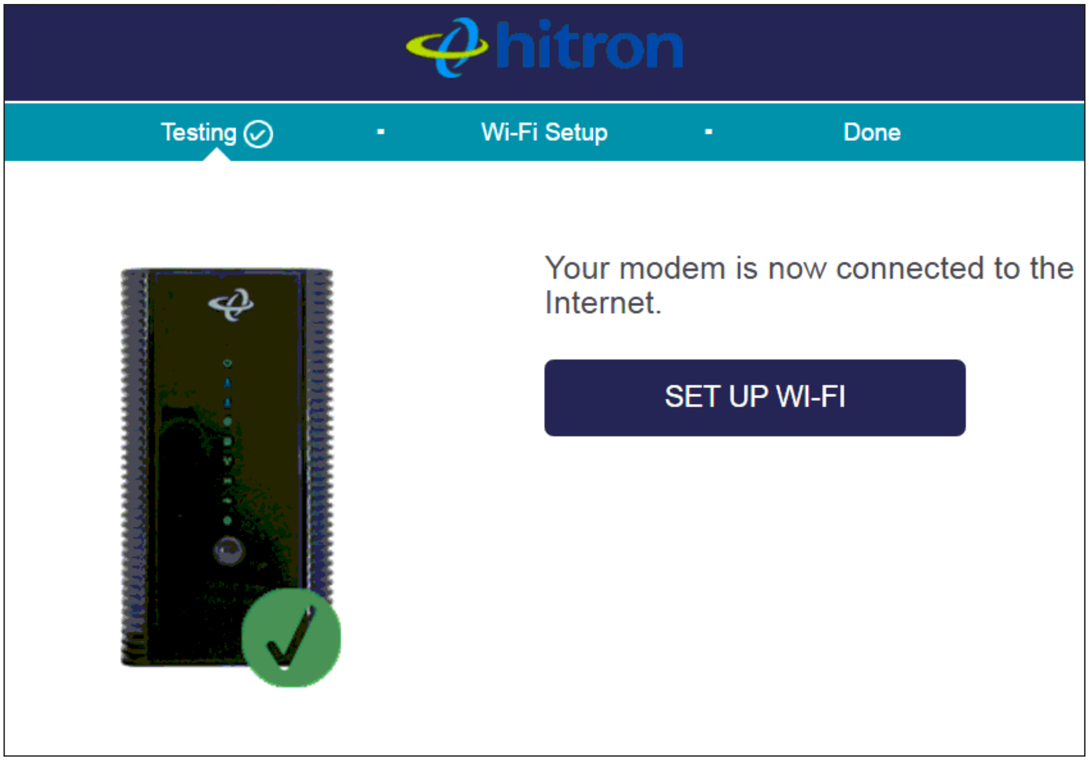


Let's test your modem's connection.

Click **Test Connection** to proceed. The Internet connection test begins.

If the test is successful, the following screen displays.

Figure 8: The EasyConnect: Internet Connection Success Screen

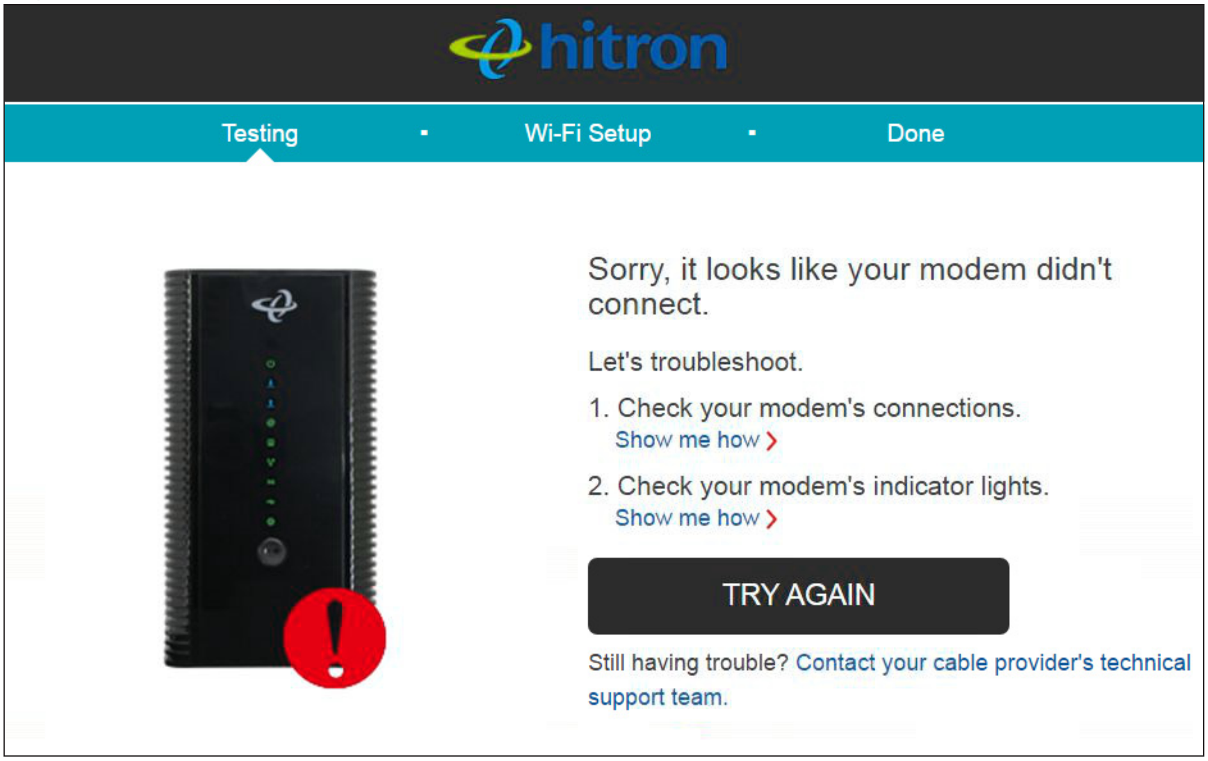


Your modem is now connected to the Internet.

Click **Set up wi-fi** to proceed to the wireless network setup screens (see EasyConnect: Wireless Settings on page 27).

If the CODA-551x was unable to connect to the Internet, the Internet connection test fails and the following screen displays.

Figure 9: The EasyConnect: Internet Connection Fail Screen



Sorry, it looks like your modem didn't connect.

Let's troubleshoot.

1. Check your modem's connections.
   Show me how ›

2. Check your modem's indicator lights.
   Show me how ›

Still having trouble? Contact your cable provider's technical support team.

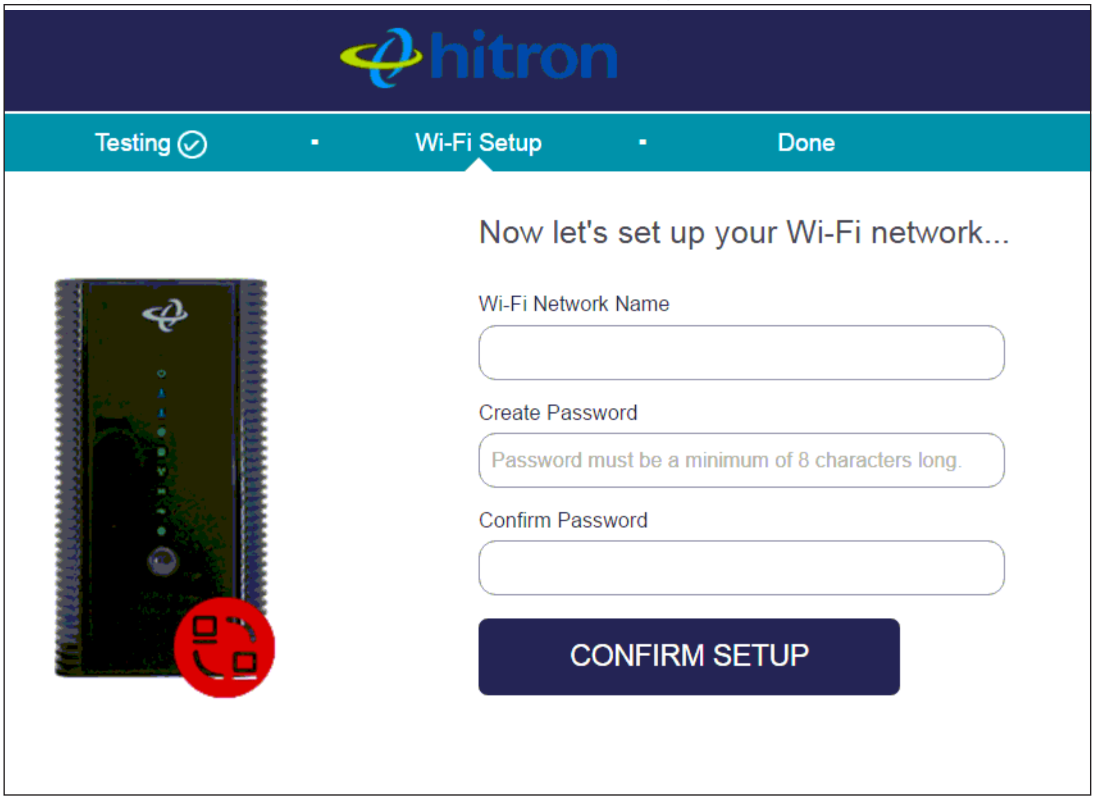
Follow the instructions on the screen and, when ready to run the Internet connection test again, click **Try again**.

2.4 EasyConnect: Wireless Settings

Use this screen to configure the CODA-551x's wireless network and set the administrative interface login password.

When EasyConnect's Internet Connection test has successfully completed, the following screen displays.

Figure 10: The EasyConnect: Wireless Settings Screen



Now let's set up your Wi-Fi network...

Wi-Fi Network Name

Create Password

Password must be a minimum of 8 characters long.

Confirm Password

- Enter the name you want to use for your wireless network in the **WiFi Network Name** field. You will use this name to identify and connect to the wireless network from your client device(s).

- Enter the password you want to use for your wireless network in the **Create Password** field, and re-enter it in the **Confirm Password** field.

NOTE: The password you enter in the EasyConnect **Wireless Settings** screen will replace the CODA-551x’s default administrative interface password. When you log into the CODA-551x, you will need to use the password you entered in the **Create Password** and **Confirm Password** fields.

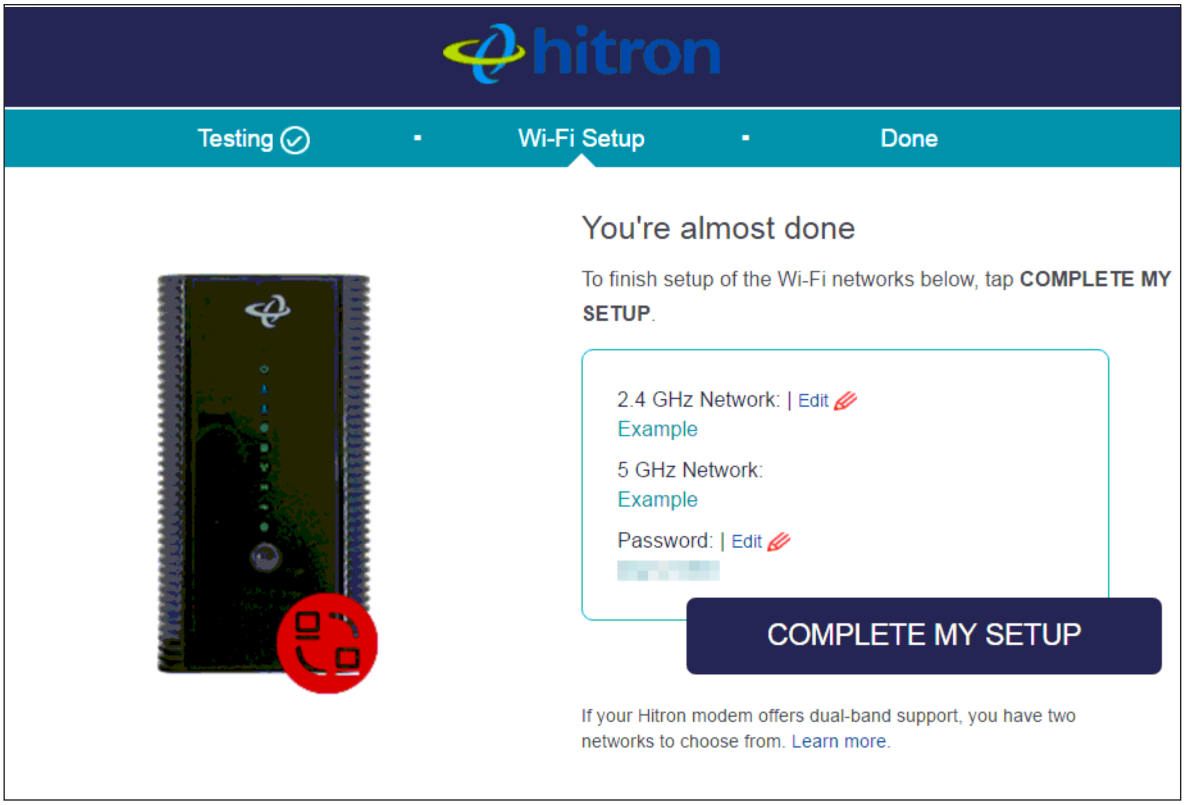
- Click **Confirm Setup** to proceed to the **Setup Completion** screen.

2.5 EasyConnect: Setup Completion

Use this screen to save your changes to the CODA-551x’s EasyConnect configuration.

Click **Confirm Setup** in the **EasyConnect: Wireless Settings** screen. The following screen displays.

Figure 11: The EasyConnect: Setup Completion Screen



You're almost done

To finish setup of the Wi-Fi networks below, tap **COMPLETE MY SETUP**.

2.4 GHz Network: | Edit
Example

5 GHz Network:
Example

Password: | Edit

If your Hitron modem offers dual-band support, you have two networks to choose from. Learn more.

If you are happy with the settings, click **Complete my setup**.

NOTE: If you changed settings, make sure you keep a note of the new details.

Alternatively, click a setting's **Edit** link to modify it before clicking **Complete my setup**.

3

Status

This chapter describes the screens that display when you click **Status** in the toolbar. It contains the following sections:

NOTE: For background information on the concepts discussed in the **Wireless Status** screen, see Wireless Overview on page 75.

3.1 Status Overview

This section describes some of the concepts related to the **Status** screens.

3.1.1 DOCSIS

The Data Over Cable Service Interface Specification (DOCSIS) is a telecommunications standard that defines the provision of data services) Internet access) over a traditional cable TV (CATV) network.

Your CODA-551x supports DOCSIS version 3.0.

3.1.2 IP Addresses and Subnets

Every computer on the Internet must have a unique Internet Protocol (IP) address. The IP address works much like a street address, in that it identifies a specific location to which information is transmitted. No two computers on a network can have the same IP address.

3.1.2.1 IP Address Format

IP addresses consist of four octets (8-bit numerical values) and are usually represented in decimal notation, for example **192.168.1.1**. In decimal notation, this means that each octet has a minimum value of 0 and a maximum value of 255.

An IP address carries two basic pieces of information: the "network number" (the address of the network as a whole, analogous to a street name) and the "host ID" (analogous to a house number) which identifies the specific computer (or other network device).

3.1.2.2 IP Address Assignment

IP addresses can come from three places:

- The Internet Assigned Numbers Agency (IANA)
- Your Internet Service Provider
- You (or your network devices)

IANA is responsible for IP address allocation on a global scale, and your ISP assigns IP addresses to its customers. You should never attempt to define your own IP addresses on a public network, but you are free to do so on a private network.

In the case of the CODA-551x:

- The public network (Wide Area Network or WAN) is the link between the cable connector and your Internet Service Provider. Your CODA-551x's IP address on this network is assigned by your service provider.

- The private network is your Local Area Network (LAN) and Wireless Local Area Network (WLAN), if enabled. You are free to assign IP addresses to computers on the LAN and WLAN manually, or to allow the CODA-551x to assign them automatically via DHCP (Dynamic Host Configuration Protocol). IANA has reserved the following blocks of IP addresses to be used for private networks only:

Table 5: Private IP Address Ranges

FROM...	...TO
10.0.0.0	10.255.255.255
172.16.0.0	172.31.255.255
192.168.0.0	192.168.255.255

If you assign addresses manually, they must be within the CODA-551x's LAN subnet.

3.1.2.3 Subnets

A subnet (short for sub-network) is, as the name suggests, a separate section of a network, distinct from the main network of which it is a part. A subnet may contain all of the computers at one corporate local office, for example, while the main network includes several offices.

In order to define the extent of a subnet, and to differentiate it from the main network, a subnet mask is used. This "masks" the part of the IP address that refers to the main network, leaving the part of the IP address that refers to the sub-network.

Each subnet mask has 32 bits (binary digits), as does each IP address:

- A binary value of **1** in the subnet mask indicates that the corresponding bit in the IP address is part of the main network.
- A binary value of **0** in the subnet mask indicates that the corresponding bit in the IP address is part of the sub-network.

For example, the following table shows the IP address of a computer (**192.168.1.1**) expressed in decimal and binary (each cell in the table indicates one octet):

Table 6: IP Address: Decimal and Binary

192	168	0	1
11000000	10101000	00000000	00000001

The following table shows a subnet mask that "masks" the first twenty-four bits of the IP address, in both its decimal and binary notation.

Table 7: Subnet Mask: Decimal and Binary

255	255	255	0
11111111	11111111	11111111	00000000

This shows that in this subnet, the first three octets (**192.168.1**, in the example IP address) define the main network, and the final octet (**1**, in the example IP address) defines the computer's address on the subnet.

The decimal and binary notations give us the two common ways to write a subnet mask:

- Decimal: the subnet mask is written in the same fashion as the IP address: **255.255.255.0**, for example.
- Binary: the subnet mask is indicated after the IP address (preceded by a forward slash), specifying the number of binary digits that it masks. The subnet mask **255.255.255.0** masks the first twenty-four bits of the IP address, so it would be written as follows: 192.168.1.1**/24**.

3.1.3 DHCP

The Dynamic Host Configuration Protocol, or DHCP, defines the process by which IP addresses can be assigned to computers and other networking devices automatically, from another device on the network. This device is known as a DHCP server, and provides addresses to all the DHCP client devices.

In order to receive an IP address via DHCP, a computer must first request one from the DHCP server (this is a broadcast request, meaning that it is sent out to the whole network, rather than just one IP address). The DHCP server hears the requests, and responds by assigning an IP address to the computer that requested it.

If a computer is not configured to request an IP address via DHCP, you must configure an IP address manually if you want to access other computers and devices on the network. See IP Address Setup on page 17 for more information.

By default, the CODA-551x is a DHCP client on the WAN (the CATV connection). It broadcasts an IP address over the cable network, and receives one from the service provider. By default, the CODA-551x is a DHCP server on the LAN; it provides IP addresses to computers on the LAN which request them.

3.1.4 DHCP Lease

“DHCP lease” refers to the length of time for which a DHCP server allows a DHCP client to use an IP address. Usually, a DHCP client will request a DHCP lease renewal before the lease time is up, and can continue to use the IP address for an additional period. However, if the client does not request a renewal, the DHCP server stops allowing the client to use the IP address.

This is done to prevent IP addresses from being used up by computers that no longer require them, since the pool of available IP addresses is finite.

3.1.5 MAC Addresses

Every network device possesses a Media Access Control (MAC) address. This is a unique alphanumeric code, given to the device at the factory, which in most cases cannot be changed (although some devices are capable of “MAC spoofing”, where they impersonate another device’s MAC address).

MAC addresses are the most reliable way of identifying network devices, since IP addresses tend to change over time (whether manually altered, or updated via DHCP).

Each MAC address displays as six groups of two hexadecimal digits separated by colons (or, occasionally, dashes) for example **00:AA:FF:1A:B5:74**.

NOTE: Each group of two hexadecimal digits is known as an “octet”, since it represents eight bits.

Bear in mind that a MAC address does not precisely represent a computer on your network (or elsewhere), it represents a network device, which may be part of a computer (or other device). For example, if a single computer has an Ethernet card (to connect to your CODA-551x via one of the **LAN** ports) and also has a wireless card (to connect to your CODA-551x over the wireless interface) the MAC addresses of the two cards will be different. In the case of the CODA-551x, each internal module (cable modem module, Ethernet module, wireless module, etc.) possesses its own MAC address.

3.1.6 Routing Mode

When your CODA-551x is in routing mode, it acts as a gateway for computers on the LAN to access the Internet. The service provider assigns an IP address to the CODA-551x on the WAN, and all traffic for LAN computers is sent to that IP address. The CODA-551x assigns private IP addresses to LAN computers (when DHCP is active), and transmits the relevant traffic to each private IP address.

NOTE: When DHCP is not active on the CODA-551x in routing mode, each computer on the LAN must be assigned an IP address in the CODA-551x’s subnet manually.

When the CODA-551x is not in routing mode, the service provider assigns an IP address to each computer connected to the CODA-551x directly. The CODA-551x does not perform any routing operations, and traffic flows between the computers and the service provider.

Routing mode is not user-configurable; it is specified by the service provider in the CODA-551x’s configuration file.

3.1.7 Configuration Files

The CODA-551x’s configuration (or config) file is a document that the CODA-551x obtains automatically over the Internet from the service provider’s server, which specifies the settings that the CODA-551x should use. It contains a variety of settings that are not present in the user-configurable Graphical User Interface (GUI) and can be specified only by the service provider.

3.1.8 Downstream and Upstream Transmissions

The terms “downstream” and “upstream” refer to data traffic flows, and indicate the direction in which the traffic is traveling. “Downstream” refers to traffic from the service provider to the CODA-551x, and “upstream” refers to traffic from the CODA-551x to the service provider.

3.1.9 Cable Frequencies

Just like radio transmissions, data transmissions over the cable network must exist on different frequencies in order to avoid interference between signals.

The data traffic band is separate from the TV band, and each data channel is separate from other data channels.

3.1.10 Modulation

Transmissions over the cable network are based on a strong, high frequency periodic waveform known as the "carrier wave." This carrier wave is so called because it "carries" the data signal. The data signal itself is defined by variations in the carrier wave. The process of varying the carrier wave (in order to carry data signal information) is known as "modulation." The data signal is thus known as the "modulating signal."

Cable transmissions use a variety of methods to perform modulation (and the "decoding" of the received signal, or "demodulation"). The modulation methods defined in DOCSIS 3 are as follows:

- **QPSK**: Quadrature Phase-Shift Keying
- **QAM**: Quadrature Amplitude Modulation
- **QAM TCM**: Trellis modulated Quadrature Amplitude Modulation

In many cases, a number precedes the modulation type (for example **16 QAM**). This number refers to the complexity of modulation. The higher the number, the more data can be encoded in each symbol.

NOTE: In modulated signals, each distinct modulated character (for example, each audible tone produced by a modem for transmission over telephone lines) is known as a symbol.

Since more information can be represented by a single character, a higher number indicates a higher data transfer rate.

3.1.11 TDMA, FDMA and SCDMA

Time Division Multiple Access (TDMA), Frequency Division Multiple Access (FDMA) and Synchronous Code Division Multiple Access (SCDMA) are channel access methods that allow multiple users to share the same frequency channel.

- TDMA allows multiple users to share the same frequency channel by splitting transmissions by time. Each user is allocated a number of time slots, and transmits during those time slots.

- FDMA allows multiple users to share the same frequency channel by assigning a frequency band within the existing channel to each user.
- SCDMA allows multiple users to share the same frequency channel by assigning a unique orthogonal code to each user.

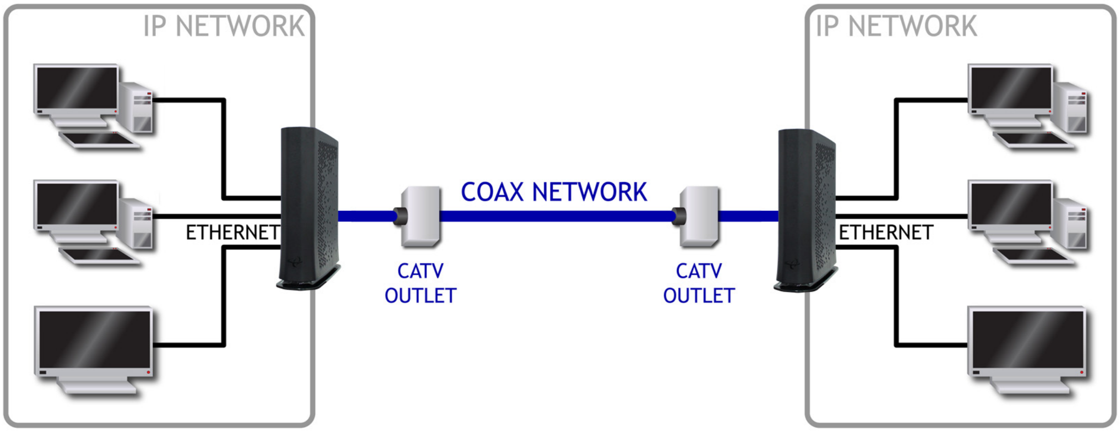
3.1.12 The Multimedia over Coax Alliance

The Multimedia over Coax Alliance (MoCA) is a non-profit technology alliance, which defines a set of specifications for the delivery of high-speed data, such as HD video, over your building's existing co-axial cabling network. Co-axial, or coax (pronounced "ko-axe") cable is already incorporated into most buildings for the transmission of RF signals, traditionally for relaying television broadcasts from a TV antenna, satellite or cable box to individual televisions around the building.

MoCA devices allow you use the coax cable network as an extension of your building's existing IP network, which includes both wired (Ethernet) and wireless (WiFi) traffic. Because they bridge the two networks, they are known as Ethernet-to-Coax Bridges, or ECBs.

NOTE: The Hitron device in the following diagrams are illustrative only, and may not resemble your device.

Figure 12: Bridging the Gap Between IP and Coaxial Networks



MoCA traffic on the coax network does not interfere with existing broadcasts from cable, telco, IPTV or satellite service providers, as it makes use of a previously-unused segment of the RF spectrum. The medium is ideal for real-time applications, providing high data throughput (100Mbps~1Gbps) with low latency, jitter or data loss. Also, coax cabling is generally better-shielded than IP networking media, especially wireless.

Applications to which MoCA networking is well-suited include:

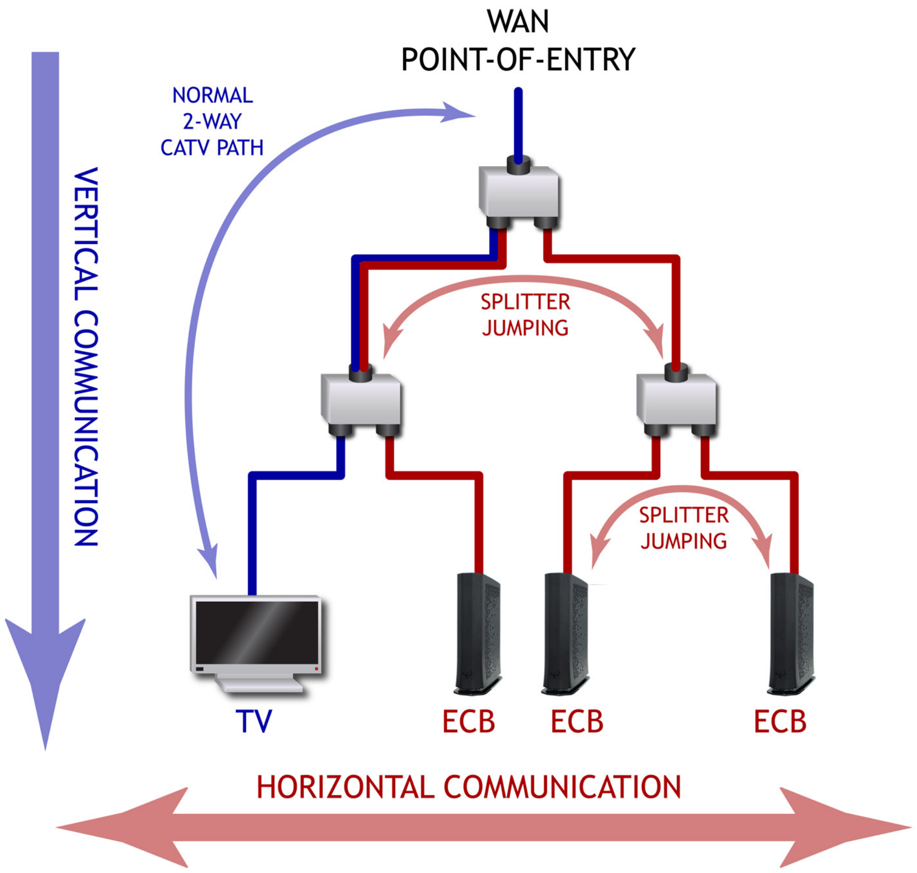
- Video on Demand (VoD)
- Multi-room, multi-camera Digital Video Recording (DVR)
- Gaming (LAN or online multiplayer)
- Internet video
- Home automation
- Video conferencing

3.1.12.1 Horizontal vs. Vertical Communications

Unlike traditional coax networking (TV, satellite, IPTV, etc.) MoCA devices do not need to receive data from a single source. It is “outlet-to-outlet”. Each MoCA network uses a Network Controller (NC) to manage the network’s communications, but any ECB on the network is capable of acting as the NC. By default, the NC is chosen by negotiation between all ECBs on the network, based on factors such as signal strength.

“Outlet-to-outlet” communications are also known as “splitter jumping”. Traditional cable networking commonly utilized splitters to split a single incoming signal into two outgoing signals. With MoCA, communications between devices connected to each splitter output are possible. For this reason, MoCA communications can be considered “horizontal”, as opposed to traditional “vertical” cable communications.

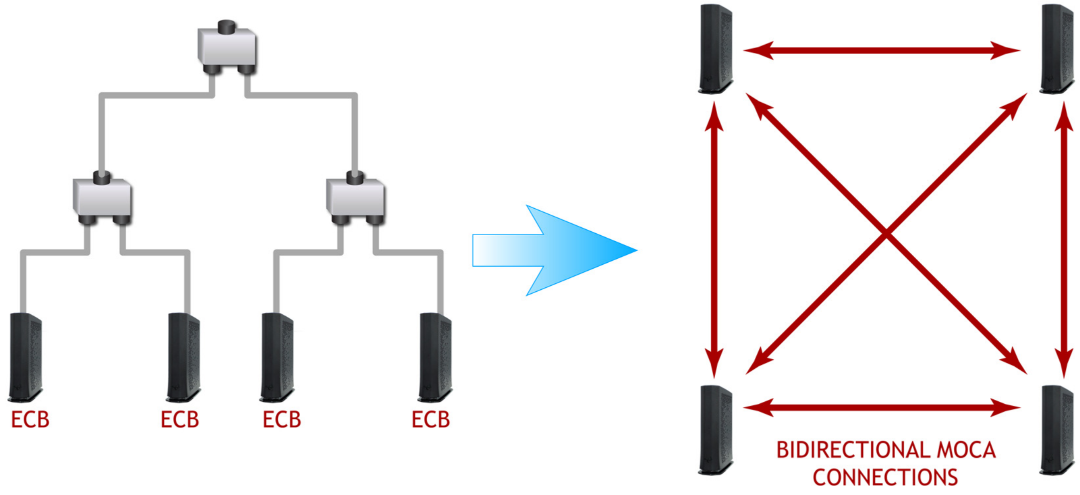
Figure 13: Traditional Vertical CATV vs. Horizontal MoCA Networking



3.1.12.2 Example MoCA Mesh Network

MoCA devices form a full "mesh", or peer-to-peer network (where all devices communicate directly with one another). In the following example, four MoCA devices connect directly to and from one another, via ECBs, forming 12 unique MoCA links (or 6 bidirectional links).

Figure 14: Example MoCA Peer-to-Peer Network



3.1.13 OFDM

Orthogonal Frequency-Division Multiplexing (OFDM) is a physical-layer data encoding method for transmitting and receiving data on Radio Frequency (RF) media, such as the CODA-551x's cable connection.

OFDM takes a single wide-band signal and separates it into multiple simultaneous subcarriers across the available RF spectrum, separated by the minimum frequency necessary to ensure non-interference among sub-carriers. “Orthogonal”, in this usage, refers to this non-interfering quality of the technique.

The primary advantage of OFDM is that a signal encoded using the method can withstand suboptimal conditions on the RF medium. Depending on its implementation, OFDM can also enable faster signal throughput.

3.1.14 FFT

The Fast Fourier Transform (FFT) is an algorithm for rapidly implementing Fourier analysis of a data stream, used by modulation methods such as OFDM. Fourier analysis is a mathematical technique that enables the representation of data using simpler trigonometric functions.

In this implementation, Fourier analysis is used to construct the frequency data for transmission, and to deconstruct received frequency data.

3.1.15 OFDMA

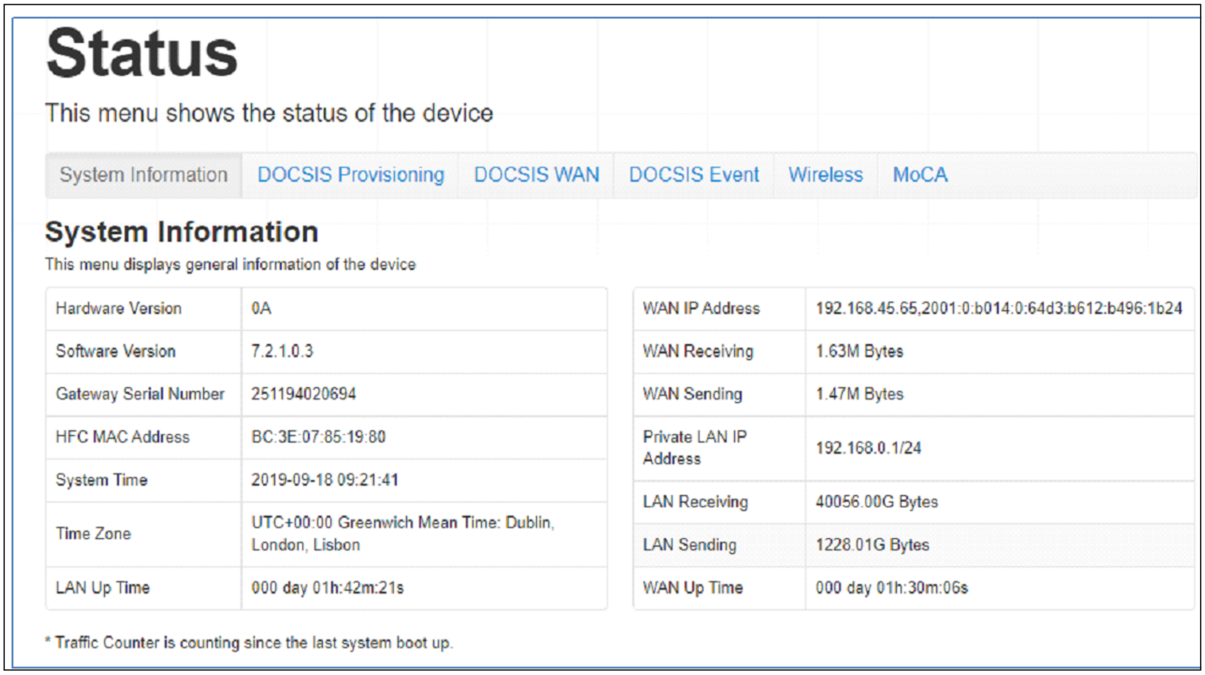
Orthogonal Frequency-Division Multiple Access (OFDMA) is a multiuser adaptation of OFDM (see OFDM on page 40) that permits simultaneous use by multiple users by assigning a specific group of OFDM subcarriers to each individual user.

3.2 The System Information Screen

Use this screen to see general information about your CODA-551x's hardware, its software, and its connection to the Internet.

Click **Status** > **System Information** The following screen displays.

Figure 15: The Status: System Information Screen



Status

This menu shows the status of the device

System Information

This menu displays general information of the device

Hardware Version	0A
Software Version	7.2.1.0.3
Gateway Serial Number	251194020694
HFC MAC Address	BC:3E:07:85:19:80
System Time	2019-09-18 09:21:41
Time Zone	UTC+00:00 Greenwich Mean Time: Dublin, London, Lisbon
LAN Up Time	000 day 01h:42m:21s

WAN IP Address	192.168.45.65,2001:0:b014:0:64d3:b612:b496:1b24
WAN Receiving	1.63M Bytes
WAN Sending	1.47M Bytes
Private LAN IP Address	192.168.0.1/24
LAN Receiving	40056.00G Bytes
LAN Sending	1228.01G Bytes
WAN Up Time	000 day 01h:30m:06s

* Traffic Counter is counting since the last system boot up.

The following table describes the labels in this screen.

Table 8: The Status: System Information Screen

System Overview	
Hardware Version	This displays the version number of the CODA-551x's physical hardware.
Software Version	This displays the version number of the software that controls the CODA-551x.

Table 8: The Status: System Information Screen

Gateway Serial Number	This displays a number that uniquely identifies the device.
HFC MAC Address	This displays the Media Access Control (MAC) address of the CODA-551x’s Hybrid-Fiber Coax (HFC) module. This is the module that connects to the Internet through the **CATV** connection.
System Time	This displays the current date and time.
Time Zone	This displays the time zone in which the CODA-551x is located.
LAN Uptime	This displays the amount of time that has elapsed since the CODA-551x’s Local Area Network connection was last restarted.
WAN IP Address	This displays the CODA-551x’s WAN IP address. This IP address is automatically assigned to the CODA-551x.
WAN Receiving	This displays the amount of data received over the WAN connection since the device was last started.
WAN Sending	This displays the amount of data transmitted over the WAN connection since the device was last started.
Private LAN IP Address	This displays the CODA-551x’s LAN subnet’s IP information.
LAN Receiving	This displays the amount of data received over the LAN connection since the device was last started.
LAN Sending	This displays the amount of data transmitted over the LAN connection since the device was last started.
WAN Up Time	This displays the amount of time that has elapsed since the CODA-551x’s Wide Area Network connection was last restarted.

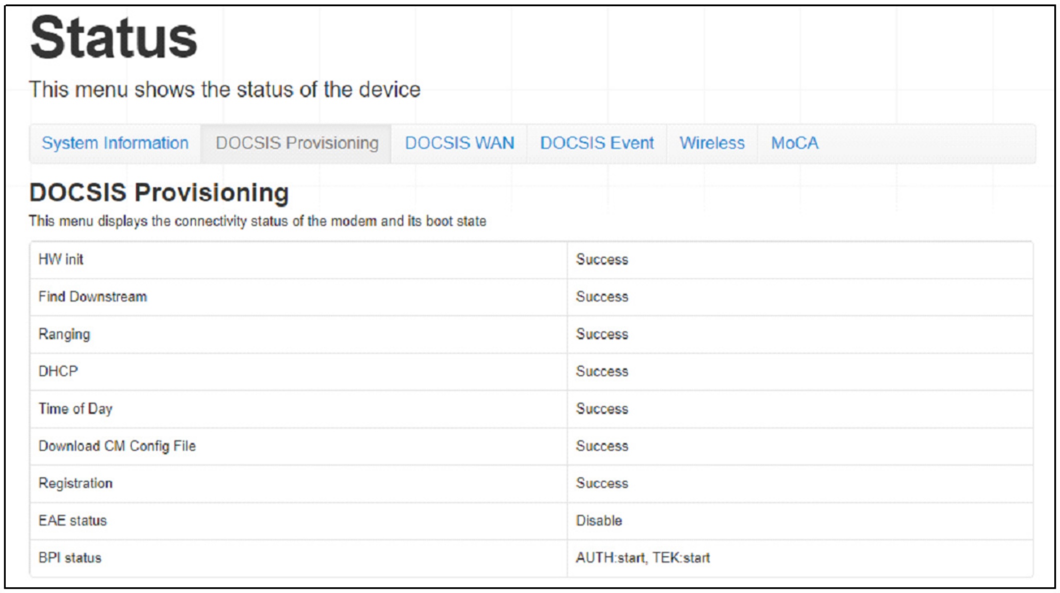
3.3 The Status: DOCSIS Provisioning Screen

This screen displays the steps successfully taken to connect to the Internet over the **Cable** connection.

Use this screen for troubleshooting purposes to ensure that the CODA-551x has successfully connected to the Internet; if an error has occurred you can identify the stage at which the failure occurred.

Click **Status** > **DOCSIS Provisioning**. The following screen displays.

Figure 16: The Status: DOCSIS Provisioning Screen



DOCSIS Provisioning

This menu displays the connectivity status of the modem and its boot state

HW init	Success
Find Downstream	Success
Ranging	Success
DHCP	Success
Time of Day	Success
Download CM Config File	Success
Registration	Success
EAE status	Disable
BPI status	AUTH:start, TEK:start

For each step:

- **Process** displays when the CODA-551x is attempting to complete a connection step.
- **Success** displays when the CODA-551x has completed a connection step.
- **Disable** displays when the relevant feature has been turned off

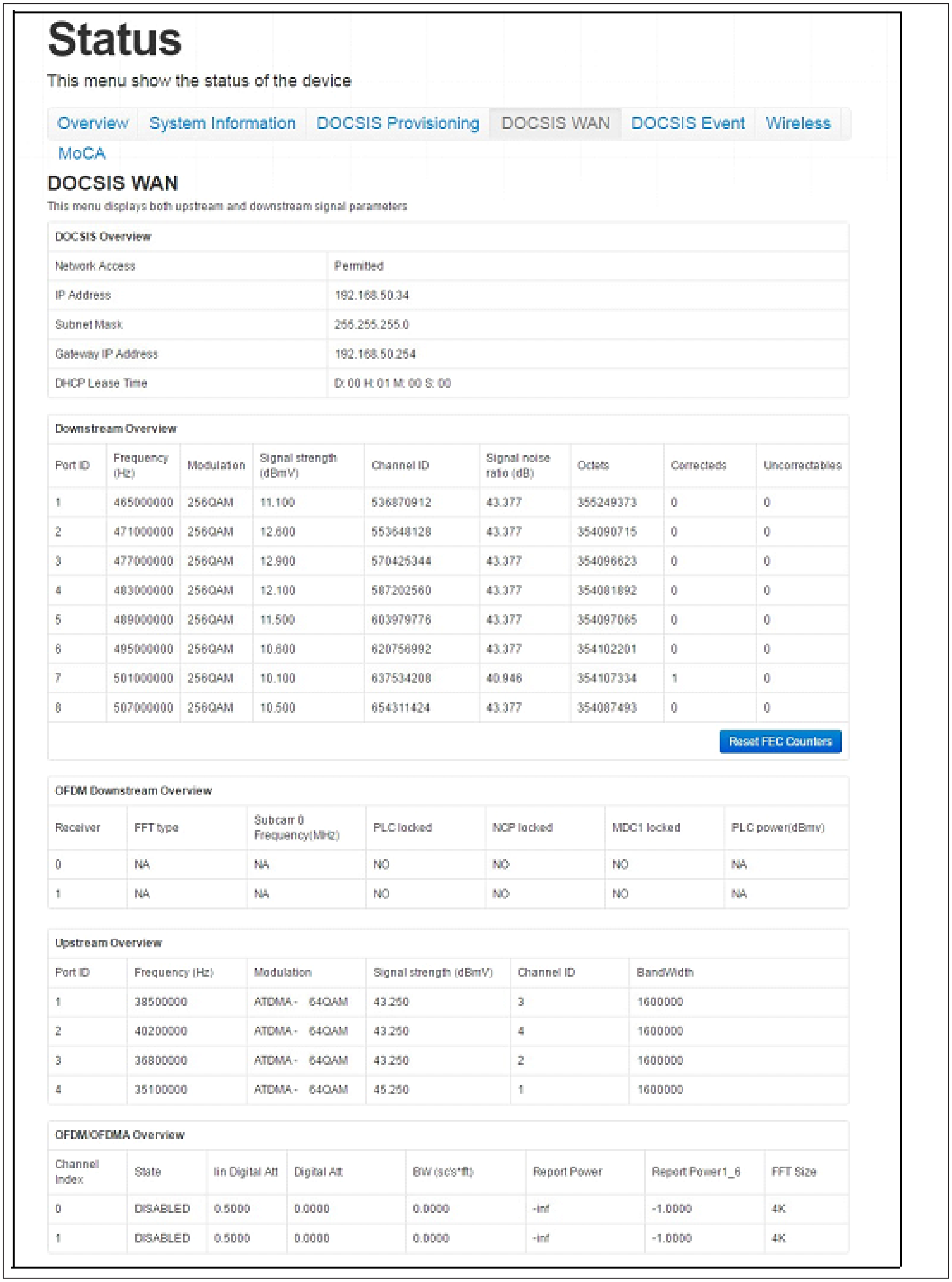
3.4 The Status: DOCSIS WAN Screen

Use this screen to discover information about:

- The nature of the upstream and downstream connection between the CODA-551x and the device to which it is connected through the **CABLE** interface.
- IP details of the CODA-551x's WAN connection.

Click **Status** > **DOCSIS WAN**. The following screen displays.

Figure 17: The Status: DOCSIS WAN Screen



Status

This menu show the status of the device

DOCSIS WAN

This menu displays both upstream and downstream signal parameters

DOCSIS Overview	
Network Access	Permitted
IP Address	192.168.50.34
Subnet Mask	255.255.255.0
Gateway IP Address	192.168.50.254
DHCP Lease Time	D: 00 H: 01 M: 00 S: 00

Downstream Overview

Port ID	Frequency (Hz)	Modulation	Signal strength (dBmV)	Channel ID	Signal noise ratio (dB)	Octets	Correcteds	Uncorrectables
1	465000000	256QAM	11.100	536870912	43.377	355249373	0	0
2	471000000	256QAM	12.600	553648128	43.377	354090715	0	0
3	477000000	256QAM	12.900	570425344	43.377	354096623	0	0
4	483000000	256QAM	12.100	587202560	43.377	354081892	0	0
5	489000000	256QAM	11.500	603979776	43.377	354097065	0	0
6	495000000	256QAM	10.600	620756992	43.377	354102201	0	0
7	501000000	256QAM	10.100	637534208	40.946	354107334	1	0
8	507000000	256QAM	10.500	654311424	43.377	354087493	0	0

OFDM Downstream Overview

Receiver	FFT type	Subcarr 0 Frequency(MHz)	PLC locked	NCP locked	MDC1 locked	PLC power(dBmv)
0	NA	NA	NO	NO	NO	NA
1	NA	NA	NO	NO	NO	NA

Upstream Overview

Port ID	Frequency (Hz)	Modulation	Signal strength (dBmV)	Channel ID	BandWidth
1	38500000	ATDMA - 64QAM	43.250	3	1600000
2	40200000	ATDMA - 64QAM	43.250	4	1600000
3	36800000	ATDMA - 64QAM	43.250	2	1600000
4	35100000	ATDMA - 64QAM	45.250	1	1600000

OFDM/OFDMA Overview

Channel Index	State	lin Digital Att	Digital Att	BW (sc's*fft)	Report Power	Report Power1_6	FFT Size
0	DISABLED	0.5000	0.0000	0.0000	-inf	-1.0000	4K
1	DISABLED	0.5000	0.0000	0.0000	-inf	-1.0000	4K

The following table describes the labels in this screen.

Table 9: The Status: DOCSIS WAN Screen

DOCSIS Overview	
Network Access	This displays whether or not your service provider allows you to access the Internet over the **CABLE** connection. ▸ **Permitted** displays if you can access the Internet. ▸ **Denied** displays if you cannot access the Internet.
IP Address	This displays the CODA-551x's WAN IP address. This IP address is automatically assigned to the CODA-551x
Subnet Mask	This displays the CODA-551x's WAN subnet mask.
Gateway IP	This displays the IP address of the device to which the CODA-551x is connected on the WAN.
DHCP Lease Time	This displays the time that elapses before your device's IP address lease expires, and a new IP address is assigned to it by the DHCP server.
Downstream Overview NOTE: The downstream signal is the signal transmitted to the CODA-551x.	
Port ID	This displays the ID number of the downstream connection's port.
Frequency (Hz)	This displays the actual frequency in Hertz (Hz) of each downstream data channel to which the CODA-551x is connected.
Modulation	This displays the type of modulation that each downstream channel uses.
Signal Strength (dBmV)	This displays the power of the signal of each downstream data channel to which the CODA-551x is connected, in dBmV (decibels above/below 1 millivolt).
Channel ID	This displays the ID number of each channel on which the downstream signal is transmitted.
Signal Noise Ratio (dB)	This displays the Signal to Noise Ratio (SNR) of each downstream data channel to which the CODA-551x is connected, in dB (decibels).
Octets	This displays the total number of octets received.

Table 9: The Status: DOCSIS WAN Screen (continued)

Correcteds	This displays the number of blocks received that required correction due to corruption, and were corrected.
Uncorrectables	This displays the number of blocks received that required correction due to corruption, but were unable to be connected.
Reset FEC Counters	Click this to return the Forward Error Connection (FEC) columns (**Correcteds** and **Uncorrectables**).
OFDM Downstream Overview	
Receiver	This displays the index number of the OFDM receiver (see OFDM on page 40).
FFT Type	This displays the type of Fast Fourier Transform in use on the relevant OFDM receiver (see FFT on page 40).
Subcarr 0 Frequency (Hz)	Each OFDM signal consists of multiple subcarriers.This displays the frequency, in Hertz, of the first OFDM subcarrier on the relevant receiver.
PLC Locked	This displays whether or not the relevant OFDM connection’s physical link channel (PLC) data is locked. The PLC tells the CODA-551x how to decode the OFDM signal, and what power level to use. Once the CODA-551x receives a PLC without uncorrectable errors, the PLC is locked and subsequent communication can continue.
NCP Locked	This displays whether or not the relevant OFDM connection’s next codeword pointer (NCP) data is locked. The NCP tells the CODA-551x which codewords are to be used for OFDM communication, and which profile to use for each codeword. Once the CODA-551x receives an NCP without uncorrectable errors, the NCP is locked and subsequent communication can continue.
MDC1 Locked	This displays whether or not the relevant OFDM connection’s Multipath Delay Commutator (MDC) data is locked. This provides information about the method of Fast Fourier Transform (FFT) to be used on the OFDM connection. Once the CODA-551x receives an MDC1 without errors, the MDC1 is locked and subsequent communication can continue.
PLC Power (dBmV)	This displays the power level the CODA-551x has been instructed to use on the relevant OFDM connection by the physical link channel (PLC) data, in dBmV (decibels above/below 1 millivolt).

Table 9: The Status: DOCSIS WAN Screen (continued)

Upstream Overview NOTE: The upstream signal is the signal transmitted from the CODA-551x.	
Port ID	This displays the ID number of the upstream connection's port.
Frequency (Hz)	This displays the actual frequency in Hertz (Hz) of each upstream data channel to which the CODA-551x is connected.
Modulation	This displays the type of modulation that each upstream channel uses.
Signal Strength (dBmV)	This displays the power of the signal of each upstream data channel to which the CODA-551x is connected, in dBmV (decibels above/below 1 millivolt).
Channel ID	This displays the ID number of each channel on which the upstream signal is transmitted.
Bandwidth	This displays the maximum available bandwidth on the relevant channel.
OFDM/OFDMA Overview NOTE: This section of the GUI provides data about upstream channels.	
Channel Index	This displays the index number of the OFDM/OFDMA channel.
State	This displays whether or not the relevant channel is currently in use, or not. ▸ **ENABLED** displays when the channel is in use. ▸ **DISABLED** displays when the channel is not in use.
Lin Digital Att.	This displays the digital attenuation, or signal loss, of the transmission medium on which the channel's signal is carried, in decibels (dB).
Digital Att.	This displays the measured digital attenuation of the channel's signal, in decibels (dB). Digital attenuation is affected by the frequency of the signal; a higher-frequency signal will suffer more attenuation than a lower-frequency signal.

Table 9: The Status: DOCSIS WAN Screen (continued)

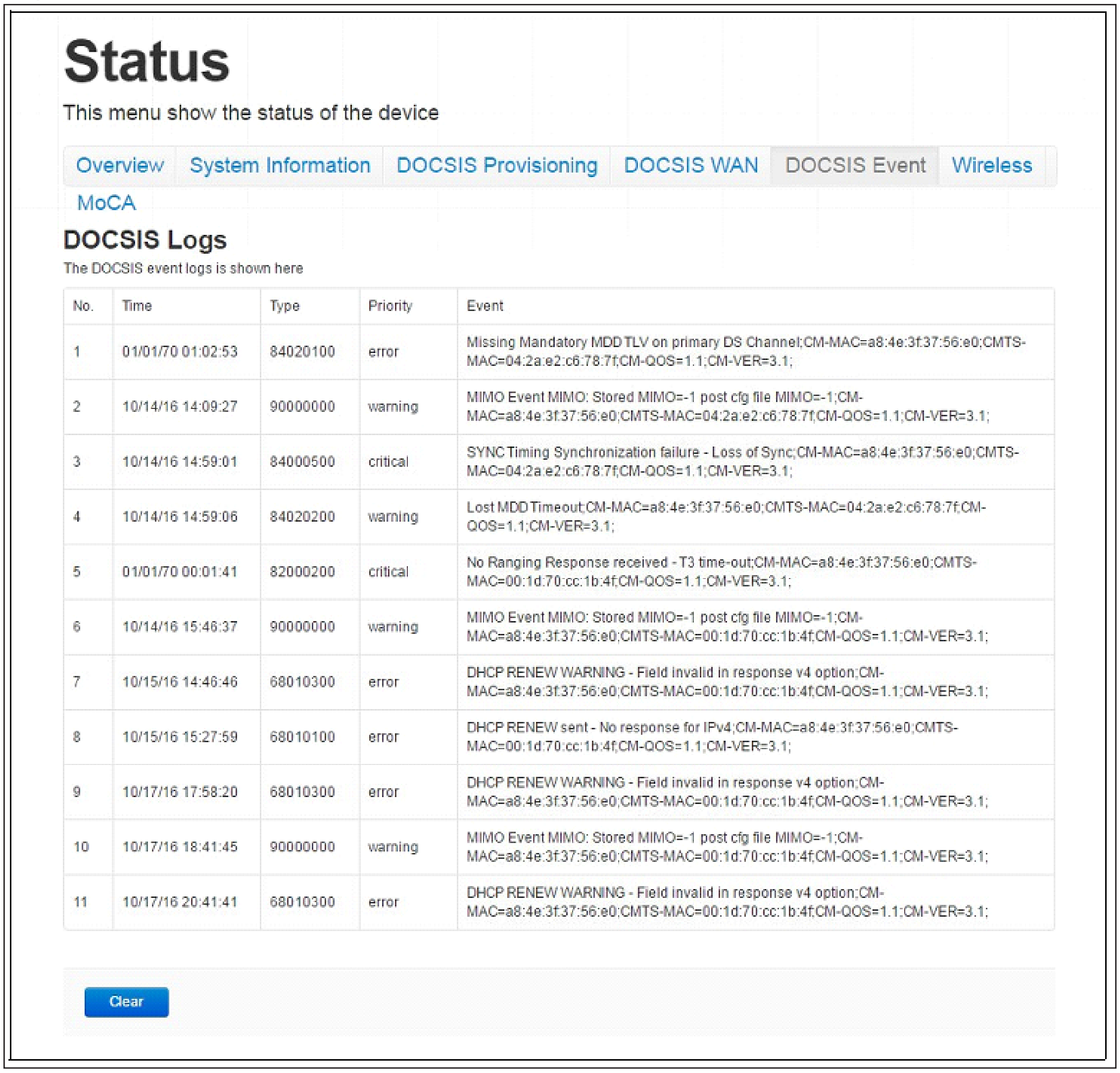
BW (sc’s*fft)	This displays the bandwidth of the relevant channel, expressed as the number of subchannels multiplied by the channel’s Fast Fourier Transform size, in megahertz (MHz).
Report Power	This displays the reported power of the relevant channel, in quarter-decibels above/below 1 millivolt (quarter-dBmV).
Report Power 1_6	This displays the target power (P1.6r_n, or power spectral density in 1.6MHz) of the relevant channel, in quarter-decibels above/below 1 millivolt (quarter-dBmV).
FFT Size	This displays the type of Fast Fourier Transform in use on the relevant channel.

3.5 The Status: DOCSIS Event Screen

Use this screen to view information about local WAN activity events.

Click **Status** > **DOCSIS Event**. The following screen displays.

Figure 18: The Status: DOCSIS Event Screen



Status

This menu show the status of the device

DOCSIS Logs

The DOCSIS event logs is shown here

No.	Time	Type	Priority	Event
1	01/01/70 01:02:53	84020100	error	Missing Mandatory MDD TLV on primary DS Channel;CM-MAC=a8:4e:3f:37:56:e0;CMTS-MAC=04:2a:e2:c6:78:7f;CM-QOS=1.1;CM-VER=3.1;
2	10/14/16 14:09:27	90000000	warning	MIMO Event MIMO: Stored MIMO=-1 post cfg file MIMO=-1;CM-MAC=a8:4e:3f:37:56:e0;CMTS-MAC=04:2a:e2:c6:78:7f;CM-QOS=1.1;CM-VER=3.1;
3	10/14/16 14:59:01	84000500	critical	SYNC Timing Synchronization failure - Loss of Sync;CM-MAC=a8:4e:3f:37:56:e0;CMTS-MAC=04:2a:e2:c6:78:7f;CM-QOS=1.1;CM-VER=3.1;
4	10/14/16 14:59:06	84020200	warning	Lost MDD Timeout;CM-MAC=a8:4e:3f:37:56:e0;CMTS-MAC=04:2a:e2:c6:78:7f;CM-QOS=1.1;CM-VER=3.1;
5	01/01/70 00:01:41	82000200	critical	No Ranging Response received - T3 time-out;CM-MAC=a8:4e:3f:37:56:e0;CMTS-MAC=00:1d:70:cc:1b:4f;CM-QOS=1.1;CM-VER=3.1;
6	10/14/16 15:46:37	90000000	warning	MIMO Event MIMO: Stored MIMO=-1 post cfg file MIMO=-1;CM-MAC=a8:4e:3f:37:56:e0;CMTS-MAC=00:1d:70:cc:1b:4f;CM-QOS=1.1;CM-VER=3.1;
7	10/15/16 14:46:46	68010300	error	DHCP RENEW WARNING - Field invalid in response v4 option;CM-MAC=a8:4e:3f:37:56:e0;CMTS-MAC=00:1d:70:cc:1b:4f;CM-QOS=1.1;CM-VER=3.1;
8	10/15/16 15:27:59	68010100	error	DHCP RENEW sent - No response for IPv4;CM-MAC=a8:4e:3f:37:56:e0;CMTS-MAC=00:1d:70:cc:1b:4f;CM-QOS=1.1;CM-VER=3.1;
9	10/17/16 17:58:20	68010300	error	DHCP RENEW WARNING - Field invalid in response v4 option;CM-MAC=a8:4e:3f:37:56:e0;CMTS-MAC=00:1d:70:cc:1b:4f;CM-QOS=1.1;CM-VER=3.1;
10	10/17/16 18:41:45	90000000	warning	MIMO Event MIMO: Stored MIMO=-1 post cfg file MIMO=-1;CM-MAC=a8:4e:3f:37:56:e0;CMTS-MAC=00:1d:70:cc:1b:4f;CM-QOS=1.1;CM-VER=3.1;
11	10/17/16 20:41:41	68010300	error	DHCP RENEW WARNING - Field invalid in response v4 option;CM-MAC=a8:4e:3f:37:56:e0;CMTS-MAC=00:1d:70:cc:1b:4f;CM-QOS=1.1;CM-VER=3.1;

The following table describes the labels in this screen.

Table 10: The Status: DOCSIS Event Screen

No	This displays the arbitrary, incremental index number assigned to the event.
Time	This displays the date and time at which the event occurred.
Type	This displays the nature of the event.
Priority	This displays the severity of the event.

Table 10: The Status: DOCSIS Event Screen (continued)

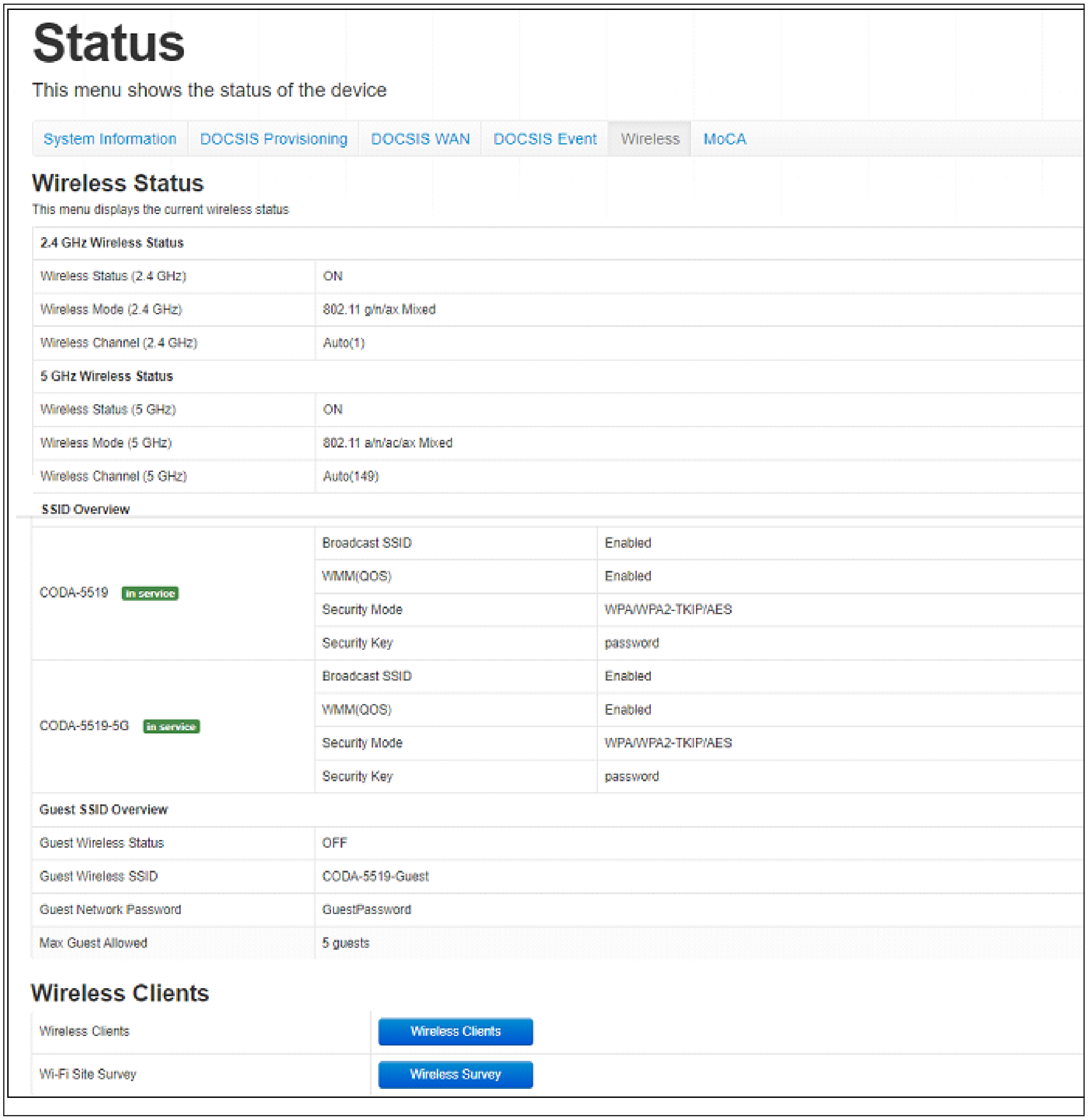
Event	This displays a description of the event.
Clear	Click this to remove all DOCSIS event logs from the system.

3.6 The Status: Wireless Screen

Use this screen to view information about the CODA-551x's wireless network.

Click **Status** > **Wireless**. The following screen displays.

Figure 19: The Status: Wireless Screen



Status

This menu shows the status of the device

Wireless Status

This menu displays the current wireless status

2.4 GHz Wireless Status	
Wireless Status (2.4 GHz)	ON
Wireless Mode (2.4 GHz)	802.11 g/n/ax Mixed
Wireless Channel (2.4 GHz)	Auto(1)
5 GHz Wireless Status	
Wireless Status (5 GHz)	ON
Wireless Mode (5 GHz)	802.11 a/n/ac/ax Mixed
Wireless Channel (5 GHz)	Auto(149)

SSID Overview		
CODA-5519 in service	Broadcast SSID	Enabled
	WMM(QOS)	Enabled
	Security Mode	WPA/WPA2-TKIP/AES
	Security Key	password
CODA-5519-5G in service	Broadcast SSID	Enabled
	WMM(QOS)	Enabled
	Security Mode	WPA/WPA2-TKIP/AES
	Security Key	password

Guest SSID Overview	
Guest Wireless Status	OFF
Guest Wireless SSID	CODA-5519-Guest
Guest Network Password	GuestPassword
Max Guest Allowed	5 guests

Wireless Clients

Wireless Clients	Wireless Clients
Wi-Fi Site Survey	Wireless Survey

The following table describes the labels in this screen.

Table 11: The Status: Wireless Screen

2.4G Wireless Status	
Wireless Status (2.4GHz)	This displays whether or not the CODA-551x's 2.4GHz wireless network is active.
Wireless Mode (2.4GHz)	This displays the type of wireless network that the CODA-551x's 2.4GHz network is using.

Table 11: The Status: Wireless Screen (continued)

Wireless Channel (2.4GHz)	This displays the wireless channel on which the CODA-551x's 2.4GHz wireless network is transmitting and receiving.
5G Wireless Status	
Wireless Status (5GHz)	This displays whether or not the CODA-551x's 5GHz wireless network is active.
Wireless Mode (5GHz)	This displays the type of wireless network that the CODA-551x's 5GHz network is using.
Wireless Channel (5GHz)	This displays the wireless channel on which the CODA-551x's 5GHz wireless network is transmitting and receiving.
SSID Overview (2.4GHz)	
(SSID)	This displays the SSID (Service Set IDentifier) of the CODA-551x's 2.4GHz wireless network, and whether or not it is currently active.
Broadcast SSID	This displays whether the CODA-551x's 2.4GHz wireless network SSID is visible to client devices (**Enabled**) or not (**Disabled**).
WMM	This displays whether Wi-Fi Multimedia is active (**Enabled**) or inactive (**Disabled**) on the CODA-551x's 2.4GHz wireless network.
Security Mode	This displays the type of security and encryption method currently enabled on the CODA-551x's 2.4GHz wireless network.
Security Key	This displays the wireless security password for the CODA-551x's 2.4GHz wireless network.
SSID Overview (5GHz)	
(SSID)	This displays the SSID (Service Set IDentifier) of the CODA-551x's 5GHz wireless network, and whether or not it is currently active.
Broadcast SSID	This displays whether the CODA-551x's 5GHz wireless network SSID is visible to client devices (**Enabled**) or not (**Disabled**).
WMM	This displays whether Wi-Fi Multimedia is active (**Enabled**) or inactive (**Disabled**) on the CODA-551x's 5GHz wireless network.

Table 11: The Status: Wireless Screen (continued)

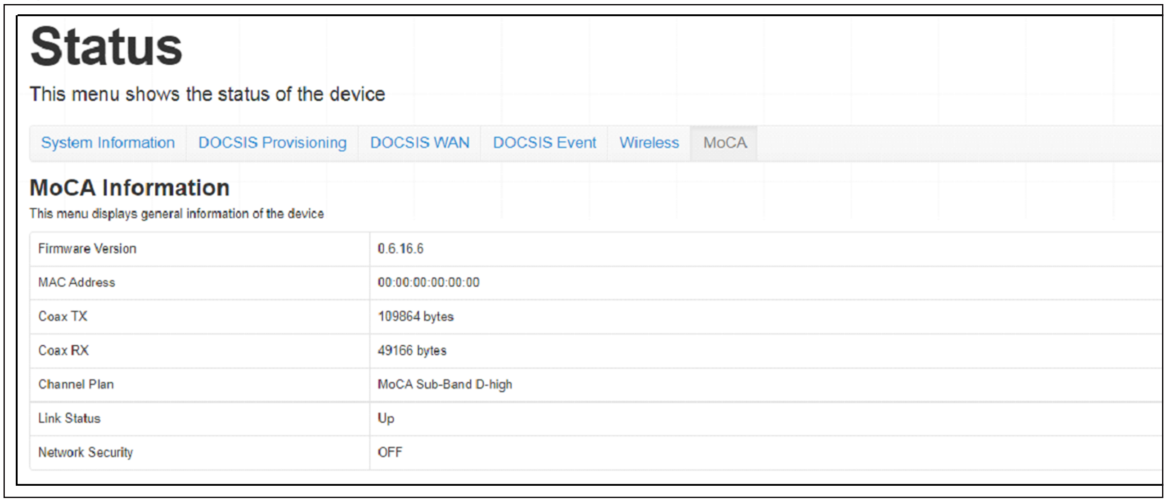
Security Mode	This displays the type of security and encryption method currently enabled on the CODA-551x's 5GHz wireless network.
Security Key	This displays the wireless security password for the CODA-551x's 5GHz wireless network.
Guest SSID Overview	
Guest Wireless Status	This displays whether the guest wireless network is active (**ON**) or inactive (**OFF**).
Guest Wireless SSID	This displays the SSID (Service Set IDentifier) of the CODA-551x's 2.4GHz wireless guest network.
Guest Wireless SSID (5Ghz)	This displays the SSID (Service Set IDentifier) of the CODA-551x's 5GHz wireless guest network.
Guest Network Password	This displays the password of both the 2.4GHz and the 5GHz wireless guest networks.
Max Guest Allowed	This displays the maximum number of wireless devices that may connect to the wireless guest network at the same time.
Wireless Clients	
Wireless Clients	Click this to display a list of the wireless devices currently connected to the CODA-551x.

3.7 The Status: MoCA Screen

Use this screen to view general information about the CODA-551x's MoCA-related settings.

Click **Status** > **MoCA**. The following screen displays.

Figure 20: The Status: MoCA Screen



Status

This menu shows the status of the device

MoCA Information

This menu displays general information of the device

Firmware Version	0.6.16.6
MAC Address	00:00:00:00:00:00
Coax TX	109864 bytes
Coax RX	49166 bytes
Channel Plan	MoCA Sub-Band D-high
Link Status	Up
Network Security	OFF

The following table describes the labels in this screen.

Table 12: The Status: MoCA Screen

Firmware Version	This displays the version number of the MoCA module’s current firmware.
Link Status	This displays whether or not the CODA-551x is connected over the cable network.
Coax TX	This displays the current MoCA transmit data rate.
Coax RX	This displays the current MoCA receive data rate.
Channel Plan	This displays the current MoCA channel plan set in this CODA-551x.
Link Status	This displays the current MoCA link status.
Network Security	This displays the MoCA Network Security is enabled or disabled in this CODA-551x.

4

Basic

This chapter describes the screens that display when you click **Basic** in the toolbar. It contains the following sections:

4.1 Basic Overview

This section describes some of the concepts related to the **Basic** screens.

4.1.1 The Domain Name System

A domain is a location on a network, for instance **example.com**. On the Internet, domain names are mapped to the IP addresses to which they should refer by the Domain Name System (DNS). This allows you to enter “www.example.com” into your browser and reach the correct place on the Internet even if the IP address of the website’s server has changed.

4.1.2 Port Forwarding

Port forwarding allows a computer on your LAN to receive specific communications from the WAN. Typically, this is used to allow certain applications (such as gaming) through the firewall, for a specific computer on the LAN. Port forwarding is also commonly used for running a public HTTP server from a private network.

You can set up a port forwarding rule for each application for which you want to open ports in the firewall. When the CODA-551x receives incoming traffic from the WAN with a destination port that matches a port forwarding rule, it forwards the traffic to the LAN IP address and port number specified in the port forwarding rule.

NOTE: For information on the ports you need to open for a particular application, consult that application's documentation.

4.1.3 Port Triggering

Port triggering is a means of automating port forwarding. The CODA-551x scans outgoing traffic (from the LAN to the WAN) to see if any of the traffic's destination ports match those specified in the port triggering rules you configure. If any of the ports match, the CODA-551x automatically opens the incoming ports specified in the rule, in anticipation of incoming traffic.

4.1.4 DMZ

In networking, the De-Militarized Zone (DMZ) is a part of your LAN that has been isolated from the rest of the LAN, and opened up to the WAN. The term comes from the military designation for a piece of territory, usually located between two opposing forces, that is isolated from both and occupied by neither.

4.1.5 Routing Mode

When your CODA-551x is in routing mode, it acts as a gateway for computers on the LAN to access the Internet. The service provider assigns an IP address to the CODA-551x on the WAN, and all traffic for LAN computers is sent to that IP address. The CODA-551x assigns private IP addresses to LAN computers (when DHCP is active), and transmits the relevant traffic to each private IP address.

NOTE: When DHCP is not active on the CODA-551x in routing mode, each computer on the LAN must be assigned an IP address in the CODA-551x's subnet manually.

When the CODA-551x is not in routing mode, the service provider assigns an IP address to each computer connected to the CODA-551x directly. The CODA-551x does not perform any routing operations, and traffic flows between the computers and the service provider.

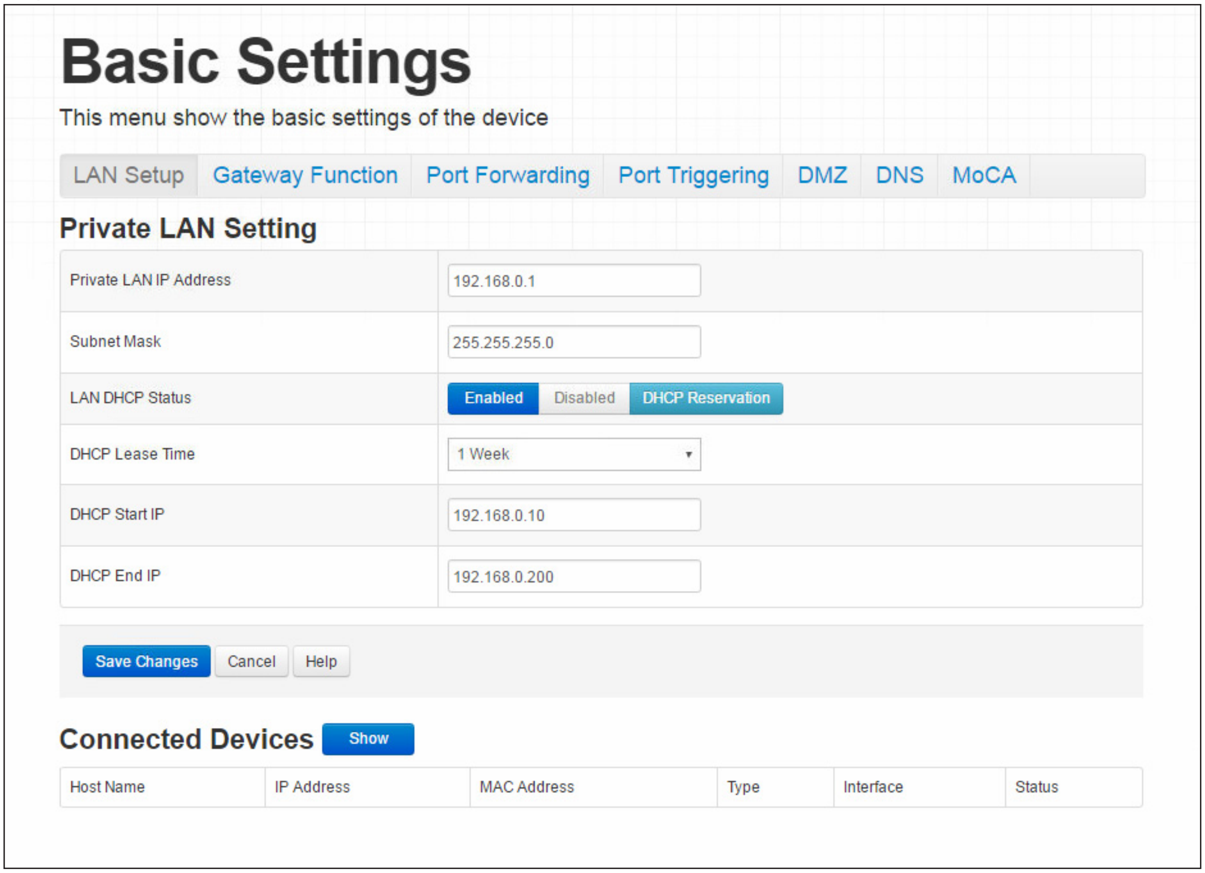
4.2 The Basic: LAN Setup Screen

Use this screen to:

- View information about the CODA-551x’s connection to the WAN
- Configure the CODA-551x’s internal DHCP server
- Define how the CODA-551x assigns IP addresses on the LAN
- See information about the network devices connected to the CODA-551x on the LAN.

Click **Basic** > **LAN Setup**. The following screen displays.

Figure 21: The Basic: LAN Setup Screen



Basic Settings

This menu show the basic settings of the device

Private LAN Setting

Private LAN IP Address	192.168.0.1
Subnet Mask	255.255.255.0
LAN DHCP Status	Enabled / Disabled / DHCP Reservation
DHCP Lease Time	1 Week
DHCP Start IP	192.168.0.10
DHCP End IP	192.168.0.200

Connected Devices

Host Name	IP Address	MAC Address	Type	Interface	Status

The following table describes the labels in this screen.

Table 13: The Basic: LAN Setup Screen

Private LAN Setting	
Private LAN IP Address	Use this field to define the IP address of the CODA-551x on the LAN.
Subnet Mask	Use this field to define the LAN subnet. Use dotted decimal notation (for example, **255.255.255.0**).
LAN DHCP Status	Use this field to configure whether or not the CODA-551x’s DHCP server is active. ▸ To turn the DHCP server on, click **Enabled**. ▸ To turn the DHCP server off, click **Disabled**.
Lease Time	Use this to select the time that elapses before your device’s IP address lease expires, and a new IP address is assigned to it by the DHCP server.

Table 13: The Basic: LAN Setup Screen (continued)

DHCP Start IP	Use this field to specify the IP address at which the CODA-551x begins assigning IP addresses to devices on the LAN (when DHCP is enabled).
DHCP End IP	Use this field to specify the IP address at which the CODA-551x stops assigning IP addresses to devices on the LAN (when DHCP is enabled). NOTE: Devices requesting IP addresses once the DHCP pool is exhausted are not assigned an IP address.
Save Changes	Click this to save your changes to the fields in this screen.
Cancel	Click this to return the fields in this screen to their last-saved values without saving your changes.
Help	Click this to see information about the fields in this screen.
Connected Computers	
Host Name	This displays the name of each network device connected on the LAN.
IP Address	This displays the IP address of each network device connected on the LAN.
MAC Address	This displays the Media Access Control (MAC) address of each network device connected on the LAN.
Type	This displays whether the device's IP address was assigned by DHCP (**DHCP-IP**), or **self-assigned**.
Interface	This displays whether the device is connected on the LAN (**Ethernet**) or the WLAN (**Wireless(x)**, where **x** denotes the wireless mode; **b**, **g** or **n**).
Status	This displays **Active** when the connected computer is online, and **Inactive** when the connected computer is offline.
Refresh	Click this to refresh the information in this section.

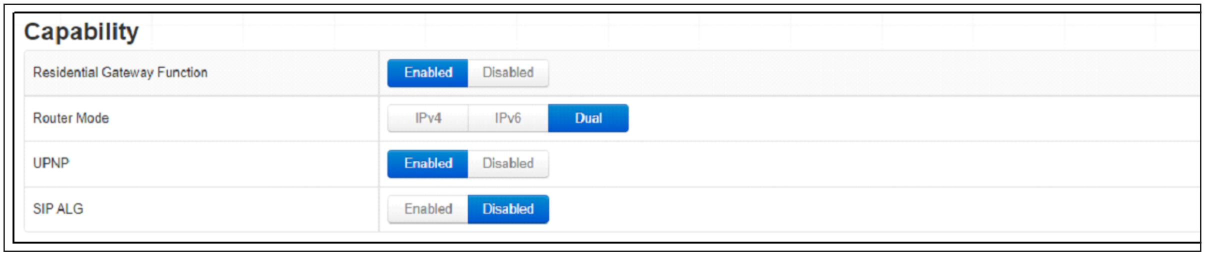
4.3 The Basic: Gateway Function Screen

Use this screen to enable or disable the CODA-551x’s residential gateway, Universal Plug n Play (UPnP) and Session Initiation Protocol Application Layer Gateway (SIP ALG) functions.

Disabling the residential gateway feature sets the unit to use bridge mode only. Use this mode when your network is already using another router.

Click **Basic** > **Gateway Function**. The following screen displays.

Figure 22: The Basic: Gateway Function Screen



Capability

Residential Gateway Function	[✓ Enabled] Disabled
Router Mode	IPv4 IPv6 [✓ Dual]
UPNP	[✓ Enabled] Disabled
SIP ALG	Enabled [✓ Disabled]

The following table describes the labels in this screen.

Table 14: The Basic: Gateway Function Screen

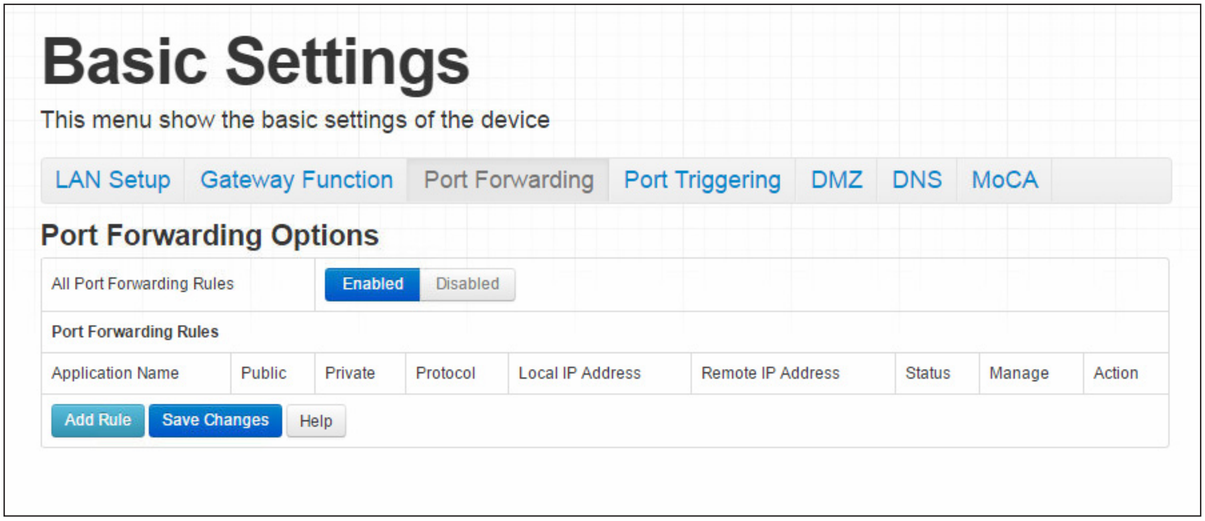
Residential Gateway function	Select **Enabled** to turn on the CODA-551x’s residential gateway features, or select **Disabled** to turn them off.
Router Mode	This field is to set the IP provision mode, it can be IPv4 only or IPv6 only or dual more for both IPv4 and IPv6.
UPnP	Select **Enabled** to turn on the CODA-551x’s Universal Plug n Play features, or select **Disabled** to turn them off.
SIP ALG	Select **Enabled** to turn on the CODA-551x’s Session Initiation Protocol Application Layer Gateway for VoIP, or select **Disabled** to turn it off.
Save Changes	Click this to save your changes to the fields in this screen.
Cancel	Click this to return the fields in this screen to their last-saved values without saving your changes.
Help	Click this to see information about the fields in this screen.

4.4 The Basic: Port Forwarding Screen

Use this screen to configure port forwarding between computers on the WAN and computers on the LAN. You can turn port forwarding on or off and configure new and existing port forwarding rules.

Click **Basic** > **Port Forwarding**. The following screen displays.

Figure 23: The Basic: Port Forwarding Screen



Basic Settings

This menu show the basic settings of the device

Port Forwarding Options

All Port Forwarding Rules: Enabled Disabled

Port Forwarding Rules

Application Name	Public	Private	Protocol	Local IP Address	Remote IP Address	Status	Manage	Action

The following table describes the labels in this screen.

Table 15: The Basic: Port Forwarding Screen

All Port Forwarding Rules	Use this field to turn port forwarding on or off. ‣ Select **Enabled** to turn port forwarding on. ‣ Select **Disabled** to turn port forwarding off.
Port Forwarding Rules	
Application Name	This displays the arbitrary name you assigned to the rule when you created it.
Public	These fields display the ports to which the rule applies: ‣ The **Public** field displays the incoming port range. These are the ports on which the CODA-551x received traffic from the originating host on the WAN. ‣ The **Private** field displays the port range to which the CODA-551x forwards traffic to the device on the LAN.
Private	

Table 15: The Basic: Port Forwarding Screen (continued)

Protocol	This field displays the protocol or protocols to which this rule applies: ▸ Transmission Control Protocol (**TCP**) ▸ User Datagram Protocol (**UDP**) ▸ Transmission Control Protocol and User Datagram Protocol (**TCP/UDP**) ▸ Generic Routing Encapsulation (**GRE**) ▸ Encapsulating Security Protocol (**ESP**)
Local IP Address	This displays the IP address of the computer on the LAN to which traffic conforming to the **Public Port Range** and **Protocol** conditions is forwarded.
Remote IP Address	This displays the IP address of the computer on the WAN from which traffic conforming to the **Public Port Range** and **Protocol** conditions is forwarded to the **Local IP Address**.
Status	Use this to turn the port forwarding rule on or off. ▸ Select **ON** to activate the port forwarding rule. ▸ Select **OFF** to deactivate the port forwarding rule.
Manage	Click this to make changes to the rule.
Action	Use this to delete the rule.
Add Rule	Click this to define a new port forwarding rule. See Adding or Editing a Port Forwarding Rule on page 63 for information on the screen that displays.
Save Changes	Click this to save your changes to the fields in this screen.
Help	Click this to see information about the fields in this screen.

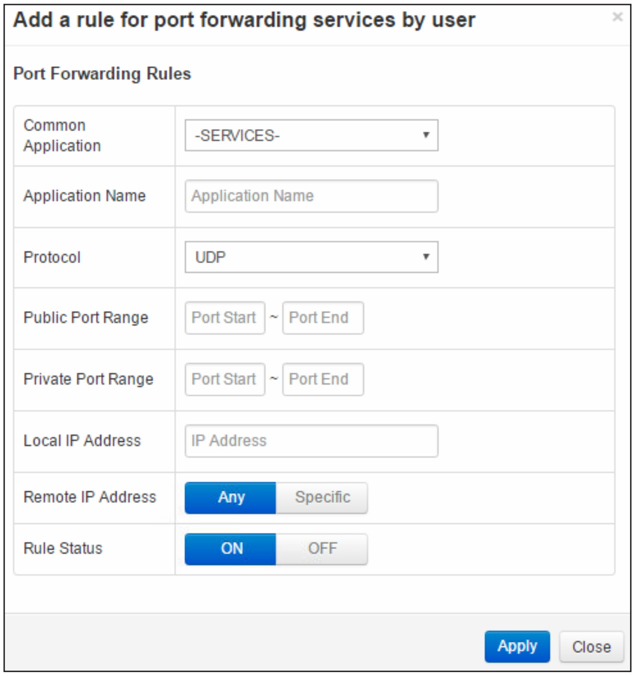
4.4.1 Adding or Editing a Port Forwarding Rule

- To add a new port forwarding rule, click **Add** in the **Basic** > **Port Forwarding** screen.
- To edit an existing port forwarding rule, select the rule's radio button in the **Basic** > **Port Forwarding** screen and click the **Edit** button.

NOTE: Ensure that **Enabled** is selected in the **Basic** > **Port Forwarding** screen in order to add or edit port forwarding rules.

The following screen displays.

Figure 24: The Basic: Port Forwarding Add/Edit Screen



Add a rule for port forwarding services by user ×

Port Forwarding Rules

Common Application	-SERVICES- ▾
Application Name	Application Name
Protocol	UDP ▾
Public Port Range	Port Start ~ Port End
Private Port Range	Port Start ~ Port End
Local IP Address	IP Address
Remote IP Address	Any / Specific
Rule Status	ON / OFF

The following table describes the labels in this screen.

Table 16: The Basic: Port Forwarding Add/Edit Screen

Common Application	Use this field to select the application for which you want to create a port forwarding rule, if desired.
Application Name	Enter a name for the application for which you want to create the rule. NOTE: This name is arbitrary, and does not affect functionality in any way.

Table 16: The Basic: Port Forwarding Add/Edit Screen

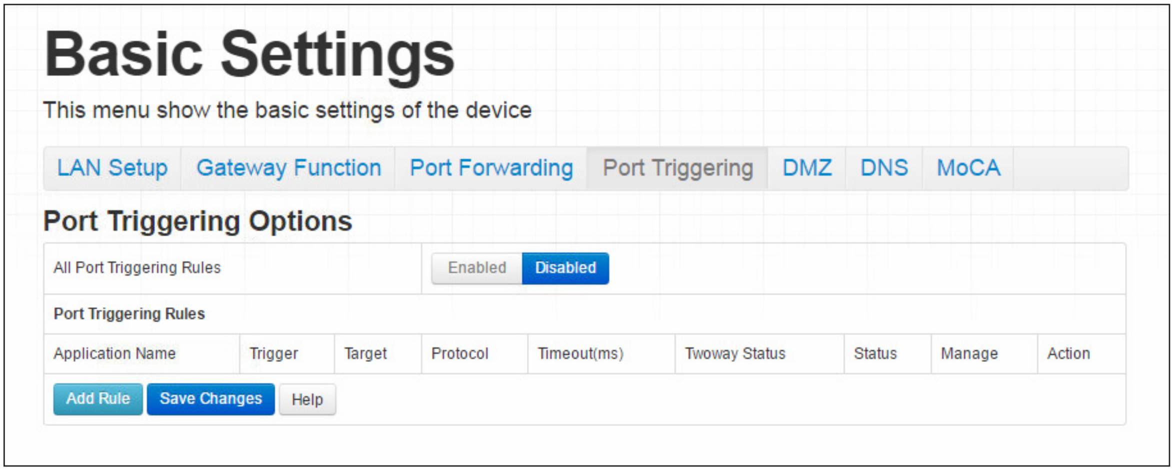
Protocol	Use this field to specify whether the CODA-551x should forward traffic via: - Transmission Control Protocol (**TCP**) - User Datagram Protocol (**UDP**) - Transmission Control Protocol and User Datagram Protocol (**TCP/UDP**) - Generic Routing Encapsulation (**GRE**) - Encapsulating Security Protocol (**ESP**) NOTE: If in doubt, leave this field at its default (**TCP/UDP**).
Public Port Range	Use these fields to specify the incoming port range. These are the ports on which the CODA-551x receives traffic from the originating host on the WAN. Enter the start port number in the first field, and the end port number in the second field. To specify only a single port, enter its number in both fields.
Private Port Range	Use these fields to specify the ports to which the received traffic should be forwarded. Enter the start port number in the first field. The number of ports must match that specified in the **Public Port Range**, so the CODA-551x completes the second field automatically.
Local IP Address	Use this field to enter the IP address of the computer on the LAN to which you want to forward the traffic.
Remote IP Address	Use this field to enter the IP address of the computer on the WAN from which you want to forward the traffic.
Rule Status	Select **ON** to enable this rule, or select **OFF** to disable it.
Apply	Click this to save your changes to the fields in this screen.
Close	Click this to return to the **Port Forwarding** screen without saving your changes to the rule.

4.5 The Basic: Port Triggering Screen

Use this screen to configure port triggering. You can turn port triggering on or off and configure new and existing port triggering rules.

Click **Basic** > **Port Triggering**. The following screen displays.

Figure 25: The Basic: Port Triggering Screen



Basic Settings

This menu show the basic settings of the device

Port Triggering Options

All Port Triggering Rules: Enabled [✓ Disabled]

Port Triggering Rules

Application Name	Trigger	Target	Protocol	Timeout(ms)	Twoway Status	Status	Manage	Action

The following table describes the labels in this screen.

Table 17: The Basic: Port Triggering Screen

All Port Triggering Rules	Use this field to turn port triggering on or off. - Select **Enabled** to turn port triggering on. - Select **Disabled** to turn port triggering off.
Port Triggering Rules	
Application Name	This displays the name you assigned to the rule when you created it.
Trigger	This displays the range of outgoing ports. When the CODA-551x detects activity (outgoing traffic) on these ports from computers on the LAN, it automatically opens the **Target** ports.
Target	This displays the range of triggered ports. These ports are opened automatically when the CODA-551x detects activity on the **Trigger** ports from computers on the LAN.
Protocol	This displays the protocol of the port triggering rule (**TCP**, **UDP** or **Both**).

Table 17: The Basic: Port Triggering Screen (continued)

Timeout (ms)	This displays the time (in milliseconds) after the CODA-551x opens the **Target** ports that it should close them.
Twoway Status	Usually a port triggering rule works for two IP addresses; when a rule is enabled, other IPs will also be allowed to use the rule as a trigger.
Status	Use this field to turn the rule **On** or **Off**.
Manage	Click this to make changes to the rule.
Action	Use this to delete the rule.
Add Rule	Click this to define a new port forwarding rule. See Adding or Editing a Port Forwarding Rule on page 63 for information on the screen that displays.
Save Changes	Click this to save your changes to the fields in this screen.
Help	Click this to see information about the fields in this screen.

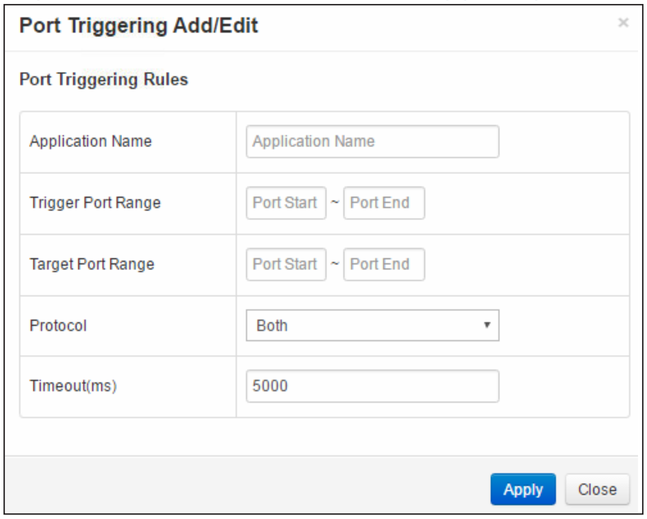
4.5.1 Adding or Editing a Port Triggering Rule

- To add a new port triggering rule, click **Add** in the **Basic** > **Port Triggering** screen.
- To edit an existing port triggering rule, select the rule’s radio button in the **Basic** > **Port Triggering** screen and click the **Edit** button.

NOTE: Ensure that **Enabled** is selected in the **Basic** > **Port Triggering** screen in order to add or edit port triggering rules.

The following screen displays.

Figure 26: The Basic: Port Triggering Add/Edit Screen



Port Triggering Add/Edit

Port Triggering Rules

Application Name	Application Name
Trigger Port Range	Port Start ~ Port End
Target Port Range	Port Start ~ Port End
Protocol	Both
Timeout(ms)	5000

The following table describes the labels in this screen.

Table 18: The Basic: Port Triggering Add/Edit Screen

Application Name	Enter a name for the application for which you want to create the rule. NOTE: This name is arbitrary, and does not affect functionality in any way.
Trigger Port Range	Use these fields to specify the trigger ports. When the CODA-551x detects activity on any of these ports originating from a computer on the LAN, it automatically opens the **Target** ports in expectation of incoming traffic. Enter the start port number in the first field, and the end port number in the second field. To specify only a single port, enter its number in both fields.
Target Port Range	Use these fields to specify the target ports. The CODA-551x opens these ports in expectation of incoming traffic whenever it detects activity on any of the **Trigger** ports. The incoming traffic is forwarded to these ports on the computer connected to the LAN. Enter the start port number in the first field, and the end port number in the second field. To specify only a single port, enter its number in both fields.

Table 18: The Basic: Port Triggering Add/Edit Screen

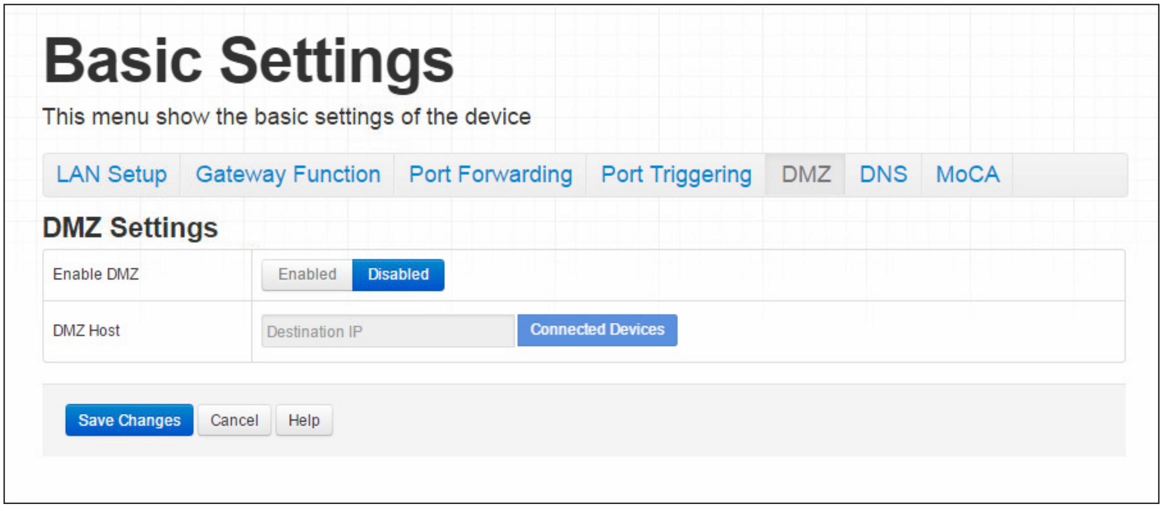
Protocol	Use this field to specify whether the CODA-551x should activate this trigger when it detects activity via: - Transmission Control Protocol (**TCP**) - User Datagram Protocol (**UDP**) - Transmission Control Protocol and User Datagram Protocol (**Both**) NOTE: If in doubt, leave this field at its default (**Both**).
Timeout (ms)	Enter the time (in milliseconds) after the CODA-551x opens the **Target** ports that it should close them.
Apply	Click this to save your changes to the fields in this screen.
Close	Click this to return to the **Port Triggering** screen without saving your changes to the rule.

4.6 The Basic: DMZ Screen

Use this screen to configure your network's Demilitarized Zone (DMZ).

Click **Basic** > **DMZ**. The following screen displays.

Figure 27: The Basic: DMZ Screen



Basic Settings

This menu show the basic settings of the device

DMZ Settings

Enable DMZ: Enabled [✓ Disabled]

DMZ Host: Destination IP

The following table describes the labels in this screen.

Table 19: The Basic: DMZ Screen

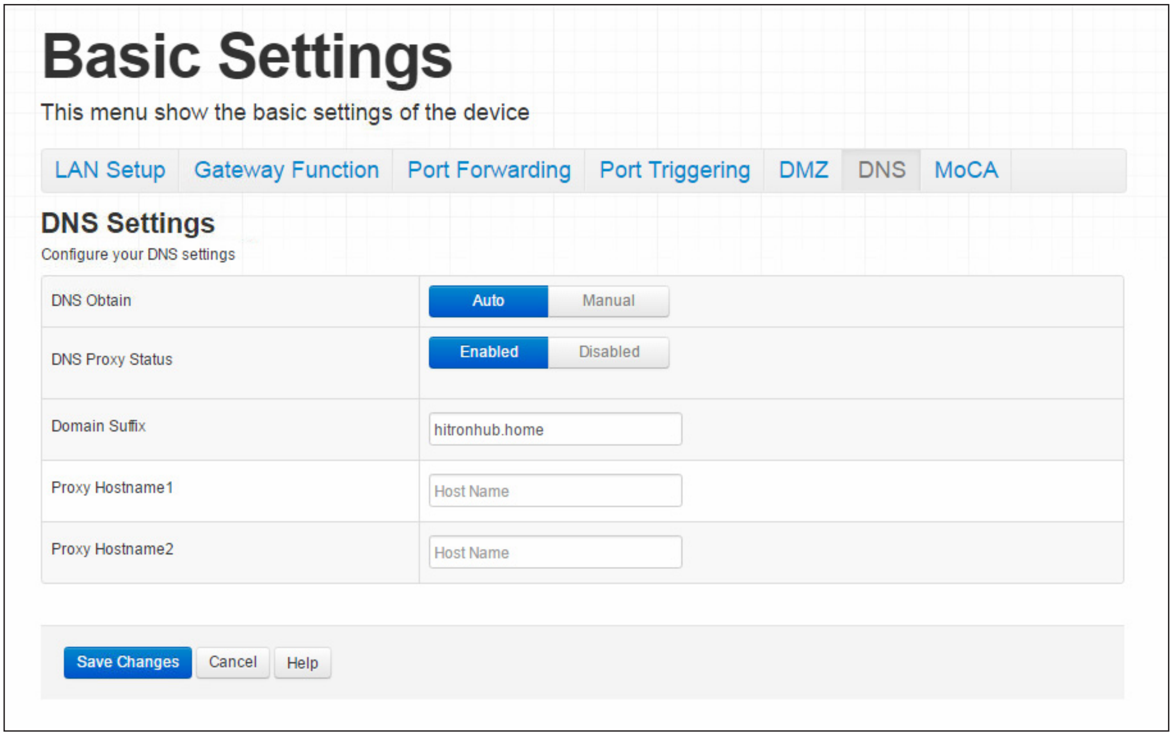
Enable DMZ	Use this field to turn the DMZ on or off. ▸ Select **Enabled** to turn the DMZ on. ▸ Select **Disabled** to turn the DMZ off. Computers that were previously in the DMZ are now on the LAN.
DMZ Host	Enter the IP address of the computer that you want to add to the DMZ.
Connected Devices	Click this to see a list of the computers currently connected to the CODA-551x on the LAN.
Save Changes	Click this to save your changes to the fields in this screen.
Cancel	Click this to return the fields in this screen to their last-saved values without saving your changes.
Help	Click this to see information about the fields in this screen.

4.7 The Basic: DNS Screen

Use this screen to configure the CODA-551x's LAN DNS settings, including its subnet mask, domain suffix and proxy hostname.

Click **Basic** > **DNS**. The following screen displays.

Figure 28: The Basic: DNS Screen



Basic Settings

This menu show the basic settings of the device

DNS Settings

Configure your DNS settings

DNS Obtain	● Auto ○ Manual
DNS Proxy Status	● Enabled ○ Disabled
Domain Suffix	hitronhub.home
Proxy Hostname1	Host Name
Proxy Hostname2	Host Name

The following table describes the labels in this screen.

Table 20: The Basic: DNS Screen

DNS Obtain	Use this to select whether to obtain DNS information automatically over the network, or to define it manually. - Select **Auto** to obtain DNS information automatically. - Select **Manual** to obtain DNS information manually.
DNS Proxy Status	Use this to turn DNS proxy on or off on the LAN. When DNS proxy is turned on (default) the DHCP server provides the CODA-551x’s LAN IP address as the DNS server for name resolution. - Selected **Enabled** to turn DNS proxy on. - Selected **Disabled** to turn DNS proxy off.

Table 20: The Basic: DNS Screen (continued)

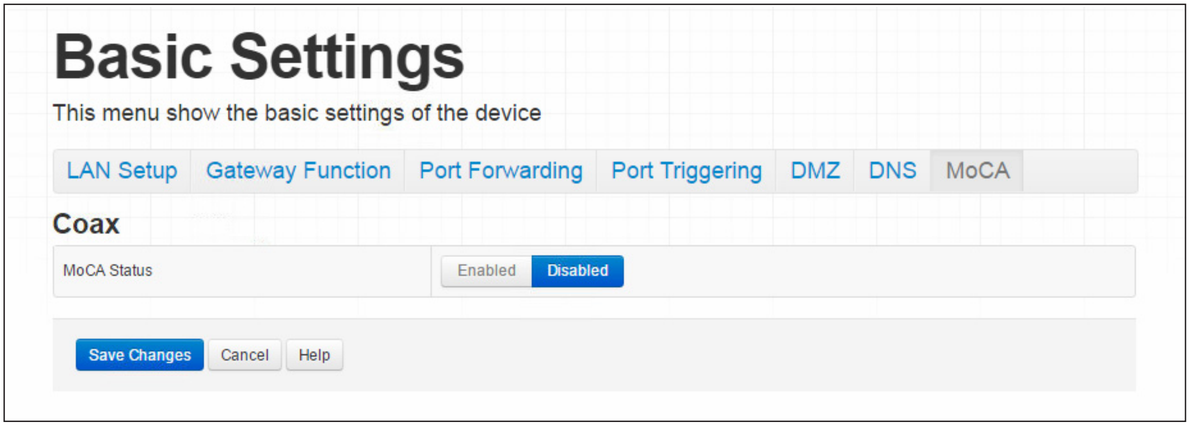
Domain Suffix	Use this field to define the domain that you can enter into a Web browser (instead of an IP address) to reach the CODA-551x on the LAN. NOTE: It is suggested that you make a note of your device’s **Domain Suffix** in case you ever need to access the CODA-551x’s GUI without knowledge of its IP address.
Proxy Hostname 1	When **LAN DNS Obtain** is set to **Manual**, enter the IP addresses of up to two computers for which you want to manually add to the DNS.
Proxy Hostname 2	
Save Changes	Click this to save your changes to the fields in this screen.
Cancel	Click this to return the fields in this screen to their last-saved values without saving your changes.
Help	Click this to see information about the fields in this screen.

4.8 The Basic: MoCA Screen

Use this screen to turn the CODA-551x’s Multimedia over Cable Alliance (MoCA) features on or off.

Click **Basic** > **MoCA**. The following screen displays.

Figure 29: The Basic: MoCA Screen



Basic Settings

This menu show the basic settings of the device

Coax

MoCA Status: Enabled [✓ Disabled]

The following table describes the labels in this screen.

Table 21: The Basic: MoCA Screen

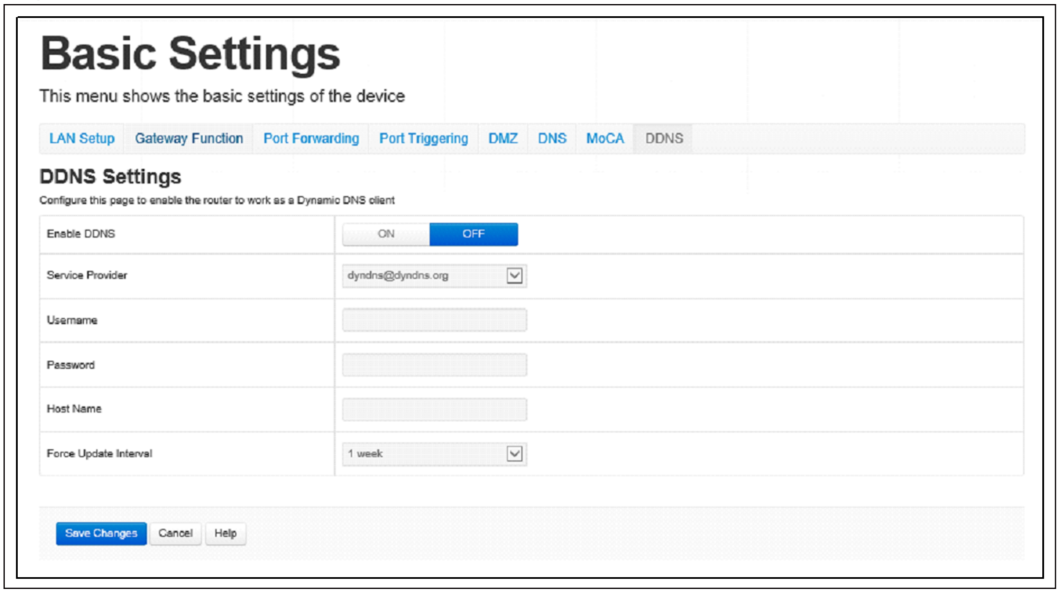
MoCA Status	▸ Select **Enabled** to turn the MoCA network off. ▸ Select **Disabled** to turn the MoCA network connection off.
Save Changes	Click this to save your changes to the fields in this screen.
Cancel	Click this to return the fields in this screen to their last-saved values without saving your changes.
Help	Click this to see information about the fields in this screen.

4.9 The Basic: DDNS Screen

Use this screen to enable the CODA-551x's router work as a Dynamic DNS client.

Click **Basic** > **DDNS** The following screen displays.

Figure 30: The Basic: DDNS Screen



Basic Settings

This menu shows the basic settings of the device

DDNS Settings

Configure this page to enable the router to work as a Dynamic DNS client

Enable DDNS	ON [✓ OFF]
Service Provider	dyndns@dyndns.org
Username	
Password	
Host Name	
Force Update Interval	1 week

The following table describes the labels in this screen.

Table 22: The Basic: DDNS Screen

Enable DDNS	To Enable or Disable the DDNS function.
Service Provider	Select your DDNS service provider from the drop down menu.
Username	Enter the username of your DDNS service account if any.
Password	Enter the password of your DDNS service account if any.
Host Name	The host name of your DDNS service.
Force Update Interval	Select a period of time to update your IP information to the DDNS service provider.

5

Wireless

This chapter describes the screens that display when you click **Wireless** in the toolbar. It contains the following sections:

5.1 Wireless Overview

This section describes some of the concepts related to the **Wireless** screens.

5.1.1 Wireless Networking Basics

Your CODA-551x's wireless network is part of the Local Area Network (LAN), known as the Wireless LAN (WLAN). The WLAN is a network of radio links between the CODA-551x and the other computers and devices that connect to it.

5.1.2 Architecture

The wireless network consists of two types of device: access points (APs) and clients.

- The access point controls the network, providing a wireless connection to each client.

- The wireless clients connect to the access point in order to receive a wireless connection to the WAN and the wired LAN.

The CODA-551x is the access point, and the computers you connect to the CODA-551x are the wireless clients.

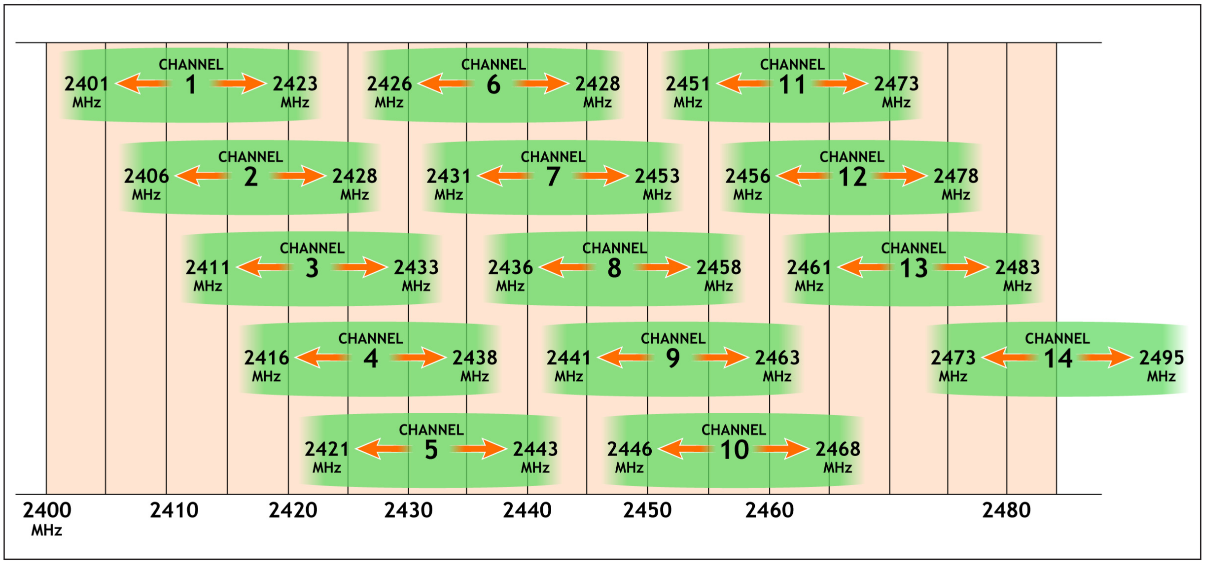
5.1.3 Wireless Frequency Ranges and Channels

Communication on the wireless network between the client and the access point takes place within specific ranges of the radio spectrum. The most common such ranges are 2400MHz ~ 2500MHz, known as the 2.4GHz band, and 5725MHz ~ 5875MHz, known as the 5GHz band.

These frequency ranges are themselves divided into multiple channels, in order to allow multiple networks to operate in the same location or overlapping locations. In a wireless network, the access point and its clients all communicate on the same radio channel.

In the 2.4GHz band, there are fourteen channels, although not all are available in all parts of the world; for instance, in North America only eleven are allowed. Each channel is 20MHz wide (although many devices can improve bandwidth by combining two channels into a single 40MHz channel) and each channel's center frequency is 5MHz greater than that of the previous channel. This means that channels overlap, potentially creating signal interference between networks competing in the same space. Therefore, selecting channels that are not used by neighboring devices, and as far as possible do not overlap with the channels ued by such devices, is important in order to minimize interference and maximize performance. The situation in the 5GHz band is more complex, but the same principles apply.

Figure 31: 2.4GHz Wireless Channel Overlap



5.1.3.1 Automatic Channel Selection

The CODA-551x's Automatic Channel Selection (ACS) feature enables the wireless module to scan the wireless network environment, discover the channel on which interference is least present, and use that channel automatically for wireless communications on the relevant network.

Environmental analysis and channel selection occurs when the CODA-551x's wireless network first starts (when the relevant wireless network's radio channel is already set to **Auto** mode), when **Auto** mode is first selected, when the **Refresh** button is pressed, or under certain specific circumstances when Dynamic Channel Change is enabled (see Dynamic Channel Change on page 78).

5.1.3.2 Band Steering

When wireless client devices are capable of operating on both the 2.4GHz band and the 5GHz band, it is generally desirable for them to connect to the CODA-551x on the 5GHz wireless network, due to the likelihood of there being less interference on that band. When enabled, band steering does this by detecting whether wireless clients are also 5GHz-capable and, if so, encouraging the client to connect on the 5GHz wireless network rather than the 2.4GHz wireless network.

5.1.3.3 Dynamic Channel Change

Dynamic Channel Change (DCC) improves strength and continuity of wireless signal even when environmental conditions change, by enabling Automatic Channel Selection (see Automatic Channel Selection on page 77) to be triggered when the current channel's interference reduces the data transmission rate below a threshold level.

NOTE: At the time of writing, the data transmission threshold level is 150Mbps; this is the bandwidth required to simultaneously transmit four high-definition video streams to the CODA-551x's wireless clients.

When DCC is enabled, a check of all available wireless channels is performed regularly. If the signal quality of the current channel deteriorates below the threshold level, the CODA-551x switches to a channel with superior signal quality.

NOTE: At the time of writing, the DCC check is performed sixty times a minute.

When environmental conditions mean there is no available channel with acceptable signal quality, DCC is automatically disabled if channel switching occurs too often in any period, in order to avoid the inconvenience of rapid unnecessary switching.

NOTE: At the time of writing, DCC is automatically disabled if automatic channel switching occurs more than three times in any five minute period.

NOTE: At the time of writing, DCC is only available on the 5GHz wireless network.

5.1.4 Wireless Standards

The way in which wireless devices communicate with one another is standardized by the Institute of Electrical and Electronics Engineers (IEEE). The IEEE standards pertaining to wireless LANs are identified by their 802.11 designation. There are a variety of WLAN standards, but the CODA-551x supports the following (in order of adoption - old to new - and data transfer speeds - low to high):

- IEEE 802.11g
- IEEE 802.11n
- IEEE 802.11ac
- IEEE 802.11ax

5.1.5 Service Sets and SSIDs

Each wireless network, including all the devices that comprise it, is known as a Service Set.

NOTE: Depending on its capabilities and configuration, a single wireless access point may control multiple Service Sets; this is often done to provide different service or security levels to different clients.

Each Service Set is identified by a Service Set IDentifier (SSID). This is the name of the network. Wireless clients must know the SSID in order to be able to connect to the AP. You can configure the CODA-551x to broadcast the SSID (in which case, any client who scans the airwaves can discover the SSID), or to “hide” the SSID (in which case it is not broadcast, and only users who already know the SSID can connect).

5.1.6 Wireless Security

Radio is inherently an insecure medium, since it can be intercepted by anybody in the coverage area with a radio receiver. Therefore, a variety of techniques exist to control authentication (identifying who should be allowed to join the network) and encryption (signal scrambling so that only authenticated users can decode the transmitted data). The sophistication of each security method varies, as does its effectiveness. The CODA-551x supports the following wireless security protocols (in order of effectiveness):

- **WPA-PSK** (WiFi Protected Access - Pre-Shared Key): WPA was created to solve the inadequacies of WEP, the Wired Equivalency Protocol, which is now considered obsolete. There are two types of WPA: the “enterprise” version (known simply as WPA) requires the use of a central authentication database server, whereas the “personal” version (supported by the CODA-551x) allows users to authenticate using a “pre-shared key” or password instead. While WPA provides good security, it is still vulnerable to “brute force” password-guessing attempts (in which an attacker simply barrages the AP with join requests using different passwords), so for optimal security it is advised that you use a random password of thirteen characters or more, containing no “dictionary” words.
- **WPA2-PSK**: WPA2 is an improvement on WPA. The primary difference is that WPA uses the Temporal Key Integrity Protocol (TKIP) encryption standard (which has been shown to have certain possible weaknesses), whereas WPA2 uses the stronger Advanced Encryption Standard (AES) in the Counter mode with Cipher block chaining Message authentication code Protocol (CCMP),

which has received the US government's seal of approval for communications up to the Top Secret security level. Since WPA2-PSK uses the same pre-shared key mechanism as WPA-PSK, the same caveat against using insecure or simple passwords applies.

NOTE: The CODA-551x can be configured to use the TKIP encryption standard; however, this limits the wireless network speed to 54Mbps (802.11g speed).

5.1.6.1 WPS

WiFi-Protected Setup (WPS) is a standardized method of allowing wireless devices to quickly and easily join wireless networks, while maintaining a good level of security. The CODA-551x provides two methods of WPS authentication:

- **Push-Button Configuration (PBC)**: when the user presses the **PBC** button on the AP (either a physical button, or a virtual button in the GUI), any user of a wireless client that supports WPS can press the corresponding **PBC** button on the client within two minutes to join the network.
- **Personal Identification Number (PIN) Configuration**: all WPS-capable devices possess a PIN (usually to be found printed on a sticker on the device's housing). When you configure another device to use the same PIN, the two devices authenticate with one another.

Once authenticated, devices that have joined a network via WPS use the WPA2 security standard.

5.1.7 WMM

WiFi MultiMedia (WMM) is a Quality of Service (QoS) enhancement that allows prioritization of certain types of data over the wireless network. WMM provides four data type classifications (in priority order; highest to lowest):

- Voice
- Video
- Best effort
- Background

If you wish to improve the performance of voice and video (at the expense of other, less time-sensitive applications such as Internet browsing and FTP transfers), you can enable WMM. You can also edit the WMM QoS parameters, but are disadvised to do so unless you have an extremely good reason to make the changes.

5.2 The Wireless: Basic Settings Screen

Use this screen to configure your CODA-551x’s 2.4GHz, 5GHz, Wifi Protected Setup (WPS) and guest network wireless settings.

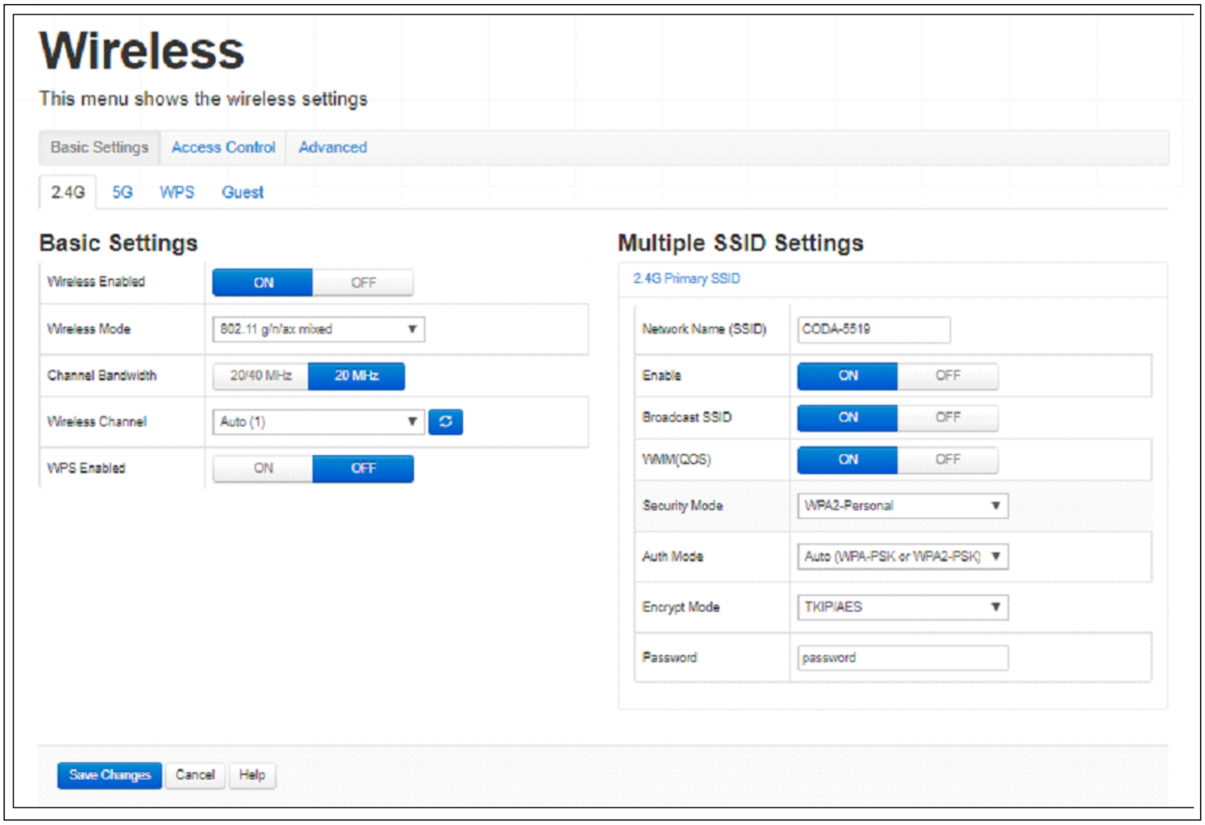
- Use the 2.4GHz network screen to enable 2.4GHz wireless clients to connect to the CODA-551x. See The Wireless: Basic Settings: 2.4G Screen on page 81.
- Use the 5GHz network screen to enable 5GHz wireless clients to connect to the CODA-551x. See The Wireless: Basic Settings: 5G Screen on page 85.
- Use the WPS screen to enable WPS-capable wireless clients to connect to the CODA-551x via a simple push-button, or by entering a password. See The Wireless: Basic Settings: WPS Screen on page 89.
- Use the Guest Network screen to enable wireless clients to connect to the CODA-551x with reduced privileges. See The Wireless: Basic Settings: Guest Screen on page 90.

5.2.1 The Wireless: Basic Settings: 2.4G Screen

Use this screen to configure the CODA-551x’s 2.4GHz wireless network.

Click **Wireless** > **Basic Settings** > **2.4G**. The following screen displays.

Figure 32: The Wireless: Basic Settings: 2.4G Screen



Wireless

This menu shows the wireless settings

Basic Settings

Wireless Enabled	ON
Wireless Mode	802.11 g/n/ax mixed
Channel Bandwidth	20 MHz
Wireless Channel	Auto (1)
WPS Enabled	OFF

Multiple SSID Settings

2.4G Primary SSID

Network Name (SSID)	CODA-5519
Enable	ON
Broadcast SSID	ON
WMM(QOS)	ON
Security Mode	WPA2-Personal
Auth Mode	Auto (WPA-PSK or WPA2-PSK)
Encrypt Mode	TKIP/AES
Password	password

The following table describes the labels in this screen.

Table 23: The Wireless: Basic Settings: 2.4G Screen

Basic Settings	
Wireless Enabled	▸ Select **On** to enable the 2.4GHz wireless network. ▸ Select **Off** to enable the 2.4GHz wireless network.
Wireless Mode	Select the type of 2.4GHz wireless network that you want to use: ▸ **802.11 g Only**: use IEEE 802.11g. ▸ **802.11 n Only**: use IEEE 802.11n. ▸ **802.11 g/n Mixed**: use IEEE 802.11g and 802.11n. ▸ **802.11 g/n/ax Mixed**: use IEEE 802.11g, 802.11n and 802.11ax. Only wireless clients that support the network protocol you select can connect to the wireless network. If in doubt, use **11g/n/ax Mixed** (default).

Table 23: The Wireless: Basic Settings: 2.4G Screen (continued)

Channel Bandwidth	Use this field to configure the width of the radio channel the CODA-551x uses to communicate with its wireless clients (IEEE 802.11n only) on the 2.4GHz network. Using the full 40MHz bandwidth can double your data speed. - Select **20 MHz** to only use a 20 megahertz band. - Select **20/40 MHz** to use a 40 megahertz band when possible, and a 20 megahertz band when a 40 megahertz band is unavailable.
Wireless Channel	Select the 2.4GHz wireless channel that you want to use, or select **Auto** to have the CODA-551x select the optimum channel to use. NOTE: Use the **Auto** setting unless you have a specific reason to do otherwise. Click the **Refresh** button (🔄) to have the CODA-551x recheck the current wireless network conditions and select the optimum 2.4GHz wireless channel afresh (see Automatic Channel Selection on page 77).
WPS Enabled	Use this field to turn Wifi Protected Setup (WPS) on or off on the 2.4GHz network (see WPS on page 80). - Select **ON** to enable WPS. - Select **OFF** to disable WPS.
Multiple SSID Settings	
Network Name (SSID)	Enter the name that you want to use for this SSID. This is the name that identifies your network, and to which wireless clients connect. NOTE: It is suggested that you change the SSID from its default, for security reasons.
Enable	Use this field to enable or disable the SSID. - Select **ON** to enable the SSID. - Select **OFF** to disable the SSID.

Table 23: The Wireless: Basic Settings: 2.4G Screen (continued)

Broadcast SSID	Use this field to make this SSID visible or invisible to other wireless devices. - Select **ON** if you want your network name (SSID) to be public. Anyone with a wireless device in the coverage area can discover the SSID, and attempt to connect to the network. - Select **OFF** if you do not want the CODA-551x to broadcast the network name (SSID) to all wireless devices in the coverage area. Anyone who wants to connect to the network must know the SSID.
WMM(QoS)	This field displays whether Wifi MultiMedia (WMM) Quality of Service (QoS) settings are **Enabled** or **Disabled** on this SSID.
Security Mode	Select the type of security that you want to use on the 2.4GHz network. - Select **Open** to use no security. Anyone in the coverage area can enter your network. - Select **WPA2-Personal** to use the WiFi Protected Access (Personal) security protocol.
Auth Mode	Select the type of authentication that you want to use. The following options display when you select **WPA-Personal** in the **Security Mode** field: - Select **WPA-PSK** to use the WiFi Protected Access (Personal) security protocol. - Select **WPA2-PSK** to use the WiFi Protected Access 2 (Personal) security protocol. - Select **Auto (WPA-PSK or WPA2-PSK)** to use both the WPA and the WPA2 security protocols; clients that support WPA2 connect using this protocol, whereas those that support only WPA connect using this protocol.

Table 23: The Wireless: Basic Settings: 2.4G Screen (continued)

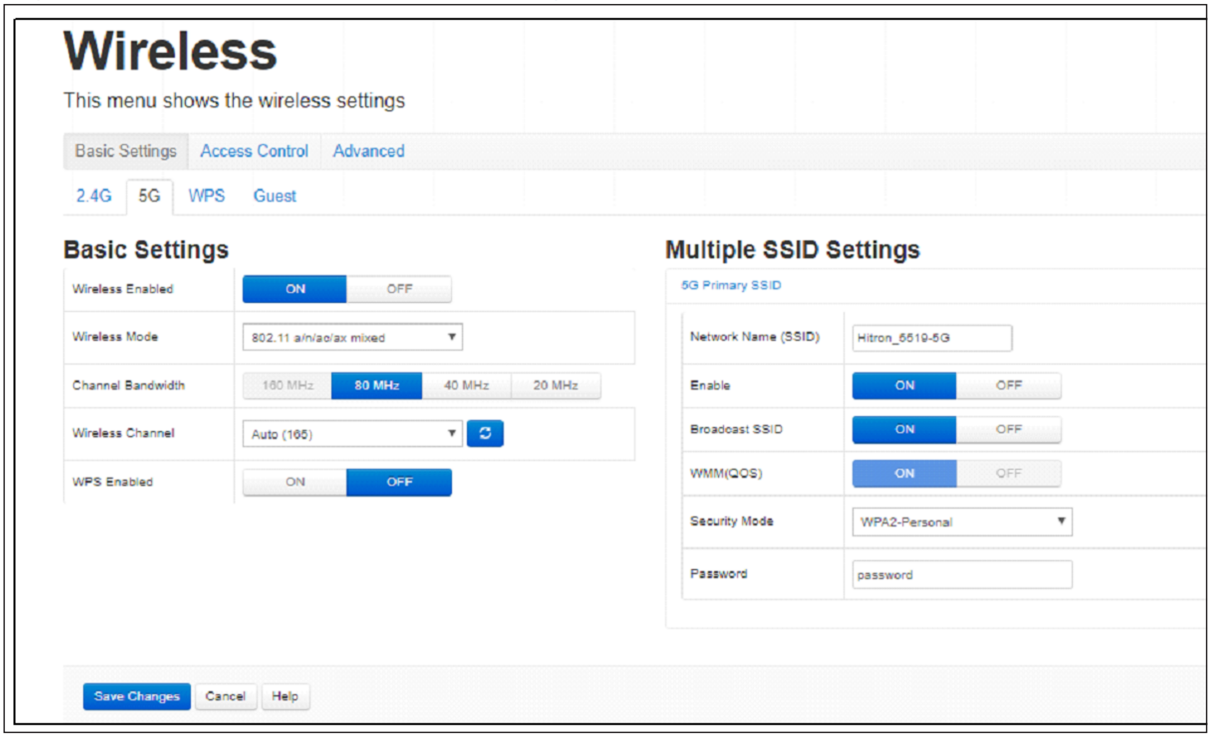
Encrypt Mode	Select the type of encryption you want to use on the 2.4GHz network. The options that display depend on the options you selected in the other fields in this screen. ▸ Select **AES** to use the Advanced Encryption Standard. ▸ Select **TKIP** to use the Temporal Key Integrity Protocol. ▸ Select **TKIP/AES** to allow clients using either encryption type to connect to the CODA-551x. NOTE: Use of the TKIP encryption standard limits the wireless network speed to 54Mbps (802.11g speed).
Password	Enter the security key or password that you want to use for the 2.4GHz wireless network. You will need to enter this key into your wireless clients in order to allow them to connect to the network.
Save Changes	Click this to save your changes to the fields in this screen.
Cancel	Click this to return the fields in this screen to their last-saved values without saving your changes.
Help	Click this to see information about the fields in this screen.

5.2.2 The Wireless: Basic Settings: 5G Screen

Use the 5GHz network screen to enable 5GHz wireless clients to connect to the CODA-551x.

Click **Wireless** > **Basic Settings** > **5G**. The following screen displays.

Figure 33: The Wireless: Basic Settings: 5G Screen



Wireless

This menu shows the wireless settings

Basic Settings

Wireless Enabled	ON (selected) OFF
Wireless Mode	802.11 a/n/ac/ax mixed
Channel Bandwidth	160 MHz, 80 MHz (selected), 40 MHz, 20 MHz
Wireless Channel	Auto (165)
WPS Enabled	ON, OFF (selected)

Multiple SSID Settings

5G Primary SSID

Network Name (SSID)	Hitron_6619-5G
Enable	ON (selected) OFF
Broadcast SSID	ON (selected) OFF
WMM(QOS)	ON (selected) OFF
Security Mode	WPA2-Personal
Password	password

The following table describes the labels in this screen.

Table 24: The Wireless: Basic Settings: 5G Screen

Basic Settings	
Wireless Enabled	▸ Select **On** to enable the 5GHz wireless network. ▸ Select **Off** to enable the 5GHz wireless network.

Table 24: The Wireless: Basic Settings: 5G Screen (continued)

Wireless Mode	Select the type of 5GHz wireless network that you want to use: - **802.11a only**: use IEEE 802.11a. - **802.11n only**: use IEEE 802.11n. - **802.11a/n mixed**: allow clients using both IEEE 802.11a and IEEE 802.11n to access the network. - **802.11ac only**: use IEEE 802.11ac. - **802.11a/n/ac mixed** (default): allow clients using and of IEEE 802.11n, IEEE 802.11ac, or IEEE 802.11a to access the network. - **802.11a/n/ac/ax mixed** (default): allow clients using and of IEEE 802.a, IEEE 802.11n, IEEE 802.11ac, IEEE 802.11ax to access the network NOTE: Only wireless clients that support the network protocol you select can connect to the wireless network. If in doubt, use **802.11a/n/ac/ax Mixed** (default).
Channel Bandwidth	Use this field to configure the width of the radio channel the CODA-551x uses to communicate with its wireless clients on the 5GHz network. Using the full 80MHz bandwidth can double your data speed, in comparison to the 40MHz bandwidth. - Select **20 MHz** to only use a 20 megahertz band. - Select **40 MHz** to use a 40 megahertz band (only clients supporting IEEE 802.11n and IEEE 802.11ac may connect). - Select **80 MHz** to use an 80 megahertz band (only clients supporting IEEE 802.11ac may connect).

Table 24: The Wireless: Basic Settings: 5G Screen (continued)

Wireless Channel	Select the 5GHz wireless channel that you want to use, or select **Auto** to have the CODA-551x select the optimum channel to use. NOTE: Use the **Auto** setting unless you have a specific reason to do otherwise. Click the **Refresh** button (🔄) to have the CODA-551x recheck the current wireless network conditions and select the optimum 5GHz wireless channel afresh (see Automatic Channel Selection on page 77).
WPS Enabled	Use this field to turn Wifi Protected Setup (WPS) on or off on the 5GHz network (see WPS on page 80). ‣ Select **ON** to enable WPS. ‣ Select **OFF** to disable WPS.
Multiple SSID Settings	
Network Name (SSID)	Enter the name that you want to use for this SSID. This is the name that identifies your network, and to which wireless clients connect. NOTE: It is suggested that you change the SSID from its default, for security reasons.
Enable	Use this field to enable or disable the SSID. ‣ Select **ON** to enable the SSID. ‣ Select **OFF** to disable the SSID.
Broadcast SSID	Use this field to make this SSID visible or invisible to other wireless devices. ‣ Select **ON** if you want your network name (SSID) to be public. Anyone with a wireless device in the coverage area can discover the SSID, and attempt to connect to the network. ‣ Select **OFF** if you do not want the CODA-551x to broadcast the network name (SSID) to all wireless devices in the coverage area. Anyone who wants to connect to the network must know the SSID.

Table 24: The Wireless: Basic Settings: 5G Screen (continued)

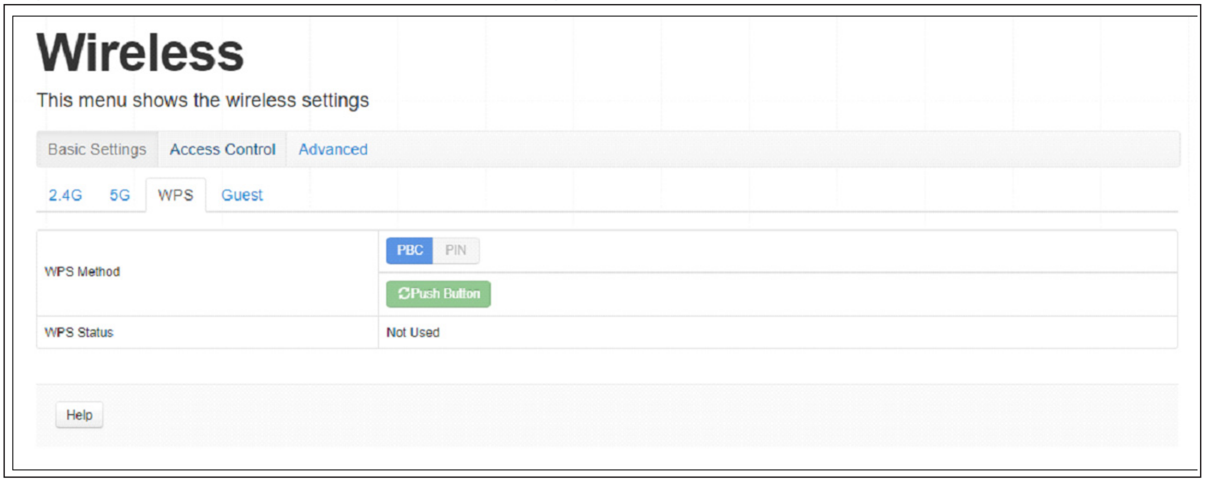
WMM(QoS)	This field displays whether Wifi MultiMedia (WMM) Quality of Service (QoS) settings are **Enabled** or **Disabled** on this SSID.
Security Mode	Select the type of security that you want to use on the 5GHz network. - Select **Open** to use no security. Anyone in the coverage area can enter your network. - Select **WPA-Personal** to use the WiFi Protected Access (Personal) security protocol. - Select **WPA-Enterprise** to use the WiFi Protected Access (Enterprise) security protocol. NOTE: The Enterprise variants of WPA require the use of a Remote Authentication Dial-In User Service (RADIUS) server for security management. Only select the **WPA-Enterprise** if you have a RADIUS server on your network. Otherwise, select **WPA-Personal**.
Password	Enter the security key or password that you want to use for the 5GHz wireless network. You will need to enter this key into your wireless clients in order to allow them to connect to the network.
Save Changes	Click this to save your changes to the fields in this screen.
Cancel	Click this to return the fields in this screen to their last-saved values without saving your changes.
Help	Click this to see information about the fields in this screen.

5.2.3 The Wireless: Basic Settings: WPS Screen

Use the WPS screen to enable WPS-capable wireless clients to connect to the CODA-551x via a simple push-button, or by entering a password. See WPS on page 80.

Click **Wireless** > **Basic Settings** > **WPS**. The following screen displays.

Figure 34: The Wireless: Basic Settings: WPS Screen



Wireless

This menu shows the wireless settings

WPS Method

WPS Status: Not Used

The following table describes the labels in this screen.

Table 25: The Wireless: Basic Settings: WPS Screen

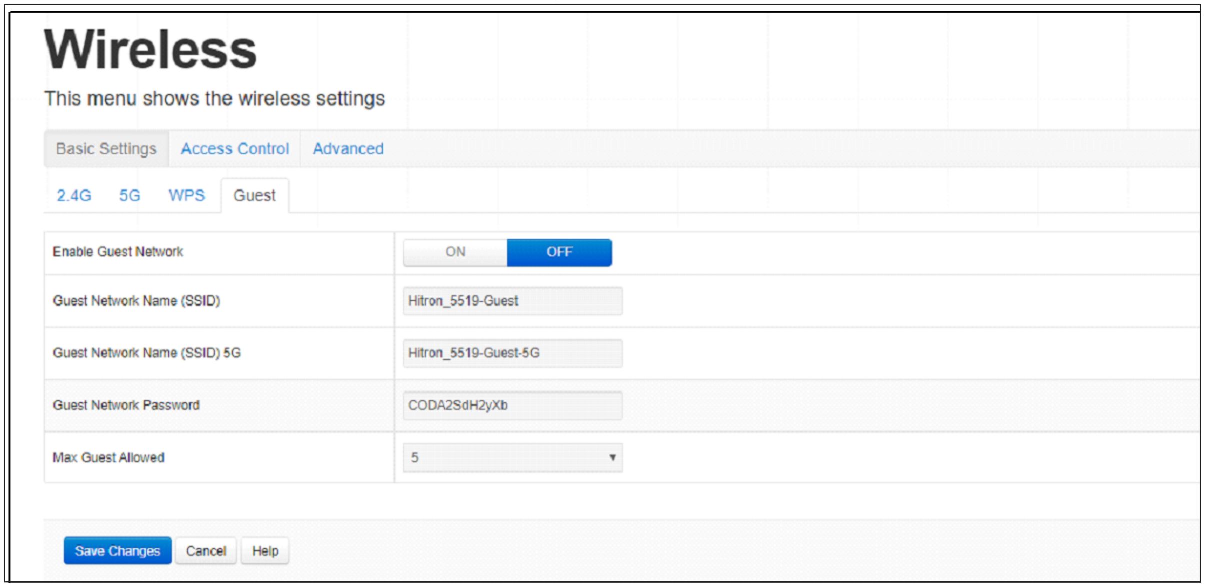
WPS Method	Use these buttons to run Wifi Protected Setup (WPS): ▸ Click the **PBC** button and then **Push Button** to begin the Push-Button Configuration process. You must then press the PBC button on your client wireless devices within two minutes in order to register them on your wireless network. ▸ Click the **PIN** button to begin the PIN configuration process. In the screen that displays, enter the WPS PIN that you want to use for the CODA-551x, or the WPS PIN of the client device you want to add to the network.
WPS Status	This displays whether or not the CODA-551x is using Wifi Protected Setup.
Help	Click this to see information about the fields in this screen.

5.2.4 The Wireless: Basic Settings: Guest Screen

Use the Guest Network screen to enable wireless clients to connect to the CODA-551x with reduced privileges.

Click **Wireless** > **Basic Settings** > **Guest**. The following screen displays.

Figure 35: The Wireless: Basic Settings: Guest Screen



Wireless

This menu shows the wireless settings

Enable Guest Network	ON [✓ OFF]
Guest Network Name (SSID)	Hitron_5519-Guest
Guest Network Name (SSID) 5G	Hitron_5519-Guest-5G
Guest Network Password	CODA2SdH2yXb
Max Guest Allowed	5 ▾

The following table describes the labels in this screen.

Table 26: The Wireless: Basic Settings: Guest Screen

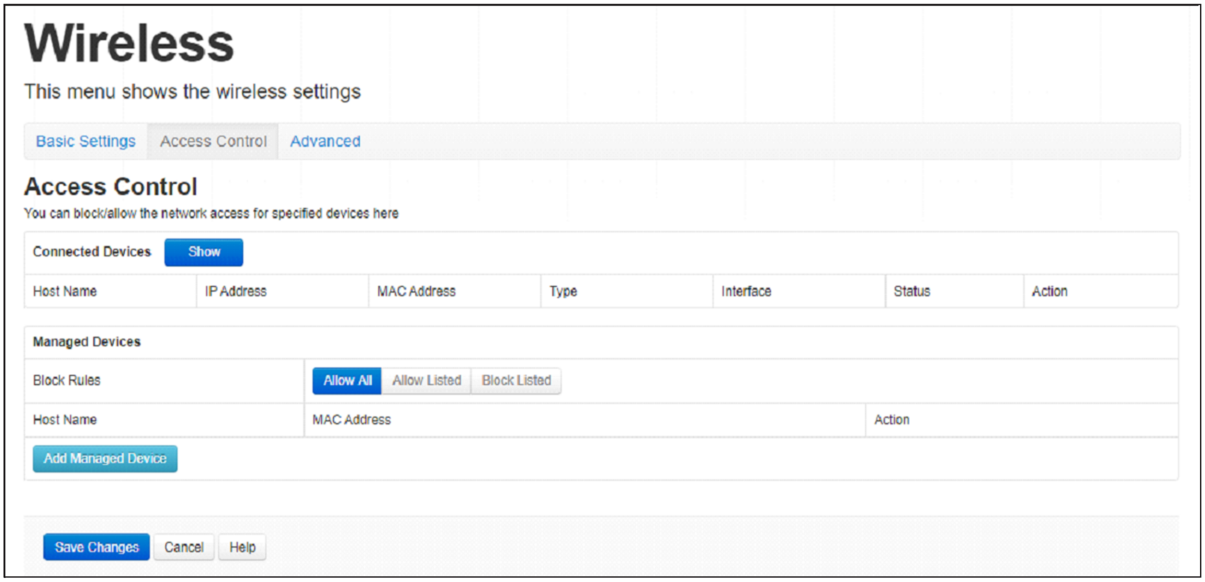
Enable Guest Network	Use this field to enable or disable the guest network. ▸ Select **ON** to enable the guest network. ▸ Select **OFF** to disable the guest network.
Guest Network Name (SSID)	Enter the SSID to use on the 2.4GHz or the 5GHz wireless guest network.
Guest Network Password	Enter the password that wireless clients must be configured to use to connect to either the 2.4GHz or the 5GHz wireless guest network.
Max Guest Allowed	Select the maximum number of wireless clients that may concurrently connect to the wireless guest network.
Save Changes	Click this to save your changes to the fields in this screen.
Cancel	Click this to return the fields in this screen to their last-saved values without saving your changes.
Help	Click this to see information about the fields in this screen.

5.3 The Wireless: Access Control Screen

Use this screen to modify the CODA-551x's wireless networks' Service Set Identifiers (SSIDs) and manage the devices that connect to the wireless network.

Click **Wireless** > **Access Control**. The following screen displays.

Figure 36: The Wireless: Access Control Screen



The following table describes the labels in this screen.

Table 27: The Wireless: Access Control Screen

Connected Devices	
Show/Refresh	Click this to reload the **Connected Devices** list.
Host Name	This displays the name of each network device connected on the wireless network.
IP Address	This displays the IP address of each network device connected on the wireless network.
MAC Address	This displays the Media Access Control (MAC) address of each network device connected on the wireless network.
Type	This displays whether the device's IP address was assigned by DHCP (**DHCP-IP**), or **self-assigned**.
Interface	This displays the name of the interface on which the relevant device is connected.

Table 27: The Wireless: Access Control Screen (continued)

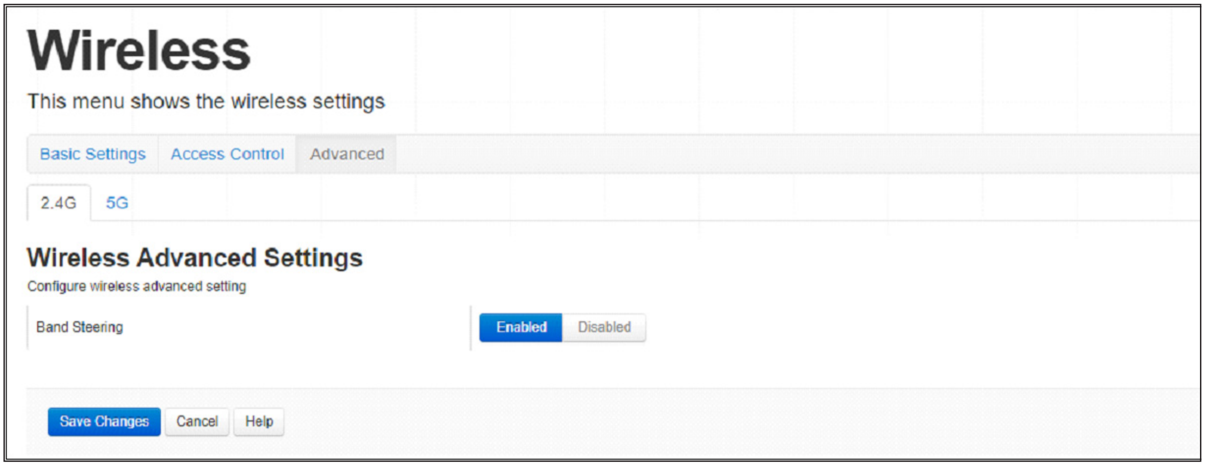
Status	This displays whether or not the connected device is active.
Action	Click **Manage** to make changes to the device's filtering status; see Adding or Editing a Managed Device on page 112 for information on the screen that displays.
Managed Wireless Clients	
Block Rules	Use these buttons to control the action to be taken for the devices listed: ▸ Select **Allow All** to ignore the **Managed Devices** list and let all devices connect to the CODA-551x. ▸ Select **Allow Listed** to permit only devices you added to the **Managed Devices** list to access the CODA-551x and the network. All other devices are denied access. ▸ Select **Block Listed** to permit all devices except those you added to the **Managed Devices** list to access the CODA-551x and the network. The specified devices are denied access.
Host Name	This displays the name of each network device in the list.
MAC Address	This displays the Media Access Control (MAC) address of each network device in the list.
Action	Click **Remove** to remove a managed device rule from the list.
Save Changes	Click this to save your changes to the fields in this screen.
Add Managed Device	Click this to add a new managed device rule (see Adding or Editing a Managed Device on page 112).
Cancel	Click this to return the fields in this screen to their last-saved values without saving your changes.
Help	Click this to see information about the fields in this screen.

5.4 The Advanced Wireless settings Screen

Use this screen to configure the advanced wireless settings.

Click **Wireless** > **Advanced**. The following screen

Figure 37: The Wireless Advanced settings



Wireless

This menu shows the wireless settings

Wireless Advanced Settings

Configure wireless advanced setting

Band Steering: Enabled

The following table describes the labels in this screen.

Table 28: The Wireless Advanced settings

Band Steering	Use this to turn ATF on or off for the relevant wireless network. ▸ Click **Enable** to turn Band Steering on for the relevant wireless network. ▸ Click **Disable** to turn Band Steering off for the relevant wireless network.
Save Changes	Click this to save your changes to the fields in this screen.
Cancel	Click this to return the fields in this screen to their last-saved values without saving your changes.
Help	Click this to see information about the fields in this screen.

6

Admin

This chapter describes the screens that display when you click **Admin** in the toolbar. It contains the following sections:

6.1 Admin Overview

This section describes some of the concepts related to the **Admin** screens.

- Ping: this tool allows you to enter an IP address and see if a computer (or other network device) responds with that address on the network. The name comes from the pulse that submarine SONAR emits when scanning for underwater objects, since the process is rather similar. You can use this tool to see if an IP address is in use, or to discover if a device (whose IP address you know) is working properly.

- Traceroute: this tool allows you to see the route taken by data packets to get from the CODA-551x to the destination you specify. You can use this tool to solve routing problems, or identify firewalls that may be blocking your access to a computer or service.

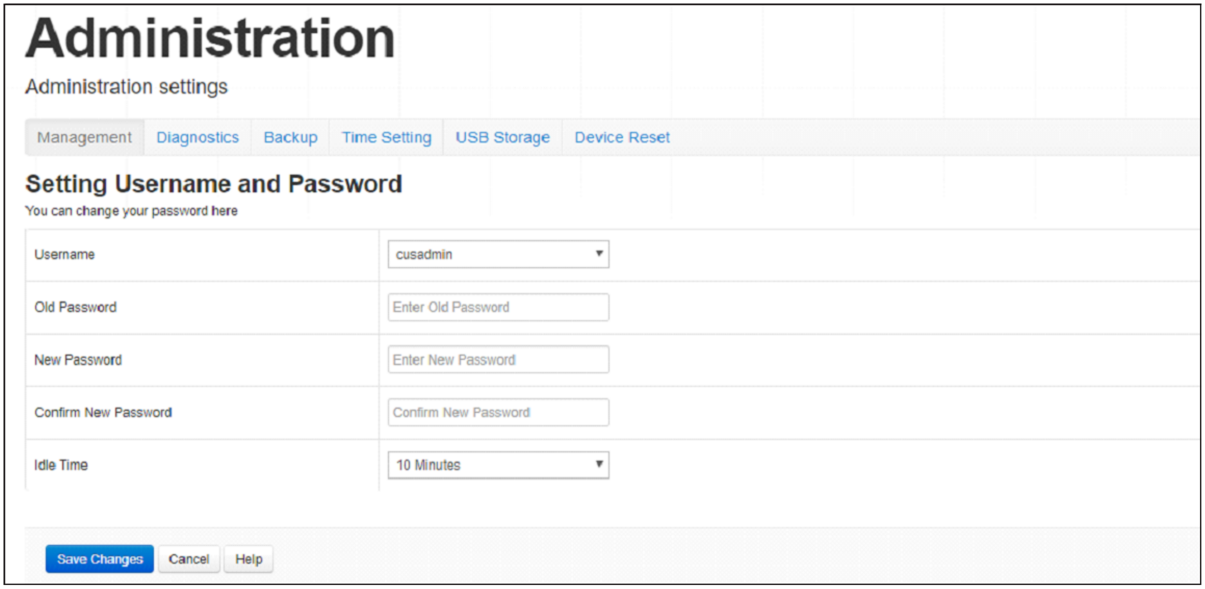
6.2 The Admin: Management Screen

Use this screen to make changes to the CODA-551x’s login credentials (username and password) and inactivity idle time.

NOTE: If you forget your password, you will need to reset the CODA-551x to its factory defaults.

Click **Admin** > **Management**. The following screen displays.

Figure 38: The Admin: Management Screen



Administration

Administration settings

Setting Username and Password

You can change your password here

Username	cusadmin ▾
Old Password	Enter Old Password
New Password	Enter New Password
Confirm New Password	Confirm New Password
Idle Time	10 Minutes ▾

The following table describes the labels in this screen.

Table 29: The Admin: Management Screen

Username	If your CODA-551x supports multiple user accounts, select the account you want to modify from the list.
Old Password	Enter the password with which you currently log into the CODA-551x for this account.

Table 29: The Admin: Management Screen (continued)

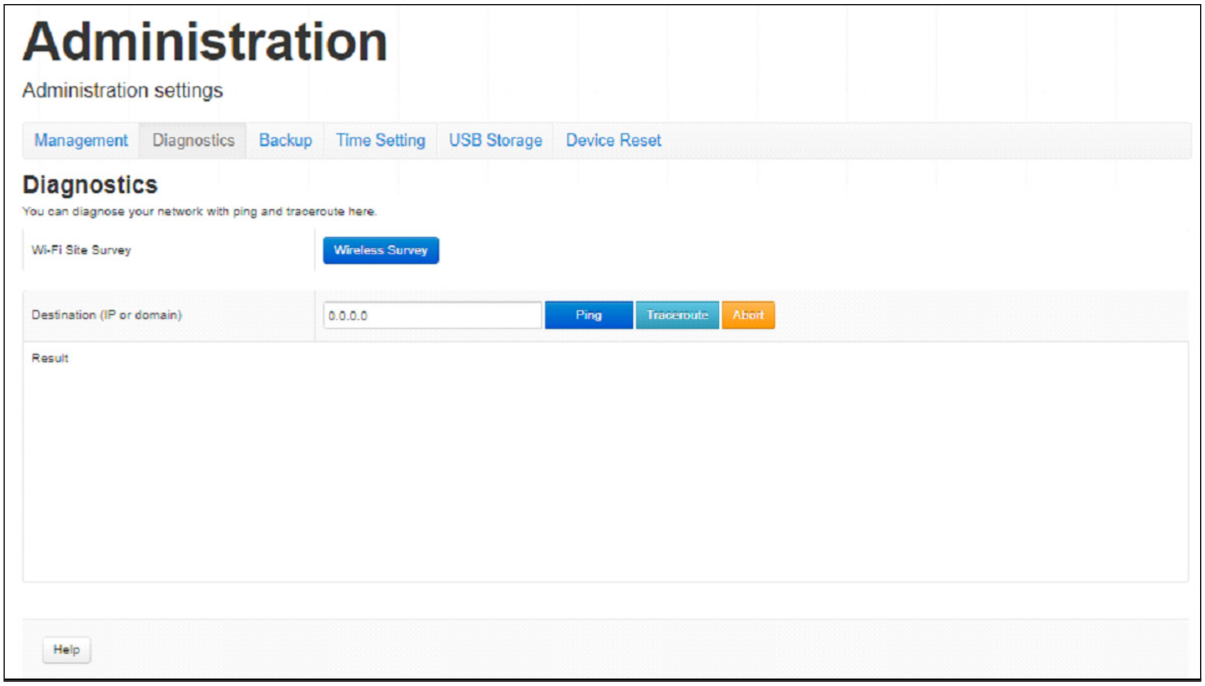
New Password	Enter and re-enter the password you want to use to log into the CODA-551x for this account.
Confirm New Password	
Idle Time	Select the time interval after which an inactive user should be logged out of the CODA-551x's admin interface.
Save Changes	Click this to save your changes to the fields in this screen.
Cancel	Click this to return the fields in this screen to their last-saved values without saving your changes.
Help	Click this to see information about the fields in this screen.

6.3 The Admin: Diagnostics Screen

Use this screen to perform ping and traceroute tests on IP addresses or URLs.

Click **Admin** > **Diagnostics** The following screen displays.

Figure 39: The Admin: Diagnostics Screen



Administration

Administration settings

Diagnostics

You can diagnose your network with ping and traceroute here.

Wi-Fi Site Survey

Destination (IP or domain) 0.0.0.0

Result

The following table describes the labels in this screen.

Table 30: The Admin: Diagnostics Screen

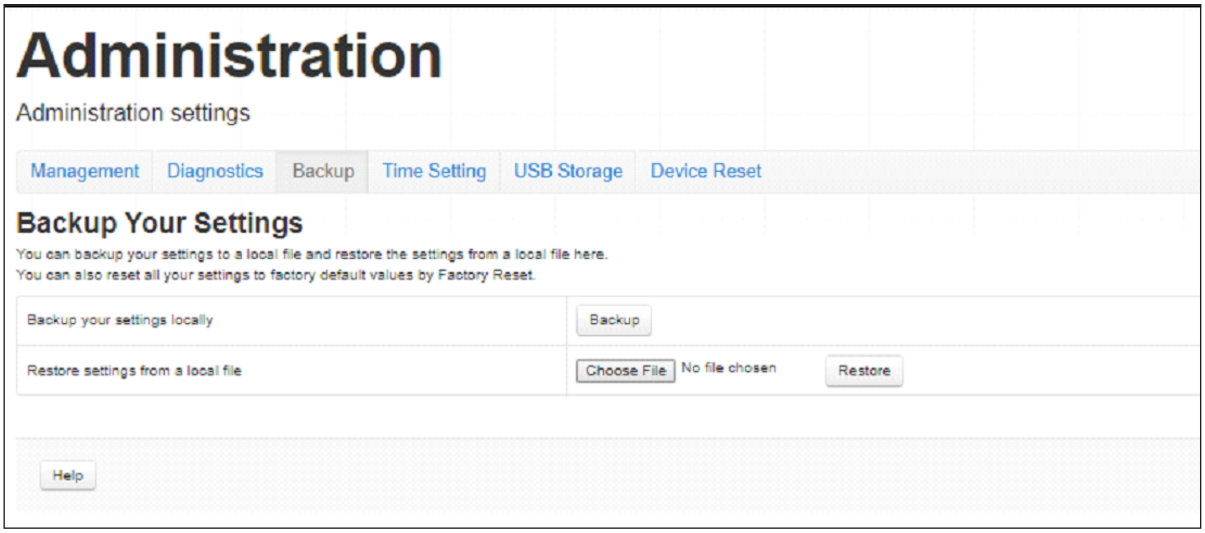
Wi-Fi Site Survey	Click the Wireless Survey button to start the Wi-Fi site survey.
Destination (IP or Domain)	Enter the IP address or URL that you want to test.
Ping	Select the type of test that you want to run on the **Destination** that you specified.
Traceroute	
Result	This field displays a report of the test most recently performed.
Abort	Click this to terminate a test in progress.

6.4 The Admin: Backup Screen

Use this screen to back up your CODA-551x's settings to your computer or load settings from a backup you created earlier.

Click **Admin** > **Backup**. The following screen displays.

Figure 40: The Admin: Backup Screen



Administration

Administration settings

Backup Your Settings

You can backup your settings to a local file and restore the settings from a local file here.
You can also reset all your settings to factory default values by Factory Reset.

Backup your settings locally	Backup
Restore settings from a local file	Choose File No file chosen Restore

The following table describes the labels in this screen.

Table 31: The Admin: Backup Screen

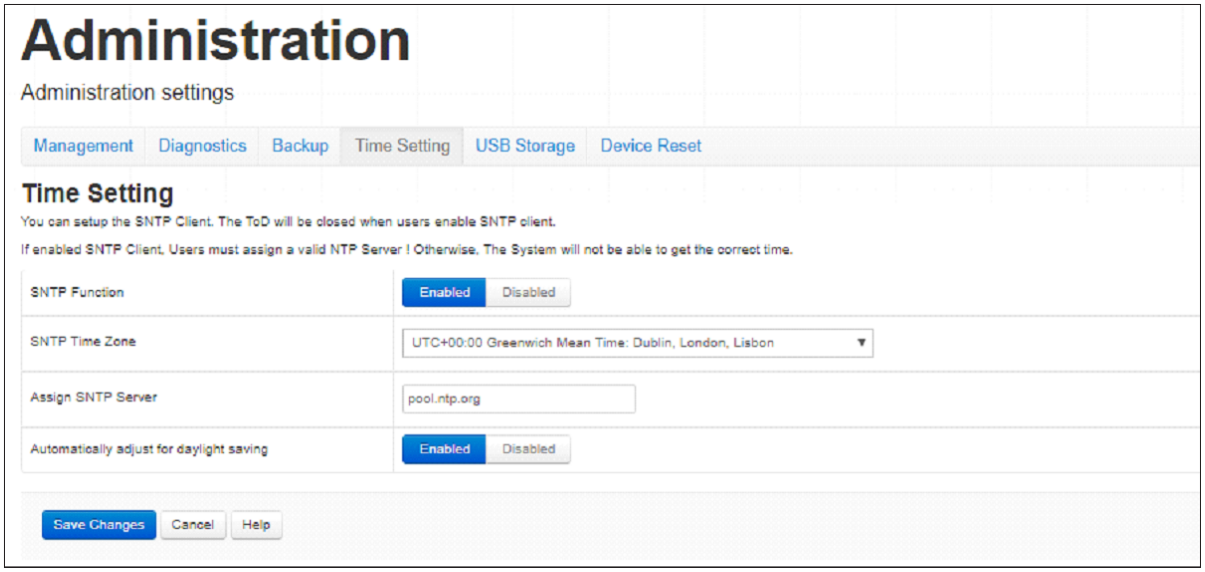
Back Up Your Settings Locally	Click this to create a backup of all your CODA-551x’s settings on your computer.
Restore Settings From a Local File	Use these fields to return your CODA-551x’s settings to those specified in a backup that you created earlier. Click **Choose File** to select a backup, then click **Restore** to return your CODA-551x’s settings to those specified in the backup.

6.5 The Admin: Time Setting

Use this screen to setup your CODA-551x as a SNTP client, The ToD will be closed when users enable SNTP client. If enabled SNTP client, User must assign a valid NTP server. Otherwise, the system will not be able to get the correct time.

Click **Admin** > **Time Setting** The following screen displays.

Figure 41: The Admin: Time Setting Screen



Administration

Administration settings

Time Setting

You can setup the SNTP Client. The ToD will be closed when users enable SNTP client.

If enabled SNTP Client, Users must assign a valid NTP Server ! Otherwise, The System will not be able to get the correct time.

SNTP Function	[✓ Enabled] Disabled
SNTP Time Zone	UTC+00:00 Greenwich Mean Time: Dublin, London, Lisbon ▼
Assign SNTP Server	pool.ntp.org
Automatically adjust for daylight saving	[✓ Enabled] Disabled

The following table describes the labels in this screen.

Table 32: The Admin: Time Setting Screen

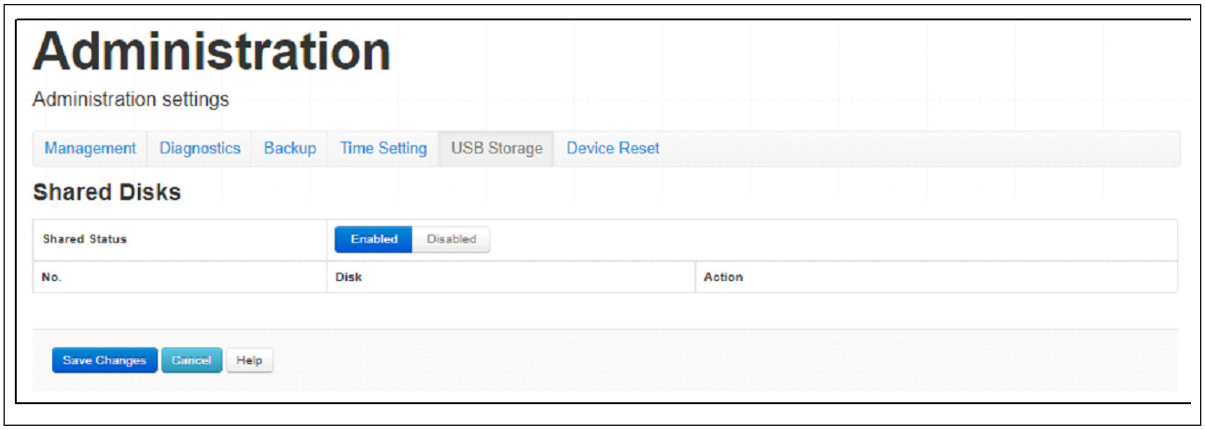
SNTP Function	This displays whether SNTP Function is active or inactive. - Select **Enabled** to turn SNTP function on. - Select **Disabled** to turn SNTP function off.
SNTP Time Zone	Select the SNTP Time Zone from one of the drop down time zone list.
Assign SNTP Server	Assign an SNTP server for use.
Automatically adjust for daylight saving	To enable or disable automatically adjust for daylight saving.
Save Changes	Click this to save your changes to the fields in this screen.

6.6 The Admin: USB Storage Screen

Use this screen to manage and share data stored on devices connected to the CODA-551x's **USB** port. The CODA-551x provides one USB 2.0 host port, allowing you to plug in a USB flash disk for mounting and sharing through the LAN interfaces via the Samba protocol (network neighborhood).

Click **Admin** > **USB Storage**. The following screen displays.

Figure 42: The Admin: USB Storage Screen



Administration

Administration settings

Shared Disks

Shared Status: Enabled

No.	Disk	Action

The following table describes the labels in this screen.

Table 33: The Admin: USB Storage Screen

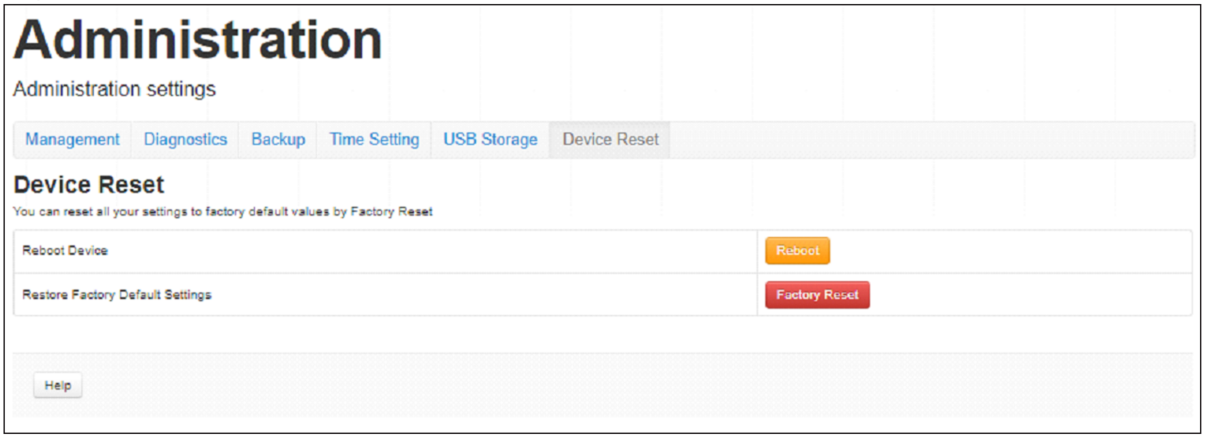
Shared Status	This displays whether USB sharing is active or inactive. - Select **Enabled** to turn USB sharing on. USB devices connected to the CODA-551x will be accessible on the network. - Select **Disabled** to turn USB sharing off. USB devices connected to the CODA-551x will not be accessible on the network.
No.	This displays the index number of the connected USB device. When no USB device is connected, no number displays.
Disk	This displays the name of the connected USB device, by which it may be accessed on the network.
Action	Click **Eject** before physically removing a connected USB device from the CODA-551x, in order to ensure all operations are correctly terminated and no data loss occurs.
Save Changes	Click this to save your changes to the fields in this screen.
Refresh	Click this to refresh the data in this screen.
Help	Click this to see information about the fields in this screen.

6.7 The Admin: Device Reset Screen

Use this screen to reboot your CODA-551x, or to return it to its factory default settings.

Click **Admin** > **Device Reset**. The following screen displays.

Figure 43: The Admin: Device Reset Screen


Administration

Administration settings

Device Reset

You can reset all your settings to factory default values by Factory Reset

Reboot Device	Reboot
Restore Factory Default Settings	Factory Reset

The following table describes the labels in this screen.

Table 34: The Admin: Device Reset Screen

Reboot Device	Click this to restart your CODA-551x.
Restore Factory Default Settings	Click this to return your CODA-551x to its factory default settings. When you do this, all your user-configured settings are lost, and cannot be retrieved.

7

Security

This chapter describes the screens that display when you click **Security** in the toolbar. It contains the following sections:

7.1 Security Overview

This section describes some of the concepts related to the **Security** screens.

7.1.1 Firewall

The term “firewall” comes from a construction technique designed to prevent the spread of fire from one room to another. Similarly, your CODA-551x’s firewall prevents intrusion attempts and other undesirable activity originating from the WAN, keeping the computers on your LAN safe. You can also use filtering techniques to specify the computers and other devices you want to allow on the LAN, and prevent certain traffic from going from the LAN to the WAN.

7.1.2 Intrusion detection system

An intrusion detection system monitors network activity, looking for policy violations, and malicious or suspicious activity. The CODA-551x's intrusion detection system logs all such activity to the **Security** > **Logs** screen.

7.1.3 Device Filtering

Every networking device has a unique Media Access Control (MAC) address that uniquely identifies it on the network. When you enable MAC address filtering on the CODA-551x's firewall, you can set up a list of devices, identified by their MAC addresses, and then specify whether you want to:

- Deny the devices on the list access to the CODA-551x and the network (in which case all other devices can access the network)

or

- Allow the devices on the list to access the network (in which case no other devices can access the network).

7.1.4 Port Blocking

Port blocking is a way of preventing users on the LAN from connecting with devices on the WAN via specific services, protocols or applications. It achieves this by permitting or denying traffic from the LAN to pass to the WAN, based on the target port.

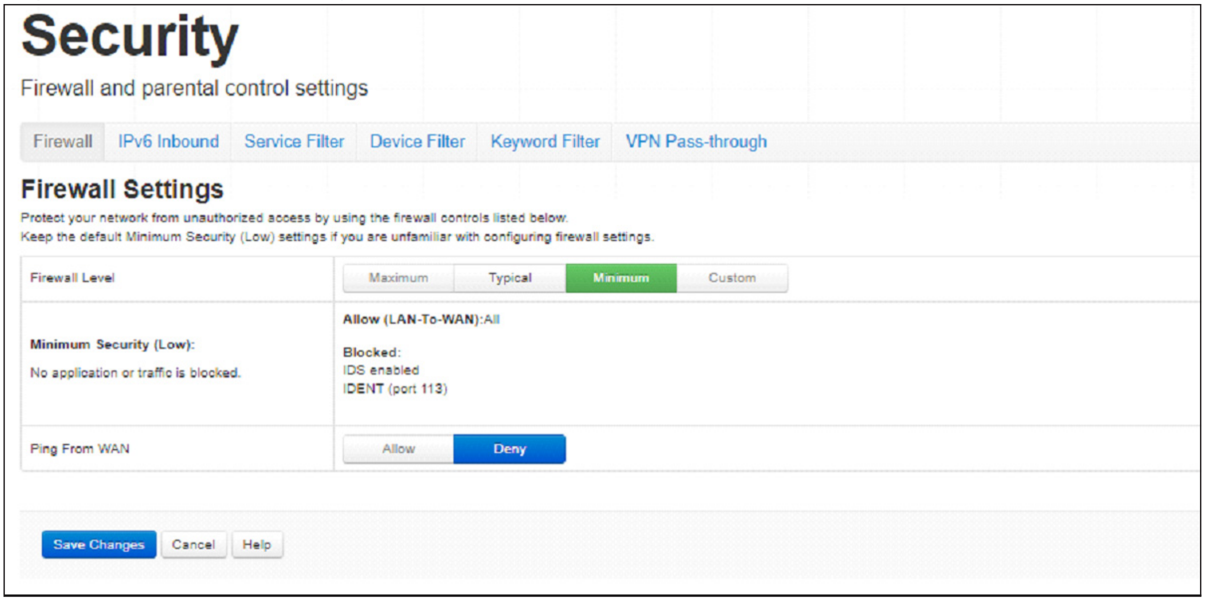
7.2 The Security: Firewall Screen

Use this screen to turn firewall features on or off and to allow or permit certain applications and protocols. You can select the level of firewall protection from pre-defined options, or create a custom protection profile.

NOTE: To block specific ports, use the **Port Blocking** screen (see The Security: IPv6 Inbound Firewall on page 106).

Click **Security** > **Firewall Settings**. The following screen displays.

Figure 44: The Security: Firewall Screen



Security

Firewall and parental control settings

Firewall Settings

Protect your network from unauthorized access by using the firewall controls listed below.
Keep the default Minimum Security (Low) settings if you are unfamiliar with configuring firewall settings.

Firewall Level	Minimum
Minimum Security (Low): No application or traffic is blocked.	**Allow (LAN-To-WAN):**All Blocked: IDS enabled IDENT (port 113)
Ping From WAN	Deny

The following table describes the labels in this screen.

Table 35: The Security: Firewall Screen

Firewall Level	Select the level of firewall protection that you want to apply to your LAN. Details about the protection level display beneath the buttons.
(Security Level)	These fields describe the specific protocols and applications that are permitted or denied by the firewall security level you select. When you select **Custom** in the **Firewall Level** field, additional fields display that allow you to toggle specific features on or off: ‣ **Entire Firewall**: select **ON** to enable firewall security protection, or select **OFF** to disable it (not recommended).
Ping from WAN	Use this field to permit or prohibit Internet Control Message Protocol (ICMP) echo requests on the WAN interface. ‣ Select **Allow** to permit pinging on the WAN Interface. ‣ Select **Deny** to prohibit pinging on the WAN Interface. Echo requests to the WAN Interface are silently ignored.

Table 35: The Security: Firewall Screen (continued)

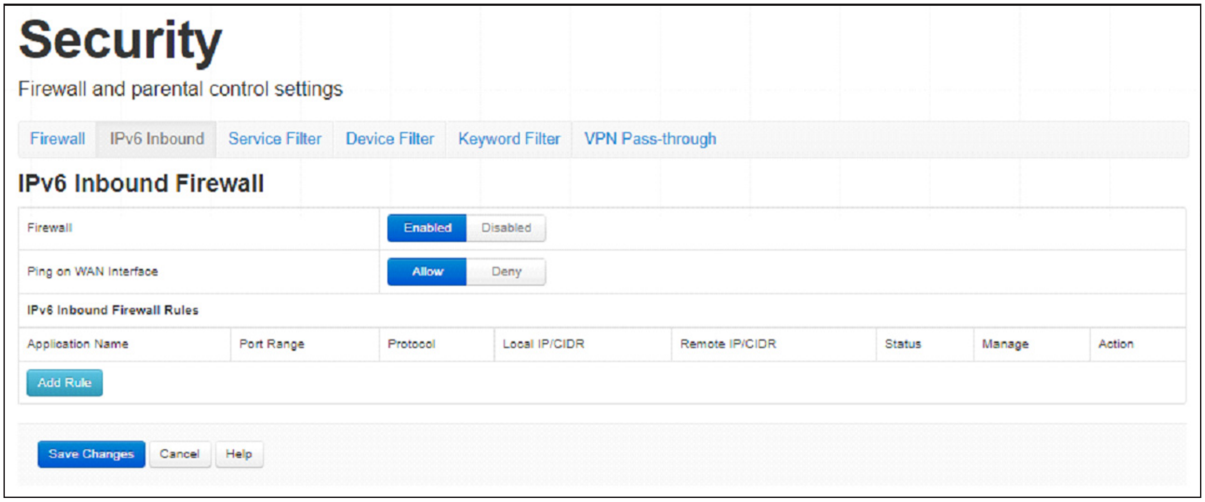
Save Changes	Click this to save your changes to the fields in this screen.
Cancel	Click this to return the fields in this screen to their last-saved values without saving your changes.
Help	Click this to see information about the fields in this screen.

7.3 The Security: IPv6 Inbound Firewall

Use this screen to configure IPv6 Inbound Firewall.

Click **Security** > **IPv6 Inbound**. The following screen displays.

Figure 45: The Security: IPv6 Inbound Firewall Screen



Security

Firewall and parental control settings

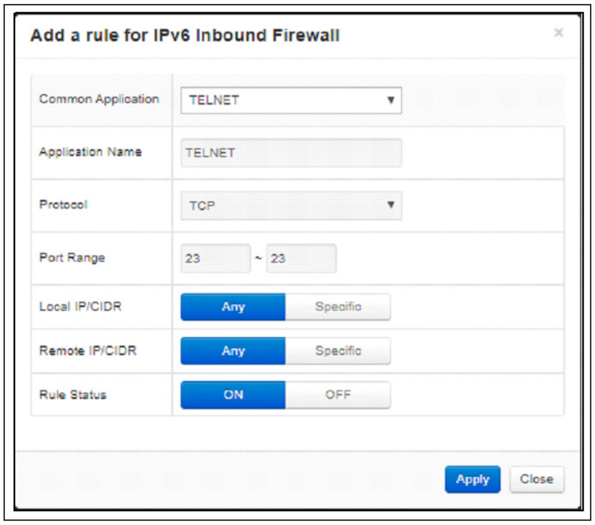
IPv6 Inbound Firewall

Firewall	[✓ Enabled] Disabled
Ping on WAN Interface	[✓ Allow] Deny

IPv6 Inbound Firewall Rules

Application Name	Port Range	Protocol	Local IP/CIDR	Remote IP/CIDR	Status	Manage	Action

Figure 46: The Security: IPv6 Inbound Firewall Screen



Add a rule for IPv6 Inbound Firewall

Common Application	TELNET
Application Name	TELNET
Protocol	TCP
Port Range	23 ~ 23
Local IP/CIDR	Any Specific
Remote IP/CIDR	Any Specific
Rule Status	ON OFF

The following table describes the labels in this screen.

Table 36: The Security: Port Blocking Screen

Firewall	Use this field to turn IPv6 Inbound Firewall on or off. - Select **Enabled** to turn IPv6 Inbound Firewall on. - Select **Disabled** to turn IPv6 Inbound Firewall off.
Ping on WAN Interface	Use this field to permit or prohibit Internet Control Message Protocol (ICMP) echo requests on the WAN interface. - Select **Allow** to permit pinging on the WAN Interface. - Select **Deny** to prohibit pinging on the WAN Interface. Echo requests to the WAN Interface are silently ignored.
IPv6 Inbound Firewall Rules	
Add Rule	Click Add Rule to add an IPv6 Inbound Firewall Rule.
Add a rule for IPv6 Inbound Firewall	
Common Application	Use this field to select the application for which you want to create a port forwarding rule, if desired
Application Name	This displays the name you assigned to the blocking rule when you created it.

Table 36: The Security: Port Blocking Screen (continued)

Protocol	Use this field to specify whether the CODA-551x should filter via: ▸ Transmission Control Protocol (**TCP**) ▸ User Datagram Protocol (**UDP**) ▸ Both TCP and UDP (**TCP/UDP**)
Port Range	This displays the start and end port for which this blocking rule applies.
Local IP/CIDR	Use this field to enter a specific IP address or any IP address from the Local to the inbound filter rule. ▸ Select **Any** for any IP address from the LAN. ▸ Select **Specific** to add an IP address for the rule.
Remote IP/CIDR	Use this field to enter a specific IP address or any IP address on the WAN(Remote) to the inbound filter rule. ▸ Select **Any** for any IP address from the WAN. ▸ Select **Specific** to add an IP address for the rule.
Rule Status	Use this field to select whether the filtering rule should be active or not. ▸ Select **ON** to activate the rule. Matching traffic will be blocked. ▸ Select **OFF** to deactivate the rule. Matching traffic will not be blocked.
Managed Services	
Filter Enabled	Use this field to turn port blocking on or off. ▸ Select **Enabled** to turn port blocking on. ▸ Select **Disabled** to turn port blocking off.
Application Name	This displays the name you assigned to the blocking rule when you created it.
Protocol	This field displays the protocol or protocols to which this filtering rule applies: ▸ Transmission Control Protocol (**TCP**) ▸ User Datagram Protocol (**UDP**)
Port Range	This displays the start and end port for which this blocking rule applies.

Table 36: The Security: Port Blocking Screen (continued)

Managed Weekdays	This displays the days of the week on which this rule applies.
Managed Time	This displays the start (**From**) and end (**To**) of the time period during which this rule applies, on the specified **Managed Weekdays**.
Status	This displays whether the blocking rule is currently in force (**Enabled**) or not (nothing displays).
Managed	Click **Manage** to make changes to a blocking rule (see Adding or Editing a Port Blocking Rule on page 109).
Action	Click **Remove** to delete a rule from the CODA-551x.
Add Managed Service	Click this to add a new port blocking rule (see Adding or Editing a Port Blocking Rule on page 109).
Save Changes	Click this to save your changes to the fields in this screen.
Trusted PC List	
Host Name	This displays the arbitrary name of each trusted PC you configured.
IP Address	This displays the LAN IP address of each trusted PC.
Status	This displays whether the device is currently trusted (**Enabled**) or untrusted (**Disabled**).
Manage	Click **Manage** to make changes to the trusted device rule. See Adding or Editing a Port Blocking Trusted Device Rule on page 112 for information on the screen that displays.
Action	Click **Delete** to remove the trusted device rule.
Add Trusted Device	Click this to create a new trusted device rule. See Adding or Editing a Port Blocking Trusted Device Rule on page 112 for information on the screen that displays.
Save Changes	Click this to save your changes to the fields in this screen.
Help	Click this to see information about the fields in this screen.

7.3.1 Adding or Editing a Port Blocking Rule

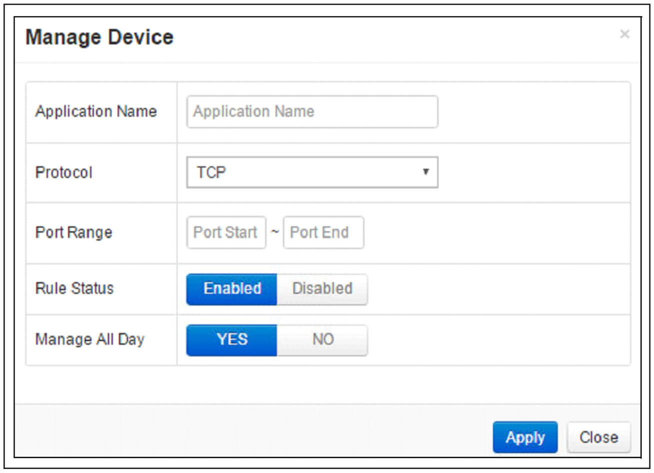
- To add a new port forwarding rule, click **Add Managed Service** in the **Security** > **Port Blocking** screen.

- To edit an existing port blocking rule, locate the rule in the **Security** > **Port Blocking** screen and click its **Manage** button.

NOTE: Ensure that **Enabled** is selected in the **Security** > **Port Blocking** screen in order to add or edit port blocking rules.

The following screen displays.

Figure 47: The Security: Port Blocking Add/Edit Screen



Manage Device

Application Name	Application Name
Protocol	TCP
Port Range	Port Start ~ Port End
Rule Status	Enabled Disabled
Manage All Day	YES NO

The following table describes the labels in this screen.

Table 37: The Security: Port Blocking Add/Edit Screen

Application Name	Enter a name for the application for which you want to create the rule. NOTE: This name is arbitrary, and does not affect functionality in any way.
Protocol	Use this field to specify whether the CODA-551x should filter via: - Transmission Control Protocol (**TCP**) - User Datagram Protocol (**UDP**) - Both TCP and UDP (**TCP/UDP**). NOTE: If in doubt, leave this field at its default.

Table 37: The Security: Port Blocking Add/Edit Screen

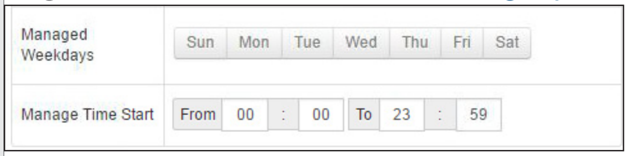
Port Range	Use these fields to specify the start and end port for which this filtering rule applies. These are the ports to which traffic will be blocked. Enter the start port number in the first field, and the end port number in the second field. To specify only a single port, enter its number in both fields.
Rule Status	Use this field to select whether the filtering rule should be active or not. ▸ Select **Enabled** to activate the rule. Matching traffic will be blocked. ▸ Select **Disabled** to deactivate the rule. Matching traffic will not be blocked.
Manage All Day	Use this field to specify whether the filtering rule should apply on all days of the week, at all times, or whether the rule should be applied only at certain times. ▸ Select **YES** to apply the rule at all times. ▸ Select **NO** to apply the rule only at certain times. Additional fields display, allowing you to specify the times at which the rule should be applied. Figure 48: Additional Port blocking Options  Managed Weekdays: Sun Mon Tue Wed Thu Fri Sat Manage Time Start: From 00 : 00 To 23 : 59 Use the **Managed Weekdays** fields to specify the days on which the rule should be applied. A red background indicates that the rule will be applied (traffic will be blocked), and a green background indicates that the rule will not be applied (traffic will not be blocked). Click a day to toggle the rule on or off for the relevant day. Use the **Manage Time Start** fields to specify the period during which the rule should be applied. Enter the start time in the **From** fields, using twenty-four hour notation, and enter the end time in the **To** fields.

Table 37: The Security: Port Blocking Add/Edit Screen

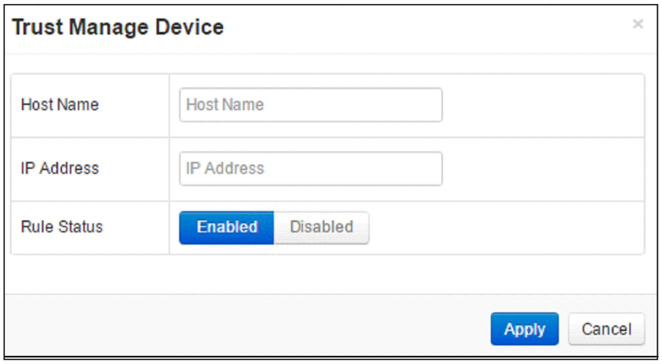
Apply	Click this to save your changes to the fields in this screen.
Close	Click this to return to the **Port Blocking** screen without saving your changes to the rule.

7.3.2 Adding or Editing a Port Blocking Trusted Device Rule

- To add a new trusted device rule, click **Add Trusted PC** in the **Security** > **Port Blocking** screen.
- To edit an existing trusted device rule, locate the rule in the **Security** > **Port Blocking** screen and click its **Manage** button.

The following screen displays.

Figure 49: The Security: Port Blocking Trusted Device Add/Edit Screen



The following table describes the labels in this screen.

Table 38: The Security: Port Blocking Trusted Device Add/Edit Screen

Host Name	Enter a name to identify the device.
IP Address	Enter the local IP address of the device.
Rule Status	Use this field to define whether the trusted device rule should be active or not. - Select **Enabled** to activate the trusted device rule. - Select **Disabled** to deactivate the trusted device rule.

Table 38: The Security: Port Blocking Trusted Device Add/Edit Screen

Apply	Click this to save your changes to the fields in this screen.
Close	Click this to return to the **Service Filter** screen without saving your changes to the rule.

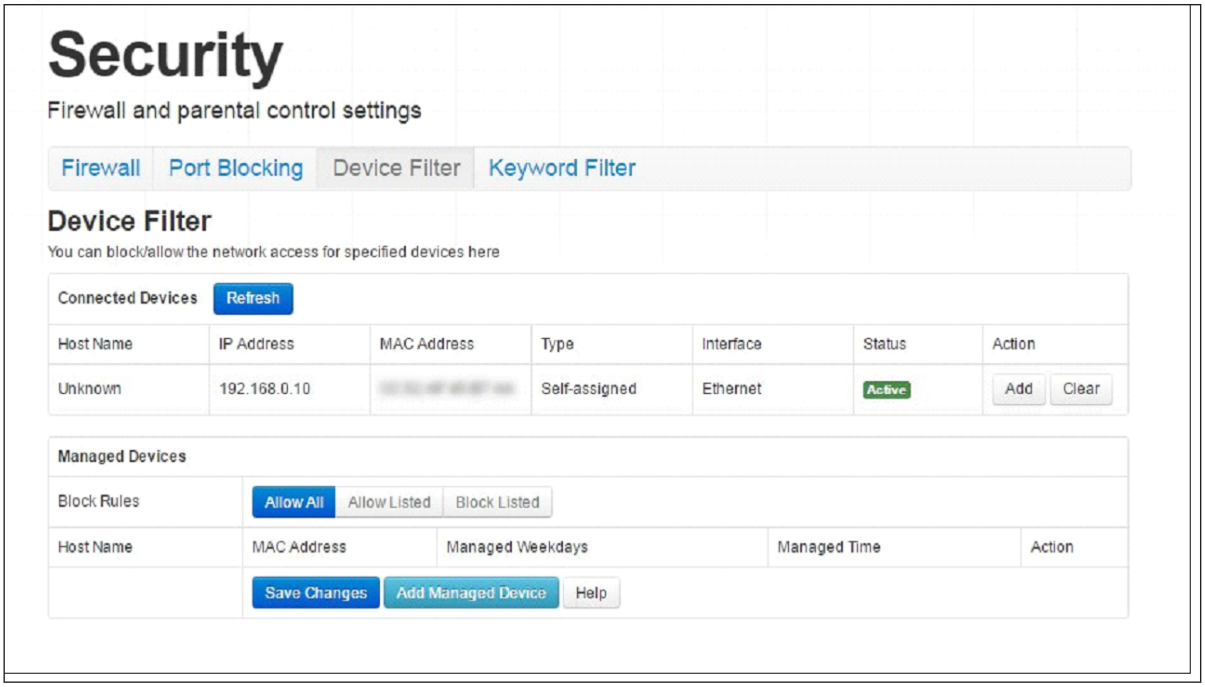
7.4 The Security: Device Filter Screen

Use this screen to configure Media Access Control (MAC) address filtering on the LAN, and to configure IP filtering.

NOTE: To configure MAC address filtering on the wireless network, see The Wireless Access Control Screen on page 75.

Click **Security** > **Device Filter**. The following screen displays.

Figure 50: The Security: Device Filter Screen



Security

Firewall and parental control settings

Device Filter

You can block/allow the network access for specified devices here

Connected Devices

Host Name	IP Address	MAC Address	Type	Interface	Status	Action
Unknown	192.168.0.10	[redacted]	Self-assigned	Ethernet	Active	Add Clear

Managed Devices

Block Rules

Host Name	MAC Address	Managed Weekdays	Managed Time	Action

The following table describes the labels in this screen.

Table 39: The Security: Device Filter Screen

Connected Devices	
Show	Click this to load the **Connected Devices** list.

Table 39: The Security: Device Filter Screen (continued)

Refresh	Click this to reload the **Connected Devices** list.
Host Name	This displays the name of each network device connected on the LAN.
IP Address	This displays the IP address of each network device connected on the LAN.
MAC Address	This displays the Media Access Control (MAC) address of each network device connected on the LAN.
Type	This displays whether the device's IP address was assigned by DHCP (**DHCP-IP**), or **self-assigned**.
Interface	This displays the name of the interface on which the relevant device is connected.
Status	This displays whether or not the connected device is active.
Action	▸ Click **Add** to make changes to the device's filtering status; see Adding or Editing a Managed Device on page 115 for information on the screen that displays. ▸ Click **Clear** to remove the device from the list.
Managed Devices	
Block Rules	Use these buttons to control the action to be taken for the devices listed: ▸ Select **Allow All** to ignore the **Managed Devices** list and let all devices connect to the CODA-551x. ▸ Select **Allow Listed** to permit only devices you added to the **Managed Devices** list to access the CODA-551x and the network. All other devices are denied access. ▸ Select **Block Listed** to permit all devices except those you added to the **Managed Devices** list to access the CODA-551x and the network. The specified devices are denied access.
Host Name	This displays the name of each network device in the list.
MAC Address	This displays the Media Access Control (MAC) address of each network device in the list.

Table 39: The Security: Device Filter Screen (continued)

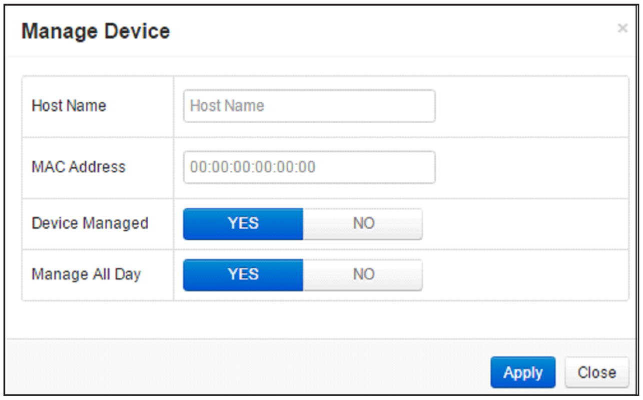
Managed Weekdays	This displays the days of the week on which the device is managed.
Managed Time	This displays the start (**From**) and end (**To**) of the time period during which the device is managed, on the specified **Managed Weekdays**.
Action	Click **Manage** to make changes to a managed device rule (see Adding or Editing a Managed Device on page 115).
Save Changes	Click this to save your changes to the fields in this screen.
Add Managed Device	Click this to add a new managed device rule (see Adding or Editing a Managed Device on page 115).
Help	Click this to see information about the fields in this screen.

7.4.1 Adding or Editing a Managed Device

- To add a new managed LAN device, click **Add Managed Device** in the **Security** > **Device Filter** screen.
- To edit an existing managed LAN device, locate the device in the **Security** > **Device Filter** screen and click its **Add** button.
- To add a new managed wireless network device, click **Add Managed Device** in the **Wireless** > **Access Control** screen.
- To edit an existing managed wireless network device, locate the device in the **Wireless** > **Access Control** screen and click its **Manage** button.

The following screen displays.

Figure 51: The Security: Device Filter Add/Edit Screen



Manage Device

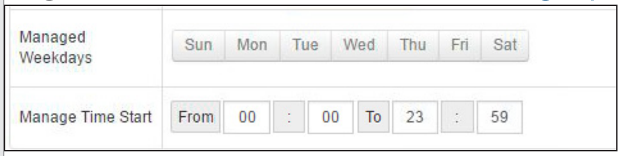
Host Name	Host Name
MAC Address	00:00:00:00:00:00
Device Managed	YES NO
Manage All Day	YES NO

The following table describes the labels in this screen.

Table 40: The Security: Device Filter Add/Edit Screen

Host Name	If you are managing a device that already connected via the LAN, this field displays the device's name. Alternatively, if you are managing a device that is not connected via the LAN, you can enter its name here if you know it.
MAC Address	If you are managing a device that already connected via the LAN, this field displays the device's MAC (Media Access Control) address. Alternatively, if you are managing a device that is not connected via the LAN, you can enter its MAC address here if you know it.
Device Managed	Use this field to define whether the device should have its access privileges filtered or not. ▸ Click **Yes** to filter the device's access privileges. ▸ Click **No** not to filter the device's access privileges. When a device is not being managed, the **Manage All Day** field, and related fields, do not display.

Table 40: The Security: Device Filter Add/Edit Screen

Manage All Day	Use this field to specify whether the device should be managed on all days of the week, at all times, or whether the device should be managed only at certain times. ▸ Select **YES** to managed the device at all times. ▸ Select **NO** to managed the device only at certain times. Additional fields display, allowing you to specify the times at which the device should be managed. Figure 52: Additional Device Filtering Options  Managed Weekdays: Sun Mon Tue Wed Thu Fri Sat Manage Time Start: From 00 : 00 To 23 : 59 Use the **Managed Weekdays** fields to specify the days on which the device should be managed. A red background indicates that the device will be managed (access will be blocked), and a green background indicates that the device will not be managed (access will not be blocked). Click a day to toggle the rule on or off for the relevant day. Use the **Manage Time Start** fields to specify the period during which the device should be managed. Enter the start time in the **From** fields, using twenty-four hour notation, and enter the end time in the **To** fields.
Apply	Click this to save your changes to the fields in this screen.
Close	Click this to return to the **Device Filter** screen without saving your changes to the rule.

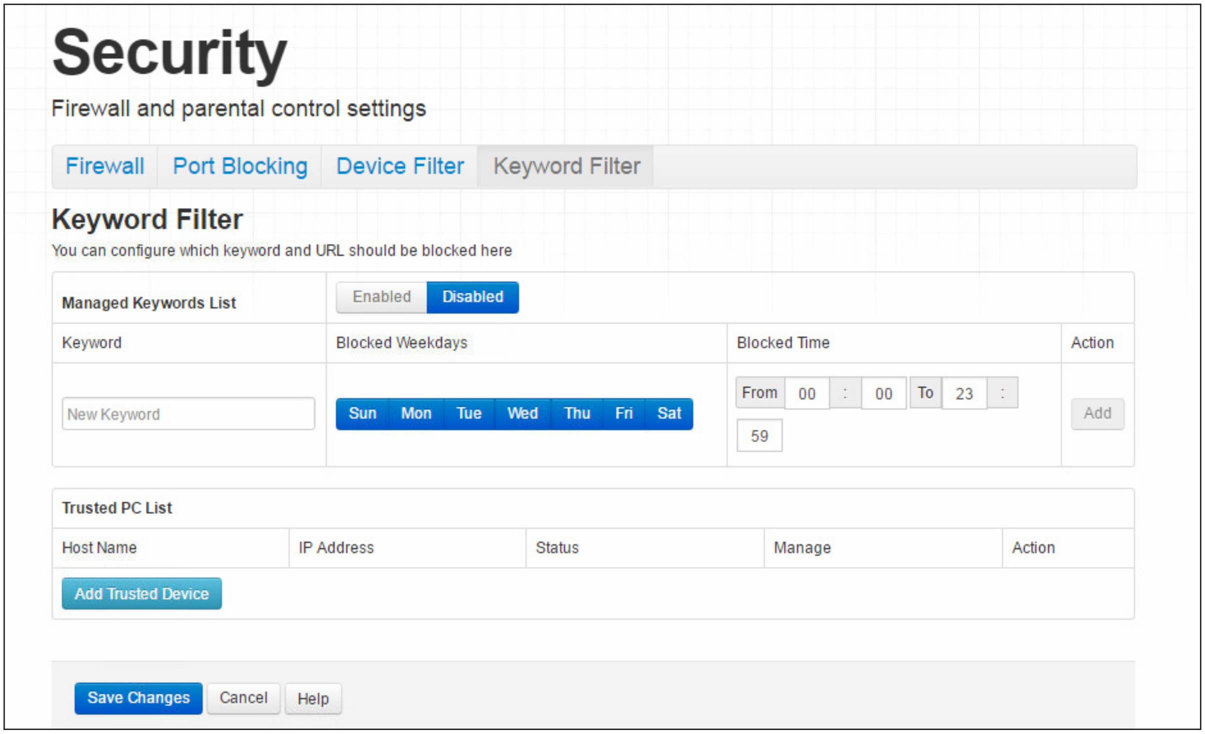
7.5 The Security: Keyword Filter Screen

Use this screen to block access from the LAN to websites whose URLs (Web addresses) and page content (text) contain certain keywords. You can create multiple keyword blocking rules, and set them to apply on certain days and at certain times.

You can also create and edit trusted device rules. Trusted devices are those to which keyword filtering rules are not applied.

Click **Security** > **Keyword Filter**. The following screen displays.

Figure 53: The Security: Keyword Filter Screen



Security

Firewall and parental control settings

Firewall | Port Blocking | Device Filter | Keyword Filter

Keyword Filter

You can configure which keyword and URL should be blocked here

Managed Keywords List — Enabled [✓ Disabled]

Keyword	Blocked Weekdays	Blocked Time	Action
New Keyword	Sun Mon Tue Wed Thu Fri Sat	From 00 : 00 To 23 : 59	Add

Trusted PC List

Host Name	IP Address	Status	Manage	Action
Add Trusted Device				

Save Changes | Cancel | Help

The following table describes the labels in this screen.

Table 41: The Security: Keyword Filter Screen

Managed Keywords List	Use this field to turn keyword filtering on or off. - Select **Enabled** to turn keyword filtering on. - Select **Disabled** to turn keyword filtering off.
Keyword	Enter the keyword that you want to block. The CODA-551x examines both the page’s URL (Internet address) and its page content (text).
Blocked Weekdays	Use these fields to specify the times at which the keyword should be blocked. A red background indicates that the rule will be applied (access will be blocked), and a green background indicates that the device will not be applied (access will not be blocked). Click a day to toggle the rule on or off for the relevant day.
Blocked Time	Use these fields to specify the period during which the rule should be applied. Enter the start time in the **From** fields, using twenty-four hour notation, and enter the end time in the **To** fields.

Table 41: The Security: Keyword Filter Screen (continued)

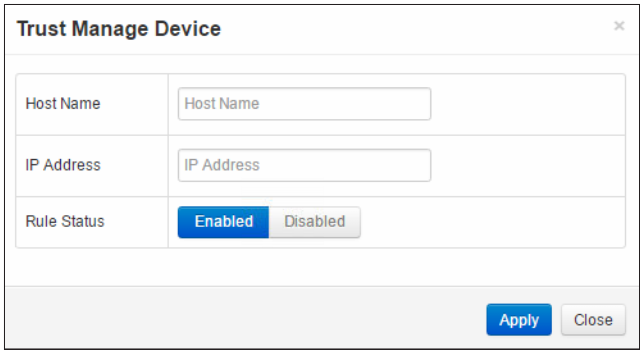
Action	Click **Add** to create a new keyword blocking rule; a new row of fields display.
Trusted PC List	
Host Name	This displays the arbitrary name of each trusted PC you configured.
IP Address	This displays the IP address of each trusted PC. Every network device has a MAC address that uniquely identifies it.
Status	This displays whether the device is currently trusted (**Enabled**) or untrusted (**Disabled**).
Manage	Click **Manage** to make changes to the trusted device rule. See Adding or Editing a Keyword Filter Trusted Device Rule on page 119 for information on the screen that displays.
Action	Click **Delete** to remove the trusted device rule.
Add Trusted Device	Click this to create a new trusted device rule. See Adding or Editing a Keyword Filter Trusted Device Rule on page 119 for information on the screen that displays.
Save Changes	Click this to save your changes to the fields in this screen.
Cancel	Click this to return the fields in this screen to their last-saved values without saving your changes.
Help	Click this to see information about the fields in this screen.

7.5.1 Adding or Editing a Keyword Filter Trusted Device Rule

- To add a new trusted device rule, click **Add Trusted PC** in the **Security** > **Keyword Filter** screen.
- To edit an existing trusted device rule, locate the rule in the **Security** > **Keyword Filter** screen and click its **Manage** button.

The following screen displays.

Figure 54: The Security: Keyword Filter Trusted Device Add/Edit Screen



Trust Manage Device

Host Name	Host Name
IP Address	IP Address
Rule Status	Enabled Disabled

The following table describes the labels in this screen.

Table 42: The Security: Keyword Filter Trusted Device Add/Edit Screen

Host Name	Enter a name to identify the device.
IP Address	Enter the IP address of the device.
Rule Status	Use this field to define whether the trusted device rule should be active or not. ▸ Select **Enabled** to activate the trusted device rule. ▸ Select **Disabled** to deactivate the trusted device rule.
Apply	Click this to save your changes to the fields in this screen.
Close	Click this to return to the **Keyword Filter** screen without saving your changes to the rule.

8

Advanced

This chapter describes the screens that display when you click **Advanced** in the toolbar. It contains the following sections:

8.1 Advanced Overview

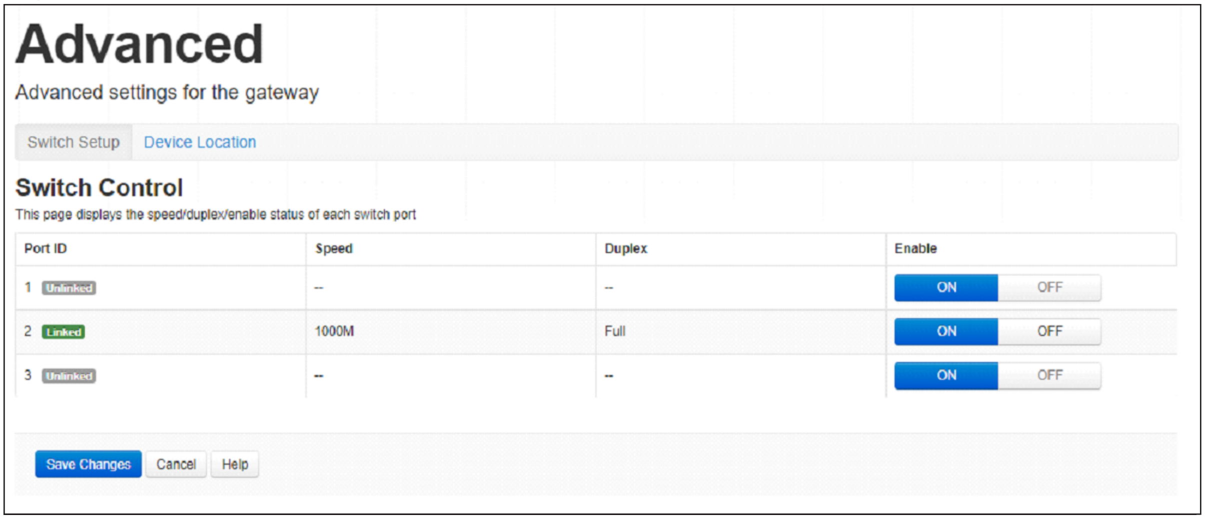
This section describes some of the concepts related to the **Advanced** screens.

8.2 The Advanced: Switch Setup Screen

Use this screen to see information about the data rate and flow of each of the CODA-551x's **LAN** ports, and to activate or deactivate each port.

Click **Advanced** > **Switch Setup**. The following screen displays.

Figure 55: The Advanced: Switch Setup Screen



Advanced

Advanced settings for the gateway

Switch Setup | Device Location

Switch Control

This page displays the speed/duplex/enable status of each switch port

Port ID	Speed	Duplex	Enable
1 Unlinked	--	--	ON OFF
2 Linked	1000M	Full	ON OFF
3 Unlinked	--	--	ON OFF

Save Changes Cancel Help

The following table describes the labels in this screen.

Table 43: The Advanced: Switch Setup Screen

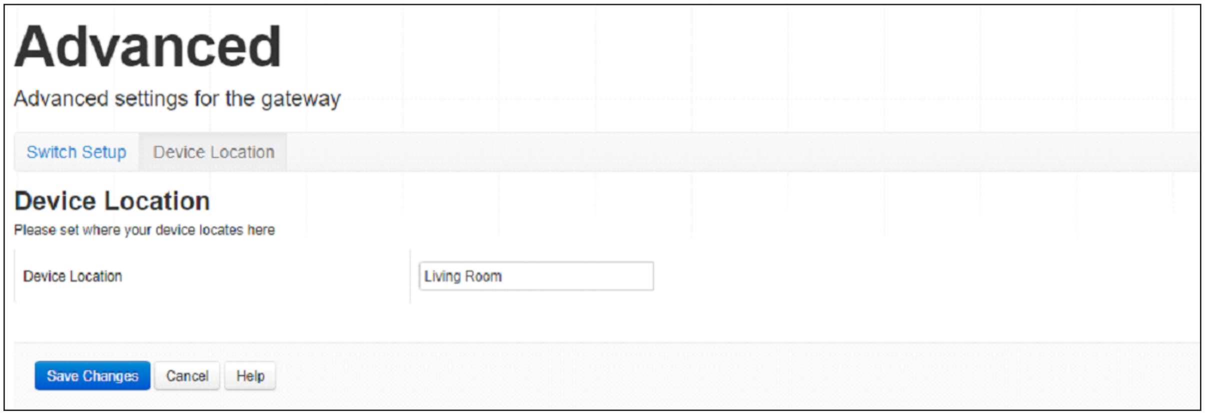
Port	This displays the physical LAN port number.
Speed	This displays the maximum achievable data speed in megabits per second (Mbps).
Duplex	- This displays **Full** when data can flow between the CODA-551x and the connected device in both directions simultaneously. - This displays **Half** when data can flow between the CODA-551x and the connected device in only one direction at a time.
Enable	- Select **ON** to enable communications between the CODA-551x and devices connected to the port. - Select **OFF** to disable communications between the CODA-551x and devices connected to the port.
Save Changes	Click this to save your changes to the fields in this screen.
Cancel	Click this to return the fields in this screen to their last-saved values without saving your changes.
Help	Click this to see information about the fields in this screen.

8.3 The Advanced: Device Location

Use this screen you can set where your device locates. This will help to optimize the network quality if more than one extender is connected,

Click **Advanced** > **Device Location**. The following screen displays.

Figure 56: The Advanced: DDNS Screen



Advanced

Advanced settings for the gateway

Device Location

Please set where your device locates here

Device Location: Living Room

The following table describes the labels in this screen.

Table 44: The Advanced: Device Location Screen

Device Location	For enter your device location.
Save	Click this to save your changes to the fields in this screen.
Cancel	Click this to return the fields in this screen to their last-saved values without saving your changes.
Help	Click this to see information about the fields in this screen.

9

Troubleshooting

Use this section to solve common problems with the CODA-551x and your network. It contains the following sections:

Problem: None of the LEDs Turn On

The CODA-551x is not receiving power, or there is a fault with the device.

1 Ensure that you are using the correct power adaptor.

Using a power adaptor other than the one that came with your CODA-551x can damage the CODA-551x.

2 Ensure that the power adaptor is connected to the CODA-551x and the wall socket (or other power source) correctly.

3 Ensure that the power source is functioning correctly. Replace any broken fuses or reset any tripped circuit breakers.

4 Disconnect and re-connect the power adaptor to the power source and the CODA-551x.

5 If none of the above steps solve the problem, consult your vendor.

Problem: One of the LEDs does not Display as Expected

1. Ensure that you understand the LED's normal behavior (see LEDs on page 16).
2. Ensure that the CODA-551x's hardware is connected correctly; see the Quick Installation Guide.
3. Disconnect and re-connect the power adaptor to the CODA-551x.
4. If none of the above steps solve the problem, consult your vendor.

Problem: I Forgot the CODA-551x's Admin Username or Password

The default username is cusadmin, and the password is the same as the password you configured for the wireless network in the EasyConnect setup wizard (see EasyConnect on page 23).

Problem: I Cannot Access the CODA-551x or the Internet

1. Ensure that you are using the correct IP address for the CODA-551x.
2. Check your network's hardware connections, and that the CODA-551x's LEDs display correctly (see LEDs on page 16).
3. Make sure that your computer is on the same subnet as the CODA-551x; see IP Address Setup on page 17.
4. If the above steps do not work, you need to reset the CODA-551x. See Resetting the CODA-551x on page 21. All user-configured data is lost, and the CODA-551x is returned to its default settings. If you previously backed-up a more recent version your CODA-551x's settings, you can now upload them to the CODA-551x; see The Admin: Backup Screen on page 98.
5. If the problem persists, contact your vendor.

Problem: I Cannot Connect My Wireless Device

1. Ensure that your wireless client device is functioning properly, and is configured correctly. See the wireless client's documentation if unsure.

2 Ensure that the wireless client is within the CODA-551x's radio coverage area. Bear in mind that physical obstructions (walls, floors, trees, etc.) and electrical interference (other radio transmitters, microwave ovens, etc) reduce your CODA-551x's signal quality and coverage area.

3 Ensure that the CODA-551x and the wireless client are set to use the same wireless mode, SSID and security settings (see The Wireless Basic Settings Screen on page 64 and The WPS & Security Screen on page 72).

4 Re-enter any security credentials (WEP keys, WPA(2)-PSK password, or WPS PIN).

5 If you are using WPS's PBC (push-button configuration) feature, ensure that you are pressing the button on the CODA-551x and the button on the wireless client within 2 minutes of one another.

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