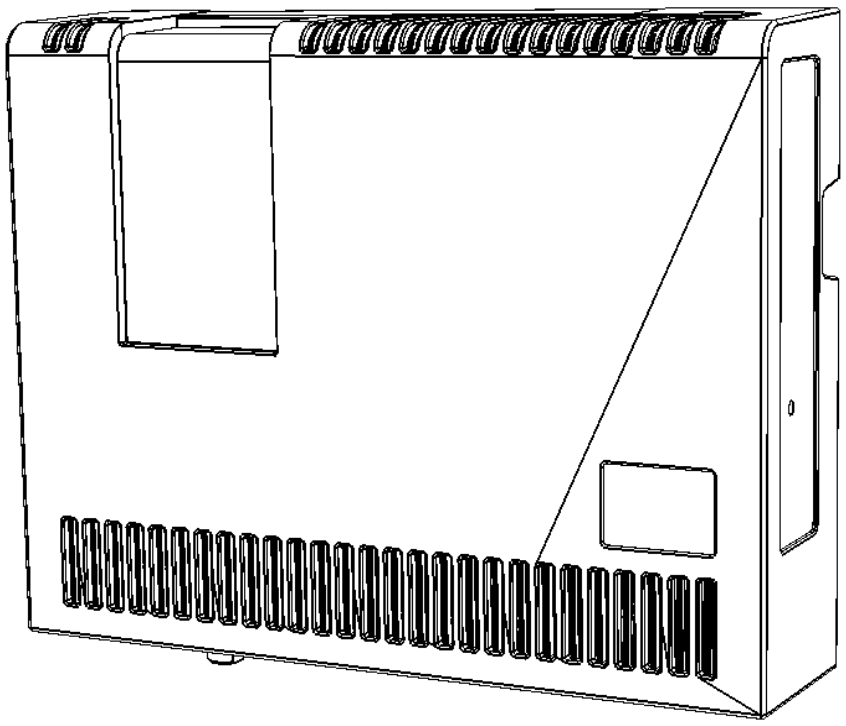
DRG

Digital Residential Gateway

DRG700

USER GUIDE



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Introduction

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This Chapter provides an overview of the DRG700 features and capabilities.

Congratulations on the purchase of your new **DRG700** router. The DRG700- is a multi-function digital residential gateway device that provides the following services:

- **Multiport GigabitEthernet Switch** for 100BaseT or 1000BaseT connections.
- **Voice over IP** Ports for IP telephones
- **Wireless Access Point** for 802.11b/g/n wireless devices
- **TV Out** coaxial connector

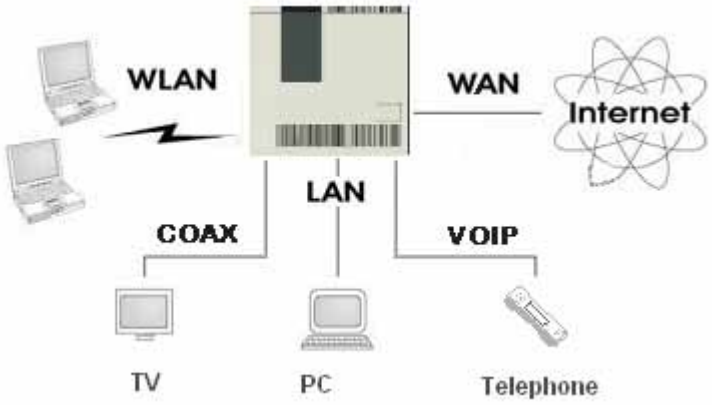


Figure 1. DRG700 multi-functions in the broadband network

DRG600 WiFi Features

The DRG700 incorporates many advanced features, carefully designed to provide sophisticated functions while being easy to use.

Internet Access Features

- **Shared Internet Access.** All users on the LAN or WLAN can access the Internet through the DRG700, using only a single external IP Address. The local IP addresses are hidden from external sources. This process is called NAT (Network Address Translation)
- **Fixed or Dynamic IP Address.** On the Internet connection, the DRG700 supports both Dynamic IP Address (IP Address is allocated on connection) and Fixed IP Address.
- **PPPoE support.** Connecting to the Internet using Point to Point Protocol over Ethernet (PPPoE) is also supported.

Wireless Features

- **Standards Compliant.** The DRG700 complies with the IEEE802.11 b/g/n specifications for Wireless LANs.
- **Supports both 802.11b and 802. 11g Wireless Stations.** The 802.11 standard is backwards compatible with earlier versions, so both 802.11b, 802.11g and 802.11n wireless clients can be used simultaneously.
- **Speeds up to 300Mbps.** All connection speeds up to the 802.11n maximum of 300 Mbps are supported.
- **WEP support.** Support for WEP (Wired Equivalent Privacy) is included. Key sizes of 64 Bit and 128 Bit are supported.
- **WPA support.** Support for WPA is included. WPA is more secure than WEP, and should be used if possible.
- **WPA2 support.** Support for WPA2 is also included. By default, WPA2 uses the extremely secure AES encryption method.
- **Wireless MAC Access Control.** The Wireless Access Control feature can check the MAC address (hardware address) of Wireless stations to ensure that only trusted Wireless Stations can access your LAN.
- **Simple Configuration.** If the default settings are unsuitable, they can be changed quickly and easily.

LAN Features

- **4 Port GigabitEthernet switch.** The DRG700 incorporates a 4 port 100/1000BaseT gigabitethernet switch, making it easy to create and extend your LAN.
- **DHCP Server Support. D**ynamic **H**ost **C**onfiguration **P**rotocol provides a dynamic IP address to PCs and other devices upon request. The DRG700 can act as a **DHCP Server** for devices on your local LAN and WLAN.

Configuration & Management

- **Easy Setup.** Use your web browser from anywhere on the LAN or WLAN to configure the DRG700 connection (if permitted by service provider).
- **Network Diagnostics.** You can use the DRG700 to perform a *Ping, traceroute* troubleshooting operation.

Security Features

- **Password - protected Configuration.** Optional password protection is provided to prevent unauthorized users from modifying the configuration data and settings.
- **Wireless LAN Security.** WEP, WPA and WPA2 data encryption protocols are supported, as well as wireless access control, to prevent unknown wireless stations from accessing your LAN.
- **NAT Protection.** An intrinsic side effect of NAT (Network Address Translation) technology is that by allowing all LAN users to share a single IP address, the location and even the existence of each PC is hidden. From the external viewpoint, there is no network, only a single device - the DRG700.
- **Stateful Inspection Firewall.** All incoming data packets are monitored and all incoming server requests are filtered, thus protecting your network from malicious attacks from external sources.
- **Protection against DoS attacks.** DoS (Denial of Service) attacks can flood your Internet connection with invalid packets and connection requests, using so much bandwidth and so many resources that Internet access becomes unavailable. The DRG700 incorporates protection against DoS attacks.

Package Contents

The following items are included in your DRG700 package:

- DRG700 Unit
- Power Supply Unit (PSU)
- Quick Guide leaflet
- CD-ROM containing this online manual

If any of the above items are damaged or missing, please contact your vendor immediately.

Physical Details

Top mounted LEDs

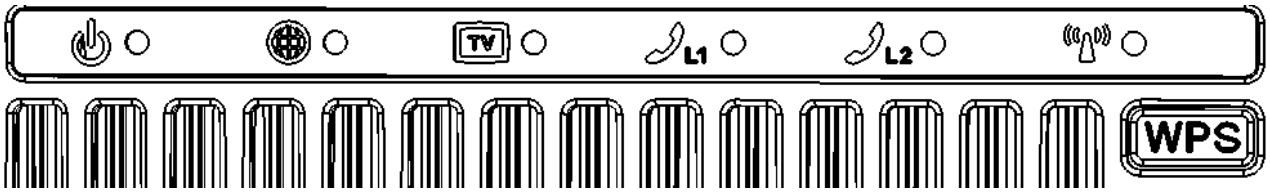


Figure 2. Top mounted LEDs

Reset. When this button is pressed and released, the DRG700 will reboot (restart).

The WiFi Protected Setup (WPS) button connects WPS devices to the wireless network..
The WPS button can only connect one device at a time.

NOT SUPPORTED AT THIS TIME!

OFF- Power OFF.

GREEN Power ON. If flashing **RED**, the module is still starting up.

When the DRG700 is operating correctly, it is lit **GREEN** .

RED. Boot error. If this LED is lit **RED**, then it means that there is an irreparable operating system error.

Try power cycling the device, if this does not work, contact your ISP (Internet Service Provider)

for assistance.

OFF- WAN not active.

GREEN WAN uplink is working and connected at 1000Mbps. If flashing, the WAN uplink is active

ORANGE WAN uplink is working and connected at 100Mbps. If flashing, the WAN uplink is active,

OFF- TV not active.

GREEN TV transmission is enabled. When the DRG700 is operating correctly, this LED is constantly lit.

RED. TV transmission error. If this LED is lit, then it means that there is an irreparable operating error.

Contact your ISP (Internet Service Provider) for assistance.

. **OFF**- Telephone Line 1 is OFF.

GREEN Telephone Line 1 is enabled and connected to server.

When the DRG700 is operating correctly, it is constantly lit.

. **OFF**- Telephone Line 2 is OFF.

GREEN Telephone Line 2 is enabled and connected to server. If flashing, the module is still connecting to the network server. When the DRG700 is operating correctly, it is constantly lit.

.

GREEN WLAN connection is enabled and at least one client is associated with the DRG access point. If blinking, WLAN connection is ACTIVE.

Bottom Panel

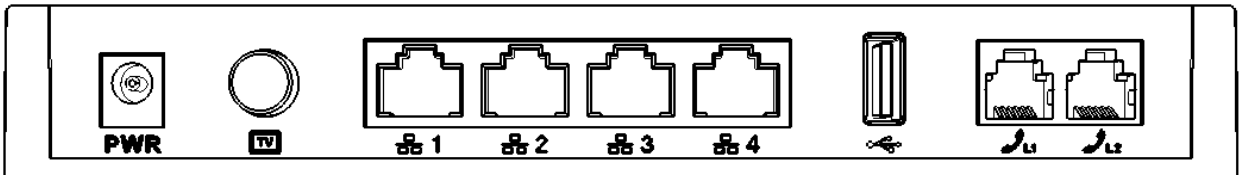


Figure 3. Bottom Panel

PWR Power connector socket. ONLY use the power supply unit shipped with the DRG700 unit.

TV **(Optional)** Connecter for RF coaxial cable for analog TV devices.

LAN 1-4 Local Area Network (LAN) device ports – each port has an orange and green LED.

Orange LED indicates that port is connected using 10Mbps or 100Mbps.

Green indicates that port is connected at 1000Mbps.

Blinking indicates that the port is active.

Use standard LAN cables (RJ45 connectors) to connect your LAN devices to these ports.

USB USB 2.0 read only socket

NOT SUPPORTED AT THIS TIME

L1 – L2 **(Optional)** Telephone Line (RJ-11) connectors. .

Installation

This chapter describes the physical installation of the DRG700.

Requirements

- DRG700 Base, preferably with an active Internet subscription.
- For DRG700 without WIFI, a network cable. Use standard 10/100/1000 BaseT network (Cat5) cables with RJ45 connector.
- For DRG700 with WIFI, a wireless device compliant with IEEE802.11b/g/n.

Installing the DRG700

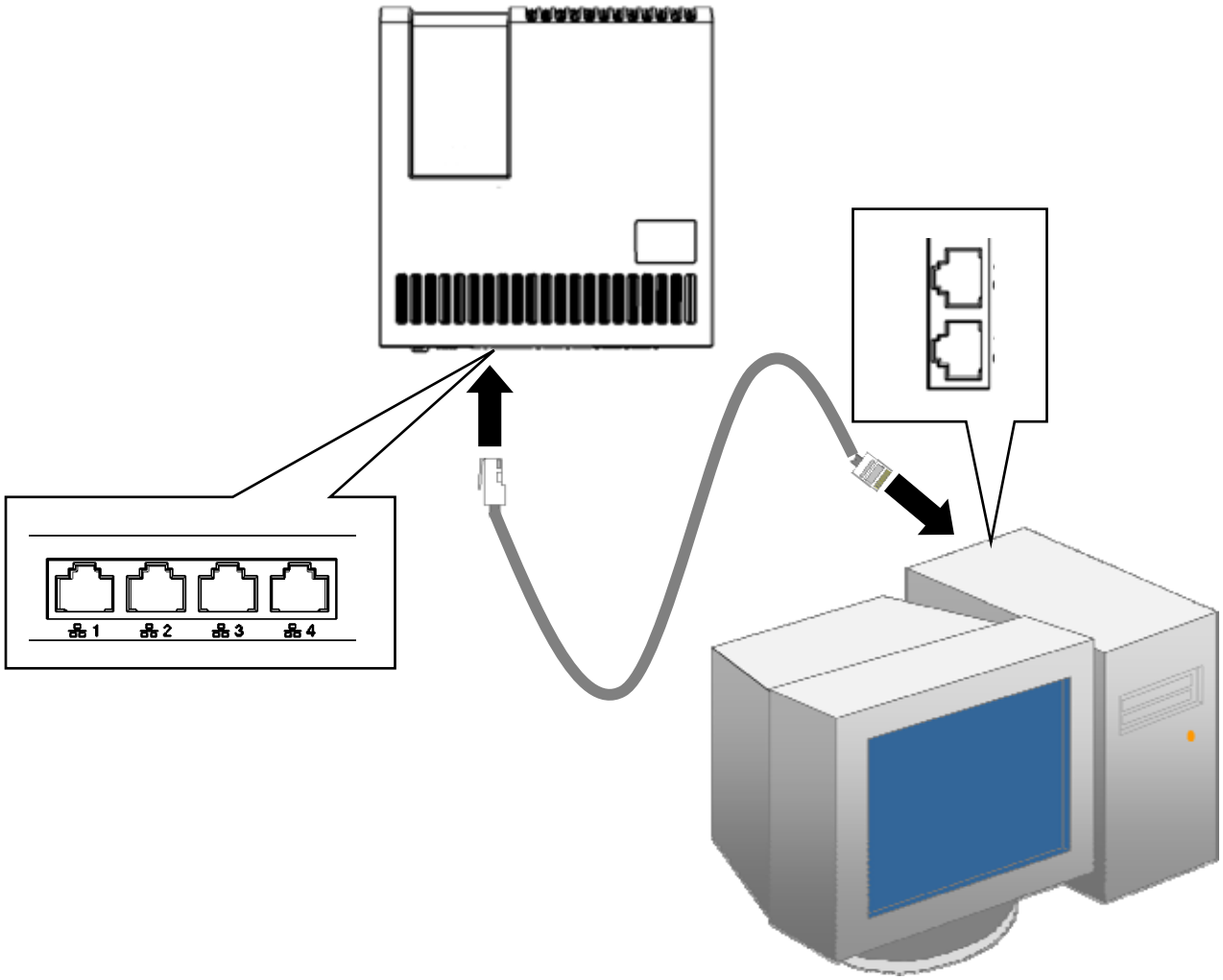
To install the DRG700, do the following:

1. Locate the DRG700Base access point for your broadband network for the DRG700 pre-installed in your home.
2. Remove the dust covers on the FTU.
3. Remove the dust covers on the DRG700.
4. Slide the DRG700 upwards until the optical connectors connect and press downwards gently so the DRG700 sits firmly on the FTU.
5. Connect the PSU to the PWR socket on the bottom panel of the DRG700. The PWR LED on the top panel will blink first GREEN, then RED, while the DRG is booting.

When the DRG has booted successfully, the PWR LED will be display a constant GREEN color. If an error occurs, it will be indicate a constant RED color.

Connect your PC to the DRG700 using a network cable

For DRGs without WIFI, use a standard Twisted Pair (TP) network cable to connect your PC LAN port to one of the LAN ports on the bottom of the DRG700. The LED indicators will start blinking showing that the port is active.

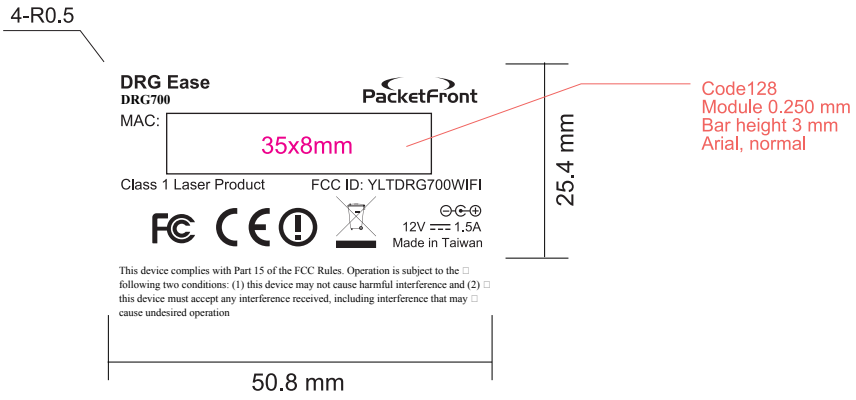


- For each LAN (PC) connection, the LAN *Link/Act* LED should be ON (provided the PC is also ON.) For more information, refer to *Top-mounted LEDs* in Chapter 1.
-

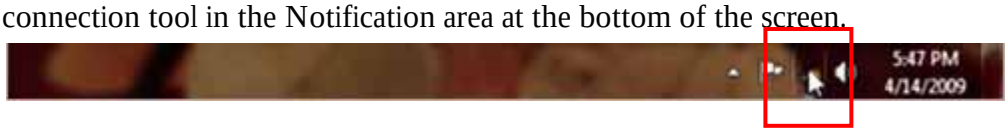
Connect to the DRG700 using WIFI

For DRG700 models with WIFI functionality, you can create a wireless connection using the SSID and the WPA2 security key supplied with the device. To create the wireless connection for a PC using Windows 7, do the following:

1. Make a note of your unique SSID and WPS PIN (a label is attached to the back of the CD envelope)



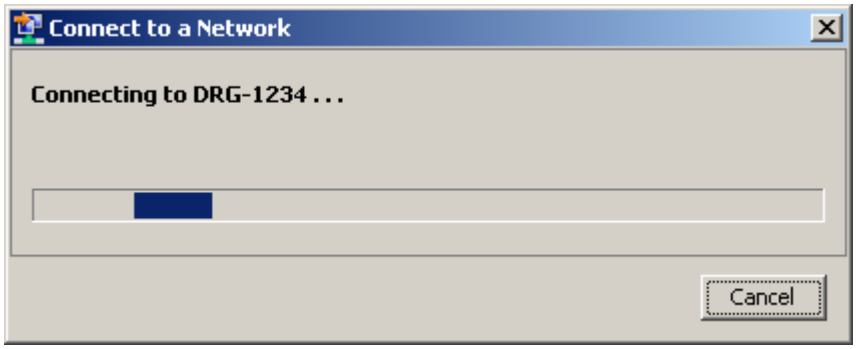
2. Start your PC. Windows 7 will automatically detect the new wireless network and displays the network connection tool in the Notification area at the bottom of the screen.



3. Right click on the tool to display all available networks and select the wireless network with your SSID to open the **Connect to Network** window.

4. Enter the WPA2 security key provided with your DRG and click **OK**.

The DRG700 will validate the keyword and Windows 7 will wait for the connection to be validated



When the connection has been successful, you can see this in the Network Connections window.

If you are not running Windows 7, please consult your operating system manuals on how to connect to a WPA2 AES protected wireless network.

If your PC does not support WPA2-AES encryption, you can also change the encryption method used by the DRG700 to suit your device. See next chapter for details.

Setup

This Chapter provides details.on how to setup your network with the DRG700.

Overview

Now that your DRG700 is installed and connected to your PC, you will need to setup your devices. This chapter describes the setup procedure for:

- Internet Access
- LAN configuration
- Wireless setup
- Change the **admin** password

To configure these settings, you need to use the DRG700 configuration program.

Start the Configuration Program

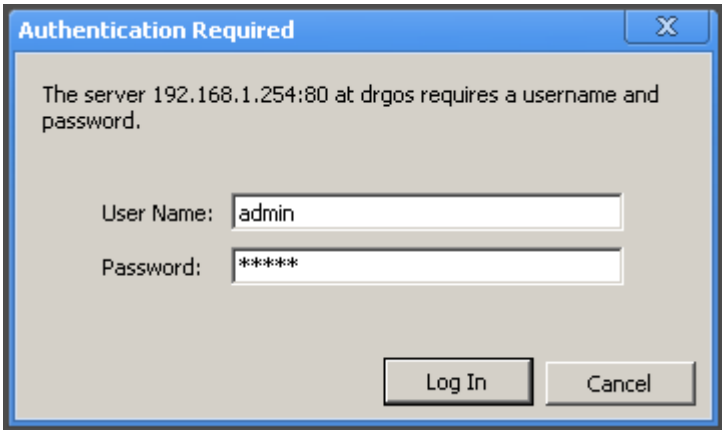
The DRG700 contains an HTTP web server. This enables you to connect to the server and configure the device using your web browser. **Your browser must support Javascript.**

The configuration program has been tested on the following browsers:

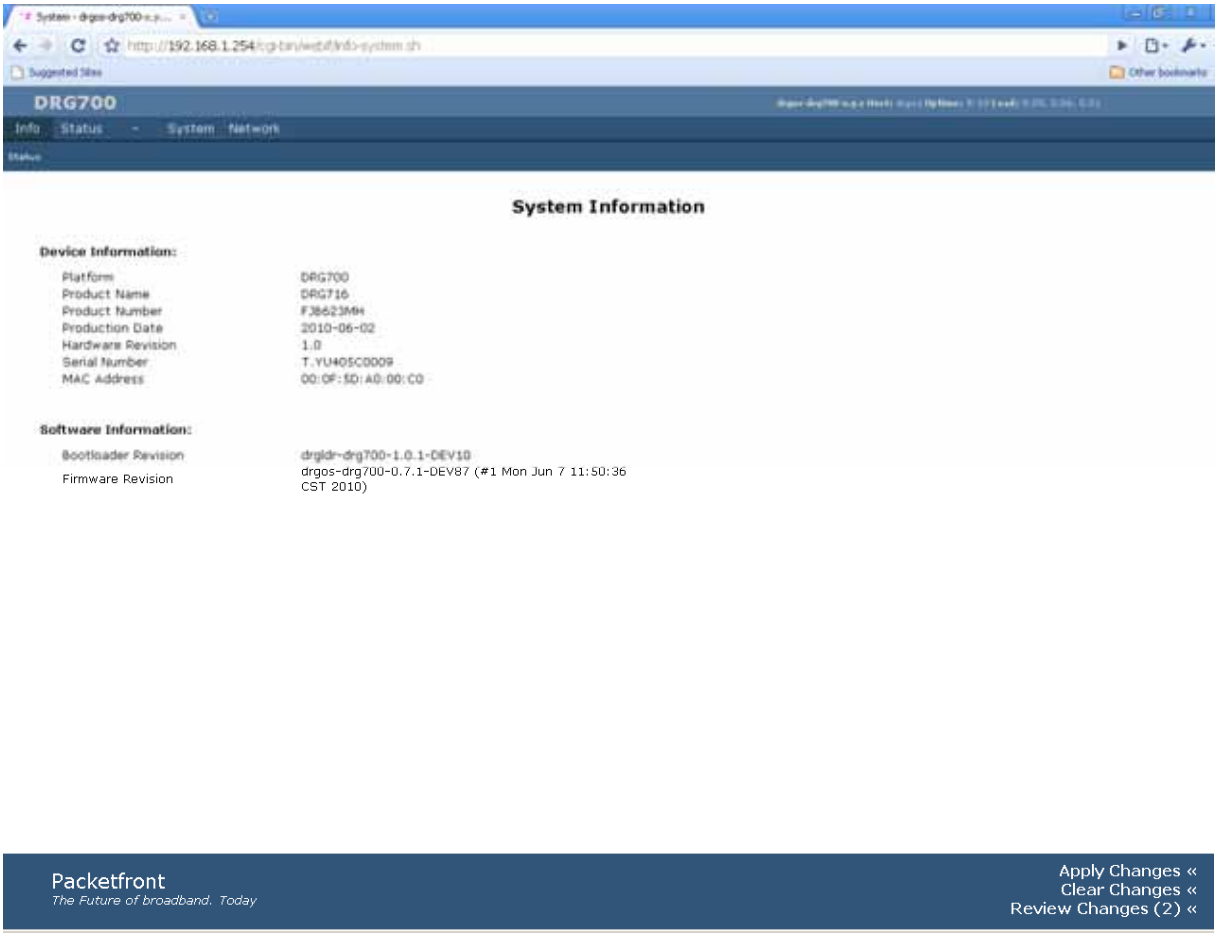
- Safari version 1.2 or later
- Firefox version 2.0 or later
- Internet Explorer version 7.0 or later

To establish a connection from your PC to the DRG700 webserver:

1. Start your WEB browser and go to: http://192.168.1.254
   The Login screen for the DRG700 Configuration Program will appear.



2. Login using with the User Name **admin** and the Password **admin**. The DRG700 configuration program now starts by displaying the system information..



Using the DRG700 Configuration Program

The main window for the GUI uses *tabs* and *buttons* to navigate between different screens of the configuration program.

The *tabs* are located at the top of the screen and will take you to related functions of the DRG700 that you can configure. The different tabs are:

- **Info** displays for system wide information for the DRG
- **Status** displays information for specific functions of the DRG
- **System** configures system parameters
- **Network** configures specific functions

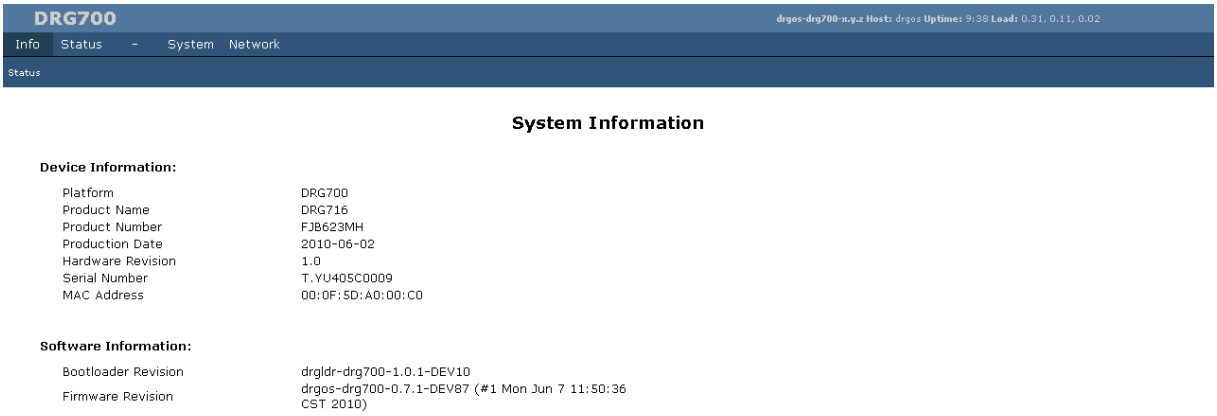
The *buttons* are located at the bottom right hand side of the screen and allow you to save, discard or review any modifications to the default parameters. The buttons are:

- **Apply Changes**
- **Clear Changes**
- **Review Changes**
- **Save Changes** (depending on context)

Remember to always **Save** and then **Apply** the changes, or they won't be activated!

Info tab

The **Info** tab only has one page; the **Status** page.



Device information and Software information is displayed.

This data is generated and cannot be changed here.

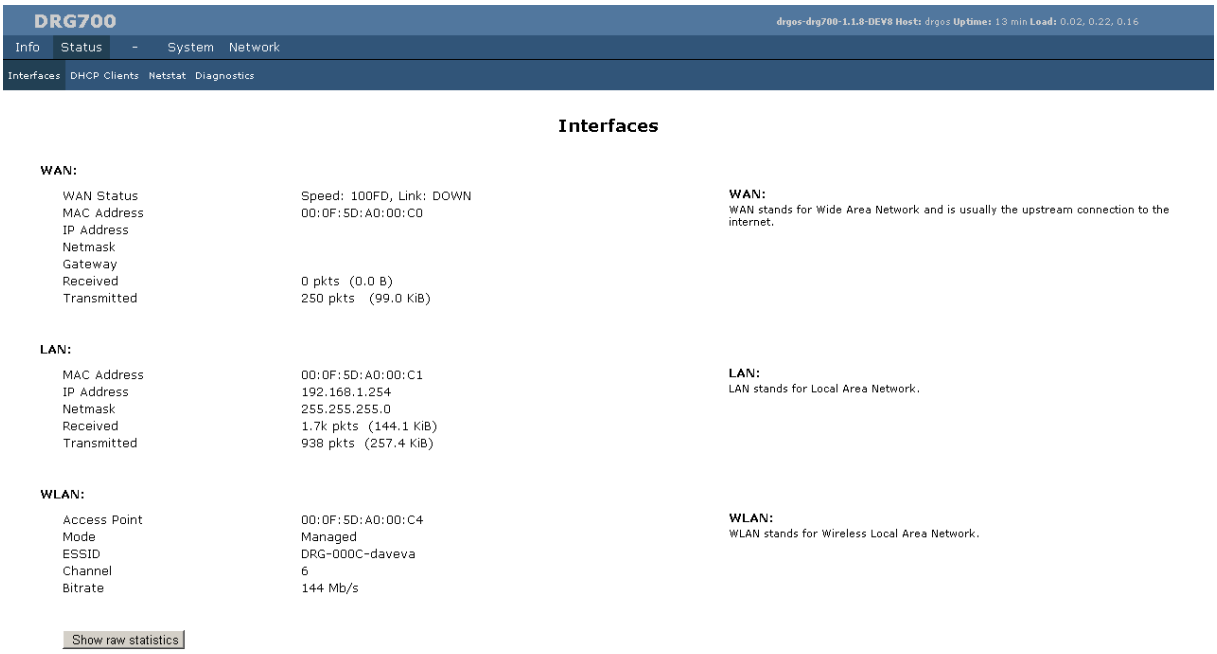
Status

The **Status** tab has the following pages:

- Interfaces
- DHCP clients
- Netstat
- Diagnostics

Status Interfaces

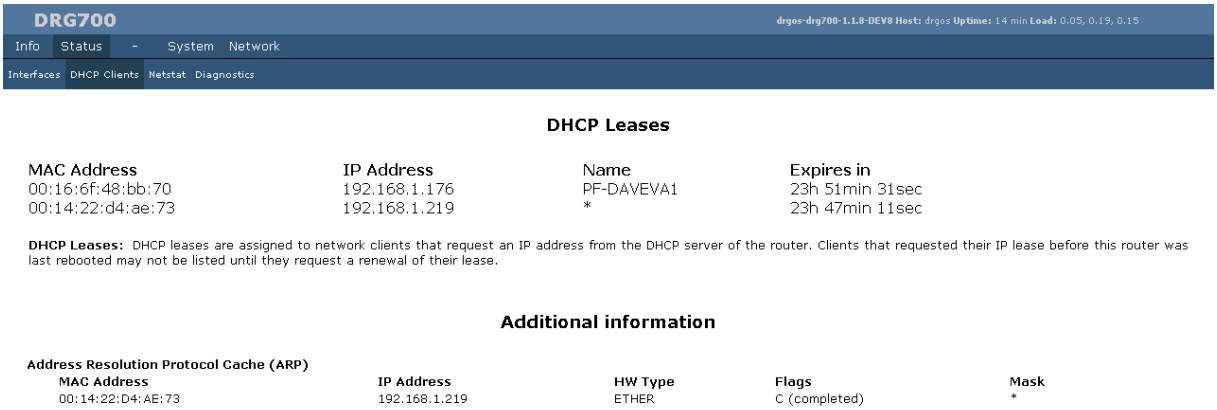
Interfaces are the physical connections to the DRG700. Statistics for the DRG700 interfaces are displayed here.



Field	Description
WAN	Displays real time information for the uplink interface to the broadband network.
LAN	Displays real time information for the devices connected to the DRG700 LAN ports.
WLAN	Displays real time information for the wireless devices connected to the DRG700

Status DHCP clients

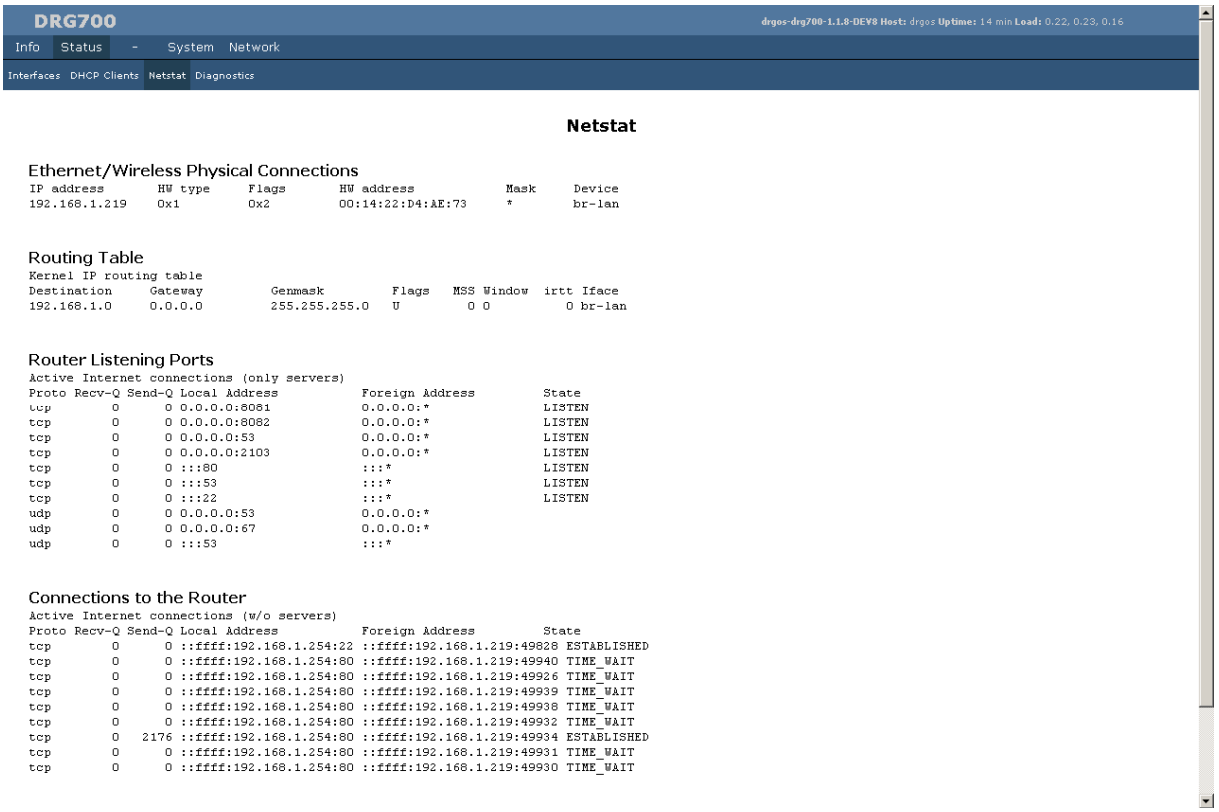
DHCP clients are the devices connected to your home network. This page allows you to see which devices are using the DRG700 at any given point in time, as well as how long they have been connected.



Field	Description
DHCP Leases	MAC Address IP address Name Expires in
Additional information	MAC Address IP address HW Type Flags Mask

Status Netstats

The network statistics shown here shows statistics for traffic over the network at any given moment.



Field	Description
Ethernet/Wireless Physical Connections	
Routing Table	
Router Listening Ports	
Connections to the Router	

Status Diagnostics

In this page, you can use the network utilities **ping** and **traceroute** to troubleshoot the internet connection status. You can change the target websites by editing the URL in the appropriate text fields.

Field	Description
Ping	This is the target webpage used by the ping utility. Enter a new webpage using alphanumeric characters (A-Z, 0-9), blank spaces are not allowed. You can enter the IP address for the target xxx.xxx.x.xxx if preferred.
TraceRoute	This is the target webpage used by the traceroute utility. Enter a new webpage using alphanumeric characters (A-Z, 0-9), blank spaces are not allowed. You can enter the IP address for the target xxx.xxx.x.xxx if preferred.

Using ping

The **ping** tool is a network utility used to test whether a particular website is reachable across the Internet Protocol (IP) network. It also measures the round-trip time for packets sent from the DRG700 to a specified destination. Use this to verify that the DRG700 has internet access.

FIXME: example of successful/unsuccessful ping requests

Using traceroute

The **traceroute** tool is a network utility used to show the route taken by packets across the IP network. The tool sends successive batches of packets and increases the number of servers that the packets traverse on their way to the target destination. The returning packets then produce a list of hosts that the packets have passed through to reach the destination. In this way, statistics are produced that can help identify routin problems, for example if a firewall configuration is blocking some types of traffic.

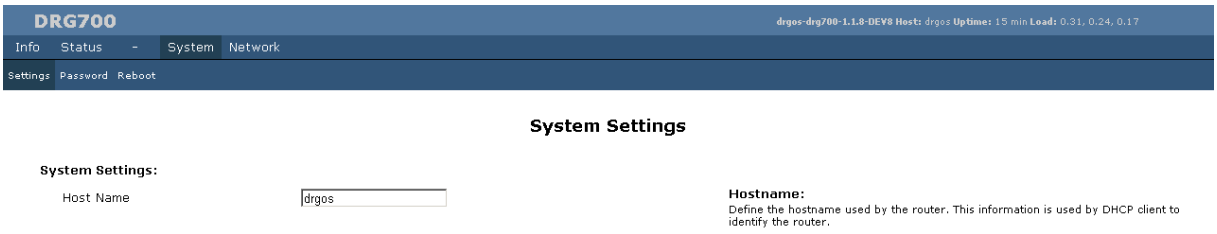
FIXME: example of successful/unsuccessful traceroute requests

System tab

The **System** tab has the following pages:

- Settings
- Password
- Reboot

System Settings

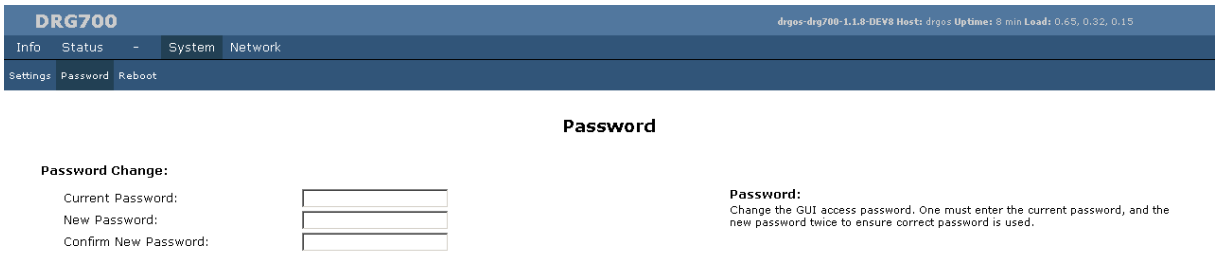


Field	Description
Host name	This is the hostname used by the router to identify it when communicating with other routers. Enter a new hostname using alphanumeric characters (A-Z, 0-9), blank spaces are not allowed.

To save the new host name for the DRG700, click **Save Changes**.

System Password

The default password is admin for all DRG700 devices. You should change this to prevent unauthorized use of the configuration program. From this page, you can change the password used to logon to the web server.

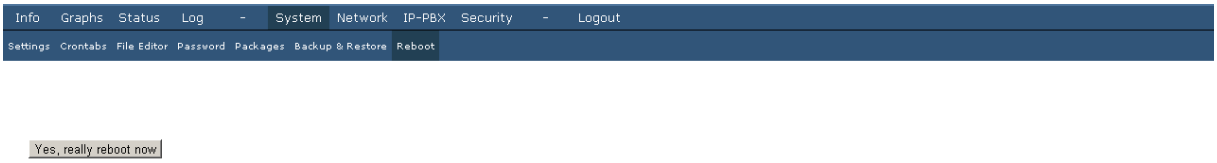


Field	Description
Current password	Enter the current password used to login to the configuration program. This is required to prevent unauthorized persons hijacking the program.
New password	Enter the new password, valid input is A-Z, 0-9. Blank spaces are not allowed.
Confirm new password	Re-enter the password. If it is not identical to the first entry, you will receive an error message. This is to prevent typing errors.

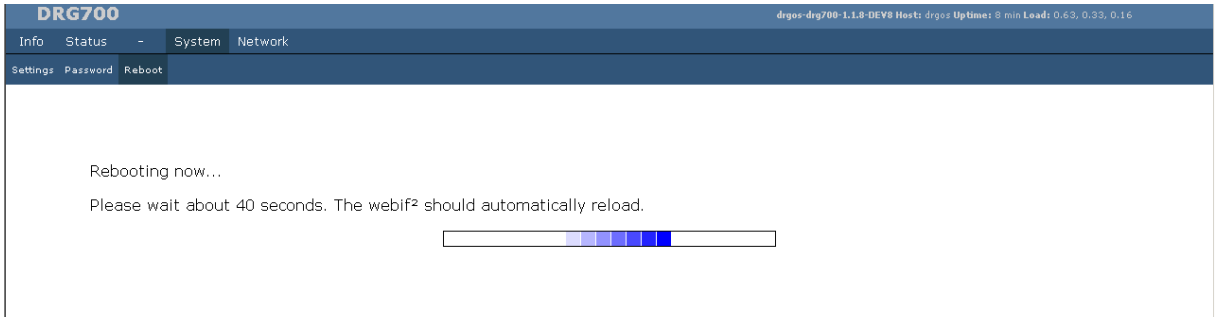
Remember to click **Save changes**. The new password will be valid the next time you logon to the web server.

System Reboot

Selecting **Reboot** will restart the DRG700 and reload the software with any modifications that you have made. First, you will have to confirm that you really want to reboot.



Click the button to confirm the reboot. The DRG700 will now restart.

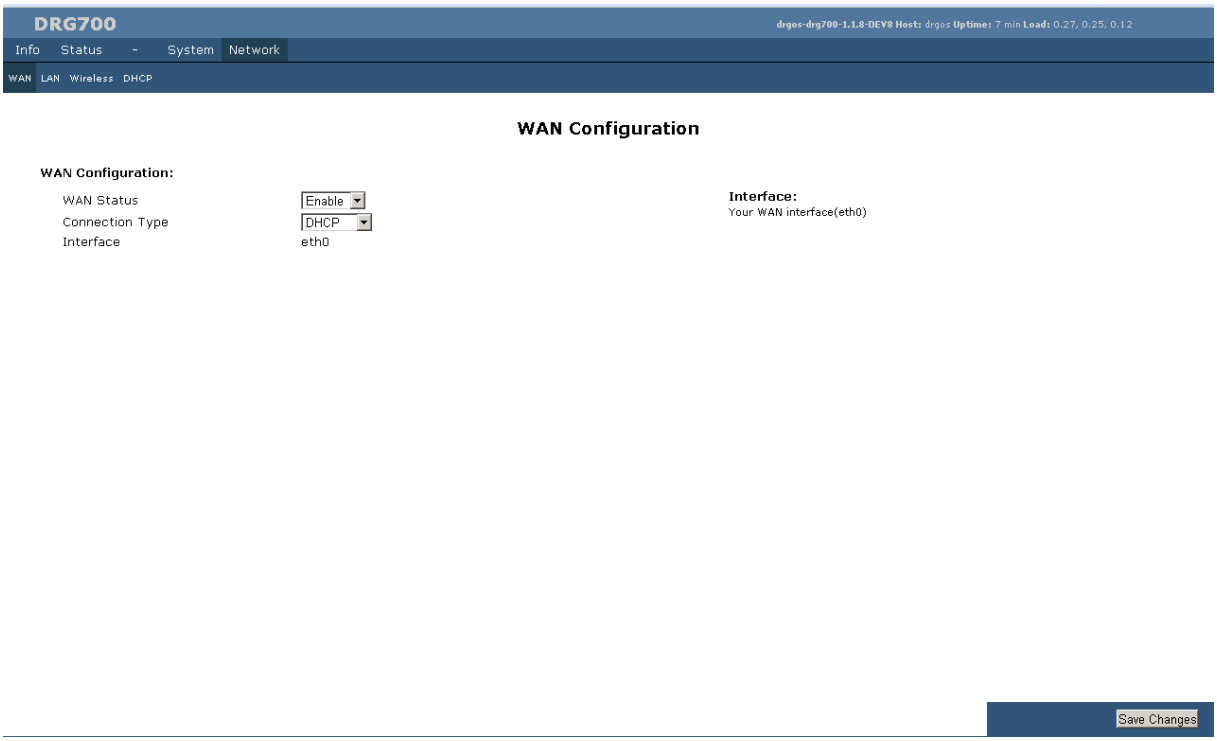


Network

Under this tab, you can configure the user settings for the following network interfaces:

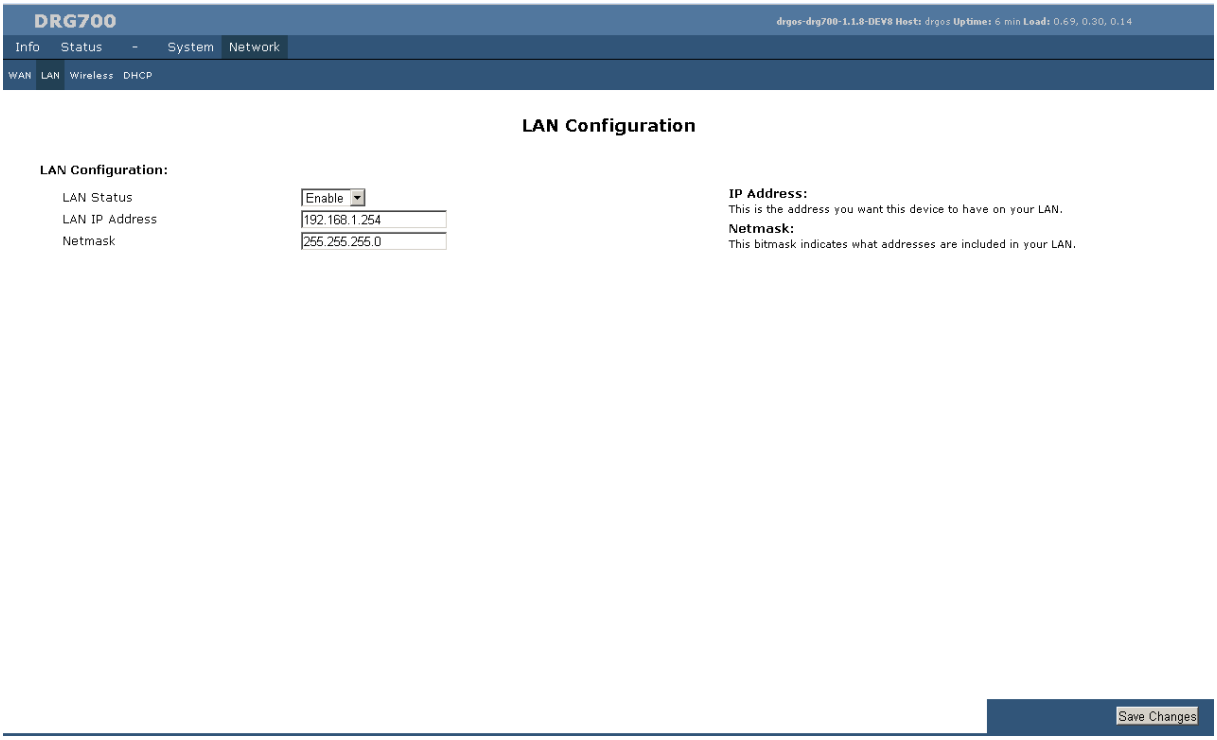
- WAN
- LAN
- Wireless

WAN Configuration



Field	Description
WAN status	This will show "Enabled" or "Disabled". If "Enabled", the Internet IP Address from your ISP is allocated automatically upon connection. (Dynamic IP Address). If "Disabled", the Internet IP Address from your ISP is Fixed or Static.
Connection Type	This is the method used to assign the IP address for the DRG700. In most cases, it will be DHCP.
Interface	The WAN interface is always eth0

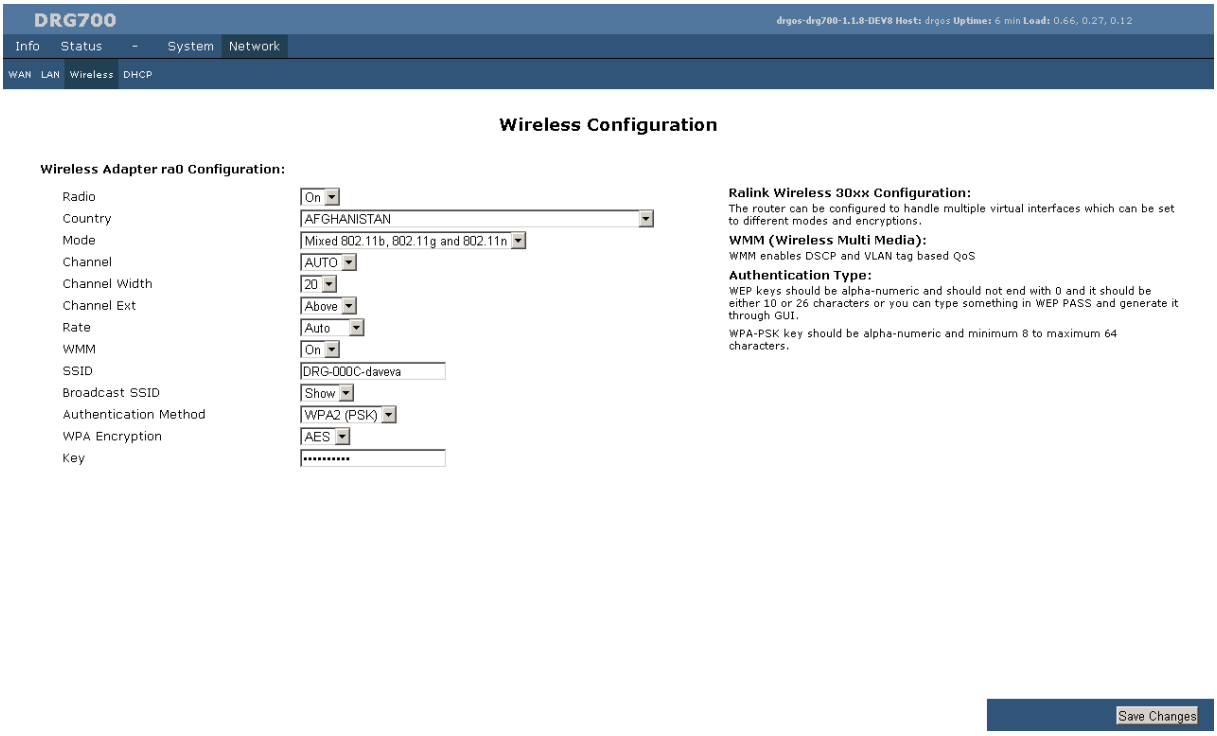
LAN Configuration



Parameter	Description
LAN status	If Enabled, the DRG700 will allocate IP Addresses to PCs (DHCP clients) on your LAN when they start up. The default (and recommended) value is Enabled. If you are already using a DHCP Server, this setting must be Disabled, and the existing DHCP server must be re-configured to treat the DRG600-WiFi as the default Gateway.
LAN IP Address	IP address for the DRG600-WiFi, as seen from the local LAN. Use the default value unless the address is already in use or your LAN is using a different IP address range. In the latter case, enter an unused IP Address from within the range used by your LAN.
Netmask	The default value 255.255.255.0 is standard for small (class "C") networks. For other networks, use the Network Mask for the LAN segment to which the DRG700 is attached. i.e. the same value as the PCs on that LAN segment.

Wireless Configuration

The wireless configuration page allows you to configure the parameters for the wireless network. For example, you may wish to change the default SSID and password.



Field	Description
Radio	By default ON, this broadcast
Country	Select your country from the drop-down list. This field displays the country of operation for which the wireless interface is intended. It may not be legal to operate the router in another country. If your country is not listed, please check with your local government agency for more information on which channels you are allowed to use, and select a country which allows those channels. (The channel list changes according to the selected region.)
Mode	Mixed 802.11b, 802.11g and 802.11n- This is the default setting, and should normally be used. All 802.11b, 802.11g and 802.11n wireless devices can use the wireless network.. 802.11g - Only 802.11g devices can use the wireless network 802.11b - Only 802.11b devices can use the wireless network. 802.11n - Only 802.11n devices can use the wireless network.

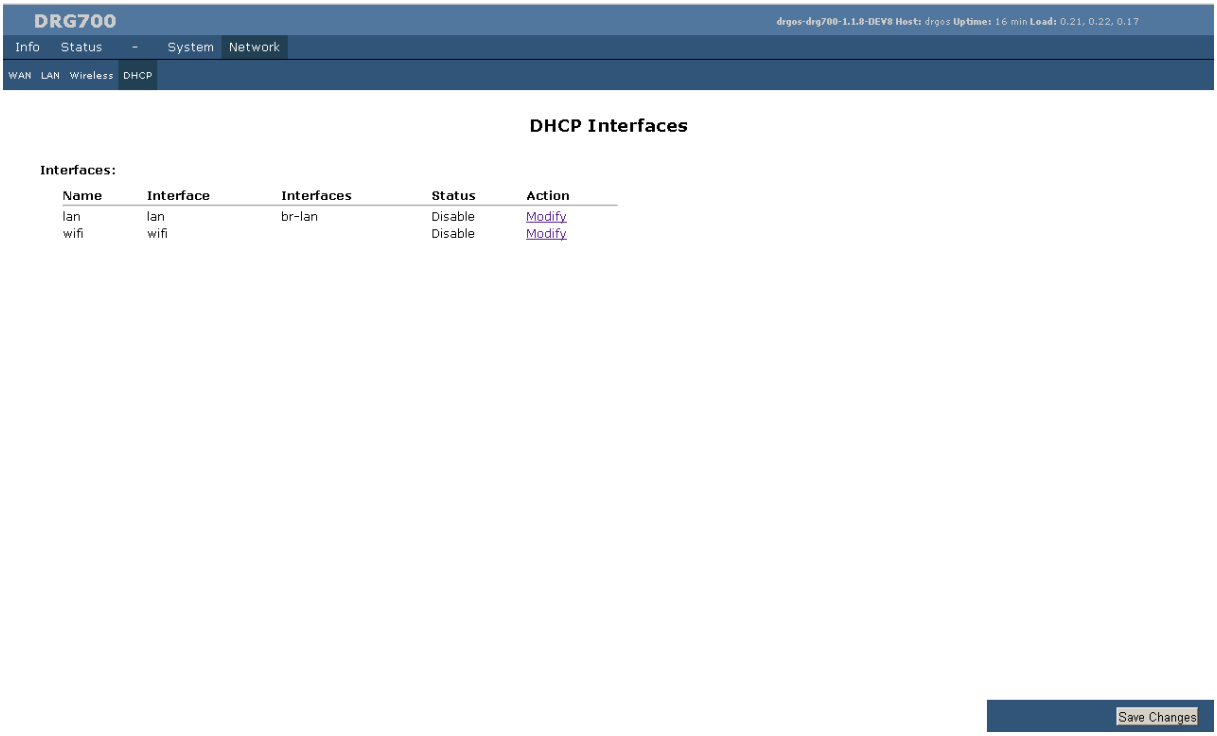
	Mixed 802.11b and 802.11g – Excludes 802.11n devices from the wireless network. Mixed 802.11g and 802.11n – Excludes 802.11b devices from the wireless network.
Channel	This field determines which operating frequency will be used. It should not be necessary to change the wireless channel unless you notice interference problems with another nearby access point. The default is Auto.
Channel Width	IEEE802.11n allows for the use of wideband channels (40MHz). This effectively doubles the bandwidth of the data channel.**NOTE**: It should be noted however, that selecting 40MHz channel bandwidth will adversely affect any other nearby WLANs. Therefore, as required by the standard, if other WLANs are detected the bandwidth used will fall back to 20MHz.
Channel Ext	
Rate	Adjusts the power strength of the wireless signal. Reducing the power strength may reduce the wireless coverage.
WMM	WMM (Wireless Multi Media) enables DSCP and VLAN tag based QoS.
SSID	The name of the wireless network
Broadcast SSID	On your PC, some wireless status screens may display the SSID as the Access Point in use. If using an ESS (Extended Service Set, with multiple access points) this ID is called an ESSID (Extended Service Set Identifier). To communicate, all wireless devices should use the same SSID/ESSID for the network.
Authentication method	The current wireless security encryption method is displayed. Default value is WPA2-PSK. Click the drop down list to select alternative encryption methods. See Wireless security for more information.
WPA Encryption	Default is AES. See Wireless security for more information
Key	The key used for the selected encryption method. See “Wireless security” for more information.

Wireless Security

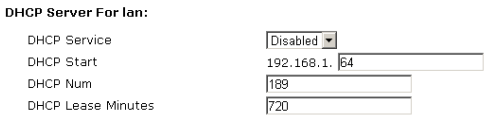
There are four options for Wireless security:

- Disabled - no data encryption is used. It is strongly recommended that this mode is not used. All WLAN data will be visible to anyone with range of the WLAN.
- WEP - data is encrypted using the WEP standard. The WEP protocol is severely compromised and, therefore, it is strongly recommended that this mode is not used.
- WPA -PSK - data is encrypted using the WPA standard. This is a later standard than WEP, and provides much better security than WEP.
- WPA2-PSK - This is a further development of WPA-PSK, and the best level of security. It is strongly recommended that this method is used.

DHCP Interfaces



Press **Modify** to edit the DHCP settings for an interface.



This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-Consult the dealer or an experienced radio/TV technician for help.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

FCC RF Radiation Exposure Statement:

1. This Transmitter has been demonstrated co-location compliance requirements with .

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

2. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.