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# 1. Introduction

Your 3G8WV – HSPA Wi-Fi Router with Voice



The NetComm 3G8WV integrates a Wireless LAN, HSPA module and voice gateway into one stylish unit. Insert an active HSPA SIM card into the slot on the rear panel and get instant access to a 3G Internet connection. The NetComm 3G8WV incorporates a WLAN 802.11b/g/n access point, two Ethernet 10/100Mbps ports and two phone ports for voice calls. It features the latest security options such as WPA2 data encryption, SPI Firewall and VPN pass through.

This feature packed device enables you to quickly and simply create a secure Wi-Fi network and provide Internet access using a 3G network. Share your 3G connection with multiple wireless and wired devices, without the hassle of a fixed line Internet connection. Featuring a voice port means you can now stay connected using the Internet and telephone. If you need a flexible Internet connection for your business, this is the perfect solution for you.

## **1.1 Package Contents**

- 1. 3G8WV HSPA Wi-Fi Router with Voice
- 2. 12VDC~1.5A Power Adapter
- 3. RJ45 LAN Cable
- 4. Quick Install Guide



5. CD(User's Manual)

## **1.2 Key Features**

- 1. Tri-band UMTS / Quad-band GSM/EDGE
- 2. 7.2Mbps down / 5.76Mbps up
- 3. 2 x Voice port (circuit-switched)
- 4. 2 x 10/100 Ethernet ports (Configurable as WAN or LAN)
- 5. 802.11n/300Mbps wireless1
- 6. WAN port for alternate Internet connection (ADSL/Cable/Satellite)
- 7. Supports auto Internet failover to 3G
- 8. 2 Transmit and 2 Receive Internal Wi-Fi antennas
- 9. Wi-Fi Protected Setup (WPS) for an easy and secure wireless connection
- 10. Browser based interface for configuration and management: OS independent and easy to use
- 11. Full wireless security WEP, WPA, WPA2

# 2. Placement of your 3G8WV

Just like your mobile phone, a 3G Router's location will affect its signal strength to the 3G Mobile Base Station (Cell Tower). The data speed achievable from a 3G Router is relative to this signal strength, which is affected by many environmental factors. Please keep in mind that the 3G Router will need adequate signal strength in order to provide Internet connectivity whilst choosing a location to place your 3G8WV.

Similarly to the 3G Router, the wireless connection between the Router and your Wi-Fi devices will be stronger the closer your connected devices are to your Router. Your wireless connection and performance will degrade as the distance between your Router and connected devices increases. This may or may not be directly noticeable, and is greatly affected by the individual installation environment.

If you have concerns about your network's performance that might be related to range or obstruction factors, try moving the computer to a position between three to five meters from the Router in order to see if distance is the problem. If difficulties persist even at close range, please contact NetComm Technical Support.

Note: While some of the items listed below can affect network performance, they will not prohibit your wireless network from functioning; if you are concerned that your network is not operating at its maximum effectiveness, this checklist may help.



## **2.1 Router Placement**

Place your Router as close as possible to the centre of your wireless network devices. To achieve the best wireless network coverage for your "wireless clients" (i.e., computers with built in or USB Wireless Adapters, Laptops with Built-in Wireless, Wireless PDA / iPhone, etc):

• Ensure that your Router's antennas are parallel to each other, and are positioned vertically (toward the ceiling). If your Router itself is positioned vertically, point the antennas in an upward direction as much as possible.

• In multi-storey homes, place the Router on a floor that is as close to the centre of the home as possible. This may mean placing the Router on an upper floor.

• Try not to place the Router near a cordless telephone that operates at the same radio frequency as the 3G8WV (2.4GHz).

## 2.2 Avoid obstacles and interference

Avoid placing your Router near devices that may emit radio "noise," such as microwave ovens. Dense objects that can inhibit wireless communication include:

- Refrigerators
- Washers and/or dryers
- Metal cabinets
- Large aquariums
- Metallic-based, UV-tinted windows

If your wireless signal seems weak in some spots, make sure that objects such as these are not blocking the signal's path (between your devices and Router).

## **2.3 Cordless Phones**

If the performance of your wireless network is impaired after considering the above issues, and you have a cordless phone:

- Try moving cordless phones away from your Router and your wireless-enabled computers.
- Unplug and remove the battery from any cordless phone that operates on the 2.4GHz band (check

manufacturer's information). If this fixes the problem, your phone may be interfering with the Wi-Fi Router.



• If your phone supports channel selection, change the channel on the phone to the farthest channel from your wireless network. For example, change the phone to channel 1 and move your Router to channel 11. See your phones user manual for detailed instructions.

• If necessary, consider switching to a 900MHz or 5GHz cordless phone.

## 2.4 Choose the "Quietest" Channel for your Wireless Network

In locations where homes or offices are close together, such as apartment buildings or office complexes, there may be wireless networks nearby that can conflict with your wireless network.

Use the Site Survey capabilities found in the Wireless Utility of your wireless adapter to locate any other wireless networks that are available (see your wireless adapter's user manual), and switch your Router and computers to a channel as far away from other networks as possible.

• Experiment with more than one of the available channels, in order to find the clearest connection and avoid interference from neighbouring cordless phones or other wireless devices.

• For NetComm wireless networking products, use the detailed Site Survey and wireless channel information included with your wireless network card. See your network card's user guide for more information.

These guidelines should allow you to cover the maximum possible area with your Router. Should you need to cover an even wider area, you should consider looking at building a hybrid network by combining your wireless network with a HomePlug Network. See the NetComm website for more details on HomePlug products.

# 3. Product Layout

## **3.1 Connecting and Configuring your Router**

The Router has been designed to be placed on a desktop. All of the cables exit from the rear of the Router for better organization. The display is easily visible on the FRONT of the Router to provide you with information about network activity and status. See below for explanation of each of the features.

Front Panel	Description
Wireless	Lights up when WLAN is enabled. Blinks on traffic
WAN	Lights up when the router is connected via WAN
LAN	Lights up when specific LAN connection is established. Blinks on LAN PORT trafficLAN
3G	Lights up when the router is connected via 3G



Phone 1	Lights up when the handset connected to Phone 1 is on hook
Phone 2	Lights up when the handset connected to Phone 2 is on hook
Power	Lights up and flashing when powered ON

Rear Ports	
SIM Slot	Insert your SIM card here
3G Antenna	Screw in the 3G Antenna here
WAN	WAN Ethernet port for Fixed Line (ADSL/Cable/Satellite) connection
LAN	LAN Port for wired Ethernet clients (Computers, Laptops, etc)
Phone 2	Phone Port for Handset
Phone 1	Phone Port for Handset
Reset	Hold this button down for 10 seconds to reset to factory defaults.
Power	Power connector, connects to DC 12V 1.25A Power Adapter

## **3.2 Network and System Requirements**

Before continuing with the installation of your 3G8WV, please confirm that you comply with the minimum system requirements below.

• Compatible 3G SIM card(850MHz/1900MHz/2100MHz) with Active SIM/Data Service if you want to use 3G Broadband service.

Note: Subject to terms and conditions from your 3G Mobile Broadband Service Provider.

• Computer with Windows, Macintosh, or Linux-based operating systems with a working Ethernet adapter with TCP/IP Protocol installed.

• A Web Browser such as Internet Explorer, Netscape Navigator, Mozilla Firefox, Opera, Safari etc.

Wireless Computer System Requirements



• Computer with a working 802.11b, 802.11g or 802.11n wireless adapter.

## 3.3 Connecting your 3G8WV

#### Step1 – Insert SIM card

Insert SIM card into the SIM Slot.

#### Step2 – Connect a computer

Connect one end of the Ethernet cable into a LAN Port on the back panel of the 3G8WV, and the other end into an available Ethernet port on the network adapter in the computer you will use to configure the unit.

#### Step3 – Plug in the power

Connect the power adapter to the port on the back panel of your 3G Router. Then plug the other end of the power adapter into a wall outlet or power strip.

**Default Settings** 

LAN (Management)

- Static IP Address: 192.168.20.1
- Subnet Mask: 255.255.255.0
- Default Gateway: 192.168.20.1

WAN (Internet)

• WAN mode: DHCP

#### Wireless

- SSID: NetComm Wireless
- Channel: 11
- Security: WEP, 64bit
- WEP Key: a1b2c3d4e5

#### Modem Access

- Username: admin
- Password: admin

## 4. Advanced Features

This section explains other features that you may want to enable depending on your application. Some features can add extra stability and error recovery. Other features are available to assist with integrating the 3G8WV with your application.



## **4.1 Login Procedure**

- 1. Open your web browser (e.g. Internet Explorer/Firefox/Safari) and navigate to http://192.168.20.1/
- 2. Click Login and type "admin" (without quotes) in the Username and Password fields. Then click on Submit.

Net Gom	<b>3</b> 0 au 30	G8Wv - 3G 2-Port 11n	Wi-Fi Router	
Status	Login	Log		
Login				
Login				
Use Pas	er Name: admin ssword: •••••			
		Submit	Clear	

Note: admin is the default username and password for the unit.

## 4.2 Status

The status page provides system related information. It is shown on login to the 3G8WV, and can also be accessed by selecting Status from the top menu.

By default, the status page will show System Info, Local Network, WWAN, Connection Status and Ethernet Status. To view either WAN, PPPoE or PPTP individually, click on their relevant buttons. To view them all, click on the All Status button.



All Status WAN PPP	OE PPTP		
📈 System Info			
Firmware Version		1.0.16.6 (Jan 13 2010)	
System Up Time		00:56:21	
Operation Mode		Gateway Mode	
// Local Network			
Local IP Address		192.168.20.1	
Local Netmask		255.255.255.0	
MAC Address		00:60:64:25:E9:DE	
WWAN (WAN/3G)			
Operation Mode		AlwaysOn	
Interface	Status	Local	Remote
3G	up	10.250.19.124	10.64.64.65
Connection Status			
Module Name	HSPA USB MODEM		
Provider	Telstra Mobile		
APN	telstra.internet		
Service Type	UMTS		
Coverage	N/A		
IMEI	352347039084974		
Frequency	N/A		
Signal Strength (dBm)	-67 dBm (strong)		
SIM Status	SIM OK		
K Ethernet Port Status			
	Full		
	1	WAN	

# **4.3 Internet Settings**

## **4.3.1 3G Internet Settings**

This page allows you to setup your WWAN (Wireless Wide Area Network) connection. Enter the relevant settings as provided by your 3G provider.

Note For 3G WAN connection: The 3G connection fields may not be necessary for your connection. The information on this page will only be used when your service provider requires you to enter a User Name and Password to connect to the 3G network.





#### Internet Settings > 3G Internet Settings

	1000		
10111012012	E & PA		
10/10/02/10		31-00	11118

This page allows you to setup your WWAN (Wireless Wide Area Network) connection. Enter the relevant settings as provided by your 3G provider.

The unit will default to 'Auto APN Select Mode' if the APN field is blank. You may need to check the APN that is displayed on the Status page while the unit is connecting. If the default APN does not match your SIM account, then you will need to type in the correct APN manually or choose one from the drop down list below.

Auto-APN	Enable 💌
Interface Metric	20
Operation Meda	Always On
operation mode	Always On Mode: Redial Period 20 seconds
	Apply Cancel
PIN Settings	
SIM Status	SIM OK
PIN	
Confirm PIN	
	Apply Cancel



#### Internet Settings > 3G Internet Settings

## WWAN (3G) Settings

This page allows you to setup your WWAN (Wireless Wide Area Network) connection. Enter the relevant settings as provided by your 3G provider.

The unit will default to 'Auto APN Select Mode' if the APN field is blank. You may need to check the APN that is displayed on the Status page while the unit is connecting. If the default APN does not match your SIM account, then you will need to type in the correct APN manually or choose one from the drop down list below.

Auto-APN	Disable 💌
APN	Australia Choose an APN here
Dial	*99# (default *99#)
Authentication Type	CHAP 💌
User Name	
Password	
Verify Password	
Interface Metric	20
Operation Mode	Always On 💌
operation mode	Always On Mode: Redial Period 20 seconds
	Apply Cancel
PIN Settings	
SIM Status	SIM OK
PIN	
Confirm PIN	
	Apply Cancel

Name	Description
Auto-APN	Default is "enabled", 3G8WV will fill up the APN automatically by detecting your SIM card.
User Name	Enter your 3G Username
Password	Enter your 3G Password
Operation Mode	There are 3 Options as following:
'Always On'	Keeps the Internet connection alive, does not disconnect
'OFF'	Does not connect to the Internet



'Automatic 3G Backup'	The Automatic 3G Backup feature of the 3G8WV is designed to provide a backup 3G
	Internet connection in case your primary connection should fail. To use this feature,
	you will need both an Ethernet WAN connection (from an xDSL
	modem/ISDN/Satellite etc) and a 3G WAN connection.
PIN	Enter the Pin Code for your SIM card

Note: For current APN's of various providers, consult the Setting Up Your Router section of this user manual.

## 4.3.2 WAN

Select the WAN connection type suitable for your environment and configure parameters according to the selected connection type.

## STATIC (fixed IP)

If your WAN connection uses a static IP address, please select Static IP Address and fill in the required information in the fields provided.

#### Internet Settings > WAN

## Wide Area Network (WAN) Settings

This page allows you to setup your WAN Connection. First select the WAN connection type (Static, DHCP, PPPoE, PPTP), then enter the relevant settings as provided by your ISP.

WAN Connection Type:	STATIC (fixed IP)
Static Mode	
IP Address	
Subnet Mask	
Default Gateway	
Primary DNS Server	139.130.4.4
Secondary DNS Server	203.50.2.71
MTU	1500
MAC Clone	
Enabled	Disable 💌
	Apply Cancel
WAN Failover Backup	
Automatic 3G Backup	Disable 💌
	Apply Cancel





Name	Description	
IP Address:	Type in the IP address assigned by your Internet Service Provider	
Subnet Mask:	Type in the Subnet mask assigned by your Internet Service Provider	
Default Gateway:	Type in the WAN Gateway assigned by your Internet Service Provider	
Primary/ Secondary DNS:	Type in the DNS address assigned by your Internet Service Provider	
MAC Clone:	Please input the MAC address of your computer here if your service provider only permits computers with a certain MAC address to access the Internet. If you are using the computer which used to connect to the Internet via a cable modern, you can simply press the 'Default' button to fill the MAC address field with the MAC address of your computer.	

Click Apply to save the settings.

## DHCP (Auto config)

This connection will get the IP address from the Internet service provider. Choose this connection if you are connecting the router to a Cable Modem service. Leave everything as default unless instructed by your Internet Service Provider.

#### Internet Settings > WAN

Wide Area Network (WAN) Settings		
This page allows you to setup your WA the relevant settings as provided by you	N Connection. First select the WAN connection type (Static, DHCP, PPPoE, PPTP), then enter Ir ISP.	
WAN Connection Type:	DHCP (Auto config)	
DHCP Mode		
Hostname (optional)		
MAC Clone		
Enabled	Disable 💌	
	Apply Cancel	
WAN Failover Backup		
Automatic 3G Backup	Disable 💌	
	Apply Cancel	

Name	Description
Host Name	Please input the host name of your computer. This is optional, and only required if your service provider asks you to do so.
Mac Clone	Please input the MAC address of your computer here if your service provider only permits computers with a certain MAC address to access the Internet. If you are using the computer which used to connect to Internet via a cable modem, you can simply press the 'Default'

button to fill the MAC address field with the MAC address of your computer.

## Click Apply to save the settings.

## PPPoE (ADSL)

Most ADSL services use the PPP over Ethernet protocol. Use this if you connect your 3G Router to a bridged ADSL modem.

#### Internet Settings > WAN

Wide Area Network (WAN) Settings		
This page allows you to setup your WAI the relevant settings as provided by you	N Connection. First select the WAN connection Ir ISP.	type (Static, DHCP, PPPoE, PPTP), then enter
WAN Connection Type:	PPPoE 💌	
PPPoE Mode		
User Name	pppoe_user	
Password	•••••	
Verify Password	•••••	
Operation Mode	Keep Alive  Keep Alive Mode: Redial Period 60 On demand Mode: Idle Time 5	senconds minutes
MAC Clone		
Enabled	Disable 💌	
	Apply Cancel	

Name	Description	
Username/Password	Type in your PPPoE account username and password.	
Operation Mode; There are	e 3 options:	
'Keep Alive'	Keeps the Internet connection alive, does not disconnect.	
'On Demand'	Only connects to the Internet when there's a connect attempt	
'Manual'	Only connects to the Internet when the 'Connect' button on this page is pressed, and disconnects when the 'Disconnect' button is pressed.	
MAC Clone	Please input the MAC address of your computer here if your service provider only permits computers with a certain MAC address to access the Internet. If you are using the computer which used to connect to the Internet via cable modern, you can simply press the 'Default' button to fill the MAC address field with the MAC address of your computer.	

Click Apply to save the settings.



## PPTP

Internet Settings > WAN

## Wide Area Network (WAN) Settings

This page allows you to setup your WAN Connection. First select the WAN connection type (Static, DHCP, PPPoE, PPTP), then enter the relevant settings as provided by your ISP.

WAN Connection Type:	PPTP
PPTP Mode	
Server IP	pptp_server
User Name	pptp_user
Password	•••••
Address Mode	Static
IP Address	192.168.100.1
Subnet Mask	255.255.255.0
Default Gateway	192.168.20.254
	Keep Alive 💌
Operation Mode	Keep Alive Mode: Redial Period 60 senconds
	On demand Mode: Idle Time 5 minutes
MAC Clone	
Enabled	Disable 💌
	Apply Cancel

Name	Description
Server IP	Type in the server IP address assigned by your Internet Service Provider.
User Name/Password	Type in the username and password assigned by your provider.
Address Mode	Select Dynamic if your service uses a DHCP server, or select Static and type in the IP
	address, Subnet Mask and Default Gateway assigned by your Internet Service Provider.
Operation Mode	
'Keep Alive'	Keeps the Internet connection alive, does not disconnect.
'On Demand'	Only connects to Internet when there's a connect attempt
'Manual'	Only connects to the Internet when the 'Connect' button on this page is pressed, and
	disconnects when the 'Disconnect' button is pressed.
Mac Clone	Please input the MAC address of your computer here if your service provider only
	permits computers with a certain MAC address to access the Internet. If you are using

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the computer which used to connect to the Internet via a cable modem, you can simply
press the 'Default' button to fill the MAC address field with the MAC address of your
computer.

Click Apply to save the settings.

#### WAN Failover Backup

The WAN Failover Backup feature of the 3G8WV is designed to provide a backup 3G Internet connection in case your primary connection should fail. To use this feature, you will need both an Ethernet WAN connection (from an xDSL modem/ISDN/Satellite etc) and a 3G WAN connection.

To set up WAN failover on your 3G Router, first tick "Enable automatic 3G backup", then fill in the fields that appear.

WAN Failover Backup	
Automatic 3G Backup	Enable 💌
Internet Host	www.netcomm.com.au
APN	
Dial	*99#
Authentication Type	CHAP 💌
User Name	
Password	
Verify Password	
Interface Metric	20
Always On Mode: Redial Period	60 Seconds
[	Apply Cancel

Name	Description	
Internet Host:	Enter an Internet address here to check the Internet connection	
APN:	Enter the APN for your 3G	
User Name:	Enter your 3G username	
Password:	Enter your 3G password	

Click Apply to save the settings.



## 4.3.3 LAN

# Local Area Network (LAN) Settings

This page allows you to configure the LAN IP address, s	ubnet mask and DHCP settings of your 3G Router.
LAN Setup	
IP Address	192.168.20.1
Subnet Mask	255.255.255.0
LAN 2	O Enable  O Disable
LAN2 IP Address	
LAN2 Subnet Mask	
MAC Address	00:60:64:25:E9:DE
DHCP Type	Server 💌
Start IP Address	192.168.20.100
End IP Address	192.168.20.254
Subnet Mask	255.255.255.0
Primary DNS Server	192.168.20.1
Secondary DNS Server	192.168.20.1
Default Gateway	192.168.20.1
Lease Time	86400
Statically Assigned	MAC:
Statically Assigned	IP:
Statically Assigned	MAC:
802.1d Spanning Tree	Disable 💌
LLTD	Disable 💌
IGMP Proxy	Disable 💌
UPnP	Enable 💌



Name	Description
IP Address:	The local IP address of this device.
Subnet Mask:	The subnet mask of the local IP address
LAN 2:	Used to configure a secondary LAN IP Address
MAC Address:	The LAN MAC address of your 3G Router
DHCP Туре:	Please leave this set to 'Enable' unless you have another DHCP server on the same network.
Primary DNS/Secondary DNS:	(Optional) This feature allows you to manually assign DNS Servers
Lease Time:	DHCP lease times of the DHCP clients of your 3G Router.

Click Apply to save the settings.

## 4.3.4 Advanced Routing

This page allows you to configure static and dynamic routing rules for your 3G Router.

## Internet Settings > Advanced Routing

Adva	Advanced Routing Settings								
This (	bage allows you to con	figure static and dynam	nic routing rule	s for your :	3G Router.				
Add a	routing rule								
Desti	nation								
Rang	e	Host 💌							
Gatev	vay								
Interfa	ace	LAN 💌							
Com	ment								
			Apply	Reset	1				
Curre	ent Routing table in the	e system:	<u> </u>		2				
No.	Destination	Netmask	Gateway	Flags	Metric	Ref	Use	Interface	Comment
1	10.64.64.65	255.255.255.255	0.0.0	5	0	0	0	ppp1(ppp1)	
2	255.255.255.255	255.255.255.255	0.0.0.0	5	0	0	0	LAN(br0)	
3	192.168.20.0	255.255.255.0	0.0.0	1	0	0	0	LAN(br0)	
4	239.0.0.0	255.0.0.0	0.0.0	1	0	0	0	LAN(br0)	
5	0.0.0.0	0.0.0.0	0.0.0.0	1	0	0	0	ppp1(ppp1)	
Delete Reset									
Dyna	mic Routing Settings								
Dyna	mic Routing Protocol								
RIP		Disable	~						
			Apply	Reset					



#### Advanced Routing – Static

Static Routing allows computers that are connected to your 3G Router to communicate with computers on another LAN segment which are connected to it via another router. To set a rule, you need to specify the following:

- Destination
- Subnet mask
- Gateway
- Interface

#### Advanced Routing – Dynamic

Dynamic Routing uses the RIP protocol to allow the 3G Router to adapt to changes in the network. RIP enables the device to determine the best route for each packet based on the "hop count" or number of hops between Source and Destination. To enable Dynamic Routing, select Enable from the drop box and click Apply.

## 4.3.5 DHCP Client

This page allows you to view the current DHCP client of your 3G Router.

# **5.0 Wireless Setting**

## 5.1 Basic

This page allows you to define the basic wireless settings for this device such as the SSID and channel.

#### Wireless Settings > Basic

Basic Wireless Settings		
This page allows you to define the basic wireless settings for this device such as the SSID and channel.		
Wireless Network		
Radio On/Off	⊙ On ◯ Off	
Network Mode	11b/g/n mixed mode 💌	
Network Name(SSID)	NetComm Wireless	
Frequency (Channel)	2437MHz (Channel 6)	
Wireless Distribution System(WDS)		
WDS Mode	Disable	
	Apply Cancel	

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- Radio On/Off: On by default. Changing this option to Off will turn off the wireless feature on the unit and you will not be able to connect to your 3G Router wirelessly.
- Network Mode: You can select which wireless standards are able to connect to your wireless network:
  - o 11b/g mixed mode: Both 802.11b and 802.11g wireless devices are in your network.
  - 11b only: Select this if all of your wireless clients are 802.11b.
  - 11g only: Select this if all of your wireless clients are 802.11g.
  - 11a only: Select this if all of your wireless clients are 802.11a.
  - 11a/n mixed mode: Both 802.11a and 802.11n wireless devices are in your network.
  - 11/b/g/n mixed mode: Select this if 802.11b and 802.11g and 802.11n wireless devices are in your network.
- Network Name (SSID): The SSID (Service Set Identifier) is the name of your wireless network. Use a unique name to identify your wireless device so that you can easily connect from your wireless clients. This field is case sensitive and can be up to 32 characters. You should change the default SSID for added security.
- Frequency (Channel): This setting configures the frequency that the Wireless Radio uses for wireless connectivity. Select one channel that you wish to use from the drop down list.
- WDS Mode: WDS (Wireless Distribution System), is a system that enables the wireless interconnection of access points, and allows a wireless network to be expanded using multiple access points without a wired backbone to link them. Each WDS Access Point needs to be set with the same channel and encryption type.

Click Apply to save the settings.

## 5.2 Advanced

This page allows you to modify the advanced wireless settings for your 3G Router. These settings should not be changed unless you are aware of what effect they will have.



# Wireless Settings > Advanced Advanced Wireless Settings

This page allows you to modify the advanced wire are aware of what effect they will have.	less settings for your 3G Router. These settings should not be changed unless you
Advanced Wireless	
BG Protection Mode	Auto 💌
Beacon Interval	100 ms (range 20 - 999, default 100)
Data Beacon Rate (DTIM)	1 ms (range 1 - 255, default 1)
Fragment Threshold	2346 (range 256 - 2346, default 2346)
RTS Threshold	2347 (range 1 - 2347, default 2347)
TX Power	100 (range 1 - 100, default 100)
Short Preamble	○ Enable ● Disable
Short Slot	● Enable ○ Disable
Tx Burst	● Enable ○ Disable
Pkt_Aggregate	⊙ Enable ○ Disable
Country Code	AU (Australia)
AP Isolation	O Enable 💿 Disable
MBSSID AP Isolation	O Enable 💿 Disable
BSSID	00:60:64:29:44:B1
Multiple SSID1	
Multiple SSID2	
Multiple SSID3	
Multiple SSID4	
Multiple SSID5	
Multiple SSID6	
Multiple SSID7	
Broadcast Network Name (SSID)	• Enable O Disable
Wi-Fi Multimedia	
WMM Capable	● Enable ○ Disable
APSD Capable	○ Enable
DLS Capable	O Enable O Disable
WMM Parameters	WMM Configuration
Multicast-to-Unicast Converter	
Multicast-to-Unicast	C Enable O Disable
Uther	2
UT DyStroom	2.4
HT Drysical Mode	2 •
Operating Mode	Mixed Mode     Green Field
Channel BandWidth	<ul> <li>○ 20 (○ 20/40)</li> </ul>
Guard Interval	O Long   Auto
MCS	Auto
Reverse Direction Grant(RDG)	O Disable
Extension Channel	2412MHz (Channel 1)
Aggregation MSDU(A-MSDU)	Disable O Enable
Auto Block ACK	O Disable 💿 Enable
Decline BA Request	Disable      Enable
	Apply Cancel

• Beacon Interval: Interval of time the wireless router broadcasts a beacon, used to synchronize the wireless network.



- Data Beacon Rate (DTIM): Enter a value between 1 and 255 for the Delivery Traffic Indication Message (DTIM). A DTIM is a countdown informing clients of the next window for listening to broadcast and multicast messages
- Fragment Threshold: This specifies the maximum size of a packet during the fragmentation of data to be transmitted. If you set this value too low, it will result in bad performance.
- RTS Threshold: When the packet size is smaller than the RTS threshold, the wireless router will not use the RTS/CTS mechanism to send this packet.
- AP Isolation: This feature allows you to isolate clients on your wireless network. To enable communication between the wireless clients connected to your 3G Router, select Disabled. To cut the communication between the wireless clients, please choose Enabled.
- TX Power: This determines the output power of the antenna
- WMM Capable: WMM (Wi-Fi MultiMedia) if enabled supports QoS for experiencing better audio, video and voice in applications
- WMM Parameters: Click on the WMM Configuration button to configure the WMM parameters
- Broadcast Network Name (SSID): Select 'Disabled' to hide the SSID of your 3G Router. If disabled, other people will not be able scan and detect this product's SSID.

Click Apply to save the settings.

## **5.3 Security**

This page allows you to configure the wireless security for your 3G Router. Setting up sufficient wireless security can prevent unauthorised access to your wireless network.



Wireless Security Settings			
This page allows you to configure the wireless security for your 3G Router. Setting up sufficient wireless security can prevent unauthorised access to your wireless network.			
Select SSID			
SSID choice		NetComm Wireless 💌	
"NetComm Wireless"			
Security Mode		WEPAUTO -	
Wire Equivalence Protection (WEP)			
Default Key		Key 1 💌	
	WEP Key 1 :	a1b2c3d4e5	Hex 💌
WER Kove	WEP Key 2 :		Hex 💌
WEI Reys	WEP Key 3 :		Hex 💌
	WEP Key 4 :		Hex 💌
Access Policy			
Policy		Disable 💌	
Add a MAC address to t	he allow/block list:		
		Apply Cancel	

- SSID Choice: Select the SSID on which to configure the security settings
- Security Mode: Select the security mode for the wireless network. See below for more information

Click Apply to save the settings.

#### Security Mode

You may choose from the following wireless security options: Disabled, Open, Shared, WEPAUTO, WPA, WPA-PSK, WPA2, WPA2-PSK, WPA2-PSK, WPA1-WPA2 or 802.1x.

• WEP: WEP (Wired Equivalent Privacy) is enabled by default to help prevent against unwanted wireless users accessing your 3G Router. The default 64 bit Hexadecimal WEP key is: a1b2c3d4e5



#### Wireless Security Settings

This page allows you to configure the wireless security for your 3G Router. Setting up sufficient wireless security can prevent unauthorised access to your wireless network.

Select SSID			
SSID choice		NetComm Wireless 💌	
"NetComm Wireless"			
Security Mode		WEPAUTO	
Wire Equivalence Prote	ection (WEP)		
Default Key		Key 1 💌	
	WEP Key 1 :	a1b2c3d4e5	Hex 💌
WER Kove	WEP Key 2 :		Hex 💌
WEI Reys	WEP Key 3 :		Hex 💌
	WEP Key 4 :		Hex 💌
Access Policy			
Policy		Disable 💌	
Add a MAC address to t	he allow/block list:		
	(	Apply Cancel	

• WPA/WPA2: WPA (Wi-Fi Protected Access) authentication is suitable for enterprises. It must be used in conjunction with an authentication server such as RADIUS to provide centralized access control and management. It can provide stronger encryption and authentication solution than non WPA modes.



Min-l		C - 441
WIRESS	Security	Seminas
	JUGUITU	Jorningo

This page allows you to configure the wireless security for your 3G Router. Setting up sufficient wireless security can prevent	
unauthorised access to your wireless network.	

Select SSID	
SSID choice	NetComm Wireless
"NetComm Wireless"	
Security Mode	WPA
WPA	
WPA Algorithms	
Key Renewal Interval	3600 seconds
Radius Server	
IP Address	
Port	1812
Shared Secret	
Session Timeout	0
Idle Timeout	
Access Policy	
Policy	Disable 💌
Add a MAC address to the allow/block list:	
	Apply Cancel

 WPA-PSK/WPA2-PSK: A newer type of security is WPA-PSK (TKIP) and WPA2-PSK (AES). This type of security gives a more secure network compare to WEP. Use TKIP Encryption Type for WPA-PSK and AES for WPA2-PSK. After that, please enter the key in the Passphrase field. The key needs to be more than 8 characters and less than 63 characters and it can be any combination of letters and numbers. Please note that the configuration for WPA-PSK and WPA2-PSK is identical.



Wireless Security Settings	
This page allows you to configure the wireless unauthorised access to your wireless network.	security for your 3G Router. Setting up sufficient wireless security can prevent
Select SSID	
SSID choice	NetComm Wireless 💌
"NetComm Wireless"	
Security Mode	WPA-PSK
WPA	
WPA Algorithms	●TKIP ◎AES ◎TKIPAES
Pass Phrase	1234567890
Key Renewal Interval	3600 seconds
Access Policy	
Policy	Disable 💌
Add a MAC address to the allow/block list:	
	Apply Cancel

• 802.1x: In order to use 802.1X security, you need to have a RADIUS server on your network that will act as the authentication server. Please type in the details for your RADIUS server in the fields required.



wireless security settings		
This page allows you to configure the wireless security for your 3G Router. Setting up sufficient wireless security can prevent unauthorised access to your wireless network.		
Select SSID		
SSID choice	NetComm Wireless 💌	
"NetComm Wireless"		
Security Mode	802.1X	
802.1x WEP		
WEP	O Disable O Enable	
Radius Server		
IP Address		
Port	1812	
Shared Secret		
Session Timeout	0	
Idle Timeout		
Access Policy		
Policy	Disable 💌	
Add a MAC address to the allo	w/block list:	
	Apply Cancel	

Note: After configuring wireless security, you also need to configure your wireless adapter to use the same security settings before you can connect wirelessly. Not all wireless adapters support WPA-PSK/WPA2-PSK/WPA/WPA2 security; please refer to your wireless adapter user guide for more details. It is strongly recommended to set up a simple wireless security such as WEP 64bit or WPA (when the wireless client supports WPA) in order to secure your network.

## **5.4 WPS**

WPS is the simplest way to establish a connection between wireless clients and your 3G Router. This method removes the need to manually select the encryption mode and fill in the passphrase. You only need to press a button on both wireless client and wireless router, and the WPS will do the rest for you. The wireless router supports two types of WPS:

- WPS via Push Button you have to push a specific button on the wireless client or in your wireless client utility to start the WPS mode, and switch the wireless router to WPS mode. You can simply push the WPS button of the wireless router, or click the 'Start to Process' button in the web configuration interface.
- WPS via PIN code you have to know the PIN code of the wireless client and switch it to WPS mode, then input the wireless client PIN to the wireless router web interface.



WPS	
page allows you to configure WPS (Wi-Fi Protected S wireless connection between wireless clients and y Button Mode), or enter a PIN (PIN Mode) on both the two.	Setup) for your 3G Router. WPS provides a simple method to establish a secure our 3G Router. Once WPS is enabled, you will only need to press a button (Push wireless client and your 3G Router to enable a secure connection between the
WPS Config	
WPS: E	nable 💌
	Apply
WPS Summary	
WPS Current Status:	Idle
WPS Configured:	Yes
WPS SSID:	NetComm Wireless
WPS Auth Mode:	Open
WPS Encryp Type:	None
WPS Default Key Index:	1
WPS Key(ASCII)	
AP PIN:	20633806
	Reset OOB
WPS Progress	
WPS mode	
DIN	
FIN	
	Apply
WPS Status	
WSC:Idle	

- WPS: Use the dropbox to either enable or disable the WPS function.
- WPS Current Status: If the wireless security (encryption) function of this wireless router is properly set, you will see a 'Success' message here. Otherwise, you will see 'Idle'.
- WPS SSID: This is the network broadcast name (SSID) of the router.
- WPS Auth Mode: It shows the active authentication mode for the wireless connection.
- WPS PIN: This is the WPS PIN code of the wireless router. You may need this information when connecting to other WPS-enabled wireless devices.
- WPS Mode: Select either PIN or PBC.



## **5.5 Station List**

The Station List shows the wireless clients currently associated with your 3G Router.

Wireless Settings > Station List

Station List							
This page allows you to view a list of the wireless clients that are currently associated with your 3G Router.							
Wireless Network							
MAC Address	Aid	PSM	MimoPS	MCS	BW	SGI	STBC
00:1F:5B:6A:B3:91	1	1	0	7	20M	0	0

# 6.0 Firewall

# 6.1 Mac/IP/Port Filtering

This page allows you to setup MAC, IP and port filtering rules to protect your network from malicious activity. The filtering rules can be used to either allow or block certain users and/or ports from accessing the Internet.



#### Firewall > MAC/IP/Port Filtering

		_							
IIII N	$\mathbf{c}$		ort	11177	orin		Sat	i nu	
1012			υiι		-	14	JEL		40

This p used	age allows yo to either allow	u to setup MAC, I or block certain u	P and port filtering isers and/or ports f	rules to prote from accessi	ect your network fr ng the Internet.	om malicious acti	vity. The fil	tering rules ca	n be
Basic	Settings								
MAC/I	MAC/IP/Port Filtering Disable 💌								
Defau	Default Policy The packet that don't match with any rules would be:								
				Apply	Reset				
MAC/	P/Port Filter S	ettings							
MAC a	address								
Dest	P Address								
Sourc	e IP Address								
Proto	col			None					
Dest Port Range			-						
Sourc	Source Port Range -								
Action	Action Accept								
Comr	nent								
(The r	maximum rule	count is 32.)							
				Apply	Reset				
Curre	nt MAC/IP/Por	t filtering rules ir	i system:						
No.	MAC address	Dest IP Address	Source IP Address	Protocol	Dest Port Range	Source Port Range	Action	Comment	Pkt Cnt
			Other	s would be d	Iropped				-
			De	elete Selecte	ed Reset				

## **Basic Settings**

- MAC/IP/Port Filtering: Select Enable to enable MAC/IP/Port Filtering
- Default Policy: Select whether packets that do not match any rules are accepted or dropped



#### **MAC/IP/Port Filtering Settings**

- MAC Address: MAC address of a local computer
- Dest IP Address: Destination IP Address for the filter rule
- Source IP Address: Source IP Address for the filter rule
- Protocol: Select the port number protocol type (TCP, UDP or both). If you are unsure, then leave it to the default "TCP&UDP" setting
- Dest Port Range: Destination Port Range of the filter rule
- Source Port Range: Source Port Range of the filter rule
- Action: Either accept or drop the packet that matches the rule
- Comment: Add a comment to identify the rule (optional)

Click Apply to save the settings.

## **6.2 Port Forwarding**

This page allows you to configure port forwarding rules to allow remote users to access services such as Web or FTP on your local computers. This allows you to redirect a particular port number (from the Internet/WAN port) to a particular LAN IP address.



#### Firewall > Port Forwarding

#### Port Forwarding Settings

This page allows you to configure port forwarding rules to allow remote users to access services such as Web or FTP on your local computers. This allows you to redirect a particular port number (from the Internet/WAN port) to a particular LAN IP address.

Virtual Server	Settings			
Virtual Server	Settings	Disable 💌		
IP Address				
Port Range		-		
Protocol		TCP&UDP 💌		
Comment				
(The maximur	m rule count is 32.)			
		Apply Reset		
Current Virtua	al Servers in system:			
No.	IP Address	Port Range	Protocol	Comment
		Delete Selected Reset		

- Virtual Server Settings: Enable/Disable port forwarding
- IP Address: The LAN IP address that the public port number packet will be sent to
- Port Range: The public port numbers to be sent to the specific LAN IP address
- Protocol: Select the port number protocol type (TCP, UDP or both). If you are unsure, then leave it as the default "TCP&UDP" setting
- Comment: Add a comment to identify the rule (optional)

Click Apply to save the settings.

## 6.3 DMZ

If you have a client PC that cannot run an Internet application (e.g. Games) properly from behind the NAT firewall, then you can open up the firewall restrictions to allow unrestricted two-way Internet access by defining a DMZ Host.

The DMZ function allows you to re-direct all packets going to your WAN port IP address, to a particular IP address in your LAN. The difference between the virtual server and the DMZ function is that the virtual server re-directs a particular service/Internet application (e.g. FTP, websites) to a particular LAN client/server, whereas DMZ redirects all packets (regardless of services) going to your WAN IP address to a particular LAN client/server.

#### Firewall > DMZ

DMZ Settings	
This page allows you to nominate a computer forwarding or firewall settings.	on your network that can be accessed from the Internet regardless of any port
DMZ Settings	
DMZ Settings	Disable 💌
DMZ IP Address	
	(Apply) (Reset)

- DMZ Settings: Enable/disable DMZ.
- DMZ IP Address: Fill-in the IP address of a particular host in your LAN Network that will receive all the packets originally going to the WAN port/Public IP address of your 3G Router.

Click Apply to save the above configurations.

## 6.4 System Security

This page allows you to improve the security of your 3G Router through the SPI firewall and remote access settings.

Firewall > System Security				
System Security Settings				
page allows you to improve the security of your 3G Route	er through the SPI firewall and remote access settings.			
Remote management				
Remote management (via WAN)	Deny 💌			
Ping form WAN Filter				
Ping form WAN Filter	Disable 💌			
Stateful Packet Inspection (SPI)				
SPI Firewall	Disable 💌			
	Apply Reset			

- Remote Management (via WAN): Enable/Disable remote management on the WAN interface.
- Deny ping from WAN interface: Select Enable to deny ICMP packets received on the WAN interface. Otherwise, select Disable to allow ICMP packets received on the WAN interface.



• SPI Firewall: Enable/Disable the SPI (Stateful Packet Inspection) firewall to improve the security of your 3G Router.

Click Apply to save the settings.

## **6.5 Content Filtering**

This page allows you to configure content, URL and host filters to restrict improper content access from LAN computers

Firewall > Content Filtering

Content Filter Settings	
This page allows you to configure	e content, URL and host filters to restrict improper content access from LAN computers.
Webs Content Filter	
Filters:	Proxy 🗖 Java 🗖 ActiveX
	Apply Reset
URL Filter Settings	
Current Webs URL Filters:	
No	URL
	Delete Reset
Add a URL filter:	
URL:	
	Add Reset
Host Filter Settings	
Current Website Host Filters:	
No	Host(Keyword)
	Delete Reset
Add a Host(keyword) Filter:	
Keyword	
	Add Reset

- Web Content Filter: Tick the boxes to enable Proxy, Java or ActiveX content filtering
- URL Filter: Block access to a website by entering its full URL address.
- Host Filter: Block access to block access to certain websites by entering a keyword



Click Apply to save the settings.

# 7.0 Administration

# 7.1 Management

This page allows you to configure administrator system settings including the administrator username and password, NTP settings, and DDNS settings.



#### Administration > Management

System Management				
This page allows you to configure administrator system settings including the administrator username and password, NTP settings, and DDNS settings.				
Language Settings				
Select Language	English 💌			
	Apply Cancel			
Adminstrator Settings				
Account	admin			
Password	•••••			
	Apply Cancel			
NTP Settings				
Current Time	Sat Jan 1 02:17:32 UTC 2000 Sync with host			
Time Zone:	(GMT-11:00) Midway Island, Samoa			
NTP Server	0.netcomm.pool.ntp.org ex: time.nist.gov ntp0.broad.mit.edu time.stdtime.gov.tw			
NTP synchronization(hours)				
	Apply Cancel			
Green AP				
Duration Action				
00 - : 00 - ~ 00 -	- : 00 - Disable -			
00 - : 00 - ~ 00 -	- : 00 - Disable -			
00 - : 00 - ~ 00 -	- : 00 - Disable -			
00 - : 00 - ~ 00 -	- : 00 - Disable -			
	Apply Cancel			
DDNS Settings				
Dynamic DNS Provider	None			
Account				
Password				
DDNS				
	Apply Cancel			

- Select Language: Select a language for the web interface.
- Administrator Settings (account/password): Configure a new administrator username and password.



- NTP Settings: The NTP (Network Time Protocol) settings allow your router to synchronise its internal clock with the global Internet Time. These settings will affect functions such as System Log entries and Firewall settings.
- DDNS: DDNS (Dynamic Domain Name Service) allows you to map the static domain name to a dynamic IP address. To use this features, you must sign up for an account from a DDNS service provider. This router supports DynDNS, TZO and other common DDNS service providers.

Click Apply to save the settings.

## 7.2 Upload Firmware

This page allows you to upgrade the router's firmware. To upgrade the firmware of your 3G Router, you need to download the firmware file to your local hard disk, and then click the Browse button to locate the firmware file on your computer.

Once you have selected the new firmware file, click Apply to start the upgrade process.

Administration > Upload Firmware					
Upload Firmware					
This page allows you to upg upgrade.Please note that it to the firmware upgrade proces	rade your 3G Routers firmware. Click on Browse to locate the firmware file to be used for the akes approximately 3 minutes for the firmware to be upgraded. DO NOT turn off your 3G Router during s.				
Update Firmware					
Location:	Browse				
	Apply				

## 7.3 Setting Manager

This page allows you to import/export the system settings, reset your 3G Router to factory defaults, or reboot your 3G Router.



#### Administration > Settings Manager

Settings Management				
This page allows you to import/export the system settings, or reset your 3G Router to factory defaults.				
Export Settings				
Export				
Import Settings				
Settings file location Browse				
Import Cancel				
Load Factory Defaults				
Load Default				
Reboot Router				
Reboot				

## 7.4 Statistics

This page allows you to view the LAN, WAN and wireless statistics of your 3G Router.

## Administration > Statistics

Statistics			
This page allows you to view the LAN, WAN and wireless statistics of your 3G Router.			
Memory			
Memory total:	13112 kB		
Memory left:	2064 kB		
WAN/LAN			
WAN Rx packets:	0		
WAN Rx bytes:	0		
WAN Tx packets:	888		
WAN Tx bytes:	521328		
LAN Rx packets:	16573		
LAN Rx bytes:	1299526		
LAN Tx packets:	11772		
LAN Tx bytes:	2262235		
All interfaces			
Name	lo		
Rx Packet	17		
Rx Byte	2995		



# 7.5 System Log

All important system events are logged. You can use this function to check the event log of your 3G Router.

Administration > System Log

System Log	
	[Refresh] Clear]
System Log	
Jan 1 02:00:20 (none) Jan 1 02:00:20 (none) Jan 1 02:00:23 (none) Jan 1 02:00:23 (none) Jan 1 02:00:24 (none) Jan 1 02:00:29 (none) Jan 1 02:10:46 (none) Jan 1 02:10:46 (none)	<pre>syslog.info syslogd started: BusyBox v1.12.1 user.notice kernel: klogd started: BusyBox v1.12.1 (2009-02-25 12:42:22 EST) user.debug kernel: ra0: no IPv6 routers present user.debug kernel: eth2.2: no IPv6 routers present user.info kernel: br0: no IPv6 routers present user.info kernel: br0: topology change detected, propagating user.info kernel: br0: port 2(eth2.1) entering forwarding state user.info kernel: br0: port 1(ra0) entering forwarding state user.warn kernel: Rcv Wcid(1) AddBAReq user.warn kernel: Start Seq = 0000008</pre>



# 8.0 Legal & Regulatory Information

This manual is copyright. Apart from any fair dealing for the purposes of private study, research, criticism or review, as permitted under the Copyright Act, no part may be reproduced, stored in a retrieval system or transmitted in any form, by any means, be it electronic, mechanical, recording or otherwise, without the prior written permission of NetComm Limited. NetComm Limited accepts no liability or responsibility, for consequences arising from the use of this product.

NetComm Limited reserves the right to change the specifications and operating details of this product without notice.

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All other trademarks are acknowledged the property of their respective owners.

## **8.1 Customer Information**

ACA (Australian Communications Authority) requires you to be aware of the following information and warnings: (1) This unit shall be connected to the Telecommunication Network through a line cord which meets the requirements of the ACA TS008 Standard.

(2) This equipment has been tested and found to comply with the Standards for C-Tick and or A-Tick as set by the ACA. These standards are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio noise and, if not installed and used in accordance with the instructions detailed within this manual, may cause interference to radio communications. However, there is no guarantee that interference will not occur with the installation of this product in your home or office. If this equipment does cause some degree of interference to radio or television reception, which can be determined by turning the equipment off and on, we encourage the user to try to correct the interference by one or more of the following measures:

- Change the direction or relocate the receiving antenna.
- Increase the separation between this equipment and the receiver.

• Connect the equipment to an alternate power outlet on a different power circuit from that to which the receiver/TV is connected.

• Consult an experienced radio/TV technician for help.

(3) The power supply that is provided with this unit is only intended for use with this product. Do not use this power supply with any other product or do not use any other power supply that is not approved for use with this product by NetComm. Failure to do so may cause damage to this product, fire or result in personal injury.

## 8.2 Federal Communication Commission Interference Statement

•This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

•This device 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 radiated 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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

•This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

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

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

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication



This device has been designed to operate with an antenna having a maximum gain of 4.35 dBi. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.