Operating Manual

VIP4G / VIP4Gb

LTE Ethernet Bridge/Serial Gateway

Document: VIP4Gb Operating Manual.v1.6.1.pdf
FW Version: 1.1.6-r1190-4

August 2016

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Important User Information (continued)

About This Manual

It is assumed that users of the products described herein have either system integration or design experience, as well as an understanding of the fundamentals of radio communications.

Throughout this manual you will encounter not only illustrations (that further elaborate on the accompanying text), but also several symbols which you should be attentive to:

Caution or **Warning**
Usually advises against some action which could result in undesired or detrimental consequences.

Point to Remember
Highlights a key feature, point, or step which is noteworthy. Keeping these in mind will simplify or enhance device usage.

Tip
An idea or suggestion to improve efficiency or enhance usefulness.

Information
Information regarding a particular technology or concept.

Important User Information (continued)

Regulatory Requirements

WARNING

To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 23cm or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance is not recommended. The antenna being used for this transmitter must not be co-located in conjunction with any other antenna or transmitter.

Pour satisfaire aux exigences de la FCC d'exposition RF pour les appareils mobiles de transmission, une distance de séparation de 23cm ou plus doit être maintenue entre l'antenne de cet appareil et les personnes au cours de fonctionnement du dispositif. Pour assurer le respect, les opérations de plus près que cette distance n'est pas recommandée. L'antenne utilisée pour ce transmetteur ne doit pas être co-localisés en conjonction avec toute autre antenne ou transmetteur.

WARNING

MAXIMUM EIRP
FCC Regulations allow up to 36dBm Effective Isotropic Radiated Power (EIRP). Therefore, the sum of the transmitted power (in dBm), the cabling loss and the antenna gain cannot exceed 36dBm.

Réglementation de la FCC permettra à 36dBm Puissance isotrope rayonnée équivalente (EIRP). Par conséquent, la somme de la puissance transmise (en dBm), la perte de câblage et le gain d'antenne ne peut pas dépasser 36dBm.

WARNING

EQUIPMENT LABELING / ÉTIQUETAGE DE L'ÉQUIPEMENT
This device has been modularly approved. The manufacturer, product name, and FCC and Industry Canada identifiers of this product must appear on the outside label of the end-user equipment.

Ce dispositif a été approuvé de façon modulaire. Le fabricant, le nom du produit, et la FCC et de l'Industrie du Canada identifiants de ce produit doit figurer sur l'étiquette à l'extérieur de l'équipement de l'utilisateur final.

WARNING

TRANSITION UPDATE TO FCC NEW UNII RULES / TRANSITION MISE À JOUR DES REGLES FCC NOUVEAU UNII
The device listed below have been originally approved under FCC rule part 15.247. Based on the implementation of the rule changes from docket 13-49 this device can no longer be manufactured, sold, imported or placed into operation after June 2, 2016. After this date this device must comply with the new rule changes provided in docket 13-49. Le dispositif énumérés ci-dessous ont été initialement approuvé en vertu de la règle FCC part 15.247. Sur la base de la mise en œuvre des changements de règles de dossier 13-49 ce dispositif ne peut plus être fabriqué, vendu, importée ou mise en service après le 2 Juin 2016. Après cette date, cet appareil doit se conformer aux nouvelles modifications aux règles prévues dans le dossier 13 -49.

The Memorandum of Opinion and Order issued on March 6 allows for this device to be updated from 15.247 to compliance with new rules 15.407(b)(4)(ii) so long as there are no hardware changes or changes to output power. Device approved under 15.407(b)(4)(ii) may be sold until March 2, 2020. Le protocole d'Avis et ordonnance rendue le 6 Mars permet à cet appareil à être mis à jour à partir de 15.247 au respect des nouvelles règles 15.407 (b) (4) (ii) tant qu'il n'y a pas de changement de matériel ou des modifications à la puissance de sortie. Dispositif approuvé en vertu de 15.407 (b) (4) (ii) peut être vendu jusqu'au 2 Mars, à 2020.

The following device approved under 15.407(b)(4)(ii) may be marketed, sold and imported until March 2, 2020. After this date this device must comply with the emission limits of 15.407. Le dispositif suivant approuvé en vertu de 15.407 (b) (4) (ii) peuvent être commercialisés, vendus et importés jusqu'au 2 Mars 2020. Après cette date, ce dispositif doit être conforme aux limites d'émission de 15,407.

- VIP4Gb FCC ID: NS9VIP4GABGN20

SAMPLE LABEL REQUIREMENT / EXIGENCE D'ÉTIQUETTE :

VIP4G

FCCID: PKRNVWE371 / NS9VIP4GABGN20
IC: 3229A-E371 / 3143A-VIP4GABGN20

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.

VIP4Gb

FCCID: R17LN930 / NS9VIP4GABGN20
IC: 5131A-LN930 / 3143A-VIP4GABGN20

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.

Please Note: These are only sample labels; different products contain different identifiers. The actual identifiers should be seen on your devices if applicable. S'il vous plaît noter: Ce sont des exemples d'étiquettes seulement; différents produits contiennent des identifiants différents. Les identifiants réels devrait être vu sur vos périphériques le cas échéant.

CSA Class 1 Division 2 Option

CSA Class 1 Division 2 is Available Only on Specifically Marked Units

If marked this for Class 1 Division 2 – then this product is available for use in Class 1, Division 2, in the indicated Groups on the product.

In such a case the following must be met:

The transceiver is not acceptable as a stand-alone unit for use in hazardous locations. The transceiver must be mounted within a separate enclosure, which is suitable for the intended application. Mounting the units within an approved enclosure that is certified for hazardous locations, or is installed within guidelines in accordance with CSA rules and local electrical and fire code, will ensure a safe and compliant installation.

Do not connect or disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

Installation, operation and maintenance of the transceiver should be in accordance with the transceiver's installation manual, and the National Electrical Code.

Tampering or replacement with non-factory components may adversely affect the safe use of the transceiver in hazardous locations, and may void the approval.

The wall adapters supplied with your transceivers are NOT Class 1 Division 2 approved, and therefore, power must be supplied to the units using the screw-type or locking type connectors supplied from Microhard Systems Inc. and a Class 1 Division 2 power source within your panel.

If you are unsure as to the specific wiring and installation guidelines for Class 1 Division 2 codes, contact CSA International.

Revision History

Revision	Description	Initials	Date
1.0	Initial Release	PEH	June 2012
1.1	Updated Screen shots, Firewall settings, added VPN settings	PEH	August 2012
1.2	Updated Network (LAN/WAN), Added SMS, SMS over Serial, GPS over serial, I/O Rules, Accelerometer, GPS, Updated Firewall, Added MultiWAN, Event Reporting, Modbus, NMS Settings, Updated Screen shots, Updated reference numbers for drawings and images, misc formatting. Added IP-Passthrough, Port Forwarding Examples. Based on firmware v1.1.6-r1114.	PEH	Dec 2012
1.3	Updated to reflect changes made in firmware version v.1.1.6-r1130. Updated Network (LAN/WAN), Added SMS Alerts, Wireless Virtual Interfaces, AP Isolation, Updated GPS Report, Added GPSGate, Recorder and Load Record, Updated Gateway-Gateway VPN, Added AT Commands (Serial & Telnet), Supported AT Commands. Misc formatting & various corrections. Updated screenshots.	PEH	Mar 2013
1.31	Added GPS Receiver specs	PEH	Mar 2013
1.32	Corrected LTE Frequency Band Specs	PEH	Apr 2013
1.33	Added PoE information	PEH	Apr 2013
1.34	Added IP67 Enclosure Dimensional Info	PEH	Apr 2013
1.4	Updated to reflect changes made up to firmware version v.1.1.6-r1172. Added Data Usage Alerts, GPS TAIP, WebSocket, Updated Firewall, Updated Network, Updated WAN, Updated MultiWan, Added Firewall Examples, Updated VPN etc.	PEH	Apr 2014
1.5	Updated to firmware version v.1.1.6-r1184-14.	PEH	June 2015
1.6	Updated to firmware version v1.1.6-r1190-4. Added Router menu. Updated AT Commands, Updated AT commands, Removed Mesh, Updated System, Updated Network, Updated Carrier, Updated Wireless, Updated Tools, Updated Screenshots. Misc Corrections & Formatting.	PEH	Dec 2015
1.6.1	Added Transition Update to FCC New UNII Rules	PEH	Aug 2016

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1.0 Overview

The VIP4G is a high-performance 4G LTE Cellular Ethernet & Serial Gateway with 802.11 a/b/g/n WiFi capability, 4 Gigabit Ethernet Ports, 4x Digital I/O, and a fully complimented RS232/485/422 serial port.

The VIP4G utilizes the cellular infrastructure to provide network access to wired and wireless devices anywhere cellular coverage is supported by a cellular carrier. The VIP4G supports up to 100Mbps when connected to a LTE enabled carrier, or global fallback to 3G/Edge networks for areas without 4G LTE.

Providing reliable wireless Ethernet bridge functionality as well gateway service for most equipment types which employ an RS232, RS422, or RS485 interface, the VIP4G can be used in a limitless number and types of applications such as:

- High-speed backbone
- IP video surveillance
- Voice over IP (VoIP)
- Ethernet wireless extension
- WiFi Hotspot
- Legacy network/device migration
- SCADA (PLC's, Modbus, Hart)
- Facilitating internetwork wireless communications

1.1 Performance Features

Key performance features of the VIP4G include:

- Fast 4G LTE Link to Wireless Carrier
- Up to 100Mbps Downlink / 50 Mbps Uplink
- Fast Data Rates to 802.11a/b/g/n WiFi Devices
- Digital I/O - 4 Inputs, 4 Outputs
- DMZ and Port Forwarding
- 4 - 10/100/1000 Ethernet Ports (WAN/LAN)
- Integrated GPS (TCP Server/UDP Reporting)
- User interface via local console, telnet, web browser
- communicates with virtually all PLCs, RTUs, and serial devices through either RS232, RS422, or RS485 interface
- Local & remote wireless firmware upgradable
- User configurable Firewall with IP/MAC ACL
- IP/Sec secure VPN and GRE Tunneling

1.0 Overview

1.2 Specifications

For detailed specifications, please see the specification sheets available on the Microhard web-site @ http:///www.microhardcorp.com for your specific model.

Electrical/General

Cellular:

	VIP4G	VIP4Gb
Supported Bands:	4G LTE B4/B17 (1700/2100/700 MHz) Global Fallback to: HSPA+/UMTS 850/AWS/1900/2100 MHz GPRS 850/900/1800/1900 MHz	LTE FDD (Bands 1-5,7,8,13,17,18,19,20) UMTS | DC-HSPA+ (Bands 1,2,4,5,8) GSM | GPRS | EDGE (Bands 2,3,5,8) 3GPP Protocol Stack Release 9
Data Features:	4G LTE Up to 100 Mbps downlink Up to 50 Mbps uplink	LTE: DL 100 Mbps, UL 50 Mbps HSPA+: DL 21 Mbps, UL 5.7 Mbps WCDMA: DL/UL 384 kbps EDGE Class 33: DL/UL 236.8 kbps GPRS Class 33: DL/UL 85.6kbps

SIM Card: 1.8 / 3.0 V

WiFi: (Order Options)

Frequency: 2.4 GHz / 5.8 GHz

Spread Method: OFDM/QPSK/16QAM/64QAM

Data Rates: 802.11 b/g (up to 30dBm) or 802.11 a/b/g/n (up to 20 dBm)

TX Power: Adjustable (See above)

Data Encryption: WEP, WPA(PSK), WPA2(PSK), WPA+WPA2 (PSK)
(Subject to Export Restrictions)

General:

Input Voltage: 7 - 30 VDC

Power over Ethernet: 802.3af Passive PoE on Ethernet Port

Serial Baud Rate: 300bps to 921kbps

Ethernet: 10/100/1000 BaseT, Auto - MDI/X, IEEE 802.3

Network Protocols: TCP, UDP, TCP/IP, TFTP, ARP, ICMP, DHCP, HTTP, HTTPS*, SSH*, SNMP, FTP, DNS, Serial over IP

Operating Modes: Access Point, Client/Station, Repeater

1.0 Overview

1.2 Specifications (Continued)

Management:	Local Serial Console, Telnet, WebUI, SNMP, FTP & Wireless Upgrade
Diagnostics:	Status LED's, RSSI, Ec/No, Temperature, Remote Diagnostics, Watchdog, UDP Reporting
Digital I/O:	4 Inputs / 4 Outputs

GPS:

Navigation Update Rate:	Up to 5 Hz	
Accuracy:	Position:	2.5 m CEP
	SBAS:	2.0 m CEP
Acquisition:	Cold Starts:	27 seconds
	Aided Starts:	4 seconds
	Hot Starts:	1 second
Sensitivity:	Tracking:	-159 dBm
	Cold Starts:	-147 dBm
	Hot Starts:	-156 dBm

Environmental

Operation Temperature:	-40°F(-40°C) to 185°F(85°C)
Humidity:	5% to 95% non-condensing

Mechanical

Dimensions:	5.65" (145mm) X 3.72" (95mm) X 1.20" (30mm)
Weight:	Approx. 405 grams

Connectors:

Antenna:	Wi-Fi: 2x RP-SMA Female	
	Cellular: 2x SMA Female (Main, DIV)	
	GPS: 1x SMA Female (Supports Active & Passive Antennas with LNA)	
Data:	RS232 Data: DE-9 Female	
	RS485:	SMT: 6-Pin Micro MATE-N-LOK AMP 3-794618-6
		Mating Connector: 6-Pin Micro MATE-N-LOK AMP 794617-6
	Ethernet :	4x RJ-45
PWR, Misc:	Power:	SMT: 4-Pin Micro MATE-N-LOK AMP 3-794618-4
		Mating Connector: 4-Pin Micro MATE-N-LOK AMP 794617-4
Misc:	Digital I/O:	SMT: 10-Pin Micro MATE-N-LOK AMP 4-794618-0
		Mating Connector: 10-Pin Micro MATE-N-LOK AMP 1-794617-0

IP67 Enclosure (Optional):

Dimensions:	Approx: 8.4"(213mm) X 7.2"(182mm) X 1.75" (44mm)
Weight:	Approx: 1.25 kg

2.0 Quick Start

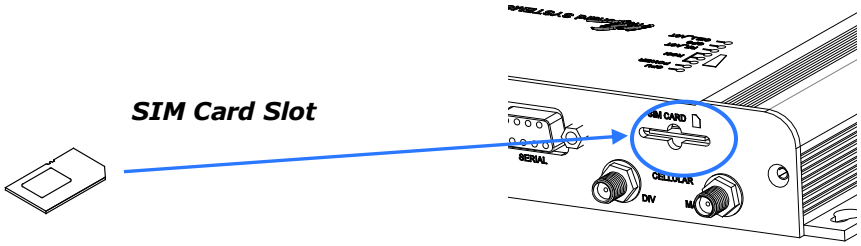
This QUICK START guide will walk you through the setup and process required to access the WebUI configuration window and to establish a basic wireless connection to your carrier.

Note that the units arrive from the factory with the Local Network setting configured as 'Static' (IP Address 192.168.168.1, Subnet Mask 255.255.255.0, and Gateway 192.168.168.1), in DHCP server mode. (This is for the LAN Ethernet Adapter on the back of the VIP4G unit.

2.1 Installing the SIM Card

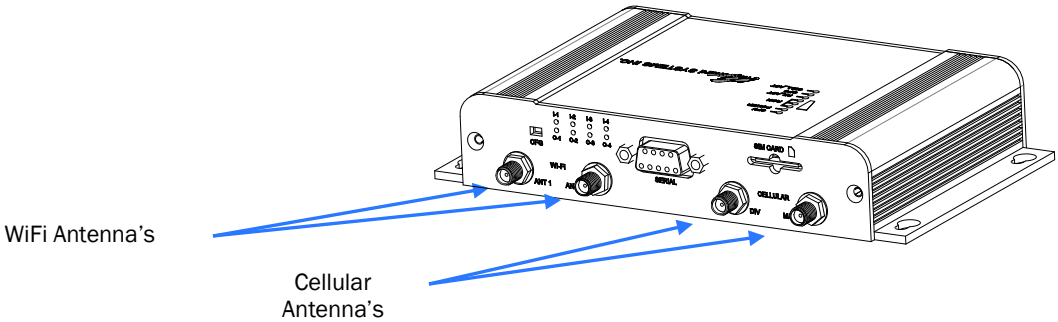
✓ Before the VIP4G can be used on a cellular network a valid ***SIM Card*** for your Wireless Carrier must be installed. Insert the SIM Card into the slot as shown below.

To reset to factory defaults, press and hold the CFG button for 8 seconds with the VIP4G powered up. The LED's will flash quickly and the IP4G will reboot with factory defaults.



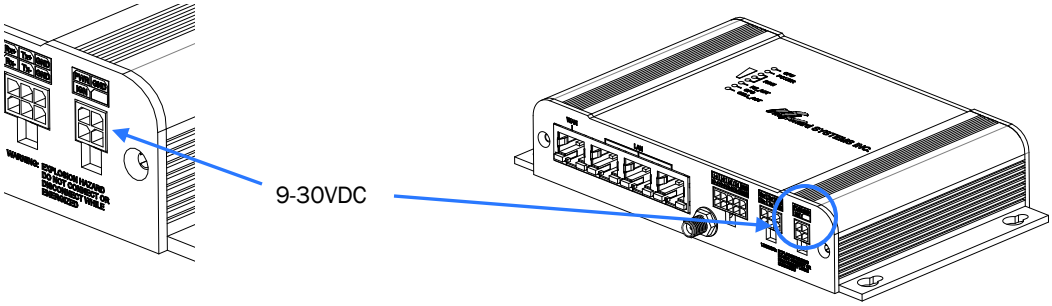
2.2 Getting Started with Cellular

✓ Connect the Antenna's to the applicable ***ANTENNA*** jack's of the VIP4G.



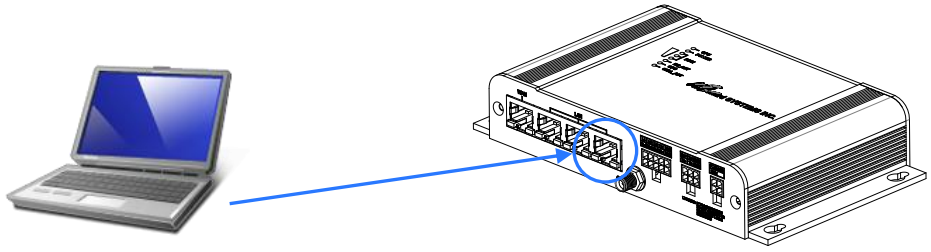
Use the MHS-supplied power adapter or an equivalent power source.

✓ Connect the power connector to the power adapter and apply power to the unit, once the blue CPU LED is on solid, proceed to the next step.



2.0 Quick Start

✓ Connect A PC configured for DHCP directly to one of the LAN ***ETHERNET*** ports of the VIP4G, using an Ethernet Cable. If the PC is configured for DHCP it will acquire a IP Address from the VIP4G.



✓ Open a Browser Window and enter the IP address 192.168.168.1 into the address bar.

The factory default network settings:

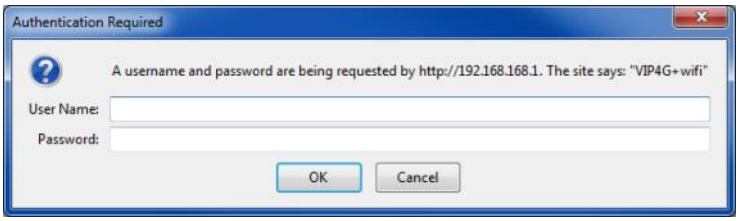
IP: 192.168.168.1
Subnet: 255.255.255.0
Gateway: 192.168.168.1

✓ The VIP4G will then ask for a Username and Password. Enter the factory defaults listed below.

The factory default login:

User name: admin
Subnet: admin

It is always a good idea to change the default admin login for future security.

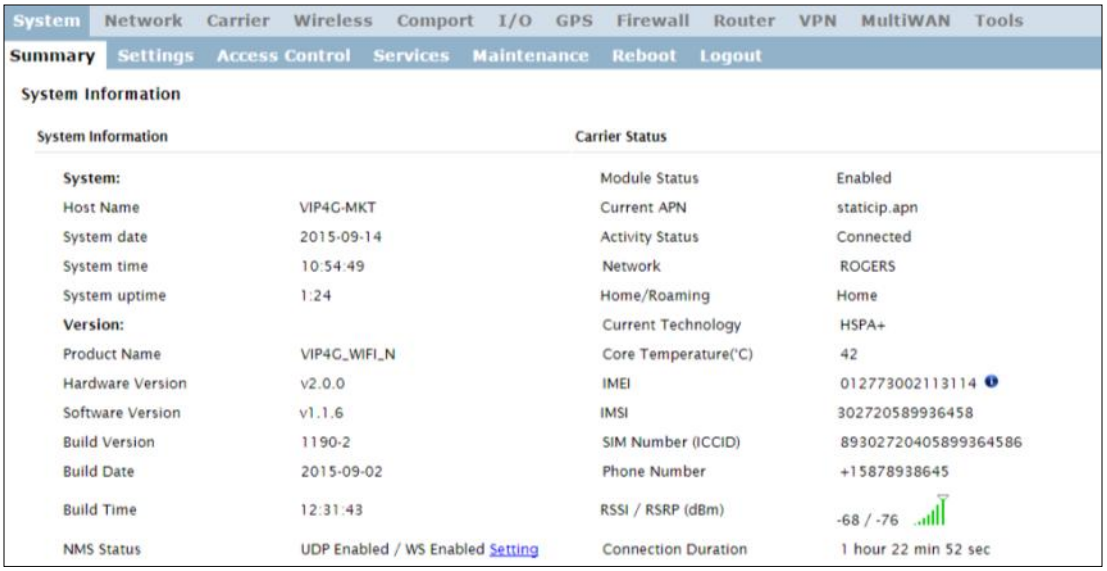


The Factory default login:

User name: **admin**
Password: **admin**

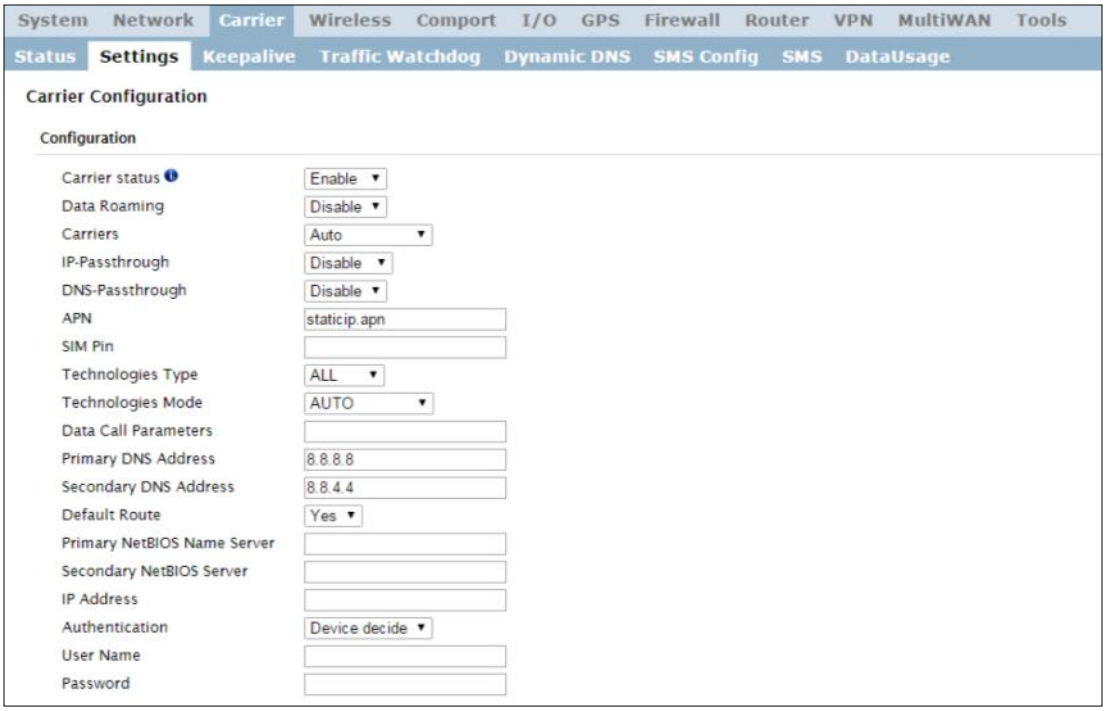
2.0 Quick Start

✓ Once successfully logged in, the System Summary page will be displayed.



Auto APN: Introduced in firmware version v1.1.6-r1142, the VIP4G will attempt to detect the carrier based on the SIM card installed and cycle through a list of commonly used APN's to provide quick network connectivity.

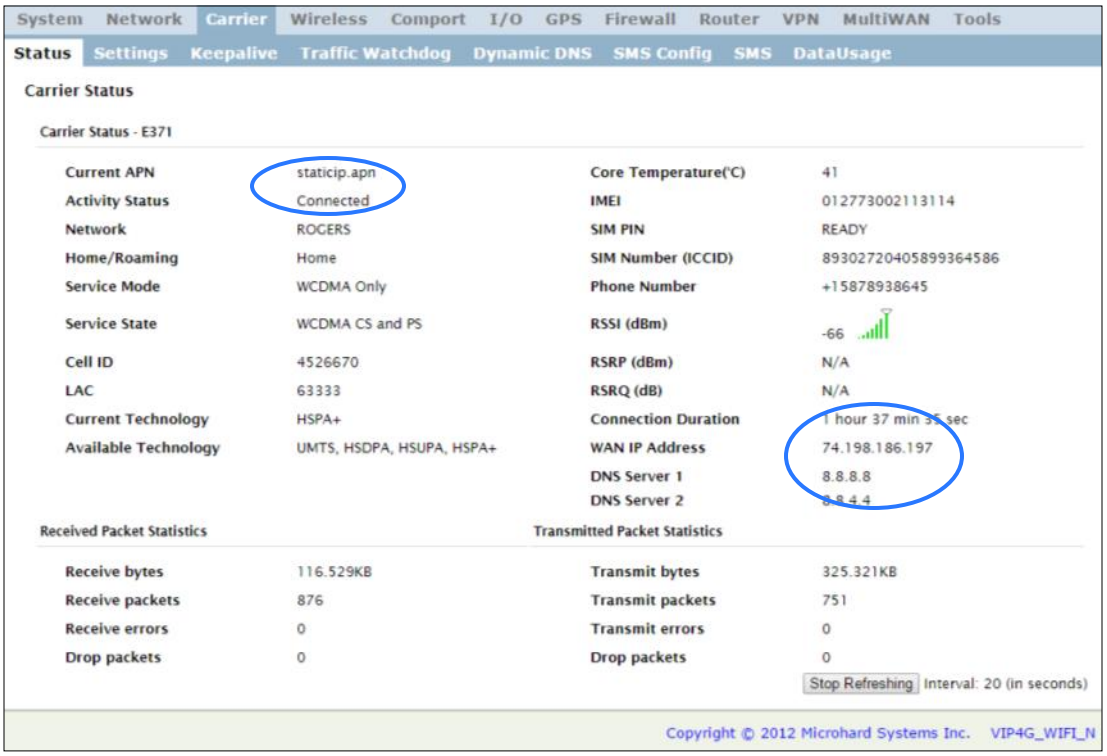
✓ As seen above under Carrier Status, the SIM card is installed, but an APN has not been specified. Setting the APN to auto (default) may provide quick network connectivity, but may not work with some carriers, or with private APN's. To set or change the APN, click on the Carrier > Settings tab and enter the APN supplied by your carrier in the APN field. Some carriers may also require a Username and Password.



✓ Once the APN and any other required information is entered to connect to your carrier, click on "Submit". Return to the System > Summary tab.

2.0 Quick Start

✓ On the Carrier > Status Tab, verify that a WAN IP Address has been assigned by your carrier. It may take a few minutes, so try refreshing the page if the WAN IP Address doesn't show up right away. The Activity Status should also show "Connected".



✓ If you have set a static IP on your PC, you may need to add the DNS Servers shown in the Carrier Status Menu to you PC to enable internet access.

✓ Congratulations! Your VIP4G is successfully connected to your Cellular Carrier. The next section gives a overview on enabling and setting up the WiFi Wireless features of the modem giving 802.11 devices network access.

✓ To access devices connected to VIP4G remotely, one or more of the following must be configured: IP-Passthrough, Port Forwarding, DMZ. Another option would be to set up a VPN.

Ensure the default passwords are changed.

✓ **Ensure that all default passwords are changed to limit access to the modem. The admin password can be changed at the System > Access Control menu.**

Set up appropriate firewall rules to block unwanted incoming data.

✓ **For best practices and to limit data charges it is critical to properly set up the firewall. (Especially important for Public Static IP addresses.)**

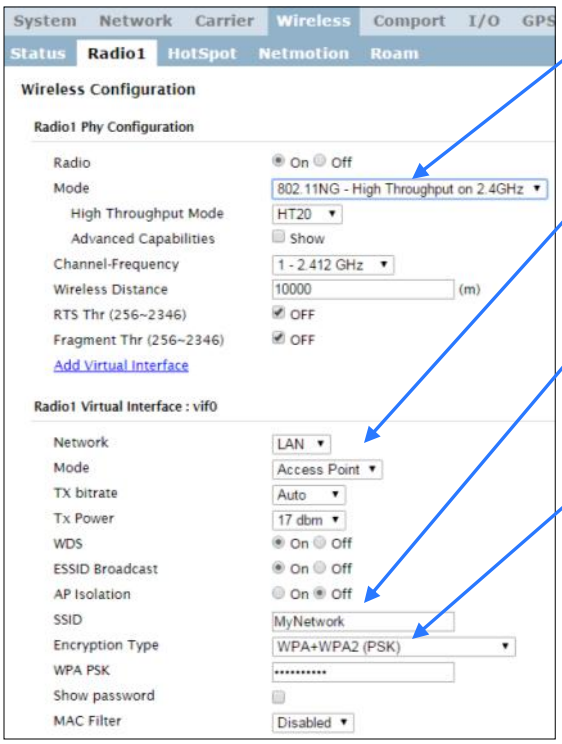
2.0 Quick Start

2.3 Getting Started with WiFi

This **Quick Start** section walks users through setting up a basic WiFi AP (Access Point). For additional settings and configuration considerations, refer to the appropriate sections in the manual. This walkthrough assumes all setting are in the factory default state.

2.3.1 Setting up WiFi

- ✓ Use ***Section 2.2*** *Getting Started with Cellular* to connect, power up and log in and configure the Carrier in a VIP4G.
- ✓ Click on the Wireless > Radio1 Tab to setup the WiFi portion of the VIP4G.



In **Radio1 Phy Configuration**, ensure the mode is set for 802.11NG.

In the **Radio1 Virtual Interface**, ensure that the Mode is set for Access Point.

Enter a name for the Wireless Network under **SSID**. This example uses MyNetwork

(Recommended) Set a password for the WiFi, this example uses MyPassword

Click **Submit.**

2.0 Quick Start

2.3.2 Connecting to WiFi

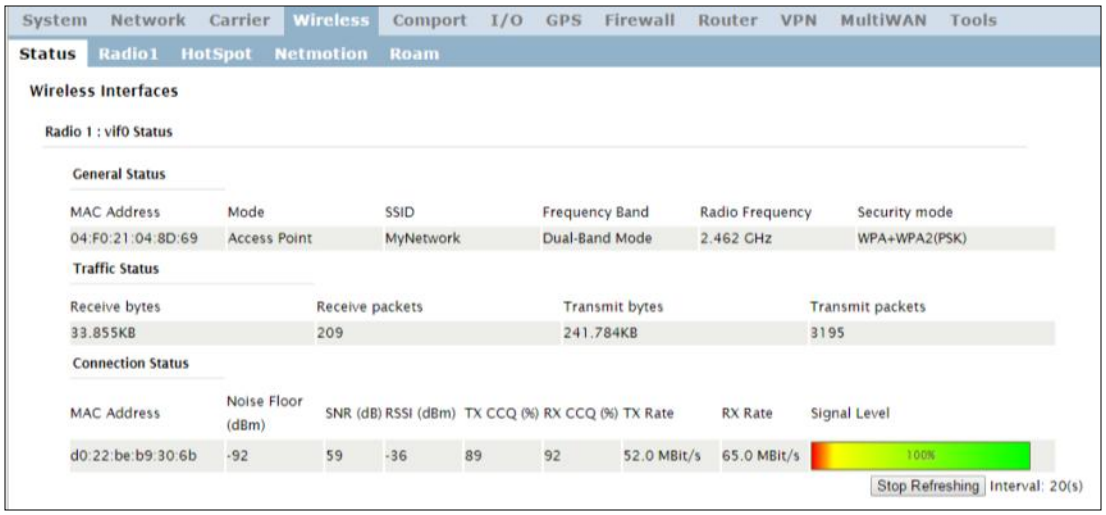
✓ Now that the VIP4G has connection to the Cellular Carrier (See Section 2.2) and the WiFI has been set up (See Section 2.3), WiFi devices should be able to detect and connect to the VIP4G.

✓ On a WiFi enabled PC/Device, the SSID of MyNetwork, that was created in the last example should be visible. Connect to that SSID and enter the password.

✓ Once connected the status should change to connected, and network access should be enabled.

2.0 Quick Start

✓ The status of the WiFi connection should also be visible in the Wireless > Status tab in the WebUI as seen below.



3.0 Hardware Features

3.1 VIP4G

The VIP4G is a fully-enclosed unit ready to be interfaced to external devices.

Image 3-1: Front View of VIP4G

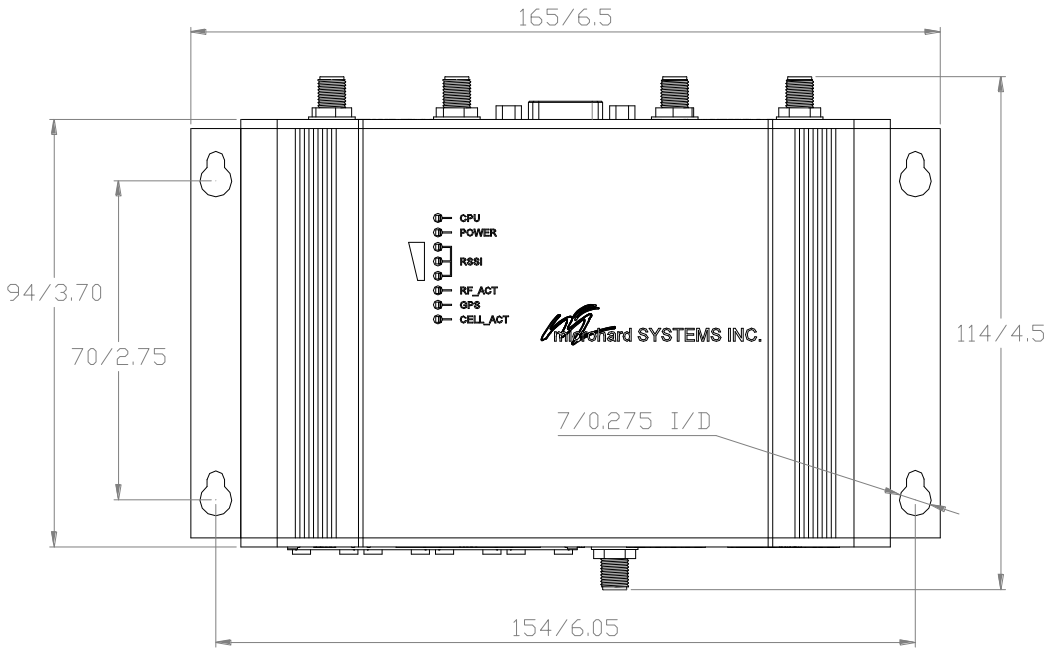
Image 3-2: Rear View of VIP4G

VIP4G Hardware Features Include:

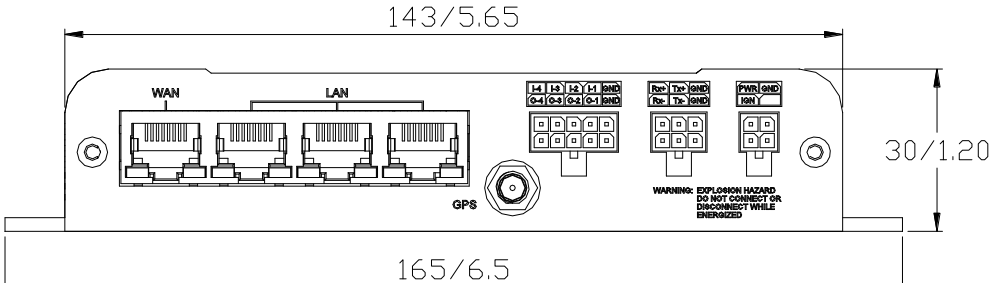
- Standard Connectors for:
  - 1 WAN Ethernet Ports (RJ45)
  - 3 LAN Ethernet Ports (RJ45)
  - Data Port (RS232/DB9)
  - 4-Pin: MATE-N-LOK Type Connector for Power
  - 6-Pin: MATE-N-LOK Type Connector for RS485 Data
  - 10-Pin: MATE-N-LOK Type Connector for Digital I/O
  - Cellular Antenna (SMA Female Antenna Connection x2)
  - WiFi Antenna (RP-SMA Female Antenna Connection x2)
  - Built in GPS (SMA Female Antenna Connection)
- Status/Diagnostic LED's for CPU, POWER, RSSI, RF_ACT, GPS, CELL_ACT
- CFG Button for resetting to factory settings and firmware recovery operations
- Mounting Holes/Tabs

3.0 Hardware Features

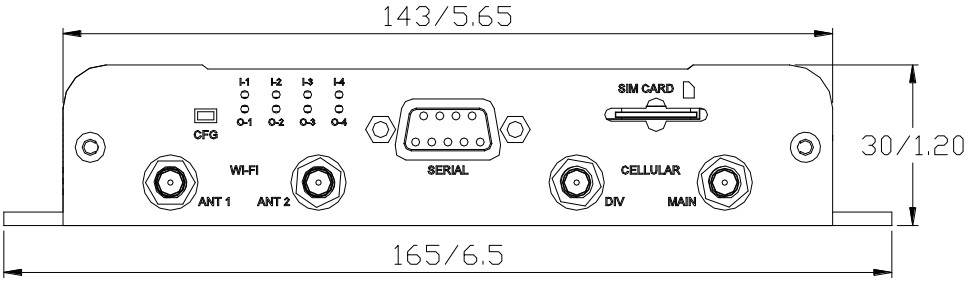
3.1.1 Mechanical Drawings



Drawing 3-1: VIP Top View Dimensions



Drawing 3-2: VIP Front View Dimensions



Drawing 3-3: VIP Rear View Dimensions

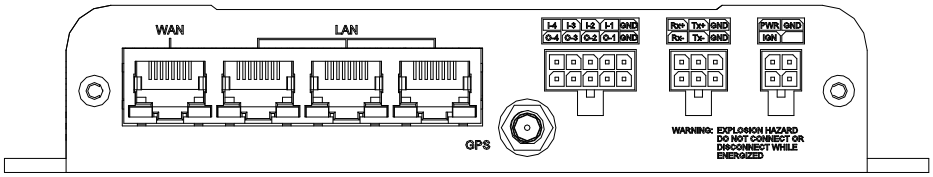
Note: All dimension units: Millimeter & Inches (mm/inches)

3.0 Hardware Features

3.1.2 Connections

3.1.2.1 Front

On the front of the VIP4G Series are, from left to right:



Drawing 3-4: VIP4G Front View

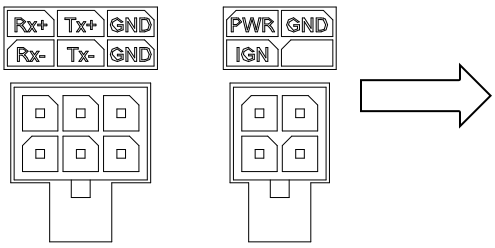
- WAN port
  - 10/100/1000 Ethernet RJ45 Connection.
  - 802.3af Passive PoE (WAN port only)

Ethernet RJ45 Connector Pin Number								
Source Voltage	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
9 - 30 Vdc	Data	Data	Data	DC+	DC+	Data	DC-	DC-

Table 3-1: WAN PoE Connections

Caution: Using a power supply that does not provide proper voltage may damage the VIP4G unit.

- LAN port
  - 3x - 10/100/1000 Ethernet RJ45 Connection.
- GPS
  - SMA Female
- Digital I/O Connector 10-Pin: (Use AMP *MATE-N-LOK PN# 1-794617-0*)
  - I-4, I-3, I-2, I-1, GND
  - O-4, O-3, O-2, O-1, GND
- RS485/422 Connector 6-Pin: (*Use AMP MATE-N-LOK PN# 794617-6*)
  - Rx+, Tx+, GND
  - Rx-, Tx-, GND
- Power Connector 4-Pin: (Use AMP MATE-N-LOK PN# 794617-4)
  - PWR, GND
  - IGN - Ignition signal for *Power Saving Mode**



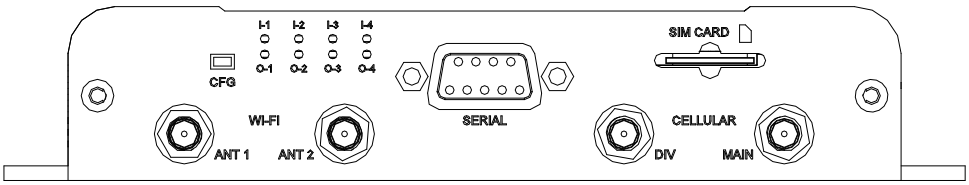
Name	Input or Output
TxB (D+)	O
TxA (D-)	O
RxB (R+)	I
RxA (R-)	I
GND -	
PWR +	I

Table 3-2: Data RS422/485 Vin Pin Assignment

**** Power Saving Mode only available on select units, must be specified at time of order or returned to factory for upgrade.***

3.0 Hardware Features

3.1.2.2 Rear



Drawing 3-5: VIP4G Rear View

CFG Button

Holding this button for 8 seconds while the VIP4G is powered up and running, will cause the unit to reset and load factory default settings:

IP: 192.168.168.1 Subnet: 255.255.255.0

With these settings a web browser can be used to configure the unit.

Holding this button depressed while powering-up the VIP4G will boot the unit into FLASH FILE SYSTEM RECOVERY mode. The default IP address for *system recovery (only - not for normal access to the unit)* is static: 192.168.1.39.

ANTENNA Connectors

The VIP4G uses female SMA antenna connectors for the Cellular and female RP-SMA connectors for the WiFi antennas. Two antenna connections are provided for Wi-Fi, ANT1, and ANT2. Two connectors are also provided for Cellular, MAIN and DIV.

Digital I/0 LED's

The I-1, I-2, I-3, and I-4 LED's indicate the status of the input pins on the digital I/O interface. The O-1, O-2, O-3 and O-4 LED's indicate the current state of the corresponding output relays.

Serial Port

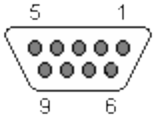
The Serial port can be used for console type configuration (If disabled), or as a data communications port for RS232 Devices.

Default Console Port Settings:

Bits per Second: 115,200
Data Bits: 8
Parity: None
Stop bits: 1
Flow control: None

3.0 Hardware Features

Serial Port (Continued)



*See **Appendix A** for a full description of the COM1 RS-232 interface functions.*

Pin Name	No.	Description	In/ Out
DCD	1	Data Carrier Detect	O
RXD	2	Receive Data	O
TXD	3	Transmit Data	I
DTR	4	Data Terminal Ready	I
SG	5	Signal Ground	
DSR	6	Data Set Ready	O
RTS	7	Request To Send	I
CTS	8	Clear To Send	O

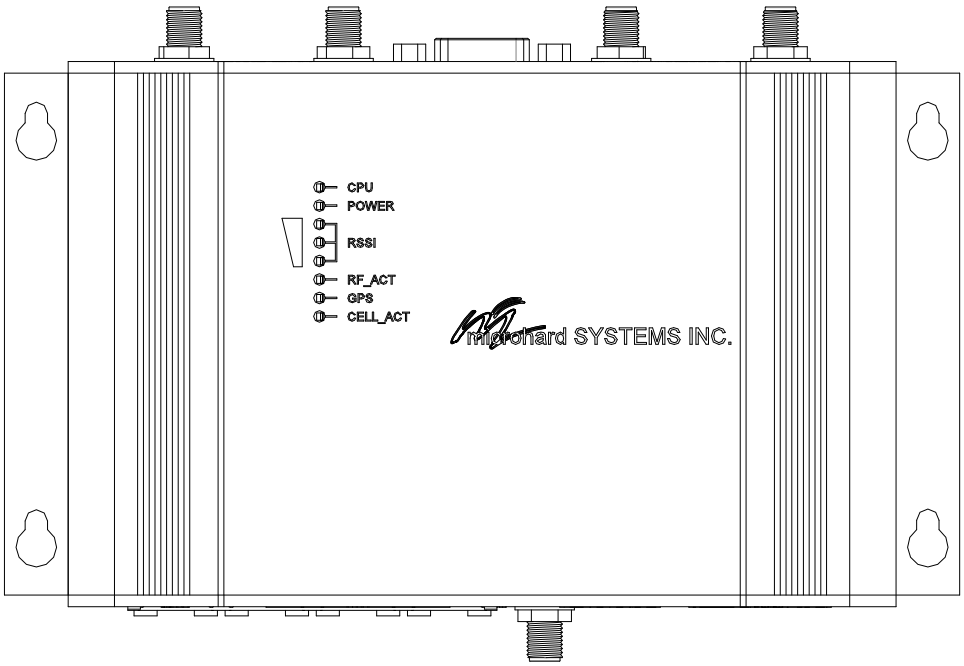
Table 3-3: COM2 DB9 Pin Assignment

SIM Card

This slot is used to install a SIM card provided by the cellular carrier to enable communication to their cellular network. Ensure the SIM card is installed properly by paying attention to the diagram printed above the SIM card slot.

3.0 Hardware Features

3.1.3 Indicators



Drawing 3-6: VIP4G Indicators

CPU (Blue)
ON indicates the CPU is running.

POWER (Red)
Illuminates when power is correctly applied to the unit.

RSSI (3 LEDs)
Indicate the received signal strength of the signal to the Cellular carrier. The number of LED's illuminated indicate the strength of the signal, with all 3 being illuminated representing a strong signal.

RF-ACT
The RF Activity LED illuminates when there is activity on the WiFi wireless interface.

GPS
Indicates that the GPS module is powered on and ready.

CELL_ACT
The CELL Activity LED illuminates when there is cellular activity.

4.0 Configuration

4.0 Web User Interface

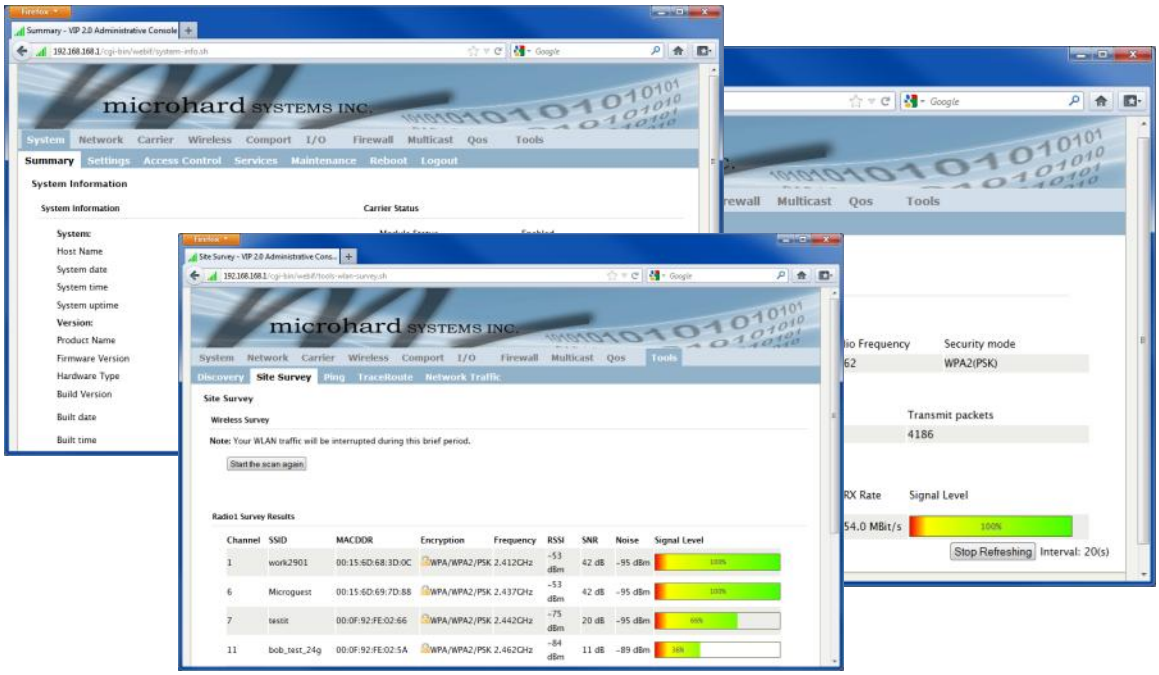


Image 4-0-1: WebUI

Initial configuration of an VIP4G using the Web User (Browser) Interface (Web UI) method involves the following steps:

- configure a static IP Address on your PC to 192.168.168.10 (or any address on the 192.168.168.X subnet other than the default IP of 192.168.168.1)
- connect a VIP4G LAN ETHERNET port to PC NIC card using an Ethernet cable
- apply power to the VIP4G and wait approximately 60 seconds for the system to load
- open a web browser and enter the factory default IP address of the unit: 192.168.168.1
- logon window appears; log on using default Username: ***admin*** Password: ***admin***
- use the web browser based user interface to configure the VIP4G as required.
- refer to **Section 2.0: Quick Start** for step by step instructions.

In this section, all aspects of the Web Browser Interface, presented menus, and available configuration options will be discussed.

4.0 Configuration

4.0.1 Logon Window

Upon successfully accessing the VIP4G using a Web Browser, the Logon window will appear.

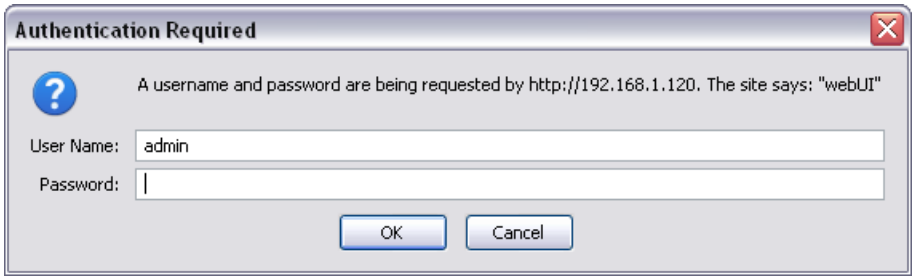


Image 4-0-2: Logon Window

For security, do not allow the web browser to remember the User Name or Password.

The factory default User Name is: **admin**

The default password is: **admin**

Note that the password is case sensitive. It may be changed (discussed further along in this section), but once changed, if forgotten, may not be recovered.

It is advisable to change the login Password. Do not FORGET the new password as it cannot be recovered.

When entered, the password appears as 'dots' as shown in the image below. This display format prohibits others from viewing the password.

The 'Remember my password' checkbox may be selected for purposes of convenience, however it is recommended to ensure it is deselected - particularly once the unit is deployed in the field - for one primary reason: security.

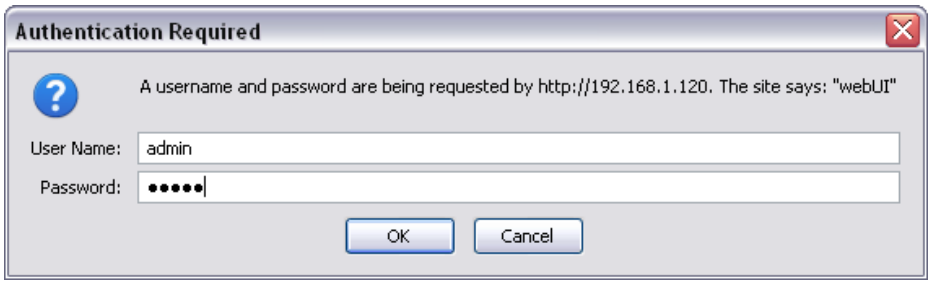


Image 4-0-3: Logon Window : Password Entry

4.0 Configuration

4.1 System

The main category tabs located at the top of the navigation bar separate the configuration of the VIP4G into different groups based on function. The System Tab contains the following sub menu's:

- Summary - Status summary of entire radio including network settings, version information, and radio connection status.
- Settings - Host Name, Default System Mode (Bridge or Router), System Time/Date, HTTP Port for the WebUI,
- Access Control - Change passwords, create new users
- Services - Enable/Disable RSSI LED's, SSH and Telnet services
- Maintenance - Version information, firmware Upgrades, reset to defaults, configuration backup and restore.
- Reboot - Remotely reboot the system.
- Logout - Logout of the current browser session.

4.1.1 System > Summary

The System Summary screen is displayed immediately after initial login, showing a summary and status of all the functions of the VIP4G in a single display. This information includes System Status, Carrier Status, LAN & WAN network information, version info and WiFi radio status as seen below.

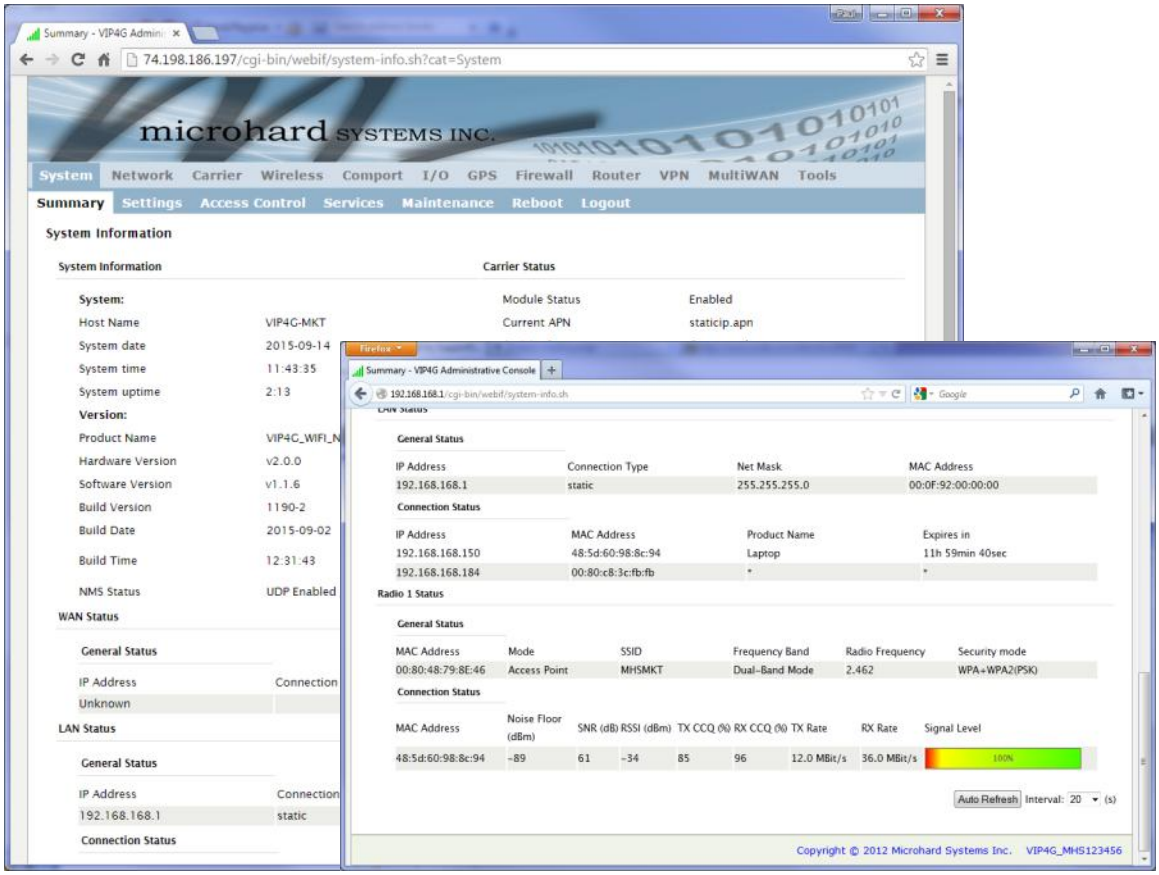


Image 4-1-1: System Info Window

4.0 Configuration

4.1.2 System > Settings

System Settings

Options available in the System Settings menu allow for the configuration of the Host Name.

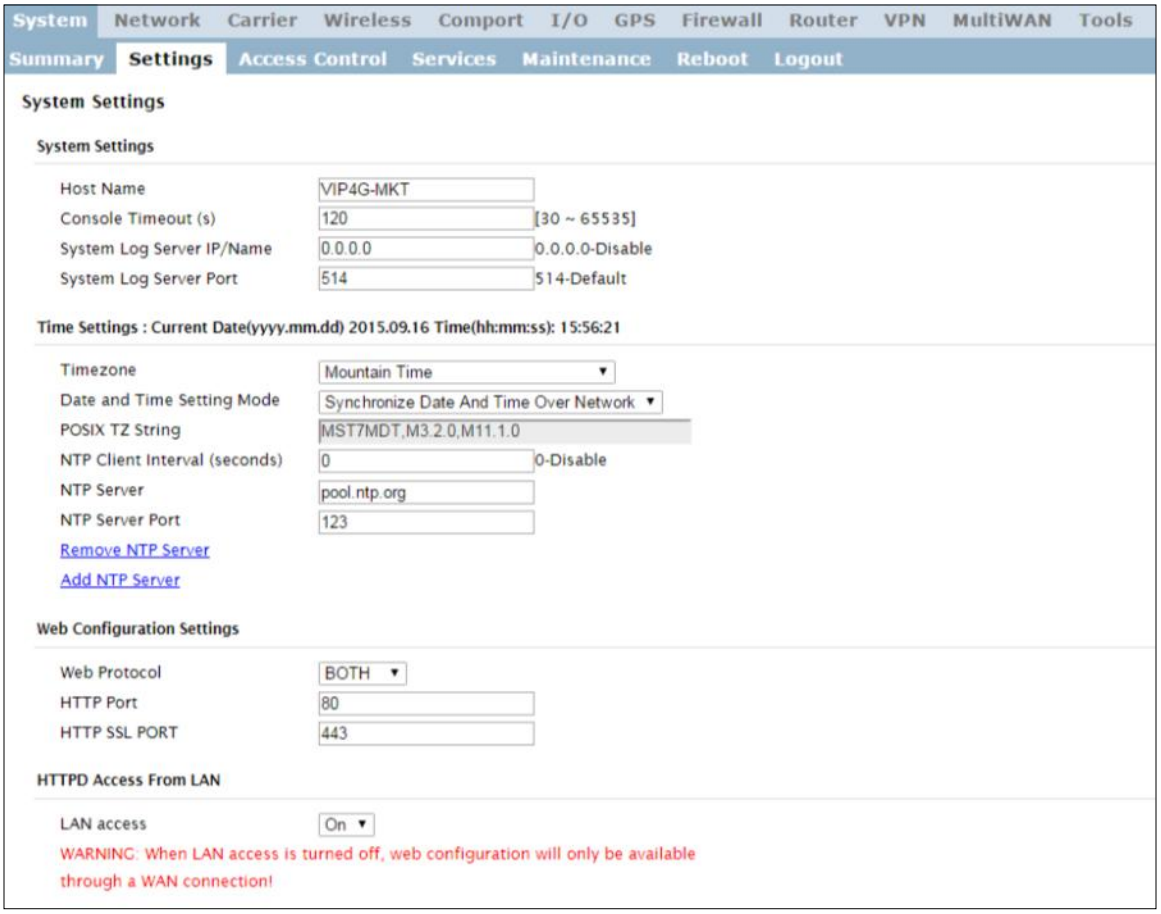


Image 4-1-2: System Settings > System Settings

The Host Name must not be confused with the **Network Name (SSID)** (Wireless Configuration menu). The Network Name MUST be exactly the same on each wireless device within a VIP4G network.

Host Name

The Host Name is a convenient identifier for a specific VIP4G unit. This feature is most used when accessing units remotely: a convenient cross-reference for the unit's WAN IP address. This name appears when logged into a telnet session, or when the unit is reporting into Microhard NMS System.

Values (characters)

VIP4G (varies)

up to 30 characters

Console Timeout

The console timeout is used to automatically logout a User, after the specified time period of inactivity, on the console port. This affects bother the serial console port or a TCP/IP telnet session.

Values (seconds)

120

4.0 Configuration

System Log Server IP/Name

The modem can be configured to report system level events to a third party Syslog server, as shown below. Syslog data can then be filtered and depending on the features of the Syslog server application, alerts can be generated accordingly.

The screenshot below shows a sample from a simple Syslog Server application.

Values

0.0.0.0

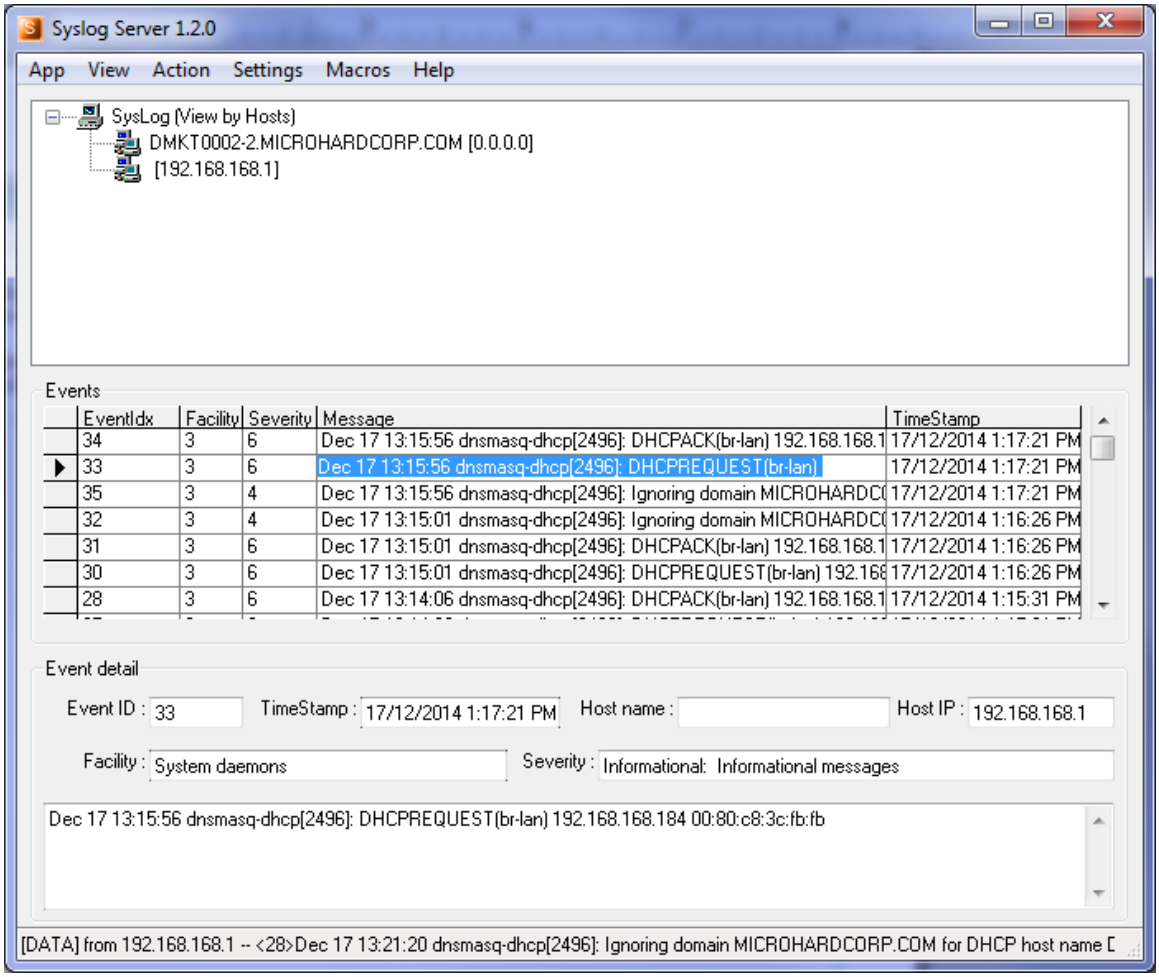


Image 4-1-3: System Settings > Syslog Server Example

System Log Server Port

Enter the UDP port number on the Syslog Server where the actual service is running. Consult with the documentation of your chosen Syslog Server for the correct port number. The most common port is 514, which has been set as the default.

Values (UDP Port #)

514

4.0 Configuration

Time Settings

The VIP4G can be set to use a local time source, thus keeping time on its own, or it can be configured to synchronize the date and time via a NTP Server. The options and menus available will change depending on the current setting of the Date and Time Setting Mode, as seen below.

Network Time Protocol (NTP) can be used to synchronize the time and date or computer systems with a centralized, referenced server. This can help ensure all systems on a network have the same time and date.

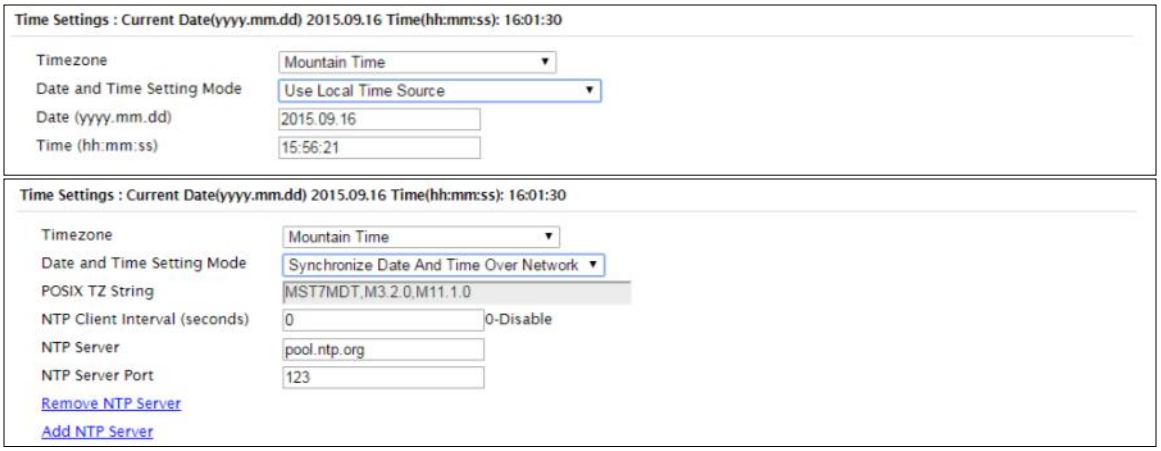


Image 4-1-3: System Settings > Time Settings

Date and Time Setting Mode

Select the Date and Time Setting Mode required. If set for 'Use Local Time' the unit will keep its own time and not attempt to synchronize with a network server. If 'Synchronize Date And Time Over Network' is selected, a NTP server can be defined.

Values (selection)

Use Local Time Source
Synchronize Date And Time Over Network

Date

The calendar date may be entered in this field. Note that the entered value is lost should the VIP4G lose power for some reason.

Values (yyyy-mm-dd)

2011.04.01 *(varies)*

Time

The time may be entered in this field. Note that the entered value is lost should the VIP4G lose power for some reason.

Values (hh:mm:ss)

11:27:28 *(varies)*

Timezone

If connecting to a NTP time server, specify the timezone from the dropdown list.

Values (selection)

User Defined (or out of date)

POSIX TZ String

This displays the POSIX TZ String used by the unit as determined by the timezone setting.

Values (read only)

(varies)

4.0 Configuration

NTP Client Interval	
Specify the frequency, in seconds, in which the VIP4G will synchronize its time and date with the specified NTP Server. If disabled the VIP4G will only sync to an NTP Server during boot-up. ***Please note: Each time the VIP4G synchronizes with a NTP Server, cellular data may be consumed***	**Values (seconds)** **0**

NTP Server	
Enter the IP Address or domain name of the desired NTP time server.	**Values (address)** **pool.ntp.org**

NTP Port	
Enter the IP Address or domain name of the desired NTP time server.	**Values (port#)** **123**

Web Configuration Settings

The last section of the System Setting menu allows the configuration of the HTTP and HTTPS Ports used for the web server of the WEBUI.

Image 4-1-4: System Settings > Web Configuration Settings

HTTP Port	
The default web server port for the web based configuration tools used in the VIP4G is port 80. If a non standard port is used, it must be specified in a internet browser to access the unit. (example: http://192.168.168.1:8080)	**Values (port#)** **80**

HTTP SSL Port	
The secure web port (HTTPS) can be enabled or disabled using the **HTTP SSL** On/Off drop down menu. If enabled, the port used can be specified, the default is port 443.	**Values (port#)** **443**

LAN Access	
This option can be used to disable LAN access of the HTTP WebUI port. If disabled, connection can only be made from the WAN side (Wired or 4G).	**Values (selection)** **On** / Off

4.0 Configuration

4.1.3 System > Access Control

Password Change

The Password Change menu allows the password of the user 'admin' to be changed. The 'admin' username cannot be deleted, but additional users can be defined and deleted as required as seen in the Users menu below.

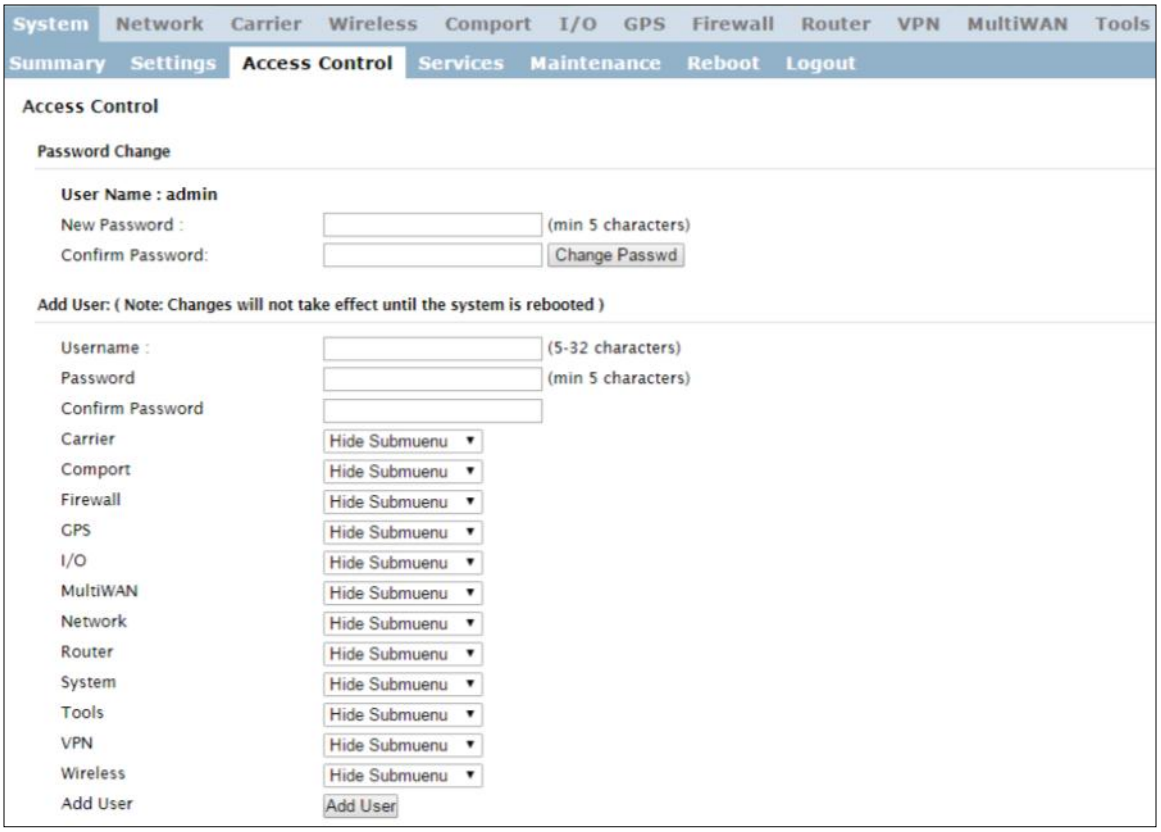


Image 4-1-5: Access Control > Password Change

New Password	
Enter a new password for the 'admin' user. It must be at least 5 characters in length. The default password for 'admin' is 'admin'.	**Values (characters)** **admin** min 5 characters

Confirm Password	
The exact password must be entered to confirm the password change, if there is a mistake all changes will be discarded.	**Values (characters)** **admin** min 5 characters

4.0 Configuration

4.1.3 System > Access Control

Users

Different users can be set up with customized access to the WebUI. Each menu or tab of the WebUI can be disabled on a per user basis as seen below.

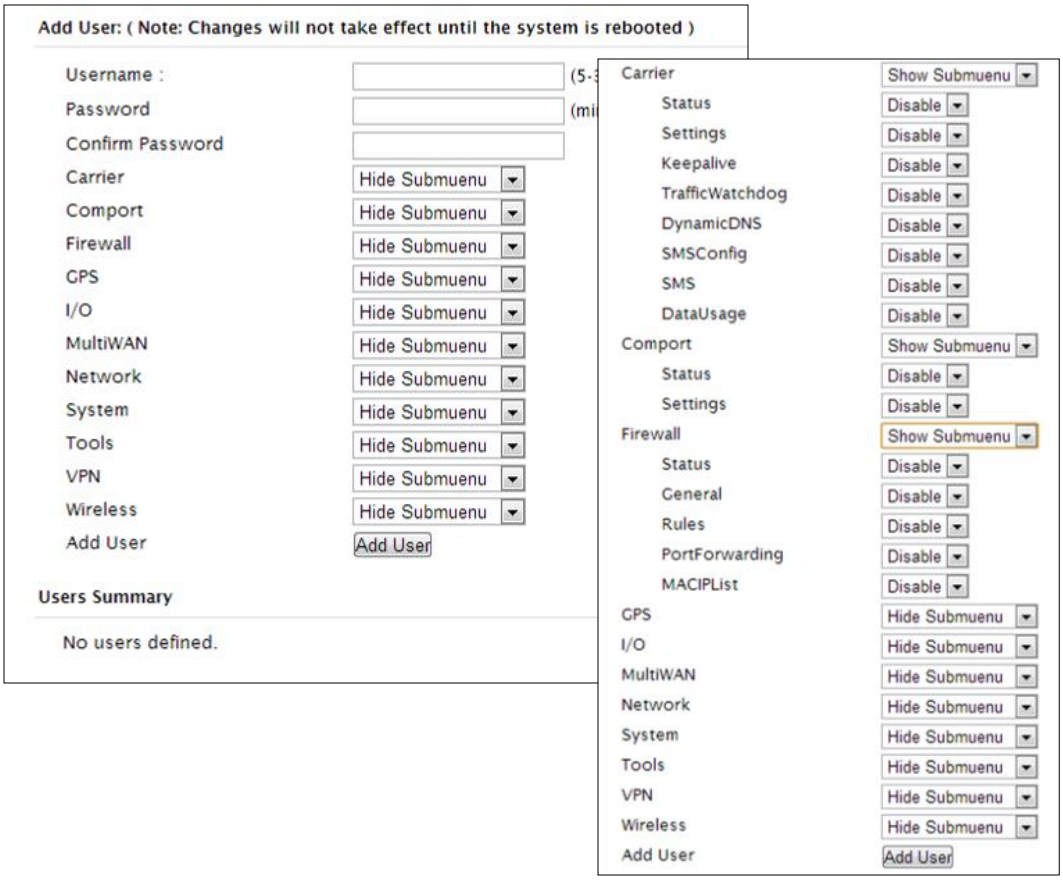


Image 4-1-6: Access Control > Users

Username	
Enter the desired username. Minimum or 5 character and maximum of 32 character. Changes will not take effect until the system has been restarted.	**Values (characters)** *(no default)* *Min 5 characters* *Max 32 characters*

Password / Confirm Password	
Passwords must be a minimum of 5 characters. The Password must be re-entered exactly in the Confirm Password box as well.	**Values (characters)** *(no default)* min 5 characters

4.0 Configuration

4.1.4 System > Services

Available Services

Certain services in the VIP4G can be disabled or enabled for either security considerations or resource/ power considerations. The Enable/Disable options are applied after a reboot and will take affect after each start up. The Start/Restart/Stop functions only apply to the current session and will not be retained after a power cycle.

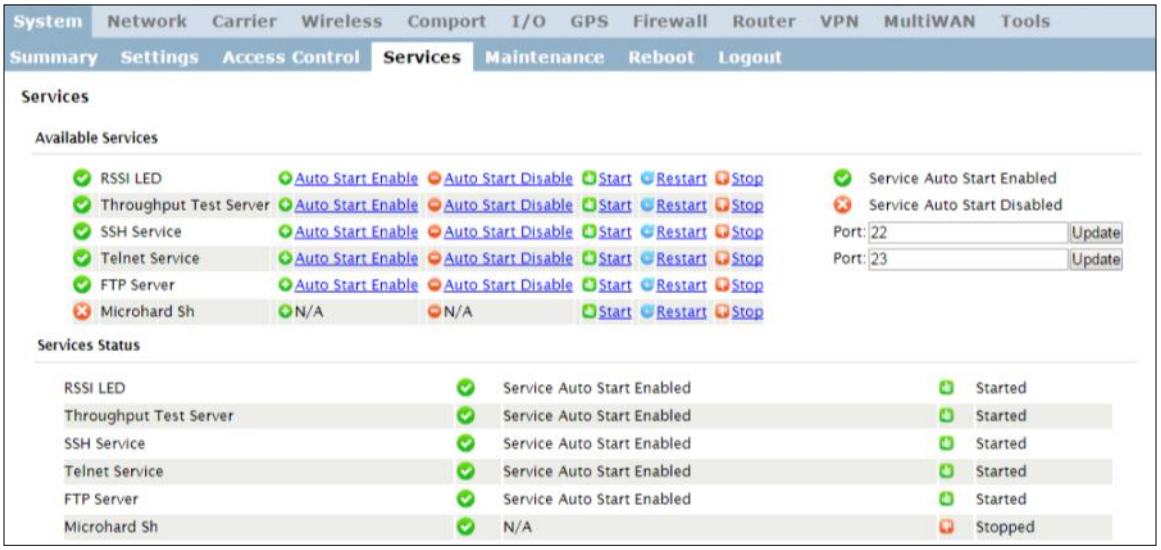


Image 4-1-7: System > Services

RSSI LED

The VIP4G has the ability to turn off the RSSI LED's. The RSSI value can still be read from the unit, but the status will not be visible on the unit itself .

Values (selection)

Enable / Disable

Throughput Test Server

For testing purposes the VIP4G has an internal iperf server that can be used to test unit performance. The user must install a iperf client to use this functionality.

Values (selection)

Enable / Disable

SSH Service

Using the SSH Service Enable/Disable function, you can disable the SSH service (Port 22) from running on the VIP4G. You can also specify a alternate port to use. Any port number changes require the modem to be restarted.

Values (selection)

Enable / Disable

4.0 Configuration

Telnet Service

Using the Telnet Service Enable/Disable function, you can disable the Telnet service (Port 23) from running on the VIP4G. You can also specify a alternate port to use. Any port number changes require the modem to be restarted.

Values (characters)

Enable / Disable

FTP Server

Using the FTP Service Enable/Disable function, you can disable the FTP service (Port 21) from running on the VIP4G. This port is reserved for internal use / future use.

Values (selection)

Start / Restart / Stop

Microhard Sh

Custom SSH Port. Reserved for internal use.

Values (selection)

Start / Restart / **Stop**

4.0 Configuration

4.1.5 System > Power Saving (Factory Installed Option)

The Power Saving feature of the VIP4G is only available in firmware version 1.1.6-1170 or later. It also requires a factory installed modification that must be specified at the time of order, or returned to the factory for an upgrade.

The Power Saving feature of the VIP4G works with the IGN line located on the PWR connector. It was designed with vehicle systems in mind, but could be useful in other applications. The VIP4G must run for at least 5 minutes before power saving will work.

The VIP4G requires that the IGN line be ON (1.8 - 32V) to boot up and perform normal operations. If the IGN line goes OFF (Less than 1.8V) or floating (The Ignition of the vehicle turned OFF), the VIP4G will then look at the Power Down Delay and start counting down to when it will turn itself off. It will also look at the Power Down Voltage, if the voltage drops below the set value, the VIP4G will power down.

The VIP4G will power up and resume normal operation once the IGN line is retuned to the ON state.

Image 4-1-8: System > Power Saving

Power Saving Status	Values (selection)
Enable or disable the power saving feature of the VIP4G. If enabled, it requires that the IGN line is high to run, if IGN is low it will initiate the power down delay.	Enable / **Disable**

Power Down Delay	Values (minutes)
Once the VIP4G is running for at least five minutes, and the IGN line goes low (less than 1.8V), the VIP4G will stay on for the amount of time (minutes) defined here.	60

Power Down Voltage	Values (8 - 32 V))
The VIP4G can be configured to power down if the supply voltage drops below the value defined here. This ensures that the unit will power down before it causes a significant drain on the vehicles battery.	10

4.0 Configuration

4.1.6 System > Maintenance

Version Information

Detailed version information can be found on this display. The Product Name, Firmware Version, Hardware Type, Build Version, Build Date and Build Time can all be seen here, and may be requested from Microhard Systems to provide technical support.

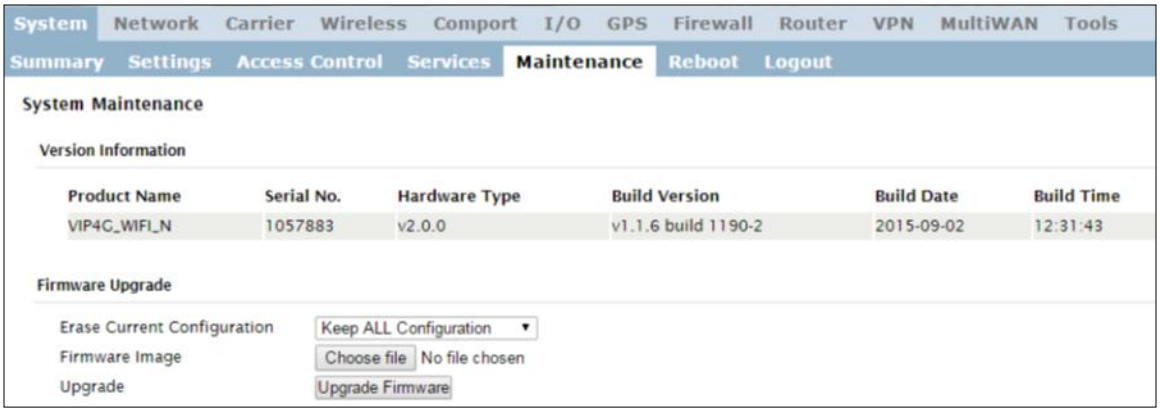


Image 4-1-9: Maintenance > Version Information / Firmware Upgrade

Firmware Upgrade

Occasional firmware updates may be releases by Microhard Systems which include fixes and new features. The firmware can be updated here wirelessly using the WebUI.

Erase Current Configuration

Allows a user to select if the unit is to keep its current configuration, erase its configuration, or to erase the configuration, but keep Carrier Settings during the firmware upgrade process.

Values (selection)

Keep ALL Configuration
Keep Carrier Configuration
Erase Configuration

Firmware Image

Use the Browse button to find the firmware file supplied by Microhard Systems. Select "Upgrade Firmware" to start the upgrade process. This can take several minutes.

Values (file)

(no default)

4.0 Configuration

4.1.6 System > Maintenance

Reset to Default

The VIP4G may be set back to factory defaults by using the Reset to Default option under System > Maintenance > Reset to Default. ***Caution* - All settings will be lost!!!**

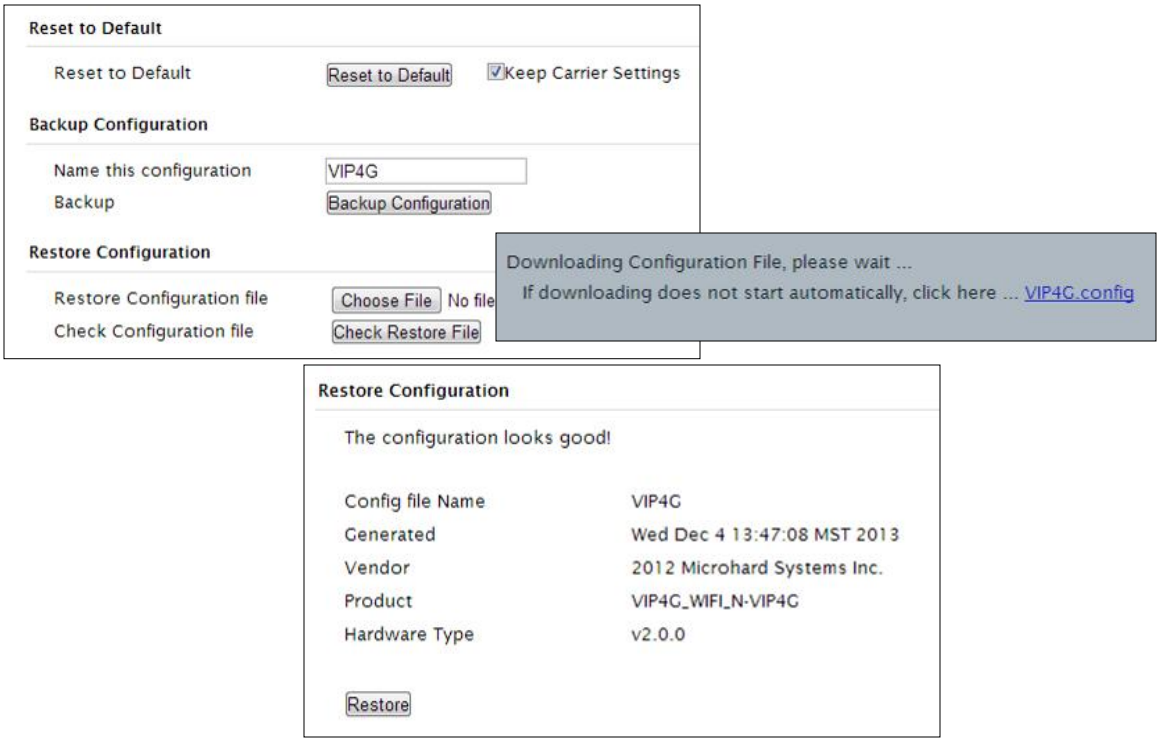


Image 4-1-10: Maintenance > Reset to Default / Backup & Restore Configuration

Backup & Restore Configuration

The configuration of the VIP4G can be backed up to a file at any time using the Backup Configuration feature. The file can the be restored using the Restore Configuration feature. It is always a good idea to backup any configurations in case of unit replacement. The configuration files cannot be edited offline, they are used strictly to backup and restore units.

Name this Configuration / Backup Configuration

Use this field to name the configuration file. The .config extension will automatically be added to the configuration file.

Restore Configuration file / Check Restore File / Restore

Use the 'Browse' button to find the backup file that needs to be restored to the unit. Use the 'Check Restore File' button to verify that the file is valid, and then the option to restore the configuration is displayed, as seen above.

4.0 Configuration

4.1.7 System > Reboot

The VIP4G can be remotely rebooted using the System > Reboot menu. As seen below a button 'OK, reboot now' is provided. Once pressed, the unit immediately reboots and starts its boot up procedure.

Image 4-1-11: System > Reboot

4.1.8 System > Logout

The logout function allows a user to end the current configuration session and prompt for a login screen.

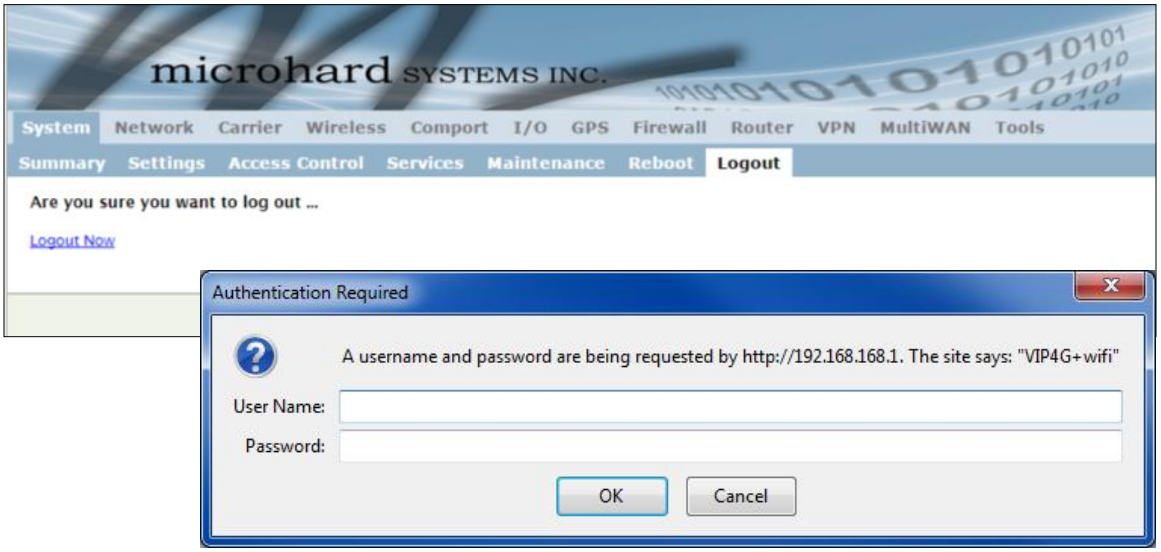


Image 4-1-12: System > logout

4.0 Configuration

4.2 Network

4.2.1 Network > Status

The Network Status display gives a overview of the currently configured network interfaces including the Connection Type (Static/DHCP), IP Address, Net Mask, Default Gateway, DNS, and IPv4 Routing Table.

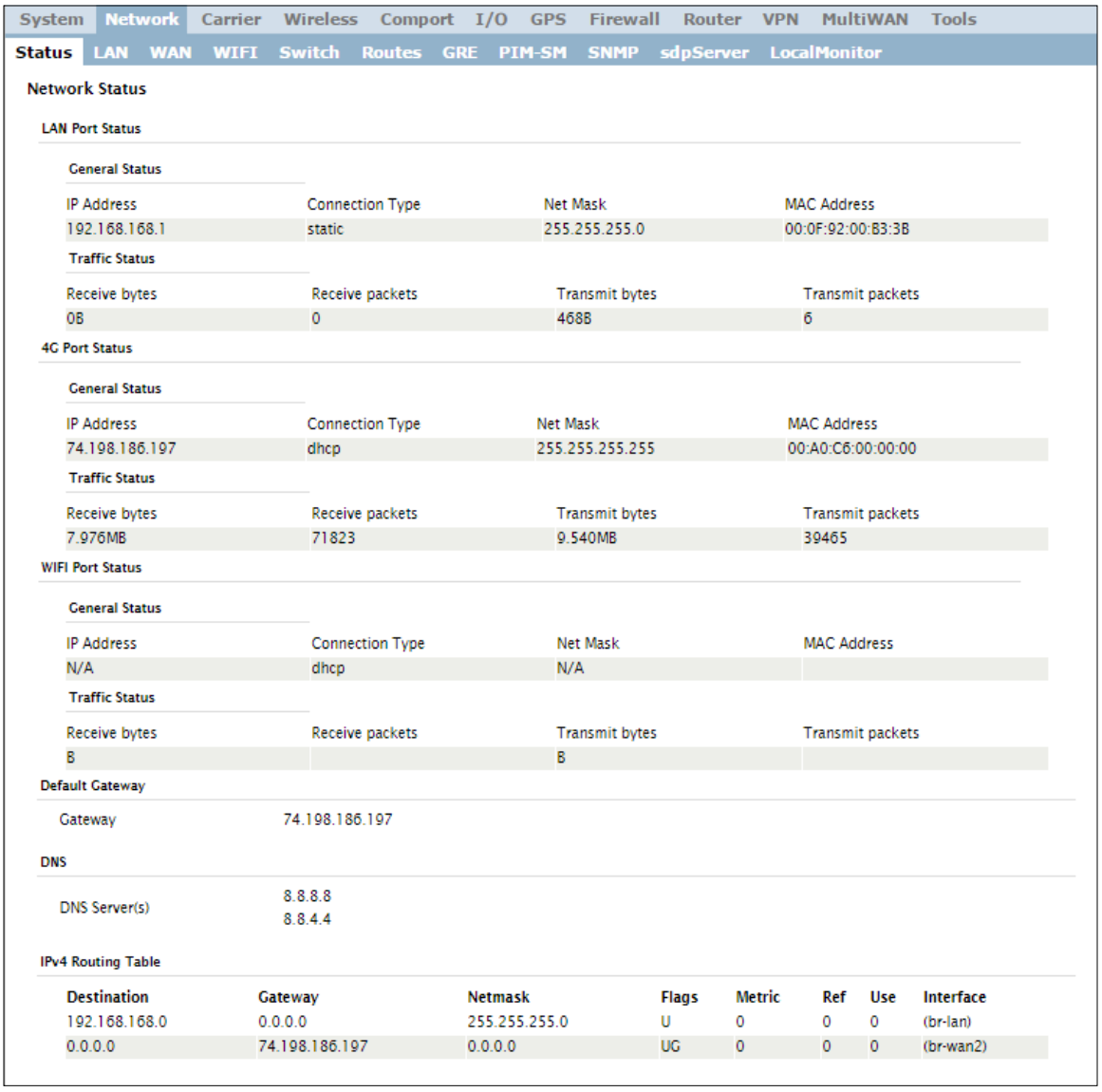


Image 4-2-1: Network > Network Status

4.0 Configuration

4.2.2 Network > LAN

Network LAN Configuration

The Ethernet port (RJ45) on the back of the VIP4G is the LAN port, used for connection of devices on a local network. By default, this port has a static IP Address of 192.168.168.1. It also, by default is running a DHCP server to provide IP Addresses to devices that are connected to the physical port, and devices connected by a WiFi connection (if equipped).

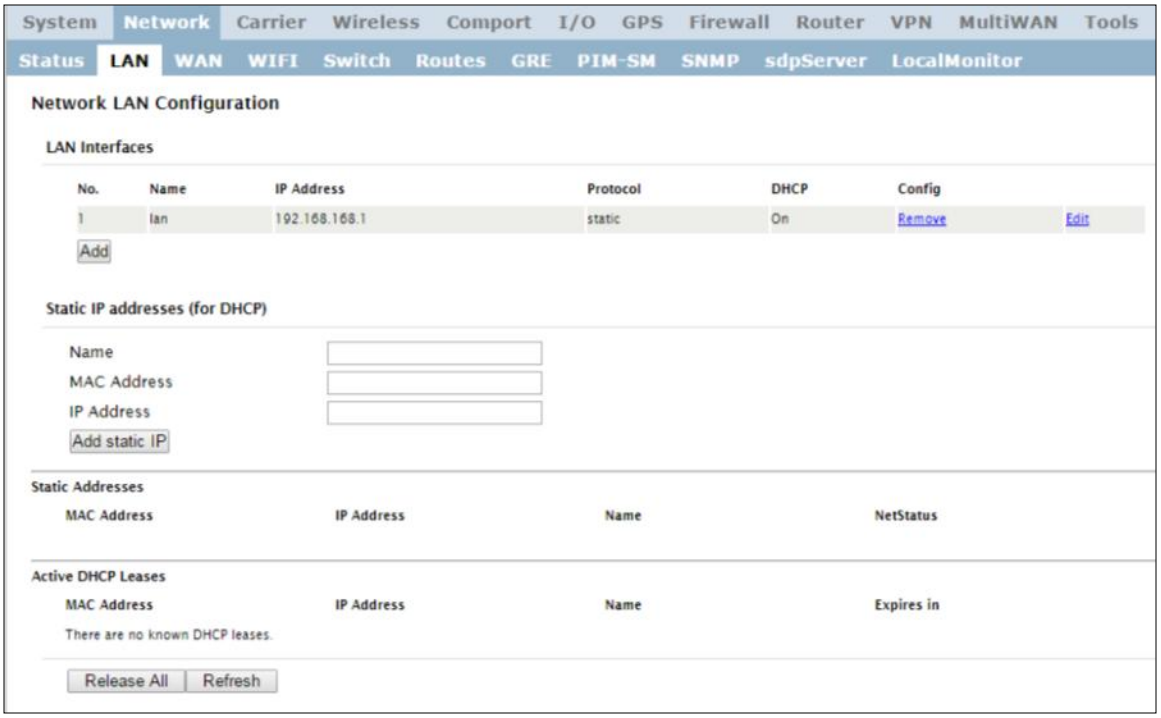


Image 4-2-2: Network > LAN Configuration

DHCP: Dynamic Host Configuration Protocol may be used by networked devices (Clients) to obtain unique network addresses from a DHCP server.

Advantage:
Ensures unique IP addresses are assigned, from a central point (DHCP server) within a network.

Disadvantage:
The address of a particular device is not 'known' and is also subject to change.

STATIC addresses must be tracked (to avoid duplicate use), yet they may be permanently assigned to a device.

LAN Add/Edit Interface

The VIP4G has the capability to have multiple SSID's for the WiFi radio (optional). New Interfaces can be added for additional SSID's, providing, if required, separate subnets for each SSID. By default any additional interfaces added will automatically assign IP addresses to connecting devices via DHCP. Additional interfaces can only be used by additional WIFI SSID's (virtual interfaces).

Image 4-2-3: Network > Add/Edit LAN Interface

4.0 Configuration

Within any IP network, each device must have its own unique IP address.

A SUBNET MASK is a bit mask that separates the network and host (device) portions of an IP address.

The 'unmasked' portion leaves available the information required to identify the various devices on the subnet.

Spanning Tree (STP)

Use this option to enable or disable the use of Spanning Tree Protocol (STP).

Values (selection)

On
Off

Connection Type

This selection determines if the VIP4G will obtain an IP address from a DHCP server on the attached network, or if a static IP address will be entered. If a Static IP Address is chosen, the fields that follow must also be populated.

Values (selection)

DHCP
Static

IP Address

If 'Static' Connection Type is selected, a valid IPv4 Address for the network being used must be entered in the field. If 'DHCP' is chosen this field will not appear and it will be populated automatically from the DHCP server.

Values (IP Address)

192.168.168.1

Netmask

If 'Static' Connection Type is selected, the Network Mask must be entered for the Network. If 'DHCP' is chosen this field will not appear and it will be populated automatically from the DHCP server.

Values (IP Address)

255.255.255.0

4.0 Configuration

LAN DHCP

A VIP4G may be configured to provide dynamic host control protocol (DHCP) service to all attached (either wired or wireless (WiFi)-connected) devices. By default the DHCP service is enabled, so devices that are connected to the physical Ethernet LAN ports, as well as any devices that are connected by WiFi will be assigned an IP by the VIP4G.

Prior to enabling this service, verify that there are no other devices - either wired (e.g. LAN) or wireless (e.g. another VIP Series unit) with an active DHCP SERVER service. (The Server issues IP address information at the request of a DHCP Client, which receives the information.)

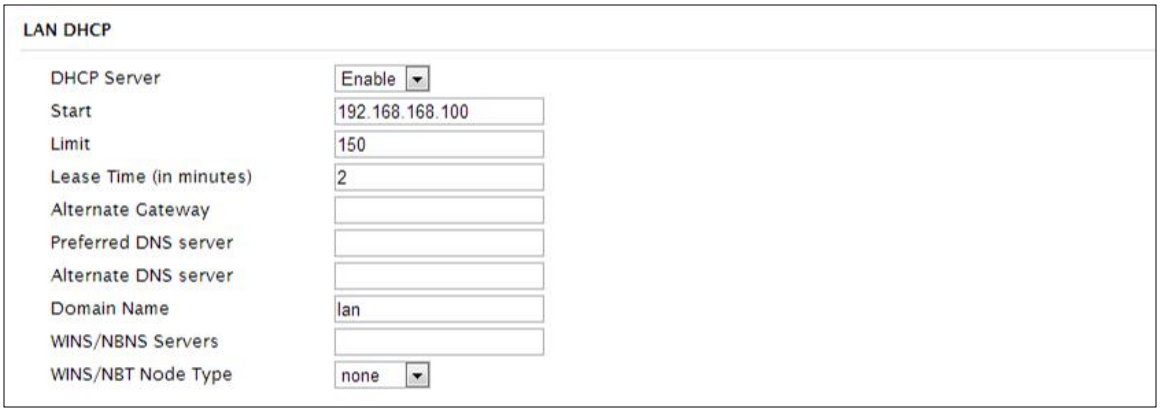


Image 4-2-4: Network > Add/Edit Interface DHCP

DHCP

The option is used to enable or disable the DHCP service for devices connected to the LAN Port and devices connected through a Wireless connection. This includes VIP connected as clients and other wireless devices such as 802.11 connections.

Values (selection)

On / Off

Start

Select the starting address DHCP assignable IP Addresses. The first octets of the subnet will be pre-set based on the LAN IP configuration, and can not be changed.

Values (IP Address)

192.168.168.100

Limit

Set the maximum number of IP addresses that can be assigned by the VIP4G.

Values (integer)

150

Lease Time

The DHCP lease time is the amount of time before a new request for a network address must be made to the DHCP Server.

Values (minutes)

(minutes)

4.0 Configuration

Alternate Gateway	
Specify an alternate gateway for DHCP assigned devices if the default gateway is not to be used.	**Values (IP Address)** *(IP Address)*

Preferred DNS Server	
Specify a preferred DNS server address to be assigned to DHCP devices.	**Values (IP Address)** *(IP Address)*

Alternate DNS Server	
Specify the alternate DNS server address to be assigned to DHCP devices.	**Values (IP Address)** *(IP Address)*

Domain Name	
Enter the Domain Name for the DHCP devices.	**Values (string)** *(IP Address)*

WINS/NBNS Servers	
Enter the address of the WINS/NBNS (NetBIOS) Server. The WINS server will translate computers names into their IP addresses, similar to how a DNS server translates domain names to IP addresses.	**Values (IP/Domain)** *(no default)*

WINS/NBT Node Type	
Select the method used to resolve computer names to IP addresses. Four name resolution methods are available: B-node: broadcast P-node: point-to-point M-node: mixed/modified H-node: hybrid	**Values (selection)** **none** b-node p-node m-node h-node

4.0 Configuration

Static IP Addresses (for DHCP)

In some applications it is important that specific devices always have a predetermined IP address. This section allows for MAC Address binding to a IP Address, so that whenever the device that has the specified MAC address, will always get the selected IP address. In this situation, all attached (wired or wireless) devices can all be configured for DHCP, but still get a known IP address.

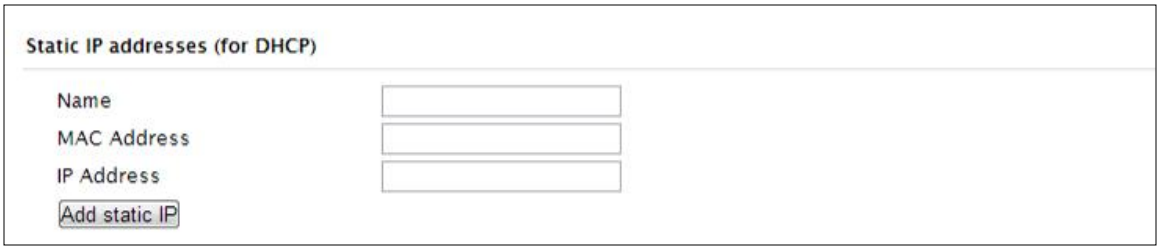


Image 4-2-5: Network > MAC Address Binding

Name	
The name field is used to give the device a easily recognizable name.	**Values (characters)** *(no default)*

MAC Address	
Enter in the MAC address of the device to be bound to a set IP address. Set the IP Address in the next field. Must use the format: AB:CD:DF:12:34:D3. It is not case sensitive, but the colons must be present.	**Values (MAC Address)** *(no default)*

IP Address	
Enter the IP Address to be assign to the device specified by the MAC address above.	**Values (IP Address)** *(minutes)*

Static Addresses

This section displays the IP address and MAC address currently assigned through the DCHP service, that are bound by it's MAC address. Also shown is the Name, and the ability to remove the binding by clicking "Remove _____".

Active DHCP Leases

This section displays the IP Addresses currently assigned through the DCHP service. Also shown is the MAC Address, Name and Expiry time of the lease for reference.

Network Interfaces

When additional Network Interfaces are added, they will show up here in a list. You can remove Network Interfaces by clicking "Remove _____".

4.0 Configuration

4.2.3 Network > WAN

WAN Configuration

The WAN configuration refers to the wired WAN connection on the VIP4G. The WAN port can be used to connect the VIP4G to other networks, the internet and/or other network resources.

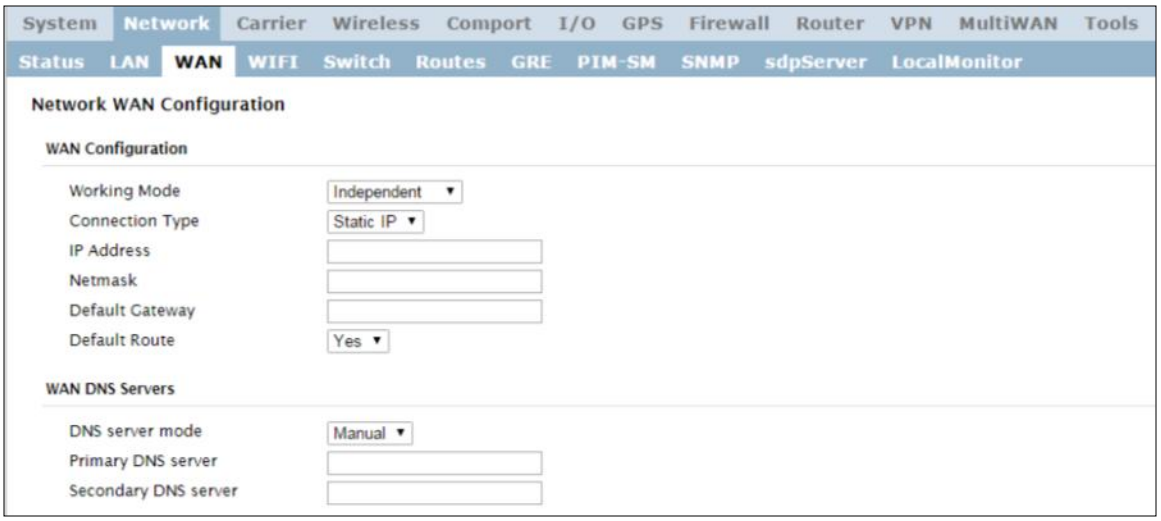


Image 4-2-6: Network > WAN Configuration

DHCP: Dynamic Host Configuration Protocol may be used by networked devices (Clients) to obtain unique network addresses from a DHCP server.

Advantage:
Ensures unique IP addresses are assigned, from a central point (DHCP server) within a network.

Disadvantage:
The address of a particular device is not 'known' and is also subject to change.

STATIC addresses must be tracked (to avoid duplicate use), yet they may be permanently assigned to a device.

Working Mode

Use this to set the function of the physical WAN RJ45 port. If set to independent, the physical WAN port will operate as a standard WAN port, if disabled, the physical port will operate as another LAN port on the LAN.

Values (selection)

Independent
Bridge to LAN

Connection Type

This selection determines if the VIP4G will obtain an WAN IP address from a DHCP server, or if a static IP address will be entered. If a Static IP Address is chosen, the fields that follow must also be populated.

Values (selection)

DHCP
Static

IP Address

If 'Static' Connection Type is selected, a valid IPv4 Address for the network being used must be entered in the field. If 'DHCP' is chosen this field will not appear and it will be populated automatically from the DHCP server.

Values (IP Address)

(no default)

Netmask

If 'Static' Connection Type is selected, the Network Mask must be entered for the Network. If 'DHCP' is chosen this field will not appear and it will be populated automatically from the DHCP server.

Values (IP Address)

(no default)

4.0 Configuration

Default Gateway

If the VIP4G is integrated into a network which has a defined gateway, then, as with other hosts on the network, this gateway's IP address will be entered into this field. If there is a DHCP server on the network, and the Connection Type (see previous page) is selected to be DHCP, the DHCP server will populate this field with the appropriate gateway address.

Values (IP Address)

(no default)

Default Route

The WAN can be added as the default route for all traffic exiting the modem (unless specified otherwise in the Routes menu).

Values (selection)

Yes / No

DNS server mode

Select between Auto and Manual for the WAN DNS Services. If set to auto it will be population by the ISP, if set the manual up to (2) DNS servers can be specified.

Values (selection)

Auto / Manual

Primary/Secondary DNS Servers

DNS (Domain Name Service) Servers are used to resolve domain names into IP addresses. If the DNS server mode is set for Auto the DHCP server will populate this field and the value set can be viewed on the Network > Status page.

Values (IP Address)

(no default)

4.0 Configuration

4.2.4 Network > WIFI

Network WIFI Configuration

The WIFI menu is used to define (if required) a virtual interface in which to bind a WIFI connection. This connection can then be bound to the Wireless Radio in the *Wireless* > *Radio1* menu. If this interface is not bound to the Wireless interface it has no operation or purpose.

The WIFI interface can be used setup a separate WIFI connection for connected devices (separating them from the devices connected to the LAN), this would be the same as adding another interface under the LAN configuration. In this mode the VIP4G would be operating as a Access Point (AP) providing network access to any connected devices. A separate DHCP server must be defined if it is required to provide DHCP services to connecting devices.

In most cases the WIFI interface would be setup to allow the VIP4G to operate as a Client to another Access Point (AP). Using this menu it can be decided to use DHCP to obtain an IP address and related networking information from the connected Access Point, or it could be setup with a static IP address that is part of the AP's network.

When connected as a Client the VIP4G would be able to use the WIFI network for data rather that the cellular connection. ***However unless NetMotion or a static default route was set to manage this connection there would be no way to predict which interface is used for data.***

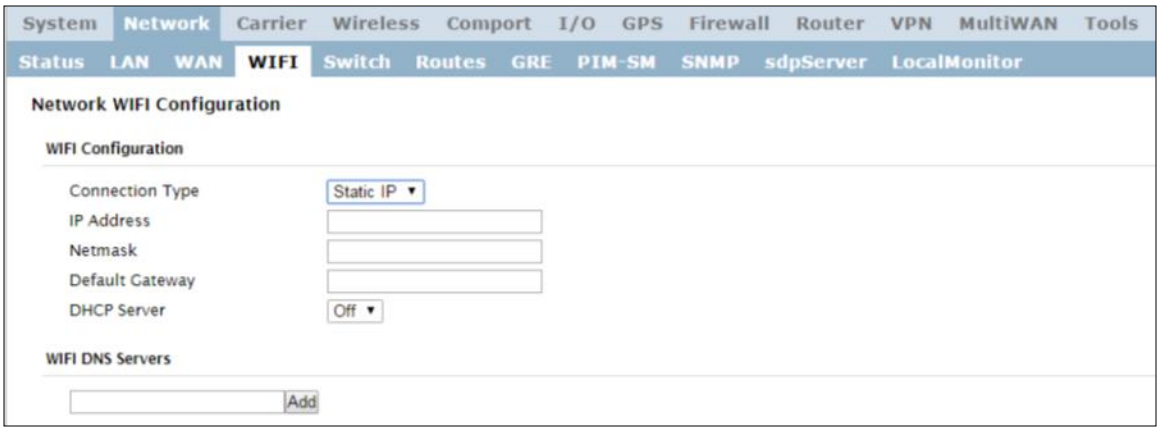


Image 4-2-7: Network > WIFI

WIFI Configuration

The description of each of the parameters for setting up a WIFI interface is identical to those of adding/ editing a virtual LAN interface, which is discussed in the last section.

4.0 Configuration

4.2.5 Network > Switch

The VIP4G has the capability to add multiple network interfaces. It may also be desirable to segment these different subnets. The VIP4G features two different VLAN mode, Port Based, and 802.1Q VLAN.

In port based VLAN port membership is exclusive, a port can only belong to a single VLAN, and is generally used to separate the different subnets. In a port based VLAN every port should be a Untagged Member, not a Tagged Member.

802.1Q VLAN uses tagging to allow separation of network segments. Ports can belong to multiple VLANs. A Trunk port can be configured to communicate with other VLAN switch by adding all configured VLANs to a single port. The native VLAN1 is used by default, it is important that any connected VLAN switch use the same Native VLAN.

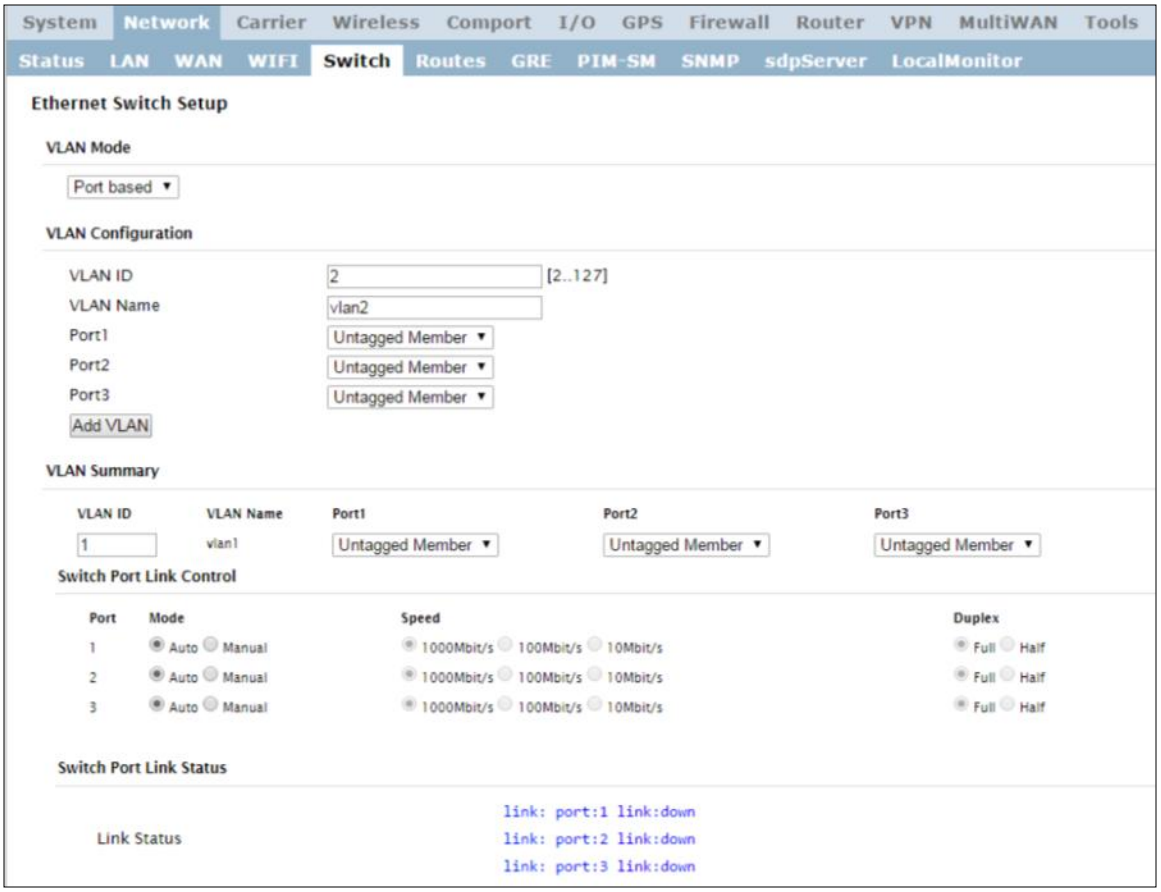


Image 4-2-8: Network > Switch

VLAN Mode

By default the VIP4G is configured to Port Based VLAN with all ports bridged. See above description for differences between Port Based and Tagged VLANs.

Values (selection)

Port Based
802.1Q (Tagged)

4.0 Configuration

Native VLAN

If 802.1Q is selected for the VLAN mode, the Native VLAN can be configured here. It is important for switch-to-switch connections to use a consistent Native VLAN.

Values

1

VLAN Mode

By default the VIP4G is configured to Port Based VLAN with all ports bridged. See above description for differences between Port Based and Tagged VLANs.

Values (selection)

Port Based
802.1Q (Tagged)

Native VLAN

If 802.1Q is selected for the VLAN mode, the Native VLAN can be configured here. It is important for switch-to-switch connections to use a consistent Native VLAN.

Values

1

VLAN ID

When adding a VLAN you must select a VLAN ID. Select between 2 and 127 for valid VLAN IDs.

Values

2 (2-127)

VLAN Name

VLAN names can be added to aid in VLAN identification (purpose, I,e Engineering, Accounting, etc).

Values

vlan2

Port 1 - 3

Assign port to the current VLAN.

Exclude: Not part of the current VLAN

Tagged Member: In 802.1Q this assigns the current VLAN to the port,

Untagged Member: In port based VLAN this assigns a port to the current VLAN. As mentioned previously, in port based VLAN, ports can only belong to a single VLAN.

Values (selection)

Exclude
Tagged Member
Untagged Member

Network

Allows the user the ability to assign specific configured network interfaces to a specific VLAN. (802.1Q)

Values (selection)

None
LAN
(additional network interfaces)

4.0 Configuration

4.2.6 Network > Routes

Static Routes Configuration

It may be desirable to have devices on different subnets to be able to talk to one another. This can be accomplished by specifying a static route, telling the VIP4G where to send data. The modem must be restarted before new routes will take effect.

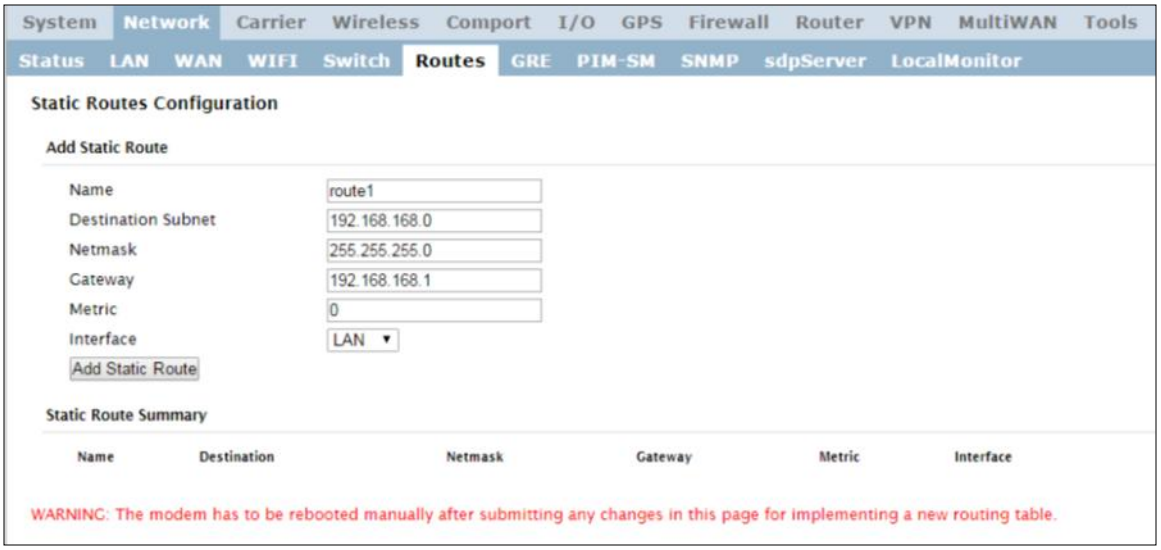


Image 4-2-9: Network > Routes

Name	
Routes can be names for easy reference, or to describe the route being added.	**Values (characters)** *(no default)*

Destination	
Enter the network IP address for the destination.	**Values (IP Address)** *(192.168.168.0)*

Gateway	
Specify the Gateway used to reach the network specified above.	**Values (IP Address)** **192.168.168.1**

Netmask	
Enter the Netmask for the destination network.	**Values (IP Address)** **255.255.255.0**

4.0 Configuration

Metric

In some cases there may be multiple routes to reach a destination. The Metric can be set to give certain routes priority, the lower the metric is, the better the route. The more hops it takes to get to a destination, the higher the metric.

Values (Integer)

0

Interface

Define the exit interface. Is the destination a device on the LAN, or the WAN?

Values (Selection)

LAN
WAN
4G
None

4.0 Configuration

4.2.7 Network > GRE

GRE Configuration

The VIP4G supports GRE (Generic Routing Encapsulation) Tunneling which can encapsulate a wide variety of network layer protocols not supported by traditional VPN. This allows IP packets to travel from one side of a GRE tunnel to the other without being parsed or treated like IP packets.

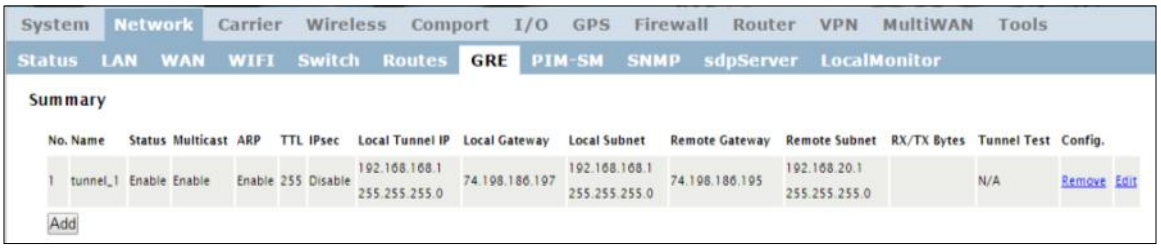


Image 4-2-10: Network > GRE Summary

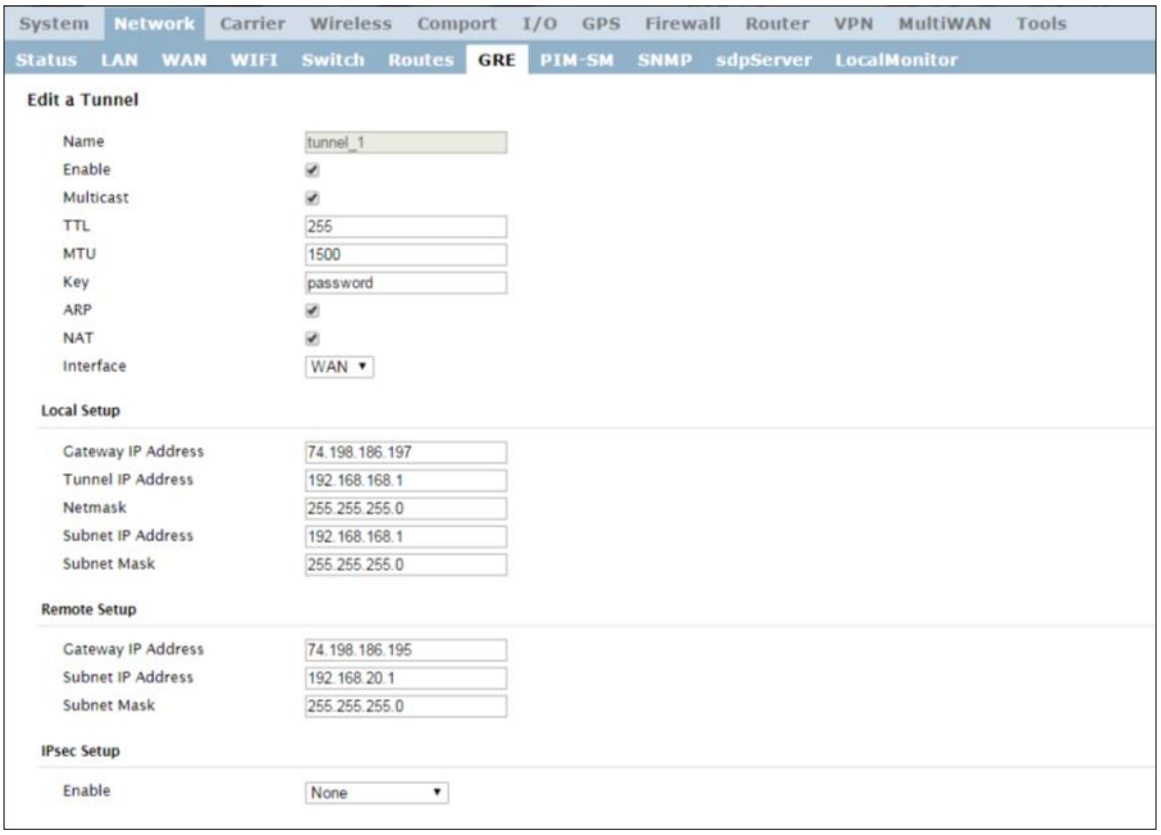


Image 4-2-11: Network > Edit/Add GRE Tunnel

For an example of how to set up a GRE Tunnel, refer to the ***Appendix: GRE Example***.

Name	Values (Chars(32))
Each GRE tunnel must have a unique name. Up to 10 GRE tunnels are supported by the VIP4G.	*gre*

4.0 Configuration

Enable	
Enable / Disable the GRE Tunnel.	**Values (selection)** Disable / **Enable**

Multicast	
Enable / Disable Multicast support over the GRE tunnel.	**Values (selection)** Disable / **Enable**

TTL	
Set the TTL (Time-to-live) value for packets traveling through the GRE tunnel.	**Values (value)** 1 - **255**

Key	
Enter a key is required, key must be the same for each end of the GRE tunnel.	**Values (chars)** *(none)*

For an example of how to set up a GRE Tunnel, refer to the ***Appendix: GRE Example***.

ARP	
Enable / Disable ARP (Address Resolution Protocol) support over the GRE tunnel.	**Values (selection)** Disable / **Enable**

Local Setup

The local setup refers to the local side of the GRE tunnel, as opposed to the remote end.

Gateway IP Address	
This is the WAN IP Address of the VIP4G, this field should be populated with the current WAN IP address.	**Values (IP Address)** *(varies)*

Tunnel IP Address	
This is the IP Address of the local tunnel.	**Values (IP Address)** *(varies)*

Netmask	
Enter the subnet mask of the local tunnel IP address.	**Values (IP Address)** *(varies)*

4.0 Configuration

Subnet IP Address	
Enter the subnet address for the local network.	**Values (IP Address)** *(varies)*

Subnet Mask	
The subnet mask for the local network/subnet.	**Values (IP Address)** *(varies)*

Remote Setup

The remote setup tells the VIP4G about the remote end, the IP address to create the tunnel to, and the subnet that is accessible on the remote side of the tunnel.

For an example of how to set up a GRE Tunnel, refer to the ***Appendix: GRE Example***.

Gateway IP Address	
Enter the WAN IP Address of the VIP4G or other GRE supported device in which a tunnel is to be created with at the remote end.	**Values (IP Address)** *(varies)*

Subnet IP Address	
The is the IP Address of the remote network, on the remote side of the GRE Tunnel.	**Values (IP Address)** *(varies)*

Subnet Mask	
The is the subnet mask for the remote network/subnet.	**Values (IP Address)** *(varies)*

IPsec Setup

Refer to the IPsec setup in the VPN Site to Site section of the manual for more information.

4.0 Configuration

4.2.8 Network > PIM-SM

PIM-SM Configuration

The VIP4G can be set up with Protocol Independent Multicast - Sparse Mode (PIM-SM) which is a multicast routing protocol developed by Cisco Systems. This menu allows the configuration of the VIP4G to perform as a multicast router, which when enabled can transport multicast data streams to/from other multicast routers or to/from source/clients.

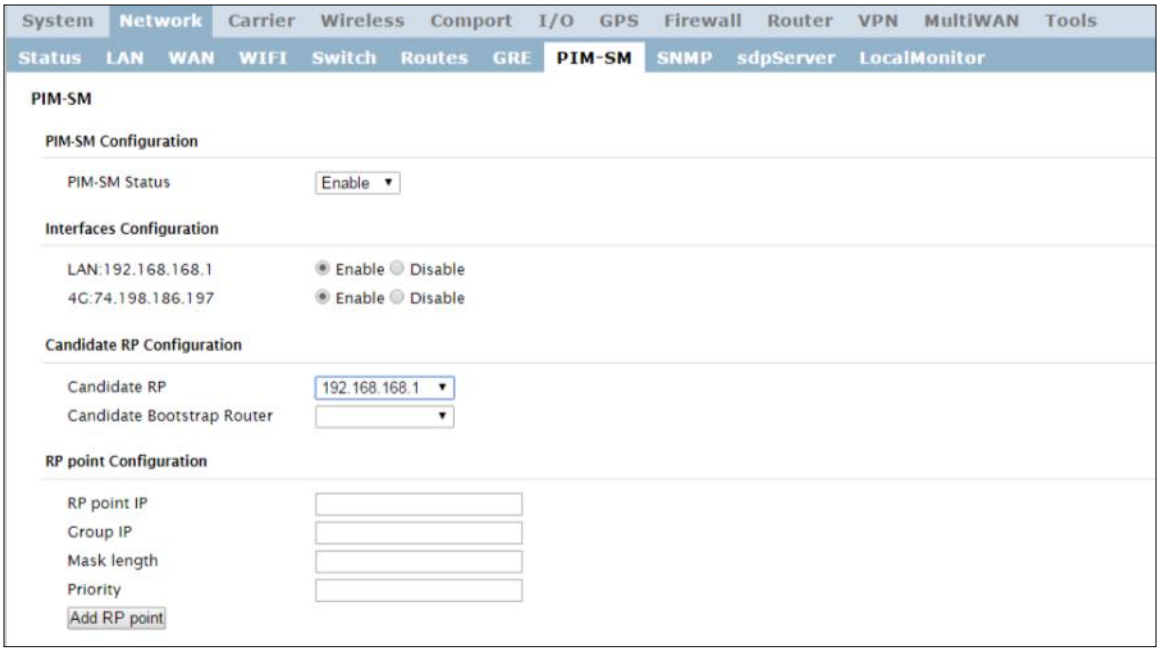


Image 4-2-12: Network > PIM-SM Configuration

PIM-SM Status	
This is the main control to enable or disable the PIM-SM service on the VIP4G. If disabled PIM-SM is not running and will not operate as a Multicast Router.	**Values (selection)** Enable / **Disable**

Interfaces Configuration	
Shows a list of available interfaces that can support multicast. Users can select which interfaces are to use multicast.	**Values (selection)** Enable / **Disable**

Candidate RP Configuration

Candidate RP	
This field is used to set up which port (IP address) is used as Candidate Rendezvous Point (CRP). It specifies which interface on the modem should be included in RP elections.	**Values (selection)** *Varies based on configured interfaces*

4.0 Configuration

time

Set the time (seconds) in which to advertise this CRP (Candidate Rendezvous Point).

Values (seconds)

(none)

Priority

The priority determines how important this CRP is compared to others. The lower the value, the more important the CRP.

Values (integer)

(none)

Candidate Bootstrap Router

This field is used to set up which port (IP address) is used as the Candidate Bootstrap Router.

Values (selection)

Varies based on configured interfaces

Candidate RP Configuration

The RP Point Configuration is for static Rendezvous Point Configurations. The argument can be either a unicast address or a multicast group, with optional group address, mask length, and priority arguments as seen below.

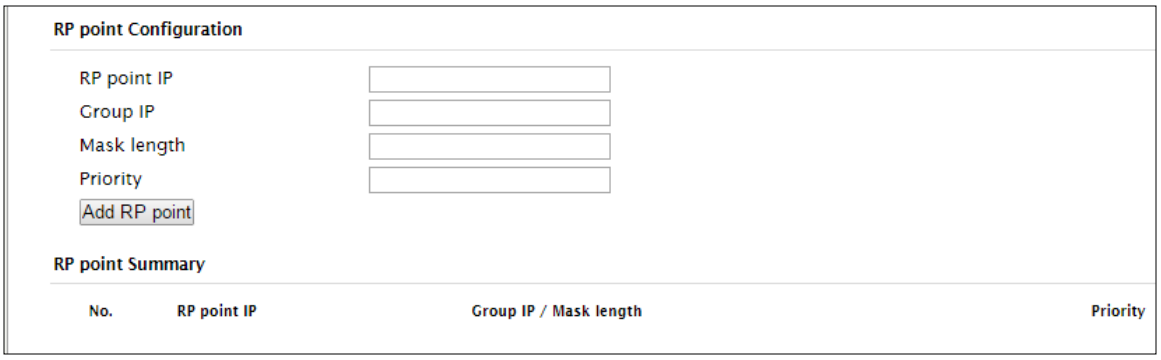


Image 4-2-13: Network > PIM-SM Configuration

RP Point IP

If the static RP is a unicast address, enter that address here.

Values

(none)

Group IP

Enter the optional multicast group IP here for the RP.

Values

(none)

4.0 Configuration

Mask Length	
Enter the optional mask length here.	**Values** *(none)*

Priority	
A priority value can be set in the filed. The lower this value, the higher the priority.	**Values** *(none)*

Group Prefix Address Configuration

The group prefix statement outlines the set of multicast addresses that the CRP, if it wins an election, will advertise to other routers.

Image 4-2-14: Network > PIM-SM Configuration

Group Prefix Address	
A specific multicast group or network range this router will handle.	**Values** *(none)*

Mask Length	
The number of IP address segments taken up by the netmask. Remember that a multicast address is a Class D and has a netmask of 240.0.0.0, which means its length is 4.	**Values** *(none)*

4.0 Configuration

Switch Threshold Configuration

The Switch Data Threshold setting defines the threshold at which transmission rates trigger the changeover from the shared tree to the RP tree; Switch Register Threshold does the opposite in the same format. Regardless of which of these you choose, the rate option is for transmission rate in bits per second, interval is the sample rate in seconds -- with a recommended minimum of five seconds. It is recommended to have the same interval if both settings are used.

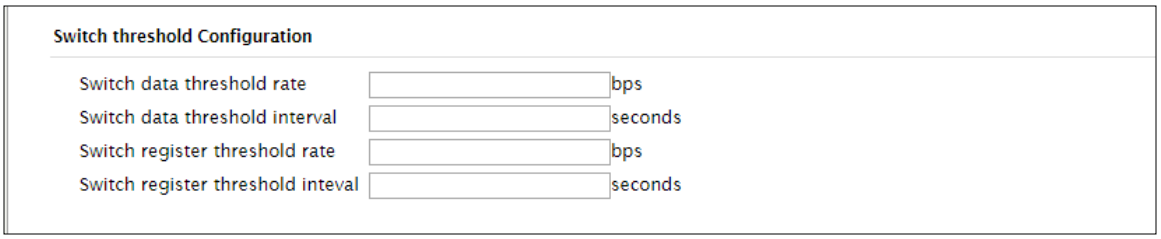


Image 4-2-15: Network > PIM-SM Configuration

Switch Data Threshold Rate

The Switch Data Threshold setting defines the threshold at which transmission rates trigger the changeover from the shared tree to the RP tree.

Values (bps)

(none)

Switch Data Threshold Interval

Sample rate in seconds (recommended minimum of 5 seconds)

Values (seconds)

(none)

Switch Register Threshold Rate

Switch Register Threshold does the opposite of the Switch Data Threshold Rate in the same format.

Values (bps)

(none)

Switch Register Threshold Interval

Sample rate in seconds (recommended minimum of 5 seconds)

Values (seconds)

(none)

4.0 Configuration

4.2.10 Network > SNMP

The VIP4G may be configured to operate as a Simple Network Management Protocol (SNMP) agent. Network management is most important in larger networks, so as to be able to manage resources and measure performance. SNMP may be used in several ways:

- configure remote devices
- monitor network performance
- detect faults
- audit network usage
- detect authentication failures

SNMP: Simple Network Management Protocol provides a method of managing network devices from a single PC running network management software.

Managed networked devices are referred to as SNMP agents.

A SNMP management system (a PC running SNMP management software) is required for this service to operate. This system must have full access to the VIP4G. Communications is in the form of queries (information requested by the management system) or traps (information initiated at, and provided by, the SNMP agent in response to predefined events).

Objects specific to the VIP4G are hosted under private enterprise number **21703**.

An object is a variable in the device and is defined by a Management Information Database (MIB). Both the management system and the device have a copy of the MIB. The MIB in the management system provides for identification and processing of the information sent by a device (either responses to queries or device-sourced traps). The MIB in the device relates subroutine addresses to objects in order to read data from, or write data to, variables in the device.

An SNMPv1 agent accepts commands to retrieve an object, retrieve the next object, set and object to a specified value, send a value in response to a received command, and send a value in response to an event (trap).

SNMPv2c adds to the above the ability to retrieve a large number of objects in response to a single request.

SNMPv3 adds strong security features including encryption; a shared password key is utilized. Secure device monitoring over the Internet is possible. In addition to the commands noted as supported above, there is a command to synchronize with a remote management station.

The pages that follow describe the different fields required to set up SNMP on the VIP4G. MIBS may be requested from Microhard Systems Inc.

The MIB file can be downloaded directly from the unit using the ***'Get MIB File'*** button on the Network > SNMP menu.

Image 4-2-16: Network > MIB Download

4.0 Configuration

SNMP Settings

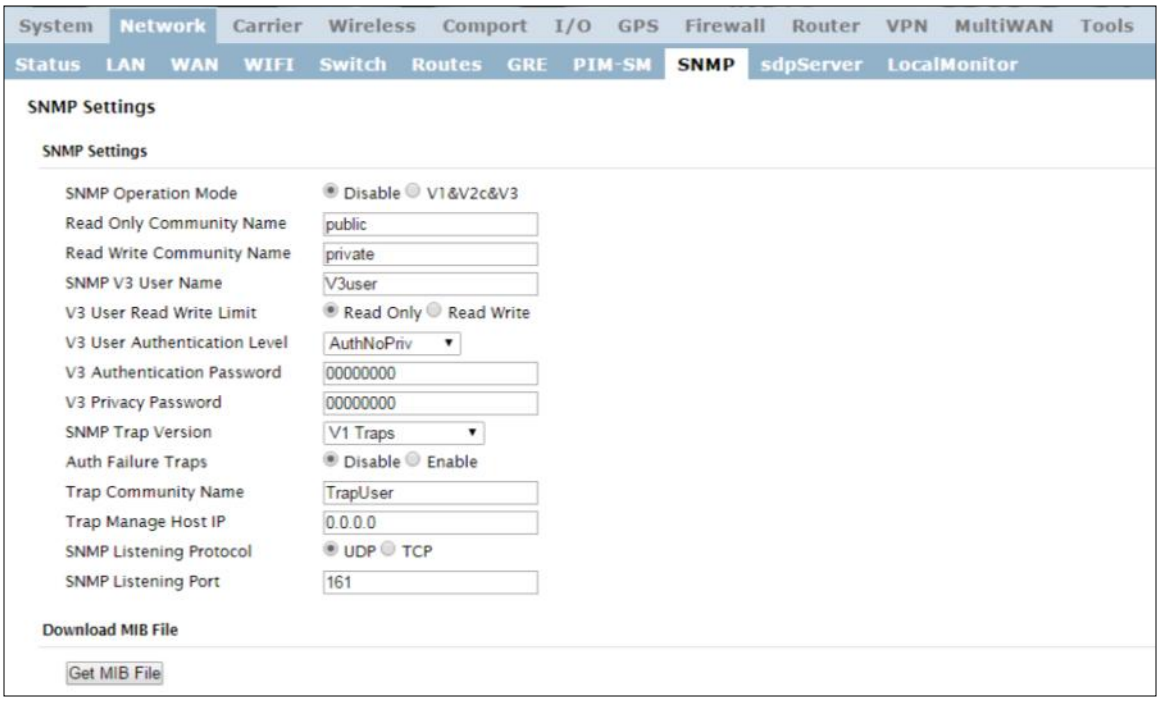


Image 4-2-17: Network > SNMP

SNMP Operation Mode

If disabled, an SNMP service is not provided from the device. Enabled, the device - now an SNMP agent - can support SNMPv1, v2, & v3.

Values (selection)

Disable / V1&V2c&V3

Read Only Community Name

Effectively a plain-text password mechanism used to weakly authenticate SNMP queries. Being part of the community allows the SNMP agent to process SNMPv1 and SNMPv2c requests. This community name has only READ priority.

Values (string)

public

Read Only Community Name

Also a plain-text password mechanism used to weakly authenticate SNMP queries. Being part of the community allows the SNMP agent to process SNMPv1 and SNMPv2c requests. This community name has only READ/WRITE priority.

Values (string)

private

SNMP V3 User Name

Defines the user name for SNMPv3.

Values (string)

V3user

4.0 Configuration

V3 User Read Write Limit

Defines accessibility of SNMPv3; If Read Only is selected, the SNMPv3 user may only read information; if Read Write is selected, the SNMPv3 user may read and write (set) variables.

Values (selection)

Read Only / Read Write

V3 User Authentication Level

Defines SNMPv3 user's authentication level:

NoAuthNoPriv:	No authentication, no encryption.
AuthNoPriv:	Authentication, no encryption.
AuthPriv:	Authentication, encryption. **(Not supported)**

Values (selection)

NoAuthNoPriv
AuthNoPriv
AuthPriv

V3 User Authentication Password

SNMPv3 user's authentication password. Only valid when V3 User Authentication Level set to AuthNoPriv or AuthPriv.

Values (string)

00000000

V3 User Privacy Password

SNMPv3 user's encryption password. Only valid when V3 User Authentication Level set to AuthPriv (see above).

Values (string)

00000000

SNMP Trap Version

Select which version of trap will be sent should a failure or alarm condition occur.

Values (string)

V1 Traps V2 Traps
V3 Traps V1&V2 Traps
V1&V2&V3 Traps

Auth Failure Traps

If enabled, an authentication failure trap will be generated upon authentication failure.

Values (selection)

Disable / Enable

Trap Community Name

The community name which may receive traps.

Values (string)

TrapUser

Trap Manage Host IP

Defines a host IP address where traps will be sent to (e.g. SNMP management system PC IP address).

Values (IP Address)

0.0.0.0

4.0 Configuration

4.2.10 Network > sdpServer

sdpServer Settings

Microhard Radio employ a discovery service that can be used to detect other Microhard Radio's on a network. This can be done using a stand alone utility from Microhard System's called 'IP Discovery' or from the Tools > Discovery menu. The discovery service will report the MAC Address, IP Address, Description, Product Name, Firmware Version, Operating Mode, and the SSID.

Image 4-2-18: Network > sdpServer Settings

Discovery Service Status	
Use this option to disable or enable the discovery service.	**Values (selection)** Disable / **Discoverable** / Changable

Server Port Settings	
Specify the port running the discovery service on the VIP4G unit.	**Values (Port #)** 20097

4.0 Configuration

4.2.11 Network > Local Monitor

The Local Device Monitor allows the VIP4G to monitor a local device connected locally to the Ethernet port or to the locally attached network. If the VIP4G cannot detect the specified IP or a DHCP assigned IP, the unit will restart the DHCP service, and eventually restart the modem to attempt to recover the connection.

Image 4-2-19: Network Configuration , Local Monitor

Status	
Enable or disable the local device monitoring service.	**Values (selection)** **Disable /** Enable

IP Mode	
Select the IP mode. By selecting a fixed IP address the service will monitor the connection to that specific IP. If auto detect is selected, the VIP4G will detect and monitor DHCP assigned IP address.	**Values (selection)** **Fixed local IP** Auto Detected IP

Local IP Setting	
This field is only shown if Fixed Local IP is selected for the IP Mode. Enter the static IP to be monitored in this field.	**Values (IP)** **0.0.0.0**

Status Timeout	
The status timeout is the maximum time the VIP4G will wait to detect the monitored device. At this time the VIP4G will restart the DHCP service. (5-65535 seconds)	**Values (seconds)** **10**

Waiting DHCP Timeout	
This field defines the amount of time the VIP4G will wait to detect the monitored device before it will reboot the modem. (30-65535 seconds)	**Values (seconds)** **60**

4.0 Configuration

4.3 Carrier

4.3.1 Carrier > Status

The Carrier Status window provides complete overview information related to the Cellular Carrier portion of the VIP4G. A variety of information can be found here, such as Activity Status, Network (Name of Wireless Carrier connected) , Data Service Type WCDMA/HSPA/HSPA+/LTE etc), Frequency band, Phone Number etc.

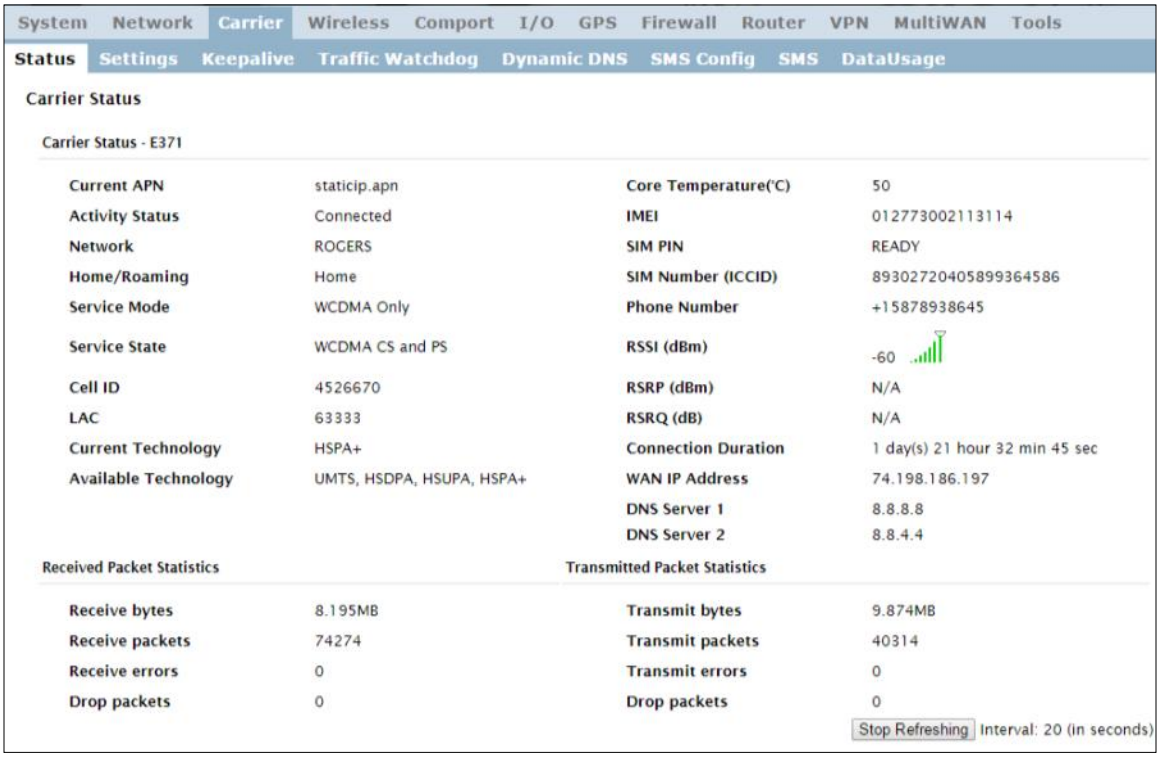


Image 4-3-1: Carrier > Status

Not all statistics parameters displayed are applicable.

The Received and Transmitted bytes and packets indicate the respective amount of data which has been moved through the radio.

The Error counts reflect those having occurred on the wireless link.

4.0 Configuration

4.3.2 Carrier > Settings

The parameters within the Carrier Configuration menu must be input properly; they are the most basic requirement required by your cellular provider for network connectivity.

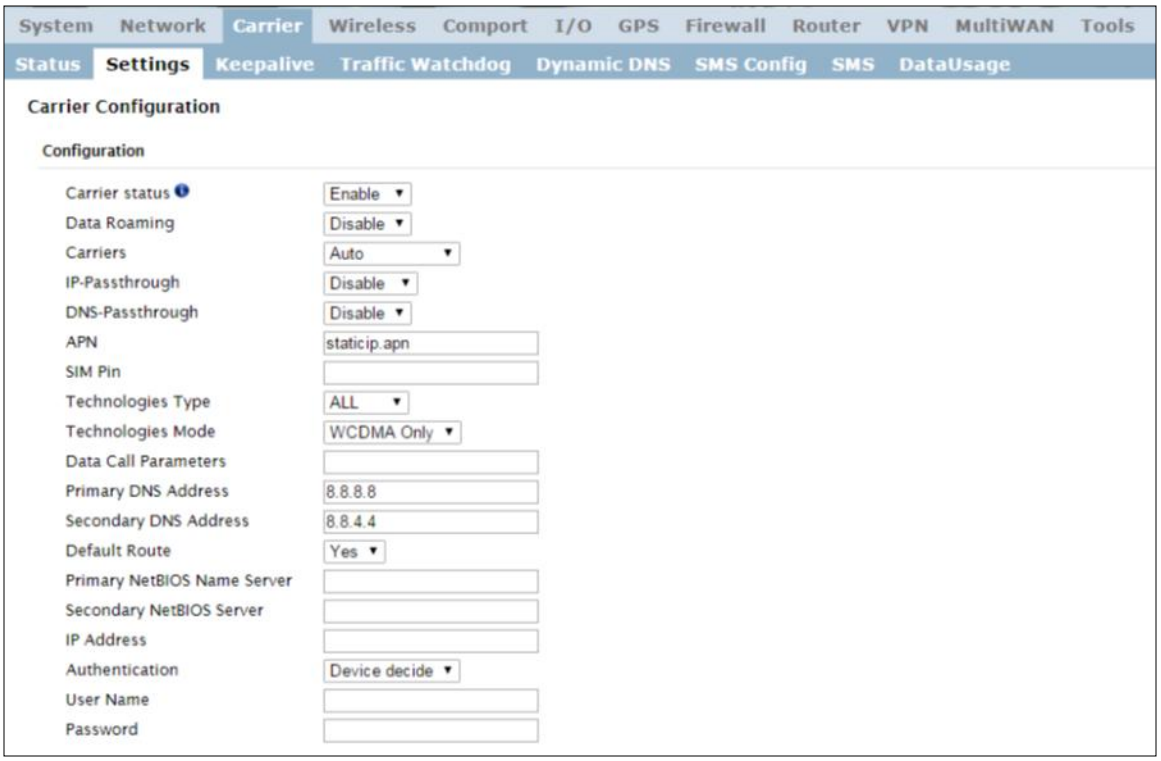


Image 4-3-2: Carrier > Settings

For best practices and to control data usage it is critical that the firewall be configured properly.

It is recommended to block all incoming 4G/Cellular traffic and create rules to open specific ports and/or use ACL lists to limit incoming connections.

Carrier Status

Carrier Status is used to Enable or Disable the connection to the Cellular Carrier. By default this option is enabled. If disabled the cellular module is disabled and the modem will not even attempt to connect to the cellular carrier.

Values (Selection)

Enable
Disable

Data Roaming

Enable or disable Data Roaming. If enabled the modem will be allowed to roam on another carriers' network if their home carrier is not available. In most cases the data roaming usage data charges are much higher than home service areas. Roaming is Disabled by default.

Values (Selection)

Enable
Disable

Enabling Data Roaming may result in increased data charges from the Carrier. In some cases this could be an excessive, and unexpected amount. It is important to understand the data plan with the Cellular Carrier.

4.0 Configuration

Carriers

In some cases, a user may want to lock onto certain carrier to avoid data roaming. There were four options presented to a user to choose from, Auto, SIM based, Scan & Select and Fixed.

- Auto will allow the VIP4G to pick the carrier automatically. Data roaming is permitted.
- SIM based will only allow the VIP4G to connect to the network indicated by the SIM card used in the unit.
- Manual will scan for available carriers and allow a user to select from the available carriers. It takes 2 to 3 minutes to complete a scan.
- Fixed allows a user to enter the carrier code (numerical) directly and then the VIP4G will only connect to that carrier.

Values (Selection)

Auto
Based on SIM
Manual
Fixed

IP-Passthrough

IP pass-through allows the 4G WAN IP address to be assigned to the device connected to the physical LAN or WAN Port (DHCP or Static). In this mode the VIP4G is for the most part transparent and forwards all traffic to the device connected to the specified port except that listed below:

- The WebUI port (*Default Port:TCP 80*), this port is retained for remote management of the VIP4G. This port can be changed to a different port under the **System > Settings** Menu.
- The SNMP Listening Port (*Default Port: UDP 161*).

Local WebUI of the VIP4G is retained by using the first 3 octets of the Wan IP and changing the last octet to 1.

Values (Selection)

Disable
Ethernet
WAN Port

IP-Passthrough Mode

This field is only visible once IP Passthrough has been selected above. This gives the user the option to manually configure the IP-Passthrough feature of the modem. (It is recommended to only use this option if you are an advanced user and the automatic settings do not work for your application or carrier)

Values (selection)

Auto / Manual

IP-Passthrough Gateway

This field is used to specify the Gateway to be used for IP Passthrough if set to manual mode. As mentioned above it is recommended to use the Auto mode for IP-Passthrough.

Values

(no default)

IP-Passthrough Netmask

This field is used to specify the Netmask to be used for IP Passthrough if set to manual mode. As mentioned above it is recommended to use the Auto mode for IP-Passthrough.

Values

(no default)

IP-Passthrough Local IP

This is a read only field that displays the current IP address assigned by the cellular carrier that will be assigned (DHCP) or needs to be configured (Static) on the attached device.

Values (selection)

(current carrier IP to be assigned to attached device).

4.0 Configuration

DNS-Passthrough

When enabled DNS-Passthrough will pass on the WAN assigned DNS information to the end device.

Values (Selection)

Enable / **Disable**

APN (Access Point Name)

The APN is required by every Carrier in order to connect to their networks. The APN defines the type of network the VIP4G is connected to and the service type. Most Carriers have more than one APN, usually many, dependant on the types of service offered.

Values (characters)

auto

Auto APN (default) may allow the unit to quickly connect to a carrier, by cycling through a predetermined list of common APN's. Auto APN will not work for private APN's or for all carriers.

SIM Pin

The SIM Pin is required for some international carriers. If supplied and required by the cellular carrier, enter the SIM Pin here.

Values (characters)

(none)

Technologies Type

Set to ALL by default, the Technologies field allows the selection of 3GPP technologies (LTE), and or 3GPP2 technology (CDMA).

Values (Selection)

ALL / 3GPP / 3GPP2

Technologies Mode

The Technologies Mode option allows a user the ability to specify what type of Cellular networks to connect to.

Values (Selection)

AUTO / LTE Only / WCDMA Only / GSM Only

Data Call Parameters

Sets the modems connect string if required by the carrier. Not usually required in North America.

Values (string)

(none)

Primary DNS Address

If let blank the VIP4G with use the DNS server as specified automatically by the service provider.

Values (IP Address)

(none)

Secondary DNS Address

If let blank the VIP4G with use the DNS server as specified automatically by the service provider.

Values (IP Address)

(none)

4.0 Configuration

Primary NetBIOS Name Server

Enter the Primary NetBIOS Name Server if required by the carrier.

Values (IP Address)

(none)

Secondary NetBIOS Name Server

Enter the Secondary NetBIOS Name Server if required by the carrier.

Values (IP Address)

(none)

IP Address

In some cases the Static IP address must be entered in this field if assigned by a wireless carrier. In most cases the IP will be read from the SIM card and this field should be left at the default value.

Values (IP Address)

(none)

Authentication

Sets the authentication type required to negotiate with peer.

PAP - Password Authentication Protocol.
CHAP - Challenge Handshake Authentication Protocol.

Values (Selection)

Device decide (AUTO)
PAP
CHAP

User Name

A User Name may be required for authentication to a remote peer. Although usually not required for dynamically assigned IP addresses from the wireless carrier, but required in most cases for static IP addresses. Varies by carrier.

Values (characters)

Carrier/peer dependant

Password

Enter the password for the user name above. May not be required by some carriers, or APN's

Values (characters)

Carrier/peer dependant

4.0 Configuration

4.3.3 Carrier > Keepalive

The Keep alive tab allows for the configuration of the keep alive features of the VIP4G. The VIP4G can either do a ICMP or HTTP keep alive by attempting to reach a specified address at a regular interval. If the VIP4G cannot reach the intended destination, it will reset the unit in an attempt to obtain a new connection to the carrier. The Keepalive ensures that there is internet/network connectivity to the address specified at all times. ***If the VIP4G does not have a SIM card installed, is not connected to the Carrier, or is on a private APN, the default keepalive may not work and the unit will reboot at the interval configured.***

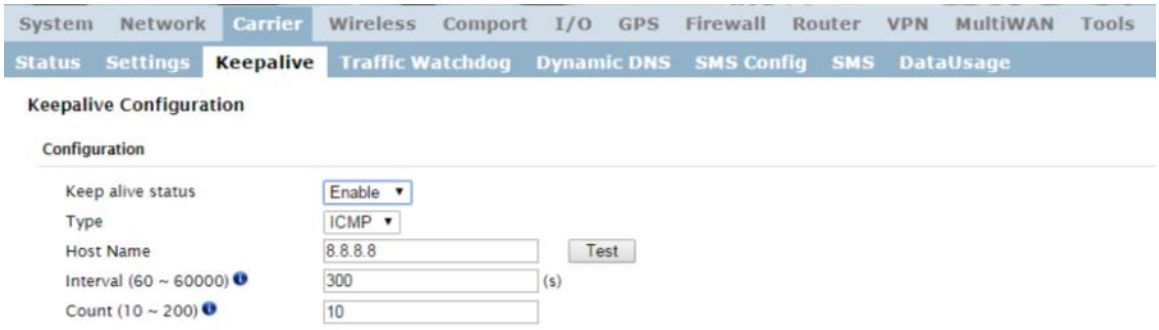


Image 4-3-3: Carrier > Keepalive

Keep Alive Status	
Enable or Disable the keep alive functions in the VIP4G.	**Values (Selection)** **Enable** / Disable

Type	
Select the type of keep alive used. ICMP uses a “ping” to reach a select destination.	**Values (Selection)** **ICMP** / HTTP

Host Name	
Specify a IP Address or Domain that is used to test the VIP4G connection. The ‘Test’ button can be used to verify that the specified host/IP is reachable and a candidate for the keepalive feature.	**Values (IP or Domain)** **8.8.8.8**

Interval	
The Interval value determines the frequency, or how often, the VIP4G will send out PING messages to the Host.	**Values (seconds)** **300**

Count	
The ***Count*** field is the maximum number of PING errors such as “Host unreachable” the VIP4G will attempt before the unit will reboot itself to attempt to correct connection issues. If set to zero (0), the unit will never reboot itself.	**Values (number)** **10**

4.0 Configuration

4.3.4 Carrier > Traffic Watchdog

The Wireless Traffic Watchdog will detect if there has been no wireless traffic, or communication with the Cellular carrier for a configurable amount of time. Once that time has elapsed, the unit will reset, and attempt to re-establish communication with the cellular carrier.

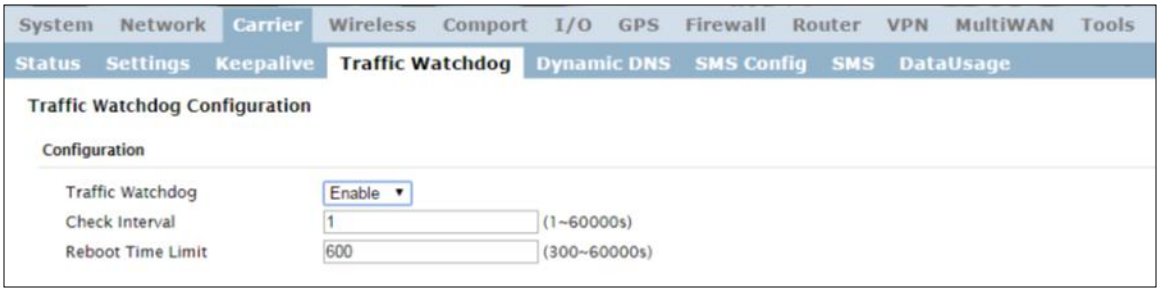


Image 4-3-4: Carrier > Traffic Watchdog

Traffic Watchdog	
Enable or Disable the Traffic Watchdog.	**Values (Selection)** **Enable** / Disable

Check Interval	
The Check Interval tells the VIP4G how often (in seconds) to check for wireless traffic to the cellular carrier. (1-60000 seconds)	**Values (seconds)** **1**

Reboot Time Limit	
The Reboot Timer will reset the unit if there has been no Cellular RF activity in the configured time. (300 –60000 seconds)	**Values (seconds)** **600**

4.0 Configuration

4.3.5 Carrier > Dynamic DNS

Unless a carrier issues a Static IP address, it may be desirable to use a dynamic DNS service to track dynamic IP changes and automatically update DNS services. This allows the use of a constant resolvable host name for the VIP4G.

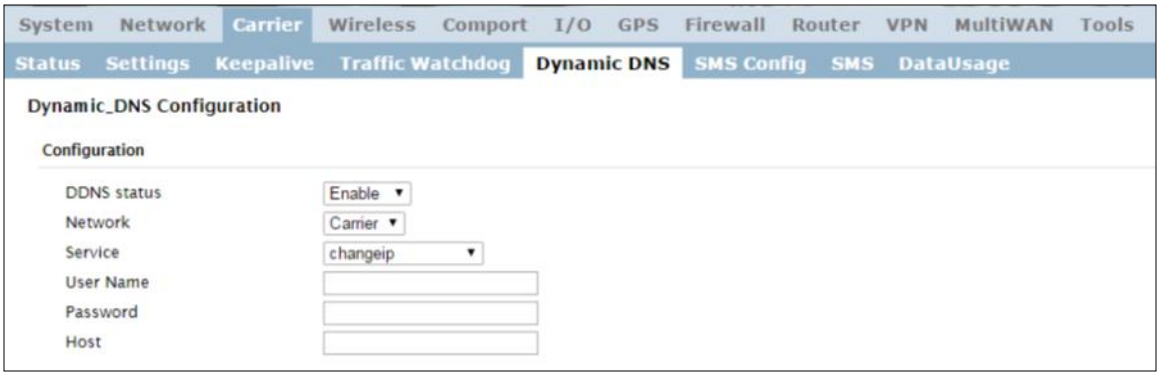


Image 4-3-5: Carrier > Traffic Watchdog

DDNS Status	
This selection allows the use of a Dynamic Domain Name Server (DDNS), for the VIP4G.	**Values (Selection)** **Enable** / Disable

Service	
This is a list of supported Dynamic DNS service providers. Free and premium services are offered, contact the specific providers for more information.	**Values (selection)** **changeip** ods dyndns ovh eurodyndns regfish hn tzo noip zoneedit

User Name	
Enter a valid user name for the DDNS service selected above.	**Values (characters)** *(none)*

Password	
Enter a valid password for the user name of the DDNS service selected above.	**Values (characters)** *(none)*

Host	
This is the host or domain name for the VIP4G as assigned by the DDNS provider.	**Values (domain name)** *(none)*

4.0 Configuration

4.3.6 Carrier > SMS Config

SMS messages can be used to remotely reboot or trigger events in the VIP4G. SMS alerts can be set up to get SMS messages based on system events such as Roaming status, RSSI, Ethernet Link Status or IO Status.

System SMS Command

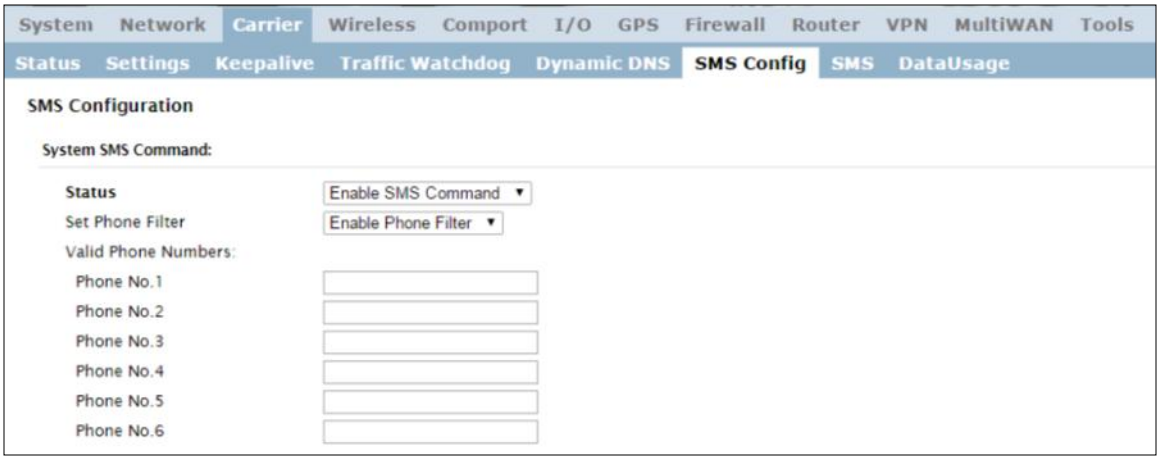


Image 4-3-6: SMS > SMS Configuration

Status

This option allows a user to enable or disable to use of the following SMS commands to reboot or trigger events in the VIP4G:

Values (Selection)

Enable / Disable

MSC#REBOOT Reboot system
MSC#NMS Send NMS UDP Report
MSC#WEB Send web client inquiry
MSC#MIOP1 open I/O ouput1
MSC#MIOP2 open I/O ouput2
MSC#MIOP3 open I/O ouput3
MSC#MIOP4 open I/O ouput4
MSC#MIOC1 close I/O ouput1
MSC#MIOC2 close I/O ouput2
MSC#MIOC3 close I/O ouput3
MSC#MIOC4 close I/O ouput4

MSC#EURD0 trigger event report0
MSC#EURD1 trigger event report1
MSC#EURD2 trigger event report2
MSC#EURD3 trigger event report3
MSC#GPSR0 trigger gps report0
MSC#GPSR1 trigger gps report1
MSC#GPSR2 trigger gps report2
MSC#GPSR3 trigger gps report3

SMS Commands are case sensitive.

Set Phone Filter

If enabled, the VIP4G will only accept and execute commands originating from the phone numbers in the Phone Filter List. Up to 6 numbers can be added.

Values (Selection)

Enable / **Disable**

4.0 Configuration

System SMS Alerts

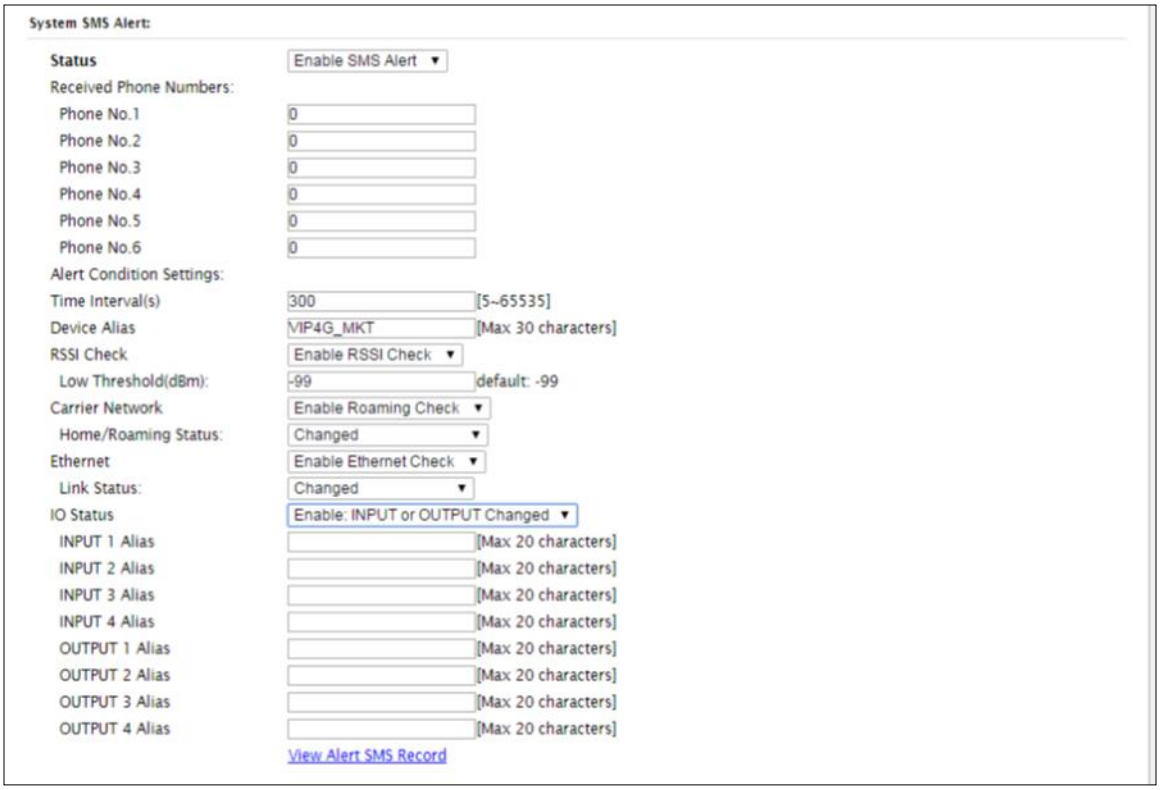


Image 4-3-7: SMS > SMS Alerts

Status

Enable SMS Alerts. IF enabled SMS alerts will be send when conditions are met as configured to the phone numbers listed.

Values (Selection)

Enable / **Disable**

Received Phone Numbers

SMS Alerts can be sent to up to 6 different phone numbers that are listed here.

Values (Selection)

(no default)

Time Interval(s)

SMS alerts, when active, will be sent out at the frequency defined here.

Values (Seconds)

300

Device Alias

The Device Alias allows you to add a useful, recognizable name or other text characters with each SMS notifcation

Values (chars)

(varies)

4.0 Configuration

RSSI Check	
Enable or disable the RSSI alerts. If enable, enter the low RSSI threshold.	**Values (Selection)** Disable RSSI check Enable RSSI check

RSSI Check	
Set the threshold for RSSI alerts.	**Values (dBm)** -99

Carrier Network	
Enable or disable SMS Alerts for Roaming Status.	**Values (Selection)** Disable Roaming Check Enable Roaming Check

Home / Roaming Status	
The VIP4G can send alerts based on the roaming status. Data rates during roaming can be expensive and it is important to know when a device has started roaming.	**Values (Selection)** In Roaming Changed or In Roaming Changed to Roaming

Ethernet	
Enable or disable SMS Alerts for the Ethernet Link status of the LAN RJ45 port.	**Values (Selection)** Disable Ethernet check Enable Ethernet check

Ethernet Link Status	
The status of the Ethernet Link of the LAN (RJ45) can be used to send SMS Alerts. The link status may indicate an issue with the connected device.	**Values (Selection)** Changed In no-link Changed or in no-link Changed to no-link

I/O Status	
SMS Alerts can be sent based on the state changes of the Digital I/O lines. Input/Out Alias: Allows 20 characters to be added to the SMS message to help identify the input or output that has triggered the alert.	**Values (Selection)** Disable IO Check Enable: INPUT Changed Enable: Output Changed Enable: INPUT or OUTPUT Changed.

4.0 Configuration

4.3.7 Carrier > SMS

SMS Command History

The SMS menu allows a user to view the SMS Command History and view the SMS messages on the SIM Card.

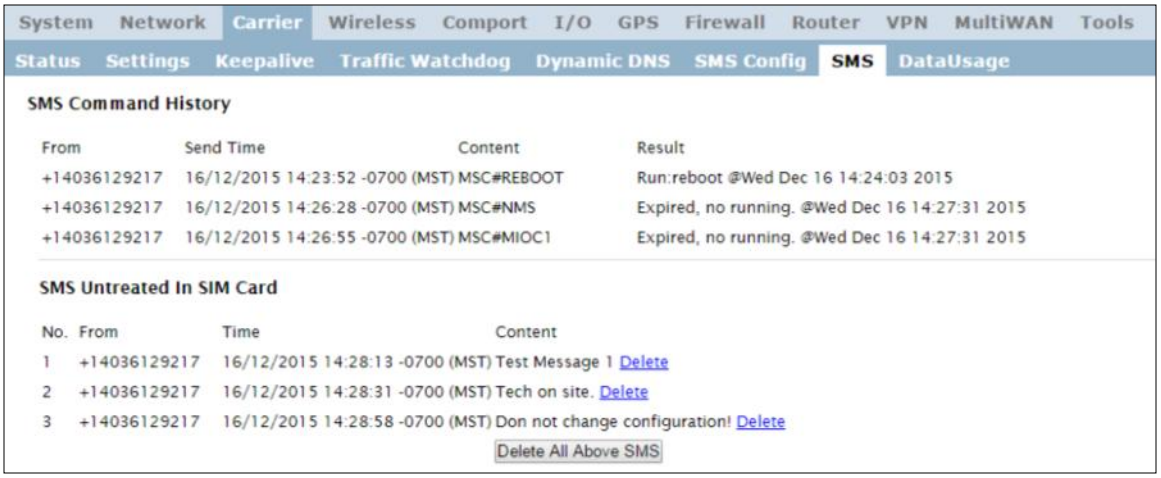


Image 4-3-8: SMS > SMS Command History

4.0 Configuration

4.3.8 Carrier > Data Usage

The Data Usage tool on the VIP4G allows users to monitor the amount of cellular data consumed. Since cellular devices are generally billed based on the amount of data used, alerts can be triggered by setting daily and/or monthly limits. Notifications can be sent using SMS or Email, allowing a early warning if configurable limits are about to be exceeded. The usage data reported by the Data Usage Monitor may not precisely match the data reported by the carrier, but it gives the users an idea of the bandwidth consumed by the VIP4G.

Set up appropriate firewall rules to block unwanted data which may result in excessive data charges.

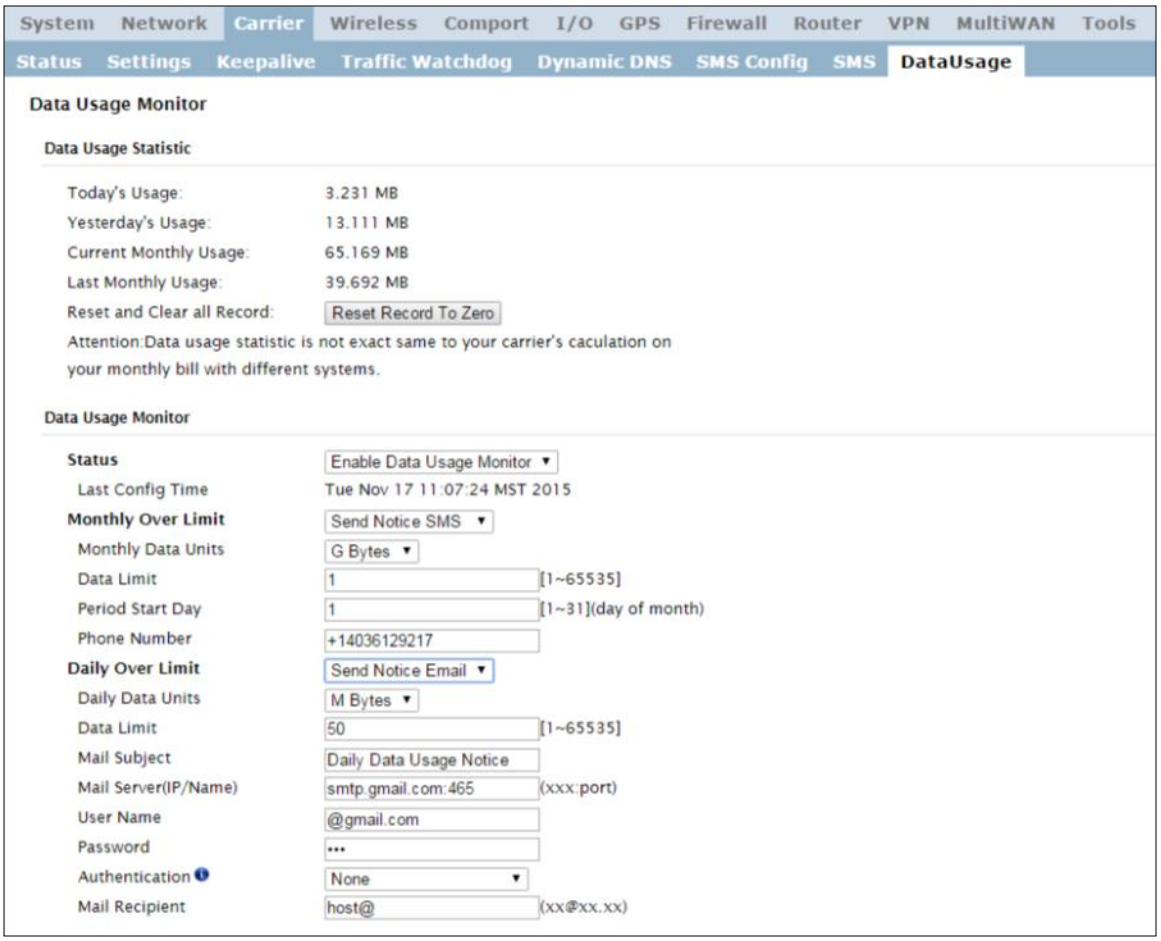


Image 4-3-10: Carrier > Data Usage

Status	Values (selection)
If enabled the VIP4G will track the amount of cellular data consumed. If disabled, data is not recorded, even in the Current Data Usage display.	**Disable** Enable

4.0 Configuration

Monthly/Daily Over Limit

Select the notification method used to send alerts when daily or monthly thresholds are exceeded. If none is selected, notifications will not be sent, but data usage will be recorded for reference purposes.

Values (selection)

None
Send Notice SMS
Send Notice Email

Monthly Over Limit	Send Notice SMS	
Monthly Data Units	M Bytes	
Data Limit	500	[1~65535]
Period Start Day	1	[1~31](day of month)
Phone Number	+1	

Image 4-3-11: Data Usage > SMS Config

Monthly/Daily Data Unit

Select the data unit to be used for data usage monitoring.

Values (selection)

Bytes / K Bytes / **M Bytes**
G Bytes

Data Limit

Select the data limit for the day or month, used in connection with the data unit is the previous field. If you want to set the limit to 250 Mbytes, select M Bytes for the data unit, and 250 for the data limit.

Values (1-65535)

500

Period Start Day

For Monthly tracking, select the day the billing/data cycles begins. On this day each month the VIP4G will reset the data usage monitor numbers.

Values (1-31)

1 (Day of Month)

Phone Number

If SMS is selected as the notification method, enter the phone number to send any SMS messages generated when the data usage exceeds the configured limits.

Values (phone)

+1403

Daily Over Limit	Send Notice Email	
Daily Data Units	M Bytes	
Data Limit	50	[1~65535]
Mail Subject	Daily Data Usage Notice	
Mail Server(IP/Name)	smtp.gmail.com:465	(xxx:port)
User Name	mhscell@gmail.com	
Password	•••	
Authentication	SSL/TLS	
Mail Recipient	alerts@microhardcorp.com	(xx@xx.xx)

Image 4-3-12: Data Usage > Email Config

4.0 Configuration

Mail Subject	
If Email is selected as the notification method, enter the desired email subject line for the notification email sent when daily and/or monthly usage limits are exceeded.	**Values (string)** Daily/Monthly Data Usage Notice

Mail Server(IP/Name)	
If Email is selected as the notification method, enter the SMTP server details for the account used to send the Email notifications. Domain or IP address with the associated port as shown.	**Values (xxx:port)** smtp.gmail.com:465

Username	
If Email is selected as the notification method, enter the username of the Email account used to send Emails.	**Values (username)** @gmail.com

Password	
If Email is selected as the notification method, enter the password of the Email account used to send Emails. Most email servers require authentication on outgoing emails.	**Values (string)** ***

Authentication	
Authentication type allows users to specific which, if any, Authentication type is used to send email via a SMTP server. Ensure that the Mail Server/ Port settings above reflect the correct settings. Contact your provider for this information if it is not known.	**Values (selection)** **None** SSL/TLS STARTTLS SSL/TLS + STARTTTLS

Mail Recipient	
Enter the email address of the individual or distribution list to send the email notification to.	**Values (xx@xx.xx)** **host@**

4.0 Configuration

4.4 Wireless (WiFi)

4.4.1 Wireless > Status

The Status window gives a summary of all radio or wireless related settings and connections.

The **General Status** section shows the Wireless MAC address of the current radio, the Operating Mode (Access Point, Client, Repeater etc), the SSID being used, frequency channel information and the type of security used.

Traffic Status shows statistics about the transmitted and received data.

The VIP4G shows information about all Wireless connections in the **Connection Status** section. The Wireless MAC address, Noise Floor, Signal to Noise ratio (SNR), Signal Strength (RSSI), The transmit and receive Client Connection Quality (CCQ), TX and RX data rates, and a graphical representation of the signal level or quality.

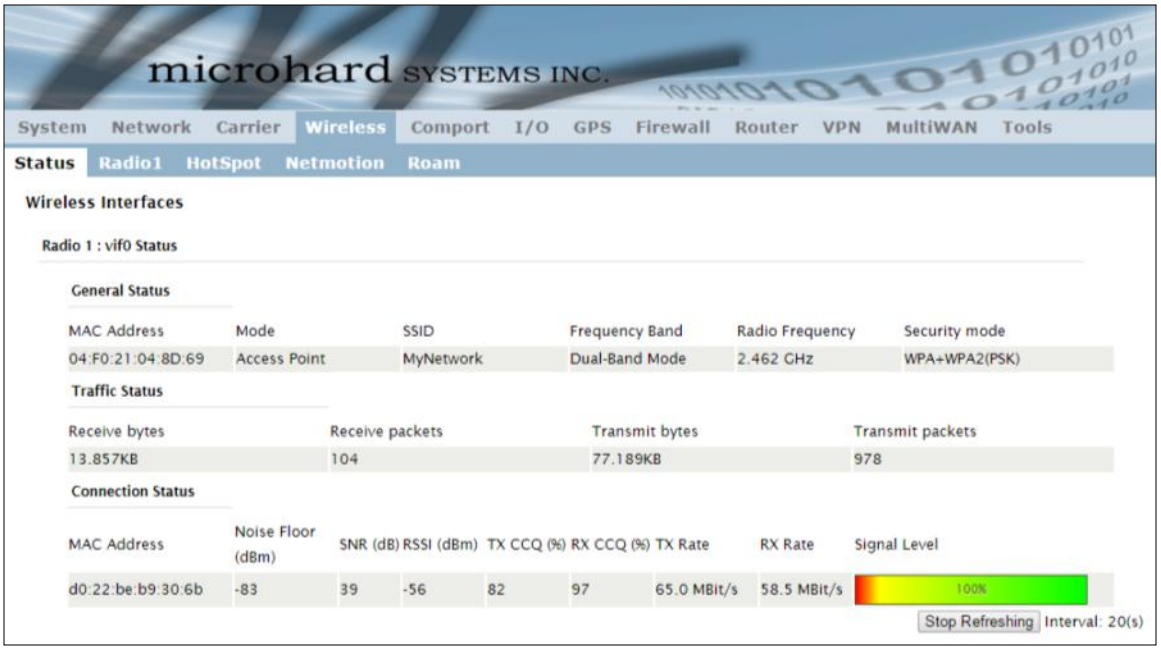


Image 4-4-1: Wireless > Status

4.0 Configuration

4.4.2 Wireless > Radio1

Radio1 Phy Configuration

The top section of the Wireless Configuration allows for the configuration of the physical radio module. You can turn the radio on or off, and select the channel bandwidth and frequency as seen below.

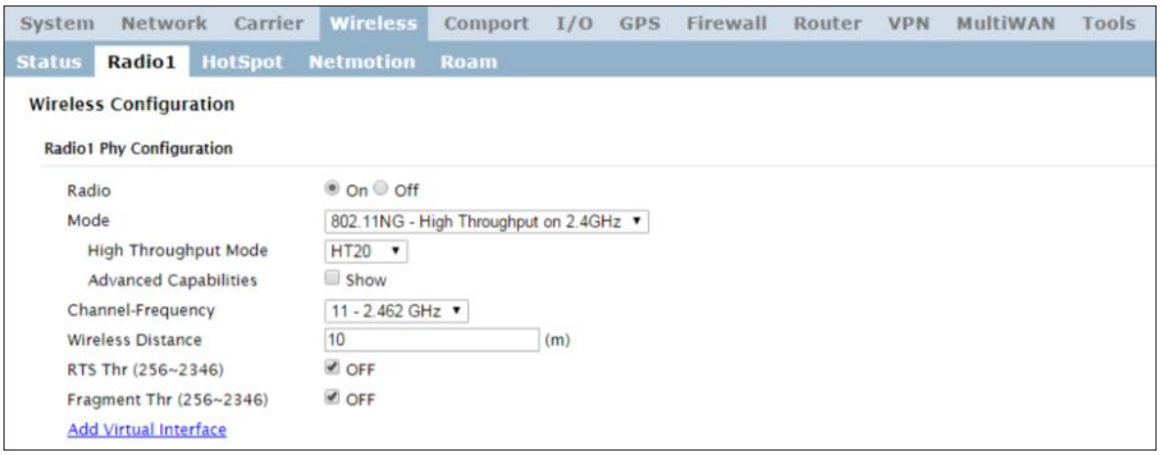


Image 4-4-2: Wireless > Radio Configuration

Radio

This option is used to turn the radio module on or off. If turned off Wireless connections can not be made. The default is On.

Values (selection)

On / Off

Mode

The Mode defines which wireless standard to use for the wireless network. The VIP4G supports all 802.11a/b/g/n modes as seen here. Select the appropriate operating mode from the list.

The options below are dependant and vary on the operating mode chosen here.

Values (selection)

802.11B ONLY
802.11BG
802.11NG-High Throughout 2.4GHz
802.11A ONLY
802.11NA-High Throughout 5GHz

Channel Bandwidth

Only appears when using 802.11b, bg or a modes. Lower channel bandwidths may provide longer range and be less susceptible to noise but at the trade off of data rates. Higher channel bandwidth may provide greater data rates but will be more susceptible to noise and shorter distance potentials.

Values (selection)

20MHz Normal Rate

4.0 Configuration

High Throughput Mode

Select HT20 for a 20MHz channel, or HT40 for a 40 MHz Channel. The 40MHz channel is comprised of 2 adjacent 20MHz channels and the + and—designate to use the higher or lower of the adjacent channels.

Values (selection)

HT20
HT40-
HT40+

Advanced Capabilities (Only shown if box is checked)

MPDU Aggregation (Enable/Disable) - Allows multiple data frames to be sent in a single transmission block, allowing for acknowledging or retransmitting if errors occur.

Short GI (Enable/Disable) - GI (guard interval) is the time the receiver waits for any RF reflections to settle before sampling data. Enabling a short GI (400ns) can increase throughput, but can also increase the error rate in some installations.

HT Capabilities Info - TX-STBC RX-STBC1 DSSS_CCK-40
Maximum AMSDU (byte) - 3839
Maximum AMPDU (byte) - 65535

Channel-Freq

The Channel-Freq setting allows configuration of which channel to operate on, auto can be chosen where the unit will automatically pick a channel to operate. If a link cannot be established it will try another channel.

2.4 GHz Channels

Auto
Channel 01 : 2.412 GHz
Channel 02 : 2.417 GHz
Channel 03 : 2.422 GHz
Channel 04 : 2.427 GHz
Channel 05 : 2.432 GHz
Channel 06 : 2.437 GHz
Channel 07 : 2.442 GHz
Channel 08 : 2.447 GHz
Channel 09 : 2.452 GHz
Channel 10 : 2.457 GHz
Channel 11 : 2.462 GHz

5 GH Channels

Auto
Channel 36: 5.18 GHz
Channel 40: 5.2 GHz
Channel 44: 5.22 GHz
Channel 48: 5.24 GHz
Channel 149 : 5.745 GHz
Channel 153 : 5.765 GHz
Channel 157 : 5.785 GHz
Channel 161 : 5.805 GHz
Channel 165 : 5.825 GHz

Wireless Distance

The Wireless Distance parameter allows a user to set the expected distance the WiFi signal needs to travel. The default is 10km, so the VIP4G will assume that the signal may need to travel up to 10km so it sets various internal timeouts to account for this travel time. Longer distances will require a higher setting, and shorter distances may perform better if the setting is reduced.

Values (meters)

10000

4.0 Configuration

RTS Thr (256 ~ 2346)	
Once the RTS Threshold defined packet size is reached, the system will invoke RTS/CTS flow control. A large RTS Threshold will improve bandwidth, while a smaller RTS Threshold will help the system recover from interference or collisions caused by obstructions.	**Values (selection)** On / **OFF**

Fragment Thr (256 ~ 2346)	
The Fragmentation Threshold allows the system to change the maximum RF packet size. Increasing the RF packet size reduces the need to break packets into smaller fragments. Increasing the fragmentation threshold slightly may improve performance if a high packet error rate is experienced.	**Values (selection)** On / **OFF**

Radio1 Virtual Interface

The bottom section of the Wireless Configuration provides for the configuration of the Operating Mode of the Wireless Interface, the TX power, Wireless Network information, and Wireless Encryption. The VIP4G can support multiple virtual interfaces. These interfaces provide different SSID's for different users, and can also be assigned to separate subnets (Network Interfaces) to prevent groups from interacting.

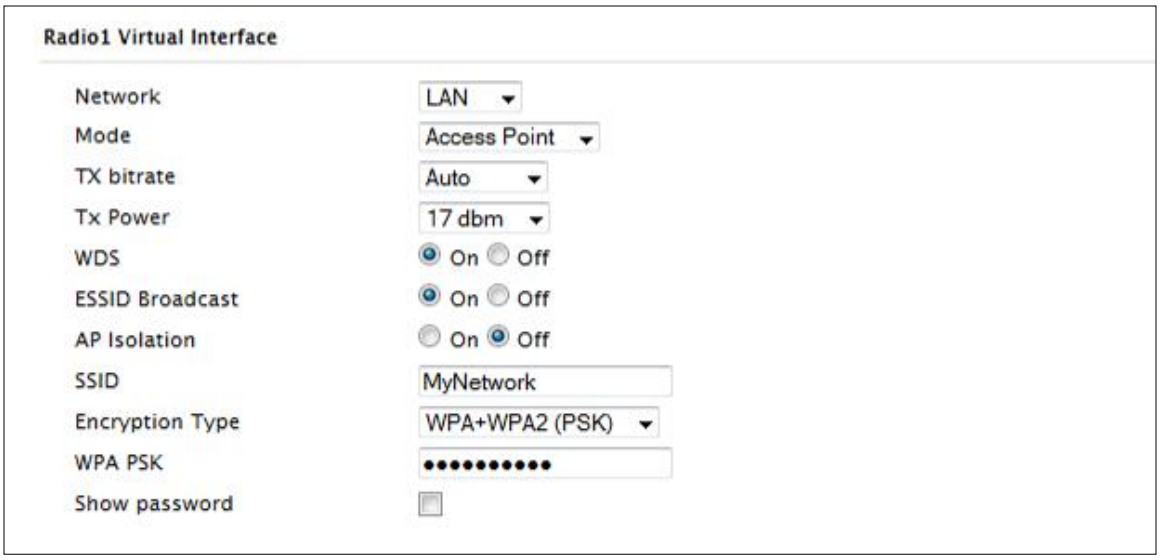


Image 4-4-3: Wireless > Radio Configuration

Network	
Choose between LAN or WIFI for the Virtual Interface. If additional ***Network Interfaces*** have been defined in the Network > LAN section, the Interface name will also appear here.	**Values (selection)** **LAN** WIFI *(Additional Interfaces…)*

4.0 Configuration

Mode

Access Point - An Access Point may provide a wireless data connection to many clients, such as stations, repeaters, or other supported wireless devices such as laptops etc.

If more than 1 Virtual Interface (more than 1 SSID) has been defined, the VIP4G can **ONLY** operate as a Access Point, and will be locked into this mode.

Values (selection)

Access Point
Client
Repeater

Station/Client - A Station may sustain one wireless connection, i.e. to an Access Point.

Repeater - A Repeater can be connected to an Access Point to extend the range and provide a wireless data connection to many clients, such as stations.

TX Rate

This setting determines the rate at which the data is to be wirelessly transferred.

The default is 'Auto' and, in this configuration, the unit will transfer data at the highest possible rate in consideration of the receive signal strength (RSSI).

Setting a specific value of transmission rate has the benefit of 'predictability' of that rate, but if the RSSI drops below the required minimum level to support that rate, communications will fail.

802.11 b/g

Auto
1 Mbps (802.11b,g)
2 Mbps (802.11b,g)
5.5 Mbps (802.11b,g)
11 Mbps (802.11b,g)
6 Mbps (802.11g)
9 Mbps (802.11g)
12 Mbps (802.11g)
18 Mbps (802.11g)
24 Mbps (802.11g)
36 Mbps (802.11g)
48 Mbps (802.11g)
54 Mbps (802.11g)

802.11a

Auto
6 Mbps
9 Mbps
12 Mbps
18 Mbps
24 Mbps
36 Mbps
48 Mbps
54 Mbps

802.11n (HT20/HT40)

Auto
mcs-0 (7.2/15) Mbps
mcs-1 (14.4/30.0) Mbps
mcs-2 (21.7/45.0) Mbps
mcs-3 (28.9/60.0) Mbps
mcs-4 (43.3/90.0) Mbps
mcs-5 (57.8/120.0) Mbps
mcs-6 (65.0/135.0) Mbps
mcs-7 (72.2/150.0) Mbps
mcs-8 (14.4/30.0) Mbps
mcs-9 (28.9/60.0) Mbps
mcs-10 (43.3/90.0) Mbps
mcs-11 (57.8/120.0) Mbps
mcs-12 (86.7/180.0) Mbps
mcs-13 (115.6/240.0) Mbps
mcs-14 (130.3/270.0) Mbps
mcs-15 (144.4/300.0) Mbps

4.0 Configuration

Refer to FCC (or as otherwise applicable) regulations to ascertain, and not operate beyond, the maximum allowable transmitter output power and effective isotropic radiated power (EIRP).

TX Power

This setting establishes the transmit power level which will be presented to the antenna connectors at the rear of the VIP4G. Unless required, the Tx Power should be set not for maximum, but rather for the minimum value required to maintain an adequate system fade margin.

Values (selection)

11 dBm	21 dBm
12 dBm	22 dBm
13 dBm	23 dBm
14 dBm	24 dBm
15 dBm	25 dBm
16 dBm	26 dBm
17 dBm	27 dBm
18 dBm	28 dBm
19 dBm	29 dBm
20 dBm	30 dBm

WDS

Wireless distribution system (WDS) is a system enabling the wireless interconnection of access points. WDS preserves the MAC addresses of client frames across links between access points

Values (selection)

On / Off

SSID: Service Set Identifier. The 'name' of a wireless network. In an open wireless network, the SSID is broadcast; in a closed system it is not. The SSID must be known by a potential client for it to be able to access the wireless network.

ESSID Broadcast

Disabling the SSID broadcast helps secure the wireless network. Enabling the broadcast of the SSID (Network Name) will permit others to 'see' the wireless network and perhaps attempt to 'join' it.

Values (selection)

On / Off

AP Isolation

When AP Isolation is enabled wireless devices connected to this SSID will not be able to communicate with each other. In other words if the VIP4G is being used as a Hot Spot for many wireless clients, AP Isolation would provide security for those clients by not allowing access to any other wireless device.

Values (selection)

On / **Off**

Change the default value for the Network Name to something unique for your network. Do this for an added measure of security and to differentiate your network from others which may be operating nearby.

SSID

All devices connecting to the VIP4G in a given network must use the SSID of the VIP4G. This unique network address is not only a security feature for a particular network, but also allows other networks - with their own unique network address - to operate in the same area without the possibility of undesired data exchange between networks.

Values (string)

wlan0

4.0 Configuration

Encryption Type

The encryption types defines the type of security used for the Wireless Interface, to join a network a device must know the correct password/ passphrase/key.

Security options are dependent on the version type. This section describes all available options. Export versions may not have all optional available to meet regulatory requirements set government policies.

Values (selection)

Disabled
WPA (PSK)
WPA2 (PSK)
WPA+WPA2 (PSK)
WPA Enterprise (RADIUS)
WPA2 Enterprise (RADIUS)
WPA+WPA2 Enterprise(RADIUS)

WPA PSK

This is the password, or preshared key that is required by any device to connect to the wireless interface of the VIP4G. It is **strongly recommended** to always have a password defined, and changed from the factory default.

Values (string)

0123456789

Show Password

Check this box to show the currently configured password for WPA/ WPA2 encryption passphrase.

Values (selection)

unchecked

RADIUS IP Address

If using Enterprise (RADIUS) encryption, enter the IP Address of the RADIUS authentication server here.

Values (IP Address)

(no default)

RADIUS Port

If using Enterprise (RADIUS) encryption, enter the port number of the RADIUS authentication server here.

Values (port)

(no default)

RADIUS Server Key

This is the password, or preshared key that is required by any device to connect to the wireless interface of the VIP4G. It is **strongly recommended** to always have a password defined, and changed from the factory default.

Values (selection)

0123456789

MAC Filter

The MAC filter allows the control of which WIFI devices can, or cannot connect to the VIP4G. If set to Allow, only the MAC Addresses listed will be allowed to connect, all others will be blocked. When set to Deny, only the devices (via MAC) will be blocked.

Values (selection)

Disabled / Allow / Deny

4.0 Configuration

4.4.3 Wireless > HotSpot

The Wireless Hotspot configuration is used when providing public hotspot services and it is required to use a server or web based authentication service to verify users.

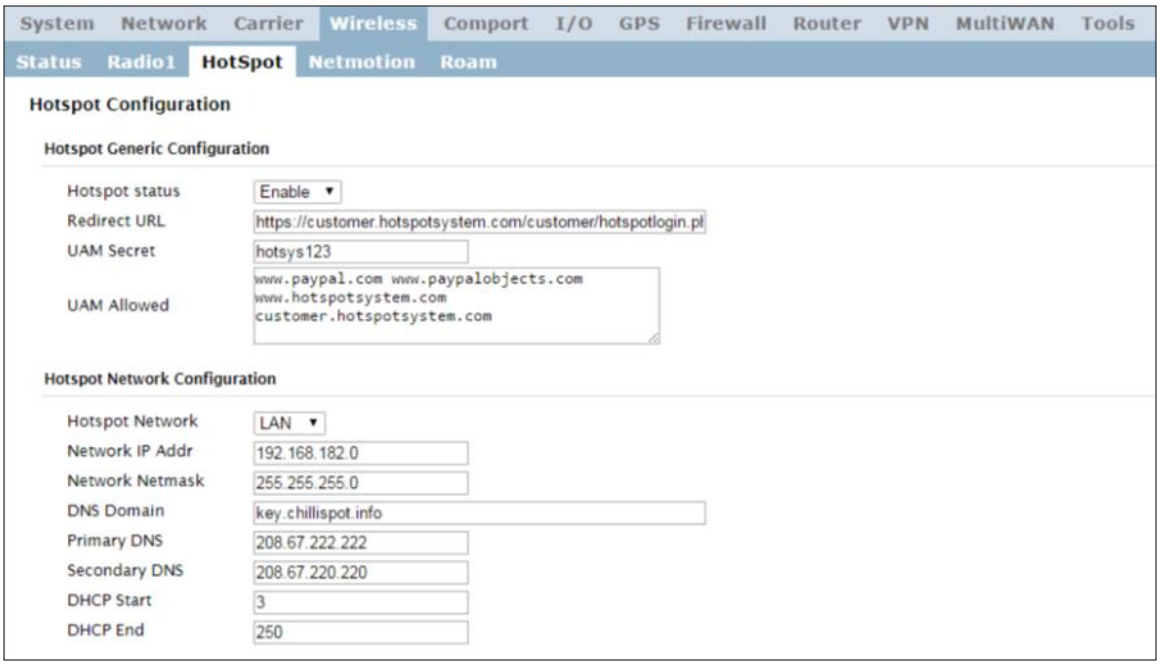


Image 4-4-5: Wireless > Hotspot

Hotspot Status	
Use this option to enable or disable the hotspot authentication service.	**Values (selection)** Enable / **Disable**

Redirect URL	
Specify the hotspot URL as given by your service provider. The address of the UAM Server, the authentication portal.	**Values** *(varies)*

UAM Secret	
This is a secret password between the Redirect URL and the Hotspot given by the hotspot provider.	**Values** hotsys123

UAM Allowed	
UAM Allowed is a list of websites that unauthenticated users are allowed to access.	**Values** *(varies)*

4.0 Configuration

Hotspot Network Configuration

Hotspot Network	
This field is used to specify which configured network is bonded to the hotspot. Sub networks can be created in the Network > LAN menu, which are dedicated to the hotspot devices. *The DHCP service for the network used should be turned off as all IP address assignments will be made by the hotspot service provider.*	**Values** *Varies*

Network IP Address	
Specify the IP Address of the Hotspot application. All hotspot clients will get an IP address in the same network as the Hotspot.	**Values** 192.168.182.0

Network Netmask	
Specify the Netmask of the Hotspot application. All hotspot clients will get an IP address in the same network as the Hotspot.	**Values** 255.255.255.0

DNS Domain	
Provide your service providers 1st DNS Server domain.	**Values** Key.chillispot.info

Primary DNS	
Specify the Primary DNS server to be used by devices connected to the Hotspot network.	**Values** 208.67.222.222

Secondary DNS	
Specify the Secondary DNS server to be used by devices connected to the Hotspot network.	**Values** 208.67.222.220

DHCP Start	
When devices connect to the BulletPlus WiFi and Hotspot is enabled, the Hotspot will assign the IP addresses to the connected devices, select the starting range here.	**Values** 3

DHCP End	
When devices connect to the BulletPlus WiFi and Hotspot is enabled, the Hotspot will assign the IP addresses to the connected devices, select the ending range here.	**Values** 250

4.0 Configuration

Hotspot Radius Configuration

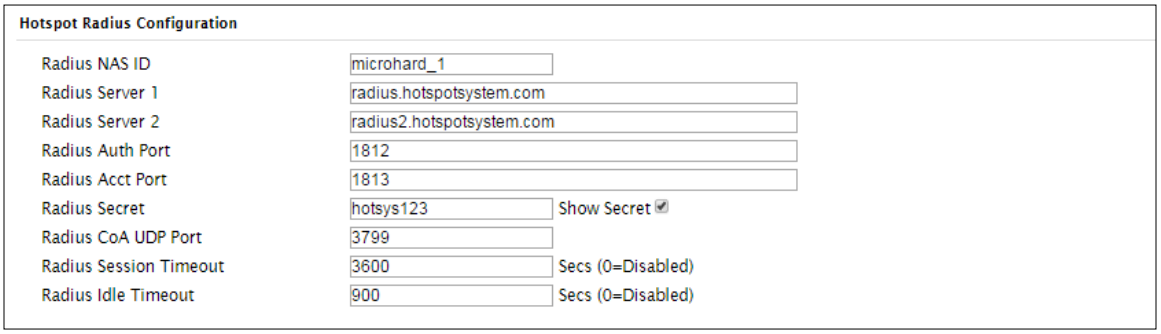


Image 4-4-5: Wireless > Hotspot Radius Configuration

Radius NAS ID

This is the RADIUS name of your Hotspot as given by your Hotspot Service Provider.

Values

Microhard_1

Radius Server 1

As assigned by the Hotspot Service Provider, the name or IP address of the primary RADIUS Server.

Values

radius.hotspotsystem.com

Radius Server 2

As assigned by the Hotspot Service Provider, the name or IP address of the alternate RADIUS Server.

Values

radius2.hotspotsystem.com

Radius Auth Port

The Radius Authentication Port Number. The default is 1812. This is provided by your Hotspot service provider.

Values

1812

Radius Acct Port

The Radius Account Port Number. The default is 1813. This is provided by your Hotspot service provider.

Values

1813

Radius Secret

Also called a shared key, this is the RADIUS password assigned by you Hotspot provider.

Values

hotsys123

4.0 Configuration

Radius CoA UDP Port	
Specify the Radius CoA UDP Port here. This information is supplied by the hotspot service provider.	**Values (port)** 3799

4.0 Configuration

4.4.4 Wireless > Netmotion

Netmotion allows the modem to use the WIFI interface for a default data connection rather than the cellular connection, when available. This is done by changing the default route between the Carrier and WIF networks. When Netmotion is enabled the modem will attempt to use the WIFI connection as a WAN connection for data first, and if that connection fails, or is not available, the modem will use the Cellular connection. Up to 10 previously used networks can be used under Roaming for mobile applications.

For Netmotion to be used the modem must be configured to meet the following prerequisites.

- The *Network* > *WIFI* interface must be configured.
- The WIFI interface must be bound to Radio1 in the *Wireless* > *Radio1* menu
- The Wireless interface must be setup as a Station/Client

When Netmotion is enabled, the Wireless interface cannot be used as a Access Point for other devices to connect to.

Image 4-4-6: Wireless > Netmotion

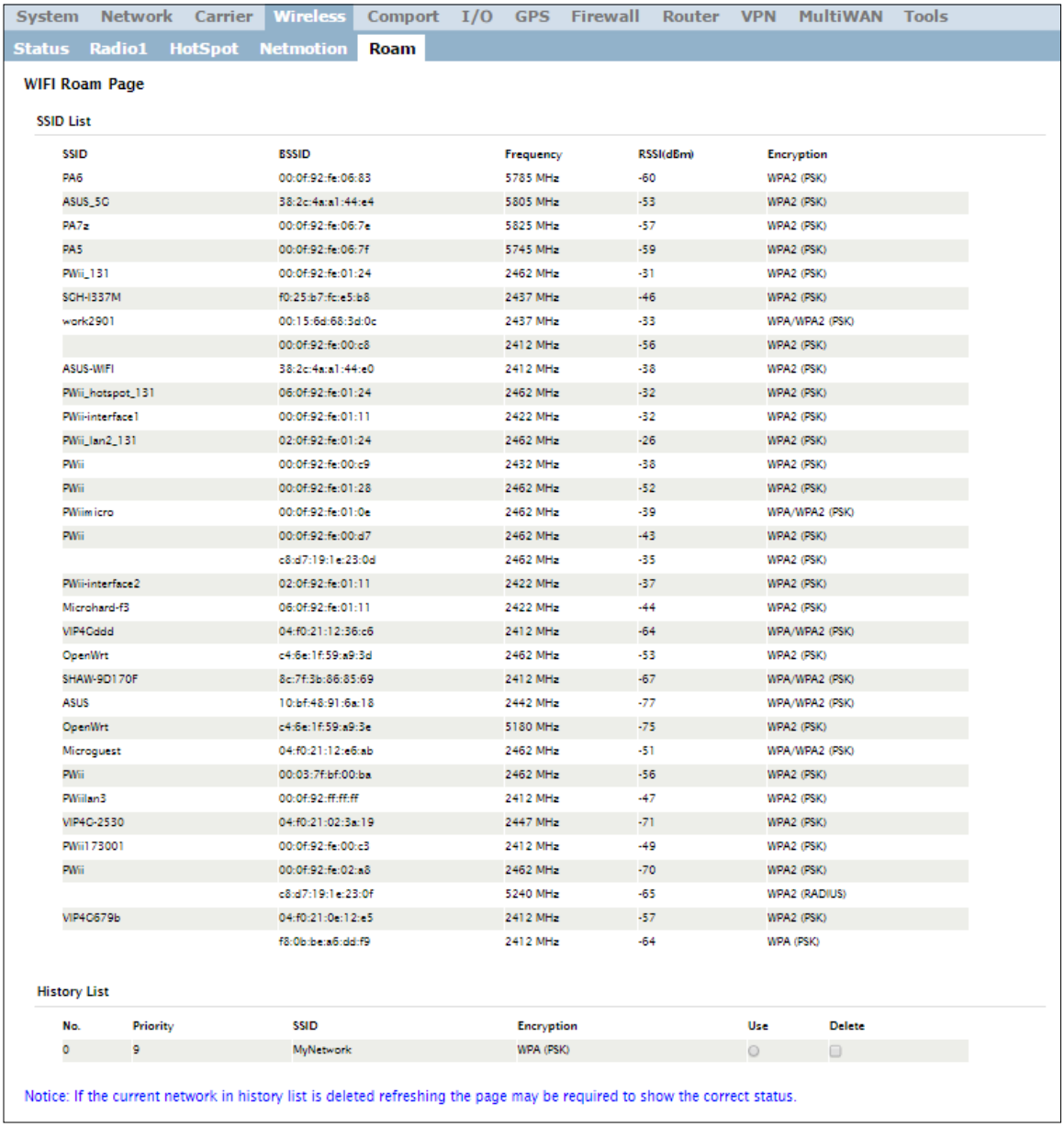
Disable/Enable	
Use this option to enable or disable the Netmotion functionality of the modem.	**Values (selection)** Enable / **Disable**

4.0 Configuration

4.4.5 Wireless > Roam

The Roam menu is used in conjunction with Netmotion. When the modem is connected to a AP (Access Point), the Roaming page will only display the currently connected network, and the History List of previously used networks. If the modem is not currently connected to a Wireless Network, Roam will display all available APs (Access Points) in range, as well as the history list of previously used networks.

The last 10 configured APs will be displayed in the list and will be automatically used if they are available. This is ideal for mobile applications, where the modem will be moving from place to place. Unwanted networks can be removed from the history list to prevent the modem from using it.



SSID	BSSID	Frequency	RSSI(dBm)	Encryption
PA6	00:0f:92:fe:06:83	5785 MHz	-60	WPA2 (PSK)
ASUS_5G	38:2c:4a:a1:44:e4	5805 MHz	-53	WPA2 (PSK)
PA7z	00:0f:92:fe:06:7e	5825 MHz	-57	WPA2 (PSK)
PA5	00:0f:92:fe:06:7f	5745 MHz	-59	WPA2 (PSK)
PWii_131	00:0f:92:fe:01:24	2462 MHz	-31	WPA2 (PSK)
SCH-I337M	f0:25:b7:fc:e5:b8	2437 MHz	-46	WPA2 (PSK)
work2901	00:15:6d:68:3d:0c	2437 MHz	-33	WPA/WPA2 (PSK)
	00:0f:92:fe:00:c8	2412 MHz	-56	WPA2 (PSK)
ASUS-WIFI	38:2c:4a:a1:44:e0	2412 MHz	-38	WPA2 (PSK)
PWii_hotspot_131	06:0f:92:fe:01:24	2462 MHz	-32	WPA2 (PSK)
PWii-interface1	00:0f:92:fe:01:11	2422 MHz	-32	WPA2 (PSK)
PWii_lan2_131	02:0f:92:fe:01:24	2462 MHz	-26	WPA2 (PSK)
PWii	00:0f:92:fe:00:c9	2432 MHz	-38	WPA2 (PSK)
PWii	00:0f:92:fe:01:28	2462 MHz	-52	WPA2 (PSK)
PWiimicro	00:0f:92:fe:01:0e	2462 MHz	-39	WPA/WPA2 (PSK)
PWii	00:0f:92:fe:00:d7	2462 MHz	-43	WPA2 (PSK)
	c8:d7:19:1e:23:0d	2462 MHz	-35	WPA2 (PSK)
PWii-interface2	02:0f:92:fe:01:11	2422 MHz	-37	WPA2 (PSK)
Microhard-f3	06:0f:92:fe:01:11	2422 MHz	-44	WPA2 (PSK)
VIP4Cddd	04:f0:21:12:36:c6	2412 MHz	-64	WPA/WPA2 (PSK)
OpenWrt	c4:6e:1f:59:a9:3d	2462 MHz	-53	WPA2 (PSK)
SHAW-9D170F	8c:7f:3b:86:85:69	2412 MHz	-67	WPA/WPA2 (PSK)
ASUS	10:bf:48:91:6a:18	2442 MHz	-77	WPA/WPA2 (PSK)
OpenWrt	c4:6e:1f:59:a9:3e	5180 MHz	-75	WPA2 (PSK)
Microguest	04:f0:21:12:e6:ab	2462 MHz	-51	WPA/WPA2 (PSK)
PWii	00:03:7f:bf:00:ba	2462 MHz	-56	WPA2 (PSK)
PWiilan3	00:0f:92:ff:ff:ff	2412 MHz	-47	WPA2 (PSK)
VIP4C-2530	04:f0:21:02:3a:19	2447 MHz	-71	WPA2 (PSK)
PWii173001	00:0f:92:fe:00:c3	2412 MHz	-49	WPA2 (PSK)
PWii	00:0f:92:fe:02:a8	2462 MHz	-70	WPA2 (PSK)
	c8:d7:19:1e:23:0f	5240 MHz	-65	WPA2 (RADIUS)
VIP4C679b	04:f0:21:0e:12:e5	2412 MHz	-57	WPA2 (PSK)
	f8:0b:be:a6:dd:f9	2412 MHz	-64	WPA (PSK)

No.	Priority	SSID	Encryption	Use	Delete
0	9	MyNetwork	WPA (PSK)		

Image 4-4-7: Wireless > Roam

4.0 Configuration

4.5 Comport

4.5.1 Comport > Status

The Status window gives a summary of the Serial port on the VIP4G. The Status window shows if the com port has been enabled, how it is configured (Connect As), and the connection status.

Also shown is statistical information about the serial port, including the number of transmitted and received packets and bytes. This can be used to diagnose connection and data usage issues.

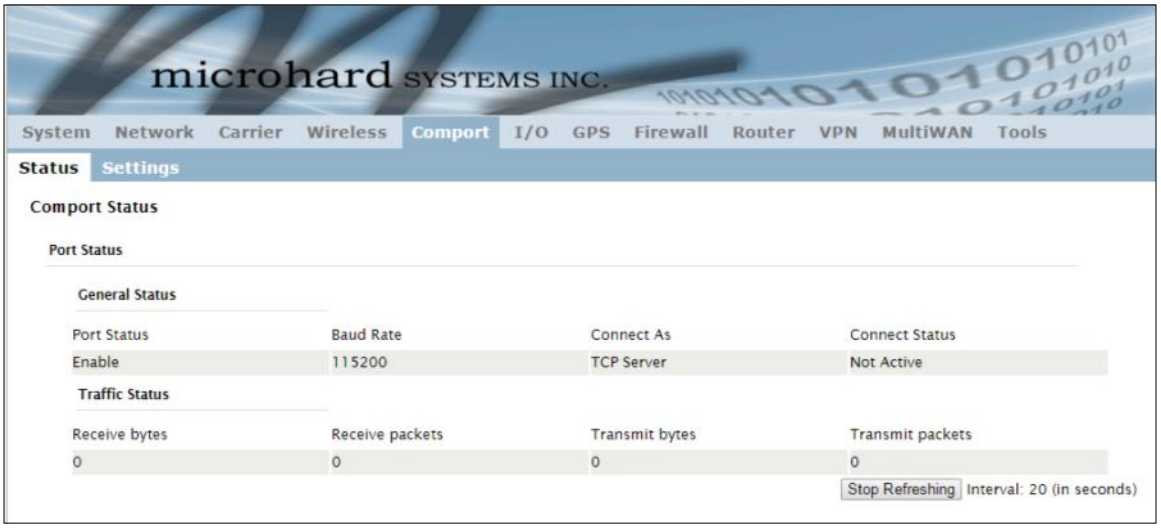


Image 4-5-1: Comport > Comport Status

4.0 Configuration

4.5.2 Comport > Settings

This menu option is used to configure the serial device server for the serial communications port. Serial device data may be brought into the IP network through TCP, UDP, or multicast; it may also exit the VIP4G network on another VIP4G serial port. The fully-featured RS232 interface supports hardware handshaking.

Basic configuration of the serial port would be to first, set the appropriate interface connection settings such as the baud rate and data format. Next, it is critical to define the IP Protocol Config, since all serial data entering the VIP4G is essentially converted to IP, to either TCP, or UDP packets. The following section describes the configuration of the serial port.

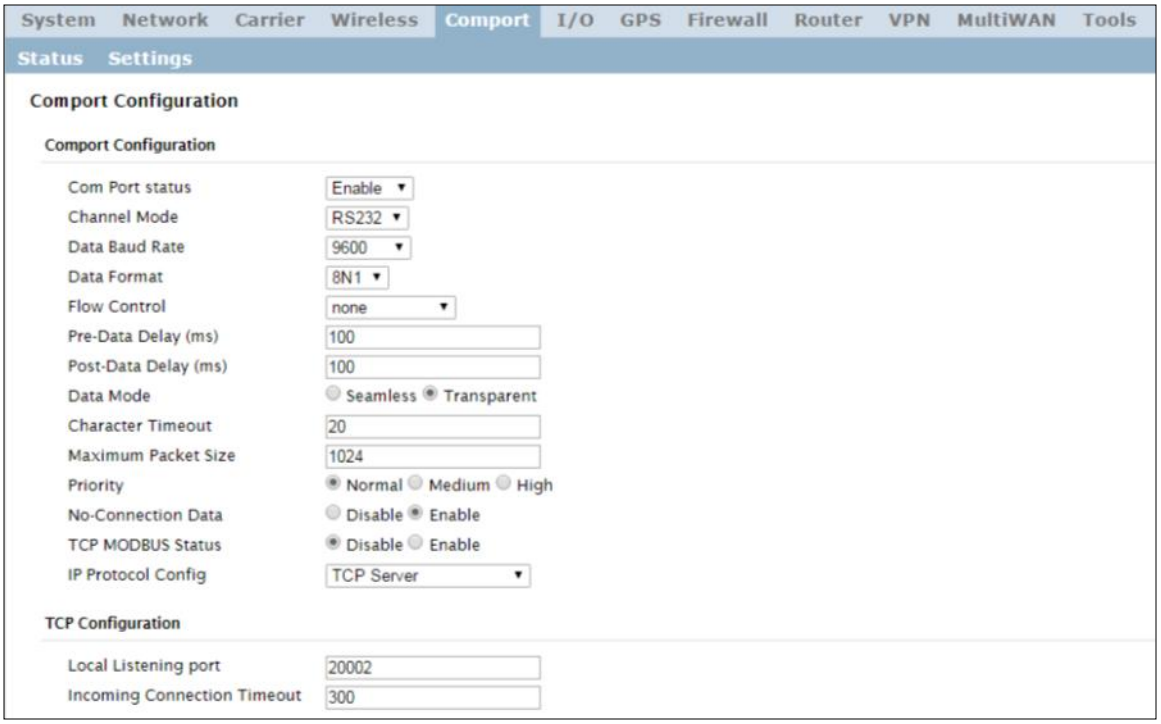


Image 4-5-2: Comport > Settings Configuration

4.0 Configuration

Com Port Status

Select operational status of the Serial Port. The port is disabled by default, to allow the port to be used for console and AT command operations. If it is required to connect to a serial based device, the port first must be enabled.

Values (selection)

Disabled / Enable

Channel Mode

Determines which serial interface shall be used to connect to external devices: RS232, RS485, or RS422. When an interface other than RS232 is selected, the DE9 port will be inactive.

Values (selection)

RS232 / RS485 / RS422

Data Baud Rate

The serial baud rate is the rate at which the modem is to communicate with the attached local asynchronous device.

Note: Most PCs do not readily support serial communications greater than 115200bps.

Values (bps)

921600	**9600**
460800	7200
230400	4800
115200	3600
57600	2400
38400	1200
28800	600
19200	300
14400	

Data Format

This setting determines the format of the data on the serial port. The default is 8 data bits, No parity, and 1 Stop bit.

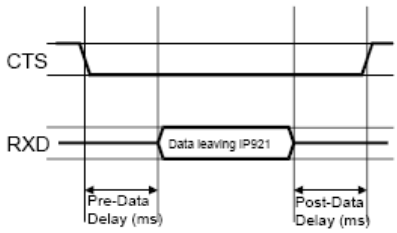
Software flow control (XON/ XOFF) is not supported.

Values (selection)

8N1	7N2
8N2	7E1
8E1	7O1
8O1	7E2
7N1	7O2

Flow Control

Flow control may be used to enhance the reliability of serial data communications, particularly at higher baud rates. If the attached device does not support hardware handshaking, leave this setting at the default value of 'None'. When CTS Framing is selected, the VIP4G uses the CTS signal to gate the output data on the serial port.



Drawing 4A: CTS Output Data Framing

Values (selection)

None
Hardware
CTS Framing

4.0 Configuration

Pre-Data Delay

Refer to **Drawing 4A** on the preceding page.

Values (time (ms))

100

Post-Data Delay

Refer to **Drawing 4A** on the preceding page.

Values (time (ms))

100

Date Mode

This setting defines the serial output data framing. In Transparent mode (default), the received data will be output promptly from the VIP4G.

Values (selection)

Seamless / **Transparent**

When set to Seamless, the serial port server will add a gap between data frames to comply with the MODBUS protocol for example. See 'Character Timeout' below for related information.

Character Timeout

In Seamless mode (see Data Mode described on the preceding page), this setting determines when the serial server will consider the recently -received incoming data as being ready to transmit. As per the MODBUS standard, frames will be marked as 'bad' if the time gap between frames is greater than 1.5 characters, but less than the Character Timeout value.

Values (characters)

0

The serial server also uses this parameter to determine the time gap inserted between frames. It is measured in 'characters' and related to baud rate.

Example: If the baud rate is 9600bps, it takes approximately 1ms to move one character. With the Character Timeout set to 4, the timeout period is 4ms. When the calculated time is less than 3.5ms, the serial server will set the character timeout to a minimum value of 3.5ms.

If the baud rate is greater than 19200bps, the minimum character timeout is internally set to 750us (microseconds).

Maximum Packet Size

Defines the buffer size that the serial server will use to receive data from the serial port. When the server detects that the Character Timeout criteria has been met, or the buffer is full, it packetizes the received frame and transmits it.

Values (bytes)

1024

Priority

This setting effects the quality of service associated with the data traffic on the COM port.

Values (selection)

Normal / Medium / High

4.0 Configuration

No-Connection Data

When enabled the data will continue to buffer received on the serial data port when the radio loses synchronization. When disabled the VIP4G will disregard any data received on the serial data port when radio synchronization is lost.

Values (selection)

Disable / Enable

MODBUS TCP Status

This option will enable or disable the MODBUS decoding and encoding features.

Values (selection)

Disable / Enable

MODBUS TCP Protection

The field allows the MODBUS TCP Protection Status flag to be enabled or disabled. If enabled the MODBUS data will be encrypted with the MODBUS Protection Key.

Values (selection)

Disable / Enable

MODBUS TCP Protection Key

MODBUS encryption key used for the MODBUS TCP Protection Status feature.

Values (string)

1234

4.0 Configuration

The protocol selected in the IP Protocol Config field will determine which configuration options appear in the remainder of the COM1 Configuration Menu.

IP Protocol Config

This setting determines which protocol the serial server will use to transmit serial port data over the VIP4G network.

The protocol selected in the IP Protocol Config field will determine which configuration options appear in the remainder of the COM1 Configuration Menu.

The serial port will not work unless the IP Protocol Config has been configured properly. Once serial data is collected at the serial port, the modem must be told how to deal with it, and where to send it.

Values (selection)

TCP Client
TCP Server
TCP Client/Server
UDP Point-to-Point
SMTP Client
SMS Transparent Mode
GPS Transparent Mode

TCP Client: When TCP Client is selected and data is received on its serial port, the VIP4G takes the initiative to find and connect to a remote TCP server. The TCP session is terminated by this same unit when the data exchange session is completed and the connection timeout has expired. If a TCP connection cannot be established, the serial port data is discarded.

UDP: User Datagram Protocol does not provide sequencing information for the packets sent nor does it establish a 'connection' ('handshaking') and is therefore most suited to communicating small packets of data.

- **Remote Server Address**
  IP address of a TCP server which is ready to accept serial port data through a TCP connection. For example, this server may reside on a LAN network server.
  Default: **0.0.0.0**

- **Remote Server Port**
  A TCP port which the remote server listens to, awaiting a session connection request from the TCP Client. Once the session is established, the serial port data is communicated from the Client to the Server.
  Default: **20001**

- **Outgoing Connection Timeout**
  This parameter determines when the VIP4G will terminate the TCP connection if the connection is in an idle state (i.e. no data traffic on the serial port).
  Default: **60** (seconds)

TCP Server: In this mode, the VIP4G Series will not INITIATE a session, rather, it will wait for a Client to request a session of it (it's being the Server—it 'serves' a Client). The unit will 'listen' on a specific TCP port. If a session is established, data will flow from the Client to the Server, and, if present, from the Server to the Client. If a session is not established, both Client-side serial data, and Server-side serial data , if present, will be discarded.

TCP: Transmission Control Protocol in contrast to UDP does provide sequencing information and is connection -oriented; a more reliable protocol, particularly when large amounts of data are being communicated.

Requires more bandwidth than UDP.

- **Local Listening Port**
  The TCP port which the Server listens to. It allows a TCP connection to be created by a TCP Client to carry serial port data.
  Default: **20001**

- **Incoming Connection Timeout**
  Established when the TCP Server will terminate the TCP connection is the connection is in an idle state.
  Default: **300** (seconds)

4.0 Configuration

IP Protocol Config (Continued…)

A UDP or TCP port is an application end-point. The IP address identifies the device and, as an extension of the IP address, the port essentially 'fine tunes' where the data is to go 'within the device'.

Be careful to select a port number that is not predetermined to be associated with another application type, e.g. HTTP uses port 80.

TCP Client/Server: In this mode, the VIP4G will be a combined TCP Client and Server, meaning that it can both initiate and serve TCP connection (session) requests. Refer to the TCP Client and TCP Server descriptions and settings described previously as all information, combined, is applicable to this mode.

UDP Point-to-Point: In this configuration the VIP4G will send serial data to a specifically-defined point, using UDP packets. This same VIP4G will accept UDP packets from that same point.

- **Remote IP Address**
  IP address of distant device to which UDP packets are sent when data received at serial port.
  Default: **0.0.0.0**
- **Remote Port**
  UDP port of distant device mentioned above.
  Default: **20001**
- **Listening Port**
  UDP port which the IP Series listens to (monitors). UDP packets received on this port are forwarded to the unit's serial port.
  Default: **20001**

SMTP Client: If the VIP4G has Internet access, this protocol may be used to send the data received on the serial port (COM1), in a selectable format (see Transfer Mode (below)), to an e-mail addressee. Both the SMTP Server and the e-mail addressee must be 'reachable' for his feature to function.

- Mail Subject
  Enter a suitable 'e-mail subject' (e-mail heading).
  Default: **COM1 Message**
- Mail Server (IP/Name)
  IP address or 'Name' of SMTP (Mail) Server.
  Default: **0.0.0.0**
- Mail Recipient
  A valid e-mail address for the intended addressee, entered in the proper format.
  Default: **host@**
- Message Max Size
  Maximum size for the e-mail message.
  Default: **1024**
- Timeout (s)
  How long the unit will wait to gather data from the serial port before sending an e-mail message; data will be sent immediately upon reaching Message Max Size.

  Default: **10**
- Transfer Mode
  Select how the data received on COM1 is to be sent to the email addressee. Options are: Text, Attached File, Hex Code.
  Default: **Text**