4.0 Configuration

IP Protocol Config (Continued…)

SMS Transparent Mode: Serial data from the COM1 port can be send to one or multiple destinations via SMS text messaging. SMS messages received by the VIP4G can also be sent to the COM1 port.

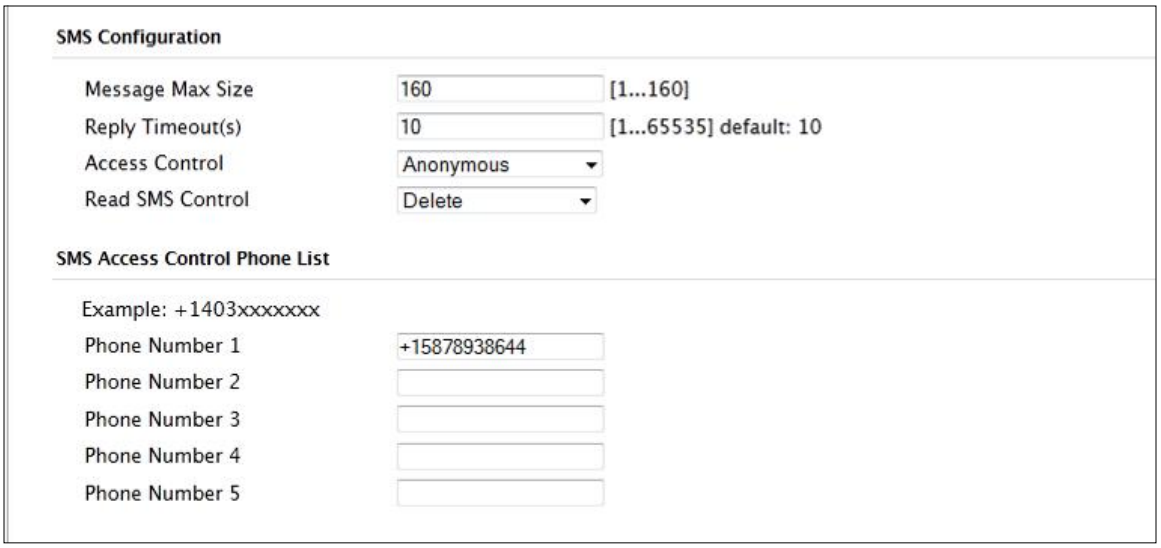


Image 4-5-3: Comport > SMS Transparent Mode

- Message Max Size
  Enter the maximum message size. Once the number of characters has been reached the VIP4G will package the data up and send it as a SMS message to the number(s) specified. [1….160]. The character timeout can be used to send messages more frequently by detecting a pause in the incoming data.
  Default: **160**

- Reply Timeout(s)
  Enter a value for the Reply Timeout in seconds.
  Default: **10**

- Access Control
  By selecting **Anonymous,** the VIP4G will accept a SMS message from any number. If **Control Phone List** is selected, only messages from the numbers in the Access Control List will be accepted.
  Default: **Anonymous**

- Read SMS Control
  Select **Keep in SIM Card** to save incoming SMS messages in the SIM card, select **Delete** to delete messages once they have been output to serial port.
  Default: **Keep in SIM Card**

- Access Control Phone List
  Messages can be sent to up to five (5) numbers, also, this list can be used to filter incoming SMS messages (See Access Control)
  Default: **None**

4.0 Configuration

IP Protocol Config (Continued…)

GPS Transparent Mode: When in GPS Transparent Mode, GPS data is reported out the serial port at 1 second intervals. Sample output is shown below:

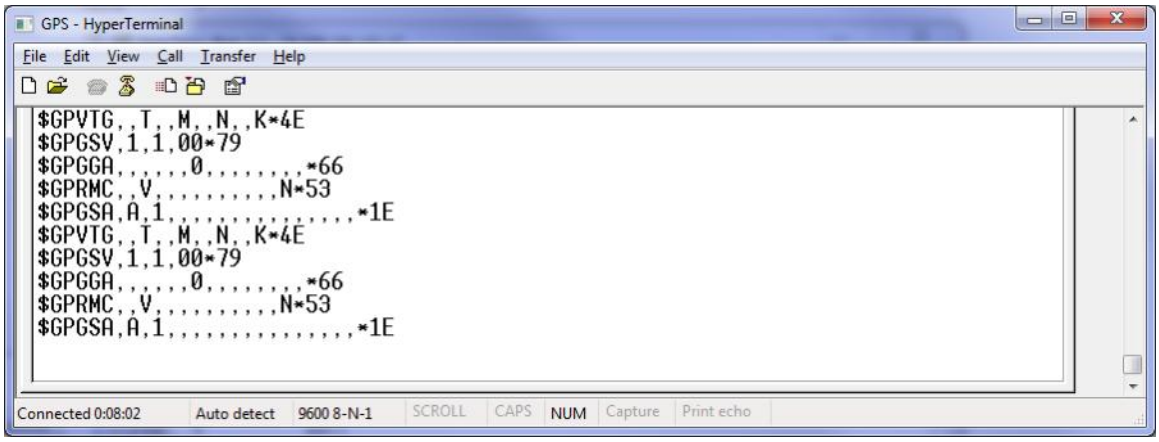


Image 4-5-4: Comport > GPS Transparent Mode

4.0 Configuration

4.6 I/O

4.6.1 I/O > Status

The VIP4G has 4 status inputs, which can be used with various alarms and sensors for monitoring, telling the modem when certain events have occurred, such as an intrusion alarm on a door, a temperature threshold has been exceed, or a generator has failed, out of fuel. Also included are 4 outputs, that can be used to drive external relays to remotely control equipment and devices.

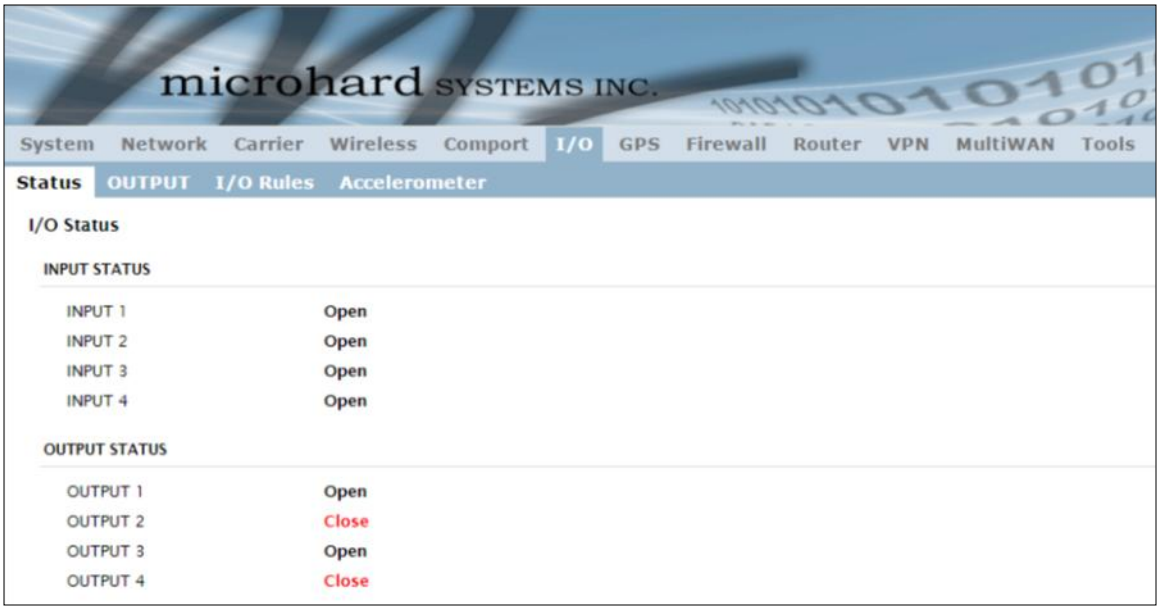


Image 4-6-1: I/O > Status

Input Status

The WebUI will display the current state of each input. The I/O pins are all normally open so an open status indicates that there is nothing connected to the input pins, or that an event has not occurred to trigger the input. The inputs have a small wetting current (Vin) used to detect a contact closure, and prevent false readings by any noise or intermittent signals, it has a threshold sensitivity of 1.8V.

Output Status

The WebUI will display the current state of each control output. Using the Output menu discussed in the next section, a user can remotely control the status of the output pins.

4.0 Configuration

4.6.2 I/O > OUTPUT

Each of the 4 Outputs can be controlled separately, allowing a user to remotely trigger an event.

Image 4-6-2: I/O > OUTPUT

The output pins on the VIP4G can be used provide output signals, which can be used to drive an external relay to control an external device. Maximum recommended load for the Output Pin is 150mA @ 32 VDC (Vin)

4.6.3 I/O > I/O Rules

Custom rules can be applied to the I/O behavior, such as setting a output after a specified time, or an input or combination of inputs triggering output(s).

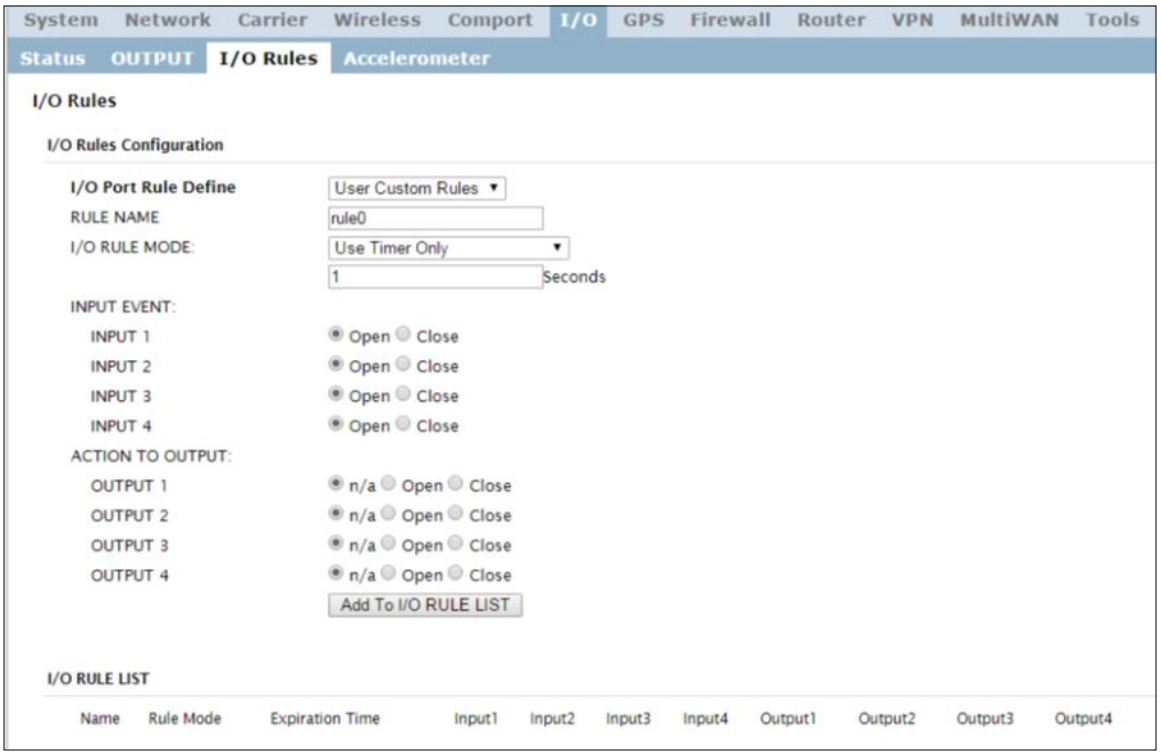


Image 4-6-3: I/O > I/O Rules

4.0 Configuration

I/O Port Rule Define

Set the type of I/O rules to perform:

Disabled: Outputs have no logical connection to inputs.

Default Rules:
Each input has a logical connection to each output as follows:
Input 1 -> Output 1
Input 2 -> Output 2
Input 3 -> Output 3
Input 4 -> Output 4

Custom Rules:
User can make custom rules to trigger output states. Custom rules can contain any of the following I/O rules:

- A timer has finished counting down
- A input signal has changed state
- A combination of a input state and a timer.

Values (selection)

Disable
Default Rules
Custom Rules

Rule Name

Each I/O rule must have a unique name. This is for reference purposes and has no effect on the rule itself.

Values (characters)

rule0

I/O Rule Mode

Define the parameters of the desired rule:

Use Timer Only: Once the programmed timer has expired, the defined output state will be triggered.

Use Input States Only: The VIP4G will set puts as defined based on input states.

Use Input States With Timer: A combination of inputs states and a timer would trigger an output action when the input state if changed for more than the specified time.

Values (selection)

Use Timer Only
Use Input States Only
Use Input States With Timer

4.0 Configuration

4.6.4 I/O > Accelerometer

The VIP4G has a internal Accelerometer, which can be configured to report events to a remote host based on a specific physical activity.

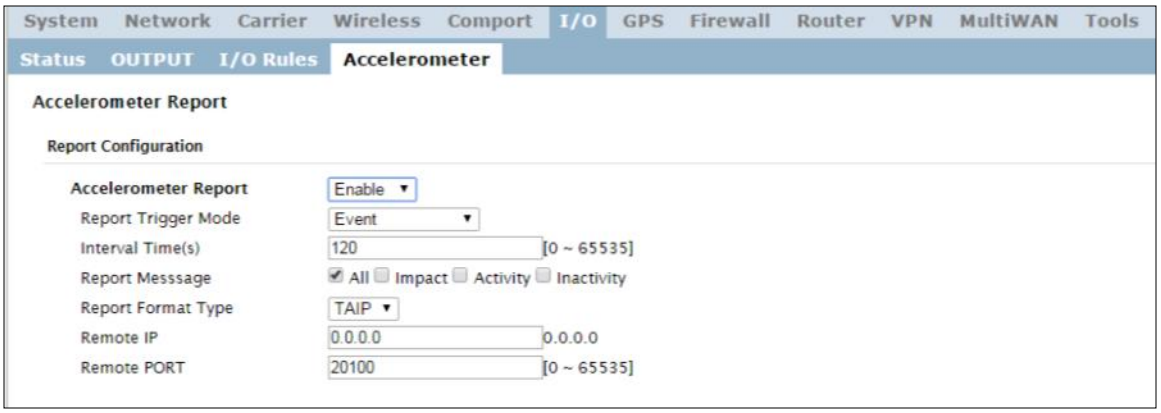


Image 4-6-4: I/O > Accelerometer

Accelerometer Report	
Enable or disable reporting by the Accelerometer.	**Values (selection)** **Disable** Enable

Report Trigger Mode	
Select reporting on event, timer or both.	**Values (selection)** **Event** Timer Event OR Timer

Interval	
Set the time at which events will be reported if the timer feature is selected.	**Values (seconds)** **120**

Report Message	
Select the types of events that cause a report to be sent.	**Values (selection)** **ALL** Impact Activity Inactivity

4.0 Configuration

	Report Format Type
Select the format in which the report will be sent, TAIP or Text.	**Values (selection)** **TAIP** Text

	Remote IP
Enter the IP Address of the remote host. This is the address in which the reports will be sent via UDP packets.	**Values (IP Address)** **0.0.0.0**

	Remote PORT
Enter the UDP port number to send the reports.	**Values (Port)** **20100**

4.0 Configuration

4.7 GPS

4.7.1 GPS > Location

Location Map

The location map shows the location on the VIP4G. The unit will attempt to get the GPS coordinates from the built in GPS receiver, and if unsuccessful, will use the Cell ID location reported by the Cellular Carrier.

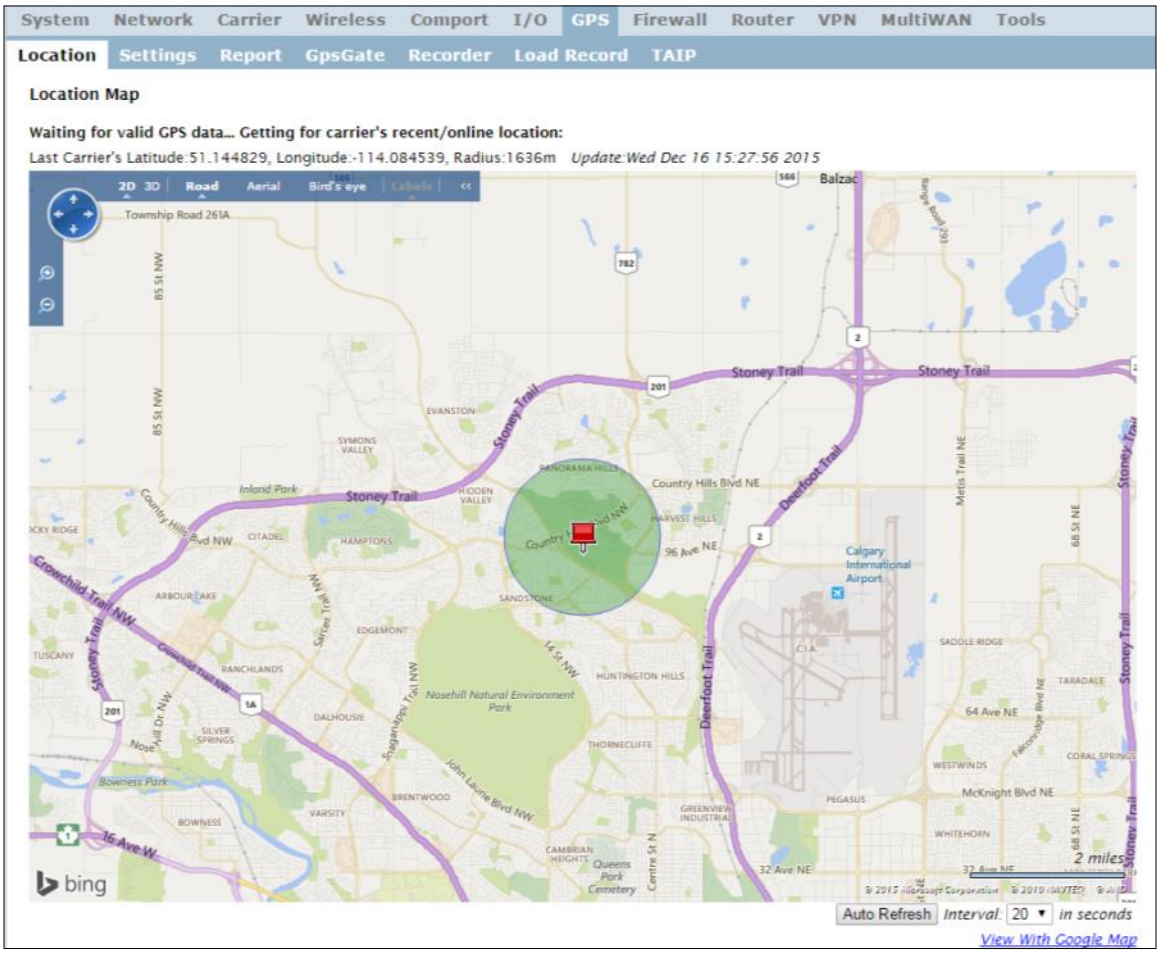


Image 4-7-1: GPS > Location Map

When using standalone GPS the specific coordinates are shown as in the above screenshot. If the VIP4G is unable to locate GPS satellites, or if configured to use Embedded Carrier GPS, only the estimated location of the VIP4G is shown with a radius drawn on the map.

4.0 Configuration

4.7.2 GPS > Settings

The VIP4G can be polled fro GPS data via GPSD standards and/or provide customizable reporting to up to 4 different hosts using UDP or Email Reporting.

GPS data can also be reported to the COM1 serial port. For more information, refer to the COM1 > IP Protocol Config > GPS Transparent Mode section.

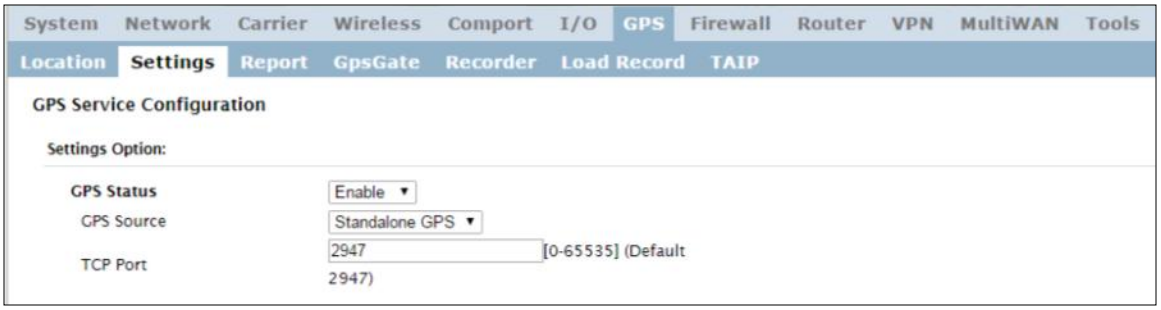


Image 4-7-2: GPS > Settings

GPS Status	
Enable or disable the GPS polling function of the VIP4G.	**Values** Disable **/ Enable**

GPS Source	
Select the data source for GPS data.	**Values** **Stand Alone GPS** Embedded Carrier GPS

TCP Port	
Specify the TCP port on the VIP4G where the GPS service is running and remote systems can connect and poll for GPSD data.	**Values** **2947**

4.0 Configuration

4.7.3 GPS > GPS Report

The VIP4G can provide customizable reporting to up to 4 hosts using UDP or Email Reporting.

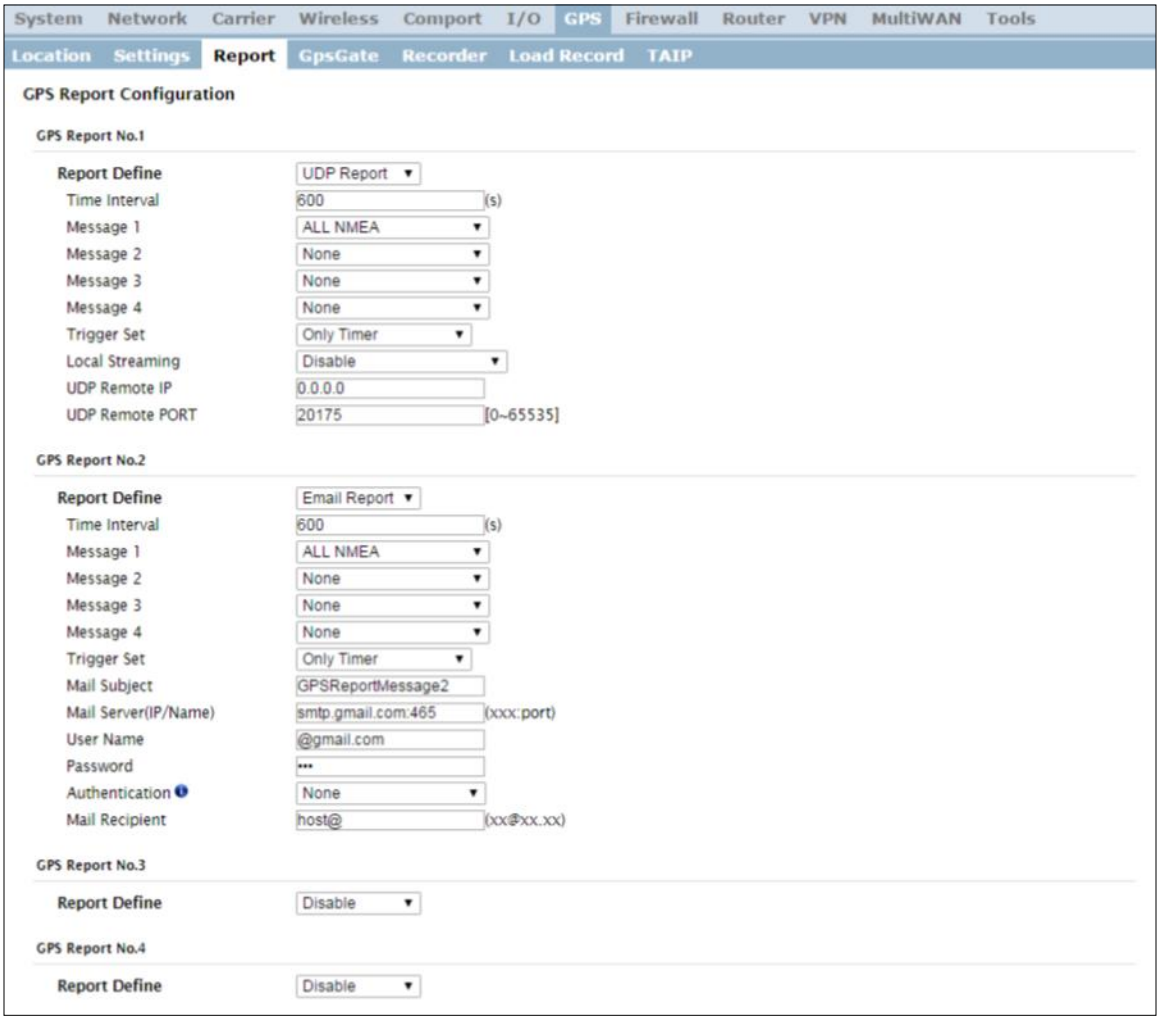


Image 4-7-3: GPS > GPS Report

Report Define	
Enable UDP and/or Email or disable GPS Reporting. Up to 4 reports can be set up and configured independently.	**Values (selection)** **Disable** UDP Report Email Report

Time Interval	
The interval timer specifies the frequency at which the GPS data is reported in seconds.	**Values (seconds)** **600**

4.0 Configuration

Message 1-4

The Message field allows customization of up to 4 different GPS messages to be sent to the specified host.

None	-	Message is not used, no data will be sent
ALL	-	Sends all of the below
GGA	-	GPS Fix Data
GSA	-	Overall Satellite Data
GSV	-	Detailed Satellite Data
RMC	-	Recommended Min Data for GPS
VTG	-	Vector Track & Ground Speed
GPSGate	-	For use with GPSGate Tracking Software

Values (selection)

None
ALL NMEA
GGA
GSA
GSV
RMC
VTG
Latitude/Longitude
GPSGate UDP Protocol

Trigger Set

The trigger condition defines the conditions that must be met before a GPS update is reported. If OR is chosen, the Repeater Timer OR the Distance trigger conditions must be met before an update is sent. The AND condition, requires that both the Repeat timer AND the Distance trigger conditions be met before an update is sent.

Values (selection)

Only Timer
Timer AND Distance
Timer OR Distance

Distance Set

The distance parameter allows the GPS data to only be sent when a specified distance has been traveled since the last report.

Values (meters)

1000

UDP Remote IP / Port

This is the IP Address and port of the remote host in which the UDP packets are to be sent.

Values (Address/Port)

0.0.0.0 / 20175

Mail Subject

If an Email report is chosen, the subject line of the Email can be defined here.

Values (characters)

1000

Mail Server

If an Email report is to be sent, the outgoing mail server must be defined, and the port number.

Values (Address:port)

smtp.gmail.com:465

Username / Password

Some outgoing mail servers required username and password to prevent an account being used for spam. Enter the login credentials here.

Values (characters)

Username / password

Mail Recipient

Some outgoing mail servers require a username and password to prevent an account being used for spam. Enter the login credentials here.

Values (characters)

host@email.com

4.0 Configuration

4.7.4 GPS > GpsGate

The VIP4G is compatible with *GpsGate - GPS Tracking Software*, which is a 3rd party mapping solution used for various GPS services including vehicle and asset tracking The VIP4G can communicate with GpsGate via Tracker Mode and TCP/IP. (UDP reporting can also send information to GpsGate, see the GPS > Report - UDP Reports)

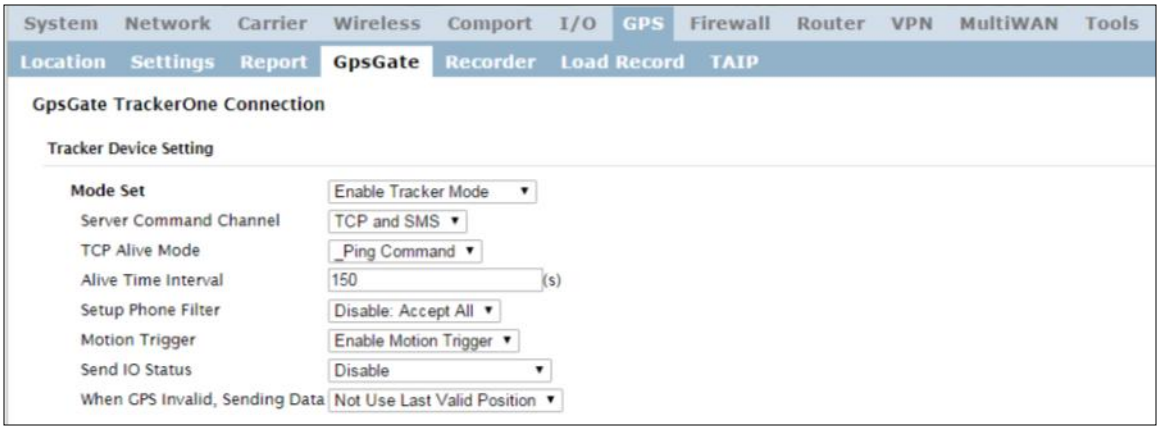


Image 4-7-4: GPS > GpsGate Tracker Mode

GpsGate - Tracker Mode

Mode Set	
Enable GpsGate Tracker Mode or TCP modes. In tracker mode The VIP4G and GpsGate software will communicate via TCP/IP, however if a connection is not available it will attempt to use SMS messaging.	**Values (selection)** **Disable** Enable Tracker Mode Enable TCP Send Mode

Server Command Channel	
By default VIP4G and GpsGate will use TCP and SMS to ensure communication between each other. It is also possible to specify TCP or SMS communication only. Initial setup in Tracker mode must be via SMS.	**Values (seconds)** **TCP and SMS** TCP Only SMS Only

TCP Alive Mode / Alive Time Interval	
TCP alive mode will keep TCP connection alive if tracker is not enabled or the tracker interval is too long. The default is 150 seconds.	**Values (seconds)** **150**

4.0 Configuration

Setup Phone Filter

A phone number filter can be applied to prevent SMS commands not intended for the VIP4G from being processed.

Values (selection)

Disable: Accept All
Enable Filter

Motion Trigger

Use this parameter to enable or disable the motion trigger in the VIP4G.

Values (selection)

Disable
Enable Motion Trigger

Send IO Status

When enabled, the VIP4G will send the current status of the Digital I/O inputs and/or outputs to the GpsGate Server.

Values (selection)

Disable
Send Input Status
Send Output Status
Send Input&Output Status

When GPS Invalid, Sending Data

Specify what happens when the GPS data is invalid, either use the last valid position or do not use the last valid position.

Values (selection)

Not Use Last Valid Position
Use Last Valid Position

GpsGate - TCP Mode

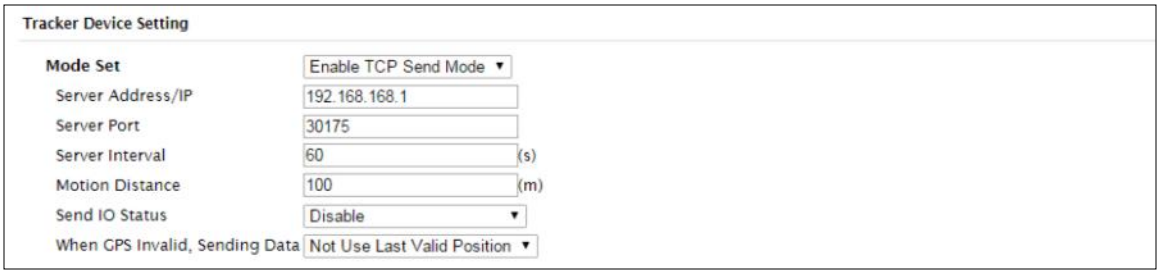


Image 4-7-5: GPS > GpsGate TCP Mode

4.0 Configuration

Mode Set

Enable GpsGate Tracker Mode or TCP modes. In TCP Mode the VIP4G will establish a connection with the GpsGate Server directly without the SMS setup process. If the TCP connection is not available, the VIP4G will continue to try to connect every few seconds.

Values (selection)

Disable
Enable Tracker Mode
Enable TCP Send Mode

Server Address / IP

Enter the IP Address of the server running the GpsGate application.

Values (IP Address)

192.168.168.1

Server Port

Enter the TCP Port of the server running the GpsGate application.

Values (Port)

30175

Server Interval

Define the interval at which the VIP4G will send data to the GpsGate Server.

Values (seconds)

60

Motion Distance

Set the motion threshold in which the VIP4G will be triggered to send location data.

Values (meters)

100

Send IO Status

When enabled, the VIP4G will send the current status of the Digital I/O inputs and/or outputs to the GpsGate Server.

Values (selection)

Disable
Send Input Status
Send Output Status
Send Input&Output Status

When GPS Invalid, Sending Data

Specify what happens when the GPS data is invalid, either use the last valid position or do not use the last valid position.

Values (selection)

Not Use Last Valid Position
Use Last Valid Position

4.0 Configuration

4.7.5 GPS > Recorder

The VIP4G can be configured to record events based on time intervals, and/or an event trigger and store them in non-volatile memory. These events can then be viewed within the WebUI, on a map, or sent to a remote server in a number of different formats.

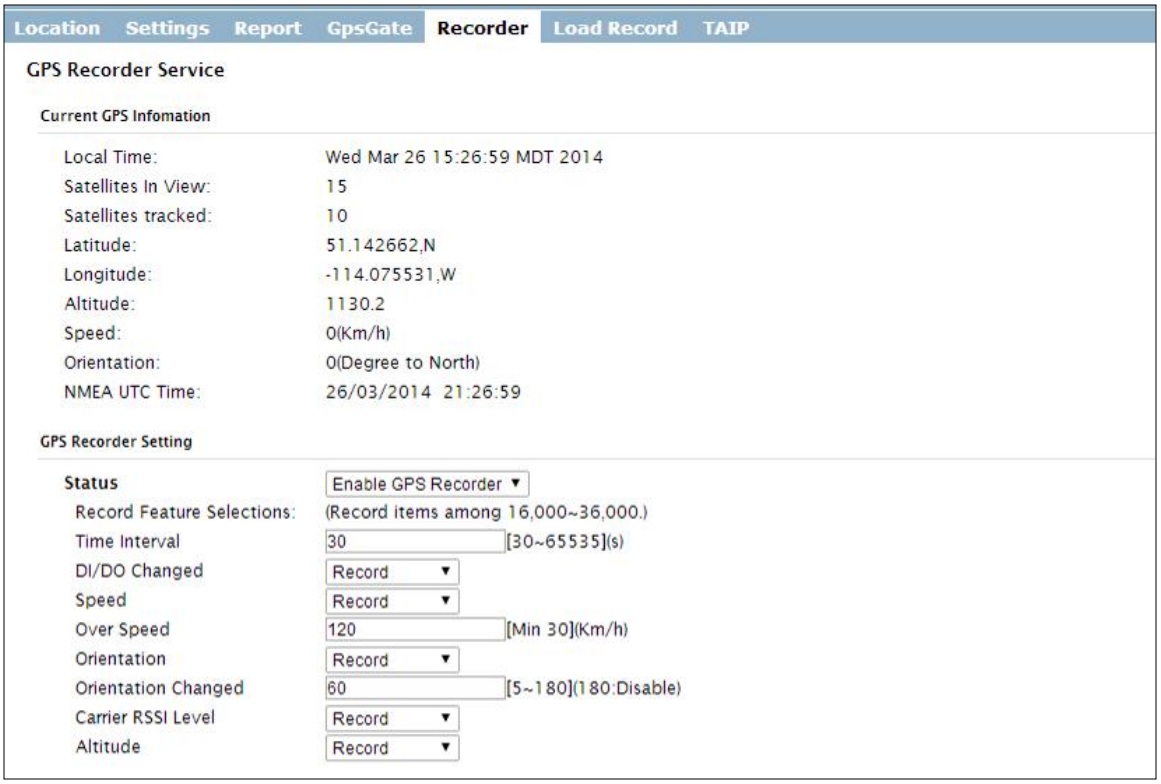


Image 4-7-6: GPS > GPS Recorder Service

Status

Use the Status parameter to enable the GPS recording functionality of the VIP4G. The total number of records that can be recorded varies between 16,000 and 36,000, depending on the number of GPS parameters that are recorded.

Values (selection)

Disable
Enable GPS Recorder

Time Interval

Define the interval at which the VIP4G will record GPS data. If there is no valid data available at the specified time (i.e. no connected satellites), the unit will wait until the next time valid information is received.

Values (seconds)

300

DI/DO Changed

The VIP4G can detect and report the current GPS info when a digital input or output status changes, regardless of the time interval setting.

Values (selection)

Record / **Don't Record**

4.0 Configuration

Speed	
Select Record to include the current speed in the reported data.	**Values (selection)** Record / **Don't Record**

Over Speed	
Trigger a GPS record entry when the speed has exceeded the configured threshold. A minimum of 30 Km/hr is required.	**Values (Km/hr)** **120**

Orientation	
Select Record to record the current orientation when a GPS entry is recorded. (Degree to North).	**Values (selection)** Record / **Don't Record**

Orientation Changed	
Record a GPS, regardless of the time interval, if the orientation of the unit changes. (5 ~ 180: 180 = Disable)	**Values (5 ~ 180)** **60**

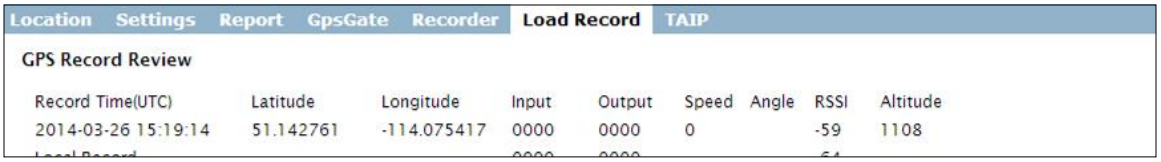
Carrier RSSI Level	
Select Record to record the current 4G/Cellular RSSI level when a GPS entry is recorded. (-dB).	**Values (selection)** Record / **Don't Record**

Altitude	
Select Record to record the current Altitude when a GPS entry is recorded (meters).	**Values (selection)** Record / **Don't Record**

4.0 Configuration

4.7.6 GPS > Load Record

Data that has been recorded and saved by the VIP4G can then be viewed or sent to a remote server in various formats. The data recorded can also be viewed directly by selecting “View Data” and the data can be traced on a map (internet access required), by selecting “Trace Map”, or “Quick Trace”. The screenshots below show the raw data that can be viewed and the Trace Map/Quick Trace output.



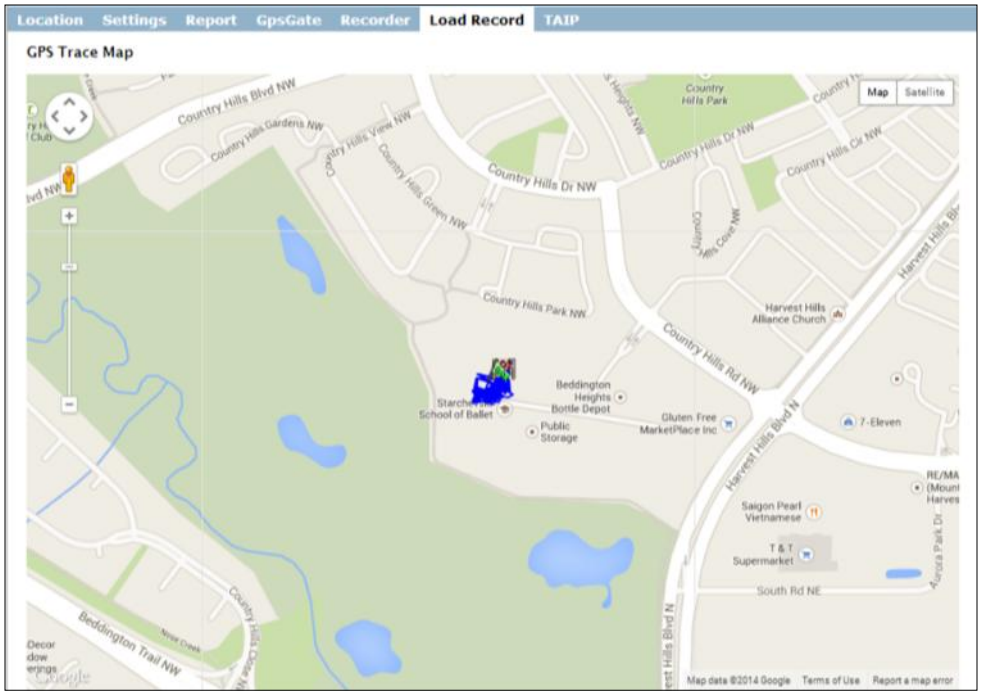


Image 4-7-7: GPS > GPS Load Record

4.0 Configuration

Record Time Range	
Check the boxes next to the records listed above that are to be sent to the server.	**Values (selection)** *(no default)*

Send Mode / Protocol	
Specify the data format / protocol type for the data to be sent.	**Values (selection)** NMEA via UDP NMEA via TCP GpsGate via UDP GpsGate via TCP **Plain Text via UDP** Plain Text via TCP

Server Address/IP	
Enter the address or IP address of the remote server to which the data is to be sent.	**Values (IP)** nms.microhardcorp.com

Server Port	
Enter the UDP/TCP port number of the remote server to which the data is to be sent.	**Values (Port)** 30175

4.0 Configuration

4.7.7 GPS > TAIP

The VIP4G has the ability to send GPS data in TAIP (Trimble ACSII Interface Protocol) format to up to 4 different TAIP servers. The following section describes the configuration parameters required to initialize TAIP reporting.

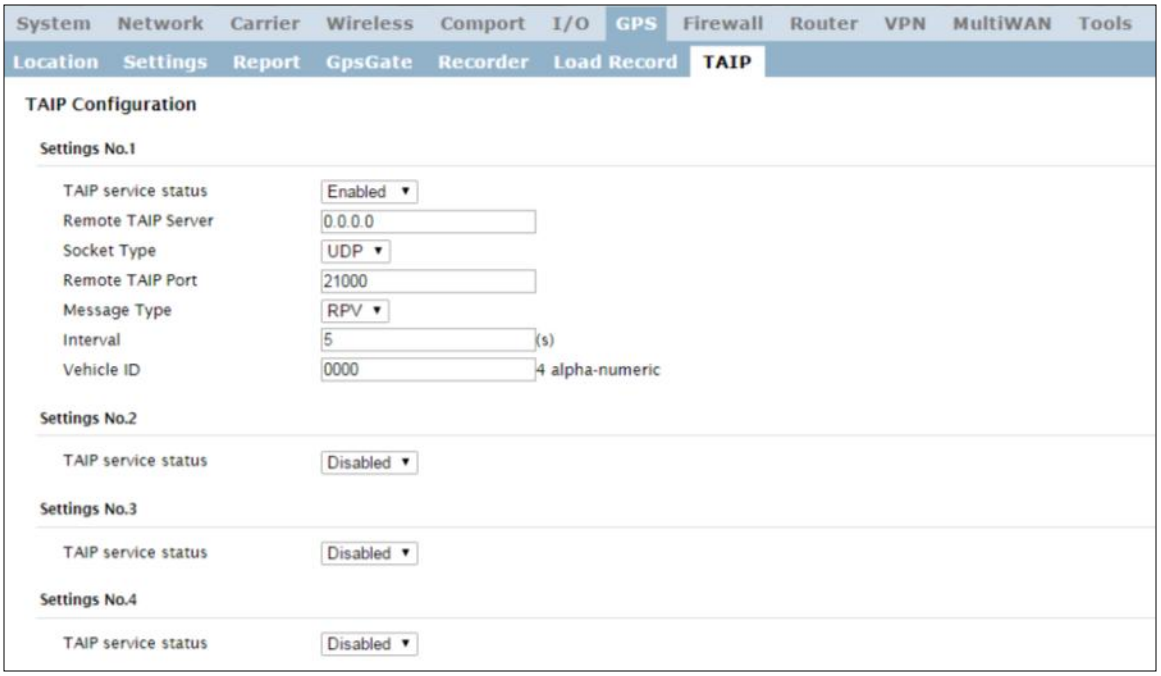


Image 4-7-8: GPS > TAIP

TAIP service status	
Enable or disable TAIP service on the VIP4G. The VIP4G can report TAIP to up to 4 different hosts.	**Values (selection)** Enable / **Disable**
Remote TAIP Server	
Enter the IP Address of the Remote TAIP Server.	**Values (IP Address)** 0.0.0.0
Socket Type	
Select the socket type that is used by the Remote TAIP server. Select TCP or UDP, this will define how the connection (TCP) or data is sent (UDP) to the server.	**Values (selection)** **UDP** / TCP
Remote TAIP Port	
Enter the TCP or UDP port number used on the Remote TAIP server.	**Values (TCP/UDP)** **UDP** / TCP

4.0 Configuration

Message Type	
Select between RPV and RLN message types. RPV - Position/Velocity RLN - Long Navigation Message	**Values (selection)** **RPV** / RLN

Interval	
Set the frequency at which TAIP messages are reported to the remote server. The unit used is seconds, and the default value is 60 seconds.	**Values (seconds)** 60

Vehicle ID	
Set the Vehicle ID using 4 alpha-numeric characters.	**Values (chars)** **0000**

4.0 Configuration

4.8 Firewall

4.8.1 Firewall > Status

Firewall Status allows a user to see detailed information about how the firewall is operating. The All, Filter, Nat, Raw, and Mangle options can be used to view different aspects of the firewall.

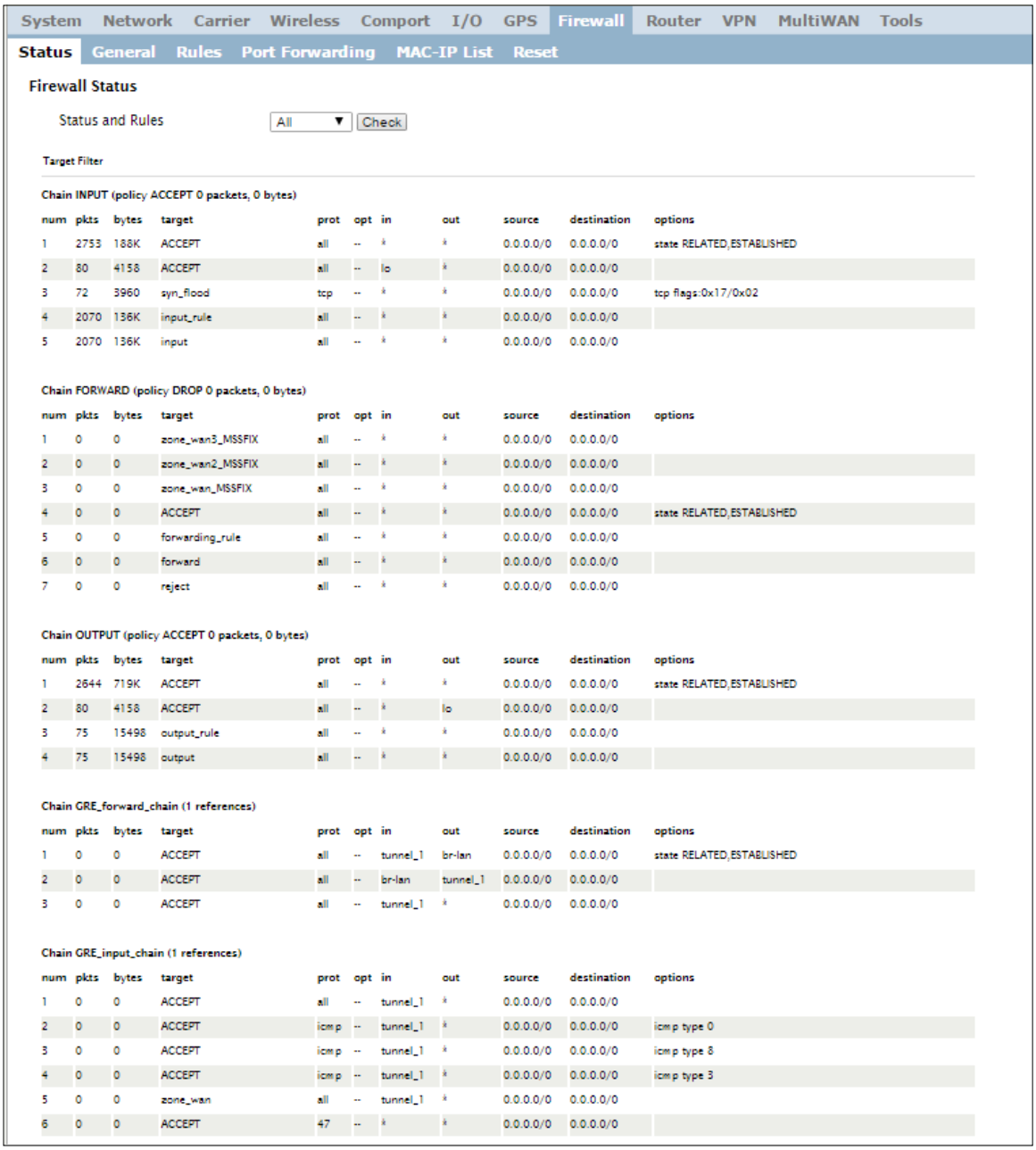


Image 4-8-1: Firewall > Status

4.0 Configuration

4.8.2 Firewall > General

The General Firewall settings allow users to enable or disable the firewall, and to decide which areas of the modem to protect. The Firewall can also be reset to factory defaults from this area of the WebUI.

In a cellular device such as this, it is highly recommended to configure the firewall to protect any devices connected to the modem, and to control data usage. This is especially important units set up with a public IP address as the modem is effectively on the public internet and is susceptible to a wide range of threats which may severely impact the data usage. This can be avoided by blocking all 4G/Cellular traffic and setting up specific rules to either open only used ports, or even restrict access to specific IP/networks.

Image 4-8-2: Firewall > General

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.

Firewall Status	
When enabled, the firewall settings are in effect. When disabled, none of the settings configured in the menu's below have an effect, the modem is "open" to anyone.	**Values** **Disable** / Enable

WAN Remote Management	
Allow remote management of the VIP4G on the WAN side using the WebUI on port 80(HTTP), and 443 (HTTPS). If disabled, the configuration can only be accessed from the LAN (or 4G if enabled)..	**Values** **Enable** / Disable

4G Remote Management	
Allow remote management of the VIP4G from the 4G side of using the WebUI on port 80(HTTP), and 443 (HTTPS). If disabled, the configuration can only be accessed from the LAN (or WAN if enabled)..	**Values** **Enable** / Disable

4.0 Configuration

WAN Request

When Blocked the VIP4G will block all requests from devices on the WAN unless specified otherwise in the Access Rules, MAC List, IP List configurations. Access to ports 80 (HTTP) and 443 (HTTPS-if enabled), is still available unless disabled in the **WAN Remote Management** option.

Values

Block / Allow

4G Request

When 4G is set to 'Allow' the modem is open to anyone, this is not recommended as it may impact data usage from unwanted sources.

When Blocked all requests from devices on the 4G (Wireless Carrier) side will be blocked, unless specified otherwise in the Access Rules, MAC List, IP List configurations. Access to ports 80 (HTTP) and 443 (HTTPS-if enabled), is still available unless disabled in the **4G Remote Management** option.

Values

Block / Allow

LAN to WAN Access Control

Allows or Blocks traffic from the LAN accessing the WAN unless specified otherwise using the Access Rules, MAC, and IP List configuration.

Values

Block / **Allow**

LAN to 4G Access Control

Allows or Blocks traffic from the LAN accessing the 4G connection unless specified otherwise using the Access Rules, MAC, and IP List configuration.

Values

Block / **Allow**

Anti-Spoof

The Anti-Spoof protection is to create some firewall rules assigned to the external interface (WAN & 4G/Cellular) of the firewall that examines the source address of all packets crossing that interface coming from outside. If the address belongs to the internal network or the firewall itself, the packet is dropped.

Values

Enable / **Disable**

Packet Normalization

Packet Normalization is the normalization of packets so there are no ambiguities in interpretation by the ultimate destination of the packet. The scrub directive also reassembled fragmented packets, protecting some operating systems from some forms of attack, and drops TCP packets that have invalid flag combinations.

Values

Enable / **Disable**

4.0 Configuration

4.8.3 Firewall > Rules

Once the firewall is turned on, rules configuration can be used to define specific rules on how local and remote devices access different ports and services. MAC List and IP List are used for general access, and are applied before rules are processed.

It is highly recommended to block as much traffic as possible from the modem, especially when using a public IP address. The best security would to be to allow traffic only from trusted IP addresses, and only the specific ports being used, and block everything else. Not configuring the firewall and the firewall rules correctly could result in unpredictable data charges from the cellular carrier.

Refer to Appendix D for an example of how to set up a firewall to block all connections and then add access to only specific IP's and Ports.

Appendix D: Firewall Example

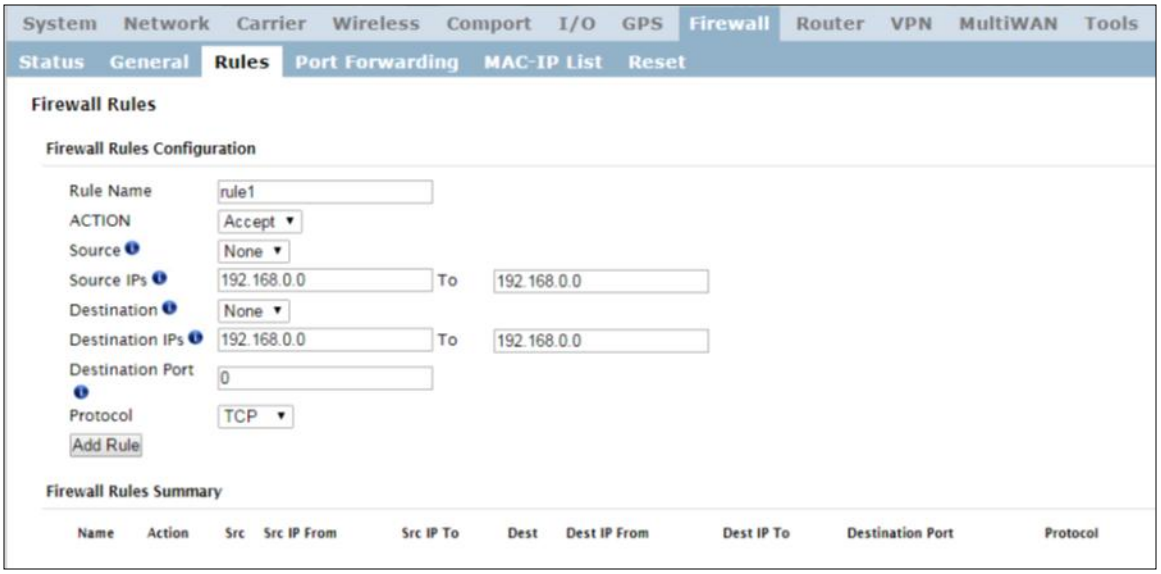


Image 4-8-3: Firewall > Rules

Rule Name	Values (10 Chars)
The rule name is used to identify the created rule. Each rule must have a unique name and up to 10 characters can be used.	characters

Action	Values (selection)
The Action is used to define how the rule handles the connection request. ACCEPT will allow a connection, while REJECT (error) and DROP (quietly dropped), will refuse connections. This is configured based on how the **WAN/4G Request** and **LAN to WAN/4G Access Control** are configured in the previous menus.	**ACCEPT** DROP REJECT

Source	Values
Select the zone which is to be the source of the data traffic. WAN applies to the WAN RJ45 connection, and 4G refers to the connection to the cellular carrier. The LAN refers to local connections on the VIP4G (Ethernet/WiFi).	LAN / 4G / WIFI / WAN **None**

4.0 Configuration

Source IPs	
Match incoming traffic from the specified source IP range. Boxes accept single IP Addresses without network masks, example: 192.168.1.0 to 192.168.1.255 represents all IP Addresses in the 192.168.1.0/24 network. (Put same IP in both boxes for a single IP match.)	**Values (IP Address)** **192.168.0.0 to 192.168.0.0**

Destination	
Select the zone which is the intended destination of the data traffic. WAN applies to the wireless connection to the cellular carrier and the LAN refers to local connections on the VIP4G (Ethernet/WiFi)	**Values (selection)** LAN / 4G / WIFI / WAN **None**

Destination IPs	
Match incoming traffic from the specified destination IP range. Boxes accept single IP Addresses without network masks, example: 192.168.1.0 to 192.168.1.255 represents all IP Addresses in the 192.168.1.0/24 network. (Put same IP in both boxes for a single IP match.)	**Values (IP Address)** **192.168.0.0 to 192.168.0.0**

Destination Port	
Match incoming traffic directed at the given destination port or port range. (To specify a port range use a From:To (100:200) format)	**Values (port)** **0**

Protocol	
The protocol field defines the transport protocol type controlled by the rule.	**Values** **TCP** UDP Both ICMP

4.0 Configuration

4.8.4 Firewall > Port Forwarding

The VIP4G can be used to provide remote access to connected devices. To access these devices a user must define how incoming traffic is handled by the VIP4G. If all incoming traffic is intended for a specific connected device, DMZ could be used to simplify the process, as all incoming traffic can be directed towards a specific IP address.

In the case where there is multiple devices, or only specific ports need to be passed, Port forwarding is used to forward traffic coming in from the WAN (Cellular) to specific IP Addresses and Ports on the LAN. Port forwarding can be used in combination with other firewall features, but the Firewall must be enabled for Port forwarding to be in effect. If the WAN Request is blocked on the General Tab, additional rules and/ or IP Lists must be set up to allow the port forwarding traffic to pass through the firewall.

IP-Passthrough (Carrier > Settings) is another option for passing traffic through the VIP4G, in this case all traffic is passed to a single device connected to a RJ45 port on the VIP4G, The device must be set for DHCP or have the WAN IP set as its static IP, as the VIP4G assigns the WAN IP to the device, and the modem enters into a transparent mode, routing all traffic to the RJ45 port. This option bypasses all firewall features of the VIP4G, as well as all other features of the VIP4G such as COM, VPN, GPS etc.

If DMZ is enabled and an exception port for the WebUI is not specified, remote management will not be possible. The default port for remote management is TCP 80.

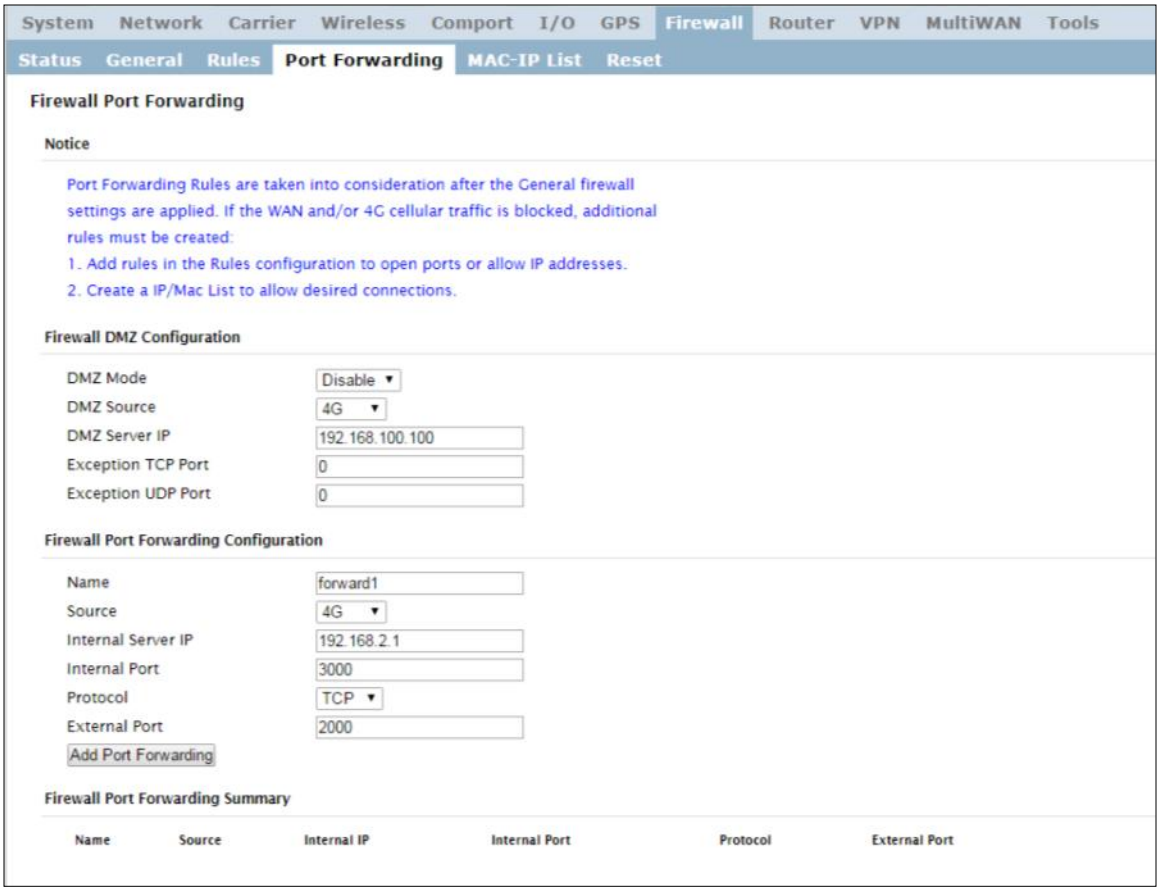


Image 4-8-4: Firewall > Port Forwarding

DMZ Mode	
Enable or disable DMZ Mode. DMZ can be used to forward all traffic to a specific IP address (DMZ Server IP) on the LAN.	**Values (selection)** **Disable** / Enable

4.0 Configuration

If the firewall is set to block incoming traffic on the WAN and/or 4G interfaces, additional rules or IP/MAC lists must be configured to allow desired traffic access.

DMZ Source	
Select the source for the DMZ traffic, either 4G or from WAN.	**Values (selection)** **4G /** WAN

DMZ Server IP	
Enter the IP address of the device on the LAN side of the VIP4G where all the traffic will be forwarded to.	**Values (IP Address)** **192.168.100.100**

Exception Port	
Enter a exception port number that will NOT be forwarded to the DMZ server IP. Usually a configuration or remote management port that is excluded to retain external control of the VIP4G.	**Values (Port #)** **443**

Name	
This is simply a field where a convenient reference or description is added to the rule. Each Forward must have a unique rule name and can use up to 10 characters.	**Values (10 chars)** **Forward**

Source	
Select the source for the DMZ traffic, either 4G or from WAN.	**Values (selection)** **4G /** WAN

Internal Server IP	
Enter the IP address of the intended internal (i.e. on LAN side of VIP4G) server. This is the IP address of the device you are forwarding traffic to.	**Values (IP Address)** **192.168.2.1**

Internal Port	
Target port number of internal server on the LAN IP entered above.	**Values (Port #)** **3000**

Protocol	
Select the type of transport protocol used. For example Telnet uses TCP, SNMP uses UDP, etc.	**Values (selection)** **TCP /** UDP / Both

External Port	
Port number of incoming request (from 4G/WAN-side).	**Values (Port #)** **2000**

4.0 Configuration

4.8.5 Firewall > MAC-IP List

MAC List configuration can be used to control which physical LAN devices can access the ports on the VIP4G, by restricting or allowing connections based on the MAC address. IP List configuration can be used to define who or what can access the VIP4G, by restricting or allowing connections based on the IP Address/Subnet.

MAC-IP List can be used alone or in combination with LAN to WAN/4G Access Control to provide secure access to the physical ports of the VIP4G.

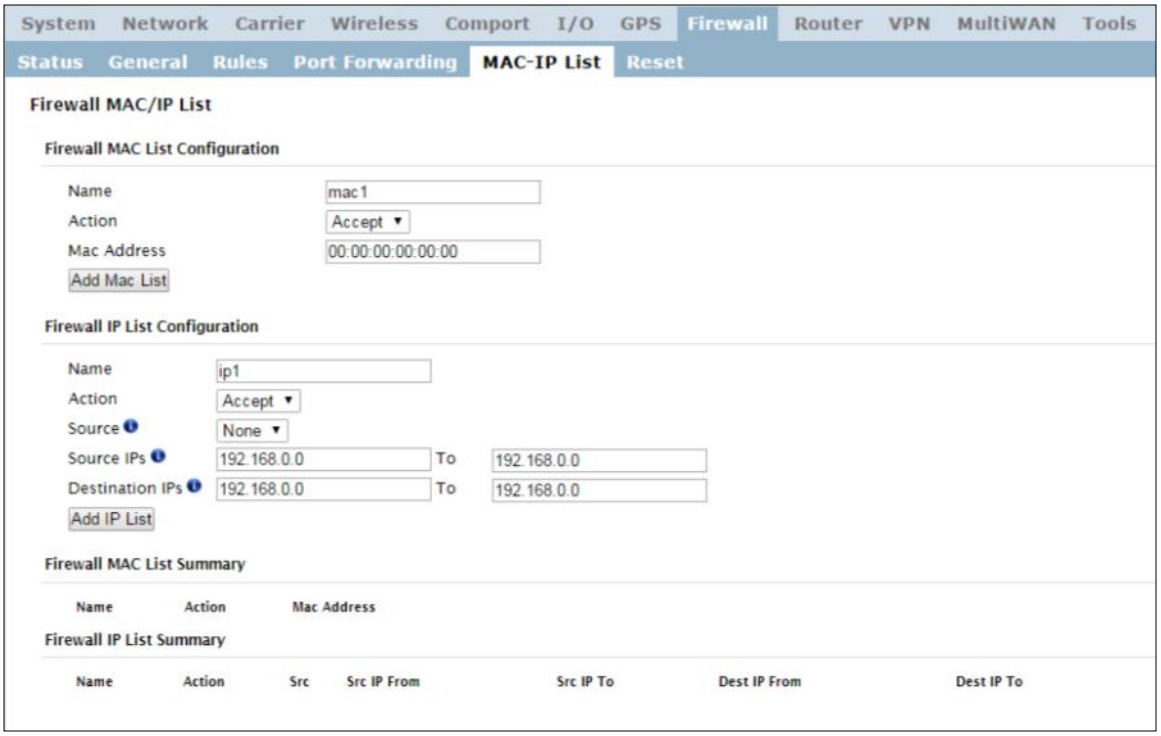


Image 4-8-5: Firewall > MAC-IP List

Firewall MAC List Configuration

Rule Name	
The Rule Name field is required to give the rule a convenient name for reference. Each rule must have a unique name, up to 10 characters in length.	**Values (10 chars)** **MAC_List**

MAC Address	
Specify the MAC Address to be added to the list. Must be entered in the correct format as seen above. Not case sensitive.	**Values (MAC Address)** **00:00:00:00:00:00**

4.0 Configuration

Firewall MAC List Configuration (Continued)

Action	
The Action is used to define how the rule handles the connection request. ACCEPT will allow a connection, while REJECT (error) and DROP (quietly dropped), will refuse connections.	**Values (selection)** **ACCEPT** DROP REJECT

Firewall IP List Configuration

Rule Name	
The Rule Name field is required to give the rule a convenient name for reference. Each rule must have a unique name, up to 10 characters in length.	**Values (10 chars)** **IP_List**

Action	
The Action is used to define how the rule handles the connection request. ACCEPT will allow a connection, while REJECT (error) and DROP (quietly dropped), will refuse connections.	**Values (selection)** **ACCEPT /** DROP / REJECT

Source	
Enter the specific zone that the IP List will apply to, 4G (Cellular), WAN , LAN (Ethernet, WiFi) or None (both).	**Values (Selection)** LAN / WAN / / WIFI / 4G / **NONE**

Source Address	
Match incoming traffic from the specified source IP range. Boxes accept single IP Addresses without network masks, example: 192.168.1.0 to 192.168.1.255 represents all IP Addresses in the 192.168.1.0/24 network. (Put same IP in both boxes for a single IP match.)	**Values (IP Address)** **192.168.0.0 to 192.168.0.0**

Destination Address	
Match incoming traffic from the specified destination IP range. Boxes accept single IP Addresses without network masks, example: 192.168.1.0 to 192.168.1.255 represents all IP Addresses in the 192.168.1.0/24 network. (Put same IP in both boxes for a single IP match.)	**Values (IP Address)** **192.168.0.0 to 192.168.0.0**

4.0 Configuration

4.8.6 Firewall > Reset

To reset the firewall back to default settings and erase all rules, port forwards, and IP/MAC lists, use the reset button see below:

Image 4-8-6: Firewall > Reset to Defaults

4.0 Configuration

4.9 Router

4.9.1 Router > RIPV2

The VIP4G is capable of providing and participating in RIPv2 (Routing Information Protocol v2), to exchange routing information from attached devices. Static routes can also be added in the Network > Routes menu.

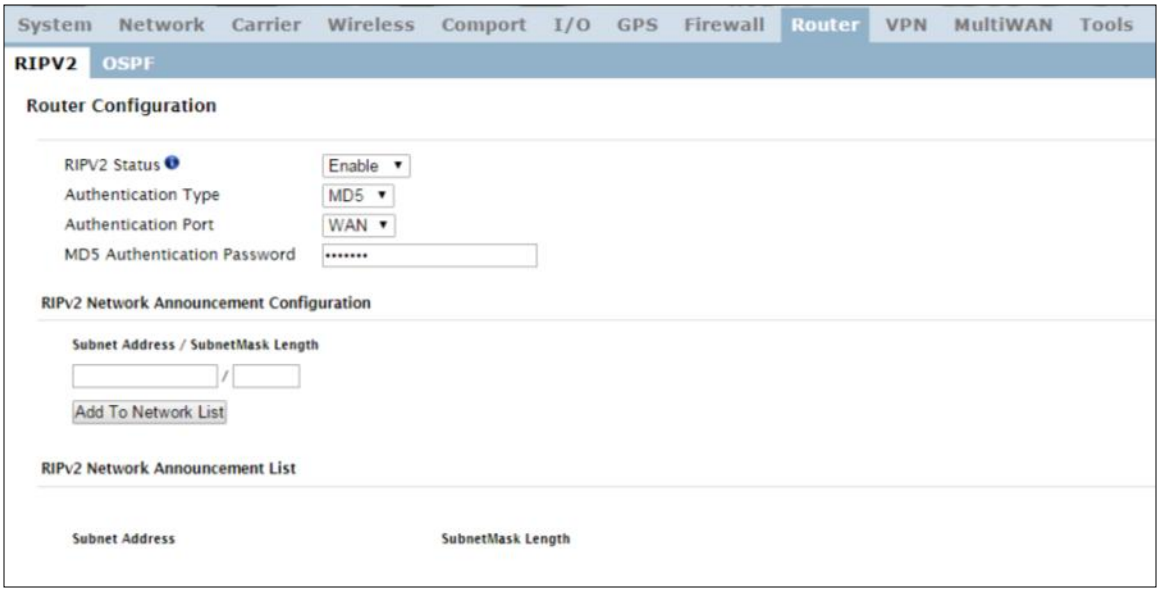


Image 4-9-1: Router > RIPv2

RIPV2 Status	
Enable or disable RIPV2 routing on the VIP4G. If enabled the VIP4G will exchange routing information on the specified (interfaces) attached networks.	**Values (selection)** Enable / **Disable**

Authentication Type / Port / Password	
Enable MD5 authentication on for the RIPV2 protocol. Also select the port used for RIPV2, and the required password.	**Values (selection)** None **MD5**

RIPV2 Network Announcement Configuration	
Each attached network that is to participate with the RIPV2 exchange must be specified here. Once added they participating networks are shown in the list.	**Values (Subnet/Length))** *(no default)*

4.0 Configuration

4.9.2 Router > OSPF

The VIP4G is also capable of providing and participating in OSPF (Open Shortest Path First), to exchange routing information from attached devices. Static routes can also be added in the Network > Routes menu.

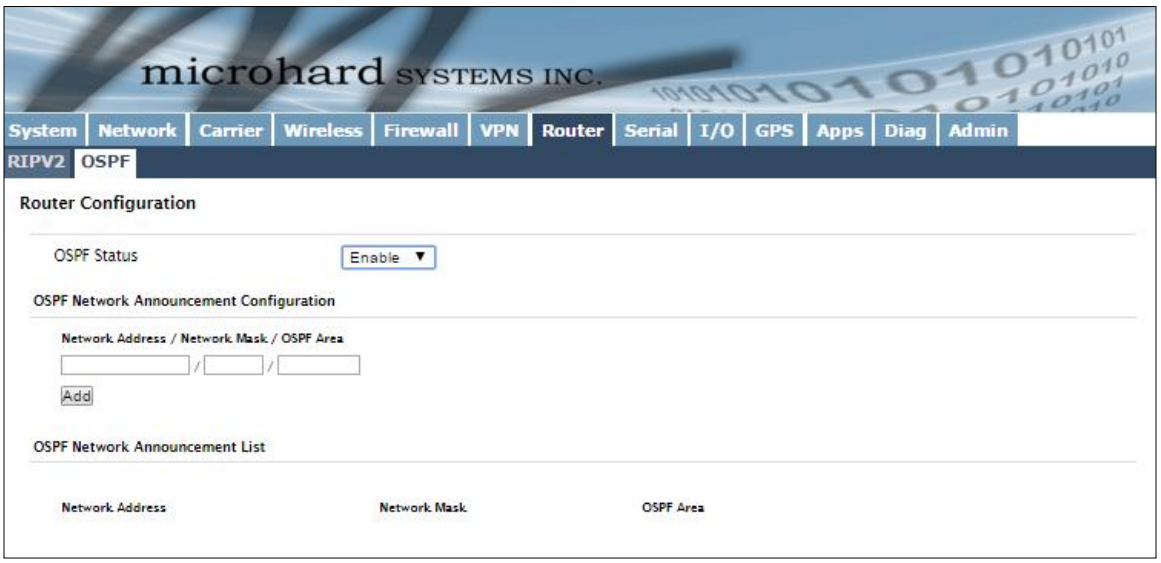


Image 4-9-2: Router > OSPF

OSPF Status	
Enable or disable OSPF routing on the VIP4G. If enabled the VIP4G will exchange routing information on the specified (interfaces) attached networks.	**Values (selection)** Enable / **Disable**

OSPF Network Announcement Configuration	
Each attached network that is to participate with the OSPF exchange must be specified here. Once added they participating networks are shown in the list.	**Values (Subnet/Length))** *(no default)*

4.0 Configuration

4.10 VPN

4.10.1 VPN > Summary

A Virtual Private Network (VPN) may be configured to enable a tunnel between the VIP4G and a remote network.. The VIP4G supports VPN IPsec Gateway to Gateway (site-to-site) tunneling, meaning you are using the VIP4G to connect a tunnel to network with VPN capabilities (Another VIP4G or VPN capable device). The VIP4G can also operate as a L2TP Server, allowing users to VPN into the unit from a remote PC, and a L2TP Client.

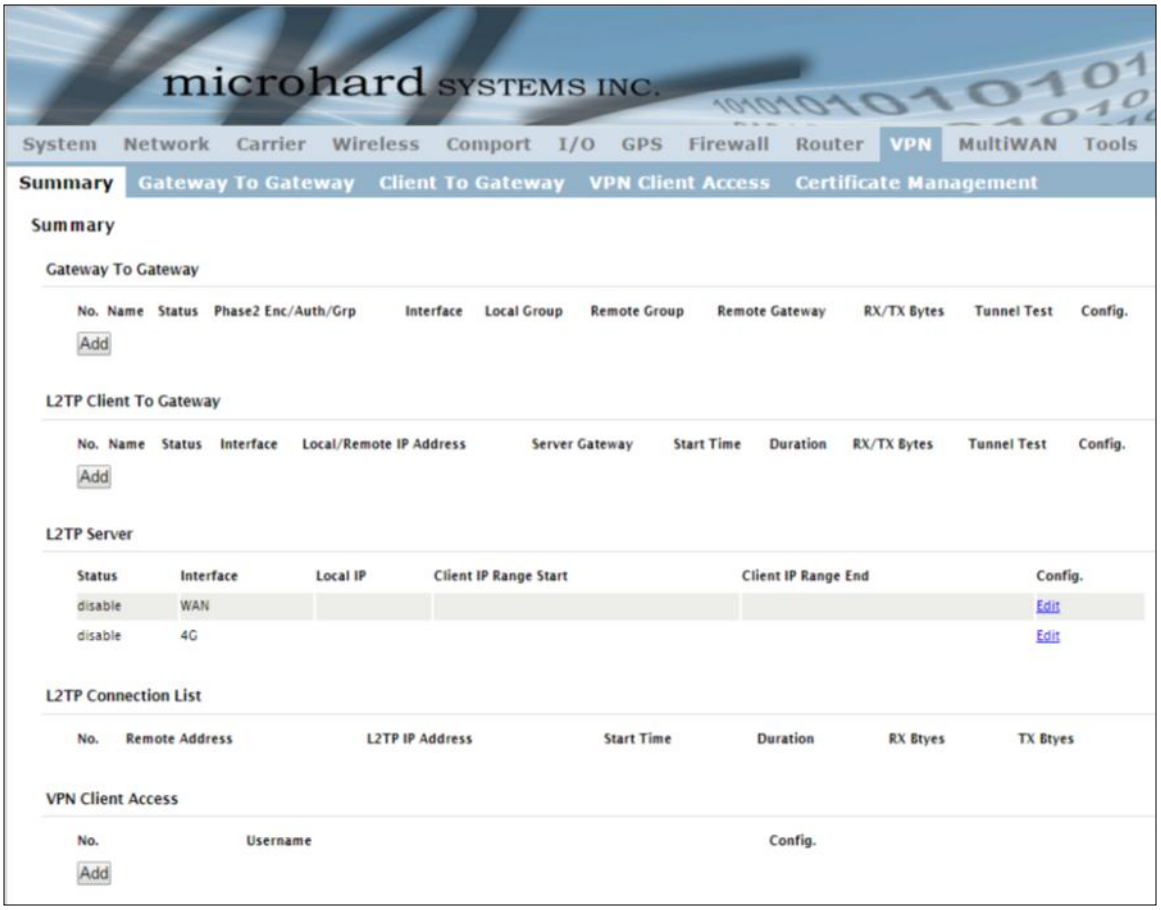


Image 4-10-1: VPN > Summary

4.0 Configuration

4.9.2 VPN > Gateway To Gateway (Site-to-Site)

A Gateway to Gateway connection is used to create a tunnel between two VPN devices such as an VIP4G and another device (another VIP4G or Cisco VPN Router or another vendor…). The local and remote group settings will need to be configured below to mirror those set on the other VPN device.

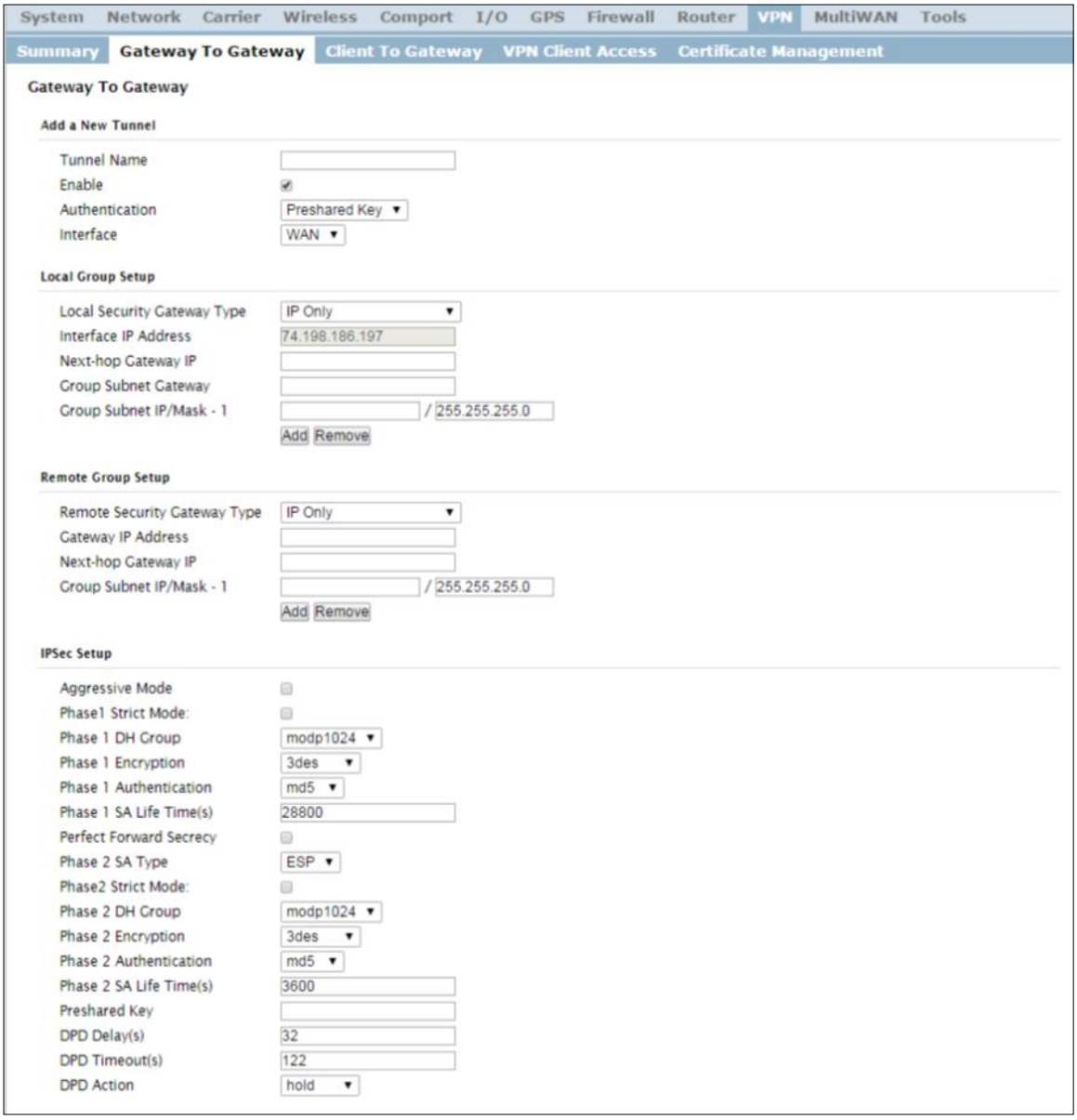


Image 4-9-2: VPN > Gateway to Gateway

Tunnel Name	
Enter a name for the VPN Tunnel. Up to 16 different tunnels can be created, each requiring a unique name.	**Values (chars)** **tunnel1**

4.0 Configuration

Enable

Used to enable (checked) is disable (unchecked) the VPN tunnel.

Values (checkbox)

Enable (Checked)

Local Group Setup

Local Security Gateway Type

Specify the method for identifying the router to establish the VPN tunnel. The Local Security Gateway is on this router; the Remote Security Gateway is on the other router. At least one of the routers must have either a static IP address or a dynamic IP with server id to make a connection.

Values (selection)

IP Only
IP + Server ID
Dynamic IP + Server ID

IP Only: Choose this option if this router has a static WAN IP address. The WAN IP address appears automatically. For the Remote Security Gateway Type, an extra field appears. If you know the IP address of the remote VPN router, choose IP Address, and then enter the address.

IP + Server ID: Choose this option if this router has a static WAN IP address and a server id. The WAN IP address appears automatically. For the Remote Security Gateway Type, an extra field appears. If you know the IP address of the remote VPN router, choose IP Address, and then enter the address.

Dynamic IP + Server ID: Choose this option if this router has a dynamic IP address and a server id (available such as @microhard.vpn). Enter the server id to use for authentication. The server id can be used only for one tunnel connection.

Interface IP Address

Displays the IP address of the VIP4G, which is the local VPN Gateway.

Values (IP Address)

Current IP Address

Server ID

This option appears when the Local Security Gateway Type specifies that the Server ID is required for the connection. The Server ID must be in the format @name, where name can be anything. Both routers must know each others names to establish a connection.

Values (IP Address)

(no default)

Next-hop Gateway IP

Next-hop Gateway means the next-hop gateway IP address for the local or remote gateway participant's connection to the public network.

Values (IP Address)

(no default)

Group Subnet IP

Define the local network by specifying the local subnet. The local and remote routers must use different subnets.

Values (IP Address)

(no default)

4.0 Configuration

Group Subnet Mask	
Specify the subnet mask of the local network address.	**Values (IP Address)** **255.255.255.0**

Group Subnet Gateway	
Enter the Gateway for the local group network.	**Values (IP Address)** *(no default)*

Remote Group Setup

Remote Security Gateway Type	
Specify the method for identifying the router to establish the VPN tunnel. The Local Security Gateway is on this router; the Remote Security Gateway is on the other router. At least one of the routers must have either a static IP address or a dynamic IP with server id to make a connection. (See Local Group Setup for details)	**Values (selection)** IP Only **IP + Server ID** Dynamic IP + Server ID

Gateway IP Address	
If the remote VPN router has a static IP address, enter the IP address of the remote VPN Gateway here.	**Values (IP Address)** *(no default)*

Server ID	
This option appears when the Remote Security Gateway Type specifies that the Server ID is required for the connection. The Server ID must be in the format @name, where name can be anything. Both routers must know each others names to establish a connection.	**Values (IP Address)** *(no default)*

Next-hop Gateway IP	
Next-hop Gateway means the next-hop gateway IP address for the local or remote gateway participant's connection to the public network.	**Values (IP Address)** *(no default)*

Subnet IP Address	
Define the remote network by specifying the local subnet.	**Values (IP Address)** *(no default)*

Subnet Mask	
Specify the subnet mask of the remote network address.	**Values (IP Address)** **255.255.255.0**

4.0 Configuration

IPsec Setup

Phase 1 DH Group	
Select value to match the values required by the remote VPN router.	**Values (selection)** **modp1024** modp1536 modp2048

Phase 1 Encryption	
Select value to match the Phase 1 Encryption type used by the remote VPN router.	**Values (selection)** 3des aes aes128 aes256

Phase 1 Authentication	
Select value to match the Phase 1 Authentication used by the remote VPN router.	**Values (selection)** md5 sha1

Phase 1 SA Life Time	
Select value to match the values required by the remote VPN router.	**Values** **28800**

Perfect Forward Secrecy (pfs)	
Select value to match the values required by the remote VPN router.	**Values (selection)** **Disable** / Enable

Phase 2 DH Group	
Select value to match the values required by the remote VPN router.	**Values (selection)** **modp1024** modp1536 modp2048

Phase 2 Encryption	
Select value to match the Phase 1 Encryption type used by the remote VPN router.	**Values (selection)** 3des aes aes128 aes256

4.0 Configuration

Phase 2 Authentication	
Select value to match the Phase 1 Authentication used by the remote VPN router.	**Values (selection)** md5 sha1

Phase 2 SA Life Time	
Select value to match the values required by the remote VPN router.	**Values** **3600**

Preshared Key	
Set the Preshared Key required to authenticate with the remote VPN router.	**Values (characters)** **password**

DPD Delay(s)	
Dead Peer Detection is used to detect if there is a dead peer. Set the DPD Delay (seconds), as required.	**Values (seconds)** **32**

DPD Timeout(s)	
Set the DPD (Dead Peer Detection) Timeout (seconds), as required.	**Values (seconds)** **122**

DPD Action	
Set the DPD action, hold or clear, as required.	**Values (seconds)** **Hold** Clear

4.0 Configuration

4.10.3 VPN > Client To Gateway (L2TP Client)

The VIP4G can operate as a L2TP Client, allowing a VPN connection to be made with a L2TP Server.

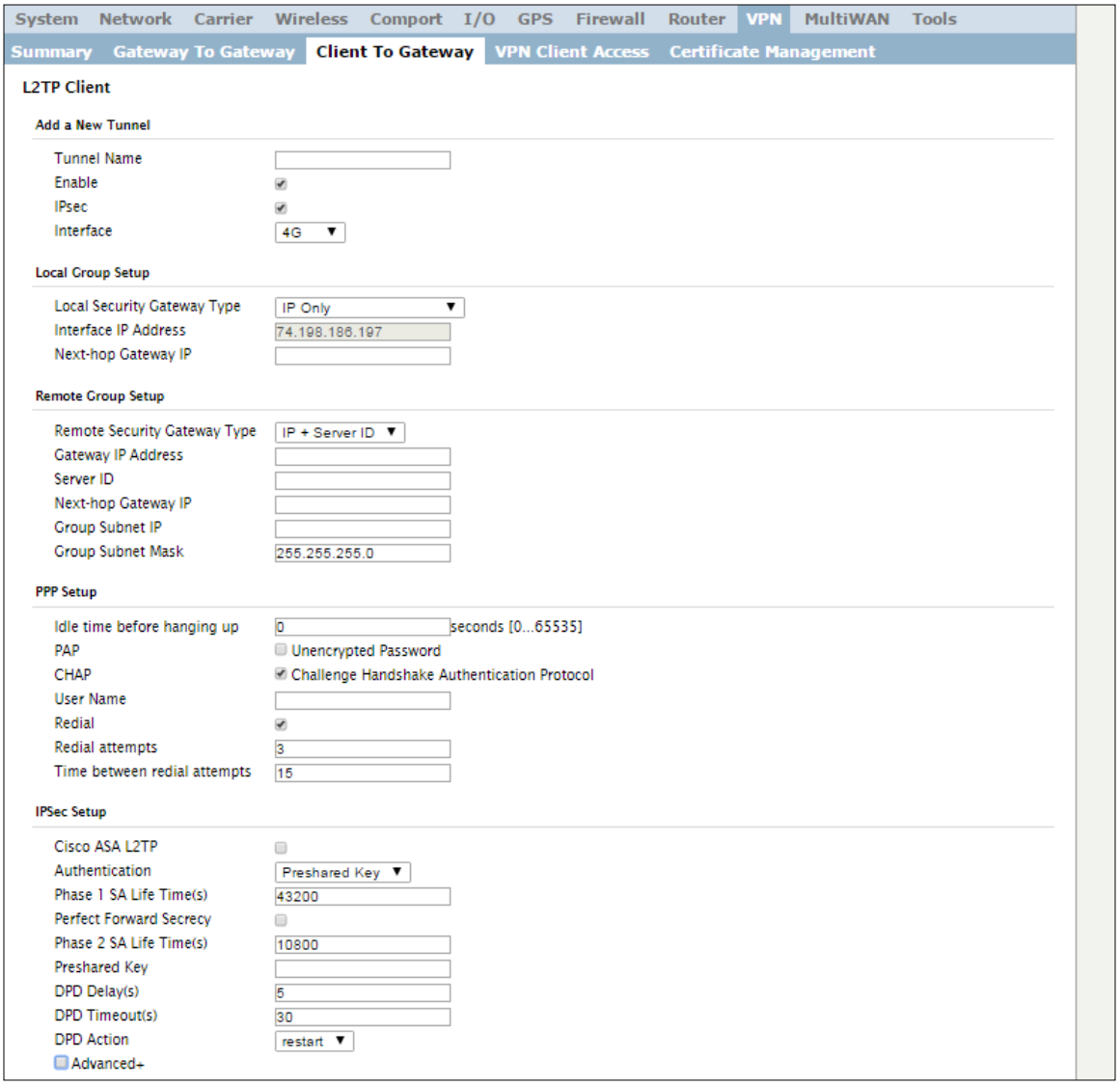


Image 4-10-3: VPN > Client to Gateway

Tunnel Name	
Enter a name for the VPN Tunnel. Up to 16 different tunnels can be created, each requiring a unique name.	**Values (chars)** **tunnel1**

Enable	
Used to enable (checked) is disable (unchecked) the VPN tunnel.	**Values (checkbox)** **Enable (Checked)**

4.0 Configuration

Local Interface IP Address	
This will show the WAN or 4G IP Address used for the L2TP Interface.	**Values (IP Address)** ***Current IP***

Remote Gateway IP Address	
Enter the IP Address of the Remote Gateway that you wish to establish a connection with.	**Values (IP Address)** *none*

Remote Server ID	
Some servers require that you know the Server ID as well as the IP address. Enter the Server ID of the remote router here.	**Values** *none*

Remote Subnet IP	
In order to communicate with the devices on the other side of the tunnel, the VIP4G must know which data to pass through the tunnel, to do this enter the Remote Subnet network IP address here.	**Values (IP Address)** *none*

Remote Subnet Mask	
Enter the Remote Subnet Mask	**Values (IP Address)** *none*

Idle time before hanging up	
Enter the Idle time (in seconds) to wait before giving up the PPP connection. The default is 0, which means the time is infinite. (0—65535)	**Values (seconds)** *0*

Username	
Enter the Username	**Values (chars)** *0*

Preshared Key	
The preshared key is required to connect to the L2TP Server.	**Values (chars)** *0*

IPSec Setup - See previous sections for additional info.

4.0 Configuration

4.10.4 VPN > VPN Client Access

For VPN L2TP Server operation, users will be required to provide a username and password. Use VPN Client Access to set up the required users.

Image 4-10-4: VPN > VPN Client Access

Username	
Enter a username for the user being set up.	**Values (characters)**

New Password	
Enter a password for the use.	**Values (characters)**

Confirm New Password	
Enter the password again, the VIP4G will ensure that the password match.	**Values (IP Address)**

4.0 Configuration

4.10.5 VPN > Certificate Management

When using the VPN features of the VIP4G, it is possible to select X.509 for the Authentication Type. If that is the case, the VIP4G must use the required x.509 certificates in order to establish a secure tunnel between other devices. Certificate Management allows the user a place to manage these certificates.

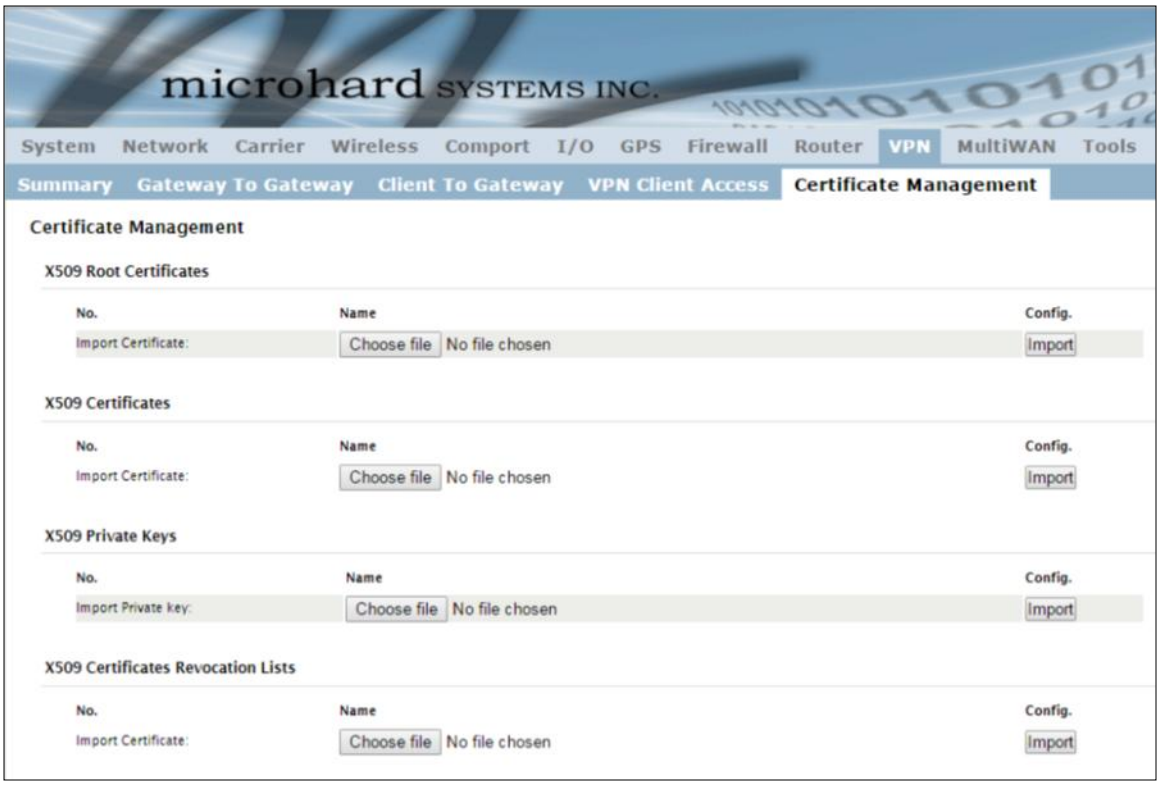


Image 4-10-5: VPN > Certificate Management

4.0 Configuration

4.11 MultiWAN

4.11.1 MultiWAN > Status

The VIP4G is capable of having 2 WAN connections, one connected to the physical WAN port on the VIP4G and the Cellular WAN connection to the wireless carrier. The MultiWAN section allows a user to define how traffic uses these WAN's.

The main purpose of the MultiWan feature is to use one network for a primary connection, such as a local, wired ISP for broadband access, and if that connection fails or is offline, the VIP4G can automatically switch to an alternate network connection such as the 4G/Cellular connection.

The Status menu gives an overview of both WAN connections and their configuration. WAN group 1 is the wired WAN and WAN group 2 is the 4G/Cellular connection to a wireless carrier.

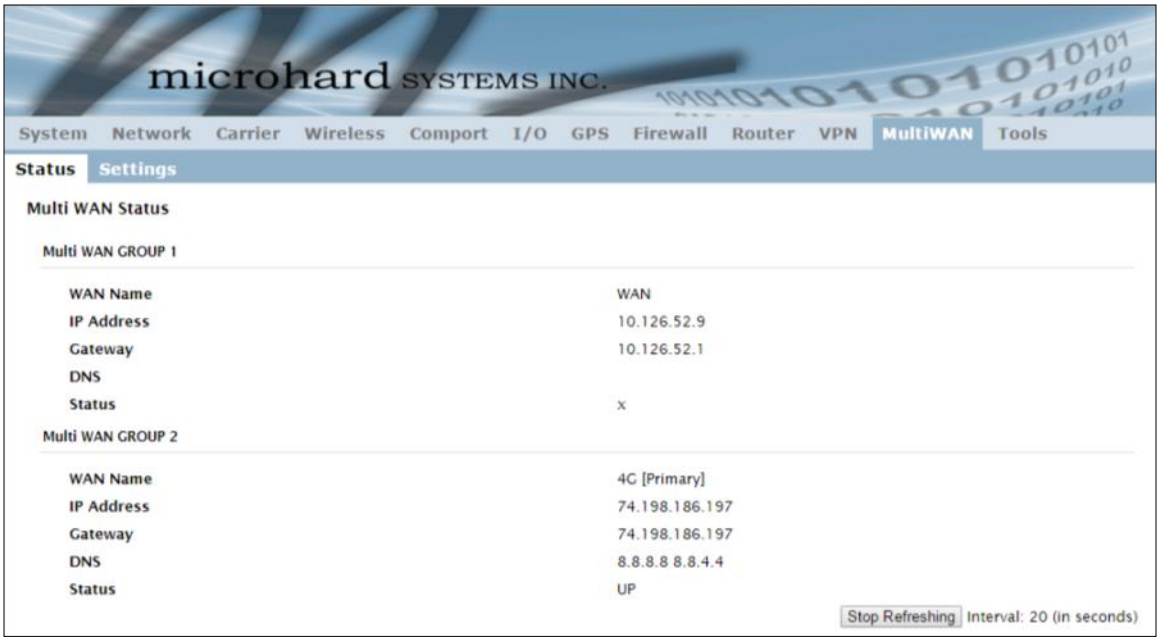


Image 4-10-1: MultiWAN > Status

4.0 Configuration

4.10.2 MultiWAN > Settings

The following section describes the parameters required for MultiWan for failover purposes. The configuration for each interface in identical, so will only be described once.

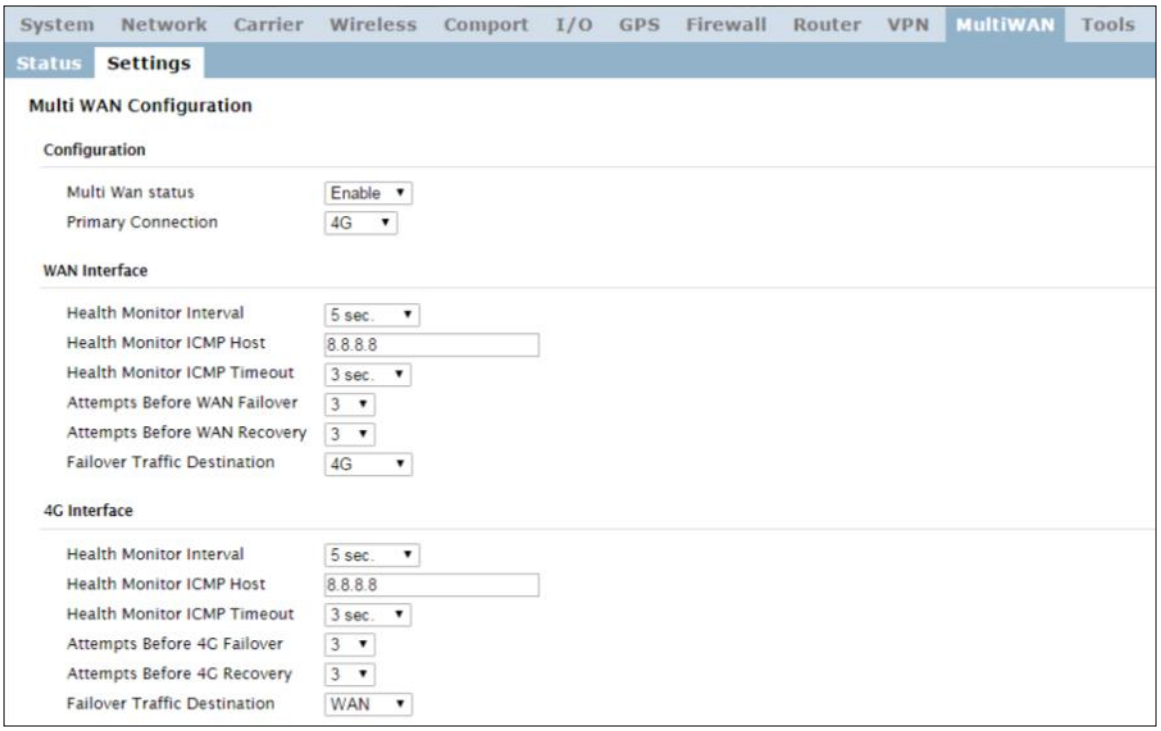


Image 4-10-2: MultiWAN > Settings

Multi Wan status

Enable or disable the MultiWan service on the VIP4G.

To use MultiWAN, the WAN (wired) must be configured as independent in the Network > WAN settings and/or the Wireless must be set to Client & bound to the WIFI interface.

Values (selection)

Enable / **Disable**

Primary Connection

Define which connection is the primary network/internet connection for the VIP4G. Normally this is the wired WAN connection to an ISP.

Values (selection)

WAN / 4G / WIFI

4.0 Configuration

Health Monitor Interval

This is the frequency at which the VIP4G will send ICMP packets to the defined host to determine if the interface has failed.

Values (selection)

5,10,20,30,60,120(sec.)
Disable

Health Monitor ICMP Host

This is the IP Address or domain name of a valid reachable host that can be used to determine link health.

Values (Address)

8.8.8.8

Health Monitor ICMP Timeout

This is the amount of time the Health Monitor will wait for a response from the ICMP Host.

Values (selection)

1, 2, **3**, 4, 5, 10 (seconds)

Attempts Before WAN Failover

This is the number of attempts the VIP4G will attempt to reach the IMCP host before going into failover and switching WAN interfaces.

Values (selection)

1, **3**, 5, 10, 15, 20

Attempts Before WAN Recovery

The VIP4G will continue to monitor the failed interface, even after failover has occurred. This defines the number of successful attempts required before recovering the failed interface.

Values (selection)

1, **3**, **5**, 10, 15, 20

Failover Traffic Destination

Select the interface to use once failover has occurred.

Values (selection)

4G, WAN, Disable

4.0 Configuration

4.12 Tools

4.12.1 Tools > Discovery

Network Discovery

The Network discovery tool allows the VIP4G to send a broadcast to all VIP4G/VIP Series units on the same network. Other units on the network will respond to the broadcast and report their MAC address, IP address (With a hyperlink to that units WebUI page), description, firmware version, operating mode, and the SSID (regardless of whether it was set to broadcast or not).

The discovery service can be a useful troubleshooting tool and can be used to quickly find and indentify other units on the network. It can be disabled from the Network > sdpServer menu.

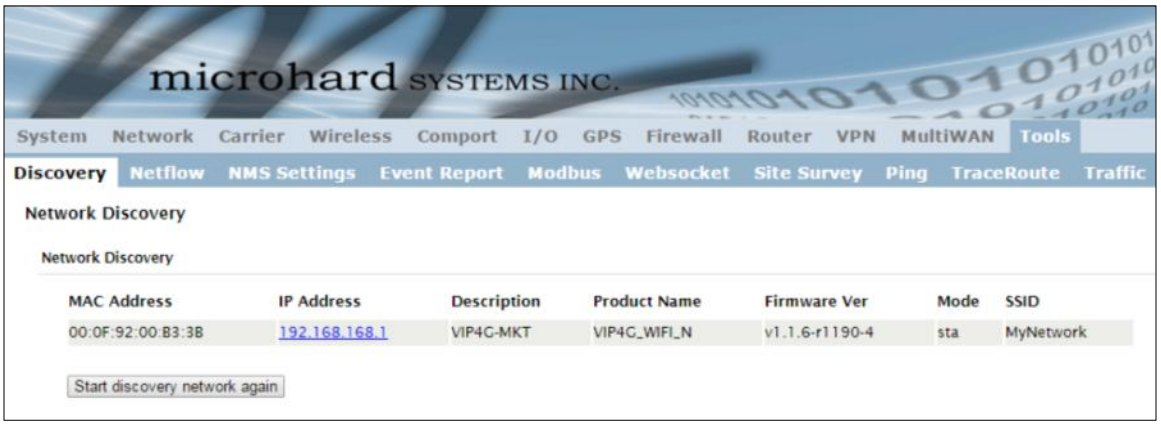


Image 4-12-1: Tools > Discovery

To begin, click the ***Start discovery network again*** button, the VIP4G will send out a broadcast message, and will report back, by populating the network discovery screen as seen above. This will detect any VIP4G or Microhard enabled devices on the local broadcast domain, regardless of the IP address or subnet. Once devices are found, and if on a accessible subnet, the IP Address link can be used to automatically open a web browser WebUI session with that unit.

4.0 Configuration

4.12.2 Tools > Netflow Report

The VIP4G can be configured to send Netflow reports to up to 3 remote systems. Netflow is a tool that collects and reports IP traffic information, allowing a user to analyze network traffic on a per interface basis to identity bandwidth issues and to understand data needs. Standard Netflow Filters can be applied to narrow down results and target specific data requirements.

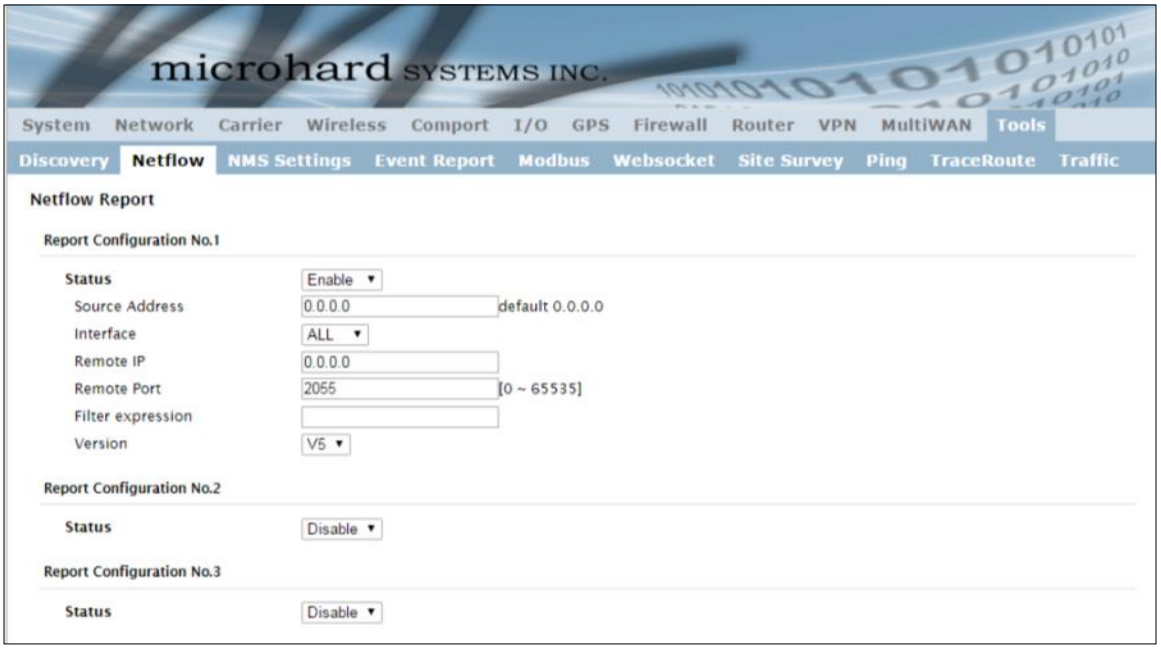


Image 4-12-2: Tools > Netflow Report

Status	
Enable / Disable Netflow Reporting.	**Values (selection)** **Disable /** Enable

Source Address	
The Source Address is the IP Address, of which data is to be collected and analyzed. The default of 0.0.0.0 will collect and report information about all addresses connected to the interface selected below.	**Values (IP Address)** **0.0.0.0**

Interface	
Select between WAN ,4G/Cellular and LAN interfaces, or capture data from all interfaces.	**Values (selection)** **LAN /** WAN / 4G / ALL

4.0 Configuration

Remote IP	
The Remote IP is the IP Address of the NetFlow collector where the flow reports are be sent.	**Values (IP Address)** **0.0.0.0**

Remote Port	
Enter the Remote Port number.	**Values (IP Address)** **0**

Filter expression	
Filter expression selects which packets will be captured. If no expression is given, all packets will be captured. Otherwise, only packets for which expression is `true' will be captured. Example: **tcp&&port 80** *The "tcpdump" manual, available on the internet provides detailed expression syntax.*	**Values (chars)** *(no default)*

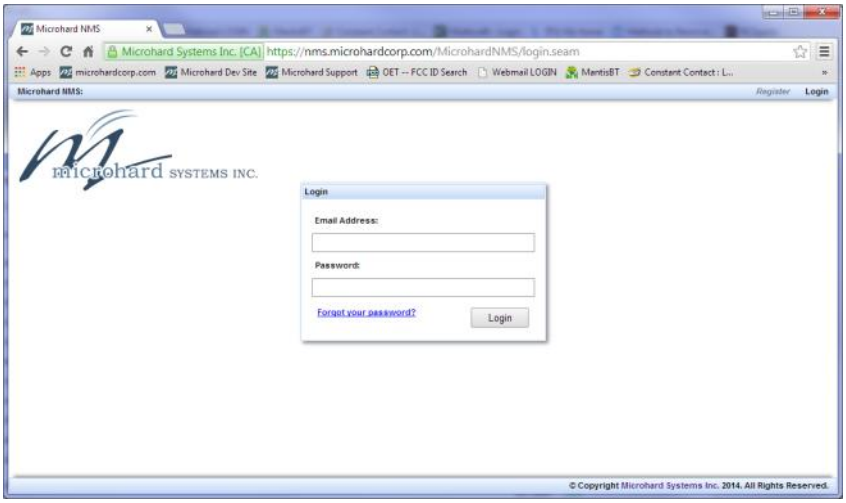
Version	
Select the Netflow version format to use. V1, 5 and 7 are supported.	**Values (selection)** **V1** / V5 / V7

4.0 Configuration

4.12.3 Tools > NMS Settings

The Microhard NMS is a no cost server based monitoring and management service offered by Microhard Systems Inc. Using NMS you can monitor online/offline units, retrieve usage data, perform backups and centralized upgrades, etc. The following section describes how to get started with NMS and how to configure the VIP4G to report to NMS.

To get started with NMS, browse to the Microhard NMS website, **nms.microhardcorp.com**, click on the register button in the top right corner to register for a Domain (profile), and set up a Domain Administrator Account.



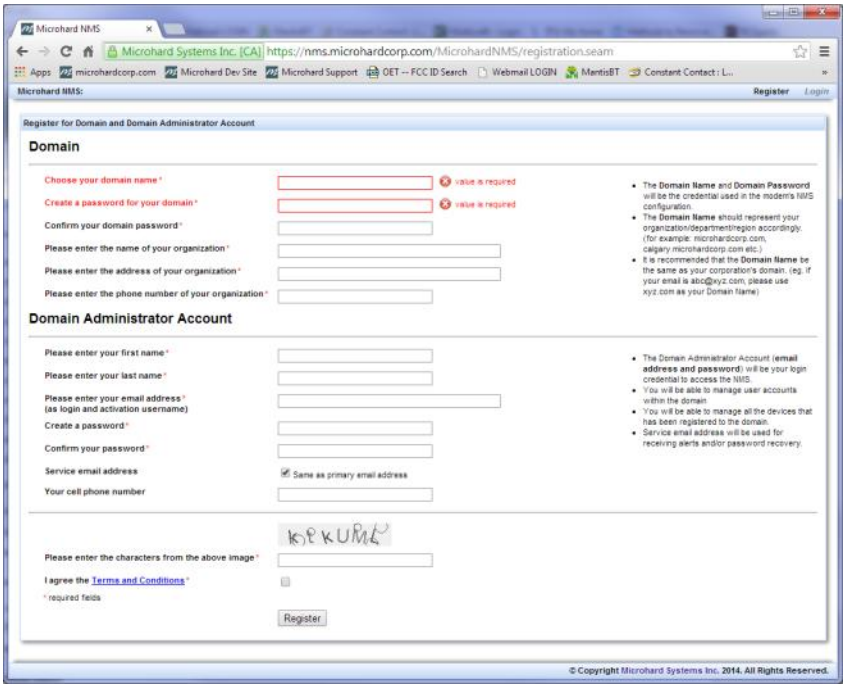


Image 4-12-3: NMS Registration

4.0 Configuration

Domain Name: A logical management zone for 3G or 4G devices will report to on NMS, the logged data is separated from any other users that are using NMS. The Domain Name is required in every 3G or 4G device for it to report to right zone. Under this user domain, one can create and manage sub-domain. The sub-domain can only be created by the domain administrator, NOT by the NMS subscription page.

Domain Password: This password is used to prevent misuse of the domain. This needs to be entered into each 3G or 4G device for it to report to right zone.

Email Address: The email address entered here will be the login username. During the registration stage, a confirmation email will be sent by the NMS system for verification and confirmation to activate your account.

Once confirmed, this account will be the administrator of the domain. The administrator can manage sub-domain and user accounts that belong to this domain.

Once NMS has been configured, each VIP4G must be configured to report into NMS.

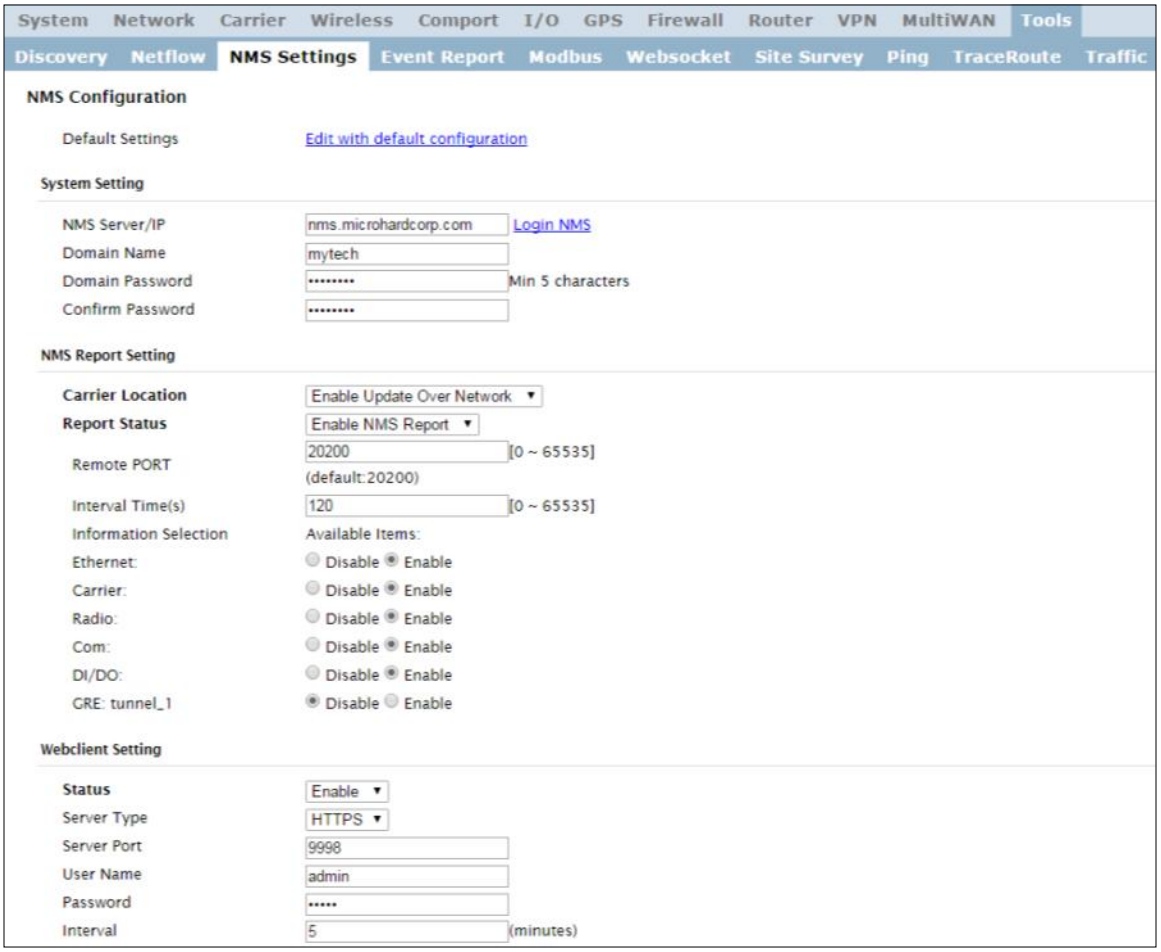


Image 4-12-4: NMS Settings

4.0 Configuration

Network Management System (NMS) Configuration

Default Settings

The default Settings link will reset the configuration form to the default factory values. The form still needs to be submitted before any changes will occur.

NMS Server/IP

The default server address for NMS is nms.microhardcorp.com. The NMS can also be hosted privately, and if that is the case, enter the address here.

Values (IP/Name)

nms.microhardcorp.com

Domain Name / Password

This is the domain name and password that was registered on the NMS website, it must be entered to enable reporting to the NMS system.

Values (chars)

default

NMS Report Setting

Carrier Location

Enable or Disable location estimation via carrier connection. When enabled, the VIP4G will consume some data to retrieve location information from the internet.

Values (chars)

Disable/Enable

Report Status

Enable or Disable UDP reporting of data to the NMS system.

Values (chars)

Enable NMS Report
Disable NMS Report

Remote Port

This is the port to which the UDP packets are sent, and the NMS system is listening on. Ensure this matches what is configured on NMS. The default is 20200.

Values (UDP Port#)

20200

Interval(s)

The Interval defines how often data is reported to NMS. The more often data is reported, the more data is used, so this should be set according to a user's data plan. (0 to 65535 seconds)

Values (seconds)

300

4.0 Configuration

Information Selection

The VIP4G can report information about the different interfaces it has. By default the VIP4G is set to send information about the Carrier, such as usage and RSSI. Statistical and usage data on the Radio (WiFi), Ethernet and Serial interfaces can also be reported.

The more that is reported, the more data that is sent to the NMS system, be aware of data plan constraints and related costs.

Values (check boxes)

Ethernet
Carrier
Radio
COM
DI / DO

Webclient Setting

Status

The Web Service can be enabled or disabled. This service is used to remotely control the VIP4G. It can be used to schedule reboots, firmware upgrade and backup tasks, etc.

Values (chars)

Disable/Enable

Server Type

Select between HTTPS (secure), or HTTP server type.

Values (chars)

HTTPS/ HTTP

Server Port

This is the port where the service is installed and listening. This port should be open on any installed firewalls.

Values (Port#)

9998

Username / Password

This is the username and password used to authenticate the unit.

Values (seconds)

admin/admin

Interval

The Interval defines how often the VIP4G checks with the NMS System to determine if there are any tasks to be completed. Carrier data will be consumed every time the device probes the NMS system.

Values (min)

60

4.0 Configuration

4.12.4 Tools > Event Report

4.12.4.1 Event Report > Configuration

Event Reporting allows the VIP4G to send periodic updates via UDP packets. These packets are customizable and can be sent to up to 3 different hosts, and at a programmable interval. The event packet can report information about the modem such as the hardware/ software versions, core temperature, supply voltage, etc; carrier info such as signal strength (RSSI), phone number, RF Band; or about the WAN such as if the assigned IP Address changes. All events are reported in binary.

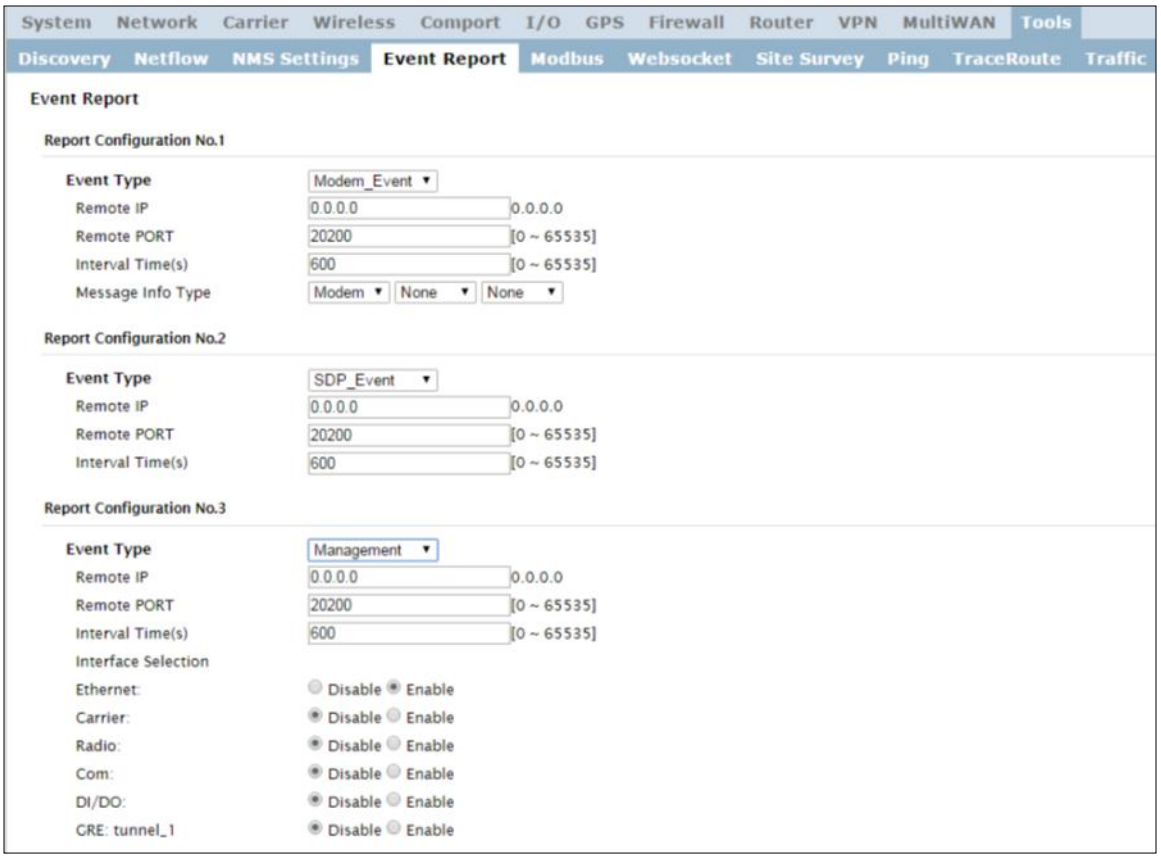


Image 4-12-5: Tools > Event Report

Event Type	Values (selection)
This box allows the selection of the type of event to be reported. The default is disabled. If Modem_Event is selected, additional options appear to the right and allow for customization of the event reported via Messages. If Management is selected, additional check boxes appear below to select the interfaces to report to the Microhard NMS system.	Modem_Event SDP_Event Management

4.0 Configuration

Remote IP	
Enter the IP Address of a reachable host to send the UDP packets	**Values (IP Address)** **0.0.0.0**

Remote Port	
Specify the UDP port number of the Remote IP Address. *Default Port Numbers for Microhard NMS (20100 for modem events, 20200 for Management)	**Values (Port #)** **20200**

Interval Time(s)	
This is the interval time in seconds, that the VIP4G will send the configured UDP message to the Remote IP and Port specified.	**Values (seconds)** **600**

Message Info Type	
When Modem_Event is selected, up to three different payloads can be selected.	**Values (seconds)** **Modem** **Carrier** **WAN**

4.12.4.2 Event Report > Message Structure

Modem_event message structure

- fixed header (fixed size 20 bytes)
- Modem ID (uint64_t (8 bytes))
- Message type mask (uint8_t(1 byte))
- reserved
- packet length (uint16_t(2 bytes))

Note: packet length = length of fixed header + length of message payload.

Message type mask

Modem info - 2 bits
00 no
01 yes (0x1)
Carrier info - 2 bits
00 no
01 yes (0x4)
WAN Info - 2 bits
00 no
01 yes (0x10)

sdp_event message structure

- spd_cmd (1 byte(0x01))
- content length (1 byte)
- spd_package - same as spd response inquiry package format

4.0 Configuration

4.12.4.3 Event Report > Message Payload

Modem info:

Content length	-	2 BYTES (UINT16_T)
Modem name	-	STRING (1-30 bytes)
Hardware version	-	STRING (1-30 bytes)
Software version	-	STRING (1-30 bytes)
Core temperature	-	STRING (1-30 bytes)
Supply voltage	-	STRING (1-30 bytes)

Carrier info:

Content length	-	2 BYTES (UINT16_T)
RSSI	-	1 BYTE (UINT8_T)
RF Band	-	2 BYTES (UINT16_T)
Service type	-	STRING (1-30 Bytes)
Channel number	-	STRING (1-30 Bytes)
SIM card number	-	STRING (1-30 Bytes)
Phone number	-	STRING (1-30 Bytes)

WAN Info:

Content length	-	2 BYTES (UINT16_T)
IP address	-	4 BYTES (UINT32_T)
DNS1	-	4 BYTES (UINT32_T)
DNS2	-	4 BYTES (UINT32_T)

Message Order:

Messages will be ordered by message type number.

For example,

If message type mask = 0x15, the eurd package will be equipped by header+modem information+carrier information+wanip information.

If message type mask = 0x4, the eurd package will be equipped by header+carrier information.

If message type mask = 0x11, the eurd package will be equipped by header+modem infomation+wanip infomation.

4.0 Configuration

4.12.5 Tools > Modbus

4.12.5.1 Modbus > TCP Modbus

The VIP4G can be configured to operate as a TCP/IP or Serial (COM) Modbus slave and respond to Modbus requests and report various information as shown in the Data Map.

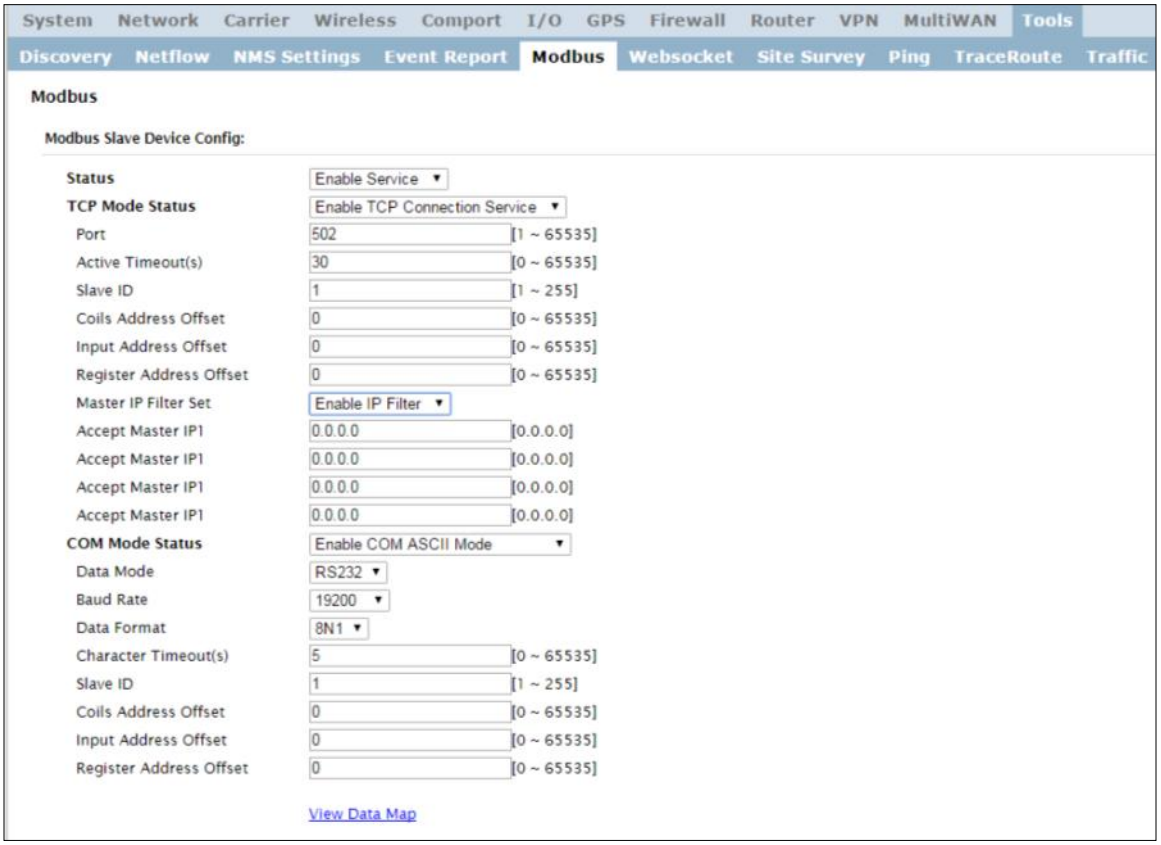


Image 4-12-6: Tools > Modbus Configuration

	Status
Disable or enable the Modbus service on the VIP4G.	**Values (selection)** **Disable Service** Enable Service

	TCP Mode Status
Disable or enable the Modbus TCP Connection Service on the VIP4G.	**Values (selection)** **Disable** **Enable**

4.0 Configuration

Port	
Specify the Port in which the Modbus TCP service is to listen and respond to polls.	**Values (Port #)** **502**

Active Timeout(s)	
Define the active timeout in seconds.	**Values (seconds)** **30**

Slave ID	
Each Modbus slave device must have a unique address, or Slave ID. Enter this value here as required by the Modbus Host System.	**Values (value)** **1**

Coils Address Offset	
Enter the Coils Address offset as required by the Master.	**Values (value)** **0**

Input Address Offset	
Enter the Input Address offset as required by the Master.	**Values (value)** **0**

Register Address Offset	
Enter the Register Address offset as required by the Master.	**Values (value)** **0**

Master IP Filter Set	
It is possible to only accept connections from specific Modbus Master IP's, to use this feature enable the Master IP Filter and specify the IP Addresses in the fields provided.	**Values (selection)** **Disable /** Enable

4.0 Configuration

4.12.5.2 Modbus > COM (Serial) Modbus

The VIP4G can also participate in serial based Modbus, to configure and view the serial Modbus settings, the COM1 port must first be disabled in the ***Comport > Settings*** menu. Only the settings that are different from TCP Modbus will be discussed.

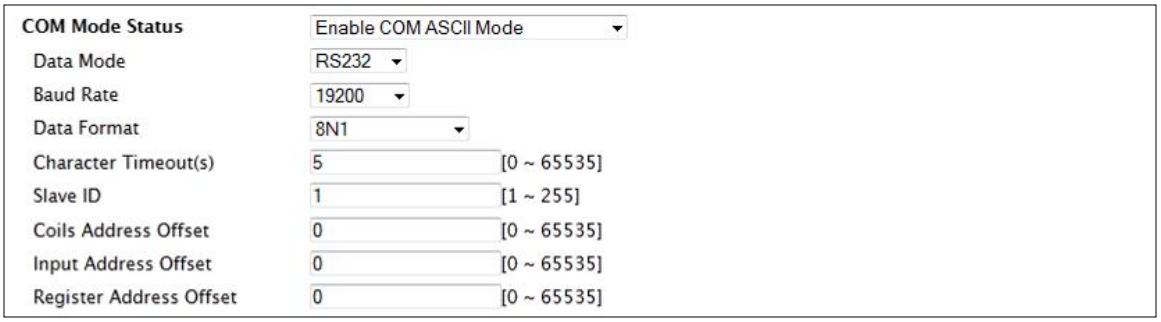


Image 4-12-7: Tools > Modbus Serial Configuration

COM Mode Status

Disable to select the Serial (COM) mode for the Modbus service. In RTU mode, communication is in binary format and in ASCII mode, communication is in ASCII format.

Values (selection)

Disable
Enable COM ASCII Mode
Enable COM RTU Mode

Data Mode

Determines which (rear of unit) serial interface shall be used to connect to external devices: RS232, RS485, or RS422. This option applies only to COM1. When an interface other than RS232 is selected, the DE9 port will be inactive.

Values (selection)

RS232
RS485
RS422

Baud Rate

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

Values (selection (bps))

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

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.

Values (selection)

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

4.0 Configuration

4.12.5.3 Modbus > Modbus Data Map

Supported Function Codes:

1---Read Coils
2---Read Inputs
3---Read Registers
5---Write Single Coil
6---Write Single Register
Data Address = Offset + Basic Address

Coil Bits (Output and Internal Status):

Bit Address	Hex Format	Definition
0	0x0000	OUTPUT 1
1	0x0001	OUTPUT 2
2	0x0002	OUTPUT 3
3	0x0003	OUTPUT 4
9	0x0009	COM2 Status
12	0x000c	LAN/eth0 Status
13	0x000d	WAN/eth1 Status
16	0x0010	Carrier Status
18	0x0012	Wifi Status
22	0x0016	GPS Status
23	0x0017	Location Over Network
24	0x0018	Event UDP Report 1
25	0x0019	Event UDP Report 2
26	0x001a	Event UDP Report 3
27	0x001b	NMS Report
28	0x001c	Web Client Service
29	0x001d	Firewall Status
40	0x0028	SYSTEM Reboot

Input Bits:

Bit Address	Hex Format	Definition
0	0x0000	INPUT 1
1	0x0001	INPUT 2
2	0x0002	INPUT 3
3	0x0003	INPUT 4

Registers:

16 Bits Address	Hex Format	Definition
0	0x0000	Modem Model Type...
1	0x0001	Build Version
2	0x0002	Modem ID Highest 2 Bytes
3	0x0003	Modem ID Higher 2 Bytes
4	0x0004	Modem ID Lower 2 Bytes
5	0x0005	Modem ID Lowest 2 Bytes
6	0x0006	RSSI(dbm)
8	0x0008	Core Temperature(C)
9	0x0009	Carrier Received Bytes(MB)
10	0x000a	Carrier Transmitted Bytes(MB)
11	0x000b	GPS Altitude(m)
12	0x000c	GPS Latitude High 2 Bytes
13	0x000d	Latitude Low 2 Bytes(x1000000)
14	0x000e	GPS Longitude High 2 Bytes
15	0x000f	Longitude Low 2 Bytes(x1000000)
18	0x0012	COM2 Baud Rate(/100)(bps)
19	0x0013	COM2 Data Format...

Caculation: Real Latitude = (signed integer)[High 2 Bytes + Low 2 Byt

Modem Model Types:

Type ID	Definition
0	Unknow
6	IPn3G
7	VIP4G
8	IPn4G

Com Data Format Definition:

Type ID	Definition
0	Unknow
1	8N1
2	8N2
3	8E1
4	8O1
5	7N1
6	7N2
7	7E1
8	7O1
9	7E2
10	7O2

Image 4-12-8: Tools > Modbus Data Map

4.0 Configuration

4.12.6 Tools > Websocket

The Websocket service is a feature of HTML5.0 or later. Web Socket is designed to be implemented in web browsers and web servers to allow XML scripts to access the HTML web service with a TCP socket connection.

It is mainly used for two purposes:

- refreshing page information without refreshing the entire page to reduce network stream.
- to integrate internet applications with xml to get required information in real time.

Currently we provide four types of information as configured:

- GPS Coordinate Information
- GPS NMEA Data
- Carrier Information
- Comport Data

Image 4-12-9: Tools > Web Socket Service

Status	
Enable or disable the web socket service in the VIP4G.	**Values (selection)** Enable / **Disable**

Web Socket Port	
Enter the desired web socket TCP port number. The default is 7681, and the valid range is 100 to 65535.	**Values (TCP port)** **7681**

4.0 Configuration

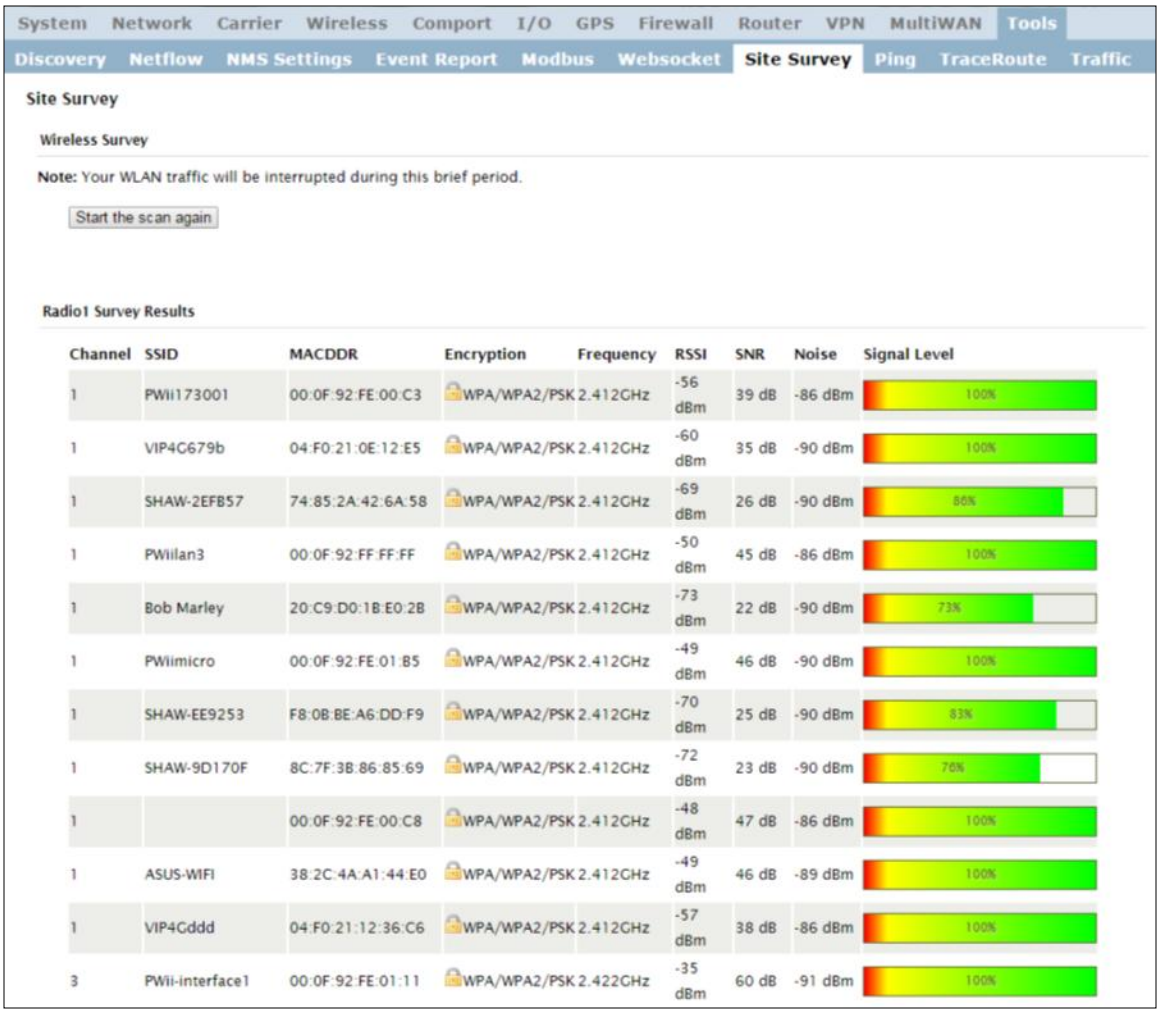
Data Fresh Intervals	
Enter in the time at which data is to be refreshed. The default is 10 seconds, the valid range is 2 to 65535 seconds.	**Values (seconds)** 10
Connect Password	
For added security a password can be required to connect to the web socket service. To disable, leave this field blank. The default is disabled.	**Values** *(blank)*
Max Keep Time	
This field determines how long the web socket is open once started/ enabled. The default is 60 mins, a value of zero means the service with continue to run indefinitely.	**Values (minutes)** **60**
GPS Coordinate	
If enabled the VIP4G will report GPS coordinate data to the websocket.	**Values (selection)** **Disable** / Enable
GPS NMEA Data	
If enabled the VIP4G will report GPS NMEA data to the websocket.	**Values (selection)** **Disable** / Enable
Carrier Information	
If enabled the VIP4G will report carrier information to the websocket.	**Values (selection)** **Disable** / Enable
Comport Data	
If enabled, and the COM1 port is configured for TCP Server, the comport data will be reported to the web socket.	**Values (selection)** **Disable** / Enable

4.0 Configuration

4.12.7 Tools > Site Survey

Wireless Survey

The Wireless Survey feature will scan the available wireless channels for any other 802.11 wireless networks in proximity to the VIP4G. The Survey will display the Channel number the other networks are operating on, the MAC address, Encryption Type, Frequency and general signal level and quality information. This can be useful for finding available networks, or troubleshooting connection and sensitivity problems. If there are other networks operating on the same frequency, or a channel close to the one chosen, it can then be decided to try to use another channel.



Channel	SSID	MACDDR	Encryption	Frequency	RSSI	SNR	Noise	Signal Level
1	PWii173001	00:0F:92:FE:00:C3	WPA/WPA2/PSK	2.412GHz	-56 dBm	39 dB	-86 dBm	100%
1	VIP4G679b	04:F0:21:0E:12:E5	WPA/WPA2/PSK	2.412GHz	-60 dBm	35 dB	-90 dBm	100%
1	SHAW-2EFB57	74:85:2A:42:6A:58	WPA/WPA2/PSK	2.412GHz	-69 dBm	26 dB	-90 dBm	86%
1	PWiilan3	00:0F:92:FF:FF:FF	WPA/WPA2/PSK	2.412GHz	-50 dBm	45 dB	-86 dBm	100%
1	Bob Marley	20:C9:D0:1B:E0:2B	WPA/WPA2/PSK	2.412GHz	-73 dBm	22 dB	-90 dBm	73%
1	PWiimicro	00:0F:92:FE:01:B5	WPA/WPA2/PSK	2.412GHz	-49 dBm	46 dB	-90 dBm	100%
1	SHAW-EE9253	F8:0B:BE:A6:DD:F9	WPA/WPA2/PSK	2.412GHz	-70 dBm	25 dB	-90 dBm	83%
1	SHAW-9D170F	8C:7F:3B:86:85:69	WPA/WPA2/PSK	2.412GHz	-72 dBm	23 dB	-90 dBm	76%
1		00:0F:92:FE:00:C8	WPA/WPA2/PSK	2.412GHz	-48 dBm	47 dB	-86 dBm	100%
1	ASUS-WIFI	38:2C:4A:A1:44:E0	WPA/WPA2/PSK	2.412GHz	-49 dBm	46 dB	-89 dBm	100%
1	VIP4Gddd	04:F0:21:12:36:C6	WPA/WPA2/PSK	2.412GHz	-57 dBm	38 dB	-86 dBm	100%
3	PWii-interface1	00:0F:92:FE:01:11	WPA/WPA2/PSK	2.422GHz	-35 dBm	60 dB	-91 dBm	100%

Image 4-12-10: Tools > Site Survey

4.0 Configuration

4.12.8 Tools > Ping

Network Tools Ping

The Network Tools Ping feature provides a tool to test network connectivity from within the VIP4G unit. A user can use the Ping command by entering the IP address or host name of a destination device in the Ping Host Name field, use Count for the number of ping messages to send, and the Packet Size to modify the size of the packets sent.

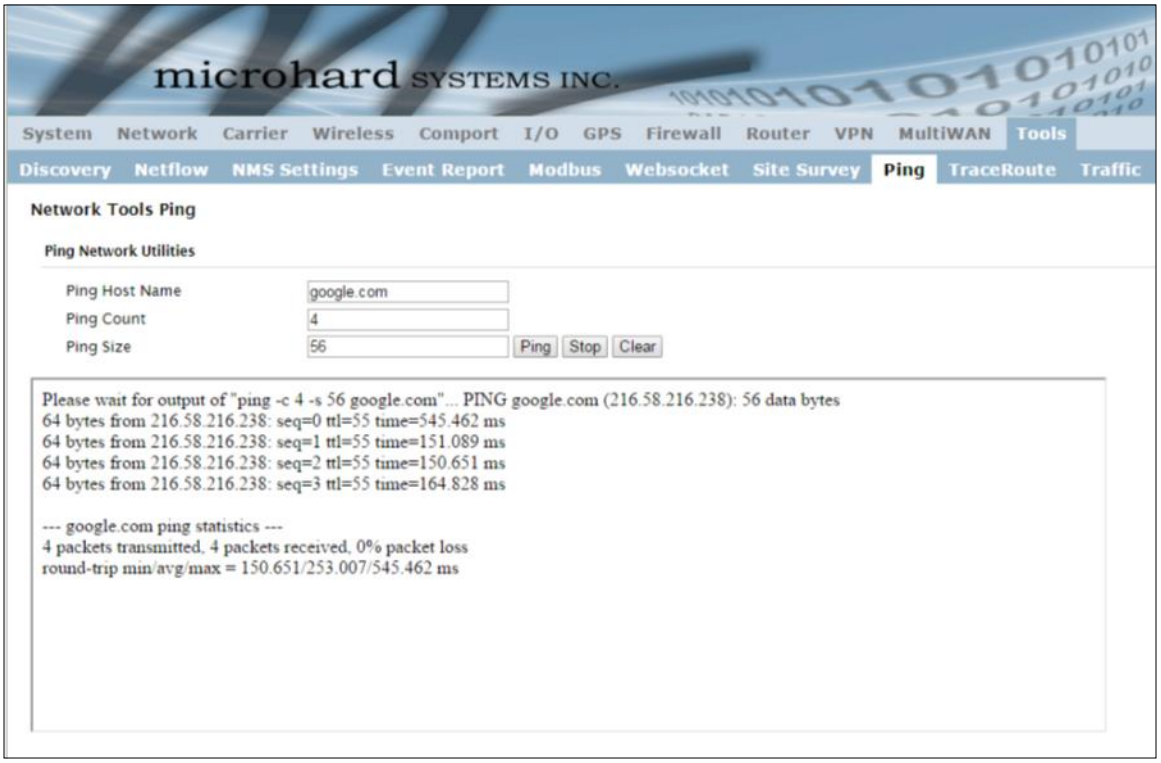


Image 4-12-11: Tools > Ping

4.0 Configuration

4.12.9 Tools > TraceRoute

Network TraceRoute

The **Trace Route** command can be used to provide connectivity data by providing information about the number of hops, routers and the path taken to reach a particular destination.

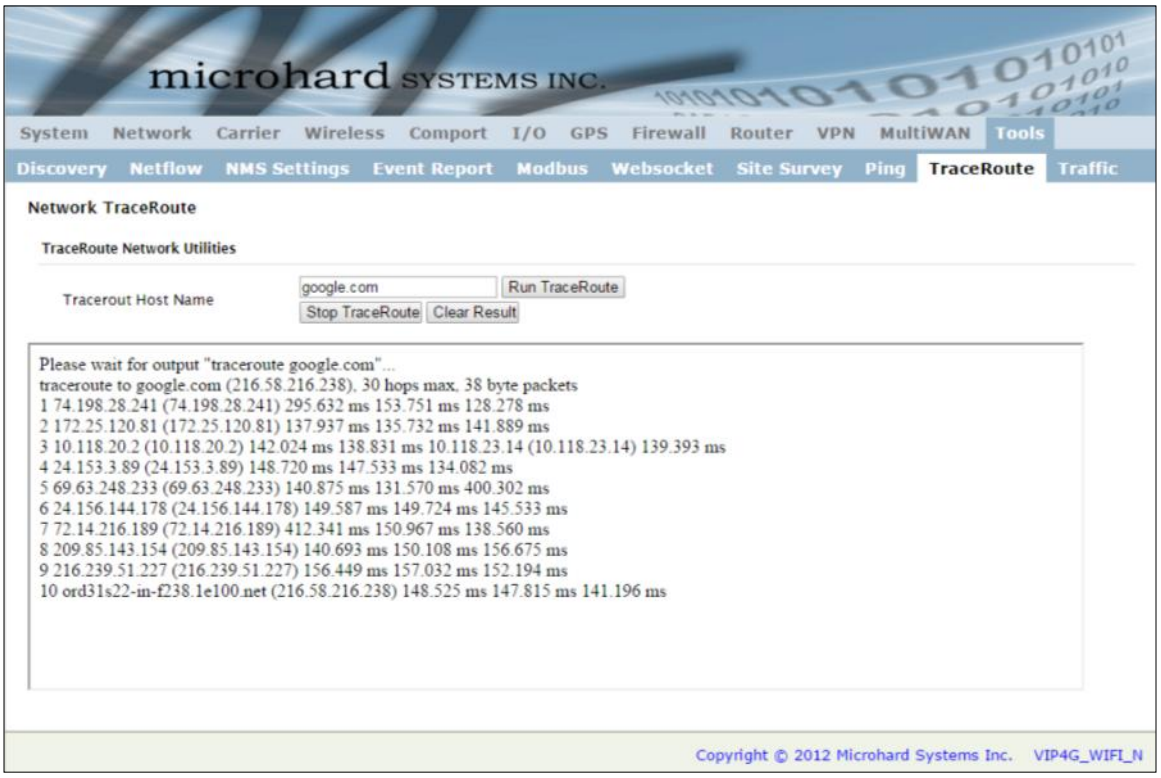


Image 4-12-12: Tools > TraceRoute

4.0 Configuration

4.12.10 Tools > Traffic

The Traffic menu shows a graphical display of the LAN traffic by day and month. It can be used to determine when there are high and low periods of LAN traffic over a period of time.

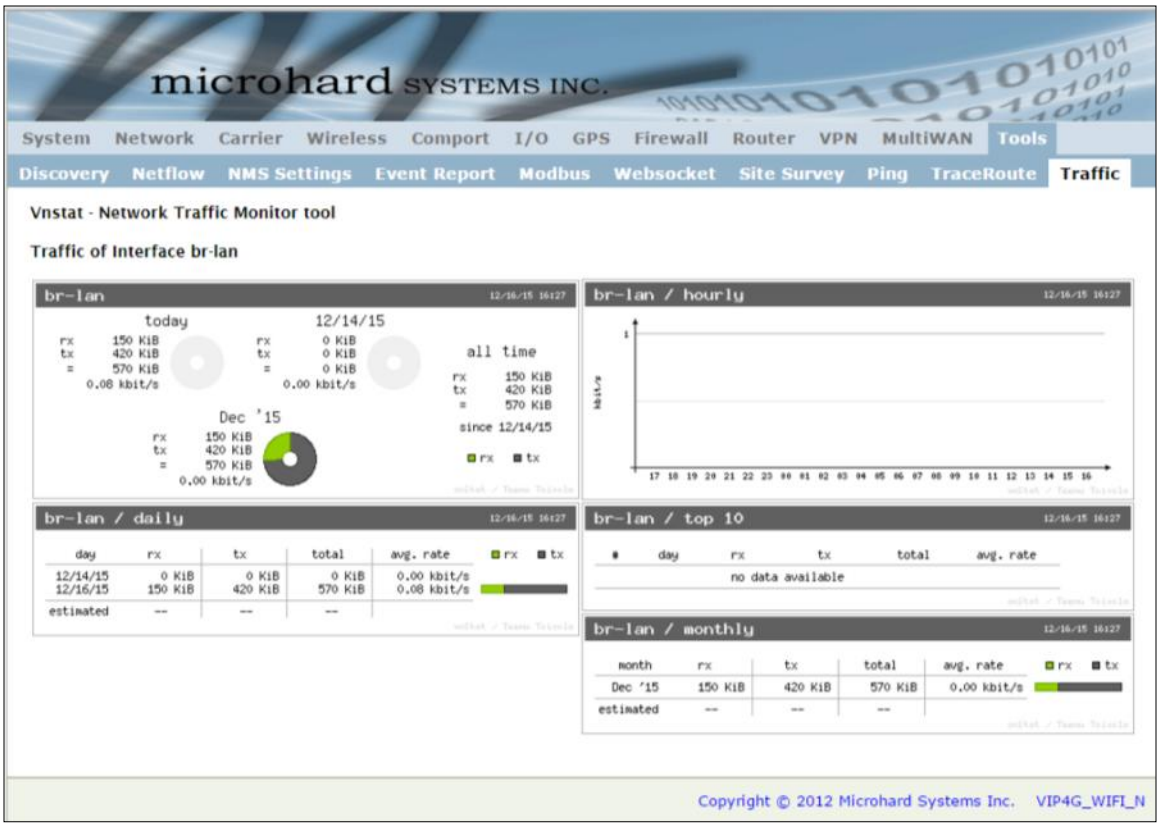


Image 4-12-13: Tools > Traffic

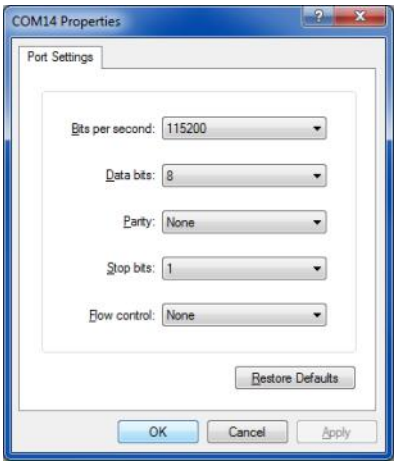
5.0 AT Command Line Interface

5.1 AT Command Overview

AT Commands can be issued to configure and manage the VIP4G, serial port (Serial), or by TCP/IP (telnet).

5.1.1 Serial Port

To connect and access the AT Command interface on the VIP4G, a physical connection must be made on the RS232 DB9 serial port labeled 'Serial'. A terminal emulation program (Hyperterminal, Tera Term, ProComm, Putty etc) can then be used to communicate with the VIP4G.



Default Settings:

Baud rate: **115200**

Data bits: **8**

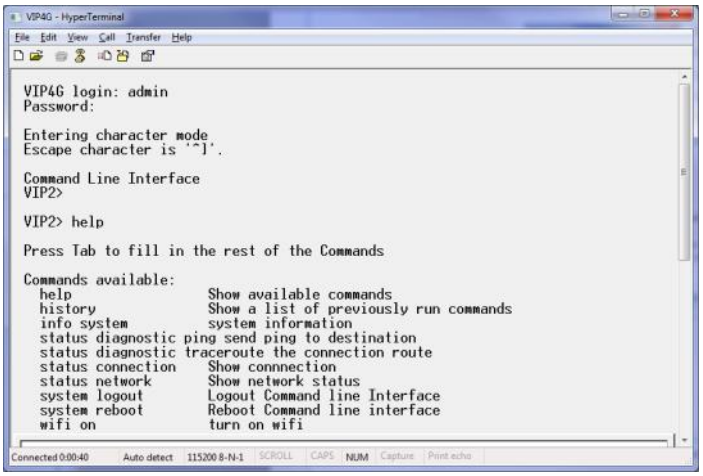
Parity: **None**

Stop Bits: **1**

Flow Control: **None**

Image 5-1: Serial Port Settings

Once communication is established, a login is required to access the AT Command interface, once logged in, the AT Command Line Interface menu is displayed. Type "?" or Help to list the menu commands.



Default Settings:

VIP4G login: **admin**

Password: **admin**

Image 5-2: AT Command Window

5.0 AT Command Line Interface

5.1.2 Telnet (TCP/IP)

Telnet can be used to access the AT Command interface of the VIP4G. The default port is TCP Port 23. A telnet session can be made to the unit using any Telnet application (Windows Telnet, Tera Term, ProComm etc). Once communication is established, a login is required to continue.

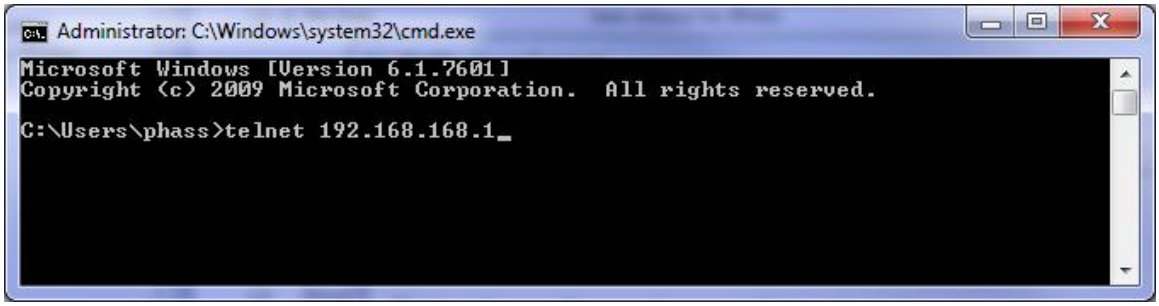


Image 5-3: Establishing a Telnet Session

A session can be made to the WAN IP Address (if allowed in the firewall settings) for remote configuration, or to the local RJ45 interface (default IP: 192.168.168.1).

Once a session is established a login is required to continue. As seen in the Serial port setup, the default login is **admin**, and the password is **admin.** Once verified, the AT Command Line Interface menu is shown and AT Commands can now be issued. (Type "?" or Help to list the commands)

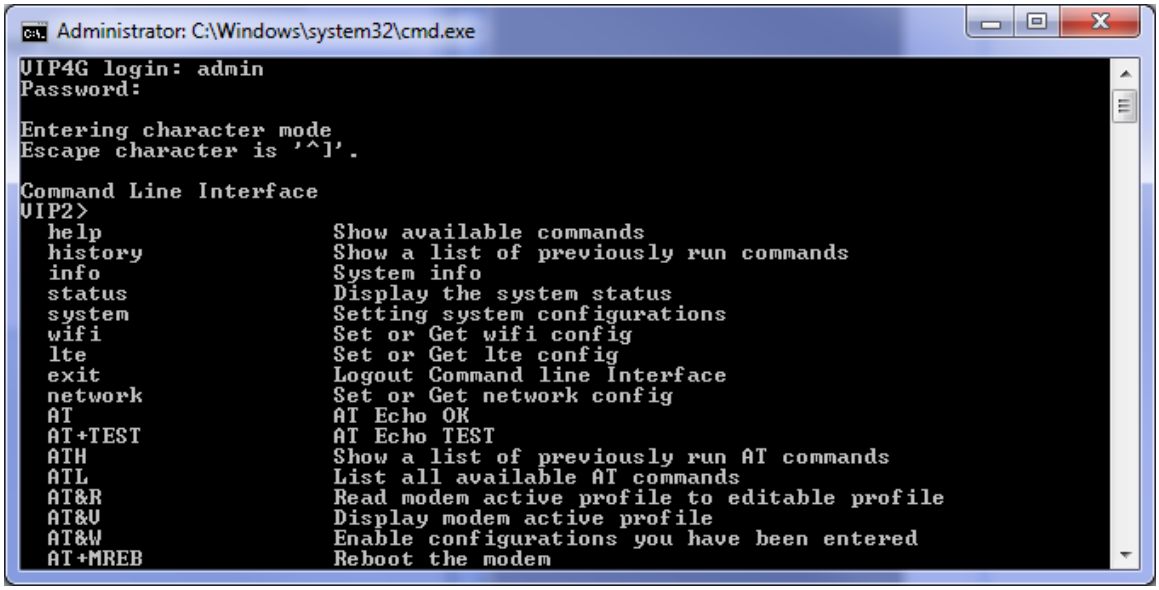


Image 5-4: Telnet AT Command Session

5.0 AT Command Line Interface

5.2 AT Command Syntax

The follow syntax is used when issuing AT Commands on the VIP4G

- All commands start with the AT characters and end with the <Enter> key
- Microhard Specific Commands start with +M
- Help will list top level commands (ATL will list ALL available AT Commands)
- To query syntax of a command: AT+<command_name>=?
- Syntax for commands that are used only to query a setting:
  AT<command_name>
- Syntax for commands that can be used to query *and* set values:
  AT<command_name>=parameter1,parameter2,… (Sets Values)
  AT<command_name>? (Queries the setting)

Query Syntax:
AT+MLEIP=? <Enter>
+MLEIP: Command Syntax:AT+MLEIP=<IP Address>,<Netmask>,<Gateway>
OK

Setting a value:
AT+MLEIP=192.168.0.1,255.255.255.0,192.168.0.1 <Enter>
OK

Query a setting:
AT+MLEIP? <Enter>
+MLEIP: “192.168.0.1”, “255.255.255.0”, “192.168.0.1”
OK

A screen capture of the above commands entered into a unit is shown below:

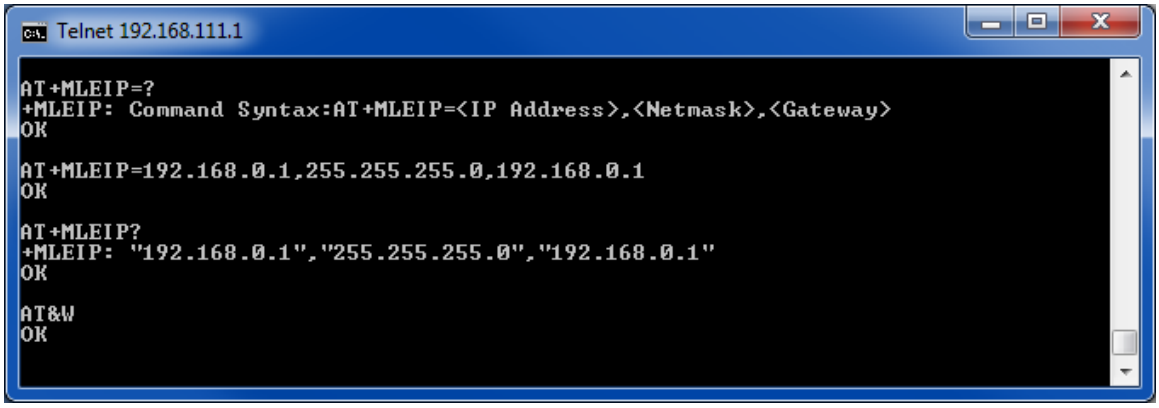


Image 5-5: Telnet AT Command Syntax

Once AT commands are entered, the changes are immediate.

ATO or ATA Exits the AT Command Line Interface.

5.0 AT Command Line Interface

5.3 Supported AT Commands

AT

Description	Command Syntax
Echo OK.	**AT <enter>**

Example

Input:
AT <enter>
Response:
OK

AT+TEST

Description	Command Syntax
Echo TEST	**AT+TEST <enter>**

Example

Input:
AT+TEST <enter>
Response:
AT ECHO TEST:
:0

ATH

Description	Command Syntax
Show a list of previously run commands.	**ATH <enter>**

Example

Input:
ATH <enter>
Response:
AT Command history: 1. ATH 2. ATL 3. ATH

AT&R

Description	Command Syntax
Read modem profile to editable profile. (Reserved)	**AT&R <enter>**

Example

Input:
AT&R <enter>
Response:
OK

5.0 AT Command Line Interface

AT&V

Description	Command Syntax
Read modem active profile.	**AT&V <enter>**

Example

Input:
AT&V <enter>
Response:
&V:
  hostname:VIP4G
  timezone:MST7MDT,M3.2.0,M11.1.0
  systemmode:gateway
  time mode:sync
OK

AT&W

Description	Command Syntax
Reserved.	**AT&W <enter>**

Example

Input:
AT&W <enter>
Response:
OK

AT+MREB

Description	Command Syntax
Reboots the modem.	**AT+MREB <enter>**

Example

Input:
AT+MREB <enter>
Response:
OK. Rebooting...

5.0 AT Command Line Interface

ATA

Description	Command Syntax
Quit. Exits AT Command session and returns you to login prompt.	**ATA <enter>**

Example

Input:
ATA <enter>
Response:
OK
IPn3G Login:

ATO

Description	Command Syntax
Quit. Exits AT Command session and returns you to login prompt.	**ATO <enter>**

Example

Input:
ATA <enter>
Response:
OK
IPn3G Login:

AT+CMGS

Description	Command Syntax
Send SMS message. To send message CTRL+Z must be entered, to exit, ESC.	**AT+CMGS=<Phone Number><CR>** text is entered <CTRL+Z/ESC>

Example

Input:
AT+CMGS=4035553776 <enter>

4035553776 Test <ctrl+z>

Response:
OK

5.0 AT Command Line Interface

AT+CMGR

Description

This command allows the application to read stored messages. The messages are read from the SIM card memory.

Command Syntax

AT+CMGR=<index>

Example

Input:
AT+CMGR=<index><enter>

Response:
+CMGR: <stat>,<oa>,,<dt>
<data>
OK

Parameters:
<index> Index in SIM card storage of the message
<stat> Status of Message in Memory (Text Mode)
“REC UNREAD” Received unread messages
“REC READ” Received read messages
<oa> Originator Address
String type
<dt> Discharge Time
String format: "yy/MM/dd,hh:mm:ss±zz" (year [00-99]/ month [01-12]/Day [01-31], Hour:Min:Second and TimeZone [quarters of an hour])
<data> SMS User Data in Text Mode
String type

AT+CMGL

Description

This command allows the application to read stored messages by indicating the type of the message to read. The messages are read from the SIM card memory.

Command Syntax

AT+CMGL=<status>
Status:
0 - Lists all unread messages
1 - Lists all read messages
4 - Lists all messages

Example

Input:
AT+CMGL=1 <enter>

Response:
AT+CMGL=1
+CMGL: 0,"REC READ","+14035553776",,"2013/10/04,11:12:27-06"
Test Message 1
+CMGL: 1,"REC READ","+14035553776",,"2013/10/04,11:12:53-06"
Test Message 2
+CMGL: 2,"REC READ","+14035553776",,"2013/10/04,11:13:06-06"
Another test message!

OK

5.0 AT Command Line Interface

AT+CMGD

Description

This command handles deletion of a single message from memory location <index>, or multiple messages according to <delflag>.

Command Syntax

AT+CMGD=<index>,<delflag>
delflag:
0 - Deletes the message specified in <index>
1 - Deletes all read messages
4 - Deletes all messages

Example

Input:
AT+CMGD=0,4 <enter>

Response:
index=0 dflag=4

OK

AT+GMR

Description

Modem Record Information

Command Syntax

AT+GMR <enter>

Example

Input:
AT+GMR <enter>
Response:
+GMR:
 Hardware Version:v1.0.0 Software Version:v1.1.0 build 1060
 Copyright: 2012 Microhard Systems Inc.
 System Time: Mon Dec 2 16:03:51 2013
OK

AT+GMI

Description

Get Manufacturer Identification

Command Syntax

AT+GMI=<enter>

Example

Input:
AT+GMI<enter>

Response:
+GMI: 2012 Microhard Systems Inc.
OK

5.0 AT Command Line Interface

AT+CNUM

Description	Command Syntax
Check modem's phone number.	**AT+CNUM <enter>**

Example

Input:
AT+CNUM <enter>
Response:
+CNUM: "+15875558645"
OK

AT+CIMI

Description	Command Syntax
Check modem's IMEI and IMSI numbers.	**AT+CIMI <enter>**

Example

Input:
AT+CIMI <enter>
Response:
+CIMI: IMEI:012773002108403, IMSI:302720406982933
OK

AT+CCID

Description	Command Syntax
Check modem's SIM card number.	**AT+CCID=<enter>**

Example

Input:
AT+CCID<enter>
Response:
+CCID: 89302720401025355531
OK

5.0 AT Command Line Interface

AT+MSYSI

Description	Command Syntax
System Summary Information	**AT+MSYSI <enter>**

Example

Input:
AT+MSYSI <enter>
Response:
Carrier:
Carrier:
IMEI:012773002113114
SIMID:89302720401025355531
IMSI:302720406982933
Phone Num: +15878938645
Status: CONNECTED
Network: ROGERS
RSSI:WCDMA RSSI : 70
Temperature:51 degC
Ethernet Port:
MAC:00:0F:92:00:B3:3B
IP:192.168.168.1
MASK:255.255.255.0
Wan MAC:00:0F:92:01:B3:3B
Wan IP:0.0.0.0
Wan MASK:0.0.0.0
System:
Device:VIP4G_MKT
Product:VIP4G_WIFI_N
Image:VIP4G
Hardware:v2.0.0
Software:v1.1.6 build 1184-14

Copyright: 2012 Microhard Systems Inc.
Time: Thu Jun 18 13:25:34 2015

AT+MMNAME

Description	Command Syntax
Modem Name / Radio Description. 30 chars.	**AT+MMNAME=<modem_name>**

Example

Input: (To set value)
AT+MMNAME=VIP4G_CLGY<enter>
Response:
OK

Input: (To retrieve value)
AT+MMNAME=?<enter>
Response:
+MMNAME: VIP4G_CLGY
OK

5.0 AT Command Line Interface

AT+MLEIP

Description	Command Syntax
Set the IP Address, Netmask, and Gateway for the local Ethernet interface.	**AT+MLEIP=<IPAddress>, <Netmask>, <Gateway>**

Example

Input:
AT+MLEIP=192.168.168.1,255.255.255.0,192.168.168.1 <enter>
Response:
OK

AT+MDHCP

Description	Command Syntax
Enable/Disable the DHCP server running of the local Ethernet interface.	**AT+MDHCP=<action>** 0 Disable 1 Enable

Example

Input:
AT+MDHCP=1 <enter>
Response:
OK

AT+MDHCPA

Description	Command Syntax
Define the Starting and Ending IP Address (range) assignable by DHCP on the local Ethernet interface.	**AT+MDHCPA=<Start IP>, <End IP>**

Example

Input:
AT+MDHCPA=192.168.168.100,192.168.168.200 <enter>
Response:
OK

5.0 AT Command Line Interface

AT+MEMAC

Description	Command Syntax
Retrieve the MAC Address of the local Ethernet interface.	**AT+MEMAC <enter>**

Example

Input:
AT+MEMAC<enter>
Response:
+MEMAC: "00:0F:92:00:40:9A"
OK

AT+MSIP

Description	Command Syntax
Set LAN static IP	**AT+MSIP=<static IP address> <enter>**

Example

Input:
AT+MSIP=192.168.168.1 <enter>
Response:
+MSIP: setting and restarting network...
OK

AT+MSCT

Description	Command Syntax
Set LAN Connection Type.	**AT+MSCT=<Mode>** **Mode:** **0 DHCP** **1 Static IP**

Example

Input:
AT+MSCT=1 <enter>
Response:
OK

5.0 AT Command Line Interface

AT+MNTP

Description

Enable and define a NTP server.

Command Syntax

AT+MNTP=<status>,<NTP server>
Status:
0 Disable
1 Enable

Example

Input:
AT+MNTP=1,pool.ntp.org<enter>
Response:
OK

AT+MPIPP

Description

Enable/Disable IP-Passthrough

Command Syntax

AT+MPIPP=<Mode>
Mode:
0 Disable
1 Ethernet

Example

Input:
AT+MPIPP=1 <enter>
Response:
OK

AT+MCNTO

Description

Sets the timeout value for the serial and telnet consoles. Once expired, user will be return to login prompt.

Command Syntax

AT+MCNTO=<Timeout_s>
0 - Disabled
0 - 65535 (seconds)

Example

Input:
AT+MCNTO=300 <enter>
Response:
OK

5.0 AT Command Line Interface

AT+MRTF

Description

Reset the modem to the factory default settings stored in non-volatile (NV) memory. Unit will reboot with default settings.

Command Syntax

AT+MRTF <action>
Action:
0 pre-set action
1 confirm action
OK

Example

Input:
AT+MRTF=1 <enter>
Response:
OK

AT+MTWT

Description

Enable/Disable the Wireless Traffic Timeout. Unit will reset if it does not see any traffic from the carrier for the amount of time defined.

Command Syntax

AT+MTWT=<Mode>[,<Interval_s>,<Reboot Time Limit_s>]
Mode:
0 Disable
1 Enable
Reboot Time Limit:300-60000

Example

Input:
AT+MTWT=1,1,300 <enter>
Response:
OK

AT+MSCMD

Description

Enable/Disable the Wireless Traffic Timeout. Unit will reset if it does not see any traffic from the carrier for the amount of time defined.

Example

Input:
AT+MSCMD=1,1,403556767,4057890909<enter>
Response:
OK

Command Syntax

AT+MSCMD=<Mode>[,<Filter Mode>[,<Phone No.1>[,...,<Phone No.6>]]]
Mode:
0 Disable
1 Enable SMS Command
Filter Mode:
0 Disable
1 Enable Phone Filter
OK

5.0 AT Command Line Interface

AT+MDISS

Description

Configure discovery mode service used by VIP4G and utilities such as “IP Discovery”.

Command Syntax

AT+MDISS=<Mode>
Mode:
0 Disable
1 Discoverable

Example

Input:
AT+MDISS=1 <enter>
Response:
OK

AT+MPWD

Description

Used to set or change the ADMIN password for the VIP4G.

Command Syntax

AT+MPWD=<New password>,<confirm password>
password: at least 5 characters

Example

Input:
AT+MPWD=admin,admin<enter>
Response:
OK

AT+MIKACE

Description

Enable or Disable IMCP ICMP keep-alive check.

Command Syntax

AT+MIKACE=<Mode>
Mode:
0 Disable
1 Enable

Example

Input:
AT+MIKACE=1<enter>
Response:
OK

5.0 AT Command Line Interface

AT+MIKAC

Description

Set ICMP Keep-alive check parameters.

Command Syntax

AT+MIKAC=<host name>, <interval in seconds>, <count>

Example

Input:
AT+MIKAC=www.google.com,600,10<enter>
Response:
OK

AT+MDDNSE

Description

Enable/Disable DDNS.

Command Syntax

AT+MDDNSE=<Mode>
Mode:
0 Disable
1 Enable

Example

Input:
AT+MDDNSE=0<enter>
Response:
OK

AT+MDDNS

Description

Select DDNS service provider, and login credentials as required for DDNS services.

Command Syntax

AT+MDDNS=<service type>,<host>,<user name>,<password>
service type:
0 changeip
1 dyndns
2 eurodyndns
3 hn
4 noip
5 ods
6 ovh
7 regfish
8 tzo
9 zoneedit

Example

Input:
AT+MDDNS=0,user.dydns.org,user,password <enter>
Response:
OK

5.0 AT Command Line Interface

AT+MEURD1
AT+MEURD2
AT+MEURD3

Description

Define Event Report UDP Report No.1/2/3.

Example

Input:
AT+MIKAC=www.google.com,600,10<enter>
Response:
OK

Command Syntax

AT+MEURD1=<Mode>[,<Remote IP>,<Remote Port>,<Interval Ti me_s>]
Mode:
0 Disable
1 Moden Event Report
2 SDP Event Report
3 Management Report

AT+MNMSR

Description

Define NMS Report.

Example

Input:
AT+MNMSR=1,20200,300<enter>
Response:
OK

Command Syntax

AT+MNMSR=<Mode>[,<Remote Port>,<Interval Time_s>]
Mode:
0 Disable
1 Enable NMS Report

AT+MGPSR1
AT+MGPSR2
AT+MGPSR3
AT+MGPSR4

Description

Define GPS Report No.1/2/3/4.

Example

Input:
AT+MGPSR1=1,192.168.168.25,20175,600 <enter>
Response:
OK

Command Syntax

AT+MGPSR1=<Mode>[,<Remote IP>,<Remote Port>,<Interval Ti me_s>]
Mode:
0 Disable
1 Enable UDP Report

5.0 AT Command Line Interface

AT+MCTPS

Description

Enable/Disable the Comport serial port. This port is located on the front of the VIP4G and is labelled as the SERIAL port. It is disabled by default allowing it to be used for Console/AT Commands. If enabled it can be used for data.

Command Syntax

AT+MCTPS=<Mode>
Mode:
0 Disable
1 Enable

Example

Input:
AT+MCTPS=0<enter>
Response:
OK

AT+MCTBR

Description

Set Comport baud rate.

Example

Input:
AT+MCTBR=13<enter>
Response:
OK

Command Syntax

AT+MCTBR=<Baud Rate>
Baud Rate:
0 300
1 600
2 1200
3 2400
4 3600
5 4800
6 7200
7 9600
8 14400
9 19200
10 28800
11 38400
12 57600
13 115200

5.0 AT Command Line Interface

AT+MCTDF

Description

Set Comport data format

Command Syntax

AT+MCTDF=<data format>
Data Format:
0 8N1
1 8N2
2 8E1
3 8O1
4 7N1
5 7N2
6 7E1
7 7O1
8 7E2
9 7O2

Example

Input:
AT+MCTDF=0<enter>
Response:
OK

AT+MCTDM

Description

Set Comport data mode.

Command Syntax

AT+MCTDM=<Data Mode>
Data Mode:
0 Seamless
1 Transparent

Example

Input:
AT+MCTDM=1<enter>
Response:
OK

AT+MCTCT

Description

Set Comport character timeout.

Command Syntax

AT+MCTCT=<timeout_s>

Example

Input:
AT+MCTCT=0<enter>
Response:
OK

5.0 AT Command Line Interface

AT+MCTMPS

Description	Command Syntax
Set comport maximum packet size.	AT+MCTMPS=<size>

Example

Input:
AT+MCTMPS=1024<enter>
Response:
OK

AT+MCTP

Description	Command Syntax
Set Comport port priority.	**AT+MCTP=<Mode>** Mode: 0 Normal 1 Medium 2 High

Example

Input:
AT+MCTP=0<enter>
Response:
OK

AT+MCTNCDI

Description	Command Syntax
Enable/Disable Comport port no-connection data intake.	**AT+MCTNCDI=<Mode>** Mode: 0 Disable 1 Enable

Example

Input:
AT+MCTNCDI=1<enter>
Response:
OK

5.0 AT Command Line Interface

AT+MCTMTC

Description

Set Comport modbus TCP configuration.

Command Syntax

AT+MCTMTC=<Status>, <Protection status>, <Protection Key>
Status and Protection Status:
0 Disable
1 Enable

Example

Input:
AT+MCTMTC=0,0,1234<enter>
Response:
OK

AT+MCTIPM

Description

Set the Comport serial port IP Protocol Mode.

Example

Input:
AT+MCTIPM=1<enter>
Response:
OK

Command Syntax

AT+MCTIPM=<Mode>
Mode:
0 TCP Client
1 TCP Server
2 TCP Client/Server
3 UDP Point to Point
4 UDP Point to Multipoint(P)
5 UDP Point to Multipoint(MP)
6 UDP Multipoint to Multipoint
7 SMTP Client
9 SMS Transparent Mode
11 GPS Transparent Mode

AT+MCTTC

Description

Set Comport TCP Client parameters when IP Protocol Mode is set to TCP Client.

Command Syntax

AT+MCTTC=<Remote Server IP>, <Remote Server Port>, <Outgoing timeout_s>

Example

Input:
AT+MCTTC=0.0.0.0,20002,60<enter>
Response:
OK

5.0 AT Command Line Interface

AT+MCTTS

Description

Set COM2 TCP Server parameters when IP Protocol Mode is set to TCP Server.

Example

Input:
AT+MCTTS=0,100,20002,300<enter>
Response:
OK

Command Syntax

AT+MCTTS=<Polling Mode>, <Polling timeout_s>, <Local Listener Port>, <Connection timeout_s>
Polling Mode:
0 Monitor
1 Multi-polling

AT+MCTTCS

Description

Set COM2 TCP Client/Server parameters when IP Protocol is set to TCP Client/Server mode.

Example

Input:
AT+MCTCS=0.0.0.0,20002,60,0,100,20002,300<enter>
Response:
OK

Command Syntax

AT+MCTTCS=<Remote Server IP>, <Remote Server Port>, <Outgoing timeout_s>, <Polling Mode>, <Polling timeout_s>,<Local Listener Port>, <Connection timeout_s>
Polling Mode:
0 Monitor
1 Multi-polling

AT+MCTUPP

Description

Set COM2 UDP Point-to-Point parameters when IP Protocol is set to UDP Point-to-Point mode.

Command Syntax

AT+MCTUPP=<Remote Server IP>, <Remote Server Port>, <Liste ner Port>, <UDP timeout_s>

Example

Input:
AT+MCTUPP=0.0.0.0,20002,20002,10<enter>
Response:
OK

5.0 AT Command Line Interface

AT+MIS

Description

Module Input Status.

Example

Input:
AT+MIS <enter>
Response:
+MIS: available input status
INPUT 1: 0 open
OK

Command Syntax

AT+MIS

AT+MOS

Description

Module Output Status.

Example

Input:
AT+MOS=0 <enter>
Response:
+MOS: available output status
OUTPUT 1: 0 open
OK

Input:
AT+MOS=1,1,1 <enter>
Response:
OK

Command Syntax

AT+MOS=<Mode>[,<Setting No.>,<Status>]
Mode:
0 All Output Status
1 Output Setting
Setting No.: 1, 2, 3, 4(if output available)
Status:
0 open
1 close

5.0 AT Command Line Interface

ATL

Description

Lists all available AT Commands.

Command Syntax

ATL <enter>

Example

ATL <enter>

AT Commands available:

AT	AT Echo OK
AT+TEST	AT Echo TEST
ATH	Show a list of previously run AT commands
ATL	List all available AT commands
AT&R	Reserved
AT&V	Display modem active profile
AT&W	Reserved
AT+MREB	Reboot the modem
ATA	Quit
ATO	Quit
AT+CMGS	Send SMS
AT+CMGR	Read SMS with changing status
AT+CMGL	List SMSs with changing status
AT+CMGD	Delete SMSs
AT+GMR	Modem Record Information
AT+GMI	Get Manufacturer Identification
AT+CNUM	Check Modem's Phone Number
AT+CIMI	Check Modem's IMEI and IMSI
AT+CCID	Check Modem's SIM Card Number
AT+MSYSI	System summary information
AT+MMNAME	Modem Name Setting
AT+MLEIP	Set the IP address of the modem LAN Ethernet interface
AT+MDHCP	Enable or disable DHCP server running on the Ethernet interface
AT+MDHCPA	Set the range of IP addresses to be assigned by the DHCP server
AT+MEMAC	Query the MAC address of local Ethernet interface
AT+MSIP	Set LAN static IP
AT+MSCT	Set LAN Connection Type
AT+MNTP	Define NTP server
AT+MPIPP	Enable or disable IP-Passthrough
AT+MCNTO	Set console timeout
AT+MRTF	Reset the modem to the factory default settings from non-volatile (NV) memory
AT+MTWT	Enable or disable traffic watchdog timer used to reset the modem
AT+MSCMD	Enable or disable system sms command service
AT+MDISS	Set discovery service used by the modem
AT+MPWD	Set password
AT+MIKACE	Enable or disable ICMP keep-alive check
AT+MIKAC	Set ICMP keep-alive check
AT+MDDNSE	Enable or disable DDNS
AT+MDDNS	Set DDNS
AT+MEURD1	Define Event UDP Report No.1
AT+MEURD2	Define Event UDP Report No.2
AT+MEURD3	Define Event UDP Report No.3
AT+MNMSR	Define NMS Report
AT+MGPSR1	Define GPS Report No.1
AT+MGPSR2	Define GPS Report No.2
AT+MGPSR3	Define GPS Report No.3
AT+MGPSR4	Define GPS Report No.4

(Continued….)

5.0 AT Command Line Interface

AT+MCTPS	Enable or disable com port
AT+MCTBR	Set com port baud rate
AT+MCTDF	Set com port data format
AT+MCTDM	Set com port data mode
AT+MCTCT	Set com port character timeout
AT+MCTMPS	Set com port maximum packet size
AT+MCTP	Set com port priority
AT+MCTNCDI	Enable or disable com port no-connection data intake
AT+MCTMTC	Set com port modbus tcp configuration
AT+MCTIPM	Set com port IP protocol mode
AT+MCTTC	Set com port tcp client configuration when IP protocol mode be set to TCP Client
AT+MCTTS	Set com port tcp server configuration when IP protocol mode be set to TCP Server
AT+MCTTCS	Set com port tcp client/server configuration when IP protocol mode be set to TCP Client/Server
AT+MCTUPP	Set com port UDP point to point configuration when IP protocol mode be set to UDP point to point
AT+MIS	Module Input status
AT+MOS	Module Output status and setting

Appendix A: Serial Interface

Module (DCE)		Signal		Host (e.g. PC) (DTE)
1		DCD	→	IN
2		RX	→	IN
3	←	TX		OUT
4	←	DTR		OUT
5		SG		
6		DSR	→	IN
7	←	RTS		OUT
8		CTS	→	IN

Arrows denote the direction that signals are asserted (e.g., DCD originates at the DCE, informing the DTE that a carrier is present).

The interface conforms to standard RS-232 signals, so direct connection to a host PC (for example) is accommodated.

The signals in the asynchronous serial interface are described below:

DCD *Data Carrier Detect* - Output from Module - When asserted (TTL low), DCD informs the DTE that a communications link has been established with another MHX 920A.

RX *Receive Data* - Output from Module - Signals transferred from the MHX 920A are received by the DTE via RX.

TX *Transmit Data* - Input to Module - Signals are transmitted from the DTE via TX to the MHX 920A.

DTR *Data Terminal Ready* - Input to Module - Asserted (TTL low) by the DTE to inform the module that it is alive and ready for communications.

SG *Signal Ground* - Provides a ground reference for all signals transmitted by both DTE and DCE.

DSR *Data Set Ready* - Output from Module - Asserted (TTL low) by the DCE to inform the DTE that it is alive and ready for communications. DSR is the module's equivalent of the DTR signal.

RTS *Request to Send* - Input to Module - A "handshaking" signal which is asserted by the DTE (TTL low) when it is ready. When hardware handshaking is used, the RTS signal indicates to the DCE that the host can receive data.

CTS *Clear to Send* - Output from Module - A "handshaking" signal which is asserted by the DCE (TTL low) when it has enabled communications and transmission from the DTE can commence. When hardware handshaking is used, the CTS signal indicates to the host that the DCE can receive data.

Notes: It is typical to refer to RX and TX from the perspective of the DTE. This should be kept in mind when looking at signals relative to the module (DCE); the module transmits data on the RX line, and receives on TX.

"DCE" and "module" are often synonymous since a module is typically a DCE device.
"DTE" is, in most applications, a device such as a host PC.

Appendix B: IP-Passthrough Example (Page 1 of 2)

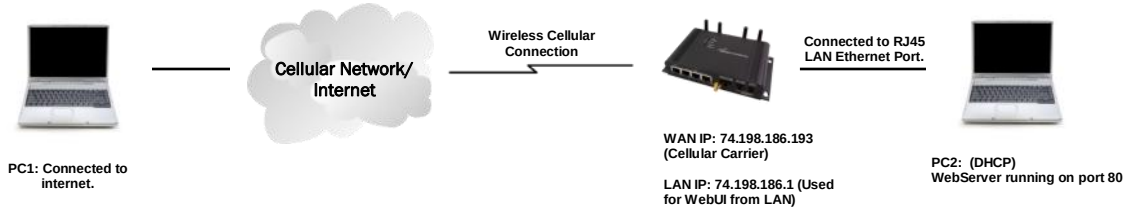
By completing the Quick Start process, a user should have been able to log in and set up the VIP4G to work with their cellular carrier. By completing this, the modem is ready to be used to access the internet and provide mobile connectivity. However, a common application of the VIP4G is to access connected devices remotely. In order to do this, the VIP4G must be told how to deal with incoming traffic, where to send it to. To accomplish this there are three options :

- IP-Passthrough
- Port Forwarding
- DMZ (a type of Port Forwarding)

In this section we will talk about IP-Passthrough and how to configure the VIP4G and the connected device/PC to work with IP-Passthrough. IP-Passthrough means that the VIP4G is transparent, and all outside (WAN) traffic is simply sent directly to a single device connected to one of the physical LAN RJ-45 ports on the VIP4G (With exception of port 80, which is retained for remote configuration (configurable). Also, any traffic that is sent to the RJ45 port is sent directly out the WAN port and is not processed by the VIP4G.

IP-Passthrough is ideal for applications where only a single device is connected to the VIP4G, and other features of the VIP4G are not required. When in passthrough mode, most features of the VIP4G are bypassed, this includes the serial ports, the GPS features, VPN, the Firewall, and much more. The advantage of IP-Passthrough is that the configuration is very simple.

In the example below we have a VIP4G connected to a PC (PC2). The application requires that PC1 be able to access several services on PC2. Using Port Forwarding this would require a new rule created for each port, and some applications or services may require several ports so this would require several rules, and the rules may be different for each installation, making future maintenance difficult. For IP-Passthrough, PC1 only needs to know the Public Static IP Address of the VIP4G, the VIP4G would then automatically assign, via DHCP, the WAN IP to the attached PC2, creating a transparent connection.

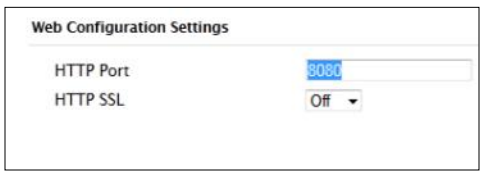


Step 1

Log into the VIP4G (Refer to Quick Start), and ensure that DHCP is enabled on the **Network > LAN** page.

Step 2

Since PC2 requires port 80 to be used as its Web server port, port 80 cannot be used on the VIP4G, by default it retains this port for remote configuration. To change the port used by the VIP4G, navigate to the **System > Settings** page as seen below. For this example we are going to change it to port 8080. When changing port numbers on the VIP4G, it is recommended to reboot the unit before continuing, remember the new WebUI port is now 8080 when you log back into the VIP4G. (e.g. 192.168.168.1:8080).



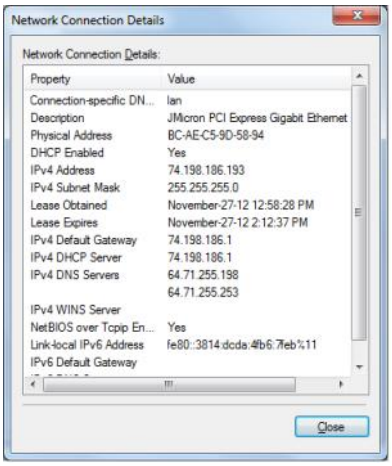
Appendix B: IP-Passthrough Example (Page 2 of 2)

Step 3

Now IP-Passthrough can be enabled on the VIP4G. Under the ***Carrier > Settings*** tab, IP-Passthrough can be found. To enable this feature, select "Ethernet" from the drop down box. Once the changes are applied, whichever device is physically connected to the LAN RJ45 port, will dynamically be assigned the WAN IP Address. In this example, this would be 74.198.186.193.

The default IP address of 192.168.168.1 on the LAN is no longer available, but it is still possible to access and configure the VIP4G on the LAN side, by using the X.X.X.1 IP Address, where the first 3 octets of the WAN IP are used in place of the X's. (e.g. 74.198.186.1, and remember the HTTP port in this example was changed to 8080).

Step 4



Attach the remote device or PC to the RJ45 port of the VIP4G. The end device has to be set up for DHCP to get an IP address from the VIP4G (Or it needs the carrier IP set as a static IP). In the test/example setup we can verify this by looking at the current IP address. In the screenshot to the right we can see that the Laptop connected to the VIP4G has a IP Address of 74.198.186.193, which is the IP address assign by the cellular carrier for the modem.

Step 5 (Optional)

IP-Passthrough operation can also be verified in the VIP4G. Once IP-Passthrough is enabled you can access the VIP4G WebUI by one of the following methods:

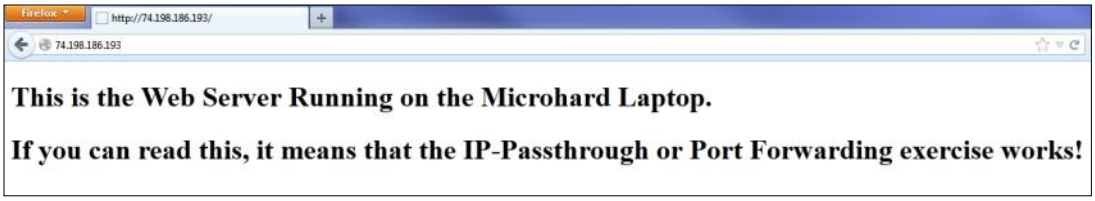
- Remotely on the WAN side (usually the internet), using the WAN IP, and the port specified for HTTP operation (or, if enabled, by using the HTTPS (443) ports), in this example with would be 74.198.186.193:8080.
- On the LAN side, by entering in the first 3 octets of the WAN IP and .1 for the fourth, so in our example 74.198.186.1:8080.

Once logged in, navigate to the ***Carrier > Status*** page. Under WAN IP Address it should look something like shown in the image to the right, 74.198.186.193 on LAN.

Connection Duration	1 min 43 sec
WAN IP Address	74.198.186.193 on LAN
DNS Server 1	64.71.255.198

Step 6

The last step is to verify the remote device can be accessed. In this example a PC is connected to the RJ45 port of the VIP4G. On this PC a simple apache web server is running to illustrate a functioning system. On a remote PC, enter the WAN IP Address of the VIP4G into a web browser. As seen below, when the IP Address of the VIP4G is entered, the data is passed through to the attached PC. The screen shot below shows that our test setup was successful.



Appendix C: Port Forwarding Example (Page 1 of 2)

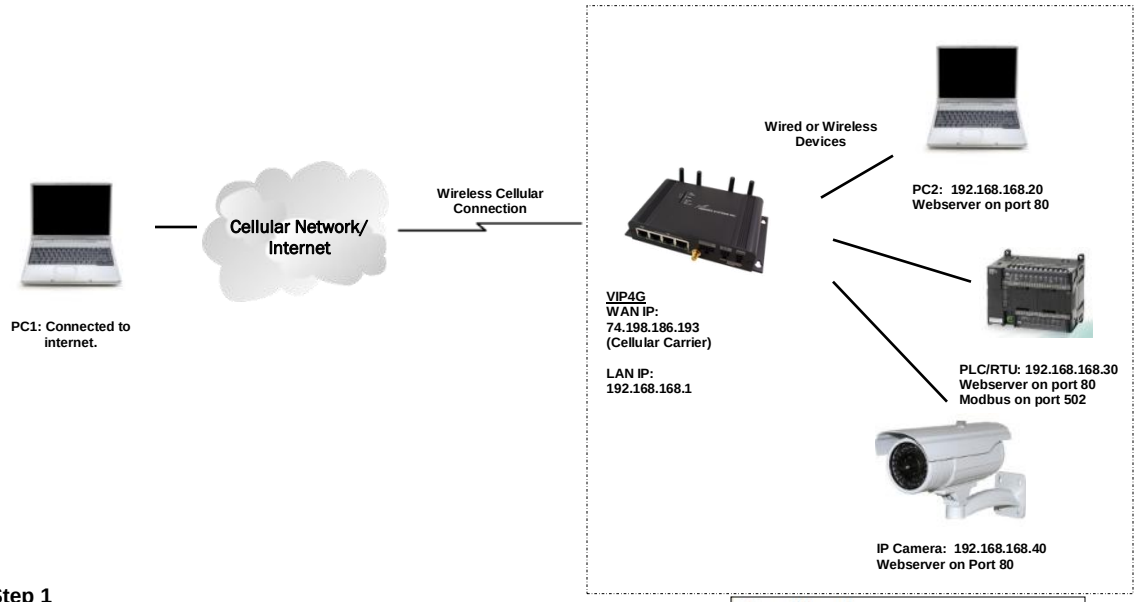
By completing the Quick Start process, a user should have been able to log in and set up the VIP4G to work with their cellular carrier. By completing this, the modem is ready to be used to access the internet and provide mobile connectivity. However, one of the main applications of the VIP4G is to access connected devices remotely. In order to do this, the VIP4G must be told how to deal with incoming traffic, where to send it to. To accomplish this there are three options :

- IP-Passthrough
- Port Forwarding
- DMZ (a type of Port Forwarding)

In the previous section we illustrated how to use and setup IP-Passthrough. In this section we will talk about port forwarding. Port forwarding is ideal when there are multiple devices connected to the VIP4G, or if other features of the VIP4G are required (Serial Ports, Firewall, GPS, etc). In port forwarding, the VIP4G looks at each incoming Ethernet packet on the WAN and by using the destination port number, determines where it will send the data on the private LAN . The VIP4G does this with each and every incoming packet.

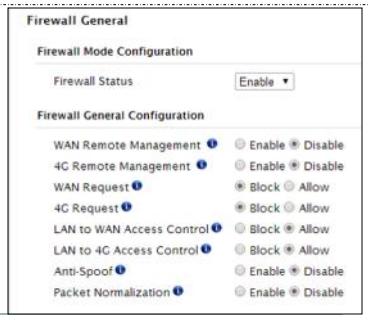
DMZ (a form of port forwarding) is useful for situations where there are multiple devices connected to the VIP4G, but all incoming traffic is destined for a single device. It is also popular to use DMZ in cases where a single device is connected but several ports are forwarded and other features of the VIP4G are required, since in passthrough mode all of these features are lost.

Consider the following example. A user has a remote location that has several devices that need to be accessed remotely. The User at PC1 can only see the VIP4G directly using the public static IP assigned by the wireless carrier, but not the devices behind it. In this case the VIP4G is acting a gateway between the Cellular Network and the Local Area Network of its connected devices. Using port forwarding we can map the way that data passes through the VIP4G.



Step 1

Log into the VIP4G (Refer to Quick Start), and ensure that the ***Firewall*** is enabled. This can be found under ***Firewall > General.*** Also ensure that that sufficient ***Rules*** or ***IP lists*** have been setup to allow specific traffic to pass through the VIP4G. See the Firewall Example in the next Appendix for information on how to allow connections from an IP or to open ports. Once that is complete, remember to “Submit” the changes.



Appendix C: Port Forwarding Example (Page 2 of 2)

Step 2

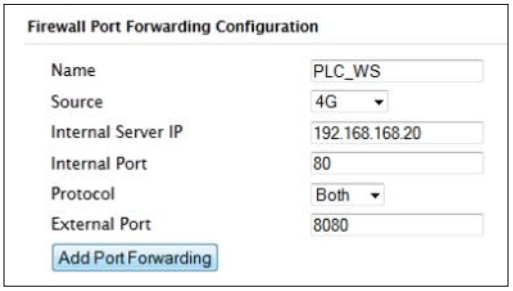
Determine which external ports (WAN) are mapped to which internal IP Addresses and Ports (LAN). It is important to understand which port, accessible on the outside, is connected or mapped to which devices on the inside. For this example we are going to use the following ports, in this case it is purely arbitrary which ports are assigned, some systems may be configurable, other systems may require specific ports to be used.

Description	WAN IP	External Port	Internal IP	Internal Port
VIP4G WebUI	74.198.186.193	80	192.168.168.1	80
PC2 Web Server	74.198.186.193	8080	192.168.168.20	80
PLC Web Server	74.198.186.193	8081	192.168.168.30	80
PLC Modbus	74.198.186.193	10502	192.168.168.30	502
Camera Web Server	74.198.186.193	8082	192.168.168.40	80

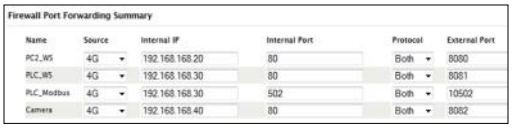
Notice that to the outside user, the IP Address for every device is the same, only the port number changes, but on the LAN, each external port is mapped to an internal device and port number. Also notice that the port number used for the configuration GUI for all the devices on the LAN is the same, this is fine because they are located on different IP addresses, and the different external ports mapped by the VIP4G (80, 8080, 8081, 8082), will send the data to the intended destination.

Step 3

Create a rule for each of the lines above. A rules does not need to be created for the first line, as that was listed simply to show that the external port 80 was already used, by default, by the VIP4G itself. To create port forwarding rules, Navigate to the ***Firewall > Port Forwarding*** menu. When creating rules, each rules requires a unique name, this is only for reference and can be anything desired by the user. Click on the **"Add Port Forwarding"** button to add each rule to the VIP4G.



Once all rules have been added, the VIP4G configuration should look something like what is illustrated in the screen shot to the right. Be sure to **"Submit"** the Port Forwarding list to the VIP4G.



For best results, reboot the VIP4G.

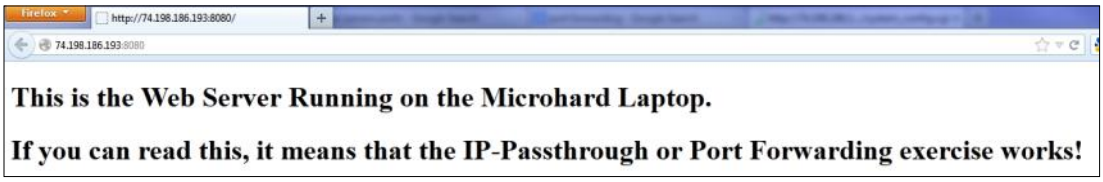
Step 4

Configure the static addresses on all attached devices. Port forwarding required that all the attached devices have static IP addresses, this ensure that the port forwarding rules are always correct, as changing IP addresses on the attached devices would render the configured rules useless and the system will not work.

Step 5

Test the system. The devices connected to the VIP4G should be accessible remotely. To access the devices:

For the Web Server on the PC, use a browser to connect to 74.198.186:193:8080, in this case the same webserver is running as in the IP-Passthrough example, so the result should be as follows:



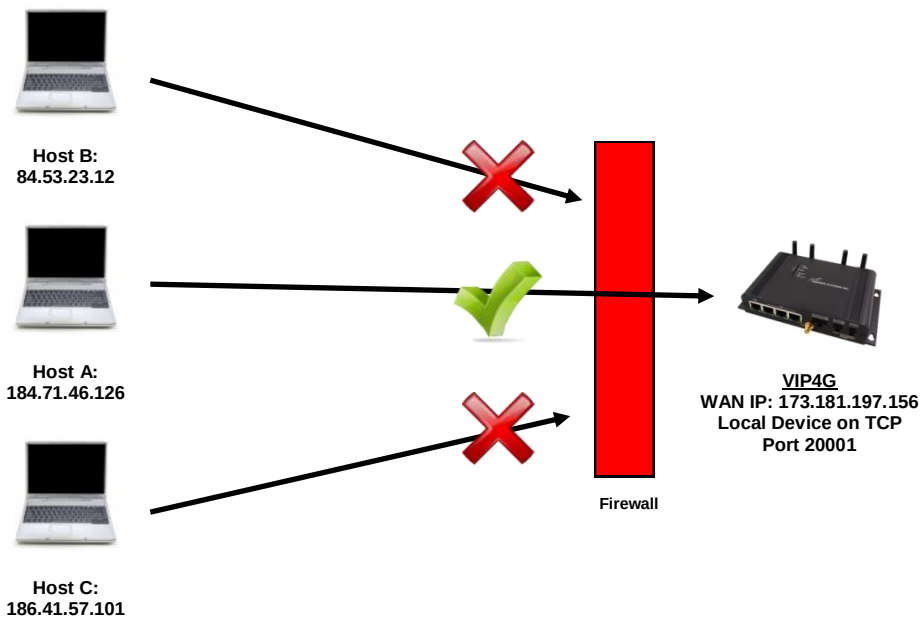
To access the other devices/services: For the PLC Web Server: 74.198.186.193:8081, for the Camera 74.198.186.193:8082, and for the Modbus on the PLC telnet to 74.198.186.193:10502 etc.

Appendix D: Firewall Example (Page 1 of 2)

By completing the Quick Start process, a user should have been able to log in and set up the VIP4G to work with their cellular carrier. By completing this, the modem is ready to be used to access the internet and provide mobile connectivity. However, one of the main applications of the VIP4G is to access connected devices remotely. Security plays an important role in M2M deployments as in most cases the modem is publically available on the internet. Limiting access to the VIP4G is paramount for a secure deployment. The firewall features of the VIP4G allow a user to limit access to the VIP4G and the devices connected to it by the following means

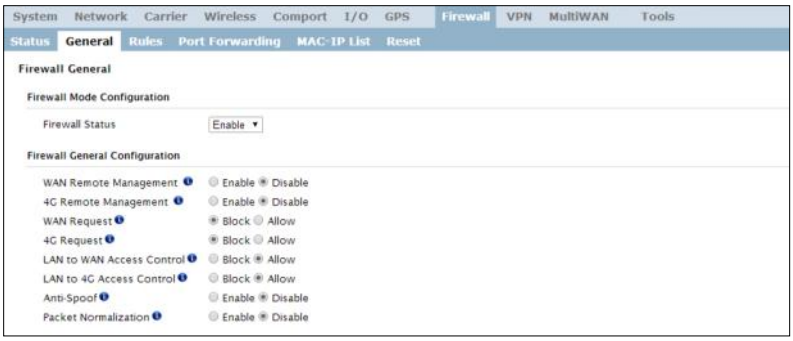
- Customizable Rules
- MAC and/or IP List
- ACL (Access Control List) or Blacklist using the above tools.

Consider the following example. An VIP4G is deployed at a remote site to collect data from an end device such as a PLC or RTU connected to the serial DATA port (Port 20001 on the WAN. It is required that only a specific host (Host A) have access to the deployed VIP4G and attached device, including the remote management features.



Step 1

Log into the VIP4G (Refer to Quick Start). Navigate to the Firewall > General tab as shown below and ensure that the Firewall is turned on by enabling the ***Firewall Status***. Next block all WAN traffic by setting the ***4G Request*** to Block, and disable ***4G Remote Management***. Be sure to Apply the settings. At this point it should be impossible to access the VIP4G remotely through its cellular connection.

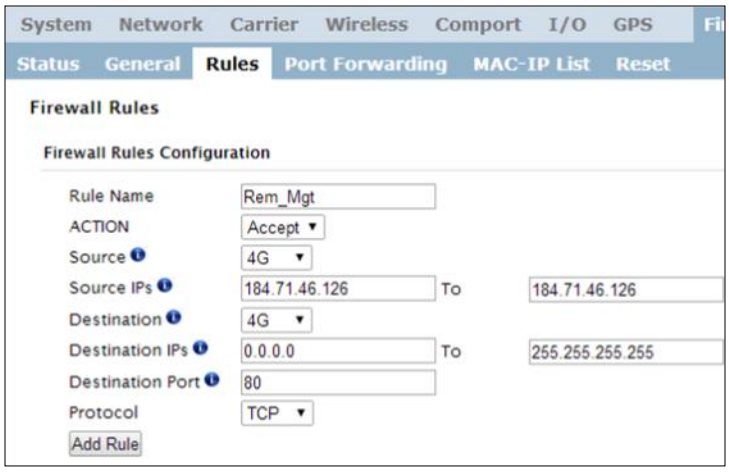


Appendix D: Firewall Example (Page 2 of 2)

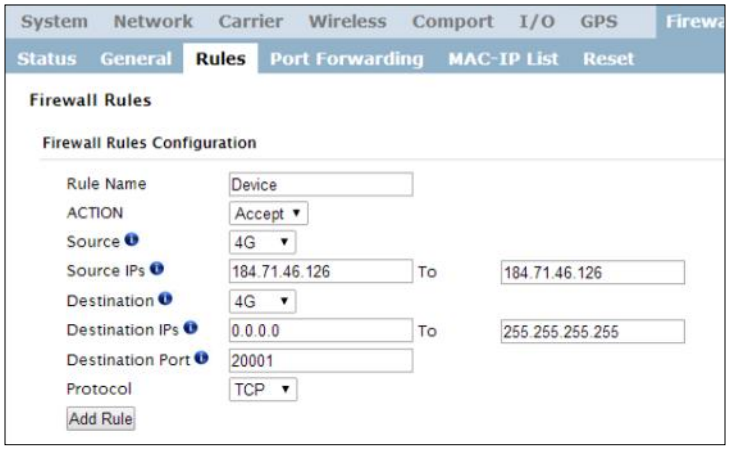
Step 2

Under the Rules tab we need to create two new rules. A rule to enable Host A access to the Remote Management Port (TCP Port 80), and another to access the device attached the to serial port (WAN TCP Port 20001).

Rule 1



Rule 2



After each rule is created be sure to click the ***ADD Rule*** button, once both rules are created select the ***Submit*** button to write the rules to the VIP4G. The Firewall Rules Summary should look like what is shown below.

Step 3

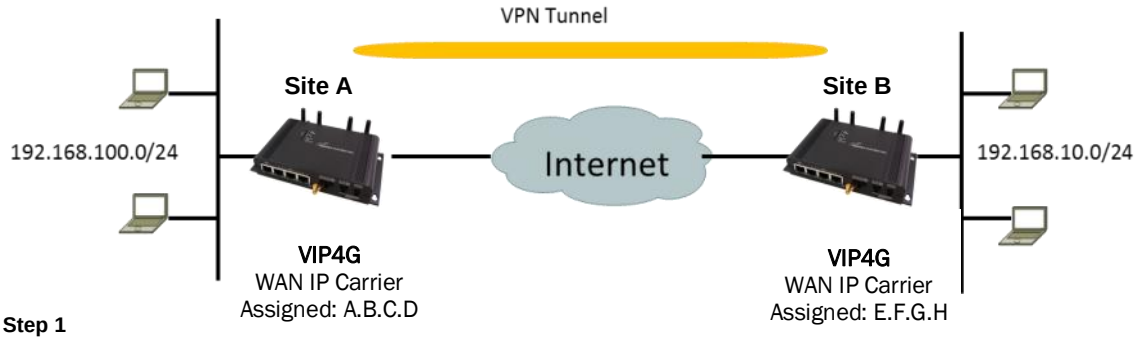
Test the connections. The VIP4G should only allow connections to the port specified from the Host A. An alternate means to limit connections to the VIP4G to a specific IP would have been to use the MAC-IP List Tool. By using Rules, we can not only limit specific IP's, but we can also specify ports that can be used by an allowed IP address.

Appendix E: VPN Example (Page 1 of 2)

By completing the Quick Start process, a user should have been able to log in and set up the VIP4G to work with their cellular carrier. By completing this, the modem is ready to be used to access the internet and provide mobile connectivity. However, one of the main applications of the VIP4G is to access connected devices remotely. In addition to Port Forwarding and IP-Passthrough, the VIP4G has several VPN capabilities, creating a tunnel between two sites, allowing remote devices to be accessed directly.

VPN allows multiple devices to be connected to the VIP4G without the need to individually map ports to each device. Complete access to remote devices is available when using a VPN tunnel. A VPN tunnel can be created by using two VIP4G devices, each with a public IP address. At least one of the modems require a static IP address. VPN tunnels can also be created using the VIP4G to existing VPN capable devices, such as Cisco or Firebox.

Example: VIP4G to VIP4G (Site-to-Site)



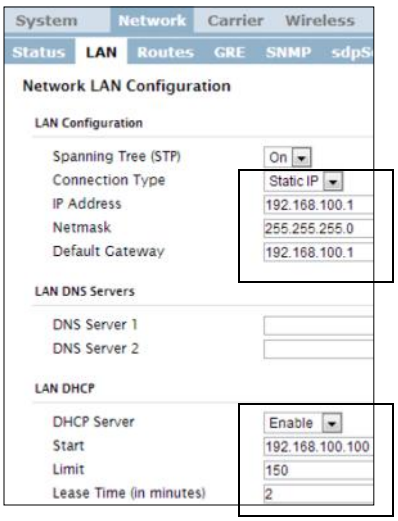
Step 1

Log into each of the VIP4Gs (Refer to Quick Start), and ensure that the ***Firewall*** is enabled. This can be found under ***Firewall > General.*** Also ensure that either ***WAN Request*** is set to Allow, which allows traffic to come in from the WAN, or that sufficient ***Rules*** or ***IP lists*** have been setup to allow specific traffic to pass through the VIP4G. Once that is complete, remember to "Apply" the changes.

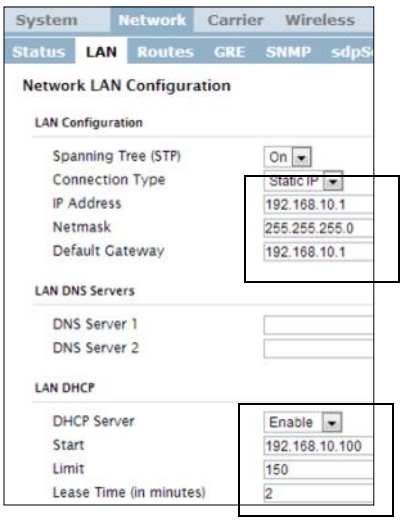
Step 2

Configure the LAN IP and subnet for each VIP4G. The subnets must be different and cannot overlap.

Site A



Site B

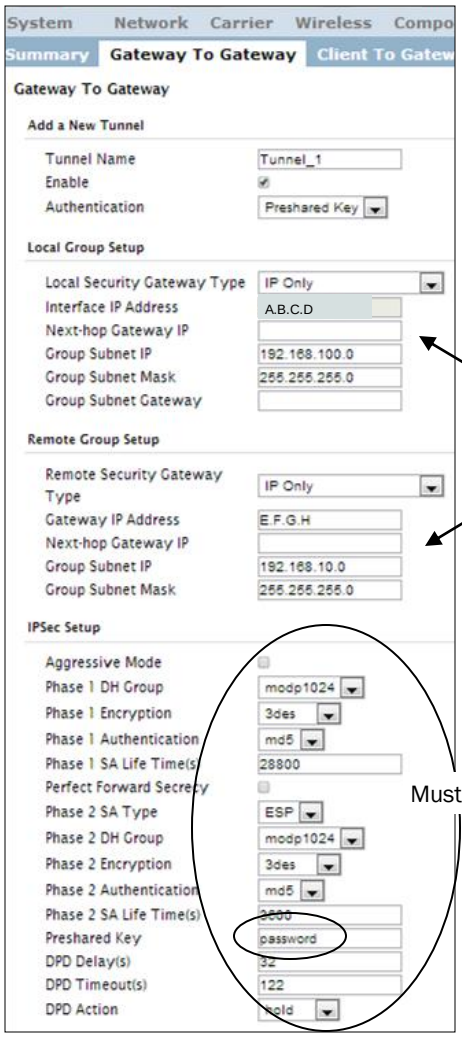


Appendix E: VPN Example (Page 2 of 2)

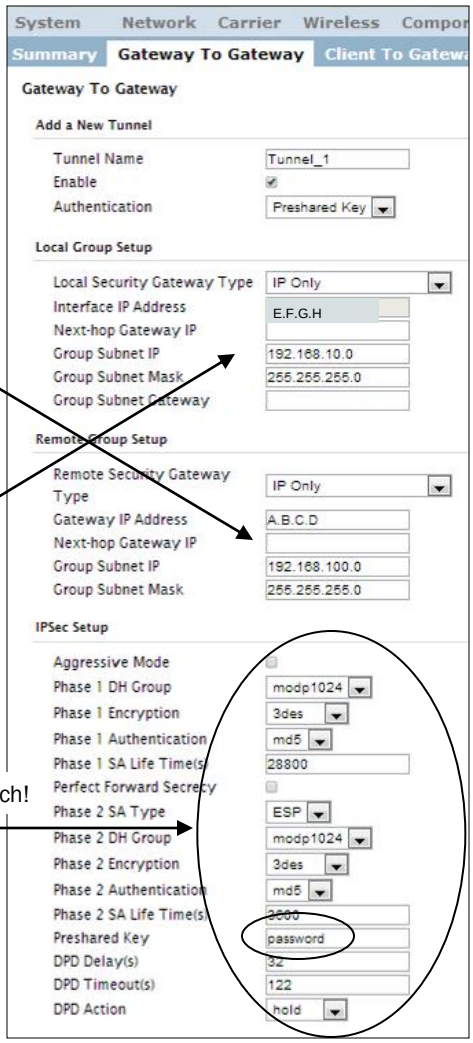
Step 3

Add a VPN Gateway to Gateway tunnel on each VIP4G.

Site A



Site B



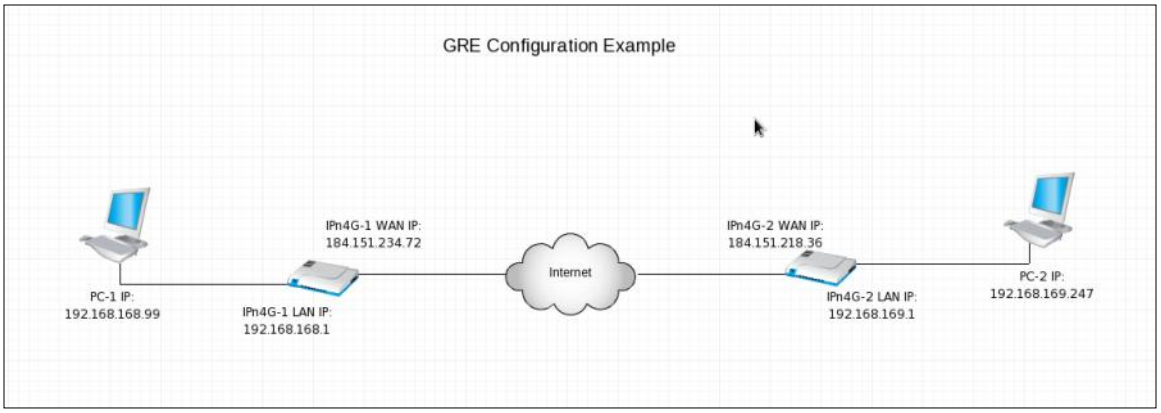
Must Match!

Step 4

Submit changes to both units. It should be possible to ping and reach devices on either end of the VPN tunnel if both devices have been configured correctly and have network connectivity.

Appendix F: GRE Example

The following pages outline the different GRE configurations available for the VIP4G. This may be useful in determining which fields are populated by showing a working example. Three different setups are shown: General GRE (without IPsec), GRE over IPsec (Transport Mode) and GRE over IPsec (Tunnel Mode).

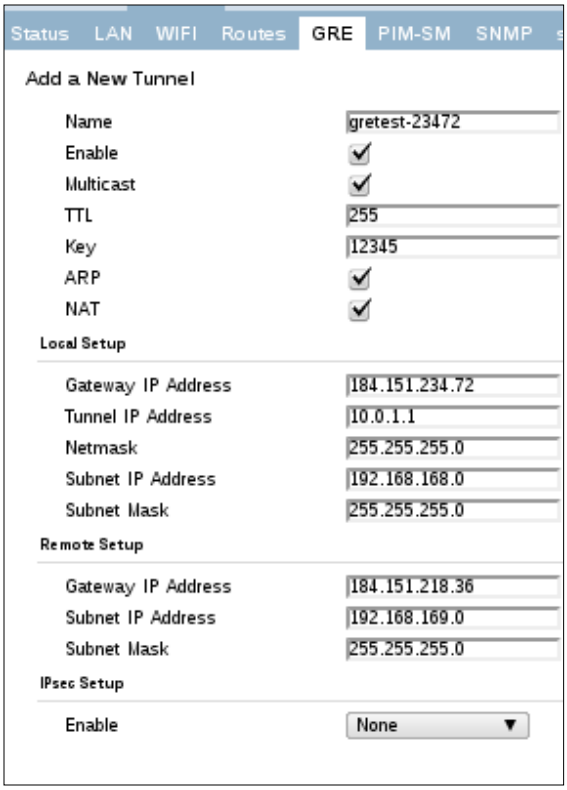


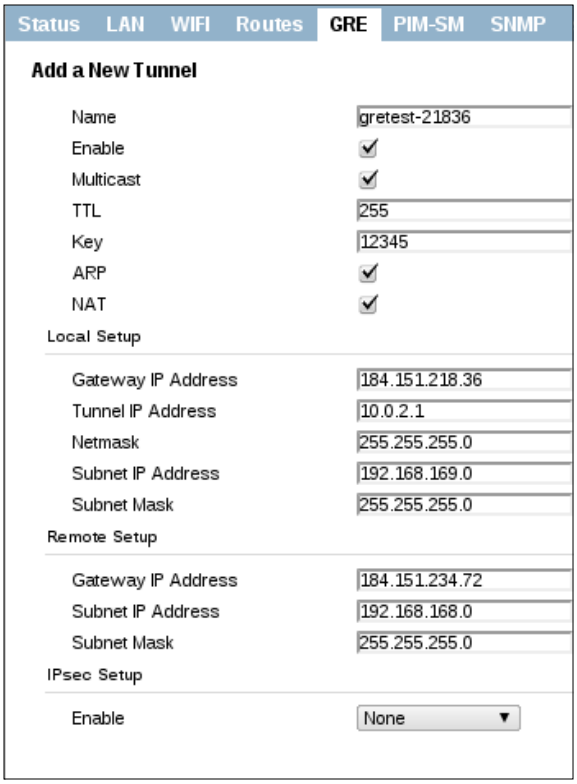
Appendix F Image 1: Network Configuration Example Topology

Prerequisites:

1. Firewall > General > WAN Request Allow (Not Recommened), OR add a specific firewall rules (Recommened)
2. Add a route on PC-1: ip route add 192.168.169.0/24 via 192.168.168.1 dev eth0
   Add a route on PC-2: ip route add 192.168.168.0/24 via 192.168.169.1 dev eth0

Example 1: General GRE (without IPsec)





Appendix F: GRE Example

Example 2: GRE over IPsec (Transport Mode)

Add a New Tunnel

Name	gretest-23472
Enable	☑
Multicast	☑
TTL	255
Key	12345
ARP	☑
NAT	☑
Local Setup	
Gateway IP Address	184.151.234.72
Tunnel IP Address	10.0.1.1
Netmask	255.255.255.0
Subnet IP Address	192.168.168.0
Subnet Mask	255.255.255.0
Remote Setup	
Gateway IP Address	184.151.218.36
Subnet IP Address	192.168.190.0
Subnet Mask	255.255.255.0
IPsec Setup	
Enable	GRE over IPsec
Tunnel Mode	Transport
Aggressive Mode	☐
Local Security Gateway Type	IP Only
Local Gateway IP	184.151.234.72
Local Next-hop Gateway IP	184.151.234.72
Local Subnet IP	192.168.168.0
Local Subnet Mask	255.255.255.0
Local Subnet Gateway	192.168.168.1
Remote Security Gateway Type	IP Only
Remote Gateway IP	184.151.218.36
Remote Next-hop Gateway IP	184.151.218.36
Remote Subnet IP	192.168.169.0
Remote Subnet Mask	255.255.255.0
Phase1 Strict Mode:	☐
Phase 1 DH Group	modp1024
Phase 1 Encryption	3des
Phase 1 Authentication	md5
Phase 1 SA Life Time(s)	3600
Perfect Forward Secrecy	☐
Phase2 Strict Mode:	☐
Phase 2 DH Group	modp1024
Phase 2 Encryption	3des
Phase 2 Authentication	md5
Phase 2 SA Life Time(s)	28800
Preshared Key	••••••••
DPD Delay(s)	32
DPD Timeout(s)	122
DPD Action	hold

Add a New Tunnel

Name	gretest-21836
Enable	☑
Multicast	☑
TTL	255
Key	12345
ARP	☑
NAT	☑
Local Setup	
Gateway IP Address	184.151.218.36
Tunnel IP Address	10.0.2.1
Netmask	255.255.255.0
Subnet IP Address	192.168.169.0
Subnet Mask	255.255.255.0
Remote Setup	
Gateway IP Address	184.151.234.72
Subnet IP Address	192.168.168.0
Subnet Mask	255.255.255.0
IPsec Setup	
Enable	GRE over IPsec
Tunnel Mode	Transport
Aggressive Mode	☐
Local Security Gateway Type	IP Only
Local Gateway IP	184.151.218.36
Local Next-hop Gateway IP	184.151.218.36
Local Subnet IP	192.168.169.0
Local Subnet Mask	255.255.255.0
Local Subnet Gateway	192.168.169.1
Remote Security Gateway Type	IP Only
Remote Gateway IP	184.151.234.72
Remote Next-hop Gateway IP	184.151.234.72
Remote Subnet IP	192.168.168.0
Remote Subnet Mask	255.255.255.0
Phase1 Strict Mode:	☐
Phase 1 DH Group	modp1024
Phase 1 Encryption	3des
Phase 1 Authentication	md5
Phase 1 SA Life Time(s)	3600
Perfect Forward Secrecy	☐
Phase2 Strict Mode:	☐
Phase 2 DH Group	modp1024
Phase 2 Encryption	3des
Phase 2 Authentication	md5
Phase 2 SA Life Time(s)	28800
Preshared Key	••••••••
DPD Delay(s)	32
DPD Timeout(s)	122
DPD Action	hold

Appendix F: GRE Example

Example 3: GRE over IPsec (Tunnel Mode)

Add a New Tunnel

Name	gretest-23472
Enable	☑
Multicast	☑
TTL	255
Key	12345
ARP	☑
NAT	☑
Local Setup	
Gateway IP Address	172.16.1.1
Tunnel IP Address	10.0.1.1
Netmask	255.255.255.0
Subnet IP Address	192.168.168.0
Subnet Mask	255.255.255.0
Remote Setup	
Gateway IP Address	172.16.2.1
Subnet IP Address	192.168.169.0
Subnet Mask	255.255.255.0
IPsec Setup	
Enable	GRE over IPsec
Tunnel Mode	Tunnel
Aggressive Mode	☐
Local Security Gateway Type	IP Only
Local Gateway IP	184.151.234.72
Local Next-hop Gateway IP	184.151.234.72
Local Subnet IP	172.16.1.1
Local Subnet Mask	255.255.255.255
Local Subnet Gateway	172.16.1.1
Remote Security Gateway Type	IP Only
Remote Gateway IP	184.151.218.36
Remote Next-hop Gateway IP	184.151.218.36
Remote Subnet IP	172.16.2.1
Remote Subnet Mask	255.255.255.255
Phase1 Strict Mode:	☐
Phase 1 DH Group	modp1024
Phase 1 Encryption	3des
Phase 1 Authentication	md5
Phase 1 SA Life Time(s)	3600
Perfect Forward Secrecy	☐
Phase2 Strict Mode:	☐
Phase 2 DH Group	modp1024
Phase 2 Encryption	3des
Phase 2 Authentication	md5
Phase 2 SA Life Time(s)	28800
Preshared Key	••••••••••
DPD Delay(s)	32
DPD Timeout(s)	122
DPD Action	hold

Add a New Tunnel

Name	gretest-21836
Enable	☑
Multicast	☑
TTL	255
Key	12345
ARP	☑
NAT	☑
Local Setup	
Gateway IP Address	172.16.2.1
Tunnel IP Address	10.0.2.1
Netmask	255.255.255.0
Subnet IP Address	192.168.169.0
Subnet Mask	255.255.255.0
Remote Setup	
Gateway IP Address	172.16.1.1
Subnet IP Address	192.168.168.0
Subnet Mask	255.255.255.0
IPsec Setup	
Enable	GRE over IPsec
Tunnel Mode	Tunnel
Aggressive Mode	☐
Local Security Gateway Type	IP Only
Local Gateway IP	184.151.218.36
Local Next-hop Gateway IP	184.151.218.36
Local Subnet IP	172.16.2.1
Local Subnet Mask	255.255.255.255
Local Subnet Gateway	172.16.2.1
Remote Security Gateway Type	IP Only
Remote Gateway IP	184.151.234.72
Remote Next-hop Gateway IP	184.151.234.72
Remote Subnet IP	172.16.1.1
Remote Subnet Mask	255.255.255.255
Phase1 Strict Mode:	☐
Phase 1 DH Group	modp1024
Phase 1 Encryption	3des
Phase 1 Authentication	md5
Phase 1 SA Life Time(s)	3600
Perfect Forward Secrecy	☐
Phase2 Strict Mode:	☐
Phase 2 DH Group	modp1024
Phase 2 Encryption	3des
Phase 2 Authentication	md5
Phase 2 SA Life Time(s)	28800
Preshared Key	••••••••••
DPD Delay(s)	32
DPD Timeout(s)	122
DPD Action	hold

Appendix G: Firmware Recovery Procedure

In event that your unit becomes unresponsive it may be required to perform a firmware recovery procedure outlined below:

1. Download and save firmware file in a local folder, for example C:\;

2. Separate the PC from the network and set IP to static:

   192.168.1.1
   255.255.255.0

3. Connect PC Ethernet port to the Ethernet port of the modem to be recovered

4. Start a ping on the PC

   C:\>ping 192.168.1.39 -t
   Pinging 192.168.1.39 with 32 bytes of data:
   Request timed out.
   Request timed out.

5. Power cycle modem while pressing and holding CFG(Config) button;

6. Release the CFG button when ping responded:

   C:\>ping 192.168.1.39 -t
   Pinging 192.168.1.39 with 32 bytes of data:
   Request timed out.
   Request timed out.
   Request timed out.
   Reply from 192.168.1.39: bytes=32 time<1ms TTL=128
   Reply from 192.168.1.39: bytes=32 time<1ms TTL=128
   Reply from 192.168.1.39: bytes=32 time<1ms TTL=128
   Reply from 192.168.1.39: bytes=32 time<1ms TTL=128

Note, If ping responds as shown above, then you can probably recover the unit, please proceed. Otherwise, send the unit back for RMA.

7. Now use TFTP to push firmware file into the corrupted unit:

   For example, on Windows XP using following command line:

   tftp -i 192.168.1.39 put VIPn4G-v1_1_0-r1084-14.bin (or the file saved).

8. Wait until above command to successfully transfered the image, similar message should show

   Transfer successful: xxxxxxx bytes in 5 seconds, nnnnnnn bytes/s, note the number might change for different firmware file

Note, if you see message above, the unit will re-flash itself and reboot, otherwise call for help or send back for RMA.

9. Wait for the unit to recover and reboot.

Appendix H: Troubleshooting (FAQ)

Below is a number of the common support questions that are asked about the VIP4G. The purpose of the section is to provide answers and/or direction on how to solve common problems with the VIP4G.

Question: *Why can't I connect to the internet/network?*

Answer: To connect to the internet a SIM card issued by the Wireless Carrier must be installed and the APN programmed into the Carrier Configuration of the VIP4G. For instructions of how to log into the VIP4G refer to the Quick Start.

Question: *What is the default IP Address of the VIP4G?*

Answer: The default IP address for the LAN is 192.168.168.1.

Question: *What is the default login for the VIP4G?*

Answer: The default username is ***admin****, the default password is* ***admin****.*

Question: *What information do I need to get from my wireless carrier to set up the VIP4G?*

Answer: The APN is required to configure the VIP4G to communicate with a wireless carrier. Some carriers also require a username and password. The APN, username and password are only available from your wireless carrier.

Newer units may support an AUTO APN feature, which will attempt to determine the APN from a preconfigured list of carriers and commonly used APN's. This is designed to provide quick network connectivity, but will not work with private APN's. Success with AUTO APN will vary by carrier.

Question: *How do I reset my modem to factory default settings?*

Answer: If you are logged into the VIP4G navigate to the System > Maintenance Tab. If you cannot log in, power on the VIP4G and wait until the status LED in on solid (not flashing). Press and hold the CONFIG button until the unit reboots (about 8-10 seconds).

Question: *I can connect the Carrier, but I can't access the Internet/WAN/network from a connected PC?*

Answer: Ensure that you have DHCP enabled or manually set up a valid IP, Subnet, Gateway and DNS set on the local device.

Question: *I connected a device to the serial port of the VIP4G and nothing happens?*

Answer: In addition to the basic serial port settings, the IP Protocol Config has to be configured. Refer to the Comport Configuration pages for a description of the different options.

Appendix H: Troubleshooting

Question: *How do I access the devices behind the modem remotely?*

Answer: To access devices behind the VIP4G remotely, several methods can be used:

A. IP Passthrough - The VIP4G is transparent and the connected device can be access directly. Refer to The IP-Passthrough Appendix for a detailed example of how this may be deployed.
B. Port Forwarding/DMZ - Individual external WAN ports are mapped to internal LAN IP's and Ports. See the Port-Forwarding Appendix for a detailed example.
C. VPN - A tunnel can be created and full access to remote devices can be obtained. Required the use of multiple modems or VPN routers. See the VPN Appendix on an example of how to set up a VPN.

Question: *I have set up firewall rules and/or port forwarding rules but they do not work?*

Answer: Ensure that the Firewall is ***Enabled***. Even port forwarding requires that the firewall feature is enabled. If the WAN/4G request is blocked (recommended), additional rules will need to be created for any external request.

Question: *I have Internet/4G access but I cannot ping the device remotely?*

Answer: Ensure that the 4G/WAN request is enabled in the Firewall settings, or create a Firewall rule to allow ping messages.

Question: *I'm using IP-Passthrough but the serial ports won't work?*

Answer: When using IP-Passthrough, the WAN IP is assigned to the device connected to the Ethernet port, all traffic is passed through to that device. As a result serials port will not work. The only port not being passed through is the remote management port (default port 80), which can be changed in the security settings.

Question: *I'm using IP-Passthrough but the modem won't take my Firewall settings?*

Answer: When using IP-Passthrough, the 4G IP is assigned to the device connected to the Ethernet port, all traffic is passed through to that device. As a result the firewall settings have no effect on the unit, and is automatically disabled.

Question: *I cannot get IP-Passthrough to work?*

Answer: When using IP-Passthrough, the 4G IP is assigned to the device connected to the Ethernet port, all traffic is passed through to that device. In order for IP-Passthrough to work, the connected local device ***must*** have DHCP enabled, or the 4G IP set as a static IP in the end device.

Appendix H: Troubleshooting

Question: *Why does my modem reset every 10 minutes (or other time)?*

Answer: There are a number of processes in the VIP4G that ensure that the unit is communicating at all times, and if a problem is detected will reboot the modem to attempt to resolve any issues:

1. Traffic Watchdog - Detects if there is any Wireless Traffic between the VIP4G and the Cellular Carrier. Will reboot modem when timer expires unless there is traffic. Carrier > Traffic Watchdog.
2. Keepalive - Attempts to contact a configured host on a defined basis. Will reboot modem if host is unreachable. Enabled by default to attempt to ping 8.8.8.8. May need to disable on private networks, or provide a reachable address to check. Access via Carrier > Keepalive.
3. Local Device Monitor - The VIP4G will monitor a local device, if that device is not present the VIP4G may reboot. Network > LocalMonitor.

Question: *How do I set up VPN?*

Answer: Refer to the VPN Appendix for an example.

Question: *Why is the data usage on my modem so high?*

Answer: Although it is impossible to answer that question without more detailed information about your modem, and the devices/application you are using, there are a number of things to keep in mind:

1. Always setup and configure a Firewall on the modem, this is especially important if the modem is using a publically accessible IP address.
2. Always change the default user/passwords.
3. Turn off any services that are not needed, such as GPS, Comports, SNMP, SSH, anything not being used specifically in your application.
4. Use the Data Usage alerts to keep informed of daily and monthly data usage of the modem to avoid surprises once the data bill arrives.

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