Telstra Smart Modem Gen 2 DJA0231

Disclaimer

This is not an official document. I am not employed by Telstra nor am I an IT professional. I don't guarantee the accuracy of it content. What worked for me might not work for you.

Table of Contents

NB: 1. There are two version of the GEN 2 modem this document is for the Technicolor version. There is a link to the Arcadyan version of Gen 2 Modem (LH1000) in this post

2. Document needs to be downloaded for internal links to work.

3. IP Address of my Modem has been changed to 192.168.178.1

Version 1.8, Last updated30/09/2020

1. Lights

Front Light

|	
(white)	Powered up, Booting up
(orange)	Connecting
(blue)	Mobile backup connection (Data+Voice calls)
(green)	**Main Link Working**
(red)	Failure on both wired and wireless connections
(green/blue/red/yellow)	Rainbow Color Cycling - Resetting the Modem to Factory Defaults

Online LED 🌐 (Broadband)	● Solid Green	Physical WAN port connected successfully or Mobile Broadband is active. Authentication of username and password is successful and a public IP address has been assigned.
	● Solid Orange	Authentication of username and password in progress
	● Solid Red	Physical WAN port is connected but authentication of username and password was unsuccessful.
	○ Off	Physical WAN port is not connected or Mobile Broadband not active.
WAN LED ←→	● Solid Green	WAN port is connected successfully to DSL or NBN
	☀ Slow Flashing	Initializing WAN-DSL interface
	☀ Quick Flashing	In progress, WAN-DSL interface connecting
	○ Off	Physical WAN port is not connected.
Mobile Mode 📡	● Solid Green	**Main link Faulty Modem on 4G Backup**
	○ Off	**4G Backup not in use**
Mobile Signal 📶	● Solid Green	Great signal strength Note: More lighted LEDs indicates stronger signal.
	● Solid Orange	Good signal strength
	● Solid Red	Limited access - Please move the Modem for stronger signal strength on mobile backup connection.
Phone Led	○ Off	SIP not registered or PSTN port not connected
	● Solid Green	SIP registered or voltage detected on PSTN
	☀ Flashing	Phone Ringing or incoming or outgoing call
	● Solid Orange	SOS calls only
	● Solid Red	Fault

2. Modem Connections and Buttons
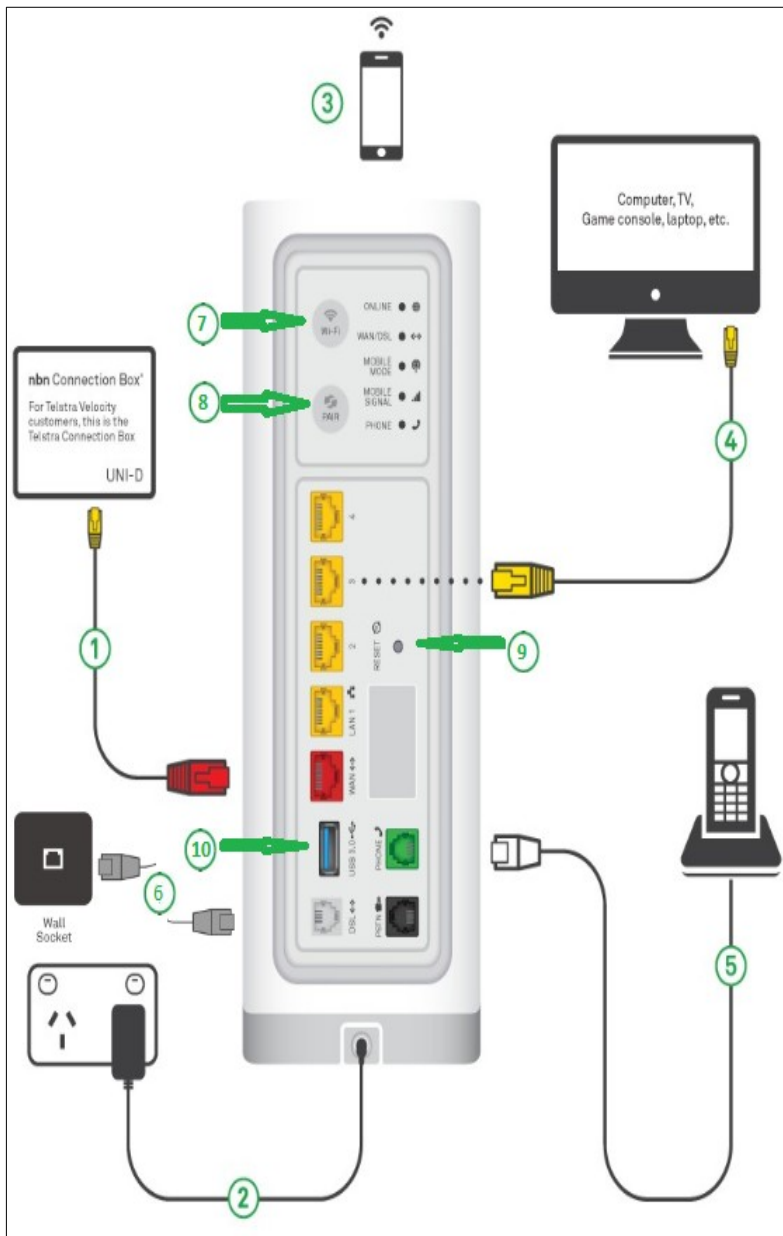
1. Gigabit WAN port for connection to NBN connection Box (FTTP FTTC and Fixed Wireless) NBN Cable Modem (NBN HFC), Cable Adaptor (Telstra Cable) or Optical terminating equipment (Telstra Velocity).

2. Power

3. Devices connected to Moem by Wi-Fi. (Default SSID and Wi-Fi password located on label base of Modem

4. Four Gigabit LAN port for connecting devices with Ethernet ports

5. RJ12 phone port for normal phones. Maximum load 3 REN

6. DSL Port connected directly to phone socket for FTTN. and FTTB connections and to phone socket via ADSL Filter / Splitter for ADSL connections

7. WiFi On Off Button
Off: All Wi-Fi Bands turned off.
Green: At least one Wi-Fi Band is turned on.
Press fTo toggle all Wi-Fi Bands Off.
Press again to turn all Wi-Fi Bands On.

8. Pair Button
Off: No DECT handset paired to Modem.
Green: DECT handset registered to modem or WPS device successfully paired to modem in last 15 minutes.
Green Flashing twice per second: Ready to pair with handset or WiFi device
Red Blinking: Registration unsuccessful
Green Flashing once per two seconds: Paging paired handsets
To pair a handset or connect to a WPS enabled Wi-Fi device press for 5 seconds. The light will **Flashing Green twice per second** for 2 minutes. During this time the modem can be paired with a handset or connect to a WPS enabled Wi-Fi device.
To page paired handset press for less than two seconds.

9. Reset Button
Use a paper clip and press for 10 seconds to reset Modem

10. USB 3.0 Port for connecting USB flash drives and external hard drives the files of which can be accessed by devices connected to modem's LAN using DLNA or SMB

3. Login and Home Screen

Open a Web browser and type [192.168.0.1](192.168.0.1) into the address bar and press enter.

The The modem Login screen loads in the Web browser..

To view more information select the more info link bottom centre of page
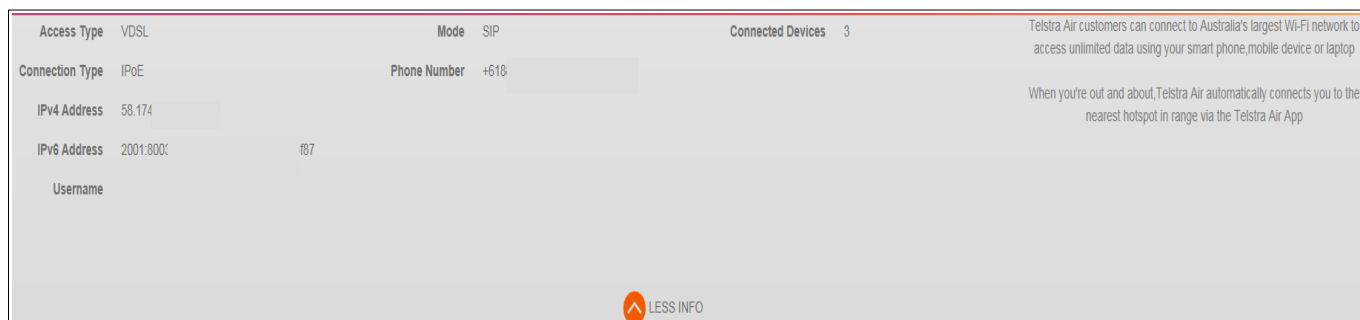
The default password is Telstra.

Enter password and select sign in.

The modems Basic Home page will open in your browser.

Log in Page on Smart device with small screen

TELSTRA
SMART MODEM™ GEN 2

Enter the Username and Password provided with your Telstra Smart Modem™ Gen 2 to access full features

admin

Telstra .....

Sign In

For Device Information Tap on Down Arrow

DEVICE INFO

Tap

MODEM INFORMATION
DEVICE STATUS
DETAILED INFORMATION

MODEM INFORMATION

Serial No

Firmware Number 18.1.c.0384-950-RB

Modem Make Model Technicolor DJA0231

DEVICE STATUS

ONLINE

Wi-Fi   WAN/DSL

ONLINE
Wi-Fi   WAN/DSL
MOBILE MODE
MOBILE SIGNAL
PAIR   PHONE

These are the LEDs on the back of your Modem

DETAILED INFORMATION

Broadband
Connected

DETAILED INFORMATION

Broadband
Connected

Access Type
VDSL

Connection Type
IPoE

IPv4 Address

IPv6 Address

Username

Phone
Enabled

Mode
SIP

Phone Number
+618

Wi-Fi
On

Number of Connected Clients
4

Telstra Air
Active
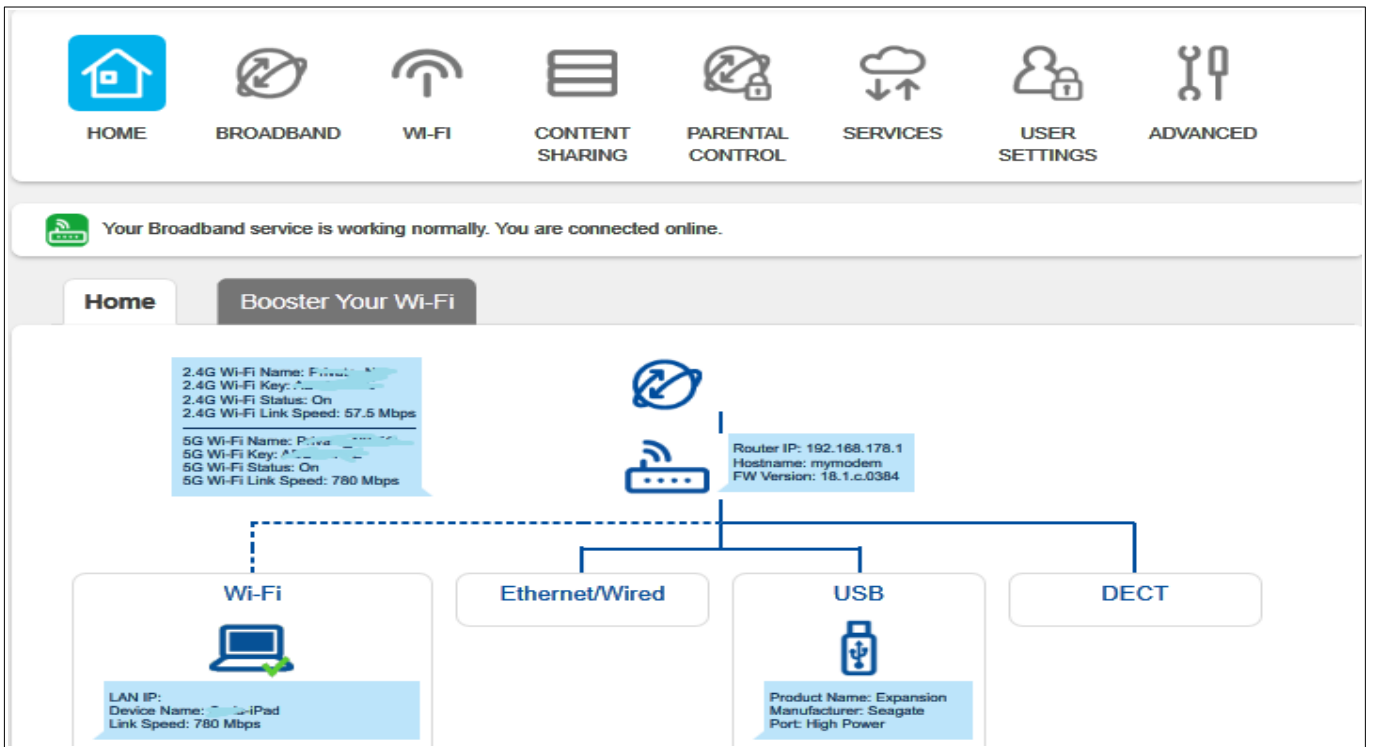
Hovering over the modem or link with the mouse pointer will display more information about the modem or link.

To learn more or change some settings on a device connected to WiFi or LAN click on the device.
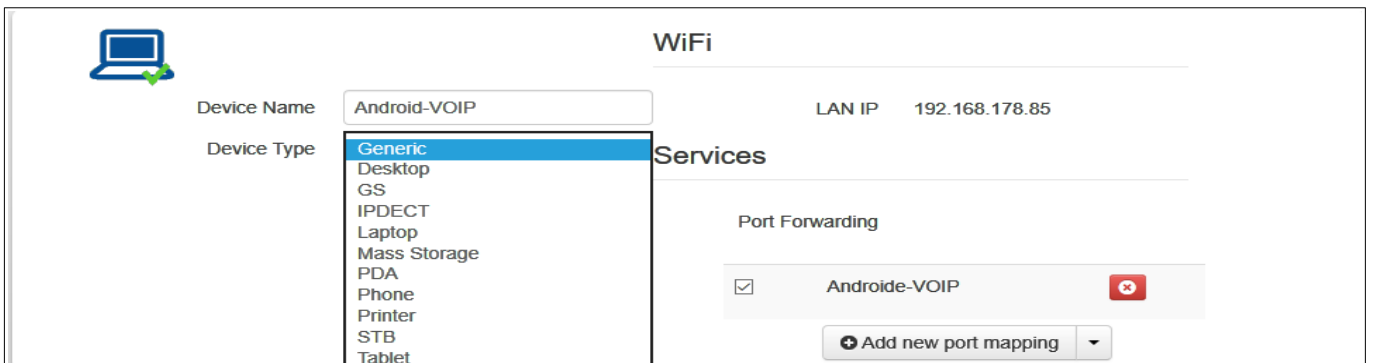
Clicking on "Advanced" top right displays the Advanced Home page
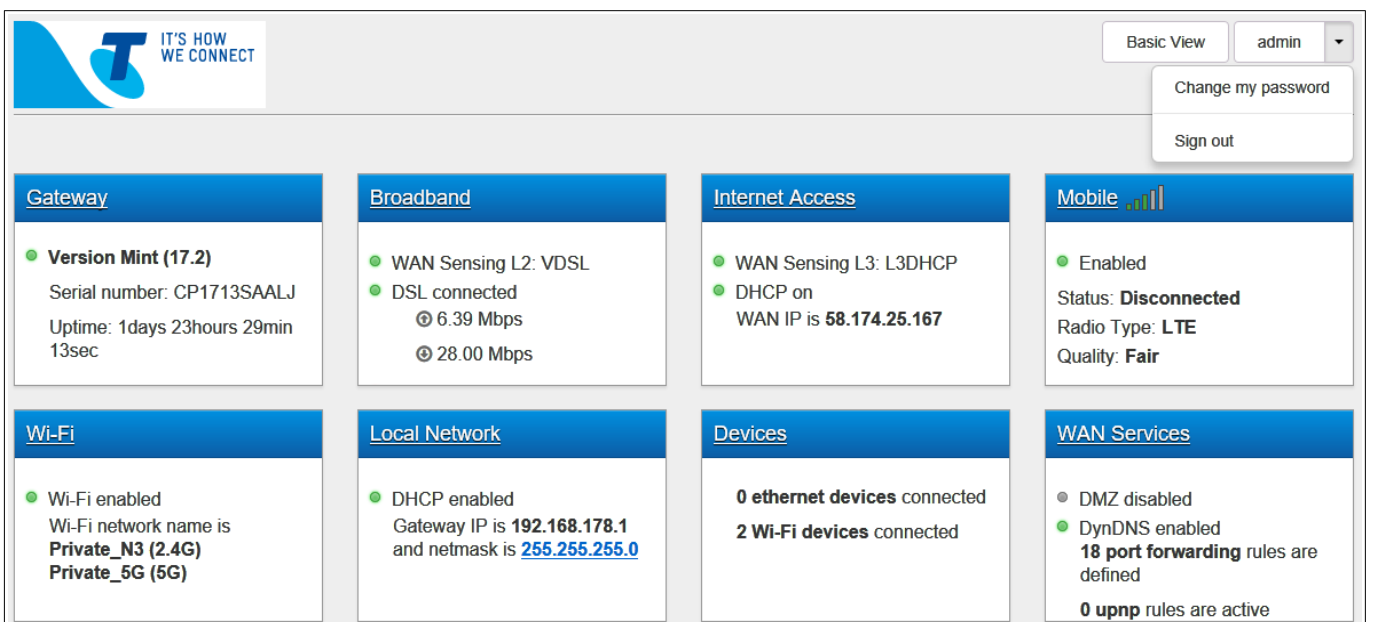
Clicking on "Basic View" takes you back to Basic Home screen.

To log out click on the down arrow to the right of "Admin" and select "Sign Out"

4. Change Modem's Login Password

The Modem by default password is Telstra. It is recommend after log in to the modem you change the password. If you forget the password modem will need to be <u>reset to factory defaults</u>

Click on 'User Settings"

Remove Tick from "Default User"

Enter a password in "Password" field

Enter the same password in "Confirm Password" field and click on Save

Password must contain at least 12 alphanumeric characters including both upper and lower case letters,

at least one number and at least one special character such as !@#$%^&*()_-?~
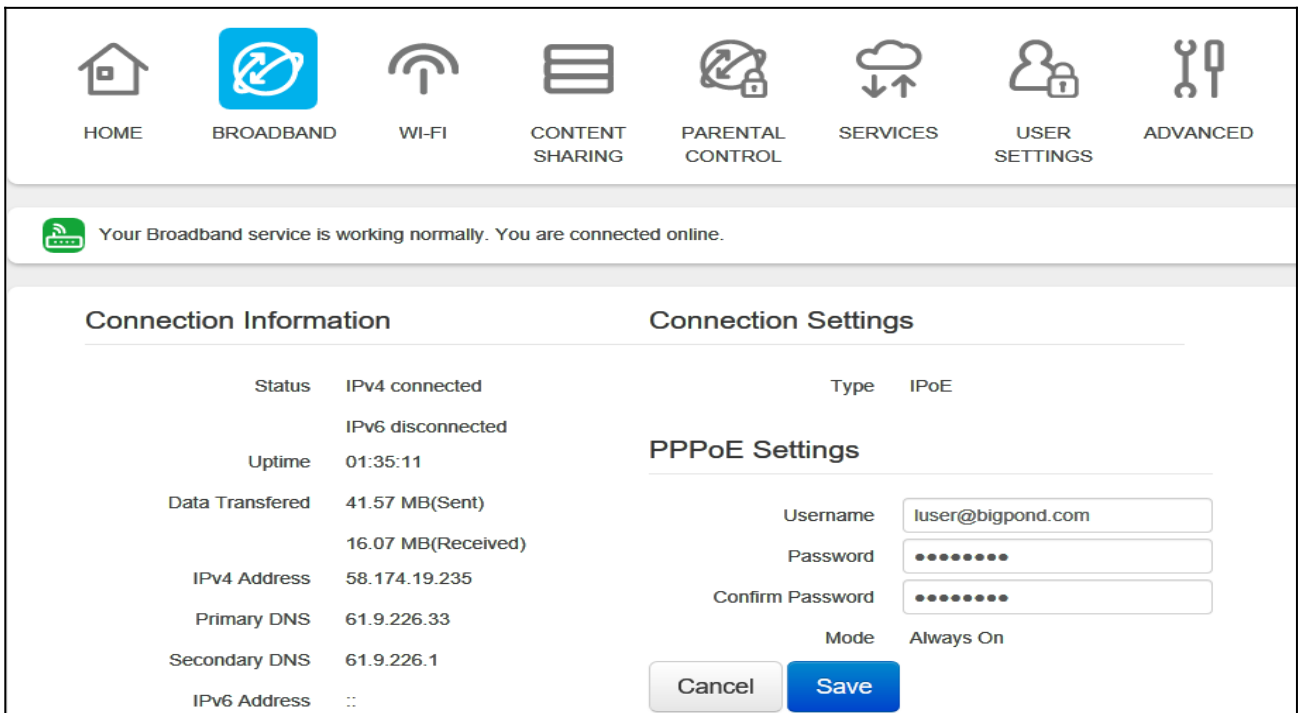
In my opinion you don't need a complicated password. Having a complicated password makes it likely that people will right it down and stick it on the modem or leave the default password. It is strange Telstra insists on a complicated password for accessing modem from LAN yet lets you use a simple four character password for remote access to modem over the internet.

5. Telstra's Internet User Name and Password

If WAN /DSL Light is green and the On Line light doesn't turn green these are the first settings you should check if you have a **non** NBN service.

Click on Broadband

The User Name is the one provided by Telstra for the internet connection. Example someone@bigpond.com. It is usually is but might not be the same as your Telstra My Account User Name and Password.
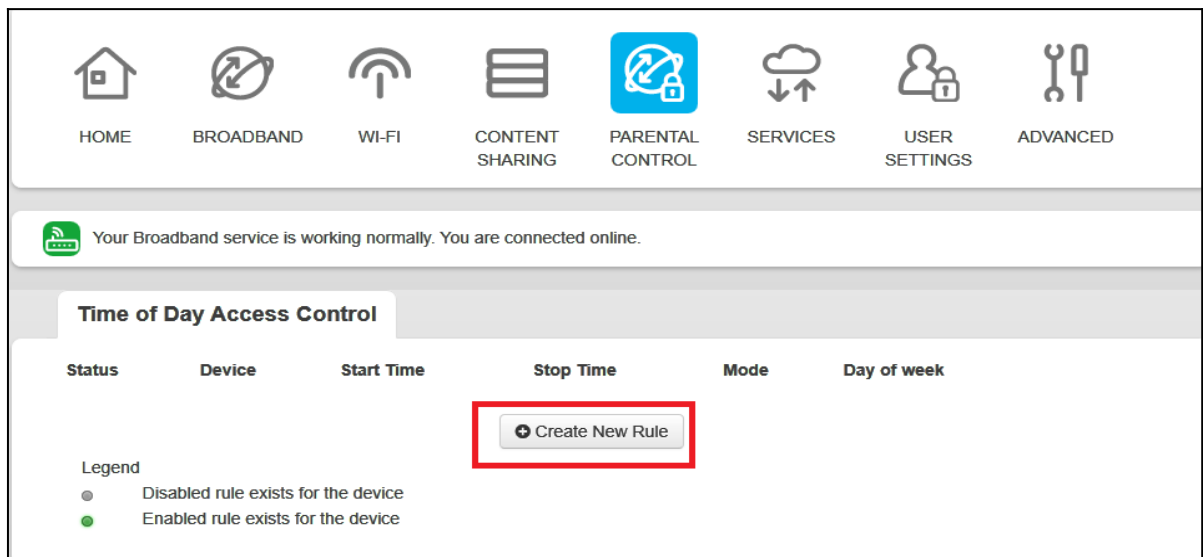
6. Parental Control

Log in to modem and click on Parental Control

Click on "Add New Rule"

Make sure enabled is on.

Start typing the MAC or IP address of device in the MAC address field. A list of connected devices is displayed. Select the device you wish to apply a time of day rule to.

Select the Mode. "Allow" will only allow the device internet access during times specified. "Block" will block internet access to device during times specified.

Select "Start Time" and "End Time".

Place a tick on the left of the days of the week that the rule will apply.

Click on add

The image above shows two Time of day rules.

The first blocks internet access between midday and midnight on Thursday to Sunday.

The second only allows internet access between midday and midnight Tiesday to Thursday. Internet access is blocked at all other times.

To edit rule click on edit

To delete a rule click on Delete. Note clicking on delete deletes rule immediately with no confirmation message.

Time of day rules only effect internet access they don't prevent devices connecting to WiFi.

Parental Controls Site Blocking

Log into Modem and go to Advanced > Parental Controls
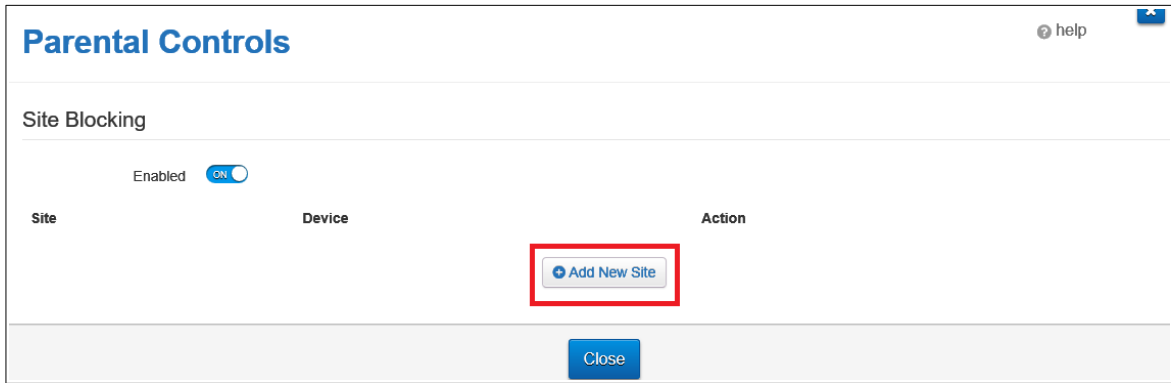
Click on "Add New Site"
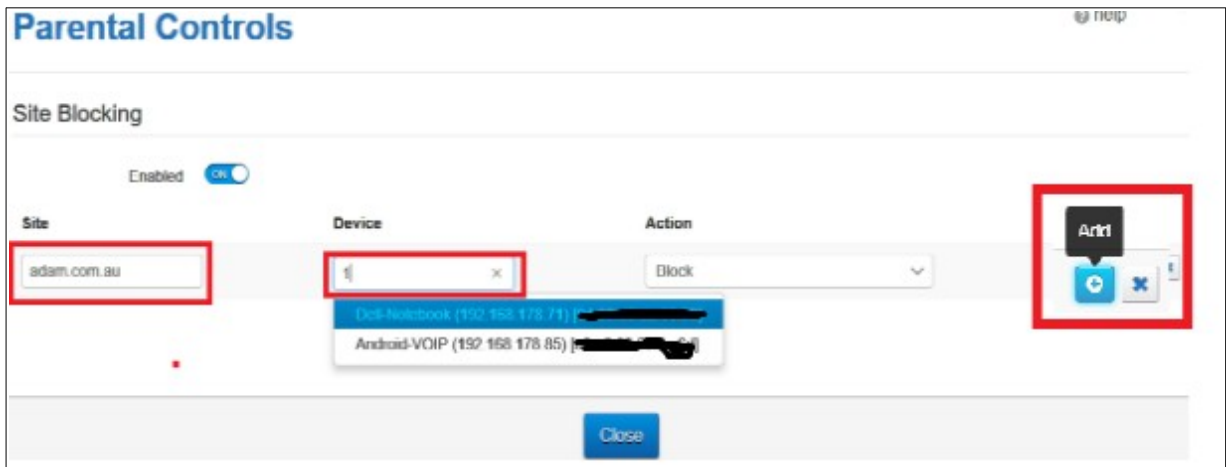
Enter site's URL

To block access to all devices enter "All" in Device field. To block access to a single device type 1 and its MAC address should appear in the list, If Device is not listed enter its address manually.

Click on "Add"
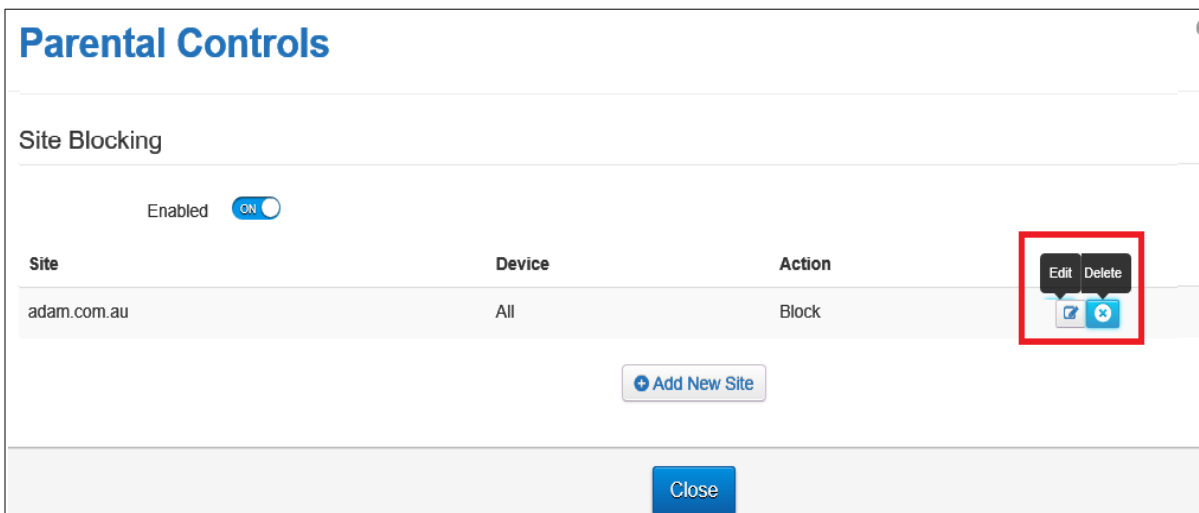
Rules can be edited or deleted by clicking on edit or delete.

Toggle Enabled to on and click on save.

If rule is successful will be redirected to http://mymodem.modem/parental-block.lp when trying to navigate to site.
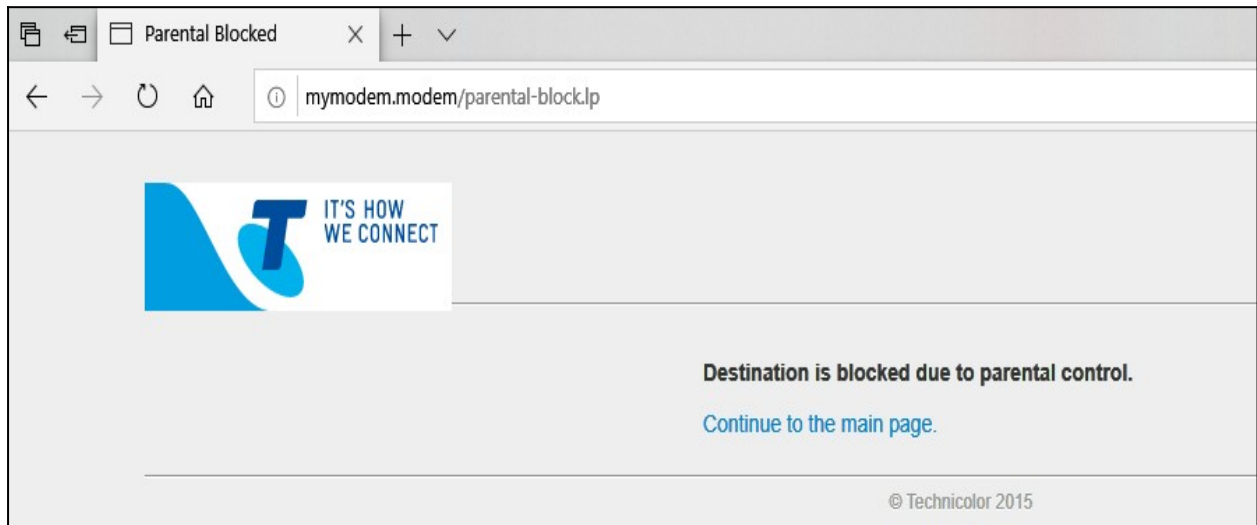
7. Connecting Wi-Fi Devices.

1. Using WPS
   Press and hold the Pair button on the back of the modem for at least 5 seconds.
   The light will flash for 3 minutes during this time a WPS device can be connected,
   Follow the instructions supplied with the Wi-Fi device.

   Note WPS has to be enabled in modem's GUI (See Change Wi-Fi SSID and Password)

2. Manually using SSID and Network Key.
   There is a label with the SSID and Network key located on the bottom of the modem.
   The SSID and Network key are also displayed on the home page of the modem.
   Follow the Wi-Fi device's instructions for manually connecting to a Wi-Fi network.

8. Address Reservation.

Hint Before reserving an IP open a new WEB browser tab, log into modem and go to Advanced > Devices. You will be able to copy MAC address and paste them into the IP address reservation table.

To reserve a LAN IP address for device. (Static IP address) log into modem and go to Advance > Local Network

Click on "Add new static lease "

Start typing the IP address of device into IP field.

A list of all connected devices is displayed.

Click on the device that requires a fixed IP address.

The devices current IP address will automatically be entered into the table. This IP address can be changed to any unused IP address within address range of router.

Fill in Host name

Click on the down arrow in the MAC column to display a list of the connected devices.

If the device is listed click on it to automatically add its MAC address.

If the devices does not appear in the list of connected device click on custom and paste in the MAC address copied from the devices page or enter the MAC address manually

Click on apply

Note: If you changed the IPv4 Address the device will have to disconnect and reconnect for the new IP address to take effect.

9. Port Forwarding

For port forwarding to work you need a fixed IP LAN address. (See [Address Reservation](#) for how to do this)

Log in to Modem and go to Services > Port Forwarding

If adding a standard port click on down arrow on the right of "Add new port mapping" to display a list of common services.

Select a service from the drop down list.
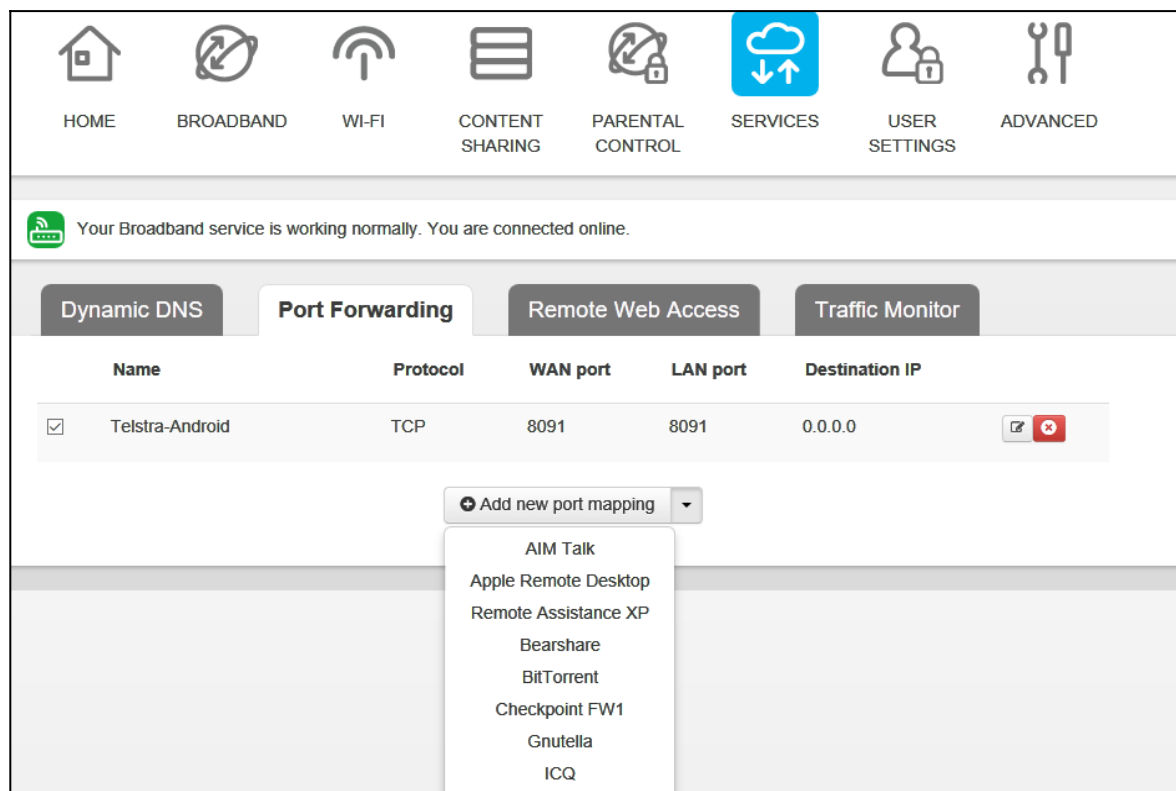
If mapping a non standard port click on "Add new port mapping"

Enter a meaningful name

Select protocol (TCP, UDP or TCP/UDP (both)). If in doubt select TCP/UDP

Type port number in WAN port and LAN port field. Best to use same port number. If there is a range of ports enter the first and last port numbers separated by a colon (eg 45:55)

Enter LAN IP address of device. A list of all currently connected device will be displayed.

Click on apply
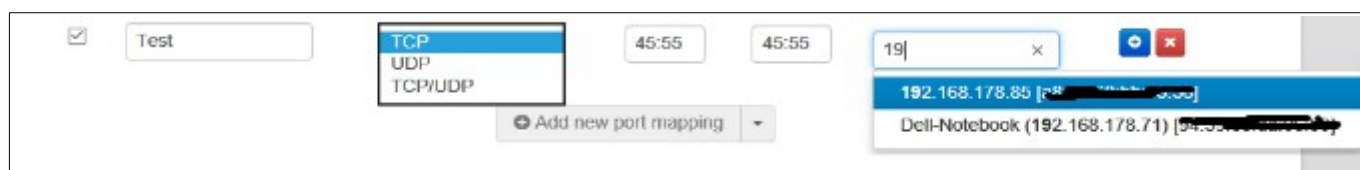
The port forwarding tool at http://www.yougetsignal.com/tools/open-ports/ can be used to check if the port is open.

10. Inbuilt Help

At the Top right of each dialogue box is a **refresh** and **help** icon.

Clicking on refresh refreshes the data on the page.

Clicking on the help icon opens the inbuilt help open at the relevant page.
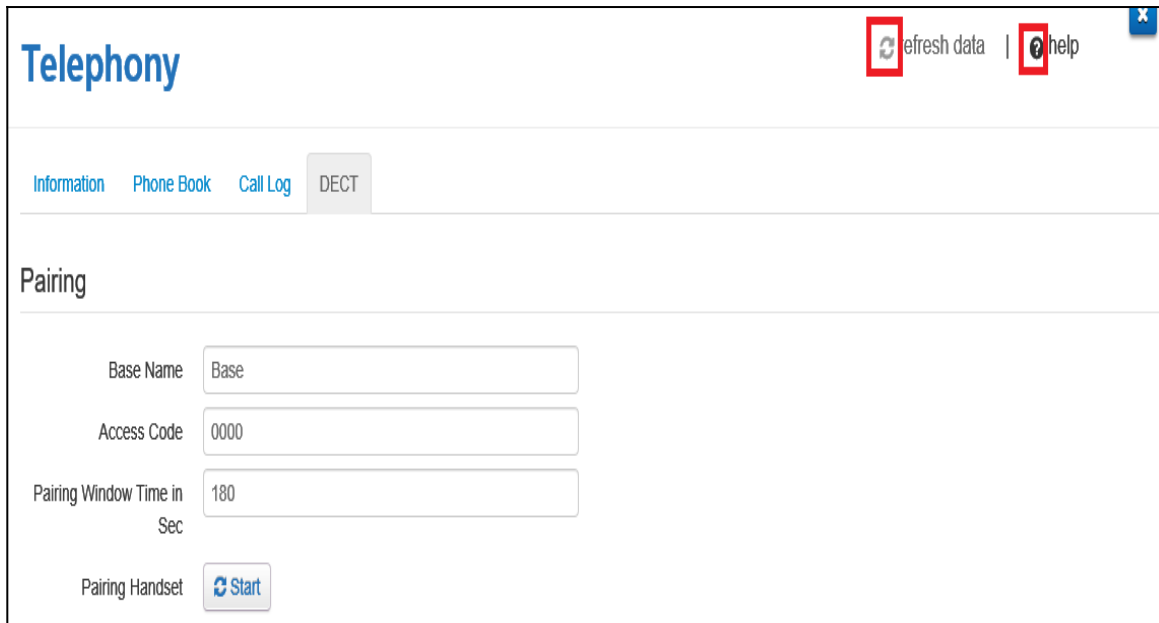
Example Help displayed when on DECT page

11. Firewall

Go to Advanced > Firewall

Select the level of protection and click on save
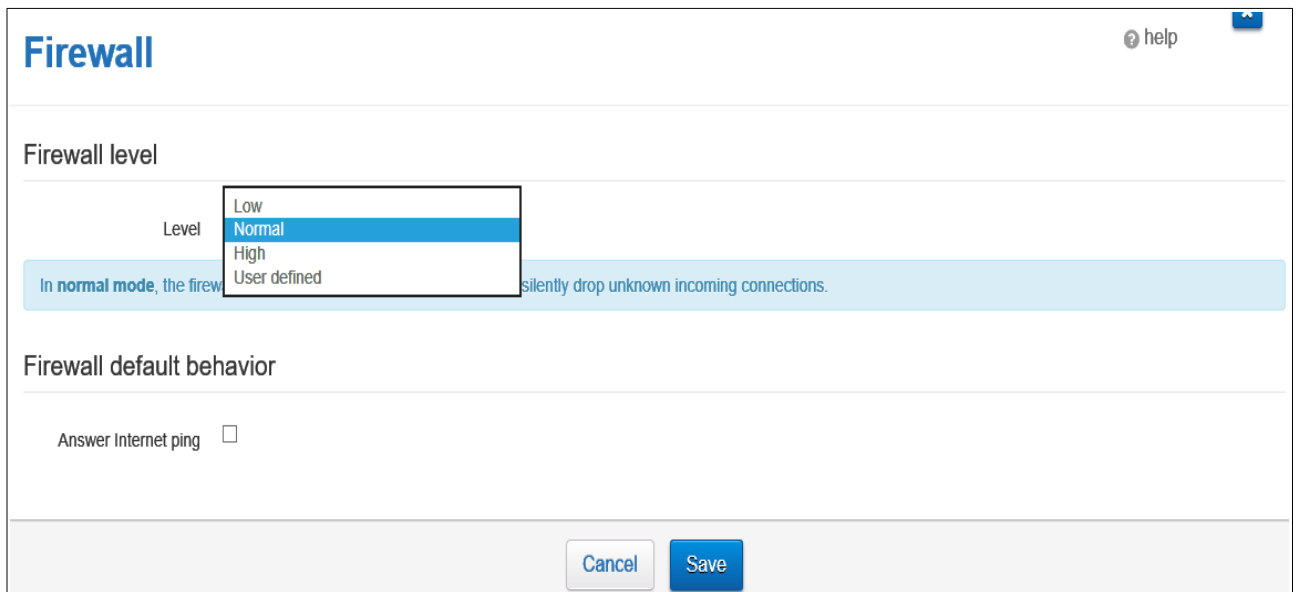
If User defined firewall is selected can select default incoming and outgoing policy.
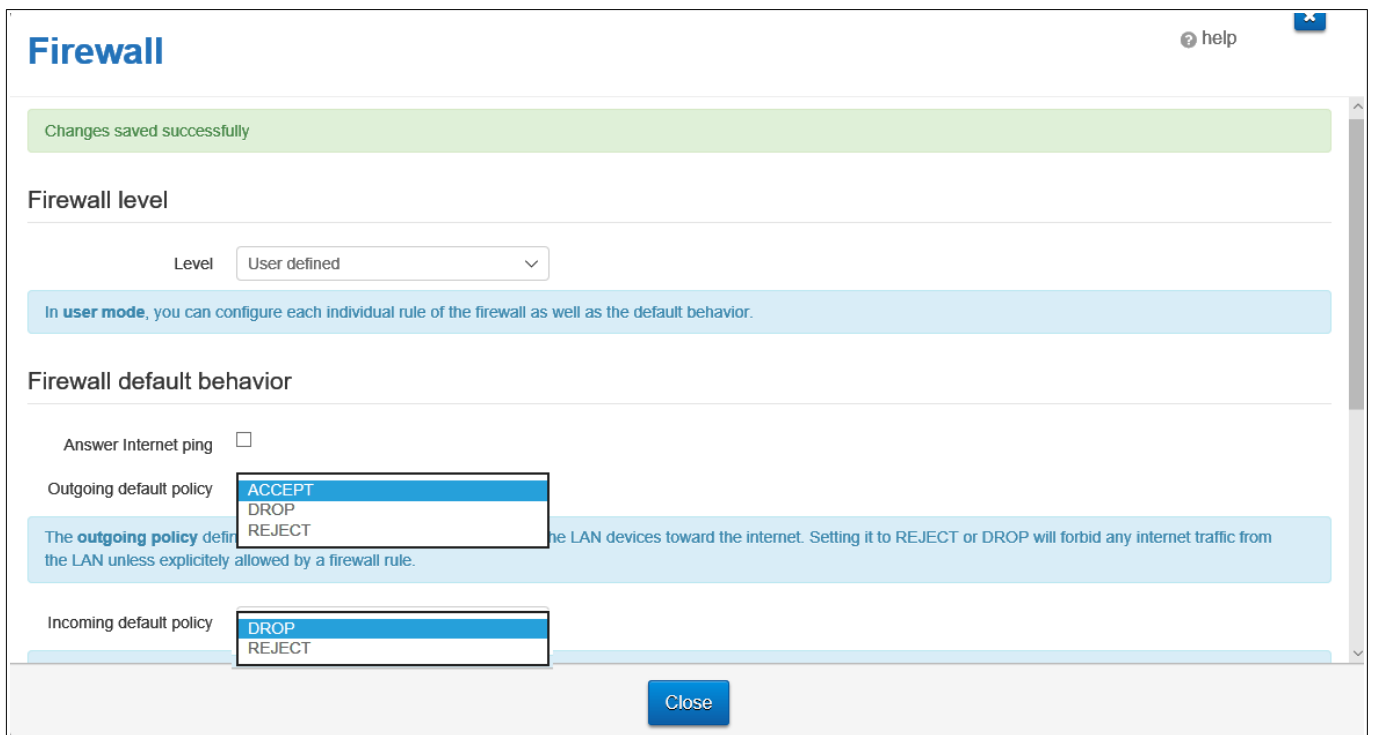
Can also configured individual rules depending on source, destination and port by clicking on "Add new firewall rule"

12. Reset Modem.

There are two methods for resetting the modem.

1. Using a paper clip press the modem's reset button for about 10 seconds. The reset button is located on back of modem near LAN port 2.

2. Log into the modem, go to Advanced > Modem.
   Ticking "Retain Contacts" will retain contact information in phone book.
   Click on reset
   Modem will reboot. Front light will cycle through the colours of the rainbow..

There is also an option to restart modem by selecting restart button.

13. Turn Wi-Fi OFF or ON.

There are two methods

1. Wi-Fi Switch back of modem
    To turn Wi-Fi of press and hold the Wi-Fi switch located on back of modem for a couple of seconds. When released the light will turn off indicating all Wi-Fi bands have been turned Off

    To turn Wi-Fi back on pressing the Wi-Fi button for a few seconds the light turns green.

2. GUI interface.
    Connect to Modem via a LAN port.
     Log into the modem and click on Wi-Fi
    The 2.4Ghz band is pre-selected.
    Click on the Enable box Below Wi-Fi Radio to toggle it to Off This disables all 2.4 GHz SSIDs
    Click on Save
    Repeat the procedure for 5Ghz
    The Enable box below Wi-Fi Network is used to turn of the normal Wi-Fi band and leaves Guest Telstra Air and FON WiFi networks on.
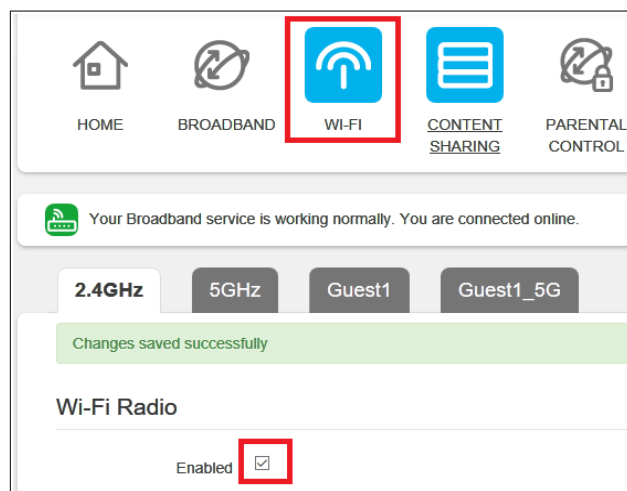
14. Bridge Mode.

Log into the modem and go to Advanced Lopcal Network, remove tick next to IPv6 state and save settings

Go to Advanced > Local Network and scroll down to Network Mode
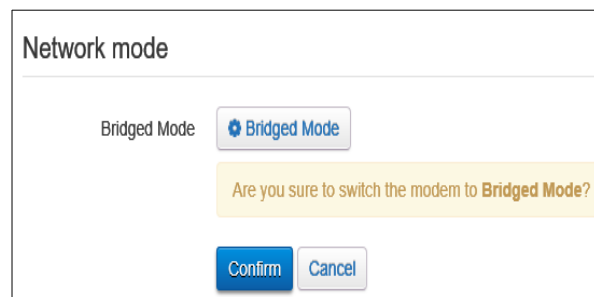
Click on *Bridge Mode and the click on confirm. Modem will reboot.

When Modem has rebooted phone light will be orange, Link light and Front light will be green, Wireless Signal light will be green, orange or red depending on signal strength, all other lights off.

Note: In bridge mode the phone and backup 4G will no longer work, and a factory reset is require to disable bridge mode resulting in loss of all settings.

Before Bridging Modem Turn off WiFi section 13 to prevent WiFi devices grabbing public IP

15. Dynamic DNS

There are two locations for setting up Dynamic DNS.

1. Services/Dynamic DNS

2. Advanced /WAN Sevices / DynDNS

I will use the second location because it gives an indication when the service is working.

Click on the Enable switch to toggle it on.

Start typing the name of your provider and select provider from drop down list that appears.
Enter the DDNS URL without the http:// in domain box
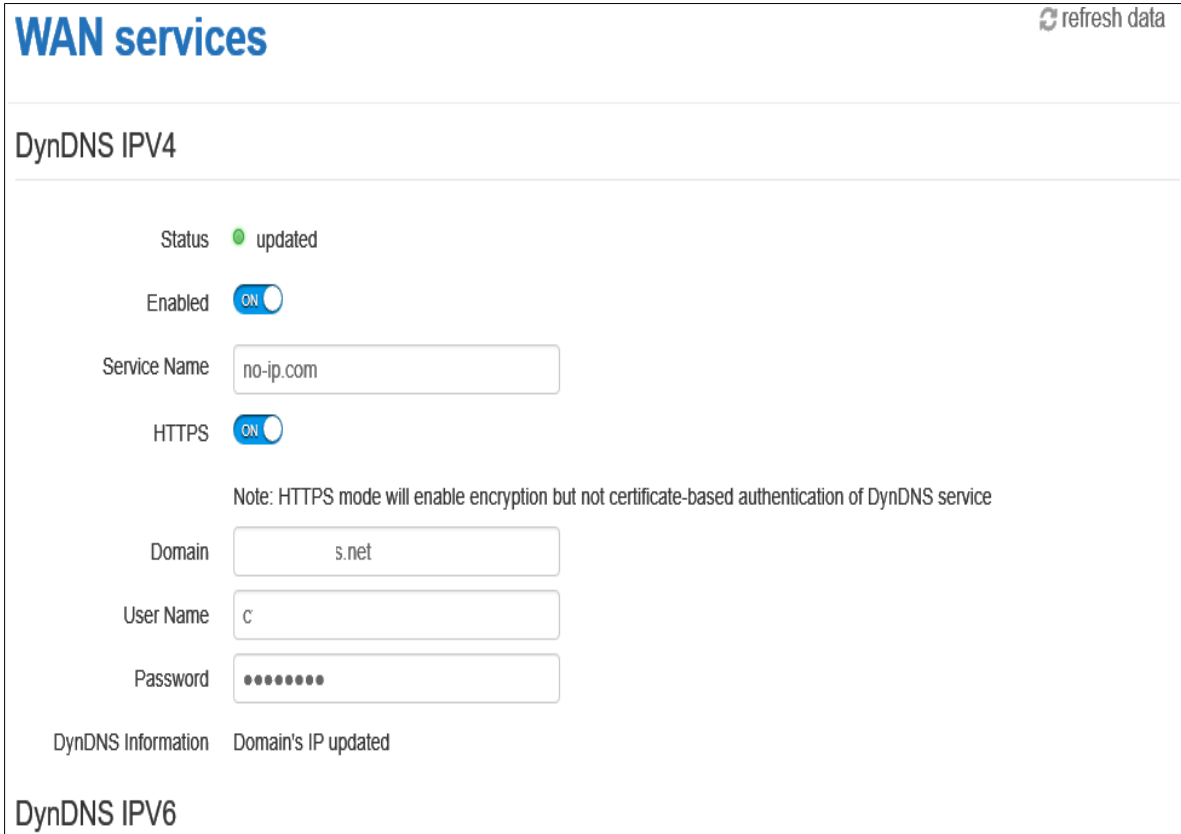
Enter the DDNS Username.

Enter the password.

Click on Save.

Status will change from disabled (Grey) to updating (Orange).

Select refresh icon top right to refresh information.

If successful DynDNS Information will display "Domain's IP updated" and status will have changed to updated (Green)

Repeat for IPv6 if your Dynamic DNS also supports IPv6.

16. Register and De-Register a DECT Handset

Can only register DECT CAT-iq2.0 handset. Not all DECT will pair with modem..

Press the Pair button on the back of the modem for at least five seconds. The button will starts flashing Green. The button will flash Green for 3 minutes.

While button is flashing the modem is ready to pair with the handset.

Follow the handset's documentation for pairing the handset. (Default Pin is 0000)

When the handset is paired the Pair light will turn green, If unsuccessful pair light will turn red.

Can also pair handset and change pin from within GUI (Advanced > Telephony > DECT)

To register or pair a handset click on "Pairing Handset" Start

To page a handset press pair button on back of modem for less than 2 seconds. To stop paging press pair button again.

To de-register (un-pair) a handset log into the modem and go to Advanced > Telephony > DECT.

Scroll down to bottom of page

Select handset from drop down list and click on "Unregister"

The handset is de-registered.

To turn off DECT Transmitter click on Emission Mode Disable.

17. Telephony (Information and Call log)

Log in to Modem and go to Advanced > Telephony

Information

Call Log

The Log can be cleared by taping or clicking on the clear call logs.

VoLTE

18. Remote Web Access.

To turn Remote Web Access on log into modem and go to Basic > Services > Remote Web Access

Place a tick next to "Enabled"

Select "Temporary" or "Permanent" and click on "Apply'

If use random password is ticked, a random password will be generated.

To connect remotely open a browser and navigate to the URL

A warning message will be displayed.

Below is the warning message displayed using the Edge Browser.

Click on "Details" and then click on "Go on to WEB page" to display log in screen.

Use the User name assist and the password displayed in the Password field to log in to GUI of modem.

NB: Remote Web access turns of if modem reboots.
Remote Web access locks up and requires reboot to fix if modem switches to 4G backup and then back to main link.

19. Wi-Fi MAC Filtering

Log into modem, go to Advanced > WiFi

Select Access Point
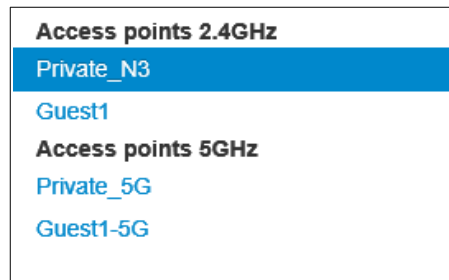
 Scroll down to Access Control List
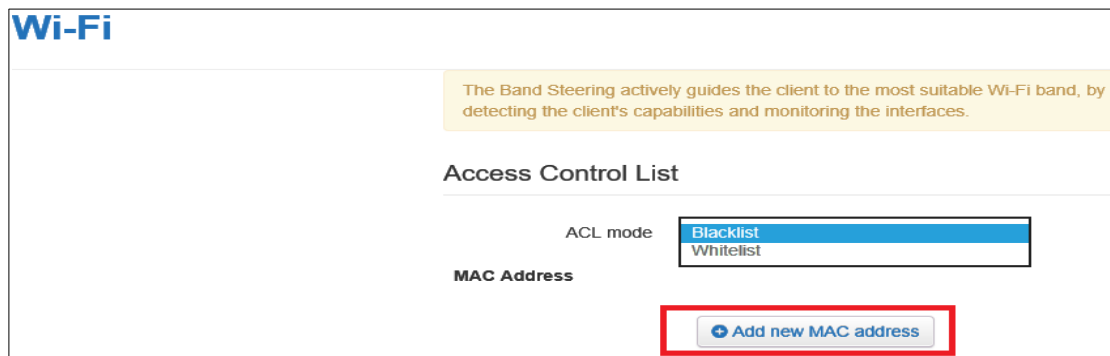
There are two Modes:

1. Blacklist: Listed devices will not be able to connect to WiFi

2. White list: Only devices in list will be able to connect.

Select mode and click on Add new MAC address.
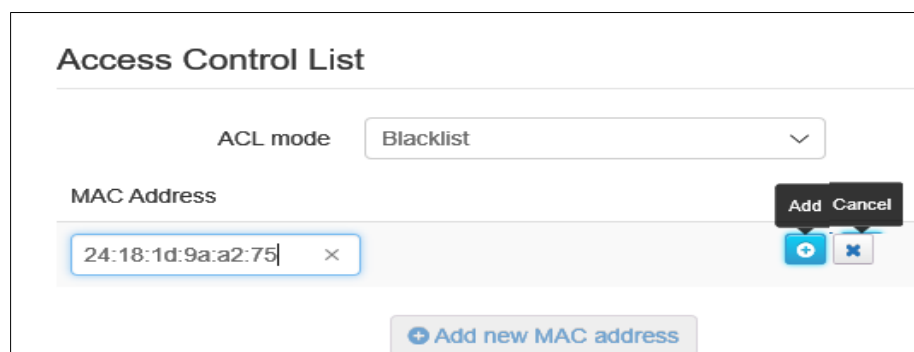
Enter Mac Address and click on Add

 **Hint: Open a new Web Browser tab, log into Modem and go to Advanced > Devices
Can then copy MAC address from Devices page and paste into Access Control List**

**Note If using White list modem automatically populates list with all connected devices after first
MAC address has been entered. These are only displayed when screen is refreshed.**

Repeat for all devices that are to be added to list.

Repeat for all Access Points. (5G, Guest, 5G and Guest_5G)

20. Management

To add a new Modem user or to change name go to Advanced > Management > User Manager
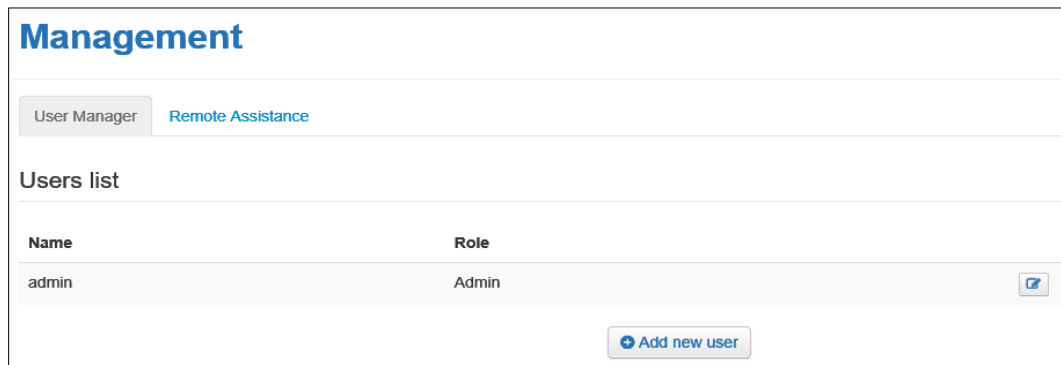
To add new user Click on "Add new user"

Fill in the name

Select type of user. Only Admin available. Admin user can edit settings,

Fill in the password and repeat password field and click on "Add"

To edit an existing user click on "Edit".

To delete a user click on "Delete"
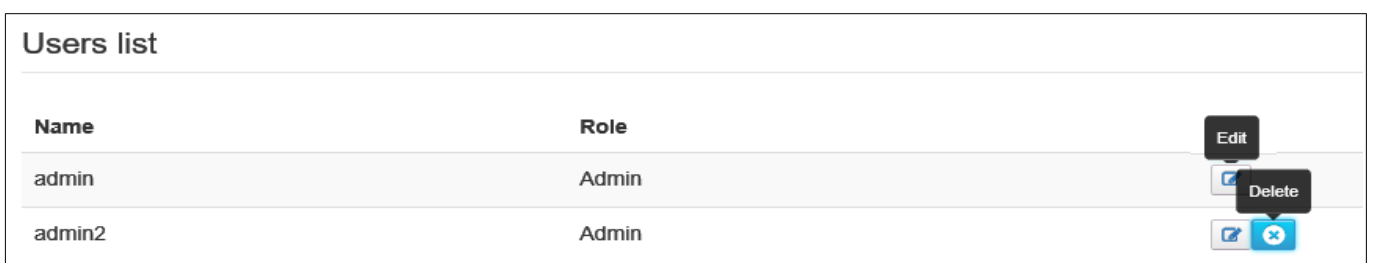
21. Change Wi-Fi Channel, SSID or Password.

In Basic Mode click on Wi-Fi
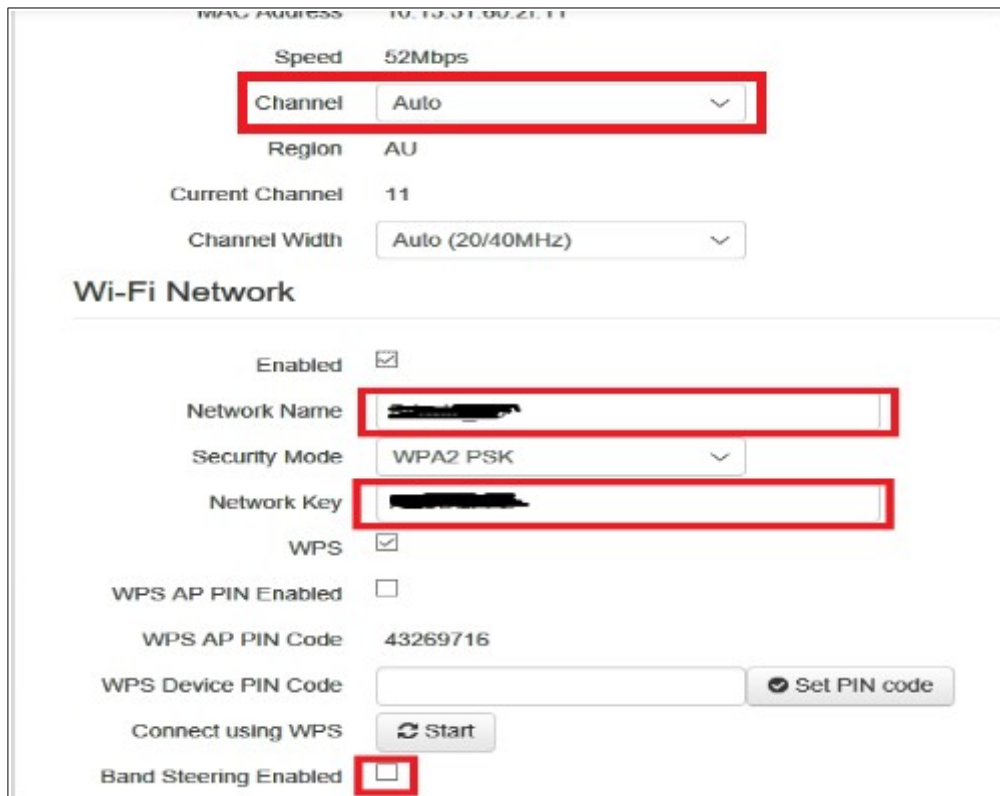
Select Wi-Fi Band you wish to change
To change Channel select a channel from the drop down list
To change the WiFi SSID enter new SSID in Network name field.
To change password enter new password in the Network Key feild.
To us separate SSID for 5G Band Band steering must be turned of in 2.4G Band tab.
When all changes have been made click on save.

Note: If you use your old Modem's SSID and Password you don't need to reconfigure Wi-Fi settings on Wi-Fi devices that could connect to the old Modem.

22. Third Party VDSL Modem Router
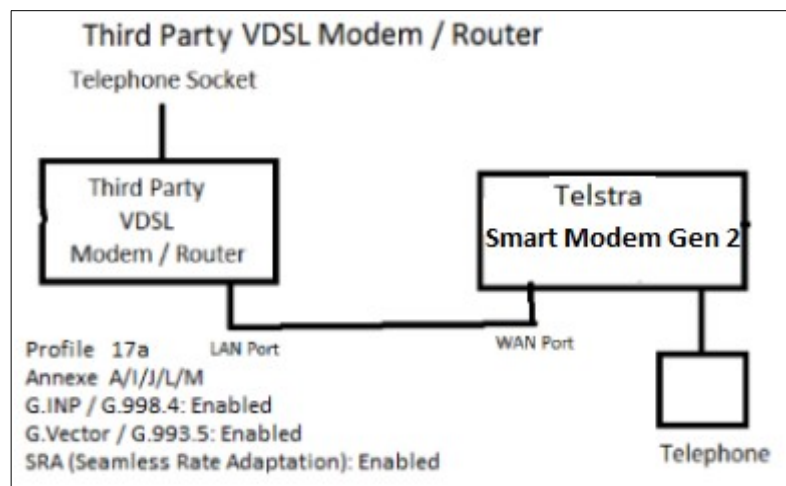
Connect as per diagram.

No special settings required in Telstra Smart Modem Gen 2.

Turn Wi-Fi Off on Telstra Smart Modem Gen 2.

In third party modem set connection type as DSL and no login ID or password required (IPOE).
If you have trouble with phone change SIP/ALG settings and or set a static address for Smart Modem in
Third party VDSL and port forwarding (TCP/UDP 5060-5061, 3478 and UDP 5004, 10000-20000) to
Smart Modem Modem

Note Before using this set up Smart Modem must be connected directly to NBN to enable registration of
VOIP in Modem.

23. DLNA Server and USB Mass Storage.

The Modem acts as DLNA server for media files on drives connected to USB ports.

A powered USB Hub can be plugged into the USB port to allow the connection of several drives

To turn DLNA on or off go to Advanced > Content Sharing and place or remove tick next to "DLNA
Enabled" and click on save.

Mass Storage

To turn File sharing on or off go to Advanced > Content Sharing and place or remove tick next to
 "File Server Enabled" and click on save.

Before removing a USB drive click on Eject

On a Windows PC can connect to drives connected to the USB ports by opening File Explorer and typing
the address shown at the bottom right of the Content sharing page into the address bar of File explorer.
(Your address will be different depending on IP address off you modem and the name of the attached
USB drive)
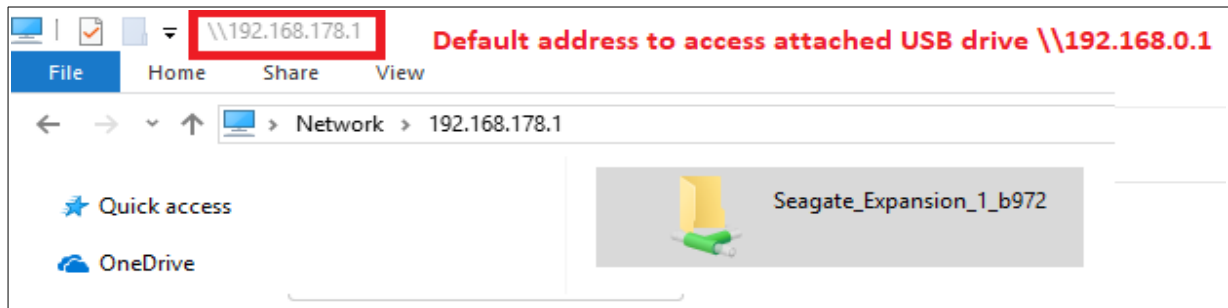
If you cannot access the drive check that Network is set to Private, Network Discovery is on and SMB 1.0 file sharing support is enabled

To check Network discovery is on
Go to Control Panel > All Control Panel Items > Network and Sharing Centre > \Advanced sharing settings and "Turn on Network Discovery" and "Turn on File and Printer Sharing"
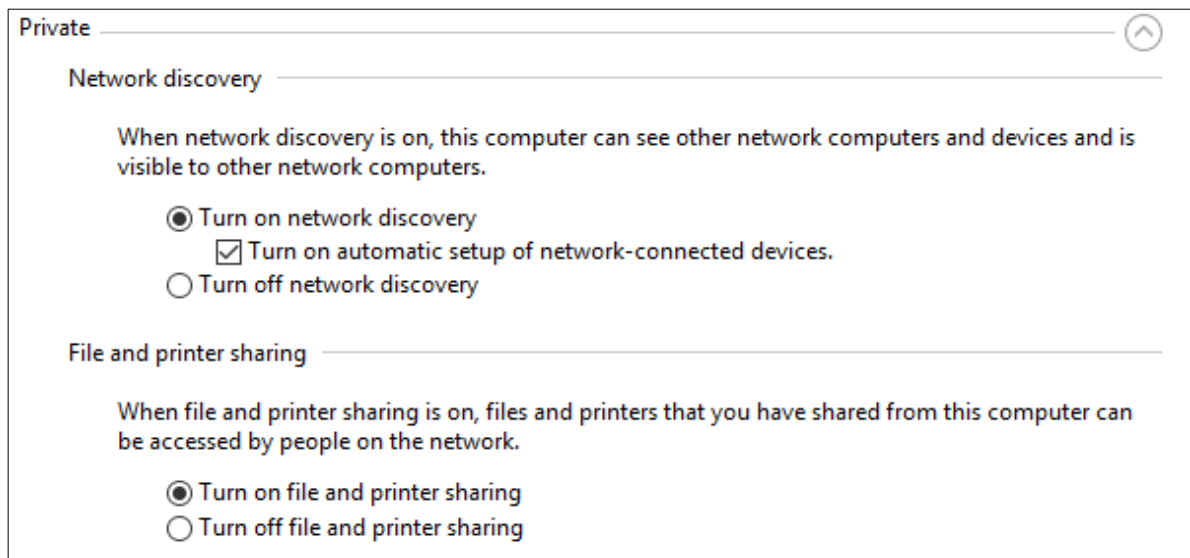
To ensure that SMB 1.0 file sharing support is on

Clicking on Start

Start typing Turn Windows Features On or Off

When "Turn Windows Features On or Off" appears in list of suggestion click on it.

Scroll down to "SMB 1.0 file sharing support" and place a tick in the box.
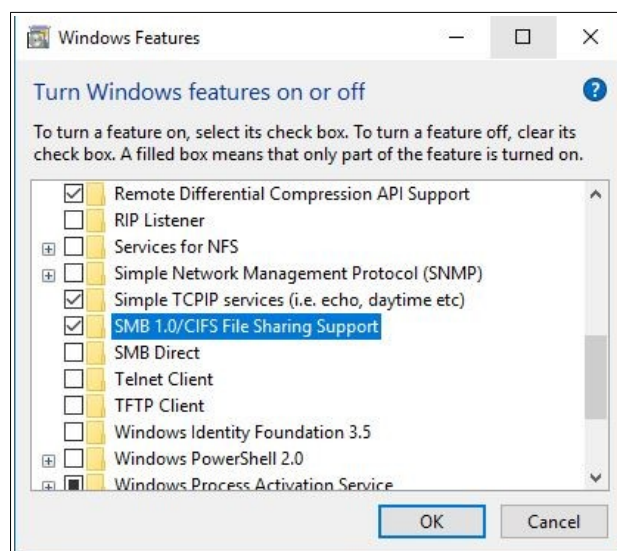
24. Traffic Monitor

To view traffic meters log into Modem and go to > Services > Traffic Monitor

Internet and LAN Ethernet Traffic past 24 hours Graph
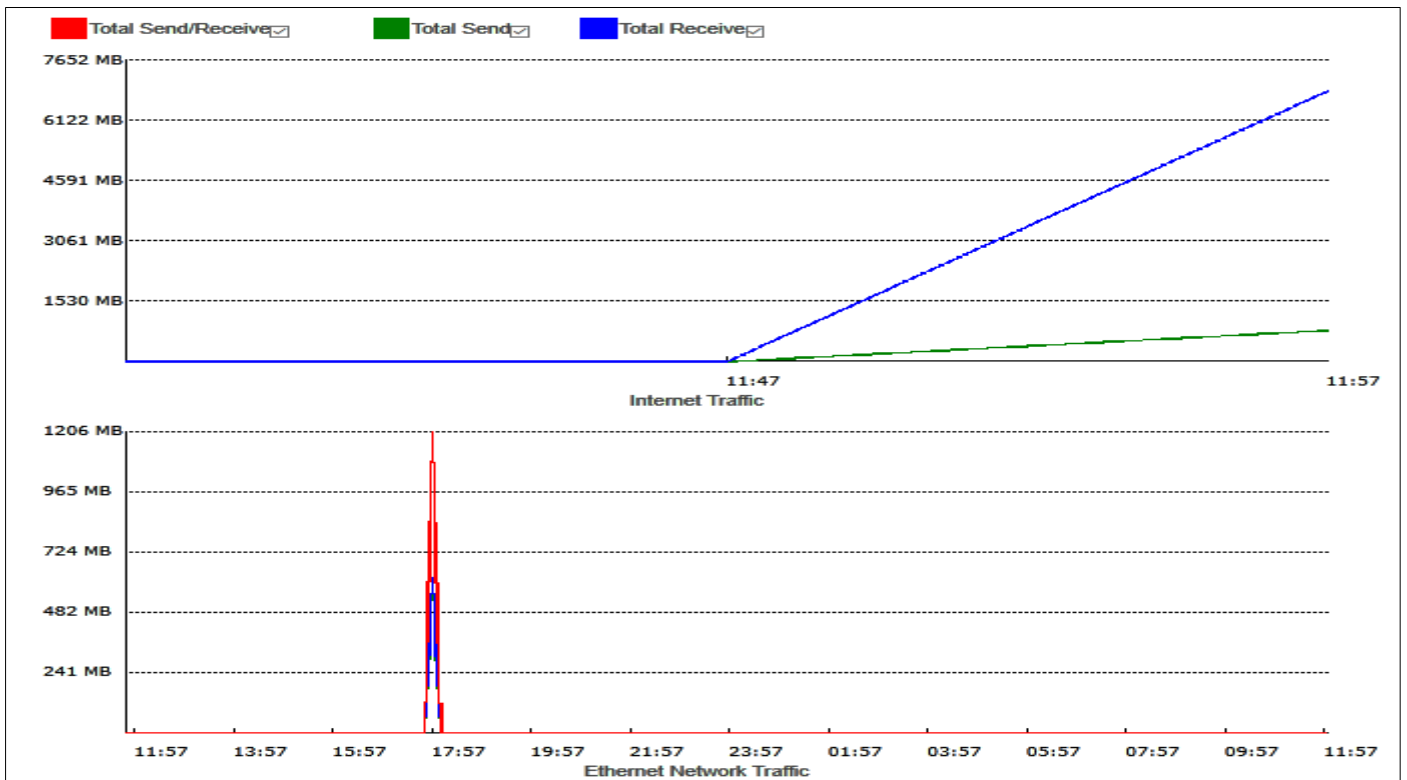
2.4G WiFi Band Traffic past 24 hours Graph

Wi-Fi Private_N3 Network Traffic

5G WiFi Band Traffic past 24 hours Graph

Wi-Fi Private_N3-5G Network Traffic
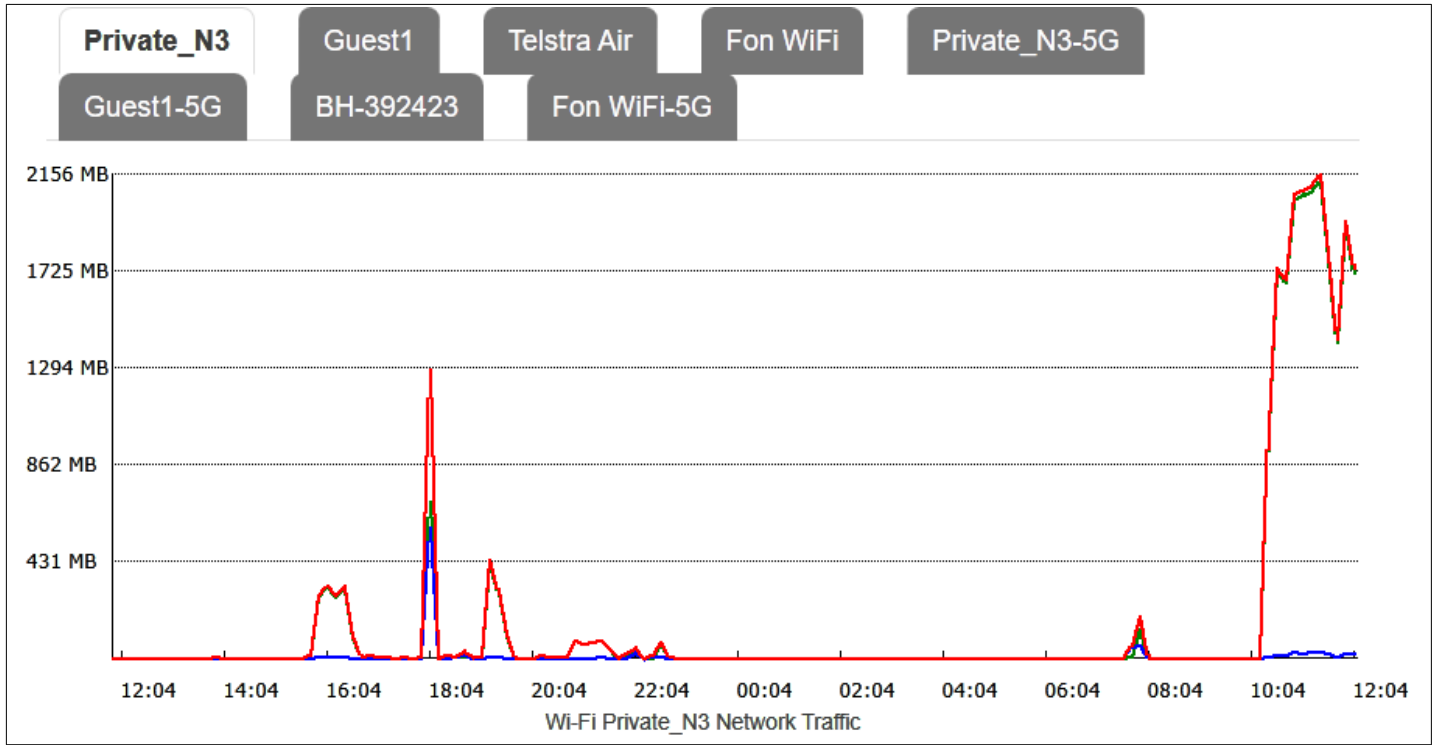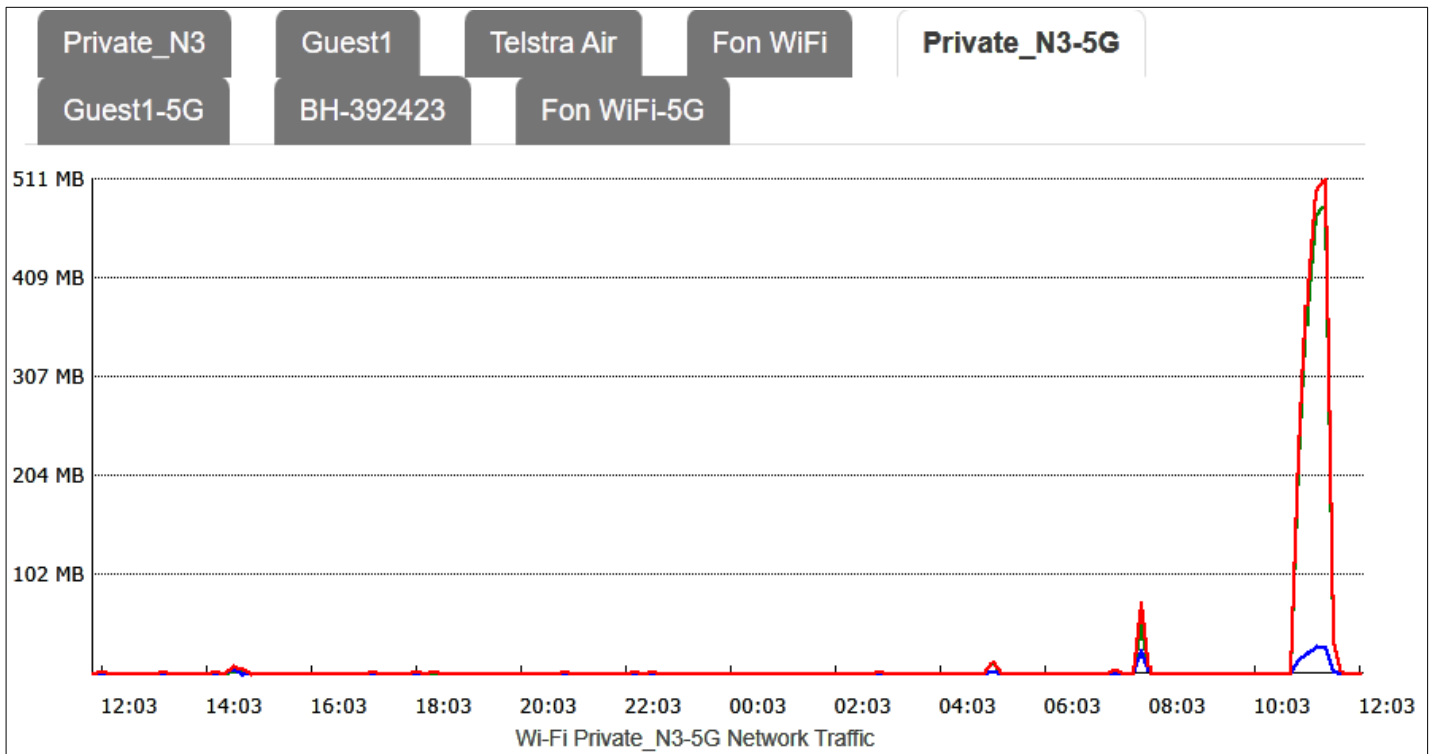
The traffic data figures are for the data transmitted and received since modem was rebooted.
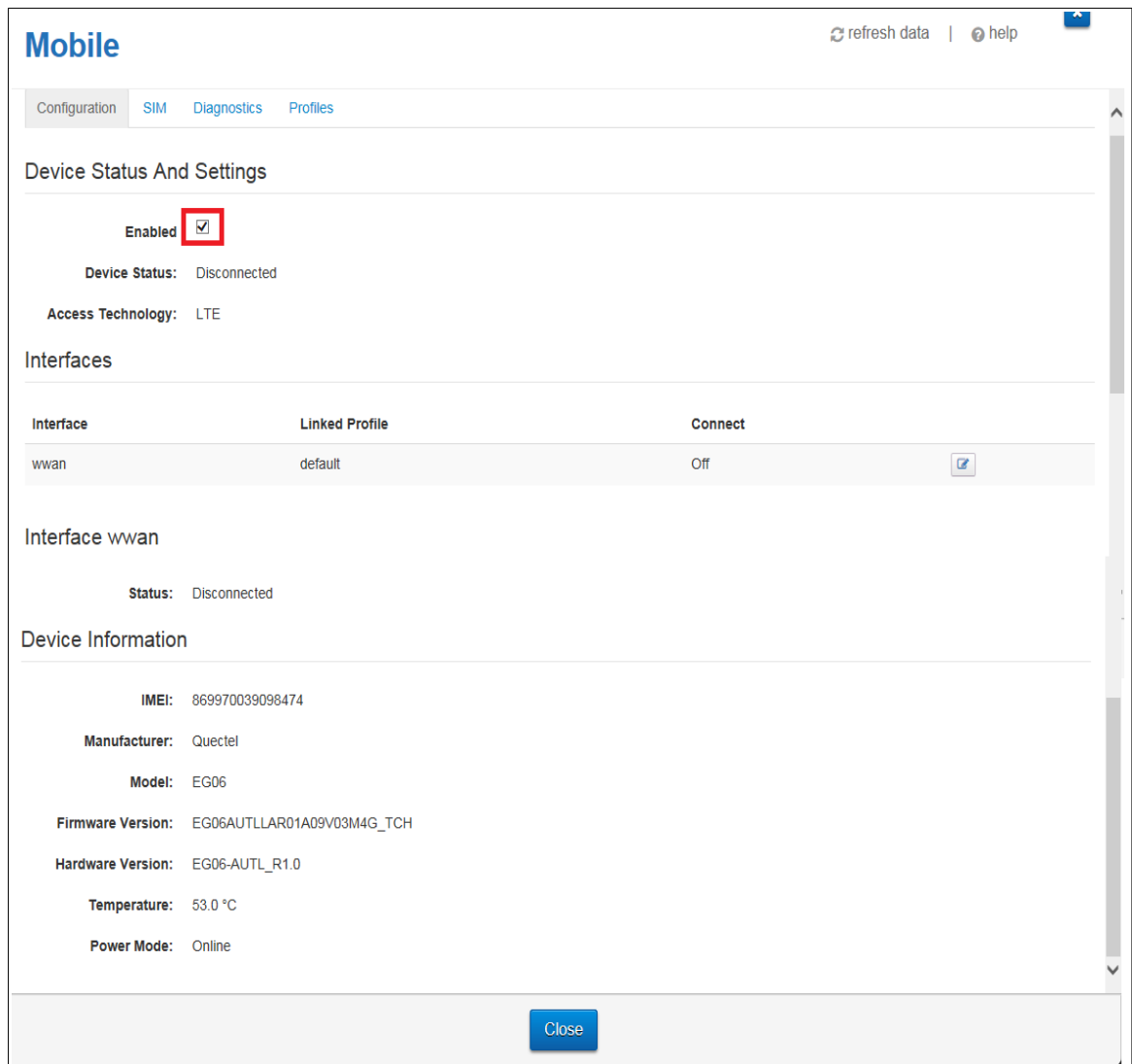
The Internet data figures are for the connection currently in use. (DSL, WAN or LTE)

The data graphs show the rate of data transmitted or received over the last 24 hours. From what I can determine the data graph measure the bytes transmitted or received over a 10 minute period. The 10 minute periods start from when modem was last rebooted.

25. 4G Cellular Backup
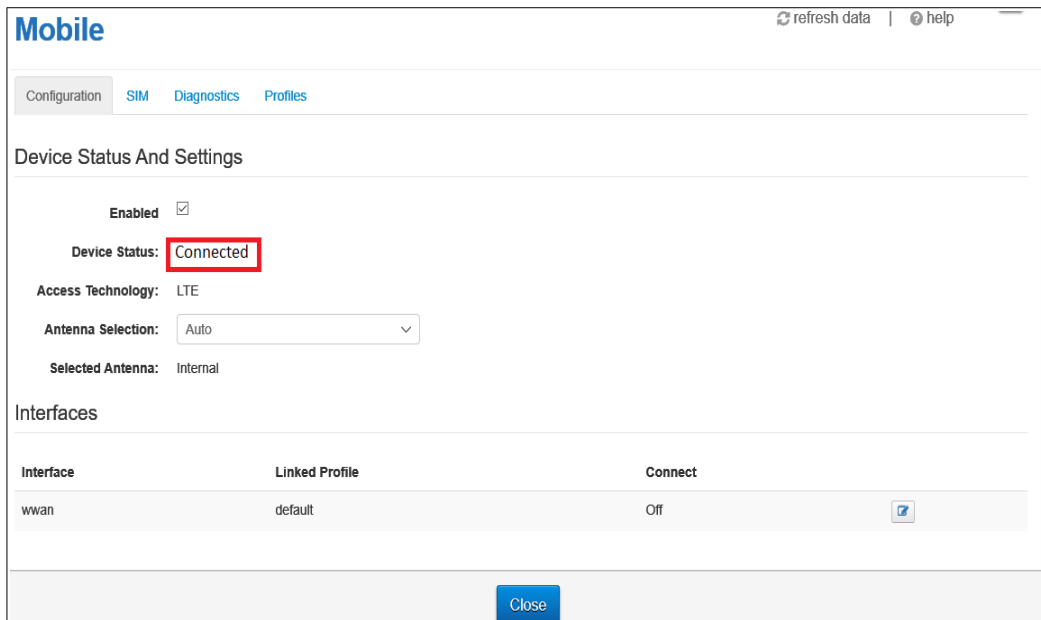
Log into Modem and go to Advanced > Mobile >

For backup to work ensure "Enabled" is On.

When main link is down and working on 4G backup Device Status will change to Connected.

Diagnostics

Advanced > Mobile > Diagnostics

The radio signal quality can be viewed over a 5, 20 or 60 minute period.

GSM & 3G networks (RSSI)
• -50dBm to -75 dBm – High Signal (good voice and data)
• -76dBm to -90 dBm – Medium Signal (good voice and data)
• -91dBm to -100 dBm – Poor Signal (good voice data, marginal data with drop-outs)
• -101dBm to -109 dBm – Very poor Signal (voice may be OK, no data)
• -110dBm to -113 dBm – No signal

4G/LTE (RSRP)
• -70dBm to -90dBm is a strong signal with fast data speeds. Stronger signals are possible. **(Green)**
• -91dBm to -105dBm is a good signal with fast data speeds **(Green)**
• -106dBm to -112dBm is fair but useful and fast and reliable data speeds may be attained **(Orange)**
• -113dBm to -125dBm reliable data, but performance may be slower and latency increased **(Red)**
• -126dBm to -136dBm performance will drop dramatically
• -136dBm to -140dBm disconnection
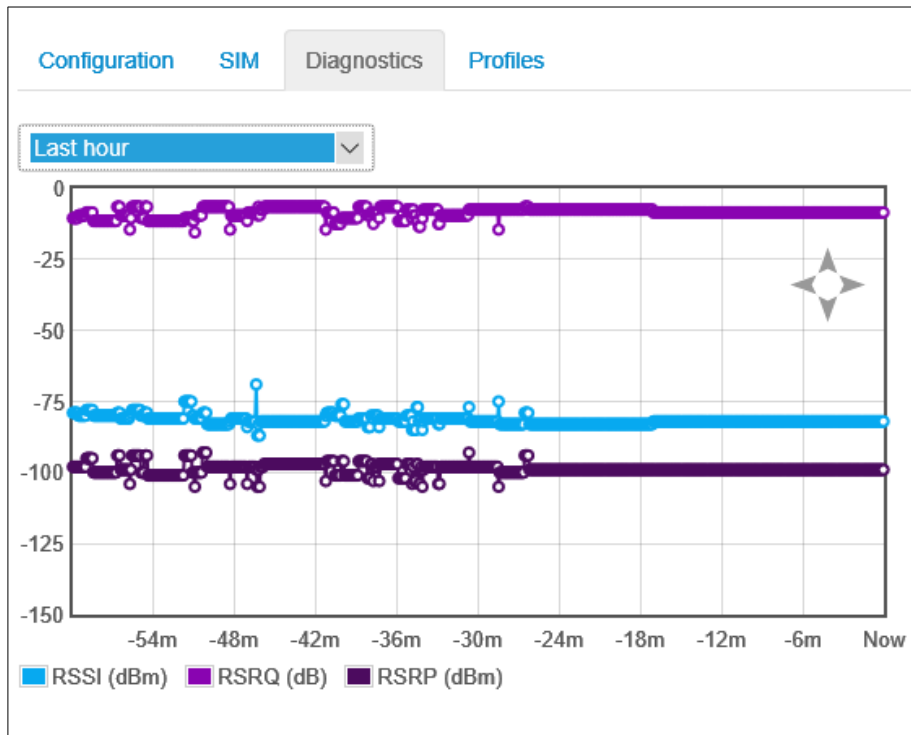
If the mouse cursor is placed over an area of interest that area can be expanded by rotating mouse wheel. (See image below).
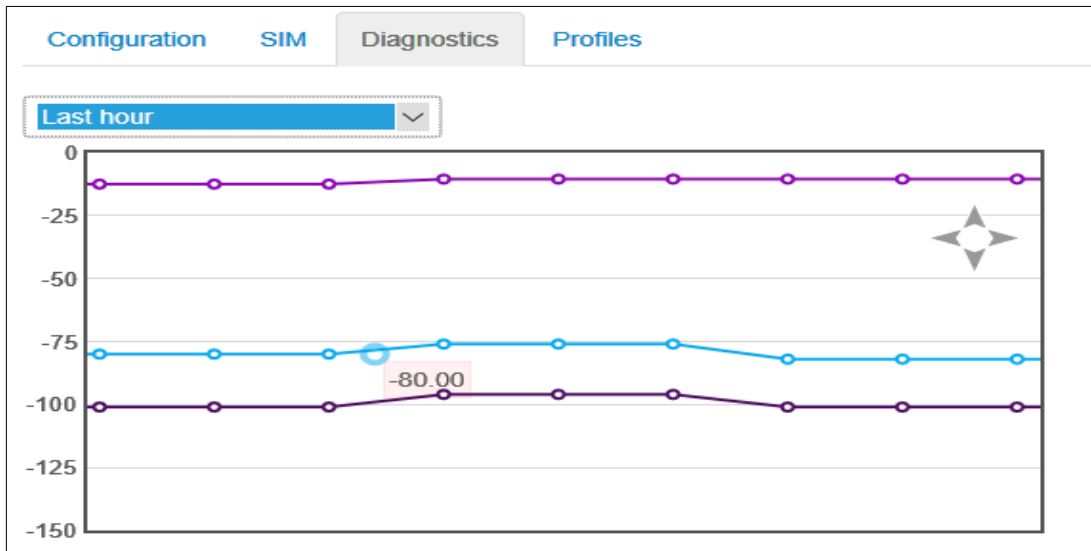
Profiles

Advanced > Mobile > Profiles

By default the modem on has an IPv6 address on the WAN. This can cause problems with some devices. To fix this a new Profile that will also provide an IPv4 address can be set up.

Click on Add new profile.

Enter a name, select IPv4v6 as PDP Type and select Add.

Go to the Configuration Tab, go to Interfaces and select edit

Select the new Linked Profile created previously and select apply.

To use the modem as a 4G modem router with a normal Telstra Data SIM installed select the telstra.internet profile.

26. Diagnostics (Fault Finding)

To view diagnostic information log in to modem and go to Advanced > Diagnostics
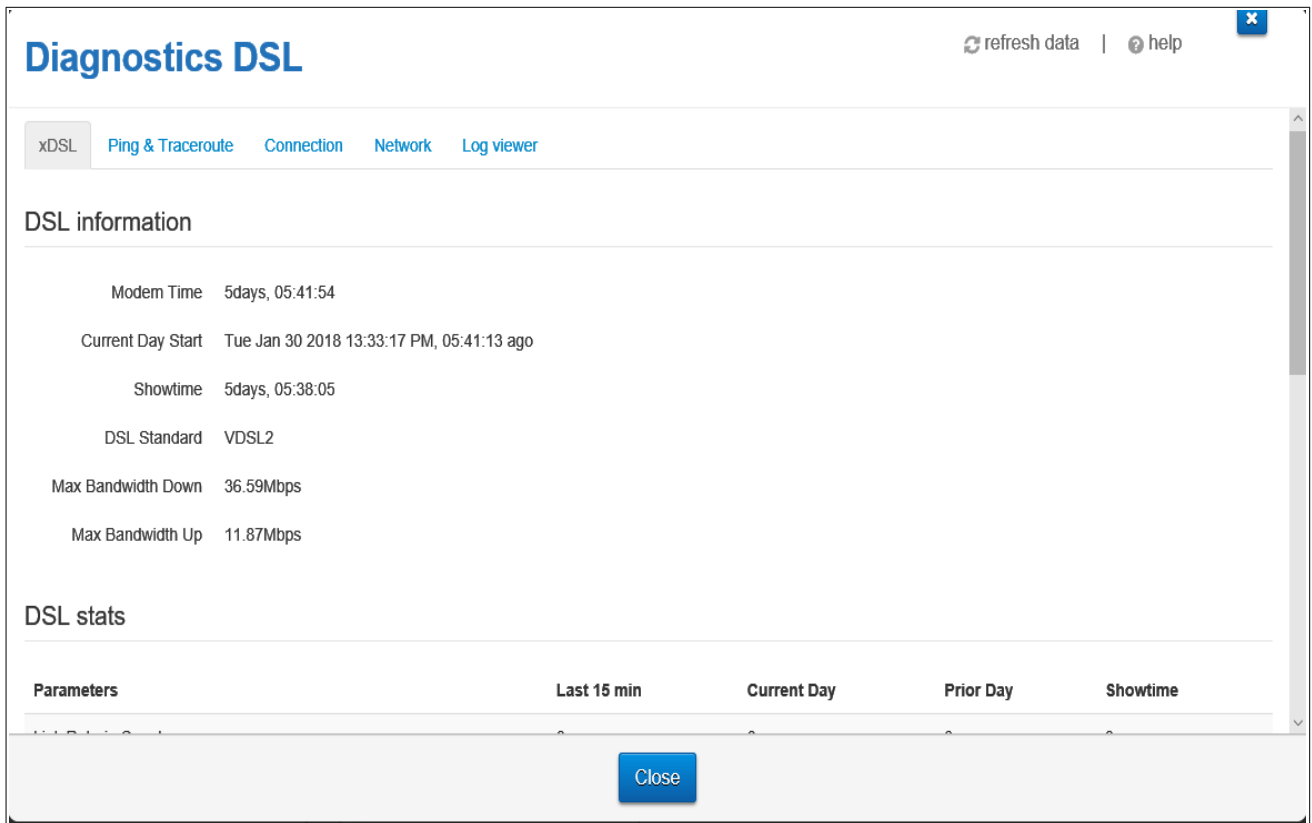
Ping

Advanced > Diagnostics > Ping & Trace Route

Enter a IP address or URL and click on "Send Ping Request". A green Status tick indicates success.

Trace Route

Advanced > Diagnostics > Ping & Trace Route and scroll down to Trace Route.
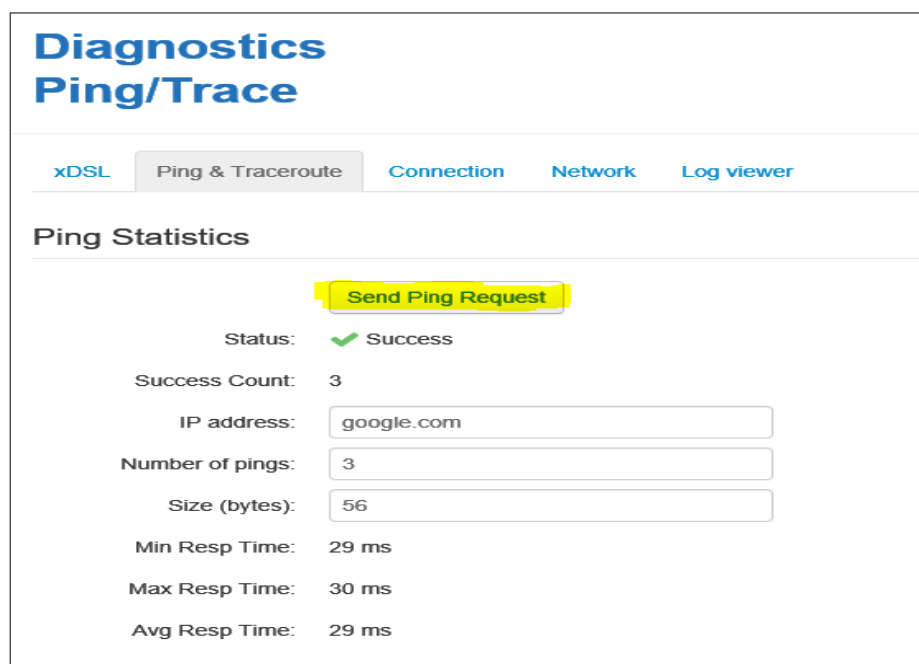
Enter the IP address or URL and click on "Trace Route".
During the test the Status will show "Ongoing"

Trace Route				

Stop Trace Route

Status: ✳ Ongoing

IP address: telstra.com

Max Hop Count: 30

Size (bytes): 38

Hostname	IP	Error code	RTT (ms)
*	*	*	*
	144.130.215.209	0	7,7,7
bundle-ether8.fli-core1.adelaide.telstra.net	203.50.11.154	0	10,9,7
bundle-ether9.win-core10.melbourne.telstra.net	203.50.11.91	0	16,16,16
tengigabitethernet7-1.win22.melbourne.telstra.net	203.50.80.162	0	15,15,15
telstr745.lnk.telstra.net	139.130.39.114	0	15,15,15

When Status shows Finished
All the hops are displayed and the latency between hops.

Connection

Advanced > Diagnostics > Connections
Shows state of connections

**Diagnostics
Connection**

xDSL   Ping & Traceroute   Connection   Network   Log viewer

Connection Check

Restart all Tests   ↩ Restart

DSL Status   ✔ Up

ATM Ping Test   ⊘ PVC 8/35 Not all ping request were answered

IP Version 4 Address   ✔ 58.174.49.224

IP Version 6 Address   ⊘ No Address Assigned

Next Hop Ping   ✔ Success

First DNS Server Ping   ✔ Success

Second DNS Server Ping   ✔ Success

LAN, WAN port and WLAN Statistics

Log in to modem and go to Advanced > Diagnostics > Network

DSL link status

Log in to modem and go to advanced > Broadband > DSL link status

Maximum Line rate is the maximum speed the link is capable of and is limited by the physical characteristics of the line.

Line Rate is the actual speed data is transferred. The line rate can not be faster than maximum Line rate but can be less due due to speed limitations on your connection. Example Maximum line rate might be 98 Mbps but if yo are on NBN 50 plan Line rate will be 62 Mbps and if Maximum line rate is 36 Mbps and you are on NBN 50 plan Line rate would be 36 Mbps

Line Attenuation is the amount the signal get decreased due to the attenuation of the line. There are several value as the attenuation increases with frequency. The greater the attenuation the lower the maximum speed.

Noise Margin is the margin between the received signal and the signal to noise ratio at which the signal can no longer be accurately decoded. Normally 6d but can be higher if noise profile has been implemented.

Statistics for VDSL or ADSL connection

Log into modem and go to Advanced > Broadband > DSL Diagnostics

Diagnostics DSL   ↻ refresh data | ❓ help

DSL stats

Parameters	Last 15 min	Current Day	Prior Day	Showtime
Link Retrain Count	0	0	0	0
Sync Bandwitdh(Down/Up)	-	-	-	37.93M/12.19M
Loss of Sync,LOS(Local/Remote)	0/0	0/0	0/0	0/0
Loss of Framming,LOF(Local/Remote)	0/0	0/0	0/0	0/0
Loss of Margin,LOM(Local/Remote)	0/0	0/0	0/0	0/0
Forward Error Correction,FEC	6057/5364	18/131	6057/5364	12111/23796
Cyclic Redundancy Correction,CRC	0/0	0/0	0/1	0/3
Errored Seconds,ES	0/0	0/0	0/1	0/3
Severely Errored Seconds,SES	0/0	0/0	0/0	0/0
Unavailable Seconds,UAS	0/0	0/0	0/0	0/0

Above is an example of a normal DSL link

1. Link Retrain count: Number of times link has had to disconnect to re-synchronise.

2. Sync Bandwidth (Down/Up): Speed of link Mega bits per second (Mbps)

3. Loss of Sync, LOS (Local / Remote) Number of times Node or modem has lost sync

4. Loss of Framing, LOF (Local / Remote): Number of times there has been a loss of frame error.

5. Loss of Margin, LOM (Local / Remote): Number of times Signal to noise margin is to small for

signal to be accurately detected due to high noise or high attenuation.

6. <u>Forward Error Correction, FEC</u>: Number of errors that were detected and corrected.

7. <u>Cyclic Redundancy Correction, CRC</u>: A CRC error indicates that part of the data packet is corrupt and requires retransmission.

8. <u>Errored Seconds, ES</u>: The number of seconds during which an CRC error was detected

9. <u>Severely Errored Seconds SES</u>: The number of seconds during 30% or more of the data blocks had CRC errors

10. <u>Unavailable Seconds UAS</u>: The number of seconds the link was unable to transmit. Usually indicate loss of the link.

Below is an example of a DSL link suffering frequent dropouts.

Diagnostics DSL

refresh data | help

DSL stats

Parameters	Last 15 min	Current Day	Prior Day	Showtime
Link Retrain Count	0	13	0	0
Sync Bandwitdh(Down/Up)	-	-	-	4.4M/0.74M
Loss of Sync,LOS(Local/Remote)	0/36	0/136	0/0	0/1
Loss of Framming,LOF(Local/Remote)	0/36	0/136	0/0	0/1
Loss of Margin,LOM(Local/Remote)	0/32	0/92	0/0	0/3
Forward Error Correction,FEC	0/0	3/3207	0/0	0/124118
Cyclic Redundancy Correction,CRC	0/6945	0/27627	0/0	0/1042
Errored Seconds,ES	0/255	0/1386	0/0	0/70
Severely Errored Seconds,SES	0/133	0/537	0/0	0/17
Unavailable Seconds,UAS	190/290	863/1273	0/0	0/0

Close

DSL Bit Loading

DSL Bit Loading
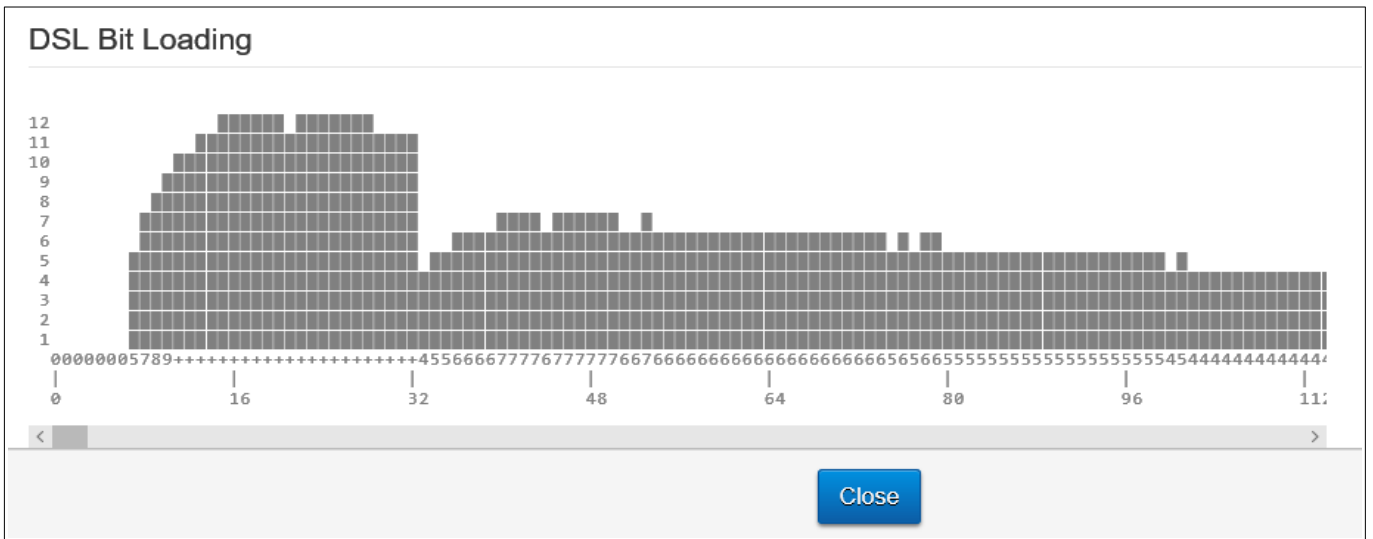
The frequency bandwidth of the link is is divided into tones of 4.3125 Khz bandwidth.

The tones are displayed along the horizontal axis.

Each tone can carry up to 56kbps of data.

On a perfect line each tone would carry 56kbps of data at lower frequencies. As the frequency increases the number of bits per second will gradually decrease.

If there is noise on the line at a particular frequency the bits per tone will be less at that frequency as indicated in image below.

DSL Bit Loading
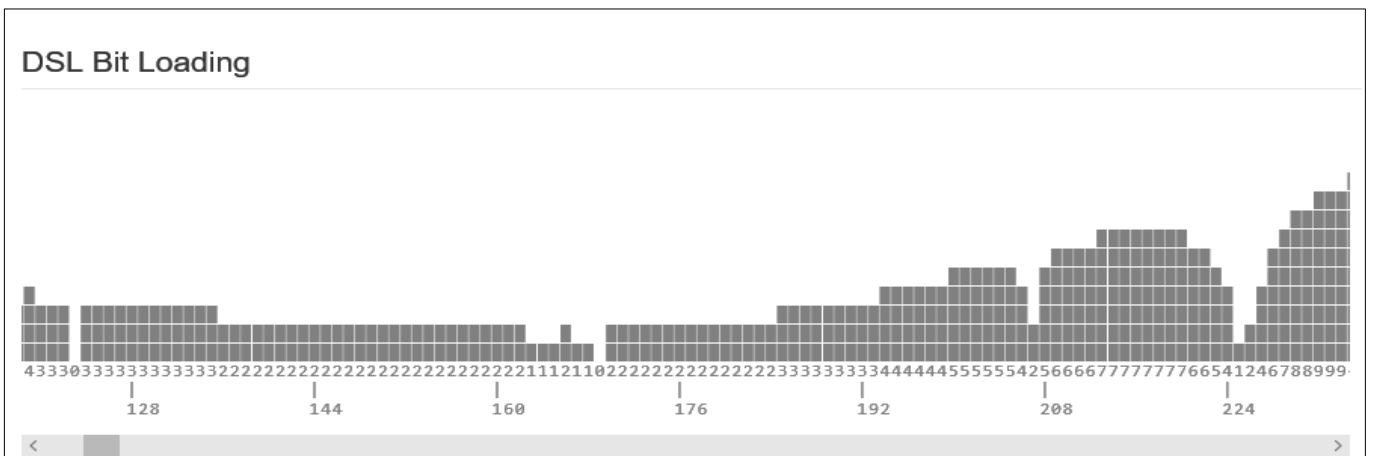
Log

The log shows events that have occurred in the last 15-50 minutes

The filter can be used to show all events or only those of a particular type.

Event Log

refresh data | help

xDSL   Ping & Traceroute   Connection   Network   **Log viewer**

Filter | Everything
        | 1867]
        | 5844]
        | crond
        | dnsmasq-dhcp
        | hostapd
        | intercept
        | ledfw
        | mmpbxd
        | nginx
        | odhcpd
        | pppoe-relay-hotplug
        | syslog
        | wansensing
        | wifi-doctor-agent

⬇Export All

Date	Facility		
Jan 30 18:50:12	daemon.info		egistration state changed to: registered
Jan 30 18:50:00	cron.info		2 cmd /sbin/trafficmon.lua
Jan 30 18:50:00	cron.info		1 cmd /usr/bin/thermalProtection
Jan 30 18:49:57	daemon.notic		Idle-Main.check(timeout, 1)
Jan 30 18:49:54	user.info	mmpbxd[19269]	SIP Registration: SIP: ⬛⬛⬛⬛⬛⬛⬛: Register Success
Jan 30 18:49:54	user.debug	mmpbxd[19269]	[MMRVSIPIMPL::NETWORKOBJ]:C: onStackLogEvent:1936 - TRANSACTION - RvSipTransactionSetLocalAddress Transaction 0x0x570010, Failed to sel local address to transmitter 0x0x529008 (rv=-3)

All the events for past 80 hours can be exported as a text file by clicking on the "Export all" button.

By default the file is downloaded to the default download folder as log.txt
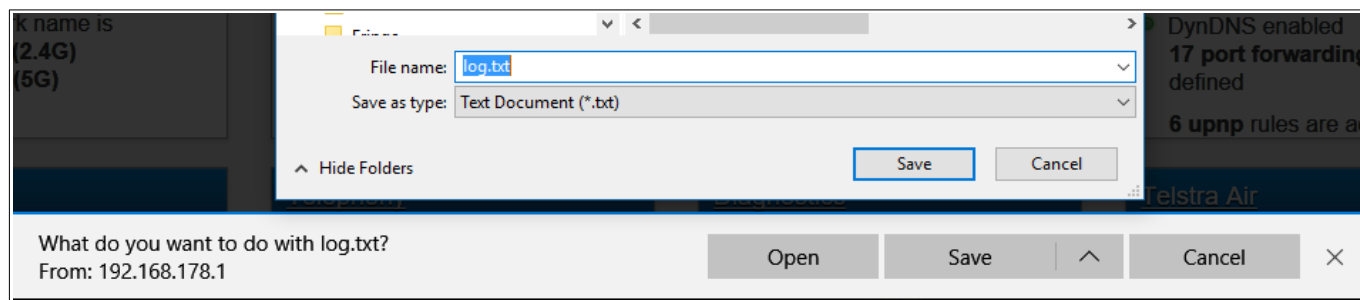
Extract from log at beginning of link loss

Tue Oct 23 09:46:38 2018 daemon.notice netifd: Network device 'ptm0' link is down
Tue Oct 23 09:46:38 2018 daemon.notice netifd: Interface 'wan6' has link connectivity loss
Tue Oct 23 09:46:38 2018 daemon.debug ledfw[1640]: setting device_name to eth4
Tue Oct 23 09:46:38 2018 daemon.debug ledfw[1640]: setting mode to link
Tue Oct 23 09:46:38 2018 daemon.info odhcpd[3376]: Raising SIGUSR1 due to default route change
Tue Oct 23 09:46:38 2018 daemon.notice netifd: Interface 'wan' has link connectivity loss
Tue Oct 23 09:46:38 2018 daemon.info odhcpd[3376]: Raising SIGUSR1 due to address change on wl1_1
Tue Oct 23 09:46:39 2018 daemon.notice miniupnpd[30444]: ProcessInterfaceWatchNotify RTM_DELADDR index=19 fam=2
Tue Oct 23 09:46:39 2018 daemon.debug ledfw[1640]: applying action on internet:green
Tue Oct 23 09:46:39 2018 daemon.debug ledfw[1640]: writing to /sys/class/leds/internet:green with action none
Tue Oct 23 09:46:39 2018 daemon.debug ledfw[1640]: setting brightness to 0
Tue Oct 23 09:46:39 2018 daemon.debug ledfw[1640]: applying action on

```
internet:red
Tue Oct 23 09:46:39 2018 daemon.debug ledfw[1640]: writing to
/sys/class/leds/internet:red with action none
Tue Oct 23 09:46:39 2018 daemon.debug ledfw[1640]: setting brightness to 0
Tue Oct 23 09:46:39 2018 daemon.debug ledfw[1640]: applying action on
internet:blue
Tue Oct 23 09:46:39 2018 daemon.debug ledfw[1640]: writing to
/sys/class/leds/internet:blue with action none
Tue Oct 23 09:46:39 2018 daemon.debug ledfw[1640]: setting brightness to 0
```

Example of events to look for during loss of internet connections

Start of loss off internet.

Tue Oct 23 09:46:38 2018 daemon.notice netifd: Interface 'wan' has link connectivity loss

Online light goes off

Tue Oct 23 09:46:39 2018 daemon.debug ledfw[1640]: applying action on internet:red

Online light purple

Tue Oct 23 09:48:50 2018 daemon.notice netifd: Interface 'wwan_6' has link connectivity

Link light green (This is for DSL connection will be different for connections using modem's WAN port)

Tue Oct 23 09:51:18 2018 kern.warn kernel: [661451.751000] bcmxtmcfg: Connection UP, LinkActiveStatus=0x1, US=12439000, DS=38565000

Online light green (Internet reconnected end of outage)

Tue Oct 23 09:51:23 2018 daemon.debug ledfw[1640]: applying action on internet:green

Tue Oct 23 09:51:33 2018 daemon.notice netifd: Interface 'wan' is now up

Phone light green (Phone service reconnected)

Tue Oct 23 09:51:46 2018 user.info mmpbxd[11841]: SIP Registration: SIP: +61xxxxxxxxx : Register Success

27. Change IP Address of Modem

Go to Advanced > Local Network

To change the IP address off Modem for LAN and normal WiFi access points select LAN as interface.

Type in New IP Address,

Change the DHCP Start and End address so that in same subset as Modems IP address. (First three group of integers are the same.

Click on Save.

Disconnect and reconnect to modem and log in using modem's new IP address.

Note: Cannot use 192.168.2.1 as this is address range of guest network.

The Guest networks IP address can also be change by select the guest network you wish to change.

28. Modem's Firmware Software

To check Firmware log in to modem and go to Advanced > Modem

The Firmware / Software can not be updated manually. When a new Firmware / Software becomes available it is pushed out to the Modem between Midnight and 6.00am. The Modem must be connected during this period to receive any Firmware / Software update.
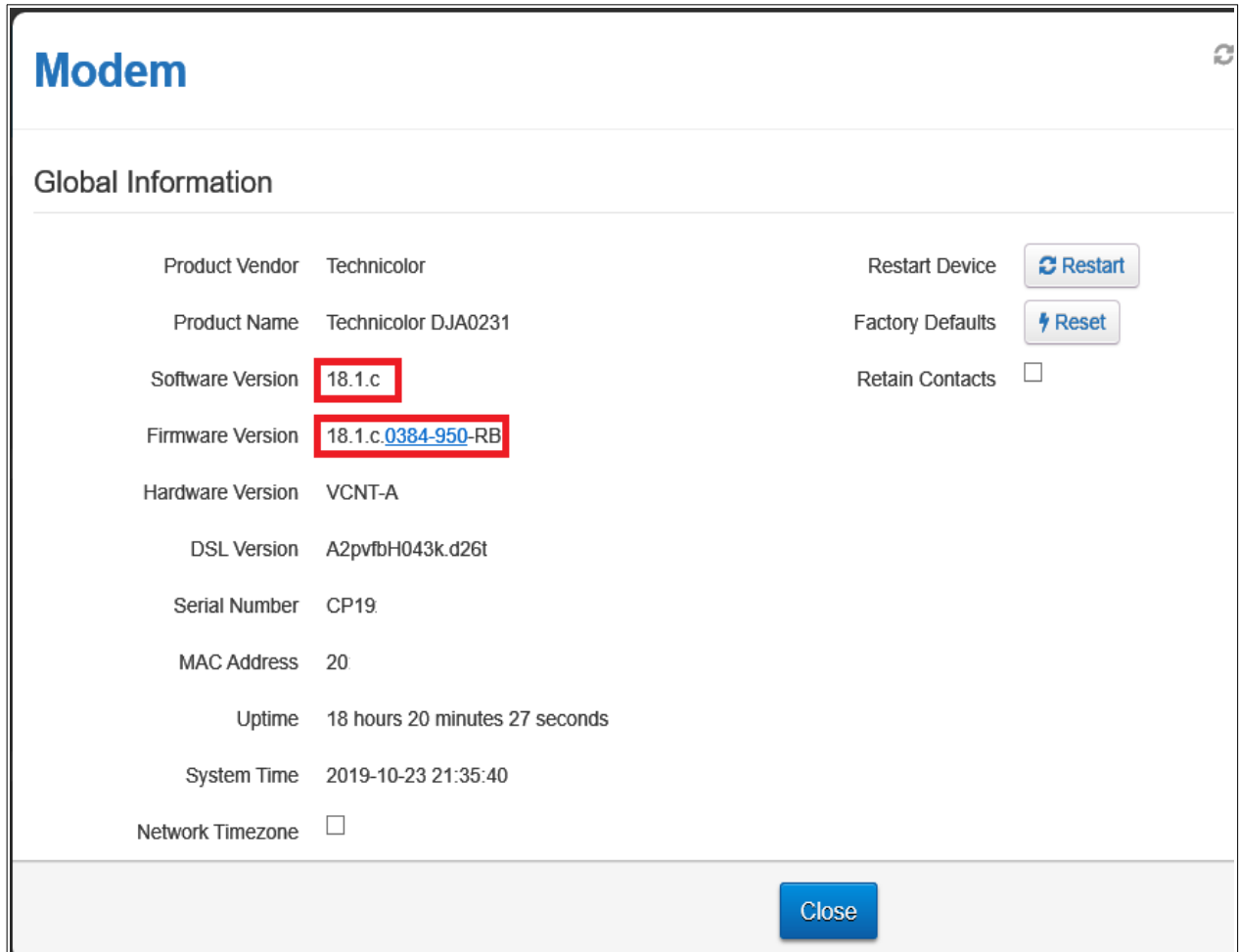
18.1.c.0241-950-RA First Maintenance Firmware. Bug fixes and a couple of minor features.

• Option to not delete contacts on factory reset

• IPv6 continuity between basic and advanced DYNDNS GUI's (basic view wasn't allowing ipv6)
• Front light rendering fix
• Fix for DynDNS getting stuck 'updating'
• Fix for some special characters not being accepted when changing management p/w
• Fix for incorrect Guest WiFi MAC address being displayed
• Fix for DECT codec, now is correctly G.726
• Fix for duplicate time of day rule being created in basic view

18.1.c.0283-950-RA April 2019
• Time of Day Rule's mini overhaul/improvements
• Further VoLTE fixes
• Lan DHCP fix from previous issue fully implemented into the FW
• WAN Supervision/Sensing improvements
• Printer sharing should be working properly
• Front LED will now be green in bridged mode
• Exploit Fix

18.1.c.0347-950-RC 13th June 2019
• Main fix is enabling integration with the Gen 2 Boosters
• Some IPv6 fixes and not much else

18.1.c.0384-950-RB 20th August 2019
● DECT Fix
● Time of Day GUI improvements
● Able to select from multiple DNS servers
● Expansion on special characters allowed for management passwords
● Basic UI DDNS Fixes
● IPv6 traceroute fix
● Front LED logic fixes for PPP failed auth attempts (no longer stays green)
● Several exploit fixes
● Several LTE/Voip/VoLTE bug fixes

18.1.c.0443-950-RA 10th November 2019

- DSL Firmware/Driver update
- Missed calls incorrectly reported for some types of phones when VMWI message received fix
- FW should allow user to disable DECT (including emissions)
- Advanced GUI should now show ipv6 DNS servers
- 2.4 channel width set to auto by default
- Cannot create parent control rule fix
- Time of day rule duplication fix
- fix for invalid sites being being saved in parental controls
- Port forward rule should no longer have destination MAC empty
- Apple WiFi instability issue fix
- reduction in some log spam
- some continuity fixes between basic and advanced pages
- Several Booster GUI fixes
- VOIP Fixes
- Length metadata for audio and video files fix
- Samsung smart TV wifi fix
- BFD enable/disable should now be working correctly
- ping/traceroute on ipv6 LTE should now work correctly

18.1.c.0443-950-RB 10th December 2019

- Same as **18.1.c.0443-950-RA** without the software that cause 2.4 GHz WiFi problems.

18.1.c.0462-950-RB 21th February 2020

- Fix for Log viewer freezing
- Telstra Air fix (Too many devices connected error)
- Traffic Graphs fix for DSL Internet graph recording incorrectly

18.1.c.0514-950-RB 21th July 2020
Main new feature was extra WiFi security Protected Management Frames (PMF) added.

18.1.c.0543-950-RA September 2020
Main new feature Game Optimiser added.

29. Modem's Time Settings

To change Modem's time settings log in to modem and go to Advanced > Modem and scroll down to Network time zone.
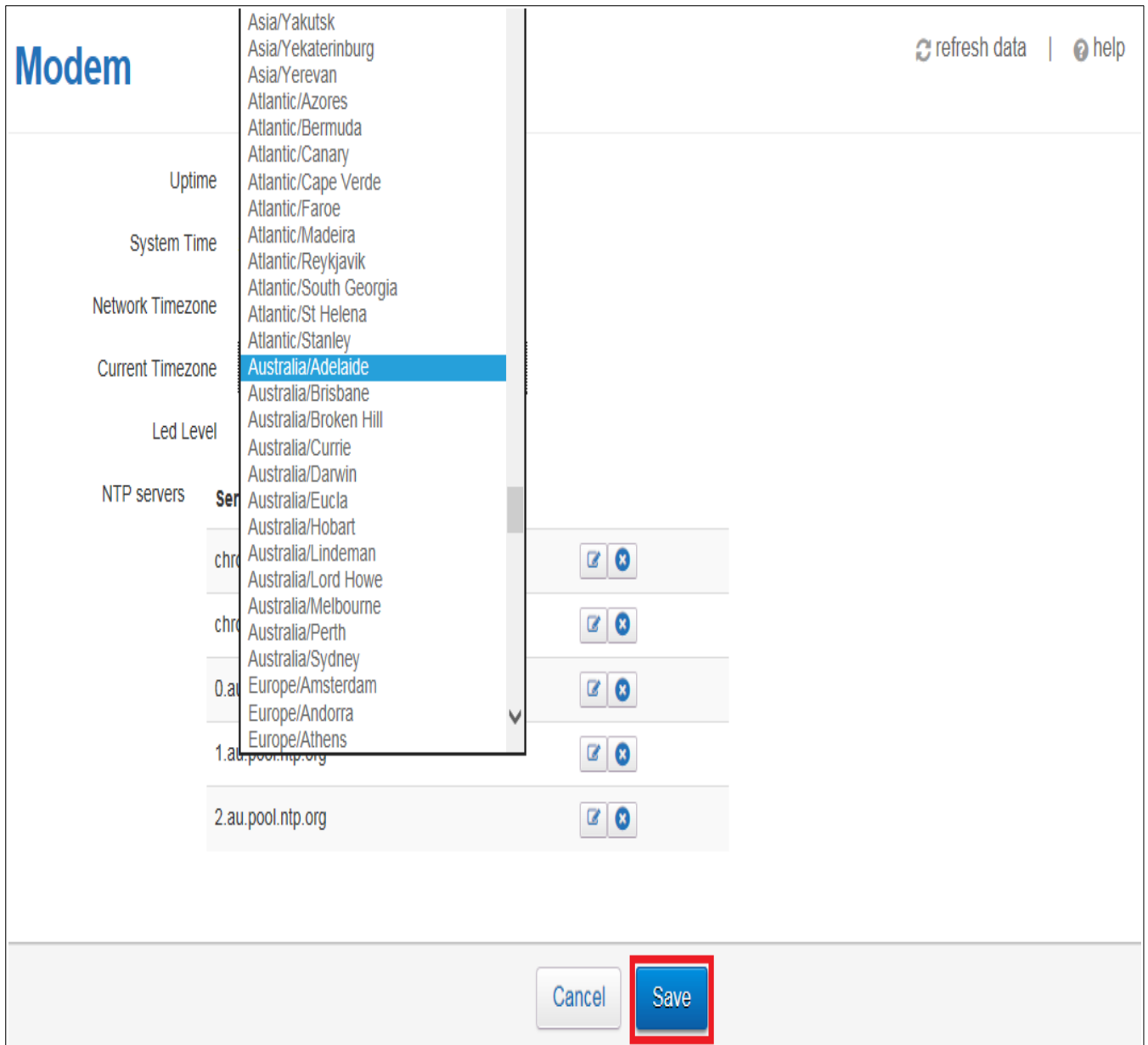
By default Network Timezone is ticked. The time zone is set automatically to time zone of Telstra server.

To set Time zone manually remove tick, select required time zone from Current Time zone selection box and click on save.

30. Connecting USB printer.

USB printer can be connected to USB port on the Modem and can be accessed from devices connected to by LAN or WiFi to the modem.

Plug the USB printer into the USB port on the Modem.

Log into Modem and go to Advanced > Printer Sharing

If printer is recognised its name will be displayed under Product Name.

Make sure Enabled is ticked.
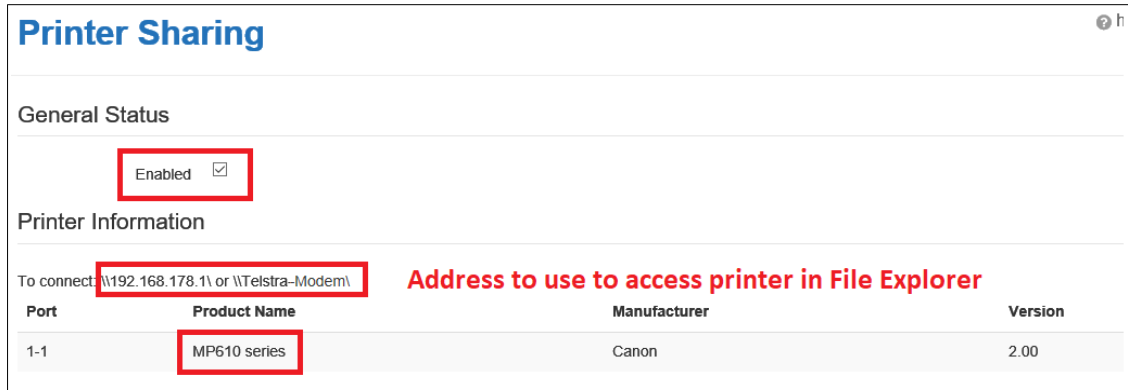
On a Windows PC open File Explorer and go to Networks.

Telstra-Modem Should be listed as a computer.
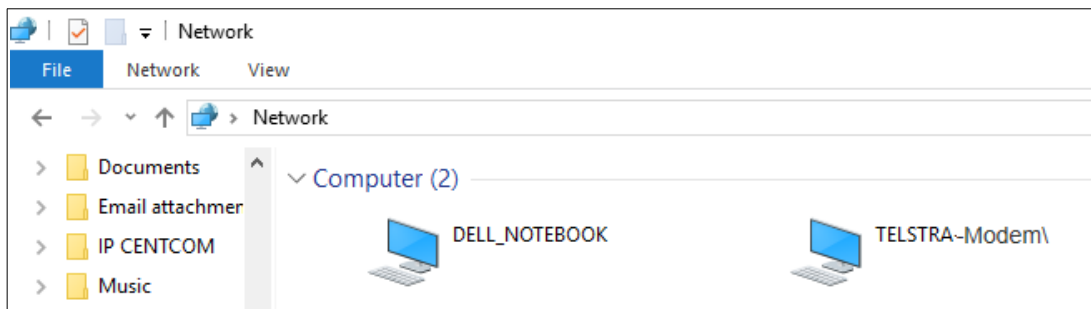
Double click on Telstra-Modem.
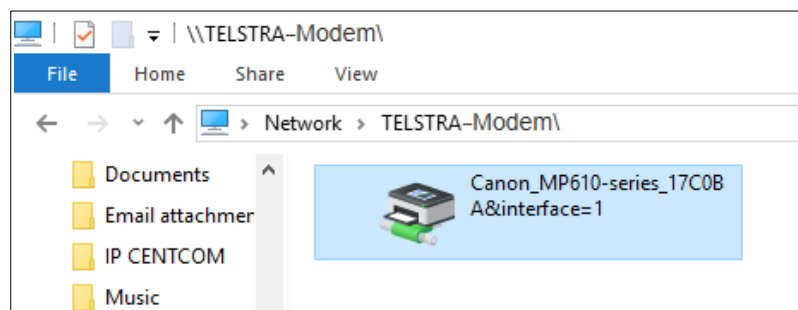
Your printer will be displayed.

Double click on the printer.

You will be prompted to install the device.

Click OK.

The printer probably want be recognised but you can install driver manually using Windows update, a disc or by selecting from a list of printers.

31. WiFi Tools

The modem has a set of WiFi Tools for monitoring WiFi devices and the strength of neighbouring networks. To access these tools go to Advanced > Wireless
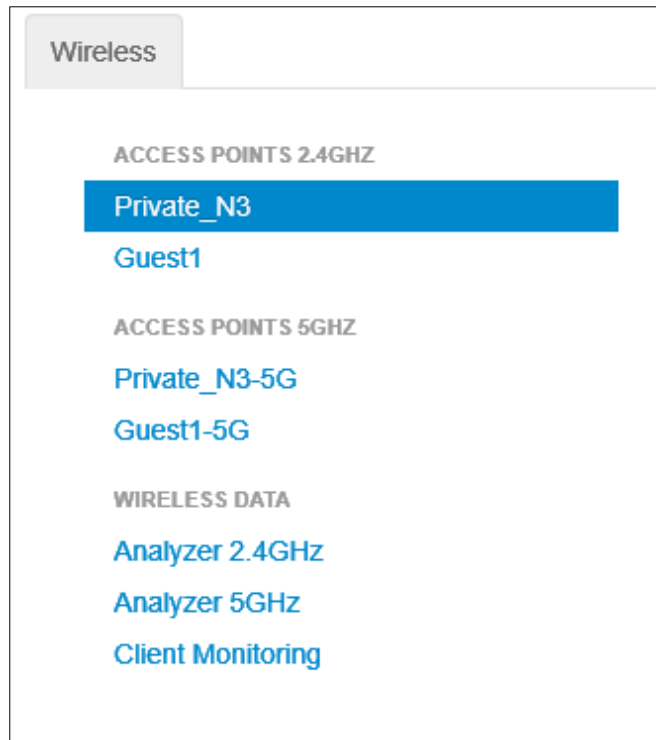
1. **Analyser 2.4GHz**
   If you use this tool, devices connected will be disconnected and will be able to connect after 1 minute.
   To refresh scan select Re-Scan button and select accept.
   Below the graph is a list of WiFi networks showing channel and power level.

2. **Analyser 5GHz**

    If you use this tool, devices connected will be disconnected and will be able to connect after 1 minute.

    To refresh scan select Re-Scan button and click on accept.

    Below the graph is a list of WiFi networks showing channel and power level.
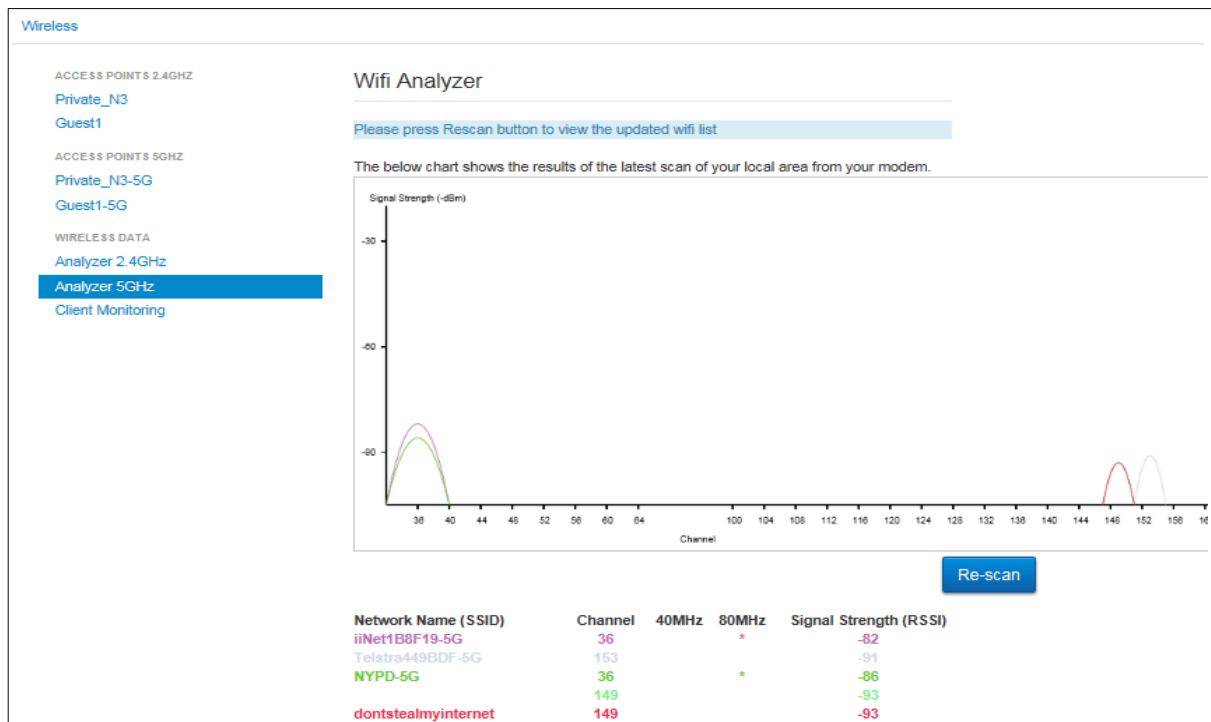
3. **Client Monitoring**

    Select WiFi Device from drop down list.

The Client Monitor is a very useful tool for monitoring the quality of the WiFi link between the modem and the WiFi device. It displays the following information.

Wireless Client Monitor

Device Details

All information is given from the Client perspective

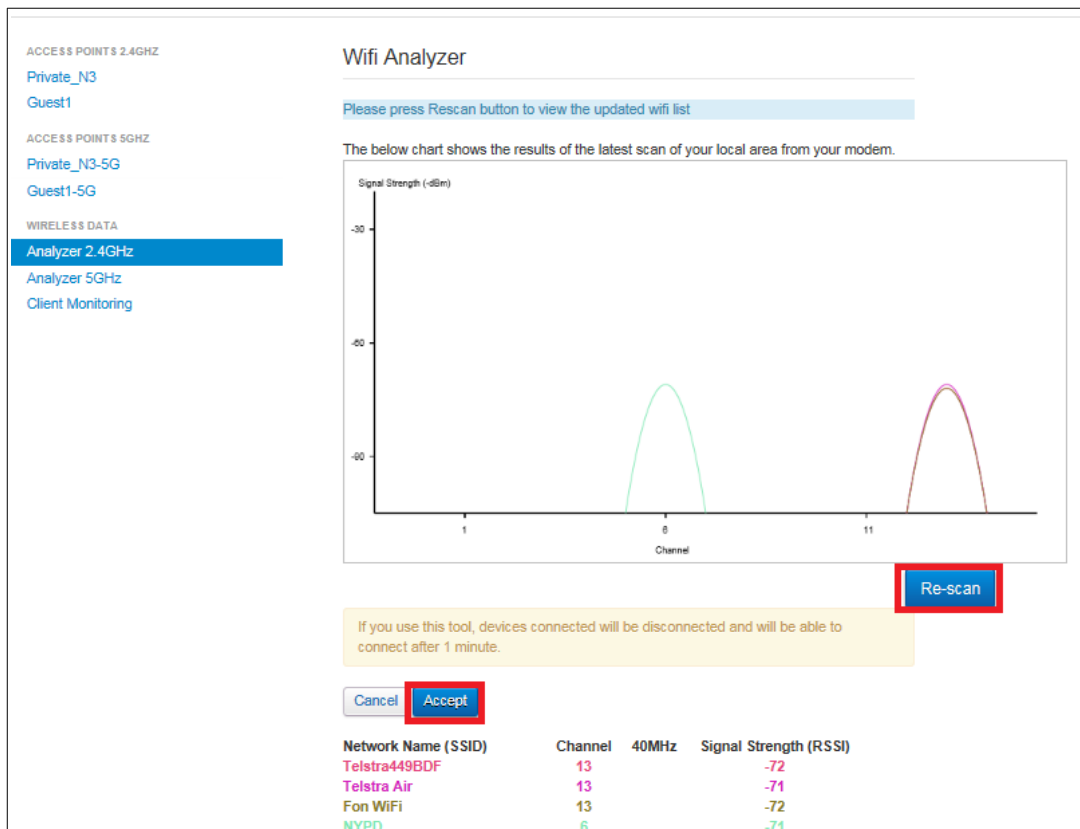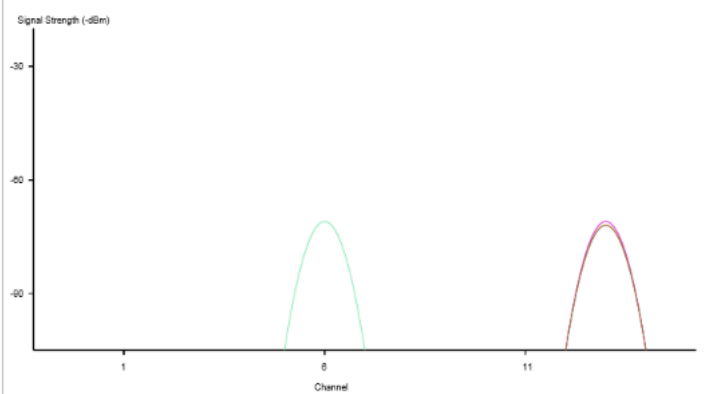|	
Host Name	Dell-Notebook
Frequency	2.4GHz
SSID	Priv
MAC Address	94:
Device Capabilities	802.11n 1x1 WMM SGI20 AMPDU
Active	WMM AMPDU
Power Transitions	511
RSSI	-0dBm -37dBm -100dBm
PHY Rate	⊙ 39 Mbps ⊕ 52 Mbps
Data Rate	⊙ 36 Kbs ⊕ 9 Kbs
Packets Sent	2281937
Packets Received	1800450
Retransmissions	560
Time Connected	4 hours 59 minutes 38 seconds
Current Time	2019-10-26 20:26:31
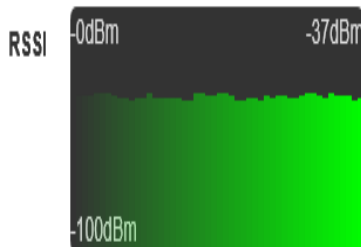
1. **Host Name:** Name of WiFi device.

2. **Frequency**: Current WiFi Frequency Band used by device

3. **MAC address** of WiFi Device

4. **Device Capabilities.**

5. **Active:** Capability being used

6. **Power Transitions** (2.4 GHz WiFi Band only)

7. **RSSI:** Graph of RSSI of modem's received WiFi signal from WiFi device which is dynamically updated. The lower the RSSI the better the signal strength.

8. **Phy Rate**: The speed of the WiFi link between modem and device. These speeds are dynamically updated.

9. **Data Rate**: (2.4 GHz WiFi Band only): The speed of the data transmitted over the WiFi link. The speeds are dynamically updated,.

10. **Packets sent**: Packets sent by device. The packets are not updated dynamically

11. **Packets Received**: Packets received by device. The packets are not updated dynamically

12. **Retransmissions**: These are similar to CRC errors on a DSL link. The packet has to be retransmitted because it either did not arrive or had to many errors for the inbuilt error correction bits to correct.

13. **Time Connected**: Time the WiFi device has been continuously connected to the modem.

14. **Current Time** Shows time when WiFi device was selected. Does not update.

32. DNS Selection

By default the modem uses Telstra as the DNS but has the option to select other DNS providers from a drop down list. To use a non Telstra DNS log into the modem and go to Advanced > Local Network.
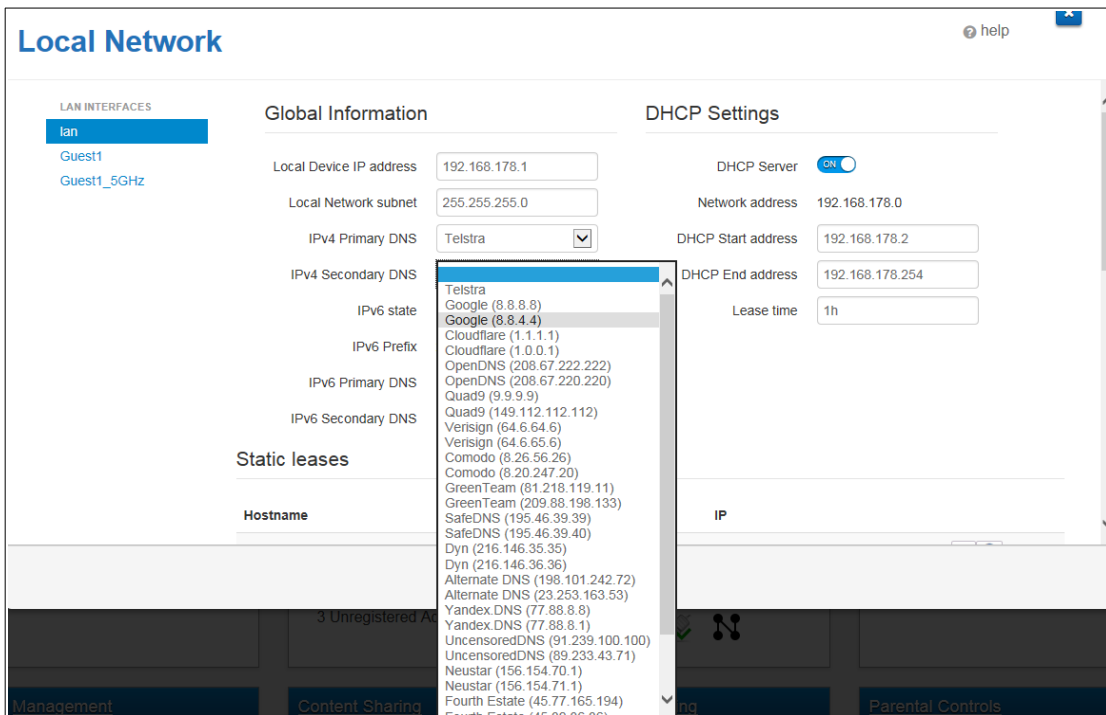
Select a DNS provider from drop down list for IPv4 Primary DNS, IPv4 Secondary DNS, IPv6 Primary DNS and IPv6 Secondary DNS.
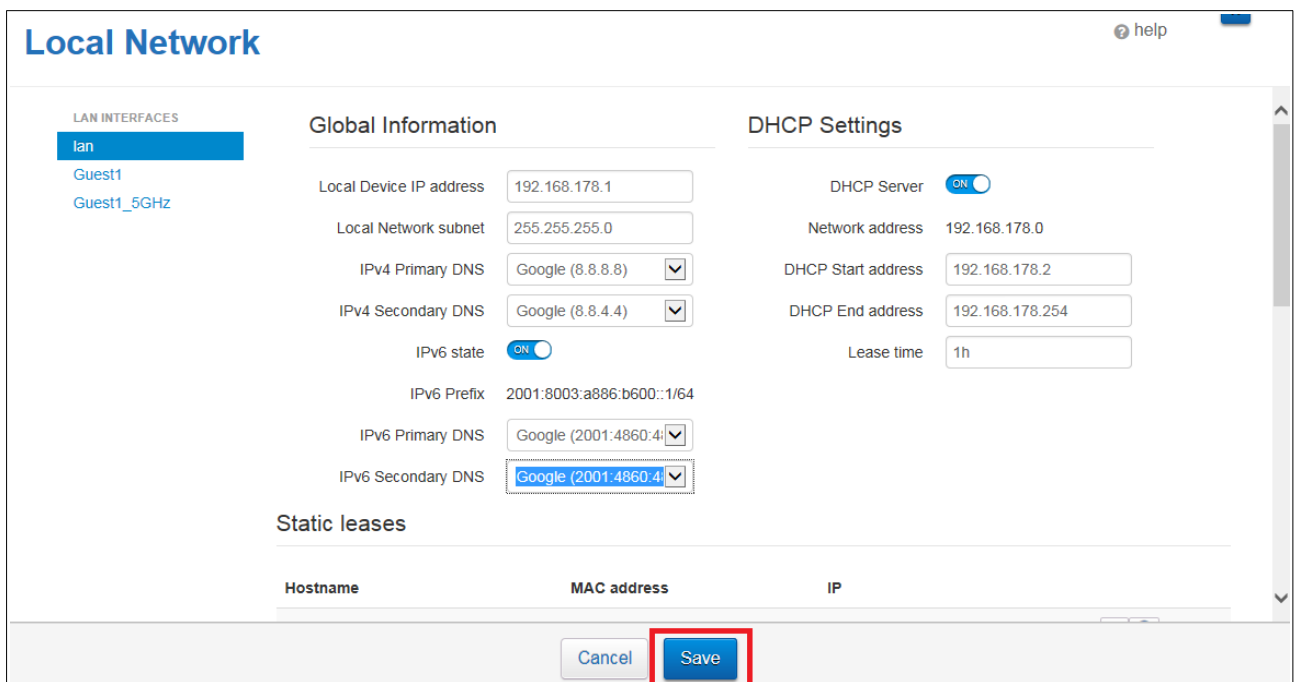
Save Settings and reboot modem or disconnect and then reconnect all devices.

33. Telstra Gen 2 WiFi Boosters

To pair a Booster with the modem

Turn Booster on and wait for front light to turn red.

Press pair button on back of modem for 5 seconds. Pair light will flash green at rate of twice per second.

Press pair button on back of booster for 5 seconds. Front light will flash orange and turn blue when connected to modem.

On my first attempt front light flashed blue and purple after flashing orange and then turned red. Had to try a second time.

When Booster is paired there is an extra Booster Status Tab and Wi-Fi Devices tab on the Modem's Home page.

Image below shows modem's home page with WiFi Booster Status tab open.
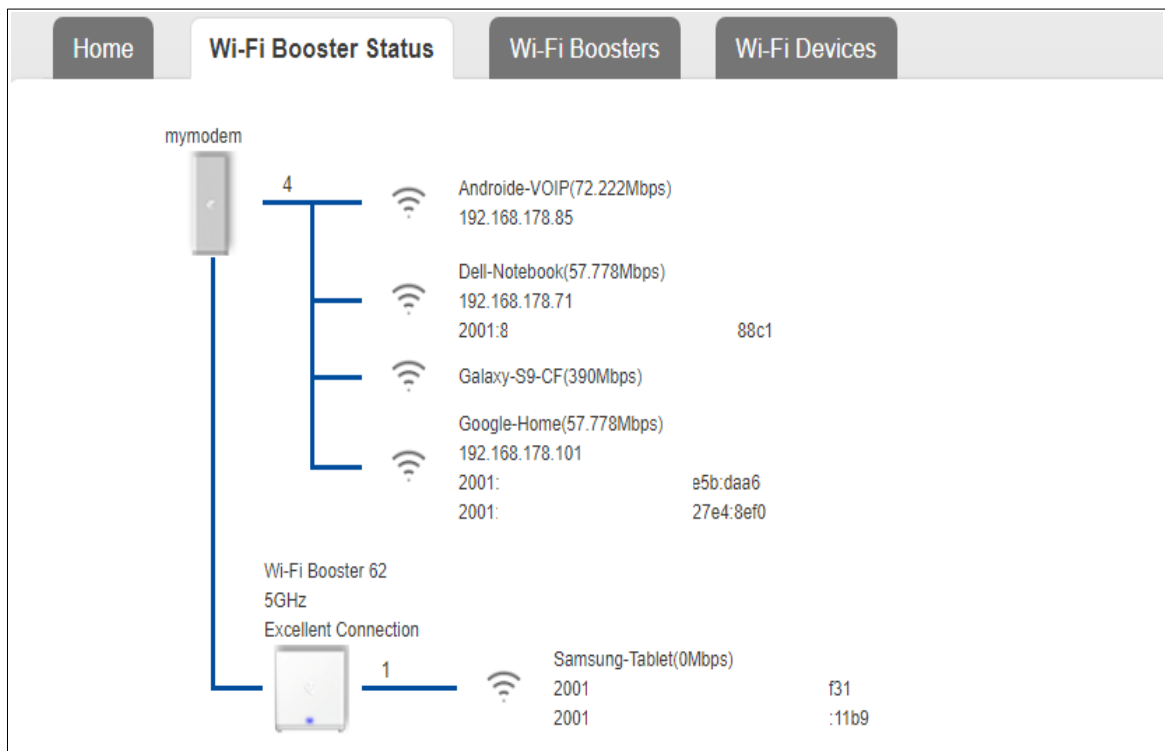
Taping or clicking on the Wi-Fi Booster Icon takes you to this page.
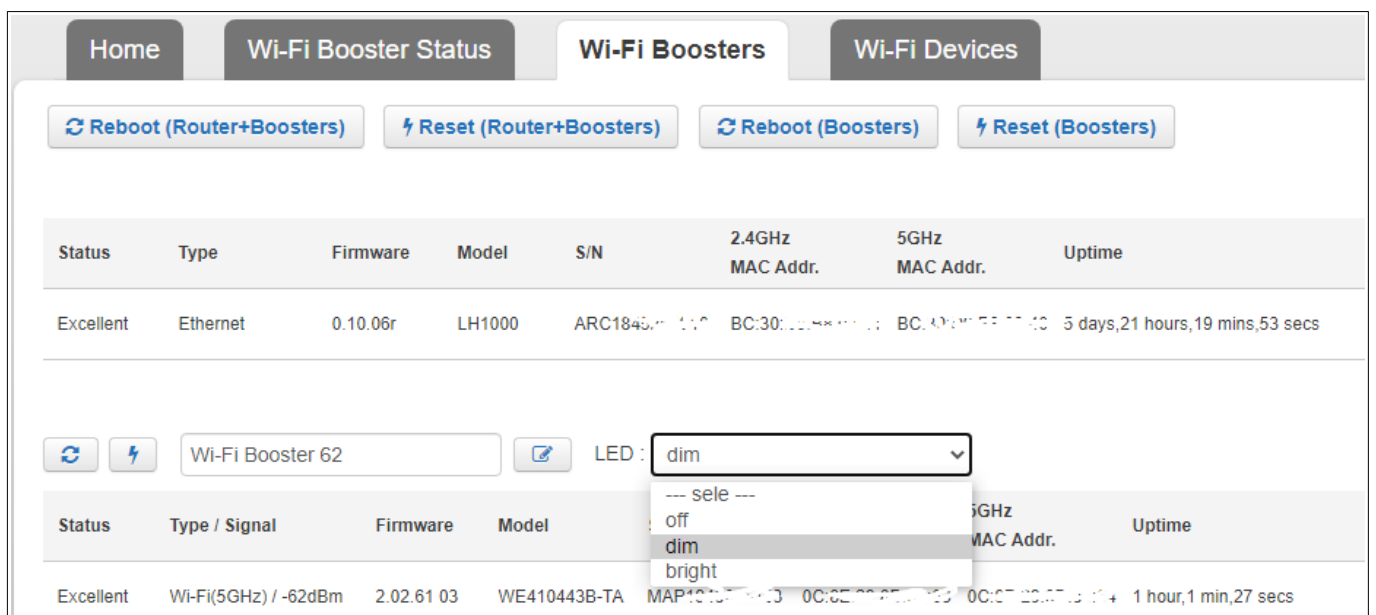
On this Tab you can

1. Reboot both modem and booster at same time.
2. Reset both modem and booster at same time.
3. Reboot booster only.
4. Reset booster only.
5. Control brightness of light on front of booster.

Tapping or clicking on WiFi Devices shows detailed information about connected devices.

An extra WiFi Graph Tab is also added to the Traffic Monitor page (Services > Traffic Monitor
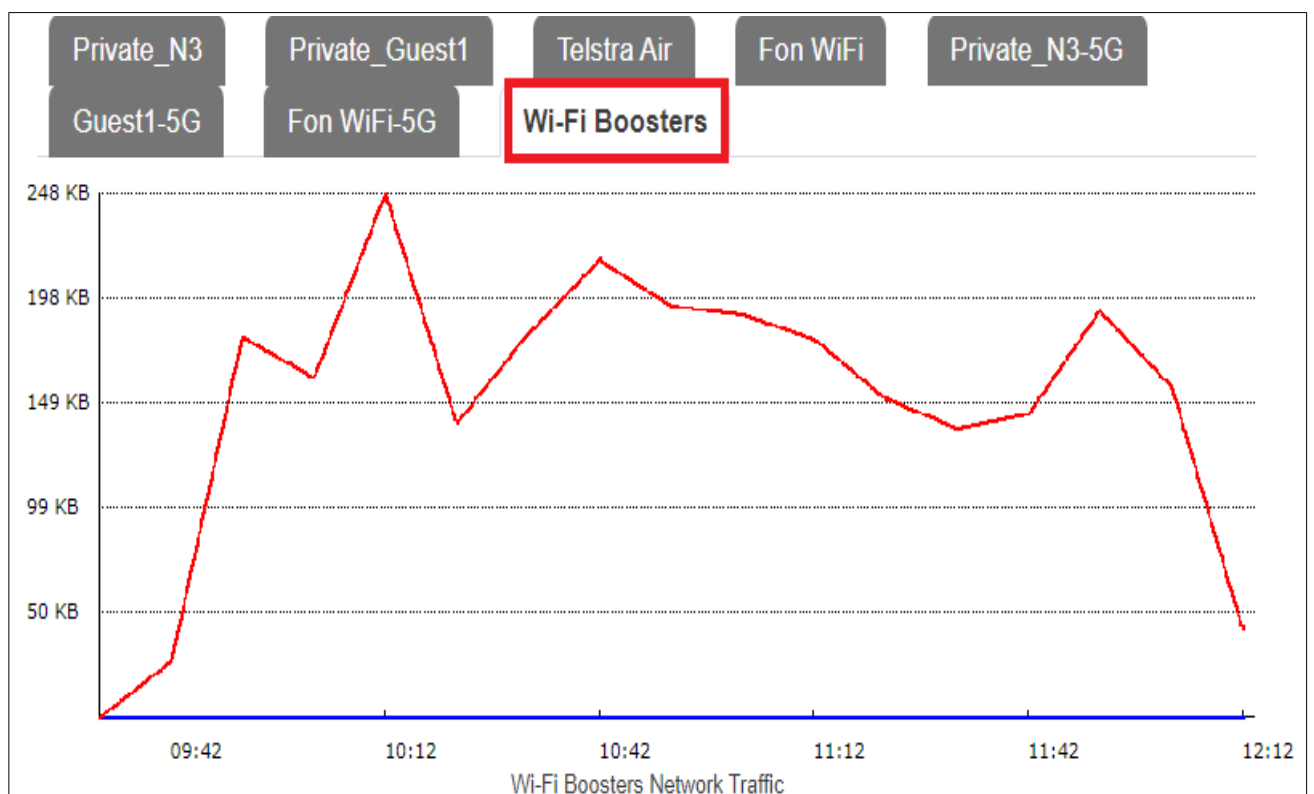
34. Modem as Access point

1. Remove SIM card

2. Open a Web browser on device connected to modem and go to http://192.168.0.1, password is Telstra and hange WiFi SSID and password to match that of main modem. See section 21 for instructions on how to do this.

3. Go to Advanced > Local Network.

4. Turn IPv6 State off.

5. Turn DHCP Server off

6. Change the LAN IPv4 address so that it is within the same subset as main modem but is different to LAN IPv4 address of first modem and IPv4 address off all other devices connected to first modem and save settings. There is a list of all connected devices with there IP address at Go to Advanced > Devices. In the image below my main modem is a Fritz box which has a LAN IP address of 192.168.178.1.
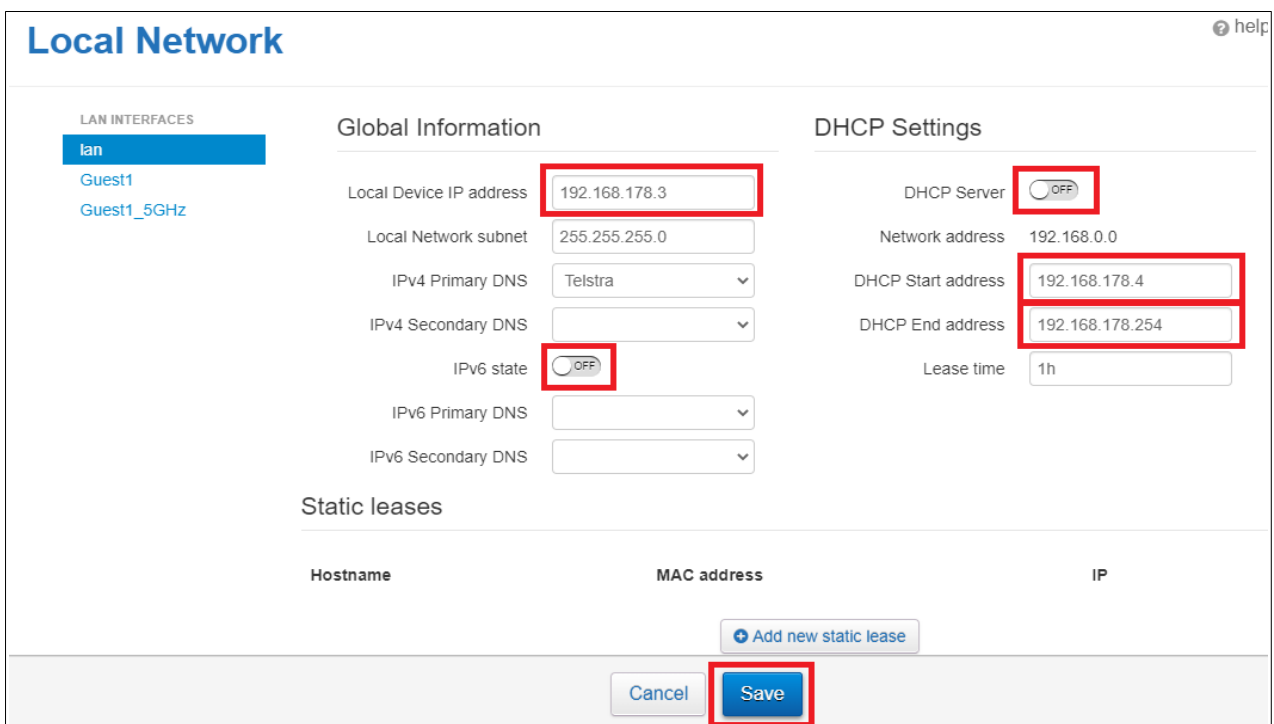
7. Save settings.

8. Connect LAN port of DJA0231 to LAN port of main modem.
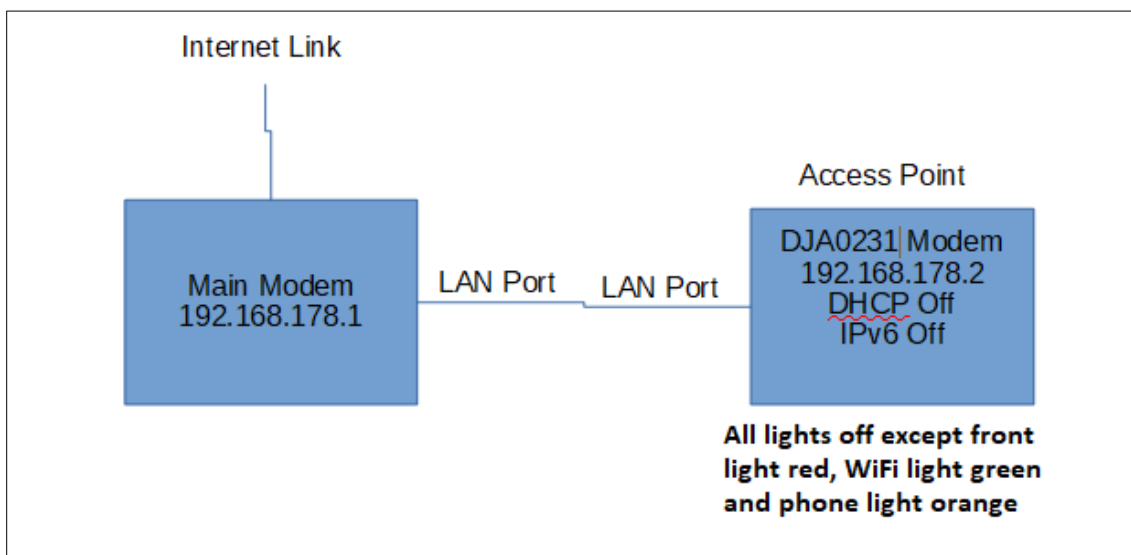
35. Enable Guest WiFi

Open a Web browser on device connected to modem and go to http://192.168.0.1, password is Telstra.

Go to WiFi.

Select the Guest1 Tab.

Tick Enabled under WiFi Network.

Save settings.

Repeat for the Guest1_5G Tab.

Device on the Guest have Internet access and the data is metered against your account but they are unable to connect to or share resources such as printers connected to main Network

36. WiFi Protected Management Frames (PMF)

The WiFi security of the modem was enhanced with the addition of Protected Management Frames in firmware update 18.1.c.512-950-RB. Protected Management Frames (PMF) is a standard defined by WiFi Alliance to enhance WiFi connection safety. It provides unicast and multicast management actions and frames a secure method with WPA2/WPA3, which can improve packet privacy protection. It causes problems with some devices manly old devices that only support the 2.4 GHz WiFi band. Some of the problems are:

1. Device want connect modem's WiFi common error is wrong password.

2. Devices connect but don't have a valid IPv4 address.

3. Causes windows to crash with blue screen of death when connecting to modems WiFi.

4. Causes some android devices to reboot when WiFi on modem is turned off and then back on.

5. Some devices connect Okay but loose connection intermittently.

If some of your device experience any of the above problems suggest you turn PMF off by logging into modem, go to Advanced > WiFi, scroll down to Protected Management Frames, set to disabled and save settings. If the problem occurs with 5 GHz devices repeat for the 5 GHz WiFi network.
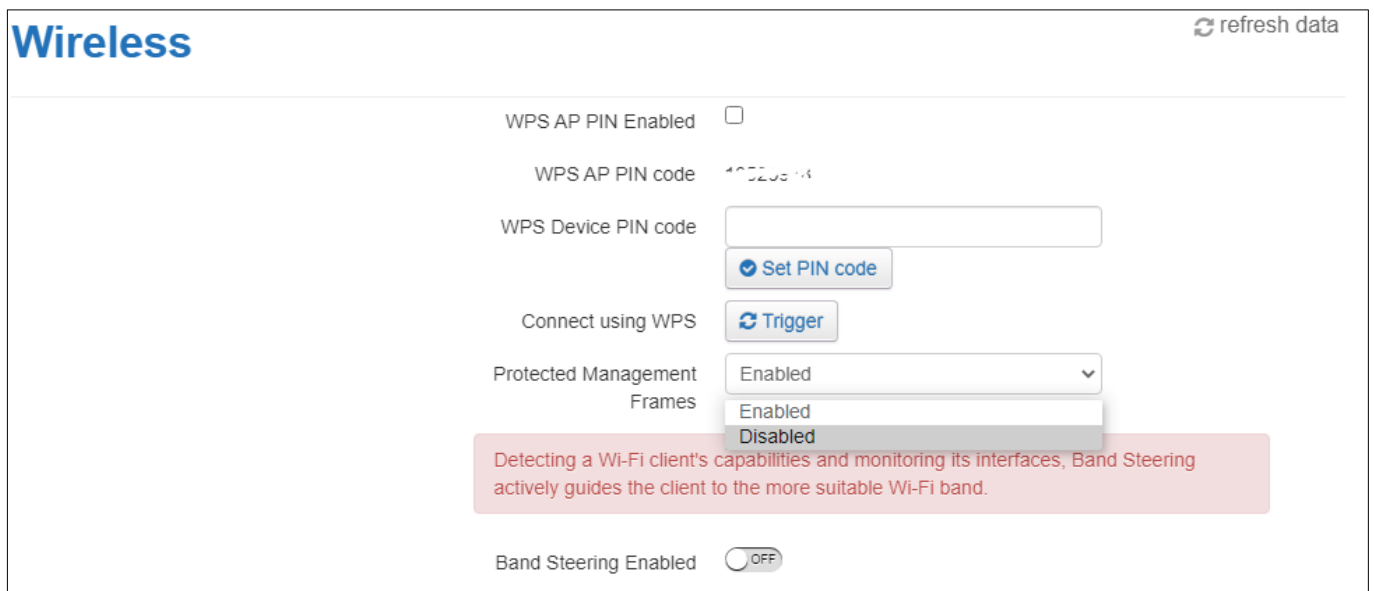
37. Specifications

Integrated LTE Module:
- **Quectel EC-25-AUTL (CAT-4)**
- External SIM slot

Main Chipset:
- BCM63138

Memory
- Non-Service-Affecting Platform Software upgrades (dual bank memory)
- 1GB RAM (DDR3)
- 512 MB Flash (2x256 Dual Bank)

Wireless capability:
- IEEE 802.11n 2.4 GHz using 2x2 BRCM 4360 maximum 26dBm (b11, g54, N450)
- IEEE 802.11ac 5 GHz using 4x4 BRCM 4366 maximum 30dBm (a54, N600, AC 1733)

Ethernet Capability:
- 1xGigabit Ethernet WAN port
- 4x10/100Mbps/1Gigabit LAN ports

USB Master Capability
- x1 USB 3.0 Interfaces (1000mA)
- Hard Disk (FAT32 EXT2)
- NTFS, HFS+ supported
- Maximum Disk Size 2TB
- DLNA and SMBA 1.0
- USB HUB

ADSL, ADSL2, ADSL2+ compliance:
- (Maximum Rate: 24 Mbps for downstream and 3 Mbps upstream)

VDSL2 compliance
- ITU G.993.2
- SOS
- SRA
- INM
- Up to 17 MHz profiles (POTS)
- ITU-T G.993.5 (G.vector)
- ITU-T G.998.4 (G.inp)
- G.Fast g.9700, g.9701

DECT
- CAT-iq™ 2.0 certification
- Up to 5 paired DECT handsets
- Up to 4 simultaneous DECT communication links

Voice
- 1 FXS ports with PSTN pass-through when operating in analogue voice mode
- 1 FXO port for PSTN requires external filter
- FXS 3 REN Equivalence

Temperature:
- 0° - 45° C (32 - 113 F) & Humidity: 20% to 80%

Power:
- Power consumption 12.9 Watts with no drive attached to USB port.
- Power factor 0.48
- Volt Amps VA 26

38. Known Limitations and Bugs.

1. DLNA server does not sort media by folders

2. Does not support FTP access to USB drives.

3. No settings in modem for VPN.

4. UPNP does not work on all devices. Have to set port forwarding manually.

5. 4G backup mode only works on 4G not 3G, speed limited to 6 Mbps down 1 Mbps up

6. When viewing Telephony information (Advance > Telephony > Information) Refresh button doesn't work

7. "Stop Trace Route" does not stop a trace route test.

(Advanced > Diagnostics > Ping & Trace Route)

8. Link Diagnostics (xDSL) last 15 minute FEC errors and Link Retrain counts are a duplicate of previous days FEC errors.

9. WPS AP pin does not work. Can connect using WPS without having to enter pin when WPS pin is enabled in GUI.

10. WPS Device Pin can only enter 4 digits.

11. Devices connected to modem via switch or WiFi extender are grouped together with same MAC address. Have to enter MAC address manually if setting up static leases and if setting up port forwarding can't use Advanced > WAN Services > Port Forwarding. Not all switches and extenders have this problem.

12. If Parental controls are used to block a secure site following message is displayed when you navigate to blocked site "Secure Connection Failed" or "Cannot securely connect to this page" instead of "Destination is Blocked due to Parental Controls"

13. Event Log resets on each reboot.

14. Internet Traffic graph on DSL links is fault. Starts at zero 10 minutes before graph is viewed and rises to the total data received or transmitted since modem was rebooted.

15. Remote Web access resets at each reboot. Locks up and requires modem reboot if modem switches to 4G and then back to main link.

16, DECT base has problems with some DECT handset.
        Intercom between handset doesn't work.
        Handsets lose contact with base.
        Outgoing call recorded on handset as two incoming calls.