



TELEDYNE PARADISE DATACOM

A Teledyne Technologies Company

Q-NET™ Navigator User Handbook

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Chapter 1 Welcome

1.1 Introduction

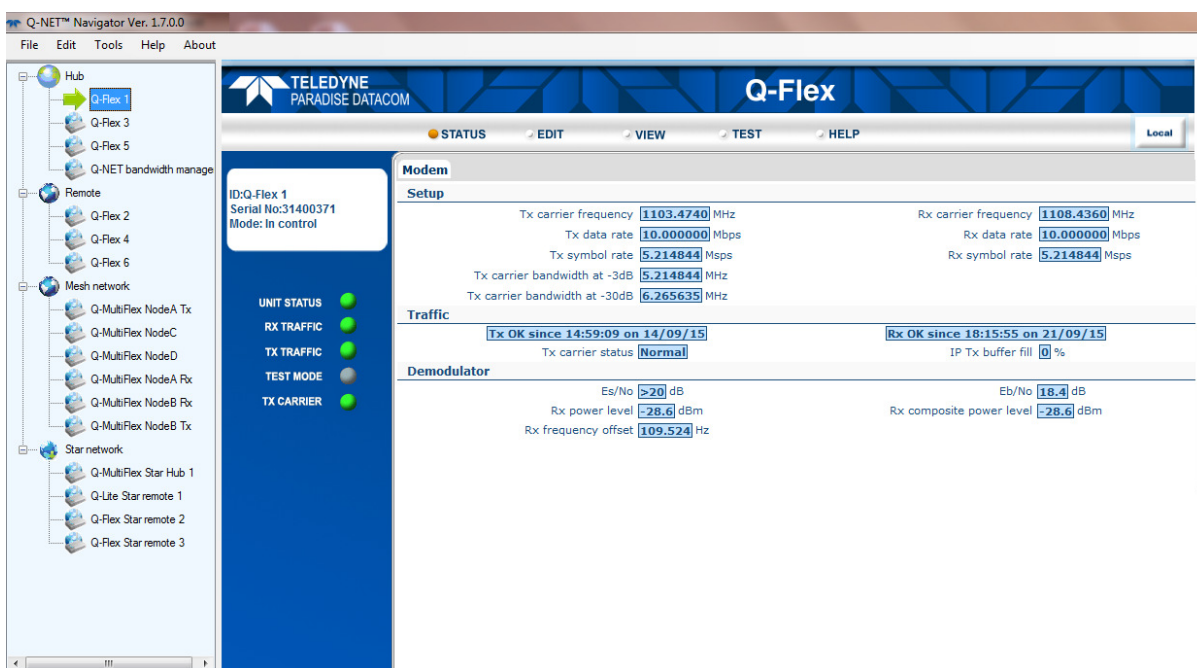


Figure 1-1 Q-NET™ Navigator User Interface

Q-NET™ Navigator (Figure 1-1) is a component of the **Q-NET™** satellite hub-remote communications system. It is a lightweight, easy-to-use network management system for point-to-multipoint systems (incorporating **Q-MultiFlex**, **Q-Flex™** and **Q-Lite™** satellite modems). It can also be used to control any Paradise point-to-point system that uses Quantum, Evolution, **Q-Flex™** and **Q-Lite™** satellite modems.

Q-NET™ Navigator complements the use of **Q-NET™ Bandwidth Manager**, which is used for carrier planning and system monitoring.



Q-NET™ Satellite Communications Systems

Q-NET™ is a scalable satellite communications system that supports highly-efficient bandwidth technology and sophisticated carrier and traffic management.

Q-NET™ systems consist of some or all of the following:

- **Q-NET™ Navigator allows all modems (and other network devices) in the system to be controlled through a single**

application. It provides full control over all modem (including multi-demodulator) functions, using an easy-to-navigate site map, which also displays the real-time alarm status of each modem. It complements the high-level control provided by the Bandwidth Manager and the two applications can be used separately or in conjunction with each other.

Unlike other systems, Q-NET™ Navigator and Bandwidth Manager can be readily used with other vendors' satellite and network devices, keeping you in charge of your future network expansion options.

- **Q-MultiFlex™ (modulator/multi-demodulator) and Q-Flex™/Q-Lite™ modems.** *These represent the state-of-the-art in terms of satellite modem technology, with support for the DVB-S2X standard and an advanced IP single-box solution. Supported network topologies include: point-to-multipoint star, full and partial mesh, hybrid star/mesh and point-to-point. Mesh network implementation is 'hubless' and does not use double-hop communications.*
- **Q-NET™ Bandwidth Manager,** *which provides multi-satellite/transponder carrier planning and high-level system control, monitoring, recording and quality-of-service reporting. The Bandwidth Manager runs on standard network server hardware and is accessed via web browser client sessions.*
- **Network devices (e.g. Ethernet switches and routers).** *Many switch and router functions are incorporated into our modems and therefore the need for standalone network devices can often be reduced or eliminated.*

The **Q-Flex™** is a flexible software-defined modem that does what you want, now and in the future. The **Q-Flex™** modem provides a flexible hardware platform with support for IF and L-band operation in one unit. Its powerful processor is ideal for handling IP traffic. The **Q-Flex™** modem can be fitted with virtually any type of terrestrial interface and will operate at data rates up to 160Mbps. The **Q-Lite™** has a similar specification to the **Q-Flex™** but is compact, light and uses less power, making it ideal for comms-on-the-move or for minimising the amount of air-conditioned rack space required.

The **Q-MultiFlex™** supports a modulator and up to 16 demodulators, enabling cost-effective point-to-multipoint IP operation. **Q-MultiFlex™** is compatible with the use of **Q-Flex™** and **Lite™** modems at the remote sites. **Q-MultiFlex™** scales to any network size.

This handbook will guide you through the process of installing and using **Q-NET™ Navigator** with your **Q-NET™** system.

1.2 Overview

Q-NET™ Navigator provides the following features:

- It provides a network view of all of the satellite devices in the network. These are displayed as a navigation tree structure, with devices collected together under user-defined groups that represent distinct parts of the system such as remote sites. Multiple networks can be controlled from one or multiple instances of **Q-NET™ Navigator**.
- Network configurations can be backed up and recalled using file import/expert features.
- Automatic status polling is supported for all devices in the navigation tree, giving instant visibility of all system alarms. In addition, alarms can optionally be masked by device and alarm category.
- The user can connect to any device in the navigation tree simply by selecting it, without having to remember IP addresses and login details. This brings up a web browser user interface for the particular device, which can be used to monitor and control every function. **Q-NET™ Navigator** will automatically connect to network devices over whatever communications path is available, including over satellite. When moving between devices, the application remembers the last web page being accessed on every device and will return to the same page when the device is next selected. **Q-NET™ Navigator** is password protected and supports secure M&C network communications.
- **Q-NET™ Navigator** is link aware and changes can be made to shared-outbound carriers from the hub and to inbounds from the remote sites as a single operation that is automatically synchronised throughout the system (meaning that the operator does not need to manually reconfigure all of the individual pieces of equipment). If the changes fail for any reason then all equipment will automatically revert back to the previous settings.
- Support is included for Virtual Network Operators (VNOs). This feature allows visibility and access to the underlying network to be virtualised on an operator-by-operator basis, meaning that the network owner can lease parts of the network to third parties.
- **Q-NET™ Navigator** provides seamless integration with **Q-NET™ Bandwidth Manager**. Both applications can be used in parallel to perform every network operation from provisioning of space segment to routine software upgrades of network devices.

Chapter 2 About This Handbook

2.1 Conventions



This information symbol is intended to alert the user to the presence of important operating instructions critical to correct system function.

2.2 Trademarks

All trademarks used in this handbook are acknowledged to be the property of their respective owners.

2.3 Disclaimer

Although every effort is made to ensure the accuracy and completeness of the information in this handbook, this cannot be guaranteed and the information contained herein does not constitute a product warranty. A separate product warranty statement is available. Teledyne Paradise Datacom maintains a programme of continuous product improvement and reserves the right to change specifications without prior notice.

Chapter 3 User's Guide

3.1 Installation and Upgrade Procedure

Q-NET™ Navigator is a Windows application that runs on any Windows PC or tablet.

Q-NET™ Navigator can be installed on the same devices that run the **Q-NET™ Bandwidth Manager** clients, giving operators access to both control applications.

Multiple instances of the application can run concurrently in any location. **Q-NET™ Navigator** supports all versions of Microsoft Windows (32-bit/64-bit) for PCs and tablets.

1. Download the **Q-NET™ Navigator** software from the Downloads area of the Paradise web site at http://www.paradisedata.com/index.php/support_form/downloads/.

It is provided as a 7-Zip file. 7-Zip is an archiving tool that can be downloaded freely from the internet and is compatible with WinZip. Ensure that 7-Zip or a compatible archive tool is available.

2. Microsoft .NET Framework 4 must be installed on the PC. You can check for this by running 'Programs and Features' from the Windows Control Panel as shown in **Figure 3-1**.

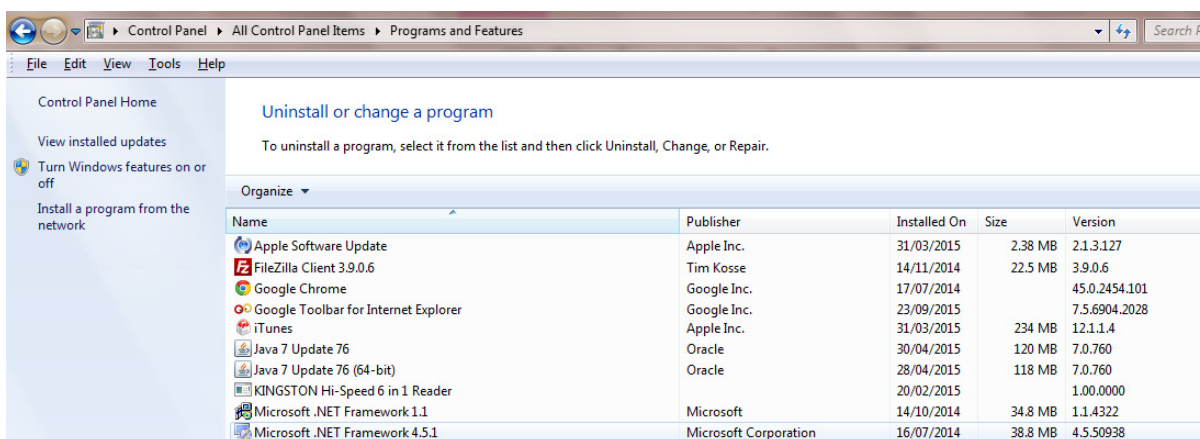


Figure 3-1 Checking for Microsoft .NET Framework

3. If necessary, Microsoft .NET Framework 4 can be downloaded from <https://www.microsoft.com/en-gb/download/details.aspx?id=30653>.
4. Navigate to the destination folder where **Q-NET™ Navigator** was downloaded to and open the archive (you may need to right-click on the file and select 'Open' or 'Open archive'). The archive tool will display the contents of the zip file (see **Figure 3-2**).

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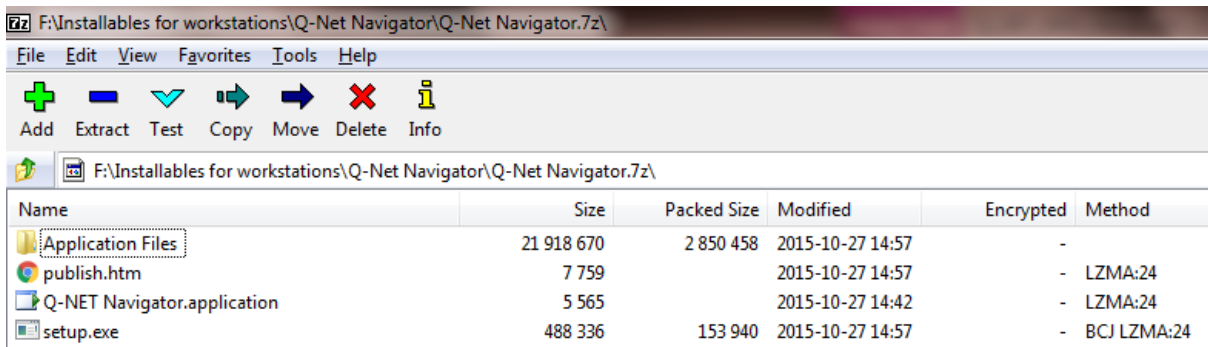


Figure 3-2 Zip File Contents

5. Select all of the files in the archive and extract them to the desired destination folder.
6. From the destination folder, double click on the **setup.exe** file. This will run an installation wizard as shown in **Figure 3-3**.

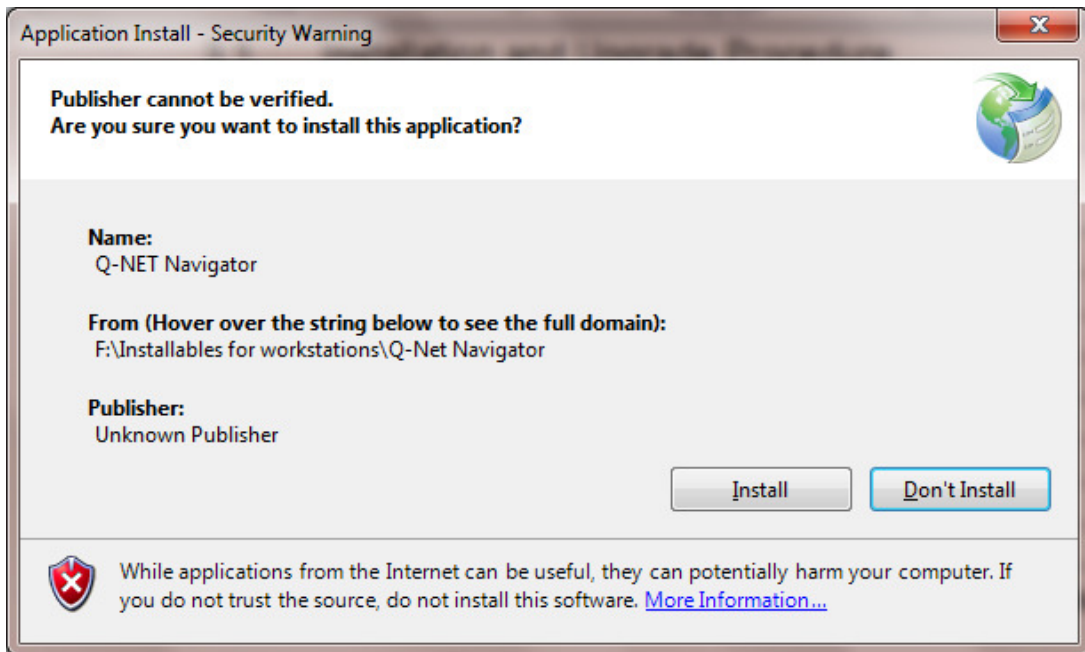


Figure 3-3 Installation Wizard

7. Click on the Install button. If the installation completes normally then the application will automatically start and the dialog box shown in **Figure 3-4** will be displayed. The location where the application is installed will be similar to the following but with the user's name in place of *'myUserName'*:

'C:\Users\myUserName\AppData\Roaming\Microsoft\Windows\Start Menu\Programs\Teledyne Paradise Datacom'

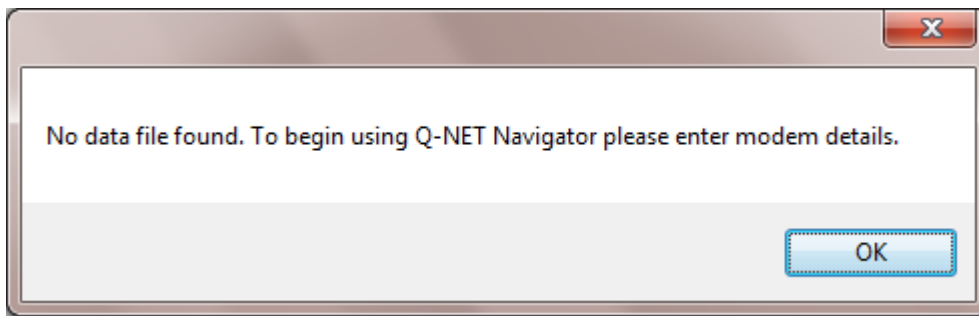


Figure 3-4 Installation Completion

8. Click the OK button. If the application is being installed for the first time then the application will be shown as in **Figure 3-5**. If the application is being upgraded then the pre-upgrade current network navigation tree will be displayed.

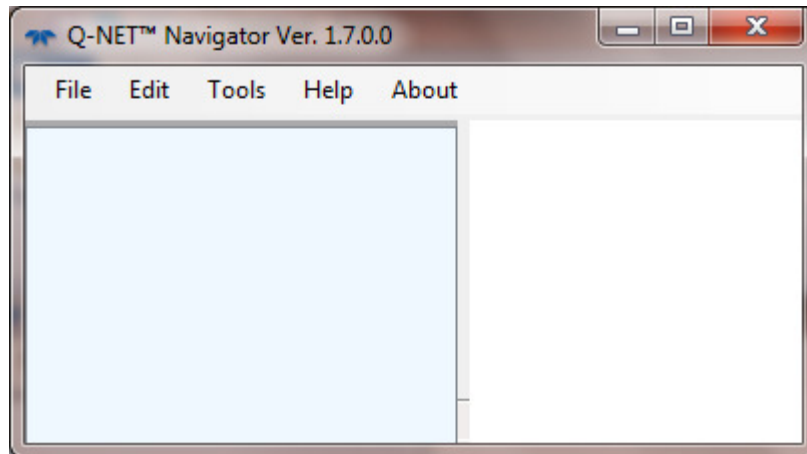


Figure 3-5 Q-NET™ Navigator Initial Start-up Screen

9. If the application fails to install properly then please check the following:
 - a. If the dialog box shown in **Figure 3-6** is displayed then ensure that all of the installation files have been extracted properly and then continue from Point 6.

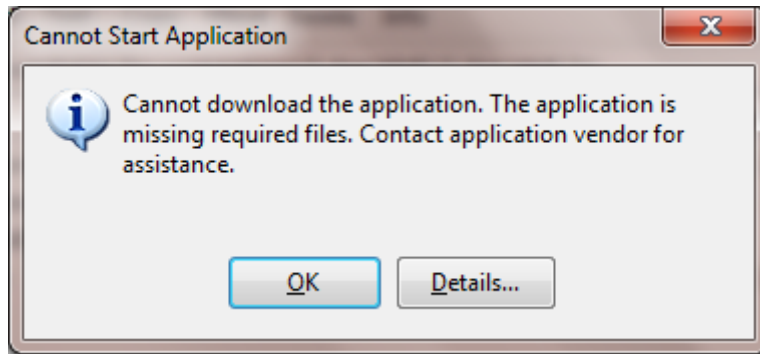


Figure 3-6 Missing Installation Files Dialog Box

- b. If the application has previously been installed then there may be incompatibilities that can be overcome by uninstalling the application and then reinstalling it.
 - c. Administrator rights should not be required in order to install the application. However, it may be that installing the application as an Administrator overcomes an obscure permissions issue and allows it to be installed successfully.

3.2 Starting the Application

From the Windows Start menu, search for 'Q-NET Navigator' as shown in **Figure 3-7**. For convenient access to the application, right click the mouse on 'Q-NET Navigator' and select 'Pin to Taskbar' and/or 'Pin to Start Menu' and/or 'Send to Desktop (create shortcut)'.

Select 'Q-NET Navigator' from the Windows Start menu in order to start the application.

The application will start with the same settings as when it was last closed, including being aware of all of the network devices and their settings.

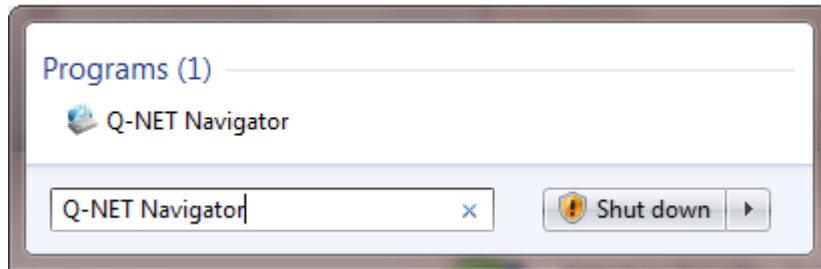


Figure 3-7 Starting Q-NET™ Navigator

The **Q-NET™ Navigator** application has an optional login process, shown in **Figure 3-8**. When password protection is switched on, the user will be requested to enter a valid username and password. Two levels of login are supported:

- An 'admin' username with default password of 'paradise'. Admin users have permission to change settings within Navigator and across the network. Specifically, all modem operations will use the modem's 'admin' login.
- A 'user' username with default password of 'paradise'. This user has view-only permissions and cannot change settings within Navigator or across the network equipment. All modem operations will use the modem's 'user' login.

Navigator 'admin' and 'user' usernames can be changed (for example, to the name of an operator).

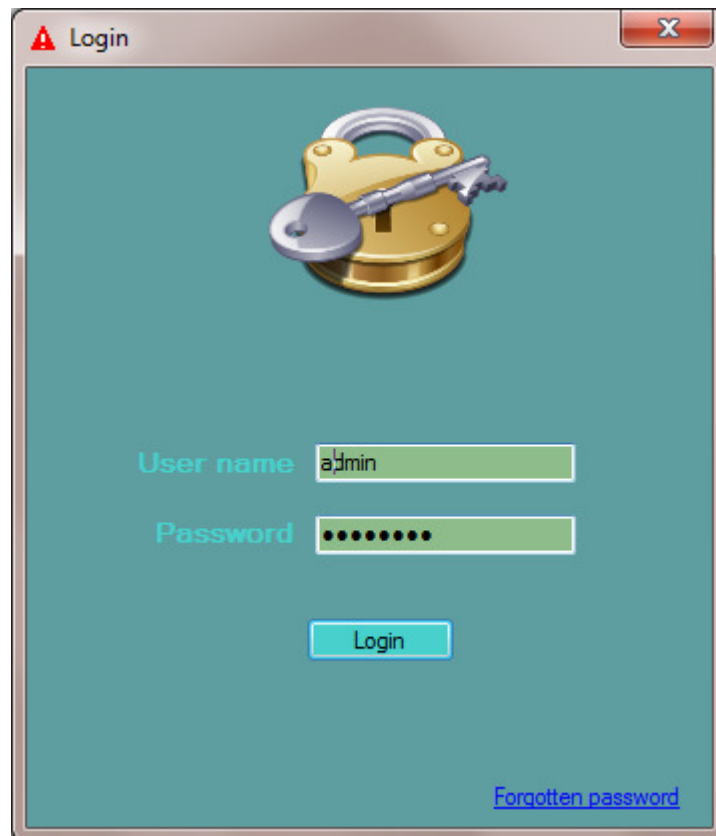


Figure 3-8 Q-NET™ Navigator Login

Selecting '*Forgotten password*' will bring up the dialog box shown in **Figure 3-9**. Selecting 'Yes' will delete the network topology database and application preferences and it will cause the username and password to reset to their default values. Selecting 'No' will return the application to the login prompt.

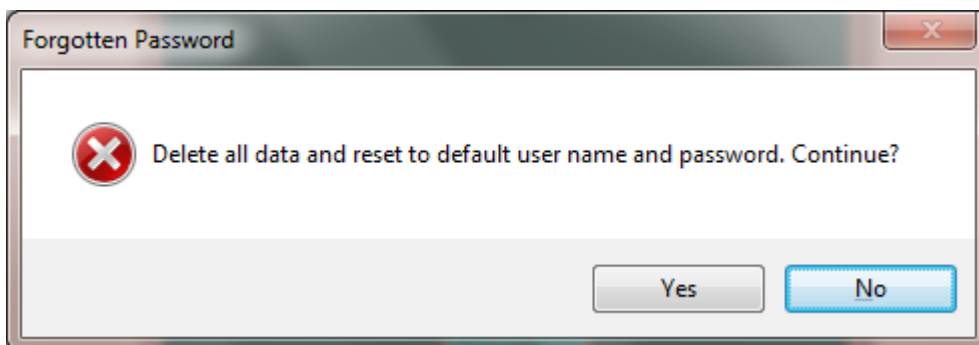


Figure 3-9 Login 'Forgotten password' Dialog Box

3.3 Defining the Network Topology

From the '*Edit*' menu, select '*Network*'.

There are three options under the '*Add*' option, namely, '*Modem*', '*Group*' and '*Other*'.

Groups represent meaningful parts of the network such as sites, racks of equipment or types of service.

Modems represent any Paradise modem that has an IP address and is controlled via a web browser. This includes all Paradise Evolution, Quantum, Q-Flex, Q-Lite and Q-MultiFlex modems.

'Other' represents any network device or service that has an IP address and is controlled via a web browser. This includes for example Cisco switches and routers.

Examples of groups and modems are shown in **Figure 3-10**.

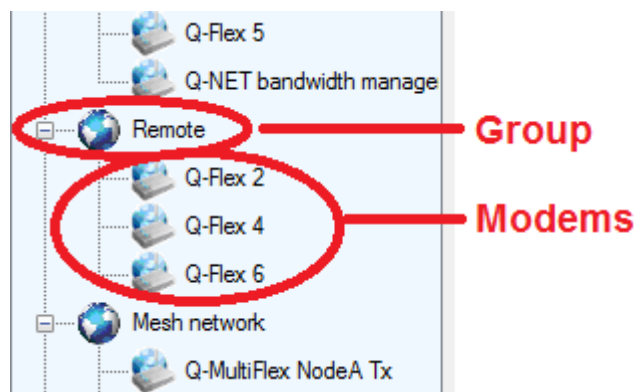


Figure 3-10 Network Topology showing Groups and Modems

3.3.1 Adding Groups

From the 'Edit' menu, select 'Network'.

The *Edit->Network->Add->Group* screen is shown in **Figure 3-11**. The process for adding groups is as follows:

- Enter the name of the group.
- Choose the icon to be displayed in connection with the group.
- Select 'Add Group'.
- Repeat the process for each group.
- Select 'Save' when all groups have been entered.
- From the 'Tools' menu, select 'Refresh tree' to see the new groups in the navigation pane.

The 'Remove' button can be used to delete groups that are not required. If the group still contains network devices at the point that it is deleted then the network devices will be assigned to a 'Default' group, which will be created if it does not already exist.

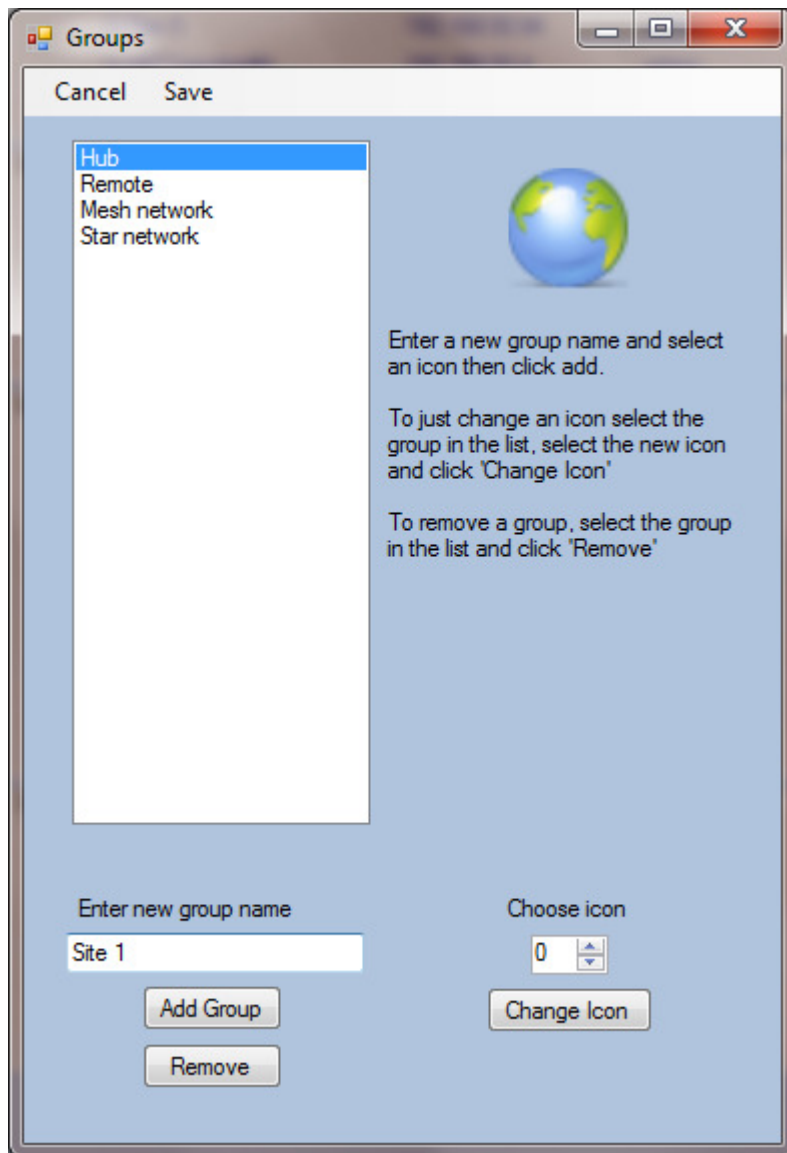


Figure 3-11 Adding Groups to the Network Topology

3.3.2 Adding Modems

To add new modems (or any other network device) to the network, select 'Network' from the 'Edit' menu.

The *Edit->Network->Add->Modem* screen is shown in **Figure 3-12**. In order to speed up the manual entry of network data, the application will prepopulate some fields such as IP addresses and username/passwords based on the previous data entered by the user.

The process for adding modems is as follows:

- Enter the IP address of the modem.
- If the modem is currently accessible over the local network then select 'Lookup' to automatically complete the name of the modem, otherwise enter the name (identity) of the modem. When using the lookup feature, the serial number of the modem will also be displayed as confirmation of the modem's identity.

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- Assign the modem to a group using the 'Group' dropdown box, which will list all of the defined groups.
- Enter the username and password to be used when logging into the modem. Setting the 'Use factory defaults' will populate the username and password with factory default values.
- Optionally mask Tx and/or Rx alarms if the modem is not providing a bidirectional service. This will prevent spurious alarms being raised as a result of regular polling by the application.
- Check the 'Use HTTPS' box if a secure connection to the modem is required.
- Select 'Save'.
- Repeat the process for each modem.

The screenshot shows the 'Modem Properties' dialog box. At the top, there are buttons for 'Close', 'Delete', and 'Save'. The dialog is divided into three main sections:

- user Settings:** Contains an 'IP address' field with the value '192.168.50.57', a 'Group' dropdown menu set to 'P2P Hub', and three checkboxes: 'Tx alarm mask', 'Rx alarm mask', and 'Use HTTPS', all of which are currently unchecked.
- Authentication:** Contains two rows of 'Name' and 'Password' fields. The first row is for 'Admin' with 'admin' in the name field and masked characters in the password field. The second row is for 'User' with 'user' in the name field and masked characters in the password field. Below these fields is a checked checkbox labeled 'Use factory defaults'.
- Properties:** Contains a 'Modem name' field with 'Q-Flex 3'. Below it are two rows of information: 'Model number' (Q-Flex) and 'Serial number' (31500726) on the first row, and 'Software Ver.' (3.1.11) on the second row. A 'Lookup' button is located at the bottom of this section.

Figure 3-12 Adding Modems to the Network Topology

The 'Delete' button can be used to delete modems that are not required.



It is strongly recommended to back up the network topology before and after making changes. This can be done using the File->Export menu option.

3.4 Editing the Network Topology

Once the network topology has been defined, it can be edited in order to keep it up to date.

To edit the network, from the 'Edit' menu, select 'Network'. The current network will be displayed as shown in **Figure 3-13**.

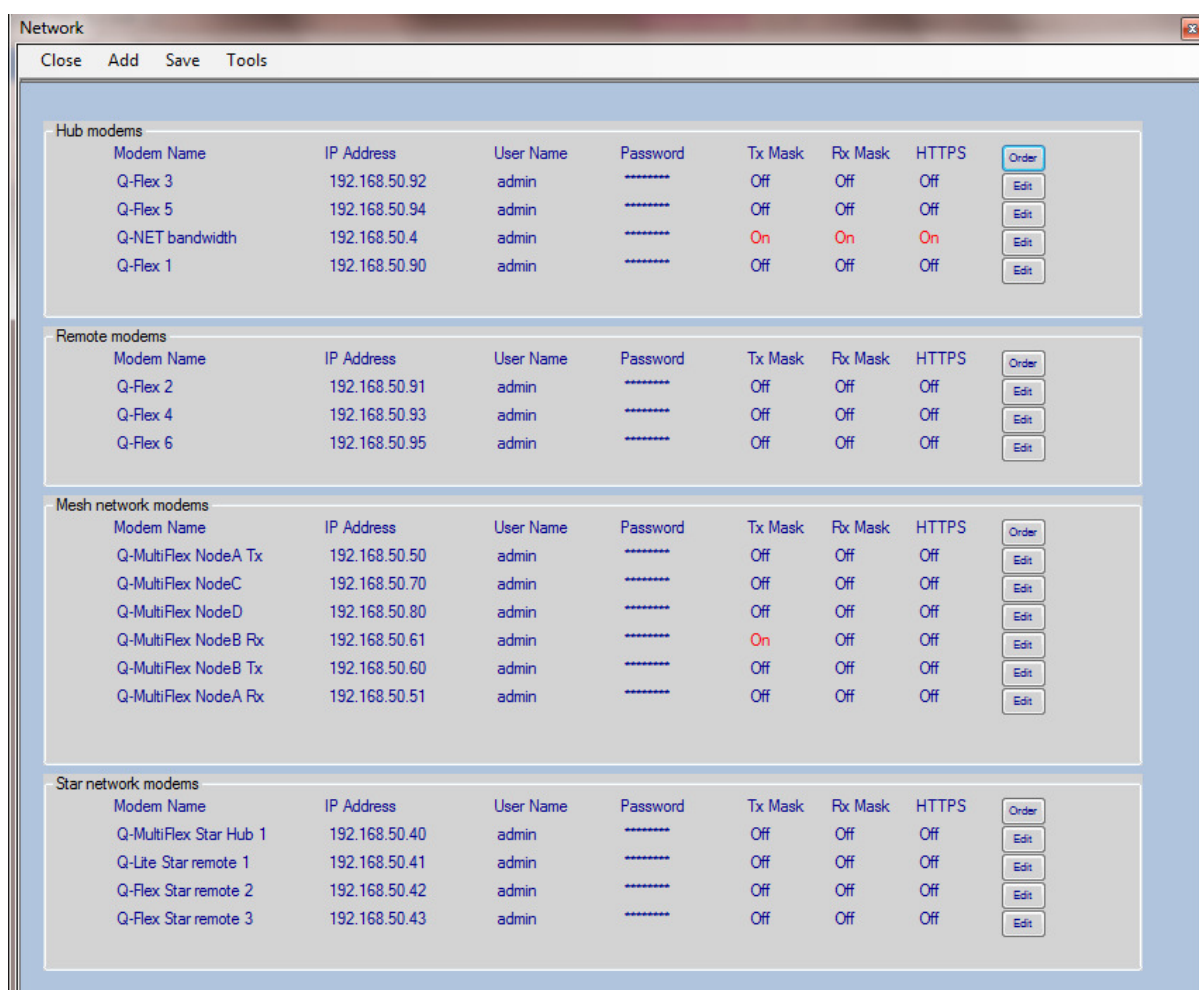


Figure 3-13 Edit Menu, showing the Network

Use the 'Edit' buttons to edit the details of individual modems. This will bring up the modem settings shown earlier in **Figure 3-12**.

3.5 Other Edit Options

The 'Edit' menu is shown in **Figure 3-14**.

The *Edit->Add->Modem* screen is shown in **Figure 3-12**.

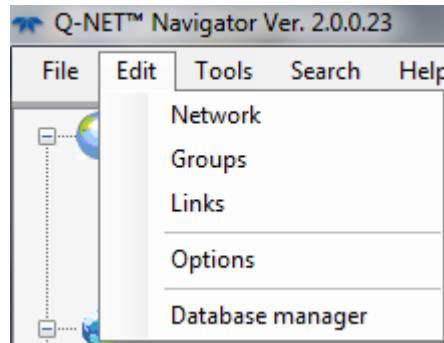


Figure 3-14 Edit Menu

Networks and groups are described in [Section 3.3](#). 'Links' allow Navigator to be link-aware and synchronise satellite carrier changes across the network as a single operation without the operator having to manually edit each piece of equipment. Satellite link control is described in [Section 3.13](#).

The *Edit->Options* dialog box is shown in **Figure 3-15**.

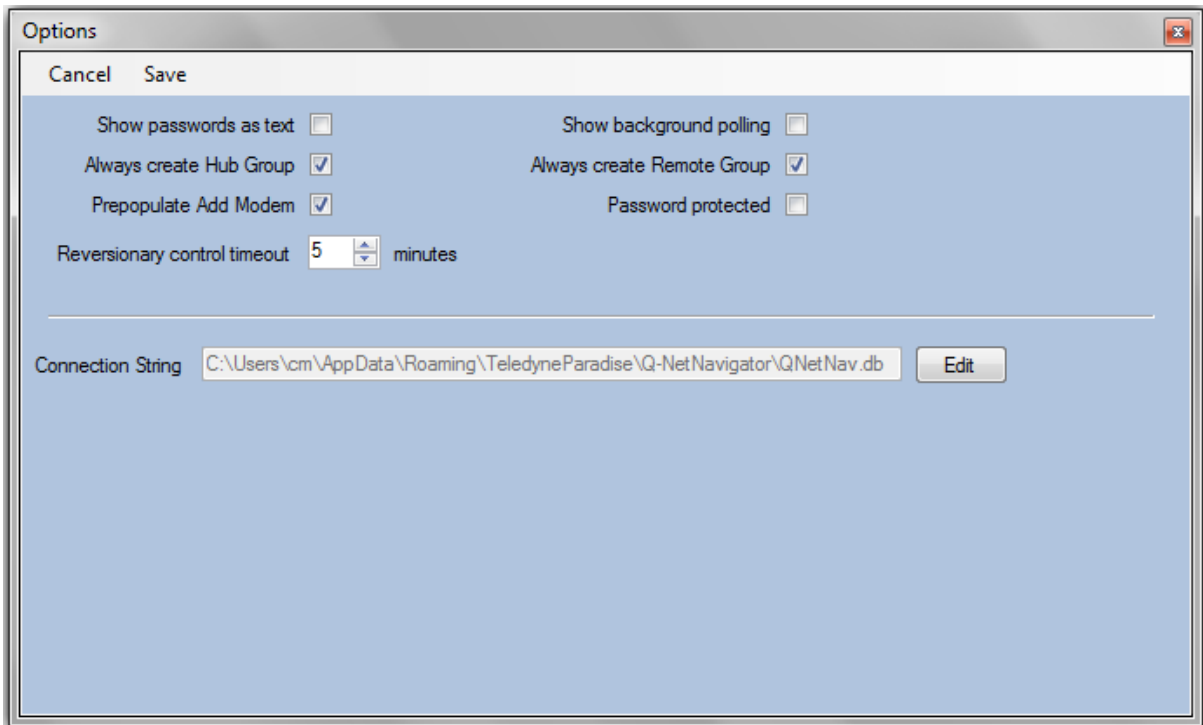


Figure 3-15 Edit->Options Dialog Box

The following options are available:

- *Show passwords as text.* This displays the password as it is typed, rather than replacing the typed characters with asterisks.
- *Show background polling.* Modems are continuously polled for their status in the background. The status is reflected in the modem icons, which change when there is a fault. Normally the polling process itself is invisible but when *Show background polling* is on, the Status Bar at the bottom of the application (**Figure 3-16**) will show the status requests and results for each modem in turn.
- *Always create Hub/Remote Group.* Hub and Remote groups are created by default. If these are not required then they can be switched off so that only user-defined groups are used.
- *Prepopulate Add Modem.* In order to speed up the manual entry of network data, the application can prepopulate some fields such as IP addresses and username/passwords based on the previous data entered by the user. If this is not required, then the checkbox should be unchecked.
- *Password protected.* The **Q-NET™ Navigator** application itself can optionally be password protected. When this is switched on, the application will request the user to enter a valid username and password when the application starts and prior to changing application preferences.
- *Reversionary control timeout.* When performing link-aware operations using the SYNC LINK feature, this timeout determines the amount of time Navigator will wait for the network to sync up after reconfiguration takes place. If the network does not reconfigure properly then all affected equipment will automatically revert back to the settings being used prior to the SYNC LINK operation. Link-aware operations are normally used to reconfigure a shared outbound carrier or one or more inbound carriers as a single synchronized operation that does not require the operator to login or manually change any of the individual pieces of equipment in the network.

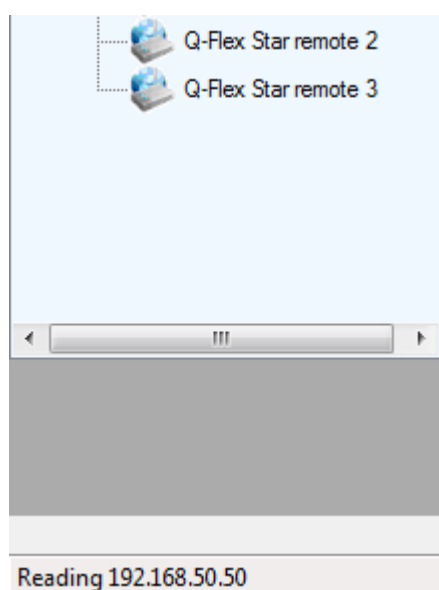


Figure 3-16 Background Polling of Modem Status, displayed on Status Bar

The 'Edit' menu 'Database manager' option brings up the screen shown in **Figure 3-17**.

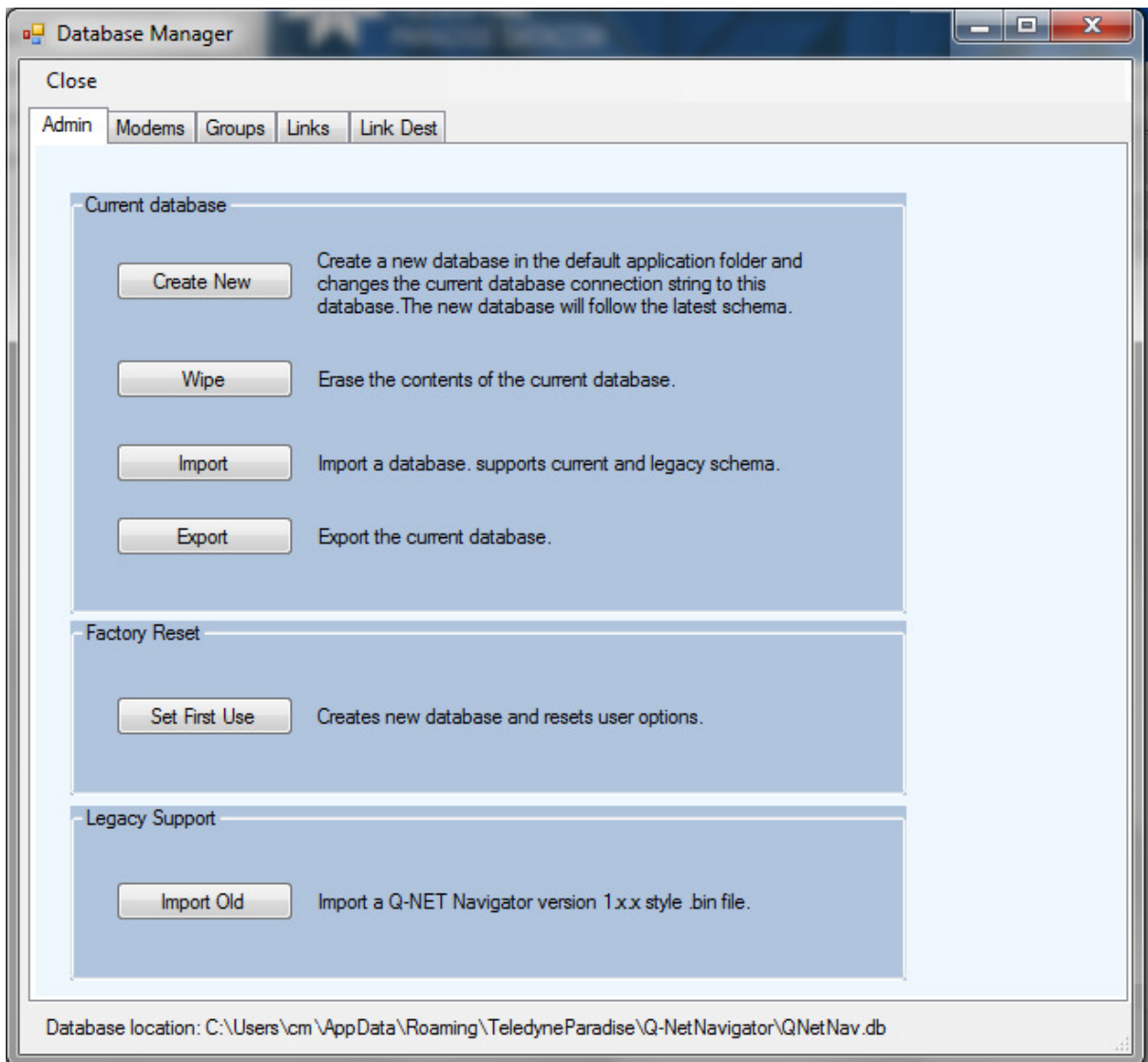
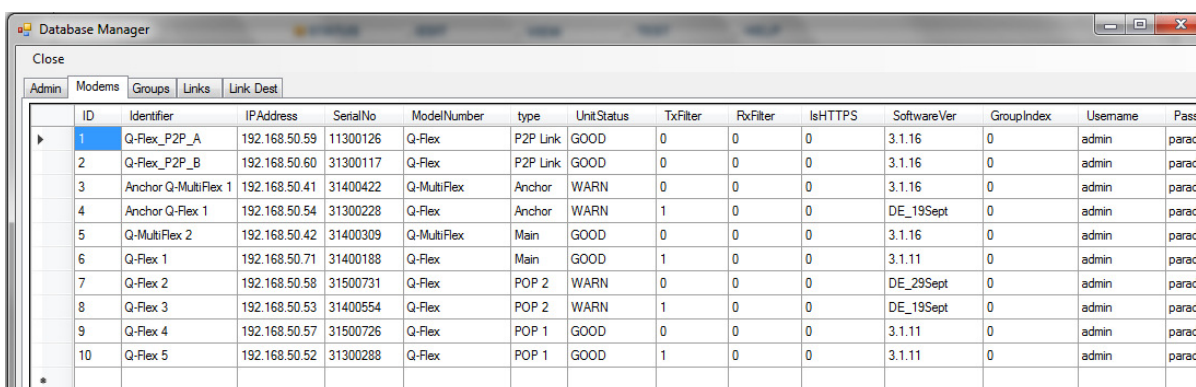


Figure 3-17 Database Manager

The database controls can be used to do basic database configuration tasks such as wiping the contents of the database or importing/exporting databases (these options perform the same functions as the 'File' menu 'Import' and 'Export' functions). The contents of the database can be viewed in a read-only mode using the tabs as shown in **Figure 3-18**.

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The screenshot shows a 'Database Manager' window with a table of modem configurations. The table has columns for ID, Identifier, IP Address, Serial No, Model Number, type, Unit Status, TxFilter, RxFilter, IsHTTPS, SoftwareVer, GroupIndex, Username, and Pass. The first row is highlighted in blue.

ID	Identifier	IP Address	Serial No	Model Number	type	Unit Status	TxFilter	RxFilter	IsHTTPS	SoftwareVer	GroupIndex	Username	Pass
1	Q-Flex_P2P_A	192.168.50.59	11300126	Q-Flex	P2P Link	GOOD	0	0	0	3.1.16	0	admin	paradi
2	Q-Flex_P2P_B	192.168.50.60	31300117	Q-Flex	P2P Link	GOOD	0	0	0	3.1.16	0	admin	paradi
3	Anchor Q-MultiFlex 1	192.168.50.41	31400422	Q-MultiFlex	Anchor	WARN	0	0	0	3.1.16	0	admin	paradi
4	Anchor Q-Flex 1	192.168.50.54	31300228	Q-Flex	Anchor	WARN	1	0	0	DE_19Sept	0	admin	paradi
5	Q-MultiFlex 2	192.168.50.42	31400309	Q-MultiFlex	Main	GOOD	0	0	0	3.1.16	0	admin	paradi
6	Q-Flex 1	192.168.50.71	31400188	Q-Flex	Main	GOOD	1	0	0	3.1.11	0	admin	paradi
7	Q-Flex 2	192.168.50.58	31500731	Q-Flex	POP 2	WARN	0	0	0	DE_29Sept	0	admin	paradi
8	Q-Flex 3	192.168.50.53	31400554	Q-Flex	POP 2	WARN	1	0	0	DE_19Sept	0	admin	paradi
9	Q-Flex 4	192.168.50.57	31500726	Q-Flex	POP 1	GOOD	0	0	0	3.1.11	0	admin	paradi
10	Q-Flex 5	192.168.50.52	31300288	Q-Flex	POP 1	GOOD	1	0	0	3.1.11	0	admin	paradi

Figure 3-18 Viewing the Database Contents

3.6 Tools Menu

The 'Tools' menu is shown in Figure 3-19.

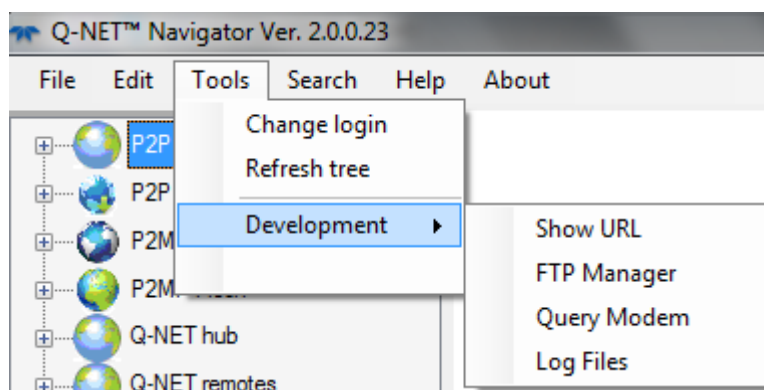


Figure 3-19 'Tools' Menu

The options available are:

- *Change login*. This allows the username and password to be changed as shown in **Figure 3-20**. In both cases, the current password has to be entered. The new username or password must then be entered twice.
- *Refresh tree*. When entering new network devices, this option will update the navigation tree to show the changes if it has not already automatically updated.
- *Development*. This has options as follows:
 - *Show URL*. This is a feature reserved for use by Technical Support.
 - *FTP Manager*. For optimal communications performance with modems, Navigator makes use of a small file on each modem that assists with the collection and communication of modem data back to Navigator. If this file is missing or out of date in relation to the version of Navigator being used then it may result in erroneous behavior within Navigator. Selection of the '*FTP Manager*' option results in the display of **Figure 3-21**, which allows a check to be made on any modem (using its IP address). **Figure 3-22** shows the result when the modem's communication file is out of date and needs to be updated. **Figure 3-23** shows the result of deleting an out-of-date modem communication file (or when no file was found). **Figure 3-24** shows the result of replacing an out-of-date modem communication file (or when the file was found to be present and at the correct version).

Selecting the '*Report*' option of the FTP Manager and selecting '*Run Check*' will result in the screen shown in **Figure 3-25** being displayed. This reports the status of the communications file for all modems and can therefore be used to quickly identify any modems that need attention.

- *Query modem*. Selecting this option brings up the screen shown in **Figure 3-26**. This can be used to query individual modems for their front-panel LED status information as shown in the example by pressing the 'Fetch Data' button (for more details of the LED status indicators, see the relevant modem user manual).
- *Log Files*. This is a feature reserved for use by Technical Support.

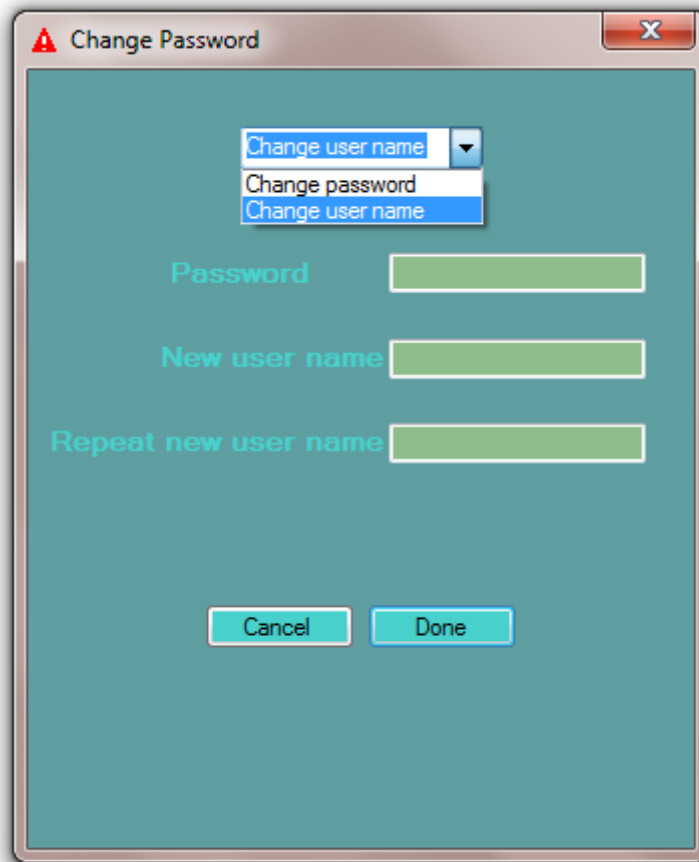


Figure 3-20 'Change login' Dialog Box

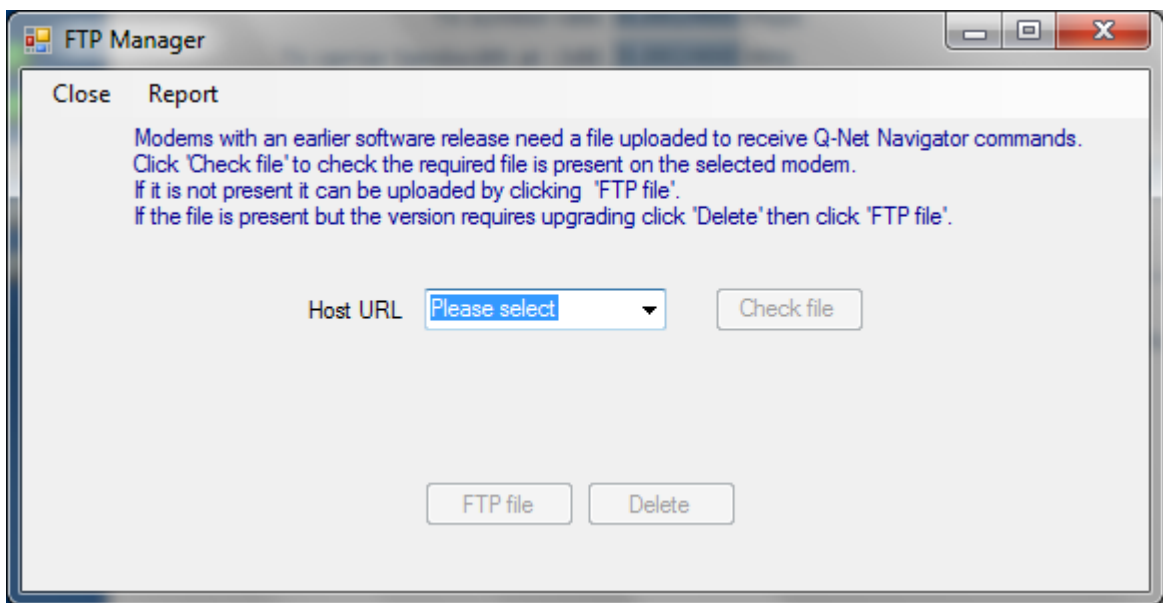


Figure 3-21 'FTP Manager' Dialog Box

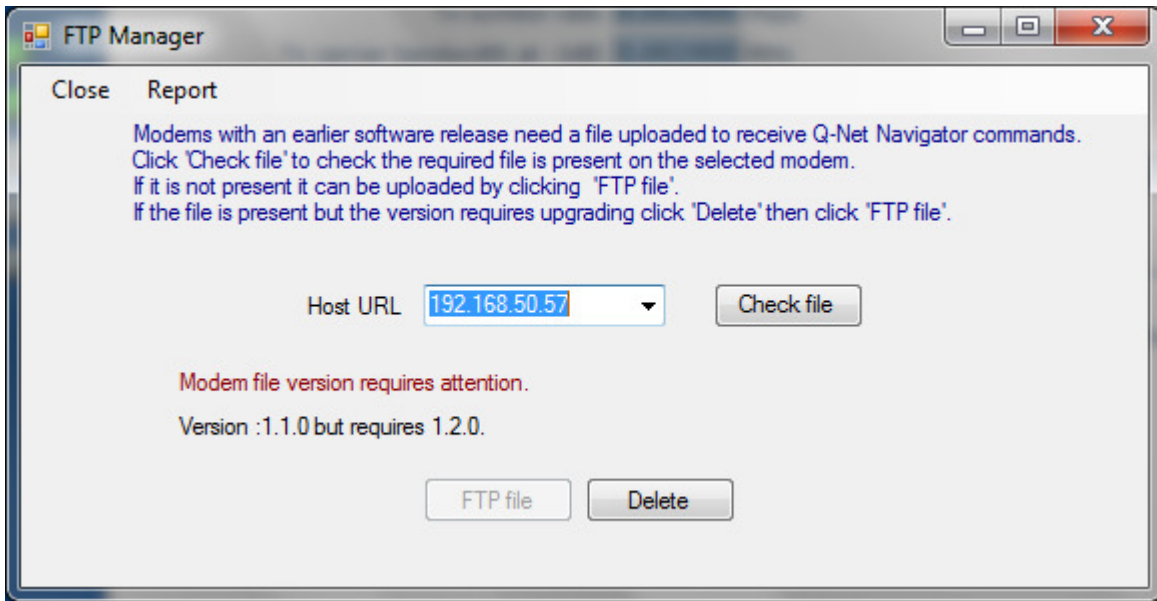


Figure 3-22 'FTP Manager' Dialog Box (showing results of file check)

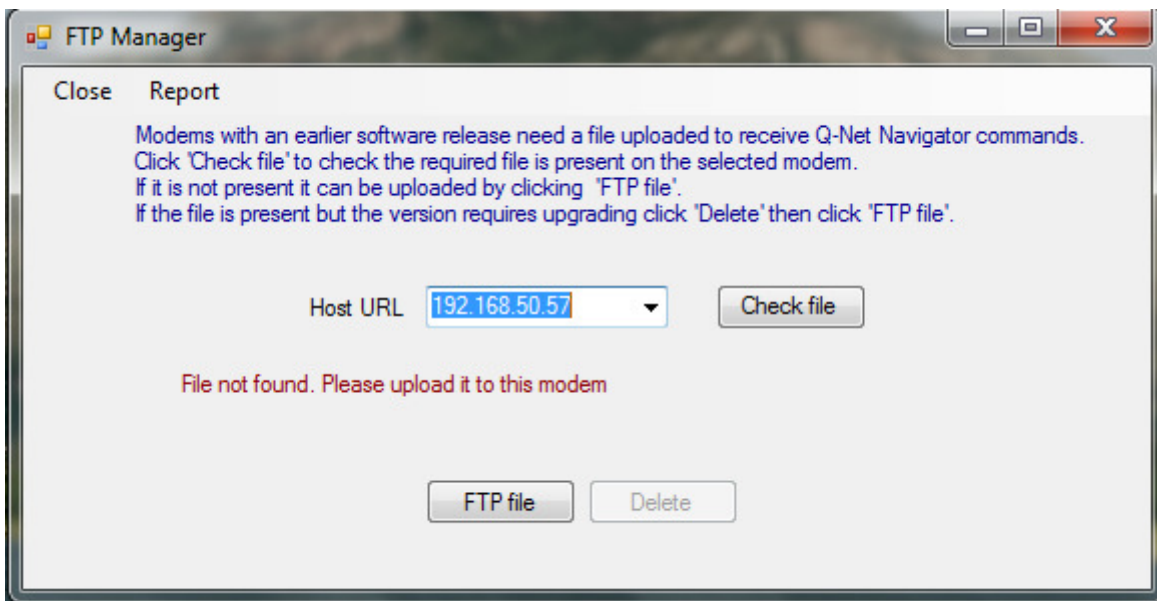


Figure 3-23 'FTP Manager' Dialog Box (showing results of deleting old file)

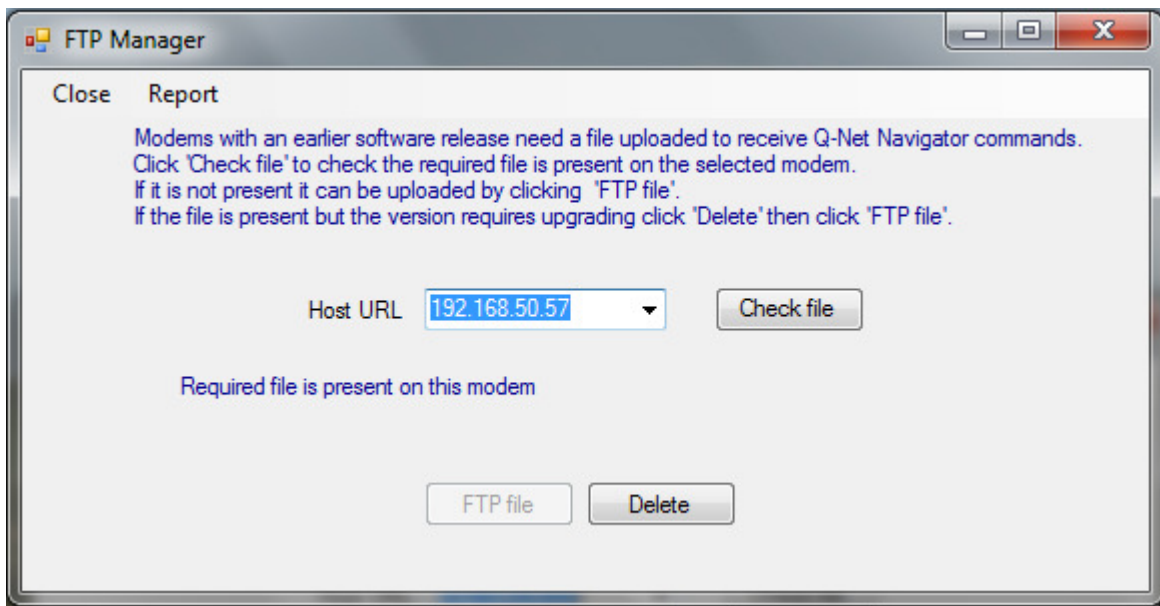


Figure 3-24 'FTP Manager' Dialog Box (showing results of updating modem file)

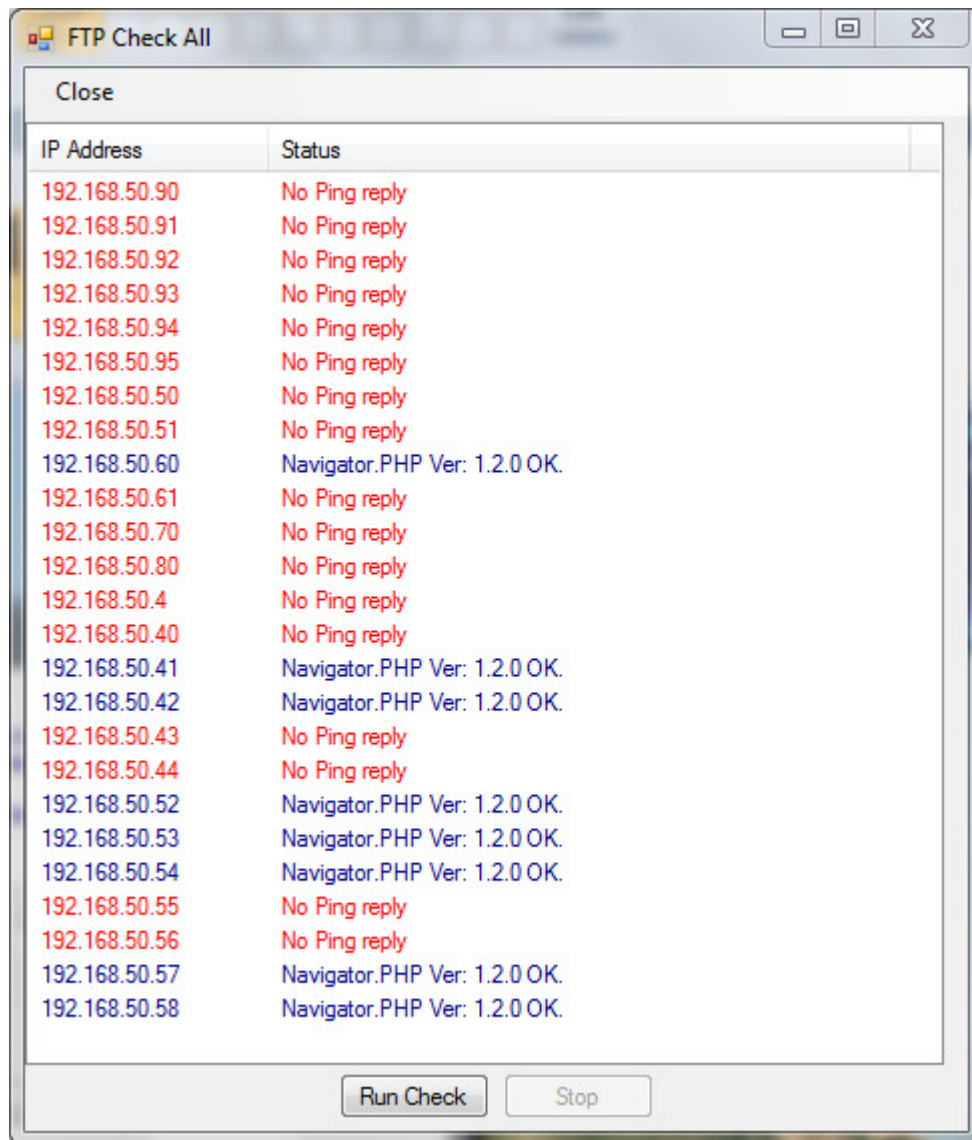


Figure 3-25 'FTP Manager' Dialog Box (showing results of 'Run Check')

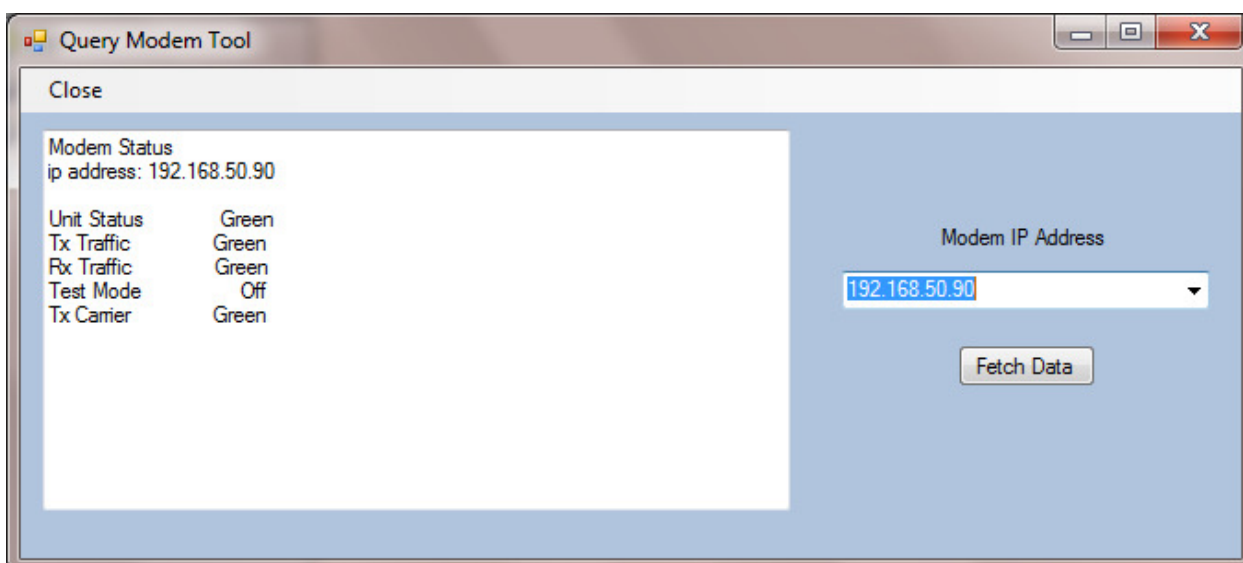


Figure 3-26 'Query modem' Screen

3.7 Help

Selecting the 'Help' menu option results in this user manual being displayed.

3.8 About

Selecting the 'About' menu option displays the dialog box shown in **Figure 3-27**.

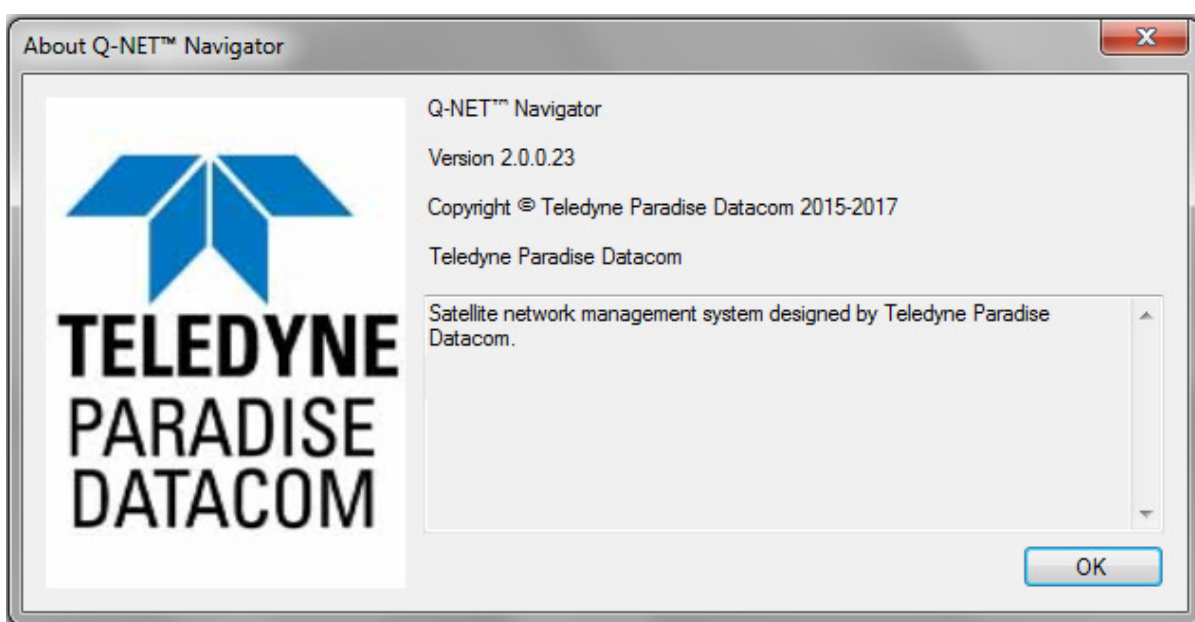


Figure 3-27 'About' Screen

3.9 File Menu

The *'File'* menu is shown in **Figure 3-28**. It is used to export and import databases that represent the network topology and user preferences for the application.

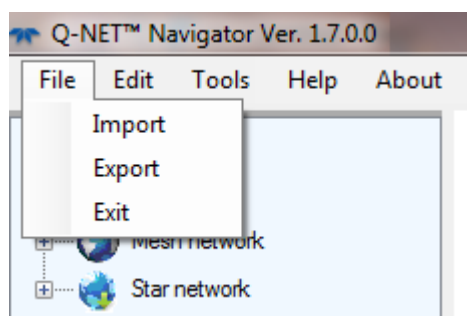


Figure 3-28 'File' Menu

The file export and import functions can be used for the following:

- Making regular backups of the network topology database.
- Copying the network topology database to different computers.
- Storing separate network topologies in different database files.
- Restricting network access to defined subsets for different classes of user. Different views or versions of the network can be created that restrict network access, such as allowing a user to access a subset of remote sites but no hub sites. Each variant can be saved using the *File->Export* menu option and then imported onto the user's computer using the *File->Import* option. The use of network databases to support Virtual Network Operators (VNOs) is described in [Section 3.14](#).

Selecting the *'Import'* menu option brings up the dialog box shown in **Figure 3-29**, which allows the user to navigate to the file location of an existing network database.

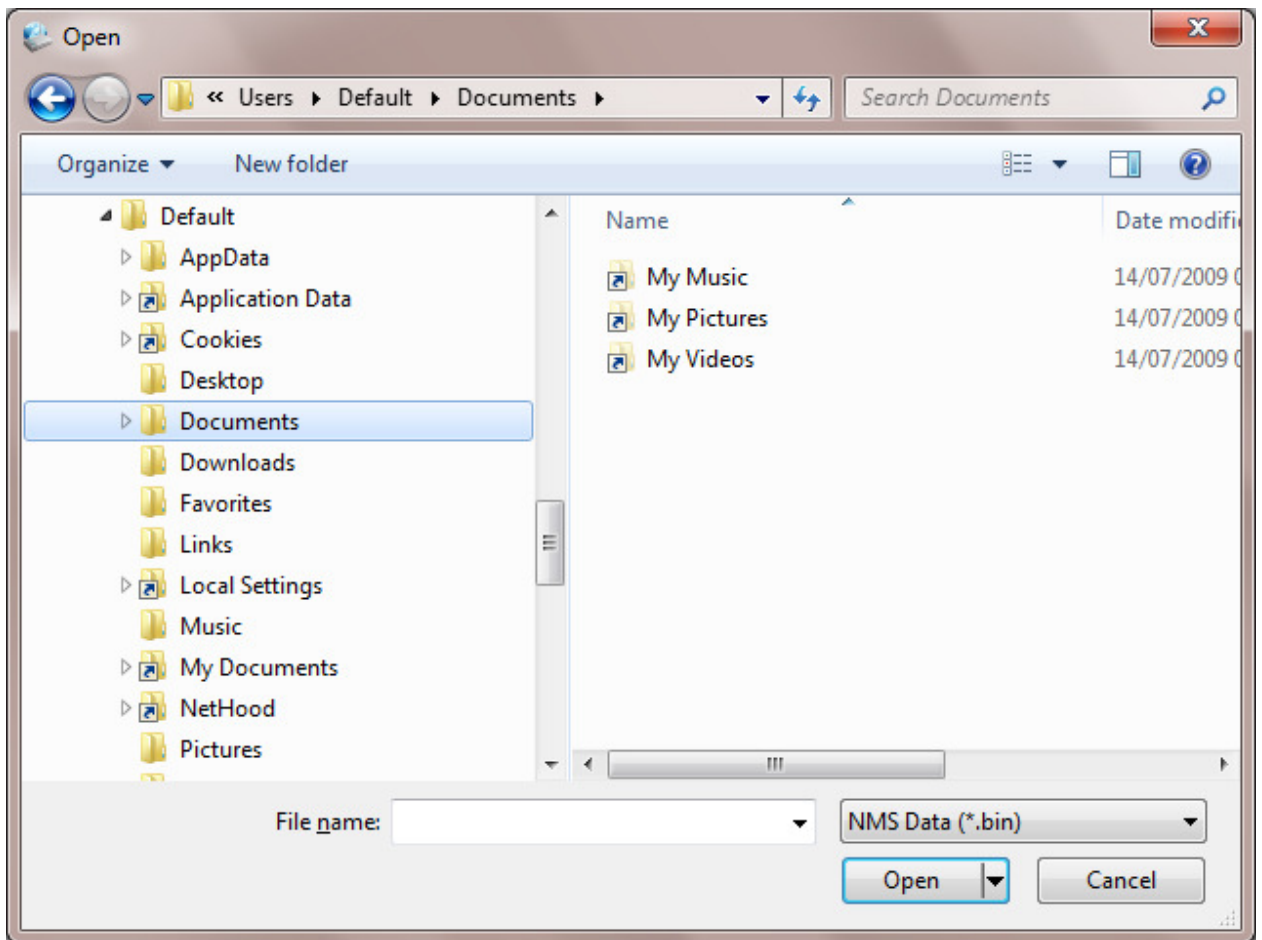


Figure 3-29 'Import' Dialog Box

Selecting the *'Export'* menu option brings up the dialog box shown in **Figure 3-30**, which allows the user to navigate to the file location where the network database is to be stored.

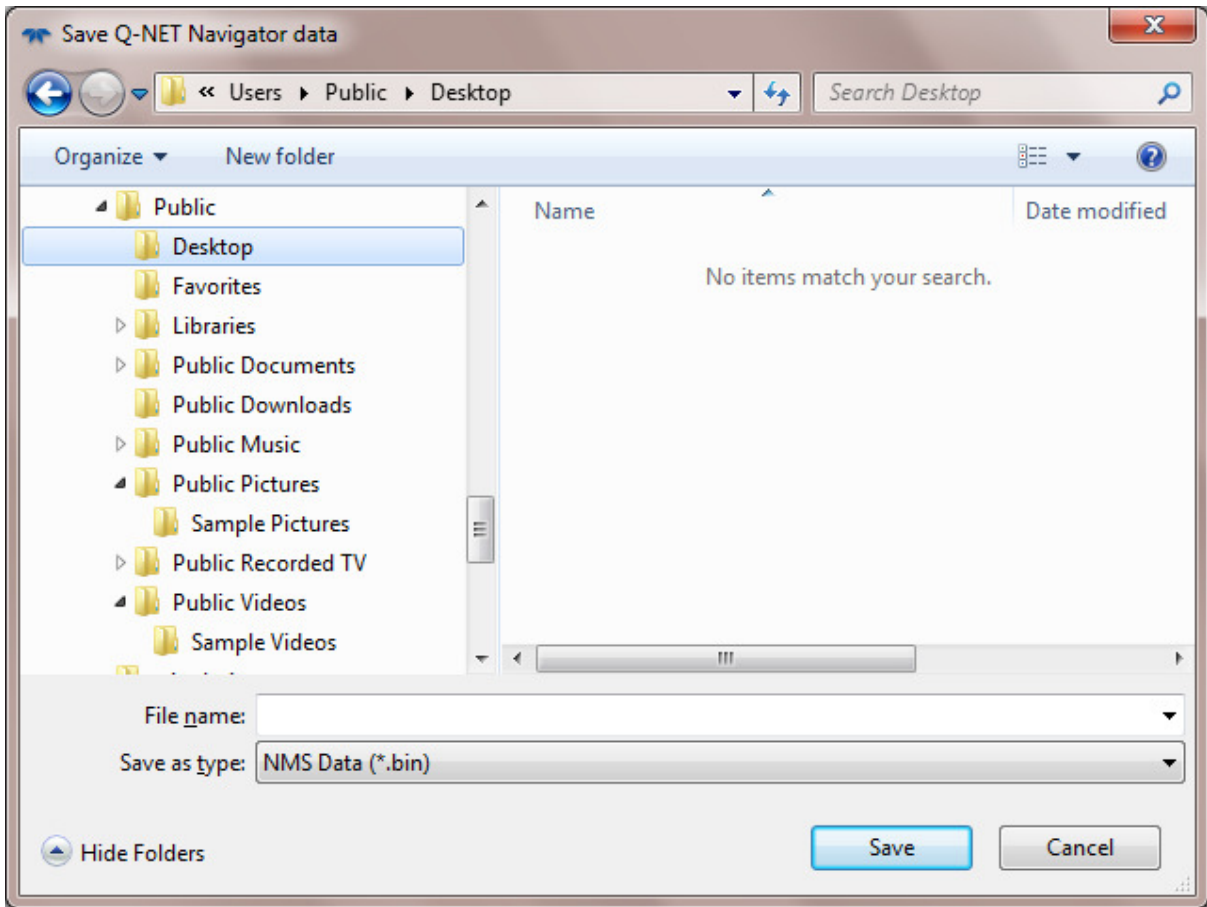


Figure 3-30 'Export' Dialog Box

The file menu '*Exit*' option is used to exit the application.

3.10 Network Alarm and Status Reporting

The network navigation tree uses a number of icons to represent the status of network devices as shown in **Figure 3-31**.

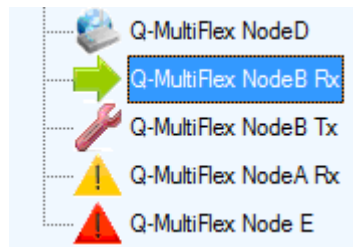


Figure 3-31 Network Status/Alarm Indicators

Icons have the following meanings:

- Globe icon. This indicates that the network device is functioning correctly and is not reporting any alarms.
- Spanner icon. This indicates that the modem is in a test mode.
- Yellow warning triangle. This indicates a transmit or receive traffic fault with the modem.
- Red warning triangle. This indicates a communications failure with the modem.

Selecting a particular network modem and right clicking on its icon will bring up a menu that contains an 'Alarm status' option as shown in **Figure 3-32**. Selecting this will display the alarm status screen shown in **Figure 3-33**. The 'Close' option closes the screen.

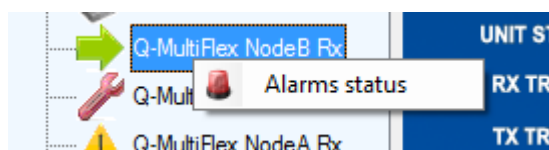


Figure 3-32 Modem Alarm Status Menu Option

Alarm Status			
Close			
Alarm Name	Status	Level	
Rx fault: Demodulators unlocked	Off	Fault	
Rx fault: FEC Decoder synchronisation lost	Off	Fault	
Wanted Rx input power out of range	Off	Warning	
Composite to wanted power level ratio	Off	Warning	

Figure 3-33 Modem Alarm Status

In addition, the right-hand window pane of the application can be used to display further status and alarm information for the modem as documented in the operating handbook for the modem.

3.11 Network Navigation

The network devices, which typically represent satellite modems, are arranged in a navigation tree. Visibility of the network can be increased or reduced by clicking on the +/- signs.

Selecting any modem by clicking on its associated icon will cause a web user interface session to be instigated to the modem's embedded web server. This session will be displayed in the right-hand window pane of the application as shown in **Figure 3-34**.

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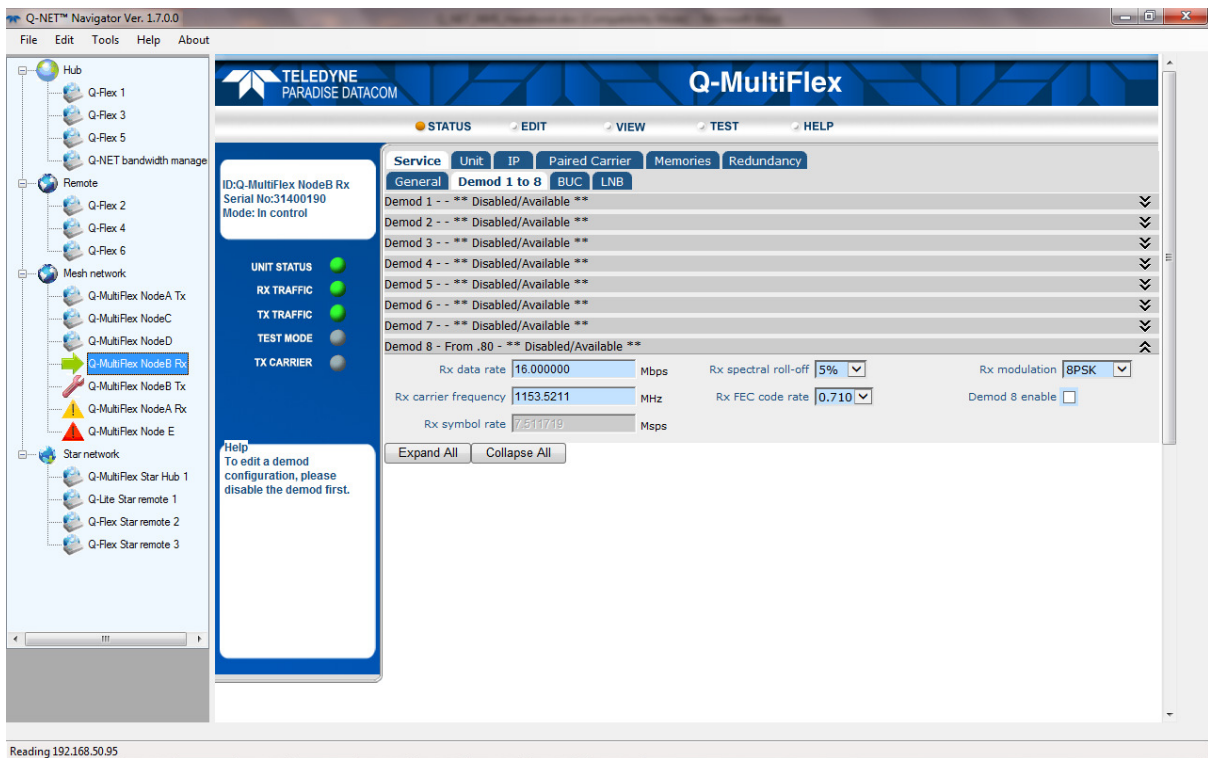


Figure 3-34 Network Navigation and Modem Web User Interface

The network device associated with the current web session is indicated by a green arrow in the navigation pane as shown in **Figure 3-34**. When moving between network devices, the application remembers which web page was last displayed when accessing that particular device and returns to the same web page.

Modem control, using the web user interface, is documented separately in the relevant modem operating handbook.

Network devices other than satellite modems that support web user interfaces can be controlled, as shown in the example of **Figure 3-35**, which shows the **Q-NET™ Bandwidth Manager**. The **Bandwidth Manager** is documented separately.

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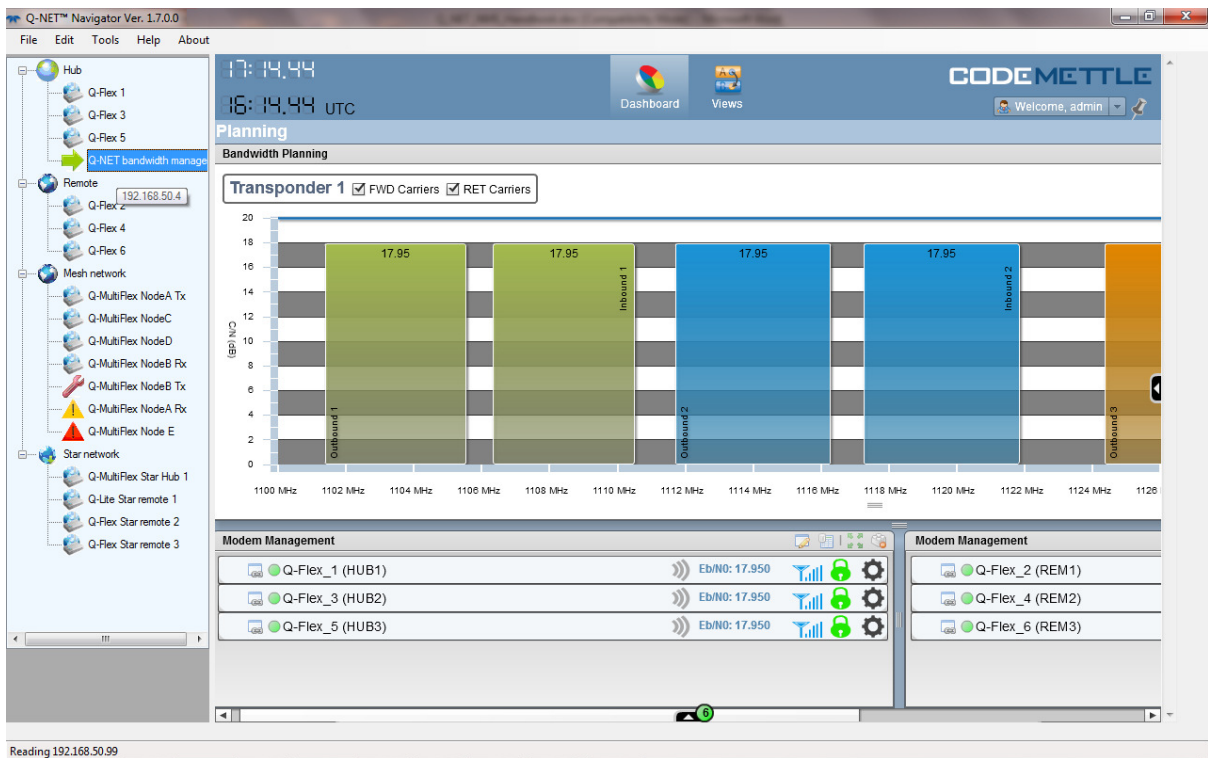


Figure 3-35 Web User Interface for Q-NET™ Bandwidth Manager

3.12 Reordering Components within the Network Navigation Tree

Groups and network devices can be reordered in the navigation tree as follows.

To reorder groups, select *Edit->Network->Tools->Reorder groups*. This will display the screen shown in **Figure 3-36**.

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Figure 3-36 Reordering Groups in the Network Navigation Tree

By clicking the mouse on an empty area of any group box where there is no text, it can be dragged to a new location as shown in the example of **Figure 3-37**, where the mesh network group has been dragged below the star network group.

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Figure 3-37 'Drag and drop' of Mesh Network below Star Network

The precise position of the group boxes does not matter, as the application notes the relative position of the top-left pixel of each group box and reorders them accordingly. In this example, selecting 'Save' results in the screen shown in **Figure 3-38** being displayed, which shows that the star network is now positioned above the mesh network, in contrast to their initial positions shown in **Figure 3-36**. The network navigation tree will reflect this new order as shown in **Figure 3-39**.

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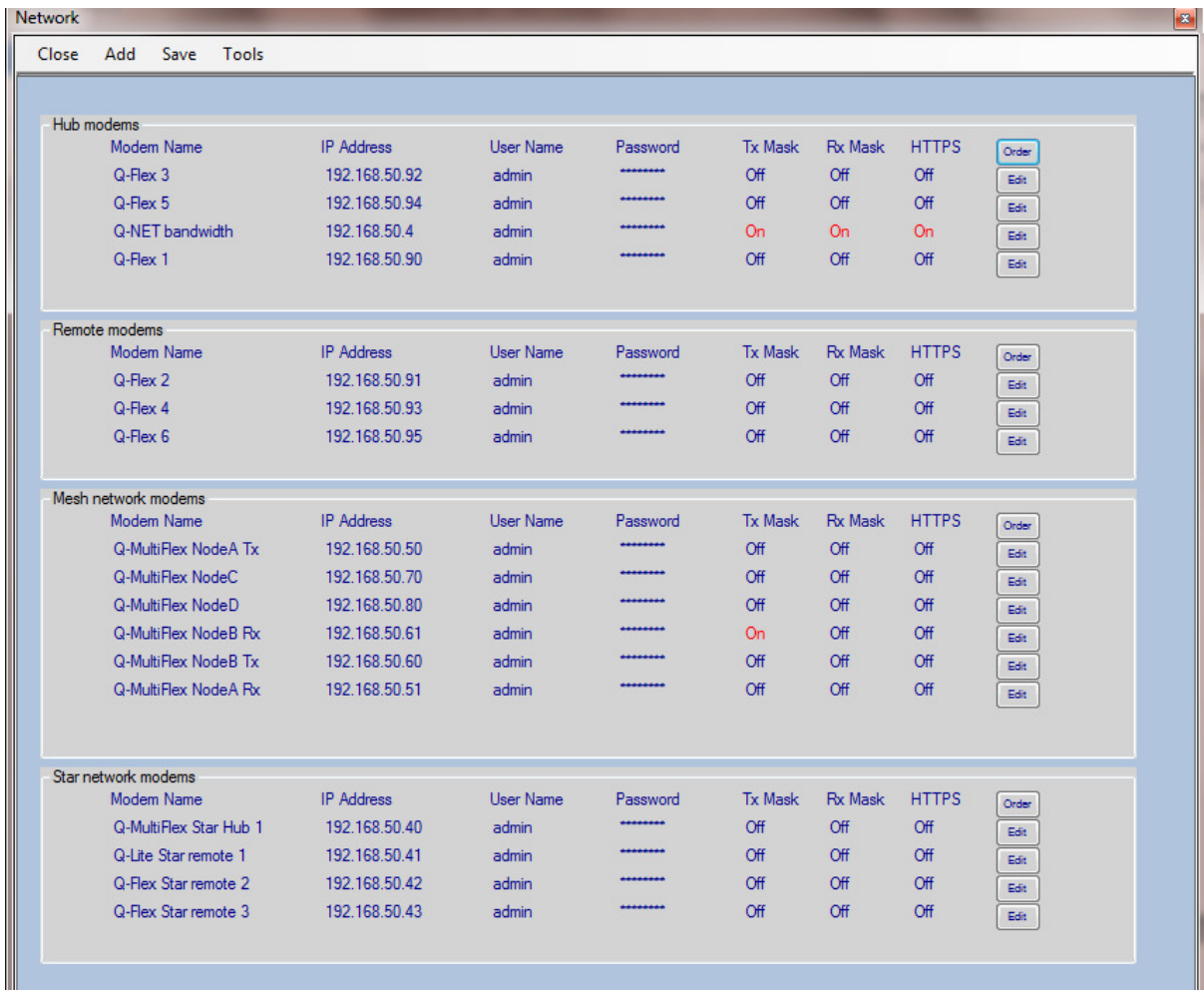


Figure 3-38 Reordered Groups following 'Drag and drop'

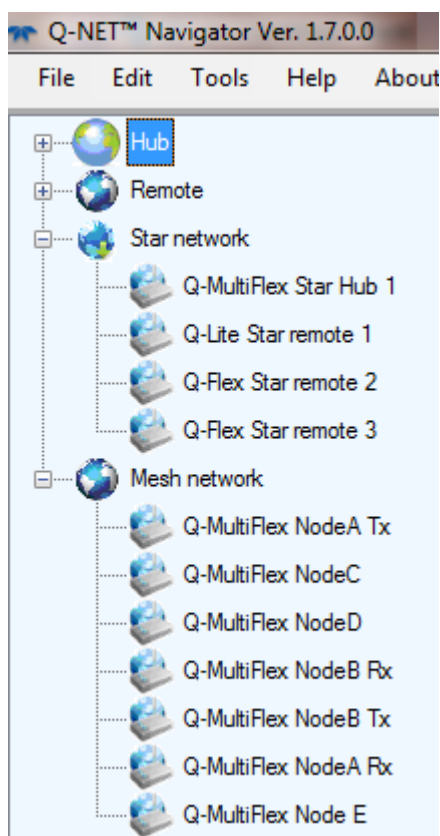


Figure 3-39 Reordered Groups in the Network Navigation Tree

Network devices can be reordered in the navigation tree as follows. Select *Edit->Network* and then select the 'Order' button for the group in which devices require to be reordered (see the example in **Figure 3-40**).



Figure 3-40 Changing the Order of Network Devices

Selecting the 'Order' button results in the display shown in **Figure 3-41**. This shows the IP addresses of the devices in the group in their current order.

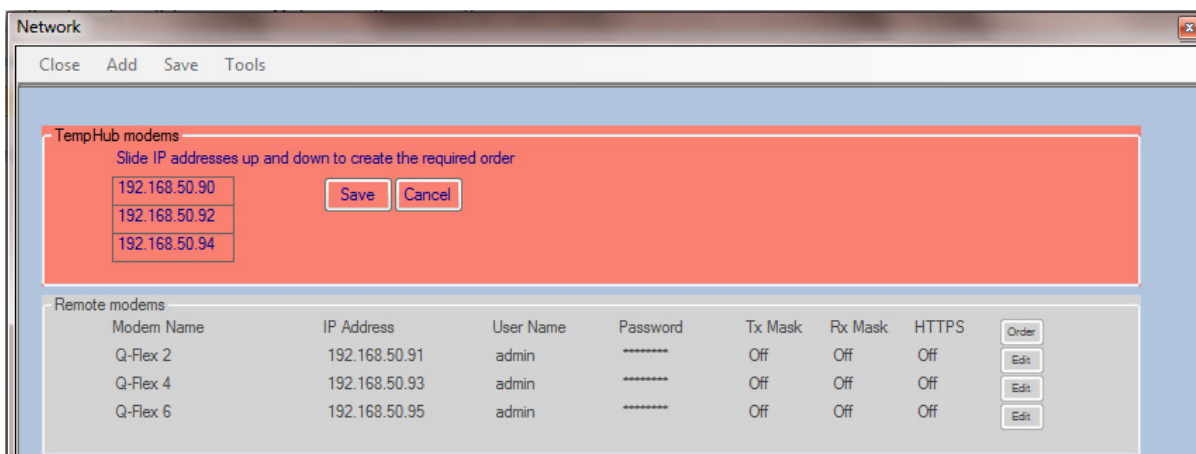


Figure 3-41 Changing the Order of Network Devices

Each of the highlit IP addresses can be dragged and dropped in order to change their relative positions, as shown in **Figure 3-42**.

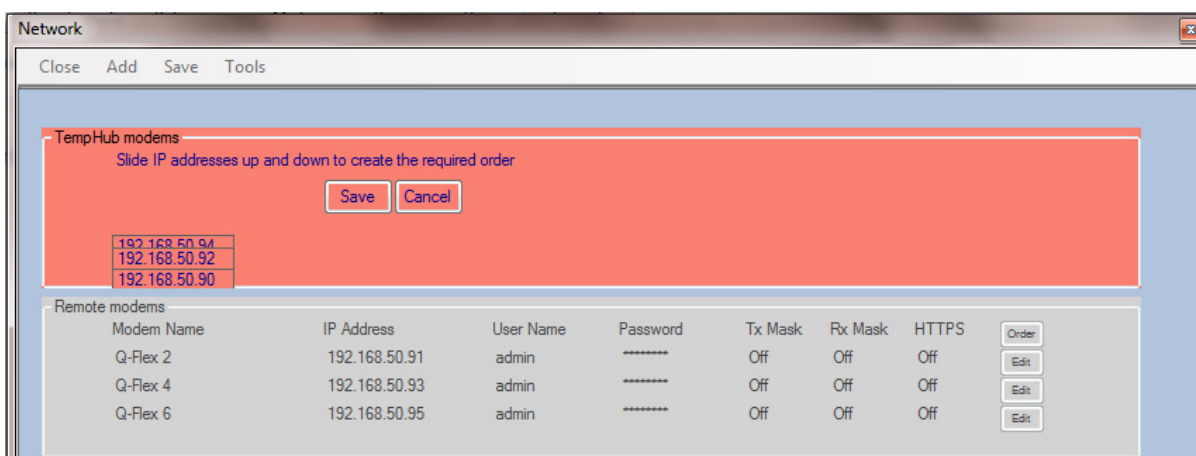


Figure 3-42 'Drag and drop' of Devices (reversing the order from lowest IP address first to to highest IP address first)

The precise position of the IP address boxes does not matter, as the application notes the relative position of the top-left pixel of each box and reorders them accordingly. In this example, selecting 'Save' results in the screen shown in **Figure 3-43** being displayed, which shows that the devices in the Hub have been reversed in order, in contrast to their initial positions shown in **Figure 3-40**. The network navigation tree will reflect this new order as shown in **Figure 3-44**.

The screenshot shows a window titled 'Network' with a menu bar containing 'Close', 'Add', 'Save', and 'Tools'. The window is divided into two sections: 'Hub modems' and 'Remote modems'. Each section contains a table of modem configurations.

Hub modems							
Modem Name	IP Address	User Name	Password	Tx Mask	Rx Mask	HTTPS	
Q-Flex 5	192.168.50.94	admin	*****	Off	Off	Off	Order Edit
Q-Flex 3	192.168.50.92	admin	*****	Off	Off	Off	Edit
Q-Flex 1	192.168.50.90	admin	*****	Off	Off	Off	Edit

Remote modems							
Modem Name	IP Address	User Name	Password	Tx Mask	Rx Mask	HTTPS	
Q-Flex 2	192.168.50.91	admin	*****	Off	Off	Off	Order Edit
Q-Flex 4	192.168.50.93	admin	*****	Off	Off	Off	Edit
Q-Flex 6	192.168.50.95	admin	*****	Off	Off	Off	Edit

Figure 3-43 Reordered Hub Modems following 'Drag and drop'

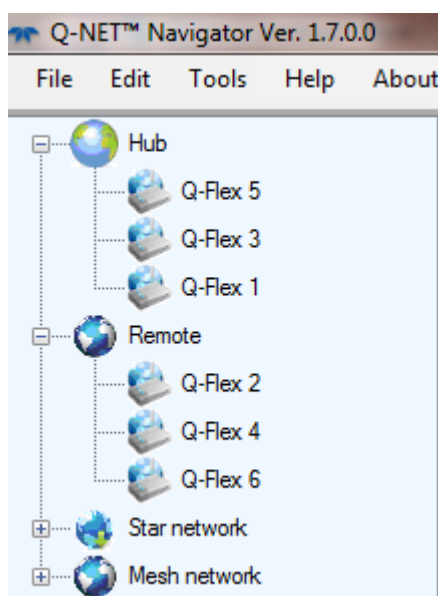


Figure 3-44 Reordered Hub Modems in the Network Navigation Tree

3.13 Synchronising Satellite Carrier Configuration Changes

Manually changing satellite carrier configuration in point-to-multipoint systems is a slow and error prone process, particularly when an outbound hub carrier is shared amongst many remote modems. Navigator supports a feature called SYNC LINK that is aware of the satellite link relationships between hub and remotes. This allows the operator to reconfigure shared outbound carriers and inbound carriers as a single operation, with Navigator taking care of synchronising all of the changes throughout the network and automatically recovering in the event that the reconfiguration fails for any reason.

SYNC LINK in a point-to-multipoint scenario is used as follows:

1. Add a link for each shared outbound (**Figure 3-45**):

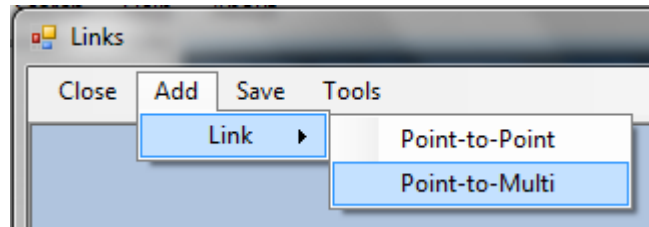


Figure 3-45 Adding a Point-to-multipoint Link

2. On the following dialog (**Figure 3-46**), select the relevant group and Q-MultiFlex. Navigator also needs to know the satellite band that is being used (C, Ku or Ka) in order to handle BUC and LNB frequency conversions correctly when adjusting frequencies. If the shared outbound is associated with multiple Q-MultiFlex (some being Rx-only) then selecting the '*Cascading*' option will bring up other options that allow all of the demodulators in the other Q-MultiFlex to be associated with specific remote modems.

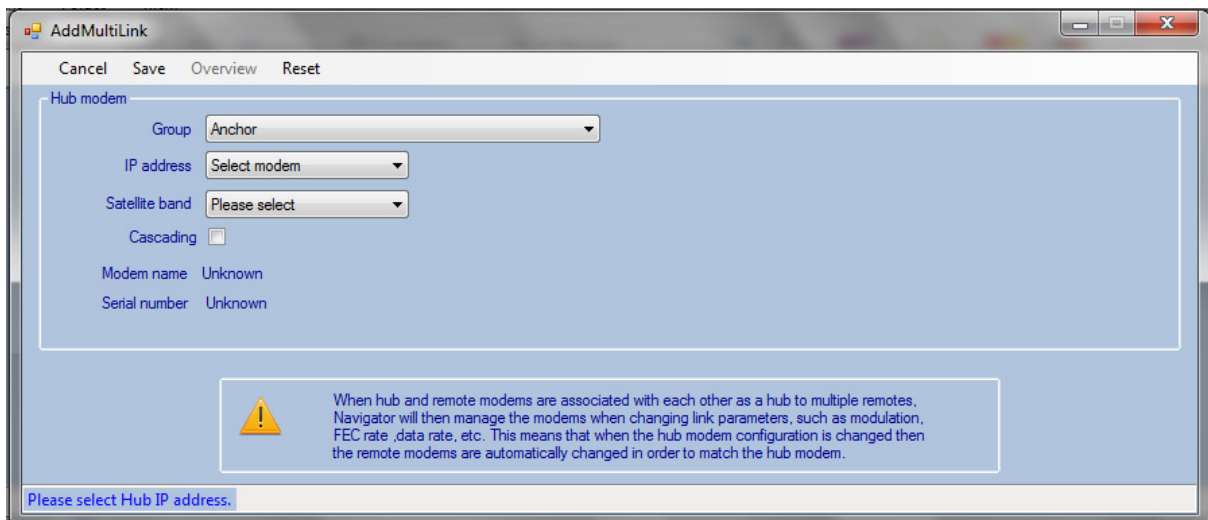


Figure 3-46 Hub Shared Outbound Modem Selection for Point-to-multipoint Link

3. The following screen (**Figure 3-47**), shows the same dialog box following selection of the various options.

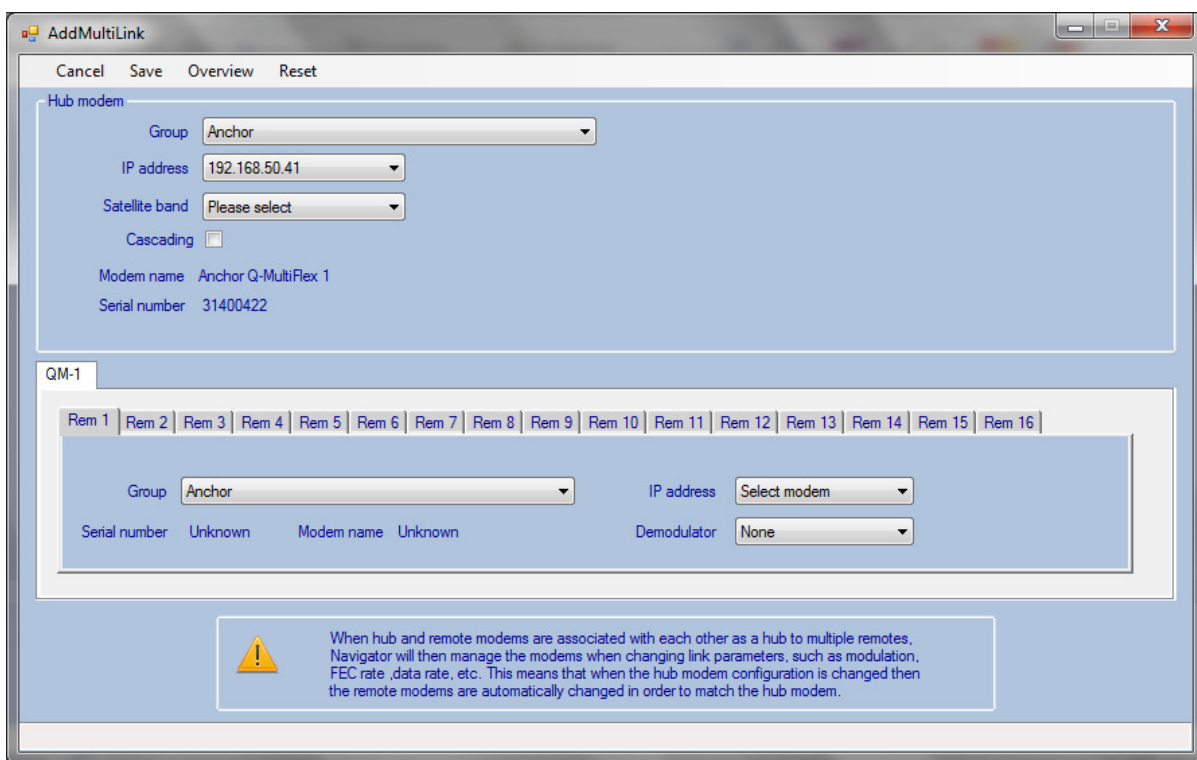


Figure 3-47 Hub Shared Outbound Modem Selection (completed)

4. **Figure 3-48** and **Figure 3-49** respectively show the association of remote modems with demod 1 and demod 2 of the hub Q-MultiFlex.

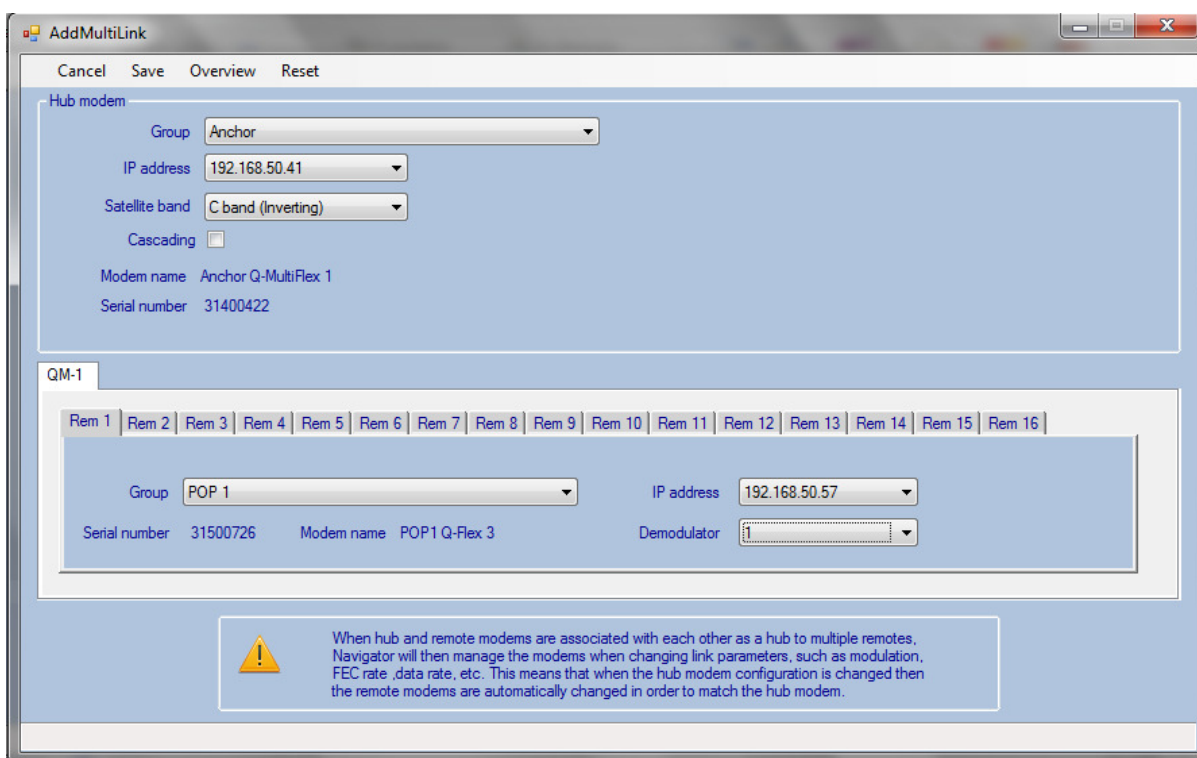


Figure 3-48 Point-to-multipoint Link, Hub Demod 1 Setup

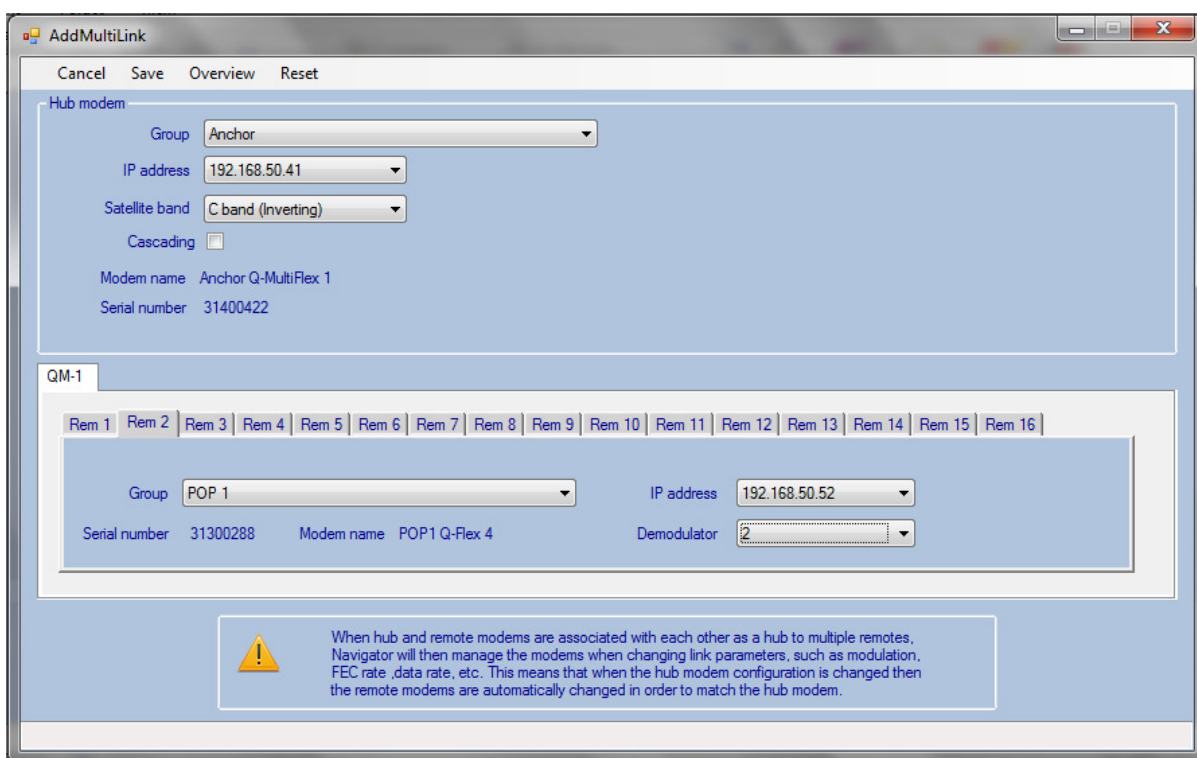


Figure 3-49 Point-to-multipoint Link, Hub Demod 2 Setup

- On selecting the 'Save' option, the Links dialog (**Figure 3-50**) will show a new entry for the link showing the hub Q-MultiFlex associated with two remote modems:

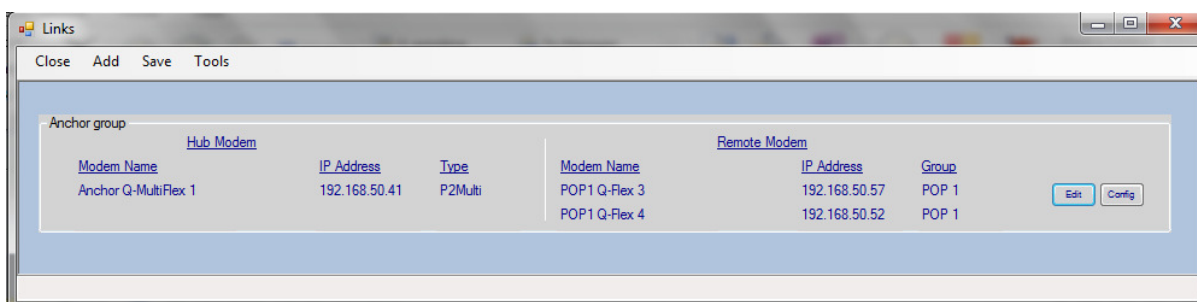


Figure 3-50 Point-to-multipoint Link (setup complete)

- The 'Edit' button (**Figure 3-50**) is used to edit the link relationships (association between hub and remotes). When the 'Config' button (**Figure 3-50**) is selected, it brings up the screen shown in **Figure 3-51**, which is used to reconfigure the shared outbound (and inbounds). This screen is created by Navigator from information it fetches from hub and remote modems. This example shows IF operation (BUC frequencies will be shown when using L-band).

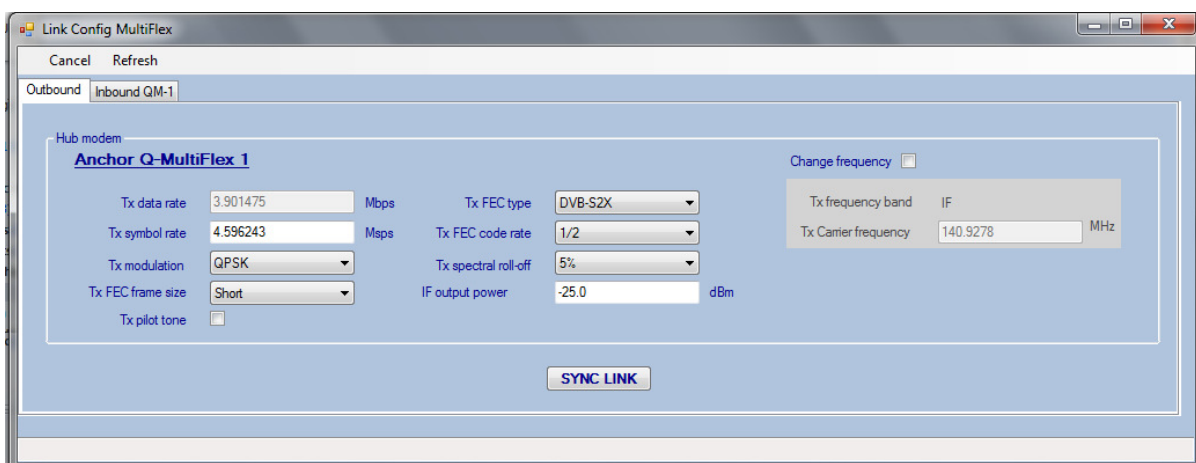


Figure 3-51 Point-to-multipoint Shared Outbound Link Configuration

7. Selecting the 'Inbound' tab allows any of the hub demodulators to be edited that are associated with the remote modems that receive the shared outbound (**Figure 3-52**).

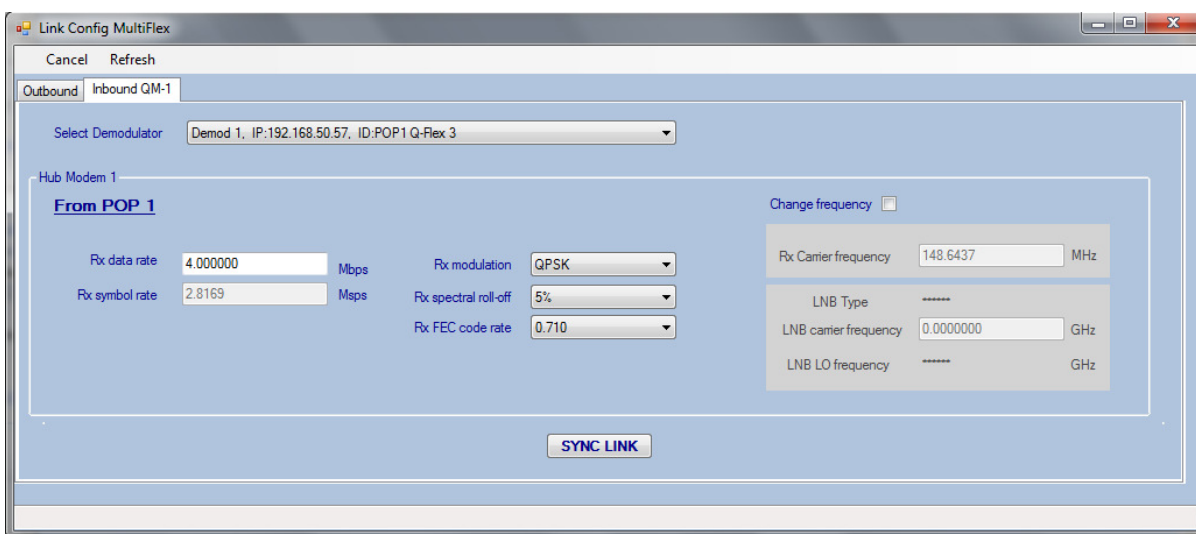


Figure 3-52 Point-to-multipoint Inbound Link Configuration

8. Once all of the edits have been completed, selecting the SYNC LINK button will result in **Figure 3-53** being displayed:

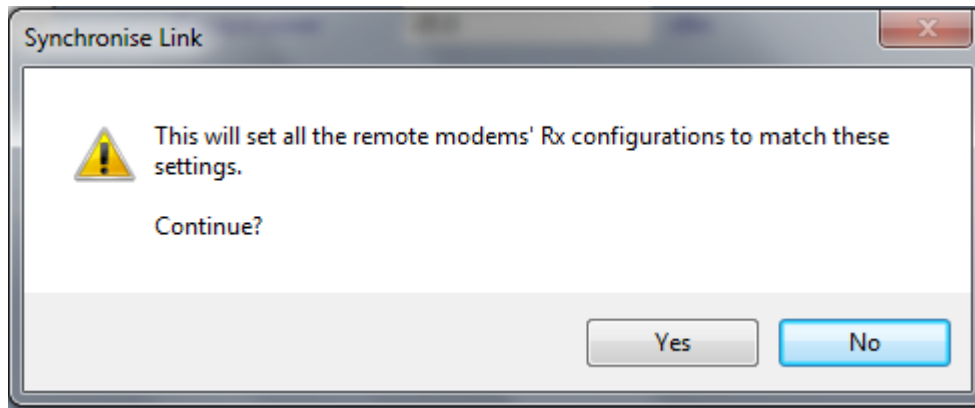


Figure 3-53 SYNC LINK Confirmation Dialog

9. Following confirmation, during the SYNC LINK configuration process the status of the ongoing reconfiguration will be reported at the bottom of the screen as shown in **Figure 3-54**.

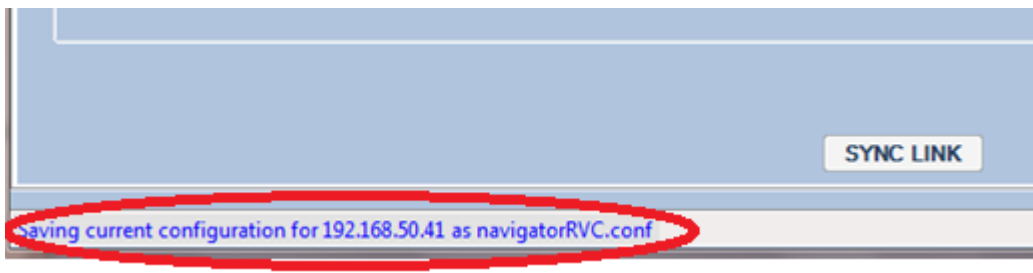


Figure 3-54 SYNC LINK Status Reporting

10. Following successful completion of the SYNC LINK reconfiguration, the dialog box of **Figure 3-55** will be shown. If the process fails for any reason then the system will automatically revert back to its previous settings (after a period of time controlled by the '*Reversionary Control Timeout*' set on the *Edit->Options* menu).

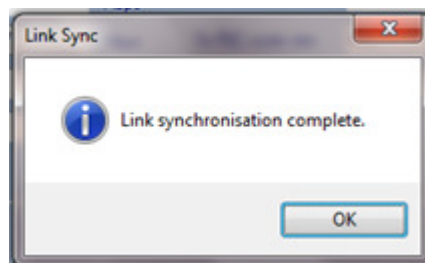


Figure 3-55 SYNC LINK Confirmation Dialog

3.14 Virtual Network Operator Support

Support is included for Virtual Network Operators (VNOs). This feature allows visibility and access to the underlying network to be virtualised on an operator-by-operator basis, meaning that the network owner can lease parts of the network to third parties.

VNO support is based on tailoring the underlying network database for each VNO, which in turn determines what parts of the network are accessible to the various different operators.

The following example provides a tutorial on how to set up support for multiple VNOs.

1. The example network (**Figure 3-56**) shows one physical network consisting of three customer networks. The first VNO has a virtual hub and two remote sites; the second VNO has a virtual hub and three remote sites and the third VNO has a virtual hub and one remote site. The actual network equipment can be located anywhere and even the hub equipment may be spread over multiple locations. Navigator access to equipment relies only on IP connectivity being available and it does not matter whether it is via local access, terrestrial WAN or over satellite.

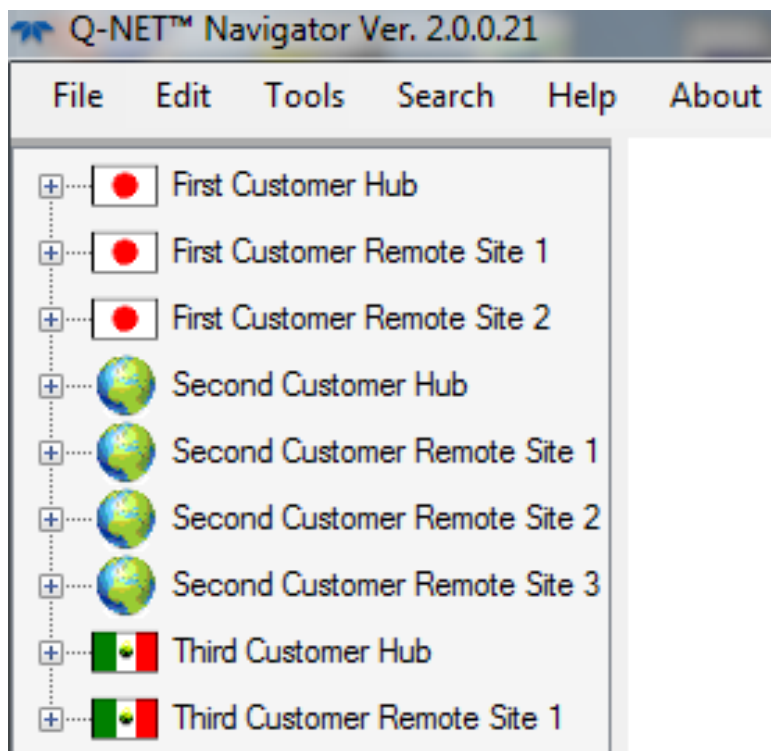


Figure 3-56 Multiple VNO Network

2. Expanding the network (**Figure 3-57**), it can be seen that each VNO has been allocated various hub and remote equipment, as required by their Service Level Agreements (SLAs). Access to the full database allows control of the whole network and is restricted to just the owner of the network infrastructure.

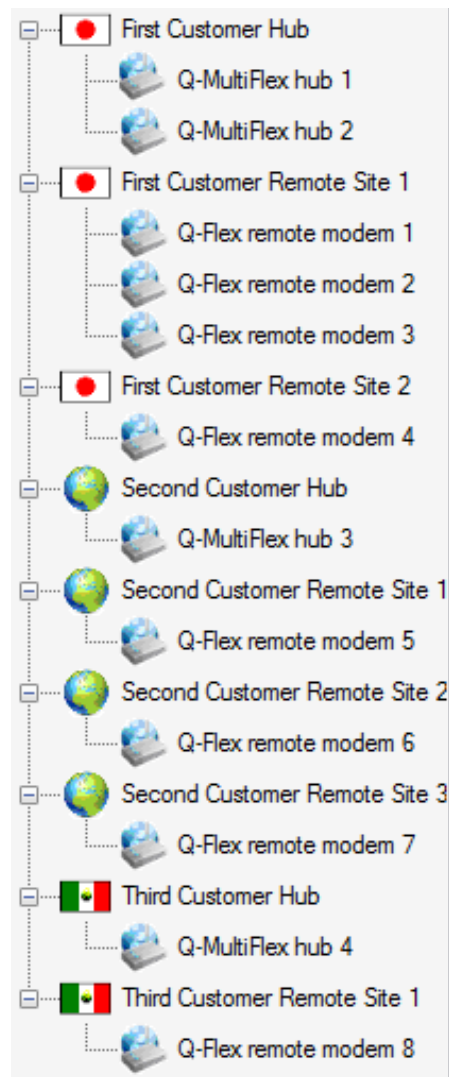


Figure 3-57 VNO Network, Expanded View

3. Database access can be tailored for every VNO as required. Normally, every VNO will be given database access that is restricted to just their allocated equipment. VNO operators can access a shared copy of their tailored database so they all work in real time on the same virtual network.

The master network database (**Figure 3-58**) shows all the equipment in the network. The database is never modified directly – all the necessary control is provided at a high level in Navigator.

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ID	Identifier	IPAddress	SerialNo	ModelNumber	type	UnitStatus	TxFILTER	RxFILTER	IsHTTPS	Software
1	Q-MultiFlex hub 1	192.168.0.1	Unknown	Unknown	First Customer Hub	FAIL	0	0	0	Unknown
2	Q-MultiFlex hub 2	192.168.0.2		Unknown	First Customer Hub	FAIL	0	0	0	Unknown
4	Q-MultiFlex hub 3	192.168.0.3		Unknown	Second Customer Hub	GOOD	0	0	0	Unknown
7	Q-MultiFlex hub 4	192.168.0.4		Unknown	Third Customer Hub	FAIL	0	0	0	Unknown
9	Q-Flex remote modem 1	192.168.0.5		Unknown	First Customer Remote Site 1	GOOD	0	0	0	Unknown
10	Q-Flex remote modem 2	192.168.0.6		Unknown	First Customer Remote Site 1	GOOD	0	0	0	Unknown
11	Q-Flex remote modem 3	192.168.0.7		Unknown	First Customer Remote Site 1	FAIL	0	0	0	Unknown
13	Q-Flex remote modem 4	192.168.0.8		Unknown	First Customer Remote Site 2	GOOD	0	0	0	Unknown
14	Q-Flex remote modem 5	192.168.0.9		Unknown	Second Customer Remote Site 1	GOOD	0	0	0	Unknown
15	Q-Flex remote modem 6	192.168.0.10		Unknown	Second Customer Remote Site 2	GOOD	0	0	0	Unknown
16	Q-Flex remote modem 7	192.168.0.11		Unknown	Second Customer Remote Site 3	GOOD	0	0	0	Unknown
17	Q-Flex remote modem 8	192.168.0.12		Unknown	Third Customer Remote Site 1	GOOD	0	0	0	Unknown

Figure 3-58 VNO Network Database

4. Different versions of the database can easily be created to restrict which parts of the network each VNO operator can control. File/Import and File/Export (**Figure 3-59**) are used to import and export the network database.

Exporting the database allows versions to be created for each VNO that restricts their access as required. The actual VNO database can be on a shared drive (at either the VNO's facility or the network owner's facility) or can be installed locally on individual operator's computers.

Each VNO will import their VNO database when the SLA comes into effect. They will also re-import the database if at a later stage further network services are leased from the network owner.

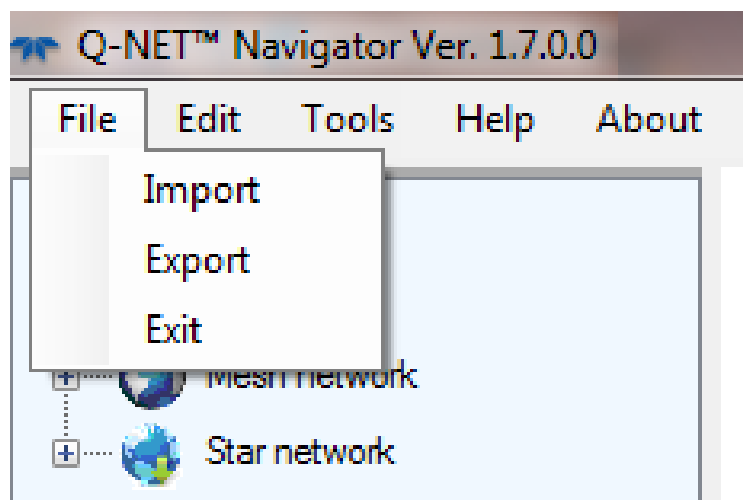


Figure 3-59 Network Database Import/Export Controls

5. The VNO operator can connect to the database simply by browsing to a local or shared drive using the *Edit->Options* menu 'Connection String' control (**Figure 3-60**).

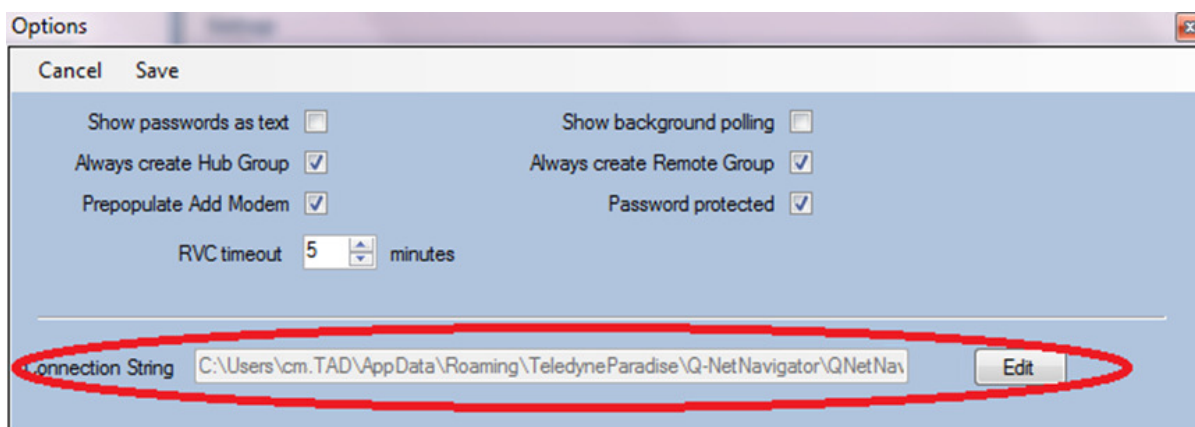


Figure 3-60 Network Database Connection String

6. Selecting the file import and export functions results in 'file browse' dialogs (**Figure 3-61**) being displayed that allow the database to be saved to or opened from a specific file location.

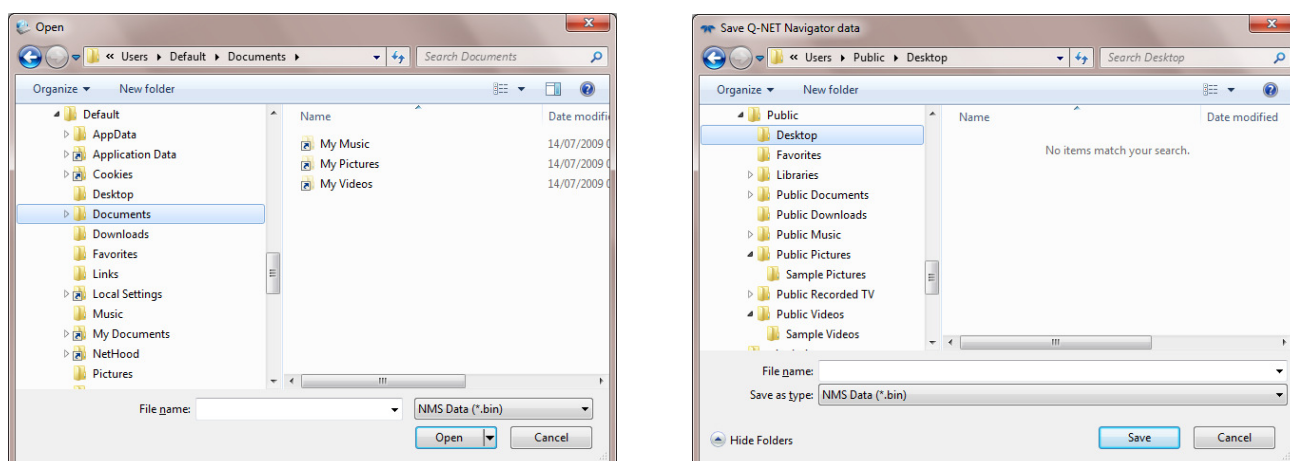


Figure 3-61 Network Database Import/Export File Browse Dialogs

7. Navigator has controls for adding/deleting network equipment. The network database is therefore reconfigured for each VNO as required. The VNO network for the First Customer is shown in **Figure 3-62** following modification of the database to restrict access. Note this contains no information for the rest of the network.

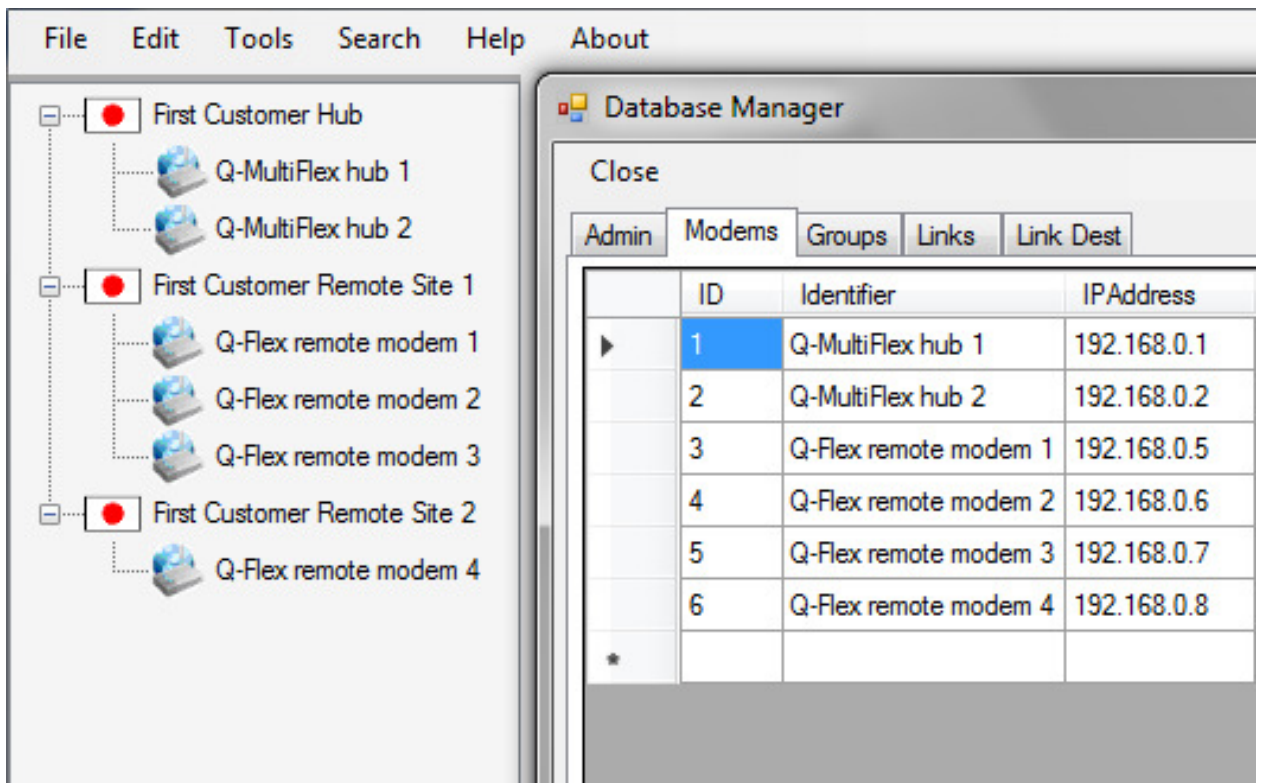


Figure 3-62 First Customer VNO Network

- The VNO network for the Second Customer is shown in **Figure 3-63**. The second VNO has no visibility or access to the first and third VNO's part of the network.

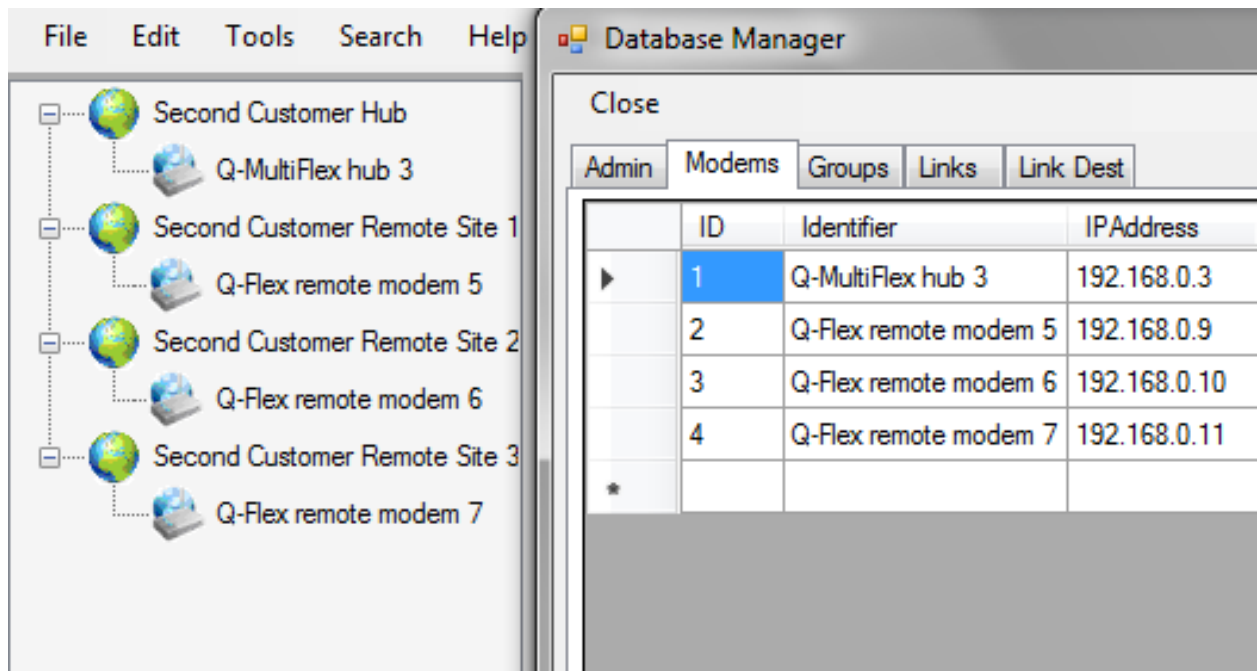


Figure 3-63 Second Customer VNO Network

- The VNO network for the Third Customer is shown in **Figure 3-64**. The third VNO has no visibility or access to the first and second VNO's part of the network.

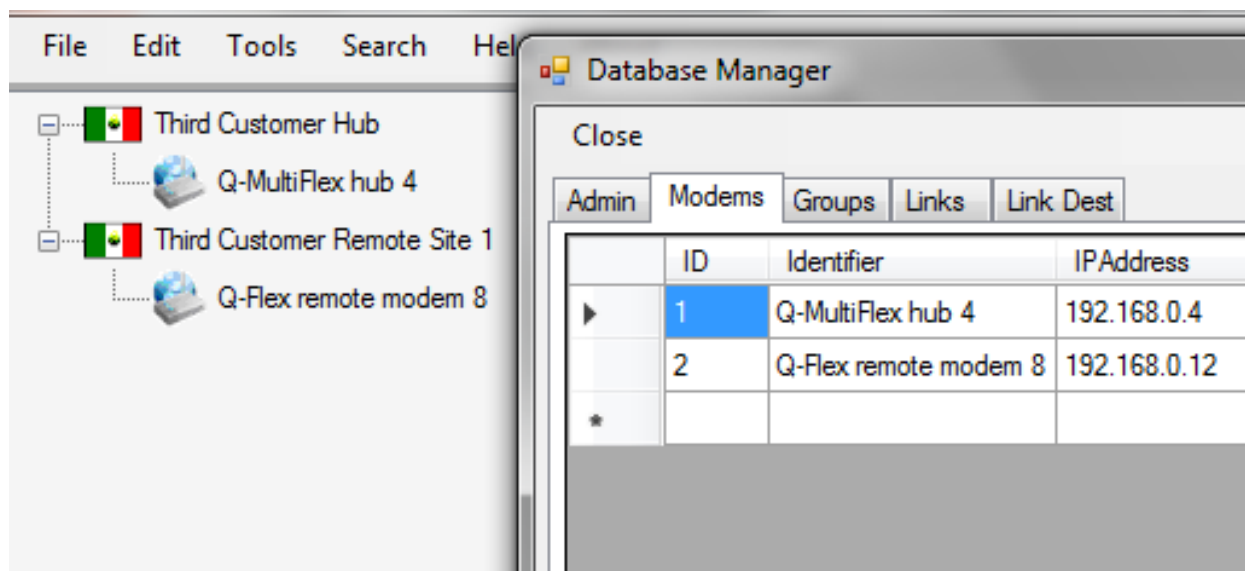


Figure 3-64 Third Customer VNO Network

- Navigator supports default login names ('user' and 'admin'). The login names and passwords can be changed by the VNO as required (**Figure 3-65**).

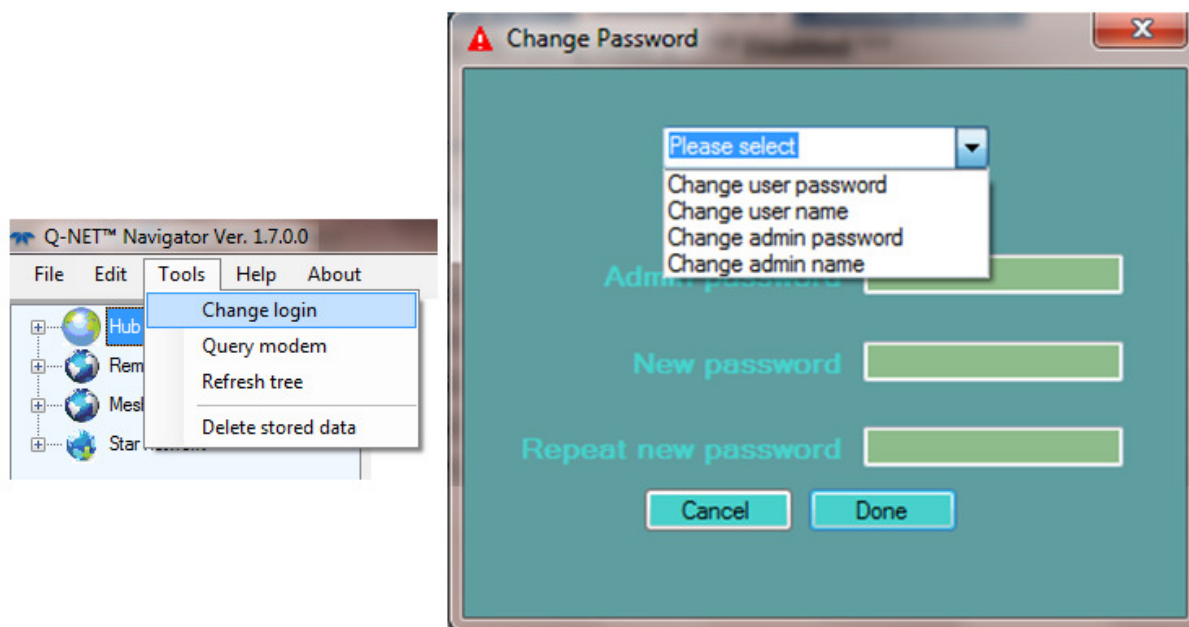


Figure 3-65 Changing Navigator Login Details

- There is a separate login process for the modems (**Figure 3-66**). Navigator automates all future logins once the details have been entered. AAA RADIUS can

optionally be used, which allows the modem to query the VNO's own domain name server to allow login using the VNO operators' normal organisation login details.

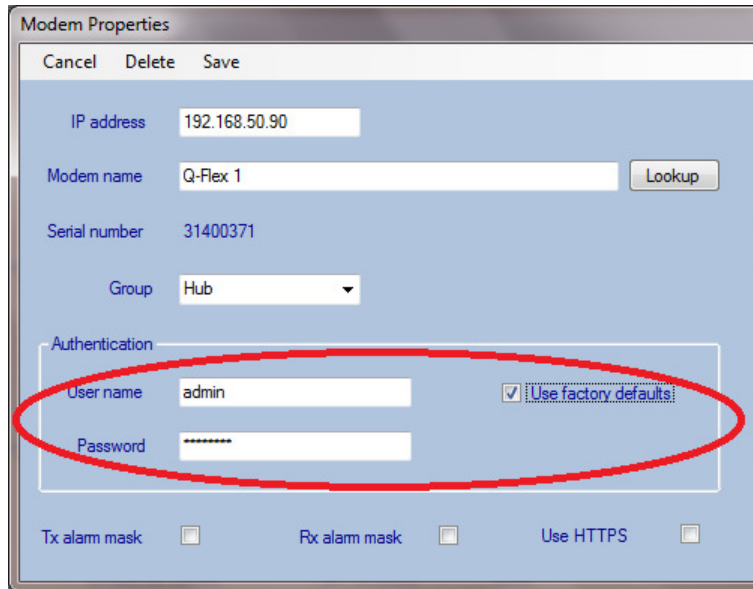


Figure 3-66 Modem Login Details

12. The network owner can choose whether to give the VNOs 'admin' passwords giving the VNO unrestricted control over the part of the network that they have leased. Or the VNO can be given 'view only' passwords that give them restricted access to part of the network where they can view information but not change any settings.
13. In summary, the network owner can limit access to every part of the physical network on an individual VNO basis, as required. VNOs are given access to only the network equipment that they have leased services on. VNOs have no ability to see or interfere with other VNO's equipment, services or customer data. The network owner can monitor all VNO network activities at all times.

Chapter 4 Technical Support

Technical Support can help with:

- Queries regarding equipment operation.
- The return of equipment for upgrade or repair.
- Customer training.
- Application notes and white papers.

Contact details in Europe and North America are as follows:

Teledyne Paradise Datacom Ltd.
2&3 The Matchyns, Rivenhall End,
Witham, Essex, CM8 3HA, England.
Tel: +44(0)1376 515636
Fax: +44(0)1376 533764

Teledyne Paradise Datacom LLC
328 Innovation Blvd.
State College, PA 16803, U.S.A.
Tel: +1 814 238 3450
Fax: +1 814 238 3829

Other regional support centres are listed on our web site.

Worldwide support via email is available by filling in the Technical Support Contact Form on the Support web page at <http://www.paradisedata.com>, which will forward your support issues to your local Teledyne Paradise Datacom Technical Support team for your geographic area.