Section 4 VNMGR

Introduction

A VersaNet2 Node is normally supplied with the NODE Software already installed. If you need to install new software or update to a later version, see Section 2.3 for full details on software installation.

The VNMGR programme does not alter the Node software, but it allows the user to configure parameters, which are then downloaded and stored in non volatile memory.

Before configuring the Communications Controller, if any other I/O cards are fitted to the Node they must have their address set using the on board DIL switches. See Section 3.7.1 for switch settings.

4.1 VNMGR Introduction

VersaNet2 is a truly modular radio telemetry product offering unrivalled flexibility. Any VersaNet2 Node can have Digital, Analogue, Pulse and Serial Data I/O capabilities. The powerful configuration program permits any Input Channel to be sent to any Output Channel destination anywhere within the radio network. This concept enables the construction of simple 'point-to-point' links or complex multi-Node networks from a standard range of I/O modules, providing an efficient and economical solution for every application.

VersaNet2 normally communicates using UHF Radio Links but it also has the capability of using modems, wire line or GSM, to further increase its flexibility. Using a modem increases the range to virtually any geographical location well outside of the range of the UHF Radio. A Node can be configured to use UHF Radio only, an external modem only or a combination of both. A GSM Modem may for example be configured as a back-up (secondary route) in case of failure of the main radio path.

The VersaNet2 Communications Controller is supplied with VersaNet2 Manager configuration software (VNMGR). This software runs on a standard PC under Windows 95 (or later) and facilitates the rapid installation of a VersaNet2 system. See Section 2.3 for more details on system requirements and installation.

4.2 Preparing for Configuration

Each VersaNet2 Node must contain a Controller module and, optionally, a selection of I/O modules from the standard range available. It is the Controller that must be configured using the VNMGR software supplied with the system.
In addition to the software you will require a PC running Windows 95 (or later) and a configuration lead (serial data cable) which is supplied with the Controller.

Connect one end of the configuration lead to the appropriate serial port (RS232) on the PC. The other end of the lead must be connected to the RS232 configuration port (JP7) on the Controller. See Figure 6 Section 3.7.1 for board layout.

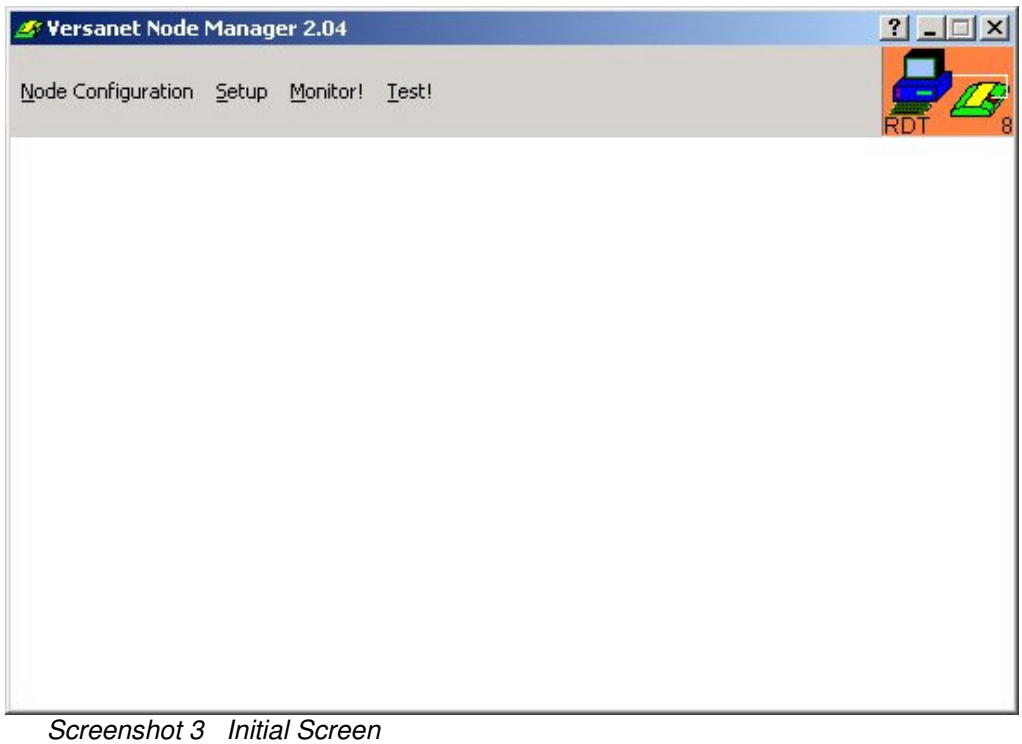
4.3 Accessing the Configuration Software

Install the VersaNet2 Manager software onto your PC by following the instructions printed on the floppy disk or CD supplied with your system, or as follows: -

- Insert disc into floppy drive 'a' (or CD in appropriate drive)
- View the directory of drive 'a' (or CD) using explore

- Copy the vnmgrX-XX.exe file to your preferred folder and create a shortcut
  or
  Drag the VNMGR Icon directly to the desktop

NOTE: The version of the software is indicated by the number 2.XX i.e.2.01, 2.02 etc.
Once installed, access the software by 'double-clicking' the VersaNet2 Icon on your screen.
When the software has loaded the following screen will be displayed: -



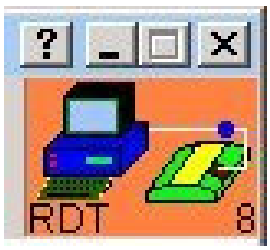
Screenshot 3 Initial Screen

The next step is to select the correct COM port for sending and receiving data to the Controller. This is achieved by selecting the **Setup** drop down menu at the top of the screen. Next select **Port** and you will see a list of available COM ports for this PC. Select the correct COM port from the list shown. The software will always default to this COM port in future.

In the top right-hand corner of the screen you will see a colour graphic, which shows a PC and Controller. Assuming that the Controller is powered and the configuration lead is connected correctly, a thin white line should be visible connecting the PC to the Controller Icon and the Controller Icon will be green/yellow in colour.

If the white line is not visible and the Controller Icon is displayed in dark green then there is no communication and you must check the Configuration Lead, the power supply to the Controller and the Setup Port selection to find the problem.
NOTE: When first connected it may take several seconds for communication to be established.

When you first access the VNMGR software, all the static data from within the Controller is uploaded. Static data refers to parameters that are factory set within the radio and cannot be modified using the VNMGR software, such as, Radio Serial Number, Operating Frequency Range, Max number of radio channels, Channel Spacing etc.



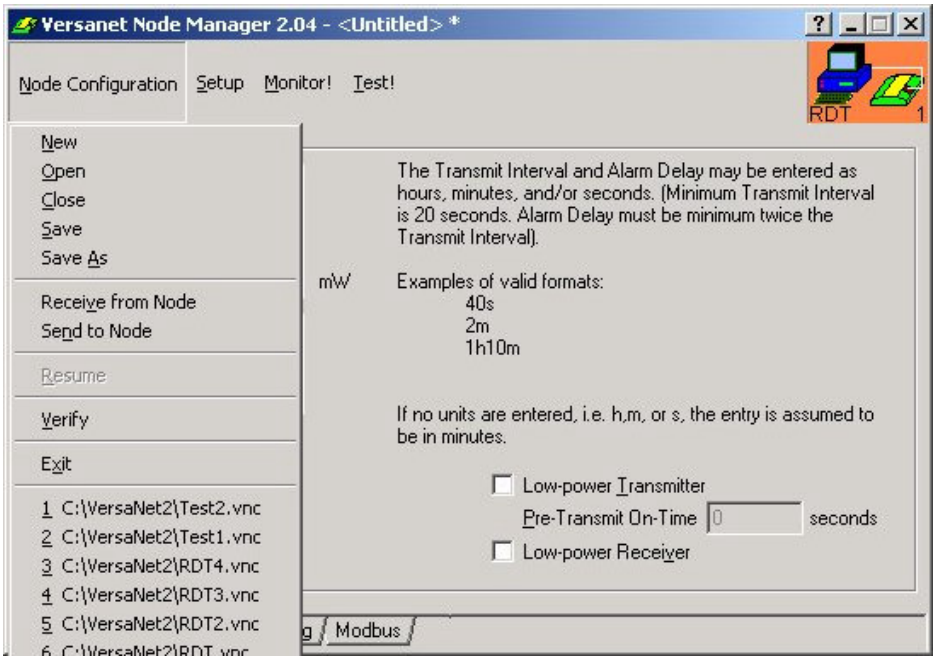
Screenshot 4

In addition, the T2-BUS on the Controller is scanned and all I/O modules connected are automatically detected and reported to the VNMGR software for use during the configuration process.

Uploading of the above information is indicated on-screen by a blue dot traveling along the white line, which connects the PC to the Controller Icon.

4.4 Node Configuration

Selecting **Node Configuration** from the on-screen options will display the following drop down menu: -



Screenshot 5 Drop Down Menu

4.4.1 Drop Down Menu 'Node Configuration'

The following is a brief description of the available options.

New This will open a completely new VNMGR configuration template, with all fields blank. If you have a current configuration file open, you will be prompted to save or discard the file before opening a new template.

Open Allows previously saved configuration files to be opened. If for example, several Nodes are being programmed and they all have similar connections, once the first has been configured, save the file and use it for the other Nodes. The saved files are also useful when installing a spare Node.

Close Closes the current configuration file. You will be prompted to save or discard the file before closing.

Save Allows the currently open file to be saved.

Save as Allows the open file to be saved under a new name and location.

Receive from Node Uploads the existing file from the Connected Node.

Send to Node Downloads the current file to the Node.

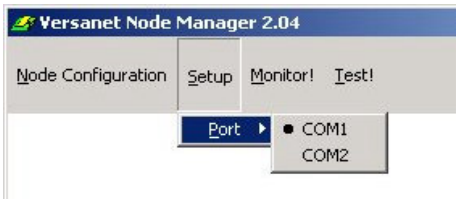
Resume This is used to return to the programming screen from either the Monitor or Test screens.

Verify After entering all the programming information verify can be used to check the information prior to downloading.

Exit Closes VNMGR and returns to Windows.

4.4.2 Drop Down Menu 'Setup'

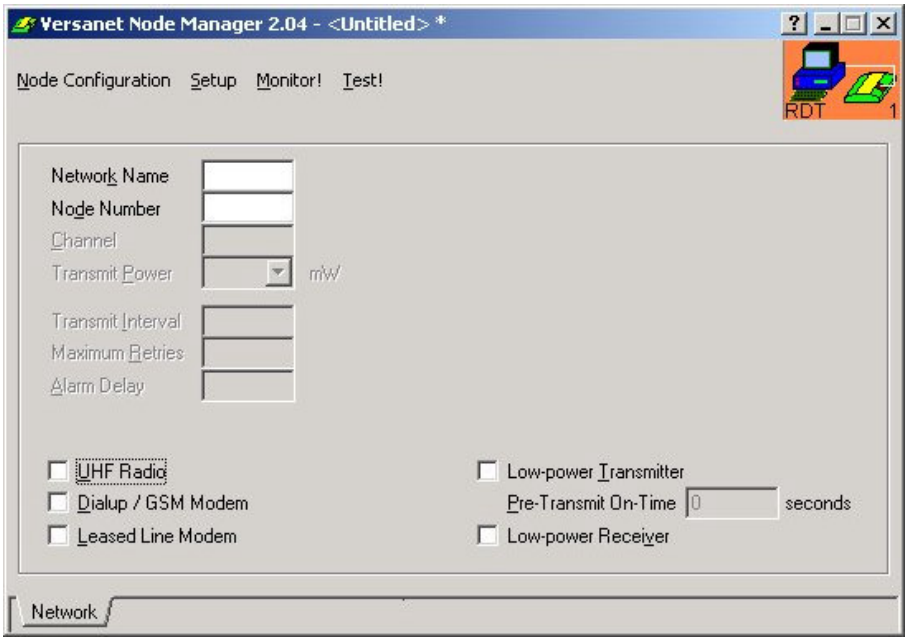
After selecting **Setup,** select the correct COM Port for your PC from the list shown. The software will always default to this COM Port in future.



Screenshot 6

4.4.3 Entering a New Configuration

Select **Node Configuration** from the on-screen options followed by **New**. The following screen is displayed:



Screenshot 7 New Screen

By default, the **Network** Tab is selected which permits you to configure all of the Network parameters as follows: -

Network Name
Enter a Network Name which must be common to all Nodes in the network. Valid characters are A-Z, 0-9 and Space. This field can be any combination of letters and numbers up to a maximum of 5 characters.

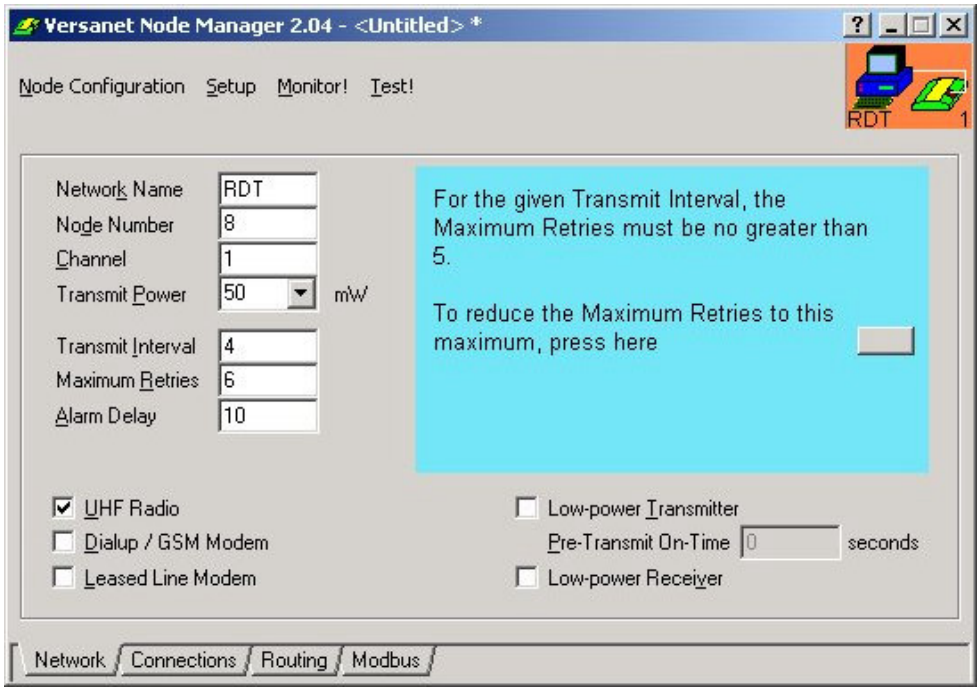
Node Number
Enter a Node Number in the range 1 to 254 inclusive. This is the unique identifier for this Node within the Network.

Note
At this stage, select the type of communication to be used for this Node. If a UHF radio is to be used on this Node, tick the box at the bottom left, this will activate the greyed out radio parameter fields, which should then be completed.

Channel
Enter a valid RF channel between 1 and the maximum available. All Nodes within the Network must be set to operate on the same channel. The channel/frequency allocations are supplied with each IRDN200 in the form of a single A4 sheet of paper. The maximum number of channels available can also be found on the TEST screen.

Transmit Power
Enter a value between 50 and 500 (mW) inclusive or select one of the pre-set values from the drop-down menu.

Transmission Interval
Enter the transmission interval between 20 seconds and 24 hours (in increments of 10 seconds). Times can be specified in seconds, minutes or hours. (See on screen notes). This value specifies how often the Controller will scan all inputs and transmit their status to other Nodes on the Network.



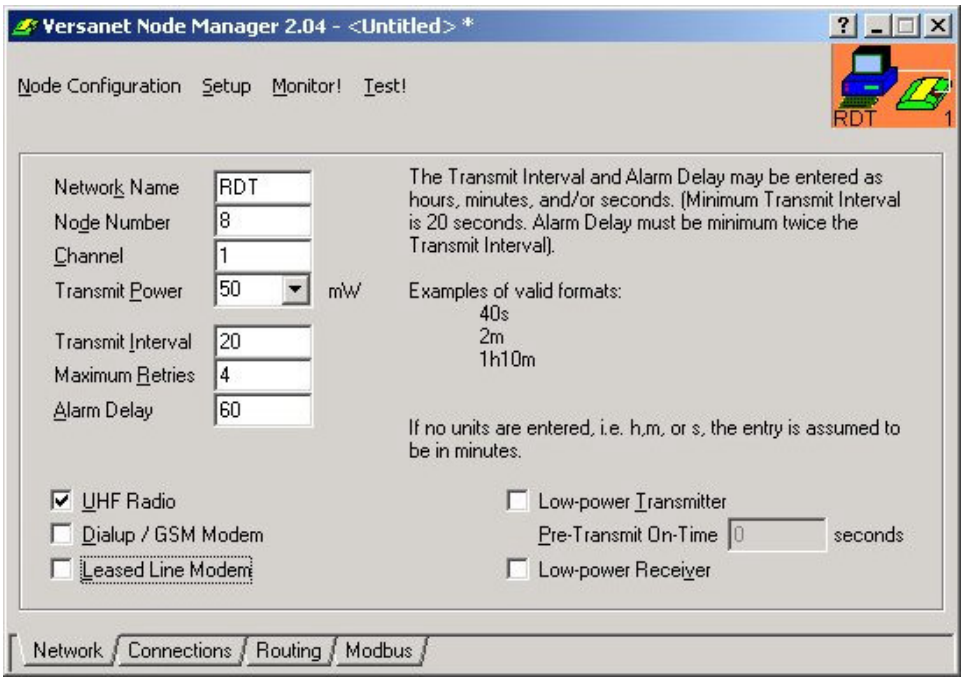
Screenshot 8 On Screen 'Wizard'

Maximum Retries
Enter a number between 1 and 9 inclusive. All Node transmissions are acknowledged and this field allows you to specify the maximum number of transmission attempts that can be made before the controller reports a failed acknowledgement (communication). The number of retries is related to the transmission interval. For example, with a short transmission interval, it is not sensible to programme a large number of retries, because the Node would be attempting to transmit continuously. The limits are therefore: -
under 1 minute TX interval, 1 retry;
under 2 minutes TX interval, 2 retries etc.
If numbers are entered outside of these limits, an on screen messages (Wizard) appears, to alert you and adjust the number of retries within these limits.

Alarm Delay
Each Controller is equipped with an Alarm LED and an Alarm Relay Output on (JP9). Every transmission to another Node is Acknowledged (Ack) to indicate correct receipt of the data. If no Ack. is received from the target Node, the alarm timer is started. If no valid Ack. is received from that target Node over the alarm delay period, the alarm will activate. Note that only an Ack. from that target Node will clear the alarm. Acks. or Transmissions from any other Node, will not clear the alarm.

The relay alarm output is a changeover switch that is normally in the energized state on a healthy Node. Note that in Low Power Modes (see below and Section 3.4.10) the alarm is disabled as the alarm relay is used for other purposes.

The Alarm Delay period should be set to a minimum of twice the TX interval. This is so that 1 single missed transmission will not immediately cause an alarm. (It is possible that a radio communication will be missed for a number of reasons such as, radio interference, abnormal weather conditions etc.). An on screen message will alert you if the alarm delay is set too low. It may be set for up to a maximum of 48 hours.



Screenshot 9 Typical Completed Network Screen

For special applications an alarm delay of zero may be selected. Remember, in this case the alarm will trigger immediately a single communication failure occurs. For this reason, zero alarm delay is not generally recommended.

Modem (GSM or Wire Line)
It is possible to configure a Node to use both UHF radio and a Modem (GSM or wire line), for example when the Modem is used for a back up (secondary route). If a UHF radio is to be used on this Node, check the first box. If a modem is used, check either the Dial-up or Leased Line box. For a Node using only a Modem and no UHF radio, un-check the UHF radio box. (This will grey out the radio parameters).
Note that the tabs at the bottom of the screen change depending on the selection. Only the relevant tabs are available.

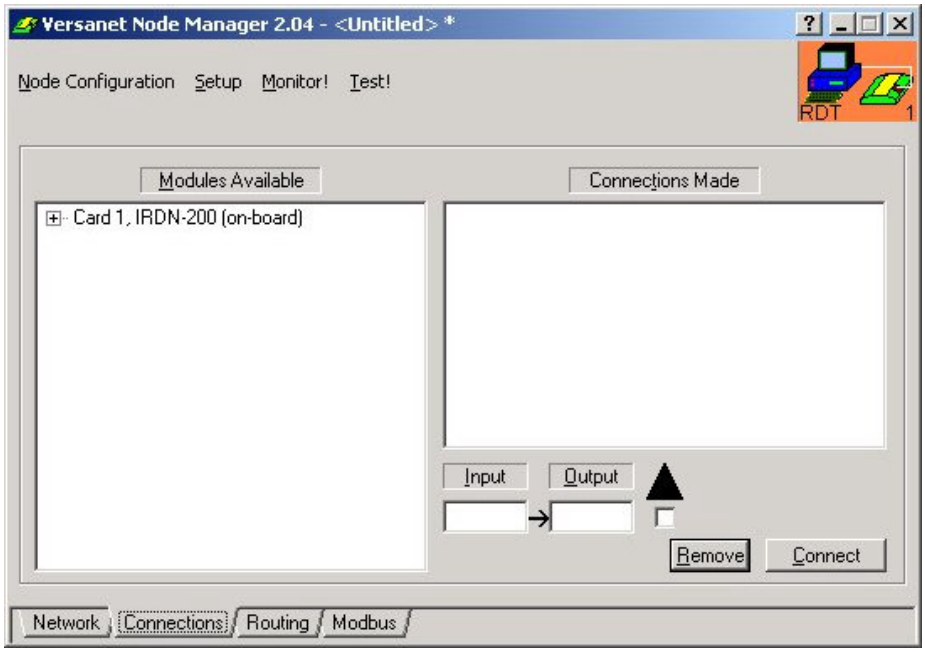
Low Power Transmitter
When selected, this check box will configure the controller to operate as a Low Power Transmitter (refer to section 3.4.10). Note that if this box is checked, the 'Pre-Transmit On-Time' box is available. This should be used if the Node is being used to power an external device. The Node will be turned on for this period of time prior to transmitting so that the external device has time to stabilize. The range is between 0 and 60 seconds.
NOTE: If no pre-transmit time is required, enter '0'.

Low Power Receiver
When selected, this check box will configure the controller to operate as a Low Power Receiver (refer to section 3.4.10).

When all the above parameters have been entered you can proceed to the next stage of configuration, Connections, by selecting the **Connections** Tab in the bottom left-hand corner of the screen

4.4.4 Connections

The following screen is displayed after selection of the **Connections** tab on the Node Configuration screen:-



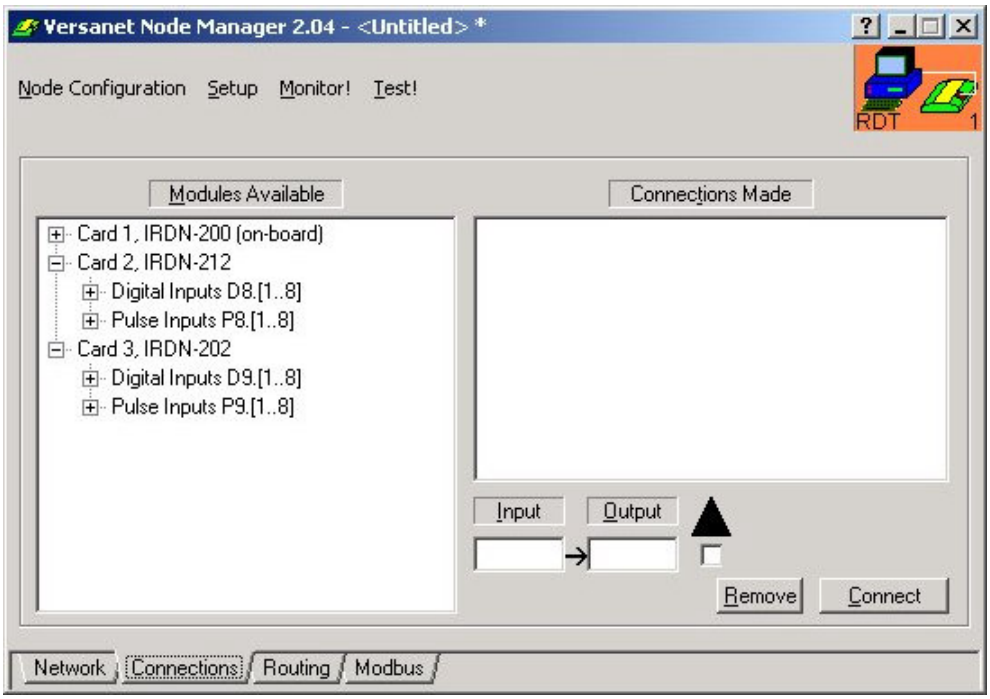
Screenshot 10 Connection Screen

Any Input Channel to be used within the Node must be sent to a corresponding Output Channel on another Node, somewhere within the Network. At this stage it does not matter if the Destination Node is within radio range because the Routing Table can be entered at a later stage (see Routing,)

The connections screen allows you to specify a destination output for all Input Channels found within the Node you are configuring.

The screen area marked 'Modules Available' displays an expandable tree view of cards available.

Selecting the '**+**' symbol next to the relevant card in the 'Modules Available' area, expands the view to display the available Input Channels on that Module. Subsequently, selecting an Input Channel (e.g. D0.1) immediately transfers the Input Channel address to the connections box labeled 'Input'. (Select an input by highlighting with a left mouse click). Alternatively the input address may be typed directly into the box.



Screenshot 11 Modules Available (Expanded)

Now you must specify where you want the Input Channel to be sent by selecting the screen area labeled 'Output' and entering a valid Node Number and Output Destination.
For example, entering 32D0.1 into the Output box will send the selected Input Channel to Node 32 and output it on Channel D0.1 (please refer to section 2.2, Data Handling, for more information on the addressing formats for VersaNet2).

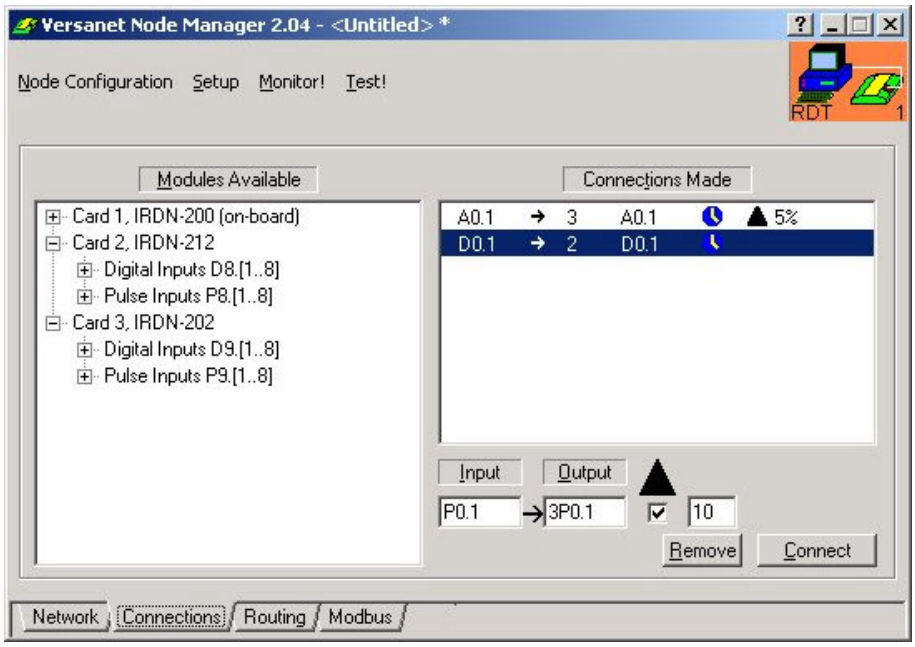
Immediately after the output destination box there is a 'state change' tick box, marked with a triangle. Checking this box allows you to specify the conditions under which a change in state of the input will cause a transmission.
NOTE: A transmission will be sent indicating the status of all inputs at every transmit interval (defined on the Network screen). Checking the state change box will cause a transmissions to be sent, for that input only, immediately the input changes.

If the State Change Icon is selected and the Input Channel you are connecting is an Analogue, then you will also be asked to specify the percentage change that needs to occur before the Analogue value will be sent. For example, a % change of 10 will cause a transmission to occur every time the input value increases or decreases by 10% of full scale or more, since the last transmission.

If the State Change Icon is selected and the Input Channel you are connecting is a Pulse, then you will also be asked to specify the number of pulses that need to occur before the count will be sent. For example, a value of 5 will cause a transmission to occur every time the input value increases by 5 or more.
NOTE: The count is cumulative so a total of 5 or more will cause a transmission.

Each time you complete an entry, the Connect button must be pressed. This transfers a summary of the connection made to the 'Connections' area on the screen. The connection process can be repeated for each Input Channel by repeating this process.

If you wish to remove/delete any connections simply highlight the appropriate connection in the Connections Made area on-screen and press the Remove button.



Screenshot 12 Completed Connection Screen

NOTE: If after you add a connection, the black triangle state change indicator is red, this indicates an error. It may be that you have selected Low Power TX or RX on the Network screen. Connections on event (state change) are not supported in Low Power Mode, (The Node is asleep and will not see the input change), except for digital input D0.1.

Pulse to Analogue

For special applications, it is possible to programme a pulse input to be sent to an analogue output. In this case, the pulses are counted and averaged over a 15 minute period. The total number of pulses received within the 15 minute period is then converted to an analogue value, corresponding to a rate of flow. This figure is then transmitted to the destination Node where it can be output and displayed.

When a pulse input is entered with an analogue output as the destination, other boxes appear so that the parameters can be added.

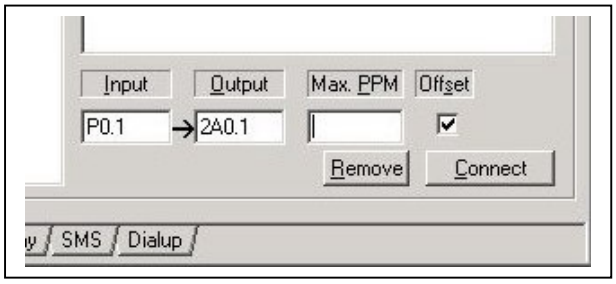


Figure 13 Pulse to Analogue

In the 'PPM' field enter the number of pulses per minute that will equal the full-scale deflection. Tick the offset box to change the range from 0 – 20 mA to 4 – 20 mA.

Example:
Enter 20 in the PPM field.
This means that a rate of 20 pulses per minute will equate to full-scale deflection, i.e. will output 20mA.
An average rate of 10 pulses per minute will therefore equate to 50% FSD and will output 10mA.
If your system is working on 4 – 20mA instead of 0 – 20mA, tick the offset box. The figures output will then relate to this scale.

4.4.6 Routing

Select the **Routing** tab at the bottom of the screen.

This facility allows you to specify the Routing table to be followed for all connections that you have made. A Route is defined as a radio path between three or more Nodes. Routing Tables must be established for every Node within the Network that cannot directly communicate with the Destination Node specified on the Connections list. This powerful facility permits the construction of complex Networks with many repeaters to circumnavigate obstructions or extend range.

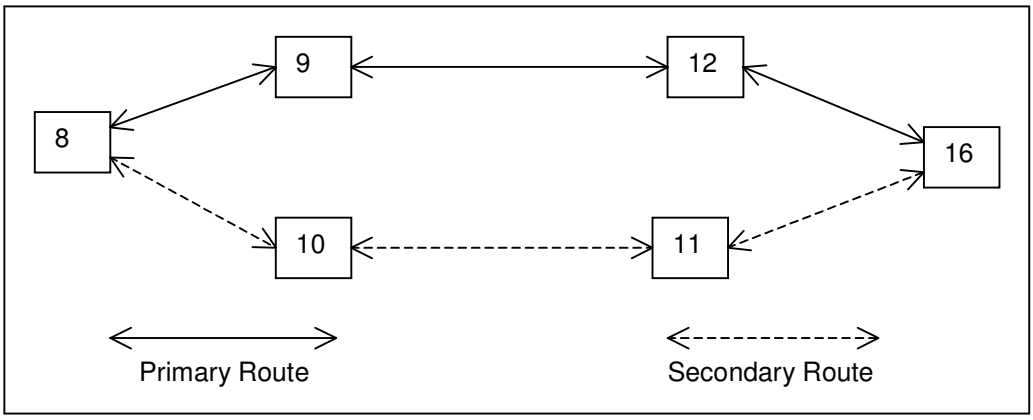


Figure 7 Example of Network Routing

Assume you are programming Node 8.
In the above example a connection is programmed from Node 8 to Node 9. There is no need for an entry in the routing table since Node 9 is adjacent to Node 8 and does not require a repeater Node. Similarly no routing is required for a connection to Node 10.

A connection programmed from Node 8 to Node 16 however, requires routing information since Node 9 and 12 will be used as repeaters. To programme this route:
Make sure ‘Primary’ is selected
Enter ‘16’ in the Destination box
Enter ‘9’ in the Repeater box. (make sure ‘Repeater Node’ is checked)
Press the ‘Add’ button and the route will be transferred to the routing list.
Note that only the first repeater is programmed in the routing table. When programming Node 9 the route from Node 9 to Node 16 will be added.

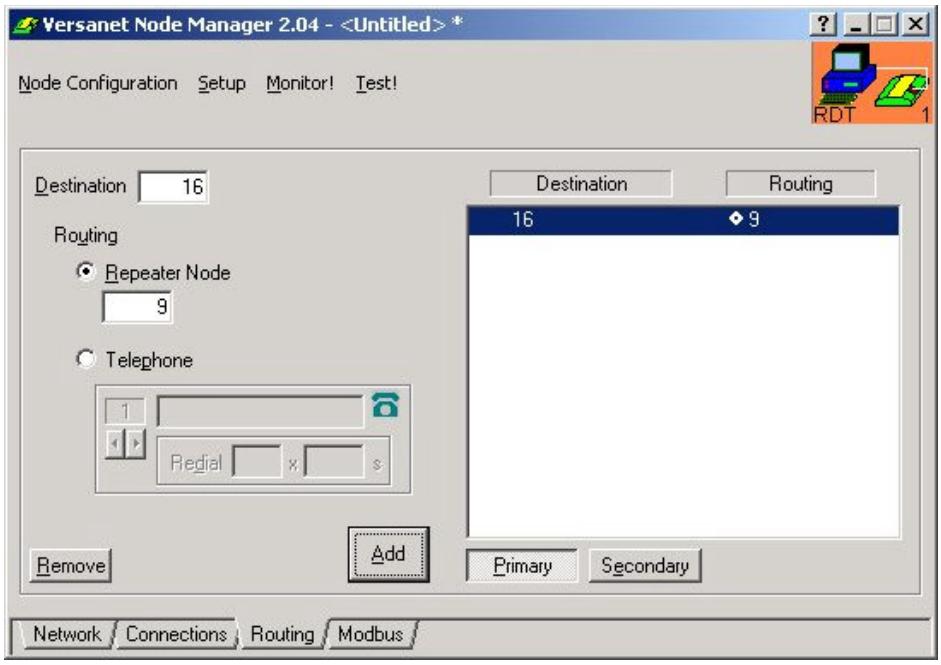
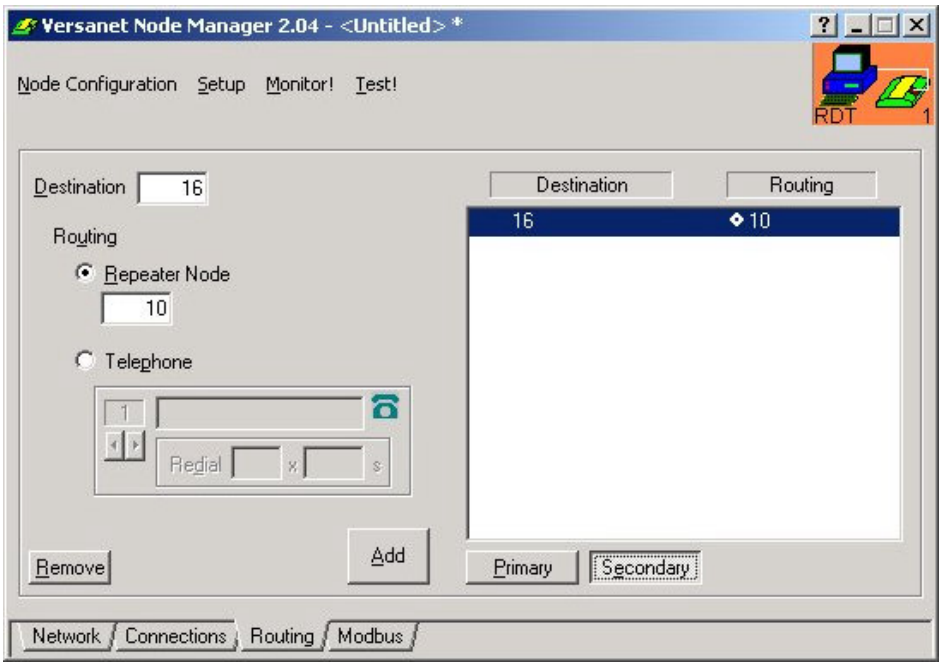


Figure 14 Primary Route

The facility exists to have two Routes for any particular Node, Primary & Secondary. The Secondary Route will only ever be followed if the Primary Route reports a communications failure.

In the above example, in Fig 7, a secondary route could be programmed from Node 8 to Node 16 using Nodes 10 and 11 as repeaters. If communication fails to Node 9, the secondary route via Node 10 would automatically be selected. To programme this route:-
Make sure ‘Secondary’ is selected
Enter ‘16’ in the destination box
Enter ‘10’ in the repeater box (make sure ‘Repeater Node’ is checked)
Press the ‘Add’ button
Remember, when programming Node 10 the route to Node 16 via Node 11 must be added.



Screenshot 15 Secondary Route Using a Modem Connection

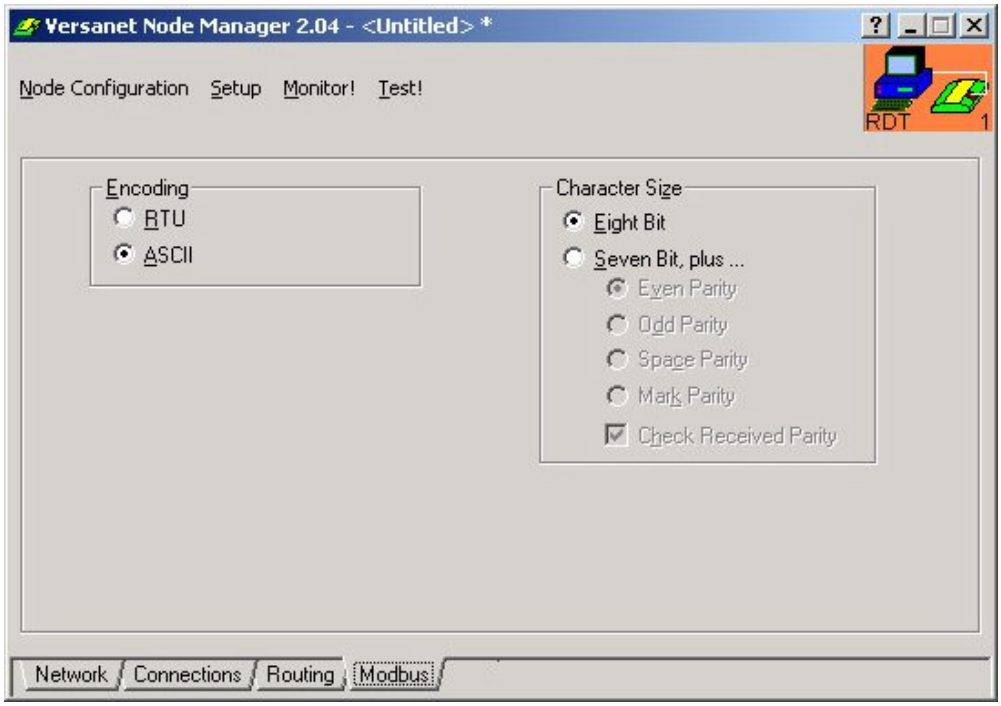
It is also possible to use a GSM or Wire Line Modem for either a Primary or Secondary route. Follow the same principle as above but this time check 'Telephone' instead of 'Repeater'. Enter the telephone number of the destination Node. Note that unlike UHF radio, the destination Node for modem connection can be anywhere and need not be the next adjacent Node in the chain. Once the telephone number has been entered add the number of retries and the interval in seconds. The Node will then, if unsuccessful the first time, automatically dial that number of retries at the specified interval.

Each telephone number has an index number associated with it for reference. These telephone numbers are stored on a list, which is used by the routing screen and the dial up screen. In other words telephone number 3 will be the same on both screens, change it on one and it changes on the other. You can scroll through the numbers using the arrow keys. Up to 32 telephone numbers may be entered.

If a GSM Modem is used for a Primary route note that it will dial out and send the status of all inputs at the interval set by the TX interval on the Network screen. If you only require the GSM to be triggered by special events use the Dial-Up screen for programming.

4.4.7 Modbus

Select the **Modbus** tab from the bottom of the screen.
This screen is only required if you are using a Modbus interface, such as a SCADA package.



Screenshot 16 Modbus Screen

For Modbus operation Select 'RTU' or 'ASCII'. Check with your SCADA package which version you are using. Also check the details required for the RS232 Protocol and fill in the 'Character size' section accordingly.

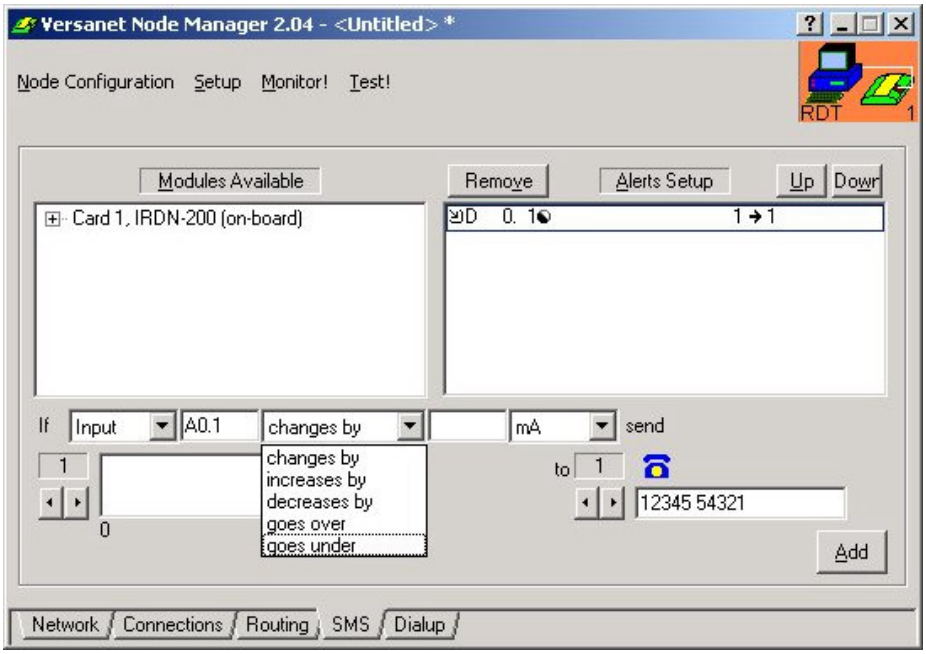
4.4.8 SMS

Select the **SMS** tab at the bottom of the screen.
This screen is only required if you are using a GSM modem with SMS messaging.
The 'Modules Available' is the same as the Connection screen. Modules can be expanded to show all available I/O.

The SMS is programmed so that if a certain defined set of conditions occur (a trigger or alert), a pre-defined message is sent to a specific telephone number. (i.e. a service engineer with a GSM mobile).

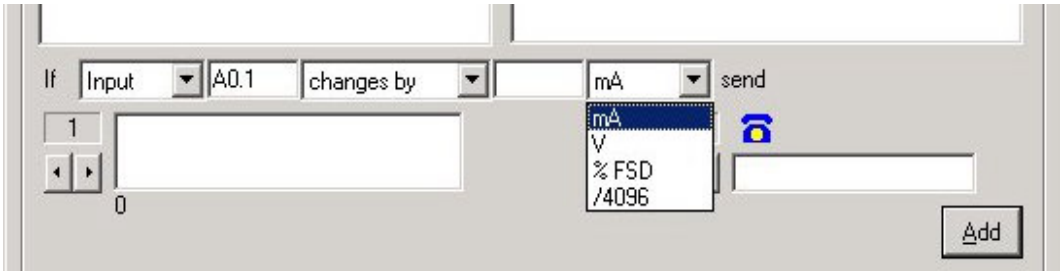
a. Defining the Alert (Trigger)

As with the Connection screen, either select an input or output from the Modules Available list or type the information directly into the input box. Select the trigger condition from the drop down menu in the third box.



Screenshot 17 SMS Screen with Analogue Input

The above example shows the conditions for an Analogue Input. After selecting the trigger condition, set the parameters in the following two boxes using the drop down menu options for the fourth box. The operation is similar for Digital or Pulse Inputs and all outputs.



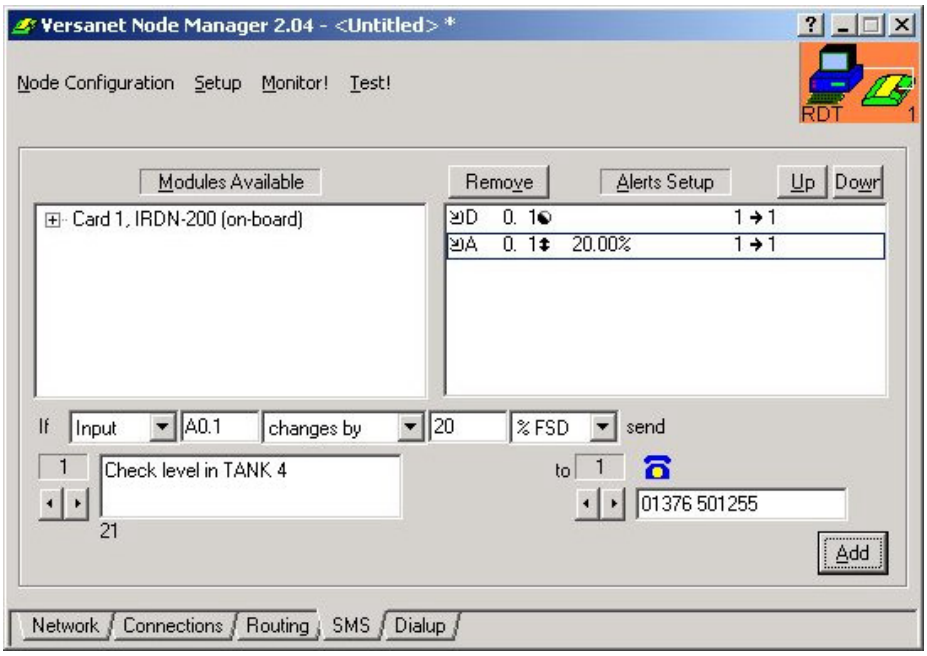
Screenshot 18 Analogue Drop Down Options

It is possible to use a 'Virtual' output to trigger an SMS message. Programme this in the same manner as above as an 'output'. Note, by using a Virtual output on this Node to trigger an SMS, a corresponding input on any Node in the network can be used to send SMS messages from this Node.

b. Defining a Message

For each SMS, a message must be entered in the message box. This can be free text of up to 160 characters per message.
NOTE: A cumulative character count is shown under the message box.
Each message is assigned an index number for reference. Using the arrow keys you can scroll through the messages. If required, the same message can be assigned to a number of I/O conditions. (i.e. different triggers can be used to send the same message). It is also possible to embed a variable string within a message. (Contact RDT for a separate data sheet).

NOTE: Up to 32 separate messages may be defined, of up to 160 characters each to a cumulative maximum total of 2,000 characters.



Screenshot 19 Example Message and Telephone Number

c. Telephone Numbers

Once the trigger conditions have been set up and the required message composed, enter the required destination telephone number in the box marked with the telephone icon. Again, each telephone number has an associated index number for reference. You can scroll through the numbers using the arrow keys.

Once you have associated a particular trigger with its message and telephone number, press the 'Add' button and the details will be transferred to the 'Alerts Setup' table. Using the arrow keys you can scroll through the alerts list and delete a highlighted selection if required. A number of different messages can be sent to the same telephone number.

NOTE: These telephone numbers are not linked to the Routing or Dial-up screen telephone number list.

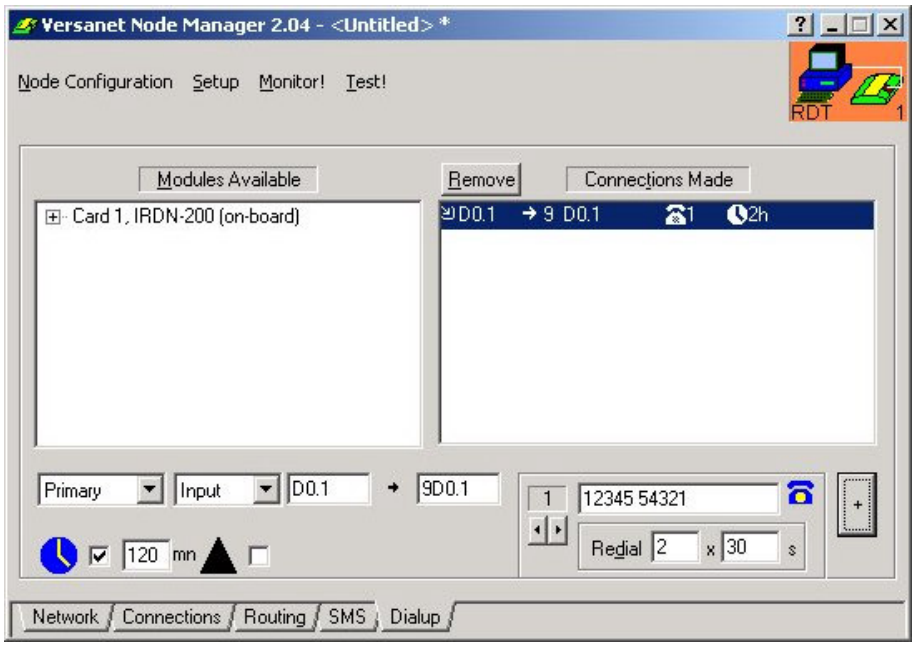
4.4.9 Dialup

Select the **Dialup** tab at the bottom of the screen.
This screen is only required if you are using a Wire Line or GSM Modem for a Dialup connection.

The 'Modules Available' is the same as the Connection screen. Modules can be expanded to show all available I/O.

The Dialup feature is programmed basically in the same way as the standard connection screen except that the transmission is via a telephone rather than uhf radio, so the destination telephone number must be specified for each connection.

a. Entering a Connection



Screenshot 20 Primary Input

In the first box make sure 'Primary' is selected.
As with the Connection screen, either select an input or output from the Modules Available list or type the information directly into the input boxes.
In the fourth box enter the destination Node and Address

NOTE: The final destination may be the Node at the other end of the modem link (Node 6 in the example below) in which case enter the Node number for that Node, e.g. 6D0.1
Node 6 can however act as a repeater and forward the message to other Nodes in the Network. In this case enter the final destination Node number in the destination box.

Example:
Assume we wish to programme D0.1 on Node 5 to go to D0.1 on Node 9
Enter 9D.01 in the destination box.
Node 5 will dialup and send the message to Node 6
Node 6 will act as a repeater and send the message to Node 9

NOTE: Node 6 will need to have the routing information programmed into its routing table.

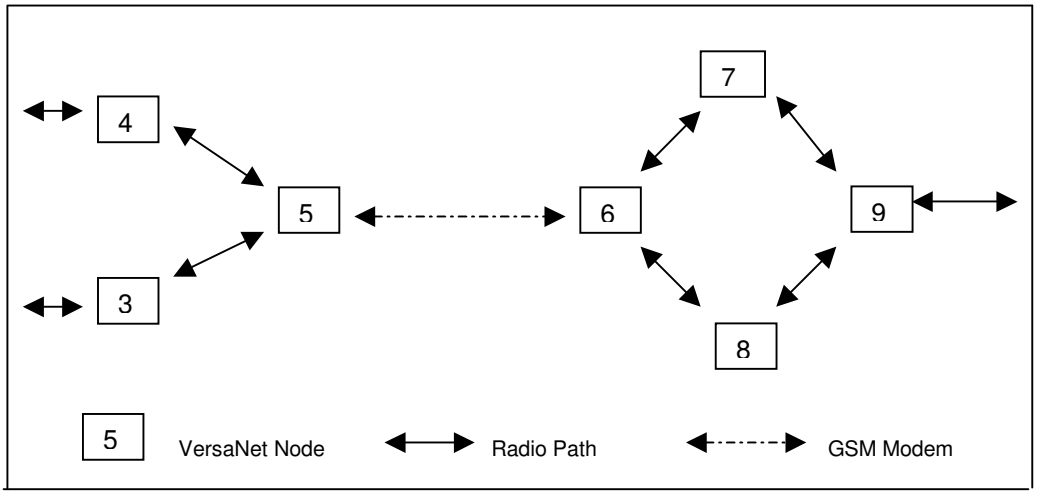


Figure 8 Example of Dial Up Routing

Once the connection details and destination are entered specify the conditions for sending the message using the boxes in the bottom left of the screen. If you want to send the connection at a specific time interval (TX interval) check the box next to the clock icon. In the second box enter the time interval in minutes.

If you want to send the connection on event, check the box next to the triangle icon. In the second box enter specify the event that triggers the transmission:-

For analogue this is the % of FSD up or down
For pulse it is the number of pulses required to trigger a transmission.

b. Secondary Connections

This is a very useful feature that allows the status of a number of I/O to be sent at the same time using only 1 telephone call.

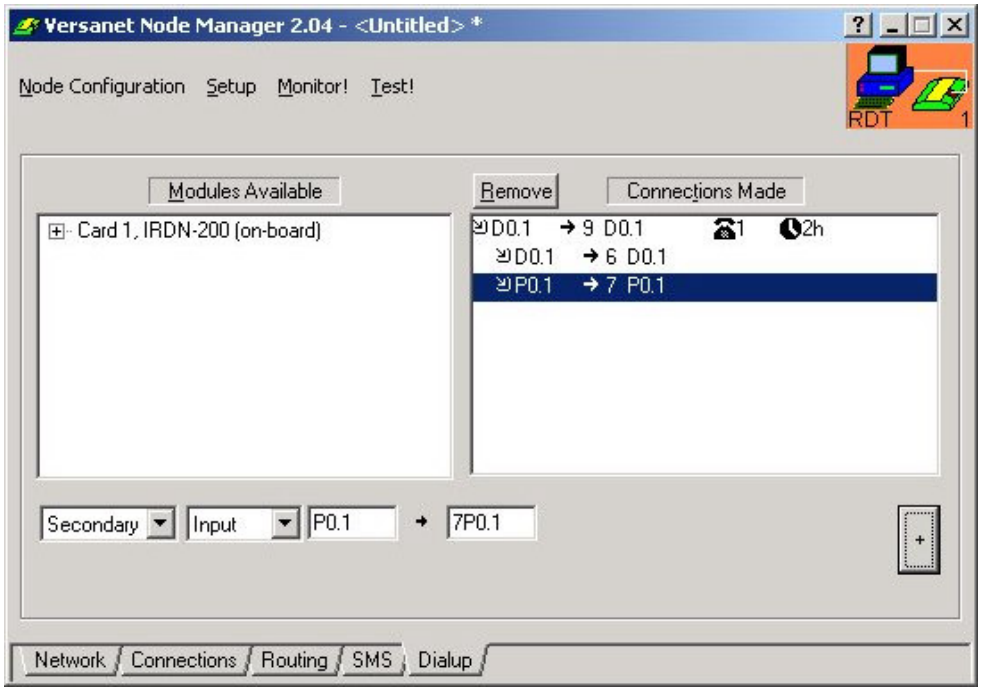
First enter the Primary Connection. This will be the trigger condition to make the dialup connection. You can then add other I/O as Secondary messages to be sent at the same time, obviously to the same telephone number.

Example:
Node 5 (in the previous diagram, Fig 9) is the originating Node.
A Primary connection is programmed to send if D0.1 changes: D0.1 to 9D0.1
Secondary connections are added to send D0.1 to 6D0.1 and P0.1 to 7P0.1.

When D0.1 on Node 5 changes the Node will dialup and send all 3 connections. The screen will look like the above example.

NOTE: The Secondary connections are indented on the connection list.

When entering the Secondary connections some of the boxes are greyed out, TX time, Event and Telephone number, because they are only relevant to the Primary connection.



Screenshot 21 Secondary Connection

c. Telephone Numbers

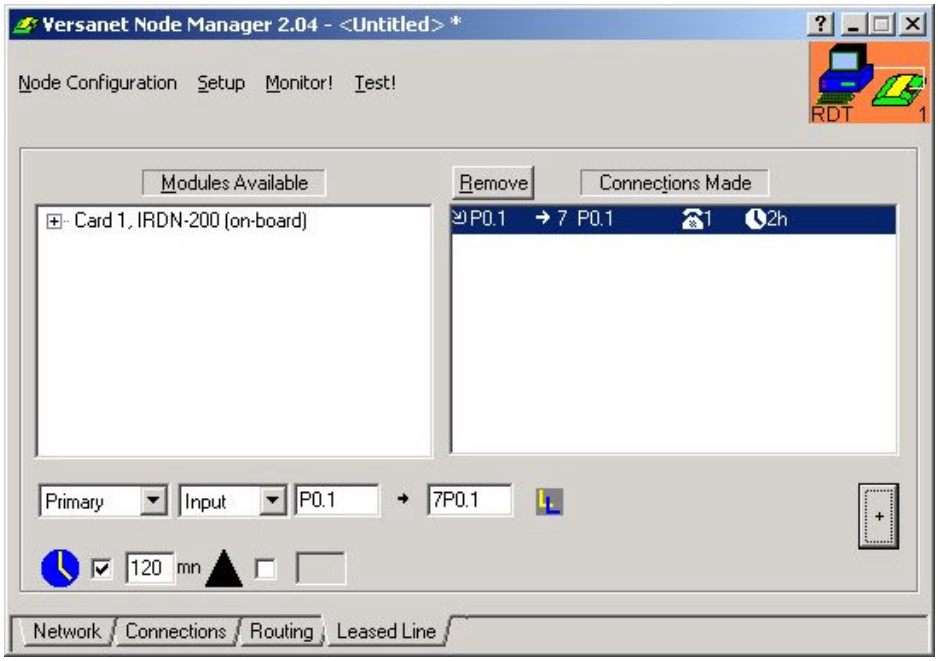
Once the connection details have been completed, enter the required telephone number in the box. Under the telephone number enter the required number of redials and the spacing. If the first attempt fails, the Node will redial the specified number of times at the set interval.

Each telephone number has an index number associated with it for reference. These telephone numbers are stored on a list, which is used by the routing screen and the dial up screen. In other words telephone number 3 will be the same on both screens, change it on one and it changes on the other. You can scroll through the numbers using the arrow keys. Up to 32 numbers may be entered.

When the connection details and the associated telephone number have been entered, press the 'Add' button and the information will be transferred to the Connection list. A connection can be removed by highlighting it and pressing the 'Remove' button.

4.4.10 Leased Line Modems

Select the Leased Line tab at he bottom of the screen.
NOTE: This tab will only be available if the leased line modem option is selected on the Network screen.



Screenshot 22 Leased Line Modem

The leased line screen works exactly as described above for the dialup modem except of course no telephone numbers are required. Leased line modems can only operate point to point, although the receiving Node can act as a repeater and forward the data to any other Node in the network, in the normal way.

4.4.11 Downloading New Parameters

Once all the new parameters have been entered in the various sections of VNMGR, they must be downloaded to the Node.

The first step, which is optional, is to check that the data is entered correctly, i.e. that no parameters are set outside of acceptable limits and that all mandatory fields have been completed. From the Node Configuration drop down menu select 'Verify'. If all details are OK a confirmation message will appear. If not, an error message indicating the fault will be displayed. If so, correct the fault and repeat the 'verify' operation.

From the Node Configuration drop down menu select 'Send to Node'. If there is any problem with the parameters, an error message will be displayed. Correct any faults and try again.
Watch the icon at the top right of the screen. Red dots will travel from the PC to the Node icon throughout the download process. Under the icon, information about the status of download will be displayed. Finally, after the download is complete, the new network name and Node number will be displayed under the icon.

It is now advisable to power the Node down and back up again to ensure correct initialisation of the Node with the new parameters.

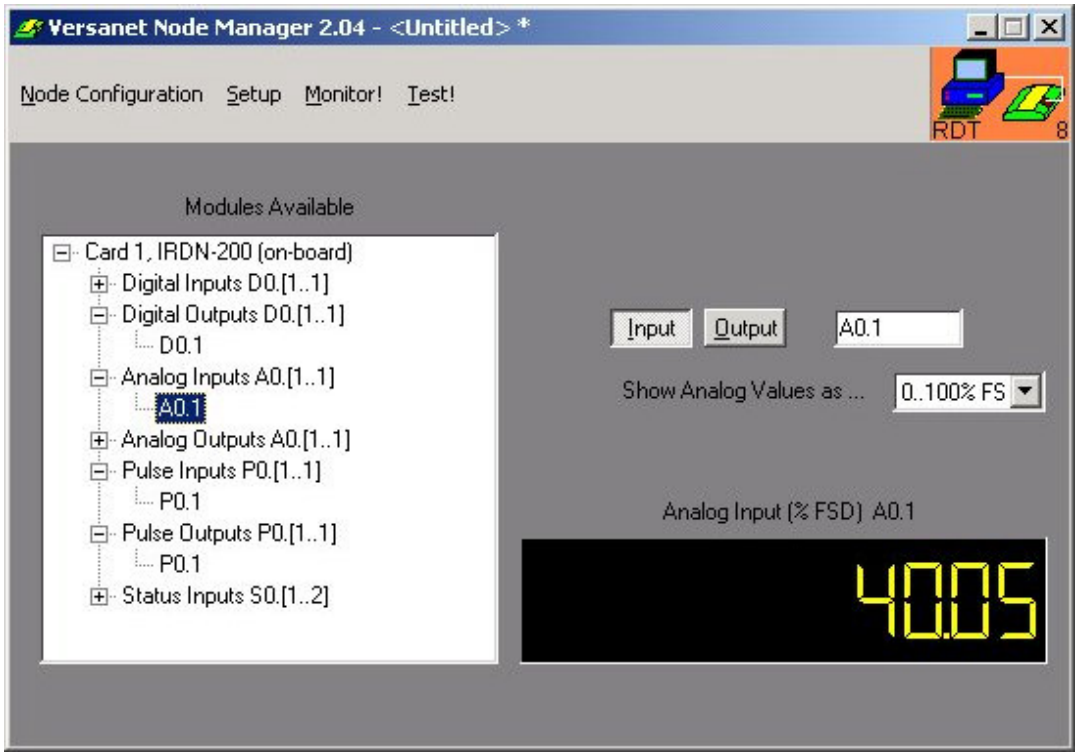
The Node is now operational.

4.4.12 Monitoring and Maintenance

The VNMGR software incorporates a monitoring section which aids system installation and maintenance. It permits the user to display the value of any piece of data either entering or exiting that Node (i.e. local I/O).

Using the monitoring function **does not** suspend the normal operation of a VersaNet2 Node.

After selecting the Monitor option from the main menu, the following screen is displayed: -



Screenshot 22 Monitor Screen

The screen area labeled 'Modules Available' displays an expandable tree view of cards available. Selecting one of the Card entries from the 'Modules Available' area expands the view to display the current Input and/or Output channels on that Module. Subsequently selecting a particular channel immediately instructs the monitoring software to read the input/output channel continuously and display the current value within the 'Channel Status' box on screen. In the screen shown above, an analogue input, A0.1 is being monitored. It is set to show a percentage of FSD which in this case is 40.05%.

For Digital channels the status will be shown as 0 (off) or 1 (on). For Pulse channels the status will display the current Pulse Count.

The status of all the Digital I/O of a module can be seen by selecting the card as opposed to the individual I/O channel. This will be displayed in the form '10011101', where '1' is on and '0' is off.

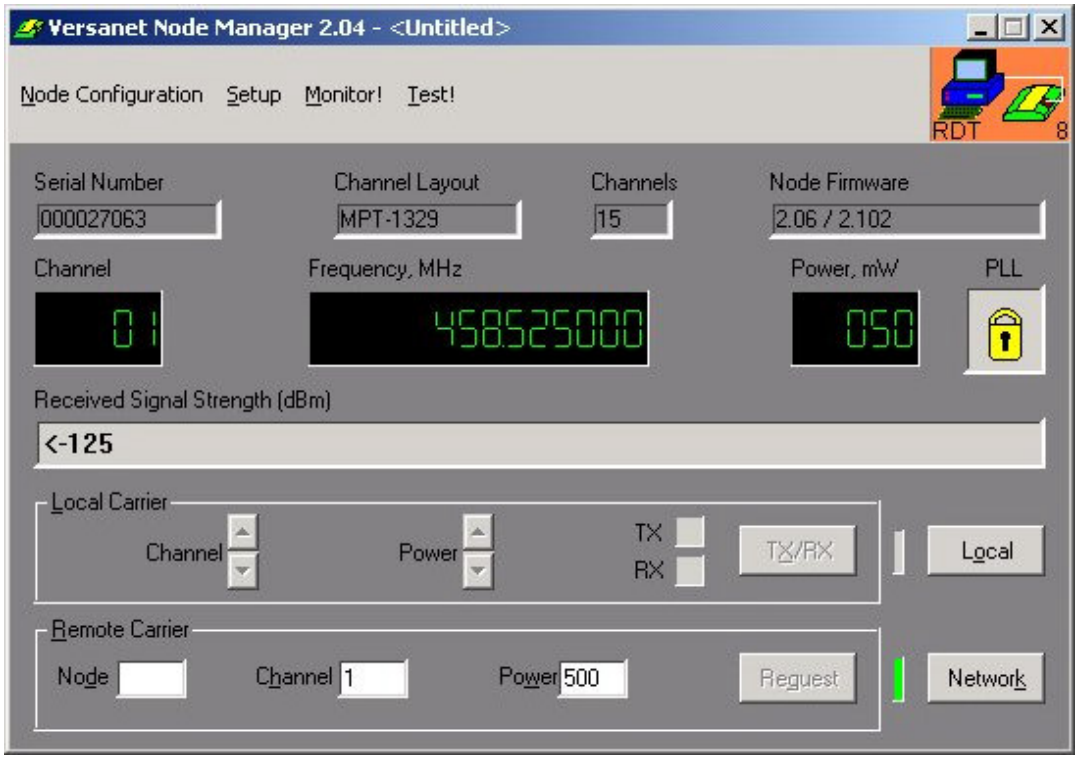
Alternatively, an input or output address may be typed directly into the box to the right of the buttons marked ' Input' and ' Output' . This is particularly useful where

' Virtual' addresses are used in a Node employing MODBUS to communicate to a SCADA system.

For Analogue channels it is possible to select how the status is displayed by selecting the on-screen drop down box 'Show Analog Value as..' and selecting an option from the available list.

4.4.13 Test

VNMGR is equipped with a Test facility which allows the user to conduct various tests, which aid the commissioning process.
Selecting the Test option from the main menu displays the following screen: -

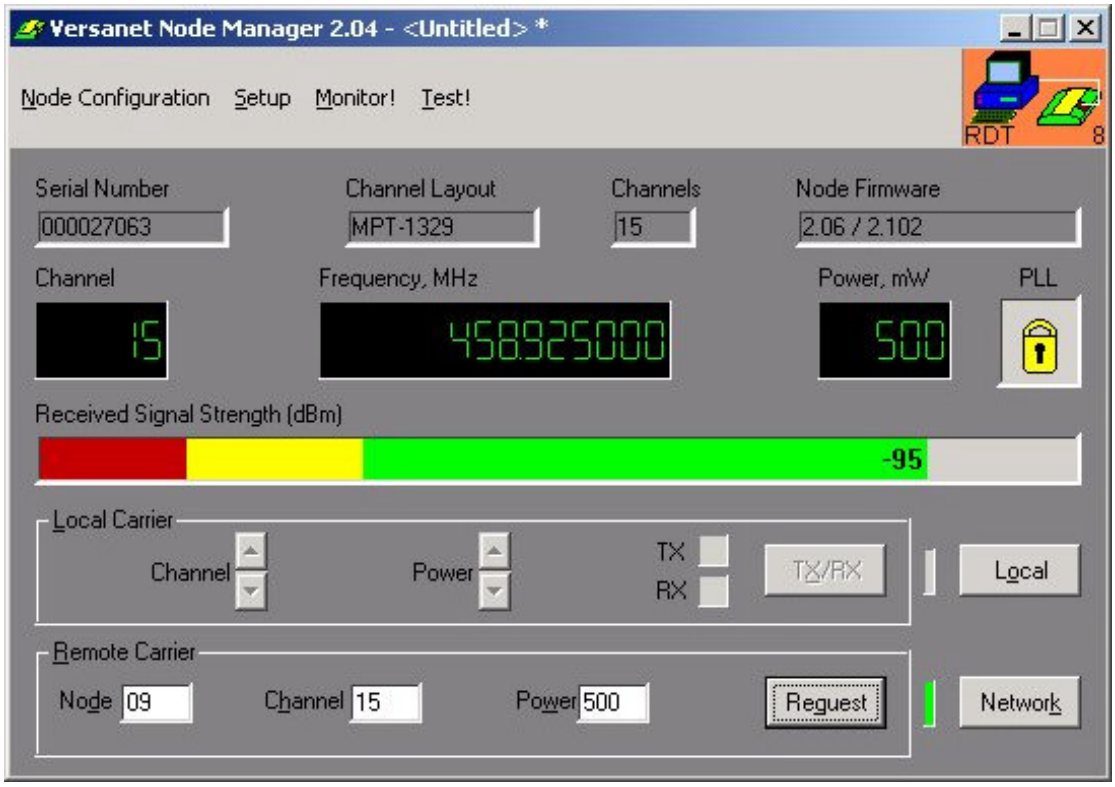


Screenshot 23 Test Screen

On entry to the Test screen, all static data is uploaded from the radio module. Static data includes Serial Number, Channel Layout and Number of Channels. This data is displayed constantly while the Node is connected to the PC. You can also see the version of software currently running.

Local/Network Mode

Two modes of operation exist within the Test facility, **Network** and **Local.**
With Network selected, it is possible to instruct a Remote Node, within radio range, to send you approximately 30 seconds of RF Carrier. This will be displayed on-screen in the form of a coloured sliding scale in the Received Signal Strength box. You can select the Node number to receive from, set its channel and power.
Using the Network mode **does not** suspend the normal operation of a VersaNet2 Node however, whilst the remote Node is transmitting the test signal, other Nodes in the network may experience radio interference, which may prevent them transmitting (listen before transmit).
For information on the signal strength indication, see Section 6.



Screenshot 24 Test Screen Showing RSSI

Local mode allows the user to 'toggle' between Transmit and Receive manually.

In Local mode the channel and output power can be selected. In Receive mode, each channel can be monitored for activity using the RSSI sliding scale with a suitable free channel selected. Transmit mode allows the user to measure output power and check antenna matching.
As a safety precaution, the Node will revert from Local back to Network mode after 30 seconds of inactivity. All original Network parameters are restored when reverting back.
It should be noted that accessing the Local mode **suspends** the normal operation of a VersaNet2 Node.

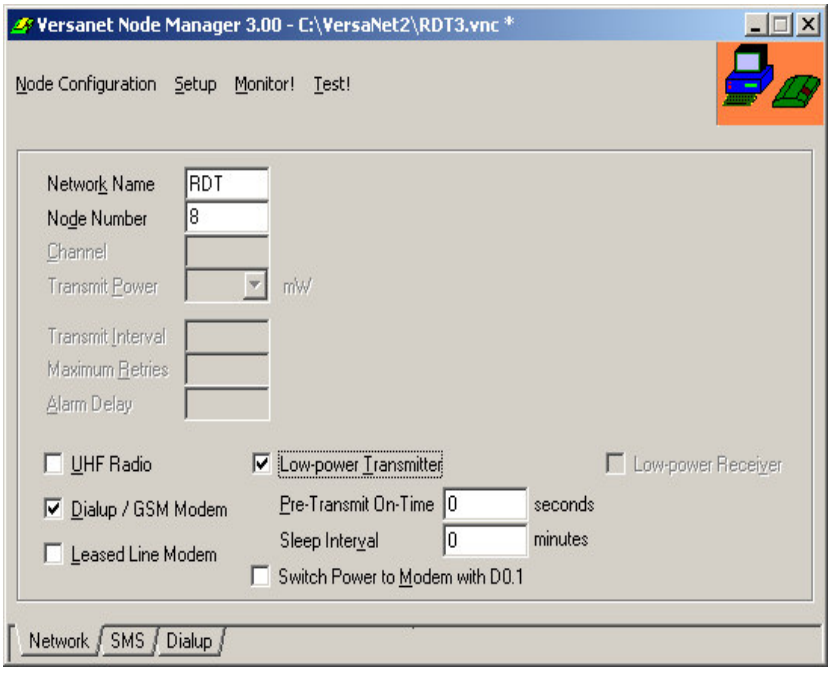
For full details of how to use the Test facilities refer to Section 6, Commissioning.

4.5 Low Power Dialup Operation

The software has been modified, from version 3 (V3.00) onwards, to improve low power operation, when using a Dialup modem, GSM or SMS. On previous versions, there was no facility to switch power to the modem, so it remained on, draining the battery. In the latest version, the D0.1 output relay can be used to switch power to the modem only when there is valid data to transmit. The 'Pre-Transmit On-Time' can still be used as before, to power up the Node a set period of time before transmitting, to allow an external sensor to stabilize.

4.5.1 Selecting Low Power Transmit

The Network screen has a new layout as shown below. (This is an update of *Screenshot 7* in section 4.4.3).



Screenshot 7a Modified Network Screen

See section 4.4.3 for general information on Node configuration.

When using a Dialup or GSM modem, ensure that the correct 'Dialup/GSM' check box is selected, as above. (Note that a UHF radio may also be selected). The Low Power Receiver check box is greyed out unless UHF radio is selected, because it is not relevant to Dialup.

The 'Pre-Transmit On-Time' allows the Node to be powered up a pre-set time before a transmission is due. This allows any sensors powered from the Node to stabilize prior to reading the value.

The 'Sleep Interval' sets the period that the Node stays in low power (sleep) mode. At the end of each period, the Node wakes up and checks its inputs. If any have changed to meet the pre-set criteria (see sections 4.4.8 and 4.4.9), they will be transmitted. The exact operation when the Node wakes up depends on the following: -

- If the 'Pre-Transmit On-Time' has been set (to e.g. 60 seconds), the Node will wake up and wait 60 seconds before checking the status of its inputs, to allow time for any sensors to stabilize.
- If the 'Switch Power to Modem with D0.1' check box is ticked, then the Node will wake up and check its inputs. If there is nothing to transmit, it will return to sleep mode. If there is data to transmit, it will switch S0.1 providing power to the modem. It will then wait until the line has been established before transmitting, hanging up and returning to sleep mode.
- If the modem is powered permanently from an external source, there is no need to tick the 'Switch Power to Modem with D0.1' check box. In this case, the Node will wake up and attempt to transmit immediately.

By switching the modem using D0.1, the modem is only powered when required and for the minimum possible time, offering maximum battery saving efficiency.

NOTE: In Low Power Transmit Mode, the Node can be activated (woken up from sleep mode), by switching the Input to D0.1. This can be used for an emergency alarm function. During sleep mode, none of the other inputs are active.

When the Node is activated by D0.1, it operates as above, scanning the inputs and sending any that have changed.

4.5.2 Dialup Connections

See Section 4.4.9 for details on programming dialup connections. The dialup screen is unchanged but one of the boxes (time interval) has a slightly different function.

Programme connections in the normal way. If the Node is in Low Power Transmit mode, make sure that the 'Transmit on Event' check-box is ticked and that the criteria for triggering the event is programmed. When the Node wakes up, it will only check inputs that have an 'Event' and associated trigger parameters programmed.

Because the Node has been programmed to wake up at set times (sleep interval), there is no need to tick the 'Transmit on Time' check box for each connection. It will automatically wake up and check the inputs at the specified time. If the 'Transmit on Time' box ticked however, and a value entered, the Node will wake up at that time (in addition to the specified sleep interval). This feature can therefore be used as a 'Health Check'.
In Low Power Transmit mode, the Node will only transmit data if an input has changed. If no input changes during a 24 hour period, no transmissions will be received and it may appear that the Node is dead or communication has failed. A selected input could therefore be set to transmit once every 12 or 24 hours to indicate that the Node and link are still working.