TNC user Guide

TNC – Telnet Communicator.

Inside -

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Quick start - for the impatient.

1. Power up each unit and see the LEDs cycle through a start-up pattern and stabilise after a few seconds.

2. Plug the unit into the same LAN segment as your workstation, or use a 'back to back' cable to connect it directly to your workstation. Use the latter method if you must be sure of the unit's settings before connecting it to your network.

3. Run the provided utility. All units that are connected to the local segment will be displayed in the left hand window. Select a unit and change its IP number by over-writing its existing number shown in the right hand box labelled 'New IP number'. Press 'SendIP' to save it to the unit. All other settings are unaffected.

4. Test that you have correctly entered the units IP number bybrowsing it with your preferred web browser (Tip – simply enter the IP number of the unit as the URL). You should now see the TNC's internal web page.

5. Using the web page you can now configure all the internal parameters of the unit–

    - You should enter the IP address of the default gateway if appropriate, and a sub-net mask. Enter IP numbers as dotted quads e.g. 158.152.46.132, and save the values into the unit by pressing 'SUBMIT'. Press the 'Back' (previous page) button to revert to the TNC page. Press 'Refresh' (or 'Reload') to check that the settings are as required. NB: if you change the IP address of the unit, remember to browse the new IP number!

    - Click on the red network port box on the picture of a back panel and select port1 as the Telnet port (port 2 is a diagnostic port) and press SUBMIT as above.

    - Click on the green serial port box for port 1 and set up the RS232 settings. Baud rate, handshake (meaning flow control method) and setting (meaning data bits, stop bits and parity). Press SUBMIT as above.

In case of problems, read the detailed sections that follow.

Diagnostic port.

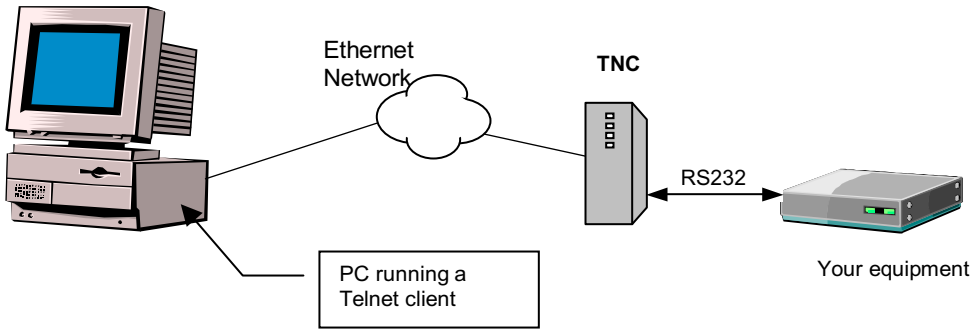
To help with testing, port 2 is a diagnostic port.

Connect a terminal, set to 9600 baud, 8, N, 1 to port 2– the 9 pin D towards the bottom of the unit. The serial ports are configured as DCEs, so a straight through cable is needed.

Type +++ to enter diagnostic mode. A string of characters appears which is a hex dump which can be viewed with Mite by selecting Hex display with key F5. In normal (not Hex display mode) type a capital S to view statistics.

Introduction

TNC allows you to communicate with all sorts of equipment fitted with V24 (RS232) ports over your network -



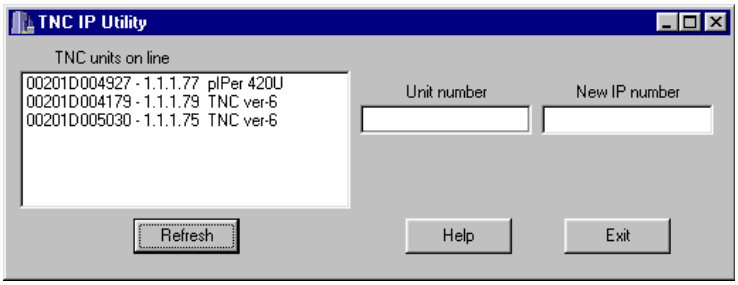
If your equipment has a V24 port offering a menu system, or a port that sends alarm messages or other data, you can now access it straight from your workstation, no matter where it is.

Entering the unit's IP number.

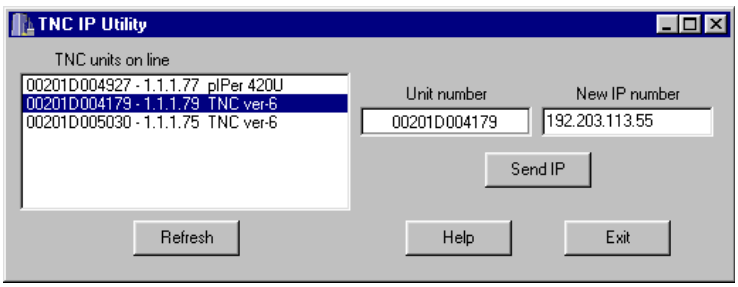
You must configure each unit by assigning a unique IP number. Each unit has storage for user settings, and these settings are reloaded each time the unit is powered up.

Power up the unit and allow the initialisation sequence to run, until only the status led (underneath) remains on. The initial IP number is entered into the unit with the supplied Windows utility. Thereafter, all settings are entered using your web browser.

Connect the new unit to the same LAN segment as your workstation. This is necessary because the utility searches by outputting an all 1's broadcast packet. Routers do not forward broadcasts by design – if they did networks all over the world would soon overload! Run the utility. All units that are connected to the local segment will be displayed in the left hand window–



Select a unit and change its IP number by over-writing its existing number shown in the right hand box labelled 'New IP number' –



Press 'SendIP' to save it to the unit. All other settings are unaffected.

Enter your chosen IP number as above into the URL line of your browser and access the TNC's internal web page. Enter an IP address for the default gateway and a sub-net mask. Enter IP numbers as dotted quads e.g. 158.152.46.132. To save the values into the unit press 'SUBMIT' and then press the 'Back' (previous page) button to revert to the TNC page. Press 'Refresh' (or 'Reload') to check that the settings are as required.

NB – if you change the IP address of the unit, remember to browse the new IP number!
You may need to use numbers provided by your network manager.

Notes on assigning IP numbers.

It is very important to assign IP numbers correctly - guessing won't do. Your workstation's IP number will determine the IP numbers you use on any TNC that will be connected to the same LAN segment. If you are using Windows 95/98 or NT workstation, you can find the IP number of your workstation by opening 'Control panel -Network – TCP/IP LAN adapter – properties'. Note the IP number and subnet mask numbers here. The 'Gateway' tab will show the IP address of the default gateway for the LAN segment used by your workstation. Note this number too.

For example, suppose your workstation has an IP number of 192.1.1.55, a gateway IP number of 192.1.1.254 and a subnet mask of 255.255.255.0 you must choose unused IP numbers in the range 192.1.1.0 to 192.1.1.253, remembering that other workstations, devices and gateways may already use some of these numbers. If in doubt, ask your network manager. So continuing this example, you could configure any TNC unit that will be connected to the same segment as your workstation with an unused IP number, perhaps 192.1.1.99, a gateway IP of 192.1.1.254 and subnet mask of 255.255.255.0. Remember that these are just examples.

If all the units are going to be connected to the same LAN segment with no gateways to other networks, you can invent IP numbers. For example, assign the default gateway the number 192.1.1.1, assign the units IP numbers in the range 192.1.1.2 to 192.1.1.255, and use a sub-net mask of 255.255.255.0.

Entering other TNC settings.

Telnet port selection - using your web browser, click on the red network port box on the picture of a back panel and select port 1 as the Telnet port (port 2 is a diagnostic port) and press SUBMIT as above. Notice that this page also shows the IP number of any workstation using the unit.

Serial port configuration - the factory default settings for the two serial ports are 9600 baud, 8 data bits, No parity, 1 stop bit, Xon/Xoff controlled output port. The unit allows setting baud rates in the range 110 to 115k, 7 or 8 data bits, odd, even or no parity, 1 or 2 stop bits. Click on the green serial port box for your chosen port and set it to suit the equipment it will be connected to-

Baud rate – choose from a pull down list.

Several serial port handshakes are available on a pull down list-

None - TNC ignores all RS232 control lines and Xon or Xoff characters passing through.
Hardware - TNC will stop inflowing data by lowering CTS and restart it by raising it again.
Xoff Input – TNC will stop inflowing data by sending an Xoff character and restart it by sending an Xon character.
Xoff Output – TNC will stop sending data if it receives an Xoff character and resume sending when it receives an Xon character.
Xoff Both – does both the actions described in 4 and 5 above.

Notes -
1. Remember to click 'SUBMIT' to save the settings
2. Incorrectly set handshakes result in data loss.

Connecting - connect to the desired terminal equipment taking with the connections in the cable. TNC serial port signals are as shown –

Signal name	Serial port 1 & 2
N/C	1
Data out of unit	2
Data into unit	3
N/C	4
Signal ground	5
N/C	6
RTS into unit	7
CTS out of unit	8
N/C	9

Testing - run your telnet client on your workstation and enter the IP number of the TNC concerned. Telnet is provided with Win95/98 and can be found in the Windows directory. Double click Telnet.exe to run it, or create a shortcut on your desktop. A large number of 3^{d} party programs can be found on the Internet, try TeraTerm, which can be found at Tucows.

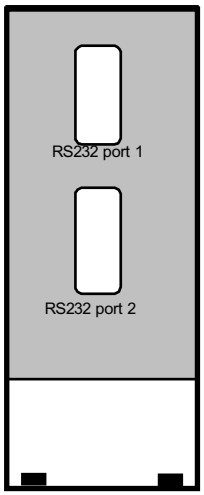
Trouble shooting.

Connect a loop back on your chosen serial port linking pins 2 and 3. Now, keys typed into your Telnet program should be echoed and appear on in the receive window.

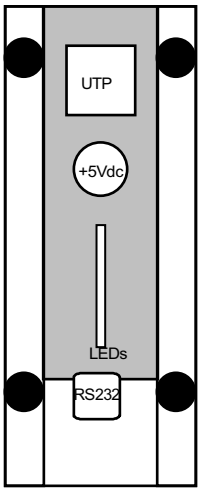
How to upgrade the firmware.

The TFTP protocol (a simple version of FTP) is used to upgrade TNC software. The software is provided as a file called TNC.BIN and is terminated with a Fletcher checksum. To upgrade aTNC, this file must be uploaded to it using TFTP. Please visit our website www.mutek.co.uk for instructions and links to TFTP clients suitable for use with Windows.

Layout of the connectors.



Rear view.



View underneath.

Specification.

RS232C ports - speeds up to 115.2k baud, 7 or 8 data, 1 or 2 stops, odd, even or no parity. Presented on D9 female connectors supporting Txd, Rxd, RTS, CTS and signal ground.

Network port - 10Mbit/s Ethernet presented on 10baseT (UTP) - 100m/segment.

Network protocols - IEEE 802.3 Ethernet encapsulates IP packets, as defined in RFC 894: IP, TCP, UDP, ARP, ICMP (ping) and TFTP.

Power supply – external universal switch mode PSU producing regulated +5Vdc. The PSU will operate correctly on AC voltages between 100Vac to 240Vac, 50/60Hz. Power requirement is 5 watts.

Indicators - LEDs are provided for each port -

- LAN port: - Front panel LEDs show, link made, error, transmitted data and received data
- Serial ports: - Bottom panel LEDs for Tx data, Rx data.

User settings are all saved in internal flash memory.

Enclosure - all metal case with electrically bonded panels ensure compliance with EMI/RFI standards. Size - Length 140mm; Width 50mm; Height 140mm. Weight 0.7Kg. Mounting arrangements - tabletop + rack mounting kit.

Environmental - 0 to 40 degrees centigrade; 5 to 95% humidity (non-condensing).