



NetPort User Guide

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1 Introduction

This User Guide provides a familiarisation tool to allow you to get your NetPort connected and get your RS232 equipment on the network as quickly as possible. It will take you step by step through hardware setup and configuration and help you verify that everything is working.

What this document will help you achieve:

- 1) Familiarise you with NetPort & the contents of the kits.
- 2) Connect NetPort to the LAN.
- 3) Install Device Installer from the CDROM and use it to detect your NetPort.
- 4) Assign an IP address to your NetPort so you can consistently reach it.
- 5) Change the serial settings in NetPort to match those of your serial equipment.
- 6) Make a successful connection and transfer data!

If you require more information than this User Guide covers, here are some options:

Data: www.alphamicro.net/netport

Technical info & FAQ's: www.alphamicro.net/netport/FAQ ** CONSTANTLY UPDATED **

Technical assistance: engineering@alphamicro.net

Note: *This document covers NetPort device server versions AMC232LAN01 & AMC232LAN01-DVK but the same knowledge can be applied to all the AMC232LAN01-06 products.*

2 What's in the Box

AMC Part Number	Comments	Type	PSU	CD	Packaging
AMC-232LAN01	NetPort bulk version	DTE	✖	✖	Bubble wrapped
AMC-232LAN01-DVK	Complete DTE kit	DTE	UK	✓	Cardboard carton
AMC-232LAN01-DVK/E	Complete DTE kit		Euro		
AMC-232LAN01-DVK/U	Complete DTE kit		USA		
AMC-232LAN02	NetPort bulk version	DCE	✖	✖	Bubble wrapped
AMC-232LAN02-DVK	Complete DCE kit	DCE	UK	✓	Cardboard carton
AMC-232LAN02-DVK/E	Complete DCE kit		Euro		
AMC-232LAN02-DVK/U	Complete DCE kit		USA		
AMC-232LAN03	NetPort encrypted bulk version	DTE	✖	✖	Bubble wrapped
AMC-232LAN03-DVK	Complete DTE encrypted kit	DTE	UK	✓	Cardboard carton
AMC-232LAN03-DVK/E	Complete DTE encrypted kit		Euro		
AMC-232LAN03-DVK/U	Complete DTE encrypted kit		USA		
AMC-232LAN04	NetPort encrypted bulk version	DCE	✖	✖	Bubble wrapped
AMC-232LAN04-DVK	Complete DCE encrypted kit	DCE	UK	✓	Cardboard carton
AMC-232LAN04-DVK/E	Complete DCE encrypted kit		Euro		
AMC-232LAN04-DVK/U	Complete DCE encrypted kit		USA		
AMC-232LAN06	NetPort bulk + DBP power feed	DTE	✖	✖	Bubble wrapped
AMC-232LAN06-DVK	Complete kit + DB9 power feed	DTE	UK	✓	Cardboard carton
AMC-232LAN06-DVK/E	Complete kit + DB9 power feed		Euro		
AMC-232LAN06-DVK/U	Complete kit + DB9 power feed		USA		

Type

DTE (Data Terminal Equipment) versions behave similarly to a PC Com Port and are regarded as the Masters in an RS232 connection. They are equipped with 200mm DB9 cables terminated with plugs (pins).

DCE (Data Communications Equipment) versions behave similarly to a modem and are regarded as the Slaves in an RS232 connection. They are equipped with 200mm DB9 cables terminated with sockets.

PSU

The PSU provided with the DVK's are:

UK versions	AMCPS046A	220v to 9v DC @ 600mA unregulated
European versions	AMCPS080	220v to 9v DC @ 600mA unregulated
USA versions	AMCPS081	110v to 9v DC @ 600mA unregulated

....and can be ordered separately should you application require. This unit supplies 9v DC (unregulated) at up to 600mA thus allowing more than one NetPort or piece of equipment to be powered at once.

With LAN06, this PSU can be used to power NetPort and the RS232 equipment but please check compatibility of your RS232 equipment before applying power to LAN06 versions.

NetPort can accept input voltages from 5v to 30v DC.

CDROM

The CDROM contains 2 software utilities that you will need for a successful installation as well as this user guide and various Applications Notes. It is free from licenses and therefore can be readily distributed to installers and end users if needed. Alternatively, all the content of the CD is available at www.alphamicro.net/netport.

Custom versions of NetPort

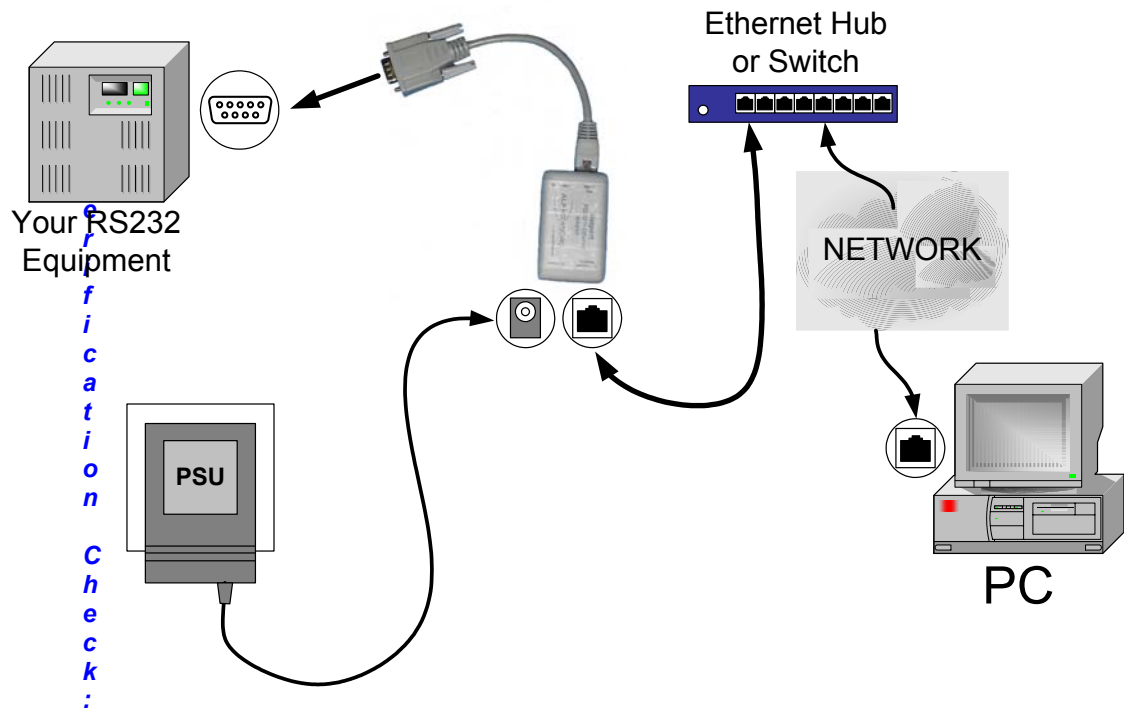
The above list is not exhaustive and customisation of NetPort to suit customer's requirements is available. Minimum order quantities for customisation will apply.

3 Connecting NetPort

To get started, you must connect the NetPort to your network. Follow the steps below:

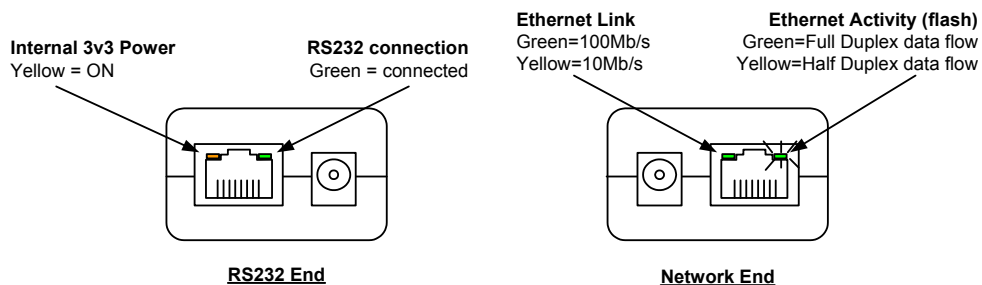
Note: This procedure assumes that the PC is connected to the network. You may connect a crossover Ethernet cable directly between the PC and NetPort if a network is not available but you will need to fix the IP address of both PC & NetPort for consistent operation.

The final setup should look like this:



If powered up correctly, the NetPort power LED will light yellow and remains on. This LED is on the RS232 end.

Verification Check 2: If the Ethernet Port on NetPort has authenticated with the LAN successfully then the LED's will confirm the speed and connect mode according to the RHS section of the diagram below:



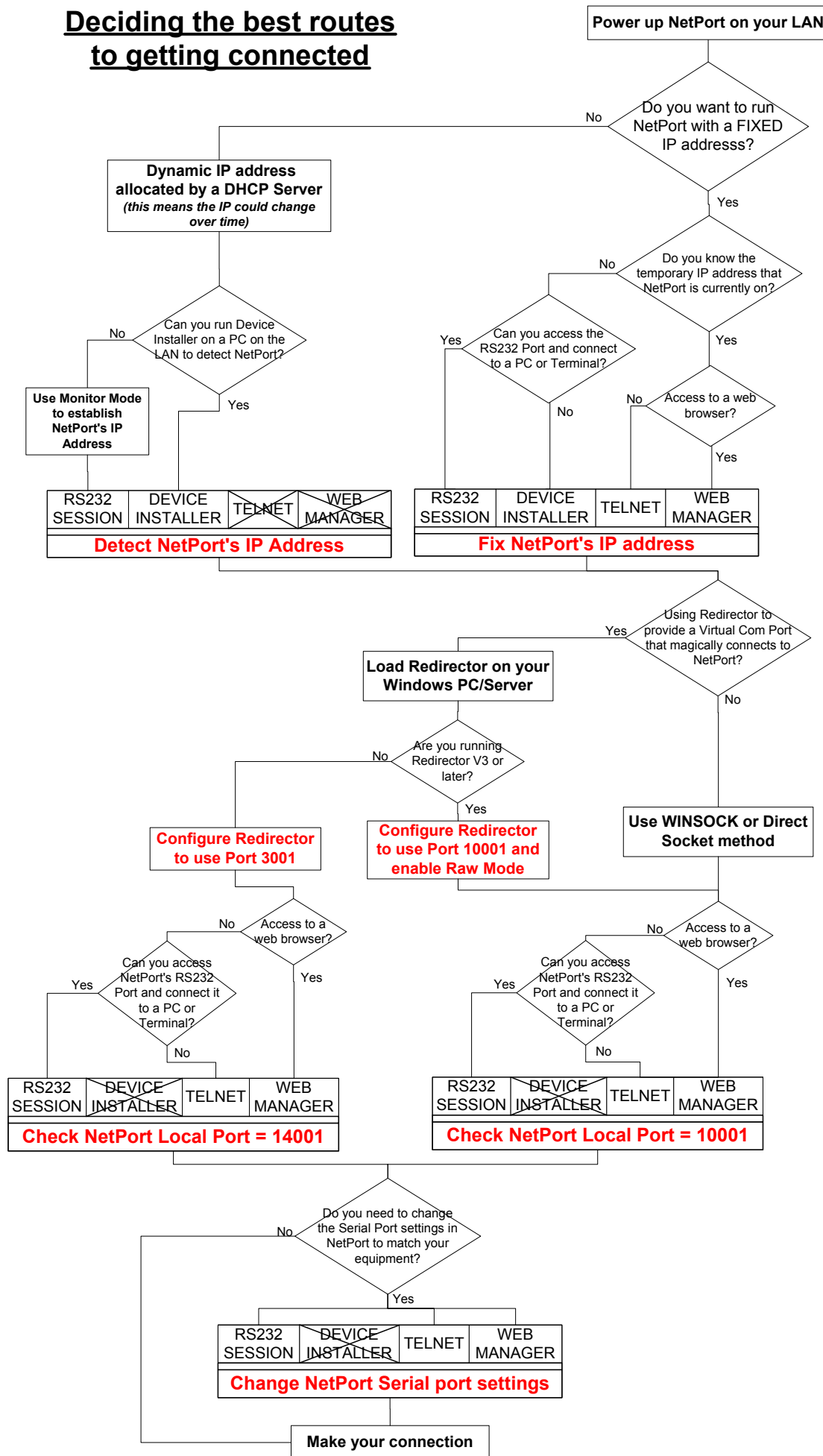
4 Configuring NetPort

The next sections will help you to carry out the following:

- Identify the NetPort on your LAN
- Allocate an IP address to your NetPort
- Set up a 'serial tunnel' from the network to the NetPort
- Change settings in NetPort to make it compatible with your serial equipment.

The following diagram may help you to establish what decisions you need to make and the appropriate action to get things running as quickly as possible:

Deciding the best routes to getting connected



Establishing the IP Address

Establishing the connection mode

Changing NetPort to suit the connection

Changing NetPort to suit your equipment

What you need to know before you start

IP Address

Your NetPort must have a unique IP address on your network.

The system administrator generally provides the IP address, subnet mask, and gateway or they will opt for it to be allocated by the DHCP Server dynamically each time it is powered up – consequently it can change.

The IP address must be within a valid range, unique to your network, and in the same subnet as your PC, check with your IT administrator for appropriate addresses.

IP Address: _____

Subnet Mask: _____

Gateway _____

Hardware Address

You may need to know the unit's hardware address (also known as a MAC address). On later NetPorts this is printed on the white label which is fixed to the underside of the unit. Earlier NetPorts did not have this label so you may need to use Device Installer to detect this MAC address and write it down if required.

The format is: 00-20-4a-XX-XX-XX, where XXs are unique numbers assigned to the product.

Assigning IP Addresses

The unit's IP address is set to 0.0.0.0 at the factory which established it in DHCP Client mode and will attempt to obtain an IP address, Subnet & Gateway from a DHCP Sever.

You have several options for manually assigning an IP to your unit. We recommend that you connect the NetPort to the network and assign the IP address using DeviceInstaller, which is on the NetPort CDROM.

4.1 Install DeviceInstaller

1. Install DeviceInstaller from the CD-ROM. If the CD does not launch automatically browse the '**Device Installer**' folder and run the **setup.EXE** file
2. Respond to the installation wizard prompts. You may be prompted to install .NET frameworks to bring your Windows installation up to date to be able to run DeviceInstaller. These are provided on the CDROM but your PC may choose to (or already done so) download from Microsoft.

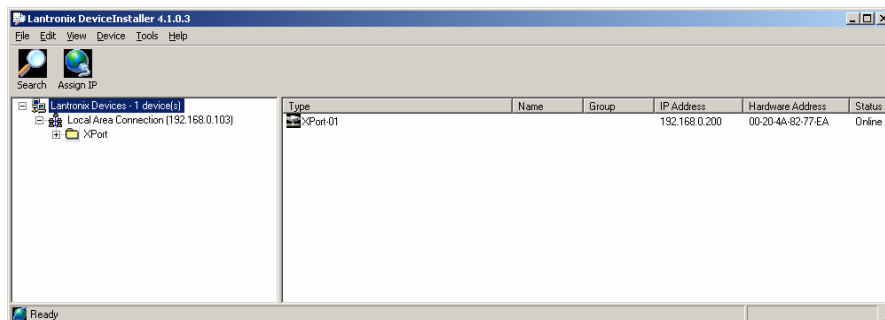
Note: For more information about DeviceInstaller, see the DeviceInstaller help menus.

4.2 Running DeviceInstaller

1. Click **Start\Programs\Lantronix\DeviceInstaller**. If your PC has more than one network adaptor, a message displays. Select the adaptor that the NetPort will be attached to and click OK.
2. Press Search to detect NetPorts on the network. If the Search window reveals 'No Devices Found', press Search again until your NetPort is shown. You may need to wait for up to 30 seconds for all NetPorts to be shown, keep pressing Search.

Note: If the unit cannot find a DHCP Server to obtain an address then it will default into AutoIP mode, assuming an IP address in the region 169.254.xxx.xxx and show in DeviceInstaller in red. In some cases re-applying power to the Netport will allow it to enumerate on your network successfully. If the Network has no DHCP Server then you will have to set the IP address manually. See section: 4.3 Assign IP Manually

You should see something like this:



By selecting the relevant NetPort you are then able to change the configuration via 2 methods, choose whichever suits you:

- Telnet (ASCII menus over the network)
- Web Config (via any web browser)

Note: It is also possible to configure NetPort via the RS232 port using an application such as HyperTerminal. See section: 4.4.4 Via Serial Port (master config port)

4.3 Assign IP Manually

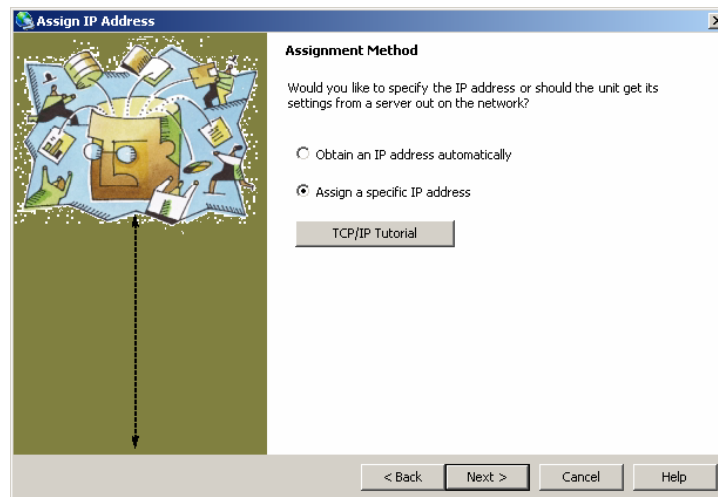
There are 2 ways to achieve this depending on whether or not you have successfully detected NetPort using Device Installer.

4.3.1 If the NetPort is shown in DeviceInstaller:

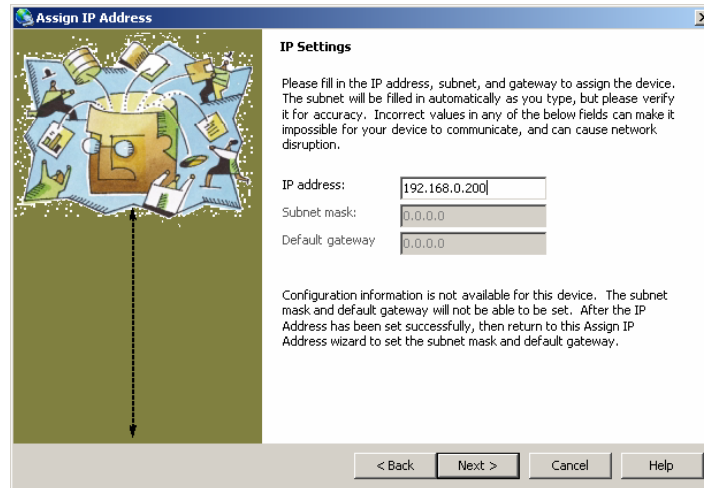
1. Select the NetPort to be modified
2. Click the **Assign IP** icon.



3. Select Assign a specific IP address and click Next.



4. Enter the IP address. The Subnet mask displays automatically based on the IP address; if desired, you may change it. On a local network, you can leave the Default Gateway blank (all zeros). Click Next.



Assign IP Address

IP Settings

Please fill in the IP address, subnet, and gateway to assign the device. The subnet will be filled in automatically as you type, but please verify it for accuracy. Incorrect values in any of the below fields can make it impossible for your device to communicate, and can cause network disruption.

IP address:

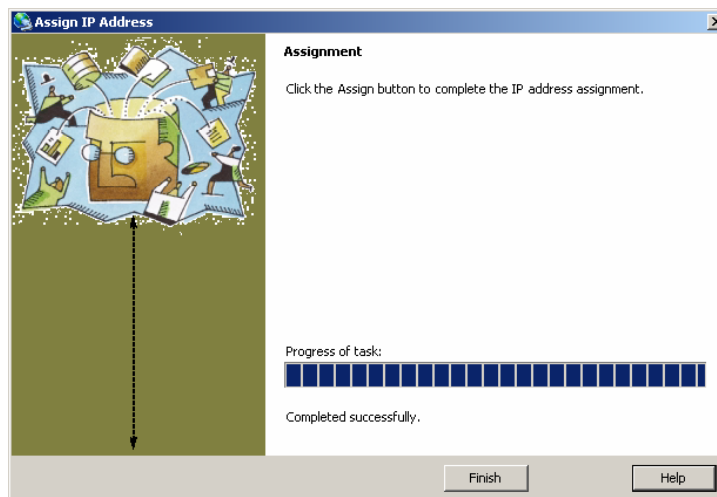
Subnet mask:

Default gateway:

Configuration information is not available for this device. The subnet mask and default gateway will not be able to be set. After the IP Address has been set successfully, then return to this Assign IP Address wizard to set the subnet mask and default gateway.

< Back Next > Cancel Help

5. Click the Assign button and wait several seconds until a confirmation message displays. Click Finish.



Assign IP Address

Assignment

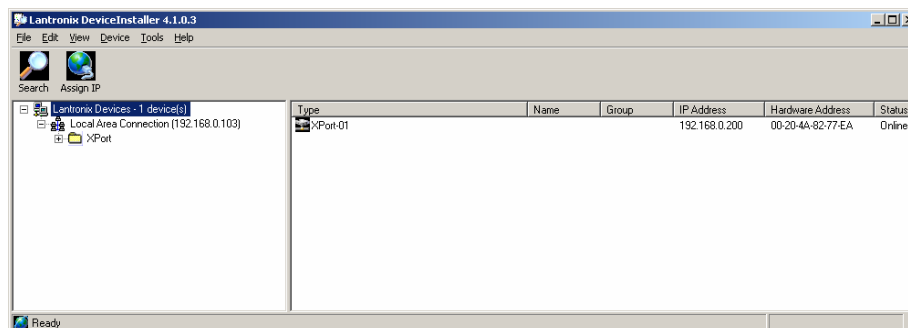
Click the Assign button to complete the IP address assignment.

Progress of task:

Completed successfully.

Finish Help

6. You should see NetPort displayed like this:



Lantronix DeviceInstaller 4.1.0.3

File Edit View Device Tools Help

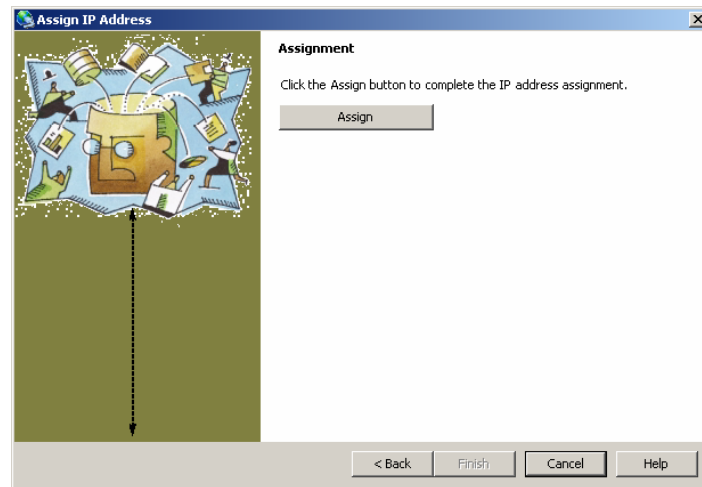
Search Assign IP

Type	Name	Group	IP Address	Hardware Address	Status
xPort	xPort-01		192.168.0.200	00:20:4A:82:77:EA	Online

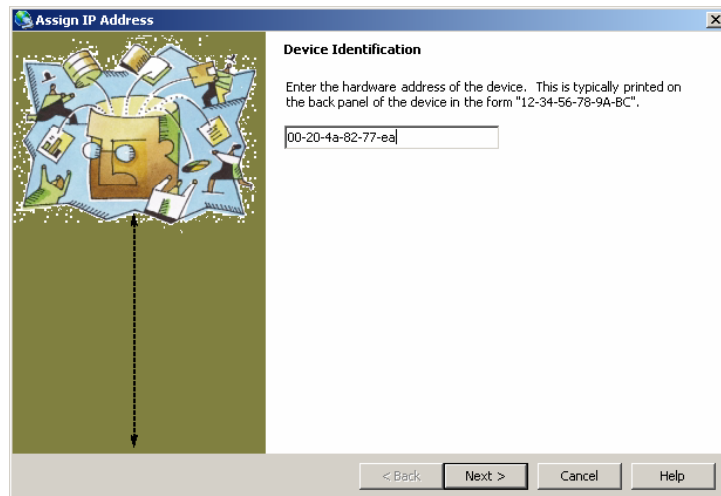
Ready

4.3.2 If the NetPort is NOT shown in DeviceInstaller:

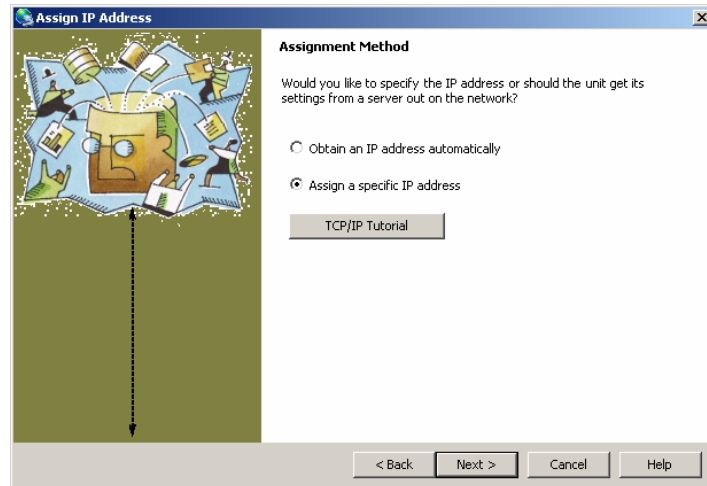
- 1) Click on **Assign IP**



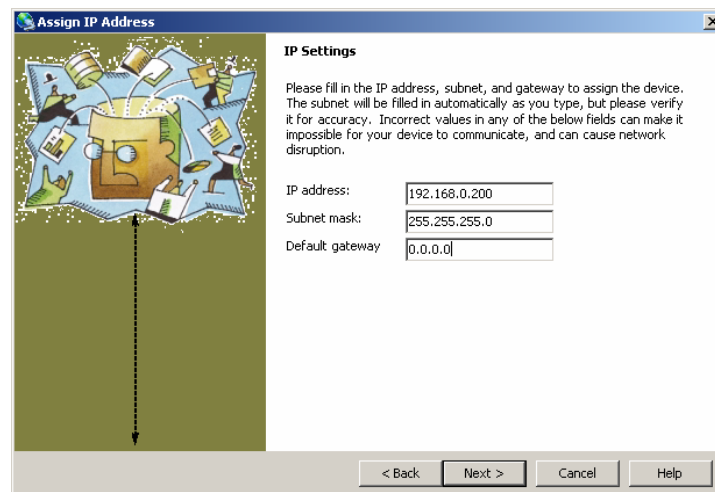
- 2) When prompted, enter the hardware address in the format 00-20-4a-XX-XX-XX, where the XXs are unique numbers assigned to each individual product. Click **Next**.



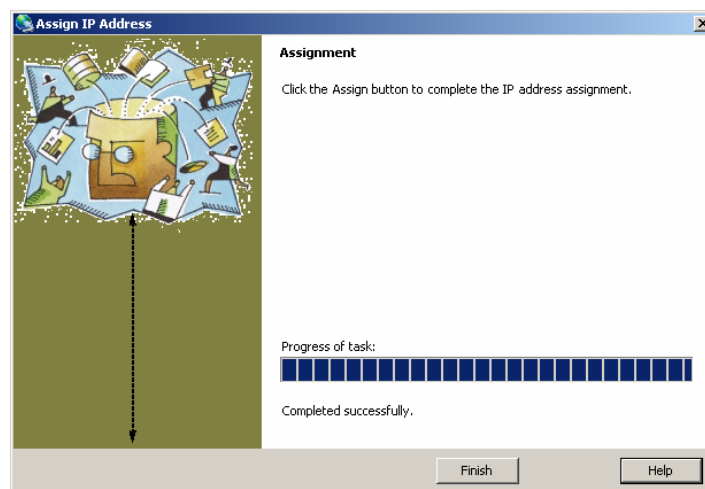
- 3) Select Assign a specific IP Address



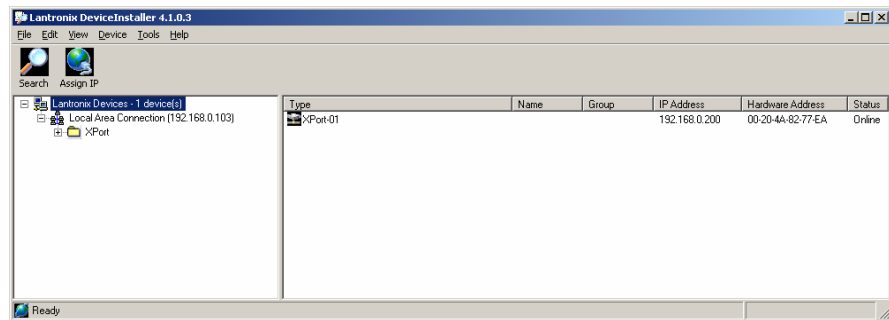
- 4) Enter the IP address. The Subnet mask displays automatically based on the IP address; if desired, you may change it. On a local network, you can leave the Default gateway blank (all zeros). Click **Next**.



- 5) Click the Assign button and wait several seconds until a confirmation message displays. Click Finish.



6) You should see NetPort shown similar to this:



4.4 Changing NetPort's Serial Parameters to connect to your Equipment

To do this you can use:

- Web Config (via any webbrowser)
- Telnet (ASCII menus over the network)
- RS232 port using an application such as HyperTerminal.

4.4.1 Via Web Interface

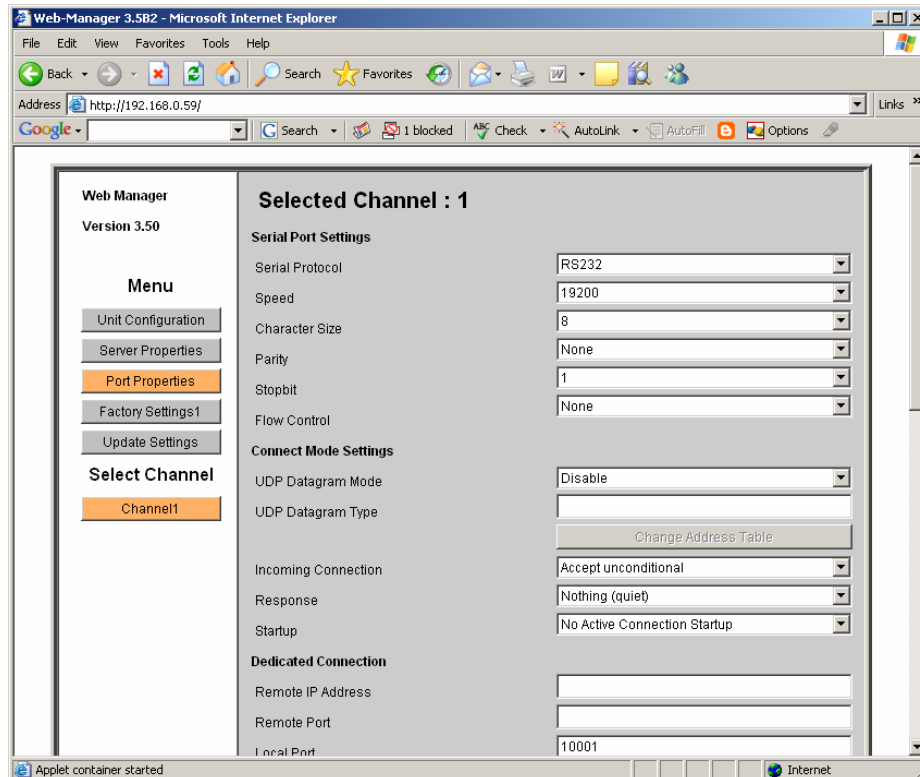
4.4.2

Open a browser on a computer on a compatible Subnet as the NetPort.

Enter the IP Address of the NetPort into the browser and press ENTER.



Within 5 seconds a Java-based applet will upload into the browser and look like this:



Change the relevant settings for your needs. Here are some of the most commonly used parameters:

In the Server Properties page:

IP Address:

The unique address that the NetPort resides at. Over type this field to fix the IP Address – this may mean that it is incompatible with other LAN's that it is subsequently connected to. Leave as 0.0.0.0 for DHCP (dynamically allocated by the DHCP Server on your LAN) but be aware that the IP Address could change over time as the DHCP Server refreshes this.

Subnet mask:

Defines the range of IP Addresses that this device has access to and vice versa. In a typical Class C Private Network using the range 192.168.0.x the subnet will be 255.255.255.0 (or 8 bit). Leave as 0.0.0.0 for DHCP allocated.

Gateway:

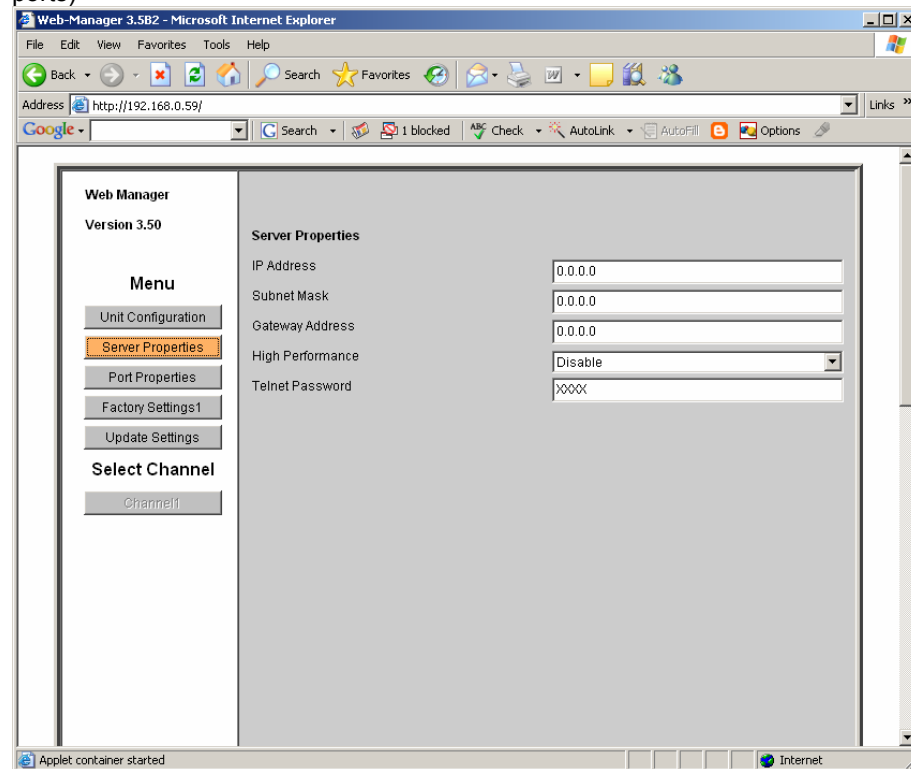
If the NetPort is expected to establish connection outside of the Firewall/Gateway that belongs to the LAN you will need to tell it which Gateway to use. Leave as 0.0.0.0 for DHCP allocated.

High Performance

ONLY enable if you need the NetPort to run at RS232 speeds of 460kbps & 920kbps.

Telnet Password

Only update this field if you wish to apply a password to Telnet sessions to the device (all ports)



In the Port Properties page

Speed

NetPort port speed which needs to match the speed of your RS232 device

Flow Control

Select **CTS/RTS** for automatic hardware flow control of buffered data (factory default) **Note:** CTS/RTS are not manually controllable over the LAN.

Select **Xon/Xoff** for software flow control of buffered data

Select **None** for simple 3 wire UART connection where flow control is not necessary

Local Port

This is the TCP/IP Port that NetPort uses for the data in & out of the RS232 port. In most cases set this to 10001 for a standard connection. (older units may be factory set to 10001)

Incoming Connection

Select **Connect with DTR** if you want an incoming connection only to be permitted when DTR is asserted by your RS232 equipment.

Select **Unconditional** to accept all incoming connections

Startup

Select the appropriate option if you want an outgoing connection to be established under certain criteria. In most cases you will need to enter a **Remote Host & Remote Port** in the field below to tell NetPort what to connect to.

Modem Mode allows you to dial an IP address manually from NetPort's RS232 port via an interface that mimics a basic modem AT command line. For example:

Type: ATDT 192.168.0.1, 10001

Reply is either: CONNECT (and you are in transparent mode)

Or NO CARRIER (and you remain in command line mode)

ATH or +++ to exit transparent mode.

Remote IP Address

In cases when you want NetPort to initiate the connection, specify the IP Address of the target device here. **Note:** if you are attaching to a device behind a firewall, you may need to add an entry into the routing table to reach the remote device.

Remote Port

Specify the remote TCP/IP port of the device you wish NetPort to connect to. This port number does not have to be the same as that set inside NetPort, thus allowing connections to equipment other than NetPort's.

Flush Mode

Controls whether you want to flush the contents of any buffers upon a new connection or preserve them.

Packing Algorithm

Can be used to avoid fragmentation of your data should packetisation cause data corruption.

Telnet Mode

Allows you to Telnet into the RS232 port of NetPort if enabled. Switch off if not used as it will filter certain bytes from your data.

Port Password

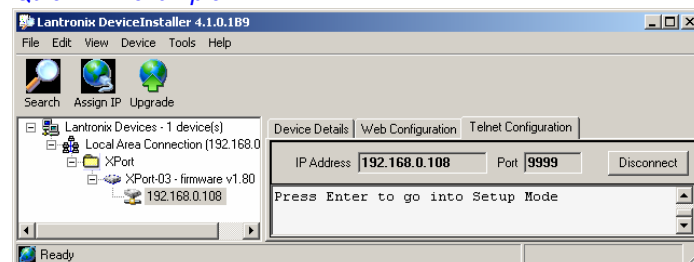
If enabled requires the Telnet Password to be entered before a connection is authorised.

4.4.3 Via Telnet

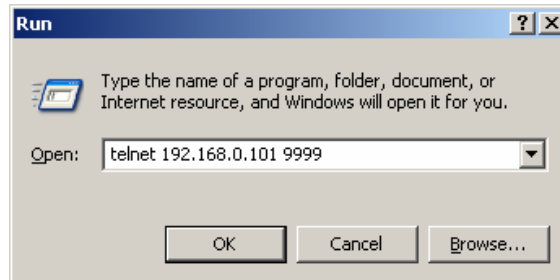
Note. If you or any other user has disabled Telnet previously inside NetPort then this option will not be available until it is re-enabled.

You can use the Quick Link Icon in Device Installer to enter Telnet config or you can run Telnet from a command line or windows shell.

Quick Link example

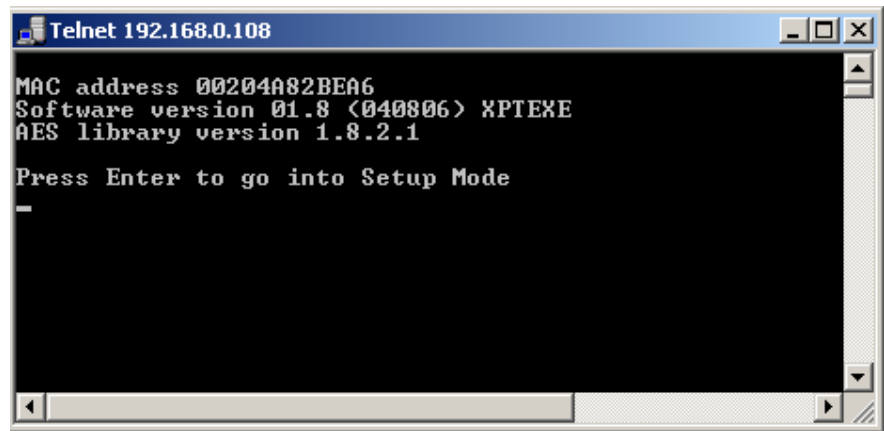


Command Line example



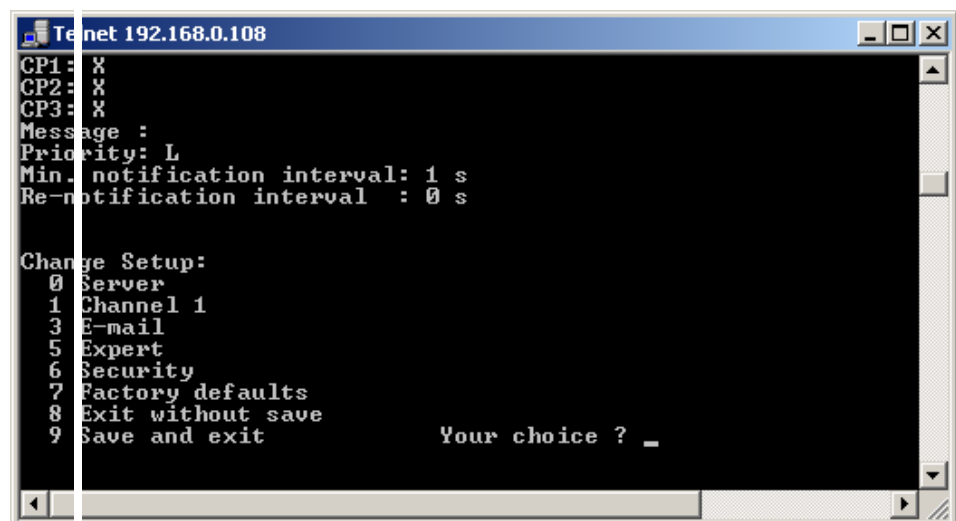
In any event, you must specify Port 9999 as the destination port to be able to enter the configuration menus. *Telnetting to port 10001 will result in you connecting to the RS232 port of NetPort and not the config menus.*

Once Telnet has established a link:



You will need to press ENTER within 3 seconds or NetPort will time out and close the session.

Once the session has begun NetPort will scroll through all of its config in an ASCII format and then offer an ASCII menu.



See Appendix A – Setup Mode Parameters for a full breakdown of the options

and hexadecimal masks.

In Summary:

To change IP address, Gateway, Subnet and DHCP name (where applicable) use **Menu 0**

To change the serial settings (baud rate handshaking etc) use **Menu 1**

To change the Local Port, Remote IP address & Remote Port use **Menu 1**

To enable or disable telnet, HTTP, SNMP, TFTP & passwords use **Menu 6**

To restore factory default settings (except IP address/subnet/Gateway) use **Menu 7**

Tip: Press ENTER to move through the menu fields without changing them.

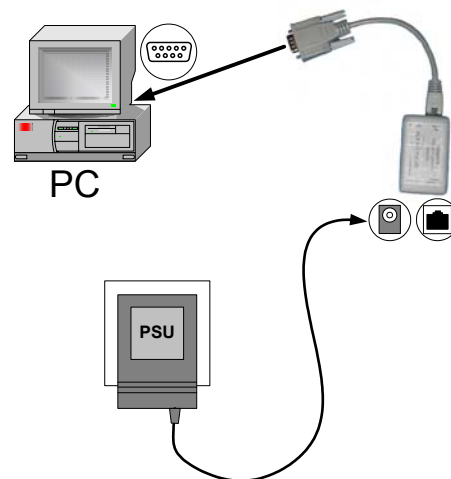
Top-tip: Ensure you save any changes made in the above by selecting **Menu 9**



4.4.4 Via Serial Port (master config port)

The RS232 port is always enabled and is therefore the master config port. To access the config menus you will need to establish a serial session using a PC or Terminal.

1. For a PC, connect as follows:



Connect NetPort to the COM Port of the PC.

LAN01 & LAN06 variants will require a null modem cable to transpose the TX/Rx wires as both the PC & LAN01 are DTE devices. A null modem cable in its simplest form connects the GND (pin 5) and crosses the Tx (pin 3) and Rx (pin 2) wires over.

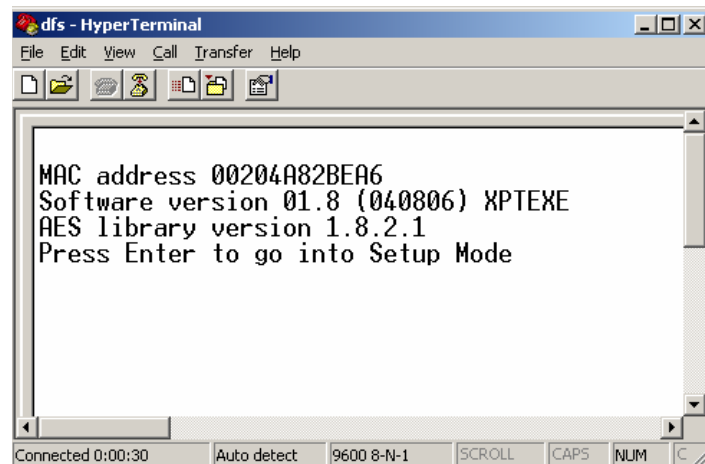
LAN02 variants will connect directly to the COM Port.

DO NOT POWER THE NETPORT YET

2. On the PC, run a Terminal Application such as HyperTerminal, MTTY or similar. Set the Application to connect with the following settings:

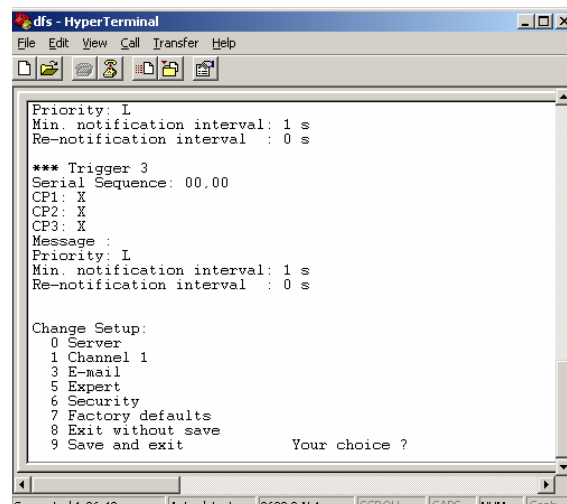
9600bps, No parity, 8 bit data, 1 stop bit, no handshaking

3. Once the Application is running, power up the NetPort and hold down the 'x' key on the PC until you receive the following prompt:



Note: If the CAPS lock is enabled on your keyboard NetPort will not respond. Turn off CAPS Lock, turn off power to NetPort and repeat the above.

4. You will need to press ENTER within 3 seconds or NetPort will time out and close the session.
5. Once the session has begun NetPort will scroll through all of its config in an ASCII format and then offer an ASCII menu.



See Appendix A – Setup Mode Parameters for a full breakdown of the options and hexadecimal masks.

In Summary:

To change IP address, Gateway, Subnet and DHCP name (where applicable) use **Menu 0**

To change the serial settings (baud rate handshaking etc) use **Menu 1**

To change the Local Port, Remote IP address & Remote Port use **Menu 1**

To enable or disable telnet, HTTP, SNMP, TFTP & passwords use **Menu 6**

To restore factory default settings (except IP address/subnet/Gateway) use **Menu 7**

Tip: Press ENTER to move through the menu fields without changing them.

Top-tip: Ensure you save changes made in the above by selecting **Menu 9** 😊

5 Sending/Receiving data

The NetPort should now be enumerated on your LAN and can receive/send data according to its standard serial settings:

- 9600b/sec, No parity, 8 bit data, 1 stop bit
- Handshaking set to CTS/RTS

If your RS232 equipment can communicate in this data format then all you need to do now is open an application on a networked PC to send/receive.

5.1 If you do NOT have an application which can talk to a TCP/IP Socket.

You have 2 options without creating a specific software application:

1. Use **Com Port Redirector** to assign a Virtual Com Port to the NetPort, you can then use your existing application software to communicate via COMx over the Ethernet without any TCP/IP knowledge. (where x is the Com Port number you have configured in Redirector)
 - a) Install Com Port Redirector on the PC that the Virtual Com Port is required using the NetPort CDROM.
 - b) Run Redirector by clicking **Start\Programs\Lantronix\Redirector\Configuration.**

See the AMC-AN-LAN07 Com Port Redirector Apps Note Iss01.pdf on the CDROM for more help.

Redirector config Notes: When configuring the **TCPPort**, enter a value of 10001, ensure **Raw Mode** is enabled in **Port Settings**.

Note: At the time of going to press, NetPort is factory set to Local Port = 14001 and will need changing by the user to 10001. See section: 4.4 Changing NetPort's Serial Parameters to connect to your Equipment

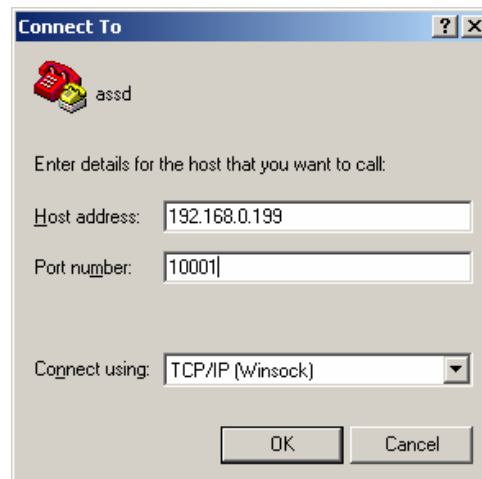
2. Use **HyperTerminal-32bit** (included in Windows Xp & Windows 2000) in Winsock mode to connect over the Ethernet to the NetPort.

Note: At the time of going to press, NetPort is factory set to Local Port = 14001 and will need changing by the user to 10001. See section: 4.4 Changing NetPort's Serial Parameters to connect to your Equipment

- Run HyperTerminal from the Accessories\Communications menu.
- Select TCP/IP (Winsock) mode from the pull-down menu.



- Enter the IP Address of your NetPort and 10001 for the port number:



If HyperTerminal does not successfully connect, check that you have entered the IP address and Port number correctly. Additionally, check that the NetPort settings match the baud rate and port number you have entered in HyperTerminal.

5.2 If you have an application already which can talk to a TCP/IP Socket

You need to configure your Application to use Socket (Port) number 10001 and ensure this is

the same inside NetPort.

To do this you can use:

- Telnet (ASCII menus over the network)
- Web Config (via any webbrowser)
- RS232 port using an application such as HyperTerminal.

Note: *At the time of going to press, NetPort is factory set to Local Port = 14001 and will need changing by the user to 10001. See section: 4.4 Changing NetPort's Serial Parameters to connect to your Equipment*

6 Appendix A – Setup Mode Parameters

The following is the raw breakdown of the Setup Mode Parameters that apply to NetPort.

You can enter Setup Mode using the following procedures locally or remotely:

- Use a Telnet connection to configure the unit over the network.
- Use a terminal/emulation program to access the serial port locally.
-

The unit's configuration is stored in nonvolatile memory and is retained without power. You can change the configuration at any time. The unit performs a reset after the configuration has been changed and stored.

Note: The menus in this section show a typical device. Your device may have different configuration options.

6.1 Accessing Setup Mode

Using a Telnet Connection

To configure the unit over the network, establish a Telnet connection to port 9999.

Note: You can also use DeviceInstaller to access Telnet. Select the device from the main window list, and click the **Telnet** icon. If you use the **Telnet** icon on the DeviceInstaller toolbar, skip steps 1 and 2.

1. From the Windows **Start** menu, click **Run** and type the following command, where x.x.x.x is the IP address, and 9999 is the unit's fixed network configuration port number:

```
telnet x.x.x.x 9999
```

Note: Be sure to include a space between the IP address and 9999.

2. Click **OK**. The following information displays.

MAC Address

```
MAC address 00204041164D
Software version 01.3b1 <030605> XPTE
Press Enter to go into Setup Mode
```

3. To enter the Setup Mode, **press Enter within 5 seconds**. The configuration settings display, followed by the setup menu options.

Setup Menu Options

```
Change Setup:
0 Server configuration
1 Channel 1 configuration
3 E-mail settings
5 Expert settings
6 Security
7 Factory defaults
8 Exit without save
9 Save and exit
?                                     Your choice
```

4. Select an option on the menu by entering the number of the option in the **Your choice?** field and pressing **Enter**.
5. To enter a value for a parameter, type the value and press **Enter**, or to confirm a current value, just press **Enter**.
6. When you are finished, save the new configurations (option 9). The unit reboots.

Using the Serial Port

To initially configure the unit through a serial connection:

1. Connect a console terminal or PC running a terminal emulation program to your unit's serial port. The default serial port settings are 9600 baud, 8 bits, no parity, 1-stop bit, no-flow control.
2. To enter Setup Mode, reset the unit by cycling the unit's power (power off and back on). The self-test will begin. **You have one second** to enter three lowercase **x** characters (**xxx**).

Note: *The easiest way to enter Setup Mode is to hold down the **x** key at the terminal (or emulation) while resetting the unit.*

3. At this point, the screen display is the same as when you use a Telnet connection

The following figure shows all of the configuration parameters. The remainder of this Appendix describes each parameter in detail.

```

*** basic parameters
Hardware: Ethernet IPI
IP addr 172.19.205.35, no gateway set

*** Security
SNMP is          enabled
SNMP Community Name: public
Telnet Setup is  enabled
TFTP Download is enabled
Port 77FEh is    enabled
Web Server is    enabled
ECHO is          disabled
Encryption is    disabled
Enhanced Password is disabled
Port 77FEh is    enabled

*** Channel 1
Baudrate 9600, I/F Mode 4C, Flow 00
Port 1000h
Remote IP Addr: --- none ---, Port 0000h
Connect Mode : 00
Disconn Mode : 00
Flush Mode : 00

*** Expert
TCP Keepalive : 45s
ARP cache timeout: 600s
High CPU performance: disabled
Monitor Mode @ bootup : enabled
HTTP Port Number : 80
SMTP Port Number : 25

***** E-mail *****
Mail server: 0.0.0.0
Unit :
Domain :
Recipient 1:
Recipient 2:

*** Trigger 1
Serial Sequence: 00.00
CP1: X
CP2: X
CP3: X
Message :
Priority: L
Min. notification interval: 1 s
Re-notification interval : 0 s

*** Trigger 2
Serial Sequence: 00.00
CP1: X
CP2: X
CP3: X
Message :
Priority: L
Min. notification interval: 1 s
Re-notification interval : 0 s

*** Trigger 3
Serial Sequence: 00.00
CP1: X
CP2: X
CP3: X
Message :
Priority: L
Min. notification interval: 1 s
Re-notification interval : 0 s

```

6.2 Server Configuration (Network Configuration)

The unit's basic network parameters display when you select **Server configuration** (option 0). The **IP Address**, **Set Gateway IP Address**, and **Netmask** fields display the current values.

Server Configuration Parameters

```

IP Address : (000) .(000) .(000) .(000)
Set Gateway IP Address (N)
Netmask: Number of Bits for Host Part (0=default) (0)
Change telnet config password (N)

```

6.2.1 IP Address

The IP address must be set to a unique value in your network.

Set Gateway IP Address

The gateway address, or router, allows communication to other LAN segments. The gateway address should be the IP address of the router connected to the same LAN segment as the unit. The gateway address must be within the local network. The default is N (No), meaning the gateway address has not been set. To set the gateway address, type **Y** and enter the address.

Netmask: Number of Bits for Host Part

A Netmask defines the number of bits taken from the IP address that are assigned for the host section.

Note: Class A: 24 bits; Class B: 16 bits; Class C: 8 bits

The unit prompts for the number of host bits to be entered, then calculates the Netmask, which displays in standard decimal-dot notation when the saved parameters are displayed (for example, 255.255.255.0).

Network Class	Host Bits	Netmask
A	24	255.0.0.0
B	16	255.255.0.0
C	8	255.255.255.0

Change Telnet Configuration Password

Setting the Telnet configuration password prevents unauthorized access to the setup menu via a Telnet connection to port 9999 or via web pages. The password must have 4 characters. An enhanced password setting (for Telnet access only) of 16 characters is available under **Security Settings**.

Note: You don't need a password to access the Setup Mode window via a serial connection.

DHCP Name

If a DHCP server has automatically assigned the IP address and network settings, you can discover the unit by using the DeviceInstaller network search feature. There are three methods for assigning DHCP names to the unit.

- **Default DHCP Name:** If you do not change the DHCP name, and you are using an IP of 0.0.0.0, then the DHCP name defaults to CXXXXXX (XXXXXX is the last 6 digits of the MAC address shown on the label on the bottom/side of the unit). For example, if the MAC address is 00-20-4A-12-34-56, then the default DHCP name is C123456.
- **Custom DHCP Name:** You can create your own DHCP name. If you are using an IP address of 0.0.0.0, then the last option in Server configuration is:

```
Change DHCP device name (not set) ? (N) Y
Enter new DHCP device name : LTX
```

- **Change DHCP device name.** This option allows you to change the DHCP name to an alphanumeric name (LTX in our example).
- **Numeric DHCP Name:** You can change the DHCP name by specifying the last octet of the IP address. When you use this method, the DHCP name is LTXYY where YY is what you chose for the last octet of the IP address. If the IP address you specify is 0.0.0.12, then the DHCP name is LTX12. This method only works with 2 digit numbers (0-99).

6.3 Channel 1 Configuration (Serial Port Parameters)

Using this option, define how the serial port will respond to network and serial communications.

Note: You must enter some values in hexadecimal notation.

Default Serial Port Settings are:

```
Baudrate <115200> ?
I/F Mode <4C> ?
Flow <00> ?
Port No <14009> ?
ConnectMode <C0> ?
Remote IP Address : <000> .<000> .<000> .<000>
Remote Port <0> ?
DisConnMode <00> ?
FlushMode <00> ?
DisConnTime <00:00> ? :
SendChar 1 <00> ?
SendChar 2 <00> ?
```

6.3.1 Baudrate

The unit and attached serial device, such as a modem, must agree on a speed or baud rate to use for the serial connection. Valid baud rates are 300, 600, 1200, 2400,

4800, 9600 (default), 19200, 38400, 57600, 115200, and 230400 bits per second. In standard Clock Mode. The unit also supports high-performance baud rates of 460800, and 921600 bits per second (see [Expert Settings](#) to configure High Performance Mode to attain these speeds).

I/F (Interface) Mode

The Interface (I/F) Mode is a bit-coded byte entered in hexadecimal notation.

Interface Mode Options

I/F Mode Option	7	6	5	4	3	2	1	0
RS-232C ⁽¹⁾							0	0
7 Bit					1	0		
8 Bit					1	1		
No Parity			0	0				
Even Parity			1	1				
Odd Parity			0	1				
1 stop bit	0	1						
2 stop bits ⁽¹⁾	1	1						

(1) 2 stop bits are implemented by the software. This might influence performance.

The following table demonstrates how to build some common Interface Mode settings:

Common Interface Mode Settings

Common I/F Mode Setting	Binary	Hex
RS-232C, 8-bit, No Parity, 1 stop bit	0100 1100	4C
RS-232C, 7-bit, Even Parity, 1 stop bit	0111 1000	78

Flow

Flow control sets the local handshaking method for stopping serial input/output. Use the following table to select flow control options:

Flow Control Options

Flow Control Option	Hex
No flow control	00
XON/XOFF flow control	01
Hardware handshake with RTS/CTS lines	02
XON/XOFF pass characters to host	05

Port Number

The setting represents the source port number in TCP connections. It is the number that identifies the channel for remote initiating connections. The default setting for Port 1 is 10001. The range is 1-65535, except for the following reserved port numbers:

Reserved Port Numbers

Port Numbers	Reserved for
1 – 1024	Reserved (well known ports)
9999	Telnet setup
14000-14009	Reserved for Redirector
30704	Reserved (77F0h)
30718	Reserved (77FEh)

Warning: We recommend that you not use the reserved port numbers for this setting as incorrect operation may result.

The port number functions as the TCP/UDP source port number for outgoing packets.

Packets sent to the unit with this port number are received to this channel.

The port number selected is the Incoming TCP/UDP port and Outgoing TCP/UDP source port.

Use Port 0 when you want the outgoing source port to change with each connection. If the port number is 0, a random value of at least 50000 is used to actively establish a connection. Each subsequent connection increments the number by 1. When the port number reaches 59999, it wraps around to 50000.

Only use the automatic port increment feature to initiate a connection using TCP. Set the port to a non-zero value when the unit is in a passive mode or when you are using UDP instead of TCP.

Connect Mode

Connect Mode defines how the unit makes a connection, and how it reacts to incoming connections over the network. Enter Connect Mode options in hexadecimal notation.

Connect Mode Options

Connect Mode Option	7	6	5	4	3	2	1	0
Incoming Connection								
Never accept incoming	0	0	0					
Accept with DTR Active	0	1	0					
Always Accept	1	1	0					
Response								
Nothing (quiet)				0				
Character response (C=connect, D=disconnect, N=unreachable)				1				
Active Startup								
No active startup					0	0	0	0
With any character					0	0	0	1
With DTR Active					0	0	1	0
With a specific start character					0	0	1	1
Manual connection					0	1	0	0
Autostart					0	1	0	1
Hostlist	0	0	1	0				
Datagram Type								
Directed UDP					1	1	0	0
Modem Mode								
Full Verbose				1	0	1	1	0
Without Echo				0	0	1	1	0
Numeric modem result codes				1	0	1	1	1

Incoming Connection

Never Accept Incoming	Rejects all external connection attempts.
Accept with DTR Active	Accepts external connection requests only when the DTR input is asserted. Cannot be used with Modem Mode.
Always Accept	Accepts any incoming connection when a connection is not already established. Default setting.

Response

Character Response	<p>A single character is transmitted to the serial port when there is a change in connection state: C = connected, D = disconnected, N = host unreachable. This option is overridden when the Active Start Modem Mode or Active Start Host List is in effect. Default setting is Nothing (quiet).</p>
No Active Startup	<p>Does <i>not</i> attempt to initiate a connection under any circumstance. Default setting.</p>
With Any Character	<p>Attempts to connect when any character is received from the serial port.</p>
With DTR Active	<p>Attempts to connect when the DTR input changes from not asserted to asserted.</p>
With a Specific Start Character	<p>Attempts to connect when it receives a specific start character from the serial port. The default start character is carriage return.</p>
Manual Connection	<p>Attempts to connect when directed by a command string received from the serial port. The first character of the command string must be a C (ASCII 0x43), and the last character must be either a carriage return (ASCII 0x0D) or a line feed (0x0A). No blanks or space characters may be in the command string. Between the first and last command string characters must be a full or partial destination IP address and may be a destination port number.</p> <p>The IP address must be in standard dot-decimal notation and may be a partial address, representing the least significant 1, 2, or 3 bytes of the remote IP address. The period is required between each pair of IP address numbers.</p> <p>If present, the port number must follow the IP address, must be presented as a decimal number in the range 1-65535, and must be preceded by a forward slash (ASCII 0x2F). The slash separates the IP address and the port number. If you omit the port number from a command string, the internally stored remote port number starts a connection.</p> <p>If a partial IP address is presented in a command string, it is interpreted to be the least significant bytes of the IP address and uses the internally stored remote IP address to provide the most significant bytes of the IP address. If the IP address entered is 0.0.0.0/0, the device server enters Monitor Mode.</p> <p>For example, if the remote IP address already configured in the unit is 129.1.2.3, then an example command string would be C3/7. (This would connect to 129.1.2.3 and port 7.) You may also use a different ending for the connection string. For example, C50.1/23 would connect you to 129.1.50.1 and port 23.</p>

Manual Connection Address Example

Command String	Result if remote IP is 129.1.2.3 and remote port is 1234
C121.2.4.5/1	Complete override; connection is started with host 121.2.4.5, port 1
C5	Connects to 129.1.2.5, port 1234
C28.10/12	Connects to 129.1.28.10, port 12
C0.0.0.0/0	Connects to 129.1.28.10, port 12; enters Monitor Mode

Autostart (Automatic Connection)

Autostart (Automatic Connection)	If you enable autostart, the unit automatically connects to the remote IP address and remote port specified when the firmware starts.
Hostlist	<p>If you enable this option, the device server scrolls through the hostlist until it connects to a device listed in the hostlist table. Once it connects, the unit stops trying to connect to any others. If this connection fails, the unit continues to scroll through the table until it is able to connect to another IP in the hostlist.</p> <p>Hostlist supports a minimum of 1 and a maximum of 12 entries. Each entry contains the IP address and the port number. The hostlist is disabled for Manual Mode and for Modem Mode. The unit will not accept a data connection from a remote device when the hostlist option is enabled.</p>

Figure 4-7. Hostlist Option

```
Change Setup:
 0 Server configuration
 1 Channel 1 configuration
 3 E-mail settings
 5 Expert settings
 6 Security
 7 Factory defaults
 8 Exit without save
 9 Save and exit          Your choice ? 1

Baudrate (9600) ?
I/P Mode (4C) ?
Flow (00) ?
Port No (10001) ?
ConnectMode (C0) ?25

Hostlist :

No Entry !

Change Hostlist ? (N) Y
01. IP address : (000) 172.(000) 19.(000) 0.(000) 1      Port :
(0) ?23
02. IP address : (000) 172.(000) 19.(000) 0.(000) 2      Port :
(0) ?3001
03. IP address : (000) 172.(000) 19.(000) 0.(000) 3      Port :
(0) ?10001
04. IP address : (000) .(000) .(000) .(000)

Hostlist :
01. IP : 172.019.000.001 Port : 00023
02. IP : 172.019.000.002 Port : 03001
03. IP : 172.019.000.003 Port : 10001

Change Hostlist ? (N) N

Hostlist Retrycounter (3) ?
Hostlist Retrytimeout (250) ?
DisConnMode (00) ?
FlushMode (00) ?
```

To enable the hostlist:

- 1) Enter a **Connect Mode** of 0x20 (2X), where X is any digit. The menu shows you
- 2) A list of current entries already defined in the product.
- 3) To delete, modify, or add an entry, select **Yes**. If you enter an IP address of 0.0.0.0, that entry and all others after it are deleted.
- 4) After completing the hostlist, repeat the previous step if necessary to edit the hostlist again.
- 5) For **Retrycounter**, enter the number of times the Lantronix unit should try to make a good network connection to a hostlist entry that it has successfully ARPed. The range is 1-15, with the default set to 3.
- 6) For **Retrytimeout**, enter the number of seconds the unit should wait before failing an attempted connection. The time is stored as units of milliseconds in the range of 1-65535. The default is 250.

Datagram Type

Directed UDP	When selecting this option, you are prompted for the Datagram type. Enter 01 for directed or broadcast UDP.
	When the UDP option is in effect, the unit never attempts to initiate a TCP connection because it uses UDP datagrams to send and receive data.

Modem Mode

In Modem (Emulation) Mode, the unit presents a modem interface to the attached serial device. It accepts **AT**-style modem commands, and handles the modem signals correctly.

Normally, there is a modem connected to a local PC and a modem connected to a remote machine. A user must dial from the local PC to the remote machine, accumulating phone charges for each connection. Modem Mode allows you to replace modems with NetPorts, and to use an Ethernet connection instead of a phone call. By not having to change communications applications, you avoid potentially expensive phone calls.

To select Modem Mode, set the Connect Mode to **C6** (no echo), **D6** (echo with full verbose), or **D7** (echo with 1-character response).

Note: If the unit is in Modem Mode, and the serial port is idle, the unit can still accept network TCP connections to the serial port if Connect Mode is set to C6 (no echo), D6 (echo with full verbose), or D7 (echo with 1-character response).

Modem Mode Messages

Message	Meaning
Full Verbose	
OK	Command was executed without error.
CONNECT	A network connection has been established.
NO CARRIER	A network connection has been closed.
RING n.n.n.n.	A remote device, having IP address n.n.n.n, is connecting to this device.
1-Character Response	
0	OK
1	Connected
2	Ring
3	No Carrier
4	Error

- Received commands must begin with the two-character sequence **AT** and be terminated with a carriage return character.
- The unit ignores any character sequence received *not* starting with **AT**, and only recognizes and processes single **AT**-style commands. The unit treats compound **AT** commands as unrecognized commands.
- If the Full Verbose option is in effect, the unit responds to an unrecognized command string that is otherwise formatted correctly (begins with **AT** and ends with carriage return) with the **OK** message and takes no further action.
- If the 1-Character Response option is in effect, the unit responds to an unrecognized command string that is otherwise formatted correctly with '1' and takes no further action.
- When an active connection is in effect, the unit transfers data and does not process commands received from the serial interface.
- When a connection is terminated or lost, the unit reverts to command mode.
- When an active connection is in effect, the unit terminates the connection if it receives the following sequence from the attached serial device:
 - No serial data is received for one second.
 - The character sequence +++ is received, with no more than one second between each two characters.
 - No serial data is received for one second after the last + character. At this time, the unit responds affirmatively per the selected echo/response mode.
 - The character string **ATH** is received terminated with a carriage return. The unit responds affirmatively according to the selected echo/response mode and drops the network connection. The serial interface reverts to accepting command strings.
- If this sequence is not followed, the unit remains in data transfer mode.

Modem Mode Commands

Modem Mode Command	Function
ATDTx.x.x.x,pppp or ATDTx.x.x.x/pppp	Makes a connection to an IP address (x.x.x.x) and a remote port number (pppp).
ATDTx.x.x.x	Makes a connection to an IP address (x.x.x.x) and the remote port number defined within the unit.
ATD0.0.0.0	Forces the unit into Monitor Mode if a remote IP address and port number are defined within the unit.
ATD	Forces the unit into Monitor Mode if a remote IP address and port number are not defined within the unit.
ATDx.x.x.x	Makes a connection to an IP address (x.x.x.x) and the remote port number defined within the unit.
ATH	Hangs up the connection (Entered as +++ATH).
ATS0=n	Enables or disables connections from the network going to the serial port. n=0 disables the ability to make a connection from the network to the serial port. n=1-9 enables the ability to make a connection from the network to the serial port. n>1-9 is invalid.
ATEn	Enables or disables character echo and responses. n=0 disables character echo and responses. n=1 enables character echo and responses.
ATVn	Enables 1-character response or full verbose. n=0 enables 1-character response. n=1 enables full verbose.

Note: The unit recognizes these **AT** commands as single commands such as ATE0 or ATV1; it does not recognize compound commands such as ATE0V.

Remote IP Address

This is the destination IP address used with an outgoing connection.

Remote Port

You must set the remote TCP port number for the unit to make outgoing connections. This parameter defines the port number on the target host to which a connection is attempted.

Note: To connect an ASCII terminal to a host using the unit for login purposes, use the remote port number 23 (Internet standard port number for Telnet services).

DisConnMode

This setting determines the conditions under which the unit will cause a network connection to terminate.

Note: In DisConnMode (Disconnect Mode), DTR drop either drops the connection or is ignored.

Disconnect Mode Options

Disconnect Mode Option	7	6	5	4	3	2	1	0
Disconnect with DTR drop ⁽⁶⁾	1							
Ignore DTR	0							
Telnet mode and terminal type setup ⁽¹⁾		1						
Channel (port) password ⁽²⁾				1				
Hard disconnect ⁽³⁾					0			
Disable hard disconnect					1			
State LED off with connection ⁽⁴⁾								1
Disconnect with EOT (^D) ⁽⁵⁾			1					

(1) The XPort sends the "Terminal Type" upon an outgoing connection.

(2) A password is required for a connection to the serial port from the network.

(3) The TCP connection closes even if the remote site does not acknowledge the disconnection.

(4) When there is a network connection to or from the serial port, the state LED turns off instead of blinking.

(5) When Ctrl+D or Hex 04 is detected, the connection is dropped. Both Telnet mode and Disconnect with EOT must be enabled for Disconnect with EOT to function properly. Ctrl+D is only detected going from the serial port to the network.

(6) When DTR transitions from a high state to a low state, the network connection to or from the serial port drops.

Flush Mode (Buffer Flushing)

Using this parameter, you can control line handling and network buffers with connection startup and disconnect. You can also select between two different packing algorithms.

Flush Mode Options

Function	7	6	5	4	3	2	1	0
Input Buffer (Serial to Network)								
Clear with a connection that is initiated from the device to the network				1				
Clear with a connection initiated from the network to the device			1					
Function								
Clear when the network connection to or from the device is disconnected		1						
Output Buffer (Network to Serial)								
Clear with a connection that is initiated from the device to the network								1
Clear with a connection initiated from the network to the device							1	
Clear when the network connection to or from the device is disconnected						1		
Alternate Packing Algorithm (Pack Control)								
Enable	1							

Pack Control

Two firmware-selectable packing algorithms define how and when packets are sent to the network. The standard algorithm is optimized for applications in which the unit is used in a local environment, allowing for very small delays for single characters, while keeping the packet count low. The alternate packing algorithm minimizes the packet count on the network and is especially useful in applications in a routed Wide Area Network (WAN). Adjusting parameters in this mode can economize the network data stream.

Pack control settings are enabled in Flush Mode. Set this value to **00** if you do not need specific functions.

Pack Control Options

Function	7	6	5	4	3	2	1	0
Clear when the network connection to or from the device is disconnected		1						
Output Buffer (Network to Serial)								
Clear with a connection that is initiated from the device to the network								1
Clear with a connection initiated from the network to the device							1	
Clear when the network connection to or from the device is disconnected						1		
Alternate Packing Algorithm (Pack Control)								
Enable	1							

Packing Interval: Packing Interval defines how long the unit should wait before sending accumulated characters. This wait period is between successive network segments containing data. For alternate packing, the default interval is 12 ms.

Trailing Characters: In some applications, CRC, Checksum, or other trailing characters follow the end-of-sequence character; this option helps to adapt frame transmission to the frame boundary.

Send Characters: If 2-Byte Send Character Sequence is enabled, the unit interprets the sendchars as a 2-byte sequence; if this option is not enabled, the unit interprets them independently. If Send Immediately After Characters is *not* set, any characters already in the serial buffer are included in the transmission after a "transmit" condition is found. If this option is set, the unit sends immediately after recognizing the transmit condition (sendchar or timeout).

Note: A transmission might occur if status information needs to be exchanged or an acknowledgment needs to be sent.

DisConnTime (Inactivity Timeout)

Use this parameter to set an inactivity timeout. The unit drops the connection if there is no activity on the serial line before the set time expires. Enter time in the format mm:ss, where m is the number of minutes and s is the number of seconds. To disable the inactivity timeout, enter **00:00**. Range is 0 (disabled) to 5999 seconds (99 minutes, 59 seconds). Default is 0.

Send Characters

You can enter up to two characters in hexadecimal representation in sendchar. If the unit receives a character on the serial line that matches one of these characters, it sends the character immediately, along with any awaiting characters, to the TCP connection. This action minimizes the response time for specific protocol characters on the serial line (for example, ETX, EOT). Setting the first sendchar to **00** disables the recognition of the characters. Alternatively, the unit can interpret two characters as a sequence (see [Pack Control](#) above).

Telnet Terminal Type

This parameter displays only if you enabled the terminal type option in Disconnect Mode. If this option is enabled, you can use the terminal name for the Telnet terminal type. Enter only one name.

If the terminal type option is enabled, the unit also reacts to the EOR (end of record) and binary options, which can be used for applications like terminal emulation to IBM hosts.

Channel (Port) Password

This parameter appears only if the channel (port) password option is enabled in Disconnect Mode. If the option is enabled, you can set a password on the serial port.

6.4 E-mail Settings

Note: You can change these settings via Telnet or serial connections only, not on the Web-Manager. To configure e-mail settings via DeviceInstaller, see the help files in DeviceInstaller\Help.

The unit can send an e-mail to multiple recipients when a specific trigger event occurs. There are three separate triggers, based on any combination of the configurable pins (GPIO) when selected as user I/O functions. You can also use a two byte serial string to initiate a trigger.

E-mail Settings

```
***** E-mail *****
Mail server: 0.0.0.0
Unit       :
Domain     :
Recipient 1:
Recipient 2:

*** Trigger 1
Serial Sequence: 00,00
CP1: X
CP2: X
CP3: X
Message :
Priority: L
Min. notification interval: 1 s
Re-notification interval : 0 s

*** Trigger 2
Serial Sequence: 00,00
CP1: X
CP2: X
CP3: X
Message :
Priority: L
Min. notification interval: 1 s
Re-notification interval : 0 s

*** Trigger 3
Serial Sequence: 00,00
CP1: X
CP2: X
CP3: X
Message :
Priority: L
Min. notification interval: 1 s
Re-notification interval : 0 s
```

E-mail Setup

E-mail setup requires you to set up the e-mail server location as follows:

Mail server	The IP address in decimal-dot notation.
Unit	The user name used by the XPort to send e-mail messages.
Domain	The domain name of your e-mail server.
Recipient 1	Full e-mail address of the recipient.
Recipient 2	Full e-mail address of the second recipient.

Trigger Setup

A trigger event can occur when the unit receives two bytes of a specified sequence on the serial port, or because of a specified combination of conditions on the configurable pins. If the serial sequence is set to **00,00**, the trigger is disabled. At the **Serial Sequence** prompt, enter the ASCII Hex value. Example: A two byte sequence of 12 would be 0x31, 0x32.

If the configurable pins are all set to **X** (Don't Care), then they are disabled. If both the serial sequence and the configurable pins are disabled, the trigger is disabled.

Note: You can set the configurable pins to A = Active, I = Inactive, or X = Don't Care. Active can be set to Active Low or Active High. To change the configurable pins' settings, you must use DeviceInstaller or see [Applications Note AMC-ANLAN012](#) on the CDROM for a web browser method.

Message	The subject line of the e-mail.
Priority	L is for normal priority; H is for high priority.
Min. notification interval	The minimum time allowed between individual triggers. If a trigger event occurs faster than the minimum interval, the unit ignores the trigger.
Re-notification interval	If a single trigger event stays asserted, then the unit sends an e-mail message at this time interval.

Each trigger is independent of the others. Each condition within an individual trigger must be met before the unit will send the e-mail.

6.5 Expert Settings

Note: You can change these settings via Telnet or serial connections only, not on the Web-Manager. Only an expert should change these parameters. You must definitely know the consequences the changes might have.

TCP Keepalive time in s (1s – 65s; 0s=disable)	(45)
ARP Cache timeout in s (1s – 600s)	(600)
High CPU performance mode (disabled or enabled)	(Disabled) applies to XPort-03 and greater only
Monitor Mode at Bootup (disabled or enabled)	(Enabled)
HTTP Port Number (1-65535)	(80)
SMTP Port Number (1-65535)	(25)

TCP Keepalive time in seconds

This option allows you to change how many seconds the unit will wait during a silent connection before attempting to see if the currently connected network device is still on the network. If the unit then gets no response, it drops that connection.

ARP Cache timeout in seconds

Whenever the unit communicates with another device on the network, it adds an entry into its ARP table. The ARP Cache timeout option allows you to define how many seconds (1-600) the unit will wait before timing out this table.

High CPU Performance mode

This option applies to NetPort Iss01 and greater units only. It allows you to increase the CPU performance and utilize the higher baud rates on the serial interface (i.e. 460Kbps and 920Kbps). Increasing CPU performance requires more power and lowers the unit's operating temperature. The standard CPU performance mode supports up to 230400 baud.

Note: If baud rates of 460Kbps or 920Kbps are set and the high performance mode disabled, the operation of the serial channel would be out of the specified error tolerance thereby leading to inconsistent speed settings on the two ends of the serial channel.

Monitor Mode at Bootup

This option allows you to disable all entries into Monitor Mode during startup, except for the 'xxx' sequence. This prevents entry via 'yyy', 'zzz', 'xx1', and 'yy1' key sequences (only during the bootup sequence). The default for Monitor Mode at Bootup is enabled. See Appendix B - Using Monitor Mode for more info on Monitor Mode

HTTP Port Number

This option allows the configuration of the web server port number. The valid range is 1-65535. The default HTTP port number is 80.

SMTP Port Number

This option allows the configuration of the email port number. The valid range is from 1-65535. The default SMTP port number is 25.

Note: When configuring the HTTP or SMTP port number, take note of the 'reserved' port numbers on above.

6.6 Security Settings

You can change security settings via Telnet or serial connections only, not on the Web-Manager. We recommend that you set security over the dedicated network or over the serial setup. If you set parameters over the network (Telnet 9999), someone else could capture these settings.

Caution: Disabling both Telnet Setup and Port 77FE will prevent users from accessing all setup menus from the network. Disabling Port 77FE also disables the Web & Device Installer from configuring the device.

Security Settings

```
Disable SNMP <N> N
SNMP Community Name <public>:
Disable Telnet Setup <N> N
Disable IFTP Firmware Update <N> N
Disable Port 77FEh <N> N
Disable Web Server <N> N
Disable ECHO ports <Y> Y
Enable Encryption <N> N
Enable Enhanced Password <N> N
Disable Port 77F0h <N> N
```

Disable SNMP

This setting allows you to disable the SNMP protocol on the unit for security reasons.

SNMP Community Name

This setting allows you to change the SNMP community name. Community name is a required field for NMS to read or write to a device. The default setting is **public**. The name is a string of 1 to 13 characters.

Disable Telnet Setup

Note: If you choose to disable this option, keep in mind that disabling both Telnet Setup and Port 77FE will prevent users from accessing any setup menu from the network.

This setting defaults to the N (No) option. The Y (Yes) option disables access to Setup Mode by Telnet (port 9999). It only allows access locally via the web pages and the serial port of the unit.

Disable TFTP Firmware Upgrade

This setting defaults to the N (No) option. The Y (Yes) option disables the use of TFTP to perform network firmware upgrades. With this option, you can download firmware upgrades over the serial port using Device Installer's Recover Firmware procedure. (See [Appendix C - Reloading Firmware](#).)

Disable Port 77FE (Hex)

Note: If you choose to disable this option, keep in mind that disabling both Telnet Setup and Port 77FE will prevent users from accessing any setup menu from the network.

Port 77FE is a setting that allows DeviceInstaller, Web-Manager, and custom programs to configure the unit remotely. You may wish to disable this capability for security purposes. The default setting is the N (No) option, which enables remote configuration. You can configure the unit by using DeviceInstaller, web pages, Telnet, or serial configuration. The Y (Yes) option disables remote configuration and web sites.

Note: The Y (Yes) option disables many of the GUI tools for configuring the unit, including the embedded Web-Manager tool.

Disable Web Server

This setting defaults to the N (option). The Y (Yes) option disables the web server.

Disable ECHO Ports

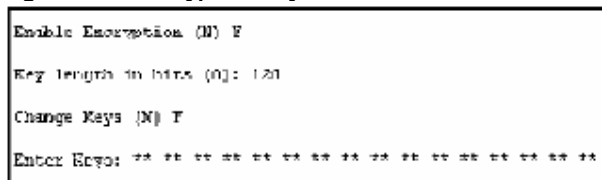
This setting controls whether the serial port echoes characters it receives.

Enable Encryption

This option displays **only** if you purchased the encrypted versions of NetPort (LAN03 or LAN04)). You can enable or disable (default) Rijndael encryption. Rijndael is the block cipher algorithm recently chosen by the National Institute of Science and Technology (NIST) as the Advanced Encryption Standard (AES) to be used by the US government.

To enable encryption, select the key length (128, 192 or 256 bits) and enter the encryption key in hexadecimals (32, 48, or 64, respectively). The hexadecimals are echoed as asterisks to prevent onlookers from seeing the key.

Figure 4-10. Encryption Keys



```
Enable Encryption (N) F
Key length in bits (N): 128
Change Keys (N) F
Enter Key: ** ** ** **
```

Encryption only applies to the port selected for tunneling (default 10001), regardless of whether you are using TCP or UDP.

Generally, one of two situations applies.

- Encrypted NetPort-to-NetPort communication (and in the future, NetPort communication to other Lantronix device servers) is supported without extra effort.
- The NetPort uses standard AES encryption protocols. To communicate successfully, products and applications on the peer side must use the same protocols and the same shared key as the NetPort. To ease the development process, Alpha Micro can provide an AES encryption DLL for Windows and protocol source code samples. Please contact sales@alphamicro.net
- The following export agreement is required for the optional encryption:
I agree that I will not export or re-export this software file to a national resident of Cuba, Iran, Iraq, Libya, North Korea, Sudan, Syria or any other country to which the United States has embargoed goods; or to anyone on the US Treasury Department's list of Specially Designated Nationals and Blocked Persons, US Commerce Department's Table of Denial Orders and Entitles List, or the US State Department's Debarred List. By receiving this software, I am agreeing to the foregoing and I am representing and warranting that I am not located in, under the control of, or a national or resident of any such country or on any such list.

6.6.1 Encryption Tutorial

Rijndael is the block cipher algorithm chosen by the National Institute of Science and Technology (NIST) as the Advanced Encryption Standard (AES) to be used by the US government. NetPort supports 128, 192 and 256 bit encryption key lengths. Follow the steps below to configure AES encryption on the XPort.

Note: Configuring encryption should be done through a local connection to the serial port of the NetPort, or via a secured network connection. Initial configuration information including the encryption key is sent in clear text over the network.

1. Telnet to the configuration port on the NetPort (Port 9999).
Example Telnet command syntax is shown below. In the command examples below, replace the x's with the IP address of the XPort.

Microsoft Windows command syntax: `telnet xxx.xxx.xxx.xxx 9999`

UNIX command syntax: `telnet xxx.xxx.xxx.xxx:9999`

2. When prompted, press **Enter** to go into Setup Mode.
3. At the Change Setup menu, select option **6** for security.
4. When prompted to enable encryption, press **Y**.
5. Enter the encryption key length when prompted. XPort supports 128-, 192- and 256-bit encryption key lengths.
6. When prompted to change keys, press **Y**.
7. At the **Enter Keys** prompts, enter your encryption key. The encryption keys are entered in hexadecimal. The hexadecimal values are echoed as asterisks to prevent onlookers from seeing the key. Hexadecimal values are 0-9 and A-F.
 - For a 128-bit key length, enter 32 hexadecimal characters.
 - For a 192-bit key length, enter 48 hexadecimal characters.
 - For a 256-bit key length, enter 64 hexadecimal characters.
8. Continue pressing **Enter** until you return to the Change Setup menu.
9. At the Change Setup menu, select option **9** to save and exit.

Enable Enhanced Password

This setting defaults to the N (No) option, which allows you to set a 4-character password that protects Setup Mode by means of Telnet and web pages. The Y (Yes) option allows you to set an extended security password of 16-characters for protecting Telnet and Web Page access.

Disable Port 77F0 (Hex)

Port 77F0 is a setting that allows a custom application to query or set the three NetPort configurable pins (factory set to CTS/RTS/DTR) when they are functioning as general purpose

I/O (GPIO). You may want to disable this capability for security purposes. The default setting is the N (No) option, which enables GPIO control. The Y (Yes) option disables the GPIO control interface.

Note: As these pins are presented through a RS232 line driver IC it is not possible to change the 'direction' of these pins on standard variants of NetPort.

6.7 Factory Defaults

Select **7** to reset the unit's Channel 1 configuration, e-mail settings, and expert settings to the factory default settings. The server configuration settings for IP address, gateway IP address, and Netmask remain unchanged. The configurable pins' settings also remain unchanged. The specific settings that this option changes are listed below.

Channel 1 Configuration Defaults

Baudrate	9600
I/F Mode	4C (1 stop bit, no parity, 8 bit, RS-232C)
Own TCP port number	10001
Connect Mode	C0 (always accept incoming connection; no active connection startup)
Hostlist retry counter	3
Hostlist retry timeout	250 (msec)
Start character for serial channel 1	0x0D (CR)
All other parameters	0

Expert Settings Defaults

TCP keepalive	45 (seconds)
ARP cache timeout	600 (seconds)
High CPU performance mode (XPort-03 or greater only)	Disabled
HTTP port number	0 (resulting in an operational value of 80)
SMTP port number	0 (resulting in an operational value of 25)

Security Settings Defaults

SNMP	Enabled
SNMP community name	public
Telnet setup	Enabled
TFTP download	Enabled
Port 77FEh	Enabled
Web Server	Enabled
ECHO	Disabled
Encryption	Disabled
Enhanced password	Disabled
Port 77F0h	Enabled

E-mail Settings

Priority	L
Min. notification interval	1 (second)
All other parameters	0 (e.g., e-mail notification and triggers are disabled)

Exit Configuration Mode

You have two options:

- Select **8** to exit the configuration mode without saving any changes or rebooting,

or

- Select **9** to save all changes and reboot the device. All values are stored in nonvolatile memory.

7

Appendix B - Using Monitor Mode

Monitor Mode is a command-line interface used for diagnostic purposes that allows the user to interrogate the NetPort and perform some low-level network tests, in some cases adding intelligence to the serial equipment to verify network & DHCP status.

There are two ways to enter Monitor Mode: locally via the serial port or remotely via the network.

7.1.1 Via the Serial Port

To initially configure the unit through a serial connection:

1. Connect a console terminal or PC running a terminal emulation program to your unit's serial port. The default serial port settings are 9600 baud, 8 bits, no parity, 1-stop bit, no-flow control.
2. To enter Monitor Mode, reset the unit by cycling the unit's power (power off and back on). The self-test will begin. **You have one second** to enter:

- three lowercase **z** characters (**zzz**) for Monitor Mode with network connections
- or
- three lowercase **y** characters (**yyy**) for Monitor Mode without network connections

Note: The easiest way to enter Setup Mode is to hold down the appropriate key at the terminal (or emulation) while resetting the unit.

A **0>** prompt indicates that you have successfully entered Monitor Mode.

7.1.2 Via a Telnet Connection

To configure the unit over the network, establish a Telnet connection to port 9999.

Note: You can also use *DeviceInstaller* to access Telnet. Select the device from the main window list, and click the **Telnet** icon. If you use the **Telnet** icon on the *DeviceInstaller* toolbar, skip steps 1 and 2.

1. From the Windows **Start** menu, click **Run** and type the following command, where x.x.x.x is the IP address, and 9999 is the unit's fixed network configuration port number:

```
telnet x.x.x.x 9999
```

Note: Be sure to include a space between the IP address and 9999.

2. Click **OK**. The following information displays.

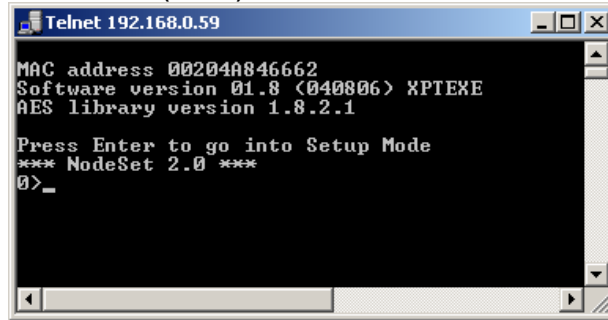
MAC Address

```
MAC address 00204041164D
Software version 01.3b1 (030605) XPTE
Press Enter to go into Setup Mode
```

3. To enter the Monitor Mode, **press Upper-case M within 5 seconds**. The command prompt will be displayed.

A **0>** prompt indicates that you have successfully entered Monitor Mode and looks like this:

Monitor Mode (Telnet)



You can perform the following actions, observe upper-case where shown.

VS x.x.x.x	Version	Queries software header record (16 bytes) of unit with IP address x.x.x.x.
PI x.x.x.x	Ping	Pings unit with IP address x.x.x.x to check device status.
AT	ARP Table	Shows the unit's ARP table entries.
TT	TCP Connection Table	Shows all incoming and outgoing TCP connections.
NC	Network Connection	Shows the unit's IP configuration - IP address, Subnet Mask & Gateway where applicable. <i>Note: if the user has fixed these parameters then they may not be an accurate reflection of the real-time status on the LAN</i>
RS	Reset	Resets the unit's power.
QU	Quit	Exits diagnostics mode.

Note: Entering any of the commands listed above generates one of the following command response codes:

Command Response Codes

Response	Meaning
0>	OK, no error
1>	No answer from remote device
2>	Cannot reach remote device or no answer
8>	Wrong parameter(s)
9>	Invalid command

8 Appendix C - Reloading Firmware

There are two ways to update the unit's internal operational code (*.ROM): via DeviceInstaller (the preferred way) or via TFTP. You can also update the unit's internal Web interface (*.COB) via TFTP or DeviceInstaller.

Here are *typical* names for those files. Check www.alphamicro.net/netport or the CDROM for the latest versions and release notes.

Firmware Files

ROM File	COB
XPTXE16.ROM	GEN3402.COB (Web-Manager)

8.1.1 Using TFTP

To download new firmware from a computer:

1. Click on Start\Run and type **cmd** and press ENTER to begin a DOS shell
2. To transfer the *.ROM runtime code type:

TFTP -i <IP address of NetPort> PUT xxxxx.ROM X2

3. To transfer a COB (webpage) file type:

TFTP -i <IP address of NetPort> PUT xxxxx.COB WEB6

4. After the firmware has been loaded and stored, which takes approximately 4-8 seconds to complete, the unit performs a power reset.

8.1.2 Using the Serial Port with DeviceInstaller

If for some reason the firmware is damaged, you can recover the firmware file by using DeviceInstaller to download the *.ROM file over the serial port.

1. Start DeviceInstaller. If your PC has more than one network adapter, a message displays. Select an adapter and click **OK**.
2. From the **Tools** menu, select **Advanced/Recover Firmware** or **f8** The Serial Port Firmware Upgrade window displays.
3. For **Port on PC**, enter the COM port to which you are connected.
4. For **Device Model**, Choose Xport-03 for Iss01 NetPorts
5. For **Firmware File**, click the **Browse** button and go to the location where the firmware file resides.

Tip: Make sure the NetPort on which you are recovering firmware is connected to this selected port on your PC and no other applications are accessing this port ☺

Tip: You may need to use a null-modem cable to connect an AMC232LAN01 (DTE) device to your PC (direct connect with AMC232LAN02 (DCE) devices)

6. Click **OK** to download the file.
7. When prompted at the bottom of the screen, reset the device. When the file transfer completes, the message "**Successful, Click OK to Close**" appears.
8. Click the **OK** button to complete this procedure.

9 Appendix D – Hexadecimal Table

Dec	Hex	Bin	Dec	Hex	Bin	Dec	Hex	Bin	Dec	Hex	Bin
0	0	00000000	64	40	01000000	128	80	10000000	192	c0	11000000
1	1	00000001	65	41	01000001	129	81	10000001	193	c1	11000001
2	2	00000010	66	42	01000010	130	82	10000010	194	c2	11000010
3	3	00000011	67	43	01000011	131	83	10000011	195	c3	11000011
4	4	00000100	68	44	01000100	132	84	10000100	196	c4	11000100
5	5	00000101	69	45	01000101	133	85	10000101	197	c5	11000101
6	6	00000110	70	46	01000110	134	86	10000110	198	c6	11000110

7	7	00000111	71	47	01000111	135	87	10000111	199	c7	11000111
8	8	00001000	72	48	01001000	136	88	10001000	200	c8	11001000
9	9	00001001	73	49	01001001	137	89	10001001	201	c9	11001001
10	a	00001010	74	4a	01001010	138	8a	10001010	202	ca	11001010
11	b	00001011	75	4b	01001011	139	8b	10001011	203	cb	11001011
12	c	00001100	76	4c	01001100	140	8c	10001100	204	cc	11001100
13	d	00001101	77	4d	01001101	141	8d	10001101	205	cd	11001101
14	e	00001110	78	4e	01001110	142	8e	10001110	206	ce	11001110
15	f	00001111	79	4f	01001111	143	8f	10001111	207	cf	11001111
16	10	00010000	80	50	01010000	144	90	10010000	208	d0	11010000
17	11	00010001	81	51	01010001	145	91	10010001	209	d1	11010001
18	12	00010010	82	52	01010010	146	92	10010010	210	d2	11010010
19	13	00010011	83	53	01010011	147	93	10010011	211	d3	11010011
20	14	00010100	84	54	01010100	148	94	10010100	212	d4	11010100
21	15	00010101	85	55	01010101	149	95	10010101	213	d5	11010101
22	16	00010110	86	56	01010110	150	96	10010110	214	d6	11010110
23	17	00010111	87	57	01010111	151	97	10010111	215	d7	11010111
24	18	00011000	88	58	01011000	152	98	10011000	216	d8	11011000
25	19	00011001	89	59	01011001	153	99	10011001	217	d9	11011001
26	1a	00011010	90	5a	01011010	154	9a	10011010	218	da	11011010
27	1b	00011011	91	5b	01011011	155	9b	10011011	219	db	11011011
28	1c	00011100	92	5c	01011100	156	9c	10011100	220	dc	11011100
29	1d	00011101	93	5d	01011101	157	9d	10011101	221	dd	11011101
30	1e	00011110	94	5e	01011110	158	9e	10011110	222	de	11011110
31	1f	00011111	95	5f	01011111	159	9f	10011111	223	df	11011111
32	20	00100000	96	60	01100000	160	a0	10100000	224	e0	11100000
33	21	00100001	97	61	01100001	161	a1	10100001	225	e1	11100001
34	22	00100010	98	62	01100010	162	a2	10100010	226	e2	11100010
35	23	00100011	99	63	01100011	163	a3	10100011	227	e3	11100011
36	24	00100100	100	64	01100100	164	a4	10100100	228	e4	11100100
37	25	00100101	101	65	01100101	165	a5	10100101	229	e5	11100101
38	26	00100110	102	66	01100110	166	a6	10100110	230	e6	11100110
39	27	00100111	103	67	01100111	167	a7	10100111	231	e7	11100111
40	28	00101000	104	68	01101000	168	a8	10101000	232	e8	11101000
41	29	00101001	105	69	01101001	169	a9	10101001	233	e9	11101001
42	2a	00101010	106	6a	01101010	170	aa	10101010	234	ea	11101010
43	2b	00101011	107	6b	01101011	171	ab	10101011	235	eb	11101011
44	2c	00101100	108	6c	01101100	172	ac	10101100	236	ec	11101100
45	2d	00101101	109	6d	01101101	173	ad	10101101	237	ed	11101101
46	2e	00101110	110	6e	01101110	174	ae	10101110	238	ee	11101110
47	2f	00101111	111	6f	01101111	175	af	10101111	239	ef	11101111
48	30	00110000	112	70	01110000	176	b0	10110000	240	f0	11110000
49	31	00110001	113	71	01110001	177	b1	10110001	241	f1	11110001
50	32	00110010	114	72	01110010	178	b2	10110010	242	f2	11110010
51	33	00110011	115	73	01110011	179	b3	10110011	243	f3	11110011
52	34	00110100	116	74	01110100	180	b4	10110100	244	f4	11110100
53	35	00110101	117	75	01110101	181	b5	10110101	245	f5	11110101
54	36	00110110	118	76	01110110	182	b6	10110110	246	f6	11110110
55	37	00110111	119	77	01110111	183	b7	10110111	247	f7	11110111
56	38	00111000	120	78	01111000	184	b8	10111000	248	f8	11111000
57	39	00111001	121	79	01111001	185	b9	10111001	249	f9	11111001
58	3a	00111010	122	7a	01111010	186	ba	10111010	250	fa	11111010
59	3b	00111011	123	7b	01111011	187	bb	10111011	251	fb	11111011
60	3c	00111100	124	7c	01111100	188	bc	10111100	252	fc	11111100
61	3d	00111101	125	7d	01111101	189	bd	10111101	253	fd	11111101
62	3e	00111110	126	7e	01111110	190	be	10111110	254	fe	11111110
63	3f	00111111	127	7f	01111111	191	bf	10111111	255	ff	11111111