

# 10

## Setting Up UNIX Fixed TTY

When a terminal logs into a UNIX host from a terminal server, it is assigned a different pseudo tty each time. This makes it difficult to distinguish between processes run by different terminals, increasing management complexity. To simplify the situation and enhance application-based security, Moxa CN2500 provides a fixed pseudo tty program, called MOXATTY.

MOXATTY is a fixed pseudo tty which works with a pair of master and slave devices. This enables UNIX applications to use Moxa CN2500 serial ports over a TCP/IP network in the same way that they use local serial ports. In other words, MOXATTY allows you to redirect UNIX tty devices to CN2500 serial ports.

We describe here the steps required to configure CN2500 to use MOXATTY.

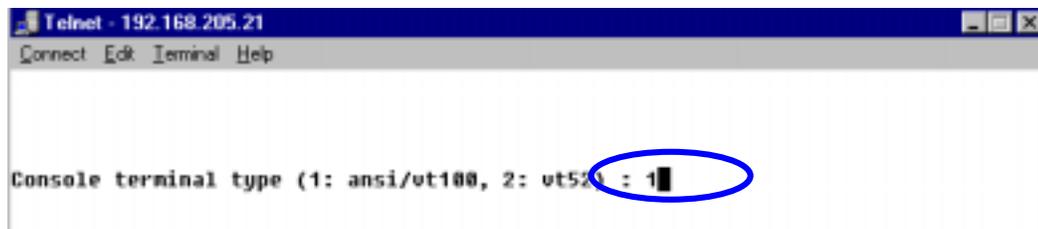
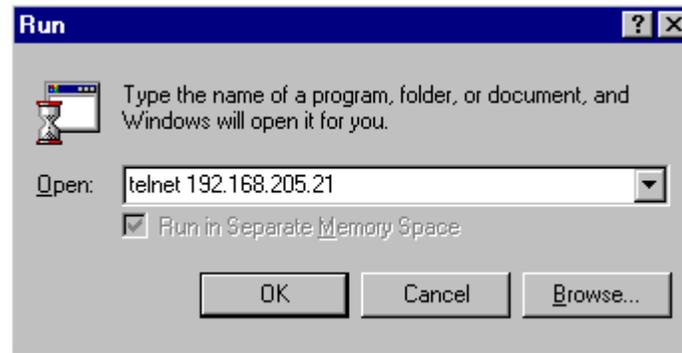
- ☐ Configuring port operation mode—Port Menu [Mode]
  1. RAW
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# Configuring port operation mode—Port Menu [Mode]

In **Port Menu [Mode]**, you can set up the UNIX fixed tty application and specify RAW settings.

## 1. Enter CN2500 **MAIN MENU**

Use either Telnet from a network terminal, or connect directly to Async Server with a console terminal. Choose **ansi/vt100** and press **[Enter]**. Refer to Chapter 2 if you have trouble entering **MAIN MENU**.

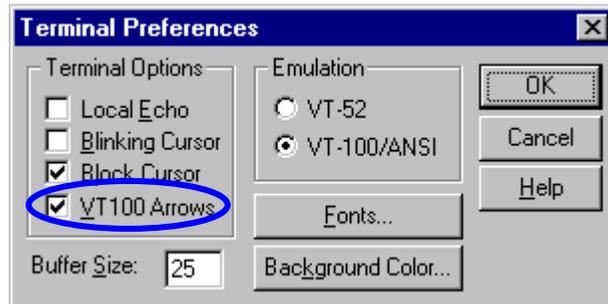
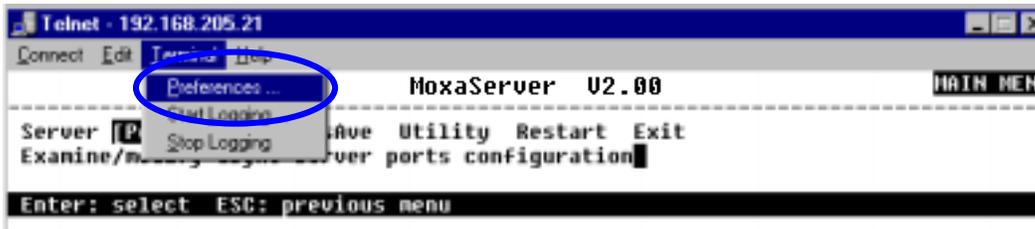


2. Below we show Async Server's **MAIN MENU**. Familiarize yourself with the cursor movement functions before we start.

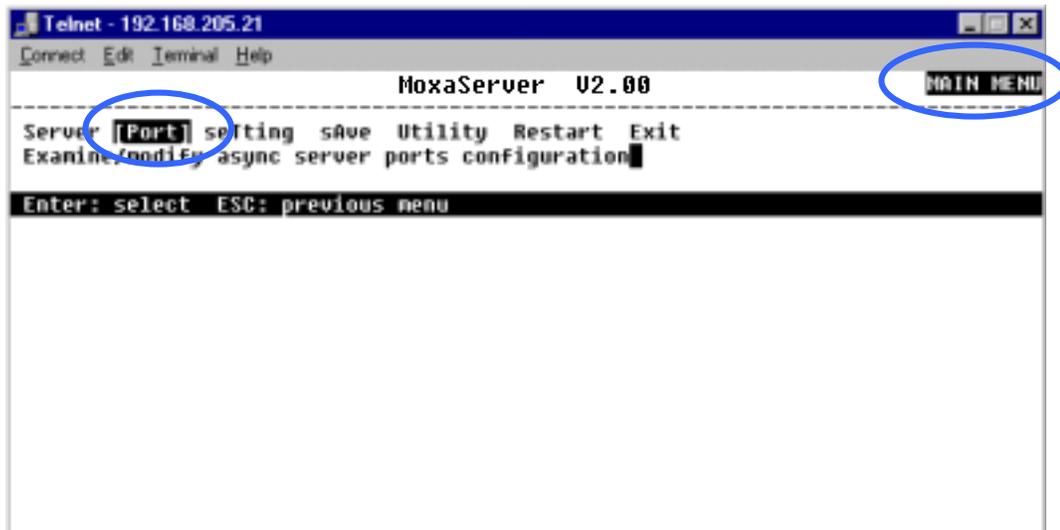
	Key
Move	[Up/Down/Left/Right] Arrow Key or [Tab] Key
Enter to next menu	[Enter] Key
Back to previous menu	[Esc] Key
Fast Key	<b>Capital</b> letter of the word



If you have problems using the arrow keys to move the cursor, click on the **Terminal** menu, choose **Preferences**, and then select **VT100 Arrows** in the **Terminal Preferences** window.



3. In **MAIN MENU**, use the arrow keys to select **Port**, and then press **[Enter]**.



4. In **Port Menu**, select **Mode**, and then press **[Enter]**.



## 5. Select Application

Use the up/down arrow keys to move to the **Application** column of the corresponding tty port. We use port 6 in the example below.

```
-----
[Mode] Line m0dem Welcome MSG Quit
Examine/modify the operation mode of async ports

ESC: back to menu  Enter: select

Port  Application      Mode      Description/more setting
01  [Device Control]  [ASPP   ]  [Async Server Proprietary Protocol]
02  [Device Control]  [ASPP   ]  [Async Server Proprietary Protocol]
03  [Dialin/out   ]  [DYNAMIC ]  [Auto Term/SLIP/PPP identification]
04  [Device Control]  [ASPP   ]  [Async Server Proprietary Protocol]
05  [Device Control]  [ASPP   ]  [Async Server Proprietary Protocol]
06  [Device Control]  [ASPP   ]  [Async Server Proprietary Protocol]
07  [Device Control]  [ASPP   ]  [Async Server Proprietary Protocol]
08  [Dialin/out   ]  [PPPD   ]  [PPP mode for in-coming only   ]
09  [Device Control]  [ASPP   ]  [Async Server Proprietary Protocol]
10  [Device Control]  [ASPP   ]  [Async Server Proprietary Protocol]
```

## 6. Press [Enter] to open the pop-up application window. Use the up/down arrow keys to select **Fixed TTY**, and then press [Enter] again to confirm.

```
-----
[Mode] Line m0dem Welcome MSG Quit
Examine/modify the operation mode of async ports

ESC: back to menu  Enter: select

Port  Application      Mode      Description/more setting
01  [Terminal      ]+-----+Binary Terminal mode (1 session) ]
02  [Multiplex    ]| Disable  |Binary Terminal mode (1 session) ]
03  [Device Control]| Dialin/out|sync Server Proprietary Protocol]
04  [Device Control]| Terminal  |sync Server Proprietary Protocol]
05  [Device Control]| Remote Control|sync Server Proprietary Protocol]
06  [Device Control]| Device Control|sync Server Proprietary Protocol]
07  [Device Control]| Multiplex  |sync Server Proprietary Protocol]
08  [Device Control]| Printer    |sync Server Proprietary Protocol]
09  [Device Control]| Fixed TTY  |sync Server Proprietary Protocol]
10  [Device Control]| NI Real Com|sync Server Proprietary Protocol]
11  [Device Control]+-----+sync Server Proprietary Protocol]
12  [Device Control] [ASPP   ]  [Async Server Proprietary Protocol]
```

- Repeat step 6. to set up other tty ports. For example, you could set ports 1 to 8 to use the **Fixed tty** application, as indicated below.

```

-----
[Mode] Line m0dem Welcome_MSG Quit
Examine/modify the operation mode of async ports

ESC: back to menu  Enter: select

Port  Application      Mode      Description/more setting
01   [Fixed TTY ] [RAW ] [Pure raw data mode ]
02   [Fixed TTY ] [RAW ] [Pure raw data mode ]
03   [Fixed TTY ] [RAW ] [Pure raw data mode ]
04   [Fixed TTY ] [RAW ] [Pure raw data mode ]
05   [Fixed TTY ] [RAW ] [Pure raw data mode ]
06   [Fixed TTY ] [RAW ] [Pure raw data mode ]
07   [Fixed TTY ] [RAW ] [Pure raw data mode ]
08   [Fixed TTY ] [RAW ] [Pure raw data mode ]

```

## RAW Mode

- Move the cursor to the **Description/more setting** column, and then press **[Enter]** to open the setting window.

```

-----
MoxaServer  V2.00
-----
[Mode] Line m0dem Welcome_MSG Quit
Examine/modify the operation mode of async ports

ESC: back to menu  Enter: select

Port  Application      Mode      Description/more setting
01   [Fixed TTY ] [RAW ] [Pure raw data mode ]
02   [Fixed TTY ] [RAW ] [Pure raw data mode ]
03   [Fixed TTY ] [RAW ] [Pure raw data mode ]

```

2. RAW Description/more setting Window

```

| TCP port          : [ 4002 ]
| Source IP address : [          ]
| Destination IP addr : [          ]
| Inactivity time   : [ 0m ]
| TCP alive check time: [ 0 ] minutes

```

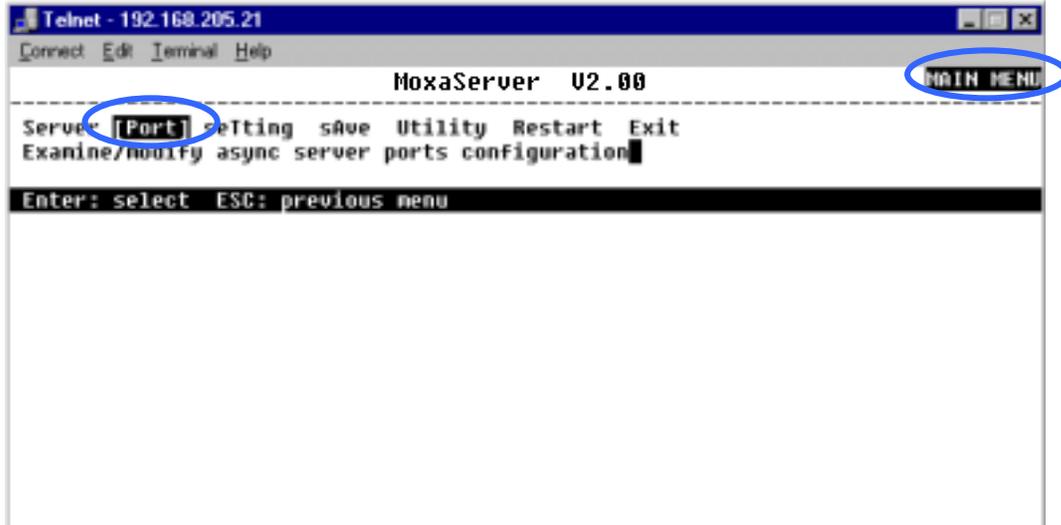
Setting	Value	Notes	Necessity
TCF port	number	Each of CN2500's serial ports is mapped to a TCP port. To avoid conflicts with TCP ports, set the port numbers to 4001 for port1, 4002 for port2, etc. (like the default value).	Optional
Source IP address	IP address for the port	Specify an IP address for this port for application needs. If left blank, CN2500 will specify its own IP address, so you will need to set a different TCP port number to avoid conflicts.	Optional
Destination IP addr	IP address	Assign a host IP on the LAN for exclusive port access. If left blank, all hosts on the network will have access to this port.	Optional
Inactivity time	0/5/10/20/30/60 minutes	Idle time setting for auto-disconnection 0 min means no disconnection	Optional
TCP alive check time	0-99 minutes	Specify the time slice for checking whether TCP connection is alive. If no response, CN2500 will reset the port and disconnect the original connection.	Optional

3. Repeat the above steps to set all RAW ports.
4. Press **[Esc]** to return to **PORT MENU**.

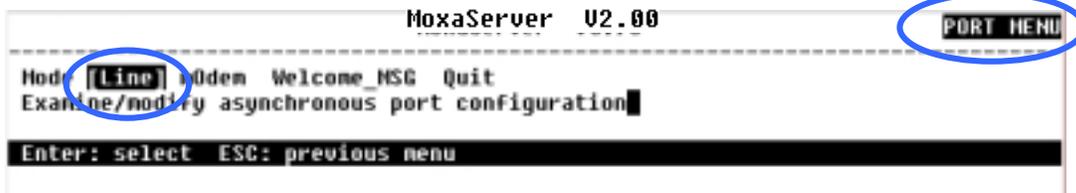
## Configuring port connection setting— Port Menu [Line]

In **PORT MENU [Line]**, you can set line settings depending on which terminal is being used.

1. In **MAIN MENU**, use the arrow keys to select **Port**, and then press **[Enter]**.



2. In **PORT MENU**, select **Line**, and then press **[Enter]**.



### 3. Specify settings

```

MoxaServer  V2.00
-----
Mode [Line] m0dem  Welcome MSG  Quit
Examine/modify asynchronous port configuration

ESC: back to menu  Enter: select

Port  Speed      Bits  Stop  Parity  TxFIFO  RTS/CTS  XON/XOFF  Discon. ctrl
01    [115.2K]    [8]   [ 1 ] [none] [yes]   [yes]   [no ]    [none ]
02    [115.2K]    [8]   [ 1 ] [none] [yes]   [yes]   [no ]    [none ]
03    [115.2K]    [8]   [ 1 ] [none] [yes]   [yes]   [no ]    [none ]
04    [115.2K]    [8]   [ 1 ] [none] [yes]   [yes]   [no ]    [none ]
05    [115.2K]    [8]   [ 1 ] [none] [yes]   [yes]   [no ]    [none ]
06    [115.2K]    [8]   [ 1 ] [none] [yes]   [yes]   [no ]    [none ]
07    [115.2K]    [8]   [ 1 ] [none] [yes]   [yes]   [no ]    [none ]
08    [19200 ]    [8]   [ 1 ] [none] [yes]   [yes]   [no ]    [DCD-off ]
09    [115.2K]    [8]   [ 1 ] [none] [yes]   [yes]   [no ]    [none ]
10    [115.2K]    [8]   [ 1 ] [none] [yes]   [yes]   [no ]    [none ]
11    [115.2K]    [8]   [ 1 ] [none] [yes]   [yes]   [no ]    [none ]
12    [115.2K]    [8]   [ 1 ] [none] [yes]   [yes]   [no ]    [none ]
13    [115.2K]    [8]   [ 1 ] [none] [yes]   [yes]   [no ]    [none ]
14    [115.2K]    [8]   [ 1 ] [none] [yes]   [yes]   [no ]    [none ]
15    [115.2K]    [8]   [ 1 ] [none] [yes]   [yes]   [no ]    [none ]
16    [115.2K]    [8]   [ 1 ] [none] [yes]   [yes]   [no ]    [none ]

```

Setting	Value	Notes
Speed	50 – 230.4 Kbps	Transmission speed
Bits	5/6/7/8	Data bit
Stop	1/1.5/2	Stop bit
Parity	None/even/odd	Parity check
TxFIFO	Yes/No	FIFO setting. Default is <b>Yes</b>
RTS/CTS	Yes/No	Hardware flow control
XON/XOFF	Yes/No	Software flow control
Discon. Ctrl	DSR-off, DCD-off and none	Inactive under this mode

4. Repeat the above steps to set up all lines.
5. Press [Esc] to return to **PORT MENU**.

## Save

1. Press [Y] to save previous settings when exiting **PORT MENU**.

```
MoxaServer  V2.00  PORT MENU
-----
[Mode] Line m0den Welcome_MSG Quit
Examine/modify the operation mode of async ports
Enter: select  ESC: previous menu

Warning !!!
You had modified the configuration without saving.
Would you save it now ?
'Y': yes   'N': no
```

2. You may also save later. In "**MAIN MENU**", select "**sAve**" to save all changed settings. Press [Enter] to confirm

```
MoxaServer  V2.00  MAIN MENU
-----
Server Port setting [sAve] Utility Restart Exit
Save current configuration to Flash ROM
Enter: select  ESC: previous menu

-----
|Enter to update, other key to cancel|
-----
```

# Restart

1. In MAIN MENU select **Restart**.

```
MoxaServer V2.00 MAIN MENU
-----
Server Port setting save Utility [Restart] Exit
Restart the whole system or selected async ports
Enter: select ESC: previous menu
```

2. Select **System** and Press **[Enter]** to continue.
3. The system will restart and the Telnet/Console session will terminate.

```
MoxaServer V2.00
-----
[System] Port Quit
Restart the Async Server
ESC: back to menu Enter: select

-----
Warning !!!
Restart system will disconnect all ports and clear all status value
Enter: continue ESC: cancel
-----
```

# Setting up the host

## Installing and configuring Moxatty

### Installing and compiling

(1) Create a directory for MOXATTY (e.g., `/usr/etc/moxatty`) as follows:

```
#mkdir /usr/etc/moxatty
```

```
#cd /usr/etc/moxatty
```

(2) Extract code from the tar-formatted file `moxatty.tar` as follows:

```
#tar xvf moxatty.tar
```

(3) After the extraction is complete, locate the following files:

`moxattyd.c` : program source code

`moxattyd.cf` : configuration file

README : description file for moxatty

(4) Compile and link files.

**SCO UNIX** : `cc -O -o moxattyd moxattyd.c -lsocket`

**LINUX** : `cc -O -o moxattyd moxattyd.c`

**AIX** : `cc -O -o -DAIX moxattyd moxattyd.c`

### Configuring tty redirection

The following example illustrates how to map and redirect a tty device to a MOXA CN2500 serial port. Use `vi` or any editor to add or modify entries in the file `moxattyd.cf`. There are three columns: **Device Name**, **CN2500 IP address** and **TCP port number** in the entry for the file `moxattyd.cf`.

Device Name	CN2500 IP address	TCP Port number
ttyp1	192.168.1.1	4001
ttyp2	192.168.1.1	4002
ttyp3	192.168.1.1	4003
ttyp4	192.168.1.1	4004



Note:

1. Device Names for SCO Unix are `ttyp0`, `ttyp1`, `ttyp2`
2. Device Names for Linux are `tty[pqrs][0-9,a-f]`

3. *Device Names for AIX are tty p[0-9,a-f]*
4. *Default TCP port numbers are from 4001 to 4016 for the 16 port CN2500. If necessary, you can customize the TCP port numbers according to your needs. However, they MUST be the same as those defined on MOXA CN2500.*

## Adding Moxatty to system booting procedures

To include MOXATTY in the booting system, add the `moxattyd` daemon process to the `/etc/inittab` file. The following example illustrates how to add the full path name for `moxattyd` to the entries of `/etc/inittab` for different UNIX hosts.

### **For SCO UNIX**

```
ts:2:respawn:/usr/etc/moxatty/moxattyd -t 1
```

### **For LINUX**

```
ts:3:respawn:/usr/etc/moxatty/moxattyd -t 1
```

### **For AIX**

```
ts:2:respawn:usr/etc/moxatty/moxattyd -t 1
```

### **For HP/UX**

```
ts:2:respawn:usr/etc/moxatty/moxattyd -t 1
```



- Note:*
1. *The option “-t 1” means the reconnection time is 1 minute after turning CN2500 on or off.*
  2. *This entry must be placed before other entries.*

## Moxatty for different applications

This section illustrates how to use MOXATTY with a number of different applications.

### Terminal Access

To use terminal access the process **getty** must be activated while the system boots up. To do this, add the following entries to the file `/etc/inittab`.

#### **For SCO UNIX**

```
ts1:234:respawn:/etc/getty ttyp1
ts2:234:respawn:/etc/getty ttyp2
ts3:234:respawn:/etc/getty ttyp3
ts4:234:respawn:/etc/getty ttyp4
```

#### **For LINUX**

```
p1:345:respawn:/sbin/mingetty ttyp1
p2:345:respawn: /sbin/mingetty ttyp2
p3:345:respawn: /sbin/mingetty ttyp3
p4:345:respawn: /sbin/mingetty ttyp4
```

#### **For AIX**

```
ts1:2:respawn:/usr/sbin/getty ttyp1
ts2:2:respawn:/usr/sbin/getty ttyp2
ts3:2:respawn:/usr/sbin/getty ttyp3
ts4:2:respawn:/usr/sbin/getty ttyp4
```

#### **For HP/UX**

```
ts1:2:respawn:/usr/sbin/getty ttyp1
ts2:2:respawn:/usr/sbin/getty ttyp2
ts3:2:respawn:/usr/sbin/getty ttyp3
ts4:2:respawn:/usr/sbin/getty ttyp4
```



*NOTE: ttyp1~ttyp4 device names are mapped to port 1~ port 4 on MOXA CN2500.*

## Transparent Printer Access

It's not necessary to add additional entries to `/etc/inittab` for printer access, as mentioned in terminal access. Since MOXATTY is a fixed pseudo tty, you can easily connect a serial printer to a Moxa CN2500 serial port to execute printing commands.

The following example is for **SCO UNIX**:

Command	Description
<code>/usr/lib/lpadmin -pLaser1 -v/dev/tty1</code>	set printer name as Laser1 and use tty1
<code>/usr/lib/accept Laser1</code>	accept printer Laser1
<code>enable Laser1</code>	enable printer Laser1
<code>lp -dLaser1 file_name</code>	print file to Laser1

## Other Applications

As mentioned earlier, system setup depends on which application you are using. Since MOXATTY is a fixed pseudo tty, no additional setup is required to enable your applications to open tty devices.

## Using MOXATTY

### Starting MOXATTY

Once you have completed the above settings, you can start. Follow the steps given below to ensure that MOXATTY is running correctly.

See if the entries added to `moxattyd.cf` are correct.

Run `init q` or reboot your system to start the MOXATTY daemon. If you see that `moxattyd` is running on your system, then MOXATTY has been successfully started.

### Stopping MOXATTY

If for any reason you need to stop the MOXATTY daemon, the two methods listed below allow you to stop the `moxattyd` daemon process:

1. Remove entries related to `moxattyd` daemon in `/etc/inittab` and execute `init q` or reboot your system.

Or:

2. Replace `respawn` with `off` in entries related to `moxattyd` daemon in `/etc/inittab`, and execute `init q` or reboot your system.



*Note: For instance, 'ts:2:off:/usr/etc/moxatty/moxattyd' for SCO UNIX, 'ts:3:off:/usr/etc/moxatty/moxattyd' for LINUX, or 'ts:2:off:/usr/etc/moxatty/moxattyd' for AIX.*