

eXMP-SynqNet

Quick Start Guide

Linux





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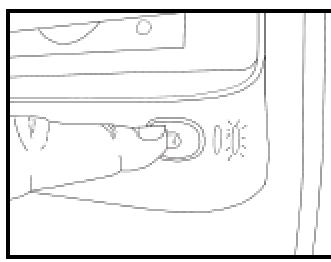
Safety Warnings

During installation, solid electrical contact must be ensured at connectors; otherwise, noise and power problems will develop. (Connections should be verified through inspection and testing.)

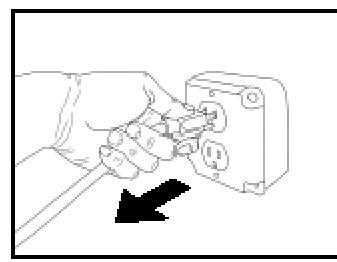
Standard safety rules prevail during installation of any hardware. Some are summarized below for the XMP. For more information, refer to local occupational safety regulations and the manufacturer of your motion drive.

Turn Off All Power Before Installing Equipment

Before installing any motion control equipment, including XMP controllers, power should be switched OFF. Unplug all power plugs from their sources of power.



Switch OFF equipment.



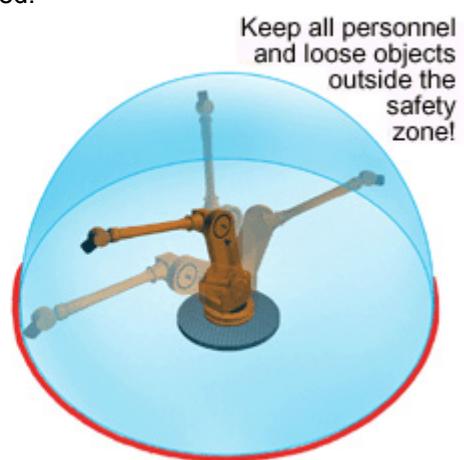
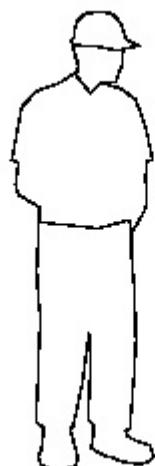
Unplug from source of power.

Define and Clear a Safety Zone!

During installation and testing of motion control hardware-software, a safety zone should be defined around moving components and kept clear of personnel, hands, fingers and loose hardware. During re-powering of the system, motion control components may behave erratically due to misconnected lines, or wrongly configured software settings. Sudden and unexpected moves by components can cause injury, property damage, or even death!

Under NO circumstances, should a motion system be tested or operated while personnel are within the safety zone.

Additionally, beware of flying debris from unsecured hardware operating at high speeds. The use of safety shielding is highly recommended.



Introduction

This Quick Start Guide explains how to configure the eXMP-SynqNet for software start-up and configuration including connection, accessing Linux, and changing network interface parameters. The eXMP-SynqNet has a default image preloaded onto the flash memory. The eXMP-SynqNet will boot this image. The MEI device driver (MEIXMP.o) will automatically load and be ready for executing motion applications at boot-up. The driver can be found in the /MEI/Release directory. Note that no MEI utilities are shipped on the eXMP at the factory. The user will need to copy the necessary files from the MPI release to the eXMP for the specific version.



Fig 1. A full version of the eXMP-SynqNet is shown above containing all the configuration options.

NOTE: Although a fully populated eXMP-SynqNet is shown, the setups should be identical for a "lite" version of the eXMP-SynqNet.

IMPORTANT NOTE

In its default shipping state, the eXMP is configured for an IP address of:

192.1.68.1.74

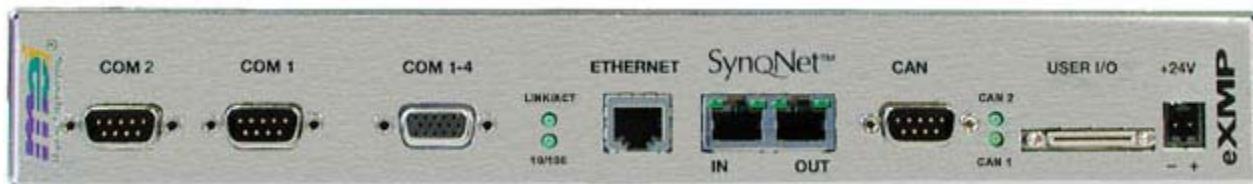
The user can change his network settings by using telnet to access the eXMP and change the IP address, or connect to the eXMP using a console connection and adapter (see the *Configuring for Console Mode* section).

IMPORTANT NOTE

The eXMP-SynqNet was designed to allow users to interact with its operating system using a local console and command line via COM1. Therefore, COM1 functions as either a standard COM1 connection or as the console mode connection. Do NOT connect a serial device into the eXMP-SynqNet when COM1 is being used in console mode. COM1 cannot function as a standard COM1 connection and a console mode connection at the same time. The following steps will explain how to set up the eXMP-SynqNet in console mode so that it may be accessed by a network computer for development and testing.

Hardware Setup

A fully populated eXMP-SynqNet is shown below. Depending on the version of eXMP-SynqNet, some connectors may not be present.



Configuring for Console Mode

The following steps will explain how to set up the eXMP-SynqNet in console mode so that it may be accessed by a host computer for local development and testing.

1. The local console must be attached to COM1 via a Null Modem serial cable whose RIN (pin 9) and DTR (pin 4) lines are tied together.



The short between these two pins indicates the presence of a valid console device and is detected during system initialization by the eXMP, thereby enabling the Console output to COM1. This can be done with either an inline adapter or modifications to the Null Modem cable itself.

One example of an inline adapter is the **MEI C001-0034** (Cable. Serial, eXMP, DE9).

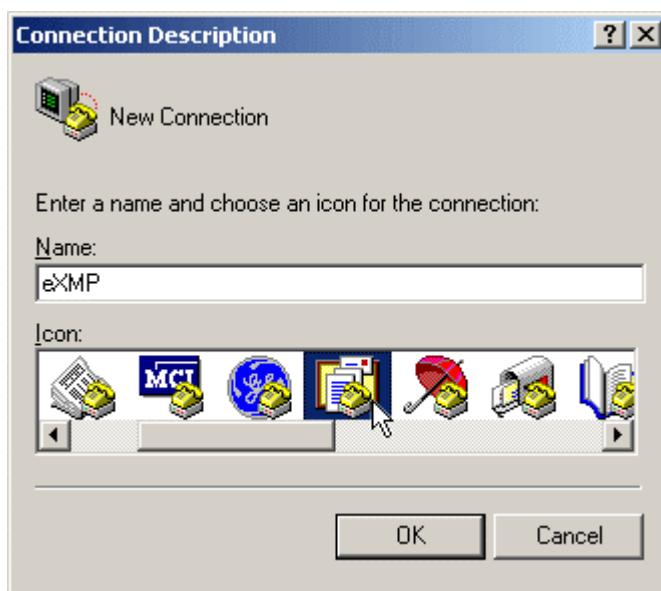


Although MEI does not sell this adapter, MEI can provide the necessary cable DWG to make your own adapter.

Host-Side Configuration

1. Power down Controller.

2. Open HyperTerminal and configure a new connection. Choose a name and icon for this connection.



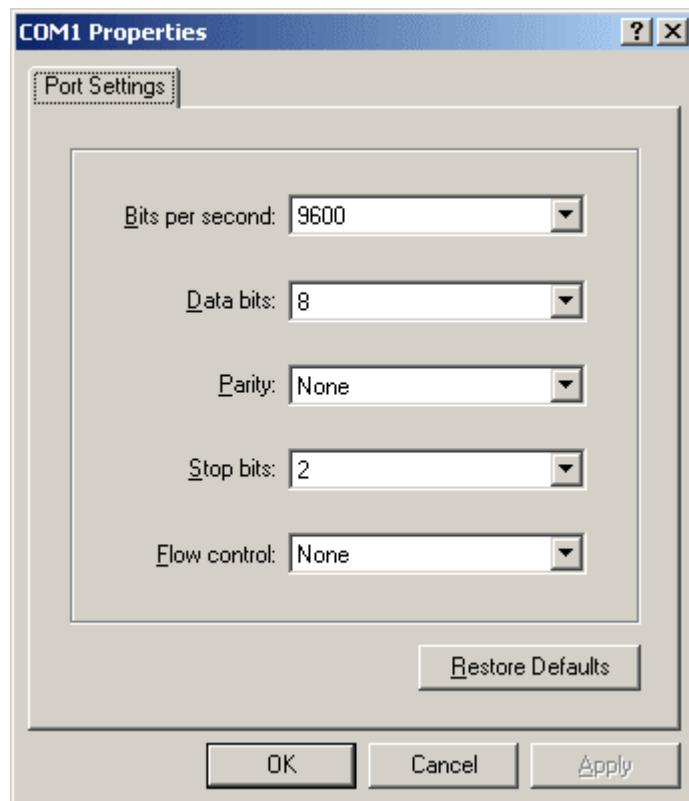
3. If it is not already connected, connect eXMP COM1/Console to COM1 on the host computer using a NULL serial cable. Console mode is now enabled on the eXMP-SynqNet.



4. After pressing OK, switch **Connect using** to the appropriate COM port. All other fields should be grayed out after selections have been made.



5. Configure the connection as follows:

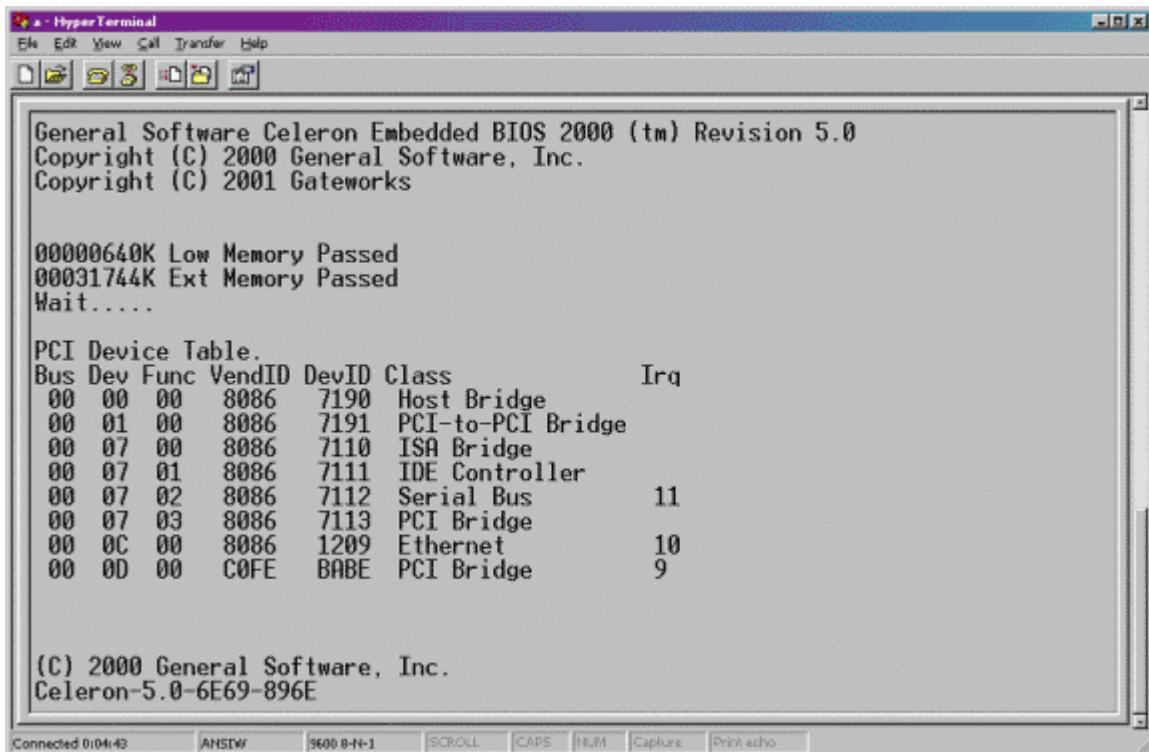


Click **OK**. The session is now active. Upon exit, save this session for later use.

6. Power up the eXMP-SynqNet.

Changing Network Interface Parameters

1. When you power up the eXMP-SynqNet, the console terminal should display the BIOS information.



The screenshot shows a Windows HyperTerminal window titled "HyperTerminal". The window displays the following text:

```
General Software Celeron Embedded BIOS 2000 (tm) Revision 5.0
Copyright (C) 2000 General Software, Inc.
Copyright (C) 2001 Gateworks

00000640K Low Memory Passed
00031744K Ext Memory Passed
Wait.....

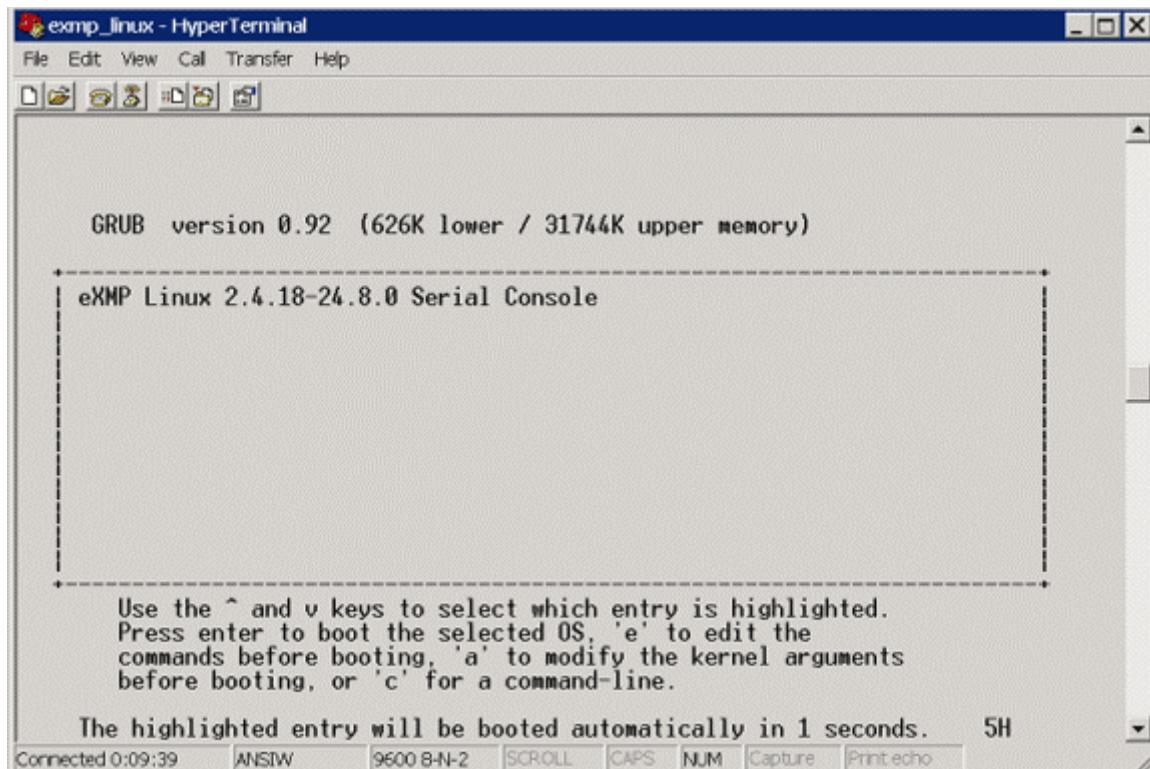
PCI Device Table.
Bus Dev Func VendID DevID Class      Irc
00 00 00 8086 7190 Host Bridge
00 01 00 8086 7191 PCI-to-PCI Bridge
00 07 00 8086 7110 ISA Bridge
00 07 01 8086 7111 IDE Controller
00 07 02 8086 7112 Serial Bus      11
00 07 03 8086 7113 PCI Bridge
00 0C 00 8086 1209 Ethernet      10
00 0D 00 C0FE B0BE PCI Bridge      9

(C) 2000 General Software, Inc.
Celeron-5.0-6E69-896E
```

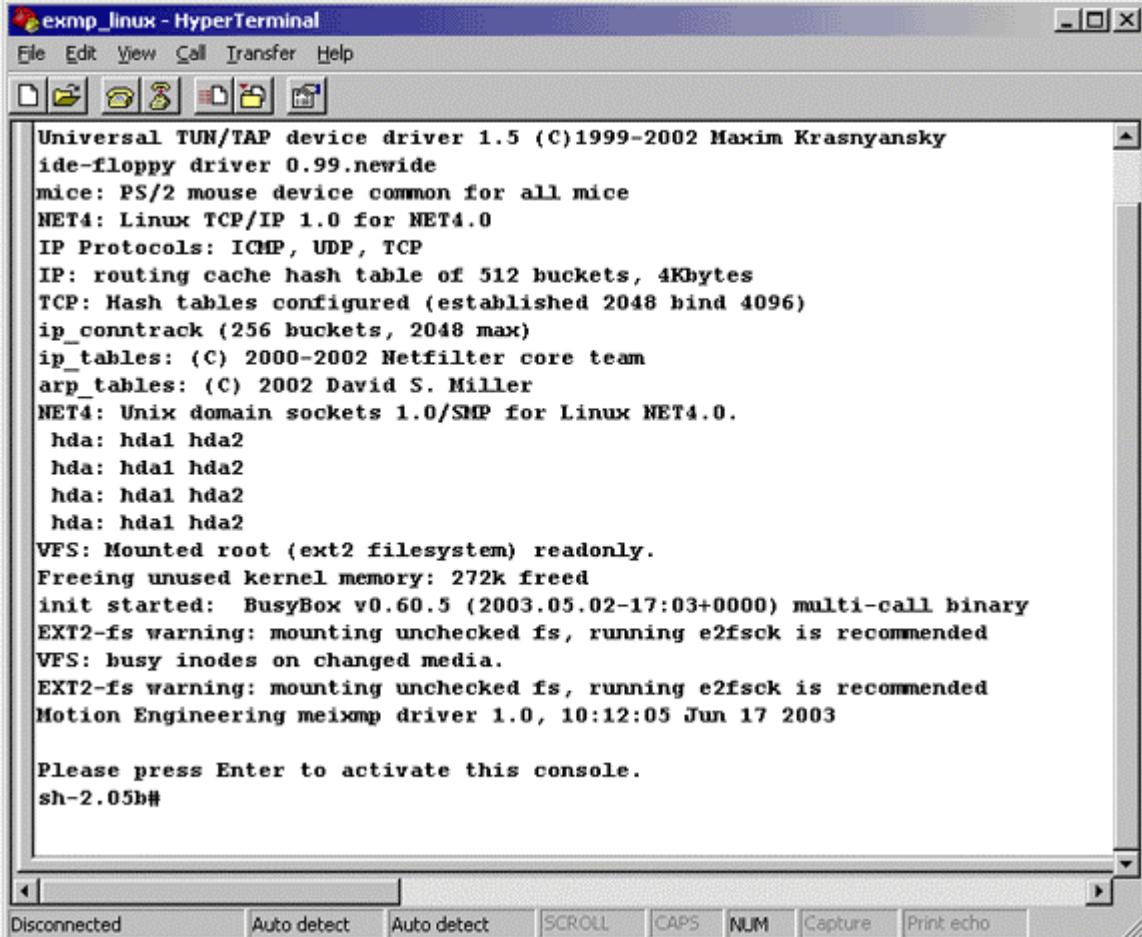
At the bottom of the window, there is a toolbar with icons for file operations like Open, Save, Print, and Exit. Below the toolbar, there is a status bar with the following text: Connected 0:04:43 ANSIW 3600 8-N-1 SCROLL CAPS NUM Capture Print echo.

2. After the BIOS information is displayed, the GRUB bootloader screen will be displayed. The default boot option will be highlighted and will auto-boot this option after waiting 5 seconds.

Advanced Linux users can edit the '/boot/grub/grub.conf' to specify a new or different boot option, if necessary.



3. As the default option is booted and the Linux kernel is loaded, the Linux kernel messages will appear in the terminal. The final message will prompt you to press a key to start a shell on the terminal.



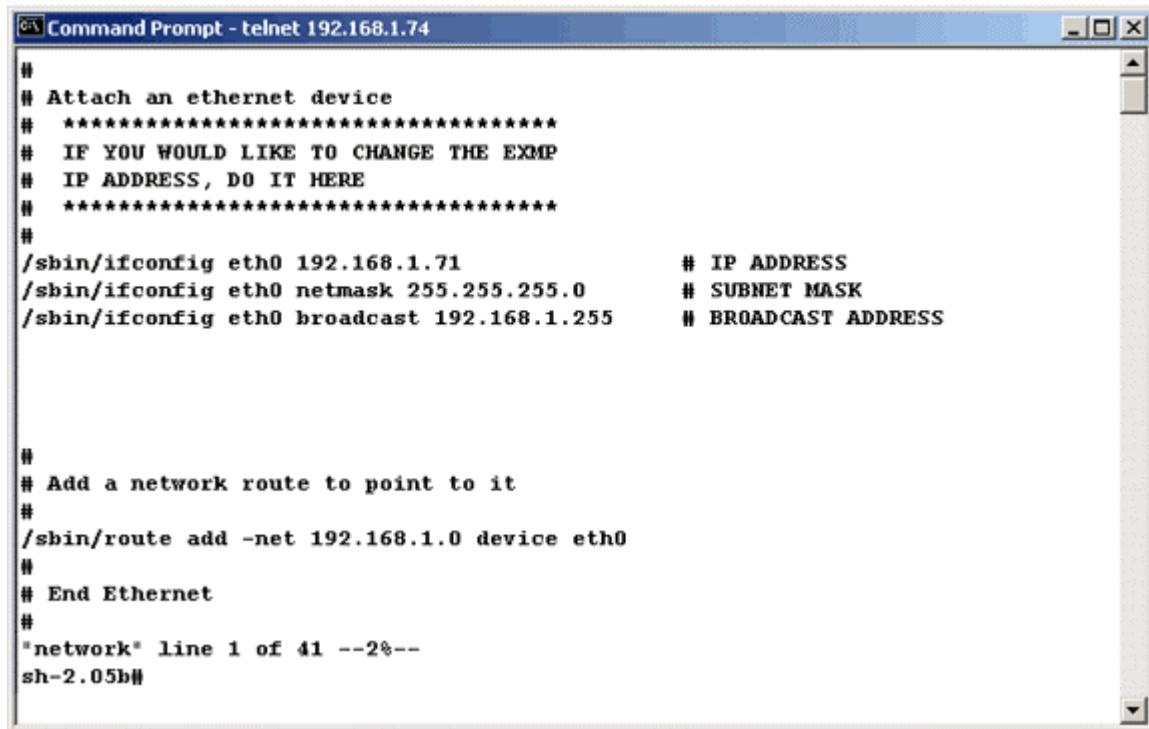
The screenshot shows a Windows HyperTerminal window titled "exmp_linux - HyperTerminal". The window displays the Linux kernel boot log. Key messages include:

- Universal TUN/TAP device driver 1.5 (C)1999-2002 Maxim Krasnyansky
- ide-floppy driver 0.99.newide
- mice: PS/2 mouse device common for all mice
- NET4: Linux TCP/IP 1.0 for NET4.0
- IP Protocols: ICMP, UDP, TCP
- IP: routing cache hash table of 512 buckets, 4Kbytes
- TCP: Hash tables configured (established 2048 bind 4096)
- ip_conntrack (256 buckets, 2048 max)
- ip_tables: (C) 2000-2002 Netfilter core team
- arp_tables: (C) 2002 David S. Miller
- NET4: Unix domain sockets 1.0/SMP for Linux NET4.0.
- hda: hda1 hda2
- hda: hda1 hda2
- hda: hda1 hda2
- hda: hda1 hda2
- VFS: Mounted root (ext2 filesystem) readonly.
- Freeing unused kernel memory: 272k freed
- init started: BusyBox v0.60.5 (2003.05.02-17:03+0000) multi-call binary
- EXT2-fs warning: mounting unchecked fs, running e2fsck is recommended
- VFS: busy inodes on changed media.
- EXT2-fs warning: mounting unchecked fs, running e2fsck is recommended
- Motion Engineering meixmp driver 1.0, 10:12:05 Jun 17 2003

Please press Enter to activate this console.
sh-2.05b#

At the bottom of the window, there are several status buttons: Disconnected, Auto detect, Auto detect, SCROLL, CAPS, NUM, Capture, and Print echo. The "Auto detect" button is highlighted.

4. Once the console is activated, use the vi editor to change the network interface settings in the 'etc/init.d/network' file. This is a small file, and there are BOLD comments marking the location to set the desired IP address, subnet mask, broadcast address, and network routing address. Be sure to write the changes to the file before quitting (:w) and (:q).



```
#  
# Attach an ethernet device  
# *****  
# IF YOU WOULD LIKE TO CHANGE THE EXMP  
# IP ADDRESS, DO IT HERE  
# *****  
  
#/sbin/ifconfig eth0 192.168.1.71          # IP ADDRESS  
#/sbin/ifconfig eth0 netmask 255.255.255.0  # SUBNET MASK  
#/sbin/ifconfig eth0 broadcast 192.168.1.255 # BROADCAST ADDRESS  
  
  
#  
# Add a network route to point to it  
#  
#/sbin/route add -net 192.168.1.0 device eth0  
#  
# End Ethernet  
#  
"network" line 1 of 41 --2%--  
sh-2.05b#
```

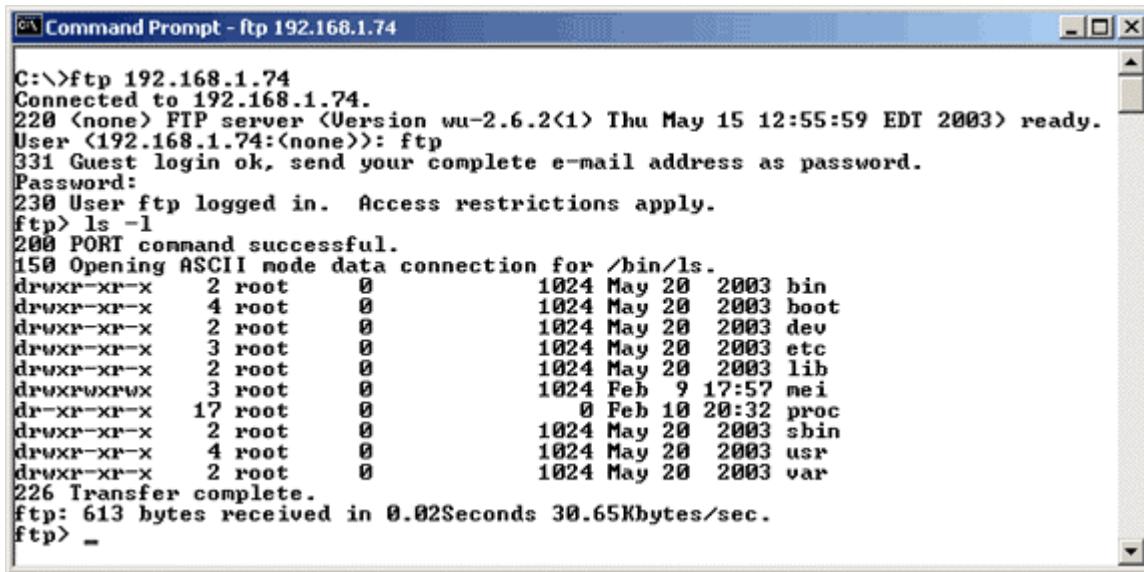
5. After saving the valid network interface parameters, reboot the eXMP using the 'reboot' command, or use the 'shutdown' command and then cycle power. After the eXMP completes the Linux boot process, the eXMP should be accessible from another computer on the local area network. The eXMP runs an anonymous FTP server, and a telnet server.

To connect to the eXMP FTP server from a Windows PC, type the following from a Command Prompt (using the new IP address for the eXMP):

```
ftp 192.168.1.74
```

Use 'anonymous' or 'ftp' as the login name; the password you choose does not matter.

Full read/write, get/put access is allowed with the eXMP in every directory. Here is a screenshot of an ftp session:



```
C:\>ftp 192.168.1.74
Connected to 192.168.1.74.
220 <none> FTP server <Version wu-2.6.2<1> Thu May 15 12:55:59 EDT 2003> ready.
User <192.168.1.74:<none>>: ftp
331 Guest login ok, send your complete e-mail address as password.
Password:
230 User ftp logged in. Access restrictions apply.
ftp> ls -l
200 PORT command successful.
150 Opening ASCII mode data connection for /bin/ls.
drwxr-xr-x  2 root      0          1024 May 20  2003 bin
drwxr-xr-x  4 root      0          1024 May 20  2003 boot
drwxr-xr-x  2 root      0          1024 May 20  2003 dev
drwxr-xr-x  3 root      0          1024 May 20  2003 etc
drwxr-xr-x  2 root      0          1024 May 20  2003 lib
drwxrwxrwx  3 root      0          1024 Feb  9 17:57 mei
dr-xr-xr-x  17 root     0          0 Feb 10 20:32 proc
drwxr-xr-x  2 root      0          1024 May 20  2003 sbin
drwxr-xr-x  4 root      0          1024 May 20  2003 usr
drwxr-xr-x  2 root      0          1024 May 20  2003 var
226 Transfer complete.
ftp: 613 bytes received in 0.02Seconds 30.65Kbytes/sec.
ftp> _
```

6. Accessing the eXMP via Telnet provides an eXMP shell with unlimited access. To connect to the eXMP FTP server from a Windows PC, type the following from a Command Prompt (using the new IP address for the eXMP):

```
telnet 192.168.1.74
```

The session should look like this:

```
Linux 2.4.18-24.8.0-eXMP <(none)> <20:34 on Sunday, 10 February 1980>
eXMP-2.05b#
```

Using the eXMP-SynqNet Motion Controller

By default, the standard Linux XMP device driver ('/mei/Release/meixmp.o') is loaded during startup. This is an MPI version-independent file.

To execute any XMP utilities or applications, load the executable file to the eXMP via ftp, and execute them from a console or telnet shell.

NOTE: As with any UNIX based system, you will need to set the attributes of any file you ftp to the eXMP-SynqNet. This can be done using the *chmod* command. Please consult your UNIX documentation for more information on using this command.

Congratulations! You have successfully configured the eXMP-SynqNet for console mode using Linux. The eXMP-SynqNet is now ready for testing and development.