

# Quick Start for LinPAC-8x4x

Version 1.4, 2010/8/23

## ➔ What's In the Box?



LinPAC-8x4x module

LP-814x: 1 slot  
LP-844x: 4 slots  
LP-884x: 8 slots

microSD card

CD

Screw Driver

(1C016)  
2.4mm

RS-232 Cable

3-wire  
(LP-814x only)

In addition to this manual, the package includes the following items:

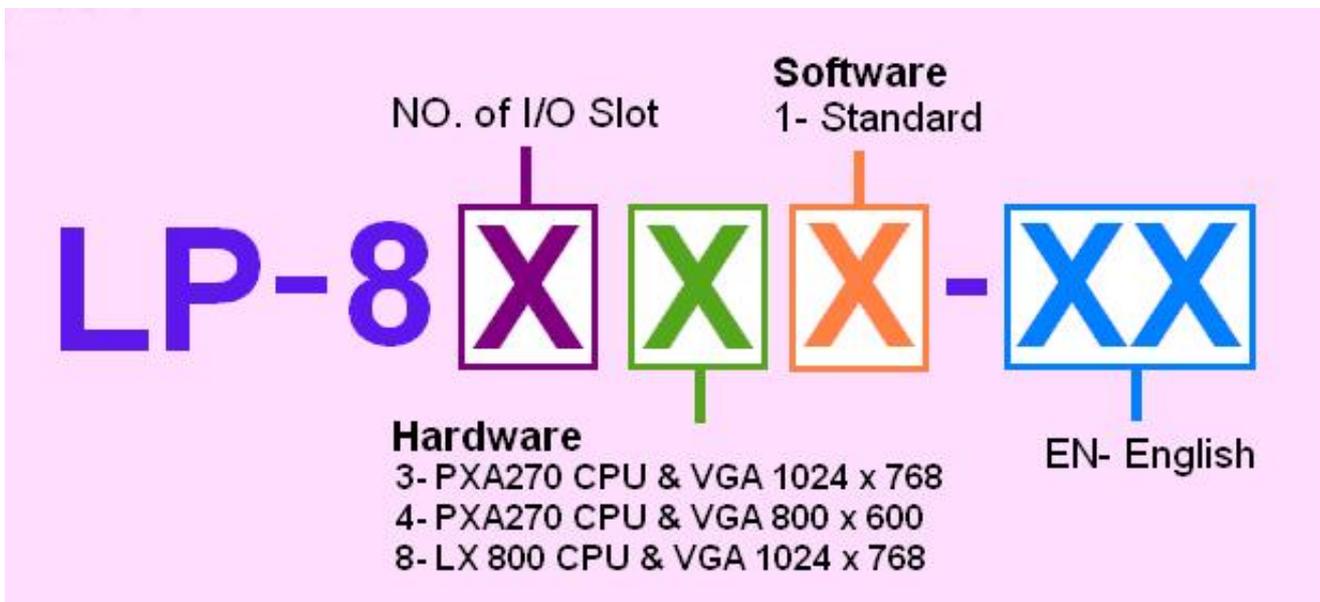
- One set of LinPAC-8x4x hardware
- One microSD card for storing system files
- One quick start guide (this manual)
- One software utility CD with Software User's Manual included
- One screw driver (2.4 mm)
- RS-232 cable (LP-814x only).

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# 1. Introduction

The LinPAC-8000 is the flagship compact embedded controller manufactured by ICP DAS. Its leading technology gives you all of the best features of both traditional PLCs and Linux capable PCs. The LinPAC-8000 system is powered by Linux and brings in the Linux programming style and skill into the world of PC-based PLC. Application developers can develop their own programs directly into C or Java language by using the LinPAC-8000 SDK, and then download them into the LinPAC-8000 for application and use.



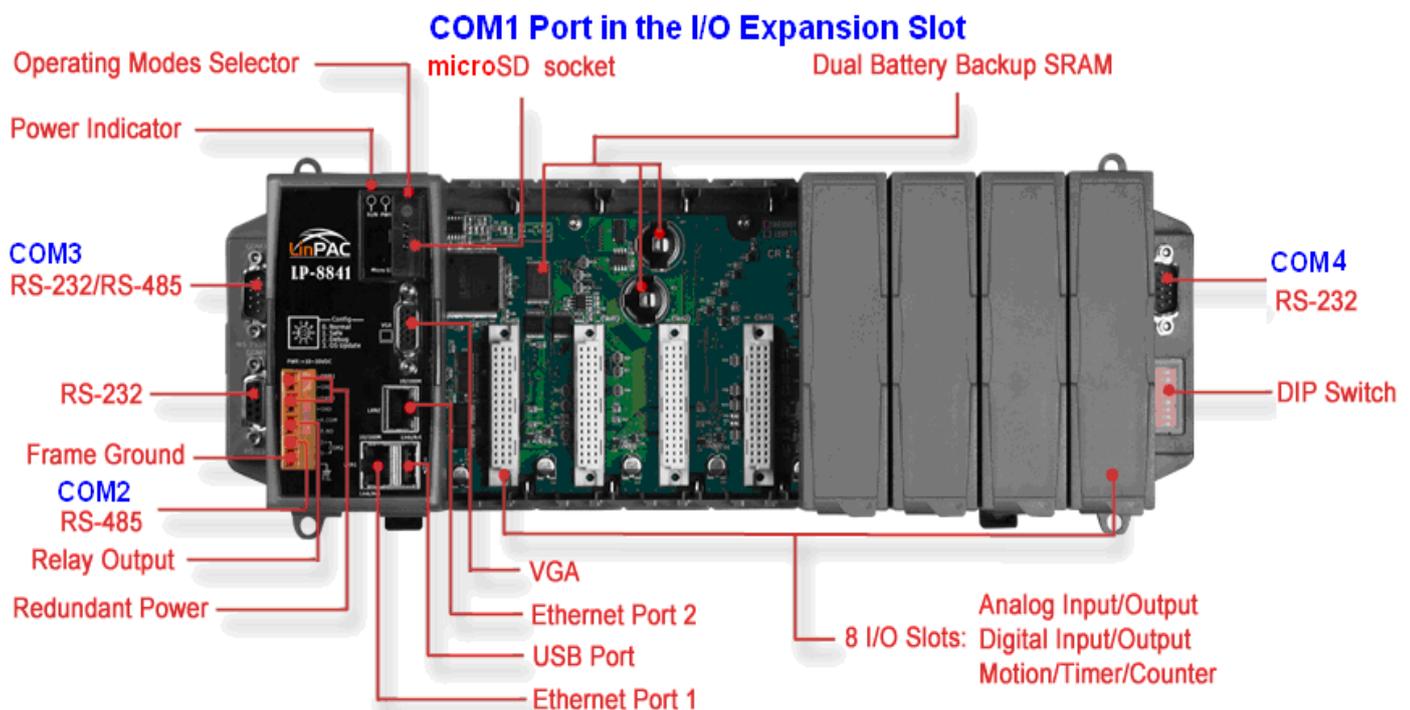
The LinPAC-8x4x model type is ruled as LP-8x4x, as shown in the above figure. The Second number shows the slot numbers coming with the main controller unit. Currently, we provide three types of 1、4 and 8 slots. The last number demonstrates the application platform. 1 stands as the Master controller and it means that the user needs to design the application program by themselves.

Model	OS	CPU	Flash	SDRAM	Ethernet	VGA Resolution	USB	I/O Slot	Audio Port
NEW LP-8141	Linux kernel 2.6	PXA270 520 MHz	48 MB	128 MB	2	800 x 600	1	1	None
NEW LP-8441								4	
NEW LP-8841								8	

## 2. Front View

The LinPAC-8000 Embedded Controller is competitive with Industrial PCs in performance, and is lower in price. The system provides VGA and USB keyboard/mouse for local visualization and management. User control programs and data can be saved in persistent storage via microSD memory card and USB interfaces. Furthermore, it has communication capabilities via the built-in Ethernet and RS-232/RS-485 interfaces

The following figure demonstrates the hardware system in the LinPAC-8x4x. It includes the main controller with HMI, serial communication and I/O expansion interface. COM3/COM4 is the standard RS-232 interface, which can be connected via the modem or to the COM1 in the LP-8x4x Controller. COM2/COM3 is the RS-485 interface, which can be applied to control the ICP DAS DCON serial modules such as the I-7000, I-8000 and I-87000. The FRnet system is an optional control interface.



### 3. Operation modes

There are four basic operation modes for running LinPAC-8x4x that can be determined through a rotary switch. The operating mode selection as below:

	Rotary switch position	Definition of operation
	0 : Normal mode	Default
	1 : Safe mode	Quick boot
	2 : Debug mode	Update OS image by user
	3 : OS update mode	Development by ICP DAS
	Others	Reserved

#### Normal mode(Default)

The normal mode is the default mode of operation. Use this mode for more tasks and configurations. Programs also are executed in this mode.

#### Safe mode

The safe mode is used to skip the LinPAC-8x4x boot screen form microSD/microSDHC card, so as to speed up the booting process.

#### Debug mode

The debug mode is a way used to update OS and **the Linux OS image was just suitable for the LinPAC-8x4x by ICP DAS**. If the LinPAC-8x4x cannot be boot or run the normal mode, please update OS image again. Please pay attention to backup important files first before updating OS image. More detail information about update the LinPAC-8x4x OS, please refer to “LinPAC-8000 OS image update manual”.

**The latest LinPAC-8x4x OS Image:** <http://ftp.icpdas.com/pub/cd/linpac/napdos/lp-8x4x/>

#### OS update mode

The purpose of this mode is used to development by ICP DAS.

#### Reserved

Rotary switch position 4~9 are reserved by ICP DAS.

## 4. Preparing start-up

Step 1. Make sure the rotary switch placed  
In the '0' position.

Step 2. Plug in your USB keyboard, mouse,  
VGA monitor and LAN.

Step 4. Insert the high profile I-8K/87K series  
I/O modules into the LinPAC-8x4x slots.

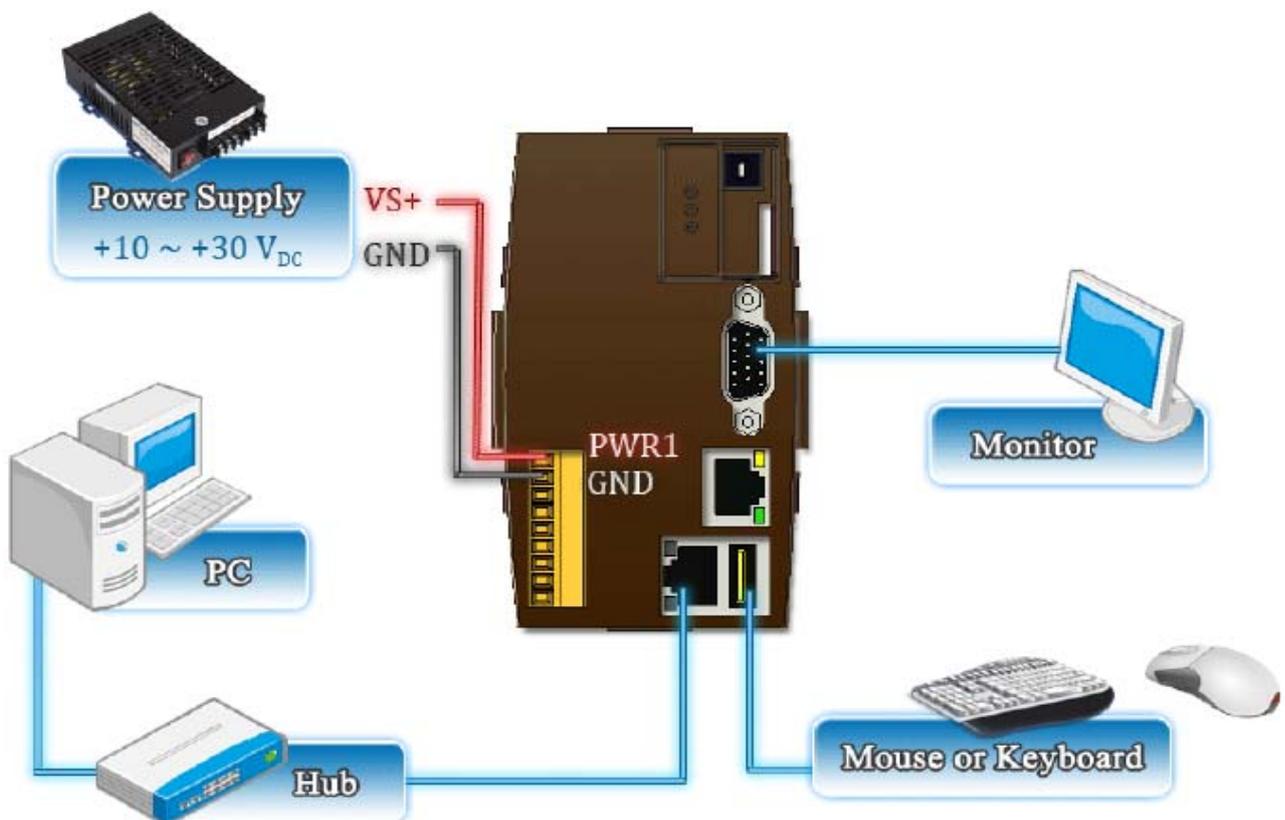
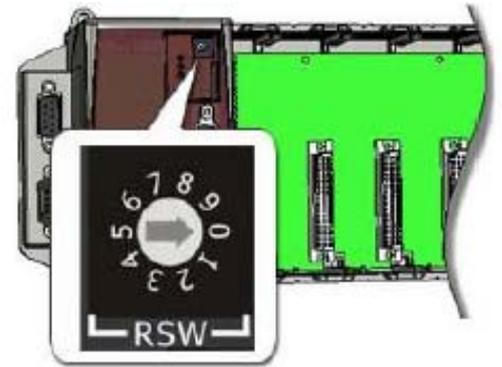
(Only high profile I-8K and I-87K series modules can be plugged)

Step 5. Connect the COM2, COM3 or the COM4  
ports to your devices controlled if necessary.

Step 6. Connect the DC power and turn it on.

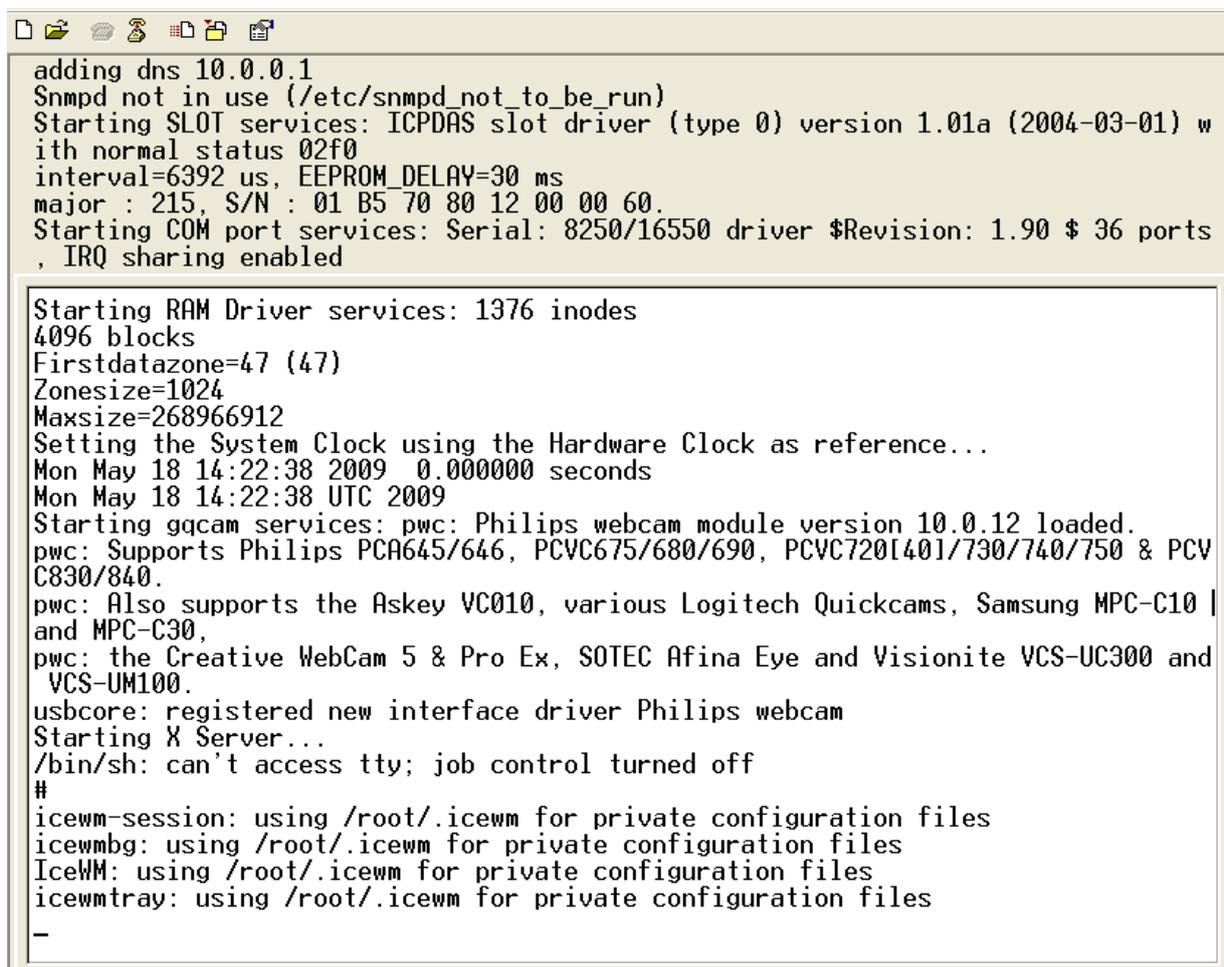
(The input range of power supply is +10~ +30V<sub>DC</sub>)

Step 7. The Linux will start up, more detail information, please refer to the  
software user's manual for further operations and for developing your  
own applications.



# 5. Connect the LinPAC and Windows PC

- ⇒ Start HyperTerminal by clicking on 'Start → Programs → Accessories → Communications → Hyper Terminal'
- ⇒ In the 'COM properties' dialog box, please set for 115200 bits per second, 8 data bits, no parity, 1 stop bit and no flow control to set up the communication parameters for the COM1 port, and press 'OK' when done.
- ⇒ Turn on the power, and user should see a message appear on the screen, and the total process is completed.



```
adding dns 10.0.0.1
Snmpd not in use (/etc/snmpd_not_to_be_run)
Starting SLOT services: ICPDAS slot driver (type 0) version 1.01a (2004-03-01) with normal status 02f0
interval=6392 us, EEPROM_DELAY=30 ms
major : 215, S/N : 01 B5 70 80 12 00 00 60.
Starting COM port services: Serial: 8250/16550 driver $Revision: 1.90 $ 36 ports , IRQ sharing enabled

Starting RAM Driver services: 1376 inodes
4096 blocks
Firstdatazone=47 (47)
Zonesize=1024
Maxsize=268966912
Setting the System Clock using the Hardware Clock as reference...
Mon May 18 14:22:38 2009 0.000000 seconds
Mon May 18 14:22:38 UTC 2009
Starting gqcam services: pwc: Philips webcam module version 10.0.12 loaded.
pwc: Supports Philips PCA645/646, PCVC675/680/690, PCVC7201401/730/740/750 & PCVC830/840.
pwc: Also supports the Askey VC010, various Logitech Quickcams, Samsung MPC-C10 and MPC-C30,
pwc: the Creative WebCam 5 & Pro Ex, SOTEC Afina Eye and Visionite VCS-UC300 and VCS-UM100.
usbcore: registered new interface driver Philips webcam
Starting X Server...
/bin/sh: can't access tty; job control turned off
#
icewm-session: using /root/.icewm for private configuration files
icewmbg: using /root/.icewm for private configuration files
IceWM: using /root/.icewm for private configuration files
icewmtray: using /root/.icewm for private configuration files
-
```

- ⇒ To login LinPAC-8x4x by 'getty ttySA0 115200' command.
- ⇒ ID: root
- ⇒ Password: root

## 6. Connect the LinPAC and Linux PC

- ➔ Install HyperTerminal tool in Linux PC such as minicom, gtkterm, etc.
- ➔ Take minicom as an example, please refer to the following steps:
- ➔ Type '**minicom -s**' to configure COM1 port, and press down and select '**Serial port setup**' ( please set for 115200 bits per second, 8 data bits, no parity, 1 stop bit and no flow control to set up the communication parameters for the COM1 port). Finally, press '**Exit**'.

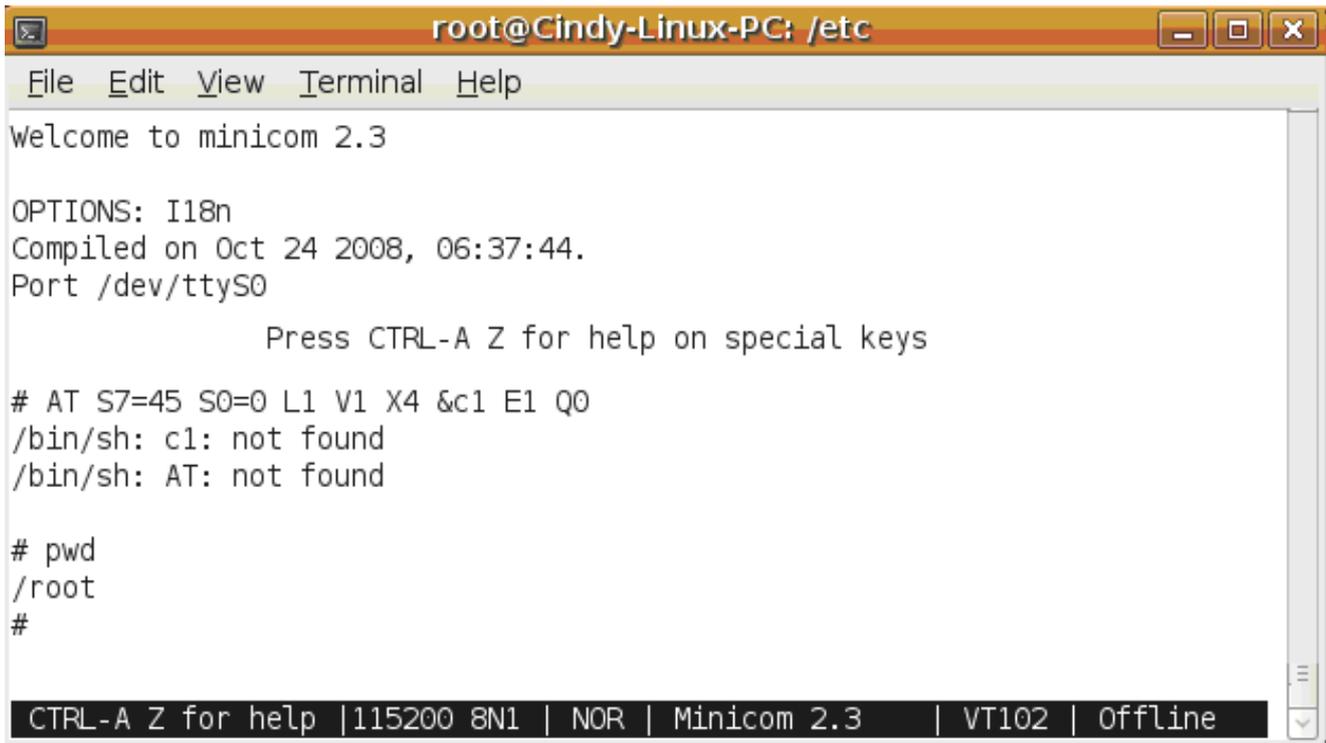
```
1. +-----[configuration]-----+
| Filenames and paths          |
| File transfer protocols      |
| Serial port setup          |
| Modem and dialing           |
| Screen and keyboard         |
| Save setup as dfl           |
| Save setup as..             |
| Exit                         |
| Exit from Minicom           |
+-----+-----+-----+-----+
```

```
2. +-----+-----+-----+-----+
| A - Serial Device       : /dev/ttyS0 |
| B - Lockfile Location      : /var/lock |
| C - Callin Program         :          |
| D - Callout Program        :          |
| E - Bps/Par/Bits       : 115200 8N1 |
| F - Hardware Flow Control  : No       |
| G - Software Flow Control  : No       |
+-----+-----+-----+-----+
|                               |
| Change which setting? [ ]   |
|                               |
| Screen and keyboard         |
| Save setup as dfl           |
| Save setup as..             |
| Exit                         |
| Exit from Minicom           |
+-----+-----+-----+-----+
```

```
3. +-----[configuration]-----+
| Filenames and paths          |
| File transfer protocols      |
| Serial port setup           |
| Modem and dialing           |
| Screen and keyboard         |
| Save setup as dfl           |
| Save setup as..             |
| Exit                     |
| Exit from Minicom           |
+-----+-----+-----+-----+
```

```
4. +-----+-----+-----+-----+
|                               |
| Initializing Modem          |
|                               |
+-----+-----+-----+-----+
```

➔ minicom in action



```
root@Cindy-Linux-PC: /etc
File Edit View Terminal Help
Welcome to minicom 2.3

OPTIONS: I18n
Compiled on Oct 24 2008, 06:37:44.
Port /dev/ttyS0

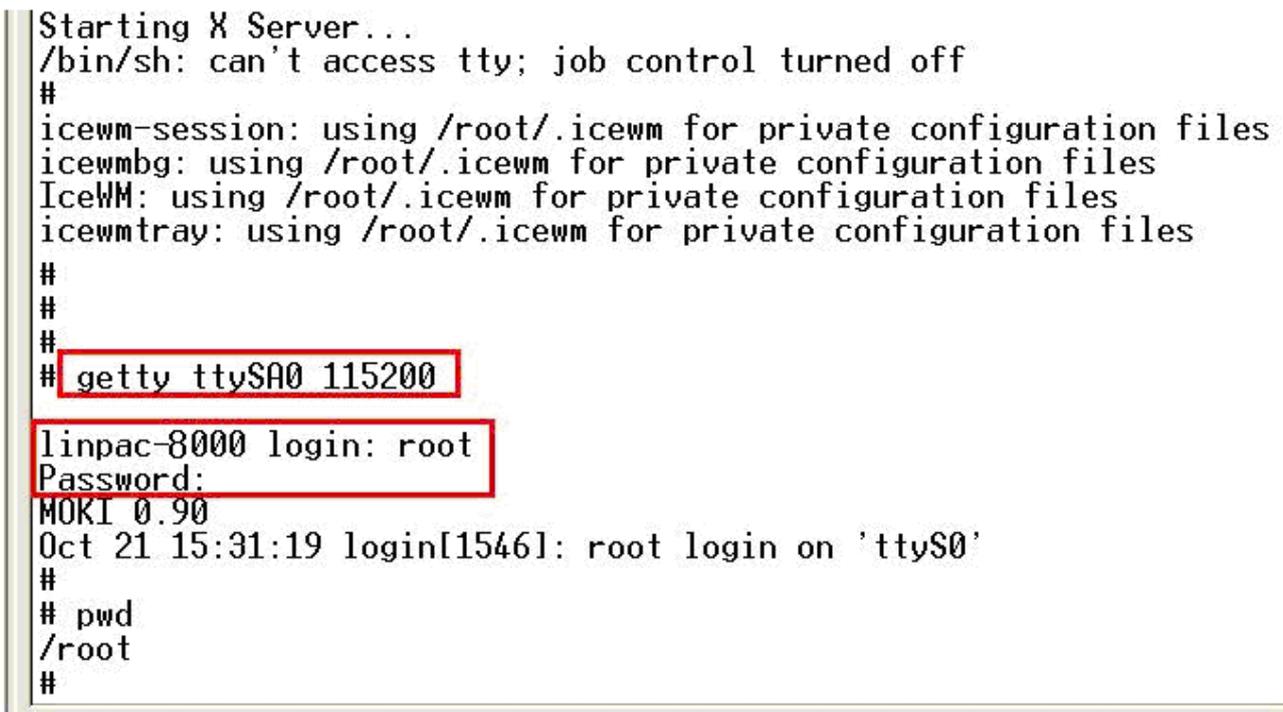
          Press CTRL-A Z for help on special keys

# AT S7=45 S0=0 L1 V1 X4 &c1 E1 Q0
/bin/sh: c1: not found
/bin/sh: AT: not found

# pwd
/root
#

CTRL-A Z for help | 115200 8N1 | NOR | Minicom 2.3 | VT102 | Offline
```

- ➔ To login LinPAC-8x41 by 'getty' command.
- ➔ ID: **root**
- ➔ Password: **root**



```
Starting X Server...
/bin/sh: can't access tty; job control turned off
#
icewm-session: using /root/.icewm for private configuration files
icewmdbg: using /root/.icewm for private configuration files
IceWM: using /root/.icewm for private configuration files
icewmtray: using /root/.icewm for private configuration files
#
#
#
# getty ttySA0 115200
linpac-8000 login: root
Password:
MOKI 0.90
Oct 21 15:31:19 login[1546]: root login on 'ttyS0'
#
# pwd
/root
#
```

## 7. Telnet to LinPAC-8x4x

➔ In HyperTerminal :

```
# ifconfig eth0
eth0      Link encap:Ethernet  HWaddr 00:0D:E0:AB:CD:33
          inet addr:10.1.0.8  Bcast:10.1.255.255  Mask:255.255.0.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:87724 errors:0 dropped:0 overruns:0 frame:0
          TX packets:966 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
          Interrupt:41 Base address:0x8000

#
# ifconfig eth1
eth1      Link encap:Ethernet  HWaddr 00:0D:E0:AB:CD:44
          inet addr:10.1.0.17  Bcast:10.1.255.255  Mask:255.255.0.0

          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:50 errors:0 dropped:0 overruns:0 frame:0
          TX packets:11 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
          Interrupt:114 Base address:0xc000

#
```

## 8. Get & Configure IP

The LinPAC-8x4x network setting includes two ways. One is **DHCP** and the other is “**Assigned IP**”. DHCP is the default setting after the LinPAC-8x4x is produced and this way is easy for users. However, if your network system is without DHCP server, then users need to configure the network setting by using “Assigned IP”.

- ➔ Boot up LinPAC-8x4x and telnet to LinPAC-8x4x first.
- ➔ Type in “**vi /etc/network/interfaces**” to open the network setting file.

```
C:\ Telnet 192.168.0.200
auto lo
iface lo inet loopback

# Enable dhcp on eth0
iface eth0 inet dhcp
iface eth1 inet dhcp
iface wlan0 inet dhcp
iface ppp0 inet dhcp

# Or unmark following lines and modify the ip configuration to enable ethernet
#iface eth0 inet static
#   address 192.168.0.200
#   netmask 255.255.0.0
#   gateway 192.168.0.254

~
~
:wq
```

dhcp

Assign IP

## 9. Technical Support

If any of these items are missing or damaged, contact the local distributors for more information. Save the shipping materials and cartons in case you want to ship in the future.



- LinPAC-8x4x User Manual : CD:\ Napdos\Linux\User\_Manual
- Our service email account : [service@icpdas.com](mailto:service@icpdas.com)
- LinPAC-8000 website:  
<http://www.icpdas.com/products/PAC/linpac-8000/introduction.htm>