

GuruPlug-Server -Users manual -- GTI -2010.04.03

A. Product description

GuruPlug Server is a Linux based small form factor computer with AC plug which has the following unique features.

1. Highly integrated all the peripherals necessary for a modern designed computer just into one chip.
2. Ultra low power consumption
3. Very high speed, the CPU is running at 1.2GHz with 800MHz DDR2 SDRAM.

With all these features described above you can just plug it into the wall's AC outlet and running all year round, it consumes much less power compared to almost all the computers on the market with the same features.

B. Hardware features.

The hardware features are described in the "[GuruPlug-plus-Block diagram.pdf](#)" and "[GuruPlug-plus-Description of Hardware block diagram.pdf](#)" documents which come along with this document although separated, please refer to it.

C. Software features

This computer is installed with Linux ubuntu 2.6.32 kernel and all the device drivers for the hardware peripherals support by this CPU like USB, Ethernet, PCIe, SATA ... etc.

D. Important information to developer

1. It is only the computer with Linux OS without any applications pre-installed, so basically it is only a development platform and also a powerful tool for engineers to develop with.
2. Whatever the develop engineers may put on to it becomes the ultimate finish products they want it to be, for example the file server, mail server or TV set-top box.
3. When you power on, it will boot up automatically and run Linux OS then wait for your login and stop there in the command prompt for you to enter the Linux command to go on.
4. Since it has no display interface like VGA or LCD so the developer has to connect a Linux PC to it or use Windows or Linux PC remotely login to it through Ethernet.

E. Connection methods to PC

There are different ways to connect GuruPlus Server to PC for development.

1. Connect to Windows XP PC via JTAG board
2. Connect to Linux PC via JTAG board (with Linux Fedora 9 ro 11 OS)
3. Connect to Windows XP PC through Ethernet

4. Connect to Linux PC through Ethernet.

F. Preparation

Here we are using #1 method mentioned above so please get the following things prepared.

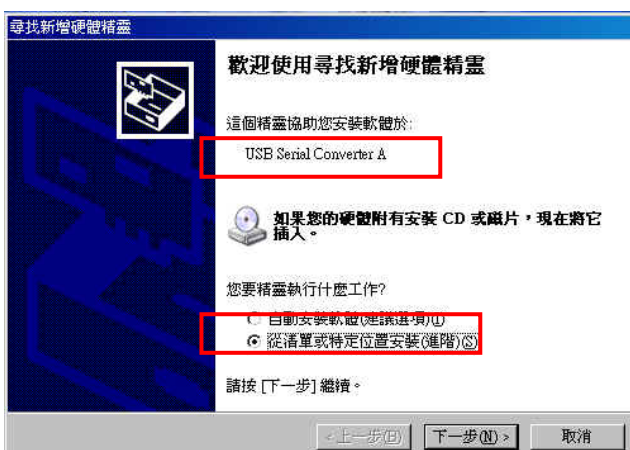
1. Windows XP PC
2. Hyper terminal software (comes with Windows) or putty.exe utility or any kind of terminal simulation utility.
3. GuruPlug Server plus.
4. JTAG board and cables
5. Mini-USB to USB cable
6. JTAG Device driver for Windows XP.

G. Connection

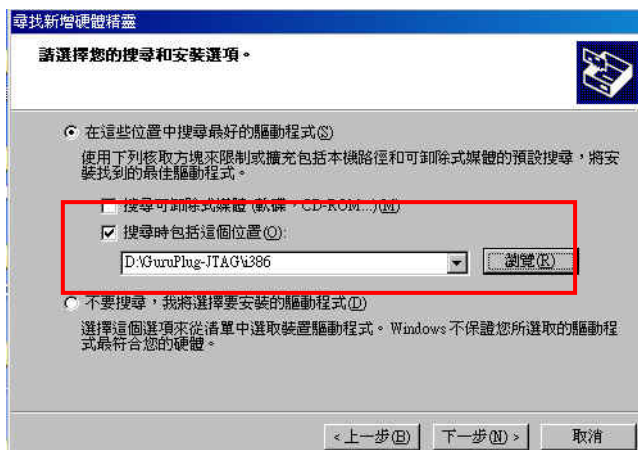
1. Power on your Windows PC.
2. Connect 4-pin UART cable from GuruPlug Server Plus to JTAG board.
3. Connect 8-pin JTAG cable from GuruPlug Server Plug to JTAG board
4. Connect mini-USB from JTAG board to Windows PC USB port.

H. Installation JTAG device driver.

1. Power on GuruPlug Server plus
2. You will see the pop-up window indicates a “new USB Serial Converter A device found”, please following the demonstration picture for installation, please refer to picture below.

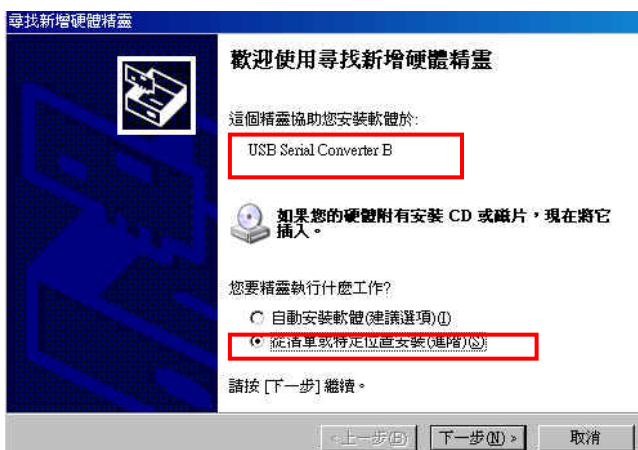


3. Specify the folder with the device driver.

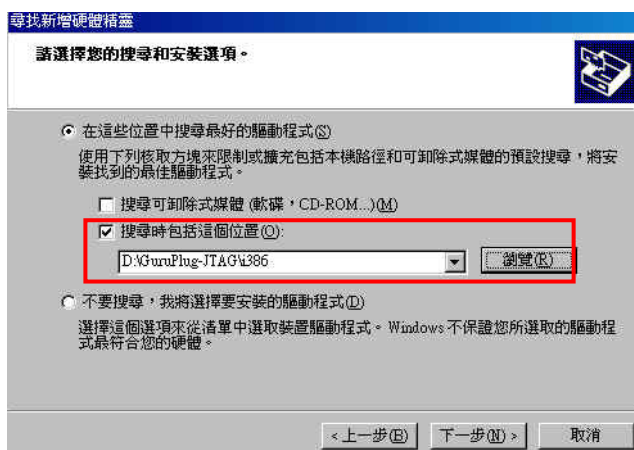


4. After installation, press complete to end this session.

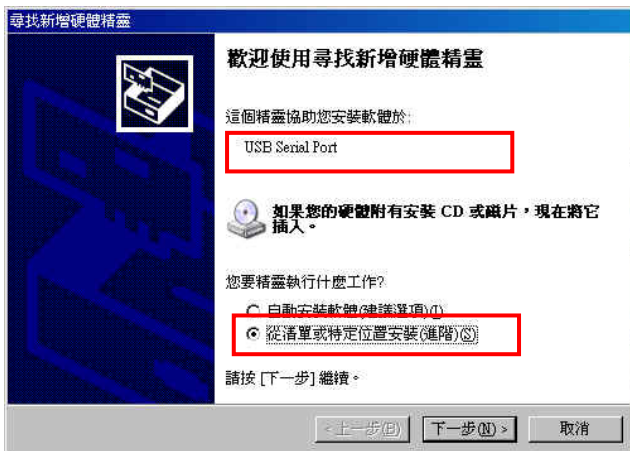
5. Another “new USB Serial Converter B device found” windows pops out.



6. Specify the folder contains the device driver again.



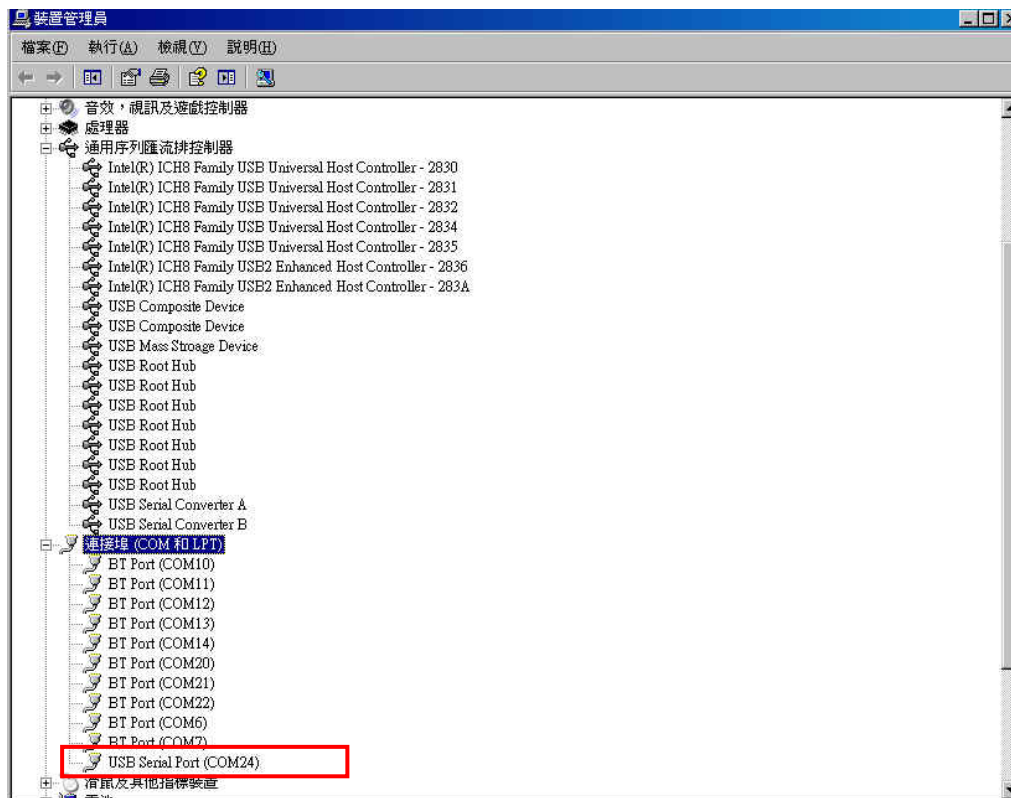
7. Pressing “completed”
8. The 3rd device found which is “USB Serial Port”.



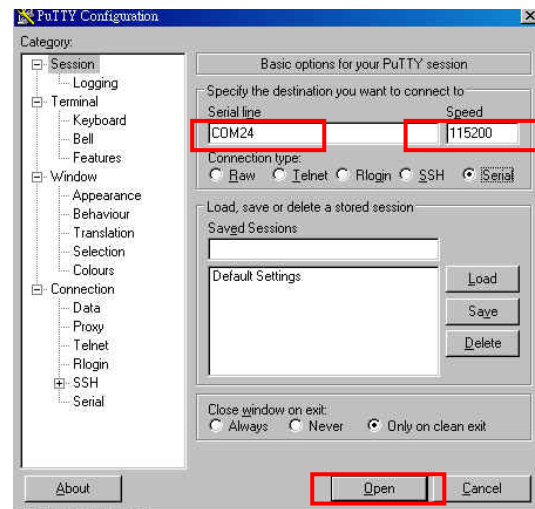
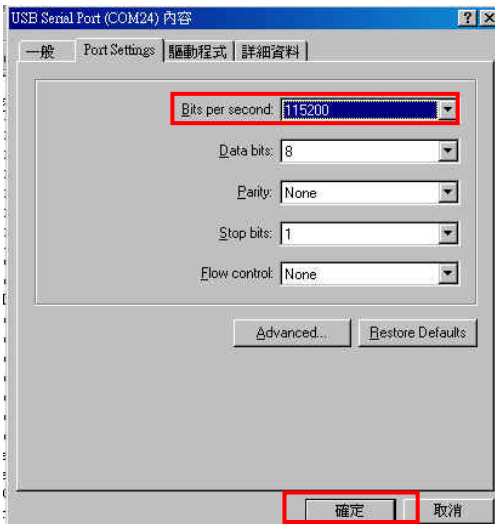
9. Specify the same folder with device driver and press “completed” after installation
10. Now all device drivers associated with this JTAG board has been installed completely.

I. Configuration com ports.

1. Run device manager and you will find a new USB serial port working as virtual COM port. For example as illustrated in the following picture there is a new COM24 port.



2. Double click on “USB Serial Port (COM24)” and set it to 115200 bits per second leave the other parameters unchanged press “ok” to save it.
3. Run putty utility, set as illustrated and press “open”



J. Connect to GuruPlug Server plus

1. Pressing reset button of GuruPlug Server plus by using a pin or ball pen head
2. You will see message on putty screen indicates the system is booting up

```

COM28 - PuTTY
mvCLAudioCodecRegGet: Error while reading register!
mvCLAudioCodecInit: Error - Invalid Cirrus Logic chip/rev ID!
Error - Cannot initialize audio decoder.at address =0xff<6>ALSA device list:
#0: Marvell mv88fx_snd ALSA driver
TCP cubic registered
NET: Registered protocol family 1
NET: Registered protocol family 17
eth0: started
IP-Config: Complete:
    device=eth0, addr=10.4.50.4, mask=255.255.255.0, gw=10.4.50.5,
    host=DB88FXX81, domain=, nis-domain=(none),
    bootserver=10.4.50.5, rootserver=10.4.50.5, rootpath=
md: Autodetecting RAID arrays.
md: autorun ...
md: ... autorun DONE.

  Marvell
  U-Boot

** MARVELL BOARD: SHEEVA PLUG LE

U-Boot 1.1.4 (Mar 19 2009 - 16:06:59) Marvell version: 3.4.16

U-Boot code: 00600000 -> 0067FF00 BSS: -> 006CEE80

Soc: 88F6281 AO (DDR2)
CPU running @ 1200Mhz L2 running @ 400Mhz
SysClock = 400Mhz , TClock = 200Mhz

DRAM CAS Latency = 5 tRP = 5 tRAS = 18 tRCD=6
DRAM CS[0] base 0x00000000 size 256MB
DRAM CS[1] base 0x10000000 size 256MB
DRAM Total size 512MB 16bit width
Flash: 0 kB
Addresses 8M - 0M are saved for the U-Boot usage.
Mem malloc Initialization (8M - 7M): Done
NAND:

```

3. After around 2 minutes it comes to the screen as below just press enter to continue to the login screen.

```

┌───┴───┐
└─ COM28 - PTTY ─┘
md: Autodetecting RAID arrays.
md: autorun ...
md: ... autorun DONE.
Empty flash at 0x087dd338 ends at 0x087dd800
Empty flash at 0x11eaea68 ends at 0x11eaf000
Empty flash at 0x187ac1ac ends at 0x187ac800
VFS: Mounted root (jffs2 filesystem).
Freeing init memory: 104K
* Setting preliminary keymap... [ OK ]
* Setting the system clock [ OK ]
* Starting basic networking... [ OK ]
* Starting kernel event manager... [ OK ]
* Loading hardware drivers... [ OK ]
* Setting the system clock [ OK ]
* Loading kernel modules... [ OK ] * Loading manual drivers...
* Setting kernel variables (/etc/sysctl.conf)... [ OK ]
* Setting kernel variables (/etc/sysctl.d/10-console-messages.conf)... [ OK ]
* Setting kernel variables (/etc/sysctl.d/10-network-security.conf)... [ OK ]
* Setting kernel variables (/etc/sysctl.d/10-process-security.conf)... error: "vm.mmap_min_addr" is an unknown key
[fail]
* Setting kernel variables (/etc/sysctl.d/10-tcp-timestamps-workaround.c[ OK ]
* Activating swap... [ OK ]
FATAL: Could not load /lib/modules/2.6.22.18/modules.dep: No such file or directory
FATAL: Could not load /lib/modules/2.6.22.18/modules.dep: No such file or directory
* Starting early crypto disks... [ OK ]
FATAL: Could not load /lib/modules/2.6.22.18/modules.dep: No such file or directory
FATAL: Could not load /lib/modules/2.6.22.18/modules.dep: No such file or directory
* Starting remaining crypto disks... [ OK ]
* Checking file systems... fsck 1.41.3 (12-Oct-2008)
* Mounting local filesystems... [ OK ]
* Activating swapfile swap... [ OK ]
* Configuring network interfaces... [ OK ]
* Setting up console font and keymap... [ OK ]
* Starting system log daemon...
Ubuntu jaunty (development branch) debian ttyS0
debian login: [ OK ]
[ OK ] * Starting kernel log daemon...
[ OK ] * Starting OpenBSD Secure Shell server sshd
[ OK ] * Starting periodic command scheduler cron
fat: exports duplicate symbol fat_add_entries (owned by kernel)
insmod: error inserting '/boot/fat.ko': -1 Invalid module format

```

4. Enter **“root”** as login name and **“nosoup4u”** as password, please be noted there will be no character shown on the screen while typing in the password.

```

┌───┴───┐
└─ COM28 - PTTY ─┘
Empty flash at 0x11eaea68 ends at 0x11eaf000
Empty flash at 0x187ac1ac ends at 0x187ac800
VFS: Mounted root (jffs2 filesystem).
Freeing init memory: 104K
* Setting preliminary keymap... [ OK ]
* Setting the system clock [ OK ]
* Starting basic networking... [ OK ]
* Starting kernel event manager... [ OK ]
* Loading hardware drivers... [ OK ]
* Setting the system clock [ OK ]
* Loading kernel modules... [ OK ] * Loading manual drivers...
* Setting kernel variables (/etc/sysctl.conf)... [ OK ]
* Setting kernel variables (/etc/sysctl.d/10-console-messages.conf)... [ OK ]
* Setting kernel variables (/etc/sysctl.d/10-network-security.conf)... [ OK ]
* Setting kernel variables (/etc/sysctl.d/10-process-security.conf)... error: "vm.mmap_min_addr" is an unknown key
[fail]
* Setting kernel variables (/etc/sysctl.d/10-tcp-timestamps-workaround.c[ OK ]
* Activating swap... [ OK ]
FATAL: Could not load /lib/modules/2.6.22.18/modules.dep: No such file or directory
FATAL: Could not load /lib/modules/2.6.22.18/modules.dep: No such file or directory
* Starting early crypto disks... [ OK ]
FATAL: Could not load /lib/modules/2.6.22.18/modules.dep: No such file or directory
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* Starting remaining crypto disks... [ OK ]
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* Mounting local filesystems... [ OK ]
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debian login: [ OK ]
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[ OK ] * Starting periodic command scheduler cron
fat: exports duplicate symbol fat_add_entries
insmod: error inserting '/boot/fat.ko': -1 Invalid module format
Ubuntu jaunty (development branch) debian ttyS0
debian login: root
Password:

```

5. After login successfully, you will get a # prompt means you are the root user (super user) of this system and have all the control rights.

```
debian login: root
Password:
Last login: Thu Apr  4 22:25:29 UTC 1935 on ttyS0
Linux debian 2.6.22.18 #1 Thu Mar 19 14:46:22 IST 2009 armv5tej1

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To access official Ubuntu documentation, please visit:
http://help.ubuntu.com/
1 failure since last login.
Last was Sat Jan  1 00:15:25 2000 on ttyS0.
root@debian:~#
```

K. Some important Linux commands

Since there is no window-like (X-window) UI pre-installed in this system so you have to give it commands to tell the machine what to do.

Here are some useful Linux commands for testing

Note: all commands are in small cases

1. `ls` and `ls -l`
lists the file names and folder names
2. `ls /dev/`
lists the name of all devices
3. `ls /dev/sd*`
lists all the USB and SATA drive devices
4. `fdisk -l`
lists partitions of disk which has been found
5. `df -h`
lists the name and size of mounted disk
6. `ifconfig`
lists or setup the configuration of all LAN devices
7. `ifconfig eth0`

lists or setup the configuration of Ethernet port 0

8. `pwd`

show me the current path

9. `cd /<path>`

goto <path>

10. `top`

Showing the CPU and Memory loadings, press CTRL-C to abort

11. `ps -a`, `ps -l`, `ps -lA`

Showing the processes which are running and the process ID number.

12. `Ping <iP address>`

Ping the ip address to see if the link is alive

For example, `ping -c4 127.0.0.1` is to ping the machine itself by 4 times.

== End Of Document ==

FCC STATEMENT

1. This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
 - (2) This device must accept any interference received, including interference that may cause undesired operation.
2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC ID: YCJ003GP

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

3. FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, Human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation.