

GENE-1270

Intel® XScale PXA 270 CPU

RISC CPU Module

USB Host x 4 / USB Client x1

RS-232 x 1/ RS-232/485 x 1

CF Type I/II x 1, SDIO x 1

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Packing List

Before you begin installing your card, please make sure that the following materials have been shipped:

- 1 1701100207 COM Port Cable
- 1 1709100201 USB Port Cable
- 1 1700140510 Audio Cable
- 1 1701440180 IDE Cable
- 1 GENE-1270 CPU Module
- 1 Quick Installation Guide
- 1 CD-ROM for manual (in PDF format)

If any of these items should be missing or damaged, please contact your distributor or sales representative immediately.

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Chapter

1

**General
Information**

1.1 Introduction

GENE-1270 Rev.B (GENE-1270B) adopts Intel® XScale PXA270. This RISC CPU module features low power consumption and cost-efficiency, to fulfill the requirements of hardy and more cost-focusing applications.

The module has 2COM ports (1 RS-232, 1 RS-232/485), 4 USB1.1 host, 1 USB1.1 Client, Digital I/O, etc., to connect and control the peripheral devices. CF and SDIO slots make the implementation of external expansion. The CPU frequency is up to 520MHz and shows a better performance. In addition, the GENE-1270B companies with Intel® 2700G Display Companion Chipset, it not only provides the functions of MPEG2/4 video decode, but also 2D/3D acceleration. Bundling with Intel® XScale PXA270, GENE-1270B features highly integration in rugged mobile applications.

Although the Intel® PXA 270 has the same kernel as Intel® PXA250, the PXA 270 has been improved to save more power and enlarged the supporting function for multimedia. The power-saving contribution helps GENE-1270B to run rich multimedia applications and perform excellently. For targeting at the vehicle PC and mobile device markets, the GENE-1270B is no doubt the best solution.

1.2 Features

- Intel® XScale PXA270 Processor
- Intel® 2700G Graphic Chip
- LCD/CRT Video Output Support
- 10/100Base-TX Ethernet
- AC97 Audio
- RS-232 x 1, RS-232/485 x 1
- IrDA Port
- USB Host x 4, USB Client x 1
- CompactFlash Type I/II x 1, SDIO x 1
- 4-wire touchScreen Support
- Digital I/O
- LCD Backlight On/Off Control
- Hardware Reset
- JTAG Port

1.3 Specifications

System

- CPU Intel® XScale PXA270 312MHz to 520MHz Processor
- System Memory 64/128MB SDRAM
- Storage Memory 128MB M-system MDOC
- Ethernet 10/100Base-TX, Davicom DM9000AEP
- Watchdog Timer Generates a Time-out System Reset, setting via software
- Power Requirement +9V to +24V
- Board Size 6.14”(L) x 4”(W) (156mm x 101.6mm)
- Gross Weight 0.88lb (0.4kg)
- Operating Temperature 32°F~140°F (0°C~60°C)

I/O

- MIO RS-232 x 1, RS-232/485 x 1 (COM1:full modem control signals, COM2: Tx, Rx, CTS, RTS only)
- USB Two Type-A Connectors and One 5 x 2 Pin header supports 4 USB2.0 Host ports, One USB

- Digital I/O

Type B connector supports

USB1.1 Client port

Supports 4 in and 4 out

Chapter

2

**Quick
Installation
Guide**



Notice:

The Quick Installation Guide is derived from Chapter 2 of user manual. For other chapters and further installation instructions, please refer to the user manual CD-ROM that came with the product.

2.1 Safety Precautions

Warning!

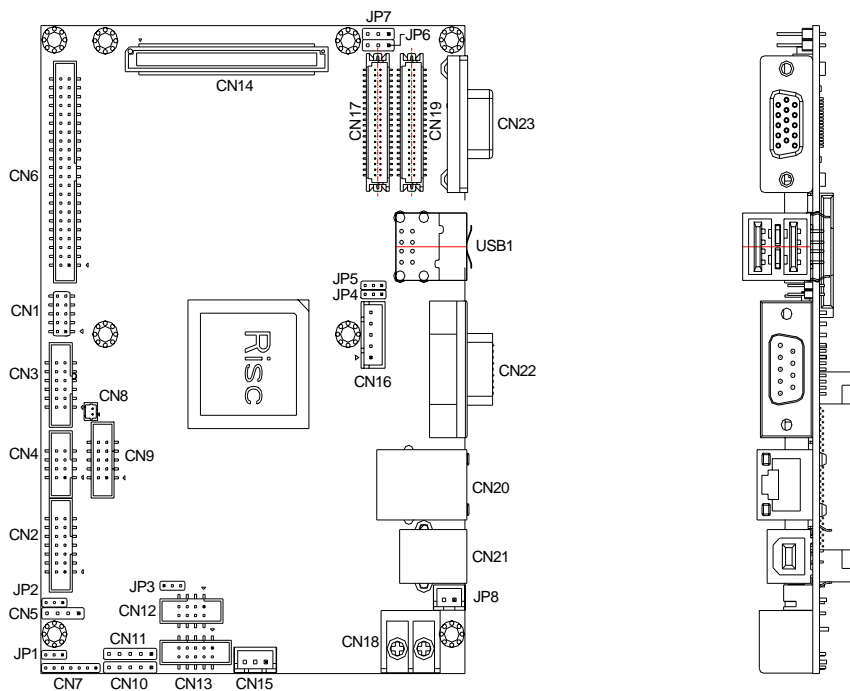
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Caution!

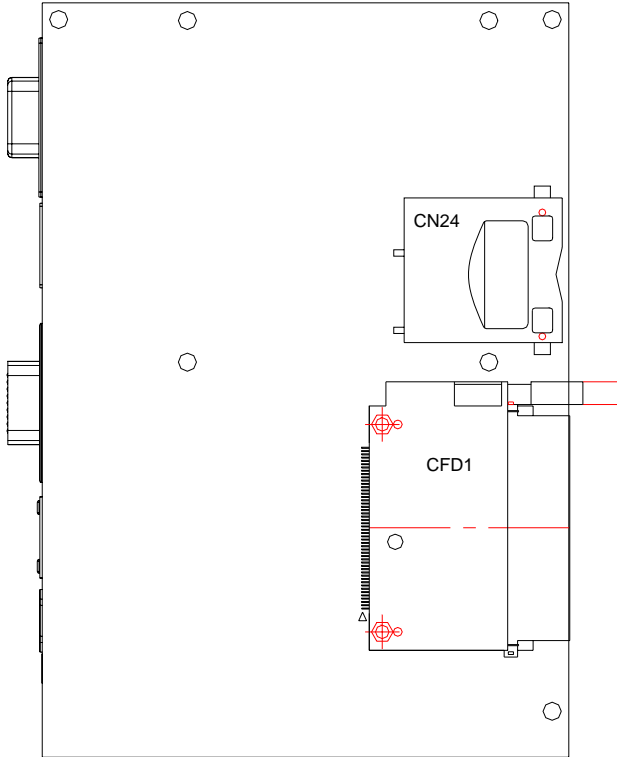
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

2.2 Location of Connectors and Jumpers

Component Side

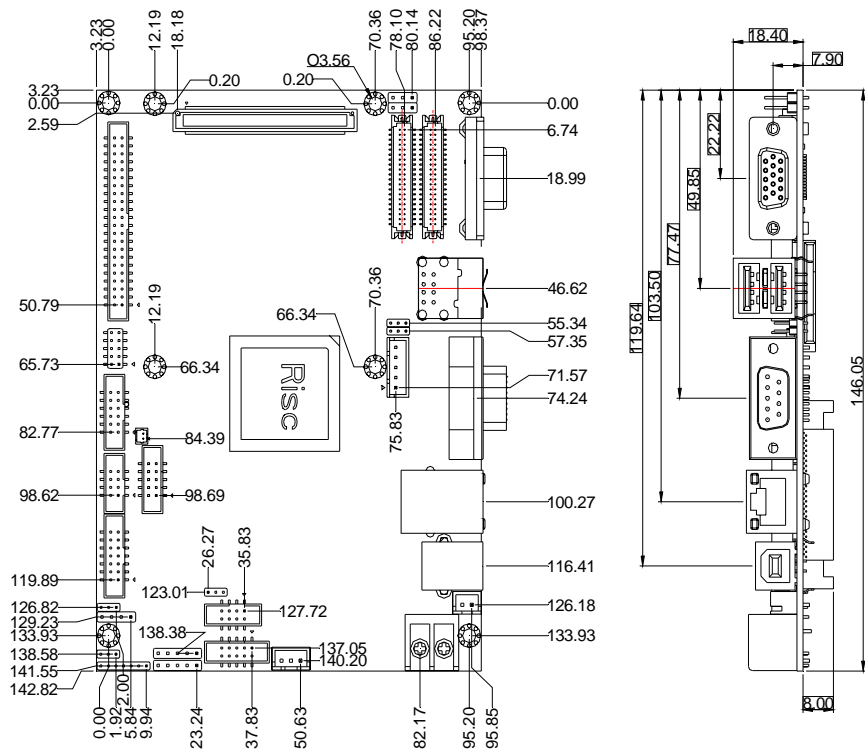


Solder Side

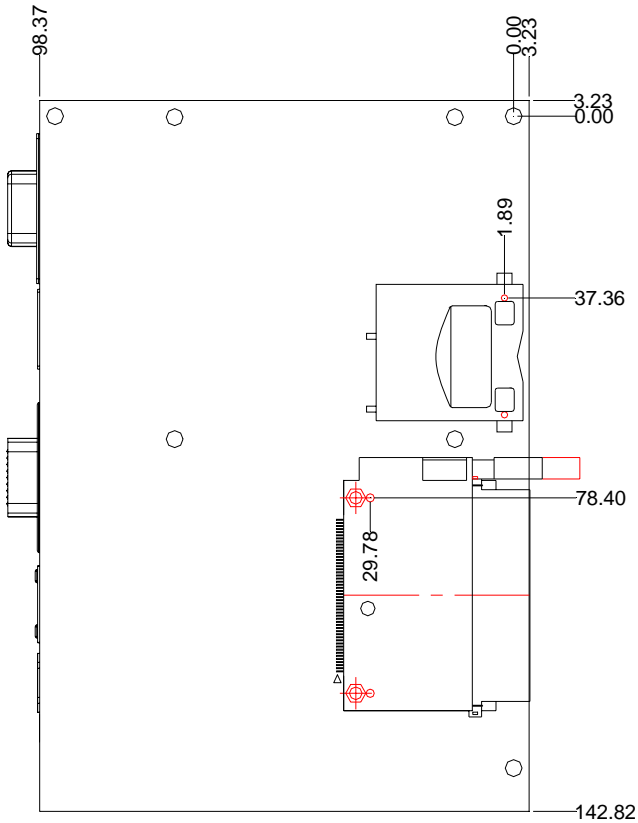


2.3 Mechanical Drawing

Component Side



Solder Side



2.4 List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the board's jumpers:

Jumpers

Label	Function
JP1	COM2 Function Selection
JP2	Audio Output Selection
JP3	COM2 Function Selection
JP4	LCD2 TTL-LCD Clock Selection
JP5	LCD1 TTL-LCD Clock Selection
JP6	LCD2 Voltage Selection
JP7	LCD1 Voltage Selection
JP8	TDP

2.5 List of Connectors

The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

Connectors

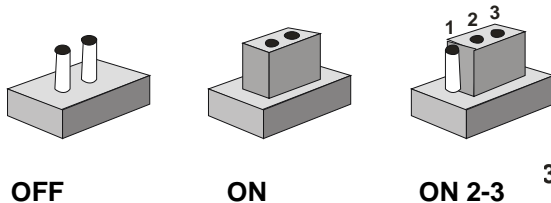
Label	Function
CN1	Front Panel Connector
CN2	Audio Connector
CN3	Digital I/O Connector
CN4	TDP
CN5	Internal Speaker Connector
CN6	EIDE Connector
CN7	Bluetooth Connector
CN8	RTC Battery Connector
CN9	USB3 & USB4 Connector
CN10	IrDA Connector
CN11	Touch Panel Connector
CN12	JTAG Connector
CN13	COM2 RS-232 Connector
CN14	TDP (Extension Connector)
CN15	COM2 RS-485 Connector
CN16	LCD Inverter Connector
CN17	LCD2 TTL_LCD Connector

CN18	Power In Connector
CN19	LCD1 TTL_LCD Connector
CN20	LAN 10/100 Base-TX Ethernet Connector
CN21	Client USB Connector
CN22	COM1 RS-232 Connector
CN23	VGA Display Connector
CN24	SD Card Connector
CFD1	CompactFlash Slot
USB1	USB1 & USB2 Connector

2.6 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip.

To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.



A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change.

Generally, you simply need a standard cable to make most connections.

2.7 COM2 Function Selection (JP1 & JP3)

JP1	Function
1-2	RS-232 (CN13) (default)
2-3	RS-485 (CN15)
2-3	BLUETOOTH (CN7)

JP3	Function
N.C.	RS-232 (CN13) (default)
1-2	RS-485 (CN15)
2-3	BLUETOOTH (CN7)

2.8 Audio Out Selection (JP2)

JP2	Function
1-2	EARPHONE (From CN2) (default)
2-3	INTERNAL SPEAKER (From CN5)

2.9 LCD2 TTL-LCD Clock Selection (JP4)

JP4	Function
1-2	CLK (default)
2-3	Reverse CLK

2.10 LCD1 TTL-LCD Clock Selection (JP5)

JP5	Function
1-2	CLK (default)
2-3	Reverse CLK

2.11 LCD2 Voltage Selection (JP6)

JP6	Function
1-2	+5V
2-3	+3.3V (default)

2.12 LCD1 Voltage Selection (JP7)

JP7	Function
1-2	+5V
2-3	+3.3V (default)

2.13 Front Panel Connector (CN1)

Pin	Signal	Pin	Signal
1	TDP	2	GND
3	N.C.	4	N.C.
5	Load default of Boot Flash	6	GND
7	TDP	8	GND
9	Hardware Reset	10	GND

2.14 Audio Connector (CN2)

Pin	Signal	Pin	Signal
1	MIC_IN	2	MIC_VCC
3	LINE_IN_GND	4	N.C.
5	LINE_IN_L	6	N.C.
7	LINE_IN_R	8	N.C.
9	LINE_IN_GND	10	N.C.
11	LINE_OUT_L	12	LINE_OUT_R
13	LINE_OUT_GND	14	LINE_OUT_GND

2.15 Digital I/O Connector (CN3)

Pin	Signal	Pin	Signal
1	Input/Output 1	2	Input/Output 2
3	Input/Output 3	4	Input/Output 4
5	Input/Output 5	6	Input/Output 6
7	Input/Output 7	8	Input/Output 8
9	Input/Output 9	10	Input/Output 10
11	+3.3V	12	GND

2.16 Internal Speaker Connector (CN5)

Pin	Signal
1	Right Speaker out-
2	Right Speaker out+
3	Left Speaker out+
4	Left Speaker out-

2.17 EIDE Connector (CN6)

Pin	Signal	Pin	Signal
1	IDE RESET	2	GND
3	DATA7	4	DATA8
5	DATA6	6	DATA9
7	DATA5	8	DATA10
9	DATA4	10	DATA11
11	DATA3	12	DATA12
13	DATA2	14	DATA13
15	DATA1	16	DATA14
17	DATA0	18	DATA15
19	GND	20	N.C.
21	REQ	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND

27	IO READY	28	GND
29	DACK	30	GND
31	HDD_IRQ	32	N.C.
33	ADDR1	34	UDMA DETECT
35	ADDR0	36	ADDR2
37	CS#1	38	CS#3
39	LED	40	GND
41	+5V	42	+5V
43	GND	44	N.C.

2.18 Bluetooth Connector (CN7)

Pin	Signal
1	+3.3V
2	BT_RXD
3	BT_TXD
4	BT_CTS
5	BT_RTS
6	Reset (-)
7	GND

2.19 RTC Battery Connector (CN8)

Pin	Signal
1	Battery VCC
2	Battery GND

2.20 USB3 & USB4 Connector (CN9)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD3-	4	GND
5	USBD3+	6	USB4+
7	GND	8	USB4-
9	GND	10	+5V

2.21 IrDA Connector (CN10)

Pin	Signal
1	+5V
2	N.C.
3	RXD
4	GND
5	TXD

2.22 Touch Panel Connector (CN11)

Pin	Signal
1	TOUCHSYP
2	TOUCHSXM
3	TOUCHSYM
4	TOUCHSXP
5	GND

2.23 JTAG Connector (CN12)

Pin	Signal	Pin	Signal
1	+3.3V	2	JTG_TMS
3	JTG_TCK	4	JTG_TRST#
5	JTG_TDI	6	JTG_RESET
7	JTG_TDO	8	GND

2.24 COM2 RS-232 Connector (CN13)

Pin	Signal	Pin	Signal
1	N.C.	2	RXD
3	TXD	4	N.C.
5	GND	6	N.C.
7	RTS	8	CTS

9	N.C.	10	N.C.
---	------	----	------

2.25 RS-485 Connector (CN15)

Pin	Signal
1	Data-
2	Data+
3	GND

2.26 LCD Inverter Connector (CN16)

Pin	Signal
1	+5V
2	+5V
3	TDP
4	GND
5	GND

2.27 LCD2 TTL_LCD Connector (CN17)

Pin	Signal	Pin	Signal
1	LCD_VCC	2	LCD_VCC
3	GND	4	GND
5	LCD_VCC	6	LCD_VCC

7	ENVEE	8	GND
9	BLUE0	10	BLUE1
11	BLUE2	12	BLUE3
13	BLUE4	14	BLUE5
15	BLUE6	16	BLUE7
17	GREEN0	18	GREEN1
19	GREEN2	20	GREEN3
21	GREEN4	22	GREEN5
23	GREEN6	24	GREEN7
25	RED0	26	RED1
27	RED2	28	RED3
29	RED4	30	RED5
31	RED6	32	RED7
33	GND	34	GND
35	DOT_CLOCK	36	VSYNC
37	DE	38	HSYNC
39	N.C.	40	ENBKL

2.28 Power In Connector (CN18)

Pin	Signal
1	+9V~+24V Input
2	GND

2.29 LCD1 TTL_LCD Connector (CN19)

Pin	Signal	Pin	Signal
1	LCD_VCC	2	LCD_VCC
3	GND	4	GND
5	LCD_VCC	6	LCD_VCC
7	ENVEE	8	GND
9	BLUE0	10	BLUE1
11	BLUE2	12	BLUE3
13	BLUE4	14	BLUE5
15	BLUE6	16	BLUE7
17	GREEN0	18	GREEN1
19	GREEN2	20	GREEN3
21	GREEN4	22	GREEN5
23	GREEN6	24	GREEN7
25	RED0	26	RED1
27	RED2	28	RED3
29	RED4	30	RED5
31	RED6	32	RED7
33	GND	34	GND
35	DOT_CLOCK	36	VSNC
37	DE	38	HSYNC
39	N.C.	40	ENBKL

Chapter

3

**Software
Installation
Guide**

3.1 Introduction

GENE-1270 is preloaded with Windows CE 5.0. After applying with power, the system will boot directly to Windows CE.

3.2 Permanent Storage

The system comes with an on board NAND Flash for permanent storage. It is mounted under “/DiskOnChip” folder. The storage space is around 70MB. User requires to put all permanent data in “/DiskOnChip” folder.

All other places in the file system are ram image. Any modification on the files of this image will be lost after any power fail.

3.3 Boot Up Execution File

The system will look for a boot script file under “\DiskOnChip\autoexec.exe” during boot up process.

If this file exists, the system will launch this application at boot.

3.4 Hive Based Registry

The Windows 5.0 Image in GENE-1270 uses hive-based registry, which stores registry data in files. These files are stored in permanent storage under “\DiskOnChip”.

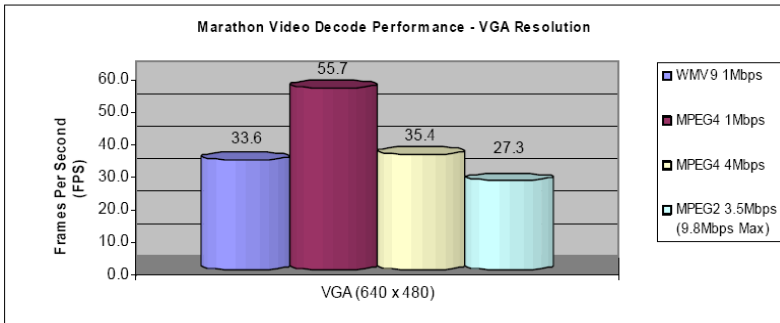
Any modifications to the system registry require manually saving the registry file. This can be done through RFLUSH.exe under “\Windows”. A program link is also available on the Desktop. If

this procedure is not done, the modifications done to registry will be lost.

3.5 TCPMP For 2700G

GENE-1270 with 2700G display accelerator improves the display performance on the MPEG2 and MPEG4 files.

Intel 2700G Video Performance For Different Video Formats



The current TCPMP player on system is able to play wmv files with accelerations.

TCPMP is an open sourced media player (License free). But because of the media decoder license issue, TCPMP on current GENE-1270 image does not have a fully loaded codec feature. For example: MPEG-4, AAC, MP3, AVC, and AC-3 codec are not included. These codec requires to license from the IP holders or MPEGLA, MP3Licensing and Vialicensing. Without the above codecs, user will have limited performance when

playback on MPEG2 and MPEG4 files.

To have the full performance of MPEG2 and MPEG4 display using 2700G, please acquire the full version of TCPMP from the following web links:

<http://tcpmp.corecodec.org/download>

<http://tcpmp.mabin.info/>

<http://www.coreplayer.com>

If user requires a way to embed media player to their applications, CorePlayer Mobile 1.0 is a closed and sourced media player, which requires license.

<http://www.coreplayer.com>

3.6 Demo Applications

GENE-1270B CD-ROM includes sample applications to controls the system resolution, GPIO and Watchdog.

Resolution tools:

2700GResolutionSW.exe: To adjust resolution of GENE-1270 with 2700G.

270ResolutionSW.exe: To adjust resolution of GENE-1270 without 2700G.

GPIO:

To control GPIO pins on CN8, a sample application with source code guides user to develop custom applications using GPIO pins. A readme file is provided with the source code.

WatchDog:

To utilize watchdog timer function on GENE-1270, a sample application with source code guides user to develop custom applications using GPIO pins. A readme file is provided with the source code.

3.7 SDK installation

GENE-1270 CDROM includes SDK for user to build custom applications. This enables the support for eMbedded Visual C++ 4.0 or .NET Compact Framework. Users building their own applications on GENE-1270 require installing this SDK. Follow the installation guide in the “SDK” folder in CDROM.

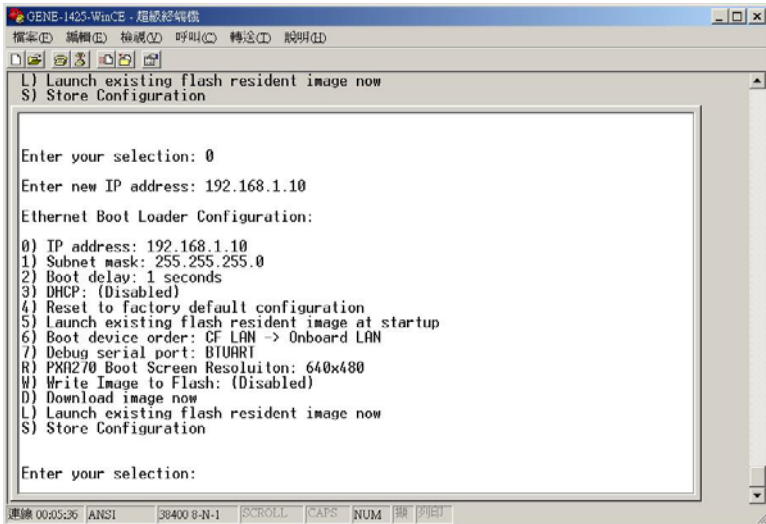
3.8 Bootloader

To gain control of Bootloader, connect a null modem cable between the Serial Port of host PC and COM2 (CN13) on GENE-1270. On the host PC, start HyperTerminal program.

Setup the connection to the following parameters:

- Speed: 38400
- Data-Bit: 8
- Parity Check: None
- Stop-Bit: 1
- Flow Control: None

Once booting the system, within 1 second, press space key in the HyperTerminal Window to enter Bootloader setup screen.



- For GENE-1270 without 2700G display accelerator, boot screen is provided. The resolution of the boot screen can be adjusted in Bootloader. Press R to change resolution.
- The debug port is default to COM2. Press '7' to change debug-port to COM1.
- To load factory default, Press 4. This will format the /DiskOnChip folder in Windows CE image. The registry in the Windows CE image will be formatted and reloaded.
- Press 'S' to save the current setting.