EBC-1100 Series

Low-cost 3.5” size Embedded SBC with NS Geode™ CPU on board, and VGA/LCD, TV, Sound, LAN, SSD, GPS, PCMCIA

User’s Guide

Recycled Paper

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Part No. 50-13026-100

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Questions			
Product Model			
Environment to Use	OS:		
	Computer Brand:		
	M/B: CPU: Chipset: BIOS: Video Card: Network Interface Card: Other:		
Challenge Description			
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Introduction

The new EBC-1100 3.5" embedded SBC, is a multimedia capable and network ready embedded PC. Its on-board low power version CPU, Geode GX1 233/300MHz, is offered by National Semiconductor Corporation (NS).

EBC-1100 features VGA/LCD display functions that support resolution and color depth up to 1024x768 at 64K colors. It also supports onboard TV output for both NTSC and PAL modes, and sound functions including speaker-out, line-out, mic-in, line-in, and CD-in.

EBC-1100 also has excellent support for mobile applications. It reserves a standard GPS socket, one PCMCIA socket. Other features include a built-in SODIMM socket, support of mobile type HDD and FDD with great vibration resistance.

The built-in 10/100 Base Ethernet controller is implemented for network connectivity. Other features on the mainboard include two PCI enhanced IDE ports supporting up to four Ultra DMA-33 devices, two 16550A compatible serial ports, one IEEE-1284 parallel port, two USB ports, one IrDA interface, and one GPS port uses COM2 interface.

1.1 Packing Check List

Before you begin to install your card, please make sure that you have received the following materials as listed below:

Item	*Qty*	*Remark*
EBC-1100	1 pc.	Embedded Single Board Computer
Keyboard/Mouse "Y" shape adapter cable	1 pc.	One PS/2 connector to provide both one PS/2 keyboard & one PS/2 mouse interface
IDE Cable	1 pc.	44p to 40p standard header flat ribbon cable
Flexible flat Cable	1 pc	26-pin floppy cable
TV adapter cable	1 pc	One PS/2 connector to provide one S-video female connector & one RCA female connector, 20cm
COM Cable	1 pc	10-pin ribbon connector to 9-pin D-Sub connector
CD-ROM	1 pc.	Drivers
User's manual	1 pc.	EBC-1100

TABLE 1: PACKING CHECK LIST

1.2 Description

EBC-1100 is a low-cost, 3.5" FDD size form factor computer mainboard which is targeted to operate under Windows 95, 98, NT, 2000, and Linux. The design of EBC-1100 is based on the NS GX1 CPU and CS5530A I/O chip. The following table lists the features of the EBC-1100 .

TABLE 2: EBC-1100 FEATURES SUMMARY

Item	Features
Processor	● NS GX1 233/300MHz CPU.
BIOS	● Support 2 Megabit flash ROM, boot block, PNP, DMI, and field upgradeable.
DRAM	● 1 piece of 144pin SODIMM socket supporting 3.3V SDRAM with Serial Presence Detect ● Support 256Mb SDRAM up to 100MHz. ● Supports 16,32,64,128,256 MB DIMM types.
VGA / Flat Panel	● Display memory: 1~4MB shared with system memory ● Display type: Simultaneously supports for CRT and 18-bit TFT LCD display (supports 3.3 V / 5V LCD) ● Display resolution: Non-interlaced CRT monitor resolution up to 1024 x 768 @ 16 bpp or 1280 x 1024 @ 8 bpp - Panel resolutions up to 1024 x 768 @ 18 bpp TFT panel
TV output	● Supports NTSC, NTSC-EIA (Japan), and PAL (B, D, G, H, I, M and N) TV formats
Audio interface	● AD1819B (Line in ,Line out , Speaker out , CD-ROM in, MIC in)
Form Factor	● 3.5” FDD size
LAN interface	● 10/100 base T (Realtek RTL8139C)
PCMCIA Interface	● RICOH R5C476 II ● one 100-pin socket for PCMCIA card
Peripheral Support	● One IEEE-1284 Parallel Port (D-Sub 26 pin) ● One PS/2 Keyboard port and Mouse port ● Two EIDE Ultra DMA/33 hard drive ports ● One Floppy drive Port supports ● Two USB ports ● One IrDA ports ● Two 16550A compatible serial ports, COM2 selectable RS-422/485/232 ● One GPS port use COM2 interface
Miscellaneous	● Resetable fuse for power of KBD, Mouse, and USB ● Watchdog timer

1.3 Features

The EBC-1100 supports the following requirements:

CPU

- NS Geode GX1 Low Power Processor
- L1 cache : 16KB unified L1 cache

Chipset

- NS GX1 and NS CS5530A chipset

BIOS

- Award PnP BIOS with 2Mb Flash ROM
- Customized power-on screen (for OEM project)
- Support Desktop Management Interface (DMI) allows users to download system hardware-level information such as CPU type, CPU speed, internal/external frequencies and memory size, etc.
- Green Function: Power management via BIOS, activated through mouse/keyboard movement

Host Memory

- One 144-pin SO-DIMM socket, Max. 256MB un-buffered SDRAM module

IDE Ports

- Bus Master IDE controller, two 44-pin EIDE interfaces support up to four IDE devices
- Support PIO Mode 3/4 or Ultra DMA/33 IDE devices

USB Interface

- Two USB ports on front faceplate compliant with USB Specification Rev. 1.1
- Individual over-current protection

On Board Supper I/O

- Winbond W83977AF
- One high-speed bi-directional SPP/EPP/ECP parallel port with ESD protection to 4KV and downstream device protection to 30V
- RTC & CMOS build on chip
- One floppy interface, support slim type floppy drive
- Two 16C550 UARTs compatible COM ports with ESD protection to 2KV, RS-232 COM1 on I/O panel, selectable RS-232/422/485 COM2 port pin header on board

Watchdog Timer

- Programmable I/O port 3F0h and 3F1h to configure watchdog timer, programmable timer 0~7635 seconds
- Bundled easy-programming library for DOS, Windows 95, 98, NT

On-board Ethernet

- Realtek RTL8139C high performance Ethernet controller
- IEEE 802.3 10Base-T/100Base-TX compatible
- IEEE 802.3u auto-negotiation support
- IEEE 802.3x 100Base-TX flow control support
- Supports Intel pre-boot execution environment (PXE) for remote boot of Windows NT/2000

PCMCIA PCI-CARDBUS BRIDGE

- One 100PIN TYPE1/2 PCMCIA interface

VGA / Flat Panel interface

- **Display memory:** 1 ~ 4 MB shared with system memory
- **Display type:** Simultaneously supports for CRT and 18-bit TFT LCD display (supports 3.3 V / 5V LCD)
- **Display resolution:** - Non-interlaced CRT monitor resolution up to 1024 x 768 @ 16 bpp or 1280 x 1024 @ 8 bpp. Panel resolution up to 1024 x 768 @ 18 bppTFT panel

TV Interface

- CHRONTEL CH7003 Supports NTSC, NTSC-EIA (Japan), and PAL (B, D, G, H, I, M and N) TV formats

Audio Interface

- AD1819B AC97 codec
- Support Line in ,Line out , Spk out , CD-ROM in, MIC in portd

Form Factor

- Standard 3.5” FDD size

Environment

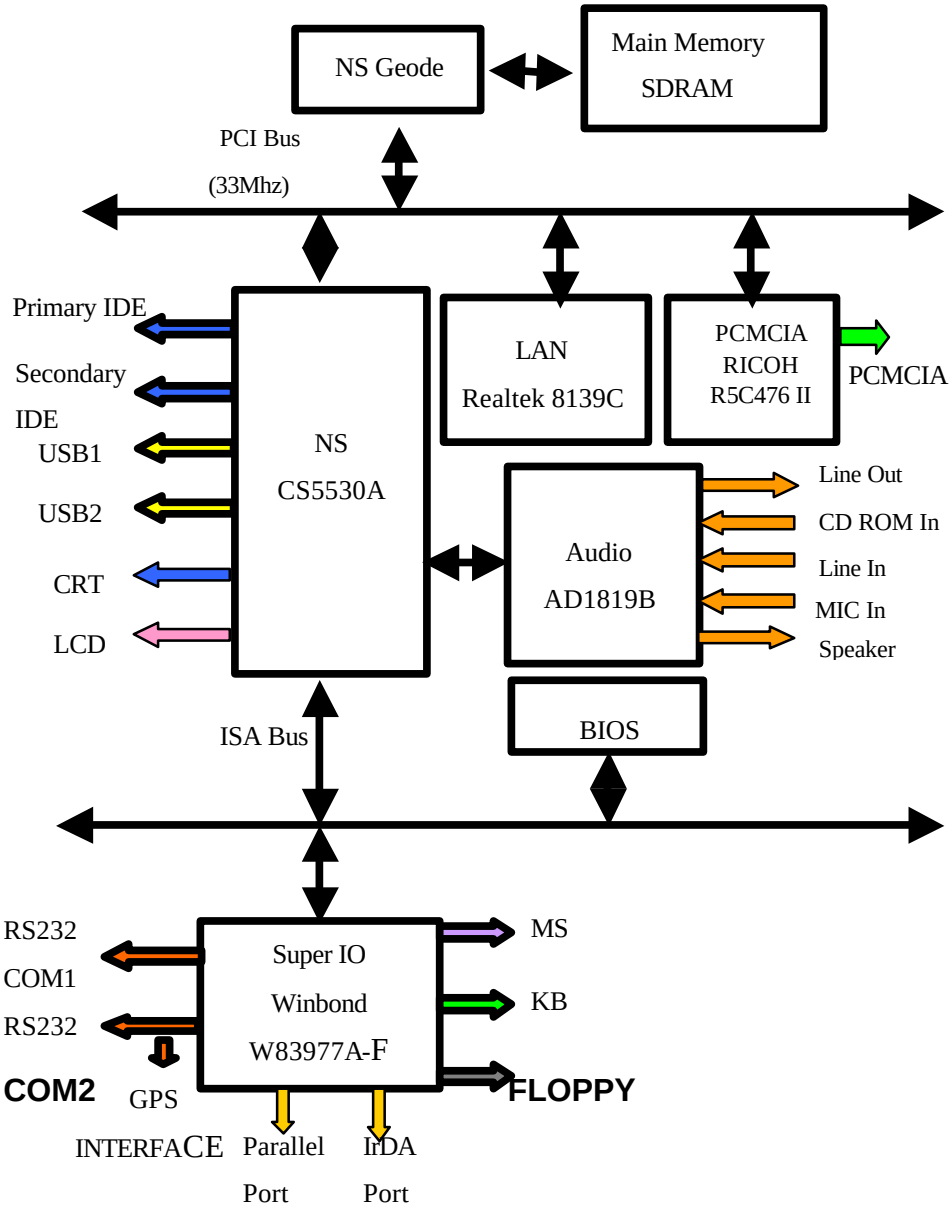
- Operating temperature: 0 to 60°C
- Storage temperature: -20 to 80°C
- Humidity: 5% to 95% non-condensed
- Shock: 15G peak-to-peak, 11ms duration, non-operation
- Vibration:
  - Non-operation: 1.88Grms, 5-500Hz, each axis
  - Operation: 0.5Grms, 5-500Hz, each axis, with 2.5” HDD

Power Consumption

Configurations	+5V	+12V
GX1 233 MHz 128MB	1.5A	0A
GX1 300 MHz 128MB	2A	0A

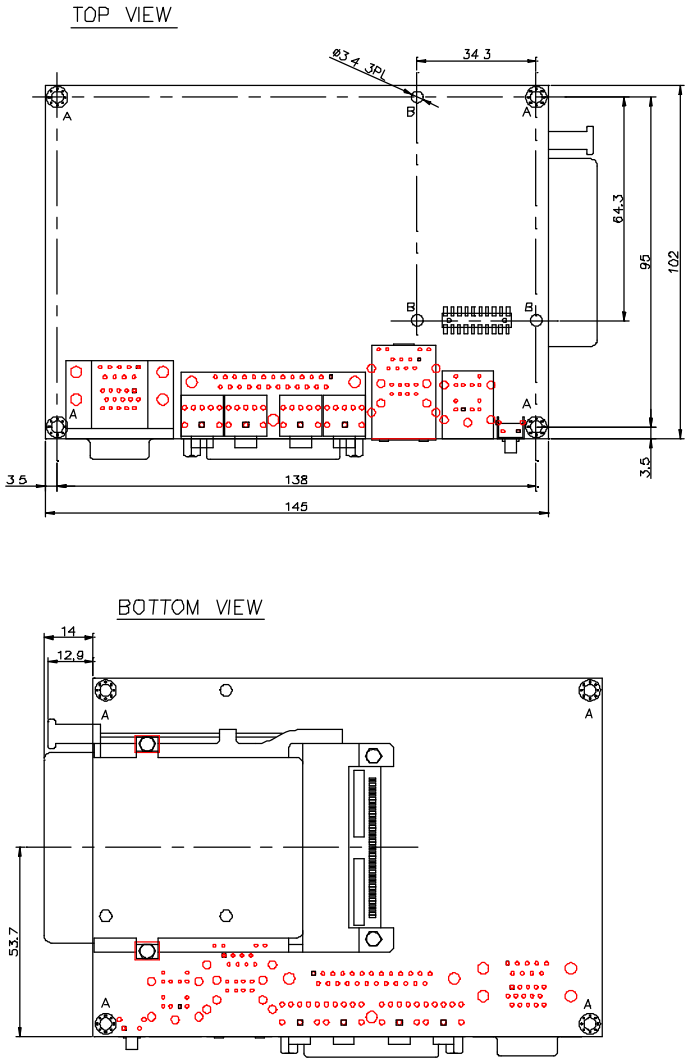
1.4 Block Diagram

Figure 1: EBC-1100 System Block Diagram



1.5 Mechanical Drawing

Figure 2: EBC-1100 mechanical drawing



2

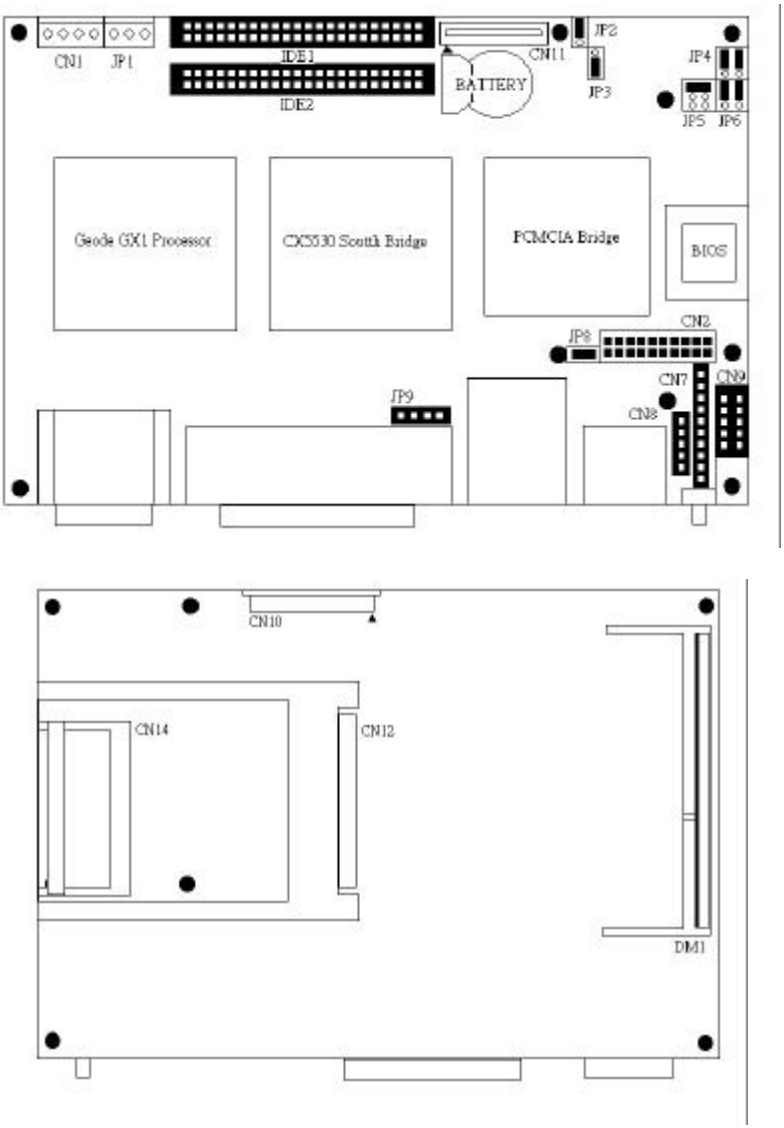
Hardware Installation

This chapter provides information on how to use the jumpers and connectors on the EBC-1100 in order to set up a workable system. The contents also include how to add on components such as memory, CPU, HDD and FDD on to the modules. The covered topics are:

- Jumpers on the EBC-1100
- Connectors on the EBC-1100
- CPU Installation
- Memory Installation
- FDD Remove and Installation
- HDD Remove and Installation

2.1 Placement Overview

Figure 3: Top (up) and bottom (down) Placement of EBC-1100



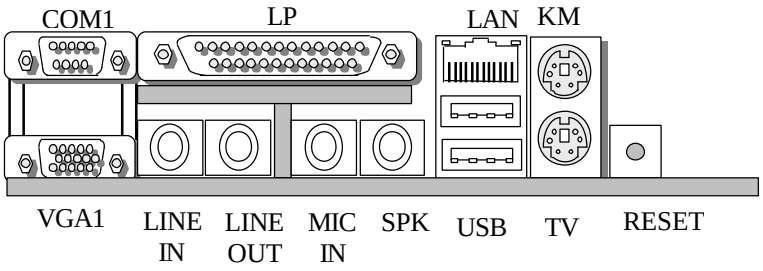


Figure 4: EBC-1100 I/O port placement

2.2 Installing the Jumpers

In order to select the operation modes of your system, configure and set the jumpers on the your SBC to match the need of your application. To set a jumper, a black plastic cap containing metal contacts is placed over the jumper pins as designated by the required configuration as listed in this section. A jumper is said to be " on " or " 1-2 " when the black cap has been placed on two of its pins, as show in the figure below:

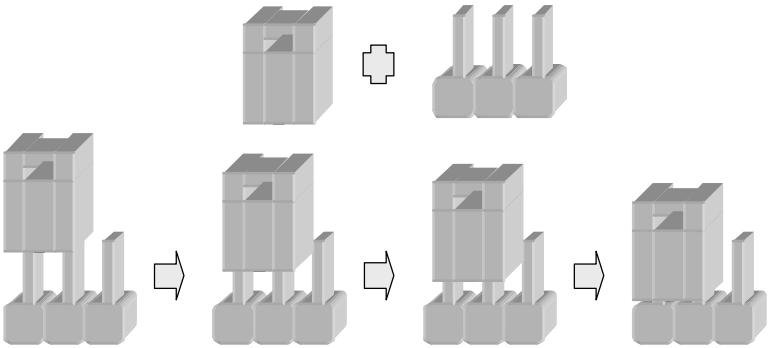


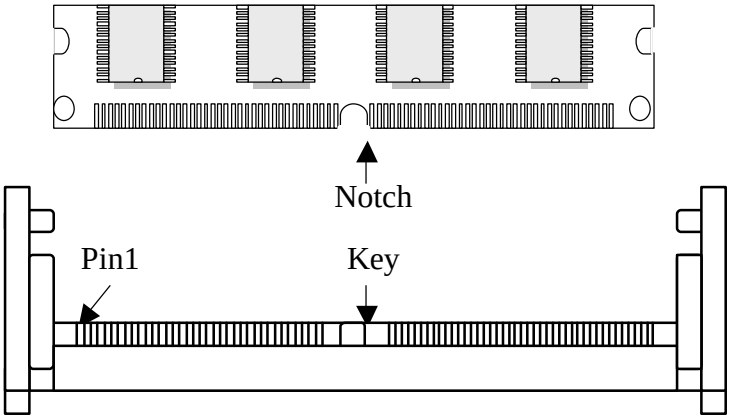
Figure 5: Jumper Installation

A pair of needle-nose pliers is recommended when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local sales representative before you make any changes. In general, you simply need a standard cable to make most connections.

2.3 Installing the SODIMM Module:

A SODIMM module simply snaps into a socket on the system board. Pin1 of the SODIMM module must correspond with Pin1 of the socket.

Figure 6: SO-DIMM Installation



1. Position the SODIMM above the socket with the “notch” in the module aligned with the “key” on the socket.
2. Seat the module 15 degree into the bank. Make sure it is completely seated. Push down it to lock the two sides.

2.4 Jumper Setting

TABLE 3: JP5, JP6: COM2 MODE SETTING

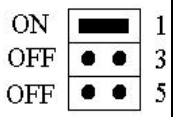
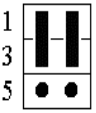
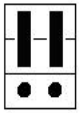
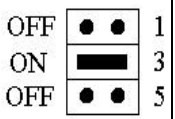
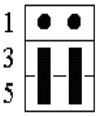
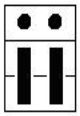
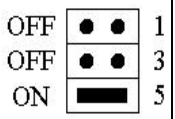
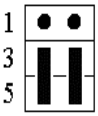
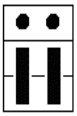
COM2 MODE	JP5	JP4	JP6
RS-232			
RS-422			
RS-485			

TABLE 4: JP2: CLEAR CMOS CONTENT

JP2	Setting	Function
	Pin 2-3 Short/Closed	Normal operation
	Pin 1-2 Short/Closed	Clear CMOS Content

TABLE 5: JP3: LCD POWER SETTING

5V Setting	3.3V Setting
	

TABLE 6: JP8: GPS CONNECTOR POWER SETTING

Power On	Power Off
	

2.5 I/O Connector Description

TABLE 7: CN3 : VGA & COM1 CONNECTOR

PIN	DESCRIPTION	PIN	DESCRIPTION
1	R Signal	1	DCD1#
2	G Signal	2	RX1#
3	B Signal	3	TX1#
4	NC	4	DTR1#
5	GND	5	GND
6	GND	6	DSR1#
7	GND	7	RTS1#
8	GND	8	CTS1#
9	GND	9	RI1#
10	GND		
11	NC		
12	D2DATA		
13	HSYNC		
14	VSYNC		
15	D2CLK		

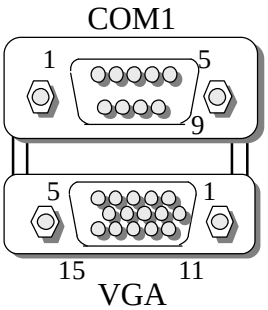


TABLE 8: CN1: POWER CONNECTOR

PIN	DESCRIPTION
1	+12V
2	GND
3	GND
4	+5V

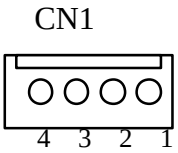


TABLE 9: CN2: GPS CONNECTOR

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	11	RX
2	VCC	12	TX
3	NC	13	GND
4	NC	14	NC
5	RESET	15	NC
6	NC	16	GND
7	NC	17	GND
8	NC	18	GND
9	NC	19	NC
10	GND	20	NC

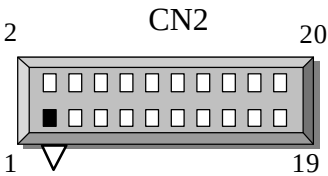


TABLE 10: IDE1/IDE2: IDE CONNECTORS

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RESET#	2	GROUND
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	GROUND	20	NC
21	NC	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IOCHRDY	28	GROUND
29	NC	30	GROUND
31	INTERRUPT	32	IOCS16#
33	SA1	34	NC
35	SA0	36	SA2
37	HDC CSO#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND
41	VCC	42	VCC
43	GROUND	44	NC

IDE1/IDE2

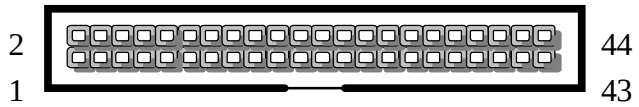


TABLE 11: JP1 : FAN CONNECTOR

PIN	DESCRIPTION
1	GND
2	+5V
3	NC

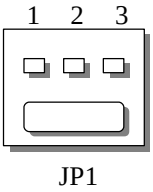


TABLE 12: CN8 : ALTERNATE IRDA CONNECTOR

PIN	DESCRIPTION
1	+5V
2	NC
3	IRRXD
4	GND
5	IRTXD

Figure 7: PJ1, 2, 3, 4: Audio Phone Jacks

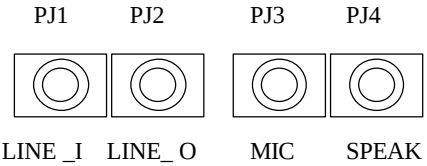


TABLE 13: CN6: PS/2 KEYBOARD/MOUSE/TV CONNECTORS

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	7	KB_DATA
2	GND	8	MS_DATA
3	COMPOSITE	9	GND
4	CHROM	10	+5V
5	LUM	11	KB_CLK
6	GND	12	MS_CLK

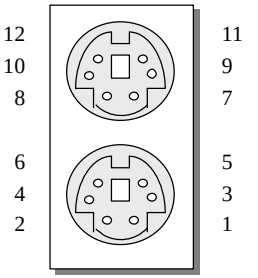


TABLE 14: CN4: PARALLEL PORT

PIN	DESCRIPTION	PIN	DESCRIPTION
1	STB#	14	AFD#
2	DATA0	15	ERROR#
3	DATA1	16	INIT#
4	DATA2	17	SLIN#
5	DATA3	18	GND
6	DATA4	19	GND
7	DATA5	20	GND
8	DATA6	21	GND
9	DATA7	22	GND
10	ACK#	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT		

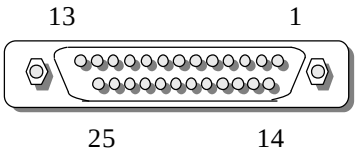


TABLE 15: CN5: USB/100 BASE-TX LAN CONNECTOR

PIN	DESCRIPTION	PIN	DESCRIPTION
P1	+5V	S1	+5V
P2	PORT 0-	S2	PORT 1-
P3	PORT 0+	S3	PORT 1+
P4	GND	S4	GND
1	TX+	2	TX-
3	RX+	4	T45
5	T45	6	RX-
7	T78	8	T78

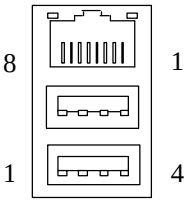


TABLE 16: LAN LEDS

Yellow (Speed status)	Function
OFF	10Mbps transfer rate
ON	100Mbps transfer rate

Green (Link status)	Function
ON	Link
OFF	Link off
Blinking	Data transfer in Progress

TABLE 17: CN7: SYSTEM STATUS INDICATE AND CONTROL CONNECTOR

PIN	DESCRIPTION	FUNCTION
1	+5V	POWER LED
2	GND	
3	+5V	HD ACTIVE LED
4	HD LED-	
5	RESET-	RESET SWITCH
6	GND	
7	SPEAKER	EXT SPEAKER
8	NC	
9	NC	
10	+5V	

TABLE 18: CN11: LCD INTERFACE CONNECTOR

PIN	DESCRIPTION	PIN	DESCRIPTION
1	FVCC	2	GND
3	FVCC	4	GND
5	NC	6	NC
7	ENVDD	8	ENBKL
9	NC	10	SHFCLK
11	FLM	12	LP
13	DE	14	FD17
15	FD16	16	FD15
17	FD14	18	FD13
19	FD12	20	FD11
21	FD10	22	FD9
23	FD8	24	FD7
25	FD6	26	FD5
27	FD4	28	FD3
29	FD2	30	FD1
31	FD0		

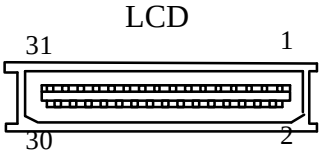


TABLE 19: JP10: CD-ROM AUDIO INPUT

PIN	DESCRIPTION	PIN	DESCRIPTION
1	Left input	2	GND
3	GND	4	Right input

TABLE 20: CN10: FLOPPY INTERFACE CONNECTOR

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	2	INDEX#
3	VCC	4	DR0#
5	VCC	6	DSKCHG#
7	NC	8	NC
9	NC	10	MTRO#
11	NC	12	DIR#
13	NC	14	SETP#
15	GND	16	WDATA#
17	GND	18	AGATE#
19	GND	20	TRK0#
21	GND	22	WP#
23	GND	24	RDATA#
25	GND	26	HDSEL#

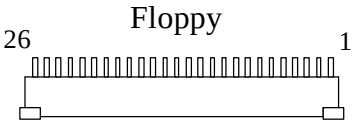
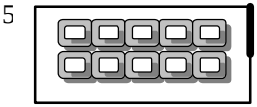


TABLE 21: CN9 : COM2 RS232/422/485 PORT

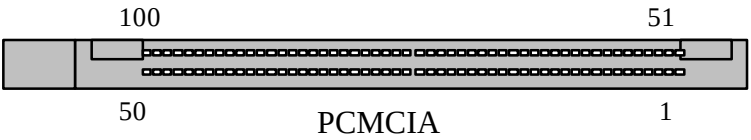
PIN	DESCRIPTION		
	RS-232	**RS-422**	**RS-485**
1	DOC	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	GND	GND	GND
6	DSR	RTS-	NC
7	RTS	RTS+	NC
8	CTS	CTS+	NC
9	RI	CTS-	NC
10	NC	NC	NC



COM2

TABLE 22: CN12: PCMCIA SOCKET

PIN	DESCRIPTION	PIN	DESCRIPTION	PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	26	GND	51	GND	76	GND
2	DATA3	27	VPP	52	CD1	77	VPP
3	DATA4	28	A16	53	DATA11	78	A22
4	GND	29	GND	54	GND	79	GND
5	DATA5	30	A15	55	DATA12	80	A23
6	DATA6	31	A12	56	DATA13	81	A24
7	GND	32	GND	57	GND	82	GND
8	DATA7	33	A7	58	DATA14	83	A25
9	CE1#	34	A6	59	DATA15	84	VS2
10	GND	35	GND	60	GND	85	GND
11	A10	36	A5	61	CE2#	86	RESET
12	OE	37	A4	62	VS1	87	WAIT#
13	GND	38	GND	63	GND	88	GND
14	A11	39	A3	64	IORD#	89	INPACK#
15	A9	40	A2	65	IOWR#	90	REG
16	GND	41	GND	66	GND	91	GND
17	A8	42	A1	67	A17	92	ABVD2
18	A13	43	A0	68	A18	93	ABVD1
19	GND	44	GND	69	GND	94	GND
20	A14	45	DATA0	70	A19	95	DATA8
21	WE#	46	DATA1	71	A20	96	DATA9
22	GND	47	GND	72	GND	97	GND
23	RDY	48	DATA2	73	A21	98	DATA10
24	VCC	49	WP	74	VCC	99	CD2
25	GND	50	GND	75	GND	100	GND



3

Driver Installation

This chapter describes the installation procedure of Device Driver for Windows 98/NT/2000/ME.

3.1 VGA Driver Installation

This section provides information on how to install the VGA driver that come in the Compact Disk with the package. Please follow the instructions set forth in this section carefully. Please note that there must be relevant software installed in your system before you could proceed to install the VGA driver.

Installing the Drivers for Windows 98/ME

The following section describes the normal display driver installation procedures for Windows 98/ME. Refer to the following procedures to install the display drivers for Windows 98/95.

1. The driver is included in the ADLINK CD. Run the "CyrixMediaGXCertifiedWin9xDrivers4.0.exe" under the following directory:

   X: \CHIPDRV\Chipset\GX1\Gx1_win9xMe .

2. Click **NEXT** on **Welcome Screen** to read and Click **YES** to agree the license agreement.

3. Click **NEXT** if you agree to continue. NOTE: If you click **Cancel**, the program will terminate.

4. Click **Yes** to restart your computer and for the new settings to take effect.

5. Follow the screen instructions and use default settings to complete the setup when Windows 98/ME re-started.

Installing the Drivers for Windows NT 4.0

IMPORTANT: You should install the Windows NT 4.0 with Service Pack 4 (version number: 4.00.1381) or later revision first before installing the VGA driver. If you don't have the Windows NT 4.0 Service Pack 4, please contact your software vendor or download it from Microsoft's web site.

The procedures below show you how to install the VGA driver for Windows NT 4.0.

1. Boot Windows NT 4.0 Click **Start**. Select **Settings** then double-click the **Control Panel**.

2. Select **Display,** Click **Settings→Display Type,** than click **CHANGE** in Adapter Type.

3. Select **Have Disk, Browse** the VGA Driver in the following PATH:

   X:\CHIPDRV\Chipset\GX1\GX1_NT\NT4.0
   Display Driver5.05 highlight **GX.inf**, click **Open**, and then click **OK**.

4. Click **Finish** than reboot Windows NT4.0.

Installing the Drivers for Windows 2000

The procedures below show you how to install the VGA driver for Windows 2000.

1. Boot Windows 2000 Click **Start**. Select **Settings** then double-click the **Control Panel**.

2. Select Display, Click Settings→, than click Advanced, Click Adapter in Adapter Type and Click Properties →Driver→Update Driver.
3. An Upgrade Device Driver Wizard windows, click **Next.**
4. Select “Search for a suitable driver for my device” and Click **NEXT**
5. Select “specify a location”**, Browse** the VGA Driver in the following PATH**:**

   X:\CHIPDRV\Chipset\GX1\Gx1_win2k\Win2k_VGA
   highlight **GX.inf**, click **Open**, and then click **OK**.
6. Click **Finish** than reboot Windows2000.

3.2 Audio Driver Installation

This section provides information on how to install the audio driver that come in the Compact Disk with the package. Please follow the instructions set forth in this section carefully. Please note that there must be relevant software installed in your system before you could proceed to install the AUDIO driver.

Installing the Drivers for Windows 98/ME

The following section describes the AUDIO driver installation procedures for Windows 98/ME. Use the following procedures when installing the display drivers for Windows 98/95.

1. The driver is included in the ADLINK CD. Browse and run the file named **"CyrixMediaGXCertifiedWin9xDrivers4.0.exe"** under the following directory:

   X: \CHIPDRV\Chipset\GX1\Gx1_win9xMe .

2. Click **NEXT** on **Welcome Screen** to read and Click **YES** to agree the license agreement.

3. Click **NEXT** if you agree to continue. NOTE: If you click **Cancel**, the program will terminate.

4. Click **Yes** to restart your computer and for the new settings to take effect.

5. Follow the screen instructions and use default settings to complete the setup when Windows 98/ME re-started.

Installing the Drivers for Windows NT 4.0

The procedures below show you how to install the AUDIO driver for Windows NT 4.0.

1. On the Start Menu, select **"Settings"** and then **"Control Panel".**

2. Double click on **Multimedia.**

3. Select the **"Devices"** tab.

4. Click on **"Audio Devices"** and select **"ADD".**

5. On the Combo box, select "Unlisted or Updated driver".

6. Select **Have Disk, Browse** the AUDIO Driver in the following PATH:

   X:\CHIPDRV\Chipset\GX1\GX1_NT\NT4.0 Audio Driver 1.2
   highlight **OEMSETUP.inf**, click ***Open***, then click ***OK***.

7. Click **Finish** than reboot Windows NT4.0.

Installing the Drivers for Windows 2000

The procedures below show you how to install the AUDIO driver for Windows 2000.

1. Right-Click on **"My computer"** on your desktop, Click on Properties. Select the **"Hardware"** tab.

2. Click on the **"Device Manager"** button, Click on the "+" symbol at the right side of **"Sound, Video and Game controllers"**

3. Right-click on "Sound Blaster 16 or AWE32 compatible (WDM)", Select "Properties"

4. Select the "Driver" tab, Click on the "Update driver" button, and Click on "Next" and Select "Display a list of the known drivers etc, Click on "Next",

5. Select **Have Disk, Browse** the AUDIO Driver in the following PATH:

   X:\CHIPDRV\Chipset\GX1\Gx1_win2k\Win2k_AUDIO
   highlight Gxwdmxa.inf, click *Open*, and then click Next.

6. Click on **"Finish"** than reboot your machine.

3.3 LAN Driver Installation

This section describes LAN driver installation for the onboard Ethernet controller **RTL8139C**. The relative drivers are under the following ADLINK CD directory: ***X:\CHIPDRV\LAN\RTL8139c***, where ***X:*** is the location of the CD-ROM drive.

The RTL-8139C drivers support the Windows 98, Windows ME, Windows 2000, and Windows NT. All the above drivers are included in the ADLINK CD, please refer the readme file inside the CD and the instructions in the following subsections.

Driver Installation on Windows 98

The Windows 98 will install the LAN driver automatically. We recommend you to manually updated the LAN, which on the ADLINK CD to guarantee the compatibility. After installing Windows 98, please update the new drivers by the following procedures.

1. Boot Windows 98, Click **Start**. Select **Settings** then double-click the **Control Panel.**
2. Double-click on the **System** icon, click on the **Device Manager** tab.
3. Double-click on the **Network Adapters** entry,. Click the **Properties**.
4. Click on the **Driver** button, then click **Update Driver…** button.
5. Update Device Driver Wizard starts, click **NEXT**
6. Select **Display a list of ...** and click **NEXT**. The next window allows the user to specify a specific path. Insert the CD and click **Have Disk.**
7. Browse the RTL-8139 driver in the following path:

   ***X:*\ CHIPDRV\LAN\RTL8139c\WINDOWS\Win9*8**

   highlight **NETRTS5.INF**, click **OK**. The Update Wizard displays the message that it has found the driver. Click **OK** again to update the driver. Note: Windows 98 may ask you to insert the original Windows 98 CD to install the LAN protocols.
8. Click **NEXT** button, then the Wizard summary window appears.

9. Click **Finish** button, then restart the computer to active the new driver.

Driver Installation on Windows NT

Before install the LAN driver on Windows NT, please copy the LAN driver in the CD to a floppy diskette. You have to put a new disk into drive A, then type the following batch command under DOS environment to copy the relative NT drivers. ***X: \CHIPDRV\LAN\RTL8139c\WINDOWS\NT4.0***, where X is the CD-ROM drive.

Windows NT may ask to installs a LAN driver from its own library of drivers. We recommend you to manually update the LAN, which on the ADLINK CD to guarantee the compatibility. After installing Windows NT, please update the new driver by the following procedures.

1. From the **Control Panel**, double-click the **Network** icon, a Network Configuration window pop up, click **Yes**.
2. In Network Setup Wizard, click **Next>**, click **Select From List...** button.
3. Insert LAN driver floppy diskette into A drive and click **Have Disk**.
4. In the dialog box of Insert Disk window, type in **A:**, Click **OK**.
5. A Select OEM Option window pop up, click **OK**, then click **Next>**.
6. Select necessary Network Protocols, click **Next>**.
7. Select necessary Network Services, click **Next>**.
8. Click **Next>** until Window NT Setup dialog box pop up. Type in **D:\i386** in the dialog box, then insert the original Windows NT CD, and click **Continue.**
9. Then click **OK** until the setup completed.
10. Restart the computer to reboot.

Driver Installation on Windows 2000

The Windows 2000 may install the LAN driver. We recommend you to manually installed the most updated LAN driver, which shipped with ADLINK CD to guarantee the compatibility. After installing the Windows 2000, please update the new drivers by the following procedures.

1. Boot Windows 2000, Click **Start**. Select **Settings** then double-click the **Control Panel**.
2. Double-click ***System*** icon, click **Hardware** tab, click **Device Manager** button.
3. Double-click Network Adapters entry, double-click the Realtek RTL 8139 PCI Fast Ethernet Adapter entry.
4. Click **Driver** tab, then click **Update Driver…** button.
5. An Upgrade Device Driver Wizard windows, click **Next>**.
6. Select **Display a list of ...** and click **Next>**. The next window may show a list of hardware models.
7. Insert the CD and click **Have Disk**.
8. Browse the RTL-8139C driver in the following path:

   ***X:*\ CHIPDRV\LAN\RTL8139c\WINDOWS\Win2k**,
   highlight **Netrts5.inf**, click **Open**, then click **OK**.
9. Highlight the model: **Realtek RTL 8139 PCI Fast Ethernet Adapter,** then click **NEXT>**. An Update Driver Warning window may pop up, click Yes to continue.
10. Click **NEXT>** button, then the Wizard summary window appears.
11. Click **Finish** button, then click **CLOSE** button.

4

Watchdog Timer Configuration

The function of the watchdog timer is to reset the system automatically whenever it encounters a system fatal fault. It contains a down counter, CRF2 of logical device 8, and two Watchdog control registers, WDT_CTRL0 and WDT_CTRL1 of logical device 8. We can uses compatible PNP protocol to access configuration registers for setting up watchdog timer configuration.

To program configuration registers, the following configuration sequence must be followed:

Enter the extended function mode by writing 87h to the location 3F0h twice.

Configure the configuration registers.

Exit the extended function mode by writing 0AAh to the location 3F0h.

The following example is written in Intel 8086 assembly language. It will reset the system in 16 seconds. We can use both keyboard interrupt and mouse interrupt to cause the watchdog to reload and start to count down from the value of CRF2. Write 0 (Zero) to CRF2 will disable the WATECHDOG Timer.

```
MODEL SMALL
DATA
CODE
STARTUP
BEGIN:

-------------------------------------------------
Enter the extended function mode, interruptible
double-write
```

```
------------------------------------------------

   MOV   DX,3F0H
   MOV   AL,87H
   OUT   DX,AL
   OUT   DX,AL

------------------------------------------------
 Configure logical device 7, configuration register CRE2
------------------------------------------------

   MOV   DX,3F0H
   MOV   AL,07H
   OUT   DX,AL    ;point to logical Device Number Reg.
   MOV   DX,3F1H
   MOV   AL,07H   ;select device 7
   OUT   DX,AL

   MOV   DX,3F0H
   MOV   AL,0E2H  ;device 7, CRE2
   OUT   DX,AL
   MOV   DX,3F1H
   MOV   AL,0AH   ;Watch Dog Timer Output
   OUT   DX,AL

   MOV   DX,3F0H
   MOV   AL,2AH   ;CR2A
   OUT   DX,AL
   MOV   DX,3F1H
   MOV   AL,80H   ;bit7=0 -> KBRST, bit7=1 -> GP12
   OUT   DX,AL

   MOV   DX,3F0H
   MOV   AL,07H
   OUT   DX,AL
   MOV   DX,3F1H
   MOV   AL,08H   ;select device 8
   OUT   DX,AL
   MOV   DX,3F0H
   MOV   AL,0F3H  ;device 8, CRF3
```

```
   OUT   DX,AL
   MOV   DX,3F1H
   MOV   AL,06H   ;Watch Dog Timer is reset upon a
   OUT   DX,AL    ;Mouse & Keyboard interrupt

   MOV   DX,3F0H
   MOV   AL,0F2H  ;CRF2
   OUT   DX,AL
   MOV   DX,3F1H
   MOV   AL,01H   ;Time-out after the value of CRF2
   OUT   DX,AL    ;range 1~255, 00 -> disable Time-out
            ;Table 1 describes more information
                  ;about the resolution
-------------------------------------------------
Exit extended function mode
-------------------------------------------------

   MOV   DX,3F0H
   MOV   AL,0AAH
   OUT   DX,AL
EXIT
END
```

ADLINK also provides watchdog programs and subroutines for easy use under DOS, Windows 95/98/2000, and Windows NT. Please browse ADLINK CD for more information.

TABLE 23: WATCH-DOG TIMER TIME-OUT PERIOD SETTING

Value of CRF2	Time Out (Sec.)
00h	Disable
01h	15
02h	45
03h	75
.	.
.	.
.	.
.	.
FFh	7635

Warranty Policy

Thank you for choosing ADLINK. To understand your rights and enjoy all the after-sales services we offer, please read the following carefully.

1. Before using ADLINK's products, please read the user manual and follow the instructions exactly. When sending in damaged products for repair, please attach an RMA application form.
2. All ADLINK products come with a two-year guarantee,free of repair charge.

- The warranty period starts from the product's shipment date from ADLINK's factory
- Peripherals and third-party products not manufactured by ADLINK will be covered by the original manufacturers' warranty
- End users requiring maintenance services should contact their local dealers. Local warranty conditions will depend on the local dealers3. Our repair service does not cover two-year guarantee while damages are caused by the following:

a. Damage caused by not following instructions on user menus.
b. Damage caused by carelessness on the users' part during product transportation.
c. Damage caused by fire, earthquakes, floods, lightening, pollution and incorrect usage of voltage transformers.
d. Damage caused by unsuitable storage environments with high temperatures, high humidity or volatile chemicals.

e. Damage caused by leakage of battery fluid when changing batteries.

f. Damages from improper repair by unauthorized technicians.

g. Products with altered and damaged serial numbers are not entitled to our service.

h. Other categories not protected under our guarantees.4. Customers are responsible for the fees regarding transportation of damaged products to our company or to the sales office.

5. To ensure the speed and quality of product repair, please download an RMA application form from our company website www.adlinktech.com. Damaged products with RMA forms attached receive priority.

For further questions, please contact our FAE staff.
ADLINK: service@adlinktech.com
Test & Measurement Product Segment: NuDAQ@adlinktech.com
Automation Product Segment: Automation@adlinktech.com
Computer & Communication Product Segment: NuPRO@adlinktech.com ; NuIPC@adlinktech.com