SOM-4455 ETX Module

AMD Geode LX series SOM-ETX CPU Module with VGA/LCD/LVDS/ LAN interface

User Manual

Packing list

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

- 1 SOM-4455 System On Module CPU module
- CD-ROM for drivers, and manual (Optional)
- Heatsink

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

Product Warranty (1 year)

We warrant to you, the original purchaser, that each of its prodct will be free from defects in materials and workmanship for one year from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by us, or which have been subject to misuse, abuse, accident or improper installation. We assume no liability under the terms of this warranty as a consequence of such events.

Because of our high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If one of our products is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class B

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.

Caution!

Achtung!

There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Technical Support and Assistance

Step 1. Visit the our web site at **www.emacinc.com** where you can find the latest information about the product.

Step 2. Contact your distributor, sales representative, or our customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
- Product name and serial number
- Description of your peripheral attachments
- Description of your software (operating system, version, application software, etc.)
- A complete description of the problem
- The exact wording of any error messages

Document Feedback

To assist us in making improvements to this manual, we would welcome comments and constructive criticism. Please send all such writing to: support@emacinc.com

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User's Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.

11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:

a. The power cord or plug is damaged.

b. Liquid has penetrated into the equipment.

c. The equipment has been exposed to moisture.

d. The equipment does not work well, or you cannot get it to work according to the user's manual.

e. The equipment has been dropped and damaged.

f. The equipment has obvious signs of breakage.

15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
16. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. We disclaim all responsibility for the accuracy of any statements contained herein.

Wichtige Sicherheishinweise

1. 1. Bitte lesen sie Sich diese Hinweise sorgfältig durch.
2. Heben Sie diese Anleitung für den späteren Gebrauch auf.
3. Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie Keine Flüssig-oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.

4. Die NetzanschluBsteckdose soll nahe dem Gerät angebracht und leicht zugänglich sein.
5. Das Gerät ist vor Feuchtigkeit zu schützen.
6. Bei der Aufstellung des Gerätes ist auf sicheren Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen.
7. Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor überhitzung schützt. Sorgen Sie dafür, daB diese Öffnungen nicht abgedeckt werden.
8. Beachten Sie beim. AnschluB an das Stromnetz die AnschluBwerte.
9. Verlegen Sie die NetzanschluBleitung so, daB niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.
10. Alle Hinweise und Warnungen die sich am Geräten befinden sind zu beachten.
11. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.
12. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. elektrischen Schlag auslösen.
13. Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von authorisiertem Servicepersonal geöffnet werden.
14. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:

a - Netzkabel oder Netzstecker sind beschädigt.

b - Flüssigkeit ist in das Gerät eingedrungen.

c - Das Gerät war Feuchtigkeit ausgesetzt.

d - Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.

e - Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.

f - Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.

15. VOSICHT: Explisionsgefahr bei unsachgemaben Austausch der Batterie.Ersatz nur durch densellben order einem vom Hersteller

empfohlene-mahnlichen Typ. Entsorgung gebrauchter Batterien navh Angaben des Herstellers.

16. ACHTUNG: Es besteht die Explosionsgefahr, falls die Batterie auf nicht fach-männische Weise gewechselt wird. Verfangen Sie die Batterie nur gleicher oder entsprechender Type, wie vom Hersteller empfohlen. Entsorgen Sie Batterien nach Anweisung des Herstellers.

Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70dB(A) oder weiger.

Haftungsausschluss: Die Bedienungsanleitungen wurden entsprechend der IEC-704-1 erstellt. lehnt jegliche Verantwortung für die Richtigkeit der in diesem Zusammenhang getätigten Aussagen ab.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

1. To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
2. Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

Contents

CHAPTER 1

General Information

This chapter gives background information on the SOM-4455 CPU System On Module.

Sections include:

- Introduction
- Specifications
- Board Dimensions

Chapter 1 Introduction

Our SOM-ETX form factor System On Module provides a scalable solution that meets customers' advanced CPU and application development needs. The SOM-4455 incorporates a low power, fanless AMD Geode LX800-500 MHz processor that has become the embedded integrators' processor of choice. It uses a AMD CS5536 chipset as its VGA/ LCD controller, with single 18 bit LVDS interface and 64-bit graphics engine. The CS5536 display controller (LCD and CRT display support) allows sharp and clear LCD screen resolutions up to 1024 x 768 and CRT resolutions up to 1600 x 1200 @ 16bpp colors. Combined with the CS5536 system chipset is a Intel® 82551ER Ethernet chipset. It supports all functions of an AT-compatible industrial computer. There is one DDR SODIMM socket that supports up to 1 GB DDR SDRAM. The small size (95 mm x 114 mm) and use of four high capacity connectors based on the proven ETX form factor, allow the SOM-ETX modules to be easily and securely mounted onto a customized solution board or our standard SOM-DB4400 development board.

Many gains were made by using the AMD Geode LX processor. The LX processor provides the lowest power consumption combined with high speed processing power. This processor also supports most popular web plug-ins and leverages existing software and hardware investments. Onboard features include an ethernet interface, socket for Compact-Flash™ card, Enhanced IDE interface capable of Ultra DMA transfer protocol, four USB2.0 ports, one parallel port, two serial ports and a PS/2 keyboard/mouse interface.

1.1 Specifications

1.1.1 Standard System On Module functions

- **CPU:** Embedded AMD Geode™ LX800-500 MHz
- **BIOS:** Award 256KB Flash BIOS
- **System memory:** One DDR SDRAM SODIMM, up to 1GB
- **Enhanced IDE interface:** 1 EIDE channels support up to 2 IDE devices. BIOS auto-detect, PIO Mode3 or Mode4, UDMA/33 transfer
- **FDD interface:** Support one FDD share with Parallel Port
- **Serial ports:** 2 serial port interfaces COM1: RS-232; COM2: RS-232 (TTL Output)
- **Parallel port:** One parallel port interface, supports SPP/EPP/ECP parallel mode
- **Infrared port:** One 115 Kbps infrared port, IrDA 1.0 compliant
- **Keyboard/mouse connector:** Supports standard PC/AT keyboard and PS/2 mouse interface
- **USB interface:** Four USB ports compliant with USB Spec. Rev. 2.0/ 1.1
- **Power management:** APM 1.2 compliant
- **Watchdog timer:** 1-255 Sec reset to system. Jumperless selection and software enable/disable

1.1.2 Local-bus VGA interface

- **Chipset:** AMD Geode™ LX800/CS 5536
- **Display memory:** 1 ~ 4 MB share memory, set in BIOS
- **Display type:** Supports CRT and TTL LCDs. Able to display both CRT and flat panel simultaneously
- **TTL LCD panel display mode:** Panel resolution supports up to 1024 x 768 @ 16bpp
- **CRT display mode:** Non-interlaced CRT monitor resolutions up to 1600 x 1200 @ 16bpp

1.1.3 Ethernet function

- **Chipset:** Intel® 82551ER
- **Ethernet interface:** IEEE 802.3U compatible 100/10Base-T interface. Includes software drivers and boot ROM

1.1.4 LVDS (Low Voltage Differential Signal) interface (SOM-4455FL only)

- **Chipset:** VT1635
- **Performance:** 18-bit ANSI EIA/TIA-644

Note: LVDS only on SOM-4455FL

1.1.5 Audio function

- **Chipset:** Realtek CODEC ALC203
- **Audio controller:** AC97 version 2.3 compliant interface
- **Audio interface:** Microphone in, Line in, Line out, SpeakerL, SpeakerR

1.1.6 TV-out function

- **Chipset:** TV Encoder VT1622A
- **Supports:** Supports both NTSC/PAL (Optional)

1.1.7 Mechanical and environmental

- **Dimensions:** (L x W): SOM-ETX form factor, 95 mm x114 mm (3.7" x 5.4")
- **Weight:** 74 g
- **Operating temperature:** 0° ~ 60° C (32 ~ 140° F)*
- **Operating humidity:** 0% to 95% relative humidity, non-condensing
- **Power supply voltage:** +5 V ± 5 %
- **Power requirements:**

  Max:5V@3A,

  Typical: 5V@1.5A

* applied conditions

1.2 Board dimensions

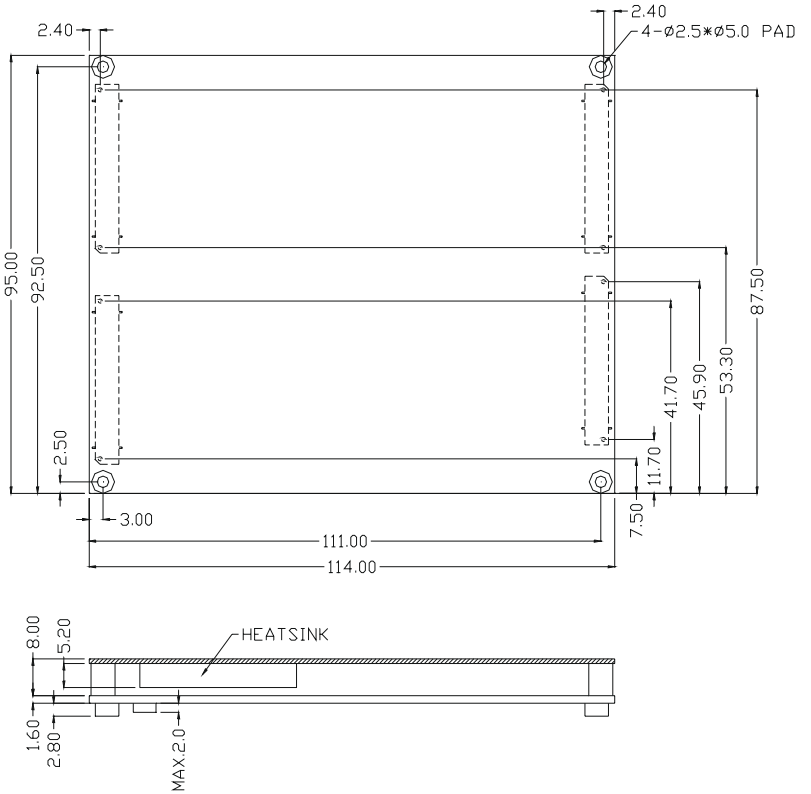


Figure 1.1: SOM-4455 dimensions

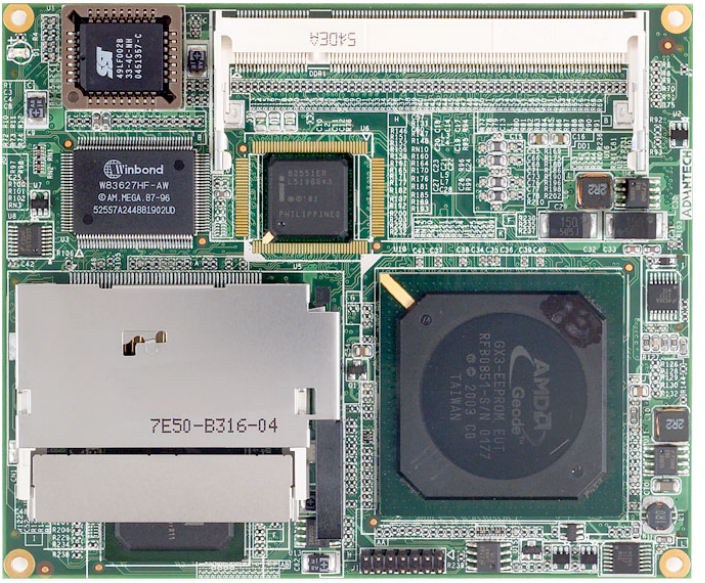


Figure 1.2: SOM-4455 Top view

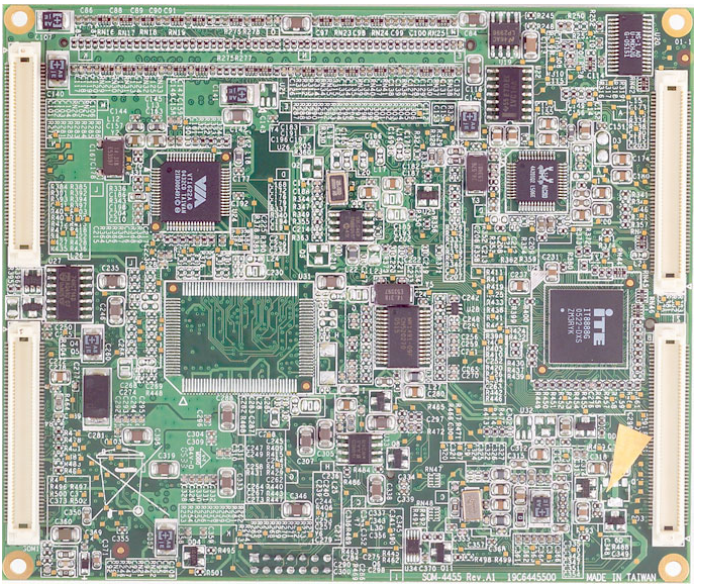


Figure 1.3: SOM-4455 Solder view

CHAPTER 2

Connector Assignments and Descriptions

This chapter tells how to set up the SOM-4455 hardware. It includes instructions on connecting peripherals, switches and indicators. Make sure you read all the safety precautions before you begin the installation procedure.

Chapter 2 Connector Assignments

2.1 Connector Locations

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

The tables below shows the function of each of the board's connectors:

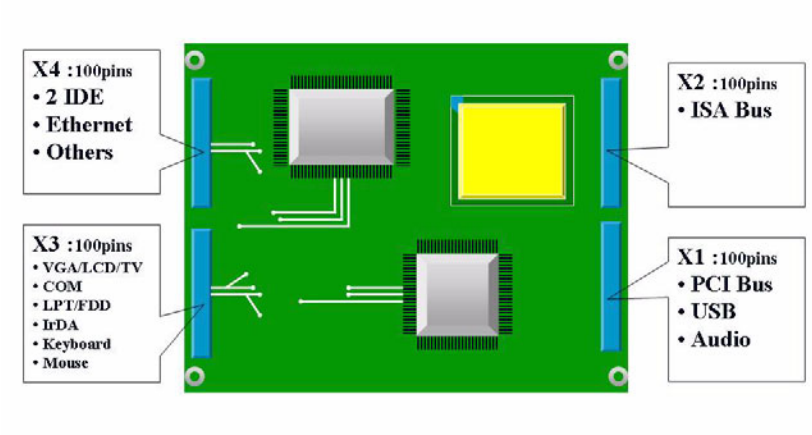


Figure 2.1: SOM-4455 Locating Connectors

2.2 Pin Assignments for X1, X2, X3, X4 connectors

Please refer to SOM-ETX Design and Specification Guide, Chapter 2

CHAPTER 3

Software Configuration

This chapter details the software configuration information. It shows you how to configure the SOM-4455 card to match your application requirements.

Sections Include:

- LCD display configuration
- Connections for two standard LCDs

Chapter 3 Software Configuration

3.1 Introduction

The SOM-4455 system BIOS and custom drivers are located in a 256 KB, 32-pin Flash ROM device, designated U1. A single Flash chip holds the system BIOS and VGA BIOS. The display type can be configured via software. This method minimizes the number of chips and eases configuration. You can change the display BIOS simply by reprogramming the Flash chip.

3.2 Utility CD disk

The SOM-4455 is supplied with a software utility on CD-ROM. This disk contains the necessary file for setting up the VGA display. Directories and files on the disk are as follows:

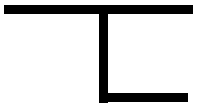


Figure 3.1: Contents of SOM-4455 utility disk

AWDFLASH.EXE

This program allows you to update the BIOS Flash ROM.

4455Vxxx.BIN

This binary file contains the system BIOS.

3.3 VGA display software configuration

The SOM-4455 onboard VGA/LCD interface supports an 18-bit TFT LCD, flat panel displays and traditional analog CRT monitors. The interface can drive CRT displays with resolutions up to 1024 x 768 in 32bpp. It is also capable of driving color panel displays with resolutions of 1600 x 1200 in 16 bpp. The LCD type is configured completely via the software utility, so you do not have to set any jumpers. Configure the LCD type as follows:

1. Apply power to the SOM-4455 application with a color TFT display attached. This is the default setting for the SOM-4455 series. Make sure that the AWDFLASH.EXE and *.BIN files are located in the working drive.

Note: Make sure that you do not run AWDFLASH.EXE while your system is operating in EMM386 mode.

2. At the prompt, type AWDFLASH.EXE and press <Enter>. The VGA configuration program will then display the following:

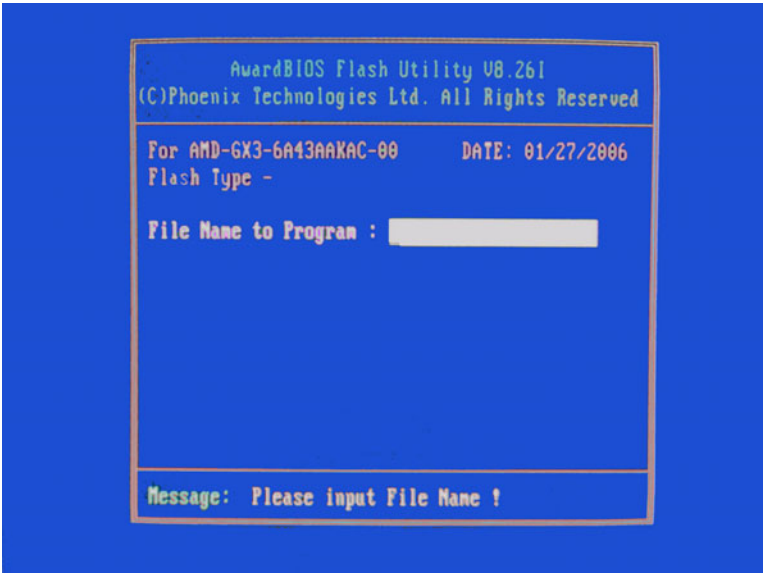


Figure 3.2: BIOS VGA setup screen

3. At the prompt, type in the BIN file which supports your display. When you are sure that you have entered the file name correctly press <Enter>. The screen will ask “Do you want to save?” If you wish to continue press Y. If you change your mind or have made a mistake press N.

4. If you decide to continue, the screen will issue a prompt which will then ask “Are you sure to program (Y/N)?” If you wish to continue, press Y. Press N to exit the program.

The new VGA configuration will then write to the ROM BIOS chip. This configuration will remain the same until you run the AWDFLASH.EXE program and change the settings.

3.4 Connections for two standard LCDs

3.4.1 Connections for Toshiba (640 x 480TFT color LCD)

Table 3.1: Connections for Toshiba LTM10C042

LTM10C042		SOM-4455	
Pin	**Name**	**Pin**	**Name**
1	GND	3	GND
2	CLK	35	SHFCLK
3	GND	4	GND
4	R0	27	PD12
5	R1	28	PD13
6	R2	29	PD14
7	GND	8	GND
8	R3	30	PD15
9	R4	31	PD16
10	R5	32	PD17
11	GND	33	GND
12	G0	19	PD6
13	G1	20	PD7
14	G2	21	PD8
15	GND	33	GND
16	G3	22	PD9
17	G4	23	PD10
18	G5	24	PD11
19	GND	34	GND
20	ENAB	37	M
21	GND	34	GND
22	B0	11	PD0
23	B1	12	PD1
24	B2	13	PD2
25	GND	39	GND
26	B3	14	PD3
27	B4	15	PD4
28	B5	16	PD5
29	GND	39	GND
30	VDD	5	+5 V
31	VDD	6	+5 V

3.4.2 Connections for Toshiba (800 x 600 TFT color LCD)

Table 3.2: Connections for Toshiba LTM12C275A

LTM12C275A		**SOM-4455**	
Pin	Name	Pin	Name
1	GND	3	GND
2	NCLK	35	SHFCLK
3	NC	-	NC
4	NC	-	NC
5	GND	4	GND
6	R0	27	PD12
7	R1	28	PD13
8	R2	29	PD14
9	R3	30	PD15
10	R4	31	PD16
11	R5	32	PD17
12	GND	8	GND
13	G0	19	PD6
14	G1	20	PD7
15	G2	21	PD8
16	G3	22	PD9
17	G4	23	PD10
18	G5	24	PD11
19	GND	33	GND
20	B0	11	PD0
21	B1	12	PD1
22	B2	13	PD2
23	B3	14	PD3
24	B4	15	PD4
25	B5	16	PD5
26	ENAB	37	M/DE
27	GND	34	GND
28	VCC	5	+5 V
29	VCC	6	+5 V
30	GND	39	GND

CHAPTER 4

PCI Graphic Setup

Introduction

Installation of PCI Graphic drivers

-for Windows XP

Further information

Chapter 4 PCI Graphic Setup

4.1 Introduction

The SOM-4455 has an onboard PCI/AGP flat panel/VGA interface. The specifications and features are described as follows:

4.1.1 Chipset

The SOM-4455 uses an AMD LX800 for its graphic controller. It supports TTL/LVDS displays, and CRT monitors.

4.1.2 Display memory

The AMD LX800 chip can support up to 8MB dynamic frame buffer shared with system memory; the VGA controller can drive CRT displays up to 1600 x 1200 at 75Hz color panel displays in TTL/LVDS model with resolutions up to 1024 x 768 panel resolution.

4.1.3 Display types

CRT and panel displays can be used simultaneously. The SOM-4455 can be set in one of three configurations: CRT only, TTL/LVDS only, both CRT and LFP (TTL/LVDS). The system is initially set to simultaneous display mode - CRT and LFP (TTL/LVDS). If you want to enable other display mode, please set up manually. Set up example is shown as in the following chapters.

4.2 Installation of the PCI Graphic driver

Complete the following steps to install the PCI graphic driver. Follow the procedures in the flow chart that apply to the operating system that you are using within your SOM-4455.

Notes:

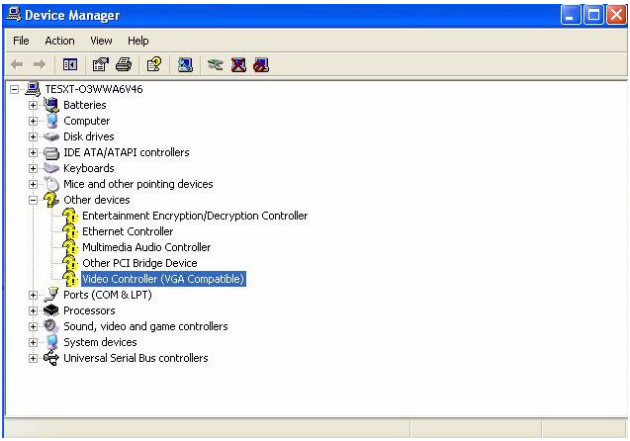
1. The windows illustrations in this chapter are intended as examples only. Please follow the listed steps, and pay attention to the instructions which appear on your screen.

2. For convenience, the CD-ROM drive is designated as "D" throughout this chapter.

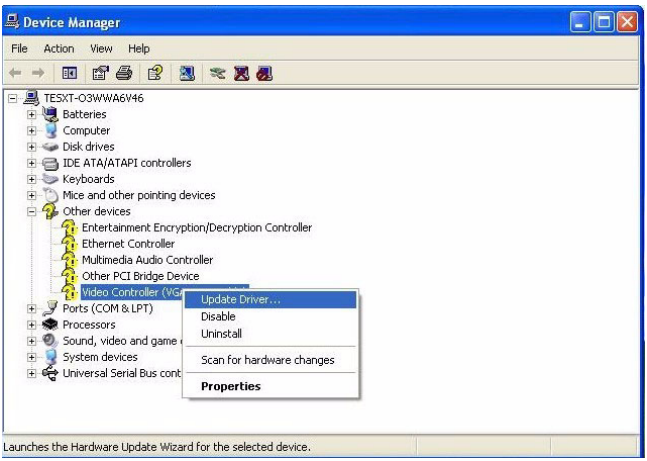
4.2.1 Installation for Windows XP

To install PCI Graphic driver for Windows XP. Example installation steps are shown below:

1. Open Device Manager from Control Panel & click on the video controller (VGA compatible) icon.



2. Right-click and select "update driver"



3. Click " Next" to go next step

4. Select "Install from specific location" and click " Next" to go next step

5. Click "Continue anyway"

6. Click" Finish" to exit

4.3 Further Information

For further information about the VGA installation in your SOM-4455, including driver updates, troubleshooting guides and FAQ lists, visit the following web resources:

EMAC website: www.emacinc.com

CHAPTER 5

Audio Setup

The SOM-4455 is equipped with an audio interface that records and plays back CD-quality audio. This chapter provides instructions for installing the software drivers included on the audio driver diskettes.

Chapter 5 Audio Setup

5.1 Introduction

The SOM-4455's onboard audio interface provides high-quality stereo sound and FM music synthesis (ESFM) by using the AC-97 controller. The audio interface can record, compress, and play back voice, sound, and music.

5.2 Driver installation

5.2.1 Before you begin

Please read the instructions in this chapter carefully before you attempt installation. The audio drivers for the SOM-4455 board are located on the audio driver CD. Run the supplied SETUP program to install the drivers; don't copy the files manually.

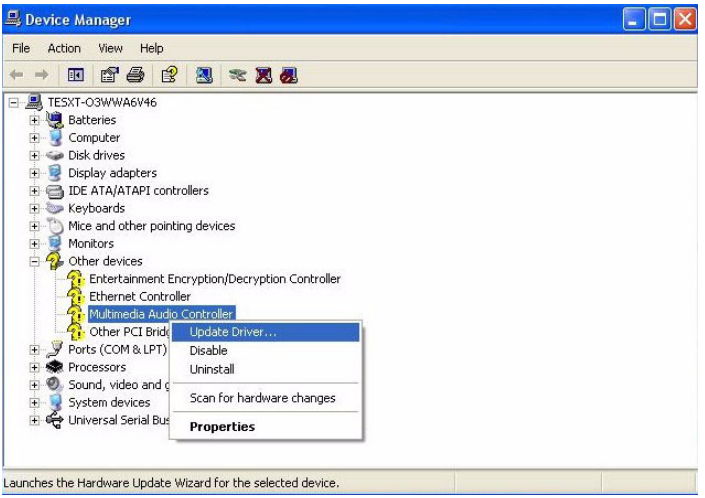
Note: *1. Note: Before trying to install the driver, go to Chapter 3 to use the "Chipset Software Installation Utility" first.*

2. The files on the software installation diskette are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.

5.2.2 Windows XP drivers

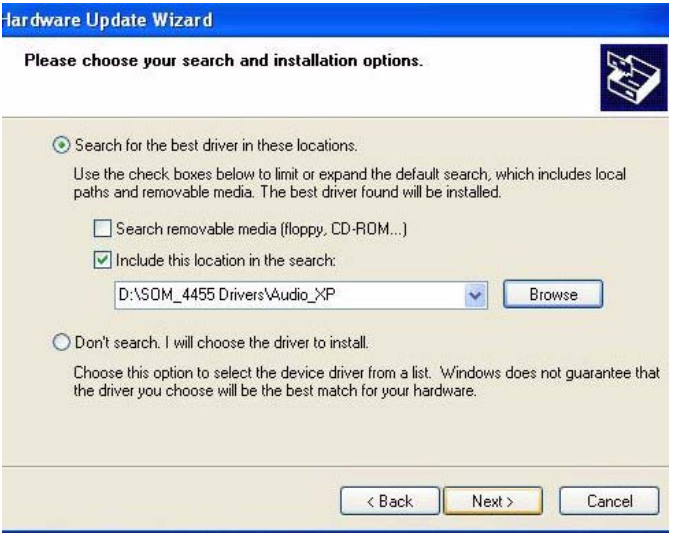
Step 1. To install Audio driver for Windows XP. Example installation steps are shown below.

2. Open the Device Manager & click the Multimedia Audio controller icon



3. Right click and choose “Update Driver“

4. Select "Install from specific location" and click " Next" to continue



5. Click "Search for the best driver in these locations"

6. Click "Next"

Click “Finish”

CHAPTER 6

LAN Configuration

- Introduction
- Features
- Installation of Ethernet Driver for
  - Windows XP Drivers Setup Steps

Chapter 6 PCI Bus Ethernet Interface

6.1 Introduction

The SOM-4455 is equipped with a high-performance 32-bit Ethernet chipset which is fully compliant with IEEE 802.3 100 Mbps CSMA/CD standards. It is supported by major network operating systems. It is also both 100Base-T and 10Base-T compatible.

6.2 Features

- Intel 82551ER 10/100Base-T Ethernet LAN controller
- Optional Intel 82540 10/100/1000 Base-T Ethernet LAN controller
- PCI Bus Master complies with PCI Rev. 2.2
- Complies with 100Base-TX, and 10Base-T applications.
- Single RJ-45 connector gives auto-detection of 10 Mbps or 100 Mbps network data transfer rates and connected cable types.
- Enhancements on ACPI & APM.
- Complies with PCI Bus Power Management Interface Rev. 1.1,
- ACPI Rev. 2.0, and Device Class Power Management Rev. 1.0.

6.3 Installation of Ethernet Driver

Before installing the Ethernet driver, note the procedures below. You must know which operating system you are using in your SOM-4455, and then refer to the corresponding installation procedure. Then just follow the steps described. You will quickly and successfully complete the installation, even if you are not familiar with instructions for Windows.

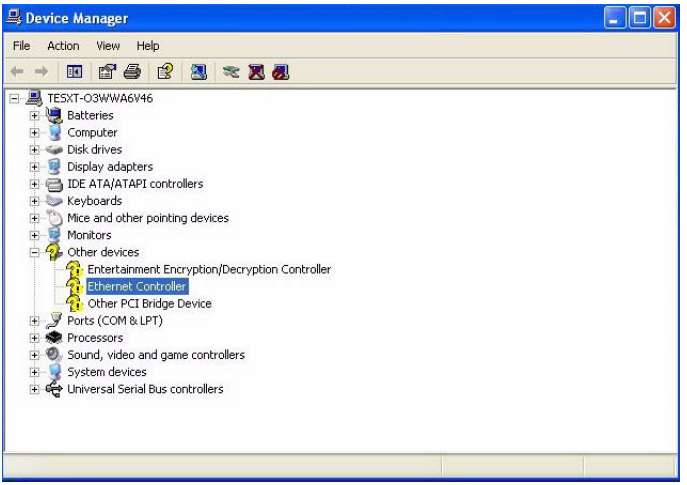
.

Note: The windows illustrations in this chapter are examples only. You must follow the flow chart instructions and pay attention to the instructions which then appear on your screen.

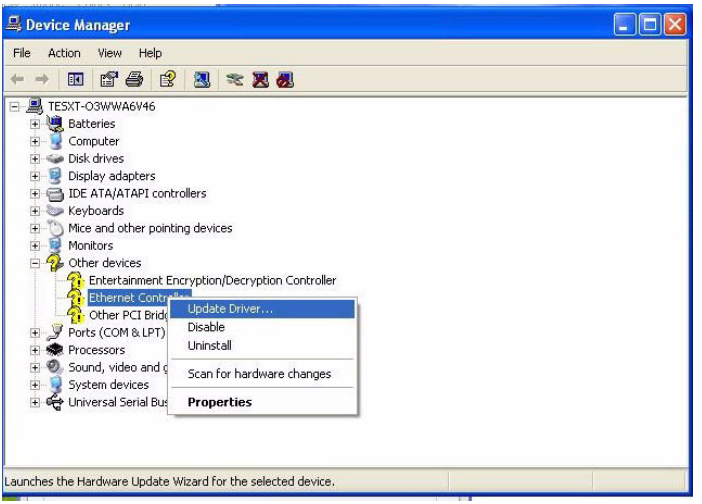
6.3.1 Installation for Windows XP

Note: *The CD-ROM drive is designated as "D" throughout this section.*

1. To install Ethernet driver for window XP. Example installation steps show below
2. Open Device Manager & select "Ethernet Controller"

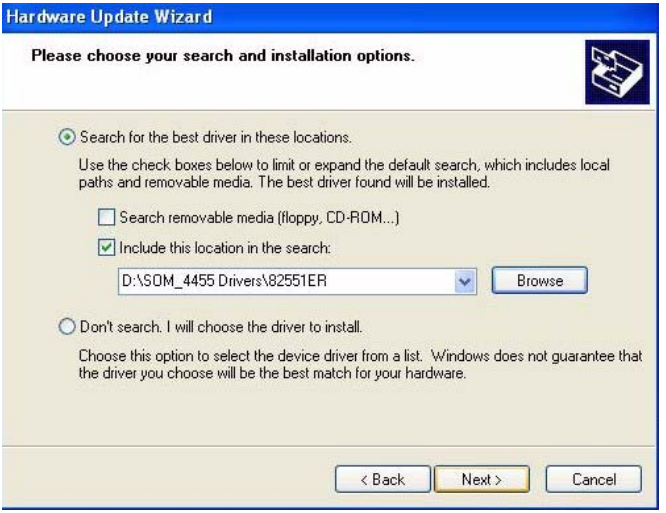


3. Right-Click and select "Update driver"



4. Click " Next " to go next step

5. Choose "Include this location in the search" & click "Next" to go next step.



6. Click " Continue anyway"

7. Click "Finish" to exit the Wizard

6.3.2 Further information

Intel website: www.intel.com

EMAC website: www.emacinc.com

CHAPTER 7

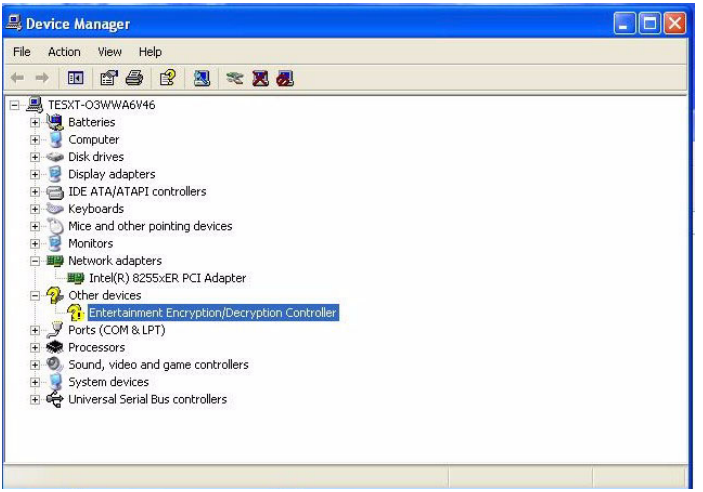
AES Driver Installation

Chapter 7 AES Driver Installation

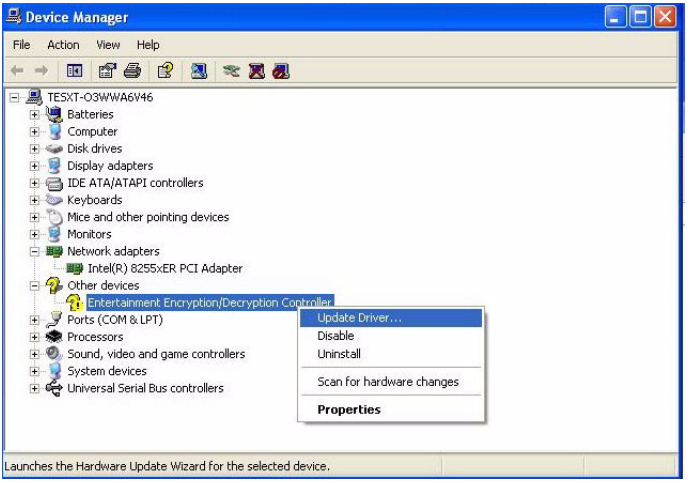
7.1 Driver Installation

7.1.1 Before you begin

1. Open the Device Manager & click the file of Entertainment Encryption/ Decryption controller



2. Right-click and choose " Update Driver"



3. Click " Next " to go next step

4. Choose "Search for the best driver in these locations" & Click " Next" to go next step.

5. Click " Finish" to go exit the Wizard

7.1.2 Further information

EMAC website: www.emacinc.com

CHAPTER 8

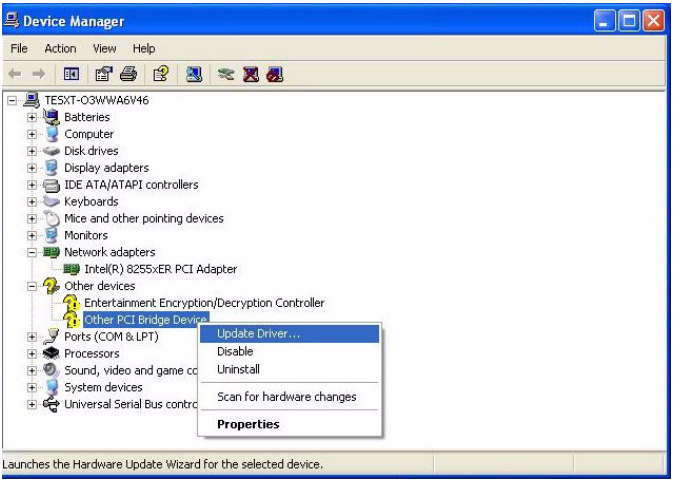
PCI Bridge

Chapter 8 PCI Bridge

8.1 Driver Installation

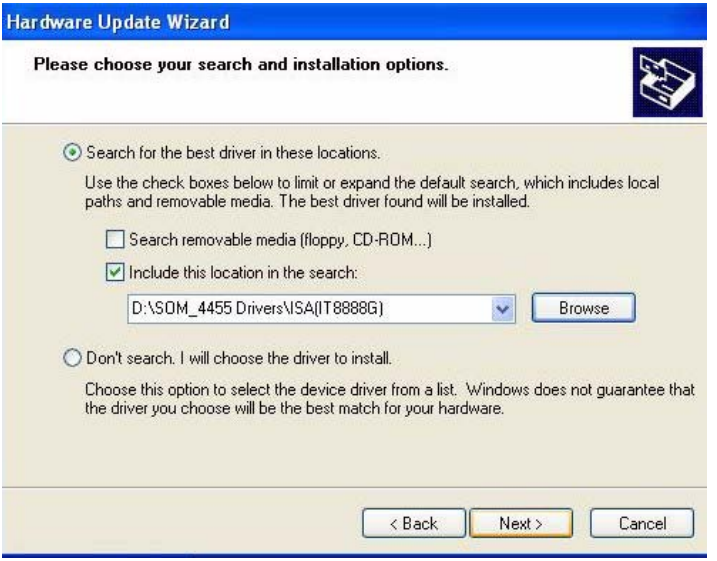
8.1.1 Before you begin

1. Open the Device Manager & click the file of other PCI bridge device



2. Click " Next " to go next step

3. Choose " Search for the best driver in these locations" & Click " Next" to go next step.



4. Click " Finish" to go exit the Wizard

8.1.2 Further information

Intel website: www.intel.com

EMAC website: www.emacinc.com

APPENDIX A

Programming the Watchdog Timer

The SOM-4455 is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for any reason. This feature ensures system reliability in industrial standalone or unmanned environments.

Appendix A Prog. Watchdog Timer

A.1 Watchdog programming

Below is a sample of programming code for controlling the Watchdog Timer function.

```
-------------------------------------------------------------------------------
Enter the extended function mode, interruptible double-write |
-------------------------------------------------------------------------------
MOV DX,2EH
MOV AL,87H
OUT DX,AL
OUT DX,AL
-------------------------------------------------------------------------------
 Configured logical device 8, configuration register CRF6 |
-------------------------------------------------------------------------------
MOV DX,2EH
MOV AL,2BH
OUT DX,AL
MOV DX,2FH
IN AL,DX
AND AL.OEFH;Setbit 4=0 Pin 89=WDTO
OUT DX,AL
MOV DX,2EH
MOV AL,07H; point to Logical Device Number Reg.
OUT DX,AL
MOV DX,2FH
MOV AL,08H; select logical device 8
OUT DX,AL;
MOV DX,2EH
MOV AL,30H;Set watch dog activate or inactivate
OUT DX,AL
```

```
MOV DX,2FH
MOV AL,01H; 01:activate 00:inactivate
OUT DX,AL;
MOV DX,2EH
MOV AL,F5H; Setting counter unit is second
OUT DX,AL
MOV DX,2FH
MOV AL,00H
OUT DX,AL;
MOV DX,2EH
MOV AL,F6H
OUT DX,AL
MOV DX,2FH
MOV AL,05H; Set 5 seconds
OUT DX,AL
;-----------------------------------------
; Exit extended function mode |
;-----------------------------------------
MOV DX,2EH
MOV AL,AAH
OUT DX,AL
```

APPENDIX B

System Assignments

- System I/O ports
- DMA channel assignments
- Interrupt assignments
- 1st MB memory map

Appendix B System Assignments

B.1 System I/O ports

Table B.1: System I/O ports

Addr. range (Hex)	Device
000-01F	DMA controller (slave)
020-03F	Interrupt controller 1, (master)
040-05F	8254 timer/counter
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI) mask
080-09F	DMA page register,
0A0-0BF	Interrupt controller 2 (slave)
0C0-0DF	DMA controller (master)
0F0	Clear math co-processor
0F1	Reset math co-processor
0F8-0FF	Math co-processor
170- 178	2nd fixed disk for CompactFlash
1F0-1F8	1st fixed disk
278-27F	Reserved
2F8-2FF	Serial port 2
360-36F	LPT2
378-37F	Parallel printer port 1 (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/graphics monitor adapter
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1

** default setting

B.2 DMA channel assignments

Table B.2: DMA channel assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Parallel**
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

** Parallel port DMA default setting: DMA 3

Parallel port DMA select: DMA 1, 3

B.3 Interrupt assignments

Table B.3: Interrupt assignments

Interrupt#	Interrupt source
NMI	Parity error detected
IRQ 0	Interval timer
IRQ 1	Keyboard
IRQ 2	Interrupt from controller 2 (cascade)
IRQ 3	Serial communication port 2
IRQ 4	Serial communication port 1
IRQ 5	Available
IRQ 6	Diskette controller (FDC)
IRQ 7	Parallel port 1 (print port)
IRQ 8	Real-time clock
IRQ 9	Reserve
IRQ 10	Available
IRQ 11	Reserved for watchdog timer
IRQ 12	PS/2 mouse
IRQ 13	INT from co-processor
IRQ 14	Preliminary IDE
IRQ 15	Secondary IDE for CompactFlash

USB and Ethernet IRQ is automatically set by the system

B.4 1st MB memory map

Table B.4: 1st MB memory map

Addr. range (Hex)	Device
F000h - FFFFh	System ROM
E000h - EFFFh	Unused
CC00h - DFFFh	available
C000h - CBFFh	VGA BIOS
B800h - BFFFh	CGA/EGA/VGA text
B000h - B7FFh	Reserved for graphic mode usage
A000h - AFFFh	EGA/VGA graphics
0000h - 9FFFh	Base memory

* default setting

APPENDIX C

LVDS Connection

This appendix contains information concerning the LVDS installation and pin assignments.

Appendix C LVDS Connection

C.1 LVDS Introduction

When you mention the impressive data rate of 400 Mbps at 15 meters for LVDS, you immediately realize how significant the differences are between analog and digital interfaces. There are several other factors other than significantly increased data transfer rate and image quality that make LVDS (Low-Voltage Differential Signaling) very attractive to industrial users. One is that LVDS drivers and receivers maintain excellent signal levels and performance while operating on supply voltages as low as 2 V. This low voltage allows LVDS to operate independently from the main power supply voltage. Another factor is that LVDS drivers and receivers have a low swing voltage. This voltage is typically around 345 mV. This allows LVDS devices to achieve high speeds while using relatively little power. This low differential swing voltage together with self-canceling EMI, reduces EMI problems significantly. This is especially important in space- critical applications. This is also why LVDS has already been widely used in Notebook computer panel connections.

All Digital Benefits

No matter which digital standard an end user uses for their industrial applications, it will have to provide the following criteria: Be compatible so that system and display products from different suppliers can be made available in an open market. Become a standard for the electronics and PC industry. Be able to transmit data over standard twisted pair cables as well as fiber optic. Maintain a low bit error rate for high quality images while operating at very low power levels, and finally, be scalable.

C.2 LVDS Pin assignments

Table C.1: LVDS Pin assignments

Pin Name	LVDS signal	Channel
LCDDO0	Txout0-	first
LCDDO1	Txout0+	first
LCDDO2	Txout1-	first
LCDDO3	Txout1+	first
LCDDO4	Txout2-	first
LCDDO5	Txout2+	first
LCDDO6	Txclk-	first
LCDDO7	Txclk+	first
LCDDO8	not used	--
LCDDO9	not used	--
LCDDO10	not used	--
LCDDO11	not used	--
LCDDO12	not used	--
LCDDO13	not used	--
LCDDO14	not used	--
LCDDO15	not used	--
LCDDO16	not used	--
LCDDO17	not used	--
LCDDO18	not used	--
LCDDO19	not used	--

Table C.2: Connector X3

Connector X3 (VGA, LCD, Video, COM1, COM2, LPT/Floppy, Irda, Mouse, Keyboard)

Pin Number	Signal	Pin Number	Signal
1	GND	2	GND
3	R	4	B
5	HSY	6	G
7	VSY	8	DDCK
9	N.C.	10	DDDA
11	LCDDO16	12	LCDDO18
13	LCDDO17	14	LCDDO19
15	GND	16	GND
17	LCDDO13	18	LCDDO15
19	LCDDO12	20	LCDDO14
21	GND	22	GND
23	LCDDO8	24	LCDDO11
25	LCDDO9	26	LCDDO10
27	GND	28	GND
29	LCDDO4	30	LCDDO7
31	LCDDO5	32	LCDDO6
33	GND	34	GND
35	LCDDO1	36	LCDD03
37	LCDDO0	38	LCDDO2
39	VCC	40	VCC
41	LTGIO2	42	LTGIO0
43	LTGIO1	44	BLON#
45	BIASON	46	DIGON
47	COMP	48	Y
49	SYNC	50	C
51	LPT/FLPY#	52	N.C.
53	VCC	54	GND
55	/STB_DRV0	56	/AFD_DENSEL
57	FIR	58	PD7
59	IRRX	60	/ERR_HDSEL#
61	IRTX	62	PD6_MOT0
63	RXD2	64	/INIT_DIR#
65	GND	66	GND

67	RTS2#	68	PD5
69	DTR2#	70	/SLIN_STEP#
71	DCD2#	72	PD4_DSKCHG#
73	DSR2#	74	PD3_RDATA#
75	CTS2#	76	PD2_WP#
77	TXD2#	78	PD1_TRK0#
79	RI2#	80	PD0_INDEX#
81	VCC	82	VCC
83	RXD1	84	/ACK_DRV1
85	RTS1#	86	/BUSY_MOT1
87	DTR1#	88	PE_WDATA#
89	DCD1#	90	/SLCT_WGATE#
91	DSR1#	92	MSCLK
93	CTS1#	94	MSDAT
95	TXD1	96	KBCLK
97	RI1#	98	KBDAT
99	GND	100	GND