<u>SBC Series</u>

Single Board Computer Full Size PICMG
with LAN,VGA,Video

SPI-6941-LV

User's Manual

CONTEC CO.,LTD.

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Acknowledgments

Liability

Limited One Year Warranty

CONTEC Industrial CPU card is warranted by CONTEC CO., Ltd. to be free from defects in material and workmanship for up to one year from the date of purchase by the original purchaser.

Repair will be free of charge only when this device is returned freight prepaid with a copy of the original invoice and a Return Merchandise Authorization to the distributor or the CONTEC group office from which it was purchased.

This warranty is not applicable for scratches or normal wear, but only for the electronic circuitry and original boards. The warranty is not applicable if the device has been tampered with or damaged through abuse, mistreatment, neglect, or unreasonable use, or if the original invoice is not included, in which case repairs will be considered beyond the warranty policy.

How to Obtain Service

For replacement or repair, return the device freight prepaid, with a copy of the original invoice. Please obtain a Return Merchandise Authorization number (RMA) from our Sales Administration Department before returning any product.

No product will be accepted by CONTEC group without an RMA number.

Caution about Battery

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of used batteries according to the local ordinances or regulations.

◎ CONTEC
SPI-6941-LV

Table of Contents

Chapter 1 Introduction

1.1 Specification

- **Processor Socket:** Socket 370

- **Processor:**
  Intel® Celeron® FC-PGA (FSB:66MHz/100MHz) up to 850MHz
  Intel® Celeron® FC-PGA2 (FSB:100MHz) up to 1.2GHz
  Intel® Pentium® III FC-PGA (FSB:100MHz / 133MHz) up to 866MHz
  Intel® Pentium® III FC-PGA2 (FSB:133MHz) up to 1.26GHz

- **Form Factor:** PICMG (PCI/ISA) Bus

- **Chipset:** VIA Apollo Pro133T VT82C694T

- **Cache Size:** Cache is integrated in CPU

- **Memory:** Up to 1.5GB (512MB SDRAM DIMM x 3), ECC support

- **Memory Sockets:** Three 168-pin DIMM socket for SDRAM in 64MB, 128MB
  256MB and 512MB configurations.

- **BIOS:** Award BIOS, PnP support
  - Flash EEPROM (256KB) for BIOS update
  - Power management

- **CPU Bus Speed:** 66MHz/100MHz/133MHz

- **Super I/O:** Built in VT82C686B chipset

- **Parallel port:** One high-speed parallel port, SPP/EPP/ECP mode

- **Series Port:** Two 16550 UART ports, COM2 is RS-232/422/485 configurable.

- **Enhanced IDE:** Two EIDE port, up to 4 IDE devices,
  support Ultra DMA 33/66/100

- **FDD Interface:** Two floppy drives (360KB, 720KB, 1.2MB, 1.44MB, 2.88MB,
  LS-120)

- **USB Interface:** Two box-header support USB v1.1 ports

- **Watchdog Timer:** Software programmable 16 levels, Reset or NMI (Jumper
  selectable)

- **Hardware Monitor:** Built in VT82C686B Chipset

- **Keyboard & Mouse connector:** One PS/2 connector with in Keyboard & Mouse
  on bracket and one 5-pins box-header for external keyboard & Mouse

- **VGA Connector**: Lynx SM722 chipset, On board 15 pin D-SUB VGA connector

- **LCD Connector:** Daughter board(ADP-6940), used connector for Panel Link
  (Silicon Image SiI164)

- **LAN:** One Intel 82559ER LAN controllers, one RJ-45 connector on bracket
- **SSD:** DIP socket supports DiskOnChip flash disks (4MB~288MB)
- **RTC:** battery backup by Lithium Battery (CR2032)
  - ◆ The coin type Lithium battery specification is shown in Table.

Specification	CR2032
Nominal Voltage	3V
Nominal Capacity	220mAh
Nominal Weight	3.1g

  - ◆ The maximum using duration of CR2032 Battery is about 3 years or more at 25ºC.
  - ◆ The clock is accurate to ± 3minutes/month at 25ºC.
- **Support OS:**

    Windows98, 98SE

    Windows NT Workstation Ver.4.0

    Windows 2000 Professional

    Windows XP Professional/Home Edition

1.2   Mechanical & Environmental

- POWER CONSUMPTION (Pentium® III FC-PGA2 1.26GHz):
  - ♦   +5VDC @13.00A max.
  - ♦   +12VDC @ 0.50A max.
  - ♦   +5VSB @ 1.0A max.
- OPTERATING TEMPERATURE: 0 ~ 60ºC.
      *This is according to installed CPU.
- STORAGE TEMPPERATURE: - 40 ~ 80ºC.
- HUMIDITY: 10% to 90%RH(no condensation)
- BOARD DIMENSION: 338mm(L) x 122mm(H) / 13.3inch x 4.80 inch.
- BOARD WEIGHT: 400g

1.3   Check List

Please check that your package is complete and contains the items below. If you discover damaged or missing items, please contact your dealer.

- The SPI-6941-LV Industrial CPU board
- This User's Manual & Registration Card
- 1 IDE 40pin Ribbon Cable
- 1 IDE 80pin Ribbon Cable
- 1 Floppy Ribbon Cable
- Driver utilities in CD-ROM
- Mounting bracket attached with 2 serial ports & 1 parallel port ribbon cable
- Mounting bracket attached with 1 parallel port ribbon cable
- Mounting bracket attached with Audio connector
- Jumper Short Pin(2mm): 5 pcs
- Jumper Short Pin(2.54mm): 5 pcs
- 6 pin mini-DIN cable (2 in 1 cable for PS2 Mouse & Keyboard functions)

1.4   Description

The SPI-6941-LV is a PICMG compatible Industrial CPU card based on VIA VT82C694T chipset and is fully designed for harsh industrial environment. It features socket 370 compatible with Intel's processor. This card accommodates up to 1.5GB of SDRAM memory.

The SPI-6941-LV comes with onboard CPU temperature sensor to protect your processor from overheating (VIA VT82C686B chipset).

The SPI-6941-LV has a LAN connector that use Intel's 82559ER PCI LAN controller.

The SPI-6941-LV has a LCD connector that uses graphic accelerator.

Lynx SM722 (8MB): Display Support Modes

CRT only				
Display Resolution	Refresh (Hz)	Color Depth		
		8bpp	16bpp	24bpp
640x480	60	O	O	O
	75	O	O	O
	85	O	O	O
	100	O	O	O
800x600	60	O	O	O
	75	O	O	O
	85	O	O	O
	100	O	O	O
1024x768	60	O	O	O
	75	O	O	O
	85	O	O	O
	100	O	O	O
1280x1024	60	O	O	O
	75	O	O	O
	85	O	O	O
	100	O	O	O

LCD/Simultaneous Mode				
Display Resolution	Refresh (Hz)	Color Depth		
		8bpp	16bpp	24bpp
640x480	60	O	O	O
800x600	60	O	O	O
1024x768	60	O	O	O
1280x1024	60	O	O	O

1.5   Power Management Features

Overview

- Support ACPI (Advanced Configuration and Power Interface) power management
- ACPI v1.0 compliant

1.6   Power Requirements

Your system requires a clean, steady power source for reliable performance of the high frequency CPU on the SPI-6941-LV Industrial CPU card, the quality of the power supply is even more important. For the best performance make sure your power supply provides a range of 4.75 volts minimum to 5.25 volts maximum DC power source.

Power Consumption

For typical configurations, the CPU card is designed to operate with at least a 200 W power supply. A higher-wattage power supply should be used for heavily-loaded configurations. The power supply must meet the following requirements:

• Rise time for power supply: 2 ms to 20 ms

The following table lists the power supply's tolerances for DC voltages:

DC Voltage	Acceptable Tolerance
+5 V	± 5 %
+5 VSB (standby)	± 5 %
+12 V	± 5 %

1.7 Connector & Jumper Location
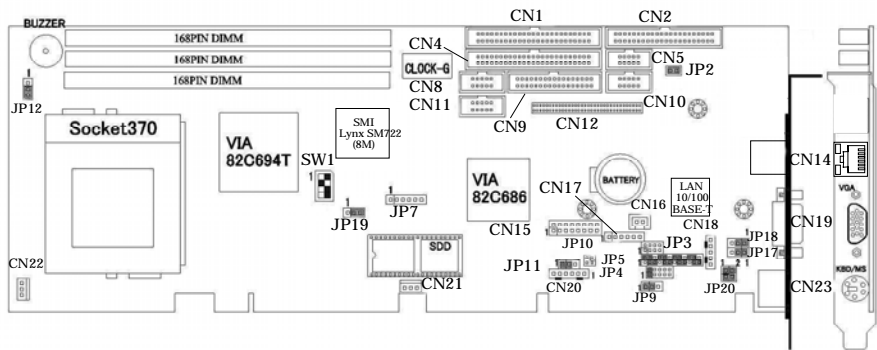
Item	Description
DIMM1/2/3	Dual inline memory module (DIMM 168-pin) sockets 1, 2, 3
CN1/CN4	IDE port Connector
CN2	Floppy Disk Connector
CN5/CN10	Serial Port Connector
CN8/CN11	USB Connector
CN9	Parallel Port Connector
CN12	Adapter for LCD transfer Connector
CN14	LAN connector (RJ-45)
CN15	Front Panel Connector
CN16	External Battery Connector
CN17	Unuseable Connector
CN18	EXT. Mouse or Keyboard Connector
CN19	VGA Connector
CN20	External ATX Power Connector
CN21	System FAN Connector
CN22	CPU FAN Connector
CN23	PS/2 Keyboard / Mouse Connector

1.8   Block Diagram

```
┌──────────┐         ┌──────────────┐         ┌──────────────┐
│   VRM    │ ⟺       │  SOCKET 370  │ ⟺       │  CLK GEN.    │
└──────────┘         └──────────────┘         └──────────────┘
         GTL+ BUS

┌──────────────┐     ┌──────────────┐         ┌──────────────┐
│     GTL      │     │  VT82C694T   │ ⟺       │  DIMM x 3    │
│ TERMINATOR   │     └──────────────┘         └──────────────┘
└──────────────┘
                        PCI BUS

┌──────────┐                                              AGP2X
│ KB / MS  │ ⟺
├──────────┤        ┌──────────────┐   ┌──────────────┐  ┌──────────────┐
│  USB     │ ⟺      │              │   │    LAN       │  │  VGA/LCD     │
├──────────┤        │              │   │ 82559ER x 1  │  │ Lynx SM722   │
│ IDE#1/2  │ ⟺      │  VT82C686B   │   └──────────────┘  └──────────────┘
├──────────┤        │              │
│  FDD     │ ⟺      │              │
├──────────┤        │              │   ┌──────────────┐
│  LPT     │ ⟺      │              │ ⟺ │    FLASH     │
└──────────┘        └──────────────┘   │     BIOS     │
┌──────────┐                           └──────────────┘
│ COM1/2   │ ⟺         ISA BUS
└──────────┘
```

PICMG CONNECTOR
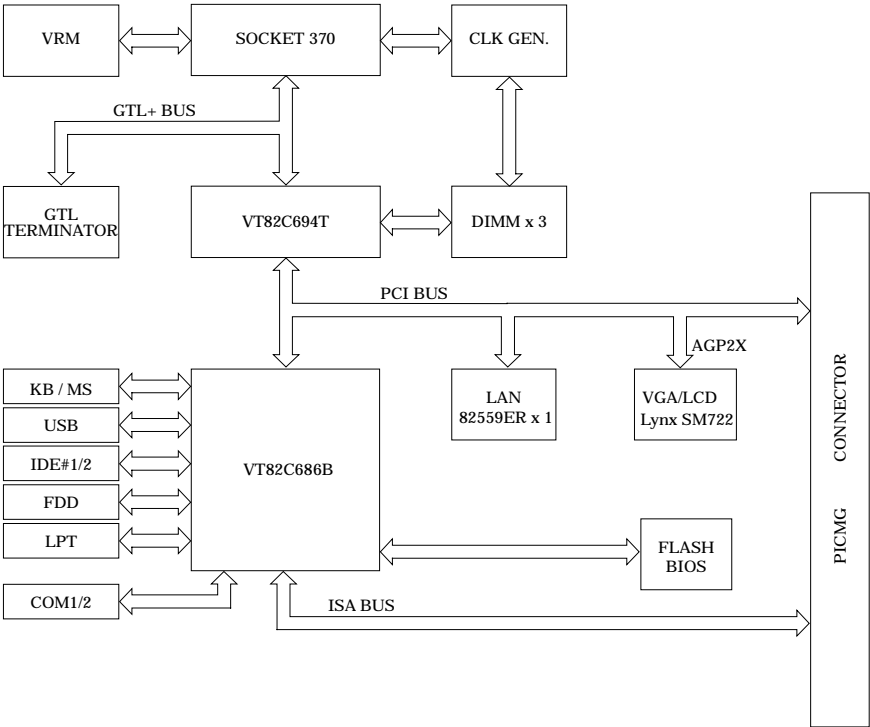
Chapter 2 Hardware Installations

This chapter provides information on how to use the jumpers and connectors on the SPI-6941-LV in order to set up a workable system.

2.1   Installation procedure

2.1.1   Install the processor with correct orientation.

2.1.2   Insert the DRAM module with correct orientation.

2.1.3   Mount the Fan on the top of the processor and connect it to FAN connector.

2.1.4   Insert all external cables except for flat panel. (Hard disk, floppy, keyboard, Mouse, LAN, etc.)

2.1.5   Prepare a CRT monitor for CMOS setup.

2.1.6   Confirm CPU card to backplane.

2.1.7   Turn on the power.

2.1.8   Enter the BIOS setup mode by pressing 'Del' key during boot up.

2.1.9   Use the "Load BIOS Optimal Defaults" feature.

2.1.10   Configure the *Peripheral Setup* and the *Standard Setup* correctly.

Note:

- *The CMOS memory may be in an undefined state at power-on after a period of no battery backup.*
- *Please change following BIOS setting before installing OS in the case that this board is used with the system of the ATX power supply.*

  1. Advanced Chipset Features /Power-Supply Type: [ATX]
  2. Power Management Setup /ACPI Functions : [Enabled]

2.2   CPU Installation:

The SPI-6941-LV Industrial CPU Card supports a single **Intel® Celeron® (FC-PGA) or Pentium® III processor (FC-PGA or FC-PGA2)**. The CPU core voltage is automatically adjusted by the voltage regulator on the CPU card, which is connected to the VID pin of the processor. The processor's VID pins automatically program the voltage regulator on the CPU card to the required processor voltage. The host bus speed is automatically selected. The processor connects to the CPU card through the 370-pins ZIF PPGA socket.

Please change the setting of JP12 in case that you use the CPU other than Tualatine CPU (PC686-1260). See page 37.

The CPU card supports the processors listed in table below:

Celeron processor (FC-PGA)		
Processor Speed	Host Bus frequency	Cache size
566 MHz to 850MHz	66MHz/100MHz	128KB
Celeron processor (FC-PGA2)		
Processor Speed	Host Bus frequency	Cache size
1.0GHz to 1.2GHz	100MHz	256KB
Pentium III processor (FC-PGA)		
Processor Speed	Host Bus frequency	Cache size
500 MHz to 866MHz	100MHz/133MHz	256KB
Pentium III processor (FC-PGA2)		
Processor Speed	Host Bus frequency	Cache size
1.13GHz to 1.26GHz	133MHz	512KB

The ZIF PPGA socket comes with a lever to secure the processor. Make sure the notch on the corner of the CPU corresponds with the notch on the inside of the socket.

After you have installed the processor into the socket 370, check if the configuration setup for the CPU type and speed are correct. The CPU should always have a Heat Sink and a cooling fan attached to prevent overheating.

Note: Ensure that the CPU heat sink and the CPU top surface are in total contact to avoid CPU overheating problem that would cause your system to hang or be unstable.

2.3   Main Memory Installation: DIMM1 / DIMM2 / DIMM3

The SPI-6941-LV PCIMG PCI/ISA Industrial CPU Card supports three dual inline memory module (DIMM 168-pin) sockets for a maximum total memory of 1.5GB. Using the serial presence detect (SPD) data structure, programmed into an E^2PROM on the DIMM, the BIOS can determine the SDRAM's size and speed. For each slot, minimum memory size is 64MB; maximum memory size is 512MB. Memory size and speed can vary between sockets.

The CPU card supports the following memory features:

- 168-pin DIMMs with gold-plated contacts

- 100 MHz or 133MHz SDRAM

- Non-ECC (64-bit) and ECC (72-bit) memory

- 3.3V memory only

- Unbuffered single or double-sided DIMMs in the following sizes:

SDRAM

SYNCHRONOUS DRAM (SDRAM) improves memory performance through memory access that is synchronous with the memory clock. Burst transfer rates at x-1-1-1 timing can be achieved using SDRAM, while asynchronous memory subsystems are typically limited at x-2-2-2 transfer rates.

The CPU card supports single or double-sided DIMMs in the following sizes:

DIMM size	Non-ECC configuration	ECC configuration
64MB	8Mbit x 64	8Mbit x 72
128MB	16Mbit x 64	16Mbit x 72
256MB	32Mbit x 64	32Mbit x 72
512MB	64Mbit x 64	64Mbit x 72

Note: *All memory components and DIMMs used with the SPI-6941-LV PICMG PCI/ISA CPU card must comply with the PC SDRAM Specification. These include: the PC SDRAM Specification *memory component specific), the PC Unbuffered DIMM Specification, and the PC Serial Presence Detect Specification.*

Chipset

VIA VT82C694T Apollo Pro133T 66/100/133 MHz

The features:

- AGP/PCI/ISA Mobile and Deep Green PC Ready

  - GTL+ compliant host bus supports write-combine cycles

  - Supports separately powered 3.3V (5V tolerant) interface to system memory and PCI bus

  - Modular power management and clock control for mobile system applications

  - Combine with VIA VT82C686B south bridge chip for state-of-the-art system power management

- High Integration

  - Single chip implementation for 64-bit Socket-370, 64-bit system memory, 32-bit PCI interface

  - Apollo Pro133T Chipset: VT82C694T system controller and VT82C686B PCI to ISA bridge

  - Chipset includes UltraDMA-33/66 EIDE, USB, and Keyboard/PS2-mouse interfaces plus RTC / CMOS on chip

- High performance CPU Interface

    - Supports Socket-370 processors

    - 66 / 100 /133 MHz CPU Front Side BUS (FSB)

    - Built-in PLL (Phase Lock Loop) circuitry for optimal skew control within an between clocking regions

    - Five outstanding transactions

    - Supports WC (Write Combining) cycles

    - Dynamic deferred transaction support

    - Sleep mode support

    - System management interrupt, memory remap and STPCLK mechanism

- Concurrent PCI Bus controller

    - PCI bus are synchronous / pseudo-synchronous to host CPU bus

    - 33 MHz operation on the primary PCI bus

    - PCI-to-PCI bridge configuration on the 66MHz PCI bus

    - Peer concurrency

    - Concurrent multiple PCI master transactions

    - Zero wait state PCI master and slave burst transfer rate

    - PCI to system memory data streaming up to 132MB/s

    - PCI master snoop ahead and snoop filtering

    - Two lines of CPU to PCI posted write buffers

    - Byte merging in the write buggers to reduce the number of PCI cycles and to create further PCI bursting possibilities

    - Enhanced PCI command optimization

    - 48 levels of post write buffers from PCI masters to DRAM

- 16 levels of prefetch buffers from DRAM for access by PCI masters

- 32 bit 3.3V PCI interface with 5V tolerant inputs

- Advanced High Performance DRAM Controller

  - DRAM interface synchronous with host CPU 66/100/133 MHz for most flexible configuration

  - 64-bit data width only

- Advanced System Power Management Support

  - Dynamic power down of SDRAM

  - Independent clock stop controls for CPU/SDRAM and PCI bus

  - PCI bus clock ran and clock generator control

VIA VT82C686B Super South Bridge

The features:

- PCI to ISA bridge

  - Integrated ISA bus Controller with integrated DMA, timer, and interrupt controller

  - K/B controller with PS2 mouse support

  - DS12885-style RTC

  - USB controller

  - UltraDMA-33/66/100 master mode EIDE controller with enhanced PCI bus commands

- UltraDMA-33/66/100 Master Mode PCI EIDE controller

  - Transfer rate up to 33MB/s to cover PIO mode 4, multi-word DMA mode 2 drives

  - Increase reliability using UltraDMA-66 transfer protocols

  - Increased performance using UltraDMA-100 mode 5

  - Support ATAPI compliant devices including DVD devices

- Integrated Super IO controller

  - Supports 2 serial ports, parallel port, and floppy disk controller functions

- Voltage, Temperature, Fan speed monitor

- Universal Serial Bus controller

  - ISB v.1.1 and Intel Universal HCI v.1.1 compatible

- System Management Bus interface

- Sophisticated PC99-Compatible mobile power management

- Plug & Play controller

- Integrated I/O APIC (Advanced Peripheral Interrupt Controller)

2.4 Primary & Secondary IDE port Connector: CN1/CN4

The CPU card SPI-6941-LV has two independent bus-mastering PCI IDE interfaces. These interfaces support PIO Mode 3, PIO Mode 4, ATAPI devices (e.g., CD-ROM), and Ultra DMA33/66/100 synchronous-DMA mode transfers. The BIOS supports logical block addressing (LBA) and extended cylinder head sector (ECHS) translation modes. The BIOS automatically detects the IDE device transfer rate and translation mode.

Programmed I/O operations usually require a substantial amount of processor bandwidth. However, in multitasking operating systems, the bandwidth freed by bus mastering IDE can be devoted to other tasks while disk transfers are occurring.

These connectors support the provided IDE hard disk ribbon cable. After connecting the single end to the board, connect the two plugs at the other end to your hard disk(s). If you install two hard disks, you must configure the second drive to Slave mode by setting its jumper accordingly. Please refer to your hard disk documentation for the jumper setting.
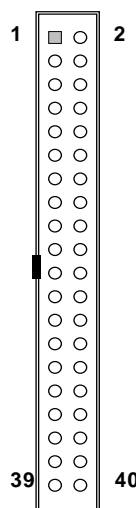
CN1/CN4
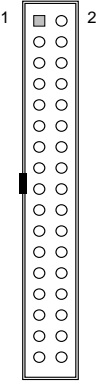
PIN No.	Function	PIN No.	Function
1	RESET	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	N.C
21	DREQ	22	GND
23	IOW	24	GND
25	IOR	26	GND
27	IORDY	28	ALE
29	DACK	30	GND
31	IRQ	32	IOCS16
33	A1	34	PDIAG
35	A0	36	A2
37	CS0	38	CS1
39	HD ACT	40	GND

2.5 Floppy Disk Connector: CN2

The floppy interface can be configured for the following floppy drive capacities and sizes:

• 360 KB, 5.25-inch

• 1.2 MB, 5.25-inch

• 720 KB, 3.5-inch

• 1.44 MB, 3.5-inch

• 2.88 MB, 3.5-inch

This connector supports the provided floppy drive ribbon cable. After connecting the single and to the board, connect the two plugs on the other end to the floppy drives.

CN2	PIN No.	Function	PIN No.	Function
	1	GND	2	RWC
	3	GND	4	N.C
	5	GND	6	N.C
	7	GND	8	INDEX
	9	GND	10	DS0
	11	GND	12	DS1
	13	GND	14	DS2
	15	GND	16	MOT ON
	17	GND	18	DIR
	19	GND	20	STEP
	21	GND	22	WD
	23	GND	24	WG
	25	GND	26	TRCK 0
	27	GND	28	WP
	29	GND	30	RD
	31	GND	32	SIDE 1
	33	GND	34	DSK CHG
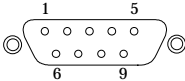
2.6   Serial Port connector: CN10/CN5

COM1 (CN10) and COM2 (CN5) are 10-pins box-header, are onboard serial ports of the CPU card SPI-6941-LV. The following table shows the pin assignments of these connectors.

RS422/485 assigned for COM2 connector only

CN10/CN5	PIN	RS-232	RS422	RS485
	1	DCD	TX-	TX-
	2	RXD	TX+	TX+
	3	TSD	RX+	RX+
	4	DTR	RX-	RX-
	5	GND	GND	GND
	6	DST	RTS-	N.C
	7	RTS	RTS+	N.C
	8	CTS	CTS+	N.C
	9	RI	CTS-	N.C
	10	N.C	N.C	N.C

Pin assignment after conversion by attached cable (DB-9 connector) (No.4-40UNC)

Pin No.	RS-232C	RS-422	RS-485
1	DCD	TX-	TX-
2	RXD	TX+	TX+
3	TXD	RX+	RX+
4	DTR	RX-	RX-
5	GND	GND	GND
6	DSR	RTS-	N.C.
7	RTS	RTS+	N.C.
8	CTS	CTS+	N.C.
9	RI	CTS-	N.C.

Note:

- *For RS-485, TX+(pin 2) and RX+ (pin 3) must jumper together inside the D type connector.*
- *TX- (pin 1) and RX- (pin 4) is the same.*

2.6.1   RS-422 / RS-485 specifications

- Transmission system: Asynchronous, half-/full-duplex serial transmission conforming to RS-422/RS-485
- Baud rate: 19200 to 50bpx (programmable)
- Signal extensible distance: 1.2km Max.

2.7   USB Connector: CN8/CN11

The Universal Serial Bus (USB) that allows plug and play computer peripherals such as keyboard, mouse, joystick, scanner, printer, modem/ISDN, CD-ROM and floppy disk drive to be automatically detected when they are attached physically without having to install drivers or reboot.
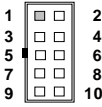
The USB connectors allow any of several USB devices to be attached to the computer. Typically, the device driver for USB devices is managed by the operating system. However, because keyboard and mouse support may be needed in the Setup program before the operating system boots, the BIOS supports USB keyboards and mice.

The CPU card has four USB ports; one USB peripheral can be connected to each port. For more than four USB devices, an external hub can be connected to either port. The CPU card fully supports the universal host controller interface (UHCI) and uses UHCI-compatible software drivers.

USB features includes:

- Self-identifying peripherals that can be plugged in while the computer is running

- Automatic mapping of function to driver and configuration

- Support for isochronous and asynchronous transfer types over the same set of wires

- Support for up to 127 physical devices

- Guaranteed bandwidth and low latencies appropriate for telephony, audio and other applications

- Error-handling and fault-recovery mechanisms built into the protocol
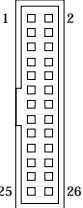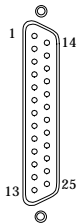
Note: *Computer systems that have an unshielded cable attached to a USB port may not meet FCC Class B requirements, even if no device or a low-speed USB device is attached to the cable. Use shielded cable that meets the requirements for full-speed devices.*

	PIN No.	Function	PIN No.	Function
CN8/CN11	1	VCC	2	VCC
	3	USBP0/2-	4	USBP1/3-
	5	USBP0/2+	6	USBP1/3+
	7	USBG	8	USBG
	9	N.C.	10	GND

2.8   Parallel Port Connector: CN9

The parallel port bracket can used to add an additional parallel port for additional parallel devices. There are four options for parallel port operation:

- Compatible (Standard mode)
- Bi-Directional (PS/2 compatible)
- Bi-Directional EPP. A driver from the peripheral manufacturer is required for operation.
- Bi-Directional High-speed ECP

Pin assignment after conversion by attached cable
(DB-9 connector)(No.4-40UNC)

Pin No.	Function	Pin No.	Function		Pin No.	Function	Pin No.	Function
1	STROBE	2	ALF		1	STROBE	14	ALF
3	PD0	4	ERROR		2	PD0	15	ERROR
5	PD1	6	INIT		3	PD1	16	INIT
7	PD2	8	SLCT IN		4	PD2	17	SLCT IN
9	PD3	10	GND		5	PD3	18	GND
11	PD4	12	GND		6	PD4	19	GND
13	PD5	14	GND		7	PD5	20	GND
15	PD6	16	GND		8	PD6	21	GND
17	PD7	18	GND		9	PD7	22	GND
19	ACK	20	GND		10	ACK	23	GND
21	BUSY	22	GND		11	BUSY	24	GND
23	PE	24	GND		12	PE	25	GND
25	SLCT	26	N.C.		13	SLCT		

2.9 Adapter for LCD transfer Connector: CN12

CN12 is a 56-pin connector (Panel link) for flat panel LCD displays. The following shows the pin assignments of this connector.
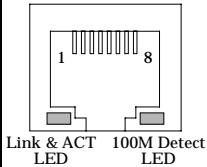
PIN No.	Function	PIN No.	Function
	CN12		
1	FTD0	2	FTD1
3	FTD2	4	FTD3
5	FTD4	6	FTD5
7	FTD6	8	FTD7
9	FTD8	10	FTD9
11	FTD10	12	FTD11
13	FTD12	14	FTD13
15	FTD13	16	FTD15
17	FTD16	18	FTD17
19	FTD18	20	FTD19
21	FTD20	22	FTD21
23	FTD22	24	FTD23
25	GND	26	FPSCLK
27	FPEN	28	LVDSCLK
29	GND	30	FTHSYNC
31	GND	32	FTVSYNC
33	FPVDDEN	34	DE
35	GND	36	Y2
37	VBIASEN	38	Y3
39	N.C.	40	NC
41	NC	42	NC
43	VCC	44	PCIRST#
45	NC	46	VCC
47	VCC3	48	VCC3
49	NC	50	VCC3
51	N.C.	52	Y
53	SDATA	54	C
55	SCLK	56	CVBS
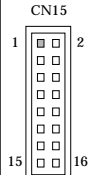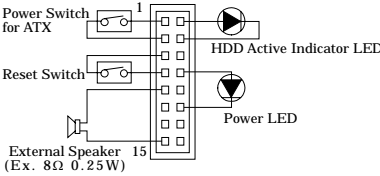
2.10   LAN connector (RJ-45): CN14

This connector are for the 10/100Mbps Ethernet capability of the CPU card. The follow table shows the pin assignments of this connector.

• The category-5 cable is required for transmission at 100Mbps.

CN14

Link & ACT LED   100M Detect LED

Pin No.	Function
1	TX+
2	TX-
3	RX+
4	N.C.
5	N.C.
6	RX-
7	N.C.
8	N.C.

2.11   Front Panel Connector: CN15

CN15

Pin No.	Function	Pin No.	Function
1	Power BT	2	VCC
3	GND	4	IDE ACT
5	RESET	6	N.C.
7	GND	8	VCC
9	VCC	10	VCC
11	GND	12	GND
13	GND	14	N.C.
15	BUZZER	16	N.C.

Speaker	9, 11, 13, 15	Power Button	1, 3
Reset Button	5, 7	HDD LED	2, 4
Power LED	8, 10, 12		

Power Switch for ATX

Reset Switch

External Speaker (Ex. 8Ω 0.25W)

HDD Active Indicator LED

Power LED

This header can be connected to a front panel power switch. The front panel connector includes headers for these I/O connections:

Power switch

Power LED

This header can be connected to an LED that will light when the computer is powered on.

Hard drive activity LED

This header can be connected to an LED to provide a visual indicator that data is being read from or written to an IDE hard drive. For the LED to function properly, the IDE drive must be connected to the onboard IDE controller.

Speaker

A speaker can be installed on the SPI-6941-LV as a manufacturing option. The speaker is enabled by a jumper on pins 9, 11, 13, 15 of the front panel connector. The speaker (onboard or offboard) provides error beep code information during the POST in the event that the computer cannot use the video interface. The speaker is not connected to the audio subsystem and does not receive output from the audio subsystem.

2.12 External Battery Connector: CN16

It is a 2 Pin connector used for external battery. An external battery powers the real-time clock and CMOS memory.
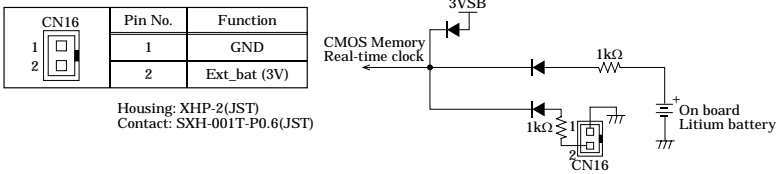
2.13   Unuseable Connector: CN17
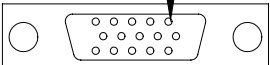
Please No Connect.

2.14   EXT. Mouse or Keyboard Connector: CN18

CN18	PIN No.	Function		Housing: XHP-5(JST)
		JP17(1-2) JP18(1-2)	JP17(2-3) JP18(2-3)	
5 4 3 2 1	5	+5V		
	4	GND		Contact: SXH-001T-P06 (JST)
	3	N.C		
	2	Mouse DATA	Keyboard DATA	
	1	Mouse CLOCK	Keyboard CLOCK	

2.15   VGA Connector: CN19

It is a VGA CRT connector (DB-15). The pin assignments are as follows: (No.4-40UNC)
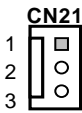
CN19

PIN No.	Function	PIN No.	Function
1	RED	9	+5V
2	GREEN	10	GND
3	BLUE	11	D-DATA
4	5V Pull high	12	5V Pull high
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	D-DCLK
8	GND		

2.16   External ATX Power Connector: CN20

Pin No.	Function
6	5V SBY
5	PS-ON (Soft ON/OFF)
4	GND
3	(PBTN-IN) N.C.
2	GND
1	N.C.

Housing: XHP-6 (JST)
Contact: SXH-001T-P0.6 (JST)

CN20   5VSB   ATX Power Control signal
PS-ON
5VSB
PS-ON
GND
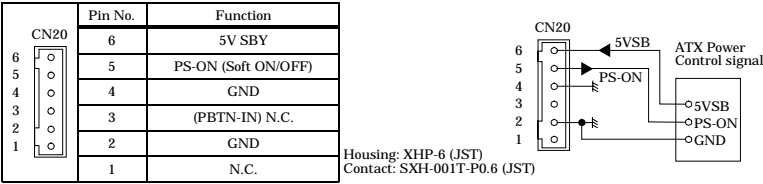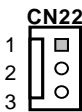
2.17   System FAN Connector: CN21

CN21 is a 3-pins header for the SYSTEM cooling fan power connector. The fan must be a 12V fan. Pin 3 is for Fan speed sensor input.

PIN No.	Function	Connector type for Cable
1	GND	Housing: 5102-03 (molex)
2	+12V	Contact: 5103 (molex)
3	FAN	
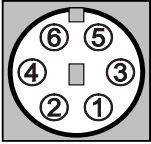
2.18   CPU FAN Connector: CN22

CN22 is a 3-pins header for the CPU cooling fan power connector. The fan must be a 12V fan. Pin 3 is for Fan speed sensor input.

PIN No.	Function	Connector type for Cable
1	GND	Housing: 5102-03 (molex)
2	+12V	Contact: 5103 (molex)
3	FAN	

2.19   PS/2 Keyboard / Mouse Connector: CN23

The CPU card provides a standard PS/2® mini DIN connector for attaching the PS/2® mouse & keyboard. You must plug a 2 in 1 cable to this connector. You can plug a PS/2® mouse and keyboard directly into each own connector. The Connector pin definition is shown below:

CN23	PIN No.	Function
	1	Mouse Data
	2	Keyboard Data
	3	GND
	4	+5VSB
	5	Mouse Clock
	6	Keyboard Clock

To connect a mouse directly to the PS/2 keyboard/mouse connector (CN23), remove the 1-2 or 3-4 connection from JP20.

```
1 | O  O | 2
3 | O  O | 4
     JP20
```
Default: 1-2 short : 3-4 short

Note: Power to should be turned off before a keyboard or mouse is connected or disconnected.

The keyboard controller contains code which provides the traditional keyboard and mouse control functions, and also supports Power On/Reset password protection. A Power On/Reset password can be specified in the BIOS Setup program.

The keyboard controller also supports the hot-key sequence <Ctrl><Alt><Del>, software reset. This key sequence resets the computer's software by jumping to the beginning of the BIOS code and running the Power On Self Test (POST).

Chapter 3 Jumper Setting
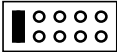
3.1   On board LAN enabled jumper: JP2

JP2	Function
JP2 ▭ 1 2	Enabled(Default)
JP2 ⬚ 3 4	Disabled

3.2   RS-422/485 Terminator: JP3

JP3	Terminator	Function
JP3 1 2 3 4 5 6 7 8	-	No terminating resister (Default)
JP3 1 2 3 4 5 6 7 8	CTS for RS-422	terminating resister provided
JP3 1 2 3 4 5 6 7 8	RTS for RS-422	terminating resister provided
JP3 1 2 3 4 5 6 7 8	RXD for RS-422/485	terminating resister provided
JP3 1 2 3 4 5 6 7 8	TXD for RS-422/485	terminating resister provided

3.3   RS232/422/485 Selector: JP5/JP4

	JP5	JP4
RS-232 (Default)		
RS-422		
RS-485		

1. For RS-485, TX+(pin 2) and RX+ (pin 3) must jumper together inside the D type connector.
2. TX- (pin 1) and RX- (pin 4) is the same.

Transmit date control in half-duplex mode

In half-duplex mode, the transmission buffer must be controlled to prevent transmit data from causing a collision. The SPI-6941-LV uses the RTS signal and bit 1 in the modem control register to control transmit data.

Modem control register

(Setting I/O address +4H) bit 1:   0 … RTS High (Disables transmission)

1 … RTS low (Enables transmission)

Setting the RS-422/RS-485 receiver disable control jumper

When the RS-422/RS-485 port is used, the RTS signal is used for driver enable control Connecting JP1 Pins 4 and 6 disables the receiver at the same time, preventing the port from receiving output data to an external device.

3.3.1   RS-422 Setting
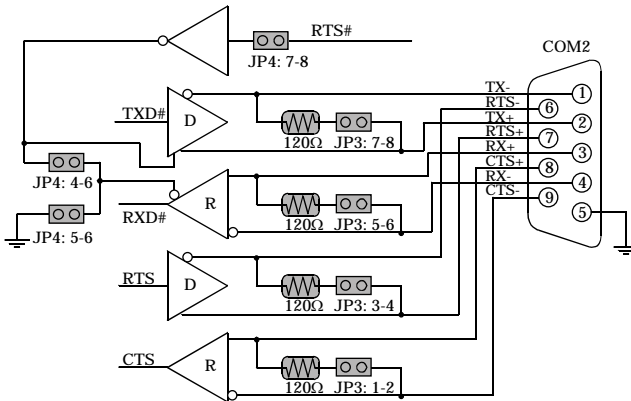
3.3.2 RS-485 Setting
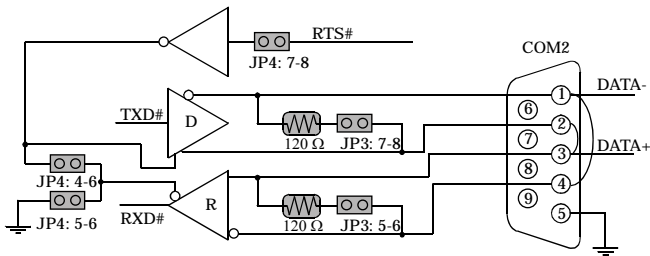
I/O addresses and instructions

The table below lists I/O addresses for use as COM2.

I/O address	DLAB	Read/Write	Register	
02F8H	0	W	Transmitter holding Register	THR
		R	Receiver buffer Register	RBR
	1	W	Divisor latch Register (LSB)	DLL
02F9H	1	W	Divisor latch Register (MSB)	DLM
	0	W	Interrupt enable Register	IER
02FAH	X	R	Interrupt ID Register	IIR
02FBH	X	W	Line control Register	LCR
02FCH	X	W	Modem Control Register	MCR
02FDH	X	R	Line status Register	LSR
02FEH	X	R	Modem Status Register	MSR
02FFH	X	R/W	Scratch Register	SCR

3.4   Unuseable Connector: JP7

JP7 is unuseabled. Don't connect to JP7.

JP7	PIN No.	Function
1	1	IRTX
2	2	GND
3	3	IRRX
4	4	NC
5	5	VCC
6	6	VCC3

3.5   Clear CMOS Content: JP9

The time, date, and CMOS values can be specified in the Setup program. The CMOS values can be returned to their defaults by using the Setup program. The RAM data contains the password information is powered by the onboard button cell battery. User can erase the CMOS memory content by short pin2 and pin3 of JP2 together.

An external coin-cell battery powers the real-time clock and CMOS memory. When the computer is not plugged into a wall socket, the battery has an estimated life of three years. When the computer is plugged in, the 3.3V standby current from the power supply extends the life of the battery. The clock is accurate to ±3 minutes/month at 25ºC with 3.3V applied.

JP9	Function
JP9 1 2 3	Normal Operation (Default)
JP9 1 2 3	Clear CMOS Content

3.6   Silicon DISK Memory Add. Selector: JP10

JP10 is used for memory address selection of DiskOnChip. Below are 4 kinds of DiskOnChip memory address configuration.

JP10	Function
3 O O 1 4 O O 2	DC000~DDFFFh (Default)
3 O O 1 4 O O 2	D4000h~D5FFFh
3 O O 1 4 O O 2	D8000h~D9FFFh
3 O O 1 4 O O 2	D0000h~D1FFFh

3.7   Watch Dog Timer output selector: JP11

When the watchdog timer activates, setup involves two jumpers. (CPU processing has come to a halt), it can reset the system or generate a NMI. This can be setting JP11 as shown below:

JP11	Function
JP11 ■ o 1 2 3	NMI(Default)
JP11 o ■ 1 2 3	Reset

Note: NMI cannot be used at Windows NT4.0, 2000 and XP.

3.8   CPU selector: JP12

JP12	Function
□ 1 □ 2 □ 3	Coppermine FC-PGA
□ 1 □ 2 □ 3	Tualatin FC-PGA2 (Default)

3.9   Unuseable Jumper: JP17, JP18

This jumper(JP17, JP18) is unuseable.

Please set this Jumper as following table.

JP17, 18
□ □ □
3   2   1

3.10   Unuseable Jumper: JP19
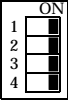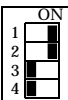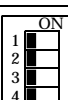
This jumper(JP19) is unuseable.

Please set this Jumper as following table.

JP19
□ □ □
1   2   3

3.11   Display Type Setting: SW1

The SPI-6941-LV supports several resolution LCD displays. Use SW1 switch to select display type. This selection will be enabled when mount ADP-6940 LCD daughter Card. And when shipping, SW1 is set to CRT only.

SW1	Resolution	LCD type
ON 1 2 3 4	640×480	CONTEC: IPC-DT/M6x Series
ON 1 2 3 4	640×480	DSTN
ON 1 2 3 4	800×600	CONTEC: IPC-DT/L6x Series IPC-DT/L40S(PC)T
ON 1 2 3 4	800×600	DSTN
ON 1 2 3 4	1024×768	CONTEC: IPC-DT/H6x Series IPC-DT/H40X(PC)T
ON 1 2 3 4	1024×768	DSTN
ON 1 2 3 4	VGA SVGA XGA SXGA	(Default)

Chapter 4 CPU card Resources

4.1. Interrupters

IRQ #	System Resources
NMI	I/O Channel check
0	Reserved, interval timer
1	Reserved, keyboard controller
2	Reserved, cascade interrupt from slave PIC
3	COM2*
4	COM1*
5	LPT2 (Plug and Play option)/audio/user available
6	Diskette drive controller
7	LPT1*
8	Real time clock
9	User available
10	USB/User available
11	Windows Sound System/User available
12	PS/2 mouse port (user not available)
13	Reserved, math coprocessor
14	Primary IDE (if present, else user available)
15	Secondary IDE (if present, else user available)

* Default, but can be changed to another IRQ

4.2. MEMORY MAP

Address Range (h)	Size	Description
100000-60C49BA5	1499MB	Extended memory
E8000-FFFFF	96KB	System BIOS
E0000-E7FFF	32KB	System BIOS (Available as UMB)
CC000-DFFFF	80KB	Available high DOS memory (open to ISA and PCI buses)
A0000-CBFFF	176KB	Video memory and BIOS
00000-9FFFF	640KB	Conventional memory

4.3. I/O MAP

Address (h)	Size	Description
0000 to 000F	16 bytes	DMA Controller
0020 to 0021	2 bytes	Interrupt Control (PIC)
002E to 002F	2 bytes	Super I/O controller configuration registers
0040 to 0043	4 bytes	System timer 1
0048 to 004B	4 bytes	System timer 2
0060	1 byte	Keyboard Controller
0061	1 byte	NMI, speaker control
0064	1 byte	Keyboard controller
0070 to 0071	2 bytes	Real Time Clock Controller
0080 to 008F	16 bytes	DMA page registers
00A0 to 00A1	2 bytes	Interrupt controller 2
00B2 to 00B3	2 bytes	APM control
00C0 to 00DE	31 bytes	DMA controller 2
00F0 to 00FF	16 bytes	Numeric processor
0170 to 0177	8 bytes	Secondary IDE controller
01F0 to 01F7	8 bytes	Primary IDE controller
0228 to 022F *1	8 bytes	LPT3
0278 to 027F *1	8 bytes	LPT2
02E8 to 02EF *1	8 bytes	COM4
02F8 to 02FF *1	8 bytes	COM2
0376 to 0377	2 bytes	Secondary IDE channel
0274 to 0277	4 bytes	I/O read data port for ISA PnP enumerator
0378 to 037F	8 bytes	LPT1
0388 to 038D	6 bytes	AdLib (FM synthesizer)
03B0 to 03BB	12 bytes	Video (Monochrome)
03C0 to 03DF	32 bytes	Video (VGA)
03E8 to 03EF	8 bytes	COM3
03F0 to 03F5, 03F7	8 bytes	Diskette controller
03F6	1 byte	Primary IDE channel
03F8 to 03FF	8 bytes	COM1

04D0 to 04D1	2 bytes	Edge/level triggered PIC
0530 to 0537	8 bytes	Windows Sound System
LPT n + 400h	8 bytes	ECP port, LPT n base address + 400h
0CF8 to 0CFF *2	4 bytes	PCI configuration address register
0CF9 *3	1 byte	Turbo and reset control register

*1: Default, but can be changed to another address range.
*2: Dword access only
*3: Byte access only

4.4. DMA Channels

DMA	Data Size	System Resource
0	8 or 16bit	Reserved
1	8 or 16bit	Reserved (or parallel port (for ECP))
2	8 or 16bit	Diskette driver
3	8 or 16bit	Reserved (or parallel port (for ECP))
4	---	Unused(Cascade channel)
5	16bit	Free
6	16bit	Free
7	16bit	Reserved

Chapter 5 Software Utilities

This chapter describes the software utility CD-ROM bundled with the CPU Card. It also describes how to set the watchdog timer (WDT) and to update the BIOS.

5.1   Appending CD-ROM

The CD-ROM bundled with the CPU Card contains Chipset Driver, Audio Driver, Graphics Driver, and Ethernet Driver. The directory structure of the CD-ROM is as follows:

```
\
└──SPI_6940
  ├─Chipset                 ----- Chipset Drivers
  │  └─VIA694x
  │    └─4in1 ---4in1438(2)v(a)     Setup Application
  ├─Video                   ----- Graphics drivers
  │  └─Lynx3DM
  │    ├─WinXP
  │    ├─Win2K
  │    ├─Winnt40
  │    └─Win9x
  └─LAN                     ----- Ethernet Drivers
    └─82559ER
      ├─WinXP
      ├─Win2K
      ├─Winnt40
      └─Win9x
```
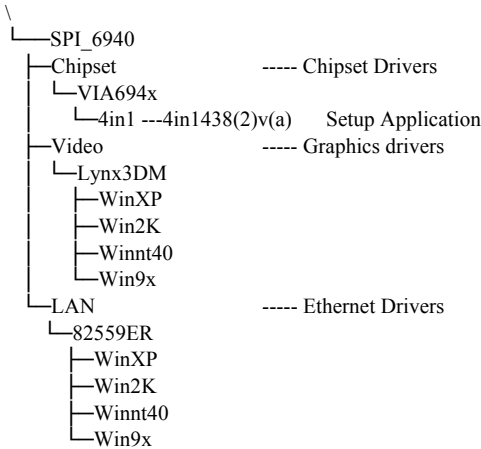
Note: For use of each driver, check the messages output during installation and documents included in the CD-ROM.

5.1.1   Driver installation to Windows 98SE

The CD-ROM bundled with talling the OS:
- Chipset Driver
- Graphics Driver
- Ethernet Driver(OS's standard driver available)

- Chipset Driver

Run the \SPI_6941\Chipset\VIA694x\4in1\4in1438(2)v(a) application. Follow the on-screen instructions to install the chipset driver with the default values. Then, reboot the system. The Setup application is common to OSs.

- Graphics Driver

Install the display driver from \SPI_6941\Video\Lynx3DM\Win9x.   Open the Display Properties dialog box from Control Panel, then select [Setting] → [Advanced] → [Adapter] → [Change] for installation. Follow the on-screen instructions and specify the above folder to install the driver. Then, reboot the system. If the monitor connected is not Plug and Play-compliant, it may not display anything.

- Ethernet Driver

Install the Ethernet driver from \SPI_6941\LAN\82559ER\Win9x. Open the System Properties dialog box from Control Panel, then select [Device Manager] → [PCI Ethernet Controller] → [Driver] → [Update Driver] for installation. Follow the on-screen instructions and specify the above folder to install the driver. Then, reboot the system.

5.1.2   Driver installation to Windows NT 4.0

Install the following drivers after installing the OS:
　　　-Chipset Driver
　　　-Graphics Driver
　　　-Ethernet Driver

-　　　Chipset Driver

　　　Run the \SPI_6941\Chipset\VIA694x\4in1\4in1438(2)v(a) application.   Follow the on-screen instructions to install the chipset driver with the default values.   Then, reboot the system. The Setup application is common to OSs.

-　　　Graphics Driver

　　　Install the display driver from \SPI_6941\Video\Lynx3DM\Winnt40.   Open the Display Properties dialog box from Control Panel, then select [Display setup] → [the kind of display] → [Change of the kind of adapter] for installation.   Follow the on-screen instructions and specify the above folder to install the driver.   Then, reboot the system.   If the monitor connected is not Plug and Play-compliant, it may not display anything.

-　　　Ethernet Driver

　　　Copy   the   files   of   Ethernet   drivers   to   a   formatted   Floppy   disk   from \SPI_6941\LAN\82559ER\Winnt40.   Open the Network Properties dialog box from Control Panel, then check "Wired to the network" and select [Next]. [Select from list] → [Have disk] for installation.   Follow the on-screen instructions and specify the Floppy disk to install the driver.   Then, reboot the system. For individual settings, consult your network administrator.

5.1.3   Driver installation to Windows 2000

Install the following drivers after installing the OS:
- Chipset Driver
- Graphics Driver
- Ethernet Driver

- Chipset Driver

Run the \SPI_6941\Chipset\VIA694x\4in1\4in1438(2)v(a) application. Follow the on-screen instructions to install the chipset driver with the default values. Then, reboot the system. The Setup application is common to OSs.

- Graphics Driver

Install the display driver from \SPI_6941\Video\Lynx3DM\Win2K. Open the Display Properties dialog box from Control Panel, then select [Hardware] → [Device manager] → [Video controller] for installation. Follow the on-screen instructions and specify the above folder to install the driver. Then, reboot the system. If the monitor connected is not Plug and Play-compliant, it may not display anything.

- Ethernet Driver

Install the Ethernet driver from \SPI_6941\LAN\82559ER\Win2K. Open the Display Properties dialog box from Control Panel, then select [Hardware] → [Device manager] →[Other Device] → [Network Adapters] → [Driver] → [Update Driver] for installation. Follow the on-screen instructions and specify the above folder to install the driver. Then, reboot the system. For individual settings, consult your network administrator.

5.1.4   Driver installation to Windows XP

Install the following drivers after installing the OS:

    -Graphics Driver
    -Ethernet Driver

-        Graphics Driver

Install the display driver from \SPI_6941\Video\Lynx3DM\WinXP.   Open the Control Panel, then select [Performance and Maintenance] → [System] → [Hardware] → [Device Manager] → [Display Addaptor] → [Silicon Motion Lynx3DM] → [Driver] → [Update Driver] for installation. Follow the on-screen instructions and specify the above folder to install the driver. Then, reboot the system. If the monitor connected is not Plug and Play-compliant, it may not display anything.

-        Ethernet Driver

Open the Control Panel, then select [Performance and Maintenance] → [System] → [Hardware] → [Device Manager] → [Other Device] → [Ethernet Controller] → [Driver] → [Update Driver] for installation. Follow the on-screen instructions and specify the above folder to install the driver. Then, reboot the system.

5.2   Watch-Dog-Timer (WDT) Setting

WDT is widely used for industry application to monitoring the activity of CPU. Application software depends on its requirement to trigger WDT with adequate timer setting. Before WDT time out, the functional normal system will reload the WDT. The WDT never time out for a normal system. The WDT will not be reload by an abnormal system, then WDT will time out and reset the system automatically to avoid abnormal operation.

SPI-6941-LV supports 16 levels watchdog timer by software programming I/O ports. Write any value to I/O address 0441H will disable Watch-Dog-Timer. Write setting code (please reference to WDT Setting Table) to I/O 0443h will re-load WDT.

Below is an assembly program example for disable and load of WDT.

```
MOV DX,0441H        ; REM Write any value to 0441H, disable WDT
OUT DX,AX;
MOV AX,0001H                  ; WDT timer = 28 Sec
MOV DX,0443H
OUT DX,AX          ; REM trigger WDT with timer setting
```

Timer Value Table

Value	Timer	Value	Timer	Value	Timer	Value	Timer
0	30sec	4	22sec	8	14sec	C	6sec
1	28sec	5	20sec	9	12sec	D	4sec
2	26sec	6	18sec	A	10sec	E	2sec
3	24sec	7	16sec	B	8sec	F	Do not setting

5.3   Update of BIOS

Each SBC may require updating the BIOS depending on the purpose for which the SBC is used. Given below are the steps to update the BIOS.

Step 1: Make a record of your original or existing BIOS Setup parameters. Press [Del] during the Power-On-Self-Test to enter BIOS Setup Program and write down the value of each parameter in order to re-configure your System after BIOS updating

Step 2: Make a System Disk. Put a 3.5 inch disk in Drive A. For MS-DOS, Key in "format a:/s" and press [Enter]. For Windows, select My Computer, click 3.5 inch Floppy (A:), select File/Format from Command Bar. On the "Format 3.5 inch Floppy (A:)" menu, select "Copy system files" and then click [Start] button.

Step3: Copy the updated BIOS bin file and awdflash.exe file to the System Disk.

Step 4: Put the System Disk in Drive A and re-start your computer from Drive A.

Step 5: Begin to update your BIOS. Enter [awdflash] command, the "Flash Memory Writer" message will appear on screen. Enter the updated BIOS file name at "File Name to Program:". Enter the backup file name for the existing BIOS at "File Name to Save:". Press [Y] to proceed with the BIOS updating.

Step 6: Re-configure your system. Remove the System Disk and re-start your computer. Press [Del] during the Power-On-Self-Test to enter BIOS Setup Program. Re-set the relevant parameters according to your record of the Original setting. Save and Exit BIOS Setup program to re-boot your system.

5.4   Hard Ware Monitor

The CPU Card has Hardware Monitor functions outlined below, although they are not implemented as software utilities. Hardware Monitor is built in the controller (VIA VT82C686B), capable of reading the SBC temperature, voltage, and fan speed.

Temperature

Two Thermistors are mounted on SBC as following. You can read Temperature of this position.

Voltage

You can read 3.3V, +5V, +12V, 2.5V, Vcore of SBC.

Speed sensor

When the CPU fan in use has a speed sensor, the controller can read the fan speed sensor signal input to pins 3 of CN21 and CN22 as the fan speed.

Caution: *To monitor the fan speed, use a CPU fan with speed sensor.*

Chapter 6 BIOS Setup

This chapter describes the Setup Utility built in the BIOS and the errors that can occur during the POST (power-on self test).

6.1　Setup Utility

The system BIOS contains the Setup Utility for configuring your system and setting up its functions. You can invoke the Setup Utility by pressing the <DEL> key with the BIOS startup screen displayed immediately after you turn the power on. The Setup Utility can be used to set the system's clock/calendar, configure drives, specify the boot device, set up the integrated peripherals such as COM/LPT devices, and to reset the BIOS settings to the factory defaults.

The factory defaults are assumed to be acceptable basically to most systems. The BIOS settings are stored in battery-backed CMOS RAM. Note, however, that the setting data may not be preserved to be stable when the board is not fixed in the frame of the system unit, for example, during transportation. You can invoke the Setup Utility by pressing the <DEL> key with the following message displayed on the BIOS startup screen immediately after turning the power on.

Press DEL to enter SETUP.
or
Press F1 continue, DEL to enter SETUP.

If the BIOS has entered the next status before you press the <DEL> key, recycle the power supply.

The basic keys to make settings on the Setup Utility screen are the arrow keys for selecting items and the <+> and <-> keys for changing their settings.

When you have finished setting the required items, select [Save & Exit] in the Main Menu, press the <Y> key to confirm your menu selection at the prompt, then press the <Enter> key to save the current BIOS settings to CMOS memory while exiting the Setup Utility.

When you want to quit the Setup Utility without making any changes to BIOS settings, press the <Esc> key to return to the Main Menu, select [Exit Without Saving], then follow the subsequent on-screen instructions to terminate the Setup Utility.

The table below lists basic navigation keys for BIOS Setup:

Key	Function
Up Arrow	Move to the previous item
Down Arrow	Move to the next item
Left Arrow	Move to the item on the left
Right Arrow	Move to the item on the right
ESC Key	Returns from the current menu to the menu one level upper in the menu hierarchy. Pressing this key on the Main Menu exits the Setup Utility without saving changes.
Enter Key	Brings up a pop-up selection menu for the currently selected menu item or accepts a setting in the selection menu.
PgUp PgDn Key + -Key	Changes the value for the currently selected item.
F1 Key	Calls up Help screen listing the navigation keys along with their functions (as in this table).
F5 Key	Reverts the current item (to the value saved last).
F6 Key	Resets the BIOS settings to the fail safe defaults (factory defaults).
F7 Key	Do not use this key.
F10 Key	Saves the current BIOS settings to CMOS memory and exits the Setup Utility.

If the system fails to get started due to some changes made to BIOS settings or possible corruption of CMOS data, check hardware options, clear the CMOS memory, then start this utility again to set up the system all over again.

This is effective, for example, in the event that the system won't start after unexpected power failure.

Caution: *Contents described in this chapter is subject to change future without notice.*

6.1.1   Main Menu

```
              Phoenix - Award BIOS CMOS Setup Utility

┌──────────────────────────────────────────────────────────────────────┐
│                                                                        │
│    >Standard CMOS Features  *2        >Frequency/Voltage Control        │
│    >Advanced BIOS Features             Load Fail-Safe Defaults          │
│    >Advanced Chipset Features          Set Supervisor Password          │
│    >Integrated Peripherals             Set User Password                │
│    >Power Management Setup             Save & Exit Setup                │
│    >PnP/PCI Configurations             Exit Without Saving              │
│    >PC Health Status                                                    │
│                                                                        │
│                                                                        │
│                                                                        │
│                                                                        │
│                                                                        │
│                                                                        │
│ ───────────────────────────────────────────────────────────────────── │
│    (General description) *1                                            │
└──────────────────────────────────────────────────────────────────────┘
```
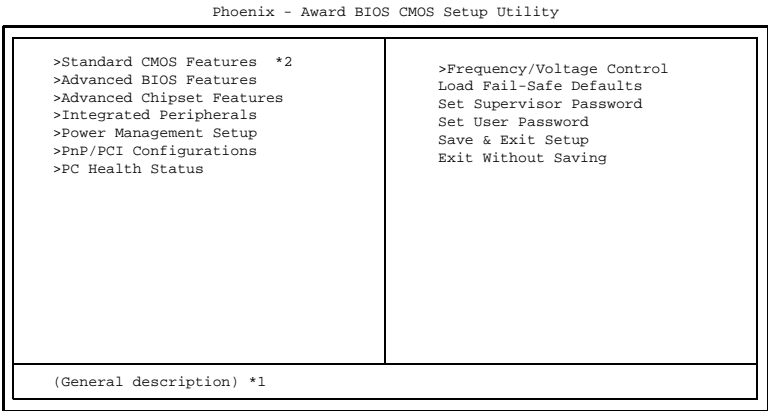
   *1 Displays brief descriptions of legend keys.
   *2 The right pointer > to the left of an item indicates that the item has a sub-menu.
       (Common to Setup menus)

Standard CMOS Features

Sets the clock/calendar and drives on your system.

Advanced BIOS Features

Enables/disables the monitoring of write access to the boot sector and selects the boot device.

Advanced Chipset Features

Enables/disables the on-chip USB and sound devices and ECC memory feature.

Integrated Peripherals

Makes settings for IDE device modes, COM/LPT devices, and so on.

Power Management Setup

Selects the function of the Power button.

PnP/PCI Configurations

Resets configuration data and allocates IRQ/DMA resources for legacy devices.   Before reinstalling the OS, reset configuration data.

PC Health Status

Displays the monitored CPU temperature, FAN speed, and power supply voltage.

Frequency/Voltage Control

Although the system clock settings can be changed, be sure to use the system at the default frequency and voltage.

Load Fail-Safe Defaults

Resets the BIOS settings to the factory defaults.

Set Supervisor Password/User Password

Allows you to set the password for accessing the Setup Utility screen. If you select this item and input a password, the Setup Utility will prompt you to enter the password upon startup the next time you invoke it.

Setting a null password (by entering no character) cancels the current password protection. If you have forgotten your password, clear the CMOS memory and set the one again on the Setup Utility screen that appears.

Save & Exit Setup

Saves the settings made on the Setup menus to CMOS, exits the Setup Utility, then reboots the system.

Exit Without Saving

Not Saves the settings made on the Setup menus to CMOS, exits the Setup Utility, then reboots the system.

6.1.2 Standard CMOS Features

```
                    Phoenix - Award BIOS CMOS Setup Utility
                            Standard CMOS Features
 ┌─────────────────────────────────────────────────────┬──────────────┐
 │ Date (mm:dd;yy)              Mon, Jan 1 2001          │  Item Help   │
 │ Time (hh:mm:ss)              00 : 00 : 00             │              │
 │                                                       │              │
 │ >IDE Primary Master          [None] *3                │     *1       │
 │ >IDE Primary Slave           [None]                   │              │
 │ >IDE Secondary Master        [None]                   │              │
 │ >IDE Secondary Slave         [None]                   │              │
 │                                                       │              │
 │ Drive A                      [1.44M, 3.5in.]          │              │
 │ Drive B                      [None]                   │              │
 │                                                       │              │
 │ Video                        EGA/VGA                  │              │
 │ Halt On                      [All, But Keyboard]      │              │
 │                                                       │              │
 │ Base Memory                     XXXK                  │              │
 │ Extended Memory              XXXXXXK                  │              │
 │ Total Memory                 XXXXXXK                  │              │
 ├─────────────────────────────────────────────────────┴──────────────┤
 │ (General key operation help) *2                                     │
 └─────────────────────────────────────────────────────────────────────┘
```

*1 Displays help with some items.(Common to Setup menus)
*2 Displays brief descriptions of legend keys.(Common to Setup menus)
*3 Displays the connected IDE devices detected according to settings.
*4 The above screen serves also for displaying factory defaults.
    (Common to Setup menus)

Date (mm:dd;yy)

Time (hh:mm:ss)

Display and set the date and time of your system's clock/calendar.

IDE Primary Master
IDE Primary Slave
IDE Secondary Master
IDE Secondary Slave

Display the devices connected to the IDE interfaces. Selecting each of these items calls up the sub-menu that allows you to manually set drive information such as the number of cylinders. Drive information on each IDE device is set automatically; it can usually be used normally without modification.

Drive A
Drive B

Select the types of the FDDs connected.

The choice: None / 360K, 5.25in. / 1.2M, 5.25in. / 720K, 3.5in. /1.44M, 3.5in. / 2.88M, 3.5in.

Video

Displays the default mode of the video device.

Halt On

Selects whether to check for connection of the FDD/keyboard during system bootup. If a relevant device is not connected, the system halts during BIOS startup and warns the operator of the absence of that device.

The choice:

All Errors   The system halts on detection of any error.

All, But Keyboard The system does not halt with no keyboard connected.

All, But Diskette   The system does not halt with no FDD connected.

All, But Disk/Key The system does not halt with no FDD/keyboard connected.

No Errors   The system does not halt on detection of any error.

Base Memory

Extended Memory

Total Memory

Display the sizes of individual types of detected memory installed on the system.

6.1.3   Advanced BIOS Features

```
                     Phoenix - Award BIOS CMOS Setup Utility
                           Advanced BIOS Features
┌─────────────────────────────────────────────────────────────────────────┐
│                                                            ┌──────────────┐│
│   Virus Warning                      [Disabled]            │  Item Help   ││
│   Quick Power On Self Test           [Enabled]             │              ││
│                                                            │              ││
│   First Boot Device                  [Floppy]              │              ││
│   Second Boot Device                 [HDD-0]               │              ││
│   Third Boot Device                  [Disabled]            │              ││
│                                                            │              ││
│   Swap Floppy Drive                  [Disabled]            │              ││
│   Boot Up Floppy Seek                [Enabled]             │              ││
│   Boot Up NumLock Status             [On]                  │              ││
│   Typematic Rate Setting             [Disabled]            │              ││
│   +Typematic Rate(Chars/Sec)         6                     │              ││
│   +Typematic Delay(Msec)             250                   │              ││
│   Security Option                    [Setup]               │              ││
│   HDD S.M.A.R.T. Capability          [Disabled]           │              ││
│                                                            └──────────────┘│
│                                                                           │
│   (General key operation help)                                            │
└─────────────────────────────────────────────────────────────────────────┘
```

Virus Warning

If an attempt is made to write to the boot sector with this item set to [Enabled] , the BIOS displays the warning message to that effect. Note that installing any OS involves write access to the boot sector.

The choice: Enabled / Disabled

Quick Power On Self Test

This setting allows a faster power-on self test (POST) to be performed when the computer is turned on. If this option is enabled, the BIOS shortens or skips some of the checks performed by the POST.

The choice: Enabled/Disabled.

First Boot Device

Second Boot Device

Third Boot Device

Set the order of devices to be searched for the OS to be booted. When you boot the system from a CD-ROM to install an OS, for example, set "First Boot Device" to [CDROM].

The choice: Floppy / HDD-0 / SCSI / CDROM / Disabled

Swap Floppy Drive

If two floppy drives are installed on the system, the logical drive names may be swapped.

The choice: Enabled/Disabled.

Boot Up Floppy Seek
The BIOS performs a disk drive seek during startup.
Disabling this option speeds up the startup sequence.

The choice: Enabled/Disabled.

Boot Up NumLock Status

Selects the initial NumLock state at startup.

The choice: On/Off.

Typematic Rate Setting
Keystrokes are repeated at a rate set by the keyboard controller. Enabling this option allows the keystroke repeat rate and keystroke delay to be selected.

The choice: Enabled / Disabled.

Typematic Rate (Chars/Sec)
Sets the number of keystrokes to generate per second when a key is held down.

The choice: 6/8/10/12/15/20/24/30

Typematic Delay (Msec)
Sets the delay between starting to hold down a key and starting to generate repeated keystrokes.

The choice: 250/500/750/1000

Security Option
Selects whether to require password entry every time the computer is started or only when entering the Setup program.

The choice: Setup/System

Advanced Chipset Features

```
                    Phoenix - Award BIOS CMOS Setup Utility
                         Advanced Chipset Features
┌─────────────────────────────────────────────────────────────────────────┐
│                                                                           │
│    Power-Supply Type              [AT]                  Item Help         │
│                                                                           │
│    OnChip USB                     [Enabled]                               │
│    USB Keyboard Support           [Disabled]                             │
│    USB Mouse Support              [Disabled]                             │
│    OnChip Sound                   [Disabled]                             │
│                                                                           │
│    Memory Parity/ECC Check        [Enabled]                              │
│                                                                           │
│                                                                           │
│                                                                           │
│                                                                           │
│                                                                           │
│  (General key operation help)                                            │
│                                                                           │
└─────────────────────────────────────────────────────────────────────────┘
```

Power-Supply Type

Sets the type of the power supply.

The choice: AT / ATX

OnChip USB

Enables/disables the USB device built in the chipset.

The choice: Enabled / Disabled

USB Keyboard/Mouse Support

The system includes a universal serial bus (USB) controller. Bacially please use as "Disabled".

OnChip Sound

Enables/disables the Sound device built in the chipset.

The choice: Enabled / Disabled

Memory Parity/ECC Check

Enables/disables the ECC feature for memory.

The choice: Enabled / Disabled

6.1.4   Integrated Peripherals

```
           Phoenix - Award BIOS CMOS Setup Utility
                   Integrated Peripherals
┌─────────────────────────────────────────────────────────────────┐
│  OnChip IDE Channel0            [Enabled]         │   Item Help   │
│  OnChip IDE Channel1            [Enabled]         │               │
│  Primary Master   PIO           [Auto]            │               │
│  Primary Slave    PIO           [Auto]            │               │
│  Secondary Master PIO           [Auto]            │               │
│  Secondary Slave  PIO           [Auto]            │               │
│  Primary Master   UDMA          [Auto]            │               │
│  Primary Slave    UDMA          [Auto]            │               │
│  Secondary Master UDMA          [Auto]            │               │
│  Secondary Slave  UDMA          [Auto]            │               │
│  Init Display First             [PCI Slot]        │               │
│  Onboard Serial Port 1          [3F8/IRQ4]        │               │
│  Onboard Serial Port 2          [2F8/IRQ3]        │               │
│  UART 2 Mode                    [Standard]        │               │
│  IR Function Duplex             Half              │               │
│  TX, RX Inverting enable        No, Yes           │               │
│  Onboard Parallel port          [378/IRQ7]        │               │
│  Onboard Parallel Mode          [Normal]          │               │
│  ECP Mode Use DMA               3          *1     │               │
│                                                   │               │
│  (General key operation help)                                     │
└─────────────────────────────────────────────────────────────────┘
```

*1 Neither of the items can be set with "Onboard Parallel Mode" set to [Normal]

OnChip IDE Channel0

OnChip IDE Channel1

Enable/disable the IDE devices built in the chipset.

The choice: Enabled / Disabled

Primary Master PIO

Primary Slave PIO

Secondary Master PIO

Secondary Slave PIO

Set the PIO modes of IDE devices. Usually, leave these items set to [Auto].

The choice: Auto / MODE 0 / MODE 1 / MODE 2 / MODE 3 / MODE 4

Primary Master UDMA

Primary Slave UDMA

Secondary Master UDMA

Secondary Slave UDMA

Set the Ultra-DMA modes of IDE devices. Usually, leave these items set to [Auto].

　　The choice: Auto / Disabled

Init Display First

Selects either the integrated video controller or the video board plugged into a PCI slot, which overrides the other.

　　The choice: PCI Slot / AGP

Onboard Serial Port 1

Onboard Serial Port 2

Assign the addresses and IRQs for the serial devices built in the chipset. By default, Ports 1 and 2 usually correspond to COM1 and COM2, respectively.

　　The choice: Disabled / 3F8/IRQ4 / 2F8/IRQ3 / 3E8/IRQ4 / 2E8/IRQ3

UART 2 Mode

This allows you to set Serial port mode.

　　The choice: Standard / HPSIR / ASKIR

IR Function Duplex

This allows you to set IR.

　　The choice: Half / Full

TX, RX Inverting enable

　　The choice: No, No / No, Yes / Yes, No / Yes, Yes

Onboard Parallel port

Assign the addresses and IRQs for the Parallel devices built in the chipset.

　　The choice: Disabled / 3BC/IRQ7 / 378/IRQ7 / 278/IRQ5

Onboard Parallel Mode

The mode of a parallel device is set up.

　　The choice: Normal / EPP /ECP / ECP/EPP

ECP Mode Use DMA

Sets the DMA channel to be used when the parallel device is used in ECP mode. This item cannot be set with "Onboard Parallel Mode" set to [Normal].

The choice: 1 / 3

Parallel Port EPP Type

Sets the type of the parallel device to be used in EPP mode. This item cannot be set with "Onboard Parallel Mode" set to [Normal].

The choice: EPP1.9 / EPP1.7

6.1.5 Power Management Setup

```
                 Phoenix - Award BIOS CMOS Setup Utility
                         Power Management Setup
┌─────────────────────────────────────────────────────────────────────┐
│ ┌───────────────────────────────────────────────────┬─────────────┐ │
│ │                                                   │             │ │
│ │  ACPI Functions                 [Disabled]        │  Item Help  │ │
│ │                                                   │             │ │
│ │  Soft-Off by PWRBTN             [Delay 4 Sec]     │             │ │
│ │  State After Power Failure      [Off]             │             │ │
│ │                                                   │             │ │
│ │                                                   │             │ │
│ │                                                   │             │ │
│ │                                                   │             │ │
│ │                                                   │             │ │
│ │                                                   │             │ │
│ │                                                   │             │ │
│ │                                                   │             │ │
│ │                                                   │             │ │
│ │                                                   │             │ │
│ │                                                   │             │ │
│ ├───────────────────────────────────────────────────┴─────────────┤ │
│ │  (General key operation help)                                    │ │
│ └──────────────────────────────────────────────────────────────────┘ │
└─────────────────────────────────────────────────────────────────────┘
```

ACPI Functions

Displays whether ACPI is enabled or disabled on your system.

Please set to same as the below table, by Power type and OS.

	ACPI Functions	Power Supply Type	State After Power Failure
Windows 98SE	Enabled	ATX	Off
	Disabled	AT	On
Windows NT4.0	Disabled	ATX	Off
	Disabled	AT	On
Windows 2000	Enabled	ATX	Off
	Disabled	AT	On
Windows XP	Enabled	ATX	Off
	Disabled	AT	On

Soft-Off by PWRBTN

Sets the behavior of the Power button.

The choice:

Delay 4 Sec Allows the Power button to place the system in sleep mode and to wake it up. Holding down the button for at least four seconds turn off the power supply.

Instant-Off   Uses the Power button as a normal system power ON/OFF button.

State After Power Failure

Selects the type of activation to be performed when the system is turned on back after power shutdown or failure.

The choice:

Auto   Places the system in the shutdown state.

On   Always turns on the system.

Off   Always turns off the system.

Note that, if you recycle the power supply while it has not been completely shut down, the system may not be turned on even with this item set to [On].

6.1.6   PnP/PCI Configurations

```
              Phoenix - Award BIOS CMOS Setup Utility
                      PnP/PCI Configurations

  Reset Configuration Data         [Disabled]           Item Help

 > IRQ Resources                   [Press Enter]
 > DMA Resources                   [Press Enter]









  (General key operation help)
```
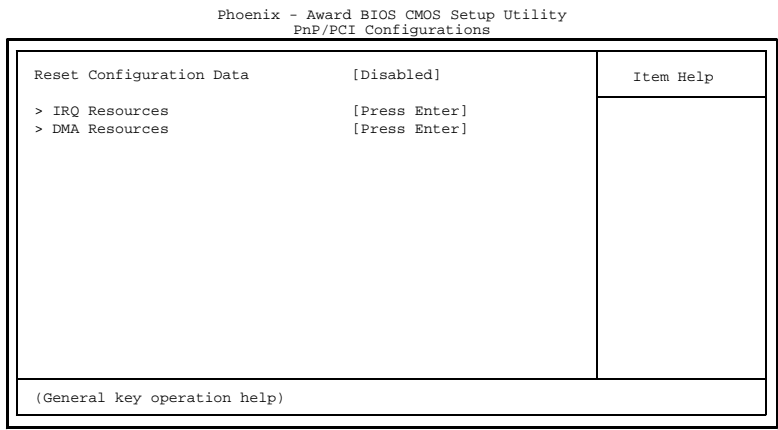
Reset Configuration Data

Enables the initialization of system configuration data stored in BIOS ROM.   To actually initialize the data, set this item to [Enabled] and exit the Setup Utility while saving the BIOS settings.

The choice: Enabled / Disabled

IRQ Resources

Calls up the sub-menu (IRQ Resources list shown below) to reserve IRQs for legacy devices.

The choice: PCI/ISA PnP / Legacy ISA

```
                    Phoenix - Award BIOS CMOS Setup Utility
                              IRQ Resources

   IRQ-3  assigned to              [PCI/ISA PnP]          Item Help
   IRQ-4  assigned to              [PCI/ISA PnP]
   IRQ-5  assigned to              [PCI/ISA PnP]
   IRQ-7  assigned to              [PCI/ISA PnP]
   IRQ-9  assigned to              [PCI/ISA PnP]
   IRQ-10 assigned to              [PCI/ISA PnP]
   IRQ-11 assigned to              [PCI/ISA PnP]
   IRQ-12 assigned to              [PCI/ISA PnP]
   IRQ-14 assigned to              [PCI/ISA PnP]
   IRQ-15 assigned to              [PCI/ISA PnP]




   (General key operation help)
```

DMA Resources

Calls up the sub-menu (DMA Resources list shown below) to reserve DMAs for legacy devices.

The choice: PCI/ISA PnP / Legacy ISA

```
                    Phoenix - Award BIOS CMOS Setup Utility
                              DMA Resources

   DMA-0 assigned to               [PCI/ISA PnP]          Item Help
   DMA-1 assigned to               [PCI/ISA PnP]
   DMA-3 assigned to               [PCI/ISA PnP]
   DMA-5 assigned to               [PCI/ISA PnP]
   DMA-6 assigned to               [PCI/ISA PnP]
   DMA-7 assigned to               [PCI/ISA PnP]




   (General key operation help)
```

6.1.7　PC Health Status

```
              Phoenix - Award BIOS CMOS Setup Utility
                         PC Health Status
┌──────────────────────────────────────────────────────────────────┐
│                                                                    │
│  Current System Temp.            35ºC/95ºF        ┌──────────────┐ │
│  Current CPU Temp                37ºC/98ºF        │  Item Help   │ │
│                                                   │              │ │
│  Current CPUFAN Speed            4714 RPM         │              │ │
│  Current SystemFAN Speed         0RPM             │              │ │
│                                                   │              │ │
│  Vore                            1.70 V           │              │ │
│  2.5V                            2.51 V           │              │ │
│  3.3V                            3.38 V           │              │ │
│  5V4.90 V                                         │              │ │
│  12V                            11.88 V           │              │ │
│                                                   │              │ │
│                                                   │              │ │
│                                                   │              │ │
│                                                   │              │ │
│                                                   │              │ │
│                                                   └──────────────┘ │
│  (General key operation help)                                      │
│                                                                    │
└──────────────────────────────────────────────────────────────────┘
```

Current System Temp

Displays the system temperature detected by the thermal sensor mounted on the SBC.

Current CPU Temp.

Displays the CPU temperature detected by the thermal sensor placed below the CPU.

Current CPUFAN Speed

Displays the CPU fan speed.

Current SystemFAN Speed

Displays the system fan speed.

Vore / 2.5V / 3.3V / 5V / 12V

Displays the power-supply voltages on the SBC.

6.1.8   Frequency/Voltage Control

```
                    Phoenix - Award BIOS CMOS Setup Utility
                           Frequency/Voltage Control
```

```
  CPU Clock (Test only)              [Default]              Item Help




  (General key operation help)
```

CPU Clock (Test only)

Although the HOST/CPU clock frequency can be changed, the CPU Card must be used with this item set to [Default].

6.2   POST beep/Error message

The BIOS tests the system by the POST (power-on self test). If the POST detects an error, it beeps or displays an on-screen message to notify you of the error. Beeps for error notification are emitted for errors detected with the screen not initialized. POST error messages are given below.

Two short beeps followed by a long beep with no message

Indicates that the video device is not working.

One long beep with no message (repeated)

Indicates that no memory has been installed or that memory detection cannot be performed.

CMOS checksum error – Default loaded
Press F1 to continue, DEL to enter SETUP

The CMOS backup battery may have been low. If so, replace it with a new one.

CMOS data may have been corrupted by incorrectly turning off the power supply or inappropriately handling the CPU Card alone. Invoke the Setup Utility to make BIOS settings again. Although you can still start the system by pressing the <F1> key, the system may run so slowly as it is started with the most conservative settings. If this error occurs after invalid shutdown during installation of an OS, you should press the <DEL> key to invoke the Setup Utility and check the settings.

DISK BOOT failure, INSERT SYSTEM DISK AND PRESS ENTER

This error occurs when the boot device cannot be detected. Possible causes are no system disk in the FDD, no power to the drive, the drive cable unplugged, the drive flat cable damaged, or the HDD boot area left inactive.

Invalid system disk Replace the disk, and then press any key

This error occurs when the FDD has been set incorrectly or when the inserted disk is not a system disk. Check the disk media type. Run the Setup Utility to check whether Drive A/B has been set correctly and whether the connected drive matches the drive setting.

Floppy disk(s) fail (40)

A possible cause is no FDD drive connected. Check the FDD cable. If your system has no FDD connected, use the Setup Utility to set "Drive A" to [None] or "Halt On" to an option that prevents the system from detecting FDD errors.

Keyboard error or no keyboard present

A possible cause is a defective keyboard or no keyboard connected. If your system has no keyboard connected, use the Setup Utility to set "Halt On" to an option that prevents the system from detecting keyboard errors.

I/O CHANELL CHECK –CHECKING FOR SEGMENT….
 OFFENDING SEGMENT:
 XXXX
 PRESS F1 TO DISABLE NMI, F2 TO REBOOT

A nonmaskable interrupt (NMI) caused by an active IOCHK signal has occurred. The prompted action to press the <F1> or <F2> key will not be processed.

RAM PARITY ERROR –CHECKING FOR SEGMENT….
 OFFENDING SEGMENT:
 XXXX
 PRESS F1 TO DISABLE NMI, F2 TO REBOOT

An NMI caused by a parity error has occurred. The prompted action to press the <F1> or <F2> key will not be processed.

Chapter 7 Appendix

7.1   Available Accessories

LCD connector converter board
-    ADP-6940   LCD Adapter board for SPI-6941-LV

Cable
-    IDE-66 Cable   Ultra ATA/66 IDE cable

-    USB Connector Cable   USB connector cable (shielded)

CPU
-    Celeron 566MHz   PC686C-566

-    Celeron 850MHz   PC686C-850

-    Pentium III 700MHz   PC686-700

-    Pentium III 850MHz   PC686-850

-    Pentium III Tualatin 1.26GMHz   PC686-1260

Memory

-    168PIN DIMM PC133 SDRAM 128MB   PC-MSD128-168V

-    168PIN DIMM PC133 SDRAM 256MB   PC-MSD256-168V

-    168PIN DIMM PC133 SDRAM 512MB   PC-MSD512-168V

-    168PIN DIMM PC133 SDRAM 128MB With ECC

                                              PC-MSD128E-168V

-    168PIN DIMM PC133 SDRAM 256MB With ECC

                                              PC-MSD256E-168V

-    168PIN DIMM PC133 SDRAM 512MB With ECC

                                              PC-MSD512E-168V

7.2   Optional LCD daughter card (ADP-6940)

Overview

The SPI-6941-LV need to connected to a LCD daughter card that has a LCD connector, it uses PanelLink Digital technology (Silicon Image SiI164 chipset) to support LCD displays ranging from VGA to XGA .
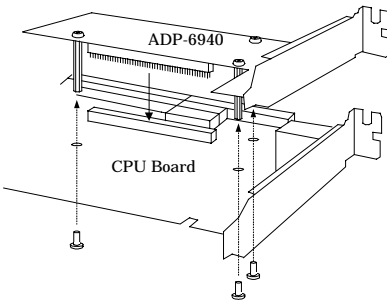
39page says the LCD display that is supported.

When using the touch panel, ADP-6940 use the COM1 port of SPI-6941-LV.
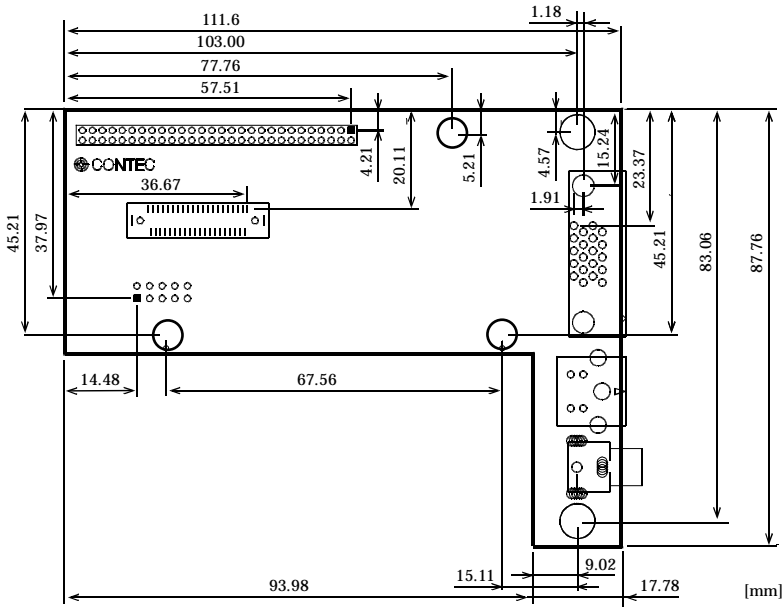
Connector Location
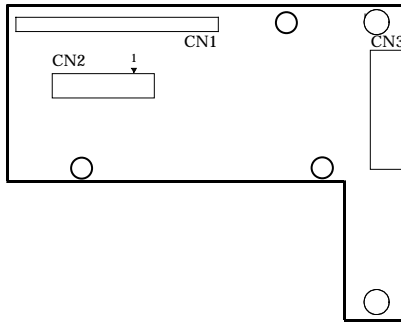
ADP-6940 Installation

CN1 of ADP-6940 is connected with CN12(LCD connector) of the CPU board. The screws is tightened from back of the CPU board by three points.

Board dimension

[mm]

LCD transfer Connector: CN1

CN1 is a 56-pin connector that can link to the SPI-6941-LV CPU card. The following shows the pin assignments of this connector.

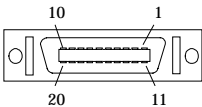| PIN No.	Function	PIN No.	Function
1	FTD0	2	FTD1
3	FTD2	4	FTD3
5	FTD4	6	FTD5
7	FTD6	8	FTD7
9	FTD8	10	FTD9
11	FTD10	12	FTD11
13	FTD12	14	FTD13
15	FTD13	16	FTD15
17	FTD16	18	FTD17
19	FTD18	20	FTD19
21	FTD20	22	FTD21
23	FTD22	24	FTD23
25	GND	26	FPSCLK
27	FPEN	28	LVDSCLK
29	GND	30	FTHSYNC
31	GND	32	FTVSYNC
33	FPVDDEN	34	DE
35	GND	36	Y2
37	VBIASEN	38	Y3
39	N.C.	40	NC
41	NC	42	NC
43	VCC	44	PCIRST#
45	NC	46	VCC
47	VCC3	48	VCC3
49	NC	50	VCC3
51	N.C.	52	Y
53	SDATA	54	C
55	SCLK	56	CVBS

LCD Connector: CN2

CN2 is a 41-pin connector for flat panel LCD displays. The following shows the pin assignments of this connector.

PIN No.	Function	PIN No.	Function
1	DP20	2	GND
3	DP16	4	VCC
5	DP21	6	DP0
7	DP17	8	DP8
9	DP22	10	DP1
11	DP18	12	DP9
13	DP23	14	DP2
15	DP19	16	DP10
17	VCC	18	DP3
19	FLM	20	DP11
21	MX	22	DP4
23	LP	24	DP12
25	SHFCLK	26	DP5
27	3.3V	28	DP13
29	3.3V	30	DP6
31	ENABLK	32	DP14
33	LCDVDD	34	DP7
35	ENVEE	36	DP15
37	GND	38	N.C.
39	GND	40	N.C.
41	N.C.		

LCD panel link Connector: CN3

CN3 is a 20-pin connector for flat panel LCD displays. The following shows the pin assignments of this connector.

PIN No.	Function	PIN No.	Function
1	TX1+	11	TX2+
2	TX1-	12	TX2-
3	GND	13	GND
4	GND	14	GND
5	TXC+	15	TX0+
6	TXC-	16	TX0-
7	GND	17	NC
8	VDDP	18	SENS
9	Y3	19	VCC
10	Y2	20	VCC

Signal Description – Panel Link Connector

TXC+/TXC-: Low voltage swing differential output clock pair.

TX0+/TX0-: Low voltage swing differential output data pair. This pair transmits the flat panel signals: DP0 to DP7, LP and FLM.

TX1+/TX1-: Low voltage swing differential output data pair. This pair transmits the flat panel signals: DP8 to DP15.

TX2+/TX2-: Low voltage swing differential output data pair. This pair transmits the flat panel signals: DP16 to DP23.

Y2(RxD): Serial(COM1)input. This signal receives serial data to the communication link.

Y3(TxD): Serial(COM1)output. This signal sends serial data to the communication link.

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