SI5TTM

Pentium All-In-One Little Board

Version 1.0

User's Manual

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Introduction

This manual is designed to give you information on the SI5TTM embedded board. It is divided into the following sections:

The topics covered in this chapter are as follows:

- Checklist
- Description
- Features
- Specifications
- Layout of Key Components and Dimensions

Checklist

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

- The SI5TTM Embedded Little Board
- This User's Manual
- 1 Diskette Containing Intel PCI IDE Driver and Flash Memory Utility
- 2 Diskettes Containing C&T 69000 VGA Driver
- 1 Diskette Containing VIA VT86C100A LAN Driver
- 8 Diskettes Containing Drivers and Programs for Creative Labs SB16 PnP
- 1 Diskette Containing System Monitor Utility

Description

The SI5TTM is a Pentium Embedded Little Board based on Intel's 430TX chipset and is fully designed for harsh industrial environment. It features ZIF Socket 7 compatible with various processors from Intel, AMD, Cyrix and IDT. With two 72-pin SIMM sockets, this board accommodates up to 128MB of DRAMs in FPM or EDO configurations.

As a multimedia embedded board, the SI5TTM incorporates the C&T 69000 VGA controller that supports both CRT and flat panel displays and XGA resolution. The ViBRA 16XV (CT2511-SBT) audio chip on board provides all the digital audio and analog mixing functions needed for recording and playing sound on personal computers.

The SI5TTM comes with a VIA LAN chip that is compatible with both traditional 10Mbps and advanced 100Mbps LAN facilities. It packs all the functions of a versatile system into a form factor that of a 5.25 floppy disk drive.

Features

- CPU Speed 90~300MHz, Intel P54C, P55C/MMX, Cyrix 6x86, 6x86L, 6x86MX, AMD K5, K6, IDT C6
- Intel 430TX PCIset
- Up to 128MB system memory
- Onboard C&T 69000 VGA CRT/LCD controller
- Onboard VIA VT86C100A 10/100Mbps Ethernet controller
- 16 level programmable watchdog timer
- High speed bi-directional SPP/ECP/EPP parallel port
- Four serial ports (two RS-232, one RS-232/422/485, one RS-232 TTL level
- PC/104 connector
- System temperature, voltage and fan speed monitoring

Specifications

- **Processor Socket**: ZIF Socket 7
- **Processor**:
  Intel Pentium/P55C* 90/100/120/133/150/166/200/233
  Cyrix 6x86/6x86L P150+/P166+
  Cyrix 6x86MX-166/180/200/PR300
  AMD K5 PR90/PR100/PR133/PR166
  AMD K6-166/200/233/266/300/333/366
  IDT WinChip C6-180/200
- **Chipset**: Intel 430TX PCIset with built-in PCI EIDE
- **Secondary Cache**: 512KB P.B. SRAM
- **Memory**: Up to 128MB FPM/EDO DRAM
- **Memory Sockets**: Two 72-pin SIMM sockets for DRAMs in 4MB, 8MB, 16MB, 32MB and 64MB configurations.
- **BIOS**: Award BIOS, PnP support
  - FLASH EEPROM (128KB) for BIOS update
  - ISA Plug and Play (PnP) extension
  - Power management

- **Multi I/O**: Winbond 977 & 877 chipset
- **Parallel Port**: One high-speed parallel port, SPP/EPP/ECP mode
- **Serial Port**: Four 16550 UART compatible RS232/422/485/TTL level ports
- **Enhanced IDE**: Two Bus Mastering EIDE mode, up to 4 devices; two EIDE interfaces for up to 4 devices; supports PIO Mode 3/4 or Ultra DMA/33 IDE Hard Disk, ATAPI CD-ROM, and LS-120.
- **FDD Interface**: Two floppy drives; supports 360KB, 720KB, 1.2MB, 1.44MB and 2.88MB formats
- **USB Interface**: Two USB pin-header connectors, compliant with USB Specification Rev. 1.0
- **Watchdog Timer**: 16-level, programmable
  - I/O port 0443H to enable watchdog
  - I/O port 0441H to disable watchdog
  - Time-out timing select 0/2/4/6/8/10/12/14/16/18/20/22/ 24/26/28/30 seconds (+/-20%)
- **Green Function**: Power management via BIOS, activated through mouse/keyboard movement
- **Keyboard/Mouse Connector**: 10-pin keyboard/mouse pin-header connector
- **IrDA Interface**: Pin-header connector for the optional IrDA external connector
- **VGA Display**:
  - C&T 69000 VGA chip on board
  - SVGA for CRT & Panel
  - 32-bit PCI local bus
  - VGA BIOS with 128KB flash ROM and system BIOS
  - 15-pin connector
  - 1024x768(High Color) resolution on SVGA(2MB memory)
  - 56-pin connector for LCD panel, 1,024 x 768 resolution
  - LCD panel supports monochrome, color STN, TFT, EL
  - Simultaneous VGA and panel display

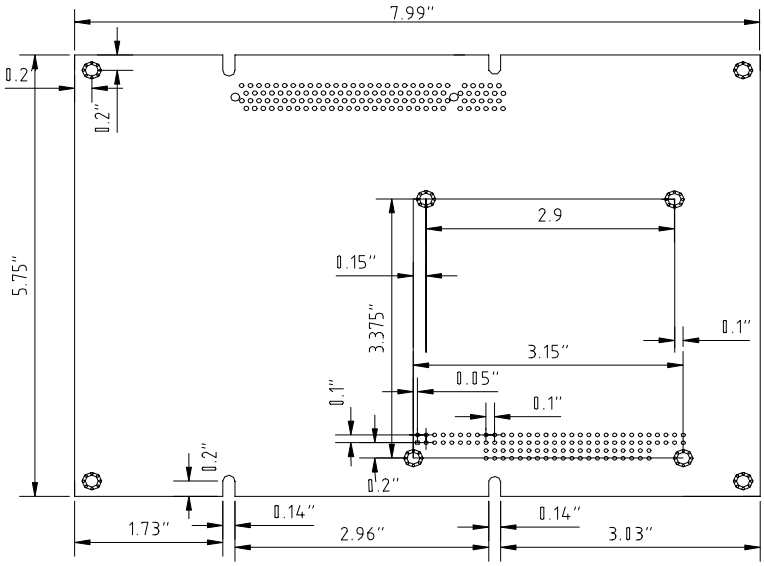
- **Audio Support**
  - Creative Labs ViBRA 16VX audio chip on board
  - Analog mixing of six audio sources
  - Digital audio (stereo)
  - CD audio (stereo)
  - Synthesized music (stereo)
  - Line level audio (stereo)
  - Microphone level audio (mono)
  - PC speaker (mono)
  - Individual software programmable volume controls
  - Mixer controlled record for recording and playing and playing sound on personal computers.

- **Environmental and Mechanical**:
  - **Power Supply**: 3.5A @+5V
  - **Temperature**: 0°C to 60°C
  - **Humidity**: 5% to 95%
  - **Dimensions**: 203mm x 146mm (7.99” x 5.75”)

Intelligence

- **CPU Slow Down**: When system overheat is detected, CPU slows down to prevent CPU damage. The CPU speed is restored when temperature falls to a safe level. System overheat is usually caused by malfunctioning of the CPU or system fan.
- **Virus Write Protection**: New-generation viruses can destroy data on storage media, as well as BIOS data. The SI5TTM is designed to work with the BIOS and flash EPROM to disable write permission until the system initialization is completed upon boot-up.
- **Temperature Monitoring and Alert**: A sensor for the CPU temperature on the SI5TTM monitors the CPU temperature and alerts the user through the speaker when temperature exceeds the safe heat level.
- **Voltage Monitoring and Alert**: Stable current is critical to system components. The SI5TTM monitors system voltage levels to ensure stable system performance.
- **Fan Status Monitoring**: The CPU fan and system fan speeds are monitored to prevent system overheat.
- **System Resources Alert**: Application crashes are sometimes caused by used up system resources. Suggestions are given to the user to effectively management their system resources.
- **Year 2000 Compliant BIOS**: The onboard Award BIOS is YK2 compliant and will pass software applications that have the tendency to invoke INT1AH function 04H such as year2000.exe utility released by NSTL.

Board Dimensions and Layout



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Installations

This chapter provides information on how to use the jumpers and connectors on the SI5TTM in order to set up a workable system. The topics covered are:

CPU Installation

The SI5TTM Embedded Little Board supports a ZIF processor socket for Pentium-level processors.

Unlike PGA sockets, ZIF (Zero Insertion Force) sockets come 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 ZIF socket, check if the jumpers for the CPU type and speed are correct.

***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.*

Memory Installation

The SI5TTM Embedded Little Board supports two 72-pin SIMM sockets for a maximum total memory of 128MB. The DRAMs (5Volts) for the SIMM sockets can be 4MB, 8MB, 16MB, 32MB, and 64MB in EDO and FPM types.

The following should be noted when populating the SIMM sockets:

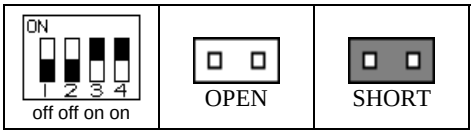
1. SIMM1 and SIMM2 should consist of the same size SIMMs.
2. SIMM1 and SIMM2 should consist of the same type SIMMs. For example, *SIMM1 and SIMM2 are both be EDO or Page Mode*.

SIMM1, SIMM2	Total Memory
4MB×2	8MB
8MB×2	16MB
16MB×2	32MB
32MB×2	64MB
64MB×2	128MB

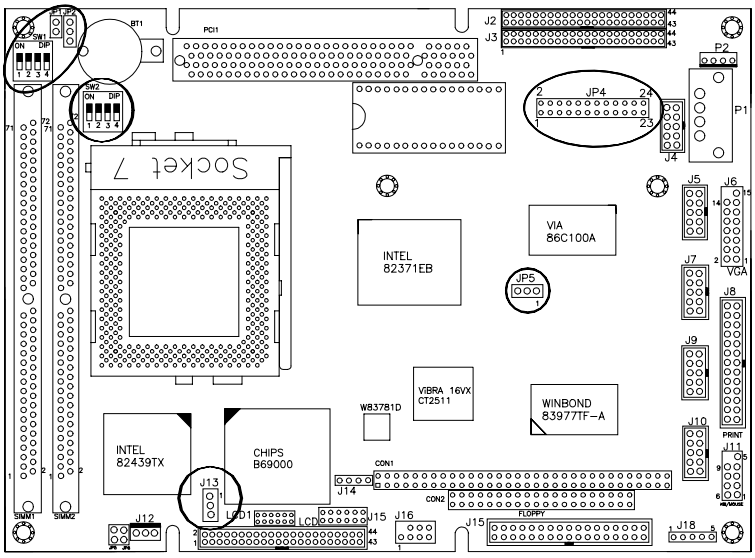
Jumpers on the SI5TTM

The jumpers on the SI5TTM allow you to configure your embedded board according to the needs of your applications. If you have doubts about the best jumper configuration for your needs, contact your dealer or sales representative. The following table lists the connectors on SI5TTM and their respective functions.

***Remarks**: The following conventions are used in this section:*



Jumper Locations on the SI5TTM



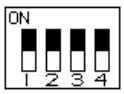
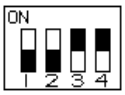
SW2 (1-4): CPU Voltage Selector

For Single Voltage CPU*: Intel P54C, Cyrix 6x86, AMD K5, IDT C6

VIO	VCORE	SW2 (1-4)	Switch Setting
3.5V	3.5V		1 2 3 4 on on on on

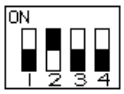
**Default*

For Dual Voltage CPU: Intel P55C, Cyrix 6x86L/MX, AMD K6**

VIO	VCORE	SW2 (1-4)	Switch Setting
3.4V	3.5V		1 2 3 4 on on on on
3.4V	3.2V		1 2 3 4 off off on on
3.4V	3.0V		1 2 3 4 off on off on
3.4V	2.9V		1 2 3 4 on off off on
3.4V	2.8V		1 2 3 4 off off off on
3.4V	2.7V		1 2 3 4 on on on off

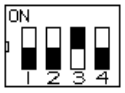
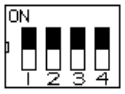
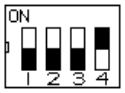
*** P55C = Pentium MMX*

For Dual Voltage CPU: Intel P55C, Cyrix 6x86L/MX, AMD K6

VIO	VCORE	SW2 (1-4)	Switch Setting
3.4V	2.6V		1 2 3 4 off on on off
3.4V	2.5V		1 2 3 4 on off on off
3.4V	2.4V		1 2 3 4 off off on off
3.4V	2.3V		1 2 3 4 on on off off
3.4V	2.2V		1 2 3 4 off on off off
3.4V	2.1V		1 2 3 4 on off off off
3.4V	2.0V		1 2 3 4 off off off off

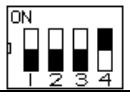
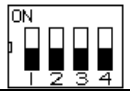
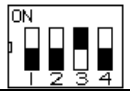
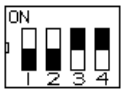
SW1 (1-4), JP1, JP5: CPU Frequency Selector

For Intel Pentium CPU

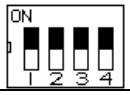
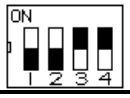
CPU FREQ.	Bus Clock Multiplier	JP1	SW1 (1-4)	Switch Setting
P54C-90	60MHz 1.5x	 OPEN		1 2 3 4 on on off off
P54C-100	66MHz 1.5x	 OPEN		1 2 3 4 off off off off
P54C-120	60MHz 2x	 OPEN		1 2 3 4 on on on off
P54C-133	66MHz 2x	 OPEN		1 2 3 4 off off on off
P54C-150	60MHz 2.5x	 OPEN		1 2 3 4 on on on on
P54C/P55C-166	66MHz 2.5x	 OPEN		1 2 3 4 off off on on
P54C/P55C-200	66MHz 3x	 OPEN		1 2 3 4 off off off on
P55C-233	66MHz 3.5x	 OPEN		1 2 3 4 off off off off

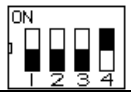
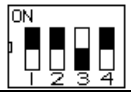
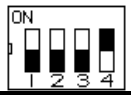
For AMD K5/K6 CPU

CPU FREQ.	Bus Clock Multiplier	JP1	SW1 (1-4)	Switch Setting
K5-PR100 (100MHz)	66MHz 1.5x	 OPEN		1 2 3 4 off off off off
K5-PR133 (100MHz)	66MHz 1.5x	 OPEN		1 2 3 4 off off on off

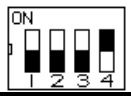
CPU FREQ.	Bus Clock Multiplier	JP1	SW1 (1-4)	Switch Setting
K5-PR166 (116.7MHz) K6-166	66MHz 1.75x	OPEN		1 2 3 4 off off on on
K6-200	66MHz 3x	OPEN		1 2 3 4 off off off on
K6-233	66MHz 3.5x	OPEN		1 2 3 4 off off off off
K6-266	66MHz 4x	SHORT		1 2 3 4 off off on off
K6-300	66MHz 4.5x	SHORT		1 2 3 4 off off on on
K6-333	66MHz 5x	SHORT		1 2 3 4 off off off on
K6-366	66MHz 5.5x	SHORT		1 2 3 4 off off off off

For Cyrix 6x86 and IDT C6 CPU

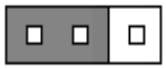
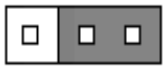
CPU FREQ.	Bus Clock Multiplier	JP1	SW1 (1-4)	Switch Setting
6x86(L)-P 150+ (120MHz)	60MHz 2x	OPEN		1 2 3 4 on on on off
6x86(L)-P 166+ (133MHz)	66MHz 2x	OPEN		1 2 3 4 off off on off
6x86MX-P R166	60MHz 2.5x	OPEN		1 2 3 4 on on on on
6x86MX-P R200	66MHz 2.5x	OPEN		1 2 3 4 off off on on

6x86MX-P R233	66MHz 3x	 OPEN		1 2 3 4 off off off on
6x86MX-P R300	66MHz 3.5x	 OPEN		1 2 3 4 off off off off
IDT C6-180	60MHz 3x	 OPEN		1 2 3 4 on on off on
IDT C6-200	66MHz 3x	 OPEN		1 2 3 4 off off off on

For Cyrix 6x86MX CPU at 75MHz Bus

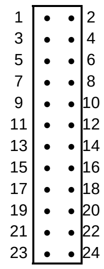
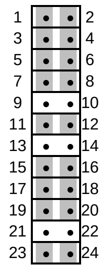
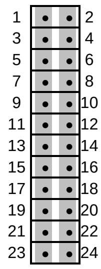
CPU FREQ.	Bus Clock Multiplier	JP5	SW1 (1-4)	Switch Setting
6x86MX-PR200	75MHz 2x	 SHORT		1 2 3 4 off off on off
6x86MX-P R233	75MHz 2.5x	 SHORT		1 2 3 4 off off on on
6x86MX-P R300	75MHz 3x	 SHORT		1 2 3 4 off off off on

JP2: Clear CMOS Content

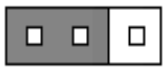
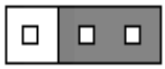
JP2	Setting	Function
 1 2 3	Pin 1-2 Short/Closed	Normal Operation
 1 2 3	Pin 2-3 Short/Closed	Clear CMOS Content

JP4: RS232/422/485 (COM2) Selection

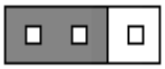
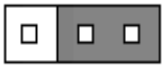
COM1 is fixed for RS-232 use only.
COM2 is selectable for RS232, RS-422 and RS-485.
The following table describes the jumper settings of this connector.

COM2 Function	RS-232	RS-422	RS-485
Jumper Setting (pin closed)	all jumpers open	1-2 3-4 5-6 7-8 11-12 15-16 17-18 19-20 23-24	1-2 3-4 5-6 7-8 9-10 11-12 13-14 15-16 17-18 19-20 21-22 23-24
Jumper Illustration	 JP4	 JP4	 JP4

JP5: DiskOnChip BIOS Expansion Address Select

JP5	Setting	Address 7
 1 2 3	Pin 1-2 Short/Closed	D0000-DFFFF
 1 2 3	Pin 2-3 Short/Closed	D8000-DFFFF

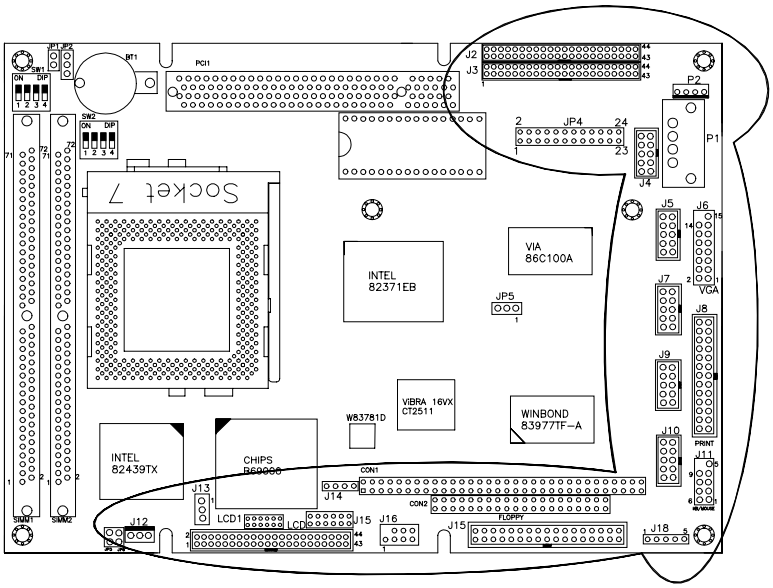
J13: LCD Power Setting

J13	Setting	Function
 1 2 3	Pin 1-2 Short/Closed	3.3V
 1 2 3	Pin 2-3 Short/Closed	5.5V

Connectors on the SI5TTM

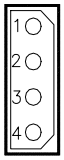
The connectors on the SI5TTM allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following table lists the connectors on SI5TTM and their respective functions.

Connector Locations on the SI5TTM



P1: Main Power Connector

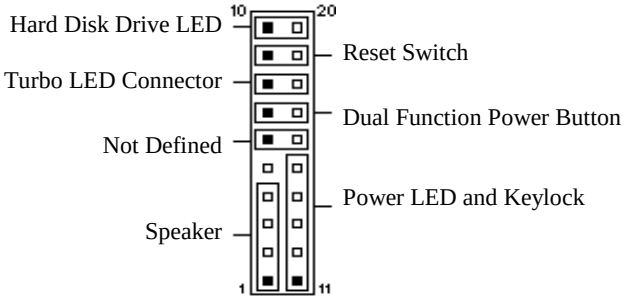
The P1 main power connector has the following pin assignments.



P1 Pin #	Signal Name
1	+12V
2	Ground
3	Ground
4	+5V

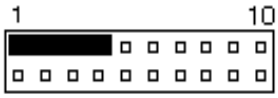
J1: Front Bezel Connector

The front bezel of the case has a control panel that provides light indication of the computer activities and switches to change the computer status. J1 is a 20-pin header that provides interfaces for the following functions.



Speaker: Pins 1 - 4

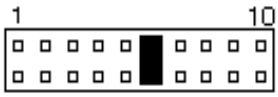
This connector provides an interface to a speaker for audio tone generation. An 8-ohm speaker is recommended.



Pin #	Signal Name
1	Speaker out
2	No connect
3	Ground
4	+5V

Green Function: Pins 6 and 16

This connector is for the "Green Switch" on the control panel, which, when pressed, will force the motherboard immediately into the power saving (sleep) mode.



Pin #	Signal Name
7	Sleep
17	Ground

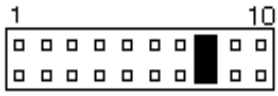
Power LED and Keylock: Pins 11 - 15

The power LED indicates the status of the main power switch. The keylock switch, when closed, will disable the keyboard function.

Pin #	Signal Name
11	Power LED
12	No connect
13	Ground
14	Keylock
15	Ground

Turbo LED Connector: Pins 8 and 18

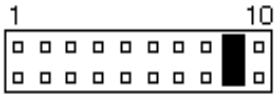
There is the no turbo/deturbo function on the embedded board. The Turbo LED on the control panel will always be on when attached to this connector.



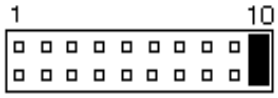
Pin #	Signal Name
8	5V
18	Ground

Reset Switch: Pins 9 and 19

The reset switch allows the user to reset the system without turning the main power switch off and then on. Orientation is not required when making a connection to this header.

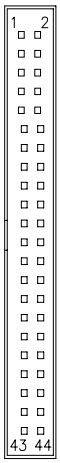


Hard Disk Drive LED Connector: Pins 10 and 20
This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.



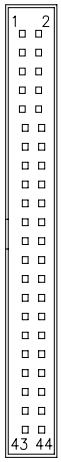
J2, J3: EIDE Connectors

J2 is the *primary* IDE connector and J3 is the *secondary* IDE connector.



J2: IDE1

Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground
Vcc	41	42	Vcc
Ground	43	44	N.C.

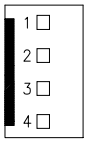


J3: IDE2

Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK1	29	30	Ground
MIRQ0	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground
Vcc	41	42	Vcc
Ground	43	44	N.C.

P2: Peripheral Main Power Connector

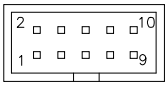
The P1 main power connector has the following pin assignments.



Pin #	Signal Name
1	Ground
2	-5V
3	Ground
4	-12V

J4: RJ45 Connector

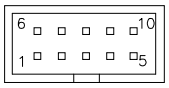
J4, an RJ45 connector, is for the external LAN connector. The SI5TTM supports both 10Mbps and 100Mbps LAN facilities.



Signal Name	Pin #	Pin #	Signal Name
Vcc	1	6	GND
LED TX	2	7	L LED
RX+	3	8	GND
RX-	4	9	TX+
Speed 10	5	10	TX-

J5, J7, J9, J10: Serial Ports

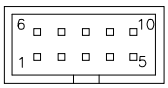
J5 (COM1), J7 (COM2), J9 (COM3) and J10 (COM4/TTL level) are the onboard serial ports on the SI5TTM.



J5, J9, J10

Pin #	Signal Name (RS-232)
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND/ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	No Connect.

J7 (COM2) is jumper (**JP3**) selectable for RS-232, RS-422 and RS-485.

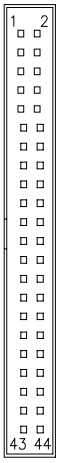


J7: COM2

Pin #	Signal Name		
	RS-232	**R2-422**	**RS-485**
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX	NC
5	GND	GND	GND
6	DSR	RTS-	NC
7	RTS	RTS+	NC
8	CTS	CTS+	NC
9	RI	CTS-	NC
10	NC	NC	NC

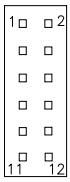
LCD, LCD1: LCD Panel Connectors

LCD and LCD1 are pin headers for flat panel LCD displays. The following shows the pin assignments of this connector.



LCD

Signal Name	Pin #	Pin #	Signal Name
+12V	1	2	+12V
GND	3	4	GND
5V/3.3V	5	6	5V/3.3V
ENAVEE	7	8	GND
P0	9	10	P1
P2	11	12	P3
P4	13	14	P5
P6	15	16	P7
P8	17	18	P9
P10	19	20	P11
P12	21	22	P13
P14	23	24	P15
P16	25	26	P17
P18	27	28	P19
P20	29	30	P21
P22	31	32	P23
GND	33	34	GND
SHFCLK	35	36	FLM
MDE	37	38	LP
GND	39	40	ENABKL
GND	41	42	LCDVDD
DNAVDD	43	44	5V/3.3V

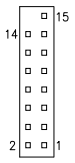


LCD1

Signal Name	Pin #	Pin #	Signal Name
P24	1	2	P25
P26	3	4	P27
P28	5	6	P29
P30	7	8	P31
P32	9	10	P33
P34	11	12	P35

J6: VGA CRT Connector

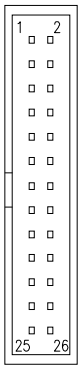
J6 is a 15-pin header for an external VGA CRT female connector.



Signal Name	Pin	Pin	Signal Name
Red	1	2	Vcc
Green	3	4	GND
Blue	5	6	N.C.
N.C.	7	8	N.C.
GND	9	10	H-Sync
GND	11	12	V-Sync
GND	13	14	N.C.
GND	15	16	N.C.

J8: Parallel Port Connector

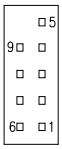
The following table describes the pin out assignments of this connector.



Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
PD7, parallel data 7	9	22	Ground
ACK, acknowledge	10	23	Ground
Busy	11	24	Ground
Paper empty	12	25	Ground
Select	13	N/A	N/A

J11: Keyboard/Mouse Connector

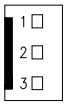
J11, a 10-pin header connector, has functions for both keyboard and mouse. The following table shows the pin assignments of this connector.



Signal Name	Pin #	Pin #	Signal Name
N.C.	10	5	N.C.
KB clock	9	4	Mouse clock
KB data	8	3	Mouse data
Vcc	7	2	Vcc
Ground	6	1	Ground

J12: CPU Fan Power Connector

J12 is a 2-pin header for a CPU fan. The fan must be a 12V fan.



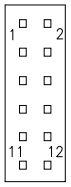
Pin #	Signal Name
1	Rotation
2	+12V
3	Ground

J14: CD Audio Connector

Pin #	Signal Name
1	CD Audio L
2	GND
3	GND
4	CD Audio R

J15: Audio Connector

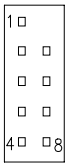
J15, a 12-pin header connector, has functions for both keyboard and mouse. The following table shows the pin assignments of this connector.



Signal Name	Pin #	Pin #	Signal Name
Line Out R	1	2	Line Out L
GND	3	4	GND
Line In R	5	6	Line In R
GND	7	8	GND
Mic	9	10	BIAS
GND	11	12	GNC

J16: USB Connector

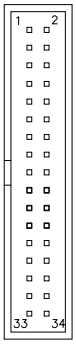
J16 is the onboard USB pin-header that supports an external USB connector with two ports.



Pin #		Signal Name
1		Vcc
2	6	USB-
3	7	USB+
4	8	Ground

J17: Floppy Drive Connector

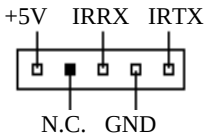
J17 of the SI5TTM is a 34-pin header and will support up to 2.88MB floppy drives.



Signal Name	Pin #	Pin #	Signal Name
Ground	1	2	RM/LC
Ground	3	4	No connect
Ground	5	6	No connect
Ground	7	8	Index
Ground	9	10	Motor enable 0
Ground	11	12	Drive select 1
Ground	13	14	Drive select 0
Ground	15	16	Motor enable 1
Ground	17	18	Direction
Ground	19	20	Step
Ground	21	22	Write data
Ground	23	24	Write gate
Ground	25	26	Track 00
Ground	27	28	Write protect
Ground	29	30	Read data
Ground	31	32	Side 1 select
Ground	33	34	Diskette change

J18: IrDA Connector

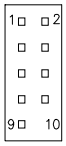
This connector is used for an IrDA connector for wireless communication.



Pin #	Signal Name
1	+5V
2	FIRRX
3	Ir RX
4	Ground
5	Ir TX

J19: Digital I/O Connector

This 10-pin Digital I/O connector supports TTL levels and is used to control external devices requiring ON/OFF circuitry.



Signal Name	Pin #	Pin #	Signal Name
Vcc	1	2	GND
DI0	3	4	DO1
DI1	5	6	DO2
DI2	7	8	DO3
DI3	9	10	DO4

SPECIFICATIONS:

Digital Input

Input channels: 4 bits
Input Voltage: High: 2.0V (min)
Low: 0.8V (max)
Input Load: High: 0.05mA max at 2.7V
Low: 0.4mA max at 0.5V
Register Address: 340H~347H
Register Format: BIT: D3 D2 D1 D0
Value: DI3 DI2 DI1 DI0

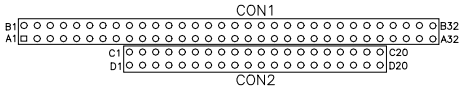
Digital Output

Output channels: 4 bits
Output voltage: High: Source -0.4mA at 2.4V min
Low: Sink 8mA at 0.5V max
Register Address: 340H (or 240H) (Write)
Register Format: BIT: D3 D2 D1 D0
Value: DO3 DO2 DO1 DO0

CON1, CON2: PC-104 Connector

CON1 and CON2 are dual-in-line pin headers that support PC-104 modules. CON1 consists of 64 pins and CON2 has 40 pins. The following table shows the their pin assignments.

CON1				CON2			
Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
A1	IOCHK	B1	GND	C1	GND	D1	GND
A2	D7	B2	REST	C2	SBHE	D2	MEMCS16
A3	D6	B3	VCC	C3	LA23	D3	IOCS16
A4	D5	B4	IRQ9	C4	LA22	D4	IRQ10
A5	D4	B5	-5V	C5	LA21	D5	IRQ11
A6	D3	B6	DRQ2	C6	LA20	D6	IRQ12
A7	D2	B7	-12V	C7	LA19	D7	IRQ15
A8	D1	B8	OWS	C8	LA18	D8	IRQ14
A9	D0	B9	+12V	C9	LA17	D9	DACK0
A10	IOCHRDY	B10	GND	C10	MEMR	D10	DRQ0
A11	AEN	B11	SMEMW	C11	MEMW	D11	DACK5
A12	A19	B12	SMEMR	C12	D8	D12	DRQ5
A13	A18	B13	IOW	C13	D9	D13	DACK6
A14	A17	B14	IOR	C14	D10	D14	DRQ6
ZA15	A16	B15	DACK3	C15	D11	D15	DACK7
A16	A15	B16	DRQ3	C16	D12	D16	DRQ7
A17	A14	B17	DACK1	C17	D13	D17	VCC
A18	A13	B18	DRQ1	C18	D14	D18	MASTER
A19	A12	B19	REFRESH	C19	D15	D19	GND
A20	A11	B20	CLK	C20	KEY PIN	D20	GND
A21	A10	B21	IRQ7				
A22	A9	B22	IRQ6				
A23	A8	B23	IRQ5				
A24	A7	B24	IRQ4				
A25	A6	B25	IRQ3				
A26	A5	B26	DACK2				
A27	A4	B27	TC				
A28	A3	B28	BALE				
A29	A2	B29	VCC				
A30	A1	B30	OSC				
A31	A0	B31	GND				
A32	GND	B32	GND				



Watchdog Timer Configuration

The function of the watchdog timer is to reset the system automatically and is defined at I/O port 0443H. To enable the watchdog timer and allow the system to reset, write I/O port 0443H. To disable the timer, write I/O port 0441H for the system to stop the watchdog function. The timer has a tolerance of 20% for its intervals.

The following describes how the timer should be programmed.

Enabling Watchdog:

```
MOV    AX, 000FH (Choose the values from 0)
MOV    DX, 0443H
OUT    DX, AX
```

Disabling Watchdog

```
MOV    AX, 00FH (Any value is fine.)
MOV    DX, 0441H
OUT    DX, AX
```

WATCHDOG TIMER CONTROL TABLE

Level	Value	Time/sec	Level	Value	Time/sec
1	F	0	9	7	16
2	E	2	10	6	18
3	D	4	11	5	20
4	C	6	12	4	22
5	B	8	13	3	24
6	A	10	14	2	26
7	9	12	15	1	28
8	8	14	16	0	30

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3

BIOS Configuration

This chapter describes the different settings available in the Award BIOS that comes with the SI5TTM embedded board. The topics covered in this chapter are as follows:

BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your system's ROM supports Intel/Cyrix/AMD/IDT processors in a standard IBM-AT compatible I/O system. The BIOS provides critical low-level support for standard devices such as disk drives, parallel port and serial ports. It also adds virus and password protection, as well as special support for detailed fine-tuning of the chipset controlling the entire system.

BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the Award BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

```
Press  <DEL>  to  Enter  Setup
```

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Time, Date, Hard Disk Type	

The section below the setup items of the Main Menu displays the control keys for this menu. At the bottom of the Main Menu just below the control keys section, there is another section that displays information about the currently highlighted item in the list.

***NOTE**: If your computer cannot boot after making and saving system changes with Setup, the Award BIOS supports an override to the CMOS settings that resets your system to its default.*

We strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability.

Standard CMOS Setup

"Standard CMOS Setup" choice allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the Embedded Little Board is already installed in a working system, you will not need to select this option. You will need to run the Standard CMOS option, however, if you change your system hardware configurations, the onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

ROM PCI/ISA BIOS
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy) : **Mon**, Aug 19 1996
Time (hh:mm:ss) : 00 : 00 : 00

HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master	Auto	0	0	0	0	0	0	Auto
Primary Slave	None	0	0	0	0	0	0	-----
Secondary Master	None	0	0	0	0	0	0	-----
Secondary Slave	None	0	0	0	0	0	0	-----

Drive A : 1.44M, 3.5in
Drive B : None
Floppy 3 Mode Support : Disabled
Video : EGA / VGA
Halt On : All Errors

Base Memory : 640K
Extended Memory : 15360K
Other Memory : 384K

Total Memory : 16384K

ESC : Quit
F1 : Help
↑ ↓ → ← : Select Item
(Shift) F2 : Change Color
PU / PD / + / - : Modify

At the bottom of the menu are the control keys for use on this menu. If you need any help in each item field, you can press the <F1> key. It will display the relevant information to help you. The memory display at the lower right-hand side of the menu is read-only. It will adjust automatically according to the memory changed. The following describes each item of this menu.

Date

The date format is:

Day : **Sun to Sat**
Month : **1 to 12**
Date : **1 to 31**
Year : **1994 to 2009**

To set the date, highlight the "Date" field and use the PageUp/ PageDown or +/- keys to set the current time.

Time

The time format is: **Hour : 00 to 23**
Minute : 00 to 59
Second : 00 to 59

To set the time, highlight the "Time" field and use the <PgUp>/ <PgDn> or +/- keys to set the current time.

Primary HDDs / Secondary HDDs

The onboard PCI IDE connectors provide Primary and Secondary channels for connecting up to four IDE hard disks or other IDE devices. Each channel can support up to two hard disks; the first is the "Master" and the second is the "Slave".

To enter the specifications for a hard disk drive, you must select first a "Type". There are 45 predefined types and 4 user definable types are for Enhanced IDE BIOS. Type 1 to 45 are predefined. Type "User" is user-definable. For the Primary Master/Slave as well as Secondary Master/Slave, you can select "Auto" under the TYPE and MODE fields. This will enable auto detection of your IDE drives and CD-ROM drive during POST.

Press <PgUp>/<PgDn> to select a numbered hard disk type or type the number and press the <Enter> key. The hard disk will not work properly if you enter incorrect information for this field. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually. If you select Type User, related information is asked to be entered to the following items.

CYLS :	Number of cylinders
HEAD :	Number of read/write heads
PRECOMP :	Write precompensation
LANDZ :	Landing zone
SECTOR :	Number of sectors
SIZE :	Automatically adjust according to the configuration
MODE (for IDE HDD only) :	Auto Normal (HD < 528MB) Large (for MS-DOS only) LBA (HD > 528MB and supports Logical Block Addressing)

***NOTE**: The specifications of your drive must match with the drive table. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually.*

Drive A / Drive B
These fields identify the types of floppy disk drive A or drive B that has been installed in the computer. The available specifications are:

360KB	1.2MB	720KB	1.44MB	2.88MB
5.25 in.	5.25 in.	3.5 in.	3.5 in.	3.5 in.

Floppy 3 Mode Support
This is the Japanese standard floppy drive. The standard stores 1.2MB in a 3.5-inch diskette. You have four options to choose:

Disabled	No 3 mode floppy drive installed. (default)
Drive A	Installed 3 mode drive at drive A.
Drive B	Installed 3 mode drive at drive B.
Both	Installed 3 mode drive at drive A and B.

Video
This field selects the type of video display card installed in your system. You can choose the following video display cards:

EGA/VGA	For EGA, VGA, SEGA, SVGA or PGA monitor adapters.(default)
CGA 40	Power up in 40 column mode.
CGA 80	Power up in 80 column mode.
MONO	For Hercules or MDA, includes high resolution monochrome adapters.

Halt On
This field determines whether or not the system will halt if an error is detected during power up.

No errors	The system boot will not be halted for any error that may be detected.
All errors	Whenever the BIOS detects a non-fatal error, the system will be halted and you will be prompted.
All, But Keyboard	The system boot will not be halted for a keyboard error; it will stop for all other errors.
All, But Diskette	The system boot will not be halted for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not be halted for a keyboard or disk error; it will stop for all other errors.

BIOS Features Setup

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

ROM / PCI ISA BIOS
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Virus Warning	**: Disabled**	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000-CBFFF Shadow	: Disabled
External Cache	: Enabled	CC000-CFFFF Shadow	: Disabled
Quick Power On Self Test	: Enabled	D0000-D3FFF Shadow	: Disabled
Boot Sequence	: A, C, SCSI	D4000-D7FFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	D8000-DBFFF Shadow	: Disabled
Boot Up Floppy Seek	: Enabled	DC000-DFFF Shadow	: Disabled
Boot Up Numlock Status	: On		
Boot Up System Speed	: High		
Gate A20 Option	: Fast		
Typematic Rate Setting	: Disabled		
Typematic Rate (chars/Sec)	: 6		
Typematic Delay (Msec)	: 250		
Security Option	: Setup	ESC : Quit	↑ ↓ → ← : Select Item
PCI /VGA Palette Snoop	: Disabled	F1 : Help	PU/PD/+/- : Modify
OS Select For DRAM>64MB	: Non-OS2	F5 : Old Values	(Shift) F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Virus Warning
This item protects the boot sector and partition table of your hard disk against accidental modifications. If an attempt is made, the BIOS will halt the system and display a warning message. If this occurs, you can either allow the operation to continue or run an anti-virus program to locate and remove the problem.

NOTE: *Many disk diagnostic programs, which attempt to access the boot sector table, can cause the virus warning. If you will run such a program, disable the Virus Warning feature.*

CPU Internal Cache / External Cache
These items allow you to enable (speed up memory access) or disable the cache function. By default, these items are ***Enabled***.

Quick Power On Self Test
This choice speeds up the Power On Self Test (POST) after you power up the system. If it is set to *Enabled*, BIOS will skip some items. By default, this choice is ***Enabled***.

Boot Sequence
This field determines the drive that the system searches first for an operating system. The options are:

A, C, SCSI	D, A, SCSI	SCSI, C, A
C, A, SCSI	E, A, SCSI	C only
C, CDROM, A	F, A, SCSI	LS120, C
CDROM, C, A	SCSI, A, C	

The default value is ***A, C, SCSI***.

Swap Floppy Drive
This item allows you to determine whether or not to enable the swap Floppy Drive. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. By default, this field is set to ***Disabled.***

Boot Up Floppy Seek
When enabled, the BIOS will seek whether or not the floppy drive installed has 40 or 80 tracks. 360K type has 40 tracks while 760K, 1.2M and 1.44M all have 80 tracks. By default, this field is set to ***Enabled.***

Boot Up NumLock Status
This allows you to activate the NumLock function after you power up the system. By default, the system boots up with ***NumLock*** On.

Boot Up System Speed
This has no function and selects the default system speed ***(High).***

Gate A20 Option
This field allows you to select how Gate A20 is worked. The Gate A20 is a device used to address memory above 1 MB. By default, this field is set to ***Fast.***

Typematic Rate Setting

When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to ***Disabled.***

Typematic Rate (Chars/Sec)

When the typematic rate is enabled, the system registers repeated keystrokes speeds. You can select speed range from 6 to 30 characters per second. By default, this item is set to ***6.***

Typematic Delay (Msec)

When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters. By default, this item is set to ***250msec.***

Security Option

This field allows you to limit access to the System and Setup. The default value is ***Setup***. When you select *System*, the system prompts for the User Password every time you boot up. When you select *Setup*, the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

PCI/VGA Palette Snoop

Some display cards that are non-standard VGA may not show colors properly. This field allows you to set whether or not MPEG ISA/VESA VGA Cards can work with PCI/VGA. When this field is enabled, a PCI/VGA can work with an MPEG ISA/VESA VGA card. When this field is disabled, a PCI/VGA cannot work with an MPEG ISA/VESA card.

OS Select for DRAM > 64MB

This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is **NON-OS/2**.

Video BIOS Shadow

This item allows you to change the Video BIOS location from ROM to RAM. Video Shadow will increase the video speed.

C8000 - CBFFF Shadow/DC000 - DFFFF Shadow

Shadowing a ROM reduces the memory available between 640KB to 1024KB. These fields determine whether or not optional ROM will be copied to RAM.

Chipset Features Setup

This menu controls the configuration of the embedded board chipset.

ROM PCI/ISA BIOS
CHIPSET FEATURES SETUP
AWARD SOFTWARE INC.

Auto Configuration	: Enabled	Current CPU Temperature:	37°C/98°F
DRAM Timing	: 70ns	CPU Warning Temperature:	70°C/158°F
	:		
DRAM Leadoff Timing	: 10/6/4	Current System Temp.	: 37°C/98°F
DRAM Read Burst (EDO/FP)	: x333/x444	Current Heat Sink Temp.	: 25°C/77°F
DRAM Write Burst Timing	: x333	Current CPU FAN Speed	: 5720 RPM
System BIOS Cacheable	: Enabled	VIO : 3.31 V VCORE	: 2.84V
Video BIOS Cacheable	: Enabled	+12(V) : 11.26V +5 (V)	: 5.11V
8 Bit I/O Recovery Time	: 4	- 5 (V) : -4.84V -12 (V)	: -10.93V
16 Bit I/O Recovery Time	: 2		
Memory Hole At 15M-16M	: Disabled		
PCI 2.1 Compliance	Enabled		

ESC : Quit	↑ ↓ → ← : Select Item
F1 : Help	PU/PD/+/- : Modify
F5 : Old Values	(Shift) F2 : Color
F6 : Load BIOS Defaults	
F7 : Load Setup Defaults	

Auto Configuration
This field predefines values for DRAM, cache timing according to CPU type and system clock. When this field is enabled, the predefined items will become read-only.

DRAM Timing
The DRAM timing is controlled by the DRAM Timing Registers. The timing type is dependent on the system design. Slower rates may be required in some system designs to support loose layouts or slower memory.

DRAM Leadoff Timing
This sets the number of CPU clocks allowed before reads and writes to DRAM are performed.

7/3	Seven clocks leadoff for reads and three clocks leadoff for writes
7/4	Seven clocks leadoff for reads and four clocks leadoff for writes
6/3	Six clocks leadoff for reads and three clocks leadoff for writes
6/4	Six clocks leadoff for reads and four clocks leadoff for writes

DRAM Read Burst (EDO/FP)
This sets the timing for burst mode reads from two different DRAM (EDO/FPM). Burst read and write requests are generated by the CPU in four separate parts. The first part provides the location within the DRAM where the read or write is to take place while the remaining three parts provide the actual data. The lower the timing numbers, the faster the system will address memory.

x222/x333	Read DRAM (EDO/FPM timings are 2-2-2/3-3-3
x333/x444	Read DRAM (EDO/FPM timings are 3-3-3/4-4-4
x444/x444	Read DRAM (EDO/FPM timings are 4-4-4/4-4-4

System BIOS Cacheable
When enabled, access to the system BIOS ROM addressed at F0000H-FFFFFH is cached, provided that the cache controller is enabled.

Video BIOS Cacheable
When enabled, access to video BIOS addressed at C0000H to C7FFFH is cached, provided that the cache controller is enabled.

8 Bit I/O Recovery Time
This field allows you to select the recovery time allowed for 8 bit I/O.

16 Bit I/O Recovery Time
This field allows you to select the recovery time allowed for 16 bit I/O.

Memory Hole at 15M-16M
In order to improve performance, certain space in memory can be reserved for ISA cards. This field allows you to reserve 15MB to 16MB memory address space to ISA expansion cards. This makes memory from 15MB and up unavailable to the system. Expansion cards can only access memory up to 16MB. By default, this field is set to ***Disabled.***

PCI 2.1 Compliance
Concurrent PCI allows multiple PCI transfers from the PCI master buses to memory to CPU. By default, this field is set to ***Disabled***.

Hardware Monitor Parameters
The onboard W83781D hardware monitor IC monitors the system's CPU temperature, heat sink temperature, CPU fan speed and system voltages. Alert is sounded through the speaker and CPU speed slows down when the temperature exceeds the temperature set in the BIOS. By default, this field is set to **70°C/158°F**.

Power Management Setup

The Power Management Setup allows you to save energy of your system effectively. It will shut down the hard disk and turn off video display after a period of inactivity.

ROM PCI/ISA BIOS (2A59IM29)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management	: Disabled	** Reload Global Timer Events **	
PM Control by APM	: Yes	IRQ3 [3-7, 9-15],NMI	: Enabled
Video Off Method	: DPMS	Primary IDE 0	: Disabled
Video Off After	: Standby	Primary IDE 1	: Disabled
Doze Mode	: Disabled	Secondary IDE 0	: Disabled
Standby Mode	: Disabled	Secondary IDE 1	: Disabled
Suspend Mode	: Disabled	Floppy Disk	: Disabled
PCI/VGA Active Monitor	: Disabled	Serial Port	: Enabled
IRQ 8 Break Suspend	: Disabled	Parallel Port	: Disabled
		ESC : Quit	↑ ↓ → ← : Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values	(Shift) F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Power Management

This field allows you to select the type of power saving management modes. There are four selections for Power Management.

Disable	No power management. (Default)
Min. Power Saving	Minimum power management.
Max. Power Saving	Maximum power management. Only available for SL CPU.
User Define	Each of the ranges are from 1 min. to 1hr. Except for HDD Power Down which ranges from 1 min. to 15 min.

PM Control by APM

This field allows you to use the Advanced Power Management device to enhance the Max. Power Saving mode and stop the CPU's internal clock. If the Max. Power Saving is not enabled, this will be preset to NO.

Video Off Method
This field defines the Video Off features. There are three options.

V/H SYNC + Blank	Default setting, blank the screen and turn off vertical and horizontal scanning.
DPMS	Allows the BIOS to control the video display card if it supports the DPMS feature.
Blank Screen	This option only writes blanks to the video buffer.

Video Off After
This field specifies the mode after which the Video Off feature is enabled. The options are *Doze, Standby, Suspend,* and *N/A.*

Doze Mode
When enabled, and after the set time of system inactivity, the CPU clock will run at a slower speed while all other devices still operate at full speed.

Standby Mode
When enabled, and after the set time of system inactivity, the fixed disk drive and the video would be shut off while all other devices still operate at full speed.

Suspend Mode
When enabled, and after the set time of system inactivity, all devices except the CPU will be shut off.

PCI/VGA Active Monitor
This option specifies if the BIOS is to monitor activity on the display monitor for power conservation purposes.

IRQ 8 Break Suspend
This field sets the wake-up call of the system. If activity is detected from the enabled IRQ 8, the system wakes up from suspend mode.

PNP/PCI Configuration

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

ROM PCI/ISA BIOS
PNP/PCI CONFIGURATION
AWARD SOFTWARE INC.

PNP OS Installed	: Yes	Used MEM base addr	: N/A
Resources Controlled by	: Manual		
Reset Configuration Data	: Disabled		
IRQ-3 assigned to	: Legacy ISA		
IRQ-4 assigned to	: Legacy ISA		
IRQ-5 assigned to	: Legacy ISA		
IRQ-7 assigned to	: Legacy ISA		
IRQ-9 assigned to	: PCI/ISA PnP		
IRQ-10 assigned to	: Legacy ISA		
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		
DMA-0 assigned to	: PCI/ISA PnP		
DMA-1 assigned to	: PCI/ISA PnP	ESC : Quit	↑ ↓ ← : Select Item
DMA-3 assigned to	: PCI/ISA PnP	F1 : Help	PU/PD/+/- : Modify
DMA-5 assigned to	: PCI/ISA PnP	F5 : Old Values	(Shift) F2 : Color
DMA-6 assigned to	: PCI/ISA PnP	F6 : Load BIOS Defaults	
DMA-7 assigned to	: PCI/ISA PnP	F7 : Load Setup Defaults	

PNP OS Installed
This field allows you to specify if the operating system installed in your system is plug and play aware.

***NOTE**: Operating systems such as DOS, OS/2, and Windows 3.x do not use PnP.*

Resources Controlled by
This PnP BIOS can configure all of the boot and compatible devices automatically. However, this capability needs you to use a PnP operating system such as Windows 95 and Windows 98. The default value is ***Manual.***

Reset Configuration Data
This field allows you to determine whether or not to reset the configuration data. The default value is ***Disabled.***

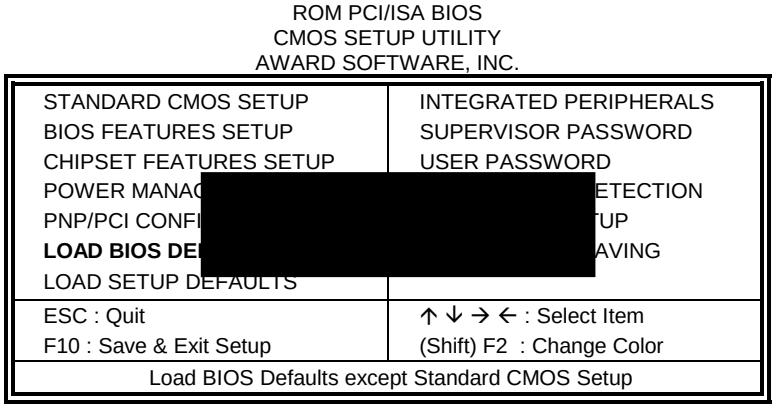
IRQ3/4/5/7/9/10/11/12/14/15, DMA0/1/3/5/6/7 assigned to
These fields allow you to determine the IRQ/DMA assigned to the ISA bus and is not available to any PCI slot.

Used MEM base addr

This field allows the user to set the base address and block size of a legacy (non-PnP) ISA card that uses any memory segment within the C800H and DFFFH address range. If you have such a card and are not using an ICU (ISA Configuration Utility) to specify its address range, select a base address from the six available options. During selection, the "Used MEM Length" field will appear with the block size options. If you have more than one legacy ISA card in your system that require the use of this address range, you can increase the block size to either 8K, 16K, 32K or 64K. If you are using ICU to accomplish this task, leave "Used MEM base addr" to its default setting of **N/A**.

Load BIOS Defaults

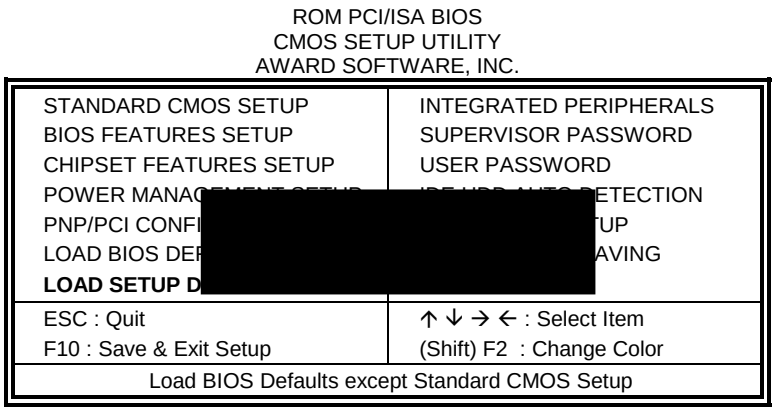
This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.



To load BIOS defaults value to CMOS SRAM, enter "Y". If not, enter "N".

Load Setup Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.



To load SETUP defaults value to CMOS SRAM, enter "Y". If not, enter "N".

Integrated Peripherals

This option allows you to determine your hard disk configuration, mode and port.

ROM PCI/ISA BIOS
INTEGRATED PERIPHERALS
AWARD SOFTWARE INC.

IDE HDD Block Mode	: Enabled	Onboard FDD Controller	: Enabled
IDE Primary Master PIO	: Auto	Onboard Serial Port 1	: 3F8 / IRQ4
IDE Primary Slave PIO	: Auto	Onboard Serial Port 2	: 2F8 / IRQ3
IDE Secondary Master PIO	: Auto	UART Mode Select	: Normal
IDE Secondary Slave PIO	: Auto		
IDE Primary Master UDMA	: Auto		
IDE Primary Slave UDMA	: Auto		
IDE Secondary Master UDMA	: Auto	Onboard Parallel Port	: 378H/IRQ7
IDE Secondary Slave UDMA	: Auto	Parallel Port Mode	: Normal
On-Chip Primary PCI IDE	: Enabled		
On-Chip Secondary PCI IDE	: Enabled	Onboard Serial Port 3	: 378H/
USB Keyboard Support	: Disabled	Serial Port 3 Use IRQ	: IRQ5
		Onboard Serial Port 4	: Disabled
		ESC : Quit	↑ ↓ ← : Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values	(Shift) F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

IDE HDD Block Mode
This field allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive.

IDE Primary Master/Slave PIO And Secondary Master/Slave PIO
These fields allow your system hard disk controller to work faster. Rather than have the BIOS issue a series of commands that transfer to or from the disk drive, PIO (Programmed Input/Output) allows the BIOS to communicate with controller and CPU directly.

The system supports five modes, numbered from 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode.

IDE Primary Master/Slave UDMA And Secondary Master/Slave UDMA
This field allows your system to improve disk I/O throughput to 33Mb/sec with the Ultra DMA/33 feature. The options are *Auto* and *Disabled*.

On-Chip Primary/Secondary PCI IDE
These fields allow you either to enable or disable the Primary/Secondary controller. You might choose to disable the controller if you were to add a higher performance or specialized controller.

USB Keyboard Support
This field allows your system to support a USB keyboard.

Onboard FDD Controller
This option allows you to select the onboard FDD port.

Onboard Serial/Parallel Port
These fields allow you to select the onboard serial/parallel port and its address. The default values for these ports are:

Serial Port 1	3F8/IRQ4
Serial Port 2	2F8/IRQ3
Serial Port 3	3F8/IRQ5
Serial Port 4	Disabled
Parallel Port	378H/IRQ7

UART 2 Mode
This field determines the UART 2 mode in your computer. The options are *Standard*, *HPSIR*, and *ASKIR*.

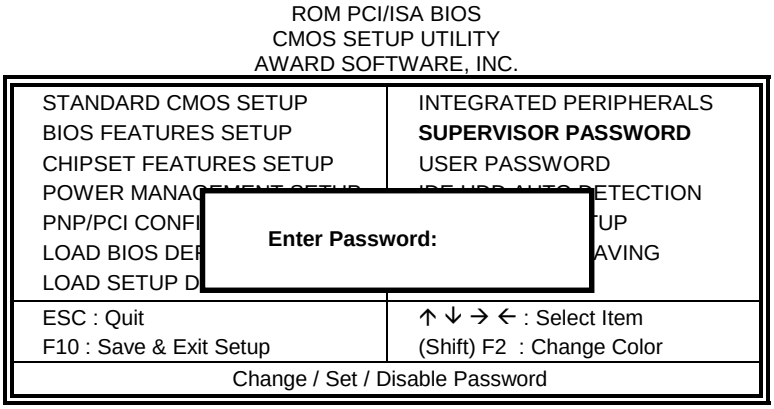
Onboard Parallel Mode
This field allows you to determine parallel port mode function.

Normal	Normal Printer Port
EPP	Enhanced Parallel Port
ECP	Extended Capabilities Port
ECP+EPP	Extended Capabilities Port or Enhanced Parallel Port

Supervisor / User Password

These two options set the system password. *Supervisor Password* sets a password that will be used to protect the system and Setup utility. *User Password* sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>. The **Enter Password:** message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

To disable a password, just press the <Enter> key when you are prompted to enter the password. A message will confirm the password to be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.



IDE HDD Auto Detection

This option detects the parameters of an IDE hard disk drive, and automatically enters them into Standard CMOS Setup screen.

ROM PCI/ISA BIOS
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master:								

Select Primary Master Option (N=SKIP) : N

OPTIONS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
1 (Y)	0	0	0	0	0	0	0	NORMAL

NOTE: Some OSes (like SCO-UNIX) must use "NORMAL" for installation

ESC: SKIP

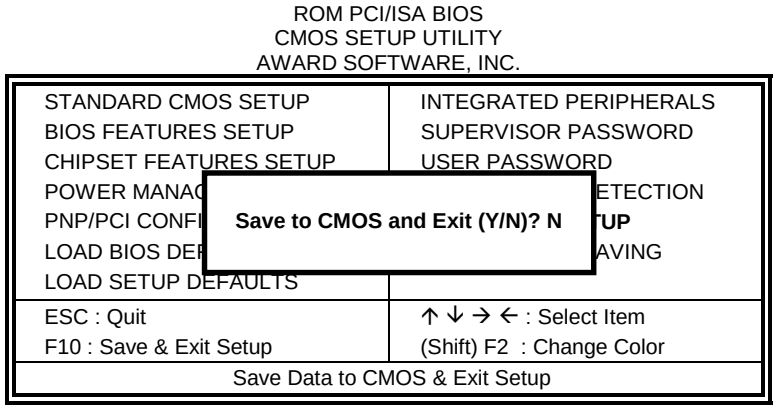
Up to four IDE drives can be detected, with parameters for each appearing in sequence inside a box. To accept the displayed entries, press the "Y" key to skip to the next drive, press the "N" key. If you accept the values, the parameters will appear listed beside the drive letter on the screen.

HDD Low Level Format

This option should only be used by a professional. Low-level formatting can cause irreparable damage to your hard disk. The procedures include selecting the drive you want to low-level format, determining the bad tracks, and proceeding with pre-formatting.

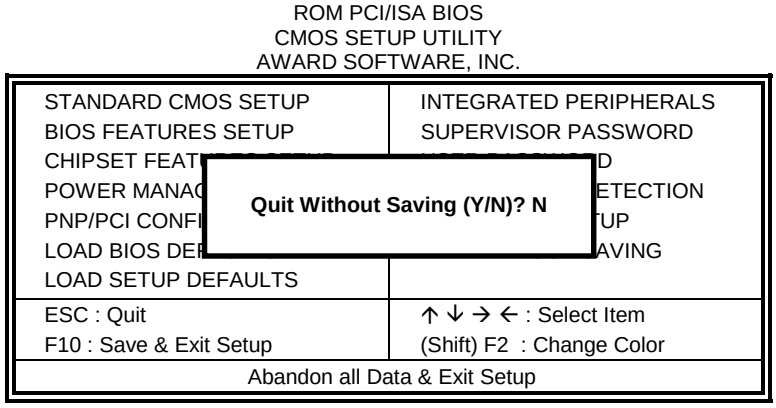
Save & Exit Setup

This option allows you to determine whether or not to accept the modifications. If you type "Y", you will quit the setup utility and save all changes into the CMOS memory. If you type "N", you will return to Setup utility.



Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing "Y" will quit the Setup utility without saving the modifications. Typing "N" will return you to Setup utility.



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4

VGA Driver Installation

This chapter provides information on how to install the VGA drivers that come in the floppy diskette with your SI5TTM board. Please follow the instructions set forth in this chapter carefully. Please note that there must be relevant software installed in your system before you could proceed to install the VGA drivers. It is recommended that you make a copy of the VGA driver diskette and put the backup copy in a safe place.

The following items are covered in this chapter:

Installing the Drivers for Windows 95/98

Driver Installation

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

Step 1. Click Start, then Settings, then Control Panel.
Step 2. Double click on Display.
Step 3. Select the Settings page, click the Change Display Type button.
Step 4. Click the Change button in the "Adapter Type" area.
Step 5. Click the Have Disk button and press OK.
Step 6. Specify the path to the new driver and press <ENTER>:
Example 1: Insert the drivers disk in the A: floppy drive, and enter A:\win95.
Example 2: Type in the name of the directory where you copied the drivers, either on your local hard drive or on a network share.
Example 3: If you're not sure exactly where the drivers are, choose the Browse... button to find them.
Step 7. The Select Device dialog box will appear. Select the adapter that corresponds to the one you installed in your machine and click OK.
Step 8. Windows 95/98 will copy the display drivers to the proper directories on your system.
Step 9. Continue choosing Close until asked to restart your machine from the "Systems Settings Change dialog box.
Step 10. After the system has restarted, you can go back into the Display applet and select alternate screen resolutions and color depths.

Installing the Drivers for Windows NT 4.0

Driver Installation

Once you are in the Windows NT 4.0 environment, follow the procedures below to install the VGA drivers in the diskette that comes with your embedded board.

Step 1. Click the Start button, then go to Settings and click on Control Panel.

Step 2. Click on the Display icon to start the Display Properties window.

Step 3. Click on the Settings tab, and then click on Display Type.

Step 4. In the Change Display Type window, click on Change Adapter Type. This will bring up the Select Device Window.

Step 5. In the Change Display Window, click on Have Disk. Follow the directions on the screen to supply the directory where the Windows NT driver files are located. Then select OK, or press ENTER.

Step 6. Select Chips Video Accelerator from Display list provided, then click OK or press ENTER.

Step 7. You will then see a warning panel about Third Party Drivers. Click on Yes to finish the installation.

Step 8. Once the installation is complete, the system must be shut down and restarted for the new drivers to take effect.

Step 9. When the system has restarted, the default graphics mode (usually 640x480x256color) has been automatically selected. Click the Start button, and then go to Settings and click on Control Panel. Click on the Display icon to start the Display Properties window. Click on the Settings tab. A new screen setting can be selected using either of the following methods:

A. Use the slide-bar in the Desktop Area to select new setting.

B. Click on List All Modes. From the list provided, select a new setting, then click OK or press ENTER.

C. Click on Test to test the newly selected graphics mode. Follow the instructions given on the screen. A test screen should appear, followed by the Testing Mode window. Click on Yes to continue. Click on Apply to switch to the new graphics mode. Graphics modes are changed dynamically on NT 4.0, so you do not need to shut down and restart for the new screen settings to work.

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5

Audio Driver Installation

This chapter provides information on how to install the audio drivers for Creative Labs ViBRA 16VX that come in the floppy diskette with your SI5TTM board. Please follow the instructions set forth in this chapter. It is recommended that you make a copy of the audio driver diskette and put the backup copy in a safe place.

The following items are covered in this chapter:

Installing The Audio Driver For Windows 95

Step 1. Turn on the computer and start Windows 95.
Step 2. Insert the diskette labeled " Windows 95 Audio Applications Diskette 1/3."
Step 3. Click on START => RUN and type A:\SETUP to install the audio software and drivers. The welcome screen is then displayed as shown below.

Step 4. Click the Next button to continue the installation process and carefully follow the installation wizard.
Step 5. When the setup wizard prompts you for the setup method, it is recommended to choose FULL INSTALLATION. Select this option and click Next.
Step 6. Upon completion of the software and driver installation, the system will prompt you to restart the system. Restart the system to activate the drivers.

Installing The Audio Driver For Windows 98

1. The Windows 98 operating system CD comes with the drivers for ViBRA 16VX. Install the Windows 98 default drivers and restart your computer for the changes to take effect.

2. To update the drivers, insert the diskette labeled Windows 95/98 Update Drivers . Click on START => RUN and type A:\upddrv95.exe. After the files are copied, restart the computer for the changes to take effect.

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Intel PIIX Bus Master IDE Driver Installation

This chapter describes the installation procedure for Intel PIIX Bus Master IDE Drivers for Windows 95.

This chapter contains the following sections:

System Requirements

This section describes system requirements for the PIIX Bus Master IDE Device Driver for Windows 95*. This driver has been designed for and tested with Windows 95 only. This driver will only install on systems with Windows 95.

1. The system must contain a supported Intel processor and chipset configuration.
2. Ensure that a mouse is connected to the system.
3. One of the following versions of Windows 95* must be installed on the system prior to running utility program.

   Windows 95* 4.00.950 (Retail)
   Windows 95* 4.00.950a (OSR1)
   Windows 95* 4.00.950b (OSR2 without USB Supplement)
   Windows 95* 4.00.950b (OSR2.1 with USB Supplement)
4. This utility should only be used on desktop systems. The utility must not be executed on notebook or portable systems with or without dock.
5. It is assumed that the BIOS properly initialized the 82371xB IDE interface for Bus Master IDE operation.
6. There is no other non-82371xB IDE controllers (add-in IDE controller or sound card with IDE) enabled on the system.

Installing the Software

This subsection describes how to install the software on a system where Windows 95 is installed.

***NOTE**: Record the location of the Windows 95* directory before installing the driver.*

1. Check the System Requirements. Windows 95* must be fully installed and running on the system prior to running this software.
2. Close any running applications.
3. Remove references to installed real-mode IDE device drivers in the AUTOEXEC.BAT and CONFIG.SYS files (especially any drivers that control ATAPI CD-ROM and special IDE features). Use the Notepad utility to do this.

The driver files are stored in an integrated application setup program. This program is a Windows 95* program that allows the driver files to be INSTALLED or DE-INSTALLED.

Execute the driver setup program.

Run SETUP.EXE.

4. Click Next on Welcome Screen to read and agree to the license agreement. View the text file and choose File\Exit to close Notepad and continue.

***NOTE**: If you click No, the program will terminate.*

5. Click Yes if you agree to continue.

***NOTE**: If you click No, the program will terminate.*

6. Select INSTALL, to install the PIIX Bus Master IDE Device Driver when prompted to do so.

***NOTE**: If the driver is currently installed on the system, SETUP will ask you whether or not you want to continue. Follow the prompts on the screen to Install the driver if desired.*

7. Click OK to restart the system when prompted to do so.

8. Follow the screen instructions and use default settings to complete the setup when Windows 95* is re-started. Upon re-start, Windows 95* will display that it has found an Intel PCI Bus Master IDE controller hardware and is installing hardware for it.

If the New Hardware Found dialog box is displayed requesting the location of the drivers, use the mouse to click on the scrollbar and click on the <Windows 95* directory>\System\IOSubSys path:

For example:
Click on C:\WINDOWS\SYSTEM\IOSUBSYS\
Click OK.

9. Select Yes, when prompted to re-start Windows 95.

***NOTE**: After installation, the following driver and related files are stored as listed.*

<Windows 95* directory>\System\IOSubSys\IDEATAPI.MPD
<Windows 95* directory>\System\IOSubSys\PIIXVSD.VXD
<Windows 95* directory>\INF\IDEATAPI.INF

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LAN Installation

This chapter describes LAN features and driver installation of the onboard VIA VT86C100A Ethernet controller.

This chapter contains the following sections:

Introduction

VIA VT86C100A is a 32-bit 10/100MBps Ethernet controller for PCI local bus-compliant PCs. It supports the bus mastering architecture, and Auto-negotiation feature which make it possible to combine one common type of Ethernet cabling – an RJ-45 connector for twisted-pair cabling that can be used for both 10Mbps and 100Mbps connection. Extensive driver support for commonly used network operating systems is also provided.

Features

- Conforms to the Ethernet IEEE 802.3u standard
- Compatible with PCI Local Bus Revision 2.1 specification
- IEEE 802.3u Auto-Negotiation for automatic speed selection
- Supports Full-Duplex/Half-Duplex Operation
- Provides 32-bit bus mastering data transfer
- Supports 10Mbps and 100Mbps operation in a single port

Software Drivers Support

NetWare ODI Drivers
Novell NetWare 3.x, 4.x, NetWare LAN WorkPlace TCP/IP, Novell LAN Analyzer for NetWare

Packet Drivers
FTP PC/TCP, NCSA TCP/IP

NDIS Drivers
Microsoft LAN Manager V2.x, Windows 3.x, Windows NT 4.0, Windows NT 3.51, Windows 98, Windows 95, SCO3, SCO5; IBM LAN Server 4.0 for DOS and OS/2, Linux,

Running Diagnostics

The SI5TTM comes with a diskette containing drivers and diagnostic software supporting the VIA VT86C100A Ethernet controller. You have to decompress the file LANDRIVE.EXE in the diskette to an empty directory in the hard drive and run SETUP in order to install the drivers and diagnostic utility to check the network cabling. You may follow the procedure below in order to do this.

1. Insert the LAN driver diskette into the floppy drive. We assume that the floppy drive is the A: Drive. Under the DOS Prompt, type the following:
   MD C:\TEMPO <ENTER>
   CD C:\TEMPO <ENTER>
   COPY A:\LANDRIVE.EXE <ENTER>
   LANDRIVE <ENTER>
   SETUP <ENTER>
2. The system starts the *Setup Utility for PCI Fast Ethernet Adapter* and shows the following screen.

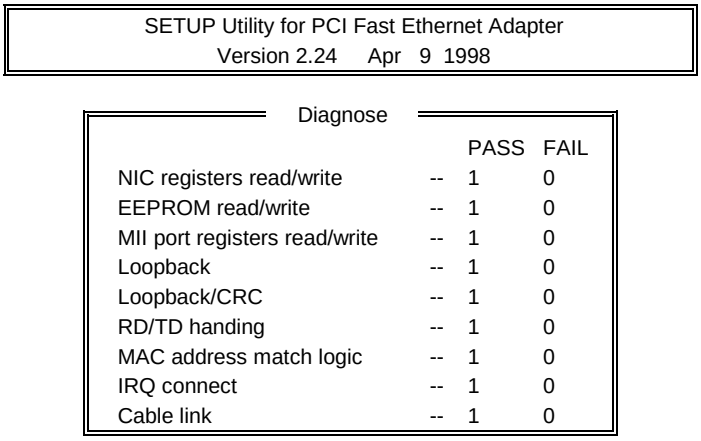
SETUP Utility for PCI Fast Ethernet Adapter
Version 2.24 Apr 9 1998

Configuration

I/O Base Address	- 0x6800
Interrupt Output Line	IRQ 11
Media Connection Type	Auto - 100M/Half
Boot ROM Size	No Boot ROM
Ethernet Address	004063001000

8. Pressing **F4** allows you to set the BootROM size. The options are:
   No Boot ROM
   8 K-Bytes
   16 K-Bytes
   32 K-Bytes
   64 K-Bytes
9. Pressing **F5** allows you to configure the test count either ***once*** or ***continuously*** and start the Diagnose procedure.

10. Pressing **F5** starts the diagnostics which performs tests on the items as shown in the figure below. The screen displays PASS or FAIL to indicate the result of each test.



11. Pressing **F6** starts the Network test and shows the following options:

1. Master workstation (100000 packets)
2. Master workstation (continuously)
3. Slave workstation

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System Monitor Utility

This chapter introduces System Monitor Utility that comes with the embedded board used in conjunction with the onboard hardware monitoring IC. The sections below give the functions of the utility.

System Monitor is a utility that oversees the general performance of systems, covering areas like system temperature, system voltage, and CPU and system fan rotational speeds. If conditions become adverse, that is, when voltages are erratic or CPU temperature exceeds the safe limits, an alarm will be sounded; thereby preventing system crashing and ensuring overall stability.

***NOTE**: System Monitor currently supports English and Chinese under Windows 95 and Windows NT. English will be used for other language environments.*

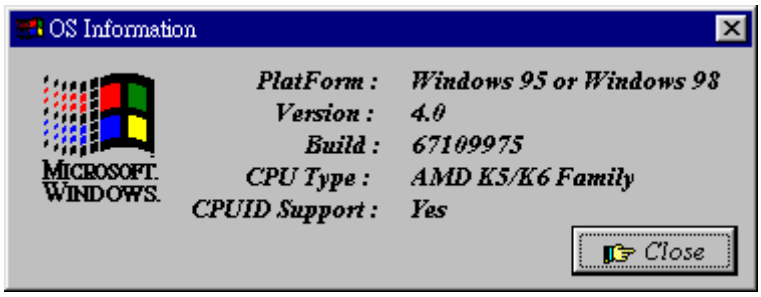
When System Monitor is initiated, the icon below appears in the task bar in the Windows environment.

The following screen appears upon clicking on the System Monitor icon.

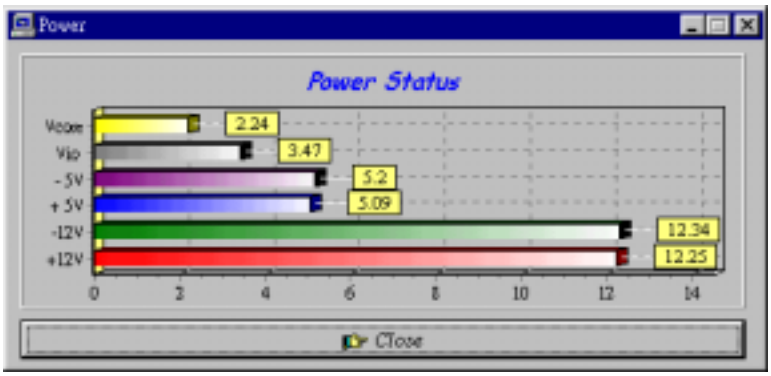
Clicking on the upper left corner button would show you the latest company information. "Summary" provides the current system status.

The section below describes the different functions of System Monitor.

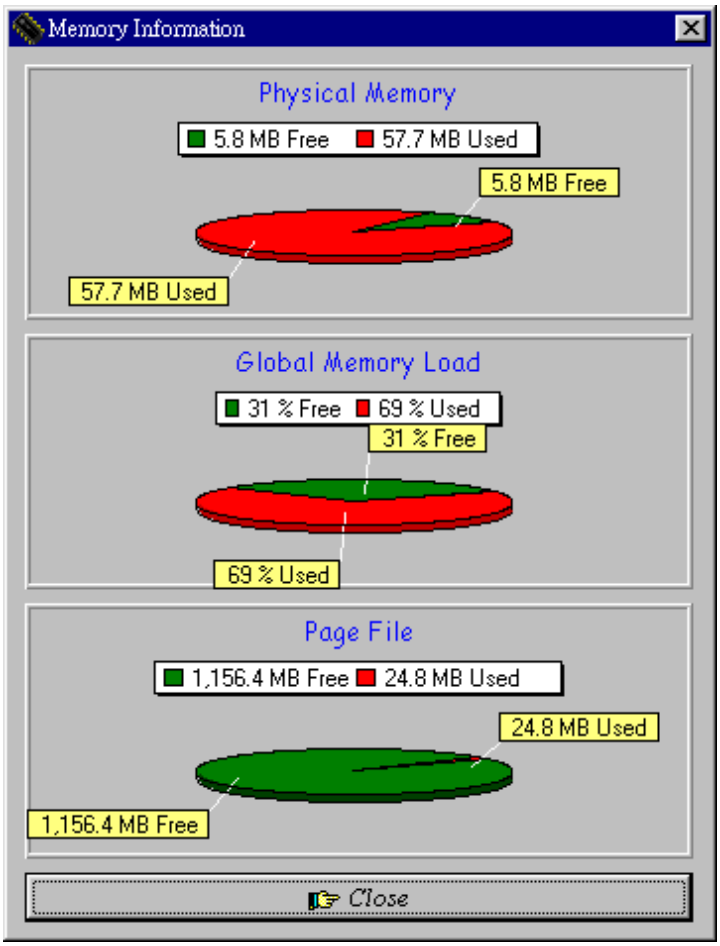
1. Computer - displays the current working system version and processor type



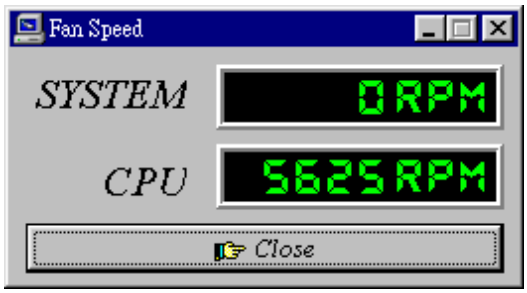
2. Power - displays the current voltage status.



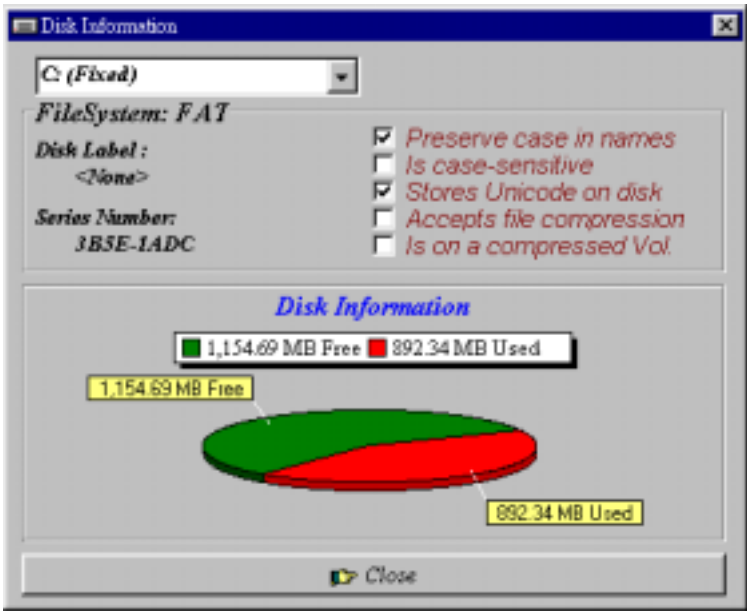
3. Memory - displays the current memory usage status.



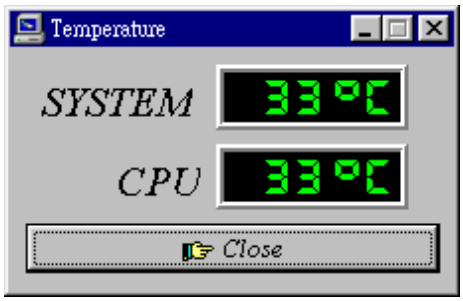
4. Fan Speed - displays the current rotational speeds of CPU and Chassis fans.



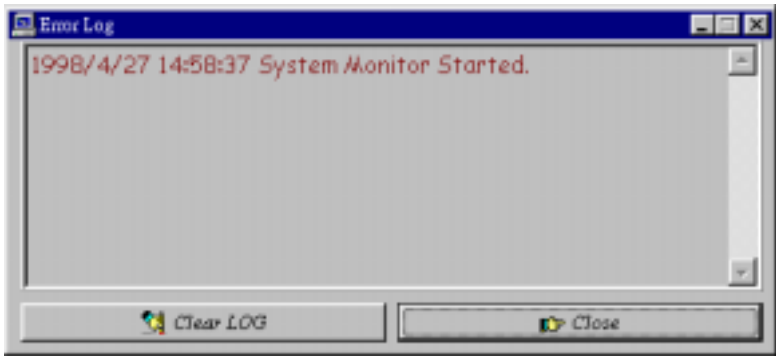
5. Disk - displays the supported disk formats and disk space.



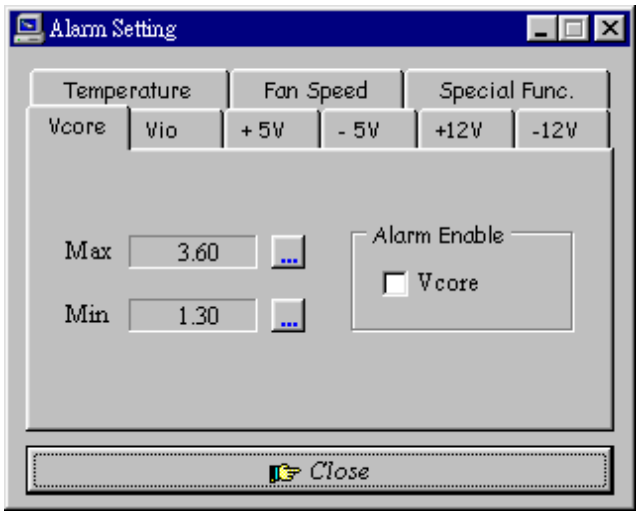
6. Heat - displays the CPU and system temperatures.



7. Error Log - displays errors occurring after System Monitor is started.



8. Setting - sets the values at which an alarm is sounded.



Voltage : the acceptable voltage range between the "MAX" and "MIN" value.
Temperature : temperature threshold.
Fan Rotation Speed : the minimum rotation speed.

***NOTE**: Intel has defined a margin of difference for the voltages as below:*
12 Volts - 10% (10.8V ~ 13.2V)
5 Volts - 5% (4.75 ~ 5.25%)
Vio - 5% (Vio for P54C CPU is 3.5V. Vio for P55C is 3.3V.)
Vcore- 5%

Appendix

A. I/O Port Address Map
B. Interrupt Request Lines (IRQ)

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. There is a total of 1K port address space available. The following table lists the I/O port addresses used on the Embedded Little Board.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278 - 27F	Parallel Port #2(LPT2)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

B. Interrupt Request Lines (IRQ)

There are a total of 15 IRQ lines available on the Embedded Little Board. Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on the Embedded Little Board.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Parallel Port #2
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Software Redirected to Int 0Ah
IRQ10	Reserved
IRQ11	Reserved
IRQ12	Reserved
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE