Athena
Athena-L2

Embedded Vortex86™ AIO SBC

With 1S/CRT/Video-In/TV-out/Audio/1 LAN/USB

User's Manual

(Revision 1.0)

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Trademarks Acknowledgment

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Chapter 0

Startup

0.1 Packing List

Product Name	Function	Package
Athena Athena-L2	Embedded Vortex86™ (SiS) All-in-One SBC	• Embedded Vortex86 All-in-One SBC • Manual & Drivers CD x 1 • D-Sub VGA cable x 1 • HDD cable x 1

0.2 Specification for Athena

Features	ATHENA
SoC	DM&P(SiS)*Vortex86™* System-on-Chip CPU–166MHz Real Time Clock with Lithium Battery Backup Watchdog Timer: 30.5uS to 512uS
BIOS	AMI BIOS
System Memory	144-pin SODIMM Socket
I/O Interface	• Enhanced IDE interface x1 • Parallel port x1 • USB port x3
Connectors	• External 15-pin D-type female VGA connector • External 25-pin D-type female Printer connector • External RCA Video In/TV Out connector • External Audio connector and Mic-In • External 6-pin Mini DIN for PS/2 Keyboard • External 6-pin Mini DIN for PS/2 Mouse • External RJ-45 connector for 10/100Base-Tx x1 • External USB connector x3 • External DC Jack for Power Adapter • 2.0mm ∅ 44-pin box header for IDE • 2.0mm ∅ 10-pin box header for RS-232 x1 • 2.0mm ∅ 10-pin box header for VGA2 • Power push button x1
Video Display	• AGP Rev.2.0 Compliant • Shared system memory • Resolution up to 1,920x1,440 true colors • CRT display
LAN	• Realtek 8100B single chip x1 • Full-duplex transfer mode, doubles effective bandwidth • NE2000 compatible with built-in 16KB RAM buffer • Throughput 10/100Mbps
Audio	• Full compliant with AC97 CODEC v2.1 • Internal MIC-in, Line-in and Line-out interface
Power Requirement	Single Voltage +5V **@1.7 A** with ACPI function support (Advanced Configuration and Power Interface)
Board Weight	350g
Board Size	133mm X 111mm (5.23 x 4.37 inches)
Operating Temperature	-20°C ~ +60°C

0.3 Specification for Athena-L2

Features	ATHENA
SoC	DM&P(SiS)*Vortex86™* System-on-Chip CPU–166MHz Real Time Clock with Lithium Battery Backup Watchdog Timer: 30.5uS to 512uS
BIOS	AMI BIOS
System Memory	144-pin SODIMM Socket
I/O Interface	• Enhanced IDE interface x1 • Parallel port x1 • USB port x3
Connectors	• External 15-pin D-type female VGA connector • External 25-pin D-type female Printer connector • External 6-pin Mini DIN for PS/2 Keyboard • External 6-pin Mini DIN for PS/2 Mouse • External RJ-45 connector for 10/100Base-Tx x2 • External USB connector x3 • External DC Jack for Power Adapter • 2.0mm ∅ 44-pin box header for IDE • 2.0mm ∅ 10-pin box header for RS-232 x1 • 2.0mm ∅ 10-pin box header for VGA2 • Power push button x1
Video Display	• AGP Rev.2.0 Compliant • Shared system memory • Resolution up to 1,920x1,440 true colors • CRT display
LAN	• Realtek 8100B single chip x2 • Full-duplex transfer mode, doubles effective bandwidth • NE2000 compatible with built-in 16KB RAM buffer • Throughput 10/100Mbps
Power Requirement	Single Voltage +5V **@1.7 A** with ACPI function support (Advanced Configuration and Power Interface)
Board Weight	350g
Board Size	133mm X 111mm (5.23 x 4.37 inches)
Operating Temperature	-20°C ~ +60°C

0.4 Ordering information

Athena	Embedded Vortex86 AIO SBC with 1S/CRT/Video-In /TV-out/Audio/1 LAN/ USB
Athena-L2	Embedded Vortex86 AIO SBC with 1S/CRT/2 LAN/ USB
EB-202	Embedded Chassis Box for Athena SBC
EB-202L2	Embedded Chassis Box for Athena-L2 SBC
PS-15W	AC to DC Power Supply Unit 15Watts

0.5 Notes

Model No.	1S	CRT	LAN	USB	Video In	TV Out	Audio
Athena	√	√	1	3	√	√	√
Athena-L2	√	√	2	3			

Chapter 1

Introduction

1.1 Features

- Embedded AIO Single Board Computer (133 x111 mm or 5.23 x4.37 inches)
- DM&P Vortex86™ System-On-Chip
- CRT Display interface
- 144-pin SODIMM Socket x1 for Memory expansion up to 512MB
- Enhanced IDE interface x1
- External Bi-directional Parallel Port x1
- Watchdog timer
- External Mini-Din PS/2 Keyboard & Mouse connectors
- External Ethernet, compatible with NE2000 x1 (option x2 for Athena-L2)
- Single voltage +5 V power connector
- Operating temperature from –20°C ～ +60°C
- Board Support Package for Windows CE.NET and Windows XP Embedded
- Flexible OEM/ODM design

1.2 Specification

- **Embedded CPU:** DM&P Vortex86™ System-on-Chip CPU – 166MHz, Realtime clock, and watchdog timer.
- **BIOS:** Y2K compliant AMI system BIOS
- **DRAM Memory:** Support up to 512MB SODIMM PC133
- **Data Bus:** 16-bit
- **Bus Speeds:** PCI Bus – 33MHz
- **DMA Channels:** 7
- **Interrupt Levels:** 15
- **Enhanced IDE:** supports one port and up to two hard drives or Enhanced IDE devices of PIO mode 4. BIOS enabled/disabled
- **Watchdog Timer:** generates either a RESET, NMI or an IRQ when your application loses control over the system. Optionally the watchdog can trigger a user specified interrupt. The watchdog is configurable from 30.5μs to 512 seconds (in 30.5μs segments)
- **Real-time Clock:** included in Vortex86 SOC with onboard lithium battery backup for 10 years of data retention. CMOS data backup of BIOS setup and BIOS default.
- **Keyboard and Mouse Connectors:**Supports PS/2 Keyboard and mouse
- **Serial ports:** Supports high speed RS-232 port, high speed RS-232/485 port (jumper selectable).
- **Bi-directional Parallel Port:** supports SPP, EPP and ECP mode. BIOS enabled/disabled
- **Environmental and Power**
- **Power Requirements:** single voltage +5 V @ 1.7A
- **Board Dimensions:** 133 (L) x 111 (W) mm or 5.23 (L) x4.37 (W) inches
- **Board Weight :** 350 g
- **Extended Operating Temperature:** -20°C ~+60 °C

1.3 VGA Interface

- **Chipset:** DM&P Vortex86™ SOC
- **Memory:** Shared system memory up to 128MB
- **System Bus:** 33-bit PCI bus
- **Panel Data Bus:** 24-bit
- **Display:** CRT

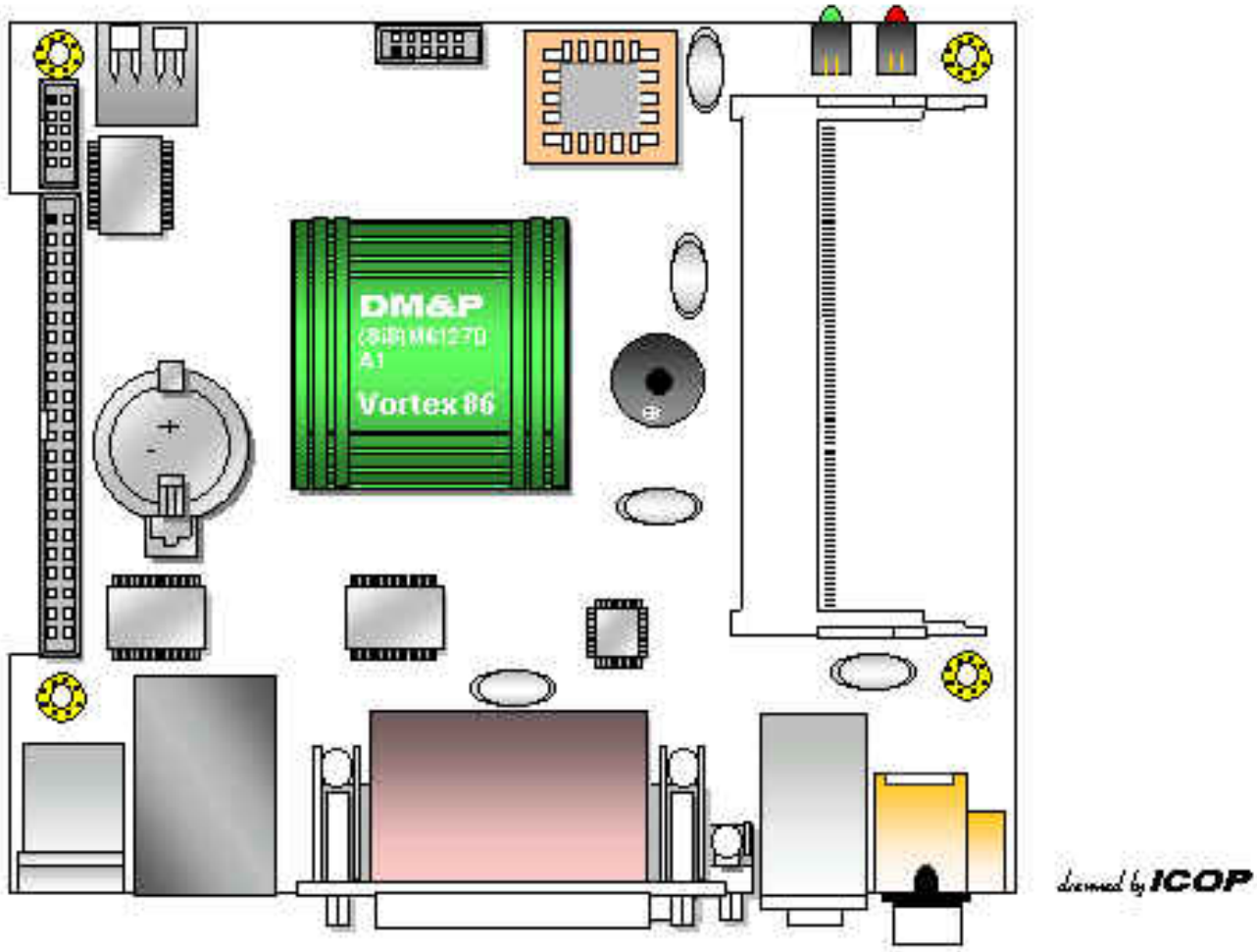
1.4 Network Interface

- **Chipset:** Realtek 8100B single chip
- **Type:** 10/100BASE-T
- **Transfer Mode:** Full duplex, doubles effective bandwidth
- **Buffer:** Built-in 16KB RAM Buffer.
- **Connectors:** 8-pin male header , pitch 2.0mm
- **Monitoring LEDs:** network ready indicator, network activity indicator
- **Compatibility:** NE2000

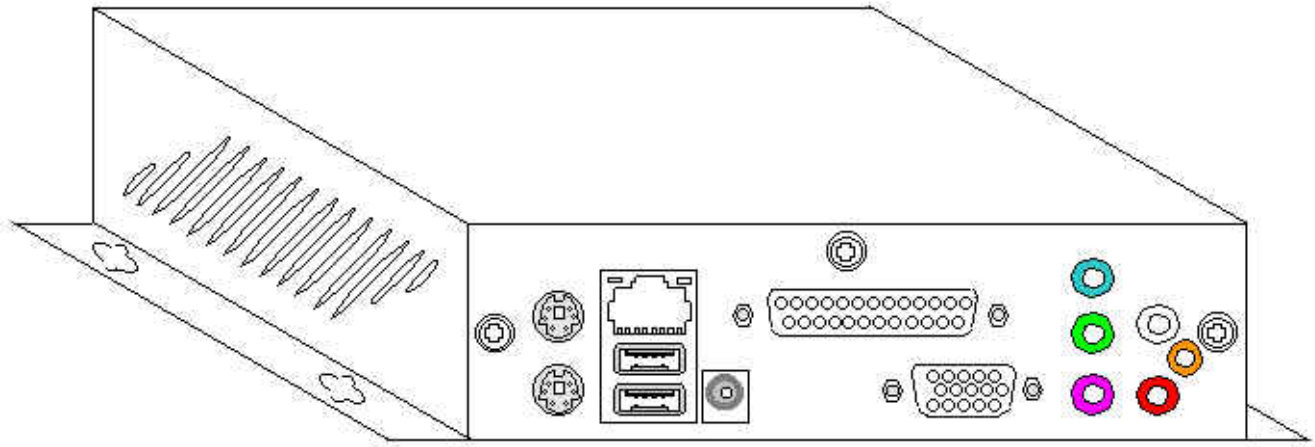
Chapter 2

Installation

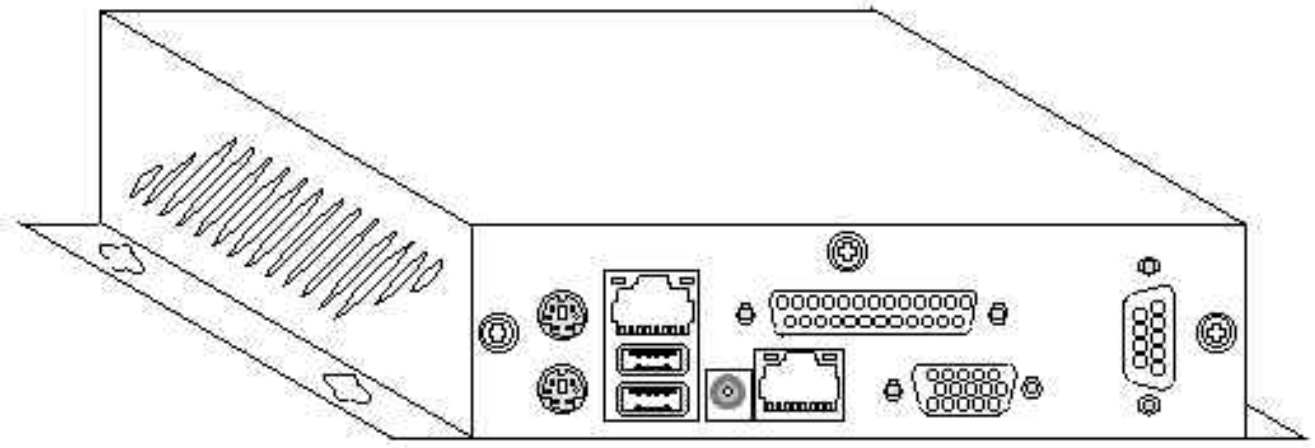
2.1 Board Outline



2.2 Chassis Outline



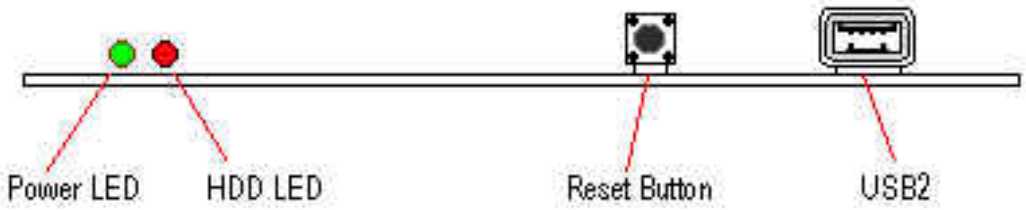
EB-202 Chassis Outine - Rear



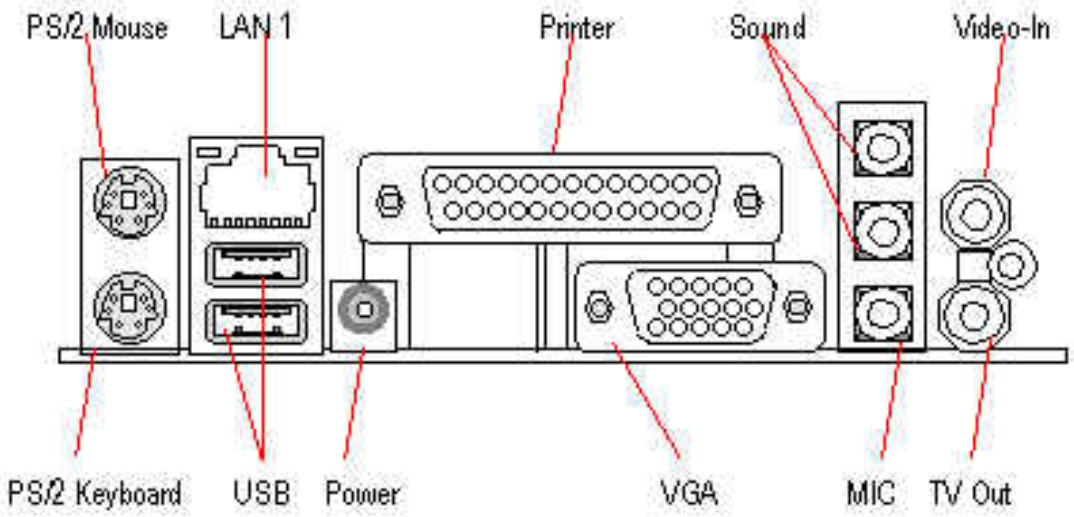
EB-202L2 Chassis Outine - Rear

EB-202	Embedded Chassis Box for Athena SBC
EB-202L2	Embedded Chassis Box for Athena-L2 SBC
Dimension (W x D x H):	145 x 115 x 50 mm

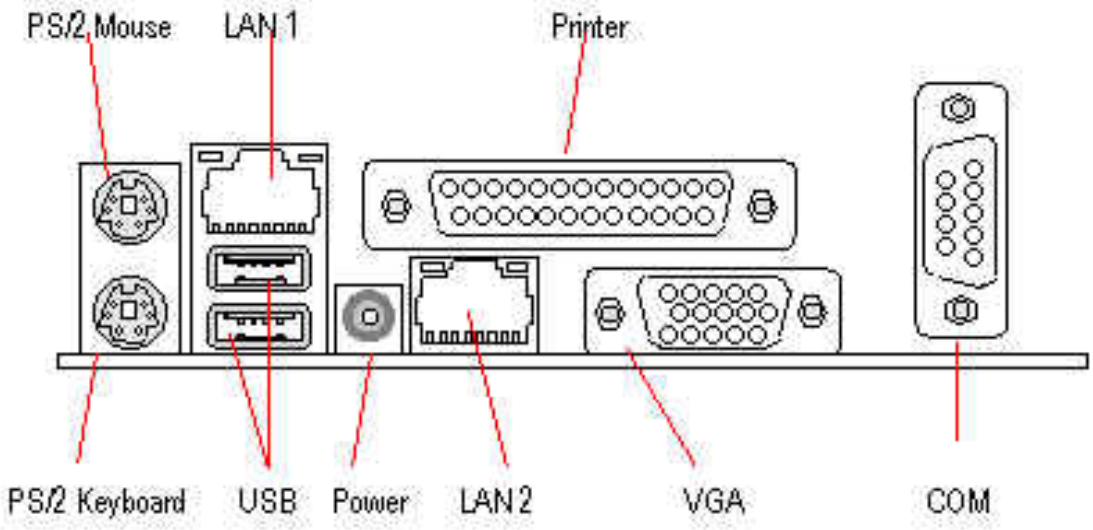
2.3 Front Chassis Connector



2.4 Rear Chassis Connectors

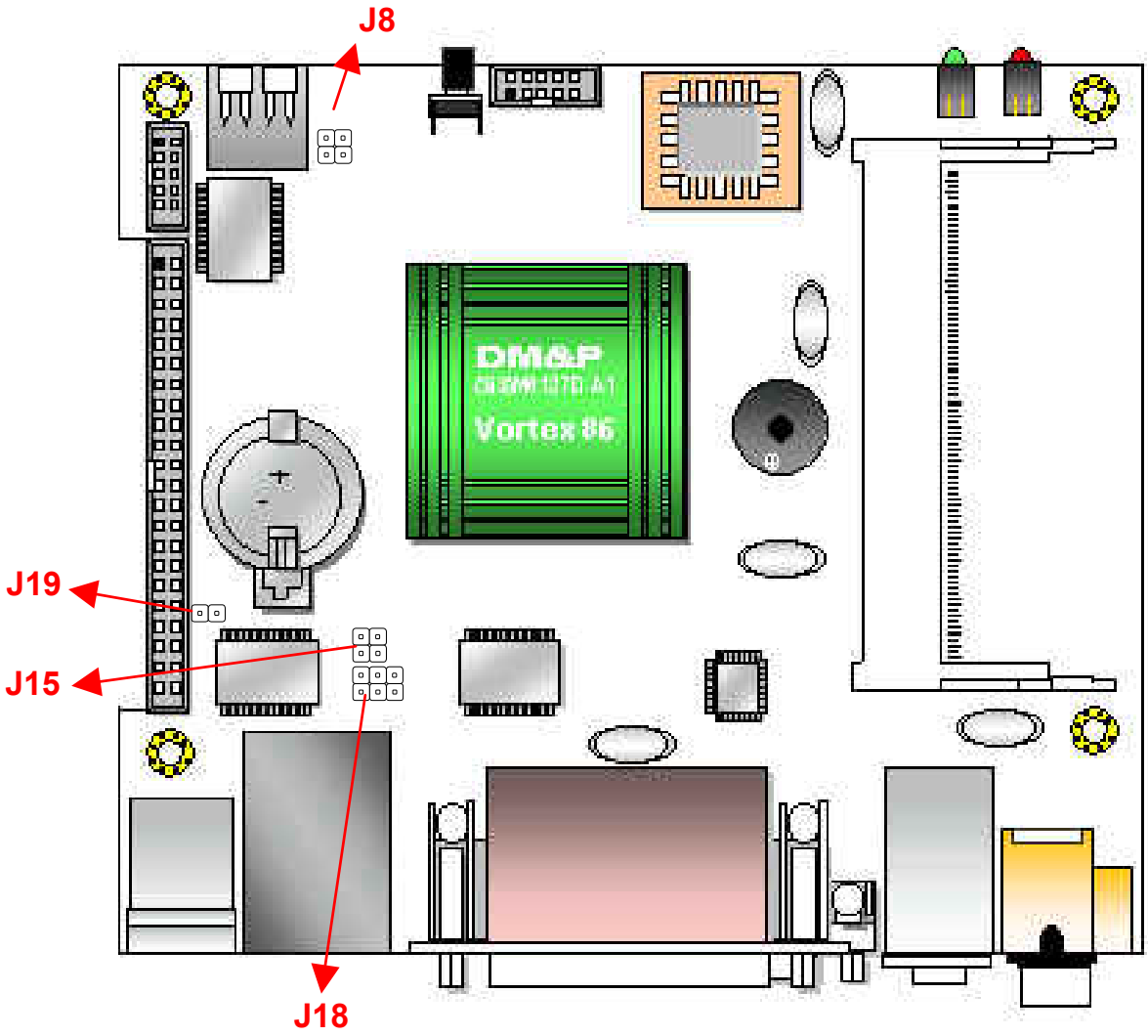


Athena Rear Connectors Outline



Athena-L2 Rear Connectors Outline

2.5 Connectors & Jumpers Location



Note: Please refer to Section 2.7 for their pin assignments.

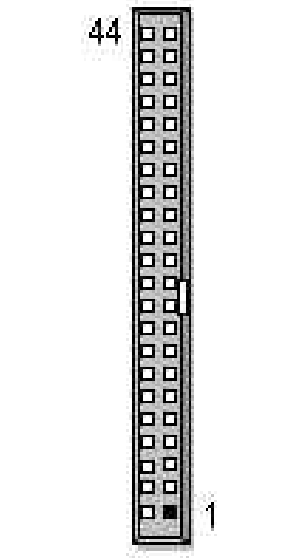
2.6 Connectors & Jumpers Summary

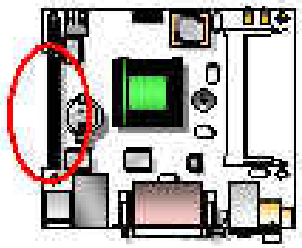
Summary Table

Nbr	Description	Type of Connections	Pin nbrs.
JP1:	IDE Connector	Box Header, 2.0∅ , 22x	44-pin
J2:	VGA Connector	D-Sub Connector	15-pin
J4:	SODIMM	Mini PCI DIMM Socket	144-pin
J5:	VGA2	Box Header, 5x2	10-pin
J6A:	VIDEO IN/OUT	RCA Jack x2	3-pin
J7:	Power Button	Two contact Switch	2-pin
J8:	System Reset/Power Button	Pin Header	4-pin
J9	PRINTER	D-Sub Connector	25-pin
J10:	100Base-T Ethernet LAN	RJ45 Connector	12-pin
J13A:	MIC IN (Pink)	Phone Jack-1	5-pin
J13B:	LINE OUT (Green)	Phone Jack-2	4-pin
J13C:	LINE IN (Blue)	Phone Jack-3	4-pin
J15	Power Mode Sel.	Pin Header, 3x2	6-pin
J16	DC Jack/DC 5V Input	Pin Header, 2x1	2-pin
J17:	COM1/RS-232	Pin Header, 5x2	10-pin
J18:	Option USB2	Pin Header	4-pin
J19	FAN PWR	Pin Header, 2x1	2-pin
KBMS1:	PS/2 Keyboard & Mouse	Mini-Din Connector x2	6-pin
ROM2:	BIOS	PLCC Socket	32-pin
USB1B:	100Base-T Ethernet LAN	RJ45 Connector	12-pin
USB1:	USB1/2	USB Type1 Connector x2	12-pin
USB2:	USB	USB Type1 Connector	6-pin

2.7 Pin Assignments & Jumper Settings

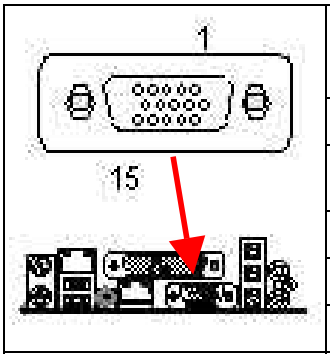
JP1: IDE Connector - 2.0 ∅ pitch 44-pin Box Header





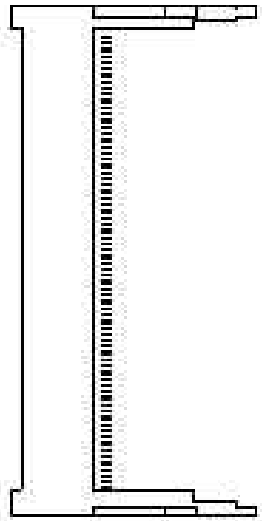
Pin #	Signal Name	Pin #	Signal Name
1	IDERST-	2	GND
3	IDED7	4	IDED8
5	IDED6	6	IDED9
7	IDED5	8	IDED10
9	IDED4	10	IDED11
11	IDED3	12	IDED12
13	IDED2	14	IDED13
15	IDED1	16	IDED14
17	IDED0	18	IDED15
19	GND	20	NC
21	IDEREQ	22	GND
23	IDEIOW-	24	GND
25	IDEIOR-	26	GND
27	ICHRDY	28	GND
29	IDACK-	30	GND
31	IDEIRQ	32	NC
33	IDESA1	34	CBLID
35	IDESA0	36	IDESA2
37	IDECS-0	38	IDECS-1
39	DASP	40	GND
41	VCC	42	VCC
43	GND	44	NC

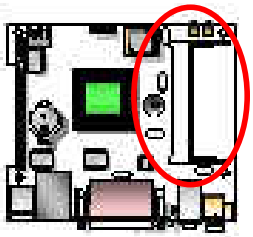
J2: VGA - 15-pin D-Sub Connector (female)



Pin #	Signal Name	Pin #	Signal Name	Pin #	Signal Name
1	MR	6	GND	11	NC
2	MG	7	GND	12	VCC
3	MB	8	GND	13	HYSYNC
4	NC	9	NC	14	VSYNC
5	GND	10	GND	15	VCC

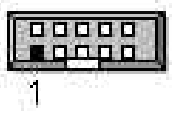
J4: SODIMM – 144-pin SODIMM Socket



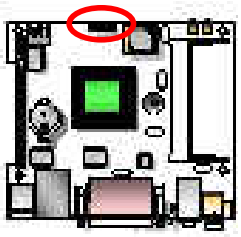


Pin #	Signal Name	Pin #	Signal Name	Pin #	Signal Name	Pin #	Signal Name
1	GND	37	MD16	73	GND	109	MA9
2	GND	38	MD48	74	SDCLK1	110	MA12
3	MD56	39	MD17	75	GND	111	MA10
4	MD24	40	MD49	76	GND	112	MA13
5	MD57	41	MD18	77	RSVD	113	VDD
6	MD25	42	MD50	78	RSVD	114	VDD
7	MD58	43	MD19	79	RSVD	115	DQM1
8	MD26	44	MD51	80	RSVD	116	DQM5
9	MD59	45	VDD	81	VDD	117	DQM4
10	MD27	46	VDD	82	VDD	118	DQM0
11	VDD	47	MD20	83	MD8	119	GND
12	VDD	48	MD52	84	MD40	120	GND
13	MD60	49	MD21	85	MD9	121	MD32
14	MD28	50	MD53	86	MD41	122	MD0
15	MD61	51	MD22	87	MD10	123	MD33
16	MD29	52	MD54	88	MD42	124	MD1
17	MD62	53	MD23	89	MD11	125	MD34
18	MD30	54	MD55	90	MD43	126	MD2
19	MD63	55	GND	91	GND	127	MD35
20	MD31	56	GND	92	GND	128	MD3
21	GND	57	RSVD	93	MD12	129	VDD
22	GND	58	RSVD	94	MD44	130	VDD
23	DQM7	59	RSVD	95	MD13	131	MD36
24	DQM3	60	RSVD	96	MD45	132	MD4
25	DQM2	61	SDCLK0	97	MD14	133	MD37
26	DQM6	62	CKE0	98	MD46	134	MD5
27	VDD	63	VDD	99	MD15	135	MD38
28	VDD	64	VDD	100	MD47	136	MD6
29	MA1	65	SRAS-	101	VDD	137	MD39
30	MA3	66	SCAS-	102	VDD	138	MD7
31	MA1	67	RAMW-	103	MA6	139	GND
32	MA4	68	CKE1	104	MA7	140	GND
33	MA2	69	CAS-0	105	MA8	141	SMBDAT
34	MA5	70	MA12	106	MA11	142	SMBCLK
35	GND	71	CAS-1	107	GND	143	VDD
36	GND	72	MA13	108	GND	144	VDD

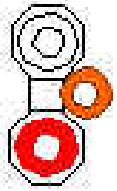
J5: VGA2 – 2.0∅10-pin Box Header



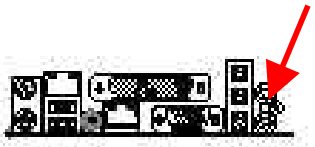
Pin #	Signal Name	Pin #	Signal Name
1	V2DACR	2	GND
3	V2DACG	4	GND
5	V2DACB	6	GND
7	HSYNC2	8	GND
9	VSYNC2	10	GND



J6A: VIDEO IN/OUT – RCA Jack x2



Pin #	Signal Name
1	GND
2	CVBSOUT
3	VIDEO_IN

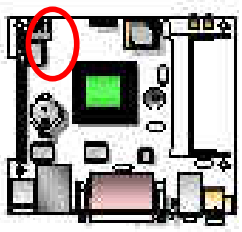


J7: Power Button – Push Button

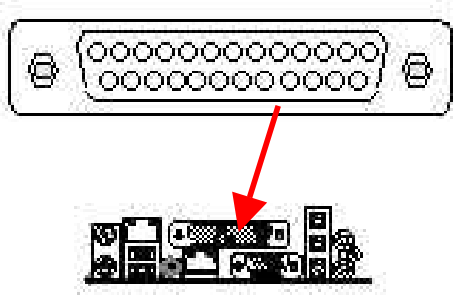
Pin #	Signal Name
1	GND
2	PWRBIN-

J8: System Reset – 4-pin Header

Pin #	Signal Name
1	
2	RST
3	
4	PWRBIN-

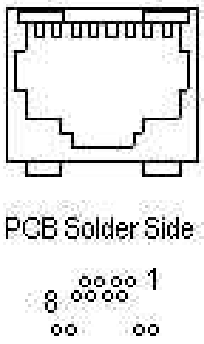


J9: PRINTER – 25-pin Box Header

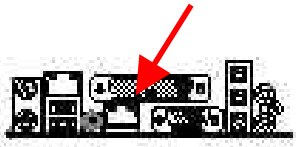


Pin #	Signal Name	Pin #	Signal Name
1	STB-	2	PD0
3	PD1	4	PD2
5	PD3	6	PD4
7	PD5	8	PD6
9	PD7	10	ACK-
11	BUSY	12	PE
13	SLCT	14	AFD-
15	ERR-	16	PRINIT-
17	SLIN-	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND	--	--

J10: 100Base-T Ethernet LAN – 12-pin RJ45 Connector

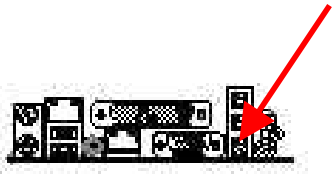


Pin #	Signal Name	Pin #	Signal Name
1	TX+	2	TX-
3	RX+	4	NC
5	NC	6	RX-
7	NC	8	NC
9	VCC	10	VCC
11	GND	12	GND



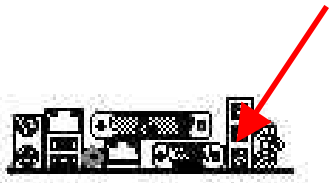
J13A: MIC IN (Pink / PHONEJACK-1) – 5-pin Phone Jack-1

Pin #	Signal Name
1	GND
2	MIC1
3	Open Touch
4	Open Touch
5	VREFOUT



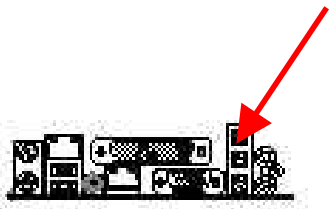
J13B: LINE OUT (Green / PHONEJACK-2) – 4-pin Phone Jack-1r

Pin #	Signal Name
6	LOUTL
7	Open Touch
8	Open Touch
9	LOUTR

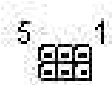


J13C: LINE IN (Blue / PHONEJACK-3) – 4-pin Phone Jack-1

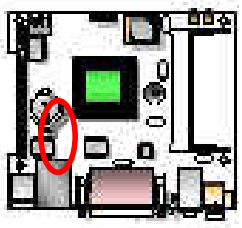
Pin #	Signal Name
10	LINEIN_L
11	Open Touch
12	Open Touch
13	LINEIN_R



J15: Power Mode Sel. – 6-pin Box Header



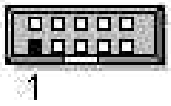
Pin #	Signal Name	Remark
1	SB5V	SINGL 5V
2	SB5V	
3	5V	SINGLE 5V ACPI
4	5V	
5	NC	ATX POWER (5V/SB5V)
6	NC-	



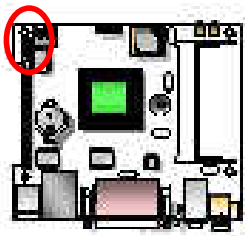
J16: DC Jack/DC 5V Input – 2-pinDC Jack r

Pin #	Signal Name
1	SB5V
2	GND

J17: COM1/RS-232– 2.0∅ 10-pin Box Header

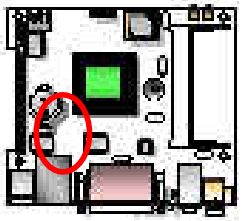


Pin #	Signal Name	Pin #	Signal Name
1	DCD1	2	RXD1
3	TXD1	4	DTR1
5	GND	6	DSR1
7	RTS1	8	CTS1
9	RI1	10	GGND



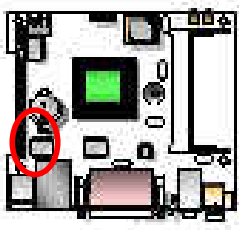
J18: System Reset/Power Button – 4-pin Header

Pin #	Signal Name
1	USB1-
2	USB+
3	GND
4	VCC

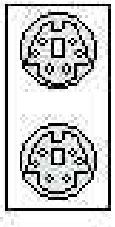


J19: FAN PWR – 2-pin Header

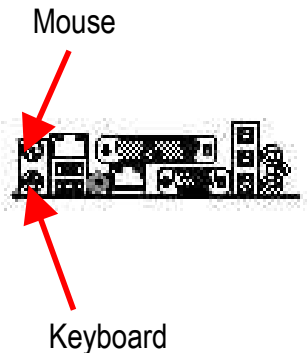
Pin #	Signal Name
1	VCC
2	GND



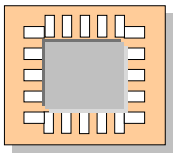
KBMS1: PS/2 Keyboard & Mouse: Mini-Din Connector x2

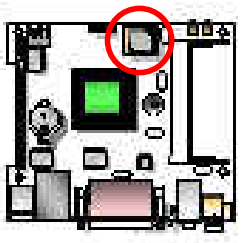


Pin #	Signal Name
1	KBDAT
2	NC
3	GND
4	SB5V
5	KBCLK
6	NC
7	PMDAT
8	NC
9	GND
10	SB5V
11	PMCLK
12	NC



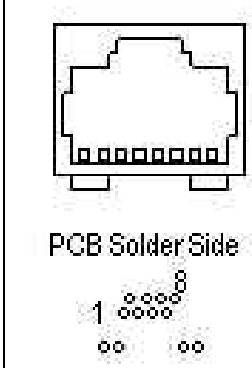
ROM2: BIOS / FLASH ROM_PLCC – 32-pin PLCC Socket



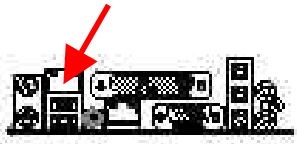


Pin #	Signal Name	Pin #	Signal Name
1	XA18	2	XA16
3	XA15	4	XA12
5	XA7	6	XA6
7	XA5	8	XA4
9	XA3	10	XA2
11	XA1	12	XA0
13	XD0	14	XD1
15	XD2	16	GND
17	XD3	18	XD4
19	XD5	20	XD6
21	XD7	22	ROMCS0
23	XA10	24	MDRCL
25	XA11	26	XA9
27	XA8	28	XA13
29	XA14	30	XA17
31	MWTCL	32	VCC

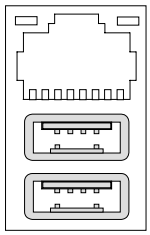
USB1B: 100Base-T Ethernet LAN – 12-pin RJ45 Connector



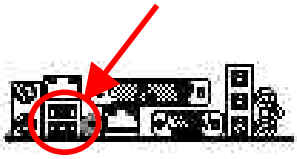
Pin #	Signal Name	Pin #	Signal Name
1	TX+	2	TX-
3	RX+	4	NC
5	NC	6	RX-
7	NC	8	NC
9	VCC	10	VCC
11	LED0 (TX/RX)	12	LED1 (LINK100)



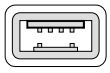
USB1A: USB1/2 – 12-pin USB Type 1 Connector x2



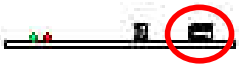
Pin #	Signal Name	Pin #	Signal Name
U1	VCC	U5	VCC
U2	-DATA	U6	-DATA
U3	+DATA	U7	+DATA
U4	GND	U8	GND
H5	Hole/GND	H3	Hole/GND
H6	Hole/GND	H4	Hole/GND



USB2: USB– 12-pin USB Type 1 Connector x2



Pin #	Signal Name
1	VCC
2	UV2-
3	UV2+
4	GND
5	NC
6	NC



2.8 Watchdog Timer

The watchdog timer uses a 32.768 KHz frequency source with a 24-bit counter. Its time range stretches from 30.5 ms to 512 sec. with a resolution of 30.5 ms. When the watchdog times out, a System RESET, NMI or IRQ can be invoked. Watchdog timer control and the 24-bit counter itself occupy 6 consecutive 8-bit address locations.

When functioning properly, the system resets the watchdog timer periodically to prohibit that it times out. If the watchdog timer times out, it will RESET the system, or generate and NMI or IRQ, depending on its configuration.

Watchdog or System Timer

Another great application is to generate a periodic IRQ signal. Under DOS environment, the 8254, system timer 0, will generate IRQ0 every 54.9 ms. The watchdog is like a system timer 0. It can be programmed to periodically generate a configurable IRQ. It may be clear that the selected IRQ, will no longer be available to the system.

Configuring the Watchdog Timer in the BIOS

The Vortex86 watchdog configuration register can be controlled by software or can be setup in the BIOS. To do so, go to BIOS Setup's "Advanced Chipset Setup"

Watchdog Function	= Enable/Disable
Watchdog Signal	= RESET, NMI or IRQ 3/4/5/6/7/9/10/11/12/14/15
Watchdog Timer	= 1/2/4/8/16/32/64/128/256/512 Seconds

The BIOS setup only offers a limited amount of time-out values. To obtain a more higher resolution of timeout values, refer to the next paragraph "Configuring the Watchdog Timer by Software". Note that in case of using the BIOS setup, the watchdog starts counting the moment it passes the BIOS setup. This means that if you set the time-out period to 1 second, the system will keep rebooting before being able to load operating system or software!

After you have finished configuring your watchdog timer, it reads "Timeout Status & Reset - INDEX 3CH" on the page 23; and look at the example on page 26 to find out how to periodically resetting the timeout status to prevent the watchdog timer from invoking a RESET, NMI or IRQ.

Configuring the Watchdog Timer by Software

Chipset configuration registers

The Vortex86 configuration register INDEX 37H, 38H, 39H, 3AH, 3BH, 3Ch are used to control the watchdog functions and/or display its current status.

Enable/Disable watchdog - INDEX 37H

Bit	Value	Action
7	reserved	Do not modify the value of these bits!
6	0 1	Disable watchdog timer Enable watchdog timer
5-0	Other function	Do not modify the value of these bits!

Watchdog time out action - INDEX 38H

Bit	Value	Action
7-4	0000	No output signal
	0001	IRQ3
	0010	IRQ4
	0011	IRQ5
	0100	IRQ6
	0101	IRQ7
	0110	IRQ9
	0111	IRQ10
	1000	IRQ11
	1001	IRQ12
	1010	IRQ14
	1011	IRQ15
	1100	NMI
	1101	System RESET
	1110	No output signal
	1111	No output signal
3-0	Other function	Do not modify the value of these bits!

Watchdog timer - INDEX 39H, 3AH, 3BH

Index	3Bh	3Ah	39h
Bits	D7……D0	D7……D0	D7……D0
counter	[VSB……	……...	……..LSB]

For example

Index	3Bh	3Ah	39h	Time out
	00h	00h	01h	30.5μs
	00h	00h	02h	61μs
	00h	01h	00h	7.8 ms
	00h	02h	00h	15.6 ms
	01h	00h	00h	2 s
	02h	00h	00h	4 s
	FFh	FFh	FFh	512 s

Timeout Status & Reset - INDEX 3CH

Bit	Value	Action
7	0 1	Timeout has not occurred Timeout has occured
6	1 0	Reset timer Has no meaning
5-0		Other function, do not modify these bits

Programming the watchdog

To perform any operation on the Vortex86 configuration registers you always have to unlock first and lock the registers afterwards.

Unlock configuration register

```
mov al, 013h
out 22h, al
nop
nop
mov al, 0c5h
out 23h, al
nop
nop
```

Lock configuration register

```
mov al, 013h
out 22h, al
nop
nop
mov al, 000h
out 23h, al
nop
nop
```

Read the value of a configuration register

For example, read INDEX 3Ch :

```
Unlock configuration register
mov al, 03ch
out 22h, al
nop
nop
in al, 23h
nop
nop
push ax
Lock configuration register
pop ax ;AL - result
```

Write data to configuration register

For example, write 0FFh to INDEX 3Bh :

```
Unlock configuration register
mov al, 03bh
out 22h, al
nop
nop
mov al, 0ffh
out 23h, al
nop
nop
Lock configuration register
```

Watchdog Program Example

We use the following sequence to initialize the watchdog timer:

(1) Unlock configuration register.

(2) Disable watchdog timer by setting INDEX 37H Bit 6 to '0'.

(3) Set the expected counter value to INDEX 3BH, 3AH, 39H.

(4) Select timeout action from INDEX 38H Bit 7-4.

(5) Enable watchdog timer by setting INDEX 37H Bit 6 to '1'.

(6) Lock configuration register.

Example: Set timeout to 128 sec to generate a system RESET.

```
; Please use MASM to compiler the following program
; Execute under DOS environment
dosseg
. model small
. stack 100h
.code
main proc
        mov ax, 0c513h ; Unlock config. register
        call writechip
        mov ax, 03737h ; Disable watchdog timer
        call readchip
        and al, 10111111b
        xchg ah, al
        call writechip
        mov ax, 0403bh ; Set the expected counter
        ; value
        call writechip ; to [400000h]
        mov ax, 0003ah ; 30.5*sec*400000h= 128 sec
        call writechip
        mov ax, 00039h
        call writechip
        mov ax, 03838h ; Select “system reset” as
        ; timeout action
        call readchip
        and al, 00001111b
        or al, 11010000b
        xchg ah, al
        call writechip
        mov ax, 03737h ; Enable watchdog timer
        call readchip
        or al, 01000000b
        xchg ah, al
        call writechip
        mov ax, 00013h ; Lock config. register
        call writechip
```

```
        mov ax, 04c00h
        int 21h
        main endp
readchip proc
        out 22h, al
        nop
        nop
        in al, 23h
        nop
        nop
        ret
readchip endp
writechip proc
        out 22h, al
        nop
        nop
        xchg ah, al
        out 23h, al
        nop
        nop
        xchg ah, al
        ret
writechip endp
end main
```

Reset watchdog timer

Resets the watchdog timer periodically to prevent timeout.

```
mov ax, 0c513h ; Unlock configuration
; register
call writechip
mov ax, 03C3Ch ; Reset watchdog timer
; counter
call readchip
or al, 01000000 ; The counter is reset at
xchg ah, al ; out 23h, al
call writechip
mov ax, 00013h ; Lock configuration
; register
call writechip
```

(the above code uses readchip and writechip procedures)

Chapter 3

SVGA Setup

3.1 Introduction

The ATHENA / ATHENA-L2 offers high performance/low cost Vortex™ SoC (System on Chip) solution that. integrates a x86 compatible processor, high performance North Bridge, advanced hardware GUI engine and Super-South bridge into a single chipset – this SoC design supports the now PC technology, USB, Legacy Removal, CIR, Memory Stick, Smart Card and Slotless Design for a variety of Information applications. It also has a built-in VGA controller.

3.1.1 SoC Chipset

The embedded video uses the integrated Ultra-AGP™ VGA controller for Hardware 2D/video/Graphics Accelerators, this board supports conventional analog CRT monitor. It also provides Monitor / Secondary CRT Monitor output. This video SVGA controller supports conventional analog CRT monitor, interlaced and non-interlaced analog monitors (color and monochrome VGA) in high-resolution modes while maintaining complete IBM VGA compatibility. Multiple frequency (multi-sync) monitors are handled as if they were analog monitors.

3.1.2 Display memory

The VGA controller can drive CRT displays with resolutions up to 1920 x 1440 at 256 colors (True colors). It supports Shared System Memory up to 128 MB.

Chapter 4

Network Interface

4.1 Introduction

The Realtek RTL-8100B 10/100Mbps Ethernet controller board supports both 10/100BASE-T and Coax 10Base-2 'BNC' connectors, and allows direct connection to your 10/100Mbps Ethernet based Local Area Network for full interaction with local servers, wide area networks such as the Internet.

I/O and IRQ settings can be done by software with the supplied utility software, or it can be set for Plug and Play compatibility. The controller supports : Full-Duplex Ethernet function to double channel bandwidth, auto media detection.

4.2 Software Support

- On-board EEPROM (93C46) programming
- Setup/Diagnostic program for DOS
- Help utility for easy installation
- RPL boot ROM for Novell Netware, Microsoft NT
- NDIS2 (DOS,OS/2,Lantastic,WFW3.1¡K¡K)
- NDIS3,NDIS4,NDIS5 for WIN95,98,NT3.51,4.0,5.0,WFW3.11
- Netware 16-bit ODI driver for DOS,OS/2 and 32-bit ODI driver for Netware 3.x,4.x,5.0 Server
- Packet driver for UNIX Client
- SCO Unix driver
- Linux driver

Note: All operating systems that support standard NE2000

Warranty

This product is warranted to be in good working order for a period of one year from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster. Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, originality to use this product. Vendor will not be liable for any claim made by any other related party. Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.