



# VORTEX86-6076

## **Embedded Vortex86 CPU AIO Board**

**with 2S/2USB/VGA/LAN/AUDIO/128MB DRAM Onboard**

## **Quick Reference Manual**

**(Revision 1.2A)**

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# Chapter 0

## Startup

### 0.1 Packing List

Product Name	Function	Package
VORTEX86-6076LV	Embedded Vortex86™ (SiS) All-in-One SBC	<ul style="list-style-type: none"><li>● Embedded Vortex86 CPU All-in-One Board</li><li>● Manual &amp; Drivers CD x 1</li><li>● RS232 cable x 1</li><li>● PRINT cable x1</li><li>● HDD 44P cable x 1</li><li>● Audio Line x 1</li><li>● Y cable for Keyboard/Mouse x1</li></ul>

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## 0.2 Specification (VORTEX86-6076)

Features	VORTEX86-6076
Chipset	DM&P(SiS) Vortex86™ System-on-Chip CPU-200MHz Real Time Clock with Lithium Battery Backup Watchdog Timer: 4 ms to 1hour
BIOS	AMI BIOS
RAM	128MB SDRAM onboard
Bus Interface	Specific X-PCI bus interface, compatible with PCI Rev.2.2, PC 98/99
I/O	<ul style="list-style-type: none"> <li>● Enhanced IDE interface</li> <li>● RS232 port x2</li> <li>● Parallel port x1</li> <li>● 10/100Mbps Ethernet port x1</li> <li>● USB port x2 (Ver1.1)</li> </ul>
Connectors	<ul style="list-style-type: none"> <li>● 2.0mm Ø 64-pin socket for 32-bit x-PCI interface</li> <li>● 2.0mm Ø 44-pin box header for IDEx1</li> <li>● 2.0mm Ø 26-pin box header for Printer</li> <li>● 2.0mm Ø 10-pin box header for RS-232 x2</li> <li>● 2.0mm Ø 4-pin wafer for Line-in x1</li> <li>● 2.54mm Ø 2-pin header for Reset x1</li> <li>● External 15-pin D-sub female connector for VGA x1</li> <li>● External RJ-45 connector for Ethernet x1</li> <li>● External USB connector x2</li> <li>● External 6-pin Mini-Din connector for Keyboard/ Mouse x1</li> <li>● PhoneJack-S for Line-out/MIC-in x2</li> </ul>
Display	<ul style="list-style-type: none"> <li>● AGP Rev.2.0 Compliant</li> <li>● Shared system memory up to 64MB (Default 8 MB).</li> <li>● Support resolution up to 1,280x1,024 true colors</li> <li>● VGA interface support</li> </ul>
LAN	<ul style="list-style-type: none"> <li>● Realtek 8100B 10/100Mbps Ethernet Controller</li> <li>● Half/full-duplex capacity</li> </ul>
udio	Fully compliant with AC97 V2.1 Hardware DirectSound accelerator
Power Requirement	Single Voltage +5V @1.2A
Dimension	133mm X 111mm (5.24 x 4.37 inches)
Weight	150g
Operating Temperature	-20°C ~ +70°C

### 0.3 Ordering information

VORTEX86-6076	Vortex86 ATX CPU Module
Power-15W-3pin-EU/US	Mini Din 3pin 15W Adapter

# Chapter 1

## Introduction

### 1.1 Features

- Embedded CPU AIO Board (133 x111 mm or 5.24 x 4.37 inches)
- DM&P Vortex86™ System-On-Chip
- CRT Display interface
- Onboard RAM 128MB
- Enhanced IDE interface x1
- External Bi-directional Parallel Port x1
- External RS-232 Port x2
- USB x2, version 1.1
- Watchdog timer
- One External Mini-Din 6-pin connector for Keyboard/Mouse x1
- External RJ-45 connector for Ethernet x1
- Expansion Slot – Specific X-PCI bus interface
- Single voltage +5 V power connector
- Operating temperature from -20°C ~ +70°C
- Board Support Package for Windows CE.NET



## 1.2 Specifications

- **Embedded CPU:** DM&P Vortex86™ System-on-Chip CPU – 200MHz, Realtime clock, and watchdog timer.
- **BIOS:** Y2K compliant AMI system BIOS
- **DRAM Memory:** Onboard 128MB
- **Bus Interface:** X-PCI Bus & PC/104 Standard Compliant
- **Data Bus:** 64-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 16 msec. to 512 seconds
- **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.
- **PS/2 Keyboard & Mouse:** Supports PS/2 Keyboard and mouse
- **Serial ports:** Supports high speed RS-232 port x2
- **USB ports:** Version 1.1 USB port x2
- **Bi-directional Parallel Port:** supports SPP, EPP and ECP mode. BIOS enabled/disabled
- **Environmental and Power**
- **Power Requirements:** single voltage +5 V @ 1.2A
- **Board Dimensions:** 133 (L) x 111 (W) mm or 5.24 (L) x 4.37 (W) inches
- **Board Weight :** 150 g
- **Extended Operating Temperature:** -20°C ~+70 °C

## 1.3 VGA Interface

- Chipset: DM&P Vortex86™ SOC
- Memory: Shared system memory up to 64MB
- System Bus: 32-bit PCI bus
- Panel Data Bus: 24-bit
- Display: CRT
- Compliance: - AGP 2.0 / 4X Compliant / Fully DirectX 8 Compliant

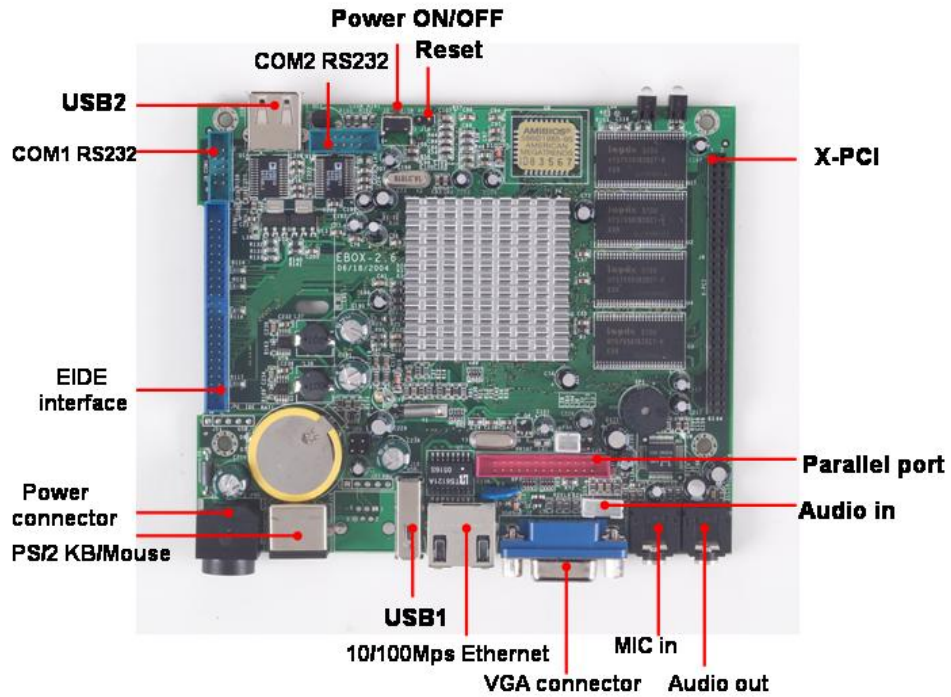
## 1.4 Network Interface

- **Chipset:** Realtek 8100B single chip
- **Type:** 10/100BASE-T
- **Transfer Mode:** Full duplex, doubles effective bandwidth
- **Buffer:** Built-in 16KB RAM Buffer.
- **Connectors:** RJ-45
- **Monitoring LEDs:** Network ready indicator, network activity indicator

# Chapter 2

## Installation

### 2.1 Board Outline



## 2.2 Watchdog Timer

The watchdog timer work flow of Vortex86 is: If the watchdog timer expires the first time, the expired event will set SFTMR0\_STS and timer will reload its initial value and count again. If the timer expires the second time, the expired event will set SFTMR1\_STS.

### Software Watchdog Timer Initial Value: Default Value: FFh

I/O Address	Bit	Access	Description
84Ah	7:0	R/W	Software Watchdog Timer Initial Value Writing to this register will reload the software watchdog timer with the value specified in this register. If the software watchdog timer expires the first time, the expired event will set the SFTMR0_STS and the timer will reload its initial value and count again. If the timer expires the second time, the expired event will set the SFTMR1_STS. The timer value can't be read from this field.

### Software Watchdog Timer Control Register: Default Value: 00h

I/O Address	Bit	Access	Description
84Bh	7	R/W	Software Watchdog Timer Counting Enable The software watchdog timer will start to count when this bit is set to one.
	6	RO	Reserved
	5:4	R/W	Software Watchdog Timer Clock Select 00 : 4 ms 01 : 1 second 10 : 1 minute 11 : 1 hour
	3:2	R/W	Software Watchdog Timer Expiration Event 1 Routing Select When SFTMR1_STS is set to one, an SMI#/SFTIRQ/PCIRST# will be generated according to the following combination. 00 : No effect 01 : SMI# 10 : SFTIRQ 11 : PCIRST#

1:0	R/W	Software Watchdog Timer Expiration Event 0 Routing Select When SFTMR0_STS is set to one, an SMI#/SFTIRQ/PCIRST# will be generated according to the following combination. 00 : No effect 01 : SMI# 10 : SFTIRQ 11 : PCIRST#
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### Legacy Event Status Register: Default Value: 00h

I/O Address	Bit	Access	Description
841h	7	R/WC	Software Watch Dog Timer Event 1 Status (SFTMR1_STS) This bit is set when the software watchdog timer expires the second time. This status bit does not have its corresponding enable bit and can survive under PCIRST#.
	6	R/WC	Software Watch Dog Timer Event 0 Status (SFTMR0_STS) This bit is set when the software watchdog timer expires the second time. This status bit does not have its corresponding enable bit and can survive under PCIRST#.

### C Example

Those C code for DOS will show you more: ([Download C source code for DOS and execute file](#))

```
#include <conio.h>
#include <stdio.h>
#include <time.h>

void main()
{
    clock_t clk;
    int      nTime = 5;

    /* set time out */
    outp(0x84a, nTime);

    /* set timer clock to 1 second and "Timer Expiration Event 0/1" to reset system. */
    outp(0x84b, 0x9c);

    printf("Press any key to stop clearing watchdog timer status...\n");
}
```

```

while(!kbhit())
{
    /* clear "Timer Expiration Event 0/1" bit */
    outp(0x841, 0xc0);
}

getch();

printf("System will be reset after %d seconds.\n", nTime * 4);

clk = clock();
while(!kbhit())
    printf("%2.2fr", (clock() - clk) / CLK_TCK);
}

```

### Assembler Example code

```

mov dx,84ah ; set timeout = 20 second
mov al,5
out dx,al
mov dx,84bh ; set timer clock to 1 second and "Timer Expiration Event 0/1" to reset
system.
mov al,9ch
out dx,al

; clearing watchdog timer status
mov dx,841h
mov al,0c0h
out dx,al

```

# Chapter 3

## SVGA Setup

### 3.1 Introduction

The VORTEX86-6076 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 IA (Information Appliance) 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 or flat panel. It is both AGP 4X / Fully DirectX 8 Compliant. It also provides Monitor / Secondary CRT Monitor output. This video SVGA controller supports conventional analog CRT monitor or flat panel. In addition, it also supports 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 or color panel 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;KjK)
- 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

## 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.