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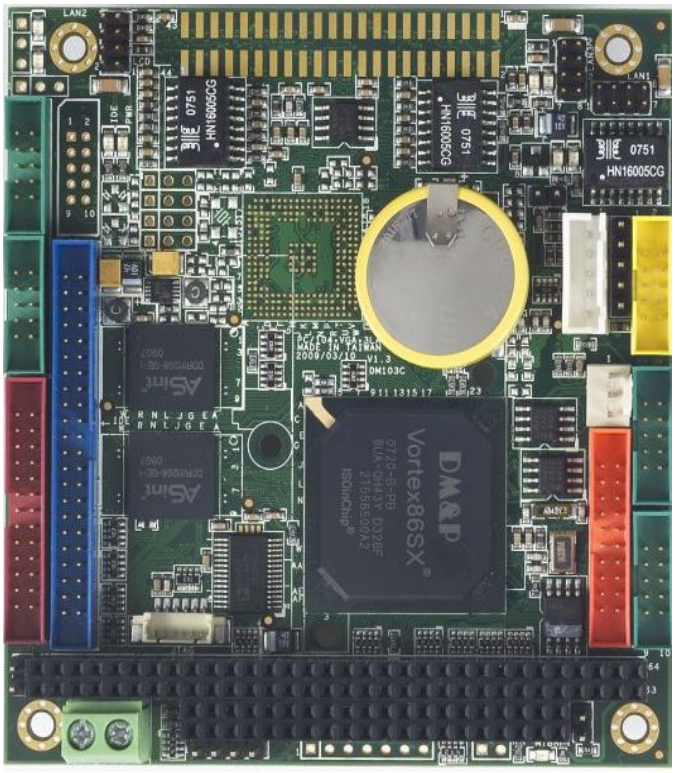
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# VSX-6156-V2

## DM&P Vortex86SX 300MHz

## PC/104 CPU Module

### with 4S/2USB/3LAN/GPIO

### 128MB DDR2 Onboard

## User's Manual

**(Revision 1.1A)**

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# Chapter 1

# Introduction

## 1.1 Packing List

| Product Name | Package |
|---|---|
| VSX-6156-V2 | • Embedded Vortex86SX CPU All-in-One Board<br>• Manual & Drivers CD x 1<br>• RS232 cable x 4<br>• PRINT cable x1<br>• IDE cable x 1<br>• USB cable x 1 (USB port x 2)<br>• LAN cable x 3<br>• GPIO cable x 1<br>• PS/2 Mouse cable x 1<br>• PS/2 Keyboard cable x 1<br>• Screw Kit x 1 |

## 1.2 Product Description

The VSX-6156-V2 family of low-power x86 embedded controller is designed to meet PC/104 specification, and integrated with the following features.

- 300MHz Vortex86SX System-On-Chip
- 128 / 256 MB DDR2 system memory
- Enhanced IDE
- 10/100Mbps Ethernet x 3
- 2 USB 2.0 (host)
- Up to 4 serial ports
- Parallel port
- 16-bit GPIOs
- Onboard 2MB SPI Flash
- Meet PC/104 stacking spec.
- 2 watchdog timer
- JTAG interface
- AMI BIOS
- Single voltage +5V DC
- Support extended operating temperature range of -20°C to +70°C

The VSX-6156-V2 PC/104 family of embedded controller is designed with backward compatibility in mind, to provide migration path for projects facing end-of-life challenges with their existing x86 based PC/104 controller. The VSX-6156-V2 family of controller is designed as a plug in replacement, with backward compatibility to support legacy software to help extend existing product life cycle without heavy re-engineering.

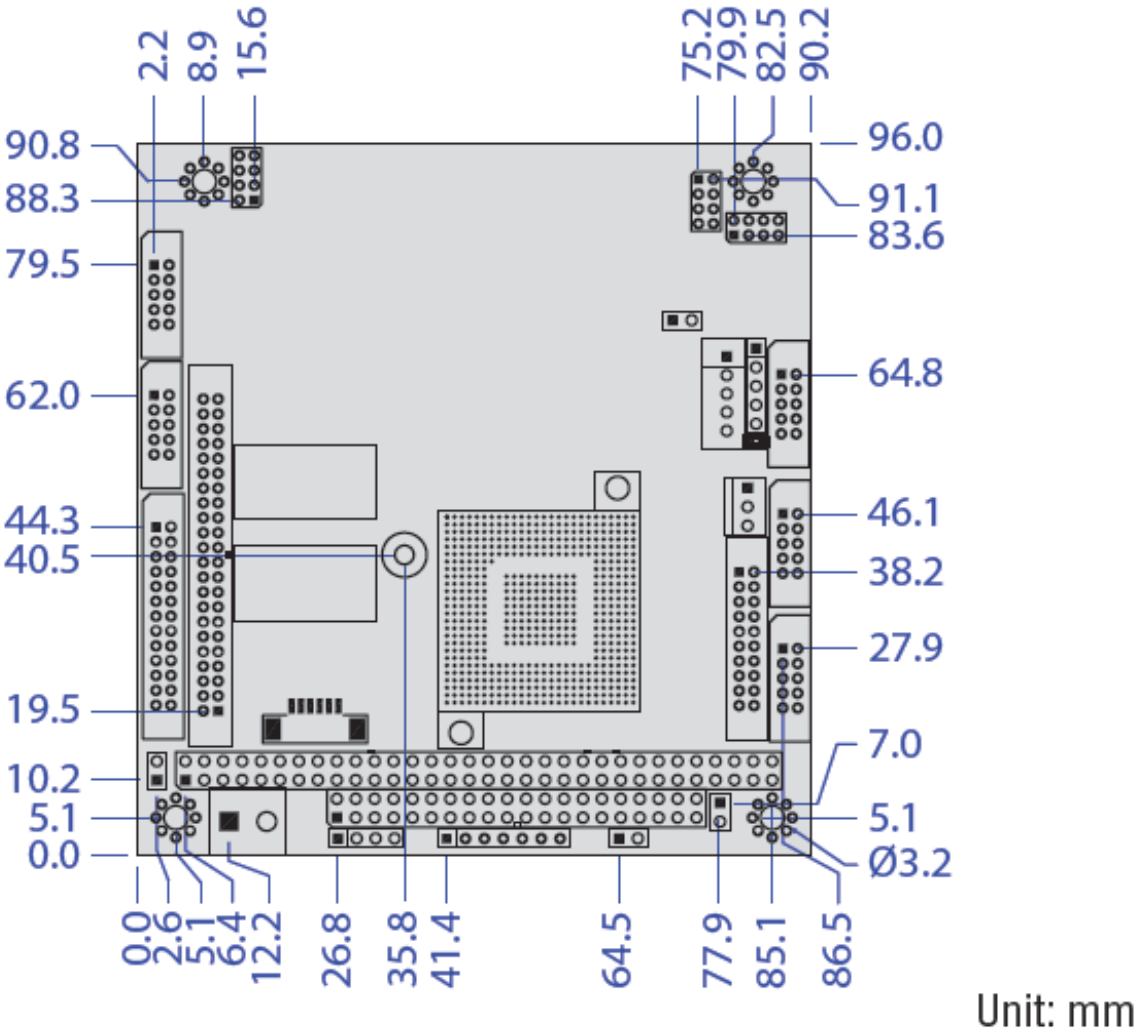
VSX-6156-V2 is suitable for broad range of data-acquisition, Industrial automation, Process control, Automotive controller, AVL, Intelligent Vehicle management devic,Medical device, Human machine interface, Robotics, machinery control And more…application that required small footprint, low-power and low-cost hardware with open industry standard such as PC/104.

## 1.3 Specifications

| Features | VSX-6156-V2 |
|---|---|
| CPU | DM&P SoC CPU Vortex86SX- 300MHz<br>Real Time Clock with Lithium Battery Backup |
| Cache | L1:16K I-Cache, 16K D-Cache |
| BIOS | AMI BIOS |
| Bus Interface | PC/104 Standard Compliant |
| System Memory | 128 / 256MB DDR2 Onboard |
| Watchdog Timer | Software programmable from 30.5 us to 512 seconds x2 sets(Watchdog 1 fully compatible with M6117D) |
| LAN | Integrated 10/100M Ethernet<br>Realtek 8100B 10/100Mbps Ethernet Controller<br>Half/Full duplex capability |
| I /O Interface | • Enhanced IDE port x1<br>• RS-232 port x3<br>• RS-232/422/485 port x1 (RS485: Auto Direction)<br>• Parallel port x1<br>• USB port x2 (USB 2.0 version)<br>• 16-bit GPIO port x1<br>• 10/100Mbps Ethernet port x3 |
| Connectors | • 2.00 mm ∅ 44-pin box header for IDE x1<br>• 2.00 mm ∅ 26-pin box header for Print x1<br>• 2.00 mm ∅ 20-pin box header for 16-bit GPIO x1<br>• 2.00 mm ∅ 10-pin box header for RS-232 x4<br>• 2.00 mm ∅ 10-pin box header for USB x1<br>• 2.00 mm ∅ 8-pin header for LAN x 3<br>• 2.54 mm ∅ 5-pin box header for Keyboard x1<br>• 2.54 mm ∅ 4-pin header for DC-in x1<br>• 2.54 mm ∅ 3-pin header for RS-485 x1<br>• 2.54 mm ∅ 5-pin header for Mouse x1<br>• 2.54 mm ∅ 2-pin header for Reset x1<br>• 2.54 mm ∅ 7-pin header for Redundancy x1(Opt.)<br>• 2.54 mm ∅ 2-pin header for SYS-Fail-SW x1(Opt.)<br>• 1.25 mm ∅ 6-pin Wafer for JTAG x1 |
| Flash Disk Support | • Onboard 2MB SPI Flash Disk (Driver: A)<br>• 44-pin IDE Flash Disk( EmbedDisk 16MB or above) |
| SRAM support | 512KB (Optional) |
| Power Requirement | Single Voltage +5V @ 440mA |
| Dimension | 90 X 96mm (3.54 x 3.77 inches) |

| | |
|---|---|
| Weight | 84g |
| Operating Temperature | -20°C ~ +70°C<br>-40°C ~ +85°C (Optional) |

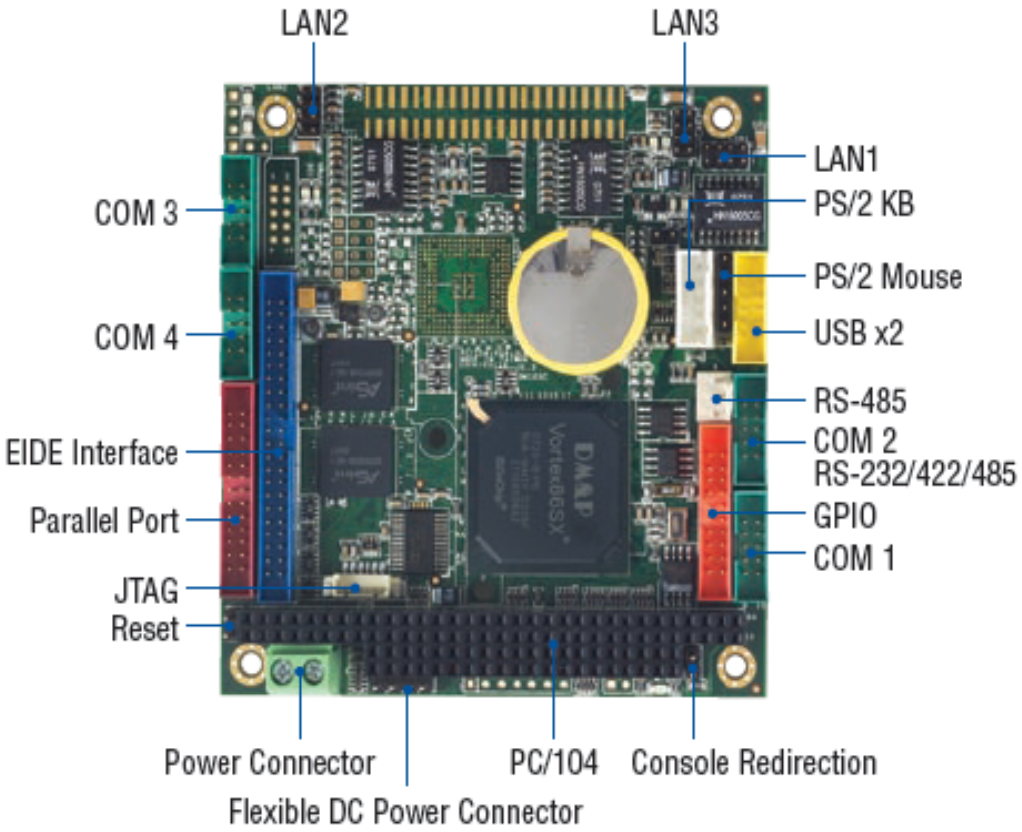
## 1.4 Board Dimension



# Chapter 2

# Installation

## 2.1 Board Outline

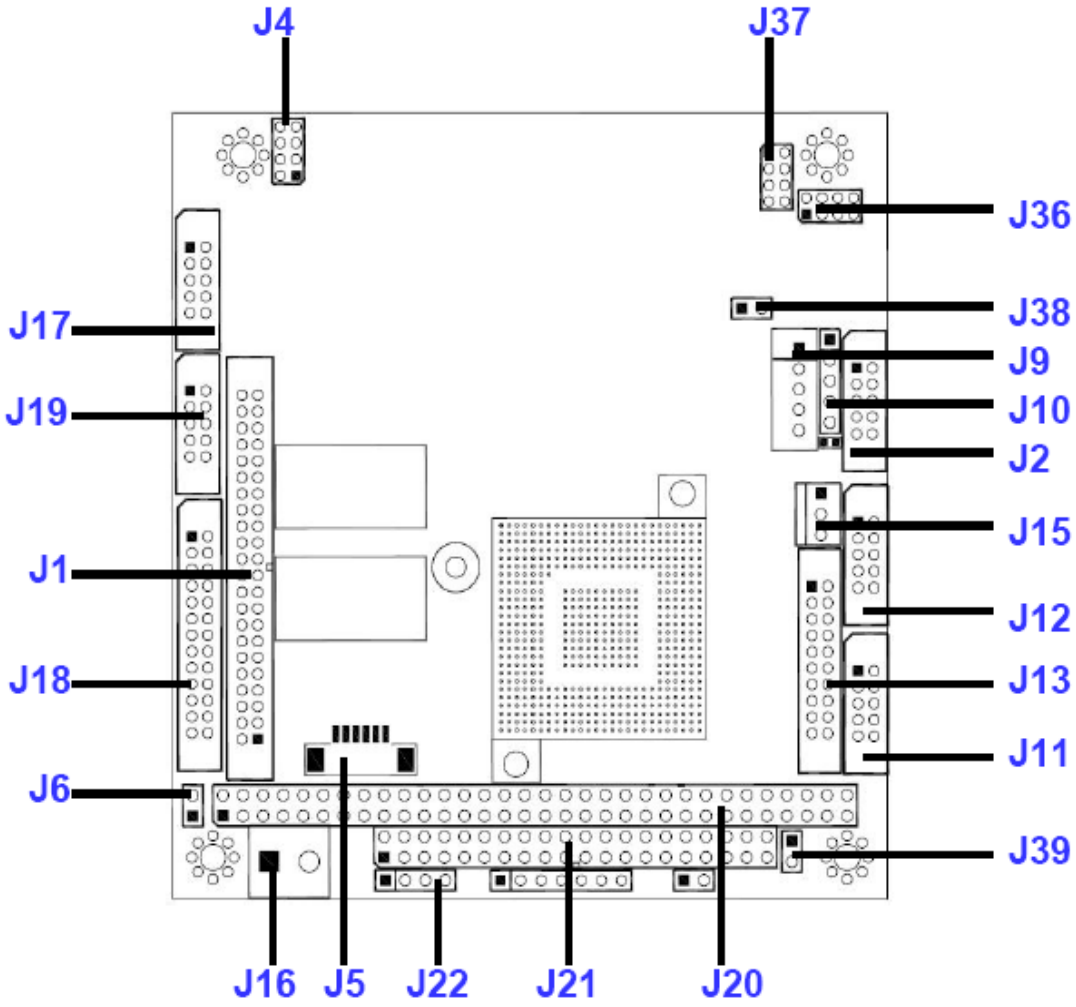



(Note1: COM2 RS232/422/485 is selected by BIOS setting)

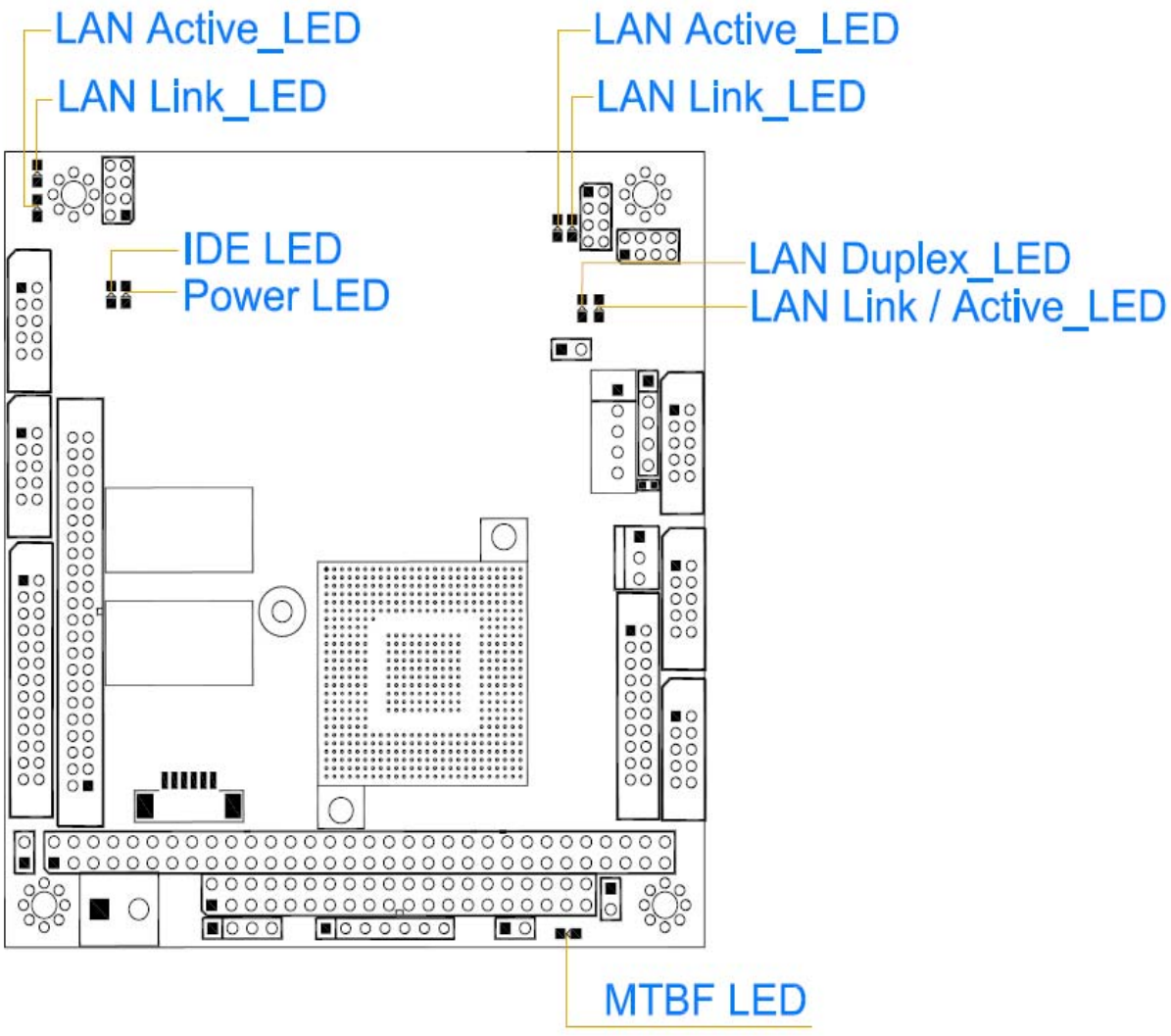
(Note2: Redundancy Signal and System-Fail-SW are optional)

(Note3: COM1/COM2/COM3/COM4 TTL are optional)

## 2.2 Connectors & Jumpers Location



## Jumpers & LEDs



## 2.3 Connectors & Jumpers Summary

Summary Table

| Nbr | Description | Type of Connections | Pin nbrs. |
|---|---|---|---|
| J1 | IDE | Box Header, 2.0∅ ,22x2 | 44-pin |
| J2 | USB | Box Header,2.0∅ , 5x2 | 10-pin |
| J4 | LAN 1 | Pin Header, 2.0∅ , 4x2 | 8-pin |
| J5 | JTAG | Box Header, 125∅ , 6x1 | 6-pin |
| J6 | Reset | Pin Header, 2,54∅,1x2 | 2-pin |
| J7 | Redundancy (Optional) | Pin Header, 2.54∅, 7x1 | 7-pin |
| J8 | System –Fail-Switch (Optional) | Pin Header, 2.54∅ , 2x1 | 2-pin |
| J9 | PS/2 Keyboard | Box Header, 2,54∅,1x5 | 5-pin |
| J10 | PS/2 Mouse | Pin Header, 2,54∅,1x5 | 5-pin |
| J11 | COM1(GPIO4/TTL Optional) | Box Header, 2.0∅ 5x2 | 10-pin |
| J12 | COM2(RS232/422/485) | Box Header, 2.0∅ 5x2 | 10-pin |
| J13 | GPIO ( Port 0 / 1 ) | Box Header, 2.0∅ ,10x2 | 20-pin |
| J15 | RS-485 (Auto direction) | Molex Header,2.54∅, 3x1 | 3-pin |
| J16 | Power Connector | Terminal Block 5.0∅,2x1 | 2-pin |
| J17 | COM3 | Box Header, 2.0∅ 5x2 | 10-pin |
| J18 | PRINT | Box Header, 2.0∅ , 13x2 | 26-pin |
| J19 | COM4 | Box Header, 2.0∅ 5x2 | 10-pin |
| J20 | PC104 Connector – 64 pin | Box Header, 2.54∅ 32x2 | 64-pin |
| J21 | PC104 Connector – 40 pin | Box Header, 2.54∅ 20x2 | 40-pin |
| J22 | 4P Power Source (Interconnect to PC/104 – J20) | Pin Header, 2.54∅ , 4x1 | 4-pin |
| J36 | LAN 2 | Pin Header, 2.0∅ , 4x2 | 8-pin |
| J37 | LAN 3 | Pin Header, 2.0∅ , 4x2 | 8-pin |
| J38 | BUZZER | Pin Header, 2.54∅ , 2x1 | 2-pin |
| J39 | Console Redirection | Pin Header, 2.54∅ , 2x1 | 2-pin |
| PWR-LED | Power Active LED (Red) | LED-SMD | |
| IDE-LED | IDE Active LED (Green ) | LED-SMD | |
| MTBF-LED | MTBF-Out (Orange) | LED-SMD | |
| LED 4 | LAN Link/Active LED (Green) | LED-SMD | |

| | | | |
|---|---|---|---|
| LED 5 | LAN Duplex LED ( Yellow ) | LED-SMD | |
| LED 6 | LAN Active LED (Green) | LED-SMD | |
| LED 7 | LAN Link LED ( Yellow ) | LED-SMD | |
| LED 8 | LAN Active LED (Green) | LED-SMD | |
| LED 9 | LAN Link LED ( Yellow ) | LED-SMD | |

## 2.4 Pin Assignments & Jumper Settings

### J1: IDE (44 Pins)

| 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 | IDEACK | 30 | GND |
| 31 | IDEINT | 32 | NC |
| 33 | IDESA1 | 34 | IDECBLID |
| 35 | IDESA0 | 36 | IDESA2 |
| 37 | IDECS-0 | 38 | IDECS1 |
| 39 | IDELED | 40 | GND |
| 41 | VCC | 42 | VCC |
| 43 | GND | 44 | NC |

### J2: USB

| Pin # | Signal Name | Pin # | Signal Name |
|---|---|---|---|
| 1 | VCC | 2 | VCC |
| 3 | LUSBD3- | 4 | LUSBD2- |
| 5 | LUSBD3+ | 6 | LUSBD2+ |
| 7 | GND | 8 | GND |
| 9 | GGND | 10 | GGND |

## J4: LAN1

| Pin # | Signal Name | Pin # | Signal Name |
|---|---|---|---|
| 1 | ATX+ | 2 | ATX- |
| 3 | ARX+ | 4 | LED0 |
| 5 | LED0+ | 6 | ARX- |
| 7 | LED1+ | 8 | LED1 |

## J5: JTAG

| Pin # | Signal Name | Pin # | Signal Name |
|---|---|---|---|
| 1 | VCC | 2 | GND |
| 3 | TCK | 4 | TDO |
| 5 | TDI | 6 | TMS |

## J6: RESET

| Pin # | Signal Name | Pin # | Signal Name |
|---|---|---|---|
| 1 | Reset | 2 | GND |

## J7: Redundancy (Optional)

| Pin # | Signal Name | Pin # | Signal Name |
|---|---|---|---|
| 1 | GND | 2 | SYS-FAIL-OUT |
| 3 | SYS-FAIL-IN | 4 | GPCS0 |
| 5 | SYS-GPCS-IN | 6 | TXD9\ |
| 7 | RXD9\ | | |

## J8: Redundancy (System-Fail-Switch) (Optional)

| Pin # | Signal Name |
|---|---|
| 1 | SYS-SW-IN |
| 2 | GND |

## J9: PS/2 Keyboard

| Pin # | Signal Name | Pin # | Signal Name |
|---|---|---|---|
| 1 | KBCLK | 2 | KBDAT |
| 3 | NC | 4 | GND |
| 5 | VCC | | |

## J10: PS/2 Mouse

| Pin # | Signal Name | Pin # | Signal Name |
|---|---|---|---|
| 1 | MSCLK | 2 | MSDATA |
| 3 | NC | 4 | GND |
| 5 | VCC | | |

## J11: COM 1 (GPIO4/TTL Optional)

| 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 | NC |

## J12: COM2 RS232 / 422 / 485 (Optional: TTL)

| Pin # | Signal Name | Pin # | Signal Name |
|---|---|---|---|
| 1 | DCD2/ 422TX- / RS485- | 2 | RXD2 / 422TX+ / RS485+ |
| 3 | TXD2 / 422RX+ | 4 | DTR2 / 422RX- |
| 5 | GND | 6 | DSR2 |
| 7 | RTS2 | 8 | CTS2 |
| 9 | RI2 | 10 | NC |

## J13: GPIO (Port 0 / 1)

| Pin # | Signal Name | Pin # | Signal Name |
|---|---|---|---|
| 1 | GND | 2 | VCC |
| 3 | GP00 | 4 | GP10 |
| 5 | GP01 | 6 | GP11 |
| 7 | GP02 | 8 | GP12 |
| 9 | GP03 | 10 | GP13 |
| 11 | GP04 | 12 | GP14 |
| 13 | GP05 | 14 | GP15 |
| 15 | GP06 | 16 | GP16 |
| 17 | GP07 | 18 | GP17 |
| 19 | VCC | 20 | GND |

## J15: RS485 (Auto direction)

| Pin # | Signal Name |
|---|---|
| 1 | RS485＋ |
| 2 | RS485－ |
| 3 | GND |

## J16: Power Connector (Terminal Block 5.0mm)

| Pin # | Signal Name |
|---|---|
| 1 | +5V |
| 2 | GND |

## J17: COM3 (Optional: TTL)

| Pin # | Signal Name | Pin # | Signal Name |
|---|---|---|---|
| 1 | DCD3 | 2 | RXD3 |
| 3 | TXD3 | 4 | DTR3 |
| 5 | GND | 6 | DSR3 |
| 7 | RTS3 | 8 | CTS3 |
| 9 | RI3 | 10 | NC |

## J18: PRINT

| Pin # | Signal Name | Pin # | Signal Name |
|---|---|---|---|
| 1 | STB- | 14 | AFD- |
| 2 | PD0 | 15 | ERR- |
| 3 | PD1 | 16 | INIT- |
| 4 | PD2 | 17 | SLIN- |
| 5 | PD3 | 18 | GND |
| 6 | PD4 | 19 | GND |
| 7 | PD5 | 20 | GND |
| 8 | PD6 | 21 | GND |
| 9 | PD7 | 22 | GND |
| 10 | ACK- | 23 | GND |
| 11 | BUSY | 24 | GND |
| 12 | PE | 25 | GND |
| 13 | SLCT | 26 | NC |

## J19: COM4 (Optional: TTL)

| Pin # | Signal Name | Pin # | Signal Name |
|---|---|---|---|
| 1 | DCD4 | 2 | RXD4 |
| 3 | TXD4 | 4 | DTR4 |
| 5 | GND | 6 | DSR4 |
| 7 | RTS4 | 8 | CTS4 |
| 9 | RI4 | 10 | NC |

## J20: PC104 Connector – 64pin

| Pin # | Signal Name | Pin # | Signal Name |
|---|---|---|---|
| 1 | IOCHCHK * | 2 | GND |
| 3 | SD7 | 4 | RESETDRV |
| 5 | SD6 | 6 | VCC |
| 7 | SD5 | 8 | IRQ9 |
| 9 | SD4 | 10 | -5V |
| 11 | SD3 | 12 | DRQ2 |
| 13 | SD2 | 14 | -12V |
| 15 | SD1 | 16 | OWS |
| 17 | SD0 | 18 | +12V |
| 19 | IOCHRDY | 20 | GND |
| 21 | AEN | 22 | SMEMW * |
| 23 | SA19 | 24 | SMEMR * |
| 25 | SA18 | 26 | IOW * |
| 27 | SA17 | 28 | IOR * |
| 29 | SA16 | 30 | DACK3 * |
| 31 | SA15 | 32 | DRQ3 |
| 33 | SA14 | 34 | DACK1 * |
| 35 | SA13 | 36 | DRQ1 |
| 37 | SA12 | 38 | REFRESH * |
| 39 | SA11 | 40 | SYSCLK |
| 41 | SA10 | 42 | IRQ7 |
| 43 | SA9 | 44 | IRQ6 |
| 45 | SA8 | 46 | IRQ5 |
| 47 | SA7 | 48 | IRQ4 |
| 49 | SA6 | 50 | IRQ3 |
| 51 | SA5 | 52 | DACK2 * |
| 53 | SA4 | 54 | TC |
| 55 | SA3 | 56 | BALE |
| 57 | SA2 | 58 | VCC |
| 59 | SA1 | 60 | OSC |
| 61 | SA0 | 62 | GND |
| 63 | GND | 64 | GND |

## J21: PC104 Connector – 40pin

| Pin # | Signal Name | Pin # | Signal Name |
|---|---|---|---|
| 1 | GND | 2 | GND |
| 3 | MEMCS16 * | 4 | SBHE * |
| 5 | IOCS16 * | 6 | SA23 |
| 7 | IRQ10 | 8 | SA22 |
| 9 | IRQ11 | 10 | SA21 |
| 11 | IRQ12 | 12 | SA20 |
| 13 | IRQ15 | 14 | SA19 |
| 15 | IRQ14 | 16 | SA18 |
| 17 | DACK0 * | 18 | SA17 |
| 19 | DRQ0 | 20 | MEMR * |
| 21 | DACK5 * | 22 | MEMW * |
| 23 | DRQ5 | 24 | SD8 |
| 25 | DACK6 * | 26 | SD9 |
| 27 | DRQ6 | 28 | SD10 |
| 29 | DACK7 * | 30 | SD11 |
| 31 | DRQ7 | 32 | SD12 |
| 33 | VCC | 34 | SD13 |
| 35 | MASTER * | 36 | SD14 |
| 37 | GND | 38 | SD15 |
| 39 | GND | 40 | NC |

## J22: 4P Power Source (Interconnect to PC/104 – J20)

| Pin # | Signal Name |
|---|---|
| 1 | -5V |
| 2 | -12V |
| 3 | +12V |
| 4 | GND |

## J36: LAN2

| Pin # | Signal Name | Pin # | Signal Name |
|---|---|---|---|
| 1 | TX+1 | 2 | TX-1 |
| 3 | RX+1 | 4 | LED01 |
| 5 | LED01+ | 6 | RX-1 |
| 7 | LED11+ | 8 | LED11 |

## J37: LAN3

| Pin # | Signal Name | Pin # | Signal Name |
|---|---|---|---|
| 1 | TX+2 | 2 | TX-2 |
| 3 | RX+2 | 4 | LED02 |
| 5 | LED02+ | 6 | RX-2 |
| 7 | LED12+ | 8 | LED12 |

## J39: Console Redirection

| Pin # | Signal Name | Pin # | Signal Name |
|---|---|---|---|
| 1 | Console | 2 | GND |

## 2.5 System Mapping

### System Mapping

#### Memory Mapping

| Address | Description | Usage |
|---|---|---|
| 0000:0000-9000:FFFF | System RAM | * |
| A000:0000-A000:FFFF | EGA/VGA Video Memory | |
| B000:0000-B000:7FFF | MDA RAM, Hercules graphics display RAM | |
| B000:8000-B000:FFFF | CGA display RAM | |
| C000:0000-C000:7FFF | EGA/VGA BIOS ROM | |
| C000:8000-C000:FFFF | Boot ROM enable. | * |
| D000:0000-D700:FFFF | Expansion ROM space. | |
| D800:0000-DB00:FFFF | SPI FLASH Emulation Floppy A Enable. | |
| DC00:0000-DF00:FFFF | Expansion ROM space. | |
| E000:0000-E000:FFFF | USB Legacy SCSI ROM space. | * |
| F000:0000-F000:FFFF | Motherboard BIOS | * |

#### I/O Mapping

| I/O Address | Owner | Usage |
|---|---|---|
| 0000h - 000Fh | DMA 8237-1 | * |
| 0010h - 0017h | COM 9 | * |
| 0018h - 001Fh | Empty | |
| 0020h - 0021h | PIC 8259-1 | * |
| 0022h - 0023h | 6117D configuration port | * |
| 0024h - 002Dh | Empty | |
| 002Eh - 002Fh | Forward to LPC BUS | * |
| 0030h - 003Fh | Empty | |
| 0040h - 0043h | Timer counter 8254 | * |
| 0044h - 0047h | Empty | |
| 0048h - 004Bh | PWM counter 8254 | * |
| 004Ch - 004Dh | Empty | |
| 004Eh - 004Fh | Forward to LPC BUS | * |
| 0050h - 005Fh | Empty | |
| 0060h | Keyboard data port | * |
| 0061h | Port B + NMI control port | * |
| 0062h - 0063h | 8051 download 4K address counter | * |

| | | |
|---|---|---|
| 0064h | Keyboard status port | * |
| 0065h | WatchDog0 reload counter | * |
| 0066h | 8051 download 8bit data port | * |
| 0067h | WatchDog1 reload counter | * |
| 0068h - 006Dh | WatchDog1 control register | * |
| 006Eh - 006Fh | Empty | |
| 0070h - 0071h | CMOS RAM port | * |
| 0072h - 0075h | MTBF counter | * |
| 0076h - 0077h | Empty | |
| 0078h - 007Ch | GPIO port 0,1,2,3,4 default setup | * |
| 007Dh - 007Fh | Empty | |
| 0080h - 008Fh | DMA page register | * |
| 0090h - 0091h | Empty | |
| 0092h | System control register | * |
| 0093h - 0097h | Empty | |
| 0098h - 009Ch | GPIO direction control | * |
| 00A0h - 00A1h | PIC 8259-2 | * |
| 00A2h - 00BFh | Empty | |
| 00C0h - 00DFh | DMA 8237-2 | * |
| 00E0h - 00FFh | Empty | |
| 0100h - 0101h | GPCS1 default setting address | * |
| 0170h - 0177h | IDE1 (IRQ 15) | |
| 01F0h - 01F7h | IDE0 (IRQ 14) | * |
| 0220h - 0227h | COM8 Forward to LPC BUS | |
| 0228h - 022Fh | COM7 Forward to LPC BUS | |
| 0238h - 023Fh | COM6 Forward to LPC BUS | |
| 0278h - 027Fh | Printer port (IRQ 7, DMA 0) | * |
| 02E8h - 02EFh | COM4 (IRQ 11) | * |
| 02F8h - 02FFh | COM2 (IRQ 3) | * |
| 0338h - 033Fh | COM5 Forward to LPC BUS | |
| 0376h | IDE1 ATAPI device control write only register | * |
| 03E8h - 03Efh | COM3 (IRQ 10) | * |
| 03F0h - 03F7h | Floppy Disk (IRQ 6, DMA 2) | |
| 03F6h | IDE0 ATAPI device control write only register | * |
| 03F8h - 03FFh | COM1 (IRQ 4) | * |
| 0480h - 048Fh | DMA High page register | * |
| 0490h - 0499h | Instruction counter register | * |
| 04D0h - 04D1h | 8259 Edge,/ level control register | * |
| 0CF8h - 0CFFh | PCI configuration port | * |
| D400h - D4FFh | on board LAN | * |
| FC00h - FC05h | SPI Flash BIOS control register | * |
| FC08h - FC0Dh | External SPI BUS control register ( output pin configurable GPIO3[0-3] ) | * |

## IRQ Mapping

| IRQ# | Description | Usage |
|---|---|---|
| IRQ0 | System Timer | * |
| IRQ1 | Keyboard Controller | * |
| IRQ2 | Cascade for IRQ8 - 15 | |
| IRQ3 | Serial Port 2 | * |
| IRQ4 | Serial Port 1 | * |
| IRQ5 | USB / RTL8100B LAN1 / RTL8100B LAN2 | * |
| IRQ6 | Ethernet 10/100M LAN | * |
| IRQ7 | Parallel Port | * |
| IRQ8 | Real Time Clock | * |
| IRQ9 | Serial Port 9 | * |
| IRQ10 | Serial Port 3 | * |
| IRQ11 | Serial Port 4 | * |
| IRQ12 | Mouse | * |
| IRQ13 | Math Coprocessor | * |
| IRQ14 | Hard Disk Controller#1 | * |
| IRQ15 | USB | * |

## DMA Mapping

| DMA# | Description | Usage |
|---|---|---|
| DMA0 | | |
| DMA1 | | |
| DMA2 | Floppy Disk Controller | |
| DMA3 | | |
| DMA5 | | |
| DMA6 | | |
| DMA7 | | |

## 2.6 Watchdog Timer

There are two watchdog timers in Vortex86SX/DX CPU. One is compatible with M6117D watchdog timer and the other is new. The M6117D compatible watchdog timer is called WDT0 and new one is called WDT1.

We also provide DOS, Linux and WinCE example for your reference. For more technical support, please visit: http://www.dmp.com.tw/tech or download the PDF file: http://www.dmp.com.tw/tech/vortex86dx/

## 2.7 GPIO (General Purpose Input / Output)

40 GPIO pins are provided by the Vortex86SX/DX for general usage in the system. All GPIO pins are independent and can be configured as inputs or outputs, with or without pull-up/pull-down resistors.

We also offer DOS, Linux and WinCE example for your reference. For more technical support, please visit: http://www.dmp.com.tw/tech or download the PDF file: http://www.dmp.com.tw/tech/vortex86dx/

## 2.8 SPI flash (Serial Peripheral Interface)

As SPI Flash (Serial Peripheral Interface) offers many benefits including: reduced controller pin count, smaller and simpler PCBs, reduced switching noise, less power consumption, and lower system cost

Many of users may consider using a formatted SPI flash to boot for the system or emulate SPI flash as Floppy (A: Driver or B: Driver). Then you must know how to set for this condition in CMOS Setup and boot up under DOS 6.22, X-DOS, DR-DOS and Free DOS.

For more technical support, please visit: http://www.dmp.com.tw/tech or download the PDF file: http://www.dmp.com.tw/tech/vortex86dx/

# Chapter 3

# Driver Installation

LAN

The Vortex86SX processor also integrated 10/100Mbps Ethernet controller that supports both 10/100BASE-T 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.

The controller supports: Half / Full-Duplex Ethernet function to double channel bandwidth, auto media detection.

Operating system support

The Vortex86SX-6156-V2 PC/104 CPU board supports Embedded software: Free DOS, DOS 6.22, PCDOS 7.1, DR-DOS, x-DOS, OS/2, Windows CE 5.0 / 6.0

Please get the drivers from the Driver CD which attached with the standard packing of Vortex86SX-6156-V2 board or please get it from DMP official website: http://www.dmp.com.tw/tech/vortex86sx/

Vortex86SX-6156-V2 also supports most of the popular Linux distributions, for more detail information, please visit DMP official website: http://www.dmp.com.tw/tech/vortex86sx/

# Appendix

## A. TCP/IP library for DOS real mode

DSock is a TCP/IP library for DOS real mode, which is used by RSIP. It provides simple C functions for programmer to write Internet applications. ICOP also provide Internet examples using DSock: BOOTP/DHCP, FTP server, SMTP client/server, HTTP server, TELNET server, Talk client/server, etc.

DSock provides a lot of example source code. Programmer can add Internet functions to their project easily and save development time. With a utility "MakeROM", programmer also can make a ROM image to fit their application, those examples can be seen in the following Application systems: Mity-Mite Serial Server, Web Camera Tiny Server and RSIP Serial Server.

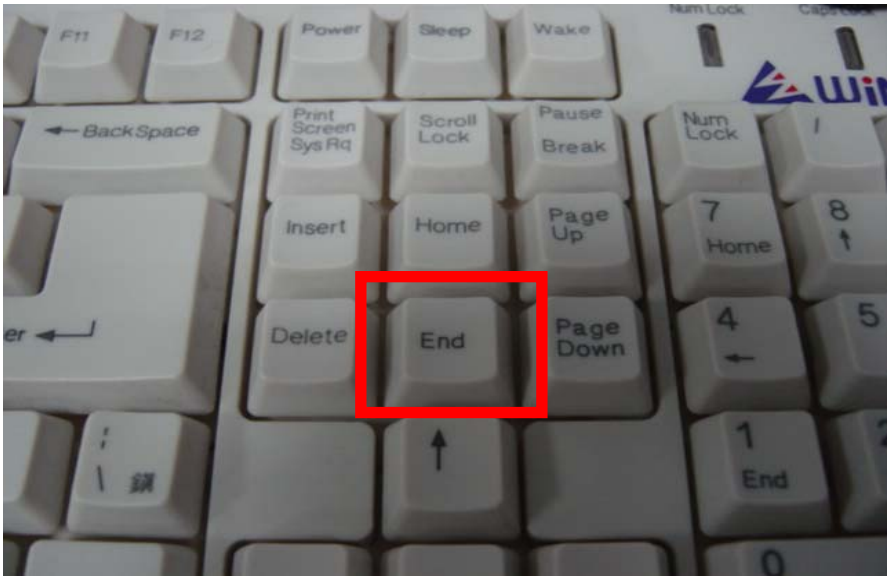
DSock is free for All ICOP products using M6117D/Vortex86/Vortex86SX/Vortex86DX CPU and ICOP also provide the business version of DSock for those customers who are using other x86 CPUs.
If you would like to use DSock or business version of DSock, Please mail to info@icop.com.tw or contact your regional sales.

Please download the trial DSock software and Utilities from our website:
http://www.dmp.com.tw/tech/dmp-lib/dsock/

# B. BIOS Default setting

If the system cannot be booted after BIOS changes are made, Please follow below procedures in order to restore the CMOS as default setting.

- Press “End” Key, when the power on




- Press <Del> to enter the AMI BIOS setup
- Press “F9” to Load Optimized Defaults
- Press “F10” to Save configuration changes and exit setup

# 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.

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