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RoBoard RB-100 Manual V1.00

The Heart of Robotics

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Table of Contents

Chapter 1

Introduction

1.1 Packing List

Product Name	Package
RB-100	RoBoard RB-100 COM Port cable x 2 (4 Pin) COM Port cable x 1 (3 Pin) USB cable x 1 (USB port x 2) LAN cable x 1 AUDIO Line x2

1.2 Product Description

The RoBoard is the heart of any Robotic system making your Robby more active and intelligent. It does not just offer control but is a complete computer system based on the Vortex86DX CPU, a 32bit x86 CPU running at 600MHz with 256MB RAM.

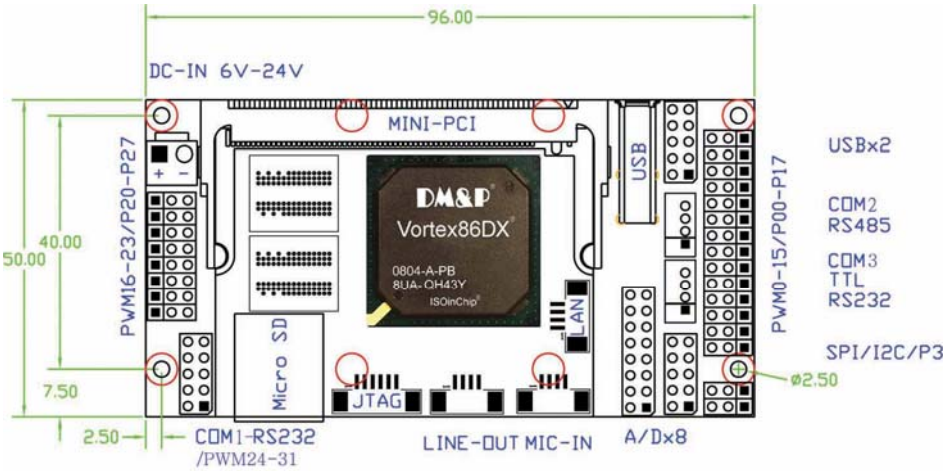
The RoBoard allows users to install a Windows or Linux Operating System onto a bootable Micro-SD card offering engineers a common storage media to develop with. The RoHS compliant CPU board measures just 96mm x 50mm and accepts a voltage input range from 6V-24V DC whilst providing extremely low power consumption.

RoBoard has the rich I/O interfaces to the servo, DC motors, sensors, gyroscope, accelerometers and other devices. Also, it has build-in the PWM up to 32 Ch, GPIO,RS-232 serial, TTL serial, RS-485,USB V2.0 x 3, A/D convert, SPI/I^2C bus, Audio out & Mic in, 10/100M LAN and Mini PCI socket.

1.3 Specifications

	RB-100
CPU	DM&P SoC CPU Vortex86DX- 600MHz
BIOS	AMI BIOS
Memory	256MB DDR2 onboard
I /O Interface	● Micro SD slot x1 ● USB port x 1 (USB 2.0 version)
Connectors	● 2.54 mm 3-pin box header for PWM x 24 ● 2.54 mm 10-pin box header for RS-232 x1 ● 2.54 mm 10-pin box header for USB x1 ● 2.0 mm 4-pin header for RS-485 x1 ● 2.0 mm 4-pin header for TTL serial x1 ● 2.54 mm 10-pin box header for SPI & I^2C x1 ● 2.54 mm 16-pin header for A/D x1 ● 1.25 mm 3-pin wafer for TTL serial x 1 ● 1.25 mm 4-pin wafer for LAN x 1 ● 1.25 mm 4-pin wafer for MIC-in x 1 ● 1.25 mm 4-pin wafer for Line-out x1 ● 1.25mm 6-pin wafer for JTAG x1 ● 0.8mm 124-Pin Mini PCI Card connector ● 3.96 mm 2 pin for Power x 1
Power Consumption	+5V @ 400mA
Power Input	DC-in 6V to 24V
Dimension	96mm X 50mm
Weight	40g

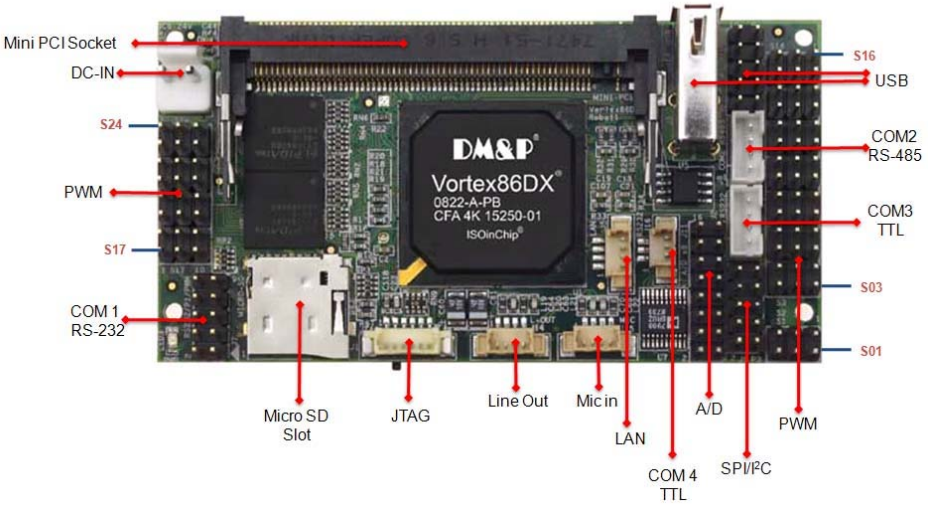
1.4 Board Dimension



Chapter 2

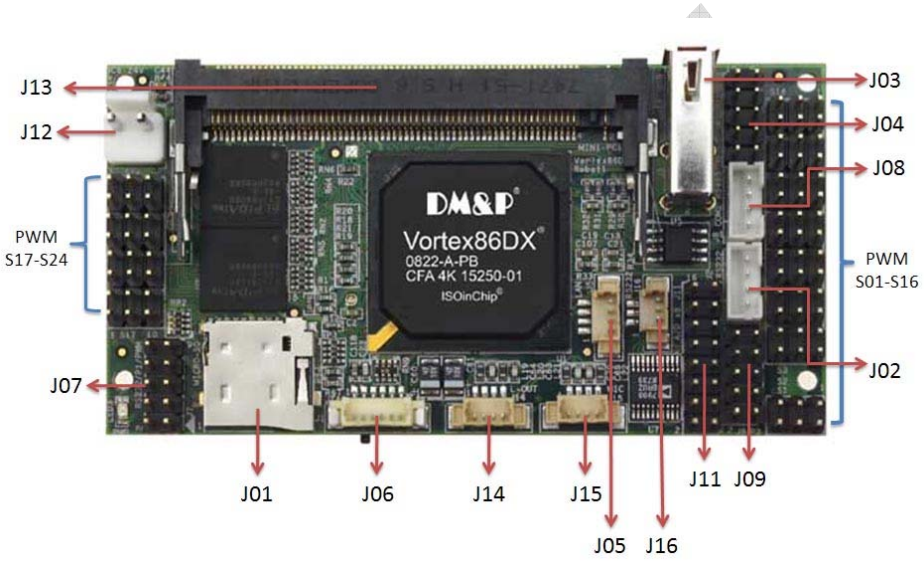
Installation

2.1 Board Outline

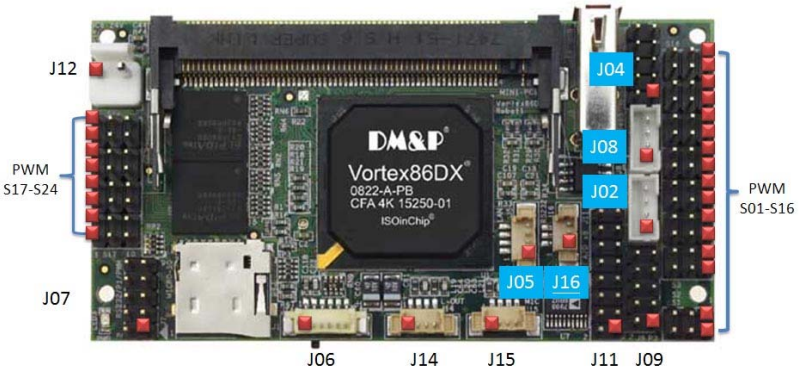


2.2 Connectors & Pin 1 Location

Connectors



Pin 1 Location



2.3 Connectors & Jumpers Summary

Summary Table			
	Description	Type of Connections	Pin
J1	Micro-SD Slot	Micro-SD slot	13-pin
J2	COM 3 TTL	Box Header,2.0mm , 4x1	4-pin
J3	USB	USB 90 Deg	4-pin
J4	USB x 2	Pin Header, 2,54mm, 5x2	10-Pin
J5	LAN	Wafer, 1,25mm, 4x1	4-pin
J6	JTAG	Wafer, 2.54mm,6x1	6-pin
J7	COM1-TTL/RS-232/PWM 25-32	Pin Header, 2.54mm,5x2	10-pin
J8	COM2 RS-485	Box Header, 2.00mm, 4x1	4-pin
J9	SPI / I^2C	Pin Header, 2.54mm,5x2	10-pin
J11	A/D 8Ch	Box Header, 2.54mm, 8x2	16-pin
J12	Power Connector	Pin Header, 3.96mm	2-pin
J13	Mini PCI Socket	Mini PCI Type III	124-pin
J14	Line Out	Wafer,1.25mm, 4x1	4-pin
J15	Mic In	Wafer,1.25mm, 4x1	4-pin
J16	COM4 TTL	Wafer,1.25mm, 3x1	3-pin

2.4 Pin Assignments

PWM

Pin #	Signal Name	Pin #	Signal Name	Pin #	Signal Name
1	GND	2	VXX	3	GPXX

J2: COM 3 TTL

Pin #	Signal Name	Pin #	Signal Name
1	GND	2	VXX
3	TXD3	4	RXD3

J3: USB -- 90 Deg

Pin #	Signal Name	Pin #	Signal Name
1	VCC	2	LUSBD2-
3	LUSBD2+	4	GND

J4: USB

Pin #	Signal Name	Pin #	Signal Name
1	VCC	2	VCC
3	LUSBD0-	4	LUSBD1-
5	LUSBD0+	6	LUSBD1+
7	GND	8	GND
9	GGND	10	GGND

J5: LAN

Pin #	Signal Name	Pin #	Signal Name
1	LAN-TX+	2	LAN-TX-
3	LAN-RX+	4	LAN-RX-

J6: JTAG

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

J7: COM1 TTL/RS-232/PWM25-32

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

J8: COM2 RS485

Pin #	Signal Name	Pin #	Signal Name
1	GND	2	VXX
3	RS-485+	4	RS-485-

J9: SPI / I²C

Pin #	Signal Name	Pin #	Signal Name
1	GND	2	VCC
3	SPICS	4	GP34
5	SPICLK	6	GP35
7	SPID0	8	GP36
9	SPID1	10	GP37

J11: A/D 8Ch

Pin #	Signal Name	Pin #	Signal Name
1	AD-VIN0	2	ADGND
3	AD-VIN1	4	ADGND
5	AD-VIN2	6	ADGND
7	AD-VIN3	8	ADGND
9	AD-VIN4	10	ADGND
11	AD-VIN5	12	ADGND
13	AD-VIN6	14	ADGND
15	AD-VIN7	16	ADGND

J12: Power Connector (DC-In 6V-24V)

Pin #	Signal Name
1	VXX
2	GND

J14: LINE OUT

Pin #	Signal Name
1	LOUTR
2	GND
3	GND
4	LOUTL

J15: MIC-IN

Pin #	Signal Name
1	MICVREF
2	GND
3	GND
4	MIC-IN

J16: COM4 TTL

Pin #	Signal Name	Pin #	Signal Name
1	GND	2	TXD4
3	RXD3		

2.6 Watchdog Timer

There are two watchdog timers in Vortex86DX 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/

Chapter 3

Driver Installation

VGA
The Vortex86DX processor also use external Display chip ““Volari™ Z9s” which is an ultra low powered graphics chipset with total power consumption at around 1-1.5 W. It is capable in providing VGA display output upto 1600x1200. With DVO interface, developers could easily connect flat Panel to support TFT and LVDS output.

LAN
The Vortex86DX 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.
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: Half / Full-Duplex Ethernet function to double channel bandwidth, auto media detection.

AUDIO
CM119 is a highly integrated single chip USB audio controller specifically for VoIP (Voice over internet protocol) application. All essential analog modules are embedded in CM119, including dual DAC and earphone driver, ADC, microphone booster, PLL, regulator, and USB transceiver. 8 GPIO pins can constitute a 24 key matrix directly support keypad control function without MCU.

Many features are programmable with jumper pins or external EEPROM. Vender can customized unique USB VID/PID to EEPROM for VoIP software authentication. Moreover, individual unique phone number for each device is possible via serial number stored in external EEPROM.

The RB-100 provides the VGA and LAN drivers for DOS 6.22 Windows CE 5.0 and Windows Embedded CE 6.0. Please get from official website:
http://www.dmp.com.tw/tech/vortex86dx/

The RB-100 also supports most of the popular Linux distributions, for more detail information, please visit DMP official website:
http://www.dmp.com.tw/tech/vortex86dx/

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.

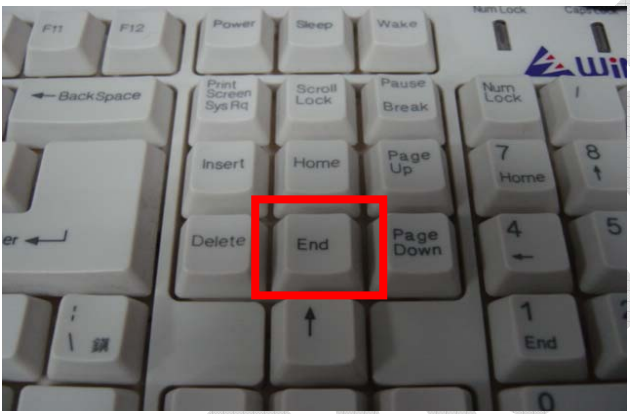
DSock is free for All ICOP products using M6117D/Vortex86/Vortex86DX CPU and ICOP also provide the business version of DSock for those customers who are using other x86 CPUs.
If you would like to use DSock or business version of DSock, Please mail to info@dmp.com.tw or contact your regional sales.

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.