WEB-2000

Web-based controller

User's Manual

Copyright notice

Acknowledgements

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Product warranty

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for one year from the date of purchase.

This warranty does not apply to any products that have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details. If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Packing list

Before installing your board, make sure that the following materials have been received:

- 1 warranty certificate
- This user's manual
- Y cable (p/n 1700060202)
- Phoenix power connector (p/n 1652002202)
- VGA cable (p/n 1703150101)

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Technical support and sales assistance

If you have any technical questions about the WEB-2000 or any other Advantech products, please visit our support website at:

http://www.advantech.com/support

For more information about Advantech's products and sales information, please visit:

http://www.advantech.com

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CHAPTER 1

Hardware Configuration

This chapter gives background information on the WEB-2000. It shows you how to configure the board to match your application and prepare it for installation into your system.

Sections include:

- Introduction
- Specifications
- Safety precautions
- Turning on procedure
- Chassis dimension

1.1 Introduction

Advantech's new product of WebCon series , the WEB-2000, is an all-in-one RISC StrongARM™ processor-based controller that brings you traditional x86-like I/O ports, yet without x86's high power comsumption. The WEB-2000's max. total power consumption is around 5W, which is 20% of the power consumption of a simalar x86 embedded controller. The Web comes equipped with 16MB SDRAM, a 10 Base-T Ethernet interface, two DB-9 RS-232 and one RS-485 serial port, 6 digital input and 6 high drive digital output,VGA output and a Phoenix connector for DC 24 V power input.

In addition, the WEB-2000 is equipped with one external Compact-Flash solid state disk socket surving as an emulated hard disk or a portable storage device. Several interfaces are also reserved, including an IDE interface and a SVGA interface which supports CRT monitors with up to 4 MB display memory. With its industrial grade reliability, the WEB-2000 can operate continuously at temperatures up to 70° C (158° F). This compact unit offers all these functions within a hand-sized chassis, measuring merely 188.8x106.5x35.5 mm. The WEB-2000 can be wall mounted. The rugged die-cast aluminum chassis that houses the WEB-2000 serves a dual purpose. Not only does it offer excellent physical and EMI component protection and convenient access to all connections, it is alson a function heat sink for heat dissipation. These numerous features provide an ideal price/performance solution for commercial and industrial applications where reliability and stability are essential.

The WEB-2000 is compact, highly integrated and easy to maintain and install. These features make it ideal for applications such as small industrial controllers, security systems, Internet gateways, Web servers, laboratory instruments, building automation, and so on.

1.2 Specifications

1.2.1 General

- **CPU**: StrongARM™ 206 MHz
- **Memory**: 16/32 MB SDRAM; 16MB Flash Memory
- **10 Baset-T Ethernet interface:**
  -Ethernet controller:SMC91C96
  -Ethernet interface: IEEE 802.3 compatible 10Base-T interface
- **Serial ports**: Two RS-232, One RS-485.
  -One DB9 2-wire RS-232 interface (COM1)
  -One DB9 full RS-232 interface (COM2)
  -One DB9 RS-485 (COM 3)
- **VGA output:**
  -VGA chip: MQ-200 with 2 MB SDRAM embedded, 128-bit 2D graphics accelerator
- **PS/2 KB/Mouse:** supports standard PC/AT keyboard and mouse
- **Reset button**
- **DIO:** One DB-15 connector (Male) for six D/I, six D/O with protection, one Vcc and two GND pin
- **Digital input :** Digital input: input voltage:
  low: 0.5 V max., high: 2.4 V min.
- **Digital output:** output voltage-open collector 5-40 V_{DC} sink current: 200 mA max.
- **Solid state disk**: one external CompactFlash™ socket emulated HDD
- **LED**: one power LED, one CF LED and four status LED

Dimension & Weight

- **Chassis size**: 188 x 106.5 x 35.5 mm
- **Weight**: .7kg

Power Supply

- **Power supply voltage**: 24 V_{DC} (input range 12-35 V_{DC})
- **Max. power requirements**: +24 V @ .2 A

Environmental Specifications

- **Operating temperature**: 0~70° C (32~158° F)

1.3 Safety precautions

The following sections tell how to make each connection. In most cases, you will simply need to connect a standard cable. All of the connector pin assignments are shown in Appendix A.

Warning! *Always completely disconnect the power cord from your PC chassis whenever you are working on it. Do not make connections while the power is on. Sensitive electronic components can be damaged by a sudden rush of power. Only experienced electronics personnel should open the PC chassis.*

Caution! *Always ground yourself to remove any static charge before touching any PC board or card. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the PC chassis.*

1.4 Turn on procedure

The needed bootloader, registry, and Windows™ CE image for booting up the system have been loaded in the on- board flash inside the WEB-2000. Before turning on the WEB-2000, please make sure wether you need to run applications.

Whether you need to run applications (please check the turning on procedure of web-2000's start up manual)

1. Make sure that all peripherials, such as LAN, COM ports, or VGA, are connected.

2. To turn on the WEB-2000, the only process is simply connecting the DC-IN 24 V power. After about 6 seconds, WINDOWS CE OS is on in the WEB-2000.

Applications in the extended CompactFlash

1.Make sure that no power line is connected to the WEB-2000.

2.Make sure that all peripherials, such as LAN, COM ports, or VGA, are connected.

3. Install the external CompactFlash into the CF slot of the WEB-2000.

4. To turn on the WEB-2000, the only process is simply connecting the DC-IN 24 V power.

1.6 Chassis: dimensions

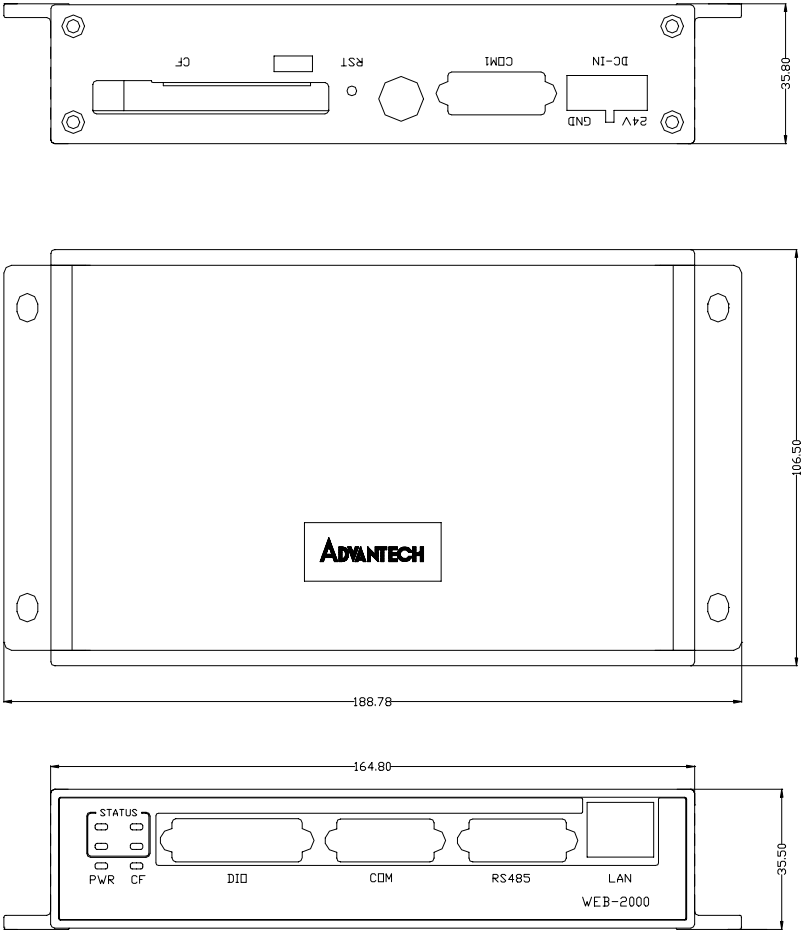


Figure 1-2 Chassis dimensions

CHAPTER 2

Connecting Peripherals

This chapter tells how to set up the WEB-2000's hardware, including connecting peripherals, switches and indicators.

2.1 Introduction to connectors

The following table lists the connectors on the WEB-2000.

Table 2.1: Connectors

Number	Function
CN1	Ethernet connector
CN2	COM3 RS-485 connector
CN3	COM2 RS-232 connector
CN4	Digital I/O connector
CN5	COM1 2-wire RS-232 serial port
CN6	External CompactFlash socket
CN8	Phoenix power connector
CN9	5V power connector
CN10	Keyboard and PS/2 mouse connector
J2	VGA control bus (must be linked to CPU card)
JP1	VGA connector
SW1	Reset button
U7	SO-DIMM Socket

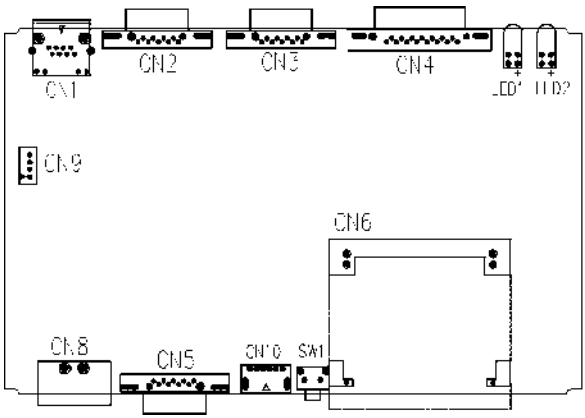


Figure 2-1: Board layout; connector locations (component side)

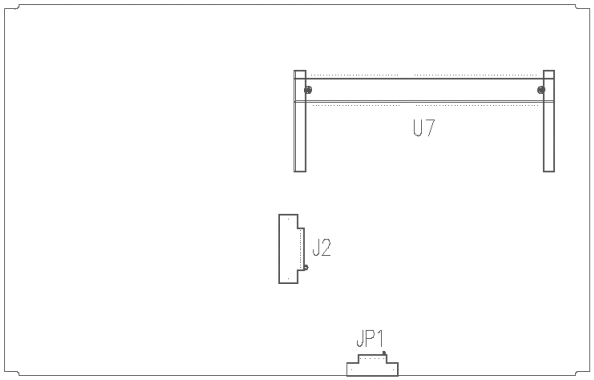


Figure 2-2: Board layout; connector locations (solder side)

2.2 Serial ports (CN2: RS485;CN3:COM2/ RS-232;CN5:COM1/RS-232

The WEB-2000 offers three serial ports: COM 1(RS-232), COM 2 (RS-232) and RS-485. These ports allow you to connect to serial devices (a mouse, etc.) or a communications network.

Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for each connector.

2.3 Digital I/O connector (CN3)

The WEB-2000 is equipped with six digital inputs and six open collector digital outputs. The open collector output with capability of 200 ma current sink can be used to drive the delay or transistor switch. A pull-up resistor is added to ensure output is held at a high level when exchanging digital signals with other TTL devices.

Digital output port

Connector Pin No.	Digital output	Discription
15	GND	GND
14	DO5	GPIO7
13	DO4	GPIO6
12	DO3	GPIO5
11	DO2	GPIO4
10	DO1	GPIO3
9	DO0	GPIO2

DO 0~4	Digital output
1	TTL low
0	TTL high (add a pull-up resistor)

Digital input port

Connector Pin No.	Digital input	Discription
7	GND	GND
6	DI5	GPIO9
5	DI4	GPIO8
4	DI3	GPIO13
3	DI2	GPIO12
2	DI1	GPIO11
1	DI0	GPIO10

2.4 Ethernet connector (CN1)

The WEB-2000 is equipped with a high performance 32-bit PCI-bus Fast Ethernet interface which is fully compliant with IEEE 802.3 10Base-T specifications. It is supported by all major network operating systems.

2.6 External CompactFlash™ (CN6)

This socket accepts an IDE-compatible CompactFlash™ memory card. The CompactFlash™ interface uses a primary IDE channel.

2.7 Power connector (CN8)

The WEB-2000 comes with a Phoenix connector which carries 24 V DC external power input. The WEB-2000 can get power from CN8.

2.8 Keyboard and PS/2 mouse connector (CN10)

The WEB-2000 board provides a keyboard connector. A 6-pin mini-DIN connector (CN10) is located on the board mounting bracket. The board comes with an adapter to convert from the 6-pin mini-DIN connector to a standard DIN connector and to a PS/2 mouse connector.

2.9 Reset button 9 (SW1)

To "press" SW1 will activate a reset.

2.10 VGA display connector (JP1)

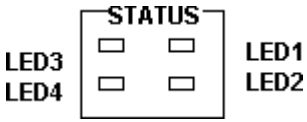
The WEB-2000 provides a VGA controller for a high resolution VGA interface. The VGA interface is reserved for system testing and debugging. The WEB-2000's JP1 is a 6-pin mini connector for a VGA monitor. A VGA cable is attached to convert from a 6-pin mini connector to standard VGA connector. Pin assignments for the CRT display are detailed in Appendix A.

2.11 LED indicators

There are six LED on WEB-2000; four to indicate system status, one for power status, and one for CompactFlash™ status.

LED 1~4

LED	Function
PWR	Power LED
CF	CompactFlash™
STATUS	LED1~4 Status LED



LED1~4 Status LED

LED	Discription
LED 4	GPIO1
LED 3	GPIO0
LED2	RS-485 Rx
LED 1	RS-485 Tx

APPENDIX A

Pin Assignments

- Floppy drive/parallel port connector
- CRT display connector
- Keyboard and mouse connector
- RS-232 serial port
- RS-485 serial port
- Phoenix power connector

A.1 CRT display connector (JP1)

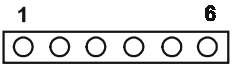


Table A-1: CRT display connector (JP4)

Pin	Signal
1	RED
2	H-SYNC
3	GREEN
4	V-SYNC
5	BLUE
6	GND

A.2 Keyboard and mouse connector (CN10)

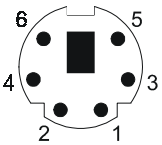


Table A-2: Keyboard and mouse connector (CN8)

Pin	Signal
1	KB DATA
2	MS DATA
3	GND
4	V_{CC}
5	KB CLOCK
6	MS CLOCK

A.3 COM1 2-wire RS-232 serial port (CN5)

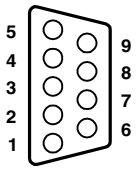


Table A-3: COM1 RS-232 serial port

Pin	Signal
1	N/A
2	RXD
3	TXD
4	N/A
5	GND
6	N/A
7	N/A
8	N/A
9	N/A

A.4 COM2 RS232 serial port (CN3)

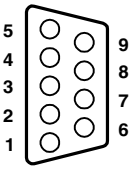


Table A-4: COM2 RS232 serial port

Pin	Signal
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

A.5 COM3 RS485 serial port (CN2)

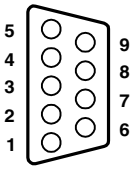


Table A-5: COM3 RS485 serial port

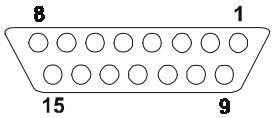
Pin	Signal
1	TX+
2	TX-
3	N/C
4	N/C
5	GND
6	N/C
7	N/C
8	N/C
9	N/C

A.6 Phoenix power connector (CN8)

Table A-6: Phoenix power connector

Pin	Signal
1	+24V
2	GND

A.7 Digital I/O connector (CN4)



A-7: Digital I/O connector

Pin	Signals	Pin	Signals
1	DI0	9	DO0
2	DI1	10	DO1
3	DI2	11	DO2
4	DI3	12	DO3
5	DI4	13	DO4
6	DI5	14	DO5
7	GND	15	GND
8	+5V		

Appendix B

Using the Watchdog Timer

The WEB-2000 is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for any reason. This feature ensures system reliability in industrial standalone or unmanned environments.

B.1 Using the Watchdog Timer

The default configuration of the timer is disabled when the system is reset.

You may enable the watchdog by using the "watchdog.exe" utility. This execution program is in the CD-ROM packaged with the WEB-2000.

To enable the watchdog timer, you can run

watchdog.exe ###.

can be 200, 500, or 1000, which are 200ms, 500ms, and 1000 ms respectively.

These parameters indicate each of the time periods that you want to trigger the watchdog timer and monitor the system.