

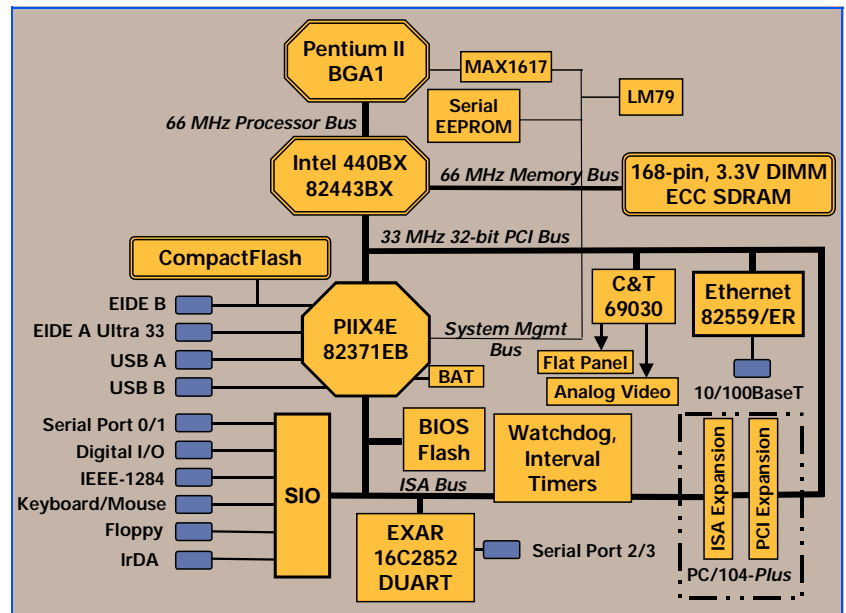


**Low power consumption and reduced heat dissipation combined in a small form factor EBX motherboard**

Motorola's MBX2000 embedded controller provides a solution to customers who require low power consumption and reduced heat generation in a small form factor board. This EBX form factor board provides a wide array of standard features including a 266/333 MHz Intel Pentium II processor—Low Power supporting 66 MHz front-side bus frequency, 440BX AGPset, 10/100Mbit Ethernet, USB, IDE CompactFlash, graphics, watchdog and countdown timers, PCI/ISA support, Phoenix BIOS, and many other features.

This EBX open architecture motherboard with value-added features, such as an on-board LCD interface, is ideal for embedded industrial automation, laboratory/scientific, medical, diagnostic, and communications applications. EBX also targets embedded applications such as vending machines, medical diagnostic touch screens, communications equipment, and information kiosks.

- 266/333 MHz BGA1 Intel Pentium II processor—Low Power
- Intel 440BX AGPset with support for 66 MHz processor-side bus
- 256KB L2 cache
- One DIMM slot supporting 3.3 V PC100 compatible SDRAM memory
- 10/100Mbit Ethernet interface
- Optional accelerated 2D graphics with 4MB video memory; available with VGA and flat panel connectors
- Four RS-232 serial ports (two RS-232, two RS-232/422/485), parallel, floppy, PS/2 keyboard/mouse support, two USB ports, IrDA header, and 16 digital I/O channels
- PC/104 and PC/104-Plus expandability (ISA and PCI support)
- Watchdog timer, interval timers, and hardware monitor
- ATA/33 EIDE interface with CompactFlash Type II socket on one EIDE channel
- Supports Windows® NT, Linux, and VxWorks operating systems



## MBX2000 DETAILS

### Intel Pentium II Processor—Low-Power

For embedded applications, the MBX2000 fully supports the Pentium II processor—Low Power. The processor is combined with the Intel 440BX PCI chipset resulting in exceptional processing capability. The low-power processor contains 32KB of internal Level 1 cache memory as well as 256KB of Level 2 cache delivering rapid data access to complex applications. Dynamic execution and dual independent buses are additional performance advantages. For continual processor speed enhancement options, consult your Motorola sales representative.

### Memory

The MBX2000 provides one 168-pin DIMM site for on-board memory expansion. 256MB of PC100 compliant synchronous DRAM is supported.

### Super I/O Functions

The National PC97317 provides a highly integrated set of functions: two asynchronous serial ports, two RS-232/422/485 ports, digital I/O, IEEE 1284 host parallel port, floppy port, keyboard and mouse ports, and IrDA port.

### 2D Accelerated Graphics

An optional CHIPS 69030 HiQVideo accelerator with 4MB integrated memory provides eye-opening 2D accelerated graphics performance for human-machine interfaces and imaging applications. Single view up to 1280 x 1024. VGA and flat-panel interfaces are provided.

## SPECIFICATIONS

### Processor

Single 266/333 MHz Intel Pentium II processor—Low Power

### Cache

**Level 1:** 16/16KB instruction/data

**Level 2:** 256KB L2 (integrated)

### Memory

**Type:** SDRAM with optional ECC (PC100 compliant)

**Capacity:** Up to 256MB

### Ultra DMA/33 EIDE Interface

**Controller:** 82371EB PCI-to-ISA/IDE Xcelerator (PIIX4E)

**Connections:** Two; one connected to hard disk drive port and one connected to Type II CompactFlash port and hard disk drive port

### Super I/O

**Controller:** National Semiconductor PC97317

**Interfaces:** Two RS-232 serial ports, parallel port, PS/2 floppy port, PS/2 keyboard/mouse interfaces and an IrDA port

### Bus Interfaces

**PCI Bus:** 32-bit PCI bus, up to 33 MHz is supported

**ISA Bus:** 16-bit ISA bus, up to 8/33 MHz supported

### PCI Bus

**Controller:** 82443BX

**Signaling:** 5 V

**Connector:** PC/104-Plus

### ISA Bus

**Controller:** PIIX4E

**Signaling:** 5 V

**Connector:** PC/104

### IDE Flash

**Type:** Type II CompactFlash

**Capacity:** 2–192MB

### Ethernet

**Controller:** Intel 82559ER

**Interface speed:** 10/100Mb/s

**Local Bus DMA:** Yes

**Connector:** RJ-45

## Graphics

<b>Controller:</b>	CHIPS 69030 2D accelerated video
<b>Video Memory:</b>	4MB on-chip SDRAM
<b>Resolution:</b>	1280 x 1024 max.

## Supervisory

<b>Watchdog Timer:</b>	Two-level, software programmable (100 msec. to 27 min.); drives interrupt, NMI, SMI, system reset
<b>LM79:</b>	Provides for temperature, fan speed, and voltage monitoring; single on-board temperature sensor and limit register for local temperature monitoring and interrupt generation
<b>MAX1617:</b>	CPU temperature monitor
<b>Reset switch:</b>	Push-button reset

## Power Requirements

Exclusive of attached daughter boards and/or peripherals.

### Notes:

1. The MBX2000A uses +5 VDC for standard operation
2. +5 VDC requirement for CompactFlash
3. ±12 VDC and +5 VDC requirement for flat panel
4. ±12 VDC and -5 VDC requirement for PC/104, PC/104-Plus, other add-on components

266 MHz Board Configuration	+5 VDC Typical	Power
MBX2000A-101—no on-board graphics; 128MB SDRAM @ 66 MHz	2.8 Amp	14.0 W
MBX2000A-102—with on-board graphics; 64MB SDRAM @ 66 MHz	3.0 Amp	15.0 W
MBX2000A-102—with on-board graphics; 128MB SDRAM @ 66 MHz	3.0 Amp	15.0 W
MBX2000A-102—with on-board graphics; 256MB SDRAM @ 66 MHz	3.3 Amp	16.5 W
333 MHz Board Configuration	+5 VDC Typical	Power
MBX2000A-103—no on-board graphics; 128MB SDRAM @ 66 MHz	3.0 Amp	15.0 W
MBX2000A-104—with on-board graphics; 64MB SDRAM @ 66 MHz	3.2 Amp	16.0 W
MBX2000A-104—with on-board graphics; 128MB SDRAM @ 66 MHz	3.2 Amp	16.0 W
MBX2000A-104—with on-board graphics; 256MB SDRAM @ 66 MHz	3.5 Amp	17.5 W

## RTC and CMOS RAM

EPROM backup for CMOS RAM

## USB

Dual independent USB channels for 1.5Mb/s and 12Mb/s transfer rates

## Software Support

The MBX2000 is supported by a variety of operating systems, including a complete range of real-time operating systems and kernels.

## Safety

All printed wiring boards (PWBs) are manufactured with a flammability rating of 94V-0 or better.

## Board Size

<b>EBX Form Factor:</b>	203.2 mm (8.0 in.) x 146.1 mm (5.75 in.)
<b>Max. Component Height:</b>	19.1 mm (0.75 in.), without DIMM or PC/104 modules

## Demonstrated MTBF

(based on a sample of eight boards in an accelerated stress environment)

<b>Mean:</b>	190,509 hours
<b>95% Confidence:</b>	107,681 hours

## Environmental

	Operating	Nonoperating
<b>Temperature:</b>	0° C to +55° C	-40° C to +70° C
<b>Humidity (NC):</b>	5% to 95%	5% to 95%
<b>Vibration:</b>	1 G Sine Sweep 5–100 Hz	0.5 G Sine Sweep 5–50 Hz; 3 G Sine Sweep 50–500 Hz;

## Electromagnetic Compatibility (EMC)

Intended for use in systems meeting the following regulations:

**U.S.:** FCC Part 15, Subpart B, Class A or B

**Canada:** ICES-003, Class A or B

This product was tested in a representative system to the following standards:

CE Mark per European EMC Directive 89/336/EEC with Amendments; Emissions: EN55022 Class B; Immunity: EN55024

## ORDERING INFORMATION

Part Number	Description
<b>MBX2000-101A</b>	266 MHz Pentium II processor, no on-board graphics
<b>MBX2000-102A</b>	266 MHz Pentium II processor, on-board graphics
<b>MBX2000-103A</b>	333 MHz Pentium II processor, no on-board graphics
<b>MBX2000-104A</b>	333 MHz Pentium II processor, on-board graphics
<b>Memory Modules (1DIMM limit per order)</b>	
<b>MEMSDRM256-F</b>	256MB, PC100, ECC, SDRAM
<b>MEMSDRM256-K</b>	256MB, PC100, ECC, SDRAM
<b>Related Products</b>	
<b>MBX2000DEVKIT</b>	MBX2000 Development Kit: Mounting plate, Cable kit, which contains the following: <ul style="list-style-type: none"> <li>• ATX to EBX power cable</li> <li>• Keyboard/mouse/reset cable</li> <li>• Parallel port transition cable</li> <li>• Serial port transition cable (dual port)</li> <li>• USB transition cable (dual port)</li> <li>• VGA transition cable</li> <li>• IDE ribbon cable (2mm, 44-position socket)</li> </ul>
<b>Documentation</b>	
<b>MBX2000AA/IH</b>	MBX2000 Installation and Use Manual
<b>MBX2000A/PG</b>	MBX2000 Programmer's Guide
Documentation is available for online viewing and ordering at <a href="http://www.motorola.com/computer/literature">http://www.motorola.com/computer/literature</a>	

**Motorola Computer Group  
Regional Offices**

NORTH AMERICA: Tempe, AZ 800-759-1107 or 602-438-5720  
 EUROPE: Loughborough, UK +44 1509 634300  
 EAST MEDITERRANEAN: Tel Aviv, Israel +972 3 568 4388

ASIA: Shanghai, China +86 21 5292 5693  
 PACIFIC RIM: Tokyo, Japan +81 3 5424 3101  
 ASIA/PACIFIC: Hong Kong +852 2966 3210



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