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386EX with Digital I/O, LCD, Keypad, A/D, D/A, Enhanced SCC, Ethernet SBC3386EX



Features

- ✓ Ready to run 386EX computer
- ✓ DiskOnChip®, up to 16MB RAM
- ✓ COM1, COM2, LPT1, LCD ports
- ✓ 24 TTL compatible I/O lines
- ✓ Watchdog, RTC, PC/104 expansion
- ✓ A/D, D/A, and dual high performance sync/async serial port options
- ✓ Ethernet network option
- ✓ Download .EXE file to run on card
- ✓ Turbo Debugger™ support

The SBC3386EX is a PC/104 expandable embeddable PC. It offers a range of features that make it ideal for embedded control applications, and offers quick development cycles. The standard configuration includes Intel's powerful 386EX processor, installed RAM and flash EPROM memory, and the time saving RUN.EXE firmware. This firmware allows an .EXE file to be downloaded into on-board flash EPROM through a serial port using XMODEM protocol, and then run the next time power is applied. Borland/ Microsoft C/C++, Turbo Pascal, and QuickBASIC are all supported directly. Support for Turbo Debugger is included.

With two PC compatible RS232/RS485 COM ports, LPT1, an LCD display interface, 24 I/O lines, three counter/timers, and a watchdog timer, the SBC3386EX provides a full set of hardware for many applications. On-board options include two high performance sync/async comm ports, A/D inputs, and D/A outputs and an Ethernet network adapter. PC/104 expansion cards can be stacked onto the SBC3386EX for additional functions.

Because the SBC3386EX is completely functional as shipped, it is ready to run an application program upon receipt.

Software Support

DOS emulation, RUN.EXE™,
MSDOS 5.0, TurboDebugger™
Comm library, CommBLOK™
PID loop library, PidBLOK™,
C, BASIC, compilers
[Items above in Section 6]
Novell Netware
UDP/IP Networks

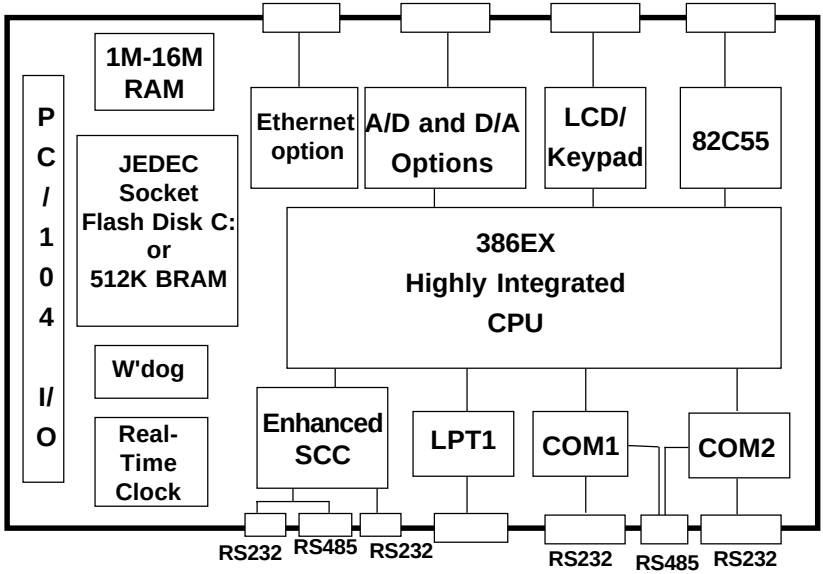
Compatible Hardware

PC/104 expansion cards
[Items above in Section 4]
RS232 devices
Ethernet Networks
SDLC, HDLC links
Analog sensors
Analog controls
Custom

Mounting/Packaging

Enclosure, ENC104-3
Standoffs, STDOFF01
[Items above in Section 5]
Custom

Micro/sys 3730 Park Place, Montrose, CA 91020 (818)244-4600 Fax (818)244-4246
email: info@embeddedsys.com



Specifications:

Mechanical:
- ❑ 5.0" x 8.5" x 1.25"
- ❑ Four mounting holes in corners

Power Requirements:
- ❑ +5V ± 5% at 850mA
- ❑ ±12V ± 5% at 40mA

Environmental:
- ❑ 0° - +70°C operating
- ❑ -40° - +85°C storage
- ❑ 5%-95% relative humidity, non-condensing

Processor Core Section:
- ❑ 386EX CPU
- ❑ 25 MHz clock rate
- ❑ Includes three 16-bit timers
- ❑ Dual 8259A interrupt controllers included
- ❑ Selectable DMA support - DRQ2 or DRQ6

On-board Memory:
- ❑ 1M DRAM based at 0, expandable to 16M
- ❑ 512K of flash at top of memory map with BIOS and operating system installed, 384K available for user application .EXE file
- ❑ Installed firmware for .EXE file download, debug, and execution
- ❑ Socket for 128K/512K RAM for system mgmt mode RAM, or battery-backed RAM
- ❑ Optional flash ROMdisk

Watchdog Timer:
- ❑ Program must refresh watchdog timer periodically, or system will be reset
- ❑ Enabled through software

COM1, COM2 Serial Ports:
- ❑ Two async serial ports, PC compatible
- ❑ RTS and CTS modem controls
- ❑ RS232 both channels
- ❑ Baud rates to 780K, DMA support
- ❑ COM1 RS485 full duplex
- ❑ COM2 RS485 half duplex

Synchronous Serial Port:
- ❑ One sync serial port, up to 6M baud
- ❑ Consists of double-buffered 16-bit RX and TX shift registers, no protocol implemented

LPT Port:
- ❑ PC compatible, output only no IRQ

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COM1 and COM2 RS232 Serial Port Connectors/Cables		
Pin	RS232	DB9 Pin
1	--	1
2	--	6
3	RX Data In	2
4	RTS Out	7
5	TX Data Out	3
6	CTS In	8
7	--	4
8	--	9
9	GND	5
10	--	--

COM1 and COM2 RS485 Serial Connector	
Pin	RS485
1	GND
2	TX1+
3	TX1-
4	RX1+
5	RX1-
6	TXRX2+
7	TXRX2-
8	--
9	TXEN1
10	TXEN2

LCD/Keypad Interface:
- ❑ Bidirectional 8-bit data
- ❑ Dual data strobes, R/W, RS signals
- ❑ Trimpot for LCD contrast voltage
- ❑ Compatible with alphanumeric and sub-VGA (under 320x200) graphic LCDs
- ❑ Support for 4x5 matrix keypad
- ❑ Software-driven keypad scan, driver included

Digital I/O Lines:
- ❑ 24 programmable lines
- ❑ 8-bit programmable input or output
- ❑ TTL compatible levels, 2.5mA drive
- ❑ Inplemented with 82C55

Real Time Clock:
- ❑ RTC with on-board battery
- ❑ Driver software in BIOS

PC/104 Interface:
- ❑ 8-bit and 16-bit PC/104 module support
- ❑ IRQ5-7,9-11,14 and IOCHCHK (NMI)
- ❑ DMA support for DRQ2 or DRQ6

Dual High Performance Serial Port Option:
- ❑ Two async/sync channels, SDLC, HDLC
- ❑ Baud rates over 2M, DMA support
- ❑ Based on Zilog 85230 enchanced SCC
- ❑ Full RS232 modem lines, both channels
- ❑ RS485 full duplex, one channel

Analog Input Option:
- ❑ Eight or sixteen 12-bit channels
- ❑ ±1/2 LSB linearity
- ❑ 6usec conversion time
- ❑ 0 to +5V, 0 to +10, ±5, ±10 input ranges
- ❑ Software-programmable input range

Analog Output Option:
- ❑ Four or Eight 12-bit outputs
- ❑ 0 to +10V output range, all channels
- ❑ ±1/2 LSB linearity
- ❑ 60usec DAC update tim

Ethernet Option:
UDP/IP Network Version Ordered as Netsock/300 (refer to separate data sheet)
- ❑ 10BASE-T twisted-pair interface
- ❑ RJ45 connector on-board
- ❑ Flash Setup configuration utility, including IRQ, IP address, and DHCP options
- ❑ UDP/IP driver stack preloaded into flash
- ❑ Implements subset of Winsock functions
- ❑ SOCK_DGRAM (UDP datagram) and SOCK_RAW (low level) sockets supported
- ❑ IP, UDP, ARP, DHCP, ICMP protocols supported
- ❑ Dynamically linked with application

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Enhanced RS232 Serial Ports COM A & COM B			
Pin	Signal	Signal	Pin
1	--	TRX CLK OUT	2
3	TXD	TRX CLK IN	4
5	RXD	RTX CLK OUT	6
7	RTS	RTX CLK IN	8
9	CTS	--	10
11	--	--	12
13	GND	DTR	14
15	DCD	--	16

DK3386 Development Kit:

- ❑ Free with first SBC3386EX purchase
- ❑ BIOS and DOS compatible O/S
- ❑ "Implied AUTOEXEC.BAT" on reset
- ❑ Directly executes programs written in C/C++, Pascal, BASIC
- ❑ No modified libraries or locator utilities
- ❑ Executes .EXE file from flash
- ❑ Includes Turbo Debugger remote support
- ❑ Download program to flash EPROM with XMODEM (using PROCOMM, etc.)
- ❑ Includes all cables and documentation

External Connections:

- ❑ 10-pin header for each RS232 COM port (2 standard, 4 with ESCC option)
- ❑ 10-pin headers for COM1 & COM2 RS485, and ESCC option port RS485
- ❑ 26-pin header for Digital I/O and LPT1
- ❑ 20-pin header for LCD display
- ❑ 50-pin header for A/D inputs and D/A outputs
- ❑ 26-pin header for timer, sync SIO, and miscellaneous CPU signals
- ❑ 9-pin header for keypad
- ❑ 2-pin header for reset input
- ❑ 5-pin plugable terminal strip for power

Ordering Information:

Single Board Computer:

SBC3386EX	386EX CPU, 25 MHz, 1MB RAM, 512K system flash
DK3386	No charge development kit, available with first order only
Netsock/300	SBC3386EX with Ethernet and UDP/IP, RJ45
Netsock/300-2	SBC3386EX with Ethernet and UDP/IP, Coax (refer to separate data sheet)
3386OPT1	4MB RAM total
3386OPT2	16MB RAM total
3386OPT10	Dual high performance sync/async comm ports (85230)
3386OPT11-8	A/D Converter, 8-Channel
3386OPT11-16	A/D Converter, 16-Channel
3386OPT12-4	D/A Converter, 4-Channel
3386OPT12-8	D/A Converter, 8-Channel
3386OPT20-2	Ethernet, 10BASE-2 (Coax, BNC)
3386OPT20-T	Ethernet, 10BASE-T (T/Pair, RJ45)
3386OPT25	MSDOS 5.0 in Bootable Flash ROMdisk A:
3386OPT30-8	8MB Flash Disk C:
3386OPT30-24	24MB Flash Disk C:
3386OPT30-48	48MB Flash Disk C:
3386OPT30-64	64MB Flash Disk C:
3386OPT31-2	2MB Flash Disk C: (Not for New Designs)
3386OPT31-4	4MB Flash Disk C: (Not for New Designs)
3386OPT31-8	8MB Flash Disk C: (Not for New Designs)
SBCOPT120ST	Stackthrough PC/104

Accessories:

MPC204	VGA, Touchscreen, Interface
MPC420	PCMCIA Controller, 2 Slot-16 bit
CA4020	COM Port DB9 breakout cable
CA4039	3386OPT10 cable to DB25 (2 required)
ENC104-3	Metal enclosure for SBC3386EX plus 3 PC/104 add-ons
TB1485-X	RS485 terminator/terminal board with cable

Cables nominally 15", other lengths available

RUN.EXE trademark Micro/sys, Inc.
CommBLOK, PidBLOK, trademark Drumlin
IBM, PC trademark IBM Corp.
MSDOS, QuickBASIC, Microsoft trademark Microsoft Corp.
Turbo Pascal, Turbo Debugger trademark Borland Intl.

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