ICE™-186 IN-CIRCUIT EMULATOR

HIGH PERFORMANCE REAL-TIME EMULATION

Intel's ICE-186 emulator delivers real-time emulation for the 80C186 microprocessor at speeds up to 12.5 MHz. The in-circuit emulator is a versatile and efficient tool for developing, debugging and testing products designed with the Intel 80C186 microprocessor. The ICE-186 emulator provides real time, full speed emulation in a users system. Popular features such as symbolic debug, 2K bytes trace memory, and single-step program execution are standard on the ICE-186 emulator. Intel provides a complete development environment using assembler (ASM86) as well as high-level languages such as Intel's C86, PL/M86 or Fortran 86 to accelerate development schedules.

The ICE-186 emulator supports a subset of the 80C186 features at 12.5 MHz and at the TTL level characteristics of the component. The emulator is hosted on IBM's Personal Computer AT, already available as a standard development solution in most of today's engineering environments. The ICE-186 emulator operates in prototype or standalone mode, allowing software development and debug before a prototype system is available. The ICE-186 emulator is ideally suited for developing real-time applications such as industrial automation, computer peripherals, communications, office automation, or other applications requiring the full power of the 12.5 MHz 80C186 microprocessor.

ICE™-186 FEATURES

- Full 12.5 MHz Emulation Speed
- 2K Bytes Deep Trace Memory
- Two-Level Breakpoints with Occurrence Counters
- Single-Step Capability
- 128K Bytes Zero Wait-State Mapped Memory
- Supports DRAM Refresh
- High-Level Language Support
- Symbolic Debug
- Coprocessor Support
- RS-232-C and GPIB Communication Links
- Crystal Power Accessory
- Interface for Intel Performance Analysis Tool (iPAT)
- Interface for Optional General Purpose Logic Analyzer
- Tutorial Software
- Complete Intel Service and Support

intel

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HIGHEST EMULATION SPEED AVAILABLE TODAY

The ICE-186 emulator supports development and debug of time-critical hardware and software using Intel's 12.5 MHz 80C186 microprocessor.

RETRACE SOFTWARE TRACKS

This emulator captures up to 2,048 frames of processor activity, including both execution and data bus activity. With this trace memory, large blocks of program code can be traced in real time and viewed for program flow and behavior characteristics.

HARDWARE BREAKPOINTS FOR COMPLEX DEBUG

User-defined "TIL-THEN" breakpoint statements stop emulation at specific execution addresses or bus events. During the hardware and software integration phase, breakpoint statements can be defined as execution addresses and/or bus addresses and/or bus access types such as memory and I/O reads or writes. Additionally, event counters provide another level of breakpoint control for sophisticated state machine constructs used to specify emulation breakpoints/tracepoints.

SMALL OR LARGE STEPS

A stepping command can be used to view program execution one frame at a time or in preset frame blocks. When used in conjunction with symbolic debug, code execution can be monitored quickly and precisely.

DEBUG CODE WITHOUT A PROTOTYPE

Even before prototype hardware is available, the ICE-186 emulator working in conjunction with the Crystal Power Accessory (CPA) creates a "virtual" application environment. 128K bytes of zero wait-state memory is available for mapped memory and I/O resource addressing in 4K increments. The CPA provides emulator diagnostics as well as the ability to use the emulator without a prototype.

DON'T LOSE MEMORY

The ICE-186 emulator continues DRAM refresh signals even when emulation has been halted, thus ensuring DRAM memory will not be lost. During interrogation mode the ICE-186 emulator will keep the timers functioning and correctly respond to interrupts in real-time.

HIGH LEVEL LANGUAGE SUPPORT OPTIMIZED FOR INTEL TOOLS

The ICE-186 supports emulation for programs written in Intel's ASM86 or any of Intel's high-level languages:

PL/M-86	Fortran-86
Pascal-86	C-86

These languages are optimized for Intel component architectures to deliver a tightly integrated, high performance development environment.

USER-FRIENDLY SYMBOLICS AID IN DEBUG

Symbolics allow access to program symbols by name rather than cumbersome physical addresses. Symbolic debug speeds the debugging process by reducing reliance on memory maps. In a dynamic development process, user variables can be used as parameters for ICE-186 commands resulting in a consistent debug environment.

COPROCESSOR SUPPORT

Coprocessor support enables applications to run faster due to off loading of the main CPU. The ICE-186 emulator supports alternate coprocessors such as LAN controllers and graphic engines, however it does not have built in support for the 8087 coprocessor.

MULTIPLE HIGH-SPEED COMMUNICATION LINKS

Two communication links are available for use in conjunction with the host IBM PC AT. The ICE-186 emulator uses either serial (RS-232-C) or a parallel (GPIB) link. A user supplied National Instruments (IEEE-488) GPIB communication board provides parallel transfers at rates up to 300K bytes per second.

SOFTWARE ANALYSIS (iPAT)

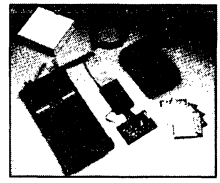
Intel's Performance Analysis Tool (iPAT) is designed to increase team productivity with features like interrupt latency measurement, code coverage analysis and software module performance analysis. These features enable the user to design reliable, high performance embedded control products. The ICE-186 emulator has an external 60 pin connector for iPAT.

BUILT-IN SUPPORT FOR LOGIC ANALYSIS

General-purpose logic analyzers can be used in conjunction with the ICE-186 to provide detailed timing of specific events. The ICE-186 emulator provides an external sync signal for triggering logic analysis, making complex trigger sequence programming easy. An additional 60 pin connector is included for the logic analyzer.

WORLDWIDE SERVICE AND SUPPORT

The ICE-186 emulator is supported by Intel's worldwide service and support organization. Total hardware and software support is available including a hotline number when the need is there.



PERSONAL COMPUTER REQUIREMENTS

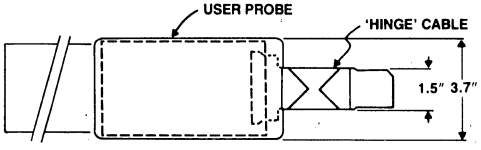
The ICE-186 emulator is hosted on an IBM PC AT. The emulator has been tested and evaluated on an IBM PC AT. The PC AT must meet the following minimum requirements:

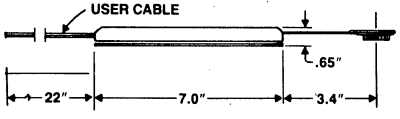
- 640K Bytes of Memory
- Intel Above Board with at Least 1M Byte of Expansion Memory
- One 360K Bytes or One 1.2M Bytes floppy Disk Drive
- One 20M Bytes Fixed-Disk Drive
- PC DOS 3.2 or Later
- A serial Port (COM1 or COM2) Supporting Minimally at 9600 Baud Data Transfers, or a National Instruments GPIB-PC2A board.
- IBM PC AT BIOS

PHYSICAL DESCRIPTION AND CHARACTERISTICS

The ICE-186 Emulator consists of the following components:

Unit	Width		Height		Length	
	Inches	Cm.	Inches	Cm.	Inches	Cm.
Emulator Control Unit	10.40	26.40	1.70	4.30	20.70	52.60
Power Supply	2.80	7.10	4.15	10.70	11.00	27.90
User Probe	3.70	9.40	.65	1.60	7.00	17.80
User Cable/ Plcc					22.00	55.90
Hinge Cable					3.40	8.60
Crystal Power Accessory	4.30	10.90	.60	1.50	6.70	17.00
CPA Power Cable					9.00	22.90





ELECTRICAL CONSIDERATIONS

Icc 1050mA

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature 10°C-40°C Ambient
Storage Temperature −40°C-70°C

ORDERING INFORMATION

ICE186	ICE-186 NMOS System including ICE software (Requires DOS 3.XX PC AT with Above Board)
ICE186PAT	ICE-186 NMOS System including ICE S/W packages and the iPAT system (Requires DOS 3.XX PC AT with Above Board)
D86ASM86NL	86 macro assembler 86 builder/binder/ mapper utilities for DOS 3.XX.
D86C86NL	86 C compiler and run time libraries for DOS 3.XX.
D86PLM86NL	86 PL/M compiler for DOS 3.XX.
D86FOR86NL	86 Fortran compiler for DOS 3.XX.