# CPS-186 S-100 BUS 16-BIT SLAVE PROCESSOR
## from InterContinental Micro

InterContinental Micro's (ICM) latest 16-bit Slave Processor (Single Board Computer) operates at a Clock Rate of 10 MHz, uses an 80186 CPU, and has 256K of on-board Dynamic RAM which is expandable to 1 Megabyte. This product is fully compatible with the IEEE 696.1/D2 S-100 specifications. It was specifically designed to interface with ICM's CPZ-186 (16-Bit) or CPZ-4800X (8-Bit) Master Processors, but can also be integrated with any Z80™ or 16-bit based CPU with extended addressing capabilities complying with the IEEE 696.1/D2 S-100 Bus Standard.

The CPS-186, like InterContinental Micro's CPS-16, CPS-B6A, and CPS-6A slave processors, is Memory Mapped. Memory Mapping allows data transfers at rates which are twice as fast as standard I/O mapped slaves. It also eliminates expensive on-board hardware such as EPROM and FIFO buffers. Memory Mapping allows the Master to download the Operating System and Application Software directly to the slave's memory, eliminating the time and protocol code usually required by both the master's and slave's CPUs.

Running under the TurboDOS™ operating system allows mixing of 8-Bit Z80 based slaves and 16-Bit 8086 or 80186 slaves on the same bus. When used with ICM's unique TurboLAN™ architecture, up to 4000 slave processors, IBM PC's™, XT's, AT's, Jr.'s, PC Compatibles, or Zenith Z-100's™ can be linked together in the same network.
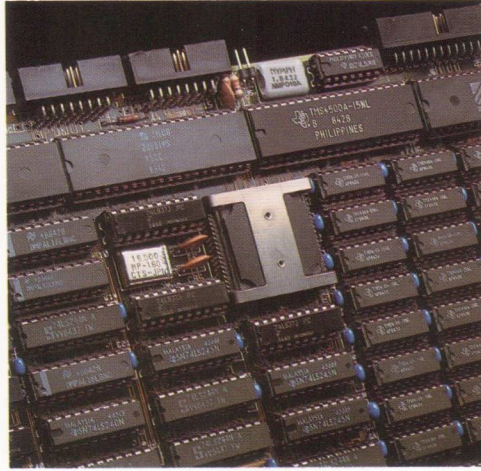


## TECHNICAL FEATURES

☐ IEEE 696.1/D2 S-100 compliance, interfaces with most IEEE S-100 Bus products on the market.
☐ Compatible with (1) InterContinental Micro's CPZ-4800X (8-Bit) Master Processor, (2) InterContinental Micro's CPZ-186 (16-Bit) Master Processor, (3) any Z80 or 16-bit based CPU with extended addressing compling with IEEE 696.1/D2 S-100 Bus Standard.
☐ Data Transfers: parallel 16-Bit or 8-Bit capability.
☐ 10 MHz 80186 CPU

☐ Four synchronous (SCC) or asynchronous (ASCC) serial I/O channels. One channel can be programmed in Direct Memory Access (DMA), interrupt, or programmable I/O mode.
☐ Two parallel I/O channels (CIO). Both channels are programmable in interrupt or programmable I/O mode and one channel can be programmed in Direct Memory Access (DMA) Mode.
☐ Two channel on-chip DMA controller.
☐ 256K Bytes of on-board RAM, expandable to 512K Bytes or 1 Megabyte.
☐ S-100 resident address is jumper selectable in 64K boundaries.
☐ I/O port address: jumper selectable from 00 to FFFF (hex).
☐ Priority interrupts (eliminate polling): 2 vectored, fixed or rotating.
☐ Software selectable baud rates. Eliminates costly, complicated hardware modifications to change baud rates. Up to 1 MegaBAUD in synchronous mode.
☐ IBM Bisync, HDLC, SDLC and other protocols. All are handled through a Z8530 SCC chip. Permits communication with micro's, mini's, or mainframes.
☐ TurboDOS operating system available which runs Application Software for CP/M 86, MS-DOS, CP/M, or MP/M.
☐ RPB-100 (RS232 communication) Personality Board Included.
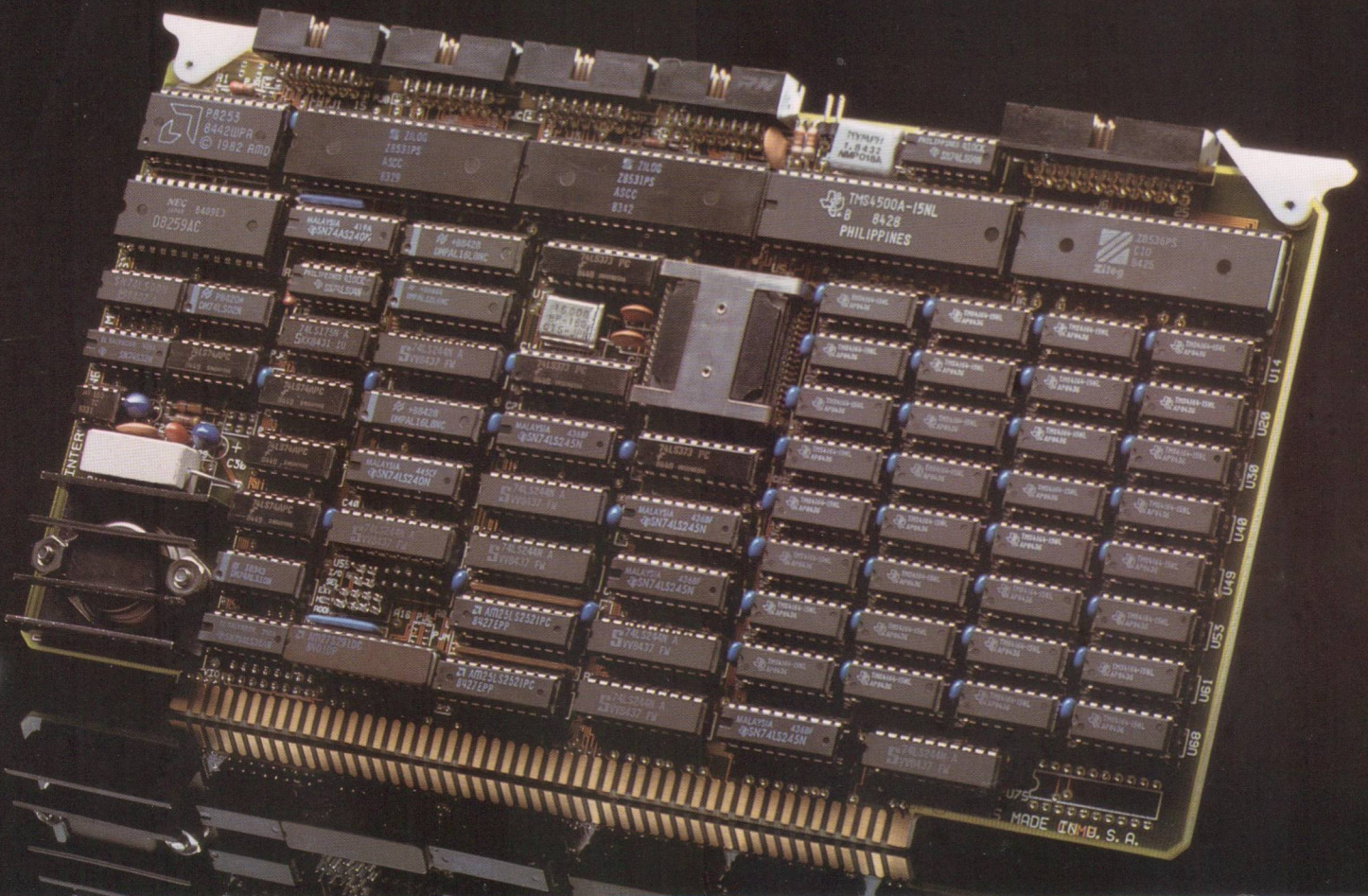
## TurboLAN NETWORK ARCHITECTURE

ICM's revolutionary TurboLAN architecture uses the TurboDOS Operating System to build sophisticated, cost effective, multi-user systems and networks. Turbo-LAN provides the flexibility of building multi-user systems with S-100 BUS Structured Networks and ARCnet™ Local Area Networks. TurboLAN offers:

- [ ] Ability to network S-100 Bus Systems, PC's, XT's™, AT's™, Z-100's, PC-JR's™, PC Compatibles, ICM's WS80 Diskless Workstations, and other ARCnet computers.
- [ ] Uses Master Processor (File Server), such as ICM's CPZ-4800X (8-bit) or CPZ-186 (16-bit) Single Board Computers, or the IBM XT or AT.
- [ ] Up to 4000 users per network with 255 nodes per network segment.
- [ ] Network self configures and efficiency increases as nodes are added.
- [ ] Up to 40 miles between processors (Active Hub) or 2300 Ft. (Passive Hub).
- [ ] 2.5 MBIT/SEC data transfers.
- [ ] Communication across S-100 BUS, Coax cable, or twisted pair.

## TurboDOS OPERATING SYSTEM

TurboDOS is a true multi-user Operating System because it was designed from its beginnings to handle multiple computers running simultaneously on one or more networks. Each user is assigned an individual PC or a terminal attached to a Single Board Computer/Processor. This PC or individual processor is called a SLAVE Processor in the TurboDOS architecture and acts independently of all other slaves on the network. A MASTER Processor, also known as a FILE SERVER, controls the network by downloading the operating system to each slave. The MASTER also downloads system files and orchestrates the use of all common peripherials. With its modular architecture, TurboDOS can increase the number of users or add peripherals on the network with a general software command that "links and patches." TurboDOS is the most sophisticated, yet cost effective Multi-user operating system available today.

## TurboDOS FEATURES

- [ ] Compatible with many OS's Application Software: CP/M™, CP/M-86™, MS-DOS™, MP/M™, MP/M 86™, CP/M PLUS™.
- [ ] Ability to mix Z-80™, 8-bit; 8088 and 8086, 16-bit families of processors.
- [ ] Flexibility to build Bus Structured (Tightly Coupled) Networks and Cable Structured (Loosely Coupled) Local Area Networks using ICM's TurboLAN.
- [ ] Record and File Locking with File Sharing among multiple users.
- [ ] Automatic Print Spooling.
- [ ] Typically 300% faster than UNIX, MP/M, Oasis™ or similar multi-user, single-processor, multi-tasking OS's.
- [ ] 16 Logical Disk Drives per Master Processor/File Server.
- [ ] Up to 1000 MB per drive and 134 MB per file.

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- [ ] 32 user areas (file libraries) on each disk.
- [ ] 25% to 30% more floppy disk capacity.
- [ ] Sharing of costly peripherals and disk drives.
- [ ] Read after Write verification of floppy and hard disk drives.
- [ ] Logon/Logoff and Privileged/Non-privileged Security
- [ ] Background processing and Archival Back-up of files.
- [ ] Queuing of multiple tasks – processing or printing.
- [ ] Each individual TurboDOS OS has 4 Circuit Drivers with 255 nodes (slaves) per circuit driver = 1020 users per File Server.
- [ ] Multiple File Servers can be linked together with ICM's TurboLAN drivers.
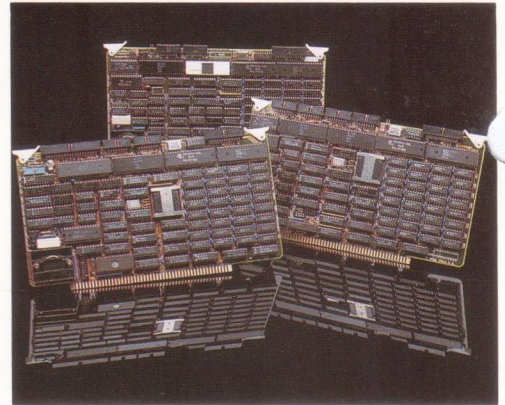
# Performance Specifications

## MICROPROCESSOR
Clock rate..10 MHz 80186

## BUS INTERFACE...IEEE 696.1/D2 S100

## DYNAMIC RAM MEMORY
Capacity...256K Bytes (64K × 1 DRAM's) or 512KB or 1 MegaByte (256K × 1 DRAM's)
Wait States...None

## SERIAL I/O CHANNELS
Synchronous Operation
Baud Rate...Up to 921.6K BAUD
Data Transfer..DMA, interrupt or Programmed I/O
Asynchronous Operation
Baud Rate...Up to 921.6K BAUD
Clock Rate...1, 16, 32, or 64 times Baud Rate
Bits/Character...5, 6, 7 or 8
Stop Bits...1, 1½ or 2
Parity...Odd, Even or None
Data Transfer...DMA, Interrupt or Programmed I/O
I/O Interface...Through Personality Boards (Typically 2″ × 3″)

## PARALLEL I/O CHANNELS
DATA RATE...Up to 500 KBytes/Sec
Channel A Data Transfer...Interrupt, Programmed I/O, or DMA
Channel B Data Transfer...Interrupt or Programmed I/O
Interface Signals...16 DataLines Plus 4 Handshaking Lines
I/O Interface...Through Personality Boards

## INTERRUPT CONTROL
Number of Channels...2
Priority...Rotating or Fixed
Interrupt Mode...Master Cascade

## REAL-TIME CLOCK
Operation...Software Polled or Interrupt Driven
Range...37.5 Hz to 921.6 KHz

## DIRECT MEMORY ACCESS CONTROLLER
Channel 0...Channel A of ASCC Controller 1
Channel 1...Channel A of ASCC Controller 2 or Channel A of CIO Controller

## DIRECT EXTERNAL MEMORY TRANSFERS
To/From ASCC (SCC), CIO, or Memory

## POWER REQUIREMENTS
Voltages... + 8 VDC @ 2.6 (max)
+ 16 VDC @ 0.2A (max)
− 16 VDC @ 0.2A (max)
Power...30.4W (max)

## OPERATING ENVIRONMENT
Temperature...0 to 50 Degrees Celsius (32 to 122 Degrees Fahrenheit)
Relative Humidity...0 to 95%

## CONSTRUCTION
Circuit Board...Four Layer Glass Epoxy, Soldermask over copper
All IC's in sockets
Connectors...Shrouded for Protection
TESTING...Completely tested and 24 hour burn-in
WARRANTY...One Year Warranty (Parts and Labor)

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**Intercontinental Micro Systems**

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