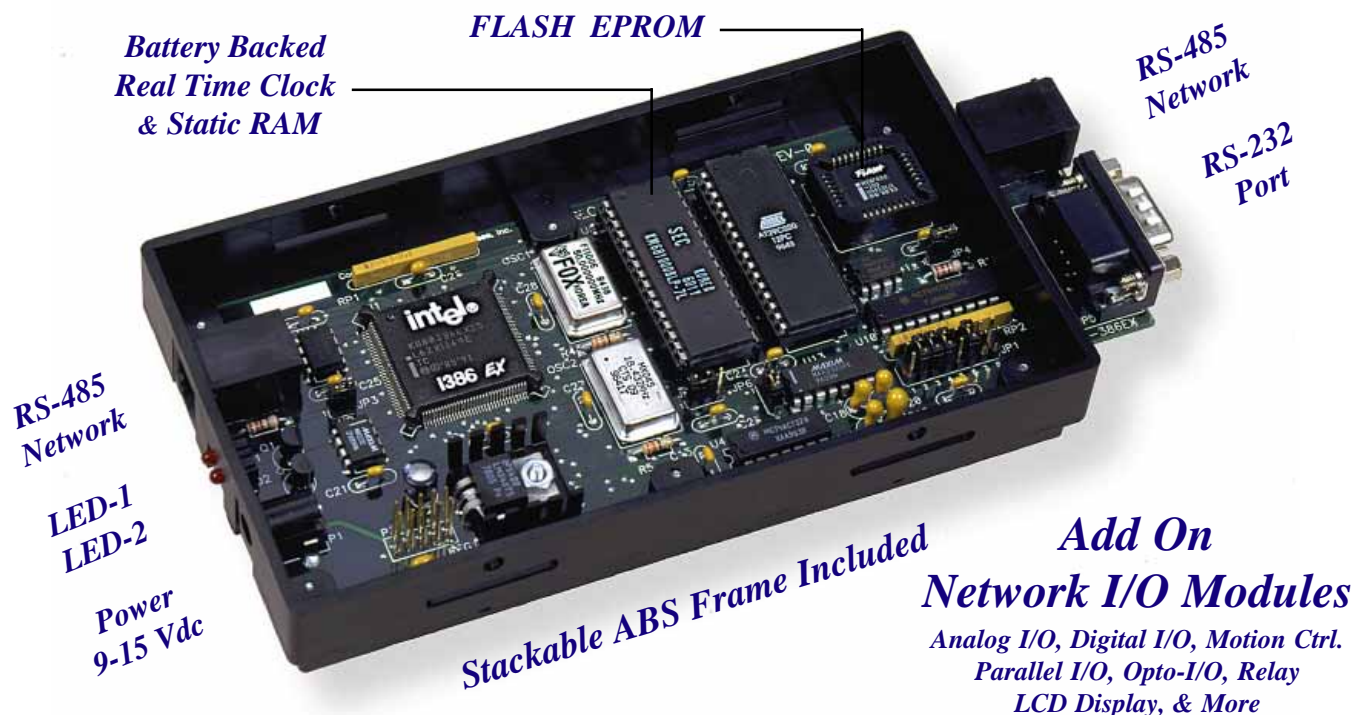


188EB or 386EX



MICRO-PlusTM

Our **MICRO-Plus** 188EB and 386EX Single Board Computers have the functions needed for most embedded applications, plus the ability to stack together and control any combination of our stackable **Network I/O Modules**. These new Single Board Computers were designed to provide a complete low cost Single Board Computer in a small modular stackable frame. Additional I/O may be added by stacking and/or networking additional **Network I/O Modules**. **Network I/O Modules** are available for a wide variety of applications, including Digital, Parallel, Analog, LCD Display, Relay, Opto, Motion Ctrl., and more.

Hardware Features

- * 32-Bit 386EX or 16-Bit 80C188EB
- * Modules Include Stacking Frame
- * Network Connects Automatically
- * Up To 33 MHz CPU
- * Real Time Clock
- * Watch Dog Timer
- * Two Serial/Network Ports (232/485)
- * Up To 512K FLASH EPROM
- * Up To 512K Battery Backed Static RAM
- * Lithium Battery For RTC And RAM
- * -40 To +85 C Temperature Range
- * Ideal For Battery Powered Applications



Software Features

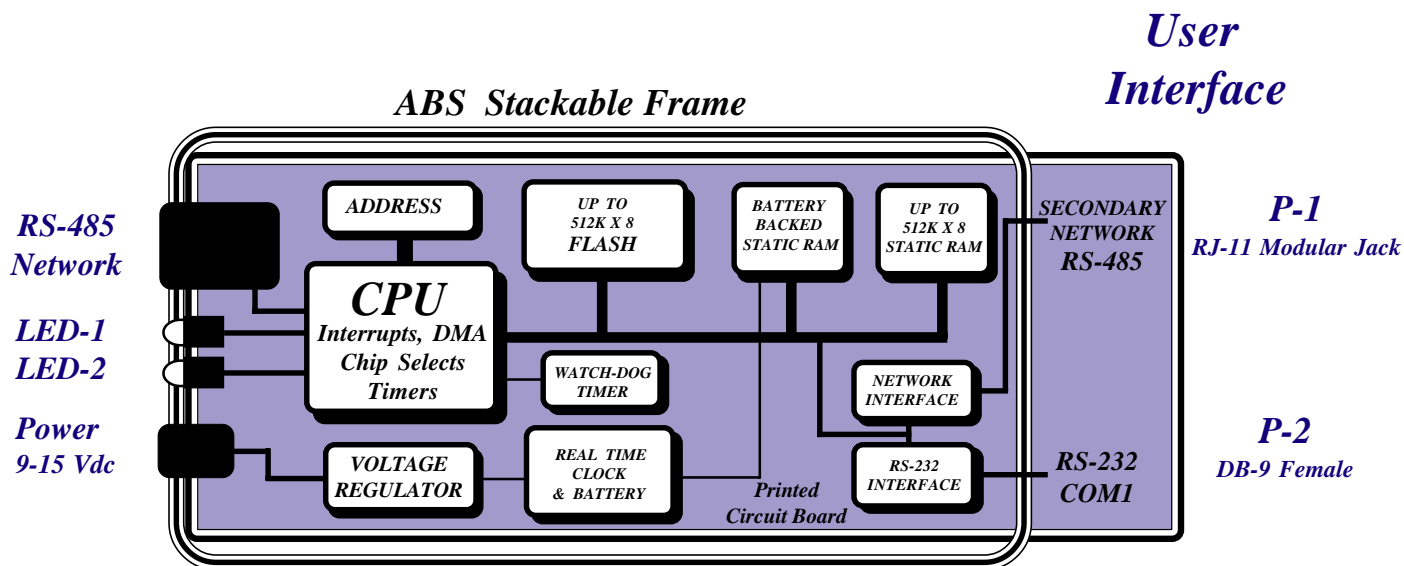
- * On-Board FLASH Programming
- * C & C++ Fully Supported
- * **RLC-RTOS** Provided Free
- * I/O Driver Library Provided Free
- * Demo Programs Provided Free
- * Embedded Debugger Available

TOLL FREE
1-888-RLC-TECH
<http://www.RLC.com>

R.L.C. Enterprises, Inc.

2985 Theatre Drive, Paso Robles, CA 93446 Phone (805) 239-9737 FAX (805) 239-9736

MICRO-PlusTM



188EB or 386EX

POWERFUL - EXPANDABLE - INEXPENSIVE - EASY

The MICRO-Plus Single Board Computers are Powerful because they use the new Intel 32-bit 386EX or 16-bit 80C188EB embedded microprocessor at speeds up to 33 MHz and are object code compatible to the PC/XT/AT.

The MICRO-Plus Single Board Computers are Expandable because they provide an auto-interconnect-stacking frame system used for adding additional *Network I/O Modules*. You may also use the additional RS-485/232 port to interface to other computers or I/O devices.

The MICRO-Plus Single Board Computers are Inexpensive because they do not need a card cage or rack full of other cards. Additional on-board expansion is provided by using our low cost, off the shelf *Network I/O Modules*.

The MICRO-Plus Single Board Computers are Easy because they are based on an industry standard Intel processor family and are fully supported by Microsoft & Borland C/C++. The *RLC-RTOS*, Embedded Real Time Operating System demos and drivers are provided free.

*Any Combination
Of I/O Modules*

User I/O Interface

*Any Number
Of I/O Stacks*

*Simple
Phone Style
Network Cable*



*Up To 5000 Feet
of Network*

Choose Either 386EX Or 188EB CPU

FUNCTIONAL DESCRIPTION

386EX or 80C188EB CPU

Our new **MICRO-Plus** Single Board Computers features a high performance, low power 16-bit or 32-bit embedded microprocessor which is object code compatible to the PC/XT/AT family. The 386EX and 80C188EB CPU chips also provides two independent UARTs, three counter/timers, programmable interrupt controller, programmable chip select unit, wait state generator, and much more. These on-chip functions have been integrated into the board design in a flexible manner. These CPU chips were specifically designed to be used in low power embedded applications.

FLASH Memory

Up to 512K bytes of FLASH EPROM are provided which include a resident BIOS. This BIOS allows new programs to be downloaded and programmed directly into the FLASH EPROMS without the use of external EPROM programmers or ultra-violet erasers. You may download through either network or RS-232 port using the provided program down loader. The area in the FLASH EPROM which holds the BIOS is protected against accidental programming. FLASH EPROMs are 100% dependable and are unaffected by glitches, program crashes, etc. FLASH EPROMs allow for fast program development and easy field updates.

Static RAM

Up to 512K bytes of low power battery backed Static RAM are provided. An on-board lithium battery is used to back up the RAM for up to 10 years. Flawless glitch prevention and battery switch-over is provided by a flawless Maxim supervisory circuit.

Network & Serial Ports

Two serial ports are provided by the on-board CPU. One port is configured as an RS-485 network port, the other port can be selected as an RS-232, or RS-485 network port. RS-485 may be used to implement an effective dependable high speed network using the provided software for interfacing automatically to other **Network I/O Modules**. Both serial ports are fully supported by interrupt driven software drivers.

Real Time Clock

A Real Time Clock provides standard time and date functions independent of the CPU. Software is provided. The Real Time Clock is battery backed by the on-board lithium battery.

Watch-Dog Reset LED's

The on-board MAX-1232 circuit provides a watch-dog timer used to monitor proper operation of the CPU. If the watch-dog is not periodically updated the system will be reset. The Reset circuit is flawless and ensures that the CPU is held in reset until the power is adequate and stable. Two LEDs are provided which can be turned on/off under program control at any time.

Power Supply

The **MICRO-Plus** accepts a wide range of unregulated DC power, making it ideal for battery operation. Simple wall transformer DC power supplies plug in directly.

Stacking Frame

The High impact ABS frame allows for stacking multiple **Network I/O Modules**. When I/O modules are stacked together power and RS-485 network are automatically connected via the internal pass-through connector.

Software Development

(Please see software data sheets for details)

Software development using C/C++ and/or assembly is fully supported. Using our Real Time Operating System (**RLC-RTOS**) you can develop your application program on any standard PC/XT/AT, and download it into the **SBC** (Single Board Computer) RAM where it is debugged using our full featured remote debugger. The RS-232 link between your PC/XT/AT and the SBC operates at speeds up to 115K baud for an almost instant response. After the application program

is debugged, it may be downloaded and programmed into the **SBC** on-board FLASH EPROMs ready for execution. **RLC-RTOS** Real Time Operating System, device drivers, start-up code, network drivers, and demo programs for all on-board functions are provided free of charge. The FLASH EPROM downloader utility is also provided free. The FLASH downloader utility fully supports Windows operation.

Specifications

Network: Two RJ-11 style phone cables with twisted pair. RS-485 signal levels.

Miscellaneous: Two user controllable LEDs, Watch-Dog-Timer, Real Time Clock, and Reset circuit.

Dimensions: 6.3in. x 3.4in. x .7in. including frame. User interface protrudes an additional .85in. past end of frame.

Minimum Power: Standard wall transformer dc power receptacle. 9-15Vdc @ 160 ma.

Environmental: -40C to +85C with unrestricted air flow and no condensation.

User Interface: RJ-11 style connectors provide connection to the Primary and Secondary Networks. One DB-9 Female connector provides direct RS-232 connection to a desk or lap-top computer's COM port.

Software Interface: Application programs are downloaded from a PC/XT/AT to either network port or the RS-232 port on the **MICRO-Plus** and burned automatically into the on-board FLASH memory. A full featured PC/XT/AT networking download utility is provided.

Memory: Module comes standard with 256K user programmable FLASH and 128K of Static RAM. The Flash and RAM are expandable to 512K each.

MICRO-Plus™ Configurations

Standard Boards: are fully assembled, tested, and shipped with 256K bytes of FLASH memory, 128K bytes of SRAM, Real Time Clock, ABS Frame, and Lithium Battery. Manuals, Software Drivers, Network Drivers, and Examples supplied free on first order.

Hardware Options: include 512K bytes Static RAM Memory expansion, 512K bytes FLASH EPROM expansion. All options are factory installed and tested.

Special Order: **R.L.C.** will, on special request, re-design the **Micro-Plus** to include the I/O functions and interfaces required by your application. Size and shape may also be changed to your specifications. Special orders may require minimum quantity purchases and NRE charges.