

## PPCMB/850, Product Description

Interested in the rapid development of electronic devices for control, data acquisition, test equipment, communications? Don't search any further for a powerful microprocessor that fits the job and is easily put to work.

With the PPCMB/850, you've got what you need, and even more! A comprehensive solution including the electronic hardware and the required software for rapid system and application development.

### PPCMB/850 Benefits

- 1° a fully functional micro-controller circuit board, powerful 32 bits **PowerPC architecture**, with flash and SRAM memory, and the required support electronics,
- 2° **input-output** signals and connections for **integrated peripherals** available on connectors easily mated with the application circuit board to be developed for your project,
- 3° **memory bus expansion** facilities, allowing application-specific digital circuits
- 4° a **small industrial-grade printed circuit board**, the PPCMB/850 fitting as a daughterboard for the application circuit board, cost-effective at the prototyping stage and initial production as well,
- 5° **software tools** for ease of application functionality development, including the GNU compiler collection and many utility programs,
- 6° the **ABCD Proto-Kernel™** control software, allowing software development focus on application features,
- 7° a reliable and low-cost **network** solution, based on two-wire RS-485 or four-wire RS-422,
- 8° ease of **flash memory programming**, including a unique "flash file system" alternative
- 9° and even more...

Our mission is to assist you in quickly bringing your product to the market, by reducing the intricacies and delays of PowerPC microprocessor deployment in embedded applications. Hardware, tools, and base software included! Why would you overlook your best chances of success?

Enjoy the renowned know-how from Motorola for peripherals integration, with the SIU and CPM modules (respectively System Integration Unit and Communications Processor Module), part of the processor lineage MC68302, MC68360, MPC860 (of which the MPC850 is a simplified variant), and the MPC8260. Nothing beats this.

## Secifications Overview

### PowerPC Processor Unit

- ✓ Motorola integrated processor MPC850DE, MPC850, MPC850SR, MPC850DSL, or MPC823e.
- ✓ Processor speed: 50 to 80 MHz.
- ✓ Features:
  - ✓ benchmarked at 87 MIPS (using Dhrystone 2.1) at 66 MHz,
  - ✓ 2 KB instruction cache and 1 KB data cache,
  - ✓ 32 bits PowerPC RISC architecture, supported by embedded development tools vendors,
  - ✓ Software watchdog.

### PPCMB/850 Memory

- ✓ 4MB flash memory.
- ✓ 1MB SRAM memory.
- ✓ A section of the flash memory is used for permanent storage of configuration data and recording of occasional log entries, typically 128KB.
- ✓ A section of the flash memory is used for the application software loader (in-system flash re-programming).

### Bus Expansion

- ✓ Features:
  - ✓ Bus is synchronous,
  - ✓ Dynamic bus sizing for 32, 16, or 8 bits memory devices,
  - ✓ Flexible memory controller,
  - ✓ Every bus and memory controller signals are available at the interface.
- ✓ Address range: 64MB, that is 26 external address lines.
- ✓ Chip select output signals from the memory controller: 6 are available at the interface.

## MPC850 Integrated Peripherals

- ✓ Parallel Input/Output: 57, including 8 input only.
- ✓ Interrupt sources: 20 external sources, plus 15 from integrated peripherals.
- ✓ Timers: 6 different types of timers, 21 timers overall.
- ✓ PWM capable outputs: 8
- ✓ Number of serial communications ports:

Processor	Overall	Multi-protocol ports
MPC850	3	1
MPC850DE, MPC850SR	4	2
MPC823e(*)	4	2
MPC850DSL	4	2, with fixed protocol selection

(\*): the MPC823e includes a video or LCD controller, but its compatibility with the PPCMB/850 SRAM memory has not been verified.

- ✓ USB Port (Universal Serial Bus).
- ✓ SPI Port (Serial Peripheral Interface).
- ✓ I2C Port (Inter-Integrated Circuit).
- ✓ TDM - type interface (Time Division Multiplexing).

## RS-422 or RS485 Communications Port Built-in the PPCMB/850

- ✓ Supports high speed networking (typically [up to] 2 to 5 Mbps).
- ✓ Supports 2-wire RS-485 multi-point and 4-wire RS-422 multi-point configurations.
- ✓ Easy to use from a personal computer with a low-cost RS-422 to RS-232 converter.
- ✓ The RS-422 electrical interface reduces the grounding problems frequently experienced with personal computer RS-232 interfaces.
- ✓ If not needed, this port can be assigned to an application-specific function.

## Power Supply and Physical Specifications

- ✓ [3.3 Volts](#) circuit operation, current consumption to be determined (less than 300 mA).
- ✓ Power management functions.
- ✓ Printed circuit dimensions: [2.75 x 3.875 inches](#).
- ✓ Vertical clearance: printed circuit thickness 0.062 inches and thin electronic components (less than 0.1 inches) on the two sides.
- ✓ A version with industrial-temperature components only is planned.

## Connectors

- ✓ Mating with the host application circuit board for the PPCMB/850: 2mm standard header or socket, two connectors, each 4 rows by 26 positions.
- ✓ For applications that use only the integrated peripherals (no bus expansion), it is enough to implement narrower connectors, 2 rows (instead of 4) by 26 positions.
- ✓ Development port connector (BDM, Background Debug Mode): .100 in. header, 2 x 5 contacts (on a 2 x 6 footprint planned for JTAG tools usage).
- ✓ RS-422/RS-485 serial port connector on the PPCMB/850: .100 in. header, 2 x 5 contacts, including configuration contacts.

## ABCD Proto-Kernel™

- ✓ “A” interrupt dispatching.
- ✓ “B” fixed priority scheduling.
- ✓ “C” mutual-exclusion semaphores.
- ✓ “D” a queuing mechanism.

## Development Environment Support

- ✓ Normal mode of software loading through a serial port (in-system loader in a flash memory section, without impeding normal system operation).
- ✓ Initial software loading through the BDM port (to recover from an inadvertent erasure of the in-system loader) from a PPCMB/850.
- ✓ The BDM port is also compatible with interactive debugging tools offered by embedded compilers and development tools vendors.
- ✓ The MPC850 includes debugging facilities, without slowing down the software.
- ✓ Two LEDs for software diagnostics.
- ✓ Inquire with CONNOTECH for up-to-date software offerings specifications.

Contact CONNOTECH to keep informed about latest developments, to discuss your projects, or simply to express your interest.

CONNOTECH Experts-conseils inc.  
9130 Place de Montgolfier  
Montréal, Qc  
Canada H2M 2A1

Tél.: +1-514-385-5691

Fax: +1-514-385-5900

E-mail: [info@connotech.com](mailto:info@connotech.com)

Web site: <http://www.connotech.com>

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