

An economical approach to product development -

M68HC12 Evaluation Board

The M68HC12A4EVB Evaluation Board (EVB) is an economical tool for designing and debugging code for, and evaluating the operation of, the MC68HC812A4 MCU. By providing the essential MCU timing and I/O circuitry, the EVB simplifies user evaluation of prototype hardware and software.

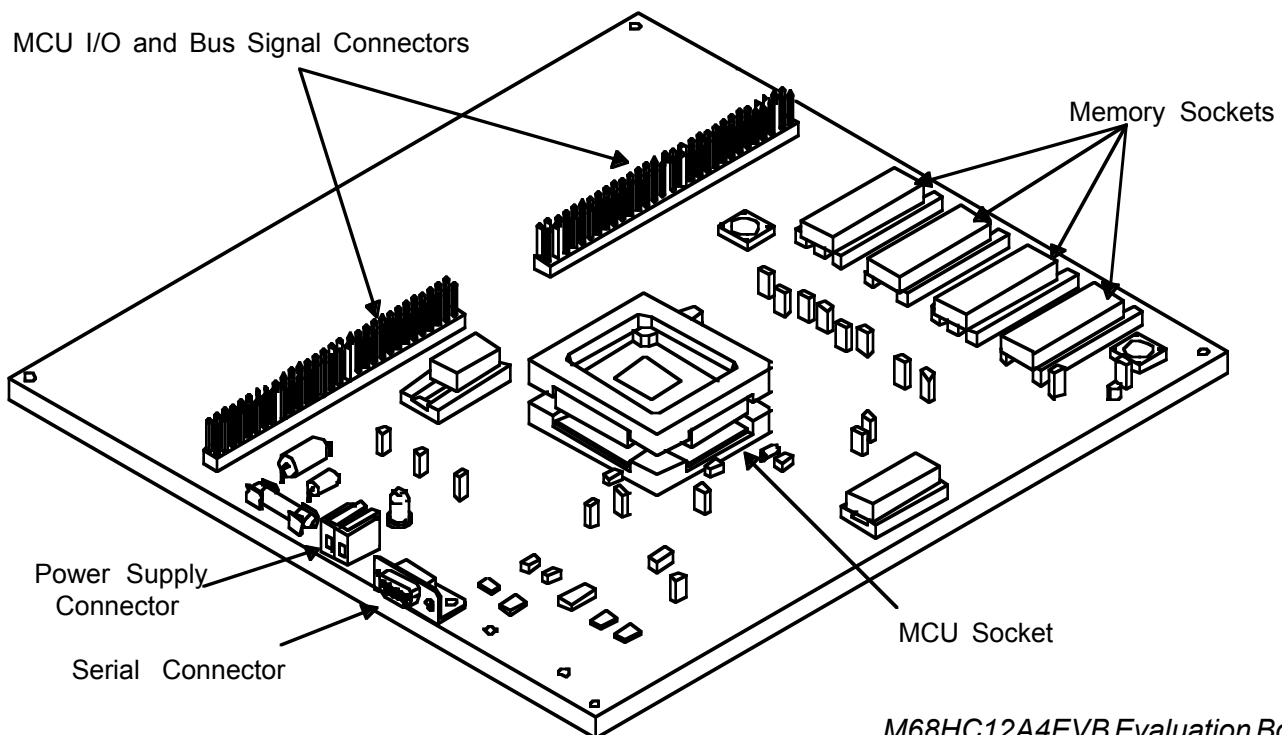
The EVB features a prototype area, which allows custom interfacing with the MCU's I/O and bus lines. These connections are broken out via on-board headers, which are immediately adjacent to the prototype area.

Optionally, the EVB can accommodate various types and configurations of external memory to suit a particular application's requirements. These custom configurations are effected by installing the appropriate memory chips in the EVB's memory sockets and by setting jumpers on the EVB to correctly establish the MC68HC812A4's memory-access operations.

The figure below shows the EVB's layout and locations of the major components, as viewed from the component side of the board.

Features

- **+3 to +5 Vdc operation**
- **RS-232C interfaces**
- **64K of on-board EPROM with resident D-Bug12 monitor/debugger program**
- **16K of on-board SRAM**
- **Jumper-selectable support for multiple memory device types and sizes**
- **Header connectors for access to the MCU's I/O and bus lines**
- **On board prototype area for customized interfacing with the MCU**
- **Low voltage inhibit protection**
- **Background mode operation**
- **Full support for either dumb-terminal or host-computer terminal interface**
- **MCUasm assembly language development toolkit**
- **File-transfer capability from a host computer, allowing off-board code generation**



M68HC12A4EVB Evaluation Board

EVB OVERVIEW

The EVB is composed of three components:

1. Hardware – the board consists of an 8-inch by 8-inch multi-layer printed circuit board that provides the platform for interface and power connections to the MC68HC812A4 MCU chip, which is installed in a production socket.
2. Firmware – D-Bug12, the EVB's firmware-resident monitor program, provides a self-contained operating environment that allows writing, evaluation, and debugging of user programs.

The hardware is factory-configured to execute D-Bug12 without further configuration by the user. It is ready for use with an RS-232C terminal for writing and debugging user code.

D-Bug12 allows programming of the MC68HC812A4's on-chip EEPROM through commands that directly alter memory.

Commands are typed on the terminal's D-Bug12 prompt line and executed when the carriage-return (ENTER) key is pressed. D-Bug12 then displays either the appropriate response to the command or an error indication.

3. Software – the MCUasm assembly language toolset provides an integrated development environment which includes a project manager (MCUproject), a relocatable macro-assembler (MASM), a linker (MLINK), a librarian (AR), a Motorola S-Record generator (HEX) and a variety of other tools.

There are two methods to generate EVB user code:

1. For small programs or subroutines, D-Bug12's single-line assembler/disassembler may be used to place object code directly into the EVB's memory.
2. For larger programs, the Motorola MCUasm assembler may be used on a host computer to generate S-Record object files, which can then be loaded into the EVB's memory using D-Bug12's LOAD command.

If the M68HC812A4's background debug mode (BDM) interface serves as the user interface, both of the SCI ports become available for user applications. This mode requires a background debug development tool, such as Motorola's SDI™ Interface, and a host computer with the appropriate interface software. Note: D-Bug12 does not use the BDM interface.

The EVB can begin operation in either of two jumper-selectable modes at reset:

1. In normal mode, D-Bug12 immediately issues its command prompt on the terminal display and waits for a user entry.
2. In the alternate mode, execution begins directly with the user code in on-chip EEPROM. This hardware function is also available for customized use in the prototype area.

SPECIFICATIONS SUMMARY

The tables below summarize EVB specifications and minimum host PC requirements.

EVB Specifications

Characteristic	Specification	Characteristic	Specification
MCU	MC68HC812A4	Communications ports	Two RS-232C DCE ports
MCU I/O ports	HCMOS compatible	Board dimensions	8 x 8 in.
EPROM: Wide mode Narrow mode	64, 128, 256, 512, or 1024 KB 32, 64, 128, 256, or 512 KB	SRAM: Wide mode Narrow mode	16, 64, 256, or 1024 KB 8, 32, 128, or 512 KB
EEPROM: Wide mode Narrow mode	64, 128, 256, or 512 KB 32, 64, 128, or 256 KB		

Minimum Requirements

Characteristic	Specification
Terminal	RS-232C compatible terminal
Host PC (optional)	386-based PC or higher with an RS-232C serial port. Requires a user-supplied communications program capable of emulating a dumb terminal.
Input/Output	Serial communication port
Cable	RS-232C compatible
External Power Supply	+3.5 to +5.0 Vdc @ 150 mA (max.), fuse-protected @ 1.5 A

ORDERING INFORMATION

EVB Part Number

Evaluated MCU	EVB Part Number	Software
MC68HC812A4	M68HC12A4EVB	MCUasm (included with the EVB)

WARRANTY INFORMATION

Motorola provides a one year limited warranty.

CUSTOMER SUPPORT

For information about a Motorola distributor or sales office near you call:

AUSTRALIA, Melbourne – (61-3)887-0711 Sydney – 61(2)906-3855	JAPAN, Fukuoka – 81-92-725-7583 Gotanda – 81-3-5487-8311 Nagoya – 81-52-232-3500 Osaka – 81-6-305-1802 Sendai – 81-22-268-4333 Takamatsu – 81-878-37-9972 Tokyo – 81-3-3440-3311
BRAZIL, Sao Paulo – 55(11)815-4200	KOREA, Pusan – 82(51)4635-035 Seoul – 82(2)554-5118
CANADA, B. C., Vancouver – (604)606-8502 ONTARIO, Toronto – (416)497-8181 ONTARIO, Ottawa – (613)226-3491 QUEBEC, Montreal – (514)333-3300	MALAYSIA, Penang – 60(4)2282514
CHINA, Beijing – 86-10-68437222	MEXICO, Mexico City – 52(5)282-0230 Guadalajara – 52(36)21-8977
DENMARK – (45)43488393	PUERTO RICO, San Juan – (809)282-2300
FINLAND, Helsinki – 358-9-6824-400	SINGAPORE – (65)4818188
FRANCE, Paris – 33134 635900	SPAIN, Madrid – 34(1)457-8204
GERMANY, Langenhagen/Hannover – 49(511)786880 Munich – 49 89 92103-0 Nuremberg – 49 911 96-3190 Sindelfingen – 49 7031 79 710 Wiesbaden – 49 611 973050	SWEDEN, Solna – 46(8)734-8800
HONG KONG, Kwai Fong – 852-6106888 Tai Po – 852-6668333	SWITZERLAND, Geneva – 41(22)799 11 11 Zurich – 41(1)730-4074
INDIA, Bangalore – (91-80)5598615	TAIWAN, Taipei – 886(2)717-7089
ISRAEL, Herzlia – 972-9-590222	THAILAND, Bangkok – 66(2)254-4910
ITALY, Milan – 39(2)82201	UNITED KINGDOM, Aylesbury – 441(296)395-252 UNITED STATES, Phoenix, AZ – 1-800-441-2447

For a list of the Motorola sales offices and distributors: http://www.mcu.motsp.com/sale_off.html

Motorola and the Motorola logo are registered trademarks of Motorola, Inc. Motorola reserves the right to make changes without further notice to any products herein to improve reliability, function or design. Motorola does not assume any liability arising out of the application or use of any product or circuit described herein; neither does it convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part.

SDI is a trademark of Motorola, Inc. All other trademarks are the property of their respective holders.
