Motorola Semiconductor Engineering Bulletin

EB188

Enabling the Security Feature on M68HC811E2 Devices with PCbug11 on the M68HC711E9PGMR

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Introduction

The PCbug11 software, needed along with the M68HC711E9PGMR to program MC68HC811E2 devices, is available from the download section of the Microcontroller Worldwide Web site www.mcu.motsps.com.

Retrieve the file pcbug342.exe (a self-extracting archive) from the MCU11 directory.

Some Motorola evaluation board products also are shipped with PCbug11.

NOTE: *For specific information about any of the PCbug11 commands, see the appropriate sections in the PCbug11 User's Manual (part number M68PCBUG11/D2), which is available from the Motorola Literature Distribution Center, as well as the Worldwide Web at www.mcu.motsps.com. The file is also on the software download system and is called pcbug11.pdf.*

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To Execute the Program

Once you have obtained PCbug11, use this step-by-step procedure.

Step 1
- Before applying power to the programming board, connect the M68HC711E9PGMR serial port P2 to one of your PC COM ports with a standard 25 pin RS-232 cable. Do not use a null modem cable or adapter which swaps the transmit and receive signals between the connectors at each end of the cable.

- Place your MC68HC811E2 part in the PLCC socket on your board.

- Insert the part upside down with the notched corner pointing toward the red power LED.

- Make sure both S1 and S2 switches are turned off.

- Apply +5 volts to +5 volts and ground to GND on the programmer board's power connector, P1. Applying voltage to the V_{PP} pin is not necessary.

Step 2
Apply power to the programmer board by moving the +5-volt switch to the ON position.

From a DOS command line prompt, start PCbug11 this way:

- C:\PCBUG11\> PCBUG11 –A PORT = 1
  when the E9PGMR connected to COM1 or

- C:\PCBUG11\> PCBUG11 –A PORT = 2
  when the E9PGMR connected to COM2

PCbug11only supports COM ports 1 and 2.

Step 3
PCbug11 defaults to base ten for its input parameters.

Change this to hexadecimal by typing

CONTROL BASE HEX

Step 4
Clear the block protect register (BPROT) to allow programming of the MC68HC811E2 EEPROM.

At the PCbug11 command prompt, type

MS 1035 00

Step 5
PCbug11 defaults to a 512-byte EEPROM array located at $B600. This must be changed since the EEPROM is, by default, located at $F800 on the MC68HC811E2.

At the PCbug11 command prompt, type

EEPROM 0

Then type: EEPROM F800 FFFF

EEPROM 103F 103F

This assumes you have not relocated the EEPROM by previously reprogramming the upper 4 bits of the CONFIG register. But if you have done this and your S records reside in an address range other than $F800 to $FFFF, you will need to first relocate the EEPROM.

Step 6
Erase the CONFIG to allow programming of NOSEC bit (bit 3). It is also recommended to program the EEPROM at this point before programming the CONFIG register. Refer to the engineering bulletin *Programming MC68HC811E2 Devices with PCbug11 and the M68HC711E9PGMR*, Motorola document number EB184.

At the PCbug11command prompt, type

EEPROM ERASE BULK 103F

Step 7   You are now ready to enable the security feature on the MCHC811E2.

At the PCbug11 command prompt, type

MS 103F 05

The value $05 assumes the EEPROM is to be mapped from $0800 to $0FFF.

Step 8   After the programming operation is complete, verifying the CONFIG on the MCHC811E2 is not possible because in bootstrap mode the default value is always forced.

Step 9   The part is now in secure mode and whatever code you loaded into EEPROM will be erased if you tried to bring the microcontroller up in either expanded mode or bootstrap mode. The microcontroller will work properly in the secure mode only in single chip mode.

NOTE: *If the part is placed in bootstrap mode or expanded mode, the code in EEPROM and RAM will be erased the microcontroller can be reused.*

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