Introduction

The bootloader software programmed into the Philips P89V51RD2 and P89LV51RD2 microcontrollers can be updated either by using a commercial parallel programmer or in-system by executing a bootloader update utility.

(Note: The first production code revision of the device was V04. Previous revisions were used during internal development and during beta site testing).

Using a commercial parallel programmer

The operating instructions for commercial eprom programmers vary considerably. Thus, in order to erase and reprogram the bootloader code, the user should consult the instructions/manual provided by the commercial eprom programmer manufacturer.

The hex file "P89V51RD2_BL_V05.HEX" contains the new Version 05 code.

Updating using ISP to load a bootloader update utility

The bootloader update utility is an application program that, when running as a user application program, will erase and reprogram the bootloader memory with the bootloader Version 05 code. The bootloader update utility is first programmed into the user code memory of the microcontroller using an ISP tool such as FlashMagic. Next, the bootloader update utility is run as an user application. The update requires only a few seconds. After completion, the device will contain the Version 05 bootloader and the utility residing in the user code memory can be erased using ISP tools such as FlashMagic.

The following instructions assumes the use of the FlashMagic ISP tool, although similar tools may be used.

Connect your target to FlashMagic

1) Without power applied, connect your target board to the serial port of your PC.
2) Start the FlashMagic utility.
3) FlashMagic remembers the type of device used during its last session.
   3.1) If the last device selected during the previous FlashMagic session was a different type of device, you will receive an error message indicating that FlashMagic is unable to read the security bits of the device. Click on the "cancel" button. Click on the "device" menu and select the "89LV51RD2" or the "89V51RD2". Apply power to your target. You can verify that your target is connected to FlashMagic and communicating by clicking on the ISP button and selecting "read device signature". If you receive a message asking you to reset your target, either perform a manual reset of your target or power cycle your target. Once the signature byte information is displayed, close the signature byte box.
   3.2) If the last device selected during the previous FlashMagic session was either the 89LV51RD2 or 89V51RD2 device, you will see a "reset device" message box. Apply power to your target. The "reset device" message should automatically be removed once FlashMagic begins communication with your target device.
4) Load the update utility hex file into FlashMagic. The file name is "P89LV51RD2_V05_UPD_ISP.hex"
5) Check the "erase all flash button" in section 2 of FlashMagic.
6) Click the "start" button in section 5 of FlashMagic.
7) FlashMagic will begin erasing the device and programming the update utility. Wait until FlashMagic completes the programming.
8) Close FlashMagic.
Connect your target to a terminal program

1) Launch a terminal program on your PC.
2) Set the baud rate to 9600 baud.
3) Select the com port connected to your target.
4) Power cycle or reset your target.
5) Type an uppercase 'U' character (do not type the quote marks).
6) The target should echo the uppercase "U" and provide information on the screen advising you that the bootloader code is being erased and programmed and has completed.
7) Exit the terminal program completely.

Reconnect your target to FlashMagic

1) Launch FlashMagic.
2) Reset the target device.
3) Erase the utility update program by erasing all the user code memory.

The update is now completed.

Revision history

Revision 04 was the previous version. Version 5 adds the following features:
1) The sector erase command was fixed.
2) After programming the Double Clock bit the ISP code adjusted the baud rate to compensate for the immediate change in clock frequency. Attempts to program the Double Clock bit if it is already programmed will be ignored and no baud rate change will occur.
3) The power-up sequence for evaluating the SoftIce bit has been changed. The SoftIce bit is now evaluated after the approximately 400ms (at 12 MHZ) delay for autobaud. This allows a device which has its SoftIce bit set to still enter ISP mode if ISP autobaud occurs prior to the timeout. The "reset serial number" command in ISP will clear the SoftIce flag.
4) A "reset" command has been added to the ISP commands to allow the user to reset the device and run the end user’s code.