THIS SPEC IS OBSOLETE

Spec No: 002-05152

Spec Title: AN205152 - F2MC-8L Family MB89201 Series 8-Bit Microcontroller Flash Programming

Replaced by: None

AN205152

F²MC-8L Family MB89201 Series 8-Bit Microcontroller Flash Programming

Associated Part Family: MB89201 Series

This application note describes the possibilities and needed tools for programming the internal flash memory of the MB89F201 series flash device MB89F202.

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1 Introduction

This application note describes the possibilities and needed tools for programming the internal flash memory of the MB89F201 series flash device MB89F202.

The first chapter shows the tools needed for the different programming possibilities.

The second chapter treats the serial asynchronous programming. It also describes the asynchronous on-board programming.

The serial synchronous programming is described in the third chapter. This chapter also shows the possibilities for onboard in-circuit programming.

In chapter four a short description for parallel programming is given.

2 Tools Overview

This chapter gives a short abstract on the needed tools for the flash programming.

2.1 Flash MCU Programmer MB91919-001

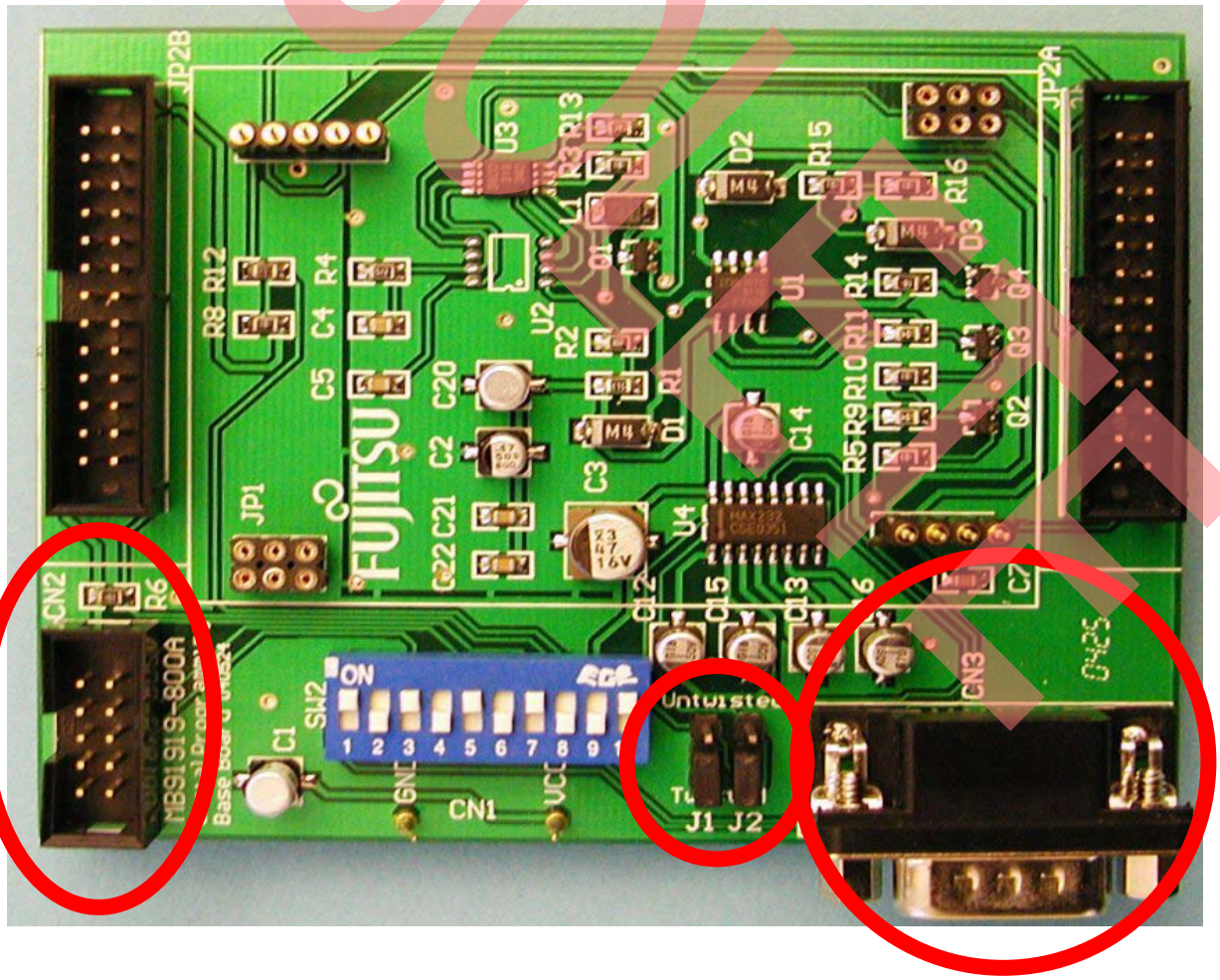
The MB91919-001 Flash MCU Programmer is a programmer tool for the 16LX and 8L family. It supports synchronous serial and parallel programming.

The MCU programmer has 512 kByte RAM onboard. For programming several devices with the same code, the code can be downloaded to the programmer once. Further programming is done directly from the onboard memory.

Connection of the programmer to a free COM port on your PC is done via twisted serial cable. Power supply for this programmer has to be +15V DC, 800mA.

2.2 Serial Programming Base Board MB91919-800A

The MB91919-800A Serial Programming Base Board is needed for the external serial programming of several 8L devices. It supports serial synchronous and asynchronous programming. A dedicated serial programming adaptor for each series is needed additionally.



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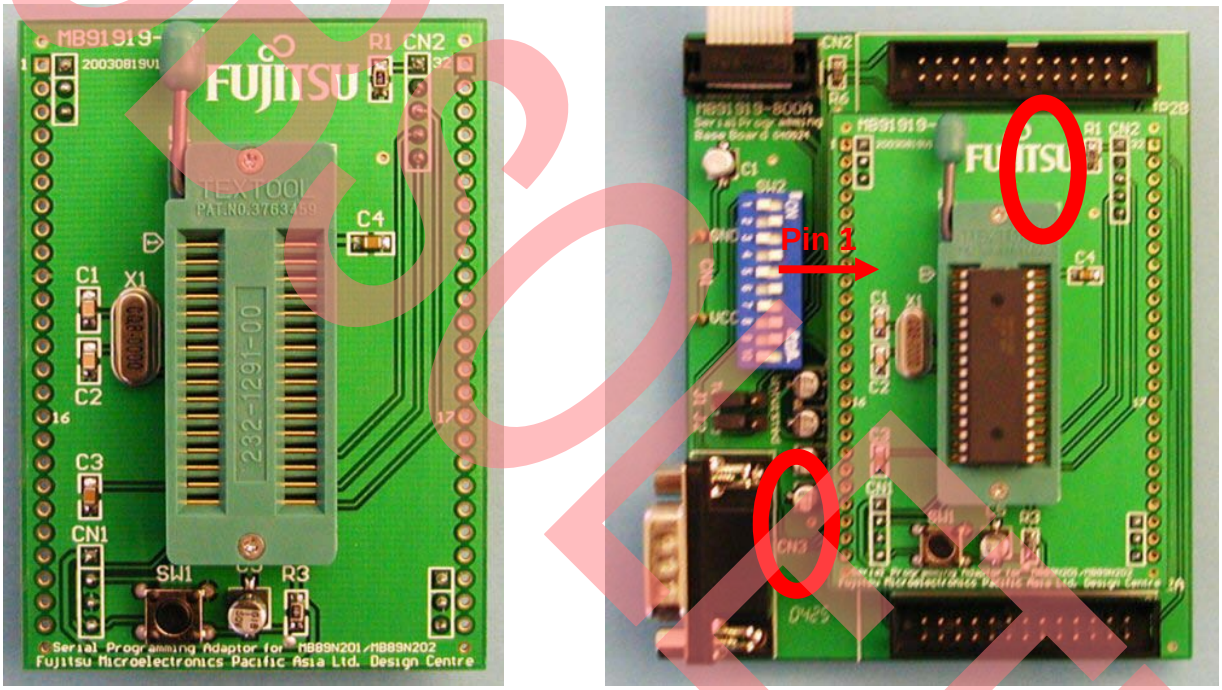
For serial asynchronous programming connect the D-Sub9 connector (CN3) to a free COM port on your PC. Direct and twisted serial cable can be used. Therefore set jumpers J1 and J2 to the right position.

For serial synchronous programming connect the IDC10 connector (CN2) to the serial connector on the MB91919-001 Flash MCU Programmer via flat cable.

Power supply for the adaptor board has to be +3.3V or +5V DC, depending on the device to be programmed. Apply the supply voltage to the VCC and GND pins (CN1).

2.3 Serial Programming Adaptor MB91919-815

The MB91919-815 Serial Programming Adaptor is an adaptor board to be mounted on the Serial Programming Base Board MB91919-800A. It can be used for the MB89201 series members MB89N201/MB89N202/MB89F201/MB89F202 with DIP-32P-M06 package.



Mount the adaptor board on the programming base board as shown in the above picture. Take care that pin connectors CN1 and CN2 are connected to the dedicated socket on the programming base board.

To flash the microcontroller place it in the programming socket like shown above. Pin 1 is the marked position. Close the socket lever after positioning the microcontroller.

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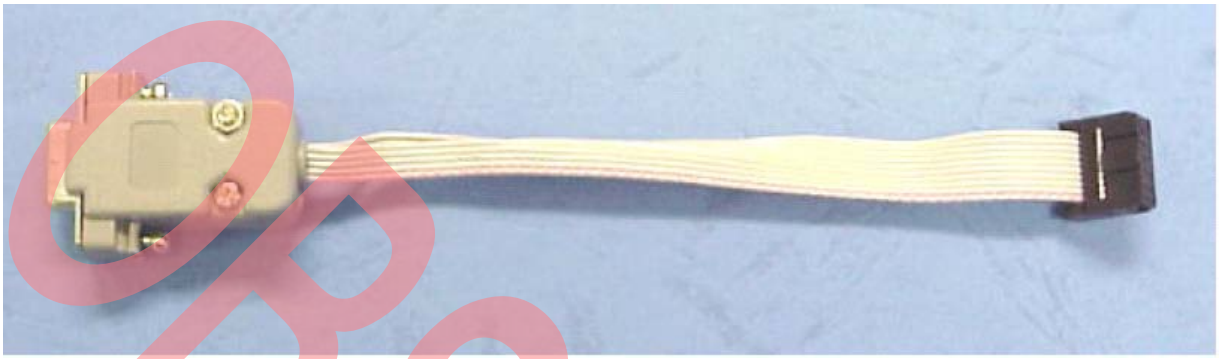
2.4 Asynchronous Serial Adapter MB91919-002

The MB91919-002 Asynchronous Serial Adapter is used for the onboard in-circuit flash programming. It is connected to the PC COM port via SubD9 plug and to the IDC10 connector on user hardware. No additional RS232 converter is needed because it is already included in the adapter.



2.5 Parallel Programming Adaptor MB91919-607

The MB91919-607 Parallel Programming Adaptor is an adaptor board to be mounted on the parallel programming socket on Flash MCU Programmer MB91919-001. It can be used for the MB89201 series members MB89N201/MB89N202/MB89F201/MB89F202 with DIP-32P-M06 package.

2.6 Cypress MCU Programmer Software

To work with the programming equipment the Cypress MCU Programmer Software is needed on your PC. Install this software first by running setup.exe on the installation CD and follow the steps in the installation process.

Used for setting up this document was the PC software version 5.0.02 and the programmer firmware version 5.0.00.

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For a detailed description of the Cypress MCU Programmer PC Software refer to the “MB91919 CYPRESS MCU Programming Kit” manual.

If the PC software has problems to recognize the MB91919-001 Flash MCU Programmer, verify that the programmer firmware version fits to your PC software version.

Warning:

To avoid damage of the programming equipment and the microcontroller take care that you apply the right supply voltages to each device!

All connections to PC and between the single boards as well as placing the microcontroller to the programming socket have to be done before these supply voltages are applied!

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3 Serial Asynchronous Programming

This chapter describes the serial asynchronous programming of the internal flash.

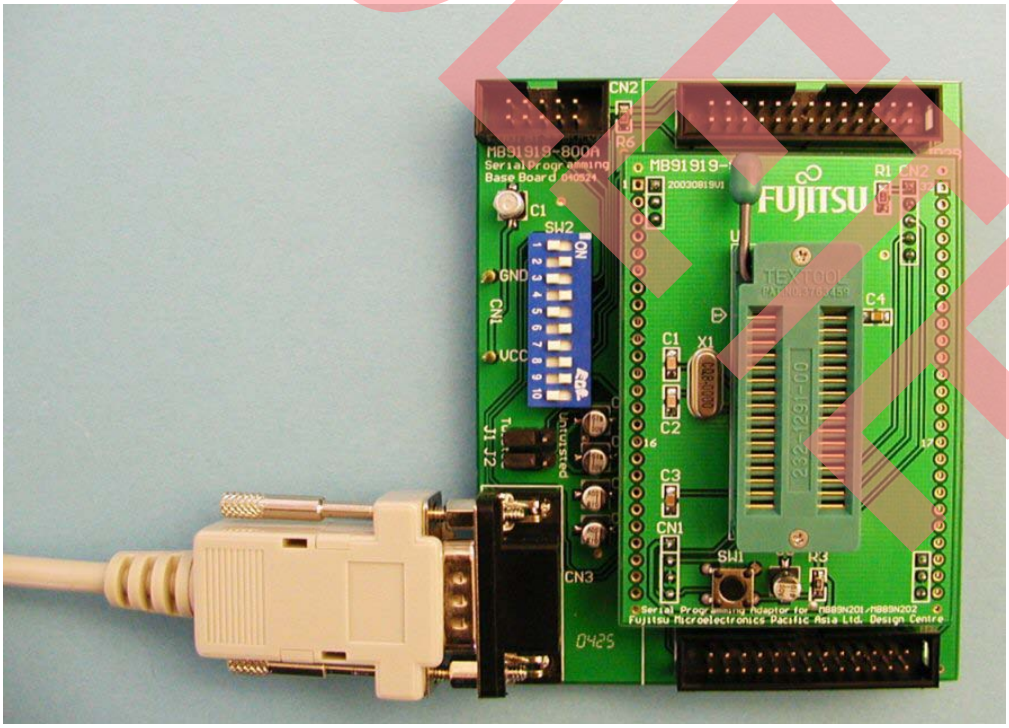
3.1 External programming

For the external serial asynchronous programming the following tools are needed:

- MB91919-800A Serial Programming Base Board
- MB91919-815 Serial Programming Adaptor

Connect the programming adaptor and the programming base board like shown in the previous chapter.

Connect the programming base board via serial cable to the PC and place the microcontroller in the programming socket.



Check the setting of the Mode Selection Switches (SW2) on programming base board. For programmer version 5.0 or later the following setting should be used:

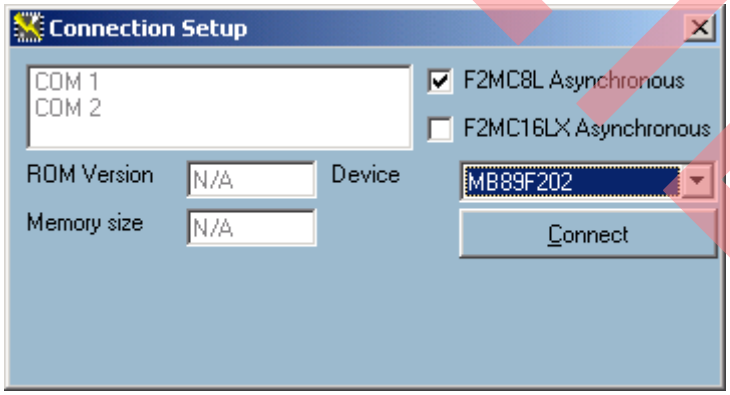
ASYN Mode > 5.0	
ON	**OFF**
2, 4, 6, 8, 9	1, 3, 5, 7, 10

If your programmer version is 4.1 or earlier the following setting should be used:

ASYN Mode < 4.1	
ON	**OFF**
2, 4, 6, 8, 10	1, 3, 5, 7, 9

Connect the supply voltage ground to the GND pin and apply 5V DC to the VCC pin. Now start the software “MCU Programmer”

The following window will occur:



Check “F2MC8L Asynchronous” and select “MB89F202” from the drop-down list, then press the “Connect” button.

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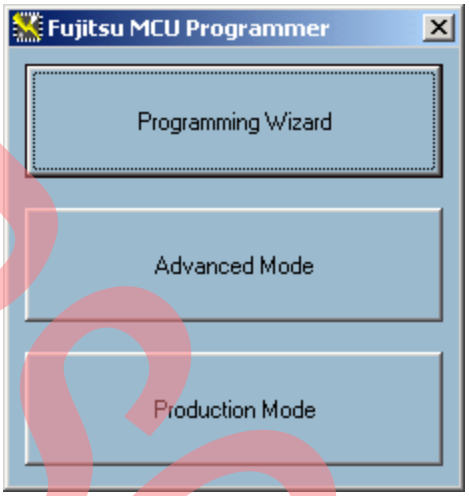
If the connection succeeds, the PC would display “ASYN adapter found” for the corresponding COM port. If connection fails, “Programmer not found” would be shown for all COM ports.

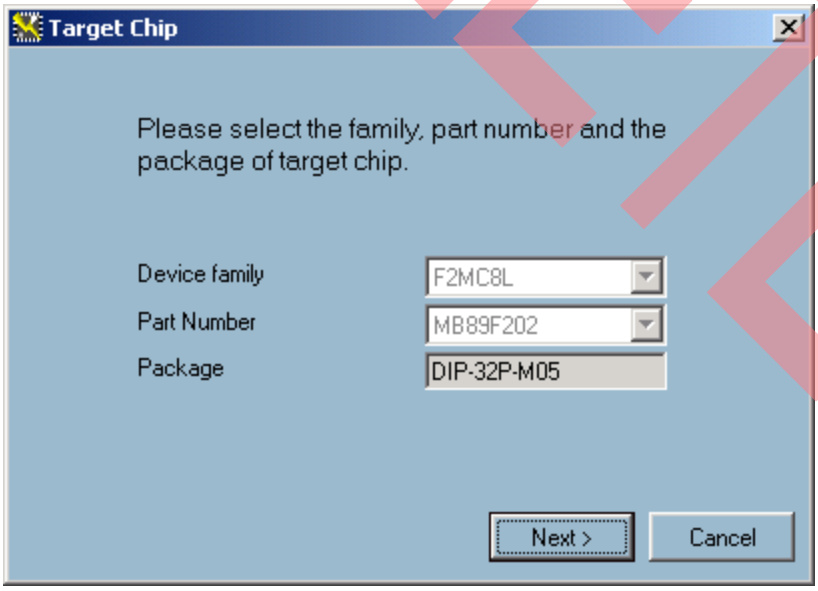
The next window gives you the possibility to select different operating modes:



The “Programming Wizard” provides step-by-step guidelines to fill in the information necessary before any programming operations. “Advanced Mode” is useful for users that want to operate according to their own desires. For users who use MCU programmer for production purpose, “Production Mode” is preferred. This mode provides a simple graphical user interface and error checking features for mass production.

The following explanations will be done only for the “Programming Wizard” mode.

The next window shows the chosen microcontroller and its package. Click “Next >”.



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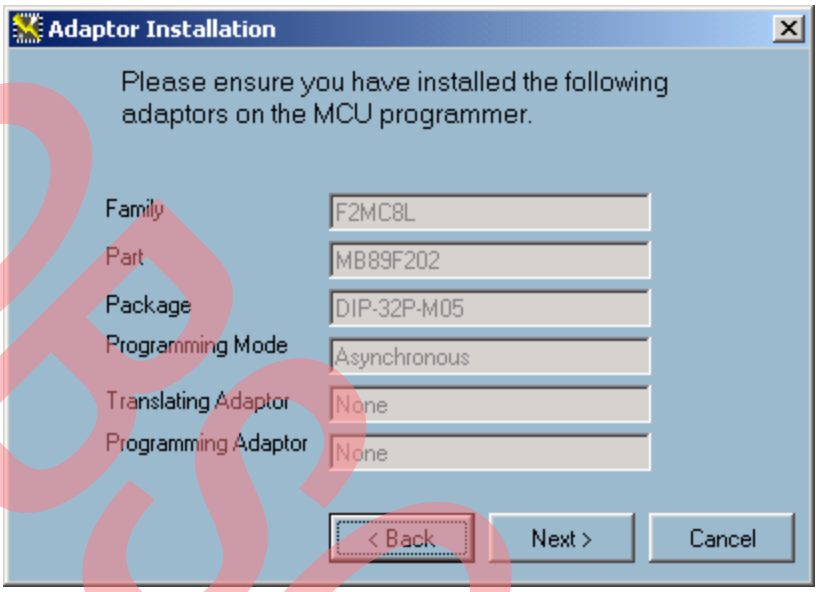
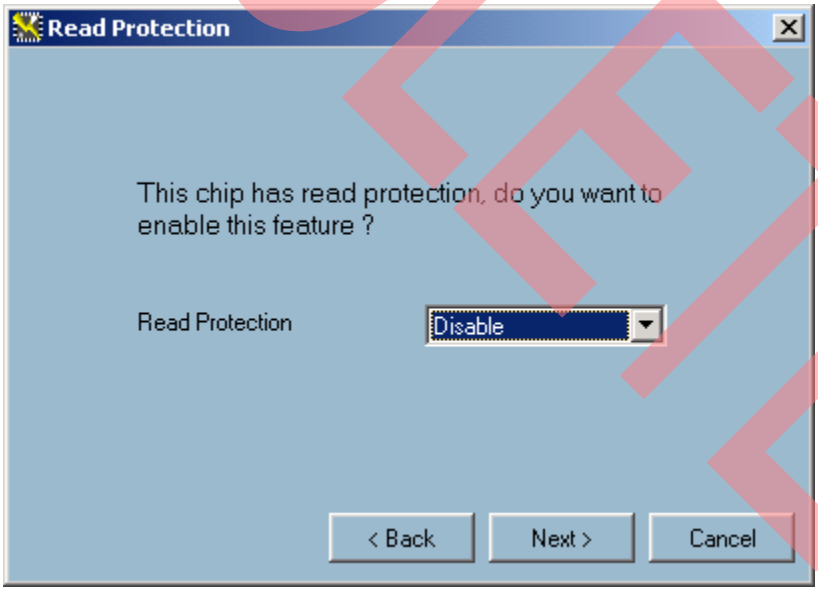
This window shows a selection of tools needed for this programming mode. Click “Next >”.



In this window you can select if you want to use the flash read protection. Chose “enable” or “disable” from the drop-down menu. Then click again “Next >”.



Choose the file type of your input file (Motorola S, Binary or Intel HEX) and press “Load File” to browse to this file. The result of file loading is displayed in the message box. Go to the next window.

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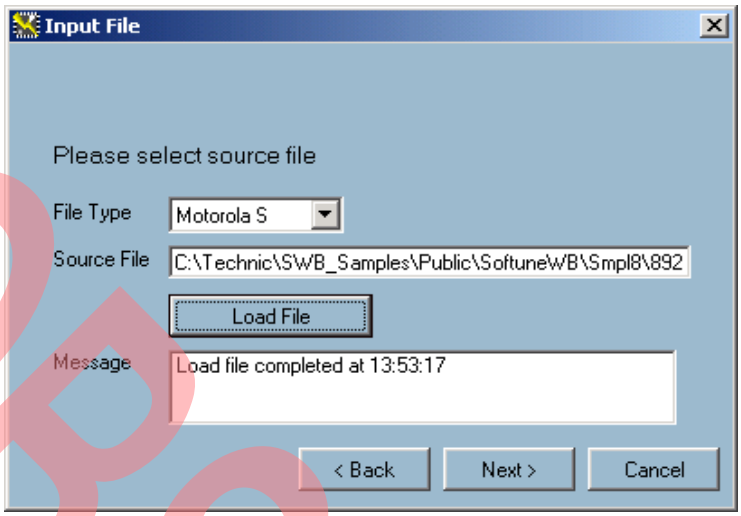
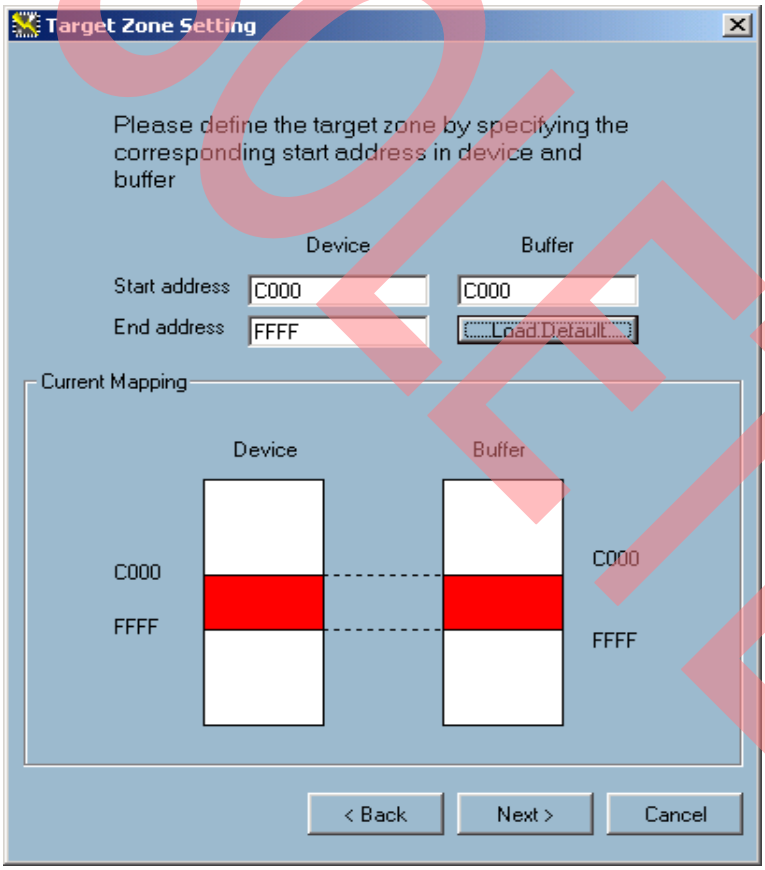


Here you have the possibility to select start and end address for the microcontroller flash memory. Normally default value should fit. Click also “Next >”.



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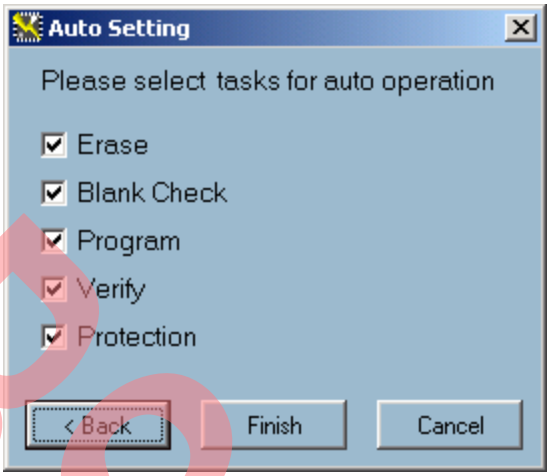
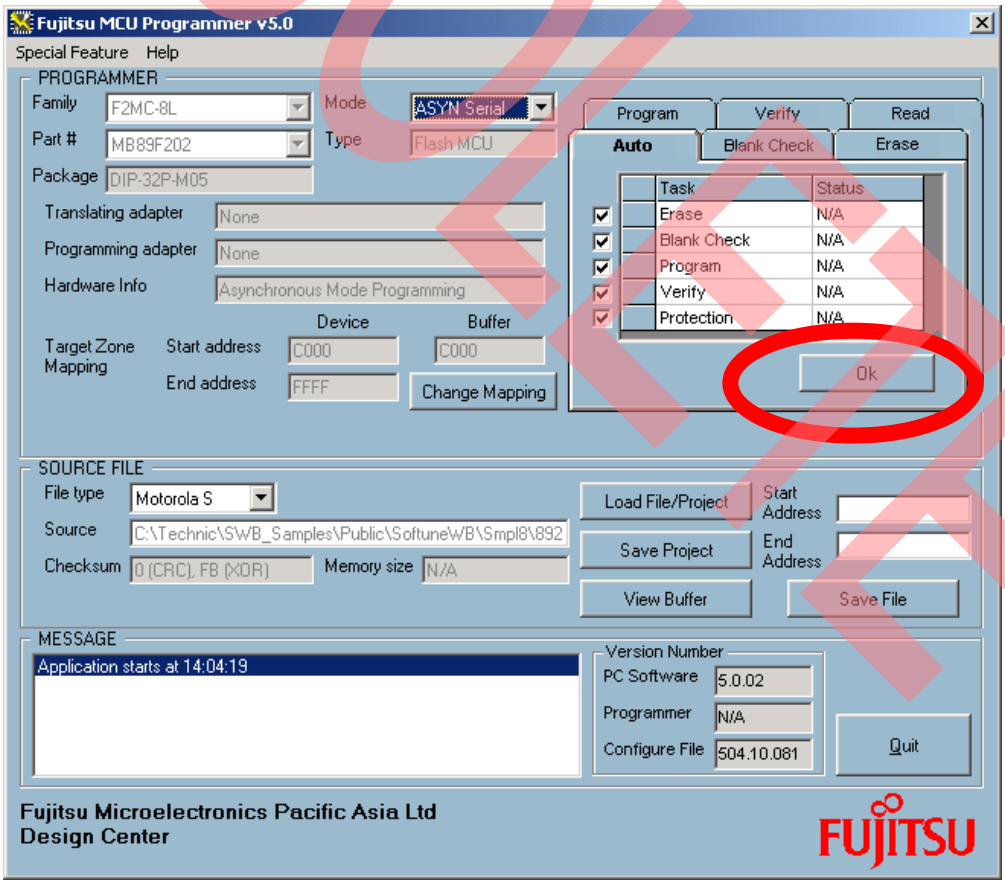
In this window you can choose the single tasks for the automatic programming sequence. After choosing the needed items click “Finish” to go to the next window.



Click the “OK” button to start the automatic programming sequence. Programmer will perform the before chosen steps. If programming succeeds, software will show “Pass”.



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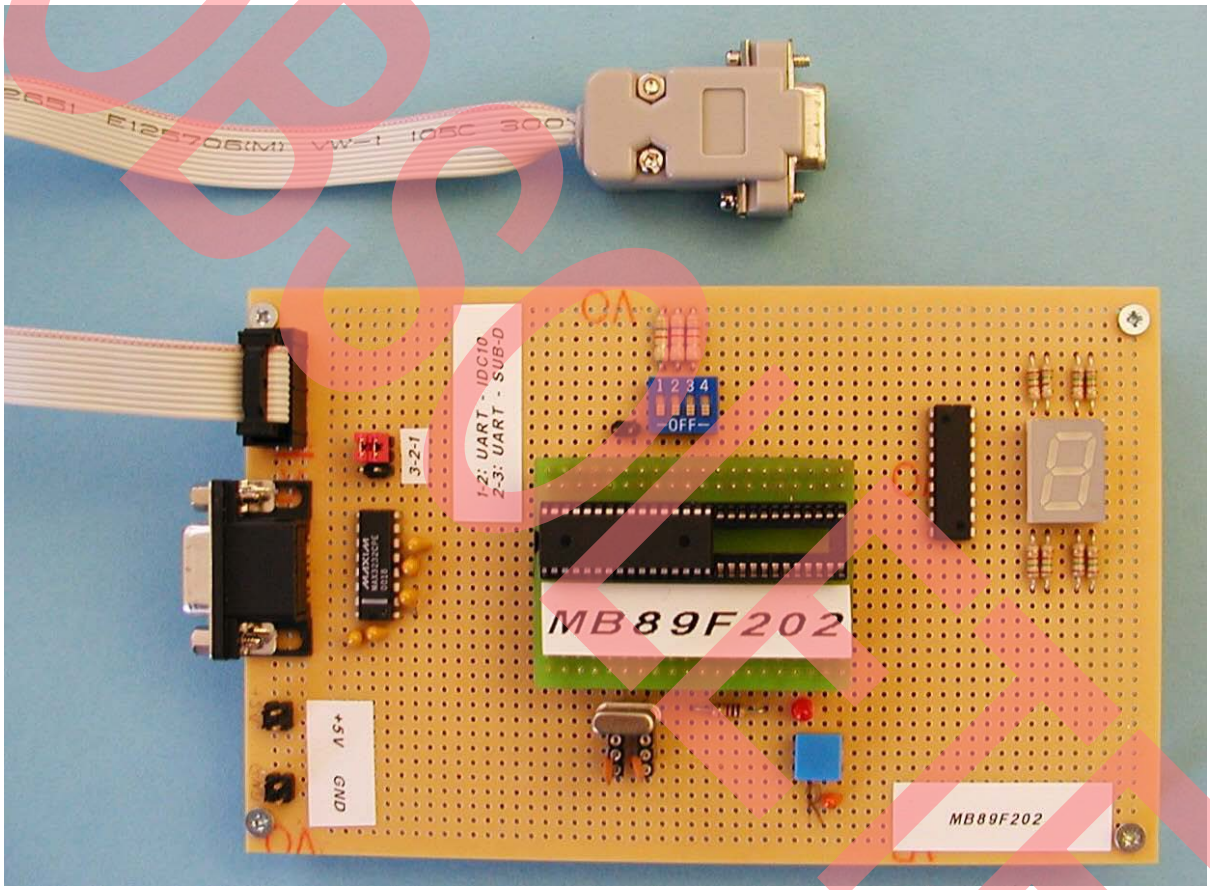
Quit the MCU Programmer software, power off the programming base board and take the microcontroller from the programming socket.

3.2 Onboard Programming

For the onboard in-circuit serial asynchronous programming the following tools are needed:

- MB91919-002 Asynchronous Serial Adapter

Connect your user hardware via the serial asynchronous adapter to your PC. Refer to the below given example of connection. **External oscillator has to be 8 MHz!**



Turn on your user application supply voltage and apply 9V DC (Vpp) to Pin 5 (P60). Apply a low level signal to RST pin to perform a reset and enter programming mode. Please hold to this power on sequence to prevent latch-up. Now start the software “MCU Programmer” and follow the steps described in chapter external serial asynchronous programming from now on.

It is also possible to program in-circuit using a serial 1:1 cable. Therefore the user hardware itself has to be equipped with a RS232 transceiver on UI/SI and UO/SO pins.

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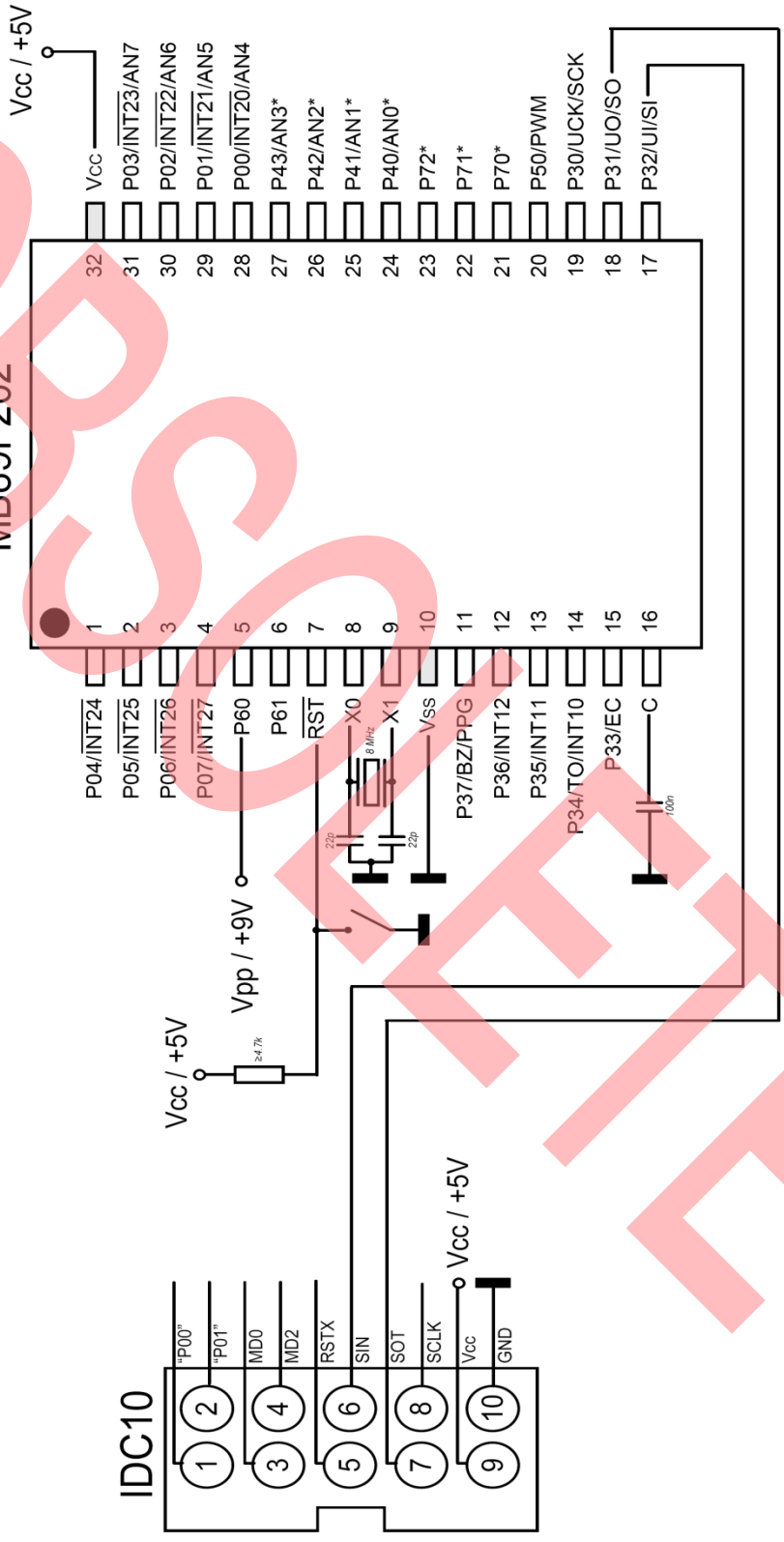
Example for onboard programming circuit (serial asynchronous):



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4 Serial Synchronous Programming

This chapter describes the serial synchronous programming of the internal flash.

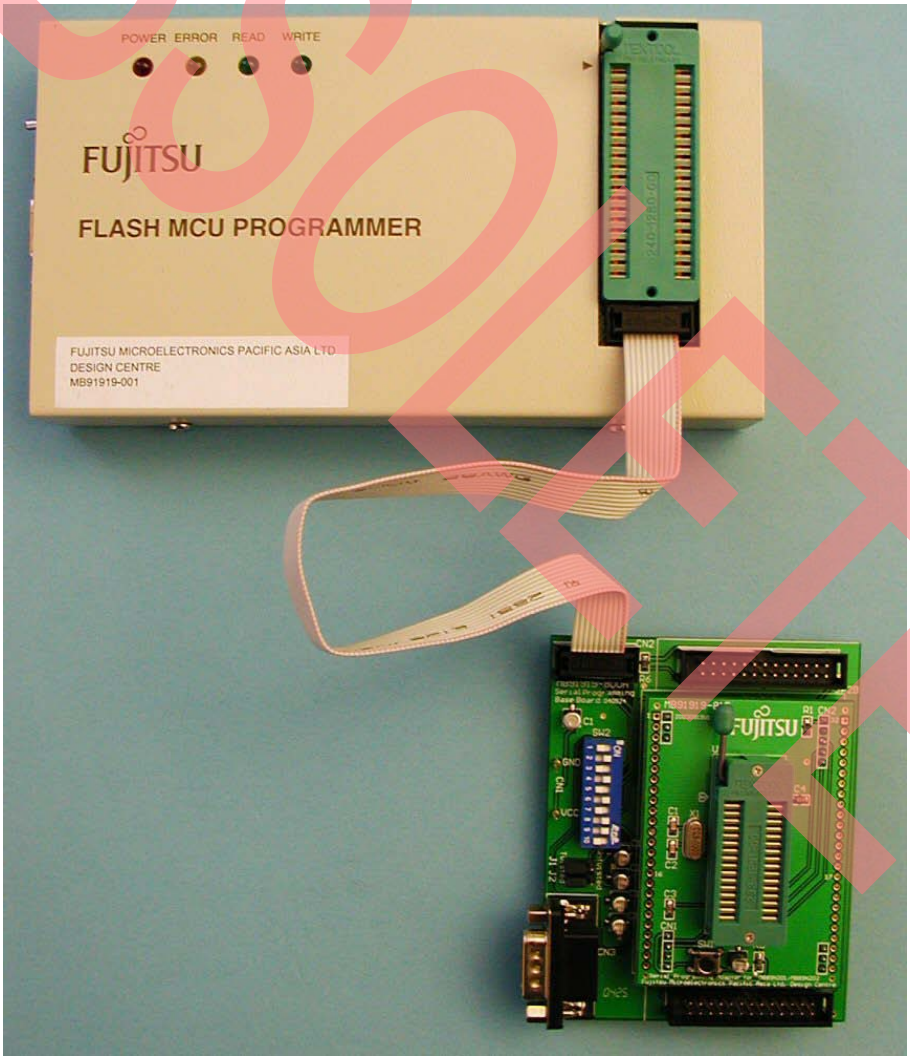
4.1 External Programming

For the external serial synchronous programming the following tools are needed:

- MB91919-001 Flash MCU Programmer
- MB91919-800A Serial Programming Base Board
- MB91919-815 Serial Programming Adaptor

Connect the programming adaptor and the programming base board like shown in the first chapter.

Connect the programming base board via flat cable to the MCU programmer. Flash MCU programmer is connected via serial cable to the PC. Place the microcontroller in the programming socket.



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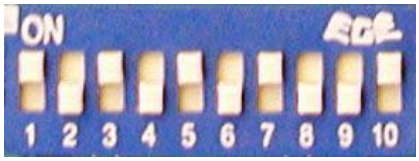
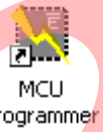
Check the setting of the Mode Selection Switches (SW2) on programming base board. The following setting should be used:



SYN Mode	
ON	**OFF**
1, 3, 5, 7, 10	2, 4, 6, 8, 9

Connect the supply voltage ground to the GND pin and apply 5V DC to the VCC pin. Apply 15V DC to the Flash MCU Programmer and set power switch to ON. Now start the software “MCU Programmer”



The following window will occur if the programmer is found by the software:

After initializing the next window gives you the possibility to select different operating modes:

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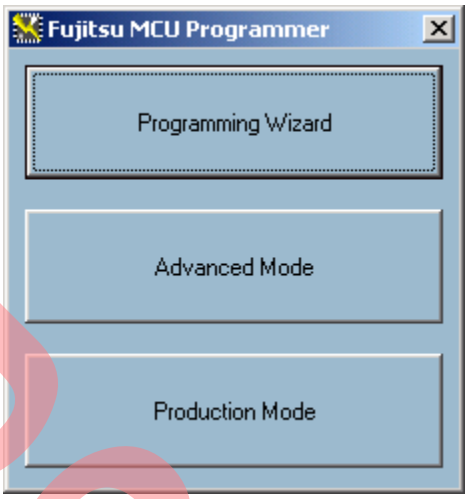
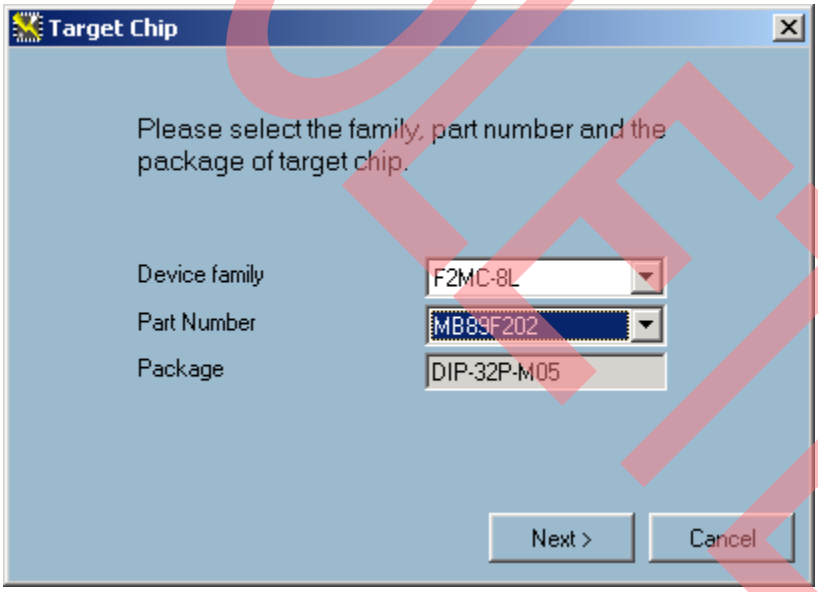


The following explanations will be done only for the “Programming Wizard” mode.

In the next window choose “F2MC-8L” as device family and “MB89F202” as part number. The package will be set automatically. Click “Next >”.



Choose “Synchronous Serial” as programming mode in the next window.

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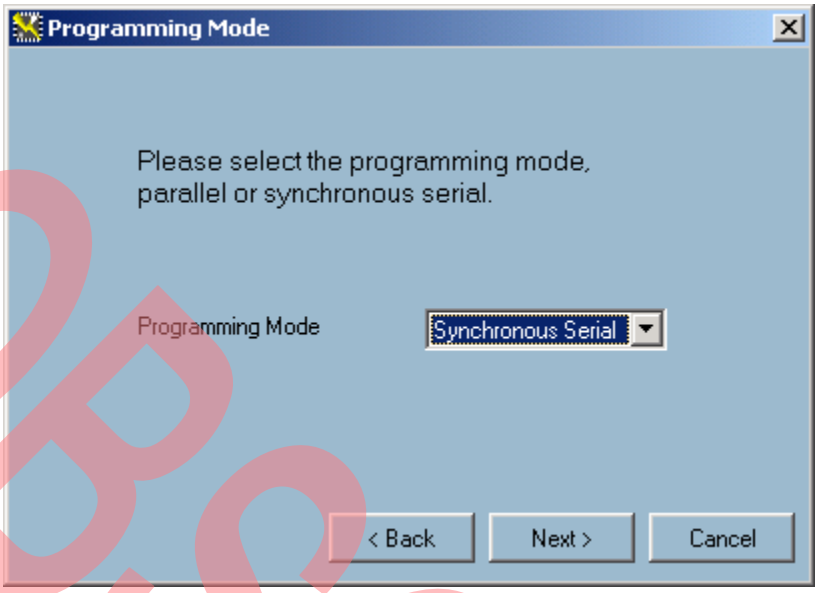
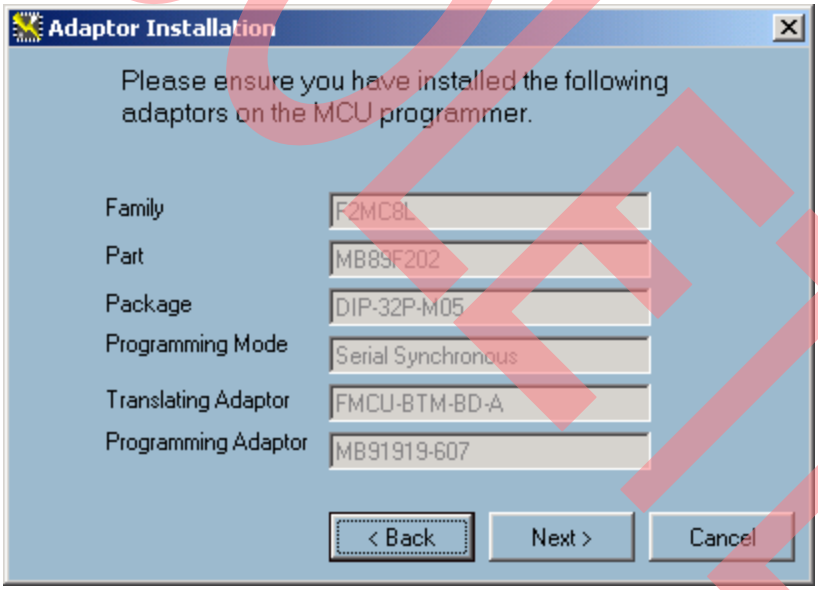


This window shows a selection of tools needed for this programming mode. Click “Next >”.



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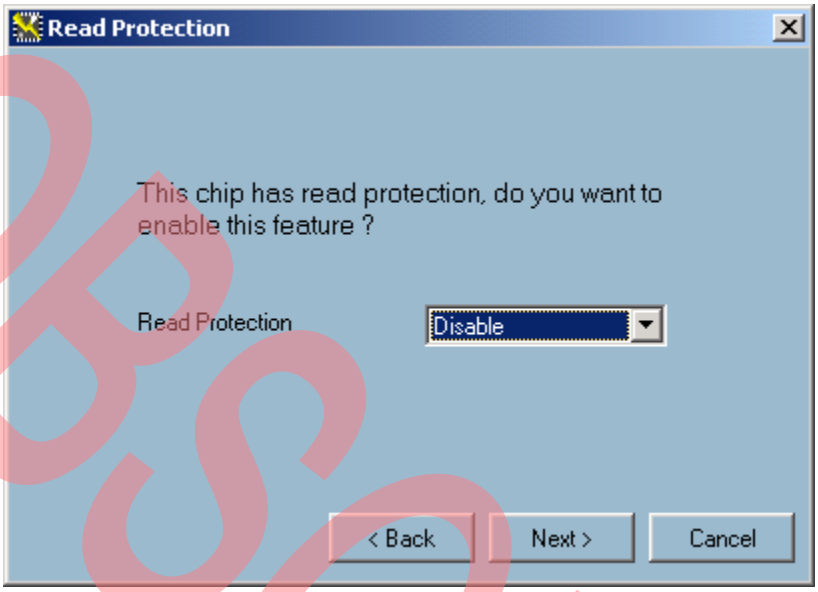
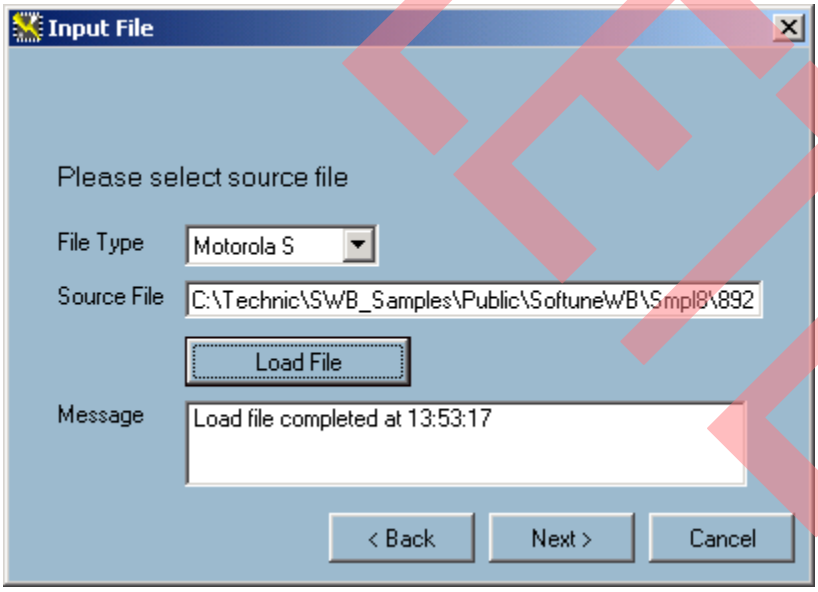
In this window you can select if you want to use the flash read protection. Chose “enable” or “disable” from the drop-down menu. Then click again “Next >”.



Choose the file type of your input file (Motorola S, Binary or Intel HEX) and press “Load File” to browse to this file. The result of file loading is displayed in the message box. Go to the next window.



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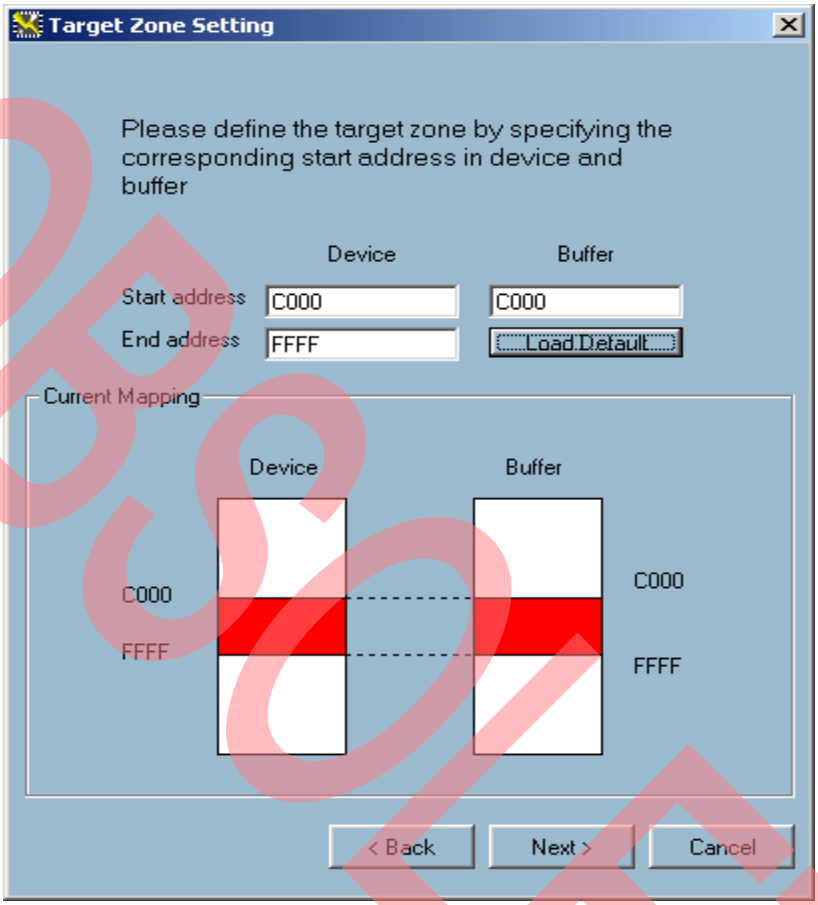
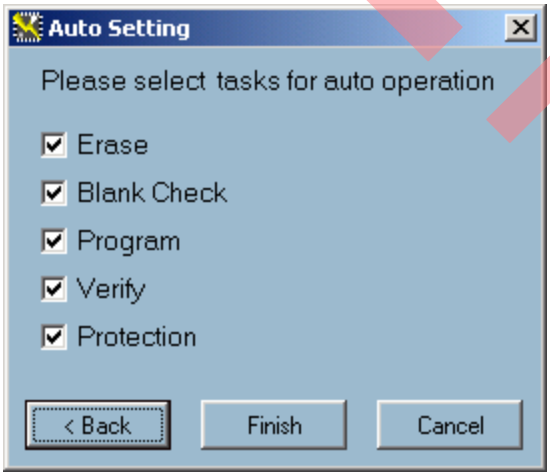
Here you have the possibility to select start and end address for the microcontroller flash memory. Normally default value should fit. Click also “Next >”.



In this window you can choose the single tasks for the automatic programming sequence. After choosing the needed items click “Finish” to go to the next window.



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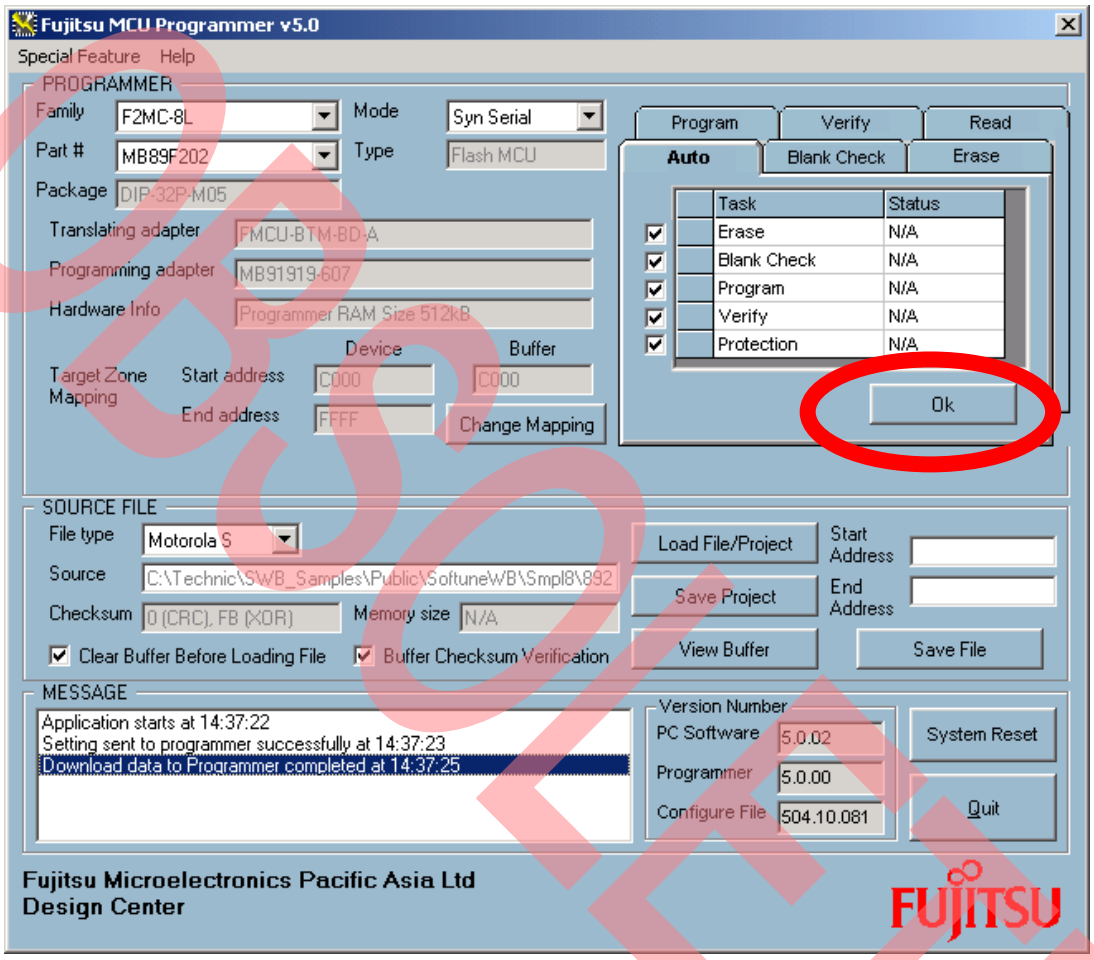
Settings and data are sent to the programmer. After this is done, click the “OK” button to start the automatic programming sequence. Programmer will perform the before chosen steps. If programming succeeds, software will show “Pass”.



Quit the MCU Programmer software, power off the programming base board and the Flash MCU Programmer. Now you can take the microcontroller from the programming socket.

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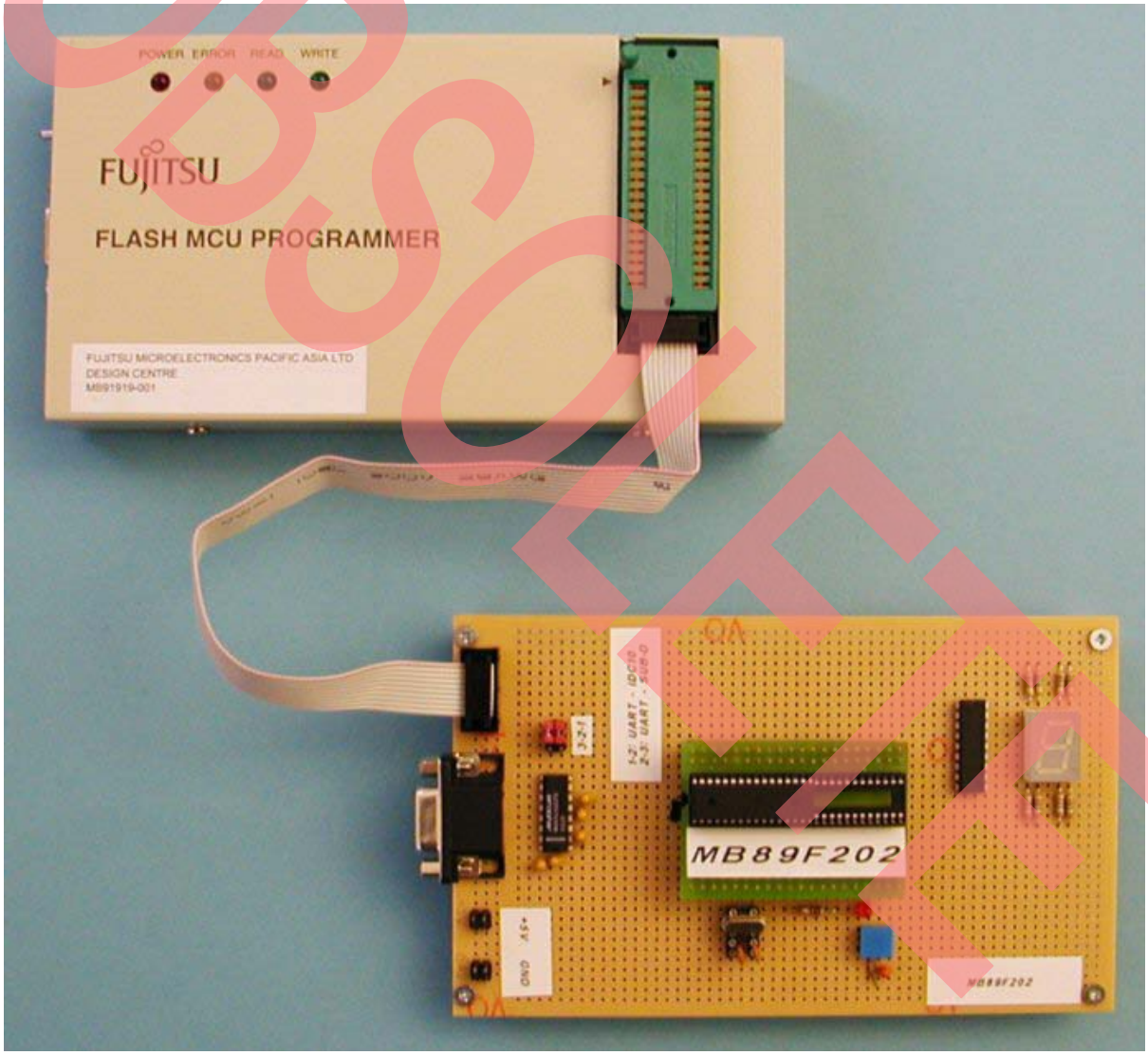
4.2 Onboard Programming

For the onboard in-circuit serial synchronous programming the following tools are needed:

- MB91919-001 Flash MCU Programmer

Connect your user hardware to the Flash MCU Programmer. Refer to the below given example of connection.

Connect the Flash MCU programmer via serial cable to the PC.



Turn on your user application supply voltage and apply 15V DC to the Flash MCU Programmer. Then apply 9V DC (Vpp) to Pin 5 (P60) to enter programming mode. Please hold to this power on sequence to prevent latch-up. Set power switch on Flash MCU Programmer to ON. Now start the software “MCU Programmer” and follow the steps described in chapter external serial synchronous programming from now on.

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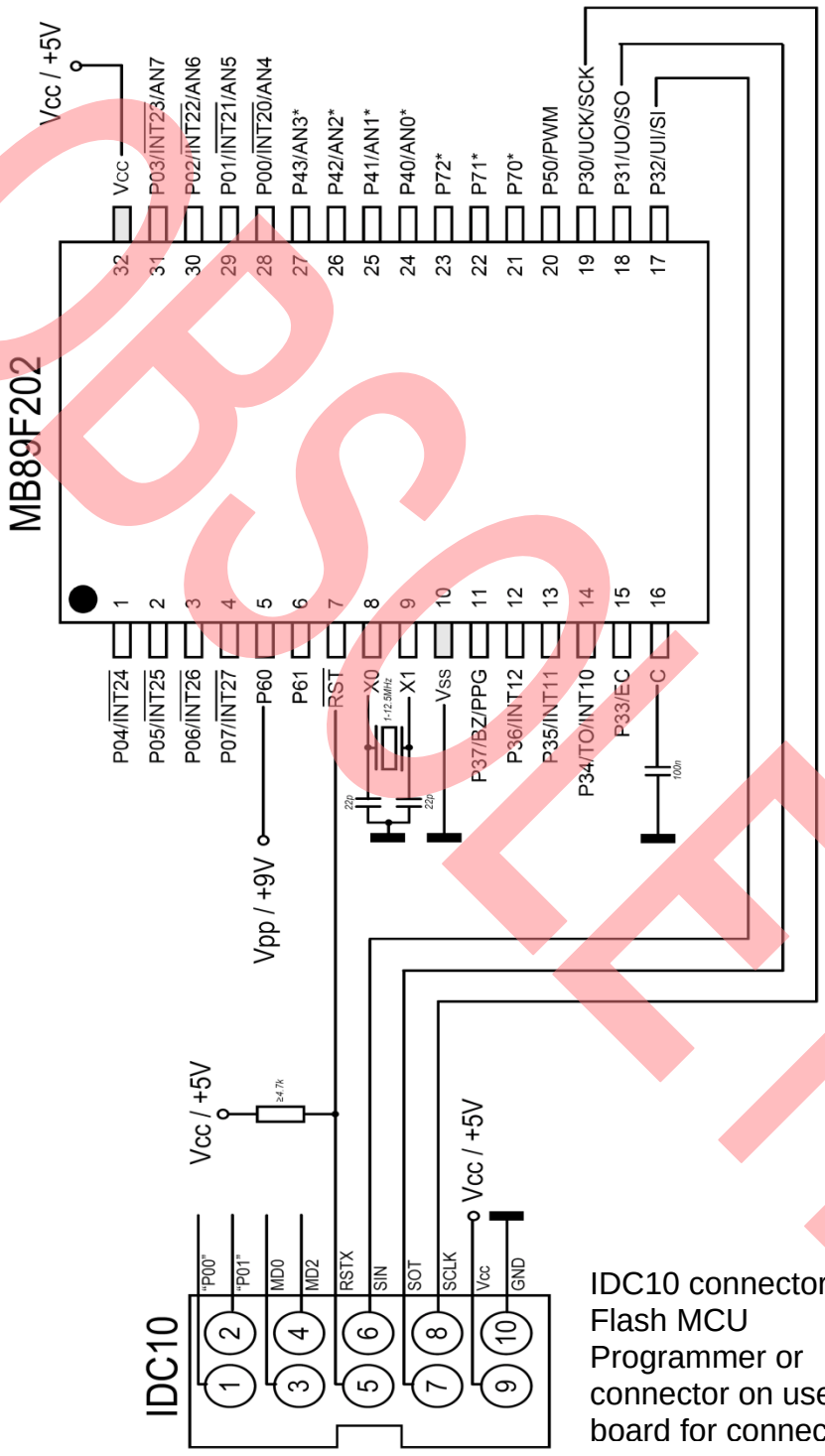
Example for onboard programming circuit (serial synchronous):



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5 Parallel Programming

This chapter describes the parallel programming of the internal flash.

Parallel programming is also possible for MB89F202. Therefore following tools are needed:

- MB91919-001 Flash MCU Programmer
- MB91919-607 Parallel Programming Adaptor

The parallel programming adaptor is placed on the parallel programming socket on flash MCU programmer. Take care of correct orientation. Place the microcontroller on the socket of the programming adaptor. Connect the flash MCU programmer to PC via twisted serial cable and power on.

Start the software “MCU Programmer” and refer to the steps described in chapter serial synchronous programming. Select “Parallel” as programming mode in the dedicated window.

6 Appendix

Additional information on the Flash MCU Programmer and the MCU programmer software can be found in “MB91919 Cypress MCU Programming Kit” manual.

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Document History

Document Title: AN205152 – F²MC-8L Family MB89201 Series 8-Bit Microcontroller Flash Programming

Document Number: 002-05152

Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	-	WOFR	02/09/2005	Initial release
			04/16/2007	Document number changed from 300001 to 300011 due to ambiguity
*A	5262160	WOFR	05/05/2016	Migrated Spansion Application Note MCU-AN-300011-E-V11 to Cypress format. Document obsoleted.

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