

PCA7302E1F-80 PCA7302E1L-80

PROM Programming Adapter for M16C/20 Series MCUs

User's Manual



* R4945 and R4945A are trademarks of Advantest Corporation.

Keep safety first in your circuit designs!

- Renesas Technology Corporation and Renesas Solutions Corporation put the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage. Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

Notes regarding these materials

- These materials are intended as a reference to assist our customers in the selection of the Renesas Technology product best suited to the customer's application; they do not convey any license under any intellectual property rights, or any other rights, belonging to Renesas Technology Corporation, Renesas Solutions Corporation or a third party.
- Renesas Technology Corporation and Renesas Solutions Corporation assume no responsibility for any damage, or infringement of any third-party's rights, originating in the use of any product data, diagrams, charts, programs, algorithms, or circuit application examples contained in these materials.
- All information contained in these materials, including product data, diagrams, charts, programs and algorithms represents information on products at the time of publication of these materials, and are subject to change by Renesas Technology Corporation and Renesas Solutions Corporation without notice due to product improvements or other reasons. It is therefore recommended that customers contact Renesas Technology Corporation, Renesas Solutions Corporation or an authorized Renesas Technology product distributor for the latest product information before purchasing a product listed herein. The information described here may contain technical inaccuracies or typographical errors. Renesas Technology Corporation and Renesas Solutions Corporation assume no responsibility for any damage, liability, or other loss rising from these inaccuracies or errors. Please also pay attention to information published by Renesas Technology Corporation and Renesas Solutions Corporation by various means, including the Renesas home page (<http://www.renesas.com>).
- When using any or all of the information contained in these materials, including product data, diagrams, charts, programs, and algorithms, please be sure to evaluate all information as a total system before making a final decision on the applicability of the information and products. Renesas Technology Corporation and Renesas Solutions Corporation assume no responsibility for any damage, liability or other loss resulting from the information contained herein.
- Renesas Technology semiconductors are not designed or manufactured for use in a device or system that is used under circumstances in which human life is potentially at stake. Please contact Renesas Technology Corporation, Renesas Solutions Corporation or an authorized Renesas Technology product distributor when considering the use of a product contained herein for any specific purposes, such as apparatus or systems for transportation, vehicular, medical, aerospace, nuclear, or undersea repeater use.
- The prior written approval of Renesas Technology Corporation and Renesas Solutions Corporation is necessary to reprint or reproduce in whole or in part these materials.
- If these products or technologies are subject to the Japanese export control restrictions, they must be exported under a license from the Japanese government and cannot be imported into a country other than the approved destination. Any diversion or reexport contrary to the export control laws and regulations of Japan and/or the country of destination is prohibited.
- Please contact Renesas Technology Corporation or Renesas Solutions Corporation for further details on these materials or the products contained therein.

Precautions to be taken when using this product

- This product is a development supporting unit for use in your program development and evaluation stages. In mass-producing your program you have finished developing, be sure to make a judgment on your own risk that it can be put to practical use by performing integration test, evaluation, or some experiment else.
- In no event shall Renesas Solutions Corporation be liable for any consequence arising from the use of this product.
- Renesas Solutions Corporation strives to renovate or provide a workaround for product malfunction at some charge or without charge. However, this does not necessarily mean that Renesas Solutions Corporation guarantees the renovation or the provision under any circumstances.
- This product has been developed by assuming its use for program development and evaluation in laboratories. Therefore, it does not fall under the application of Electrical Appliance and Material Safety Law and protection against electromagnetic interference when used in Japan.

Renesas Tools Homepage <http://www.renesas.com/en/tools>

Contents

1. Precautions for Safety	4
1.1 Safety Symbols and Meanings	4
2. Introduction	6
2.1 Things to Check When Unpacking	6
3. Specifications	7
4. How to Write the Program	8
4.1 Programming Procedure	8
4.2 Attaching Adapter to PROM Programmer	9
4.3 Setting Switches	9
4.4 Inserting MCU into Adapter	10
4.5 Precautions When Opening and Closing IC Socket	10
4.6 Precautions When Handling Adapter	11
4.7 Setting Programming Area	11
5. Recommended PROM Programmers	11
6. Memory Map	12
7. How to Request for Support	13

To use the product properly

Precautions for Safety



- Either in the instruction manual or on the product, several icons are used to insure proper handling of this product and also to prevent injuries to you or other persons, or damage to your properties.
- Their graphic images and meanings are given in Chapter 1, Precautions for Safety. Be sure to read this chapter before using the product.

1. Precautions for Safety


In both the user's manual and on the product itself, several icons are used to insure proper handling of this product and also to prevent injuries to you or other persons, or damage to your properties.


This chapter describes the precautions which should be taken in order to use this product safely and properly. Be sure to read this chapter before using this product.


1.1 Safety Symbols and Meanings

	WARNING	If the requirements shown in the "WARNING" sentences are ignored, the equipment may cause serious personal injury or death.
	CAUTION	If the requirements shown in the "CAUTION" sentences are ignored, the equipment may malfunction.
	IMPORTANT	It means important information on using this product.

In addition to the three above, the following are also used as appropriate.

△ means WARNING or CAUTION.
Example:  **CAUTION AGAINST AN ELECTRIC SHOCK**

⊘ means PROHIBITION.
Example:  **DISASSEMBLY PROHIBITED**

● means A FORCIBLE ACTION.
Example:  **UNPLUG THE POWER CABLE FROM THE RECEPTACLE.**

The following pages describe the symbols "WARNING", "CAUTION", and "IMPORTANT".

WARNING

Warning for Use Environment :

- This equipment is to be used in an environment with a maximum ambient temperature of 35°C. Care should be taken that this temperature is not exceeded.
- Select the proper programming mode of the PROM programmer.

CAUTION

Cautions to Be Taken for This Product :



- Do not disassemble or modify this product. Personal injury due to electric shock may occur if this product is disassembled or modified.
- Use caution when handling this product. Be careful not to apply a mechanical shock such as falling, etc.
- Do not directly touch the connector pins of this product.
- Be careful with the static electricity when handling this product and the MCU.

When Not Using This Product for a Long Time :

- (1) Attach the connector pins of this product to the conductive sponge.
- (2) Put it into a conductive polyvinyl, and keep it in the package case shipped from the factory.
- (3) Store it in the place where humidity and temperature are low and direct sunshine does not strike.

IMPORTANT

When Using the Products :

- Attach this product to the IC socket on the PROM programmer properly.
- Insert the MCU to the IC socket of this product properly.
- When opening and closing the IC socket of this product, be sure to keep it horizontal.
- Be sure to set the programming area as described in this instruction manual.
- Do not use the PROM programmer's device identification code readout function.

2. Introduction

This product is a PROM programming adapter for 16-bit microcomputers of M16C/20 Series. The adapter is a tool that can be used to write a program into internal ROM of microcomputers using a commercially available PROM programmer.

This manual describes the specifications and operation of this product. Figure 2.1 shows the external view of this product and constituent parts.

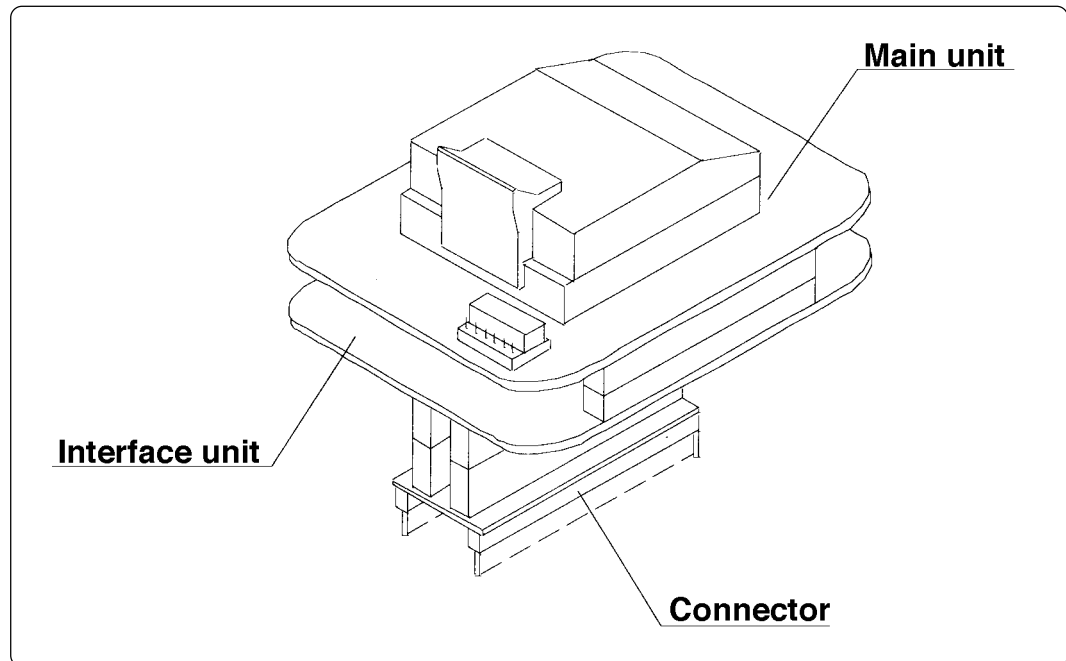


Figure 2.1 External view of the adapter and constituent parts

2.1 Things to Check When Unpacking

This product consists of the following parts. Check to see that it contains all of the components shown in Table 2.1 below.

Table 2.1 Contents

Product type name	PCA7302E1F-80	PCA7302E1L-80
Main unit	PCA7302E1F-80	PCA7302E1L-80
Interface unit	PCA7412C	
Connector	PCA7402E (32-pin)	
Instruction manual	PCA7302E1F-80, PCA7302E1L-80 Instruction Manual (This manual)	

If any part is missing or there is any doubt about your product package, contact your local distributor.

3. Specifications

Tables 3.1 and 3.2 list specifications of PCA7302E1F-80 and PCA7302E1L-80 respectively.

Table 3.1 Specifications of PCA7302E1F-80

MCU type		80-pin QFP packages (80P6N-A) of M16C/20 Series 80-pin FP packages
Type of internal ROM of MCU		EPROM
IC socket		IC51-0804-819-6 (Yamaichi Electronics Co., Ltd.)
Operating clock frequency		8 MHz (Supplied by the ceramic oscillator mounted on the adapter)
Power supply		Supplied from V_{CC} of a PROM programmer
Board configuration	PCA7302E1F-80 (Main unit)	Board to insert a programmable MCU (IC socket is mounted on this board.)
	PCA7412C (Interface unit)	Interface board (Connected by two standard-pitch 20-pin connectors and two standard-pitch 16-pin connectors to the upper and lower boards.)
	PCA7402E (Connector)	Board to connect to the PROM programmer (Standard-pitch 32-pin pin-header is mounted on it.)

Table 3.2 Specifications of PCA7302E1L-80

MCU type		80-pin LCC packages (80D0) of M16C/20 Series 80-pin FS packages
Type of internal ROM of MCU		EPROM
IC socket		IC51-0804-890 (Yamaichi Electronics Co., Ltd.)
Operating clock frequency		8 MHz (Supplied by the ceramic oscillator mounted on the adapter)
Power supply		Supplied from V_{CC} of a PROM programmer
Board configuration	PCA7302E1L-80 (Main unit)	Board to insert a programmable MCU (IC socket is mounted on this board.)
	PCA7412C (Interface unit)	Interface board (Connected by two standard-pitch 20-pin connectors and two standard-pitch 16-pin connectors to the upper and lower boards.)
	PCA7402E (Connector)	Board to connect to the PROM programmer (Standard-pitch 32-pin pin-header is mounted on it.)

Note:

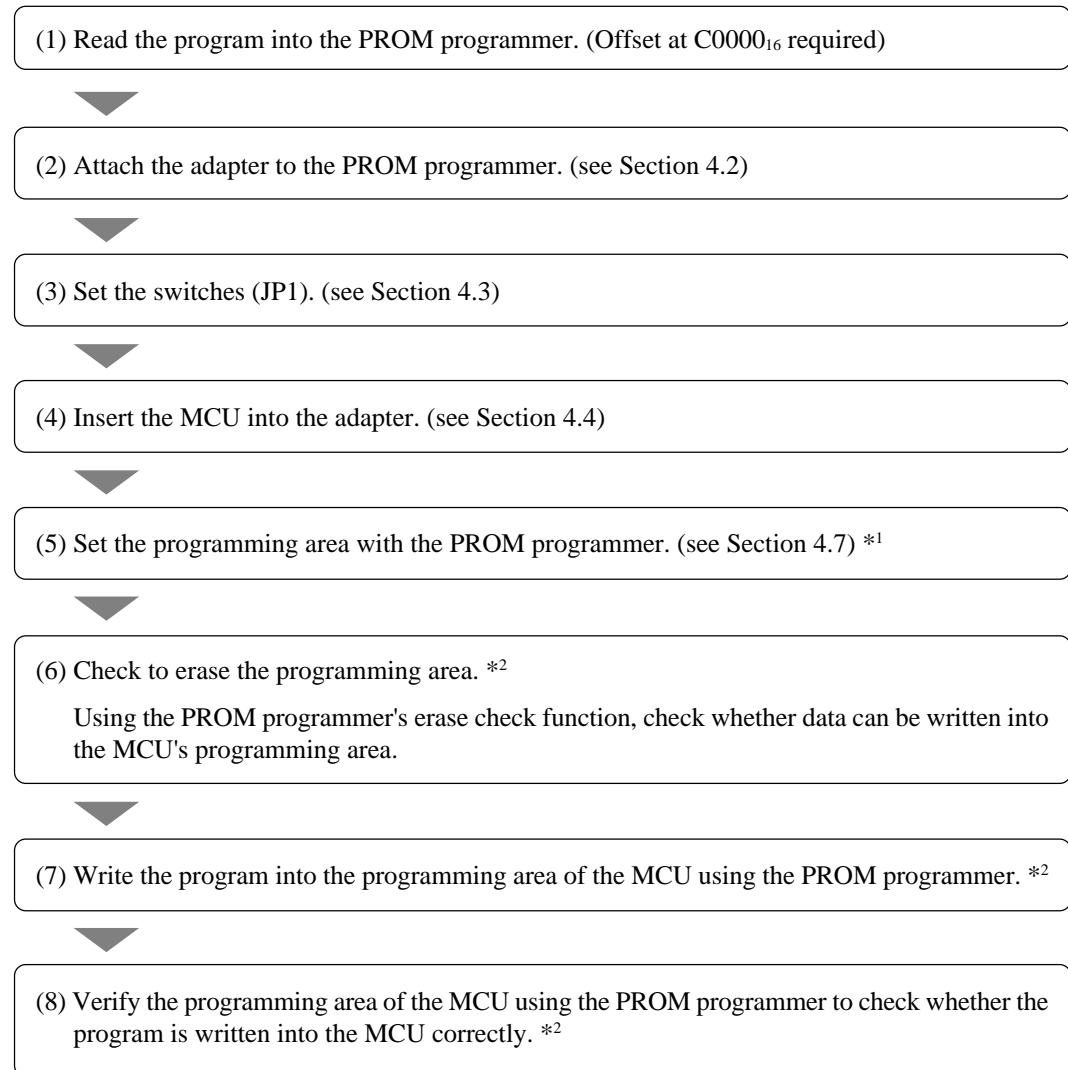
As this product is designed to support the same packages of M16C/20 Series, it is ready for most of the products which will be introduced in the future.

4. How to Write the Program

This chapter describes procedures you need to follow when writing a program. For details on how to operate the PROM programmer, refer to the user's manual of the PROM programmer.

4.1 Programming Procedure

Follow procedures (1) to (8) to write a program.



Notes:

*1 Be sure to set the programming area. Otherwise the mode's shift to the programming mode may not be performed successfully. The erase check function etc. may not also be performed completely.

*2 Some PROM programmers perform the steps (6) to (8) automatically.

4.2 Attaching Adapter to PROM Programmer

As shown Figure 4.1, attach the pin No. 1 of the PCA7402E connector (standard-pitch 32-pin pin-header mounted) to the pin No. 1 of the IC socket of the PROM programmer.

Be careful when attaching the adapter because incorrect insertion can cause fatal damage to the MCU.

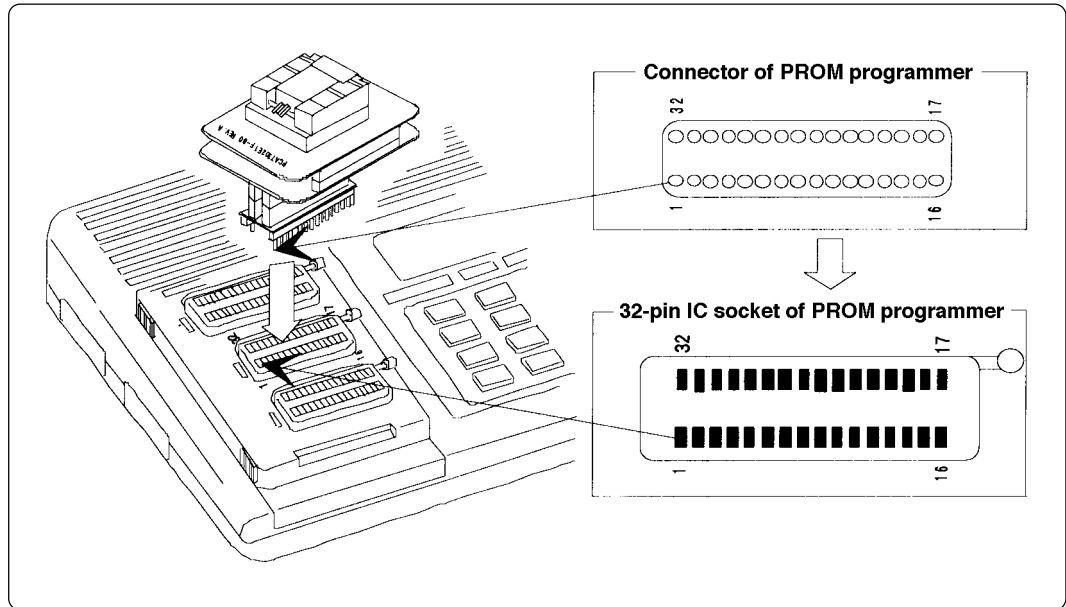


Figure 4.1 Attaching adapter to PROM programmer

4.3 Setting Switches

The setting of JP1 switch is prepared for MCUs with their ROM area expanded in the future. Use this setting for the current MCUs. Figure 4.2 shows the factory-setting of JP1 switch.

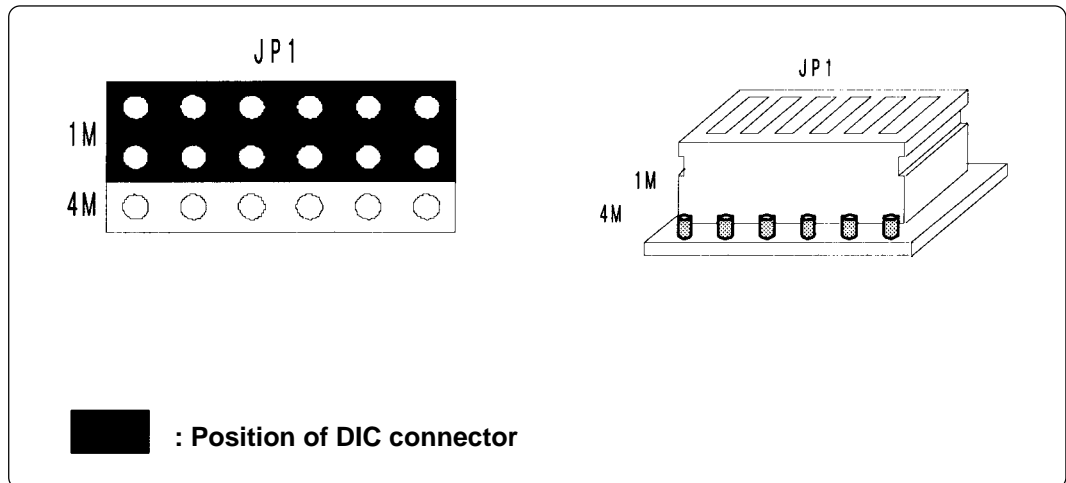


Figure 4.2 JP1 switch setting

Note:

- (1) Be sure to set the switch properly. Otherwise wrong settings can cause fatal damage to the MCU.
- (2) Figure 4.2 applies to both PCA7302E1F-80 and PCA7302E1L-80.

4.4 Inserting MCU into Adapter

As shown in Figure 4.3, insert the MCU into the IC socket, with the pin No. 1 of the MCU matched to the pin No. 1 of the IC socket on the adapter.

Be careful when inserting the MCU because incorrect insertion can cause fatal damage to the MCU.

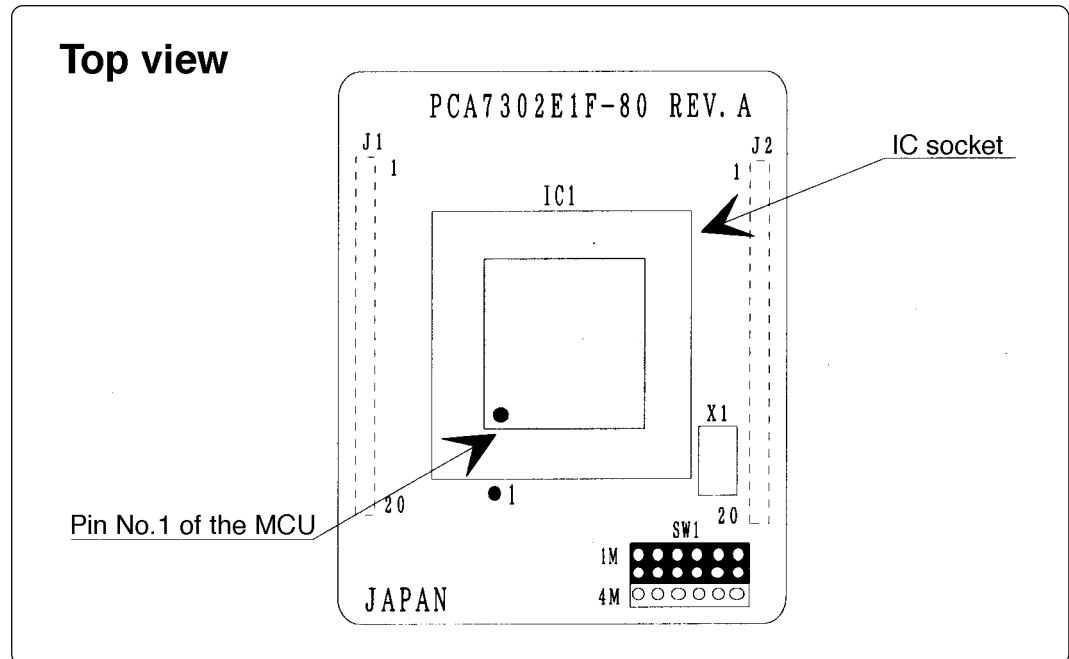


Figure 4.3 Inserting the MCU

4.5 Precautions When Opening and Closing IC Socket

When opening and closing the IC socket to insert the MCU, hold the adapter horizontally. Otherwise the inside of the IC socket may become damaged and cause an electrical insulation failure. Figure 4.4 shows opening and closing of the IC socket.

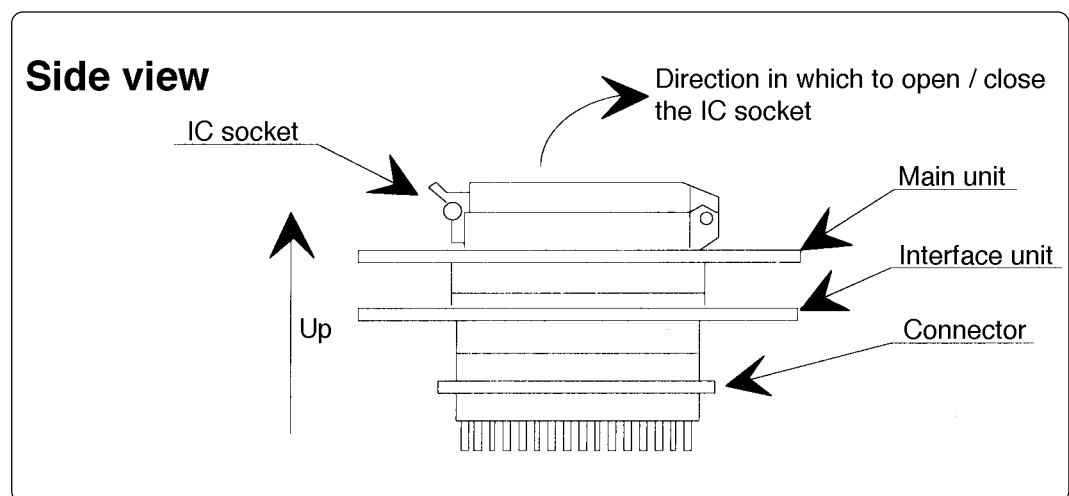


Figure 4.4 Opening and closing the IC socket

4.6 Precautions When Handling Adapter

Don't touch the connector in the IC socket and the pins on the PROM programmer connector. Otherwise it can cause an electrical insulation failure because of dirt.

When not using, attach the connector pins of this product to the conductive sponge as it was shipped from the factory.

4.7 Setting Programming Area

When writing the program into the MCU, be sure to set the programming area. And also, specify its device of the PROM programmer.

Table 4.1 Programming area

MCU type name		ROM size	PROM programmer		Internal ROM area of MCU
MCU type	Example		Device	Programming area	
M302XXEC	M30240ECP	128K byte	M5M27C201	20000 ₁₆ - 3FFFF ₁₆	E0000 ₁₆ - FFFFF ₁₆

Note:

- (1) Be sure to set the programming mode properly. Otherwise wrong settings can cause fatal damage to the MCU.
- (2) The programming method for the M5M27C201 mode is the byte-programming method.

5. Recommended PROM Programmers

PROM programmers listed in Table 5.1 are recommended for the adapter. Using the actual products, we have verified that these PROM programmers can be used to write programs without problem. Nonconformity occurring by using any other PROM programmers can not be supported. For the latest type of PROM programmers, contact the manufacturer to confirm whether it can be used for your product.

Table 5.1 Recommended PROM Programmers

Manufacturer	Type name	Device	Programming voltage (V _{PP})
Advantest	R4945	M5M27C201 mode	12.5 V
	R4945A		

Note:

- (1) Be sure to set the programming mode properly. Otherwise wrong settings can cause fatal damage to the MCU.
- (2) The programming method for the M5M27C201 mode is the byte-programming method.

6. Memory Map

Figure 6.1 shows memory maps of the MCU and the PROM programmer.

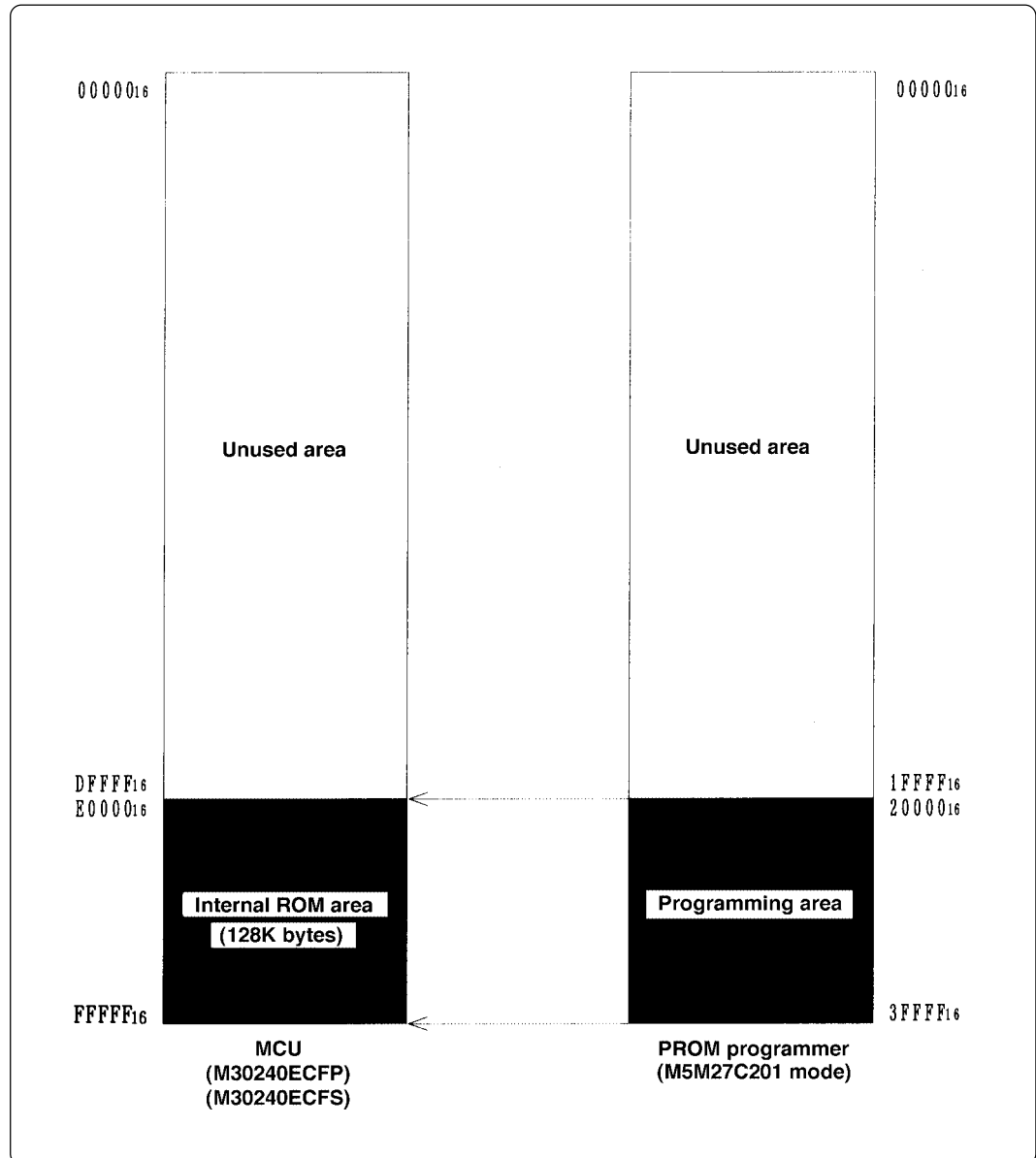


Figure 6.1 Memory Map

7. How to Request for Support

After checking this manual, fill in the following information and email to your local distributor. For prompt response, please specify the following information:

(1) Contact address

- Company name
- Department
- Responsible person
- Phone number
- Fax number
- E-mail address

(2) Product information

- Name of the programming adapter
- Serial number
- Date of purchase
- Target MCU
- Symptoms (Fails blank check/Cannot write a program/Fails verification etc.)
- Detailed symptoms
- How often does the problem occur? (2 out of 10 etc.)
- When did the problem start to occur? (Since purchase/Used to work correctly)
- Type name of the PROM programmer (Advantest R4945A etc.)
- Specified device when writing to PROM (M27C101 etc.)
- Specified programming area when writing to PROM
- Switch settings of the adapter when writing to PROM

MEMO

PCA7302E1F-80/PCA7302E1L-80 User's Manual

Rev.1.00
September 1, 2003
REJ10J0336-0100Z

COPYRIGHT ©2003 RENESAS TECHNOLOGY CORPORATION
AND RENESAS SOLUTIONS CORPORATION ALL RIGHTS RESERVED



RenesasTechnology Corp.

2-6-2, Ote-machi, Chiyoda-ku, Tokyo, 100-0004, Japan