PCA7441
PCA7442FPG02
PCA7442SP

PROM Programming Adapters for 4513, 4514, 4518, 4519, 4583 and 4584 Groups

User's Manual

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Contents

Chapter 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.

⚠ **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

Warnings 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

Caution to Be Taken for Modifying This Product:

- Do not disassemble or modify this product. Disassembling or modifying this product can cause damage. Disassembling and modifying the product will void your warranty.

Cautions to Be Taken for This Product:

- Use caution when handling this product. Be careful not to apply a mechanical shock such as falling.
- Do not directly touch the connector pins of this product.
- Be careful with the static electricity when handling this product and the MCU.

Caution for Keeping This Product:

- 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

Note on This Product:

- We cannot accept any request for repair.

When Using This Product:

- 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 user's manual.
- Do not use the PROM programmer's device identification code readout function.

Chapter 2. Introduction

This product is a PROM programming adapter for the 4513, 4514, 4518, 4519, 4583 and 4584 Groups of 4-bit MCUs. This product is used to write programs into the internal EPROM of MCU with commercially available PROM programmer. This manual mainly explains specifications of this product and how to operate it. Figures 2.1 to 2.3 show the external view of the products and their constituent parts.

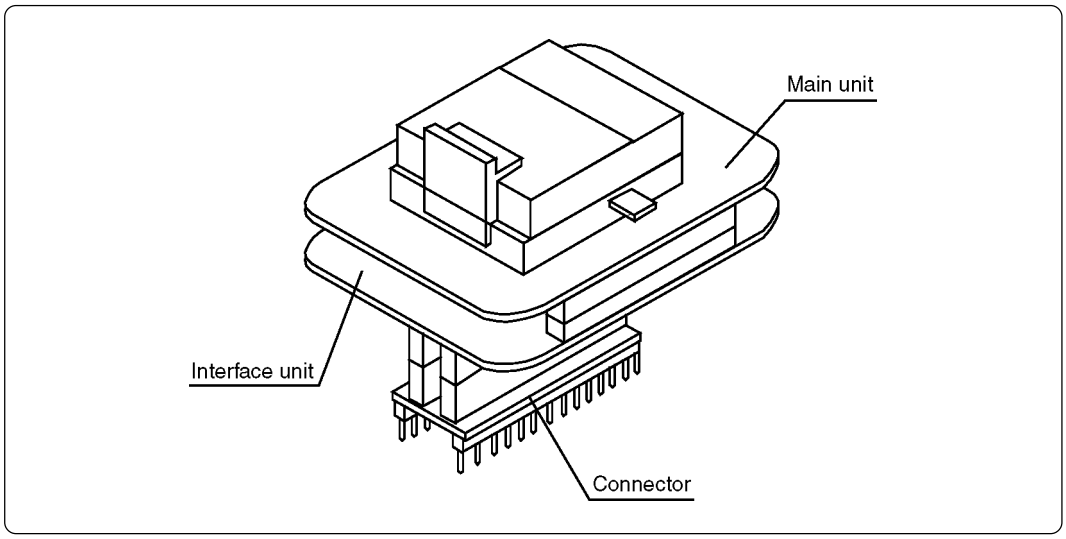


Figure 2.1 External view of the adapter and constituent parts (PCA7441)

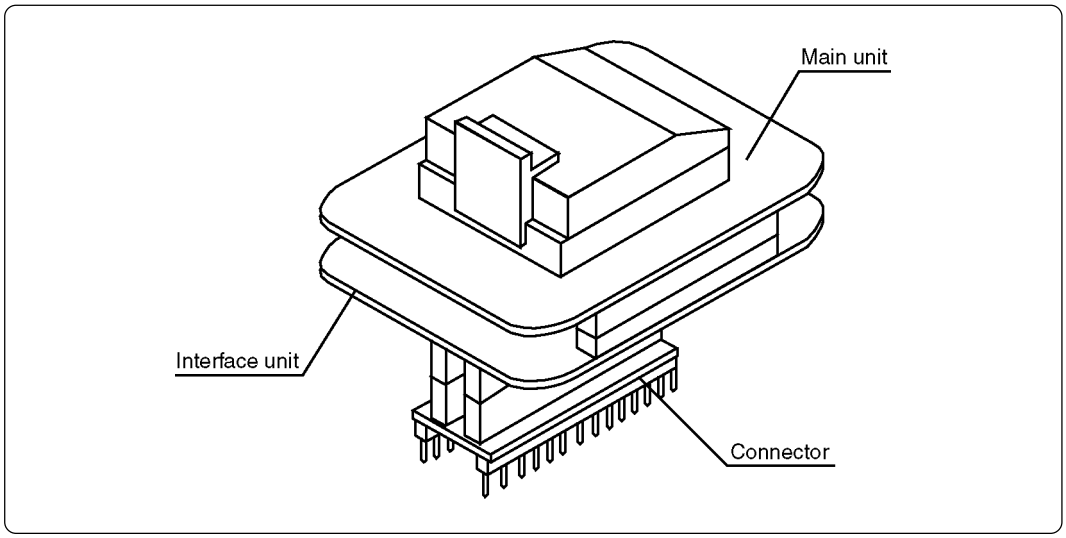


Figure 2.2 External view of the adapter and constituent parts (PCA7442FPG02)

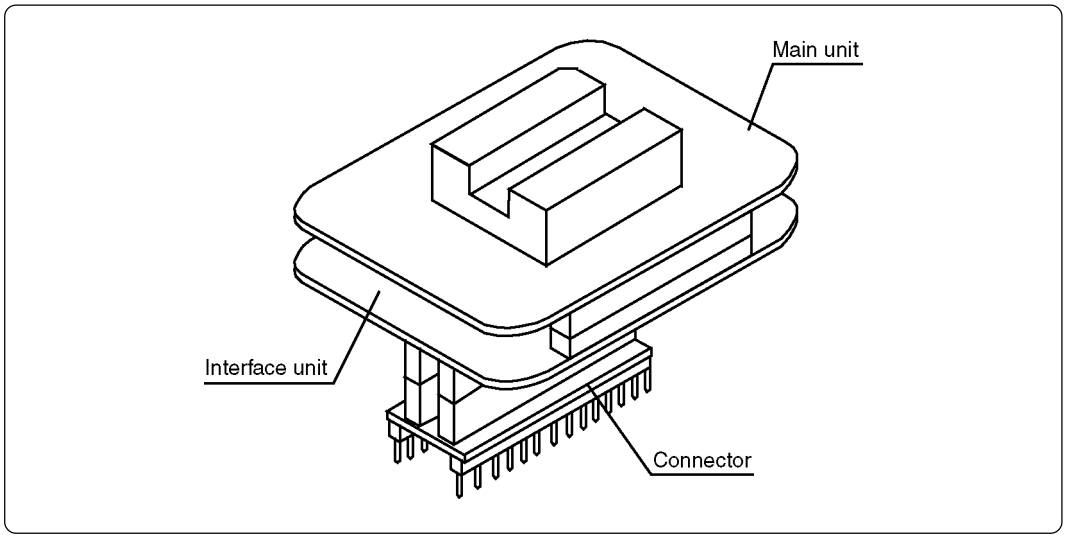


Figure 2.3 External view of the adapter and constituent parts (PCA7442SP)

2.1 Things to Check When Unpacking

This product consists of the parts listed in Table 2.1. When unpacking, check to see that it contains all of the components.

Table 2.1 Package components

Main unit	PCA7441/PCA7442FPG02/PCA7442SP
Interface unit	PCA7414B
Connector	PCA7402D (28-pin)
User's manual	This manual

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

Chapter 3. How to Write Programs

This chapter describes procedures you need to follow when writing the program.

For details on how to operate the PROM programmer, refer to the user's manual of the PROM programmer.

3.1 Programming Procedures

Follow the steps (1) to (6) to write the program.

(1) Read the program into the PROM programmer.

▼

(2) Attach the adapter to the PROM programmer. (see 3.2).

▼

(3) Insert the MCU into the adapter. (see 3.3)

▼

(4) Using the PROM programmer's erase check function, check whether data can be written into the MCU's programming area. *

▼

(5) Write the program into the programming area of the MCU using the PROM programmer. *

▼

(6) Verify the programming area of the MCU using the PROM programmer to check whether the program has been written into the MCU correctly. *

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 (4) through (6) automatically.

3.2 Attaching the Adapter to a PROM Programmer

As shown in Figure 3.1, attach the No. 1 pin of the PCA7402D connector (standard-pitch 28-pin pin-header mounted) to the No. 1 pin of the IC socket of the PROM programmer.

Be careful when attaching to the PROM programmer because an incorrect insertion can cause fatal damage to the MCU.

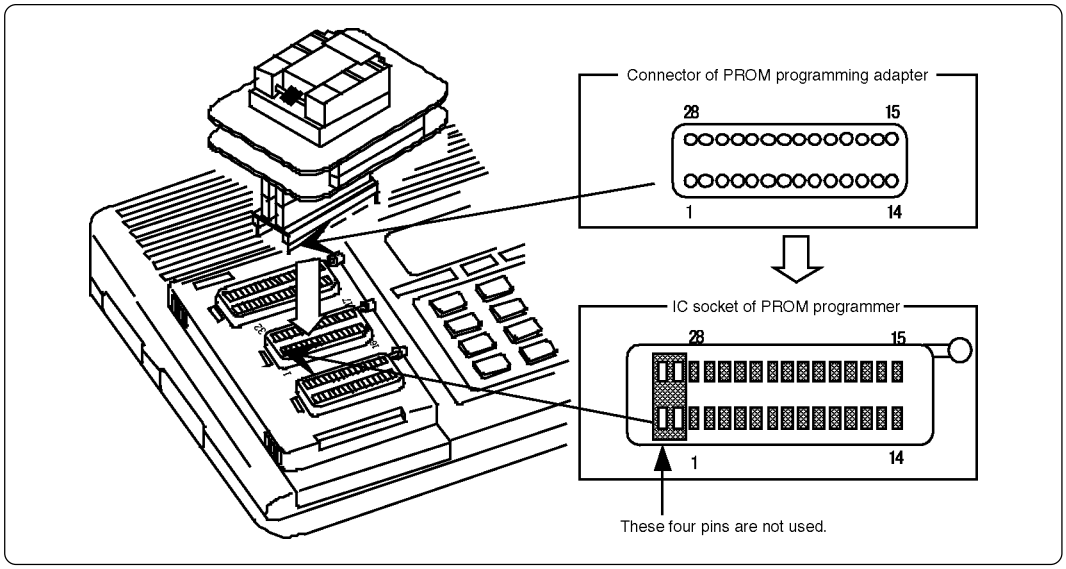


Figure 3.1 Attaching the adapter to a PROM programmer

3.3 Inserting an MCU into the Adapter

(1) For PCA7441

As shown in Figure 3.2, set the slide bar of the IC socket to the right side (marked on the board) and 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.

Be careful when attaching to the PROM programmer because an incorrect insertion can cause fatal damage to the MCU.

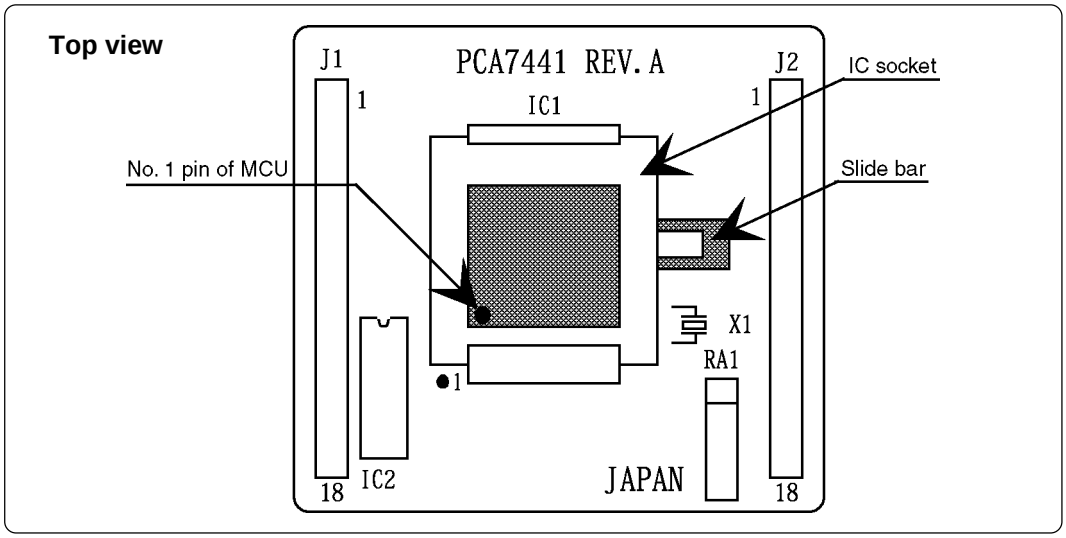


Figure 3.2 Inserting an MCU (PCA7441)

(2) For PCA7442FPG02

As shown in Figure 3.3, insert the MCU into the IC socket with the No. 1 pin of the MCU matched to the No. 1 pin of the IC socket on the PCA7442FPG02.

Be careful when attaching to the PROM programmer because an incorrect insertion can cause fatal damage to the MCU.

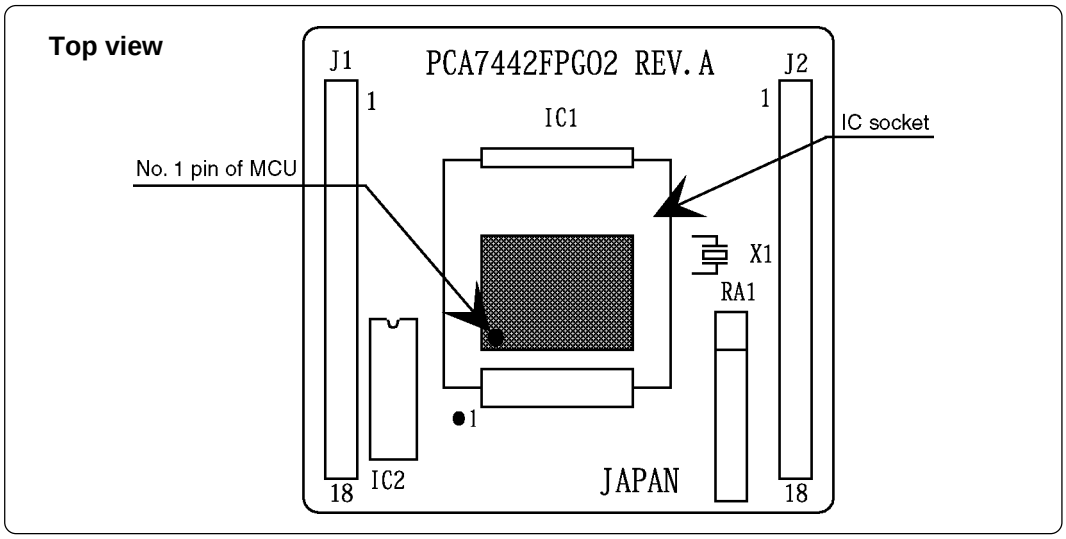


Figure 3.3 Inserting an MCU (PCA7442FPG02)

(3) For PCA7442SP

As shown in Figure 3.4, insert the MCU into the IC socket with the No. 1 pin of the MCU matched to the No. 1 pin of the IC socket on the PCA7442SP.

Be careful when attaching to the PROM programmer because an incorrect insertion can cause fatal damage to the MCU.

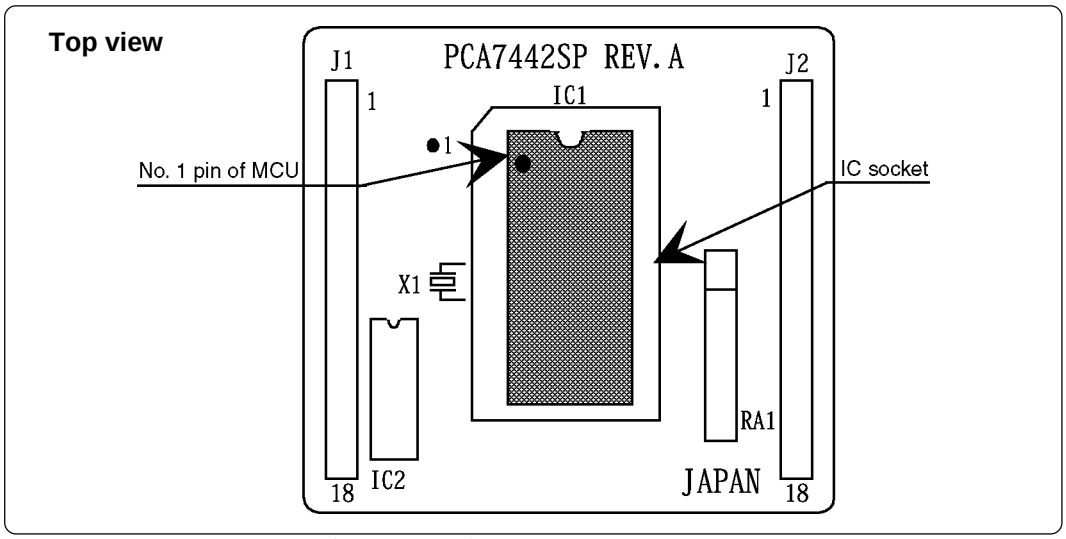


Figure 3.4 Inserting an MCU (PCA7442SP)

⚠CAUTION

Cuation for the Slide Bar of the PCA7441:

- There is a slide bar in the center of the PCA7441. Set this slide bar to the shaded area (factory-setting). Otherwise the MCU may cause a break because of an electrical insulation failure.

Caution to Be Taken for Handling an MCU:

- Do not 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.

Caution When Opening and Closing the IC Socket:

- When opening and closing the IC socket, hold the adapter horizontally as shown in Figure 3.5. Otherwise the inside of the IC socket may become damaged and cause an electrical insulation failure.

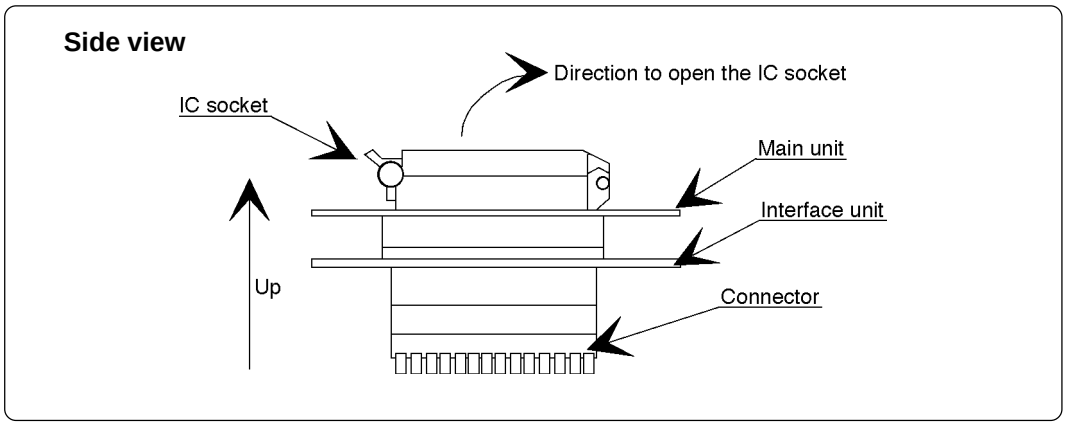


Figure 3.5 Opening and closing the IC socket

3.4 Recommended PROM Programmers

The PROM programmers listed in Table 3.1 are recommended for this product. 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 listed in Table 3.1 can not be supported. For how to operate the PROM programmer and the latest type of PROM programmers, contact the manufacturer to confirm whether it can be used for your product.

Table 3.1 Recommended PROM programmers

Manufacturer	Type name	Device	Programming voltage (Vpp)
Advantest Corporation	TR4943	M5L27256 mode	12.5 V
	R4944A	M5L27C256 mode	
	R4945	M5M27C256A mode	
	R4945A	M5M27C256A mode	

Chapter 4. Specifications

4.1 Specifications

Table 4.1 lists common specifications of the programming adapters, and Table 4.2 lists individual specifications of each programming adapter.

Table 4.1 Common specifications of the PCA7441, PCA7442FPG02 and PCA7442SP

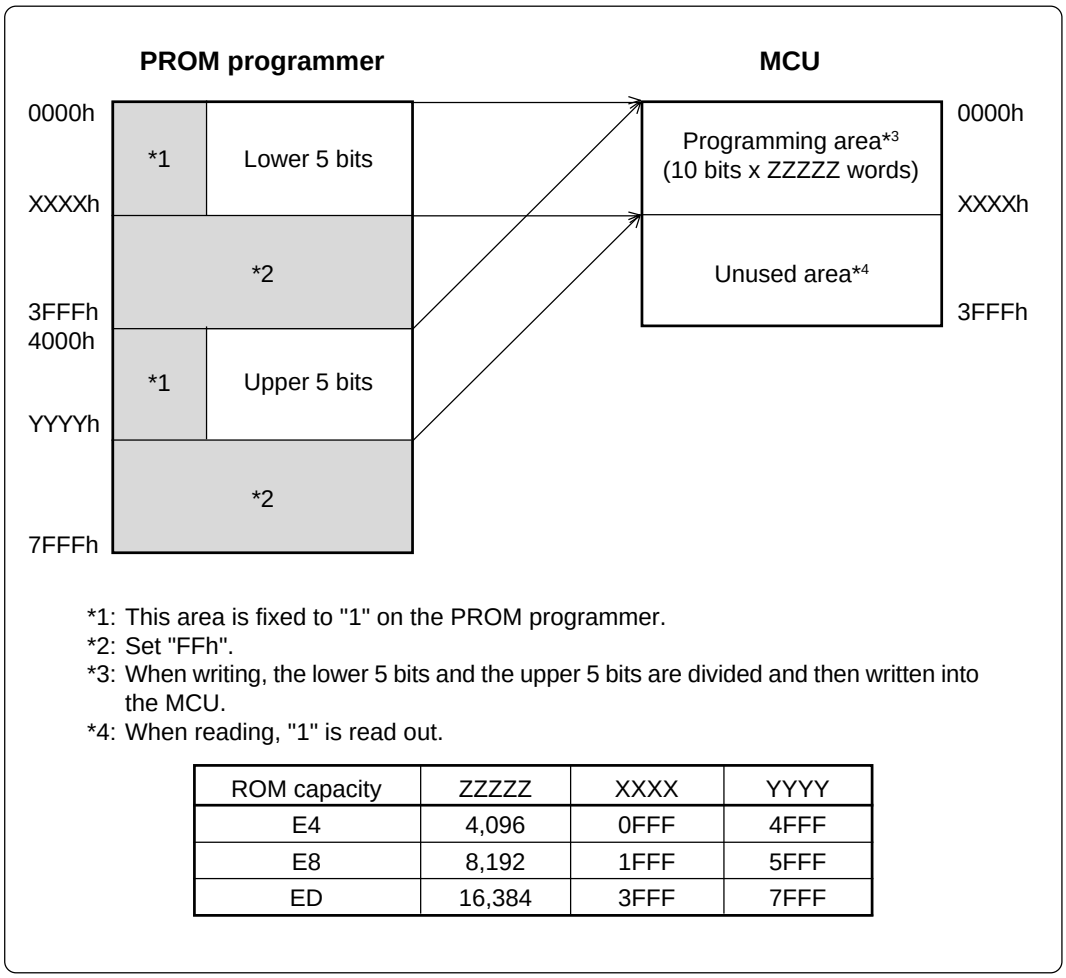
Operating clock frequency		1.0 MHz (Supplied by the ceramic oscillator mounted on the adapter)
Power supply		Supplied from Vcc of the PROM programmer
Board configuration	Main unit	Board to insert a programmable MCU (IC socket for MCU mounted)
	PCA7414B (Interface unit)	Interface board (Connected by two rows of standard-pitch 18-pin connectors and two rows of standard-pitch 16-pin connectors to the upper and lower boards)
	PCA7402D (Connector)	Board to connect to the PROM programmer (Standard-pitch 28-pin pin-header mounted)

Table 4.2 Specifications of each adapter

Product name	Item	Description
PCA7441	MCU	4500 Series 42-pin 0.8-mm-pitch SSOP (42P2R-A) M34514E8FP, M34519E8FP, M34574EDFP
	IC socket	IC51-0422-393 (made by Yamaichi Electronics Co. Ltd.)
PCA7442FPG02	MCU	4500 Series 32-pin 0.8-mm-pitch LQFP (32P6B-A, 32P6U-A) M34513E4/E8FP, M34518E8FP, M34583EDFP
	IC socket	IC51-1498.AC-26323 (made by Yamaichi Electronics Co. Ltd.)
PCA7442SP	MCU	4500 Series 32-pin 1.778-mm-pitch SDIP (32P4B) M34513E4/E8SP, M34518E8SP
	IC socket	IC59-3204-G4 (made by Yamaichi Electronics Co. Ltd.)

4.2 Memory Maps

Figure 4.1 shows memory maps of the MCU and the PROM programmer.



*1: This area is fixed to "1" on the PROM programmer.
*2: Set "FFh".
*3: When writing, the lower 5 bits and the upper 5 bits are divided and then written into the MCU.
*4: When reading, "1" is read out.

ROM capacity	ZZZZZ	XXXX	YYYY
E4	4,096	0FFF	4FFF
E8	8,192	1FFF	5FFF
ED	16,384	3FFF	7FFF

Figure 4.1 Memory maps

Chapter 5. Troubleshooting

The table below summarizes errors to be checked carefully before you determine them to be a fault.

5.1 Errors That Occur When Writing to PROM

(1) When Newly Purchased

Cause	Remedy	See page
Programming adapter	Is the adapter attached to the correct position of the PROM programmer?	9
	Is the MCU attached to the correct position?	9
PROM programmer	Is the correct device selected?	12
Contact failure	The IC socket of the PROM programmer may be stained. The socket needs replacing.	-

(2) Previously Written Normally

Cause	Remedy	See page
Programming adapter	Is the adapter attached to the correct position of the PROM programmer?	9
	Is the MCU attached to the correct position?	9
PROM programmer	Is the correct device selected?	12
Contact failure	The IC socket of the PROM programmer may be stained. The socket needs replacing.	-
	The PROM programmer connector (28-pin pin-header) at which the PROM programmer is contacted may be stained. Clean it with alcohol, etc.	-

5.2 MCUs Do Not Function Normally

The program operates normally on the emulator, but when the MCU that has normally been written is attached the same program does not function normally.

(1) In the emulator, NOPs are often inserted in the area where the program has not been read, therefore the program happens to appear functioning normally even though it may have gone wild. Check your program again.

(2) The emulator and the actual MCU may differ in characteristics. Consult the user's manual of the emulation pod to check for differences in characteristics again.

5.3 Other Precautions

(1) About the Recommended PROM Programmers

Not all PROM programmers available on the market can be checked to see if they function properly. There are several PROM programmers that we have verified to function properly. These products are listed as recommended PROM programmers in this user's manual. Other PROM programmers may also be used providing that you verified them to function properly.

Note: No matter which type of PROM programmer you use, it is necessary to verify completion of programming by executing screening, etc. that are stipulated for each MCU used.

(2) About Reading Out of Device Identification Code *1

Please do not use the PROM programmer's device identification code readout function.

Using this function may break down the MCU. The device identification code is included in EPROM to indicate the manufacturer code and device code; it is not included in the MCU.

*1 Depending on PROM programmer manufacturers, this may be referred to by another name (e.g. ID code).

5.4 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

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