

To our customers,

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April 1<sup>st</sup>, 2010  
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**PCA7430**

**PCA7431**

User's Manual

PROM Programming Adapter for M37630E4FP/  
M37630E4FS

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## To Use the Product Properly

### Precautions for Safety:





- Either in the User's 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 this user's manual, 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 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

	<b>WARNING</b>	If the requirements shown in the "WARNING" sentences are ignored, the equipment may cause serious personal injury or death.
	<b>CAUTION</b>	If the requirements shown in the "CAUTION" sentences are ignored, the equipment may malfunction.
	<b>IMPORTANT</b>	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**

### **Cautions in Handling 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.

### **Caution in 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**

### **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, hold the adapter horizontally.
- 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.

## 2. Introduction

The PCA7430 and PCA7431 are PROM programming adapters for 8-bit 7600 Series MCUs. These adapters are tools that can be used to write a program into internal PROM of MCUs using a commercially available PROM programmer.

This manual describes the specifications and the operation of the PCA7430/PCA7431.

Figure 2.1 shows the external view and the constituent parts of them.

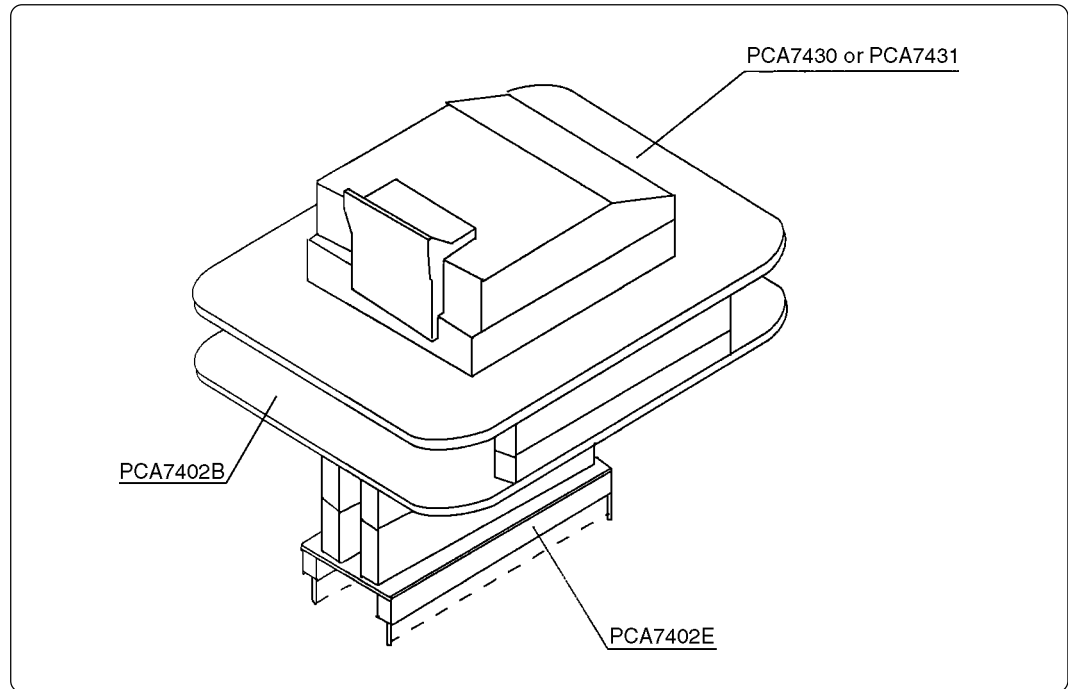


Figure 2.1 External view of the PCA7430/PCA7431 and their constituent parts

### 2.1 Things to Check When Unpacking

The PCA7430/PCA7431 consist of the following items. Check to see that it contains all of the components shown in Table 2.1.

Table 2.1 Contents of the PCA7430/PCA7431 package

Main unit	PCA7430/PCA7431
Interface unit	PCA7402B
PROM programmer connector	PCA7402E (32-pin)
User's Manual	This user's manual

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



### 3. Specifications

Table 3.1 lists the common specifications of the PCA7430 and PCA7431. Tables 3.2 and 3.3 list the each specification.

*Table 3.1 Common specifications of the PCA7430 and PCA7431*

Operating clock frequency		4 MHz (Supplied by the ceramic oscillator mounted on the main unit)
Power supply		Supplied from the Vcc of the PROM programmer
Board configuration	Main unit	A programmable MCU mounted (IC socket for the MCU mounted)
	PCA7402B	Interface board (buffer IC mounted) (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)
	PCA7402E	Board to be connected to the PROM programmer (Standard-pitch 32-pin pin-header to be connected to the PROM programmer mounted)

*Table 3.2 Specifications of the PCA7430*

MCU	M37630E4FP
IC socket	IC51-0444-825 (made by Yamaichi Electronics Co., Ltd.)

*Table 3.3 Specifications of the PCA7431*

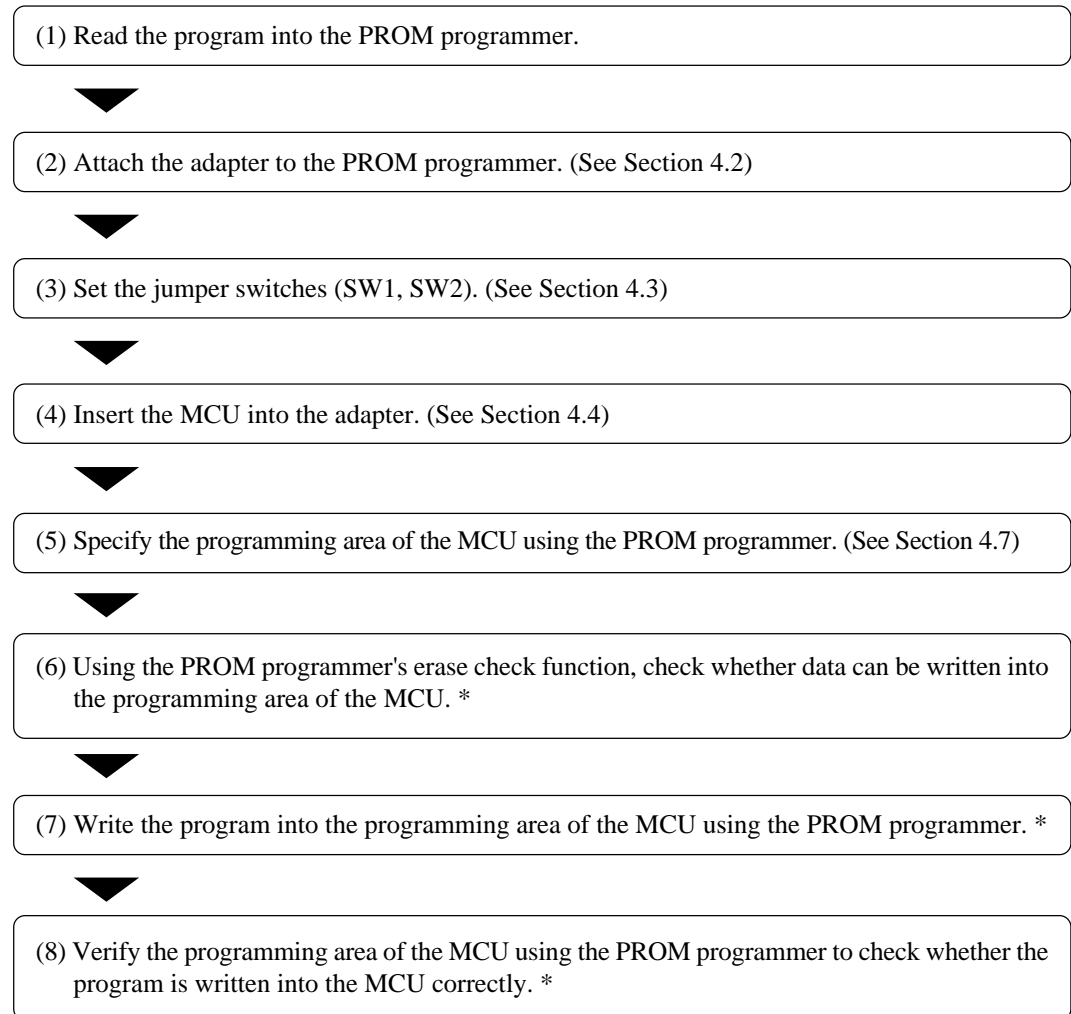
MCU	M37630E4FS
IC socket	IC51-0804-890 (made by Yamaichi Electronics Co., Ltd.)

## 4. How to Write the Program

This chapter describes how to write programs using a PROM programmer. For details on how to operate the PROM programmer, refer to the user's manual of the PROM programmer.

### 4.1 Programming Procedures

Follow procedures (1) to (8) to write programs into the MCU.



Notes:

\* Some PROM programmers perform the steps (6) through (8) automatically.

\* **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.**

## 4.2 Attaching the Adapter to a PROM Programmer

As shown in Figure 4.1, attach the pin No. 1 of the PCA7402E PROM programmer 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.**

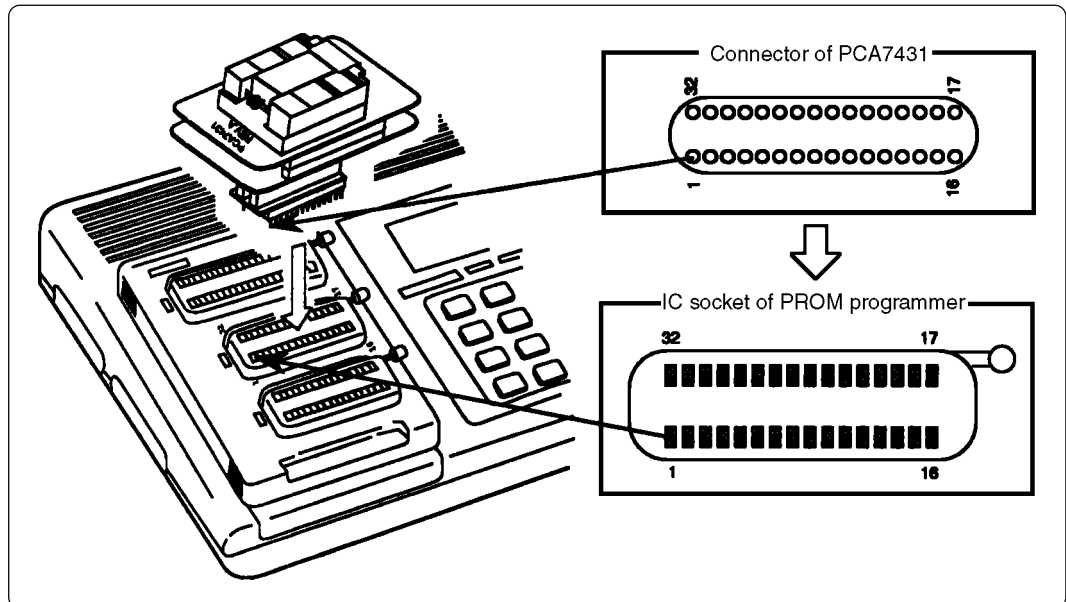


Figure 4.1 Attaching the adapter to the PROM programmer

### 4.3 Setting the Jumper Switches

(1) Jumper switch SW1

Set the SW1 according to the output type of MCU's ports P4<sub>0</sub> - P4<sub>3</sub> (data buses D0-D3). For setting, see Table 4.2 and Figure 4.2.

- Ports P4<sub>0</sub> - P4<sub>3</sub>: CMOS output ..... SW1: CMOS
- Ports P4<sub>0</sub> - P4<sub>3</sub>: Pch output ..... SW1: Pch
- Ports P4<sub>0</sub> - P4<sub>3</sub>: Nch output ..... SW1: Nch

(2) Jumper switch SW2

Set the SW2 according to the output type of MCU's ports P4<sub>4</sub> - P4<sub>7</sub> (data buses D4-D7). For setting, see Table 4.2 and Figure 4.2.

- Ports P4<sub>4</sub> - P4<sub>7</sub>: CMOS output ..... SW2: CMOS
- Ports P4<sub>4</sub> - P4<sub>7</sub>: Pch output ..... SW2: Pch
- Ports P4<sub>4</sub> - P4<sub>7</sub>: Nch output ..... SW2: Nch

Table 4.2 Jumper switch settings

MCU	Example	SW1	SW2
M3763xEx-xxxFP	M37630E4FP	CMOS	CMOS
M3763xEx-xxxFS	M37630E4FS	CMOS	CMOS

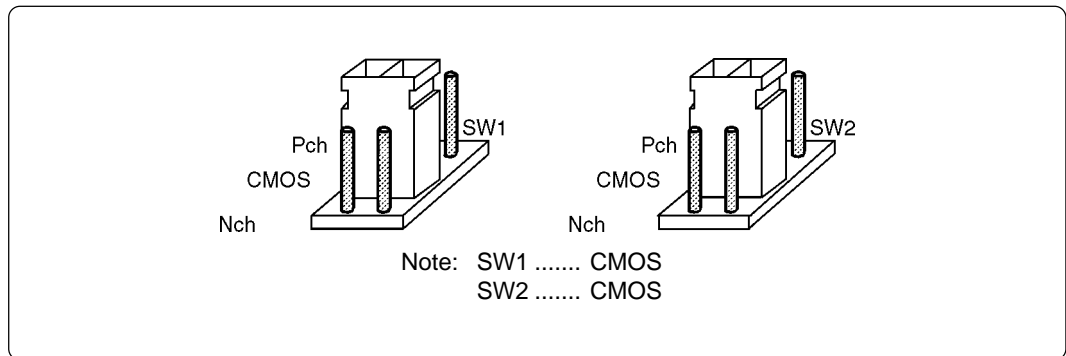


Figure 4.2 Jumper switch settings

#### 4.4 Inserting an MCU into the Programming 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 PCA7430 (same for the PCA7431).

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

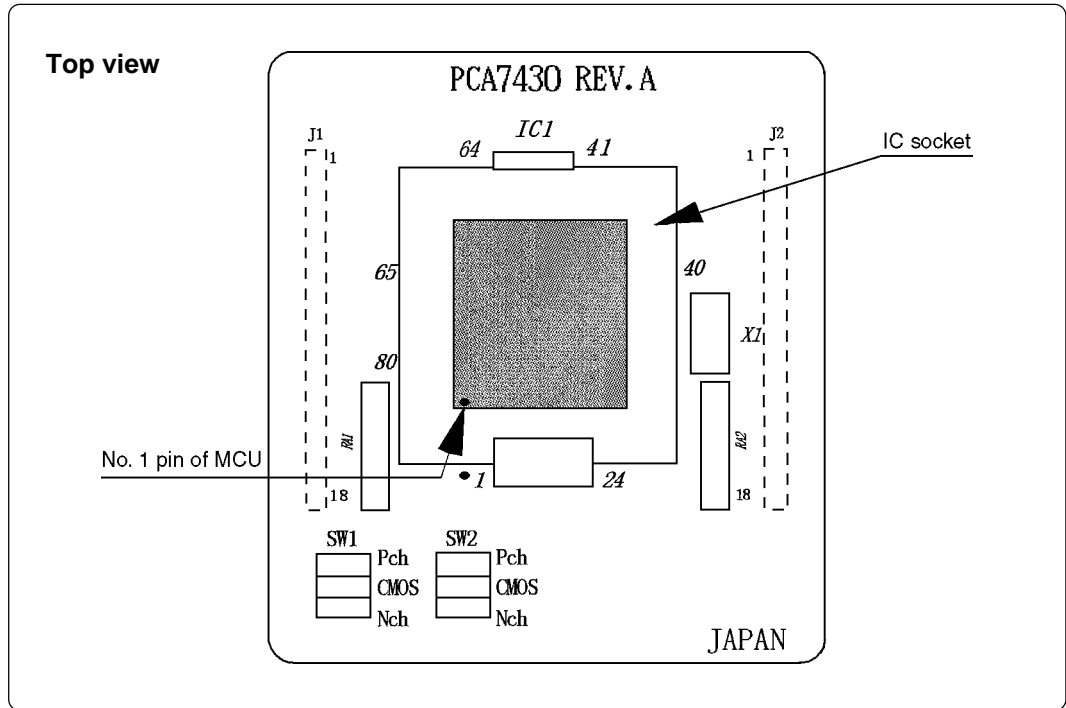


Figure 4.3 Inserting an MCU

#### 4.5 Precautions When Opening and Closing the IC Socket

When opening and closing the IC socket, hold the adapter horizontally as shown in Figure 4.4. Otherwise the inside of the IC socket may become damaged and cause an electrical insulation failure.

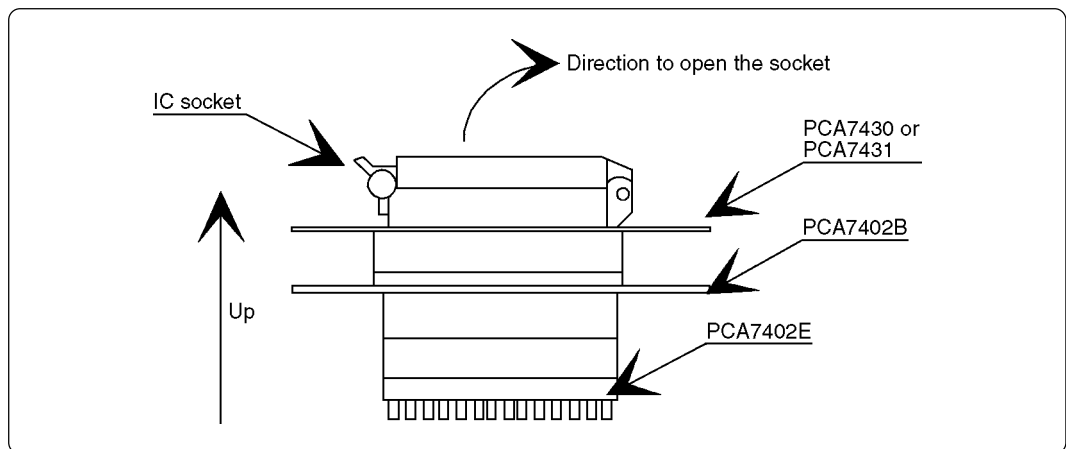


Figure 4.4 Holding the adapter in a horizontal position

## 4.6 Precautions When Handling the Adapter

Do not touch the connector in the IC socket and the pins on the PROM programmer connector, otherwise it 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 a 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 4.2 Programming area

MCU type		ROM capacity	PROM programmer		Programming area of MCU
MCU	Example		Device	Programming area	
M376xxE2	Presently not available	About 8 KB	M5M27C101	E080 <sub>16</sub> -FFFB <sub>16</sub>	E080 <sub>16</sub> -FFFB <sub>16</sub>
M376xxE3		About 12 KB		D080 <sub>16</sub> -FFFB <sub>16</sub>	D080 <sub>16</sub> -FFFB <sub>16</sub>
M376xxE4	M37630E4FP/FS	About 16 KB		C080 <sub>16</sub> -FFFB <sub>16</sub>	C080 <sub>16</sub> -FFFB <sub>16</sub>
M376xxE5	Presently not available	About 20 KB		B080 <sub>16</sub> -FFFB <sub>16</sub>	B080 <sub>16</sub> -FFFB <sub>16</sub>
M376xxE6		About 24 KB		A080 <sub>16</sub> -FFFB <sub>16</sub>	A080 <sub>16</sub> -FFFB <sub>16</sub>
M376xxE7		About 28 KB		9080 <sub>16</sub> -FFFB <sub>16</sub>	9080 <sub>16</sub> -FFFB <sub>16</sub>
M376xxE8		About 32 KB		8080 <sub>16</sub> -FFFB <sub>16</sub>	8080 <sub>16</sub> -FFFB <sub>16</sub>
M376xxE9		About 36 KB		7080 <sub>16</sub> -FFFB <sub>16</sub>	7080 <sub>16</sub> -FFFB <sub>16</sub>
M376xxEA		About 40 KB		6080 <sub>16</sub> -FFFB <sub>16</sub>	6080 <sub>16</sub> -FFFB <sub>16</sub>
M376xxEB		About 44 KB		5080 <sub>16</sub> -FFFB <sub>16</sub>	5080 <sub>16</sub> -FFFB <sub>16</sub>
M376xxEC		About 48 KB		4080 <sub>16</sub> -FFFB <sub>16</sub>	4080 <sub>16</sub> -FFFB <sub>16</sub>
M376xxED		About 52 KB		3080 <sub>16</sub> -FFFB <sub>16</sub>	3080 <sub>16</sub> -FFFB <sub>16</sub>
M376xxEE		About 56 KB		2080 <sub>16</sub> -FFFB <sub>16</sub>	2080 <sub>16</sub> -FFFB <sub>16</sub>
M376xxEF	About 60 KB	1080 <sub>16</sub> -FFFB <sub>16</sub>		1080 <sub>16</sub> -FFFB <sub>16</sub>	

Note: The MCUs shown above are examples. Therefore, some MCUs may not be available at the moment.

## 5. Recommended PROM Programmers

The PROM programmers listed in Table 5.1 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 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 name	Programming voltage (Vpp)
Advantest	R4944A	M5M27C101 mode	12.5 V
	R4945		
	R4945A		

# 6. Memory Maps

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

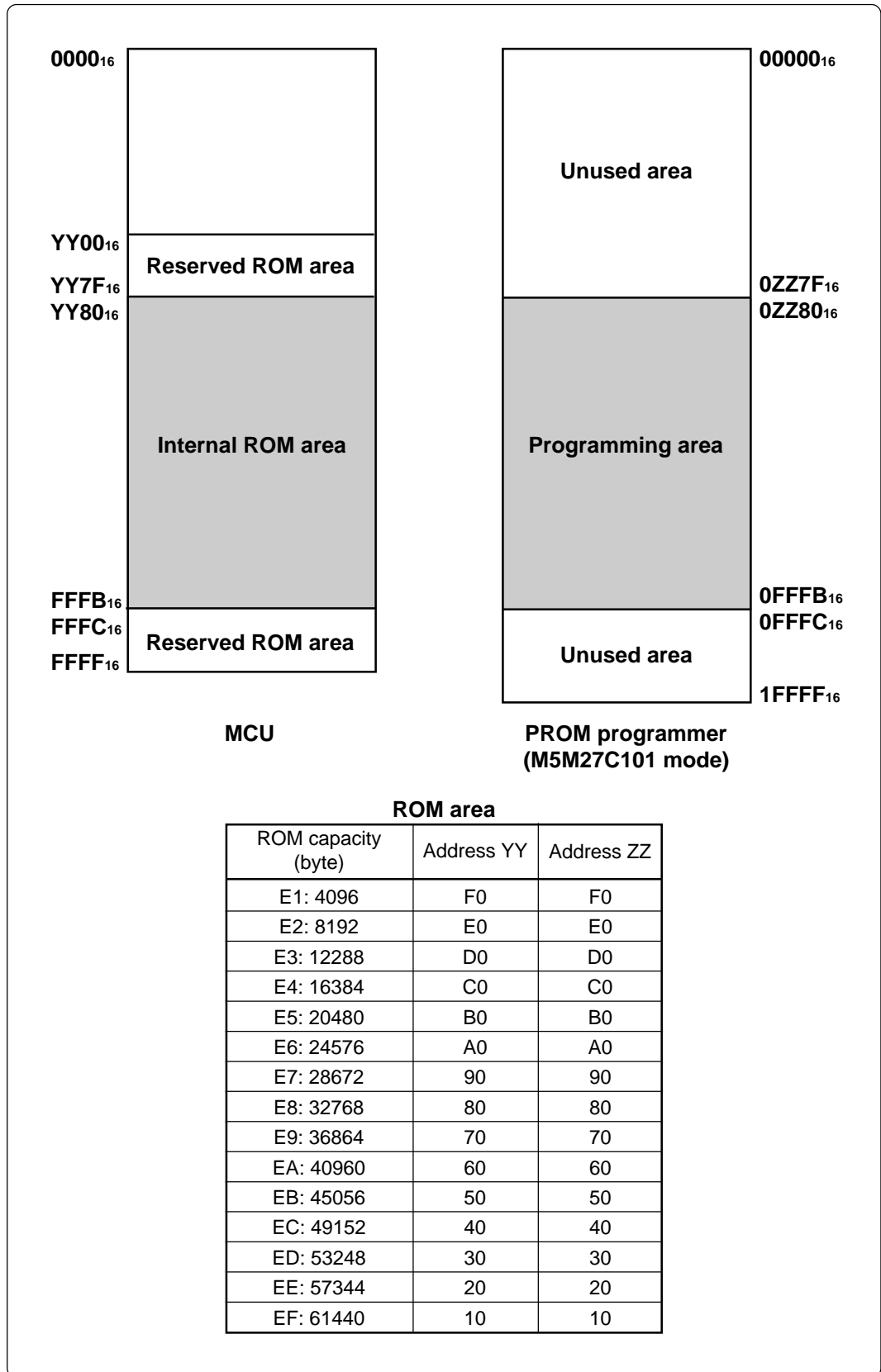


Figure 6.1 Memory maps

## 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



# PCA7430/PCA7431 User's Manual

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User's Manual



Renesas Electronics Corporation

1753, Shimonumabe, Nakahara-ku, Kawasaki-shi, Kanagawa 211-8668 Japan

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