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# H8/300H Tiny Series

## Dedicating an I/O Port for Input

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### Introduction

This document describes how to connect a switch to P11 and store the status of P11 in RAM.

### Target Device

H8/300H Tiny Series H8/36014 CPU

### Contents

1. Specifications .....	2
2. Description of Functions .....	3
3. Description of Operation .....	4
4. Description of Software .....	5
5. Flowchart.....	6
6. Program Listing.....	7

### 1. Specifications

- As shown in Figure 1, connect a switch to P11.
- When the switch is turned off, the status of P11 is "Low". When the switch is turned on, the status of P11 is "High".
- The H8/3664 reads the status of P11 and stores it in RAM.

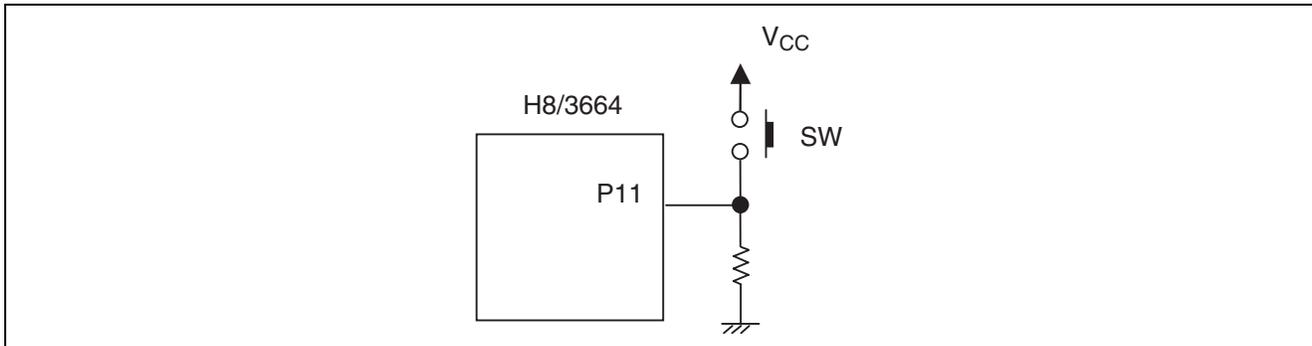
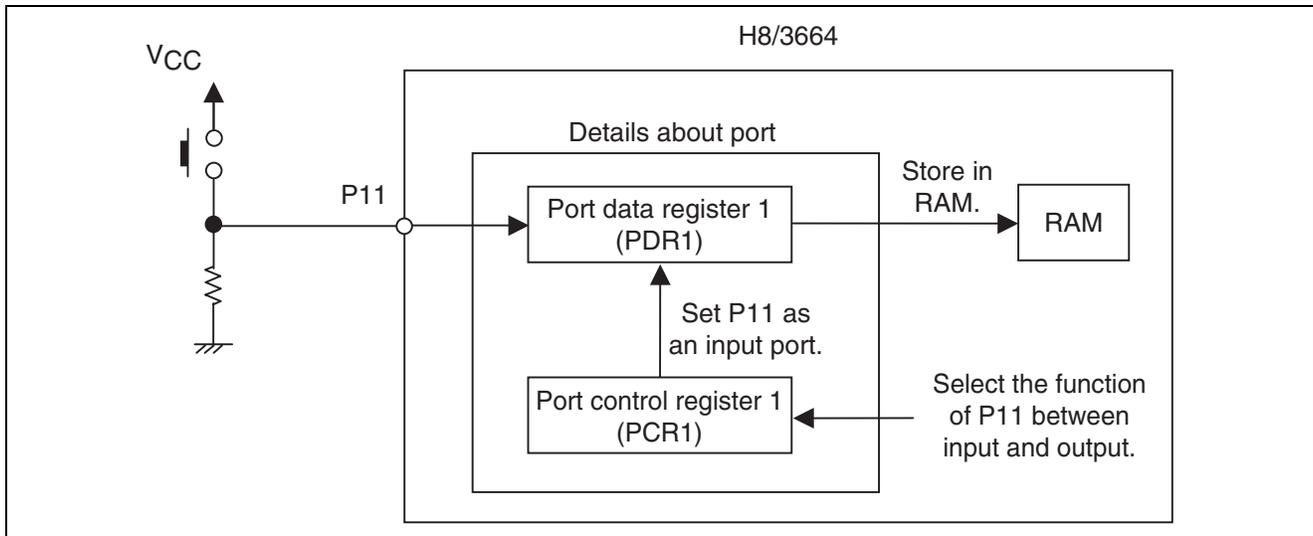


Figure 1 Example of Connecting a Switch to an I/O Pin

### 2. Description of Functions

This task describes how to connect a switch to P11 and store the status of P11 in RAM. Figure 2 shows the block diagram of the I/O port.

- Port control register 1 (PCR1)  
Used to set the function of port 1 between input and output. In this task, P11 is set to an input port.
- Port data register 1 (PDR1)  
Port 1 is the I/O port data register. In this task, the status of the pin is read when this register is read.



**Figure 2 Block Diagram of an I/O Port**

Table 1 shows the details about each function of the registers. The functions (registers) allow the status of P11 to be stored in RAM.

**Table 1 Details about the Functions**

Register	Description
PCR1	Used to set P11 as an input port.
PDR1	Stores the status of P11.

### 3. Description of Operation

Figure 3 shows the operation. As shown in Figure 3, the status of P11 is stored in RAM through software processing.

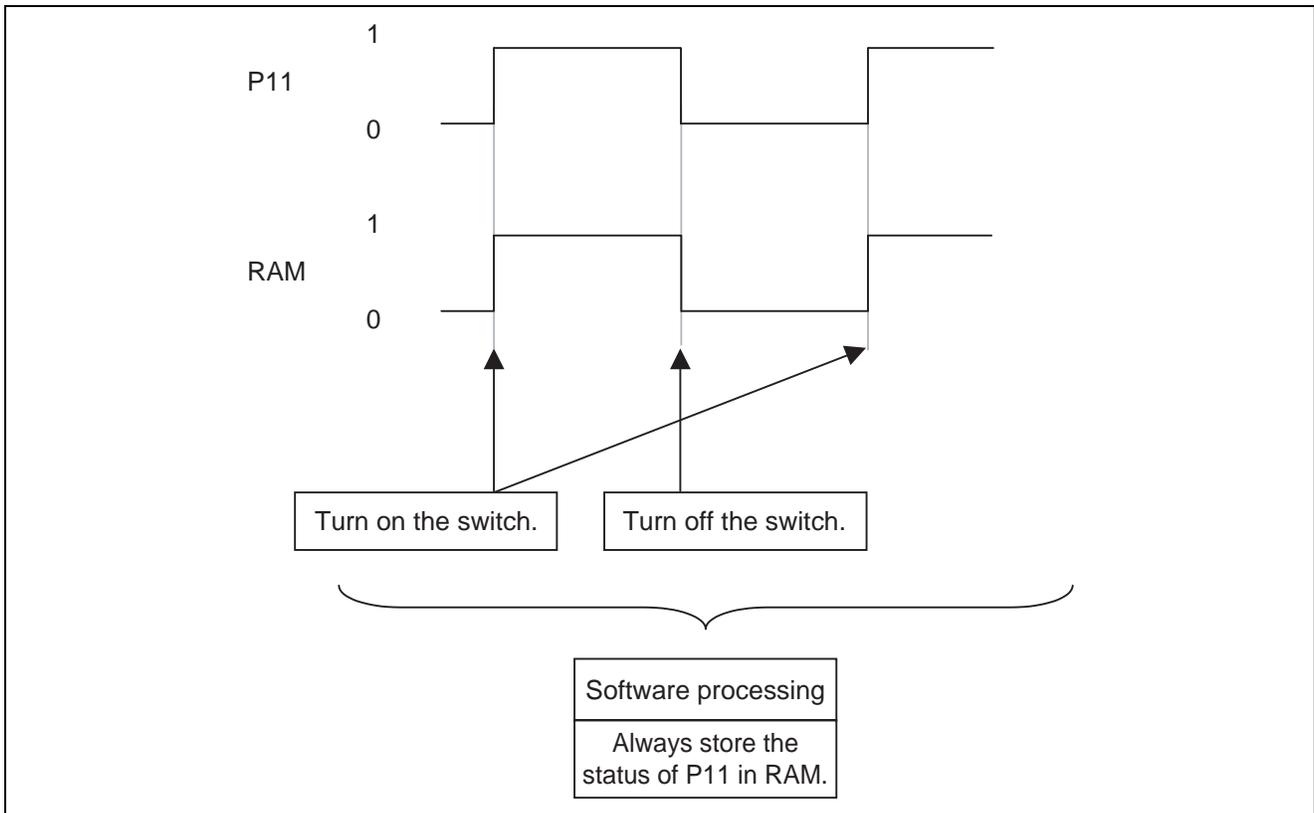


Figure 3 Operation

## 4. Description of Software

### 4.1 About the module

Table 2 lists the module used in this task.

**Table 2 Description about the Module**

Module	Label	Description
Main routine	main	Sets port 1, reads the status of P11, and stores it in RAM.

### 4.2 About the Arguments

No arguments are used in this task.

### 4.3 About the Registers

The following registers are used in this task.

- PCR1 (port control register 1) address: H'FFE4

Bit	Bit name	Set value	Description
1	PCR11	0	Used to select the function of port 1 between input and output. PCR11 = 0: P11 functions as an input port. PCR11 = 1: P11 functions as an output port.

- PDR1 (port data register 1) address: H'FFD4

Bit	Bit name	Set value	Description
1	P11	—	Input data P11 = 0: The status of P11 is "Low". P11 = 1: The status of P11 is "High".

### 4.4 About RAM

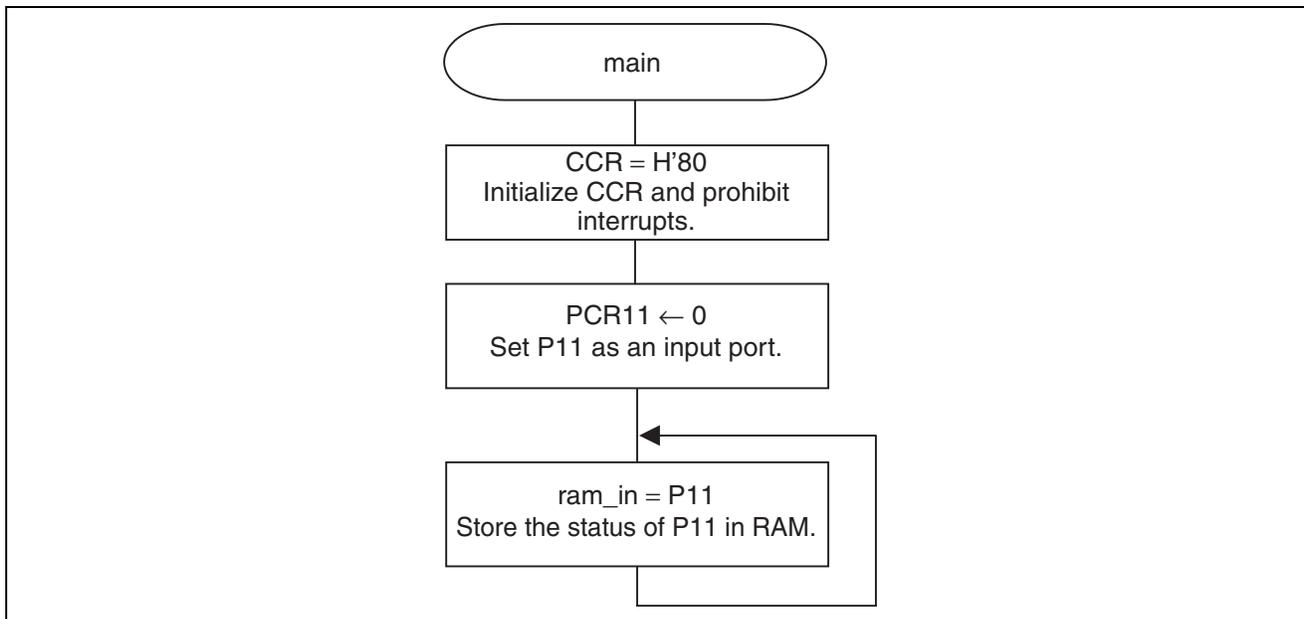
Table 3 shows how RAM is used in this task.

**Table 3 Description about RAM**

Label	Description	Required memory size	Used by:
ram_in	Stores the status of P11.	One byte	Main routine

### 5. Flowchart

#### 5.1 Main routine



- Specified Link Addresses

Section	Address
CV1	H'0000
P	H'0100
B	H'FB80

## 6. Program Listing

```

/*****/
/*
/* H8/300HN Series -H8/3664-
/* Application Note
/*
/* 'I/O input'
/*
/* Function
/* : I/O Port
/*
/*
/* External Clock : 16MHz
/* Internal Clock : 16MHz
/* Sub Clock      : 32.768kHz
/*
/*****/

#include <machine.h>

/*****/
/* Symbol Definition
/*****/
struct BIT {
    unsigned char  b7:1;      /* bit7 */
    unsigned char  b6:1;      /* bit6 */
    unsigned char  b5:1;      /* bit5 */
    unsigned char  b4:1;      /* bit4 */
    unsigned char  b3:1;      /* bit3 */
    unsigned char  b2:1;      /* bit2 */
    unsigned char  b1:1;      /* bit1 */
    unsigned char  b0:1;      /* bit0 */
};

#define PCR1_BIT    (*(struct BIT *)0xFFE4)      /* Port Control Register 1      */
#define PCR11    PCR1_BIT.b1                    /* Port Control Register 11     */
#define PDR1_BIT    (*(struct BIT *)0xFFD4)      /* Port Data Register 1         */
#define P11        PDR1_BIT.b1                  /* Port 11                       */

/*****/
/* Function define
/*****/
void main ( void );

/*****/
/* RAM define
/*****/
unsigned char ram_in;      /* RAM area */

/*****/
/* Vector Address
/*****/
#pragma section V1        /* VECTOR SECTION SET */
void (*const VEC_TBL1[])(void) = {

```

```
main
};

#pragma entry main(sp=0xFF80)
#pragma section /* P */
/*****/
/* Main Program */
/*****/
void main ( void )
{
    set_ccr(0x80); /* Initialize CCR/Interrupt Disable */

    PCR11 = 0; /* P11 set input port */

    while(1){
        ram_in = P11; /* copy P11 to RAM */
    };
}
```

### Revision Record

Rev.	Date	Description	
		Page	Summary
1.00	Dec.20.03	—	First edition issued

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