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H8/300H Tiny Series

Dedicating an I/O Port for Input

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

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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.

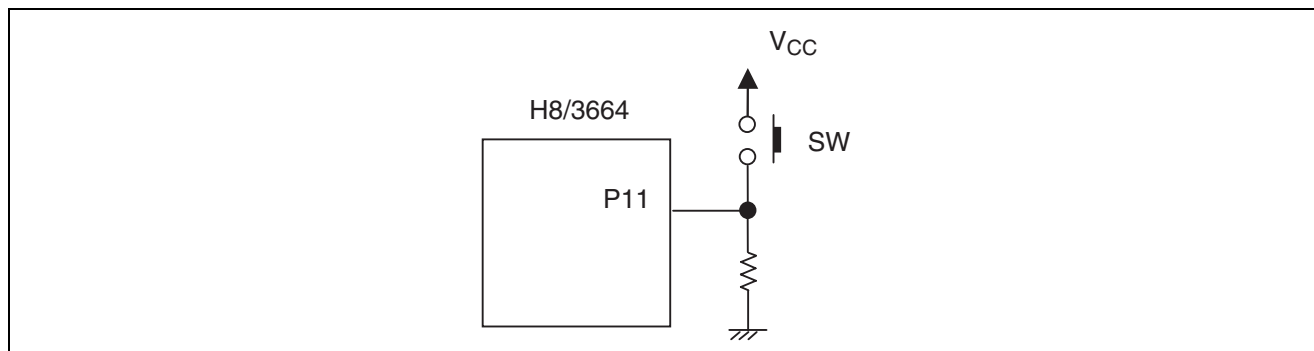


Figure 1 Example of Connecting a Switch to an I/O Pin

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.

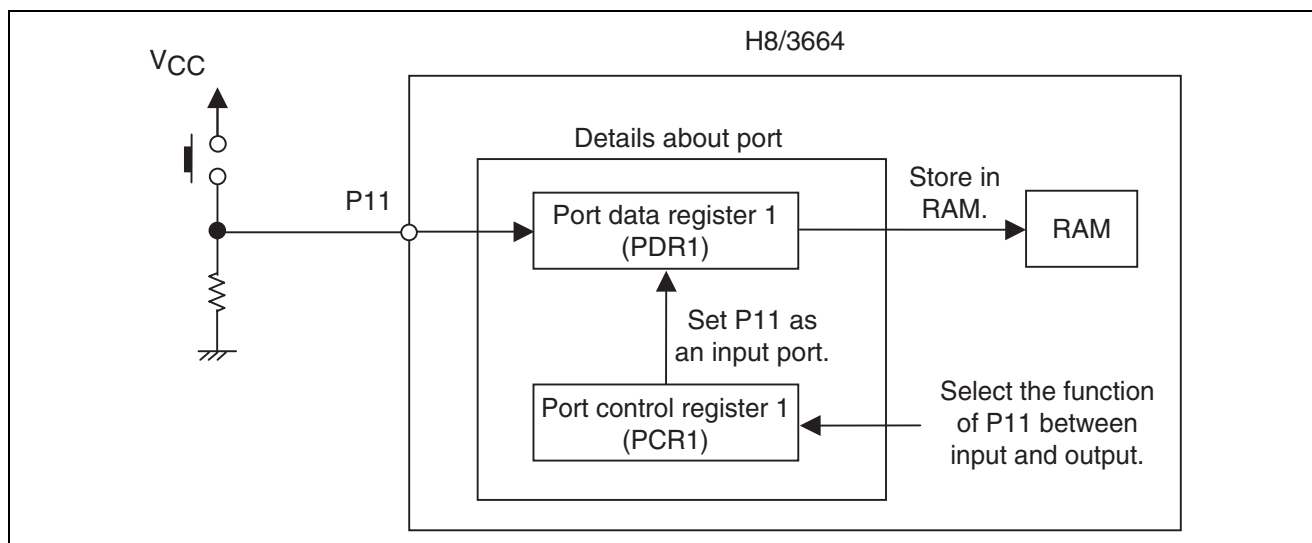


Figure 2 Block Diagram of an I/O Port

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.

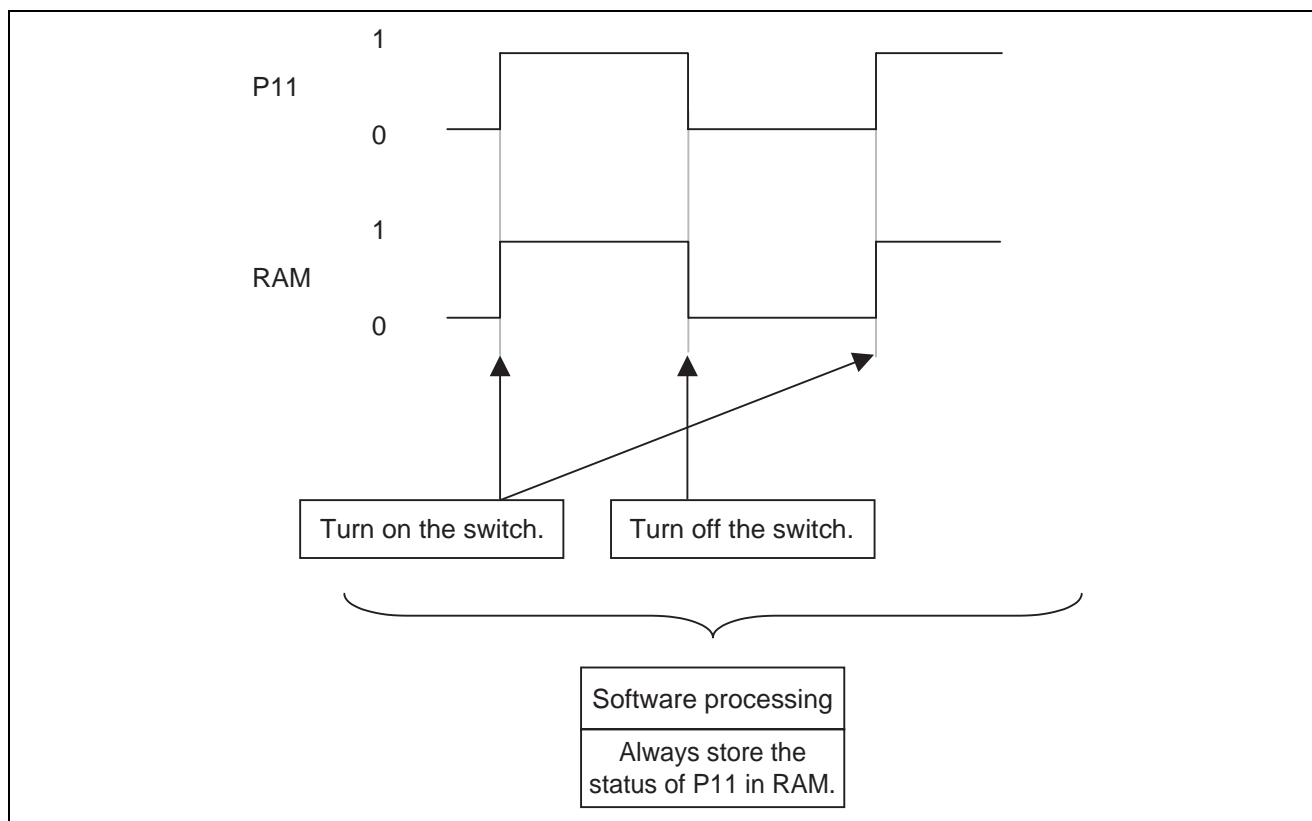


Figure 3 Operation

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

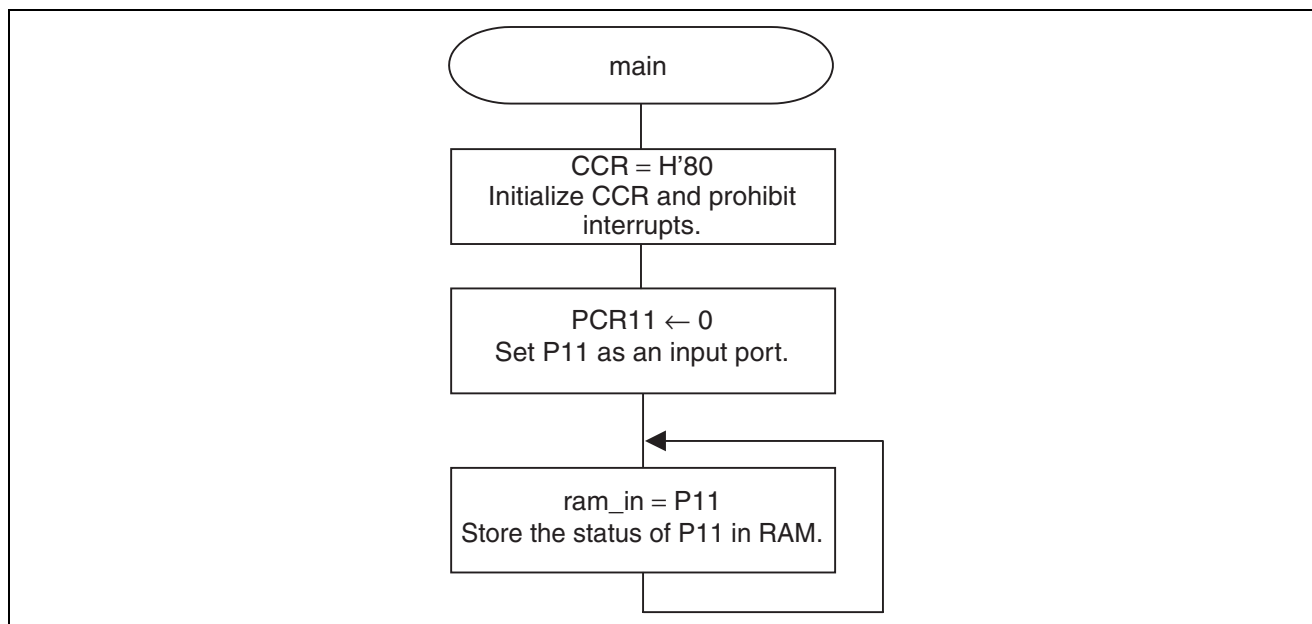
Table 3 shows how RAM is used in this task.

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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