Introduction

PES-2402

PES-2402, 4-Port Photocoupler Input board, is one of smart expansion boards for PHPoC boards. You can monitor both DRY contact and WET contact outputs from some devices by using this board.

Highlights of PES-2402

- 4 digital input ports(WET/DRY, NPN or PNP)
- Input interface: 8-pole terminal block(S type, T type)
- Input maximum voltage: DC 30[V]
- Current comsumption: approximately 30[mA]

※ Caution: A PHPoC Board is required to use this PES-2402 board!

> What is the Smart Expansion Board?
>
> A smart expansion board has own devices and firmware unlike the other expansion boards. This board communicate in a master-slave protocol through the designated port. Two or more smart expansion boards can be connected to one PHPoC board and each of them required to be setting a slave id.

Dimension

Body
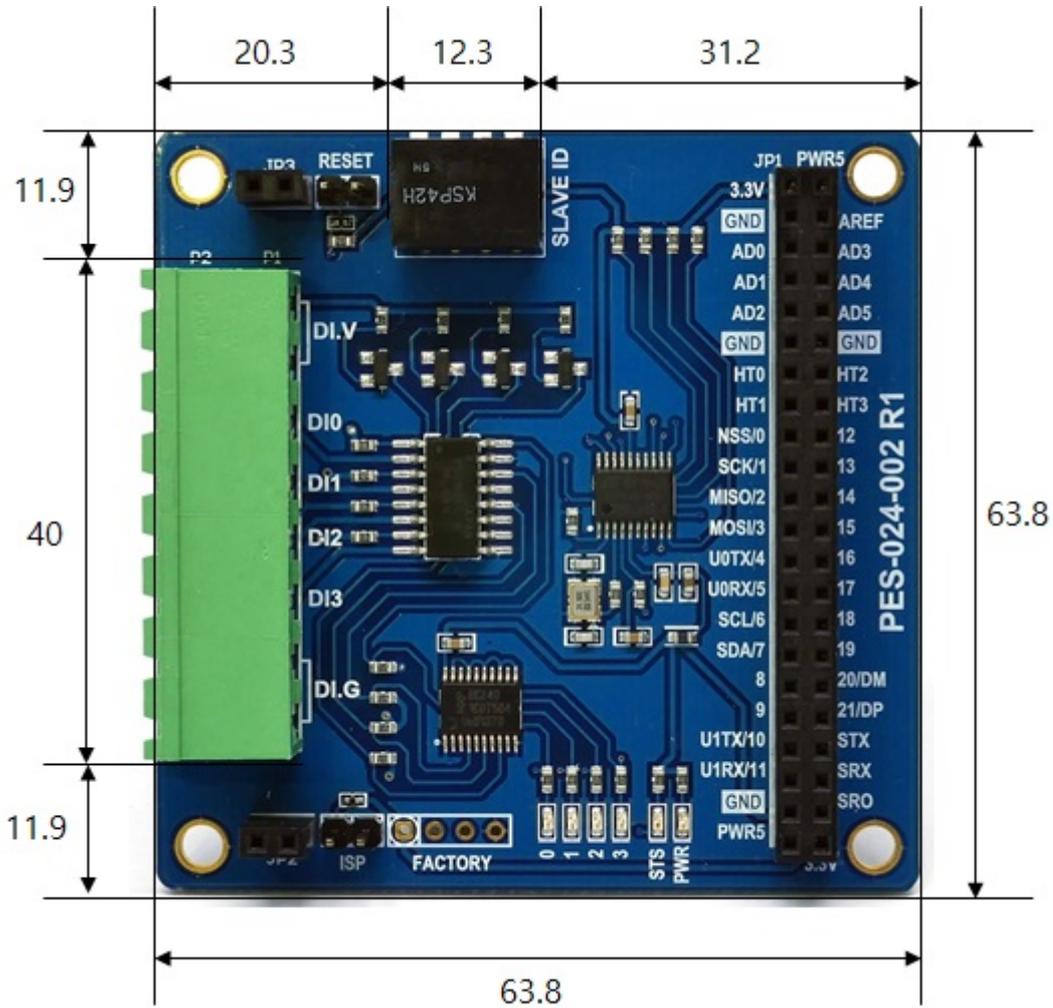
with Terminal Block (T type)
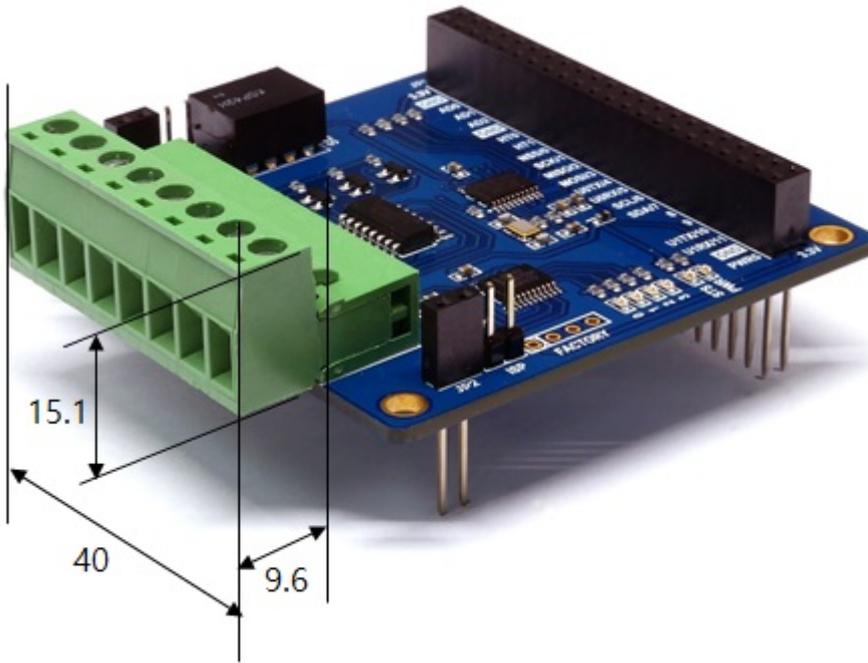
with Terminal Block (S type)
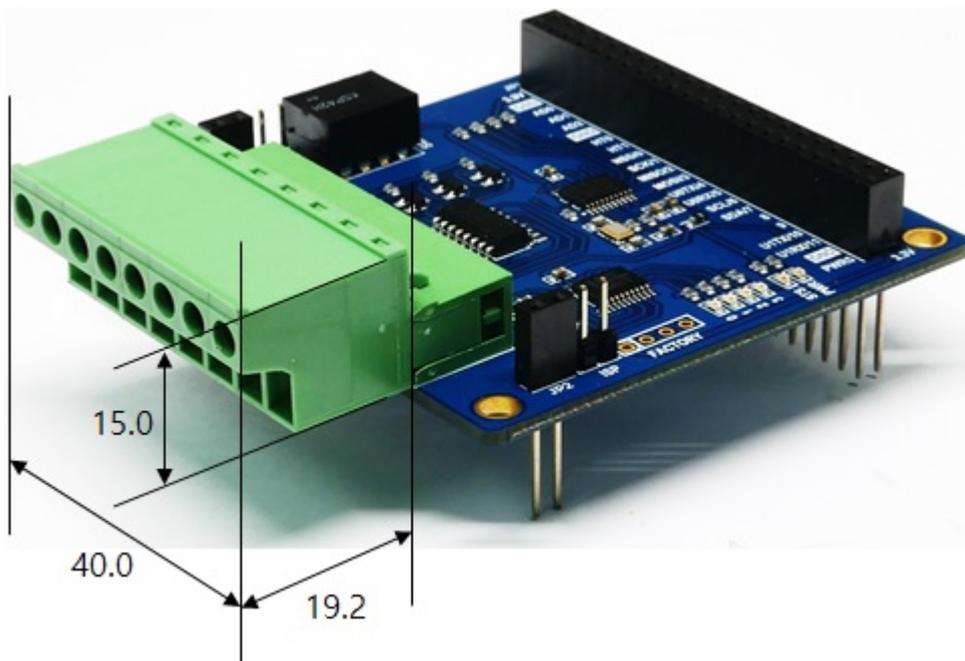
※ Dimensions(unit : mm) may vary according to a method of measurement.

Schematic

This is the schematic of PES-2402.

- PES-2402-R1-PO.pdf

Layout

② ID Switch
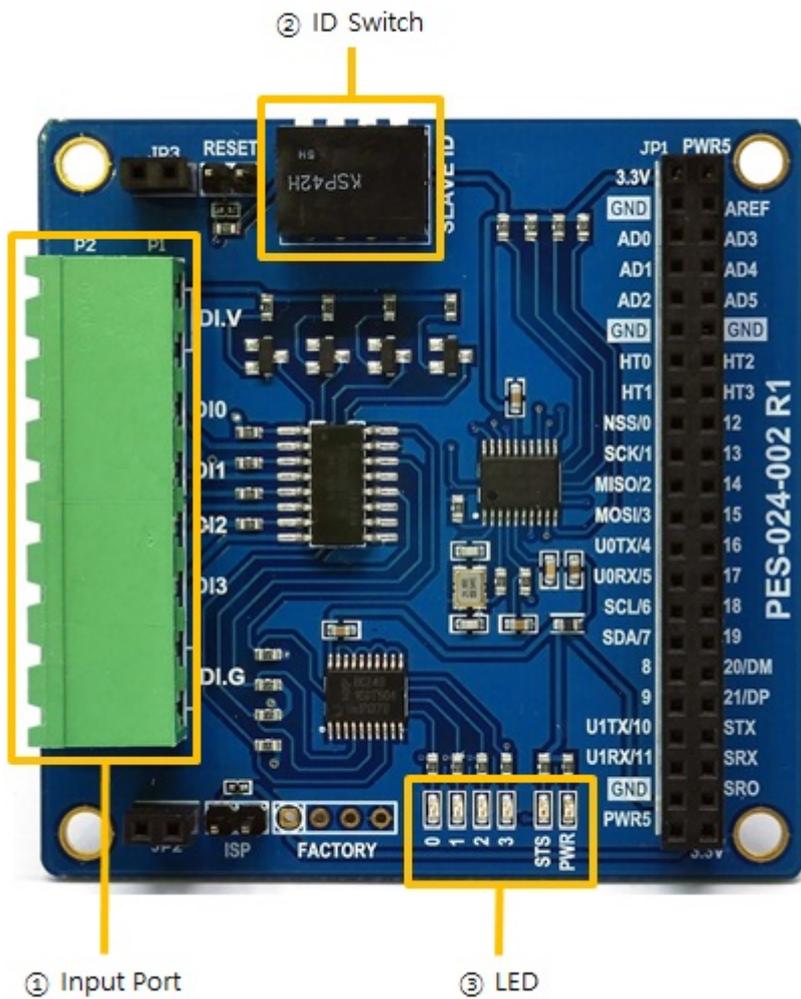
① Input Port   ③ LED

1. Input Ports

Input ports are interfaced with a 5mm spaced terminal block which has 8 terminals. Every output port is isolated by photocoupler and supports wet contact, dry contact, NPN transistor and PNP transistor input.

Circuit Diagram of Input Port
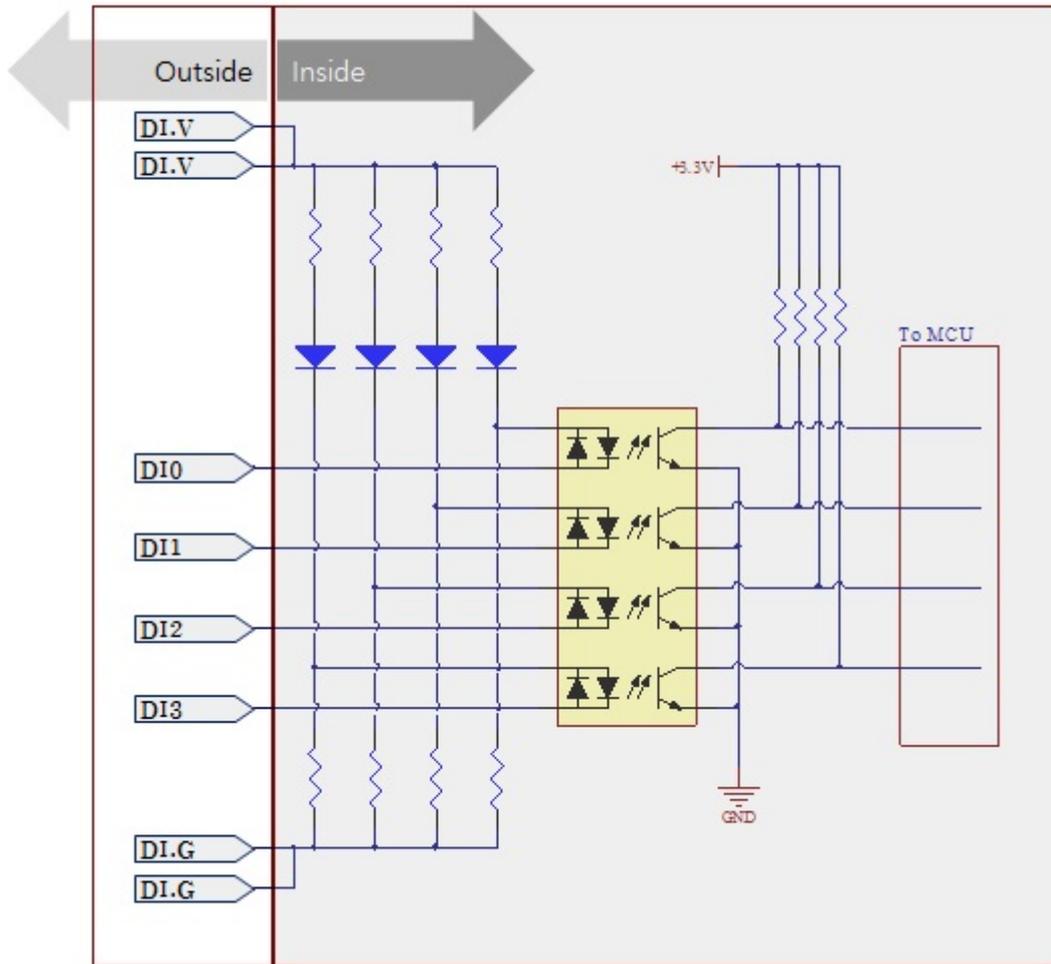
WET contact

Voltage conditions in wet contact is as follows:

division	condition
maximum DC input	DC 30V
ON	more than DC 3V
OFF	less than DC 1.5V

Refer to the following figure for connection with your device.
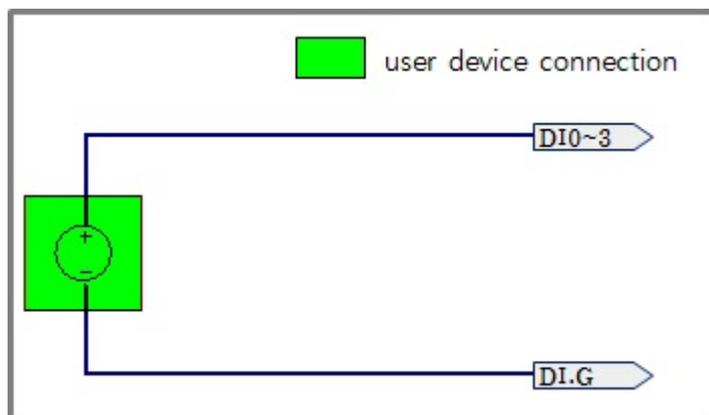
Dry contact

An input port is ON under being short circuit between the port and DI.G port in this type. It means additional power should be supplied between DI.V and DI.G. Refer to the following figure for connection with your device.
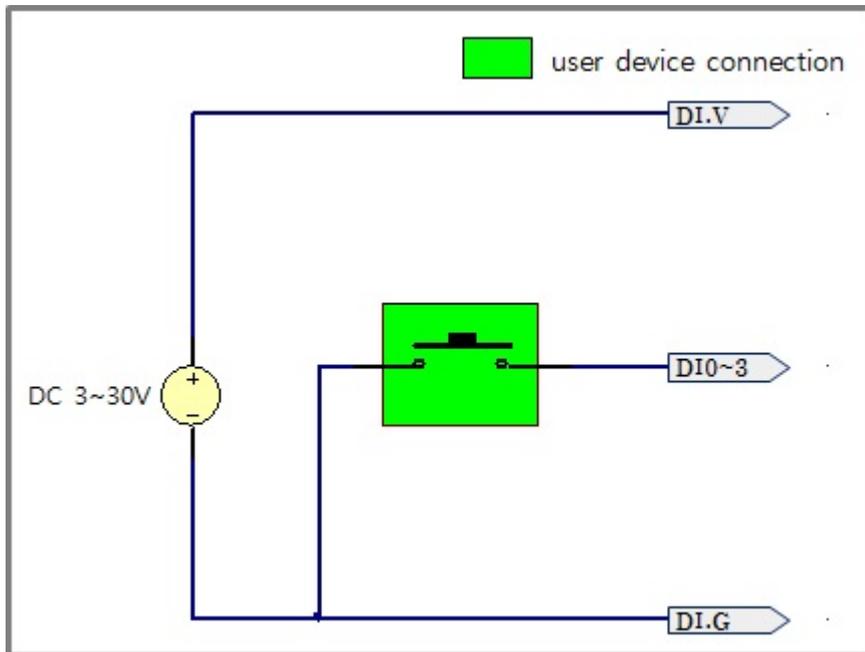
NPN Transistor Connection

Refer to the following figure for connection with an NPN transistor.
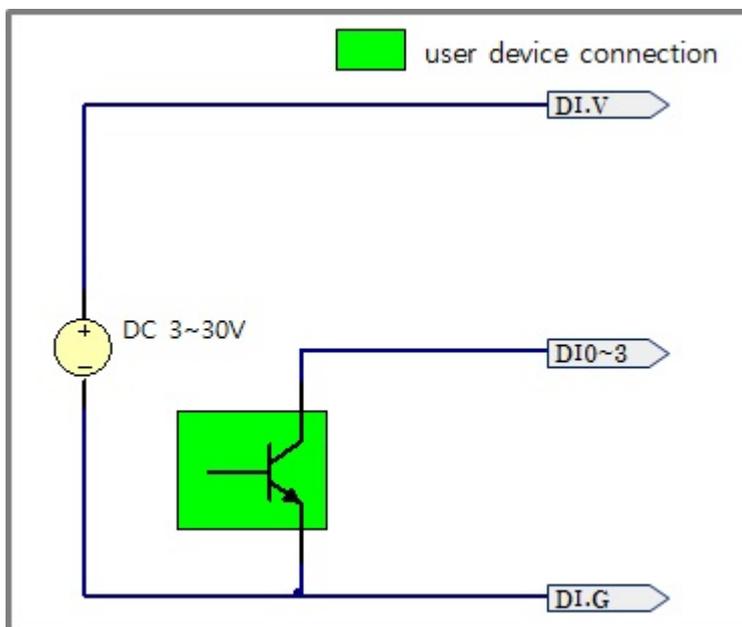
PNP Transistor Connection

Refer to the following figure for connection with a PNP transistor.
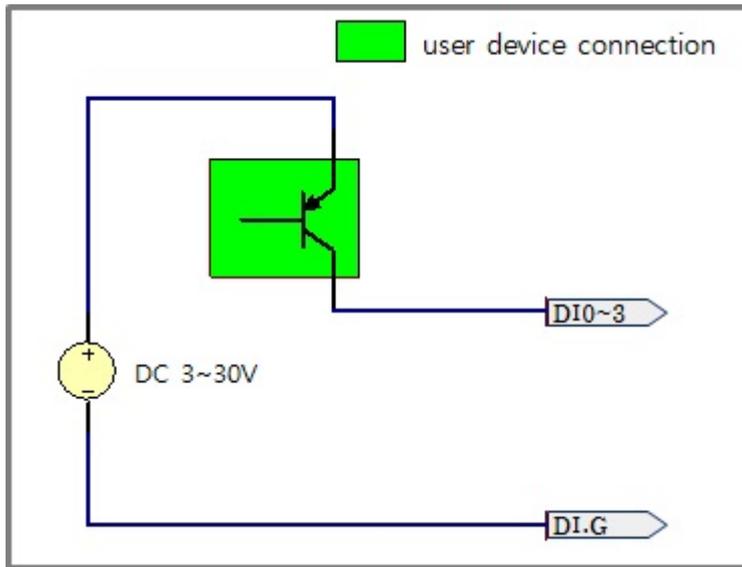
2. Slave ID Switch

The slave ID is used when PHPoC board, which is called master, identifies each smart expansion board. Each smart expansion board, which is connected to one PHPoC board, should have a unique slave ID. The slave ID can be set one of the numbers from 1 to 14 by 4 DIP switches as follows:
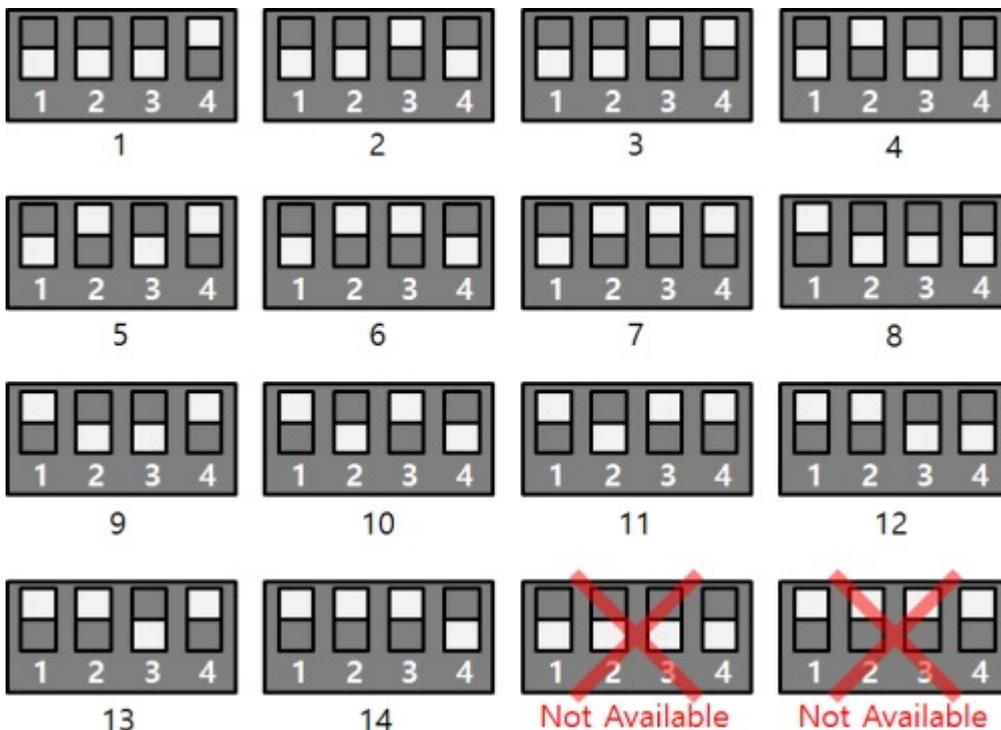
3. LED

PES-2402 has 6 on-board LEDs.

LED	Description
PWR	turned ON with stable power supply
STS	setting a valid slave ID > repeat On/Off in every second setting an invalid slave ID > blinks fast without communication with PHPoC > Off
0	turned ON with detecting input 0 is ON
1	turned ON with detecting input 1 is ON
2	turned ON with detecting input 2 is ON
3	turned ON with detecting input 3 is ON

How to Use

PES-2402 can be used by steps as follows.

1. Connect to a PHPoC board

It is not possible to use PES-2402 alone. Please be sure that connection to a PHPoC board is required.

2. Install Software (IDE)

PHPoC Debugger is a software which is used for configuring PHPoC products and developing PHPoC script. It is requried to install this software on your PC because PES-2402 must be controlled by PHPoC.

- PHPoC Debugger Download Page
- PHPoC Debugger Manual Page

3. Use SPC Library and Sample Codes

The SPC library is for smart expansion boards such as PES-2402. This library makes it easy for you to use smart expansion boards. Refer to the manual page of SPC library for more information.

- SPC Library Manual Page

Commands

You can use spc_request_dev or spc_request_sys function of the SPC library when setting or using a smart expansion board.

> spc_request_dev($sid, $cmd)
> spc_request_sys($sid, $cmd)

- $sid: a slave ID
- $cmd: a command string

Common Commands of Smart Expansion Boards

The commands commonly supported by all smart expansion boards use the spc_request_sys function.
The following is a list of smart expansion board common commands.

Command	Option	Description
get	did	get a device ID
get	uid	get a unique ID

PES-2402 Commands

The commands that apply to each smart expansion board use the spc_request_dev function.
The following is a list of commands supported by the PES-2402.

Command	Option	Description
set	$port delay $time	set a delay time on a specified port
get	$port input	get status of a specified port

- $time : delay time(1 ~ 30,000, unit : millisecond)
- $port : an input port(0 ~ 3)

"set ~ delay" command

If the input signal level changes but does not be maintained for the specified delay time, PES-2402 will ignore it. The unit is milliseconds and the setting range is 1 to 30,000. If set to zero, the minimum value is applied. This command takes effect until the another "set delay" command for the same port is run.

This command is designed to avoid impact of the chattering phenomenon. This phenomenon happens when a manual switch repeatedly turns on and off in a short time because of vibration of the contact. This may cause malfunction in some kind of application.

Chattering
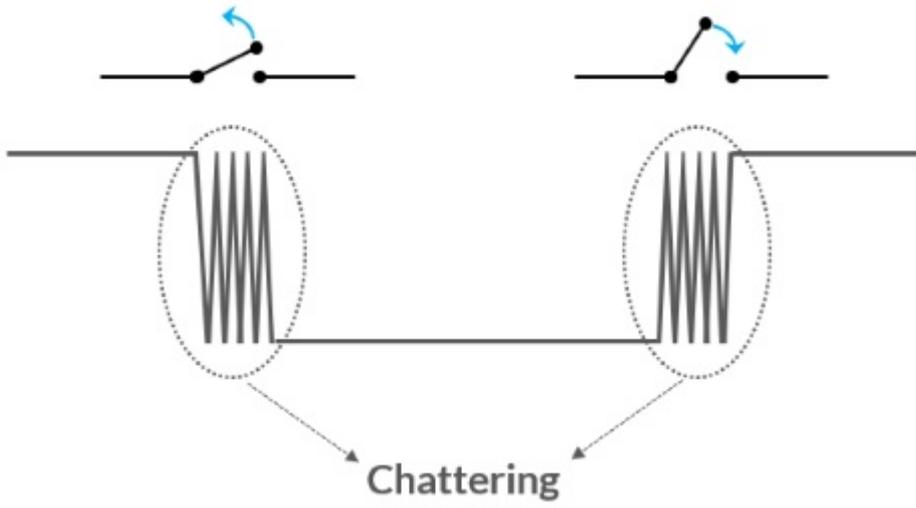
Monitoring Input Ports

Calling spc_request_dev function for monitoring input ports

```
spc_request_dev($sid, $cmd);
```

- $sid : a slave ID
- $cmd : a command string

Structure of a command string is as follows:

```
"get $port input"
```

- $port : an index number of an input port, 4 numbers from 0 to 3 are available

Return Value

The normal return value is in string form and is as follows:

value	description
0	OFF
1	ON

Example

```php
<?php
include "/lib/sd_spc.php";
spc_reset();
spc_sync_baud(115200);
$sid = 1;

// get status of input ports
echo "Port 0: ", spc_request_dev($sid, "get 0 input"), "\r\n";
echo "Port 1: ", spc_request_dev($sid, "get 1 input"), "\r\n";
echo "Port 2: ", spc_request_dev($sid, "get 2 input"), "\r\n";
echo "Port 3: ", spc_request_dev($sid, "get 3 input"), "\r\n";
?>
```

output (example)

```
Port 0: 0
Port 1: 1
Port 2: 0
```

Port 3: 1