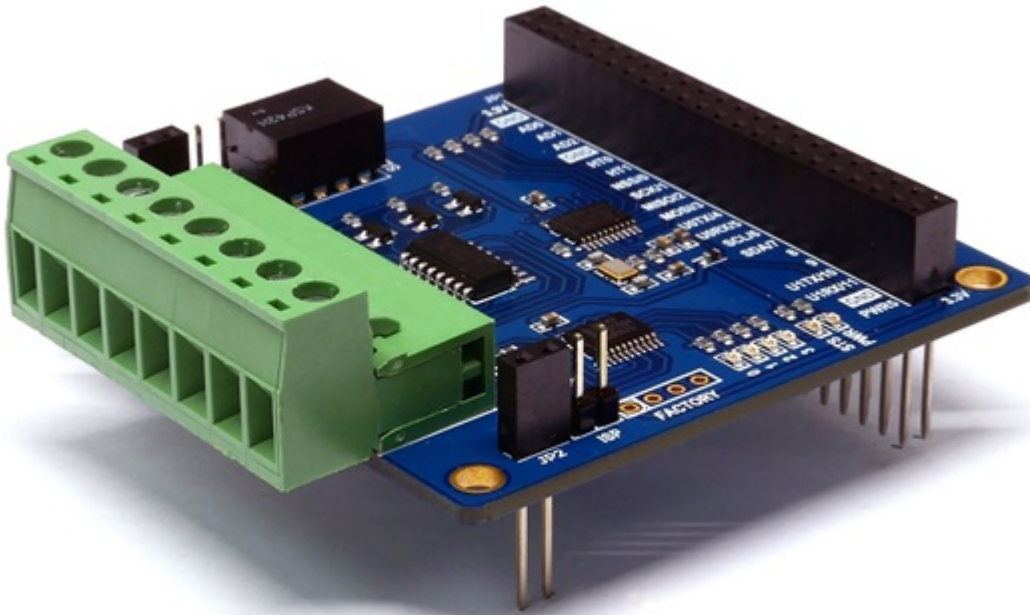


Introduction



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.

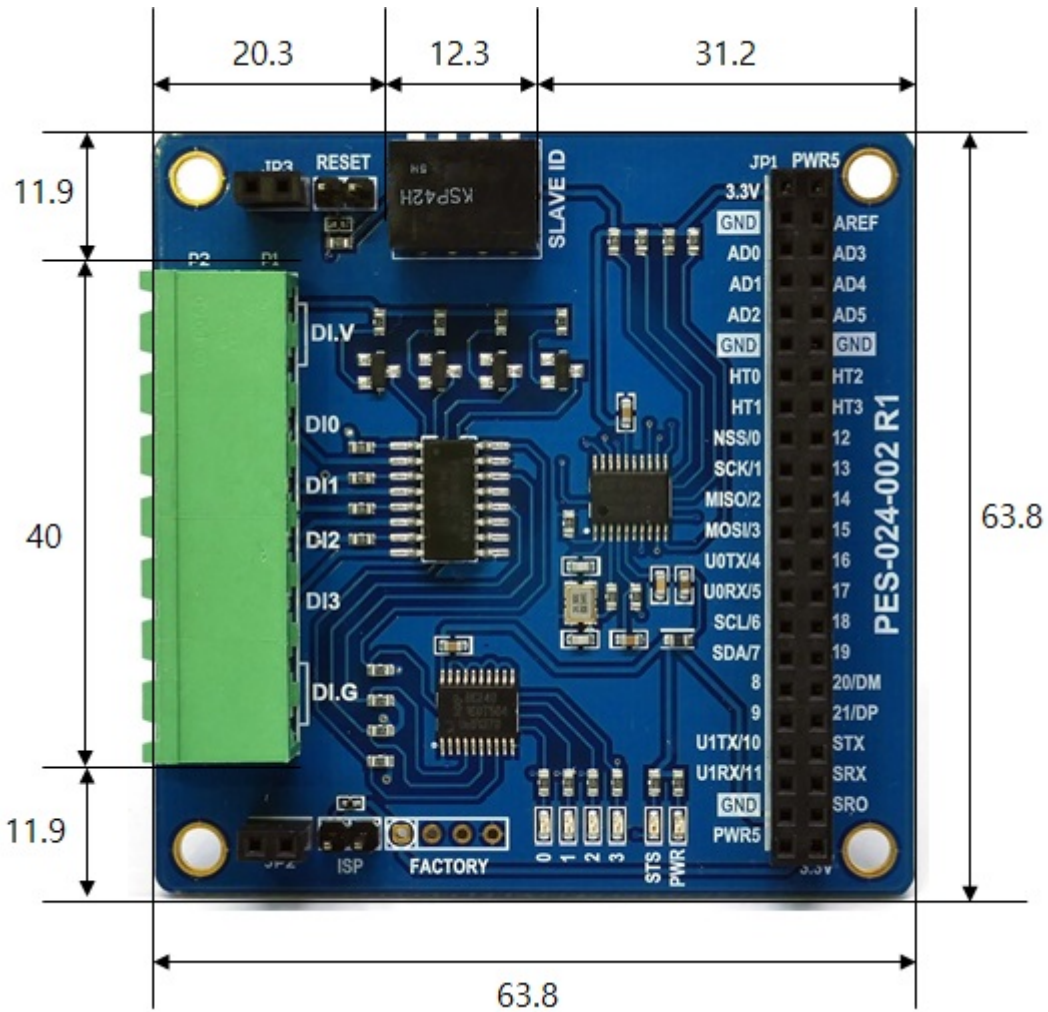
※ Caution: A PHPoC Board is required to use this PES-2402 board!

What is the Smart Expansion Board?

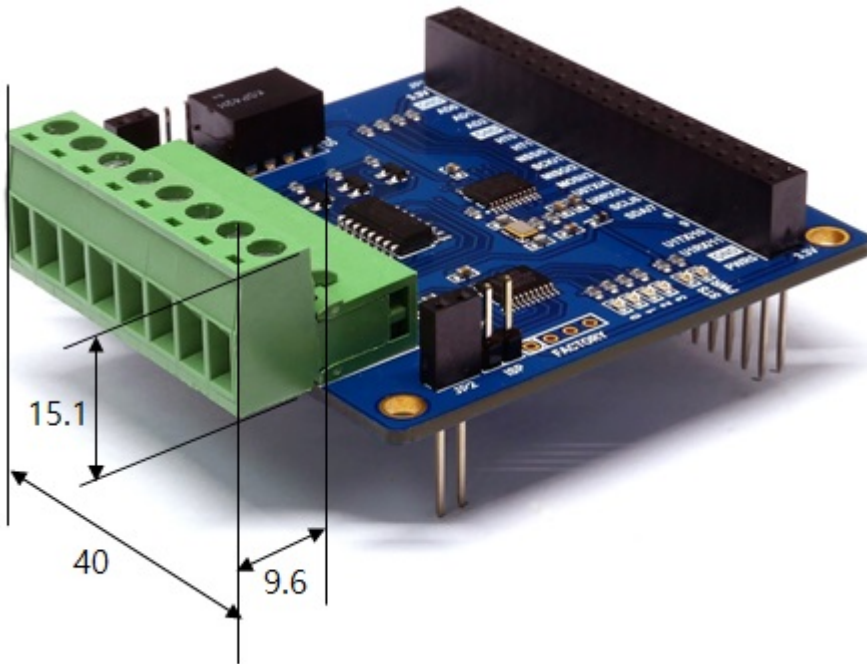
A smart expansion board has own devices and firmware unlike the other expansion boards. This board communicate in a master-slave protocol through the designated port. Two or more smart expansion boards can be connected to one PHPoC board and each of them required to be setting a slave id.

Dimension

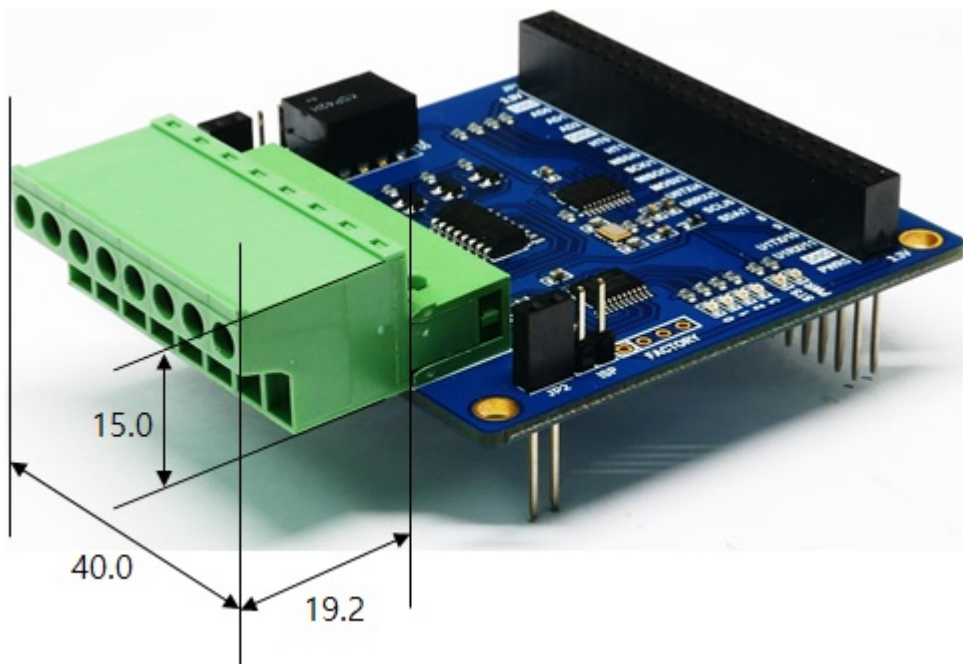
Body



with Terminal Block (T type)

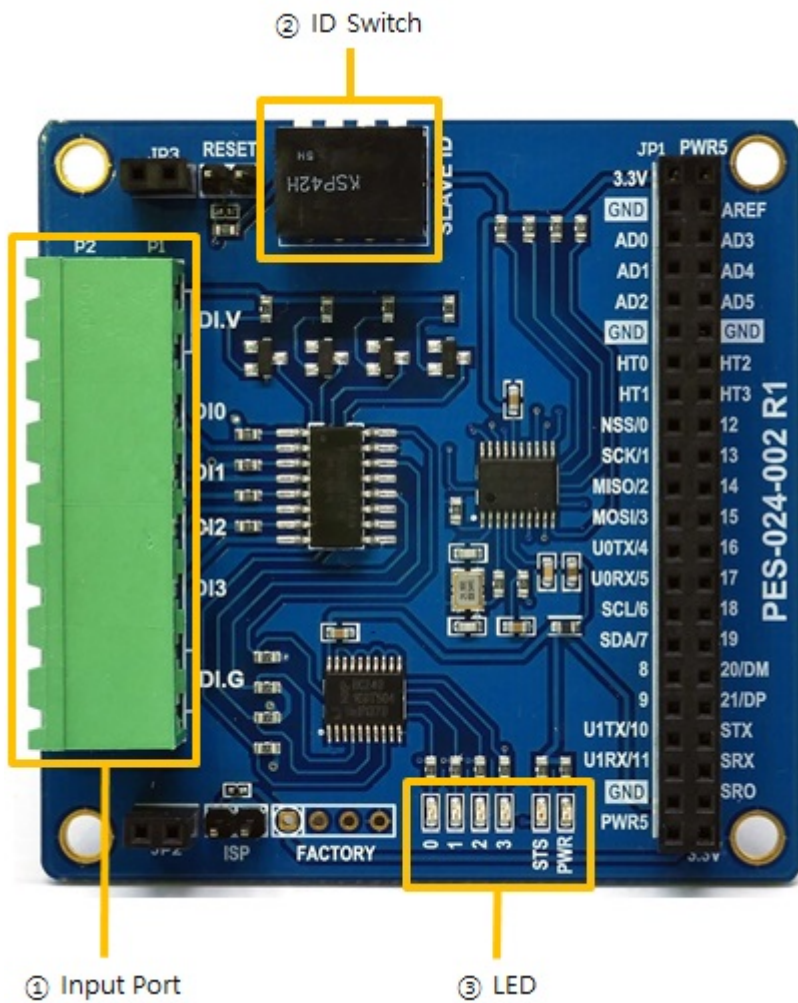


with Terminal Block (S type)



※ Dimensions(unit : mm) may vary according to a method of measurement.

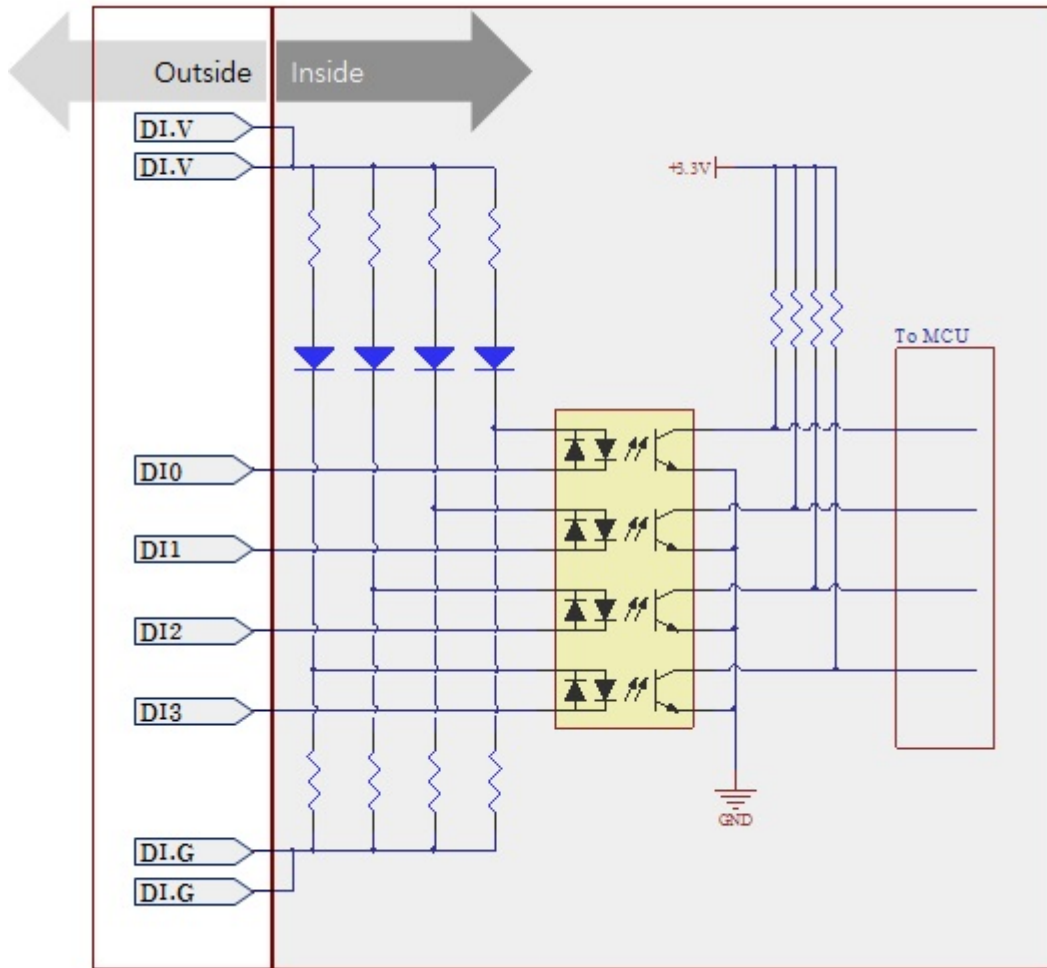
Layout



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

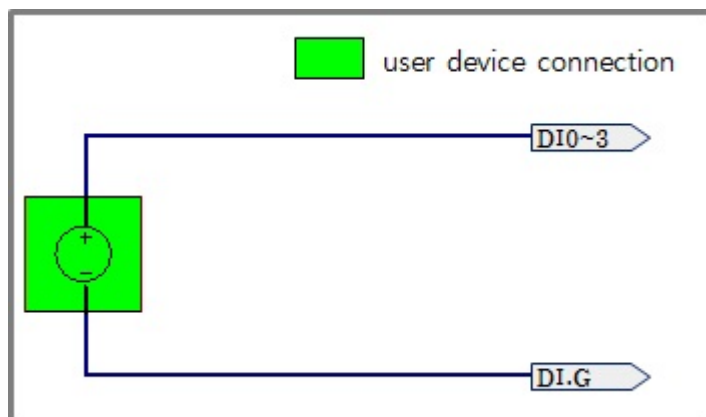


WET contact

Voltage conditions in wet contact is as follows:

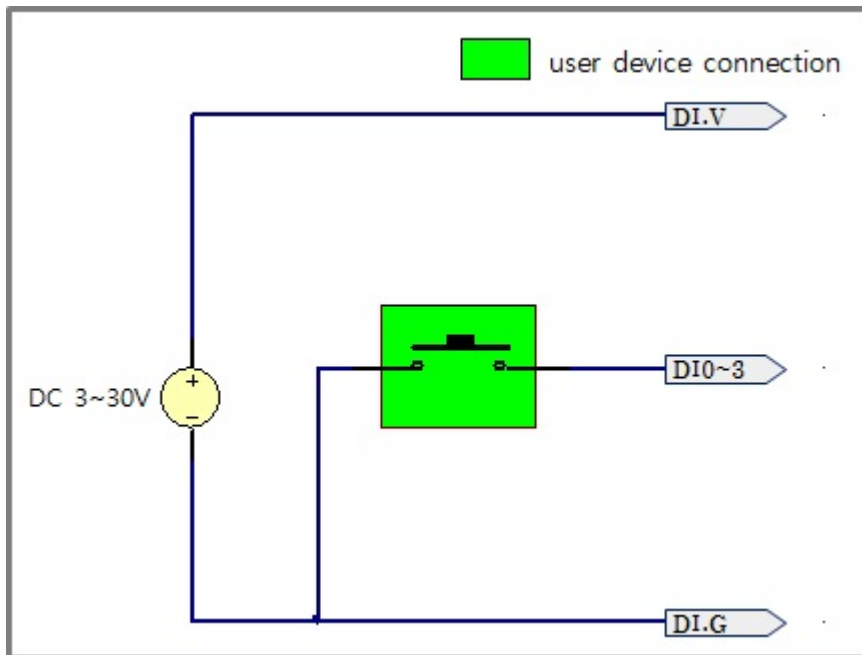
division	condition
maximum DC input	DC 30V
ON	more than DC 3V
OFF	less than DC 1.5V

Refer to the following figure for connection with your device.



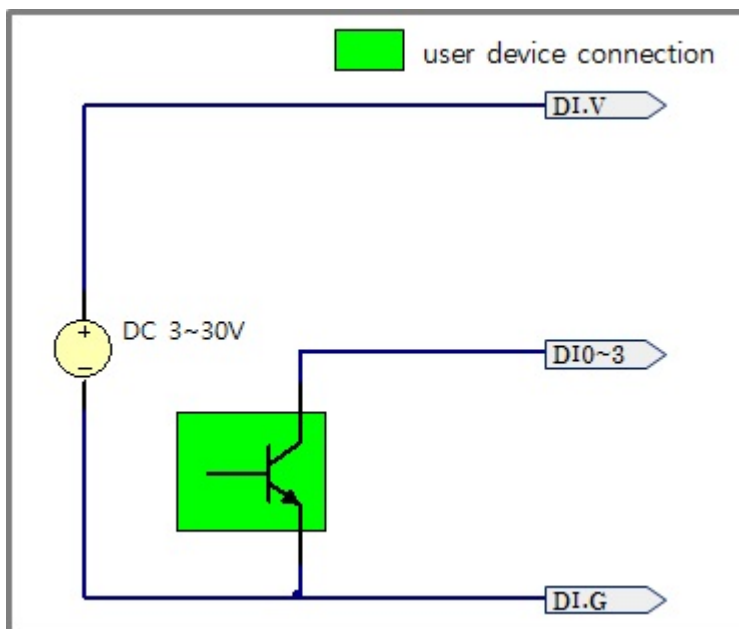
Dry contact

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.



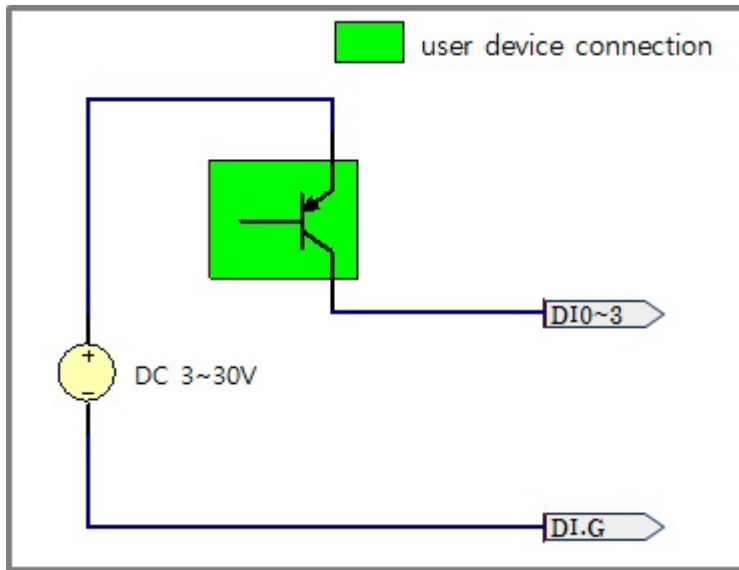
NPN Transistor Connection

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



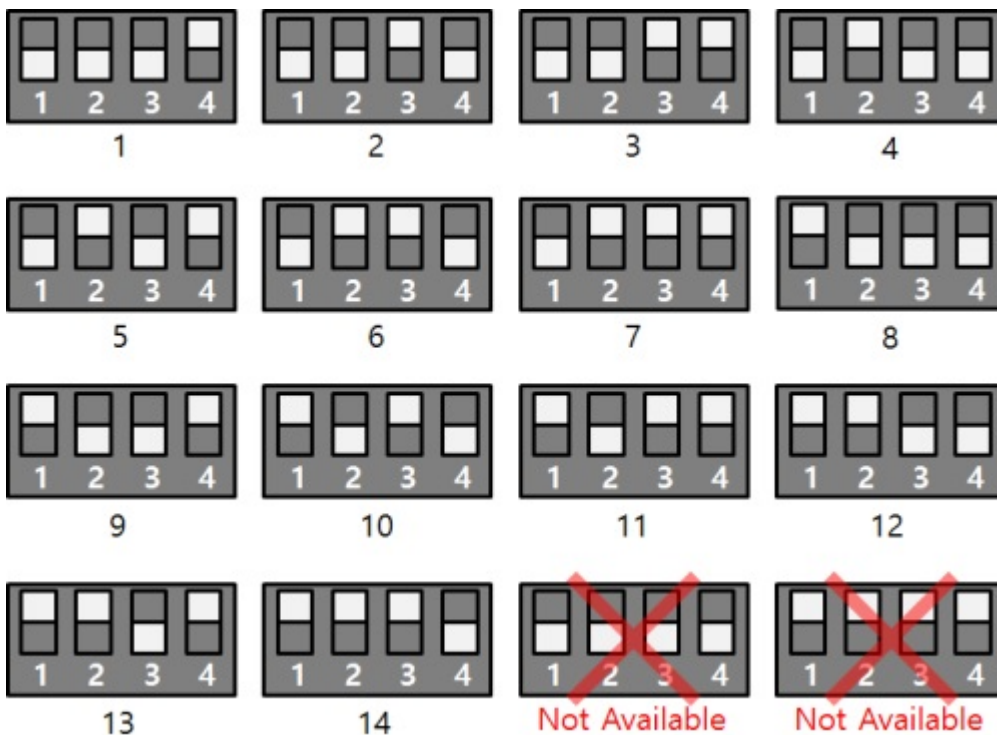
PNP Transistor Connection

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 required to install this software on your PC because PES-2402 must be controlled by PHPoC.

- [Download PHPoC Debugger](#)
- [PHPoC 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 and Responses

You can use `spc_request` or `spc_request_csv` function when setting or using a smart expansion board.

Common Commands of Smart Expansion Boards

A common command list of `spc_request` function for all smart expansion boards is as follows:

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

PES-2402 Commands

A command list of `spc_request` function only for PES-2402 is as follows:

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

- \$time : delay time(unit : millisecond)
- \$port : an input port(0 ~ 3)

Response of PES-2402

1. Response Codes

Response Code	Description
200	command ok
300	unknown command
301	invalid argument

2. Response of `spc_request`

A response of `spc_request` from smart expansion boards is a string in CSV(comma-separated values) format.

e.g. "200,0,1,..."

※ Structure of Response Frame(String)

Name	Size	Example(ASCII)
response code	3 bytes	200
comma	1 byte	,
value1	variable	0
comma	1 byte	,
value2	variable	1
...

3. Response of spc_request_csv

A response of spc_request_csv from smart expansion boards is an array.

e.g. array(200,0,1,...)

※ Structure of Response Frame(Array)

Name	Index #	Exmample
response code	0	200
value1	1	0
value2	2	1
...

Monitoring Input Ports

Calling spc_request for monitoring input ports

```
spc_request($sid, 4, $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

A normal response is as follows:

```
"200,$state"
```

- \$state: 0 on LOW, 1 on HIGH

Example

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

// get status of input ports
echo "Port 0: ", spc_request($sid, 4, "get 0 input"), "WrWn";
echo "Port 1: ", spc_request($sid, 4, "get 1 input"), "WrWn";
echo "Port 2: ", spc_request($sid, 4, "get 2 input"), "WrWn";
echo "Port 3: ", spc_request($sid, 4, "get 3 input"), "WrWn";
/*
output example
Port 0: 200,0
Port 1: 200,1
Port 2: 200,1
Port 3: 200,0
*/
```

?>