Programmable I/O controller

PBH-204 User Manual

Version 1.1

Sollae Systems Co., LTD.

PHPoC forum: http://www.phpoc.com/forum/

Homepage: http://www.eztcp.com

This symbol, found on your product or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. For more detailed information about the recycling of this product, please contact your local city office, household waste disposal service or the retail store where you purchased this product.

※ This equipment obtained certification by using 1.5M serial cable.

Contents

1 Overview

1.1 Overview

PBH-204 is a programmable I/O controller for industrial network communication. You can build various systems which are based on network using PBH-204 with many kinds of devices such as a personal computer.

We provide a self-development programming language, which is called PHPoC, for programing PBH-204. This language is easy to use and compatible with PHP which is widely used script language.

☞ ***PHPoC is basically compatible with PHP but those languages are not the same because of restrictions about embedded system. Please refer to the "PHPoC Language Reference Manual" and "PHPoC vs PHP" for detailed information.***

1.2 Features

- Provides Self-Development PHPoC Interpreter
- Provides simple development environment via USB
- Provides 4 digital input ports: DRY/WET contact selectable
- Provides 4 digital output ports: NC/NO selectable
- Provides serial port with RS232/RS422/RS485 interface
- Provides 10/100Mbit Ethernet
- Provides IEEE802.11b/g Wireless LAN
- Provides development tool for Windows

1.3 Specification

Power	Input #1	DC 8.5 ~ 38V
	Input #2	DC 5V (±0.5V)
	Input #3	DC 5V (±0.5V) - USB Device Port
	Consumption	about 4.2W(without USB WLAN adapter)
Dimension		180㎜ x 110㎜ x 26㎜
Weight		about 470g (without USB WLAN adapter)
Interfaces	Digital Input	4 x Digital Input (DRY/WET contact, NPN/PHP)
	Digital Output	4 x Digital Output (Relay - NC/NO)
	Serial	1 x RS232/RS422/RS485 (Baud Rate: 1,200bps ~ 230,400bps)
	Network	10 Base-T / 100 Base-TX Ethernet Auto MDI/MDIX (cable auto-sensing)
		IEEE802.11b/g (require Ralink RT3070/5370 chipset WLAN adapter)
	USB	USB Host – for WLAN adapter
		USB Device – for PC
Firmware		PHPoC Interpreter
Temperature	Storage /Operating	-40 ~ 85℃
Approval		KC, CE, FCC
Environment		RoHS Compliant
Software		PHPoC Debugger

Table 1-1 specification

1.4 Dimension

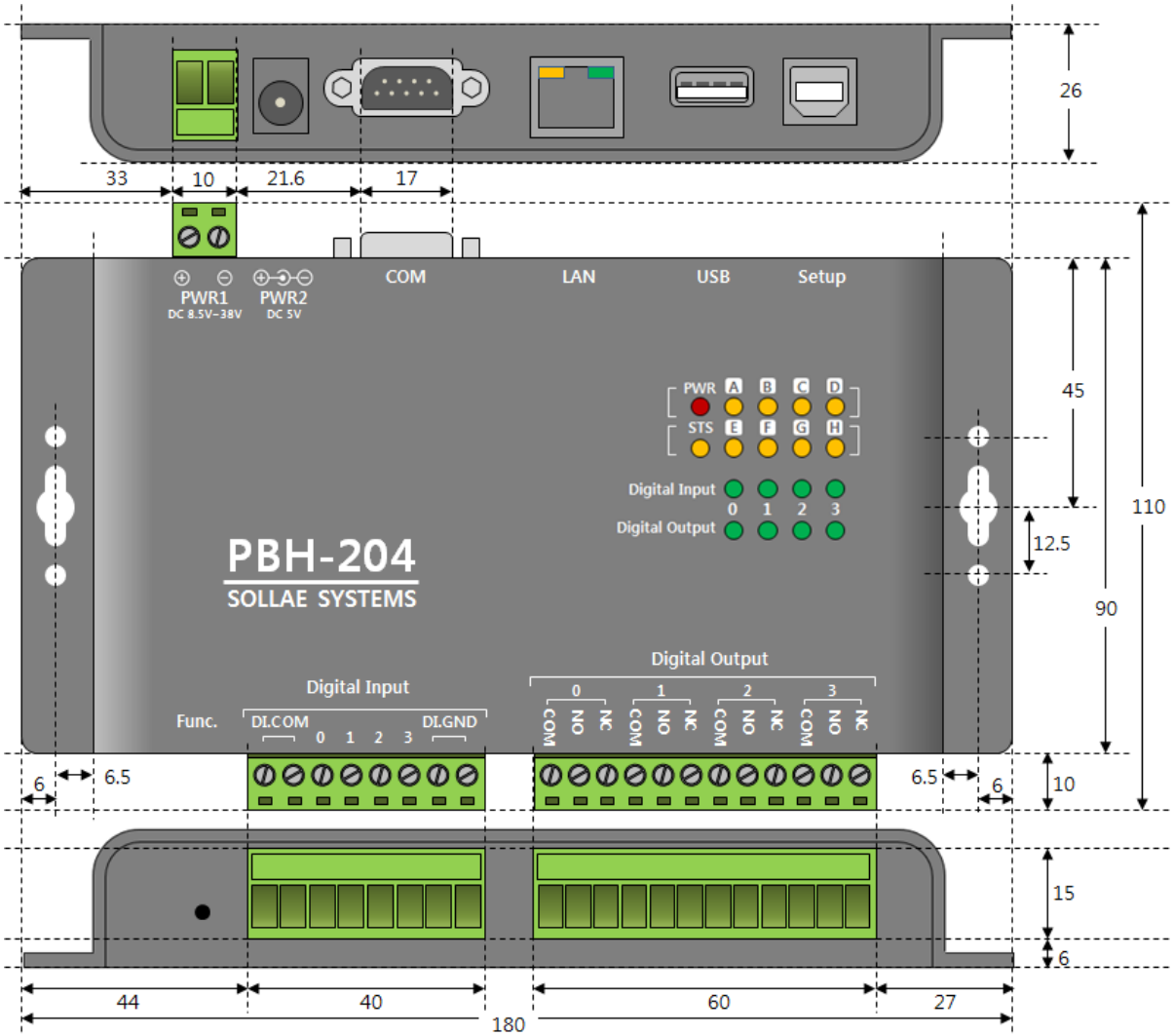

Figure 1-1 dimension

☞ ***Dimensions may vary according to a method of measurement.***

1.5 Interface

1.5.1 Panel Layout

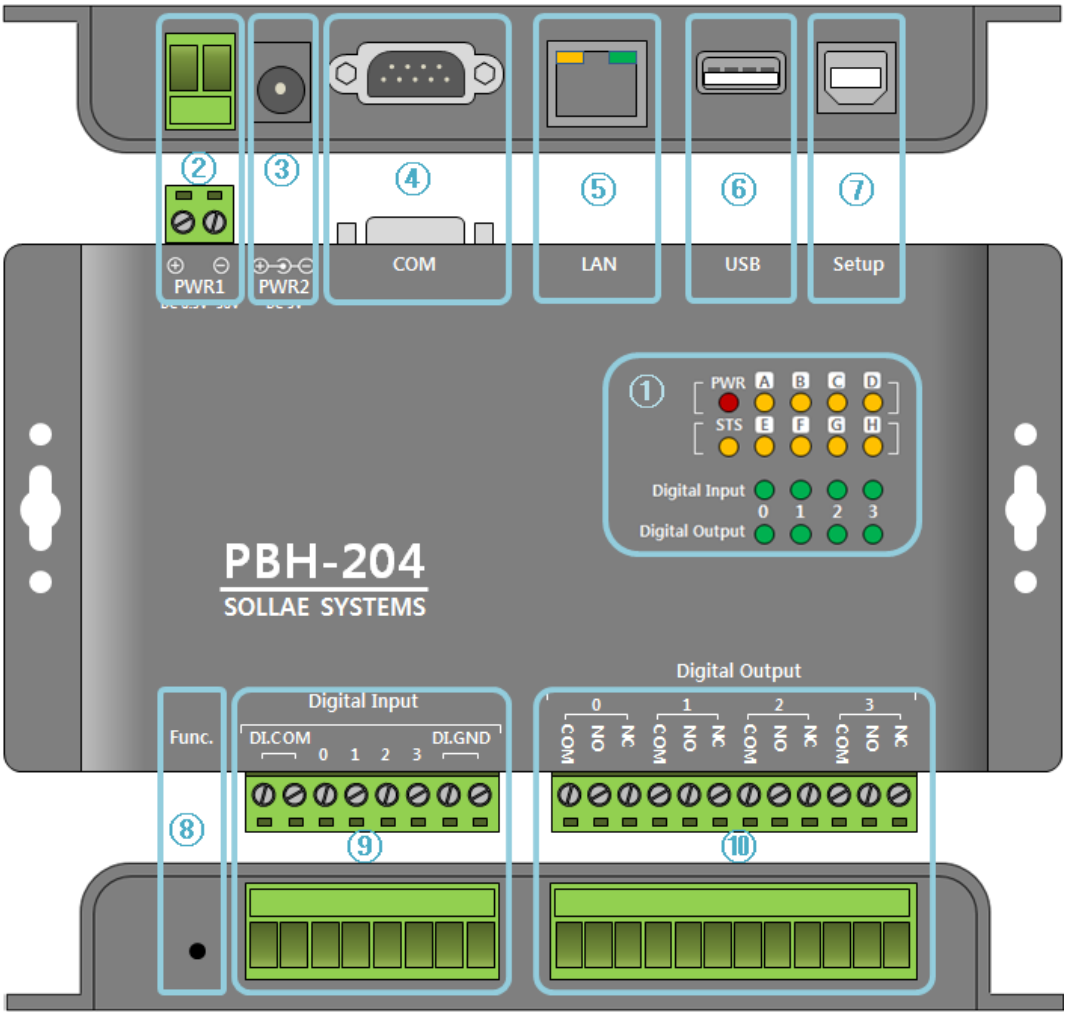

Figure 1-2 panel layout

① LED PWR, STS, A ~ H, Digital Input 0 ~ 3, Digital Output 0 ~ 3
② Power 1: DC 8.5V ~ 38V
③ Power 2: DC 5V
④ Serial port: RS232 / RS422 / RS485
⑤ Ethernet port: 10/100M
⑥ USB host port: USB WLAN adapter connection
⑦ USB device port (Setup): PC connection, DC 5V power supply
⑧ Function button (Func)
⑨ Digital input port: DRY/WET contact, NPN/PNP
⑩ Digital output port: NO/NC

1.5.2 LED

LED	Name	Action
Power LED	PWR	turned ON with stable power supply
Status LED	STS	running PHP > repeat On and Off in every second
		not running PHP > briefly blinks 1 time at a time
User-defined LED	A ~ H	follows definition on user script
Digital Input	0 ~ 3	with valid input signal > ON
Digital Output	0 ~ 3	with valid output signal > ON

Table 1-2 LED

1.5.1 USB Device Port for connection with PC

The USB device port is to connect with PC. You can access to products via development tool with connecting USB cable to this port. However, PBH-204 may not work properly in case of supplying power via this port only due to insufficient current.

1.5.2 Function Button (Func)

Function button is used for changing mode to button setup mode.

1.5.3 Supplying Power

- PWR1 port

  PWR1 port is interfaced with terminal block. The range is from DC 8.5V to 38V and the polarity does not need to be concerned.

- PWR2 port

  Power port uses DC 5V and its specification is as follows:

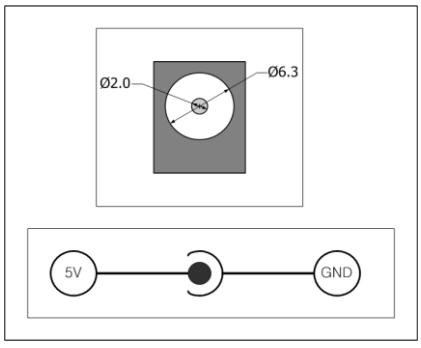

Figure 1-3 PWR2 port specification

- USB Device port (Micro USB)

  This port can be a sub input port for supplying power.

1.5.4 USB Host Port for Connection with a WLAN adapter

PBH-204 provides a USB host port for an USB WLAN adapter. You can connect your product to Wireless LAN by connecting a WLAN adapter to this port. Note that you cannot use Ethernet (Wired LAN) while using this port.

☞ ***Caution: Only adapters using Ralink RT3070/5370 chipsets are available.***

☞ ***Caution: WLAN cannot be used with Ethernet at the same time.***

1.5.5 Serial

PBH-204 provides one serial port interfaced to D-SUB 9pin male connector and you can select the type of RS422, RS485 or RS232. Uploading PHPoC codes to your product is required to set the type of serial.

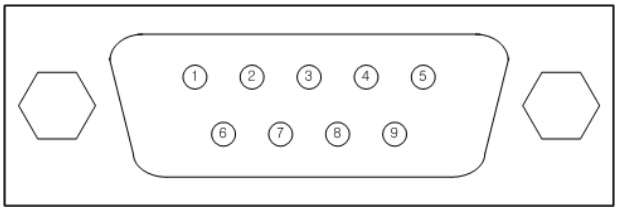

Figure 1-4 serial

☞ ***Please refer to the "PHPoC Device Programming Guide for P20" for detailed information about setting type of serial.***

- Serial Port Specification

Parameter	Value
The number of port	1
Serial Type	RS232 / RS422 / RS485
Baud rate	1,200 ~ 230,400 [bps]
Parity	NONE / EVEN / ODD / MARK / SPACE
Data bit	8 or 7(7 data bit is only available on using Parity)
Stop bit	1 or 2
Flow control	NONE, RTS/CTS

Table 1-3 serial port specification

- RS232 pin assignment

Pin	Name	Description	Level	I/O	Note
1	DCD	Data Carrier Detect	RS232	-	N/A
2	RXD	Receive Data	RS232	In	basic
3	TXD	Transmit Data	RS232	Out	basic
4	DTR	Data Terminal Ready (always output active signal)	RS232	Out	optional
5	GND	Ground	-	-	basic
6	DSR	Data Set Ready	RS232	-	N/A
7	RTS	Request To Send	RS232	Out	optional
8	CTS	Clear To Send	RS232	In	optional
9	RI	Ring Indicator	RS232	-	N/A

Table 1-4 RS232 pin assignment

- RS422 pin assignment

Pin	Name	Description	Level	I/O	Note
9	TX +	Transmit Data +	RS422	Out	basic
1	TX -	Transmit Data -	RS422	Out	basic
4	RX +	Receive Data +	RS422	In	basic
3	RX -	Receive Data -	RS422	In	basic
5	GND	Ground	-	-	basic

Table 1-5 RS422 pin assignment

- RS485 pin assignment

Pin	Name	Description	Level	I/O	Note
9	TRX +	Data +	RS485	In/Out	basic
1	TRX -	Data -	RS485	In/Out	basic
5	GND	Ground	-	-	basic

Table 1-6 RS485 pin assignment

☞ ***Biasing Register (100KΩ) is connected to RS422/485 line.***

1.5.6 Ethernet

PBH-204 has Ethernet port which supports 10/100M bit Ethernet. Both direct and cross over cable can be used because it automatically detects the type of cable.

- LED of RJ45 Connector

LED	Operation	State
Green	ON	Connected to Network
	OFF	Not connected to Network
	Blink	Receiving or Transmitting Network Data
Yellow	ON	Connected to 100M Ethernet
	OFF	Connected to 10M Ethernet

Table 1-7 LED of RJ45 connector

1.5.7 Digital Input

Digital input ports are interfaced with 5mm spaced terminal block. Each port is isolated by photo-coupler and provides 4 input types: WET contact, Dry contact, NPN and PNP transistor connection.

- Circuit diagram of digital input port

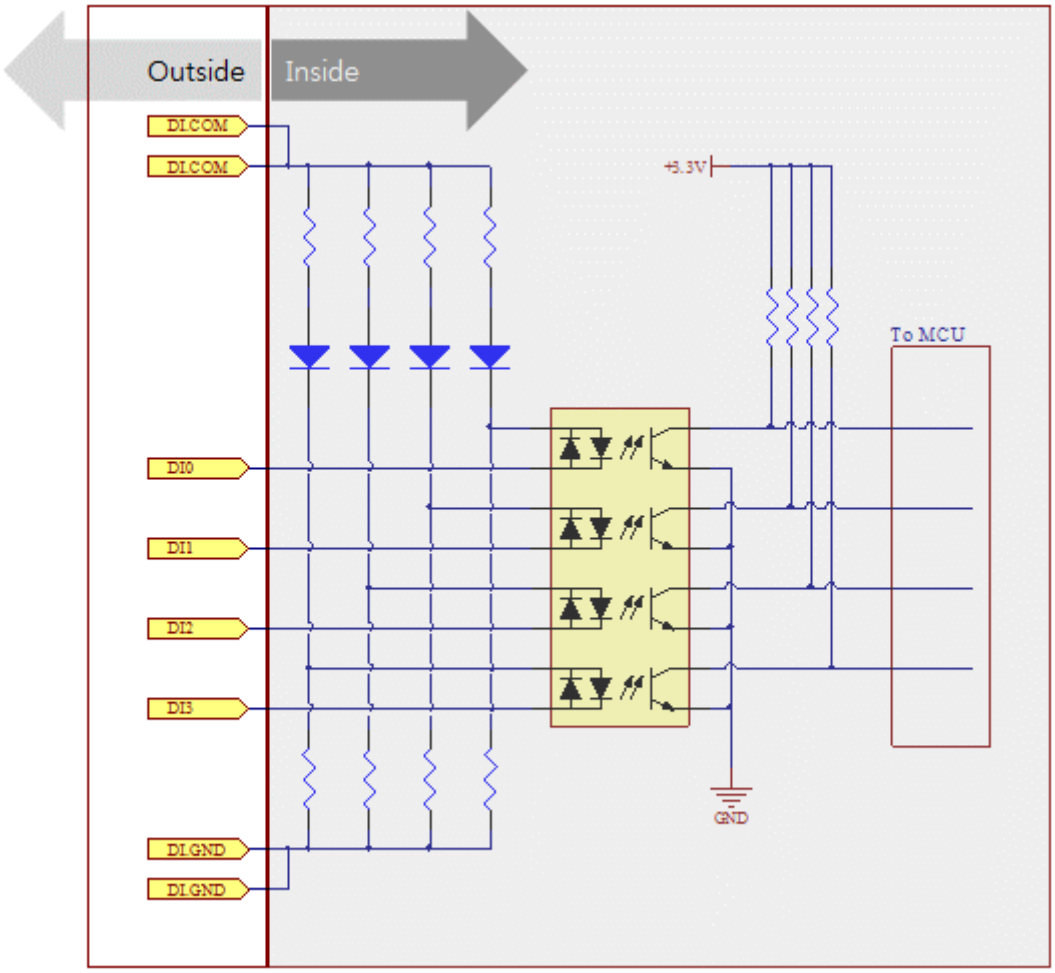

Figure 1-5 circuit diagram of digital input port

- Wet Contact

  In this method, a port is ON under supplying sufficient DC voltage between the port and DI.GND port. The voltage condition is as follows:

Status	Condition
maximum DC input	DC 30V
ON	more than DC 3V
OFF	less than DC 1.5V

Table 1-8 voltage condition in wet contact

Refer to the following figure for connection with your device.

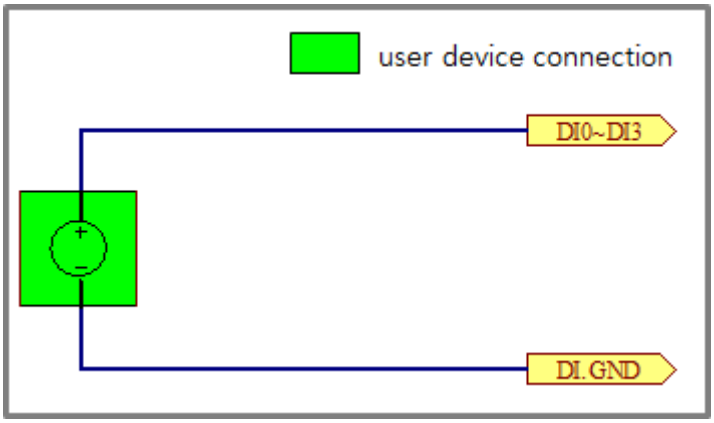

Figure 1-6 connection with user device in wet contact

- Dry Contact

  In this method, a port is ON under being short circuit between the port and DI.GND port. To use this method, additional power should be supplied between DI.COM and DI.GND.

  Refer to the following figure for connection with your device.

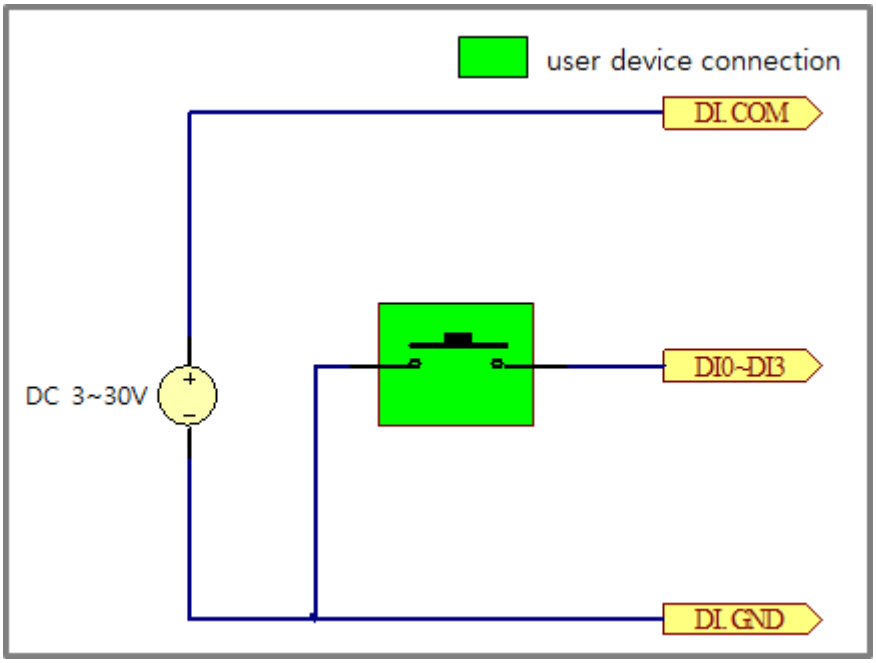

Figure 1-7 connection with user device in dry contact

- NPN transistor connection

  Refer to the following figure for connection with NPN transistor.

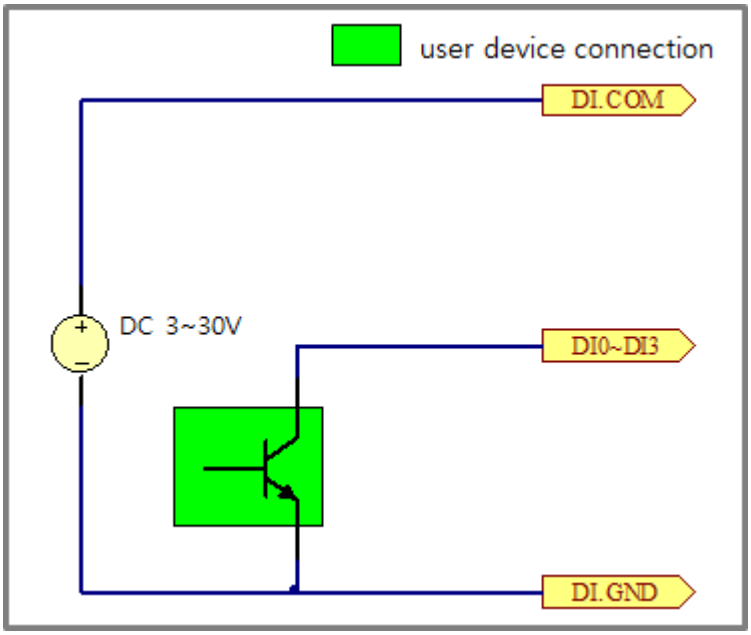

Figure 1-8 connection with NPN transistor

- PNP transistor connection

  Refer to the following figure for connection with PNP transistor.

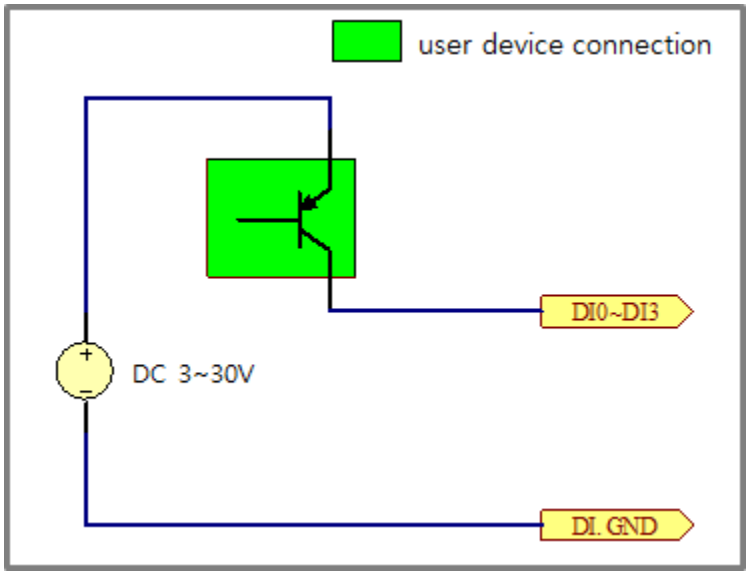

Figure 1-9 connection with PNP transistor

1.5.8 Digital Output

Digital output ports are interfaced with 5mm spaced terminal block. Each port is connected to a relay and provides two output types: Normal Open (NO) and Normal Closed (NC).

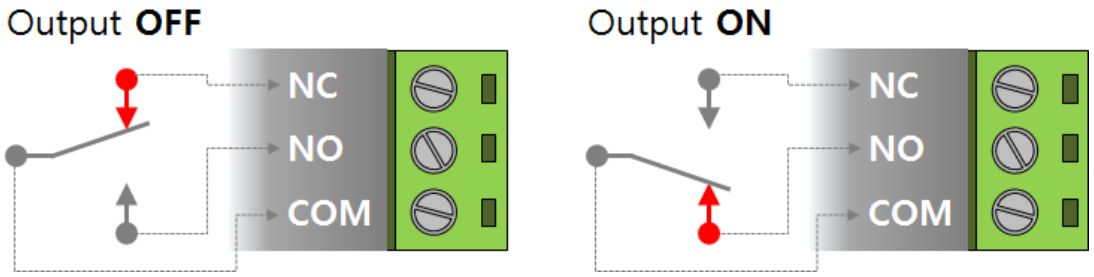

Figure 1-10 digital output port

- Normal Open

  Normal Open means that default state of output port is OFF when product is off. You can use this method by connecting your device to each COM and NO terminal.

- Normal Close

  Normal Close means that default state of output port is ON when product is off. You can use this method by connecting your device to each COM and NC terminal.

Digital output port's range of use is as follows:

Type	Voltage	Current
NO (Normal Open)	DC 30V	5A
NC (Normal Close)	DC 30V	1A

Table 1-9 digital output port's range of use

1.6 Development Environment

1.6.1 Overview

PBH-204 provides development environment over USB. PHPoC Debugger, which is development software, is required to program to your product or to debug PHPoC source codes.

1.7 PHPoC Debugger

1.7.1 Program Overview

PHPoC Debugger is a software running on Windows. This program does not require installation. You can upload files to your product with this program through USB port. Features of PHPoC Debugger are as follows:

- Upload files from local PC to PHPoC product
- Save files which are in PHPoC product to local PC
- Edit files stored in PHPoC device
- Debug PHPoC scripts
- Monitor PHPoC product resources
- Set PHPoC product
- Upgrade Firmware of PHPoC product

1.7.2 Program Structure

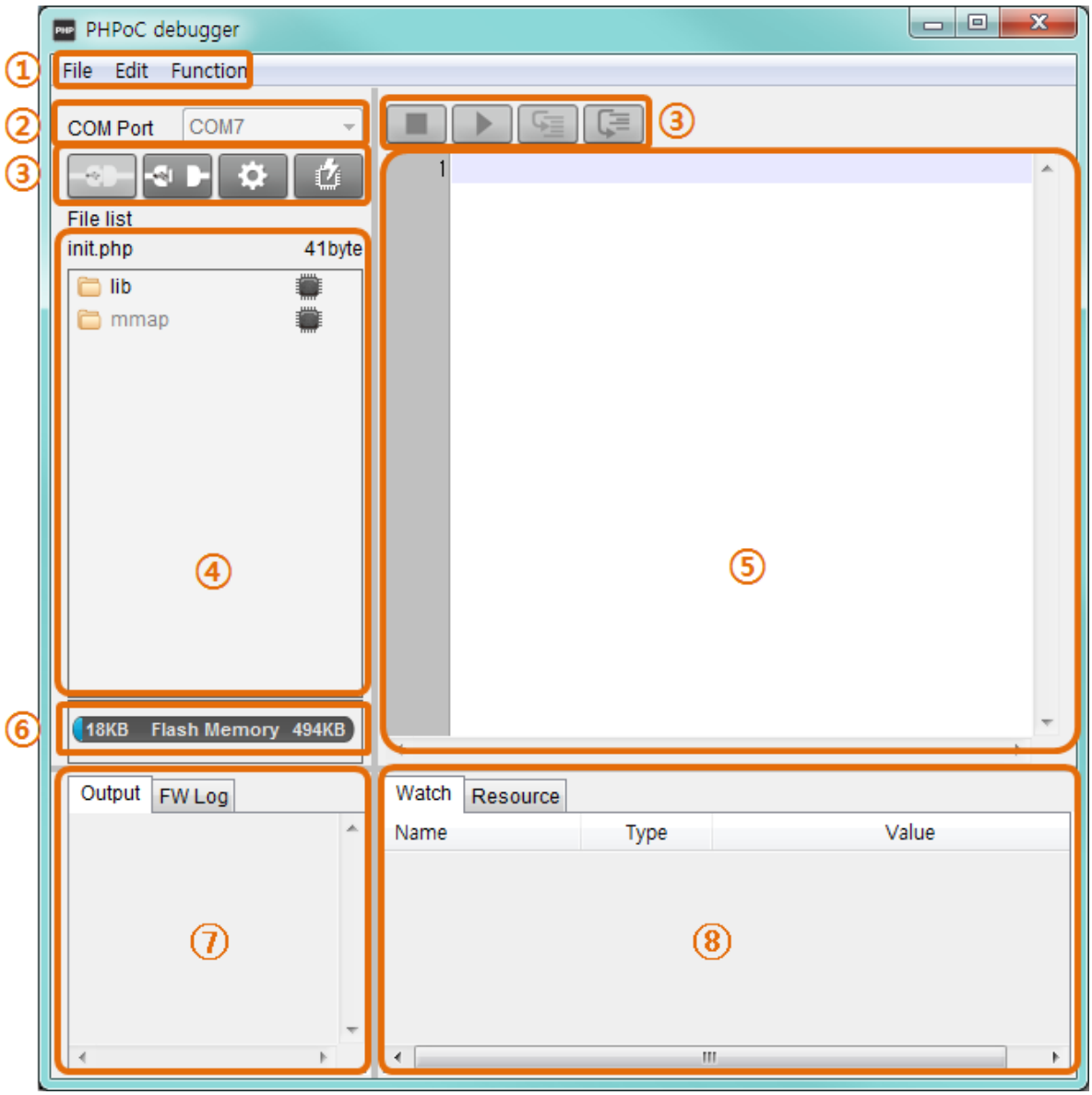

Figure 1-11 program structure

① Menu bar

Menu	Sub menu	Description
File	Open a poc file	Open a poc format file
	Save selected file(s)	Save selected files in file list to local PC
	Save a poc file	Save all files in file list to local PC (.poc)
Edit	Undo	Undo the latest job
	Redo	Redo the latest job undone
	Cut	Cut selected text and copy it to clip board
	Copy	Copy selected text to clip board
	Paste	Paste text of clip board
	Select all	Select all text
	Find	Find specified text
	Find Next	Find the next text by down direction
	Find Previous	Find the next text by up direction
	Change	Replace specified text with given text
	Preferences	Program preference
Function	Product / Firmware information	Information of current firmware and product
	Network information	Current network information
	View PHP error log	View firmware log messages in error
	View firmware error log	View firmware messages in error
	Upgrade firmware	Upgrade firmware
	Reboot a product	Reboot a product
	View firmware log	view firmware log messages
	Firmware Debug mode	Enable/disable Firmware debugging mode
	PHP Debug mode	Enable/disable PHP debugging mode
	Font	Change font
	Language	Change language
	PHPoC Debugger information	Information about PHPoC Debugger

Table 1-10 menu bar

- Preferences

Menu	Sub menu	Description
View	View margin	Show / Hide margin
	View line number	Show / Hide line number on margin
	View current line	Enable / Disable current line emphasis
	Auto scroll	Enable / Disable auto scroll
	Line ratio	Set line space: 100, 120, 150, 200, 300
	Tab size	Set tab size: 1, 2, 4, 8, 16
Action of file add	Internal editor	PHPoC Debugger internal editor
	External editor	External editor
	Ask	Show select option every time
Backup path		Path of backup files
Initialization	Enter initialization mode	Set product to initialization mode

Table 1-11 preferences

② COM PORT

Part for choosing a virtual USB COM port

③ Buttons

Button	Description
	Connect to PHPoC product
	Disconnect to PHPoC product
	Configure environmental values of PHPoC product
	Upload files on [File list] to PHPoC product
	Stop running PHPoC codes
	Run / Pause PHPoC codes
	Run line by line
	Run procedure by procedure

Table 1-12 buttons

④ File list

List of files in PHPoC product or to be uploaded to it

Icon	Description
	Synchronized files
	Files on PHPoC product before synchronization
	Files on local PC before synchronization
	Synchronized files on local PC for external editors

Table 1-13 file list

Following menus will be popped up when right clicking on file list area.

Menu	Description
New	Create a new php file
Change the filename	Modify file name
Add	Add files from local PC
Delete	Delete file on the list

Table 1-14 pop up menu on file list

⑤ Editor

Show and edit contents of selected file on the file list.

Following menus will be popped up when right clicking on editor area.

Menu	Description	Shortcut
Toggle Breakpoint	Set / Unset break point on current line	F9
Remove All Breakpoints	Unset all break points on current file	Shift+F9
Step Into	Run line by line	F11
Step Over	Run procedure by procedure	F10
Cut	Cut selected codes and copy to clip board	Ctrl+X
Copy	Copy selected codes to clip board	Ctrl+C
Paste	Paste codes on clip board	Ctrl+V
Select all	Select all codes	Ctrl+A

Table 1-15 pop up menu on editor

⑥ Flash memory size

This shows currently available or in-use space on flash memory of PHPoC product.

⑦ Output / FW Log

This window is for displaying standard output and F/W log messages.

The following menus will be popped up when right clicking on the windows.

Menu	Description
Delete all logs	Clear screen buffer
Copy a log	Copy selected log to clip board
Auto scroll	Set / Unset auto scroll

Table 1-16 pop up menu on output / console window

⑧ Watch / Resource

This window is for checking run time variable information and system resources.

The following menus will be popped up when right clicking on the watch window.

Menu	Description
Add	Add a variable
Modify	Modify a name of selected variable
Delete	Delete selected variables
Delete all	Delete all variables
Detail	Create a new window for detailed information
Refresh	Refresh variables

Table 1-17 pop up menu on watch box

2 Test Run

This chapter instructs how to program and execute provided example codes.

2.1 Development Environment Construction

2.1.1 Local PC

A MS windows PC is required to upload php files to the PBH-204 while creating and modifying php files are available on other operating systems.

2.1.2 Connecting PBH-204

Connect PBH-204 to PC with a USB cable.

2.1.3 Running PHPoC Debugger

Run PHPoC Debugger on the PC.

☞ ***This document defines "Upload" to "Sending files from a PC to PHPoC product."***

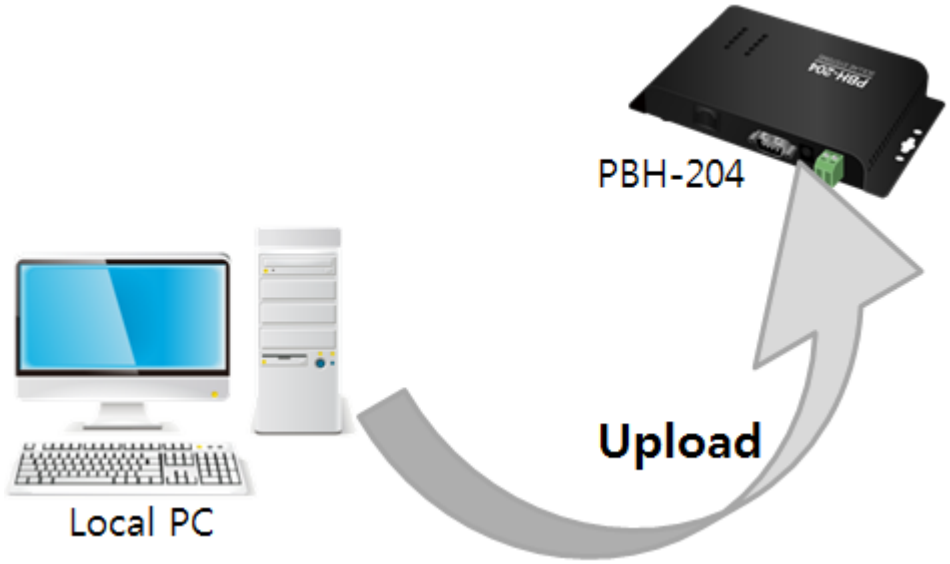

Figure 2-1 definition of upload

2.2 Connecting Product

2.2.1 Connecting Product

Connect PBH-204 to a PC with a USB cable.

☞ ***Device driver will be automatically installed when you connect PBH-204 to your PC. When automatic installation fails, download and install the driver on ST Micro's web site.***

☞ ***STM32 USB Virtual Com Port Driver Download page:***
http://www.st.com/web/catalog/tools/FM147/CL1794/SC961/SS1533/PF257938

2.2.2 Ready to Communicate

① Run PHPoC Debugger

② Select connected COM PORT and press connect () button.

③ If USB is successfully connected, connect button will be inactivated and disconnect button () will be activated.

2.3 Practice

2.3.1 PHPoC Operation

PHPoC searches the "init.php" file right after it boots up. If there is no "init.php" file, none of PHPoC code will be implemented. Thus, you must create or upload the "init.php" file into PHPoC file system.

You can write a script on the "init.php" as well as running other php files using php commands of system function. The "init.php" is implemented just once but loaded files by the command can be repeatedly run.

☞ ***Please refer to the "PHPoC System Function" document for detailed information about system function.***

- Running script on "init.php"

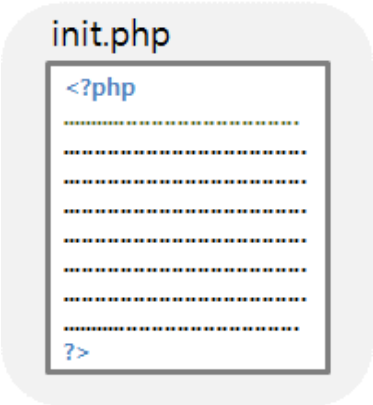

Figure 2-2 running script on "init.php"

- Running another php file in "init.php"

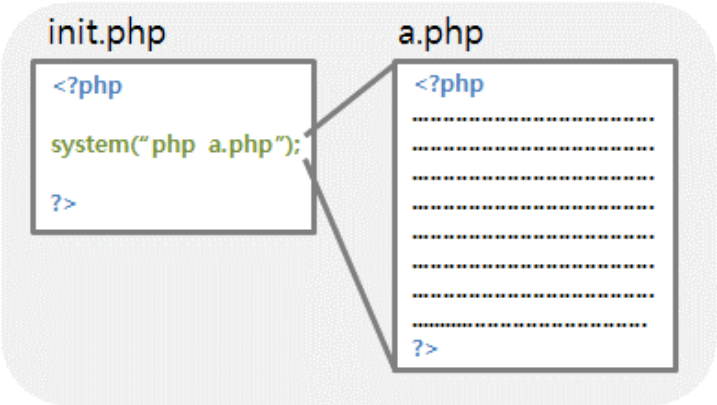

Figure 2-3 running another php file in "init.php"

- Script run flow chart

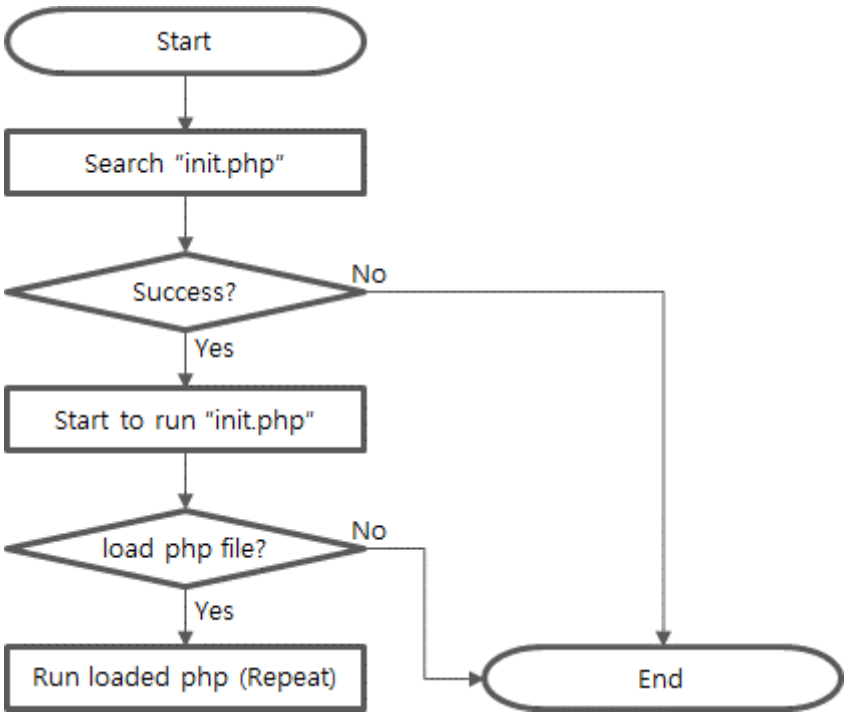

Figure 2-4 flow chart of script run

☞ ***"init.php" is start of all scripts. It means that every php file is directly or indirectly required to be loaded on "init.php" to run it.***

2.3.2 Default Files

PBH-104 is released with the following files uploaded.

File Name	Description
/lib/sd_204.php	Basic library of PBH-204
/lib/sn_tcp_ac.php	TCP library
/lib/sn_tcp_ws.php	Web socket library
/lib/sc_envs.php	System ENV write library

Table 2-1 default files

2.3.3 Create "init.php"

- Click file list with the right button of your mouse and select [New] menu.

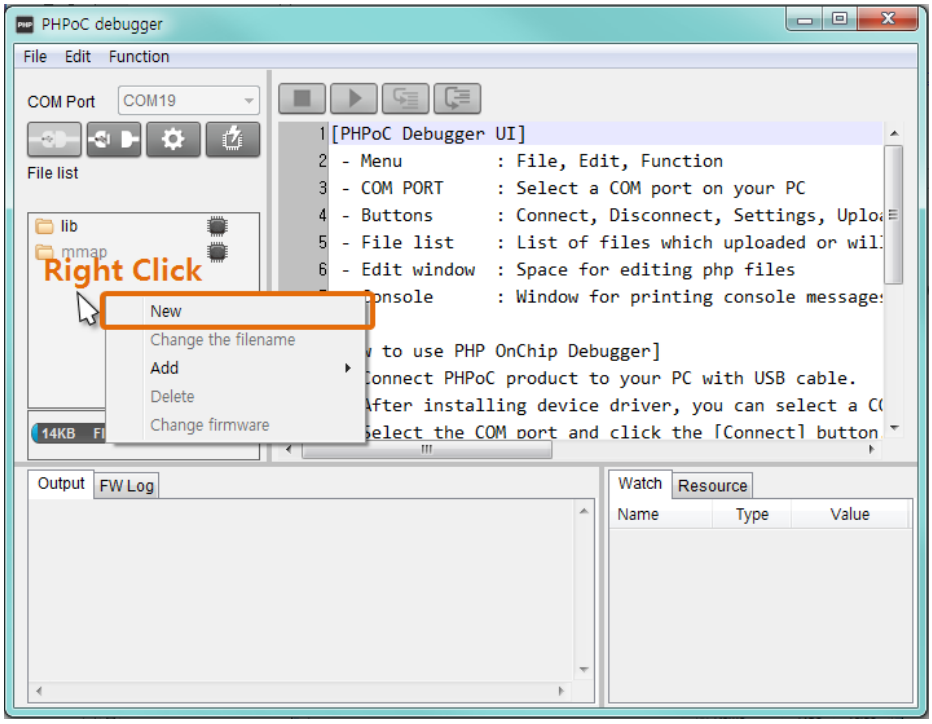

Figure 2-5 create "init.php" (1)

- Input "init" into the file name box.

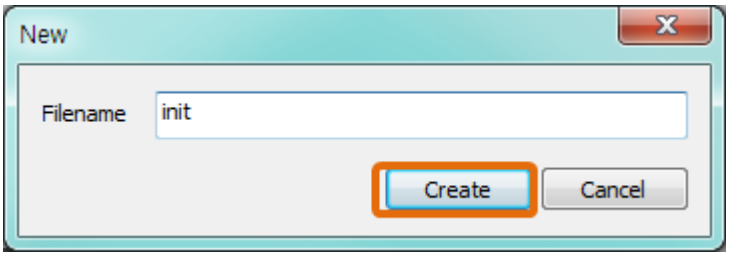

Figure 2-6 create "init.php" (2)

- Select init.php file in the file list.

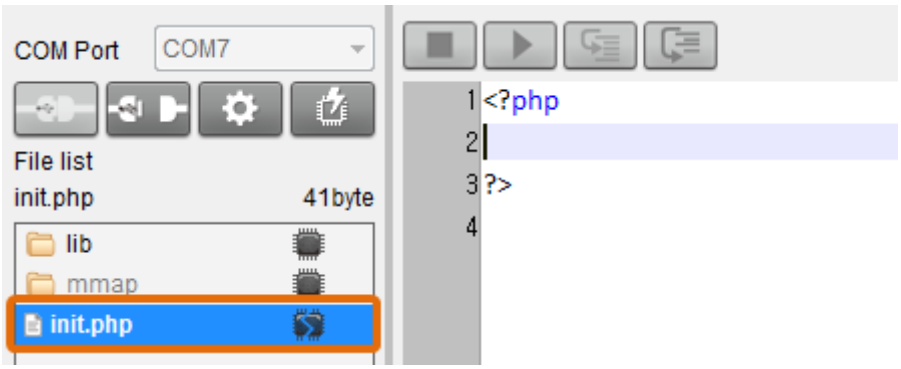

Figure 2-7 select init.php

- Input the following command lines into the editor.

```
1 <?php
2 echo "Hello PHPoC\r\n";
3 ?>
```

Figure 2-8 Hello PHPoC (1)

- Click upload button. ()
- After PHPoC finishes uploading files, icon will be changed. ( → )

2.3.4 Excecute Script

PHPoC automatically runs a script when it boots up or uploads file system. You can find the result in the Output window of PHPoC Debugger.

Figure 2-9 result

☞ ***If [PHP debug mode] option of PHPoC Debugger is enabled, PHPoC does not execute a script automatically. You can manually run the script by clicking the Run button. ()***

2.4 Saving Files to PC

2.4.1 Saving File to PC

- Select files in file list

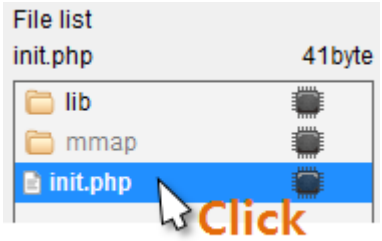

Figure 2-10 saving files to PC (1)

- Click [File] > [Save selected file(s)]menu on menu bar

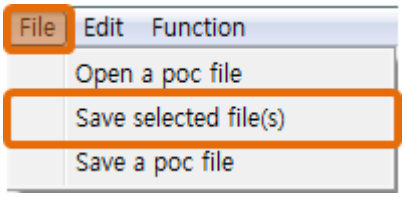

Figure 2-11 saving files to PC (2)

- Choose a path and click [OK] button.

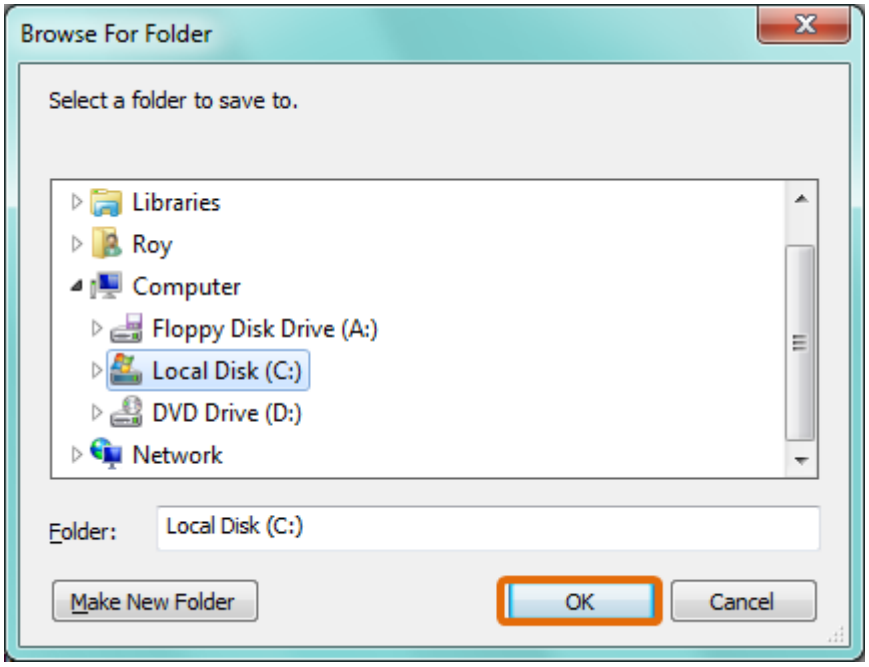

Figure 2-12 saving files to PC (3)

2.4.2 Save as a Integrated (.poc) file

- When you want to save all files on the file list as a single file, use [Save a poc file] menu.

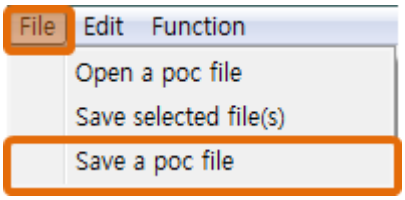

Figure 2-13 save as a poc file (1)

".poc" is filename extension. Input filename and click [Save] button.

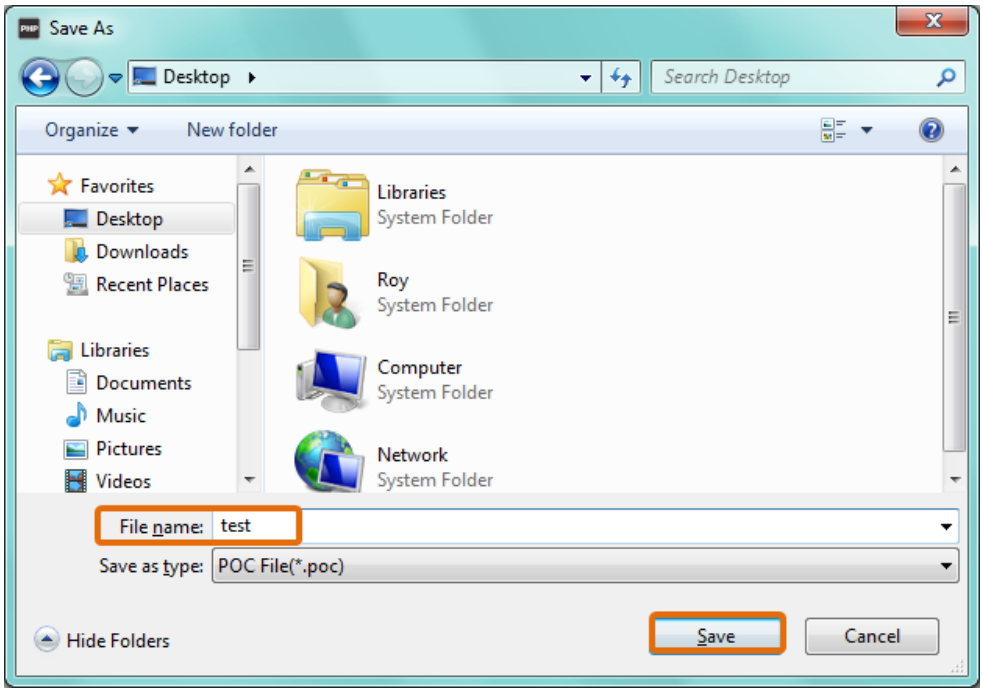

Figure 2-14 save as a poc file (2)

2.5 Upload Files to Product

PHP files in local PC can be uploaded to PHPoC products.

2.5.1 How to Add Files to File list

- Drag & Drop

  Select and drag files on Window explorer to file list box and drop them.

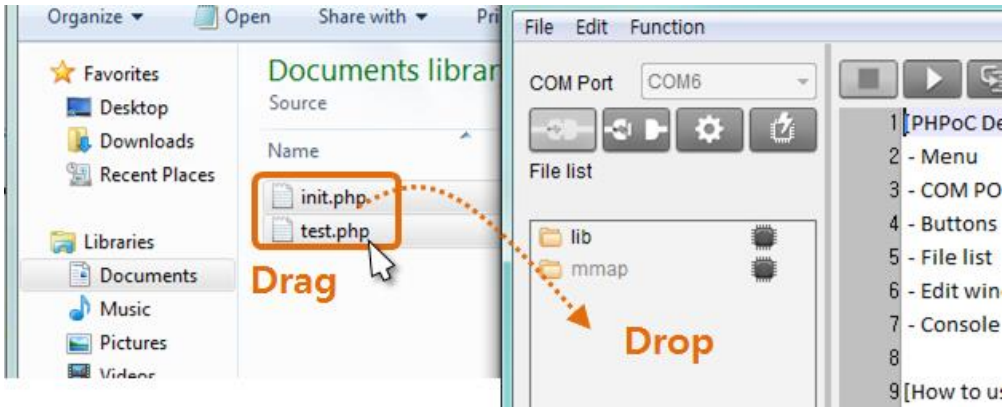

Figure 2-15 add files to file list (1)

- Add menu

  If you click [Add] after right-clicking in file list box, a window for selecting files will be created. Selected files on the windows will be added to the file list.

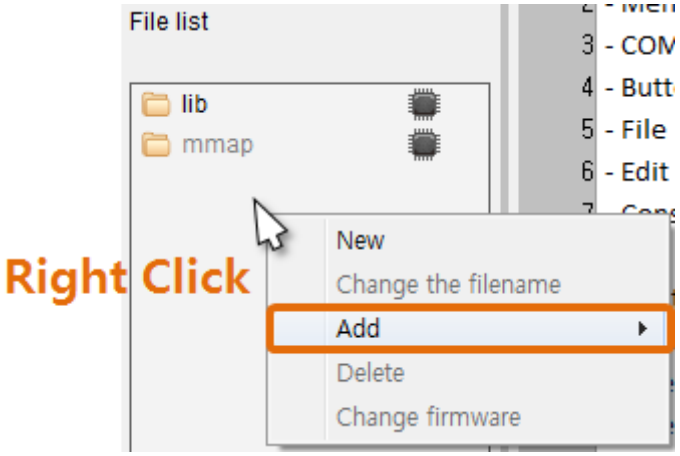

Figure 2-16 add files to file list (2)

☞ ***Integrated file(.poc) should be added by [File]>[Open a poc file] menu only***

2.5.2 Upload files

Files in the file list will be uploaded to product by clicking upload ( ) button. If the uploading is completed, both files on the file list and in the product are synchronized with changing ( ) icons

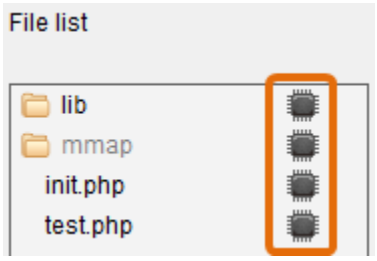

Figure 2-17 upload files

3 Management

3.1 Configure Parameters

All parameters including an IP address can be configured by PHPoC Debugger.

3.1.1 Configuration Procedure

① Connect PHPoC product to PC.

② Run PHPoC Debugger and click connect ( ) button.

③ After then, click configuration ( ) button.

☞ ***Sometimes you can see inactivated configuration button. In this case, click stop ( ) button before configuration.***

④ Configure parameters

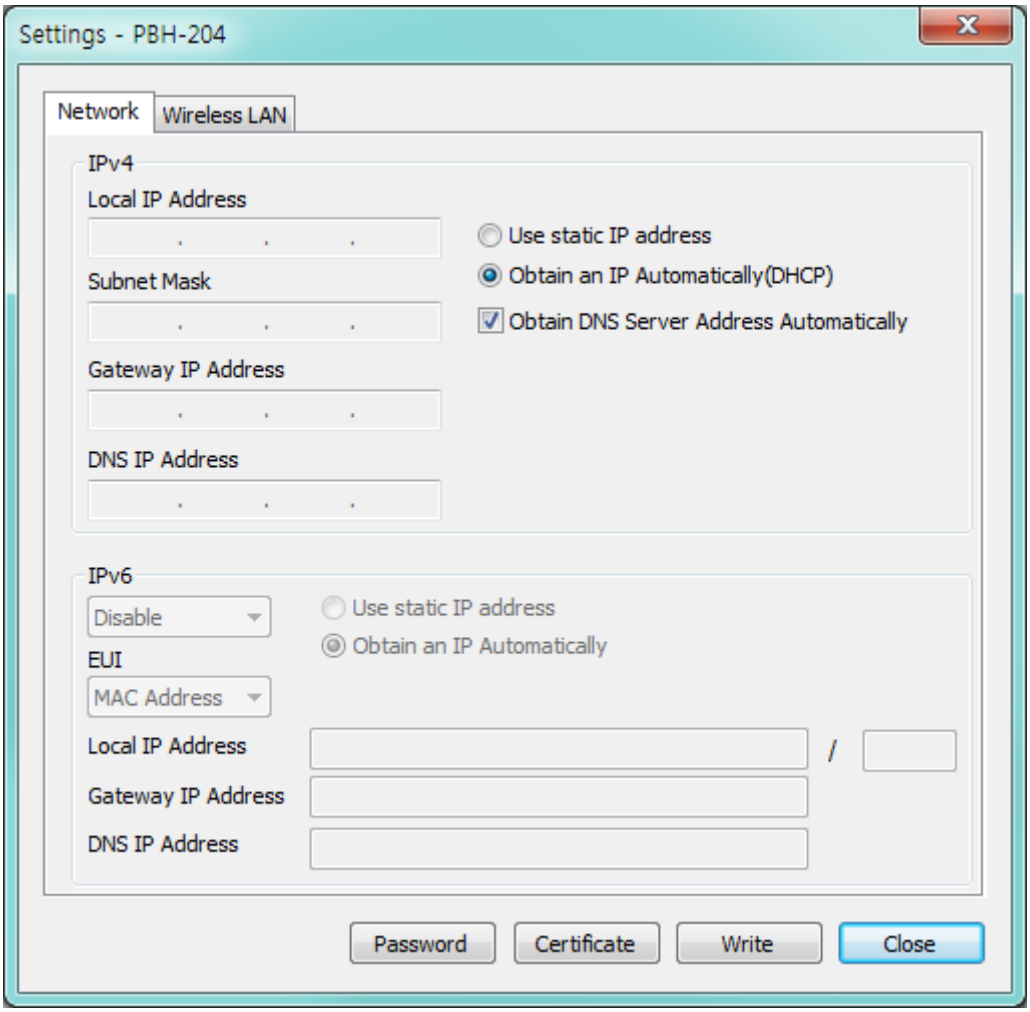

Figure 3-1 configuration window

3.1.2 System Parameters

Tab	Category	Parameter
Network	IPv4	IP address
		Subnet mask
		Gateway IP address
		DNS server IP address
		IP address type - Use static IP address
		IP address type - Obtain an IP automatically (DHCP)
		IP address type - Obtain DNS server address automatically
	IPv6	(scheduled to support in the future)
Wireless LAN	Basic Settings	WLAN - Enable / Disable
		WLAN Topology - Ad-hoc / Infrastructure / Soft AP
		Search AP / Search channel
		Channel
		SSID
		Internal Antenna / External Antenna
		Advanced Settings
	Security Settings	Shared Key
		802.1X: EAP-TLS / EAP-TTLS / PEAP
Buttons	Password	Password (ID: Admin)
	Certificate	Write self-signed certificate
		Write signed certificate from certification authorities
		Read the certificate form a device

Table 3-1 system parameters

☞ ***Caution: PHPoC does not support restoration when you lose your password. You can restore your product to factory default condition by using level 2 initialization but all of your settings, files and the password will be deleted.***

3.2 Initialization

3.2.1 Level 1

Implementing level 1 initialization, both system parameters and user parameters including stored certificate will be initialized to factory state. However, password and file system will not be changed.

- Level 1 Initialization Procedure

Step	Action	Product State	STS LED
1	Press function button shortly (less than 1 second)	Button setup mode	On
2	Keep pressing the function button over 5 seconds	Preparing initialization	Blink very rapidly
3	Check STS LED after 5 seconds	Initialization ready	Off
4	After the step 3, release the function button within 2 seconds (After 2 seconds elapsed, state go back to the step 3)	Progressing initialization	On
5	Rebooting automatically	Initial state	Off

Table 3-2 level 1 initialization procedure

☞ ***WLAN easy setup function will be activated in the button setup mode in level 1 initialization. Thus, a STS LED can be blink if a wireless LAN client is linked.***

3.2.2 Level 2

When you implement level 2 initialization, all parameters including user password and file system is initialized to factory state.

☞ ***Level 2 initialization should be used very carefully. Note that you had better to back up you files to a local PC before doing this because they will be deleted.***

- Level 2 Initialization Procedure

Step	Action	Product State	STS LED
1	Set PHPoC to initialization mode (Use [Edit]>[Preferences] menu on PHPoC Debugger)	Enter Initialization mode after reboot	Blink rapidly
2	Keep pressing the function button over 10 seconds	Preparing initialization	Blink very rapidly
3	Check STS LED after 10 seconds	Initialization ready	Off
4	After the step 3, release the function button within 2 seconds (After 2 seconds elapsed, state go back to the step 3)	Progressing initialization	On
5	Initialization is finished	Initial state	Off

Table 3-3 level 2 initialization procedure

3.3 WLAN Easy Setup

Product enters into button setup mode when you push function button in normal state. In the mode, WLAN easy setup function is activated if an USB WLAN adapter is connected so you can access to your product by smartphone or laptop by WLAN.

3.3.1 SSID

Once WLAN easy setup function is activated in button setup mode, product uses SSID including own MAC address like an AP. SSID is contained the second half of the product's MAC address after "phpoc_" which is a prefix. For example, if the MAC address is "0030f9060101", the SSID is "phpoc_060101".

3.3.2 WLAN Connection

Find your product's SSID via a smartphone or laptop.

Figure 3-2 WLAN connection

3.3.3 DHCP

While using WLAN easy setup function, a mobile automatically gets a dynamic IP address from your product. The IP address of your product is fixed to 192.168.0.1 and mobile obtains an IP address in 192.168.X.X range.

3.3.4 Access to Product

After uploading setting page to product, you can access to it by web browser.

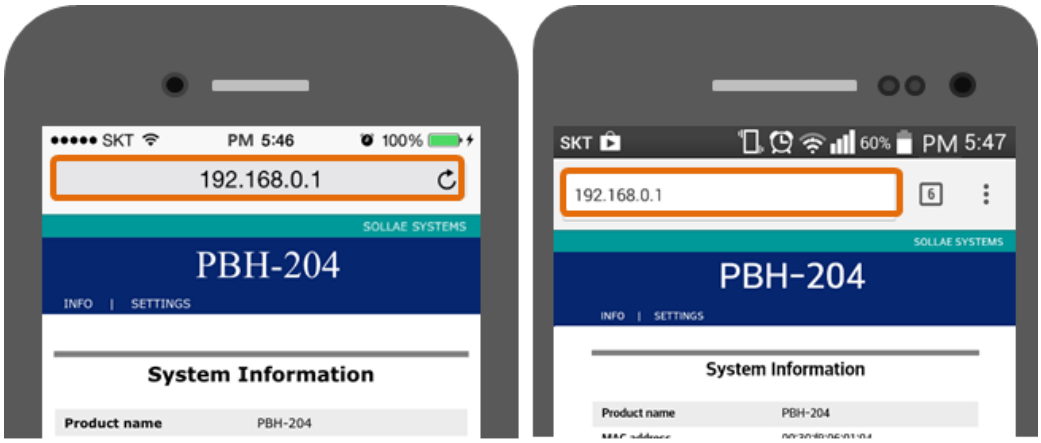

Figure 3-3 mobile connection (left: iOS, right: Android)

☞ ***WLAN easy setup function is available on connecting a USB WLAN adapter.***

3.4 Web Interface

PHPoC provides web interface regardless of script execution. TCP 80 is used for web interface and you can use the interface via Internet Explorer, Chrome or any other web browser.

3.4.1 How to use web interface

To use the web interface, "index.php" file should be in the file system of PBH-204. Connect to this page by entering device IP address after connecting it to network.

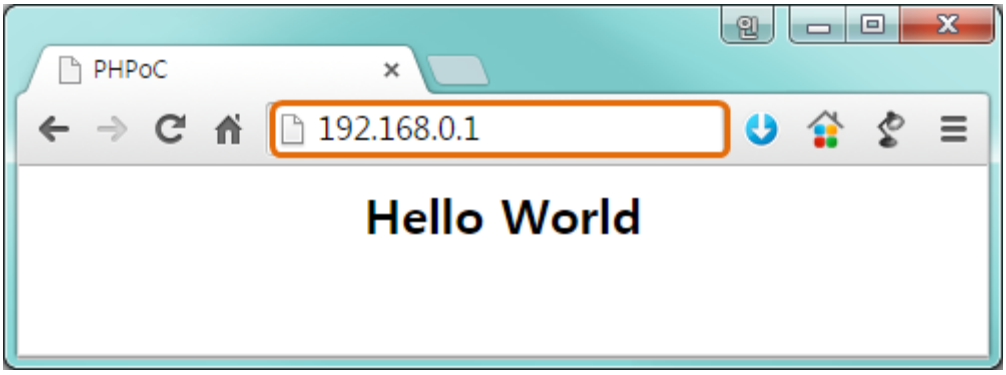

Figure 3-4 web interface (1)

If the name of file is not "index.php", just specify the name of file after the IP address with slash mark.

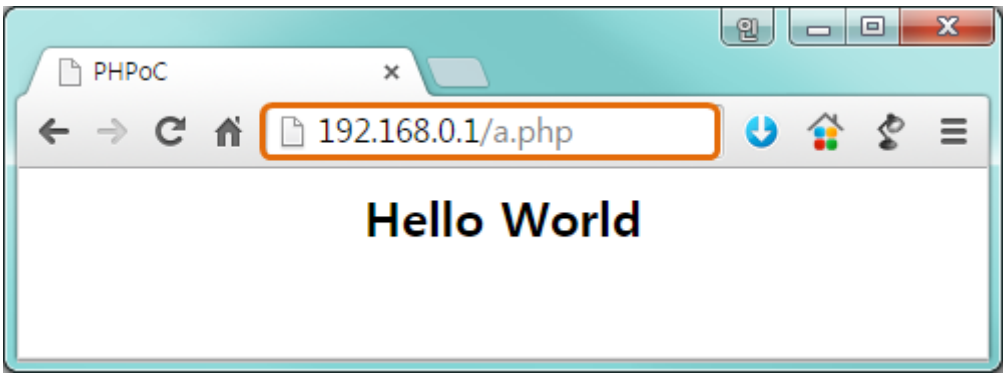

Figure 3-5 web interface (2)

3.4.2 Practical Use of Web Interface

A web interface is very useful because it runs while PBH-204 is operating in button setup mode. If you upload web pages for running any function, you can easily use it by wireless LAN.

3.5 Firmware Upgrade

3.5.1 Download Firmware File

Check and download firmware file on PHPoC web site to your local PC.

3.5.2 Firmware Upgrade

① Connect setup port of PHPoC product to local PC via USB cable.

② Run PHPoC Debugger and click connect ( ) button.

③ Click [Function] > [Upgrade Firmware] menu.

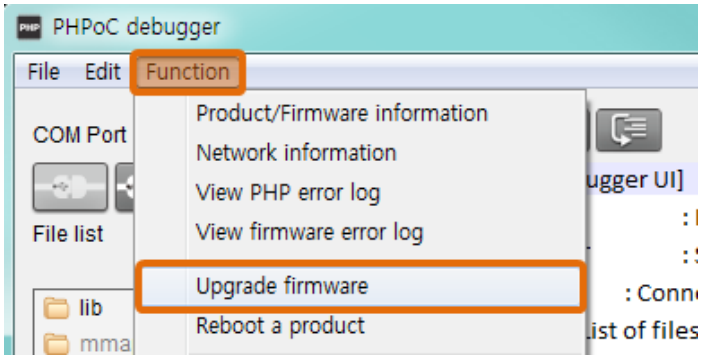

Figure 3-6 firmware upgrade (1)

④ Click [Open] button to select the firmware file.

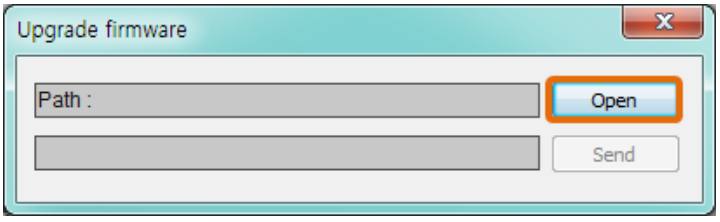

Figure 3-7 firmware upgrade (2)

⑤ Click [Send] button.

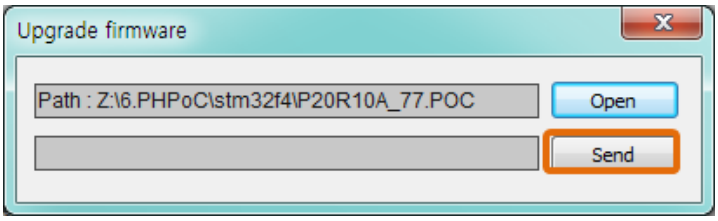

Figure 3-8 firmware upgrade (3)

⑥ Firmware Upgrade Completed.

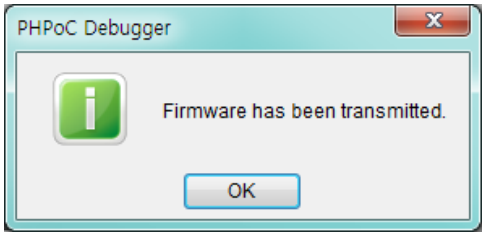

Figure 3-9 firmware upgrade (4)

3.6 Etcetera

3.6.1 Using External Editor

In case that you want to use not PHPoC Debugger's internal editor but external editor, just set [External editor] option of [action of file add] item on preferences window.

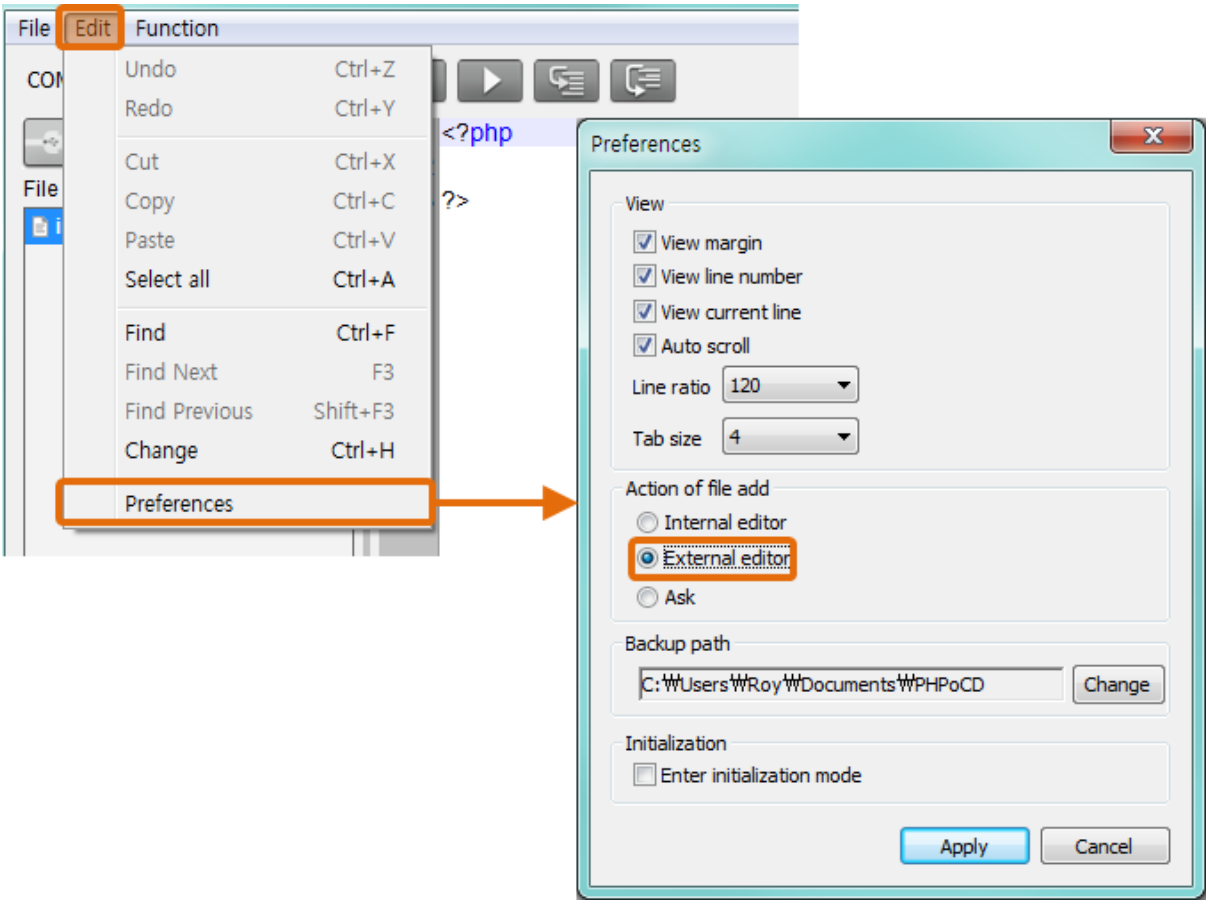

Figure 3-10 using external editor (1)

Upload php files with this option, synchronized files have lock icons as follows. Files with this icon cannot be modified by PHPoC Debugger's internal editor but external editors available.

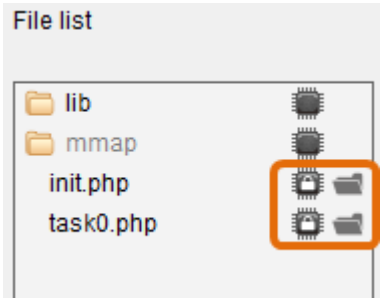

Figure 3-11 using external editor (2)

3.6.2 PHP Debug Mode

PHPoC provides run-time debugging function. Buttons for debugging are enabled when you check the PHP debug mode option in PHPoC Debugger. In this mode, you can set break points or check values of variables at every command line.

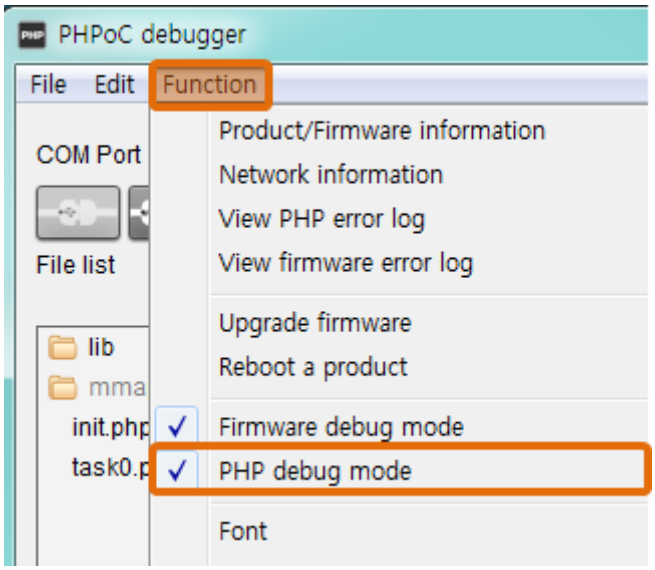

Figure 3-12 enable debug mode (1)

When enabling debug mode, PHPoC pause running script at the first line.

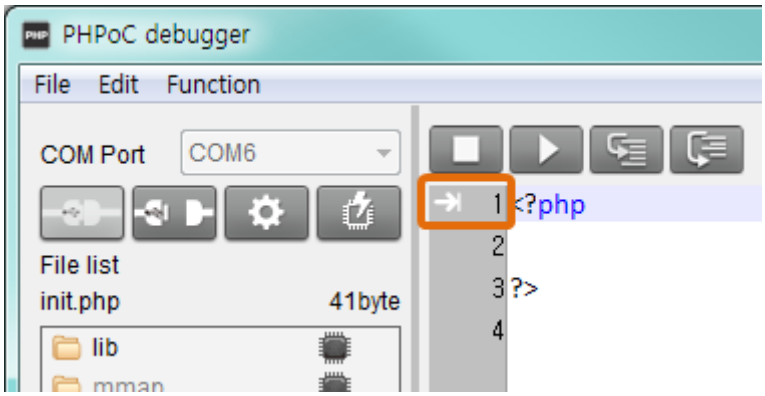

Figure 3-13 enable debug mode (2)

3.6.3 Escape Infinite Reboot Problem

PHPoC basically runs scripts when it boots up. Therefore, it is possible that a PBH-204 cannot be escape from infinite reboot by system command such as "reboot". To solve this problem, it is required to stop the running script. Refer to the following.

① Entering ISP mode

Make PBH-204 to enter ISP mode by supplying power while pressing FUNC button. In the ISP mode, you can access to PHPoC by PHPoC Debugger without running a script.

② Connect to PHPoC

Connect a PC to PHPoC via a USB cable and connect to the port via PHPoC Debugger. A message window related with ISP mode will be popped up.

③ Reboot PHPoC

Reboot PHPoC by using "Reboot a product" menu in PHPoC Debugger. After rebooting, PHPoC stops running script even it is not in the ISP mode.

④ Correct source code

Correct the source code to prevent infinite reboot state.

4 Technical Support and Warranty

4.1 Technical Support

Sollae Systems operates PHPoC forum web site. This forum is for solving problem, asking questions and sharing opinions among PHPoC users.

- PHPoC Forum: http://www.phpoc.com/forum/

4.2 Customer Support

If you have any question regarding products, service and others, visit message board of Customer Support on Sollae Systems' web site or send us an email:

- Website Address for Customer Support: http://www.eztcp.com/en/support/
- E-mail: support@eztcp.com

4.3 Warranty

4.3.1 Refund

Upon the customer's request to refund the product within two weeks after purchase, Sollae Systems will refund the product.

4.3.2 Free Repair Services

For product failures occurring within two years after purchase, Sollae Systems provides free repair services or exchange the product. However, if the product failure is due to user's fault, repair service fees will be charged or the product will be replaced at user's expense.

4.3.3 Charged Repair Services

For product failures occurring after the warranty period (two years) or resulting from user's fault, repair service fees will be charged and the product will be replaced at user's expense.

5 Precaution and Exemption from Liability

5.1 Precaution

- Sollae Systems is not responsible for product failures occurring due to user's alternation of the product.
- Specifications of the product are subject to change without prior notice for performance improvement.
- Sollae Systems does not guarantee successful operation of the product if the product was used under conditions deviating from the product specifications.
- Reverse engineering of firmware and applications provided by Sollae Systems is prohibited.
- Use of firmware and applications provided by Sollae Systems for purposes other than those for which they were designed is prohibited.
- Do not use the product in an extremely cold or hot place or in a place where vibration is severe.
- Do not use the product in an environment in which humidity is high or a lot of oil exists.
- Do not use the product where there is caustic or combustible gas.
- Sollae Systems does not guarantee normal operation of the product under the conditions a lot of noise exists.
- Do not use the product for a purpose that requires exceptional quality and reliability relating to user's injuries or accidents – aerospace, aviation, health care, nuclear power, transportation, and safety purposes.
- Sollae Systems is not responsible for any accident or damage occurring while using the product.

5.2 Exemption from Liability

5.2.1 English version

In no event shall Sollae Systems Co., Ltd. and its distributors be liable for any damages whatsoever (including, without limitation, damages for loss of profit, operating cost for commercial interruption, loss of information, or any other financial loss) from the use or inability to use the PBH-204 even if Sollae Systems Co., Ltd. and its distributors have been informed of such damages.

The PBH-204 is not designed and not authorized for use in military applications, in nuclear applications, in airport applications, in applications involving explosives, in medical applications, in security alarm, in a fire alarm, in applications involving elevators, or in embedded applications in vehicles such as but not limited to cars, planes, trucks, boats, aircraft, helicopters, etc.

In the same way, the PBH-204 is not designed, intended, authorized to test, develop, or be built into applications where failure could create a dangerous situation that may result in financial losses, damage to property, personal injury, or the death of people or animals. If you use the PBH-204 voluntarily or involuntarily for such unauthorized applications, you agree to subtract Sollae Systems Co., Ltd. and its distributors from all liability for any claim for compensation.

Sollae Systems Co., Ltd. and its distributors entire liability and your exclusive remedy shall be Sollae Systems Co., Ltd. and its distributors option for the return of the price paid for, repair, or replacement of the PBH-204.

In no event shall Sollae Systems Co., Ltd. and its distributors be liable for loss of user program codes which are stored in PBH-204.

Sollae Systems Co., Ltd. and its distributors disclaim all other warranties, either expressed or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose, with respect to the PBH-204 including accompanied written material, hardware and firmware.

5.2.2 French version

- Documentation

La documentation du boîtier PBH-204 est conçue avec la plus grande attention. Tous les efforts ont été mis en œuvre pour éviter les anomalies. Toutefois, nous ne pouvons garantir que cette documentation soit à 100% exempt de toute erreur. Les informations présentes dans cette documentation sont données à titre indicatif. Les caractéristiques techniques peuvent changer à tout moment sans aucun préavis dans le but d'améliorer la qualité et les possibilités des produits.

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Le boîtier PBH-204 est exclusivement prévu pour un usage en intérieur, dans un environnement sec, tempéré (+10 °C à +40°C) et non poussiéreux. Le boîtier PBH-204 n'est pas prévu, ni autorisé pour être utilisé en extérieur, ni de façon embarquée dans des engins mobiles de quelque nature que ce soit (voiture, camion, train, avion, etc...), ni en milieu explosif, ni dans des enceintes nucléaires, ni dans des ascenseurs, ni dans des aéroports, ni dans des enceintes hospitaliers, ni pour des applications à caractère médical, ni dans des dispositifs de détection et d'alerte anti-intrusion, ni dans des dispositifs de détection et d'alerte anti-incendie, ni dans des dispositifs d'alarme GTC, ni pour des applications militaires.

De même, le boîtier PBH-204 n'est pas conçu, ni destiné, ni autorisé pour expérimenter, développer ou être intégré au sein d'applications dans lesquelles une défaillance de celui-ci pourrait créer une situation dangereuse pouvant entraîner des pertes financières, des dégâts matériel, des blessures corporelles ou la mort de personnes ou d'animaux. Si vous utilisez le boîtier PBH-204 volontairement ou involontairement pour de telles applications non autorisées, vous vous engagez à soustraire Sollae Systems Co., Ltd. et ses distributeurs

de toute responsabilité et de toute demande de dédommagement.

En cas de litige, l'entière responsabilité de Sollae Systems Co., Ltd. et de ses distributeurs vis-à-vis de votre recours durant la période de garantie se limitera exclusivement selon le choix de Sollae Systems Co., Ltd. et de ses distributeurs au remboursement de votre produit ou de sa réparation ou de son échange. Sollae Systems Co., Ltd. et ses distributeurs démentent toutes autres garanties, exprimées ou implicites.

Tous les boîtiers PBH-204 sont testés avant expédition. Toute utilisation en dehors des spécifications et limites indiquées dans cette documentation ainsi que les court-circuit, les chocs, les utilisations non autorisées, pourront affecter la fiabilité, créer des dysfonctionnements et/ou la destruction du boîtier PBH-204 sans que la responsabilité de Sollae Systems Co., Ltd. et de ses distributeurs ne puissent être mise en cause, ni que le boîtier PBH-204 puisse être échangé au titre de la garantie.

- Rappel sur l'évacuation des équipements électroniques usagés

Le symbole de la poubelle barré présent sur le boîtier PBH-204 indique que vous ne pouvez pas vous débarrasser de ce dernier de la même façon que vos déchets courants. Au contraire, vous êtes responsable de l'évacuation du boîtier PBH-204 lorsqu'il arrive en fin de vie (ou qu'il est hors d'usage) et à cet effet, vous êtes tenu de le remettre à un point de collecte agréé pour le recyclage des équipements électriques et électroniques usagés. Le tri, l'évacuation et le recyclage séparés de vos équipements usagés permettent de préserver les ressources naturelles et de s'assurer que ces équipements sont recyclés dans le respect de la santé humaine et de l'environnement. Pour plus d'informations sur les lieux de collecte des équipements électroniques usagés, contacter votre mairie ou votre service local de traitement des déchets.

6 Appendix

6.1 Device Information

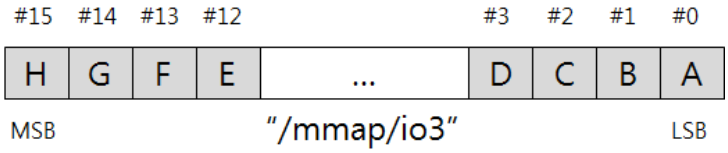
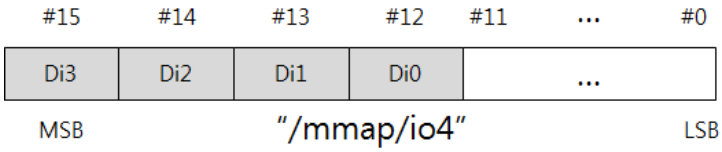
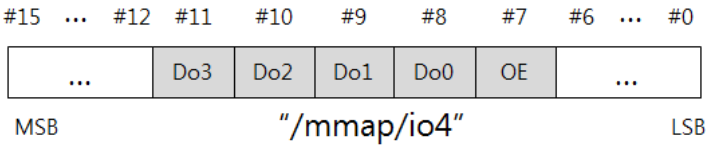
6.1.1 Device overview

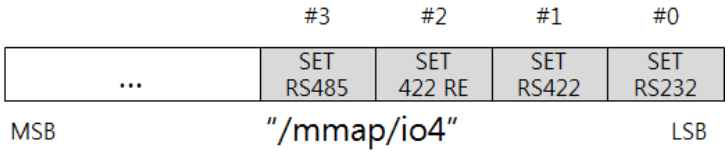
Device		Number	Path	Note
UART		1	/mmap/uart0	
NET		2	/mmap/net0~1	0: wired, 1: wireless
TCP		5	/mmap/tcp0~4	
UDP		5	/mmap/udp0~4	
I/O	Digital Input (Photo-coupler)	4	/mmap/io4	
	Digital Output (Relay)	4	/mmap/io4	
	Digital Output(LED)	8	/mmap/io3	
ST		4	/mmap/st0~3	

Table 6-1 device overview

☞ ***Refer to the "Device Programming Guide for P20" for detailed information about using devices.***

6.1.2 I/O port

<table>
<tr><th colspan="2">Type</th><th>Path and Mapping information</th></tr>
<tr><td rowspan="4">PBH-204</td><td>LED</td><td>/mmap/io3
 
</td></tr>
<tr><td>Digital Input</td><td>/mmap/io4
 
</td></tr>
<tr><td>Digital Output</td><td>/mmap/io4
 

※ OE: bit for Enable / Disable output relay
- Enable: LOW(0), Disable: HIGH(1)</td></tr>
<tr><td>UART Mode</td><td>/mmap/io4
 

● Values for Serial Type
<table>
<tr><th>Type</th><th>Value</th><th>SET RS485</th><th>SET 422 RE</th><th>SET RS422</th><th>SET RS232</th></tr>
<tr><td>RS232</td><td>0x05</td><td>0</td><td>1</td><td>0</td><td>1</td></tr>
<tr><td>RS422</td><td>0x02</td><td>0</td><td>0</td><td>1</td><td>0</td></tr>
<tr><td>RS485</td><td>0x0c</td><td>1</td><td>1</td><td>0</td><td>0</td></tr>
</table></td></tr>
</table>

Table 6-2 I/O port

7 Revision History

Date	Version	History	Author
2014.10.24	1.0	Created	Roy Lee
2015.11.10	1.1	Updated screenshots	Amy Kim