



PHPoC

Programmable IoT Solution
for Dynamic Web Control



Introduction

New era – Internet of Things (IoT) has come up. There are a lot of the smart things have been created such as Nest Learning Thermostat, Philips Hue–Smart Home Lighting, Apple Watch and HomeKit, Google Glass, The Air Quality Egg, Amazon Echo, etc. PHPoC helps you to quickly realize your idea, rapidly make your application prototyping. PHPoC lets you develop your application on embedded devices as easily as on your computer. With supported library, you can do something as big as you can imagine by some simple lines of codes without worrying about designing hardware.

PHPoC vs PHP

Similar to PHP, PHPoC (PHP on Chip) can create a variety of web pages to suit your environment and perform other network functions such as sending email or accessing the database. Unlike PHP, however, PHPoC has some additional features that an embedded system needs in order to interact with hardware. It provides a variety of hardware interfaces and functions to monitor sensor status and control machines or devices.



Get inspired and share projects

You can get inspired and share your projects with worldwide PHPoC users through our channels on YouTube or social networks such as Facebook, Instagram and Hackster. Simple examples and tutorials are available on YouTube and PHPoC Forum to help you quickly get started with PHPoC. If you face difficulties during using PHPoC, PHPoC community members are willing to help you.

“Imagine with PHPoC”

-  www.facebook.com/iot.device
-  www.instagram.com/phpoc
-  www.youtube.com/phpocplus
-  www.hackster.io/phpoc



Line up

PHPoC IoT Board



PHPoC Black
P4S-341 [P.09](#)



PHPoC Blue
P4S-342 [P.10](#)

PHPoC Smart Expansion Board



4-Port Relay Board
PES-2401 [P.11](#)



4-Port Digital Input Board
PES-2402 [P.11](#)

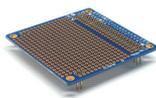


Stepper Motor Controller
PES-2403 [P.12](#)



Brushed DC Motor Controller
PES-2404 [P.12](#)

PHPoC Expansion Board



Proto Board
PES-2001 [P.13](#)



Bread Board
PES-2002 [P.13](#)



PWM and Sensor Board
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mikroBUS™ Board
PES-2004 [P.13](#)



Grove Board
PES-2005 [P.13](#)



RS232 Board
PES-2201 [P.14](#)



RS422/RS485 Board
PES-2202 [P.14](#)



Analog Input Board
PES-2203 [P.14](#)

Coming soon

PHPoC Shield for Arduino



PHPoC WiFi Shield for Arduino
P4S-347 [P.18](#)



PHPoC Shield for Arduino
P4S-348 [P.18](#)

PHPoC IoT Gateway



PHPoC IoT Gateway
PBH-101

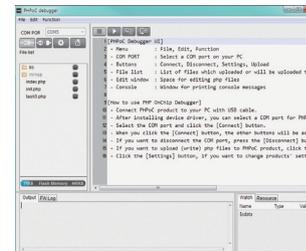


PHPoC IoT Gateway
PBH-104



PHPoC IoT Gateway
PBH-204

Software (PHPoC Debugger)



PHPoC Debugger, required for the script development, is a development tool for Windows.

What PHPoC Debugger does :

- Uploads/Downloads files
- Real-time debugging scripts
- Edits the script files
- Sets system environment
- Determines resource status
- Changes firmware

Advantage of PHPoC Debugger :

- Real-time script debugging function to clearly and quickly diagnose problems
- An option to use an external editor
- Sets passwords to protect the source code
- Simple and easy to use

PHPoC Features

Sensor Monitoring

You can monitor data from various sensors such as temperature, pressure, acceleration, fine dust, etc.

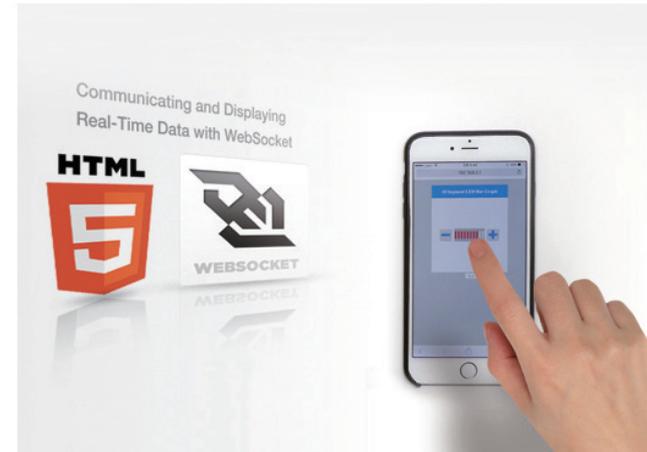
PHPoC Black/Blue are equipped with ADC, I2C, SPI, UART, timer, and digital input interfaces for a variety of sensors.



Actuator Control

You can control actuators, motors or others devices connected to PHPoC Black/Blue via digital outputs, I2C, SPI, UART.

PHPoC Black/Blue gives an output of PWM up to 12units.



WebSocket Application

PHPoC Black/Blue has built-in web server and support the standard HTML5 WebSocket to send and receive data in real time on the Web, enabling to monitor sensors and control devices remotely using web browser.

Library & Sample Code for Internet Connection

PHPoC Black/Blue connects to Internet via Ethernet/Wifi with a lot of supported protocols allowing to reach anywhere on Internet through various ways.

- TCP/UDP
- IPv4/IPv6
- ICMP/DHCP/HTTP/SSH
- SMTP/ESMTP
- DNS/DDNS
- WebSocket Server



PHPoC Features

Smart Device

You can use smart devices to monitor and control connected devices.



RTC (Real-Time Clock)

PHPoC Black/Blue has a built-in battery for RTC, so it can be applied in which time-related information is needed.



Source Level Debugging

You can save development time with a source-level debugging function.

When trouble occurs on a system, it can be solved quickly without stopping the operating system.



Security Protocol

PHPoC Black/Blue offers a variety of security protocols and authentication algorithm.



PHPoC IoT Board



It is a wired LAN programmable board embedded with a PHPoC interpreter. It supports various interfaces to connect with sensors and equipment, and you can control your equipment from a remote site via web browser. Also, you can stack expansion boards to implement additional functions.

PHPoC Black | P4S-341

SPECIFICATIONS

Hardware

| | |
|--------------|---|
| MCU | : Cortex-M4 168MHz, flash 1024K, SRAM 192K |
| Digital I/O | : 10 x DIO dedicated (8 x User, 2 x LED), 14 x DIO shared (SPI, I2C, 2 x UART) |
| Analog Input | : 6 x ADC (AREF, 12bit) |
| H/W timer | : 4 x H/W timer |
| USB | : 1 x USB device |
| LAN | : 10 Base-T/100 Base-TX, 10/100M auto-sensing, auto MDI/MDIX |
| RTC | : CR1225 Coin Battery (48mAh) |

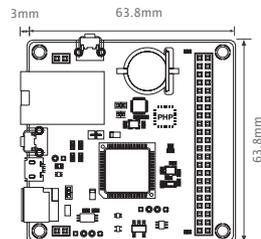
Software

| | |
|--------------|---|
| PHPoC | : PHP compatible interpreter (limited syntax & internal functions) |
| Connectivity | : TCP/UDP/IPv4/IPv6/ICMP/DHCP/DNS/HTTP/ SSH/WebSocket Server |
| Security | : SSL/SSH, AES/RC4/3DES/MD5/SHA1 |

FEATURES

- PHPoC interpreter/debugger
- 64bit integer, double-precision floating point
- Max. 12 PWM output (4 x H/W timer, 8 x S/W timer)
- Multi-tasking capability (application and HTTP server)
- Web and WebSocket Server
- Uploading and debugging codes via USB

DIMENSIONS



PHPoC Blue | P4S-342

SPECIFICATIONS

Hardware

| | |
|--------------|---|
| MCU | : Cortex-M4 168MHz, flash 1024K, SRAM 192K |
| Digital I/O | : 10 x DIO dedicated (8 x User, 2 x LED), 14 x DIO shared (SPI, I2C, 2 x UART) |
| Analog Input | : 6 x ADC (AREF, 12bit) |
| H/W timer | : 4 x H/W timer |
| USB | : 1 x USB device, 1 x USB host |
| WLAN | : IEEE802.11b/g Wireless LAN (USB dongle provided by Sollae Systems is required) |
| RTC | : Rechargeable Battery (5.8mAh) |

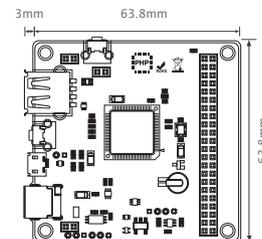
Software

| | |
|--------------|---|
| PHPoC | : PHP compatible interpreter (limited syntax & internal functions) |
| Connectivity | : Ad-hoc/Infrastructure/Soft AP, TCP/UDP/IPv4/IPv6/ICMP/DHCP/DNS/HTTP/ SSH/WebSocket Server |
| Security | : SSL/SSH, AES/RC4/3DES/MD5/SHA1, WPA-PSK/Enterprise |

FEATURES

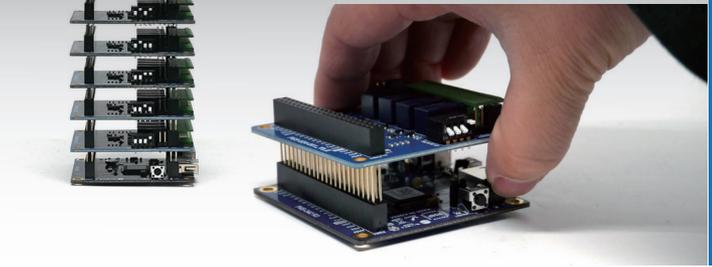
- PHPoC interpreter/debugger
- 64bit integer, double-precision floating point
- Max. 12 PWM output (4 x H/W timer, 8 x S/W timer)
- Multi-tasking capability (application and HTTP server)
- Web and WebSocket Server
- Uploading and debugging codes via USB

DIMENSIONS

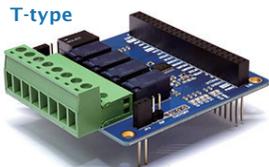


It is a wireless LAN programmable board embedded with a PHPoC interpreter. It supports various interfaces to connect with sensors and equipment and USB wireless LAN adapter is provided for network connectivity. Also, you can stack expansion boards to implement additional functions.

PHPoC Smart Expansion Board



Smart Expansion Boards communicate with PHPoC Black/Blue as master and slave way through a smart expansion port. They can be stacked and recognized by each slave ID number among 14 different ID numbers which you can set by a dip switch. Two different types of terminal blocks are supported according to the direction of the terminal screw. S-type is convenient to screw from side when it is stacked. T-type is for you to screw from top.

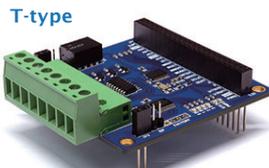


4-Port Relay Board | PES-2401

4-port Relay Board is a PHPoC smart expansion board for relays. This board can be used to turn on/off devices.

FEATURES

- 1x8 5mm pitch terminal block interface
- 4-port A-type(NO) relay output(DC 30V/2A)



4-Port Digital Input Board | PES-2402

4-port Digital Input Board is a PHPoC smart expansion board for WET Contact or Dry Contact which can be used to monitor status of input ports.

FEATURES

- 1x8 5mm pitch terminal block interface
- 4-port electrically isolated Digital Input
- WET/DRY contact, NPN/PNP transistor input

Stepper Motor Controller | PES-2403

The Stepper Motor Controller supports acceleration, deceleration and resonance avoidance in bi-polar type, so it can easily realize smooth movements and safely control stepper motor.

FEATURES

- 1x6 5mm pitch terminal block interface
- Bi-polar stepper motor controller
- Input voltage : DC 4V ~ DC 18V
- Maximum current : 1A each coil
- Drive mode : full-step/half-step
- Acceleration and deceleration function
- Dynamic current control
- Resonance avoidance function
- Safe switch

※ Micro Stepper Motor Controller (PES-2405) is coming soon.

T-type



S-type



Brushed DC Motor Controller | PES-2404

Brushed DC Motor Controller can drive two brushed DC motors and has two incremental encoder ports for feedback control. Noise generated by DC motor and effected encoder is canceled by hardware and software. Filter in addition, we can expect more stable operation since the built-in MCU and motor drive are electrically isolated.

FEATURES

- 1x6 5mm pitch terminal block interface
- Supporting 2 brushed DC motors
- 2 incremental encoders
- Input voltage : DC 4V ~ DC 18V
- Maximum current : 1A each motor
- Electrically isolated circuit
- Fast/slow decay mode
- Noise cancellation by hardware and software for encoder

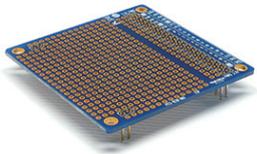
T-type



S-type

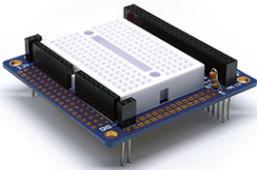


PHPoC Expansion Board



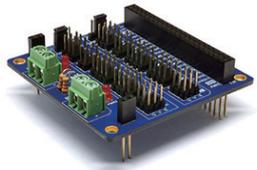
Proto Board | PES-2001

Proto Board makes it easy to configure the circuit with soldering.



Bread Board | PES-2002

Bread Board makes it easy to design custom circuits. Users can use the bread board to quickly test circuit ideas without having to solder. Users can also solder some components on the prototyping area to create projects.

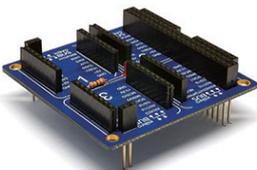


PWM and Sensor Board | PES-2003

As an expansion board, PWM and Sensor Expansion Board provides 3-pin interfaces, allowing easy connection of motors, sensors or I/O devices to PHPoC. This board gives the option to switch to external power sources in case applications require a lot of power such as multiple high-weight servo motors.

FEATURES

- 4 hardware timer interfaces
- 6 ADC interfaces
- 21 I/O interfaces
- Two optional terminal blocks for external power (max. input of 10V)



mikroBUS™ Board | PES-2004

mikroBUS™ Expansion Board provides four mikroBUS™ sockets, allowing easy connection of PHPoC to mikroBUS™ sensors and actuators.



Grove Board | PES-2005

Grove expansion board makes connection between PHPoC and grove-sensor simpler and neater.

FEATURES

- 2 UART groves
- 1 SPI grove
- 1 I2C grove
- 6 ADC groves
- 4 PWM groves
- 11 I/O groves
- Power switch between 3.3V and 5V

RS232 Board | PES-2201

RS232 Board is a PHPoC expansion board designed for RS232 communication. The type of the communication port is D-SUB9 and RTS/CTS flow control is available.

FEATURES

- 9 pin D-sub male interface for RS232
- 2.54mm pitch 1x4 hole for RS232
- UART jumper (either UART0 or UART1)
- RTS/CTS jumper (either EN-enabled or DIS-disabled)



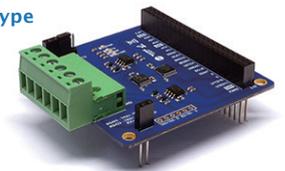
RS422/RS485 Board | PES-2202

RS422/RS485 Board is a PHPoC expansion board for RS422 or RS485 communications. The type of the communication port is 5mm pitch 1x6 terminal block and it is equipped with 3.9k biasing resistance. Two different types of terminal blocks are supported according to the direction of the terminal screw. S-type is convenient to screw from side when it is stacked. T-type is for you to screw from top.

FEATURES

- 1x6 5mm pitch terminal block interface
- 2.54mm pitch 1x6 Hole for RS422/RS485
- UART jumper (either UART0 or UART1)

T-type



S-type



Analog Input Board | PES-2203

Coming soon

Analog Input Board is a board that provides interfaces to measure voltage and current values. It is embedded with various circuits to be protected by external electric shocks.

FEATURES

- 1x6 5mm pitch terminal block interface
- 3 ADC Input ports
- DC 0V~5V or 0mA~20mA with jumper
- Transient over-voltage protection

T-type



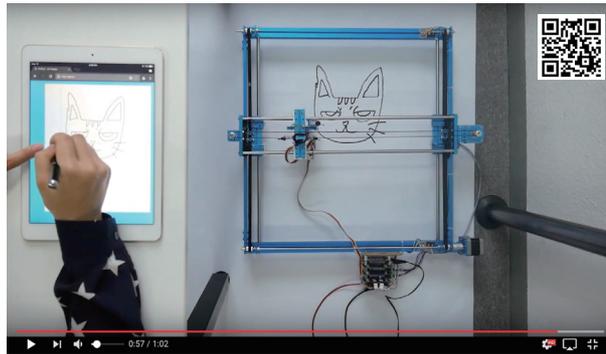
S-type



PHPoC Project

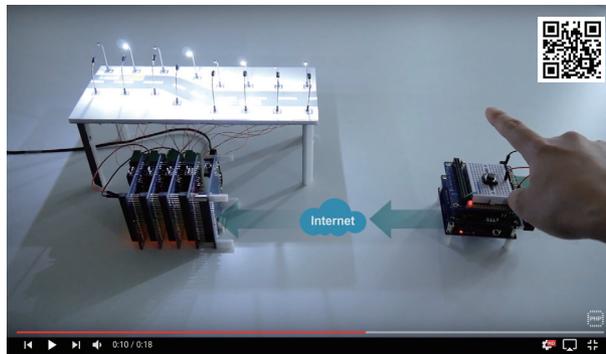
XY Plotter Drawing via Web Using PHPoC Blue

When a finger touches a certain point of the drawing area in a web page, the XY coordinate touching point is sent to PHPoC. After scaling the coordinate, PHPoC will move two step motors to locate the pen to the coordinate.



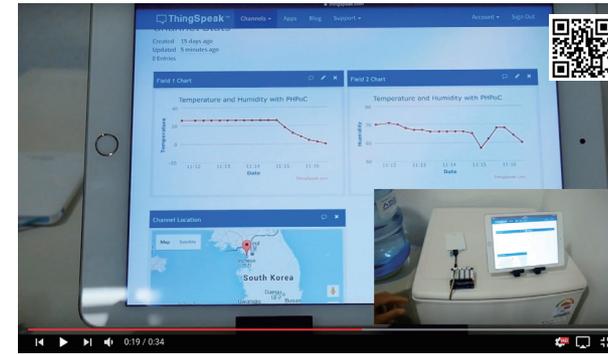
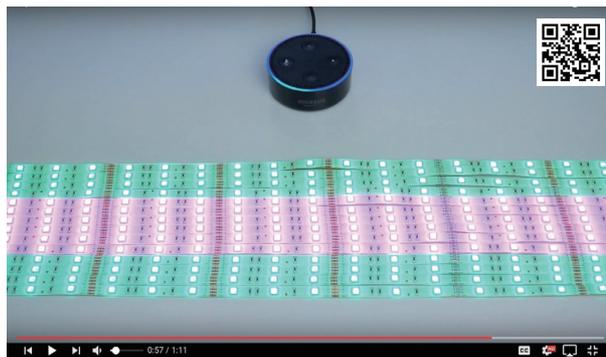
Controlling Street Lights with PHPoC Blue

This project is an implementation of controlling 16 minimized street lights by a PHPoC board with 4-Port Relay Boards (PES-2401).



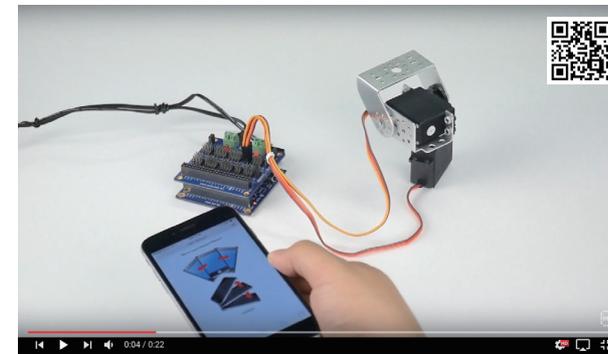
LED Control by Alexa with PHPoC Blue

Watch this voice-controlled LED by Amazon's Echo Dot with PHPoC Blue!



PHPoC Blue, ThingSpeak, Temperature and Humidity Sensor

This project shows how PHPoC Blue reads data from temperature and humidity sensor, and then send these values to ThingSpeak. You can store your data on ThingSpeak for storing, analyzing, visualizing data.



Remote Control Servo Motor with PHPoC Blue

Applying PHPoC Blue, you can remotely control the servo motor with your smart phone. In this video, Willy presents an application example of PHPoC Blue where the servo motor is programmed to move accordance to the movement of the smart phone.

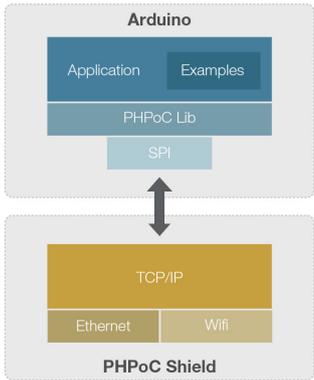


Feed Your Fish with PHPoC Blue

With PHPoC Blue, now you can feed your fish while you're away from home. Watch how we feed our fish by remotely controlling the feeder over the smartphone.



PHPoC Shield for Arduino



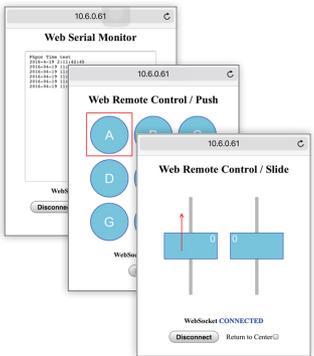
Why PHPoC Shield for Arduino?

In the era of IoT (Internet of Things), everything should be connected to Internet. Arduino Uno and Mega are popular hardware platforms, and they are widely used in many applications. However, It does not have an ability to connect to Internet. That is the reason why PHPoC shield appears. PHPoC shield is a bridge between Arduino and Internet. PHPoC shield not only has all functions of WiFi shield and Ethernet shield, but also has many advanced functions. With PHPoC shield, Arduino can connect to Internet via wired or wireless network.

In depth, let's think about 7 layers in OSI model. PHPoC shield already has layers from 1 to 6, and you just need to develop layer 7 (application) on Arduino. With powerful libraries and examples, you can easily realize it.

For easy control through the web interface! Fulfill your ambition and make your life more convenient than ever.

PHPoC Shield for Arduino has some built-in Web applications. Just by using the Web browser on your smartphone, you can easily control anything (e.g. power, motor's speed) via the Web. This is not all about what to do with the Web. Serial monitor function is a great feature which allows you to real-time monitor sensing data through a web page. Change your network configuration at any time through web interface.

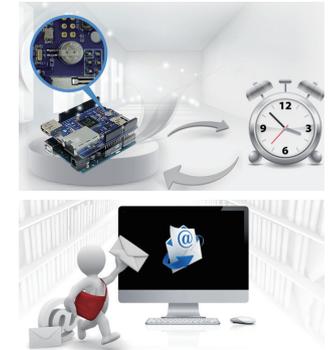


Next-generation Internet protocol, IPv6 on PHPoC

We are living in a IoT world and the Internet connects people from all over the world. Because many people have started using the Internet, it caused a problem- 'shortage of IP address capacity'. To solve this problem, IPv6 is developed and intended to replace IPv4. Thankfully, PHPoC Shield for Arduino supports both IPv4 and IPv6 for you to not experience any compatibility issues.

PHPoC Shield for Arduino brings joy to use a variety of functions.

PHPoC shield is not just a shield for the network. A built-in rechargeable battery and RTC allow to get time information and to perform time-related functions such as scheduling and alarming. With its Email library, you can get the desired information via Email. It also supports a variety of protocols, such as SSH, Telnet and WebSocket. You are now available to enjoy a variety of functions with just one shield. This is why you need the shield.



PHPoC (WiFi) Shield for Arduino | P4S-347/P4S-348

PHPoC Shield for Arduino is compatible with Arduino Uno or Mega products. PHPoC shield is equipped with both wired and wireless LAN functions, providing various network functions according to your environment, bring a Arduino to Internet, spreading Arduino's voice to unlimited distance. In addition to the network function, PHPoC shield supports a wide range of API. In particular, a built-in web application provides easy web applications control and network setup. Also, you can monitor the output of Arduino serial monitor via Web from a remote location in real time.

P4S-347
Wireless LAN



P4S-348
Ethernet/Wireless LAN



SPECIFICATIONS

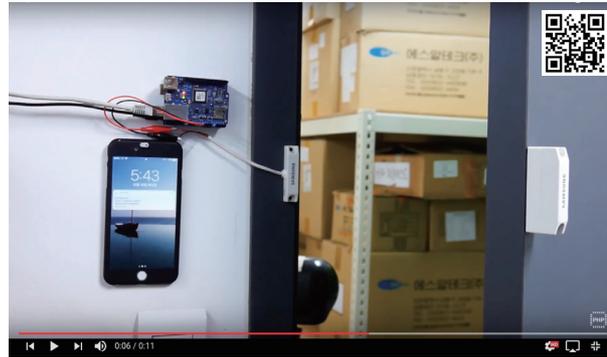
| | |
|-----------------|--|
| Software | |
| Class | : PhpocClient, PhpocServer, PhpocEmail, PhpocDateTime |
| Connectivity | : IPv4/IPv6 dual stack, ICMP/TCP/UDP, DNS, Telnet, SMTP, HTTP, WebSocket |
| Security | : SSL Server/Client, SSH Server |
| Web Application | : WebSerialMonitor, WebRemoteControl (push/slide) |
| Setup | : Web |
| Hardware | |
| microSD | : SPI - ICSP, SS: 4, Push-Pull Type |
| RTC | : Rechargeable Battery (5.8mAh) |



PHPoC Shield Project

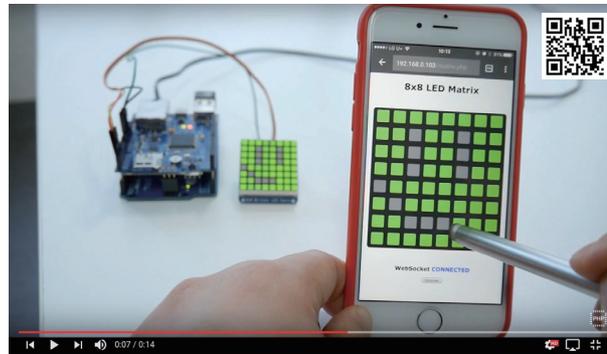
Monitoring Door-Opening via Gmail

PHPoC Shield for Arduino sends you an email every time the door is opened. With PHPoC Shield's Email library, you can receive the desired information via Email.



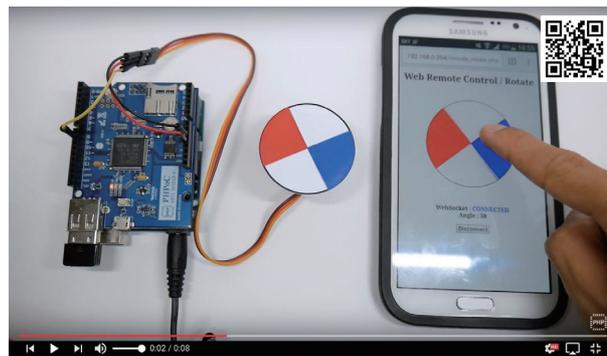
Remote-Controlled 8X8 LED Matrix with PHPoC Shield for Arduino

We added a web page to the PHPoC Shield to control the 8X8 Matrix LED. If you send data from a web page using HTML5 Web socket, then it responds to turn each 8X8 LED on or off right away!



PHPoC Shield for Arduino -Dynamic Web Control

This video shows how to control a servo motor using arduino and PHPoC shield via dynamic web page.

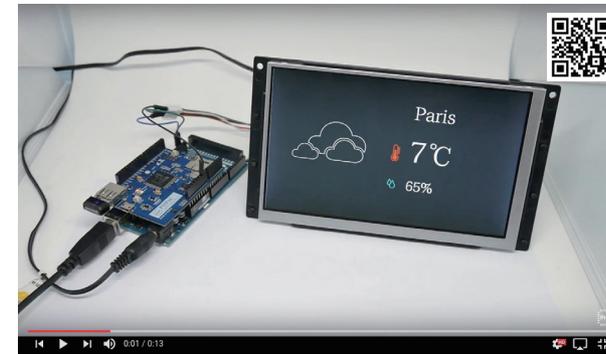


Control Your Lights with PHPoC Shield for Arduino

With Built-in Web application of PHPoC Shield for Arduino, you can control your lights to turn on or off easily.

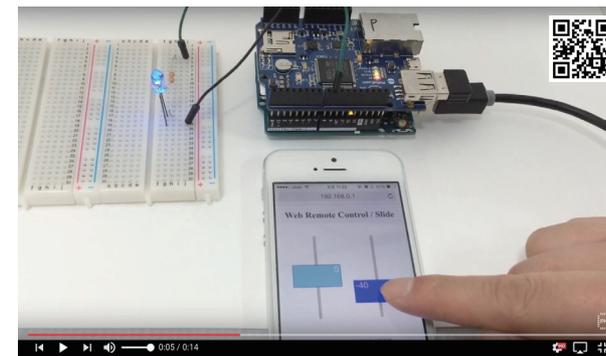
Getting Weather Data from OpenWeatherMap.org with PHPoC WiFi Shield for Arduino

This project shows how to get current weather data for any city in the world from a website "OpenWeatherMap.org".

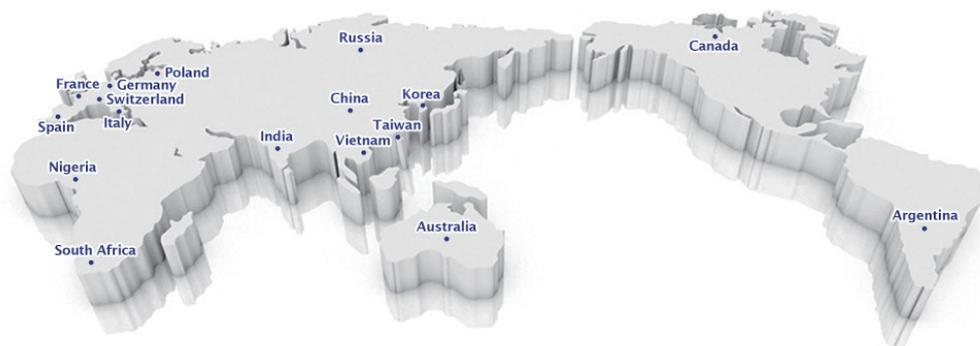


Control Brightness Using PHPoC Shield for Arduino

Using PHPoC Shield for Arduino, control brightness to save energy or create different atmosphere from the distance!



Global Partners



Argentina

EtherPower SRL Juana de Ibarbourou 1083 Piso 2 Of.B(1405) Ciudad de Buenos Aires
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T +27 86 155 0850 H <http://www.fibrenetworks.co.za>

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