Overview



Introduction

PHPoC WiFi Shield for Arduino connects Arduino to Wi-Fi networks. Attach this board over Arduino, and connect a WIFI dongle. After a simple network setup, Arduino is connected to the Internet.

The network function of this shield is based on the TCP/IP stack using PHPoC interpreter. The shield can be easily accessed by Phpoc Library. Phpoc Library is very similar to the usage of Arduino WIFI library. Therefore, source codes using existing WIFI library can be used immediately after modifying just few lines. It will surely reduce trials and errors of users with the previous experience using WIFI shield.

Furthermore, Phpoc Library has a wider range of applications since it supports a variety of API(e.g. SSL, SSH, TELNET, Web socket, ESMTP and so on) absent from the existing libraries.

Key Features

- Mounted on Arduino board (Compatible boards: Uno & Mega)
- Power: DC 5V (Supplied from Arduino boards)
- Network controller: PHPoC interpreter
- Wireless LAN: IEEE802.11b/g
- WLAN security: WPA-PSK/Enterprise
- Save time information (RTC Battery Backup)
- Web settings (Smartphone or PC)
- Embedded web applications: Serial monitor, remote control (push), remote control (slide)
- SPI communication with Arduino board
- Support IPv6

Protocol Stack



Hardware Specifications

Block Diagram



Dimension

2.4 15.34 13.15 ON SETUP SETUP SETUP 68.58 ON STATUS WIFI SETUP 68.58 ON STATUS STATUS SETUP 68.58 ON STATUS STATUS SETUP 68.58 ON STATUS SETUP 68.58 ON STATUS SETUP 66.58 ON STATUS SETUP SE

The dimensions of PHPoC WiFi Shield for Arduino are as follows: (Unit: mm)

Weight

The weight is about 23.1g (without USB Wireless LAN dongle).

Communication with Arduino

PHPoC WiFi Shield for Arduino communicates to Arduino via SPI through ICSP header. SPI interface of the Arduino Uno and Mega is as follows:

Pin	Uno	Mega
MOSI	11	51
MISO	12	50
CLK	13	52
SS	10	10

On the Mega, the pin 53 must be kept as an output or the SPI interface won't work.

Connectors & Components



1. USB Port

It supports IEEE 802.11b/g wireless LAN. Connect a USB WIFI dongle to this port.

You must use a USB WIFI dongle equipped with Ralink RT3070 or RT5370 chipset.

2. Micro USB Port

It is a reserved port.

3. MicroSD Socket

It provides a microSD card socket. Arduino directly communicates with SD memory through SPI. The SS pin of SPI for selecting SD memory communication is 4.

4. Built-in Battery

It provides a built-in battery for RTC features and saving log information.

5. SETUP Button

It is used to change or to initialize environment values to default value.

6. RESET Button

This button is for product reset.

LED Indicators

PHPoC WiFi Shield for Arduino has 4 LEDs to indicate the status of the shield.

- ON: shows that power is being supplied to the shield
- STATUS: indicates the operating state of the shield
 - Operation toggle ON/OFF with the same duration
 - Others blinks every second
- WIFI: indicates the wireless LINK state; blinks during data transmission/reception

First Use (Web Serial Monitor)

Below is the process of monitoring the serial port of the Arduino using a smartphone. If you are new to PHPoC WiFi Shield for Arduino, follow our step-by-step guide.

First Use (Web Serial Monitor)

1. Connect PHPoC WiFi shield for Arduino to your Arduino.



2. Insert a USB WIFI dongle to the shield.



3. Connect the Arduino to your PC with a USB cable.



4. Run Arduino IDE on your PC.



5. Write sketch below and upload it to your Arduino.



6. With your smartphone, connect to the wireless network starting with "phpoc_".

●●○○ olleh 🗢 1:41 PM		7 🍯 😤 71% 🔳
Settings	Wi-Fi	
CHOOSE A NETWOR	RK	
amy_test		≜ ≈ (i)
ASUS		€ ≈ (i)
dlink_eap		₽ \$ (i)
ICKITA		€
JACK_SOLL	AE	₽ \$ (i)
khanh_test		€ ≈ (i)
khanh_test5		₽ \$ (i)
kyungin 2G		€ ╤ (j)
matt_iptime		₽ \$ (i)
phpoc_0603	348	≎ (j
phpoc_1c00	06	∻ (i)
sara_ap		₽ ≈ (i)
Sollae_HQ_D	David	ê ╤ (j)

7. Run a web browser once it is properly connected to the wireless LAN.



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8. Connect to the shield by entering "192.168.0.1" in the address bar.

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192	.168.	0.1					0	Can	cel
Тор	Hit								
PH 192.	PoC 168.0.1	Shiel 1	d for	Ardu	ino				
Go	ogle	Sear	ch						
Q	192	.168.	0.1						
Q	192	.168.	0.1/						
Boo	okma	arks a	and H	listo	ry				
PH 192.	PoC 168.0.1	1							
PH 192.	PoC 168.0.1	1							
PH 192.	PoC 168.0.1	1							
PH	PoC	Shiel	d for	Ardu	ino				
1	2	3	4	5	6	7	8	9	0
-	1	:	;	()	\$	&	@	"
#+=		•	,		?	!	'		\bigotimes
ABC		¢	þ	s	pace		•	6	90

9. Select "Web Serial Monitor" on the main page.



Setup



Web Remote Control / Push

Web Remote Control / Slide



10. Select the speed to "9600" and press the "Connect" button.

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	192.168.0.1	Ċ

Web Serial Monitor

WebSe	ocket CLO	SED	
Connect	Clear	9600	

11. Once the connection is established, you can monitor the serial port of Arduino.

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		192.168.0.1	l	Ċ
	Web S	Serial M	onitor	
Hel	lo PHPoC Shi lo PHPoC Shi	eld for Arduin eld for Arduin	o! o!	
Hel	lo PHPoC Shi	eld for Arduin eld for Arduin	01	
Hel	lo PHPoC Shi	eld for Arduin	01	
	WebSo	ocket CONNE	CTED	
C	Disconnec	t Clear	9600	-

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Set for the First Time

The existing Arduino Ethernet and WIFI shields set IP address and MAC address in the source codes. Unlike those shields, PHPoC WiFi Shield for Arduino provides a function which manages environment parameters related to the network of the shield itself. Using this shield, therefore, makes Arduino source codes more concise.

Here is how to set up parameters related to wireless network on PHPoC WiFi Shield for Arduino for the first time. A smartphone or laptop is required for wireless LAN connection settings.

Set for The First Time

1. Connect PHPoC WiFi Shield for Arduino to your Arduino.



2. Input power to the Arduino.



3. Insert a USB WIFI dongle to the shield.



4. Push SETUP button on the shield once.



5. With your laptop or smartphone, connect to the wireless network starting with "phpoc_".

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Settings	Wi-Fi			
CHOOSE A NETWOR	RK			
amy_test		₽ \$ (j)		
ASUS		€ ╤ (j		
dlink_eap		€ ╤ (j		
ICKITA		€ ╤ (j)		
JACK_SOLL	AE	ê 🗢 (Ì)		
khanh_test		ê 🗢 (Ì)		
khanh_test5		ê 🗢 (j)		
kyungin 2G		ê 🗟 (j)		
matt_iptime		€ ╤ (j)		
phpoc_0603	348	∻ (j)		
phpoc_1c00	06	∻ (j)		
sara_ap		ê 🗢 (Ì)		
Sollae_HQ_D	David	ê 🗟 (j)		

6. Run the web browser once it is properly connected to the wireless LAN.



7. Connect to the shield by entering "192.168.0.1" in the address bar.



8. Once it is connected to the setup page, you can configure the network environment.

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	192.168.0.1	Ċ

Setup

PHPoC Shield is running in SETUP mode. Web service is not available except SETUP.



9. This is the screen of basic setup page.

•••• olleh 🗢	1:45 PM	7 🍯 🕴 69% 🔳
	192.168.0.1	¢
		SOLLAE SYSTEMS
	PHPoC Shie	ld
HOME INFO	SETUP TIME APP	

System Information

Product name	PHPoC Shield
MAC address	00:30:f9:06:03:48
Firmware name	p4s_348_1.2.0_b2.poc
Firmware version	1.2.0_b2

	Netwo	ork Information	
	IP address	192.168.0.1	
10.4	Subnet mask	255.255.0.0	
194	Gateway	0.0.0.0	
	DNS Server	192.168.0.1	
	Link Local	::0	
10.0	Global	::0 / 0	
1.40	Gateway	::0	
	DNS Server	::0	
WLAN	Wireless	S LAN Information	ı
	~	ά m	-
	2		

Operate Shield to AP



It is a mode to operate PHPoC WiFi shield for Arduino to AP by selecting Soft AP. Wireless LAN mode for PHPoC WiFi Shield for Arduino is set to Soft AP as the default value. Therefore, this mode can be used without additional set for using it for the First Use.

However, when you want to change the WLAN name (SSID) or channel you can change the settings using the following procedure.

Operate Shield to AP

1. Connect to the Web setup page of the shield according to the instructions from Set for the First time.



Setup

PHPoC Shield is running in SETUP mode. Web service is not available except SETUP.



2. Move to the SETUP page.

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	192.168.0.1	Ċ
		SOLLAE SYSTEMS
]	PHPoC Shie	ld
HOME INFO S	ETUP TIME APP	

System Information

Product name	PHPoC Shield	
MAC address	00:30:f9:06:03:48	
Firmware name	p4s_348_1.2.0_b2.poc	
Firmware version	1.2.0_b2	

Pv4 S C C Pv6 C C	IP address Subnet mask Gateway	192.168. 255.255.	0.1	
Pv4 C C Pv6 C VLAN m	Subnet mask Gateway	255.255.	0.0	
PV4 (L PV6 (C	Gateway	0000		
Pv6 C C		0.0.0.0		
VLAN m	DNS Server	192.168.	0.1	
Pv6 C	Link Local	::0		
VLAN m	Global	::0 / 0		
t VLAN m	Gateway	::0		
VLAN m	DNS Server	::0		
VLAN m	Wireless	LAN Info	rmation	
	node	Soft AP		
		cîa	m	6

3. Select Soft AP of the WLAN mode in the Wireless LAN category.

•••• olleh	i ≎ 1	:45 PM	7 🛛 🖇 69% 🔳 🕨
	192	.168.0.1	c
			SOLLAE SYSTEMS
	PHPC	C Shield	d
HOME	INFO SETUP TIM	E APP	SAVE
	IP address Type	Auto IP addre Static IP addr	ress
IPv6	EUI	MAC Address Random	
	IP address	=0	/ •
	Gateway	=0	
	DNS Server	=0	

v	Vireless LAN
WLAN	Enable Disable
WLAN mode	Ad-hoc Infrastructure Soft AP
Channel	Auto Search
SSID	phpoc_\$emac_id Search
Shared Key	(hide key)
802.1x	None

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4. Click 'Search' on Channel item.

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	192	2.168.0.1	¢
			SOLLAE SYSTEMS
	PHP	oC Shield	d
HOME	INFO SETUP TIM	E APP	SAVE
	IP address Type	Auto IP addre Static IP addr	ss ess
IPv6	EUI	MAC Address Random	
	IP address	=0	/ •
	Gateway	=0	
	DNS Server	::0	

v	/ireless LAN
WLAN	Enable Disable
WLAN mode	 Ad-hoc Infrastructure Soft AP
Channel	Auto Search
SSID	phpoc_\$emac_id Search
Shared Key	(Shide key)
802.1x	None

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5. Locate and select the less popular channels in the new pop-up Channel List page.

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	192.168.0.1	Ċ
	Channel List	SEARCH
Channel 1	kyungin 2G, SODATA04F3, amy_tes	t Select
Channel 2		Select
Channel 3	U+NetC058, sara_ap	Select
Channel 4	ilee_ap	Select
Channel 5	iptime, S0070SPEED, S0070VOIP	Select
Channel 6	dlink_eap, HP-Print-ED-Officejet Pro 8610, Samsung1606	Select
Channel 7	U+NetA3D3, matt_iptime	Select
Channel 8	phpoc_1c0006, Will	Select
Channel 9	ICKITA, iptimego, khanh_test	Select
Channel 10		Select
Channel 11	SK_WiFi4F21, SmartAfrica, KT_WLAN_28AA, ASUS, iptime	Select
Channel 12	JACK_SOLLAE	Select
Channel 13	nj, Sollae_Secure, mumu	Select
Channel 14		Select
<	n m <	1 6

6. Enter arbitrarily the SSID to use in the SSID.

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	192	2.168.0.1	C
			SOLLAE SYSTEMS
	PHP	oC Shield	d
HOME	INFO SETUP TIM	IE APP	SAVE
	IP address Type	Auto IP addre Static IP addr	ess
IPv6	EUI	MAC Address Random	
	IP address	=0	/ •
	Gateway	=0	
	DNS Server	=0	

v	Vireless LAN
WLAN	 Enable Disable
WLAN mode	 Ad-hoc Infrastructure Soft AP
Channel	13 Search
SSID	my_ssid Search
Shared Key	(Shide key)
802.1x	None

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7. Click 'Save' on the top right.

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	192	2.168.0.1		C	
			SOL	LAE SYSTEM	s
	PHP	oC Shiel	d		
HOME	INFO SETUP TIM	E APP		SAVE	
	IP address Type	Auto IP addr Static IP add	ess ress		
IPv6	EUI	MAC Address Random			
	IP address	=0	10		
	Gateway	=0			
	DNS Server	=0			

Wireless LAN O Enable WLAN O Disable O Ad-hoc Infrastructure WLAN mode O Soft AP Channel 13 Search SSID my_ssid (Search) Shared Key (hide key) None 802.1x

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8. The message below indicates that the setup is complete.



IP address may be changed. Please check newly assigned IP address from PHPoC Debugger and reconnect to the device.

setup complete



9. Search SSID from step 6 and connect to WLAN.

●●●○○ olleh 🗢	1:47 PM	7 🛛 🕸 69% 🔳 🕨
Settings	Wi-Fi	
CHOOSE A NETWOR	8K 3	
amy_test		€ ╤ (j)
ASUS		€ ╤ (j
ASUS_5G		≜ ╤ (j
dlink_eap		₽ ≈ (j
ICKITA		€ ╤ (j)
iptime		? (j)
JACK_SOLL	ΑE	ê 🕈 (j)
khanh_test		ê 🕈 (j)
khanh_test5		ê 🕈 (j)
matt_iptime		ê 🗢 (j)
my_ssid		≈ (j)
phpoc_0603	48	? (j)
phpoc_1c00	06	≈ (i)

10. Rerun the web browser and type 192.168.01 into the address bar to access.

••••○ olleh 1:48 PM
192.168.0.1

Setup

Web Serial Monitor

Web Remote Control / Push

Web Remote Control / Slide



Connect Shield to WLAN Router or AP



In order to connect the PHPoC WiFi Shield for Arduino to a WIFI router or AP, you must set up your wireless LAN as infrastructure mode. This mode is the most common wireless LAN mode where a plurality of wireless network devices including AP is connected.

Connect Shield to WLAN Router or AP

1. Connect to the Web setup page of PHPoC WiFi Shield for Arduino according to the instructions from Set for the First time.

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	192.168.0.1	C

Setup

PHPoC Shield is running in SETUP mode. Web service is not available except SETUP.



2. Move to the SETUP page.

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	192.168.0.1	C
		SOLLAE SYSTEMS
HOME INFO	PHPoC Shie	ld

System Information

Product name	PHPoC Shield	
MAC address	00:30:f9:06:03:48	
Firmware name	p4s_348_1.2.0_b2.poc	
Firmware version	1.2.0_b2	

	Netwo	rk Information	
	IP address	192.168.0.1	
	Subnet mask	255.255.0.0	
1974	Gateway	0.0.0.0	
	DNS Server	192.168.0.1	
IPv6 Global Gateway DNS Server	Link Local	::0	
	Global	::0 / 0	
	Gateway	::0	
	DNS Server	::0	
	Wireless	LAN Information	
WLAN	mode	Soft AP	
WLAN	mode	Soft AP	

3. Select "Infrastructure" for WLAN mode in the Wireless LAN category.

●●●○○ olleh	n ≎ 1 19	2.168.0.1	♥ ∦ 68% ■⊃
			SOLLAE SYSTEMS
	PHPo	oC Shield	
HOME	INFO SETUP TIM	E APP	SAVE
	DNS Server	0.0.0.0	
		-	
	IPv6	Disable Enable	
	IP address Type	address Type O Auto IP address Static IP address MAC Address Random	
IPv6	EUI		
	IP address	=0 / O	
	Gateway		
	DNS Server	=0	

Wireless LAN		
WLAN	 Enable Disable 	
WLAN mode	Ad-hoc Infrastructure Soft AP	
Channel	Auto Search	
SSID	my_ssid Search	
Shared Key	(Shide key)	
802.1x	None	
4. Click "Search" in the SSID.

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			SOLLAE SYSTEMS
	PH	PoC Shiel	d
HOME	INFO SETUP	TIME APP	SAVE
	DNS Server	0.0.0.0	
IPv6	IPv6	O Disable	
	IP address Typ	Auto IP addr	ess ress
	EUI	MAC Address Random	5
	IP address	=0	/ 0
	Gateway	=0	
	DNS Server	=0	

Wireless LAN

WLAN	 Enable Disable
WLAN mode	 Ad-hoc Infrastructure Soft AP
Channel	Auto Search
SSID	my_ssid Search
Shared Key	(Chide key)
802.1x	None

5. Search and select the AP you are going to connect on the new popup AP List page.

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	192	.168.0.1		C
_				
	Al	P List		SEARCH
	amy_test	WPA2	-35dBm	Select
	SODATA04F3	WPA2	-73dBm	Select
	U+NetCB20	WPA2	-71dBm	Select
	sollae	None	-77dBm	Select
	sara_ap	WPA2	-25dBm	Select
_ [ilee_ap	WPA2	-15dBm	Select
	SO070SPEED	WPA2	-73dBm	Select
	janus_bb_gn100_871F5E	WPA2	-69dBm	Select
	Samsung1606	WPA2	-75dBm	Select
	IROAD_V7_90096C	WPA2	-63dBm	Select
	U+NetA3D3	WPA2	-67dBm	Select
	matt_iptime	WPA2	-33dBm	Select
	phpoc_1c0006	None	-45dBm	Select
	hp	WPA2	-75dBm	Select
	ICKITA	WPA2	-67dBm	Select
	khanh_test	WPA2	-31dBm	Select
	iptimego	WPA2	-69dBm	Select
	SmartAfrica	WPA2	-77dBm	Select
	KITAIC	None	-65dBm	Select
	ASUS	WPA2	-41dBm	Select
	KT_WLAN_28AA	WPA2	-77dBm	Select
	iptime	None	-67dBm	Select
	JACK_SOLLAE	WPA2	-33dBm	Select
	Sollae_Secure	WPA2	-47dBm	(Select)
<	>	Û	m	D

6. Enter AP security key for the Shared Key.

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	192	2.168.0.1	Ċ
			SOLLAE SYSTEMS
	PHP	oC Shield	d
HOME	INFO SETUP TIM	IE APP	SAVE
IPv6	IP address Type	Auto IP addre Static IP addr	ress
	EUI	MAC Address Random	
	IP address		/ •
	Gateway	=0	
	DNS Server	=0	

Wireless LAN O Enable WLAN O Disable O Ad-hoc WLAN mode Infrastructure Soft AP Channel Auto Search SSID ilee_ap (Search) [.....] Shared Key (hide key) 802.1x None ſĴ <

7. Click "SAVE" on the top right.

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	192	2.168.0.1		C	
			SOL	LAE SYSTEM	15
	PHPC	oC Shiel	d		
HOME	INFO SETUP TIM	E APP		SAVE	
	IP address Type	Auto IP addr Static IP add	ess ress		
IPv6	EUI	MAC Address Random	5		
	IP address	=0	10		
	Gateway	=0			
	DNS Server	=0			

Wireless LAN O Enable WLAN O Disable O Ad-hoc WLAN mode Infrastructure Soft AP Channel Auto Search SSID ilee_ap (Search) •••••• Shared Key (Shide key) 802.1x None



8. The message below indicates that the setup is complete.

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	192.168.0.1	Ç

IP address may be changed. Please check newly assigned IP address from PHPoC Debugger and reconnect to the device.

setup complete



Automatical IP Address Setup

If there is a device assigning the IP address such as router on the user's network, you can automatically set the IP address.

1. Connect to Web setup page of PHPoC WiFi Shield for Arduino.

	Syste	m Informatie	on
Product name	8	PHPoC Shield	
MAC address		00:30:f9:06:03:48	
Firmware nar	ne	p4s_348_1.2.0_b2	.poc
Firmware ver	sion	1.2.0_b2	
	Netwo	ork Informati	on
IP add	dress	192.168.0.1	
Subne	et mask	255.255.0.0	
Gatew	vay	0.0.0.0	
DNS S	erver	192.168.0.1	
Link L	ocal	::0	
Globa	1	::0 / 0	
IPv6 Gatew	vay	::0	
DNS S	erver	::0	

2. Move to the SETUP page.

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	192.168.0.1	¢
		SOLLAE SYSTEMS
	PHPoC Shie	ld
HOME INFO	SETUP TIME APP	

System Information

Product name	PHPoC Shield	
MAC address	00:30:f9:06:03:48	
Firmware name	p4s_348_1.2.0_b2.poc	
Firmware version	1.2.0_b2	

	Netwo	rk Inforn	nation	
	IP address	192.168.	0.1	
10.4	Subnet mask	255.255.	0.0	
IPV4	Gateway	0.0.0.0		
	DNS Server	192.168.	0.1	
	Link Local	::0		
IPv6	Global	::0 / 0		
	Gateway	::0		
	DNS Server	::0		
	Wireless	LAN Info	rmation	_
WLAN	mode	Soft AP		

3. Select Auto IP address for IP Address Type.

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		19.	2.108.0.1	C				
				SOLLAE SYSTEMS				
		PHP	oC Shield	d				
	HOME INFO SETUP TIME APP SAVE							
-		N	etwork					
		IP address Type	Auto IP addre	ss				
		IP address	0.0.0.0					
	IPv4	Subnet mask	0.0.0.0					
		Gateway	0.0.0.0					
		DNS Server	0.0.0.0					
		IPv6	Disable					
		IP address Type	Auto IP addre Static IP addre	ss ess				
	IPv6	EUI	MAC Address Random					
		IP address	=0	/ •				
		Gateway	=0					
		DNS Server	=0					
		Wir	eless LAN					
<		>	rîn (n a				

4. Click "SAVE" on the top right of the page.

•••• oller	n ବି 1	:51 PM	1 0 ∦ 68% ■			
	192	.168.0.1	C			
			SOLLAE SYSTEMS			
	PHPC	oC Shield	d			
HOME	INFO SETUP TIM	E APP	SAVE			
_	Ne	etwork				
	IP address Type	Auto IP addre	ress			
	IP address	0.0.0.0				
IPv4	Subnet mask	0.0.0.0				
	Gateway	0.0.0				
	DNS Server	0.0.0				
	IPv6	Disable				
	IP address Type	Auto IP addre Static IP addr	ress			
IPv6	EUI	MAC Address Random				
	IP address		/ •			
	Gateway	=0				
	DNS Server	0				
_	Wireless LAN					
,	×	-f= (n s			

5. Once the setup is completed, it will be automatically assigned with an IP address after rebooting.

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	192.168.0.1	C

IP address may be changed. Please check newly assigned IP address from PHPoC Debugger and reconnect to the device.



6. To confirm the assigned IP address, follow the instructions from Verify the IP Address.

Manual IP Address Setup

1. Connect to Web setup page of PHPoC WiFi Shield for Arduino.



System Information

Product name	PHPoC Shield
MAC address	00:30:f9:06:03:48
Firmware name	p4s_348_1.2.0_b2.poc
Firmware version	1.2.0_b2

Network Information

10.4	IP address	192.168.0.1
	Subnet mask	255.255.0.0
1644	Gateway	0.0.0.0
	DNS Server	192.168.0.1
	Link Local	::0
TDue	Global	::0 / 0
IPVO	Gateway	::0
	DNS Server	::0

Wireless LAN Information



2. Move to SETUP page.

•••• olleh 🗢	1:52 PM	7 🛛 🕸 67% 🔳
	192.168.0.1	¢
		SOLLAE SYSTEMS
]	PHPoC Shie	ld
HOME INFO S	ETUP TIME APP	

System Information

Product name	PHPoC Shield	
MAC address	00:30:f9:06:03:48	
Firmware name	p4s_348_1.2.0_b2.poc	
Firmware version	1.2.0_b2	

	Netwo	rk Inforn	nation	
	IP address	192.168	.0.1	
10.4	Subnet mask	255.255	.0.0	
124	Gateway	0.0.0.0		
	DNS Server	192.168	.0.1	
	Link Local	::0		
TDue	Global	::0 / 0		
IPVO	Gateway	::0		
	DNS Server	::0		
	Wireless	LAN Info	ormation	
WLAN	mode	Soft AP		
	>	гî	m	ſ

3. Select "Static IP Address" for IP Address Type.

HOME	PHP INFO SETUP TIM	oC Shiel	SOLLAE SYS d SAVE
_	N	etwork	
	IP address Type	O Auto IP addre	ress
	IP address	0.0.0.0	
IPv4	Subnet mask	0.0.0.0	
	Gateway	0.0.0.0	
	DNS Server	0.0.0.0	
	IPv6	O Disable	
	IP address Type	Auto IP addre Static IP addre	ress
IPv6	EUI	MAC Address Random	
	IP address	=0	/ 💿
	Gateway	=0	
	DNS Server	=0	
	Wire	eless LAN	

4. Input IP address, Subnet mask, Gateway IP address and DNS IP address.

••••• 0	lleh ᅙ	1:53 PM	7 🛛 🕴 67% 🔳
	192.168.0.1		C
			SOLLAE SYSTEMS
	PHE	oC Shiel	d
ном	E INFO SETUP 1		SAVE
		Network	
	IP address Type	Auto IP addr Static IP addr	ess ress
	IP address	10.6.0.61	
IPv	⁴ Subnet mask	255.255.0.0	
	Gateway	10.6.0.1	
	DNS Server	10.6.0.1	
	IPv6	O Disable	
	IP address Type	Auto IP addr Static IP add	ess ress
IPv	6 EUI	MAC Address Random	6
	IP address	=0	/ •
	Gateway	=0	
	DNS Server	=0	
	Wi	reless LAN	
<	>	Û (D D

The IP address must be unique within the network. If you connect the shield to a public network, please make sure whether IP address is already in use or not. If there is a manager in charge of IP address assignment in the environment, we recommend to get assistance from the manager.

5. Click the "SAVE" on the top right of the page.

•••	• oller	n 🗢	1:53 PM	7 🛛 🕴 67%	•
		1	92.168.0.1	(Ċ
				SOLLAE SYS	TEMS
		PHI	PoC Shie	ld	
	HOME	INFO SETUP	TIME APP	SAVE	
	_		Network		
		IP address Type	e O Auto IP add	dress Idress	
		IP address	10.6.0.61		
	IPv4	Subnet mask	255.255.0.0		
		Gateway	10.6.0.1		
		DNS Server	10.6.0.1		
		IPv6	Disable Enable		
		IP address Type	e O Auto IP add	iress idress	
	IPv6	EUI	MAC Addre Random	ss	
		IP address	=0	/ 0	
		Gateway	=0		
		DNS Server			
	Wireless LAN				
<		>	Û	m f	נ

6. Once the setup is completed, the Web browser will be reconnected to its IP address.

		1.53 PM	1
	19	2.168.0.1	
			SOLLAE SY
	PHP	oC Shiel	d
HOME	INFO SETUP TI	ME APP	SAVE
	N	etwork	
	IP address Type	O Auto IP addr	ess
		Static IP add	ress
	IP address	10.6.0.61	
IPv4 Redi	IP address Subnet mask rect to : http://10	10.6.0.61 (255.255.0.0 0.6.0.61/setup_ne	t.php
IPv4 Redi	IP address Subnet mask	10.6.0.61 (255.255.0.0 0.6.0.61/setup_ne	t.php Close
IPv4 Redi	IP address Subnet mask rect to : http://10	10.6.0.61 255.255.0.0 0.6.0.61/setup_ne Auto IP addm Static IP addm	t.php Close ress
IPv4 Redit	IP address Subnet mask rect to : http://10 IP address Type EUI	Auto IP addm Static IP add MAC Address Random	close ess ress
IPv4 Redii	IP address Subnet mask rect to : http://10 IP address Type EUI IP address		t.php Close ress ress
IPv4 Redit	IP address Subnet mask rect to : http://10 IP address Type EUI IP address Gateway		t.php Close

7. To confirm the assigned IP address, follow the instructions from Verify the IP Address.

Verify the IP Address

- 1. Connect shield to the network according to the instruction from Connecting to Network.
- 2. Input power to the Arduino and run the Arduino IDE.



3. Enter the following code in the Arduino IDE.



4. Upload the entered code on the Arduino.



5. Click the serial monitor button of Arduino IDE.



- 6. Verify the IP Address appearing on the serial monitor window.
 - $\circ\,$ When the shield is set to AP

💿 COM3 (Arduino Uno)	- • ×
	Send
log> phpoc_begin: WiFi AP log> phpoc_begin: IPv4 192.168.0.1 :55.255.0.0 0.0.0.0 192.168.0.1	
Autoscroll No line ending	▶ 9600 baud

 $\circ\,$ When the shield is connected to a WLAN router or AP

💿 COM3 (Arduino Uno)	
<pre>log> phpoc_begin: WiFi INFRA log> phpoc_begin: IPv4 10.6.0.61 255.255.0.0 10.6.0.1</pre>	send
V Autoscroll	nding 🖌 🥑 9600 baud 👻

Library Overview

PHPoC WiFi Shield for Arduino provides Phpoc Library so users can easily access a variety of functions, including basic network communications capabilities. With Phpoc Library you can easily implement the following functions:

- TCP client
- TCP Server: SSL, SSH, Telnet and WebSocket Server
- E-mail
- Date and time information inquiry

TCP or WebSocket server allows up to four clients to simultaneous connect. However, if it is SSL or SSH server, it only allows one client for each.

Installing the Library

1. Run Arduino IDE.



2. Click the Sketch > Include Library > Manage Libraries.. menu.



3. Search "phpoc" on the Library Manager.

💿 Library Manager	×
Type All Topic All phpoc	
PHPoC by Sollae Systems PHPoC Ethernet/WiFi Shield for Arduino IPv6/TCP/EMAIL/SSL/SSH/Web communication helper based on PHPoC More info	^
	Close

4. Select the PHPoC library and press the [Install] button.

0	Dibrary Manager	×)
	Type [All -] Topic [All -] phpoc		
	PHPoC by Sollae Systems PHPoC Ethernet/WiFi Shield for Arduino IPv6/TCP/EMAIL/SSL/SSH/Web communication helper based on PHPoC More Info	*	
	Install		
	Cit	+ DSE	
_			

"INSTALLED" message will appear on success.

💿 Library Manager	
Type All Topic All phpoc	
PHPoC by Sollae Systems Version 1.0. INSTALLED PHPoC Ethernet/WiFi Shield for Arduino IPvty/ICP/EMAIL/SSL/SSH/Web communication helper based on PHP More info	oC
	Close

5. Confirm the additional Arduino Phpoc Library.

Check if "PHPoC" has been added to the "Include Library" menu of the sketch menu of Arduino IDE.



6. Confirm the additional Arduino PHPoC examples.

Check if "PHPoC" has been added to the "Examples" menu in the file menu of Arduino IDE.

ej Edit Sketch	Tools Help		-	
New	Ctrl+N		₽	
Open	Ctrl+O			
Open Recent				
Sketchbook		•	_ 1	
Examples		Built-In Examples		
Close	Ctrl+W	01.Basics		
Save	Ctrl+S	02.Digital		
Save As	Ctri+Shift+S	Us.Analog		
Page Setup	Ctrl+Shift+P	04.Communication		
Print	Ctrl+P	OS.Control		
Dreferencer	Ctrl. Comma	06.Sensors		
Preferences	curreomina	07.Display		
Quit	Ctrl+Q	00.strings		
		10 Statestik Basiatik		
		10.StarterKit_BasicKit		
		11.Arduinoise		
		Examples for any board		
		Adafruit Circuit Playground	•	
		Bridge	•	
		Esplora	•	
		Ethernet	•	
		Firmata	•	
		GSM	•	
		LiquidCrystal	P:OM1	
		Robot Control	,	J
		Robot Motor		
		SD		
		Servo	1	
		SpacebrewYun	Chat	Server
		Stepper	Chat	ServerIPv6
		Temboo	Date	Time
		TFT	Emai	ilClient
		WiFi	Gma	ilClient
		RETIRED	SSH:	Server
		Examples for Arduino/Genuino Lino	SSLS	Server
		FEDROM	Telne	etServer
		SoftwareSerial	Web	Client
		CDI	Web	ClientIPv6
		Wire	Web	RemotePut
		wite	Web	RemoteSlid
		Examples from Custom Libraries	Web	SSLClient
		PHPoC	Web	SSLClient

7. To run the built-in examples of PHPoC Shield, follow the instructions from Run the Example.

Run the Examples

Examples included in the Arduino Phpoc Library can be loaded and run directly from Arduino IDE. Here is the procedure for running the Chat Server examples.

- 1. Install the Phpoc Library through Installing The Library.
- 2. Run the Arduino IDE and select ChatServer in the File> Examples > Phpoc menu.



3. Upload the example code to the Arduino via "Check (compile)" and "Upload" button.



4. When the upload is complete, click the Serial Monitor icon.



5. Check the execution results of the serial monitor window.

```
      COM3 (Arduino Uno)
      ■ ■ ▲

      Iog> phpoc_begin: WiFi INFRA
      Send

      log> phpoc_begin: IFv4 10.6.0.61 255.255.0.0 10.6.0.1
      Jog> phpoc_server: listen 2/23

      Chat server address : 10.6.0.61
      Chat server address : 10.6.0.61
```

The Phpoc Library includes various examples using E-mail transmission, SSL communications, SSH communications and Websockets. Try to use more examples in accordance with the above procedure.

Web Serial Monitor

Serial Monitor is provided by Arduino IDE and can be used to debug source codes or to output the results. PHPoC Shield for Arduino provides the same function with the serial monitor via web. With your smartphone, you can operate whenever or wherever without connecting Arduino to the PC because of its web-based features.

Using Web Serial Monitor

- 1. Connect the shield to the network according to Connecting to Network.
- 2. Install Phpoc Library on your PC according to Installing the Library.
- 3. Run the Arduino IDE from the PC.



4. Open the "DateTime" example to confirm the web serial monitor feature.



5. After checking the loaded examples, upload them to the Arduino.



6. Now run a web browser on your smartphone or PC and connect to the IP address of the shield.

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	10.6.0.61	¢

Setup

Web Serial Monitor

Web Remote Control / Push

Web Remote Control / Slide



Please, check Verify The IP Address if you do not know the IP address.

7. Click "Web Serial Monitor".


8. Set the rate to "9600" and click "Connect".

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		10.6.0.61		¢
	Web Se	erial M	onitor	
	Wahe	advat CL O	SED	
	Connect	Clear	9600	
<	>	ſĴ		Ц

9. Once it is successfully connected, it will output the date and time as shown in the serial monitor.

••••• 0	olleh 🗢	11:42	708	91% 🔳)
		10.6.0.61		C
	Web	Serial Mo :42:45 42:45 42:46 42:47 42:48 42:49	onitor	
	WebS Disconnee	ocket CONNE	CTED 9600 •	
<	>	Û	Ш	D

10. Click on the button in the serial monitor of Arduino IDE, you can see the same output.

💿 COM3 (Arduino Uno)	
	Send
Get year/month/day/dayofWeek/hour/minute/second from RTC in PHPoC Shield 2016-5-3 2:15:42:34 2016-05-03 15:42:35 2016-05-03 15:42:36 2016-05-03 15:42:37 2016-05-03 15:42:38 2016-05-03 15:42:39 2016-05-03 15:42:40	
✓ Autoscroll No line ending →	9600 baud 👻

Web Remote Control (Push)

Using the web remote control, you can control Arduino remotely by sending specific data to the Arduino on the Web. PHPoC WiFi Shield for Arduino provides the ability to send data to the Arduino using buttons on the Web.

Using the Web Remote Control (Push)

- 1. Connect the shield to the network according to Connecting to Network.
- 2. Install Phpoc Library to your PC according to Installing The Library.
- 3. Run the Arduino IDE from the PC.



4. Open the "WebRemotePush" example.



5. Check and upload the example to the Arduino.



6. Click the serial monitor of Arduino IDE.



7. Check the IP address of the shield and leave the windows open.

💿 COM3 (Arduino Uno)	- • •
	Send
<pre>log> phpoc_begin: WiFi INFRA log> phpoc_begin: IPv4 10.6.0.61 255.255.0.0 10.6.0.1 log> phpoc_server: listen 2/80 WebSocket server address : 10.6.0.61</pre>	
Autoscroll No line ending	• 9600 baud •

8. Now run a web browser on your smartphone or PC and connect to the IP address of the shield.

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	10.6.0.61	C

Setup

Web Serial Monitor

Web Remote Control / Push



9. Click "Web Remote Control / Push".

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Setup

Web Serial Monitor

Web Remote Control / Push



10. Click "Connect" to connect to the shield.

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Web Remote Control / Push



11. After the connection, check if the status of the A, B, and C buttons are appeared on the serial monitor of Arduino IDE. (release state)



12. Press button 'A' two times from the web.



Web Remote Control / Push



13. Verify the state of button 'A' is updated on the Arduino Serial Monitor IDE.

💿 COM3 (Arduino Uno)	- • ×
	Send
<pre>log> phpoc_begin: WiFi INFRA log> phpoc_begin: IPv4 10.6.0.61 255.255.0.0 10.6.0.1 log> phpoc_server: listen 2/80 WebSocket server address : 10.6.0.61 log> phpoc_server: listen 3/80 button A release button B release button C release button A press button A press button A press button A release</pre>	
V Autoscroll No line ending	9600 baud 🔻

This example only processes for these three buttons (A, B, C). Add the rest of buttons to Arduino codes yourself.

Web Remote Control (Slide)

We can control Arduino remotely by using the web remote control and sending Arduino specific data on the web. PHPoC WiFi Shield for Arduino provides the ability to send continuous data to the Arduino using a lever on the Web.

Using Web Remote Control (Slide)

- 1. Connect the shield to the network according to Connecting to Network.
- 2. Install Phpoc Library to your PC according to Installing The Library.
- 3. Run the Arduino IDE from the PC.



4. Open the "WebRemoteSlide" example.



5. After checking the example, upload it to the Arduino.



6. Click the serial monitor of the Arduino IDE.



7. Check the IP address of the shield and leave the window open.

💿 COM3 (Arduino Uno)	
	Send
<pre>log> phpoc_begin: WiFi INFRA log> phpoc_begin: IPv4 10.6.0.61 255.255.0.0 10.6.0.1 211.180.144.240 log> phpoc_server: listen 2/20 WebSocket server address 10.6.0.61</pre>	
Autoscroll No line ending	9600 baud 👻

8. Now run a web browser on your smartphone or PC and connect to the IP address of the shield.

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	10.6.0.61	C

Setup

Web Serial Monitor

Web Remote Control / Push



9. Click "Web Remote Control / Slide" link.

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10.6.0.61 ℃

Setup

Web Serial Monitor

Web Remote Control / Push



10. Click "Connect" to connect to the shield.





11. Pull the left lever up on the web.





12. Ensure that the data of the 'A' lever is properly updated on the Serial Monitor of Arduino IDE.

💿 со	M3 (Arduino Uno)	
I		Send
A/21		*
A/22		
A/24		
A/25		
A/26		
A/27		
A/28		
A/29		
A/30		
A/31		
A/32		
A/33		
A/34		
A/35		=
A/36		
		Ψ.
🔽 Au	toscroll No line ending	▼ 9600 baud ▼

Setting the Time

PHPoC WiFi Shield for Arduino provides an RTC function for time information. With the built-in battery mounted on the shield, it maintains the time information even when the power is turned off. Therefore, time setting requires only once.

Because of the built-in battery charging system, the battery is charged whenever the power is connected to the shield. However, if you do not connect power to shield for a long period (about 30 days), the battery is discharged and time information may be initialized.

Setting the Time

- 1. Connect the shield to the Network, following the instructions from Connecting to Network.
- 2. Connect SETUP page of the built-in web server of the product with your smartphone or PC.

		192.168.0.1	
	DIT		SOLLAE SY
	PH	PoC Shie	ld
HOME	INFO SETUP	TIME APP	
	Syste	em Informatio	on
Produ	ict name	PHPoC Shield	
MAC a	ddress	00:30:f9:06:03:48	
Firmv	vare name	p4s_348_1.2.0_b2	.poc
Firmv	vare version	1.2.0_b2	
	Netwo	ork Informati	on
	IP address	192.168.0.1	
TDu4	Subnet mask	255.255.0.0	
1.44	Gateway	0.0.0.0	
	DNS Server	192.168.0.1	
	Link Local	::0	
-	Global	::0/0	
IPv6	Gateway	::0	
	DNS Server	::0	
	Wireless	s LAN Inform	ation
WIAN	mode	Soft AP	
TT LAN	moue	3010 10	

3. Click "TIME".

			SOLLAE SY
	PH	PoC Shie	ld
HOME	INFO SETUP	TIME APP	
_	Syste	m Informatio	on
Produ	ict name	PHPoC Shield	
MAC a	ddress	00:30:f9:06:03:48	
Firmv	vare name	p4s_348_1.2.0_b2	.poc
Firmv	vare version	1.2.0_b2	
_	Netwo	ork Informati	on
	IP address	192.168.0.1	
TRut	Subnet mask	255.255.0.0	
194	Gateway	0.0.0.0	
	DNS Server	192.168.0.1	
	Link Local	::0	
10.0	Global	::0 / 0	
IPV6	Gateway	::0	
	DNS Server	::0	
_	Wireless	LAN Inform	ation
-	mode	Soft AP	

4. Click "TIME SYNC" to synchronize the current time of the shield with your smartphone or PC.

••••∘ olleh 🗢	1:56 рм 192.168.0.1	1 © \$ 66% ■⊃ C			
_		SOLLAE SYSTEMS			
P HOME INFO SET	HPoC Shie	1d Time sync.			
Time					
PHPoC Shield Tim	e 2016-06-09 13:55:	59			

Note : Depending on the network environment, the synchronization may not match with host local time.

Host local Time

2016-06-09 13:55:59

<	>	Û	\square	D

5. Make sure that the current time and the time on your smartphone or PC is synchronized with the shield.



 PHPoC Shield Time
 2016-06-09 13:55:59

 Host local Time
 2016-06-09 13:55:59

Note : Depending on the network environment, the synchronization may not match with host local time.

