

Overview

PHPoC is a programming language that Sollae Systems has developed. All of our PHPoC products have PHPoC interpreter in firmware. PHPoC is based on a wide use script language PHP. As PHPoC is simple, whoever has seen the programming language once can use it easily.

There are a few limitations due to embedded systems' characteristic even if PHPoC is basically compatible with PHP. We recommend you to read this page before using the product.

Basic Grammar

Comment

Not support for #, single line comment.

Types

Booleans

String "0" will be not FALSE but TRUE when being converted to Boolean.

Integers

the maximum value of an integer is about 9.2×10^{18} in PHPoC.

Classes

Not support for classes.

Arrays

Features are as follows:

- Initial value should be assigned in their declaration.
- Only number is acceptable to KEY value.
- Not support for array generation or functional call with a square bracket.
- Examples

```
// Example 1
$var0 = array(3, 7, "array", "test");
$int0 = $var0[0] + $var0[1];
$str0 = $var0[2] . " " . $var0[3];
```

```
// Example 2
$int0 = 3;
$int1 = 7;
$str0 = "array";
$str1 = "test";
$var1 = array($int0, $int1, $str0, $str1);
```

```
// Example 3
$str0 = "array test";
$str0[6] = "T";
$str0[7] = "E";
$str0[8] = "S";
$str0[9] = "T";
echo $str0;    // Output : array TEST
```

Null

Not support for Null.

Type Juggling

- Arithmetic Operator: addition(+), subtraction(-), multiplication(*), division(/)

Types	Boolean	Integer	Floating Point	String
Boolean	X	X	X	X
Integer	X	O	O	X
Floating Point	X	O	O	X
String	X	X	X	X

- Arithmetic Operator: the rest(%)

Types	Boolean	Integer	Floating Point	String
Boolean	X	X	X	X
Integer	X	O	X	X
Floating Point	X	X	X	X
String	X	X	X	X

- Bitwise Operator: AND(&), OR(|), XOR(^), left shift(<<), right shift(>>)

Types	Boolean	Integer	Floating Point	String
Boolean	X	X	X	X
Integer	X	O	X	X
Floating Point	X	X	X	X
String	X	X	X	X

- Bitwise Operator: compliment(~)

Boolean	Integer	Floating Point	String
X	O	X	X

- Comparison Operator: less than(<), greater than(>), less or equal(<=), greater or equal(>=)

Types	Boolean	Integer	Floating Point	String
Boolean	X	X	X	X
Integer	X	O	O	X
Floating Point	X	O	O	X
String	X	X	X	O

- Comparison Operator: equal(==), not equal(!=), not equal(<>)

Types	Boolean	Integer	Floating Point	String
Boolean	O	X	X	X
Integer	X	O	X	X
Floating Point	X	X	O	X
String	X	X	X	O

- Increment/Decrement Operator: increment(++), decrement(--)

Boolean	Integer	Floating Point	String
X	O	X	X

- Logical Operator: AND(&&), OR(||)

Types	Boolean	Integer	Floating Point	String
Boolean	O	O	X	O
Integer	O	O	X	O
Floating Point	X	X	O	X
String	O	O	X	O

- Logical Operator: NOT(!)

Boolean	Integer	Floating Point	String
O	O	X	O

- Sign Operator: positive(+), negative(-)

Boolean	Integer	Floating Point	String
X	O	O	X

- Expression in Control Structure: if, for, (do) while

Boolean	Integer	Floating Point	String
O	O	X	O

- printf function output format

Types	Boolean	Integer	Floating Point	String
%b, %o, %x	X	O	X	X
%d, %u	X	O	X	X
%c	X	O	X	X
%e, %f, %g	X	X	O	X
%s	X	X	X	O

Variables

Variables Definition

Initial value should be assigned when you declare variables. You cannot declare more than 2 variables in single line.

Max size of variable's name is 32 bytes. If it exceeds the max length, the rest are ignored.

Variable Variables

Not support for variable variables.

Constants

Constants Definition

Not support for declaring constants with 'const' keyword.

Predefined Constants

PHPoC provides several predefined constants. Refer to the appendix for more details.

Operators

Operator Precedence

Precedence	Operator Mark	Operators
High Low	[(Parenthesis
	++ -- ~ (int) (string) (bool)	Types / Increment / Decrement
	!	Logical
	* / %	Arithmetic
	+ - .	Arithmetic
	<>	Bitwise
	< <= > >=	Comparison
	== != === !== <>	Comparison
	&	Bitwise
	^	Bitwise
		Bitwise
	&&	Logical
		Logical
	? :	Ternary
	= += -= *= /= .= %= &= = ^= <>=	Assignment

Arithmetic Operators

The result of arithmetic operations between integers is always integer at PHPoC.

- PHPoC

```
$a = 3;
$b = 2;
echo $a / $b; // Output: 1(Integer)
```

- PHP

```
$a = 3;
$b = 2;
echo $a / $b; // Output: 1.5
```

Error Control Operators

Not support for error control operators(@).

Execution Operators

Not support for execution operators(` `).

Logical Operators

Logical operators only accept mark ('!', '&&', '||' and '^') but not accepts letter (NOT, AND, OR, and XOR).

Array Operators

Not support for array operators (Union, Equality, Identity and etc.).

Control Structures

Control Structures

Not support for control structure as follows.

- foreach, declare, require, require_once, goto and label

Alternative Syntax for Control Structures

Not support for any alternative syntax for control structure (':', endif, endwhile and etc.).

Switch

It is not acceptable to use ';' (semicolon) instead of ':' (colon) after case expression of switch statement.

Functions

Function Definition

In PHPoC, function has to be declared before being called. Meanwhile, PHP can call function before declaring.

Function Arguments

It is not allowed to use the duplicated argument names in a user-defined function.

Returning Values

If there is no returning value, user-defined function returns zero (0) instead of NULL.
Not support for returning by reference.

Variable Functions

Not support for variable functions.

Anonymous functions

Not support for anonymous functions

Internal Functions

PHPoC supports for various internal functions. Refer to a document named [PHPoC Internal Functions](#) to know how to use those functions.

Namespaces

User-defined Namespaces

Not support for User-defined Namespaces.

Function Arguments

Keywords, functions and constants share namespaces. Be careful not to make the same name of those when you create them.

Predefined Constants

PHPoC provides predefined constants as follows.

Name	Description	Value
COUNT_NORMAL	Normal Counting for one-dimension array	0
COUNT_RECURSIVE	Recursive Counting for multi-dimension array	1
EPIPE	Broken Pipe, Returned as connection is broken while sending TCP data	32 (0x20)
EBUSY	Device or Resource Busy	16 (0x10)
ENOENT	Not exist in file entry	2
FALSE	False	0
M_PI	Pi	≈3.141592653589793
M_E	Euler's Constant	≈2.718281828459045
O_NODIE	Avoid php die due to file open	4
MAX_STRING_LEN	Maximum length of a string variable	1,534
PHP_VERSION_ID	PHPoC Version	-
SEEK_SET	File pointer position: at the beginning of file	0
SEEK_CUR	File pointer position: current position of file	1
SEEK_END	File pointer position: at the end of file	2
SSL_CONNECTED	SSL status: connected	19 (0x13)
SSL_CLOSED	SSL status: not connected	0
SSL_LISTEN	SSL status: wait for connection	1
TRUE	Ture	-
TCP_CLOSED	TCP status: not connected	0
TCP_LISTEN	TCP status: wait for connection	1
TCP_CONNECTED	TCP status: connected	4

Keyword

The table below shows the predefined keywords in PHPoC. Since keywords, functions and constants share namespace, do not use duplicated names with those keywords when creating functions or constants.

Alphabet	Predefined Keywords
a	array
b	bool boolean break
c	case const continue
d	default define die do echo
e	else elseif exit
g	global goto
i	if int integer include include_once
p	print
r	return
s	static string switch
w	while

Restriction about Memory

Number of Variables

PHPoC is limited memory size for using variables. Thus, both the number of variables and the length of string variables are limited. The max number for variable creation is in inverse proportion to the size of variables.

Error Messages

PHPoC prints various error messages out for debugging by console.

Error Messages
address already in use
argument count mismatch
cannot break/continue N level(s)
'case' or 'default' expected
device or resource busy
divided by zero
duplicated name
expression syntax error
file name too long
file not found
function not implemented
integer number too large
invalid argument
invalid constant name
invalid device or address
maximum execution time exceeded
missing operator
missing terminating character ''' or ''''
modifiable value required
only variable can be passed by reference
operation not permitted
out of memory
string too long
syntax error
syntax error, unexpected array [, expecting 'token']
syntax error, unexpected character
syntax error, unexpected 'character' [, expecting 'character']
syntax error, unexpected end of file
syntax error, unexpected 'name' [, expecting 'character']
syntax error, unexpected number [, expecting 'character']
syntax error, unexpected 'operator' [, expecting 'token']
syntax error, unexpected string [, expecting 'character']
syntax error, unexpected 'token' [, expecting 'token']
syntax error, unexpected variable [, expecting 'character']
too many open files
undefined name
undefined offset
unsupported argument type
unsupported operand type
unsupported operator
unsupported pid
unsupported type juggling
'while' expected