

# Programming the Wattmon

“Programming” and “scripting” are used interchangeably throughout this documentation.

The Wattmon is built on a scripting language that is syntactically identical to PHP<sup>1)</sup> - we call it uPHP for Micro-PHP. It has a small but powerful subset of the functions and features found in the PHP language.

## Why uPHP?

First perhaps it would be good to explain a bit about how and why we chose PHP. The goal of the Wattmon is to provide a highly flexible platform that can be customized for pretty much any application imaginable, keeping in mind very low memory availability. It became clear that a scripting language would be required to implement this, since having custom firmwares for various applications would be very tedious. The question then became: what would be the *\*best\** scripting language that is well known today and can be deployed on a microcontroller with such limited resource? The choices are actually very small. Most modern scripting languages require quite a bit of RAM. So, we decided to roll our own scripting language from scratch and base it off a well known language.

The Wattmon interface is primarily browser based, and generates HTML pages on the fly from uPHP scripts. The methodology of HTML-PHP integration is well understood by most programmers and hence it allows you to become more productive quickly.

## Challenges

The biggest challenge with the scripting language is its memory limitation. The [WattmonPRO](#) and [WattmonMINI](#) processors have a total of 128KB (yes, Kilobytes!) of RAM available to run a multitasking OS with a TCP/IP and USB stack, modbus polling engine, scheduler and more. For these platforms during normal operation scripts have a maximum of about 30 KB of memory for variables, which means that as a programmer you need to be very conscious of memory allocation. We have introduced some special non-PHP compatible variable types to help with this. The [indexed\\_array\(\)](#) function lets you create arrays of a very specific type (int, byte, etc) which will reduce the amount of resources compared to hash arrays created with the [array\(\)](#) function.

The [WattmonMEGA](#) processor has a total of 512KB of RAM (4 times as much as for the PRO and the MINI). Memory limitations are much less of a challenge when scripting for the MEGA.

## Benefits

Having a scripting language that lets you modify and edit your program remotely is a very powerful thing. It lets you provide remote support to your clients and fix issues without needing to visit the site, and also makes your applications future-proof as you can at any time update the code base and integrate new features or protocols.

## Further Information on uPHP

Of interest to those who want to dig deeper and advance into making tweaks and changes to the system:

[uPHP Language Basics](#) - Basic syntax and tips to get started

[uPHP Function Reference](#) - The entire function list (advanced)

[uPHP Special Variables](#) - Special arrays that are populated automatically before a script is run

<sup>1)</sup>

PHP is a server-side scripting language designed primarily for web development but also used as a general-purpose programming language. PHP stands for “PHP: Hypertext Preprocessor.” This confuses many people because the first word of the acronym is the acronym (this type of acronym is called a recursive acronym.)

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