

Scada_HTTP_DBDriver_HowTo

SCADA Server

620.1

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Version

Version	Date	Comment	Author
1	30.03.2015	First release db driver and installation PHP script	kn
2	09.04.2015	Vf modif after first release implement in Scada Server with POST commands	vf

References

Abbreviations

1. Introduction

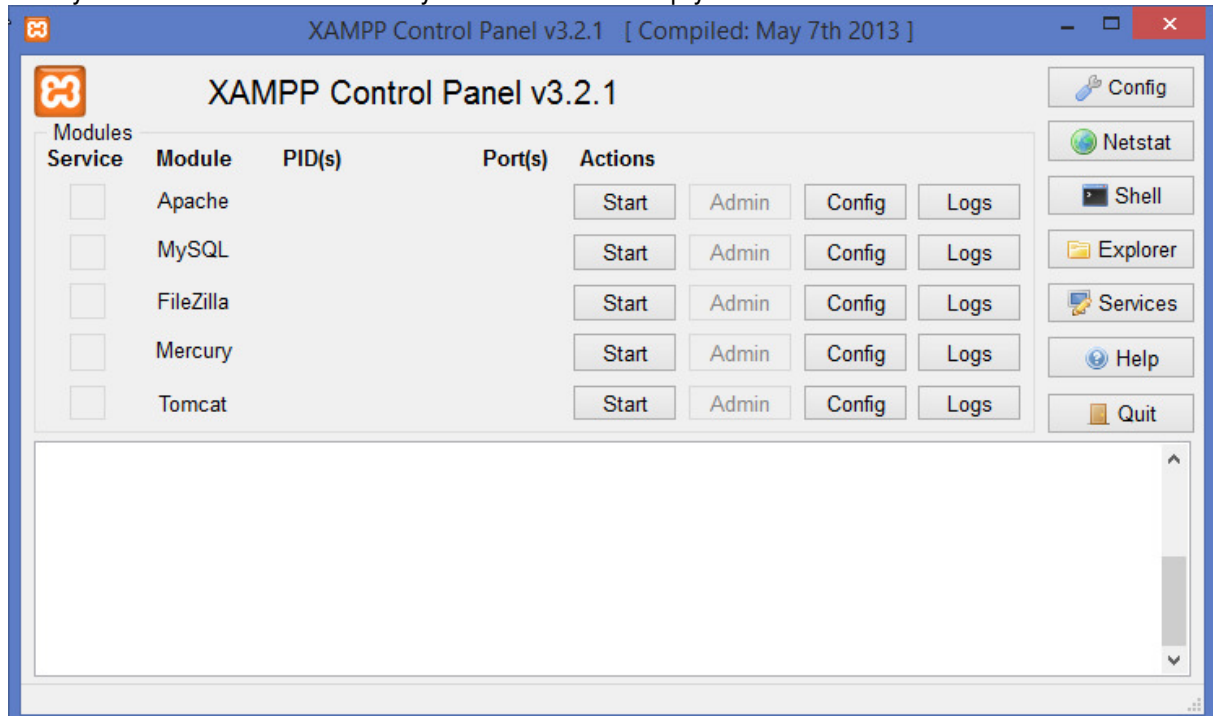
The following text is giving you an tutorial how to setup a Apache and an MySQL server, how to create a database based on MySQL and how you can create a script which can read and write in the database.

For the implementation we used an Apache Server with free SQL tool : the XAMPP pack that we downloaded here:

<https://www.apachefriends.org/de/download.html>

2. Install and Start the XAMPP Server

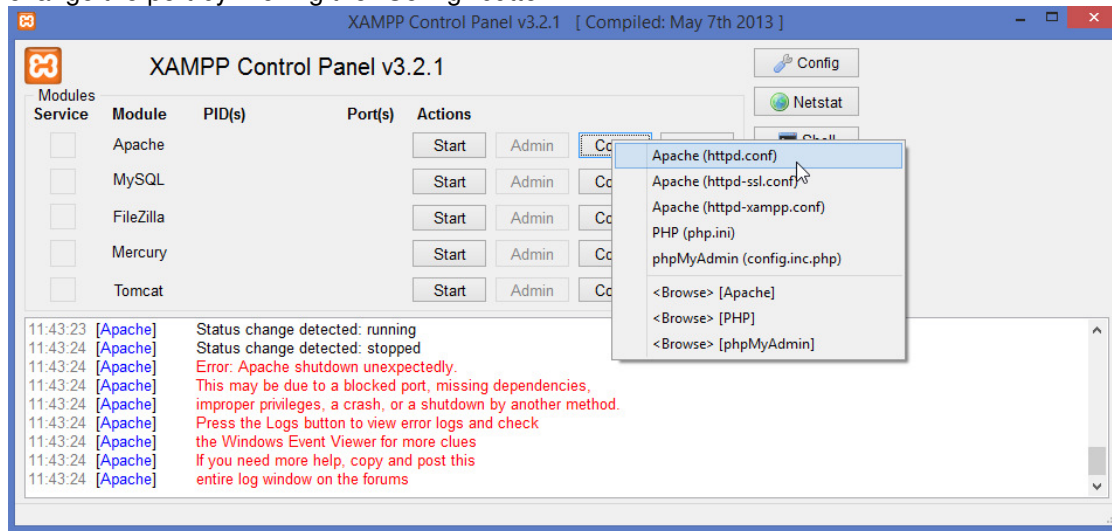
After you downloaded the tool and you installed the setup you should be here:



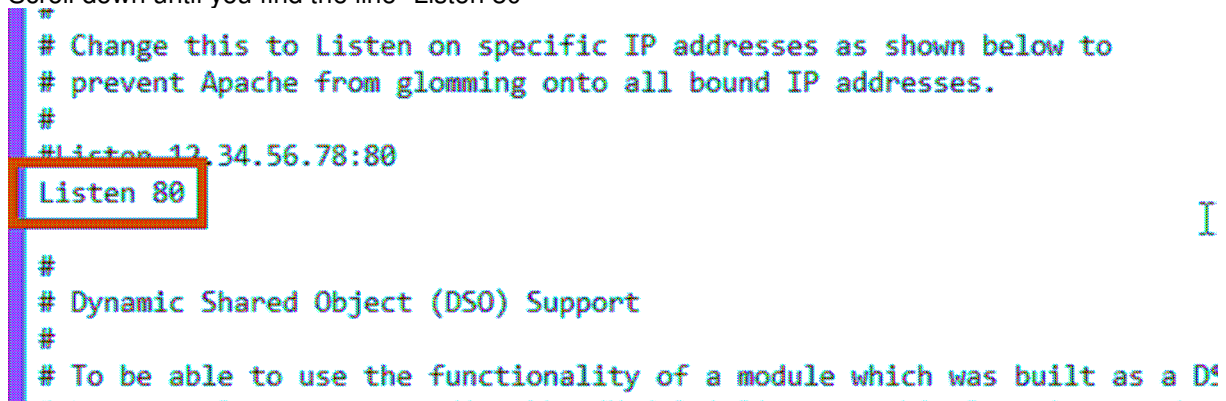
To start the Apache and the MySQL server you have to press the Start button for Apache and MySQL

2.1 Problems with starting

If you can't start the Apache server you probably are using the port 80 for something else. You can change the port by clicking the "Config" button

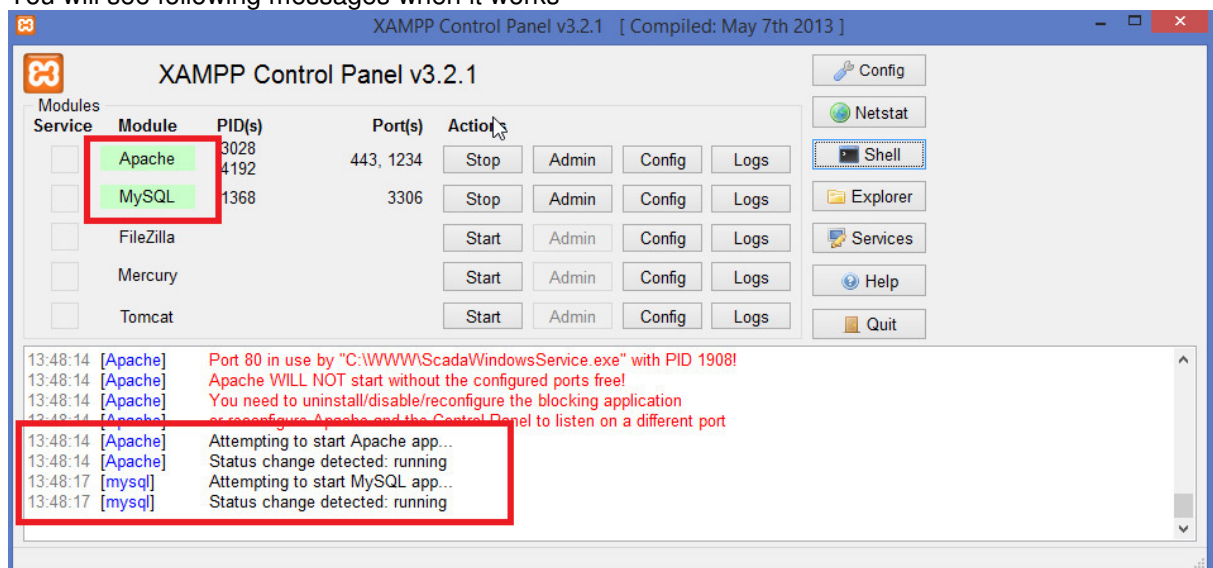


After you pressed "Apache (httpd.conf)" it opens a new window. Scroll down until you find the line "Listen 80"



Change the number "80" to a port which is free. Save the file and restart the server.

You will see following messages when it works



3. Generate a sample DB

3.1 Add a sample table “ppo_new” to the test DB

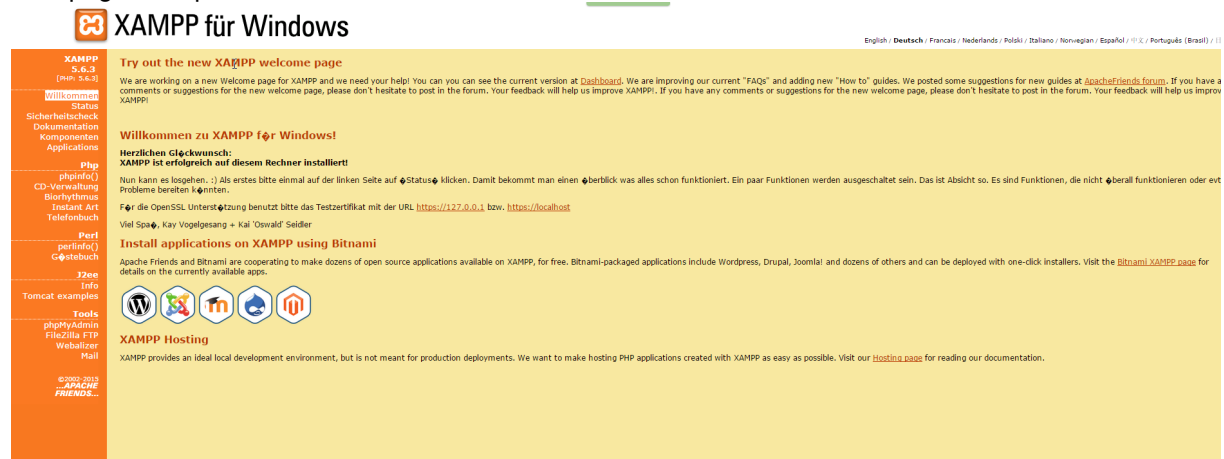
To create your database you have to run your Webbrowser and type in:

"localhost/xampp"

If you changed your port like we did, you have to type in: "localhost:your port/xampp"

For example: " localhost:1234/xampp "

This page will open:

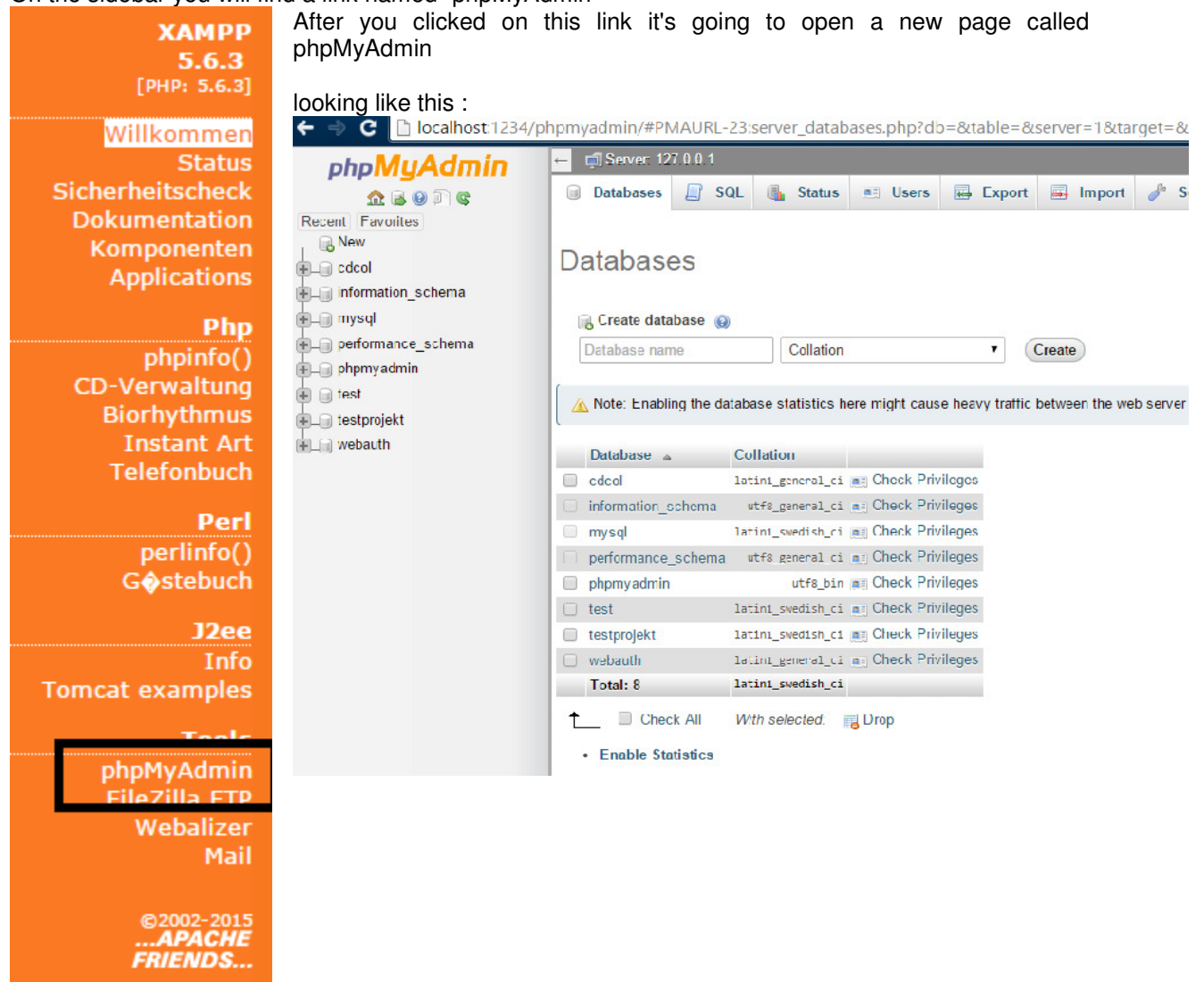


On this page you are going to find Information about the XAMPP tool.

On the sidebar you will find a link named "phpMyAdmin"

After you clicked on this link it's going to open a new page called phpMyAdmin

looking like this :



The image shows the phpMyAdmin interface. On the left is an orange sidebar with various links. The 'phpMyAdmin' link is highlighted with a black box. The main content area shows the 'Databases' tab selected. It includes a 'Create database' form and a table listing existing databases.

phpMyAdmin Sidebar Links:

- XAMPP 5.6.3 [PHP: 5.6.3]
- Willkommen
- Status
- Sicherheitscheck
- Dokumentation
- Komponenten
- Applications
- Php
- phpinfo()
- CD-Verwaltung
- Biorhythmus
- Instant Art
- Telefonbuch
- Perl
- perlinfo()
- Gastebuch
- J2ee
- Info
- Tomcat examples
- Tools
- phpMyAdmin**
- FileZilla FTP
- Webalizer
- Mail
- ©2002-2015 ...APACHE FRIENDS...

phpMyAdmin Databases Tab:

Server: 127.0.0.1

Tools: Databases, SQL, Status, Users, Export, Import, S

Create database

Database name: Collation: Create

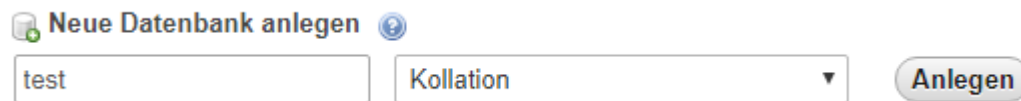
Note: Enabling the database statistics here might cause heavy traffic between the web server

Database	Collation	
<input type="checkbox"/> cdcol	latin1_general_ci	Check Privileges
<input type="checkbox"/> information_schema	utf8_general_ci	Check Privileges
<input type="checkbox"/> mysql	latin1_swedish_ci	Check Privileges
<input type="checkbox"/> performance_schema	utf8_general_ci	Check Privileges
<input type="checkbox"/> phpmyadmin	utf8_bin	Check Privileges
<input type="checkbox"/> test	latin1_swedish_ci	Check Privileges
<input type="checkbox"/> testprojekt	latin1_swedish_ci	Check Privileges
<input type="checkbox"/> webauth	latin1_general_ci	Check Privileges
Total: 8	latin1_swedish_ci	

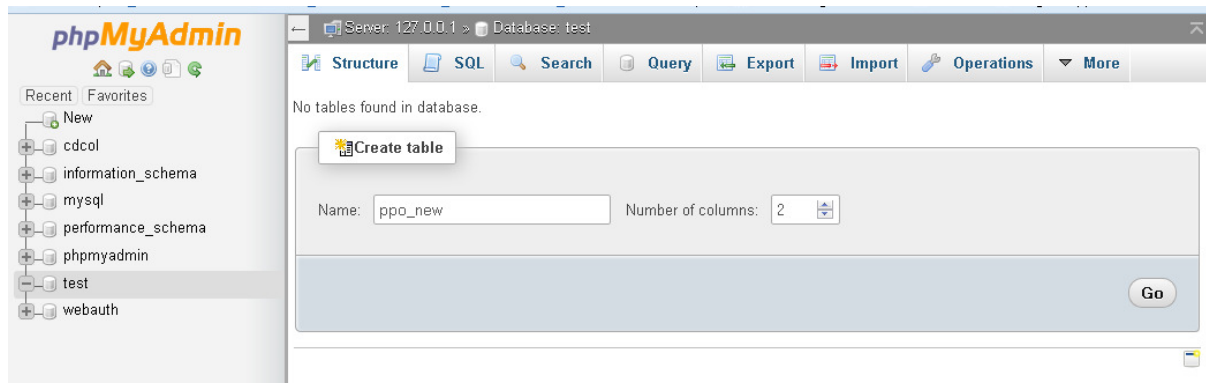
Check All With selected: Drop

• Enable Statistics

Here you can now create easily your database. Just press "New" on the sidebar, and add the name "test":



For our coming PHP samples we used the DB named **"test"** and we added a table named **"ppo_new"** (If you want to skip creating a table with all parameters just go to Import in the navigator and choose the "test.sql" file you have in the Zip.)



3.2 Configure the ppo_new table and add some entries to the table for testing purpose.

(Skip this if you used the "Import function we discribed earlier)

We defined the ppo_new table with 2 columns :

- 1 column for the name of your PPOs : we used for the PHP script : **"PPO_NAME"** (type VARCHAR(100))
- 1 column for the value of the PPOs : we used for the PHP script : **"PPO_VALUE"** (type VARCHAR(255).)

Here is an example:

#	Name	Typ	Kollation	Attribute	Null	Standard	Extra	Aktion
1	PPO_NAME	varchar(100)			Nein	kein(e)		Bearbeiten Löschen Primärschlüssel Unique Index Räumlich Volltext Mehr
2	PPO_VALUE	varchar(255)			Nein	kein(e)		Bearbeiten Löschen Primärschlüssel Unique Index Räumlich Volltext Mehr

4. PHP / MySQL -Script

4.1 Script Configurations

If you have different parameters for either the server IP or the DB-/Table name, you can configure those at the start of our script:



```
1 <html>
2 <head>
3     <title>PPO-Read-WritePHP</title>
4 </head>
5 <body>
6     <?php
7         date_default_timezone_set("UTC");
8         $servername = "localhost";
9         $username   = "root";
10        $password    = "";
11        $dbname      = "test";
12        $dbtablename = "ppo_new";
13        $the_Action = "";
14        $the_PPOName = "";
15        $the_PPOValue = "";
16        $msec0       = microtime(true);
17        $method       = $_SERVER['REQUEST_METHOD'];
18        $xmlPOSTBody = null;
19        $ilrPPOListAskedSize = 0;
20        //for debug purpose
21        $DEBUG        = 1;
22        $mylogfile     = null;
23        $myFailingPPOlogfile = null;
24
```

4.2 PHP-Script files location on Xampp Server

First you need to go into your Xampp folder on your PC (normally it's **C:\xampp**). Then in the subfolder "**htdocs**", to create a subfolder where you will put your own PHP script files. We defined for example: "**ininet_php**". In this folder you have to save the script if you want to use it for the DB driver.

Both, read and write will be executed from one script only this is called **myScript_Complete.php**. After choosing the type Data Base Over HTTP (DB), the Editor will automatically insert this name into both Service Scripts.

If you add a var in your project make sure that you add the Driver prefix in front of the var.

4.3 The PPO Read PHP Scrip :

For the PPOs Read , the SCADA Server will make a **POST command** on the apache Webserver according to the configurations you made for the DB Driver

Type	Data base over HTTP (DB)
Parameters	
DB HTTP Service IP Address	127.0.0.1
DB HTTP Service IP Port	80
DB HTTP Service Read PPOs Script	/inet_php/myScript_Complete.php
DB HTTP Service Write PPOs Script	/inet_php/myScript_Complete.php
PPO Update Mode	Periodic
PPO Update Periode (ms)	1000
String Encoding	ANSI current code page
HMI's PPOList File Name (*.tcr)	E:_ININET_HMIs\Projects\SQL\ScadaSample.tcr
Driver's Variables_Resolve File (*.csv)	
DB HTTP Service Alarming Script	/inet_php/alarm2.php
DB HTTP Service Trending Script	/inet_php/trend2.php
Import Variable List Files	

4.3.1 For Reading:

in that sample it will update the DB driver's PPO periodically in that it will call the configured READPPOScript "**/ininet_php/myScript_Complete.php**" in a post command and add at least one parameter (**action=r**) in the POST request's content part.

When called , your PHP script has to give back the PPO's name/values in our defined SpiderILR format:

```
<html>
<head>
<title>PPO Update</title>
</head>
<body>
<version>1.0</version>
<client>MyApp</client>
<client_ver>1.0</client_ver>
<file_name>Page1</file_name>
<action>Read</action>
<item_list_size>2</item_list_size>
<item_list>
<i>
<n>PPO3</n>
<v>300</v>
</i>
<i>
<n>ppodb1</n>
<v>1</v>
</i>
</item_list>
</body>
</html>
```

in our sample we can see such a READ PPO communication with wireshark :

```
POST /ininet_php/myScript_Read.php HTTP/1.1
User-Agent: SpiderControl/1.0 (ininet-solutions GmbH)
Host: 192.9.225.57:1234
Connection: keep-alive
Content-Type: application/x-www-form-urlencoded
Content-Length: 8
Cache-Control: no-cache
Pragma: no-cache

action=rHTTP/1.1 200 OK
Date: Thu, 09 Apr 2015 09:30:21 GMT
Server: Apache/2.4.10 (win32) OpenSSL/1.0.1f PHP/5.6.3
X-Powered-By: PHP/5.6.3
Content-Length: 521
Keep-Alive: timeout=5, max=100
Connection: Keep-Alive
Content-Type: text/html; charset=UTF-8

<html>
<head>
<title>PPO Update</title>
</head>
<body>
<version>1.0</version>
<client>MyApp</client>
<client_ver>1.0</client_ver>
<file_name>Page1</file_name>
<action>Read</action>
<item_list_size>6</item_list_size>
<item_list>
<i>
...<n>PPO3</n>
...<v>300</v>
...</i>
<i>
...<n>ppodb1</n>
...<v>1</v>
...</i>
<i>
...<n>ppodb2</n>
...<v>2</v>
...</i>
<i>
...<n>ppodb3</n>
...<v>3</v>
...</i>
<i>
...<n>ppodb4</n>
...<v>4</v>
...</i>
<i>
...<n>var1</n>
...<v>0</v>
...</i>
</item_list>
</body>
</html>
```

4.3.2 For Write

in that sample it will make the PPO Write in that it will call with the same script **“/inet_php/myScript Complete.php”** in a post command and add the parameters **action=w&n=[ThePPOToWriteName]&v=[ThePPOToWriteValue]** in the POST request's content part.

When called , your PHP script has to give back “OK” or “!Failed”.

in our sample we can see such a Write PPO communication with wireshark :

```
POST /inet_php/myScript_write.php HTTP/1.1
User-Agent: SpiderControl/1.0 (iniNet-Solutions GmbH)
Host: 192.9.225.57:1234
Connection: keep-alive
Content-Type: application/x-www-form-urlencoded
Content-Length: 23
Cache-Control: no-cache
Pragma: no-cache

action=w&n=ppodb1&v=111HTTP/1.1 200 OK
Date: Thu, 09 Apr 2015 09:49:20 GMT
Server: Apache/2.4.10 (win32) OpenSSL/1.0.1i PHP/5.6.3
X-Powered-By: PHP/5.6.3
Content-Length: 155
Keep-Alive: timeout=5, max=100
Connection: Keep-Alive
Content-Type: text/html; charset=UTF-8

<html>
<head>
.<title>PPO write</title>
</head>
<body>
.OK
(PHP write with .Action = w
.the_PPOName = ppodb1
.the_PPOValue = 111)
</body>
</html>
```

4.4 How to start your PHP-Scripts for testing purpose

From your Internet-Browser you can now run your PHP script Like this:

"localhost:your-port/your-subfolder/YourPHP-Script"

If you are using the Complete PHP script then you need to parse the action, the character r stands for read and the character w stands for write.

The url in your Internet-Browser would look like this:

"localhost:your-port/your-subfolder/YourPHP-Script"

POST request's content : "action=r"

For example: **http://localhost:1234/inet_php/myScript_Read.php.**