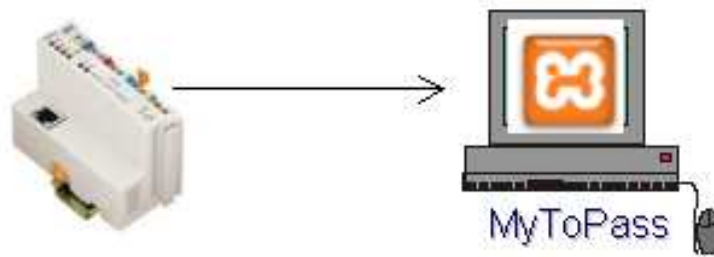


# WAGO I/O SYSTEM

## Set up your own TO-PASS web portal



## Application note

A301100, English  
Version 1.1.3

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Every conceivable measure has been taken to ensure the correctness and completeness of this documentation. However, as errors can never be fully excluded we would appreciate any information or ideas at any time.

We wish to point out that the software and hardware terms as well as the trademarks of companies used and/or mentioned in the present manual are generally trademark or patent protected.

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# 1 Important comments

To ensure fast installation and start-up of the units described in this manual, we strongly recommend that the following information and explanation is carefully read and adhered to.

## 1.1 Legal principles

### 1.1.1 Copyright

This manual is copyrighted, together with all figures and illustrations contained therein. Any use of this manual which infringes the copyright provisions stipulated herein, is not permitted. Reproduction, translation and electronic and photo-technical archiving and amendments require the written consent of WAGO Kontakttechnik GmbH & Co. KG. Non-observance will entail the right of claims for damages.

### 1.1.2 Personnel qualification

The use of the product detailed in this manual is exclusively geared to specialists having qualifications in PLC programming, electrical specialists or persons instructed by electrical specialists who are also familiar with the valid standards. WAGO Kontakttechnik GmbH & Co. KG declines all liability resulting from improper action and damage to WAGO products and third party products due to non-observance of the information contained in this manual.

### 1.1.3 Intended use

For each individual application, the components supplied are to work with a dedicated hardware and software configuration. Modifications are only admitted within the framework of the possibilities documented in the manuals. All other changes to the hardware and/or software and the non-conforming use of the components entail the exclusion of liability on part of WAGO Kontakttechnik GmbH & Co. KG.







Please direct any requirements pertaining to a modified and/or new hardware or software configuration directly to WAGO Kontakttechnik GmbH & Co. KG.

## 1.2 Range of validity

This application note is based on the stated hardware and software of the specific manufacturer as well as the correspondent documentation. This application note is therefore only valid for the described installation.

New hardware and software versions may need to be handled differently. Please note the detailed description in the specific manuals.

## 1.3 Symbols

	<b>Danger</b> Always observe this information to protect persons from injury.
	<b>Warning</b> Always observe this information to prevent damage to the device.
	<b>Attention</b> Marginal conditions must always be observed to ensure smooth operation.
	<b>ESD (Electrostatic Discharge)</b> Warning of damage to the components by electrostatic discharge. Observe the precautionary measure for handling components at risk.
	<b>Note</b> Routines or advice for efficient use of the device and software optimisation.
	<b>More information</b> References to additional literature, manuals, data sheets and INTERNET pages

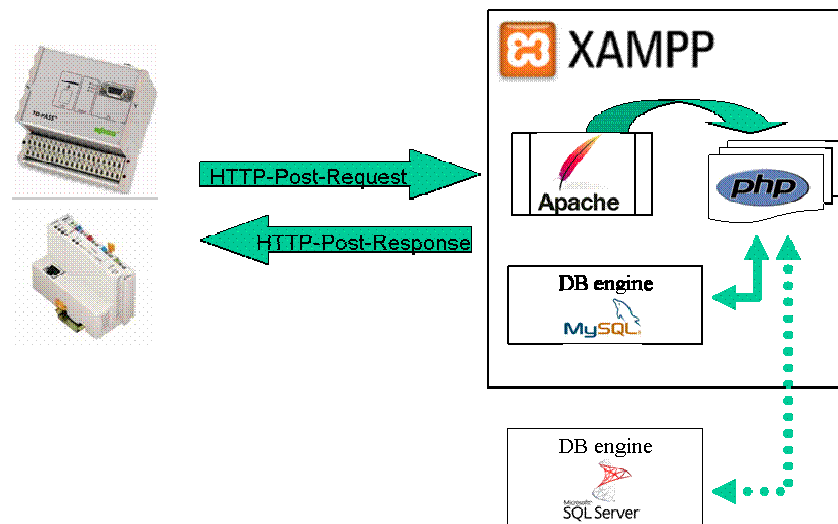
## 2 Description

This application note describes how to set up customer specific TO-PASS-Web-Portal based on XAMPP (cross-platform web server package) in your local area network and how to apply a WAGO Ethernet Controller to collect process data into a database engine, either MySQL or Microsoft SQL server.

The focus of this application note points to the transfer of process data from a TO-PASS device or WAGO Ethernet-Controller into a TO-PASS database.

The presentation layer for stored data does not fall into the scope of this document, we only provide a lite PHP-Script that process data of single device.

The TO-PASS-Web-Portal requires a suitable database structure and set of PHP-Scripts to store the allocated process data into the database.



The process data are submitted as parameters of a HTTP-Post telegram. The web server forwards the parameters together with the specified script to the PHP-engine. The PHP-engine contacts either the MySQL database or other database engines to inserts the process data into it.

To operate with a TO-PASS device series 761, the XAMPP server must be reachable from the internet. For how to configure series 761 see application note “a301000”.

To operate with a WAGO Ethernet Controller via a wide area network(WAN) See application note “a301001” for details. Discussed are the configuration of WAGO GPRS-VPN-Router(761-520) and additional steps to log process data on WAGO’s TO-PASS-WebPortal “<http://www.to-pass.com>”.

## 3 Set up TO-PASS server

This chapter guides you step-by-step to your own To-Pass solution.

### 3.1 Software installation

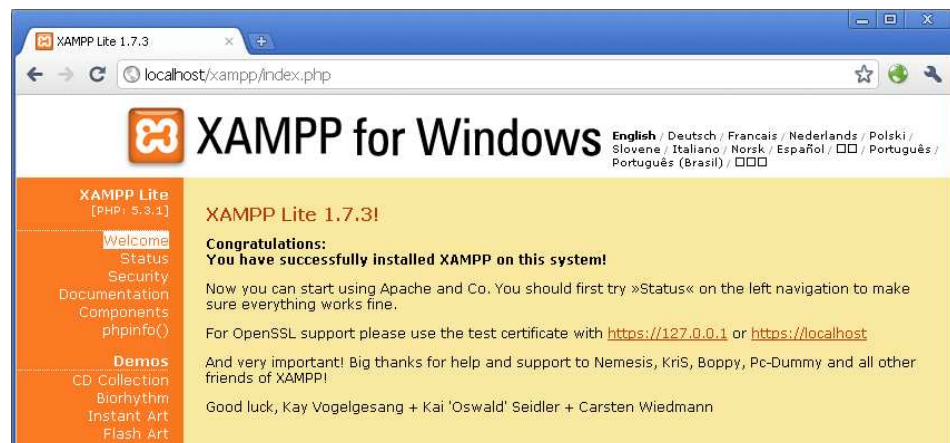
#### XAMPP

XAMPP is a free and open source cross-platform web server package, consisting mainly of the Apache HTTP Server, MySQL database, and interpreters for scripts written in the PHP and Perl programming languages.

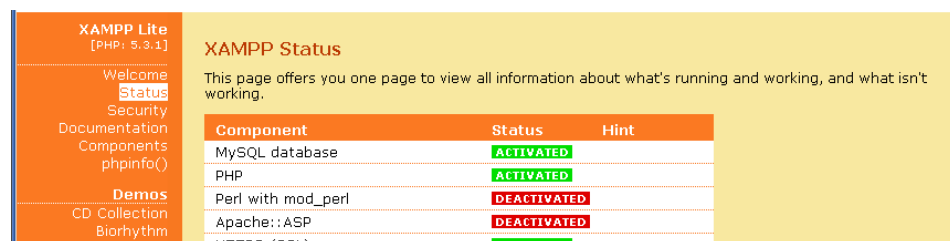
Download the XAMPP package for your operating system from <http://www.apachefriends.org/en/xampp.html> and follow the installation instructions. This application note is created on a Microsoft operating system.

Please keep in mind that XAMPP provides an easy to install system for developing and testing of web solutions. Care should be taken when applying security settings for your own application.

Test: After Apache starts, open the URL <http://localhost> or <http://127.0.0.1> and examine all of the XAMPP examples and tools.



To check that all required services are running, go to the XAMPP menu and press Status. You should see all needed services activated (PHP, MySQL).

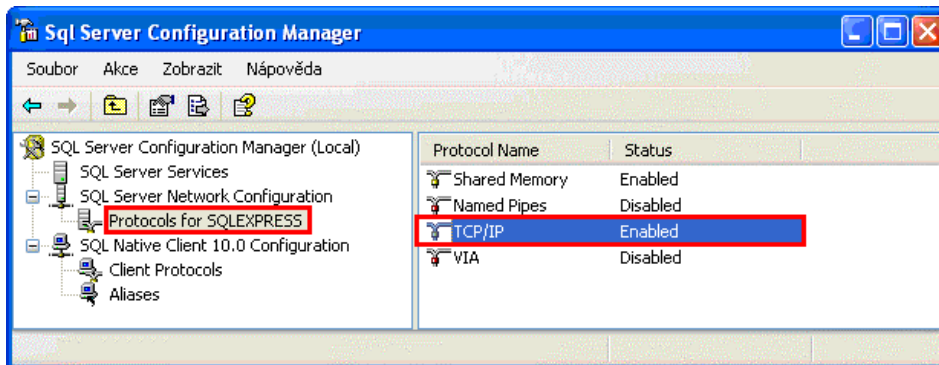


## Microsoft SQL Server database engine (optional)

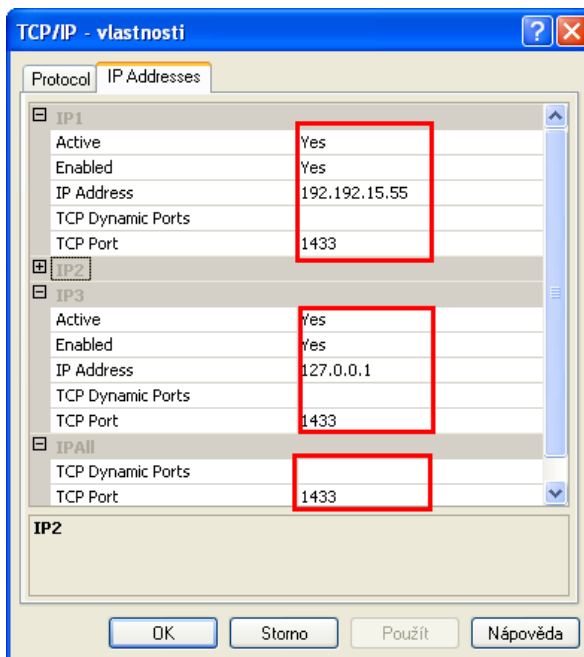
Microsoft SQL server database is not part of XAMPP package. Install it as given by the Microsoft SQL Server instructions.

### Microsoft SQL server setup – connectivity

Check the SQL server network configuration



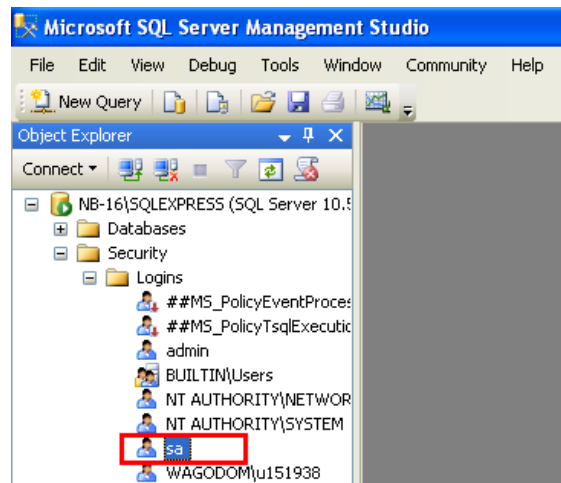
Activate TCP/IP and set properties for all required connections as follows. Note TCP Dynamic port set to 0 forces use of dynamic port feature, i.e. set it blank to activate the static port



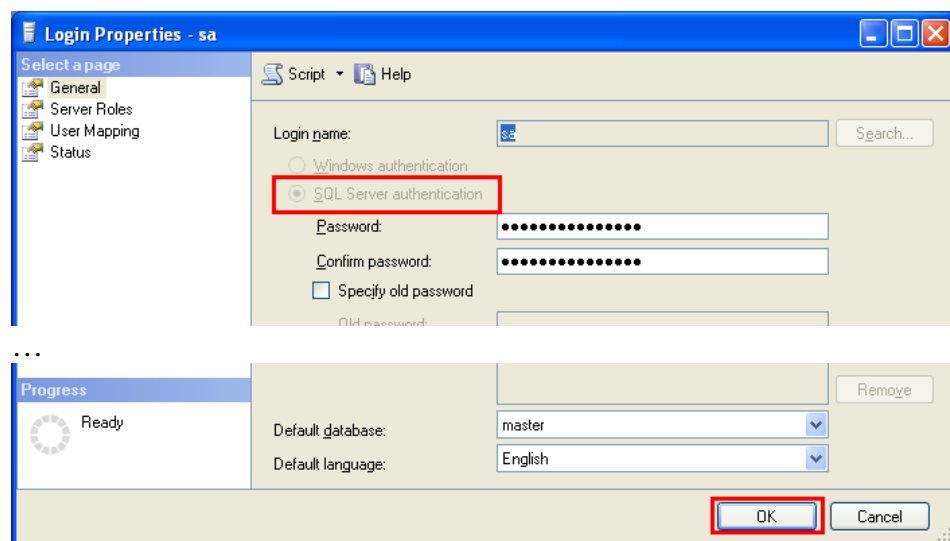


## Microsoft SQL server setup – user authentication

In Microsoft SQL Server Management Studio set administrator “sa” account properties.



Set *SQL Server authentication* to access the database using username and password



## XAMPP configuration

To enable the PHP MS-SQL database handling the “PHP.ini” configuration file should be edited in folder “~/xampp/php” folder. To activate the feature just uncomment (delete “;”) the php\_mssql.dll extension as follows.

```

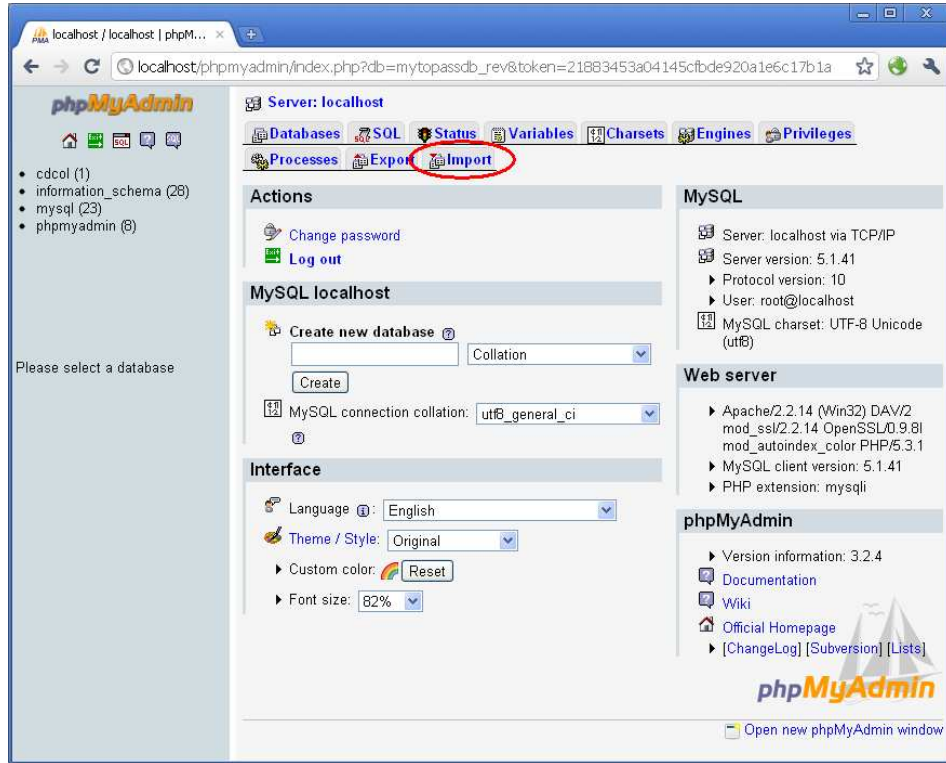
964 ;extension=php_intl.dll
965 ;extension=php_ldap.dll
966 extension=php_mcrypt.dll
967 extension=php_mssql.dll
968 ;extension=php_mysql_mysqlnd.dll
969 extension=php_mysql_libmysql.dll
  
```

Restart the XAMPP Apache server to activate it.

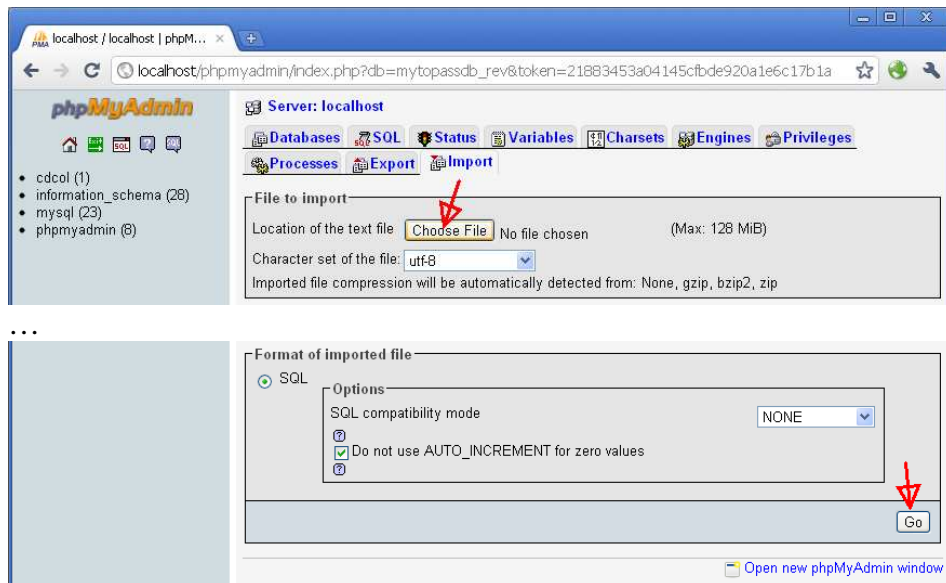
## 3.2 Create TO-PASS database

### MySQL

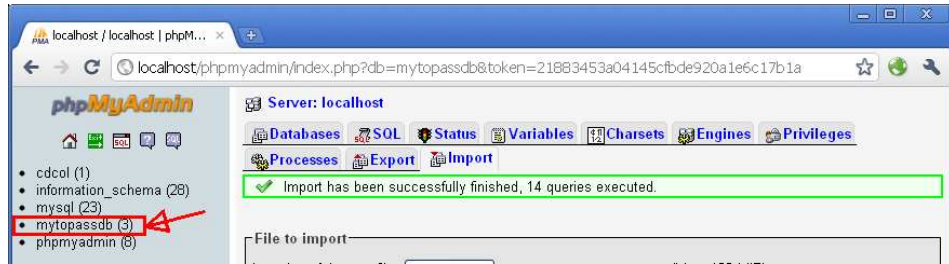
Open the MySQL administration tool by typing URL <http://localhost> or <http://127.0.0.1> and click the “PhpMyAdmin” item in the XAMPP menu.



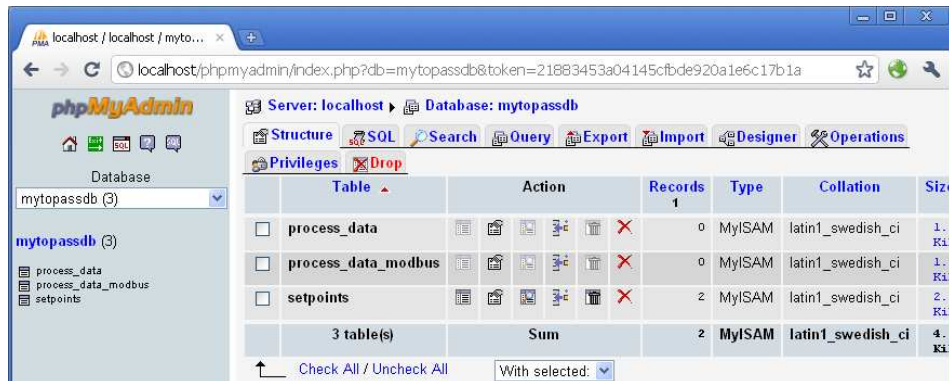
Click “Import” and further “Choose file” button to locate the TO-PASS database batch file.



Press “Go” button create application note database called “mytopassdb”.



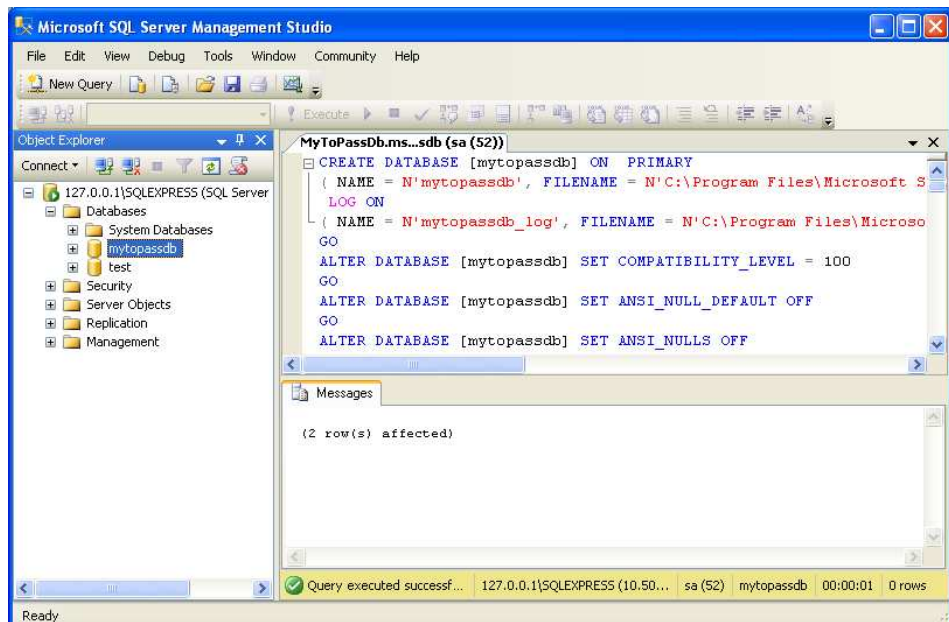
Click the 'mytopassdb' to see the database structure



Next step is to copy and modify the PHP scripts.

## MS-SQL

Open Microsoft SQL Server Management Studio and locate the application note TO-PASS database batch file for MS-SQL. Open it and "Execute".



Now the TO-PASS database in SQL server is ready for use.

### 3.3 Publish TO-PASS PHP scripts

The folder “~/xampp/htdocs” is the web server’s root folder. All files within this folder are accessible for HTTP-Clients. Other distributions refer to this folder as “wwwroot”.

Create the folder “mytopass” in the root folder to store your TO-PASS scripts. Copy the attached files (shown below) into this folder depending on the database engine you use (either MySQL or MSSQL specific).



Filename:	Description:
index.php	Presentation layer to show stored data.
config.inc.php	Defines user specific constants.
savedata.php	Script API called by TO-PASS client to insert data into database.
savecompresseddata.php	Script API called by TO-PASS client to insert data into database (request in compressed form processing TO-PASS device series 761).
style.css	Cascading style sheet for presentation layer
setpoints.php	Service script to update the predefined device setpoints

To make changes to the default server values (server host name, user name, password, topass database name, etc.), open the *config.inc.php* script using a text editor (e.g. Notepad) and enter the changes.

```

/**
 * database parameters
 */
$db_server = "localhost";
$db_user = "root";
$db_password = "wago";
$db_database = "mytopassdb";

/**
 * device_id used by index.php to select a single device
 */
$device_id = "My841";

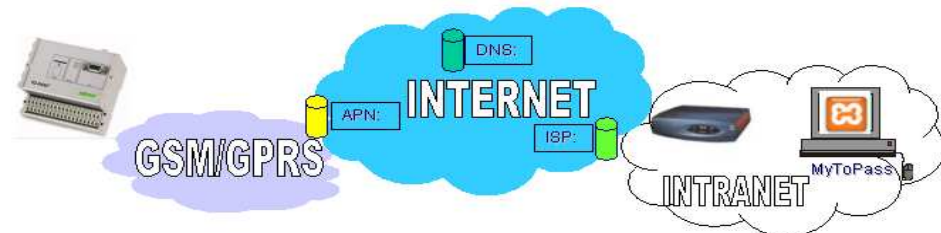
```

The server is configured and ready for data processing.

## 4 Set up a TO-PASS client

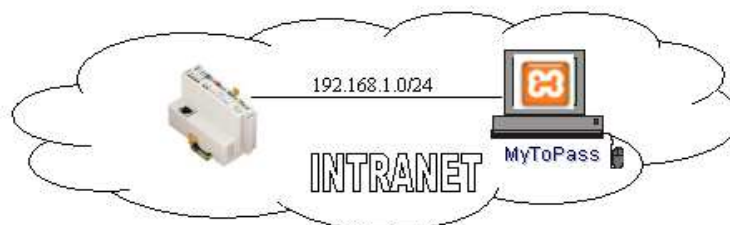
Currently there are two device groups who could act as TO-PASS clients: the WAGO Ethernet-Controller and the TO-PASS Series 761 device.

To operate with TO-PASS Series 761 devices you need an additional SIM-card that is enabled for data exchange. Additionally, your XAMPP server must be reachable from the internet. For details, reference the Series 761 device manual.

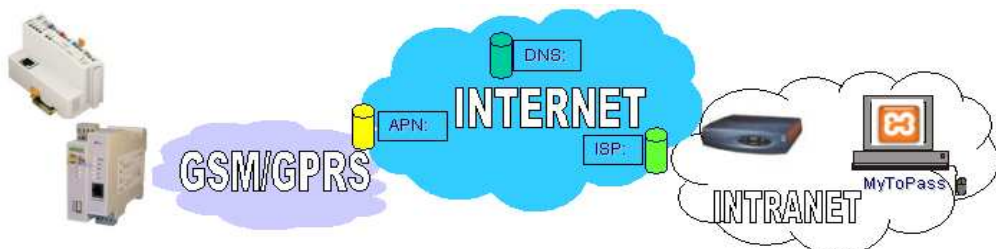


Accessibility from the internet requires additional configuration, such as:  
 -“port forwarding” from your NAT-Router to the XAMPP server,  
 - a DynDNS account like “myToPassPortal.dyndns.org” which makes your router accessible from the internet when your internet provider only assigns dynamic IP addresses.

Using a WAGO Ethernet-Controller inside a local network is easier to demonstrate, and will be discussed in this example.



Together with WAGO’s GPRS-VPN-Router 761-520, you can apply this solution for wireless WAN applications as well.

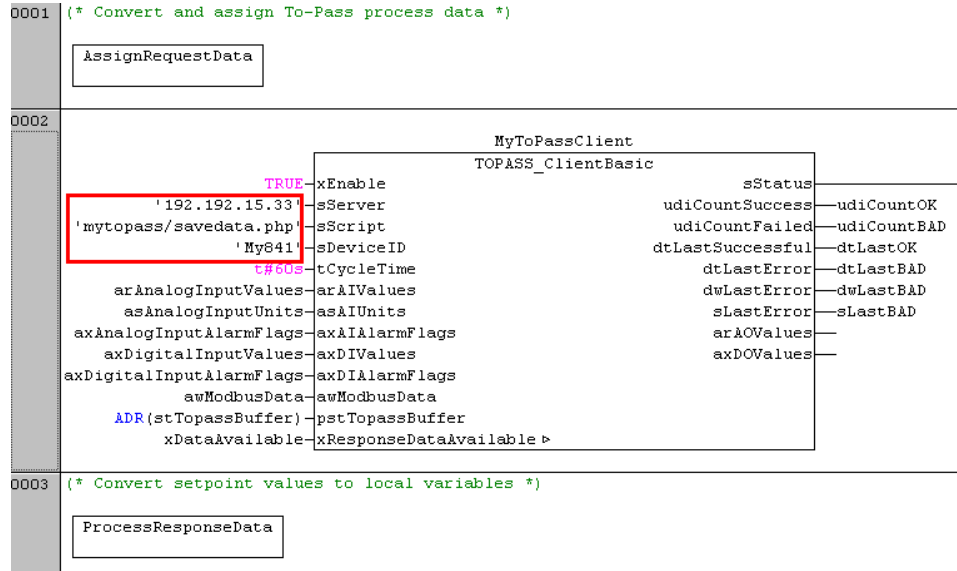


In each of these cases, the basic functionality is the same. A client sends a HTTP-POST-Request (together with process data) to a specialized script on a web server. The web server processes the request and sends a HTTP-Response back containing “values stored”.

## 4.1 Ethernet Controller as TO-PASS client

Open `WagoLibToPass01_Example01.pro` in CodeSys 2.3.

You will find a PLC program which makes use of the function block `TOPASS_ClientBasic` from the library `WagoLibToPass_01.lib`.



The program consists of three networks.

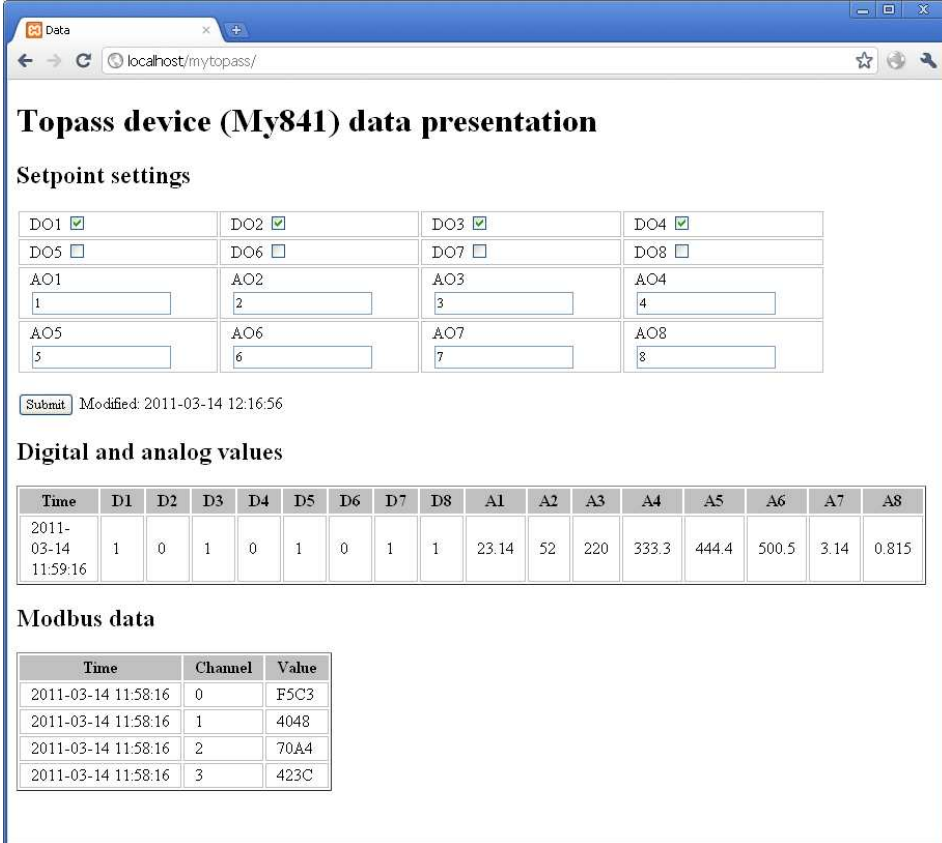
- In Network one, the process data are converted and copied to arrays used by the function block `TOPASS_ClientBasic`.
- Network two processes all the TO-PASS specific content and provides some statistics about successful and failed transmissions. Setting is required as follows:
  - Set input “sServer” with the hostname or IP-address of your XAMPP-server. For hostname, don’t forget to configure a DNS server for host name resolution.
  - Set the relative link to the PHP API script in “sScript” (for this application note ‘mytopass/savedata.php’)
  - Set device identifier to obtain setpoints. Use PhpMyAdmin database administrator to insert setpoint values for your “sDeviceID”, otherwise the TO-PASS returns only the “value stored” without additional parameters.
- Network number three retrieves setpoint values out of the HTTP-Response if available for the current “sDeviceID”,

If everything is working fine, the output “udiCountSuccess” is incremented otherwise the output “sLastError” will point to the problem.

## 5 Test and analyze your TO-PASS solution

This application note provides just a basic representation layer as a starting point for developing your own web portal or database application.

Using the address <http://localhost/mytopass/index.php>, the device data should be presented as follows.



**Topass device (My841) data presentation**

**Setpoint settings**

DO1 <input checked="" type="checkbox"/>	DO2 <input checked="" type="checkbox"/>	DO3 <input checked="" type="checkbox"/>	DO4 <input checked="" type="checkbox"/>
DO5 <input type="checkbox"/>	DO6 <input type="checkbox"/>	DO7 <input type="checkbox"/>	DO8 <input type="checkbox"/>
AO1 1	AO2 2	AO3 3	AO4 4
AO5 5	AO6 6	AO7 7	AO8 8

Modified: 2011-03-14 12:16:56

**Digital and analog values**

Time	D1	D2	D3	D4	D5	D6	D7	D8	A1	A2	A3	A4	A5	A6	A7	A8
2011-03-14 11:59:16	1	0	1	0	1	0	1	1	23.14	52	220	333.3	444.4	500.5	3.14	0.815

**Modbus data**

Time	Channel	Value
2011-03-14 11:58:16	0	F5C3
2011-03-14 11:58:16	1	4048
2011-03-14 11:58:16	2	70A4
2011-03-14 11:58:16	3	423C

To capture a device with a different identifier (e.g. My761), change the value of `$device_id` in `config.inc.php` script.

For a deeper insight on how it all works, the debugging tool “wireshark” may be helpful.

Under <http://www.to-pass.com/wago-demo/> you will find a WAGO example for the representation layer of a heating system. Login as user “wago” with password “demo”.

If you don't want to develop your own presentation layer scripts contact [info@wago.com](mailto:info@wago.com) for additional information.



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