

WAGO-I/O-PRO CAA Library

# WagoLibToPass\_02.lib

This library provide with 'TOPASS\_ClientBasic' a function block to communicate with WAGO's TO-PASS web portal "www.to-pass.com" or any other TO-PASS web portal.

A TO-PASS web portal consists of a webserver, PHP engine, database and a bunch of PHP scripts to log data.

Also provided are different PHP scripts as representation layer for historical data and trending.

## Content

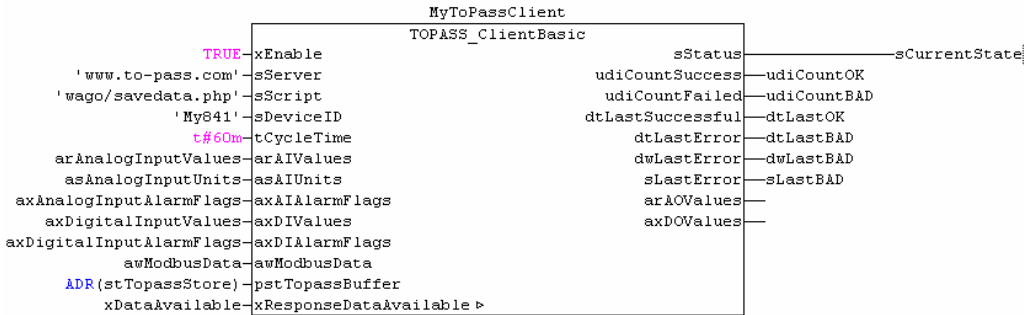
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# WagoLibToPass\_02.lib

## TOPASS\_ClientBasic

WAGO-I/O-PRO Library elements			
Category:	Communication		
Name:	TOPASS_ClientBasic		
Type:	Function	Function block	X Program
Library name:	WagoLibTopass_02.lib		
Used Librarys	WagoLibEthernet_01.lib, WagoLibTime.lib, WagoLibRTC.lib, WagoLibHttp_02.lib, WagoLibBase64_01.lib		
Applicable to:	WAGO Ethernet Controller except 750-842		
Inputparameters:	Data type:	Comments:	
xEnable	BOOL	Enable cycled execution	
sServer	STRING	IP-Address or hostname of TO-PASS server, e.g.: 85.220.143.234 or www.to-pass.com	
sScript	STRING	URL of PHP script should be called, e.g 'wago/savedataM15.php'	
sDeviceID	STRING(20)	Topas device identifier, e.g. 'My841'	
tCycleTime	TIME	Intervall to send data	
arAIValues	ARRAY[0..7] OF REAL	Current state of all "Analog Inputs"	
asAIUnits	ARRAY[0..7] OF STRING(5)	Unit code for each "Analog Inputs", such as "Volt, mA, %,..."	
axAIAlarmFlags	ARRAY[0..7] OF BOOL	Separate alarm flag for each "Analog Input" useful for "Out of range"	
axDIValues	ARRAY[0..7] OF BOOL	Current state of all "Digital Inputs"	
axDIAlarmFlags	ARRAY[0..7] OF BOOL	Separate alarm flag for each "Digital Input" useful for "Is it an alarm"	
awModbusData	ARRAY[0..gc_bTOPASS_ModbusDataCount] OF WORD	Modbus data to transmit. Customize the number of transmitted 'registers' by hiding libraries global constant with a global constant in your project.	
pstTopassBuffer	POINTER TO stTOPASS_Data Store	Buffer to store untransmitted data. The buffer should be defined as RETAIN.  Customize the buffer size, by hiding libraries global constant 'gc_uiTOPASS_BUFFERSIZE' in your project	
In-/Out parameters:	Data type:	Comments:	
xResponseDataAvailable	BOOL	Server has sends response data	

WAGO-I/O-PRO Library elements		
Outputparameters:	Data type:	Comments:
sStatus	STRING	Current processed step in state machine
udiCountSuccess	UDINT	Number of successful executed transmissions
udiCountFailed	UDINT	Number of failed transmissions
dtLastSuccessful	DT	Timestamp of last succesful transmission
dtLastError	DT	Timestamp of last failed transmission
dwLastError	DWORD	Error code of last failed transmission. See section 'Function description' for details
sLastError	STRING	Error code as textual description
arAOValues	ARRAY[0..7] OF REAL	Analog setpoint values received from server
axDOValues	ARRAY[0..7] OF BOOL	Digital setpoint values received from server
<b>Graphic display:</b> 		
<b>Function description:</b> <p>This function block is designed to communicate with WAGO's TO-PASS web portal "www.to-pass.com" or any other TO-PASS web portal via HTTP protocol. It emulate a WAGO TO-PASS device series 761 to store process data into a remote database and receive setpoints within the response.</p> <p>A TO-PASS web portal consists of a webserver, PHP engine, database and a bunch of PHP scripts to log data.</p> <p>Supported script's:</p> <ul style="list-style-type: none"> <li>- SaveDataM15.php: Write data into database, returns "Values stored". (available on www.to-pass.com)</li> <li>- SaveDataSP.php: Write data into database, returns "Values stored" and setpoints (available on www.to-pass.com)</li> <li>- savedata.php: Write data into database, returns "Values stored" and setpoints (published with appnote a301100)</li> </ul>		

## WAGO-I/O-PRO Library elements

The function block send following HTTP-Request to the given Server/Script:

```
POST /wago/savedataSP.php HTTP1.1
Host: 85.220.143.234
User-Agent: WAGO 750-841
Connection: Keep-Alive
Content-TYPE: application/x-www-form-urlencoded
Content-length: 239
ID=My841;12345&PA=0060;home;99&TI=08/10/07,10:30:49
&D1=1;0&D2=0;1&D3=1;0&D4=0;0&D5=1;1&D6=0;0&D7=1;0&D8=1;1
&A1=3.14;.C;0&A2=4711;%;1&A3=0.0;Volt;0&A4=0;kWh;0
&A5=0.0;Watt;1&A6=0;Umin;0&A7=0.0;Amper;0&A8=0;qm/h;1
&MV=AFFE;AFFE;AFFE;AFFE;AFFE
```

The Server/Script should send a HTTP-Response with "200 OK" and "Values Stored":

```
HTTP/1.1 200 OK
Date: Tue, 07 Oct 2008 10:32:47 GMT
Server: Apache
Content-Length: 154
Keep-Alive: timeout=15, max=100
Connection: Keep-Alive
Content-Type: text/html
Values stored:08/10/07,12:32:47
?AO1=0.1234&AO2=0.234&AO3=0.34&AO4=0.45
&AO5=0.56&AO6=0.67&AO7=0.78&AO8=0.89
&DO1=1&DO2=0&DO3=1&DO4=0&DO5=1&DO6=0&DO7=1&DO8=0
```

ReturnValues 'dwError':

```
16#80001001 => 'TCP-ERROR: DNS-Request failed, could not retrieve servers IP address'
16#80001002 => 'TCP-ERROR: Could not convert servers IP address into dotted format'
16#80002001 => 'HTTP-ERROR: Server returns "xyz" instead of "200" OK'
               - visit "http://en.wikipedia.org/wiki/List_of_HTTP_status_codes" for details
16#80002002 => 'HTTP-ERROR: "Content-Length" not found in response header'
16#80002003 => 'HTTP-ERROR: Begin of data area [CR;LF;CR;LF] not found in response'
16#80003001 => 'TOPASS-ERROR: Bad response data, cant find "Values stored:"'
16#80003002 => 'TOPASS-ERROR: Bad response data, cant find "&AOx="'
16#80003003 => 'TOPASS-ERROR: Values stored, but setpoints not configured on server'
16#80003004 => 'TOPASS-ERROR: Bad response data, cant find "&DOx="'
16#80004001 => 'TIMEOUT-ERROR: <actual processed step in state machine>'
16#80005001 => 'RTC-ERROR: Invalid setting of coupler Real-Time-Clock'
```

Remarks:

Declare the buffer variable as "VAR RETAIN" for proper operation

```
VAR RETAIN
(*Topass-Data-Buffer to store dataset when tranmissions fails *)
myBuffer: stTOPASS_DataStore; (*Buffer for untransmitted topass data *)
END_VAR
```

The number of transmitted modbus register can be modified by "hiding" libraries

```
GLOBAL CONSTANT
(* Number of modbus data(register) to transmit to server *)
gc_bTOPASS_ModbusDataCount: BYTE := 2;
END_VAR
```

## TOPASS\_ClientRS232

WAGO-I/O-PROLibrary elements			
Category:	Communication		
Name:	TOPASS_ClientRS232		
Type:	Function	Function block <b>X</b>	Program
Library name:	WagoLibTopass_02.lib		
Used Librarys	WagoLibEthernet_01.lib, WagoLibTime.lib, WagoLibRTC.lib, WagoLibHttp_02.lib, WagoLibBase64_01.lib		
Applicable to:	WAGO Ethernet Controller except 750-842		
Input parameters:	Data type:	Comments:	
xEnable	BOOL	Enable cycled execution	
bComPort	BYTE	COM-Port to connect with 761-510	
sScript	STRING	URL of PHP script should be called	
sDeviceID	STRING(20)	Topas device identifier	
tCycleTime	TIME	Intervall to send data	
arAIValues	ARRAY[0..7] OF REAL	Current state of all "Analog Inputs"	
asAIUnits	ARRAY[0..7] OF STRING(5)	Unit code for each "Analog Inputs", such as "Volt, mA, %,..."	
axAIAlarmFlags	ARRAY[0..7] OF BOOL	Separate alarm flag for each "Analog Input" useful for "Out of range"	
axDIValues	ARRAY[0..7] OF BOOL	Current state of all "Digital Inputs"	
axDIAlarmFlags	ARRAY[0..7] OF BOOL	Separate alarm flag for each "Digital Input" useful for "Is it an alarm"	
awModbusData	ARRAY[0..gc_bTOPASS_ModbusDataCount] OF WORD	Modbus data to transmit	
pstTopassBuffer	POINTER TO stTOPASS_DataStore	Buffer to store untransmitted data	
In/Out parameters:	Data type:	Comments:	
xResponseDataAvailable	BOOL	Server has sends response data	
Output parameters:	Data type:	Comments:	
sStatus	STRING(200)	Current processed step in state machine	
udiCountSuccess	UDINT	Number of successful executed transmissions	
udiCountFailed	UDINT	Number of failed transmissions	
dtLastSuccessful	DT	Timestamp of last succesful transmission	
dtLastError	DT	Timestamp of last failed transmission	
dwLastError	DWORD	Error code of last failed transmission	
sLastError	STRING	Error code as textual description	

WAGO-I/O-PROLibrary elements		
arAOValues	ARRAY[0..7] OF REAL	Analog setpoint values received from server
axDOValues	ARRAY[0..7] OF BOOL	Digital setpoint values received from server
Graphic display:		
<div><div>TOPASS_ClientRS232</div><div><div><div>- xEnable</div><div>- bComPort</div><div>- sScript</div><div>- sDeviceID</div><div>- tCycleTime</div><div>- arAIValues</div><div>- asAIUnits</div><div>- axAIAlarmFlags</div><div>- axDIValues</div><div>- axDIAlarmFlags</div><div>- awModbusData</div><div>- pstTopassBuffer</div><div>- xResponseDataAvailable ▶</div></div><div><div>sStatus</div><div>udiCountSuccess</div><div>udiCountFailed</div><div>dtLastSuccessful</div><div>dtLastError</div><div>dwLastError</div><div>sLastError</div><div>arAOValues</div><div>axDOValues</div></div></div></div>		
Function description:		
<p>This function block simulate a WAGO TO-PASS device series 761 and send data via GPRS-Modem 761-510.</p> <p>supported script's:</p> <p>savedataM15.php: Write data into database, returns "Values stored" (available on <a href="http://www.to-pass.com">www.to-pass.com</a>)</p> <p>savesataSP.php: Write data into database, returns "Values stored" and setpoints (available on <a href="http://www.to-pass.com">www.to-pass.com</a>)</p> <p>savedata.php: Write data into database, returns "Values stored" and setpoints (published with appnote a301100)</p> <p>The function block send following TOPASS-Request to the given Serial-Interface:</p> <pre>LEN=0199;SCRIPT=/wago/savedataSP.php?ID=my510&amp;TI=08/10/07,10:30:49 &amp;D1=1;0&amp;D2=0;1&amp;D3=1;0&amp;D4=0;0&amp;D5=1;1&amp;D6=0;0&amp;D7=1;0&amp;D8=1;1 &amp;A1=3.14&amp;A2=4711&amp;A3=0.815&amp;A4=0.7&amp;A5=1.4&amp;A6=2.1&amp;A7=2.8&amp;A8=3.5 &amp;MV=AFFE;AFFE;AFFE;AFFE;AFFE</pre> <p>The Server/Script should response with RETVAL "200 OK" and "Values Stored":</p> <pre>&amp;LEN=0154;&amp;RETVAL=200&amp;RESULT=Values stored:08/10/07,12:32:47 ?AO1=0.1234&amp;AO2=0.234&amp;AO3=0.34&amp;AO4=0.45&amp;AO5=0.56&amp;AO6=0.67&amp;AO7=0.78&amp;AO8=0.89&amp;DO1=1&amp;DO2=0&amp;DO3=1&amp;DO4=0&amp;DO5=1&amp;DO6=0&amp;DO7=1&amp;DO8=0</pre> <p>RetVal dwError:</p> <pre>16#800070xy =&gt; 'COM-ERROR: Send data failed on port: COM', bComPort); 16#80007001 =&gt; 'COM-ERROR: Sendbuffer "abTxBuffer" to small, increase RING_BUFFER_SIZE greater then &lt;n&gt; 16#80003001 =&gt; 'TOPASS-ERROR: Bad response data, cant find "Values stored:" 16#80003002 =&gt; 'TOPASS-ERROR: Bad response data, cant find "&amp;AOx="'</pre>		

### WAGO-I/O-PROLibrary elements

16#80003004 => 'TOPASS-ERROR: Bad response data, cant find "&DOx="'

16#80003005 => 'TOPASS-ERROR: Bad response, do not start with length information field  
"LEN="'

16#80003006 => 'TOPASS-ERROR: Bad response data, cant find field "&RETVAL="'

16#80003007 => 'TOPASS-ERROR: Server returns "xyz" instead of "200" OK'

16#80013001 => 'TOPASS-WARNING: Values stored, but setpoints not configured on server'

16#80004001 => 'TIMEOUT-ERROR: <actual processed step in state machine>'

16#80005001 => 'RTC-ERROR: Invalid setting of coupler Real-Time-Clock'

#### Remarks:

When operate with external serial interface 750-650, you have to set baudrate to 19200 on both sides. Declare the buffer variable as "VAR RETAIN" for proper operation in your PLC program

```
VAR RETAIN
    (*Topass-Data-Buffer to store dataset when tranmissions fails *)
    (*Buffer for untransmitted topass datasets *)
    myBuffer : stTOPASS_DataStore;
END_VAR
```

The number of transmitted modbus register can be modified by "hiding" libraries

```
GLOBAL CONSTANT
    (* Number of modbus data(register) to transmit *)
    gc_bTOPASS_ModbusDataCount: BYTE := 2;
END_VAR
```