# **Wizard BTM software 1.90**: BTM-PCRUNTIME, SH4WEB WEB-app, KNX Gateway, BACnet client

rev. 0.2, 04/07/2014

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# 1 General Notes

This manual describes how to use the following three features of the BTM display and software:

- BTM-PCRUNTIME:
  a powerful Client for Windows PCs;
- WEB-APP:
  with a smart-device the user can access the same pages available in the BTM display or in the PC, if the BTM-PCRUNTIME is used;
- KNX:
  The display can be turned into a gateway between a smart-house and a KNX system by means of the plug-in module BTM-KNX;
- BACNET:
  the BACNET protocol is available as client;
- DATA TRANSFER:
  The BTM displays can be used as gateways between different protocols;

# 2 BTM-PCRUNTIME

BTM-PCRUNTIME for Windows is a unique HMI platform that combines advanced HMI features and vector graphics with powerful web technologies. The user can choose the platform to monitor and control the equipment with tags, alarms, schedulers, recipes, trends, JavaScript logic and events while at the same time gaining ubiquitous web access, e-mail alerts and mobile display. The Runtime architecture is built from the core using Internet standards.

## 2.1 BTM-PCRUNTIME System Requirements

The minimum system requirements to use BTM-PCRUNTIME are the following:

| | |
|---|---|
| **Operating System** | Windows XP Professional (SP2/SP3)<br>Windows Vista Business/Ultimate (32 bit)<br>Windows 7 Professional (32/64 bit)<br>Windows 8 / 8.1<br>Windows 2003 Server |
| **Storage** | 256 MB Min |
| **RAM** | 512 MB |
| **CPU** | min. 300 MHz Pentium III or similar processors with 500 MHz. |
| **Graphic** | min. SVGA min 1024x768 |
| **Other** | One Ethernet connection |

## 2.2 Wizard System Requirements

The configuration Wizard software has the following system requirements:

| | |
|---|---|
| **Operating System** | Windows XP (SP2 or SP3)<br>Windows Vista (SP1 or SP2)<br>Windows 7<br>Windows 8 / 8.1 |
| **Storage** | 500 MB Min |
| **RAM** | 512 MB |
| **Other** | One Ethernet connection |

## 2.3 How to install the Software

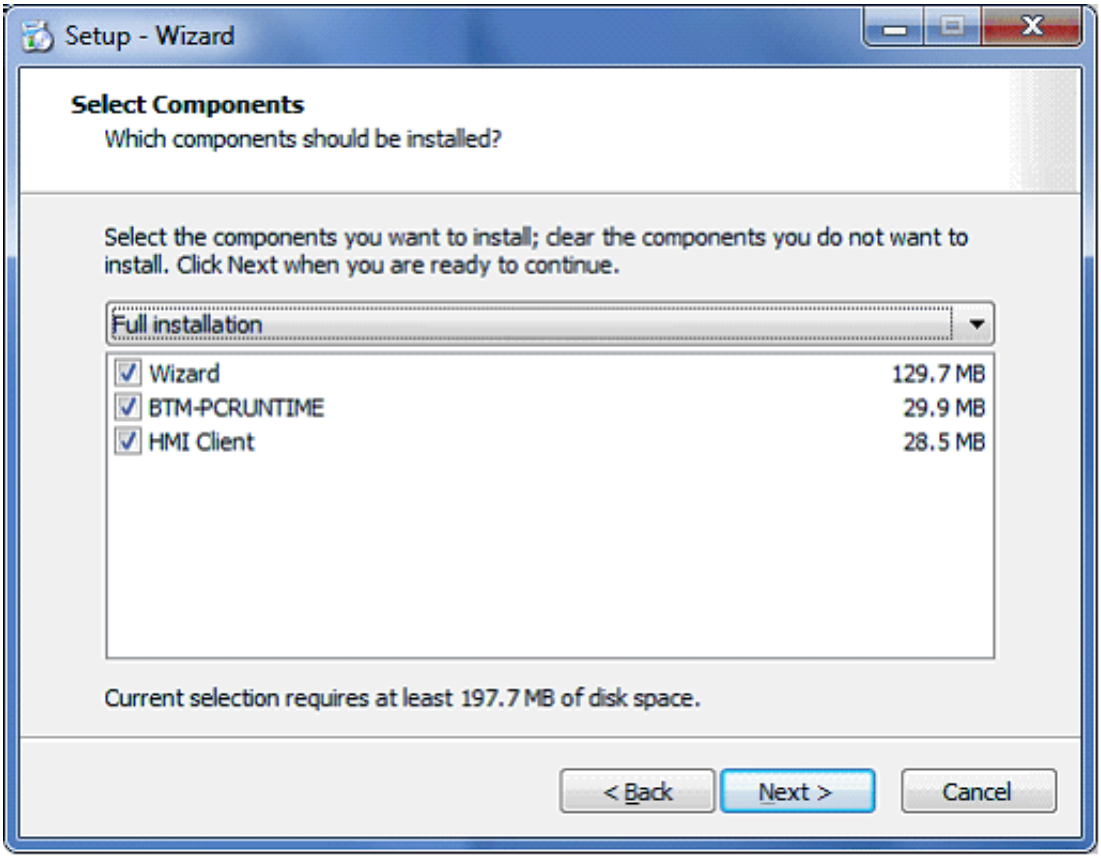
The Wizard contains the following as part of the installation:

**Wizard**
Wizard is an application for designing custom HMI projects in a user-friendly manner, along with a variety of options in its built-in library, the Widget Gallery.

**BTM-PCRUNTIME**
The BTM-PCRUNTIME is a standalone application that runs on a Win32 platform. It is like an HMI Runtime but has been designed to work on Win32 platforms such as Windows 8/7, Windows XP etc.

**HMI Client**
HMI Client is a light-weight application that can be used on Windows computers to remotely view and manage an application running on an HMI Runtime (another PC or a BTM display).

To install the software, double click on the setup file called *Wizard 1.90.xxxxx*, and select all the components:




After the installation, the user can turn his pc into a BTM panel, launching the application by double clicking on the icon

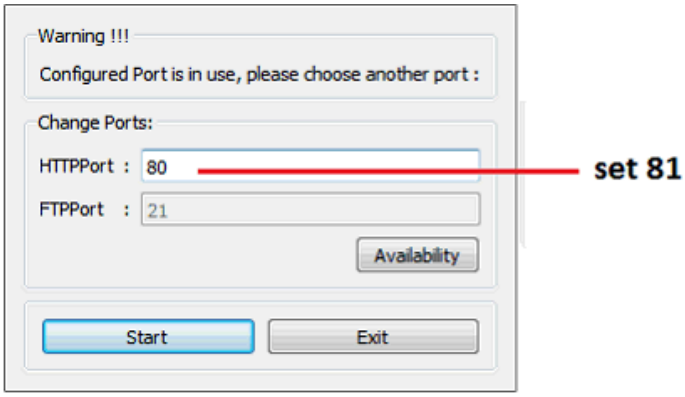
.

## 2.4 How to configure the communication ports

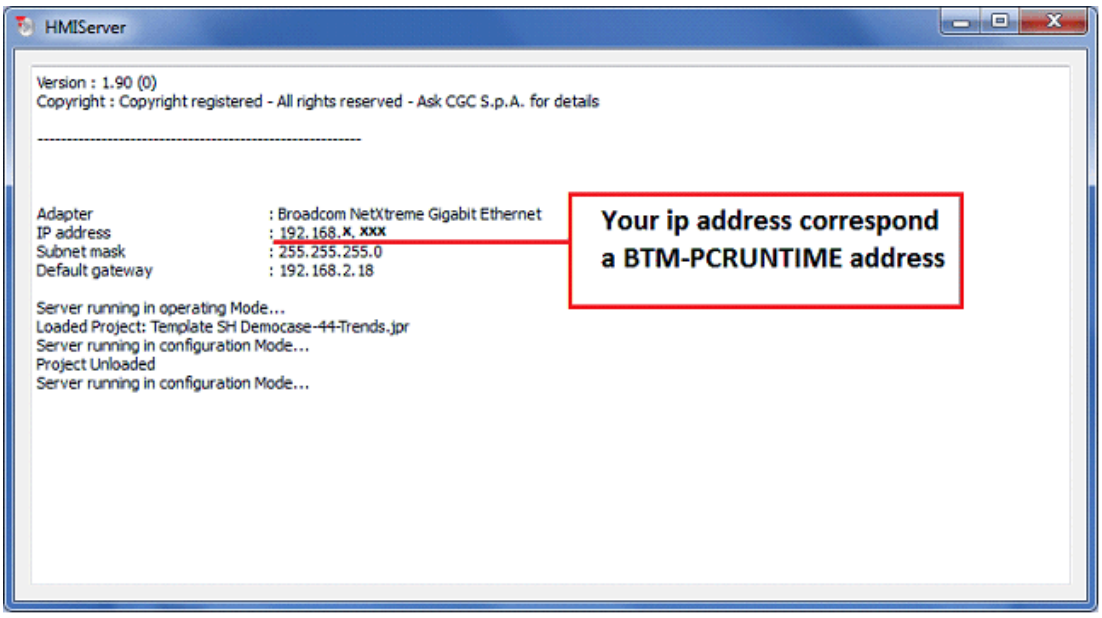
**By default, BTM-PCRUNTIME uses ports 80 and 21 for operations.**

At the first startup, the system checks if these ports are already occupied by other services and since port 80 is usually already in use, we suggest changing it and setting it to 81.

**The user can set port 81 then press Availability and press START**

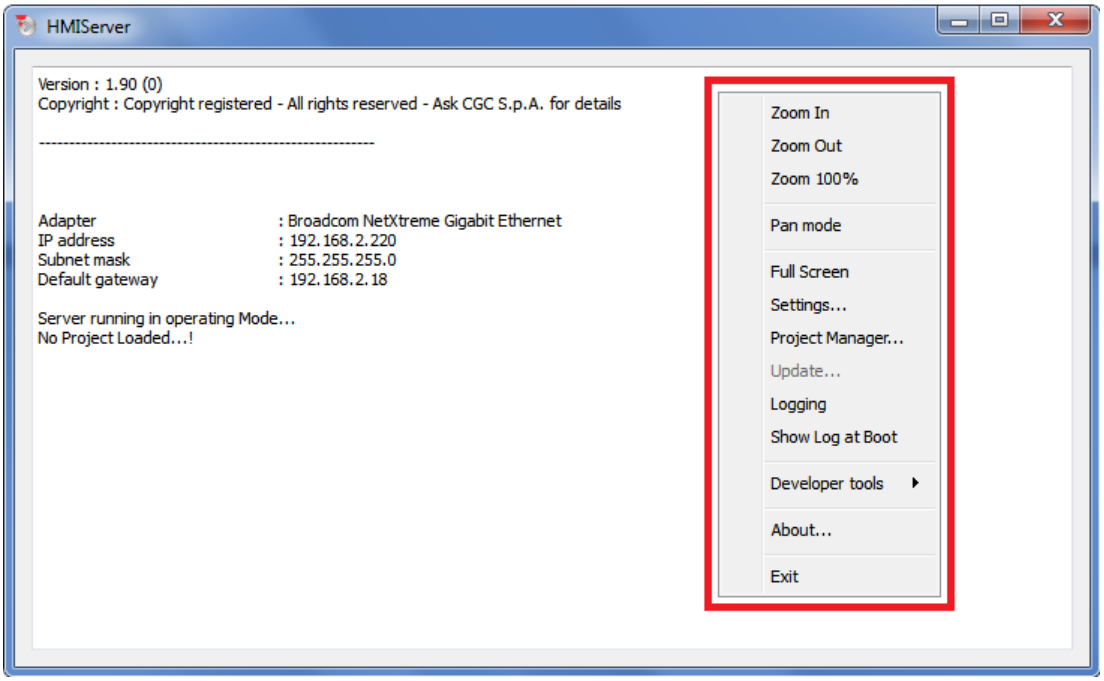



After pressing *Start,* the BTM-PCRUNTIME will appear, showing the following window:



## 2.5 The Runtime menu on BTM-PCRUNTIME

From the BTM-PCRUNTIME window it is possible to access the Settings by right-clicking the mouse on an empty area. By using this property the user can customize the BTM-PCRUNTIME.

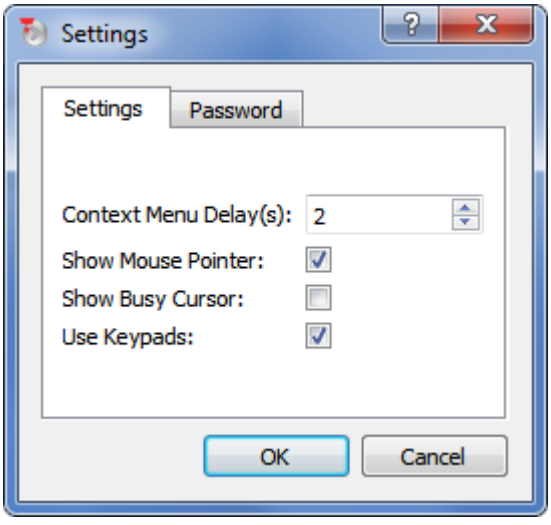



**Zoom In/Out/100%**
Select view at runtime.

**Pan Mode**
Enable/disable the pan mode; this works only when you have previously activated a *Zoom in*.

**Full Screen**
It is possible to choose this if BTM-PCRUNTIME has to start in full-screen mode or in a window.

**Settings**
The following runtime settings are available:



**Context Menu Delay (sec)**
Range is 1-60 seconds.
The context menu is activated by pressing and holding on an empty screen area (without buttons or other touch sensitive elements) for this delay time. The menu is displayed when this delay expires if the device is a BTM display. The delay time is ignored if the device used is a PC.

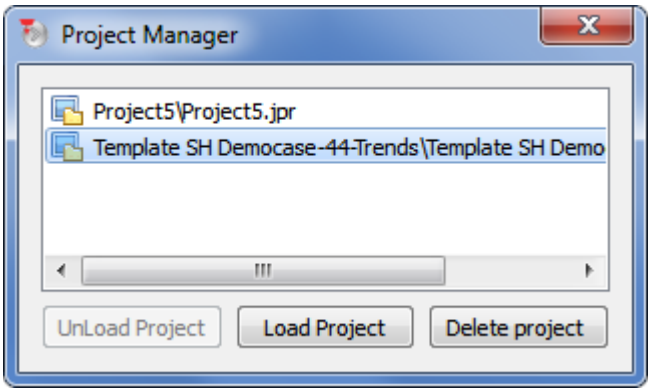
**Show Busy Cursor**
When enabled, this shows an hourglass if the system is busy

**Use keypads**
When enabled, this shows touch keypads when users touch/click on fields for data entry. When disabled, it does not show any keypad on the screen (this option might be useful when an external USB keyboard is connected to a device)

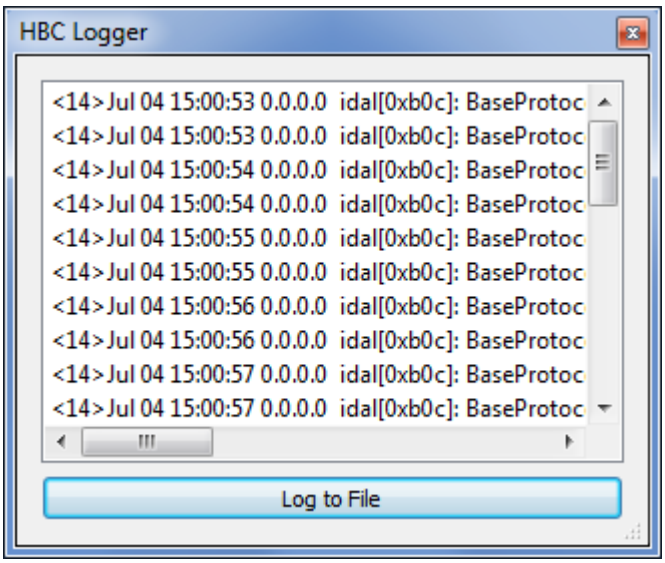
**Password**
This changes the password, which protects operations such as:
- Download Project/Runtime
- Upload project
- Board management (BSP Update)

**Project Manager**
When activated, a dialog box will appear (see figure below) providing the options to unload (de-activate) the current project, load (activate) another project present in the panel memory, or delete a project.
Please note that projects can be deleted only after being unloaded. If you click on a project name other than the active one, the option "Load project" will first unload the running application and then automatically activate the new one.

See picture below:



**Logging**
This enables you to display a track of the system operation log; it may be very useful if there is a need to debug a problem of any nature. The following figure shows a case in which the system reports a communication error; the decoding of the reported information may not be immediate, but you can always use the option “Log to file” to save the dialog context into a file that can later be provided to Technical Support for investigation. The log file is called “logger.txt” and it is saved in the folder “...\var\log” on the panel flash disk. The file can be retrieved from the panel by using an FTP client.
**Note**: The “Log To File” Option is saved and retained after power cycles; when not needed any more, it must be manually deactivated.



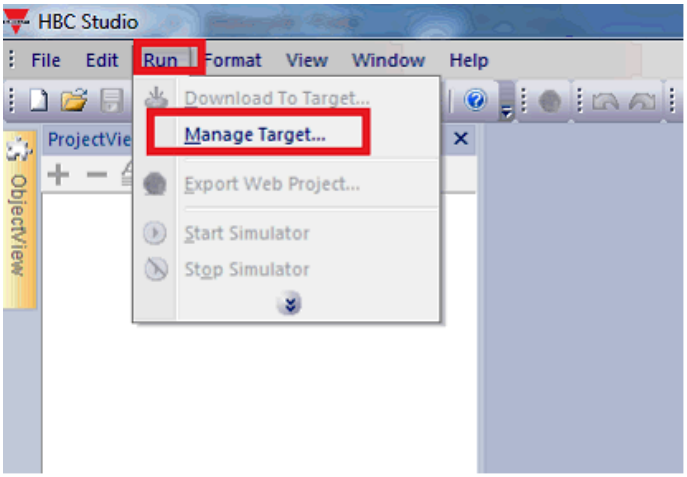

**Show log at boot**
This enables the logger at start up; if the “Log to file” option has been enabled, the files are saved from the startup phase.

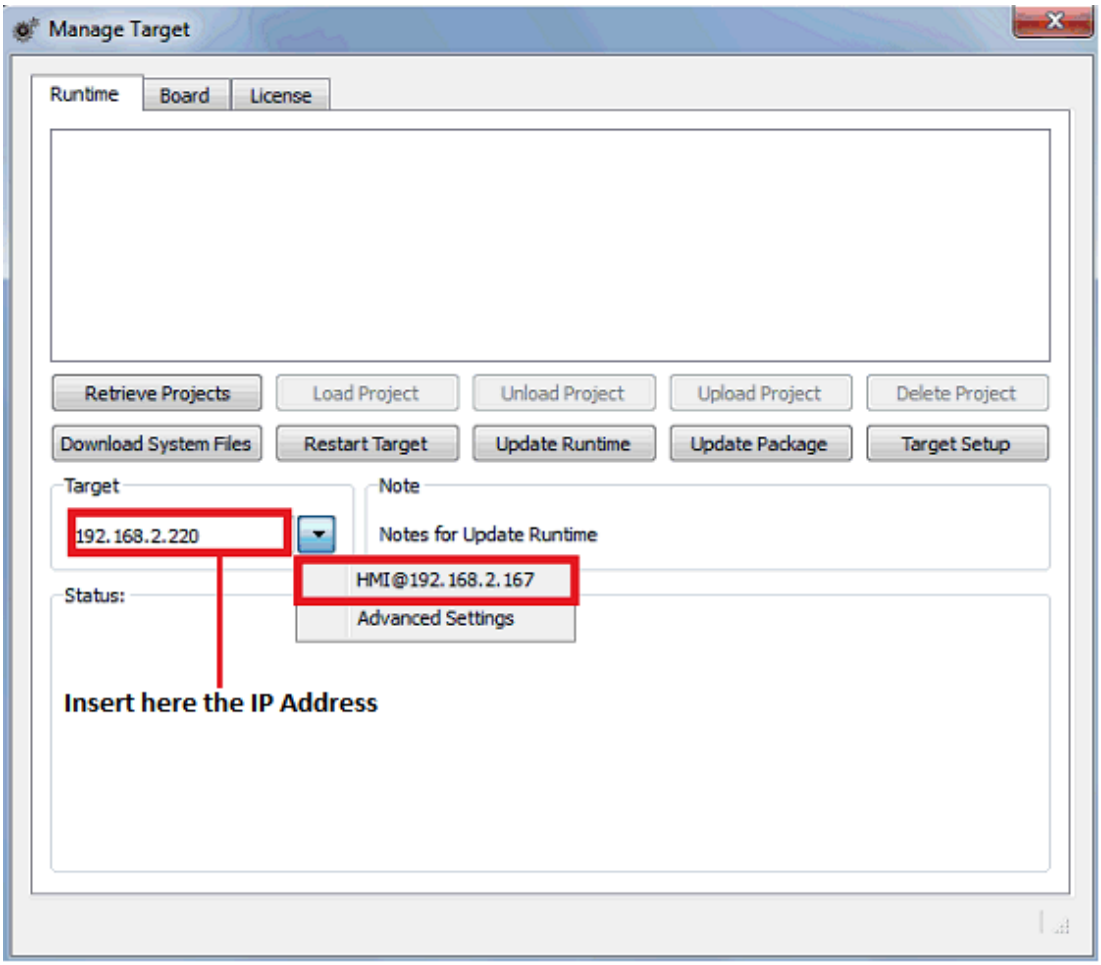
**Developer tools**
This is a collection of utility functions for debugging.

**About**
This shows information about the Runtime version.

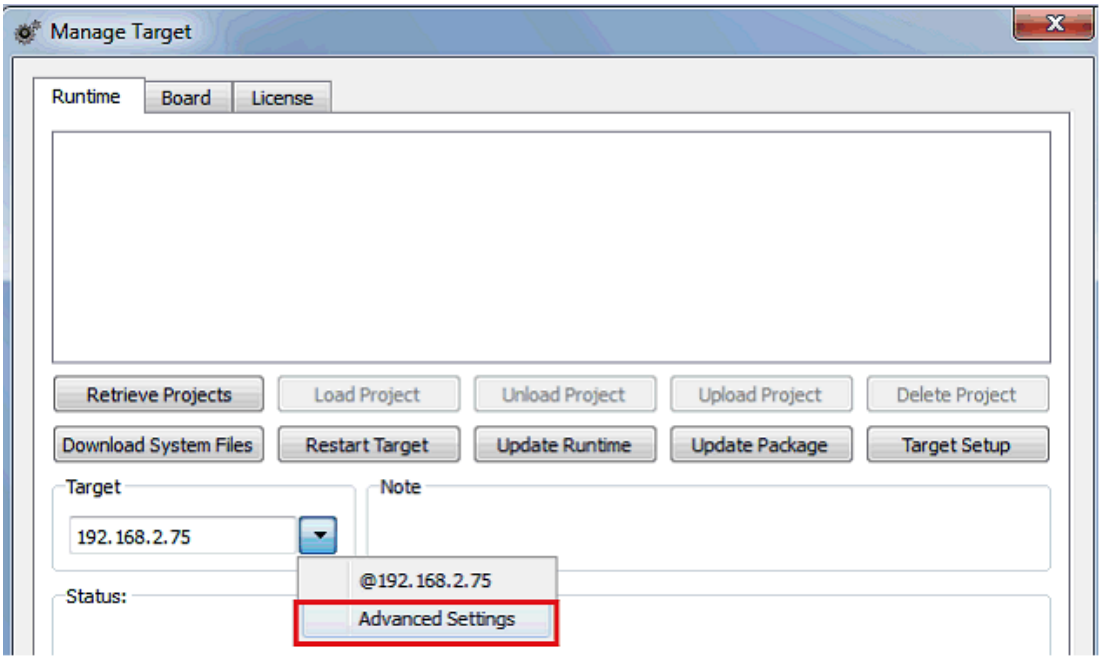
## 2.6 How to launch and configure the BTM-PCRUNTIME

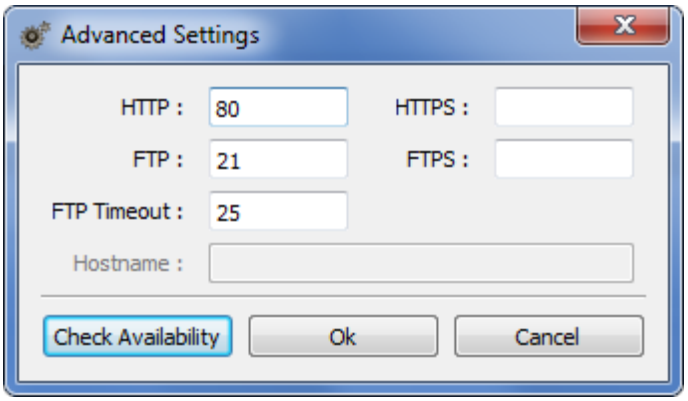
Launch the Wizard software and the BTM-PCRUNTIME, then select the IP address of your PC and the communication ports following the steps described below.

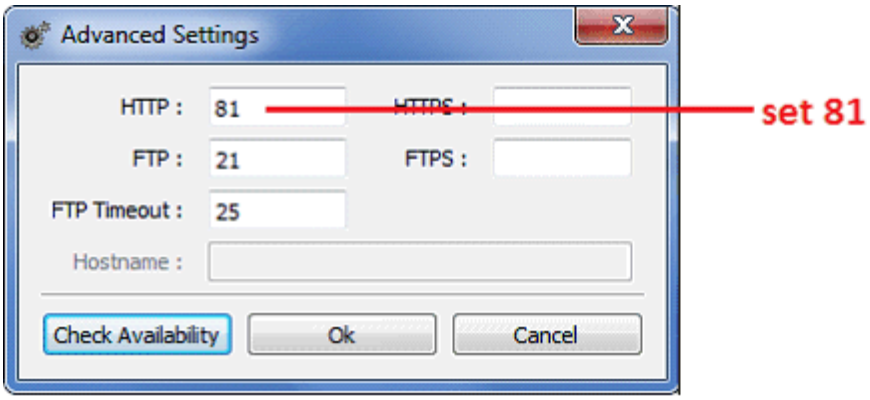


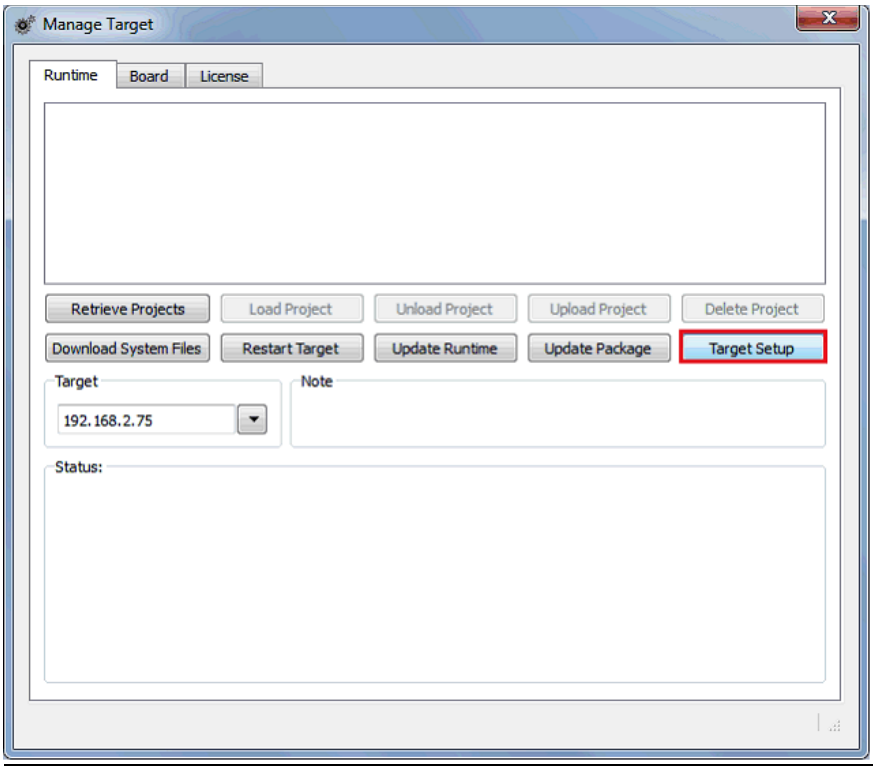
The communication ports have to be configured by clicking on *Advanced settings* and *Target setup* as described below.



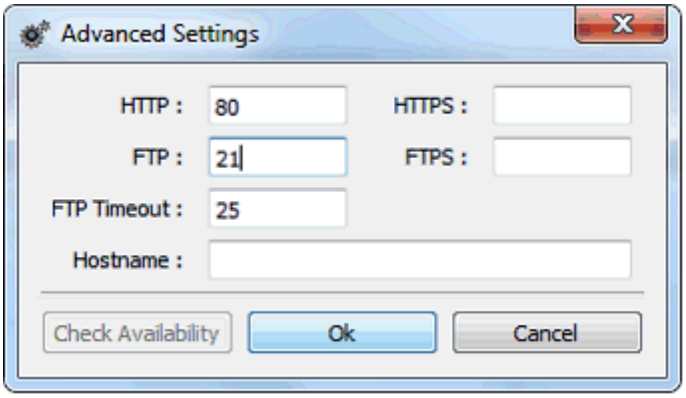



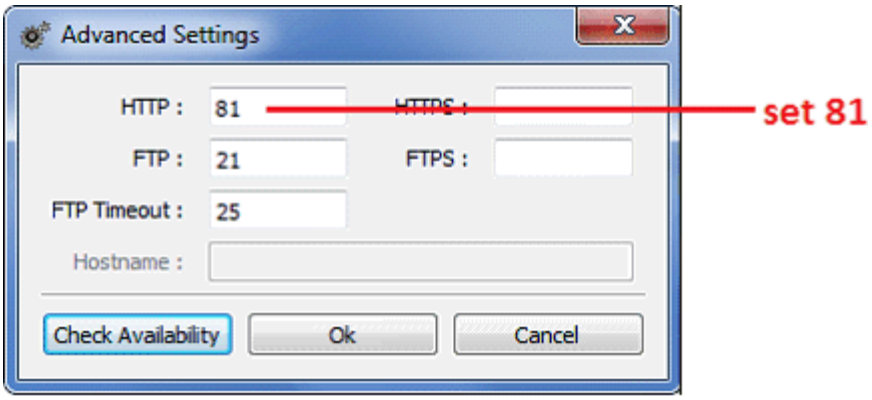




Since port 80 is normally used to access the Internet, we suggest settting it to 81.




The same settings also have to be carried out by clicking on *Target setup*:



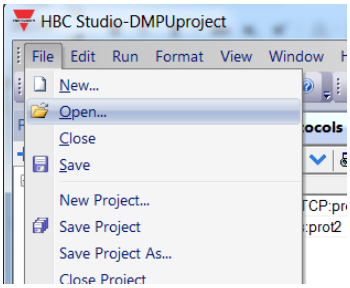



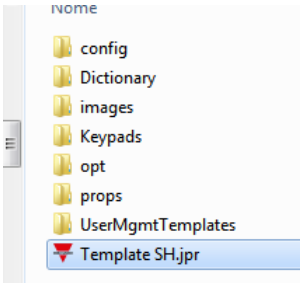

The HTTP and FTP port numbers **must** be the same in both *Advanced settings* and *Target setup*.

## 2.1 How to download the project into BTM-PCRUNTIME

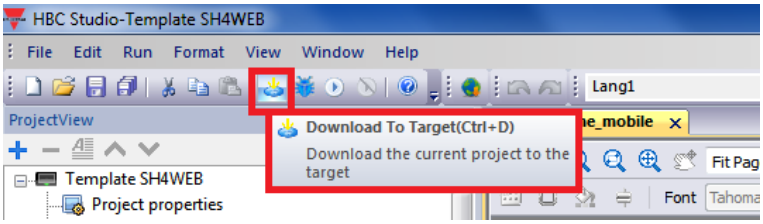
To download the project into the BTM-PCRUNTIME, the user has to perform the same steps he would do using a BTM display.

Starting from the template of the smart-house democase, which can be downloaded from the CARLO GAVAZZI website….
First, open the SH template project (Template SH.jpr file) from "File" ➔ "Open…" menu, using the Wizard HBC Studio software:




To perform the download, click on the **Run > Download To Target** menu item. The user can also initiate the download process by clicking the **Download To Target…** button in the Wizard toolbar.




After the download process is completed, the Download dialog box will be removed and the SH project will be ready for use on the BTM-PCRUNTIME.

# 3 SH4Web: the Web-App

SH4Web allows users to access HMI projects from a remote web browser running on a computer or on a mobile device such as a tablet or a smartphone. With SH4Web, users can create a web project that shows remotely the same graphical display as shown on the HMI panel. SH4Web projects are based on HTML5 technology, which means that no plug-ins or external software are needed to display the information.
This document assumes that the user has a basic understanding of how to operate the web browser on mobile devices as well as how to set up a connection to the HMI panel where the server is running. For example, you may need to set-up Wi-Fi access if you are working with a tablet or phone device to access the SH4Web pages on the HMI panel.

## 3.1 PC Browser supported

SH4Web works with all modern web browsers. The following browsers have been tested for compatibility with SH4Web:

- Mozilla Firefox 3.6+
- Microsoft Internet Explorer 9+
- Apple Safari 5+
- Google Chrome 6+

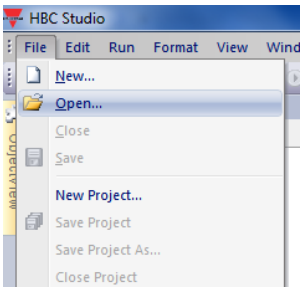
## 3.2 Tablets / Phones

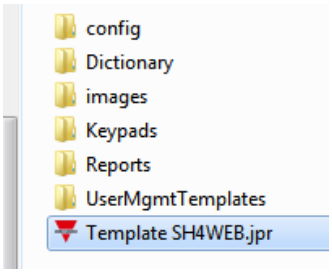
SH4Web works with most tablets and phone devices. The following tablets have been tested for compatibility with SH4Web:

iOS 4.1+ - Mobile Safari
Android 2.1+ - Android Webkit

## 3.3 How to open a project with HBC Studio

Starting from the template of the smart-house democase, which can be downloaded from the CARLO GAVAZZI website….
Open the SH template project (Template SH4WEB.jpr file) from "File" ➔ "Open…" menu using the Wizard HBC Studio software:

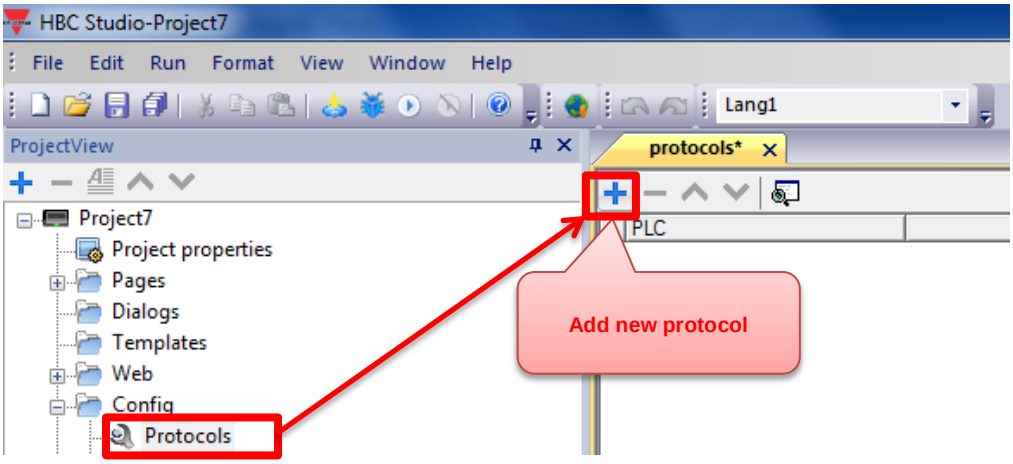


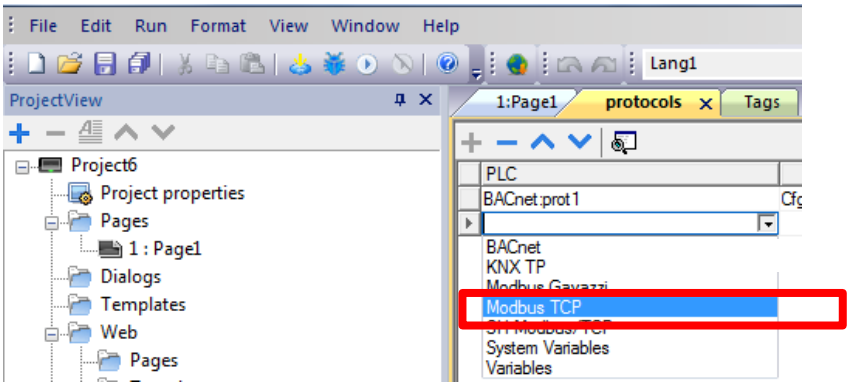

### 3.3.1 How to set the protocol to communicate with a smart-house system

To add a new communication protocol, as shown in the picture below:

- Double click on the *Protocols* item in *ProjectView* to open the *protocols* sheet, and click on **+** to add a new protocol:



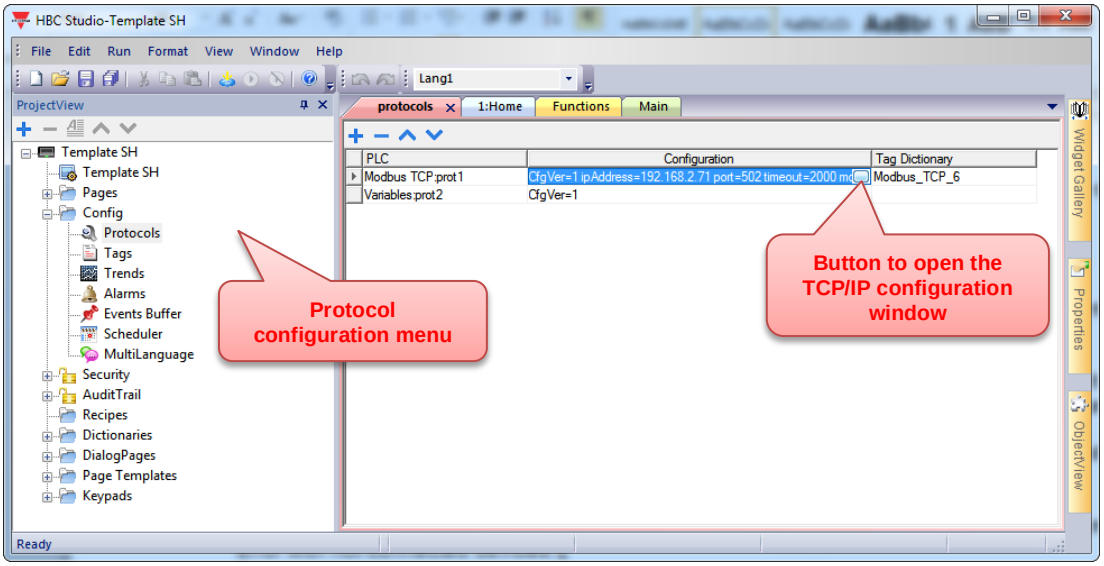

- Click on the button which appears on/in (?) the cell (??) in the *Modbus TCP* row:



- The Modbus TCP protocol properties must be set in the *Protocol* window

At the top of this window in the *IP address* field, set the IP address of your smart-house system.

By means of the button which appears in the cell in Modbus TCP:port 1 row and Configuration column, the user can modify the protocol settings in a second moment.

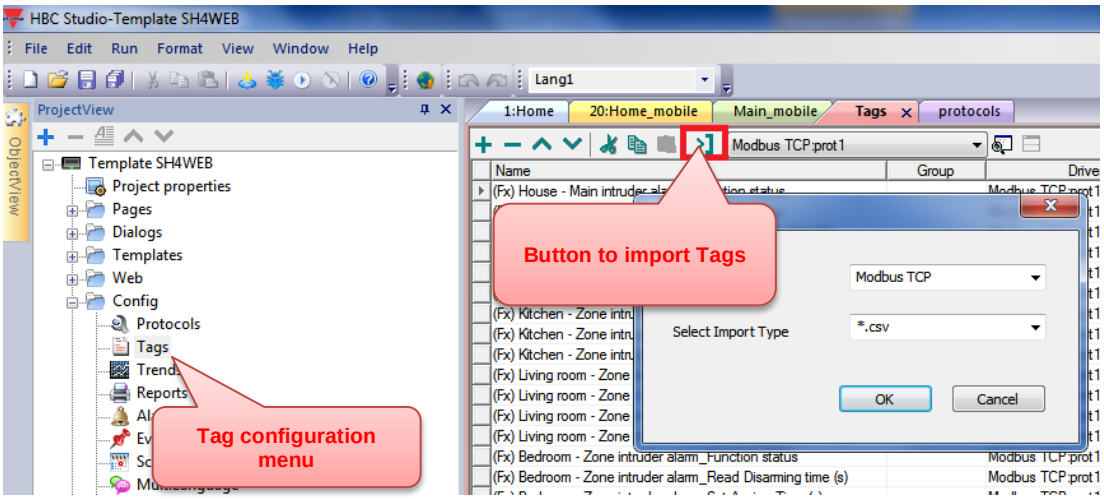


### 3.3.2 How to import the smart-house values accessible via Modbus

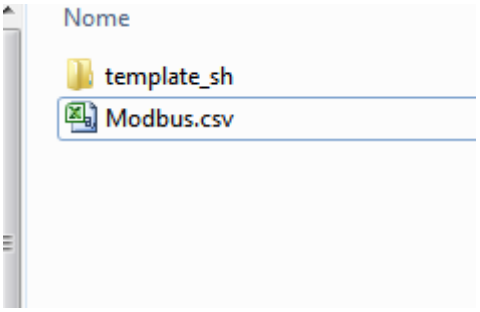
The Modbus TCP driver supports the import of tag (i.e. values) information when provided in CSV format, according to the format.

**The SH tool provides a file ready to be imported by the Wizard HBC studio (see the SH tool manual).**

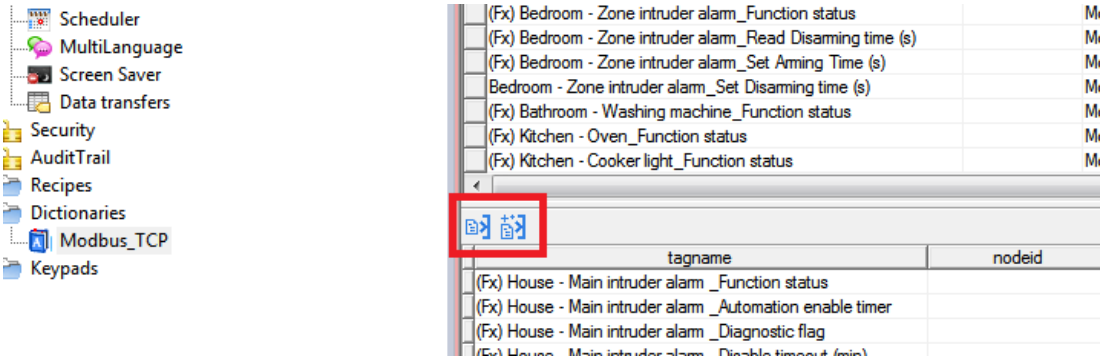
In the Tag Editor, select the driver and click on the “Import tag” button to start the import process.




Locate the “.csv” file and confirm.




The tags present in the imported file are listed in the tag directory at the bottom of the window, from where they can be directly added to the project by using the *Add tags* button, as shown in the following figure.

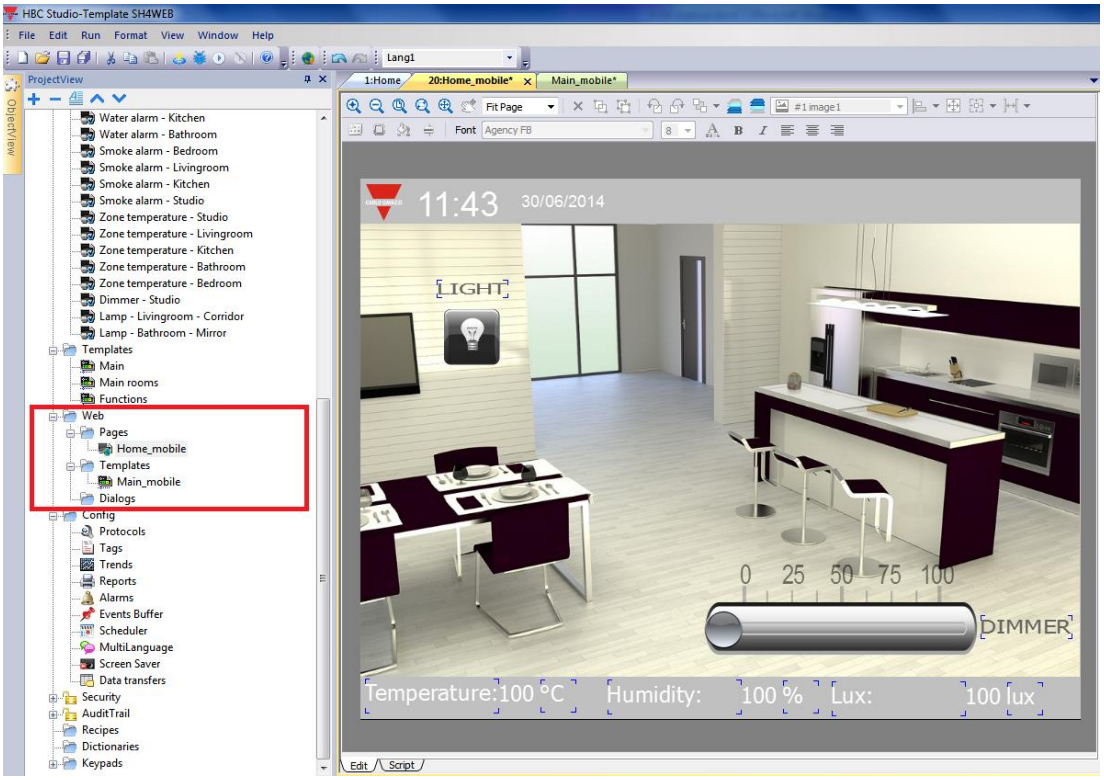


## 3.4 How to create the pages for the Web-APP access

**Note:** This template is useful to quickly configure the SH system to run on a tablet with a standard resolution of **1024*768** pixels, without performing the entire display programming. Follow this guide to adjust the template according to the resolution of the smart-device/PC. This template is designed to monitor one SH system which is connected to a BTM-Tx-24 display or a BTM-PCRUNTIME using TCP/IP communication.
This template is designed to monitor and control some of the basic functions of a smart-house system (lights, dimmers).

***SH4WEB provides a large number of functions.***

In the *ProjectView* box on the left of the window, in the *Web* section, all the pages used in this project are listed:

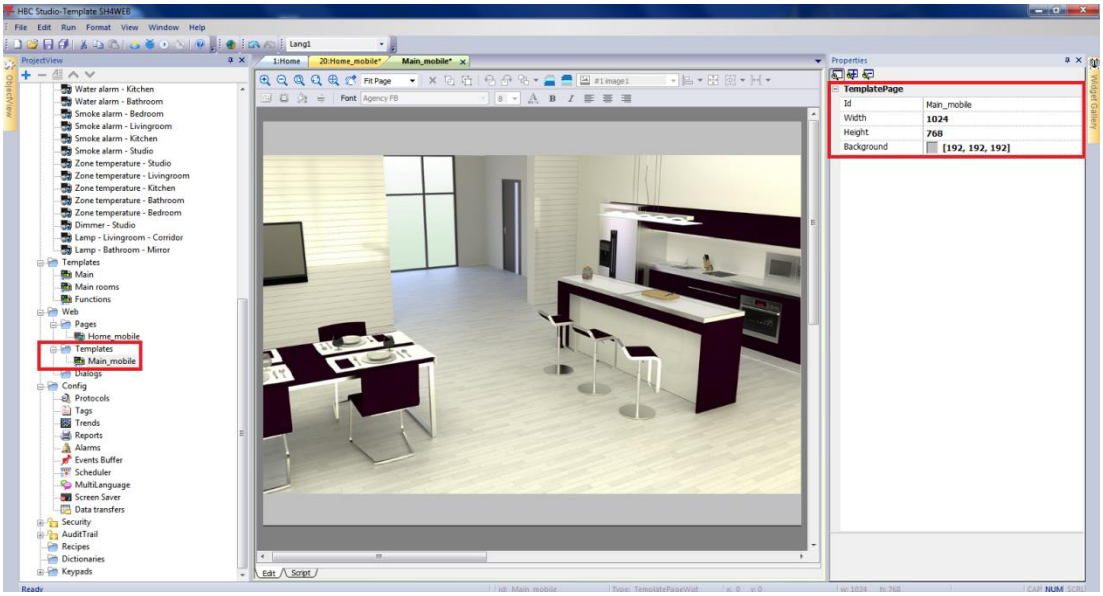


### 3.4.1 How to set the Template page Properties

The user can create different template pages according to the different smart-devices that will be used to access the Web-App (for example a landscape view for tablets and a portrait one for smart-phones).

It is important to set the height and width of each template page and they must have the same dimensions as the project pages where they are used.

As shown in the example below, double click on the *Templates* item in *ProjectView* to open the *Main_mobile* sheet:



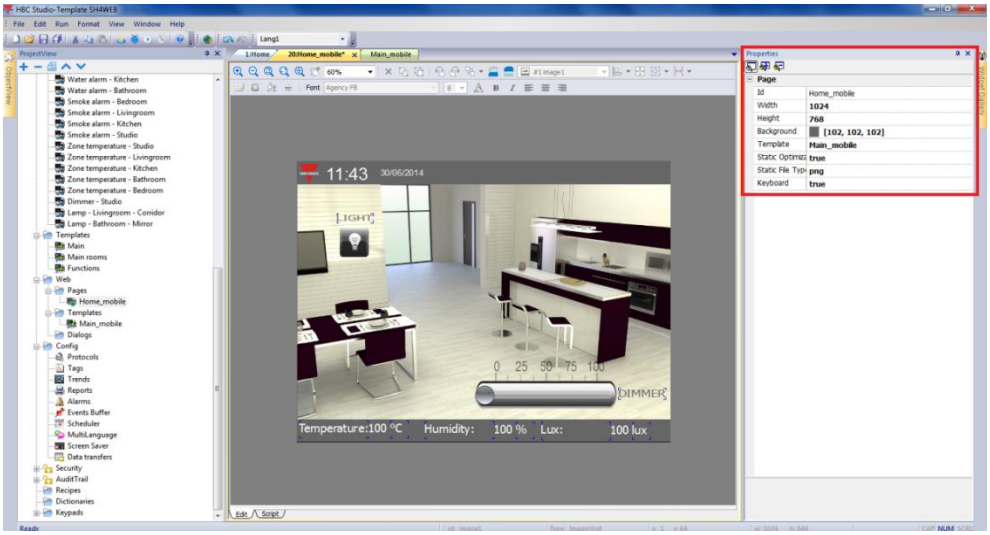

In the *Properties* window on the right, define the size of the device in pixels: for example the resolution of a standard iPad is*1024*768* pixels, while that of an Android tablet is *1024*600.*

| **Propriety** | **Setting** |
|---|---|
| *Page attributes* | Define Width and Height in pixel<br>Width **1024**<br>Height **768** |

### 3.4.2 How to set the WEB page proprieties

Double click on the *WEB-Pages* item in *ProjectView* to open the *Home_mobile* page:

Select the *Home_mobile* page and change the settings in the *Proprieties* page according to the needs of the project:




This page has the following proprieties:

| Page | |
|---|---|
| Id | Home_mobile |
| Width | **1024** |
| Height | **768** |
| Background | **[102, 102, 102]** |
| Template | **Main_mobile** |
| Static Optimiza | **true** |
| Static File Typ | **png** |
| Keyboard | **true** |

Define the size of the device in pixels: for example, the resolution of a standard iPad is*1024*768* pixels, while that of an Android tablet is *1024*600.*

| **Propriety** | **Setting** |
|---|---|
| *Page attributes* | Define Width and Height in pixels<br>Width **1024**<br>Height **768** |

Select the template page for the background.

| **Propriety** | **Setting** |
|---|---|
| *Template* | Background **none**<br>Template **Main_mobile**<br>Static Optimization<br>none<br>Main_mobile |

## 3.5 How to add a Widget already used in the smart-house democase template

This chapter describes how to set the widget functions according to the smart-house system register map. Copy and paste the existing widgets to add a new function.

### 3.5.1 ON-OFF Light

The light widget is represented by the following figure:

It is a button with a lamp image which shows the light status:

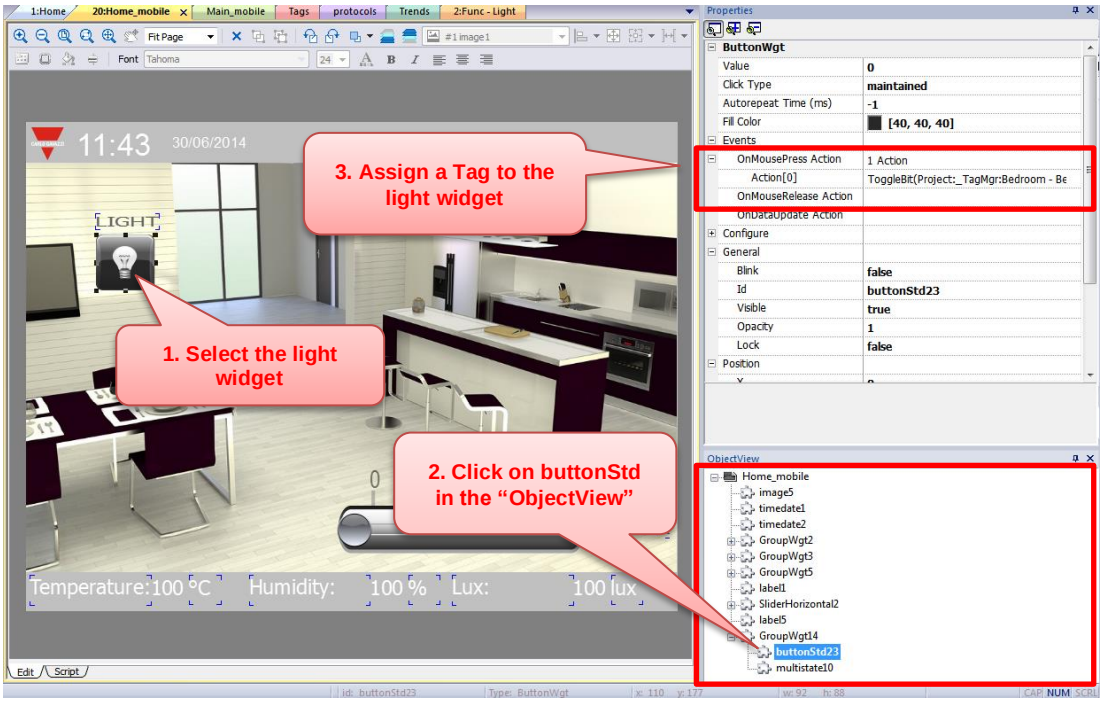
Light ON

Light OFF

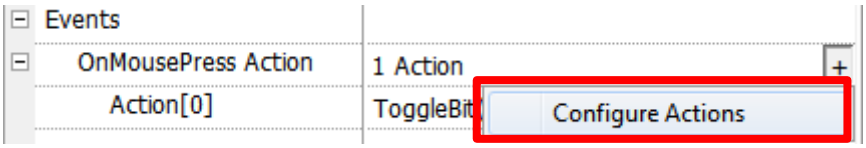
When the button is pressed, the light switches its status (ON➔OFF; OFF➔ON).

### 3.5.2 How to set the widget proprieties

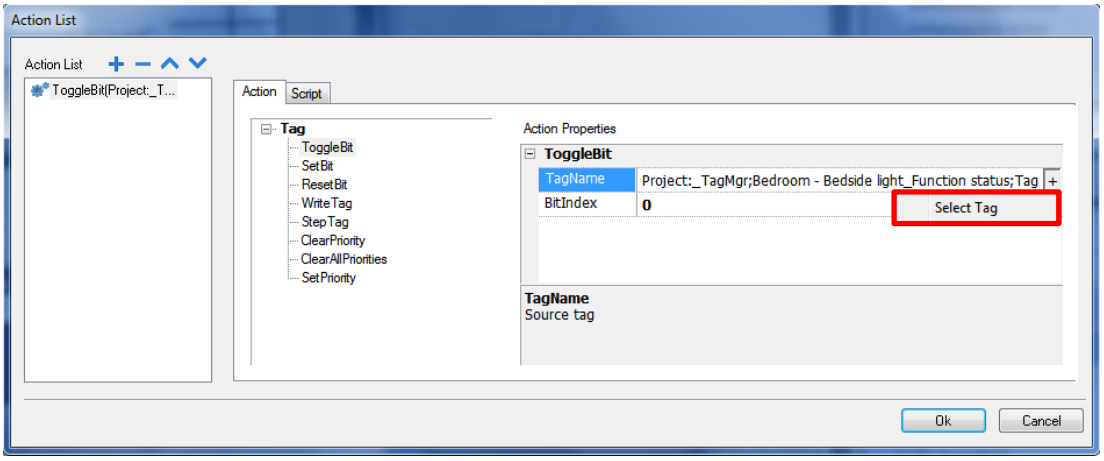
Select the widget and set its proprieties in the *Proprieties* sheet according to the needs of theproject:

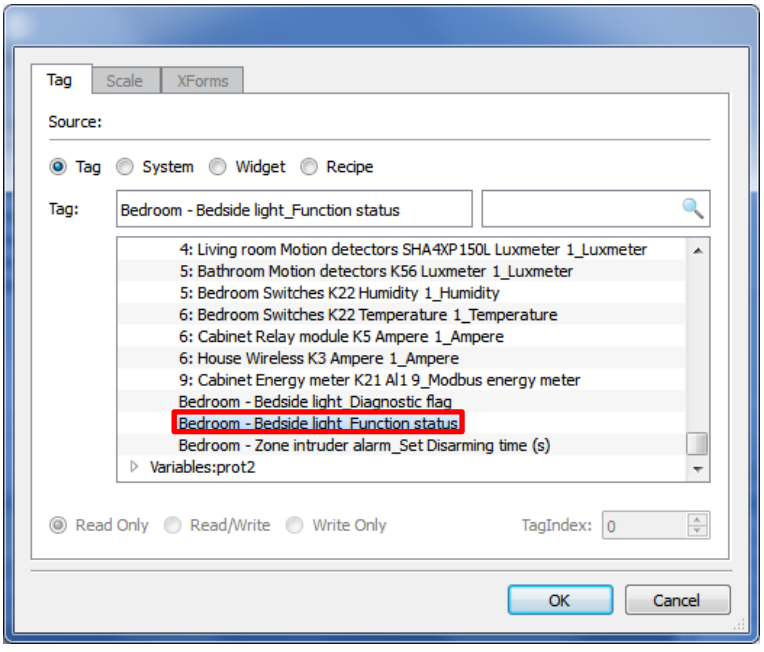



Press *Configure Actions* to modify the action executed when the Light button is pressed:




Attach *TagName,* macro propriety of *ToggleBit*, to simulate a 2 status button.

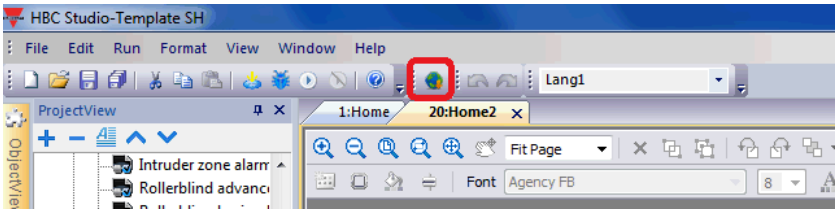


## 3.6 How to download the Web Project into a target device

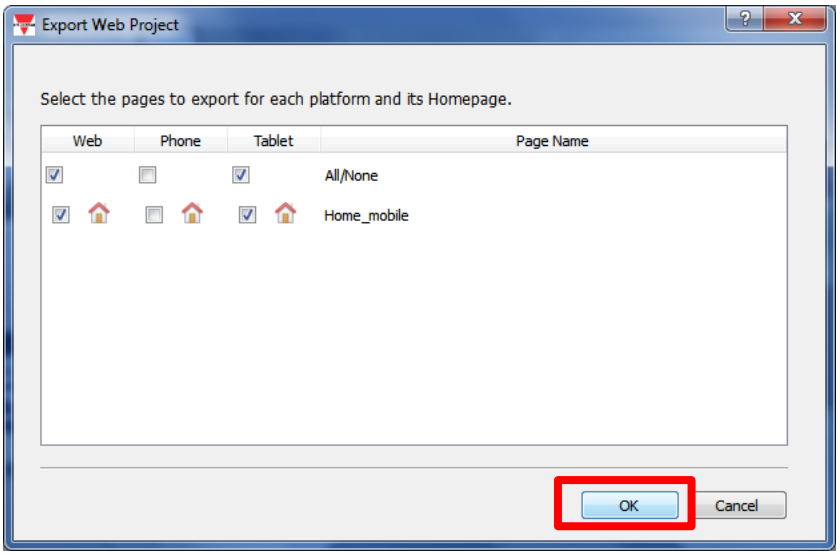
After testing the SH4Web pages, the next step is to download the project to the target device.

Click on the icon highlighted by the red rectangle to export the web project:

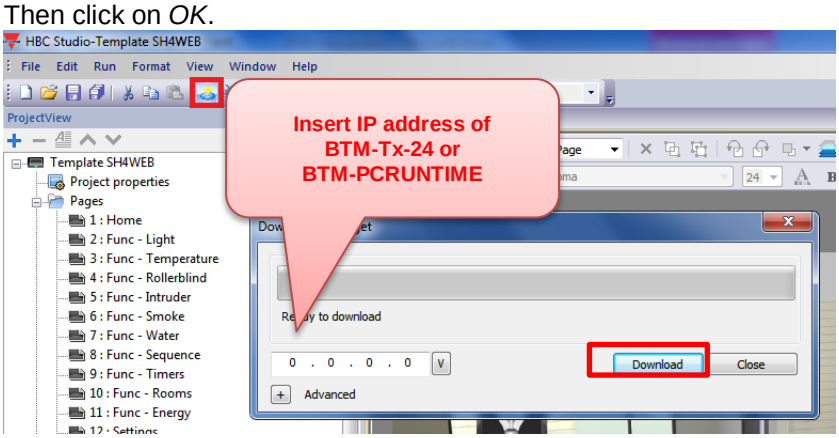



For each page created, select the kind of device that needs to be enabled. It is possible to have a version in landscape view for tablets and a portrait version for smart-phones.

In the example shown in the picture below, the web project will be exported for PC (Web) and for Tablets.




Then click on *OK*.

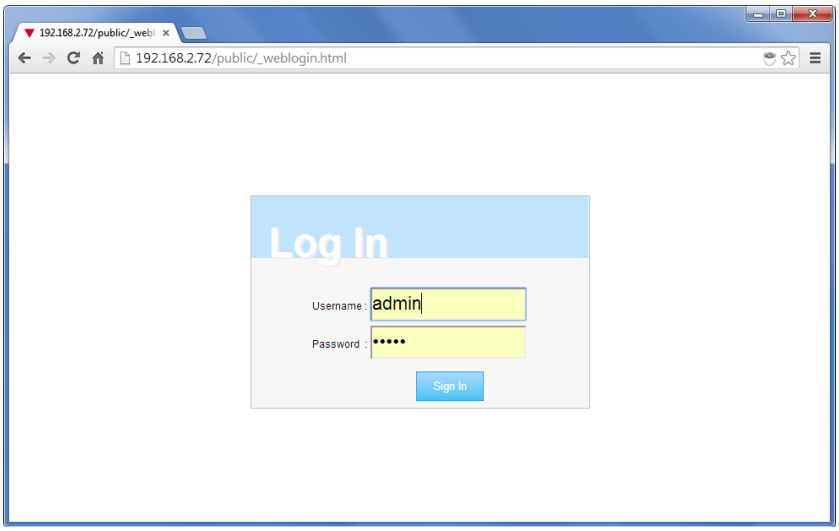



To transfer this into a BTM-Tx-24 or BTM-PCRUNTIME click on *Download*.

After the download process is completed, the Download dialog box will be removed and the HMI project will start automatically in the HMI panel/PC. The SH4Web project is now ready to be used.

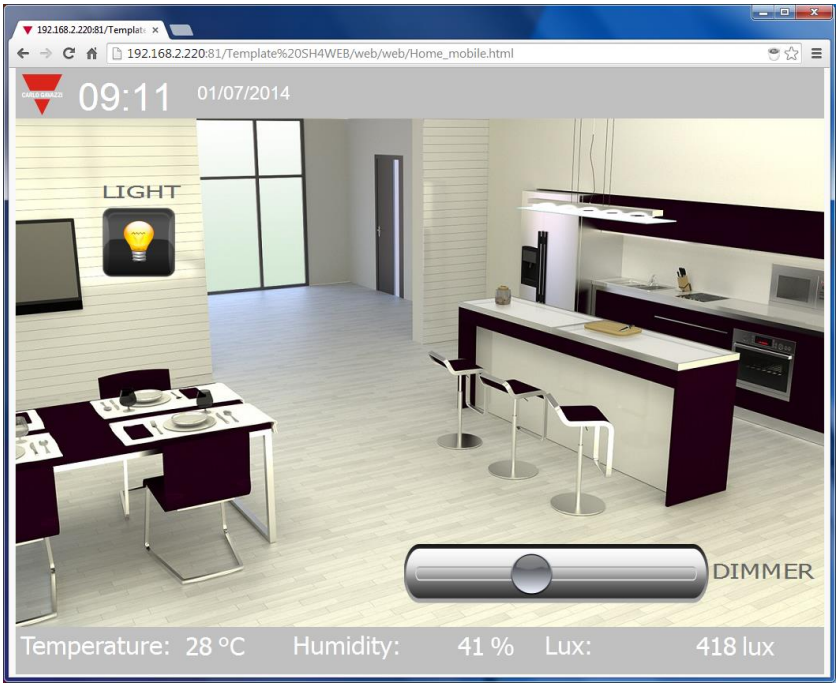
### 3.6.1 How to launch the SH4Web from a Browser

To access SH4Web, open the browser and type in the IP address of your HMI panel/PC. You will see the SH4Web Login page.




Enter **User Name** and **Password** and click on Sign In. The User Name and Password are the credentials that you have defined in your project, using the User Management features (see **Configuring Security Options**)

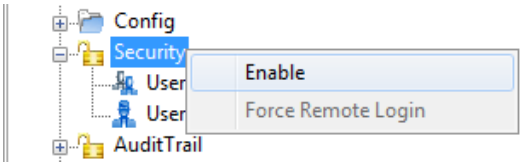
When the correct credentials are entered, you will be redirected to the home page that you have created during the page export. An example of the home page is shown in the figure below.




You can interact with the smart-house system by using the browser in the same way as you interact with a BTM display when touching the screen. You can click on the buttons to switch the lights on/off or you can drag the slider to change light level, etc.

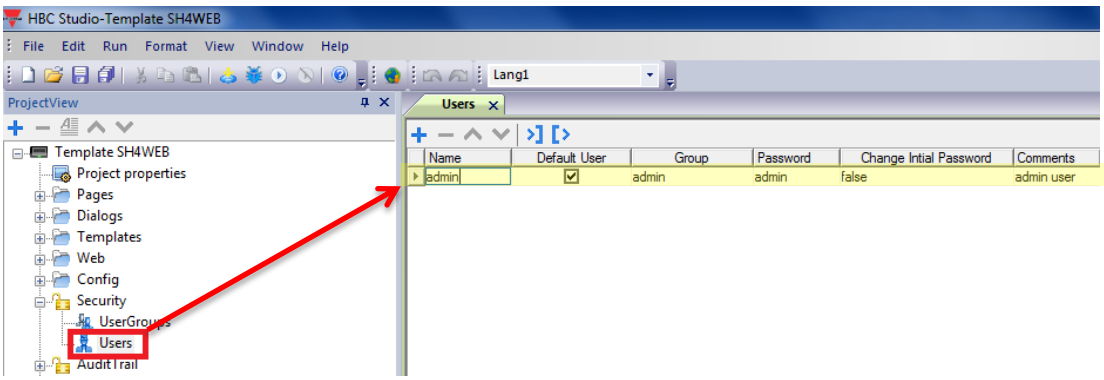
## 3.7 How to configure the security options

To enable/disable the user management feature, right click on the *Security* folder in the ProjectView window and set Enable or Disable. See the following figure as a reference.




### 3.7.1 How to configure the Users

To configure the users once the security option is enabled, double click on ***Users*** from *ProjectView*, and then click on the **+** sign to add a new user. A user named ***admin*** is already present by default and it cannot be deleted.




| Field | Description |
|---|---|
| **Name** | User name |
| **Default User** | This identifies the user who is automatically logged-in by the system at start-up; only one default user is allowed |
| **Group** | This is the group the user belongs to. Groups are used to assign authorization to users |
| **Password** | Password for the user |
| **Change Initial Password** | If True, the user must change his password at the first logon |
| **Comments** | Comments for the user |
| **Logoff time (In Min)** | The user will be automatically logged off after the specified time with no actions on the panel. After Log off, the Runtime goes to the default user |
| **Minimum Length** | This is the minimum length of the password. It should be equal to or greater than the set value |
| **Must Contain Special Characters** | If True, the password should contain at least one special character |
| **Must Contain Numbers** | If True, the password should contain at least one numeric digit |

## 3.8 LIMITATIONS OF SH4WEB

There are some known issues that you may experience while using SH4Web.

- Widget rotation is not supported.
- Not all custom fonts appear correctly in iOS devices.
- Vertical Slider reverse mode is not supported.
- Shape widgets are generated as images. As a result, the look and feel of the shape cannot be changed by attaching tag to the UI-based properties of the widget.
- ColorPalette XForm works only with selected widgets, including Buttons, Images, Bar Graphs.
- Ticks, Labels and Scale widgets are not supported. However, if you set 'static optimization' to 'static' on ticks, labels and scale widgets, they may be available under certain conditions.
- Widget properties with **Attach to…** dynamic behaviour may not work for all properties supported by the Wizard software.
- Dialog pages support only modal dialogs.
- Dialog pages do not support runtime positioning and are not movable.
- Round Bar Button widget is not supported.
- User management features of widgets are not supported.
- **onDataUpdate event on Page/Template Page/Dialog Pages is not supported.**
- The following chars are not supported in the tag names used in SH4WEB **: . \ / * ? : > < | " & # * ; =**

# 4 KNX TP Driver

The plug-in module BTM-KNX provides a gateway between the smart-house system and KNX/EIB bus.

Using this feature, a BTM-Tx-24 can operate as a gateway between two systems, even if they do not use the same communication protocol.

In the following steps, how to establish the communication between smart-house (via Modbus TCP) and KNX/EIB devices will be shown.

## 4.1 General notes

The connection to KNX systems requires the BTM-KNX communication module:

*NOTE: to install the BTM-KNX module please refer to the installation guide provided with the module package.*

BTM-Tx-24s are not powered from the KNX network and they still need the usual power supply.
To establish connection with the KNX bus, connect the TP-1 (twisted pair type 1 cable) to the connector on the BTM-KNX plug-in, matching the bus polarity.

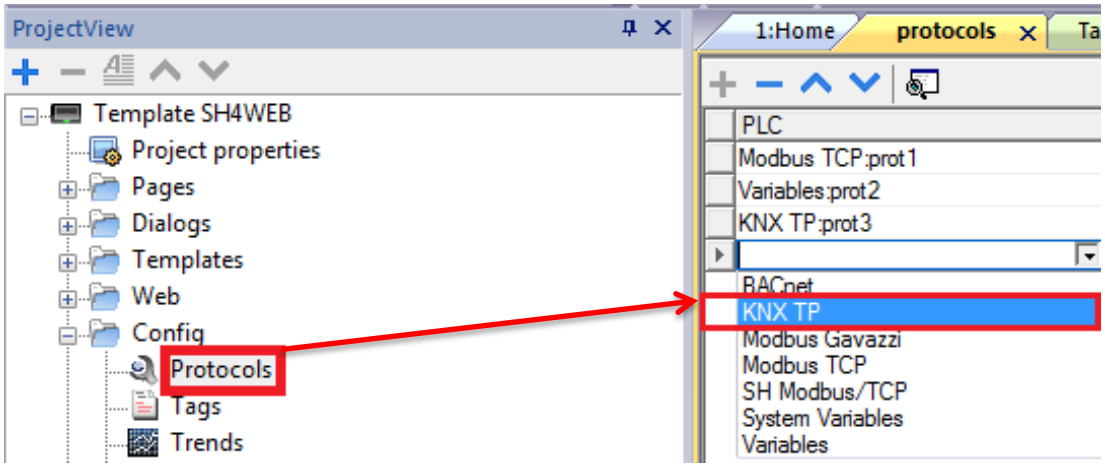
The planning, design and commissioning of KNX installations are normally carried out using the ETS configuration software. This software tool is supplied by the KNX organization.
This document refers to the ETS 4 version of the software. ETS is a registered trademark of KNX.

The programming of a KNX system is not part of this manual. The next few pages will explain how to export the database information related to group addresses in the ".esf" file, to be imported in the Wizard HBC Studio Tag Editor.

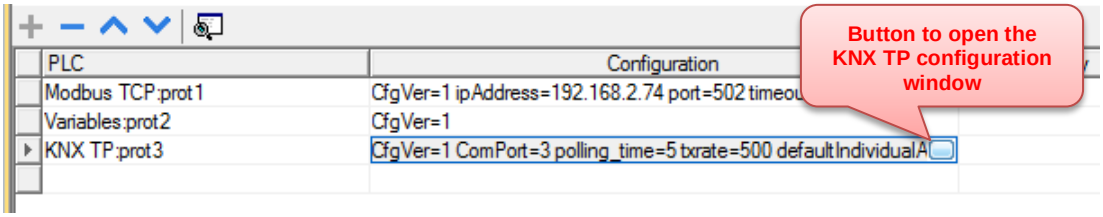
## 4.2 How to set a KNX TP protocol

In this chapter the personalization of the project according to KNX TP settings is described:

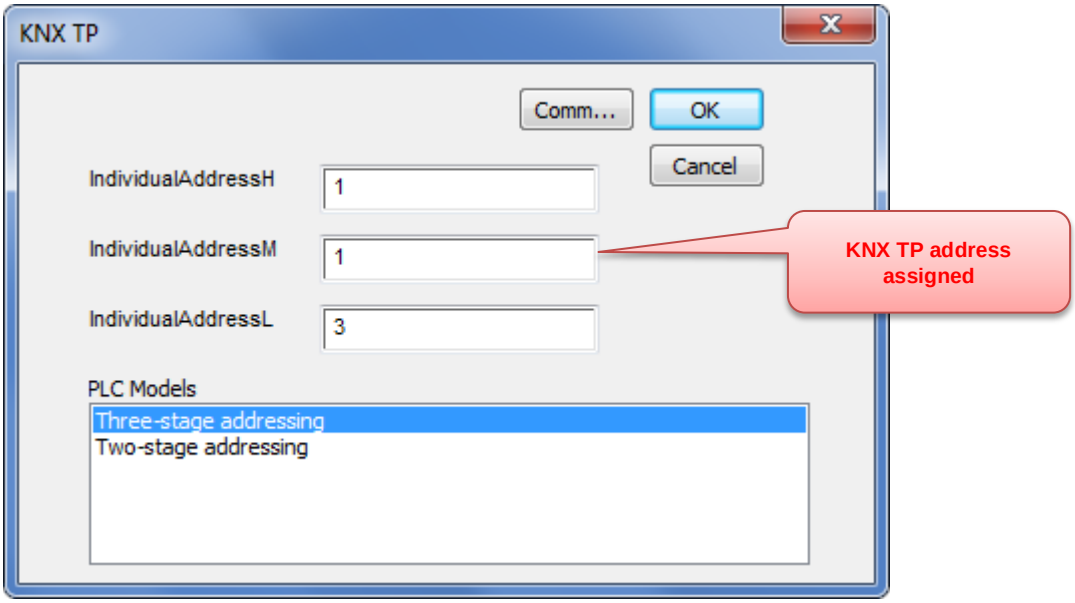
- Double click on the *Protocols* item in *ProjectView* to open the *protocols* sheet:




- Click on **+** and then on the button which appears in the cell in the *KNX TP:prot* line in the *Configuration* column;




- The following window will appear:



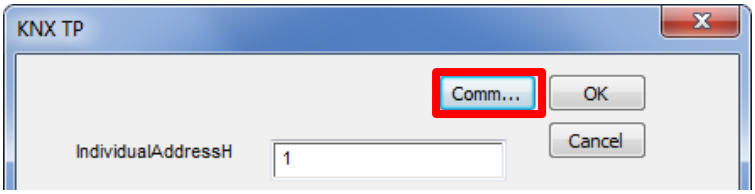
The Individual Address is assigned to the BTM-KNX module at the first download of the project to the BTM-Tx-24 display. This is the standard KNX address xxx/yyy/zzz. The default address value of the BTM-KNX is 15/15/255.
We suggest changing it, since usually in a KNX network, the address 15/15/255 is used by the USB module programmer. In the picture above, the individual address 1/1/3 is assigned to the BTM-KNX module.

Please note that, as with any other KNX device, the BTM-Tx-24 panels must also have a unique Individual Address in the KNX network.

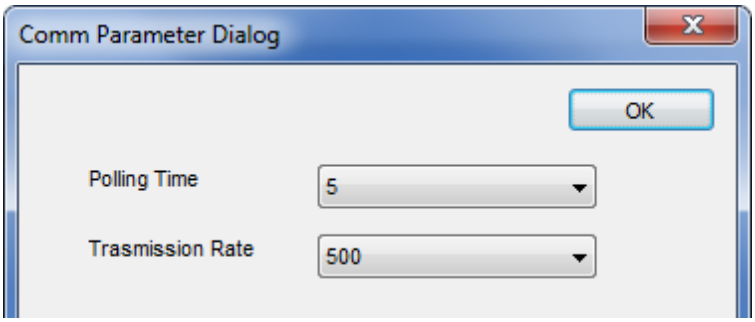
| Field | Description |
|---|---|
| **IndividualAddressH** | Individual Address is composed of High, Medium and Low parts |
| **IndividualAddressM** | |
| **IndividualAddressL** | |
| **PLC Models** | The KNX telegram can have three or two stage addressing: select the model corresponding to your needs |

### 4.2.1 How to set the communication parameters for KNX TP

- In the configuration window of KNX TP protocol click on the *Comm…* button:




- The following window will appear:




**Polling Time**
This defines how often the KNX tags are polled in the network.

**Transmission Rate**
This defines the interval of time between two consecutive writing operations carried out by the display.

## 4.3 How to manage Tags

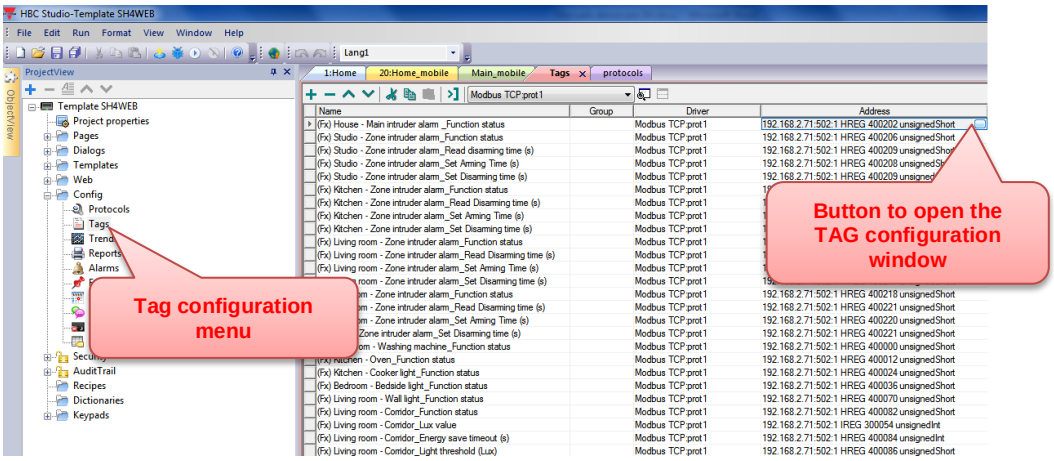
The KNX TP driver supports the Tag import facility. The import filter accepts symbol files with extension ".esf" generated by the ETS programming tool.

### 4.3.1 How to export an ".esf" file from ETS software

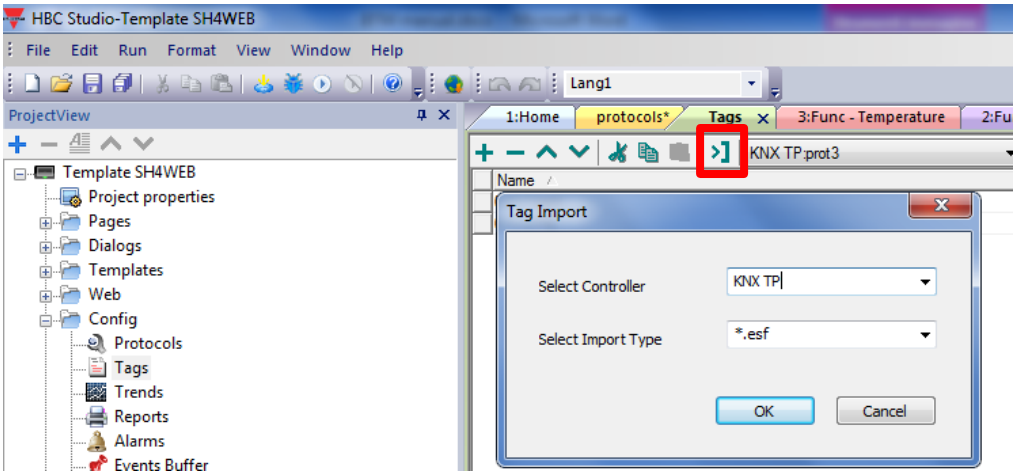
The ETS 4 configuration software can export the database information related to group addresses.
To export this information, select "Extras" from the ETS menu. Use the option "Export OPC" to export data in ".esf" format.
By clicking on "Export..." the software will generate the ".esf" file to be imported into the Wizard Tag Editor.

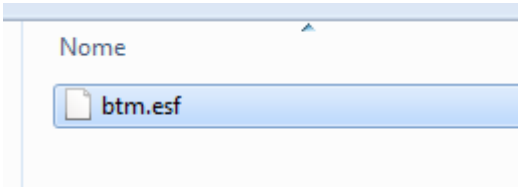
### 4.3.2 How to import the KNX tags

- Double click on *Tags* in *ProjectView* to open the *Tags* page:



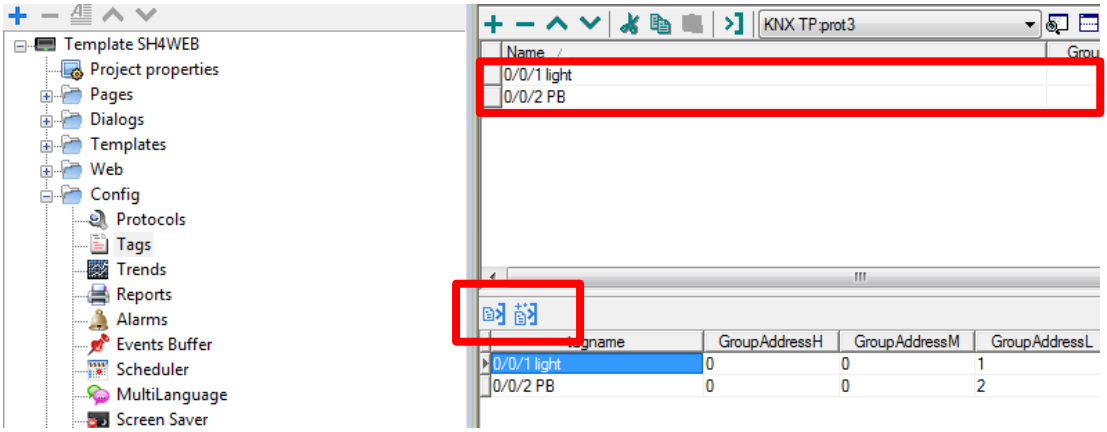

In the Tags Editor, select the driver and click on the *Import tag* button to start the import process.






Locate the ".esf" file and confirm.

The tags present in the imported document are listed in the tag directory, from where they can be directly added to the project, using the add tags button as shown in the following figure.



## 4.1 Applications

The user can assign the KNX TP tags to the Studio Widgets or configure a gateway through the BTM to directly connect the smart-house system (via Modbus TCP) to the KNX-TP bus by the *Date transfer* function.

This chapter describes the two ways of operation.

### 4.1.1 How to assign a KNX TP tag to a Studio Widget

In the example shown below, the user has set a light widget to switch ON/OFF the lamp connected to a KNX output object.

The light widget is represented by the following figure:

It is a button with a lamp image which shows the light status:

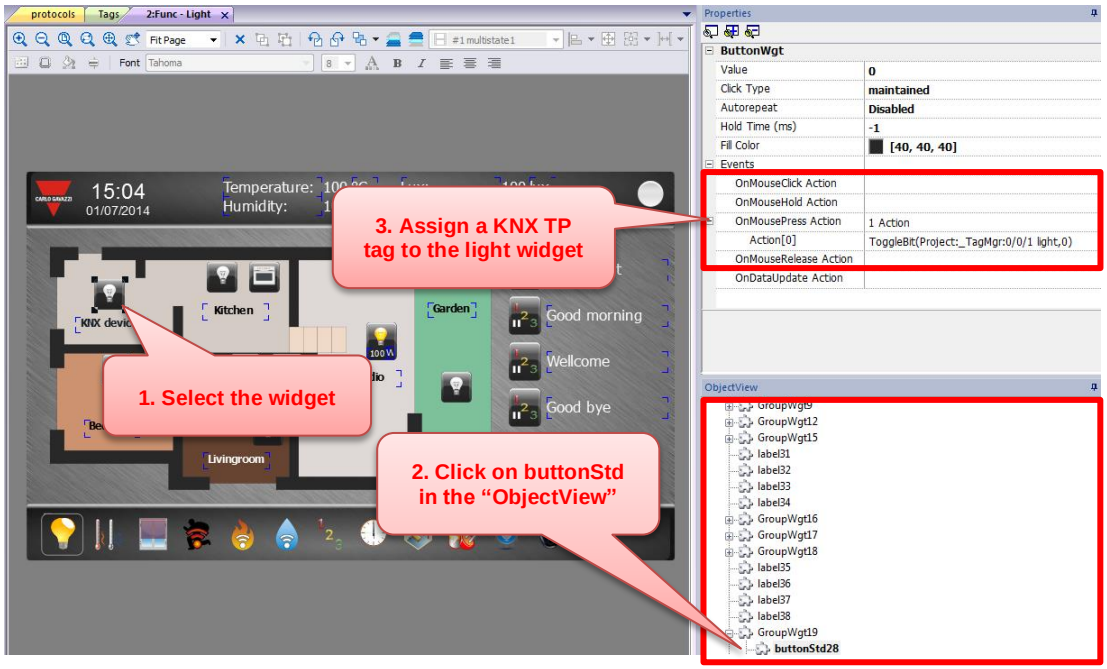
Light ON

Light OFF

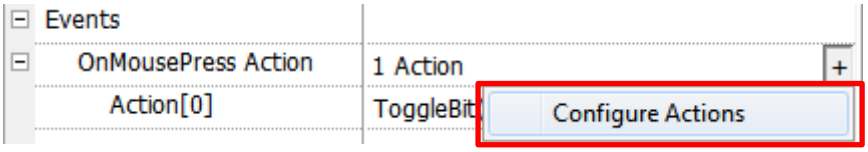
When the button is pressed, the light switches its status (ON➔OFF; OFF➔ON).

### 4.1.2 How to set the widget proprieties

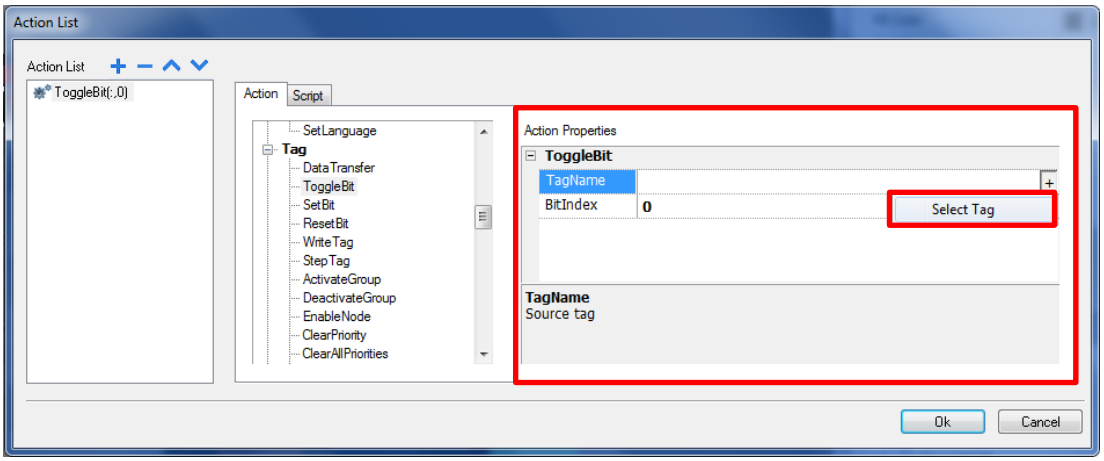
Select the widget and set its proprieties on the *Proprieties* page according to the needs of the project:

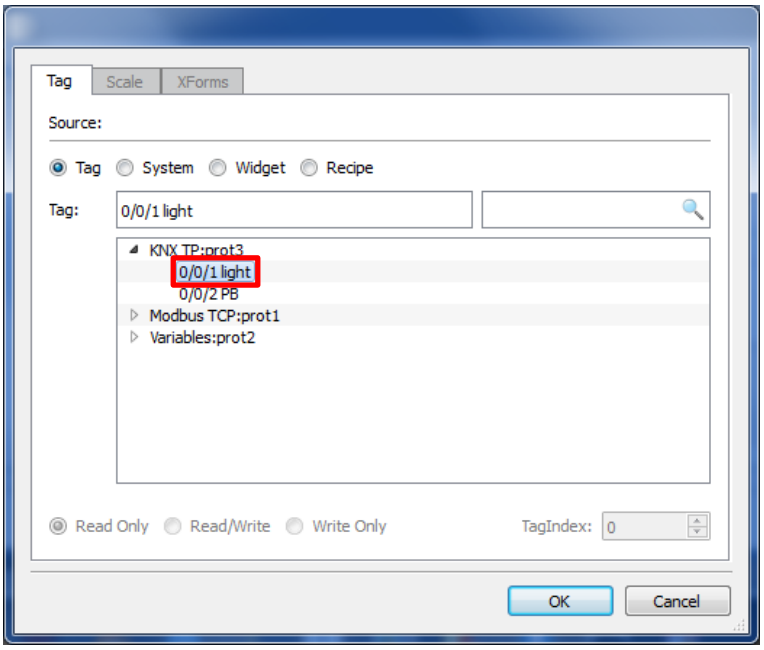


Press *Configure Actions* to modify the action executed when the Light button is pressed:




Attach *TagName* macro propriety of *ToggleBit* to simulate a toggle on/off push button.



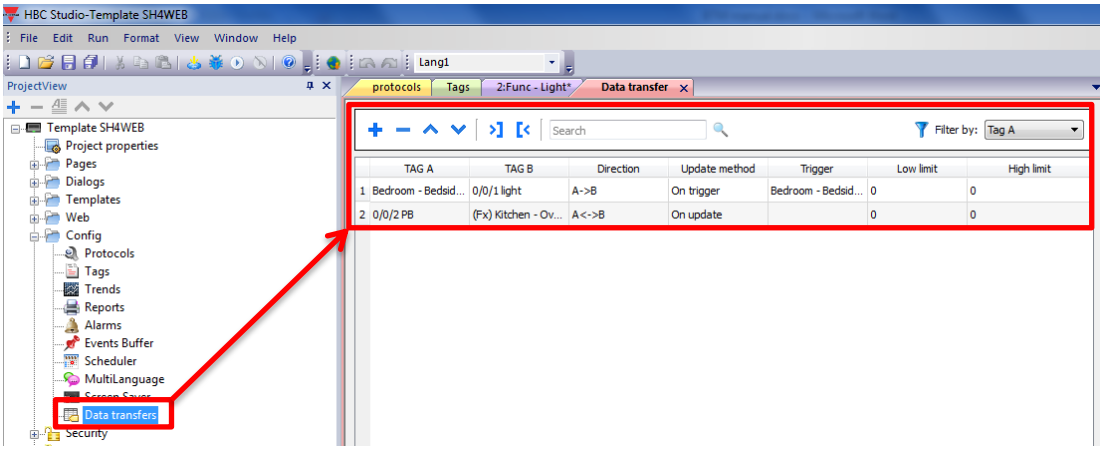



## 4.2 How to use the BTM-Tx-24 as a gateway

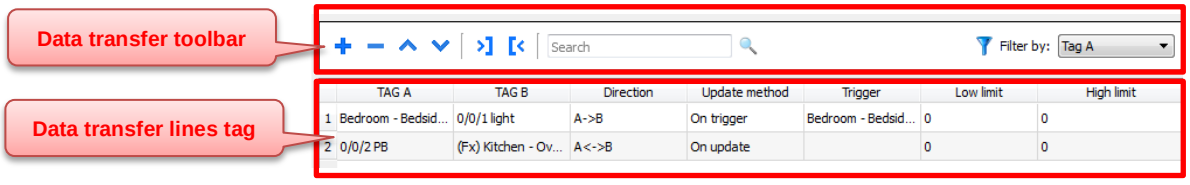
The *Data Transfer* feature allows the transfer of variable data from one device to another.
Using this feature, a BTM-Tx-24 can operate as a gateway between two devices, even if they do not use the same communication protocol.

This paragraph will explain how to configure a BTM-Tx-24 display as a gateway between a Modbus TCP network and a KNX TP network.
Please refer to chapter *3.2.1* of this manual for the Modbus TCP protocol settings.

- Double click on the *Data transfer* item in *ProjectView* to open the *Data transfer* sheet:

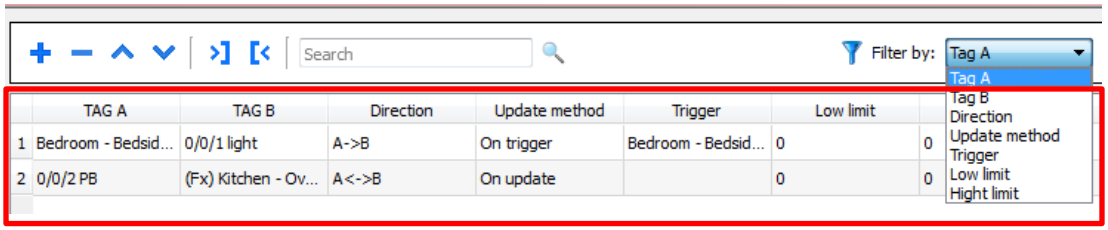



To configure each *data transfer*, the user has to map the tags correctly. This mapping is carried out by means of the *Data Transfer* editor.




Each line in the *Data Transfer* editor defines a mapping rule for the alignment of the two tags.
The user can define more mapping rules with different update methods or directions.

### 4.2.1 Data Transfer Toolbar Buttons




To add a tag, click on the + icon: a new tag line is added.

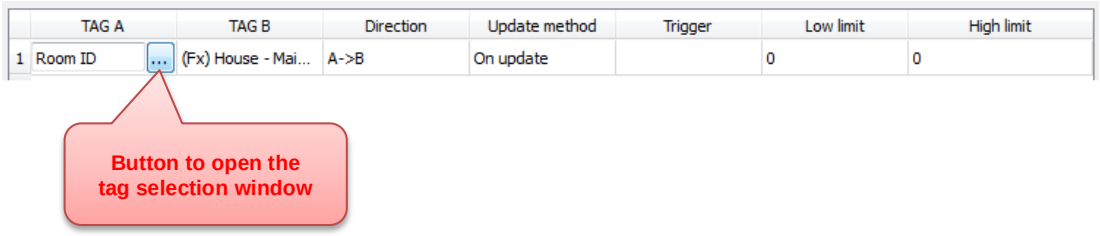
**Export** **Import**
Data Transfer settings can be imported and exported in .csv format. This feature can be effectively used whenever it is more convenient to carry out changes directly in the .csv file and then reimport the modified file.

The tag lines can be moved up or down: select the line you want to move and press the up or down symbols.

**Filter keyword**
Sort only lines containing that keyword. Click on the list box to select the column where you need to apply the filter.

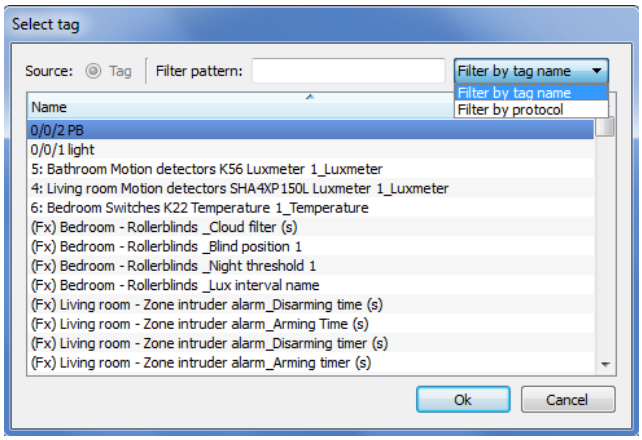
### 4.2.2 How to create a Data transfer “line tag”

Click on the “+” to create a new tag line.



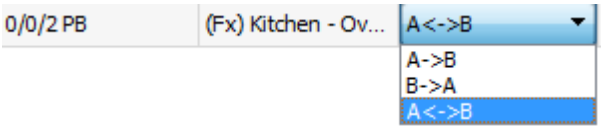
**TAG A/**
**TAG B**

Names of the pair of tags to be mapped in order to be exchanged through the HMI panel. The user can filter the tags by *tag name* or by *protocol*




**Direction**

A->B and B->A: Unidirectional transfers, where values are always received by one tag and sent by the other tag in the specified direction.
A<->B: Bidirectional transfer, where values are transferred to and from both tags.




**Update Method**

**OnTrigger**: Data transfer occurs when the value of the tag set as the trigger changes above or below the values set as boundaries of a tolerance range. Limits are recalculated on the previous tag value, the same one that triggered the update.

NOTE: this method applies only to unidirectional transfers (A->B or B->A).

**OnUpdate**: Data transfer occurs whenever the value of the source tag changes.
NOTE: this method applies both to unidirectional and to bidirectional transfers (A->B, B->A and A<->B).

NOTE: when using the **OnUpdate** method, the first tags shown at start-up of the BTM-KNX may not correspond to current values. Content is synchronized the first time the source value changes.

**Trigger**

Tag values that trigger the data transfer process.

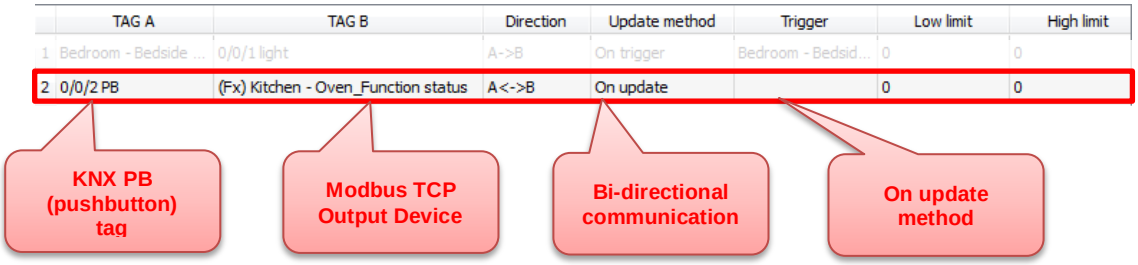
**High limit**
**Low limit**

When this tag changes its value outside the boundaries set as **High limit** and **Low limit**, data transfer is started. The range of tolerance is recalculated according to the specified limits on the tag value which triggered the previous update. No action is taken if the change falls within the set limits.
This mechanism allows triggering data transfers only when there are significant variations in the reference values.

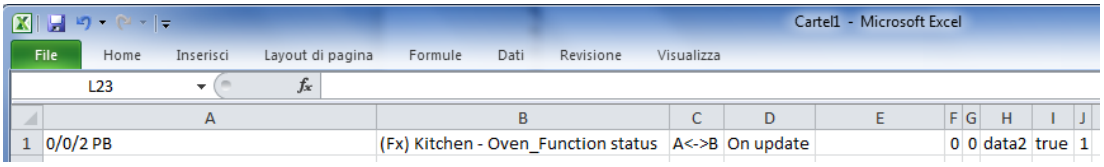
NOTE: if both **Low limit** and **High limit** are set to "0", data transfer is triggered as soon as there is a change in the value of the trigger tag.
NOTE: Low limit is less or equal to zero.

### 4.2.3 Example of a tag line

In the example shown below, a KNX input device interacts with a smart-house system; the communication between the two systems is bi-directional. When the smart-house output goes on, the feedback status LED of the KNX module indicates the new status.




Configuration information for data transfers exported to a .csv file. An example is shown in the figure below.




Columns A to G contain the same data as in the Data Transfer editor. Some additional columns are present.

**Column H** Unique identifier automatically associated by the Data Transfer to each line. When you edit the .csv file and you add one extra line, make sure you enter a unique identifier in this column.

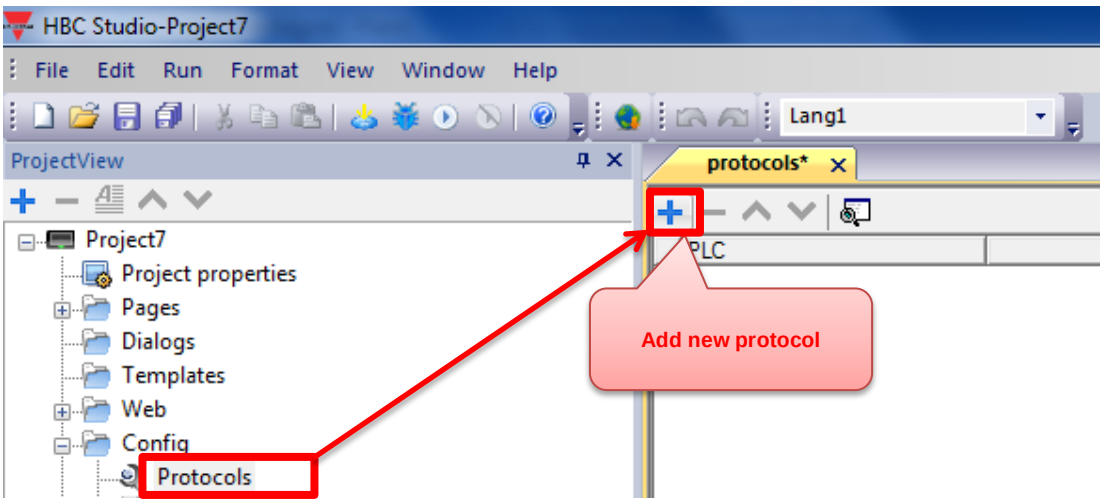
**Columns I-J** reserved for future use.

# 5 BACNET

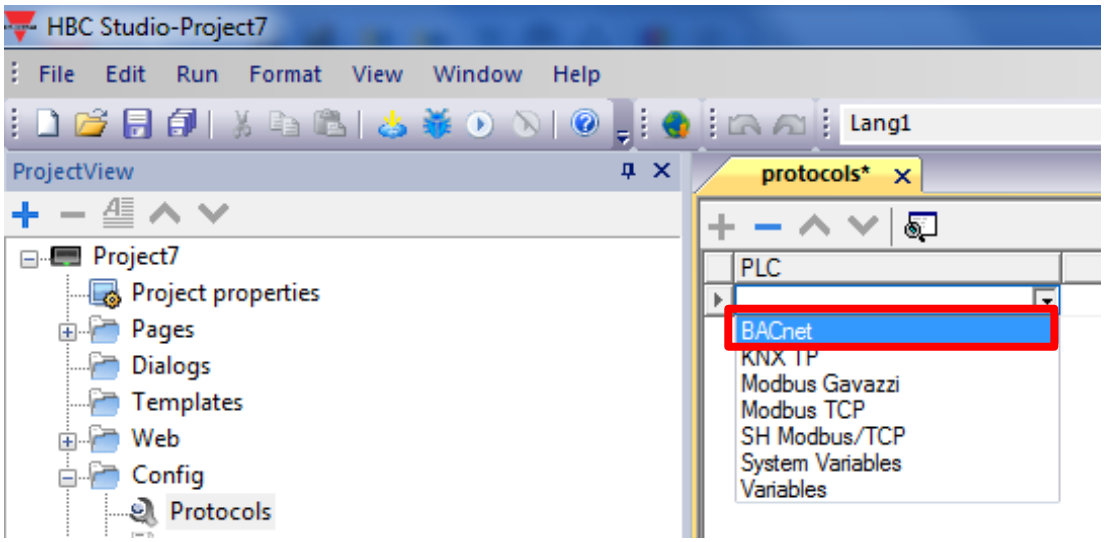
## 5.1 How to set a protocol

In this chapter the personalization of the project according to SH IP address settings is described:

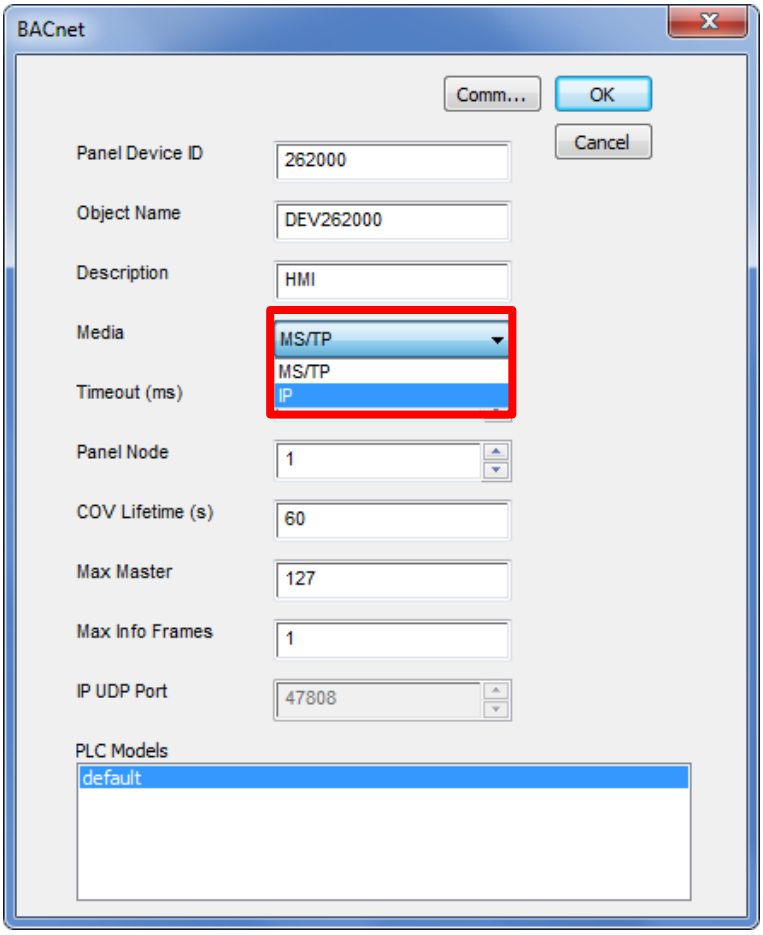
- Double click on the *Protocols* item in *ProjectView* to open the *protocols* page, and click on **+** to add a new protocol




- Click the button which appears on the cell in the *BACnet* line:



- The BACnet protocol properties must be set in the *Protocol* window




**Panel Device ID** — Unique BACnet instance number for the BTM controlled. This number identifies the device in the network.

**Object Name** — BACnet Object Name for the BTM device

**Description** — Description of the BACnet device. Used for documentation purposes.

**Media** — Type of communication for the protocol.
IP: based on standard UDP/IP communication.
MS/TP: Master-Slave/Token-Passing communication (RS-485).

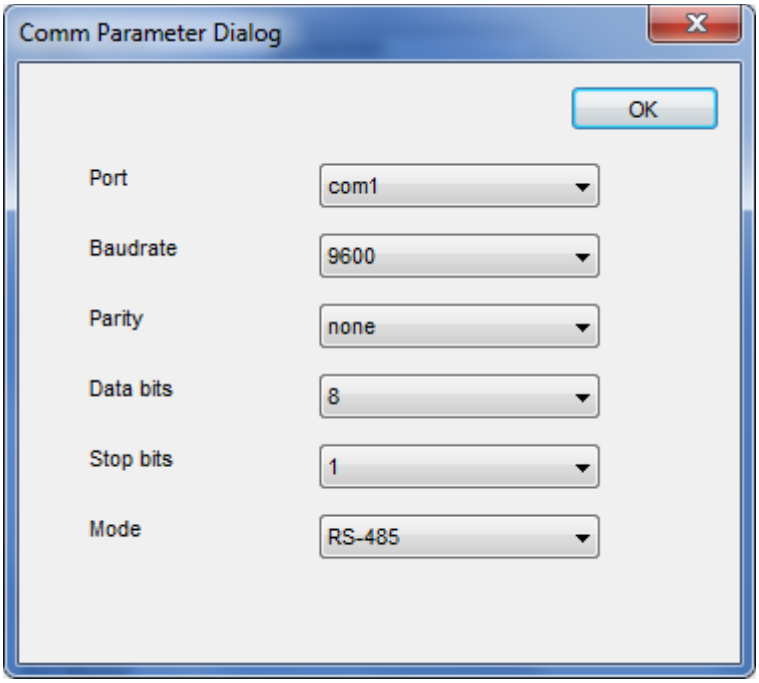
**Timeout (ms)** — Timeout value in milliseconds. The response from the BACnet device must be received within this time, otherwise the BTM-T7-24 will report a communication error.

**Panel Node** — MS/TP address. Physical device address on the link; this is not passed through routers.

**COV Lifetime (s)** — Desired lifetime of the subscription in seconds. A value of zero indicates an indefinite lifetime, without automatic cancellation. A non-zero value indicates the number of seconds that must elapse before the subscription is automatically cancelled.

| | |
|---|---|
| **Max Master** | Highest allowable address for master nodes. The value of Max Master must be less than or equal to 127. Available only if media is set to MS/TP. |
| **Max Info Frames** | Maximum number of information frames the node may send before it must pass the token (is this correct?). Max Info Frames may have different values on different nodes. This may be used to allocate more or less of the available link bandwidth to particular nodes. Available only if media is set to MS/TP. |
| **IP UDP Port** | Port number for IP communication. Available only if media is set to IP. |
| **PLC Models** | Reserved for future use. |

- MS/TP Communication options can be defined in the Comm Parameter Dialog box. Press the button "**Comm**…" to recall the Comm Parameter Dialog box. Parameters in the Dialog box are available only if media is set to MS/TP.

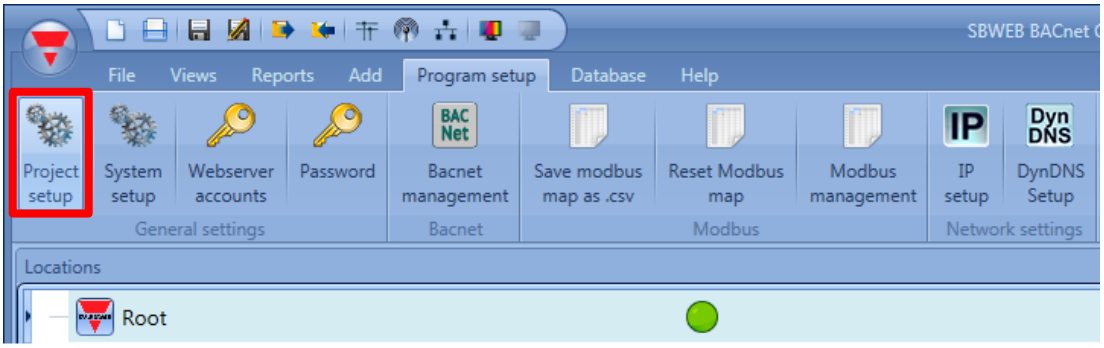



| | |
|---|---|
| **Port** | MS/TP communication port. |
| **Baudrate** | MS/TP communication speed. |
| **Parity**<br>**Data bits**<br>**Stop bits** | MS/TP communication parameters. |
| **Mode** | Communication mode for the selected comm port. Use RS-485 for normal operation. |

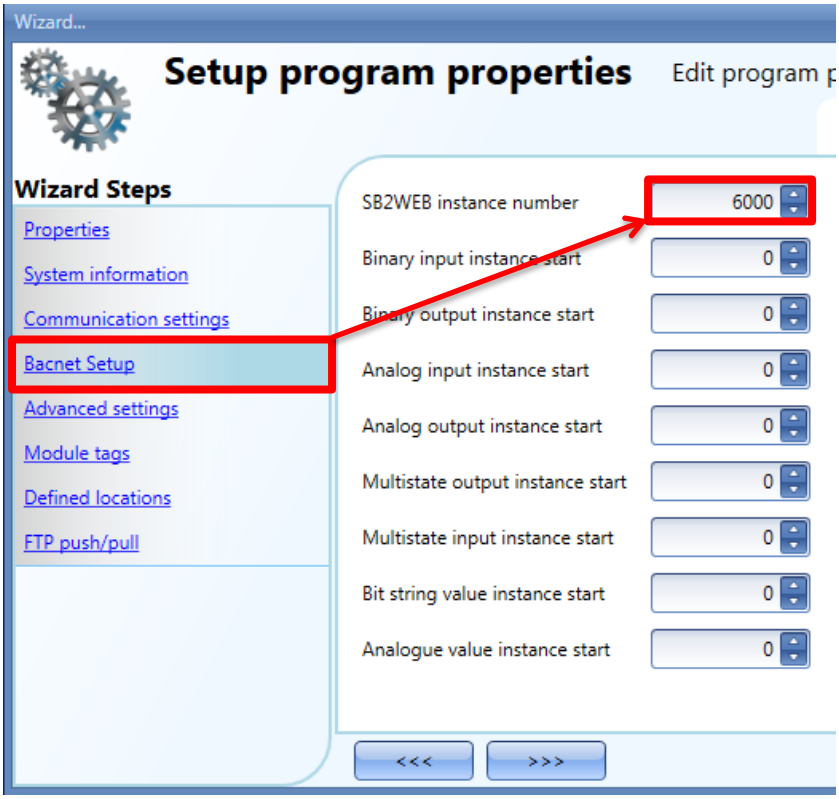
## 5.2 How to configure protocol for SB2WEB24

Open *SB Tool* and connect to the SB2WEB24.

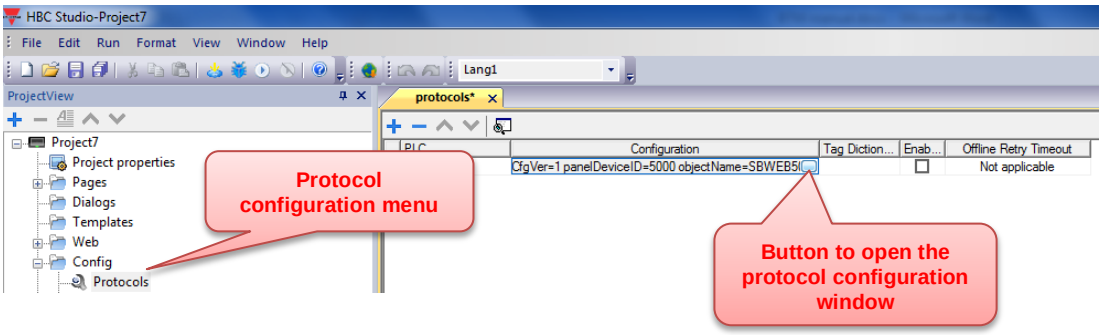
In the *Program setup* menu of *SB Tool* the user can configure the settings relevant to a specific project.



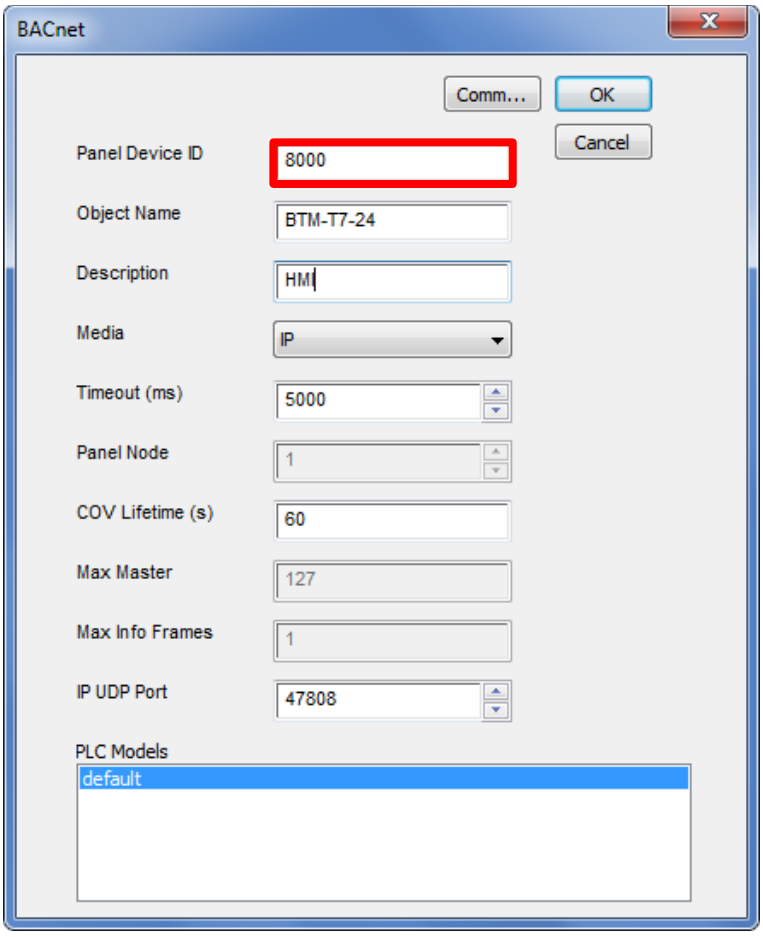

By clicking on *Project setup*, the following window will appear: in the *Bacnet setup* the user can define the **SB2WEB instance number** of the BACnet protocol.



- This Unique number must be set in the *Panel Device ID* in the *Protocol* page *Configuration*



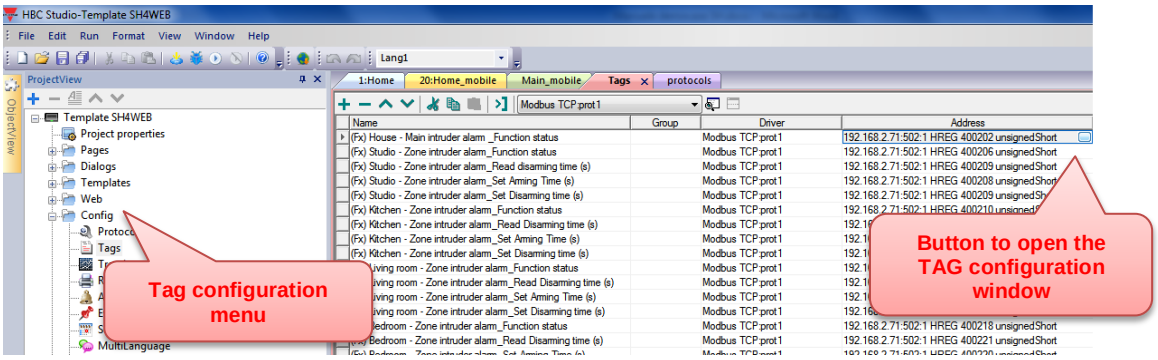

- **The Panel Device ID must be different from the variable *Value* set in the Bacnet setup of the SB Tool software**



## 5.3 How to manage Tags

In this chapter the personalization of the project according to SH IP address settings is described:

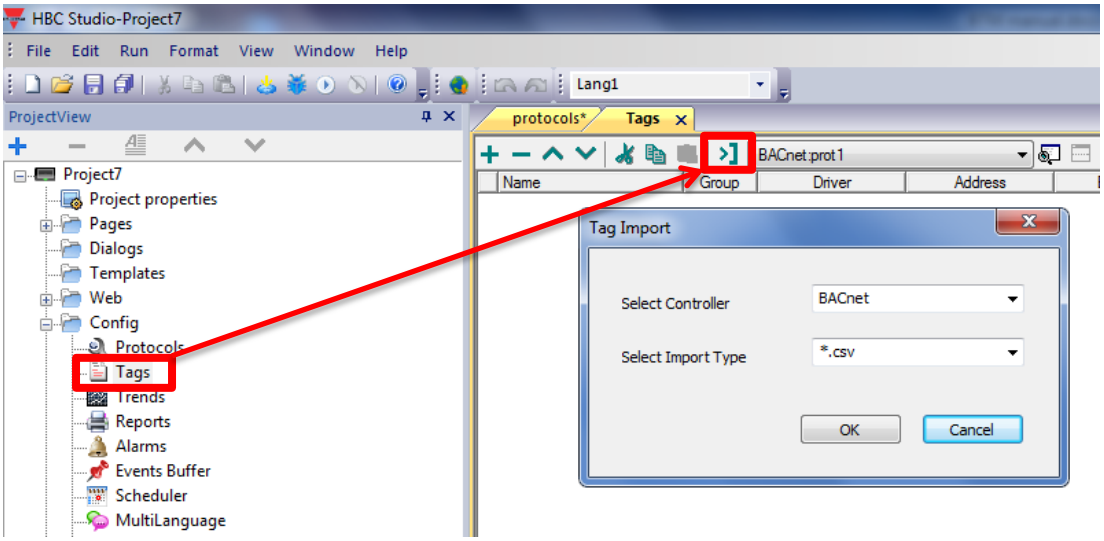
- Double click on the “Tags” item in “ProjectView” to open the “Tags” sheet:



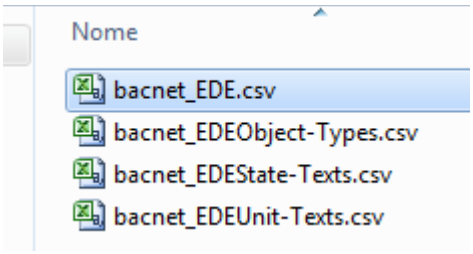

## 5.4 Tag Import

To create a Tag Dictionary you may import BACnet object information from BACnet EDE (Engineering Data Exchange) files.

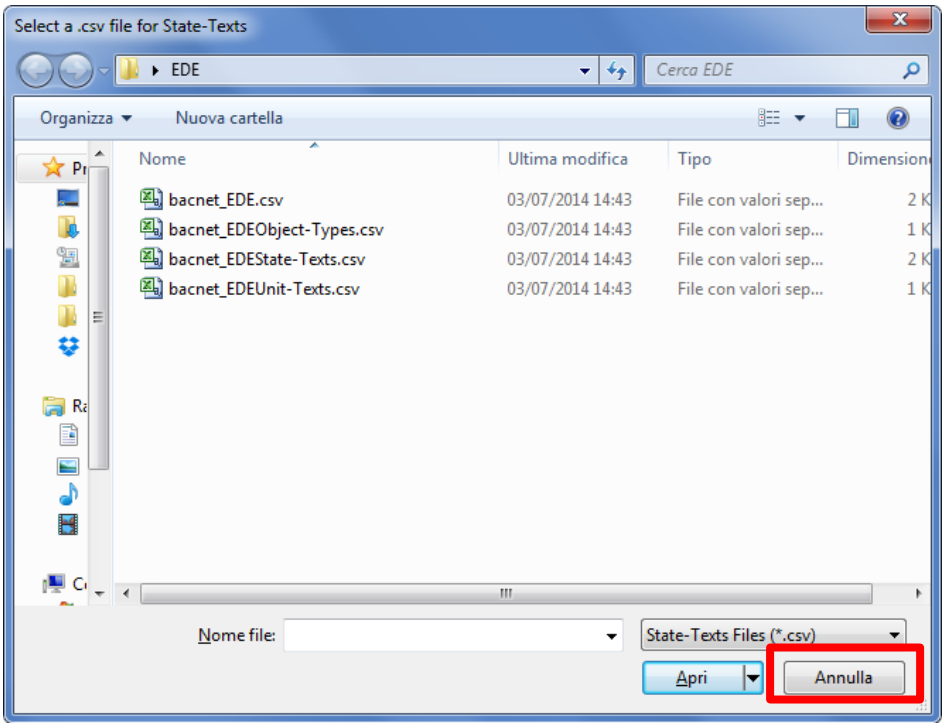
In the Tag Editor select the BACnet:prot*x* driver and click on the “Import tag” button to start the import process.




Locate the EDE “.csv” file and confirm.

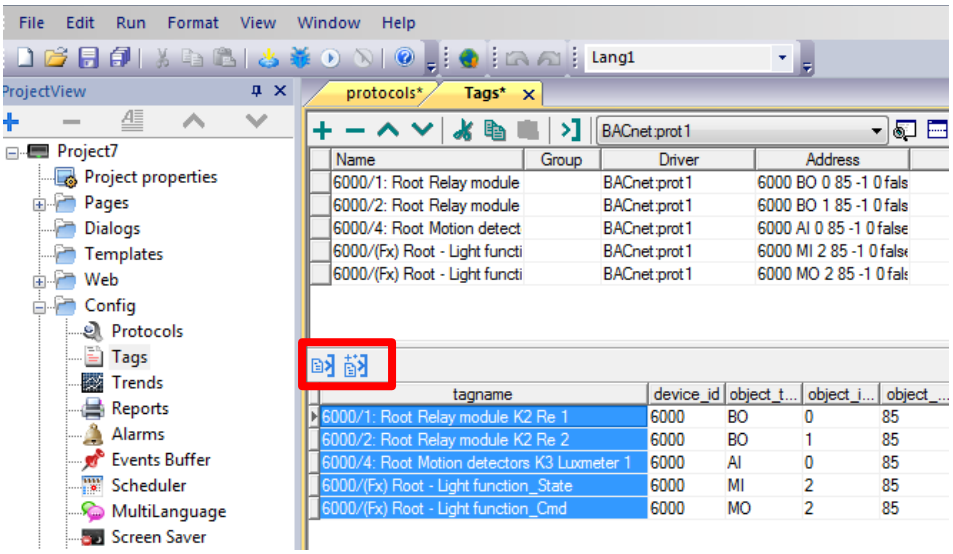



The importer will then ask you to locate the *StateTexts* file. Click “Cancel” to ignore.



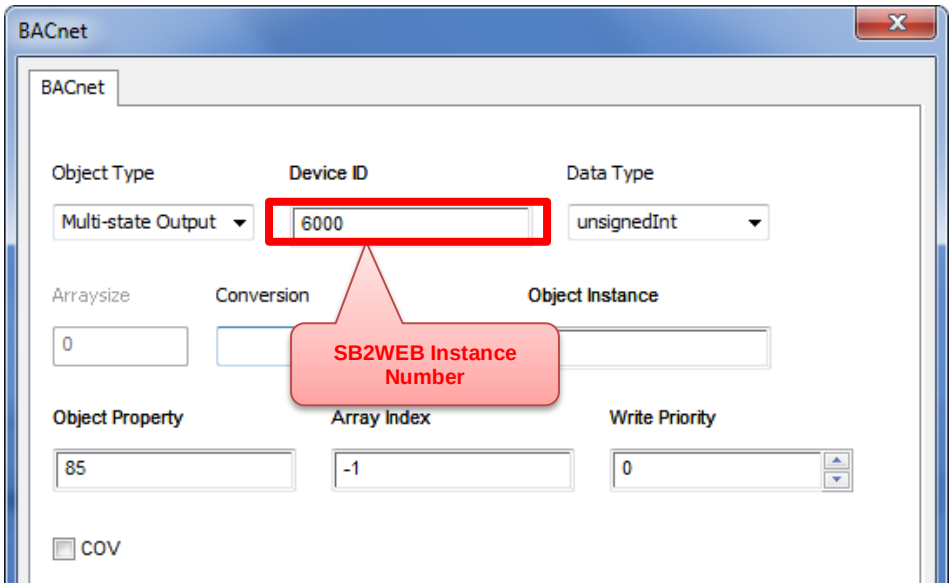

Tags will be created using the string specified in the column *object-name* of the EDE file. The importer will add the device instance number as a prefix to avoid duplication of tag names.

The tags present in the imported document are listed in the tag directory, from where they can be directly added to the project, using the add tags button as shown in the figure below:


File Edit Run Format View Window Help
Lang1
ProjectView
protocols*
Tags*
BACnet:prot1
Project7
Project properties
Pages
Dialogs
Templates
Web
Config
Protocols
Tags
Trends
Reports
Alarms
Events Buffer
Scheduler
MultiLanguage
Screen Saver
Name
Group
Driver
Address
6000/1: Root Relay module
6000/2: Root Relay module
6000/4: Root Motion detect
6000/(Fx) Root - Light functi
6000/(Fx) Root - Light functi
BACnet:prot1
6000 BO 0 85 -1 0 fals
6000 BO 1 85 -1 0 fals
6000 AI 0 85 -1 0 false
6000 MI 2 85 -1 0 fals
6000 MO 2 85 -1 0 fals
tagname
device_id
object_t...
object_i...
object_...
6000/1: Root Relay module K2 Re 1
6000/2: Root Relay module K2 Re 2
6000/4: Root Motion detectors K3 Luxmeter 1
6000/(Fx) Root - Light function_State
6000/(Fx) Root - Light function_Cmd
6000
BO
AI
MI
MO
0
1
2
85

## 5.1 Tag Definition

The definition of a BACnet tag is shown in the figure below.




The elements of a BACnet tag are the following:

**Object Type** — Type of BACnet object to be referenced. Available object types are:
Device
Analog Input
Analog Output
Analog Value
Binary Input
Binary Output
Binary Value
Multi-state Input
Multi-state Output
Multi-state Value
Integer Value
Positive Integer Value
Large Analog Value

**Device ID** — BACnet Device Instance of the device containing the object SB2WEB24

**Data Type**

Data type for display presentation. Available data types are:
boolean
int
unsignedInt
float
double
string
binary
boolean[]

These data types are data types as defined in the software.
The equivalence with BACnet data types is shown in the following table:

| BACnet data type | Software data type | |
|---|---|---|
| BOOLEAN | Boolean | |
| INTEGER | Int | |
| UNSIGNED_INTEGER | unsignedInt | |
| REAL | Float | |
| BIT_STRING | boolean-x | x = size |
| CHARACTER_STRING | string-x | x = size |
| OCTET_STRING | binary-x | x = size |
| DATE | int or unsignedInt | |
| TIME | int or unsignedInt | |
| BACnetObjectIdentifier | int or unsignedInt | Use conversions “instance” and “objType” for correct display |

**Array size**

Array size for the variable

**Conversion**

Conversion to be applied to the value for presentation

**Object Instance**

Unique BACnet ID of the object to be referenced

**Object Property**

N>numeric value of the property to be referenced (for example: the value 85 means “present-value” for most standard objects)

**Array Index**

Index for subscribing elements in BACnet arrays.
-1 means read all elements
0 to n means read the specified element

**Write Priority**

Priority level for write (‘written’) requests. Priority value is in the range 1 – 16. The value 0 is interpreted as 16.

**COV**

Subscribe this communication item for the change of value notification.

The BACnet driver supports the import of tag information when provided in EDE .CSV format according to the format:

**keyname, device obj.-instance, object-name, object-type, object-instance, [optional fields ]**

Example of CSV line:

| | | | | |
|---|---|---|---|---|
| (Fx) Root - Light function_Cmd | 6000 | (Fx) Root - Light function_Cmd | 14 | 2 |

## 5.2 How assign a tag to a Studio Widget

This chapter describes how to use a BACnet object in a Project.

### 5.2.1 How assign a BACnet tag to a Studio Widget

In the example shown below, the user has set a light widget to switch ON/OFF the lamp connected to a BACnet object.

The light widget is represented by the following figure:

It is a button with a lamp image which shows the light status:

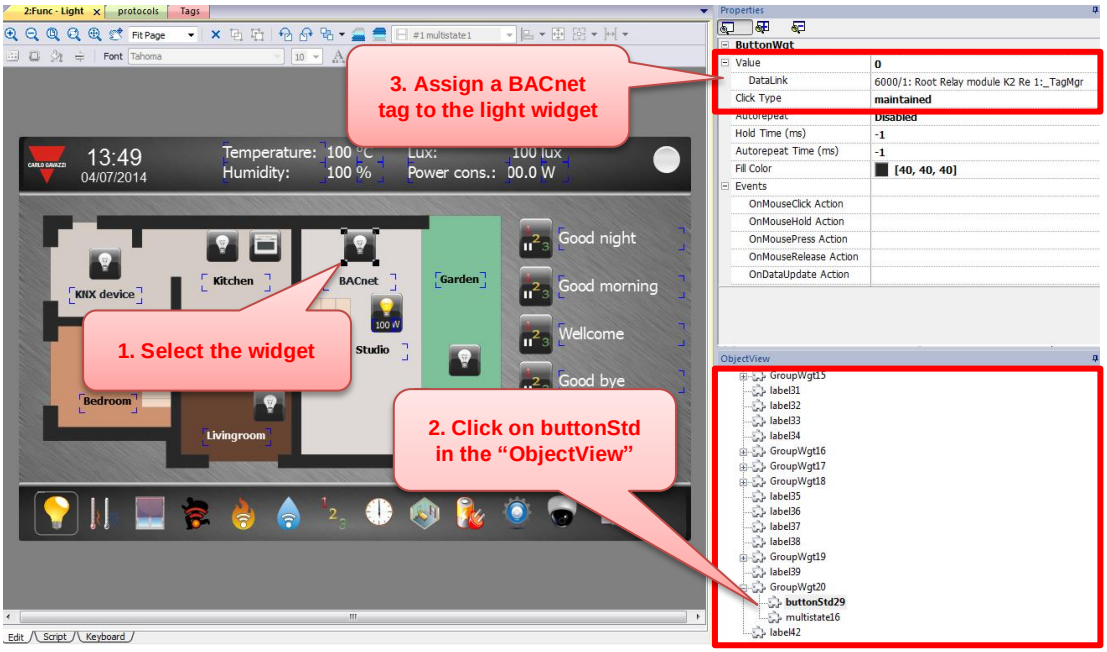
Light ON

Light OFF

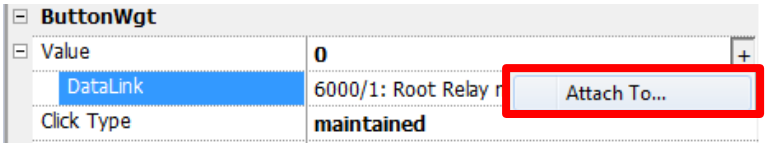
When the button is pressed, the light switches its status (ON➔OFF; OFF➔ON).

### 5.2.2 How to set the widget proprieties

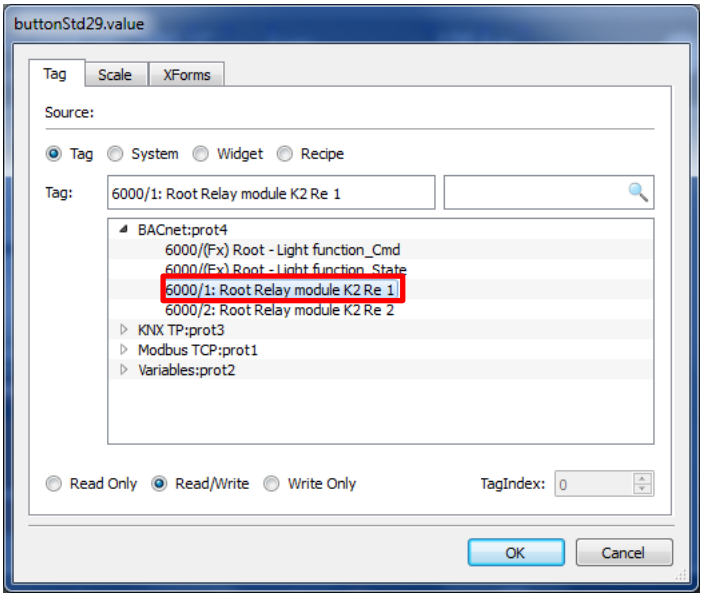
Select the widget and set its proprieties in the *Proprieties* page according to the needs of the project:



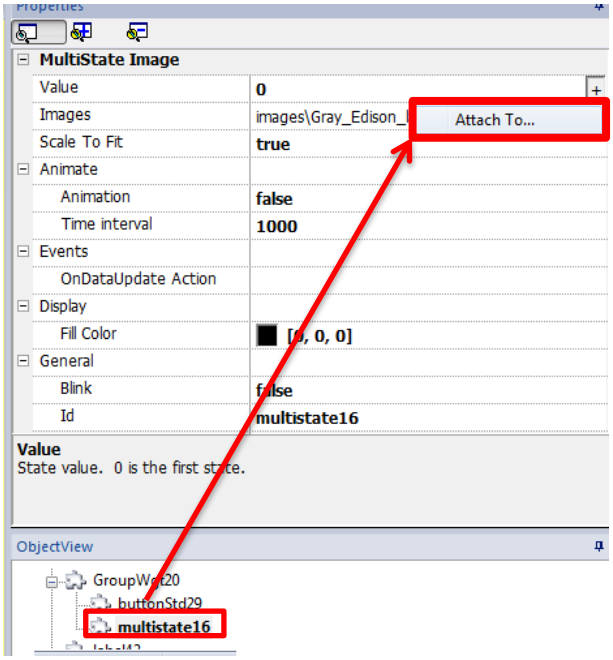

Press *Attach to…* in the *Value* row to select the action to be executed when the Light button is pressed:



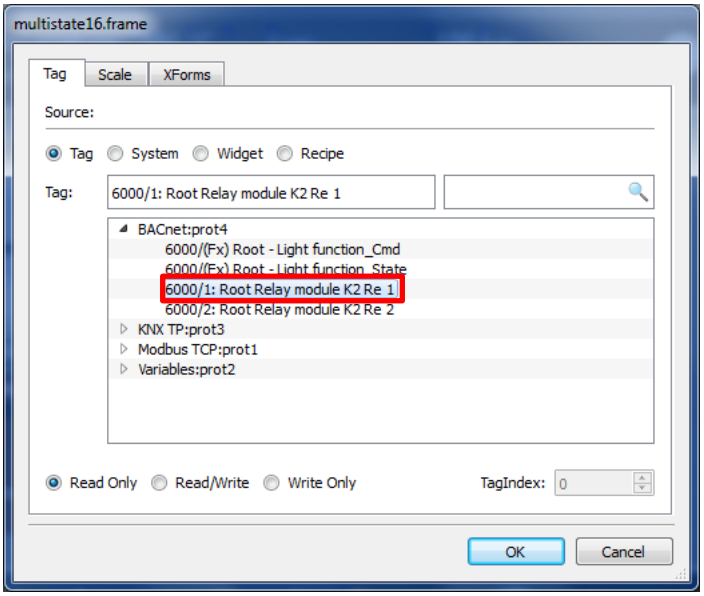

Expand *BACnet:protx* and select the Tag, being sure to enable *Read/Write*:



Select the widget and click on the "*Multistatexx*" item in the "*ObjectView* and set its proprieties on the *Multistate Image* page, according to the needs of the project. Attach this propriety to the light function status:




Expand *BACnet:protx* and select the TAG, being sure to enable *Read/Write*:



# 6 DATA TRANSFERS

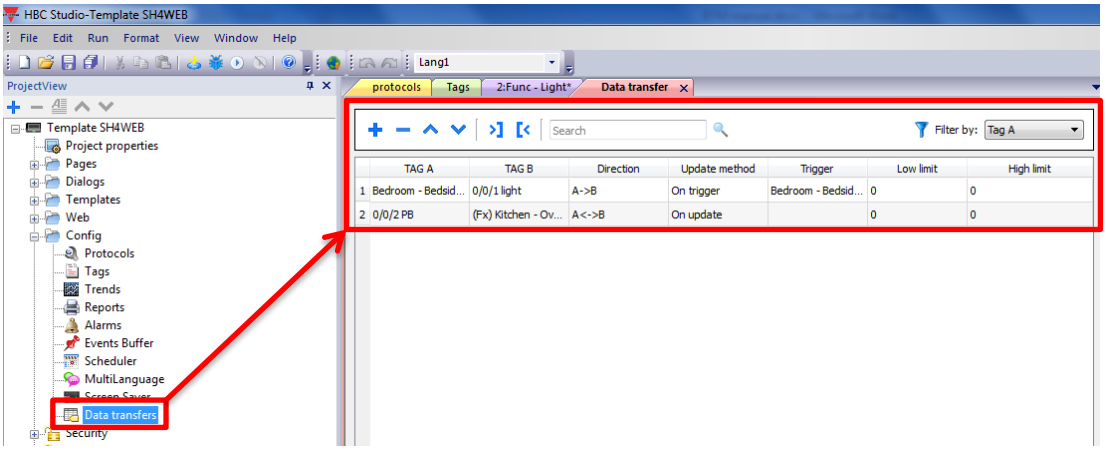
The *data transfer* feature makes the BTM-Tx-24 display a gateway between different protocols.

## 6.1 How to use the BTM-Tx-24 as a gateway

The Data Transfer feature allows the transfer of variable data from one device to another.
Using this feature a BTM-Tx-24 can operate as a gateway between two devices, even if they do not use the same communication protocol.

Please follow the instructions present in paragraph 6.1.1.

- Double click on the “Data transfer” item in “ProjectView” to open the “Data transfer” sheet:




To configure each data transfer, the user needs to correctly map the tags. This mapping is carried out in the *Data Transfer* editor.

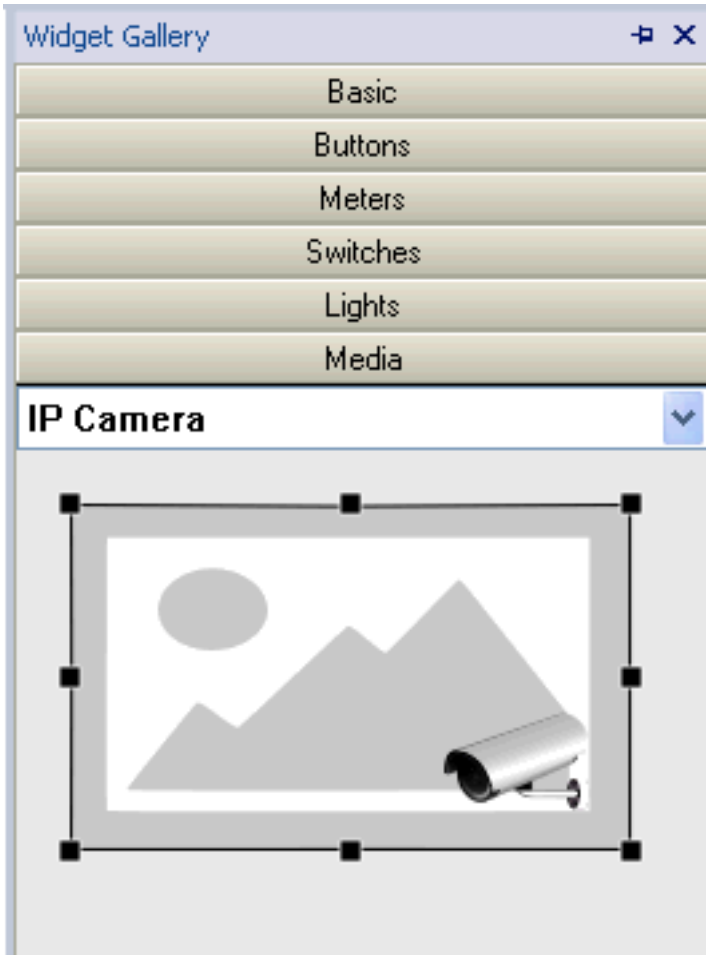
Some example:

Modbus TCP
BACnet
Modbus RTU

BACnet
Modbus RTU
Modbus TCP

# 7 IP Camera integration

The IP Camera widget is under the category "Media -> IP Camera" of the Widget Gallery:

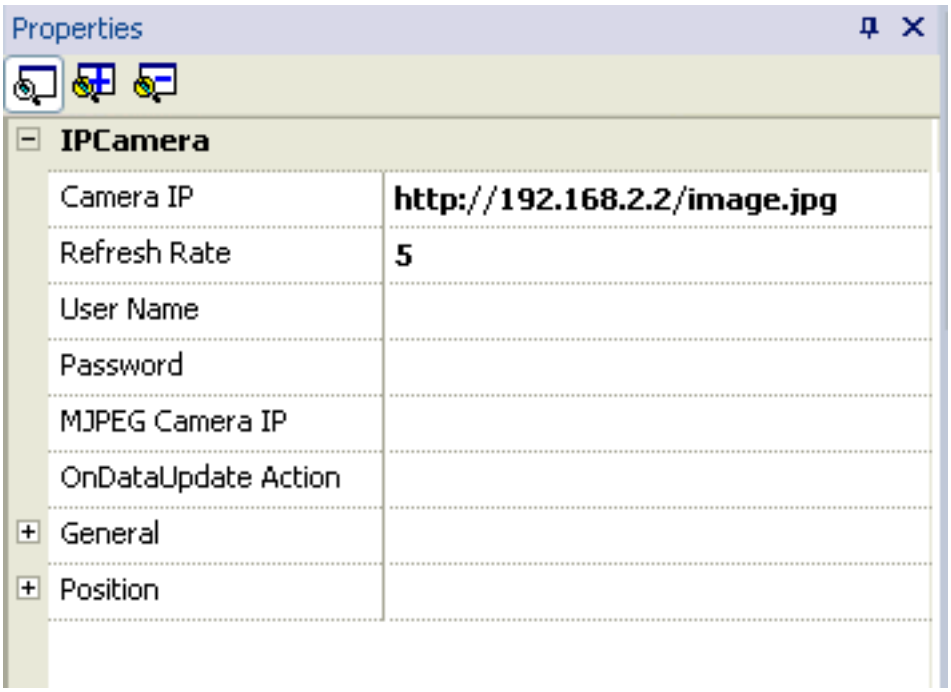



Drag and Drop in page the IP Camera widget and set the "Camera IP" properties.

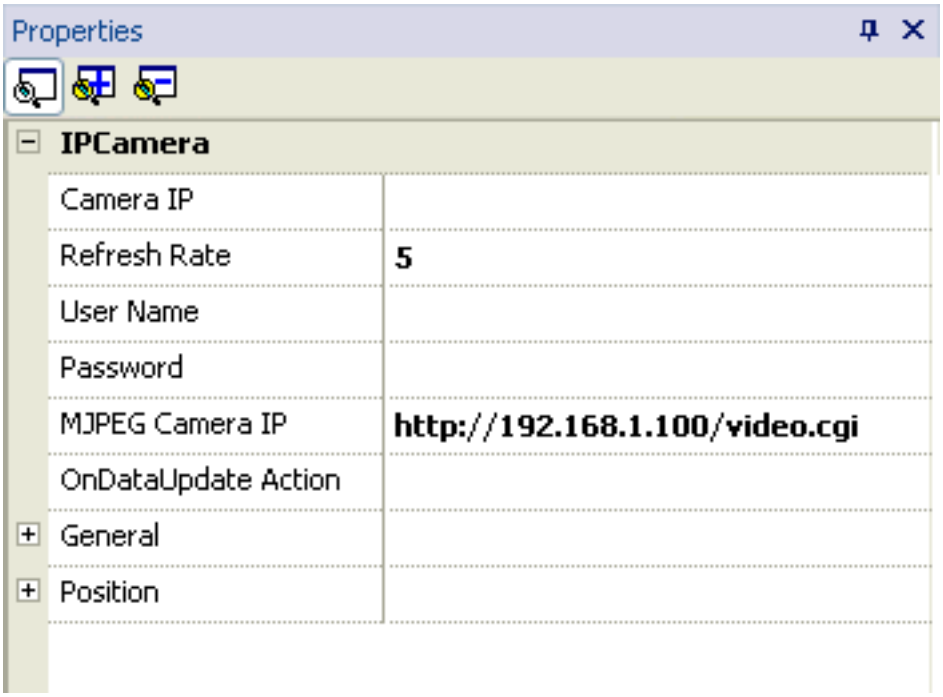
For instance, let's suppose to have an IP Camera with IP address = 192.168.2.2,
that allow access to images snapshot by this URL:

http://{ip_address}/image.jpg

The correct configuration of the widget property will be:




For instance, let's suppose to have JMobile Studio 1.9, an IP Camera with IP address = 192.168.1.100, that allow access to MJPEG streaming by this URL:

http://{ip_address}/video.cgi

The correct configuration of the widget will be: