

WebMaker tool

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4th edition
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History

Datum	Issue	Description of changes
February 2009	1	First version (corresponds to the tool status in version 1.6.2)
August 2009	2	Second version (corresponds to the tool status in version 1.7.8)
April 2010	3	Third version (corresponds to the tool status in version 1.9.11)
March 2011	4	Fourth version (corresponds to the tool status in version 1.10.0)

Content

1 Introduction.....	3
1.1 Tool start.....	3
2 WebMaker tool operation.....	4
2.1 Tool window.....	4
2.1.1 Top tool bar.....	4
2.1.2 Left panel of pages and groups.....	7
2.1.3 Editing area.....	8
2.2 Images manager.....	10
2.3 Global settings.....	11
2.4 Password settings.....	12
2.5 Object list.....	13
2.6 Automatic array indexing.....	14
3 Object properties.....	15
3.1 Label properties.....	15
3.2 Edit field properties (with own submit button).....	16
3.3 Submit button properties.....	17
3.4 Rectangle properties.....	17
3.5 Dynamic bar properties.....	18
3.6 Double-state image properties.....	19
3.7 Picture properties.....	20
3.8 Multi-state image properties	21
3.9 IP camera picture properties.....	22
4 Groups and pages properties.....	23
4.1 Group properties.....	23
4.2 Page properties.....	24
5 Debugging mode.....	25
5.1 Different behavior of objects in the debugging mode vs. displaying from the web server.....	25
6 Web server operation.....	26
6.1 Minimum requirements on the web browser.....	27
6.2 Access to files on the memory card via the web interface.....	27
6.3 System pages.....	27

1 Introduction

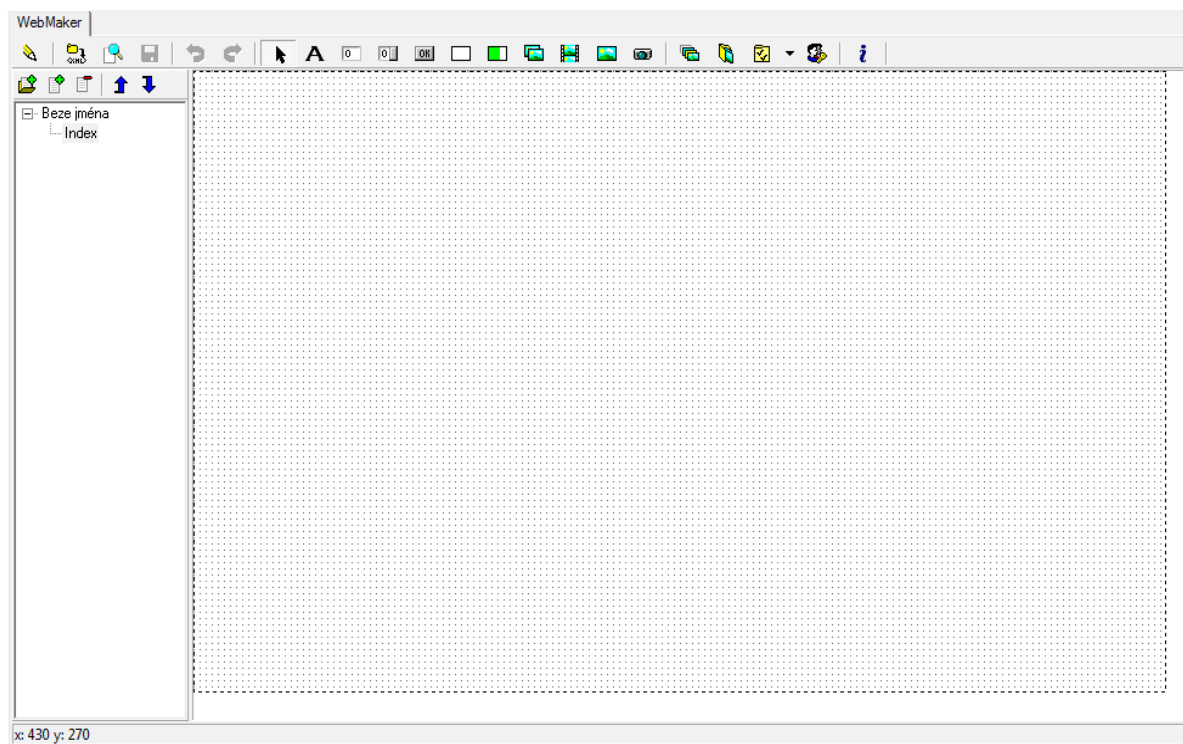
WebMaker is a tool designed primarily to create web pages for Tecomat systems with a web server. The second function is the possibility to use the tool for visualization within the Mosaic environment – this function can be also used for systems that are not equipped with the web server providing they are programmed according to the IEC 61113 standard.

For web server function utilization within the PLC Foxtrot and TC700, the memory card is necessary for saving web pages files.

1.1 Tool start

The tool is activated in the Mosaic environment either from the main menu Tools >WebMaker or from the tool bar using the icon .

After the start the tool window will open with the editing area.



2 WebMaker tool operation

2.1 Tool window

The window consist of three sections:

- 1) Top tool bar
- 2) Left panel of pages and groups
- 3) Editing area

2.1.1 Top tool bar



Tool bar buttons



Pencil/Bug – switches the editing mode (pencil) and debugging mode (bug). In the editing mode, it is possible to add and change groups, pages, objects and their features.



Arrow symbol<XML> – compiles web pages – Generating of the XML code for PLC. Generated XML code is saved in the project into the subdirectory SendRoot. This directory is automatically synchronized with the PLC during sending of the program code. (PLC must support the file system, otherwise, the synchronization is not undertaken.).



Page with zoom tool – Preview – Generated code is opened from the PC hard disc in the web browser. These pages do not contain real data from the PLC and serves for appearance and links control only.



Diskette – Save – saves work in progress without generating of the XML code. The work in progress is automatically saved during the generating of the XML code and while the tool is closed.



Back arrow – undoes one change done within the editing area.



Forward arrow – does one change undone by the „back arrow“.



Arrow tool – Select – switches on and indicates the selection mode. In this mode it is possible to select items within the editing area. Items position can be changed by dragging. Size of chosen objects can be changed by same way.



A character – Static text – switches on the mode of static text insertion. This text can also be used as a link.



Edit field – Edit field – switches on the mode of edit field insertion. Edit field serves for displaying and/or editing of PLC variables. Edited values are sent to the PLC after the global submit

button is pressed.



Edit field with button – Edit field with its own submit button – Enables insertion mode of the edit field with its own submit button. Edit field serves for displaying and/or editing of PLC variables. Edited values are sent from web pages to the PLC after the submit button is pressed next to the edit field. Global submit button has no effect on this field.



OK button – Submit button for edit fields without own submit button. Switch on the mode of insertion of the global submit button. This button, after it is pressed, submit all edit fields without their own submit buttons. If this button is missing on the web page, it is not possible to send values from edit fields to the PLC!



Rectangle – Solid color object of rectangular shape used to divide area with controls. Object can be used event for signaling with conditional visibility.



Dynamic Bar – Object of rectangular shape used to express value by width or height of bar. Object can be displayed as a gradient shaded bar on ID-18/28 panels. It is displayed as a rectangle in a web browser.



Picture pair – Double-state image – Enables insertion mode of the double-state image. The double-state image serves for control and displaying of BOOL type variables. One picture is displayed when the value is not equal to zero, second one is displayed when the value is zero. After clicking on the picture, the value of the variable will be negated. The value is set to 1 after zero and to 0 after non-zero for other types of variables.



Filmstrip – Multi-state image – Enables insertion mode of the multi-state image. The multi-state image is used to display the graphic symbol of the state represented by value of control variable. Integer control variable can take values from 0 (displays first image) to a value one less than the number of images (displays last picture). If the variable value is outside of these limits no image is displayed.



Picture – Static image – Enables insertion mode of the static image. This item serves for displaying of static picture. This picture can also serve as a link.



Camera – Picture from the IP camera – Enables insertion mode of the picture from the IP camera. This item serves for cyclic loading of the picture from IP camera. There can be only one item per web page. This item is not active within the simulation in the Mosaic environment.



Skupina objektů – Seznam objektů – Group of objects - Object List - Opens a window with a list of objects on the page where objects can be selected and modified.



Folder with pictures – Picture manager – opens window for adding pictures into the project. These pictures can be then used on web pages.



Folder with check signs – Global setup – opens window with global setup for the whole project.



Head with a key – Password settings – opens window for editing passwords and MAC addresses for the automatic logging in.



i character – Information about tool version.

2.1.2 Left panel of pages and groups

Panel is used to editing and switching of groups and pages. Panel has a tool bar.



Tool bar buttons



Folder with page and plus – adds a group – Adds another group behind the actual selected node. The group serves for logic pages division.



Page with plus – Add a page – adds another page behind the actual selected node.



Page with minus – Delete – deletes page or group.



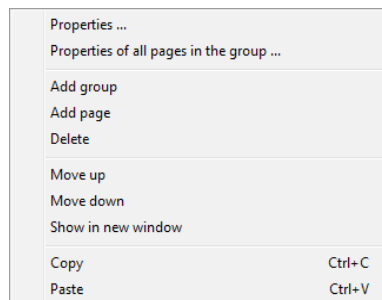
Blue up arrow – Move up – Move the selected group or page in front of the page or group that precedes it.



Blue down arrow – Move down – Move the selected group or page behind the page or group that succeed it.

Tree of groups and pages

Particular nodes represent groups and pages. The particular object setup is opened by double clicking on the node. On each node local menu can be invoked using the right mouse button.



Properties... – opens a window with properties of page or group

Properties of all pages in group... – opens a window of page properties, changes in the dialogue will appear in all pages in the group

Add group – duplicates the tool bar button

Add page – duplicates the tool bar button

Delete – duplicates the tool bar button

Move up – duplicates the tool bar button

Move down – duplicates the tool bar button

Display in a new window – Display the actual page in the new window. In this window it is not possible to edit the page. Changes done in the main tool window are not propagated to this window. This display serves for debugging mode only when it is necessary to see more than one page at a time

Copy – Copy the selected page or group into the clipboard

Paste – Insert group or page from the clipboard

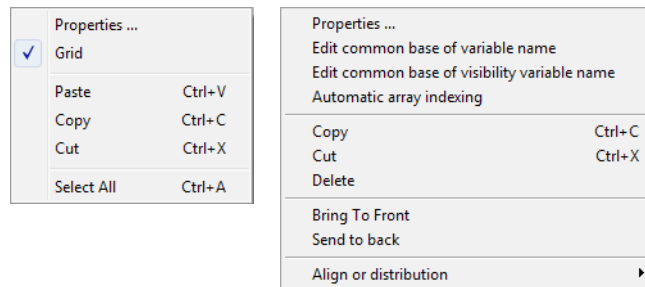
2.1.3 Editing area

Editing area displays page selected in the left panel. If a group is selected, the first page from this group is displayed. In the beginning the area is empty and displays only page margins, according to the final resolution selected in the global settings with grid 8x8 pixels onto which the objects are attached.

Various objects from the tool bar can be inserted to this area.



Anywhere on the screen the local menu can be invoked by right mouse button. The local menu differs according to whether it is invoked on the empty screen or on the object.



Properties... – Opens window with properties of the selected object(s) or page if no object was selected. If more objects are selected, changes appear in all objects of the same type as the one where the properties were invoked.

Grid – switches on and off the grid.

Paste, Copy, Cut – Object and clipboard operations.

Select all – Selects all objects on the page.

Change the common base of variable name – Invokes a dialogue for a change of the common name of variables within the selected objects. The common name base is pre-filled into the dialogue and substituted by newly inserted text.

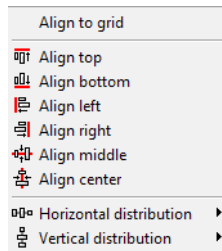
Change the common base of visibility variable name – Invokes a dialogue for a change of the common name of variables controlling visibility within the selected objects. The common name base is pre-filled into the dialogue and substituted by newly inserted text.

Automatic array indexing – Invokes a dialog that allows automatically index objects whose variables are the type of array.

Bring to front – Selected objects are moved in front of all other objects on the page.

Send to back – Selected object are moved behind all other objects on the page.

Align and distribute – includes options for aligning or distributing multiple objects.



Align to grid – adjusts the coordinates of selected objects to match the selected grid.

Align top – Aligns the top edges of the controls with the top edge of the highest control.

Align bottom – Aligns the bottom edges of the controls with the bottom edge of the lowest control.

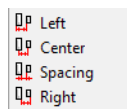
Align left – Aligns the left edges of the controls with the left edge of the leftmost control.

Align right – Aligns the right edges of the controls with the right edge of the rightmost control.

Align middle – Aligns the centers of the objects in a horizontal plane so that they lie in the arithmetic average of the positions of all centers.

Align center – Aligns the centers of the objects in the vertical plane so that they lie in the arithmetic average of the positions of all centers.

Horizontal distribution – Contains options for placement of objects in the horizontal direction. The leftmost and the rightmost object remains stationary. Others are distributed according to the choice below.



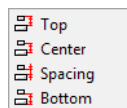
Left – The objects located between the left edge of the leftmost and the rightmost object are placed to have left edges evenly spaced.

Center – The objects located between the center of the leftmost and the rightmost object are placed to have centers evenly spaced.

Spacing – The objects located between the leftmost and the rightmost object are placed to have even space between each other.

Right – The objects located between the right edge of the leftmost and the rightmost object are placed to have right edges evenly spaced .

Vertical distribution – Contains options for the placement of objects in vertical direction. The topmost and the lowest object remains stationary. Others are distributed according to the choice below.



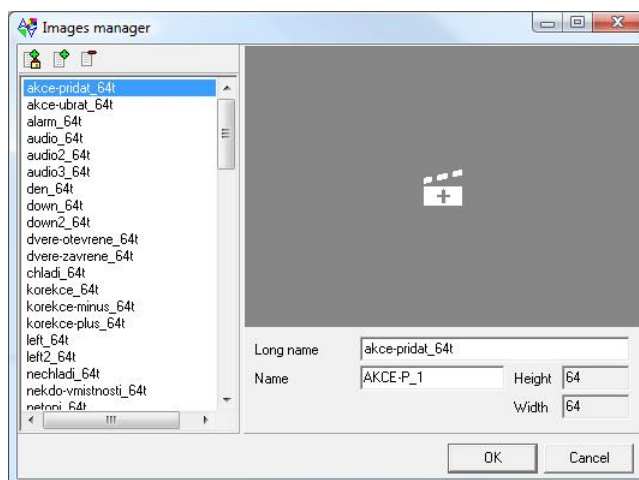
Top – The objects located between the top edge of the topmost and the lowest object are placed to have top edges evenly spaced.

Center – The objects located between the center of the topmost and the lowest object are placed to have centers evenly spaced.

Spacing – The objects located between the topmost and the lowest object are placed to have even space between each other.

Bottom – The objects located between the bottom edge of the topmost and the lowest object are placed to have bottom edges evenly spaced.

2.2 Images manager

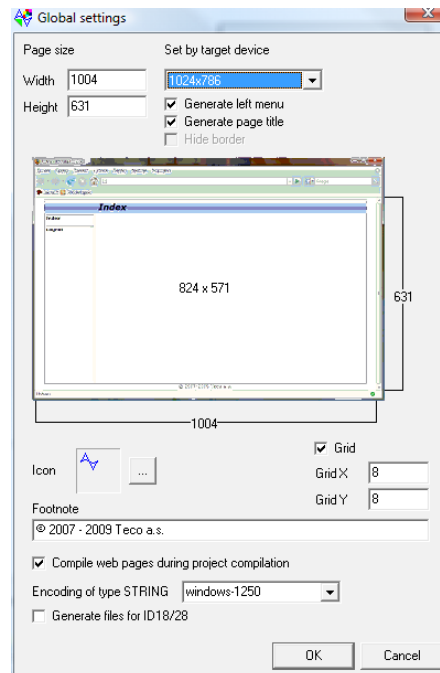


Images manager serves for adding images to the project. The tool bar enables to add a image from the home directory , from the user directory  (the last path from which has been added to the actual project is remembered) a picture removal .

Bellow the tool bar there is a list of all pictures available within the project. On the right side there is a preview of actually selected picture. Bellow the preview area it is possible to edit the long picture name (without restrictions) and name used to store inside PLC (max 8 characters, without diacritics and spaces). There are also displayed information of height and width there.

Changes done in the dialogue are confirmed by OK button.

2.3 Global settings



Global setup enables the entry of area size that the target browser will provide (from this area the size of the editing area is calculated). Height and width is possible to set manually or leave it to be estimated with respect to the final device resolution. If ID-18/28 is selected there are set other settings for this type of devices together with size of page.

Generate left menu – enables to switch off the generating of the left menu. In the left menu there are displayed groups and pages in a way they are sorted in the left panel of the tool.

Generate title – enables to switch off the blue title with the page name.

Hide border – suppresses black border of page. Option is available only if left menu is not generated.

Grid – switches grid onto which the objects are attached.

Grid X – sets horizontal spacing of grid.

Grid Y – sets vertical spacing of grid.

Footnote – Entered text will be displayed under the page.

Compile web pages during project compilation – If the option is checked, files for web pages are generated after each project compilation. It guarantee up to date web presentation.

Encoding of type STRING – sets code page that will be used for displaying strings in the web browser.

Generate files for ID18/28 – This option enables generating of files necessary for displaying pages on panels ID-18/28.

2.4 Password settings

The image displays two side-by-side screenshots of the 'Access settings' dialog box. Both windows have a title bar with a close button and a tab bar with 'Password settings' and 'Automatic login'.

The left window, titled 'Access settings', has the 'Password settings' tab selected. It contains a table with four columns: 'Level', 'User name', 'Password', and 'Default page'. The 'Level' column has a dropdown menu with values 0 through 9. The 'User name' column has text input fields with values 0 through 9. The 'Password' column has text input fields with asterisks. The 'Default page' column has dropdown menus. At the bottom are 'OK' and 'Cancel' buttons.

The right window, also titled 'Access settings', has the 'Automatic login' tab selected. It contains a table with three columns: 'Level', 'MAC Address', and 'Default page'. The 'Level' column has a dropdown menu with values 0 through 9. The 'MAC Address' column has text input fields with values 00:00:00:00:00:00. The 'Default page' column has dropdown menus. At the bottom are 'OK' and 'Cancel' buttons.

On the card Password settings there are ten pairs of user name – password which can be set. This data will be required while logging in the web server via the web browser. The level of access can be set to each pair. Default settings is user name same as the password and as the access level (i. e. for level 0 the user name is 0 and password 0, too.).

On the card Access settings it is possible to set ten device MAC addresses and their access level. For those devices logging in will not be required.

The level represents the logged user rights. The user can display and edit all objects that are of the same or lower level than its own is. Objects of higher level can be only displayed. The user can not access pages of higher level and they are not displayed in the menu. Groups of higher level are not shown in the menu.

2.5 Object list

Object list displays all the objects on the page and basic information about them. Objects can be sorted according to their characteristics (type, variable, variable controlling visibility, position and size). Objects selected in the list are selected in the editor area. Following action can be performed directly on the list via local menu.

- **Properties ...**
- **Change the common base of variable name**
- **Change the common base of visibility variable name**
- **Automatic array indexing**
- **Bring to front**
- **Send to back**

The behavior of actions is the same as in the local menu of the editor.

2.6 Automatic array indexing

The dialog allows index selected objects according to specified criteria. Objects are indexed according to position from left to right and from top to bottom. Either the main control variable or visibility variable can be indexed.

There are following criteria for indexing:

Origin – The index of the leftmost object on top

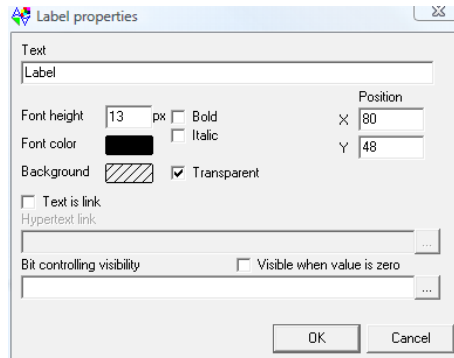
Step – specifies how much will be larger (or smaller for negative values) index of the following object

Order of modified index – Number represents which of indexes will be modified in order from left to right. This option is important for multidimensional arrays and structured variables containing more indexes. If order of modified index is greater than the number of indexes in the original variable names, the index is added to the end of the names.

The final variable names with changed index are displayed at the bottom of the dialog, where there is the original name for each modified name. Changes are committed by OK button.

3 Object properties

3.1 Label properties



Positions – determines coordinates of top left corner of object on page

Text – Static text itself.

Font height – Height of the text characters.

Bold – switches on bold font.

Italics – switches on italics font.

Font color – Color of text.

Background color – Text background color.

Transparent – determines whether the text background should be transparent.

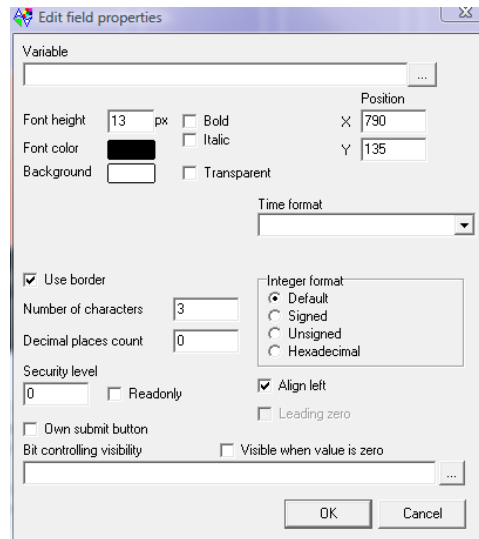
Text is a link – switches on link function.

Hypertext link – Address to go after clicking on the label. The button beside edit box enables to choose any of current pages or the page for logging out. Links outside the PLC webserver must start with http://

Bit controlling visibility – If there is filled name of variable in edit box, visibility of the object is conditioned by its value.

Visible when value is zero – If the option is not checked, the object is visible during non-zero value of controlling variable and vice versa.

3.2 Edit field properties (with own submit button)



This dialogue is common for edit field with its own button or without. Objects are switched via the option Own submit button.

Variable – Variable that is displayed in the edit field.

Use border – determines whether the field should be framed.

Number of characters – Number of all displayed characters in the edit field.

Decimal places count – Number of decimal places displayed.

Time format – specifies format of variable of type TIME, DATE and DATE_AND_TIME. Syntax of format is “YYYY-MM-DD-hh:mm:ss.zzz”, where “Y” is placeholder for year digit, “M” for month digit, “D” for day digit, “h” for hour digit, “m” for minute digit, “s” for second digit and “z” for digits of tenths, hundredths and thousandths.

Integer format – enables to change standard mode of displaying integral number variables.

Align left – switches on and off the left alignment.

Leading zero – determines whether left characters for numeric values should be substituted by zeros.

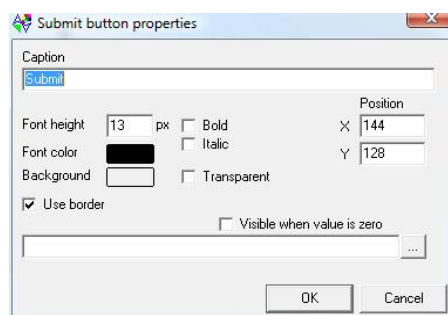
Security level – Minimum level that is required for item editing.

Readonly – determines whether the value can be edited or displayed only.

Own submit button – switches the object type – add/reduce the button for sending.

Options Position, Font height, Bold, Italics, Font color, Background color, Transparent, Bit controlling visibility, Visible when value is zero have similar function as for label properties.

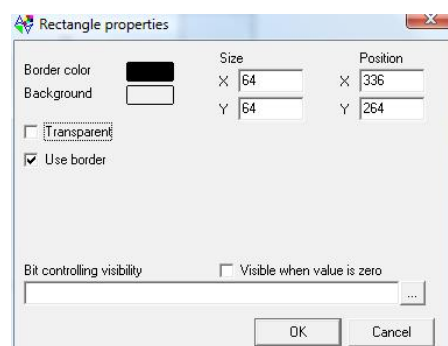
3.3 Submit button properties



Caption – Text displayed on the button

Options Position, Font height, Bold, Italics, Font color, Background color, Transparent, Bit controlling visibility, Visible when value is zero have similar function as for label properties.

3.4 Rectangle properties



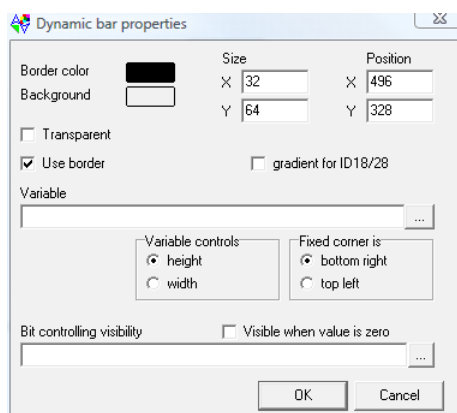
Size – determines size of rectangle in pixels (minimum value is 8)

Border color – sets color of border of rectangular area

Use border – determines whether the rectangle be framed.

Options Transparent, Bit controlling visibility, Visible when value is zero have similar function as for submit button.

3.5 Dynamic bar properties



Gradient pro ID18/28 – switch on scheme with gradient for ID-18/28 that makes 3D effect.

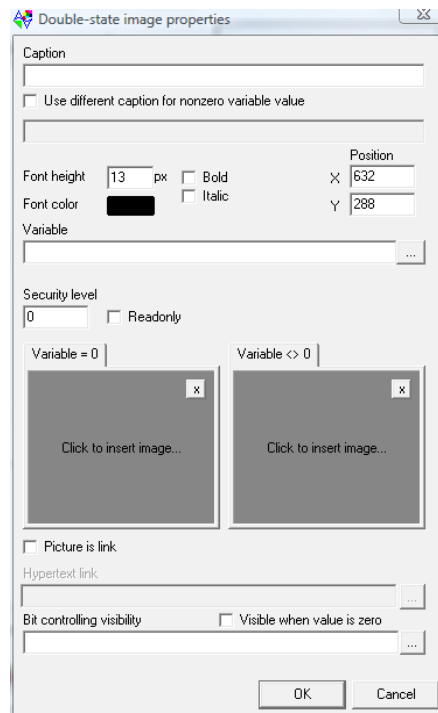
Variable – Variable determining one of measures by options below.

Variable controls (height/width) – determines if variable controls height or width of bar.

Fixed corned is (bottom right/top left) – determines which of corners doesn't change position during bar size changing.

Options Size, Border color, Use Border, Transparent, Bit controlling visibility, Visible when value is zero have similar function as for rectangle.

3.6 Double-state image properties



Caption – Text displayed over the picture

Use a different caption for nonzero variable value – switches the option of displaying an alternative legend for non zero value of the variable

Variable – Variable which value affects the picture (caption) displayed

Variable = 0 – Displayed picture for zero value

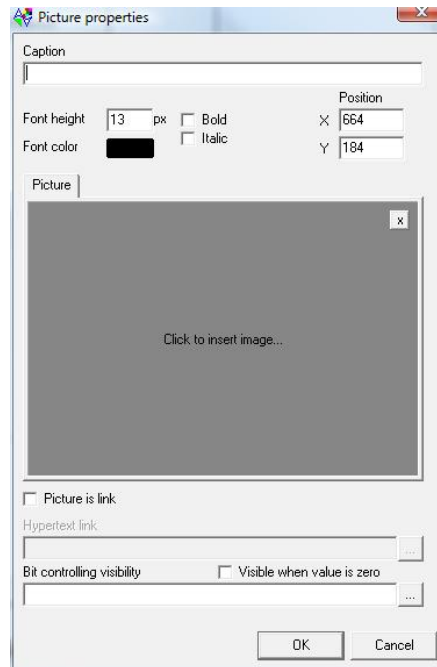
Variable <> 0 – Displayed picture for non zero value

Picture is a link – switches the option when the picture is a link to another page

Hypertext link – Address to go after clicking on the label. The button beside edit box enables to choose any of current pages or the page for logging out. Links outside the PLC webserver must start with http://

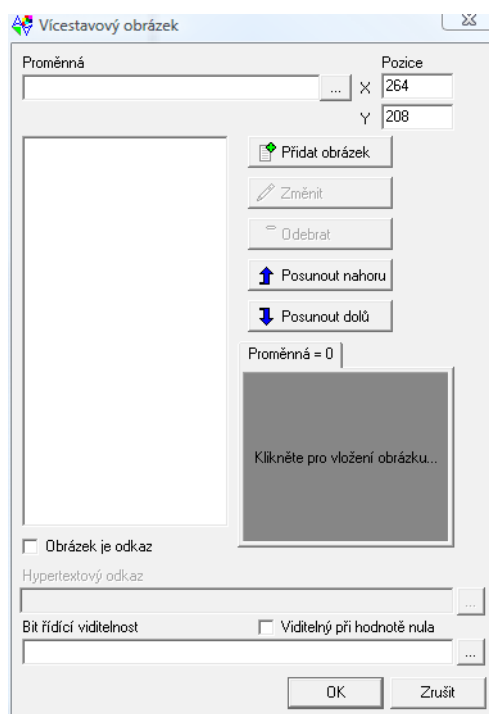
Options Font height, Bold, Italics, Font color, Background color, Transparent, Bit controlling visibility, Visible when value is zero have similar function as for rectangle.

3.7 Picture properties



Options Position, Caption, Picture is link, Hypertext link, Font height, Font color, Bold, Italic, Bit controlling visibility, Visible when value is zero have similar function as for double-state image.

3.8 Multi-state image properties



Variable – The value of variable affects which of the image will be displayed. The first picture is displayed at the value of 0, the next one at value of 1, etc. The last picture is displayed when the value is one less than the number of pictures. If the variable value is less than 0 or equal or greater than number of images the object is not displayed.

Add picture – Invokes a dialog for selecting pictures. The selected picture is added to the list.

Modify – Invokes a dialog for selecting pictures. The selected picture will replace the selected one in the list.

Remove – Deletes the selected picture from the list.

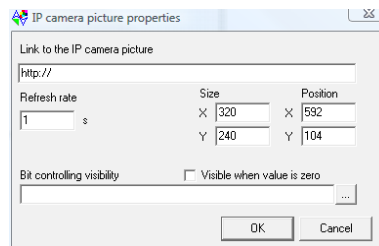
Move Up – Moves the selected picture in the list up.

Move Down – Moves the selected picture in the list down.

Variable = x – Displays image and value of the variable according to currently selected row in the list.

Options Position, the Picture is link, Hypertext link, Bit controlling visibility, Visible when value is zero when the value of zero have similar function as for double-state image.

3.9 IP camera picture properties

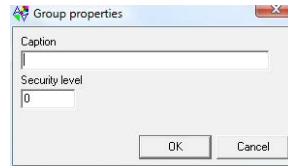


Link to the IP camera picture – Address where the IP recorder publish picture in the JPG format.
Refresh rate– Rate of picture loading form IP camera in seconds.

Options Position, Size, Bit controlling visibility, Visible when value is zero have similar function as for double-state image.

4 Groups and pages properties

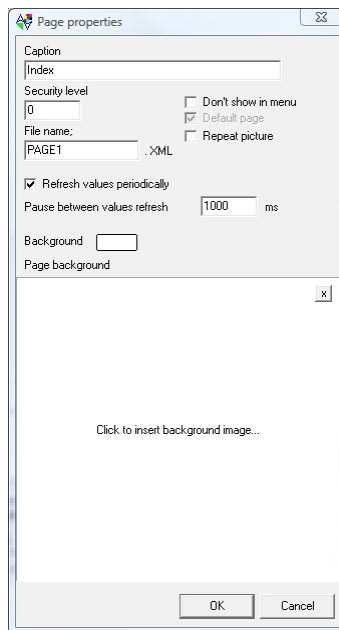
4.1 Group properties



Caption – The group name. This name is displayed in the menu on pages. If it is not set, only separation line is inserted to the menu.

Security level – determines the minimum level which the group in the menu will be displayed for

4.2 Page properties



Caption – Name of the page displayed in the heading

Security level – determines the minimum level which the group in the menu will be displayed and accessible for. The page is not displayed to users with lower security level, server returns to this user error 403 – access denied.

Don't show in the menu – switches whether the page is displayed in the menu.

Default page – determines whether the page will be the default page after logging in. Default page can be only one. There can be set different pages for each user name or MAC address in the password setting dialogue.

File name – Name of the file with the page content (max 8 characters).

Repeat picture – determines whether the picture on the page background is repeated as a wallpaper.

Refresh values periodically – switches on the value renewal on the page using the AJAX technology (requires the javascript support on the side of the browser).

Pause between values refresh – The delay between the query on new values after the successful reception of previous values in ms (minimum 250 ms).

Background color – Page background color.

Page background – Picture displayed on the page background.

5 Debugging mode

Debugging mode can be switched on from the tool bar via the pencil symbol. This mode is also activated automatically while the debugging is switched on in the environment directly. To ensure the correct operation of this mode, it is not necessary to compile the web pages.

In the debugging mode, apart from few stated exceptions, objects behave in the same manners as on the web pages. Data for objects are retrieved via standard communication therefore no support of the web server is required within the PLC.

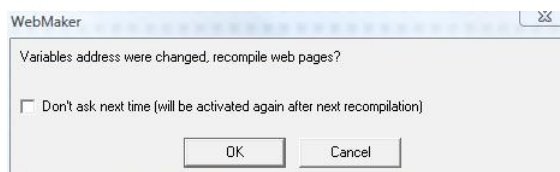
5.1 Different behavior of objects in the debugging mode vs. displaying from the web server

- Links to external pages are not functional during debugging
- Entry field without the sending button can be sent using the enter key
- Edited and unsent values are always indicated in the debugging mode by red color (this indication is functional in the web browser only on periodic refreshed pages).
- During debugging the picture from the IP camera is not displayed.
- There are displayed gradients on dynamic bars in the debugging mode in the same manner as on the ID-18/28 panels. This gradients are not displayed in a web browser.

6 Web server operation

The memory card is necessary to save files from web pages for use of web server function within the PLC Foxtrot and TC700. These files are necessary to generate by compilation of web pages before sending of the program code. The final files are saved in the project in the directory „SendRoot“ in the subdirectory „WWW“. The directory „SendRoot“ is automatically synchronized during the code sending with the directory „ROOT“ on the memory card in the PLC thus the web pages are actualized automatically.

In case that the last generated pages refer to variables which absolute positions were changed since generated, the user is asked during the program compilation to compile web pages again by the following dialogue.



The dialogue can be suppressed by checking the option „Do not ask again“. This option is accepted also in case that the dialogue is canceled. The dialogue remains suppressed until the next compilation of web pages is selected within the tool.

If web pages are left with old absolute addresses, it can cause unpredictable user program behavior during data entry, therefore, it is advised to compile pages every time the absolute addresses are changed.

Web pages are, after a successful loading of files into the PLC, accessible via web browser on the IP address of PLC (e.g. <http://192.168.134.176>).

When accessing the web server, the user (if MAC address of his network adapter was not found in the table for access without logging in) will be first redirected to login page with the address „http://<ip_address>/syswww/login.xml“. After the right password is entered, user is redirected back to the default page. The validity of the login page is 30 seconds. If the logging in proceeds after this period, the password entry will be required again. During the login page validity period, the web server replies to all other requirements by error 403 – access denied. The solution is to return to login page address.

The login to web server expires during two minutes from the last access. After the login expires, the user is, when accessing the web server, redirected to the login page again. Within pages with automatically refreshed values, each refresh is taken as an access thus until data are still refreshed, the login will not expire.

6.1 Minimum requirements on the web browser

For correct web pages displaying, it is necessary to ensure that the browser meets following requirements:

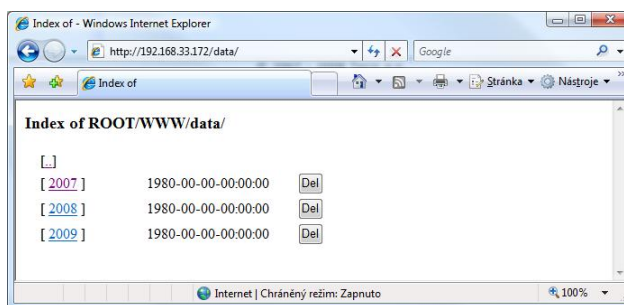
- support of XSLT (Extensible Stylesheet Language Transformation)
- support of cascade styles CSS2 (Cascading Style Sheets, level 2)
- support of javascript for pages with periodic refreshed variables (especially object XMLHttpRequest and access to the page via DOM – Document Object Model)

These requirements fulfill all mass used web browsers designed for PC (Internet Explorer 7, Firefox 3, Google Chrome, Opera 9, Safari 4). The mobile device can be used in Safari (iPhone) and Opera Mobile 10 (Android, WM), Mobile Internet Explorer 7 (WM).

6.2 Access to files on the memory card via the web interface

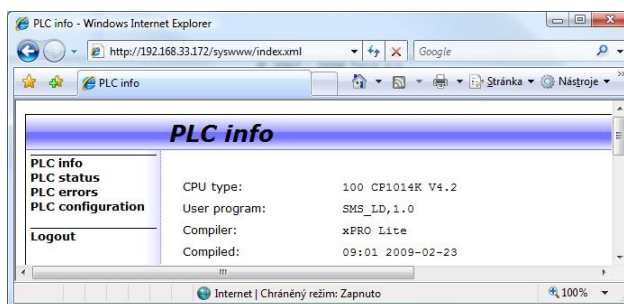
If we want the files on the memory card to be accessible via the web interface, it is necessary to save them into the independent directory under the directory „WWW“. Such subdirectory can be accessed via the web interface via the link consisting of the subdirectory name and a slash (“http://<ip_address>/<directory>/“).

The page with the list of files and subdirectories is automatically generated over the directory. From this page it is possible to download or delete files that the directory contains.



6.3 System pages

There are in the PLC, independently on the memory card presence, system web pages with basic data about the system. These pages are accessible at the address “http://<ip_address>/syswww/index.xml“. The access names and passwords are the same as for the user settings. If there is no memory card in the PLC or there are no user pages loaded on it, names and passwords have default values, as stated in chapter 2.4.





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