compatible with you

NETLink® WebService

for NETLink® PRO family

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Installation instruction and Application examples

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Note:

We have checked the content of this manual for conformity with the hardware and software described. Nevertheless, because deviations cannot be ruled out, we cannot accept any liability for complete conformity. The information in this manual is regularly updated. When using purchased products, please heed the latest version of the manual, which can be viewed in the Internet at www.helmholz.com, from where it can also be downloaded.

The application examples are not a prescribed configuration. They are intended as a guide to help you with some typical tasks. The application examples are not customer-specific solutions and do not purport to be complete. Configuration and operation in a manner suitable for your application is your responsibility. Systeme Helmholz GmbH cannot be held liable for any damage that may result from configuration and operation.

Changes to the application examples shown may be made by Systeme Helmholz GmbH at any time and without prior notice.

We accept no liability for the information contained in this document.

Our customers are important to us. We are always glad to receive suggestions for improvement and ideas.

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Status	Date	Changes
1	15.07.2009	First edition
2	08.04.2010	Customize the PRO family

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1 Overview

1.1 Application and function description

NETLink® WebService (short WebService) is a configuration software that enables the creation of an own browser surface for simple visualizations. Thereby, connections with one or several automatization devices can be established via a NETLink® Ethernet gateway.

The WebService installation setup is available on the NETLink® product CD or in the download section at www.helmholz.de.

This manual describes step by step the procedure necessary to work with the WebService application:

- Activation of the *'RFC 1006'* function (needed in NETLink® PRO)
- Installation and configuration of the WebService software
- Initiation and explanations for the included application examples
- Annotations to the configuration tool
- Advices for the creation of an own website

In order to build own visualization surfaces HTML and JavaScript programming skills are mandatory. These are expected, and therefore there are no further explanations about them in this manual.

Configuration and installation of NETLink® products for operations with automatization devices are not explained in this manual. Therefore, this document is to be used in addition to the manuals for the *NETLink® product line* respectively.

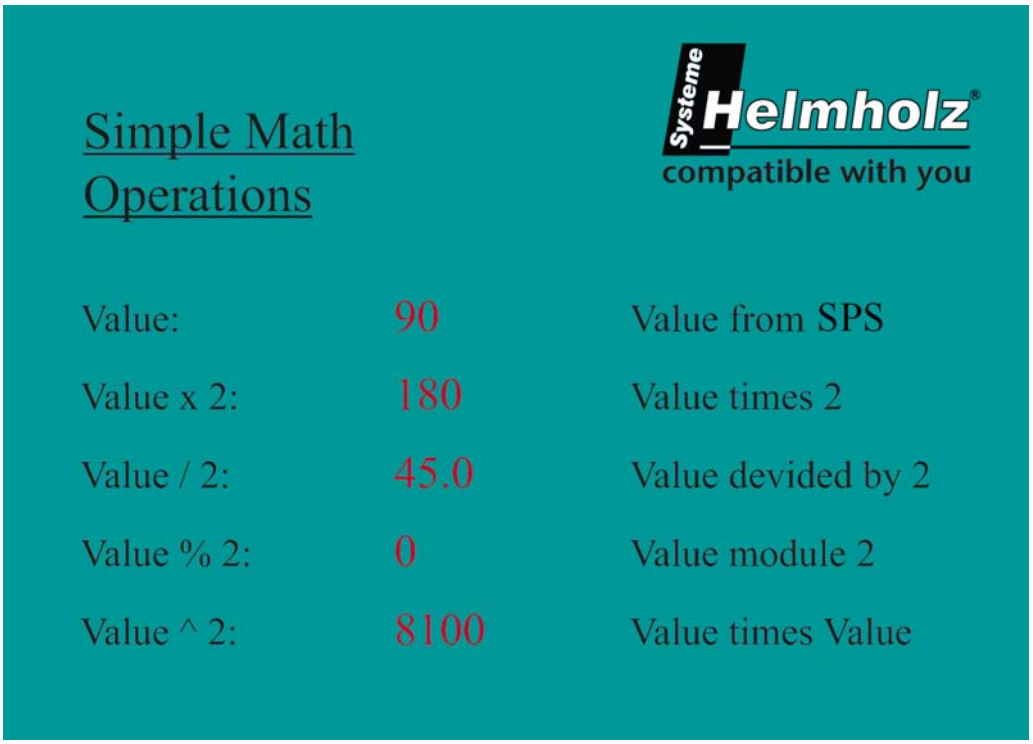
1.2 Information about figures

! *Mind the notes in the figures!*

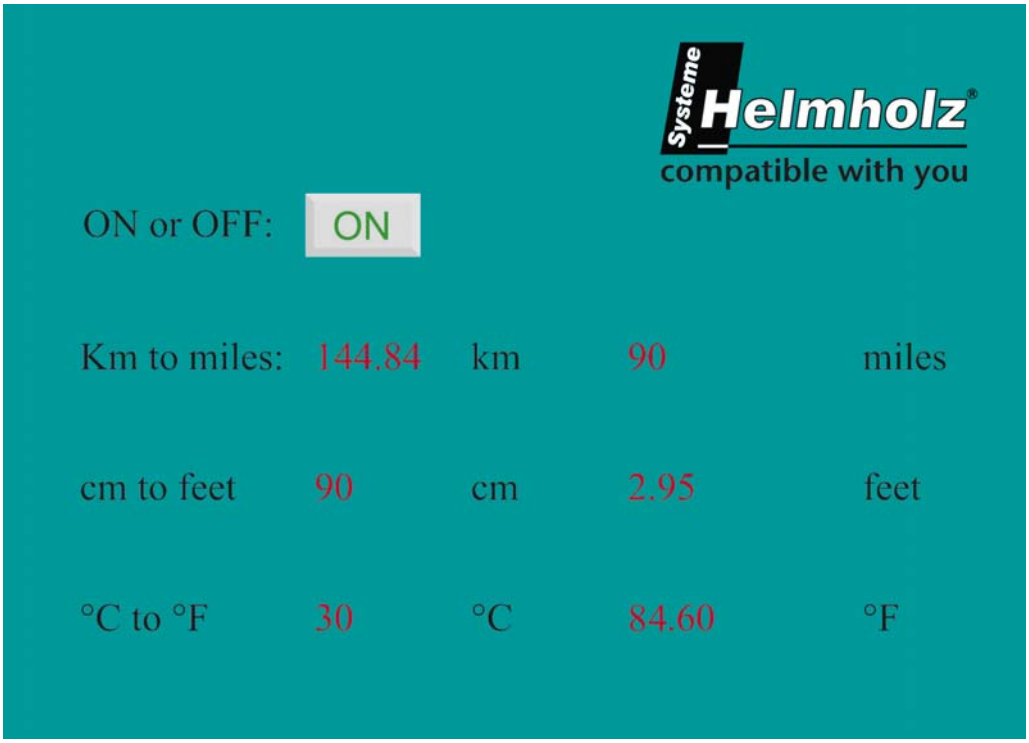
There are important settings and user advices marked red or highlighted in many of the figures in this document.

1.3 Short description of examples

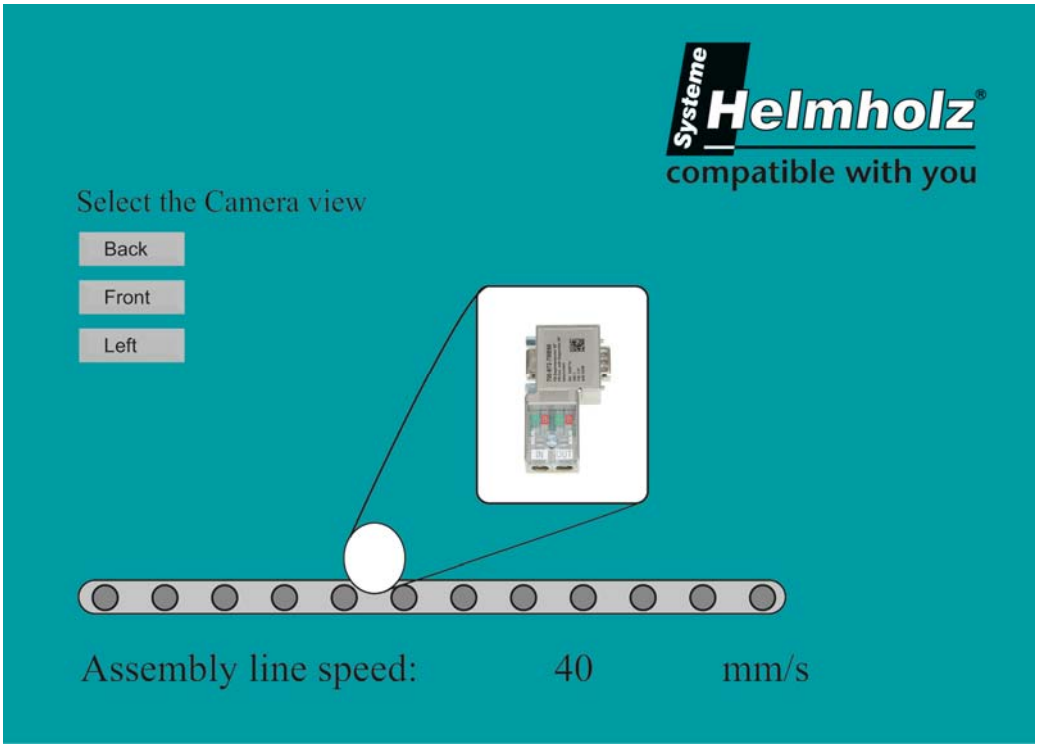
The first and second application examples illustrate the read-out of a parameter and the execution of simple calculation operations.



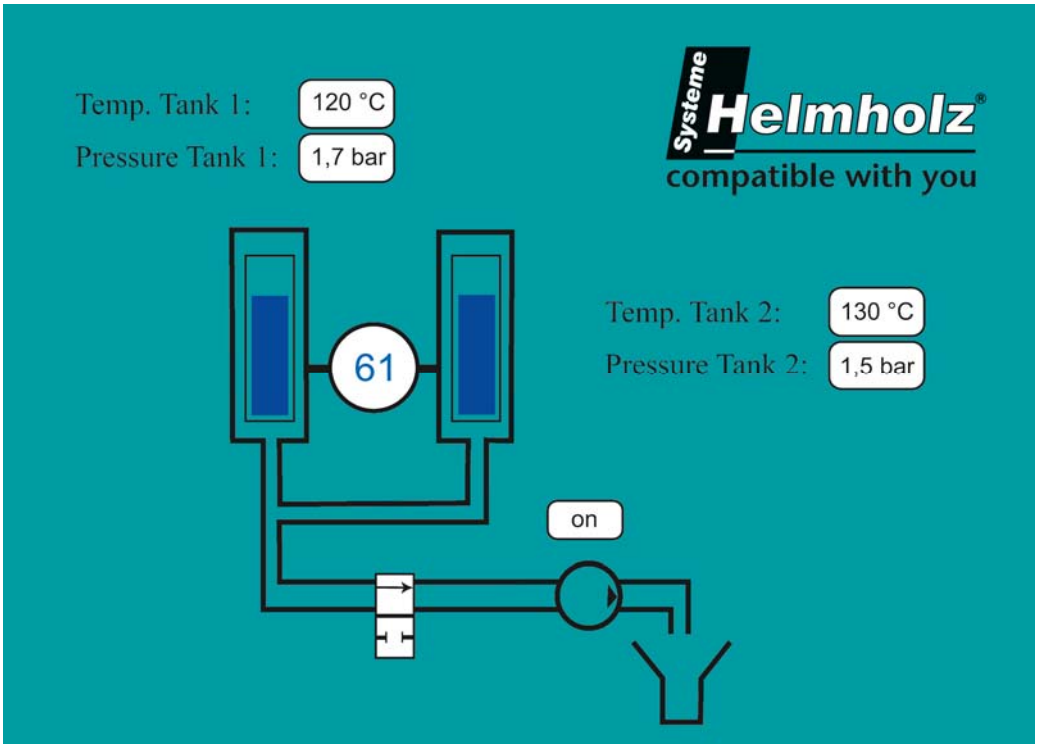
The following example shows in addition that also the text of pushbuttons can be changed by mouse click.



The third application example shows the speed of a conveyor band. It is e. g. possible to display different webcam perspectives by clicking the pushbuttons.



The last example shows, how pictures can be changed by using JavaScript functions in a way that fill levels of tanks or valve positions can be displayed.



2 System requirements

In order to use WebService a PC with a 32-bit Windows operating system is required. The operating systems Windows XP as well as Windows Vista can be used.

An installation under Windows 98/ME/NT/2000/64-bit Vista is possible, but is not supported by the technical support of Systeme Helmholz GmbH.

A functioning network connection via TCP/IP or WLAN needs to be set up in the used PC. The network configuration of the used PC has to be known. Standard network interface cards can be applied.

When working with a wired system one should use at least 100 MBit/s network interface cards and switches in local networks. Network interface cards and hubs with different speed can be applied as well.

To simplify matters the following chapters refer to NETLink® PRO (short NETLink®). Functions and settings are equivalent in all NETLink® devices.

In some newer firmware versions of the NETLink® product line the *"RFC 1006"* function is always active. What versions are affected can be found in the appropriate historical texts of the adapter.

The described applications were executed on a Windows XP operating system with service package 3 upgrade.

NETLink® is accessed via an installed internet browser (e. g. Mozilla Firefox, Opera, Konqueror or Internet Explorer). In order to do so the web interface function of NETLink® must not be disabled.

The installation of further NETLink® drivers is not necessary.

2.1 RFC 1006 activation via web interface

!

It is possible that data from the original Windows XP CD need to be loaded during the installation.

The WebService functions demand the previous activation of the RFC 1006 functionality in NETLink® PRO.

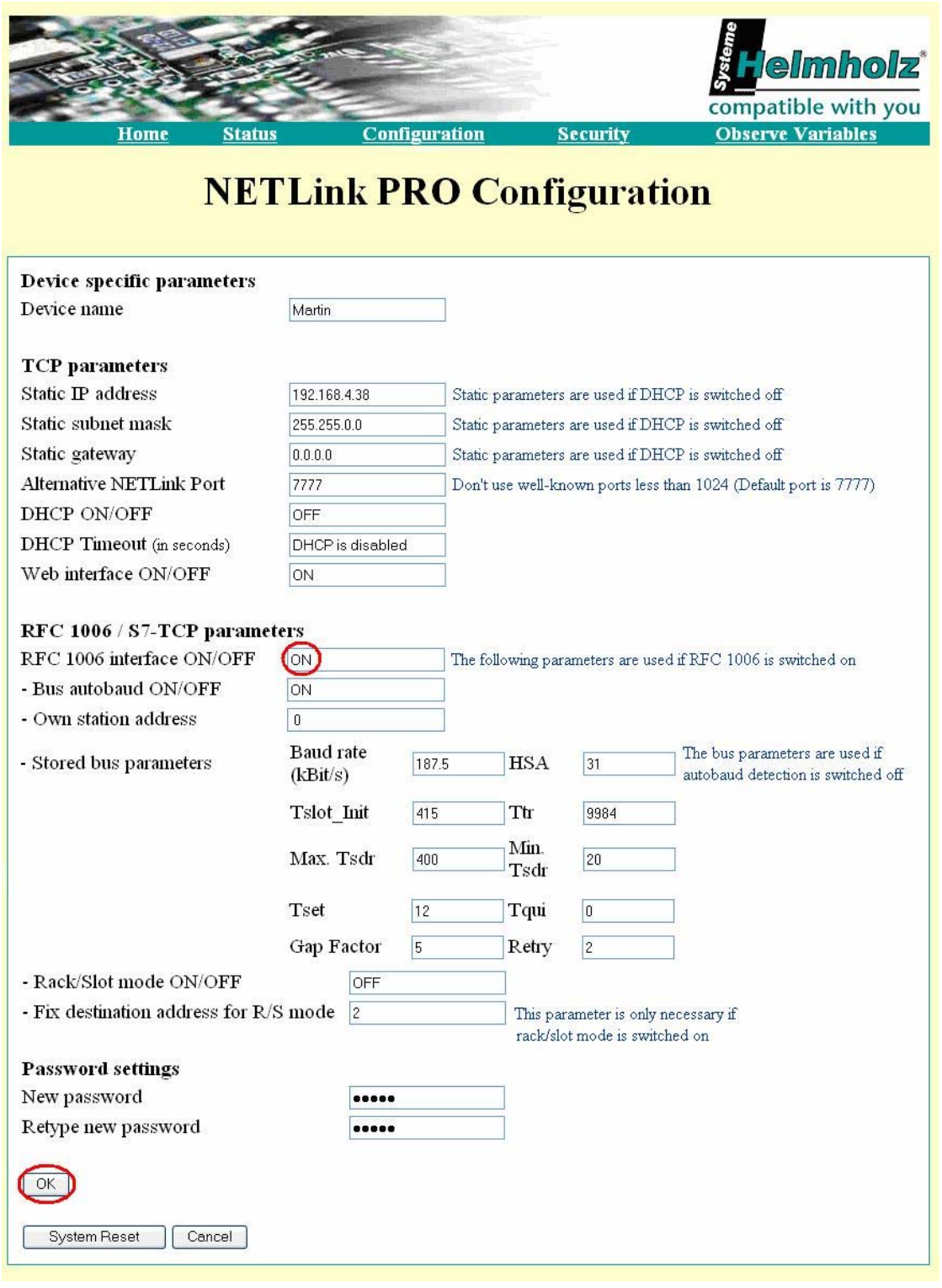
A detailed description is also given in the NETLink® manual! Maybe there is already a firmware installed in your NETLink® for which this manual setting is no longer necessary.

2.1.1 Adjustment on the configuration site

When you open the web interface by entering the respective URL *'http://<ip-address>'*, you can select the *'Configuration'* link. After a successful security query one has writing access to all parameters.

The option *'RFC 1006 interface ON*/OFF' is activated by entering *'ON*' and applied by confirming the *'OK'* button.

Configuration menu of NETLink® PRO (exemplary):



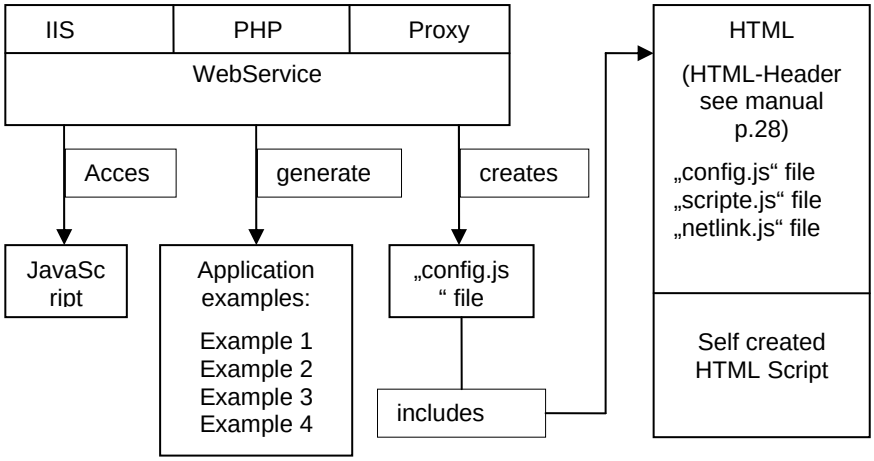
In the next window the settings are displayed again, and for a definite transfer to NETLink® they need to be confirmed with '*OK*'.

After saving of the new parameterizing data NETLink® is re-started in order to activate the new configuration.

The restart can take up to 15 seconds.

3 Installation of the configuration tool

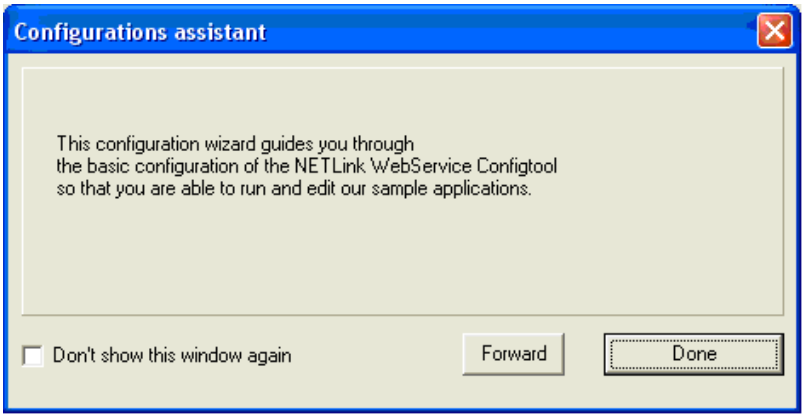
When inserting the NETLink® product CD the user guidance starts automatically. An installation assistant copies all relevant data to the hard drive. After it has been installed the WebService tool is accessible at *'Start/Programs/ Systeme Helmholz/NETLink WebService/WebService'*. During the first run the required services, utility programs and Systeme Helmholz application examples need to be installed. The block diagram shows an overview of the structural design.



If the user guidance does not start automatically, the setup file can be started manually in the directory "*CD-Drive: /SOFTWARE/NETLink WebService Setup.exe*"

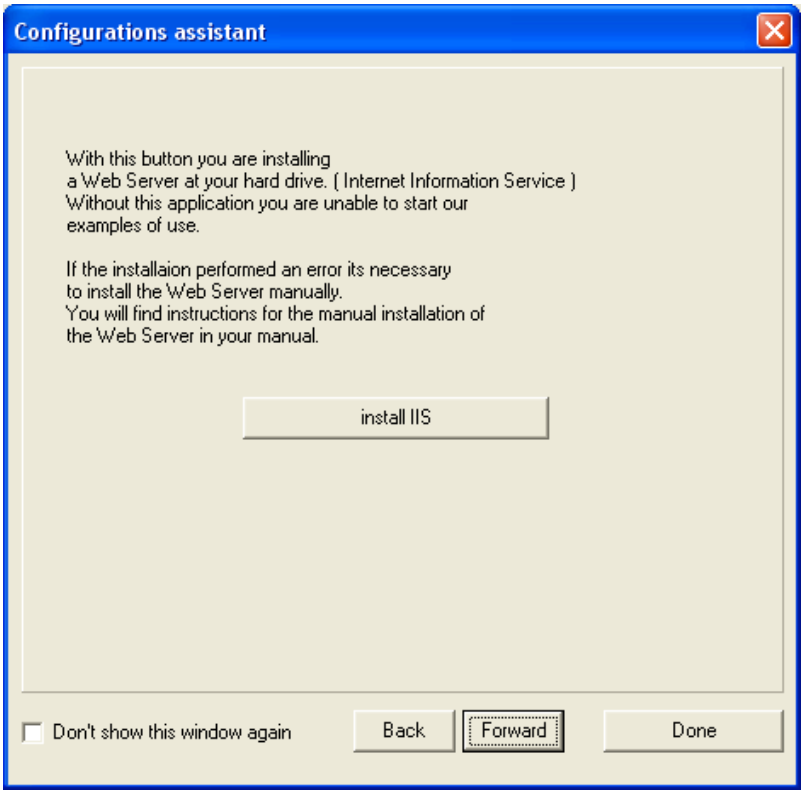
3.1 Configuration assistant

When you first run WebService a configuration assistant starts automatically. It guides you through the further installation procedures automatically.



3.1.1 Installation of the internet information service

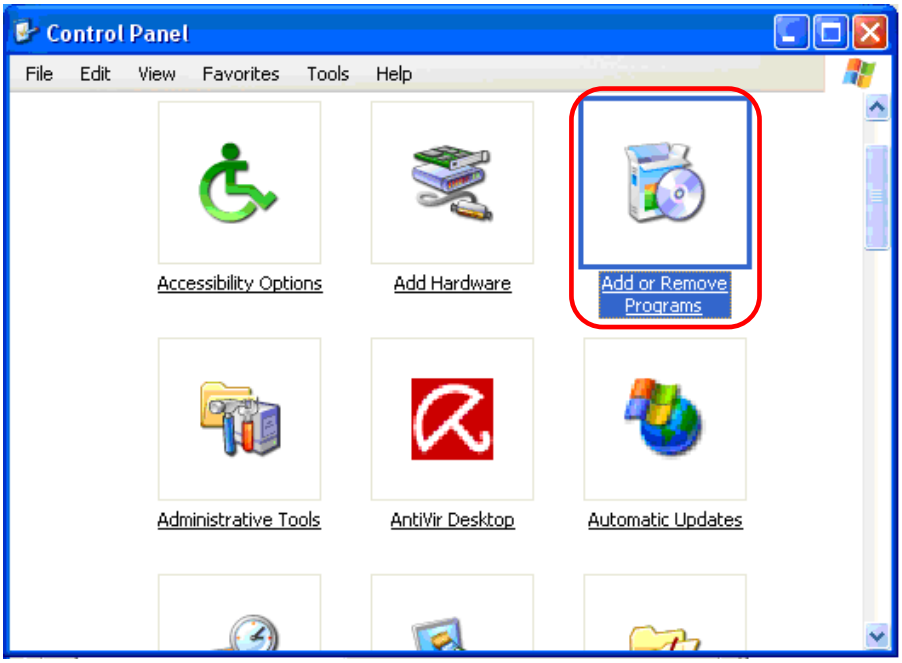
The Internet Information Server (IIS) is the web server that Microsoft provides as optional component for all operating systems since Windows 2000. IIS does not belong to the Windows standard installation but is always an option that has to be activated after the installation of the operating system.



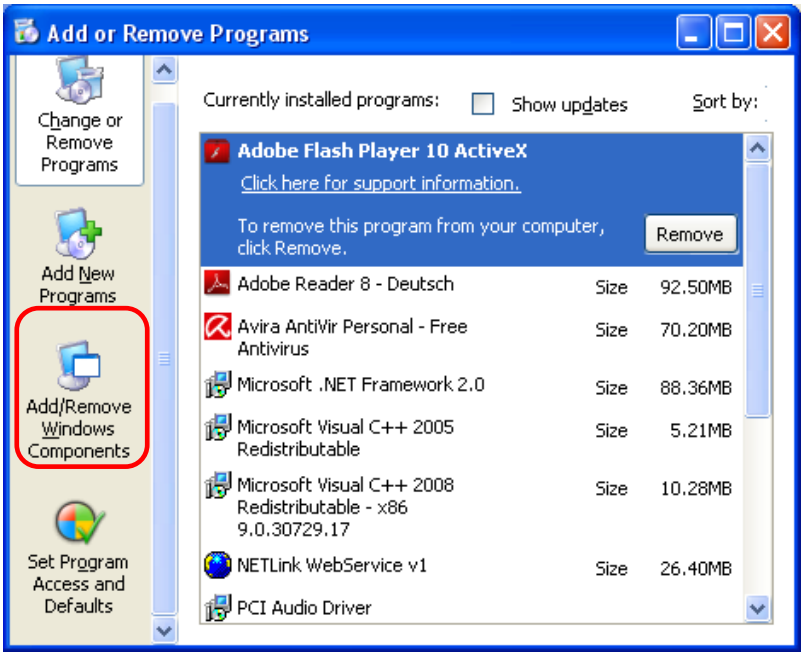
If the installation of the IIS server does not start when you push the *'Install IIS'* button, it is necessary to install it manually.

3.1.1.1 Manual installation of the internet information service

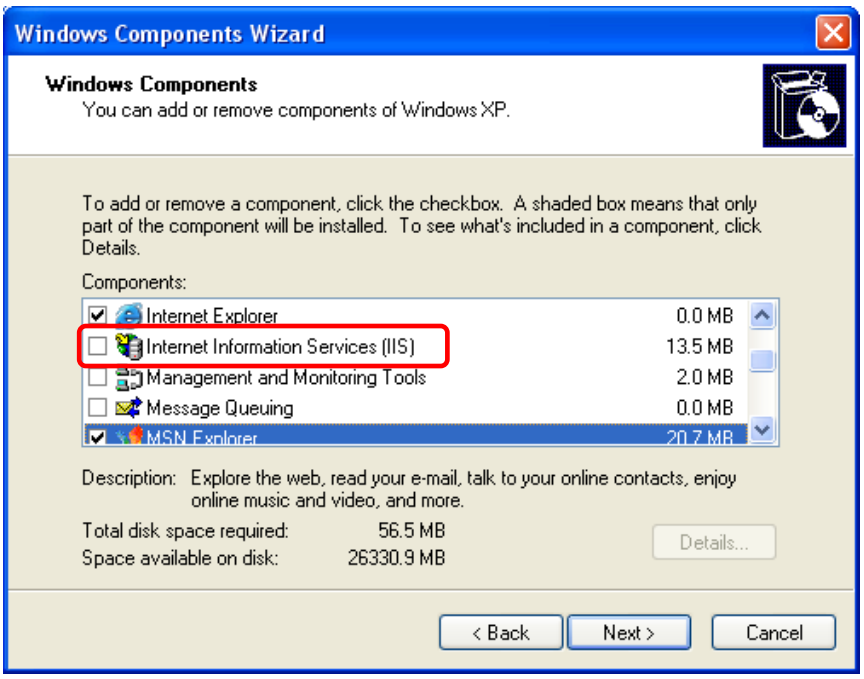
Go via start menu in the system control and open the menu item *'Add or Remove Programs'*.



Click on the *"Add/Remove Windows Components"* icon.



Tick the field next to "*Internet Information Services (IIS)*" and confirm by clicking the "*Next*" pushbutton.



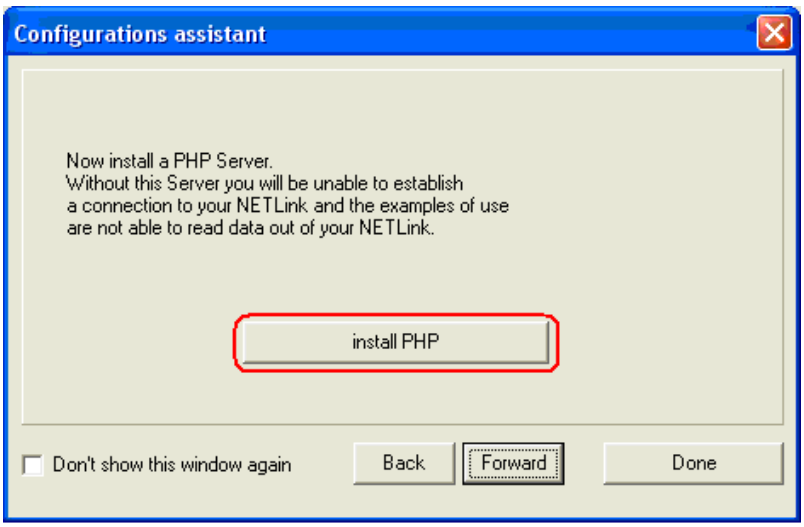
The operating system guides you through the further steps to install this Windows component subsequently.

Data of the original Windows XP CD may be necessary during a subsequent installation.

3.1.2 Installation of PHP

PHP („*Personal Home Page*" tool) is a script language with a syntax that is related to high level language programming. It is used for the creation of dynamic websites or web applications.

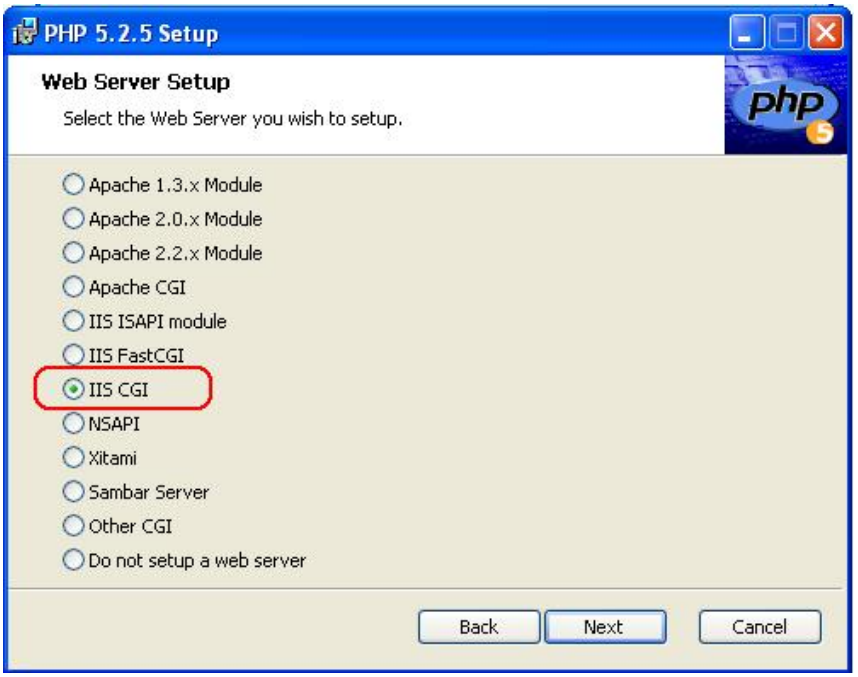
There are, for example, program libraries to dynamically generate pictures and graphics for websites.



After you have clicked the *"Install PHP Function"* pushbutton, an installation assistant starts automatically that will guide you through the installation process of the PHP function.

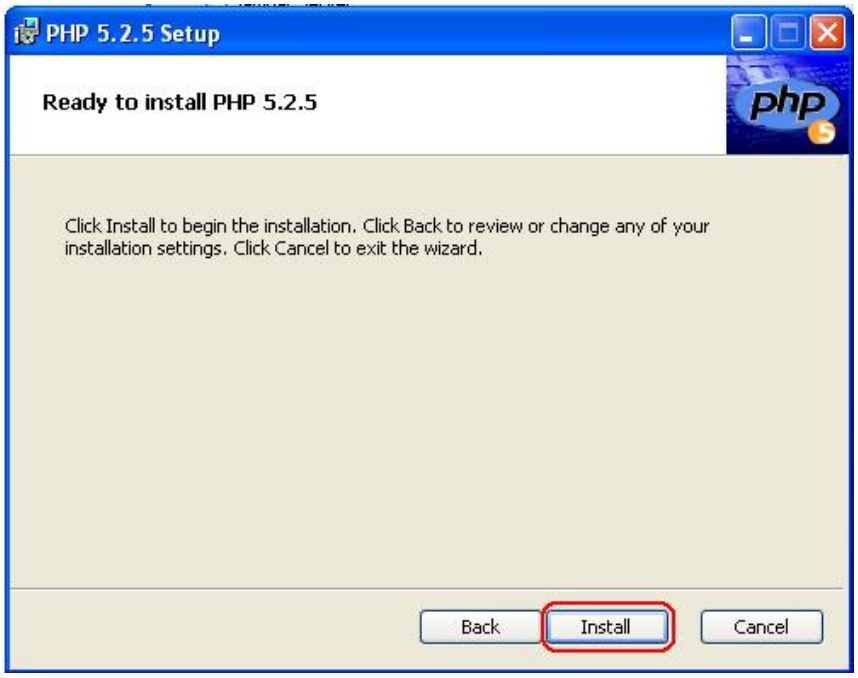
Before you start the installation by clicking *"Next"* you should deactivate all active anti-virus-programs for the duration of the installation process. Then you need to accept the license agreement. Also accept the hereupon suggested target drive in order to allow the individual program parts to interact without complications afterwards.

In the next step the web server type needs to be selected. Select *"IIS CGI"* and confirm the selection by clicking the *"Next"* pushbutton.



The selection of the available modules in the next step does not have to be changed and can be accepted by clicking *"Next"*.

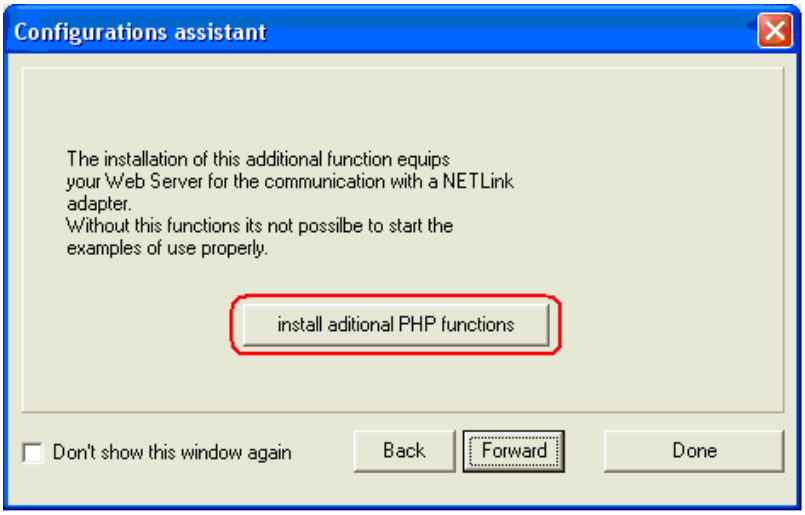
Now start the installation by clicking *"Install"*.



When you click the *"Finish"* pushbutton the installation is completed successfully.

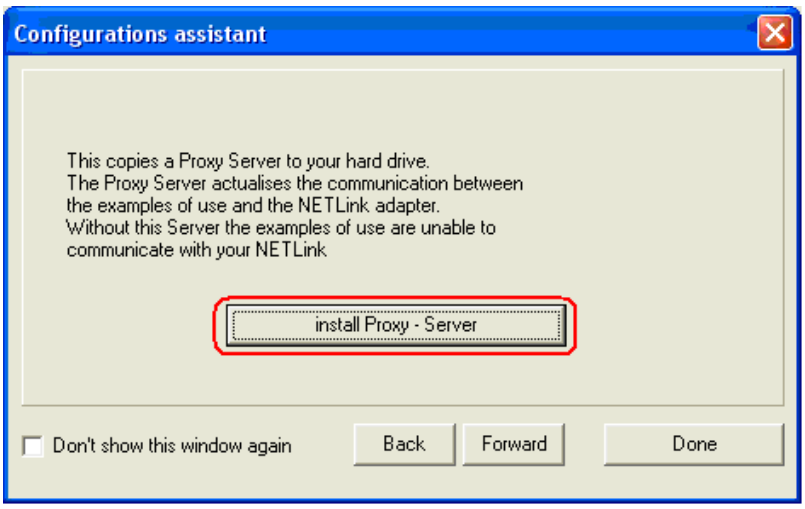
3.1.3 Installation of PHP additional options

During this step further library files for the PHP functions are copied into the respective directories.



3.1.4 Proxy Server

The here used CGI script operates as proxy function. Thereby, the data transfer between the web server and NETLink® is guaranteed.



All mentioned applications (IIS, PHP and Proxy Server) need to be installed only once during the first run of the configuration assistant.

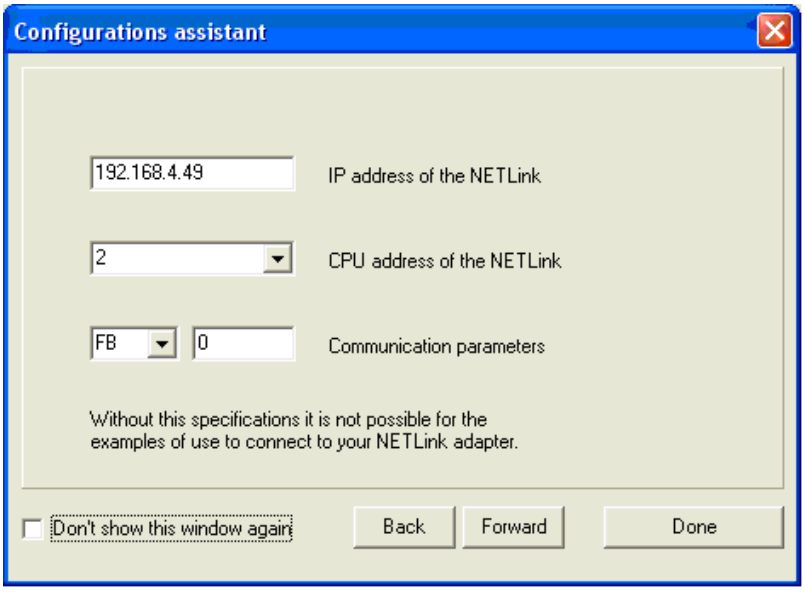
3.2 Communication parameters

In order to display values in the example applications, the following fundamental entries have to be completed:

- NETLink® IP address.
- MPI/PROFIBUS address of the CPU.
- Operand that is to be read.

!

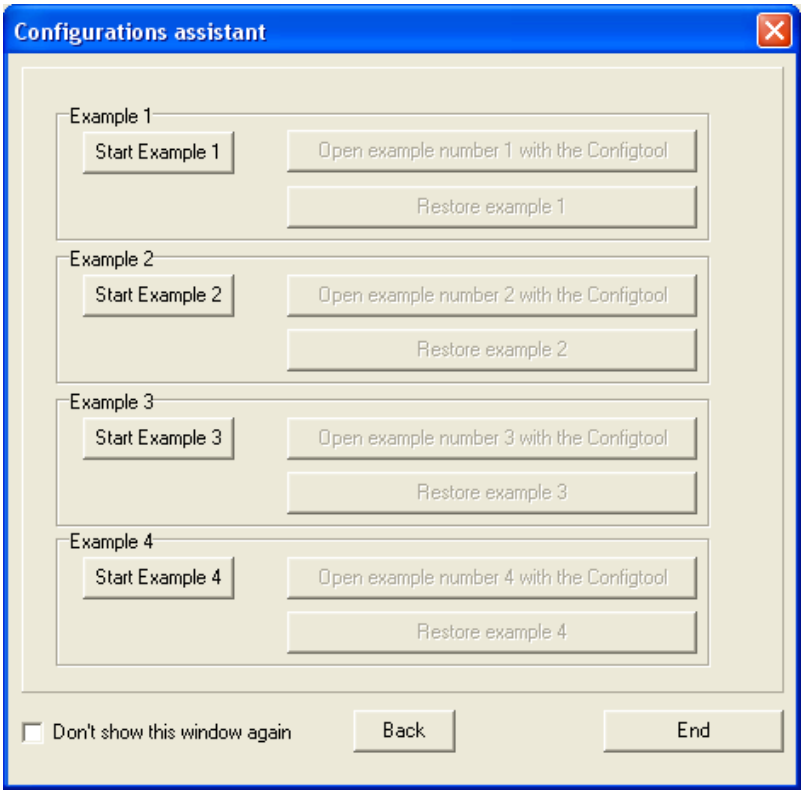
The information in this picture is just an example of the syntax. You need to enter the correct values.



After entering the values confirm by clicking *"Next"*.

3.2.1 Starting example applications

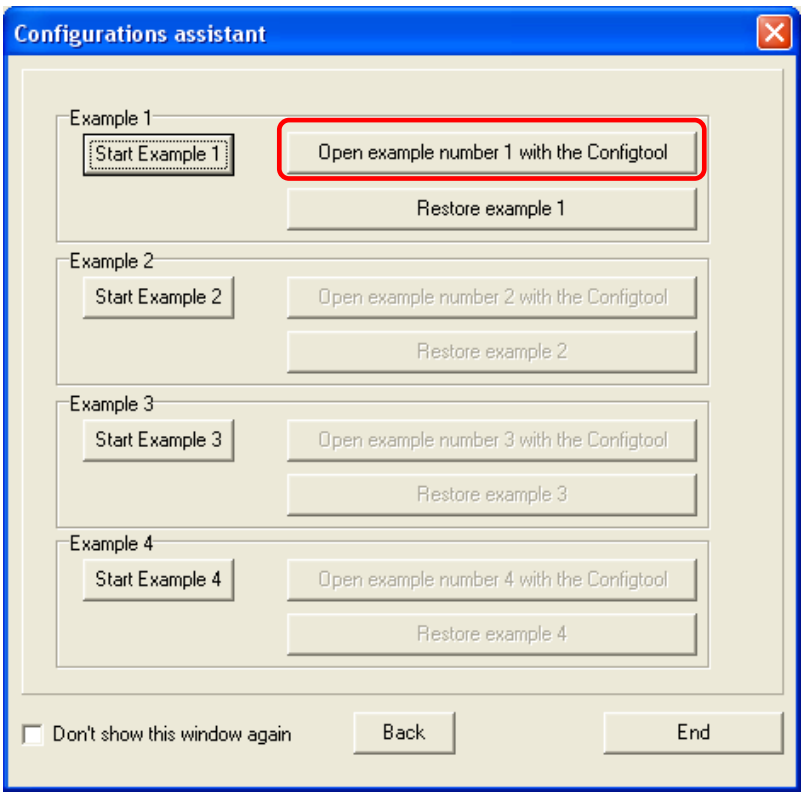
Finally the different example applications can be started by clicking the respective pushbutton. If this is not desired, the assistant can be quit by clicking *"End"*.



The application examples are copied into the directory *"C:\Inetpub\wwwroot\"* automatically and then executed in your standard browser, when you click the respective pushbutton (see chapter 1.3).

3.2.2 Editing the example applications

After an example has been copied to your hard drive and has been displayed, you can change some parameters of the example applications with the configuration tool which you can access via the *"Open example number 1 with the Configtool"* pushbutton.



A configuration site for the respective example opens. Further annotations are described in the next chapter.

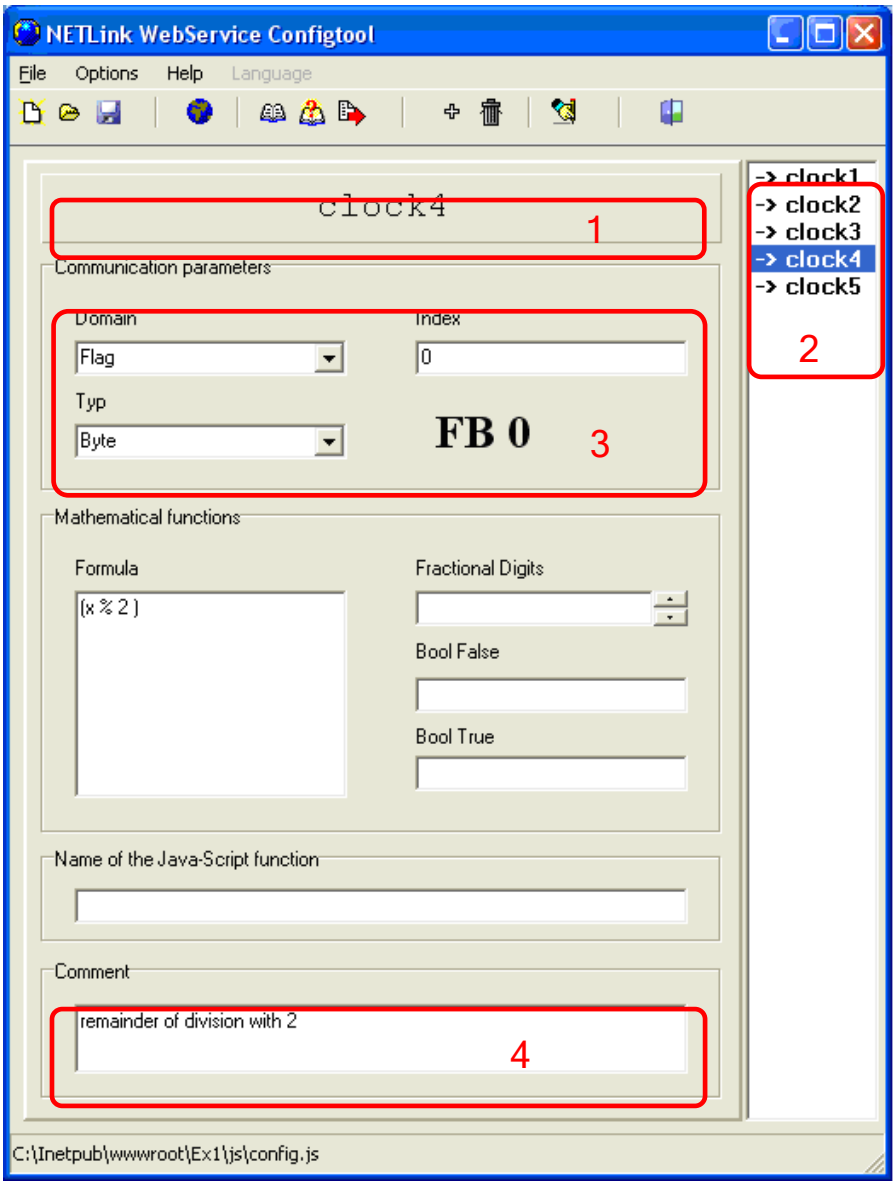
If you have edited and saved example projects for your applications, they can be reset to the initial state by clicking the *"Restore example 1"* pushbutton, if required. In that case values that have been changed by you will also be lost in the HTML file.

4 Editing of application examples

Below is described which changes in examples 1 and 4 can be done with Configtool (for a detailed description see chapter 5).

4.1 Example 1

When you open example 1 via the configuration assistant (see chapter 3.2.2) the following menu appears:



!

The IDs of the application examples can be changed and newly generated respectively.

4.1.1 ID name

1. clock4
   Currently selected ID. The name can be changed by the user, if required.
2. clock1 to clock5
   5 different calculating options were implemented in example 4. Those IDs can be selected and edited separately in the list.

4.1.2 Communication parameters

3. FB0
   The example reads the selected parameter (here flag byte 0) out of the CPU.

4.1.3 Commentary

4. Rest of a division by 2 (Modulo)
   Info box for user-defined notes. Not relevant for WebService functions.

   If changes have been made, you are asked to save the data when you quit Configtool. Switch to the display of your internet browser afterwards and actualize it. The application example is now loaded with the new parameters and displays them accordingly.

   If your browser does not display your changes correctly, it might be necessary for you to delete your *"Temporary Internet Files"*:

   In Internet Explorer:

   - Tools/Internetoptions, in tab *"General"* -> Delete Files.

   In Mozilla Firefox 3.5:

   - Tools/Clear Recent History, set the mark in *"Cache"* and -> clear now.

4.2 HTML code extract for example 1

The HTML file accesses the config.js that belongs to the project and has possibly been edited in WebService Configtool by means of the JavaScript modules. The IDs which are deposited there (possibly with the allocated simply mathematical options) are then displayed at the respective spot on the browser surface.

The extract shown below can be found under *"C:\Inetpub\wwwroot\Ex1\start.htm"* on your hard drive.

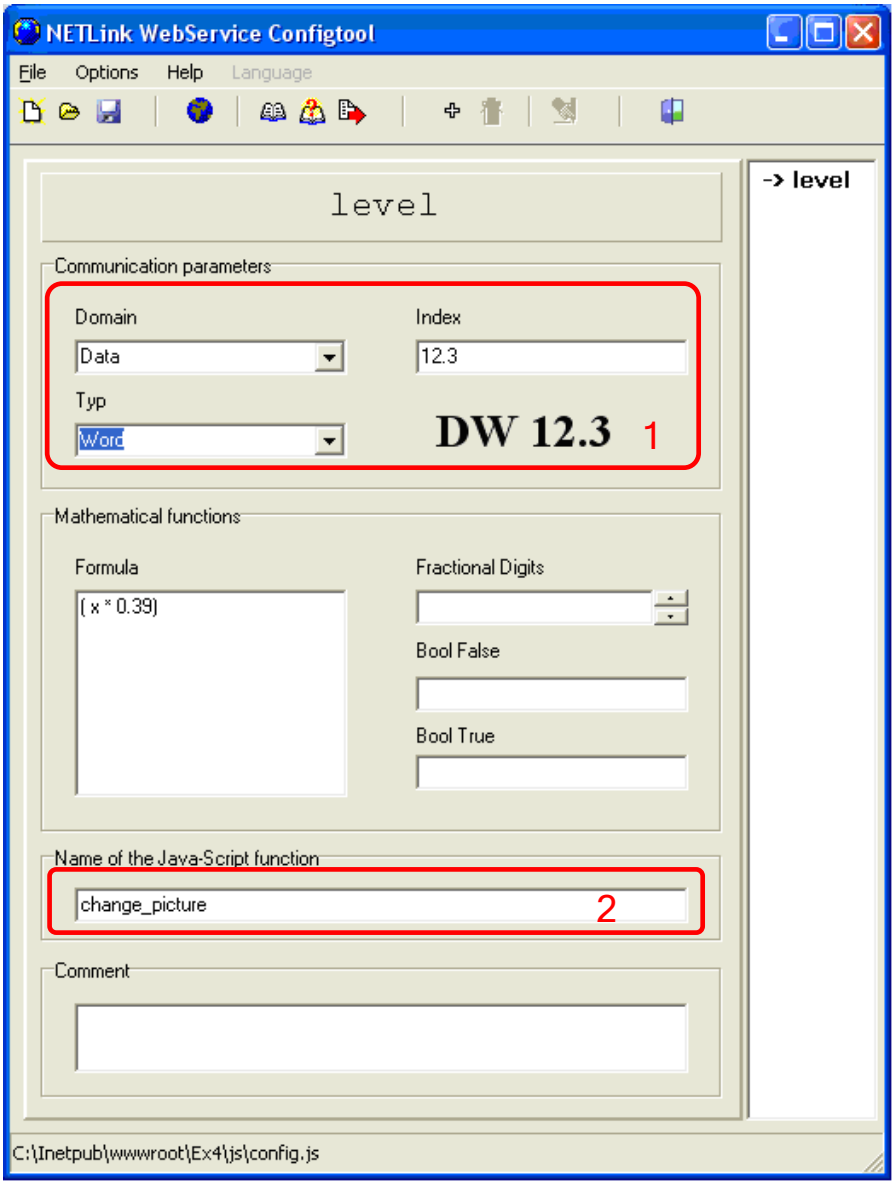
```
<table>

<tr height="100">
  <td width="100"></td>
  <td width="300"><font size="6">Value:</font></td>
  <td width="200"><font size="7" color="#FF0000" id="clock">XXX</font></td>
  <td width="300"><font size="6">Value from MB 0 </font></td>
</tr>
<tr height="100">
  <td width="100"></td>
  <td width="300"><font size="6">Value x 2:</font></td>
  <td width="200"><font size="7" color="#FF0000" id="clock2">XXX</font></td>
  <td width="300"><font size="6">Value times 2</font></td>
</tr>
<tr height="100">
  <td width="100"></td>
  <td width="300"><font size="6">Value / 2:</font></td>
  <td width="200"><font size="7" color="#FF0000" id="clock3">XXX</font></td>
  <td width="300"><font size="6">Value devided by 2</font></td>
</tr>
<tr height="100">
  <td width="100"></td>
  <td width="300"><font size="6">Value % 2:</font></td>
  <td width="200"><font size="7" color="#FF0000" id="clock4">XXX</font></td>
  <td width="300"><font size="6">Value modulo 2</font></td>
</tr>
<tr height="100">
  <td width="100"></td>
  <td width="300"><font size="6">Value ^ 2:</font></td>
  <td width="200"><font size="7" color="#FF0000" id="clock5">XXX</font></td>
  <td width="300"><font size="6">Value times value</font></td>
</tr>

</table>
```

1 2 3 4

1. Text that is shown to the left of the variables.
2. Here, it is determined that the displayed text (3) is the ID clock5.
3. This text is displayed before WebService reads data out of the SPS or if an error occurs.
4. Text that is shown to the right of the variables.

4.3 Example 4

If you open example 4 via the configuration assistant (see chapter 3.2.2) you see the following settings:



4.3.1 Communication parameters

1. DW12.3
   For all changes in this example the data block 12 with byte 3 and 4 is used.

4.3.2 Name of the JavaScript function

2. Here, it is determined that the parameter is transferred to the JavaScript function "*change_picture*" after the application of the formula.

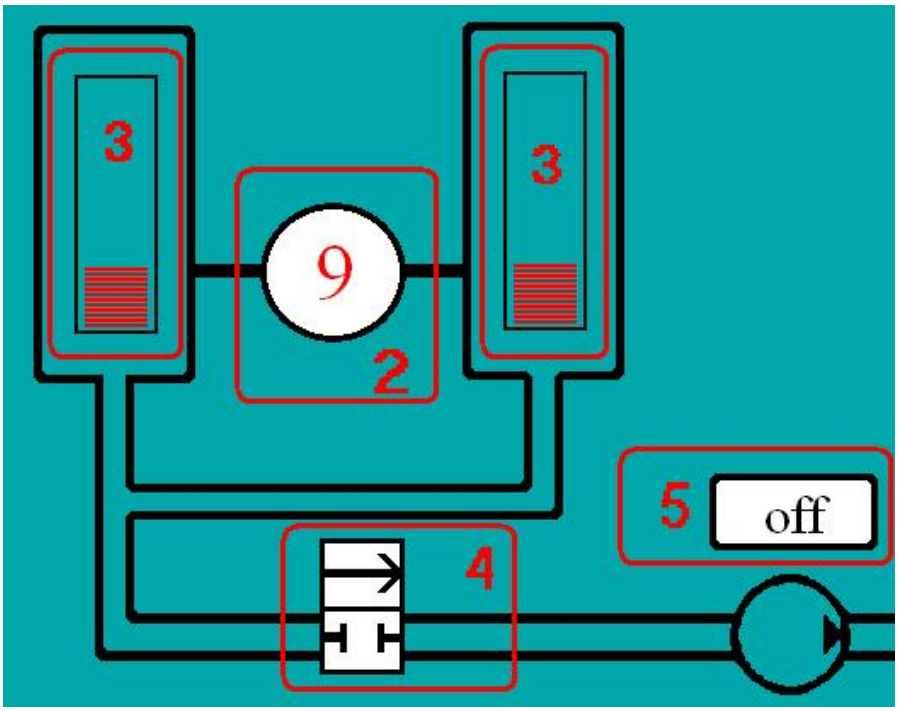
(See chapter 5 for further details)

4.4 Java code extract for example 4

Extract from the JavaScript function *"change_picture"*:

The whole JavaScript can be found under *"C:\Inetpub\wwwroot\Ex4\js\scripte.js"* on your hard drive.

```
if(var_level < 10)    1
{
  document.getElementById("level").color = "red"; 2
  document.getElementById("picture").src = "1_10.bmp"; 3
  document.getElementById("picture2").src = "1_10.bmp";
  document.getElementById("vent").src = "vent_stop.bmp"; 4
  document.getElementById("switch").firstChild.nodeValue = "off"; 5
}
```

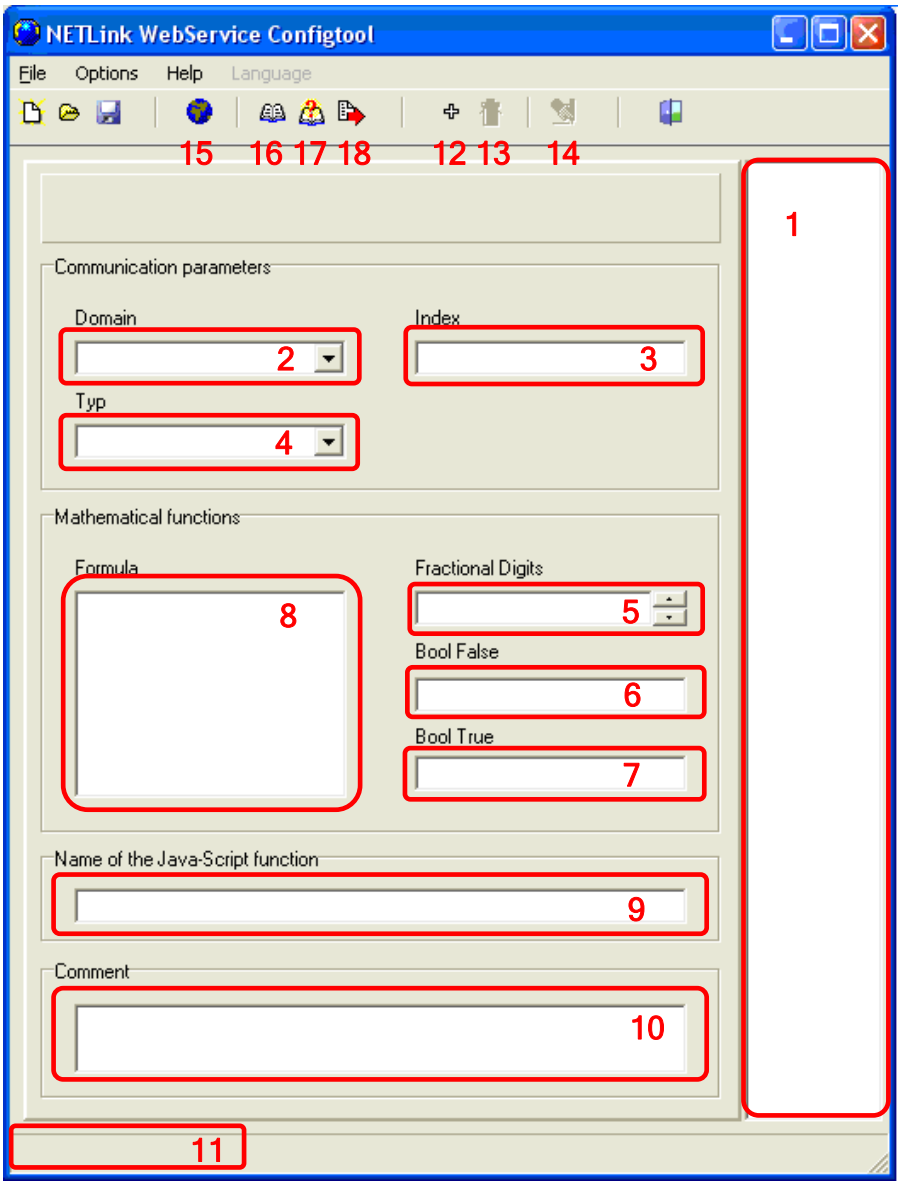


1. The following query function is accessed if *var_level* returns a value that is smaller than 10.
2. The values are shown in red.
3. The symbol for the tanks shows the level with the lowest fill level.
4. The symbol for the valve changes from flow (arrow) to locked position.
5. The display of the operating status above the pump symbol is changed to *"off"*.

5 Configuration tool

! *Important information about the creation of an own website are described in chapter 7.*

WebService Configtool represents the variables of the automatization device on the respective HTML surface by means of JavaScript. The generated code is stored in the *config.js* file. Below the different functions and settings are described.



! *At least 3 digits are necessary to display a valid function in JavaScript. If no function is to be used you can either leave the field "Formula" empty or enter "(x)".*

5.1 Description of marked fields

1. ID List
   In this list all IDs of the configuration file are displayed. Any adjustments made here are always saved in the config.js that belongs to the project.

5.2 Communication parameters

2. Domain [Periphery, Entrance, Exit, Marker, Data].
3. Index [0 - 256].
4. Type [Byte, Word, dWord, Integer].

5.3 Mathematical functions

5. Displayed decimal places fort his ID [0 - 100]. If no information is given here, the value is assumed from the "*Global Variables*", or the standard value for decimal places is used. [Optional].
6. Free editable text that is displayed instead of the value if this is 0 (false) (only valid after application of the formula!) [Optional].
7. Text that is displayed if the returned value does not equal (true) (only valid after application of the formula!) [Optional].
8. Formula that is applied to the value read out of the SPS. Here, all mathematical functions are allowed that support JavaScript [Optional].

!

The JavaScript file in which the function is defined needs to be included in the HTML script!

5.4 Name of the JavaScript function

9. Here, the name of the own JavaScript function can be determined. The resulting value of the respective mathematical function (see items 5 to 8) is always transferred to it. [Optional].

5.5 Commentary

10. Commentary for the respective ID. Has no effect on the display [Optional].
11. Path and name of the opened configuration file.

5.6 Menu bar

12. With the *"Add new ID"* pushbutton a new ID is created.
13. With the *"Delete selected ID"* pushbutton the currently selected ID is deleted.
14. With the *"Change ID name"* pushbutton you can rename your IDs.
15. Here, the window "*Change Global Variables*" is opened (see chapter 5.7).
16. Starts the configuration assistant.
17. Opens window with the Systeme Helmholz examples.
18. Imports IDs from a HTML files
    The selected IDs have to be entered in the HTML script as follows:

    Id="*Name_of_ID*" (see chapter 4.1.1)

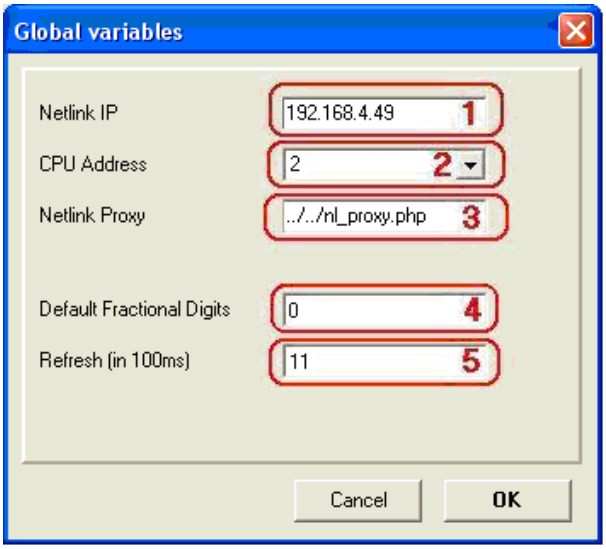
    No special or space characters may be within or outside of the quotations marks!

!

When you import an HTML file, all values that are currently used by the program are overwritten.

5.7 Parameters for global variables

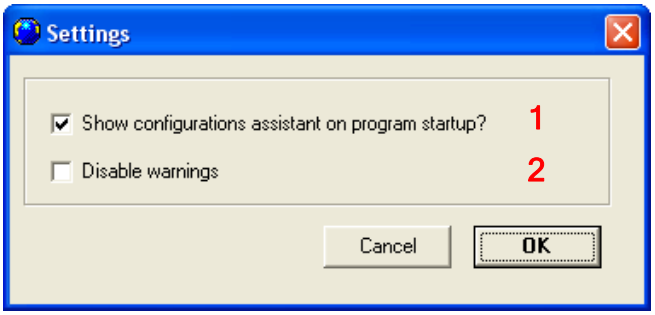
The window "*Global variables*" opens automatically when you create a new configuration file. If you like to change the parameters of an existing project, you get to this window via the "*Change global variables*" pushbutton (see marking 15 in chapter 5).



1. Enter the IP address of NETLink® here.
2. Set the MPI/PROFIBUS Address or your connected automatization device here.
3. Here you can enter an alternative path to the NETLink® proxy server. The proxy server that is used in the example applications (see 3.1.4) is located in the root directory of the internet information service (*C:\Inetpub\wwwroot\nl_proxy.php*).
4. Standard number of decimal places (used if no value for the number of decimal places for the IDs is given).
5. Here, you can determine the updating interval for your website (entered value multiplied by 100 ms).

! *When you create your own website please contact your web host.*

5.8 Options



1. When ticked the configuration assistant keeps on showing during program start-up.
2. When ticked the info boxes with warnings and error controls are switched off.

6 Creating an own website

The created website can be user-defined, but the following aspects need to be minded in order to assure that the change and update of the values actually work.

6.1 Including JavaScript

The following reference needs to be included in the <head> of the HTML file:

```
<!-- Javascript-Module zur Kommunikation mit NETLink PRO Adapter -->
 <script src="js/scripte.js" type="text/javascript"></script>
 <script src="js/config.js"  type="text/javascript"></script>
 <script src="js/netlink.js" type="text/javascript"></script>
```

Here, the path *C:/Inetpub/wwwroot/Ex1/Start.html* can be used as example.

- The JavaScript functions are located in the script file "*scripte.js*".
- The file *"config.js"* includes all parameters that are necessary for the communication with the NETLink® adapter.
  The file can be generated and changed by means of the Web-Service configuration tool.
- The *„netlink.js*" script file controls the communication with the NETLink® adapter. It should not be changed.

6.2 Automatically updating website

```
<body onload="updateStatus();">
```

By inserting the *updateStatus()* function in the <body> of the HTML file the values are read out of the NETLink® adapter and updated periodically.

6.3 Generating own IDs

Values that are to be changed are displayed as follows:

```
<font id="ID_NAME" > Zu_Ändernder_Wert </font>
```

!

Each ID name can be used only once and may not include space or special characters.

Note, that the entered text is displayed until your website is updated for the first time.

It is also displayed if your function is erroneous or your NETLink® is not reachable by the *updateStatus()* function.

IDs do not necessarily have to be inside a <font>, it is also possible to access pictures by means of the IDs.

```
<img src="Bild.jpg" id="NAME_DER_ID">
```

Note, that the changing of pictures can only be realized with a JavaScript function.

(See application example 4)

6.4 Importing IDs

After you have created your own homepage, you can import all IDs that you have used in your HTML script into the WebService configuration tool by means of the *"Import IDs from a html file"* pushbutton.

There you can delete the unused IDs or generate new ones, if applicable, and edit them according to your requirements.

Notes