



Overview

The ProfiLab WebServer 1.0 is an add-on product to our current ProfiLab product series 4.0. With the WebServer it is most simple to publish ProfiLab projects on local networks (LAN/WLAN) or on the Internet. The front panels of a ProfiLab project are transformed to a live html web content, accessible with any web browser.

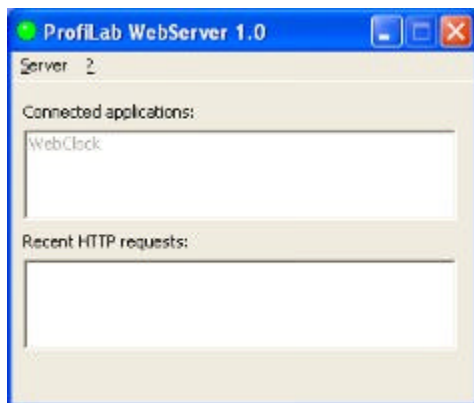
The WebServer works together with DMM-ProfiLab, Digital-ProfiLab and ProfiLab Expert, as well as it works with compilations made with ProfiLab-Expert, but please remember that the WebServer itself is NOT part of the compilation. This means that people using ProfiLab compilations need to have their own WebServer license to take advantage of the web server functionality. Otherwise the compilation can be used as a local application as usual.

WebServer and ProfiLab application need to run on the same PC system in any case. The WebServer recognises published ProfiLab applications automatically and serves their corresponding HTML pages.

Please feel free to visit our homepage www.abacom-online.de as well.

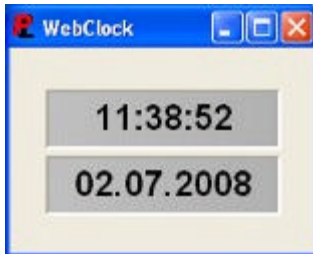
Getting started

The WebServer is started from the Windows start menu or with a desktop icon that was created from the installation routine. As it makes no sense to run more than one instance of the WebServer, you will be informed that the server is already running on every start attempt. On initial start the following window will appear:

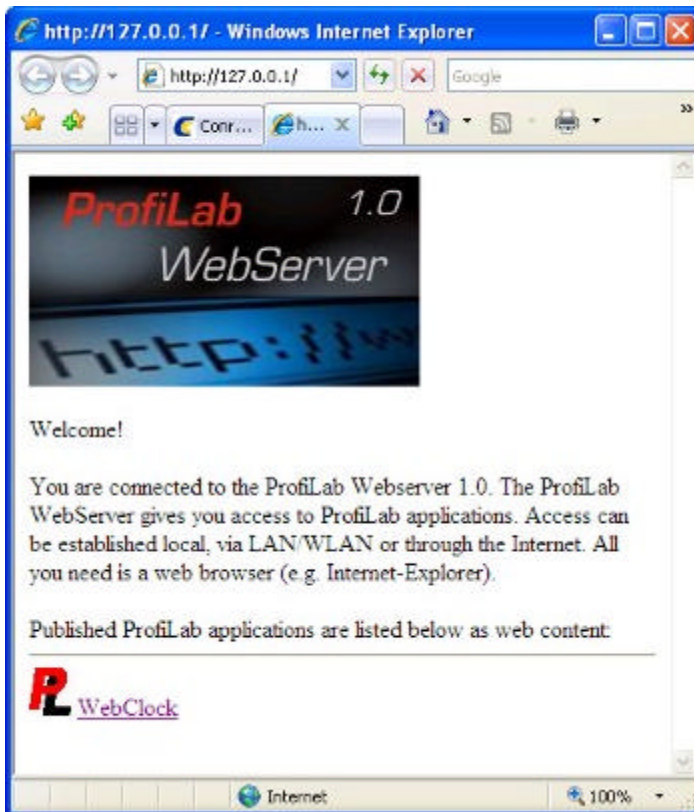


The simple menu is self-explaining and two lists provide information about currently published ProfiLab applications and IP addresses of latest http requests.

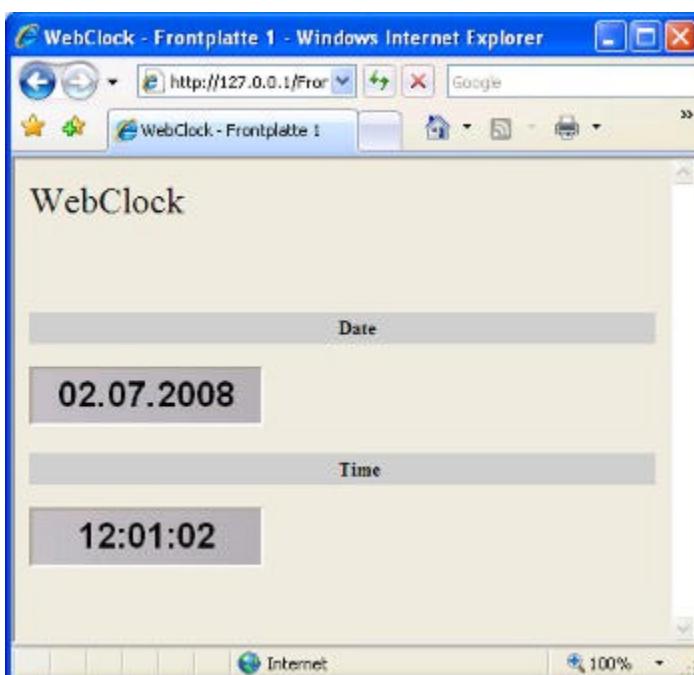
On first go we recommend to try the TEST function from the SERVER menu. This will open your Internet browser and request the servers welcome page, using the local request `http://127.0.0.1`. After that a simple ProfiLab application (WebClock) is load for demonstration.



The WebClock application should now appear in your web browser as well:



On bottom of the welcome page you can follow the WebClock link, showing current time and date displays on a html page.



Getting so far the first test was performed successfully.

Terminating the server and running it in background

The WebServer can exclusively be terminated from the main menu.

In opposite to 'normal' Windows applications can NOT be terminated with the close button (<ALT><F4>). This avoids accidental program termination. Clicking the CLOSE or MINIMISE buttons, the server continue running iconized in the taskbar notification area, as other background programs do.



Clicking the icon will restore the server window to its normal size. The server can be started iconized automatically, if corresponding option is checked under SERVER->[SETTINGS](#).

Settings

With SERVER->SETTINGS the server name can be changed as you like it.

A simple password protection can be activated to prevent unauthorized access. The browser will request username and password in that case. Please be careful with that function. You need to enter the right password to change the password again! Access is granted with the same username and password in any case. It is not possible to configure additional usernames with different passwords.

Check the option [MINIMIZE ON START](#) if you prefer that.

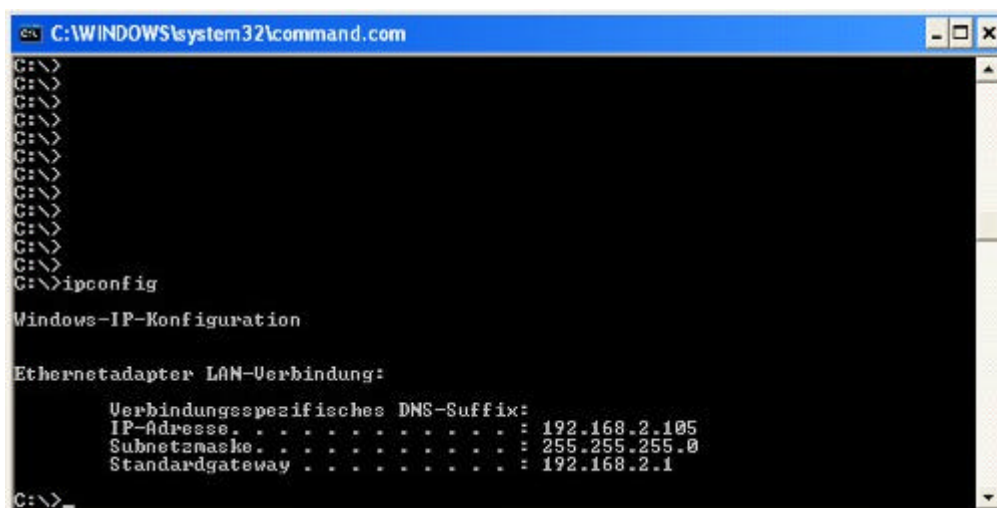
Access from remote computers

Primary intention installing the WebServer is to grant access to information from remote computers over networks. As network and Internet installation is part of almost any computer installation these days, we will not take a close look on that topic.

As our initial test had shown your web browser can access the servers welcome page under address <http://127.0.0.1>. The local IP 127.0.0.1 is common to all network enabled PC systems.

To connect to a server the remote client need to know the IP address of the server. The IP address is comparable with a phone number that tells the client where to call the server in the network. Every PC that is part of a network has a unique IP in each network. This means that computers that are connected to two networks, for example LAN and Internet, do have two IP addresses. A private one for the LAN and a public one for the WAN.

To find out the local IP address (LAN) for a PC, you can type the command IPCONFIG in the command line windows (START->EXECUTE "COMMAND").



The public IP for the Internet (WAN) can be found out with the Internet itself. Several Internet pages offer the service to investigate and display your Internet IP.

After determining the server IP (e.g. 192.1.1.100) your browser can connect at `http:192.1.1.100` to the server. Some networks substitute IP addresses with better readable computer names, like LaptopMary, PC-Peter, etc. In that case the browser can use the address `http://PC-Peter` for example as well.

The ProfiLab-WebServer uses the fixed port 80, which is default for http.

Firewall

A Firewall prevents connections via TCP or other protocols for safety reasons locking ports. The firewall opens ports only for programs that are "registered" in the firewall software. So you will have to let the firewall know, that your application uses a TCP port and which one. How to do this depends on the firewall software you have installed.

For test purposes it could be useful to disable the firewall temporary and make the firewall settings later, when everything else works correctly.

Routers

Routers are often used to distribute an Internet connection to several PC systems.

This leads to the fact that these computers do not have an individual Internet IP, as they share the INTERNET IP of the router that has the Internet connection. (Within the LAN these system still have an individual LOCAL IP, but this is not known in the Internet.)

Make yourself clear that INTERNET IP and LOCAL IP are not the same.

Imagine you have setup a server application in such an constellation. Now a client tries to connect from some on the Internet. Which IP can we connect? The only IP that is available is the INTERNET IP of the router, but this is shared by several systems behind the router.

To solve this problem routers offer a specialised technology called NAT (Net address translation) or VIRTUAL SERVER. The router need to simulate a TCP server, that routes incoming TCP request for a certain TCP port to a certain PC in the local network, where you server application is installed.

Usually you need to make the following NAT settings with the routers configuration program:

- Type of protocol. TCP in our case.
- The TCP port for incoming requests (public port). This is the TCP port you have configured in the client application.
- The TCP port of the "real" server (local port). This is the TCP port configured in the server application.
- The LOCAL IP address of the PC system on which your server application is running.

Now the client can access the virtual TCP server using the INTERNET IP of the router and the public port of the virtual server. The virtual server will now hand-over the client request to the real server in the local network using the NAT list. As the public port and the local port of the virtual server need not to be the same in this constellation, client component and server component may have different ports as well

Fixed / dynamic Internet IP

Another problem with connections via Internet are dynamic IP addresses. In that case the Internet provider hands out a new (dynamic) Internet IP each time a connection with the Internet is established. Even worse that some providers force a disconnect and re-login. This fact prevents to set up a server via a DSL connection, as the server would have a new, unknown IP regularly. Some providers offer a fixed Internet IP, for some extra costs. Also some Internet services offer a fixed IP that is mapped to a dynamic IP.

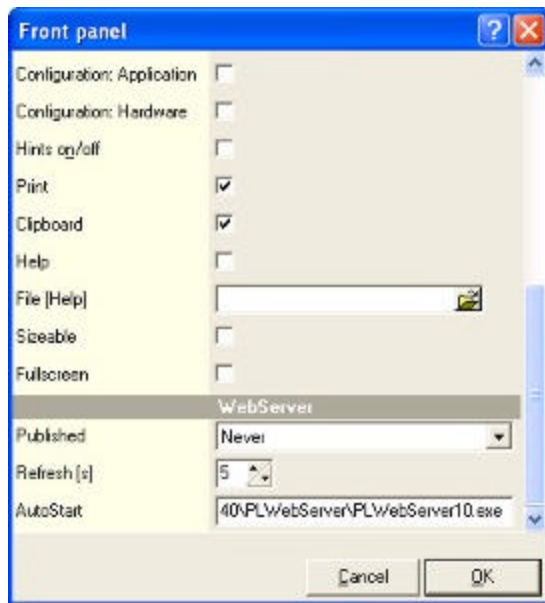
If you want to set up TCP server via Internet you will have to make sure that you have a fixed Internet IP first!

Publishing ProfiLab applications

With the ProfiLab WebServer you can publish all your ProfiLab 4.0 applications on a html web page. This is true for DMM-ProfiLab, Digital-ProfiLab and ProfiLab-Expert, having installed the update from our webpage from July 2008 or later. Compilations made with ProfiLab Expert need to be recompiled after

installing the update to take advantage of the web server functions.

One of three publish modes can be selected for a ProfiLab application. This is done in the FRONT PANEL PROPERTIES:



Published

- **Never:** The project will not perform any web server functions and is not public. This is the default setting.
- **Run-time only:** The project is published at run-time only. It is not public while the project is being edited. This setting is recommended for the final release of the project.
- **Anytime:** The project is public as soon as it is loaded – running or not. This is helpful while your project is still under construction and you want to monitor changes to web settings in the web browser.

Refresh [s]

Enter the interval of front panel updates for the browser in seconds. Short interval gives a more direct feel, but could lead to flickering displays depending on the browser software used and also consume network and processing time. It is recommended to set the interval as long as acceptable for your project. An interval value of zero will disable the automatic refresh. In that case the front panel pages need to be re-loaded manually with the browser.

AutoStart

If you enter the EXE of your WebServer installation, ProfiLab can start the WebServer automatically whenever necessary.

As soon as a ProfiLab application wants to publish its content on the WebServer it establishes a connection to the WebServer software. This happens automatically, but to be complete we want to take a little closer look at that. Data exchange between WebServer and ProfiLab application is made in two different ways:

- 1.) A (local) TCP connection is established between both processes, to exchange internal commands and simple HTML content.
- 2.) A certain directory is shared and administered by both processes. This is used to exchange larger amounts of data, mainly images. For a typical XP installation this directory is C:\Documents and Settings\All Users\Application data\PLWebServer10\wwwRoot\TempFiles.

The directory (TempFiles) for temporary (image) files is part of the so-called wwwRoot directory. wwwRoot is a special directory that contains contents to be published by the WebServer. So you could add additional files to this folder to publish them.

Example:

```
C:\Documents and Settings\All Users\Application data\PLWebServer10
\wwwRoot\MyContent\MyHTMLpage.htm
```

Such a file could be opened with a WebBrowser using an address like
<http://127.0.0.1/MyContent/MyHTMLpage.htm>

The directory wwwRoot\HTML contains files that are necessary for basic operation of the WebServer:

- Welcome.html is the header of the WebServer's welcome page.
- Error.html is displayed if a request could not be responded correctly for some reason.

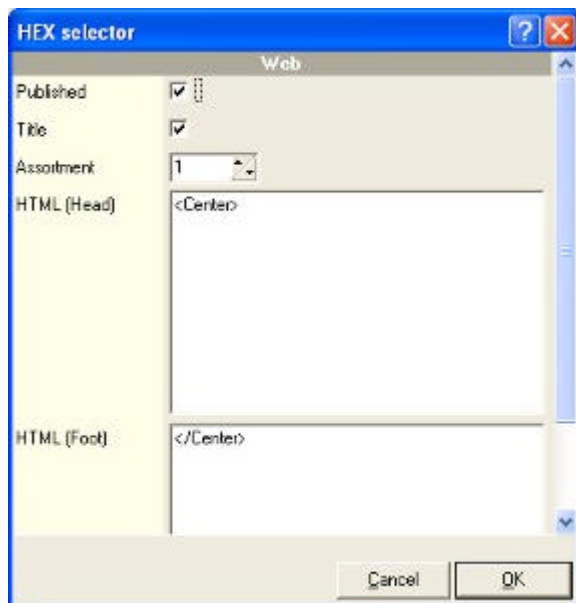
Both files could be customized if necessary.

Designing a published ProfiLab application

To publish a ProfiLab application on the WebServer open the front panel properties and set the PUBLISH MODE to ANYTIME.

While the WebServer is running you can now access the project and its front panels using the local address <http://127.0.0.1> with your web browser.

ProfiLab does convert the front panel to a html format that lists front panel elements as a table. To have some influence on the displayed format each front panel element has some web properties that can be configured. The dialog is called from the local popup menu (right mouse button->Web...)



Option PUBLISHED

If checked the element will be visible in the web browser, otherwise it is hidden.

Option TITLE

By default each front panel element is listed with a caption. This option can be disabled, which is useful to arrange elements beside each other. As far as the browser is wide enough, the front panel element will be placed beside its predecessor, otherwise beneath.

ASSORTMENT

Enter the list position at which the element is listed in the browser.

Lower number will move the element up in the list. Higher numbers will move it down.

HTML (head) / HTML (foot)

Additional (html) text could be added to these fields. The header is processed immediately before the front panel element, the footer is added immediately after.

For example the HTML-tag <center> in the header and the HTML-tag </Center> in the footer, would adjust the front panel element to the middle of the browser window. Headers and footers offers lots of opportunities to customise the webpage, but some skills in html programming is necessary for that.

Design considerations for published applications

There are some considerations that should be taken care of designing ProfiLab web applications.

- Front panel elements are controlled by simple clicks in the web browser, while ProfiLab front pane also use other mouse actions like 'right mouse button', 'push', 'pull', etc. Therefore it could be recommended in some case using edit fields instead of potentiometers and sliders.
- The status of front panels is updated in certain refresh intervals. Fast changes (like a blinking LED) could lead to confusion and misinformation.
- Large scaled elements (especially plotters) should be designed as small as acceptable to save network bandwidth.
- Page refresh and scrollbars are handled with some differences depending the browser software and can appear more or less flickering. It would be ideal to design compact pages, where scrollbars are not needed. Keep element small and use as few as possible, or distribute them on additional front panel pages. Set refresh interval as long as acceptable.
- Front panel elements are displayed as image in the web browser, to have a real look and feel. To shorten load time of pages most browsers use caching, where images are loaded only once. The browser will then display previously saved images, which may be not be up-to-date. It is strongly recommended turning off the browsers cache functions for control applications.