

SBC.Net and Web Connect

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0.1 Document History

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2007-08-29	EN02	-	Document completely redone
2007-12-05	EN03	Whole doc.	New Screen shots
2013-11-12	EN04	-	New logo and new company name

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1 SBC.Net and Web Connect

1.1 Introduction

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SBC.Net is a platform containing different components based on Microsoft.Net compact framework for communication and media exchange between Saia PCD® Systems and Windows applications. The media exchange can be done with S-Bus or CGI calls over Serial or Ethernet connections.

One of the main purposes using Web Connect is to allow HTTP clients like the Internet Explorer, Firefox and the Micro-Browser to access web pages located in PCDs even if they doesn't support the HTTP-direct protocol. This access is transparent to the HTTP clients.

On some PCDs (mostly the PCD2.Mxxxx and PCD3.Mxxxx with Ethernet) web pages can be accessed directly using HTTP-direct, without using Web Connect. Nevertheless in some situations it makes sense to use Web Connect to accelerate access to big projects by the caching functionality. Web Connect can also be used as Proxy-server.

This document describes how to setup and use SBC.Net and describes the Web Connect part of this application.

1.2 Features of SBC.Net and Web Connect

The following list shows the most important features SBC.Net and Web Connect version:

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- **HTTP server.** A HTTP 1.1 compliant web server is included in SBC.Net. Simply put some HTML pages into the web pages directory and they're available over the network.
- **Manageable over the internet.** All steps of configuring and managing SBC.Net can be done using only a web browser.
 - Access to the PCD's Web Server. This version of SBC.Net supports nearly all communication protocols to gain access to the web server in the PCD. Supported protocols are:
 - Ether S-Bus
 - Profi S-Bus
 - Serial S-Bus
 - Ether S-Bus SComm - (Windows XP with SComm only)
 - Profi S-Bus SComm - (Windows XP with SComm only)
 - Serial S-Bus SComm -(Windows XP with SComm only)
 - USB S-Bus SComm - (Windows XP with SComm only)
 - Modem S-Bus SComm - (Windows XP with SComm only)
 - USB S-Bus - (WinCE only)
 - USB xx7 - (Windows XP only)
 - Serial xx7
 - Modem xx7 - (Windows XP only)
 - RIO
 - HTTP-Direct
- **Caching.** Data transferred from the PCD can be cached to accelerate access to big projects.
- **Security.** The configuration area of SBC.Net can be protected by a password.
- **Common user interface.** The user interface is the same whether SBC.Net is running on a Windows XP or a Windows CE system.
- **Advanced logging.** Just in the case something is not going as intended the advanced logging functionality will help to find the cause of the problem.

1.3 Requirements

SBC.Net with Web Connect is able to run a desktop computer or on a Saia PCD® Web Panel CE/eXP some features depend on the operating system which Web Connect is running on and are therefore not available on all platforms.

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- Hardware Requirements:
 - 20 MB free disk space
 - 30 MB of free RAM
 - 400 MHz or better CPU
- Software Requirements:
 - Windows XP, Windows CE 5.0, Windows Mobile 5
 - Microsoft .Net Framework 2.0 or .Net Compact Framework 2.0 SP1
 - Microsoft Internet Explorer 6.0 or Firefox 1.5+ (recommended)

1.4 Installation

1.4.1 Windows XP/eXP

To install SBC.Net with Web Connect on a Windows XP or eXP based system start the setup.exe delivered together with the Web Connect package. The setup program will guide you through all steps of the installation process.

To use all communication channels make sure SComm is installed too. SComm is part of Saia PG5® but can be installed as a stand alone communication driver.

1.4.2 Windows CE/Windows Mobile 5

To install SBC.Net with Web Connect on a Windows CE 5.0 or Windows Mobile 5 device copy the cab file onto the device. Run the installer by double clicking the file. Follow the instructions of the installer. On a PDA Web Connect is now ready to use. On a Saia PCD® Web Panel CE restart the device by using the Reboot applet of the Saia PCD® Web Panel Manager.

1.5 Starting SBC.Net and Web Connect

To start Web Connect on Windows XP/eXP run
Start → Program → SBC → Web Connect → Web Connect.

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On a Windows CE panel go to the installation directory of Web Connect and run
swebconnect.exe.



If the Web Connect runs, then the following icon of Web Connect is displayed on the system tray:

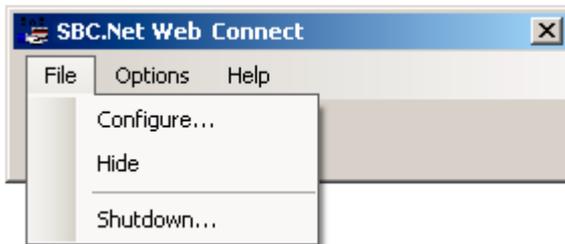
Depending on Web Connects configuration it's possible that nothing will be shown on the screen when Web Connect is started. To check whether Web Connect is running open
<http://localhost:80> in a browser.

The HTTP server of SBC.Net is listening by default on port 80 but if the port is already used by another application or server it will try to use port 81 then 82 etc. So if <http://localhost:80> doesn't display the SBC.Net start page or your own start page in the web pages directory then try
<http://localhost:81>, <http://localhost:82>, etc.



The actual used port of SBC.Net Web Connect can be displayed by double-clicking on the icon of SBC.Net Web Connect on the system tray.

The following options are possible:



1

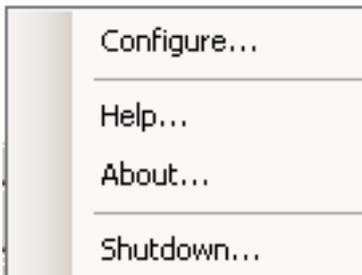
File, Configure: Open the setup area of SBC.Net Web Connect.
(Details on chapter 2.5)

File, Hide: Close the window

File, Shutdown: Shutdown SBC.Net Web Connect

Option: Starts the SBC.Net Web Connect if Windows does start

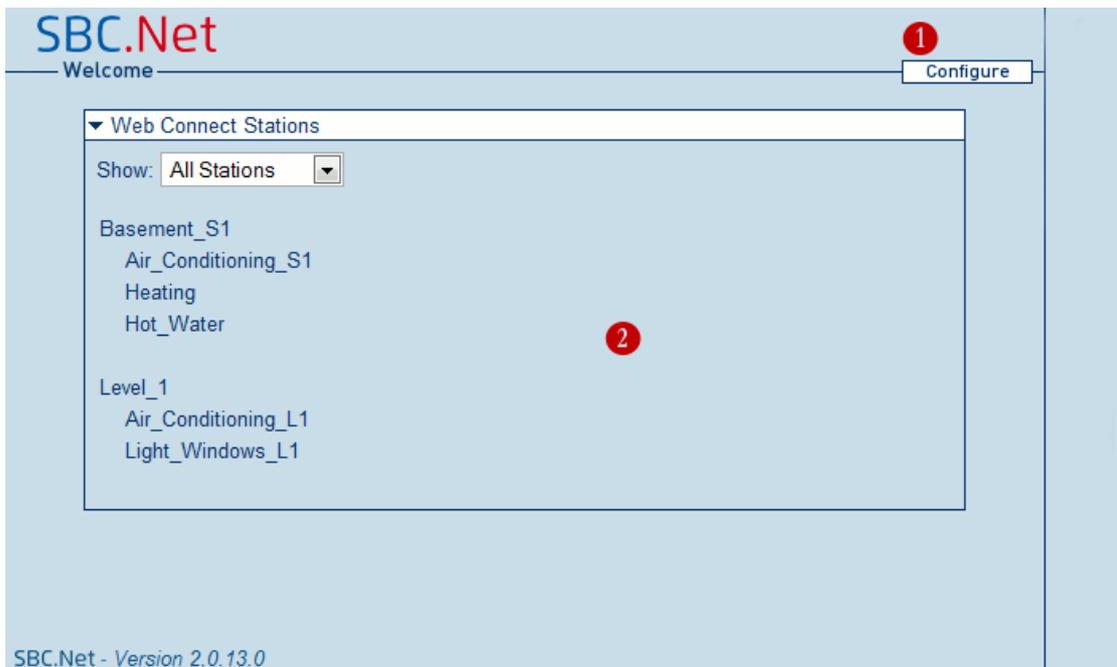
A right mouse click on the icon of SBC.Net Web Connect on the system tray does open the following window and does offer the same options as described above.



1.6 SBC.Net Web Interface

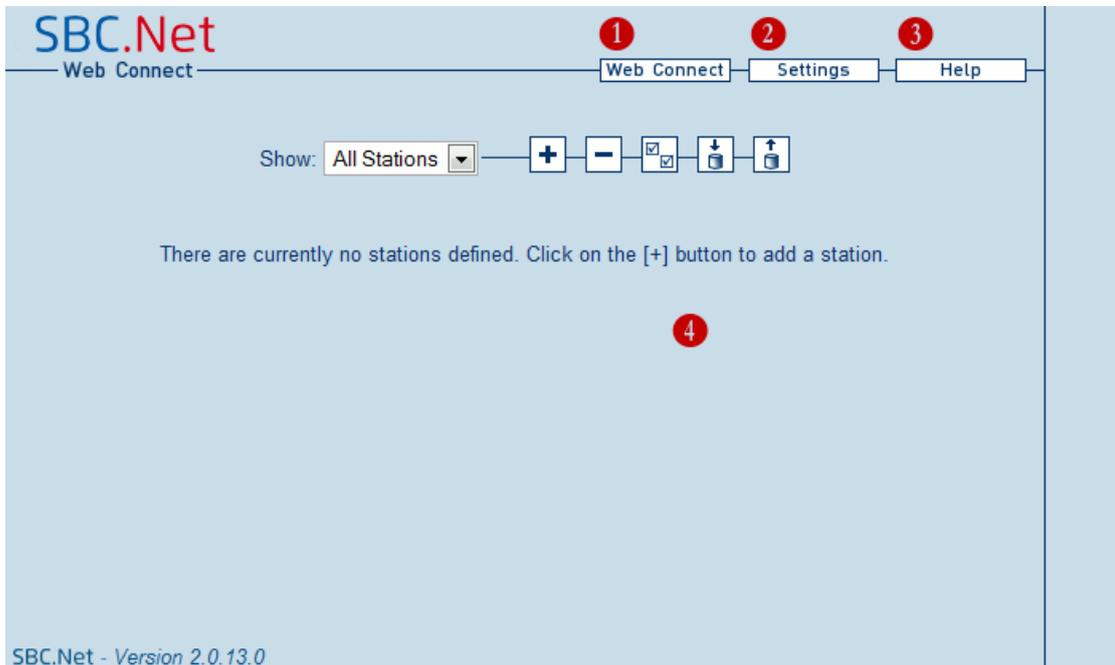
The web interface of SBC.Net consists of two main areas. The Welcome or Start page it is displayed when `http://<sb.net_ip>` is opened in a browser and the Setup Pages of SBC.Net (also called setup area). The picture below shows the Welcome Page. The Setup Area is reached by clicking on the [Configure] button (1) or by opening `http://<sb.net_ip>/setup` in a browser. The Start Page shows a list of all available Web Connect stations (2).

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This Welcome Page can actually be replaced by custom made page. Before SBC.Net delivers its Welcome Page it is looking in the root of the web pages directory if there is a file called `index.html`, `index.htm`, `start.html`, `start.htm`, `default.html` or `default.htm`. If it finds one of these files, then the file is delivered to the client instead of the Welcome Page.

The following picture shows the Setup Area for SBC.Net. This page can not be replaced by a custom page but the access to these page can be restricted by means of a password. See Configuring SBC.Net to learn how to protect the Setup Area.



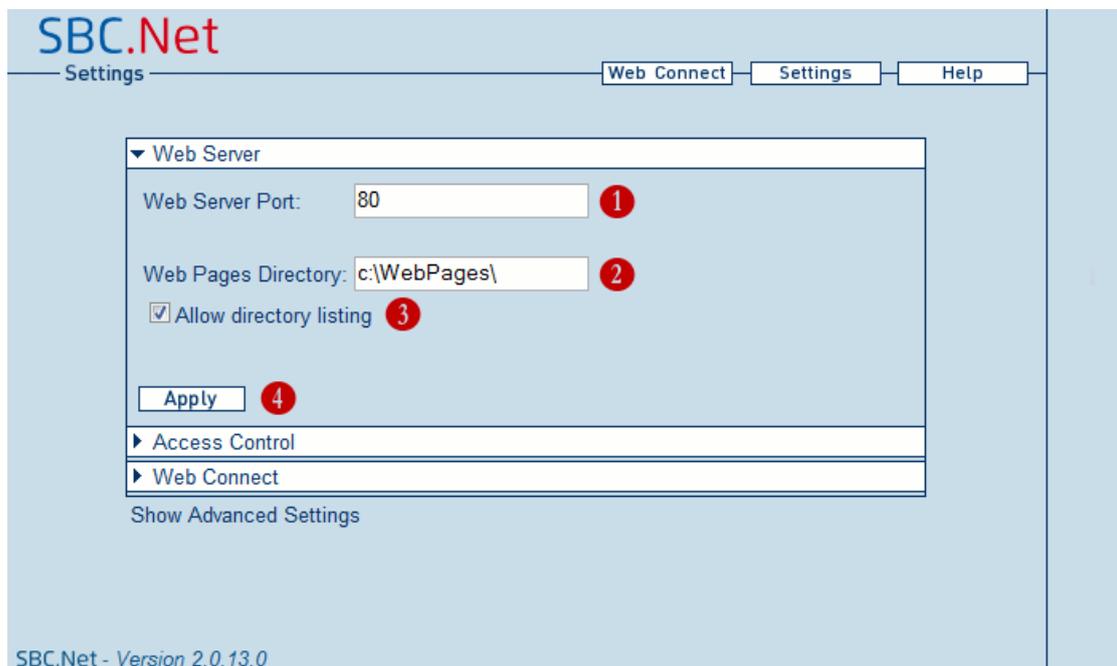
The Setup Area is divided into two parts the menu part (1-3) and the content area (4). Depending on the enabled options of SBC.Net more or less menu buttons may be displayed. By clicking on one of the menu buttons a new page is loaded into the content area. Clicking on the help menu button (3) for example will replace the Web Connect's station list in the content area (4) by this document.

1.7 Configuring SBC.Net

Once you got to the Welcome Page of SBC.Net click on the [Configure] button in the right corner at top of the page to go to the setup area. Now click on the [Settings] button. On the Settings page you are able to adjust all important parameters of SBC.Net. Some of the advanced settings of SBC.Net are initially hidden. To make them visible, click on the „Show Advanced Settings“ link at the bottom of the settings page. Click the link again to hide the advanced settings.

1.7.1 Web Server

SBC.Net contains a web server. This web server can be configured on the Web Server tab of the Settings Page.

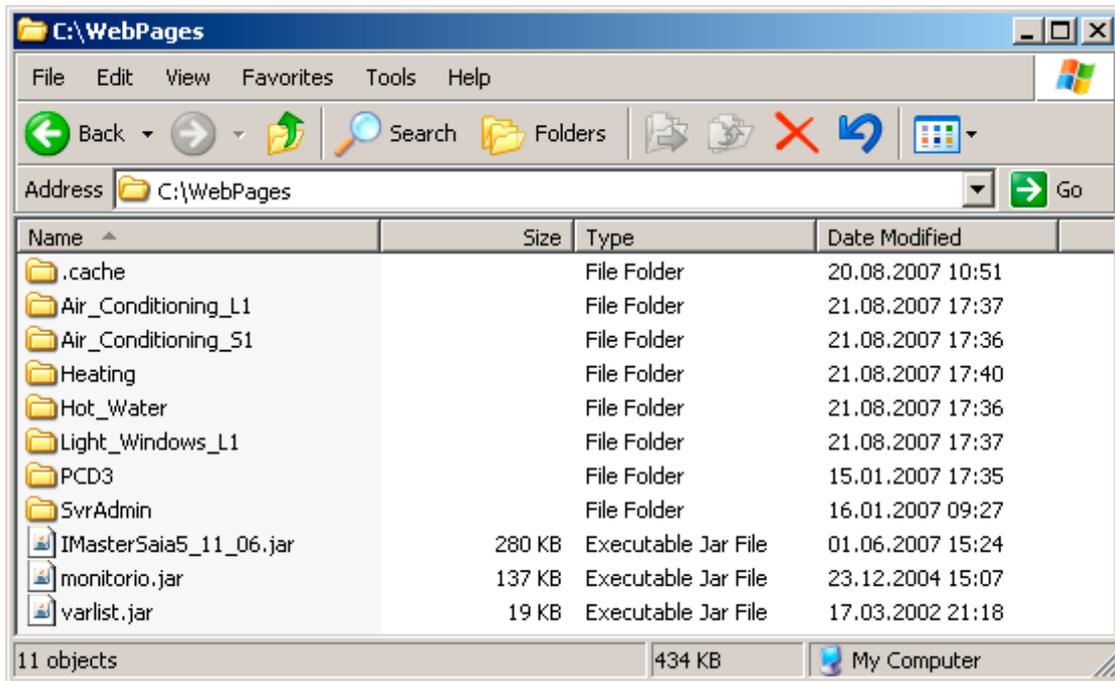


- 1. Web Server Port:** By default the web server of SBC.Net tries to listen on port 80. If this port is already in use, one of the higher port numbers will be used. To access SBC.Net from a browser when not using port use the following URL:
http://<sbcs.net_ip>:<port>
- 2. Web Pages Directory:** This field allows you to define the root directory of the web server. On Windows XP/eXP this directory is by default C:\WebPages on Windows CE \StorageCard\WebPages.

All files served by the web server have to be in that directory.

The user has the possibility to create subdirectories on this folder with the name <StationName> and to store the station specific files on these subdirectories.

The configuration example on chapter 2.5 would allow the following folders:



1

The search order of the Web-Pages is described on the chapter 2.4

- 3. Allow directory listing:** If a directory is requested by an HTTP client then the web server of SBC.Net is first looking for a default page in that directory, if it finds such a page then this page will be delivered. If no default page is found then a list of all files is sent to the client if „Allow directory listing“ is activated. Otherwise an error message is sent back. Default pages must be saved in a file with one of the following names: start.html, start.htm, index.html, index.htm, default.html, default.htm.
- 4. Apply:** Saves and applies the new web server settings.

1.7.2 Access Control

Sometimes it should not be allowed to access the „Setup Area“ of SBC.Net. Therefore there exists a way to protect this part of SBC.Net by a password. This password is defined on the Access Control tab of the settings page.

1

- 1. Current Password:** The password that is currently used to protect the the „Set-up Area“. If the protection is currently disabled then let this field empty.
- 2. New Password:** The new password which will allow access to the „Setup Area“ of SBC.Net
- 3. Confirm New Password:**
To make sure that the new password contains no error the new password has to be filled into this field. SBC.Net won't change the password if the last two fields do not match.
- 4. Current state of the protection.**
Red = no protection, everyone can access the „Setup Area“
Green = the „Setup Area“ is protected by a password.
- 5. Apply:** Saves and applies the new settings.

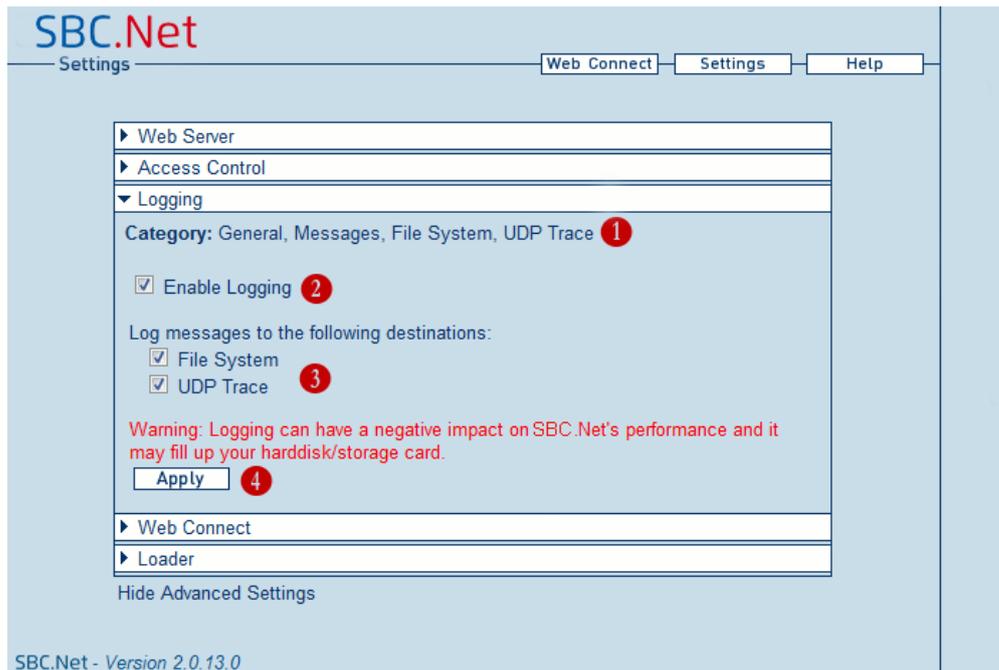


If your browser asks you for an user name and a password when entering the „Setup Area“ simply ignore the user name and fill in the password defined here.

1.7.3 Logging

SBC.Net includes a logging facility which can be very handy when something doesn't work as it was expected. The Logging tab is only visible if the advanced settings are displayed and the Logging plug-in is enabled (See Loader). To display the advanced settings click on the „Show Advanced Settings“ at the bottom of the „Settings Page“.

SBC.Net provides a very flexible way of logging events. It is able to write log messages to a file or send them over a network wire to a specific host. All of these settings can be altered on the Logging tab:



1. **Categories:** The logging tab can show four categories General (this is what is shown on the picture), Messages, UDP Trace, FileSystem.
 - ➔ Messages: Shows a list of the latest messages at the moment the page was loaded.
 - ➔ UDP Trace: Shows a list of all message types sent by all active plug-ins. This allows to filter those log messages which should be sent over a network. In that category it's also possible to define the destination host and destination port where the messages will be sent to.
 - ➔ File System: Shows a list of all message types sent by all active plug-ins. This allows to filter those log messages which should be written to a file. The destination directory of the log file can be specified in that category.
2. **Enable Logging:** This generally enables or disables logging
3. **Destinations:** Here destinations of log messages can be enabled or disabled.

- 4. Apply:** Saves and applies the settings of this category. NOTE: Each category has its own apply button which must be pressed that changes take effect.



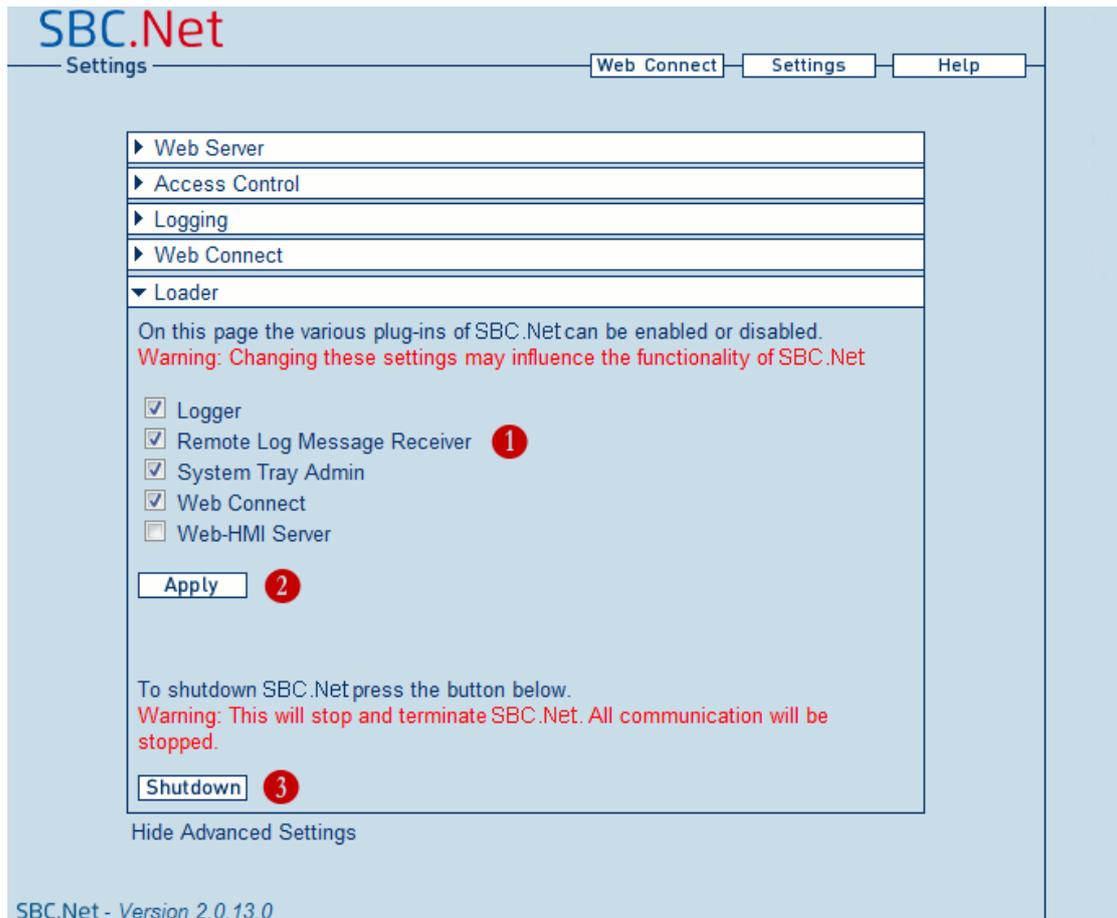
Logging my slow down SBC.Net and if the messages are saved to a log file SBC.Net may fill up your harddisk / storage card. As more log message type are activated as slower SBC.Net will be and as more disk space will be used.

1

1.7.4 Loader

This tab is only visible if the advanced settings are displayed. To display the advanced settings click on the „Show Advanced Settings“ at the bottom of the „Settings Page“. To understand this tab you need to know, that SBC.Net consists of individual software components, so called “plug-ins”. To loader is managing these “plug-ins”, so on this page “plug-ins” can be enabled or disabled depending on the actual needs of SBC.Net. The logging facility for example is only available if the logging “plug-in” is activated.

1



- 1. Plug-in list:** List off all available plug-ins. Plug-ins whose check box is checked are running. Click into the check box of a particular plug-in to change its state. Changes are not applied until the apply button is pressed.
- 2. Apply button:** Saves and applies the changes to running plug-ins list. Warning: Make sure you know what you're doing if you change the running plug-in list. Depending on the selected options SBC.Net may not provide the functionality or performance you expect.
- 3. Shutdown:** By clicking on this button SBC.Net will be terminated. Be aware, if you stop SBC.Net from a remote host make sure you have a way to start it again if you will need in a later point in time.

2 Using Web Connect

2.1 Introduction

Web Connect provides a way to access pages of the Saia PCD® Web Server even if the PCD doesn't support the HTTP-Direct protocol. This access is transparent to HTTP clients like the Internet Explorer or Firefox. This chapters talks only about the Web Connect part of SBC.Net.

2

2.2 Accessing SBC Web Server

The PCD's Web Server is accessed using a special URL: `http://<webconnect_ip>/<station_name>/` where `webconnect_ip` is the IP address or host name of the host where SBC.Net is running on (usually localhost if you're not accessing a remote SBC.Net). `station_name` is a symbolic name of the station to access. The station name can be chosen when you add a new station to Web Connect.

If a resource from a PCD is requested Web Connect gets such a URL. It removes then from the special URL the station name and forwards the request to the PCD. If the station is disconnected when the request is received then Web Connect automatically establishes a connection to the station before forwarding the request to it. The following picture shows how this URL rewrite works. In this picture Web Connect is communicating with the PCD using the HTTP-Direct protocol but the URL rewrite works the same way for every other supported protocol.

2.3 Start page

On the start page of SBC.Net a list of all currently defined stations is shown. The stations are grouped by their group name and can be filtered by the same name.



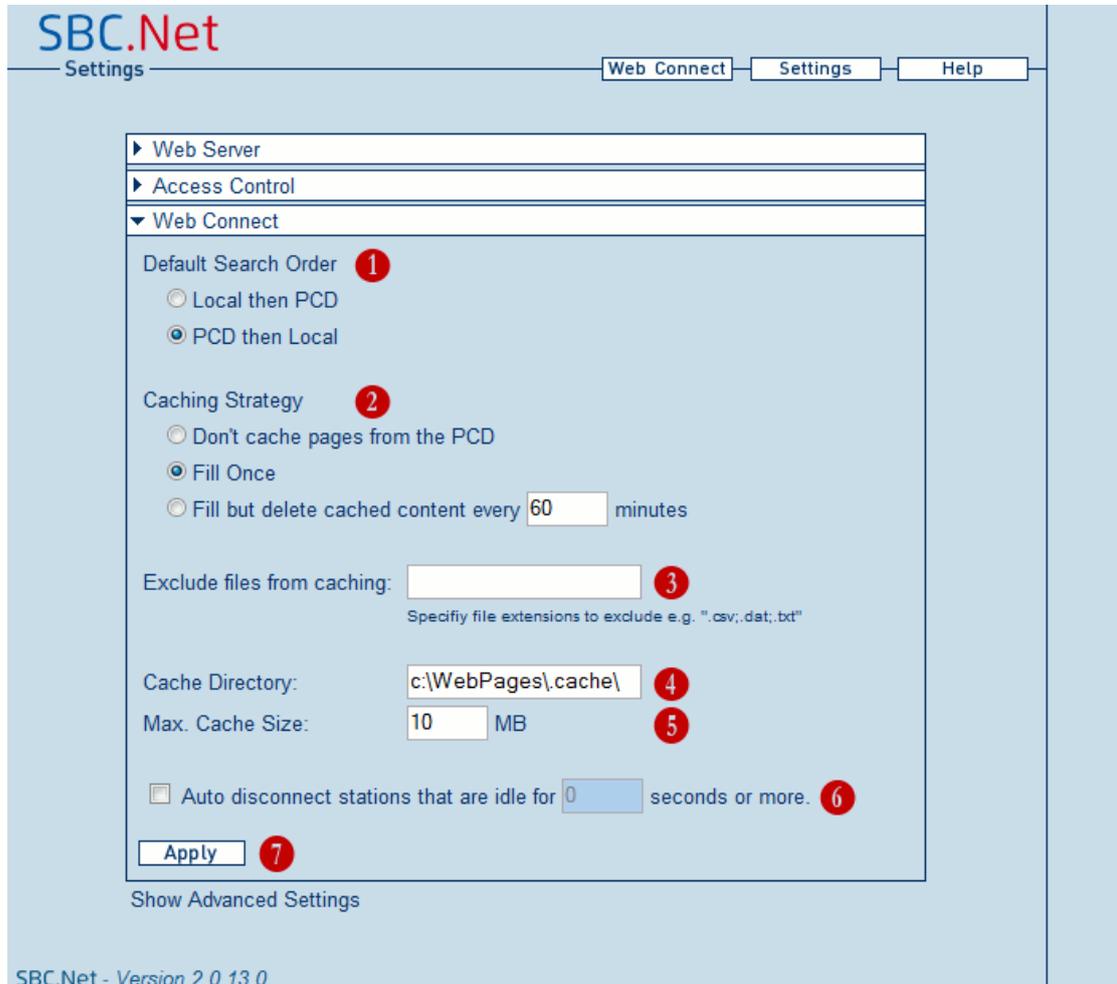
- 1. Configure button.** By clicking this button the Setup Area of SBC.Net will be opened in the browser. The setup area can be reached directly by opening to the following URL:

`http://<webconnect_ip>/setup`

- 2. Station filter.** With the station filter it's possible to show only stations of a given group. Simply select the name of the group which should be shown and all stations in other groups will be hidden.
- 3. Group header.** The group header shows the name of the group of the following stations.
- 4. Station name.** The name of the station. By clicking on the station a connection to the PCD is established and the start page of the station will be shown.

2.4 Web Connect Settings

There are some settings which are global and affect all stations defined in Web Connect (some of the settings may be overridden by the individual settings of a station). To access these settings go to setup area (http://<webconnect_ip>/setup) and click on the settings button then open the Web Connect page. You should see the following picture in the browser:



1. **Search order.** This settings defines where Web Connect is looking first for a requested resource.
 - **Local then PCD** means that Web Connect is first looking in the <WebPagesDir>\<StationName>\ then <WebPagesDir>\ and then on the PCD's Web Server (<WebPagesDir> is the directory of the webpages define in the web server settings).
 - **PCD then Lokal** means that Web Connect looks first in the PCD's Web Server and then in the local directories:
 1. PCD's Web Server,
 2. <WebPagesDir>\<StationName>\,
 3. <WebPagesDir>\
2. **Caching Strategy.** This version of Web Connect contains a simple cache.

The behaviour of this cache can be defined by the caching strategy setting.

→ **Don't cache pages from the PCD:**

The cache is disabled. This strategy is very helpful when developing HMI visualizations and therefore the resources in the PCD's Web Server are changing frequently.

2

→ **Fill Once:**

The cache acts the same way as the cache in the Micro-Browser terminal. The cache is filled up and only cleared when Web Connect is restarted. NOTE: If a resource is once in the cache the client will get always the cached resource. This strategy is useful when the resources in the PCD's Web Server never change or Web Connect is restarted when the resource in the web server were changed.

→ **Fill but delete cached content every xx minutes:**

Same as Fill Once but the cache is cleared every xx minutes. This strategy is useful when resources in the PCD's Web Server are changing rarely

3. Exclude files from caching:

Sometimes caching is desired but some files should never be cached. If for example the PLC program is writing some data files which are periodically read over the web server, then these files should not be cached. The "Exclude files from caching" option allows to specify a list of files extensions that will not be cached.

4. Cache Directory:

Defines where Web Connect saves the cached resources.

5. Max. Cache Size:

Defines how big the cache directory may grow. NOTE: The maximum size is the cache size for all stations of Web Connect together.

6. Apply:

Saves and applies the settings.

7. Time out:

If this option is enabled, then the Web Connect will disconnect a station if no communication took place for the specified time.

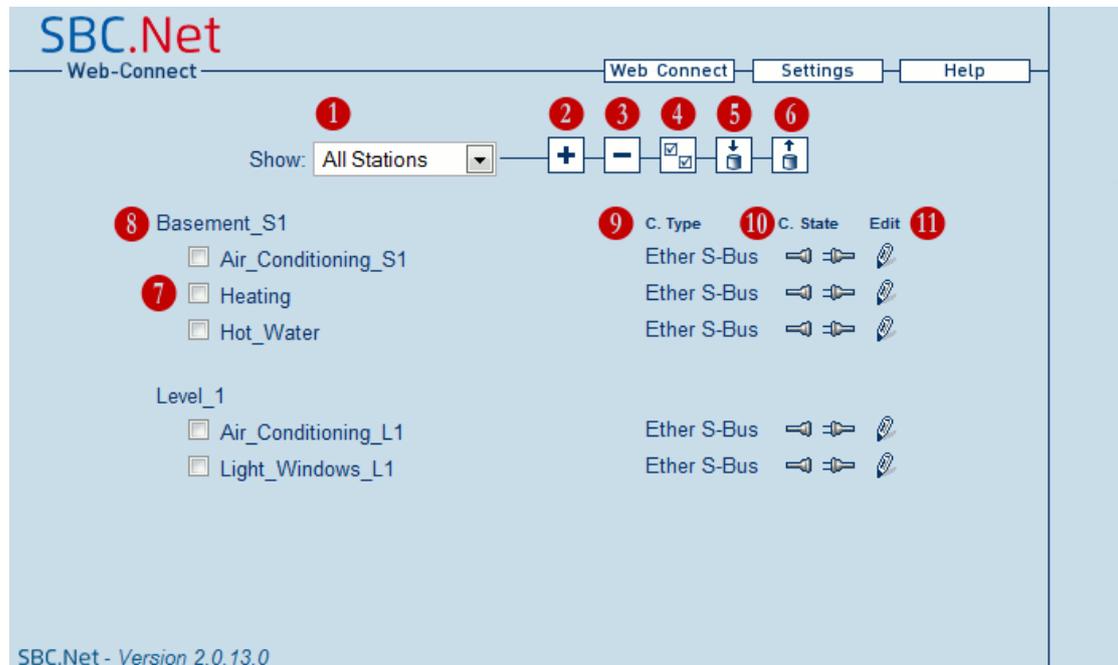


Every station has its own time out counter.

2.5 Managing stations

Adding, editing and removing Web Connect stations is done in the setup area of SBC.Net (http://<webconnect_ip>/setup). If the station list is not shown, click on the Web Connect button in the top right menu SBC.Net. You should get a picture like the following (the lower part, of course may look different, depending on the stations defined):

2



1. **Station filter:** With the station filter it's possible to show only stations of a given group. Simply select the name of the group which should be shown and all stations in other groups will be hidden.
2. **Add station:** By clicking on this button a new station can be added.
3. **Remove station:** This button allows to remove Web Connect stations. To remove stations check the check box (7) in front of the station's name and then click on the [-] button.
4. **Select all:** By clicking this button all stations' check boxes are checked. This can be a very handy if you would like to remove all or export all stations.
5. **Import stations:** By clicking this button you can select a file with saved station data. All stations of the file will be added to the station list. If a station with the same name already exists in the list then a _x suffix is added to the imported station. This version of Web Connect is able to import stations of SBC.Net 2.0, Web Connect version 1.3/1.4 for Windows 98...XP and Web Connect version 1.0.x for Windows CE.
6. **Export stations:** This button allows to export the selected stations to a file. Select the stations to export by clicking on the check box

on the left hand side of the stations name and then click the export button.

7. The station list:

Below the control buttons described above follows the list of the defined stations. Left to the **(8)** is group name (Basement_S1) of the following three station. A bit lower is another group of stations. The Level_1 group consists of two stations.

2

Group names are only used for visually grouping stations together. The group name does not have any technically meaning.

8. Station:

On the right hand side of the **(7)** is the table of the stations. Each station consumes exactly one row. Columns starting from left to right:

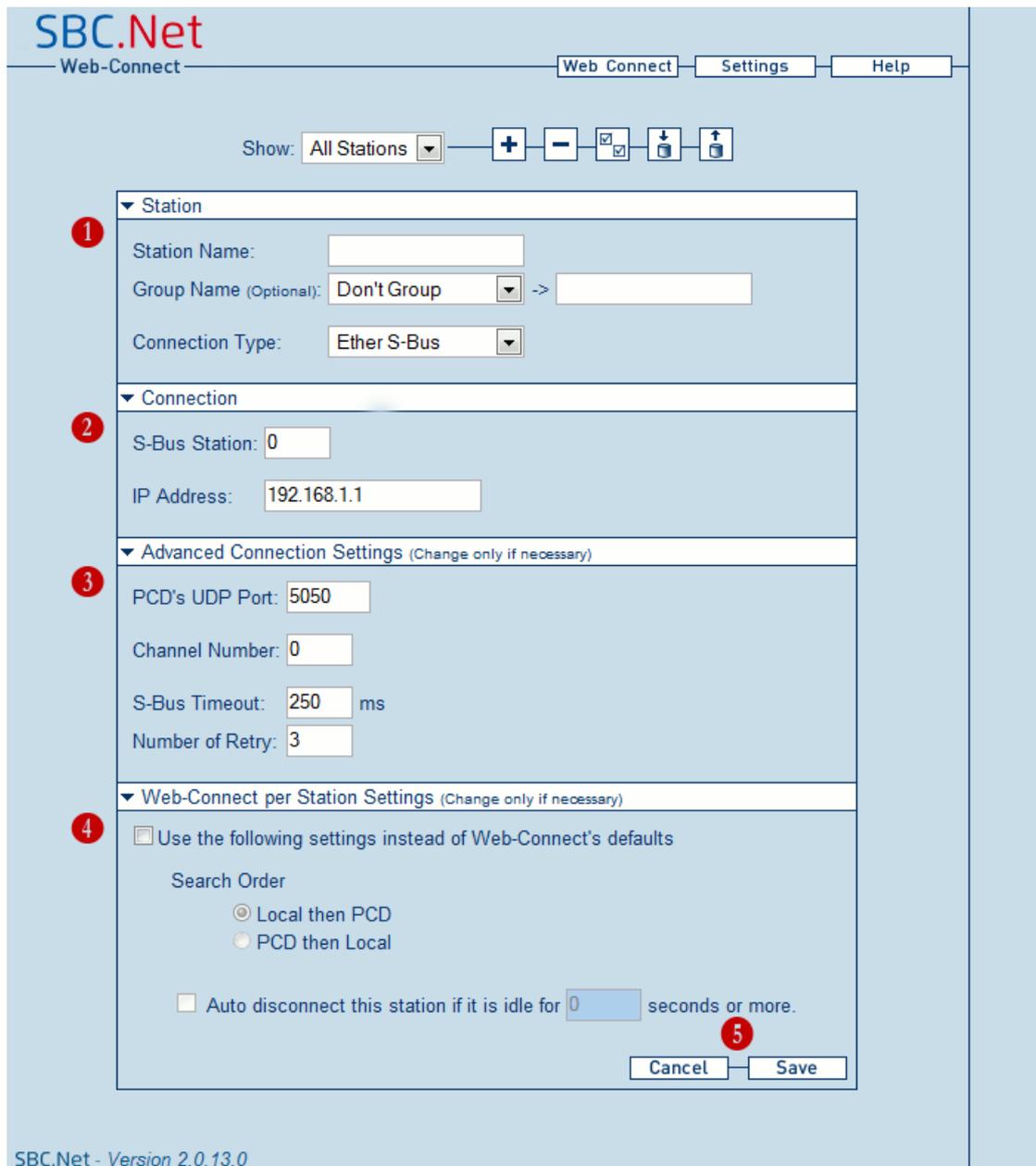
- 1.) Check box: The station is selected for remove or export if the check box is checked.
- 2.) Name of the station:
The name must be unique to all other stations. This name is used to access the station by `http://<webconnect_ip>/<station_name>/`. By clicking on the station's name the a connection to the station is established and its start page will by shown.
- 3.) Connection type **(9)**:
This column describes what kind of transport media/protocol is used to establish a connection to the station.
- 4.) Connection state **(10)**:
This icon display the current state of the connection. In the picture above all stations are currently disconnected. Clicking on the picture changes the connection state.
- 5.) Edit **(11)**:
Clicking on the station's pencil opens the page for editing the station's settings.



If the station is connected and the settings of the station are changed then Web Connect will disconnect the station and reconnect it again.

2.5.1 Add/Edit a Station

Adding and editing a Web Connect station is done using exactly the same web interface described in the following picture. To get this page go to the Web Connect station list in the setup area of Web Connect and click on the [+] button to add an station or on the pencil button of a station to edit it. In earlier Web Connect versions the task of adding/editing a station was done by a wizard like approach. Now everything is on one page:



- 1. Station tab:** The Station tab defines the very basic properties of a Web Connect station.
 - ➔ **Station name:** A unique name for the station. This name will be used in the URL to access the station.
 - ➔ **Group name:** The name of the group to which this station belongs to. To

not group the station just let the group name field empty. To put the station in an already existing group simply select the group from the combo box the name is then filled automatically into the right group name field.

→ **Connection**

Type: With this box the way how Web Connect will communicate with the PCD is defined. The box shows only this connection types which are supported by Web Connect (depending on the operating system and the installed options). The content of the Connection and Advanced Connection Settings tabs depend on the selected connection type. The page is changing immediately when the type is changed.

2

- 2. Connection tab:** The content of this tab depends very much of the connection type but always contains the information that has to be provided to make a connection possible.
- 3. Advanced Connection Settings:** The content of this tab depends very much of the connection type. The settings in this tab should only be changed if there is a good reason not to keep the defaults.
- 4. Web Connect per Station Settings:** Within this tab the default search order of Web Connect can be overridden for this particular station if „Use Default Web Connect Settings“ is unchecked.
- 5. Cancel/Save:** To cancel the creation of a station or to not change a station click on the [Cancel] button. To add the new station or apply the changed settings click on the [Save] button.

A Appendix

A.1 Icons

	<p>In manuals, this symbol refers the reader to further information in this manual or other manuals or technical information documents. As a rule there is no direct link to such documents.</p>
	<p>This symbol warns the reader of the risk to components from electrostatic discharges caused by touch. Recommendation: Before coming into contact with electrical components, you should at least touch the Minus of the system (cabinet of PGU connector). It is better to use a grounding wrist strap with its cable permanently attached to the Minus of the system.</p>
	<p>This sign accompanies instructions that must always be followed.</p>
	<p>Explanations beside this sign are valid only for the Saia PCD® Classic series.</p>
	<p>Explanations beside this sign are valid only for the Saia PCD® xx7 series.</p>

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