

STEPtoWEB[®]

Drücker Steuerungssysteme GmbH, Neuhausen a.d.F.

User`s manual



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1. Introduction

This document is meant to be a guide for installing and configuring the software of STEPToWEB.

STEPToWEB enables PLCs to be connected to the Intranet/Internet in an easy way. To do so there is no need for making changes in the existing PLC program. You simply assign a unique IP address to STEPToWEB. Then the PLC needs to be connected to the serial port of STEPToWEB via the AS511 interface. That is all there is to it. From now on, the PLC can be accessed from any Intranet/Internet PC by using a configurable HTML web page which is stored in STEPToWEB. Additionally, STEPToWEB can be set up that emails are generated automatically each time a variable in the PLC is changed. The text shown in the subject line of an email is variable and stored in a separate configuration file. Addressees of the emails are variable as well.

1.1. Hardware requirements

The installation must fulfill hardware requirements as follows:

- STEPToWEB Box *)
- PG port linking cable (AS511) between STEPToWEB and PLC **)
- null modem cable socket (9p) - socket (9p) **)
- PLC Siemens S5 or in the future S7 as well
- network cable with plug RJ45
- PC connected to network

*) included
**) optional

1.2. Software requirements

The installation must fulfill software requirements as follows:

- software for setting up the IP address of STEPToWEB jw2nset.exe *)
- software tool for setting up users and their passwords genpass.exe *)
- PC running Windows95/98/NT
- Microsoft Internet Explorer 5.0 or better, Netscape Navigator 4.5 or better or any other compatible internet browser

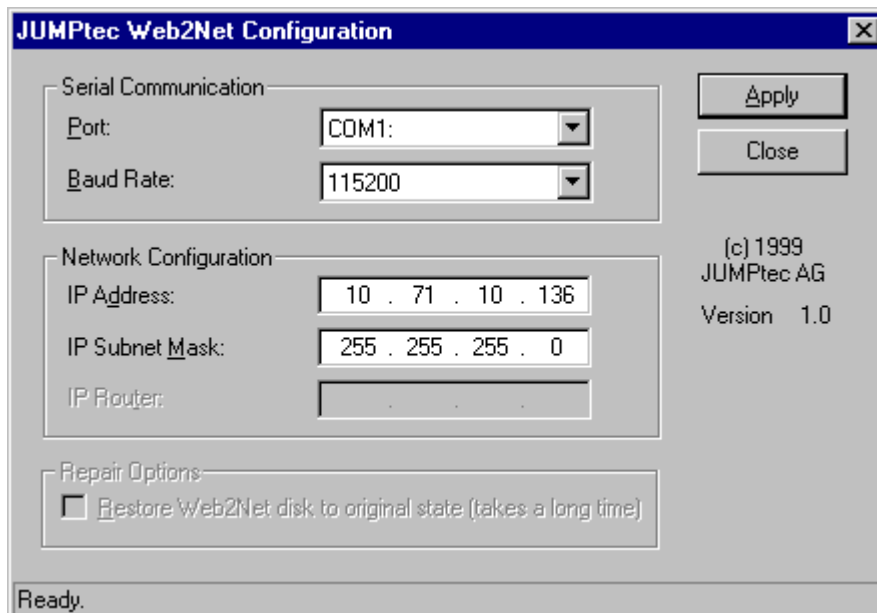
*) included

2. Installation

This paragraph describes the hardware integration of STEPToWEB in an existing LAN.

Firstly, STEPToWEB is connected to the LAN by using RJ45 network cable. In the next step the power supply must be established. After that a red LED located in a group of three LEDs between serial port and network socket is turned on automatically. This LED will start flashing as soon as the web-server is up and running. A green LED shows an intact network connection. In the middle between red and green LED sits a yellow one that describes the network traffic.

In order to access STEPToWEB on the LAN, a unique IP address and a so called subnet mask must be assigned to it. IP address and subnet mask are permanently stored in an EEPROM. This means STEPToWEB is always identifiable in a network. For changing these settings you need a nullmodem cable, a PC running Windows95/98/NT and software tool called jw2nset.exe that is located on a disk enclosed.



The following steps show how to change the settings:

- switch off STEPToWEB (unplug the power supply)
- connect the nullmodem cable to COM-Port of STEPToWEB and to COM1/2 of a PC
- switch on STEPToWEB
- start software tool jw2nset.exe
- set COM-Port of the PC: COM1
- set baudrate: 115200
- set IP address: 10.71.10.136
- set subnet mask: 255.255.255.0
- confirm the settings by pressing [*Apply*]
- in the status field at the bottom of the window a message comes up "Trying to connect on..."
- switch off STEPToWEB
- switch on STEPToWEB
- in the status field various messages come up in quick succession
- the process of updating the EEPROM is finished as soon as the following message comes up "Command completed successfully"
- switch off STEPToWEB
- remove nullmodem cable
- switch on STEPToWEB

From now on STEPToWEB can be accessed on the computer network by the IP address set up before.

3. Handling

It is possible to access STEPToWEB from virtually any computer on the LAN. All you need to do so is a PC with a standard internet browser, i.e. Microsoft Internet Explorer or Netscape Navigator. Microsoft Internet Explorer is being used for reference purposes in this manual. After starting the Internet Explorer you can type in the address box the IP address of STEPToWEB, i.e. <http://10.71.10.136>. By doing so you call up an HTML page which sits in STEPToWEB. The HTML page is of standard HTML format.

Important:

The browser configuration must not contain a proxy server! Otherwise HTML pages may not be found or data may not be interpreted correctly.

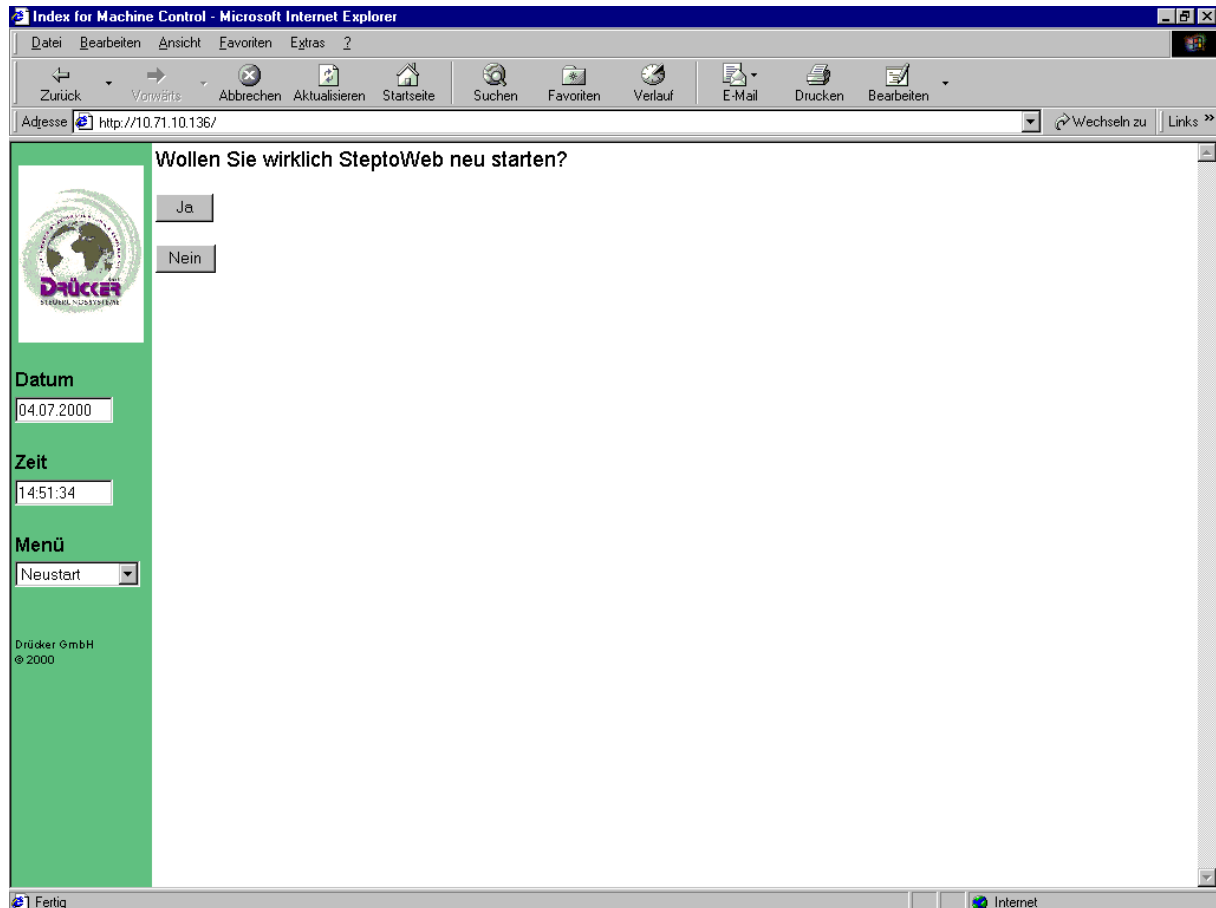


The HTML page shown is divided into two sections. On the left hand side you will find status information like date and time. There you will also find a small menu. The remaining part of the window shows a PLC control panel. It contains a selection of PLC data. Data shown next to a yellow heading is just for the purpose of display. This data can not be altered. While data next to a red heading can be changed and represents data that is written to a PLC. Data is altered by moving the slider up and down or by typing a new value in the respective field. It must be confirmed by `<Enter>`. The HTML page (s5.htm) shown simply is suggestion of our side. You may use this as a basis and adjust it as you wish. All you need is a basic understanding of HTML programming.

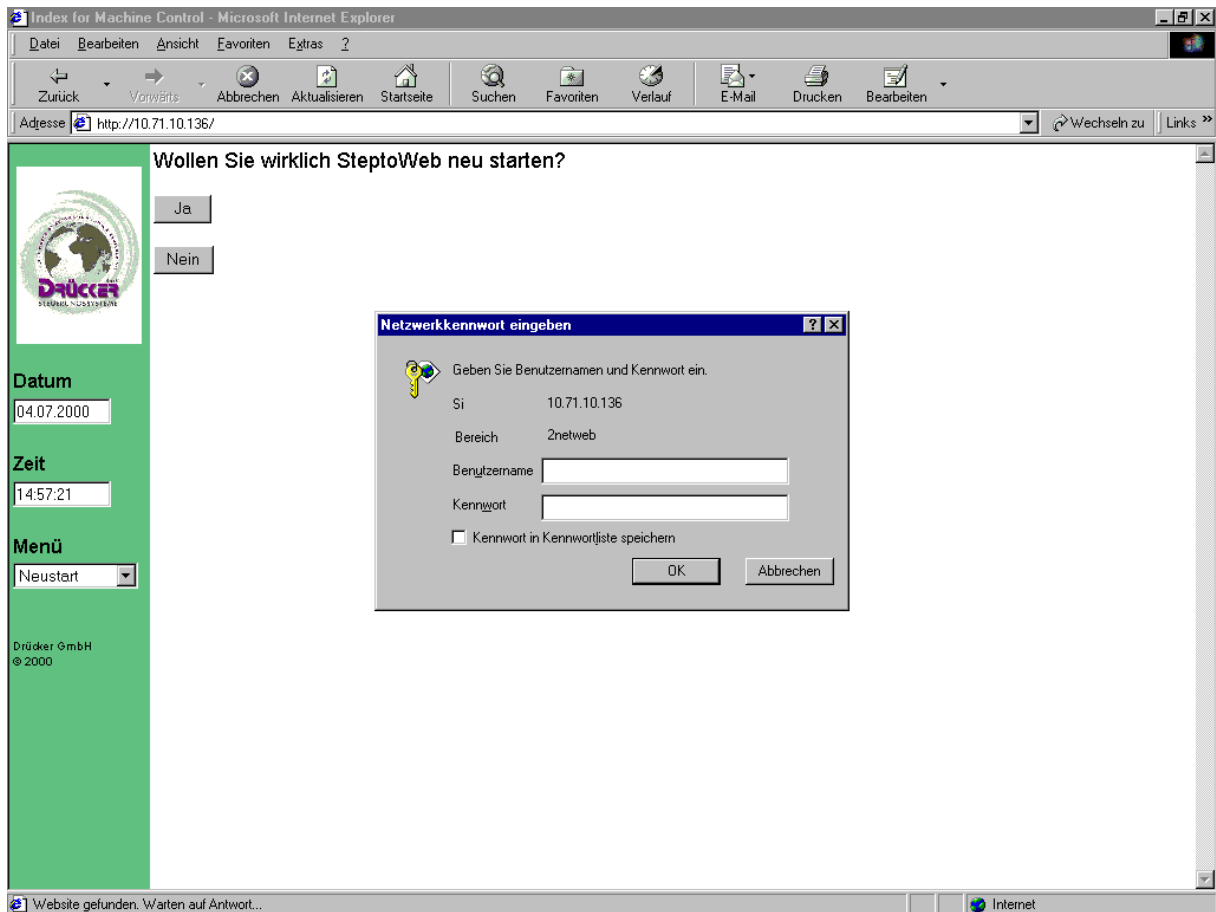
The small menu on the left hand side gives you access to the file system of STEPToWEB. The only reason for allowing this is to be able to make changes

in the configuration. Therefore the menu item is called Konfiguration. Chapter 4 will go into further detail.

The third and last menu item lets you restart STEPToWEB. This is necessary if changes have been made in the configuration or if times for accessing STEPToWEB appear to be unusually high. Choosing the menu item brings up the page shown below.



There a very last check takes place. It is asked, if STEPToWEB really is to be restarted. If you say [Yes] ([Ja]), you will be asked for a user name and a corresponding password. By default user name and password are "super". STEPToWEB will be restarted as soon as [Ok] is pressed. See picture below.



The screenshot shows a Microsoft Internet Explorer browser window. The address bar contains the URL `http://10.71.10.136/`. The main content area displays a confirmation message: "Wollen Sie wirklich SteptoWeb neu starten?" (Do you really want to restart SteptoWeb?). Below this message are two buttons: "Ja" (Yes) and "Nein" (No). To the left of the main content is a green sidebar with a logo and the following information:

- Datum** (Date): 04.07.2000
- Zeit** (Time): 14:57:21
- Menü** (Menu): Neustart (Restart)
- Drücker GmbH © 2000

Overlaid on the main content is a "Netzwerkennwort eingeben" (Enter network password) dialog box. It contains the following fields and options:

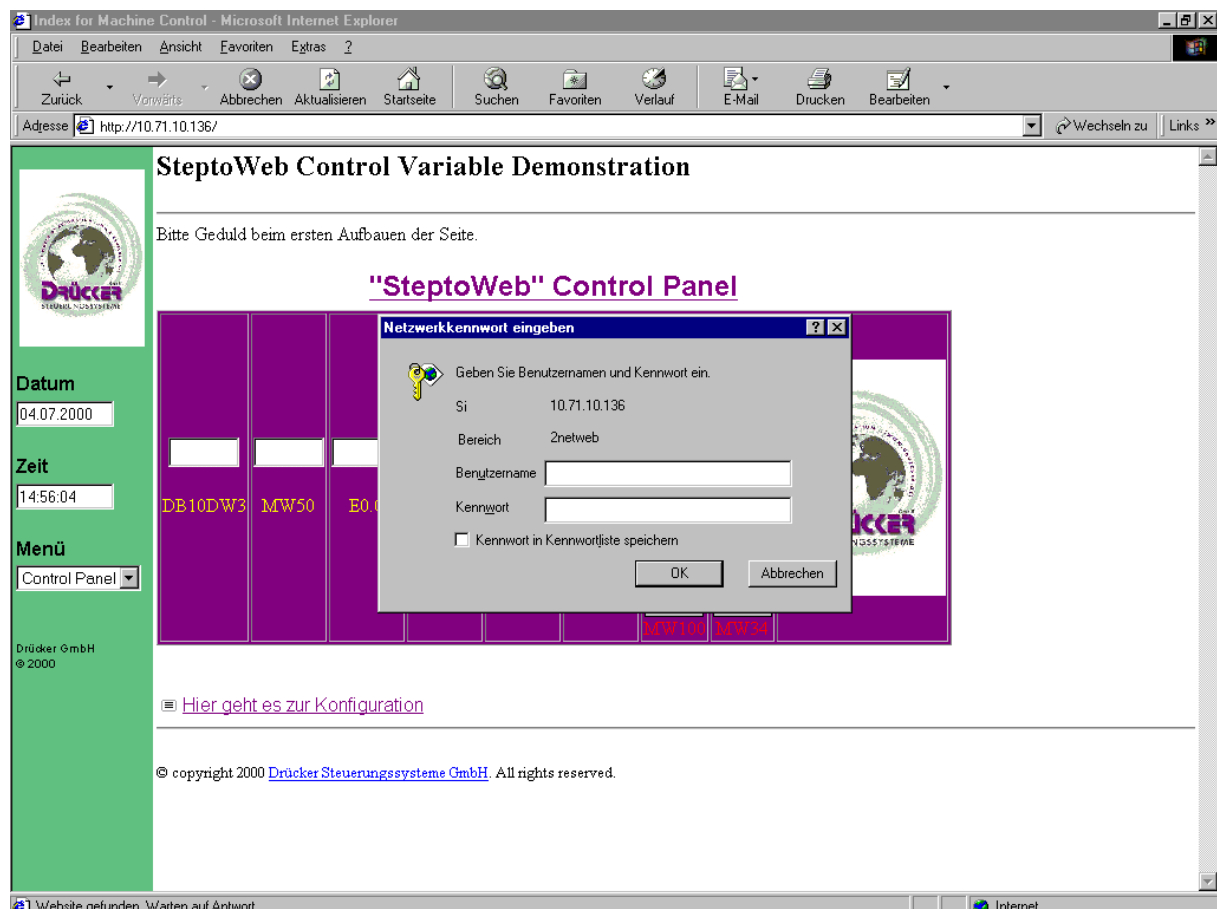
- Si: 10.71.10.136
- Bereich: 2netweb
- Benutzername (Username): [Empty text box]
- Kennwort (Password): [Empty password box]
- Kennwort in Kennwortliste speichern (Save password in password list)
- Buttons: OK, Abbrechen (Cancel)

The status bar at the bottom of the browser window shows "Website gefunden. Warten auf Antwort..." (Website found. Waiting for response...) and "Internet".

4. Configuration

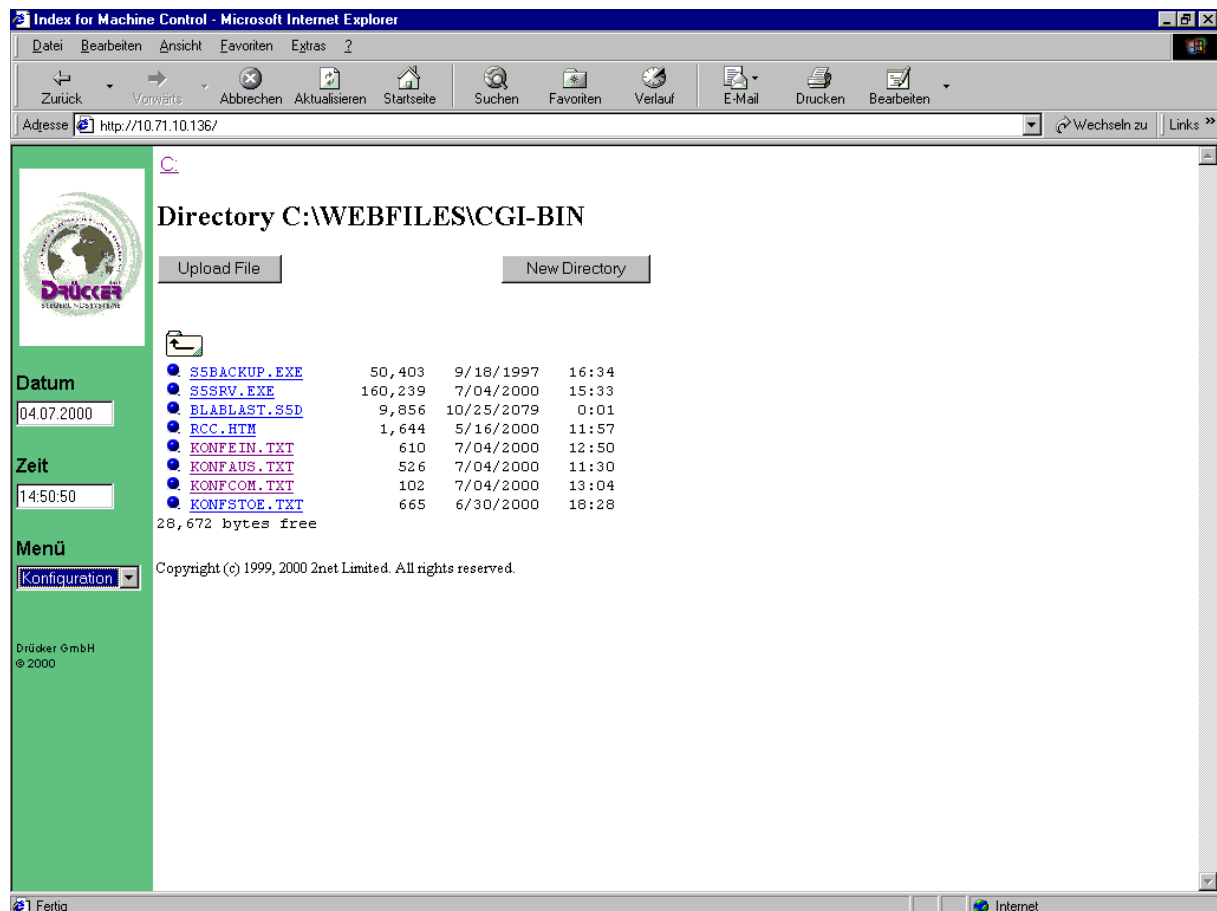
Settings (PLC parameters, PLC interface parameters, email parameters, ...) necessary for running STEPToWEB are stored in configuration files. Since STEPToWEB is available in Intranet/Internet, it can be accessed by any networked PC. So the configuration files are easily accessible. They are standard text (ASCII) files and are therefore editable by any editor, i.e. Notepad.

If the configuration files need to be altered, they have to be downloaded on a local PC. In order to do so, you must get access to the file system of STEPToWEB. Just select menu item Konfiguration in the menu list on the left hand side. Before the file system shows up, you must be granted access to it. A window for user name and password pops up.



Only a user with correct user name and password will be granted access to the configuration.

By default user name and password are "admin". After you have confirmed your input data with [Ok] the file system comes up.



In the file system you can move around as you please. The symbol of a registry card gets you to the next higher directory. By clicking on a directory name the directory is opened. For a download (STEPToWEB → PC) of a file just click on it with the right mouse button. In the menu that pops up select "Save to...". Then an Explorer like window appears. Now you can download the file. An upload (PC → STEPToWEB) works alike. To get to the upload window click on a button labeled [Upload File].

Files required for configuration are:

File	Directory	Comment
2net.cfg	c:\web	Network parameters
Konfcom.txt	c:\webfiles\cgi-bin	PLC interface parameters
Konfein.txt	c:\webfiles\cgi-bin	PLC data: read
Konfaus.txt	c:\webfiles\cgi-bin	PLC data: written
Konfstoe.txt	c:\webfiles\cgi-bin	Alarm messages for emails
S5.htm	c:\webfiles	HTML page showing PLC data

The configuration files need to be downloaded on a local PC in order to be changed. After that they must be copied back to STEPToWEB.

A description of all files comes next.

4.1. 2net.cfg

```
webroot=c:\webfiles

[network]
my_ip=10.71.10.136
netmask=255.255.255.0
router=0.0.0.0
gateway=10.71.10.1

[smtp]
smtp_host=62.140.20.226
smtp_local_id=step2web@druecker.de
```

my_ip:

- is the during installation assigned IP address of STEPtoWEB
- is looked up in the EEPROM at startup and copied into this files
- manual changes in this file have no effect
- just for information purpose

netmask:

- is the during installation assigned subnet mask of STEPtoWEB
- is looked up in the EEPROM at startup and copied into this file
- manual changes in this file have no effect
- just for information purpose

router:

- links different networks
- differentiation of who is allowed to be in what network is made by IP address
- usually replaced by value in gateway

gateway:

- contains IP address of computer that acts like an interface between Intranet and Internet
- is used when sending emails

smtp_host:

- contains IP address of an email server capable of SMTP

smtp_local_id:

- email address of sender
- standard email address format

4.2. *konfcom.txt*

```
[Com]
COM1
[Baudrate]
9600
[Stoerwort]
MW52
[email]
info@druecker.de
[Ende]
```

[Com]:

- assign a COM port
- internally STEPToWEB supports more than one
- it has only got one COM port built in
- normally you enter COM1

[Baudrate]:

- describes the data transfer rate between PLC and STEPToWEB
- default is 9600 baud
- COM port of STEPToWEB supports 115kbaud

[Stoerwort]:

- a data word in the PLC is assigned that is used for an automatic generation of emails
- if the data value changes and the value is greater than 0, an email is sent to all addressees
- according to the data value the message used in the email is looked up in a file called konfstoe.txt
- you can use MW or DW
- usually this kind of data word already exists in the PLC (value and text are displayed in an operating panel), therefore there aren't any alterations necessary in the PLC

[email]:

- all email addressees are stored here

4.3. *konfein.txt*

```
[bool]
M0.0
M0.1
E0.0
E0.1
E0.2
E0.3
E0.4
E0.5
E0.6
E0.7
[word]
MW24
MW26
MW50
DB10DW3
[dword]
[zaehler]
Z55
[zeit]
T120
[byte]
MB12
[pEW]
[ende]

Bits can be read from E / A and M, i.e. E23.5, M234.6
Bytes can be read from E / A and M, i.e. EB33, AB66
Words can be read from E / A, M and DW, i.e. DB22DW123
Flags (MW) only with even address, i.e. MW12 (correct), MW11 (wrong)
Peripheral words for EW can be read (even address), i.e. EW >= 128
```

This file contains all PLC data that is read from the PLC and displayed on an HTML page.

4.4. *konfaus.txt*

```
[bool]
[word]
MW34
MW100
[dword]
[zeit]
[byte]
[pAW]
[zaehler]
[ende]
```

Bytes can be written to E / A and M, i.e. MB33, AB66

Words can be written to E / A, M and DW, i.e. DB22DW123

Flag (MW) only with even address, i.e. MW12 (correct), MW11 (wrong)

Peripheral words for AW can be written (even address), i.e. AW >= 128

This file contains all PLC data that is written to the PLC and entered in an HTML page.

4.5. konfstoe.txt

```
Text000 Das ist ein Test
Text001 Fernwärme
Text002 Not - Aus
Text003 Schaltschrank brennt
Text004 Schaltschrank gibt Rauchzeichen
Text005 Relais
Text006 Schütz
Text007 Tür klemmt
Text008
Text009
Text010
Text011
Text012
Text013
Text014
Text015
Text016
Text017
Text018
Text019
Text020
Text021
Text022
Text023
Text024
Text025
Text026
Text027
Text028
Text029
Text030
Text031
Text032
Text033
Text034
Text035
Text036
Text037
Text038
Text039
Text040
Text041
Text042
Text043
Text044
Text045
Text046
Text047
Text048
Text049
Text050
Text051
Text052
Text053
Text054
Text055
Text056
Text057
Text058
```

Text059 [ende]

This file contains all messages that can be sent in emails according to data value to the respective addressees. Example: in the PLC data value 7 comes up; then the respective message (Text007 Tür klemmt) is looked up in the list shown above; finally this message is sent to all addressees.

4.6. s5.htm

This HTML page represents the so called control panel. In the control panel all PLC data is displayed. The data configured as writing to PLC can be changed. The HTML page is meant as a template and therefore can be built to your needs.

The PLC data is accessed by using Java applets. To keep it simple only three different applets are used. One applet is used for display purposes (cvptext.class), another one for data input (cvptxtin.class) and the third one for data input with a slider (cvpslidr.class). These applets are shown in the box below. It is easy to adjust the template. Just delete or copy the applets and change the parameter values. The connection between STEPToWEB and PLC is made by the parameter written behind the text "value". The heading of the applet is located between "#FFFF00" and .

```
<td>
<center><applet code="cvptext.class" align="baseline" width="60"
height="25" archive="cvpdea.jar"><param name="varname"
value="DB200DW10"></applet>
<p><font color="#FFFF00">DB200DW10</font></center>
</td>

<td>
<center><applet code="cvptxtin.class" align="baseline" width="60"
height="25" archive="cvpdea.jar"><param name="varname"
value="MW12"></applet>
<p><font color="#FF0000">MW12</font></center>
</td>

<td>
<center><applet code="cvpslidr.class" align="baseline" width="50"
height="255" archive="cvpdea.jar"><param name="max" value="255"><param
name="min" value="0"><param name="varname" value="MW100"></applet></center>

<center><font color="#FF0000">MW100</font></center></td>
```

Example: DB200DW10

- connection to STEPToWEB: value="DB200DW10"
- heading: „#FFFF00">DB200DW10

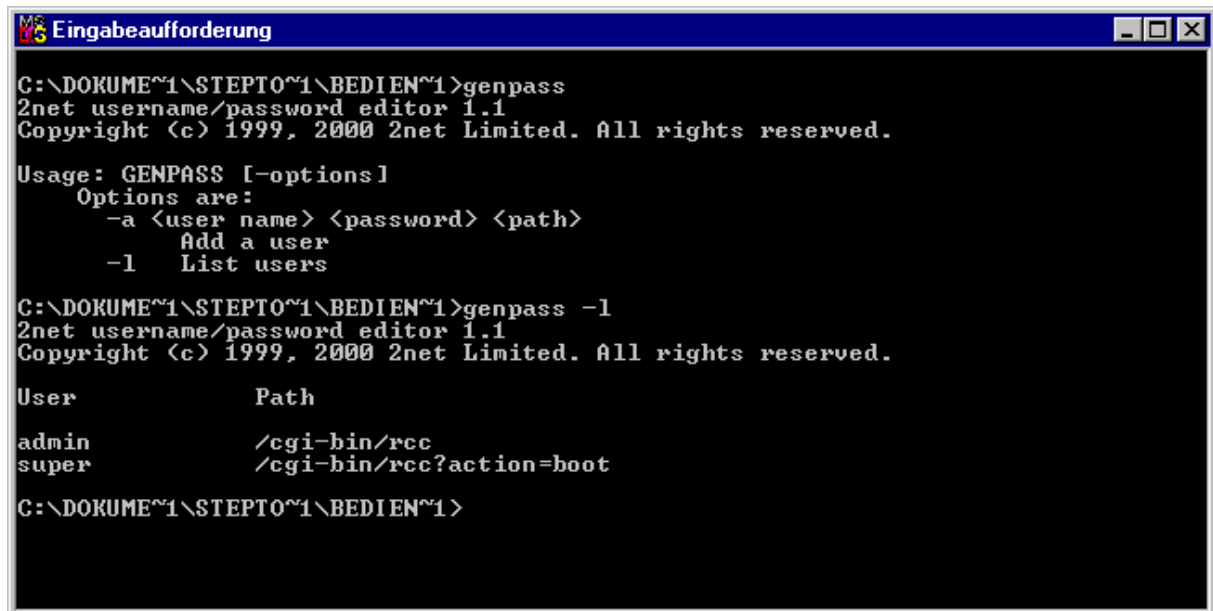
Important:

If individual bits are to be displayed, the "." must be changed to "_" in the connection definition. The heading can be assigned as usual.

5. Security

Virtually any directory or file can be made secure by using user names and passwords. By default access to file system and restart of STEPToWEB are secured by password. This can be changed and adjusted to your needs. Because all passwords are stored encoded in a file, there is a software tool to encode the file after being changed. The tool is called genpass.exe and is stored on the disk that comes with STEPToWEB. It is a DOS program and must therefore be run in a DOS window. Genpass.exe creates the encoded password file mentioned above. The file is located under c:\web in STEPToWEB and is called pwd. It can be downloaded, altered and uploaded.

When genpass.exe is started without any parameter a brief description of its options is shown. Use option -l if you want to get a list of all users currently contained in the password file and their rights. Of course, the password is not displayed!



```
C:\DOKUME~1\STEP~1\BEDIEN~1>genpass
2net username/password editor 1.1
Copyright (c) 1999, 2000 2net Limited. All rights reserved.

Usage: GENPASS [-options]
Options are:
  -a <user name> <password> <path>
    Add a user
  -l    List users

C:\DOKUME~1\STEP~1\BEDIEN~1>genpass -l
2net username/password editor 1.1
Copyright (c) 1999, 2000 2net Limited. All rights reserved.

User          Path
admin         /cgi-bin/rcc
super        /cgi-bin/rcc?action=boot

C:\DOKUME~1\STEP~1\BEDIEN~1>
```

You add users to the list by using option -a <user name> <password> <path>. The list shown above must be interpreted as follows. User "admin" is allowed to access the file system at path /cgi-bin/rcc. By the way, the file system used in STEPToWEB is accessed by a program called RCC (remote control centre). The user doesn't notice this because it supports a look & feel as in Windows. The user called "super" is allowed to make a restart of STEPToWEB which is done by using a command line /cgi-bin/rcc?action=boot. The command restart is also integrated in before mentioned RCC.