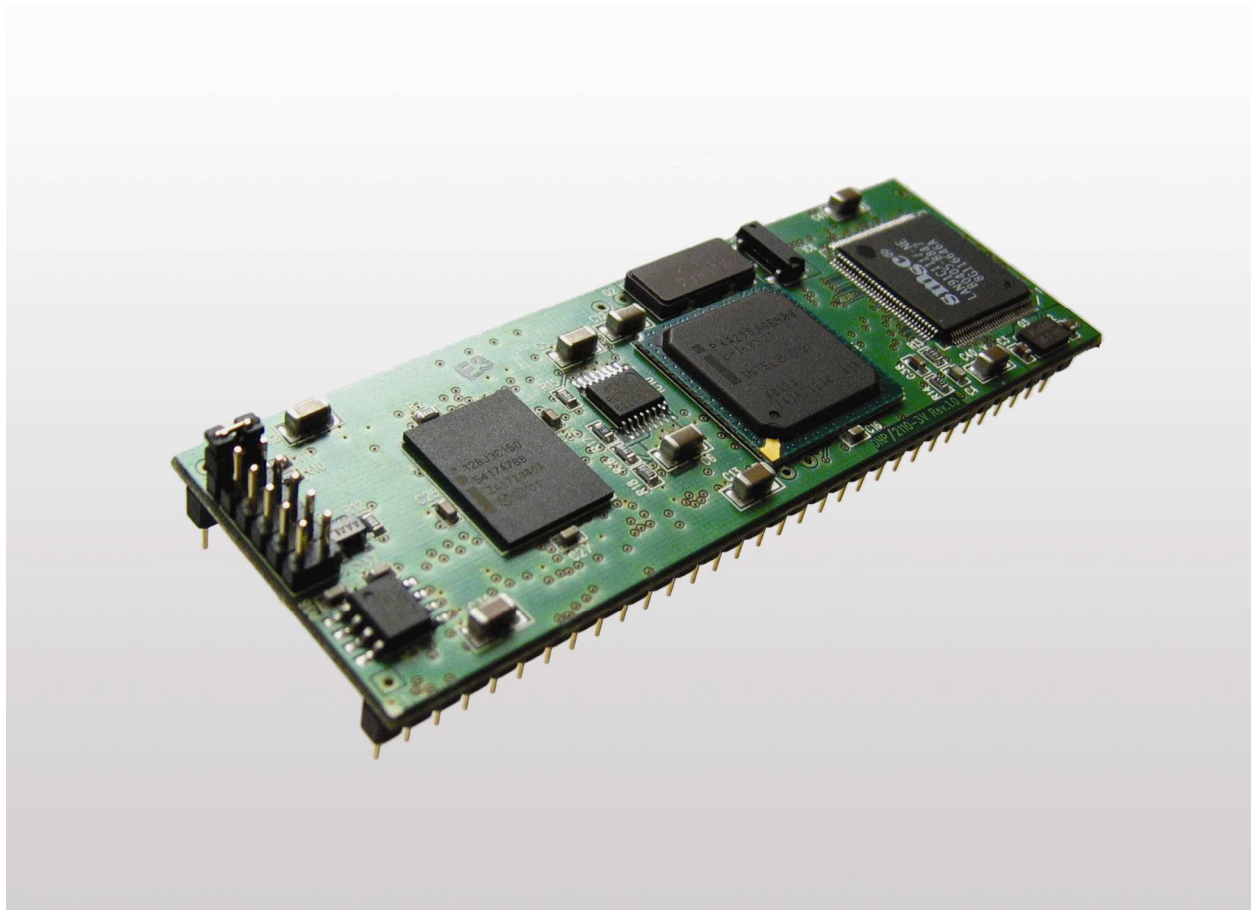


# ***DIL/NetPC DNP/2110*** Installing an SSH Connection

## User Manual



### **SSV Embedded Systems**

Heisterbergallee 72

D-30453 Hannover

Phone: +49-(0)511-40 000-0

Fax: +49-(0)511-40 000-40

E-mail: [sales@ist1.de](mailto:sales@ist1.de)

Manual Revision: 1.0

Date: 2006-05-22

# CONTENT

---

- 1 INTRODUCTION ..... 3
  - 1.1 Hardware Requirements ..... 3
  - 1.2 Software Requirements ..... 3
  
- 2 PREPARATIONS ..... 5
  - 2.1 Serial Link between Evaluation Board and PC ..... 5
  - 2.2 Ethernet Link between Evaluation Board and PC ..... 6
  - 2.3 Configuring Ethernet Link ..... 7
  - 2.4 Connecting Power Supply ..... 8
  - 2.5 Configuring HyperTerminal ..... 9
  
- 3 INSTALLING THE SSH CONNECTION ..... 10
  - 3.1 Uploading the SSH Files on the DNP/2110 ..... 10
  - 3.2 Installing the SSH Files on the DNP/2110 ..... 11
  - 3.3 Starting an SSH Connection ..... 12
  - 3.4 Login as root ..... 13
  
- CONTACT ..... 14
  
- DOCUMENT HISTORY ..... 14
  
- COPYRIGHT ..... 14

# 1 INTRODUCTION

---

This document describes how to install an SSH (Secure Shell Protocol) connection on the DNP/2110 with a Windows-PC. For further information about the individual components of this product you may follow the links from our website at <http://www.dilnetpc.com>.

Our website contains a lot of technical information, which will be updated in regular periods.

The SSH shell script **ssh-dnp2110.sh** will install:

- OpenSSL 0.9.8a
- OpenSSH 4.1p1

OpenSSL Lib supports

**Message Digest:** md2, md4, md5, rmd160, sha, sha1

**Cipher:** aes-128-cbc, aes-128-ecb, aes-192-cbc, aes-192-ecb, aes-256-cbc, aes-256-ecb, base64, bf, bf-cbc, bf-cfb, bf-ecb, bf-ofb (blowfish), cast, cast-cbc, cast5-cbc, cast5-cfb, cast5-ecb, cast5-ofb, des, des-cbc, des-cfb, des-ecb, des-edc, des-edc-cbc, des-edc-cfb, des-edc-ofb, des-edc3, des-edc3-cbc, des-edc3-cfb, des-edc3-ofb, des-ofb, des3, desx (Triple DES), idea, idea-cbc, idea-cfb, idea-ecb, idea-ofb, rc2, rc2-40-cbc, rc2-64-cbc, rc2-cbc, rc2-cfb, rc2-ecb, rc2-ofb.

## 1.1 Hardware Requirements

---

The following hardware is needed to install an SSH connection on the DNP/2110:

- One PC with Windows XP and one unused COM port
- One Evaluation Board (e.g. EVA6) with mounted DNP/2110 and one COM port
- One plug-in power supply (5 VDC)
- One Ethernet cross-over cable
- One null modem cable

## 1.2 Software Requirements

---

- **ssh-dnp2110.sh** (Starter Kit CD directory CD:\Linux\SSH)
- **install.sh** (Starter Kit CD directory CD:\Linux\SSH)
- **install\_busybox** (Starter Kit CD directory CD:\Linux\SSH)
- **PuTTY** (Starter Kit CD directory CD:\Putty-Win32)

PuTTY is a small terminal software with SSH support. PuTTY works without installation, just run the putty.exe. PuTTY is freeware. You may also look for a newer version of PuTTY in the internet at

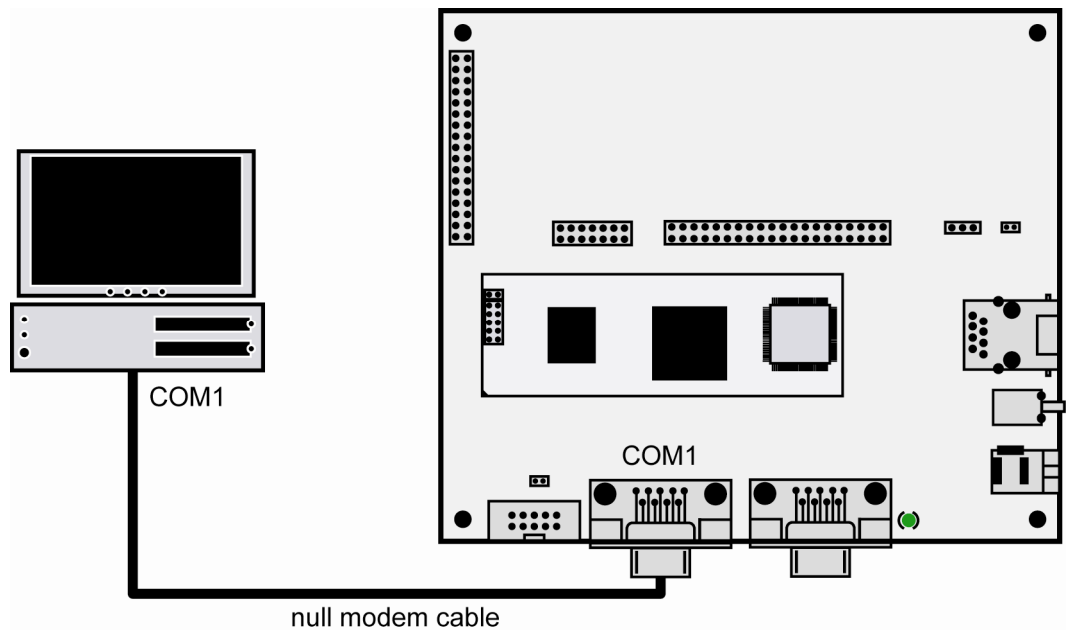
<http://www.chiark.greenend.org.uk/~sgtatham/putty>.

## 2 PREPARATIONS

### 2.1 Serial Link between Evaluation Board and PC

Setup the serial link between the Evaluation Board and your PC. Use a null modem cable for this connection.

The serial link is for communication between the DNP/2110 and your PC via HyperTerminal. Connect one end of the **null modem cable** with the **COM1** port of your PC and the other end with the **COM1** port of the Evaluation Board.



**Figure 1: Serial link between Evaluation Board and PC**

Please make sure that the PC COM port supports 115.200 bps and is unused.

## 2.2 Ethernet Link between Evaluation Board and PC

Setup the Ethernet link between the Evaluation Board and your PC. Use an Ethernet cross-over cable for this connection.

The Ethernet link is for the SSH connection between the DNP/2110 and your PC. Connect one end of the Ethernet cross-over cable with the LAN interface of your PC and the other end with the LAN interface of the Evaluation Board.

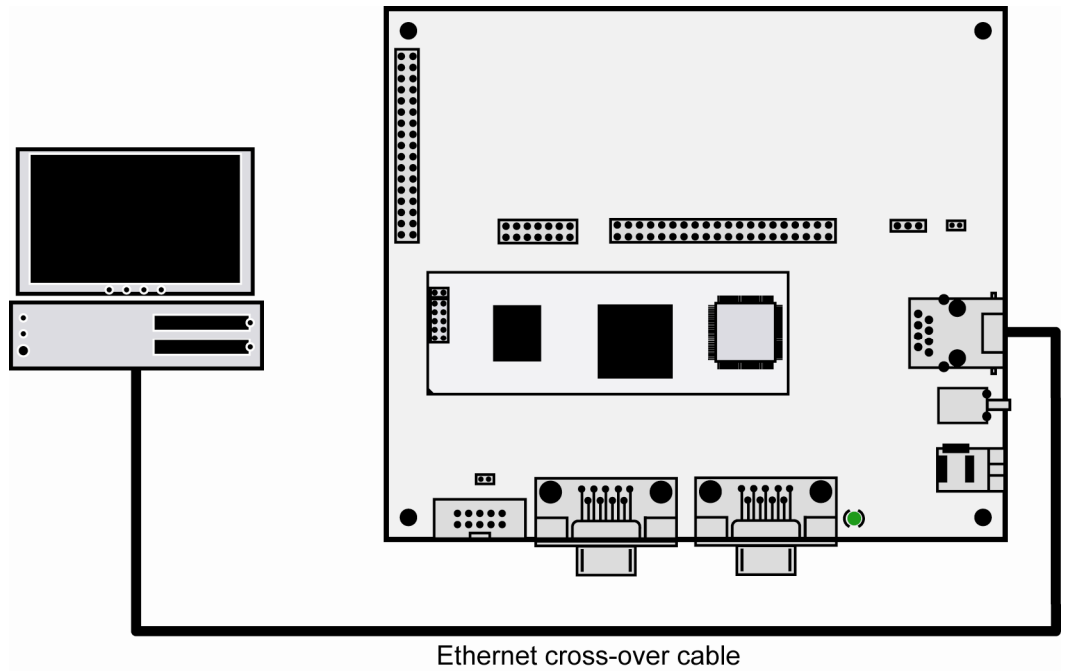


Figure 2: Ethernet link between Evaluation Board and PC

## 2.3 Configuring Ethernet Link

The IP address of the DNP/2110 is ex factory set to **192.168.0.126**. To enable the Ethernet connection between the DNP/2110 and the PC, please change the IP address of the PC.

Open the **Control Panel** and select **Network Connections**. Right click on the LAN connection and click on **Properties**.

Open the tab **General** and select **Internet Protocol (TCP/IP)** from the list and click on **Properties**.

In the following dialog select **Use the following IP address** and enter **192.168.0.254** as IP address and **255.255.255.0** as subnet mask. Click on **OK** to close the dialog. Click again on **OK** to finish the configuration.

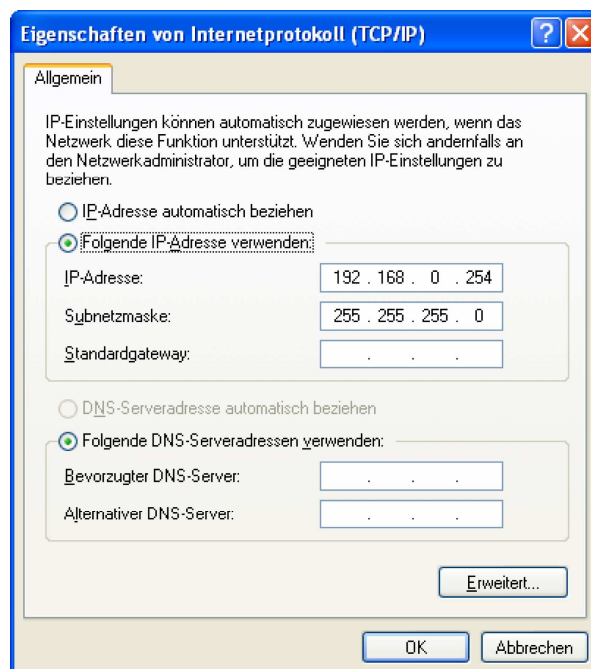


Figure 3: Configuring the IP address of the Ethernet link on the Windows PC

## 2.4 Connecting Power Supply

Connect a 5 VDC power supply with a 5.5 mm x 2.5 mm jack plug with the Evaluation Board.

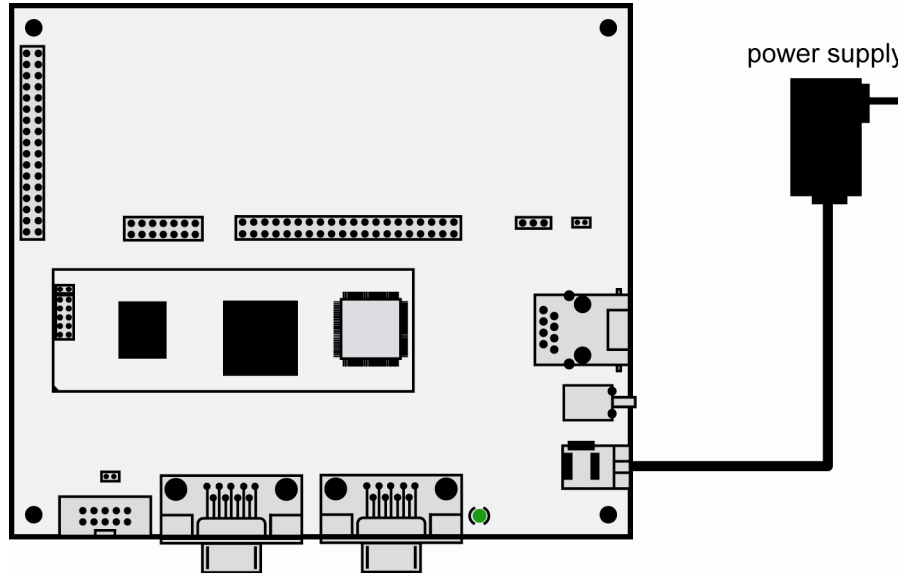


Figure 4: Power supply for the Evaluation Board

Please pay attention to the polarity of the power connector: **the + pole is in the center!**

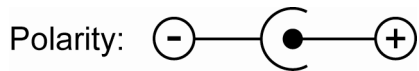


Figure 5: Polarity of the power connector



## 2.5 Configuring HyperTerminal

Run HyperTerminal on your PC. Enter a name for the new connection. In the next dialog select **COM1** for the connection.



**Figure 6: Direct connection setup with HyperTerminal**

Now change the connection parameters to the values of table 1. Make sure, that you use the **COM1** port of your PC and that it supports 115.200 bps.



**Figure 7: Parameter setup with HyperTerminal**

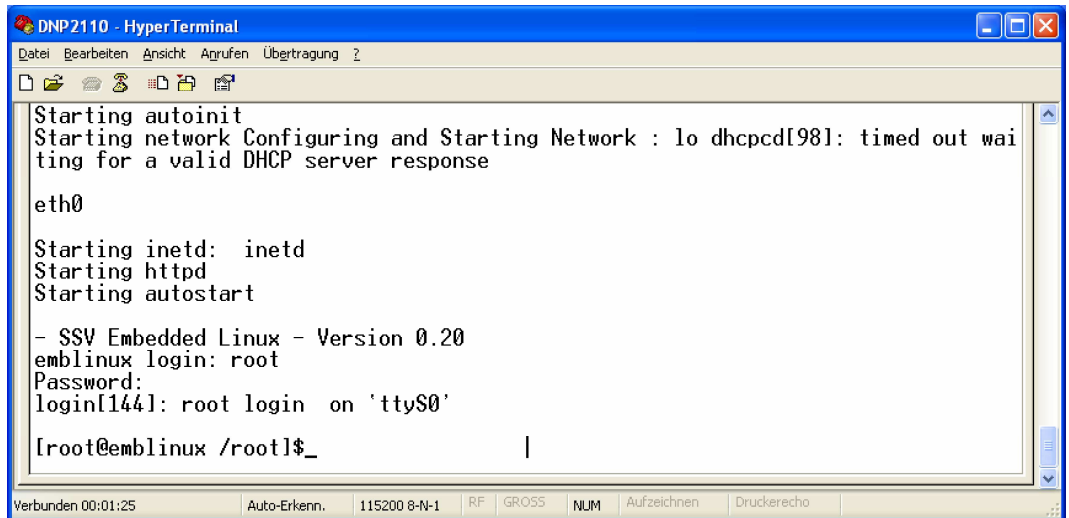
Parameter	Value
Speed	115.200 bps
Data Bits	8
Parity	None
Stop Bits	1
Protocol	No (Xon/Xoff, RTS/CTS or similar)

**Table 1: Setup parameters for HyperTerminal**

## 3 INSTALLING THE SSH CONNECTION

### 3.1 Uploading the SSH Files on the DNP/2110

Start the HyperTerminal connection you created in chapter 2.5. If you have not powered up the Evaluation Board so far, please do it now. Wait until the Linux boot process finishes (this may take a few seconds). You will see the Linux login prompt. Enter the user name **root** and hit Return if Linux asks for a password.



```

DNP2110 - HyperTerminal
Datei Bearbeiten Ansicht Agrufen Übertragung ?
Starting autoinit
Starting network Configuring and Starting Network : lo dhcpd[198]: timed out waiting for a valid DHCP server response
eth0
Starting inetd: inetd
Starting httpd
Starting autostart
- SSV Embedded Linux - Version 0.20
emlinux login: root
Password:
login[144]: root login on 'ttyS0'
[root@emlinux /root]$_
Verbunden 00:01:25 Auto-Erkenn. 115200 8-N-1 RF GROSS NUM Aufzeichnen Druckerecho

```

Figure 8: DNP/2110 boot messages and login prompt

Stay in the current directory **root**.

Open **Transfer > Send file...** from the menu bar and select all files from the Starter Kit CD-ROM directory **CD:\Linux\SSH**. Enter therefore **\*.\*** in the field **Filename** like shown in the next figure. Choose **Zmodem with Crash Recovery** as protocol and send the files.

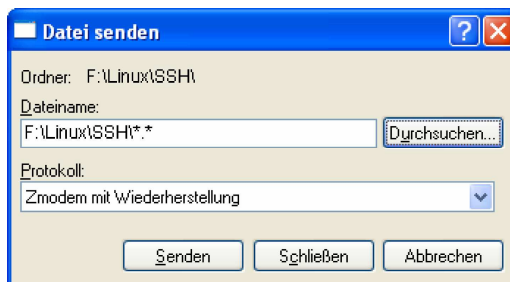
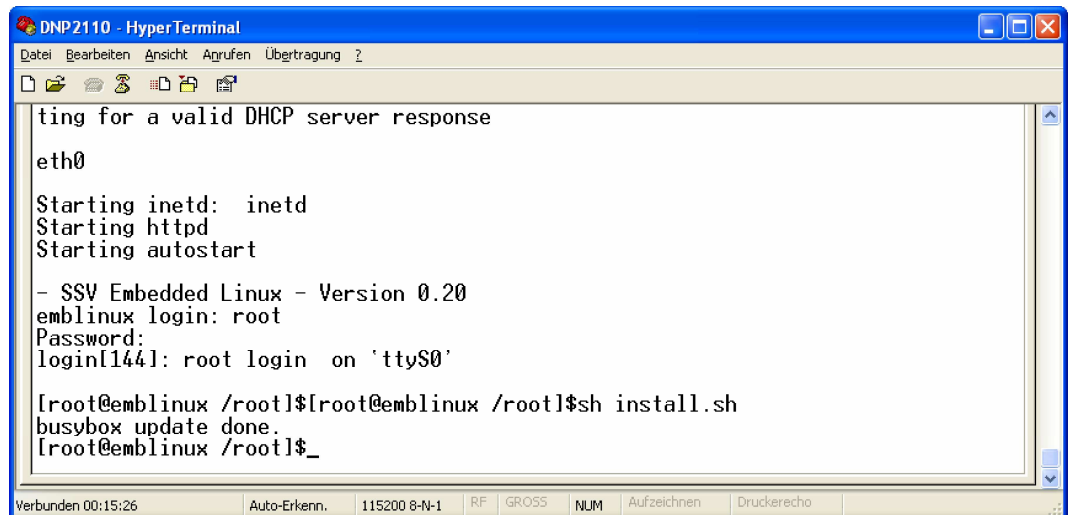


Figure 9: Selecting SSH files for transfer

## 3.2 Installing the SSH Files on the DNP/2110

Change to the directory `root` if you are not already there and enter the command `sh install.sh` to install the BusyBox first.



```

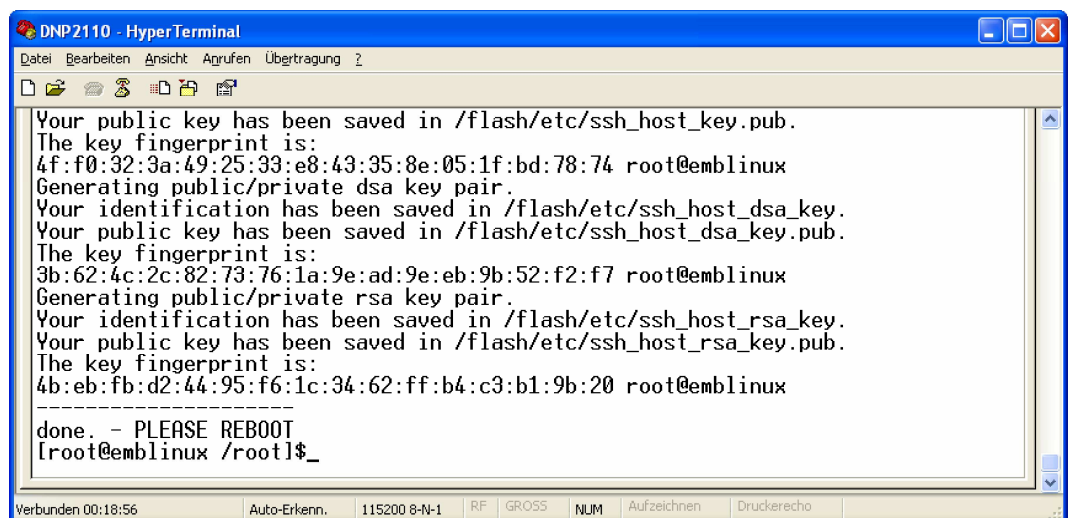
DNP2110 - HyperTerminal
Datei Bearbeiten Ansicht Agrufen Übertragung ?
[Icons]
ting for a valid DHCP server response
eth0
Starting inetd: inetd
Starting httpd
Starting autostart
- SSV Embedded Linux - Version 0.20
emblinux login: root
Password:
login[144]: root login on 'ttyS0'

[root@emblinux /root]#[root@emblinux /root]#sh install.sh
busybox update done.
[root@emblinux /root]$_
Verbunden 00:15:26 Auto-Erkenn. 115200 8-N-1 RF GROSS NUM Aufzeichnen Druckerecho

```

**Figure 10: Installing BusyBox**

Now enter the command `sh ssh-dnp2110.sh` to install the SSH files. The SSH files will be installed automatically in the directory `flash`. Generating the SSH keys may take a while, please be patient.



```

DNP2110 - HyperTerminal
Datei Bearbeiten Ansicht Agrufen Übertragung ?
[Icons]
Your public key has been saved in /flash/etc/ssh_host_key.pub.
The key fingerprint is:
4f:f0:32:3a:49:25:33:e8:43:35:8e:05:1f:bd:78:74 root@emblinux
Generating public/private dsa key pair.
Your identification has been saved in /flash/etc/ssh_host_dsa_key.
Your public key has been saved in /flash/etc/ssh_host_dsa_key.pub.
The key fingerprint is:
3b:62:4c:2c:82:73:76:1a:9e:ad:9e:eb:9b:52:f2:f7 root@emblinux
Generating public/private rsa key pair.
Your identification has been saved in /flash/etc/ssh_host_rsa_key.
Your public key has been saved in /flash/etc/ssh_host_rsa_key.pub.
The key fingerprint is:
4b:eb:fb:d2:44:95:f6:1c:34:62:ff:b4:c3:b1:9b:20 root@emblinux
-----
done. - PLEASE REBOOT
[root@emblinux /root]$_
Verbunden 00:18:56 Auto-Erkenn. 115200 8-N-1 RF GROSS NUM Aufzeichnen Druckerecho

```

**Figure 11: SSH installation complete**

Reboot the DNP/2110 when the installation is complete. After the reboot the DNP/2110 is ready for an SSH connection.

### 3.3 Starting an SSH Connection

Run the **putty.exe** on the PC. Enter the IP address of the DNP/2110 (192.168.0.126), select **SSH** as protocol and click on **Open**.

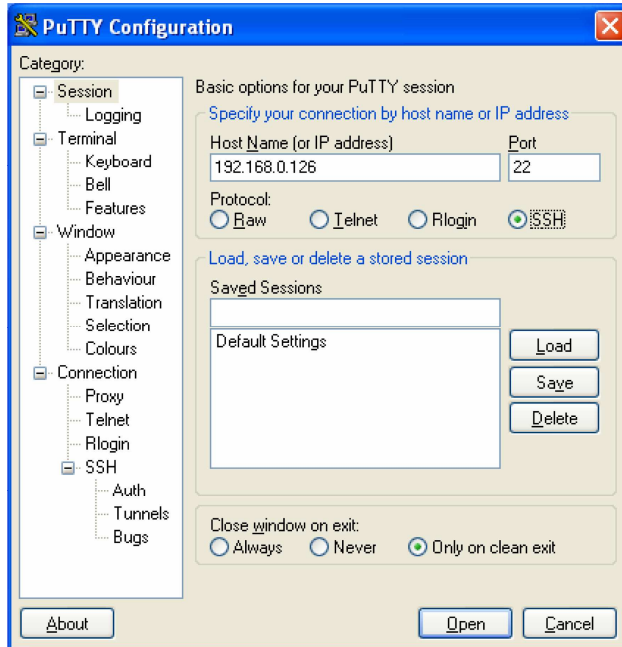


Figure 12: Configuring PuTTY

Before the SSH session starts, PuTTY shows an alert, that the host key of the server is unknown. Click **Yes** to save the key permanently. Click **No**, if you want to connect just once.

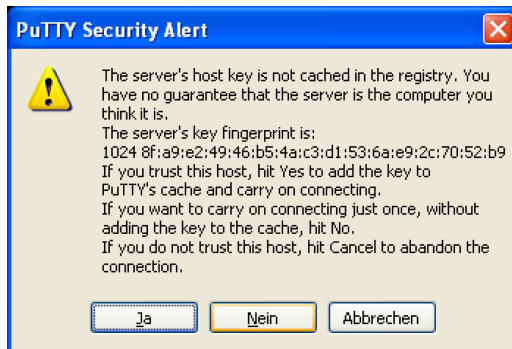
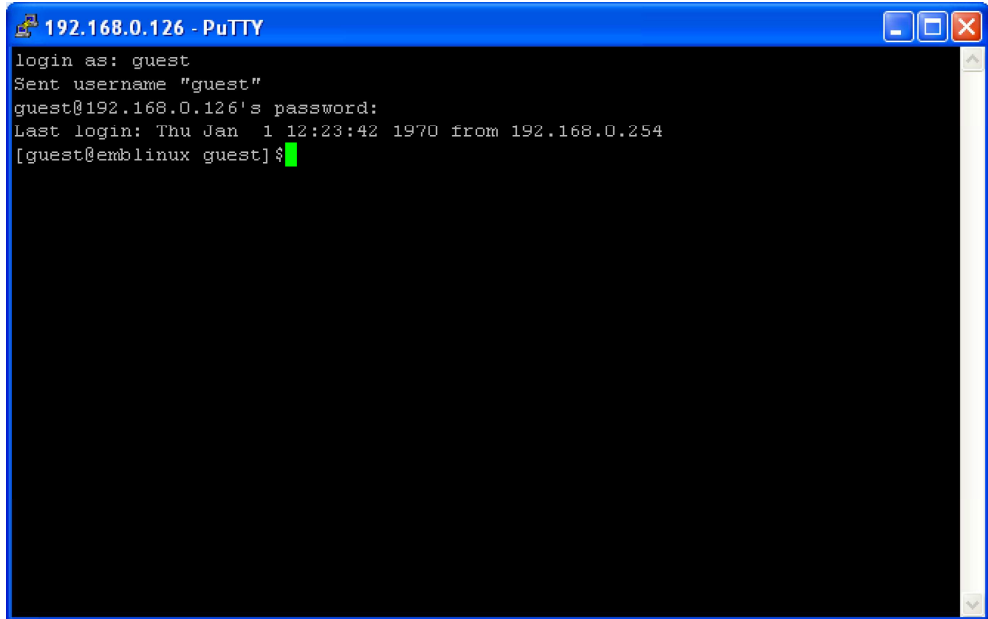


Figure 13: PuTTY security alert

The username as well as the password for the SSH session is **guest**. In the directory `/home/guest` you can store and/or modify your own files.

It is also possible to login as root, please refer to chapter 3.4.



```
192.168.0.126 - PuTTY
login as: guest
Sent username "guest"
guest@192.168.0.126's password:
Last login: Thu Jan  1 12:23:42 1970 from 192.168.0.254
[guest@emblinux guest]$
```

Figure 14: PuTTY SSH session as ‘guest’

### 3.4 Login as root

---

Before you can login as root, you have to set a password for root.

Open a serial connection (HyperTerminal), start Linux, login as root and enter the command `passwd`. Just follow the instructions on the screen.

**Please note:** The root password is temporary. After a reset of the DNP/2110 you have to set the root password again.

## CONTACT

---

**SSV Embedded Systems**  
Heisterbergallee 72  
D-30453 Hannover  
Phone: +49 (0)511/40 000-0  
Fax: +49 (0)511/40 000-40  
E-mail: sales@ist1.de  
Internet: www.ssv-embedded.de

## DOCUMENT HISTORY

---

Revision	Date	Remarks	Name
1.0	2006-05-22	first version	WBU

## COPYRIGHT

---

The content of this document can change any time without announcement. There is taken over no guarantee for the accuracy of the statements. The user assumes the entire risk as to the accuracy and the use of this document. Information in this document is provided 'as is' without warranty of any kind.

Some names within this document can be trademarks of their respective holders.

© 2006 SSV EMBEDDED SYSTEMS. All rights reserved.