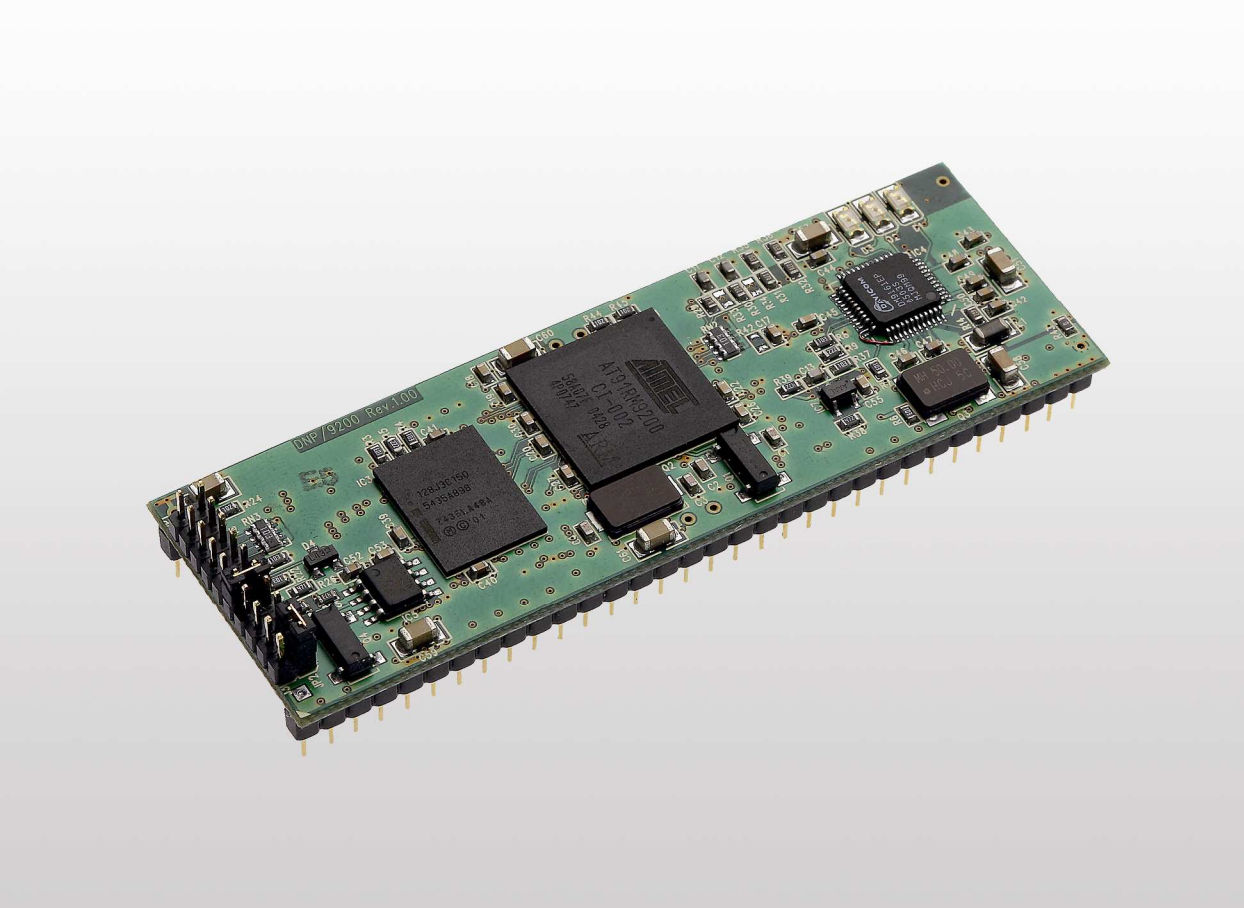
DIL/NetPC DNP/9200
Board Revision 1.1

Installing an SSH Connection User Manual



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Manual Revision: 1.1
Date: 2006-07-24

For further information regarding our products please visit us at www.dilnetpc.com

CONTENT

1 INTRODUCTION

This document describes how to install an SSH (Secure Shell Protocol) connection on the DNP/9200 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-dnp9200.sh*** will install:

- OpenSSL 0.9.8a
- OpenSSH 4.1p1

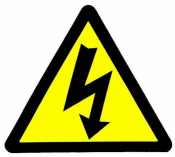
OpenSSL Lib supports

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-ede, des-ede-cbc, des-ede-cfb, des-ede-ofb, des-ede3, des-ede3-cbc, des-ede3-cfb, des-ede3-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 Safety Guidelines

Please read the following safety guidelines carefully! In case of property or personal damage by not paying attention to this document and/or by incorrect handling, we do not assume liability. In such cases any warranty claim expires.



ATTENTION: Observe precautions for handling – electrostatic sensitive device!

- Discharge yourself before you work with the device, e.g. by touching a heater of metal, to avoid damages.
- Stay grounded while working with the device to avoid damage through electrostatic discharge.

1.2 Conventions

Convention	Usage
bold	Important terms
italic	Filenames, user inputs and command lines
`monospace`	Pathnames, internet addresses and program code

Table 1: Conventions used in this Document

1.3 Hardware Requirements

The following hardware is needed to install an SSH connection on the DNP/9200:

- One PC with Windows XP and one unused COM port
- One Evaluation Board (e.g. EVA9) with mounted DNP/9200 and one COM port
- One plug-in power supply (5 VDC)
- One Ethernet cross-over cable
- One null modem cable

1.4 Software Requirements

- *ssh-dnp9200.sh* for Linux Kernel version 2.4 or *ssh-sftp-dnp9200.sh* for Linux Kernel version 2.6 (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 the null modem cable for this connection.

The serial link is for communication between the DNP/9200 and your PC via HyperTerminal. Connect one end of the **null modem cable** with the **COM1** port of your PC. Connect the other end with the **COM1** port of the Evaluation Board.

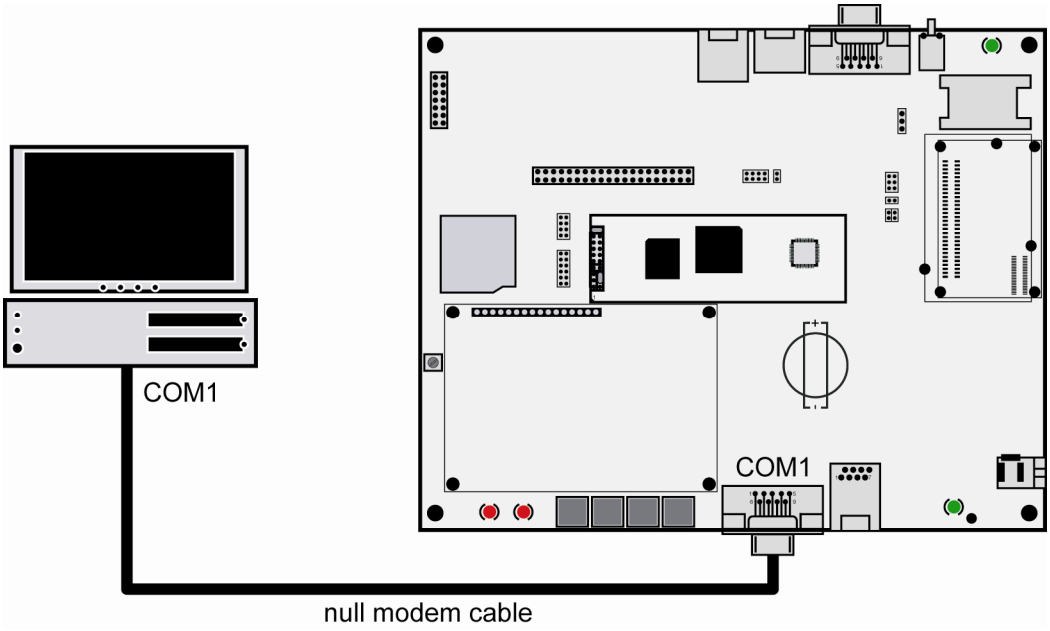


Figure 1: Serial link between Evaluation Board and PC

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/9200 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.

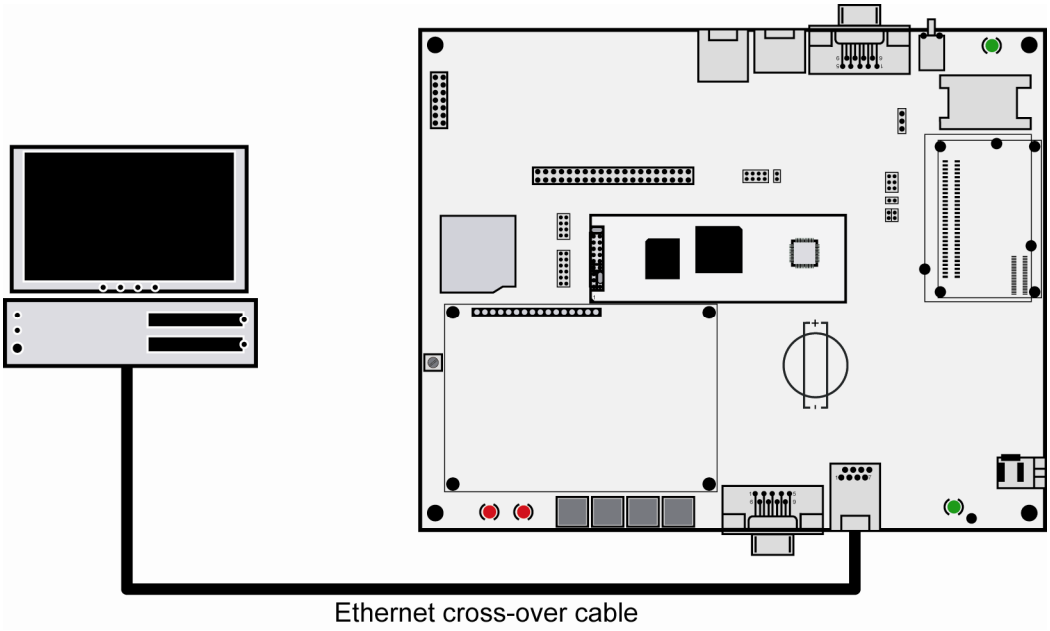


Figure 2: Ethernet link between Evaluation Board and PC

2.3 Configuring Ethernet Link

The IP address of the DNP/9200 is ex factory set to **192.168.0.126**. To enable the Ethernet connection between the DNP/9200 and the PC, please change the IP address of the PC.

Open the **Control Panel** and select N**etwork 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.

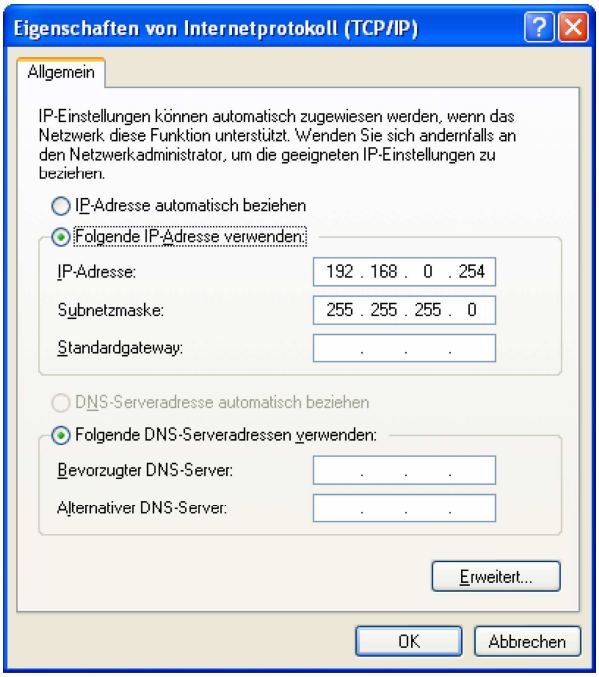


Figure 3: Changing the IP address of the Ethernet link on the Windows PC

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.

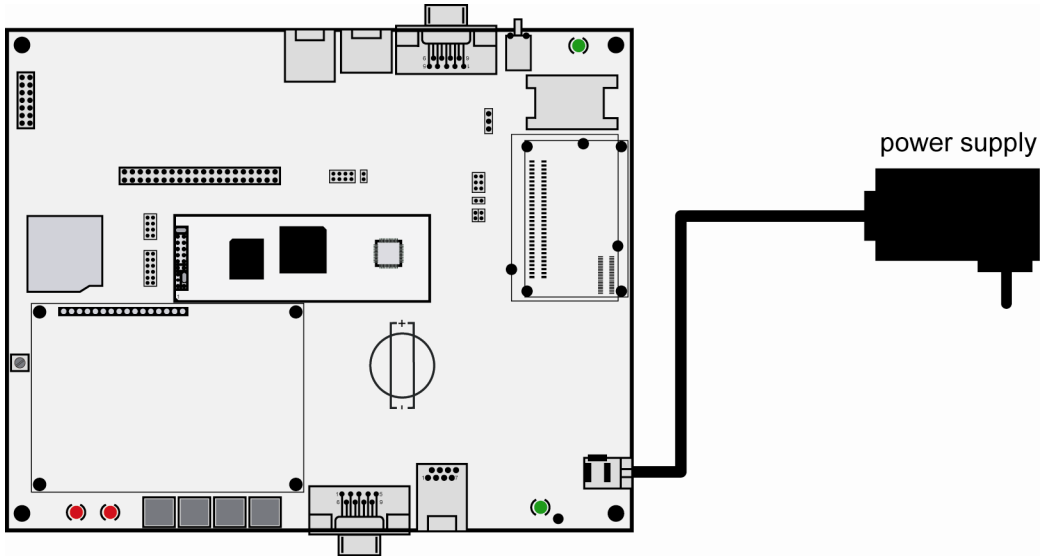


Figure 4: Power supply for the Evaluation Board

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

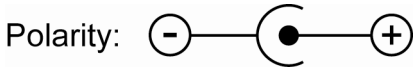


Figure 5: Polarity of the power connector

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 2: Setup parameters for HyperTerminal

3 INSTALLING THE SSH CONNECTION

3.1 Uploading the SSH Files on the DNP/9200

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.

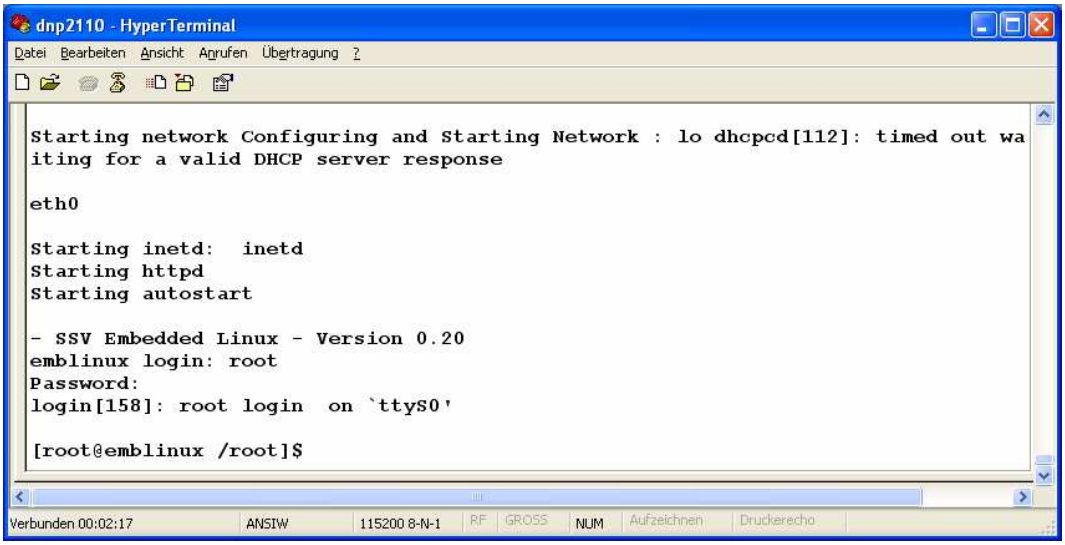


Figure 8: DNP/9200 boot messages and login prompt

Change to the directory **tmp** with the command **cd ../tmp**.

Open **Transfer > Send file…** from the menu bar and select the **ssh-dnp9200.sh** (Linux Kernel 2.4) or the **ssh-sftp-dnp9200.sh** (Linux Kernel 2.6) from the Starter Kit CD-ROM directory CD:\Linux\SSH. Choose **Zmodem with Crash Recovery** as protocol and send the file.

Figure 9: Selecting SSH file for transfer

3.2 Installing the SSH Files on the DNP/9200

Change to the directory **tmp** if you are not already there and enter the command **sh ssh-dnp9200.sh** to start the installation. The SSH files will be installed automatically in the directory **flash**.

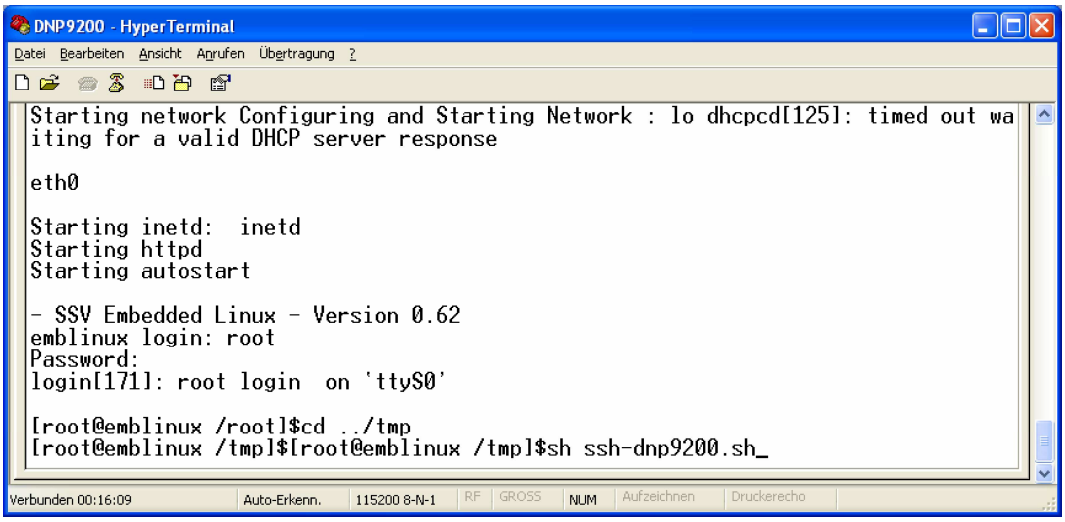


Figure 10: Installing the file ssh-dnp9200.sh

Generating the SSH keys may take a while, please be patient. Reboot the DNP/9200, when the installation is complete.

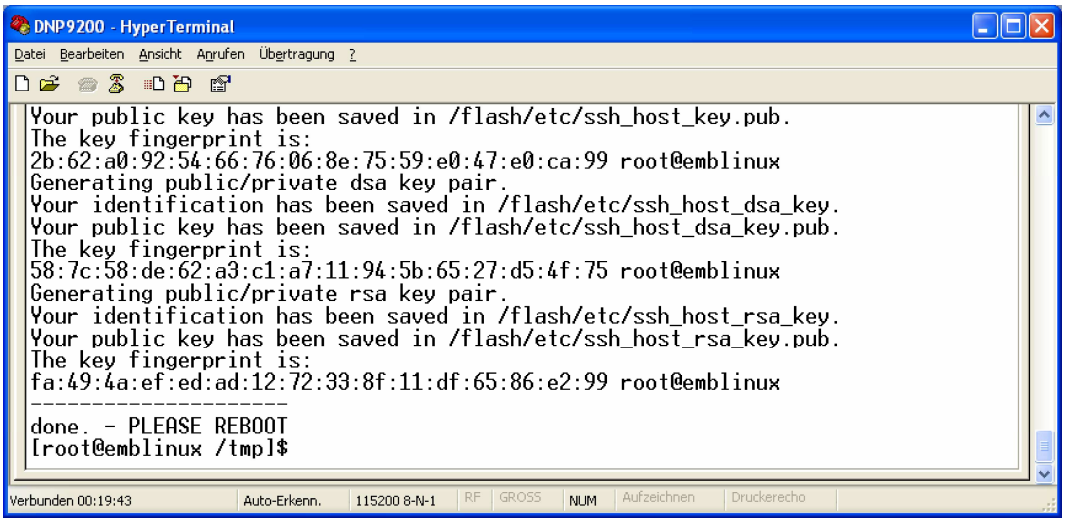


Figure 11: SSH installation complete

After the reboot the DNP/9200 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/9200 (192.168.0.126), select **SSH** as protocol and click on **Open**.

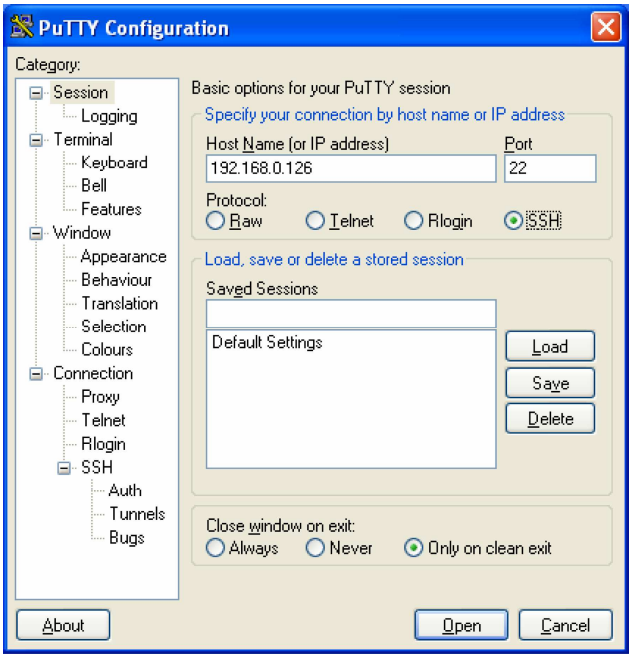


Figure 12: Configuring PuTTY

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.

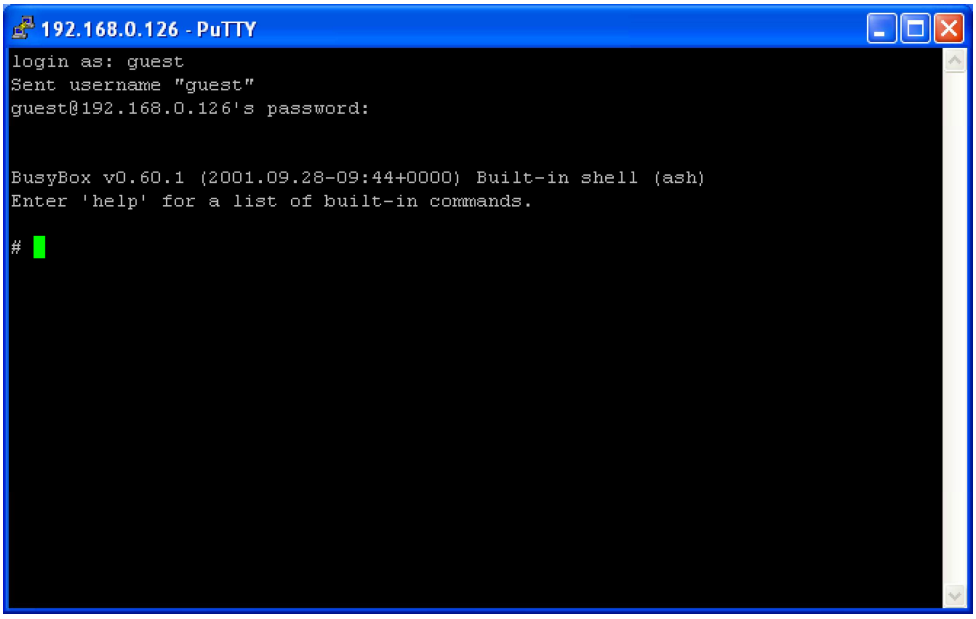


Figure 14: PuTTY SSH session as 'guest'

To gain root permissions while working as guest enter the command ***su*** ("superuser") and hit Return if Linux asks for a password.

3.4 Login as root

Before you can login as root in a Telnet session, 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/9200 you have to set the root password again.

4 HELPFUL LITERATURE

- Hardware Reference Evaluation Board DNP/EVA9
- First Steps Starter Kit DNP/SK23

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DOCUMENT HISTORY

Revision	Date	Remarks	Name
1.0	2006-04-25	first version	WBU
1.1	2006-07-24	chapter 1.1 and 1.2 added, chapter 3.1 and 3.3 modified	WBU