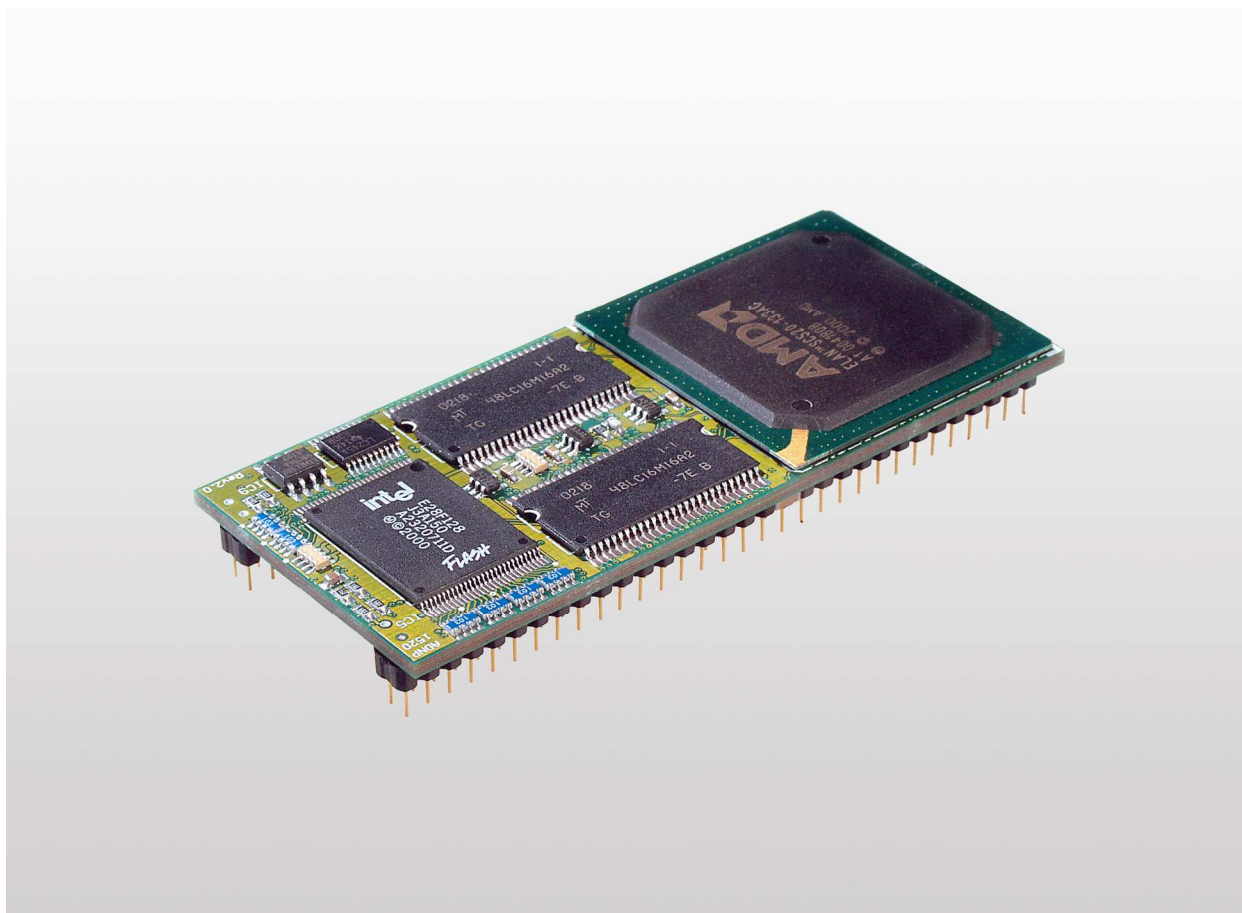


# ***DIL/NetPC ADNP/1520*** ***Board Revision 2.1***

## **Installing an SSH Connection User Manual**



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# 1 INTRODUCTION

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This document describes how to install an SSH (Secure Shell Protocol) connection on the ADNP/1520 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-adnp1520.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

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The following hardware is needed to install an SSH connection on the ADNP/1520:

- One PC with Windows XP and one unused COM port
- One Evaluation Board (e.g. EVA7) with mounted ADNP/1520 and one COM port
- One plug-in power supply (5 VDC)
- One Ethernet cross-over cable
- One null modem cable

## 1.2 Software Requirements

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- **Formatted Flash** (<http://www.dilnetpc.com/mHT1520A-03.pdf>)
- **Gateway Linux** (Starter Kit CD directory CD:\DNPX\DOSSSD\PreCfg6)
- **ssh-adnp1520.sh** (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 ADNP/1520 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.

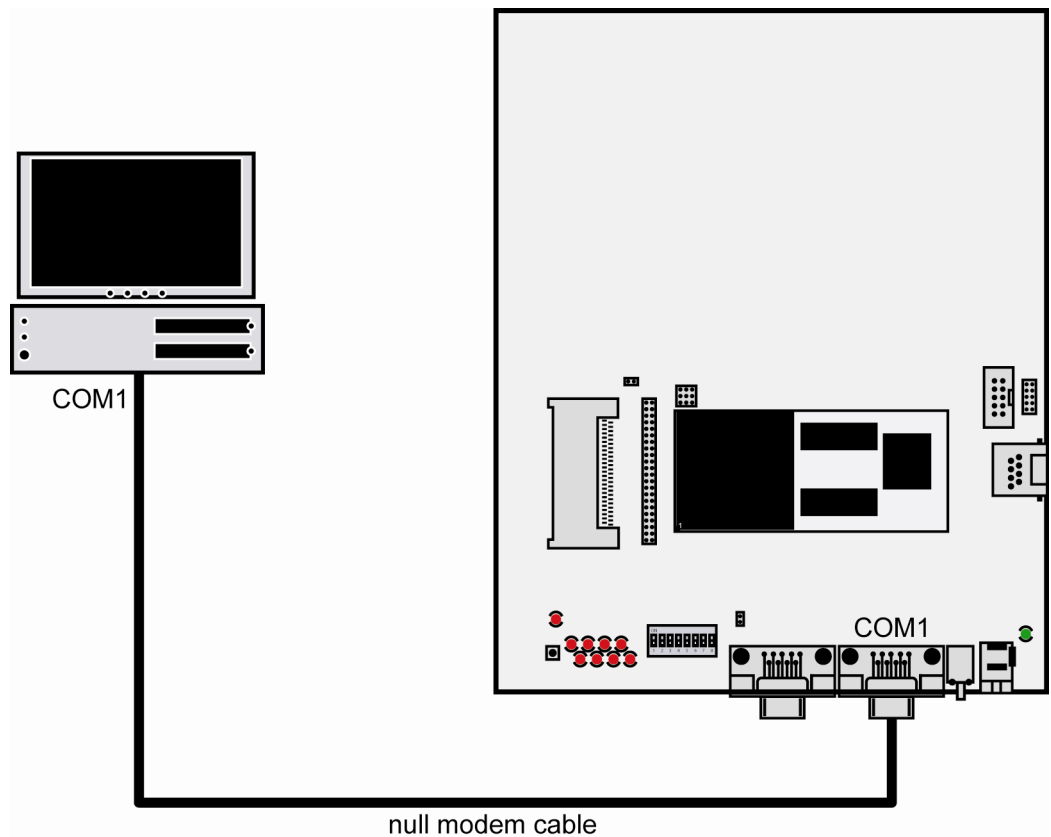


Figure 1: Serial link between Evaluation Board and PC

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 ADNP/1520 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.

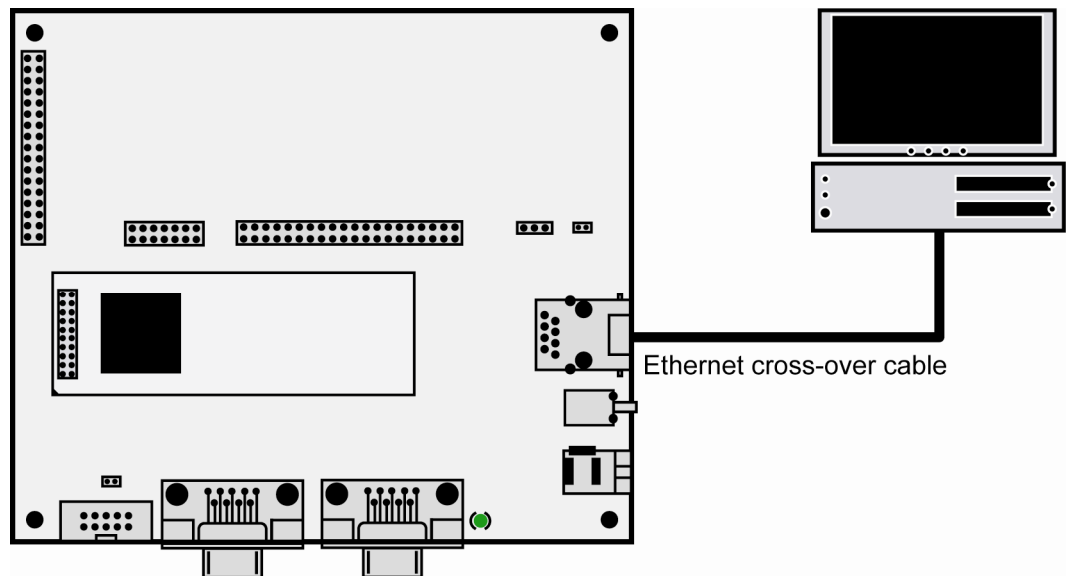


Figure 2: Ethernet link between Evaluation Board and PC

## 2.3 Configuring Ethernet Link

The IP address of the ADNP/1520 is ex factory set to **192.168.0.126**. To enable the Ethernet connection between the ADNP/1520 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.

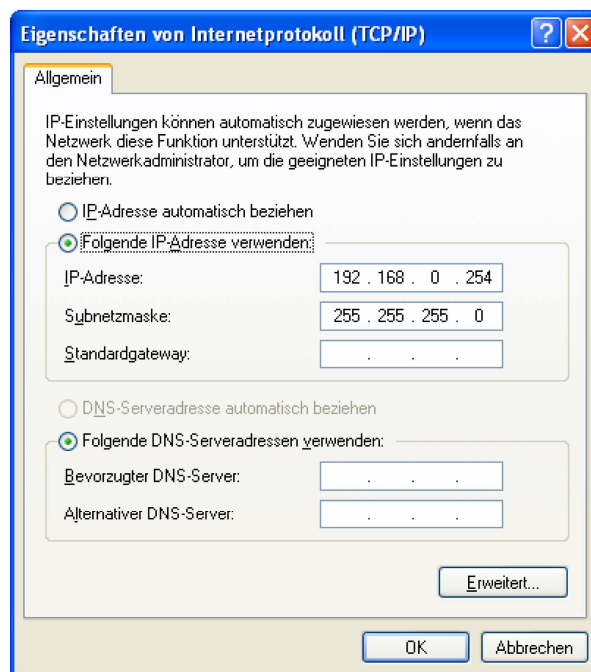


Figure 3: Changing the IP address of the Ethernet link on the Windows PC

## 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.

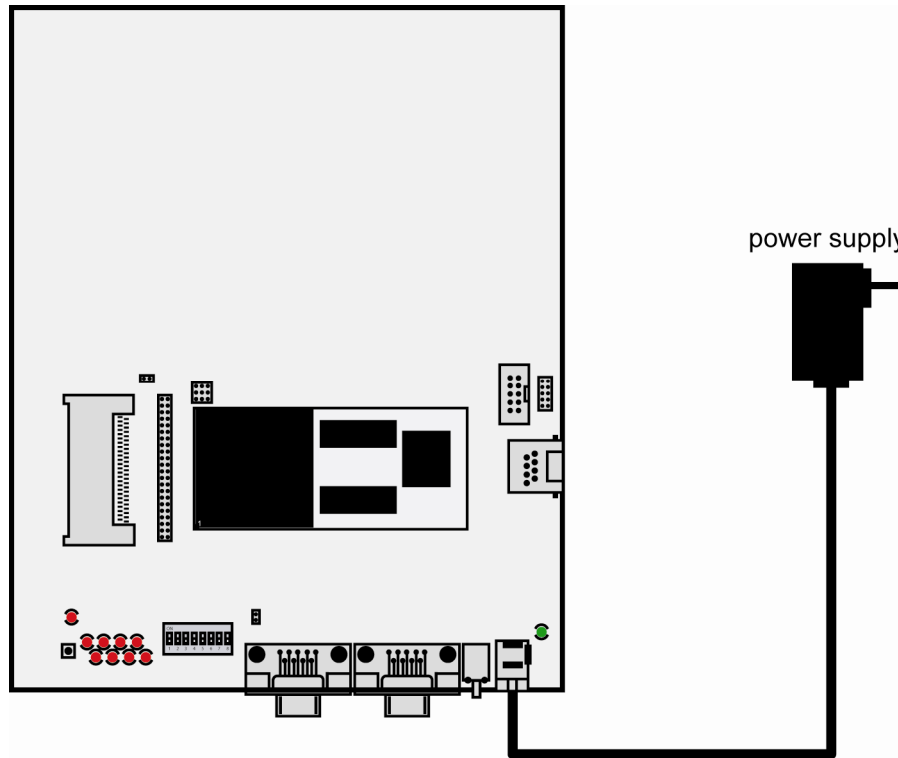


Figure 4: Power supply for the Evaluation Board

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

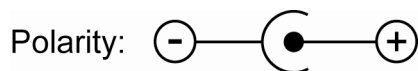


Figure 5: Polarity of the power connector

## 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 1: Setup parameters for HyperTerminal**



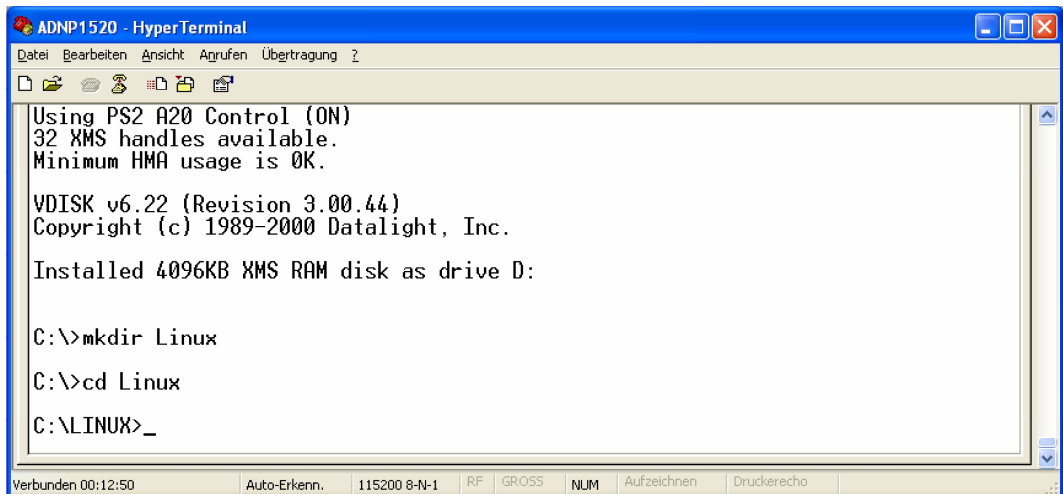
## 3 INSTALLING LINUX

Before it is possible to create an SSH connection, the DOS-based ADNP/1520 has to be upgraded to Linux with a few simple steps.

### 3.1 Uploading the Linux Files on the ADNP/1520

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 DOS boot process finishes (this may take a few seconds). You can hit the Escape key to accelerate the memory test.

Create a new directory, e.g. `Linux`. Use this command: `mkdir Linux`. Change to the new created directory with `cd Linux`.



```

ADNP1520 - HyperTerminal
Datei Bearbeiten Ansicht Anrufen Übertragung ?
Using PS2 A20 Control (ON)
32 XMS handles available.
Minimum HMA usage is 0K.

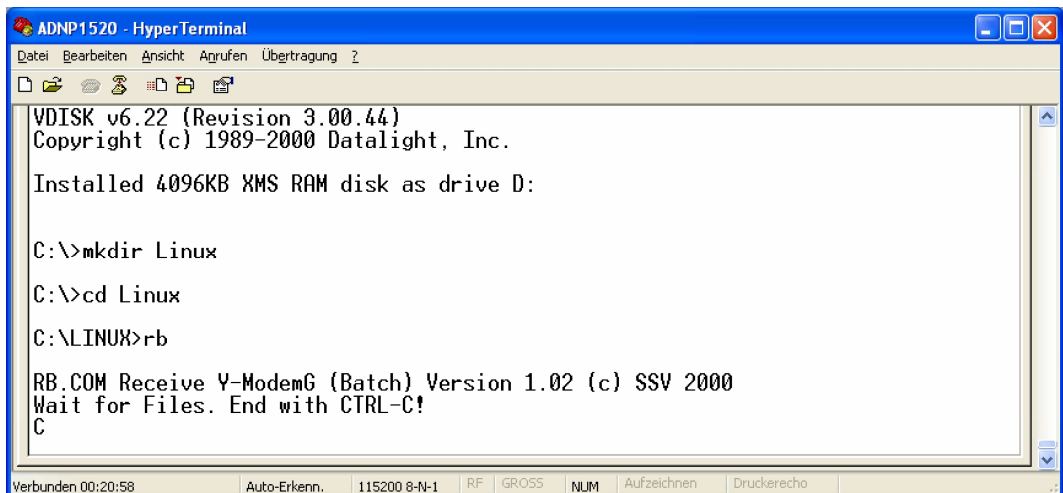
VDISK v6.22 (Revision 3.00.44)
Copyright (c) 1989-2000 Datalight, Inc.

Installed 4096KB XMS RAM disk as drive D:

C:\>mkdir Linux
C:\>cd Linux
C:\LINUX>_
  
```

Figure 8: Creating the new Linux directory

Copy all files from the Starter Kit CD-ROM directory `CD:\DNPX\DOSSSD\PreCfg6` into the new Linux directory on the ADNP/1520. Therefore type `rb` and hit Enter.



```

ADNP1520 - HyperTerminal
Datei Bearbeiten Ansicht Anrufen Übertragung ?
VDISK v6.22 (Revision 3.00.44)
Copyright (c) 1989-2000 Datalight, Inc.

Installed 4096KB XMS RAM disk as drive D:

C:\>mkdir Linux
C:\>cd Linux
C:\LINUX>rb

RB.COM Receive Y-ModemG (Batch) Version 1.02 (c) SSV 2000
Wait for Files. End with CTRL-C!
C
  
```

Figure 9: Preparing file transfer

Then open **Transfer > Send file...** from the menu bar and browse to the directory CD:\DNPX\DOSSSD\PreCfg6. You can enter \*.\* to send all Linux files at once from the Starter Kit CD-ROM. Choose **Ymodem-G** as protocol and send the files.

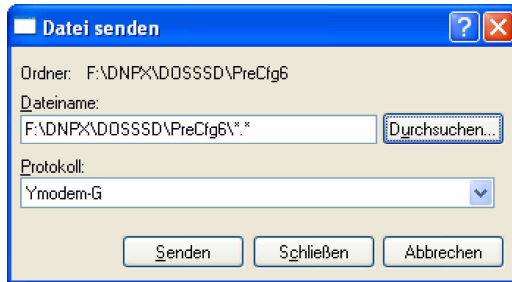


Figure 10: Selecting files for transfer

You will see a window with information about the file transfer progress.

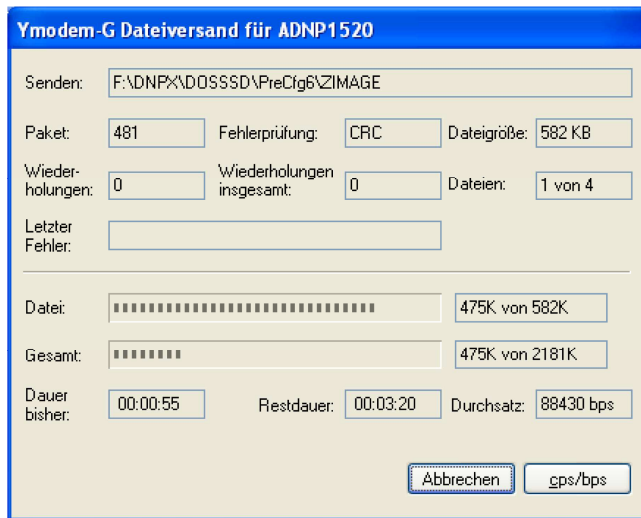


Figure 11: Information about file transfer

When the file transfer is complete, hit CTRL+C to exit the file transfer mode.

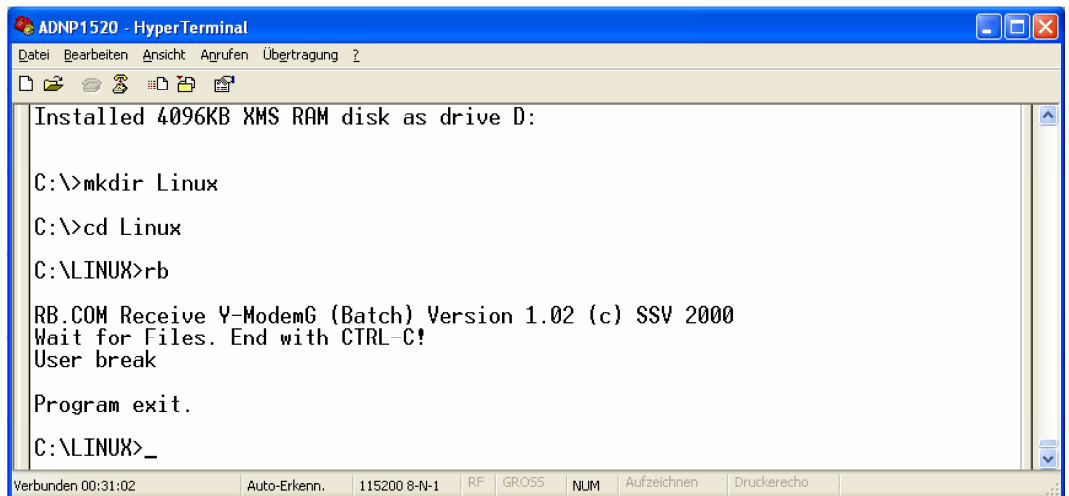
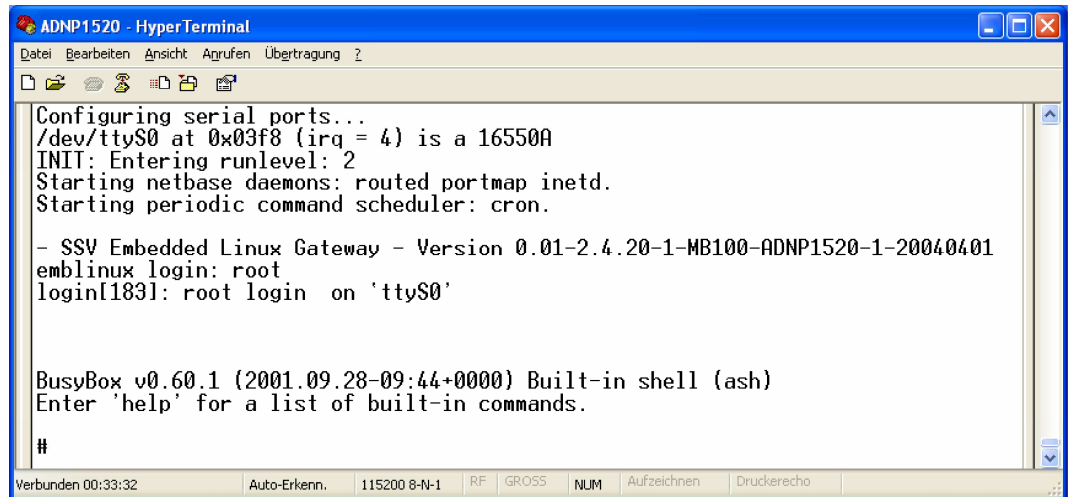


Figure 12: File transfer completed

## 3.2 Running Linux on the ADNP/1520

To run Linux, just start the batch file `C:\Linux\start.bat`. Use **root** as username for the Linux login.



```
ADNP1520 - HyperTerminal
Datei Bearbeiten Ansicht Anrufen Übertragung ?
Configuring serial ports...
/dev/ttyS0 at 0x03f8 (irq = 4) is a 16550A
INIT: Entering runlevel: 2
Starting netbase daemons: routed portmap inetd.
Starting periodic command scheduler: cron.

- SSV Embedded Linux Gateway - Version 0.01-2.4.20-1-MB100-ADNP1520-1-20040401
emblinux login: root
login[183]: root login on 'ttyS0'

BusyBox v0.60.1 (2001.09.28-09:44+0000) Built-in shell (ash)
Enter 'help' for a list of built-in commands.

#
Verbunden 00:33:32 Auto-Erkenn. 115200 8-N-1 RF GROSS NUM Aufzeichnen Druckerecho
```

**Figure 13: Linux boot messages**

Now you can work with Linux and create an SSH connection.

**Please note:** After a reset of the ADNP/1520 you have to run the `start.bat` again to boot Linux.

## 4 INSTALLING THE SSH CONNECTION FOR LINUX

Start the HyperTerminal connection you created in chapter 2.5 and power up the Evaluation Board. Wait until the DOS boot process finishes. Run the `start.bat` (refer to chapter 3.2) to boot Linux.

### 4.1 Uploading the SSH Files on the ADNP/1520

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

Open **Transfer > Send file...** from the menu bar and select the `ssh-adnp1520.sh` from the Starter Kit CD-ROM directory `CD:\Linux\SSH`. Choose **Zmodem with Crash Recovery** as protocol and send the file.

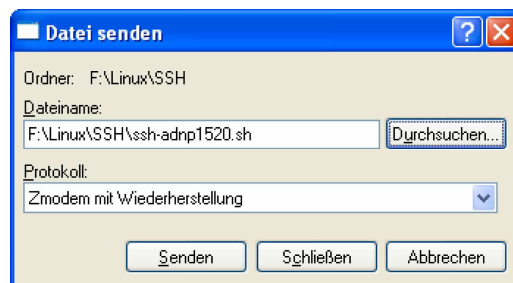


Figure 14: Selecting SSH file for transfer

You will see a window with information about the file transfer progress.

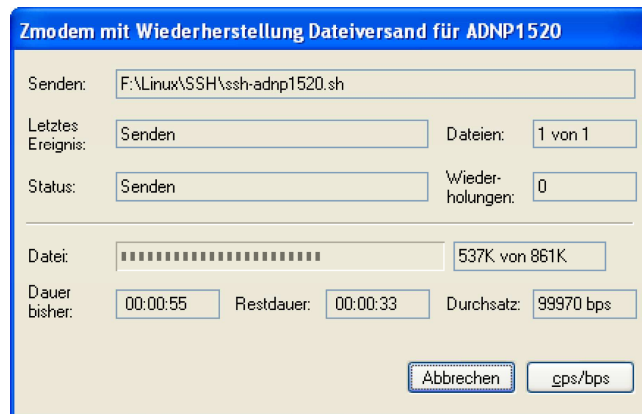
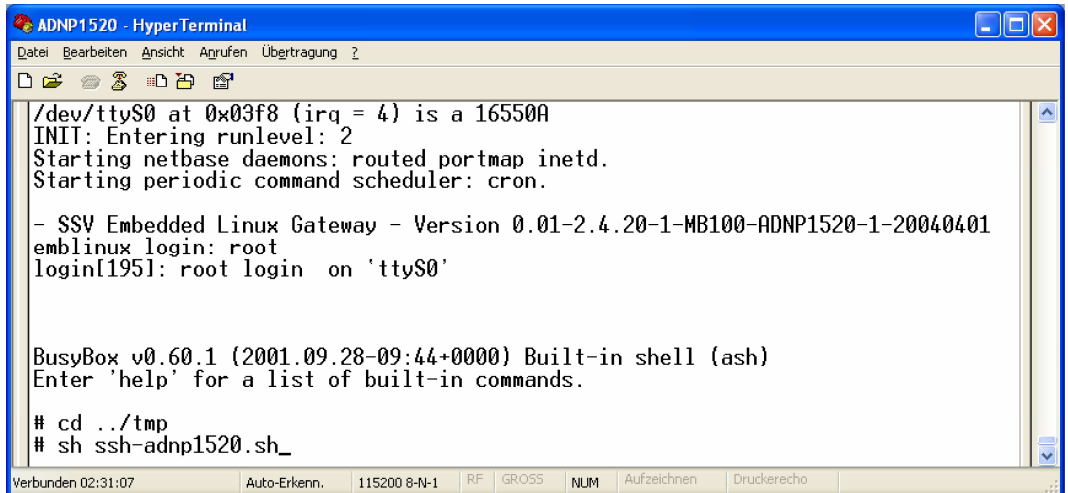


Figure 15: Information about file transfer

## 4.2 Installing the SSH Files on the ADNP/1520

Change to the directory `tmp` and enter `sh ssh-adnp1520.sh` to start the installation. The SSH files will be installed automatically in the directory `flash`.



```

ADNP1520 - HyperTerminal
Datei Bearbeiten Ansicht Anrufen Übertragung ?
/dev/ttyS0 at 0x03f8 (irq = 4) is a 16550A
INIT: Entering runlevel: 2
Starting netbase daemons: routed portmap inetd.
Starting periodic command scheduler: cron.

- SSV Embedded Linux Gateway - Version 0.01-2.4.20-1-MB100-ADNP1520-1-20040401
emblinux login: root
login[195]: root login on 'ttyS0'

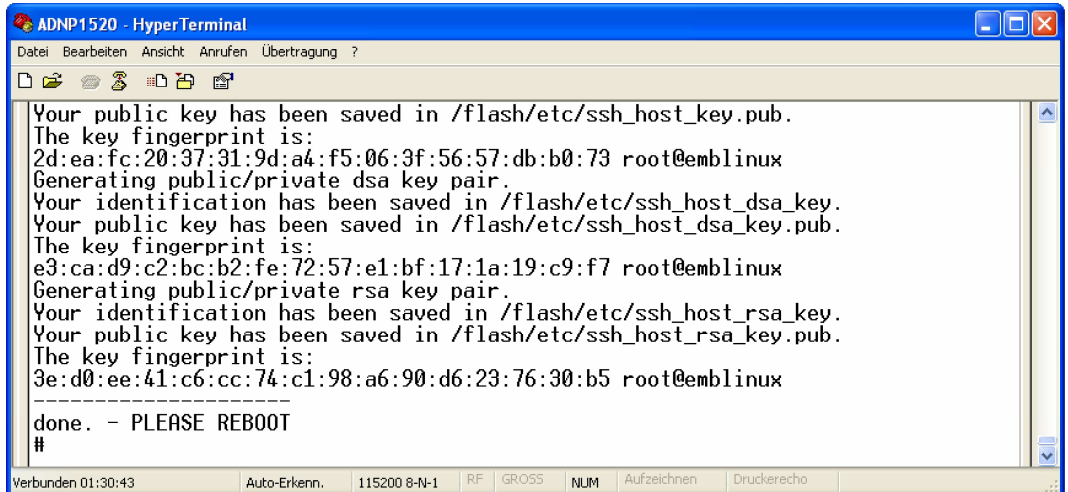
BusyBox v0.60.1 (2001.09.28-09:44+0000) Built-in shell (ash)
Enter 'help' for a list of built-in commands.

# cd ../tmp
# sh ssh-adnp1520.sh_

```

Figure 16: Installing the file `ssh-adnp1520.sh`

Generating the SSH keys may take a while, please be patient. Reboot the ADNP/1520, when the installation is complete.



```

ADNP1520 - HyperTerminal
Datei Bearbeiten Ansicht Anrufen Übertragung ?
Your public key has been saved in /flash/etc/ssh_host_key.pub.
The key fingerprint is:
2d:ea:fc:20:37:31:9d:a4:f5:06:3f:56:57:db:b0:73 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:
e3:ca:d9:c2:bc:b2:fe:72:57:e1:bf:17:1a:19:c9: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:
3e:d0:ee:41:c6:cc:74:c1:98:a6:90:d6:23:76:30:b5 root@emblinux
-----
done. - PLEASE REBOOT
#

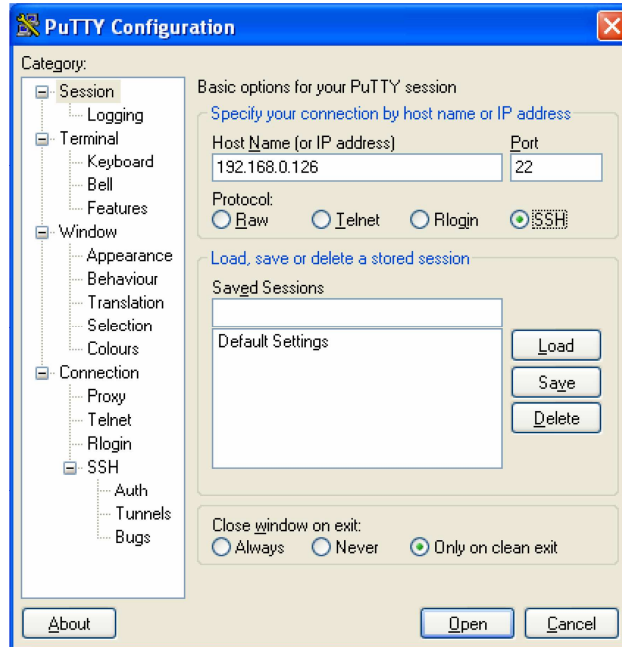
```

Figure 17: SSH installation complete

After the reboot of the ADNP/1520 start Linux and login. Now the ADNP/1520 is ready for an SSH connection.

## 4.3 Starting an SSH Connection

Run the **putty.exe** on the PC. Enter the IP address of the ADNP/1520 (192.168.0.126), select **SSH** as protocol and click on **Open**.



**Figure 18: Configuring PuTTY**

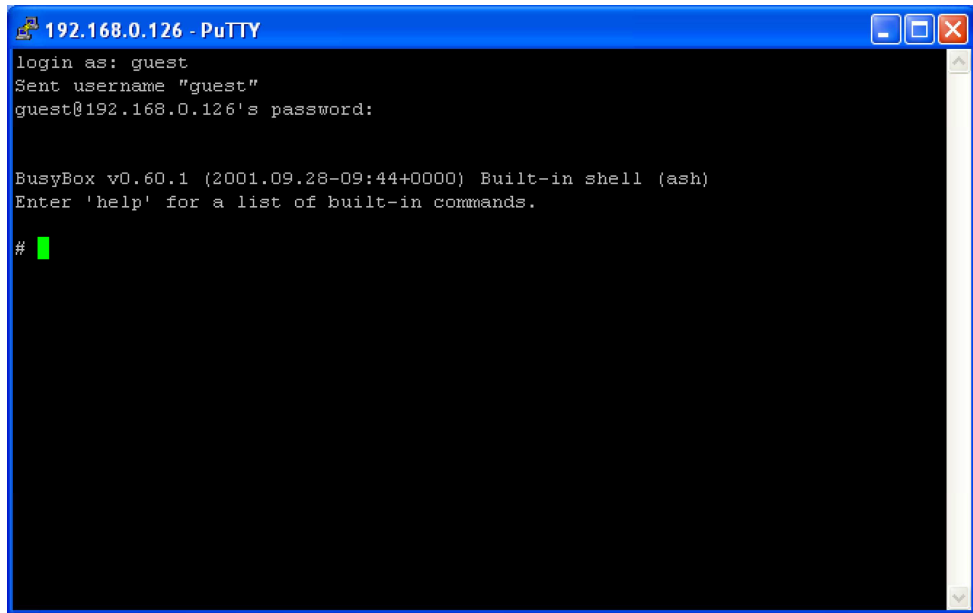
Before the SSH session starts, PuTTY shows an alert, that the host key of the server is unknown. Click **Yes** to save the key permanently. Click **No**, if you want to connect just once.



**Figure 19: 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 4.4.



```
192.168.0.126 - PuTTY
login as: guest
Sent username "guest"
guest@192.168.0.126's password:
BusyBox v0.60.1 (2001.09.28-09:44+0000) Built-in shell (ash)
Enter 'help' for a list of built-in commands.
#
```

Figure 20: PuTTY SSH session as 'guest'

## 4.4 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 ADNP/1520 you have to set the root password again.

## CONTACT

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## DOCUMENT HISTORY

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Revision	Date	Remarks	Name
1.0	2006-04-25	first version	WBU

## COPYRIGHT

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