

# *Slax+8* User Guide

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# **Slax+8 - The Portable Linux Distribution with *Channel 8* Data Logger**

## **Features:**

- **Converts Any PC into a Linux Data Logger**
- **Includes *Channel 8*, gcc Compiler**
- **Portable Linux OS – No Installation Required**
- **Available as CD or USB Thumb Drive**
- **Works with External A/D Converters**
- **Auto-Configures for Easy Networking**
- **Includes Secure FTP and SSH Telnet**
- **Open Source Software**

## **Introduction:**

The *Slax+8* Linux System converts any PC into a networked data logging system. The PC boots from the CD or USB thumb drive – no software installation is required and nothing is changed on your PC when you power down. Combine *Slax+8* with your A/D converter to create a complete network-based data logger.

*Slax+8* self-configures, automatically detecting the ethernet port and assigning itself an IP address on your network. The *Channel 8* data logger is also launched on boot-up and is ready to be accessed by network browser. Secure FTP and Telnet servers are ready for remote requests. The USB drive version of *Slax+8* stores logged data on the thumb drive for later review under Windows and Excel.

*Slax+8* also includes the gcc compiler so you can customize the *Channel 8* programs and develop code for your A/D interface.

*Slax+8* is open source software and is derived from the Slax Linux distribution found at [www.slax.org](http://www.slax.org). *Slax+8* is offered under the terms of the GNU General Public License (complete available at <http://channel8.sourceforge.net>). You can modify *Slax+8* and redistribute under the terms of this license.

## **Specifications:**

**Platform:** CD or USB Thumb Drive

**Operating System:** Slax Linux V 5.1.8

**Compiler:** gcc

**Text Editor:** Joe

**Data Logging:** Channel 8 Data Logger Installed

**A/D Drivers:** Supplied by User in C Code

## **Minimum PC Requirements:**

i486, 32 Mbyte RAM, Ethernet, Serial or Parallel Ports, USB, CD Drive

## Starting Slax+8 - CD Version:

Verify that the system bios is set to allow your PC to boot off of the CD drive. Access to the bios, and the organization of the settings there varies greatly among PCs. Be sure to have your system documentation handy!

### **Caution: Check your PC documentation carefully before changing any bios settings!**

Most PCs are already configured to boot off of a CD if one is detected in the drive, so simply place the *Slax+8* CD into the CD drive and turn on your PC.

## Starting Slax+8 – USB Thumb Drive Version:

Newer PCs can be configured to boot from a USB drive but you may have to check the bios settings to be sure. In any case a boot CD is provided with the *Slax+8* USB version so that the PC boot process is redirected from the CD drive to the USB drive.

Put the *Slax+8* USB boot CD into your CD drive and insert the *Slax+8* thumb drive in the USB port, and turn on the PC.

## The Slax Boot-up Process:



As your PC boots, the Slax cloverleaf logo (shown above) will appear on the screen and a series of cryptic Linux messages will scroll quickly down the screen. It may take a minute or so for the boot process to finish. You might catch some of the auto-detection process as Slax finds the Ethernet port and LAN settings.

***Hint:* Try to note and write down the IP address assignment during the Ethernet auto-configuration. This is the IP address of the Channel 8 logger on your network.**

At this time also the FTP and Telnet servers as well as Channel 8 are launched.

Towards the end of the boot up process you should see the SSH security codes being generated. These are used with the Telnet and FTP servers to communicate with clients on the LAN.

## Logging In:

After Slax has been successfully booted you will come to a final log-in screen in text mode on your PC that looks like this:

```
=====
Welcome to Channel 8 Data Logger
=====
```

The system is up and running now.

Login as "root", with password "toor", both without quotes, lowercase.

If you're new to Channel 8, visit <http://www.sourceforge.net/projects/channel8> for info.

Channel 8 Data Logger is running and ready

FTP is enabled

SSH Telnet is enabled

```
When finished, use "poweroff" or "reboot" command and wait until it completes
=====
```

At this point *Slax+8* and *Channel 8* are installed into your PC and fully functional. During the boot process you may have noted the IP address assigned to the *Slax+8* PC during the auto-configuration process. If for example the IP address assigned was 192.168.1.103, then you can point any browser on the network to the *Slax+8* PC as follows: **<http://192.168.1.103>**

You don't have to log-in to *Slax+8* or do anything further on the *Slax+8* PC.

However, if you did not see the IP address assignment, then you can log into *Slax+8* and request it as follows:

Log-in is simple. Type in "**root**" at the log-in prompt and then "**toor**" as the password (both without the parentheses and in lower case). You will then be logged into the *Slax+8* system.

All the standard Linux commands can be used at this point. There are many good tutorials and books on the use and syntax of these commands, so we won't cover them here. It may take a second or so for system to respond to normal commands. The reason for this is that *Slax+8* Linux resides in the PC RAM. The entire Linux system is some 115 Mbytes, but only 32 Mbytes or so are put into RAM. If you pick a command that is not currently in RAM, Slax unpacks it from the CD and executes it. So this process can lead to a slight delay.

## Closing Down Slax+8:

Simply press Ctl Alt Del to re-boot the PC.

## IP Address Identification:

To identify the IP address of the *Slax+8* machine, type in the following Linux command:

```
ifconfig eth0
```

You will see something like the following in response.

```
root@slax:/# ifconfig eth0
eth0      Link encap:Ethernet  HWaddr 00:EO:98:8A:01:C0
          inet addr:192.203.0.126  Bcast:192.203.0.255  Mask:255.255.255.0
          inet6 addr: fe80::2e0:98ff:fe8a:1c0/64 Scope:Link
          UP BROADCAST NOTRAILERS RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:170 errors:0 dropped:0 overruns:0 frame:0
          TX packets:61 errors:1 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:19377 (18.9 KiB)  TX bytes:8757 (8.5 KiB)
          Interrupt:11 Base address:0x300
```

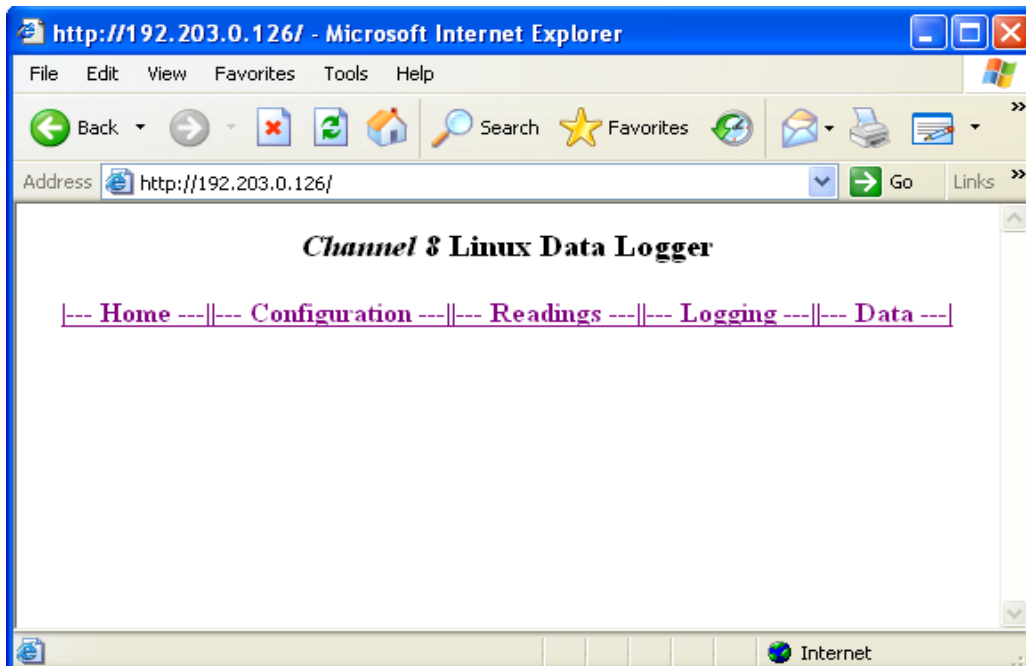
The IP address for this particular *Slax+8* PC is 192.203.0.126.

## Accessing *Channel 8*:

The *Channel 8* user interface is any web browser connected to the same network as the *Slax+8* PC. From the above example, type in the IP address into your browser, as follows:

<http://192.203.0.126>

You should get the *Channel 8* opening screen, as shown below:



## Using FTP with Slax+8:

*Slax+8* includes an FTP server that will respond to SSH inquiries from external clients on the network. This allows you to download the logged readings in the **data.txt** file from the *Slax+8* PC.

The best Windows FTP client to use with *Slax+8* is **Core FTP LE**. This is a free program available at [www.coreftp.com](http://www.coreftp.com). Core FTP LE provides the SSH security protocol that is enabled on the *Slax+8* FTP server. Installing and using Core FTP LE is straightforward.

To set up the *Slax+8* site in Core FTP, go to the Sites, Site Manager selection from the top drop-down menu. Enter *Slax+8* PC as the Site Name, the *Slax+8* PC IP address Host/IP/URL box, the User name as root, password as toor. Be sure to check the SSH/SHFTP box at the bottom of the form.

When you connect you will get an SSH security message – simply press the Yes button to proceed. After the handshaking has finished, you will be in the **/root/** directory on the *Slax+8* machine.

For *Slax+8* CD versions, the *Channel 8* files are located off the main directory: **/Ch8**. To navigate there in Core FTP, simply go up one directory and then double click on the Ch8 folder icon in the directory listings.

For *Slax+8* USB Thumb drive versions, the **/Ch8** directory is mounted on the thumb drive itself. This is found at **/mnt/sda1\_removable/Ch8**. To navigate there in Core FTP, go up one directory from the **/root/** and look for **mnt**, double-click, then find the thumb drive **sda1\_removable**, double-click and look for **Ch8**.

When in the **/Ch8** directory you will see all the files that comprise *Channel 8*. Simply highlight the **data.txt** file and download it by double-clicking or pressing the left-pointing Download arrow button. The **data.txt** file will be transferred to the directory on your PC shown in the left-hand window. You can navigate about *Slax+8* and your local machine and use Core FTP to transfer files back and forth.

## Using Telnet with Slax+8:

Telnet is a convenient way to enter the *Slax+8* machine remotely over the network and execute Linux commands on the *Slax+8* PC. The best Telnet client for windows is **Putty**, available for download at <http://www.chiark.greenend.org.uk/~sgtatham/putty/>.

The installation and configuration of Putty is very straightforward. Simply put the *Slax+8* IP address into the Putty configuration box and check the SSH button.

When connected you will be given a log-in screen. Enter root at the log-in prompt and toor as the password.

Once into the *Slax+8* system it is just as if you were typing at the *Slax+8* PC keyboard. To end the Putty session, simply type logout.

## Using the Joe Text Editor:

The Joe text editor is included with *Slax+8* and can be used to modify *Channel 8* programs. To use Joe you must be logged into *Slax+8* (see Logging In, above). Navigate to the */Ch* directory to modify or create a new file.

To open the *Channel 8* readings server source code for editing, type in: **Joe Ch8RndServer.c**. You may have to press the enter key to load the file, but at some point you should see the contents of **Ch8RndServer.c**. You can edit as needed, then save by pressing **Ctl+k**.

To see all of the editing commands available in Joe, press **Ctl+h**

Joe will save the modified file to its original name, and save the previous version of the file with the same name followed by `~`. So the unedited version of the readings server would be `Ch8RndServer.c~`

You can go back to the original version by deleting the new file and copying the previous version to its original name. So if you modified the readings server file and don't want it, do the following:

```
rm Ch8RndServer.c (deletes the modified file)
cp Ch8RndServer.c~ Ch8RndServer.c (copies previous version to original name)
rm Ch8RndServer.c~ (deletes duplicate file)
```

To create a new file, simply type: **Joe newfilename**

**Caution: The *Slax+8* CD version is running Linux in the PC RAM. All files modified or new files created under Joe will disappear when the PC is powered down!**

**To save new or modified files, FTP them into another PC on the network.**

For the *Slax+8* thumb drive version, files changed or created in the */Ch8* directory will be preserved. New or modified files not residing on the `/sda1_removable` drive will be lost.

## Using the gcc Compiler:

Modifying *Channel 8* source code or creating new C programs is easy. Simply write or modify the *Channel 8* program in Joe, save and then compile as follows: **gcc -O filename.c**

The executable file will be named **a.out** and can be executed by `./a.out`. The `a.out` file can then be renamed to something suitable with the **cp** command: **cp a.out filename.run**

Note that compiling the `Ch8WebServer.c` file requires a special syntax:

```
gcc -O Ch8WebServer.c shttpd.c -DEMBEDDED -ldl
```

## Links and Resources for *Slax+8*:

<b>Channel 8 Website:</b>	<a href="http://channel8.sourceforge.net">http://channel8.sourceforge.net</a>
<b>Channel 8 Project Page:</b>	<a href="http://sourceforge.net/projects/channel8">http://sourceforge.net/projects/channel8</a>
<b>Slax Website:</b>	<a href="http://www.slax.org">www.slax.org</a>
<b>Putty Website:</b>	<a href="http://www.chiark.greenend.org.uk/~sgtatham/putty/">www.chiark.greenend.org.uk/~sgtatham/putty/</a>
<b>Core FTP Website:</b>	<a href="http://www.coreftp.com">www.coreftp.com</a>
<b>Linux Online Man Pages:</b>	<a href="http://man.he.net">http://man.he.net</a>
<b>Linux Documentation Project:</b>	<a href="http://www.tldp.org">www.tldp.org</a>
<b>Misc. Linux Info:</b>	<a href="http://www.linux.org">www.linux.org</a>

## *Slax+8* Technical Support:

Online technical support is available via the *Channel 8* forum at <http://sourceforge.net/projects/channel8>.

Technical support via e-mail is available at: **[documatrix@linuxmail.org](mailto:documatrix@linuxmail.org)**

## License Terms & Warranty:

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