

# Serial Console

Slackware can be installed on various embedded devices. A lot of those don't have a traditional console, like a monitor and keyboard. Instead, the console is often routed to the serial port. In order to take advantage of this, some post-install configuration is necessary.

This howto can also be used to setup a serial console on an existing headless server as a backup for administering the machine.

## Preparation

You need to know the serial device and the speed. The device will mostly be `ttyS0`, the first serial device. If you are using a serial to USB adapter, it will likely be `ttyUSB0`. Consult the documentation of your board if you are not sure.

Some devices have an option in the BIOS to change the speed and other serial settings. Make sure you know the speed that is currently set.

In the below examples we will assume `ttyS0` with speed 38400.

## Host configuration

### Activate serial port

Edit `/etc/inittab` and uncomment the correct serial console line. Change the speed setting when required.

[/etc/inittab](#)

```
# Local serial lines:  
s1:12345:respawn:/sbin/agetty -L ttyS0 38400 vt100  
#s2:12345:respawn:/sbin/agetty -L ttyS1 9600 vt100
```

### Allow root login

Edit `/etc/securetty` and uncomment your serial device to allow root to login via the serial console. You can omit this step if you will access the machine with a normal user id.

[/etc/securetty](#)

```
# These are some remote ttys, and uncommenting them might be less than
fully secure:
ttyS0
#ttyS1
```

## Setup LILO boot loader

Edit `/etc/lilo.conf`. Add a line to the general section:

[/etc/lilo.conf](#)

```
serial=0,38400n8
```

The 0 refers to the first serial device, `ttyS0`.

Add the following parameter to the kernel line:

[/etc/lilo.conf](#)

```
append="console=ttyS0,38400n8"
```

If the `append` line already exists, add the parameter as follows:

[/etc/lilo.conf](#)

```
append="mem=1024M console=ttyS0,38400n8"
```

Now run `/sbin/lilo` to write the new bootloader configuration.

To have the console on normal tty as well as serial port, adjust the kernel line as follows:

[/etc/lilo.conf](#)

```
append="console=tty0 console=ttyS0,38400"
```

## Setup GRUB-legacy boot loader

Edit `/boot/grub/menu.lst` and change it as follows:

Add lines to the general section as follows:

[/boot/grub/menu.lst](#)

```
serial --speed=38400
terminal serial
```

Add the following parameter to the kernel line:

[/boot/grub/menu.lst](#)

```
console=ttyS0,38400n8
```

The complete kernel line might look like this (substitute your root partition and vmlinuz file):

[/boot/grub/menu.lst](#)

```
kernel /boot/vmlinuz root=/dev/sda2 ro vga=normal console=ttyS0,38400n8
```

To have the console on normal tty as well as serial port, adjust the terminal and kernel lines as follows:

[/boot/grub/menu.lst](#)

```
terminal --timeout=5 serial console
```

[/boot/grub/menu.lst](#)

```
kernel xxx console=tty0 console=ttyS0,38400n8
```

When the terminal timeout expires, the first option (in this case serial) will be chosen as the console. The normal bootloader timeout will start when the terminal timeout ends.

## Setup GRUB2 boot loader

Edit file `/etc/default/grub` and change the following line to define the console:

[grub](#)

```
GRUB_CMDLINE_LINUX_DEFAULT="console=ttyS0,38400n8"
```

Add the following lines to define the console settings:

[grub](#)

```
GRUB_TERMINAL=serial
GRUB_SERIAL_COMMAND="serial --speed=38400 --unit=0 --word=8 --parity=no
--stop=1"
```

Now rebuild the GRUB2 configuration:

```
# grub-mkconfig -o /boot/grub/grub.cfg
```

## Connect from a remote computer

To use the serial console, you need to attach a second computer to the serial port of the host. Use a null modem cable. Most modern computers no longer have a serial port so you might need a serial to USB connector as well.

Once you have physically connected the machines, you need a communications package to interact with the console. Two popular options are **screen** and **minicom**.

### Connect using screen

This is the easiest option because it doesn't need any configuration. Start **screen** and specify the serial device and the desired speed on the command line.

```
user@darkstar$ screen /dev/ttyUSB0 38400
```

### Connect using minicom

Before using minicom, you need to configure it. Start with the `-s` switch as follows:

```
user@darkstar$ minicom -s
```

You will see the main menu.

```
+-----[configuration]-----+
| Filenames and paths          |
| File transfer protocols      |
| Serial port setup            |
| Modem and dialing            |
| Screen and keyboard          |
| Save setup as dfl             |
| Save setup as..              |
| Exit                          |
| Exit from Minicom            |
```

```
+-----+
```

Select *Serial port setup*. You will see the serial port settings.

```
+-----+
+
| A -   Serial Device       : /dev/ttyS1
|
| B - Lockfile Location    : /var/lock
|
| C -   Callin Program     :
|
| D -   Callout Program    :
|
| E -   Bps/Par/Bits       : 115200 8N1
|
| F - Hardware Flow Control : Yes
|
| G - Software Flow Control : No
|
|
|   Change which setting?
|
+-----+
+
```

Use the **A** to **G** keys to change various settings. Make sure the *device* and *Bps/Par/Bits* settings are correct. Hit **Enter** to return to the main screen and select the *Modem and dialing* option. On the detail screen, make sure the *Init string* and *Reset string* options are empty. Hit **Enter** again to return to the main screen. Now you can save your options. Use *Save setup as df1* to save this as your new default. Use *Save setup as..* to save as a certain profile.

Call *minicom* again and the new options will take effect.

```
user@darkstar$ minicom
```

Or you can start with a certain configuration

```
user@darkstar$ minicom myprofile
```

Use **Ctrl+A**, **Z** for help. Use **Ctrl+A**, **X** to quit.

## Troubleshooting

## Garbled characters in terminal

When you see progress in the terminal but the characters are garbled and unreadable, make sure you have the same speed set in the following sections: BIOS, bootloader and inittab. Also make sure your client connects with the same speed.

## Unable to sign on as root

Check the securetty settings. See section above.

## Unable to use screen or minicom as a regular user

When you get authorization problems using the serial device, make sure your user is in the dialout group.

## Further reading

- Check the official [Remote Serial Console HOWTO](#) for much more details.
- screen [manual](#)
- `man 1 minicom`

## Sources

- Originally written by [Frank Donkers](#).

[howtos](#), [console](#), [serial](#), [embedded](#), [author fdonkers](#)

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