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How To Check and Use Serial Ports Under Linux

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How do I check and configure serial ports under Linux for various purposes such as modem, connecting null modems or connect a dumb terminal?



Linux offers various tools and commands to access serial ports. Linux uses `ttySx` for a serial port device name. For example, COM1 (DOS/Windows name) is `ttyS0`, COM2 is `ttyS1`, and so on. USB based serial ports might use a name such as `ttyUSB0`. All these devices are located under `/dev/` directory.

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Display Detected System's Serial Support Under Linux

Simple run the dmesg command:

```
$ dmesg | grep tty
```

```
[ 37.531286] serial8250: ttyS0 at I/O 0x3f8 (irq = 4) is a 16550A
[ 37.531841] 00:0b: ttyS0 at I/O 0x3f8 (irq = 4) is a 16550A
[ 37.532138] 0000:04:00.3: ttyS1 at I/O 0x1020 (irq = 18) is a 16550A
```

A note about USB based serial ports

USB to RS232 adapter cable connects from the USB port of a computer to a device. Such serial to USB adapter connects to devices for configuration or programming under Linux. Here is what the dmesg command displays when you enter USB adapter:

```
$ dmesg
## use grep command/egrep command to filter out USB devices ##
$ dmesg | grep -i serial
$ dmesg | grep -i FTDI
```

Listing and using USB serial ports on Linux

Here is how it looks when I attached USB device:

```
$ sudo dmesg | more
```

Use the setserial command to check and use serial ports

The setserial is a program designed to set and/or report the configuration information associated with a serial port. This information includes what I/O port and IRQ a particular serial port is using, and whether or not the break key should be interpreted as the Secure Attention Key, and so on.

Debian/Ubuntu Linux install setserial using the [apt-get command/apt command](#)

```
$ sudo apt install setserial
```

```
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  setserial
0 upgraded, 1 newly installed, 0 to remove and 14 not upgraded.
Need to get 35.9 kB of archives.
After this operation, 120 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal/main amd64 setserial amd64 2.17-52 [35.9 kB]
Fetched 35.9 kB in 1s (25.7 kB/s)
Preconfiguring packages ...
Selecting previously unselected package setserial.
(Reading database ... 292992 files and directories currently installed.)
Preparing to unpack .../setserial_2.17-52_amd64.deb ...
Unpacking setserial (2.17-52) ...
Setting up setserial (2.17-52) ...
removing the old setserial entry in the rcn.d directories
Update complete.
update-rc.d: warning: start and stop actions are no longer supported; falling back to defaults
```

update-rc.d: warning: start and stop actions are no longer supported; falling back to defaults

update-rc.d: warning: start and stop actions are no longer supported; falling back to defaults

update-rc.d: warning: start and stop actions are no longer supported; falling back to defaults

Stopping setserial (via systemctl): setserial.service.

Created symlink /etc/systemd/system/multi-user.target.wants/setserial.service → /lib/systemd/system/setserial.service.

Created symlink /etc/systemd/system/multi-user.target.wants/etc-setserial.service → /lib/systemd/system/etc-setserial.service.

Processing triggers for man-db (2.9.1-1) ...

Processing triggers for systemd (245.4-4ubuntu3.2) ...

CentOS/RHEL/Oracle Linux install setserial using the [yum command](#)

```
$ sudo yum install setserial
```

Fedora Linux user try the dnf command:

```
$ sudo dnf install setserial
```

Using setserial to list serial ports and devices

Now we installed required package. Open the terminal and then type the following setserial command:

```
$ setserial -g /dev/ttyS[0123]
```

If you get an error/warning that reads as “Permission denied,” try running the

command as the root user. For example, I am running it using the `sudo` command/`su` command:

```
$ sudo setserial -g /dev/ttyS[0123]
```

```
/dev/ttyS0, UART: 16550A, Port: 0x03f8, IRQ: 4
```

```
/dev/ttyS1, UART: 16550A, Port: 0x1020, IRQ: 18
```

```
/dev/ttyS2, UART: unknown, Port: 0x03e8, IRQ: 4
```

```
/dev/ttyS3, UART: unknown, Port: 0x02e8, IRQ: 3
```

The `setserial` with `-g` option help to find out what physical serial ports your Linux box has.

Listing or displaying USB serial ports on Linux

Try:

```
$ sudo setserial -g /dev/ttyUSB[01]
```

```
/dev/ttyUSB0, UART: unknown, Port: 0x0000, IRQ: 0
```

Linux serial console programs

Once serial ports identified you can configure Linux box and use serial ports using various utilities:

1. [minicom](#)— The best friendly serial communication program for controlling modems and connecting to dump devices
2. [wvserial or other GUI dial up networking program](#) – a PPP dialer with built-in intelligence.
3. [Screen Command](#): Set Baud Rate [Terminal Communication]

4. **getty / agetty** – agetty opens a tty port, prompts for a login name and invokes the /bin/login command.
5. **grub / lilo configuration** – To configure serial port as the system console

Cocnlusion

You learned how to list or check serial ports including USB based adptor on Linux.

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User Information	groups • id • lastcomm • last • lid/libuser-lid • logname • members • users • whoami • w

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Scott

Sep 29, 2008 @ 18:14

I don't know if this is the place, but I'm looking for information that is similar. I have 2 machines setup through a null modem. I want to read through the com port from one machine to the other. The sending machine is running Windows sending through COM1: and the receiving computer is Linux Red Hat. Any help on this would be appreciated.

[reply](#) [link](#)

Arpan Chatterjee

Aug 20, 2015 @ 9:37

You can use pyserial ,its a python package,can be used to read and write in serial ports

[reply](#) [link](#)

leszek

Sep 30, 2008 @ 16:34

another simple serial console program not mentioned is gtkterm.

[reply](#) [link](#)

Alessandro

Jan 28, 2010 @ 8:38

I want to advise you that probably there is an error in the last sentence “seserial with -g option help to find out what physical serial ports your Linux box has.”; isn't it setserial?

Bye

[reply](#) [link](#)

Mike Bushroe

Apr 12, 2011 @ 19:17

I have 4 standard serial ports defined, /dev/ttyS0-4, but I added a PCI-E 16 port serial adapter, and I have not found a way to connect anything to the upper 16 ports. How do you create the virtual links? what options do you give setserial to define the new ports?

[reply](#) [link](#)

arek

Apr 17, 2011 @ 8:20

it doesn't work :(I can't connect to my ASA using debian.

[reply](#) [link](#)

Joe Knifer

Nov 1, 2011 @ 18:39

Daemon is a program called getty used by UNIX/Linux systems. There are many different versions of getty. The first modem detected is /dev/ttys0 or /dev/ttys1. To create a link to the devices file so that you can view modem information. Type `ln -s /dev/ttys1 /dev/modem`.

It is essential to set the modem to AUTO ANSWER using getty.

download minicom from alioth.debian.org/projects/minicom.

create a modem config file by entering minicom -s from the root command line
select the options you want to configure using AT commands
connect to the modem by typing in minicom

[reply](#) [link](#)

AC

Nov 10, 2011 @ 12:28

Thanks very useful..save my time :)

[reply](#) [link](#)

abdel

Jan 19, 2012 @ 13:41

Hi,everybody

I have a serial PCI card with two ports but neither of them is working, on Linux fedora 16. I have tried using "gtkterm" and "minicom" but unfortunately I can't make a serial connection to my Cisco lab. Here is my output when I issue the command: "setserial -g /dev/ttyS[0123]".

```
/dev/ttyS0, UART: 16550A, Port: 0xec00, IRQ: 16  
/dev/ttyS1, UART: 16550A, Port: 0xe880, IRQ: 16  
/dev/ttyS2, UART: unknown, Port: 0x03e8, IRQ: 4  
/dev/ttyS3, UART: unknown, Port: 0x02e8, IRQ: 3
```

also I want to mention that when I try to connect through the terminal it generates a message like so: " Cannot open /dev/ttyS0: Permission denied".

any help please.

abdel

[reply](#) [link](#)

Tom Schuneman

Jan 23, 2012 @ 22:29

Check the permissions on /dev/ttyS0... Likely problem is it's owned by root, and is part of the uucp group. Add yourself to the uucp group, and all should be better. I'm curious to know if this is enough for you as I am having problems communicating with a serial port on Linux as well. I got past the permissions stuff, but it is still not working.

[reply](#) [link](#)

abdel

Jan 25, 2012 @ 14:11

Thanks Tom,

I actually I tried but it's does not work, still says "permission denied". I would appreciate if you explain to me step by step the procedure how to do it, I'm knew to Linux.

Best Regards

Abdel

[reply](#) [link](#)

Tom Schuneman

Jan 25, 2012 @ 16:36

1) `ls -la /dev/ttyS0` — This will report the permissions on the port. Typically, this will say `crw-rw— 1 root uucp`. The "c" in the string indicates that it's a "character device" the first "rw" indicates that the owner has read/write permission. The second "rw" means that the group has read/write permissions. The "—" indicates that the rest of the world has no permissions. After the "—", "root" indicates that the owner of the device is root, and that the group id is "uucp". So, you either need to be root, or a member of the uucp group to have read/write access to the port.

2) To add yourself to the uucp group (to get read/write access), you need to edit the file `/etc/group`, and add your user name to the line that begins with "uucp:" User names are separated by commas, so add a comma, then your user name to the end of the line. You will need root permissions to edit this file.

3) log out, and log back in because group associations are made at login time, and are not queried on each request.

[reply](#) [link](#)

abdel

Jan 28, 2012 @ 1:22

Thanks Tom,
here is my output from the group file I have added my username to it but does not work.

```
abdelinux:x:1000:uucp,adm,abdelinux,
```

I will just give up.Thanks a lot for your help I relay appreciate it.

[reply](#) [link](#)

Tom Schuneman

Jan 30, 2012 @ 16:04

Your entry in /etc/group is incorrect. If you read my previous post, I said to add your user id to the line that _begins_ with uucp. You added uucp to the group of users that can access your account. You want an entry in the /etc/group file that looks something like:

```
uucp:x:14:uucp,abdelinux
```

The critical element is that it's the line that begins with uucp

[reply](#) [link](#)

abdel

Jan 31, 2012 @ 8:58

Hi Tom,

It works. I just add my username to " dialout " and it worked fine. Iwould like to thank you for you time and support.

Best Regards

Abdel

[reply](#) [link](#)

Mahesh

Apr 14, 2012 @ 13:35

hi,

I have connected the SIM300(gsm model) to my pc running ubuntu. I need a code to send a AT command to the GSM module and it should read and display the reply.

Please let me know steps.

I tried so many methods and codes, but no use...

Thank you

[reply](#) [link](#)

Mahesh

Apr 14, 2012 @ 13:37

i need C code(program).

[reply](#) [link](#)

nicolethomson

May 22, 2012 @ 13:32

all my ttyS* shows unknown, earlier it was working fine, now it doesnt recognise

```
setserial -g /dev/ttyS*
```

```
/dev/ttyS0, UART: unknown, Port: 0x03f8, IRQ: 4
```

```
/dev/ttyS1, UART: unknown, Port: 0x02f8, IRQ: 3
```

```
/dev/ttyS2, UART: unknown, Port: 0x03e8, IRQ: 4
```

```
/dev/ttyS3, UART: unknown, Port: 0x02e8, IRQ: 3
```

```
#cat /etc/redhat-release
```

```
CentOS Linux release 6.0 (Final)
```

```
#dmesg | grep tty
```

```
console [tty0] enabled
```

can u pls help me

[reply](#) [link](#)

nicolethomson

May 25, 2012 @ 1:31

tried spending time in google two days, still no success, tried connecting a brand new device too, still no success.

[reply](#) [link](#)

mickeyf

Jul 4, 2012 @ 18:01

Sorry, but that second sentence is not necessarily true. I have a PC with two dual com port adapters. Windows sees them as COM1 -> COM4 (there is no built in COM port). Linux sees them as /dev/ttyS4->/dev/ttyS7.

/dev/ttyS0-/devttyS3 are apparently reserved, exist whether or not a physical port exists, and /dev/ttyS0 for certain is "special" in that it is used by the default terminal window:

```
dmesg | grep tty
```

```
[ 0.000000] console [tty0] enabled
```

```
[ 1.009457] 0000:02:00.0: ttyS4 at I/O 0xd030 (irq = 16) is a ST16650V2
```

```
[ 1.077312] 0000:02:00.1: ttyS5 at I/O 0xd020 (irq = 17) is a ST16650V2
```

```
[ 1.141309] 0000:02:00.2: ttyS6 at I/O 0xd010 (irq = 18) is a ST16650V2
```

```
[ 1.205307] 0000:02:00.3: ttyS7 at I/O 0xd000 (irq = 19) is a ST16650V2
```

```
setserial -g /dev/ttyS[012345657]  
/dev/ttyS0, UART: unknown, Port: 0x03f8, IRQ: 4  
/dev/ttyS1, UART: unknown, Port: 0x02f8, IRQ: 3  
/dev/ttyS2, UART: unknown, Port: 0x03e8, IRQ: 4  
/dev/ttyS3, UART: unknown, Port: 0x02e8, IRQ: 3  
/dev/ttyS4, UART: 16650V2, Port: 0xd030, IRQ: 16  
/dev/ttyS5, UART: 16650V2, Port: 0xd020, IRQ: 17  
/dev/ttyS6, UART: 16650V2, Port: 0xd010, IRQ: 18  
/dev/ttyS7, UART: 16650V2, Port: 0xd000, IRQ: 19
```

[reply](#) [link](#)

Arash Jabeti

Sep 21, 2012 @ 11:39

I think minicom still superior to other console utility.

[reply](#) [link](#)

Kevin

Oct 30, 2013 @ 21:33

Hi All tried all of the above and still get permission denied ???? HELP

Kevin

```
kevin@Linux-Radio:~/bpq$ groups ${USER}
```

```
kevin : kevin adm dialout cdrom sudo dip plugdev lpadmin sambashare
```

```
kevin@Linux-Radio:~/bpq$ setserial -g /dev/ttyS[012345657]
```

```
/dev/ttyS[012345657: No such file or directory
```



```
g7uxw@Linux-Radio:~/bpq$ setserial -g /dev/ttyS[012345657]
```

```
/dev/ttyS0: Permission denied  
/dev/ttyS1: Permission denied  
/dev/ttyS2: Permission denied  
/dev/ttyS3: Permission denied  
/dev/ttyS4: Permission denied  
/dev/ttyS5: Permission denied  
/dev/ttyS6: Permission denied  
/dev/ttyS7: Permission denied
```

[reply](#) [link](#)

Baran

Jun 25, 2014 @ 16:58

try this kevin

```
sudo setserial -g /dev/ttyS1
```

[reply](#) [link](#)

Amit

Jul 31, 2014 @ 5:19

Hiiiiiiii

Please help me

i am install minicom and use serial modem sim300 v7.03 but there is problem to type AT cmd on minicom console.....

[reply](#) [link](#)

Jim Moore

Oct 7, 2014 @ 22:34

Edgeports are very easy to use the firmware is on Ubuntu they are from 2 ports to 16+
I bought my last two of them on ebay,,
Jim

[reply](#) [link](#)

Casper JB

Jul 26, 2016 @ 2:13

Hi all..

I got problem to connect with my USB serial port,
i already create

```
In -s /dev/ttyUS0 ~/.wine/dosdevices/com1
```

and check dmesg | grep tty

```
[ 0.000000] console [tty0] enabled
```

```
[ 7.722004] systemd[1]: Created slice system-getty.slice.
```

```
[ 3659.524452] usb 1-1.1: FTDI USB Serial Device converter now attached to ttyUSB0
```

```
[ 4850.183339] ftdi_sio ttyUSB0: FTDI USB Serial Device converter now disconnected  
from ttyUSB0
```

```
[ 4857.907567] usb 1-1.1: FTDI USB Serial Device converter now attached to ttyUSB0
```

when running SDNC program and select com1 will shown "port is already in use"

[reply](#) [link](#)

Elmi morina

Sep 29, 2020 @ 16:17

hi, have are you\

i have a problem with machine xnc . old version sistem operating linux,
pc removed battery cmos . but change battery do it so machine different data serial
port linux dont recognized machine.

how can you slove this problem

your help wil be welcome

[reply](#) [link](#)

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