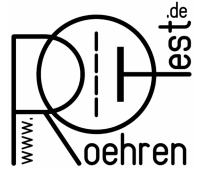


RoeTest - das Computer-Röhren-Messgerät -

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Improved USB-Software connection for the RoeTest on Linux

The RoeTest uses as interface to the computer a serial interface with an USB-chip. On Linux serial USB-devices get the primary device names /dev/ttyUSBxxx (xxx stands for a number starting with the value 0). If there is only one serial USB-interface attached, namely the RoeTest, this interface will always be assigned the name /dev/ttyUSB0. In this case the soft link to the windows emulation layer can be established as before using this real (primary) device name and the RoeTest software will recognize the RoeTest hardware correctly.

The situation is different if there are further serial USB-devices attached to the computer in combination with the RoeTest. Then the order of connecting or switching on the serial USB devices determines which primary device name each device gets assigned. This means that in this case the RoeTest may get different primary device names assigned. So the above mentioned soft link to the windows emulation layer will no longer work stable with the primary device name.

There is a simple and elegant solution available to give the RoeTest a unique device name, a so called alias name. This alias name is then used to link the USB-device to the windows emulation layer instead of using the primary device name. The alias names are assigned independently of their connection- or switch-on order. Instead they are unambiguously assigned on the basis of the device's USB-parameters product-ID, device-ID and serial number. You only have to chose an alias name for the RoeTest (e.g. roetest) and then connect it to the USB-parameters for the RoeTest using an entry in a special system control file.

This control file must be named 99-usb-serial.rules and must be located in the directory /etc/udev/rules.d. If there is already such a file present you just have to add an additional entry for the RoeTest to this file. If there is no such file yet just create one in the correct directory with an entry for the RoeTest.

The required USB-parameters for specifying the entry for the RoeTest (Product-ID, Device-ID and Serial number) can be figured out as follows:

- First disconnect **all** USB-connectors from the computer (but bear in mind where which connector was attached to, for reconnecting them later)
- Then connect **only** the RoeTest hardware to the computer and switch on the RoeTest hardware's power to activate the USB-interface

For some of the following Linux-commands you have to be logged in as root or must prefix them with 'sudo' (without the single quotation marks!).

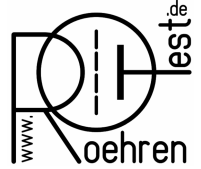
With the command:

```
lsusb
```

you list the properties of the connected USB devices. As there is only one device connected at the moment a possible answer could e.g. look like that:

```
Bus 001 Device 011: ID 0403:6001 FTDI FT232 USB-Serial (UART) IC
```

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So we already have two of the required parameters available:

1. The Vendor-ID: 0403 (first part from *ID 0403:6001*)
2. The Product-ID: 6001 (second part from *ID 0403:6001*)

What is still missing is the serial number of the USB-device. This can be queried using the Linux command:

```
udevadm info -a -n /dev/ttyUSB0 | grep '{serial}' | head -n1
```

The answer could e.g. look like:

```
ATTRS{serial}=="A6485521"
```

This is the required 3rd parameter, the serial number: A6485521

Now the entry for the RoeTest alias name in the above mentioned control file is generated as follows:

```
SUBSYSTEM=="tty", ATTRS{idVendor}=="0403", ATTRS{idProduct}=="6001",  
ATTRS{serial}=="A6485521", SYMLINK+="roetest"
```

Note: All elements must be contained in a single line, there is a space after each comma and the line should be terminated with a NL (\n) character.

(The numbers for idVendor, idProduct and serial must correspond with the numbers you have figured out on your computer with the commands above!)

Then the disconnected other USB-devices can be reconnected.

To get the new defined alias name installed for the RoeTest interface it may be necessary to reboot the Linux computer. Normally it should suffice to disconnect (or switch off) the RoeTest interface and then reconnect it (or switch it on).

When the RoeTest interface is now connected/switched on the computer will generate an alias device named `/dev/roetest`. This alias name can then be connected with a softlink

```
ln -s /dev/roetest ~/.wine/dosdevices/com1
```

with the windows emulation layer.