



## Compiling Linux kernel

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*During this laboratory you will configure and compile Linux kernel for Galileo platform. Next, you will prepare Ubuntu Linux distribution system.*



# 1 Preparing galileo-linux-stable kernel

Note, that in order to follow instructions in this lab session you need to have prepared the following configuration:

- PC computer with Linux Kubuntu installed on it in the lab.
- Galileo2 development board.
- Arduino mezanine board.
- I2C display extension.
- Photoresistor extension.
- Potentiometer extension.
- An SD card reader for PC computer.
- Power supply.
- USB UART cable.
- An SD card prepared on the last laboratory session.

The setup is shown in the following picture.



1. In your directory where you normally operate clone Linux kernel repository for Galileo:

`https://github.com/todorez/galileo-linux-stable.git`

This may take a while.

2. Enter the `galileo-linux-stable` directory and compile the kernel:

```
make ARCH=i386 -j <X>
```

where `< X >` denotes the number of parallel compilation threads.

3. create modules installation directory and install them with the following commands:

```
mkdir <instalation-dir-path>  
make ARCH=i386 INSTALL_MOD_PATH=<installation-dir-path> modules_install
```

Install the new kernel and modules from the target directory (e.g `../galileo-stable-install`) to your micro SD card

4. Replace the `bzImage` found in the first partition of your micro SD card with the one from your target directory (backup the `bzImage` on the micro SD card e.g. rename it to `bzImage.old`)
5. Copy the kernel modules from the target directory to the `/lib/modules/` directory found in the second partition of your micro SD card (e.g `/lib/modules/3.18.1-galileo-g1`)
6. Reboot into your new kernel  
NOTE: If you experience any issues with your custom-built kernel you can revert to you kernel backup from step 4.
7. If kernel starts and system is up and running, check if all the functionality (readout of the voltages of photoresistor and potentiometer, LCD controll via I2C) is working correctly. Why it doesn't?

## 2 Preparing Ubuntu system for Galileo2

1. Download the latest sd card image of Ubuntu for Galileo2 board:  
[https://sourceforge.net/projects/galileodebian/?source=typ\\_redirect](https://sourceforge.net/projects/galileodebian/?source=typ_redirect)
2. Install the image on the SD card:

```
dd if=<image-file-name> of=/dev/sd<X> bs=1M
```

Where `X` is the letter obtained eith `dmesg` command.

3. Boot the new system. It should respond with new Grub setup where one of the options is Linux 3.8.7. Chose this one and press enter.
4. The system is prepared to configure the board with DHCP but there's no DHCP server in the lab. Wait till the system boots and change `/etc/network/interfaces` with the following content:



```
1 auto eth0
2 iface eth0 inet static
3 hwaddress ether <MAC-address>
4 address 150.254.21.<X>
5 netmask 255.255.255.128
6 gateway 150.254.21.1
7 dns-nameservers 150.254.5.4 150.254.5.11 8.8.8.8 8.8.4.4
```

5. Reboot. Check if analog inputs of photoresistor and potentiometer are working.