

YOUBOT INSTALLATION INSTRUCTIONS



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Version: 0.1 (19.11.2012)

Contents

1	Ubuntu Distribution	3
1.1	User Name(s) and Password(s)	3
1.2	Add BRSU Mirror Server	3
1.3	Remove Unused Software	3
1.4	Install Additional Software Packages	4
1.5	Cleanup and Update	4
1.6	Special Settings	4
2	Network Configuration	6
2.1	IP Address(es)	6
2.1.1	Ethernet	6
2.1.2	EtherCAT	6
2.2	Hostname(s)	6
2.3	Generate SSH key	7
3	GIT	8
4	youBot Software	9
4.1	RoboCup@Work	9
4.2	Setup .bashrc	9
4.3	UDEV Rules	9
4.4	Battery Status Monitor	9
4.4.1	Enable PC-Steaker / Disable Soundcard	10
4.4.2	On youbot-hbrs#-pc1	10
4.4.3	On youbot-hbrs#-pc2	10

1 Ubuntu Distribution

This installation guide was created while installing the *11.10* (Oneiric) Ubuntu distribution on the internal PC of the youBot. In general, this guide should be also applicable to all other earlier distributions down to *10.04* (Lucid). For future release like *12.04* (Precise) we do not have any experience up to now.

1.1 User Name(s) and Password(s)

For the internal and a potential external pc, please use the following information to setup the standard user account

- User name: b-it-bots
- Password: *please ask a staff member for the current password to set*

If the Ubuntu installation is succesfully completed, set the root password with same password as used for the previously mentioned user account:

```
sudo passwd
```

1.2 Add BRSU Mirror Server

The BRSU mirror servers is located at

```
http://brics.inf.h-brs.de
```

and hosts mirrors for various Ubuntu and ROS release. Please go to the mentioned website and add the information displayed there to the source.list file:

```
sudo nano /etc/apt/source.list
```

1.3 Remove Unused Software

Some software or tools of the standard Ubuntu installation are not required for a youBot installation. In order to save space, those packages can be removed:

```
sudo apt-get remove deja-dup brasero brasero-cdrkit brasero-common tomboy
ubuntuone-control-panel ubuntuone-client gbrainy gnome-mahjongg gnome-
sudoku gnomine libreoffice-* shotwell simple-scan empathy gwibber
thunderbird transmission-* banshee usb-creator-gtk onboard
```

1.4 Install Additional Software Packages

Some network tools and other packages are required for latter installation steps:

```
sudo apt-get install openssh-server beep
```

1.5 Cleanup and Update

Clean up downloaded packages and do an update of the whole system:

```
sudo apt-get clean
sudo apt-get autoclean
sudo apt-get autoremove
sudo apt-get update
sudo apt-get upgrade
sudo apt-get dist-upgrade
```

Remove the default folders from the home directory:

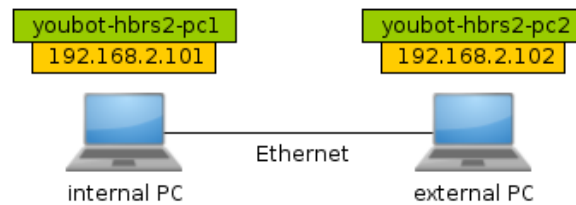
```
rm -rf ~/Documents/ ~/Downloads/ ~/examples.desktop ~/Music/ ~/Pictures/
~/Public/ ~/Templates/ ~/Videos/
```

1.6 Special Settings

- **Update manager** → disable distribution upgrade in settings of the update manager
- **Power management** → don't suspend if inactive
- **Power management** → do nothing if lid is closed
- **Power management** → hibernate if power is critical low

- **Screen** → dim screen to save power
- **Screen** → turn off after 5min
- **Screen** → lock: off

2 Network Configuration



2.1 IP Address(es)

2.1.1 Ethernet

In case of an additional laptop beside the internal youBot PC, the network connection needs to be configured. According to the previous paragraph the IP addresses are set as follows:

192.168.#.10#

- **first '#':** indicates the actual youBot, i.e. for the youBot-hbrs2 the IP address space is 192.168.2.10#
- **second '#':** indicates the PC ID on a particular youBot, i.e. *youbot-hbrs2-pc1* gets the IP 192.168.2.101 and *youbot-hbrs2-pc2* gets the IP 192.168.2.102.

2.1.2 EtherCAT

For the EtherCAT connection, a random but valid static IP address is recommended.

INFO: do not forget to set the subnet mask to 255.255.255.0

2.1.3 WLAN

TDB: connect to youbot-developers, PW, Fritz Stick works plug and play, other stick drivers see wiki, youbot-hbrs2 has not internal wifi, but 1 has

2.2 Hostname(s)

If the hostname was not set correct during the installtion, it can be changed by editing the file:

```
sudo nano /etc/hostname
```

The hostname of a youbot PC is constructed as follows:

```
youbot-hbrs#-pc#
```

- **first '#':** indicates the actual youBot. At BRSU, there currently exist two youBots, resulting in the names *youbot-hbrs1-pc#* and *youbot-hbrs2-pc#*.
- **second '#':** indicates the PC ID on a particular youBot. The *youbot-hbrs2* has two PCs, the internal and and additional laptop. The internal PC is called *youbot-hbrs2-pc1* and the second laptop *youbot-hbrs2-pc2*.

Finally, add the hostname and the related IP address of another youBot PC to the hosts file:

```
sudo nano /etc/hosts
```

2.3 Generate SSH key

Generate a SSH key pair ...

```
ssh-keygen
```

... and copy it to all remote computers on which components need to be launched:

```
cat ~/.ssh/id_rsa.pub | ssh b-it-bots@youbot-hbrs#-pc# 'cat >> ~/.ssh/authorized_keys'
```

Now, login once from one PC to the other and vice versa. You should NOT be asked for a password. Otherwise something went wrong in the previous steps.

Finally, copy the generated SSH key and add it to the related github account:

```
cat ~/.ssh/id_rsa.pub
```

2.4 NTP Server and Client

TBD

3 GIT

Install git version control system and various GUI tools:

```
sudo apt-get install git-core gitg gitk
```

Enable auto coloring for git outputs in the terminal:

```
git config --global color.branch auto  
git config --global color.diff auto  
git config --global color.interactive auto  
git config --global color.status auto
```

4 youBot Software

4.1 RoboCup@Work

Please follow the instructions on the following webpage to setup the RoboCup@Work software on the youBot:

```
https://github.com/b-it-bots/RoboCupAtWork
```

4.2 Change GIT Remotes

By default the repositories of the b-it-bots are read-only. In order to push changes from the youBot PCs to a repository, the github user "youbot-hbrs" has a fork for each repository. The remotes can be changed as follows:

```
cd ~/RoboCupAtWork/  
git remote rename origin b-it-bots  
git remote add origin git@github.com:youbot-hbrs/RoboCupAtWork.git
```

```
cd ~/external_software/hbrs-ros-pkg/  
git remote rename origin b-it-bots  
git remote add origin git@github.com:b-it-bots/hbrs-ros-pkg.git
```

```
roscd third-party-software/  
git remote rename origin b-it-bots  
git remote add origin git@github.com:youbot-hbrs/third-party-software.git
```

4.3 Setup .bashrc

Please follow the instructions on the following webpage to setup the RoboCup@Work software on the youBot:

```
cd ~/RoboCupAtWork/setup/bashrc  
sudo mkdir /etc/youbot  
sudo cp youbot-pc#.bashrc /etc/youbot/youbot.bashrc  
cp user.bashrc ~/.bashrc
```

Adapt all aliases, variables like `ROBOT`, `ROBOT_ENV` in the `.bashrc` file to the needs of the specific youBot.

INFO: do not forget to replace the `#` with the specific PC ID on which you are working on right now.

4.4 UDEV Rules

Copy the predefined udev rules into the `rules.d` directory:

```
cd ~/RoboCupAtWork/setup/udev_rules
sudo cp 50-youbot-hbrs#-devices.rules /etc/udev/rules.d/
```

INFO: do not forget to replace the `#` with the specific youBot ID on which you are working on right now.

4.5 Battery Status Monitor

The battery status monitor checks the current state of the battery and also the power connection. In case of a drop of the battery level below 10%, a beep sound will be played on the mainboard speaker. If a roscore is present the voltage information are published as a rostopic.

4.5.1 Enable PC-Steaker / Disable Soundcard

Remove or comment the following line from `"/etc/modprobe.d/blacklist.conf"`

```
blacklist pcspkr
```

and add the following line:

```
blacklist snd_hda_intel
```

4.5.2 On youbot-hbrs#-pc1

```
roscd raw_youbot_battery_monitor
rosmake
sudo cp youbot_battery_monitor.sh ./bin/youbot_battery_monitor /etc/youbot
/
```

4.5.3 On youbot-hbrs#-pc2

WARNING: TBD

```
roscd raw_laptop_battery_monitor
rosmake
sudo cp youbot_battery_monitor.sh ./bin/youbot_battery_monitor /etc/youbot
/
```

4.6 ZeroMQ - RefereeBox Communication

TBD