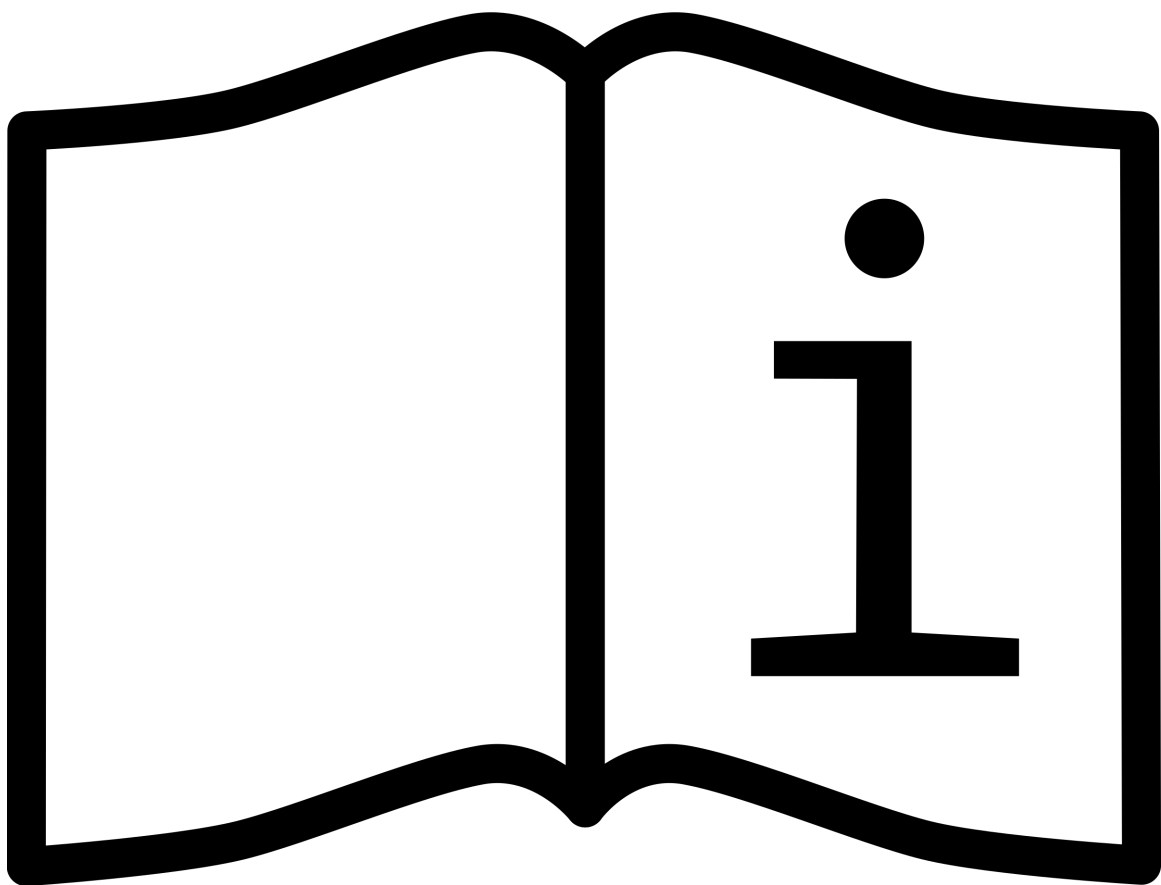# Bern University of Applied Sciences

Project 1

Module: BTI 7301

RPiHSM - Instruction manual

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Contents

1 Introduction

This document describes how to install and use the RPiHSM. The section 2 explains how to configure the different applications, the Raspberry Pi 3 model B and how to set up the electrical components.

2 Configuration

To configure the different application some software are required. First download and install the Java Development Kit 1.8 or above for you system, then download and install Apache Maven 3.3.9 or above (`https://maven.apache.org/`). Once the two software are installed and correctly configured download the source code from `https://github.com/nolithepain/RPiHSM.git`.

2.1 RPiHSM - IoT

This application runs on the Raspberry Pi 3 model B, hence it must be correctly configured.

2.1.1 Raspberry Pi 3 model B configuration

OS installation If the Raspberry Pi have a valid operation system installed please go to the next step. First download the Raspbian Jessie with Pixel OS and create a bootable SD card. Once the SD card is ready, to be able to use the serial port at the maximum speed, open it and modify the cmdline.txt. The following line must be replaced by the second one.

```
bash dwc_otg.lpm_enable=0 console=serial0,115200 console=tty1
root=PARTUUID=402e4a57-02 rootfstype=ext4 elevator=deadline
fsck.repair=yes rootwait quiet
init=/usr/lib/raspi-config/init_resize.sh
splash plymouth.ignore-serial-consoles

bash dwc_otg.lpm_enable=0 console=tty1,115200
kgdboc=tty1,115200 console=tty1,115200 root=PARTUUID=402e4a57-02
rootfstype=ext4 elevator=deadline fsck.repair=yes rootwait quiet
init=/usr/lib/raspi-config/init_resize.sh
splash plymouth.ignore-serial-consoles
```

Default user The Pi user is a well know name so please change its password. To have higher security (the Pi user have a lot of permissions) a new user with less persmissions must be created. The goal of this user is to be automatically logged in when the Raspberry Pi starts.

```
$ sudo adduser hsm
```

No password for sudo So that the hsm user can execute the sudo command, to start the RPiHSM-IoT application, without the password,the file /etc/sudoers.d/010_pi-nopassword must be modified by adding this line in the end of the file.

```
hsm ALL=(ALL) NOPASSWD: ALL
```

Key sets folder   The application needs a specific directory to store the key sets. To have a new keyset directory on every new user a directory must be created in skel folder.

```
$ sudo mkdir sudo mkdir /etc/skel/keyset
```

Application users   To be able to use the application with multiple users they must be first added on the Raspberry Pi OS. To each new user the permission on the previously created hsm directory must be changed so that only the owner and the hsm user can write and the others users not.

```
$ sudo adduser $user
$ sudo chgrp −R hsm /home/$user
$ sudo chmod −R 770 /home/$user
```

The variable $user is the new user name.

hsm user auto login   To auto login the hsm user so that the IoT application can be executed when the Raspberry Pi start up some operations must be done.

```
$ sudo cp /lib/systemd/system/getty@.service
/etc/systemd/system/autologinhsm@.service

$ sudo ln −s /etc/systemd/system/autologinhsm@.service
/etc/systemd/system/getty.target.wants/getty@tty8.service

$ sudo nano /etc/systemd/system/getty.target.wants/
getty@tty8.service
```

Now the line that start with ExecStart= must be modified in:

```
ExecStart=−/sbin/agetty −−autologin hsm %I $TERM
```

Then to execute a correct login the following line must be added in the end of the file.

```
Alias=getty.target.wants/getty@tty8.service
```

To continue this configure new the system must be rebooted (sudo reboot).
————————————————TODO FINISH IOT configuration (found in the IoT readme)

2.1.2   Google Keyczar configuration

To use the Google Keyczar library the source code must be downloaded from `https://github.com/google/keyczar`. Once the code is downloaded a new branch with the last library version as name must be created so that in the compile process errors do not appear (e.g. git checkout -b Java_release_0.71j). To compile the source code so that it can be installed on Maven the following command must be executed in the folder java/code of the Keyczar project. To complete the process, the generated jar must be installed on Maven.

```
Mvn install:install-file -Dfile=keyczar-0.71j-031417.jar
-DgroupId=org.keyczar  -DartifactId=keyczar -Dversion=0.71j
-Dpackaging=jar
```

2.2   RPiHSM - Pc

2.2.1   Command Line

2.2.2   Graphical Interface

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References

[1] $\LaTeX$ is a typesetting system designed for the production of technical and scientific documentation
https://www.latex-project.org/