ClimaSens

This document describes how to build your own ClimaSens device and set up a system to log the data.

Contents

1. Required hardware

Control center:

- Raspberry Pi 3 (not tested with others, Bluetooth required)

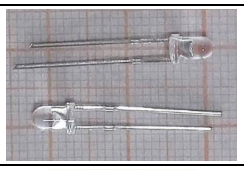
For programming:

- Arduino Uno (or similar)

Smart-ClimaSens:

- BLE-Module: JDY-08 with CC2541 Controller
- Battery: CR2032 (3V)
- Clima-Sensor: Si7021 or BME280 (does also measure pressure)
- Optionally:
    - Light-Sensor: LED 3mm + 10nF capacitor
    - Magnet-Contact: Reed-Contact

Order list:

Bluetooth Module	JDY-08	
Clima-Sensor	Si7021	
Clima-Sensor	BME280	
Light-Sensor	LED 3mm	
Capacitor	10nF 0805	
Magnet-Contact	Reed-Contact	
	Package	
	Battery Clip	

2. Programming the software

Download and install Arduino IDE from the official homepage.

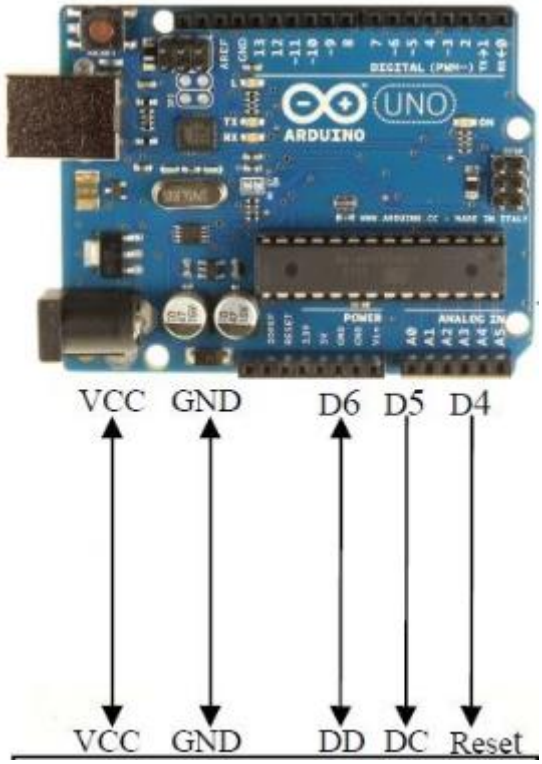
https://www.arduino.cc/en/Main/Software

Start Arduino IDE and load the “CCLoader.ino” sketch.

Smart-ClimaSens/Development/Development-Tools/Programming software/CCLoader-master/Arduino/CCLoader/CCLoader.ino

Connect your Arduino to the computer and start loading the sketch.

Connect your Bluetooth module to the Arduino.



Find out the COM-Port of the Arduino.

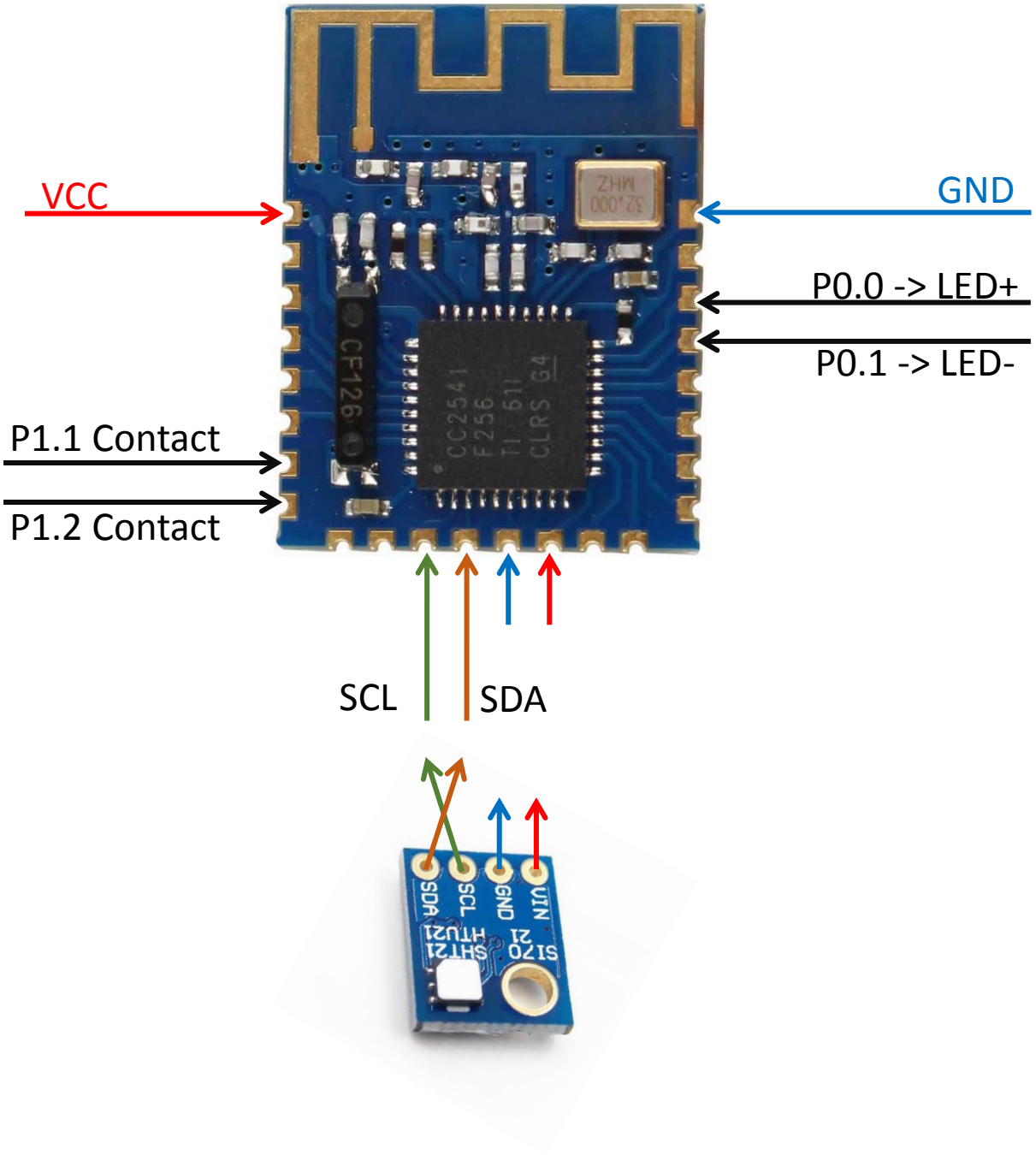
Open the “ConvertAndProgram.bat” and change the COM-Port to yours.

```
CCLoader.exe YourComPort SimpleBLEBroadcaster.bin 0
```

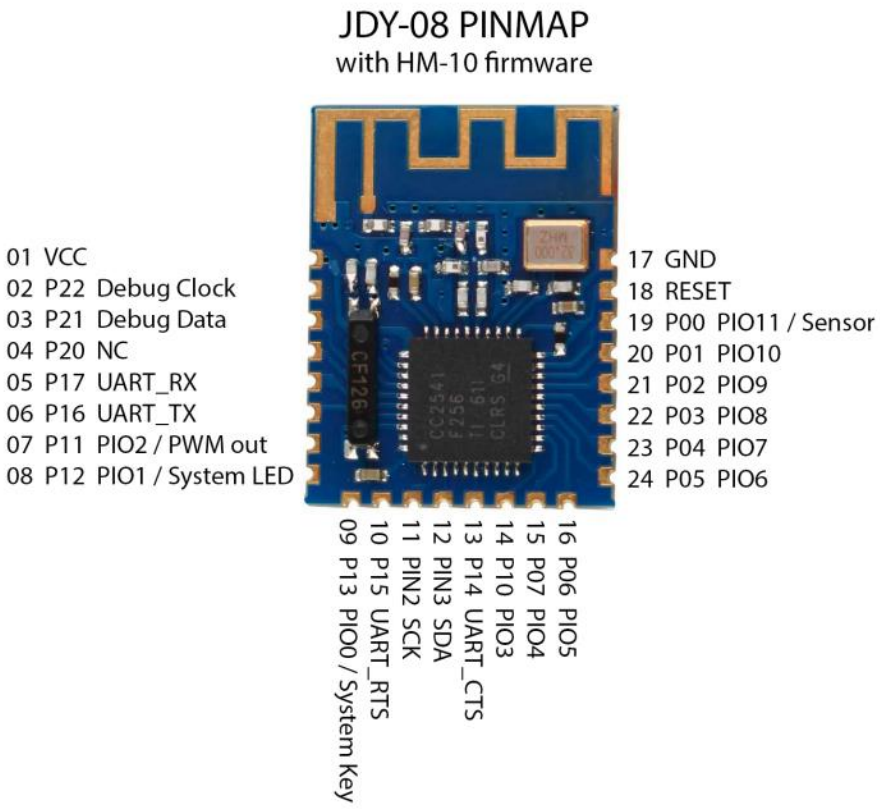
Execute “ConvertAndProgram.bat”, the programming should start.

3. Build your Smart-ClimaSens

1. Wire schematic



2. Pinmap



Component	Component Pin	Controller Pin	Controller Pin Number
Power Supply	Vcc	Vcc	01
	GND	GND	17
Sensor	Vin		
	GND		
	SCL		
	SDA		
Contact	1	P11	07
	2	P12	08
LED	+	P00	19
	-	P01	20

4. System installation

3. Download “raspbian”

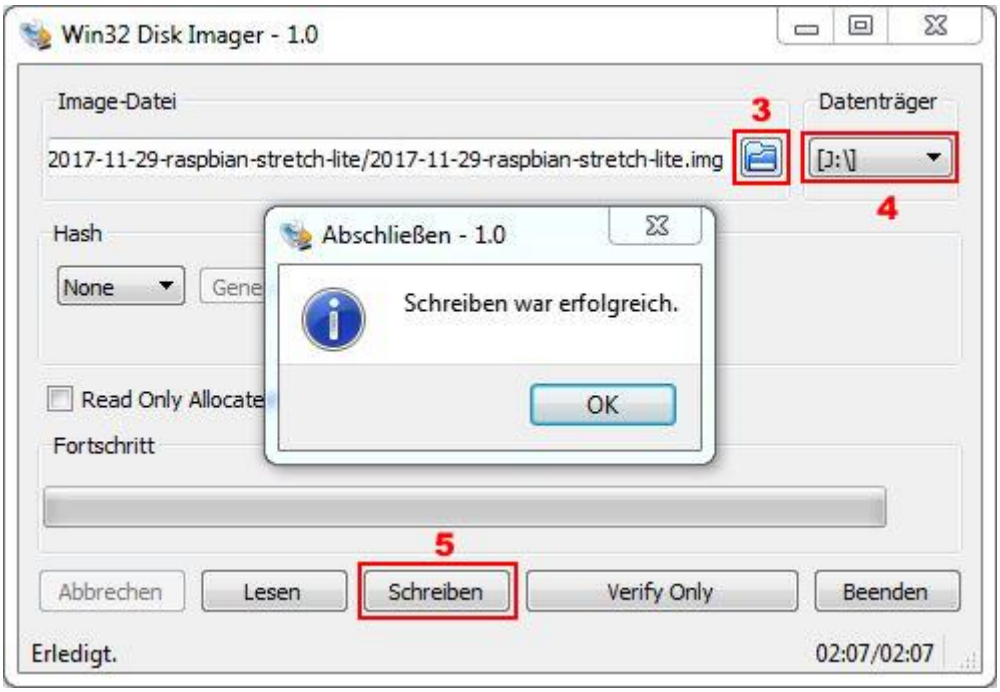
https://www.raspberrypi.org/downloads/raspbian/

4. Download “Win32 Disk Imager”

http://www.chip.de/downloads/Win32-Disk-Imager_46121030.html

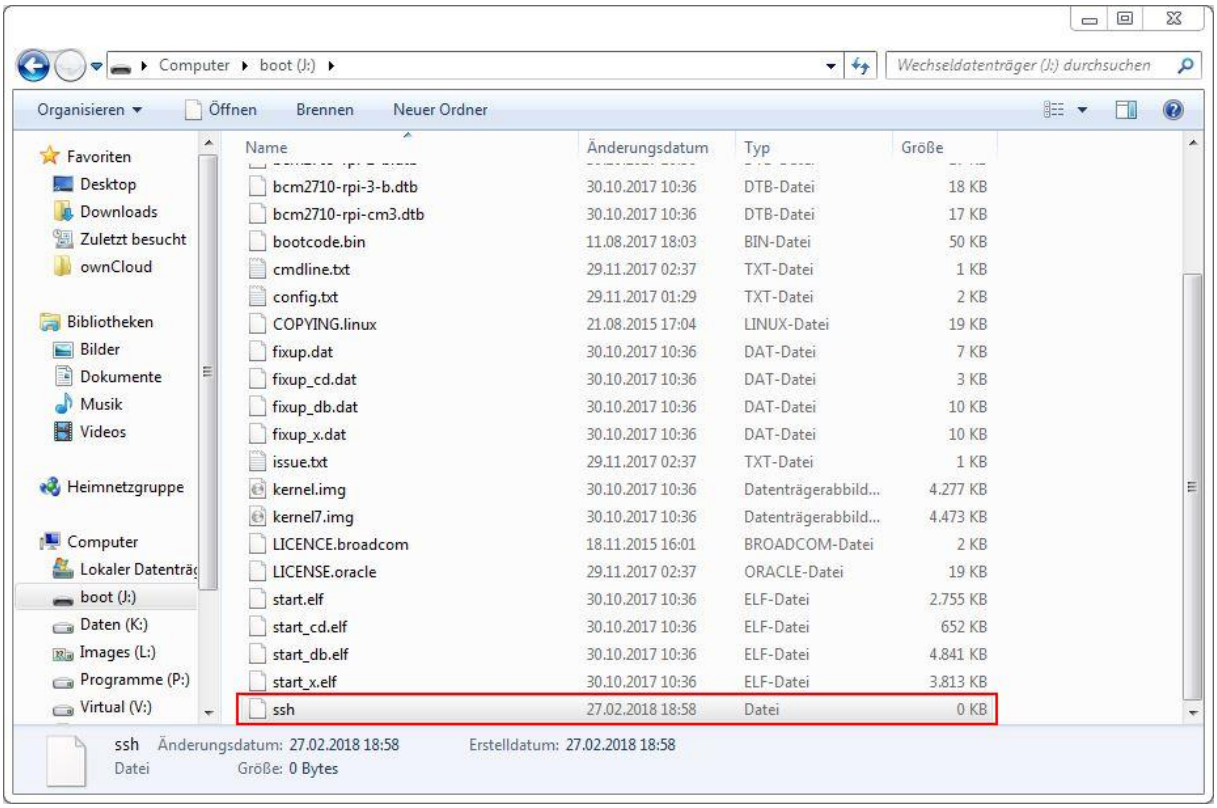
5. Flash the “raspbian“ image with “Win32 Disk Imager”

1. Unzip the raspbian image
2. Open Win32 Disk Imager
3. Select the image file
4. Select your SD-Card
5. “Write” to the SD-Card



6. Enable SSH

Open your SD-Card with the windows explorer and create a file called “ssh”



7. First run

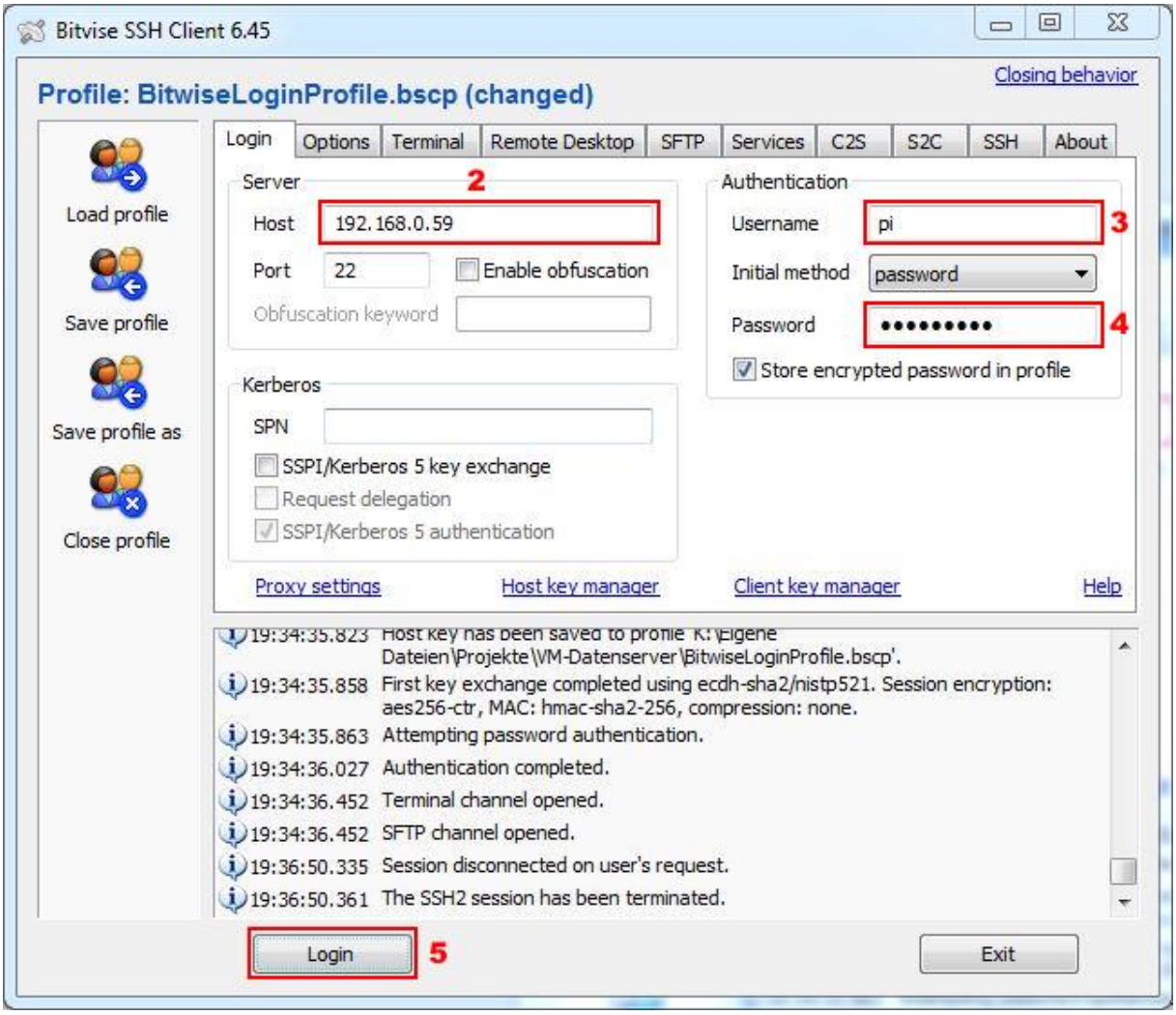
- Put the SD-Card into your raspberry
- connect the patch cable with your local network
- plug in the power supply

Find out the ip address of your raspberry:

- Using the client list of your router
- Or an app on your smartphone like “Fing”: https://play.google.com/store/apps/details?id=com.overlook.android.fing&hl=de

Connect to your raspberry:

1. Get a SSH-Client like “Bitwise-SSH”
2. Type in the IP-Address of your pi
3. Type in the username “pi”
4. Type in the password “raspberry”
5. Login to the raspberry

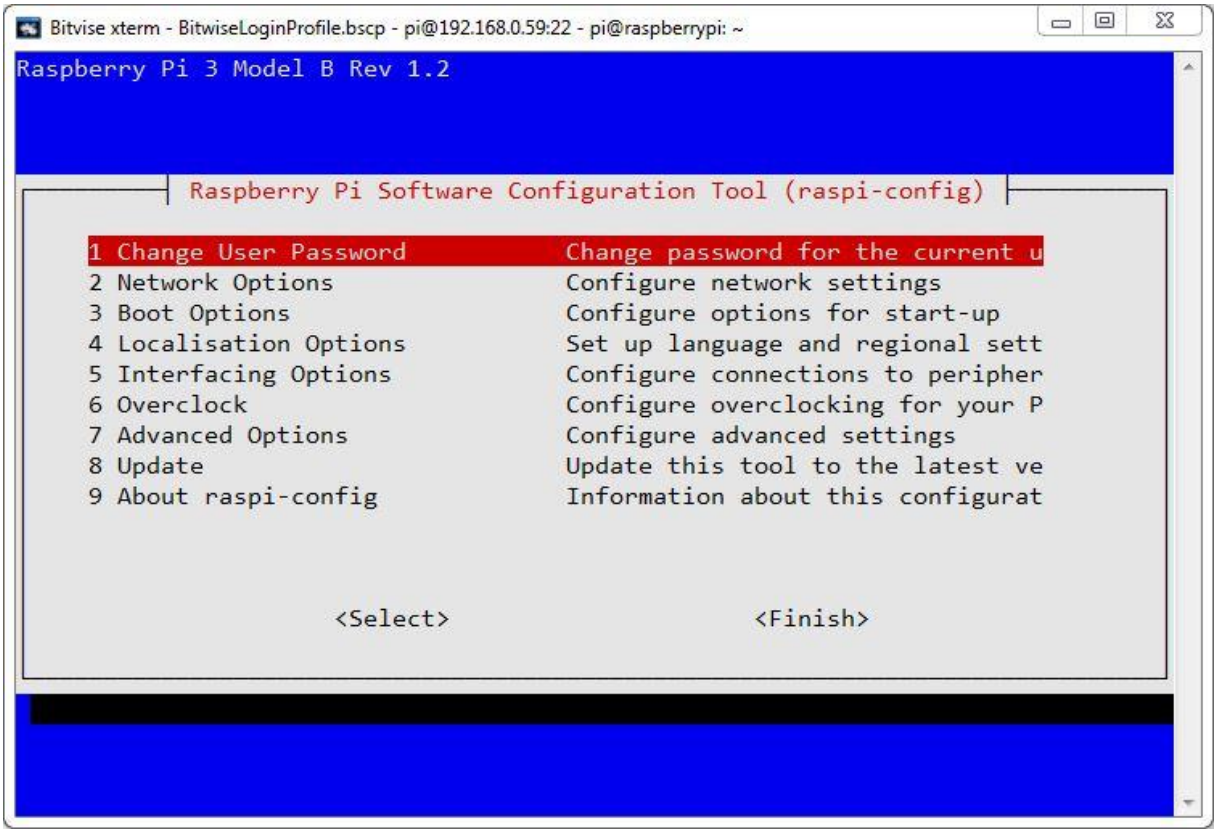


5. System configuration

1. Change default settings

Use raspi-config to change the default system settings

```
sudo raspi-config
```



Some useful changes:

- User password
- Network-Settings -> Wifi
- Internationalization Options
- Update

6. Pimatic installation

1. Prepare for installation

Download “nodejs”

```
wget https://nodejs.org/dist/v4.6.2/node-v4.6.2-linux-armv7l.tar.gz -P /tmp
```

Move to local directory

```
cd /usr/local
```

Unpack the folder

```
sudo tar xzvf /tmp/node-v4.6.2-linux-armv7l.tar.gz --strip=1
```

Install “git”

```
sudo apt-get install build-essential git
```

Move to user directory

```
cd ~
```

Create a directory for pimatic

```
mkdir pimatic-app
```

2. Install pimatic

Run the installation of pimatic

```
npm install pimatic --prefix pimatic-app --production
```

This will take a while

Move to the installation directory

```
cd pimatic-app
```

Copy default configuration

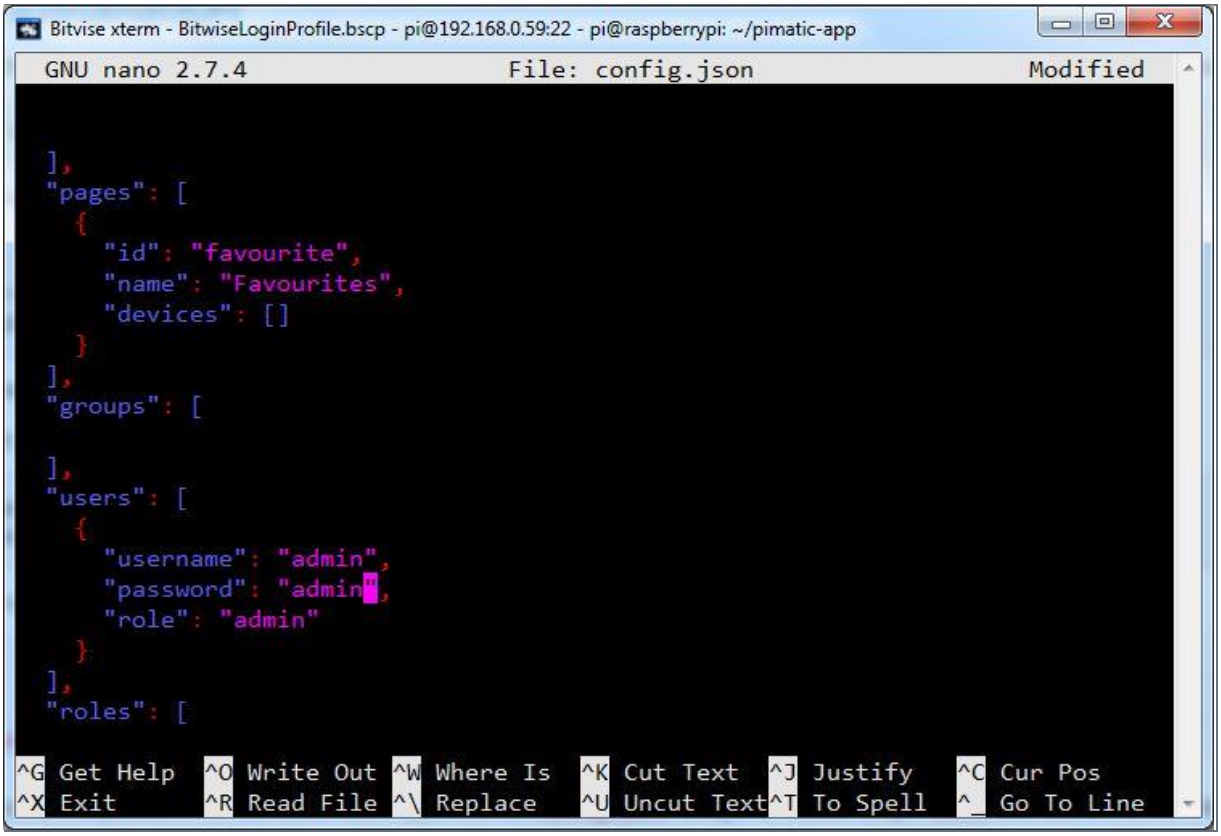
```
cp ./node_modules/pimatic/config_default.json ./config.json
```

3. Setup user

Open the configuration file

```
nano config.json
```

Set a password for the admin user



Save and close the file by entering “Strg” + “C” and confirm with “y” followed by “Return”

Start pimatic

```
sudo node_modules/pimatic/pimatic.js start
```

4. Configure auto start

Move to the pimatic directory

```
cd node_modules/pimatic
```

Make pimatic globally available

```
sudo npm link
```

This will take a while

Download “pimatic-init-d” file

```
wget https://raw.githubusercontent.com/pimatic/pimatic/v0.9.x/install/pimatic-init-d
```

Copy the file to pimatic

```
sudo cp pimatic-init-d /etc/init.d/pimatic
```

Make the file executable

```
sudo chmod +x /etc/init.d/pimatic
```

Change the owner of the file to “root”

```
sudo chown root:root /etc/init.d/pimatic
```

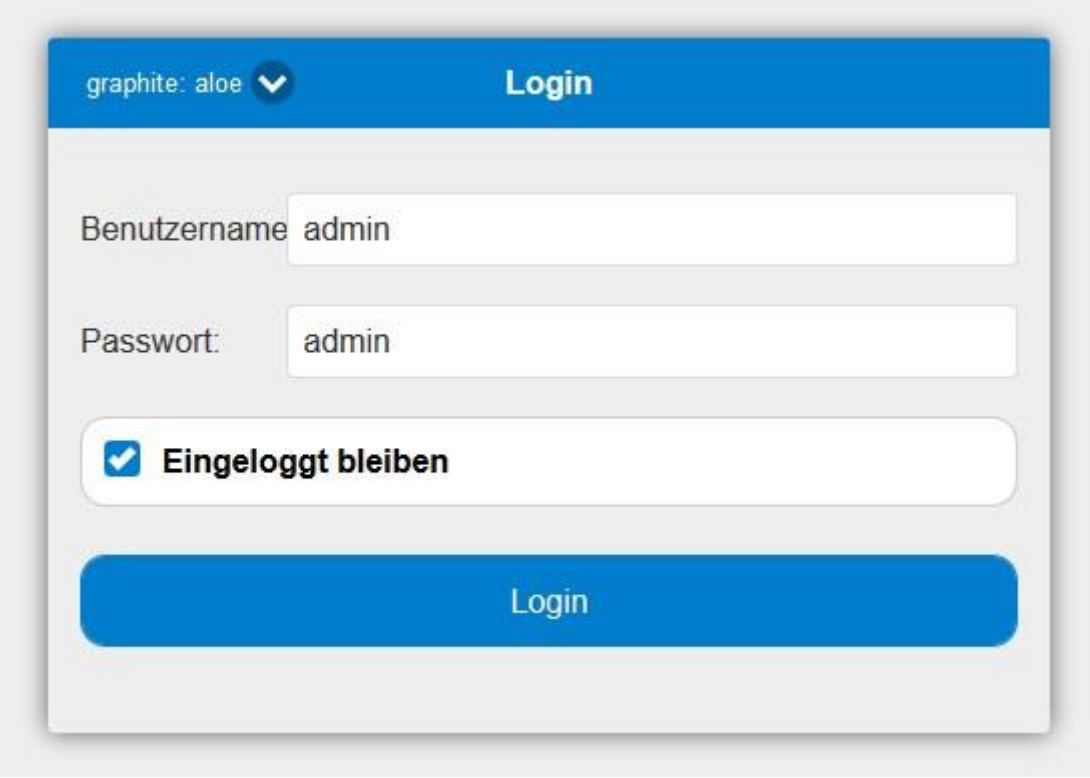
Call the system to auto start the file

```
sudo update-rc.d pimatic defaults
```

5. Access pimatic

Pimatic is still processing its first start this can take about 10min.

Open your internet browser and type in the IP-Address of your raspberry pi.
The login screen should show up.



Enter the user name “admin” and the password you have set.

7. Install Pimatic-ClimaSens

Download the “Pimatic-ClimaSens” project

```
git clone https://github.com/FROeHlyEisvogel/Pimatic-ClimaSens.git
```

Move the project to the pimatic plugin directory

```
mv Pimatic-ClimaSens ~/pimatic-app/node_modules/pimatic/node_modules/
```

Restart your system

```
sudo reboot
```

Now you can see the “Pimatic-ClimaSens” plugin in the pimatic plugin section.