LEGO BOOST

Dot-Matrix Writer

Instructions for Control

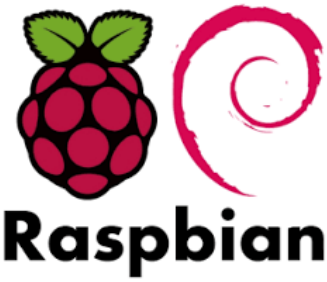
of the MoveHub via Raspberry Pi

Hardware:

The following instructions have been tested on a Raspberry Pi 3 Model B+ with 16GB microSD-Ram. This model has an internal Bluetooth Low Energy (BLE) module which is compatible with the LEGO MoveHub. In general, these instructions and the software should run on most Linux based systems with BLE hardware, e.g. a BLE-USB-adapter.

Operating system:

As an operating system the standard Raspian installation (pre-installed on microSD) was used.



Setup:

Assemble all hardware: Insert microSD into Raspberry-Card slot. Mount Raspberry into housing. Attach Keayboard, Mouse and Monitor to Raspberry. Alternatively, if you do not have a keyboard or Monitor, you can control your raspberry remotely from a seperate PC. Please search the internet on the options how to do the setup for remote control of the raspberry Pi. Attach Power source and plug it into power socket.

Follow the NOOBS installation instructions to install the standard Raspbian operating system.

After first startup of your Raspberry you have to prepare the BLE interface drivers as well as the Python3 software developper environment.

Open a terminal window. 

Type the following commands into the window:

```
sudo apt-get update
sudo apt-get install build-essential checkinstall
sudo apt-get install libreadline-gplv2-dev libncursesw5-dev libssl-dev
libsqlite3-dev tk-dev libgdbm-dev libc6-dev libbz2-dev
pip3 install https://github.com/undera/pylgbst/archive/0.9.tar.gz
sudo apt-get install libglib2.0-dev
pip3 install pygatt
pip3 install gatt
```

If some of the commands run into errors, you might have to update some libraries or pre-install other software first. Please search the internet for solutions.

If everything installed without errors, you can start to test your first programs to control the Lego MoveHub.

Control of the Lego MoveHub:

To control the MoveHub I use the code provided by Andrey Pokhilko on GitHub: https://github.com/undera/pylgbst

Copy the dot-matrix.zip file onto your raspberry and unpack it into one folder e.g. under „Documents“.

At the end, the folder should look like this:

```
dot-matrix.py
world.txt
pig.txt
pylgbst
   ↳ __init__.py
     constans.py
     movehub.py
     peripherals.py
     utilities.py
     comms
       ↳  __init__.py
          cgatt.py
          cgattlib.py
          cpygatt.py
```

To start the program, right click on Dot-matrix.py and select „Open with...“ and then „Idle3“.

Within Idle3 hit the „F5“ key to run the program.

When prompted for a file name, enter `pig.txt`

For Distance A and and Distance M enter the default values of 25 and 20.

When prompted, push the green button on the MoveHub.

Generating new dot-matrix data:

Dot-Matrix Pictures are stored in as simple tab stop seperated text file. These files consists of two columns with the coordinates of each dot in a seperate row.

Such a file can be generated using the Excel-File included in the downloadable files.

Simply draw a picture by typing an X in a cell on sheet „draw“.

On sheet „Convert“ youcan filter the table for rows with „x“ only.

Highlight the entire table and copy all entries on a new sheet.

Save this new Excel-sheet as a tab-stop seperated text file in the same file you run the dot-matrix.py program from.

You can now reference to your new txt-file when prompted for the file name within the program.