# Raspberry state machine

The raspberry program is written using python and executed automatically when the system starts.

The program starts communication with the Mega board using the ttyUSB0 port. Once the program has started, it sends the number “1” to the Mega board to initialize the program. The Raspberrypi board will wait for the Arduino Mega runs its program and sends the commands of the process. The different commands are sent to the Raspberry Pi using the following codes:

**IZUM Code:**

When received this code, the Raspberry Pi will program the Zum board with the calibration program placed in the following directory:

/home/pi/zowi/python/zowi\_offset\_i2c.cpp.hex

The program upload is carried out using avrdude with the next instruction:

*avrdude -patmega328p -carduino -P/dev/ttyUSB1 -b 115200 -D -Uflash:w:/home/pi/zowi/python/zowi\_offset\_i2c.cpp.hex:i*

This program has the necessary code to interpret the calibration codes sent by Mega board. Once the calibration is done, it is sent a confirmation code to the Mega board telling whether it is right or wrong.

**FZUM Code:**

When received this code, the Raspberry Piboard will program the Zum board with the final program to check the calibration realized. The program is placed in the following directory:

/home/pi/zowi/python/Final\_Test.cpp.hex

After an uploading, a confirmation code will be sent to the Mega board if it is right as well as wrong.

**ROFF Code:**

This code is sent by the Mega board to the Raspberry Pi board to switch off the system.

**WERC Code:**

This code is sent by the Mega board to the Raspberry Pi board and it indicates the calibration errors for each joint.

**WOFF Code:**

This code is sent by the Mega board to the Raspberry Pi board and it indicates the new 90º position, which is the calibrated position. The Raspberry Pi sends this code to the Zum board that will calculate the error (new 90º-90) and will keep it in its EEPROM memory.

**WSQL Code:**

When received this code the Raspberry Pi saves the error of the calibration, the new 90º position and whether the calibration is right or wrong in the local and remote database.