## 0.1 SOFTWARE INSTALLATION

We will need softwate listed bellow:

1. Arduino IDE is basics “development environment”
2. RobDuino library for easier programming
3. Ardublockly is needed for introduction to programming

- Python is needed for running Ardublockly

4. VSC in PlatformIO proper IDE include:

- auto-completion,
- error marking (e.g. forgotten ";"),
- auto-detect USB port,
- function information

### 0.1.1 Arduino IDE

1. Go to Arduino web page Arduino->Software->Download.
2. Download Arduino IDE 1.8.9 choose Windows Install…
3. … click `JUST DOWNLOAD`.
4. run `arduino-1.8.9.exe` and follow the instructions.
5. … don’t forget to install also 3rd party drivers (for Chinese version of Arduino UNO controller)…
6. if you do forget… Try this Russian drivers from page.

#### 0.1.1.1 Getting started

1. Run `Arduino IDE`
2. Connect Arduino Uno controller to USB port.
   `Arduino Uno`
3. Open simple basic program:
   `files` -> `examples` -> `01.basics` -> `blink`

```
void setup() {
  pinMode(LED_BUILTIN, OUTPUT);
}

void loop() {
  digitalWrite(LED_BUILTIN, HIGH);   // turn the LED on (HIGH is the
     voltage level)
  delay(1000);                       // wait for a second
  digitalWrite(LED_BUILTIN, LOW);    // turn the LED off by making the
     voltage LOW
  delay(1000);                       // wait for a second
}
```

4. Make this settings in `Tools` menu ->
    1. `Board`: Arduino/Genuino Uno
    2. `Port`: COM3 *or similar*
5. Run :
   `Upload` to transfere the program to Arduino UNO controller.
6. If everything is OK you will get this message:

```
Done uploading.
Sketch uses 970 bytes (3%) of program storage space. Maximum is 32256
   bytes.
Global variables use 9 bytes (0%) of dynamic memory, leaving 2039 bytes
   for local variables. Maximum is 2048 bytes.
```

9. Optional this preferences are suggested:
   `File` -> `Preferences`:
    1. `Editor Language`: English
    2. `Editor font size`: 20
    3. `Show verbose output during`: [ ]compiling [x] upload
    4. `[x] Display linenumbers`
    5. `[x] Enable code folding`

### 0.1.2 RobDuino

RobDuino is Arduino library which include some usefull functions for driving motors and on-board key usage…

#### 0.1.2.1 RobDuino Library Installation

1. Download zip file:
    - RobDuino-master.zip
2. rename RobDuino-master.zip in:
    - **RobDuino.zip**
3. run Arduino IDE
4. choose:
    - `Sketch` -> `Include Library` -> `Add .ZIP Library...`
5. find
    - `.../Download/RobDuino.zip`
    - `[OK]`

### 0.1.3 Ardublockly

Ardublockly is graphical programming environment for programming Arduino controllers. A demo version of the program is also available on-line.

Note: For actual programming you will need Arduino IDE installed.

Note: For running Ardublockly you will need to install Python program.

#### 0.1.3.1 Python Installation

1. You will have to install Python 3.7 or grater. First Download the newest version of Python.
2. Run installation file and set this settings:
    1. `[x] Add Python to PATH` in
    2. choose `Clasic Instalation`

#### 0.1.3.2 Ardublockly Installation

3. From github.com/.../ardublockly download **zip** file by clicking **Clone or download** and choosen Download ZIP file.
4. Extract `ardublockly-master.zip` to dirrectory of your choice e.g. `C:\\Program Files(x86)`
5. That is it! Installation is complete.

#### 0.1.3.2.1 Running Ardublockly

6. Find this file `C:\\Program Files(x86)\\ardublockly-master` and double-click on `start.py`. Python program should run and you should see:
    1. terminal window with some code running…
    2. and a new window should apear in your Internet Browser. If this is will not happend try to run `start.py` with right mouse button and `Start program with` then choose `Python 3.7`.

### 0.1.3.3 Settings

7. Click `menu` and choose `Settings`:
    1. `Compiler Location`: C:\Program Files (x86)\Arduino\arduino_debug.exe
    2. `Arduino Board`: Uno
    3. `Com port`: COM3 *or appropriate one*
    4. Click `[RETURN]`.

## 0.1.4 VSC in PlatformIO

Note: For programming Arduino controllers you will need Arduino IDE installed.

Download installation file:

1. run `VSCodeUserSetup-ia32-1.49.3.exe` installation file.
2. run VSC program and click `Extensions`
3. search for `PlatformIO IDE` and
4. run `Install`.
5. restart VSC or click `Reload now`.

### 0.1.4.1 Getting Started

Write basic program `Blink`:

1. plug in Arduino Uno.
2. open `PlatformIO - Home Page`:

- in left icon bar find `PlatformIO`
    - `QUICK ACCESS` -> `PIO Home` -> `Open`

3. choose + `New Project`
4. Setup:

- `Name`: ime_projekta
- `Board`: Arduino UNO
- `Framework`: Arduino Framework

5. click `Finish`
6. Find directory `src` (e.g. `source code`), where you can find main program code in file `main.cpp`
7. Copy-Paste this example:

```
#include <Arduino.h>
void setup() {
  pinMode(13, OUTPUT);
}

void loop() {
  digitalWrite(13,HIGH);
  delay(500);
  digitalWrite(13,LOW);
  delay(500);
}
```

8. Run `Build` and `Upload`.