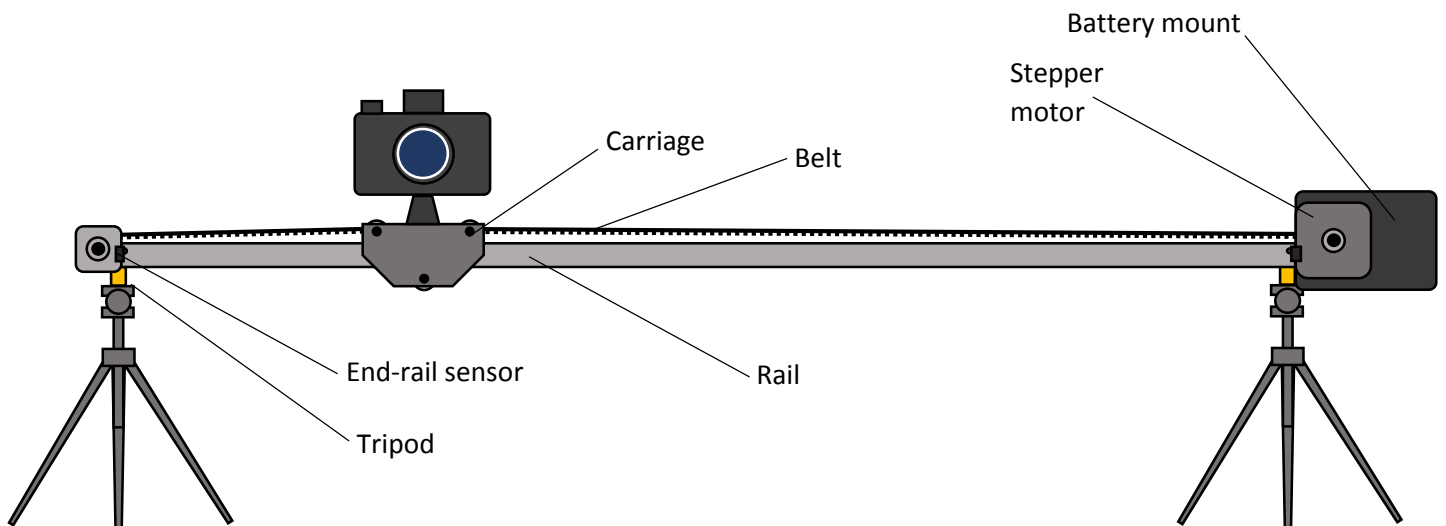


# **MR Slider V1.0**

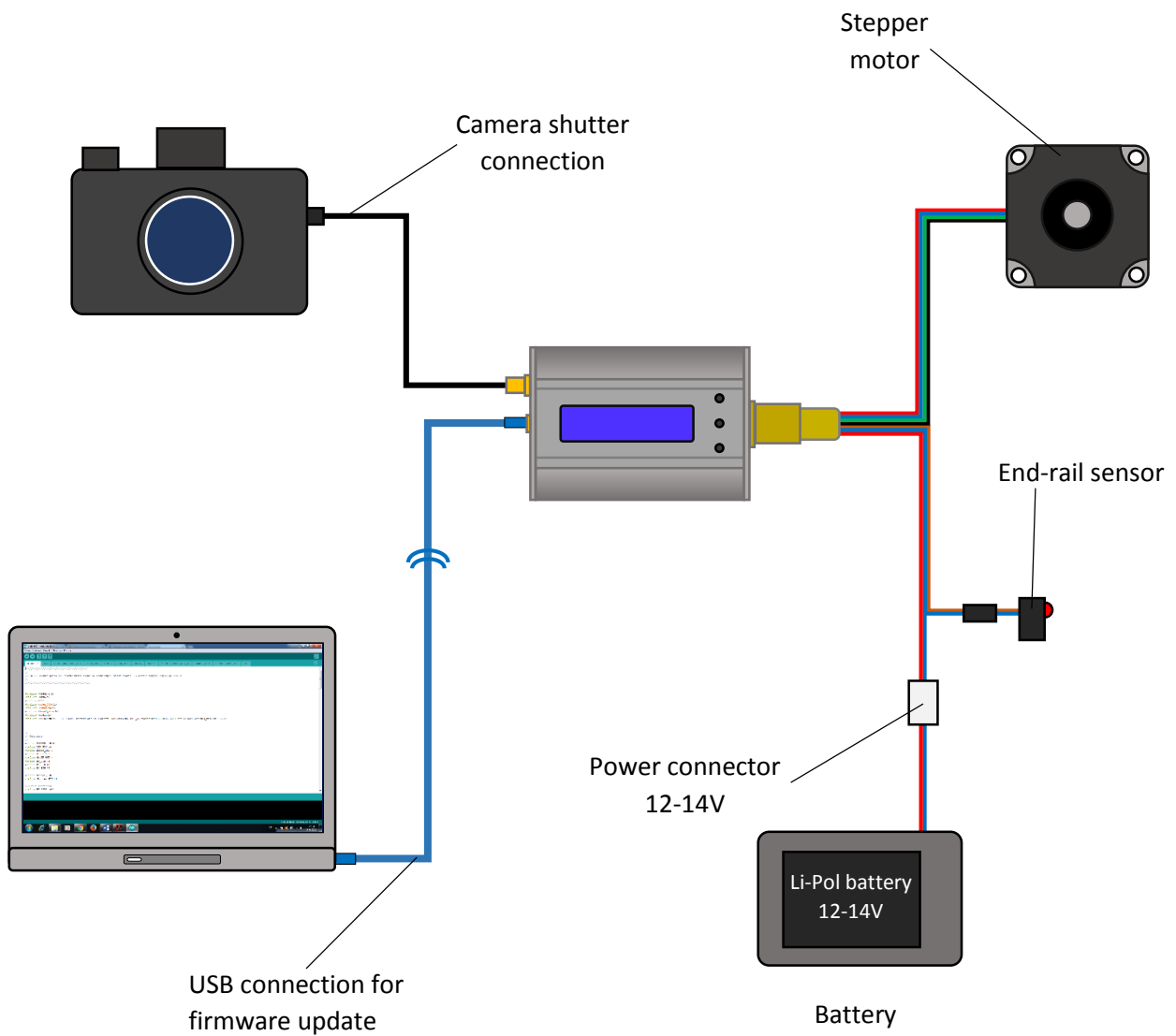
Controller for time-lapse and step-less motion.

Maksim Rezenov,  
Radoslav Dodek,  
Lukaš Ildža

## 1. Hardware.



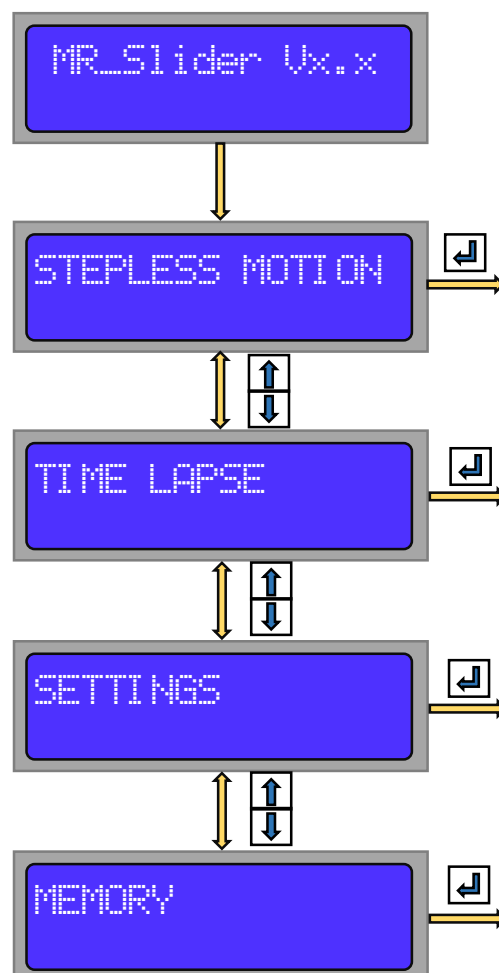
## 2. Wiring.



### 3. Functions.

#### 3.1 Main menu.

After turning-on the controller, on display the main screen is showed. Where we see the name of the controller and number of the firmware version. Next, the controller setting the carriage on the starting point – rightmost point on the rail. After that, the user can switch the menu item by the "Up" and "Down" buttons. There are four items: "Stepless motion", "Time lapse", "Settings" and "Memory". The menu item is chosen by "Enter" button.

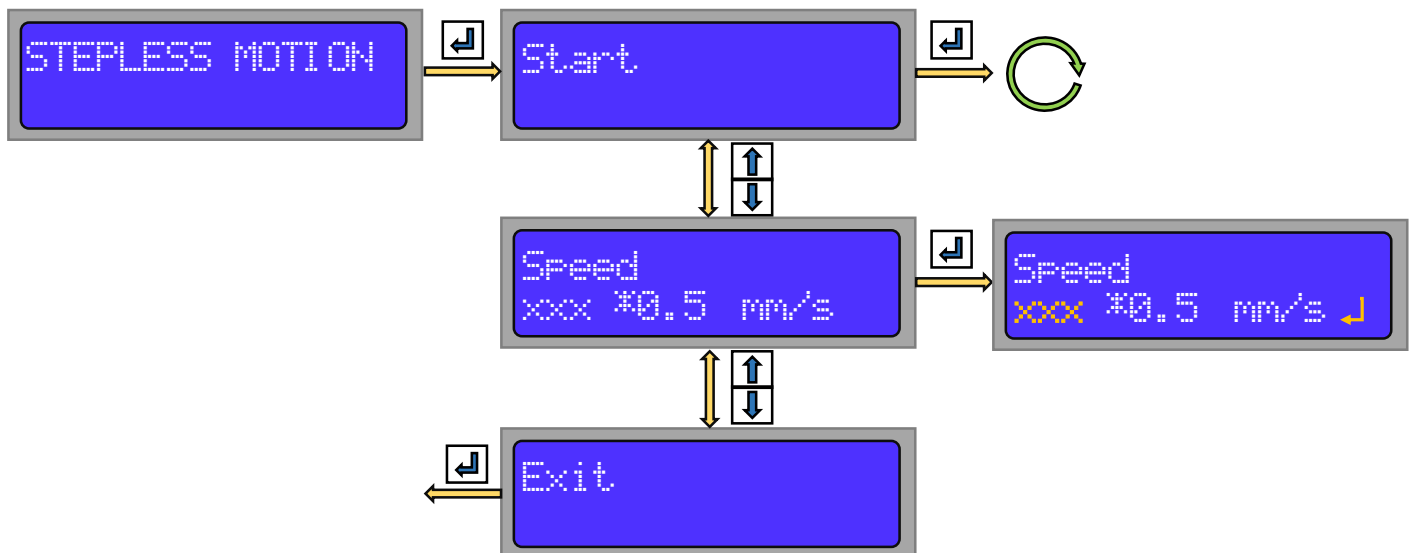


### 3.2 Stepless motion.

In the **“Stepless motion”** topic, user can see three items: **“Start”**, **“Speed”**, **“Exit”**.

Item **“Speed”** allow the speed setting for the stepless motion. Available range is 10–999 \* 0.5 mm/s. Item **“Start”** will start the moving sequence. The **“Wait!”** message will be showed on the screen. If speed setting is under 10, the warning message **“Speed is too low”** will be showed on the screen. Moving sequence will be stopped, when carriage arrive to the opposite side of the rail. If the speed setting is in 10-100 range, is possible stop the moving sequence before carriage arriving to the opposite side of the rail. Push the **“Enter”** button. The **“STOP?”** message will be showed. If **“Enter”** button will be pushed again within 5 seconds interval, the moving sequence will be aborted and carriage will stop. The **“DONE!”** message will be showed. After stopping, selection of the **“Start”** item will be starting moving sequence again, but in the opposite direction.

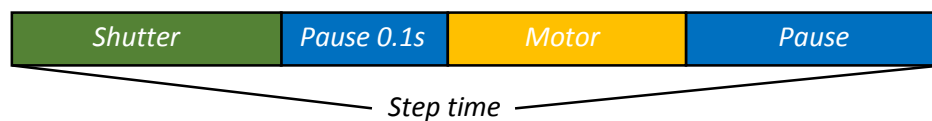
Item **“Exit”** mean returning to the main menu.



### 3.3 Time lapse.

In the ***“Time lapse”*** topic, user can see seven items: ***“Start”***, ***“Step time”***, ***“Step length”***, ***“Shutter”***, ***“Hard duty”***, ***“Return to start”***, ***“Exit”***.

The time lapse moving sequence have 4 parts. First is the making photo part. Second part is pause 0.1s. Third is moving and fourth is a pause again. For proper function is necessary make some settings of the timing.



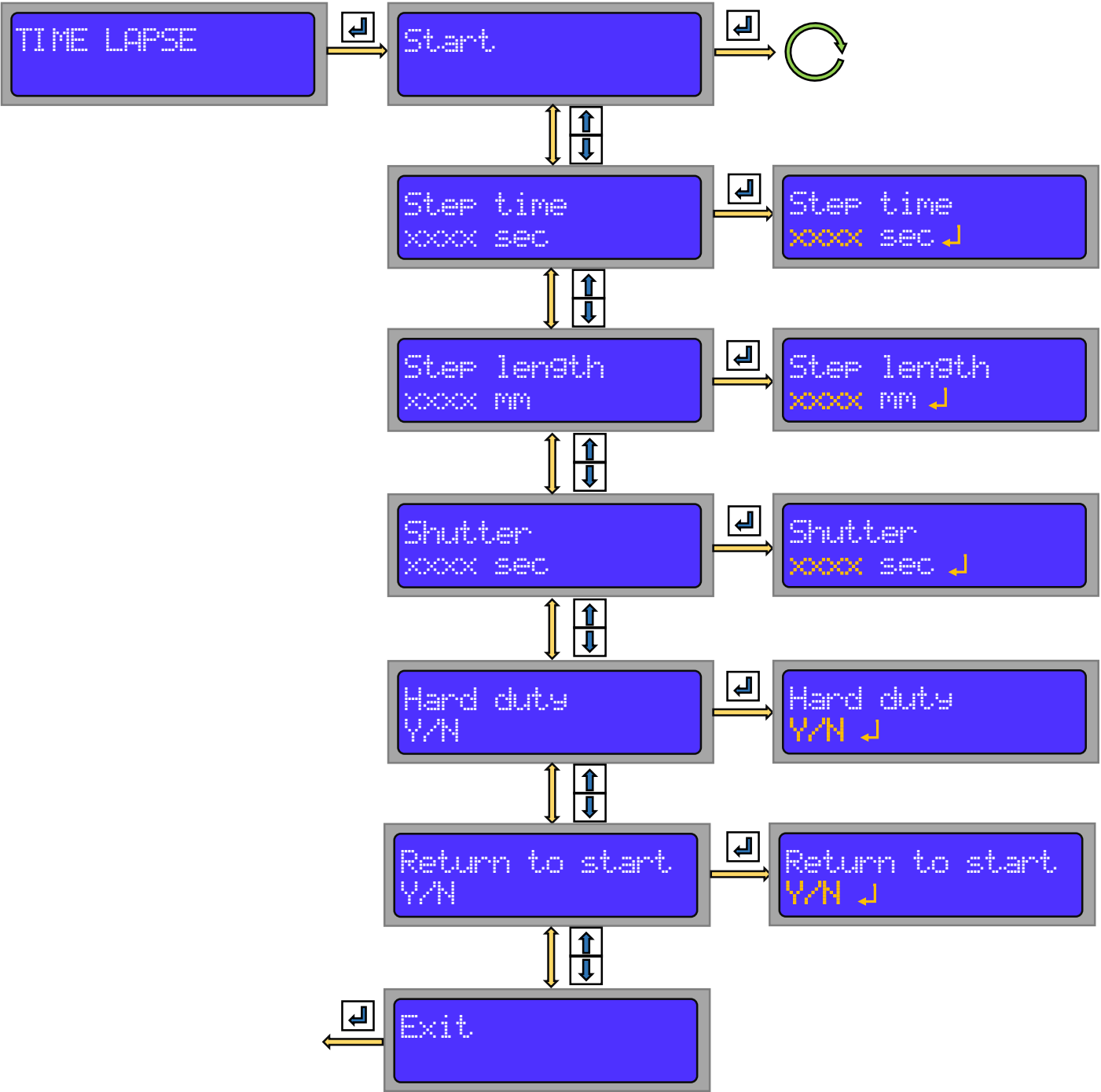
The setting called ***“Step time”*** allow set a whole step timing from 1 to 9999 seconds. Next setting is the ***“Step length”***. Its allow set how long will be one step in mm. Next setting, called ***“Shutter”***. It means a time, when photo camera shutter is open. For long timing is possible to set time from 1 to 9999 seconds. When ***“Shutter”*** have a ***“0000”*** setting, controller make a 0.1 second pulse to trigger photo camera shutter.

***“Hard duty”*** setting means a possibility to set brake, which not allow moving carriage in time, when motor doesn't move the carriage.

The last setting is the ***“Return to start”***. When moving sequence are ended by carriage arriving to the opposite side, or it was aborted by buttons, carriage return to the start point when ***“Return to start”*** is set to ***“Yes”***. Otherwise carriage stays on its place.

Important! Step time should be greater than shutter time, moving time and pause 0.1 + 1 seconds together! Otherwise, after choosing ***“Start”*** item, the ***“WRONG TIMELAPSE CONST.”*** message will be showed on the screen. In this case is necessary to change step timing.

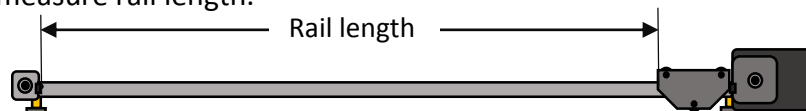
Item ***“Exit”*** mean returning to the main menu.



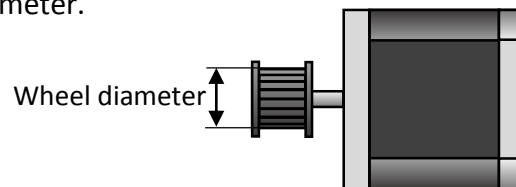
### 3.4 Settings

In the **"Settings"** topic user can see four items: **"Rail length"**, **"Wheel diameter"**, **"Motor SpR"** and **"Exit"**. All these settings are necessary for proper function of the slider. Without it can't be possible make a precision distance steps, control speed, make right steps timing and make smooth deceleration on the ends of rail.

**"Rail length"** is setting in mm. The maximum rail length is 9999mm. The picture showing how to measure rail length.

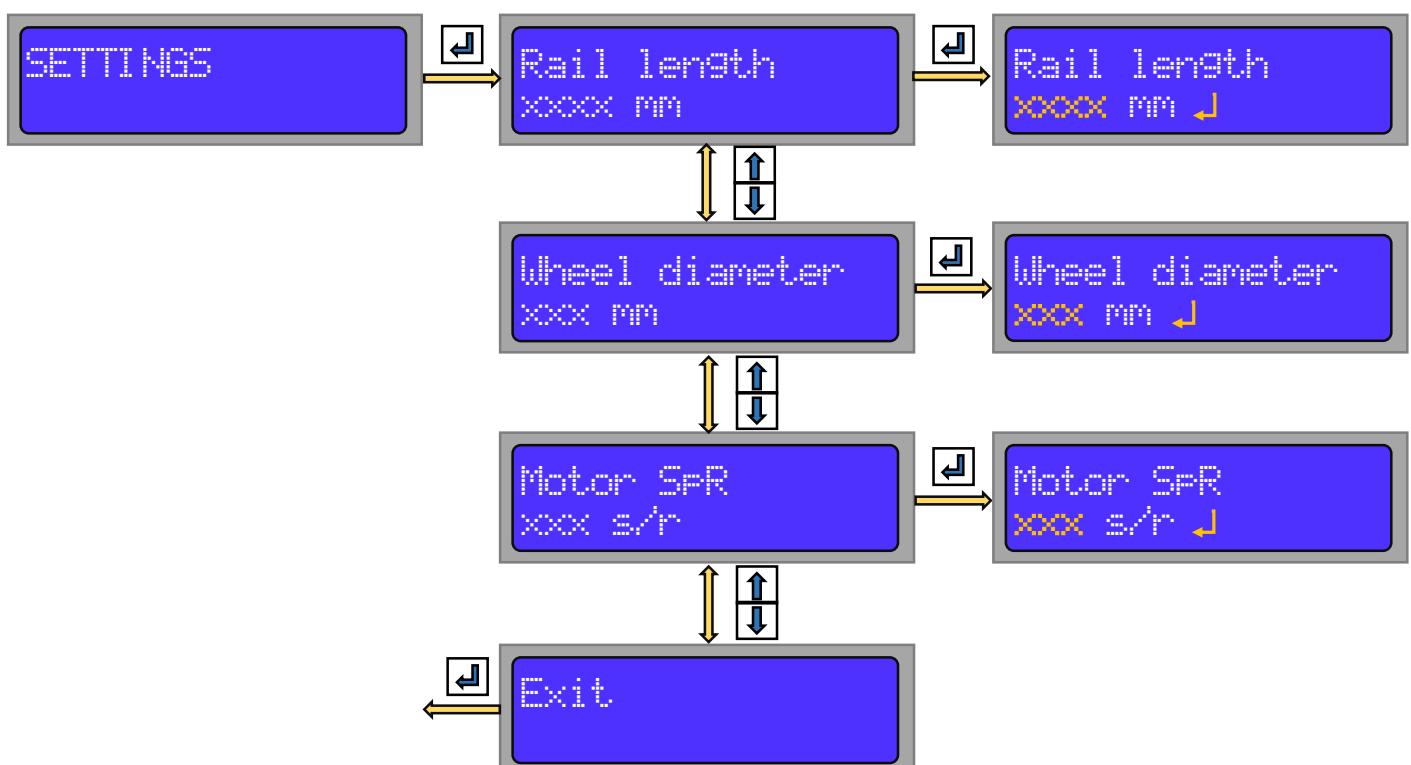


**"Wheel diameter"** means diameter of the driving wheel on the stepper motor. "Wheel diameter" is setting in mm. The maximum wheel can be 999mm. The picture showing how to measure wheel diameter.



**"Motor SpR"** means motor steps per revolution. Each manufacturer of stepper motors gives information on how many steps the engine shaft rotates in one step ( $\alpha$ ). We use the formula to calculate SpR:  $SpR = 360/\alpha$ .

Item **"Exit"** mean returning to the main menu.





### 3.5 Memory

All settings, made by user will be lost, if controller will be unplugged from power supply. For saving settings, the **"Memory"** topic should be used. First item is **"Save settings"**. When user push **"Enter"** button, all settings will be write into the EEPROM memory. After the controller restarting, all settings will be read from EEPROM memory.

Item **"Clear settings"** erase EEPROM memory.

Item **"Exit"** mean returning to the main menu.

