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Title: Control system for automation of a didactic testbench water canal

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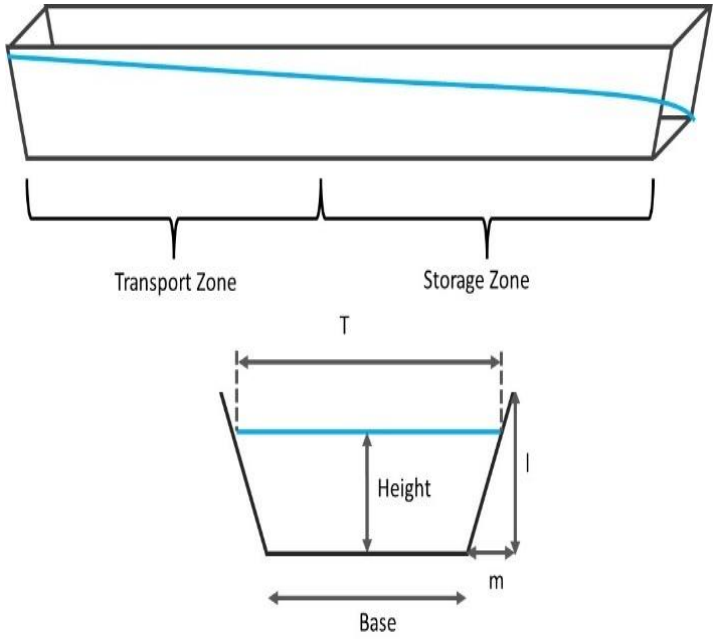
Introduction

Water canal didactic testbench



Introduction

Hydraulic phenomena

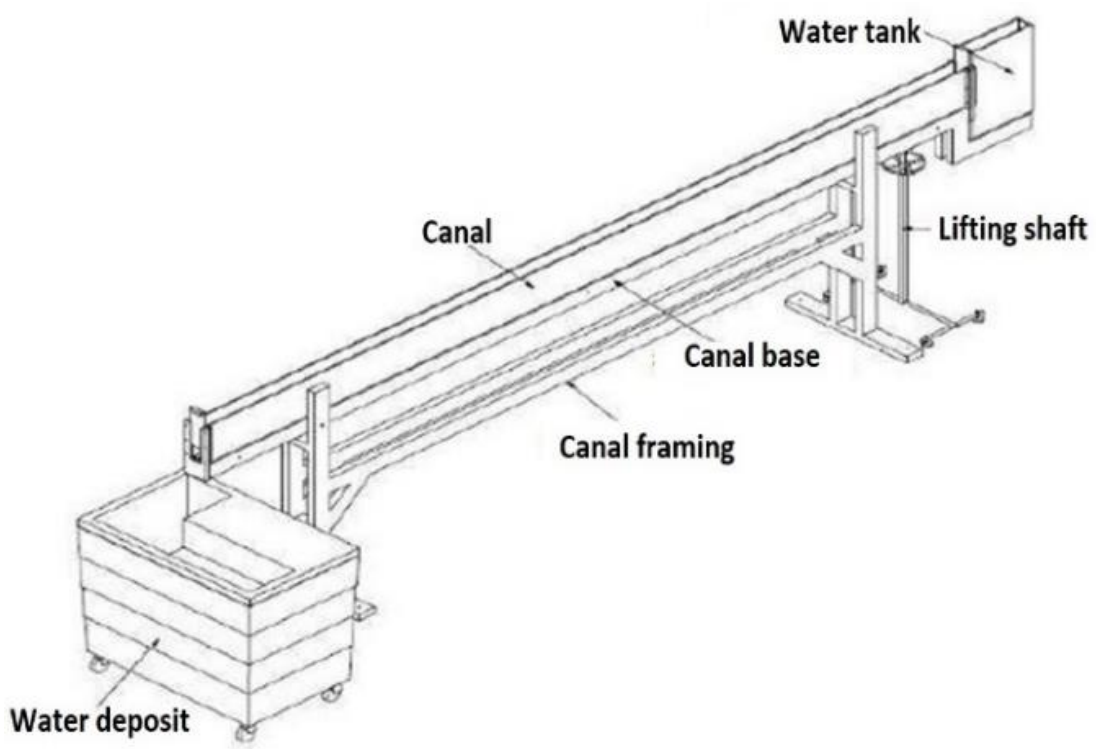
Sediment drag

Water flow

Waves

Introduction

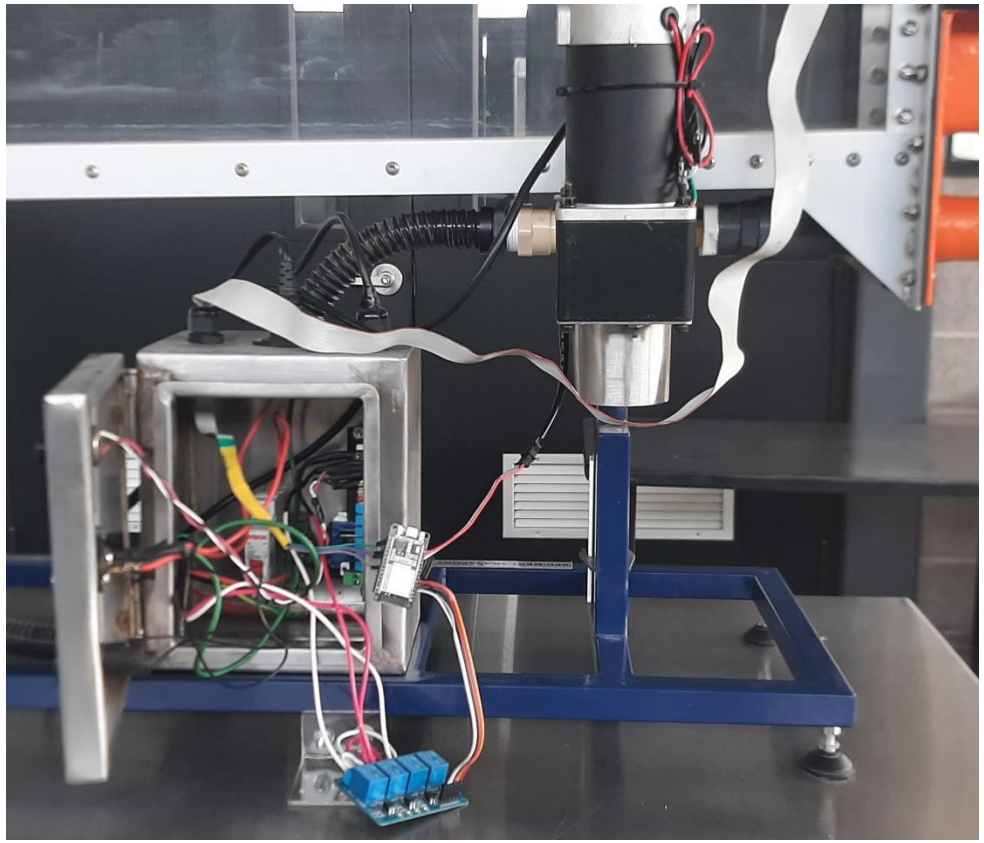
Configuration of a didactic basic canal



Parts of a testbench

Introduction

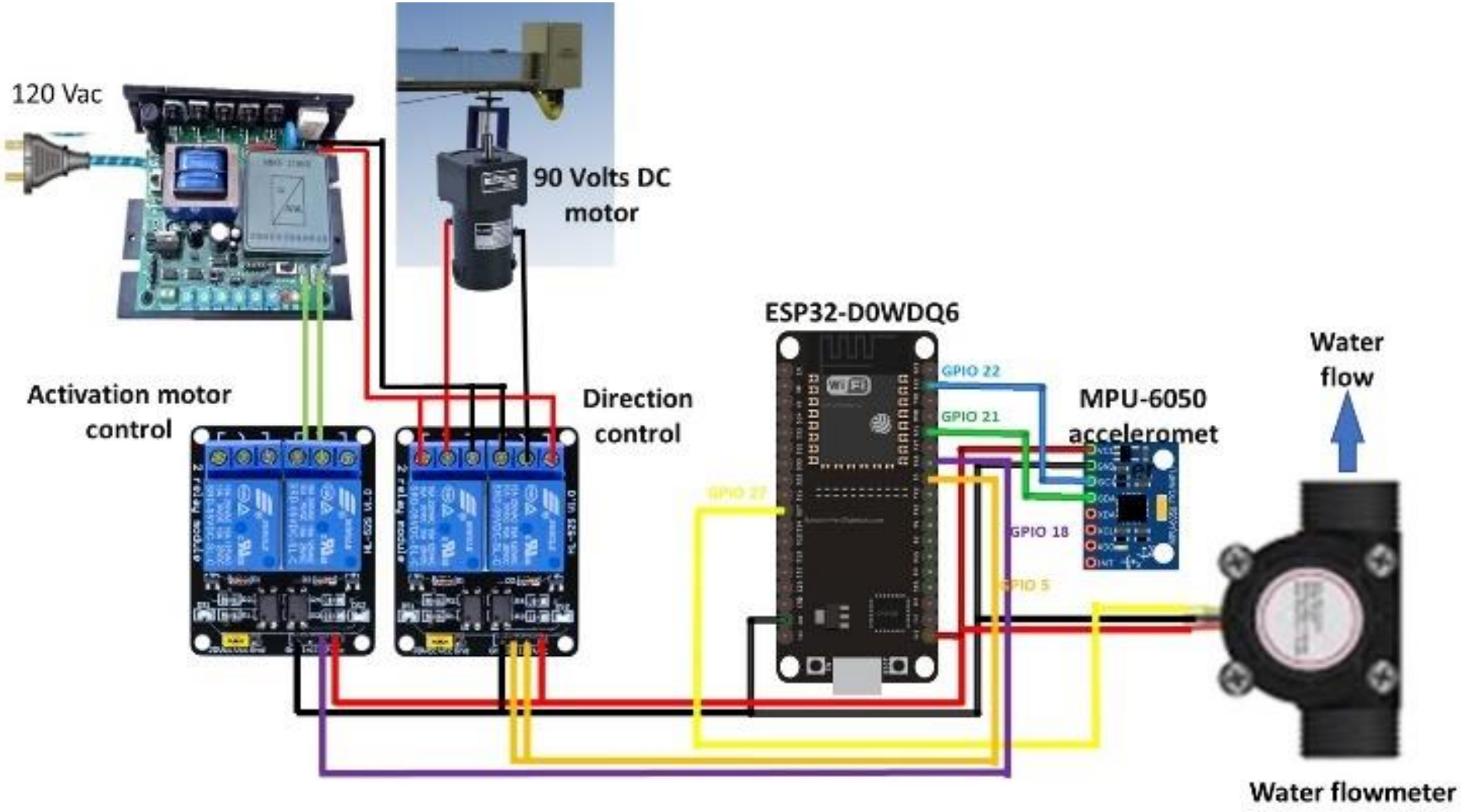
Manual mechanism for slope adjustment



Control system and motor connected to the adjustment screw

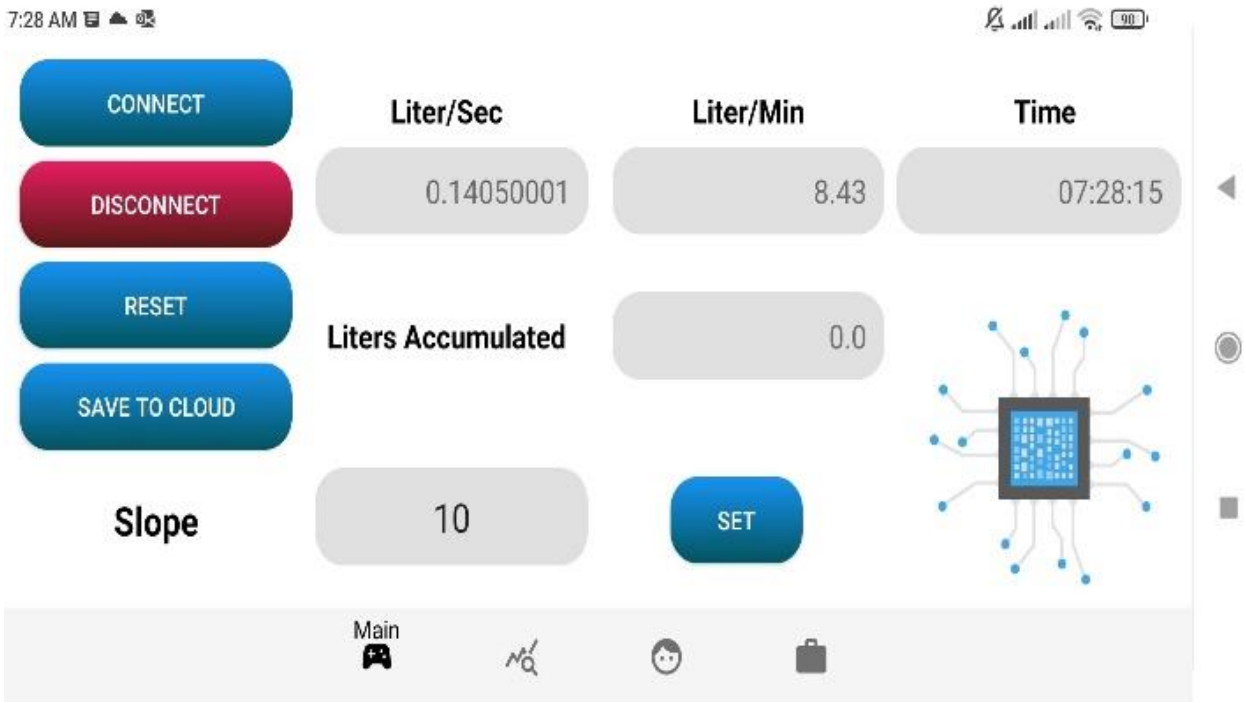
Methodology

Developed system



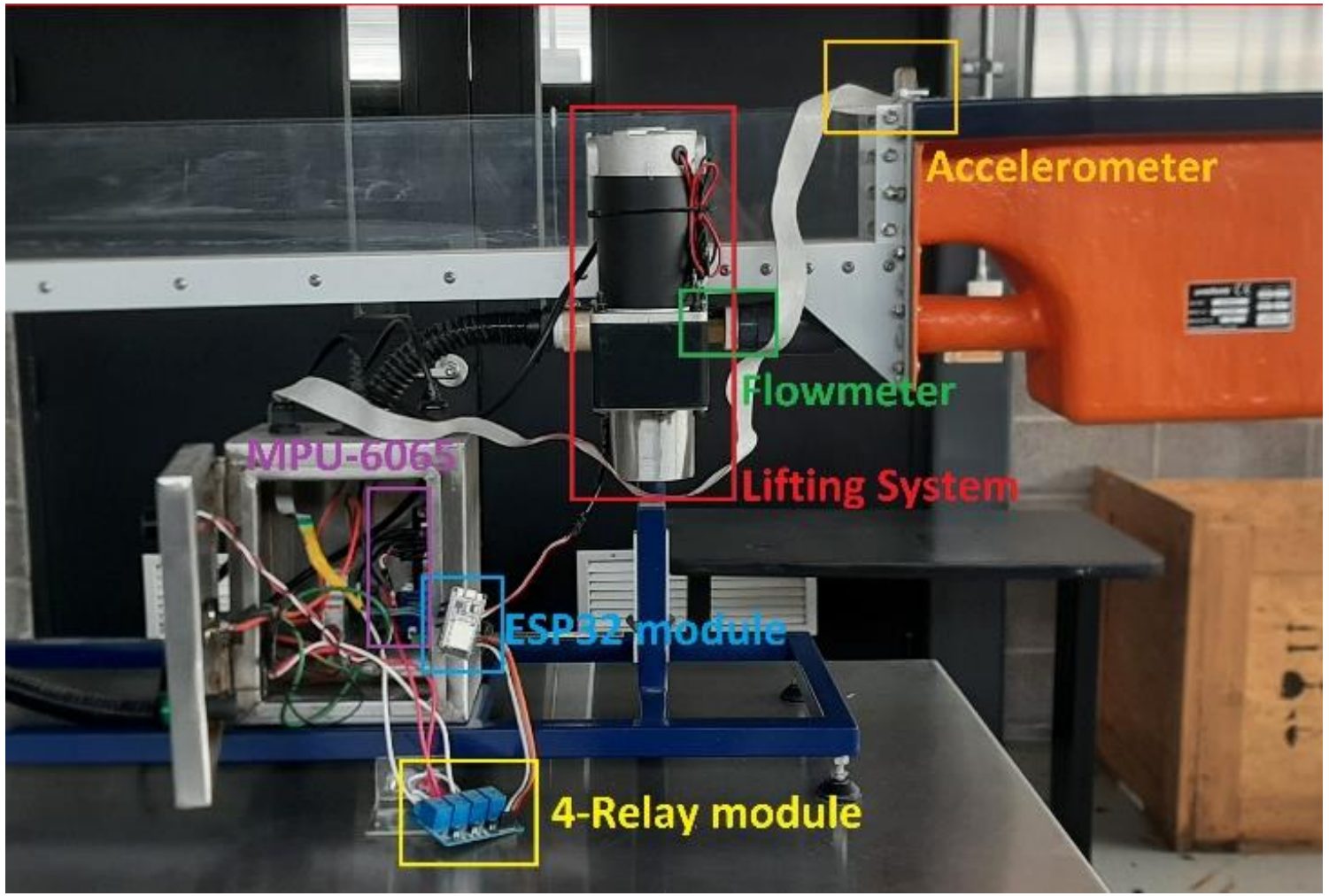
Methodology

App for mobile devises to control the new system



Results

Stages of the system



Results

The slope position control has an accuracy of 98% compared to the plastic scale glued on the metallic structure.

The water flow measurement helps to corroborate the water flow estimated by students with a high precision sensor, so students compare they estimation.

The water flow can be saved even per weeks on a cloud data base.

Conclusions

The proposed modifications present:

A good alternative to update and automate a basic configuration testbench canal at a low cost.

The slope can easily be selected, and the water flow can be measured as well, besides the amount of water passing through the canal in liters is saved in real time in a cloud data base.

The main board can be replaced for a bigger one according to necessities, due to the modularity of the system.

A future work on the system update is to control the water pump to move more water into the tank and increase water speed.

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