

Declaration of authorship

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I declare that this piece of work which is the basis for recognition of achieving learning outcomes in the (Microprocessor Systems) EMISY course was completed on my own

EMISY Project 21 Portable Compass

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1 Analysis of the project

1.1 Discussion of project requirements

We need to create a simple portable compass circuit
It should:

- Use energy-saving power modes of microcontroller
- Be battery powered
- Be portable (cellphone/wrist watch)
- Communicate using graphical OLED display and two buttons keyboard

1.2 Discussion of solution

2 Detailed circuit diagram

3 Diagram

3.1 Diagram itself

3.2 Diagram description

3.2.1 How to make the project

3.2.2 Microcontroller

I decided to use STM32L082CZ from STM32L0 line

Relatively small Up to $10\text{ mm} \times 10\text{ mm}$ dimensions, compared to apple watch display of 34 mm by 40 mm for smaller version. [1] 111th page

Square It is shaped in a square which also simplifies portability [1] 111th page

Power saving STM32L0 line was designed specifically for low power consumption with power consumption as low as 0.29 A in Standby mode [1] 1st page

Consumer devices This microcontroller comes from STM32LOx2 line prepared to be used in consumer devices [2]

Ease of use USB compatible microcontroller and dedicated debug port allows for swift code creation. [1] 1st page

3.2.3 All other components

4 Draft of the microcontroller firmware

4.1 Block diagram

4.2 Description of the algorithm

References

[1] STM32L082CZ datasheet

[2] Consumer Device STM32LOx2 Line