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Embedded Programming Project

Ventilation System

Helsinki Metropolia University of Applied Sciences

Bachelor Degree

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# Introduction

Ventilation system is one of the most important things in big building. Its duty is to maintain the ideal atmosphere by controlling air temperature and humidity as administration settings. As a project of our second year, we have to control a ventilation system located in Metropolia (Espoo Campus) by LPCXpresso 1549 with Modbus.

This project, as schedule, will take approximately 2 months to complete and delivery to the customer.

# General description

## Controlling system

In order to control our ventilation system, we used LPCXpresso 1549 evaluation board, which works with the same IDE name.

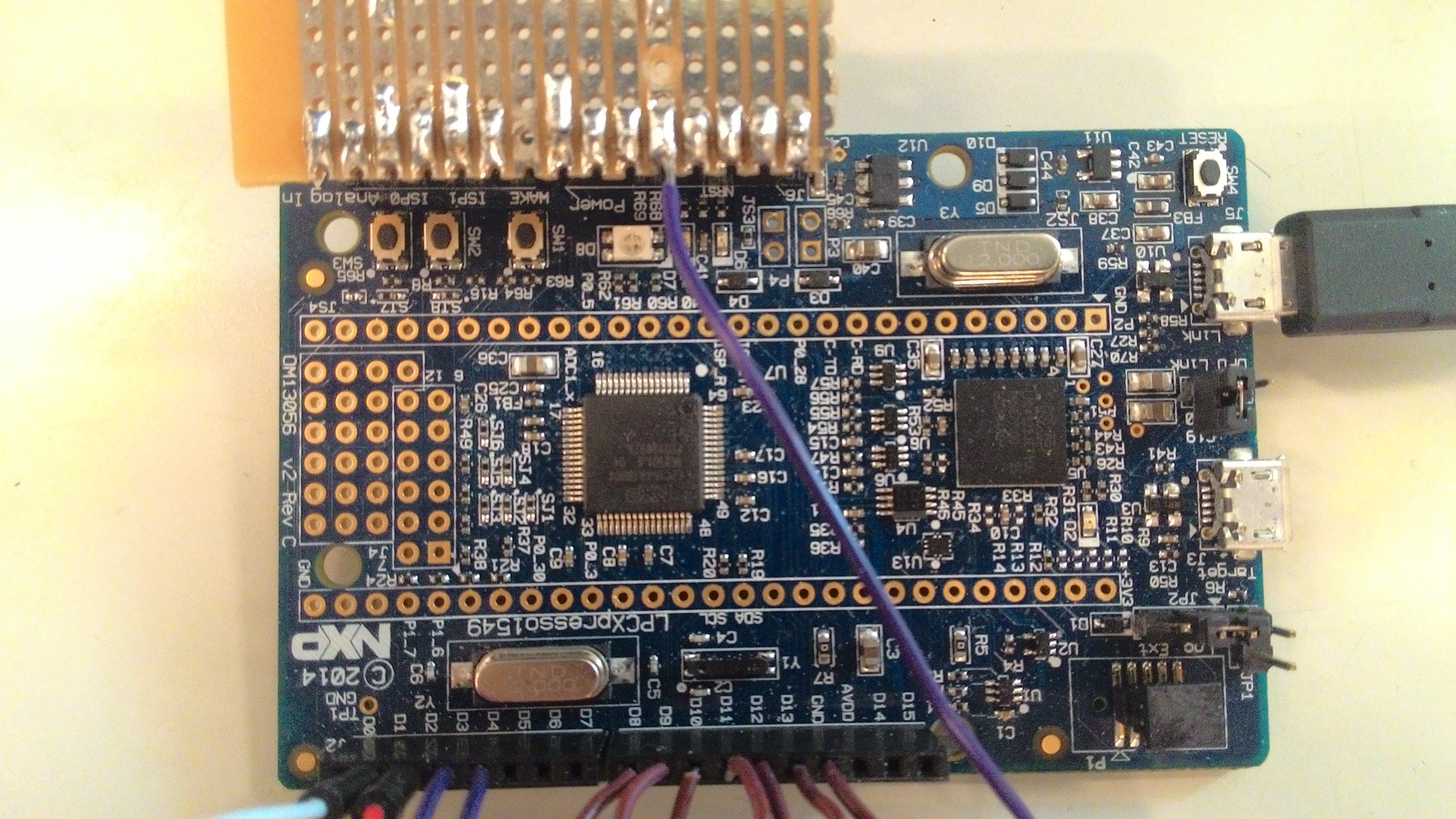


Figure 1. LPCXpresso 1549 evaluation board.

This board uses 32–bit ARM Cortex-M3 microcontroller.

## Sensor

### Pressure Sensor

Add information about pressure sensor

Figure 2. Pressure sensor

Table 1. Pressure Sensor specification

|  |  |
| --- | --- |
| Field of study | Studies completed, ECTS |
| Culture | 131 |
| Technology, Communication and Transport | 552 |
| Health Care and Social Services | 175 |
| Business and Administration | 52 |
| Not bound to a field of study | 18 |
| Metropolia total | 928 |

There must always be text between a figure or table and a new figure or table or a new heading.

### Temperature Sensor

Add information about Temperature sensor

Figure 3. Temperature sensor

Table 12 Temperature Sensor specification

|  |  |
| --- | --- |
| Field of study | Studies completed, ECTS |
| Culture | 131 |
| Technology, Communication and Transport | 552 |
| Health Care and Social Services | 175 |
| Business and Administration | 52 |
| Not bound to a field of study | 18 |
| Metropolia total | 928 |

There must always be text between a figure or table and a new figure or table or a new heading.

### CO2 Sensor

Add information about CO2 sensor

Figure 3. CO2 sensor

Table 12 CO2 Sensor specification

|  |  |
| --- | --- |
| Field of study | Studies completed, ECTS |
| Culture | 131 |
| Technology, Communication and Transport | 552 |
| Health Care and Social Services | 175 |
| Business and Administration | 52 |
| Not bound to a field of study | 18 |
| Metropolia total | 928 |

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## LED Screen and buttons

In order to make the controlling and setting friendly, we ended up with 4 buttons and 1 LCD

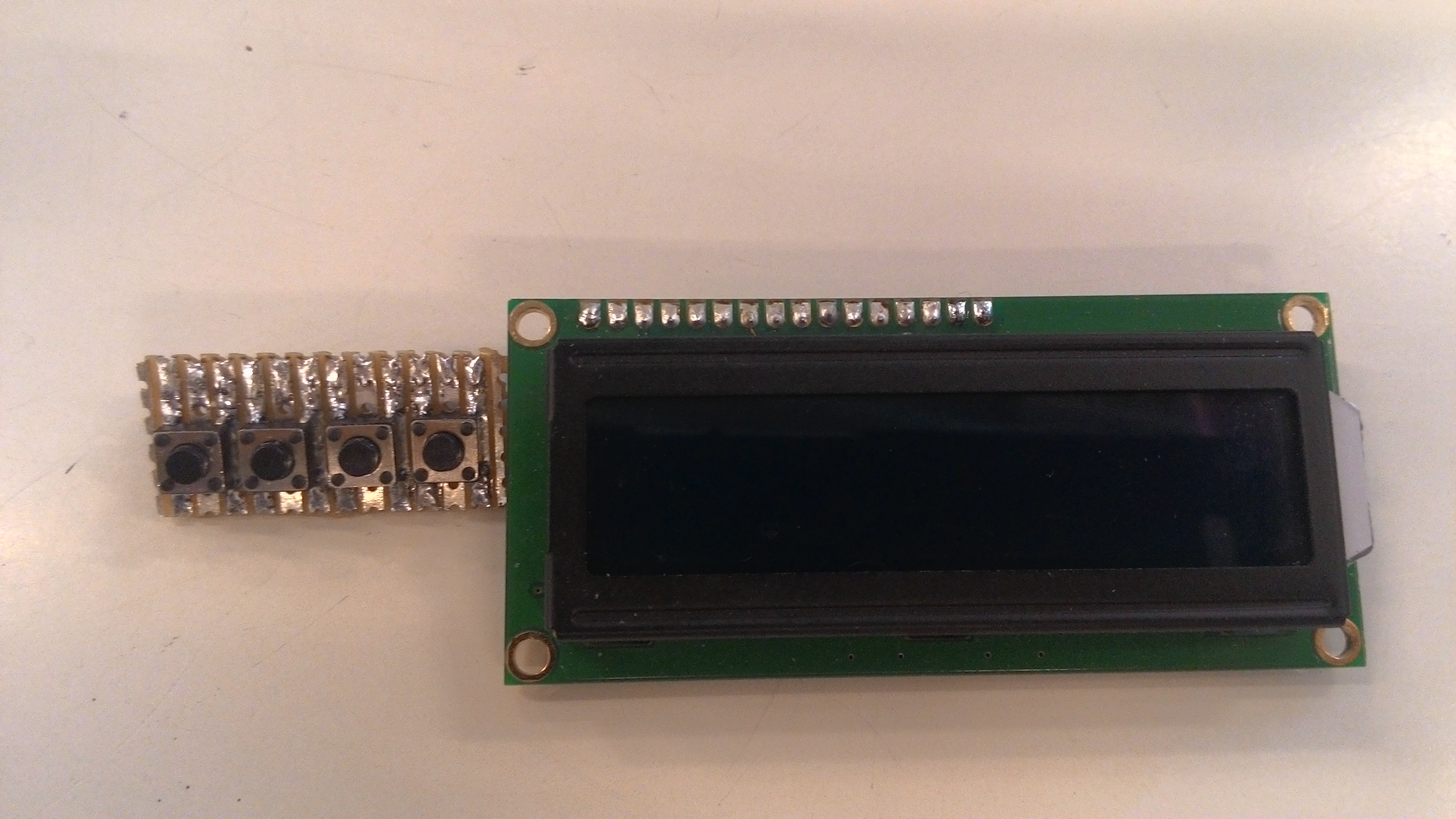


Figure 5. LED Screen and buttons.

This is a 16 characters wide and 2 rows LCD, with white text on blue background. There order of 4 buttons are: up, down, enter and exit (respectively).

## Implementation

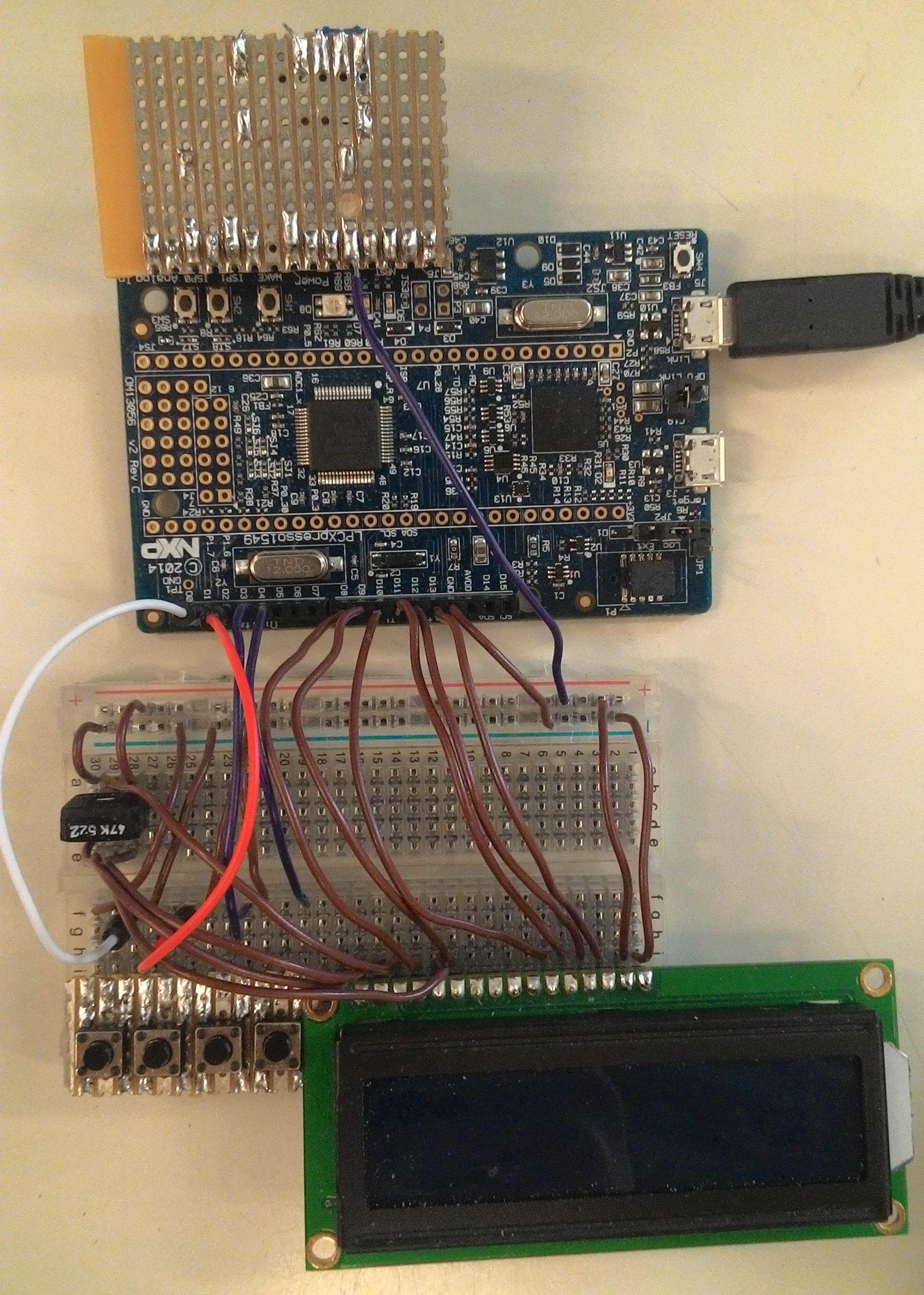


Figure 6. Implementation

As shown in the picture, we also use a trimmer to control the contrast of the LCD.

# Principle architecture

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# Instruction

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# References

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