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## ABB Modbus Project

Metropolia University of Applied Sciences

Embedded Systems Programming TX00CI61-3010

Project Documentation

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## Abstract

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This project aims at creating a ventilation fan controlled via Modbus protocol with its own LCD user interface. It can also be controlled via web interface.

The fan supports both an automatic and a manual mode.

In automatic mode, the pressure level in the ventilation duct is set to 120pa; the controller measures this pressure and adjusts the fan speed accordingly.

In manual mode, the fan speed can be adjusted in the UI.

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## 1 User Manual

Web Interface:

- In Manual Mode, the fan speed can be adjusted by the slider.
- For Automatic mode, the fan will adjust the speed to the target pressure that is input by the user.

Due to unforeseen errors and time constraints, mqtt has not been implemented in the interface, hence the website is not fully functional.

Button functionality:

- SW2 changes the mode. Available modes are: Automatic and Manual.
- SW1 increases the target value.
- SW2 Decreases the target value.

Automatic mode:

The user provides a target pressure value which is automatically achieved by the system. The mode of operation is displayed as AUTOMATIC. Target pressure range is between 0 and 120pa. If the system does not reach the target pressure within 10 seconds, it produces an error message – which can be cleared by pressing any of the buttons.

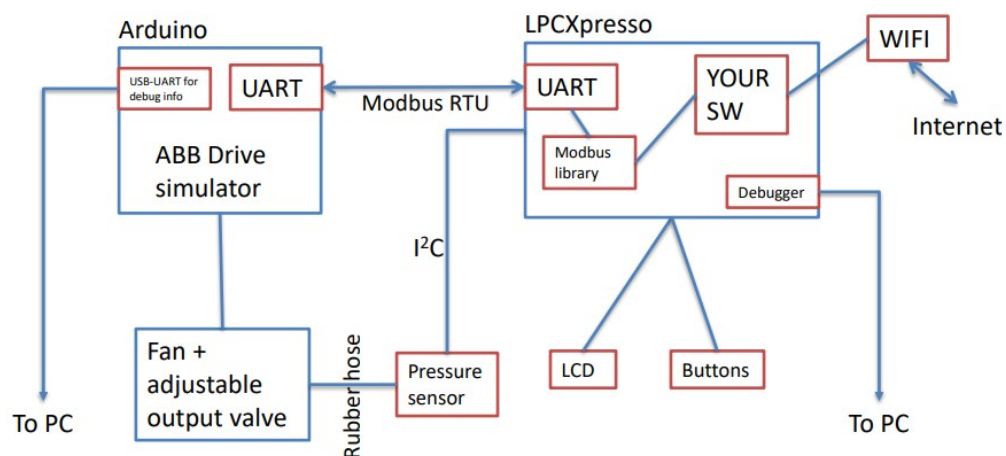
Manual mode:

The user provides the fan speed based on the desired pressure. The mode of operation is displayed as MANUAL. Fan speed ranges from 0-100, with 0 being OFF and 100 being the highest possible speed that can be achieved by the fan.

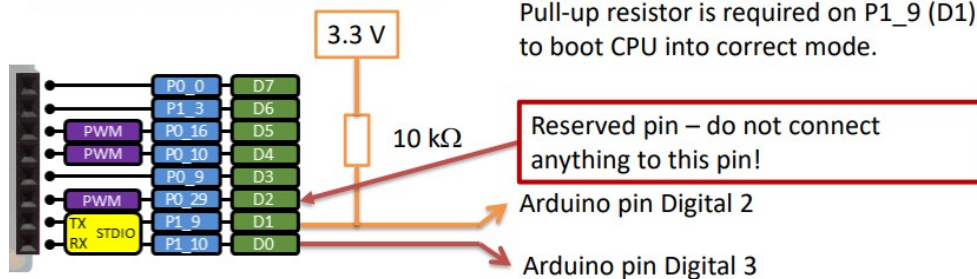
## 2 Wiring and System Diagrams

The wiring and system diagrams followed the diagrams below:

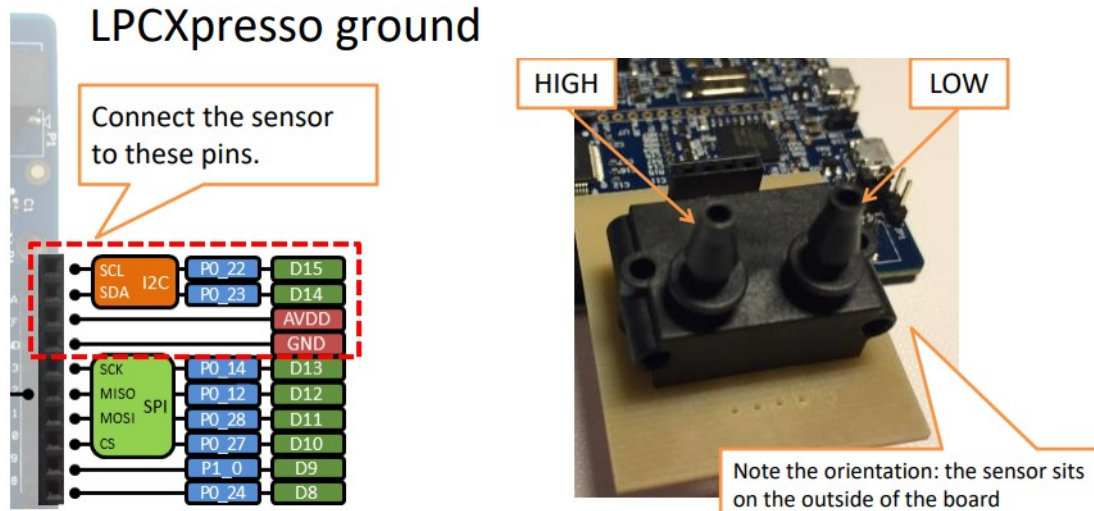
ABB drive is controlled by reading/writing Modbus registers.  
Modbus register is a "variable" that can be accessed using Modbus protocol.

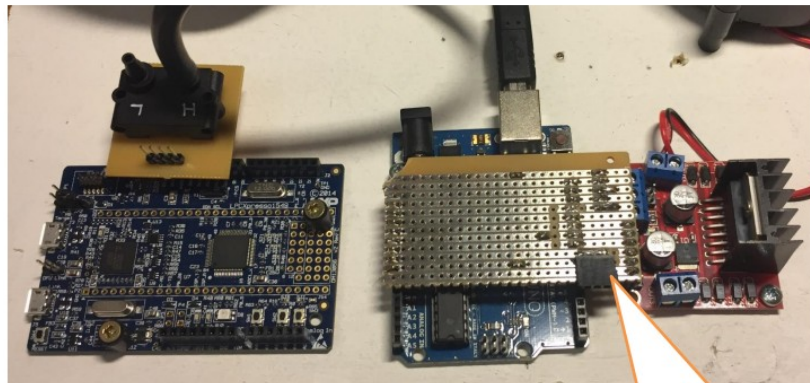


This is for connecting LPCXpresso to frequency converter simulator



Connect a wire from Arduino ground to LPCXpresso ground

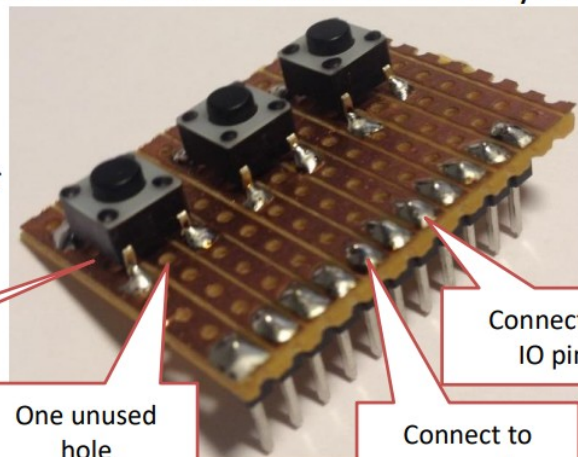




Arduino ground is available in this connector.  
Connect Arduino ground to LPC1114 Expresso ground!

The buttons are soldered to a piece of strip board (vero board). Pay attention to the orientation of the buttons. Incorrectly oriented button will create a short circuit and your button will not work.

Wire all three buttons in same fashion (one side to ground the other to IO pin)



Two unused holes

One unused hole

Connect to IO pin

Connect to ground