Final Project Report on

Ultrasonic sensor to measure distances

MIS NO: 121942004

Branch: Information Security

Report submitted by:

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I. Features:

1. Ability to detect the presence or absence of an object in front of the sensor.
2. Is accurate up to 4mm (error margin is 4mm) and can detect objects as far as 5m.
3. On-device LCD for testing.
4. Readings sent over a serial communication channel as input to other devices.
5. Readings are sent only when changes are detected.
6. Works under dusty, smoky and similar conditions.
7. Contactless operation. Works with moving objects.
8. Works with variety of objects regardless of shape, color, transparency or surface texture.

II. Block diagram:

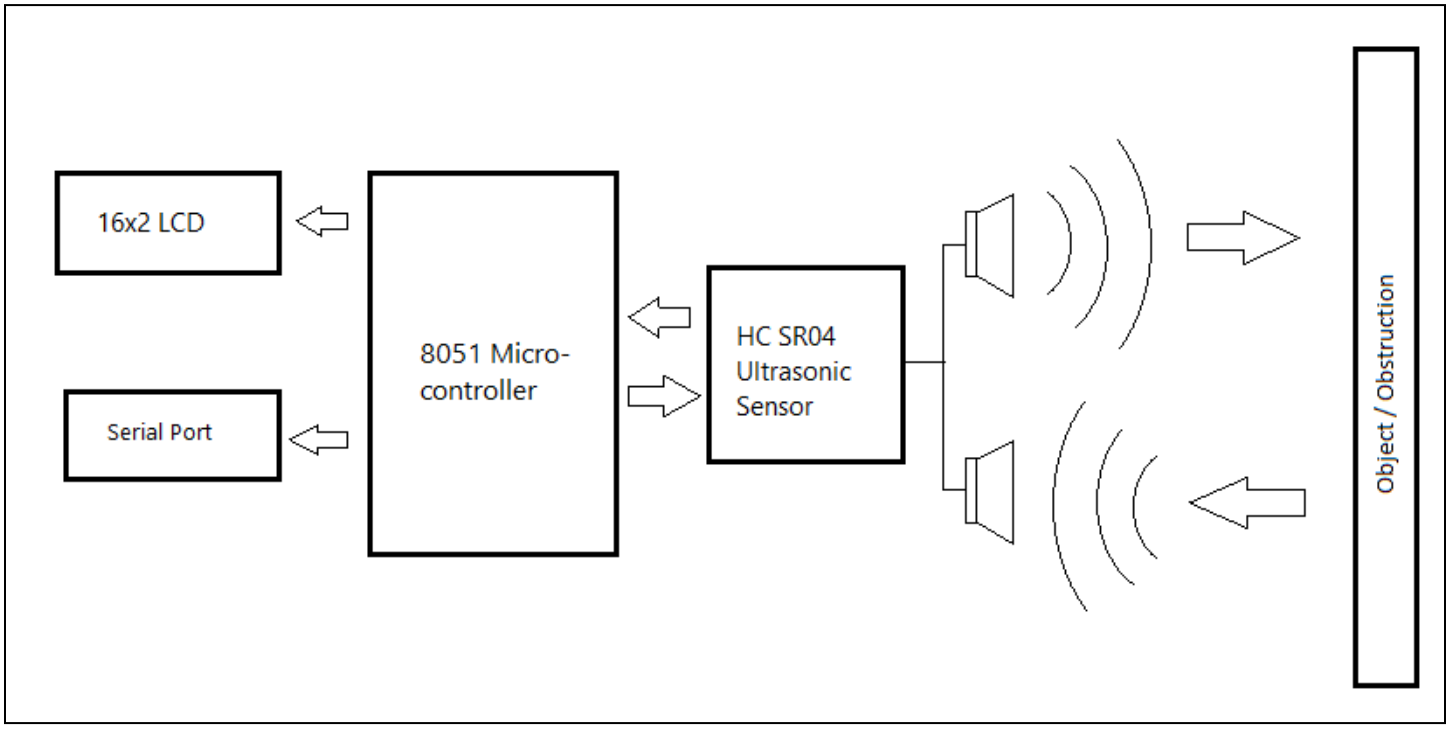
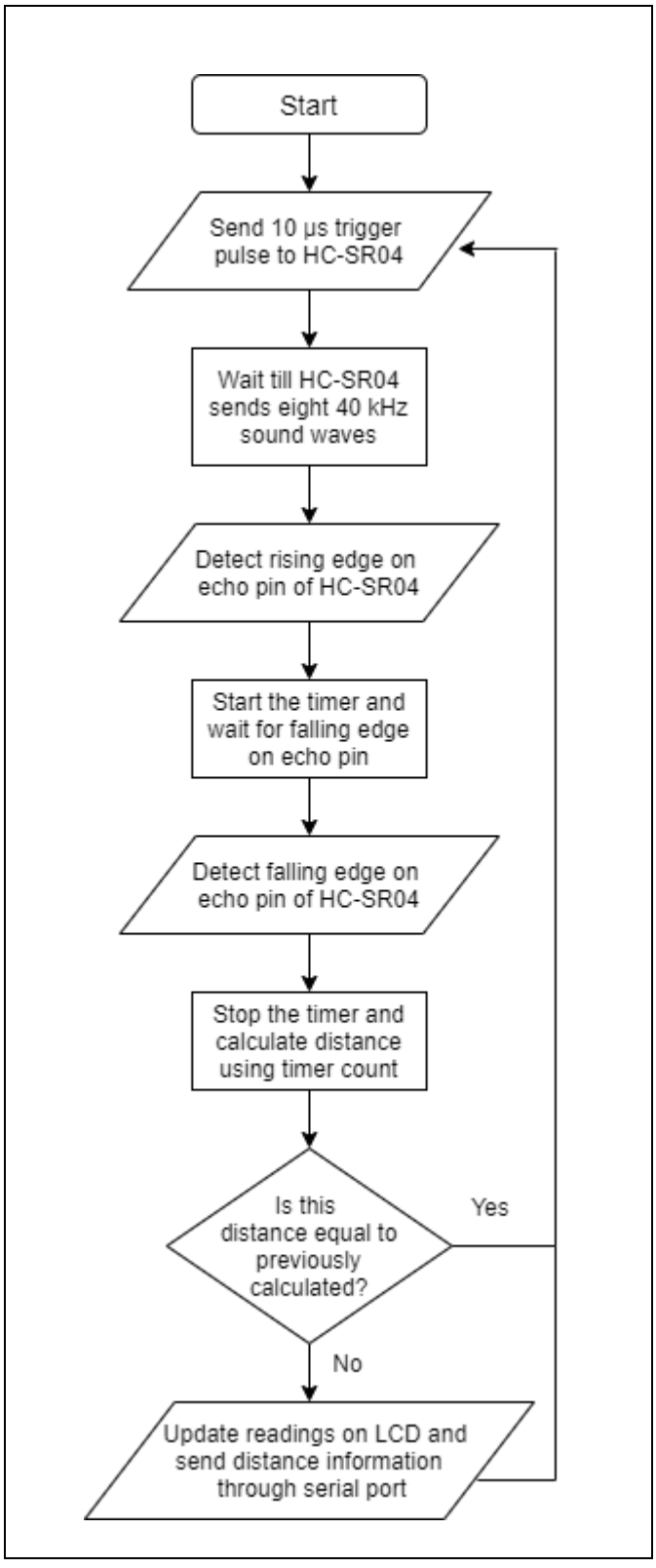


Fig 1: Block diagram of ultrasonic distance measurement system

The middle-piece of this system is the 8051 microcontroller. It operates the HC-SR04. This sensor is controlled sending pulses to it and receiving pulses from it. Distance is computed by microcontroller and sent to LCD and other devices by serial communication.

III. Flowchart:



IV. Working:

Detailed working of HC-SR04 is covered in technical report. The microcontroller receives a high signal and then a low signal by this sensor. The time difference between these signals is used to compute the distance. Accordingly, LCD is updated as well as readings are sent serially to other devices.