KY_035 HALL MAGNETIC SENSOR

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1.Abstract

The project focuses on the integration and interaction between the Rugged Board A5D2x and the KY-035 sensor. The Rugged Board A5D2x serves as the central processing unit, providing a robust and versatile platform, while the KY-035 sensor is employed to capture environmental data, specifically designed to detect magnetic fields.

The aim of this project is to establish a seamless communication channel between the Rugged Board A5D2x and the KY-035 sensor, allowing the board to receive and interpret sensor data. The interfacing process involves understanding the hardware requirements, configuring the necessary connections, and implementing the software logic to acquire and process information from the KY-035 sensor.

2.Hardware Components

i. KY-035 Hall Magnetic Sensor.

ii. Rugged Board-a5d2x.

KY-035 Hall Magnetic Sensor

The KY-035 is a Hall magnetic sensor module that can be used to detect the presence of magnetic fields. Here is some basic information about the KY-035 analog Hall magnetic sensor:

- The sensor consists of a Hall Effect sensor and a comparator.
- When a magnetic field is present, the Hall sensor produces a voltage proportional to the magnetic flux density.
- The detection range of the KY-035 sensor depends on the strength of the applied magnetic field.
- The module provides an analog output that varies with the strength of the magnetic field. The analog signal can be read by an analog-to-digital converter (ADC) on a microcontroller.
- The module typically operates on a low voltage (e.g., 3.3V or 5V) and consumes a small amount of current.

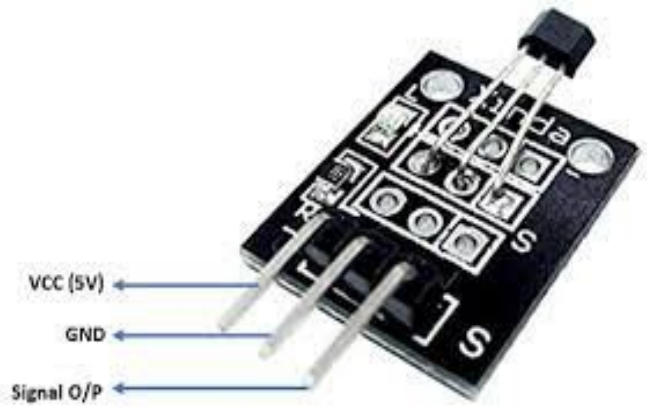


Fig: KY_035 Hall magnetic sensor

Rugged Board-a5d2x

Rugged Board is an Open Source Hardware & Software initiative to align with the fast growing Semiconductor technologies with a switch from classic to modern product development strategy & process. The usage of System on Module over a System on Chip is the rapid way to achieve time to market, curtail development risks for product quantities ranging from few to thousands.Rugged Board team targets to combine the Open source (Carrier Boards) community strength with industrial grade some and initiated the first Open Source Hardware "Industrial Pico Computer" which is powered by phyCORE-A5D2 SOM with Microchip A5D2x Cortex-A5 Core @500 Mhz.

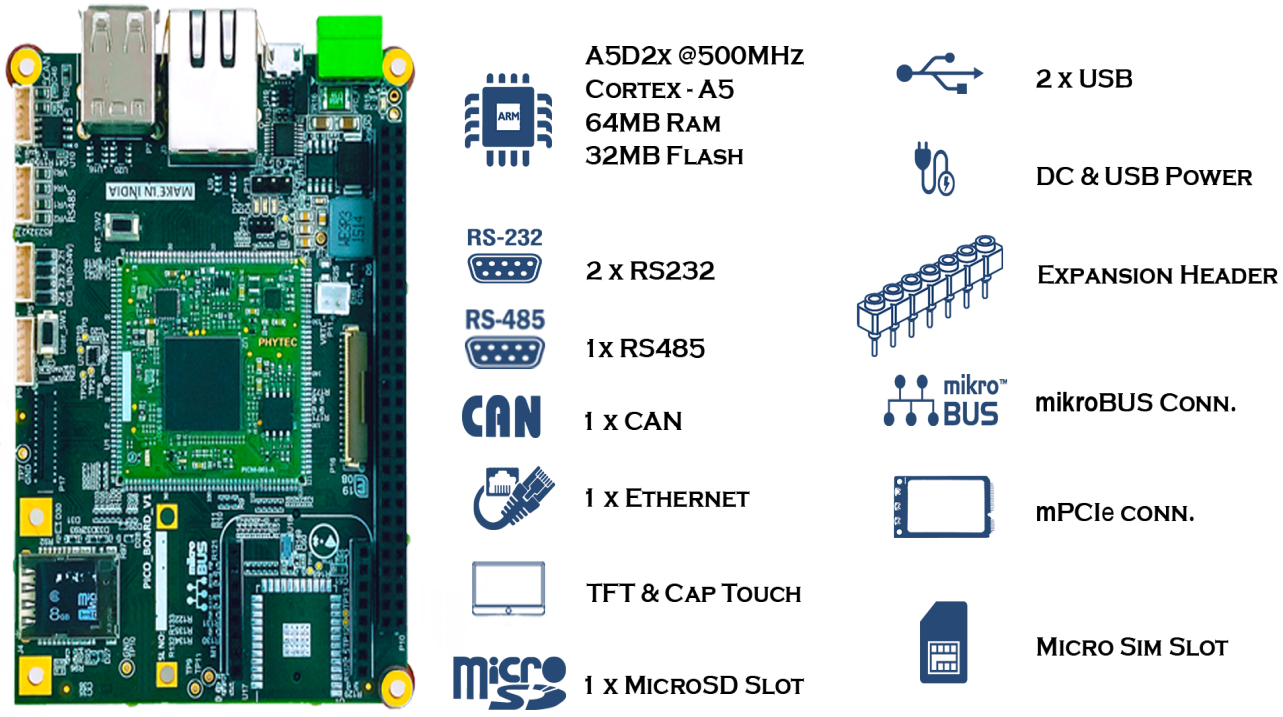


Fig:Rugged board

3.Source Code

```
#include <stdio.h>
#include <stdlib.h>
#include <stdint.h>
#include <unistd.h>
#define ANALOG_PIN_PATH "/sys/class/gpio/PD25/value"

// Function to read analog sensor value
uint16_t readSensor() {
    FILE *fp;
    uint16_t sensorValue;

    // Open the file for reading
    fp = fopen(ANALOG_PIN_PATH, "r");
    if (fp == NULL) {
        perror("Error opening input file");
        exit(EXIT_FAILURE);
    }

    // Read the analog sensor value
    if (fscanf(fp, "%hu", &sensorValue) != 1) {
        perror("Error reading sensor value");
        fclose(fp);
        exit(EXIT_FAILURE);
    }
```

```
    // Close the file
    fclose(fp);

    return sensorValue;
}

int main() {
  while (1) {
        uint16_t sensorValue = readSensor();
        printf("Sensor Value: %u\n", sensorValue);
        if(sensorValue)
        {
              printf("Magnet not detected\n");
        }
        else
        {
              printf("Magnet detected\n");
        }

        usleep(1000000); // 1 second delay
    }

    return 0;
}
```

USING MRAA LIBRARY

```
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <mraa.h>

#define GPIO_PIN 73
void error(const char *msg) {
    fprintf(stderr, "%s\n", msg);
    exit(1);
}
int read_Value(mraa_gpio_context gpio) {
    return mraa_gpio_read(gpio);
}

int main() {
    mraa_result_t status = MRAA_SUCCESS;
    mraa_gpio_context gpio;
    mraa_init();
    gpio = mraa_gpio_init(GPIO_PIN);
    if (gpio == NULL) {
        error("Error initializing GPIO pin");
    }
    status = mraa_gpio_dir(gpio, MRAA_GPIO_IN);
    if (status != MRAA_SUCCESS) {
        error("Error setting direction for GPIO pin");
```

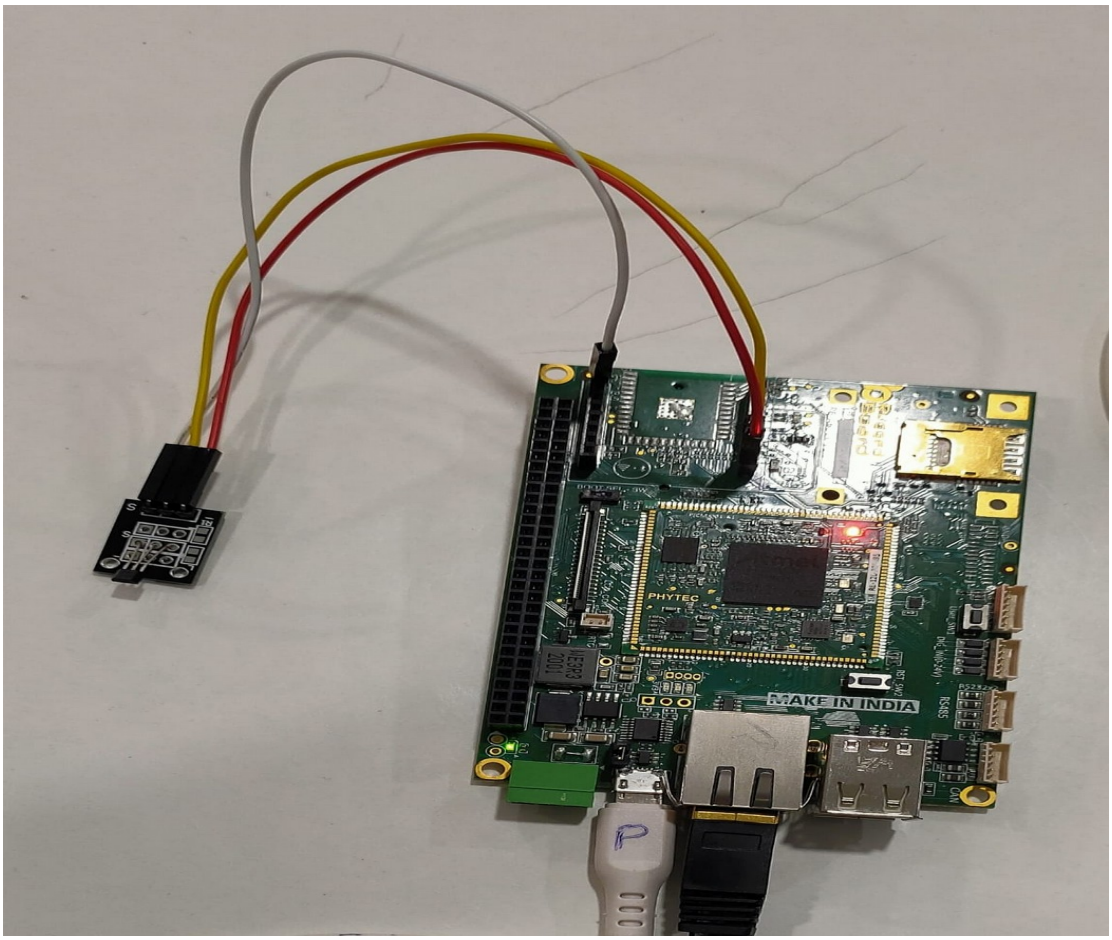
```
    }

    while (1) {
        int sensor_value= read_Value(gpio);
         if (sensor_value) {
            printf("Magnet is detected. sensor value: 1\n");
        } else {
            printf("Magnet is not detected. sensor value: 0\n");
        }
        sleep(1);  // Sleep for 1 second between readings
    }
    mraa_gpio_close(gpio);
  return 0;
}
```

4.Pin Configurations

- Connect the VCC of sensor to the 5V of Rugged board in micro bus.
- Connect the GND of sensor to the GND of Rugged board.
- Connect signal pin of sensor to analog pin of Rugged board in micro bus.

5.Connections



6.Conclusion

The project commenced with a thorough exploration of both the Rugged Board A5D2x and the KY-035 sensor.In the pursuit of interfacing the Rugged Board A5D2x with the KY-035 sensor, this project has successfully achieved a harmonious integration between a robust processing unit and a specialized magnetic field sensor.