User's Manual

SmartElex RLS05

5 Array Line follower Sensor

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1. INTRODUCTION AND OVERVIEW

SmartElex RLS05 is Line follower sensor module used to detect the Line. SmartElex RLS05 consists of 5 array TCRT5000 IR transmitter and IR receiver pairs.

Line follower Robot is a machine which follows a line, either a black line or white line. Basically there are two types of line follower robots: one is black line follower which follows black line and second is white line follower which follows white line. Line follower actually senses the line and run over it.

Concept of working of line follower is related to light. We use here the behavior of light at black and white surface. When light fall on a white surface it is almost full reflected and in case of black surface light is completely absorbed. This behavior of light is used in building a line follower robot.

SmartElex RLS05 have 5 analog and digital outputs to user indicating the presence of the line. The user can use both analog and/or digital signal. Each Sensor has its own LED as indication of line detection. Each sensor on SmartElex RLS05 is independent of each other.

SmartElex RLS05 has a manual calibration button. The calibration button is multifunctional. SmartElex RLS05 also have SPI and Serial communication Pins. By this communication protocol we can get the data of IR output values.

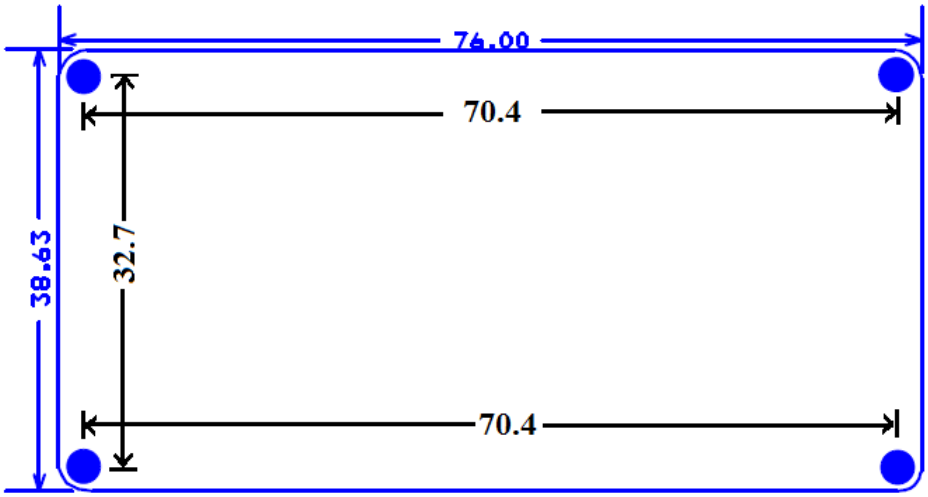
2. Packing List

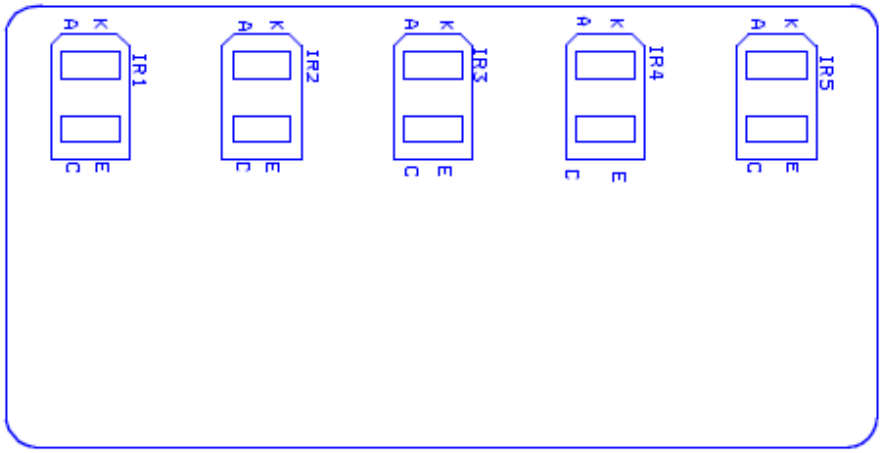
1) SmartElex RLS05 module.
2) Three Relimate Connectors MALE-FEMALE with connecting wire

3. Specification and Features.

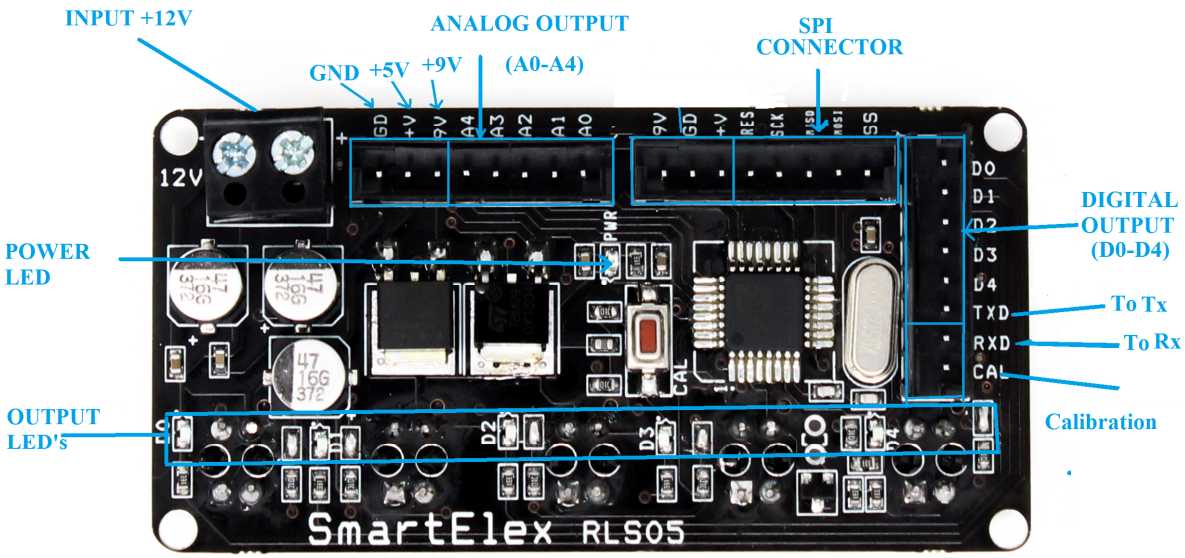
1. Operating Range :- (9V– 12V).
2. 5 Analog and 5 Digital Output signals with Respective LED.
3. Each IR have indicating LED (D1-D5).
4. Optimal sensing distance: 0.125″ (3 mm).
5. Available 5V and Ground pin.
6. Available SPI and Serial communication Pins.

4. Dimensions





5. PRODUCT LAYOUT



TCRT 5000 IR
SENSOR

1) Input 9-12V Power supply. Please check Polarity has given bottom side of PCB.

2) Five Analog Output signal (A0-A4).Pinouts {GND, 5V, 9V, A4-A0}.

3) SPI Connector. You can get Digital output values via SPI Connector. You need to program SPI slave to read the values. Pinouts {9V, GND, 5V, RESET, SCK, MISO, MOSI, SS}.

4) Digital Output signal (D0-D4). Serial communication Tx - Rx pins. SmartElex RLS05 also provide serial data via Tx - Rx pins. Pinouts {D0-D4, Tx, Rx, CAL.}.

5) Digital Output LED's. (D0-D4).

6) Power LED. It glows when we power up to the SmartElex RLS05 Module.

7) Calibration Button. Used to calibrate each and every sensors values. By pressing calibration Button SmartElex RLS05 enter into the calibration mode.

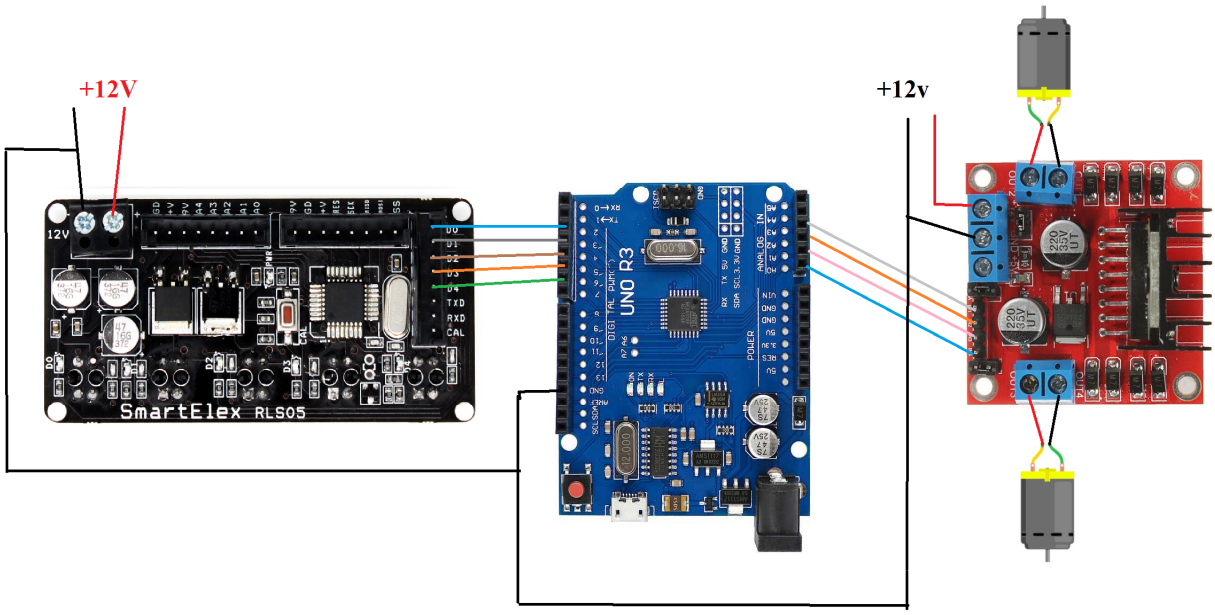
8) 5 Array of TCRT5000 IR sensor.

6. HOW TO CALIBRATE?

RLS05 need to be calibrated to save the black and white value of the surface that it will do the line follow. SmartElex RLS05 save values in EEPROM. Hence, only one time calibration is needed for the same surface and line.

Step 1	**Entering into Calibration Mode :-** To calibrate RSLS05, simply press the calibration button once or pulling down the Cal. for few milliseconds. Three LED's (D0-D2-D4) turns ON means it entered in calibration mode.
Step 2	**White surface reading :-** Here you have to place RLS05 Module on white surface to read the values. By pressing calibration button one more time, two led turn ON (D3-D4) means it read and saved the white surface data in EEPROM.
Step 3	**Black surface Reading :-** Now it ready to read black surface value, so you have place module on black surface. Press the calibration button one more time three led turns ON (D2-D3-D4) to indicate that it read and saved black surface value.
Step 4	**Selection of White or Black line Tracing:-** Now you have to decide whether SmartElex RLS05 follows the black line follower or white line follower. To enter into the white line follower you need to press calibration three time's within second. When you pressed here calibration thrice within second three led blinks (D2-D3-D4) for few times to indicate that module ready for white line follower. For black line follower you need to press calibration button two time which will enter into the black line follower. It indicated by three led blinks (D0-D1-D2) for few times.

7. SmartElex RLS05 Interfacing with Arduino UNO :-



8. Warranty

1. Standard warranty of product is 6 months.
2. Warranty only applies to manufacturing defect.
3. No warranty will apply if the Product has been subject to misuse, static discharge, neglect, accident, modification, or has been soldered or altered in any way.