Slide1: Introduction

Hello everyone, this is a video tutorial on interfacing RFID reader Module on FireBird V robot.

Slide 2: Agenda for discussion

We will be discussing on what exactly is RFID, the need for RFID and its recent applications

We will also be discussing on the working principle of RFID.

Most importantly let us learn how to interface RFID to FBV by looking into its pin and Circuit diagram.

Let us also see how the output of the RFID module can be seen on the Serial Terminal. And its necessary requirements.

Finally, lets see the basic interfacing c code for ATmega2560 and a small video at the end demonstrating a small application using RFID midule.

Slide 3:

First of all let us ask ourselves what is an RFID??

RFID means, Radio Frequency Identification. It is a module which transfers that data to the microcontroller which is wirelessly read from a passive RFID Tag.

This feature that helps in identifying various objects attached to these passive tags.

One feature that distinguishes RFID with a bar code is, these tags are available as active or passive tags. The active tags have a small memory embedded in them and hence data can be both read and written to it as well.

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Let us see some of the features of EM-18 RFID reader module.

* EM-18 operates on $+5V$ power supply.
* Read frequency of the reader is 125kHz
* maximum read range is 10 cm
* The serial transmission rate is 9600bps, TTL and RS232 output

Now let us look into the Pin details of EM-18 RFID reader module

* Pin 1 and 2: These are supply and ground pins
* Pin 3: The Beep pin is the output pin which provides series of pulses which could be connected to an led or a buzzer for the read indication
* Pin 4 and 5: These two are antenna pins which are left unconnected.
* Pin 6: SEL Pin is pulled high to get RS232 output. If the Pin is held low then data is received from DO and D1 pins.
* Pin 7: The serial output is taken from this pin in RS232 format
* Pin 8 and 9: These Data signal Pins used to output the data in 26 bit Wiegand format

Slide 5:

Now that we know the Pin details let us build a small application circuit. The figure shows the Application circuit with,

* RFID EM-18 reader module
* A Passive RFID tag
* An Led

Slide 6:

Now let us see only the necessary requirements to interface the module with FireBird V

* As shown in the figure, firstly, the VCC and GND Pins are connected.
* In order to receive the data serially at 9600bps we pull the SEL pin high
* Now the OUT pin is connected to the RX Pin of the microcontroller. This Pin is found on the 46th female connector on the expansion slot.

Slide 7:

Now that we are sure of our connections in order to check the output.

We can check the output in two ways..

1. Using the Serial Terminal Software with the help of USB to Serial converter
2. Writing the C code and checking the output on the LCD screen.

Now lets see how to see output on Serial Terminal. Follow these steps to achieve the task

* The first figure shows the USB to Serial converter
* The second figure shows the connections to be made for serial transmission
* Connect the common ground - pin of the converter
* VCC Pin of the Converter need not be connected
* The RS232 output pin is connected to RX pin of the Converter

Slide 8:

To see the output on the Serial Terminal,

* Open the serial terminal software
* Set the COM port for the device
* Set the baud rate to 9600
* Set the number of start bits, stop bits and \item parity bits
* Change the Data mode to Text

Slide 9:

This slide shows the Sample output as seen on the LCD screen of the FireBird V robot.

Here the module is displaying the Read Tag on the Second line of the LCD Display.

Slide 10:

Now let us see the necessary C Code for the RFID module to function.