

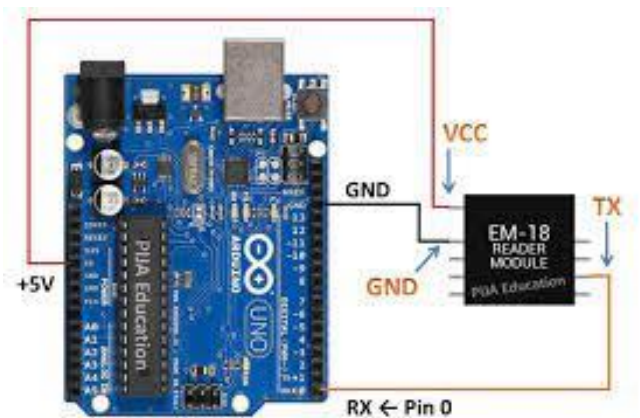
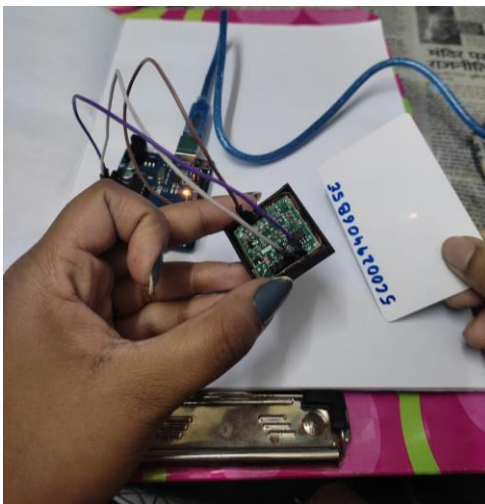
Working

The existing system would use a RFID tag placed on the road signs and the reader module placed inside vehicles. When the vehicle comes in the read range, message will be displayed inside the vehicle. This setup has a very small range, hence is unreliable for a vehicle- road sign scenario.

Our setup will place the RFID tag, reader and RF transmitter module on the road and receiver module in the vehicle. This RF communication will increase the range significantly. When the receiver which is placed inside the vehicle comes in range of the transmitter, the road sign is displayed inside the vehicle.

Our prototype can communication within a radius of 15m -18m.

1. EM 18 reader module reading the 12 digit tag id, which we have written on the card as shown. The read range was just 3cm with passive card of 125KHz and therefore placement of RF modules was a necessity.



2. After the tag id is read by the reader module, the data is given to tws-434 transmitter rf module. TWS-434 works on ASK modulator technique This is the module which gives 434 MHz of carrier frequency to the message.
3. The message is received by RWS-434 receiver rf module, wherein it demodulates the signal.
4. The output can be seen on both sides using the serial monitor.
5. The transmitter side indicates that the data is sent successfully, and receiver side shows what road sign has been detected.

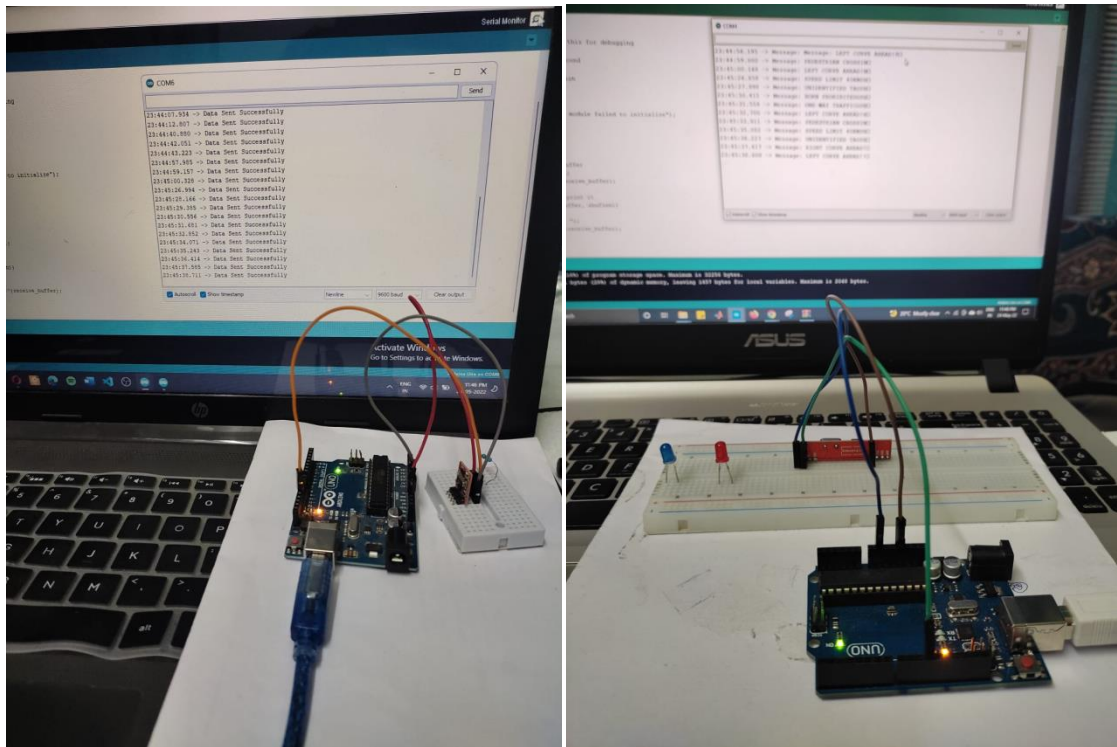


Fig: Arduino Interface with TWS & RWS respectively

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TX_NEW_NEW | Arduino 1.8.16
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TX_NEW_NEW
#include <RH_ASK.h> // Include the RH_ASK library
#include <SPI.h> // Not actually used but needed to compile the RH_ASK library

RH_ASK radio(2000, 11, 12);
#define ARRAYSIZE 5
String results[ARRAYSIZE] = { "5C0029375614", "5C0029373577", "5C0029374002", "5C00294068" };
String tag[ARRAYSIZE] = { " RIGHT CURVE AHEAD!", "LEFT CURVE AHEAD!", "PEDESTRIAN CROSSING" };

void setup()
{
    Serial.begin(9600); // Use this for debugging

    // Speed of 2000 bits per second
    // Use pin 11 for reception
    // Use pin 12 for transmission

    if (!radio.init())
    {
        Serial.println("Radio module failed to initialize");
    }
    Serial.println("TAG ID in Proximity");
    while (Serial.available() == 0) {
    }
}

char commandChar;
String serialReceived;

Sketch uses 7760 bytes (24%) of program storage space. Maximum is 32256 bytes.
Global variables use 981 bytes (47%) of dynamic memory, leaving 1067 bytes for local variables. Maximum is 2048 bytes.

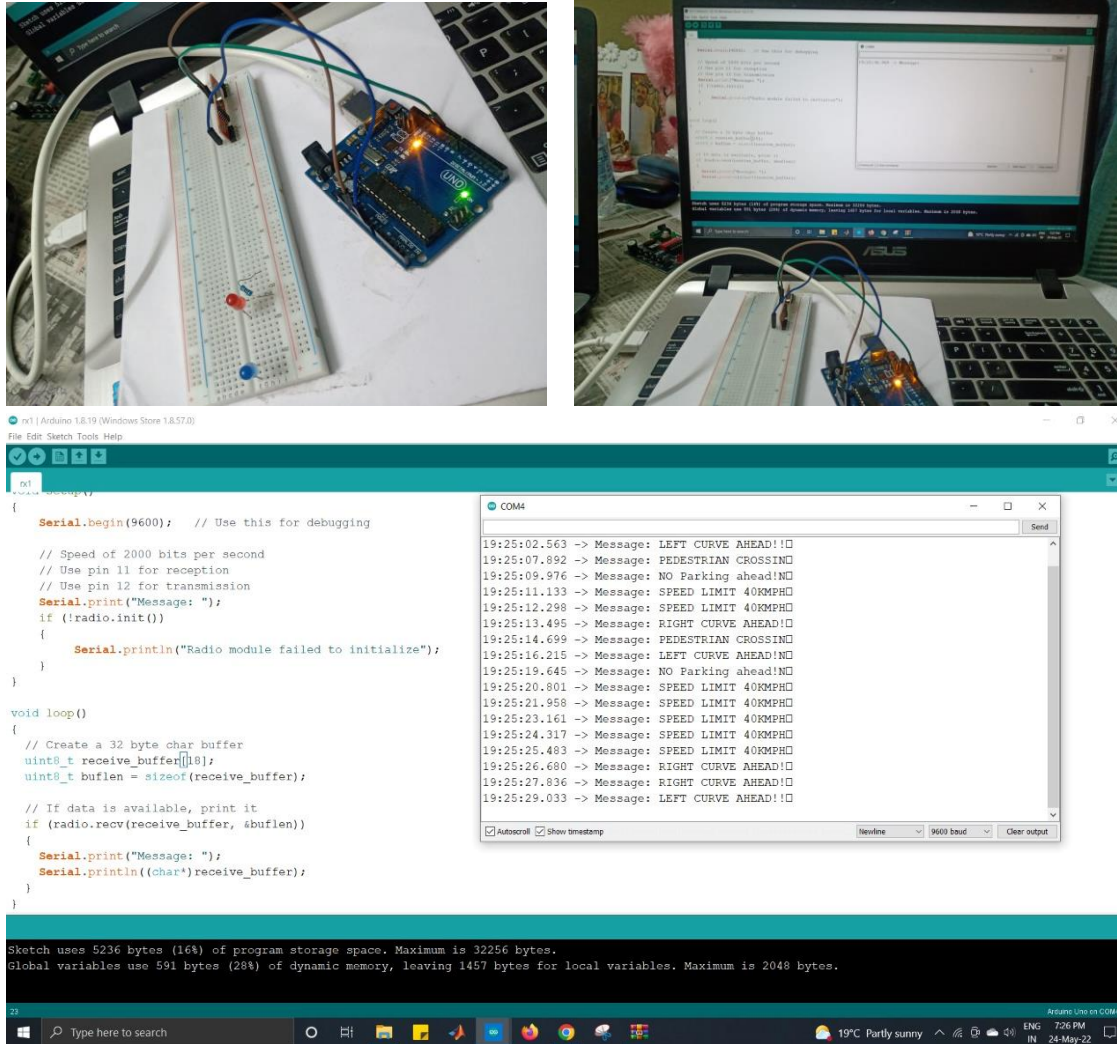
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COM6
23:07:03.339 -> TAG ID in Proximity
23:07:05.548 -> Data Sent Successfully
23:07:09.199 -> Data Sent Successfully
23:07:10.409 -> Data Sent Successfully
23:07:11.569 -> Data Sent Successfully
23:07:12.709 -> Data Sent Successfully
23:07:13.899 -> Data Sent Successfully
23:07:15.059 -> Data Sent Successfully
23:07:16.219 -> Data Sent Successfully
23:07:17.429 -> Data Sent Successfully
23:07:43.018 -> Data Sent Successfully
23:07:44.179 -> Data Sent Successfully
23:07:45.418 -> Data Sent Successfully
23:07:46.579 -> Data Sent Successfully
23:07:47.819 -> Data Sent Successfully
23:07:49.985 -> Data Sent Successfully
23:07:51.179 -> Data Sent Successfully
23:07:52.339 -> Data Sent Successfully
23:07:53.539 -> Data Sent Successfully
23:07:54.729 -> Data Sent Successfully

```



The tag, reader module and the transmitter section placed on road sign will continuously sends signals. The reader module will continuously receive signals from tag. When the commuting vehicle having receiver comes in the range, the vehicle will receive the corresponding sign, which will be displayed on the screen the vehicle. Additionally, we can add voice module for the convenience of commuter.

RESULT:

For the given setup, where the passive tag working at 125KHz (low frequency) and rf module (TWS-434 and RWS-434), we have received a read range of 15 -18cm, which is tried and tested.

We have used the data of 5 signs of which, one is considered an unidentified sign namely:

S. No	TAG ID	Corresponding Road Sign
1.	5C0029375614	Right Hand Curve
2.	5C0029373577	Left Hand Curve
3.	5C0029374002	Pedestrian Crossing
4.	5C0029406B5E	Speed Limited
5.	5C00293FD892	Unknown Sign - Tag did not assign a road sign

The 12-bit tag number is taken from reader module itself.