# DSM LAB REPORT – 9

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Experiment: **Communication between Microcontrollers**

## Objective:

1) To establish a bi-directional serial communication between two microcontrollers (Arduino)

2) To send and receive data (both string and numbers) between two microcontrollers.

## Description:

Function: Serial()

Used for communication between the Arduino board and a computer or other devices. All Arduino boards have at least one serial port (also known as a UART or USART), and some have several. On Uno, Nano, Mini, and Mega, pins 0 and 1 are used for communication with the computer. Connecting anything to these pins can interfere with that communication, including causing failed uploads to the board. Serial communication on pins TX/RX uses TTL logic levels (5V or 3.3V depending on the board). Do not connect these pins directly to an RS232 serial port; they operate at +/- 12V and can damage your Arduino board. To use these extra serial ports to communicate with your personal computer, you will need an additional USB-to-serial adaptor, as they are not connected to the Mega's USB-to-serial adaptor. To use them to communicate with an external TTL serial

device, connect the TX pin to your device's RX pin, the RX to your device's TX pin, and the ground of your Mega to your device's ground.

## Electronic components required:

- Two Arduino's (Transmitter, Receiver)
- Connecting wires
- Slide switch

## Reference circuit:
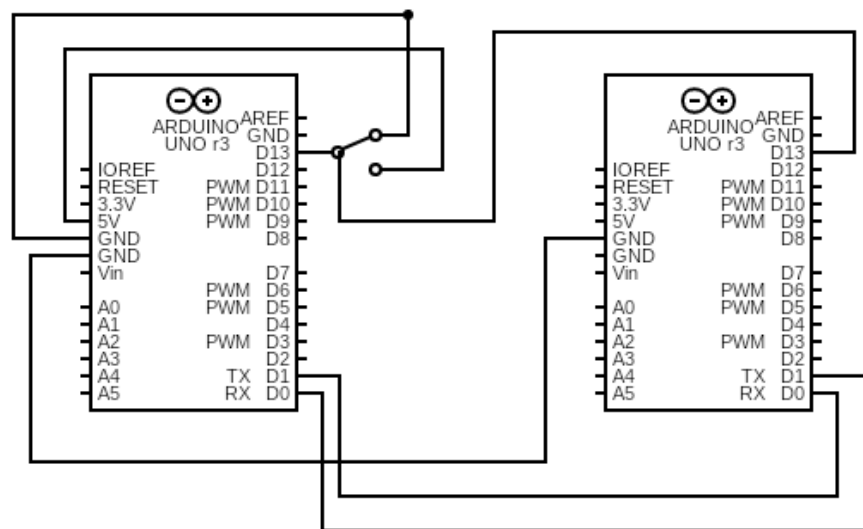


## Procedure:

RX receives serial data and TX sends the serial data to other board or device.

- Make a circuit as per the given diagram.
- Connect both the RX and TX pins of Arduino's vice versa.
- First Arduino's TX pin to another's RX pin and first Arduino's RX pin to another's TX pin.
- Also, common the ground pin of both Arduino.

- Connect the common pin of slide switch to the Pin 13 of the both the Arduino's.
- If the slide switches connected is LOW then the first Arduino acts as sender.
-  If the slide switches connected is HIGH then the second Arduino acts as sender.

## Code for 1st Arduino:

```
char Transmit[6] = "Words"; //String data

char Recieve[10];

int fix = LOW;

int contrast = LOW;

void setup()

{

// Begin the Serial at 9600 Baud

Serial.begin(9600);

pinMode(13, INPUT);

}

void loop()

{

fix =digitalRead(13);

if(contrast == fix)

{

Serial.write(Transmit,5); //Write the serial data
```

```
  delay(2500);

}

else

{

Serial.readBytes(Recieve,8); //Read the serial data and store in var

Serial.println(Recieve);//Print data on Serial Monitor

delay(2500);

}

}
```

## Code for 2nd Arduino:

```
char Transmit[9] = "Document"; //String data

char Recieve[10];

int fix = LOW;

int contrast = LOW;


void setup()

{

// Begin the Serial at 9600 Baud

Serial.begin(9600);

pinMode(13, INPUT);

}

void loop()
```

```
{

fix = digitalRead(13);

if(fix == contrast)

{

Serial.readBytes(Recieve,5); //Read the serial data and store in var

Serial.println(Recieve);//Print data on Serial Monitor

}

else

{

delay(2500);

Serial.write(Transmit,8); //Write the serial data

delay(2500);

    }

}
```

## Observations:

If both the slide switch is LOW then first Arduino is the Sender and second arduino is receiver.

Then the input given to the sender Arduino will be read and displayed by the receiver Arduino on the serial monitor.

If both the slide switches are HIGH then second Arduino is our sender and first arduino is receiver.

The string input given to the sender Arduino will be read and displayed by the receiver Arduino on the serial monitor.

**Link For Tinker Cad simulation:**

[https://www.tinkercad.com/things/9GqziojVt11-2020102062lab9/editel?sharecode=XSnANIa36uIh0dweuj3Huc9hrJd8mKSmRerTQf5yFis](https://www.tinkercad.com/things/9GqziojVt11-2020102062lab9/editel?sharecode=XSnANIa36uIh0dweuj3Huc9hrJd8mKSmRerTQf5yFis)

**Conclusion:**

From this experiment we can understand the serial communication between two microcontrollers by this experiment in bi-directional mode.