# Basic fiber optics experiment

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we are going to create a 1 Mbps fiber optic link between a computer and Arduino Due and send hello there message repeatedly

we need following things

one Arduino due ( any other arduino will work, for example arduino Uno )

one Serial Fiber Modem SPX-17508 https://www.sparkfun.com/products/17508 $24.95

one Fiber Duplex Breakout SPX-17510 https://www.sparkfun.com/products/17510 $19.95

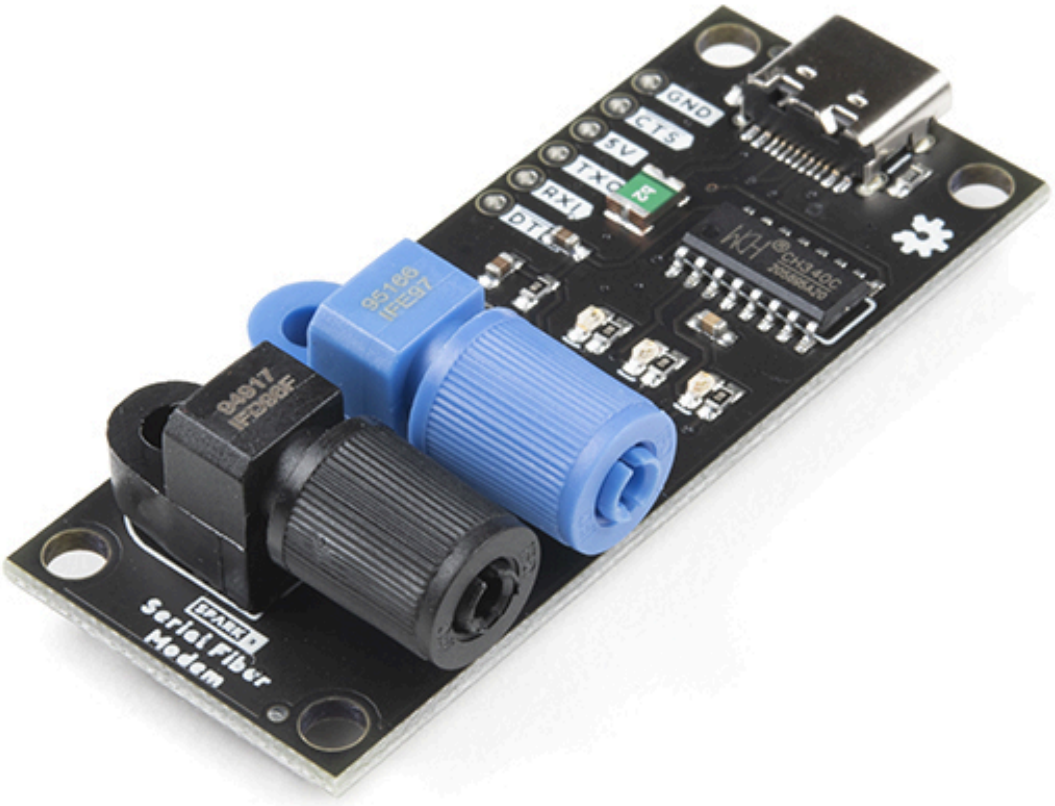


Figure 1:- fiber modem

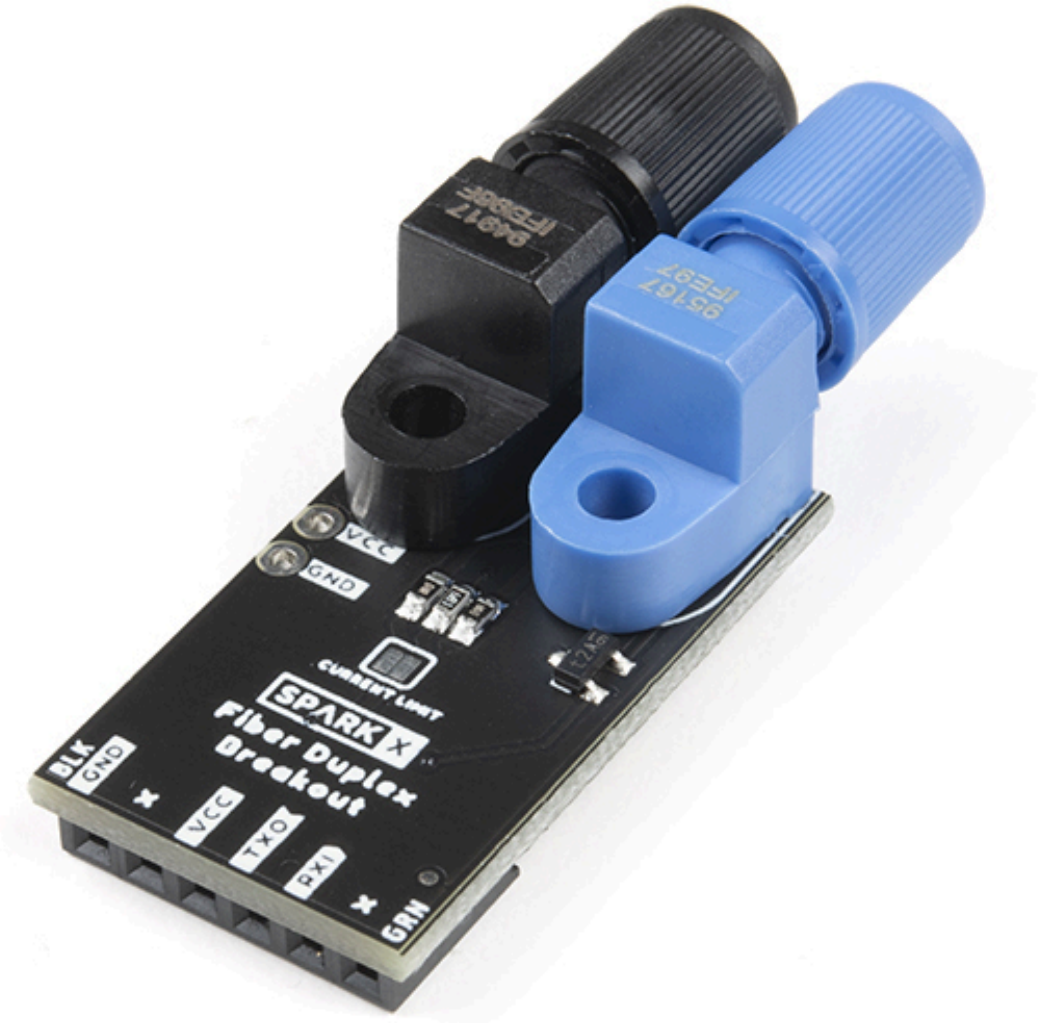


figure 2 :- fiber duplex breakout

two 2.2mm Simplex Plastic Fiber - Black Jacket 960/1000um (1m length)  CAB-17511 (https://www.sparkfun.com/products/17511)  $2.95 each

figure 3 :- plastic fiber optic cable

connect/insert  cable to blue terminal of fiber duplex breakout board and other end to black terminal/plug  of Serial fiber modem

connect/insert  cable to black terminal/plug  of fiber duplex breakout board and other end to blue terminal/plug  of serial fiber modem , also turn plug to tighten the connections , it should come out .

what we are doing is connecting fiber emitter (blue plug of serial fiber modem ) to fiber receiver (black plug of fiber duplex break out board ) and emitter ( blue plug of fiber duplex breakout board to black  plug of receiver fiber modem.

here is picture of connections

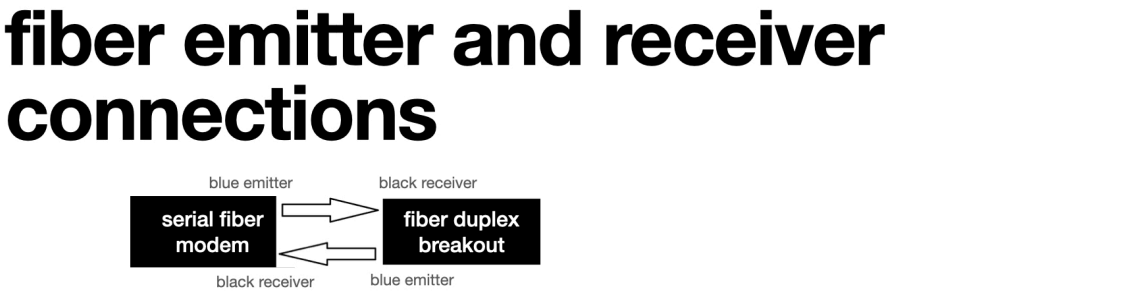


figure 4:-  fiber emitter and receiver connections , arrow represents plastic fiber optical cable

connect vcc of fiber duplex breakout to 3.3v of Arduino pin and connect GND to GND of Arduino Due

connect TXO of fiber duplex breakout board to RX1 ( serial1 ) of arduino Due and connect RXI of fiber duplex breakout board too TX1 ( serial1) of arduino due.

connect USB cable of serial fiber modem to computer and note down the com port number. a red LED will be lit on Serial fiber modem.

load following Arduino sketch to Arduino due

```
#if defined (_VARIANT_ARDUINO_DUE_X_)

#define mySerial4 Serial1
#else
#include <SoftwareSerial.h>

SoftwareSerial mySerial4(2, 3); // RX, TX
#endif



void setup() {
  // initialize both serial ports:
  Serial.begin(9600);
  // mySerial4.begin(115200);
  mySerial4.begin(9600);
```

```
}

void loop() {
  // read from port 1, send to port 0:
  while (mySerial4.available()) {
    char inByte = mySerial4.read();
    Serial.write(inByte);
  }

  // read from port 0, send to port 1:
  if (Serial.available()) {
    int inByte = Serial.read();
    mySerial4.write(inByte);
  }
  mySerial4.println("hello there");
  delay(500);
}
```

open a serial port in Arduino by choosing port ( previous noted com port , for example /dev/ttyUSB0 in my case , com port may be different in your setup), set baud rate of com port to 9600 and you'll see hello there message being printed as shown below.


Figure 5:- output on Arduino serial port

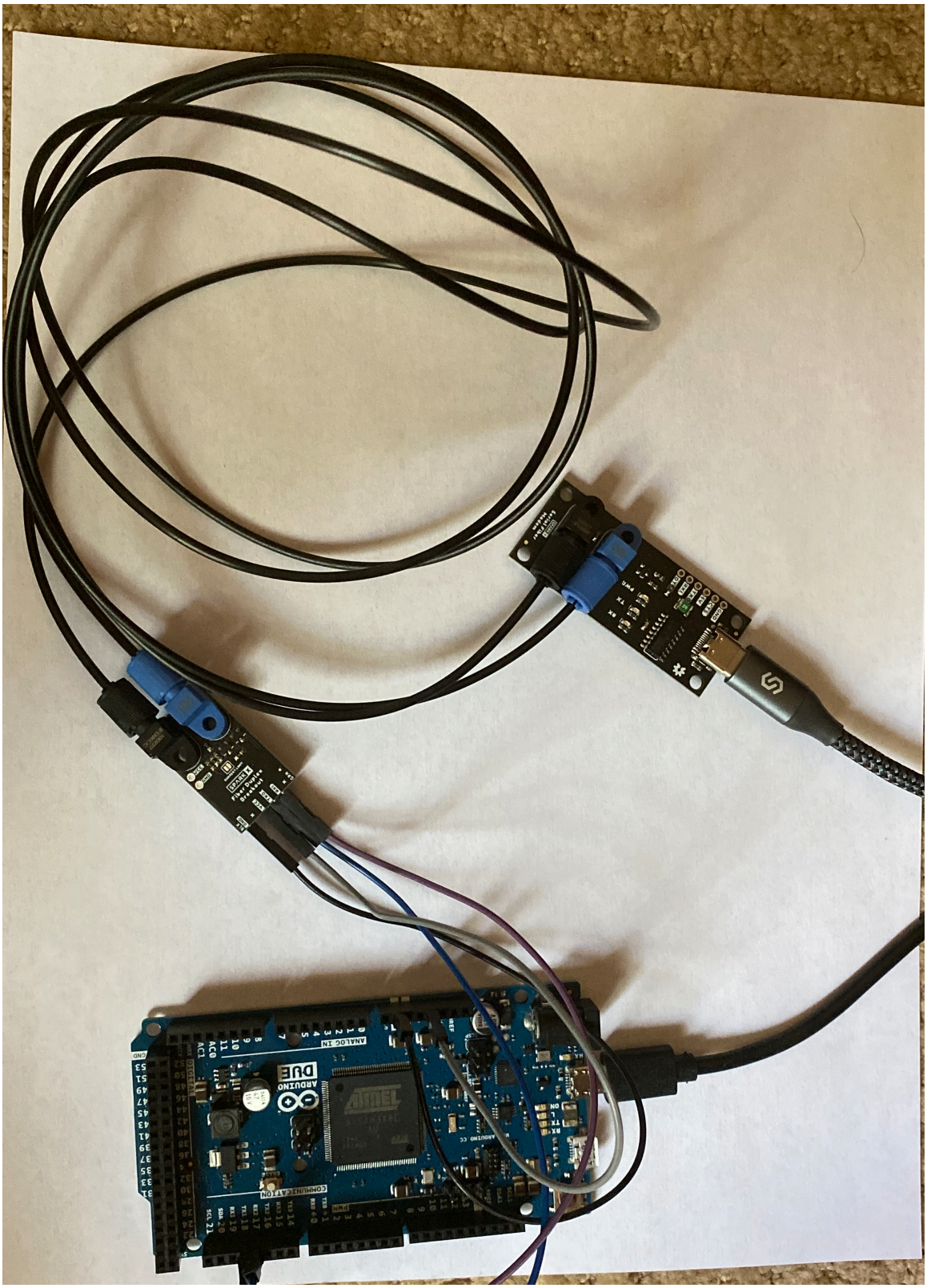


**FIGURE 6:- COMPLETE SETUP**

above  is picture of complete setup , in picture bottom is Arduino due, on right top is  serial fiber modem and top left is fiber duplex breakout and they are connected by tow plastic fiber optical cable.

for more information Please visit https://learn.sparkfun.com/tutorials/industrial-fiber-optics-hookup-guide?_ga=2.149983090.512290311.1625784796-729357332.1623965029

I have also experimented by connecting two fiber duplex breakout board and using two Arduino uno ,one Arduino acts as transmitter and another as receiver.