Experiment 4 : Write an Arduino program to Connect Arduino board with BH1750 Sensor (Light Meter) to Sense the light . light on when it is low or Night / light off when light is more in day time

Aim: The main aim of this experiment is to interface a sensor with the microcontroller and to Sense the light . light on when it is low or Night / light off when light is more in day time

1. COMPONENTS REQUIRED

a) Arduino UNO
b) Breadboard
c) BH1750 Sensor
d) Jumper wires

a. ARDUINO UNO:

Arduino UNO is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. You can tinker with your UNO without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.

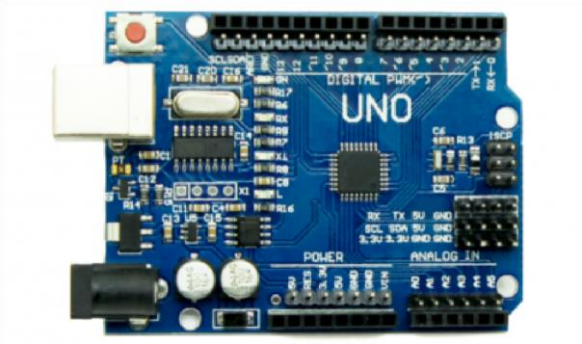


Figure 1.0 - Arduino UNO

b. BREADBOARD:

Breadboards are one of the most fundamental pieces when learning how to build circuits. Breadboards are commonly utilized while prototyping temporary circuits. It is useful to designers because it allows components to be removed and replaced easily.

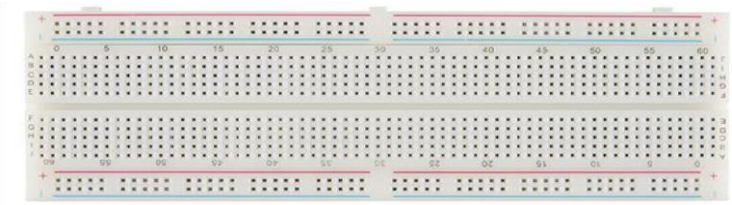
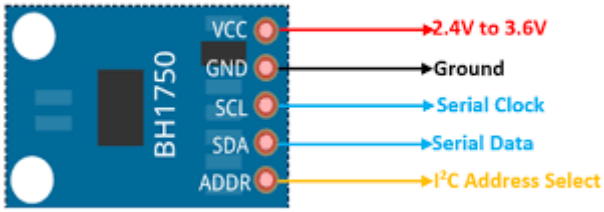


Figure 1.1 – Breadboard

BH1750 Sensor: The **BH1750** is a digital light intensity sensor that measures ambient light levels in **lux** (lx). It is commonly used in electronics projects, IoT devices, and automation systems where light sensing is required.

Key Features:

- **Measurement Range**: 1 – 65535 lx



2.SOFTWARE

Software is a generic term to refer to the scripts and programs that run on a microprocessor or microcontroller and execute specific tasks.

2.1 GET START WITH ARDUINO IDE

Follow the steps to install Arduino IDE:

Step 1: Browse for the URL - ' https://www.arduino.cc/en/software '

Step 2: In DOWNLOAD OPTIONS, choose Windows/Linux/Mac OS accordingly.

Step 3: Select - JUST DOWNLOAD. The download will start!

Step 4: Run the downloaded setup file.

Step 5. Goto Sketch-Include Library- Manage Librarys(ctr+shift+I) install BH1750 Software/ Drivers

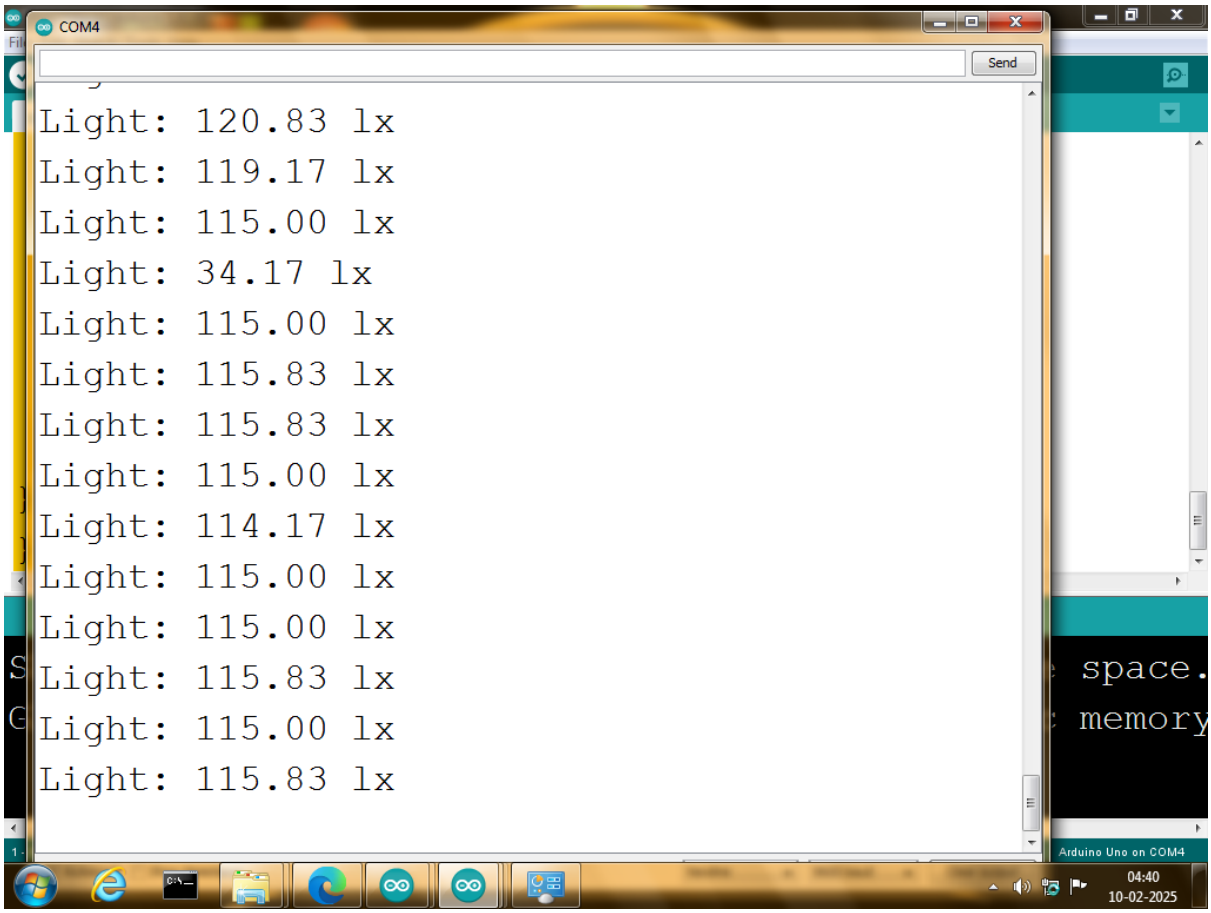
Step 6: Goto Files- Example -BH1750- Select read BH1750 sample program – change boudrate to 9600

3. PROGRAM

```
#include <BH1750.h>
```

```
#include <Wire.h>

BH1750 lightMeter;

void setup() {
  Serial.begin(9600);

  // Initialize the I2C bus (BH1750 library doesn't do this automatically)
  Wire.begin();
  // On esp8266 you can select SCL and SDA pins using Wire.begin(D4, D3);
  // For Wemos / Lolin D1 Mini Pro and the Ambient Light shield use
  // Wire.begin(D2, D1);
  pinMode(7,OUTPUT);
  lightMeter.begin();

  Serial.println(F("BH1750 Test begin"));
}

void loop() {
  float lux = lightMeter.readLightLevel();
  Serial.print("Light: ");
  Serial.print(lux);
  Serial.println(" lx");
  delay(1000);
  if(lux < 90){
    digitalWrite(7,HIGH);
  }
  else{
  digitalWrite(7,LOW);
}
}
```

Output:



4. Results

BH1750 Sensor to Sense the light. The light on when it is low or Night / light off when light is more in day time using the microcontroller unit is successfully implemented.