Testplan
Fase 0

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Project Information

In phase 0 the goal is to run raw arduino code on the nordic develepor kit (Nordic nRF52-DK). Phase 0 has been broken down to 2 use cases.

- Use case 1: Run Arduino Blink

- Use case 2: Auto Intensity Control of Power LED

This test is for use case 1. The goal is to test the basic functions of the arduino library on the Nordic nRF52 DK. The functions digitalWrite(), digitalRead(), analogRead() & analogWrite() are subjected to the test in this plan. Also the posibility to use the analog and digital pins on the Nordic nRF52-DK is to be tested. In order to test this there are a few requirements that need to be met.

1 Use Case 1

1.1 Requirements

In preparations of this test these are the requirements that should be met:

- A Editor (Visual Code, Atom, eclipse, etc)

- Platformio IDE installed.

- Segger J-Link & tool-jlink (in Platformio) installed

- 1x Nordic nRF52 Developor Kit

- 1x Small LED

- 2x Circuit building wires

- 1x 220K Resistor

- Connecting Wires

- 1x Breadboard

- 1x Infrared Sensor

- Arduino Script: *'Blink'*

1.2 Constructing

These are the schematics and code for the test setup. Setup the parts in the same positions as in the schematics. Then upload the code to the board.

Figure 1: Setup Schemetic
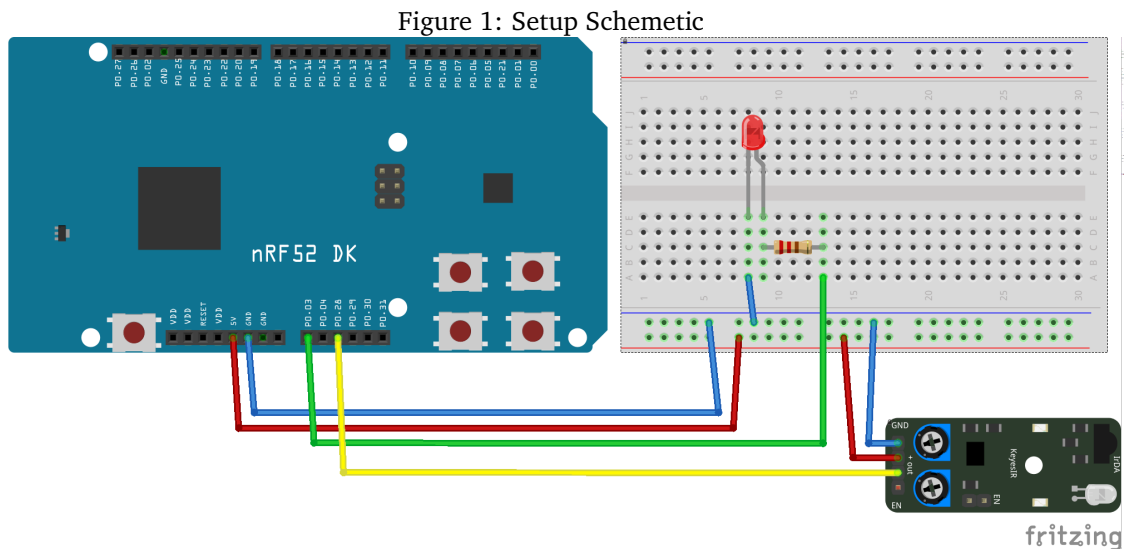
Listing 1: Test Code

```
#include <Arduino.h>

#define ledPin PIN_A0
#define irPin PIN_A1

void setup() {
  Serial.begin(9600);
  pinMode(ledPin,OUTPUT);
  pinMode(irPin,INPUT);
}

void loop() {
  Serial.println(analogRead(irPin)); // Shows the values from the sensor
  if(analogRead(irPin) < 600){
    digitalWrite(ledPin, HIGH); // set the LED on
    Serial.println("Led On");
  }
  else {
    digitalWrite(ledPin, LOW); // set the LED off
    Serial.println("Led Off");
  }
}
```

1.3 Testing

Instructions: After constructing the circuit and uploading the script, the Infrared Sensor has to be configured. The Infrared Sensor has it's own resistor on the circuitboard which can be adjusted with a screwdriver. When the sensor has been configured, test the object detection. The values should appear in the serial monitor. The low values (when there is no object detected) should be between 0-200 and the high

values should be higher than 600. To test the setup place an object in front of the sensor. The led should light up when the object is detected by the sensor.

Questions during the performance For performing the test itself there are a few questions that need to be answered during the test.

Question 1

Does the LED turn on when an object is placed in front the sensor?

   a) Yes   b) No

Question 2

Does the Infrared Sensor detect the object when placed in front of the sensor? (The light on the sensor itself wil light up when detecting an object)

   a) Yes   b) No

Question 3

Do the printed lines 'Led on' or 'Led off' appear in the serial monitor?

   a) Yes   b) No

2 Use Case 2

2.1 Requirements

- A Editor (Visual Code, Atom, eclipse, etc)

- Platformio IDE installed.

- Segger J-Link & tool-jlink (in Platformio) installed

- 1x Nordic nRF52 Developor Kit

- 1x LDR (Light Density Resistor) Sensor

- 1x Resistor (510, 100k ohm)

- 1x Capacitor (0.1uF)

- 1x Transistor 2N2222

- 1x 1 watt Power LED

- Connecting Wires

- 1x Breadboard

- Flashlight or mobile light source

2.2 Constructing

These are the schematics and code for the test setup. Setup the parts in the same positions as in the schematics. Then upload the code to the board.

Figure 2: Schematic
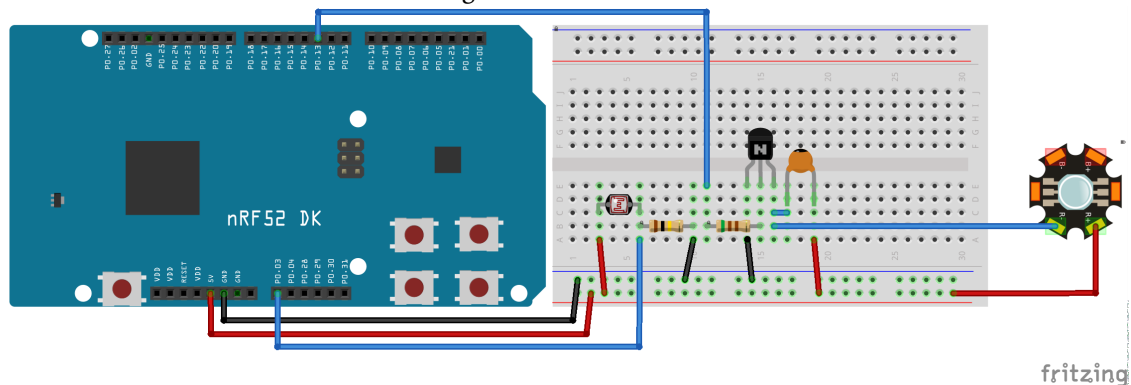
Listing 2: Test Code

```
#include <Arduino.h>

int pwmPin = (2); // assigns pin 12 to variable pwm
int pot = A0; // assigns analog input A0 to variable pot
int c1 = 0;    // declares variable c1
int c2 = 0;    // declares variable c2

void setup()  // setup loop
{
  pinMode(pwmPin, OUTPUT);
  pinMode(pot, INPUT);
  Serial.begin(9600);
```

```
}

void loop()
{
  int value = analogRead(pot);
  Serial.println(value);
  c1= value;
  c2= 500-c1;            // subtracts c2 from 1000 ans saves the result in c1

  if (value < 500)
  {
  digitalWrite(pwmPin, HIGH);
  delayMicroseconds(c2);
  digitalWrite(pwmPin, LOW);
  delayMicroseconds(c1);
  }
  if (value > 500)
  {
    digitalWrite(pwmPin,LOW);
  }
}
```

2.3 Testing

Instructions: After constructing the circuit and uploading the script, the setup is ready to be tested. To test the setup you must aim the light source in straight unto the LDR Sensor. This should cause the LED (that is turned on by default) to turn off.

Questions during the performance For performing the test itself there are a few questions that need to be answered during the test.

Question 4

Does the LED turn off when you shine light unto the LDR?

  a) Yes   b) No

Question 5

Does the serial monitor show the values given by the LDR?

  a) Yes   b) No