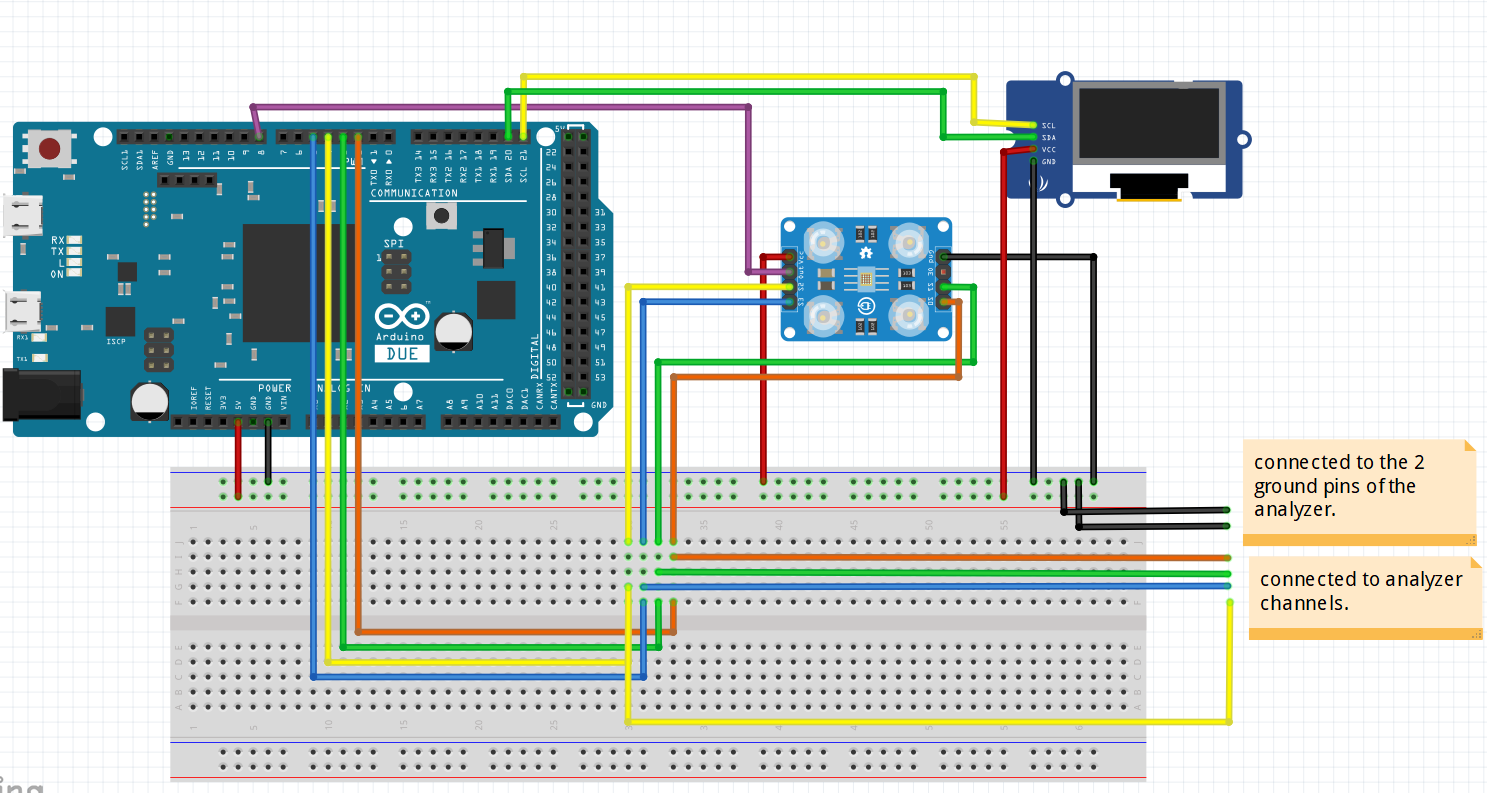
Test instructions

# Parts

* Arduino Due
* Breadboard
* Sensor with frequency output of choice (in this case the tcs3200 colour sensor)
* Salsea analyser and software.
* oled I2C display 128x64 (optional)
* 6x male to male cables
* 13x female to male cables

# Build

Build the circuit after the schematic pictured down below. The screen is not necessary and can be left out.



# Software test freqMeasurement

After building the circuit.

1. Connect the pins of the sensor to the analyser pins.
   1. S0 to channel 1
   2. S1 to channel 2
   3. S2 to channel 3
   4. S3 to channel 4
   5. Output to channel 5
2. Place the test code into a main and run the code.
   1. The code outputs a frequency that it measures out of the input pin.
3. While the code runs open the analyser software and start the test.
4. Channel 2 should be high and channel 1 low. The fifth channel should show a square wave. If channel 1 is not high it will not put out a wave and the cable of channel one should be replaced.
5. In the software of the analyser if you hover your mouse over the created frequency chart of channel 5 it will show the frequency in kilohertz. Compare the outputted frequency with the frequency that is shown in the logic software.
6. If the code works and the build is correct the given frequency from the code and from the analyser software will match.

# Software test colorSensor

After building the circuit

1. Run the test code for the colorsensor
2. It will output the frequency of the RGB values, colorzone’s and colorname.
3. It can be tested using items of the corresponding colours.
4. If the colour name is wrong check the colour zones printed on screen with the ones in the colour name mode function and changes the values if necessary.

## Hardware test

1. Testing the Arduino:
   1. While uploading the code the TX light of the Arduino will blink. If this doesn’t happen the Arduino is broken and must be replaced.
2. Testing the wires.
   1. Output a high signal through the wire and into a led. If the led burns the cable is functional, otherwise it should be replaced.
3. Testing the sensor
   1. If the leds of the sensor don’t burn the sensor is broken and should be replaced. If the channel 1 on the analyser is high but it does not output a signal the cable should be tested. If the cable is functional the sensor is broken and should be replaced.
4. Testing the screen
   1. If the screen is connected properly and the application code is run it should show a character and four health bars. If it does not check the cables if the cables are functional the screen is broken and should be replaced.

# Test results

After building the circuit as pictured in build.

|  |  |  |  |
| --- | --- | --- | --- |
| Test | Expected result | result | Test successful |
| Freq Measure test | The given Hertz from the code and the measurement form the analyser software are a close match. A close match means a difference of maximum 10 hertz. | After measuring 5 times. The average difference is about 7 Hertz. | The test result is successful. |
| Colour Sensor test Mode1 | The three colours in this mode can be defined successfully 8/10 times. | The colour red is recognized 9/10 times. Blue and green are sometimes confused but are accurate 8/10 times. | The colours are successfully identified 8/10 times. |
| Colour Sensor test Mode2 | The 7 colours in mode 2 should be identified correctly 7/10 times. | The colours red, green and blue are correct 8/10 times. Pink, brown and orange are correctly identified 7/10 times but can be confused for one another. One a white service surrounded by yellow light the yellow colour can be detected from white objects. | Successful but keep ambient light in mind when conducting tests. |
| Light intensity test | The light intensity should drop when the sensor is obscured from light. | The light intensity is dropped from around 4000 to 300 when the sensor is obscured from light. It will not drop lower due to the attached led on the sensor itself | Successful, but keep the attached led on the sensor in mind. |