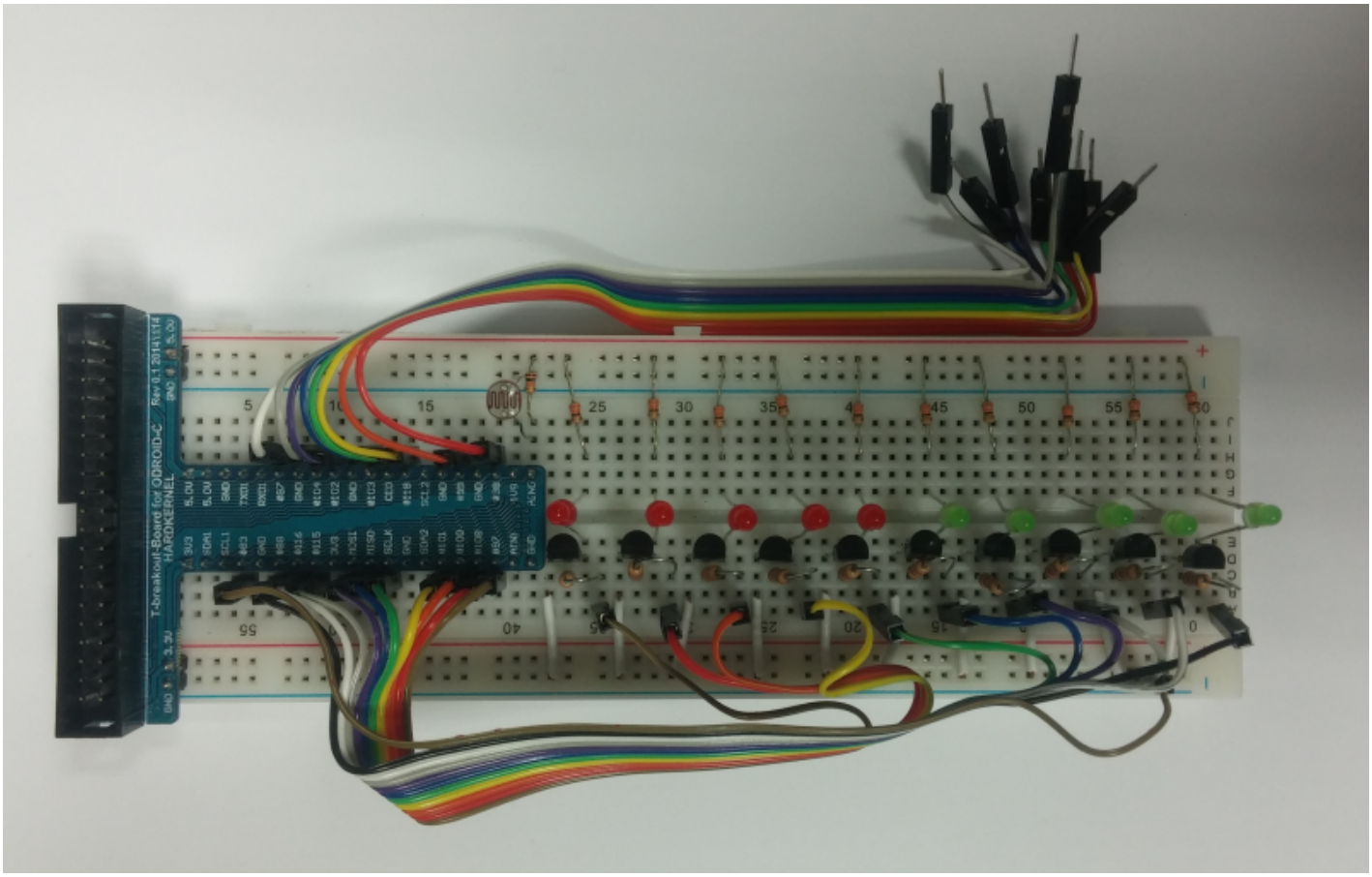
Introduction



You're probably itching to make some fun embedded computer projects with **ODROID-XU4**. What you need is an add on prototyping T-breakout board, which can break out all those tasty power, GPIO, I2C, ADC pins from the 40 pin header onto a solderless breadboard. This set will make “cobbling together” prototypes with the **ODROID-XU4** super easy.

This kit comes with below many items.

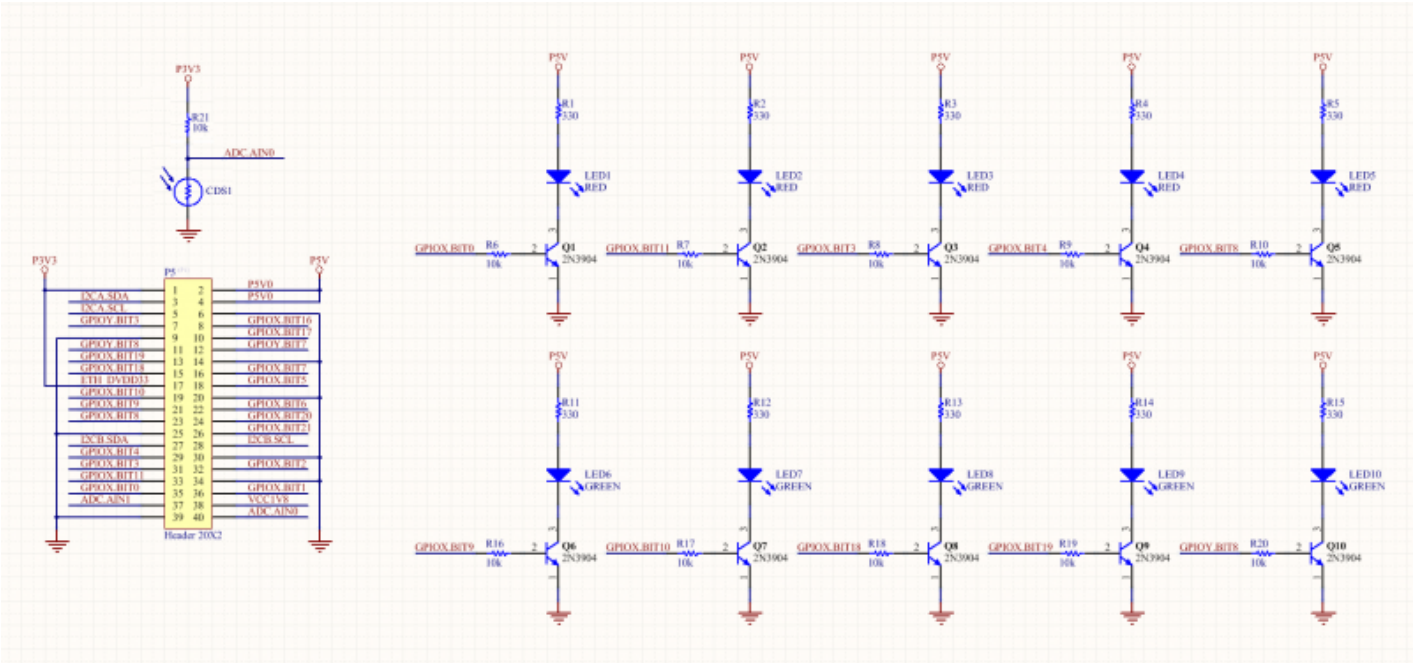
- Assembled T-breakout PCB - 40Pin GPIO Breakout board
- Breadboard - 630 Tie-points with dual powerlanes
- 40pin Ribbon cable - IDC Flat cable 100mm
- 40pin Male-to-Male Dupont jumper Wire 170mm
- 7 x Green LED 3mm
- 7 x Yellow LED 3mm
- 7 x Red LED 3mm
- 2 x Photo Cell (CdS Light sensor)
- 6 x Tact Switchs
- 50 x 330 Ohm 1/6W resister
- 50 x 10K Ohm 1/6W resister

Where to buy [http://www.hardkernel.com/main/products/prdt_info.php?g_code=G141637532784]

DIY light level meter project

Linux

1. Configuration tinkering kit such as below schematic.
Light Level Meter schematic



2. Get the wiringPi library compatible**ODROID**

```
# git clone https://github.com/hardkernel/wiringPi
```

3. Build the library

```
# cd wiringPi
# ./build
```

4. Compile and run the example source code.

example-led.c

```
//----------------------------------------------------------------------
//
// ODROID-C GPIO(LED) / ADC Test Application.
//
// Defined port number is wiringPi port number.
//
// Compile : gcc -o <create excute file name> <source file name> -lwiringPi -lwiringPiDev -lpthread
// Run : sudo ./<created excute file name>
//
//----------------------------------------------------------------------
#include <stdio.h>
#include <stdlib.h>
#include <stdint.h>

#include <unistd.h>
#include <string.h>
#include <time.h>

#include <wiringPi.h>
#include <wiringPiI2C.h>
#include <wiringSerial.h>
#include <lcd.h>

//----------------------------------------------------------------------
//
// Global handle Define
//
//----------------------------------------------------------------------

#define DATA_UPDATE_PERIOD  100 // 100ms

//----------------------------------------------------------------------
//
// ADC:
//
//----------------------------------------------------------------------
#define PORT_ADC   0   // ADC.AIN0
#define MAX_ADC_VALUE    4095

//----------------------------------------------------------------------
//
// LED:
//
//----------------------------------------------------------------------
```

```
const int ledPorts[] = {
        7,
        0,
        2,
        3,
        12,
        13,
        14,
        21,
        22,
        23,
};

#define MAX_LED_CNT (sizeof(ledPorts) / sizeof(ledPorts[0]))
#define ADC_UNIT       (MAX_ADC_VALUE / MAX_LED_C  NT)

//-----------------------------------------------------------------
//-----------------------------------------------------------------
//
// system init
//
//-----------------------------------------------------------------
int system_init(void)
{
    int i;

    // GPIO Init(LED Port ALL Output)
    for(i = 0; i < MAX_LED_CNT; i++)    pinMode  (ledPorts[i], OUTPUT);

    return  0;
 }

//-----------------------------------------------------------------
//
// board data update
//
//-----------------------------------------------------------------
void boardDataUpdate(void)
{
    int i, adcValue, ledPos;

    // adc value read
    if((adcValue = analogRead  (PORT_ADC)))    {
        ledPos = adcValue  / ADC_UNIT;
    }
    else
        ledPos  = 0;

    //  LED Control
    for(i = 0; i < MAX_LED_CNT; i++)    digitalWrite  (ledPorts[i], 0); // LED All Clear
    for(i = 0; i < ledPos;      i++)    digitalWrite  (ledPorts[i], 1); // LED On
}

//-----------------------------------------------------------------
//
// Start Program
//
//-----------------------------------------------------------------
int main (int argc, char *argv[])
{
    static int timer = 0 ;

    wiringPiSetup  ();

    if (system_init() < 0)
    {
        fprintf (stderr, "%s: System Init failed \n", __func__);     return -1;
    }

    for(;;)    {
        usleep(100000);
        if (millis () < timer)  continue ;

        timer = millis () + DATA_UPDATE_PERIOD ;

        // All Data update
        boardDataUpdate ();
    }

    return 0 ;
}
```

Python example

- WiringPi2-Python repository for ODROID[https://github.com/hardkernel/WiringPi2-Python]

Prerequisites: You must have *python-dev* and *python-setuptools* installed If you manually rebuild the bindings with swig-python wiringpi.i

1. Get/setup WiringPi 2 for Python repository

```
# git clone https://github.com/hardkernel/WiringPi2-Python.git
# cd WiringPi2-Python
# git submodule init
# git submodule update
```

2. Build & install

```
# sudo python setup.py install
```

3. Run the example source code

example-led.py

```
#!/usr/bin/python
import wiringpi2 as wpi
import time

leds = [7, 0, 2, 3, 12, 13, 14, 21, 22, 23]
wpi.wiringPiSetup()

# GPOI pin setup
for x in leds:
        wpi.pinMode(x, 1)
        wpi.digitalWrite(x, 0)

adc_unit = 4095 / len(leds)
while True:
        time.sleep(0.05)
        adcValue = wpi.analogRead(0)
        ledPos = adcValue / adc_unit
        for x in leds:
                wpi.digitalWrite(x, 0)

        for x in xrange(ledPos):
                wpi.digitalWrite(leds[x], 1)
```