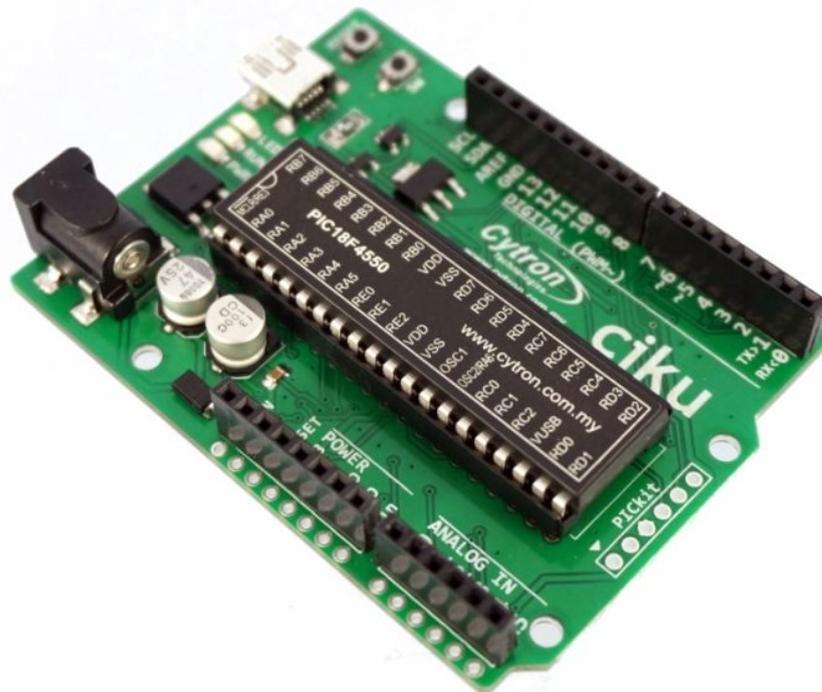




CIKU



User's Manual

V1.0

July 2014

Information contained in this publication regarding device applications and the like is intended through suggestion only and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. No representation or warranty is given and no liability is assumed by Cytron Technologies Incorporated with respect to the accuracy or use of such information or infringement of patents or other intellectual property rights arising from such use or otherwise. Use of Cytron Technologies's products as critical components in life support systems is not authorized except with express written approval by Cytron Technologies. No licenses are conveyed, implicitly or otherwise, under any intellectual property rights.

INDEX

1. Introduction	3
2. Packing List	4
3. Product Specification And Limitations	5
4. Dimension	6
5. Board Layout	7
6. Hardware Installation	9
7. Getting Started	11
8. Warranty	23
9. Appendix A: CIKU's Pinout Diagram	24

1. INTRODUCTION

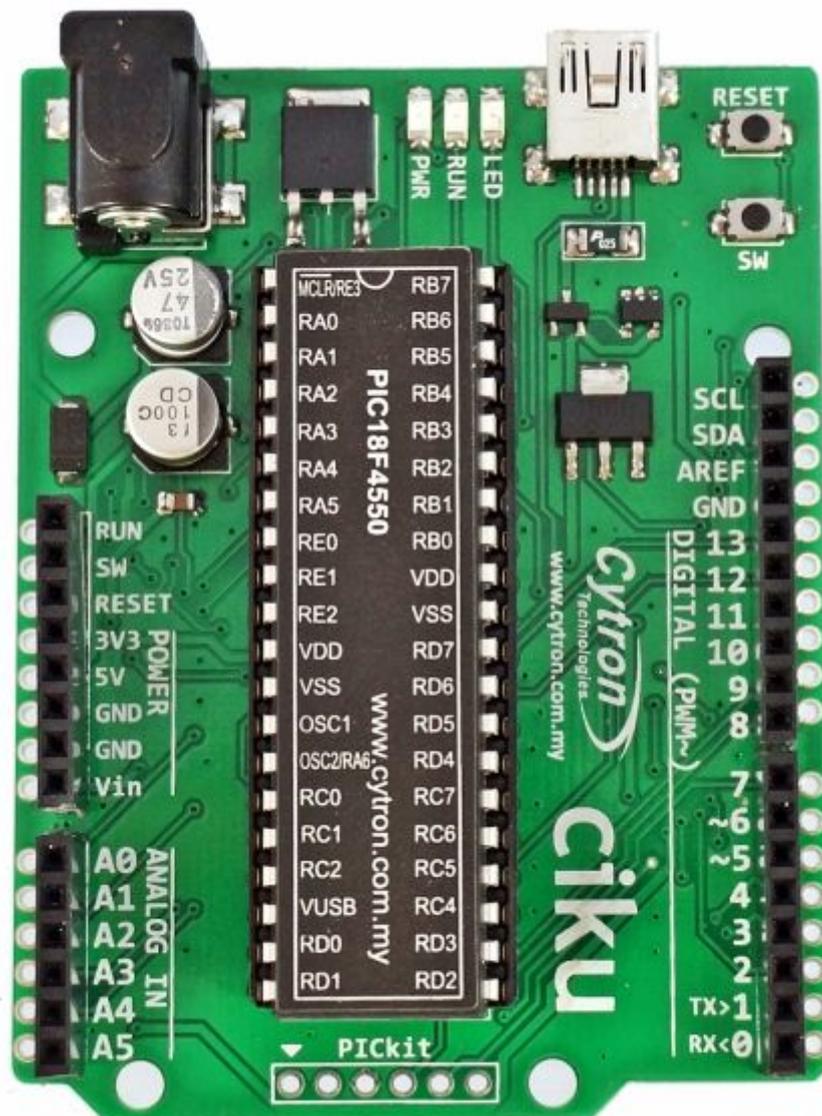
[CIKU](#) is a microcontroller board based on the [PIC18F4550](#) with Arduino standard IO headers. It has 20 digital input/output pins (of which 2 can be used as PWM outputs and 6 as analog inputs), a 20 MHz crystal oscillator (clock speed up to 48 MHz after [PLL](#)), a mini-B USB connection, a power jack, standard Arduino IO headers, a PICkit header, a bootloader switch and a reset button.

CIKU comes with following features:

- Power via USB or external DC adapter (7 - 12V).
- On board 5V 800mA (Max 1A) voltage regulator.
- On board 3.3V 500mA (Max 500mA) voltage regulator.
- USB mini-B receptor for USB connection.
- 20 digital I/O pins.
- 6 analog input pin.
- 2 PWM output pin.
- Standard Arduino UNO R3 header, utilize Arduino shield.
- Extra pads with standard 0.1" (2.54 mm) pitch to pitch provided.
- 32KByte flash/program memory (~28K after bootloader).
- PIC18F4550 running at 48MHz clock speed (external 10MHz oscillator + PLL).
- On board Power, Run and programmable LED.
- Reset button and bootloader button for entering bootloader mode.
- Program with MPLAB X IDE and XC8 compiler (library provided).
- Program loading via USB HID, GUI from Microchip provided.

2. PACKING LIST

Please check the parts and components according to the packing list. If there are any parts missing, please contact us at sales@cytron.com.my immediately.



- 1 x [CIKU board](#)

Optional (not included):

- [USB MiniB Cable \(2.0\)](#) for program loading.

3. PRODUCT SPECIFICATION AND LIMITATIONS

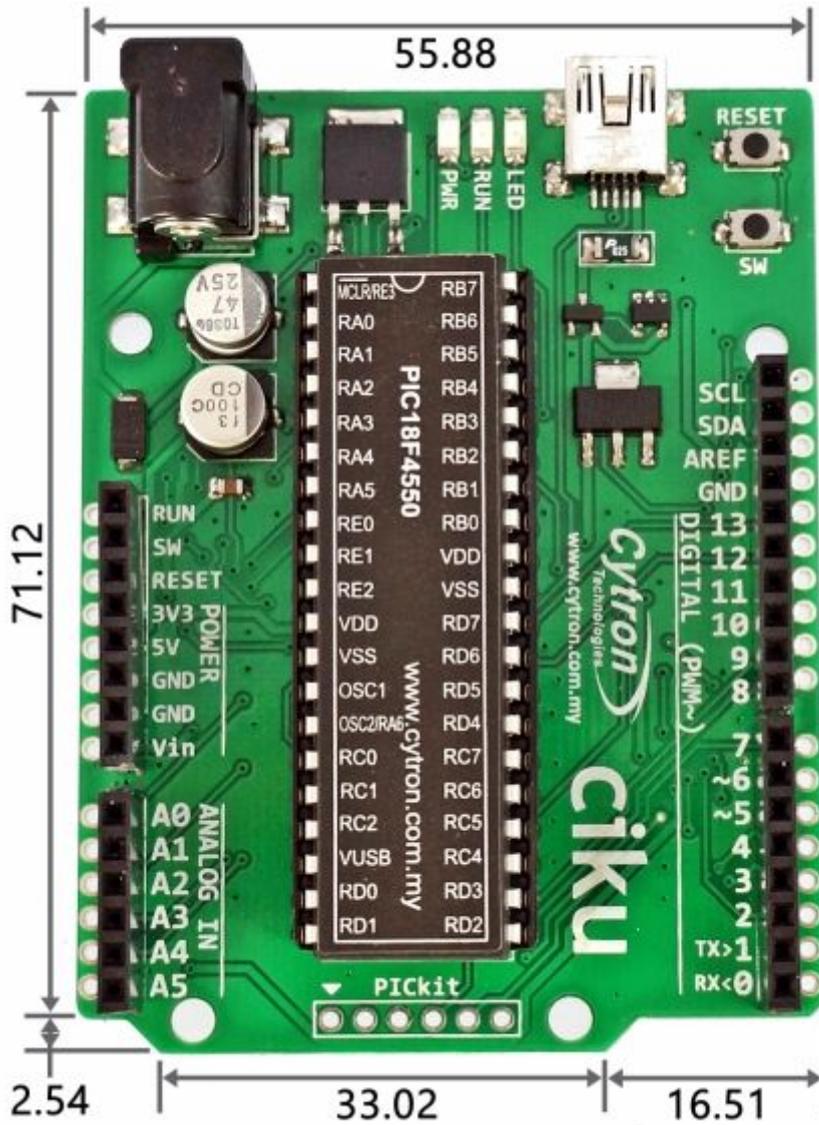
CIKU is designed to offer starting up platform for development, the specification of PIC18F4550 used should be referred.

Absolute Maximum Rating

Parameter	Min	Max	Unit
Input Voltage via Adapter (Recommended)	7	12	V
Input Voltage via Adapter (Limits)	6	15	V
$I_{MAX(5V)}$ (from on-board 5V Voltage regulator)*	-	1	A
$I_{MAX(3.3V)}$ (from on-board 3.3V Voltage regulator)	-	500	mA

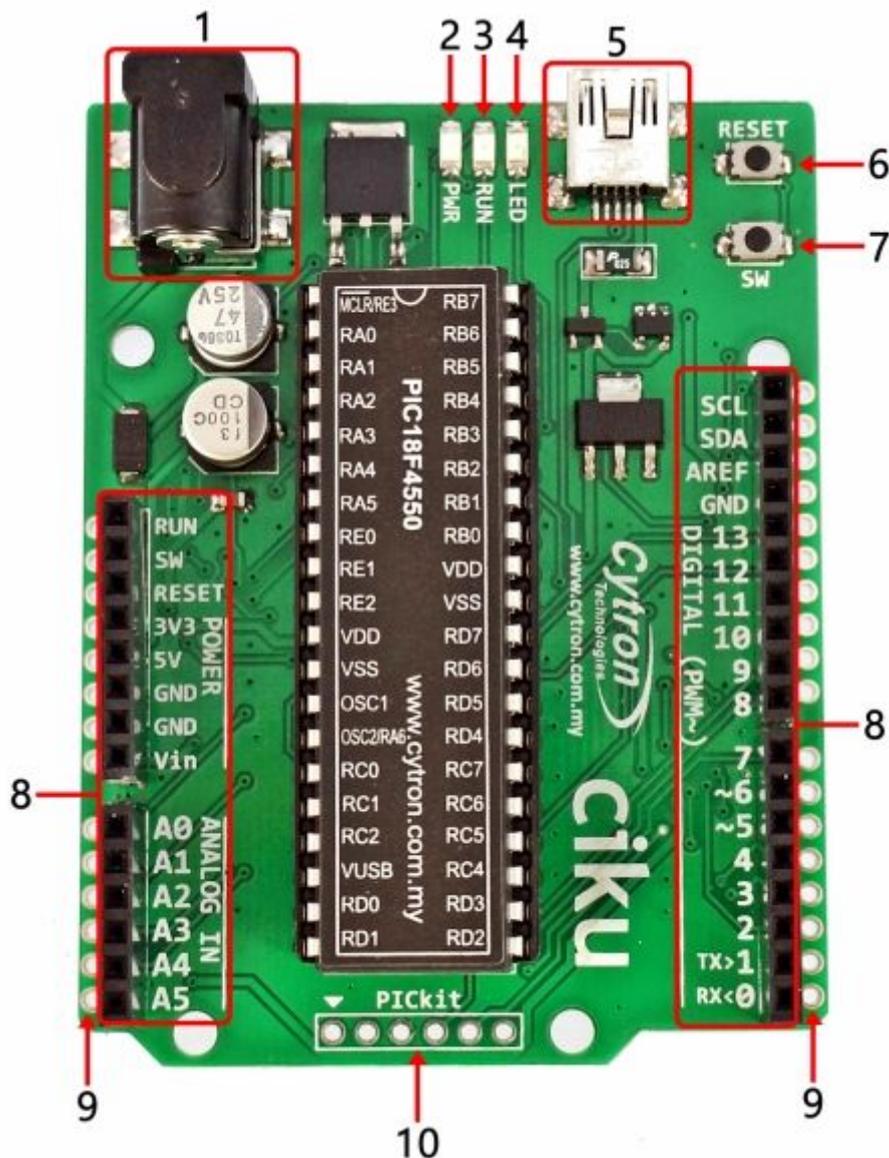
* With V_{in} at 12V

4. DIMENSION



*Note: For more details on the dimension, please refer to Eagle PCB files.

5. BOARD LAYOUT



Label	Function
1	Adapter socket (2.1mm)
2	Power indicator LED
3	Run LED
4	Programmable LED (connected to Pin 13, active high)
5	Mini USB B type (female)
6	Reset button
7	Bootloader button

8	Arduino standard header
9	Extra pad with standard 0.1" (2.54mm) pitch
10	PICKit header

Adapter socket (2.1mm)

DC power adaptor socket for user to plug in DC adapter. The input voltage should be ranged from 7 to 12V.

Power LED

Power LED will light ON once the board is powered.

Run LED

Run LED will blink if CIKU in bootloader mode, and turn ON if in user mode.

Programmable LED

Programmable LED is active HIGH and it is connected to pin 13.

Mini USB B type (female)

This connector is for USB connection to upload program or power it via USB cable. A USB Mini-B type cable is needed.

Reset button

Reset button can be used to reset/restart the CIKU program.

Bootloader button

To enter the bootloader mode, this button need to pressed (for more details, please refer to Getting started section).

Arduino standard header

CIKU can be stacked with Arduino shield.

Extra pad with standard 0.1" (2.54mm) pitch

This extra pad allow CIKU to be stacked on donut board.

PICKit header

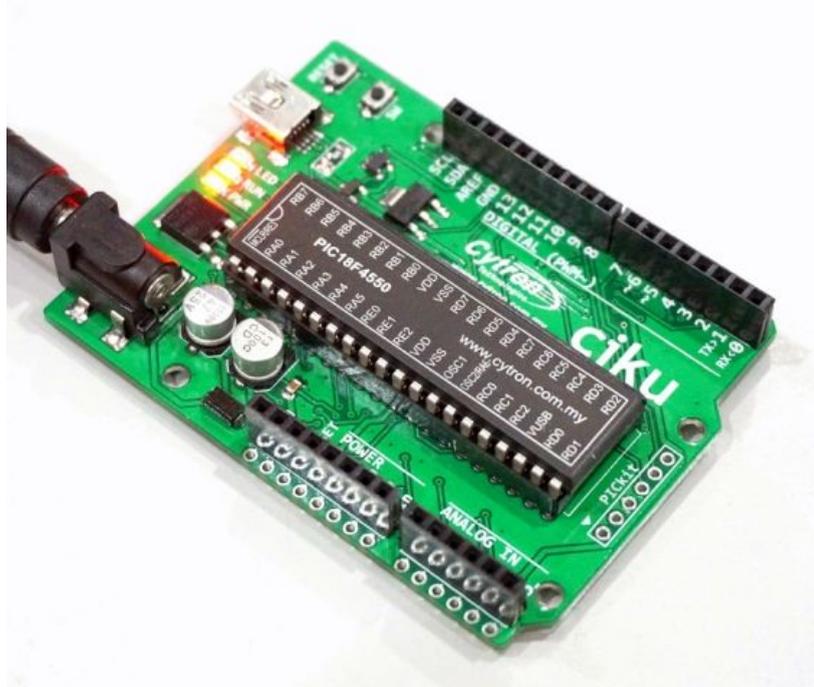
User can connect PICKit programmer to this header.

6. HARDWARE INSTALLATION

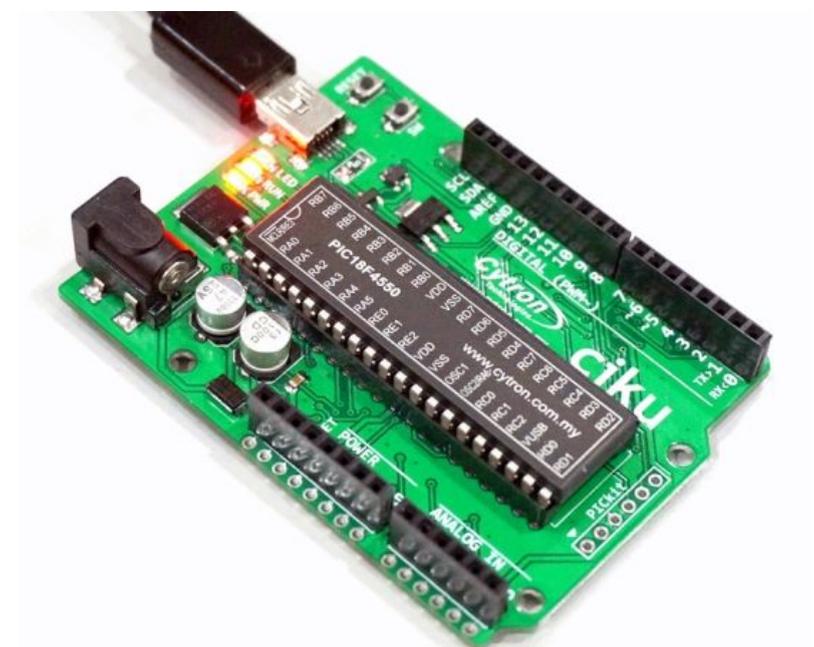
6.1 CIKU Power Supply

CIKU power source is either from [12V power adapter](#) (via DC jack) or [USB cable](#). If CIKU is powered using both supply (12V adapter and USB cable) it will automatically choose power from adapter.

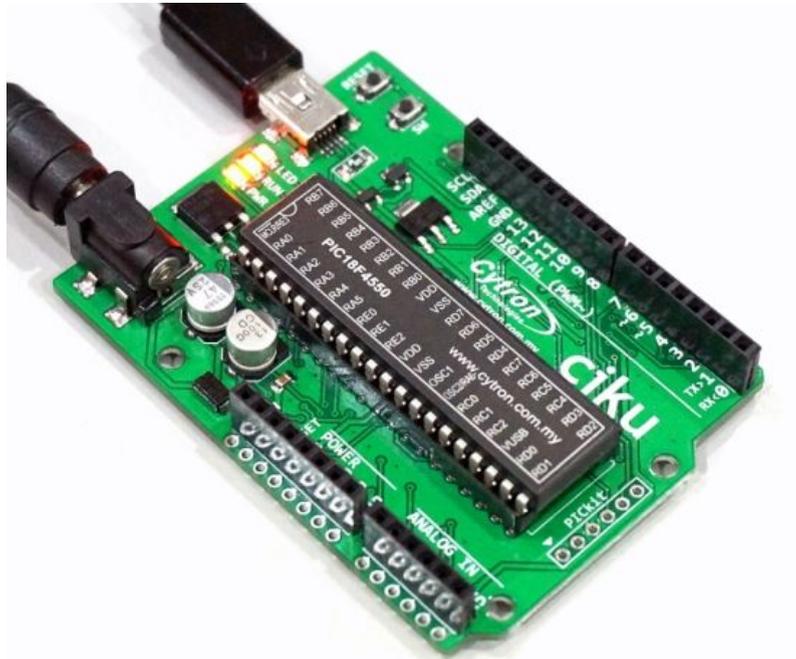
- CIKU is being powered using 12V power adapter



- Besides using 12V power adapter, CIKU also can be power up using USB cable



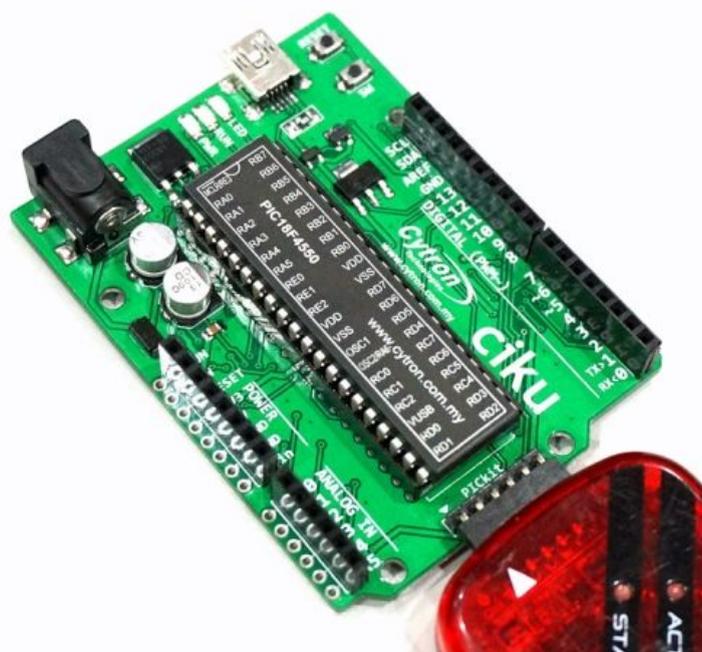
- If [CIKU](#) is powered with both 12V Power adapter and USB cable, it will automatically choose power from power adapter.



6.2 Downloading bootloader firmware

PICKit port is reserved for user to load bootloader into CIKU. Users need to solder [1x6 Right angle header pin](#) at PICKit port. Power supply is needed to load bootloader into CIKU.

- Users may use [PICKit2/3](#) to load bootloader into CIKU.



- Besides using [PICKit2/3](#), the alternative way to load bootloader is using [UIC-A](#) + [UIC00B](#).

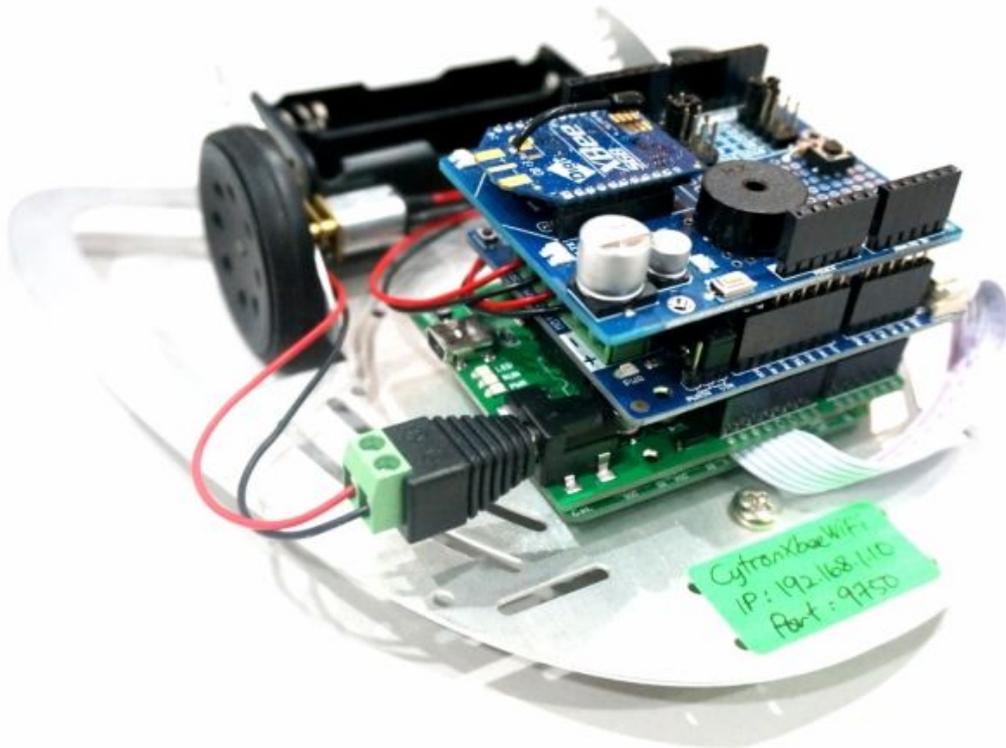


6.3 Interface CIKU

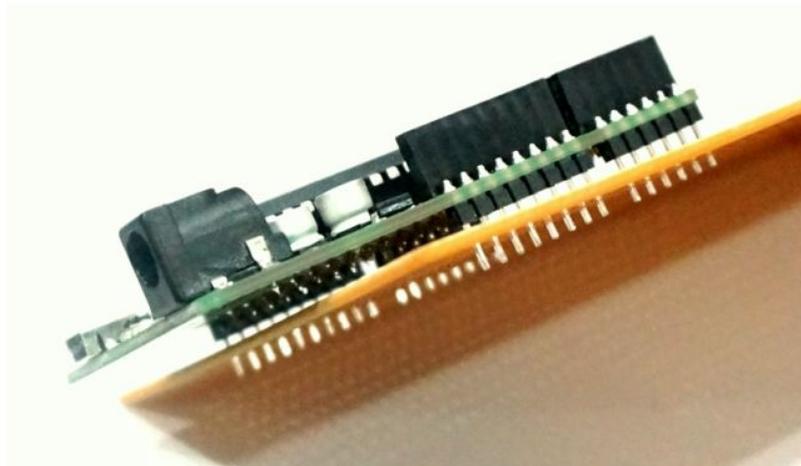
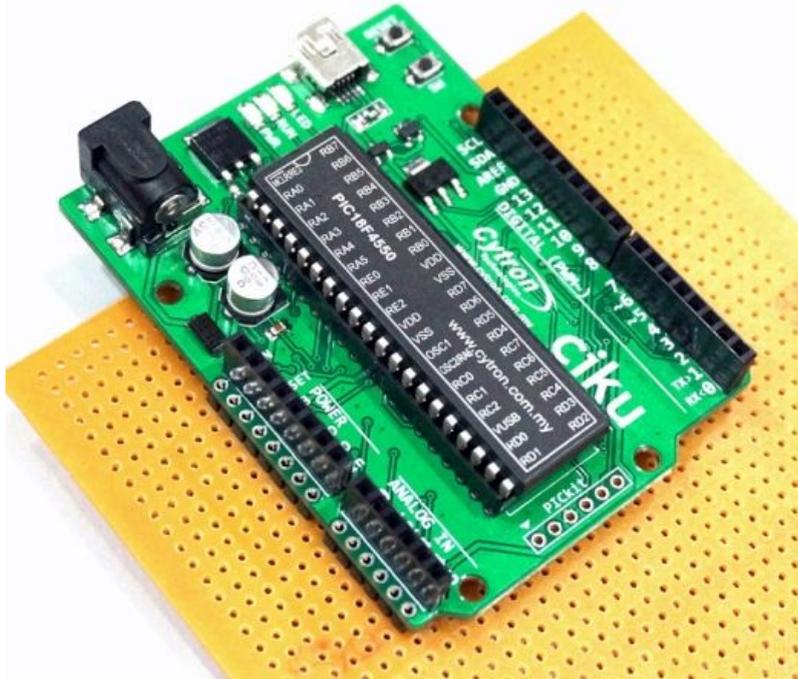
- [CIKU](#) is compatible with arduino shield. Below are examples shown [SHIELD-LCD](#) and [SHIELD-PROTO2](#) is stacking onto CIKU.



- This is example of wireless remote mobile robot that uses [CIKU](#), [SHIELD-2AMOTOR](#) and [SHIELD-XBEE](#).



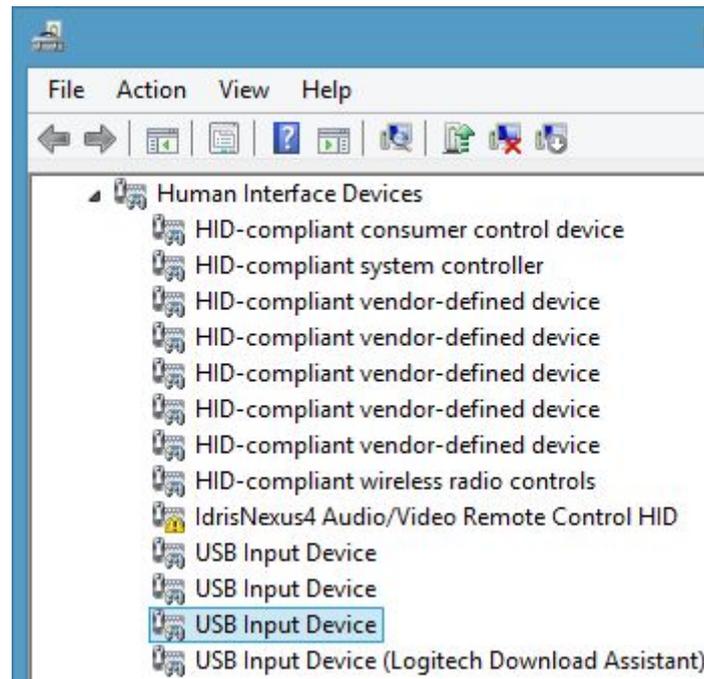
- [CIKU](#) also can be stacked onto donut board. Users need to solder header pins at left and right side to stack CIKU onto [donut board](#).



7. GETTING STARTED

*This section will guide user to get started with [CIKU](#). **User also can refer to “[Getting Started with CIKU](#)” tutorial for better explanation and view.**

For your information, CIKU bootloader doesn't need any driver to be installed since it is recognized as HID (Human Interface Devices).



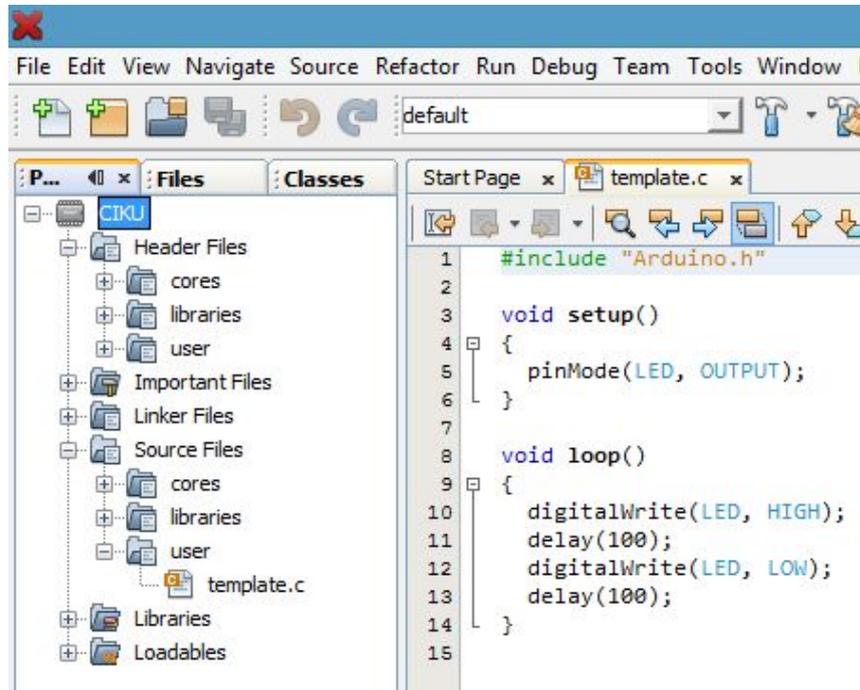
When CIKU enter bootloader mode, PC will recognize CIKU as **USB Input Device.*

In software part, CIKU is designed to compatible with MPLAB X IDE ([download](#)) and XC8 compiler ([download](#)). You can download and install it to your computer for free. If you are new to this version, please refer to “[Getting Started with MPLAB X IDE](#)” tutorial.

CIKU Arduino library already developed base on XC8 compiler and you can download it [here](#).

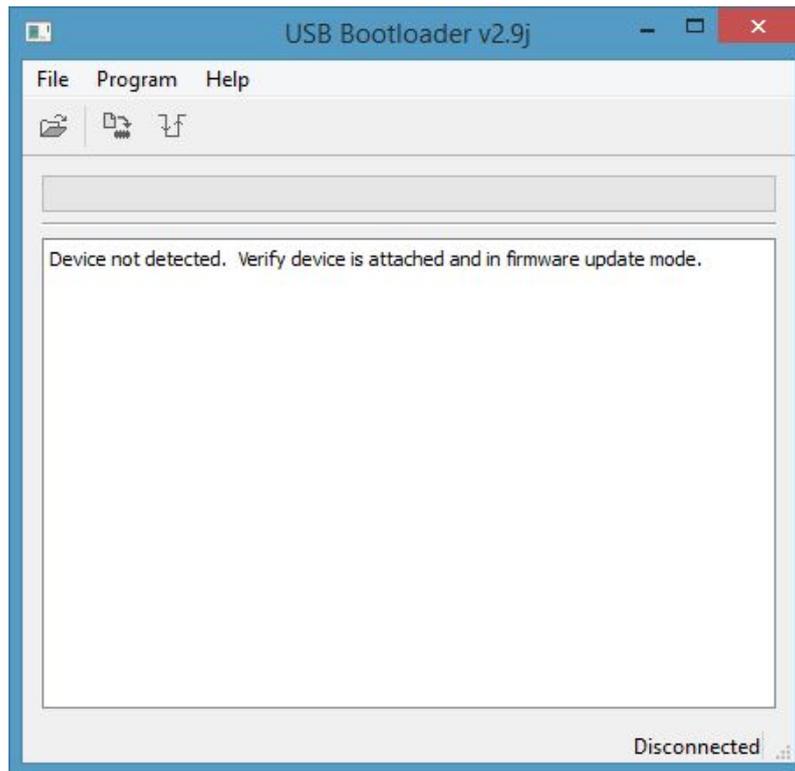
Ok now you already have all the tools. Please refer to the steps below for programming and uploading code into CIKU board.

- Open **MPLAB X IDE**. Go to **File - Open Project - CIKU.X**.
**CIKU.X* represent the *CIKU Arduino library that you have downloaded*.



CIKU.X project files divided into 3 categories which are **cores**, **libraries**, and **user**. You can write the Arduino coding style under **Source Files -> user -> template.c**. The picture above shows LED blinking example. Click on Build Project (hammer icon) to generate the hex file.

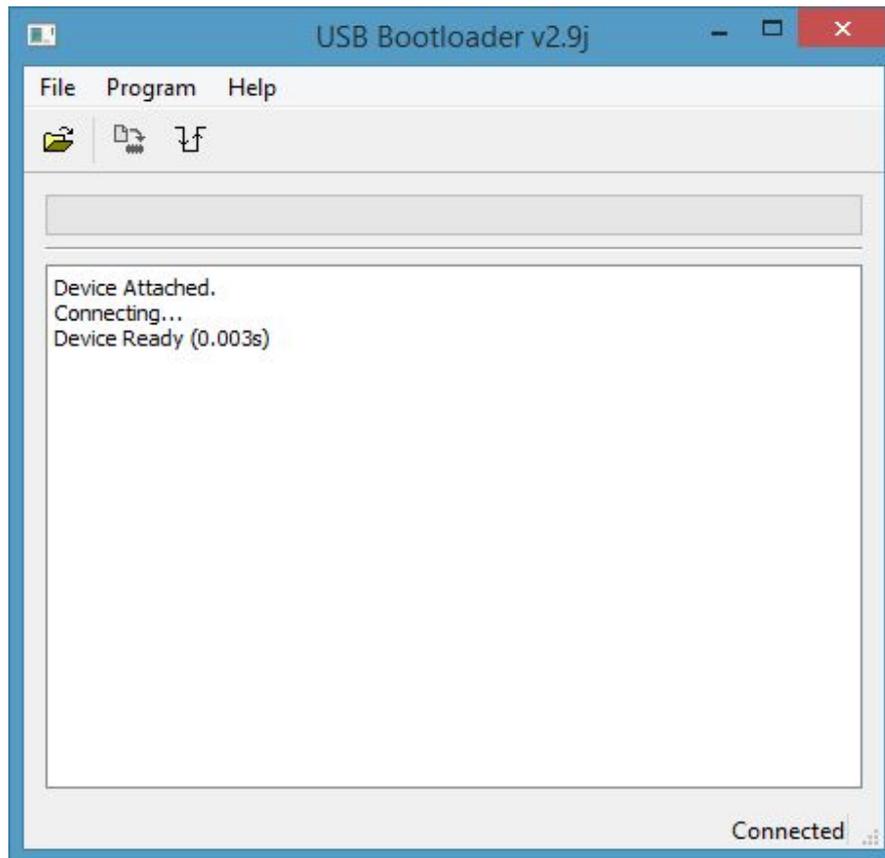
- Now go to your CIKU.X folder, open bootloader software.
**Path to bootloader software: CIKU.X\Bootloader Software\win\HIDBootloader.exe*.



- Connect USB cable to your [CIKU](#) board and computer. Then enter the bootloader mode. To enter the bootloader mode, look at the sequence below.

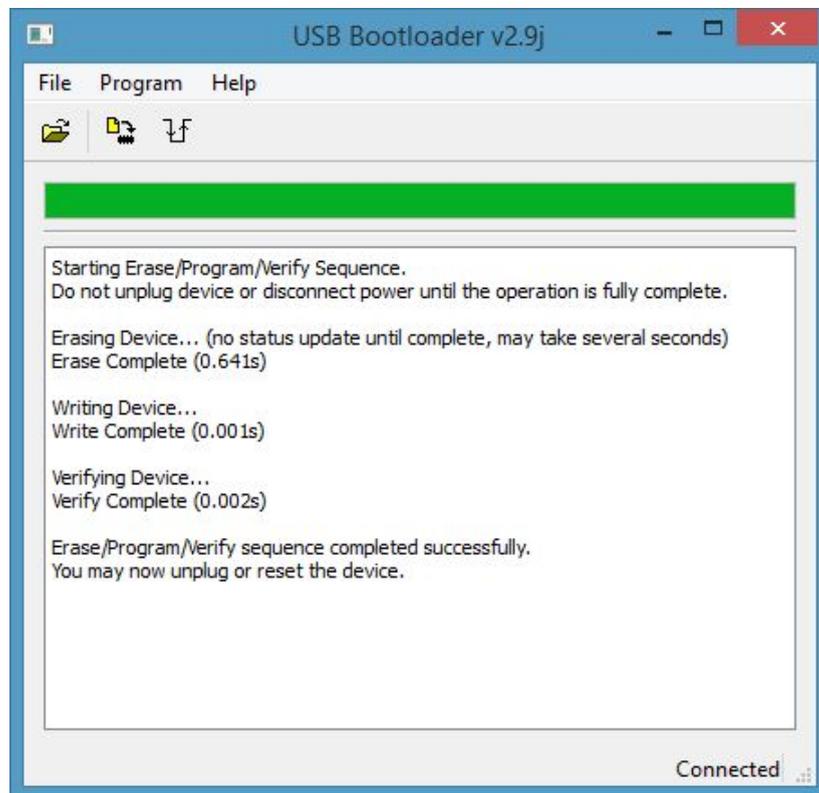
Sequence	SW button	Reset button
1	Pressed (Hold)	Released
2	Pressed (Hold)	Pressed
3	Pressed (Hold)	Released
4	Released	Released

- Run LED will blink when enter the bootloader mode.

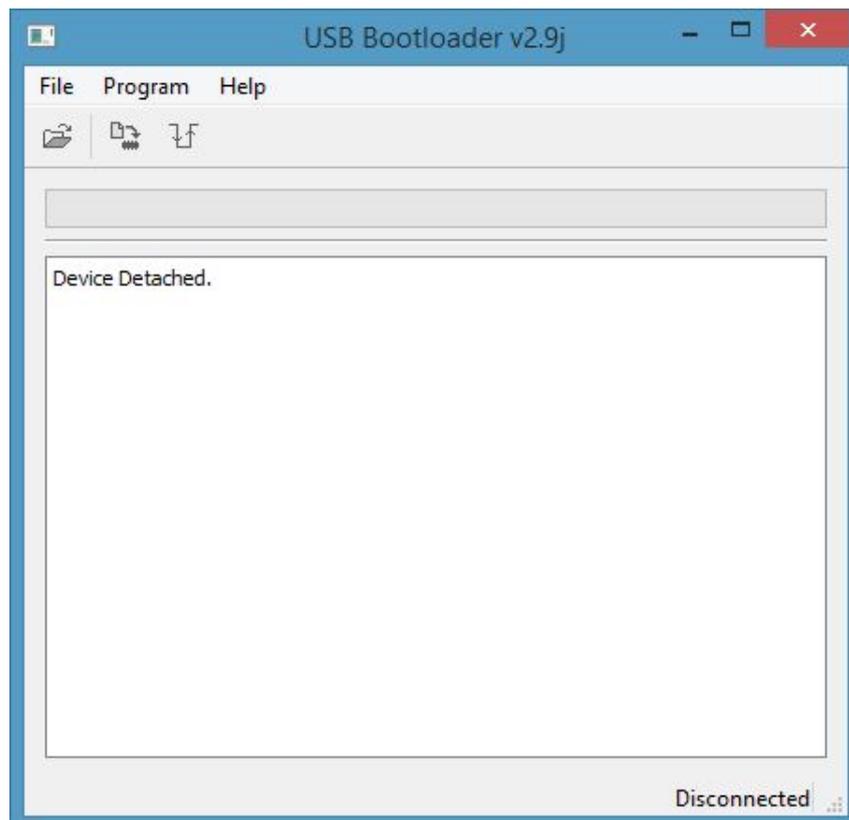


- The Bootloader GUI will automatically detect there is device attached. Open your hex file, **File -> Import Firmware Image -> CIKU.X.production.hex**. If successful, it will display “Opened: CIKU.X.production.hex” under “Device Ready (0.003s)”.
Path to hex file: **CIKU.X\dist\default\production\CIKU.X.production.hex.*

- Click on **Erase/Program/Verify Device** icon (middle icon) to upload the hex file into [CIKU](#) board.



- Click **Reset Device** icon (right icon) to start the user program on CIKU board. LED will blink with 100ms delay.



8. WARRANTY

- Product warranty is valid for 12 months.
- Warranty only applies to manufacturing defect.
- Damaged caused by misuse is not covered under warranty
- Warranty does not cover freight cost for both ways.

Prepared by:

Cytron Technologies Sdn. Bhd.

No. 16, Jalan Industri Ringan Permatang Tinggi 2,
Kawasan Industri Ringan Permatang Tinggi,
14100 Simpang Ampat,
Penang, Malaysia.

Tel: +604 - 504 1878

Fax: +604 - 504 0138

URL: www.cytron.com.my

Email: support@cytron.com.my
sales@cytron.com.my

Appendix A:

