

Bluetooth 4.0 Development Board (B-DB001 Base Board with B-001 core module)



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Version Information

Version	Date	Modified By	Introduction
1.1	01.2018	Guo	Release

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1. Hardware Description

1.1 Base Board

B-DB001 can use Nr-7 (3.7V lithium) battery (see picture below) through the LDO regulator as power supply. In this case D-DB001 turns into BT4.0 mobile node. The design greatly improves the node's working time and saves user expenses. Add on lithium battery charging circuit, makes USB Plug & Play for charging.



Features:

Base plate size: 7 * 5 cm

Serial communication: USB to serial port function (PL2102)

Power supply: square port USB, DC2.1 power supply (5V). 7 lithium battery (3.7V)

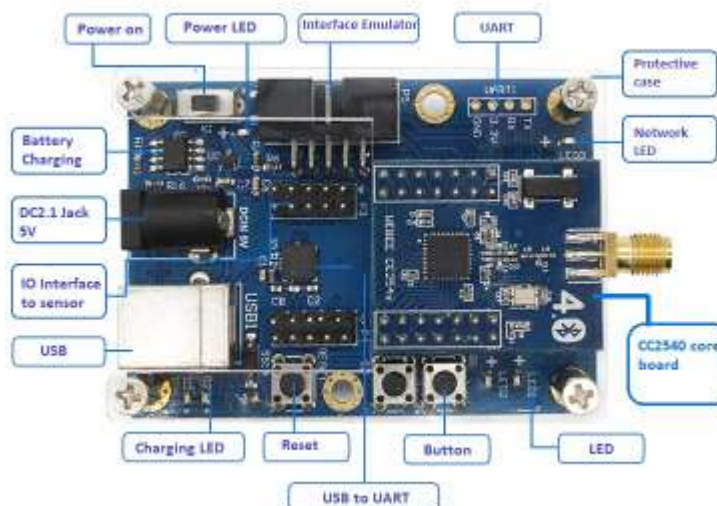
Interface: Debug interface, compatible with TI standard simulation tool, all IO ports are available, commonly used serial port pin and 5V / 3.3V pin

Buttons: 1xReset, 2xButton

LEDs: Power Indicator, Network Indicator and Common LED

Core Module: B-001 (CC2540) core module (which is included in shipment package)

Sensor module(optional): Temperature/Smoke/Humidity and so on.



1.2 B-001 Core Module

B-DB001 Base board supports one type of core module: B-001.

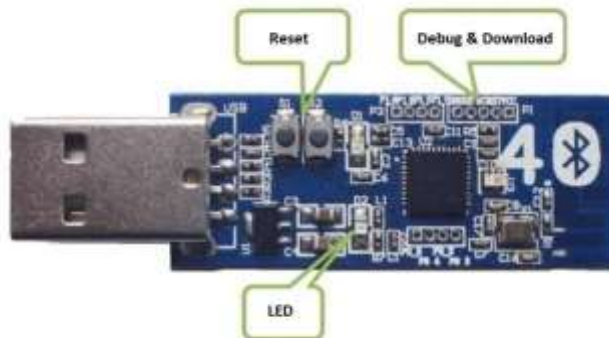
Refer to <http://h-2technik.com/online/webee/Bluetooth/B-001/B-001.pdf> for detail;



1.3 Emulator

User programs can be downloaded and debugged by using emulator. SmartRF Studio and packet sniffer function are also supported by emulator.

Key Feature: 4.7 x 1.7 cm; USB interface; PCB antenna; BT Packet sniffer function; compatible with TI BTool software;



2. Set up IDE

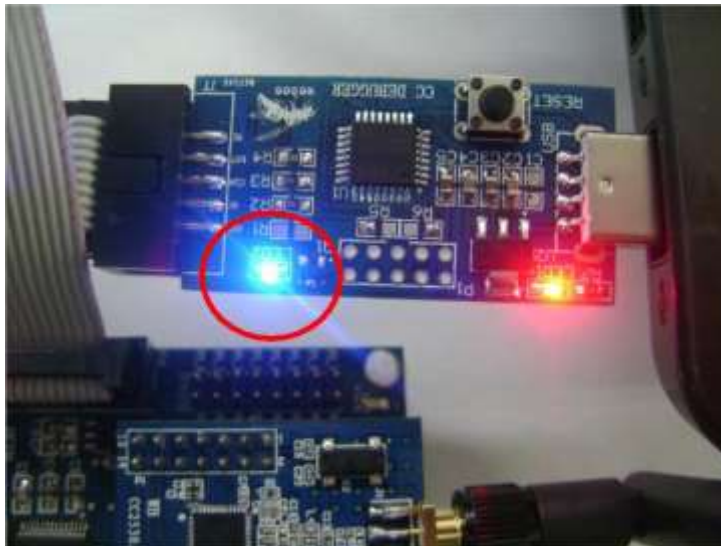
2.1 Installation Software and Driver

- IAR: To programming B-DB001 development kit is IAR (8.10, <https://www.iar.com/>) recommended. The advantage of using IAR as IDE is that BLE-Stack (<http://www.ti.com>) library can be imported/referred in project very easily.
- BLE-Stack version: BLE-CC254x-1.3.2.
- Emulator (SmartRF04EB) driver (<http://h-2technik.com/online/webee/Bluetooth/Dongle/Driver/cebal.zip>).

After installation, you insert the emulator into PC USB port, in device manager following should be seen:



To test if emulator can recognize develop board, you connect emulator to base board (with B-001) and press "Reset" button, LED2 is ON (blue) meaning CC2540 has been detected.



- Install Driver for USB to UART(http://h-2technik.com/online/webee/USB_TTL/CH340G_Driver%26Tool.zip): B-DB001 board integrated CP2102 USB to serial chip, we can install the corresponding driver for developing and debugging. After successful installation, in device manager you can see following:

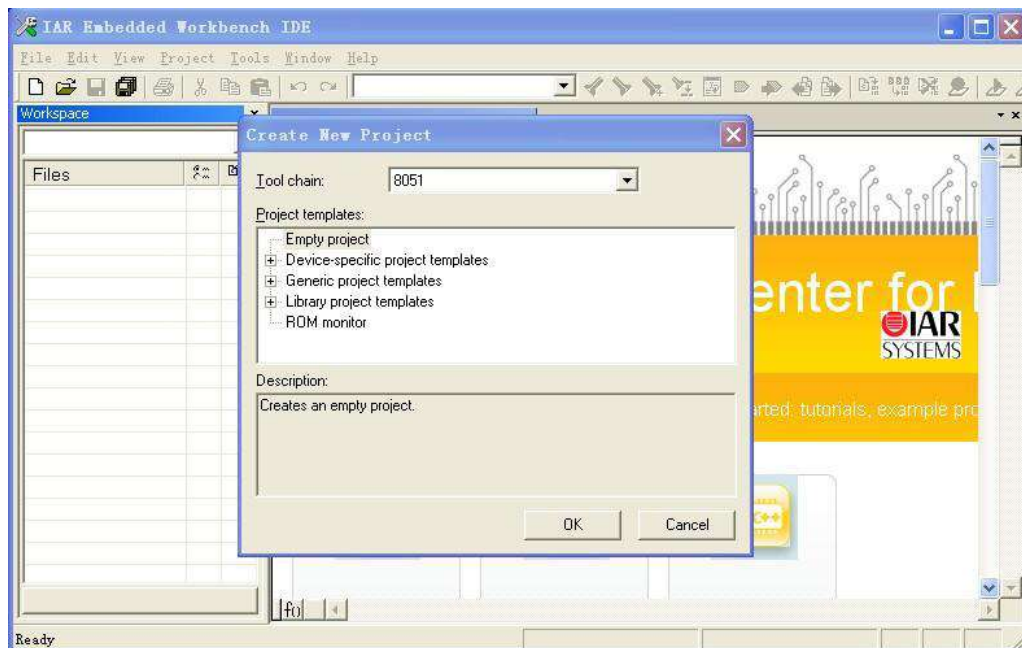


2.2 Test Project

After development environment has been set up, we can start with a simple project and test.

2.2.1 Create new project in IAR

Open IAR, project->Create New Project, accept all default settings and save project.



2.2.2 Create new file

File->new File to create a new file and input "#include <ioCC2540.h>" at the beginning of file, saving file with ".c" suffix under project path.



2.2.3 Programming

You type following code in your c file:

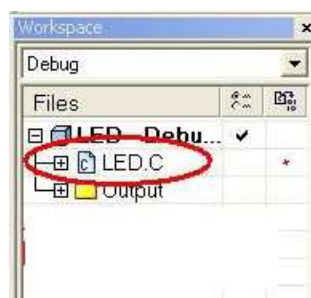
```
#define LED1 P1_0

Void main(void)
{
    P1DIR != 0x01; // set P1_0 as output

    LED1 = 0; //on LED

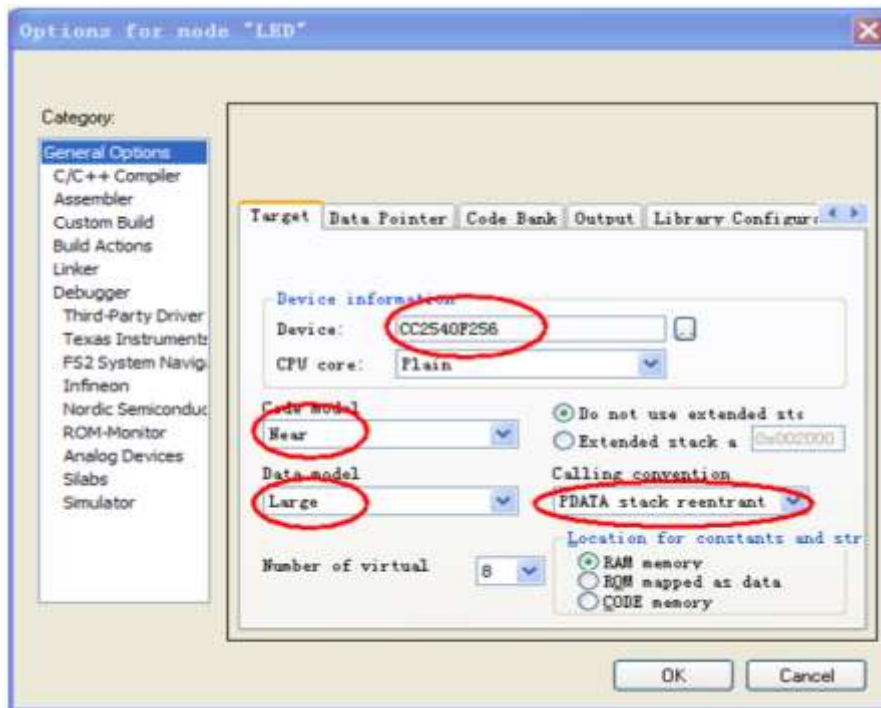
    While(1);
}
```

After saving, right clicking on project in workspace and “add” this file which is edited above into project.

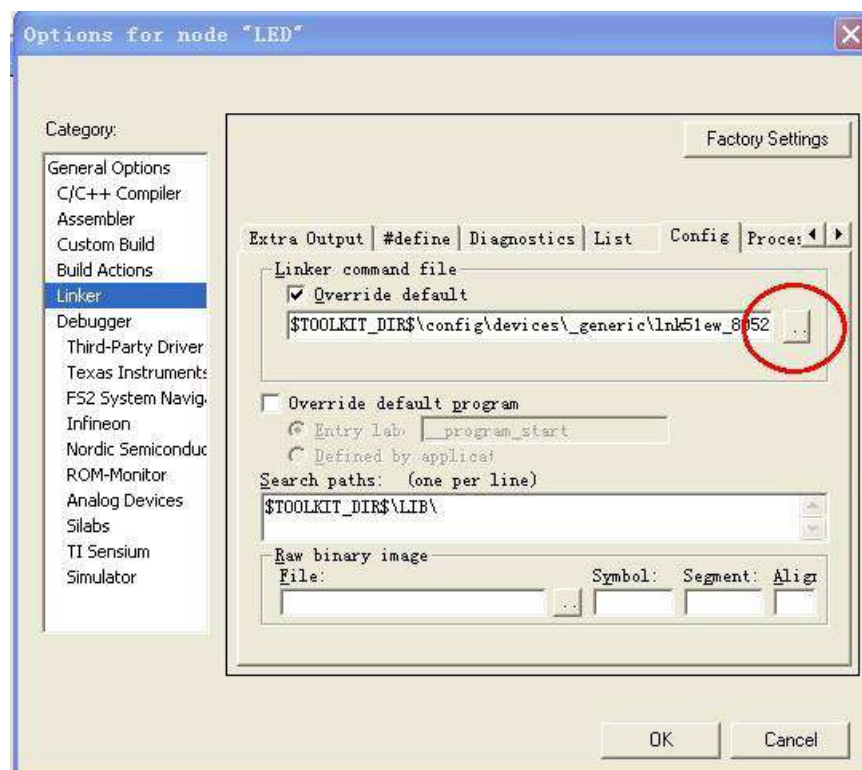


2.2.4 Options

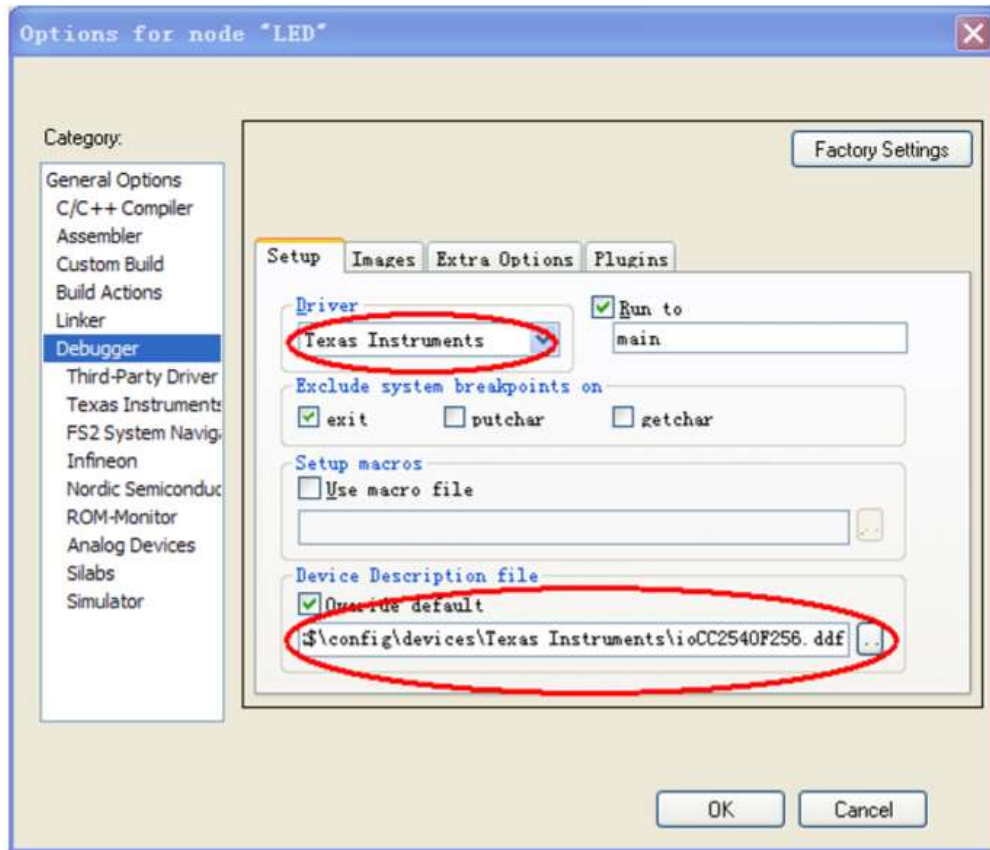
Project->Options, opening options configuration windows and selecting “General Options”. Now you have to select “CC2540F256” in “Device” from <Texas Instruments> directory.



Selecting Linker on left side, open “Config” register, choosing “lnk51ew_cc2540F256.xcl” for “Linker command file” from <Texas Instruments> directory.

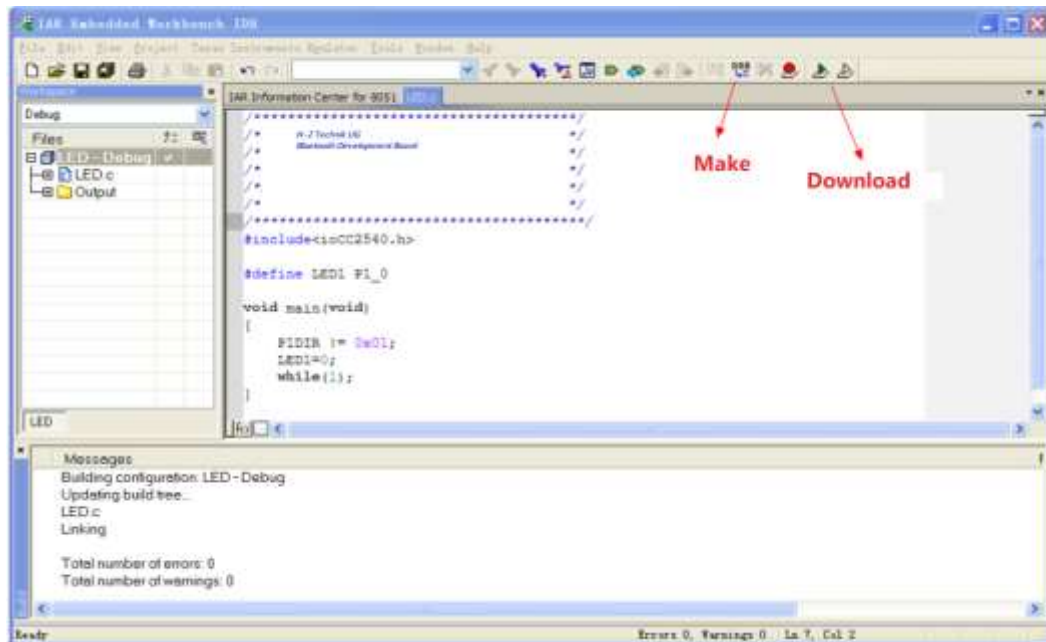


Selecting Debugger on left side, changing driver to “Texas Instruments” (emulator) and choosing “ioCC2540F256.ddf” as Driver Description file.



2.2.5 Make and debug

You can start to compile first project. If there is neither Error nor warning, you can connect emulator to B-DB001 base board, click Project->Download and Debug (You find short-cut key in IAR as well).



debugging process is started after download is over. You will see the LED1 is turned on.



After debugging, the program has been already written into flash of CC2530.