# Debugging the KeyFob demo software on CC2540 with CC-Debugger and IAR Embedded Workbench for 8051 8.20.2

The following document shows the few steps required to successfully download and debug the CC2540 KeyFob Demo software from the BLE stack, version 1.3.

Step 1: Download and install TI's Bluetooth Low Energy Stack, version 1.3 from www.ti.com/tool/ble-stack.

Step 2: Install IAR Embedded Workbench for 8051, v8.20 + Service Pack 8.20.2

Step 3: Open the KeyFobDemo project (C:\Texas Instruments\BLE-CC254x-1.3\Projects\ble\KeyFob\CC2540DB). The following warning might appear:
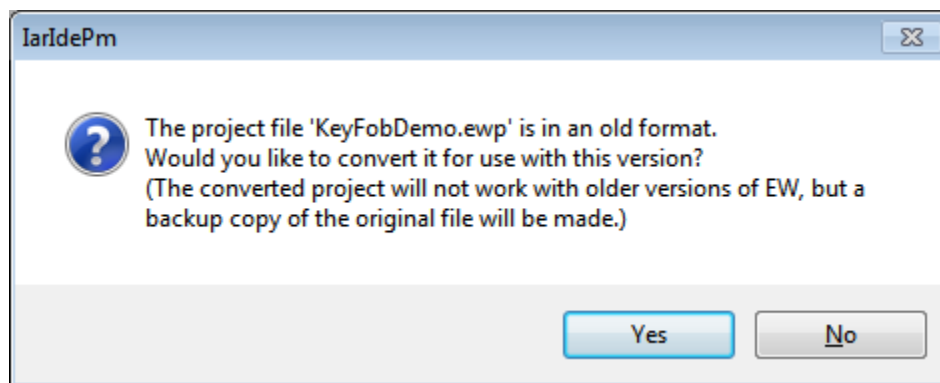
Just click yes and continue

Step 4: Build the project (Project -> Make). The compiler and linker should report 0 errors and 0 warnings.

Step 5: Debug (Project -> Download and Debug). A dialog window like the one below might appear. Select the correct target. In this case, it's the CC Debugger connected to the CC2540 KeyFob. Highlight the correct target and click the Select button.
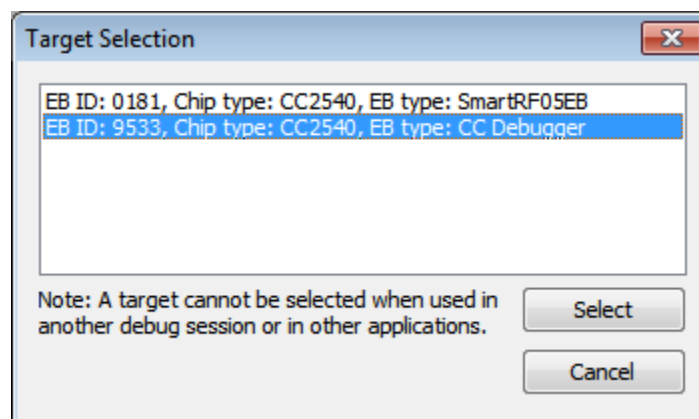
Step 6: IAR downloads the software to the target, and runs and halts the target at main. Everything looks good so far.
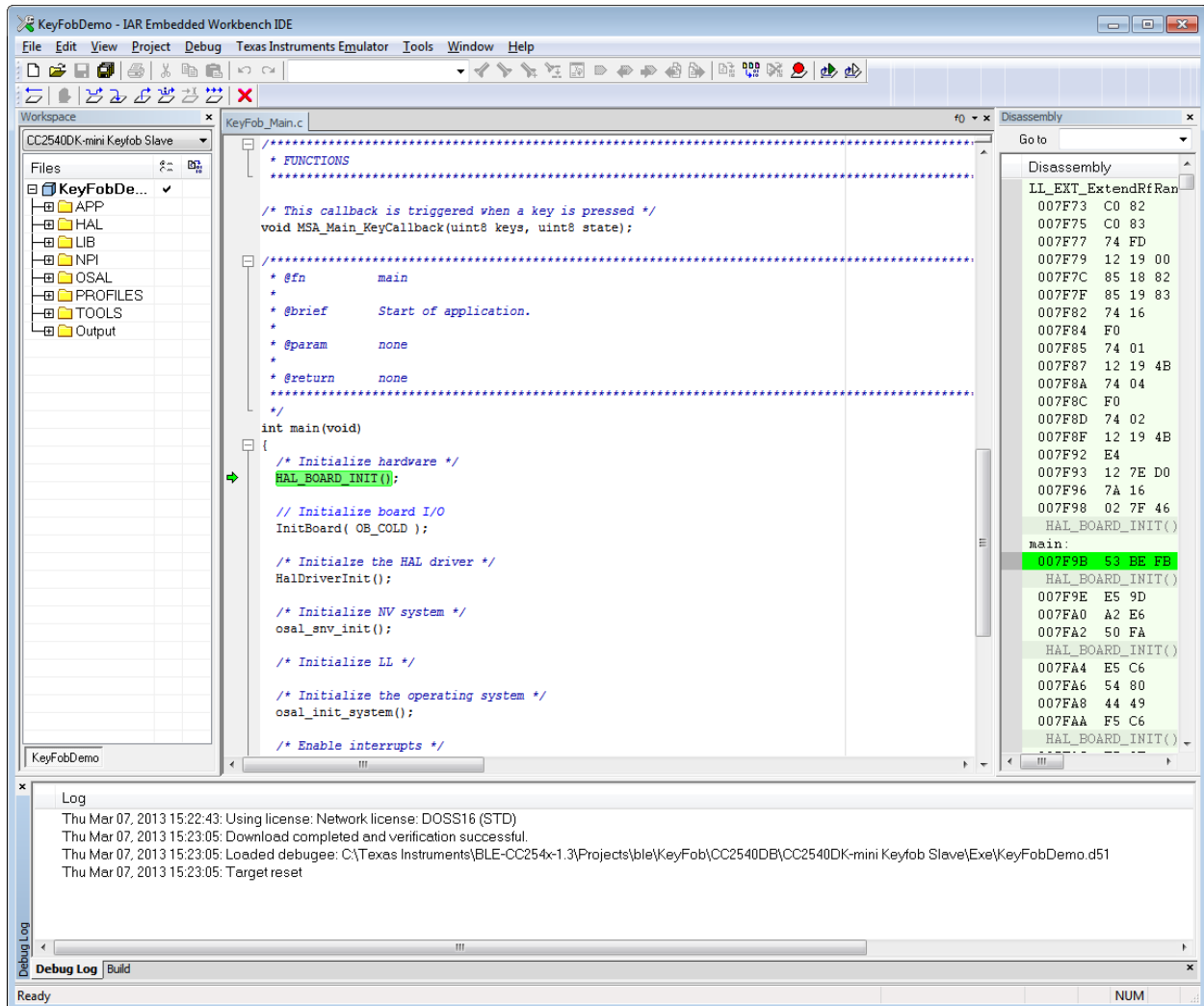
Step 7: Single stepping in the code. I observe that the target steps through the assembly code for the HAL_BOARD_INIT() macro, and eventually gets as far as to the InitBoard() function. So single stepping seems to be working fine.

Step 8: Click the "go" button ("->->->") and let the target run freely for a while. Now press Break. The IDE displays the following:
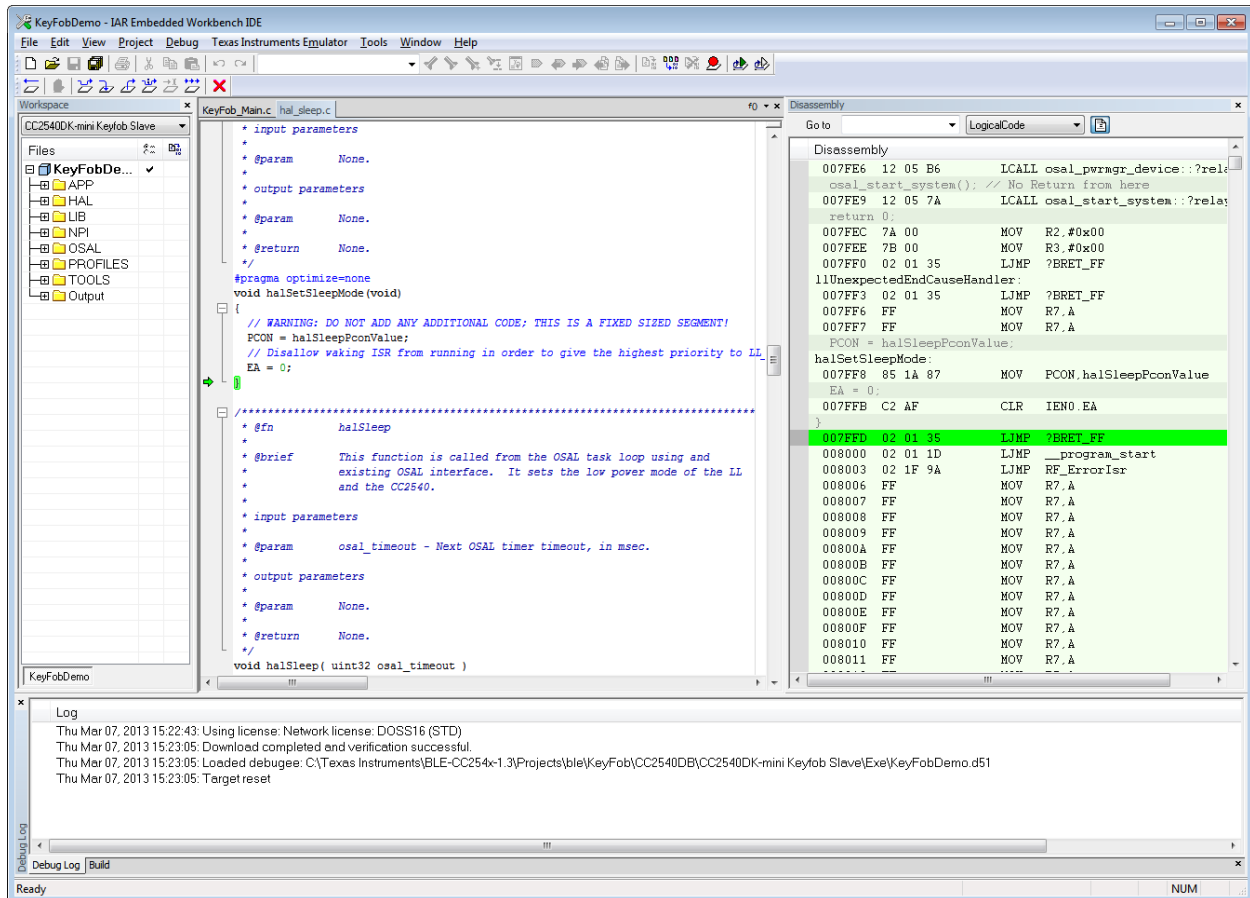
If I now try to single step again, I still have full control of the target. So it seems like debugging works fine.

So what about the project options? Let's take a closer look at the most relevant options:

Options for node "KeyFobDemo"

Category:

- General Options
- C/C++ Compiler
- Assembler
- Custom Build
- Build Actions
- Linker
- Debugger
  - Third-Party Driver
  - Texas Instruments
  - FS2 System Navig.
  - Infineon
  - Nordic Semiconduc
  - ROM-Monitor
  - Analog Devices
  - Silabs
  - Simulator

Tabs: **Target** | Data Pointer | Code Bank | Output | Library Configuration | Lib

Device information

Device: CC2540F256

CPU core: Plain

Code model: Banked

Data model: Large

Number of virtual registers: 16

- ⦿ Do not use extended stack
- ○ Extended stack at: 0x002000

Calling convention: XDATA stack reentrant

Location for constants and strings
- ○ RAM memory
- ⦿ ROM mapped as data
- ○ CODE memory

OK   Cancel

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Factory Settings

Config | Output | Extra Output | List | #define | Diagnostics | Check ◄ ►

Linker configuration file

☑ Override default

$PROJ_DIR$\..\..\common\cc2540\ti_51ew_cc2540b.xcl [...]

☐ Override default program entry

◉ Entry symbol   __program_start

◯ Defined by application

Search paths: (one per line)

Raw binary image

File: Symbol: Segment: Align:

[...]

OK   Cancel

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Factory Settings

Tabs: Config | **Output** | Extra Output | List | #define | Diagnostics | Check ◀ ▶

Output file

☐ Override default

KeyFobDemo.d51

Secondary output file:

(None for the selected format)

Format

◉ Debug information for C-SPY
    ☑ With runtime control modules
        ☑ With I/O emulation modules
            ☐ Buffered terminal output
    ☑ Allow C-SPY-specific extra output file
○ Other
    Output format: `intel-extended`
    Format variant: `None`

Module-local symbols: `Include all`

[OK]   [Cancel]

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Factory Settings

Tabs: Config | Output | **Extra Output** | List | #define | Diagnostics | Check ◄ ►

☑ Generate extra output file

Output file

☑ Override default

CC2540MiniDkDemoSlave.hex

Format

Output format: intel-extended ▼

Format variant: None ▼

OK   Cancel

Options for node "KeyFobDemo"

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Factory Settings

| Setup | Images | Extra Options | Plugins |

Driver

Texas Instruments ▼

☑ Run to

main

Exclude system breakpoints on

☑ exit   ☐ putchar   ☐ getchar

Setup macros

☐ Use macro file

[   ] [...]

Device Description file

☐ Override default

$TOOLKIT_DIR$\config\devices\Texas Instruments\ioCC2540F. [...]

OK   Cancel

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[Factory Settings]

Download | Target

☑ Erase flash

☐ Suppress download

☑ Retain unchanged pages

☐ Retain flash pages

[   ]

☑ Verify download

   ◉ CRC-16

   ◯ Read back memory

Flash lock protection

☐ Lock flash memory

  ◉ CC111x, CC243x, CC251x

    ☐ Boot block lock

    [Lock bits 000b (all page ▾]

    <page size info. missing>

  ◯ CC253x, CC254x

    [   ]

    example: 0-6,8,12

☐ Debug interface lock

[OK] [Cancel]