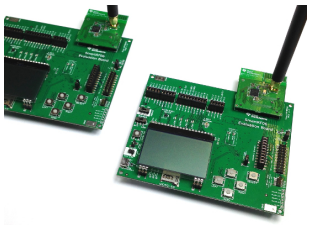
CC13xx CC26xx Tools Overview

This article gives you an overview of the Tools and kits available for developing on the CC13xx and CC26xx family of devices.

Contents

Kits

CC1310DK



- Platform for firmware development
- RF performance reference design
- 2x CC1310EM-7XD-7793
- 2x SmartRF06EB

Get CC1310DK (http://www.ti.com/tool/cc1310dk)

CC1310EMK

- RF performance reference design
- Compatible with SmartRF06EB
- 2x CC1310EM-7XD-7793
- 2x Pulse W5017 antennas

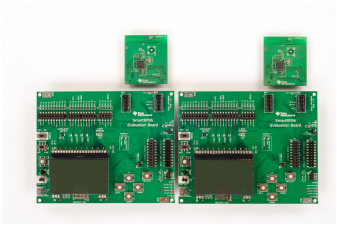
Get CC1310EMK (http://www.ti.com/tool/cc1310emk)

CC2640R2 LaunchPad

- XDS110 debugger included on board
- RF performance reference design
- Primary kit for BLE development with the SIMPLELINK-CC2640R2-SDK (http://www.ti.com/tool/SIMPLELINK-CC2640R2-SDK)
- Bluetooth 5 Ready

Get LAUNCHXL-CC2640R2 (http://www.ti.com/tool/launchxl-cc2640r2)

CC2650DK



- Platform for firmware development
- RF performance reference design
- 2x CC2650EM-7ID
- 2x SmartRF06EB

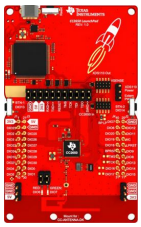
Get CC2650DK (http://www.ti.com/tool/cc2650dk)

CC2650STK

- Sensor kit for app developers
- iOS and Android apps available
- Contains CC2650 BLE SensorTag
- IoT enabled

Get CC2650STK (http://www.ti.com/tool/cc2650stk)

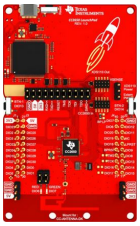
CC2650 LaunchPad



- XDS110 debugger included on board
- RF performance reference design
- Note: TI recommends CC2640R2F LaunchPad (http://www.ti.com/tool/launchxl-cc2640r2)for BLE development
- IoT and multi-protocol enabled

Get LAUNCHXL-CC2650 (http://www.ti.com/tool/launchxl-cc2650)

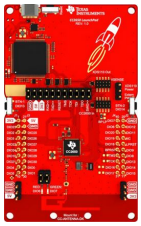
CC1350 LaunchPad



- XDS110 debugger included on board
- RF performance reference design
- Dual-band Wireless MCU
- Supported in the BLE-Stack (http://www.ti.com/ble-stack) SDK
- IoT enabled

Get LAUNCHXL-CC1350 (http://www.ti.com/tool/launchxl-cc1350)

CC1310 LaunchPad



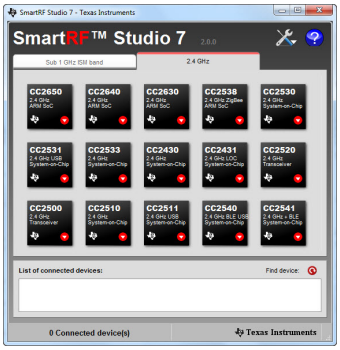
- XDS110 debugger included on board
- RF performance reference design
- Sub
- IoT enabled

Get LAUNCHXL-CC1310 (http://www.ti.com/tool/launchxl-cc1310)

- All LaunchPad and SmartRF06 kits featured above can be used as a standalone JTAG debugger / programmer to custom boards with CC26xx / CC13xx wireless MUCs. Refer to the LaunchPad procedure in Application Note SWRA534 (http://www.ti.com/lit/pdf/swra534).

Software Tools

This section covers the software tools available for the CC13xx/CC26xx device family.



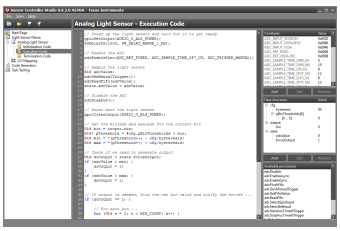
SmartRF Studio 7

What is SmartRF Studio?

SmartRF Studio is a PC application that helps designers of radio systems to easily evaluate the RF-IC at an early stage in the design process.

- Can be used in combination with several development kits for Texas Instruments' CCxxxx RF-ICs.
- Test functions for sending and receiving radio packets, continuous wave transmit and receive.
- Evaluate RF performance on custom boards by wiring it to a supported evaluation board or debugger.
- Can also be used without any hardware, but then only to generate, edit and export radio configuration settings.

Get SmartRF Studio 7 (http://www.ti.com/tool/smartrftm-studio)



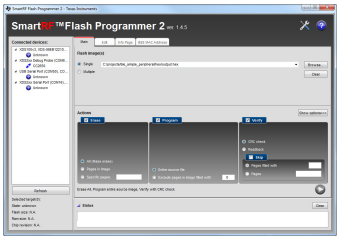
Sensor Controller Studio

What is Sensor Controller Studio?

Sensor Controller Studio provides a development environment for the CC26xx/CC13xx Sensor Controller. The Sensor Controller is a proprietary, power-optimized CPU located in the CC26xx/CC13xx AUX domain, which can perform simple background tasks autonomously and independent of the System CPU state.

- Allows for Sensor Controller task algorithms to be implemented using a C-like programming language
- Outputs a Sensor Controller Interface driver, which incorporates the generated Sensor Controller machine code and associated definitions
- Allows for rapid development by using the integrated Sensor Controller task testing and debugging functionality. This allows for live visualization of sensor data and algorithm verification.

Get Sensor Controller Studio (http://www.ti.com/tool/sensor-controller-studio)



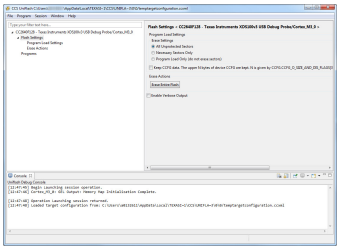
SmartRF Flash Programmer 2

What is SmartRF Flash Programmer 2?

SmartRF Flash Programmer 2 is a PC application for JTAG programming TI CC13x0 & CC26x0 ARM devices.

- Graphical User Interface (GUI) and Command Line Interface (CLI) versions.
- Features: Edit secondary MAC addresses, program multiple files.
- Supports cJTAG/JTAG interface and CC13xx/CC26xx serial bootloader
- Please note JTAG programming of CC13x2 and CC26x2 devices is not supported. Please use Uniflash

Get SmartRF Flash Programmer 2 (http://www.ti.com/tool/flash-programmer)



Uniflash

What is Uniflash?

Uniflash is a standalone flash programmer with Windows, Mac and Linux desktop support

- Graphical User Interface (GUI) and Command Line Interface (CLI) versions.
- Uniflash 4.x has built-in support for CC13xx/CC26xx devices (for CCS Uniflash 3.1, see here)

Get Uniflash (http://processors.wiki.ti.com/index.php/Category:CCS_UniFlash)

IDEs and Compilers

This section covers IDEs and compilers supported for the CC13xx/CC26xx device family. Refer to the SDK documentation for the supported IDE and compiler versions.

Code Composer Studio

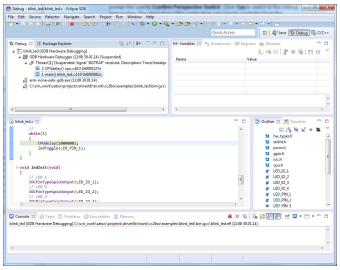
- Integrated development environment with project management tools and editor
- Code Composer Studio (CCS) 6.1 has built-in support for the CC13xx/CC26xx device family (CCS 6.0.1 support via in-app updates)
- Best support for XDS debuggers; XDS100v3, XDS110 and XDS200
- High integration with TI-RTOS with support for TI-RTOS Object View
- Use CCS for free - A free, unlimited code size license will be generated that supports working with attached low cost XDS100v3/XDS110 equipped debug probes from TI or TI development kits with an on board debug probe.
  This includes the CC2650DK (XDS100v3), CC13xx/CC26xx LaunchPads & the Debugger DevPack (XDS110) for the CC2650 SensorTag. CCS v7 and later can be used for free without the need of an attached TI development kit / probe.
  See the CCS Licensing Wiki for more details.

More about Code Composer Studio (http://www.ti.com/ccs)

IAR Embedded Workbench for ARM

- Integrated development environment with project management tools and editor
- IAR EWARM 7.30.3 and up has built-in support for the CC13xx/CC26xx device family
- Broad debugger support, supporting XDS100v3, XDS110, XDS200, IAR I-Jet and Segger J-Link
- Integrated development environment with project management tools and editor
- RTOS plugin available for TI-RTOS

More about IAR EWARM (https://www.iar.com/iar-embedded-workbench/partners/texas-instruments/ti-wireless/)



GCC/GDB

GNU Compiler Collection (GCC) and GNU Project Debugger (GDB) support is documented in an application note using CGG ARM Embedded.

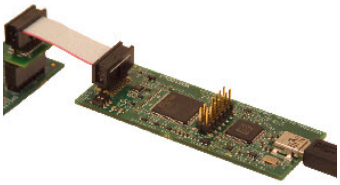
- Basic support
- Application note Using GCC/GDB with CC26xx/CC13xx (http://www.ti.com/lit/swra446)
- Not supported for developing BLE-Stack applications

More about GCC ARM Embedded (https://launchpad.net/gcc-arm-embedded)

Debuggers

This section covers the debuggers that support the CC13xx/CC26xx device family.

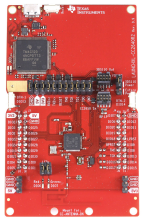
XDS100v3



- Integrated on SmartRF06EB (http://www.ti.com/tool/smartrf06ebk)
- Stand-alone version from Spectrum Digital (http://www.spectrumdigital.com/product_info.php?products_id=251)
- Supported in CCS and IAR
- 2-pin cJTAG and 4-pin JTAG
- Low-cost

More about XDS100v3 (http://processors.wiki.ti.com/index.php/XDS100)

XDS110



- Faster download speeds than XDS100v3
- On board debugger for CC13xx and CC26xx LaunchPads
- Functions as a standalone debugger for CC26xx/CC13xx custom boards
- 2-pin cJTAG and 4-pin JTAG
- SWO trace support
- Supported in IAR and CCS 6.1+

More about XDS110 (http://processors.wiki.ti.com/index.php/XDS110)

XDS200

- Stand-alone version from Spectrum Digital (http://www.spectrumdigital.com/product_info.php?&products_id=261)
- Supported in CCS and IAR
- 2-pin cJTAG and 4-pin JTAG
- SWO trace support
- Faster download speeds than XDS110

More about XDS200 (http://processors.wiki.ti.com/index.php/XDS200)

IAR I-Jet

- Supported in IAR
- 2-pin cJTAG and 4-pin JTAG
- SWO trace support

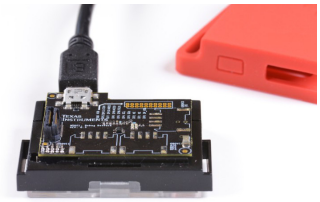
More about IAR I-Jet (https://www.iar.com/iar-embedded-workbench/add-ons-and-integrations/in-circuit-debugging-probes/)

Segger J-Link

- Supported in IAR and CCS
- 4-pin JTAG
- Requires v6.00g or later of the jLink drivers (https://www.segger.com/jlink-software.html)

More about Segger J-Link (https://www.segger.com/jlink-debug-probes.html)

CC-DEVPACK-DEBUG



- Integrated XDS110
- Debugger DevPack for the CC2650STK SensorTag
- Not recommended for custom board programming or debugging
- No Vsense or level shifters

More about Debugger DevPack (http://www.ti.com/tool/cc-devpack-debug)

- Note: ICDI based debuggers, such as found on TM4C LaunchPads, are not compatible with CC13xx/CC26xx devices
- Note: XDS100v2 is not compatible with CC13xx/CC26xx devices

Production Programmers

There are several production programming solutions available for the CC26xx and CC13xx devices. Please refer to e.g.

- Elprotronic (http://www.elprotronic.com)
- Elnec (http://www.elnec.com)
- BPM Microsystems (http://www.bpmmicro.com)

Tips & Tricks

XDS100v3

- How to setup XDS100v3 (Olimex) to be able to run example project UartEcho with CC2650/CC2640 on a custom board or SensorTag (TI E2E) (https://e2e.ti.com/support/wireless_connectivity/f/538/t/448029)

XDS110

CC-DEBUG-DEVPACK + SensorTag 2.0

When using the CC-DEBUG-DEVPACK (XDS110 debugger) with the SensorTag 2.0 (CC2650STK), make sure the SensorTag battery is mounted before attaching USB.

If you power up a CC-DEBUG-DEVPACK (Debugger DevPack) when connected to a SensorTag without battery (or a weak battery), it will boot in "firmware upgrade mode" in the Windows Control Panel. The Debugger DevPack cannot be used to debug or program CC26xx in "firmware upgrade mode." If this mode occurs, disconnect USB, remove & re-insert a fresh battery into the SensorTag, then re-attach USB to the Debugger DevPack. The battery can then be removed once the Debugger DevPack is powered up correctly.

Using IAR 7.40.2 with XDS110 and CC26xx

This section applies to IAR EWARM 7.40.2. EWARM 7.40.3 has built-in support for XDS110 (last updated 2015-08-19).

IAR 7.40.2+ has built-in support for XDS110 debugger that works together with CC13xx/CC26xx devices. To enable XDS110 support, follow the below steps.

1. Install the included XDS Emulation Software Package on your computer (Important: use "Run as administrator" on Win7)
    1. It is recommended to use the default installation directory
2. Configure your IAR project to use XDS110 debugger
    1. Project > Options > Debugger: Select "TI XDS" as the Debugger driver
    2. Project > Options > Debugger > TI XDS:
        1. Select "TI XDS110 Emulator" from drop down menu.
    3. Click OK to save settings.

4. Repeat for each project in the Workspace.

3. Connect your XDS110 debugger to your CC26xx target and make sure both are powered up.

You should be able to download and debug your CC26xx project using XDS110.

Using CCS v6.1 with XDS110 and CC13xx/CC26xx

CCS v6.1 supports XDS110 when the latest updates are applied. Refer to the Debug_DevPack_User_Guide for the setup procedure.

Using 2-wire / cJTAG with CCS

To use the XDS110 in cJTAG (2-wire) mode, please make sure your XDS110 firmware and CC26xx Device Support in CCS are up-to-date. Most CC26xx/CC13xx SDKs, including BLE-Stack v2.2.0, by default configure CCS to support cJTAG mode. If you are using an older SDK that does not configure XDS110 for cJTAG, you can configure CCS according to the procedure in this E2E post (https://e2e.ti.com/support/wireless_connectivity/bluetooth_low_energy/f/538/p/410451/1971482#1971482).

Adding device support to CCS Uniflash 3.1

This section applies to CCS Uniflash 3.1. It is recommended to upgrade to Uniflash v3.3 or later (last updated 2015-08-19)

CCS Uniflash 3.1 does not have built-in support for CC13xx and CC26xx devices. Follow the below steps to add device support to CCS Uniflash 3.1.

1. Open CCS Uniflash
2. Addding software site
    1. Go to Help > Install New Software ...
    2. Click "Available Software Sites" in the upper right corner
    3. Click Add ...
    4. The actual URL to be filled in the 'location' dialog is dependent on CCS version:
        1. Name: *CC2xxx Device Support Updates*
        2. Location: *http://software-dl.ti.com/dsps/dsps_public_sw/sdo_ccstudio/smartrf/CCSv6*
    5. Click OK twice to get back to the main window of Uniflash
3. Go to Help > Check for Updates
4. If updates are available, they will appear in the list of updates.
5. Follow the Wizard to complete the update

Using CC13xx/CC26xx in MDK-ARM with Segger J-Link

This article describes how: Using Keil MDK-ARM with CC13xx/CC26xx

{{ 1. switchcategory:MultiCore= • For technical support on MultiCore devices, please post your questions in the C6000 MultiCore Forum • For questions related to the BIOS MultiCore SDK (MCSDK), please use the BIOS Forum Please post only comments related to the article **CC13xx CC26xx Tools Overview** here.	Keystone= • For technical support on MultiCore devices, please post your questions in the C6000 MultiCore Forum • For questions related to the BIOS MultiCore SDK (MCSDK), please use the BIOS Forum Please post only comments related to the article **CC13xx CC26xx Tools Overview** here.	C2000=*For technical support on the C2000 please post your questions on The C2000 Forum. Please post only comments about the article **CC13xx CC26xx Tools Overview** here.*	DaVinci=*For technical support on DaVincoplease post your questions on The DaVinci Forum. Please post only comments about the article **CC13xx CC26xx Tools Overview** here.*	MSP430=*For technical support on MSP430 please post your questions on The MSP430 Forum. Please post only comments about the article **CC13xx CC26xx Tools Overview** here.*	OMAP35x=*For technical support on OMAP please post your questions on The OMAP Forum. Please post only comments about the article **CC13xx CC26xx Tools Overview** here.*	OMAPL1=*For technical support on OMAP please post your questions on The OMAP Forum. Please post only comments about the article **CC13xx CC26xx Tools Overview** here.*	MAVRK=*For technical support on MAVRK please post your questions on The MAVRK Toolbox Forum. Please post only comments about the article **CC13xx CC26xx Tools Overview** here.*	*For technical su please post you questions at http://e2e.ti.cor Please post on comments abo article **CC13xx CC26xx Tools Overview** here* }}

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- Microcontrollers (MCU)
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