University of Strathclyde Glasgow

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OMAP-L138 Experimenter Kit and CCS6: Setup guide

This document describes how to install CCS6 and DSP/BIOS on Windows 10. Installation procedure on on other operating systems may differ and it has not been tested.

1 Software installation

The programming environment that will be used for the OMAP-L138 Experimenter Kit is Code Composer Studio 6 (CCS6), version 6.1.3.00034 (Jul 2, 2016). CCS6 is available as free download from the TI Wiki website: http://software-dl.ti.com/ccs/esd/documents/ccs_downloads.html. In section "Code Composer Studio Version 6 Downloads", go to version 6.1.3.00034 and click on the "Off-line Installers" link for Windows (Figure 1).

6.1.3	6.1.3.00034	Jul 2, 2016	**Off-line Installers:** Windows MD5 Linux MD5 MacOS MD5	• **New in this release:** • Support for MacOS (CC13xx, CC2538, CC2650, CC3200, C2000, MSP430, MSP432, TM4C, Hercules) • Bug fixes • Updated device support • Eclipse 4.5 • ARM, C2000, MSP430 compiler update to 15.12 LTS • **Build 33 vs 34** There is no functional difference between build 33 and 34, the only change was to correct an issue in the installer. • **Installation**: see instructions in README Linux file. See also additional Linux Installation Instructions • The manifest lists the software components included in this product. • **Update Status**: this release will not be available as an update.

Figure 1: "Off-line Installers" links.

You will be redirected to the TI website. Register on the TI website, log in and complete the required export approval form (select "Civil" for end-equipment/application); download the CCS6.1.3.00034_win32.zip file and unzip it.

A pop-up window may appear, asking to turn off the real-time file scanning (Figure 2). Temporarily disable your anti-virus software and click "Yes" to continue.

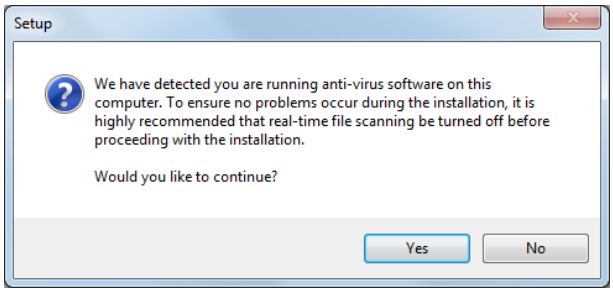

Figure 2: Pop-up window.

Accept the terms of the license agreement and click “Next” (Figure 3).

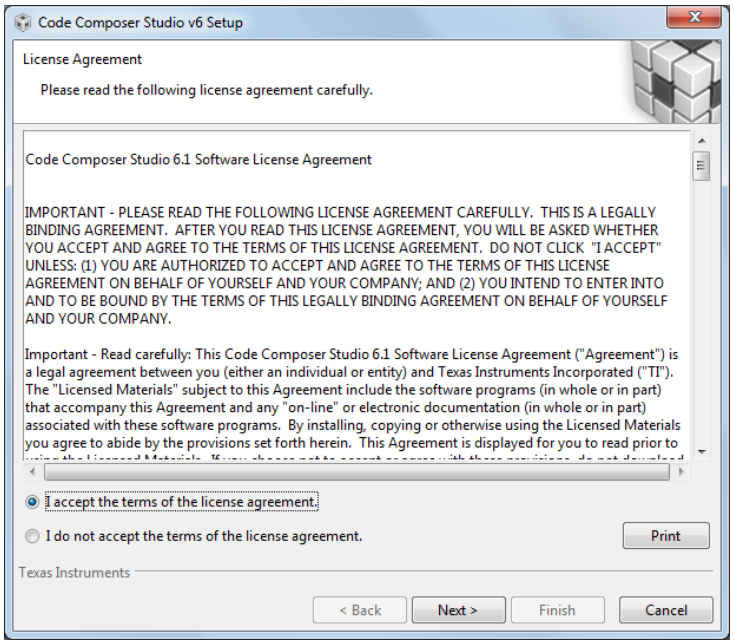

Figure 3: License agreement.

Select an installation folder and click “Next” (Figure 4).

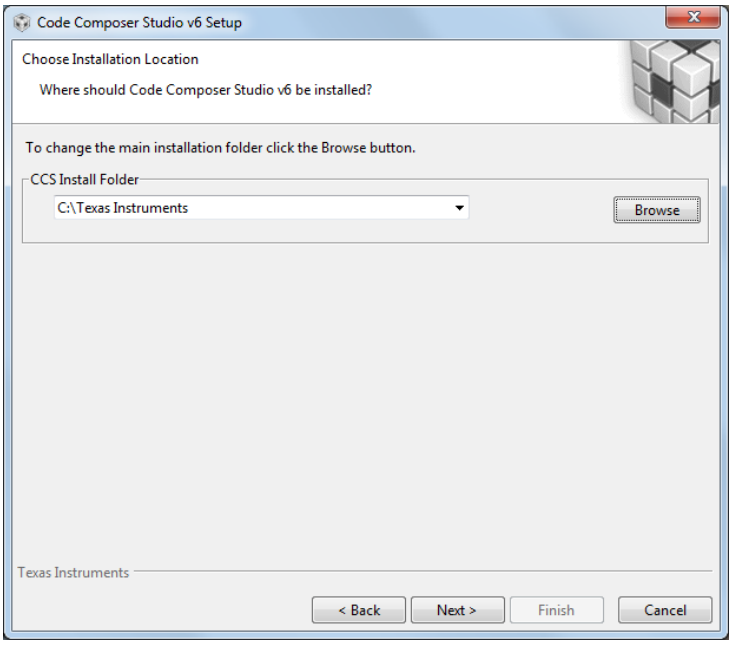

Figure 4: Installation folder.

Select the processor support as indicated in Figure 5 and click “Next”.

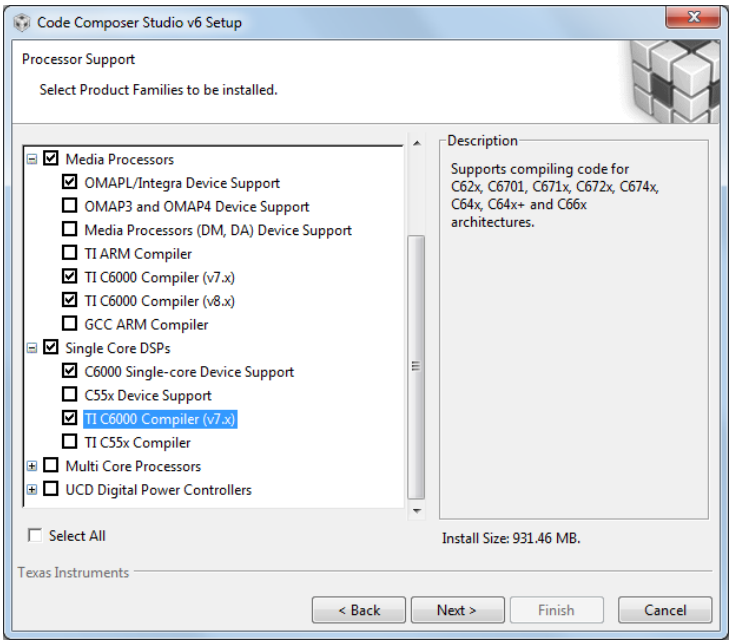

Figure 5: Processor support.

Select the debug probes as indicated in Figure 6 and click “Next”.

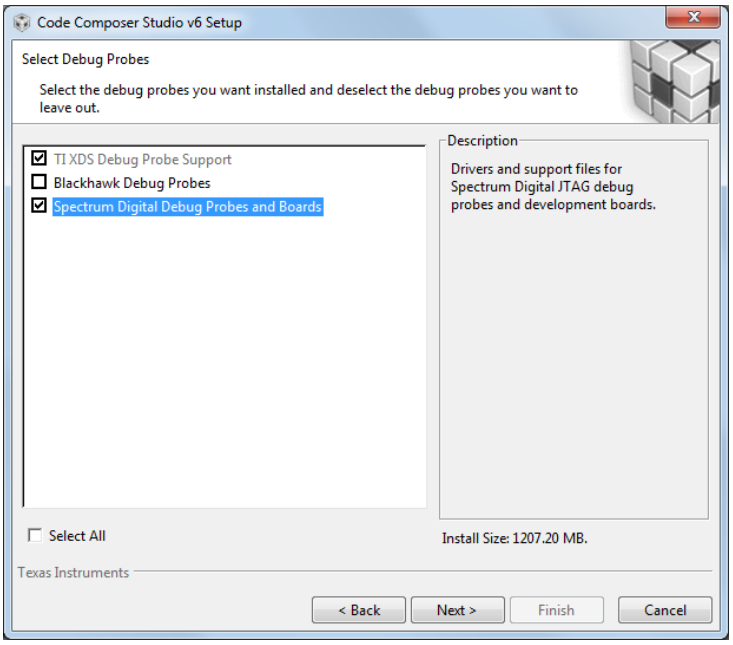

Figure 6: Debug probes.

Then click "Finish" (Figure 7).

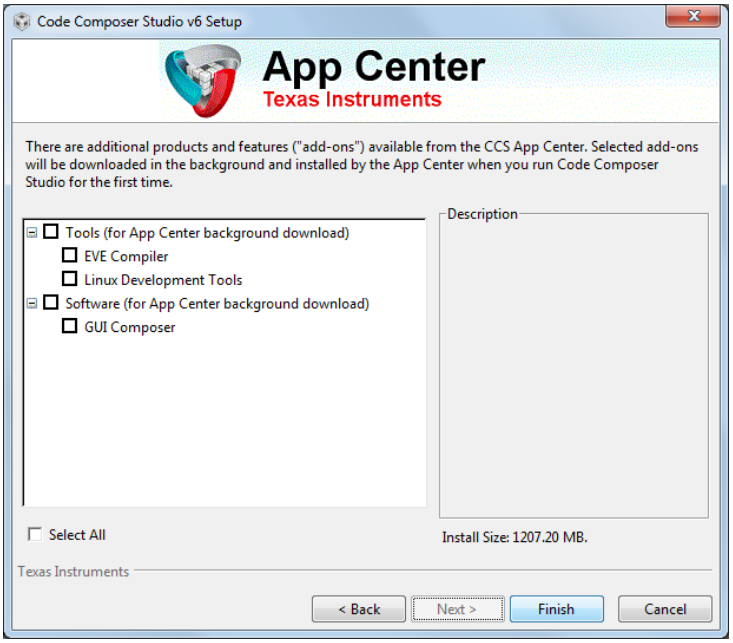

Figure 7: Click "Finish".

The installation of CCS6 will start. A Window Security Alert may pop-up. Select "Private networks" and "Allow access" (Figure 8).

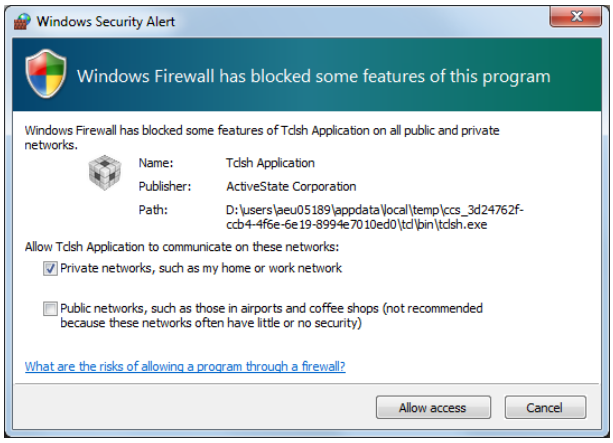

Figure 8: First Window Security Alert.

Let the installation proceed and, when asked, select to create the wanted shortcuts (Figure 9).

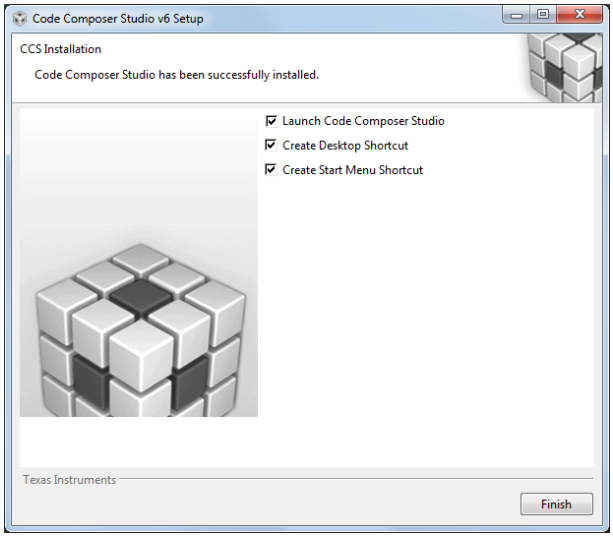

Figure 9: Creation of shortcuts.

A warning message (Figure 10) may pop-up and the installation procedure may end. Please don't panic: CCS6 has been installed correctly!

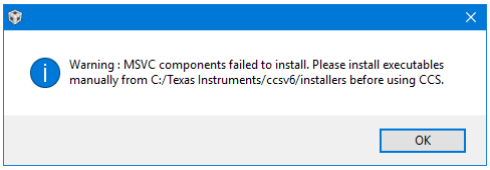

Figure 10: Warning message on Windows 10.

If asked, choose a location on disk to create the workspace (Figure 11).

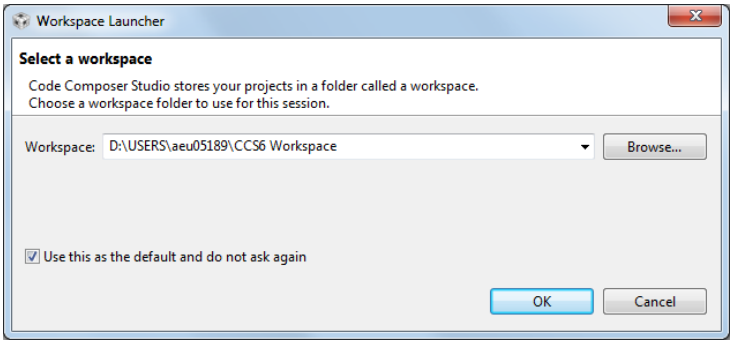

Figure 11: Workspace selection.

When the next Window Security Alert pops-up, select "Private networks" and "Allow access" (Figure 12).

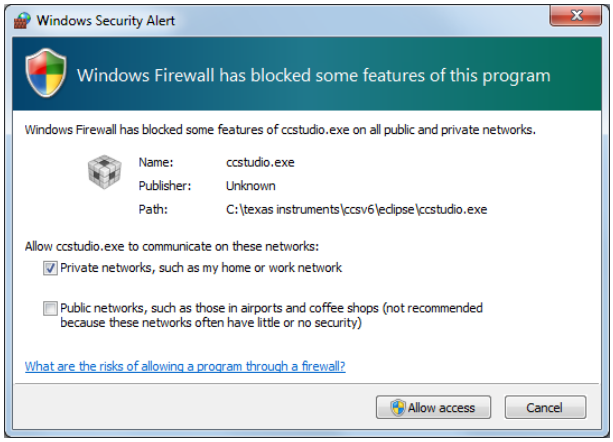

Figure 12: Second Window Security Alert.

Finally the CCS6 workspace will appear (Figure 13).

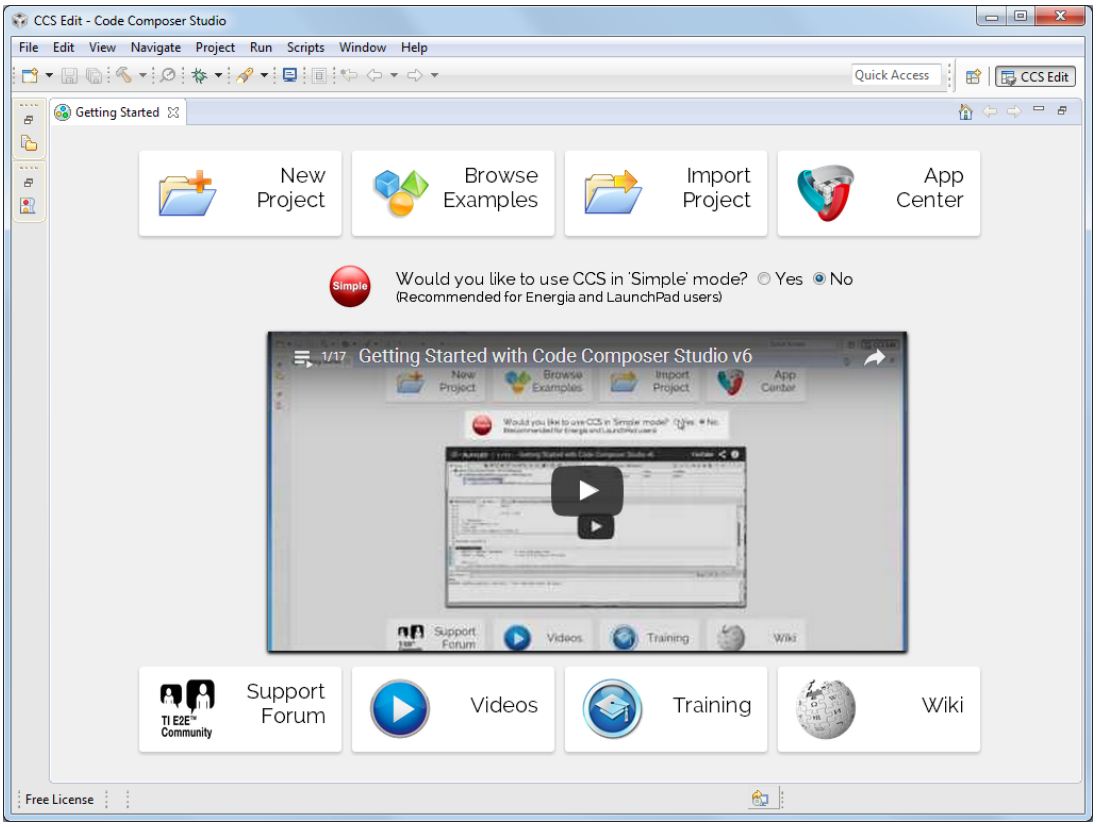

Figure 13: CCS6 workspace.

To install DSP/BIOS for CCS6, follow the procedure described here:

- Go to http://software-dl.ti.com/dsps/dsps_public_sw/sdo_sb/targetcontent/dspbios/index.html and click "DSP/BIOS 5.42.01.09".
- On the subsequent page, click "5.42.01.09 Windows installer"
- Save the file to download as "bios_setupwin32_5_42_01_09.exe", i.e. add the ".exe" extension, in case it is missing.
- Once downloaded, launch the executable and follow the installation procedure (Figure 14).

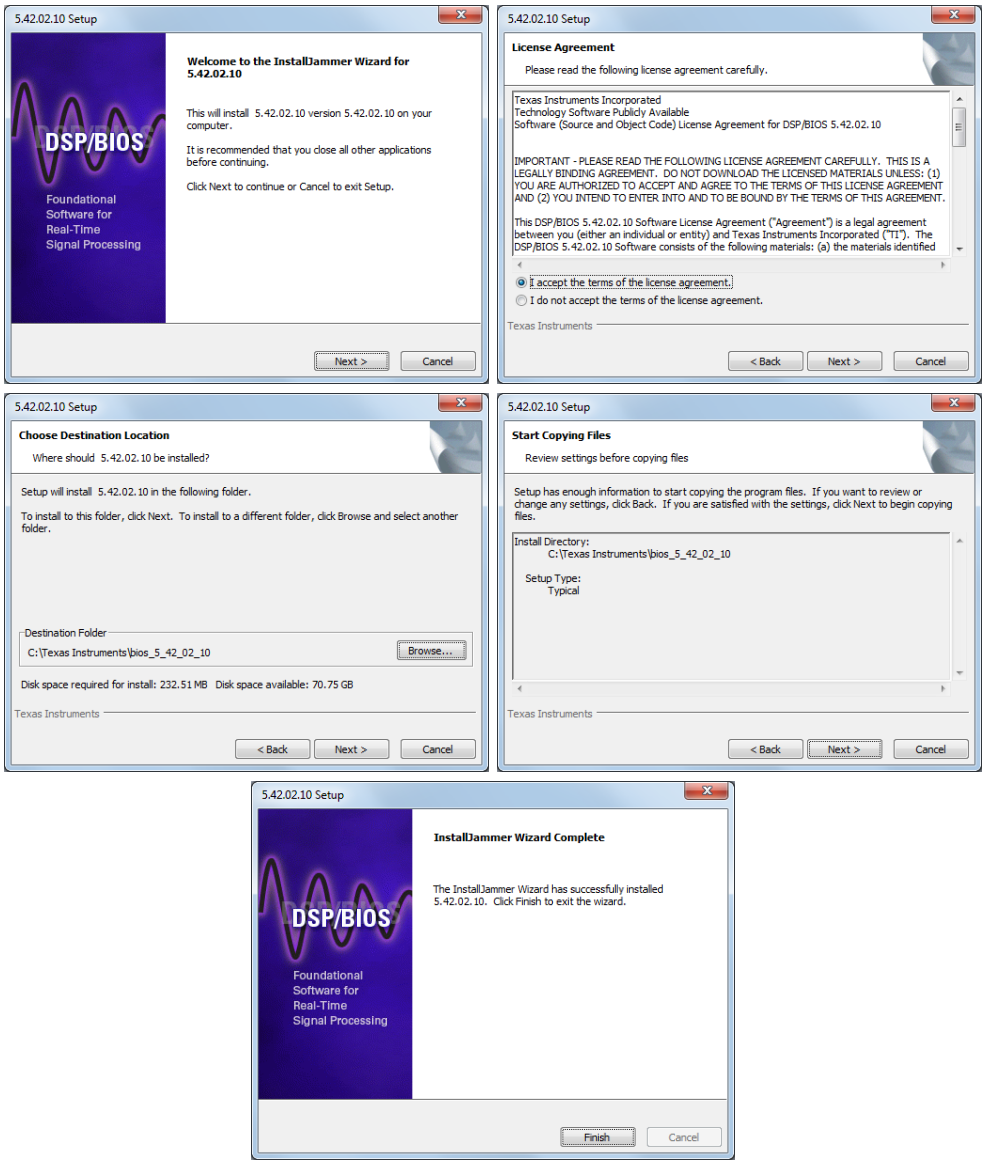

Figure 14: Installation of DSP/BIOS.

Next time you start CCS6, the program will prompt that the new product DSP/BIOS has been discovered. Click “Finish” and CCS6 will be restarted.

To install the Board Support Library for the OMAP-L138 board, download the zip file “c6748.zip” available on Myplace and unzip it in the “Texas Instruments” installation folder in “C:”.

2 Hardware setup

The OMAP-L138 Experimenter Kit comprises:

- A System on Module (SOM) board with an OMAP-L138 processor, which consists of a TMS320C6748 DSP and an ARM9 processor (Figure 15).

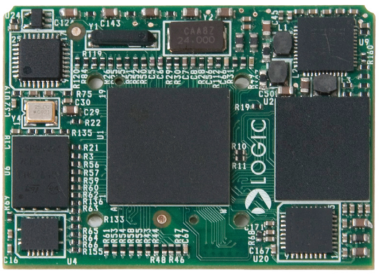

Figure 15: System on Module board.

- An application baseboard (Figure 16).

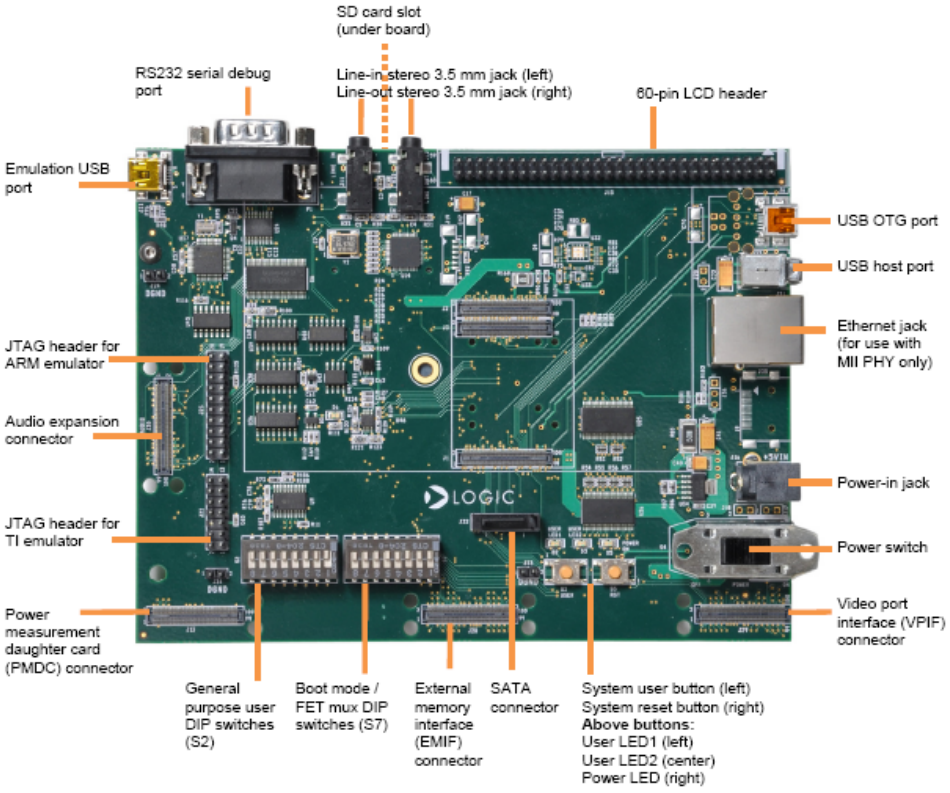

Figure 16: Application baseboard.

The SOM board sits on top of the baseboard as illustrated in Figure 17.

To communicate with the OMAP-L138 Experimenter Kit using CCS, connect the USB A to mini-B cable to the USB Emulation port on the application baseboard (Figure 18), and connect the USB to the host PC.

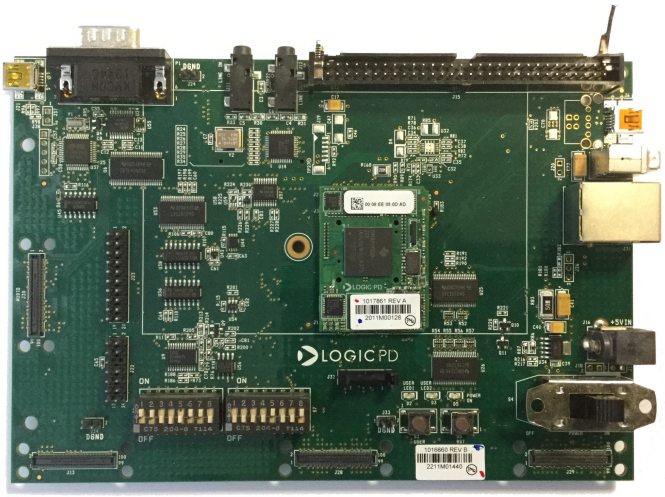

Figure 17: SOM board on top of baseboard.

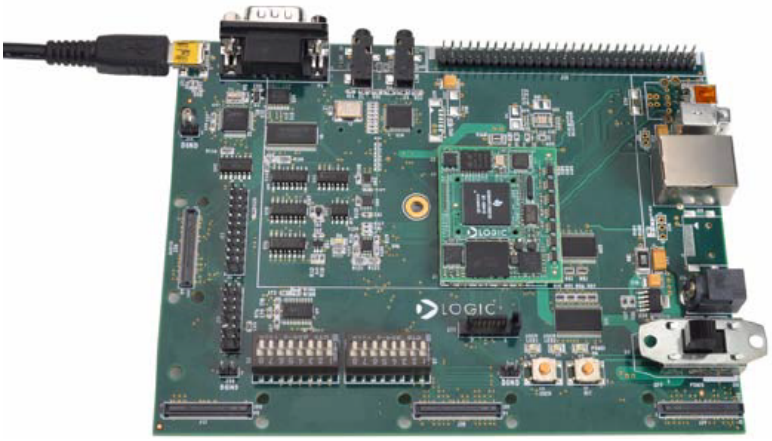

Figure 18: Connect the USB A to mini-B cable to the USB Emulation port on the application baseboard.

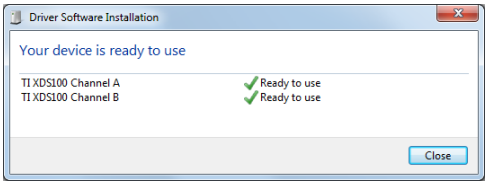

Figure 19: Drivers been installed.

As soon as the USB cable is connected to the PC, Windows should automatically recognise that a new hardware has been connected and it should install the necessary drivers (Figure 19).

To power on the OMAP-L138 Experimenter Kit, make sure that the power switch on the application baseboard is initially set to "OFF".

Connect the regulated 5V power supply to the appropriate power adapter (Figure 20).

Figure 20: Connect the appropriate power adapter.

Plug the power adapter into an electrical outlet and the 5V line output connector into the power-in connector on the baseboard (Figure 21).

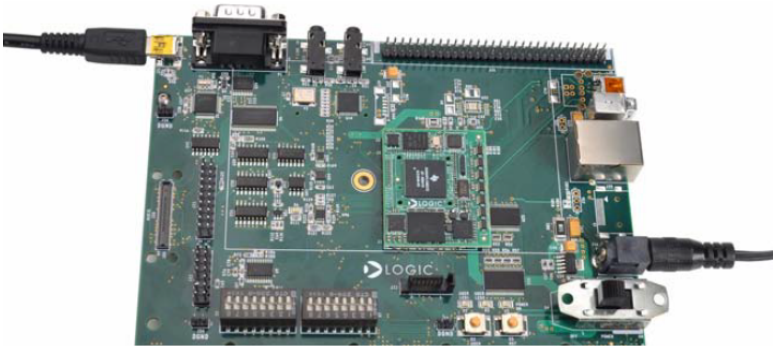

Figure 21: Connect the 5V line output connector into the power-in connector on the baseboard.

Before powering the Experimenter Kit, you will have to verify that the baseboard DIP switches are in the correct positions. There are two 8-position DIP switches located on the application baseboard at reference designators S2 and S7 (Figure 22). The S2 DIP switch is reserved for user application general purpose. The S7 DIP switch controls the processor's boot mode and several other features on the baseboard. Figure 23 describes the function of each slide in S7 DIP switch.

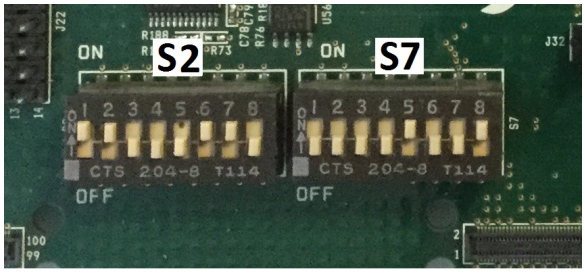

Figure 22: S2 and S7 DIP switches.

Switch	OFF Position	ON Position
S7:1*	Baseboard LCD drive enabled.	Baseboard LCD drive disabled.
S7:2	Baseboard audio enabled. Associated McASP lines connect to baseboard audio only.	Baseboard audio disabled. Associated McASP lines are available on audio expansion connector.
S7:3	OMAP-L138 I/O runs at 3.3V	OMAP-L138 I/O runs at 1.8V
S7:4	No connection	
S7:5	BOOT[1]	
S7:6	BOOT[2]	
S7:7	BOOT[3]	
S7:8	BOOT[4]	

Figure 23: S7 DIP switch functions, where S7:1 indicates slide 1 on the S7 DIP switch, S7:2 indicates slide 2 on the S7 DIP switch, and so on.

All available boot modes are described in Figure 24. To be able to interface the board with the development environment on the PC, "EMU Debug" (Emulator debug) must be selected as boot mode (Figure 25).

		DIP Switch Setting—S7[5:8]			
		BOOT[4]	BOOT[3]	BOOT[2]	BOOT[1]
	Boot Mode	S7:8	S7:7	S7:6	S7:5
	NOR EMIFA	OFF	ON	ON	ON
	NAND-8 EMIFA	OFF	OFF	OFF	ON
Default	SPI1 Flash	OFF	OFF	OFF	OFF
	UART2	ON	ON	OFF	OFF
	EMU Debug	ON	OFF	OFF	ON

Figure 24: S7 DIP switch boot modes.

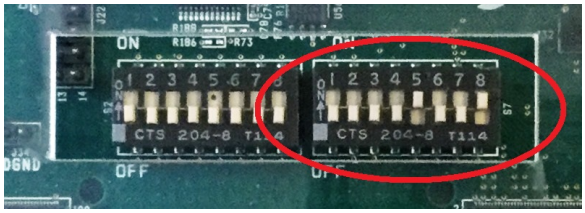

Figure 25: "EMU Debug" mode.

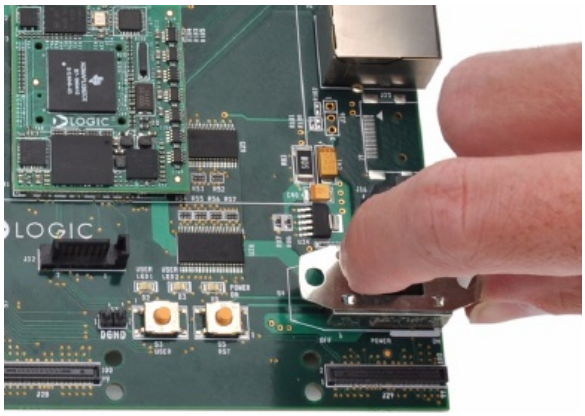

Figure 26: Power on.

Now it is possible to power on the baseboard by moving the "POWER ON/OFF" switch to the "ON" position (Figure 26).

3 Additional documentation

- CCS page on TI website: http://www.ti.com/tool/ccstudio
- "*Zoom OMAP-L138 Experimenter Kit*", from Logic PD: https://beaconembedded.com/system-on-modules/#processors.
- "*Digital Signal Processing and Applications with the OMAP- L138 eXperimenter*", by Donald Reay: https://suprimo.lib.strath.ac.uk/permalink/f/2esacs/SUALMA517036898-0002996