

MDL-LM3S818CNCD README FIRST

Stellaris® LM3S818 controlCARD Module (MDL-LM3S818CNCD)

The Stellaris® LM3S818 controlCARD module is a DIMM form-factor module that is designed to be used with a range of baseboards to accelerate evaluation and development for motor and power control applications. Texas Instruments offers a range of baseboards for motor and power-control applications that can be used with controlCARDS for Texas Instruments' Stellaris, C2000, and MSP430 devices. In most cases, these baseboards are available as complete kits that include a controlCARD module and a baseboard. The Stellaris MDL-LM3S818CNCD module can also be configured to operate as a standalone development platform that can run a set of example applications that Texas Instruments provides with the module.

This document describes how to start using the controlCARD module as a standalone board, without requiring a baseboard.

MDL-LM3S818CNCD Kit Contents

The LM3S818 controlCARD kit comes with the following:

- MDL-LM3S818CNCD controlCARD module
 - On board Stellaris In-Circuit Debug Interface
- Cables/Accessories
 - USB-miniB to USB-A plug cable (for debug and serial communication)
 - ½-inch green jumper wires (for bridging power)
- Development Kit CD containing:
 - For the controlCARD module in standalone use
 - Complete documentation
 - StellarisWare® Peripheral Driver Library and example source code
 - For the controlCARD module when used with a supported baseboard
 - Source-code and binaries
 - Documentation specific to each supported baseboard (for example, TI's DRV8312 Three-Phase PWM Motor Driver)
 - CrossHairs control GUI Windows application
- Tools CD
 - Texas Instruments' Code Composer Studio™ IDE



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Requirements

- A PC, with a USB interface, running Microsoft® Windows 2000, XP, Vista, or Windows 7.
- The Stellaris DK-LM3S-DRV8312 Development Kit Documentation and Software CD. This CD is common to both the DK-LM3S-DRV8312 and MDL-LM3S818CNCD kits.

Step 1: Set Up Board

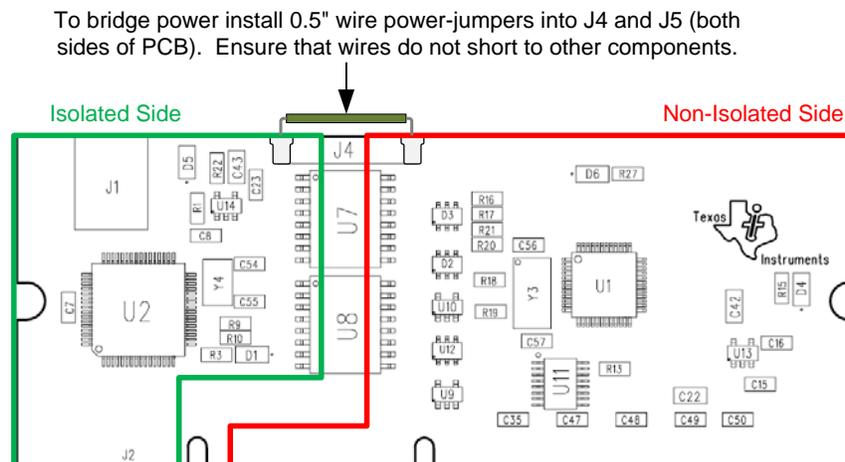
The controlCARD module has an on-board isolation barrier to allow safe debugging of the microcontroller in high-voltage applications. When the controlCARD module is used without a baseboard, power to the microcontroller must be bridged across the isolation barrier from the In-Circuit Debug Interface (ICDI) side. The ICDI and microcontroller now receive power and communication from a single USB cable.

To set-up the controlCARD module for standalone use:

1. Insert a ½-inch green jumper wire in the J4 location on the top-side of the PCB.
2. Insert a ½-inch green jumper wire in the J5 location on the bottom-side of the PCB.
3. To power the controlCARD module, connect the USB Mini-B cable supplied in the kit to the USB Connector labeled “J1” on the top edge of the board. Connect the other end of the cable (Type A) to a free USB port on your host PC.

LEDs D4 and D5 illuminate to indicate power is present on both sides of the controlCARD.

Note: The figure shows only the top-side of the PCB.



WARNING: Do not install controlCARD in a base-board when wire power-jumpers are installed!

WARNING: Do not install the controlCARD module in a baseboard if the jumpers are installed. If the jumpers are installed, the isolation barrier is compromised and an electric shock hazard exists. Power supply contention can also damage the controlCARD module or the baseboard.

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Step 2: Install Drivers on the Host Computer

In order to debug and download the custom application in the microcontroller's Flash memory and use Virtual COM Port connectivity, you must first install the following drivers on the host computer:

- Stellaris Virtual Serial Port
- Stellaris ICDI JTAG/SWD
- Stellaris ICDI DFU

Note: This README First document describes the procedure to install drivers on the Windows XP operating system. There might be some variation for installing the drivers on other Windows operating systems, although the procedure should be similar.

To see which drivers are installed on the host computer, check the hardware properties using the Windows Device Manager. Do the following:

1. Right-click the My Computer menu item from the Windows Start button and select Properties from the drop-down menu.
2. In the System Properties window, click the Hardware tab.
3. Click the Device Manager button. The Device Manager window displays a list of hardware devices installed on your computer and allows you to set the properties for each device.

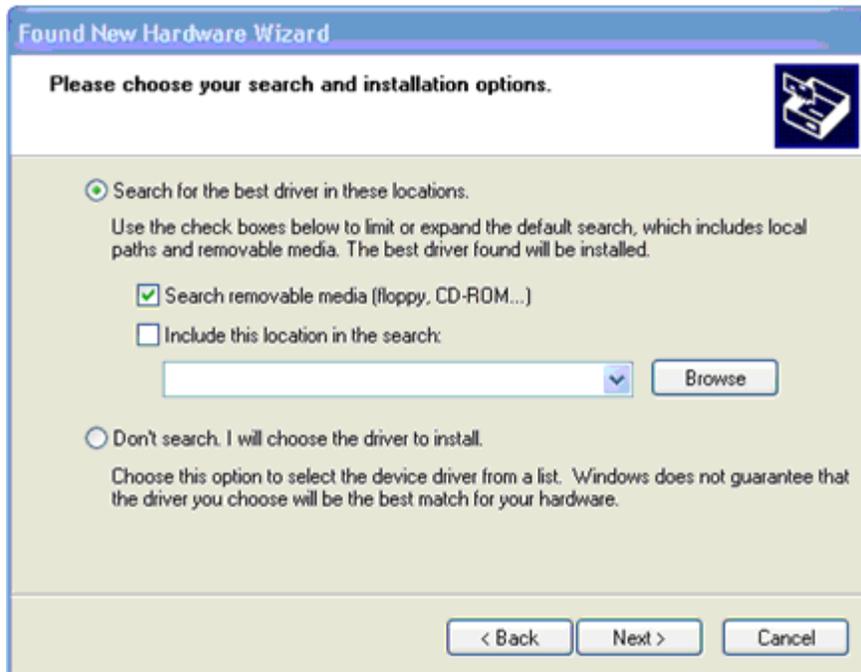
When the controlCARD module is connected to the computer for the first time, the computer detects the on-board ICDI interface. Drivers that are not yet installed display a yellow exclamation mark in the Device Manager window.

When you plug in the EVB for the first time, Windows starts the Found New Hardware Wizard and asks if you want to install the drivers for the Stellaris Virtual Serial Port. Select "Install from a list or specific location (Advanced)" and then click Next.

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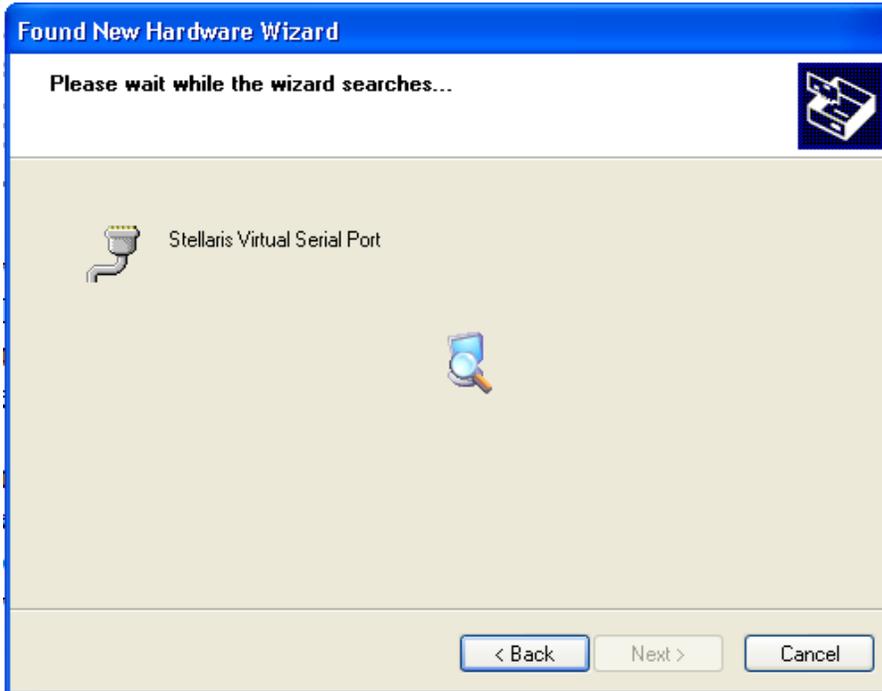


Make sure the “Documentation and Software” CD that came with the kit is in your CD-ROM drive. Select “Search for the best driver in these locations,” and check the “Search removable media (floppy, CD-ROM...)” option. Click Next.

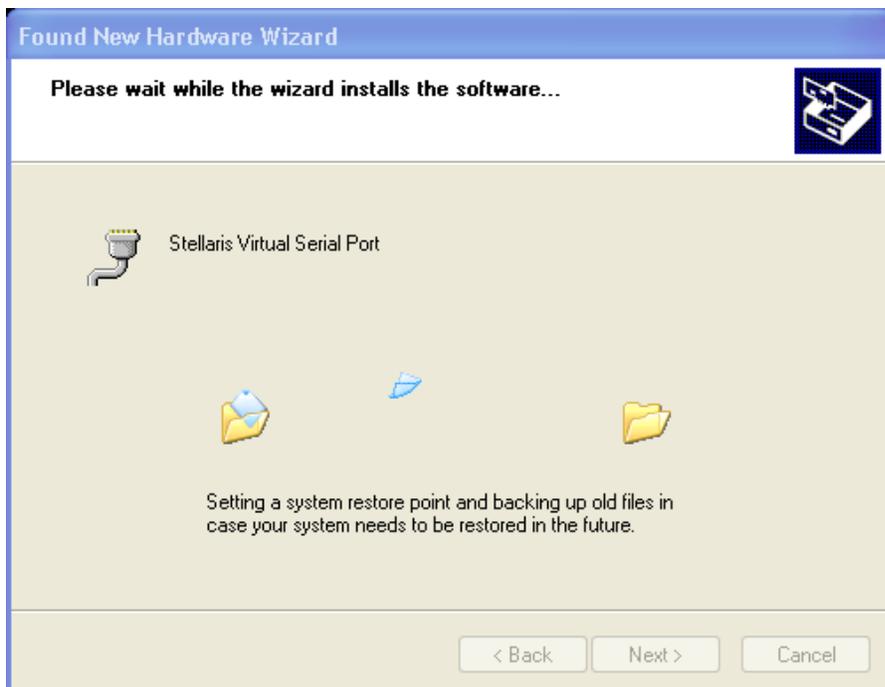


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A warning may pop up during the installation process regarding the driver not being signed, click Continue Anyway to proceed. The wizard displays a “Please wait while the wizard searches...” status window. No user action is required.

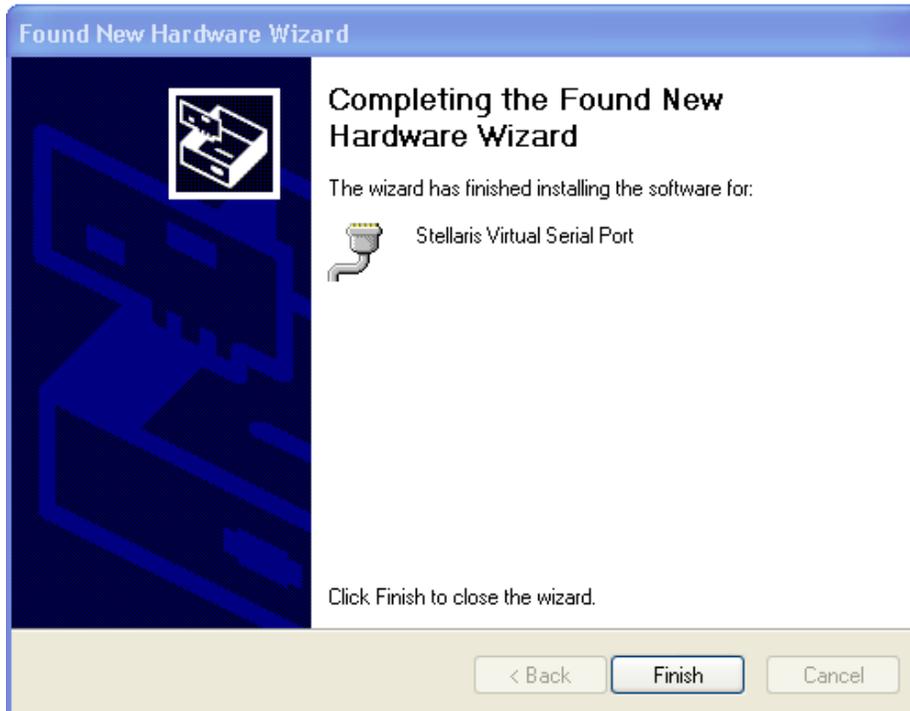


The wizard then displays a “Please wait while the wizard installs the software...” status window as the software is installed.



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After the installation of the Stellaris Virtual Serial Port drivers, click Finish to close the dialog box.



You have just installed the drivers for the Stellaris Virtual Serial Port.

The Found New Hardware Wizard appears again for the Stellaris ICDI JTAG/SWD Interface and then one more time for the Stellaris ICDI DFU Device drivers. Follow the same instructions to install the drivers for these two devices.

You can confirm the three device driver installations by launching the Windows Device Manager and right-clicking to select “Scan for Hardware Changes.” This updates the Device Manager properties list. The Stellaris Virtual COM Port appears under the Ports section, and the Stellaris ICDI JTAG/SWD Interface, and Stellaris ICDI DFU Device now appear in the Stellaris In-Circuit Debug Interface section of the Hardware Manager. This indicates that the drivers have been successfully installed.

These drivers provide the debugger with access to the JTAG/SWD interface, and the host PC access to the Virtual COM Port. With these drivers installed, Windows automatically detects any new Stellaris boards (with a Stellaris-based ICDI) that you connect to your computer, and installs the required drivers for you.

Step 3: Communicate with the controlCARD Module Using the `uart_echo` Example Application

The controlCARD module is shipped with an example application factory-programmed into on-chip Flash memory. The `uart_echo` example simply echoes characters received via the Virtual COM Port.

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To use the `uart_echo` example application:

1. Run Windows HyperTerminal or another Terminal emulator application
2. From the Windows Start Menu, select:
Start→All Programs→Accessories→Communications→HyperTerminal
3. Enter a name for the HyperTerminal Configuration and click 'OK'. The name you choose is not important.



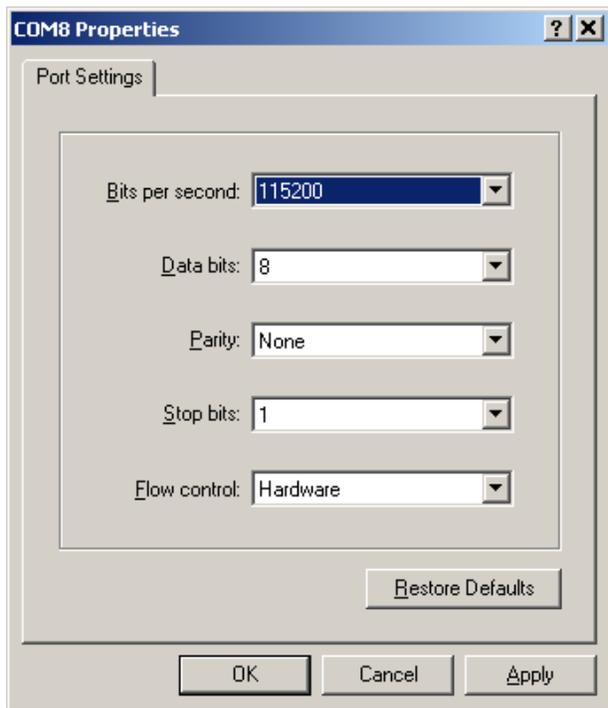
4. Select the COM port that matches the assigned Virtual COM port for the controlCARD module and click 'OK'.

If multiple COM ports are listed, it will be necessary to determine the correct COM port number for your system. This can be found by clicking the Start menu and selecting the Control Panel. Then select System→Hardware tab→Device Manager→Ports (COM & LPT). Look for the port which is described as Stellaris Virtual Serial Port and make a note of the COM port number.

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5. Configure the Port Settings as shown below and click 'OK'



6. HyperTerminal is now connected to the controlCARD module. Any characters entered in the Terminal window are echoed back to the Terminal Window by the controlCARD module.

Note: If you expect to see two characters when you type, make sure that the “Echo typed characters locally” checkbox is selected in the HyperTerminal properties.

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Step 4: Program the controlCARD Module

The MDL-LM3S818CNCD kit includes a controlCARD module that is pre-programmed with the `uart_echo` binary. The controlCARD can be programmed with other example binaries using the LM Flash Programmer utility. The programming procedure is described in the *MDL-LM3S818CNCD controlCARD Module User's Manual*.

Conclusion

You have now successfully operated the controlCARD module. For more information on using the MDL-LM3S818CNCD module, see the *MDL-LM3S818CNCD controlCARD Module User's Manual*, which also contains information that can assist you with adapting the software and hardware for a specific application.

References

In addition to this document, the following references are included on the Stellaris controlCARD Development Kit CD and are also available for download at www.ti.com/stellaris:

- *Stellaris® LM3S818 controlCARD Module (MDL-LM3S818CNCD) User's Manual*, publication MDL-LM3S818CNCD-UM
- *Stellaris® Development and Evaluation Kits for Code Composer Studio™ Quickstart Guide*
- *Stellaris® LM3S818 Microcontroller Data Sheet*, publication DS-LM3S818
- StellarisWare Driver Library
- *StellarisWare Driver Library User's Manual*, publication SW-DRL-UG
- *Stellaris® DK-LM3S-DRV8312 InstaSPIN™-BLDC README First*, publication DK-LM3S-DRV8312-RMF
- *Medium Voltage Digital Motor Control Kit for Stellaris® Microcontrollers (DK-LM3S-DRV8312) Baseboard Hardware Reference Guide*, publication DK-LM3S-DRV8312-RG
- *Three-Phase PWM Motor Driver (DRV8312) Data Sheet*, publication SLES256
- *Sensorless Trapezoidal Control of BLDC Motors Using BEMF Integration (InstaSPIN™-BLDC) on Stellaris® Microcontrollers Application Note*, publication AN01289

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Texas Instruments
108 Wild Basin Rd., Suite 350
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