

DSP Starter Kit (DSK) for the TMS320VC5509A

C55xx Power Optimization Quick Start Guide

System Requirements

- 500MB of free hard disk space
- Microsoft Windows™ 2000/XP
- 128MB of RAM
- 16-bit color display
- CD-ROM Drive

Installation Time and Setup Time

It takes approximately 15 minutes to install the National Instruments C55xx Power Optimization components and verify the capabilities of your new DSK.

Service and Support

Web	http://support.spectrumdigital.com
E-Mail	support@spectrumdigital.com

Description

The 5509A DSP Starter Kit (DSK) is an all-in-one evaluation platform for the TMS320C5509A Digital Signal Processor from Texas Instruments. It includes a target board that can be used as a reference design for interfacing the DSP to common devices such as SDRAM, Flash and a codec as well as a special introductory version of TI's flagship Code Composer Studio development tools. An on-board JTAG emulator allows debug from Code Composer Studio through your PC's USB port.

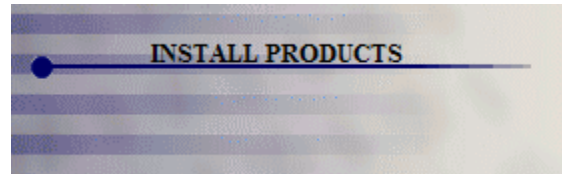
This kit contains everything you need to get started with TI DSPs. It can also be used with the full version of Code Composer Studio and an external JTAG emulator.

Install DSK Content from the CD-ROM

Before you install the DSK software, please make sure you are using **Administrator privileges** and any **virus checking** software is turned off. The DSK board should not be plugged in at this point. During the installation process if you are presented with a dialog box and cannot determine the best option then take the default(s).

1. Insert the C55xx Power Optimization installation CD into the CD-ROM Drive. An install menu (see below)

should appear. If it does not, manually run Launch.exe from the CD-ROM. Select the **Install Products** option from the menu.



2. There are 3 components being installed as part of the C55xx Power Optimization software:
 - DSK5509A Specific Product Key
 - C55xx Power Optimization Tool
 - NI DAQmx/Labview ComponentsYou should select the defaults for all three installations.
3. At the end of the C55xx Power Optimization software installation you may be prompted to "Restart" your computer. You should select "Restart" before continuing with the installation. If you do not restart then Windows will not be able to properly install the National Instruments USB driver in the next step of the install process.

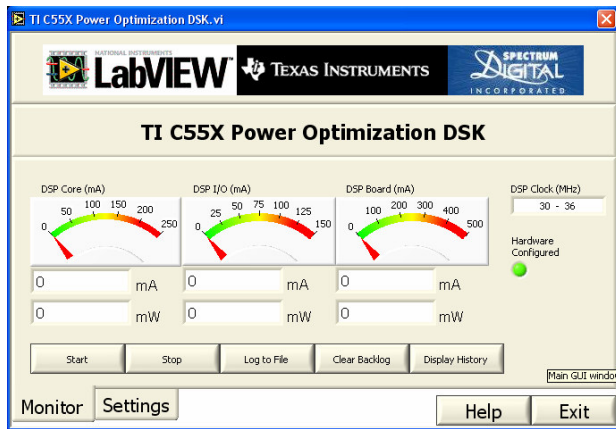
Connect the DSK NI-USB port to Your PC

1. After you have restarted your computer connect the supplied USB cable to your PC or laptop. We recommend that anyone making hardware modifications connect through a USB hub for safety.
2. Connect the included 5V power adapter brick to your AC power source using the AC power cord.
3. Apply power to the DSK by connecting the power brick to the 5V input on the DSK.
4. When power is applied to the board the Power On Self Test (POST) will run. LEDs 0-3 will flash. When the POST is complete all LEDs blink on and off then stay on. At this point your DSK is functional and you can now finish the USB driver install.

- Now connect to the NI-USB port (J402) to your PC using the included USB cable. The "NI-USB" port (J402) port is located along the short side of the DSK on the opposite end of the DSK from the +5V power connector. After a few seconds Windows will launch its "Add New Hardware Wizard" and prompt for the location of the DSK drivers.
- Follow the instructions on the screens and let Windows install the necessary drivers. When connecting to the NI-USB port Windows should find a new USB device named "NI_6009OEM1". If you are prompted with a "New Data Acquisition Device" screen, select "Take No Action" and check "Always Take This Action" then select "OK".

Testing Your Connection

To test the NI-USB connection; from the Windows Start menu select "All Programs->TI C55xx Power Optimization DSK". A National Instruments registration screen may prompt you, you may skip the registration if you like. You should then get the C55xx Power Optimization display similar to the following:



If you then select the **Start** button data collection will begin and the meter displays should begin displaying the operating current for the C5509A DSK, which is running the Power On Self Test (post). Selecting the **Stop** button stops data collection.

C55xx Power Optimization Basic Operation

Measurements

DSP Core: Measures the current of the C5509A core supply. The core voltage may be set at 1.2v, 1.4v or 1.6v (default).

DSP I/O: Measures the current of the C5509A 3.3v I/O supply.

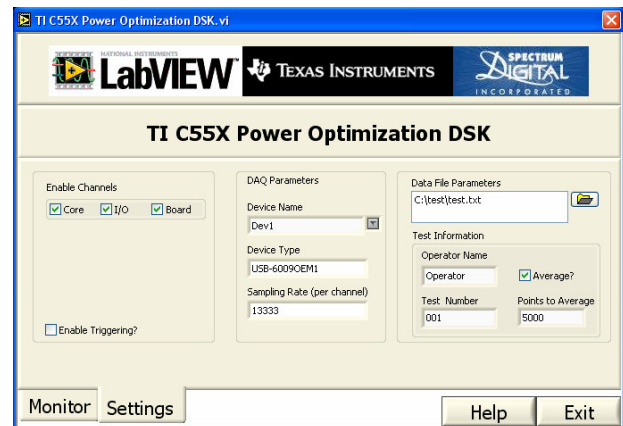
DSP Board: Measures the current of the +5v input supply for the DSK. This is a total current measurement for the DSK board but does NOT include either 5v or 3.3v supplies to the daughter card.

DSP Clock: Displays the C5509A core frequency. This frequency is derived from the C5509A clock out pin divided by 4. The frequency measurement is accurate in the range of 12MHz-200Mhz. The C5509A clock out pin is configured and enabled in the C5509A Board Support Library (BSL).

The C55xx Power Optimization Tool and Code Composer Studio run independently. This allows you to measure the power of a target application that has been programmed into the DSK on-board FLASH memory without starting CCStudio. When measuring power while CCStudio is running the most accurate measurements occur when the application is started with a "Run Free" mode. In this mode the power consumed by the C5509A emulation logic is minimized.

Channel Selection

Channels are enabled and disabled during acquisition to increase the sampling rate. By selecting fewer channels, the embedded NI USB-6009 samples at a faster rate. The sample rate is shown in the Sampling Rate (per channel) indicator on the Settings tab.



File Logging

All data is automatically logged to memory. To log the data to file at any time, click Log to File on the Monitor tab. Pertinent information, including the Operator Name and Test Number on the Settings tab are logged along with the sampled data. Click Average? to reduce the number of samples logged and generate a more compact logfile. All logging settings are available on the Test Information control on the Settings tab.

To create a text logfile, click Log to File on the Monitor tab. File logging DOES NOT work properly if the logfile is open or if the logfile directory is open when you click Log to File.

At any point during operation, you can click Clear Backlog on the Monitor tab to clear the raw data buffer. The text logfile contains all the raw data (averaged or not averaged) that is in the buffer.

Triggering

The TI C55X Power Optimization DSK monitors a DSP digital I/O line to determine when to acquire current data. The digital I/O line is hardwired to the USB DAQ hardware to provide pause triggering capabilities. When the digital line is low, the acquisition is paused and no data is collected. When a rising edge occurs on the trigger line, the acquisition starts immediately and continues until a trigger line falling edge or until you click Stop. This functionality is useful for enabling monitoring within certain regions of interest within a large DSP program or routine.

After a rising edge trigger has occurred, triggering can not be disabled until a falling edge trigger occurs. To enable triggering, click Enable Triggering? on the Settings tab. Triggering is disabled by default. When triggering is enabled, all three current channels must be monitored.

Display History

To display real-time data, click Display History on the Monitor tab.