Getting Started Guide
C2000Ware MotorControl SDK

TEXAS INSTRUMENTS

Whitney Dewey

ABSTRACT

The MotorControl SDK for C2000™ real-time controller-based motor control system development time targeted for various three-phase motor control applications. The software includes firmware that runs on C2000 motor control evaluation modules (EVMs) and TI designs (TIDs) that are targeted for industrial drives, robotics, appliances, and automotive applications. MotorControl SDK provides all the needed resources at every stage of development and evaluation for high performance motor control applications.

Code Composer Studio™ is required to use the software in the MotorControl SDK, which can be downloaded from the CCSTUDIO tool page.

Table of Contents

List of Figures

List of Tables

Trademarks
C2000™, Code Composer Studio™, FAST™, InstaSPIN-FOC™, and are trademarks of Texas Instruments.
All trademarks are the property of their respective owners.

1 Package Structure

The C2000Ware MotorControl SDK software package is organized into the directory structure shown in Table 1-1.

Table 1-1. MotorControl SDK Root Directories

Directory Name	Description
.metadata	Contains the MotorControl SDK Resource Explorer GUI files (do not modify)
c2000ware	Contains the C2000Ware development software and documentation
docs	Contains the MotorControl SDK package user's guides and a document ion index HTML page
libraries	Contains libraries with algorithm modules specific to motor control applications
solutions	Contains the development kits and solutions for C2000 devices targeting different application areas
uninstallers	Contains the MotorControl SDK uninstaller

1.1 C2000Ware

MotorControl SDK contains the necessary software and support for C2000 real-time microcontrollers, including the foundational software provided by C2000Ware. C2000Ware is a cohesive set of development software and documentation designed to minimize software development time. From device-specific drivers and libraries to device peripheral examples, C2000Ware provides a solid foundation to begin development and evaluation of your product.

To learn more, visit C2000Ware.

1.2 Documentation

Within MotorControl SDK, there is an extensive amount of development documentation ranging from development kit hardware documentation to device-specific user's guides. To assist with locating the necessary documentation, an HTML page is provided that contains a full list of all the docs in the MotorControl SDK package. Locate the "C2000Ware_MotorControl_SDK_Documentation.html" page in the "docs" directory.

1.3 Libraries

The libraries included in the MotorControl SDK range from angle generator and datalog to the FAST™ Software Encoder symbols for enabling InstaSPIN-FOC™ software. The libraries directory includes documentation and examples when applicable.

1.4 Solutions

The MotorControl SDK provides demo code for various motor control applications in the "solutions" directory. These solutions provide software support for TI motor control development kits and TI designs (TIDs) with related documentation, source code, and CCS projects.

For a complete list of the supported solutions, you should view the **Hardware Support** table in the SDK release notes. The table lists the supported device family, the associated EVMs, a list of supported features, and where to find them in the SDK "solutions" directory. The release notes for the latest version of the SDK can be viewed online in the TI Resource Explorer or in the "release_notes.html" file at the root MotorControl SDK installation directory.

To import the examples associated with a selected solution into your CCS workspace, you can go to **Project → Import CCS Projects...** and specify the solution's location in the **Select search-directory** field. Select the associated project or projects you wish to import and click **Finish**. Alternatively, you can also use the Resource Explorer import method described in Section 2.

2 MotorControl SDK GUI

MotorControl SDK provides a graphical user interface (GUI) for intuitive navigation of software, libraries, user's guides, and other package content. The GUI is integrated into Code Composer Studio™ upon installation. Within Code Composer Studio, go to **View → Resource Explorer** and locate the C2000Ware MotorControl SDK. Example projects and their corresponding documentation are mostly found under the **Development Kits** section. When a CCS example project is selected as shown in Figure 2-1, an **Import** button appears, allowing you to import the project into your workspace. The documentation found in the corresponding Documentation folder guides you through how to use the example project.
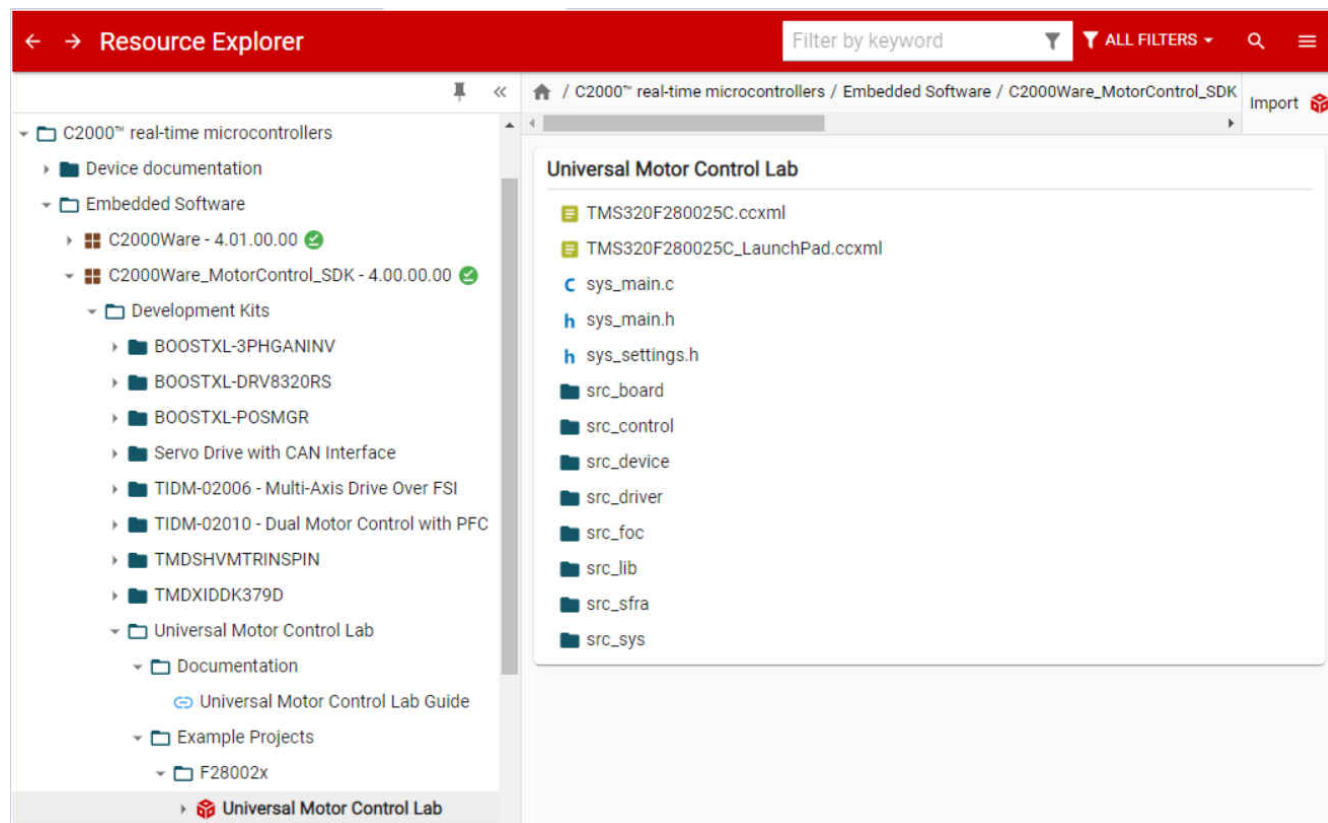
Figure 2-1. MotorControl SDK Resource Explorer folder Within Code Composer Studio

The MotorControl SDK is also available in the online Resource Explorer, which allows for full package navigation in a browser without requiring installation of MotorControl SDK. For more information, see the C2000Ware MotorControl SDK Resource Explorer folder.

There is an additional GUI, specifically for the F28004x InstaSPIN-FOC labs, that is available online in the TI Cloud tools Gallery. The InstaSPIN Universal GUI provides a dashboard for viewing and updating variables in these lab projects. For more details, view the GUI Quick Start Guide: *<SDK install>/solutions/common/ sensorless_foc/docs/gui_quick_start_guide.pdf*.
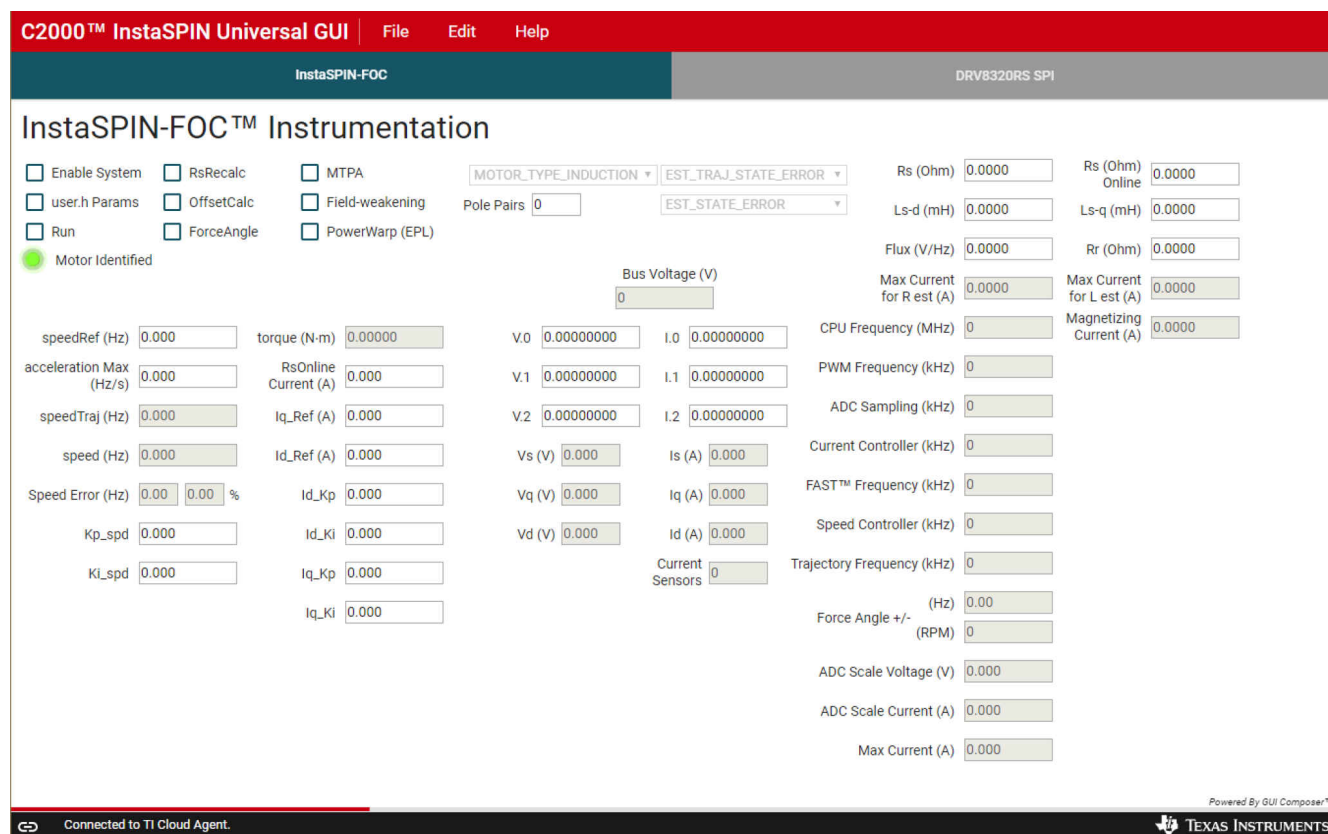
Figure 2-2. C2000 InstaSPIN Universal GUI

Although the GUI is specifically designed for use with the F28004x InstaSPIN-FOC labs (under *solutions/ boostxl_drv8320rs* and *solutions/tmdshvmtrinspin*), the GUI can be imported from the Gallery into TI's GUI Composer tool and customized.

3 Updating MotorControl SDK

Within the MotorControl SDK installation directory, an update checking application, "MotorControlSDKUpdater.exe", is provided to check for a newer version of the MotorControl SDK. When the updater is run, a window is displayed, stating that the current version installed is the newest version or that a newer version is available for download. When a new version is available, the option is given to download and install the new version. The application proceeds to download the latest MotorControl SDK installer to the specified download directory. Upon completing the download, the installer automatically runs and continues with the standard installer steps.

4 Code Composer Studio

Code Composer Studio is an integrated development environment (IDE) that supports TI's Microcontroller and Embedded Processors portfolio. Code Composer Studio comprises a suite of tools used to develop and debug embedded applications. The latest version of Code Composer Studio can be obtained at the following URL: .

All projects and examples in the MotorControl SDK are built for and tested with TI's Code Composer Studio. Although Code Composer Studio is not included with the MotorControl SDK installer, it is easily obtainable.

Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

IMPORTANT NOTICE AND DISCLAIMER