DRV8873x EVM GUI User's Guide

This document is provided with the DRV8873x-EVM customer evaluation module (EVM) as a supplement to the *DRV8873-Q1 Automotive H-Bridge Motor Driver* data sheet and *DRV8873 H-Bridge Motor Driver* data sheet. This user's guide details how to use the DRV8873x EVM GUI Application.

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1 Hardware and Software Setup

The hardware (HW) and software (SW) tools that follow are required for the evaluation of DRV8873x-EVM:

- DRV8873x-EVM
- A micro-USB cable
- Brushed motor or other inductive load
- Voltage supply 4.5 V to 38 V
- Jumper wires (for connections)
- DRV8873x EVM GUI

For additional details on hardware connections refer to the *DRV8873x-EVM User's Guide*.

This document describes the usage of the DRV8873x EVM GUI.

2 GUI Application

Figure 1 shows the launch page for the DRV8873x EVM GUI.

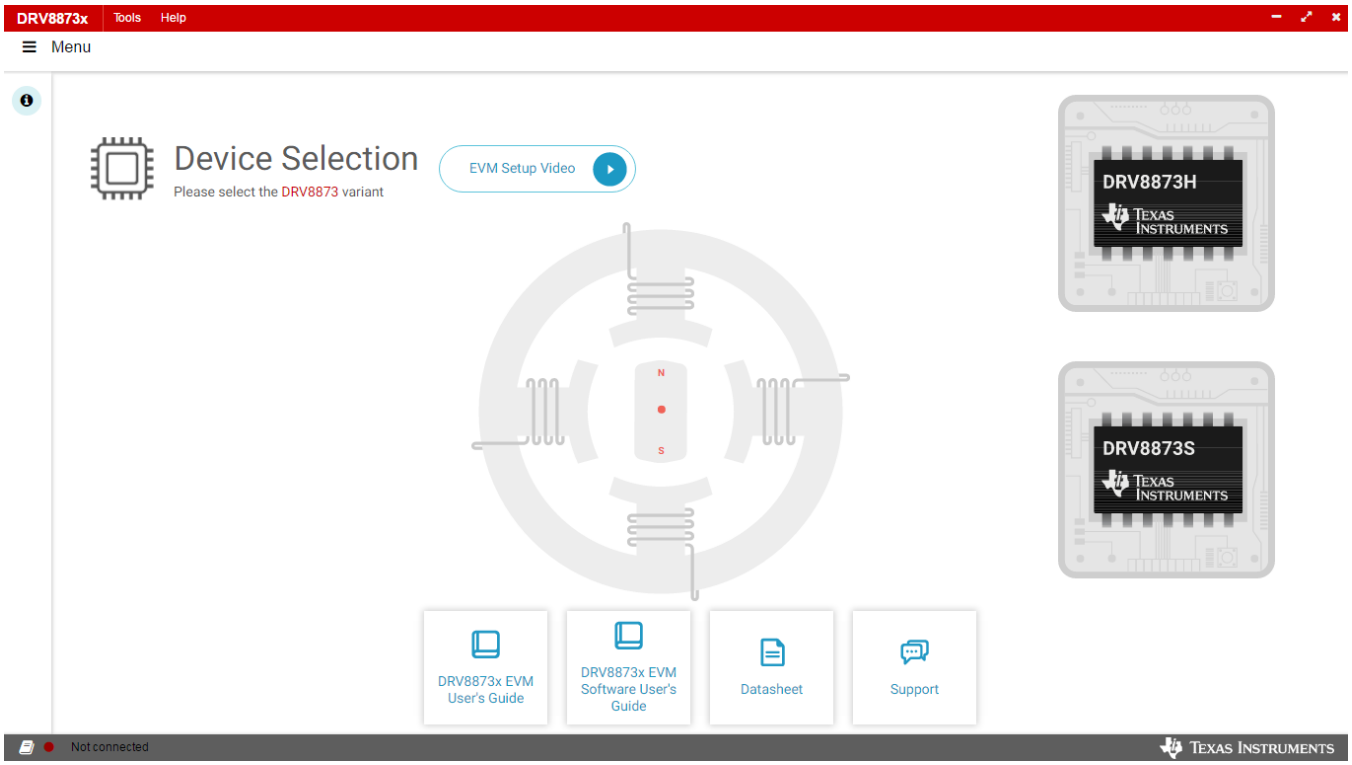

Figure 1. DRV8873x EVM GUI (Launch Page)

2.1 Using DRV8873x EVM GUI

The DRV8873x EVM GUI along with DRV8873x-EVM facilitates control of a brushed DC motor and manipulation of various settings. It provides functionality for adjusting the speed and direction of the motor, adjusting the other parameters such as voltage and current regulation limits and monitoring the device status. Use the steps that follow to get started with the GUI:

Step 1. Attach one or two Brushed DC motors, or other inductive loads.

Step 2. Plug in the micro-USB cable to the PC.

Step 3. Enable the motor power supply. For additional details on hardware connections refer to the *DRV8873x-EVM User's Guide*.

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Step 4. Click on DRV8873x EVM GUI shortcut either on the desktop or from the start menu to run the GUI application.

Step 5. Select the device variant to be used in the launch page shown in Figure 1.

Step 6. The first matching device(device supported by the app for selected variant) that is connected to the PC will be auto connected to the application. If multiple devices are connected go to the Serial Port page by clicking the wrench icon in the sidebar menu to manually select an available COM port. The Serial Port page displays the list of COM ports available and have connect/disconnect button for the matching devices of the app as shown in Figure 2. If no hardware is physically connected to the PC, -- No Device Connected – will be displayed.

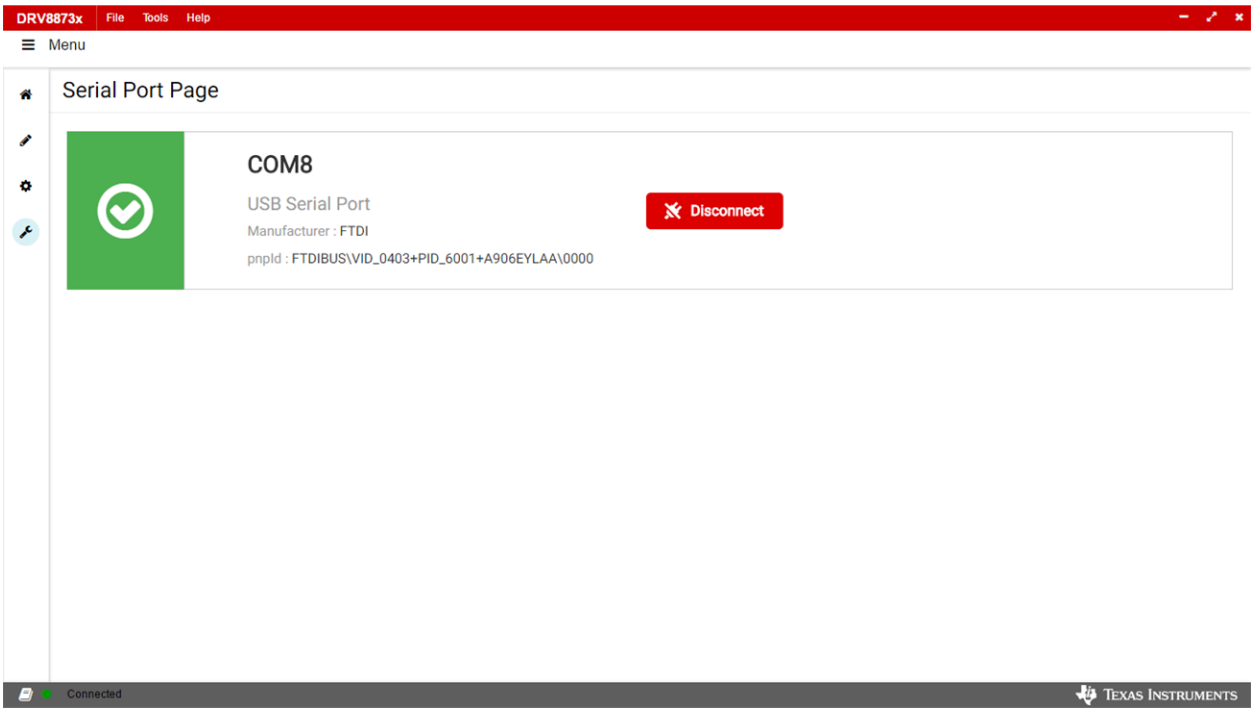

Figure 2. DRV8873x EVM GUI (Serial Port Page Showing the Required Friendly Name)

Step 7. Select the relevant COM port from the drop-down menu (as shown in Figure 2) and click the *Connect* button.

The *Friendly Name* for the DRV8873x-EVM is *USB Serial Port*. If nothing is physically connected to the PC, the COM list in the drop-down menu displays -- *No Ports* --.

Step 8. After the GUI connects, the status shown in Figure 3 is displayed.

The bottom-left corner of the status bar displays a green indicator to indicate the connection with the opened COM and device mentioned in brackets.

Figure 3. DRV8873x EVM GUI (COM Opened)

Step 9. Click on the hamburger button for the menu on the top-left corner of the GUI to open a side-bar menu.

Step 10. Use the side-bar menu to navigate to the following pages or sub-pages at any time. The pages that follow are in context to the launched device:

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- Introduction (Home)
- Registers
- Motor Control
- Serial Port
- Back

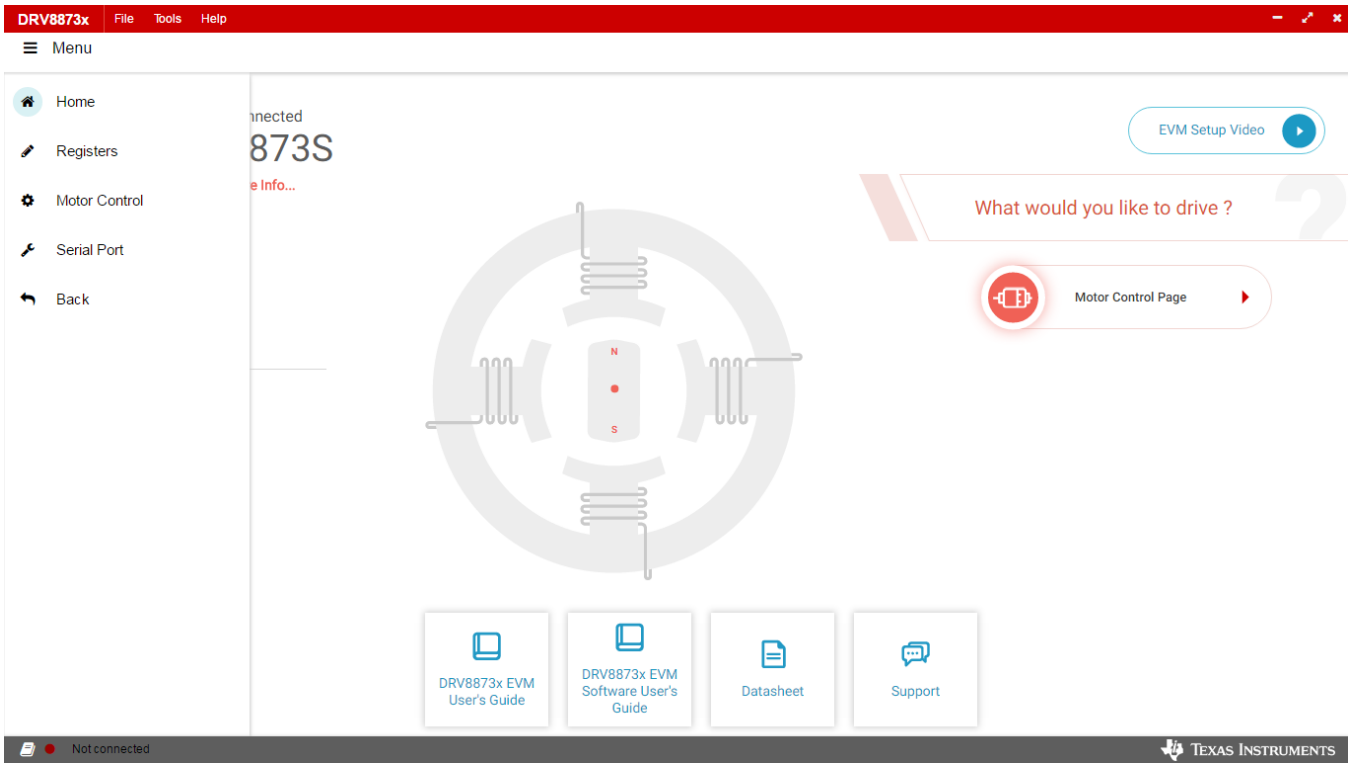

Figure 4. DRV8873x EVM GUI (Menu)

Step 11. Introduction (Home) page

The Introduction (Home) page provides access to all pages in the DRV8873x EVM GUI.

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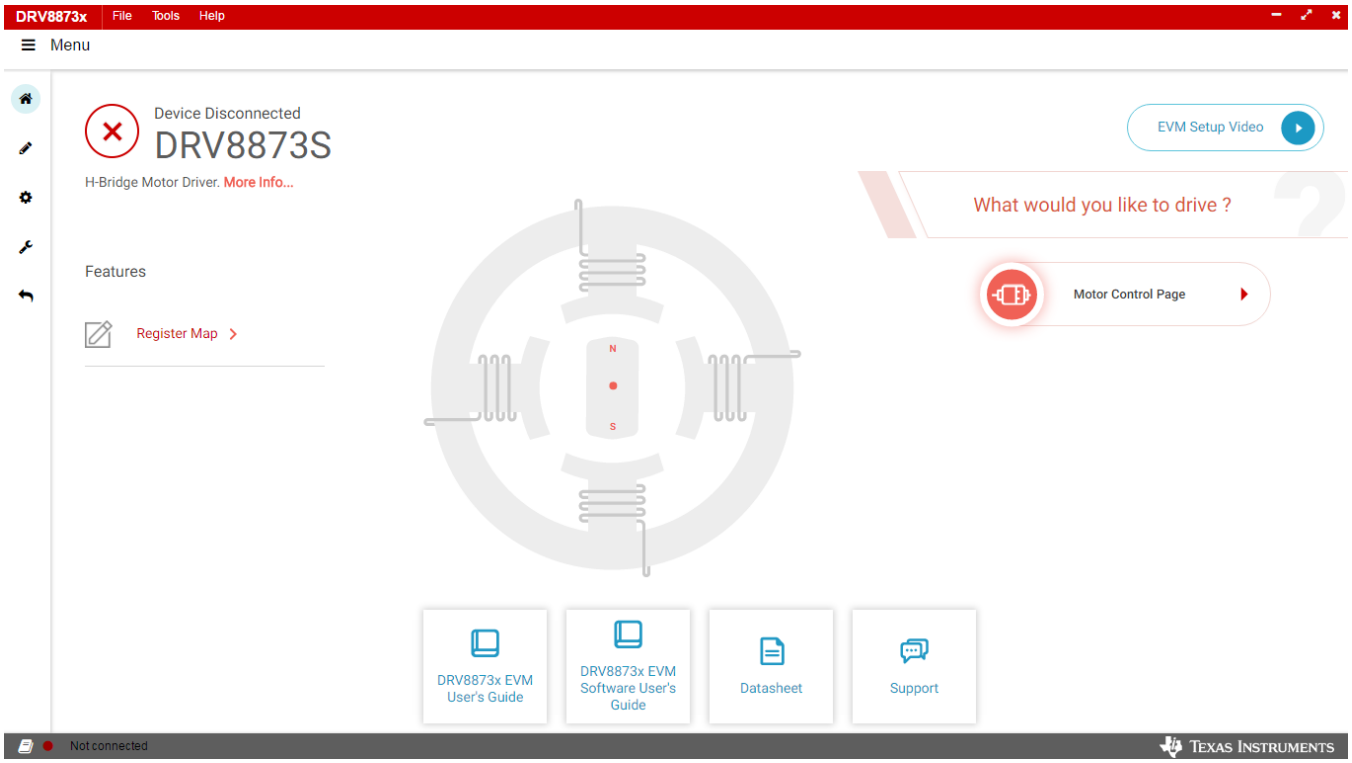

Figure 5. DRV8873x EVM GUI (Introduction Page)

Step 12. Registers page (only for S variant)

This page shows all the registers and their fields present on the DRV8873S device. The page allows reading and writing any register, field, or bit. Click on the question mark icon on any register or field to get in-place data sheet help.

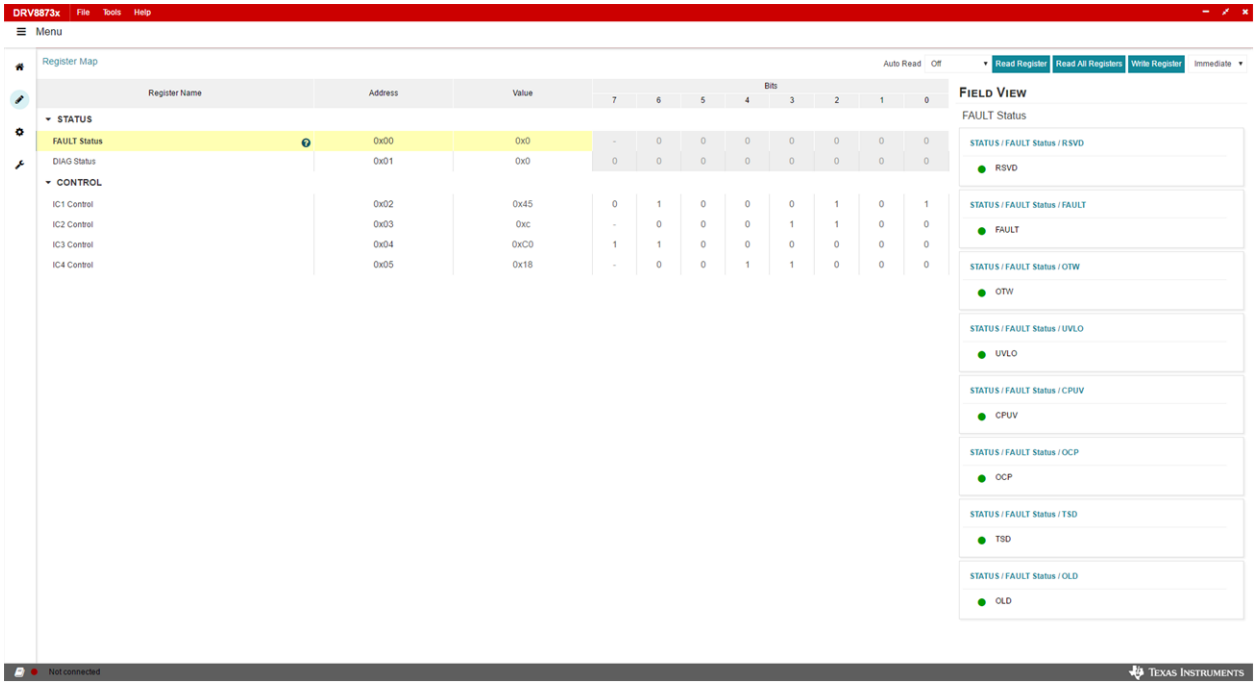

Figure 6. DRV8873x EVM GUI (Registers Page)

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Step 13. Motor Control pages

- Motor Control (Motor Control And Tuning)

  This page has different widget controls to control the motor and tune the parameters using the Motor Control algorithm as shown in Figure 7.

  – Refer to the *DRV8873x-EVM User's Guide* by clicking its link in the home page to understand Motor Control operation and get details on each of the parameters on this page.

  – Click on the question mark icon available on each of the controls in the GUI to understand operation and range of input values of that particular widget.

- Follow these steps to run the motor with a Motor Control algorithm:

  a. Enable the driver

  1. Click on the *Wake* slider button to wake the device.
  2. Click on the *Start motor* to run the motor.
  3. Set the desired current regulation using the *nITRIP* options.
  4. If necessary, write appropriate values to the registers from the *Register Page*.
  5. Select the operation mode, by clicking the mode images, based on the loads connected to the outputs. (In H Variant, select the mode when the device is in sleep).

  NOTE: When the driver is disabled, the register read-write (R/W) operations are not allowed.

  6. Set the desired motor speed by adjusting the sliders.

     For *PH/EN* mode, change the percentage of duty cycle using the *H-Bridge Control IN 1 Duty Cycle* slider. The direction can be changed by clicking the *Motor Direction* arrow.

     For *PWM or Independent 1/2 bridge* mode, change the percentage of duty cycle using the *H-Bridge Control IN 1 Duty Cycle* and *H-Bridge Control IN 2 Duty Cycle* sliders.

  7. Monitor the *Fault Status Section* when the motor is running:

     If any fault occurs, the motor stops spinning and the corresponding fault is reported in this section.

  8. The *IPROP Status Output* section displays the analog current value proportional to the current flowing in the HS1 mosfet of H-bridge.

  NOTE: Valid results for IPROP output depend on duty cycle and motor parameters.

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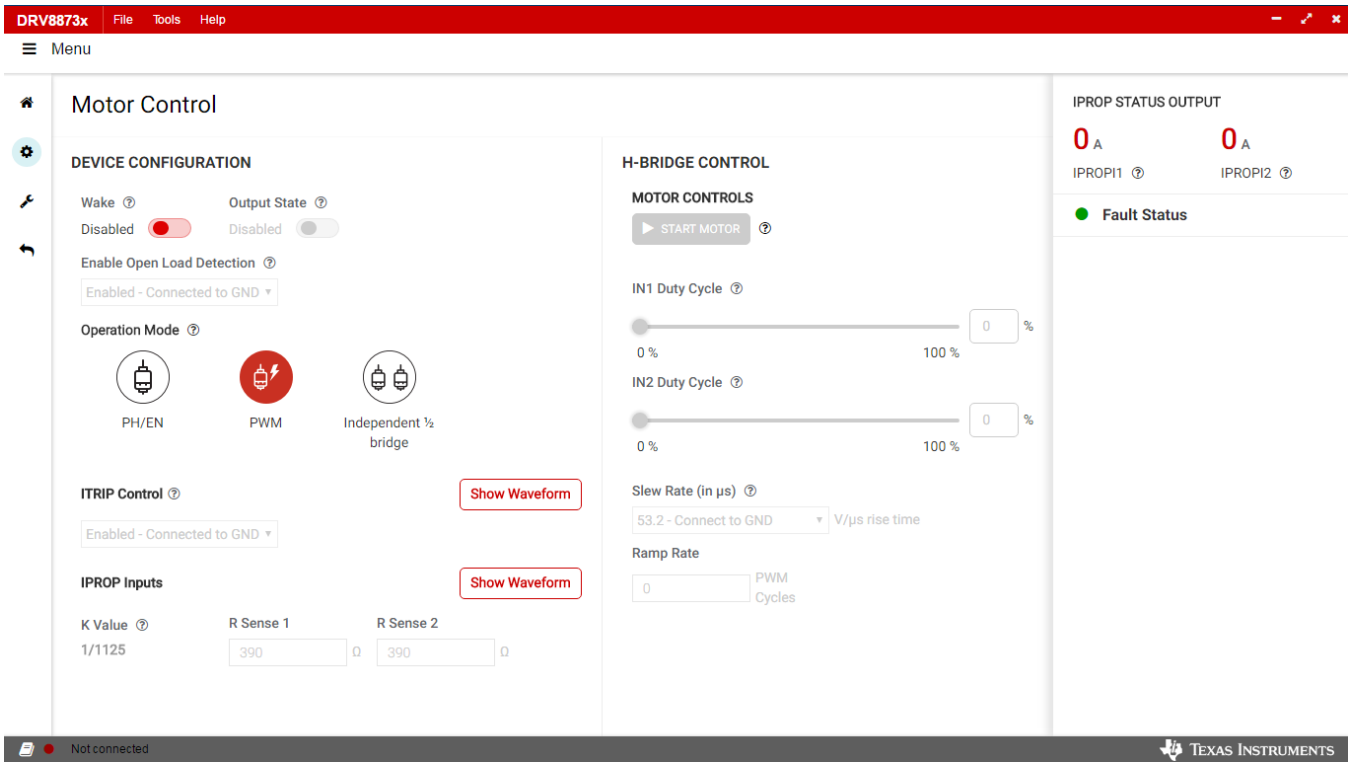

Figure 7. DRV8873x EVM GUI - Motor Control Page (Motor Control and Tuning)

Step 14. The following toolbar options are available on the top of the GUI as shown in Figure 8:

- File—Different options in this menu are available to load and save from and to a JSON file respectively: the register values on the register page and motor control settings.

NOTE: The user can save (and load) a particular configuration of the registers and the Motor Control parameters (as set on the *Motor Control* pages). This feature can also be used when no actual EVM is connected to the computer.

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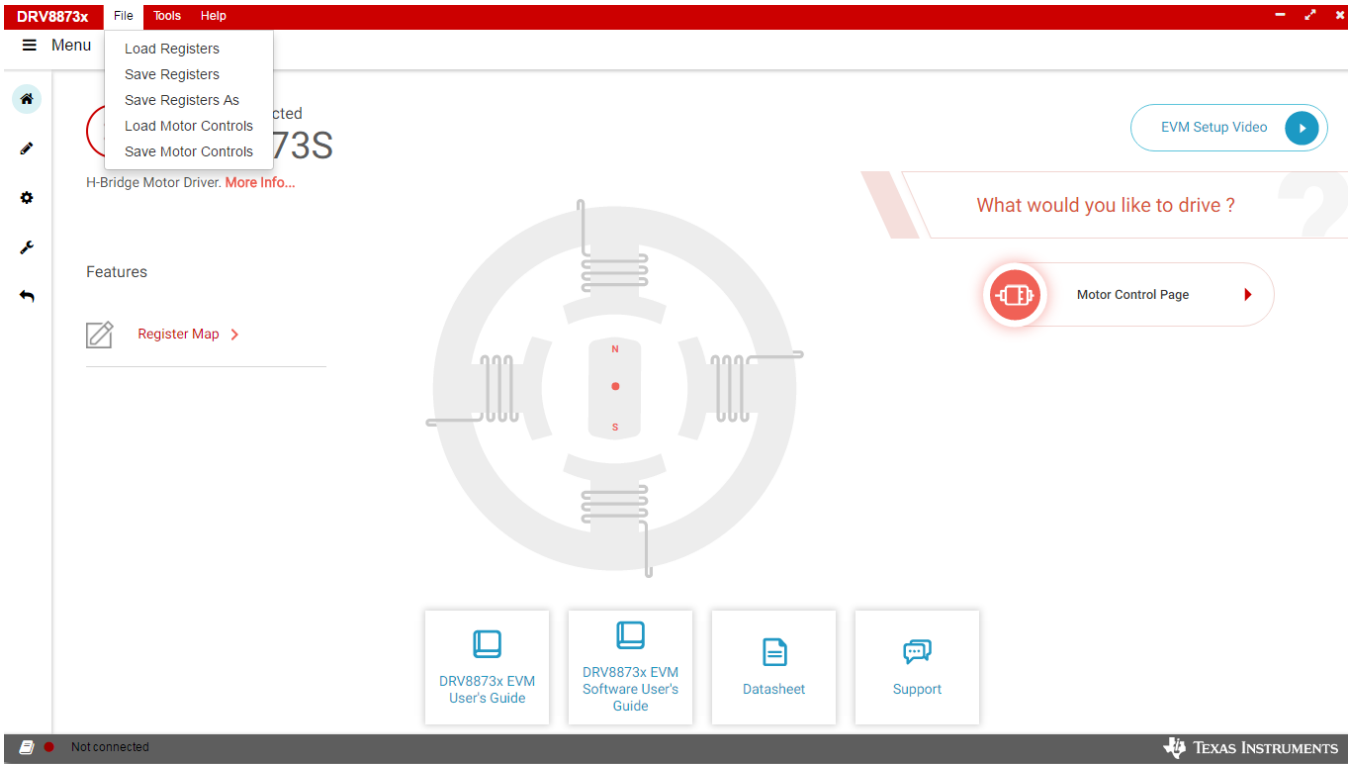

Figure 8. DRV8873x EVM GUI - (File Toolbar Menu)

- Tools—The only available option in this menu is to open a log pane at the bottom of the GUI which shows different logs: information, warning, error, debug.

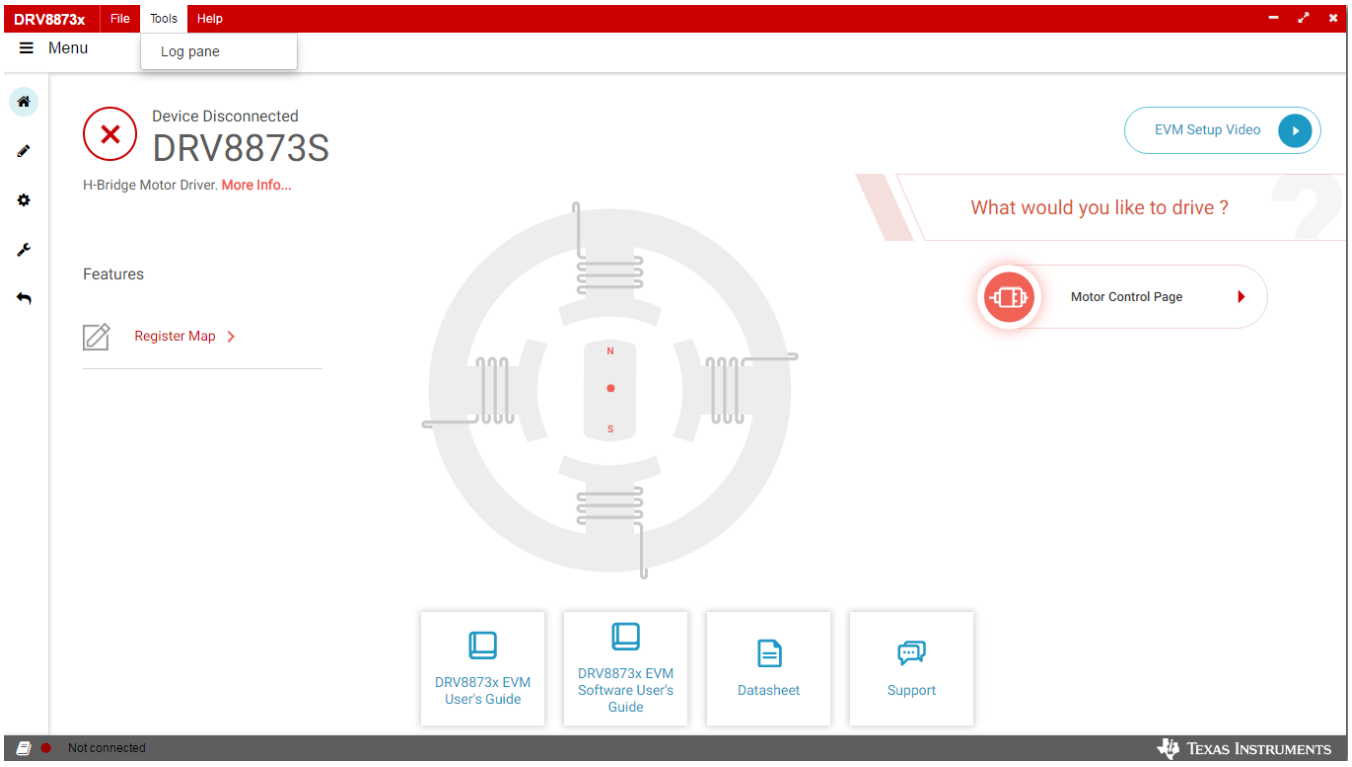

Figure 9. DRV8873x EVM GUI (Tools Toolbar Menu)

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- Help—This menu shows the information such as version of this GUI application under the *About* option.

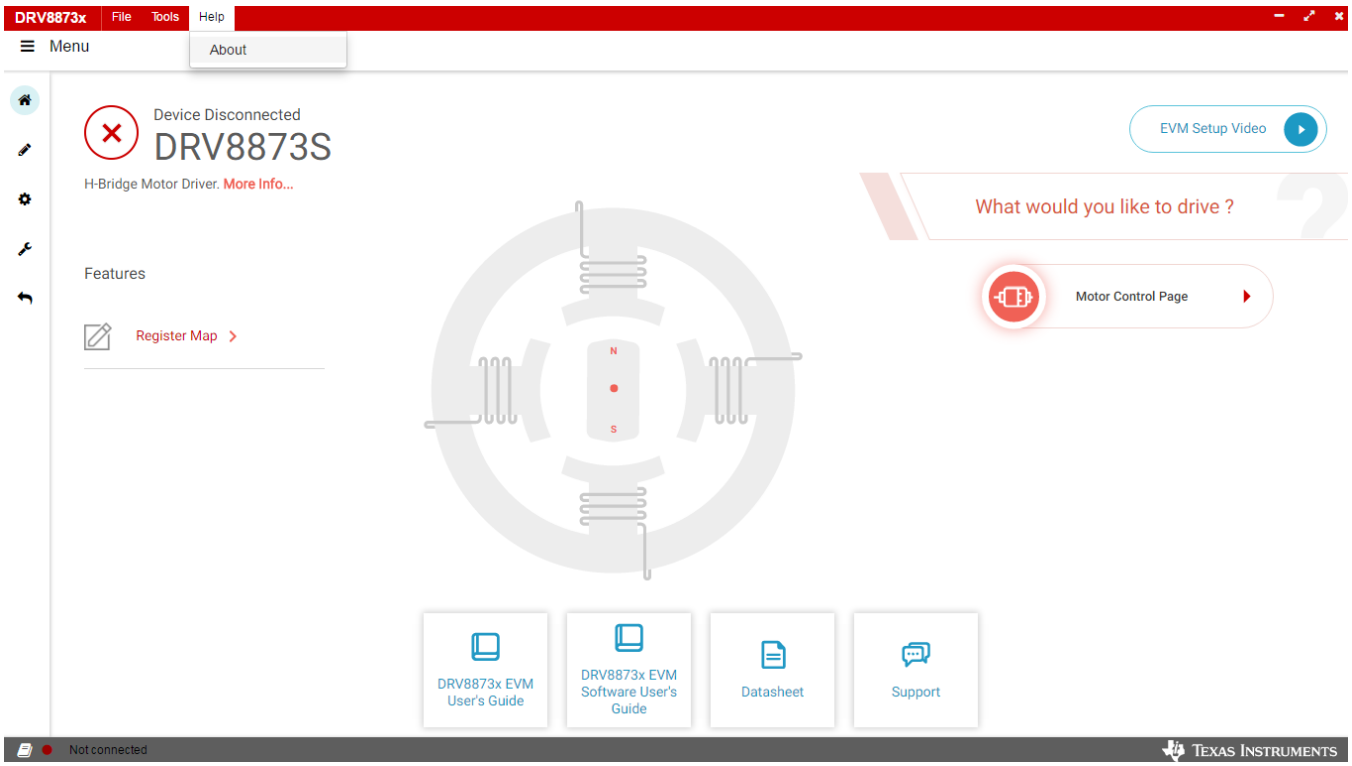

Figure 10. DRV8873x EVM GUI (Help Toolbar Menu)

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Revision History

DATE	REVISION	NOTES
August 2018	A	Updated to reflect latest EVMs (S and H variants)
December 2018	B	Updated to include DRV8873

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