DRV84xxP EVM GUI User's Guide

This document is provided with the DRV84xxP evaluation module (EVM) as a supplement to RV84xxP Stepper Motor Driver datasheet. This user's guide details on how to use the DRV84xxP EVM GUI application.

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1   Overview

The DRV84xxP EVM is a platform to support prototyping and evaluation for the DRV84xxP, a medium-voltage dual H-bridge driver for brushed DC and stepper driving applications.

The EVM uses an MSP430™ microcontroller and a USB interface chip to manage communication from the GUI software application installed on a PC computer with Windows®. The GUI sends serial commands to the MSP430 to control the device signals, monitor faults, read and write SPI registers, and drive a stepper motor by issuing the step commands at the desired rate. This document describes the software and tools used to evaluate DRV84xxP device for stepper motor driving on the DRV84xxP EVM.

2   Hardware and Software Setup

The hardware (HW) and software (SW) tools that follow are required for the evaluation of DRV84xxP:

*   DRV84xxP EVM
*   Stepper motor
*   Voltage supply from 4.5 to 48 V

This document only describes the installation and usage of the DRV84xxP EVM GUI. For additional details on hardware connections refer to the DRV84xxE/P EVM User's Guide .

3   GUI Application

3.1   Installation

Installation (For Desktop Version Only)

*   Download the installable DRV84xx_x.x.x_installer_win.zip file.
*   Extract the zip.
*   Double click on the installer to install the GUI Application. During first time installation, the installer prompts for installation of Cloud Agent. Please Install it. During the installation, customer company's firewall may block "download from website" option for the GUI composer runtime installation, please download GUI runtime v7.4.1 from this link: https://software-dl.ti.com/ccs/non-esd/gui_composer/runtime/gcruntime-7.4.1-windows-installer.exe and save it to your local harddrive. And then, use "Install from File" option to install the GUI composer runtime.

3.2   Getting Started with DRV84xxP EVM GUI

The DRV84xxP EVM GUI and DRV84xxP EVM allows the user to configure various settings required for BDC motor or stepper motor driving. The DRV84xxP EVM GUI lets the user adjust the motor speed, control the direction, control the step movement, configure various device settings, and monitor the device status.

Perform the following steps to begin using the GUI:

*   Connect the stepper motor to the EVM.
*   Plug in the micro-USB cable to the PC.
*   Enable the motor power supply. For additional details on hardware connections refer to the DRV84xxE/P EVM User's Guide

Click on DRV84xxP EVM GUI shortcut either on the desktop or from the start menu to run the GUI application.

3.3   Use the DRV84xxP EVM GUI

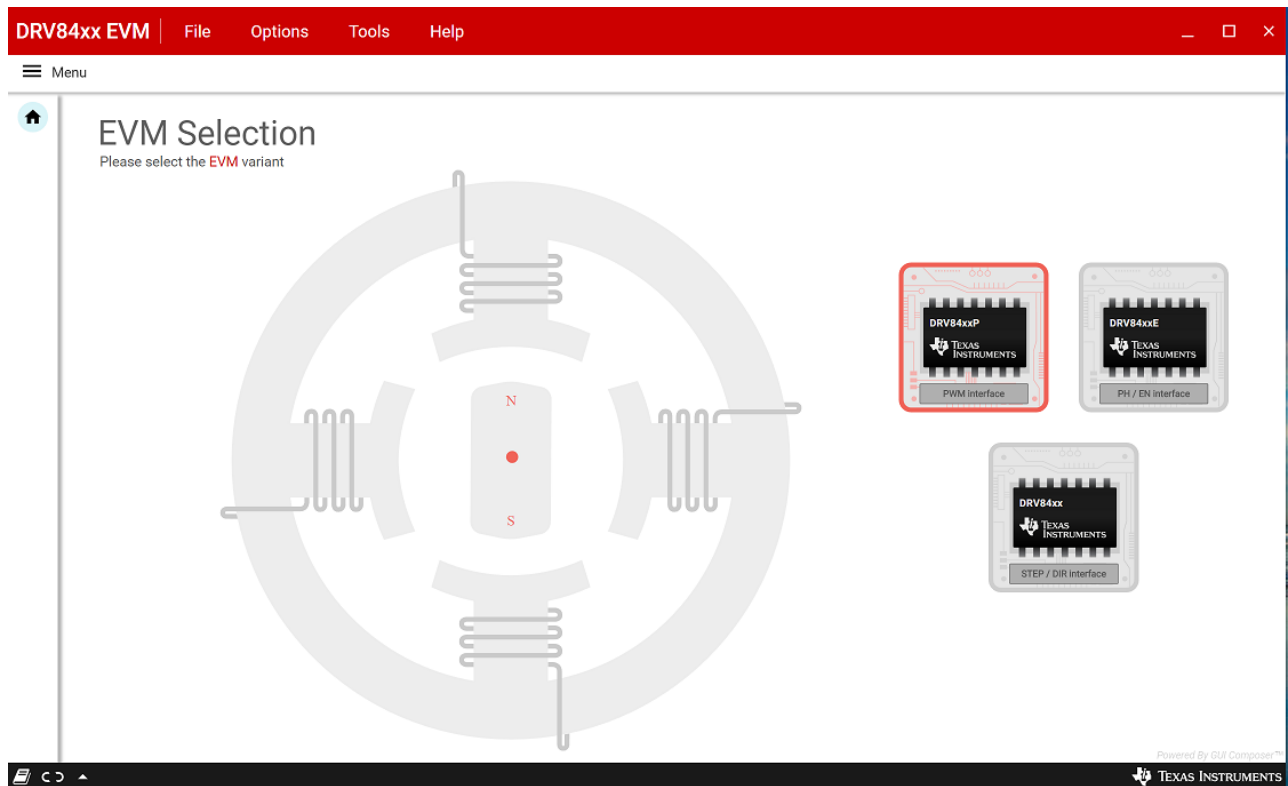After open the DRV84xx GUI, the GUI landing page shown in Figure 1

Figure 1. DRV84xx EVM GUI (Landing Page)

After click the DRV84xxP device from the GUI landing page, the DRV84xxP GUI home page shown in Figure 2
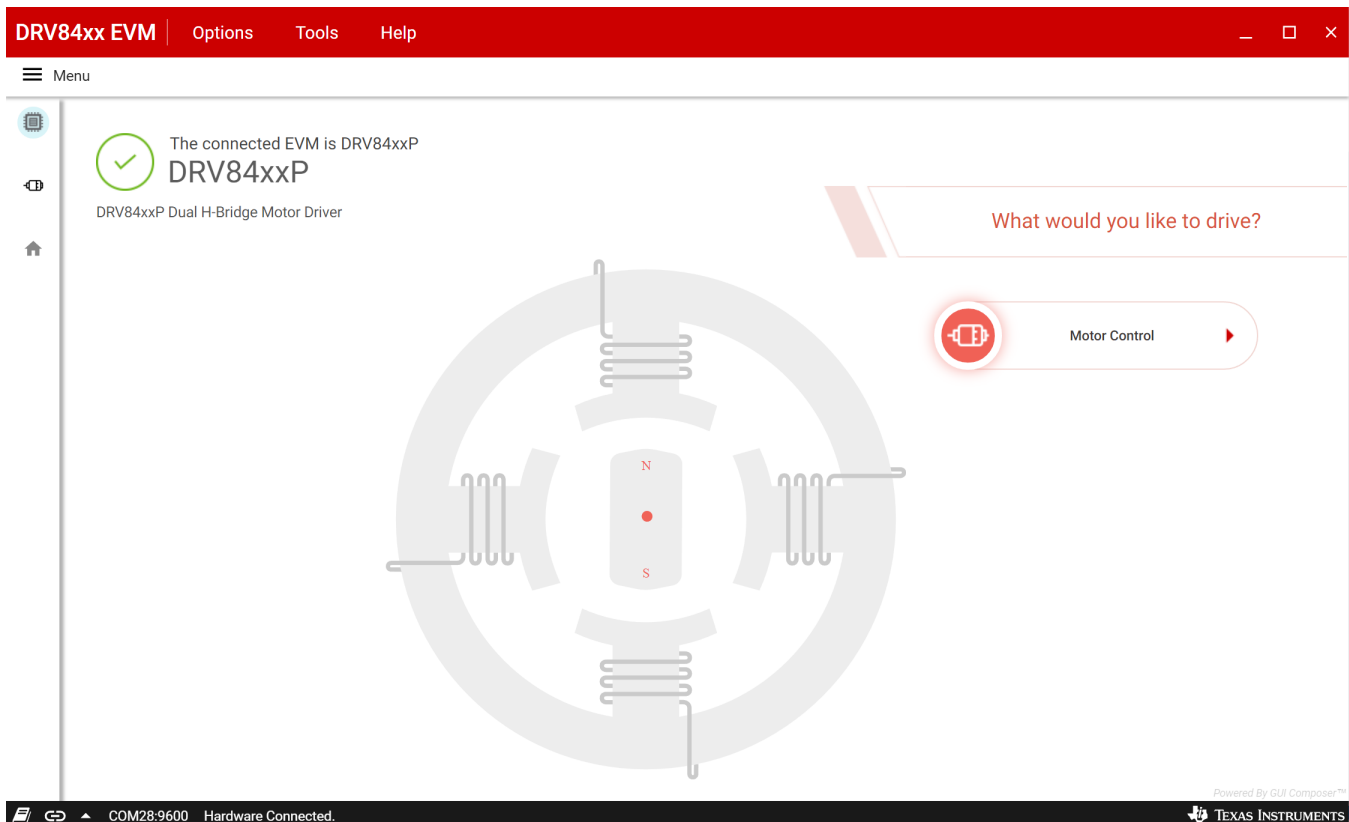
Figure 2. DRV84xxP EVM GUI (Home Page)

The application will try to establish communication with the device connected. A message showing 'Connected to Cloud Agent. Connecting to target…' will be displayed in the hardware connection status pane at the bottom of the screen. If the connection is successful, 'COMxx:9600 Connected to Target' message appears as shown in Figure 3 below
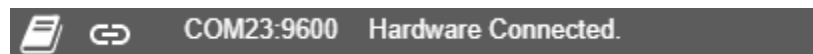
Figure 3. DRV84xxP EVM GUI (Device Connection Pane)

If the GUI fails to connect to the EVM, the hardware connection status pane will show the message 'Hardware Not Connected'.

If the GUI is opened without connecting the EVM, the hardware connection status pane will show 'Error: no serial ports found'.

If there are more than one DRV84xxP EVM boards connected, the first matching device will be connected automatically. In order to switch to another EVM:

1. Click Options -> Serial Port. A serial port configuration popup is displayed as shown below in Figure 4.
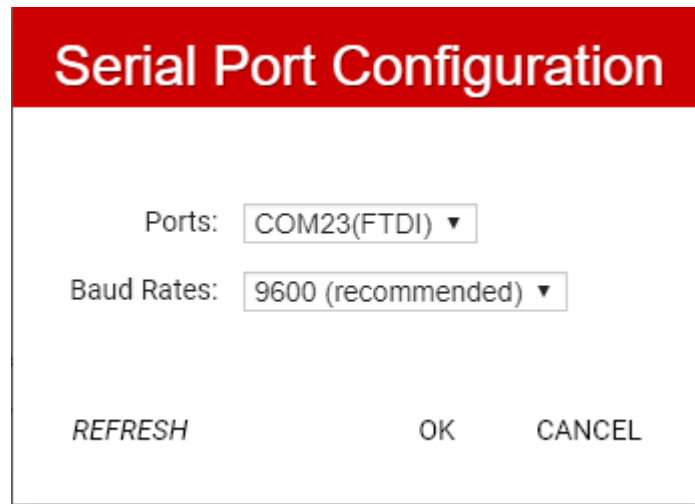2. Choose the appropriate port and baud rate.
3. Click OK

Figure 4. Serial Port Configuration

Once the correct device is connected, the home page will show a message 'Device Connected' with a green check mark as shown in Figure 1

Click on the 'Stepper Motor' button to open the motor control page.

3.3.1   Motor Control Page

This page (shown in Figure 5) includes various controls to sleep/wake the driver and control the motor by configuring various parameters such as AVREF_VALt, control mode and so forth. Hovering over the (?) icon to the right of a control displays a brief description about the control.
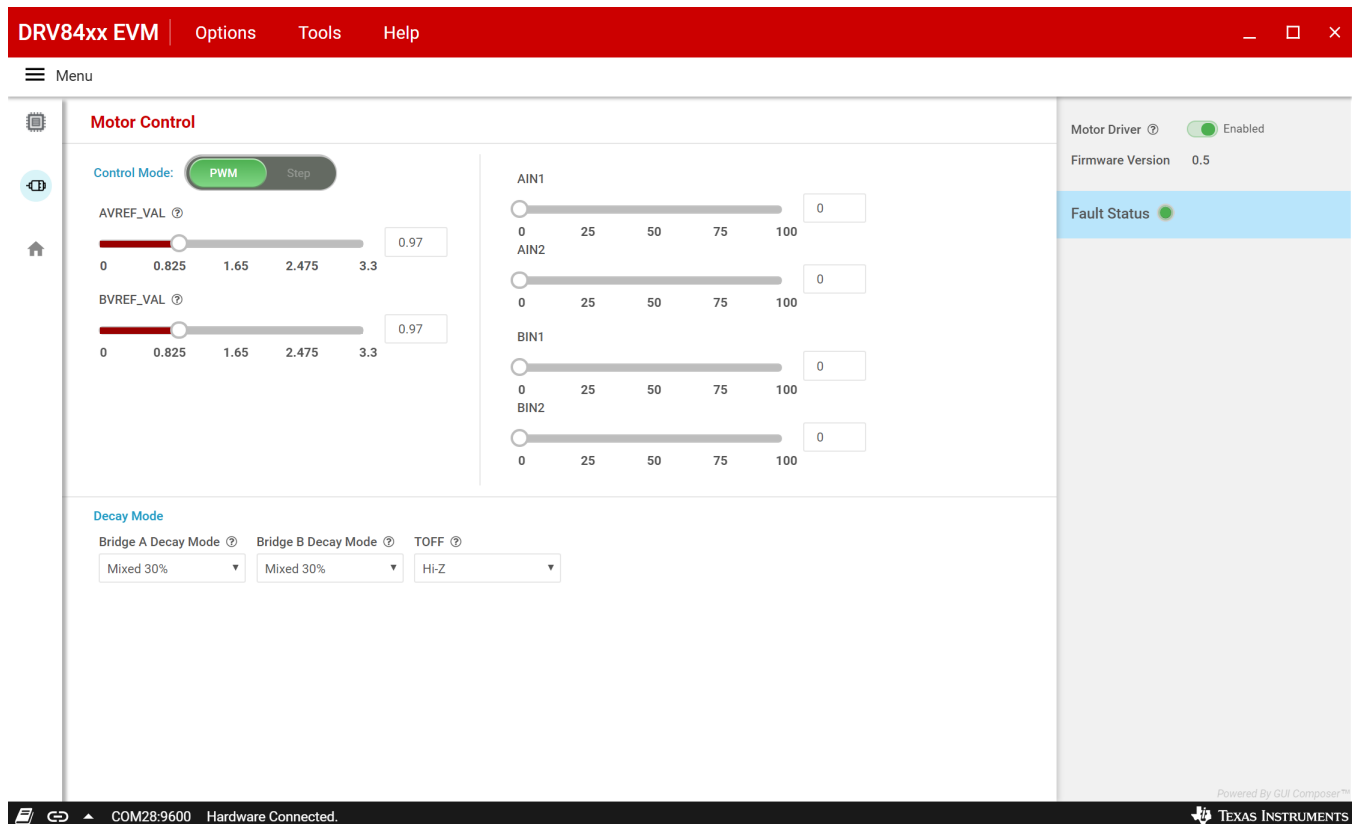
Figure 5. DRV84xxP EVM GUI (Motor Control Page)

3.3.1.1 Control Modes

The GUI allows the user to control the stepper motion profile in two modes – PWM Mode and Step Mode. To toggle between the modes, use the toggle button at the top of the screen.

3.3.1.1.1 PWM Mode

By default, PWM operation mode is selected. This configuration allows the user to connect one or two brushed motors for evaluation. If transitioning to pwm mode from step mode, the following actions will take place:

1. The AINx and BINx sliders will appear.

2. The chopping current will be recalculated.
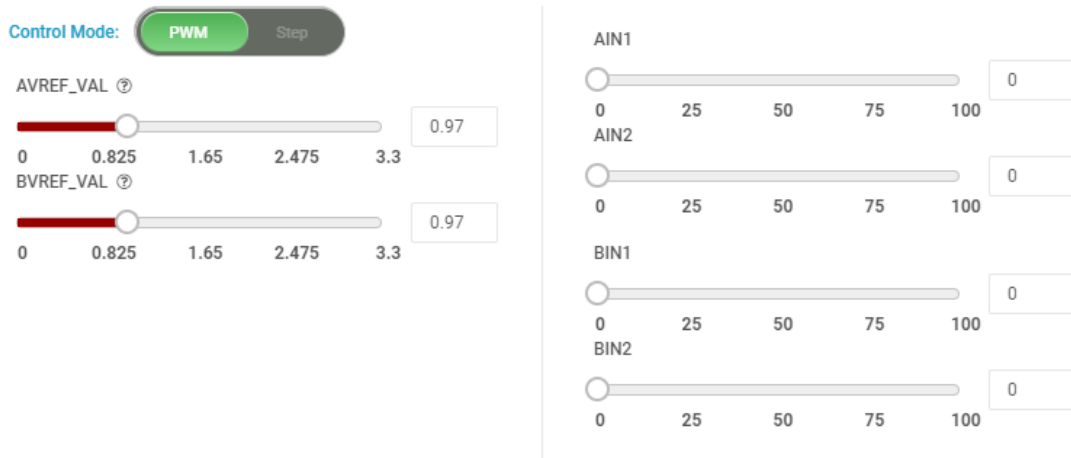
Figure 6. Controls Available for Speed Mode

3.3.1.1.2 *Step Mode*

The DRV84xxP EVM provides the ability to operate a stepper motor in full step mode. The firmware provides the necessary timing pulses on the AINx/BINx input signals to drive the stepper at the desired speed and direction.

To use the stepper feature, set the "Control Mode" toggle to "Step".
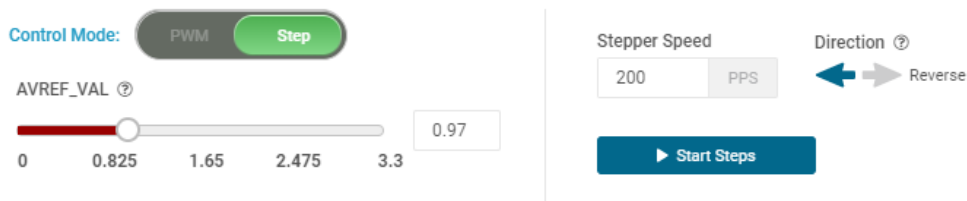
Figure 7. Controls Available for Step Mode.

Set the desired stepper step and direction, and then click "Start Steps". The stepper speed and direction can be changed as the motor is running.

3.3.2 Decay Mode

Decay refers to how the driving currents recirculate in H-bridge FETs during the off time. Using the GUI, users can configure the decay mode for each bridge.
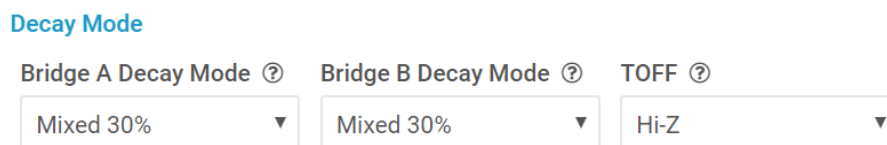
Figure 8. DRV84xxP EVM Decay Mode and TOFF setting for PWM mode
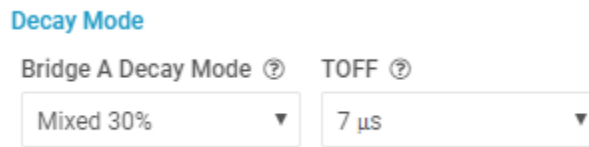
Figure 9. DRV84xxP EVM Decay Mode and TOFF setting for STEP mode

Decay mode and appropriate TOFF values can be configured in this section. .

3.3.3 Fault Monitoring

The fault monitor section at the right side of the screen allows the user to monitor the fault. The LED staying green indicates 'No Fault'. When the LED turns red, it indicates that a fault has occurred.

3.3.4 Use the Side-Bar Menu

Use the side-bar menu in the left pane to navigate to the different pages at any time. Click on the hamburger button in the top-left corner of the GUI to expand the side-bar menu. The following pages that are displayed in the side-bar menu:

- Home
- Motor control

3.3.5 Menu Bar Options

The following menus are available in the menu bar displayed at the top of the GUI as shown in Figure 10.
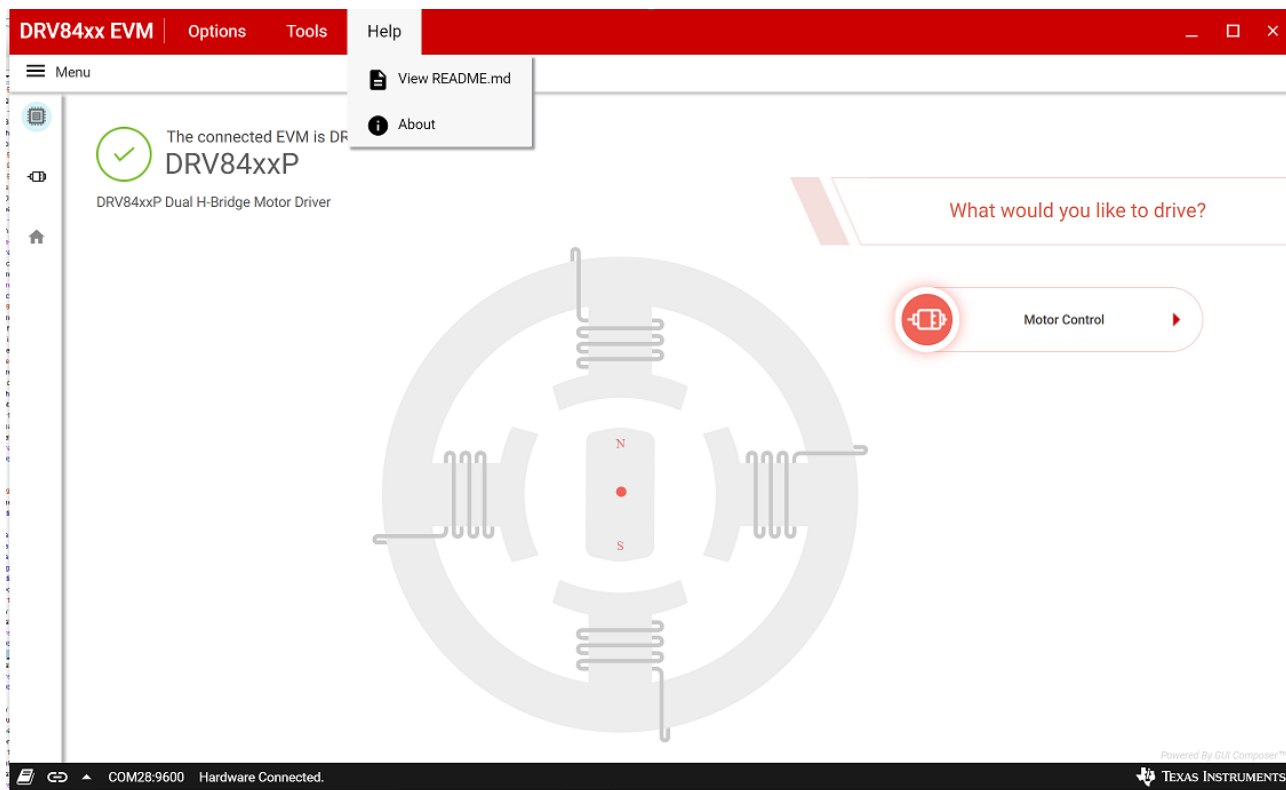
Figure 10. DRV84xxP EVM GUI (Menu Bar – Help Option)

3.3.5.1   File Menu

The File Menu has the following options:

Program Device—The user can load the firmware (.out) file onto the device by clicking this option. For the firmware load to work, MSP430 FET needs to be plugged into the J2 connector on the EVM board.

3.3.5.2   Options Menu

This menu provides the option to configure the serial port communication settings.

3.3.5.3   Help Menu

The Help Menu contains options to view Readme File and About Section. The About Section displays the installed software information, including the application version.

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