

DRV8702D-Q1 EVM User's Guide

1 DRV8702D-Q1-EVM

This user's guide is provided with the DRV8702D-Q1 customer evaluation module (EVM) as a supplement to the DRV8702D-Q1 data sheet. This document details the hardware implementation of the EVM and how to use DRV8702D-Q1-EVM GUI application.

1.1 Board Overview

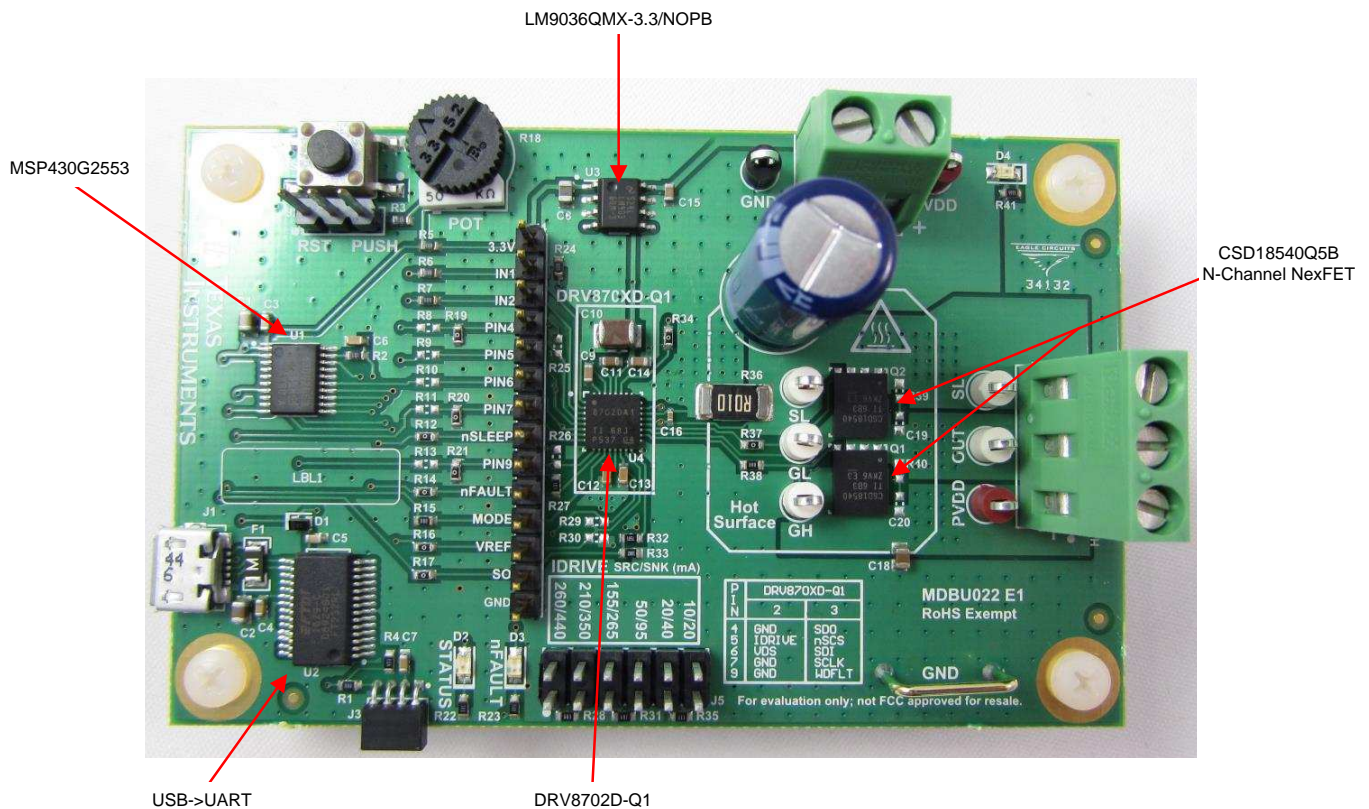


Figure 1. Board Components

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WARNING

Hot surfaces include the power MOSFETs (Q1-Q2), power sense resistor R36, and areas around them.

The DRV8702D-Q1-EVM serves as an evaluation kit to demonstrate TI's DRV8702D-Q1 half-bridge gate driver in a 3.5-in x 2.2-in compact form factor. An MSP430G553 device is used to control the speed and direction of the motor, while also monitoring the motor current from the DRV8702D-Q1 device. The power stage is created using the DRV8702D-Q1 half-bridge gate driver and the CSD18540Q5B N-channel NexFET™ power MOSFETs. The EVM is a high-performance, power-efficient, and cost-effective platform that speeds development for a quicker time to market.

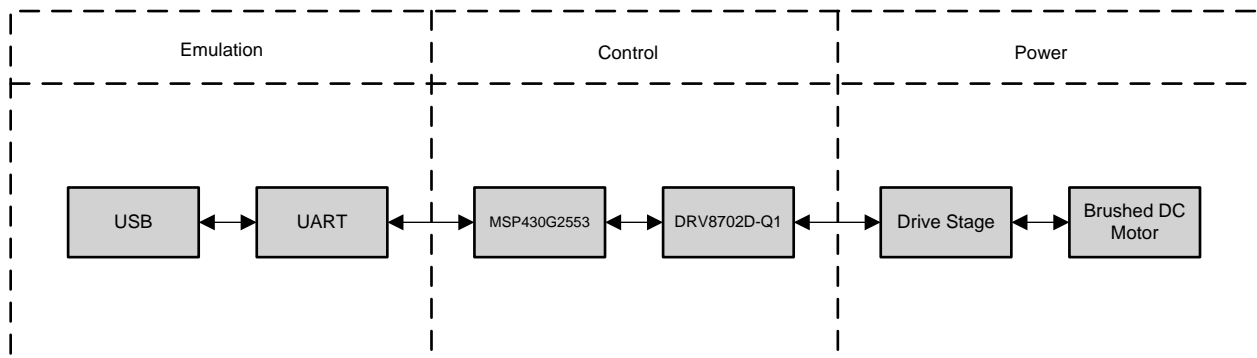


Figure 2. Block Diagram

1.2 Jumper Settings and Test Points

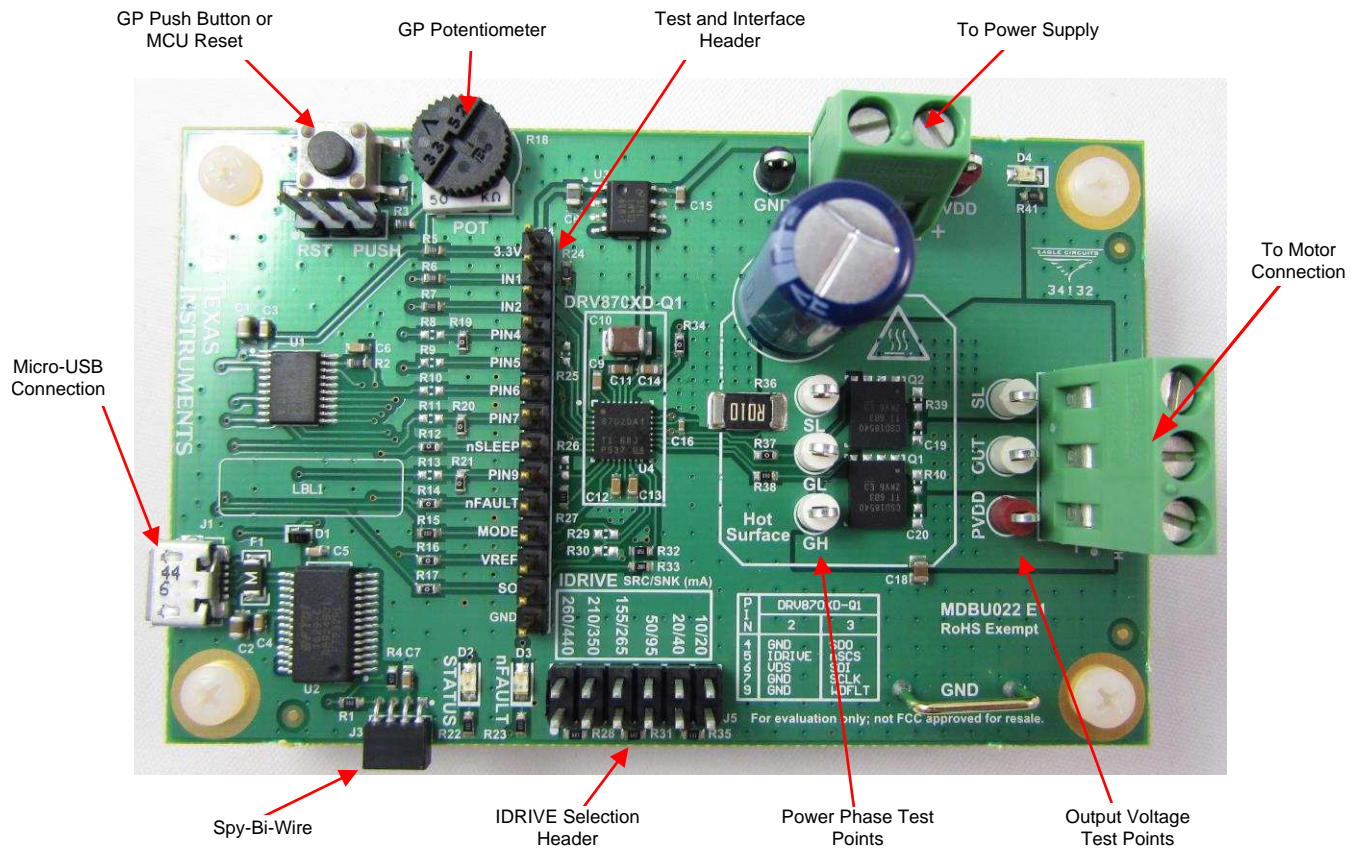


Figure 3. Board Jumpers and Test Points

The jumper settings and test points are as follows:

micro-USB (J1) — Use J1 to interface to a micro-USB cable used to download a program to the MSP430™ MCU memory and run it.

GP Push Button or MCU Reset (J2) — Set J2 to RESET for MCU reset functionality or PUSH for general-purpose input functionality.

Spy-Bi-Wire (J3) — J3 is for a serialized JTAG protocol used for MSP430 MCUs. J3 can connect an MSP430 Spy-Bi-Wire male header to this female header. Essentially it can be used to program the MSP430 on the EVM instead of using the USB-to-JTAG interfaces.

Test and Interface Header (J4) — J4 can be used to monitor input or output signals from the EVM or supply external control signals.

IDRIVE Selection Header (J5) — J5 is the current setting header for the gate drive. Placing a jumper to a specific header configures the peak source and sink current.

Power Phase Test Pinouts— These pinouts are to measure the single-half-bridge node voltages.

To Motor — Three-port bulk header to connect the brushed DC motor.

To Power Supply — Two-port power-supply bulk header. This header accepts supplies from 5.9 V to 45 V.

2 GUI Application

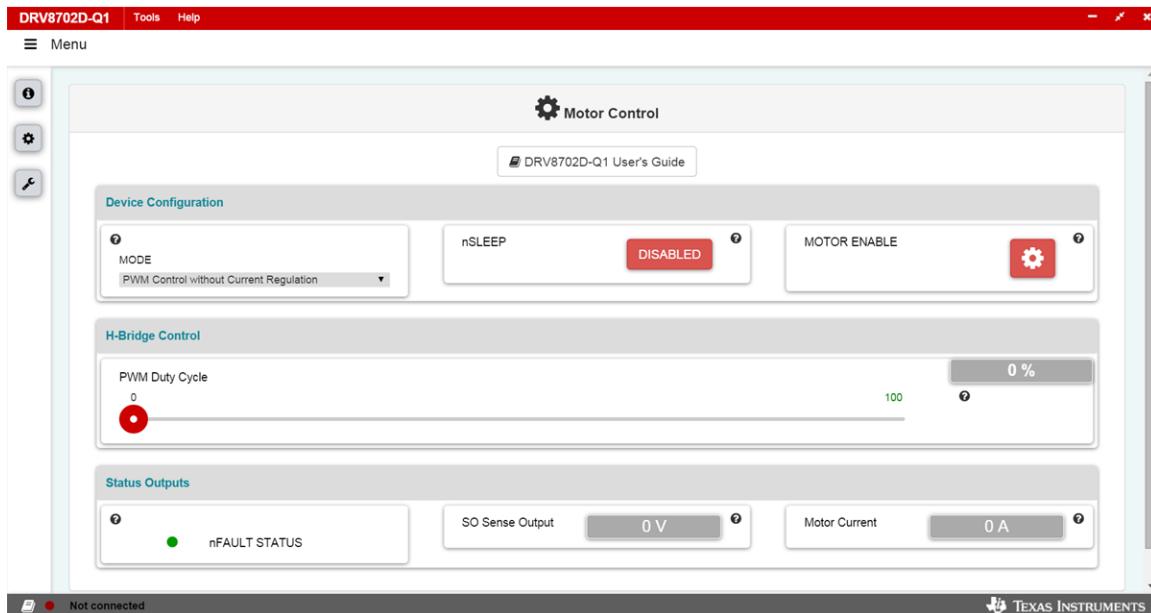


Figure 4. DRV8702D-Q1-EVM GUI (Motor Control Page)

2.1 Installation

Follow these steps to get started:

Step 1. Install the GUI.

Download and run the installer, *Setup_DRV8702DQ1EVM-1.X.X_EVM*, to install the GUI application.

Step 2. Install the FTDI device driver.

The FTDI USB device driver must be installed manually. The driver setup can be found in the `C:\Program Files (x86)\Texas Instruments\DRV8702D-Q1\FTDI_USB_DRIVER` folder after successfully completing installation in [Step 1](#). Run the *CDM21216_Setup.exe* file in this folder and follow the installation instructions.

2.2 Hardware Setup

The hardware required to run the motor control is a micro-USB cable, the DRV8702D-Q1-EVM, and a power supply with a DC output from 5.9 to 45 V. First the brushed DC motor is connected to the motor header on the DRV8702D-Q1-EVM. Next the micro-USB is connected to the PC and to the DRV8702D-Q1-EVM. Finally the power supply is connected to the DRV8702D-Q1-EVM. Verify any faults by testing the nFAULT pin voltage to have a high logical value (pulled logic low if a fault condition exists).

2.3 DRV8702D-Q1-EVM GUI

The DRV8702D-Q1-EVM_GUI is provided with the DRV8702D-Q1-EVM to control a brushed DC motor and manipulate various settings. The GUI provides functionality for adjusting the speed and direction of the motor, adjusting the current-regulation limit, observing the measured drive current, and monitoring the device status.

Use these steps to control the DRV8702D-Q1 EVM through the GUI application

Step 1. Attach the brushed DC motor.

Step 2. Plug in the micro-USB cable.

Step 3. Enable your motor power supply (see [Section 2.2](#)).

Step 4. Click on the DRV8702D-Q1-EVM shortcut either on the desktop or from the start menu to run the GUI application.

The GUI will redirect to the *Serial Port* page for a manual connection of COM port out of the available for connection as shown in [Figure 5](#). If nothing is physically connected to the PC, the COM drop-down list displays -- No Ports --.

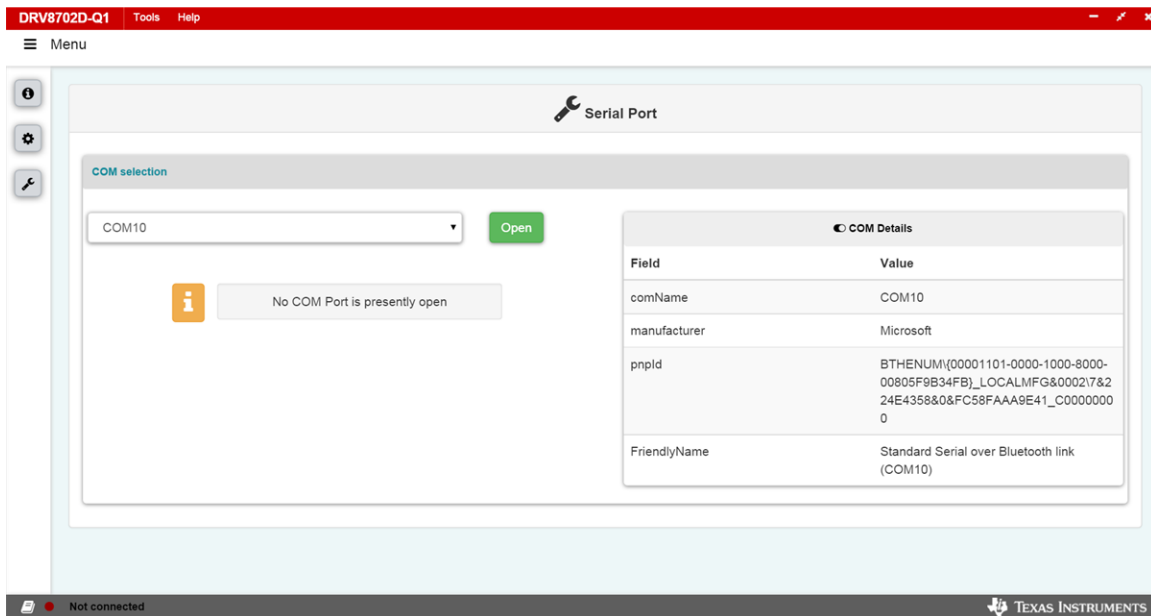


Figure 5. DRV8702D-Q1-EVM GUI (List COM Ports)

- Step 5. Select the relevant COM (USB Serial Port) from the drop-down list and click on the *Open* button.
- Step 6. After the GUI connects, the window in [Figure 6](#) is displayed. Verify that the COM port name (COM port number may differ), and baud rate match what is shown in [Figure 6](#). The bottom left corner of the status bar shows a green indicator to indicate the connection with the opened COM port number and connected device's name mentioned in the bracket.

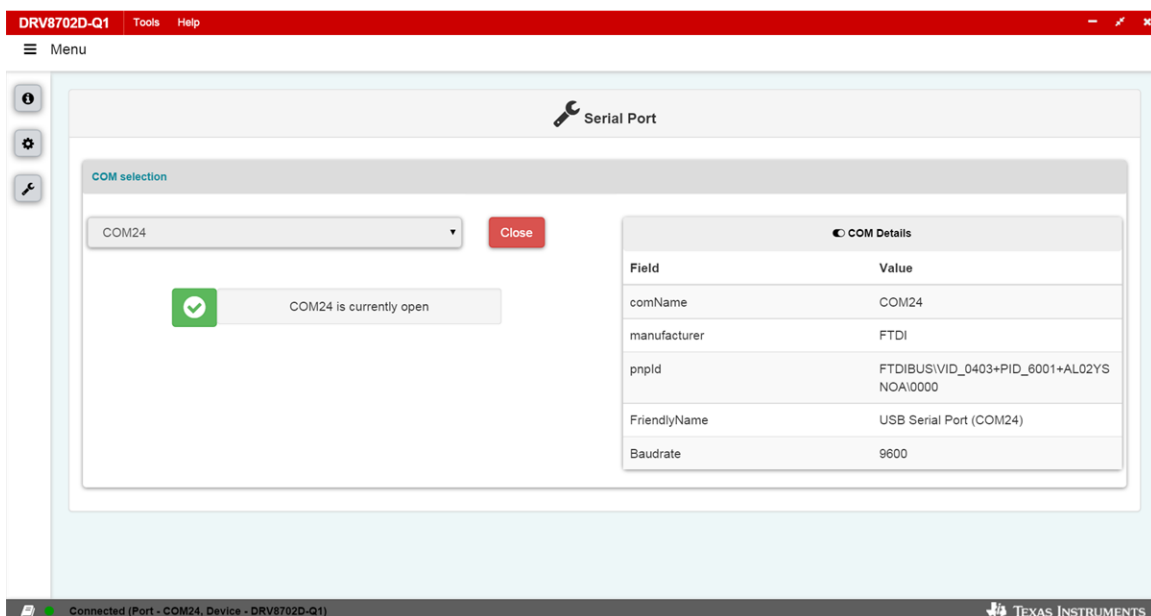


Figure 6. DRV8702D-Q1-EVM GUI (COM Opened)

Step 7. Click on the *Menu* icon in the top-left corner of the GUI to open a side-bar menu. Using the side-bar menu, navigate to the following pages or sub-pages at any time:

- Introduction
 - General
 - Device
 - EVM
- Motor Control
- Serial Port

2.3.1 Introduction Page

The *Introduction* page has the general information about the DRV8702D-Q1 device. The sub-pages, *Device* and *EVM*, under *Introduction* page have the detailed description about the device and EVM respectively as shown in [Figure 7](#).

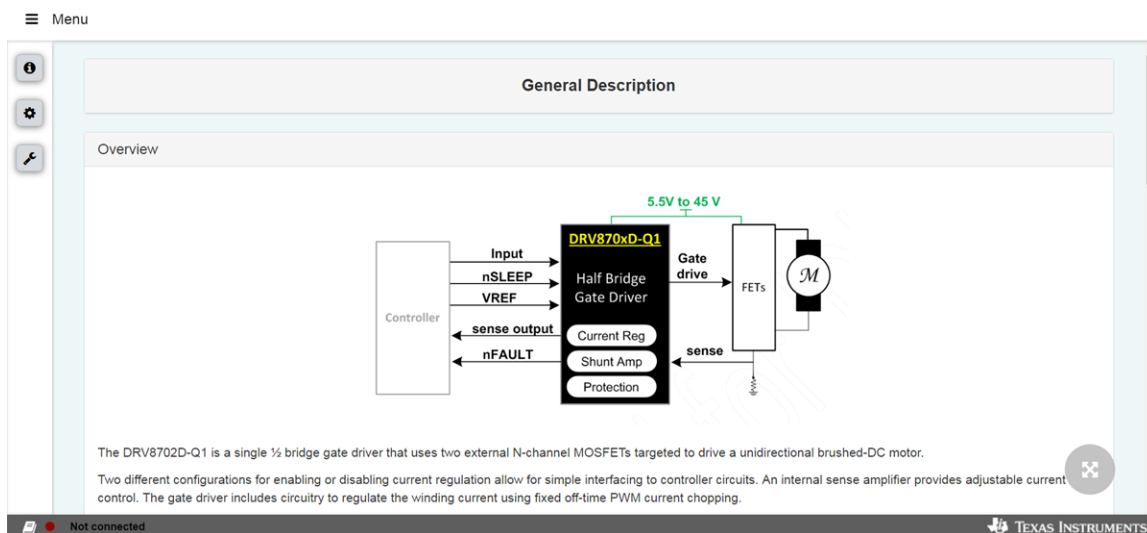


Figure 7. DRV8702D-Q1-EVM GUI (Introduction Page)

2.3.2 Motor Control Page

This page has different widget controls to control the motor as shown in [Figure 8](#).

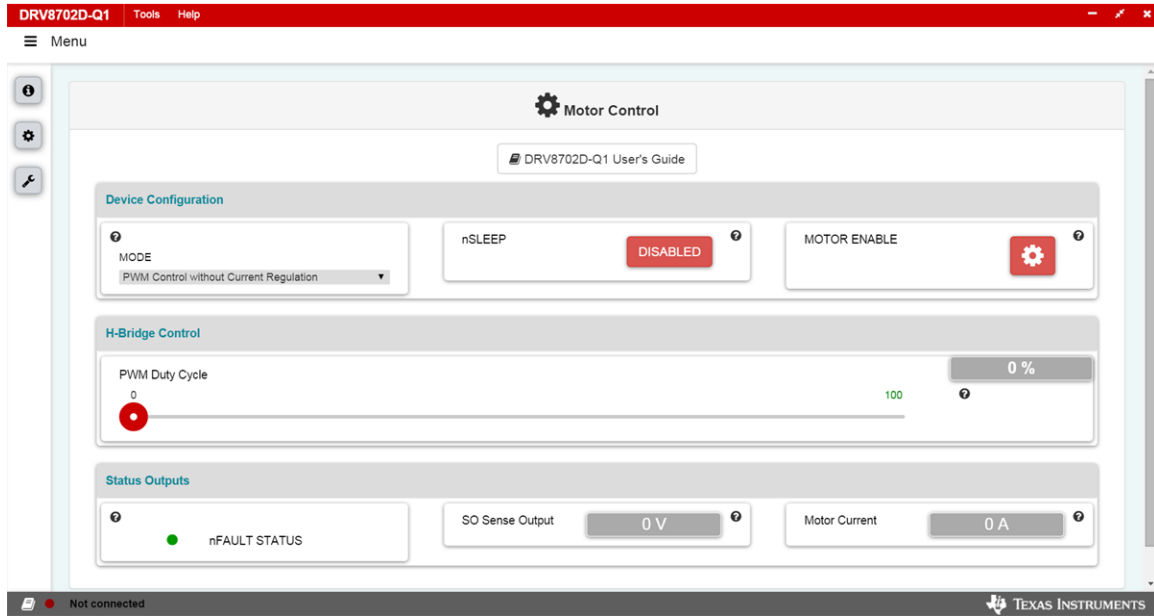


Figure 8. DRV8702D-Q1-EVM GUI (Motor Control Page)

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Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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2. Use EVMs only after User obtains the license of Test Radio Station as provided in Radio Law of Japan with respect to EVMs, or
3. Use of EVMs only after User obtains the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to EVMs. Also, do not transfer EVMs, unless User gives the same notice above to the transferee. Please note that if User does not follow the instructions above, User will be subject to penalties of Radio Law of Japan.

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