

DRV8703-Q1 EVM User's Guide

1 DRV8703-Q1-EVM

This user's guide is provided with the DRV8703-Q1 customer evaluation module (EVM) as a supplement to the DRV8703-Q1 data sheet. This document details the hardware implementation of the EVM and how to use DRV8703-Q1 EVM GUI application.

1.1 Board Overview

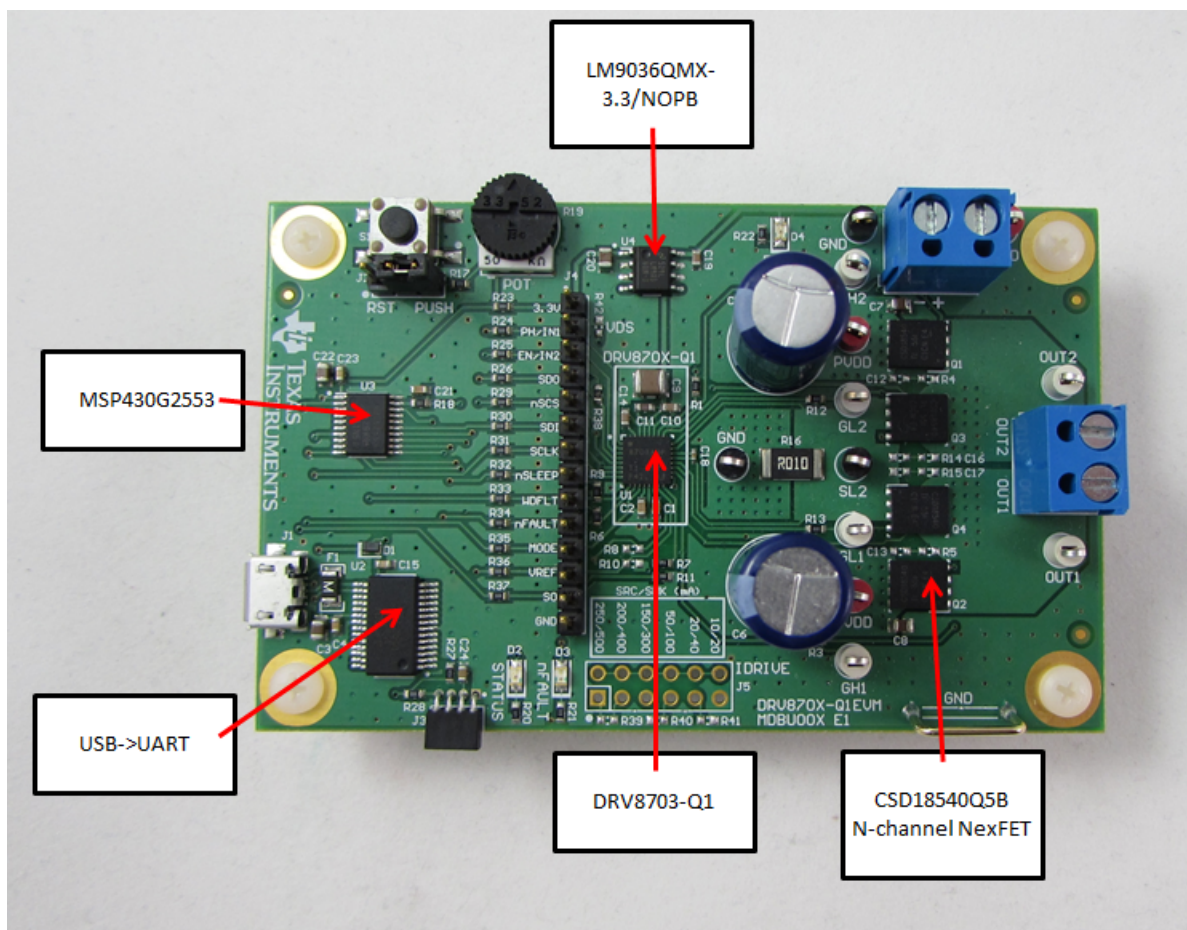


Figure 1. Board Components

⁽¹⁾ NexFET, MSP430 are trademarks of Texas Instruments.

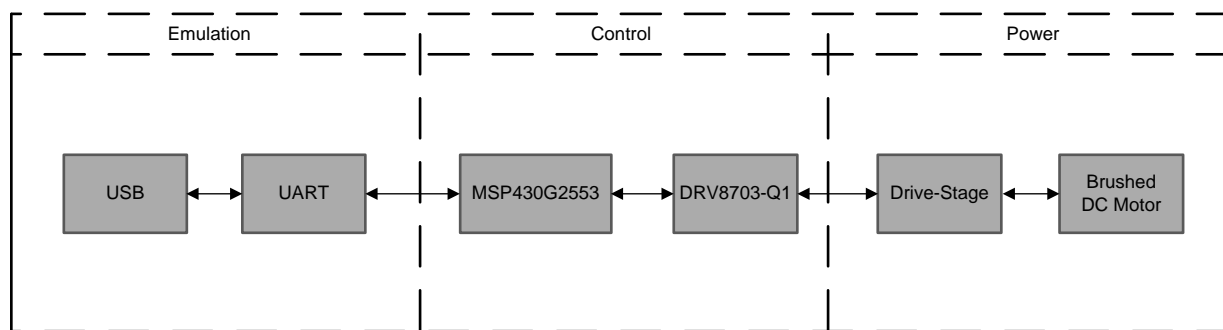
⁽²⁾ All other trademarks are the property of their respective owners.



WARNING

Hot surfaces include the power MOSFETs (Q3-Q8), power sense resistors (R74-77), and areas around them.

The DRV8703-Q1 EVM serves as an evaluation kit to demonstrate TI's DRV8703-Q1 H-bridge gate driver in a 3.5-in × 2.2-in compact form factor. An MSP430G2553 device is used to control the speed and direction of the motor, while also monitoring the motor current from the DRV8703-Q1 device. The power stage is created using the DRV8703-Q1 H-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.



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Figure 2. Block Diagram

1.2 Jumper Settings and Test Points

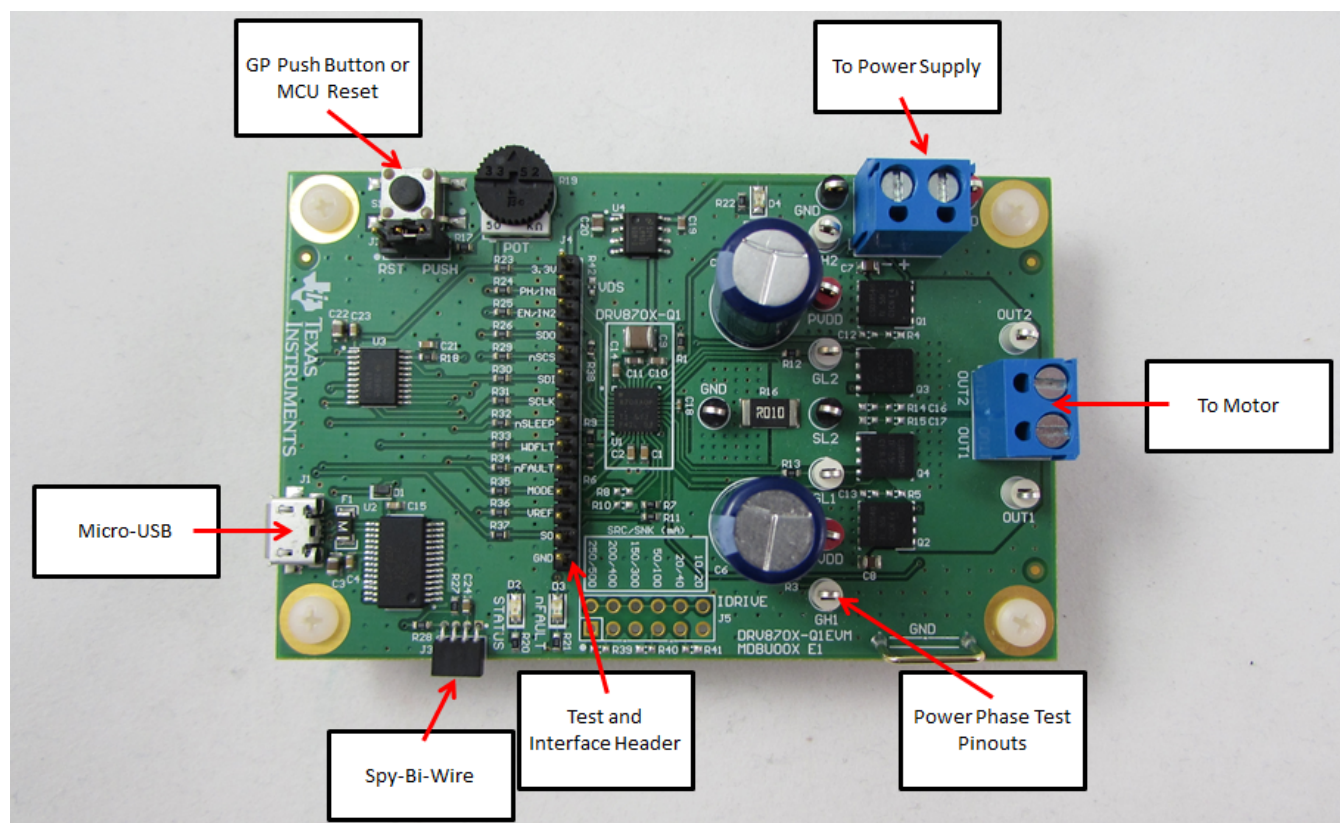


Figure 3. Board Jumpers and Test Points

The jumper settings and test points are as follows:

micro-USB (J1) — Use J1 to interface to a micro-USB cable for GUI evaluation purposes.

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. It is the only way to reprogram the MSP430™ MCU on the EVM and it is the method utilized instead of the USB-to-JTAG method.

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

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

To Motor — Two-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

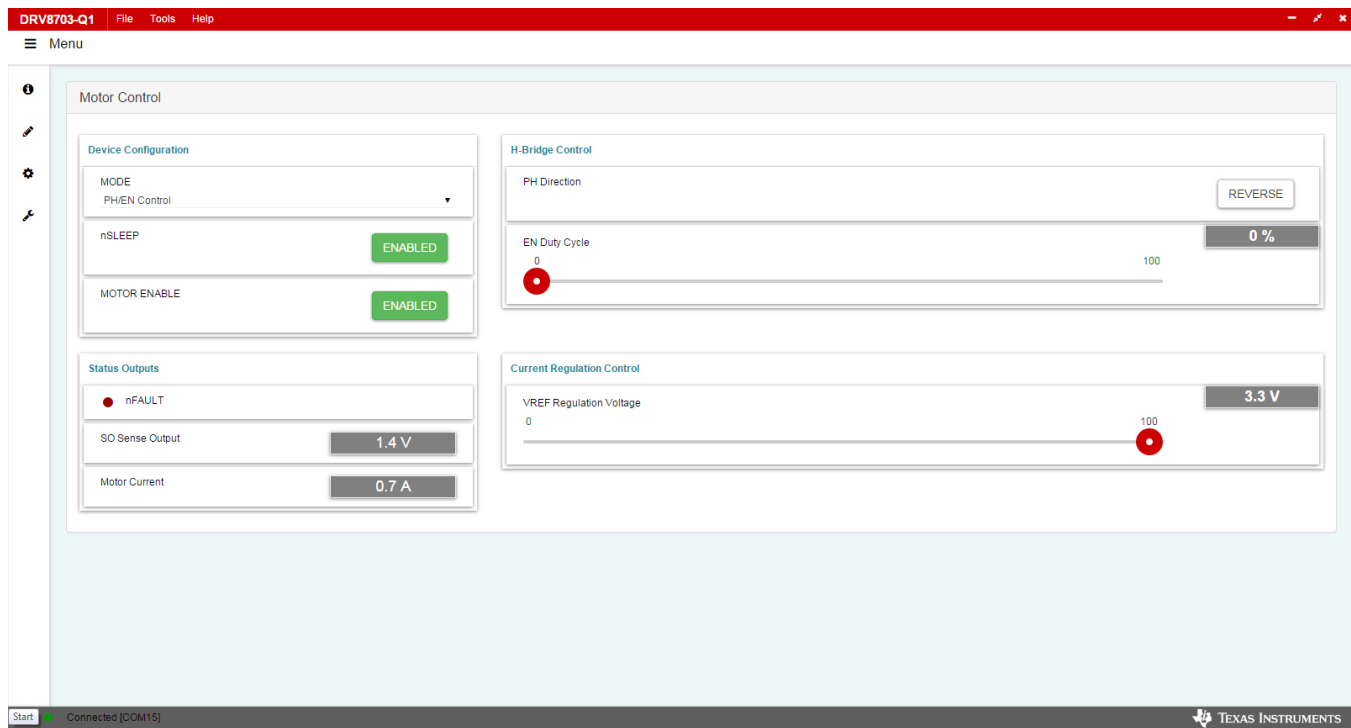


Figure 4. DRV8703-Q1-EVM GUI (Motor Control Page)

2.1 Installation

Follow these steps to get started:

Step 1. Install the GUI.

Download and run the installer, *Setup_DRV8703-Q1_DRV8703Q1EVM.exe*, to install the GUI application.

Step 2. Install the FTDI device driver.

If the FTDI USB device driver is not already installed, the driver must be installed manually. The device driver setup can be found in the C:\Program Files (x86)\Texas Instruments\DRV8703-Q1\FTDI_USB_DRIVER folder after successfully completing the 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 DRV8703-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 terminal block on the DRV8703-Q1 EVM. Next the micro-USB cable is connected to the PC and to the DRV8703-Q1 EVM. Finally the power supply is connected to the DRV8703-Q1 EVM. Verify any faults by testing the nFAULT pin voltage to be 3.3V (pulled logic low if a fault condition exists).

2.3 DRV8703-Q1 EVM GUI

The DRV8703-Q1 EVM_GUI is provided with the DRV8703-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 DRV8703-Q1 EVM through the GUI application:

Step 1. Attach the brushed DC motor

- Step 2. Plug in the micro-USB cable.
- Step 3. Enable the motor power supply (see [Section 2.3](#)).
- Step 4. Click on the DRV8703-Q1 EVM shortcut either on the desktop or from the start menu to run the GUI application.
- Step 5. The *Serial Port* page displays a list of COMs available for opening the connection as shown in [Figure 5](#). If nothing is physically connected to the PC, the COM drop-down list displays -- No Ports --.

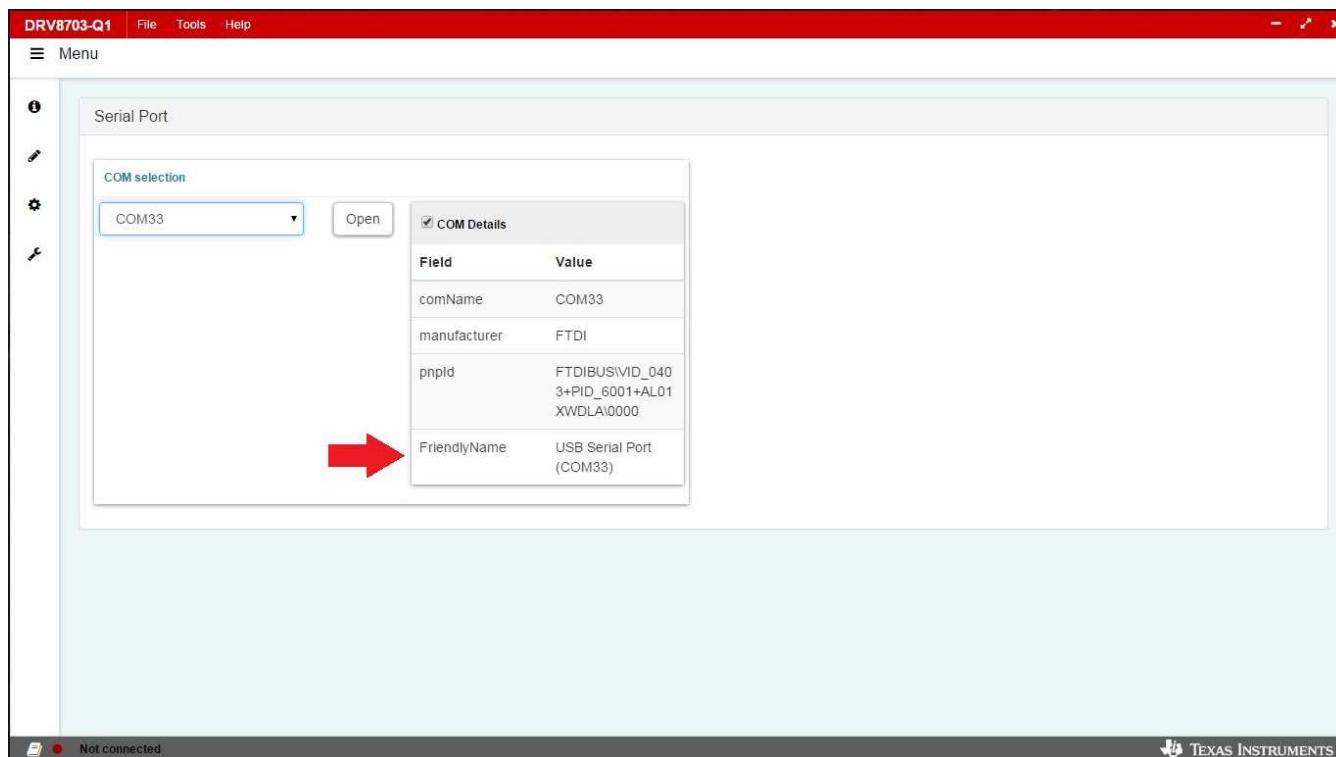


Figure 5. DRV8703-Q1-EVM GUI (List COM ports)

- Step 6. Select the relevant COM from the drop-down list and click on the *Open* button.
- Step 7. 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 mentioned in the bracket.

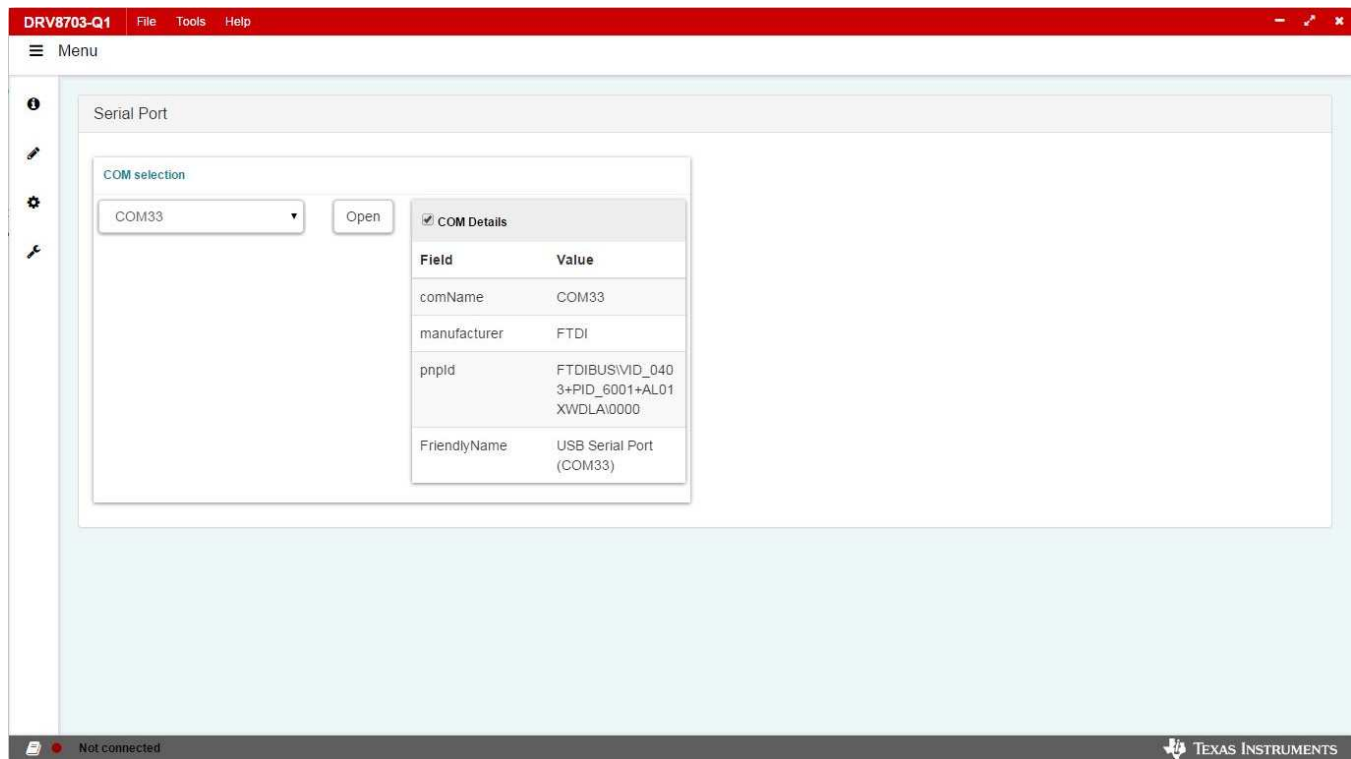


Figure 6. DRV8703-Q1-EVM GUI (COM Opened)

- Step 8. 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
 - Device
 - EVM
 - Registers
 - Motor Control
 - Serial Port

2.3.1 Introduction Page

The *Introduction* page has the general information about the DRV8703-Q1 device. The sub-pages, *Device* and *EVM*, under the *Introduction* page have a detailed description about the device and EVM respectively as shown in [Figure 7](#).

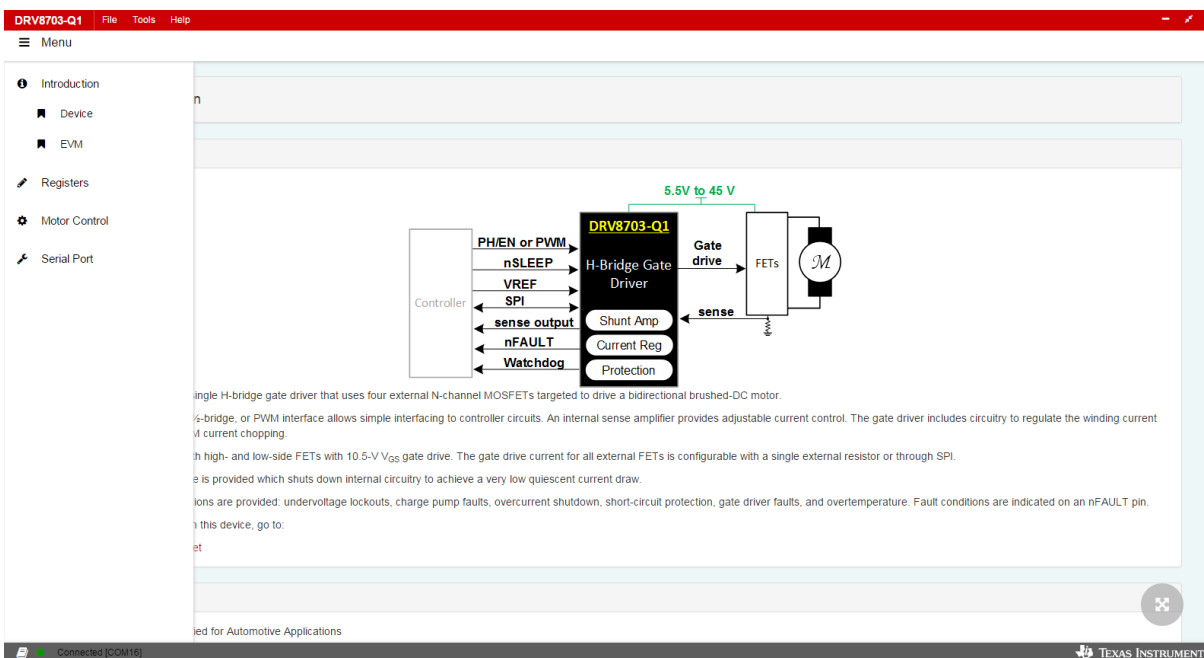


Figure 7. DRV8703-Q1-EVM GUI (Introduction Page)

2.3.2 Registers Page

This page shows all the registers and register fields present on the DRV8703-Q1. The page allows reading, writing, or both to any register, register field, or bit as shown in [Figure 8](#).

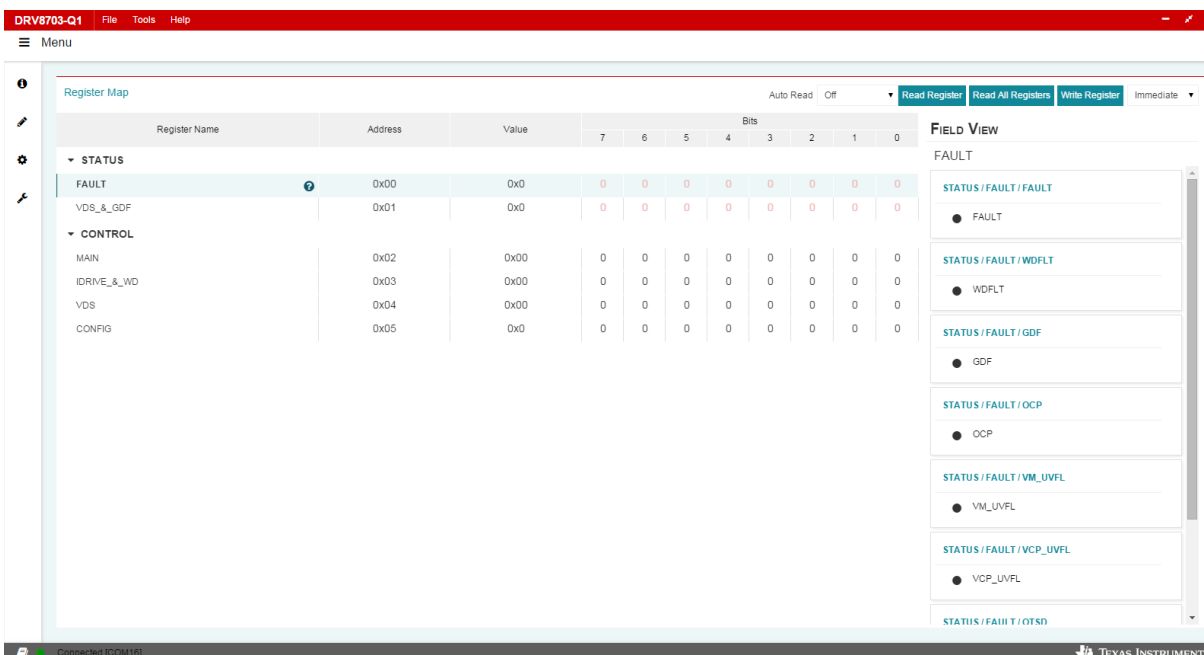


Figure 8. DRV8703-Q1 EVM GUI (Register Page)

2.3.3 Motor Control Page

This page has different widget controls to control the motor as show in [Figure 9](#).

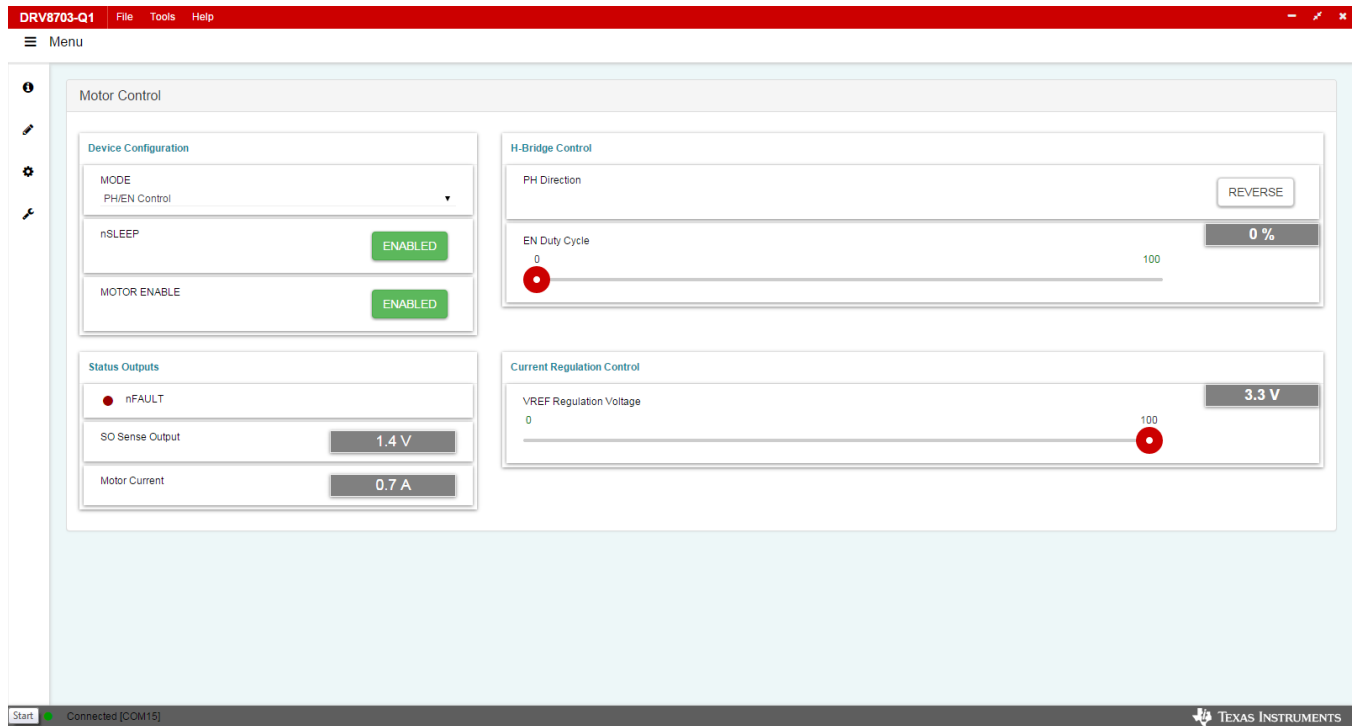


Figure 9. DRV8703-Q1-EVM GUI (Motor Control Page)

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