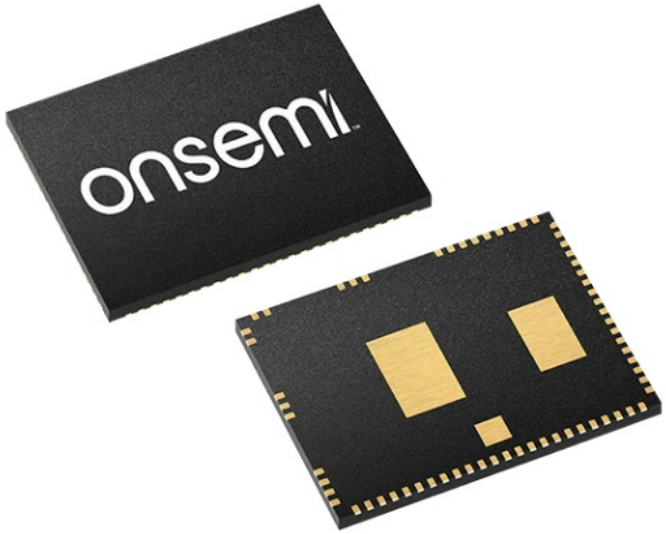
onsemi ECS640A Development Platform User Manual

Contents

Onsemi ECS640A Development Platform



Product Information

The ECS640A development platform is a system designed for operating a 3-phase BLDC motor. It consists of three basic elements:

1. ecoSpin DTFC GUI Application
2. ECS640A EVB Unit with Embedded Motor Control Direct Torque and Flux Control (DTFC) Firmware
3. Set of Closed Loop Control Parameters

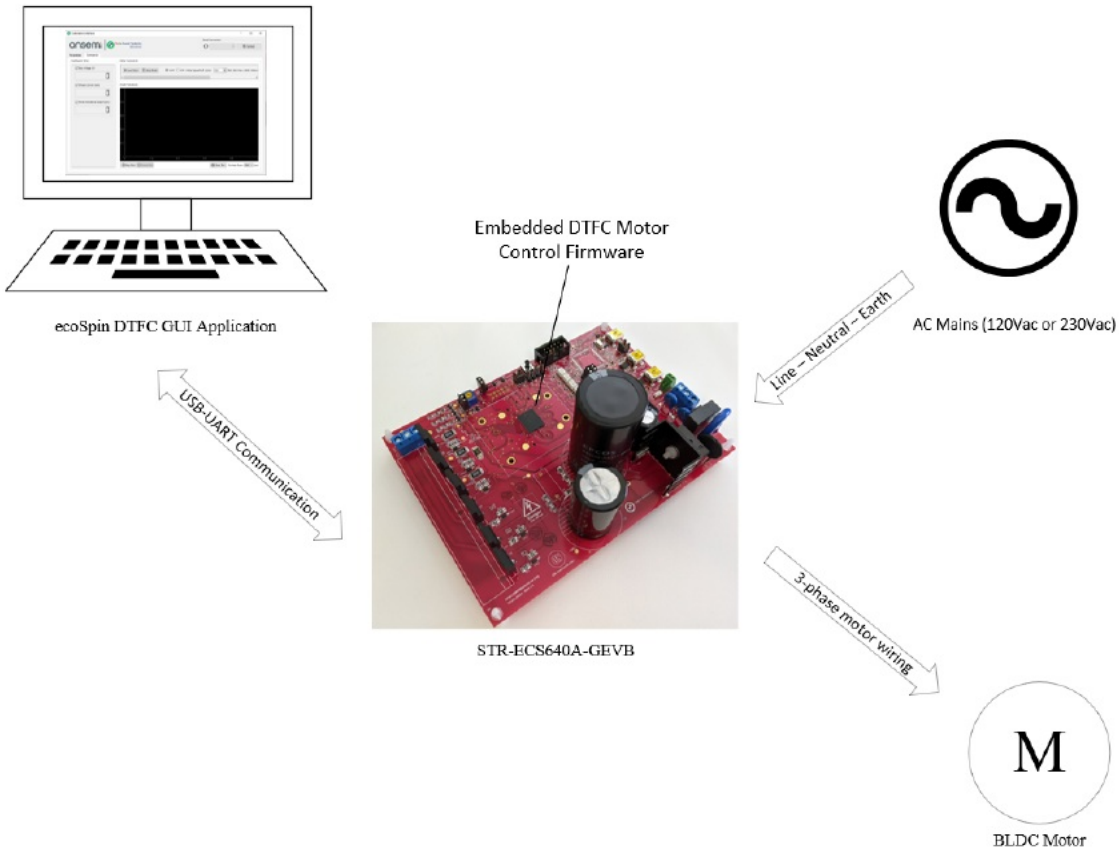
The ecoSpin DTFC GUI application runs on a Windows-based computer and enables data communication with the ECS640A EVB unit, which is embedded with DTFC Motor Control firmware. The ECS640A development platform features a graphical waveform interface, allowing users to issue BLDC motor movement commands using the embedded DTFC motor control algorithm firmware. For more details and a visual representation of the ECS640A
Development Platform, refer to Figure 1 and Figure 2.

Product Usage Instructions

1. Download the ecoSpin DTFC Interface.exe application from the Strata Developer Studio environment.
2. Download the latest ECS640A EVB User Manual (EVBUM2816 file) and ecoSpin DTFC GUI User Manual (UM70067 file) from the Strata Developer Studio environment.
3. Launch the ecoSpin DTFC Interface.exe application on a Windows-based laptop. Follow the “New BLDC Motor Setup Process” section in the ecoSpin DTFC GUI User Manual document (UM70067 file) for further instructions.
4. Connect the ECS640A EVB J3 serial communication connector to a laptop USB port using the provided USB cable.
5. Connect the 3-phase motor wiring to the ECS640A EVB J2 connector, following the phase sequence depicted on the PCB silkscreen.
6. Connect the AC mains wiring cable to the ECS640A EVB J1 connector. Please note that the AC mains power cord is not provided with the ECS640A EVB.
7. Enable ecoSpin GUI USB communication with the ECS640A EVB and download parameter settings to the ECS640A flash memory. Refer to the “USB Connection” and “ECS640A EVB Send and Reload Parameters” sections in the ecoSpin DTFC GUI User Manual document (UM70067 file) for a detailed process.
8. Start the 3-phase BLDC motor using the ecoSpin DTFC Interface.exe application. Refer to the “BLDC Motor Commands” section in the ecoSpin DTFC GUI User Manual document (UM70067 file) for further instructions.
9. Plot motor lives data in the Graph Feedbacks window.

ECS640A Development Platform – Quick Start
STR-ECS640A-GEVK

Description

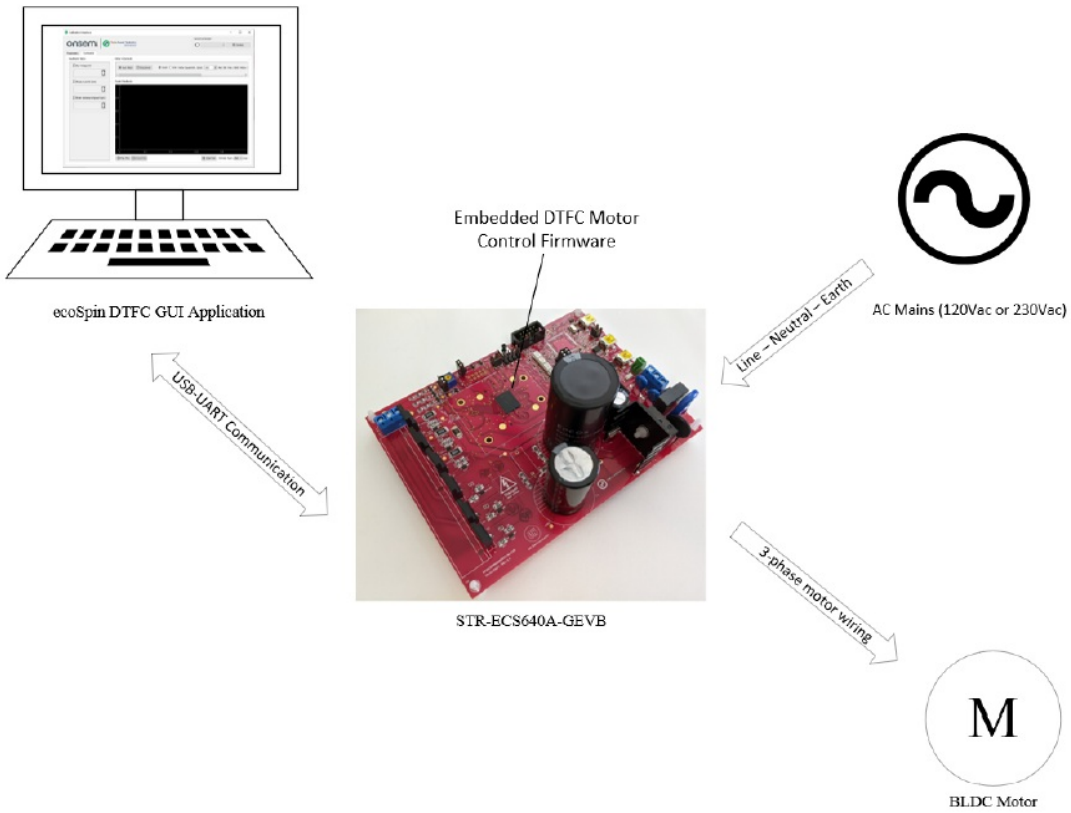


This document describes how to get started with the ECS640A development platform. A 10−steps process on setting up STR−ECS640A−GEVB unit with ecoSpin DTFC motor controller graphical user interface (ecoSpin DTFC GUI) application and how to issue BLDC motor movement commands using embedded “Direct Torque and Flux Control” (DTFC) motor control algorithm firmware is described.

Features

- ECS640A Development Platform Comprises a User−friendly ecoSpin DTFC GUI Application and an ECS640A EVB Unit with Embedded Motor Control “Direct Torque and Flux Control” (DTFC) Firmware
- Configurable “BLDC Motor and Motor Control” Parameters Set for Direct Torque and Flux Control – DTFC. Trapezoidal and Field Oriented Control (FOC) Algorithms will be Available in Future Release.
- Seamless Motor Electromechanical Characterization Using a Single Set of Closed Loop Control Parameters
- Enables BLDC Motor Start/Stop Commands and Clockwise (CW) and Counterclockwise (CCW) Speed Reference Selection
- Live Motor Performance Variables Monitoring in a Display or Graphical Waveform Interfaces
- Isolated USB Communication

ECS640A DEVELOPMENT PLATFORM
The ECS640A development platform has 3 basic elements. These elements are listed below:



- STR–ECS640A–GEVB unit (ECS640A EVB)
- ecoSpin DTFC Motor Controller Graphical Interface (ecoSpin DTFC GUI)
- Embedded Motor Control “Direct Torque and Flux Control” (DTFC) firmware

Each element is important to enable a target 3–phase BLDC motor operation. Figure 2 shows these elements’ roles and how they are linked to each other. STR–ECS640A–GEVB unit is embedded with “DTFC Motor Control” firmware. The embedded firmware enables data communication with the “ecoSpin DTFC GUI” application running on a Windows-based computer.

Getting Started with the ECS640A Development Platform

Please follow these steps to run a 3–phase BLDC motor.

Step 1
Download the “ecoSpin DTFC Interface.exe” application from the Strata Developer Studio environment.

Step 2
Download the latest “ECS640A EVB User Manual” (EVBUM2816 file) and “ecoSpin DTFC GUI User Manual” (UM70067 file) from the Strata Developer Studio environment.

Step 3
Launch the “ecoSpin DTFC Interface.exe” application on a Windows-based laptop. Follow the “New BLDC Motor Setup Process” section in the “ecoSpin DTFC GUI User Manual” document (UM70067 file) downloaded from the Strata environment (see “Step 2” for details)

Step 4
Connect ECS640A EVB J3 serial communication connector to the laptop USB port using the USB cable provided in the ECS640A EVB box. See details in Figure 3.

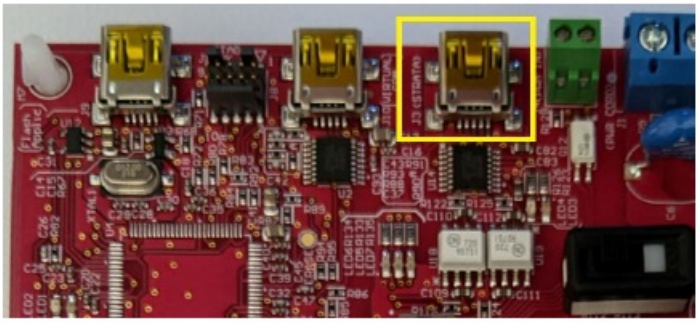
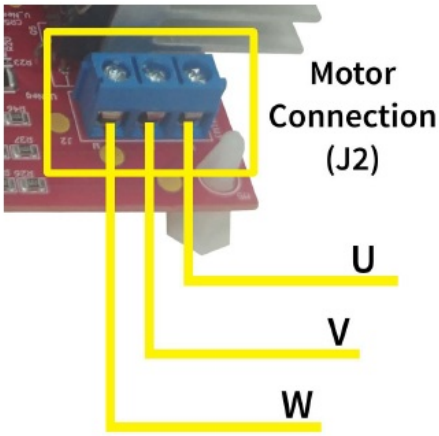
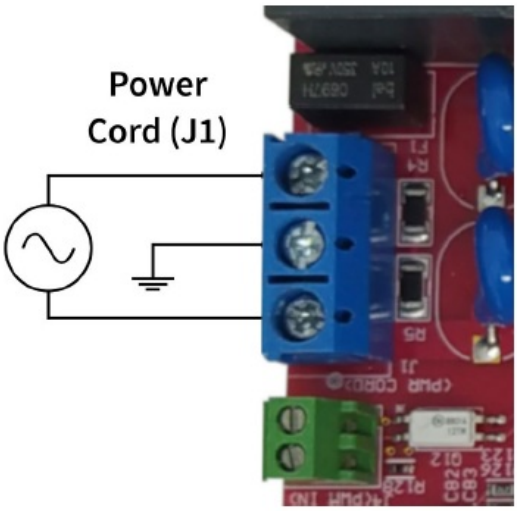


Figure 3. ECS640A EVB USB Connector (J3)

Step 5
Connect 3−phase motor wiring to ECS640A EVB J2 following phase sequence depicted on PCB silkscreen. See Figure 4 for details.



Step 6
Connect the AC mains wiring cable to the ECS640A EVB J1 connector. AC mains power cord is not provided with ECS640A EVB. See Figure 5 for details.



Step 7
Enable ecoSpin GUI USB communication with ECS640A EVB and download parameters set to ECS640A flash memory. The detailed process is described in the “USB Connection” and “ECS640A EVB Send and Reload Parameters” sections in the “ecoSpin DTFC GUI User Manual” document (UM70067 file).

Step 8
Start the 3−phase BLDC motor using the “ecoSpin DTFC Interface.exe” application. The detailed process is

described in the “BLDC Motor Commands” section in the “ecoSpin DTFC GUI User Manual” document (UM70067 file).

Step 9
Plot motor lives data in the “Graph Feedbacks” window. The detailed process is described in the “Plot Window” section in the “ecoSpin DTFC GUI User Manual” document (UM70067 file).

Step 10
Keep up-to-date ECS640A documentation by visiting the Strata Developer Studio environment.

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Documents / Resources

	**onsemi ECS640A Development Platform** [pdf] User Manual STR-ECS640A-GEVK, ECS640A, ECS640A Development Platform, Development Platform, Platform

References

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