

# ECS640A Development Platform - Quick Start

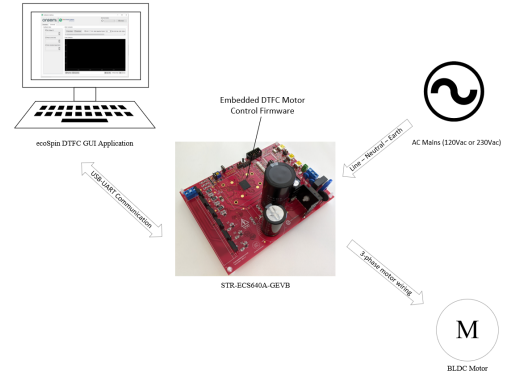
## STR-ECS640A-GEVK

### Description

This document describes how to get started with 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 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



**Figure 1. ECS640A Development Platform (See Figure 2 for Details)**

# STR-ECS640A-GEVK

## 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 role 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 “ecoSpin DTFC GUI” application running on a Windows based computer.

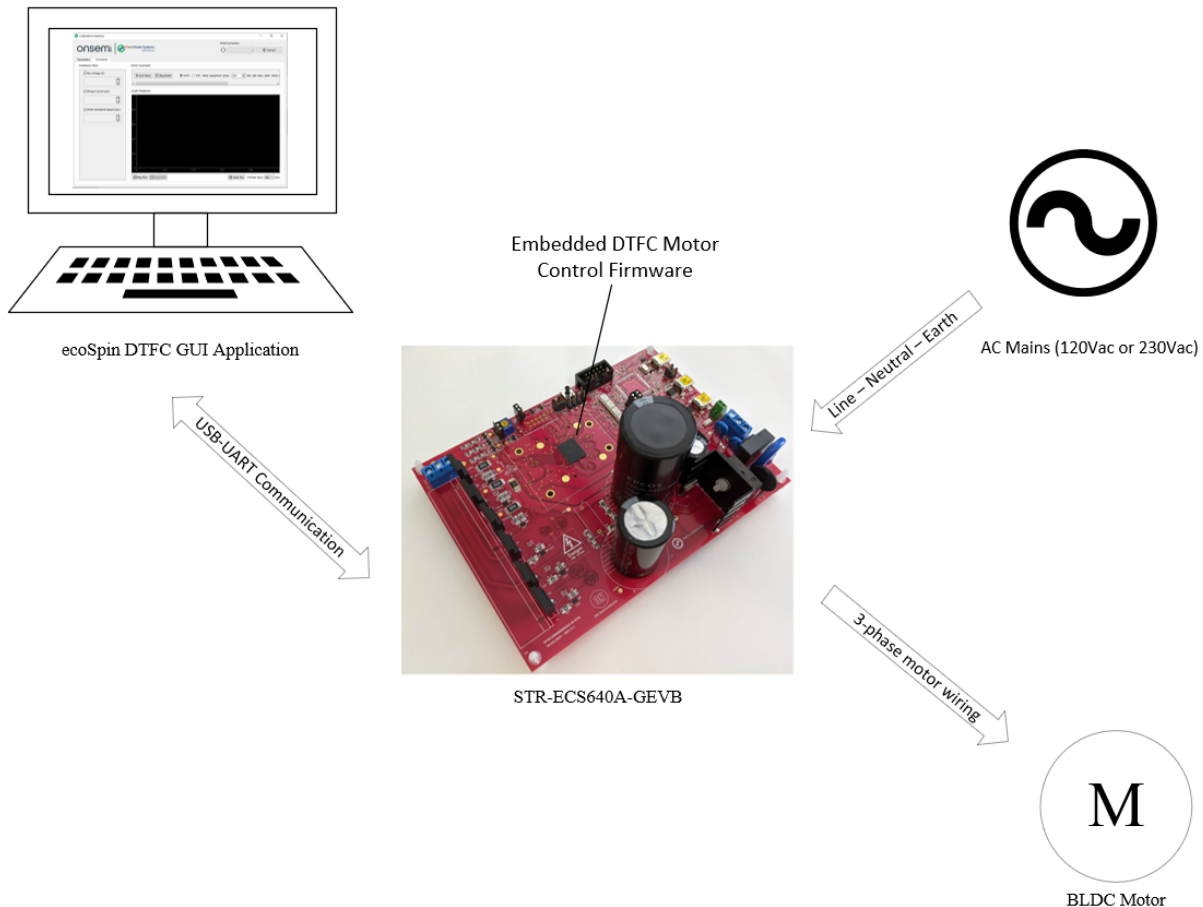


Figure 2. ECS640A Development Platform

### Getting Started with ECS640A Development Platform

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

#### Step 1

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

#### Step 2

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

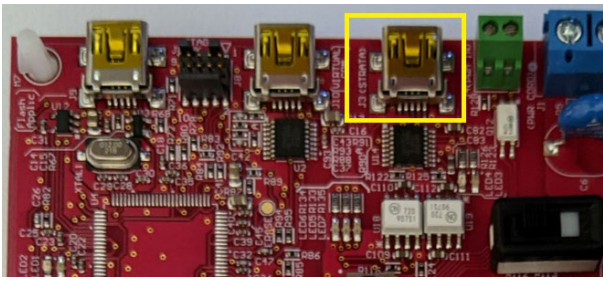
#### Step 3

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

#### Step 4

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

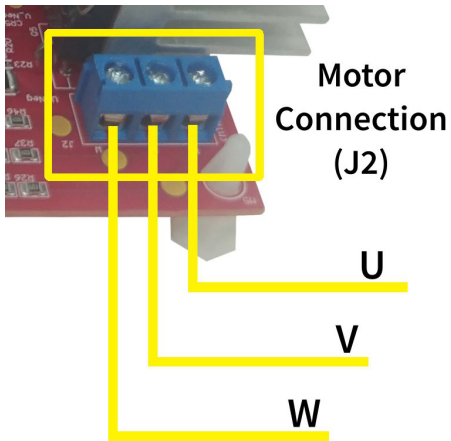
## STR-ECS640A-GEVK



**Figure 3. ECS640A EVB USB Connector (J3)**

### Step 5

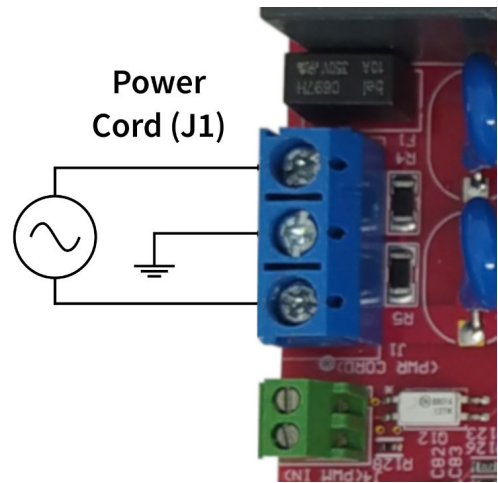
Connect 3-phase motor wiring to ECS640A EVB J2 following phase sequence depicted on PCB silkscreen. See Figure 4 for details.



**Figure 4. ECS640A EVB BLDC Motor Connection (J2)**

### Step 6

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



**Figure 5. ECS640A EVB AC Mains Connection (J1)**

### Step 7

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

### Step 8

Start 3-phase BLDC motor using “ecoSpin DTFC Interface.exe” application. Detailed process is described in “BLDC Motor Commands” section in “ecoSpin DTFC GUI User Manual” document (UM70067 file).

### Step 9

Plot motor live data in “Graph Feedbacks” window. Detailed process is described in “Plot Window” section in “ecoSpin DTFC GUI User Manual” document (UM70067 file).

### Step 10

Keep up to date ECS640A documentation by visiting Strata Developer Studio environment.

**onsemi**, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

The evaluation board/kit (research and development board/kit) (hereinafter the "board") is not a finished product and is not available for sale to consumers. The board is only intended for research, development, demonstration and evaluation purposes and will only be used in laboratory/development areas by persons with an engineering/technical training and familiar with the risks associated with handling electrical/mechanical components, systems and subsystems. This person assumes full responsibility/liability for proper and safe handling. Any other use, resale or redistribution for any other purpose is strictly prohibited.

**THE BOARD IS PROVIDED BY ONSEMI TO YOU "AS IS" AND WITHOUT ANY REPRESENTATIONS OR WARRANTIES WHATSOEVER. WITHOUT LIMITING THE FOREGOING, ONSEMI (AND ITS LICENSORS/SUPPLIERS) HEREBY DISCLAIMS ANY AND ALL REPRESENTATIONS AND WARRANTIES IN RELATION TO THE BOARD, ANY MODIFICATIONS, OR THIS AGREEMENT, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION ANY AND ALL REPRESENTATIONS AND WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, NON-INFRINGEMENT, AND THOSE ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE CUSTOM OR TRADE PRACTICE.**

**onsemi** reserves the right to make changes without further notice to any board.

You are responsible for determining whether the board will be suitable for your intended use or application or will achieve your intended results. Prior to using or distributing any systems that have been evaluated, designed or tested using the board, you agree to test and validate your design to confirm the functionality for your application. Any technical, applications or design information or advice, quality characterization, reliability data or other services provided by **onsemi** shall not constitute any representation or warranty by **onsemi**, and no additional obligations or liabilities shall arise from **onsemi** having provided such information or services.

**onsemi** products including the boards are not designed, intended, or authorized for use in life support systems, or any FDA Class 3 medical devices or medical devices with a similar or equivalent classification in a foreign jurisdiction, or any devices intended for implantation in the human body. You agree to indemnify, defend and hold harmless **onsemi**, its directors, officers, employees, representatives, agents, subsidiaries, affiliates, distributors, and assigns, against any and all liabilities, losses, costs, damages, judgments, and expenses, arising out of any claim, demand, investigation, lawsuit, regulatory action or cause of action arising out of or associated with any unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of any products and/or the board.

This evaluation board/kit does not fall within the scope of the European Union directives regarding electromagnetic compatibility, restricted substances (RoHS), recycling (WEEE), FCC, CE or UL, and may not meet the technical requirements of these or other related directives.

FCC WARNING – This evaluation board/kit is intended for use for engineering development, demonstration, or evaluation purposes only and is not considered by **onsemi** to be a finished end product fit for general consumer use. It may generate, use, or radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to part 15 of FCC rules, which are designed to provide reasonable protection against radio frequency interference. Operation of this equipment may cause interference with radio communications, in which case the user shall be responsible, at its expense, to take whatever measures may be required to correct this interference.

**onsemi** does not convey any license under its patent rights nor the rights of others.

LIMITATIONS OF LIABILITY: **onsemi** shall not be liable for any special, consequential, incidental, indirect or punitive damages, including, but not limited to the costs of requalification, delay, loss of profits or goodwill, arising out of or in connection with the board, even if **onsemi** is advised of the possibility of such damages. In no event shall **onsemi**'s aggregate liability from any obligation arising out of or in connection with the board, under any theory of liability, exceed the purchase price paid for the board, if any.

The board is provided to you subject to the license and other terms per **onsemi**'s standard terms and conditions of sale. For more information and documentation, please visit [www.onsemi.com](http://www.onsemi.com).

## PUBLICATION ORDERING INFORMATION

### LITERATURE FULFILLMENT:

Email Requests to: [orderlit@onsemi.com](mailto:orderlit@onsemi.com)

**onsemi Website:** [www.onsemi.com](http://www.onsemi.com)

### TECHNICAL SUPPORT

**North American Technical Support:**

Voice Mail: 1 800-282-9855 Toll Free USA/Canada

Phone: 011 421 33 790 2910

**Europe, Middle East and Africa Technical Support:**

Phone: 00421 33 790 2910

For additional information, please contact your local Sales Representative