

ECS640A Development Kit - Quick Start

STR-ECS640A-GEVK

Box Content

- 01 STR-ECS640A-GEVB Unit
- Embedded “Direct Torque and Flux Control” (DTFC) Motor Control Algorithm Firmware flashed in ECS640A Part
- 01 USB Cable
- ECS640A Development Kit – Quick Start Printout (this document)

SAFETY PRECAUTIONS

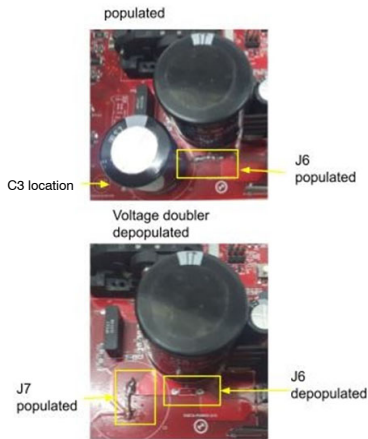
It is **mandatory** to read the following precautions before manipulating the STR-ECS640A-GEVB unit.

	When connecting an oscilloscope probe to EVB unit the probe's ground needs to be isolated. Failure to do so may result in personal injury or death.
	STR-ECS640A-GEVB unit contains DC bus capacitors which take time to discharge after removal of the main supply. Before touching the module, wait ten minutes for capacitors to discharge to safe voltage levels. Failure to do so may result in personal injury or death.
	Only personnel familiar with the drive and associated machinery should plan or implement the installation, start-up and subsequent maintenance of the system. Failure to comply may result in personal injury and/or equipment damage.
	The surfaces of the heat sink may become hot, which may cause injury.
	STR-ECS640A-GEVB unit contains parts and assemblies sensitive to Electrostatic Discharge (ESD). ESD control precautions are required when installing, testing, servicing or repairing this unit's parts or assemblies. ESD control procedures not followed may lead to component damage. If you are not familiar with electrostatic control procedures, refer to applicable ESD protection handbooks and guidelines.
	A drive, incorrectly applied or installed, can result in component damage or reduction in product lifetime. Wiring or application errors such as under sizing the motor, supplying an incorrect or inadequate AC supply or excessive ambient temperatures may result in system malfunction.
	Remove and lock out power from STR-ECS640A-GEVB unit before you disconnect or reconnect wires or perform service. Wait ten minutes after removing power to discharge the bus capacitors. Do not attempt to service the drive until the bus capacitors have discharged to zero. Failure to do so may result in personal injury or death.
	Voltage doubler configuration is the default STR-ECS640A-GEVB unit configuration and can be used only with 120Vrms AC input. The use of voltage doubler configuration at 230Vrms AC input may result in personal injury or death.

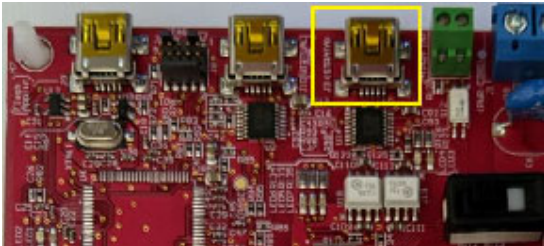
STR-ECS640A-GEVK

Thanks for your interest in onsemi STR-ECS640A-GEVK development platform. Please follow the instructions below and get access to latest ECS640A Interface GUI application and evaluation kit documentation available online in Strata Developer Studio (Visit <https://www.onsemi.com/design/tools-software/strata-developer-studio> for additional information).

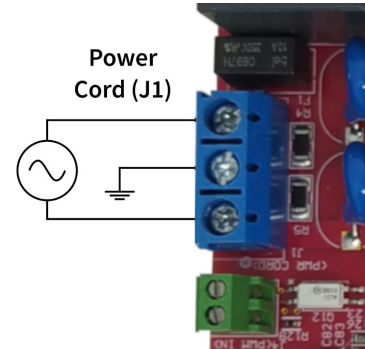
1. STR-ECS640A-GEVB unit is set up for 120Vac AC mains supply. The EVB unit will be permanently damaged if connected to a 230Vac AC mains supply. Please follow the instructions below to set up the EVB unit for 230Vac supply. If the unit is being powered with 120Vac you may skip to step 3.
2. The full wave rectification topology needed for 230Vac AC mains supply requires STR-ECS640A-GEVB hardware configuration change by following the steps below:
 - a. Remove C3 (150 μ F / 450 V capacitor)
 - b. Add J7 jumper as indicated in the picture
 - c. Remove J6 jumper



3. Connect USB cable (provided in EVK box) to EVB J3 connector and laptop USB port. See picture below for EVB J3 details. EVB LED3 turns on if laptop is powered on.



4. Connect AC mains power cord Line, Neutral and Ground signals wire to EVB J1 connector. AC power cord is not included in EVK box. See picture below for details. **Do not connect power cord to AC mains outlet at this time.**



5. Visit <https://www.onsemi.com/design/tools-software/strata-developer-studio> to properly set up “Strata Developer Studio” environment on the laptop. The “Strata Developer Studio” environment enables access to up-to-date documentation and latest ECS640A Interface application to issue BLDC motor commands.
6. Connect EVB power cord to proper AC mains voltage (120Vac or 230Vac according to setup explained in steps 1 and 2 of this Quick Start guide). **Do not touch EVB unit components when energized. Failure to do so may result in personal injury or death.**
7. EVB LED5 and LED7 will start blinking (~1 second period) when properly energized and successful ECS640A boot up sequence.
8. Launch “Strata Developer Studio” application. Make sure EVB unit is AC mains powered and USB cable properly connected to laptop to enable automatic EVB part number identification. A successful STR-ECS640A-GEVB automatic identification in Strata Developer Studio is shown below.

STR-ECS640A-GEVK



Figure 1. STR-ECS640A-GEVB automatic identification in Strata Developer Studio

9. Download and read “*ECS640A Development Platform – Quick Start*” documentation available at “Strata Developer Studio” for setting up a new BLDC motor using ECS640A development platform.

All brand names and product names appearing in this document are registered trademarks or trademarks of their respective holders.

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. **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.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:

Technical Library: www.onsemi.com/design/resources/technical-documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales