



# C8051F850 BLDC Motor Reference Design Quick-Start Guide

The C8051F850 BLDC Motor Reference Design comes with an MCU board, Powertrain Board, BLDC motor, and all cables and power supplies needed to evaluate the reference design and develop code.

### Development Kit

- MCU Board: MCRD-MCU-C8051F850 with the motor control firmware preprogrammed into the MCU
- Powertrain Board: MCRD-PWR-NLV-F85X
- BLDC Motor: Turnigy 450 Series 3800 kV Brushless Outrunner Helicopter Motor
- Motor Mount Board
- 8-bit MCU Kit CD
- 12 V, 5 A Universal Input Power Adapter



**Note:** This Development Kit includes a **Product Serial Number** that expands the 2 kB code-limited evaluation version of the Keil tools to a full version with no code limit. Registration instructions can be found in “AN104: Integrating Keil 8051 Tools into the Silicon Labs IDE”. This Keil tools upgrade process is not required to complete the steps listed in this document.

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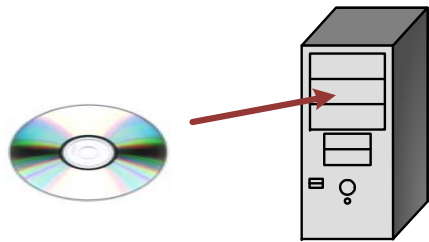
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Mailing Address:  
400 W. Cesar Chavez  
Austin, TX 78701

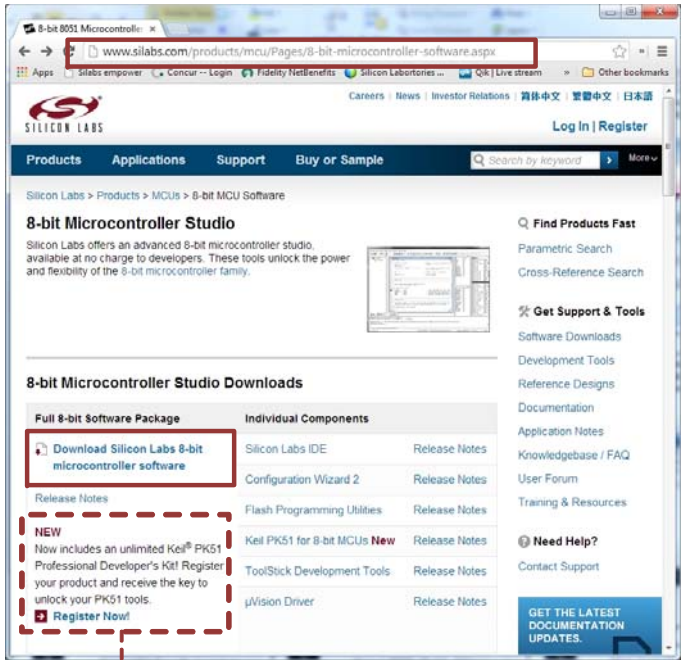
## A. Install Software

1

Insert the CD included in the kit to start installing the F850 BLDC Reference Design Kit software. The latest version of the installer can also be found on the Silicon Labs web site:  
<http://www.silabs.com/8bit-software>

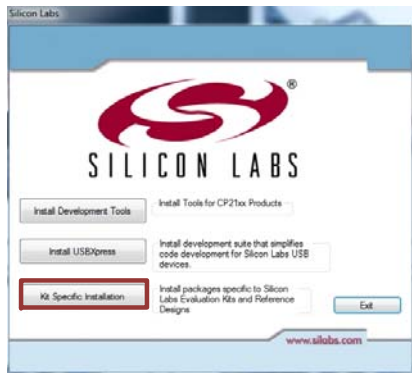


OR



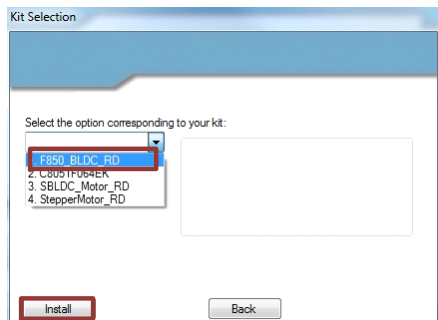
4

Select “Kit Specific Installation” to activate the Kit Selection installation dialog.



5

Select the “F850\_BLDC\_RD” kit option and click “Install” to install the Spinner application, BLDC motor firmware, and BLDC hardware design guide tool.



6

Go to the Silicon Labs web site to register the compiler toolchain (an unlimited version of the Keil PK51 Professional Developer's Kit).

**NEW**  
Now includes an unlimited Keil® PK51 Professional Developer's Kit! Register your product and receive the key to unlock your PK51 tools.

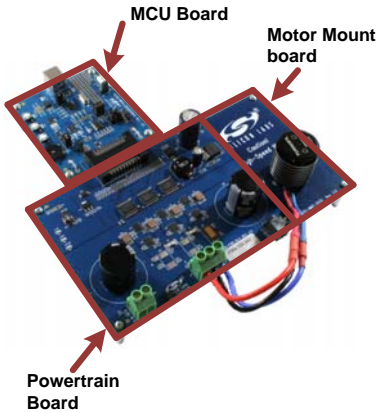
[Register Now!](#)



B. Stand-Alone Operation


1

Identify the boards.



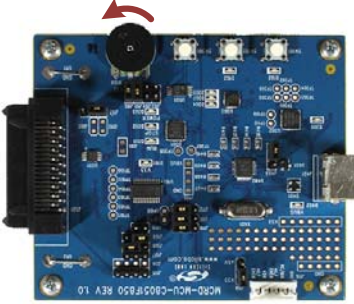
2

Connect the AC/DC Adapter to the Powertrain board, and power up the board.




3

Find the POT on the MCU board and rotate it fully counterclockwise to prepare to spin the motor at minimum speed.



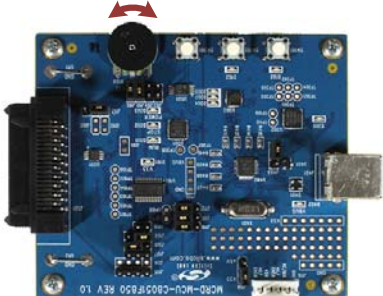
4

Press the Start/Stop Button to start spinning the motor.




5

Adjust the POT to control motor speed.




6

Press the Start/Stop Button to stop spinning the motor.



7

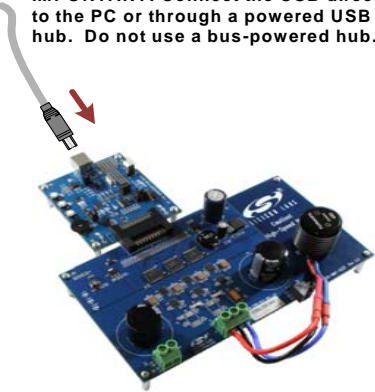
Important: The MCU Reset button can also be used to stop the motor at any time.



C. PC Controlled Operation


1

Connect the USB cable between the PC and the MCU board.  
**IMPORTANT:** Connect the USB directly to the PC or through a powered USB hub. Do not use a bus-powered hub.



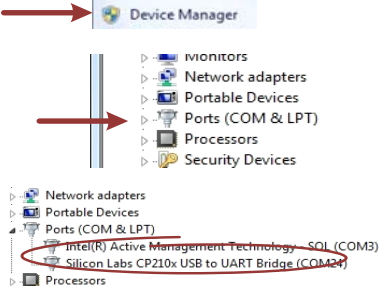
2

Connect the AC/DC Adapter to the Powertrain board and power up the board.



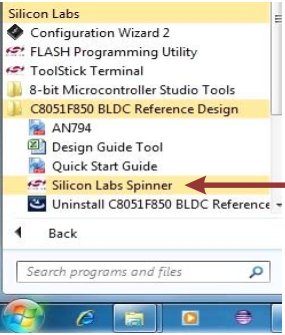
3

Use the Device manager to identify the COM Port "Silicon Labs CP210x USB to UART Bridge". This is COM24 in the example below.



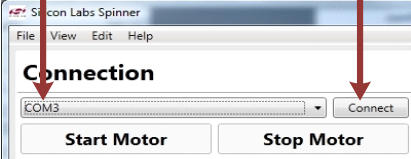
4

Run the Silicon Labs Spinner application.



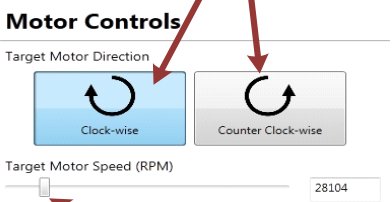
5

Select the COM port of the BLDC Kit (found in Step 3 earlier). Then press the Connect button.



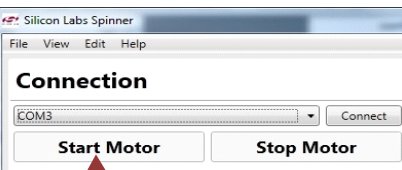
6

Select the motor spin direction.



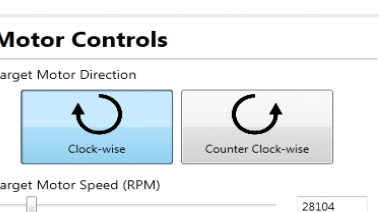
7

Click the "Start Motor" button to spin the motor.



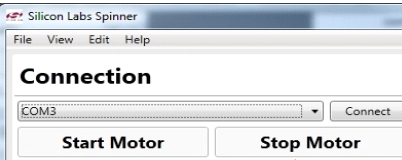
8

Change the motor speed while it is spinning.

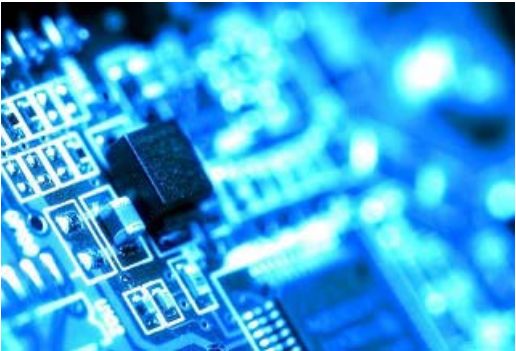


9

Click the "Stop Motor" button to stop the motor.  
OR  
The Start/Stop hardware button can also be used to stop the motor.



D. Additional Support



Where to Find Support

Application Notes:  
[www.silabs.com/8bit-appnotes](http://www.silabs.com/8bit-appnotes)  
MCU KnowledgeBase:  
[www.silabs.com/Support/Knowledge Base](http://www.silabs.com/Support/Knowledge Base)  
User's Forums:  
[forum.silabs.com](http://forum.silabs.com)  
Contact an Applications Engineer:  
[www.silabs.com/Support/Contact Technical Support](http://www.silabs.com/Support/Contact Technical Support)



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**Наши контакты:**

**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331