bq34110 Out-of-Box Quick Start Guide

This quick start guide details the out-of-box experience for the bq34110 Evaluation Module (EVM); enabling communication with the bq34110 using the bqStudio and EV2400 toolchain.

Contents

List of Figures

1 Introduction

This quick start guide is intended to allow a user to quickly communicate with the bq34110 device using bqStudio and the EV2400 toolchain. This guide assumes the firmware on the bq34110 is default from the factory. To learn more about the bq34110 EVM and how to configure the bq34110 gauge on the bq34110 EVM, please refer to the bq34110 EVM User's Guide.

2 Required Materials

- bq34110 EVM
- EV2400
- Windows® 7 Capable PC (or higher)
- Power Supply

3 Download and Installation

In an effort to make the out-of-box guide as self-contained as possible, all download and installation steps are described in detail herein.

3.1 Battery Management Studio (bqStudio) Software

bqStudio is a graphical user interface that allows the user to interact with the bq34110 device.

1. Download the latest version of bqStudio.
2. Run the installer by double clicking on it.
3. Read and accept the license agreement to proceed.
4. Choose the desired path to install the software (otherwise the default is chosen).
5. Proceed with the installation and click the Finish button when done.

3.2 EV2400 Communications Interface

The EV2400 is a communications interface adapter that enables a PC (with required driver for the platform) to communicate with the bq34110. Communication flows from the PC to the EV2400 via USB and from the EV2400 to the bq34110 via I^2C.

To install the driver for the EV2400:

1. Connect the EV2400 to the PC via a USB cable. The driver will install automatically, as shown in Figure 1.
2. Open bqStudio, select 'Gauge' and press the 'Next' button. A new window will appear listing the target devices supported by bqStudio.
3. Select '0110_0_02-bq34110.bqz' and press the 'Finish' button. A prompt will appear stating that the detected device is not compatible with the application because no target boards are currently connected and powered.
4. Press the 'OK' button and the bqStudio graphical interface will load.

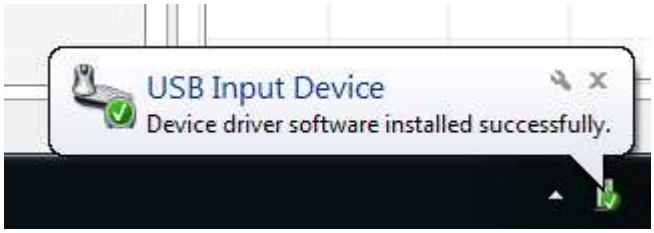

Figure 1. Driver Installation Success Message

The EV2400 icon and version number will be displayed in the 'Dashboard' on the left hand side of the application, as shown in Figure 2.

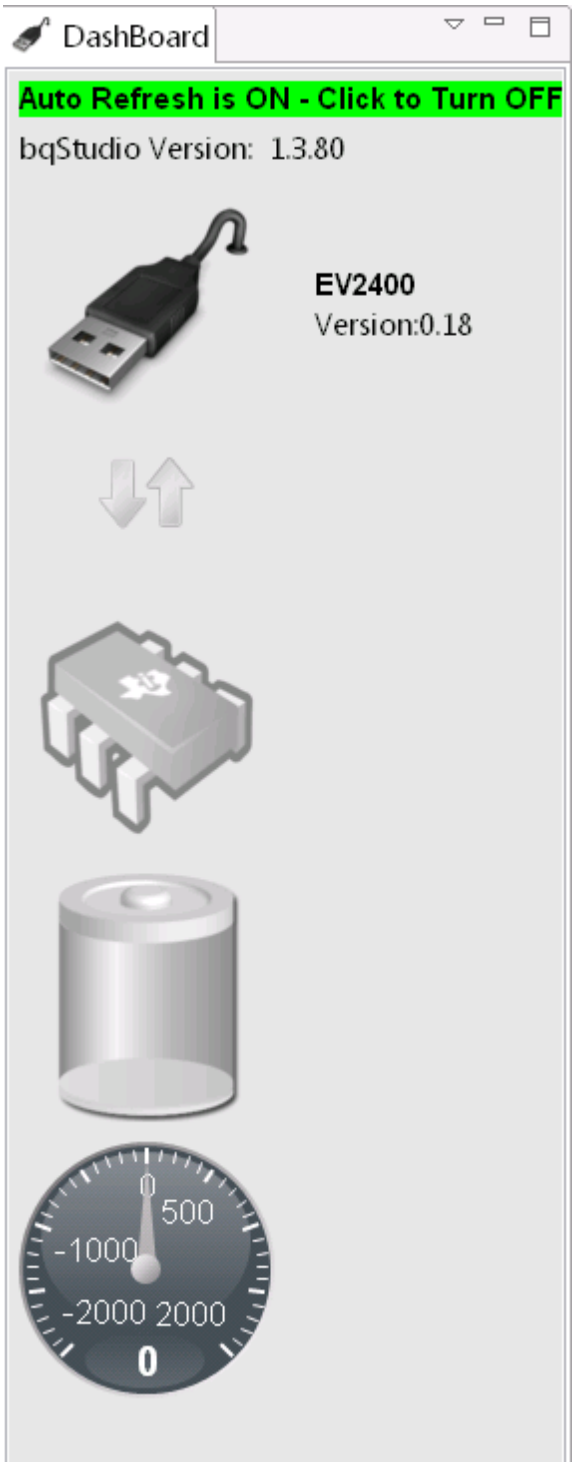

Figure 2. EV2400 Connected as Shown in Dashboard

3.3 EV2400 Firmware Updater Installation

To Install the firmware updater for the EV2400:

1. Download the latest version of the EV2400 Firmware Updater.
2. Extract the installer from the zip file.

3. Run the installer by double clicking on it.
4. Read and accept the license agreement to proceed.
5. Choose the desired path to install the software (otherwise the default is chosen).
6. Proceed with the installation and click the Finish button when done.

3.4 Updating the EV2400 Firmware

To Update the firmware for the EV2400:

1. Make sure all versions of bqStudio are closed and that the EV2400 is connected via USB to the PC.
2. Run the updater by double clicking on it.
3. Type 'Y' in the prompt and press the 'ENTER' key, as shown in Figure 3.
4. Press the 'enter' key again to close.

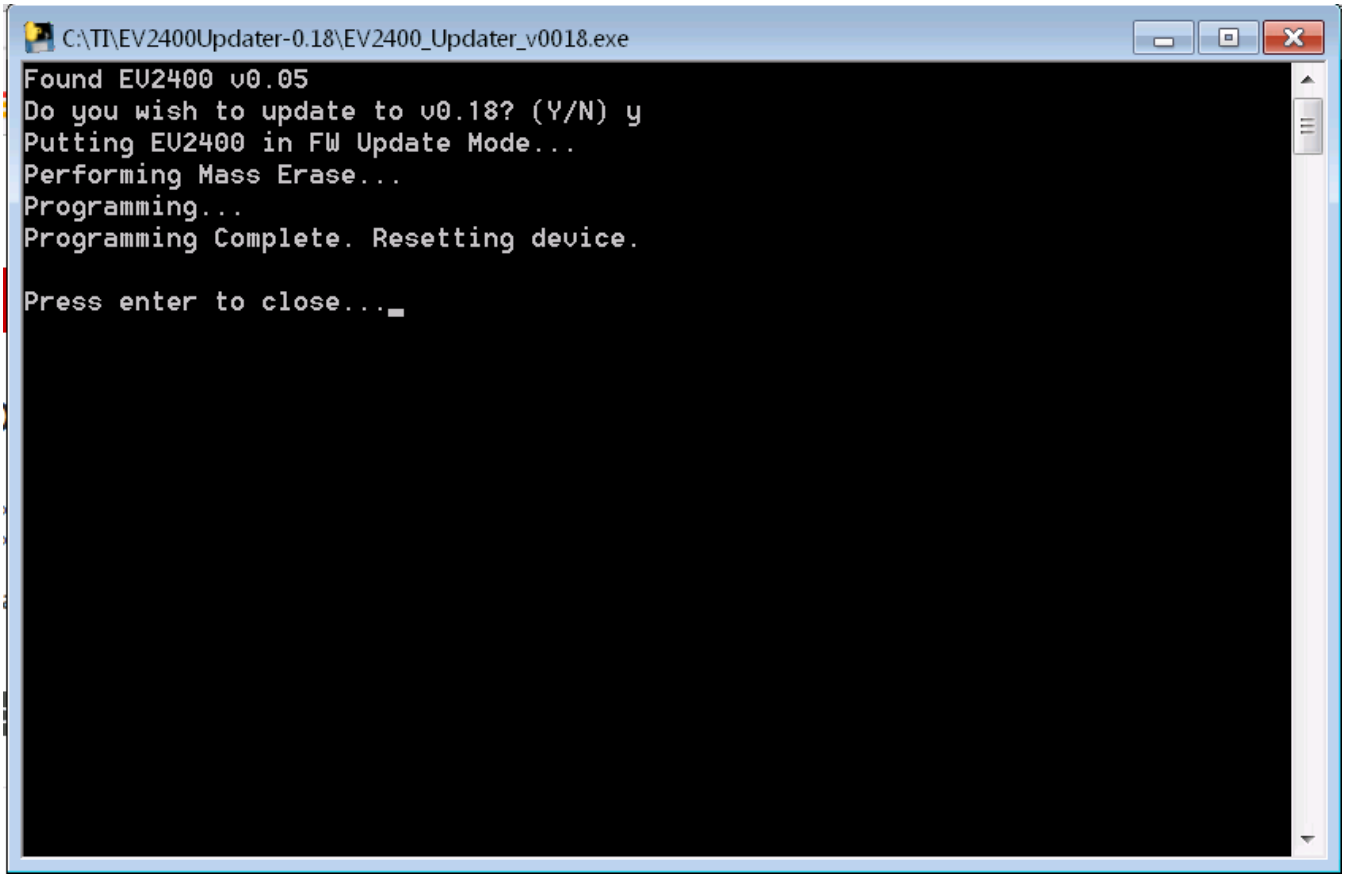

Figure 3. EV2400 Firmware Updater Success Message

4 EVM Configuration

Perform the following steps in order to configure the bq34110 EVM to facilitate communication between bqStudio on the PC and the bq34110 on the bq34110 EVM via the EV2400.

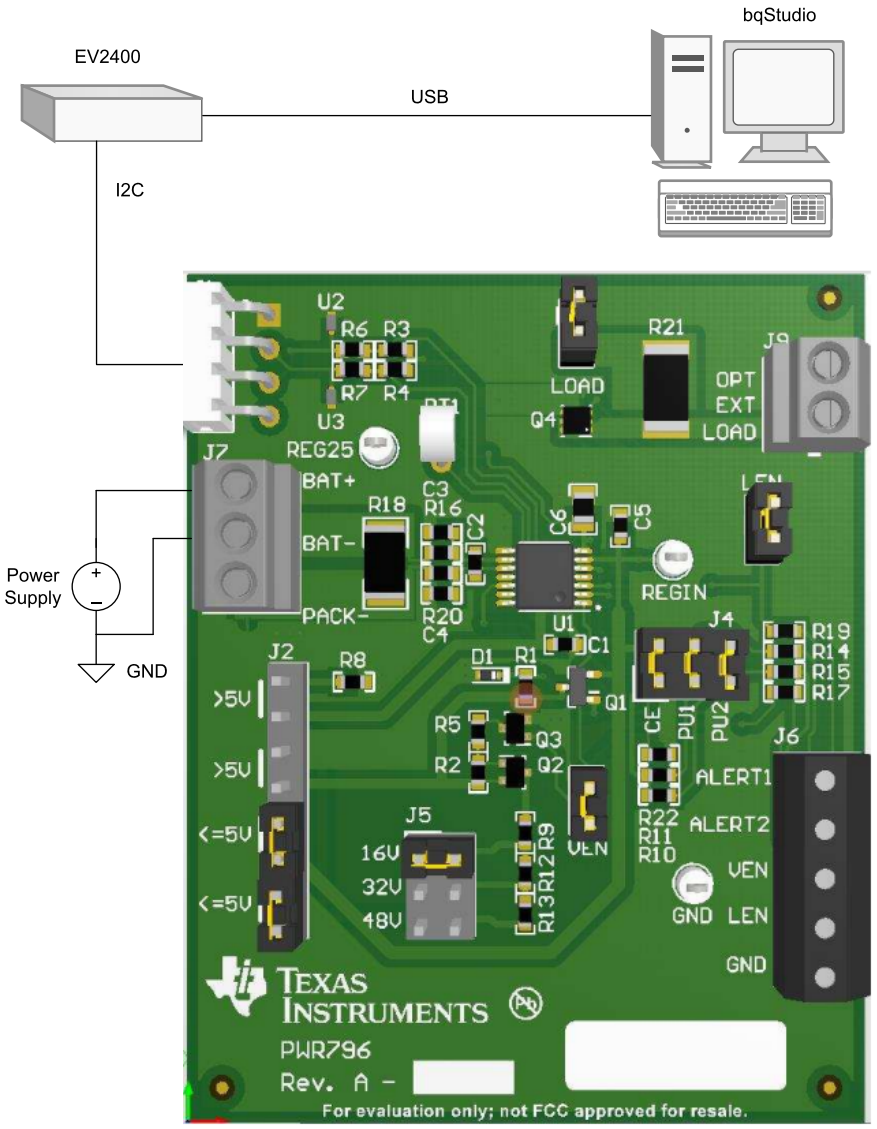

Figure 4. EVM Configuration Block Diagram

4.1 Jumper Configuration

Connect the jumpers as described in the following steps and as shown in Figure 4. Individual 2 pin jumpers are indicated by jumpers in Figure 4 covering their respective pins.

1. Orient the EVM so the silkscreen is readable, as shown in Figure 4.
2. On J2 place two 2 pin jumpers vertically to short the lower two pairs of pins marked by <= 5 V, respectively. These jumpers disconnect the external voltage divider on the board.
3. On J3, place one 2 pin jumper vertically to short the pins marked by VEN. This jumper enables the power saving external voltage divider circuitry.
4. On J4 place one 2 pin jumper vertically to short the pins marked by CE. This jumper enables the REG25 regulator to power the bq34110.
5. On J4 place two 2 pin jumpers vertically to short the pins marked by PU1 and PU2, respectively. These jumpers apply pull-up resistors to open drain outputs ALERT1 and ALERT2, respectively. ALERT1 and ALERT2 may be monitored on J6.

6. On J5 place one 2 pin jumper horizontally to short the pins marked by 16 V. This jumper is not used in the <= 5 V configuration.
7. On J8 place one 2 pin jumper vertically to short the pins marked by LOAD. This jumper selects the onboard load resistor R21 instead of an external load resistor on J9. Do not populate J9 with an external load resistor.
8. On J10 place one 2 pin jumper vertically to short the pins marked by LEN. This jumper enables the use of the internal or external load resistor for the End of Service (EOS) determination system.

4.2 External Connections

With the Power Supply set to 0 V, connect the external components, as described in the following steps and as shown in Figure 4.

1. Connect one end of the keyed 4 wire I^2C cable included with the bq34110 EVM to J1 on the bq34110 EVM.
2. Connect the other end of the keyed 4 wire I^2C cable included with the bq34110 EVM to PORT 2 on the EV2400.
3. Connect a Power Supply set to 0 V between the BAT+ and BAT- terminals of J7 on the bq34110 EVM.
4. Connect one end of the USB cable to the PC and the other end of the USB cable to the EV2400.

5 EVM Bring-Up

With the device configured and connected as described in Section 4.2, and as shown in Figure 4, perform the following steps to bring-up the bq34110 EVM, thereby enabling communication between bqStudio on the PC and the bq34110 on the bq34110 EVM.

1. Increase the voltage on the Power Supply from 0 V to 4 V.
2. Launch bqStudio. bqStudio should auto detect the bq34110 gauge and display data from the bq34110 gauge.

6 Next Steps

To learn more about the bq34110 EVM and how to configure the bq34110 gauge on the bq34110 EVM, please refer to the bq34110 EVM User's Guide.

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      3.1.1 *Notice applicable to EVMs not FCC-Approved:*

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      3.1.2 *For EVMs annotated as FCC – FEDERAL COMMUNICATIONS COMMISSION Part 15 Compliant:*

      CAUTION

      This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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      FCC Interference Statement for Class A EVM devices

      NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/TV technician for help.*

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3.2.1 *For EVMs issued with an Industry Canada Certificate of Conformance to RSS-210 or RSS-247*

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(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

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Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Concernant les EVMs avec antennes détachables

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante. Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés dans le manuel d'usage et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur

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http://www.tij.co.jp/lsds/ti_ja/general/eStore/notice_01.page

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1. Use EVMs in a shielded room or any other test facility as defined in the notification #173 issued by Ministry of Internal Affairs and Communications on March 28, 2006, based on Sub-section 1.1 of Article 6 of the Ministry's Rule for Enforcement of Radio Law of Japan,
2. Use EVMs only after User obtains the license of Test Radio Station as provided in Radio Law of Japan with respect to EVMs, or
3. Use of EVMs only after User obtains the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to EVMs. Also, do not transfer EVMs, unless User gives the same notice above to the transferee. Please note that if User does not follow the instructions above, User will be subject to penalties of Radio Law of Japan.

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4.2 User must read and apply the user guide and other available documentation provided by TI regarding the EVM prior to handling or using the EVM, including without limitation any warning or restriction notices. The notices contain important safety information related to, for example, temperatures and voltages.

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