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Document Number: KTFRDMBC3770UG
Rev. 2.0, 8/2016

Freedom expansion boards FRDM-BC3770-EVB and FRDM-BC3770-EVM

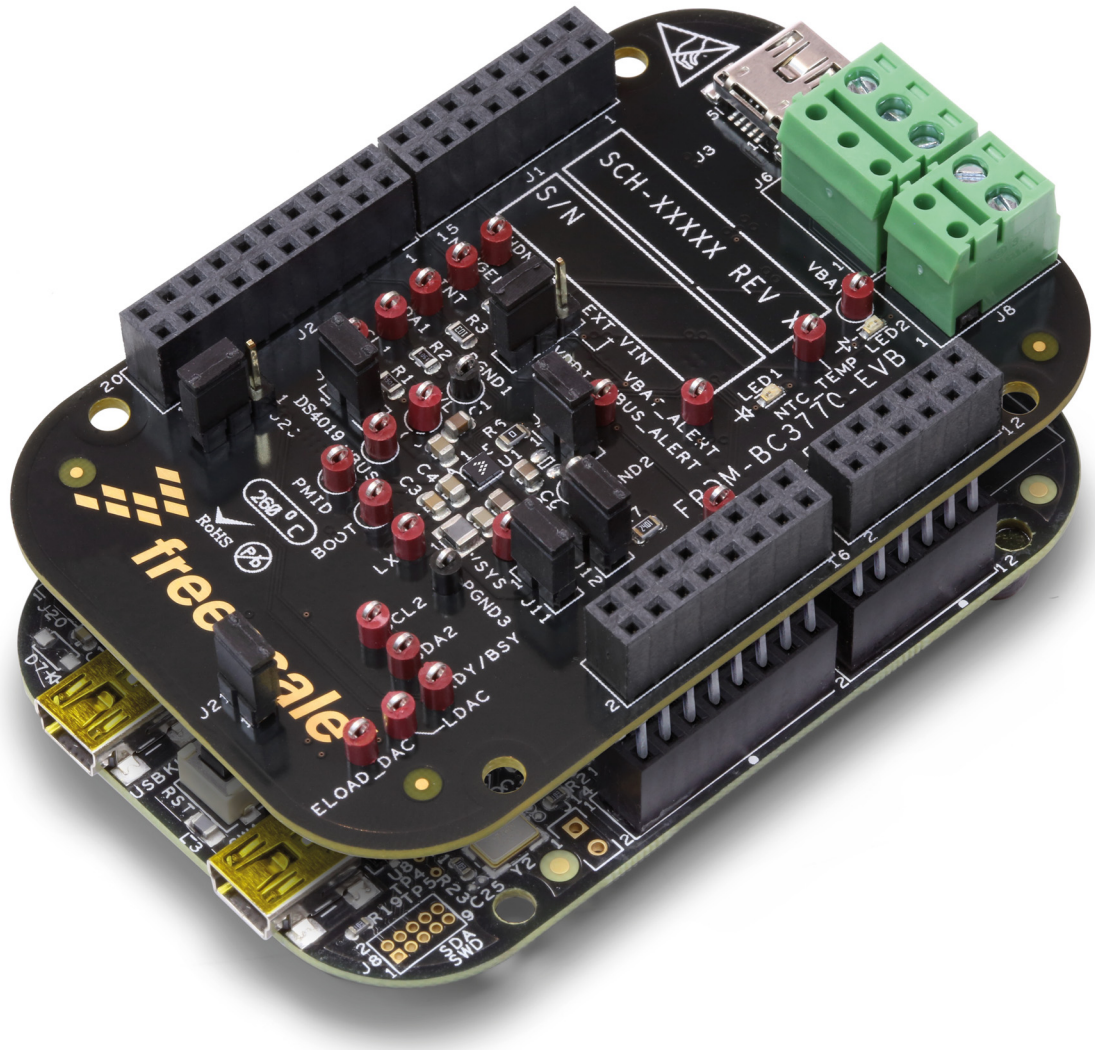

Figure 1. FRDM-BC3770-EVM

Contents

1 Important notice

NXP provides the enclosed product(s) under the following conditions:

This evaluation kit is intended for use of ENGINEERING DEVELOPMENT OR EVALUATION PURPOSES ONLY. It is provided as a sample IC pre-soldered to a printed circuit board to make it easier to access inputs, outputs, and supply terminals. This evaluation board may be used with any development system or other source of I/O signals by simply connecting it to the host MCU or computer board via off-the-shelf cables. This evaluation board is not a Reference Design and is not intended to represent a final design recommendation for any particular application. Final device in an application will be heavily dependent on proper printed circuit board layout and heat sinking design as well as attention to supply filtering, transient suppression, and I/O signal quality.

The goods provided may not be complete in terms of required design, marketing, and or manufacturing related protective considerations, including product safety measures typically found in the end product incorporating the goods. Due to the open construction of the product, it is the user's responsibility to take any and all appropriate precautions with regard to electrostatic discharge. In order to minimize risks associated with the customers applications, adequate design and operating safeguards must be provided by the customer to minimize inherent or procedural hazards. For any safety concerns, contact NXP sales and technical support services.

Should this evaluation kit not meet the specifications indicated in the kit, it may be returned within 30 days from the date of delivery and will be replaced by a new kit.

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2 Getting started

2.1 Kit contents/packing list

2.1.1 FRDM-BC3770-EVM

If you ordered the FRDM-BC3770-EVM, your kit contents include:

- Assembled and tested evaluation board/module in anti-static bag.
- FRDM-KL25Z Freedom board with programming loaded
- Two USB Mini-B to Standard-A cables
- Quick Start Guide, Analog Tools
- Warranty card

2.1.2 FRDM-BC3770-EVB

If you ordered the FRDM-BC3770-EVB, your kit contents include:

- Assembled and tested evaluation board/module in anti-static bag.
- Quick Start Guide, Analog Tools
- Warranty card

2.2 Jump start

NXP's analog product development boards help to easily evaluate NXP products. These tools support analog mixed signal and power solutions including monolithic ICs using proven high-volume SMARTMOS mixed signal technology, and system-in-package devices utilizing power, SMARTMOS and MCU dies. NXP products enable longer battery life, smaller form factor, component count reduction, ease of design, lower system cost, and improved performance in powering state of the art systems.

- Go to www.nxp.com/FRDM-BC3770-EVB
- Review your Tool Summary Page
- Look for

Jump Start Your Design

- Download documents, software, and other information

Once the files are downloaded, review the user guide in the bundle. The user guide includes setup instructions, BOM, and schematics. Jump start bundles are available on each tool summary page with the most relevant and current information. The information includes everything needed for design.

2.3 Required equipment and software

To use this kit, you need:

- A Win 32 or higher PC
- A Lithion Ion (or Lithium Polymer) battery 3.7 V – 4.2 V, Max Charge Current 2.0 A
- Two USB Mini-B (Male) to Standard-A (Male) cables (included in FRDM-BC3770-EVM kit)
- A FRDM-KL25Z board with programming loaded (included in FRDM-BC3770-EVM kit)

2.4 System requirements

The kit requires the following to function properly with the software:

- Windows® XP, Windows 7, or Vista in 32- and 64-bit versions, Windows 8

3 Understanding the Freedom platform

The NXP Freedom development platform is a small, low-power, cost-effective evaluation and development system for quick application prototyping and demonstration of Kinetis MCU families. The assembled platform incudes the FRDM-BC3770-EVB expansion board mounted to the KL25Z board.

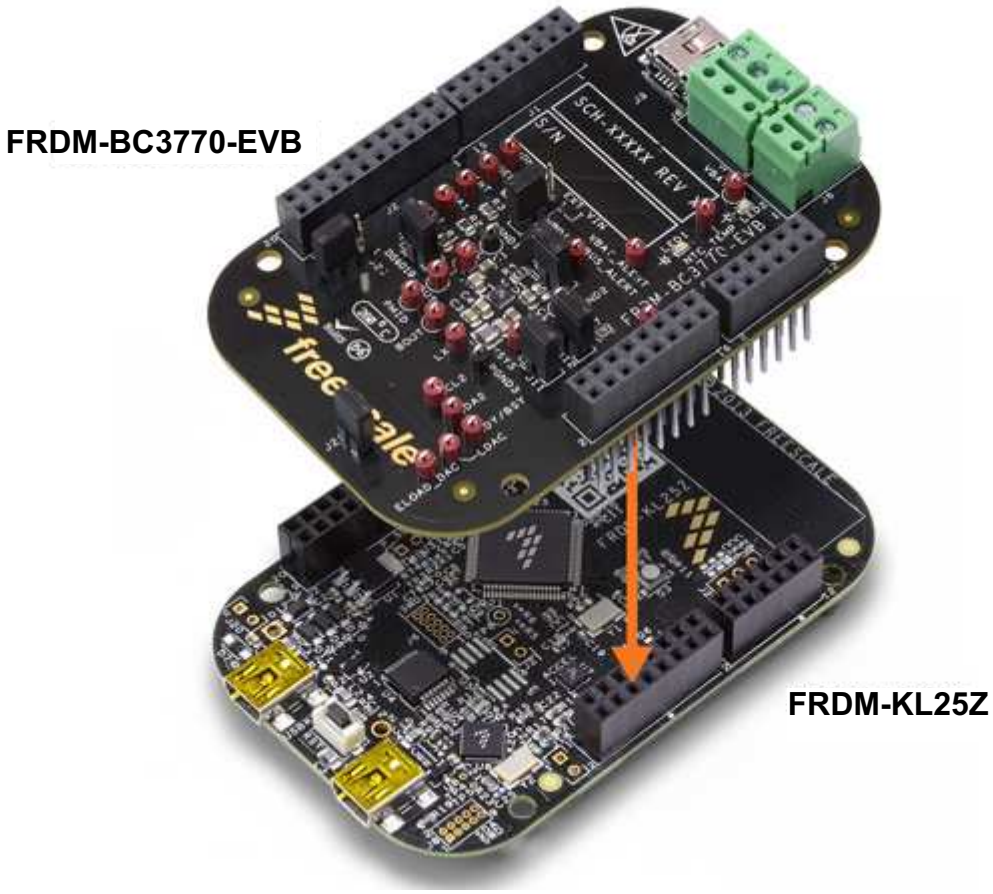

Figure 2. Freedom development platform

3.1 FRDM-BC3770-EVB

The Freedom expansion board FRDM-BC3770-EVB is a fully programmable switching charger with dual-path output for single-cell Li-Ion and Li-Polymer battery. This dual-path output allows mobile applications with fully discharged battery or dead battery to boot up the system. The high-efficiency and switch-mode operations of the BC3770 reduce heat dissipation and allow a higher current capability for a given package size. In addition, the FRDM-BC3770-EVB features a single 20 V maximum input and charges the battery with a current of up to 2.0 A. The charging parameters and operating modes are fully programmable over an I^2C Interface operating up to 400 kHz.

Features

- The FRDM-BC3770-EVB is a highly integrated synchronous switch-mode charger, featuring integrated OVP and Power FET.
- The charger and boost regulator circuits switch at 1.5 MHz to minimize the size of external passive components
- The BC3770 is able to operate as a boost regulator for USB-OTG function via either I^2C command or an external pin from the host/processor
- The BC3770 is available in a 25-bump, 2.27 mm x 2.17 mm, WLCSP package

3.2 FRDM-KL25Z

The FRDM-KL25Z is an ultra-low-cost development platform for Kinetis L Series KL1x (KL14/15) and KL2x (KL24/25) MCUs built on the ARM® Cortex™-M0+ processor. Features include easy access to MCU I/O, battery-ready, low-power operation, a standard-based form factor with expansion board options, and a built-in debug interface for flash programming and run-control. The FRDM-KL25Z is supported by a range of NXP and third-party development software.

The user can use mbed.org at no charge, with full access to the online SDK, tools, reusable code (no downloads, installations or licenses), and an active community of developers.

3.2.1 Features

- MKL25Z128VLK4 MCU - 48 MHz, 128 KB flash, 16 KB SRAM, USB OTG (FS), 80LQFP
- Capacitive touch “slider,” MMA8451Q accelerometer, tri-color LED
- Easy access to MCU I/O
- Sophisticated OpenSDA debug interface
- Mass storage device flash programming interface (default) - no tool installation required to evaluate demo apps
- P&E Multilink interface provides run-control debugging and compatibility with IDE tools
- Open-source data logging application provides an example for customer, partner and enthusiast development on the OpenSDA circuit
- mbed™ enabled

To view an online video providing an introduction to using the FRDM-KL25Z, go to the following URL:
http://www.NXP.com/webapp/video_vault/videoSummary.sp?code=FRDMKL25ZINTRO_VID

3.3 Block diagram

The high level system block diagram here outlines the way the NXP standard products are used to implement an example airbag ECU.

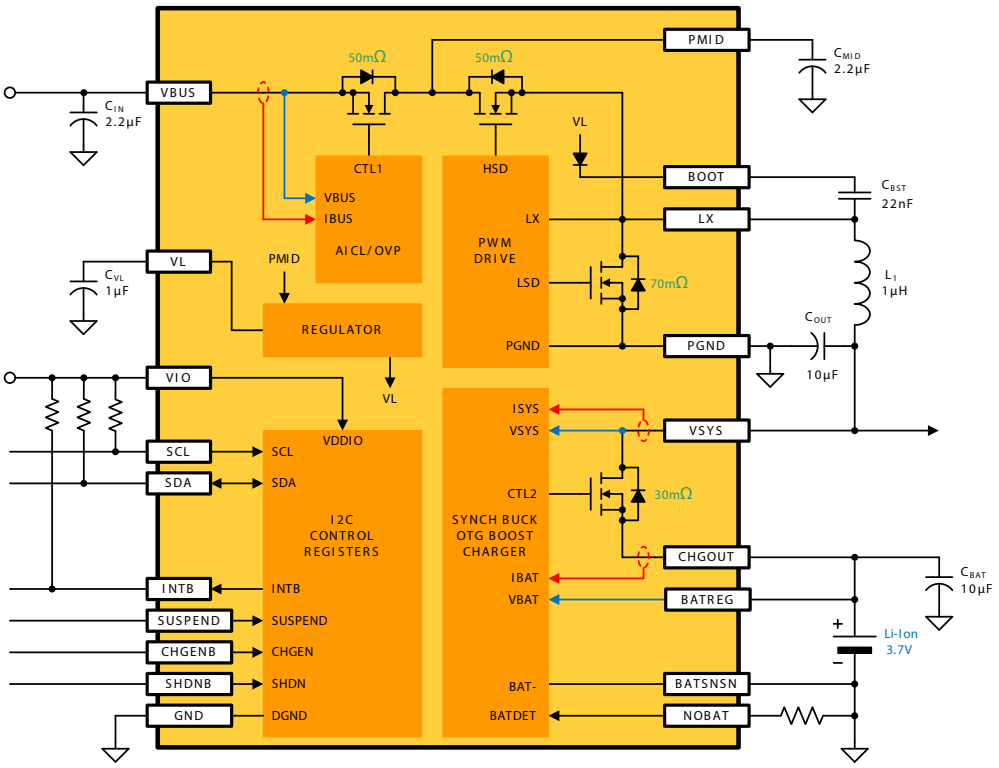

Figure 3. BC3770 simplified block diagram

4 Getting to know the hardware

The Freedom platform consists of the FRDM-BC3770-EVB board mounted to a FRDM-KL25Z board.

4.1 FRDM-BC3770-EVB board overview

The FRDM-BC3770-EVB expansion Board (EVB) is an easy-to-use circuit board allowing the user to exercise all the functions of the MC32BC3770CS fully programmable switching charger. A PC communicates to the EVB through the FRDM-KL25Z's USB communication port.

4.1.1 FRDM-BC3770-EVB board description

The FRDM-BC3770-EVB board consists of the MC32BC3770CS chip and its associated circuitry.

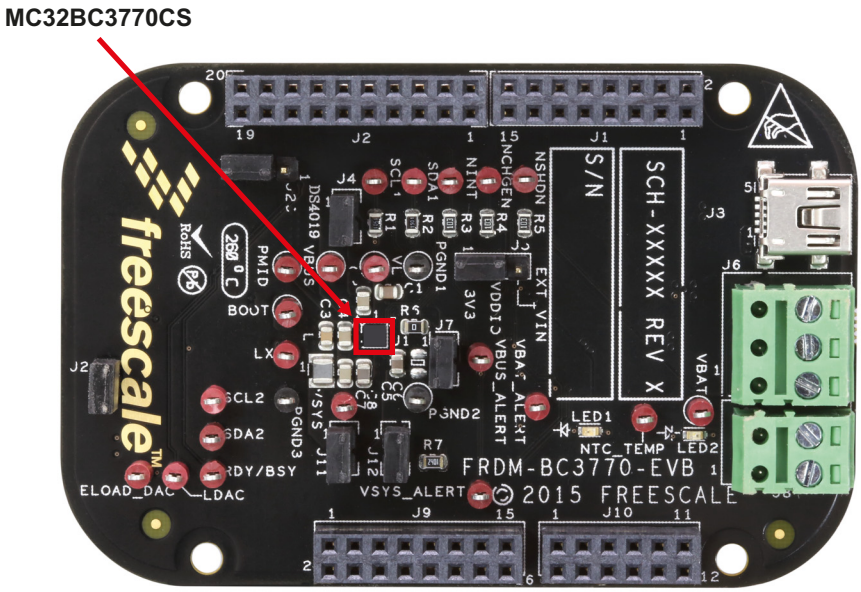

Figure 4. FRDM-BC3770-EVB (top view)

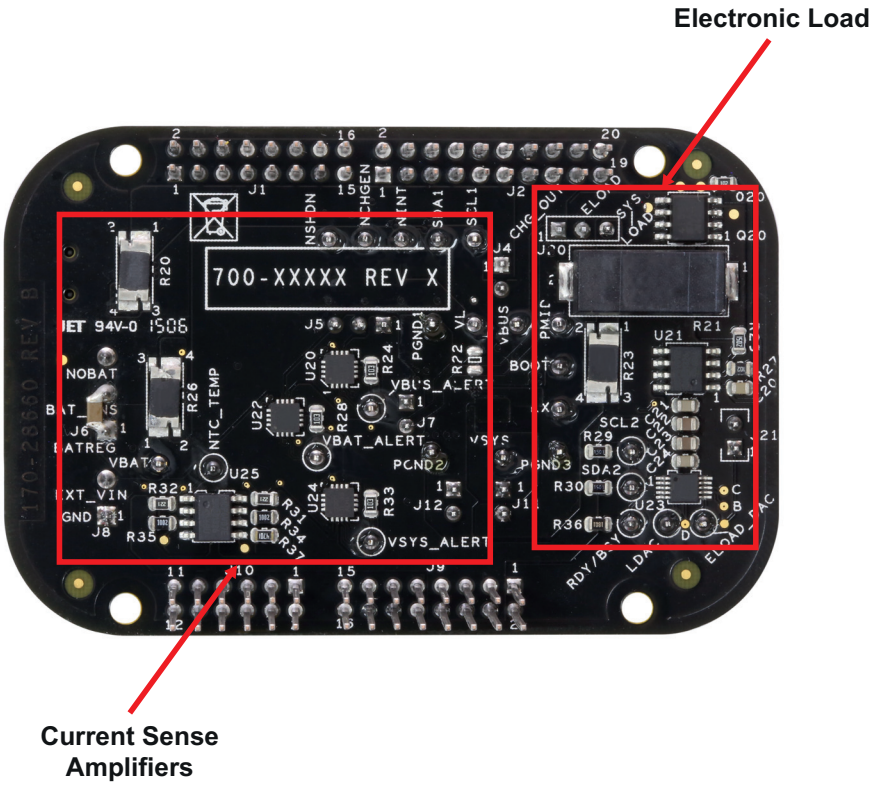

Figure 5. FRDM-BC3770-EVB (bottom view)

Table 1. Board description

Name	Description
MC32BC3770CS	A fully programmable switching charger with dual-path output for single-cell Li-Ion and Li-Polymer battery
Current Sense Amplifiers	Three integrated current sense amplifiers (CSAs) permit the real-time measurement of current and voltage on the VBUS input supply, the VSYS output supply and the battery (VBAT)
Power Supply	A programmable electronic load (ELOAD), 0 A to 1.0 A, in 50 mA steps. It is used to demonstrate system performance with an active load applied to either the VSY supply, or the battery VBAT. When attached to the battery, the ELOAD can be used to discharge the battery in a controlled manner

4.1.2 LED display

The following LEDs are provided as visual indicators on the FRDM-BC3770-EVB evaluation board:

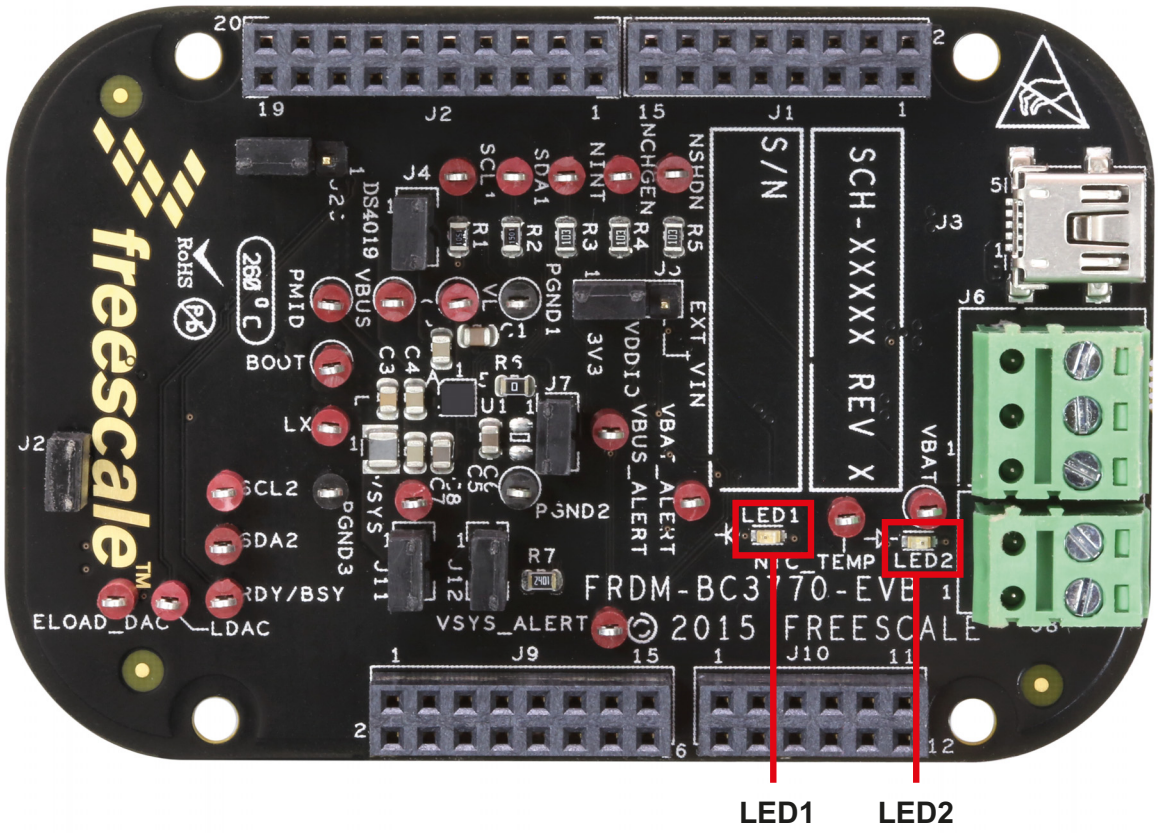

Figure 6. LED locations on the FRDM-BC3770-EVB evaluation board

Table 2. LEDs

Schematic label	Name	Description
LED1	LED Green	This indicates the target has been selected/deselected through the GUI. It turns on when the target is selected and turns off when the target is deselected. (Note: Exiting the GUI while the target is still selected results in the LED remaining on.)
LED2	LED Red	This indicates the presence of charge current. It turns on when a charge current of 10 mA or greater occurs.

4.1.3 Connectors

Input/output connectors function as follows:

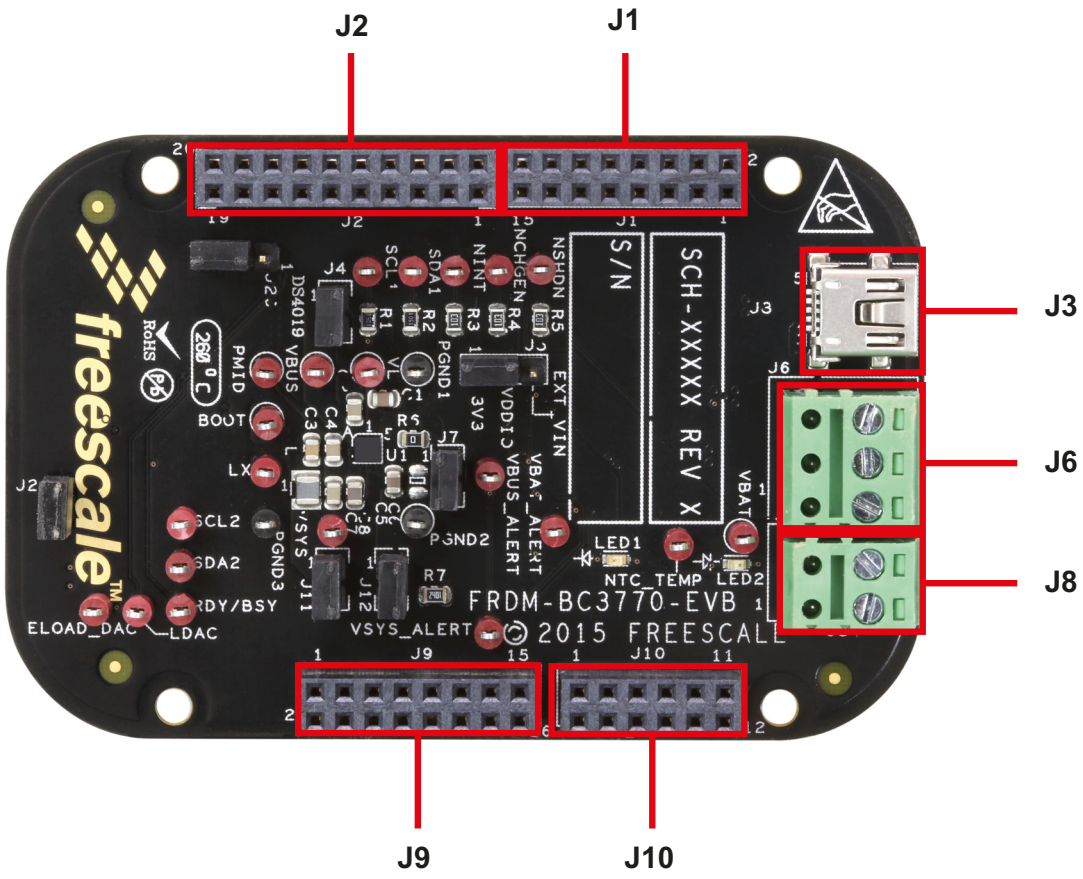

Figure 7. Connector locations on the FRDM-BC3770-EVB evaluation board

Table 3. Connectors

Schematic label	Name	Description
J1	CON_2X8	2 x 8 Female Arduino connector. Supports addition of shield boards.
J2	CON_2X10	2 x 10 Female Arduino connector. Supports addition of shield boards.
J3	USB MINI-B	USB Mini port supplies power to the Freedom platform
J6	TB_3x1	Three-position detachable terminal block. The bottom terminal connects to positive battery pole and the middle terminal connects to negative battery pole. The top terminal is used for battery detection.
J8	TB_2x1	Two-position detachable terminal block. Supports eternal temperature measurement (NTC). Note: currently not supported in software.
J9	CON_2X8	2 x 8 Female Arduino connector. Supports addition of shield boards.
J10	CON_2X6	2 x 6 Female Arduino connector. Supports addition of shield boards.

4.1.4 Test point definitions

Figure 8 and Table 4 define the evaluation board test points and their locations.

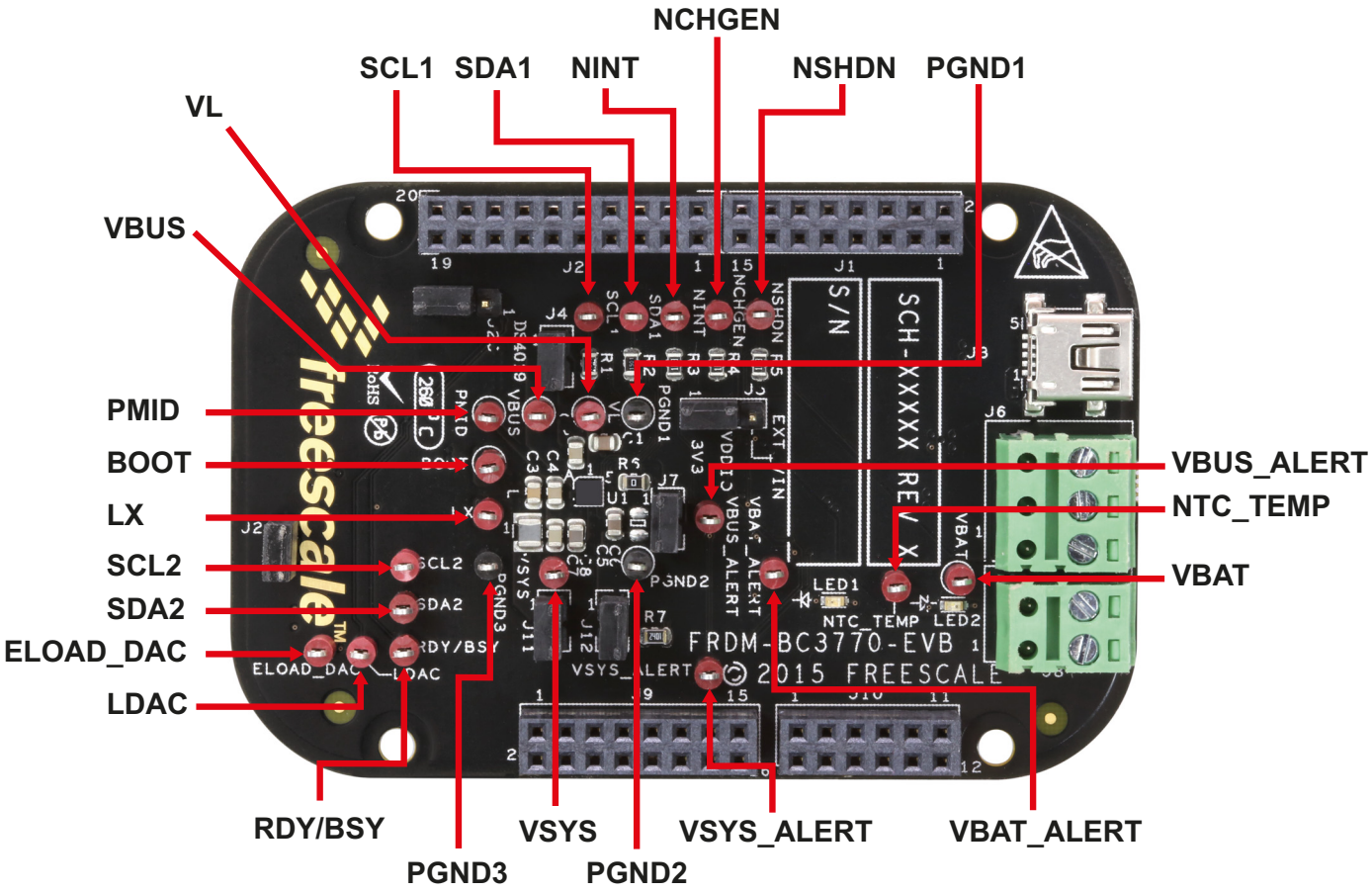

Figure 8. Test point locations on the FRDM-BC3770-EVB evaluation board

The following test-point jumpers provide access to signals on the MC32BC3770CS IC:

Table 4. Test points

Schematic label	Description
BOOT	Bootstrap Capacitor Voltage
ELOAD_DAC	Voltage DAC Output
LDAC	DAC Address Latch
LX	Buck Supply Switching Node
NCHGEN	Charger Enable (Active Low)
NINT	Interrupt Out (Active Low)
NSHDN	Charger Shutdown (Active Low)
NTC_TEMP	NTC Thermistor Voltage
PMID	BC3770 VBUS Bypass Output
RDY/BSY	DAC Ready/Busy Output
SCL1	I^2C Clock Signal to the BC3770

Table 4. Test points (continued)

Schematic label	Description
SCL2	I^2C Clock Signal to other devices
SDA1	I^2C Data Signal to/from BC3770
SDA2	I^2C Data Signal to/from other devices
VBAT	Battery Positive Terminal
VBAT_ALERT	VBAT CSA Interrupt
VBUS	USB/Charge Source Input
VBUS_ALERT	VBUS CSA Interrupt
VL	BC3770 Internal Regulator Output (Do not Load)
VSYS	System Supply Output
VSYS_ALERT	VSYS CSA Interrupt
PGND1	Analog Power Ground
PGND2	Analog Power Ground
PGND3	Analog Power Ground

4.1.5 Jumper definitions

The following table defines the evaluation board jumper positions and explains their functions.

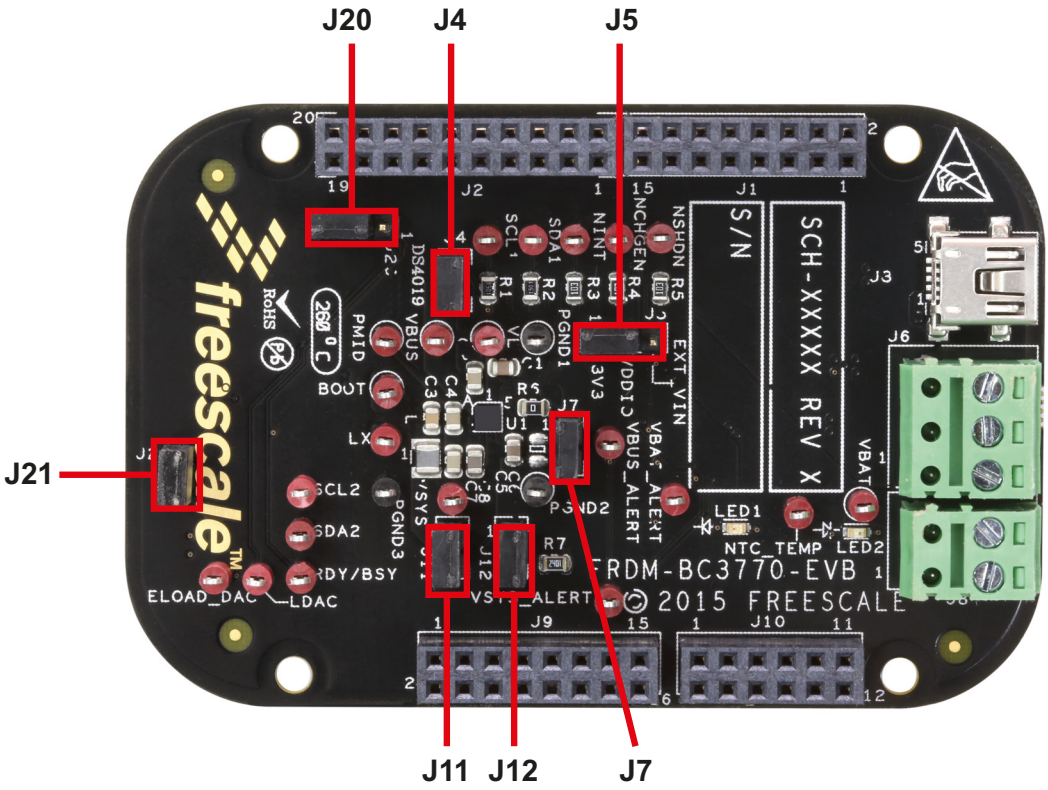

Figure 9. Jumper locations on the FRDM-BC3770-EVB evaluation board

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Table 5. Jumpers

Jumper	Name	Description	Pins 1-2 (default)	Pins 2-3
J4	VBUS	Input Power Source For Charger	Shorted	–
J5	VDDIO	Power Source for Digital Interface	Shorted	–
J7	CHGOUT	Charger Output to Battery	Shorted	–
J11	VSYS	Power Output to System Load	Shorted	–
J12	NOBAT		Shorted	–
J20	ELOAD SELECT	Connects ELOAD to VBAT or VSYS	VBAT	VSYS
J21	VDAC	VDAC Output to drive ELOAD	Shorted	–

4.2 Accessory interface board

The FRDM-BC3770-EVB kit is typically used with the FRDM-25KLZ shown in Figure 10. The FRDM-KL25Z is an ultra-low-cost development platform for Kinetis L Series KL1x (KL14/15) and KL2x (KL24/25) MCUs built on ARM® Cortex™-M0+ processor. Its features include easy access to MCU I/O, battery-ready, low-power operation, a standard-based form factor with expansion board options, and a built-in debug interface for flash programming and run-control. The FRDM-KL25Z is supported by a range of NXP and third-party development software.

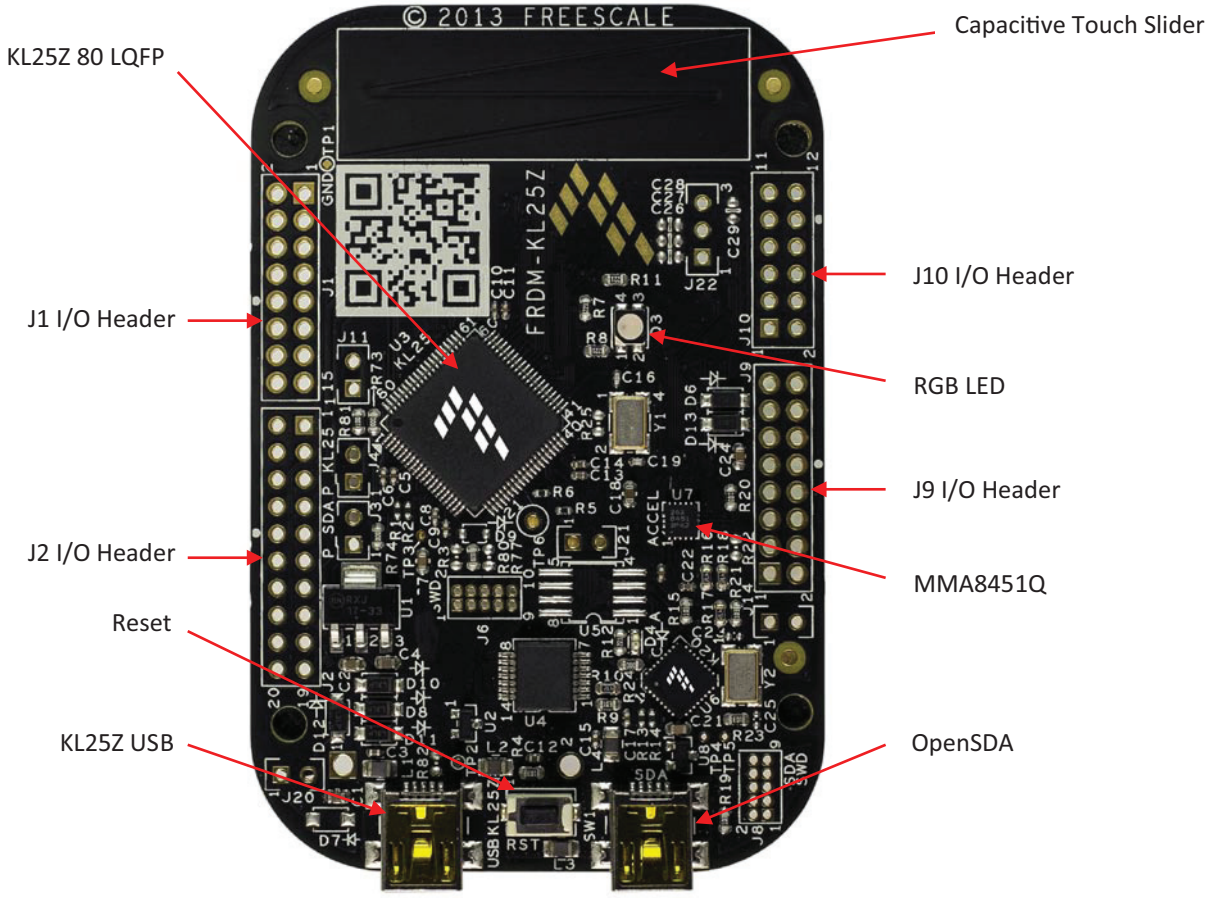


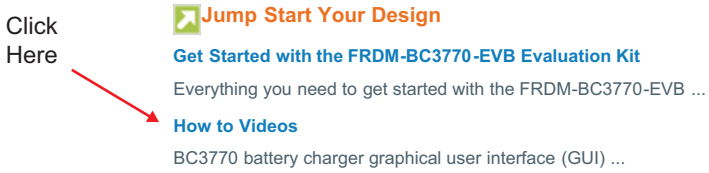
Figure 10. FRDM-KL25Z Freedom development platform

For more information on the FRDM-KL25Z board, go to the NXP product summary page at:
http://www.NXP.com/webapp/sps/site/prod_summary.jsp?code=FRDM-KL25Z

5 Installing the software and setting up the hardware

5.1 Video tutorials

A series of video tutorials provide in depth information on the operations described in this section. To access these tutorials, go to the following url:http://www.nxp.com/webapp/sps/site/prod_summary.jsp?code=FRDM-BC3770-EVB. In the “Jump Start Your Design” block, click on the “How To Videos” link.



The following tutorials apply to this section

Table 6. Video tutorials

Title	Description
01A - BC3770 GUI Install Video	Describes how to download and install the GUI on a PC
01B - BC3770 Battery Connections Video	Describes the Freedom platform links to a Lithium Ion battery, the PC, and a power supply
01C - BC3770 GUI Launch Video	Describes how to launch the GUI and verify the connections
02 - BC3770 GUI Main Log Video	Describes the GUI Startup screen and the use of the Main Log
03 - BC3770 GUI I^2C Communication Video	Describes how to control 1^2C Communications through the GUI
04 - BC3770 GUI Control Registers Video	Describes the GUI Control Register functions (System, VBUS, Charger, and Interrupt register parameters)
05 - BC3770 GUI Script Editor Video	Describes GUI scripting capability
06 - BC3770 GUI Charge Plots Video	Describes the GUI Charge Plot function
07 - BC3770 GUI Discharge Plots Video	Describes the GUI Discharge Plot function
08A - BC3770 GUI Load Sharing Video	Describes the load sharing support via the GUI
08B - BC3770 GUI Battery Supplement Video	Describes battery supplement support via the GUI
08C - BC3770 GUI OTG Boost video	Describes OTG Boost support via the GUI

5.2 Installing the MC32BC3770 graphical user interface on the computer

The latest version of the MC32BC3770 GUI is designed to run on any Windows 8, Windows 7, Vista, or XP-based operating system.
To install the software:

- Go to www.nxp.com/analogtools and select the kit.
- Click on the link to open the corresponding Tool Summary Page.
- Look for “Jump Start Your Design”.
- Download the MC32BC3770_GUI(x.x.x.x) file to a directory on the computer.
- Open the MC32BC3770_GUI_(x.x.x.x).zip file and extract the compressed files. (The software creates a subdirectory containing the extracted files.)
- Open the subdirectory containing the extracted files and run the setup.exe file. The Installation Wizard guides the user through the rest of the process.
- When the installation completes, the MC32BC3770 Charger Panel GUI automatically opens on the computer. In addition, a BC3770_GUI icon appears on the desktop.

For an in-depth tutorial on installing the MC32BC3770 GUI, see the video “01A - BC3770 GUI Install Video” in the FRDM-BC3770-EVB Product Summary page.

5.3 Starting the MC32BC3770 GUI

To launch the MC32BC3770 GUI:

- From your desktop, click on the BC3770_GUI icon. The Graphic User Interface (GUI) appears.

5.3.1 The MC32BC3770 GUI startup screen

Figure 11 shows the MC32BC3770 GUI Graphical User Interface (GUI) screen displayed at startup. A row of tabs along the top of the screen selects among four types of control panel functions. (At startup the Control Register function is active.) The display related to the selected function appears immediately below the row of tabs.

The USB Connection Panel at the top left of the screen verifies the GUI is properly connected to the target. It also controls certain parameters related to the connection. For complete instructions on using the USB Connection Panel, see the video “01C - BC3770 GUI Launch Video” in the FRDM-BC3770-EVB Product Summary page.

A Main Log in the middle left panel maintains a running record of all events occurring during the MC32BC3770 GUI session. For instructions on using the Main Log, see the video “02 - BC3770 GUI Main Log Video” in the FRDM-BC3770-EVB Product Summary page. The Direct 1^2C Communication Panel at the bottom left of the screen reads and writes bytes to the 1^2C registers. For complete instructions on using the 1^2C Communication Panel, see the video“03 - BC3770 GUI I^2C Communication Video” in the FRDM-BC3770-EVB Product Summary page.

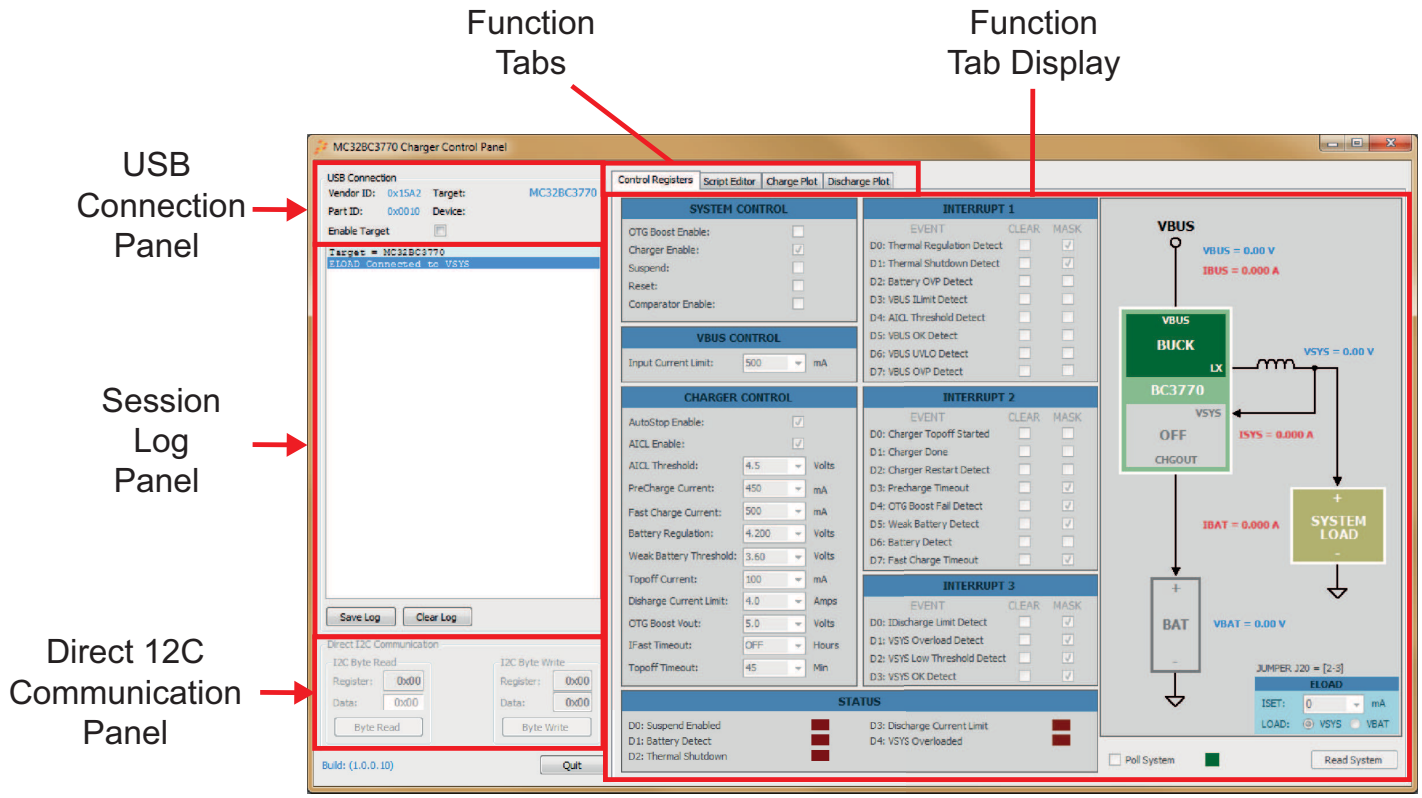


Figure 11. GUI startup screen

5.3.2 The control registers screen

Figure 12 shows the Control Register screen. The parameter control panel on the left manipulates system VBUS and charger control parameters. It also controls events related to the MC32BC3770's three interrupt registers. Finally, the panel at the bottom left provides a snapshot of the MC32BC3770 status registers. For instructions on using the Control Register Panel, see the video "04 - BC3770 GUI Control Registers Video" in the FRDM-BC3770-EVB Product Summary page.

The real-time system performance measurements panel on the right controls load sharing, battery supplement, and OTG boost functions in real-time. Clicking on the Read System button at the bottom right updates the panel. If the Poll System check box is set, the panel automatically updates on a periodic basis.

For a tutorial on using the Control Registers screen to support load sharing, see the video "08A - BC3770 GUI Load Sharing Video" in the FRDM-BC3770-EVB Product Summary page.
For a tutorial on using the Control Registers screen to battery supplement, see the video "08B - BC3770 GUI Battery Supplement Video" in the FRDM-BC3770-EVB Product Summary page.
For a tutorial on using the Control Registers screen to support OTG boost, see the video "08C - BC3770 GUI OTG Boost video" in the FRDM-BC3770-EVB Product Summary page.

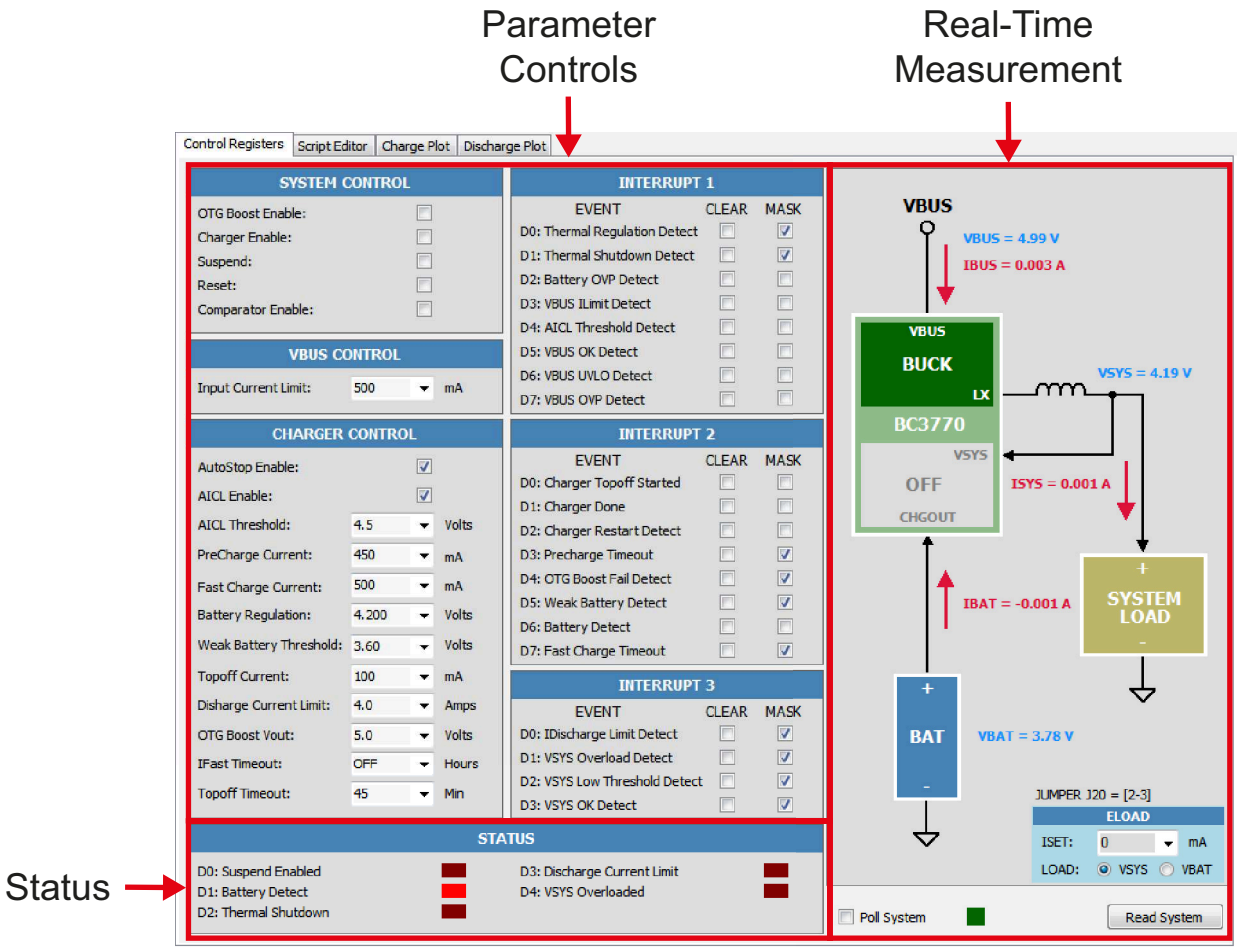


Figure 12. Control register screen

5.3.3 Script editor screen

The Script Editor tab loads and runs scripts automating the execution of Charger Control Panel commands. **Figure 13** shows the Script Editor screen.

The panel on the left is the script editor window. Enter commands directly into this window from the keyboard, or click on the Commands button at the bottom of the window. Doing so opens a panel to select commands and enter values for their associated variables. These commands automatically load into the editor in the sequence they were selected. Other buttons below this panel load, save, run, and clear the script. The Insert Line Separator button enters a full line of dashes at the cursor location in the Script Editor.

The panel on the right shows a log of events occurring as the script executes. Buttons below this panel clears or saves the log. For complete instructions on using the Script Editor panel, see the video “05 - BC3770 GUI Script Editor Video” in the FRDM-BC3770-EVB Product Summary page.

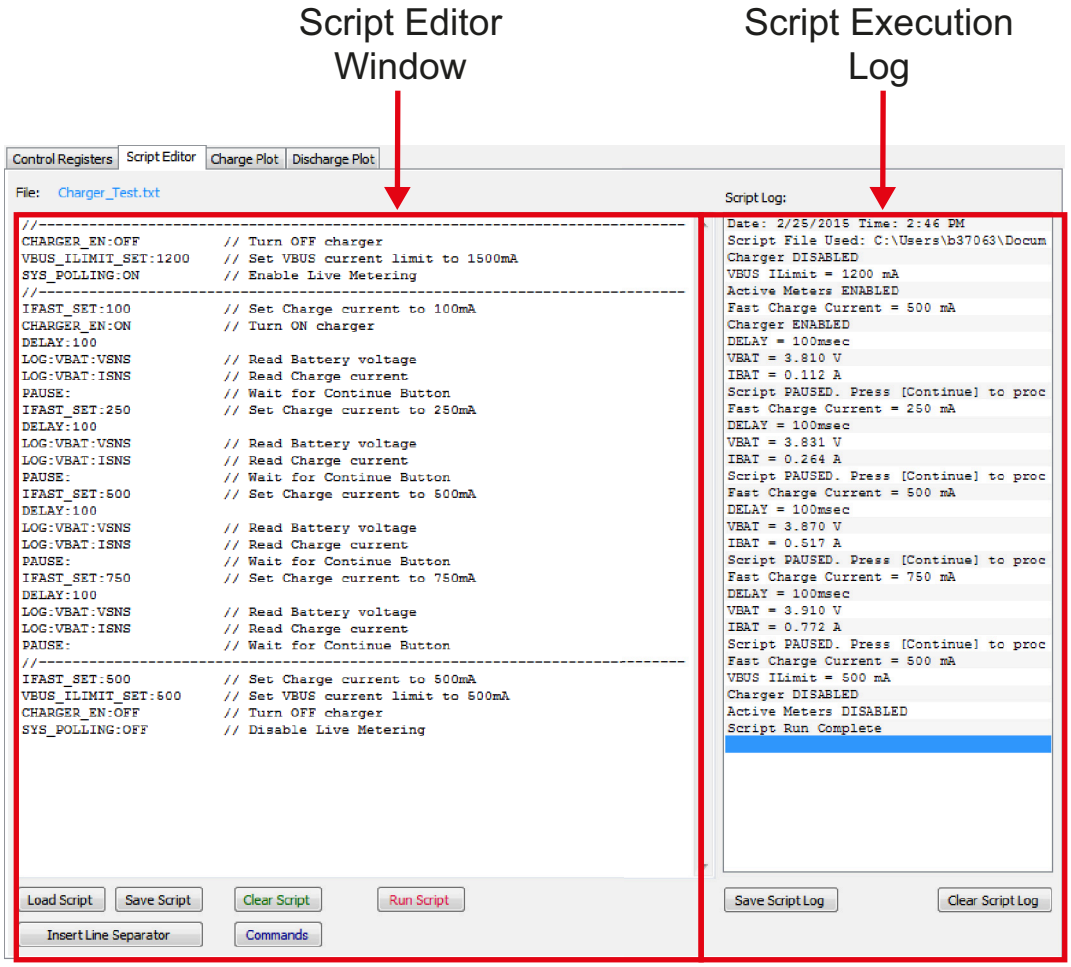


Figure 13. Script editor screen

5.3.4 Charge plot screen

The Charge Plot tab graphs voltage and current in real-time as the battery charges. Save the resulting plot data as an Excel file. Figure 14 shows the Charge Plot screen during a battery charging session. The panel on the upper left displays a log of events occurring during the charging session. Clear or save the log by clicking the corresponding buttons below the log. The Charge Parameters panel controls the current and voltage related to the battery charging session. The Plot Parameters panel controls the appearance of the graph. The Charge State panel shows the current status of the charging session. It also starts, stops, clears, and saves the results of a battery charging session.

For complete instructions on using the Charge Plot panel, see the video “06 - BC3770 GUI Charge Plots Video” in the FRDM-BC3770-EVB Product Summary page.

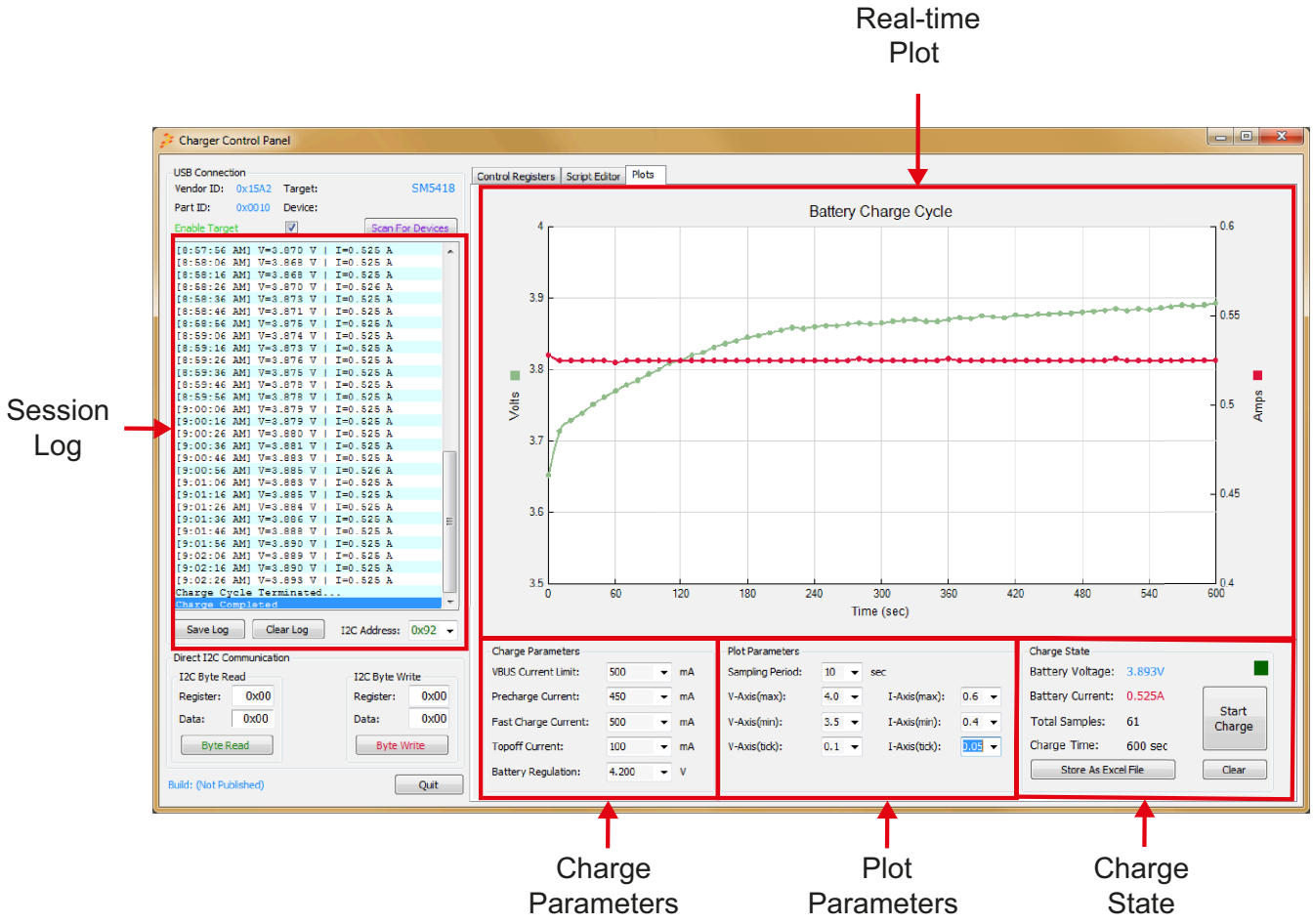


Figure 14. Charge plot screen

5.3.5 The discharge plot screen

The Discharge Plot tab graphs voltage and current in real-time as the battery discharges. Save the resulting plot data as an Excel file. Figure 15 shows the Discharge Plot screen during a battery charging session. The panel on the upper left displays a log of events occurring during the charging session. Clear or save the log by clicking the corresponding buttons below the log. The Discharge Parameters panel controls the current and voltage related to the battery charging session. The Plot Parameters panel controls the appearance of the graph. The Discharge State panel shows the current status of the discharging session. It also starts, stops, clears, and saves the results of a battery charging session.

For complete instructions on using the Discharge Plot panel, see the video “07 - BC3770 GUI Discharge Plots Video” in the FRDM-BC3770-EVB Product Summary page.

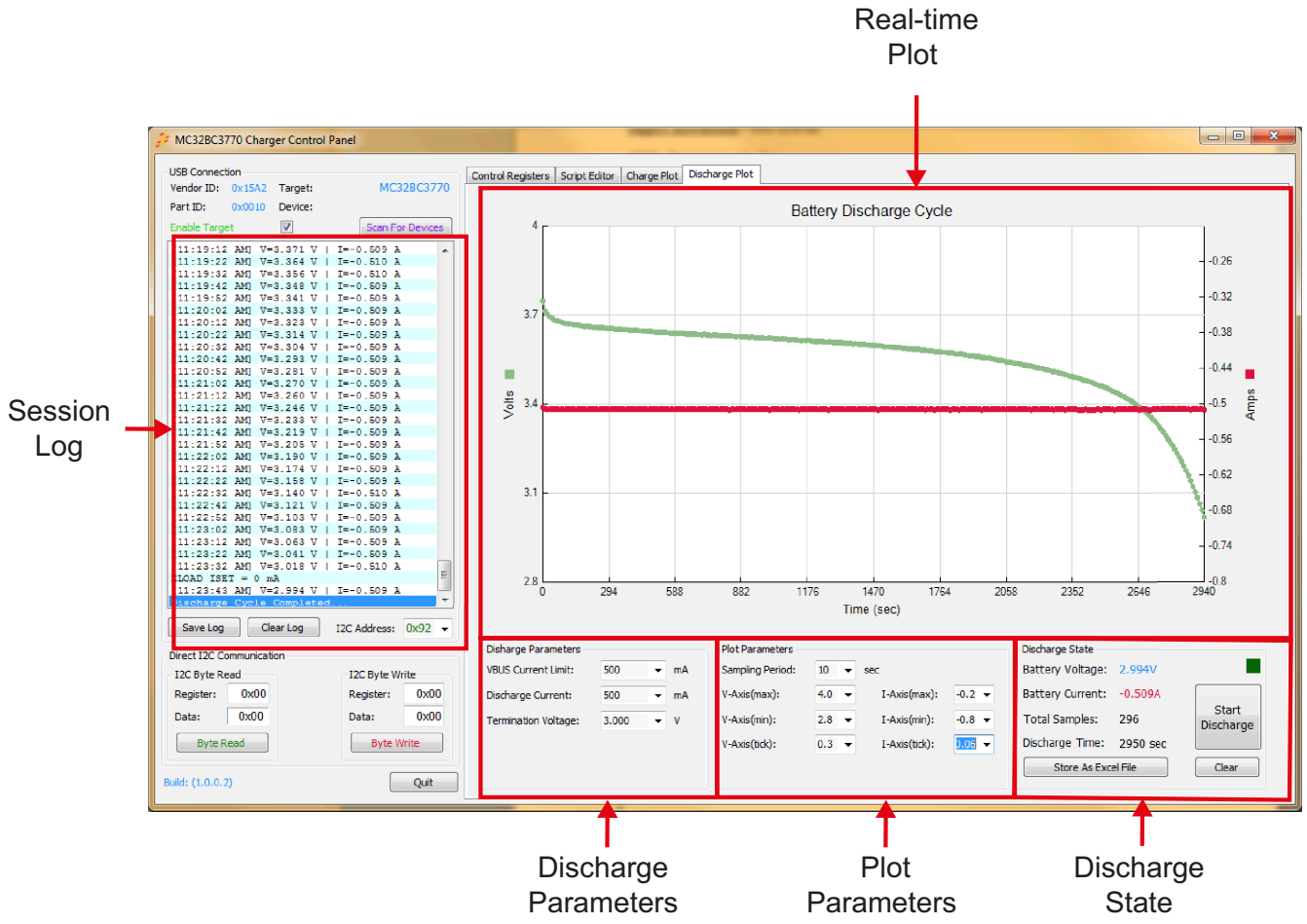


Figure 15. Discharge plot screen

5.4 Configuring the hardware

Figure 16 shows the hardware setup using the FRDM-BC3770-EVB and the FRDM-KL25Z boards. For a tutorial on setting up the FRDM-BC3770-EVB/FRDM-KL25Z platform, see the video “01B - BC3770 Battery Connections Video” in the FRDM-BC3770-EVB Product Summary page.

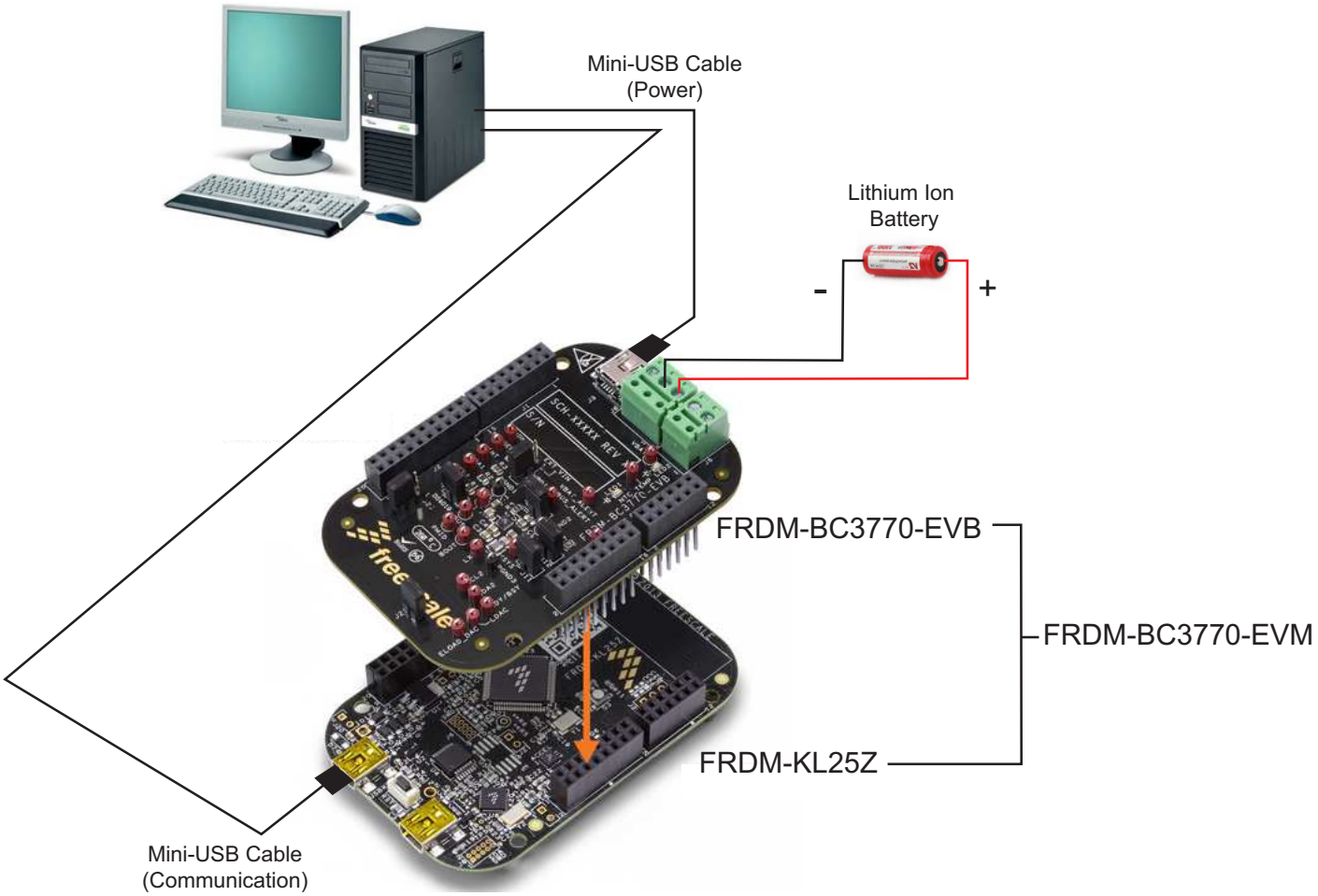


Figure 16. FRDM-BC3770-EVM hardware configuration

5.4.1 Step-by-step instructions for setting up the hardware

To perform the demonstration examples, the following connections and setup must be performed:

1. Mount the FRDM-BC3770-EVB board firmly to the Arduino connectors on the FRDM-KL25Z board. (If purchasing the FRDM-BC3770-EVM kit, the boards are already mounted.)
2. Solder a wire lead to each pole of the Lithium Ion battery.
3. Attach the Lithium Ion leads to the two-pole terminal block (J8) on FRDM-BC3770-EVB. The negative lead goes to the inboard connector. The positive lead goes to the outboard connector.
4. Connect the FRDM-BC3770-EVB board to a power supply. There are two methods of making this connection.
   - Attach a USB mini-cable between the PC and the USB mini-plug connector on the FRDM-BC3770-EVB board. This draws power from the PC via the USB port. However, because of the USB power supply is relatively low, the battery charges more slowly.
   - Cut the Standard-A plug off the USB cable. Identify and separate out the USB power lines in the cable. Attached the USB power lines to a power source (either a power supply or a power adaptor.) Note that the source connected must supply 2.0 A current at 5.0 V. Attach the min-plug end of the cable to the USB port on the FRDM-BC3770-EVB board.
5. Attach a USB mini-cable between the PC and the USB communication port on the FRDM-KL25Z board. This cable serves as the communication link between the Freedom platform and the PC.

6 Using BC3770 components with Processor Expert

6.1 Installing CodeWarrior

This procedure explains how to obtain and install the latest version of CodeWarrior (version 10.6 in this guide).

NOTE

The sample software in this kit requires CodeWarrior 10.6 or newer. The component and some examples in the component package are intended for Kinetis Design Studio 3.0.0. If CodeWarrior 10.6 and Kinetis Design Studio 3.0.0 are already installed on the system, skip this section.

1. Obtain the latest CodeWarrior installer file from the NXP CodeWarrior website here: www.nxp.com/webapp/sps/site/homepage.jsp?code=CW_HOME&tid=vanCODEWARRIOR.
2. Run the executable file and follow the instructions.
3. In the Choose Components window, select the Kinetis component and click on **Next** to complete the installation.

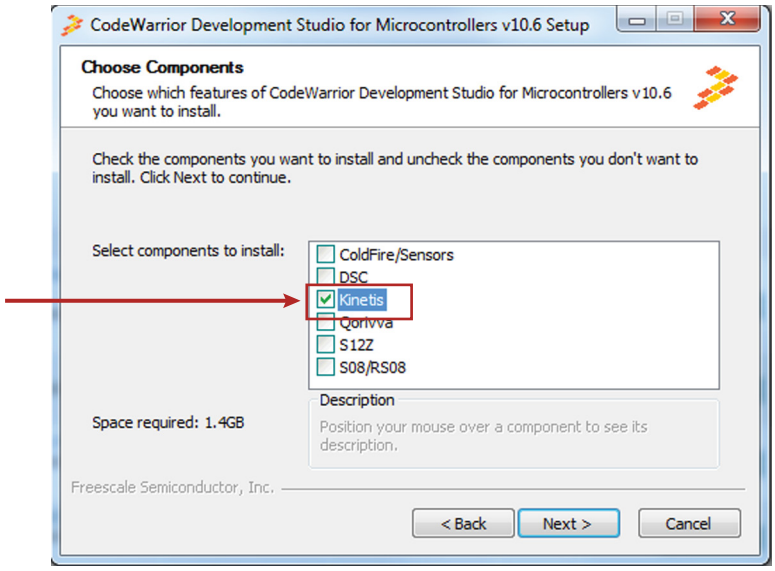


Figure 17. Choose components window

6.2 Downloading the components and example projects

The examples used in this section are based on a pre-configured CodeWarrior project. To download the project and its associated components:

1. Go to the NXP website www.npx.com/BC3770-PEXPERT
2. Download the zip file containing components and example projects.
3. Unzip the downloaded file and check to see the folder contains the files listed in Table 7.

Table 7. BC3770 example project and components

Folder name	Folder contents
Components	Component folder
BC_MC32BC3770_b15xx.PEupd	Battery charger BC3770 component
FRDM_BC3770_b15xx.PEupd	Freedom board FRDM-BC3770 component
ChannelAllocator_b15xx.PEupd	Component for ADC channel allocation
Examples	
Battery_Charger_BC3770_Control	Folder containing application files used in BCF_KLxxZ_Battery_Charger_BC3770_Control_Usb_Hid example
CodeWarrior_Examples	Example project folder for CodeWarrior
BCF_KL25Z_BC3770_GUI_Usb_Hid	Example with BC3770_GUI for FRDM-KL25Z
BCF_KLxxZ_Battery_Charger_BC3770_Control_Usb_Hid	Example showing usage of BC_MC32BC3770 and FRDM_BC3770 methods with Battery_Charger_BC3770_Control application for FRDM-KL25Z, FRDM-KL26Z and FRDM-KL46Z (where xx is the MCU)
BCF_KLxxZ_Monitoring_CDC	
KDS_Examples	Example project folder for Kinetis Design Studio 3.0.0 or newer
BCF_KL25Z_BC3770_GUI_Usb_Hid	Example with BC3770_GUI for FRDM-KL25Z
BCF_KL25Z_Battery_Charger_BC3770_Control_Usb_Hid_IAR	Example showing usage of BC_MC32BC3770 and FRDM_BC3770 methods with Battery_Charger_BC3770_Control application for FRDM-KL25Z and IAR Embedded Workbench.
BCF_KLxxZ_Battery_Charger_BC3770_Control_Usb_Hid	Example showing usage of BC_MC32BC3770 and FRDM_BC3770 methods with Battery_Charger_BC3770_Control application for FRDM-KL25Z, FRDM-KL26Z and FRDM-KL46Z (where xx is the MCU)
BCF_KLxxZ_Monitoring_CDC	Example showing current, voltage and temperature measurement with output to terminal for FRDM-KL25Z, FRDM-KL26Z and FRDM-KL46Z
Readme.pdf	Read me file with installation instructions.

6.2.1 Import the BC3770 components into the Processor Expert library

1. Launch CodeWarrior by clicking on the CodeWarrior icon (located on the desktop or in Program Files -> NXP CodeWarrior folder.) When the CodeWarrior IDE opens, go to the menu bar and click **Processor Expert** -> **Import Component(s)**.
2. In the pop-up window, locate the component file (.PEupd) in the Components and Example Projects folder BC3770_PEx_SW\Component. Select **BC_MC32BC3770_bxxxx.PEupd, FRDM_BC3770_bxxxx.PEupd,** and **ChannelAllocator_bxxxx.PEupd** files then click **Open** (see Figure 18).

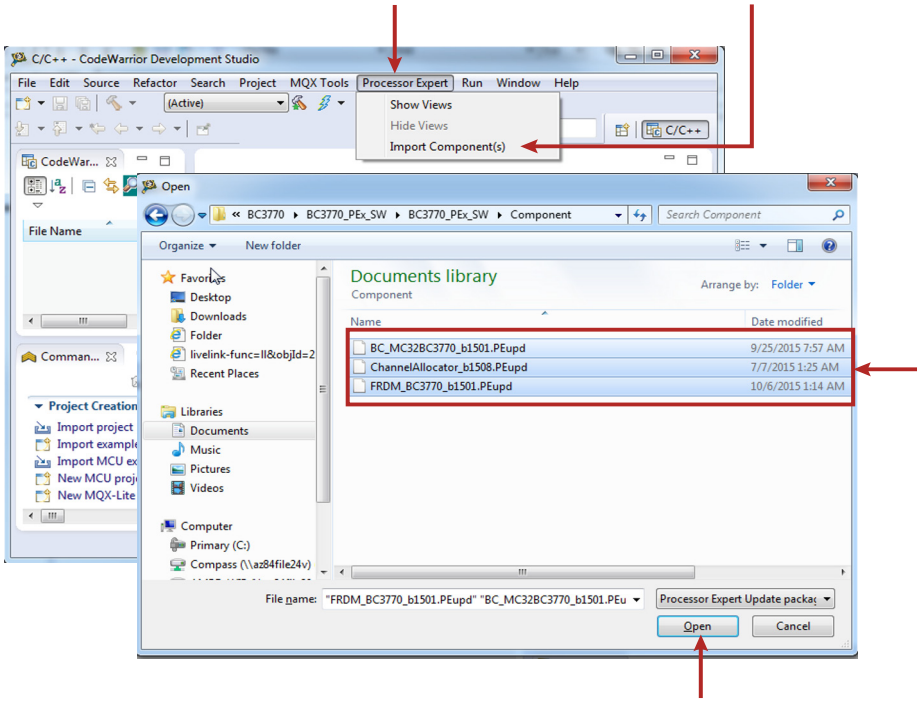


Figure 18. Import the BC3770 components

3. If the import is successful, the BC3770 and FRDM_BC3770 component appears in Components Library -> SW -> User Component (see Figure 19). Note that the component **ChannelAllocator** is hidden and is not accessible to users. This component is used by the BC3770 components only.