UG417: EFM32GG Gecko Starter Kit User's Guide

The EFM32GG-STK3700A Starter Kit is an excellent starting point to get familiar with the EFM32GG™ Gecko Microcontroller.

The Starter Kit contains sensors and peripherals demonstrating some of the Gecko's many capabilities. The kit provides all necessary tools for developing an EFM32GG Gecko application.

TARGET DEVICE

- EFM32GG Gecko Microcontroller (EFM32GG990F1024G-E-BGA112)
- CPU: 32-bit ARM® Cortex-M3
- Memory: 1024 kB flash and 128 kB RAM

KIT FEATURES

- USB connectivity
- Advanced Energy Monitor
- SEGGER J-Link on-board debugger
- Debug Multiplexer supporting external hardware as well as on-board MCU
- User LEDs / Pushbuttons
- 8x20 segment LCD
- Inductive LC sensor
- Photo transistor for light sensing applications
- USB Micro-AB connector supporting both host and device mode USB applications
- 2 push buttons and 2 LEDs connected to EFM32 for user interaction
- Backup battery
- 1 Gbit NAND flash memory
- 4-segment Capacitive Touch Slider
- 20-pin 2.54 mm header for expansion boards
- Breakout pads for direct access to I/O pins
- Power sources include USB and CR2032 coin cell battery.

SOFTWARE SUPPORT

- Simplicity Studio™
- IAR Embedded Workbench

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1. Introduction

1.1 Description

The EFM32GG-STK3700A is an excellent starting point to get familiar with the EFM32GG Gecko Microcontrollers. The kit contains sensors and peripherals demonstrating some of the EFM32GG Gecko's many capabilities. The kit can also serve as a starting point for application development.

In addition to supporting application development on the starter kit itself, the board is also a fully featured debugger and energy monitoring tool that can be used with external applications.

1.2 Features

- EFM32GG Gecko Microcontroller
  - 1024 kB Flash
  - 128 kB RAM
  - BGA112 package
- Advanced Energy Monitoring system for precise current and voltage tracking
- Integrated Segger J-Link USB debugger/emulator with the possiblity to debug external Silicon Labs devices
- 20 pin expansion header
- Breakout pads for easy access to I/O pins
- Power sources include USB and CR2032 battery
- 8x20 segment LCD
- USB Micro-AB connector supporting both host and device mode USB applications
- 1 Gbit parallell interface NAND flash memory
- 2 push buttons and 2 LEDs connected to EFM32 for user interaction
- LC tank circuit for inductive proximity sensing of metallic objects
- Photo transistor for light sensing applications
- Backup battery
- 4-segment capacitive touch slider
- Crystals for LFXO and HFXO: 32.768 kHz and 48.000 MHz.

1.3 Getting Started

Detailed instructions for how to get started with your new EFM32GG-STK3700A can be found on the Silicon Labs web pages:

https://www.silabs.com/mcu/32-bit/efm32-giant-gecko

2. Kit Block Diagram

An overview of the EFM32GG Gecko Starter Kit is shown in the figure below.
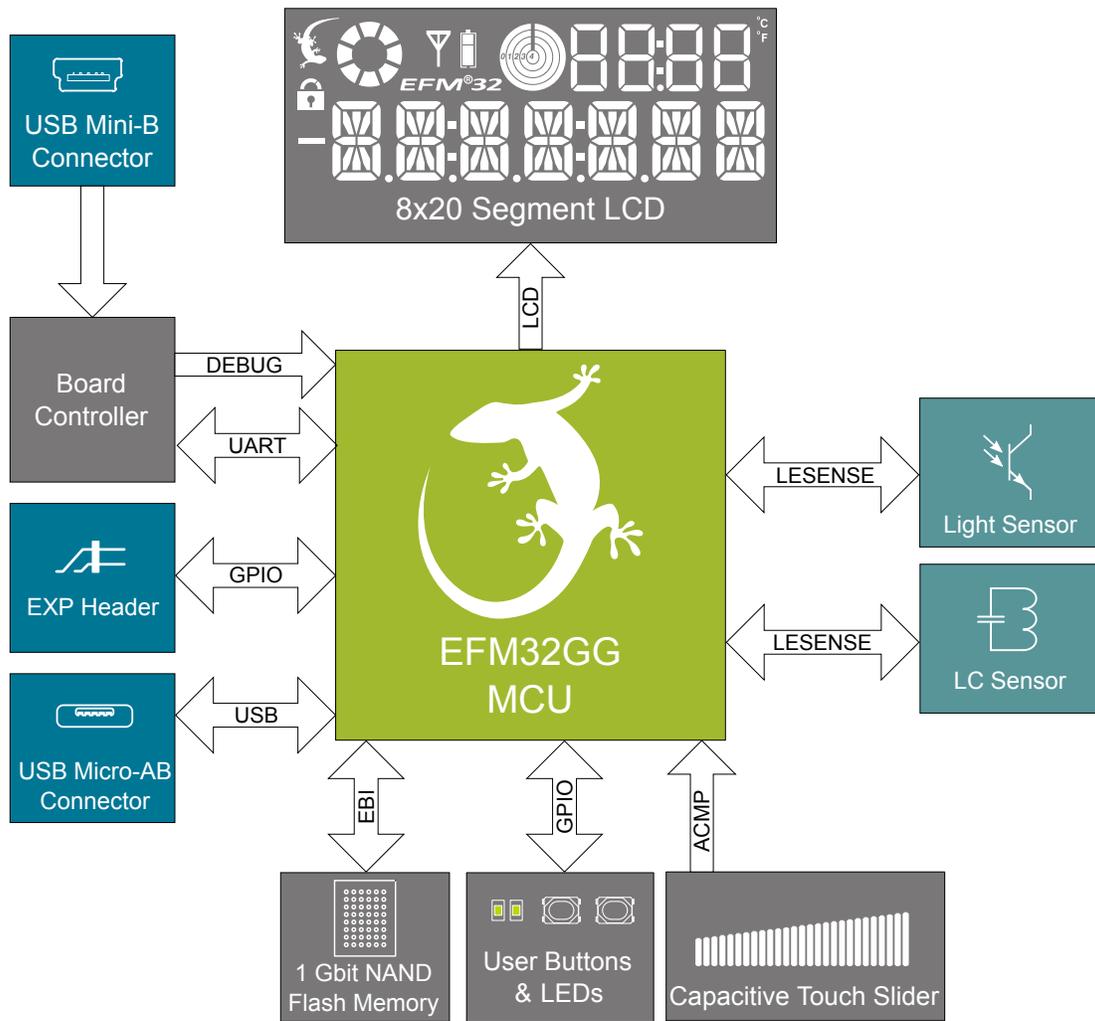

Figure 2.1.   Kit Block Diagram

3. Kit Hardware Layout

The layout of the EFM32GG Gecko Starter Kit is shown below.
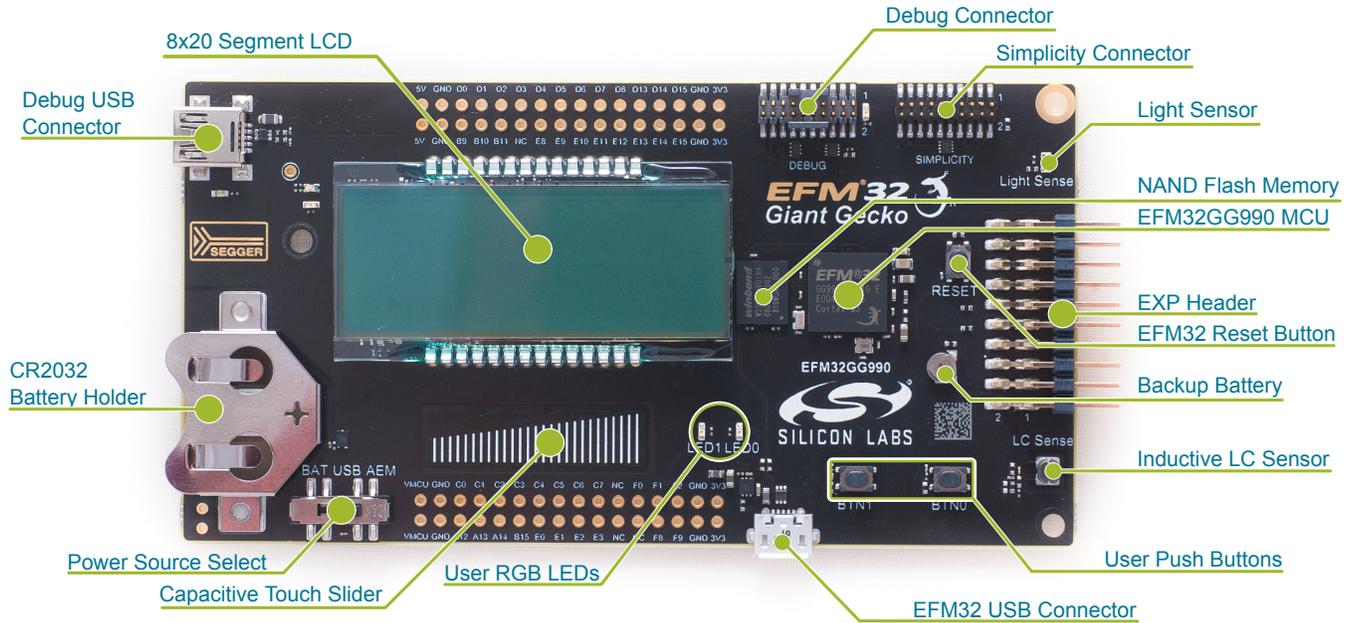
Figure 3.1.   EFM32GG-STK3700A Hardware Layout

4. Connectors

4.1 Breakout Pads

Most of the EFM32GG's GPIO pins are available on two pin header rows at the top and bottom edges of the board. These have a standard 2.54 mm pitch, and pin headers can be soldered in if required. In addition to the I/O pins, connections to power rails and ground are also provided. Note that some of the pins are used for kit peripherals or features, and may not be available for a custom application without tradeoffs.

The figure below shows the pinout of the breakout pads, as well as the pinout of the EXP header on the right edge of the board. The EXP header is further explained in the next section. The breakout pad connections are also printed in silk screen next to each pin for easy reference.
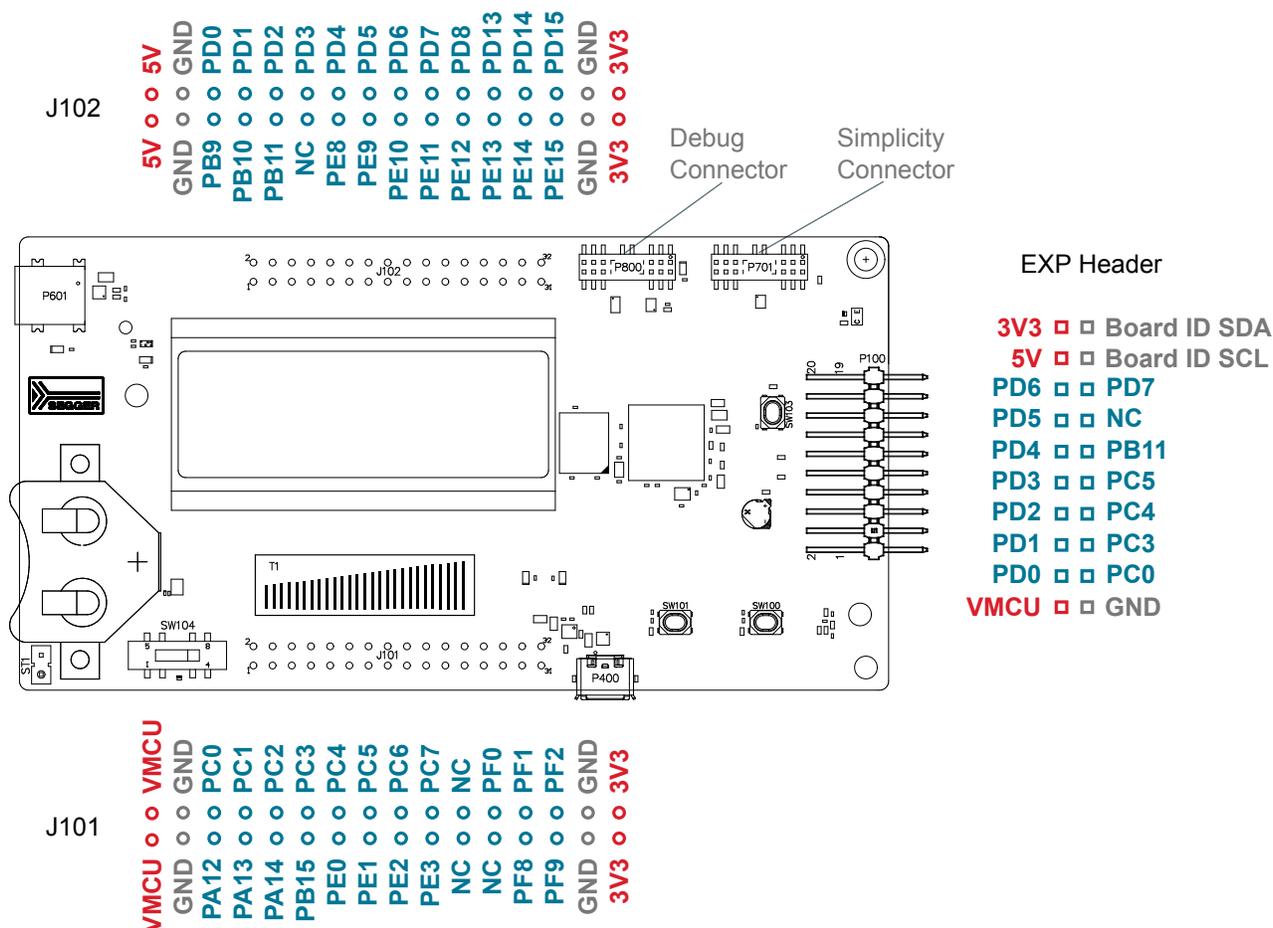
Figure 4.1. Breakout Pads and Expansion Header

The table below shows the connections of each pin of the breakout pads. It also shows which kit peripherals or features that are connected to the different pins.

Table 4.1. Bottom Row (J101) Pinout

Pin	EFM32GG I/O pin	Shared feature	Pin	EFM32GG I/O pin	Shared feature
1	VMCU	EFM32GG voltage domain	2	VMCU	EFM32GG voltage domain
3	GND	Ground	4	GND	Ground
5	PA12	LCD_BCAP_P	6	PC0	EXP3
7	PA13	LCD_BCAP_N	8	PC1	NAND_ALE

Pin	EFM32GG I/O pin	Shared feature		Pin	EFM32GG I/O pin	Shared feature
9	PA14	LCD_BEXT		10	PC2	NAND_CLE
11	PB15	NAND_PWR_EN		12	PC3	EXP5
13	PE0	VCOM_TX		14	PC4	EXP7
15	PE1	VCOM_RX		16	PC5	EXP9
17	PE2	UIF_LED0		18	PC6	LES_LIGHT_SENSE
19	PE3	UIF_LED1		20	PC7	LES_LC_SENSE
21		Not connected		22		Not connected
23		Not connected		24	PF0	DEBUG_SWCLK
25	PF8	NAND_WE#		26	PF1	DEBUG_SWDIO
27	PF9	NAND_RE#		28	PF2	DEBUG_SWO
29	GND	Ground		30	GND	Ground
31	3V3	Board controller supply		32	3V3	Board controller supply

Table 4.2. Top Row (J102) Pinout

Pin	EFM32GG I/O pin	Shared feature		Pin	EFM32GG I/O pin	Shared feature
1	5V	Board USB voltage		2	5V	Board USB voltage
3	GND	Ground		4	GND	Ground
5	PB9	UIF_BUTTON0		6	PD0	EXP4
7	PB10	UIF_BUTTON1		8	PD1	EXP6
9	PB11	EXP11		10	PD2	EXP8
11		Not Connected		12	PD3	EXP10, OPAMP_N2
13	PE8	NAND_IO0		14	PD4	EXP12, OPAMP_P2
15	PE9	NAND_IO1		16	PD5	EXP14, OPAMP_OUT2
17	PE10	NAND_IO2		18	PD6	EXP16, LES_LIGHT_EXCITE
19	PE11	NAND_IO3		20	PD7	EXP15
21	PE12	NAND_IO4		22	PD8	BU_VIN
23	PE13	NAND_IO5		24	PD13	NAND_WP#
25	PE14	NAND_IO6		26	PD14	NAND_CE#
27	PE15	NAND_IO7		28	PD15	NAND_R/B#
29	GND	Ground		30	GND	Ground
31	3V3	Board controller supply		32	3V3	Board controller supply

4.2 Expansion Header

On the right hand side of the board an angled 20 pin expansion header is provided to allow connection of peripherals or plugin boards. The connector contains a number of I/O pins that can be used with most of the EFM32GG Gecko's features. Additionally, the VMCU, 3V3 and 5V power rails are also exported.

The connector follows a standard which ensures that commonly used peripherals such as an SPI, a UART and an I^{2}C bus are available on fixed locations in the connector. The rest of the pins are used for general purpose I/O. This allows the definition of expansion boards that can plug into a number of different Silicon Labs starter kits.

The figure below shows the pin assignment of the expansion header for the EFM32GG Gecko Starter Kit. Because of limitations in the number of available GPIO pins, some of the expansion header pins are shared with kit features.

3V3	20		19	BOARD_ID_SDA
5V	18		17	BOARD_ID_SCL
PD6	16		15	PD7
PD5	14		13	NC
PD4	12		11	PB11
PD3	10		9	PC5
PD2	8		7	PC4
PD1	6		5	PC3
PD0	4		3	PC0
VMCU	2		1	GND

TARGET I/O Pin
Power
Ground
Reserved (Board Identification)
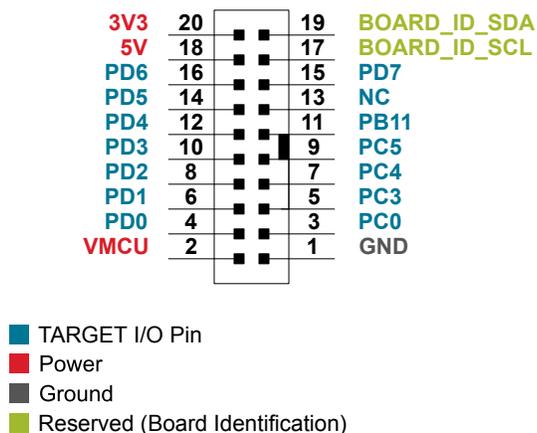
Figure 4.2. Expansion Header

Table 4.3. EXP Header Pinout

Pin	Connection	EXP Header function	Shared feature	Peripheral mapping
20	3V3	Board controller supply		
18	5V	Board controller USB voltage		
16	PD6	I2C_SDA	LES_LIGHT_EXCITE	I2C0_SDA #1
14	PD5	UART_RX	OPAMP_OUT2	LEUART0_RX #0
12	PD4	UART_TX	OPAMP_P2	LEUART0_TX #0
10	PD3	SPI_CS	OPAMP_N2	USART1_CS #1
8	PD2	SPI_SCLK		USART1_CLK #1
6	PD1	SPI_MISO		USART1_RX #1
4	PD0	SPI_MOSI		USART1_TX #1
2	VMCU	EFM32GG voltage domain, included in AEM measurements.		
19	BOARD_ID_SDA	Connected to Board Controller for identification of add-on boards.		
17	BOARD_ID_SCL	Connected to Board Controller for identification of add-on boards.		
15	PD7	I2C_SCL		I2C0_SCL #1
13	NC		Install R300 to connect to PB12/DAC_LC_EXCITE	DAC0_OUT1
11	PB11	DAC_OUT		DAC0_OUT0

Pin	Connection	EXP Header function	Shared feature	Peripheral mapping
9	PC5	GPIO		
7	PC4	GPIO		
5	PC3	GPIO		
3	PC0	GPIO		
1	GND	Ground		

4.3 Debug Connector (DBG)

The Debug Connector serves a dual purpose, depending on the "debug mode", which can be set up using Simplicity Studio. In the "Debug IN" mode this connector allows an external debug emulator to be used with the on-board EFM32GG. In the "Debug OUT" mode this connector allows the kit to be used as a debugger towards an external target. In the "Debug MCU" (default) mode this connector is isolated from the debug interface of both the Board Controller and the on-board target device.

Because this connector is automatically switched to support the different operating modes, it is only available when the Board Controller is powered (J-Link USB cable connected). If debug access to the target device is required when the Board Controller is unpowered, this should be done by connecting directly to the appropriate breakout pins.

The pinout of the connector follows that of the standard ARM Cortex Debug+ETM 19-pin connector. The pinout is described in detail below. Note that when using the on-board debugger to debug an mcu on an external board, JTAG and ETM functionality is only available if the target device supports it.
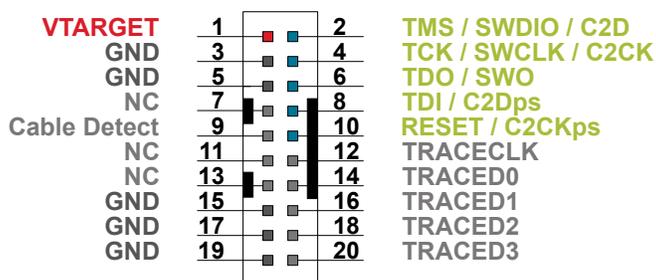

Figure 4.3. Debug Connector

Note that the pin-out matches the pin-out of an ARM Cortex Debug+ETM connector, but these are not fully compatible as pin 7 is physically removed from the Cortex Debug+ETM connector. Some cables have a small plug that prevent them from being used when this pin is present. If this is the case, remove the plug, or use a standard 2x10 1.27 mm straight cable instead.

Table 4.4. Debug Connector Pin Descriptions

Pin number(s)	Function	Note
1	VTARGET	Target reference voltage. Used for shifting logical signal levels between target and debugger.
2	TMS / SDWIO / C2D	JTAG test mode select, Serial Wire data or C2 data
4	TCK / SWCLK / C2CK	JTAG test clock, Serial Wire clock or C2 clock
6	TDO/SWO	JTAG test data out or Serial Wire Output
8	TDI / C2Dps	JTAG test data in, or C2D "pin sharing" function
10	RESET / C2CKps	Target device reset, or C2CK "pin sharing" function
12	TRACECLK	ETM Trace Clock
14	TRACED0	ETM Trace Data 0
16	TRACED1	ETM Trace Data 1
18	TRACED2	ETM Trace Data 2
20	TRACED3	ETM Trace Data 3
9	Cable detect	Connect to ground
11, 13	NC	Not connected
3, 5, 15, 17, 19	GND	

4.4 Simplicity Connector

The Simplicity Connector featured on the Starter Kit enables advanced debugging features such as the AEM and the Virtual COM port to be used towards an external target. The pinout is illustrated in the figure below.

```
       VMCU   1  ☐ ■  2   Virtual COM TX
        3V3   3  ☐ ■  4   Virtual COM RX
         5V   5  ☐ ■  6   Virtual COM CTS
        GND   7  ☐ ■  8   Virtual COM RTS
        GND   9  ☐ ■  10  NC
        GND  11  ☐ ■  12  NC
        GND  13  ☐ ■  14  NC
        GND  15  ☐ ■  16  NC
Board ID SCL  17  ☐ ■  18  NC
Board ID SDA  19  ☐ ■  20  NC
```
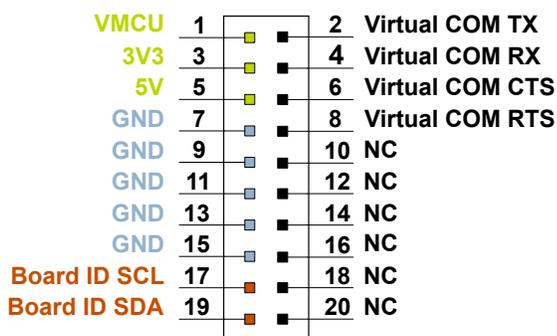
Figure 4.4. Simplicity Connector

The signal names in the figure and the pin description table are referenced from the board controller. This means that VCOM_TX should be connected to the RX pin on the external target, VCOM_RX to the target's TX pin, VCOM_CTS to the target's RTS pin and VCOM_RTS to the target's CTS pin.

Note: Current drawn from the VMCU voltage pin is included in the AEM measurements, while the 3V3 and 5V voltage pins are not. To monitor the current consumption of an external target with the AEM, put the on-board MCU in its lowest energy mode to minimize its impact on the measurements.

Table 4.5. Simplicity Connector Pin Descriptions

Pin number(s)	Function	Description
1	VMCU	3.3 V power rail, monitored by the AEM
3	3V3	3.3 V power rail
5	5V	5 V power rail
2	VCOM_TX	Virtual COM Tx
4	VCOM_RX	Virtual COM Rx
6	VCOM_CTS	Virtual COM CTS
8	VCOM_RTS	Virtual COM RTS
17	EXT_ID_SCL	Board ID SCL
19	EXT_ID_SDA	Board ID SDA
10, 12, 14, 16, 18, 20	NC	Not connected
7, 9, 11, 13, 15	GND	Ground

5. Power Supply and Reset

5.1 MCU Power Selection

The EFM32GG on the Starter Kit can be powered by one of these sources:

• The debug USB cable; or
• the EFM32GG's own USB regulator; or
• a 3 V coin cell battery.

The power source for the MCU is selected with the slide switch in the lower left corner of the Starter Kit. The figure below shows how the different power sources can be selected with the slide switch.
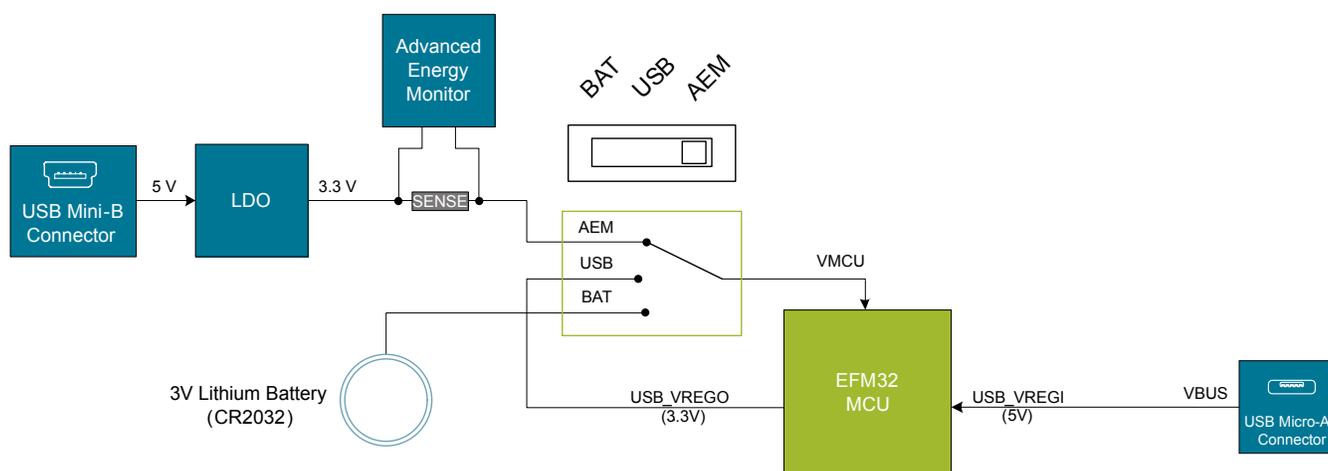

Figure 5.1. Power Switch

With the switch in the **AEM** position, a low-noise 3.3 V LDO on the Starter Kit is used to power the EFM32GG. This LDO is again powered from the debug USB cable. The Advanced Energy Monitor is now connected in series, allowing accurate high-speed current measurements and energy debugging/profiling.

With the switch in the **USB** position, the integrated linear regulator in the EFM32GG Gecko MCU is used to power the rest of the chip as well as the USB PHY with the cable connected to the target USB connector. This allows a USB device application where the MCU acts as a bus powered device. Current consumption monitoring using the AEM is not available when USB is selected as power source.

Finally, with the switch in the **BAT** position, a 20 mm coin cell battery in the CR2032 socket can be used to power the device. With the switch in this position no current measurements are active. This is the recommended switch position when powering the MCU with an external power source.

5.2 Board Controller Power

The board controller is responsible for important features, such as the debugger and the AEM, and is powered exclusively through the USB port in the top left corner of the board. This part of the kit resides on a separate power domain, so a different power source can be selected for the target device while retaining debugging functionality. This power domain is also isolated to prevent current leakage from the target power domain when power to the Board Controller is removed.

The board controller power domain is not influenced by the position of the power switch.

The kit has been carefully designed to keep the board controller and the target power domains isolated from each other as one of them powers down. This ensures that the target EFM32GG device will continue to operate in the **USB** and **BAT** modes.

5.3 EFM32GG Reset

The EFM32GG MCU can be reset by a few different sources:

- A user pressing the RESET button
- The on-board debugger pulling the #RESET pin low
- An external debugger pulling the #RESET pin low

In addition to the reset sources mentioned above, a reset to the EFM32GG will also be issued during board controller boot-up. This means that removing power to the board controller (unplugging the J-Link USB cable) will not generate a reset, but plugging the cable back in will, as the board controller boots up.

6. Peripherals

The starter kit has a set of peripherals that showcase some of the features of the EFM32GG.

Be aware that most EFM32GG I/O routed to peripherals are also routed to the breakout pads or the EXP header. This must be taken into consideration when using these.

6.1 Push Buttons and LEDs

The kit has two user push buttons marked BTN0 and BTN1. They are connected directly to the EFM32GG and are debounced by RC filters with a time constant of 1 ms. The buttons are connected to pins PB9 and PB10.

The kit also features two yellow LEDs marked LED0 and LED1 that are controlled by GPIO pins on the EFM32GG. The LEDs are connected to pins PE2 and PE3 in an active-high configuration.
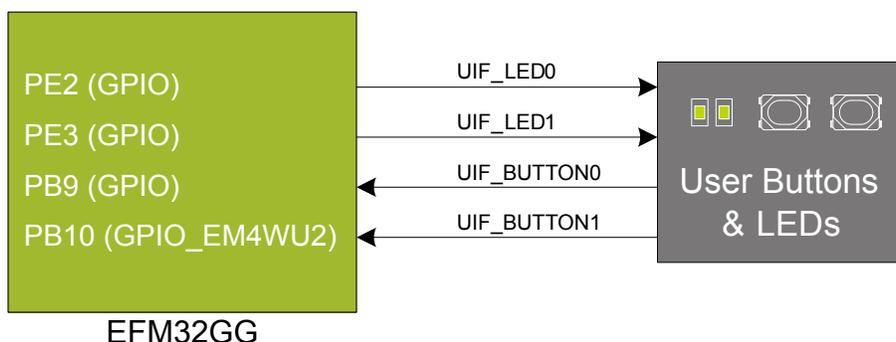
Figure 6.1. Buttons and LEDs

6.2 LCD

A 28-pin segment LCD is connected to the EFM32's LCD peripheral. The LCD has 8 common lines and 20 segment lines, giving a total of 160 segments in octaplex mode. These lines are not shared on the breakout pads. Refer to the kit schematic for information on signals to segments mapping.

A capacitor connected to the EFM32 LCD peripheral's voltage boost pin is also available on the kit.
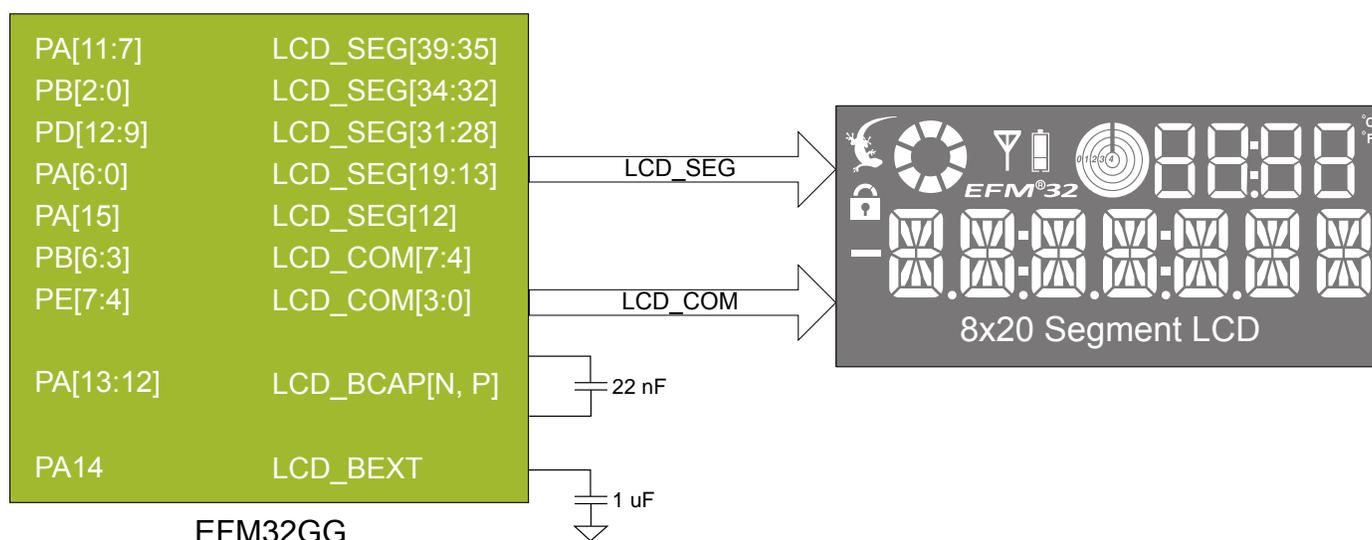
Figure 6.2. Segment LCD

6.3 Capacitive Touch Slider

A touch slider utilizing the capacitive touch capability of the EFM32GG's analog comparator (ACMP) is located on the bottom side of the board. It consists of four interleaved pads which are connected to PC8, PC9, PC10 and PC11.
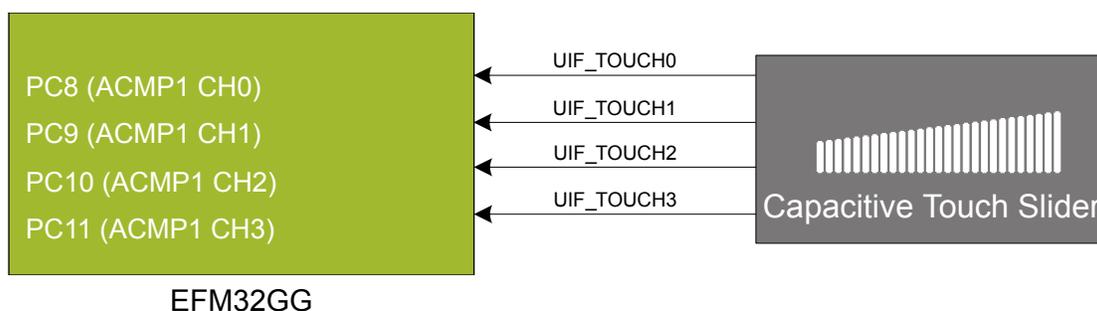
Figure 6.3. Touch Slider

The capacitive touch pads work by sensing changes in the capacitance of the pads when touched by a human finger. Sensing the changes in capacitance is done by setting up the EFM32GG's analog comparator (ACMP) in capacitive touch sensing mode. For low-power operation, the Low Energy Sensor Interface (LESENSE) can be configured to continuously scan all pads.

Sensing change in capacitance is done by setting up the touch pad as part of an RC relaxation oscillator, where the analog comparator counts the number of oscillations for a fixed period of time.

For more information about usage and theory of low-energy capacitive sensing, refer to application notes *AN0028 Low Energy Sensor Interface - Capacitive Sense*, which is can be found in Simplicity Studio or in the document library on the Silicon Labs website.

6.4 LC Sensor

In the bottom right corner of the board there is an inductive-capacitive sensor for demonstrating the Low Energy Sensor Interface (LE-SENSE). The LESENSE peripheral uses the voltage digital-to-analog converter (VDAC) to set up an oscillating current through the inductor, and then uses the analog comparator (ACMP) to measure the oscillation decay time. The oscillation decay time will be affected by the presence of metal objects within a few millimeters of the inductor.

The LC sensor can be used for implementing a sensor that wakes up the EFM32GG from sleep when a metal object comes close to the inductor, which again can be used as a utility meter pulse counter, door alarm switch, position indicator or other applications where one wants to sense the presence of a metal object.
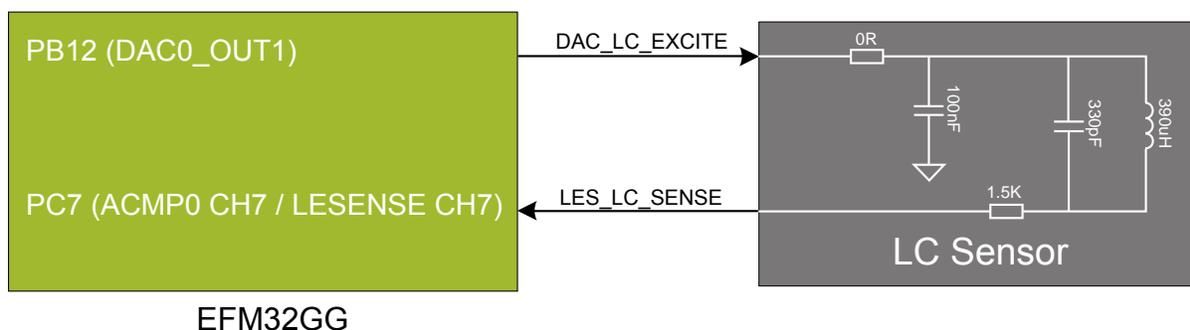
Figure 6.4. LC Metal Sensor

For more information about usage and theory of operation of the LC sensor, refer to application note *AN0029 Low Energy Sensor Interface - Inductive Sense*, which is can be found in Simplicity Studio or in the document library on the Silicon Labs website.

6.5 Ambient Light Sensor

In the top right corner of the board there is an ambient light sensor implemented using a TEMT6200FX01 photo transistor connected to the EFM32GG's Low Energy Sensor Interface (LESENSE) peripheral as a resistive sensor element. One pin is used for excitation of the transistor, while another senses the state of the sensor. LESENSE can take care of both the excitation and sensing part of the operation.
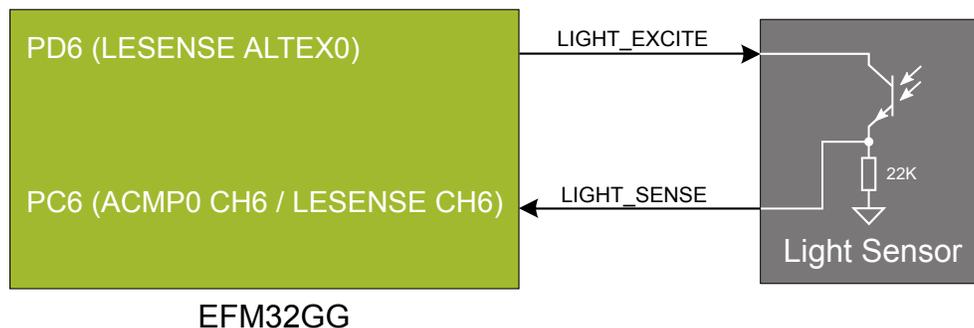
Figure 6.5. Ambient Light Sensor

For more information about using LESENSE for resistive sensor applications, refer to application note *AN0036 Low Energy Sensor Interface - Resistive Sense*, which is can be found in Simplicity Studio or in the document library on the Silicon Labs website.

6.6 USB Micro-AB Connector

The EFM32GG-STK3700A board is equipped with a USB Micro-AB connector interfacing with the EFM32GG's USB peripheral. This allows the development and evaluation of applications using USB in both host and device mode. For host mode, the board can supply 5 V power to the USB VBUS if the board itself has been powered using the debug-USB connector. The VBUS power switch also provides an overcurrent flag which can be read in order to detect if a connected device draws too much current.

The EFM32 has an internal LDO regulator that powers the USB PHY inside the chip. 5 V from VBUS is applied to the USB_VREGI pin, and the output is decoupled on the USB_VREGO pin. When the power select switch is set to the *USB* position, USB_VREGO is connected to the VMCU net, which powers the chip and all peripherals in the target voltage domain. When the J-Link USB cable is inserted, it is possible to monitor the current that supplies the USB PHY, the EFM32 device and all user peripherals on the board.
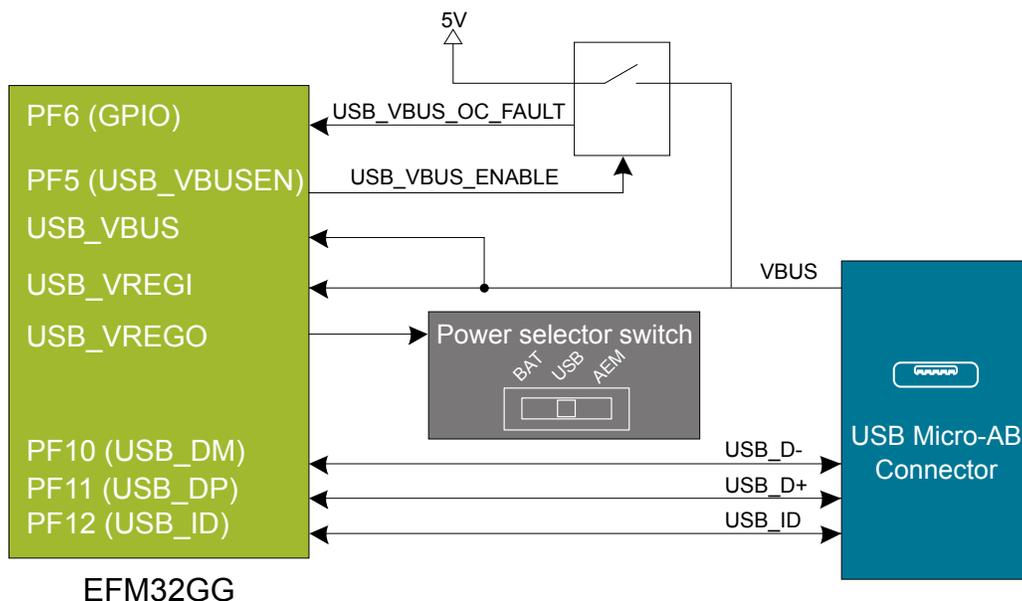
Figure 6.6. USB Connector and Power Supply

6.7 NAND Flash Memory

The EFM32GG Gecko Starter Kit features a Winbond W29N01HVDINA 1 Gbit parallel NAND flash memory connected to the EFM32GG's External Bus Interface (EBI) peripheral.

A separate power switch is used to enable/disable the NAND flash, therefore avoiding excess current consumption when not in use. When NAND_PWR_EN is high, the NAND flash memory is powered by the same supply rail as the EFM32GG. It is recommended to keep the write-protect line low during power transitions.

The ALE (address latch enable) and CLE (command latch enable) pins of the NAND flash memory are connected to EBI address pins 24 and 25, and the CE (chip enable) line is connected to a generic GPIO pin. this causes the NAND data, address and command registers to be mapped to the EFM32GG's address space as follows:

- Data register: 0x80000000
- Address register: 0x81000000
- Command register: 0x82000000
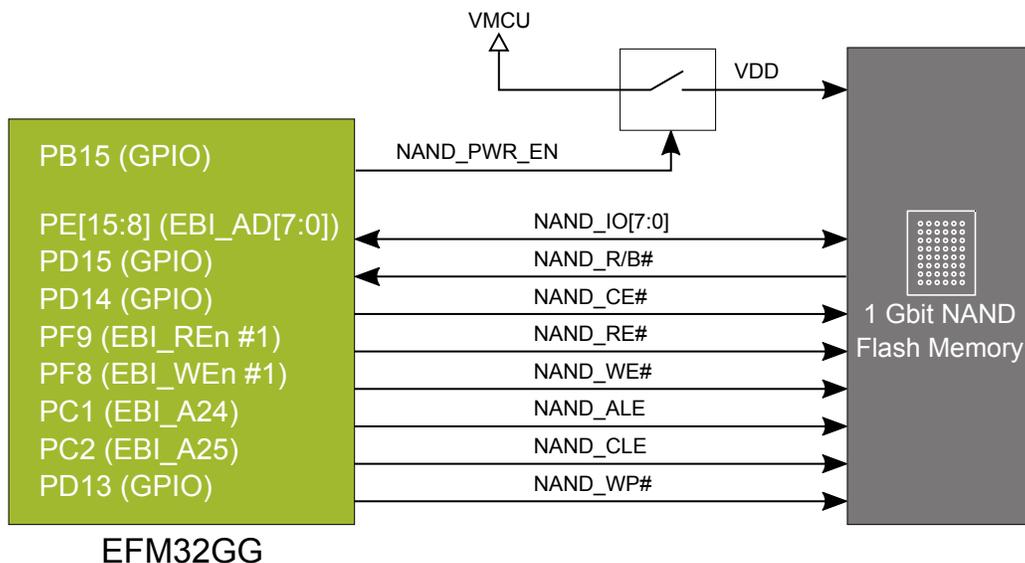
Figure 6.7. NAND Flash Memory

6.8 Opamp Footprint

On the board's back side there is a silk screen diagram showing and operational amplifier (opamp) with unpopulated positive and negative feedback circuits. The circuit connects to one of the EFM32GG's internal opamps, and allows the user to build an opamp circuit by installing 0603 size passive components in the available footprints. Various types of passive components (resistors, capacitors, inductors, ferrites) can be used to implement the desired amplifier circuit, such as a positive or negative feedback amplifier, buffer amplifier or active filter circuit.
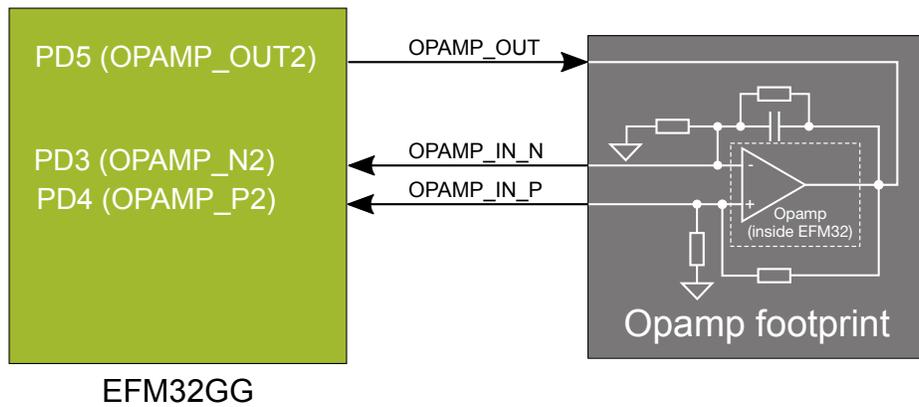
Figure 6.8. Opamp Footprint

Note: The opamp symbol in the figure represents the EFM32GG's integrated opamp peripheral. There is no discrete opamp or footprint for installing a discrete opamp on the board.

6.9 Virtual COM Port

An asynchronous serial connection to the board controller is provided for application data transfer between a host PC and the target EFM32GG. This eliminates the need for an external serial port adapter.
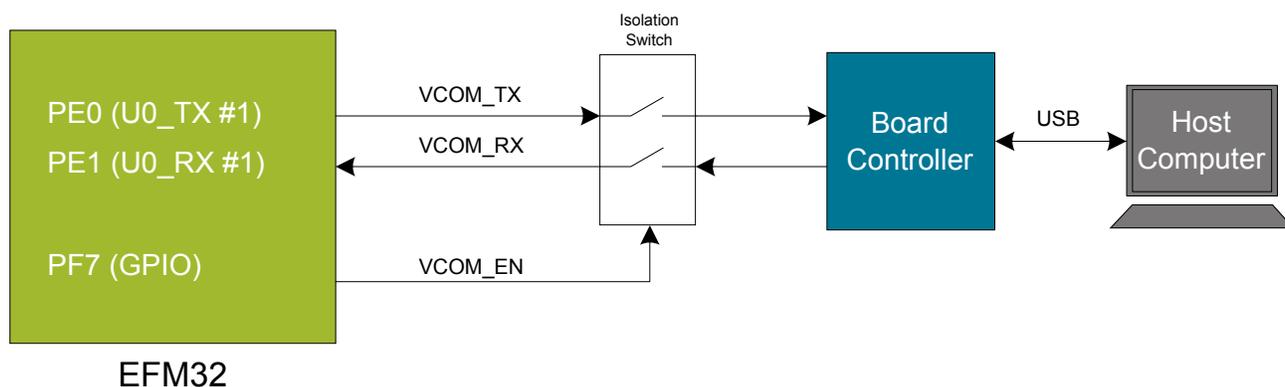
Figure 6.9. Virtual COM Port Interface

The Virtual COM port consists of a physical UART between the target device and the board controller, and a logical function in the board controller that makes the serial port available to the host PC over USB. The UART interface consists of two pins and an enable signal.

Table 6.1. Virtual COM Port Interface Pins

Signal	Description
VCOM_TX	Transmit data from the EFM32GG to the board controller
VCOM_RX	Receive data from the board controller to the EFM32GG
VCOM_ENABLE	Enables the VCOM interface, allowing data to pass through to the board controller.

Note: The VCOM port is only available when the board controller is powered, which requires the J-Link USB cable to be inserted.

7. Advanced Energy Monitor

7.1 Usage

The AEM (Advanced Energy Monitor) data is collected by the board controller and can be displayed by the Energy Profiler, available through Simplicity Studio. By using the Energy Profiler, current consumption and voltage can be measured and linked to the actual code running on the EFM32GG in realtime.

7.2 Theory of Operation

To accurately measure current ranging from 0.1 µA to 47 mA (114 dB dynamic range), a current sense amplifier is utilized together with a dual gain stage. The current sense amplifier measures the voltage drop over a small series resistor, and the gain stage further amplifies this voltage with two different gain settings to obtain two current ranges. The transition between these two ranges occurs around 250 µA. Digital filtering and averaging is done within the Board Controller before the samples are exported to the Energy Profiler application.

During startup of the kit, an automatic calibration of the AEM is performed. This calibration compensates for the offset error in the sense amplifiers.
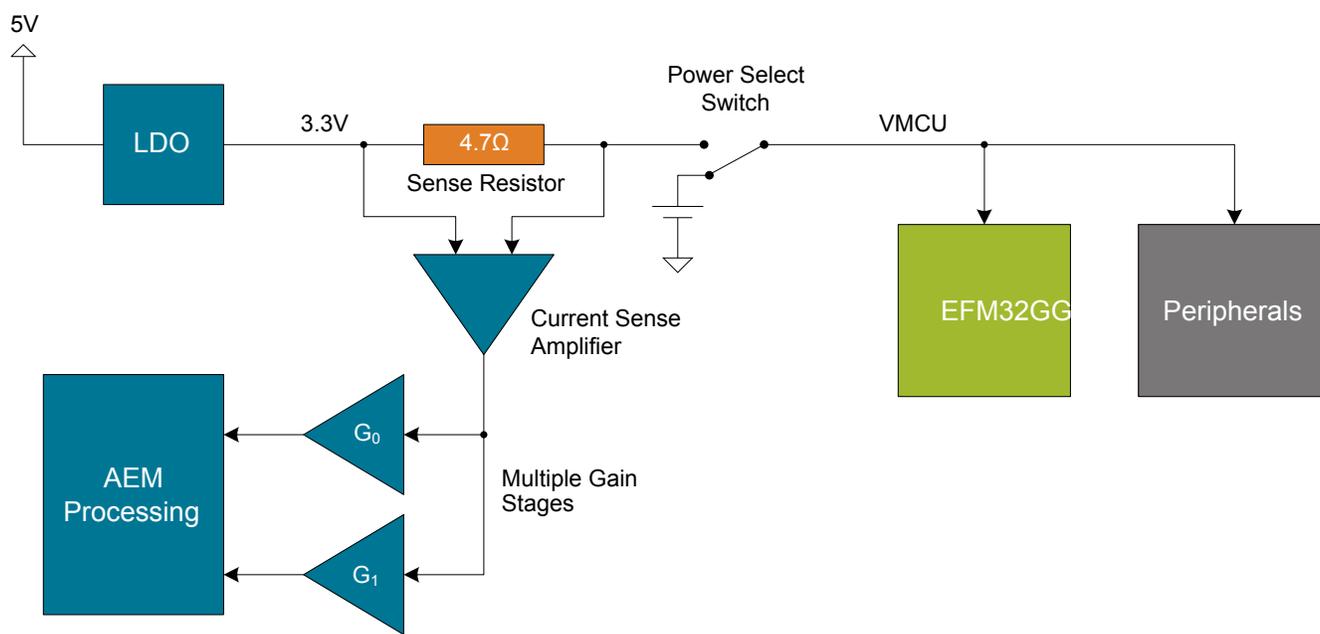
Figure 7.1. Advanced Energy Monitor

7.3 Accuracy and Performance

The Advanced Energy Monitor is capable of measuring currents in the range of 0.1 µA to 47 mA. For currents above 250 µA, the AEM is accurate within 0.1 mA. When measuring currents below 250 µA, the accuracy increases to 1 µA. Although the absolute accuracy is 1 µA in the sub 250 µA range, the AEM is able to detect changes in the current consumption as small as 100 nA. The AEM produces 6250 current samples per second.

8. On-Board Debugger

The EFM32GG-STK3700A contains an integrated debugger, which can be used to download code and debug the EFM32GG. In addition to programming the EFM32GG on the kit, the debugger can also be used to program and debug external Silicon Labs EFM32, EFM8, EZR32 and EFR32 devices.

The debugger supports three different debug interfaces used with Silicon Labs devices:

- Serial Wire Debug, which is used with all EFM32, EFR32 and EZR32 devices
- JTAG, which can be used with EFR32 and some EFM32 devices
- C2 Debug, which is used with EFM8 devices

To ensure that debugging works correctly, ensure that the appropriate debug interface that works with your device is selected. The debug connector on the board supports all three of these modes.

8.1 Debug Modes

Programming external devices is done by connecting to a target board through the provided debug connector and by setting the debug mode to [**Out**]. The same connector can also be used to connect an external debugger to the EFM32GG MCU on the kit by setting debug mode to [**In**].

Selecting the active debug mode is done in Simplicity Studio.

Debug MCU: In this mode, the on-board debugger is connected to the EFM32GG on the kit.
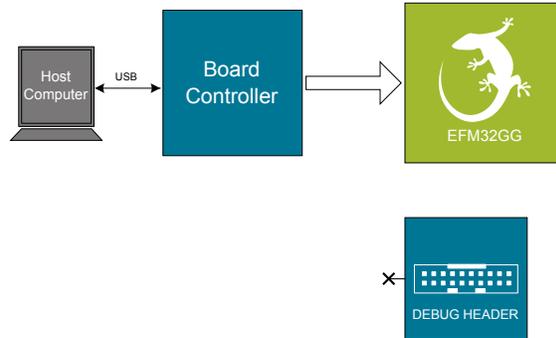
Figure 8.1. Debug MCU

Debug OUT: In this mode, the on-board debugger can be used to debug a supported Silicon Labs device mounted on a custom board.
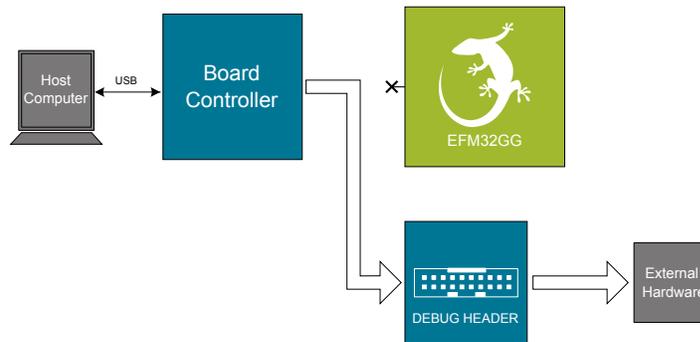
Figure 8.2. Debug OUT

Debug IN: In this mode, the on-board debugger is disconnected, and an external debugger can be connected to debug the EFM32GG on the kit.
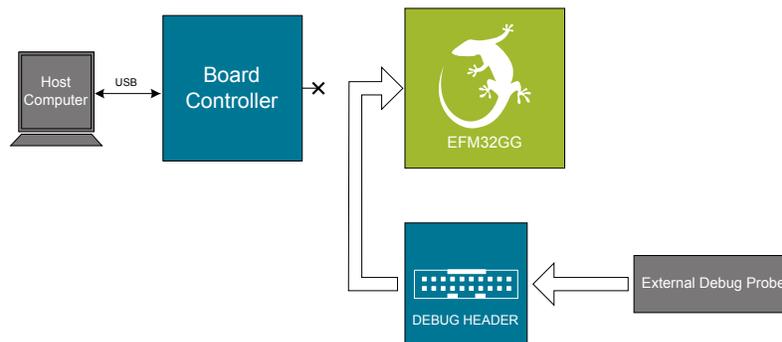
Figure 8.3. Debug IN

Note: For "Debug IN" to work, the kit board controller must be powered through the Debug USB connector.

8.2 Debugging During Battery Operation

When the EFM32GG is powered by battery and the J-Link USB is still connected, the on-board debug functionality is available. If the USB power is disconnected, the Debug IN mode will stop working.

If debug access is required when the target is running off another energy source, such as a battery, and the board controller is powered down, make direct connections to the GPIO used for debugging. This can be done by connecting to the appropriate pins of the breakout pads. Some Silicon Labs kits provide a dedicated pin header for this purpose.

9. Kit Configuration and Upgrades

The kit configuration dialog in Simplicity Studio allows you to change the J-Link adapter debug mode, upgrade its firmware, and change other configuration settings. To download Simplicity Studio, go to http://www.silabs.com/simplicity.

In the main window of the Simplicity Studio's Launcher perspective, the debug mode and firmware version of the selected J-Link adapter is shown. Click the [**Change**] link next to any of them to open the kit configuration dialog.
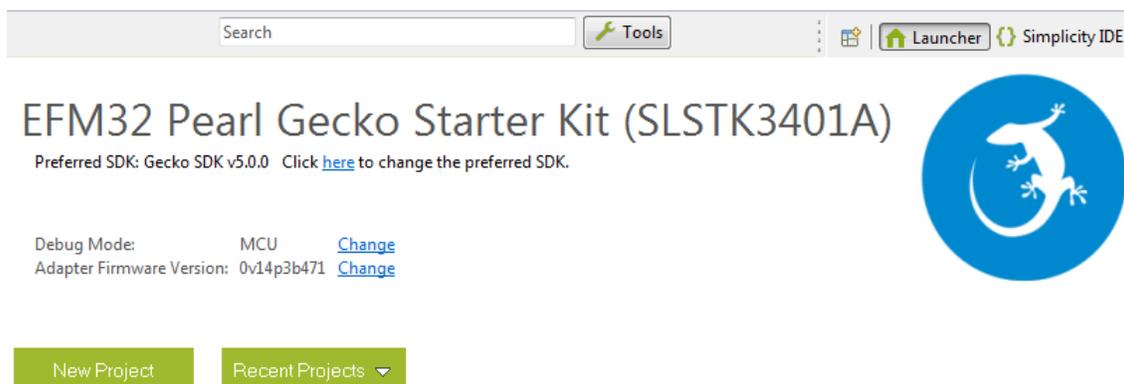
Figure 9.1. Simplicity Studio Kit Information
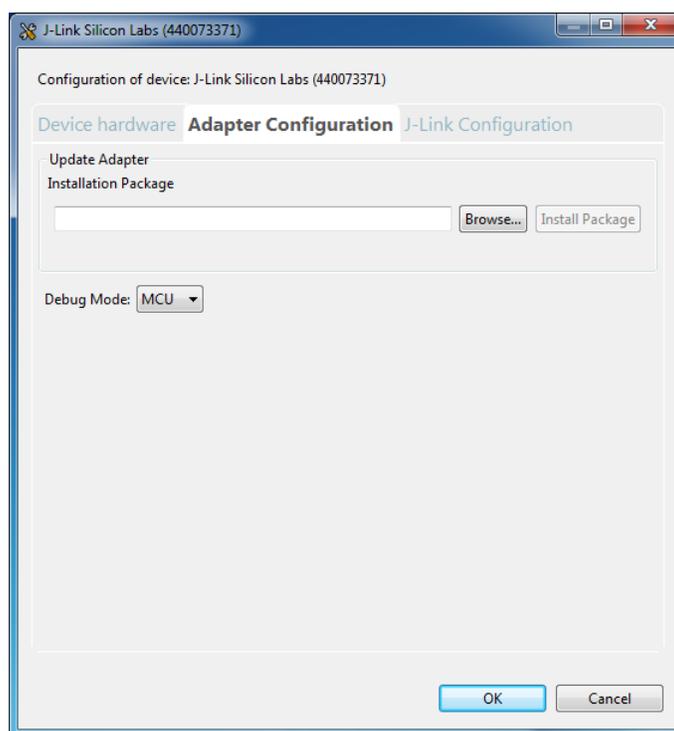
Figure 9.2. Kit Configuration Dialog

9.1 Firmware Upgrades

Upgrading the kit firmware is done through Simplicity Studio. Simplicity Studio will automatically check for new updates on startup.

You can also use the kit configuration dialog for manual upgrades. Click the [**Browse**] button in the [**Update Adapter**] section to select the correct file ending in `.emz`. Then, click the [**Install Package**] button.

10. Schematics, Assembly Drawings, and BOM

Schematics, assembly drawings, and bill of materials (BOM) are available through Simplicity Studio when the kit documentation package has been installed. They are also available from the Silicon Labs website and kit page.

11. Kit Revision History and Errata

11.1 Revision History

The kit revision can be found printed on the box label of the kit, as outlined in the figure below.

EFM32 Giant Gecko Starter Kit

(1P) Part: SLSTK3700A   (D) Date: 24-02-20

S.nr: 200800046   (Q) Qty: 1

Rev. C00
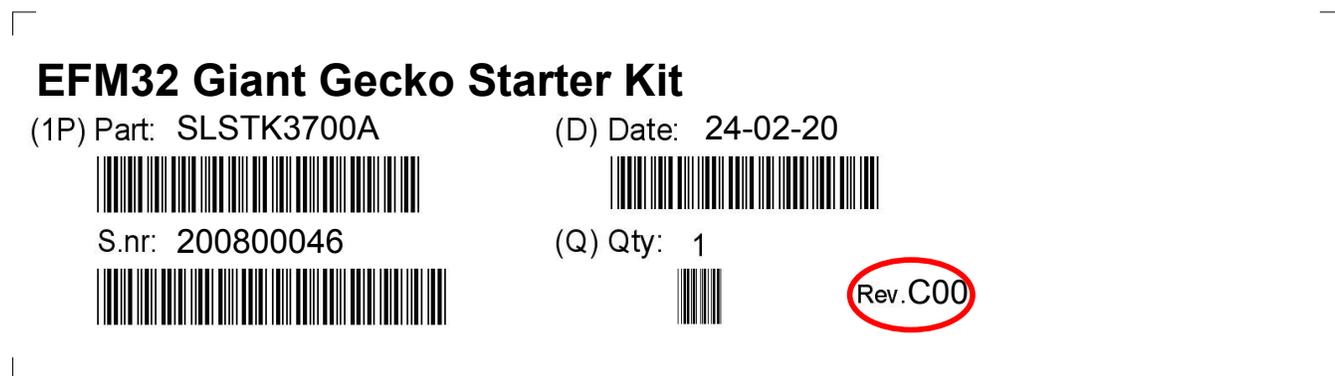
Figure 11.1. Revision Info

Table 11.1. Kit Revision History

Kit Revision	Released	Description
C00	2020-02-12	Updated kit to new platform. NAND flash changed to 1 Gbit.
A05	2012-10-18	Added USB micro-B to USB A female adapter cable to kit BOM.
A04	2012-06-15	Updated PCB to improve USB micro-AB connector footprint.
A03	2012-05-15	Updated PCB to add test-points for EFM32 USB.
A02	2012-04-26	Initial production version

11.2 Errata

There are no known errata at present.

12. Document Revision History

Revision 1.00

March, 2020

Updated in conjunction with release of new kit revision.

Revision 0.21

October, 2013

Updated document template and Silicon Labs contact/legal information.

Revision 0.20

April, 2013

Updated kit revision section.

Revision 0.11

May, 2012

Fixed error in expansion header pinout shown in Figure 9.1

Revision 0.10

May, 2012

Initial version.

Simplicity Studio

One-click access to MCU and wireless tools, documentation, software, source code libraries & more. Available for Windows, Mac and Linux!

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