

## Features

- 50mm x 50mm
- KC-4014 Bluetooth Low Energy Module
- Wireless firmware updates
- FTDI USB-UART interface
- 2 user buttons
- 2 indicator leds
- 10 PIO pins
- 3 AIO pins
- Current measurement test points

## Description

Use our BlueDemo Board as a fast introduction to wireless capabilities and performance of our kcEnergy hardware and firmware systems. The BlueDemo board can be easily reprogrammed with different firmware, useful for trying various editions, or for use while developing some customizations. Also, the BlueDemo Board is useful as a performance benchmark for customer prototypes and products.

Please refer to the *KC-4014 Low Energy Module Datasheet* for details of the low energy module hardware capabilities.

Please refer to the *kcEnergy User Guide* for details of the low energy firmware usage and off-the-shelf capabilities.

Customized firmware is available.

## Standard Bluetooth Low Energy Profiles

The KC-4014 Low Energy modules comes standard with KcEnergy firmware which includes support for GAP, GATT, FMP, PXP, LLS, Device Information, Battery profiles, and other profiles and services. Here is a description of some of the main ones.

### **GAP – Generic Access Profile**

The Generic Access Profile is a BLE mandatory profile responsible for the device name, appearance and Bluetooth connecting, advertising, and scan responses. It determines device interactions and defines the peripheral or central roles between two devices. It is also where pairing, bonding, and security measures take place.

### **GATT – Generic Attribute Profile**

The Generic Attribute Profile is the profile in which determines how two BLE devices transfer data via the client/server relationship. The server is the device with the service and the client is the device that communicates with the server to complete the service. The GATT governs profiles, services, and characteristics transactions. Its job starts once two devices are connected. Other BLE profiles, besides GAP, are GATT based.

### **FMP – Find Me Profile**

The Find Me Profile is a profile designed for locating another low energy device. An alert signal is activated on one device, while a trigger is set on the other device.

### **PXP – Proximity Profile**

The Proximity Profile is used as an alert system that activates when two connected devices become out of range or beyond a desired distance. This triggers a response for the device, such as locking down, shutting off or perhaps rescanning for devices. It can also be used to detect when devices are closer, such as to trigger a different response like reconnection. It works in a proximity monitor and proximity reporter relationship where the GATT server is the proximity reporter.

### **LLS – Link Loss Service**

The Link Loss Service is responsible for defining the behavior of a device after a link is lost between two devices. This service does not require other GATT –based services or devices.

### **BAS – Battery Service**

The battery service is an internal device service that monitors and exposes the state of the battery within a device.

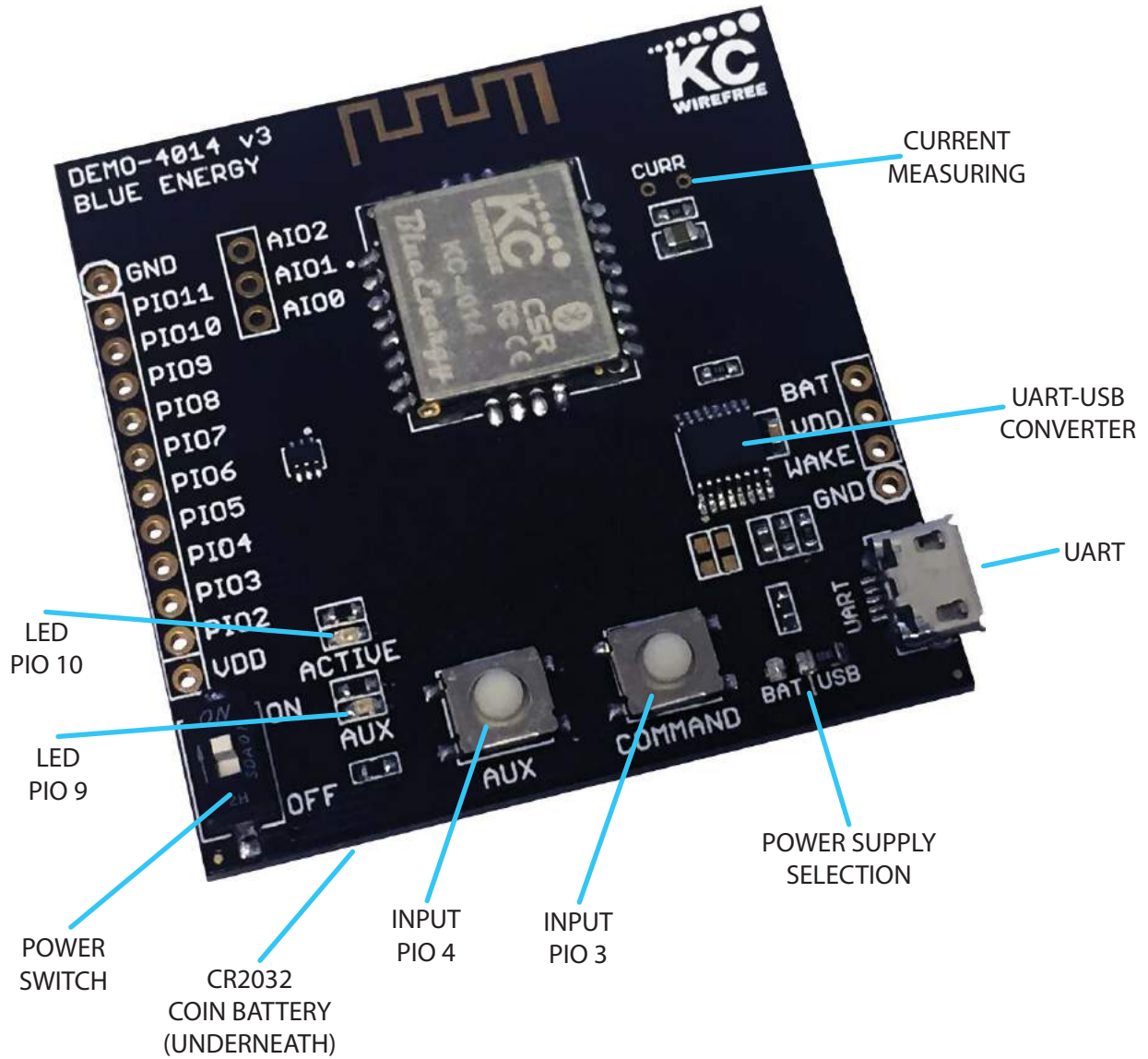
### **OTA – Over The Air Update mode**

The over the air update mode enables users to update the application software using a wireless server/client connection. This is a different operating mode from the devices normal operating mode. The host device will actually disconnect from the server and then reconnect under the update mode. When the update is complete, the host disconnects and then resets, starting the new device application. Upon updating, the GATT database may change depending on the actions of the update.

### **Other Bluetooth Low Energy Profiles**

KC-4014 is capable of supporting additional Low Energy profiles. Please contact KC Wirefree for customization options.

### BlueDemo Features



## Demo Board Features

### Battery

A CR2032 3.0V non-rechargeable Lithium battery is included.

### Power Supply Selection

The DEMO-4014 can be powered by a Lithium coin battery or the USB-UART port. There is a 0 ohm resistor that is used to select the desired power source.

### Power Switch

Connect/Disconnects both power supplies from the board circuitry.

### Current Measurement

A 1 ohm 1% resistor is placed in-line with the power supply rail to the module and before and after test points are available. A simple volt meter can detect the voltage drop across this resistor, and the actual current draw can be easily calculated.

### Usb-Uart

While the connector is a USB connector, it is connected to a UART-USB converter chip. The converter chip enumerates a virtual COM port with the host computer, and the converter chip is also connected to the module UART pins. The converter is powered by the USB cable connection, and will enumerate the virtual COM port even if the DEMO board battery switch is off.

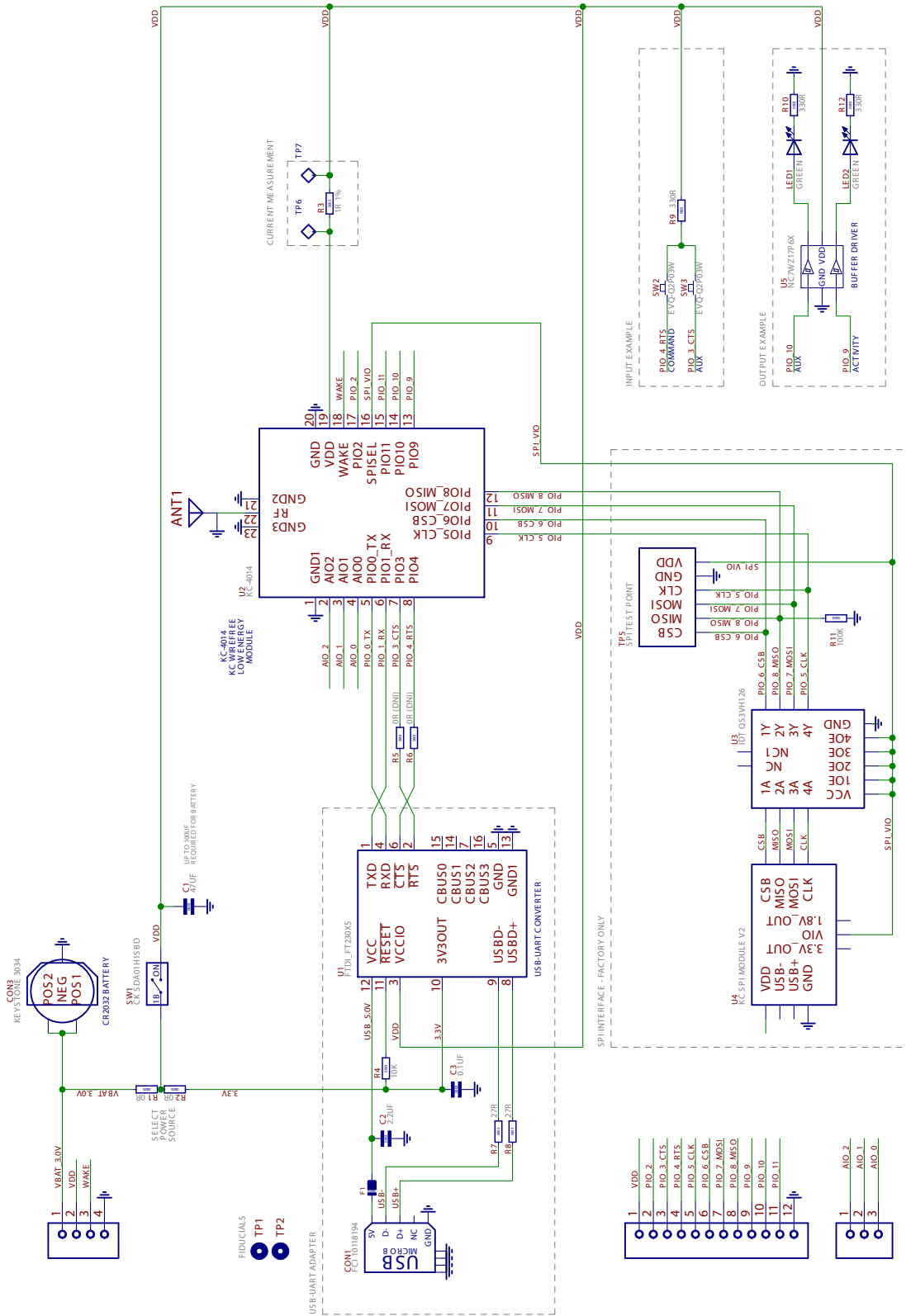
### Leds

The LED indications are determined by firmware. Please see *kcEnergy User Guide* for more information.

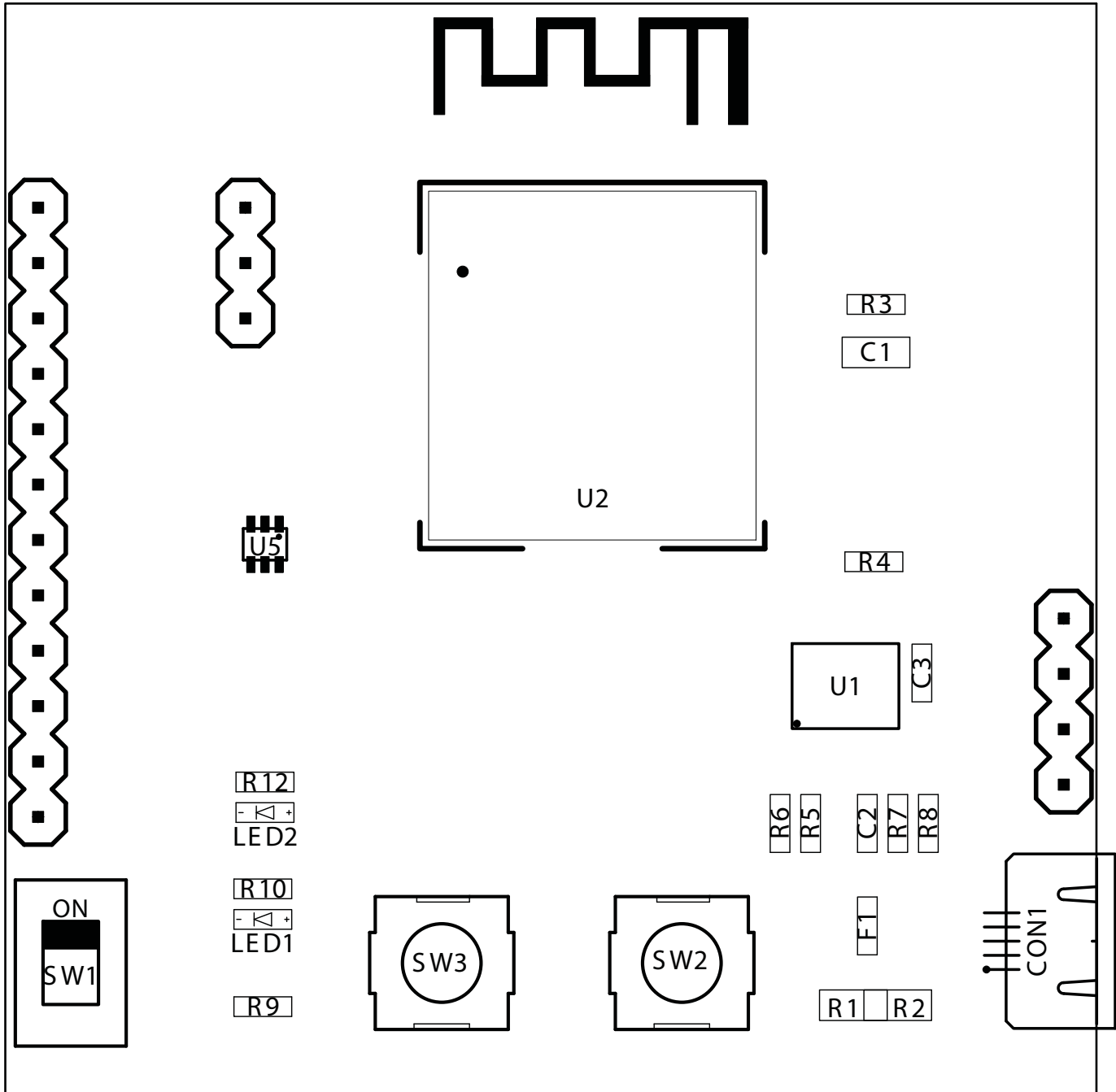
### Buttons

The button features are determined by firmware. Please see *kcEnergy User Guide* for more information.

### BlueDemo Schematic



Assembly



## BOM

QTY	LOCATION	DESCRIPTION	SIZE	MANF	MANF PART
1	PCB	PCB		KCC	PCB.DEMO-4014.3
1	U1	USB-UART BRIDGE	16-SSOP	FTDI	FT230XS
1	U2	LOW ENERGY MODULE		KCC	KC-4014
1	U5	DUAL BUFFER DRIVER	6-TSSOP	FAIRCHILD	NC7WZ17P6X
1	C1	CAP CER 47UF	0805	TAIYO	JMK212BJ476MG-T
1	C2	CAP CER 2.2UF	0603	KEMET	C0603C225K9PACTU
1	C3	CAP CER 0.1UF	0603	KEMET	C0603C104K4RACTU
1	CON1	CONN USB MICRO-B		FCI	10118194-0001LF
1	CON3	COIN CELL BATTERY HOLDER		KEystone	3034TR
1	F1	FERRITE CHIP BEAD 40 OHM	0603	TDK	MMZ1608S400ATA00
2	LED1, LED2	LED GREEN	0603	KINGBRIGHT	APT1608SGC
2	R1 or R2	RES SMD 0.0 OHM JUMPER	0805	YAGEO	RC0805JR-070RL
2	R5, R6	RES SMD 0.0 OHM JUMPER	0603	YAGEO	RC0603JR-070RL
1	R3	RES SMD 1 OHM 1%	0805	VISHAY	CRCW08051R00FKEA
2	R7, R8	RES SMD 27 OHM	0603	VISHAY	CRCW060327R0JNEA
3	R9, R10, R12	RES SMD 330 OHM	0603	VISHAY	CRCW0603330RJNEA
1	SW1	SWITCH DIP 1POS		C&K	SDA01H1SBD
2	SW2, SW3	PUSH BUTTON SWITCH	6MM DIA	PANASONIC	EVQ-Q2P03W

## Qualifications

### Bluetooth

Qualification Design ID: B017702.

The KC-4014 is registered with and licensed by Bluetooth SIG as a qualified design. KC Wirefree provides a Qualified Design that should be sufficient for product licensing without additional Bluetooth testing requirements. Usage of Bluetooth registered trademarks must be licensed directly from Bluetooth SIG. Please contact Bluetooth SIG regarding product licensing fees.

### FCC

Pending

### CE

Pending

### Industry Canada

Pending

### SAR

Pending



## Datasheet Versions

Revisions	Changes
Jan 13, 2016	Original Release

## Ordering Information

<b>Product Series</b>	DEMO-4014
<b>Product Version</b>	3
<b>Country of Manufacture</b>	USA
<b>Order Part Number</b>	<b>Description</b>
DEMO-4014.3	kcEnergy Firmware
DEMO-4014.3-FW	Custom Firmware

## Contact Information

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