Z-Stack Demonstration – Quick Start

1. Switches and LEDs

In this, and other Figure 8 Wireless documents, references are made to switches and LEDs on the evaluation boards. These devices are used to control certain Z-Stack features and display status.

Certain procedures require user input via switches, commonly referred to as SW1 through SW5. The SmartRF04EB and CC2430DB boards have a 5-position joystick, designated U400, which provides these switch inputs as shown in the table below. Pressing the joystick toward the U400 label (up position) activates the SW1 input. Switch inputs SW2 – SW4 result from pressing the joystick to the right, down (away from U400), and left positions, respectively. SW5 occurs when the joystick is pressed straight down when in the center position.

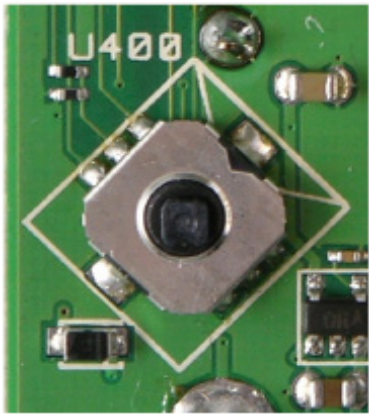

Figure 1: CC2430DB Joystick

SWITCH	JOYSTICK
SW1	***U400*** position
SW2	right position
SW3	down position
SW4	left position
SW5	press down

Z-Stack sample applications display various operational status LEDs, commonly referred to as LED1 through LED4. The CC2430DB has 2 colored LEDs, designated D1 and D2, which provide these LED indications as shown in the table below:

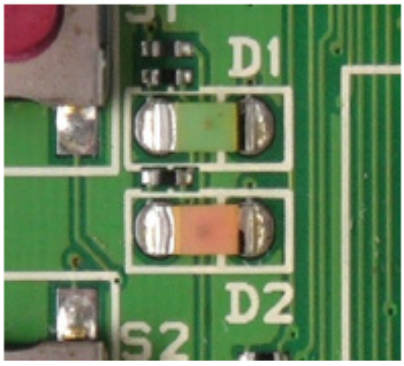

Figure 1: CC2430DB Joystick

LED	LABEL	COLOR
LED1	***D1***	Green
LED2	***D2***	Red

The SmartRF04EB has 4 colored LEDs, designated 1 - 4. The CC2430EM module does not have connections to the red LED (2) or the blue LED (4). Therefore, LEDs 1 and 3 are used to provide all LED indications from Z-Stack applications as shown in the table below:

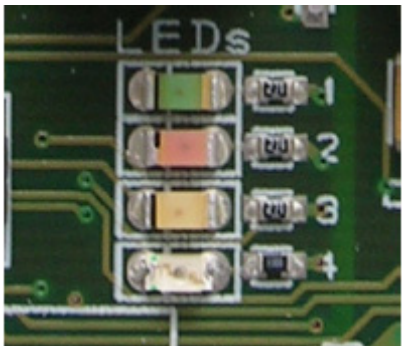

Figure 3: SmartRF04EB LEDs

LED	LABEL	COLOR
LED1	***1***	Green
LED2	***3***	Yellow
LED3	***3***	Yellow
LED4	***1***	Green

2. Running the Sample Application (SLC and SRC)

All devices in the CC2430 Zigbee DK are pre-programmed with a sample application. The following are instructions for easy setup and use of the application.

Initially, place all the devices on the same table or work area. You will initially establish the network while the devices are all in view of each other. Later, you can experiment with various distances and different power-up sequences.

To begin execution of the programmed sample application, apply power to each programmed SmartFR04EB and CC2430DB board or press the RESET (S2) button on each board, in the following sequence:

Start with the device which will run the **Switch Load Controller** (coordinator) application. Once this device has been initialized and begun operation, LED3 will be turned on. If the LED3 is not turned on, after a period of time (based on the number of channels selected), it could mean that it didn't find a channel with a suitable energy level and could not start a network.

Next, power up or RESET the first **Switch Remote Control** (router) device. Once this device has begun operation and successfully joined (associated), the LED2 will be turned on.

Finally, power up or RESET the remaining **Switch Remote Control** (router) devices. Once these devices have begun operation and successfully joined the network, their LED3s will be turned on.

2.1. Sample Use of Device Binding

After association, the devices need to be either bound together or they need a destination address to be established. Perform an *End Device Bind* with the following steps:

- On the first **Switch Remote Control (SRC)** device, press the joystick to the right (toward center of the board) and release to send an *End Device Bind Request*. This will initiate an "*End Device Bind Period*" of about 5 seconds.
- Before the "*End Device Bind Period*" expires, on the **Switch Load Controller** device, press the joystick to the right and release. The SRC device should turn on its LED1 to indicate success.

LED1 flashes if the binding process is not completed before the "*End Device Bind Period*" expires.

- Repeat the previous two steps with the remaining **Switch Remote Control** device(s) and the **Switch Load Controller** device.

2.2. Sample Use of Service Discovery

After association, the devices need to be either bound or they need a destination address to be established. As an alternative to binding, an SRC device can initiate an *Auto Match* function. This function uses the Zigbee Match Description Request to get the address of a device that accepts the output messages of the SRC device. For an example, take a look at the function ZDApp_AutoFindDestination( ) in ZDApp.c.

- On the first **Switch Remote Control (SRC)** device, press the joystick to the left (away from the center of the board) to initiate a *Service Discovery Match*. The SRC device should turn on its LED1 to indicate success.
- Repeat the previous step with the other **Switch Remote Control** device(s).

2.3. Sending Application Data

After the SRC devices have successfully associated, and have either been bound or auto matched to the SLC, pressing the joystick to the UP position on an SRC device will turn LED1 on the SLC device ON or OFF. This demonstrates a simple light-switch application. Note that the SRC devices send ON or OFF commands, not TOGGLE commands, to the SLC device. This allows the possibility that multiple SRC devices can get "out of phase" with each other, requiring two joystick presses on an SRC to toggle the SLC device's LED1.