CE216197 – FM0+ GPIO Toggling LED

This application toggles an LED when the user switch is pressed.

Overview

This application simply toggles a green LED. When the user switch is pressed the LED pin is read, then the value is toggled (ON/OFF) and it is written back to the GPIO. This demonstrates the use of GPIO for input and output and shows how to read the state of an output pin.

Requirements

Tool: PSoC Creator 4.0

Programming Language: C (GCC 4.9.3)

Associated Parts: All S6E1 parts

Related Hardware: FM0-V48-S6E1A1 and FM0-64L-S6E1C3

Design

The schematic file includes two GPIO components, renamed as shown below.



The firmware performs following functions:

1. Initialize the LED GPIO (off) and enable read
2. Initialize the switch GPIO (pulled up)
3. Detect a switch press event
4. Read, toggle, and write the state of the LED pin

Design Considerations

PDL Installation

The project assumes that you have installed the PDL in the location specified in the Project Management panel of the Tools > Options dialog. If that location is incorrect you will see the build error “The given PDL path is invalid. Unable to find required PDSC file.” To correct this problem in a newly-created project open the Project > Properties dialog and enter the correct path to the PDL. To avoid the problem in projects you create in the future, make sure you put the correct path in the Tools > Options dialog.

Pin Selection

The project includes control files to automatically place the GPIO onto the appropriate pins for the supported kit hardware. To change the pin selections, delete the control file or over-ride the control file selections in the Design Wide Resources Pin Editor.

Hardware Setup

The GPIO are connected to the user switch (SW3 on FM0-V48-S6E1A1, SW2 on FM0-100L-S6E1B8 and FM0-64L-S6E1C3) and the green LED.

Table 1 lists the pin connections required to use this code example on FM0+ kits.

Table 1. List of Pins

Pin	FM0-V48-S6E1A1	FM0-64L-S6E1C3
Green_LED:GPIO	P61	P3E
SW:GPIO	P04	P30

Components

Table 2 lists the PSoC Creator Components used in this example, as well as the hardware resources used by each.

Table 2. List of PSoC Creator Components

Component	Version	Hardware Resources
PDL_GPIO	1.0	GPIO pin

Parameter Settings

All the components use their default parameter settings. Only the component instance names have been changed for readability.

Operation

Press the user switch repeatedly to toggle the LED on/off.

Related Documents

Table 3 lists all relevant application notes, code examples, knowledge base articles, device datasheets, and Component datasheets.

Table 3. Related Documents

PSoC Creator Component Datasheets	
PDL_GPIO	Supports firmware access to physical pins (right-click on the component to access)
Device Documentation	
S6E1A	FM0+ S6E1A-Series 5V Robust ARM® Cortex®-M0+ Microcontroller (MCU) Family
S6E1C	FM0+ S6E1C-Series Ultra Low Power ARM® Cortex®-M0+ Microcontroller (MCU) Family
Development Kit (DVK) Documentation	
FM0-V48-S6E1A1	ARM® Cortex®-M0+ FM0+ MCU Evaluation Board
FM0-64L-S6E1C3	ARM® Cortex®-M0+ MCU Starter Kit with USB and Digital Audio Interface

Document History

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Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	5415875	YFS	08/25/16	New Code Example.
*A	5448720	YFS	9/29/16	Added workspace file.
*B	5776484	YFS	6/16/17	Added search keyword so that user can quickly find Code Examples from the component instance popup menu. Updated logo and copyright date.
*C	5987643	YFS	12/7/17	Removing S6E1B support.

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