CE217911 - PSoC® 6 FreeRTOS Example Project

Objective

This example demonstrates the basic use of FreeRTOS with the Cypress Peripheral Driver Library (PDL) on a PSoC® 6 device. The firmware runs on the CM4 core.

Overview

This code example project demonstrates how to use FreeRTOS with PSoC 6.

The code example creates two FreeRTOS tasks. The tasks communicate using a message queue. One task sends a message, the other receives the message. The receiving task toggles pin state depending on the received message.

Requirements

Tool: IAR 8.11, Keil uVision 5, GCC ARM Embedded 5.4-2016-q2-update, iSYSTEM winIDEA 9.12 or later

Programming Language: C

Associated Parts: All PSoC 6 parts

Related Hardware: CY8CKIT-062-BLE

Design

The design uses FreeRTOS to create two tasks communicating via message queue. See Figure 1.

Hardware Setup

This example project runs on the CY8CKIT-062-BLE development kit from Cypress Semiconductor. No additional hardware setup is required.

Components / Drivers

Table 1 lists the PDL Drivers used in this example, as well as the hardware resources used by each.

Table 1. List of PDL Drivers

Driver	Hardware Resources
GPIO	Digital Pin

Operation

1. Plug the CY8CKIT-062-BLE kit board into your computer's USB port.
2. Build and program the project into the development kit. Confirm that the kit's red LED blinks.

NOTE If you debug your project with the µVision IDE, you may need to install special debug support on some platforms (such as Windows 10). You add support for these probes by installing the *cypress.uvision_support.1.0.0.pack*. The pack is located here:

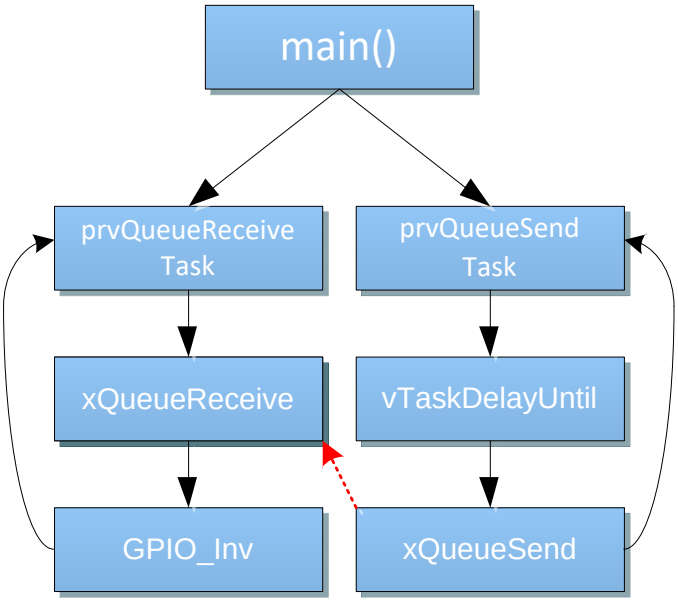
<PDL 3.x install folder>\tools\probes\cypress.uvision_support.1.0.0.pack

To install the pack, locate the file and double-click. The Pack Installer installs the necessary files in the µVision IDE. See Peripheral Driver Library User Guide for details.

Program Flow

The firmware implements a FreeRTOS message queue. It then creates two tasks. The prvQueueSendTask sends a message through the message queue. The second task, prvQueueReceiveTask, retrieves and verifies the message. If the message is correct, it inverts pin state. The prvQueueSendTask uses the RTOS delay feature to pause between messages. The receive task calls the FreeRTOS function xQueueReceive(), and then verifies the message. See Figure 1.

Figure 1. Program flow.



Related Documents

Table 2 lists all relevant application notes, code examples, knowledge base articles, device datasheets, and Component / user module datasheets.

Table 2. Related Documents

Application Notes		
AN210781	Getting Started with PSoC 6 BLE	Describes the PSoC 6 BLE, and how to build a basic code example.
AN215656	PSoC 6 Dual-Core MCU System Design	Presents theory and design considerations related to this code example.
PSoC Creator Component Datasheets		
Pins	Supports connection of hardware resources to physical pins	
Device Documentation		
PSoC 6 Datasheets	PSoC 6 Technical Reference Manuals	
Development Kit (DVK) Documentation		
PSoC 6 Kits		

Document History

Document Title: CE217911 - PSoC(R) 6 FreeRTOS Example Project

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Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	5607107	RODI	5/13/17	New code example
*A	5823238	TARM	7/19/17	Added project templates in GCC ARM Embedded, Atollic TrueSTUDIO and iSYSTEM winIDEA integrated development environments.
*B	6167527	VALK	5/7/18	Removed project template for Atollic TrueSTUDIO integrated development environments. Add note about using some probes.
*C	6249280	VALK	16/7/18	Updated project templates to support IAR 8.11

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