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1 Introduction

Many applications require simple I/O functions such as blinking multiple LEDs, reading digital inputs, sampling with ADC, or communicating through additional ports; however, there may be not enough general-purpose I/O pins for the host microcontroller (MCU) or processor to perform these tasks.

Acting as an I/O expander, the MSPM0C™ microcontroller can provide general-purpose remote I/O expansion for a host MCU through serial communication interfaces such as synchronous SPI and I2C, or an asynchronous UART interface. MSPM0C I/O expander can offer lower cost than I/O expander ICs and more flexible configurations.

2 Implementation

As shown in Figure 2-1, the MSPM0 I/O expander communicates with a host MCU/MPU using SPI, UART, or I2C interfaces. Meanwhile, the host performs system main functions.

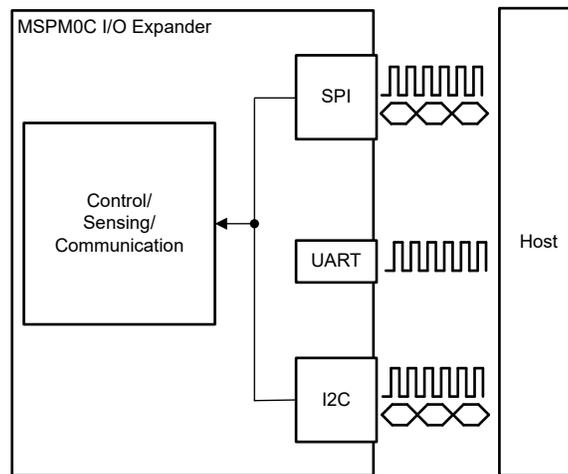


Figure 2-1. Block Diagram of MSPM0C as I/O Expander

3 Features

MSPM0C as I/O expander can offer not only basic input/output functions, it is more flexible compare to I/O expander ICs. It can be programmed based on applications and offer more functions:

- pull up/down resistors

- open-drain
- high drive strength
- inversion
- high impedance
- interrupts

Setting up these features is simple using the SYSCONFIG configuration tool. Direct SET/CLEAR/TOGGLE functionality on every I/O expander pin makes it easy for the host MCU to control the I/O expander to the bit level.

4 Performance

Fast data rates and multiple instances minimize system boot up time:

- SPI up to 12MHz
- UART up to 3MHz
- I2C Fast-mode plus (1MHz)

5 Get Started Today

Order a [MSPM0C LaunchPad kit](#) to evaluate the I2C I/O Expander example Code in [SDK](#).

6 Device Recommendations

[MSPM0C1104](#) 16KB Flash, 1KB SRAM, 12-bit ADC, UART/SPI/I2C, Timer

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