

# Subsystem Design

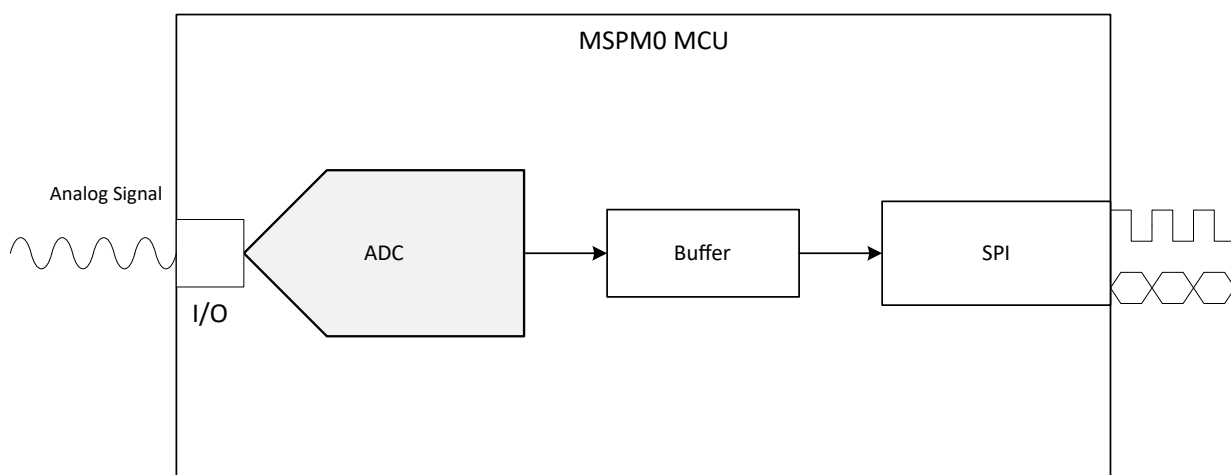
## ADC to SPI



### Description

The ADC to SPI subsystem example demonstrates how to use the internal ADC to convert an analog signal into a digital representation and transfer the result through SPI. The example configures the MCU to act as an external ADC, receive SPI commands from a SPI controller, and execute the received command accordingly. With simple example commands provided, users can utilize the framework to implement their own commands. Optionally, the MCU can also process the ADC data before transmitting the data through SPI, which is especially useful in applications that need to process the raw data into meaningful values. [Download the code for the ADC to SPI example.](#)

The following figure shows a block diagram of the system.



**Figure 1-1. Subsystem Functional Block Diagram**

### Required Peripherals

The application requires the internal ADC and 1 instance of the SPI.

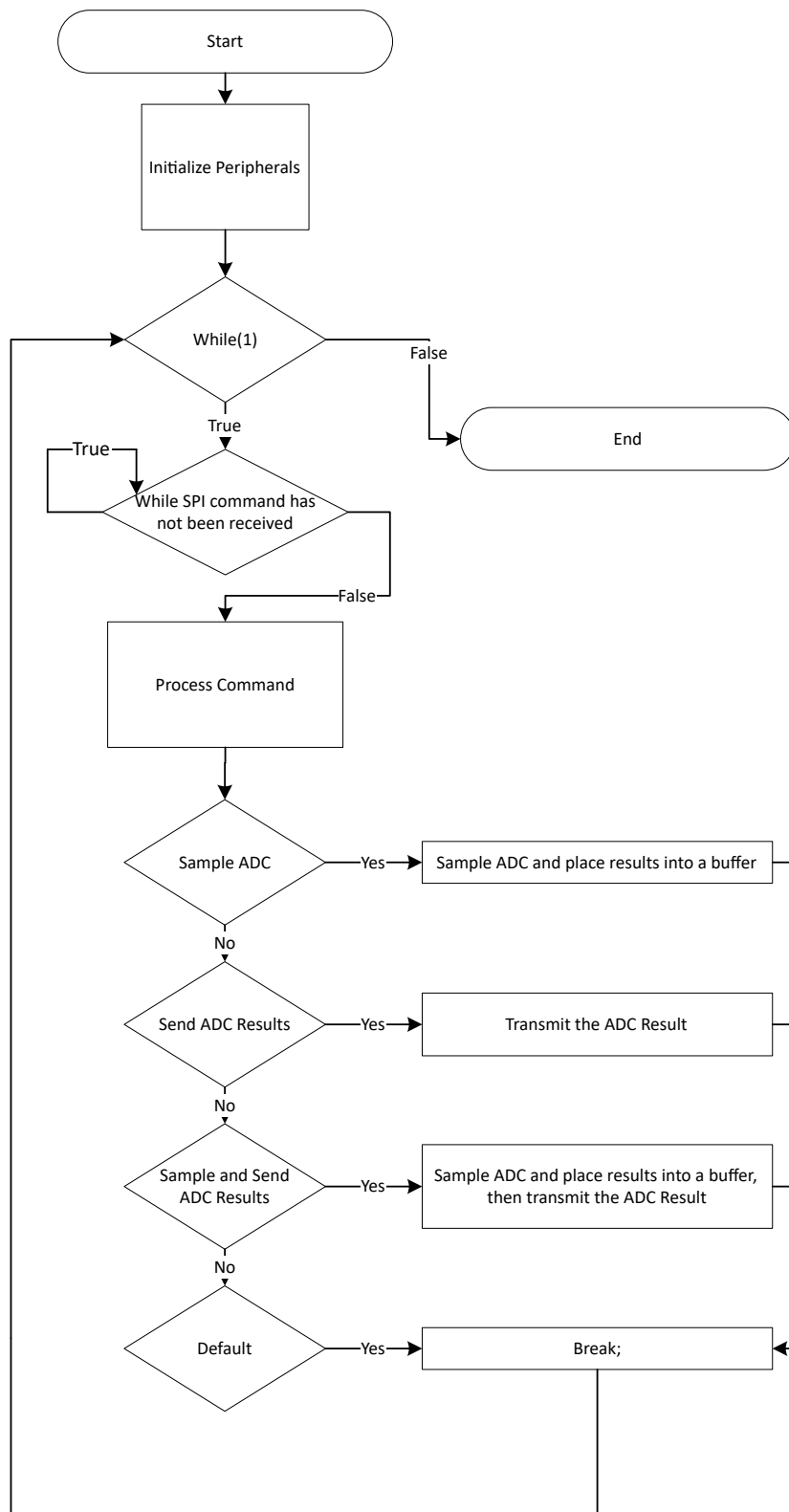
| Sub-block Functionality | Peripheral Used | Notes                                     |
|-------------------------|-----------------|-------------------------------------------|
| Analog signal capture   | ADC             | Called ADC12_0_INST in code               |
| Sending ADC data        | SPI             | Device is the peripheral for this example |

### Design Steps

1. Determine the configuration for the ADC including reference source, reference value, and sampling rate based on the expected analog input and design requirements.
2. Configure the ADC in SysConfig based on requirements in the previous step.
3. Configure the SPI peripheral in SysConfig, setting the SPI in peripheral mode.

4. Write Application Code to transfer the ADC data from the memory registers to transmit through SPI. Optionally add commands to perform different tasks. See the Software Flowchart for an overview or view the code directly.

## Software Flowchart



**Figure 1-2. Application Software Flowchart**

## Additional Resources

- [Download the MSPM0 SDK](#)
- [Learn more about SysConfig](#)
- [MSPM0L1306](#)
- [MSPM0G3507](#)
- [MSPM0 ADC Academy](#)
- [MSPM0 SPI Academy](#)

## Revision History

| Changes from Revision * (December 2023) to Revision A (August 2025) | Page              |
|---------------------------------------------------------------------|-------------------|
| • Removed Compatible Devices section.....                           | <a href="#">1</a> |

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