مرکز آموزش نیـــرا سیستم

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SDIO
(Secure Digital Input Output)

Ali Mirghasemi

Introduction

- The Secure Digital Input Output (SDIO) protocol is a communication interface primarily used for connecting SD cards and other peripheral devices to microcontrollers.
- The STM32F407 microcontroller from STMicroelectronics supports the SDIO protocol, providing a high-speed interface for data transfer between the microcontroller and SD cards or other SDIO devices.

Applications

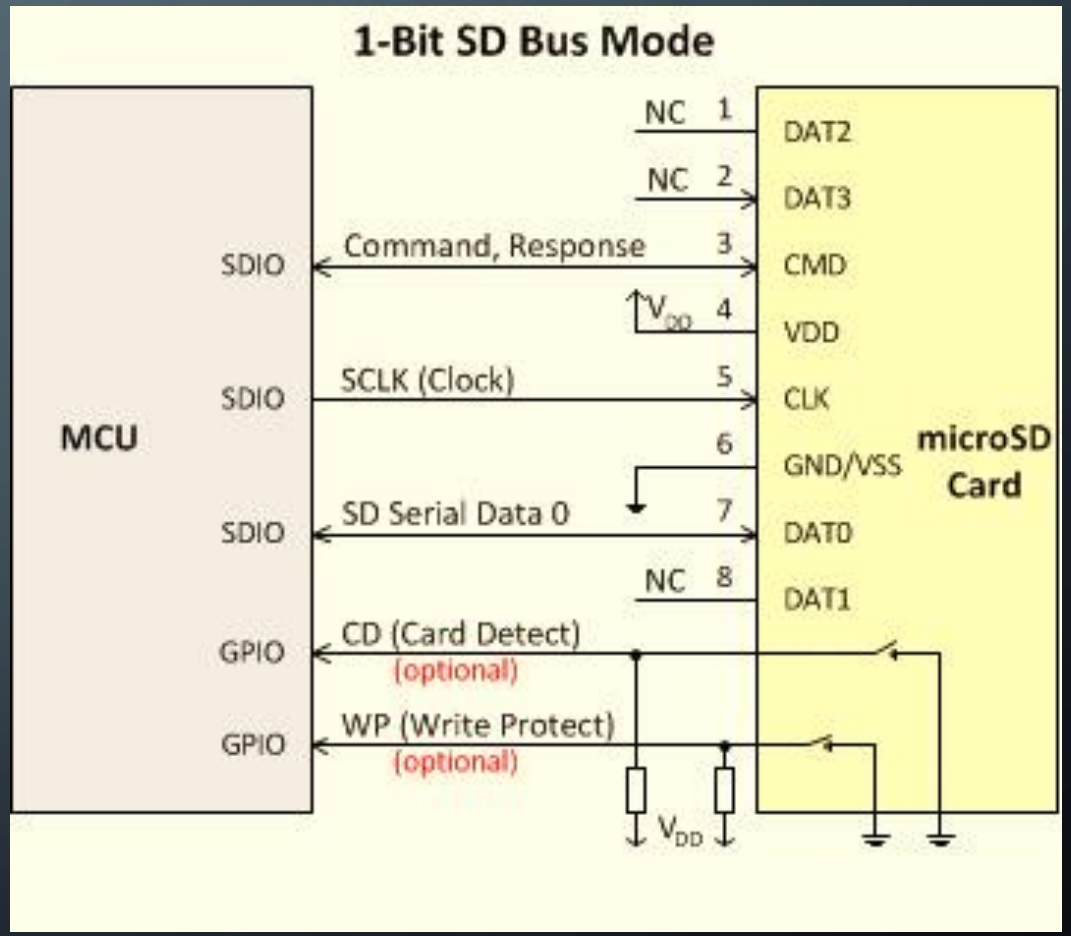
- **Data Storage**
  - Interfacing with SD cards for data logging and file storage.
- **Multimedia**
  - Managing audio, video, and image files in embedded systems.
- **Connectivity**
  - Enabling communication with Wi-Fi, Bluetooth, and GPS modules via SDIO cards.
- **Industrial Control**
  - Storing and retrieving large datasets in industrial automation systems.

Features

- **High-Speed Data Transfer**
  - Supports up to 50 MHz clock frequency, allowing for fast data transfer rates.
- **Multiple Bus Modes**
  - Includes support for 1-bit and 4-bit data bus modes.
- **DMA Support**
  - Direct Memory Access (DMA) support for efficient data transfer without CPU intervention.
- **Interrupt and Polling Modes**
  - Configurable to work in interrupt-driven or polling modes for flexibility in application design.
- **Voltage Compatibility**
  - Operates at 3.3V, compatible with standard SD card voltage levels.

Properties

- Connection Type: Semi-Parallel
- Communication Type: Half-Duplex
- Data Type: Byte
- Synchronize: Sync
- Voltage State: TTL



Registers

- **SDIO_POWER**
  - Controls the power state of the SDIO interface.
- **SDIO_CLKCR**
  - Configures the clock control settings, including the clock divider and power-saving modes.
- **SDIO_ARG**
  - Holds the command argument for SDIO commands.
- **SDIO_CMD**
  - Issues commands to the SDIO card.
- **SDIO_RESPCMD**
  - Holds the response to the last issued command.

Frame

- **Command Frame**
  - Contains command index, argument, and CRC, initiating operations such as data read/write or status queries.
- **Response Frame**
  - Sent by the card in reply to a command, containing response type, status, and sometimes data.
- **Data Frame**
  - For data transfer operations, encapsulating data blocks with start/stop bits, data, CRC, and end bits.