ARM Microcontroller Course

May 27, 2015

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SPI

Four wire serial interface:

- SCLK
- MOSI
- MISO
- CS / SS

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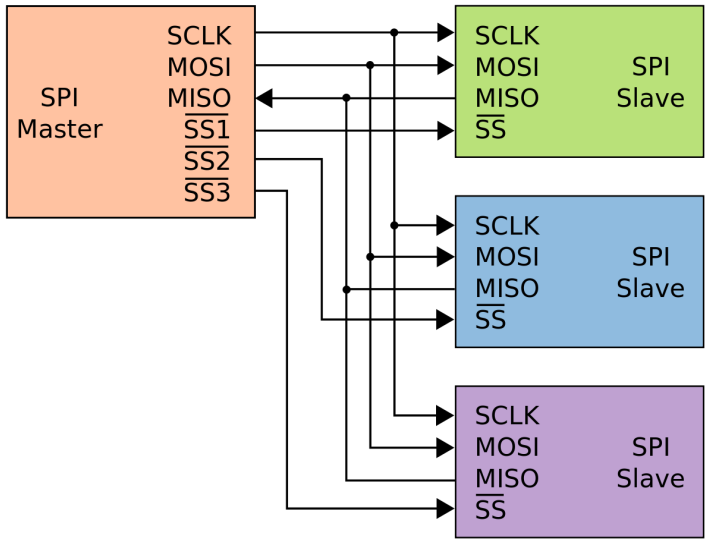
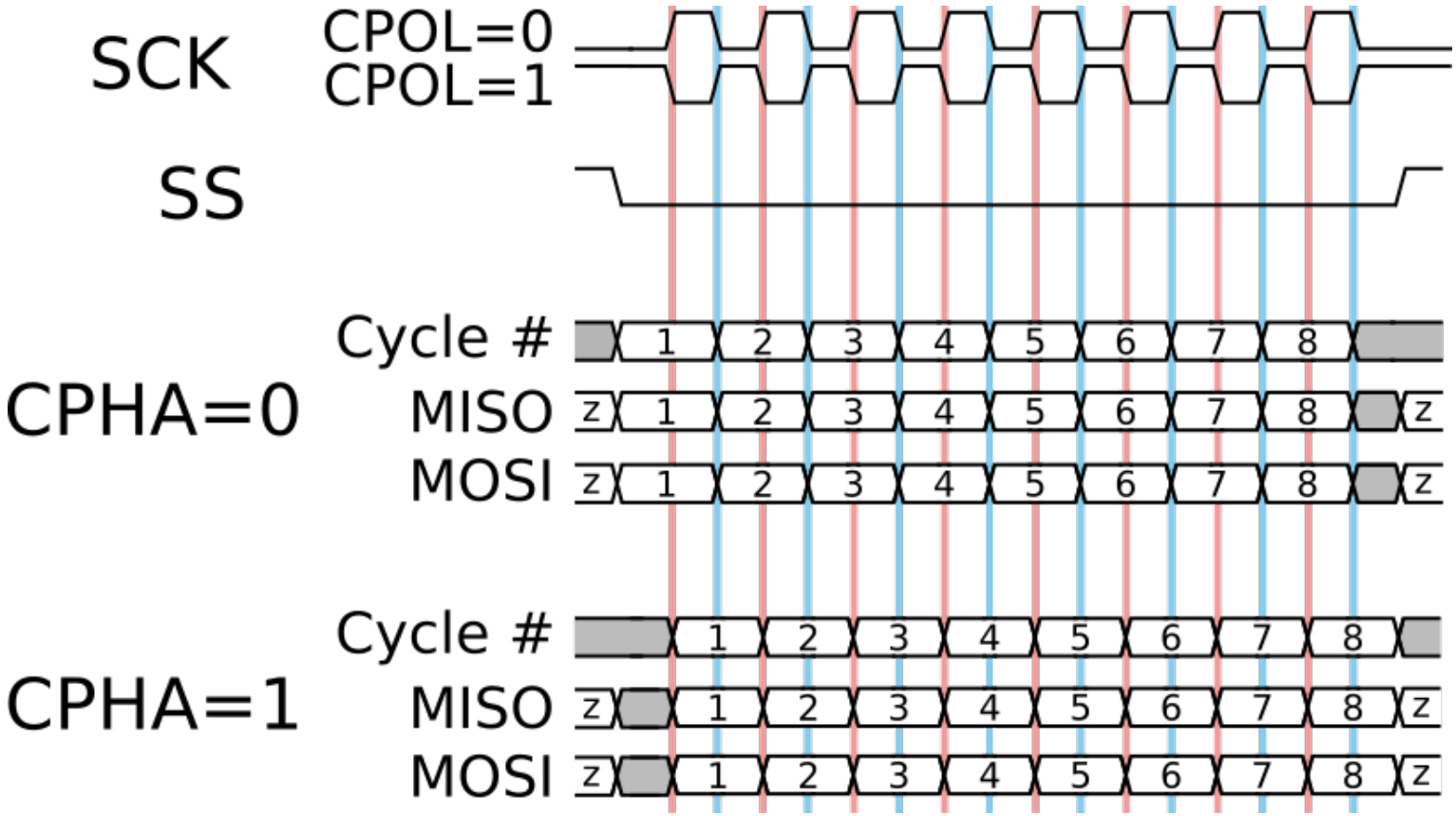


SPI Options

- Clock polarity CPOL
- Clock phase CPHA (also known as clock edge CKE)
- Word length (usually 8- or 16-bit)
- Data order: MSB first or LSB first.
- Hardware or software Slave Select.

SPI Timing diagrams



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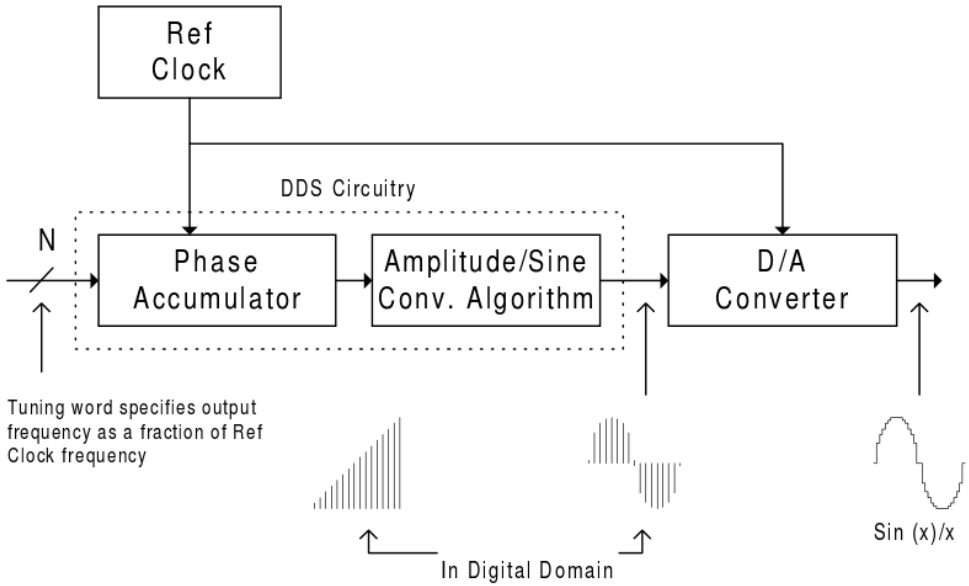
DDS

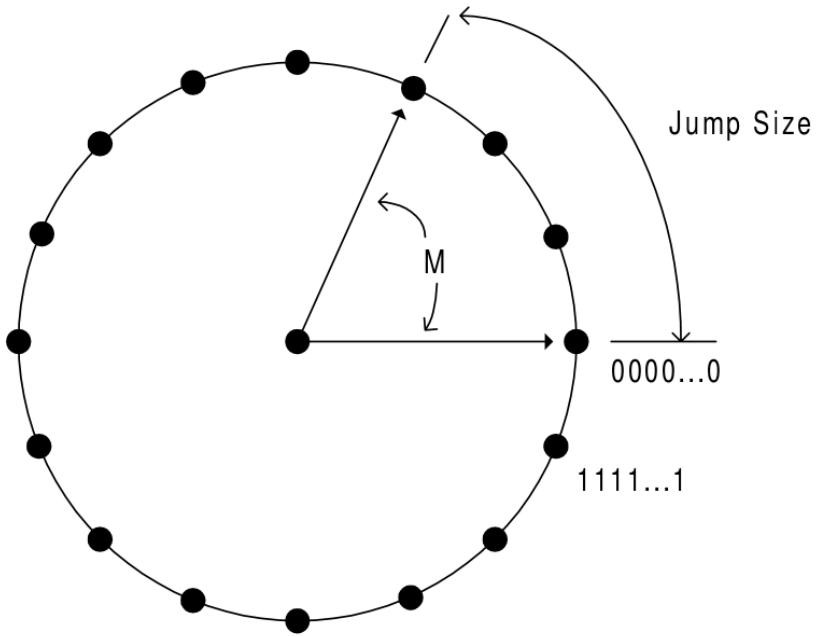
DDS consists of:

- Reference clock
- Tuning Word
- Phase Accumulator
- Phase to Amplitude algorithm



Phase Accumulator

- Size of Phase Accumulator 2^N
- Jump size (tuning word) M
- Reference clock f_s



Example

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Our 8-bits are in the most significant byte.

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What to do today

Try to finish the exercises on timers and ADC using HAL or registers.

Talk to the DAC using SPI.

Start with a frequency generator.

Material

You can find all material on
`http://www.scintilla.utwente.nl/docs/cursus`
Make sure you download:

- The Updated Manual (0527)
- The Usermanual of the Nucleo-F411RE
- The Reference Manual of the STM32F411RE
- Datasheet AD5611 DAC.

Optional:

- HAL document
- Programming Guide