CSSE2010

CSSE2010/CSSE7201
Learning Lab 17

Serial Peripheral Interface (SPI)

School of Information Technology and Electrical Engineering
The University of Queensland

LED Matrix

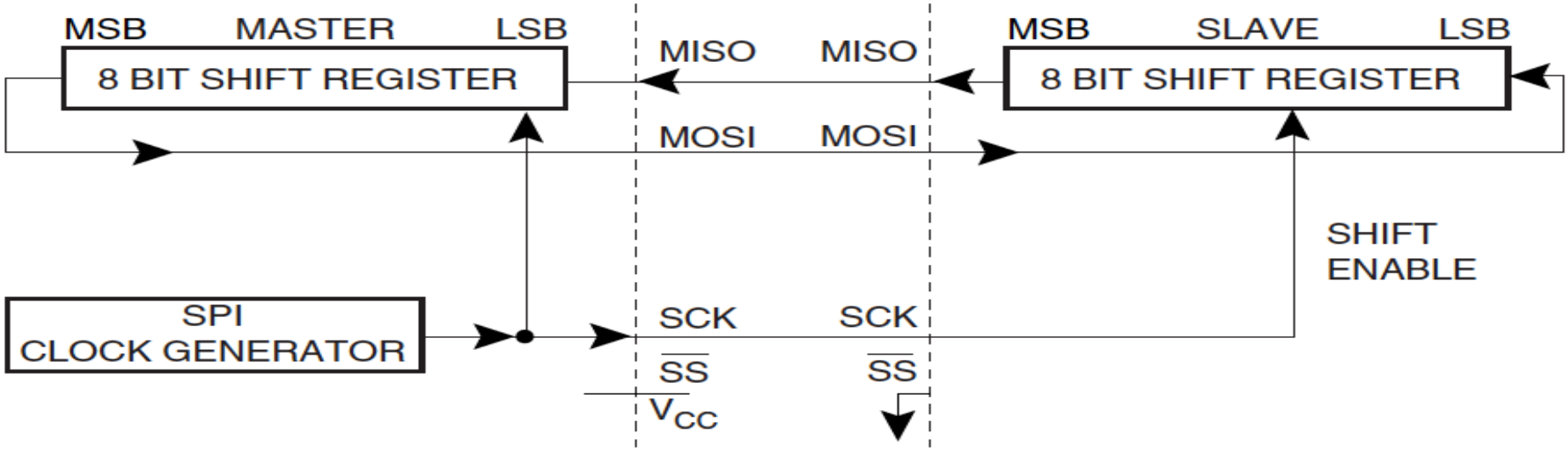
Two connections

- K1: 2-pin connector (VCC and GND)
  - Connect to IOBoard connector J1 (VCC on left, GND on right pin) - use 2-wire connector
- K2: 4-pin connector SPI connection
  - Connect to AVR SPI port (pins B7 to B4)
    - Check datasheet to confirm orientation
- Check LED Matrix Reference Manual
  - Blackboard – Learning Resources -> Learning Labs -> Lab Resources
- Note AVR SPI port also used for device programming – can lead to error (Err) state on LED matrix
  - After programming, you may need to hold down AVR reset button for at least 0.5 second to ensure error is cleared before AVR program starts

Recall from lecture 19

SPI

- Serial Peripheral Interface



- Note – communication takes time
  - Like ADC – poll for completion or set up interrupt

Question

- Which bits of SPI control registers SPCR and SPSR need to be set (1) to enable SPI in Master Mode with the slowest possible clock rate?

Register/bit naming note

- Registers named **SPCR** and **SPSR** in the datasheet (pages 172 and 173 and IO register summary) are named **SPCR0** and **SPSR0** in C/Assembly code
- Bit names shown on pages 172/173 must also have 0 appended to use them in code, e.g.
  - SPIE is SPIE0, SPE is SPE0, SPR1 is SPR10 etc.
- Bit names in the IO register summary are correct (i.e. have the 0 appended)
  - Except, the bit labelled SPR01 should be SPR10

Tasks

- Task 1 – LED matrix demo
  - Create project with lab17-1.c (from Blackboard)
  - Consult datasheet and update as required
  - Build and test
  - Try some of the the other SPI commands