

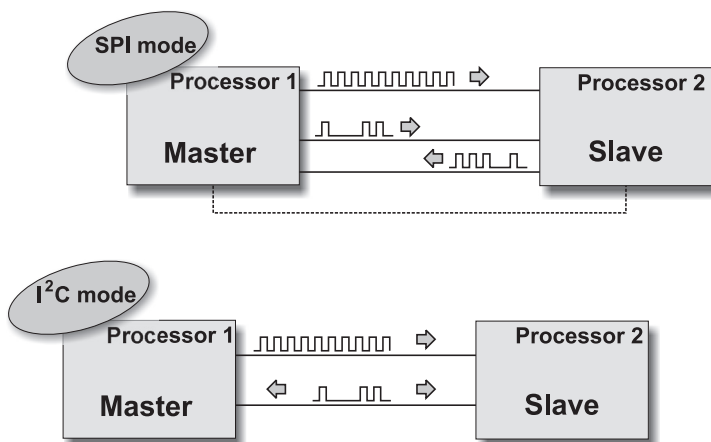
MASTER SYNCHRONOUS SERIAL PORT MODULE

MSSP module (*Master Synchronous Serial Port*) is a very useful, but at the same time one of the most complex circuits within the microcontroller. It enables high speed communication between the microcontroller and other peripherals or other microcontrollers by using few input/output lines (maximum two or three). Therefore, it is commonly used to connect the microcontroller to LCD displays, A/D converters, serial EEPROMs, shift registers etc. The main feature of this type of communication is that it is synchronous and suitable for use in systems with a single master and one or more slaves. A master device contains a circuit for baud rate generation and supplies all devices in the system with the clock. Slave devices may in this way eliminate the internal clock generation circuit. The MSSP module can operate in one out of two modes:

- ▶ SPI mode (*Serial Peripheral Interface*); and
- ▶ I²C mode (*Inter-Integrated Circuit*).

As seen in figure below, one MSSP module represents only a half of the hardware needed to establish serial communication, while the other half is stored in the device it exchanges data with. Even though the modules on both ends of the line are the same, their modes are essentially different depending on whether they operate as a *Master* or a *Slave*:

If the microcontroller to be programmed controls another device or circuit (peripherals), it should operate as a *master* device. It will generate clock when needed, i.e. only when data reception and transmission are required by the software. Obviously, connection establishment depends exclusively on the master device.



Otherwise, if the microcontroller to be programmed is integrated into a more complex device (for example, a PC) then it should operate as a *slave* device. As such, it always has to wait for data transmission request to be sent by the master device.