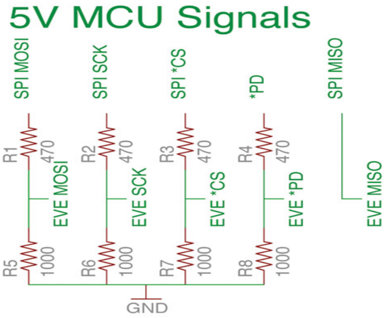

svet ELEKTRONIKE

Sophisticated graphics using only a modest 8-bit MCU

Most electronics enthusiasts strive to make their projects as user-friendly and commercial in appearance as possible. I'm no exception, and lately I have been trying to use TFT colour displays with touch-screen capability whenever practical. Although they are still somewhat expensive, you should also consider the savings that you can obtain by eliminating many of the switches, potentiometers, etc. that the touch-screen can replace.

In late 2013, FTDI (the company that makes the USB-serial interface chips we all use) started advertising their new EVE display controller chips. Soon afterward, Mikroelektronika started selling 4.3” TFT display boards based upon this new controller. I got quite intrigued at this point, and started to look into the EVE controllers more closely.

Basically, the EVE controller chip is a very intelligent TFT display controller which can handle TFT panels up to 512 x 512 pixels, in up to 18-bit colour depth, or resolution. They will interface to any MCU with an SPI port, which covers most all MCUs apart from a few low pin-count ones. The EVE SPI interface is high speed (up to 30 Mb/s). This, coupled with the fact that the EVE controller is an intelligent one, executing high-level graphics commands, means that you can achieve very impressive graphics displays, even if you are hosting it on a modest 8-bit MCU, as FTDI's advertisements claim. In my personal experience, it is possible to implement a very nice GUI using the EVE controller driven with the Atmel AVR Atmega328 (as found on the Arduino Uno board ,for example.)

The EVE controller provides a comprehensive variety of low-level graphics commands such as those needed to clear all/part of the screen, draw lines, rectangles, circles and other basic block figures. In addition, it also contains a co-processor engine, which adds a whole series of widgets such as buttons, sliders, rotary controls, clocks, switches, progress bars, etc. These are generated quite easily by sending out the proper widget command, along with the parameters needed to customize it to your needs: i.e. size, orientation, full scale value, etc.

The EVE controller also handles the resistive touch-screen functionality. In addition to the normal touch screen routines, where the controller returns the X-Y value of the spot being pressed, the widgets mentioned earlier can be “tagged” with an ID number, and when the user touches those widgets, this distinctive “tag” ID is returned to your program. This makes a touch-enabled GUI quite easy to implement, even when using only a modest 8-bit MCU.

Finally, the EVE controller provides an audio output. I'll discuss this further, but at this point, let's just say that the EVE can “play” sound files of various compressed formats. Also, it implements a sound synthesizer function, which allows it to play musical notes,melodies, or provide sound effects.

Download article

The FTDI EVE graphics controller (1)

2014_217_49