MSP430 Education Board Manual

MSP430 education board consists of a MSP-EXP430G2 launchpad board that is attached to the Çizgi-Tagem Education Board. The education board can be seen in Fig. 1.
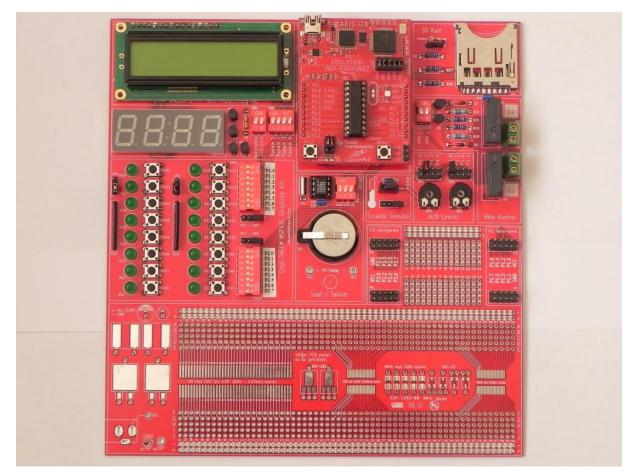

Figure 1: Çizgi-Tagem MSP430 Education Board

MSP-EXP430G2 Launchpad by Texas Instruments is a microcontroller development board for low power and low cost applications. It has a MSP430G2553 microcontroller, an on board emulator with another MSP430 device, push buttons, LEDs and pinouts that are used to connect the launchpad to other boards (Çizgi-Tagem MSP430 Education Board in this case).

The MSP430G2553 microcontroller includes a 16-bit RISC MSP430 processor which can run at frequencies up to 16 MHz, 512B RAM, 16KB flash/ROM and integrated peripherals that are 8 channels 10-bit ADC (Analog to Digital Converter), 2 16-bit timers, communication modules (UART, I2C & SPI), 2 8-bit general purpose input output ports (GPIO). The details about the MSP430G2553 architecture will be given on the following sections.

The Çizgi-Tagem education board includes several peripherals and interfaces that are connected to the MSP430 launchpad via pinouts. The MSP430 microcontroller can be programmed to access and use these peripherals in company with the programmer, altering the positions of the jumpers.

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The Çizgi-Tagem education board includes several peripherals and interfaces that are connected to the MSP430 launchpad via pinouts. These are LCD, 7-segment display, LEDs, push buttons, switches, connectors for ADC, relay controlling interface, temperature sensor, SD card interface and a prototype breadboard. The MSP430 microcontroller can be programmed to access and use these peripherals in company with the programmer, altering the positions of the jumpers.

In accordance with the MSP430G2553 microcontroller GPIO ports, namely port 1 (P1) and 2 (P2), the education board accomodates LEDs, push buttons, switches and jumpers that can be used with these ports.

For the first port (P1), jumper 1 (JP1) and jumper 2 (JP2), push buttons at port 1, LEDs at port 1 and the switch group 4 (SW4) are used. The schematics of the corresponding part of the board is shown in Fig. 2.
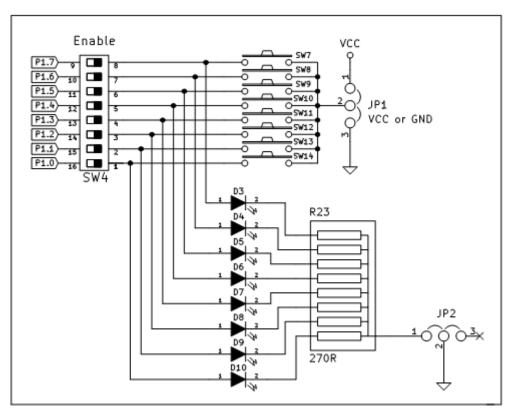

Figure 2: Schematics for Port 1, switches, LEDs and jumpers

As shown in the Fig. 2, JP1 enables the push buttons SW7 to SW14 by connecting them to VCC and disables them by connecting them to the ground. P1.0 to P1.7 are the connections coming from the MSP430G2553, which can be enabled/disabled by the groupd of switches on SW4. JP2 is used to enable LEDs to light.

For the second port (P2), jumper 4 (JP4) and jumper 5 (JP5), push buttons at port 2, LEDs at port 2 and the switch group 15 (SW15) are used. The schematics of the corresponding part of the board is shown in Fig. 3.
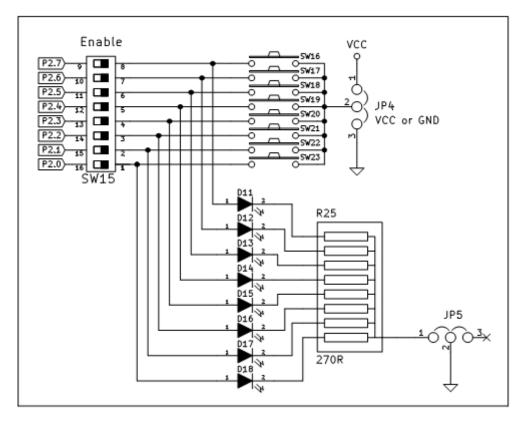
Figure 3: Schematics for Port 2, switches, LEDs and jumpers

As shown in the Fig. 3, JP4 enables the push buttons SW16 to SW23 by connecting them to VCC and disables them by connecting them to the ground. P2.0 to P2.7 are the connections coming from the MSP430G2553, which can be enabled/disabled by the groupd of switches on SW15. JP5 is used to enable LEDs to light.

The port connections P1.0 to P1.7 and P2.0 to P2.7 can be configured either as an input or output port both individually and together. For example, a programmer can configure P2.6 and P2.0 as input ports and rest of the ports on P2 as output port. Within the program, data can be read from P2.0 and P2.6 and can be written to the rest of the ports easily.

The rest of the peripherals and interfaces will be explained later in the corresponding experiment documents.

The education board and the launchpad board get power from the USB cable that is connected to the launchpad. The same cable will be used for on board debugging and programming.

Note that before using the board, you are advised to get rid of the static electric load on your body and not to remove any parts from the board during the operation.