

Low Cost CDAC Educational Boards

CDAC Noida has developed low cost Educational Trainer boards for the Digital Electronics, Embedded System and Digital Signal Processing courses, namely Field Programmable Gate Array (FPGA), Embedded System Design (ESD), Digital Signal Processing (DSP).

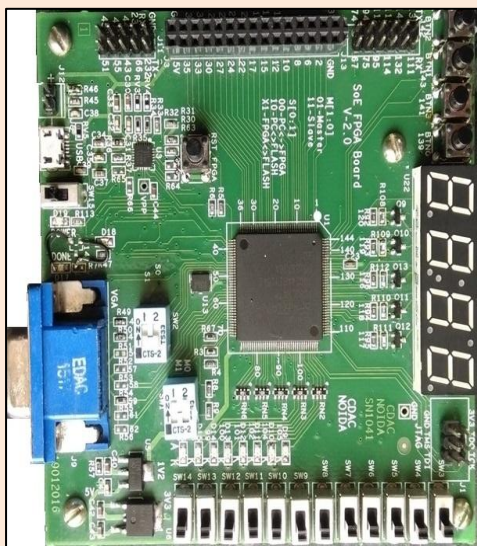
The developed educational boards offer a rich set of features which enables the students to perform basic to complex experiments. Each board is supported by a user manual that illustrates the procedure to perform step-by-step experiments on these boards. Besides this, the support is also available online in the form of e-learning content at <https://esdt.dcservices.in/>.

Main advantages of the boards are:

1. All the boards are indigenously designed and are Low cost
2. The boards have the capability to perform simple to complex experiments
3. Free access to the associated e-learning content

A short glimpse of the boards' features is given below

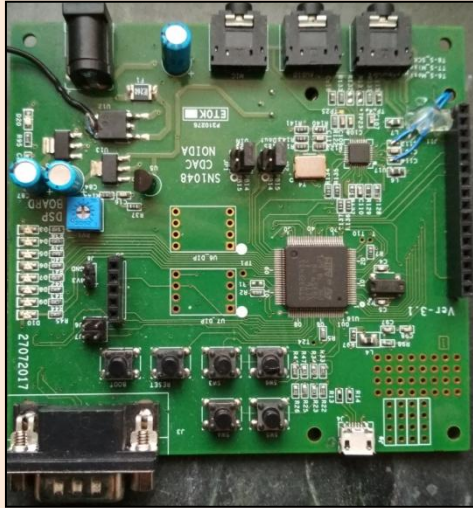
FPGA Board



The Spartan 6 LX4 is optimized for high performance logic and offers

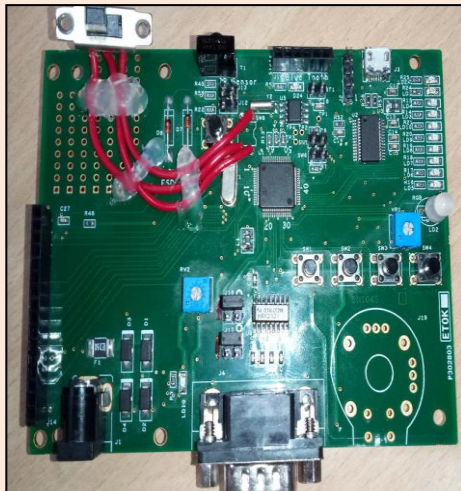
- 600 slices, each containing four LUTs and eight Flip Flops
- 216 Kb fast Block RAM
- Two CMTs (two DCMs and one PLL)
- 8 DSP48A1 slices
- SPI Flash ROM that stores FPGA configuration indefinitely
- 25 MHz oscillator frequency
- USB cable for providing power and programming interface
- 8 LEDs, 4 Push buttons, 12 slide switches
- 4 digit seven segment display
- 8 bit VGA display
- UART communication pins
- 30 pin expansion connectors

Digital Signal Processing Board



- ARM Cortex M4 32 bit STM32F411XC microcontroller with features
 - Microcontroller Control Unit (MCU) & Floating Point Unit (FPU)
 - 512 KB Flash
 - 125 DMIPS
 - 128 KB SRAM
 - 1 ADC
 - 13 Interface – 3 I2C, 3 USART, 5 SPI/I2S and 1 SDIO
- SGT5000 Codec IC with features
 - Low power stereo codec with headphone amplifier
 - I2C, I2S/SPI interface
- 8 MHz Oscillator Frequency
- RS232 Communication
- Microchip 16 MBit SPI Serial Flash
- USB Cable for providing power and programming
- One LCD (16x2) display
- Line and MIC input
- Headphone output
- 8 LEDs and 4 Pushbuttons

Embedded System Board



- SPI serial Flash Interface with SST25VF040B
- Bluetooth module interface
- I2C Interface with DS1307
- ADC input through joystick
- Infrared interface with TSOP31238
- USB 2.0 interface: USB host and USB device interface
- Serial port support for ISP through USB.
- Standard Serial ISP download function
- RS232 communication interface
- Alphanumeric LCD interface
- 4 Push buttons, 1 Reset button and 8 LED lights
- 1 Multi-directional joystick
- Supports KEIL, Eclipse, Cocox and other mainstream IDE environment
- Opensource "STMFlashLoader" flash burning tool
- USB input to provide power supply

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