# Digital Signal Processor FACET Board
## 585736 (91031-20)

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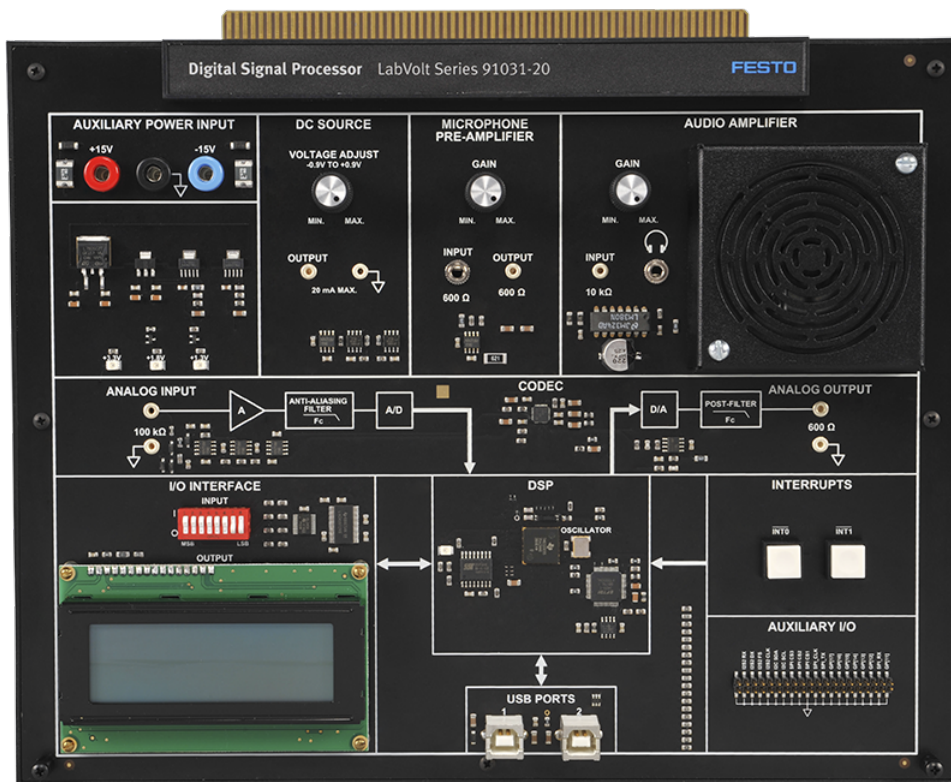
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# General Description

The Digital Signal Processor circuit board introduces students to the vast field of digital signal processing and DSP applications. This module is built around a modern DSP and includes all of the peripherals and accessories required to run multiple DSP applications.

A version of Code Composer Studio, a typical Integrated Development Environment (IDE) used to develop, debug, and compile DSP applications, is bundled with the module. The source code for the applications used in the courseware is also included.

The courseware covers the basic concepts of digital signal processing, as well as DSP architectures, memory, addressing, I/O, and peripherals. It also presents several essential aspects of real-time DSP processing, such as sampling, A/D and D/A conversion, and the fast Fourier transform. Practical techniques such as the use of library functions, DSP application optimization, and digital filtering algorithms, are also covered in the courseware.

The module can be used either with the FACET base unit or without the base unit as a stand-alone trainer. To use the module as a stand-alone trainer, an external +15 V / -15 V dc power source is required to power the circuit board through 4 mm input jacks.
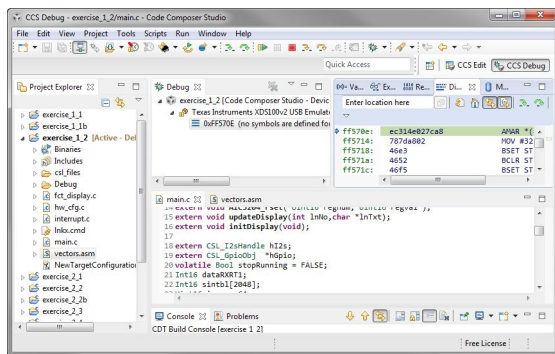


Through a USB port with a computer, a Windows-based software (debugger) allows for a direct interraction with the program DSP registers, memory, and peripherals.

## Topic Coverage

- Familiarization with DSPs and DSP programming, Overview of the DSP Circuit Board, The Integrated Development Environment (IDE) and Project Structure
- DSP Architecture, Processor Arithmetic, The Data Computation Unit, Memory, Addressing
- I/O and Peripherals, An Application Using I/Os and Peripherals
- DSP Real-time Processing, Sampling and Analog-to-Digital/Digital-to-Analog Conversion, The Fast Fourier transform (FFT), Optimizing DSP applications
- Signal Processing Applications, FIR and IIR Filters

## Features & Benefits

- The module and courseware provide an introduction to DSPs, some typical DSP applications, and how DSPs are programmed. Programming experience may be helpful but is not required to perform the exercises.
- The module features the TMS320C5535 Fixed-Point Digital Signal Processor from Texas Instruments.
- Built-in accessories include a DC source, microphone pre-amplifier, audio amplifier and speaker.

- Built-in peripherals include a CODEC for A/D and D/A conversion, an I/O interface with DIP switches and an LCD display, two interrupt pushbuttons, two USB ports, and an auxiliary I/O block.

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