Freescale Semiconductor's S12 DG128 microcontroller stand-alone student learning kit (S12UB) is targeted at teaching the first course in microcontrollers at the university level. The kit contains all of the materials needed to learn MC9S12DG128 operation,embedded assembly and C programming.

The S12UB board provides both debug and user circuitry sections. The debug, or development tool section, supports both D-Bug12 and CodeWarrior debuggers through a serial RS-232 interface. The user circuitry, or Target, provides prewired Input/Output circuitry to learn the DG128 microcontroller peripheral operation without any hookup.Both CodeWarrior for HCS12(X) special edition, and S12UB distribution disk software are provided in the kit. The special edition CodeWarrior is the full Integrated Development Environment with a cap on code size (32K Bytes) and number of project files (32). The distribution disk provides twenty one prewritten Prelab/Labs; Twelve Core, Five Hookup, and Four Advanced. By following the lab progress the student or hobbyist can learn DG128 operation and embedded programming in a class room, or at their own pace.

* To support the S12UB Hookup labs a device Input/Output kit is available, Part number LFEBS12UBLAB and includes; Lamp, Relay, Motor, Keypad, LCD display, and Mechanical Encoder.

About the microcontroller

The MC9S12DG128 microcontroller unit (MCU) is a 16-bit device composed of standard on-chip peripherals including a 16-bit central processing unit (HCS12 CPU), 128K bytes of Flash EEPROM, 8K bytes of RAM, 2K bytes of EEPROM, 2 asynchronous serial communications interfaces (SCI), 2 serial peripheral interfaces (SPI), an 8 channel IC/OC enhanced capture timer, two 8-channel, 10-bit analog-to-digital converters (ADC), an 8-channel pulse-width modulator (PWM), 89 discrete digital I/O channels (Port A, Port B, Port K and Port E), 20 discrete digital I/O lines with interrupt and wakeup capability, 2 CAN 2.0 A, B software compatible modules (MSCAN12), and an Inter-IC Bus. System resource mapping, clock generation, interrupt control and bus interfacing are managed by the System Integration Module (SIM). The MC9S12DG128 has full 16-bit data paths throughout. However, the external bus can operate in an 8-bit narrow mode so single 8-bit wide memory can be interfaced for lower cost systems. The inclusion of a PLL circuit allows power consumption and performance to be adjusted to suit operational requirements.

Features

Course Material Features:

- All primary course collateral needed to teach the first course in microcontrollers at the university level.
- Hardware course collateral and tools developed for seamless integration and easy learning.
- Twenty-one pretested prelab/labs and CodeWarrior projects provided for quick and diverse learning
- Learn assembly and C embedded programming using CodeWarrior and D-Bug12

Board Features:

- Both Debug and Target circuitry on a single board
- Real-time debugging using Background Debug Mode(BDM)

- Removable solderless breadboard provided to support hookup labs and circuit prototyping
- Signal breakout headers arranged around breadboard
- Hardwire solder prototype area beneath solderless breadboard
- Ground banana jack access in all four corners
- Screw terminal Power IC access
- On-board 5V fully protected power supply with status LED
- +12V power input through barrel or banana jacks

Prewired Input/Output includes:

- Dip switch inputs
- Push button inputs
- LED and 7-segment display outputs
- MC33879 SmartMOS SPI power IC
- Piezo transducer
- RS-232 interface with DB9 connector
- Two CAN 2.0 A/B interfaces with connector
- LIN interface with LIN IN and LIN OUT connectors
- Two Potentiometer inputs and misc ATD inputs
- Mechanical encoder interface

Specifications:

Board Size: 7.0" by 6.0"

Power input +12V at 400mA nominal.