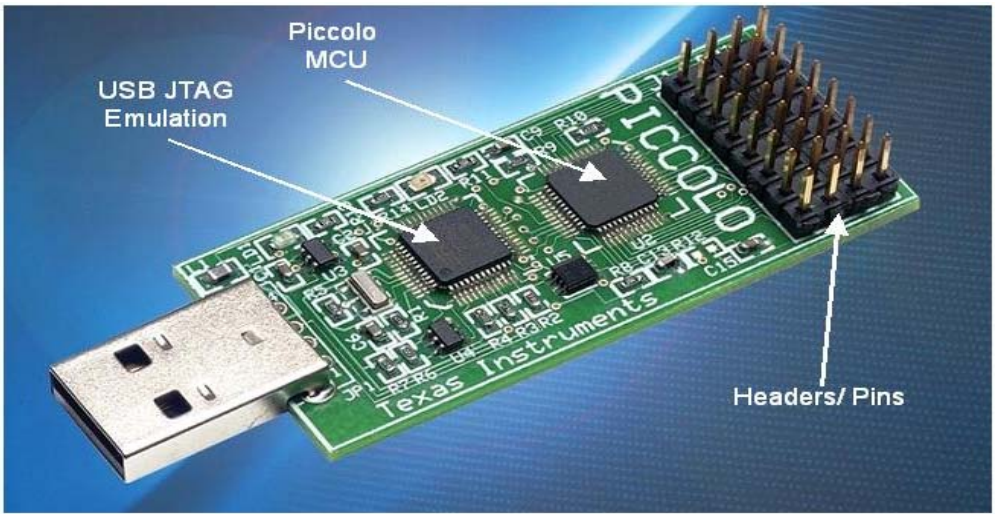
University Program

Real-Time Control

C2000™ tools for projects and teaching



TMX20F28027 Piccolo™ controlSTICK™ Part#: TMDX28027USB $39

Control applications are an exciting area for University activities like robotics, mechatronics, electric drives, power conversion, and renewable energy are all applications where C2000 microcontrollers add performance and unique technology integration. These 32 bit devices span a wide range from the very low-cost “Piccolo” to the high-performance floating-point 28335.

Also, new tools like the Peripheral Explorer and Experimenters Kits make this an ideal teaching and project platform. When combined with modern, professional software development environments like Code Composer Studio, Matlab, Simulink, and VisSim, these powerful devices also become easy to use. To take it one step further, TI has also facilitated the creation of excellent teaching materials for the C2000 family by other academics.

Why Teach with C2000?

Powerful

For high-powered applications like those listed above, C2000 is the best in terms of fully integrated control loop peripherals that can match and exceed most performance requirements. A 12-bit Analog-to-digital converter with up to 12.5 million samples per second and a full-featured enhanced PWM peripheral with micro-stepping resolution down to 65 *picoseconds* is just one example of how the C2000 has more than enough horsepower to handle most control applications.

Flexibile

The F28x core at the heart of the C2000 family is a great example of design for future use. Originally considered a DSP, it has been adapted for microcontroller applications and features either fixed- or floating-point variations. The C2000 family also contains devices from $2.00 at 40-MHz CPU speed up to 300 MHz! All of these devices are completely code compatible, and you can easily switch from fixed to floating point for your application with the IQ Math library built into most code examples. Finally, the unique ControlCARD tool system allows you to move seamlessly up and down this performance spectrum for a host of learning and application specific kits.

Smart

The real-time control peripherals in C2000 also come complete with full-featured, fully debugged software to set up your application quickly as well as hardware features to keep your design safe. Whether it’s a dead-band generator and a fault-indicator on your PWM controller or a SIL-3 certified software stack with a Q100 quality device, C2000 can help make your design robust enough for any task.

Texas Instruments

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C2000 Teaching ROM

This CD-ROM provides a series of 16 modules with teaching material for the TMS320F2812. The contents include presentation slides, a textbook with 488 pages, along with procedures and solutions for laboratory exercises, all presented in source-code form to allow flexibility of use. The laboratory exercises are based on the TMS320F2812 eZdsp and the C programming language.
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Request or download your FREE CD at: www.ti.com/university

The new TMS320F28335Control Card and a new platform called “Peripheral Explorer Board”.

The new C2000 Teaching ROM will cover all internal peripherals (ADC, PWM, Capture, Timer, the Interrupt system, watchdog timer), all communication channels (CAN, SPI, I2C, SCI, McBSP), the main features of the Integrated Design Environment (Code Composer Studio) and some typical application examples. It will be divided into a series of chapters; each of them will provide set of PowerPoint slides, a student textbook, and laboratory exercises.

Tools for Teaching

TMS320F28335 eZdsp Starter Kit — **Part#: TMDSEZ28335** — **$459**
http://focus.ti.com/docs/toolsw/folders/print/tmdsez28335.html

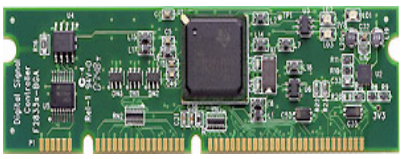
The F28335 eZdsp starter kit is a complete software development platform for the TMS320F2833x series of floating-point Digital Signal Controllers. The eZdsp kit includes an F28335 target board that features integrated JTAG emulation, CAN 2.0 and RS-232 interfaces, and expansion headers that provide access to all F28335 I/O signals. Also included in the kit is the Code Composer Studio™ Integrated Development Environment, USB interface to the host PC, and a universal power supply.

Features:

- TMS320F28335 Floating Point Controller
  - 150 MHz operation
  - 512 KB on-chip flash memory
  - 68 KB on-chip RAM
  - 12-bit ADC with 16 input channels
- 128k x 16 off-chip SRAM
- CAN interface with on-board transceiver and 9-pin DSUB connector
- Embedded USB JTAG Controller
- Operates from a single 5V supply with provided AC adapter
- IEEE 1149.1 JTAG emulation connector

TMS320F28335 controlCARD — **Part#: TMDSCNCD28335** — **$69**
http://focus.ti.com/docs/toolsw/folders/print/tmdscncd28335.html

ControlCARDs are complete board-level modules that utilize an industry-standard DIMM form factor to provide a low-profile single-board controller solution. All of the C2000 controlCARDs use the same 100-pin connector footprint to provide the analog and digital I/Os on-board controller and are completely interchangeable. Each controlCARD provides an isolated RS-232 interface for communications. The host system needs to provide only 5V power to the controlCARD.



Features:

- TMS320F28335 Digital Signal Controller
- Small form factor – 9 cm x 2.5 cm
- Standard 100-pin DIMM interface
- 5-V power supply required
- F28x analog I/O, digital I/O and JTAG signals
- Isolated RS-232 interface
- Standalone JTAG emulator required for debug.

  Sold separately.

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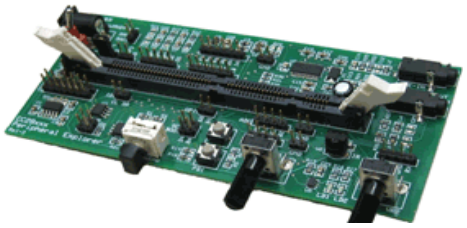
C2000 Peripheral Explorer Kit | **Part#: TMDSPREX28335** | **$89.50**
http://focus.ti.com/docs/toolsw/folders/print/tmdsprex28335.html



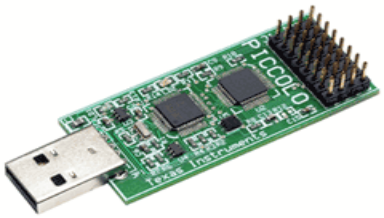
The C2000 Peripheral Explorer Kit enables new C2000 users to easily learn how to use all of the advanced peripherals on a C2000 microcontroller. The kit includes an F28335 controlCARD and a baseboard with all the hardware necessary to interact with the peripherals. The included software allows users to easily learn how to use each peripheral. Users can easily move to designing their own application specific baseboard with the included F28335 controlCARD. The kit includes a peripheral explorer EVM, an F28335 controlCARD, 32KB limited version of CCS and full hardware and software documentation.

Features:

- F28335 controlCARD based learning platform
- Demos all major C2000 peripherals including the ePWM, ADC, eCAP, CAN, I2C, SPI, GPIO pins, McBSP and DMA
- Quick Start GUI demonstrates the functionality of the kit
- Open source software and hardware
- 32KB Code Composer Studio included
- F28335 controlCARD included

C2000 for Projects

TMX20F28027 Piccolo controlSTICK | **Part#: TMDX28027USB** | **$39**
http://focus.ti.com/docs/toolsw/folders/print/tmdx28027usb.html

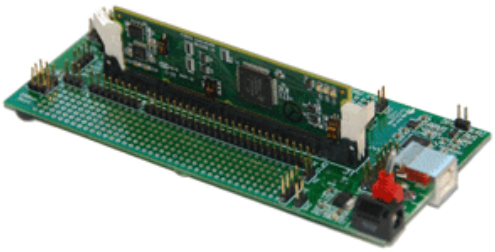


The innovative Piccolo controlSTICK allows quick and easy evaluation all of the advanced capabilities of TI's new Piccolo microcontroller for just $39. Slightly larger than a memory stick, the Piccolo controlSTICK features on board JTAG emulation and access to all control peripherals. Example projects walk the user through the advanced functionality of Piccolo, from simply blinking an LED to configuring the high resolution ePWM peripherals.

Features:

- On board USB JTAG emulation
- Small USB memory stick form factor
- Access to all control peripherals through header pins
- Example projects show how to use Piccolo's features low cost

F28035 Piccolo Experimenter's Kit | **Part#: TMDXDOCK28035** | **$44.50**
http://focus.ti.com/docs/toolsw/folders/print/tmdxdock28035.html



The Piccolo Experimenter Kit has a docking station that features on board USB JTAG emulation, access to all controlCARD signals, breadboard areas and RS-232 and JTAG connectors. Each kit contains a 28035 controlCARD. C2000 applications software with example code and full hardware details also available as well as a free code-limited version of Code Composer Studio.

Features:

- TMX320F28035 microcontroller based controlCARD.
- Docking station with on board USB JTAG emulation and access to all controlCARD signals
- Fully powered from USB connection, no external power supply needed
- Code Composer Studio™ IDE v3.3 C28x™ Free 32K Byte Version
- Applications software and example code also available for download.

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C2000 Digital Power Experimenter Kit	**Part#: TMDSDCDC2KIT** http://focus.ti.com/docs/toolsw/folders/print/tmdsdcdc2kit.html	**$229.01**

C2000 Digital Power Experimenter Kit (DPEK) is ideal for hardware or software design engineers who want to explore the concept of digital power supply design. The kit contains a 2-rail DC-DC evaluation board using TI PowerTrain™ modules, on-board digital multi-meter and active load for transient response tuning. The DPEK also contains Code Composer Studio™ IDE, 9V power supply and a TMS320F2808-based controlCARD. C2000 application software with example code and full hardware details available. Digital Power Supply Workshop teaching material and lab software are also available. Standalone JTAG emulator required.

Code Composer Studio Version 4	http://focus.ti.com/docs/toolsw/folders/print/ccstudio.html	**FREE**

Code Composer Studio v4 is a major new release of Code Composer Studio (CCS) that is based on the Eclipse open source software framework. The Eclipse software framework is used for many different applications but it was originally developed as an open framework for creating development tools. We have chosen to base CCSv4 on Eclipse as it offers an excellent software framework for building software development environments and is becoming a standard framework used by many embedded software vendors. CCSv4 combines the advantages of the Eclipse software framework with advanced embedded debug capabilities from TI resulting in a compelling rich development environment for embedded developers.
On request, TI will usually donate the FULL version of CCS to Universities for academic use.

Prices Valid as of 1st May 2011

For more information about the University Program
www.ti.com/university

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