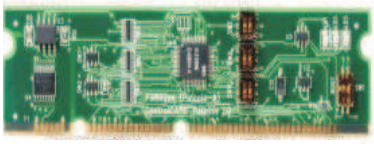
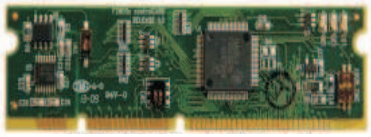
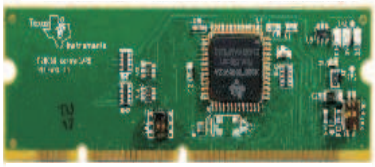
TMS320C2000™ Experimenter Kit Overview



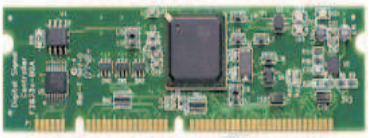
F28027 Piccolo™ Family



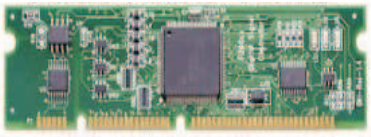
F28035 Piccolo™ Family



F28069 Piccolo™ Family



F28335 Delfino™ Family



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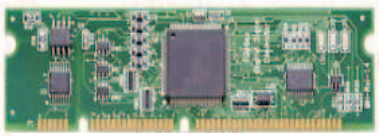

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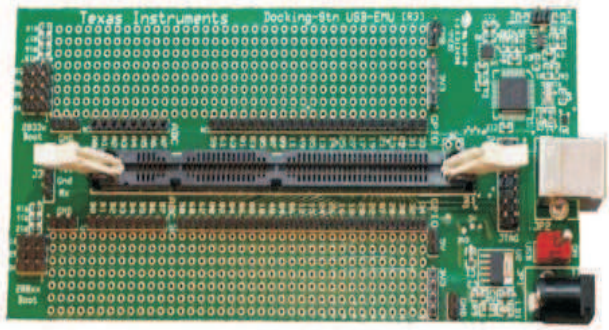


Experimenter's Kit USB Docking Station

The C2000™ Experimenter's Kit is a quick, easy, low cost way to evaluate the TMS320F28x family of devices. It consists of a docking station and a F28x controlCARD™. The docking station is a small mother board that accepts any of the plug-in controlCARDs and gives the user access to all the F28x device's GPIO and ADC signals. Additionally, it also provides two prototyping areas (one on each side of the DIMM100 connector) with an array of 0.1" spaced plated through holes for wire-wrapping and soldering.

Other features of the Docking Station include:

- On-board USB emulation or the ability to use an external JTAG emulator
- Ability to use either the USB's 5-V supply or an external power supply to power the board.
- UART communications through on-board USB-to-UART bridge
- Boot jumpers for all boot modes covered by F280xx and F2833x devices
- 5.0-V supply for prototyping area
- 3.3-V supply for prototyping area

- All key signals accessible via clearly labeled header pins

controlCARDs are small 100-pin Dual In Line Memory Module (DIMM) style vertical plug-in boards that have all the necessary support circuitry (clock, supply LDO, decoupling, pull-ups, etc.) to provide reliable operation for the C2000 MCU. The board design is robust and meant for operation in noisy electrical environments. TI offers several pin compatible controlCARDs for evaluating the different MCUs available in the C2000 family.

controlCARDs include the following features:

- Small size - 90 mm x 25 mm (3.5" x 1")
- All GPIO, ADC, and other key signal routed to gold edge connector fingers
- Extensive supply pin decoupling with L+C close to pins
- Clamping diode protection at ADC input pins
- Anti-aliasing filter (noise filter) at ADC input pins
- Ground plane

Both the controlCARD and Docking Station include a "Hardware Developer's Package", a set of files that make copying or redeploying this technology very easy (see Section 2).

The Hardware Developer's Package includes:

- Schematics (source or .PDF files)
- Bill of materials (BOM)
- Gerber files to freely use or modify
- Pin-out table showing all key signals on the 100-pin connector
- DIMM100 pin / socket mechanical details
- PCB files done in popular Freeware tool for easy modification (Docking Station only)
- Template mother board PCB file created in a popular freeware tool – great way to begin a new prototype design

In addition, this kit includes a free, fully functional trial of Vissim, a model-based development platform for simulation and code generation. Learn more and see how to get started in the Vissim ECD Quickstart Guide, also located in this folder.

1 Hardware Setup

This guide sets up the board to use on-board USB emulation and uses the USB's 5V supply to power the board.

Please follow the steps below to setup the hardware:

Step 1. Unpack the DIMM style controlCARD

Step 2. Spread open the winged retaining clips on connector J1

Step 3. Sit the DIMM card loosely in the connector slot. Make sure to align the 2 keyed notches and position the card bottom corners inside the retaining clips (see Figure 1)

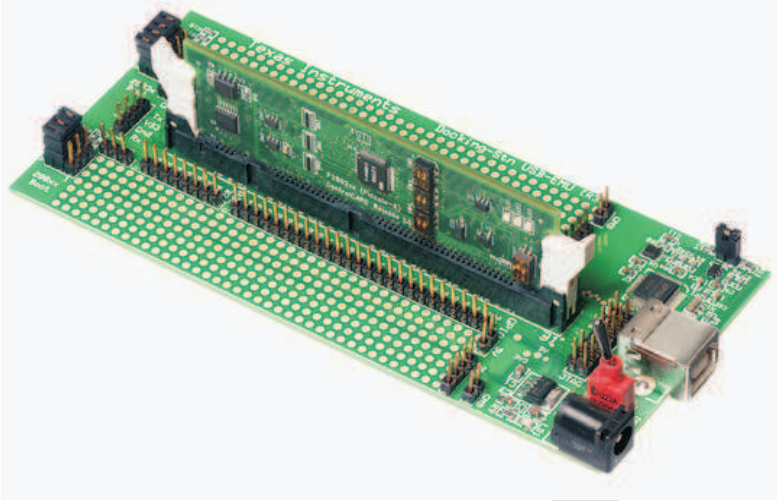
Step 4. Push vertically down using even pressure from both ends of the card until the clips snap and lock. (note: to remove or eject the card simply spread open the retaining clips with thumbs)

Step 5. Place switch 1 (SW1) in the “ON” position, then connect the USB cable to USB connector JP2

Step 6. Once you have downloaded the TI Software or are ready to run your own project, turn on the board power by putting SW1 in the “USB” position. This will allow the board to use the USB’s 5 V as the supply voltage.

Step 7. For full details (schematics, pin-out table, etc.) of the Hardware please refer to the Hardware Developer’s package, DockingStnHWdevPkg

Figure 1. Retaining Clips



2 Software Setup

All of the documentation, software, and hardware files needed to use the Experimenter's Kit and develop on a C2000 MCU can be found in the controlSUITE package. controlSUITE installs the Hardware Developer's for the Experimenter's Kit baseboard and for all C2000 controlCARDs. In addition all software and documentation for this and all other kits can also be installed.

Installing controlSUITE

1. Visit http://www.ti.com/controlsuite and download the controlSUITE installer.
2. Run the installer and after a few clicks select the Experimenter's kit checkbox.
3. The installer will, by default, create a directory called "controlSUITE" con the C drive inside the TI directory.
   - The example software for the Experimenter's Kit can be found at: \controlSUITE\development_kits\TemplateProjects\
   - The hardware documentation for the Experimenter's kits can be found at: \controlSUITE\development_kits\~ExperimentersKits
   - The controlCARD hardware developer's package can be found at: \controlSUITE\development_kits\~controlCARDs

3 Using the Onboard USB JTAG Emulation

The onboard USB JTAG emulation is based on TI's XDS100 emulation technology and provides an easy way to connect to the board and begin Code Composer Studio development.

To set up the onboard USB JTAG emulation follow these steps:

- Install the included 32KB limited version of Code Composer Studio V4.
- Connect the USB docking station to an available USB port.
- When prompted, do not allow Windows to go online to search for drivers, but allow Windows to search your computer for drivers.
- Once Windows has finished installing the drivers the onboard USB JTAG emulator is ready to be used.
- Open CCS and create a new target configuration, “Target -> New Target Configuration…”.
- Choose the title of your new configuration to be xds100v1-f28X (where X is the part number of the C2000 MCU that is being worked with. (for example F28035). Use the shared location.
- Choose the device that goes with your kit. In CCS the onboard emulator will be called the “Texas Instruments XDS100v1 USB Emulator.”
- Open up the project for the kit by clicking “Project -> Import Existing CCS/CCE Eclipse Project.” Once the dialog box pops up, browse to find the applicable project.

4 Running Your First Program

The FlashingLeds project included as a template within the controlSUITE download allows the user to quickly get started with a C2000 MCU. The documentation for this project can be found at:

\controlSUITE\development_kits\TemplateProjects\~Docs\SystemFrameworkOverview.pdf

5 References

controlSUITE Desktop

C:\TI\controlSUITE\controlSUITE.exe (default)

http://www.ti.com/controlsuite

C2000 Getting Started Guide with CCS v4

http://processors.wiki.ti.com/index.php?title=C2000 Getting Started with Code Composer Studio v4

C2000 Processor Wiki

http://processors.wiki.ti.com/index.php/Category

C2000 XDS100 Wiki

http://processors.wiki.ti.com/index.php/XDS100

C2000 Tools Page

http://www.ti.com/c2000tools

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