

Tiva™ C Series TM4C129X Development Kit ReadMe First

The Tiva TM4C129X Development Kit provides a feature-rich development platform that allows users to evaluate Tiva TM4C129x series microcontrollers (MCUs). The development board features a 10/100-Mbit Ethernet interface, an on-board QVGA color display with resistive touch screen, an In-Circuit Debugging Interface (ICDI), microSD card slot, USB Host, Device, and OTG capabilities, and multiple connectors for expandability. The board comes preprogrammed with a quickstart application that is ready to use out of the box to view weather data provided by Open Weather Map (openweathermap.org) for any major city in the world.

1 Using the DK-TM4C129X Development Board

1.1 Requirements

- A PC, with a USB interface, running Microsoft® Windows® 2000 or later
- Tiva TM4C129X Development Kit Documentation and Software USB Flash Drive

1.2 Board Set-Up

The DK-TM4C129X Development Board is configured for immediate use. Before the board is powered on and connected to the computer for the first time, ensure that the Power Select shunt (J11) on the left side of the board is connected between the center pin and the pin labeled *ICDI*. To power the board, connect one of the USB Micro-B cables supplied in the kit to the USB Connector labeled *Debugger USB* on the right edge of the board. Connect the other end of the cable (Type A) to a free USB port on your host PC. This USB port provides debug and Virtual COM Port connectivity when the appropriate drivers and software are installed on the host PC. If connecting the board through a USB hub, it must be a powered hub.

Once the board powers up, the power LEDs at the center left of the board (D9 and D10) light up and the preloaded quickstart application begins to run. The Texas Instruments logo appears on the color QVGA screen as shown in [Figure 1](#) followed by a screen populated with "--" entries for the weather data for Austin, Texas as shown in [Figure 2](#).



Figure 1. Texas Instruments Splash Screen

Tiva, Code Composer Studio, CodeBench are trademarks of Texas Instruments.
Keil is a trademark of Arm Limited.

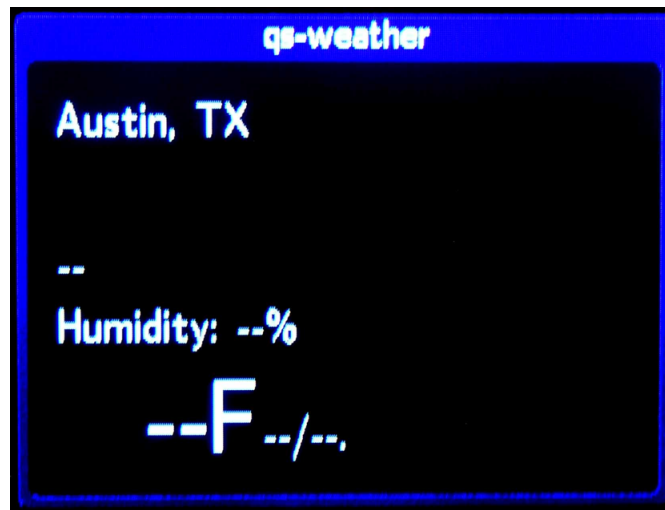


Figure 2. No Data Available to Display

If your computer is on a network behind a corporate firewall, you may need to enter information on your corporate proxy server to access the internet. In this case, swipe top to bottom on the screen to access the Configuration screen shown in [Figure 3](#) and slide the "Proxy" switch to the "On" position.

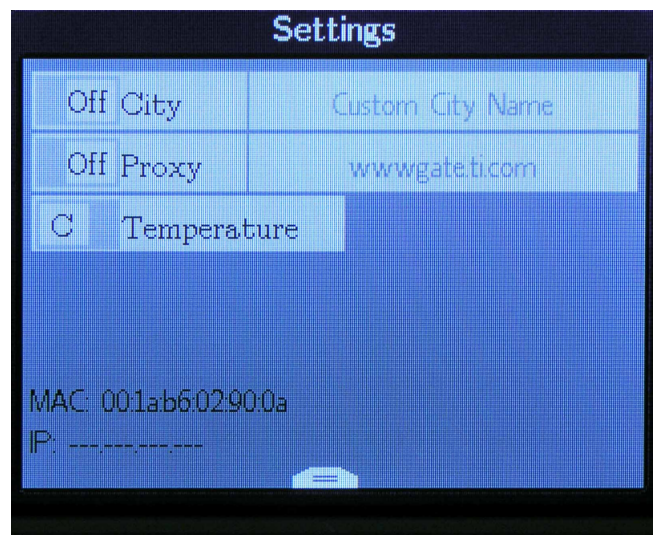


Figure 3. Configuration Menu

Tap inside the proxy data field and a touch screen keyboard is shown as in [Figure 4](#). Enter the proxy information using the keyboard and touch "Ent."

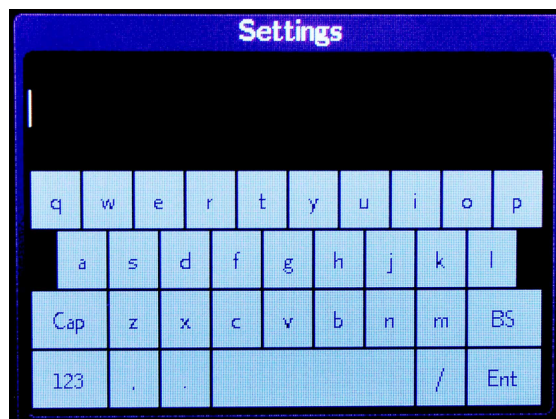


Figure 4. Touch Screen Keyboard

You then return to the Configuration display. Swipe bottom to top to return to the weather data display. Data becomes available for each city, as shown in [Figure 5](#), sequentially with a delay of a few seconds between cities. Swipe left to right or right to left to scroll through the list of pre-programmed cities.

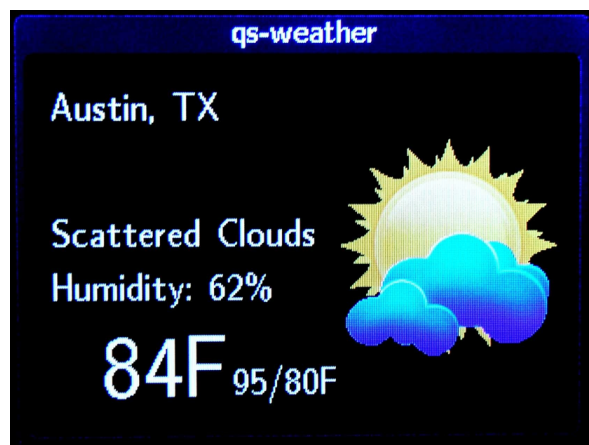


Figure 5. Filled-In Data Screen

If you enter a city name that cannot be found, the screen displays "City Not Found." [Figure 6](#) shows the result when the character "h" is entered.

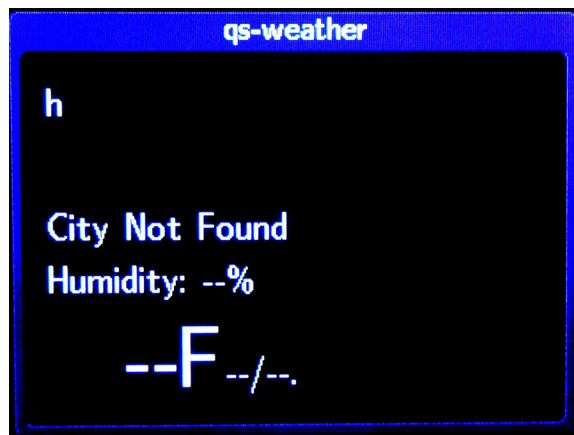


Figure 6. Incorrect City Screen

1.3 Install Drivers on the Host Computer

In order to debug and download a custom application in the microcontroller's flash memory and use Virtual COM Port connectivity, you must first install the following drivers on the host computer:

- Stellaris Virtual Serial Port
- Stellaris ICDI JTAG/SWD
- Stellaris ICDI DFU

Please see [SPMU287](#) for detailed instructions on the driver install process.

NOTE: The ICDI drivers identify themselves as Stellaris ICDI, but they work properly with both Stellaris and Tiva microcontroller kits.

These drivers provide the debugger with access to the JTAG/SWD interface and the host PC with access to the Virtual COM Port. With these drivers installed, Windows automatically detects any new Tiva boards (with a Stellaris ICDI) that you connect to your computer and installs the required drivers for you.

2 Configuring the Weather Display Quickstart Application

The DK-TM4C129X development board comes preprogrammed with the Weather Display quickstart application. Once you power the board and connect it to the internet with an Ethernet cable, this application runs automatically. The quickstart application displays current weather data along with forecasted high and low temperatures for 30 cities around the world. The user can input another city to see data for that city and can configure temperature data to display in degrees Celsius or degrees Fahrenheit. The application supports the use of an internet proxy that can be entered by the user.

Swipe your finger across the screen to the left or right to scroll through the pre-programmed cities. Swipe your finger down the screen to get to the Configuration display, which provides the following options:

- Toggle switch to enable a custom city and a city data field to enter the city name. The city name should be entered as "City, State" for cities in the United States and "City, Country" for cities in other countries. The city that is manually entered appears in the city list after Vancouver, Canada.
- Toggle switch to enable a proxy server and a proxy data field to enter the proxy information.
- Toggle switch to change from degrees Celsius or degrees Fahrenheit.

The MAC and IP addresses are visible at the bottom of the Configuration display. If you enter a custom city or a proxy server, this information is stored away from the application in Flash memory and persists if the application is reprogrammed onto the board. To remove these entries, you must erase the entire Flash memory.

3 Using the Weather Display Quickstart Application

You can navigate among the screens by swiping on the screen. Side-to-side swipes scroll through the list of cities. Swiping top to bottom opens the Configuration display and swiping bottom to top closes the Configuration display. In addition, you can tap the screen to bring up some navigational arrows. Tap the arrows to move through the city list. Tap the tab at the top to open the Configuration display and tap the tab at the bottom to close it.

Note that there may be a small delay in data availability as data is obtained from Open Weather Map. The application uses the lwIP stack to obtain an address through DNS, resolve the address of the Open Weather Map site and then build and handle all of the requests necessary to access the weather information. The data is updated once when the application starts, so any subsequent views of the data are not updated. To update the weather data, press the Reset button. Be aware that the Open Weather Map site limits the number of requests coming from a single IP address and may fail to respond if a request for data for a city is made more often than once every 10 minutes.

4 Software Development Tools

To begin exploring other software examples and create your own projects, open the directory on the included USB flash drive and install the TivaWare package using the installer in the */TivaWare* directory. Also install and run the software development tools such as CCS, CodeBench, IAR, Keil, LM Flash Programmer, and so on, that are included in the */Tools* folder.

5 Debugging

In order to download code to the microcontroller's flash memory and debug the code, the onboard ICDI can be used. The onboard ICDI supports source-level debugging and code download to the microcontroller's flash memory using supported toolchains.

6 References

The following documents are included on the Tiva DK-TM4C129X Development Kit Documentation and Software USB Flash Drive and are also available for download from the Texas Instruments website at www.ti.com/tiva:

- Tiva TM4C129X Development Kit User's Guide ([SPMU357](#)).
- TivaWare™ Peripheral Driver Library User's Manual ([SPMU298](#)).
- Tiva TM4C129XH6PGE Microcontroller Data Sheet ([SPMS375](#)).
- DK-TM4C129X Getting Started Guide ([SPMU361](#)).
- Tiva C Series Development and Evaluation Kits for Code Composer Studio™ Quickstart Guide ([SPMU352](#)).
- Tiva C Series Development and Evaluation Kits for Keil™ Quickstart Guide ([SPMU355](#)).
- Tiva C Series Development and Evaluation Kits for IAR Quickstart Guide ([SPMU354](#)).
- Tiva C Series Development and Evaluation Kits for CodeBench™ Quickstart Guide ([SPMU356](#)).

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as "components") are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI's terms and conditions of sale of semiconductor products. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

TI assumes no liability for applications assistance or the design of Buyers' products. Buyers are responsible for their products and applications using TI components. To minimize the risks associated with Buyers' products and applications, Buyers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of significant portions of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI components or services with statements different from or beyond the parameters stated by TI for that component or service voids all express and any implied warranties for the associated TI component or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences, lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI's goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed a special agreement specifically governing such use.

Only those TI components which TI has specifically designated as military grade or "enhanced plastic" are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have **not** been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.

Products

Audio	www.ti.com/audio
Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DLP® Products	www.dlp.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
OMAP Applications Processors	www.ti.com/omap
Wireless Connectivity	www.ti.com/wirelessconnectivity

Applications

Automotive and Transportation	www.ti.com/automotive
Communications and Telecom	www.ti.com/communications
Computers and Peripherals	www.ti.com/computers
Consumer Electronics	www.ti.com/consumer-apps
Energy and Lighting	www.ti.com/energy
Industrial	www.ti.com/industrial
Medical	www.ti.com/medical
Security	www.ti.com/security
Space, Avionics and Defense	www.ti.com/space-avionics-defense
Video and Imaging	www.ti.com/video

TI E2E Community

e2e.ti.com