



Torrox Bootloader Datasheet for C2000 Family Microcontrollers

Torrox GmbH & Co. KG
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1.0 Datasheet

1.1 Description

The Torrox bootloader allows the easy, fast, and reliable update and installation of new firmware for C2000 family microcontrollers over the CAN bus.

After a reset, instead of the firmware, the bootloader is running shortly and checks for an installed firmware. The firmware will only be started if that check found a valid and uncorrupted application firmware.

This boot order and checksum test, guarantees that the bootloader can install new firmware, even when the old firmware was faulty or corrupted and that the bootloader will only start firmware that proved to be installed correctly.

For a configurable amount of time, after the bootloader started, the bootloader accepts commands over the CAN bus to start the installation of new firmware. This way, there is no need to trigger any external signals during the boot process. The only interface that the firmware needs to implement, in order to start the bootloader, is the ability to reset the device.

To update the firmware, the device is reset to start the bootloader and the new firmware is transferred over the CAN bus.

1.1.1 Configuration Parameters

The bootloader will be configured specifically to your needs at compile time. You give us the parameters (baud rate, pins, etc.) and options that you need for your project and we will return you the bootloader binary along with the corresponding documentation.

As we understand that a project might undergo some changes during it's live time, we give you the ability to change your parameters 5 times within 2 years.

If you obtain a source code licence, you are free to change your parameters as often as you need to, as you will be able to build the bootloader binary on your own.

1.1.2 Supported Devices

Currently the bootloader supports all devices of the TMS320F2806x, TMS320F28003x, TMS320F28004x, TMS320F2837xS, and TMS320F2837xD series. We plan to further expand this list. So if you didn't find your particular device in that list, contact us to get information as to when we plan to support your device.

1.1.3 Available Client

A command line client to upload new firmware for Windows, Linux and MacOS is shipped with the bootloader. The client runs on a desktop PC and uses a PEAK USB to CAN Bus adapter.

1.1.4 Protocol

The protocol is implemented by a library (written in C99) that is available to interested customers. The protocol requires 4 consecutive, configurable message IDs on the CAN bus and was designed with robustness, reliability, and upload speed in mind.

1.1.5 Client Library

The command line client uses a library that implements the protocol, to update the firmware. This client library is written in C99 and factors out, the access to hardware like CAN bus and timers. Customers can use this library to implement their own clients or to integrate the firmware update into their own systems.

The source code of this library will be available to interested customers and is free of charge.

1.1.6 Deliveries

The bootloader is delivered as hex file, ready to be deployed on your platform. The bootloader is accompanied with:

- Documentation, documenting the use of the bootloader and your design parameters.
- A set of example linker scripts (cmd file), that show you how to adjust your linker script to allow your application to be installed by the bootloader.
- Command line clients to upload / install new firmware.
- Tool to merge the bootloader with your application to a single hex files suitable for the production process.

1.1.7 Required Resources

The bootloader occupies a single flash sector. All other sectors can be used by the firmware with the exception of the last 16 bytes of the last sector. Some versions of the bootloader also require 32 bit of RAM.

1.0 Datasheet

1.2 Order, License and Prices

To order a bootloader, simply send us a mail to Info@Torrox.de, name the device to be supported and the required parameters for your bootloader along with the license, you want to buy.

1.2.1 Single Project License

A single project is either a product, that you offer to the market or a hardware component that you use unchanged internally to build other components or products.

By obtaining a Single Project license, you are allowed to install the bootloader on all C2000 microcontrollers of that project. Different variations of the project are also covered by this license (for example, if you have to change the layout of a PCB and thus have to change the pins for the CAN bus).

There are no limitations to the number of installations of the bootloader and no additional fees per installation.

This license should be your first choice. You can later upgrade your Single Project license to the Company license.

1.2.2 Company License

By obtaining a Company license, you get the right to install the bootloader on as many products, build by your company, as you like to.

There are no limitations to the number of installations of the bootloader and no additional fees per installation.

If you have already a Single Project licence, you can easily upgrade to the Company license by simply paying the price difference between both licences.

1.2.3 Prices

To get the most resent price list, please follow this link: <https://www.torrox.de/prices/>

2.0 Legal

2.1 Disclaimer

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2.0 Legal

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