

Embedded Artists' LPC2103 Christmas Tree



The Art of Embedded Systems Development – made Easy™

Please read this paper – Important Information

Thank you for buying Embedded Artists' *Christmas Tree* based on NXP's LPC2103 ARM7TDMI-S microcontroller. This box contains the following:

- One (1) *LPC2103 Christmas Tree* board, v1.2
- One (1) USB cable (mini-B to A)

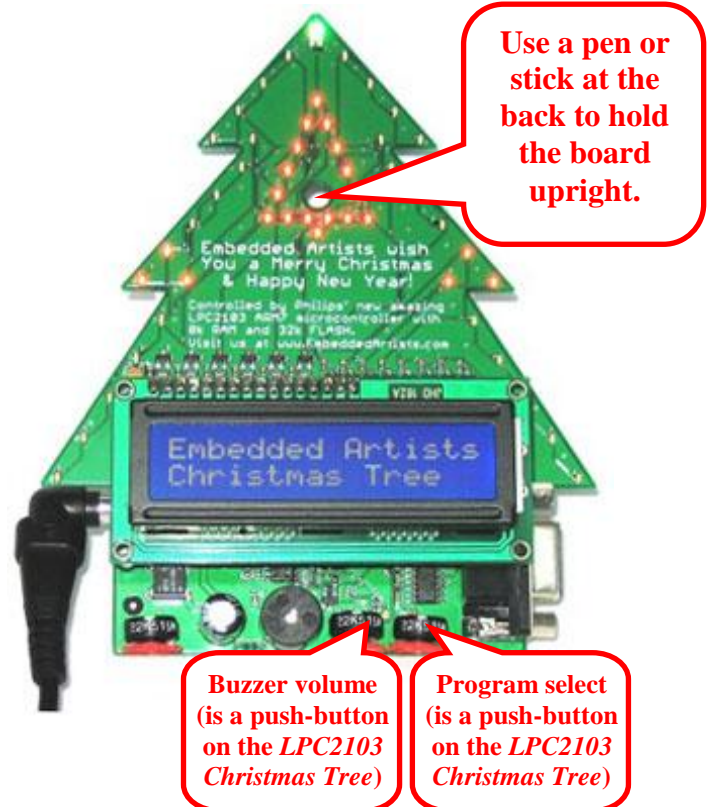
The board is powered via USB, which is also used for application program updates and/or connecting the *Christmas Tree* to the Internet.

Adjusting the Christmas Tree

There are two pushbuttons, one for adjusting the buzzer volume (in a few coarse steps) and selecting LED flash program (one of 8 different).

A short pen or a small stick can be used to hold the board in an upright position (via the small hole in the middle of the board).

The picture to the right illustrates an older version of the *LPC2103 Christmas Tree* (v1.0), which is almost identical to the new *LPC2103 Christmas Tree*, v1.2. Instead of trim potentiometers for adjusting the volume and selecting program (which the picture illustrates), the new *LPC2103 Christmas Tree* uses pushbuttons. Also the *Christmas Tree* is now powered via USB and has no serial port (instead it has serial channel over USB).



Registering as a Customer

Remember to register as a customer at Embedded Artists.

By registering, you will get access to all the source code, development environment and program updates.

You can also send Christmas greeting to all other users of this *Christmas Tree*

Registering is easy and done quickly.

- 1) Go to <http://www.EmbeddedArtists.com>, select *Support* and then *Register*.
- 2) Type in the products serial number (see label to the right) along with your personal information.
- 3) If you have many different boards, it's important that you register all serial numbers (and not just one of them).

If you experience any problem, contact: support@EmbeddedArtists.com

Product Serial Number

Internet Connection

You can download a java program from the support page. There are also instructions on how to start the program (it's really easy, just use the included bat-files). Messages from other *Christmas Tree* users can be displayed on your *Christmas Tree* via this PC-program. You can send your own messages via the support page. The *LPC2103 Christmas Tree* communicates with the PC via USB.



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Application Program Update

Updating the application program is really simple. Just follow the four steps below:

- 1) Download *Flash Magic* from Embedded Systems Academy. This download/ISP tool is now the official tool recommended by NXP to use with the LPC2xxx series.
<http://www.flashmagictool.com/download.html&d=FlashMagic.exe>
- 2) Download the hex-file of the updated application program, typically from our support page.
- 3) Install the FTDI USB driver and configure the USB serial COM port to a number between 1 and 5, 57600 bps, 8N1, no flow control. The FTDI VCP USB driver (VCP = Virtual Com Port) can be found at:
<http://www.ftdichip.com/Drivers/VCP.htm>
- 4) Start *Flash Magic*, set COM Port, Baud Rate to 115200, Device to LPC2103, Interface to None (ISP), and Oscillator Freq. to 14,746. Also check the 'Use DTR and RTS...' checkbox (found under Options – Advanced Options – Hardware Config-tab. Also set T1 and T2 numbers to 400 ms on the same config page.
Then select the hex-file to download (via the Browse-button) and then press the *Start*-button to download.
- 5) You can verify that the program update was successful by connecting the serial port of the Christmas Tree to a terminal (use setting: 57600, 8N1) and check the startup message. Note that Windows™ Hyperterminal does not work since it controls the DTR/RTS pins in a way that will reset the *Christmas Tree*. Flash Magic has an integrated terminal.

Hopefully new versions of the application program will be available soon from users contributing enhancements. Check out the support page.

Source Code and Program Development

You can download everything you need for program development on the board from our support page. Everyone is encouraged to contribute with new features and functionality.

Some Final Notes

- The volume of the buzzer is controlled digitally and is not exact. Further, the piezo-electric buzzer can resonate at some frequencies which make the tone/note sound a little louder or sometimes out-of-tune. The buzzer is of course not an ideal speaker for playing songs, but for this purpose we think it is OK.
- The possibility to send Christmas greetings to all other users is a privilege under responsibility. You are under no circumstances allowed to write anything offending (race, religion, sex, etc.) or advertise products. ***Only nice greetings in the spirit of the Christmas are allowed.*** If you violate this we will cancel your support account and in worst case start screening messages before they are sent. ...so please let the spirit of the Christmas guide your usage of this unique possibility!

Last but not least; **A Merry Christmas and A Happy New Year!!!**